Area sensor with plastic case

▣ Features

- **13mm slim body with fresnel lens**
- Adoption of plastic(PC/ABS) injection case
- Various functions; stop transmission, interference prevention, lightening/flashing JOB indicator, Light ON/Dark ON operation
- Easy to recognize at side, front, and long-distance by high brightness LED of Emitter and Receiver
- Fast response time up to 7ms
- 4 models with various optical axes (8 to 20EA) and sesing height (140 to 380mm)
- Protection structure IP40(IEC standard)

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

CE

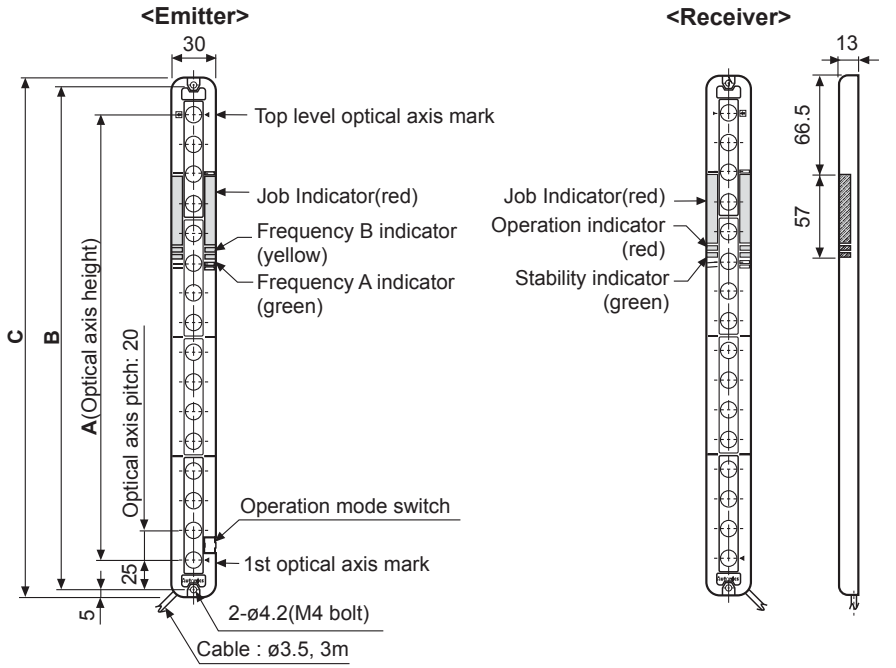
▣ Specifications

Model	NPN open collector output	BWP20-08	BWP20-12	BWP20-16	BWP20-20
	PNP open collector output	BWP20-08P	BWP20-12P	BWP20-16P	BWP20-20P
Sensing type		Through-beam			
Sensing distance		0.1 to 5m			
Sensing target		Opaque materials of Min.ø30mm			
Optical axis pitch		20mm			
Number of optical axis		8pcs	12pcs	16pcs	20pcs
Sensing width		140mm	220mm	300mm	380mm
Power supply		12-24VDC ±10%(Ripple P-P : Max. 10%)			
Protection circuit		Includes			
Current consumption		Emitter : Max. 80mA, Receiver : Max. 80mA			
Control output		NPN or PNP open collector output • Load voltage : Max. 30VDC • Load current : Max. 150mA • Residual voltage - NPN : Max. 1V, PNP : Min. 2.5V			
Operation mode		Light ON/Dark ON by switch			
Short-circuit protection		Built-in			
Response time		Max. 6ms(Frequency B selection is max. 7ms)			
Light source		Infrared LED(850nm modulated)			
Synchronization type		Synchronized by synchronous line			
Interference protection		Interference protection by transmission frequency selection			
Environment	Ambient illumination	Sunlight : Max. 10,000lx			
	Ambient temperature	-10 to 55℃, storage : -20 to 60℃			
	Ambient humidity	35 to 85%RH, storage : 35 to 85%RH			
Noise resistance		The square wave noise by the noise simulator(Voltage : ±240V, Period : 10ms, Pulse width : 1μs)			
Dielectric strength		1,000VAC 50/60Hz for 1minute			
Insulation resistance		Min. 20MΩ(at 500VDC megger)			
Vibration		1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours			
Shock		500m/s²(Approx. 50G) in each of X, Y, Z directions for 3 times			
Protection		IP40(IEC standard)			
Material		Case : PC/ABS, Sensing part : PMMA			
Cable		ø3.5mm, 4-wire, Length : 3m(Emitter : ø3.5mm, 4-wire, Length : 3m) (AWG 24, Core diameter : 0.08mm, Number of cores : 40, Insulator out diameter : ø1mm)			
Approval		CE			
Unit weight		Approx. 280g	Approx. 320g	Approx. 360g	Approx. 430g

