

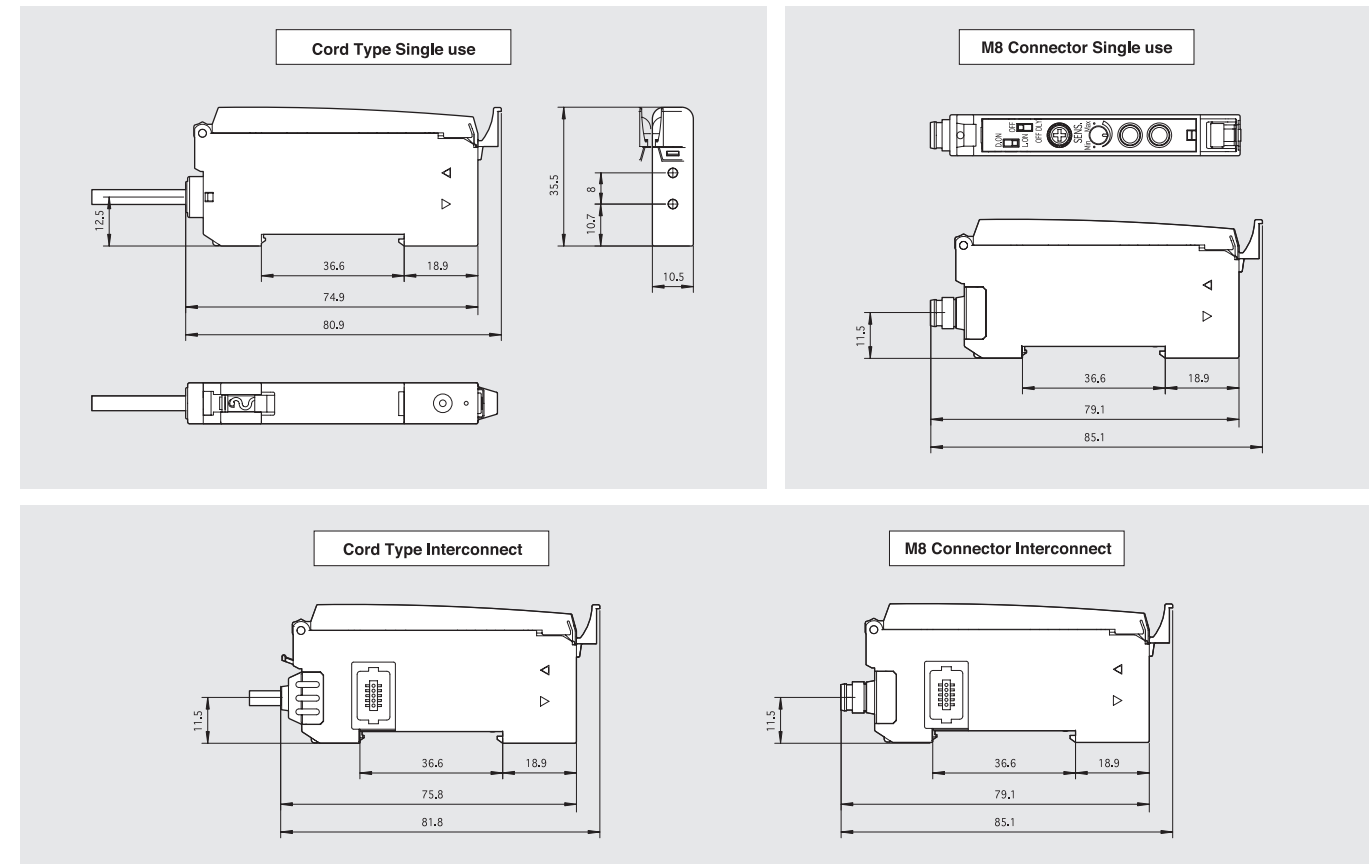
BGF series Mark Sensor

Sensing Chart by colours

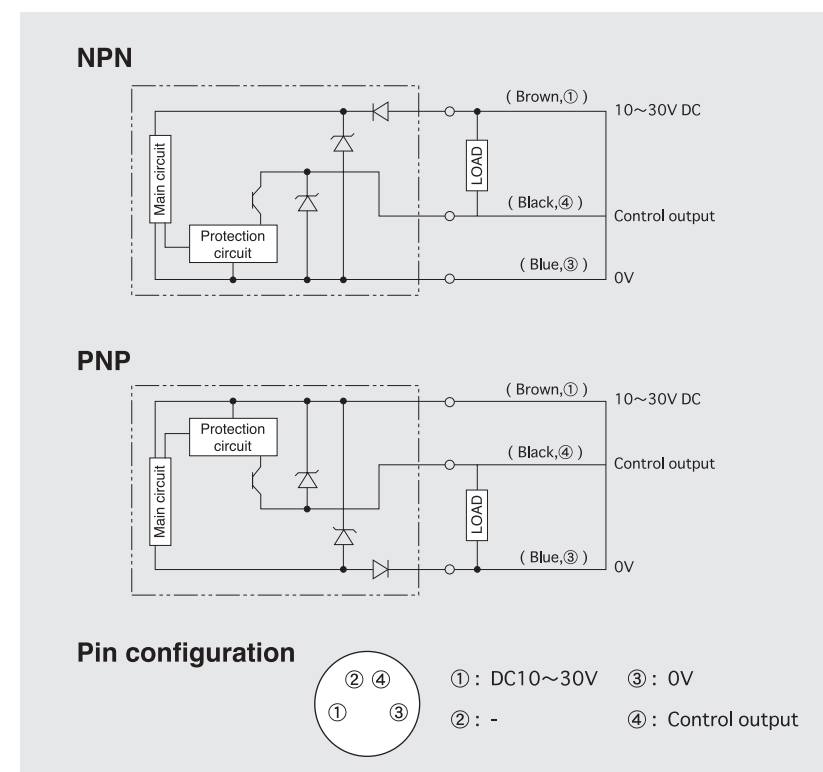
	88N			77N			23N			8N			4N			54N			47N			43N			33N							
	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100				
88N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
77N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
23N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
8N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
54N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
47N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
43N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
33N	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

○ : Stable sensing
