

PL-F Series

PL-FB15*

PL-FB30*

PL-F51*

Instruction Manual

- Please confirm whether this product meets your requirements.
- Please carefully read the precautions in the instruction manual and use the product only after understanding the relevant content.

19258872



WARN

Failure to follow the specified operating instructions when using this product may result in personal injury or property damage.



WARN

- This product does not have an explosion-proof design. Do not use it in environments with flammable, explosive gases, or combustible liquids.
- Do not disassemble or modify this product, as it is not designed to automatically shut off laser emission when opened. Unauthorized disassembly or modification may result in personal injury, fire, or electric shock hazards.
- Using control, adjustment, or operating procedures other than those specified here may lead to hazardous radiation exposure.



NOTE

- Performing wiring, connection, or disconnection while the power is on is extremely dangerous. Always turn off the power before any operation.
- Avoid installing this product in the following locations, as they may cause malfunctions:
 1. Dusty or humid environments
 2. Areas with corrosive gases
 3. Locations exposed to splashing water or oil
 4. Places subject to severe vibration or shock
- Outdoor use is not recommended.
- Do not use this sensor immediately after power-on, as it requires approximately 1.5 minutes of warm-up time to stabilize.
- If a switching-mode power supply must be used, ensure the ground terminal is properly earthed.
- Never connect this product to high-voltage cables or power lines, as improper operation may result in induction interference or damage.
- Unauthorized disassembly, repair, or modification of this product is strictly prohibited, as it may lead to electric shock, fire, or personal injury.
- Regularly clean dust from the emitter and receiver lenses to ensure accurate detection. Avoid direct physical impact on the product.
- Use only within specified rated parameters.

Product Accessories Confirmation

Please verify that the product package contains the following items:

Sensor unit × 1

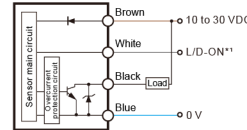
Product manual (this instruction manual) × 1



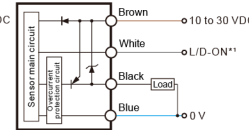
I/O Circuit Diagrams

BGS Reflective / Receiver of thrubeam type

NPN

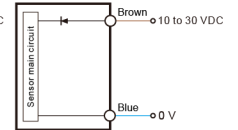


PNP



Transmitter of thrubeam type

NPN / PNP



** L-ON - Connect white wire to blue wire; D-ON - Connect white wire to brown wire or leave unconnected.

Specifications

Cable type

Type		Flat type		
		BGS Reflective		Thrubeam type
Model	NPN output	PL-FB15N	PL-FB30N	PL-F51N
	PNP output	PL-FB15P	PL-FB30P	PL-F51P
Detection distance		1–15 mm	1–30 mm	600 mm
Disable maximum detection distance (white paper**)		20 mm	47 mm	-
Current consumption		20 mA or less		
Control output		NPN output type: NPN open collector; PNP output type: PNP open collector 30 VDC or less, 50 mA or less Residual voltage: 10 mA or less at 1.0 V or less, 10–30 mA or less at 1.5 V or less		
Spot size		Approx. Φ3 mm (at 15 mm)	Approx. Φ5 mm (at 30 mm)	-
Hysteresis (white paper**)		1 mm or less	2 mm or less	-
Light source (wavelength)		4-element point light source red LED (650 nm)		
Power voltage		10 to 30 VDC with ripple current (P-P) 10%		
Response time		0.5 ms		
Operating ambient temperature		-25 to +55 °C (no freezing)		
Storage ambient temperature		-25 to +75 °C (no freezing)		
Ambient humidity		35 to 85% RH (no condensation)		
Vibration (Endurance)		10 to 55 Hz, Double amplitude 1.5 mm, 2 hours in each of the X, Y, and Z directions		
Shock (Endurance)		1,000 m/s², 6 times in each of the X, Y, and Z directions		
Protection class		IP67 IEC60529		
Protection circuit		Power reverse connection protection, output overcurrent protection, power surge protection, output surge protection		
Indicator		Output indicator (orange), stable operation indicator/power indicator (green)		
Sensitivity adjustment		Not supported		
NO/NC mode		Switchable to L-ON or D-ON via input cable		
Connection method		Cable: 3 m		
Housing material		Housing: SUS316L, Indicator lampshade: PC, Lens cap: PMMA, Cable & Sheath: PVC		
Weight		Approx. 40 g		Approx. 80 g