※ The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

▣ Dimensions

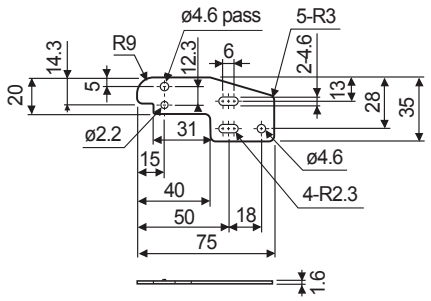
(unit: mm)



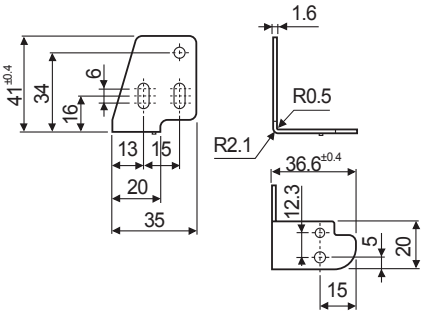
Model	A	B	C
BWP20-08	140	180	190
BWP20-12	220	260	270
BWP20-16	300	340	350
BWP20-20	380	420	430

◎ Mounting of bracket

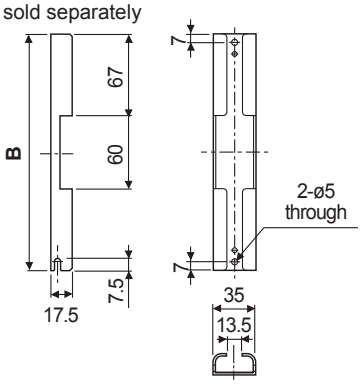
- **Flat bracket(BK-BWP-ST)**
  sold separately

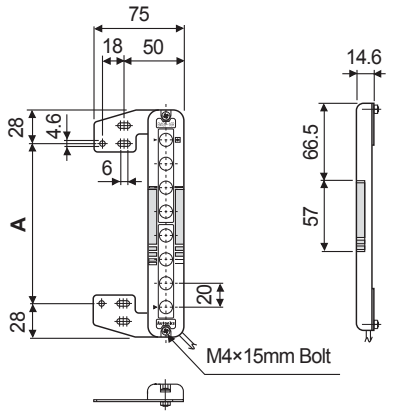


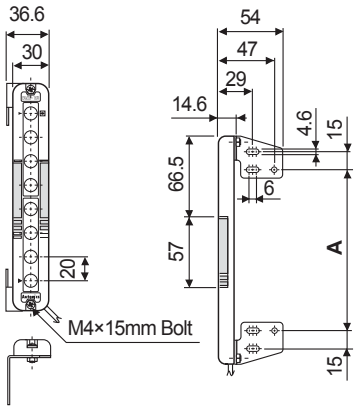
- **L-Shaped bracket(BK-BWP-L)**
  sold separately

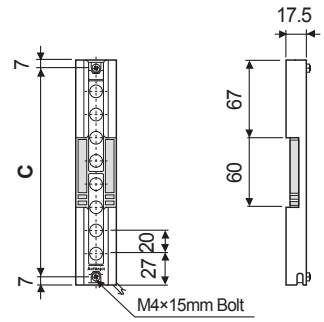


- **Protection bracket(BK-BWP-P□)**
  sold separately









※ It is able to mount parallel or L-shaped bracket together.

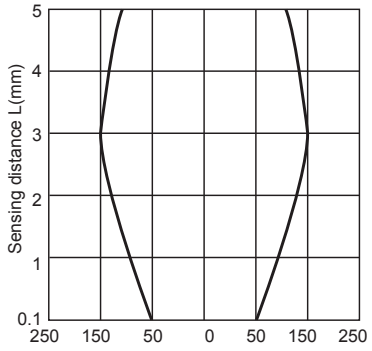
Model	A	BK-BWP-P		
		Bracket model	B	C
BWP20-08	134	BK-BWP-P08	194	180
BWP20-12	214	BK-BWP-P12	274	260
BWP20-16	294	BK-BWP-P16	354	340
BWP20-20	374	BK-BWP-P20	434	420

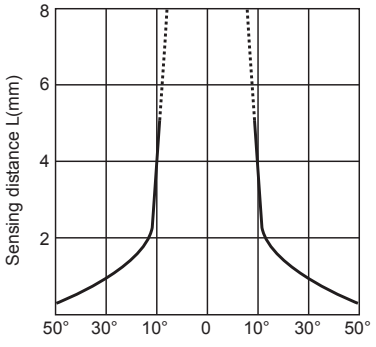
(unit: mm)

※ Bracket is sold separately.

