Area sensor with plastic case

▣Features

- ●13mm slim body with fresnel lens.
- ●Adoption of plastic (PC/ABS) injection case
- ●Includes Stop transmission function, Mutual interference prevention function, Job indicator Blink function, Light ON/Dark ON switching function
- ●Easy to distinguish of side/front and long distance with high luminance twin operation indicators
- ●Fast response time, max. 7ms
- ●4 types of product (Optical axis pitch : 20mm, Number of optical axis : 8, 12, 16, 20)

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

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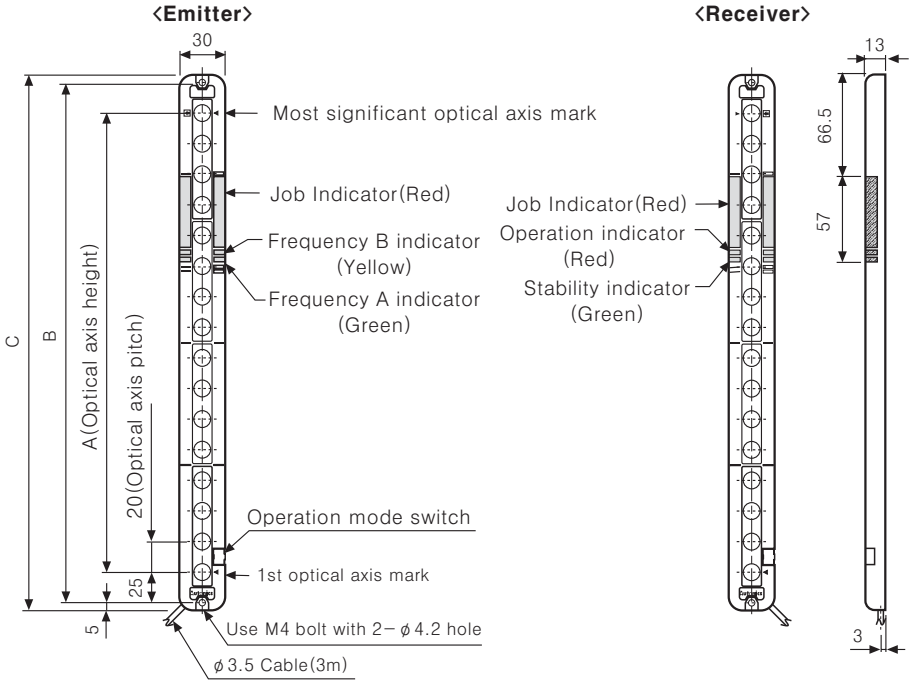
▣Specifications

Model		BWP20-08(P)	BWP20-12(P)	BWP20-16(P)	BWP20-20(P)
Sensing type		Transmitted beam type			
Sensing distance		0.1 ~ 5m			
Sensing target		Opaque materials of min. ϕ30mm			
Optical axis pitch		20mm			
Number of optical axis		8pcs	12pcs	16pcs	20pcs
Sensing width		140mm	220mm	300mm	380mm
Pointing angle		Within ±5° (At over 3m sensing distance)			
Power supply		12-24VDC ±10%(Ripple P-P:Max. 10%)			
Protection circuit		Includes			
Current consumption		Emitter : Max. 80mA, Receiver : Max. 80mA			
Control output		• NPN open collector output ☞ Load voltage:Max. 30VDC, Load current:Max. 150mA, Residual voltage:Max. 1VDC • PNP open collector output ☞ Load current:Max. 150mA, Output voltage:Min.(Power supply-2.5)VDC			
	Operation mode	Light ON/Dark ON switching			
	Short-circuit protection	Includes			
	Response time	Max.6ms(Frequency B select Max. 7ms)			
Light source		Infrared LED(850nm modulated)			
Synchronization type		Timing method by synchronous line			
Interference protection		Interference protection by master/slave function			
Environment	Ambient temperature	-10 ~ +55℃(at non-freezing status)			
	Storage temperature	-20 ~ +60℃			
	Ambient humidity	35 ~ 85%RH			
	Storage humidity	35 ~ 85%RH			
	Ambient illumination	Sunlight : Max. 10,000ℓx, Incandescent lamp : Max. 3,000ℓx			
Noise strength		The square wave noise by the noise simulator(Voltage:±240V, Period:10ms, Pulse width:1㎲)			
Dielectric strength		1,000VAC 50/60Hz for 1minute			
Insulation resistance		Min. 20MΩ(500VDC mega)			
Vibration		1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours			
Shock		500m/s² (Approx. 50G) in X, Y, Z directions for 3 times			
Protection		IP40(IEC standard)			
Material		• Body : PC/ABS, Lens : Acrylic			
Cable		Emitter : ϕ3.5mm, 4P, 3m / Receiver : ϕ3.5mm, 4P, 3m			
Unit weight		Approx. 280g	Approx. 320g	Approx. 360g	Approx. 430g

