

Photoelectric Sensor

FK

Proximity Sensors

Photoelectric Sensors

Measurement Sensors

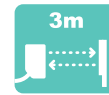
Vision & Safety Sensors



SALIENT FEATURES

- ◆ Upto 15m sensing
- ◆ Sensitivity Adjustable
- ◆ Light On/Dark On selectable
- ◆ Mutual Interference Prevention
- ◆ Compact; IP65 (□-2M)/ IP67 (□-M8C)

CE



Model Number Legend

FK - □ - □ □ □ - □
1 **2** **3** **4** **5**

1. Series

FK

2. Type

T: Through Beam
R: Retro Reflective
D: Diffuse Reflective

3. Sensing Distance

100: 100 mm
300: 300 mm
1M: 1 Meter
3M: 3 Meters
10M: 10 Meters
15M: 15 Meters

4. Output

N: NPN
P: PNP

5. Connection

2M: 2 meter Cable
M8C: M8 Connector

#. Accessories included

Mounting Bracket: 1 Set
Screws: 1 Set
Sensor Adjuster: 1 No.
Reflector (MS-2A): 1 No. (with Retro reflective models only)

Example:

FK-D-1MP-2M
FK Series - Diffuse Reflective - 1 meter sensing, PNP, Prewired 2 meter

NOTE: Contact us for models not shown in catalogue.
Connector cables are sold separately; look in CC series catalogue for the same (www.inno.sg/cc).

Control

Weighing

Automation

Components

Ratings and Specifications

Sensing Type		Through Beam		Retro-Reflective	Diffuse Reflective			
Type	NPN	Cable	_T-15MN-2M	_T-10MN-2M	_R-3MN-2M	_D-1MN-2M	_D-300N-2M	_D-100N-2M
		Connector	_T-15MN-M8C	_T-10MN-M8C	_R-3MN-M8C	_D-1MN-M8C	_D-300N-M8C	_D-100N-M8C
	PNP	Cable	_T-15MP-2M	_T-10MP-2M	_R-3MP-2M	_D-1MP-2M	_D-300P-2M	_D-100P-2M
		Connector	_T-15MP-M8C	_T-10MP-M8C	_R-3MP-M8C	_D-1MP-M8C	_D-300P-M8C	_D-100P-M8C
Sensing Distance		15000mm	10000mm	3000mm	1000mm	300mm	100mm	
Test Object				reflector MS-2A	Translucent/ Opaque Materials			
Response Time		max. 1ms						
Light Source		Infrared LED	Red LED	Red LED	Infrared LED	Red LED	Infrared LED	
Light Wavelength		850nm	660nm	660nm	850nm	660nm	850nm	
Sensitivity Adjustment		Built-in one turn adjustment						
Operation Mode		Light ON/ Dark ON selectable						
Supply Voltage		12 - 24 VDC; ± 10% (Ripple Max 10%)						
Current Consumption		Transmitter: max. 20mA Receiver: max. 20mA		max. 30mA				
Protection Circuits		Reverse power supply polarity protection, Output short- circuit protection		Reverse power supply polarity protection, Output short- circuit protection, Interference Prevention Function				
Connection		Prewired 2 meter cable outgoing type & M8 Connector (Male) type						
Control Output		NPN or PNP open collector output						
Control Output Rating		Load Voltage: max. 26.4 VDC; Load Current: max 100mA; Residual Voltage: NPN- max 1 V, PNP- min (-2.5 V)						
Insulation Resistance		20 MΩ (at 500VDC)						
Dielectric Strength		1000 VAC at 60Hz for 1min						
Shock Resistance		500 m/s ² X, Y, Z directions for 3 times						
Vibration Resistance		To Destruction: 1.5 to 200mm at 10-55 hz in X, Y, Z directions for 2 hours						
Ambient Temperature		Operation: -25° ~ 55°C; Storage: -35° ~ 60°C (non- freezing; non- condensing)						
Ambient Humidity		Operation: 30 ~ 80% RH; Storage: 30 ~ 85% RH (non- condensing)						
Protection Class		Cable Type: IP65 & Connector Type: IP67						
Indicators		Operation/ Detection = RED Stable/ Normal = GREEN Emitter Power Indication = GREEN						
Accessories	Common	Mounting bracket, Bolt, Nut, Sensitivity Adjustment Driver						
	Individual			Reflector MS-2A*				
Unit Weight		Cable Type: 90g; Connector Type: 20g		Cable Type: 60g; Connector Type: 30g	Cable Type: 45g; Connector Type: 15g			
Material	Casing	PBT (Polybutylene Terephthalate) or eqv.						
	Lens	Modified Polyarylate or eqv.						

