PW Series

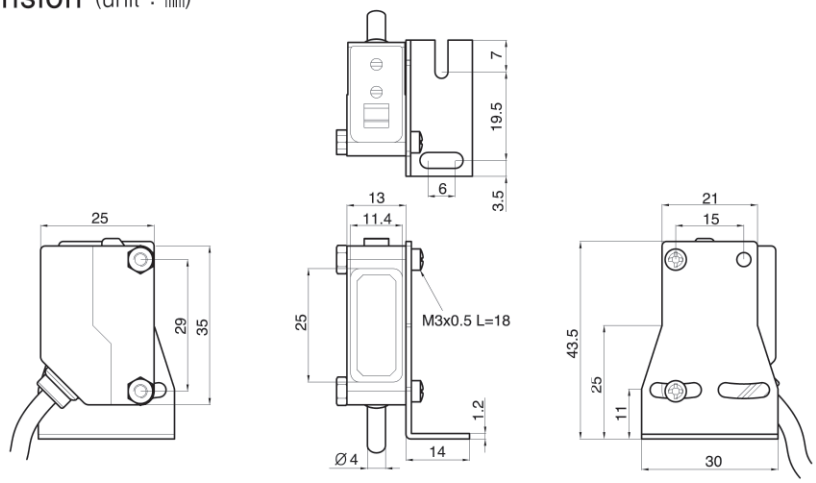
Compact photo sensor for setting up the distance

- Relatively stable output even with the lens being polluted
- Dual element which minimizes the influence from the color of sensing object
- IP 67 protective structure

Specification

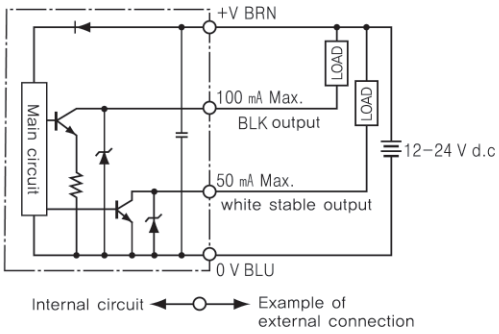
Model	NPN	PW-D10RN	PW-D10N	PW-D15N	PW-D20N
	PNP	PW-D10RP	PW-D10P	PW-D15P	PW-D20P
Sensing method		Distance-settable			
Sensing distance		10 – 100 ㎜		10 – 150 ㎜	10 – 200 ㎜
Sensing object		standard sensing object (White paper with no gloss 100 X 100 ㎜)			
Power supply voltage		12 – 24 V DC, ± 10 % (max ± 10 % of ripple)			
Current consumption		max 30 ㎃			
Output	Control	NPN/PNP open collector output max 100 ㎃ (30 V DC)			
	Stable	NPN open collector output max 50 ㎃(30 V DC). but there is no stable output with PNP output type			
Output action		L.ON/D.ON (Switch operation)			
Response time		max 0.7 ㎳			
Hysteresis		Less than ±10 % of operation distance			
Light source (wave length)		Red light LED (660 ㎚)	Infrared lightening LED (880 ㎚)		
LED		Control output indicator : Red LED, stable output indicator : green LED			
Sensitivity adjustment		Built in the sensitivity adjusting volume			
Protective circuit		Power reverse connection protecting circuit and output break protecting circuit			
Ambient illumination		Sunlight: max 5,000 lx			
Ambient temperature		-25 ~ 55 ℃ (Surrounding storage temperature : -25 ~ 70 ℃)			
Ambient humidity		35 ~ 85 % RH (with no condensation)			
Protective structure		IP 67			
Insulation resistance		min 20 MΩ (500 V DC, between the code and case)			
Dielectric strength		1,000 V AC, for 1 min			
Vibration resistance		10 – 55 ㎐ double amplitude: 1.5㎜, X, Y, Z for 2 hours each in X, Y and Z direction			
Shock resistance		500 ㎨, 3 times each in X, Y and Z directions			
Connection method		NPN : 4P, PNP : 3P, thickness : Ø4 ㎜, length : 2 m			
Material		Case : Heat resistance ABS, Lens : PC (Red translucency)			
Weight		Approx. 115 g (Include the weight of box)			

Dimension (unit : mm)

