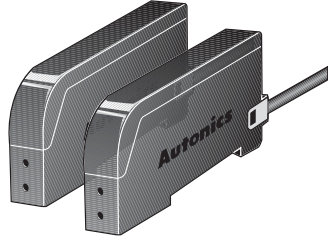


# Selection Guide

## FIBER OPTIC SENSOR(BF4R SERIES)

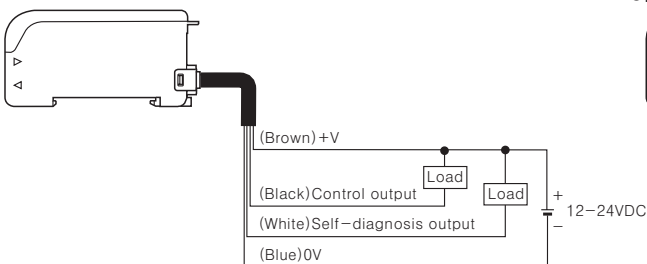
### Specifications

Model	Standard type				External synchronization input type		Remote sensitivity setting type	
	BF4RP	BF4GP	BF4R	BF4G	BF4R-E	BF4G-E	BF4R-R	BF4G-R
Appearances	 <p>CE</p> <p>[W12×H32.8×L65.3mm]</p>							
Response Frequency	Max. 0.5ms (FREQ.1), Max. 0.7ms (FREQ.2)							
Power voltage	12-24VDC ±10%, Ripple P-P:Max. 10%							
Current consumption	Max. 45mA							
Light source (Modulated)	Red LED	Green LED	Red LED	Green LED	Red LED	Green LED	Red LED	Green LED
Sensitivity adjustment	Selectable sensitivity adjustment button							
Operation mode	Selectable sensitivity with ON/OFF button							
Control output	<b>PNP O · C output</b>				<b>NPN O · C output</b>			
	Load current:Max. 100mA Applied voltage:Max. 30VDC Output voltage:Min. (Power supply -2.5)VDC				Load current:Max. 100mA, Applied voltage:Max. 30VDC Residual voltage:Max. 1V (at 100mA load current), Max. 0.4V (at 16mA load current)			
Self-diagnosis output	ON state under unstable sensing (When the target stays for 300ms in unstable level), ON state when control output short-circuited							
	Load current:Max. 50mA Applied voltage:Max. 30VDC Output voltage:Min. (Power supply -2.5)VDC				Load current:Max. 50mA, Applied voltage:Max. 30VDC Residual voltage:Max. 1V (at 50mA load current), Max. 0.4V (at 16mA load current)			
Protection circuit	Short-circuit protection, Reverse polarity protection circuit							
Indicator	Operation indicator:Red LED, Stability indicator:Green LED flash when the target stays in stable sensing level							
Stop transmission function	—	—	—	—	Including		—	—
External synchronization function	—	—	—	—	Including (Gate/Trigger)		—	—
Remote sensitivity setting function	—	—	—	—	—	—	Including	
Interference prevention function	Including differential frequency function (Selectable FREQ.1 or FREQ.2 by ON/OFF button)							
Timer function (Selectable)	OFF delay timer (Approx. 40ms fixed)				—	—	OFF delay timer (Approx. 40ms fixed)	

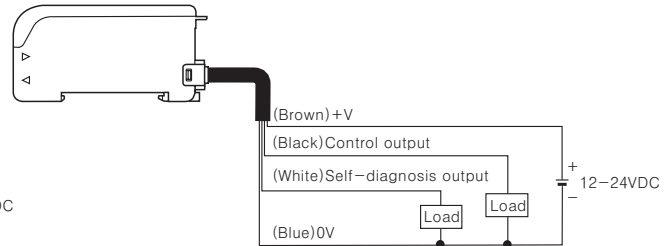
※ (Note1) Frequency1 (Normal mode) : Max. 0.5ms, Frequency2 : Max.0.7ms