Note:

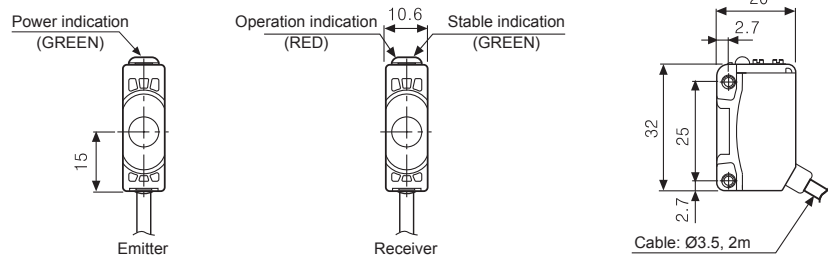
* - Standard reflector. Special types are to be ordered separately.

Sensor Dimension Drawing

FK

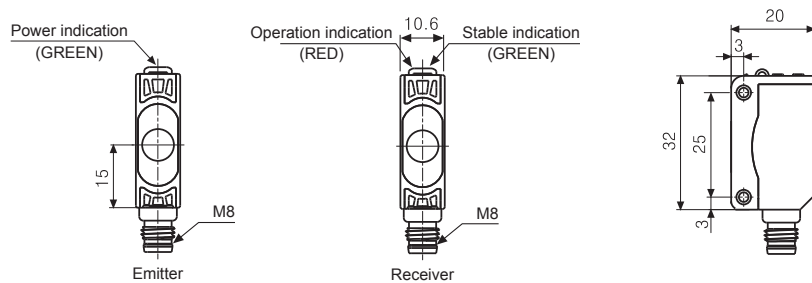
Through Beam - Cable Type

- ◆ FK-T-15MN-2M
- ◆ FK-T-15MP-2M
- ◆ FK-T-10MN-2M
- ◆ FK-T-10MP-2M



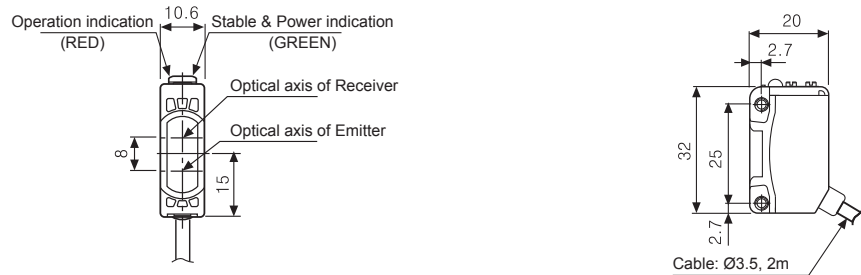
Through Beam - Connector Type

- ◆ FK-T-15MN-M8C
- ◆ FK-T-15MP-M8C
- ◆ FK-T-10MN-M8C
- ◆ FK-T-10MP-M8C



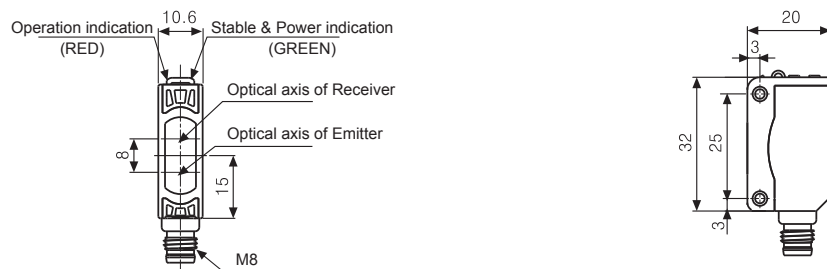
Retro-reflective - Cable Type

- ◆ FK-R-3MN-2M
- ◆ FK-R-3MP-2M



Retro-reflective - Connector Type

- ◆ FK-R-3MN-M8C
- ◆ FK-R-3MP-M8C



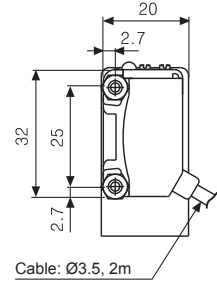
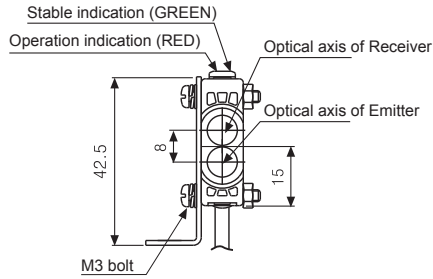
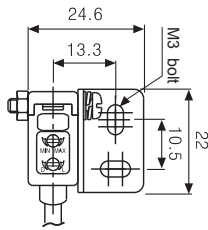
All dimensions are in mm