** Represents value

Relay type

Type		Flat type		
		BGS Reflective		Thrubeam type
Model	NPN output	PL-FB15CAN	PL-FB30CAN	PL-F51CAN
	PNP output	PL-FB15CAP	PL-FB30CAP	PL-F51CAP
Detection distance		1–15 mm	1–30 mm	600 mm
Disable maximum detection distance (white paper**)		20 mm	47 mm	-
Current consumption		20 mA or less		
Control output		NPN output type: NPN open collector; PNP output type: PNP open collector 30 VDC or less, 50 mA or less Residual voltage: 10 mA or less at 1.0 V or less, 10–30 mA or less at 1.5 V or less		
Spot size		Approx. Φ3 mm (at 15 mm)	Approx. Φ5 mm (at 30 mm)	-
Hysteresis (white paper**)		1 mm or less	2 mm or less	-
Light source (wavelength)		4-element point light source red LED (650 nm)		
Power voltage		10 to 30 VDC with ripple current (P-P) 10%		
Response time		0.5 ms		
Operating ambient temperature		-25 to +55 °C (no freezing)		
Storage ambient temperature		-25 to +75 °C (no freezing)		
Ambient humidity		35 to 85% RH (no condensation)		
Vibration (Endurance)		10 to 55 Hz, Double amplitude 1.5 mm, 2 hours in each of the X, Y, and Z directions		
Shock (Endurance)		1,000 m/s ² , 6 times in each of the X, Y, and Z directions		
Protection class		IP67 IEC60529		
Protection circuit		Power reverse connection protection, output overcurrent protection, power surge protection, output surge protection		
Indicator		Output indicator (orange), stable operation indicator/power indicator (green)		
Sensitivity adjustment		Not supported		
NO/NC mode		Switchable to L-ON or D-ON via input cable		
Connection method		M8 Connector 4-Pin		
Housing material		Housing: SUS316L, Indicator lampshade: PC, Lens cap: PMMA, Cable & Sheath: PVC		
Weight		Approx. 40 g		Approx. 80 g

** Represents value

Dimensions

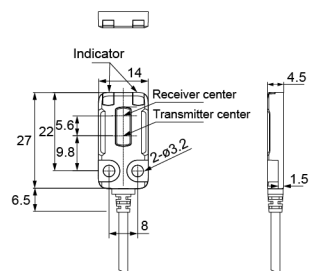
Unit: mm

Cable type

BGS Reflective

PL-FB15N / PL-FB15P

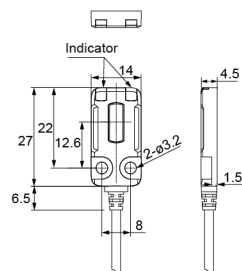
PL-FB30N / PL-FB30P



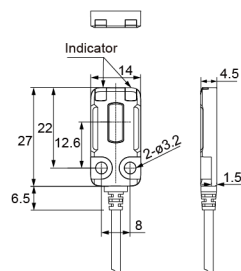
Thrubeam type

PL-F51N / PL-F51P

Receiver



Transmitter

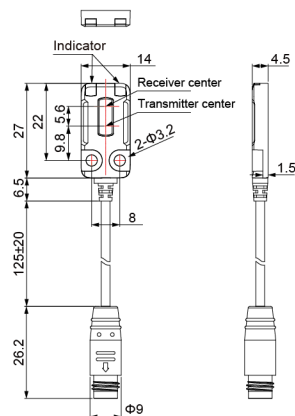


Relay type

BGS Reflective

PL-FB15CAN / PL-FB15CAP

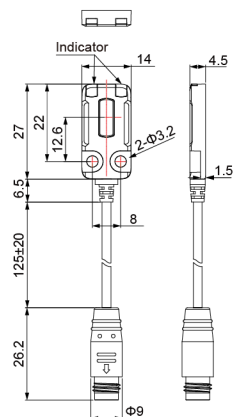
PL-FB30CAN / PL-FB30CAP



Thrubeam type

PL-F51CAN / PL-F51CAP

Receiver



Transmitter