### Connections

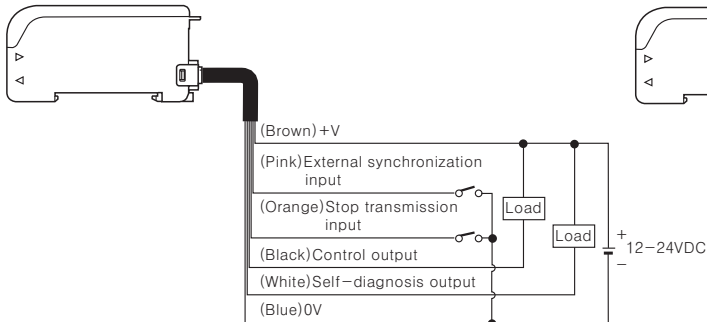
#### ●BF4R/BF4G



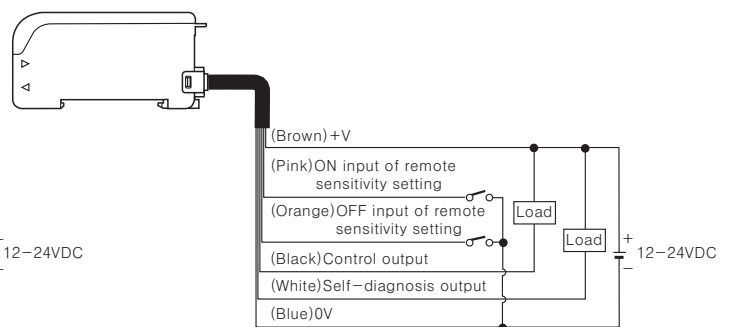
#### ●BF4RP/BF4GP



#### ●BF4R-E/BF4G-E

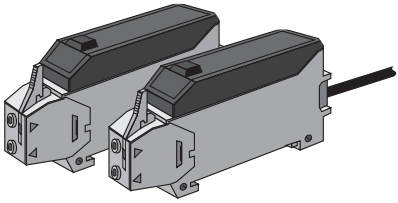


#### ●BF4R-R/BF4G-R



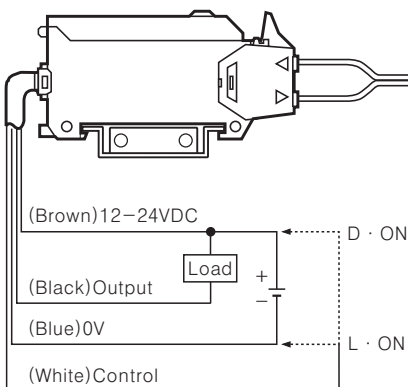
## FIBER OPTIC SENSOR(BF3R SERIES)

### Specifications

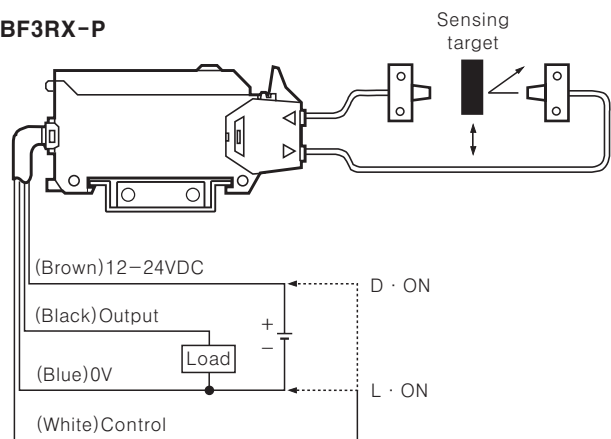
Model	BF3RX	BF3RX-P
Appearances	 [W15×H39×L73mm]	
Response time	Max. 1ms	
Power supply	12-24VDC ±10% (Ripple P-P:Max. 10%)	
Current consumption	Max. 40mA	
Light source	Red LED (Modulated)	
Sensitivity adjustment	Adjuster (Dual adjustment : Coarse adjustment, Fine adjustment)	
Operation mode	Selectable Light ON/Dark ON by control wire	
Control output	<b>●NPN open collector output</b> Load voltage : Max. 30VDC, Load current : Max. DC200mA, Residual voltage : Max. 1VDC	<b>●PNP open collector output</b> Output voltage : Min. (Power supply-2.5)VDC Load current : Max. DC200mA
Protection circuit	Reverse polarity protection, Output short-circuit protection	
Indicator	Operation indicator : Red LED	
Connection	Outgoing cable 2m	

### Connections

#### ●BF3RX



#### ●BF3RX-P



※ Enable to use as Diffuse reflective type or Transmitted beam type according to the fiber Optic Cable.

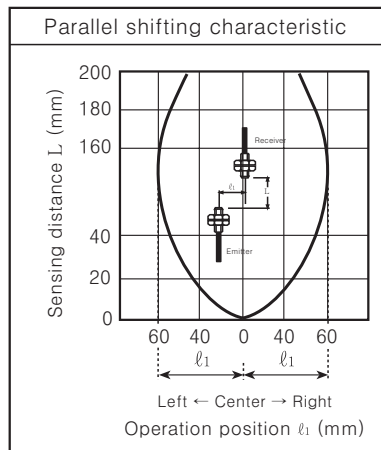
※ Adapter marked Fiber Optic Cable should be used with Adapter ( ).