▣Dimensions

(Unit:mm)



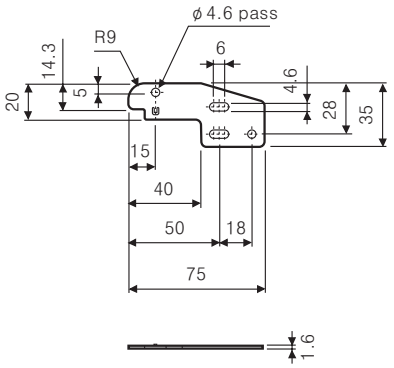
Application model	A	B	C
BWP20−08	140	180	190
BWP20−12	220	260	270
BWP20−16	300	340	350
BWP20−20	380	420	430

◎Mounting of bracket

(Unit:mm)

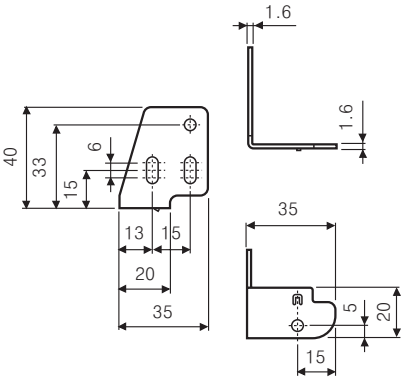
●BK−BWP−ST(Equilibrium bracket)

Option



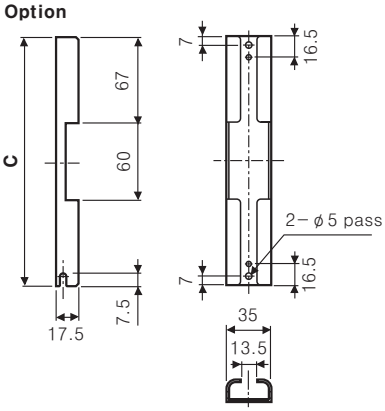
●BK−BWP−L(L−Shaped bracket)

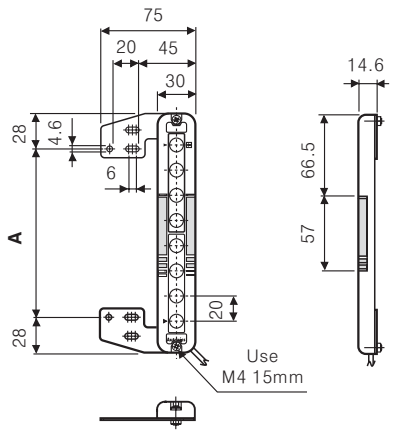
Option

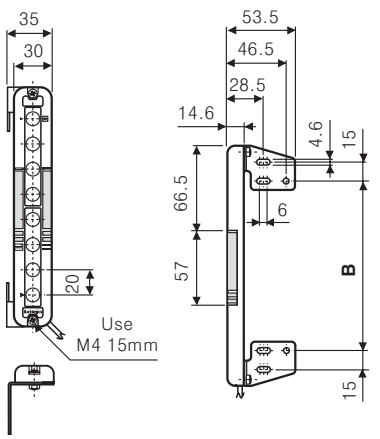


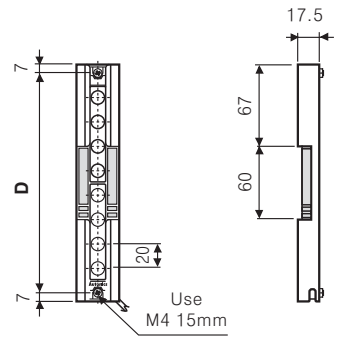
●BK−BWP−P□(Protection bracket)

