Ultra-Flat (Width 10mm) Picking Sensor

▣ Features

- Plastic injection case
- Slim body (W30×H140×T10mm)
- Long/Short sensing distance mode
  (sensing distance selection function)
- Mutual interference prevention (frequency switching function)
- Selectable Light ON/Dark ON operation mode by switch
- Picking indicator includes
- Protection structure IP40 (IEC standard)

Please read "Safety Considerations" in operation manual before using.

▣ Specifications

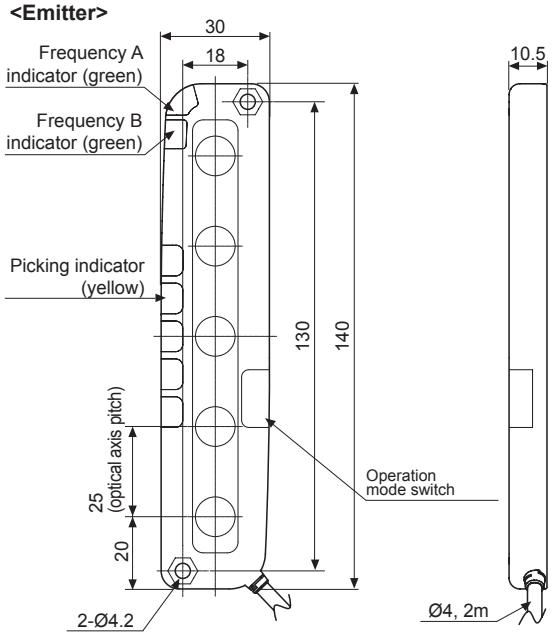
Model	NPN open collector output	**BWPK25-05**
	PNP open collector output	**BWPK25-05P**
Sensing type		Through-beam
Sensing distance	Long distance mode	0.1 to 3m
	Short distance mode	0.05 to 1m
Sensing target		Opaque materials of min. Ø35mm
Optical axis pitch		25mm
Number of optical axis		5
Sensing height		100mm
Response time		Max. 30ms
Power supply		12-24VDC⎓ ±10% (ripple P-P: max. 10%)
Current consumption		Emitter: max. 60mA, Receiver: max. 60mA
Light source		Infrared LED (850nm modulated)
Operation mode		Selectable Light ON/Dark ON by switch
Control output		NPN or PNP open collector output • Load voltage: max. 30VDC⎓ • Load current: max. 150mA • Residual voltage - NPN: max. 1VDC⎓, PNP: Min. 2.5VDC
Protection circuit		Reverse power polarity, Output short-circuit (overcurrent) protection
Insulation resistance		Over 20MΩ (at 500VDC megger)
Interference protection		Interference protection by transmission frequency selection
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)
Noise immunity		±240V the square wave noise (pulse width: 1μs) by the noise simulation
Dielectric strength		1,000VAC 50/60Hz for 1minute
Vibration		1.5mm amplitude or 300m/s^2 at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours
Shock		500m/s² (approx. 50G) in each X, Y, Z direction for 3 times
Environment	Ambient illumination	Ambient light: max. 10,000lx, Incandescent lamp: max. 3,000lx (received light side illumination)
	Ambient temperature	-10 to 55℃, storage: -20 to 60℃
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Protection structure		IP40 (IEC standard)
Material		Case: Polycarbonate/Acrylonitrile butadiene styrene, Sensing part: Polymethyl methacrylate
Cable		Ø4.0mm, 4-wire, 2m (emitter: Ø4.0mm, 3-wire, 2m) (AWG 22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.25mm)
Approval		CE
Weight※1		Approx. 220g (approx. 180g)

※1: The weight includes packaging. The weight in parenthesis is for unit only.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

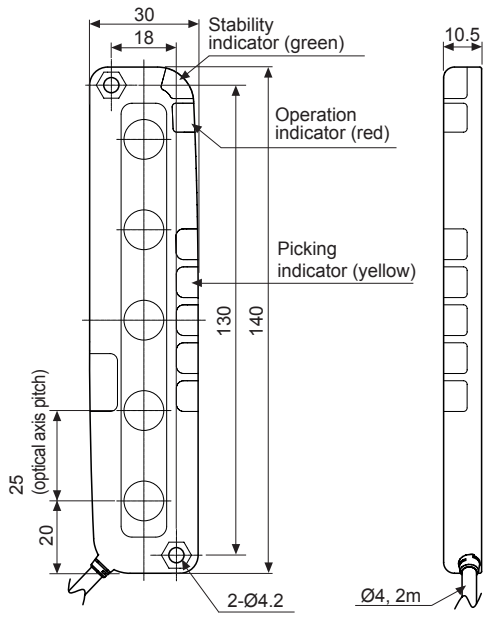
▣ Dimensions

(unit: mm)

