

# Model PRB-□□□-□ Diffuse Reflection Photoelectric Sensor



## □ Model List

On when light goes through

Detection distance	Power supply voltage		
	5V DC	12V DC	24V DC
300mm	PRB-301-5	PRB-301-12	PRB-301-24
500mm	PRB-501-5	PRB-501-12	PRB-501-24
1000mm	PRB-102-5	PRB-102-12	PRB-102-24

On when light is blocked

Detection distance	Power supply voltage		
	5V DC	12V DC	24V DC
300mm	PRB-301-51	PRB-301-121	PRB-301-241
500mm	PRB-501-51	PRB-501-121	PRB-501-241
1000mm	PRB-102-51	PRB-102-121	PRB-102-241

## Application

- Human sensor of ATM
- Automatic door for human sensor
- Object detection of production line
- Vending machine for human sensor
- Safety management platform

## Features

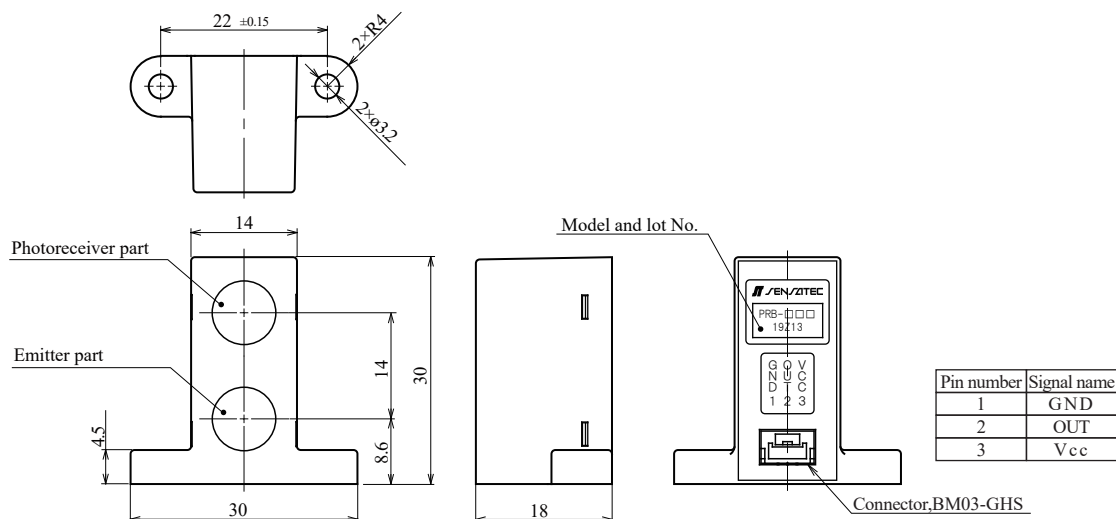
- Uses infrared light modulation method for increased resistance to external light(10,000Lx).
- Small sensor supporting detection at long distances.
- The output is an open drain type (Nch MOSFET) that can directly open and close the load, which facilitates wiring.

## Rating / Performance

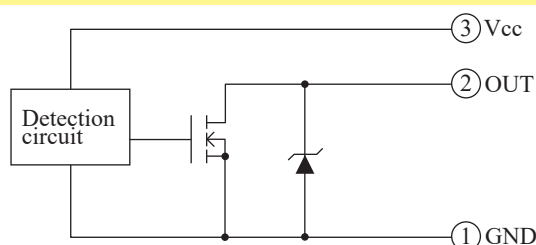
Model	PRB-□□□-5	PRB-□□□-51	PRB-□□□-12	PRB-□□□-121	PRB-□□□-24	PRB-□□□-241
Detection Surface	Front side detection					
Power Supply Voltage	5 V DC (Operating voltage range: 4.5 V to 5.5 V DC)		12 V DC (Operating voltage range: 10.8 V to 13.2 V DC)		24 V DC (Operating voltage range: 21.6 V to 26.4 V DC)	
Power Consumption	50 mA DC or less				15 mA DC or less	
Output	30 V DC 100 mA DC or less Nch MOSFET open drain					
Output Residual Voltage	1 V DC or less (Load current 100 mA DC)					
Operation Configuration	Light On (On when light goes through)	Dark On (On when light is blocked)	Light On (On when light goes through)	Dark On (On when light is blocked)	Light On (On when light goes through)	Dark On (On when light is blocked)
Response Time	100 ms or less					
Peak Emission Wavelength	940 nm					
Allowed Illuminance from External Day Light	10000 Lx or less					
Operating Temperature Range	-10 to 55 °C (-10 to 65 °C during storage)(Without dew condensation or freezing)					
Operating Humidity Range	85% RH or less (90% RH or less during storage) (Without dew condensation)					
Withstand Voltage	1 min at 500 V AC 50/60 Hz (Between the live part and case)					
Insulation Resistance	50 MΩ or more measured with an ohmmeter at 500 V DC (Between the live part and case)					
Vibration Resistance	Durability: 2 hours in each X, Y, Z direction at 10 to 55 Hz and with peak-to-peak amplitude of 1.5 mm (At power off)					
Shock Resistance	Durability: 3 times at 200 m/s <sup>2</sup> (approx. 20 G) in each X, Y, Z direction (At power off)					
Protection Rating	IP50					
Case Material	ABS					
Connector	Connector : BM03B-GHS (3-pin)(from J.S.T. Mfg. Co., Ltd.) [Connections] Housing : GHR-03V-S, Contact : SSSL-002T-P0.2 (from J.S.T. Mfg. Co., Ltd.)					
Weight	Approx. 6 g					
Options (Sold Separately)	Connector harness : CNH-GHR03S28-300					