▣ Feature data

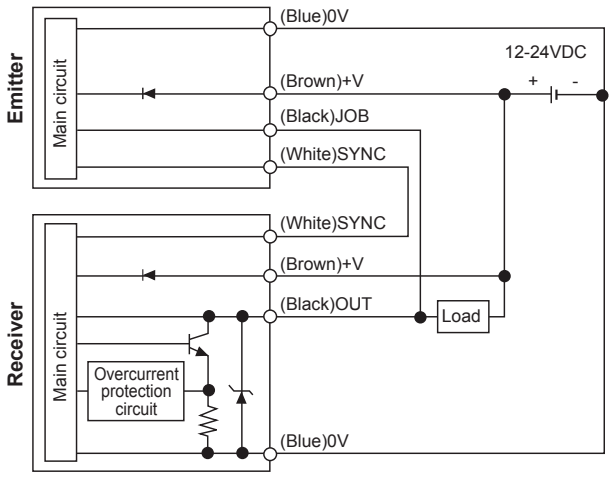
Parallel shifting characteristic	Angle characteristic
Data	Data



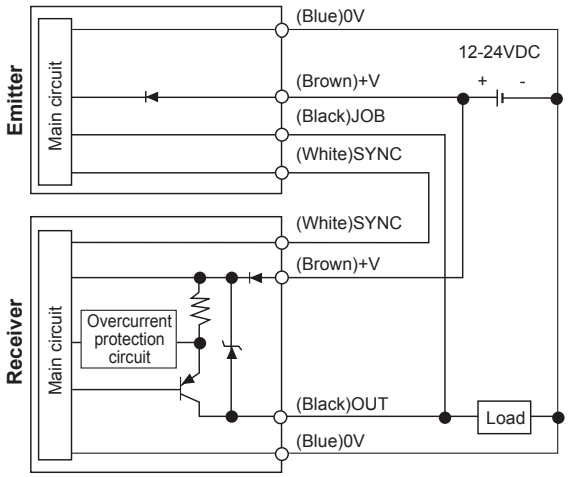


▣ Input/Output circuit and connection diagram

● **NPN open collector output**



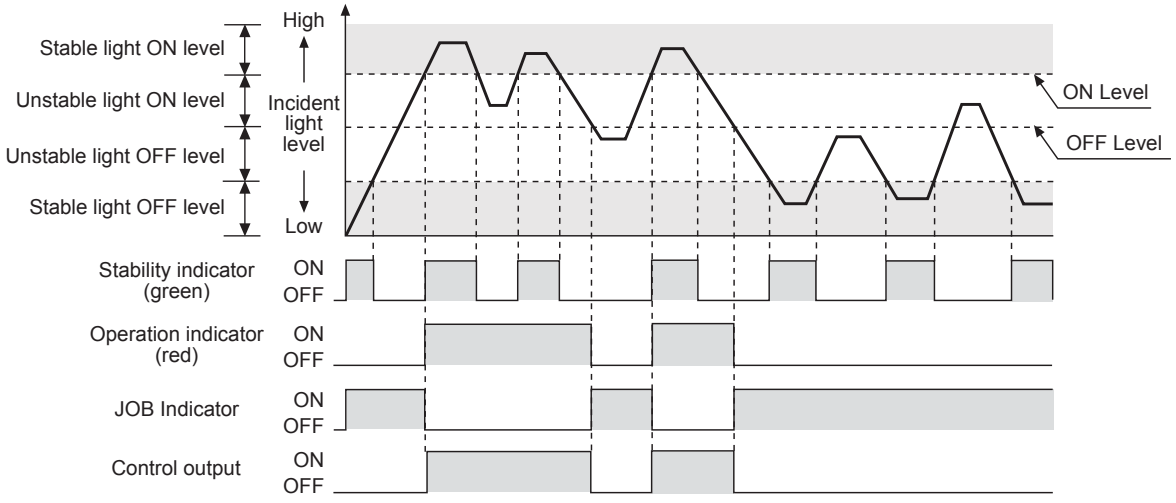
● **PNP open collector output**



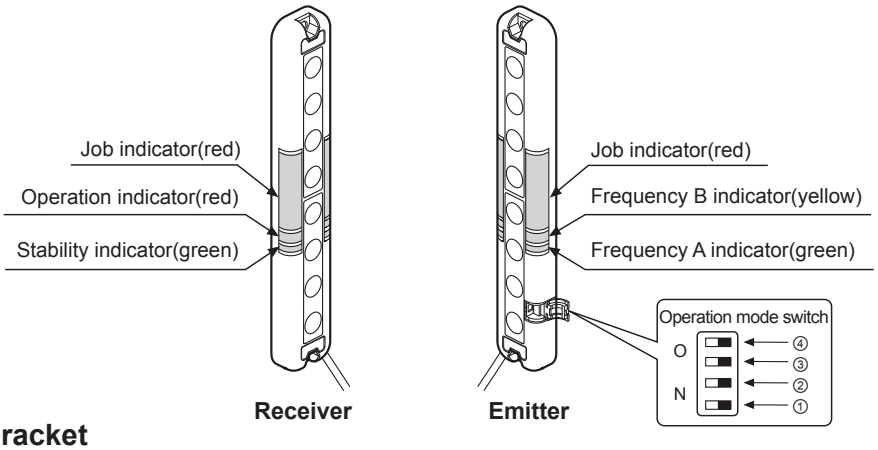
※ If the receiver OUT(Black) line and the emitter JOB(Black) line are not connected each other, the JOB indicator of the emitter is not operated and maintain the light status.

▣ Operation timing diagram

● The waveforms of operation indicator, job indicator, and control output are the state of operation for Light ON, but in case of Dark ON, it is opposite operation against Light ON mode.



▣ Structure



◎ Mounting of bracket

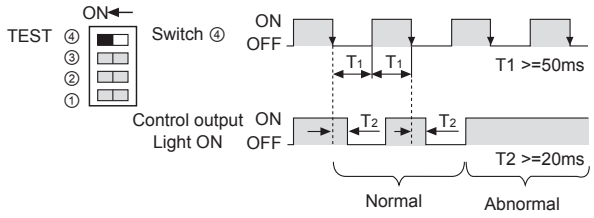
No	Function	Switch OFF	Switch ON
①	Transmission frequency selection	Frequency A	Frequency B
②	Light ON/Dark ON selection	Light ON operation	Dark ON operation
③	Steady/flashing light of Job indicator selection	Job indicator with Steady light	Job indicator with Flashing light
④	Job/TEST selection	Normal mode	TEST mode