 △ : Not recommended

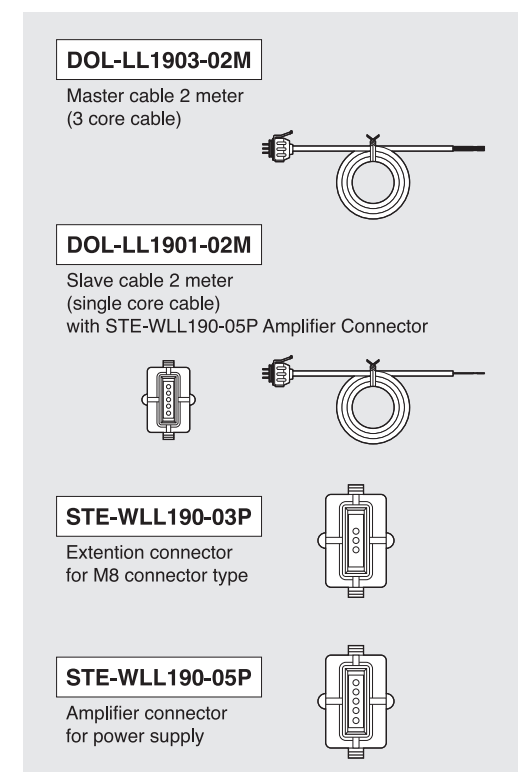
Dimensions



Input/ Output circuit design



Options



● Specifications and technical information not mentioned here are written in Operation Manual. Or visit our website for getting details.
 ● All the warnings and cautions to know prior to use are given in Operation Manual.



Fiberoptic photoelectric sensor

BRF SERIES

- (Stand-alone type)**
 Standard type BRF-N/P
 High Speed type BRF-HN/HP
 Mark type BGF-N/P
 Moisture type BIF-WN/P
- (Interconnection type)**
 Standard type B2RF-N/P
 High Speed type B2RF-HN/HP
 Mark type B2GF-N/P
 Moisture type B2IF-WN/P

32 models of Fiberoptic Sensor BRF series versatiled in 4 basic types ; Standard, High Speed, Mark and Moisture.

