

Picking sensor

■ Features

- Plastic injection case
- Slim body (W30×H140×T10mm)
- Wide range of sensing distance (0.1 to 3m, 0.05 to 1m)
- Mutual interference prevention (Frequency Switching Function)
- Light ON/Dark ON switching mode
- Picking indicator includes
- Protection structure IP40 (IEC standard)

 Please read "Caution for your safety" in operation manual before using.



■ Specifications

Model	NPN open collector output	BWPK25-05
	PNP open collector output	BWPK25-05P
Sensing type		Through-beam
Sensing distance	Long mode	0.1 to 3m
	Short mode	0.05 to 1m
Sensing target		Opaque materials of Min. ϕ 35mm
Optical axis pitch		25mm
Number of optical axis		5pcs
Sensing width		100mm
Power supply		12-24VDC \pm 10% (Ripple P-P : Max. 10%)
Current consumption		Emitter : Max. 60mA, Receiver : Max. 60mA
Control output		NPN or PNP open collector output • Load voltage : Max. 30VDC • Load current : Max. 150mA • Residual voltage \Rightarrow NPN : Max. 1V, PNP : Min. (Power voltage - 2.5V)
Operation mode		Switching of Light ON/Dark ON
Response time		Max. 30ms
Light source		Infrared LED (850nm)
Interference protection		Anti-interference by transmittance frequency selection
Protection circuit		Reverse power polarity, Output short-circuit (Overcurrent) protection
External picking input		Non-contact or contact input • NPN open collector output : Lighting (0-2V), Light out (5-30V or open) • PNP open collector output : Lighting (4-30V), Light out (0-3V or open)
Ambient temperature		-10 to 55°C (at non-freezing status)
Storage temperature		-20 to 60°C (at non-freezing status)
Ambient humidity		35 to 85%RH
Storage humidity		35 to 85%RH
Ambient illumination		Sunlight : Max. 10,000lx, Incandescent lamp : Max. 3,000lx
Insulation resistance		Min. 20M Ω (at 500VDC megger)
Noise strength		The square wave noise by the noise simulator (Voltage : \pm 240V, Period : 10ms, Pulse width : 1 μ s)
Dielectric strength		1,000VAC 50/60Hz for 1minute
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours
Shock		500m/s ² (50G) in X, Y, Z directions for 3 times
Protection		IP40 (IEC standard)
Material		• Case : PC/ABS, Lens : Acrylic
Cable		Emitter : ϕ 4.0mm, 3P, 2m / Receiver : ϕ 4.0mm, 4P, 2m (AWG 22, Core wire diameter : 0.08mm, No. of core wire : 60, Insulator out diameter : ϕ 1.2mm)
Unit weight		Approx. 250g

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching power supply

(Q) Stepping motor & Driver & Controller

(R) Graphic/Logic panel

(S) Field network device

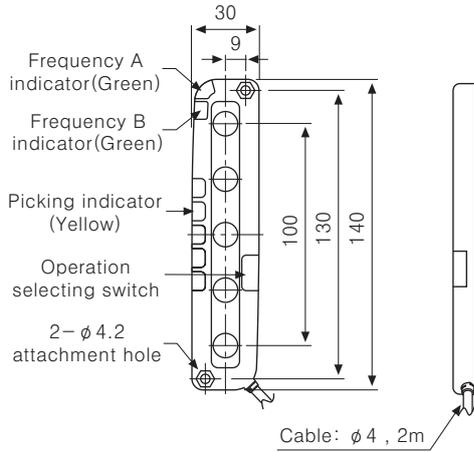
(T) Production stoppage models & replacement

BWPK Series

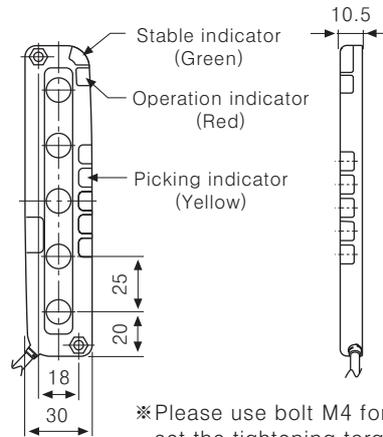
Dimensions

Product dimension

(Unit:mm)