※ GT-420-14H2 can not be used because the length inserted into Amp is too short.

### Feature data

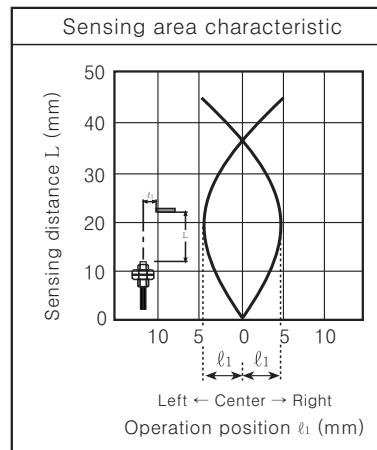
#### ○Transmitted beam

##### ●BF3RX + FT-420-10








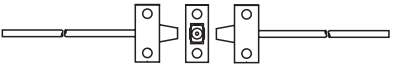

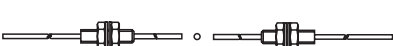





#### ○Diffuse reflective

##### ●BF3RX + FD-620-10



# Selection Guide

## FIBER OPTIC CABLE(TRANSMITTED BEAM)

Dimension	Model	(Note1) Cable length(L)	(Note2) Sensing distance (mm)	(Note3) Min. sensing target	Allowable bend radius	Temperature
Free cut 	FT-320-05	2m	150	φ 0.5	15R	-40~+70℃ (Humidity:35~85%RH)
Free cut 	FT-420-10	2m	500	φ 1	30R	
Free cut Cylinder type 	FTC-220-05	2m	150	φ 0.5	15R	
Free cut Cylinder type 	FTC-320-10	2m	500	φ 1	30R	
Free cut SUS Cylinder type 	FTCS-220-05	2m	150	φ 0.5	15R	
Free cut Plastic type 	FTP-320-10	2m	500	φ 1	30R	
Free cut High-flex type 	FT-420-13	2m	400	φ 1	4R	
Free cut SUS type 	FTS-320-05	2m	150	φ 0.5	15R (SUS part 10R)	
	FTS2-320-05					
Free cut SUS type 	FTS-420-10	2m	500	φ 1.0	30R (SUS part 10R)	
	FTS2-420-10					
Free cut SUS type 	FTS1-320-05	2m	150	φ 0.5	15R	
Free cut Heat-resistant type 	FT-420-10H	2m	300	φ 1.0	30R	-40~+105℃
Free cut Heat-resistant type 	FT-420-15H1	2m	500	φ 1.0	50R	-40~+150℃
Glass type Heat-resistant type For BF4R 	GT-420-13H2	2m	400	φ 1.0	25R	-40~+250℃

※ (Note1) Fiber optic cable out of the rated length can be customizable.

※ (Note2) 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.

※ (Note3) Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance(Note2).

※ Free cut The sensing distance can be shortened about 20% than the normal according to condition of the cable. [(FC-2) should be used for cutting fiber cable.]

※ Glass type is for BF4R Series.

## FIBER OPTIC CABLE(DIFFUSE REFLECTIVE)

Dimension	Model	(Note1) Cable length(L)	(Note2) Sensing distance (mm)	(Note3) Min. sensing target	Allowable bend radius	Temperature
Free cut	FD-320-05	2m	40	φ 0.03	15R	-40~+70℃ (Humidity:35~85%RH)
Free cut	FD-420-05	2m	40	φ 0.03	15R	
Free cut	FD-620-10	2m	120	φ 0.03	30R	
Free cut Cylinder type	FDC-320-05	2m	40	φ 0.03	15R	
Free cut SUS Cylinder type	FD-CS-320-05	2m	40	φ 0.03	15R	
Free cut Plastic type	FDP-320-10	2m	120	φ 0.03	30R	
Free cut SUS type	FDS-320-05	2m	40	φ 0.03	15R (SUS part 10R)	
SUS type	FDS2-320-05					
Free cut SUS type	FDS-420-05	2m	40	φ 0.03	15R (SUS part 10R)	
SUS type	FDS2-420-05					
Free cut SUS type	FDS-620-10	2m	120	φ 0.03	30R (SUS part 10R)	
SUS type	FDS2-620-10					
Free cut Coaxial type	FD-320-F	2m	40	φ 0.03	15R	
Free cut Coaxial type	FD-320-F1	2m	60	φ 0.03	15R	
Free cut Coaxial type	FD-620-F2	2m	120	φ 0.03	30R	
Free cut Heat-resistant type	FD-620-10H	2m	120	φ 0.03	30R	-40~+105℃
Free cut Heat-resistant type	FD-620-15H1	2m	160	φ 0.03	50R	-40~+150℃
Glass type Heat-resistant type For BF4R	GD-420-20H2	2m	100	φ 0.03	50R	-40~+250℃
Glass type Heat-resistant type For BF4R	GD-620-20H2	2m	100	φ 0.03	50R	-40~+250℃

※ (Note1) Fiber optic cable out of the rated length can be customizable.