Interconnectable up to 100pcs
 (at surrounding temp around 45°C,12V)



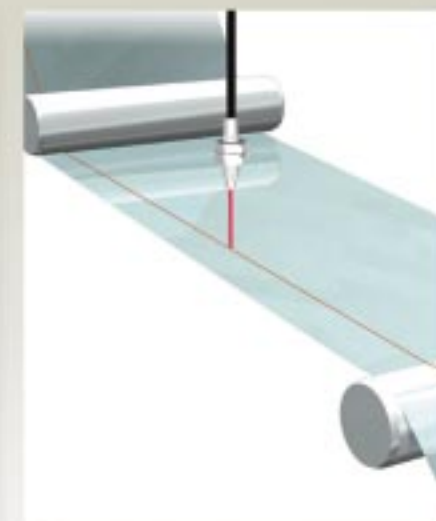
Moisture Type BIF-W Series

Cold/hot glue in a packaging process of box



Mark Type BGF Series

Marks on a transparent film

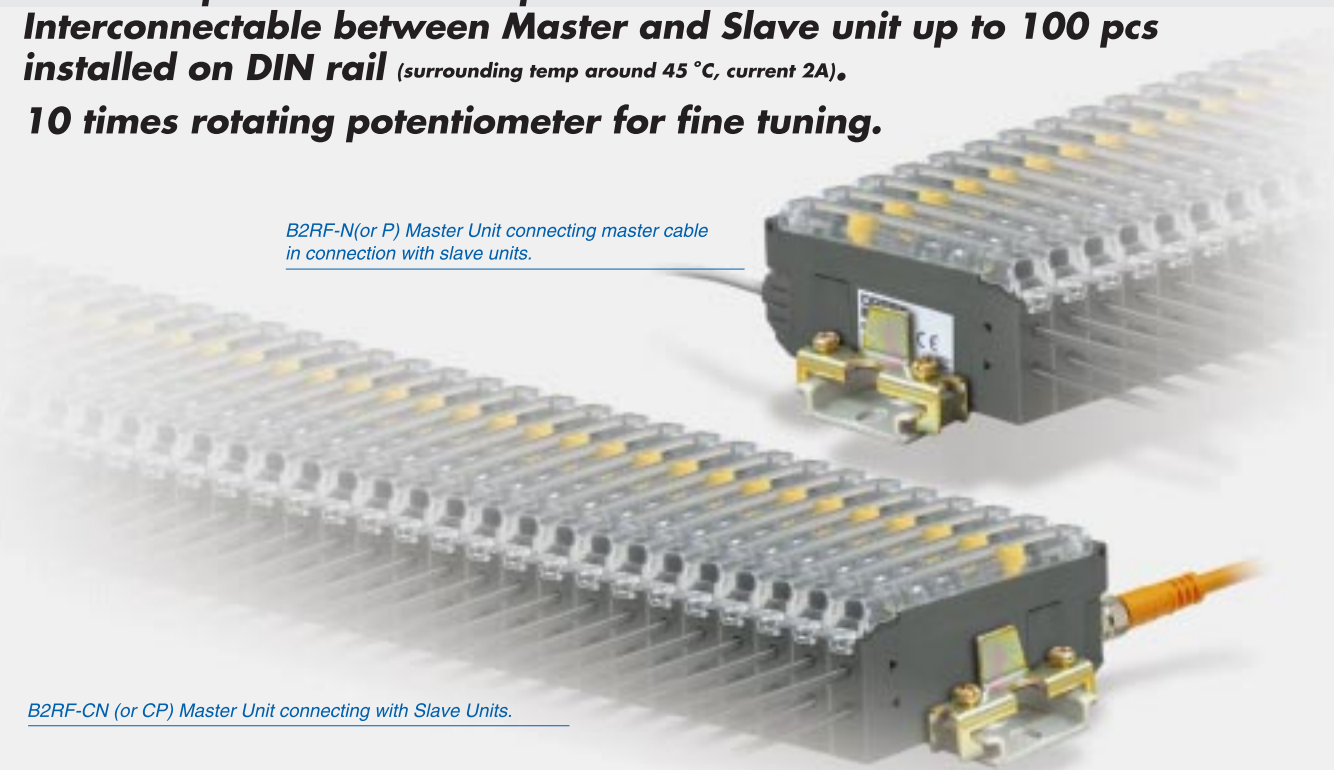


High Speed Type BRF-H Series

Counting plastic buttons



Crosstalk prevention. IP66 protection.
Interconnectable between Master and Slave unit up to 100 pcs installed on DIN rail (surrounding temp around 45 °C, current 2A).
10 times rotating potentiometer for fine tuning.



B2RF-CN (or CP) Master Unit connecting with Slave Units.