Detection Distance	300mm	500mm	1000mm	<div><div>PRB-102-5</div><div><div></div><div></div><div></div></div></div>	Detection Distance
Min	270mm	450mm	900mm		301 : 300mm
Typ	300mm	500mm	1000mm		501 : 500mm
Max	420mm	700mm	1400mm		102 : 1000mm
Hysteresis	20% or less of the detection distance				
Standard Detection Target	200 mm×200 mm Kodak Gray Card 90% reflectance				

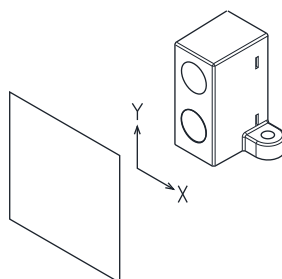
## External Dimensions Diagram



## Output Circuit

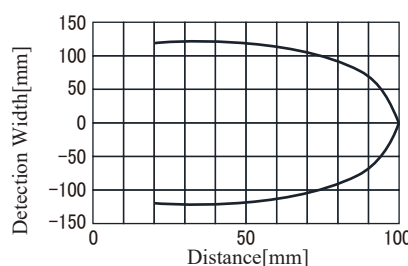


## Detection Area Diagram. Detection Distance - Detection Width (Typical Example)

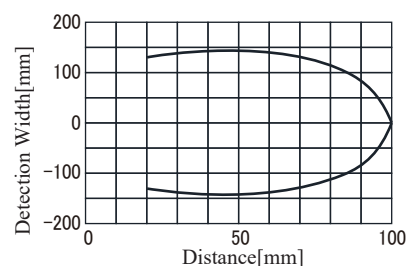


### Measurement Condition

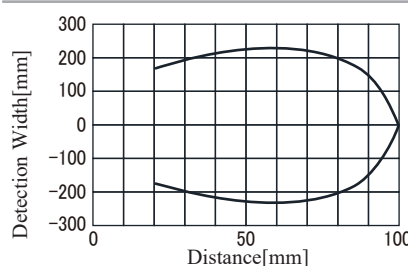
Output ON position that is slid from the outside of the X axis and Y axis as the detection target (with the 200 mm × 200 mm Kodak Gray Card 90% reflectance). Detection width the distance from the center of the sensor to the center of the detector.



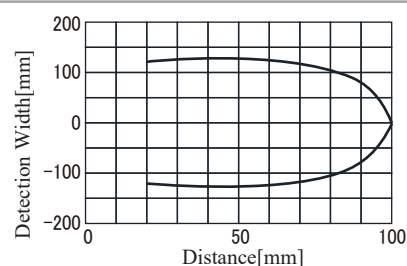
PRB-301-5,-12,-24



PRB-501-5,-12,-24



PRB-102-5,-12



PRB-102-24

## Usage Precautions

1. If there is a structure that should not be detected in front of the sensor detection surface, install the sensor with the light axis shifted approximately 15° from the structure surface.
2. The sensor is pulse-driven. To ensure good performance, install a 100 μF capacitor between the power supply Vcc and GND near the sensor when possible.
3. Detection distances have been set for each model using a standard detection target of a specific size. The detection distances may decrease with smaller detection targets. The detection distance also varies depending on the target material. Therefore, check the detection distance in advance using the appropriate target, and set the distance taking into account an error margin.
4. It is recommended to use black color with low reflectivity for the detection target background.
5. See Photoelectric sensors general usage precautions for other precautions.

\*For a detailed specification of the other, please refer to specifications.