<Emitter>

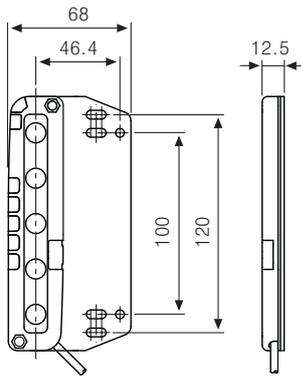


<Receiver>

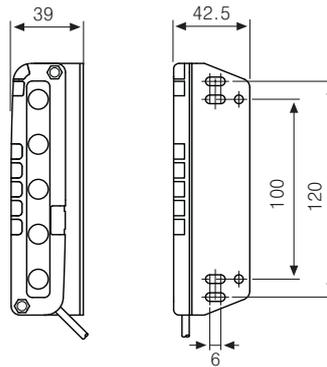
※Please use bolt M4 for mounting of sensor, set the tightening torque under 20kgf·cm.

Bracket mounting dimension

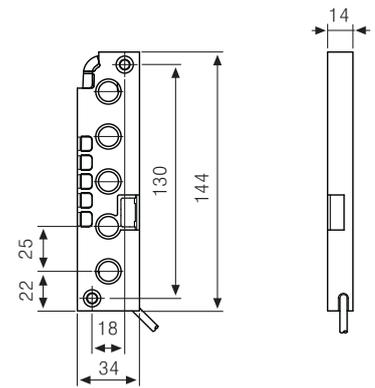
Connect the bracket A



Connect the bracket L

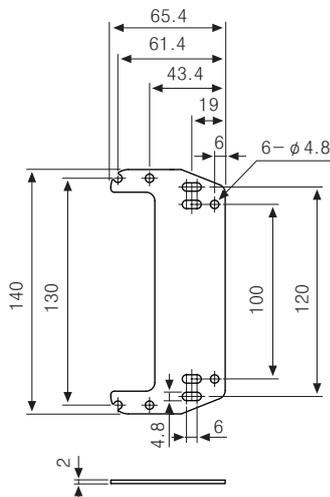


Connect the protection Bracket

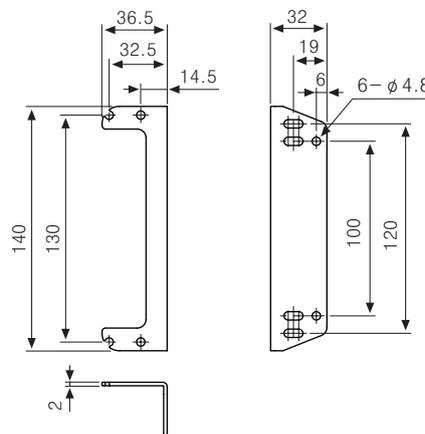


Bracket dimension (Sold separately)

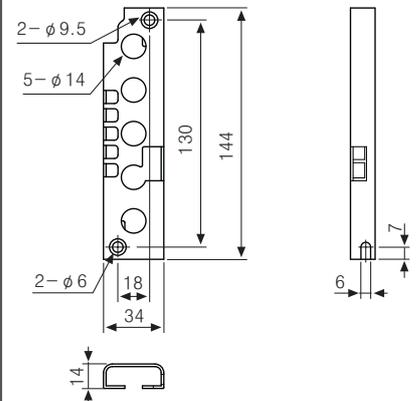
Bracket A (BK-BWPK-ST)



Bracket L (BK-BWPK-L)