System requirements (Example, standard BRF series)

Stand-alone type / Cable lead



BRF-N / BRF-P

Nothing required

Stand-alone type / M8 connector



BRF-CN / BRF-CP

M8 connector cable

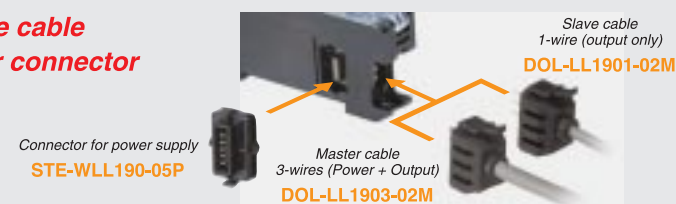


Inter-connecting type / Cable lead



B2RF-N / B2RF-P

Master / Slave cable + amplifier connector



Inter-connecting type / M8 connector

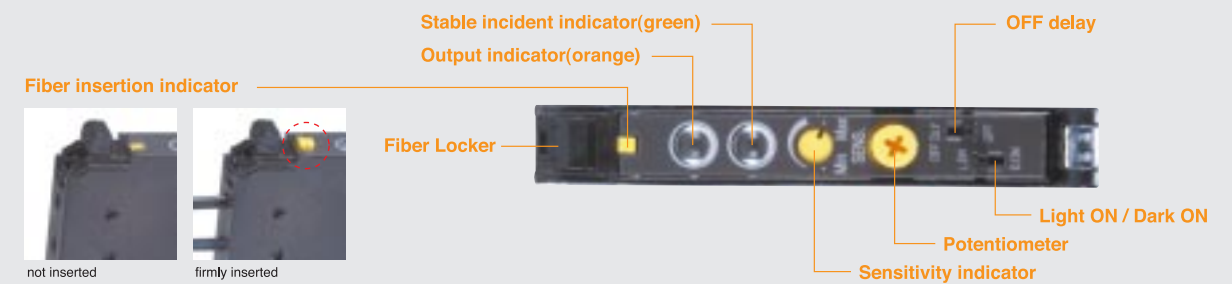


B2RF-CN / B2RF-CP

M8 connector cable + amplifier connector

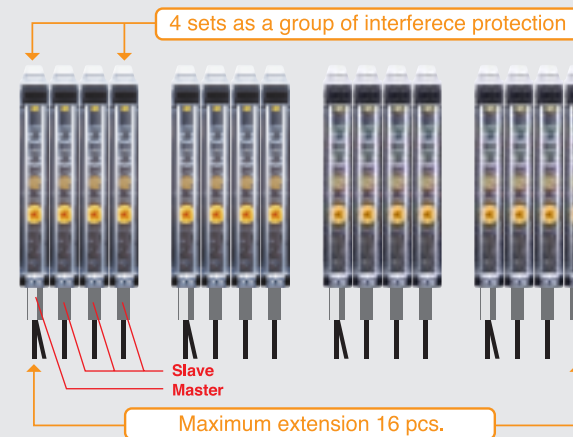


Parts Name



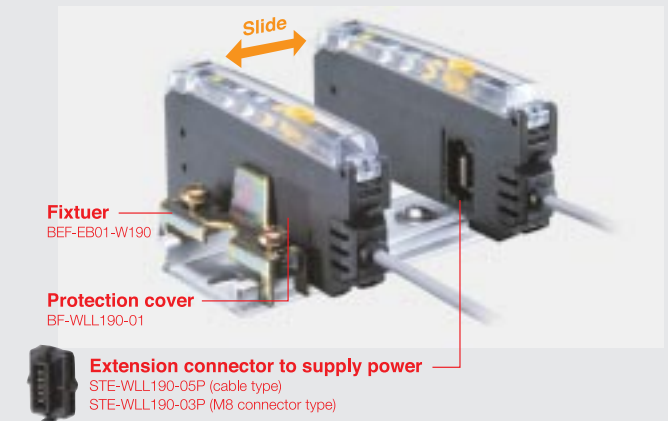
Interference Protection (up to 4pcs)

- Interference Protection functions in 4pcs as a group.
 - You are requested to install every multiple numbers of 4 in case Interference protection was required.
 - Any product of Interconnecting type can function either Master or Slave unit.
- ※ Not able to connect Moisture sensing type to other connectable types due to different response time.