Sensor Dimension Drawing

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Diffuse Reflective - Cable Type

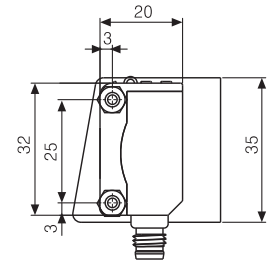
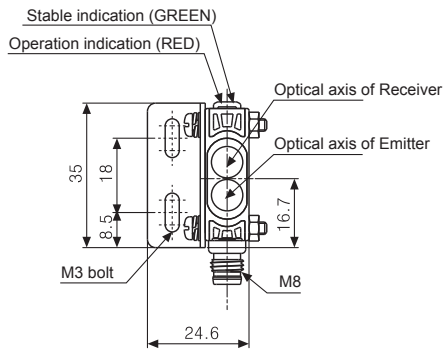
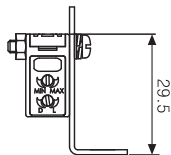
- ◆ FK-D-1MN-2M
- ◆ FK-D-1MP-2M
- ◆ FK-D-300N-2M
- ◆ FK-D-300P-2M
- ◆ FK-D-100N-2M
- ◆ FK-D-100P-2M



*Shown mounting to bracket 'A'

Diffuse Reflective - Connector Type

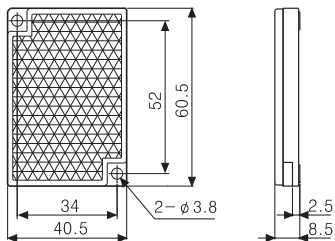
- ◆ FK-D-1MN-M8C
- ◆ FK-D-1MP-M8C
- ◆ FK-D-300N-M8C
- ◆ FK-D-300P-M8C
- ◆ FK-D-100N-M8C
- ◆ FK-D-100P-M8C



Shown mounting to bracket 'B'

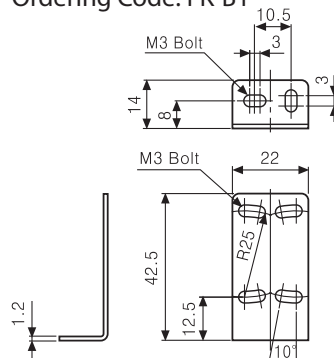
Reflector

Ordering Code: MS-2A



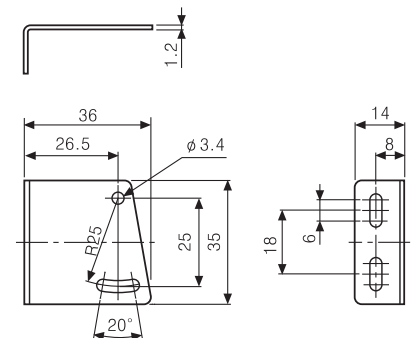
Bracket - A

Ordering Code: FK-B1



Bracket - B*

Ordering Code: FK-B2

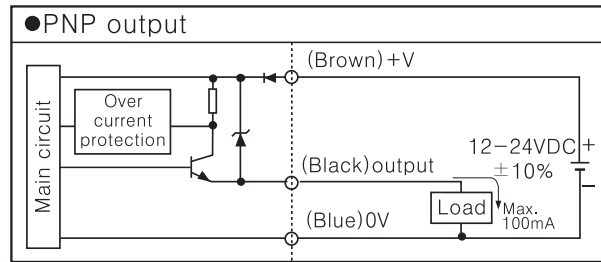
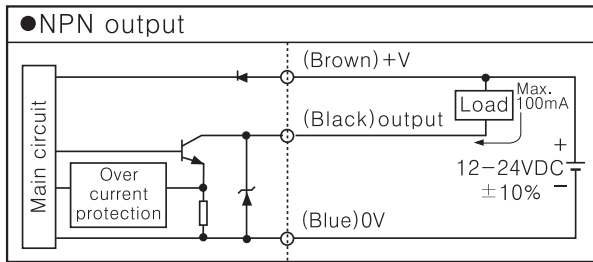