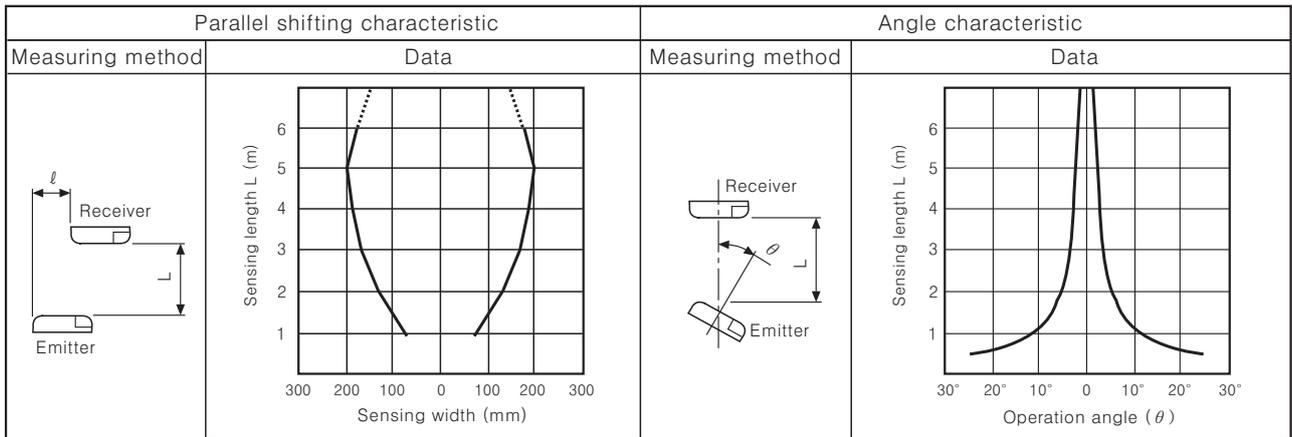


Protection Bracket (BK-BWPK-P)