<Emitter>

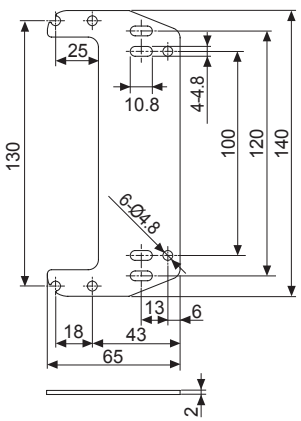


<Receiver>

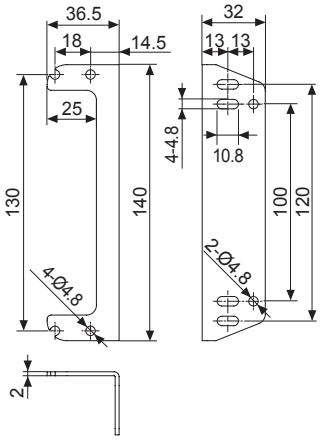


<Bracket>: sold separately

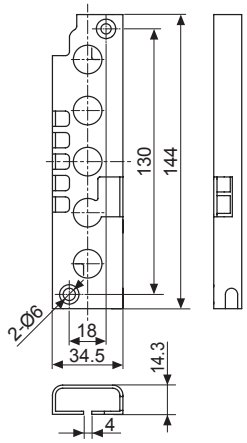
● Flat bracket (BK-BWPK-ST)



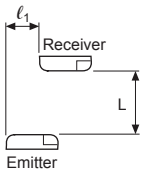
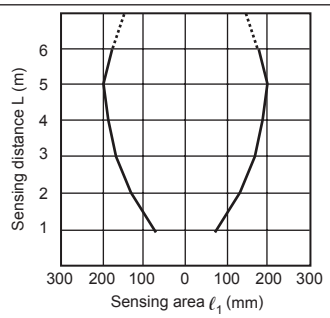
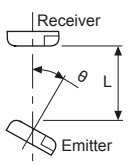
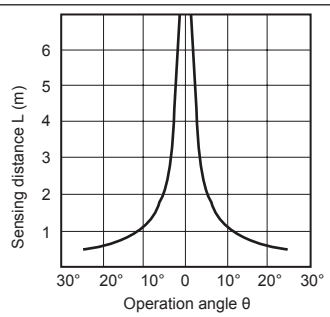
● L-shaped bracket (BK-BWPK-L)



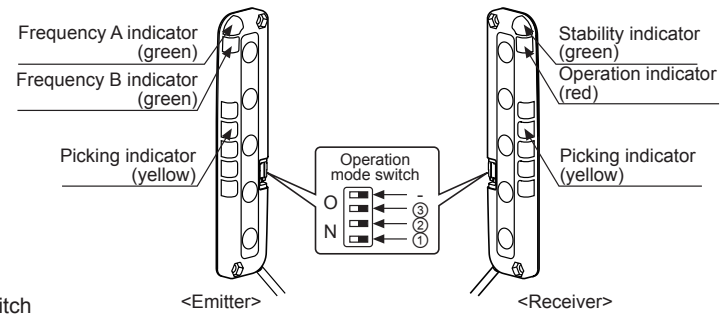
●Protection bracket (BK-BWPK-P)



▣ Feature Data

Parallel shifting characteristic		Angle characteristic	
Measuring method	Data	Measuring method	Data
			

▣ Structure

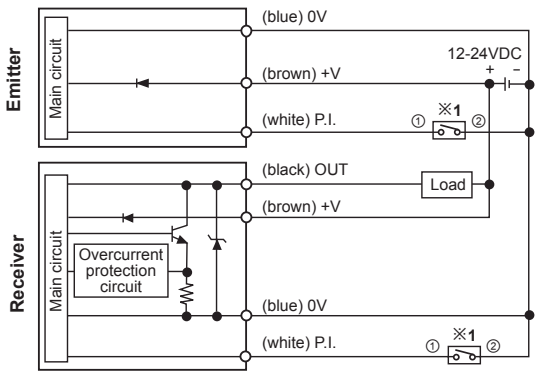


◎ Operation mode switch

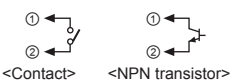
No	Function		Switch OFF	Switch ON
①	Selection of transmission frequency		Frequency A	Frequency B
②	Selection of operation indicator		Lighting indicator	Flashing indicator
③	Emitter	Selection of sensing distance mode	Long mode	Short mode
	Receiver	Selection of operation mode	Light ON	Dark ON