Note: * - Bracket 'B' is optional and is to be ordered separately

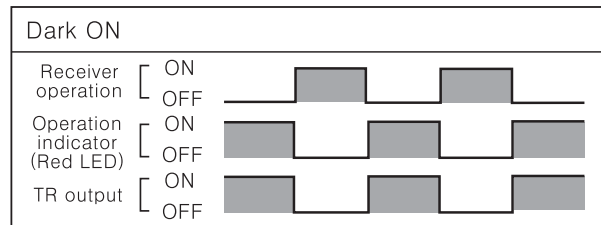
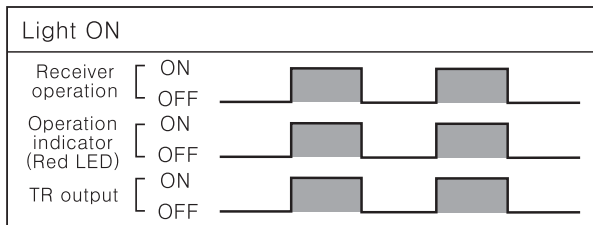
All dimensions are in mm

Control Output Diagram

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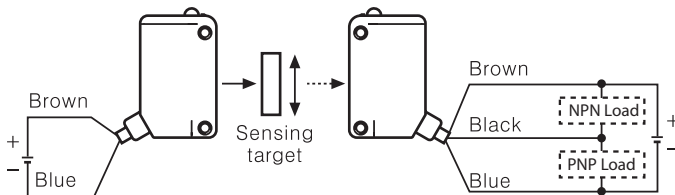


Operation Type

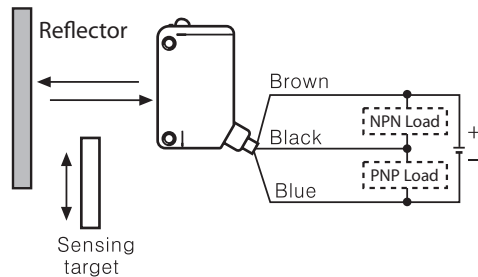


Connection

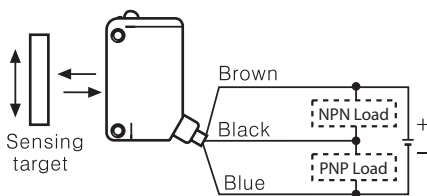
• Through Beam



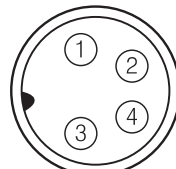
• Retro-reflective



• Diffusive



• Connector *



M8 Connector pin

Pin	Cable colors	Function
①	Brown	Power Source (+V)
②	White	—
③	Blue	Power Source (0V)
④	Black	Output

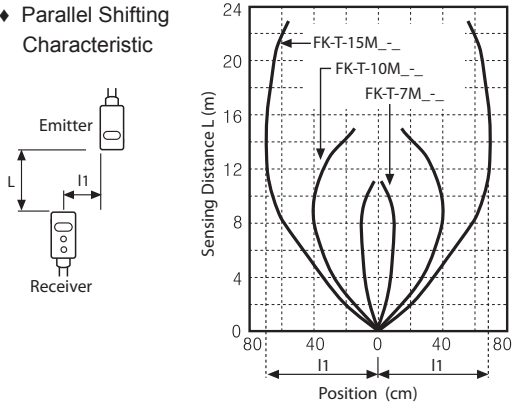
② is N.C (Not Connected) terminal.

Note: * - Connector Cable is not supplied along with unit. (Sold Separately)