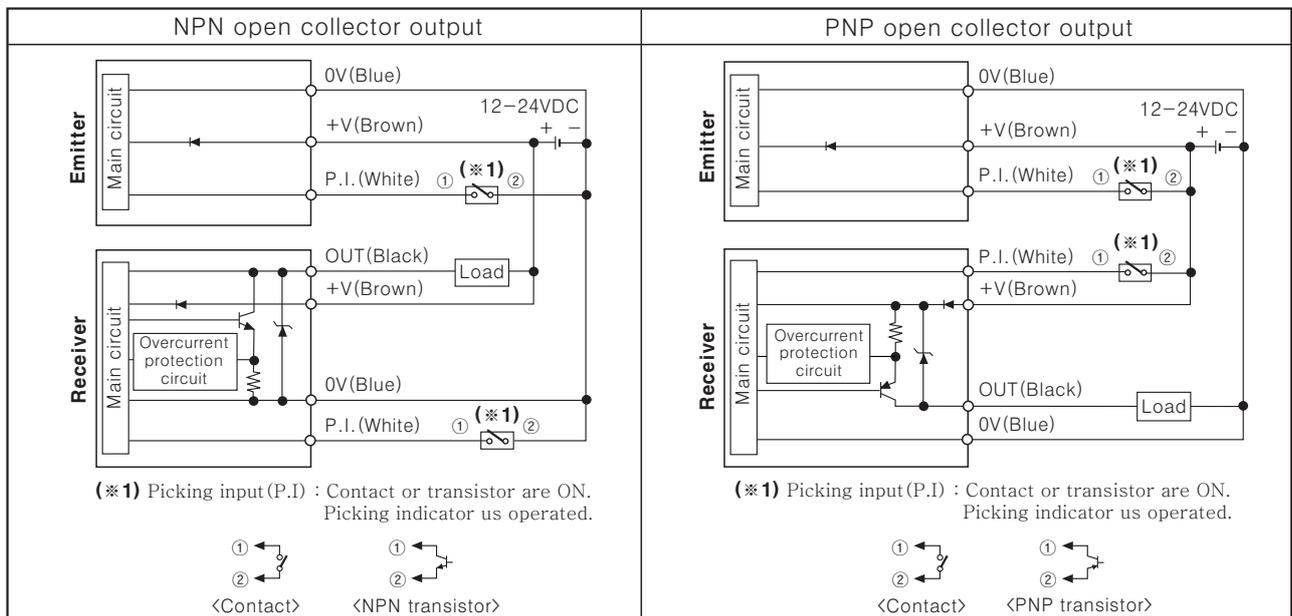


Area Sensor

Feature data

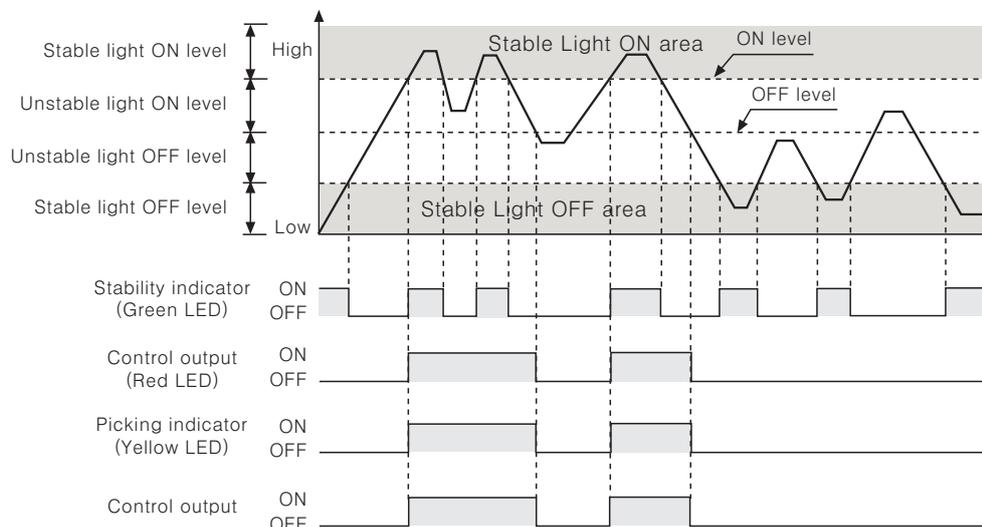


Input/Output circuit and connection diagram



※Picking indicator:When external picking input (P.I) is short-circuited with OUT (Black), it is operated same as ON/OFF status of control output.

Operation timing diagram

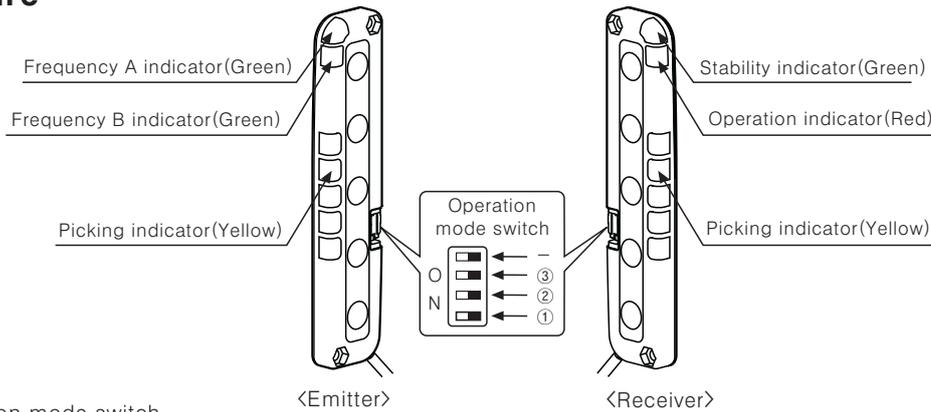


※1. Picking indicator is operated connecting output to picking input, or it will be OFF regardless of operation mode.
 2. The above diagram is for Light ON mode, it is operated reversely in Dark ON.