※ (Note2) The sensing distance is a standard for Red LED of BF4 Series and the sensing target is □ 50mm of non-glossy white paper and 10% of Red LED is applied when it is Green LED.  
(FD-620 Type is the value measured at the max. sensitivity using □ 100mm of non-glossy white paper.)

※ (Note3) Min. sensing target is a value measured opaque material in accurate output status and the sensing distance is different with the rated sensing distance(Note2).

※ Free cut The sensing distance can be shortened about 20% than the normal according to condition of the cable.  
[(FC-2) should be used for cutting fiber cable.]

※ Glass type is for BF4R Series.

# Selection Guide

## FIBER OPTIC CABLE

Model	Diffuse reflective	Model	Transmitted beam
<b>FD-320-05</b> M3-D0.5 	<b>FT-320-05</b> M3-D0.5 		
<b>FD-420-05</b> M4-D0.5 	<b>FT-420-10</b> M4-D1.0 		
<b>FD-620-10</b> M6-D1.0 	<b>FTC-220-05</b> φ2-D0.5 		
<b>FDC-320-05</b> M3-D0.5 	<b>FTC-320-10</b> φ3-D1.0 		
<b>FDCS-320-05</b> φ3-D0.5 SUS φ1.5×15mm 	<b>FTCS-220-05</b> φ1.0-D0.5 SUS φ1×15mm 		
<b>FDP-320-10</b> D1.0×2 Plastic 	<b>FTP-320-10</b> D1.0 Plastic 		
<b>FDS-320-05</b> M3-D0.5 SUS φ1.5×90mm 	<b>FT-420-13</b> M4-D0.265×16 		
<b>FDS2-320-05</b> M3-D0.5 SUS φ1.5×45mm 	<b>FTS-320-05</b> M3-D0.5 SUS φ1.0×90mm 		
<b>FDS-420-05</b> M4-D0.5 SUS φ1.5×90mm 	<b>FTS1-320-05</b> M3-D0.5 SUS φ1.0×35mm 		
<b>FDS2-420-05</b> M4-D0.5 SUS φ1.5×45mm 	<b>FTS2-320-05</b> M3-D0.5 SUS φ1.0×45mm 		
<b>FDS-620-10</b> M6-D1.0 SUS φ2.5×90mm 	<b>FTS-420-10</b> M4-D1.0 SUS φ1.5×90mm 		
<b>FDS2-620-10</b> M6-D1.0 SUS φ2.5×45mm 	<b>FTS2-420-10</b> M4-D1.0 SUS φ1.5×45mm 		
<b>FD-320-F</b> Co-axial M3 φ0.5, φ0.25×4 	<b>FT-420-15H</b> M4-D1.0 Heat Resistant 105°C 		

FIBER OPTIC CABLE

<p><b>Model</b></p> <p><b>FT-420-15H1</b></p> <p>M4-D1.0 Heat Resistant 150°C</p> <p>Free cut</p>	<p><b>Model</b></p> <p><b>GT-420-13H2</b></p> <p>M4-D1.4 Heat Resistant Max. 250°C Glass</p> <p>Free cut</p>
<p><b>Model</b></p> <p><b>FD-320-F1</b></p> <p>Co-axial M3 φ0.5, φ0.25×9</p> <p>Free cut Adapter</p>	<p><b>Model</b></p> <p><b>FD-620-15H1</b></p> <p>M6-D1.5 Heat Resistant 150°C</p> <p>Free cut</p>
<p><b>Model</b></p> <p><b>FD-620-F2</b></p> <p>Co-axial M6 φ1.0 φ0.25×16</p> <p>Free cut</p>	<p><b>Model</b></p> <p><b>GD-420-20H2</b></p> <p>M4-D0.05×1000 Heat Resistant 250°C</p> <p>Free cut</p>
<p><b>Model</b></p> <p><b>FD-620-10H</b></p> <p>M6-D1.0 Heat Resistant 105°C</p> <p>Free cut</p>	<p><b>Model</b></p> <p><b>GD-620-20H2</b></p> <p>M6-D0.05×1000 Heat Resistant 250°C</p> <p>Free cut</p>

Protection tube for fiber optic cable (Sold separately)

◎Usage : Protect cable from impact or cutting

Model	Dimension
<b>FTH-310</b>	
<b>FTH-410</b>	
<b>FDH-610</b>	