▣ Functions

◎ TEST(Stop transmission function) function

When selecting TEST mode, emit is stopped and green&yellow LED of emitter flashes. It is available to check whether sensor operates properly with stopping the transmission in TEST mode. It is changed to light OFF status when emit the transmission is stopped, control output is OFF in Light ON mode and ON in Dark ON mode.

● Control output pulse for TEST input



◎ Interference prevention function

In case of using 2pcs 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	Frequency A, B indicator
Sensor Ⓐ (Transmission frequency A)	ON ④③②① FREQ.A	JOB INDI. Frequency B(Yellow) Frequency A(Green)
Sensor Ⓑ (Transmission frequency B)	ON ④③②① FREQ.B	JOB INDI. Frequency B(Yellow) Frequency A(Green)

◎ Light-ON / Dark-ON operation 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	Control output operation
Light ON	ON ④③②① Light ON	It is ON when it is light ON.
Dark ON	ON ④③②① FREQ.B	It is ON when it is light OFF.

◎ Lightening/Flashing JOB indicator

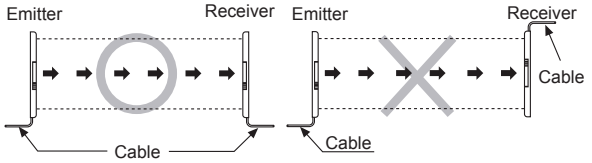
JOB indicator will be lighted and flashed to make out work sensing operation more easily.