- (A) Photo electric sensor
- (B) Fiber optic sensor
- (C) Door/Area sensor
- (D) Proximity sensor
- (E) Pressure sensor
- (F) Rotary encoder
- (G) Connector/Socket
- (H) Temp. controller
- (I) SSR/ Power controller
- (J) Counter
- (K) Timer
- (L) Panel meter
- (M) Tacho/ Speed/ Pulse meter
- (N) Display unit
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BWPK Series

Structure



◎ Operation mode switch

No	Function	Switch OFF	Switch ON
①	Transmission frequency selection	Frequency A	Frequency B
②	Steady/Flashing Light of Picking indicator Selection	Lighting indicator	Flashing indicator
③	Emitter	Sensing distance mode selection	Long mode
	Receiver	Operation mode selection	Light ON mode
			Dark ON mode

Functions

◎ Switching function of Long / Short mode (Selectable sensing distance)

The rated sensing distance is 3m for Long mode, 1m for short mode. It minimizes interference setting as short mode when using more than 3 sets closely together.

	Operation mode switch (Emitter)	Rated sensing distance
Long mode		3m
Short mode		1m

◎ Interference protection function

In case of using 2 pcs of sensor in serial or parallel in order to extend sensing width, the detection can be failed because of their light interference.

This function is to avoid the light interference as operating a sensor in transmission frequency A and another sensor in transmission frequency B to protect these kinds of failures.

	Operation mode switch (Emitter+Receiver)	Frequency A, B indicator (Emitter)
Sensor A (Transmission frequency A)		
Sensor B (Transmission frequency B)		

◎ Switching Light-ON / Dark-ON

In Light-ON mode, the control output is ON when the target is missing. In Dark-ON mode, the control output is ON when the target is present.

	Operation mode switch (Receiver)	Control output operation
Light ON		It is ON when it is lighted.
Dark ON		It is ON when it is shaded.

◎ Switching Steady / Flashing Light of Picking indicator

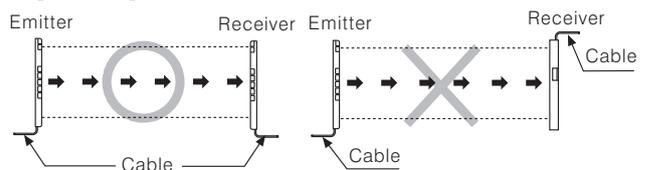
Select the indication method of operating indicator LED to make out work sensing operation more easily.

	Operation mode switch (Emitter+Receiver)	Picking indicator operation
GLOW		Lighting indicator
BLINK		Flashing indicator

Installation

◎ For direction of installation

Emitter and receiver should be installed in same up/down position.

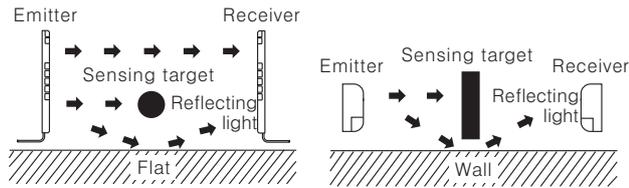


◎ Reflective Surface Interference

In the case shown below, the beam can be reflected from the wall or flat surface and exposed to the receiver. Please pre-test the operation of sensor with a target under this condition.

(Interval distance : Min. 0.3m)