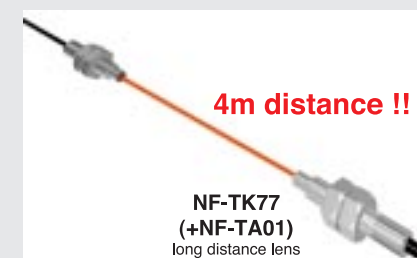


Extension of amplifier

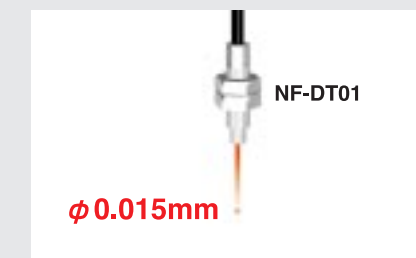
- Up to 100 pcs to be connected via Extension Connector STE-WLL190-05P (for cable type) or via STE-WLL190-03P (for M8 connector type)
- Put to fix on DIN rail, and inter-connect amplifiers with the Extension Connector.
- Protection cover BF-WLL190-01 is useful for masking the hole at Amplifier that is located at the end of row.
- Fixture terminal BEF-BE01-W190 is useful for firmly fixing the amplifier on DIN rail.



Long distance sensing



Min object $\phi 0.015mm$



High Speed response 50 μ sec



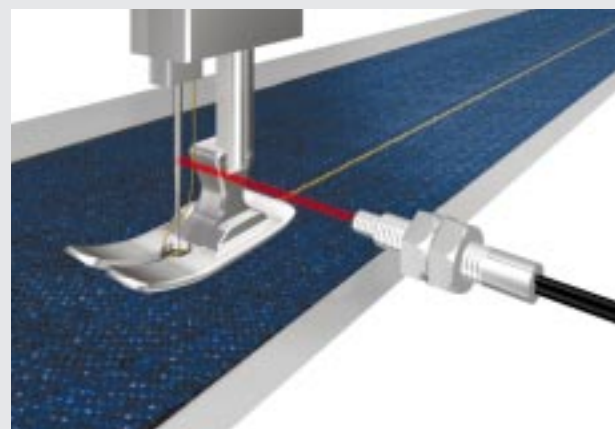
Types and Features

<p>STANDARD TYPE BRF-N or P B2F-N or P and their M8 connector types Basic & strong model</p>	<p>HIGH SPEED TYPE BRF-HN or HP B2RF-N or P and their M8 connector types 50 μ sec speed</p>	<p>MARK TYPE BGF-N or P B2GF-N or P and their M8 connector types Green LED for mark sensing</p>	<p>MOISTURE TYPE BIF-WN or WP B2IF-WN or WP and their M8 connector types Special element that senses moisture of workpiece.</p>
---	---	--	--

Details continued on the next page

4 types are available for versatility of your demands.
Each type has two ways ; Stand-alone use and Inter-connection use.

STANDARD TYPE : Long Distance



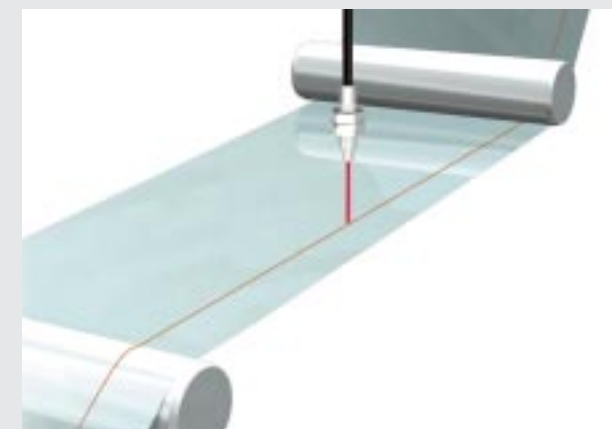
Stand-alone use (BRF-N/P), or parallel use of inter-connection (B2RF-N/P) up to 100 sets. When surrounding temperature up to 45 °C, 12V. 250 μsec response. MAX 4 meter distance with optical lens.

HIGH SPEED TYPE : 50 μsec response



50 Micro Sec speed response even sensing as long as 50 mm distance. A fine setting is available with 10 times rotating potentiometer.

MARK TYPE : 250 μsec response



Designed based upon Green LED as the best device for Mark Sensing.
 250 micro sec response even for dispersion of colors. Delay function of 40msec is available.
 Mixed connection with Standard Type B2RF series is possible.

Unique !

MOISTURE TYPE : 1.45 μm spectral response IR element



A special Infrared LED of 1.45 micron spectral is adopted inside. Water and humid will absorb optical energy at that spectral response, then the sensor will know if the object contains humidity inside.