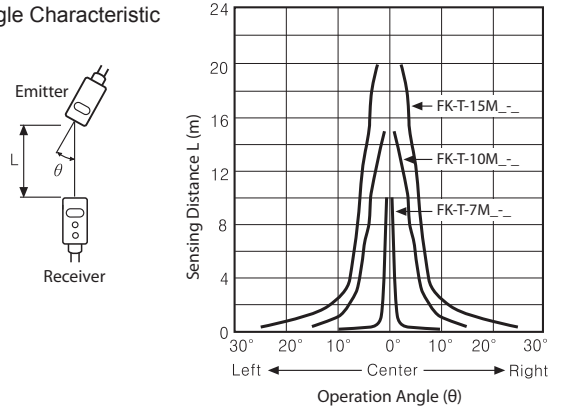
Operational Data

Through Beam Type

Parallel Shifting Characteristic

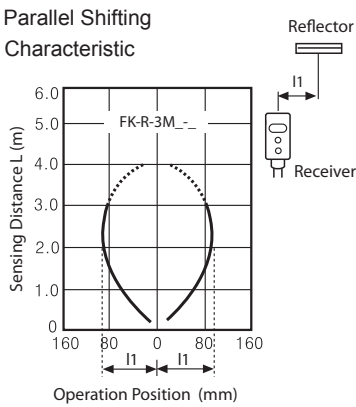


Angle Characteristic

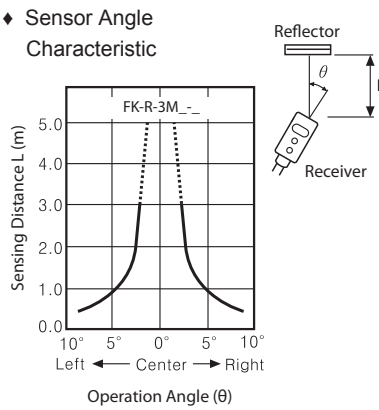


Retroreflective Type

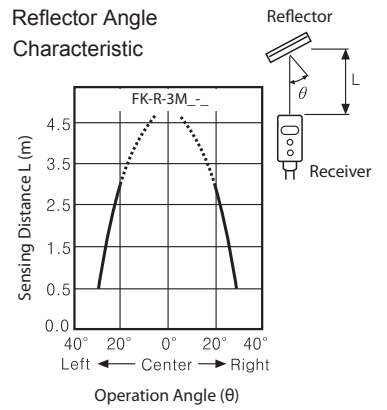
Parallel Shifting Characteristic



Sensor Angle Characteristic

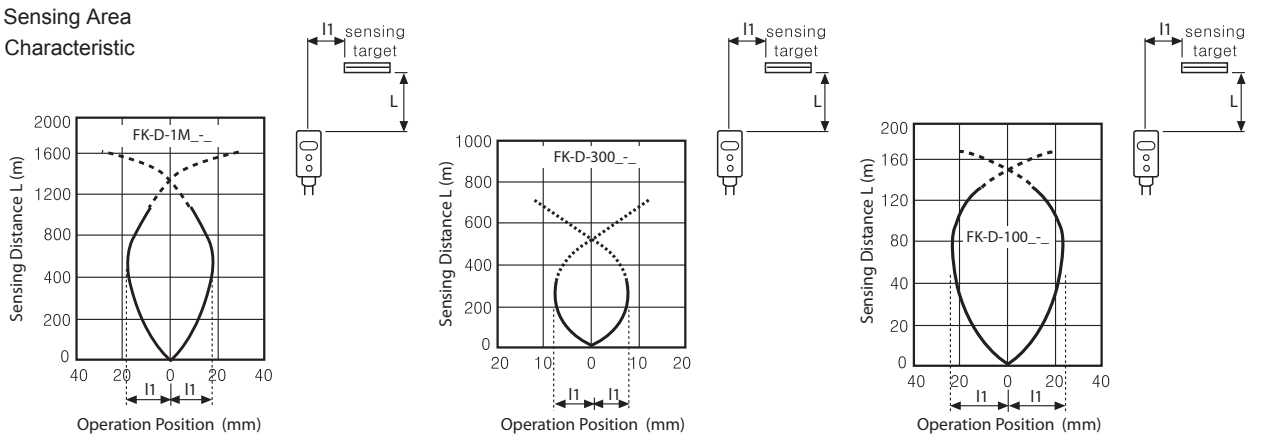


Reflector Angle Characteristic



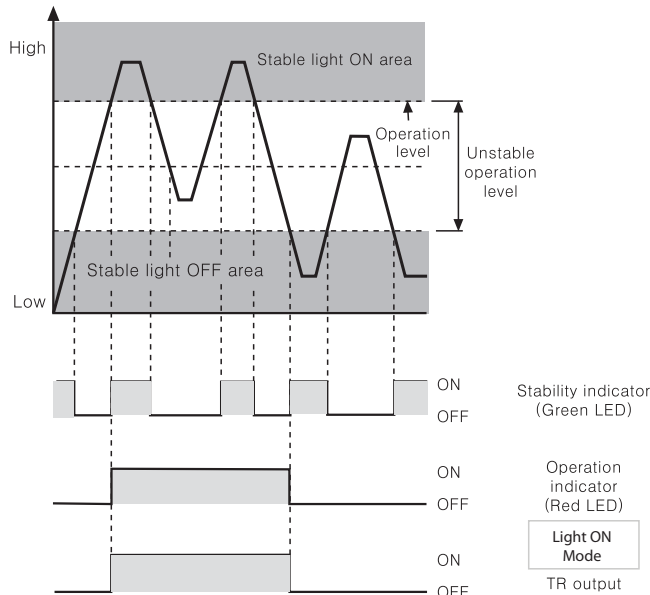
Diffuse Reflective Type

Sensing Area Characteristic

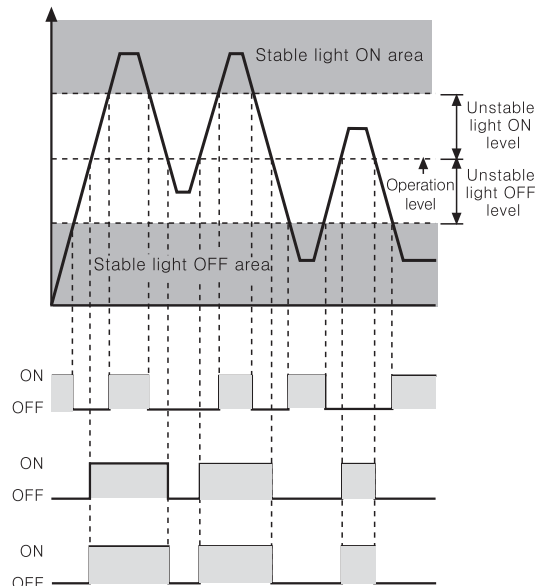


Operation and Timing Diagram

◆ Through Beam Type



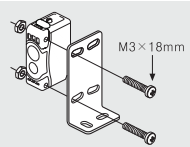
◆ Retroreflective, Diffuse Type



The waveform of "Operation indicator" & "TR output" is for Light ON mode, it is operated conversely for Dark ON mode

Mounting and Adjustments

NOTE: Screw size M3 is to be used for mounting of sensor to the bracket. Tightening torque is max. 0.5kgf-cm



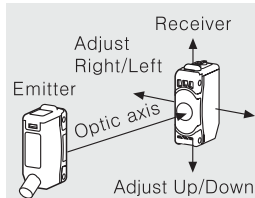
◆ Through Beam Type

Place the emitter and receiver facing each other and connect to power

Adjust the position of the emitter and receiver to check their stable indicating range. Mount them in the middle of the range.

After mounting, check the operation of the sensor and the light of the Operation indicator in both None and Sensing target* status.

*When the sensing target is translucent or small i.e. does not fall under the sensing target specifications; it can be missed by the sensor.

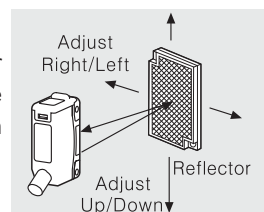


◆ Retroreflective Type

Place the sensor and reflector facing each other and connect to power

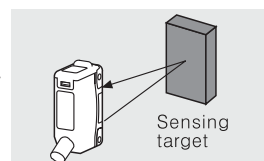