Option







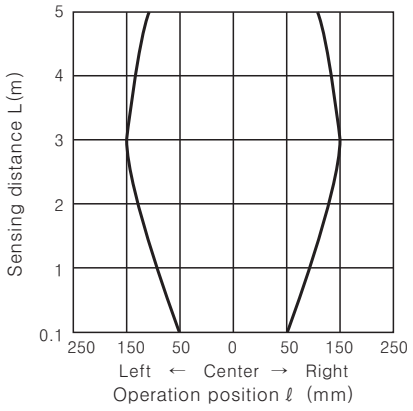
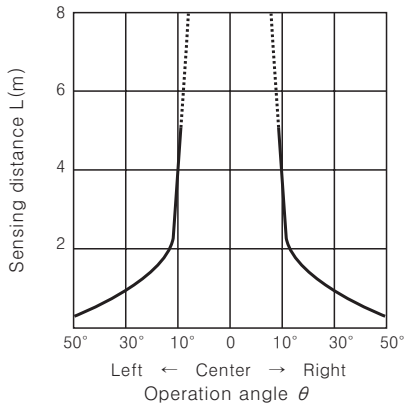


※It is enable to mount balanced or L−shaped bracket together.

Model	A[mm]	B[mm]	BK−BWP−P		
			Name of bracket	C[mm]	D[mm]
BWP20−08	134	160	BK−BWP−P08	194	180
BWP20−12	214	240	BK−BWP−P12	274	260
BWP20−16	294	320	BK−BWP−P16	354	340
BWP20−20	374	400	BK−BWP−P20	434	420

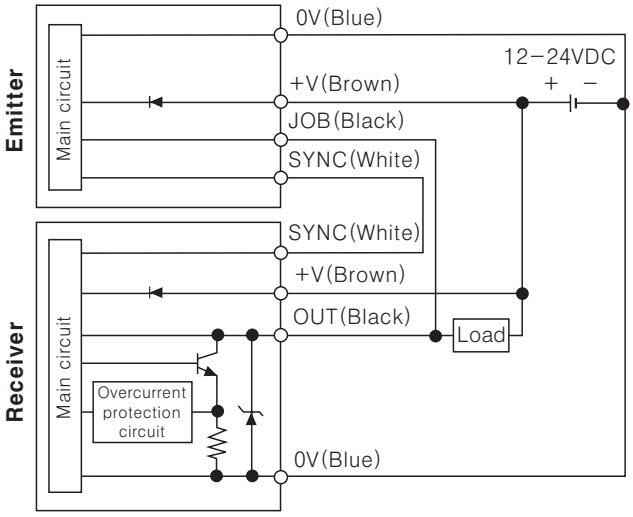
※Bracket is sold separately.

▣Feature data

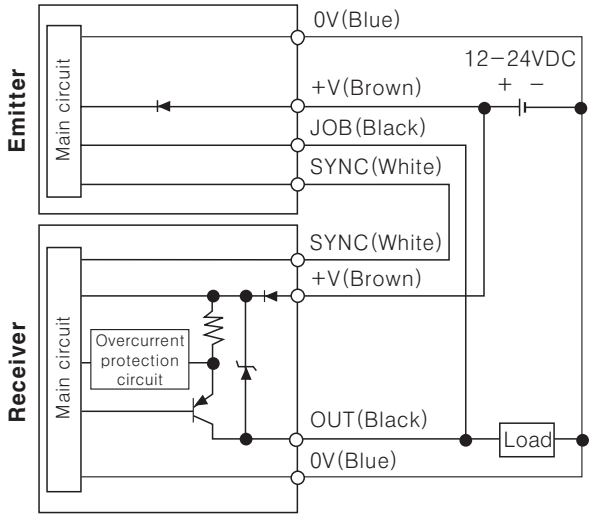
Parallel shifting characteristic	Angle characteristic
Data	Data
	