Remark : Not possible to interconnect with other products of BRF family

Specification

TYPE		STANDARD TYPE	HIGH SPEED TYPE
Stand-alone	Cable type	BRF(N,P)	BRF-H(N,P)
	Connector type	BRF-C(N,P)	BRF-CH(N,P)
Interconnection	Cable type	B2RF(N,P)	B2RF-H(N,P)
	Connector type	B2RF-C(N,P)	B2RF-CH(N,P)
Sensing Distance	90% 250mm×200mm DK-06 Diffuse Fiber	150mm	50mm
Response Time		250us	50us
Output		NPN or PNP Open Collector 100mA/DC30V max. 1.8V/100mA max.	NPN or PNP Open Collector 100mA/DC30V max. 1.8V/100mA max.
Emitter LED		Red LED	Red LED
Indicator	Stable output	Green	Green
	Output	Orange	Orange
Potentiometer		10 rotation	10 rotation
Dark On/Light On selection		Dark On/Light On by SW	Dark On/Light On by SW
Timer		Off Delay 40msec fixed	Off Delay 40msec fixed
Supply Voltage		DC10 ~ 30V Inc. 10% ripple	DC10 ~ 30V Inc. 10% ripple
Current Consumption		25mA/30V (30mA/30V Interconnection type)	25mA/30V (30mA/30V Interconnection type)
Ambient Illuminance	Sunlight	10,000 lx min.	10,000 lx min.
	Incandescent Lamp	3,000 lx min.	3,000 lx min.
Ambient Temperature		-25 ~ +55°C	-25 ~ +55°C
Ambient Humidity		35 ~ 85%	35 ~ 85%
Storage Temp / Humidity		-40 ~ +70°C/35 ~ 95%	-40 ~ +70°C/35 ~ 95%
Insulation Resistance		Min. 20MΩ/DC500V	Min. 20MΩ/DC500V
Noise Resistance	EMC Test	CE regulation	CE regulation
	Failen Test (house test)	Level 3	Level 3
Temperature Drift		±5% max.	±5% max.
LED Damping ratio		-10% max./1000 h	-10% max./1000 h
Vibration Resistance	IEC68	10 ~ 55Hz, 1.5mm	10 ~ 55Hz, 1.5mm
Shock Resistance	IEC68	500m/s ²	500m/s ²
Protection Category	Stand-alone	IP66	IP66
	Interconnection	IP50	IP50
Warm-up Period		100ms max.	100ms max.
Circuit Protection		Overcurrent (output), Reverse Polarity, Short Circuit	Overcurrent (output), Reverse Polarity, Short Circuit
VED Classification		Class 3	class 3
Housing material	Housing	PBT G10	PBT G10
	Cover	PC	PC
Dimensions		W10.5 x D80 x H35.5mm	W10.5 x D80 x H35.5mm
Regulation	UL	cRU recognition	cRU recognition
	CE	CE sign	CE sign

Specification

Type		MARK TYPE	MOISTURE TYPE
Stand-alone	Cable type	BGF(N,P)	BIF-W(N,P)
	Connector type	BGF-C(N,P)	BIF-CW(N,P)
Interconnection	Cable type	B2GF(N,P)	B2IF-W(N,P)
	Connector type	B2GF-C(N,P)	B2IF-CW(N,P)
Sensing Distance	90% 250mm×200mm DK-06 Diffuse Fiber	40mm	30mm Diffuse 100mm Thru-beam
Response Time		250us	1msec
Output		NPN or PNP Open Collector 100mA/DC30V max. 1.8V/100mA max.	NPN or PNP Open Collector 100mA/DC30V max. 1.8V/100mA max.
Emitter LED		Green LED	Infrared LED
Indicator	Stable output	Green	Green
	Output	Orange	Orange
Potentiometer		10 rotation	10 rotation
Dark On/Light On selection		Dark On/Light On by SW	Dark On/Light On by SW
Timer		Off Delay 40msec fixed	Off Delay 40msec fixed
Supply Voltage		DC10 ~ 30V Inc. 10% ripple	DC10 ~ 30V Inc. 10% ripple
Current Consumption		25mA/30V (30mA/30V Interconnection type)	25mA/30V (30mA/30V Interconnection type)
Ambient Illuminance	Sunlight	10,000 lx min.	10,000 lx min.
	Incandescent Lamp	3,000 lx min.	3,000 lx min.
Ambient Temperature		-25 ~ +55°C	-25 ~ +55°C
Ambient Humidity		35 ~ 85%	35 ~ 85%
Storage Temp / Humidity		-40 ~ +70°C/35 ~ 95%	-40 ~ +70°C/35 ~ 95%
Insulation Resistance		Min. 20MΩ/DC500V	Min. 20MΩ/DC500V
Noise Resistance	EMC Test	CE regulation	CE regulation
	Failen Test (house test)	Level 3	Level 3
Temperature Drift		±5% max.	±5% max.
LED Damping ratio		-10% max./1000 h	-10% max./1000 h
Vibration Resistance	IEC68	10 ~ 55Hz, 1.5mm	10 ~ 55Hz, 1.5mm
Shock Resistance	IEC68	500m/s ²	500m/s ²
Protection Category	Stand-alone	IP66	IP66
	Interconnection	IP50	IP50
Warm-up Period		100ms max.	100ms max.
Circuit Protection		Overcurrent (output), Reverse Polarity, Short Circuit	Overcurrent (output), Reverse Polarity, Short Circuit
VED Classification		class 3	class 3
Housing material	Housing	PBT G10	PBT G10
	Cover	PC	PC
Dimensions		W10.5 x D80 x H35.5mm	W10.5 x D80 x H35.5mm
Regulation	UL	cRU recognition	cRU recognition
	CE	CE sign	CE sign