Adjust the position of the sensor and reflector to check their stable indicating range. Mount them in the middle of the range.

After mounting, check the operation of the sensor and the light of the Operation indicator in both None and Sensing target* status.



◆ Diffuse Reflective Type

Place a sensing target; adjust the sensor Up/ Down/ Right/ Left. Then, fix the sensor in the center position of where the indicator is operational.



Operation Mode Adjustment

	Light ON Mode Turn the operation switching adjuster to the right to set it in Light ON mode.		Dark ON Mode Turn the operation switching adjuster to the left to set it in Light OFF/ Dark ON mode.
		"LIGHT ON" Status	"LIGHT OFF" Status
Output ON	Through Beam Type		
Output ON	Retroreflective Type		
Output ON	Diffuse Reflective Type		

Sensitivity Adjustment

Follow the steps given below after mounting the sensor for optimum performance

	Turn the sensitivity adjuster to the right of min. and check the position (A) where the indicator is turned on in "Light ON Status".
	Turn the sensitivity adjuster more to the right of the position (A); check the position (B) where the indicator is turned on and turn the adjuster to the left, check the position (C) where the indicator is turned off in "Light OFF Status". *if the indicator is not lighted although the adjuster is turned to the max position, the max. position is (C).
	Set the adjuster at the center of (A) and (C). To set the optimum sensitivity, check the operation and lighting of stable indicator with sensing target or without it. If the indicator is not lighted, please check the sensing method again because sensitivity is unstable.

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