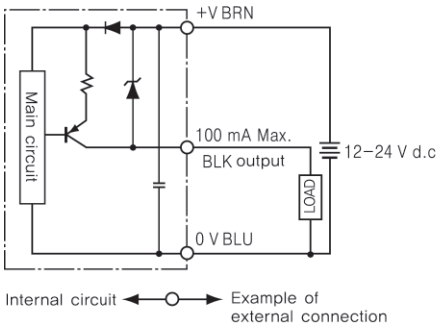


Output circuit

■ NPN output circuit



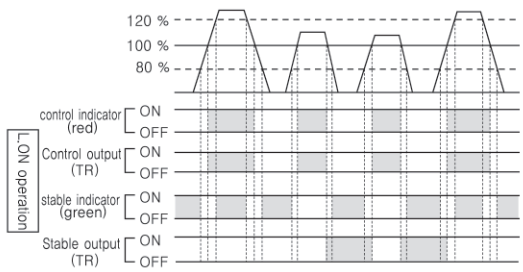
■ PNP output circuit

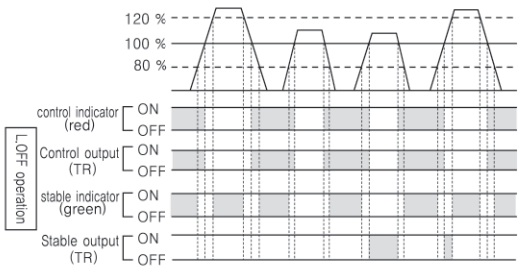


Regarding the stable output

It can be used as checking the initial movement, checking the environmental changes after setting up or level dropping during the usage. If it does not reach 120 % (Stable light ON area) when it has passed the operation level, the control output will decide it as OFF and generate the output.

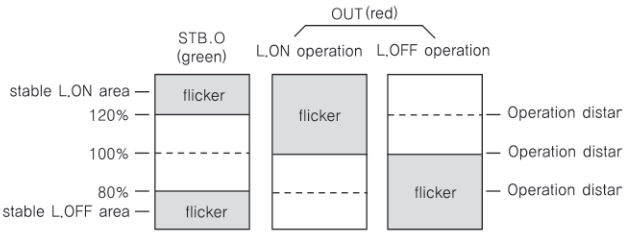
(But there is no stable output in the PNP output type)





Regarding the indicator

- Operation indicator (red LED) and stability indicator (green LED) indicate the operation level
- After completing the optical axis adjustment or sensitivity adjustment, repeat the L.ON/D.ON operation(operation which depends on the sensing object) and check whether they are in the area of stable L.ON/D.ON area.
- Setting as a stable area will provide the high reliability regarding the environmental changes or etc after setting up is completed.
- When using the selecting switch as L.ON, the red LED will be lighted once the light is turned ON. When using the selecting switch as D.ON, the red LED will be lighted once the light is turned OFF.



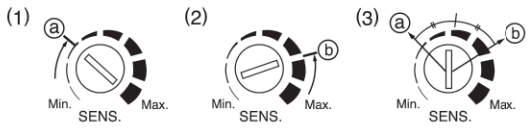
How to adjust the sensitivity

(When the L.ON operation is operated–adjustment performed when reflective object is presence in the background.)

(1) After placing the sensing object at the designated location, gradually increases the sensitivity adjustment volume and once the operation LED is lighted then that position will be referred as point ⓐ.

(2) Gradually decrease the sensitivity adjustment volume from max to min with the absence of sensing object and once the operation LED is turned off then that position will be referred as point ⓑ. (If the operation LED of max sensitivity does not get turned ON then assume that point ⓑ is the Max.

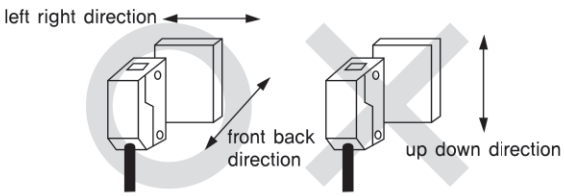
(3) Set the volume halfway between the point ⓐ and ⓑ then adjustment is completed.



Regarding the detecting direction

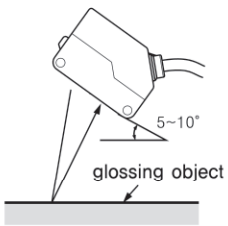
There is directional matter in the dual photo diode so there are directions that cannot be detected so please be cautious.

※ The product can be used for the up and down directions of the surface within the distance that had been set up by the sensing range adjusting volume.

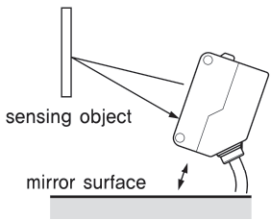


Regarding the background object

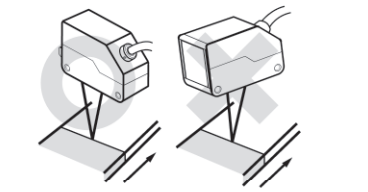
- Presence of objects with gloss and mirror surface can cause malfunction depending on the angle of background objects so slant the sensor when installing it.
- When detecting the gloss object (surface with shine), please slant the sensor about 5–10degree and install it.(image 1)
- If there is a mirror surface on the bottom side of the sensor, movement may become unstable therefore either slant the sensor or maintain a certain distance that will not affected by the bottom side and install it.(image 2)
- In case of when color and quality of sensor change dramatically, the detecting side and the surface of the sensing object must be in parallel when installing it.



[Image1]



[Image2]



[Image3]

Example of characteristic of sensing distance according to the colors

■ PW-10N