▣ Input/Output Circuit and Connection Diagram

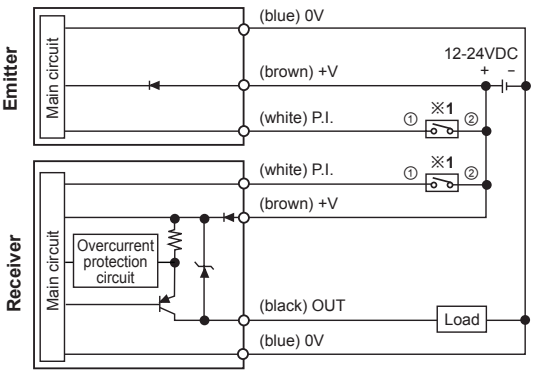
● NPN open collector output



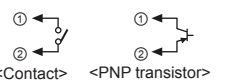
※1: Picking input (P.I): Contact or transistor is ON, and picking indicator operates.



● PNP open collector output

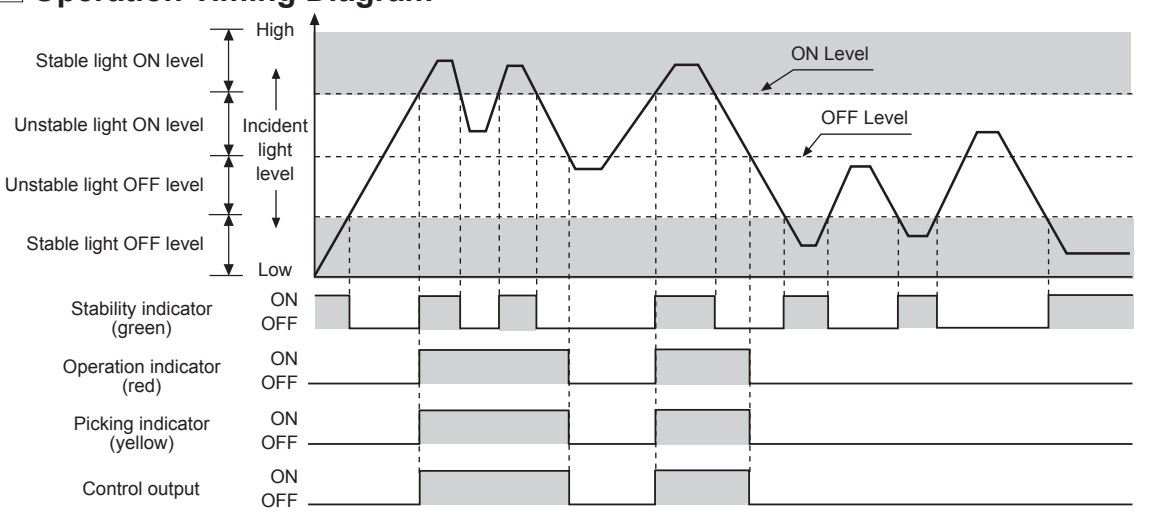


※1: Picking input (P.I): Contact or transistor is ON, and picking indicator operates.



※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



※The above diagram is the state of operation for Light ON, but in case of Dark ON, it is opposite operation against Light ON.
※Picking indicator is operated by connecting picking input line and output line. (If not connecting these, picking indicator is OFF regardless of operation mode.)

▣ Operation Indicator

Item	Emitter			Receiver			
	Indicator			Indicator			Control output
	Green	Green	Picking indicator (yellow)	Green	Red	Picking indicator (yellow)	
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

※The operations of 'Operation indicator' and 'Picking indicator (red)' for stable light ON level, unstable light ON level, unstable light OFF level, and stable light OFF level are for Light ON. (In case of overcurrent, control output is OFF regardless of operation mode.)

▣ Function

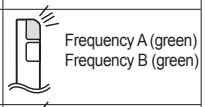
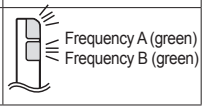
◎ Switching of Long/Short mode (selectable sensing distance)

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

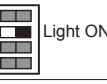
◎ Interference protection

In case of using 2 pcs of sensor in serial or parallel in order to extend sensing width, it may cause sensing error because of light interference.
This function is operating a sensor in transmission frequency A and another sensor in transmission frequency B to avoid these sensing errors by the light interference.