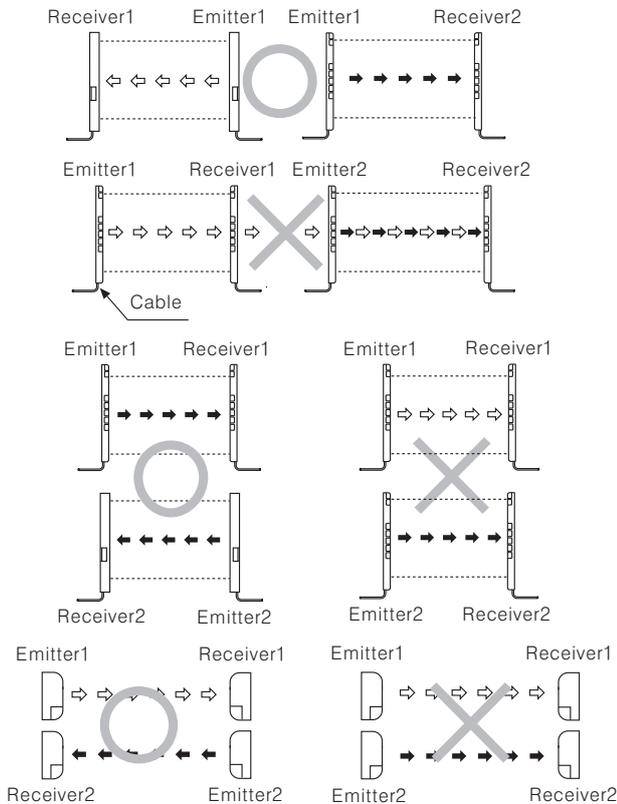
Area Sensor



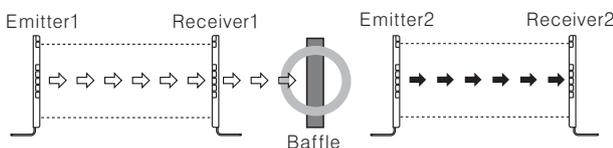
○ For prevention of interference

It may cause interference when installing more than 2 sets of the sensor. In order to avoid the interference of the sensor, please install as following figures and use the interference prevention function not to let light of the other emitter in a receiver..

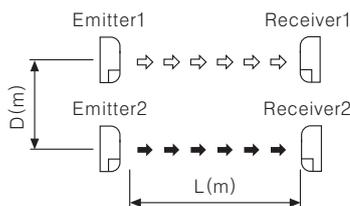
● Transmission direction should be opposite between 2 sets.



● Baffle should be installed between 2 sets.



● Keep sufficient distance between two sets of sensors to avoid mutual interference.



Sensing distance(L)	Allowable installation of distance(D)
0.1 to 1m	Min. 0.1m
Min. 1m	Min. 0.2m

※ There will be small difference depending on installing environment.

■ Operation indicator

Item	Emitter			Receiver			Control output
	Green A	Green B	Picking indicator	Green	Red	Picking indicator	
Power on	☀	●	—	—	—	—	—
FREQ. A operation	☀	●	—	—	—	—	—
FREQ. B operation	☀	☀	—	—	—	—	—
Stable light ON	—	—	☀	☀	☀	☀	ON
Flashing function ON	—	—	◐	☀	☀	◐	ON
Unstable light ON	—	—	☀	●	☀	☀	ON
Unstable light OFF	—	—	●	●	●	●	OFF
Stable light OFF	—	—	●	☀	●	●	OFF
Overcurrent	—	—	●	◐◐	●	●	OFF

Display classification list	
☀	Light ON
●	Light OFF
◐	Flashing by 0.3 sec.
◐◐	Flashing simultaneously by 0.3 sec.

※ Picking indicator operates when output is connected to picking input. (When it is not connected, picking indicator is OFF regardless of operation modes.)

※ Red indicator, Picking indicator, Control output are for Light ON mode in Stable light ON, Unstable light ON, Unstable light OFF and Stable light OFF. For Dark ON mode, they operate in opposite. (When malfunction of synchronous line or overcurrent occurs, control output is OFF in both modes.)

■ Troubleshooting

Malfunction	Cause	Troubleshooting
Non-operation	Power supply	Supply rated power
	Cable disconnection, incorrect connection	Check the wiring
	Rated connection failure	Use within rated sensing distance
Irregular operation	Pollution by dirt on sensor cover	Remove dirt by soft brush or cloth
	Connector connection failure	Check the assembled part of the connector
Control output is OFF even though there is not a target object.	Out of rated sensing distance	Use within rated sensing distance
	There is an obstacle that cut off the light between emitter and receiver	Remove the obstacle
	There is a strong electric wave or noise generated by motor, electric generator, high voltage line etc.)	Put away the strong electric wave or noise generator.
LED display for overcurrent	Control output line shorted	Check the wiring
	Over load	Check the rated load capacity

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