Sensing distance

Thru-Beam type

Type	STANDARD	HIGH SPEED	MARK	bending R	Ambient Temperature	Object	
	Sensing Distance numeric value	Sensing Distance numeric value	Sensing Distance numeric value			Standard	Min.
Standard							
NF-TS07	700	350	350	R30	-40~70°C	φ 1.5mm	φ 0.5mm
NF-TB01	700	350	350	R30	-40~70°C	φ 1.5mm	φ 0.5mm
NF-TB01-10	400	160	260	R30	-40~70°C	φ 1.5mm	φ 0.5mm
NF-TB02	450	160	130	R25	-40~70°C	φ 1.0mm	φ 0.2mm
Super Flexible							
NF-TK05	360	120	110	R2	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TK77	360	120	110	R2	-40~70°C	φ 1.0mm	φ 0.2mm
Flexible							
NF-TR01	330	120	120	R4	-40~70°C	φ 1.0mm	φ 0.3mm
NF-TR02	110	35	20	R4	-40~70°C	φ 0.5mm	φ 0.1mm
NF-TR03	110	35	20	R4	-40~70°C	φ 0.5mm	φ 0.1mm
Sleeve Head							
NF-TB03	450	160	130	R25	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TT01	30	12	4	R15	-40~70°C	φ 0.25mm	φ 0.1mm
NF-TK75	120	40	25	R15	-40~70°C	φ 0.5mm	φ 0.1mm
Side View							
NF-TV01	320	110	85	R25	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TV02	75	25	15	R15	-40~70°C	φ 0.5mm	φ 0.1mm
NF-TV04	75	25	15	R15	-40~70°C	φ 0.5mm	φ 0.1mm
NF-TS08	350	120	110	R25	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TS12	1700	830	750	R25	-40~70°C	φ 1.7mm	φ 0.5mm
NF-TK34	320	110	85	R25	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TK16	2000	900	800	R25	-40~100°C	φ 1.0mm	φ 0.2mm
Array Head							
NF-TS01	330	120	85	R25	-40~70°C	φ 2.0mm	φ 1.0mm
NF-TS14	330	120	85	R25	-40~70°C	φ 1.5mm	φ 0.5mm
Heat Resistance							
NF-TH01 (100°C)	300	120	45	R25	-40~100°C	φ 1.0mm	φ 0.2mm
NF-TH02 (180°C)	600	250	120	R35	-40~180°C	φ 1.5mm	φ 0.5mm
NF-TH84 (300°C)	350	150	130	R25	-40~300°C	φ 1.0mm	φ 0.2mm
Fluorescesen							
NF-TY01	2000	400	380	R60	-40~100°C	φ 4.0mm	φ 0.3mm
NF-TY02	550	220	210	R60	-40~100°C	φ 4.0mm	φ 0.3mm
Small Head							
NF-TM01	450	160	130	R25	-40~70°C	φ 1.0mm	φ 0.2mm
NF-TM02	120	40	25	R15	-40~70°C	φ 0.5mm	φ 0.1mm
NF-TM03	120	40	25	R15	-40~70°C	φ 0.5mm	φ 0.1mm