	Operation mode switch (emitter+receiver)	Frequency A, B indicator (emitter)
Sensor Ⓐ (Transmission frequency A)		
Sensor Ⓑ (Transmission frequency B)		

◎ Light ON/Dark ON mode

The control output is ON when it is light ON in Light ON and the control output is ON when it is light OFF in Dark ON. It is available to select with user's preference.

	Operation mode switch (receiver)	Control output operation
Light ON		It is ON when it is light ON.
Dark ON		It is ON when it is light OFF.

◎ Switching of Lighting/Flashing of Picking indicator

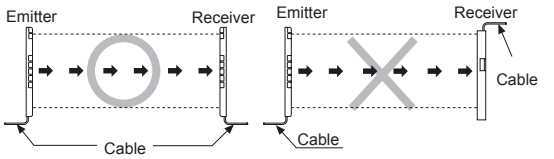
Picking indicator is lighting or flashing to make out work sensing operation more easily.

	Operation mode switch (emitter+receiver)	Picking indicator operation
Lighting		Lighting indicator
Flashing		Flashing indicator

▣ Installation

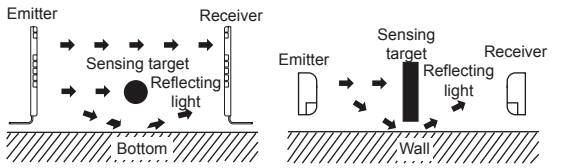
◎ For direction of installation

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



◎ For reflection from the surface of wall and flat

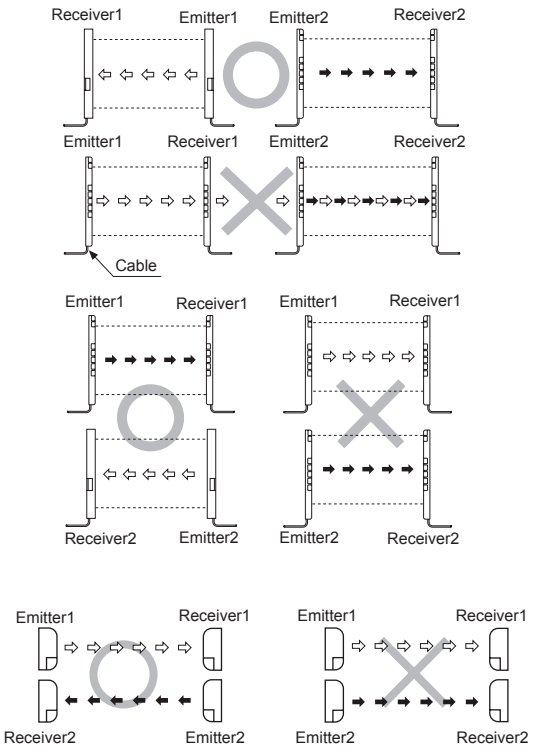
When installing it as below the light reflected from the surface of wall and flat will not be shaded. Please, check whether it operates normally or not with a sensing target before using. (interval distance: min. 0.3m)



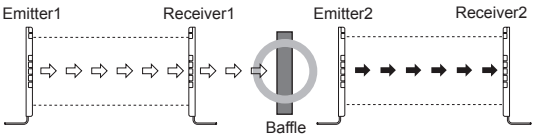
◎ For prevention of interference

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 protection function.

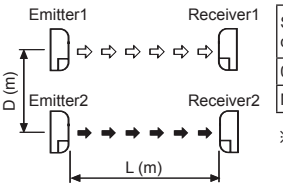
- **Transmission direction should be opposite between 2 sets**



- **Baffle should be installed between 2 sets.**



- **It should be installed out of the interference distance**



Sensing distance (L)	Installation allowable distance (D)
0.1 to 1m	Min. 0.1m
Min. 1m	Min. 0.2m

※It may be a little different based on installation environment.

▣ Troubleshooting

Malfunction	Cause	Troubleshooting
Non-operation	Power supply	Supply rated power.
	Cable incorrect connection or disconnection	Check the wiring.
	Rated connection failure	Use it within rated sensing distance.
Non-operation in sometimes	Pollution by dirt of 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 to cut off the light emitted 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 displays for over current	Control output line is shorten	Check the wiring.
	Over load	Check the rated load capacity.