Operation mode switch	JOB indicator operation
ON ④③②① GLOW	Lighting indicator
ON ④③②① BLINK	Flashing indicator

▣ Installation

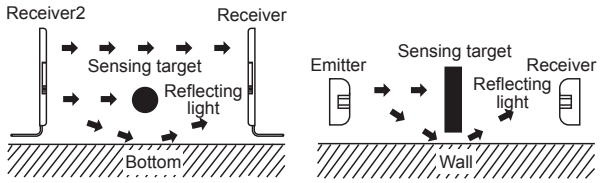
◎ For direction of installation

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



◎ For reflection from the surface of wall and flat

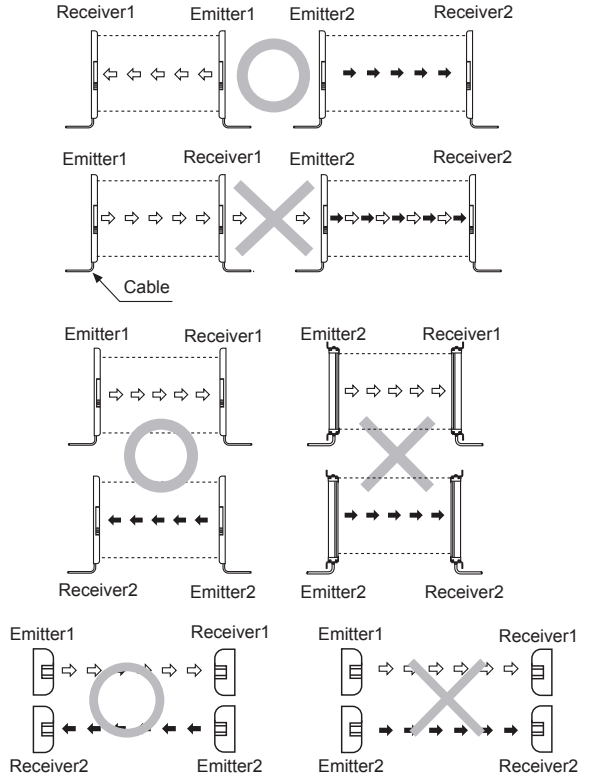
When installing it as below the light reflected from the surface of wall and flat will not be shaded. Please, check whether it operates normally or not with a sensing target before using. (Interval distance : Min. 0.3m)



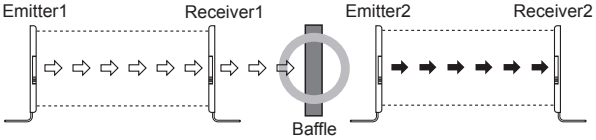
◎ For prevention of interference

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.

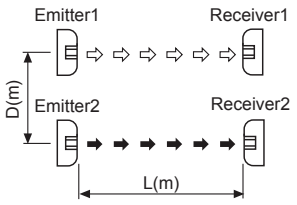
- **Transmission direction should be opposite between 2 sets**



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



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



Sensing distance(L)	Installation allowable distance(D)
0.1 to 1m	Min. 0.2m
Min. 1m	Min. 0.3m

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

▣ Operation indicator

Item	Emitter			Receiver			
	Indicator			Indicator			Control output
	Green	Yellow	JOB Indicator	Green	Red	JOB Indicator	
Power on	☼	●	—	—	—	—	—
FREQ. A operation	☼	●	—	—	—	—	—
FREQ. B operation	☼	☼	—	—	—	—	—
TEST	▶	◀	☼	☼	●	☼	OFF
Stable light ON	—	—	●	☼	☼	●	ON
Unstable light ON	—	—	●	●	☼	●	ON
Unstable light OFF	—	—	☼	●	●	☼	OFF
Stable light OFF	—	—	☼	☼	●	☼	OFF
Flashing function ON	—	—	◑	☼	●	◑	OFF
Synchronous line malfunction	—	—	☼	▶	◀	☼	OFF
Overcurrent	—	—	☼	◑	◑	☼	OFF

Display classification list	
☼	Light ON
●	Light OFF
◑	Flashing by 0.3 sec.
◑ ◑	Flashing simultaneously by 0.3 sec.
▶ ◀	Cross-Flashing by 0.3 sec.

※ The operation of 'Operation indicator(Red)', 'Job indicator (Red)', 'Control output' is for Light ON, in case of Dark ON, it is opposite operation against Light ON. (In case, malfunction of synchronous line and over current, control output is OFF regardless of the mode.)

▣ 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 synchronous line malfunction	Synchronous line incorrect connection or disconnection	Check the wiring.
	Break of synchronous circuit of emitter or receiver	Contact our company.
LED displays for over current	Control output line is shorten	Check the wiring.
	Over load	Check the rated load capacity.