Diffuse

Type	STANDARD	HIGH SPEED	MARK	bending R	Ambient Temperature	Object	
	Sensing Distance numeric value	Sensing Distance numeric value	Sensing Distance numeric value			Standard	Min.
Standard							
NF-DM01	160	60	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DT03	45	15	5	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DS06	45	15	5	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DK06	160	60	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DK04	160	60	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
Coaxial							
NF-DB01	150	65	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DB03	150	65	45	R15	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DB01-10	80	25	35	R15	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DT01	70	20	10	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DM02	70	20	10	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DK23	150	65	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DK21	20	5	4	R15	-40~70°C	White 90% 50×50mm	φ 0.015mm
Super Flexible							
NF-DK66	110	45	25	R2	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DK67	110	45	25	R2	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DK04Z	110	45	25	R2	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DK63Z	110	45	25	R2	-40~70°C	White 90% 250×200mm	φ 0.015mm
Flexible							
NF-DR01	130	45	15	R4	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DR02	20	8	2	R4	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DR03	35	10	5	R4	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DR04	20	8	2	R4	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DR06	35	10	5	R4	-40~70°C	White 90% 100×100mm	φ 0.015mm
Sleeve Head							
NF-DB02	150	65	45	R25	-40~70°C	White 90% 250×200mm	φ 0.015mm
NF-DM03	45	15	5	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DT02	10	3	2	R4	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DT04	15	8	2	R4	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DT05	45	15	5	R15	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DR05	10	3	2	R4	-40~70°C	White 90% 50×50mm	φ 0.015mm
NF-DK22	70	20	10	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DK43	45	15	5	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
Side View							
NF-DV01	90	40	25	R25	-40~70°C	White 90% 250×200mm	φ 0.025mm
NF-DV02	15	5	3	R15	-40~70°C	White 90% 100×100mm	φ 0.015mm
NF-DV03	90	40	25	R25	-40~70°C	White 90% 250×200mm	φ 0.025mm
NF-DK33	90	40	25	R25	-40~70°C	White 90% 250×200mm	φ 0.025mm
Liquid Detection							
NF-DF03	-	-	-	R60	-40~70°C	Clear Liqued	-
NF-DF02	-	-	-	R60	-40~70°C	Cloudy Liqued	-
NF-DF04	-	-	-	R60	-40~180°C	Clear Liqued	-
Heat Resistance							
NF-DH01 (180°C)	210	90	40	R35	-40~180°C	White 90% 250×200mm	φ 0.015mm
NF-DH02 (100°C)	110	40	7	R25	-40~100°C	White 90% 250×200mm	φ 0.015mm
NF-DH83 (300°C)	140	55	25	R25	-40~300°C	White 90% 250×200mm	φ 0.015mm
Fluorescesen							
NF-DY01	45	25	10	R60	-40~100°C	White 90% 250×200mm	φ 0.02mm
Limited Range							
NF-DC01	3	2	1.5	R15	-40~70°C	-	φ 0.015mm

Thru-Beam type with optional lens

Type	STANDARD	HIGH SPEED	MARK	Object	
	Sensing Distance numeric value	Sensing Distance numeric value	Sensing Distance numeric value	Standard	Min.
Long distance lens NF-TA01					
NF-TB01 with NF-TA01	3000	1200	1200	-	φ 4mm
NF-TB01-10 with NF-TA01	1900	800	1100	-	φ 4mm
NF-TB02 with NF-TA01	4000	1600	1700	-	φ 4mm
NF-TR01 with NF-TA01	3000	1500	1100	-	φ 4mm
NF-TH01 with NF-TA01	4000	1500	800	-	φ 4mm
NF-TK77 with NF-TA01	4000	1400	1500	-	φ 4mm
Side view lens NF-TA02					
NF-TB01 with NF-TA02	600	200	200	-	φ 3mm
NF-TB01-10 with NF-TA02	450	180	250	-	φ 3mm
NF-TB02 with NF-TA02	600	250	250	-	φ 3mm
NF-TR01 with NF-TA02	500	200	150	-	φ 3mm
NF-TH01 with NF-TA02	500	200	90	-	φ 3mm
NF-TK77 with NF-TA02	600	200	200	-	φ 3mm

Special fiber unit for BIF-W Moisture Type