▣Input/Output circuit and connection diagram

<NPN open collector output type>



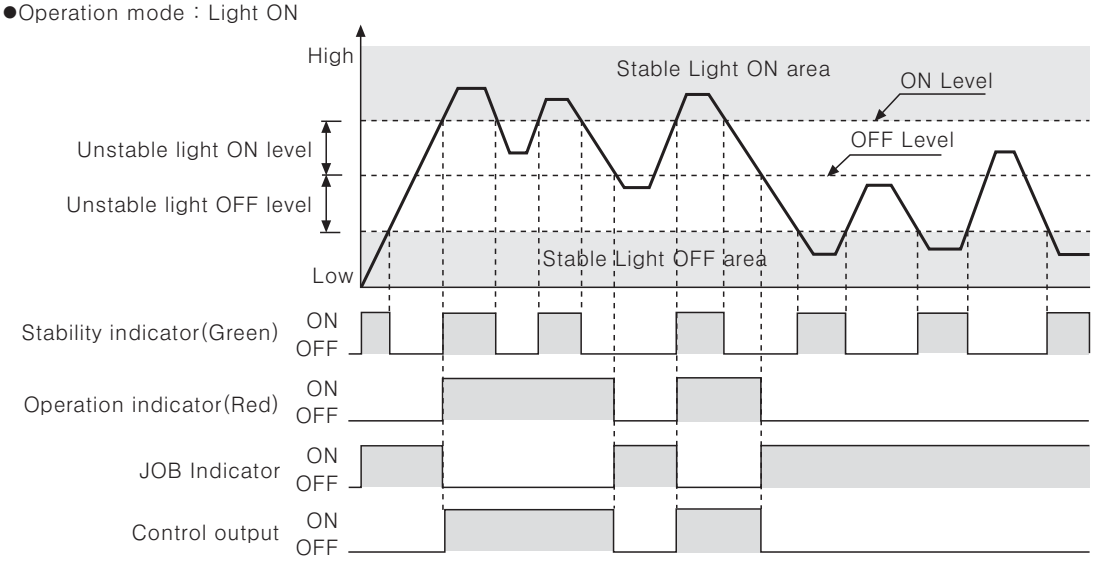
<PNP open collector output type>



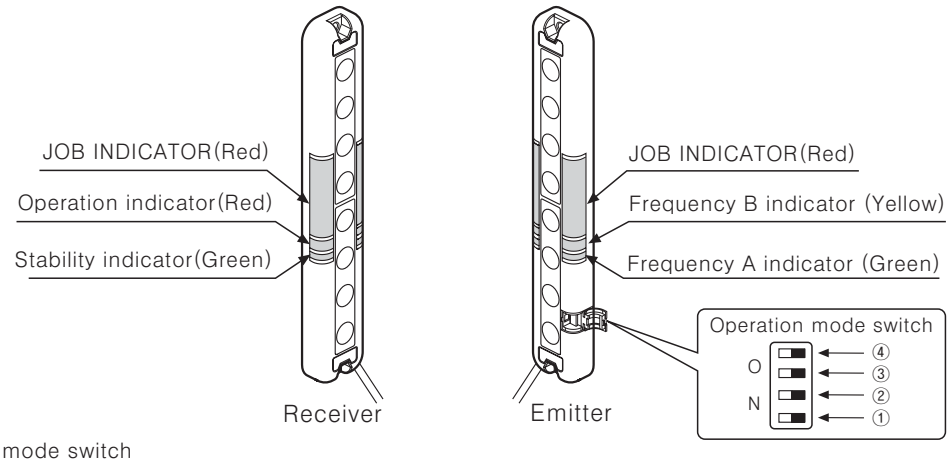
※If the receiver OUT(Black) line and the emitter JOB(Black) line are not connected each other, the JOB indicator of the emitter is not operated and maintain the light status.

▣Timing diagram of operation

●Operation mode : Light ON



▣Structure



◎Operation mode switch

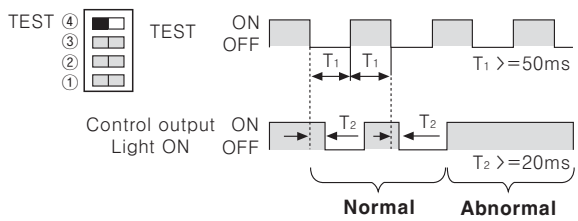
No	Function	Switch OFF	Switch ON
①	Transmission frequency selection	Frequency A	Frequency B
②	Light ON/Dark ON selection	Light ON operation	Dark ON operation
③	Steady/flashing light of JOB indicator selection	JOB indicator with Steady light	JOB indicator with Flashing light
④	JOB/TEST selection	Normal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

▣Functions

◎TEST(Stop transmission function) functions

In TEST mode, emission is stopped and Green & Yellow LED on emitter flashes alternately.
This function is to see whether sensor operates properly when the transmission is stopped. As it is changed to dark status, control output will be OFF in Light-ON mode and ON in Dark-ON mode.

●Control output pulse for TEST input



◎Interference prevention function

In case of using 2 pcs of sensor in serial or parallel in order to extend sensing height, 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	Frequency A, B indicator
Sensor Ⓐ (Transmission frequency A)	④ ③ ② ① FREQ.A	JOB INDI. Frequency B(Yellow) Frequency A(Green)
Sensor Ⓑ (Transmission frequency B)	④ ③ ② FREQ.B ①	JOB INDI. Frequency B(Yellow) Frequency A(Green)

◎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	Control output operation
Light -ON	④ ③ ② ① Light-ON	It is ON when it is lighted.
Dark -ON	④ ③ Dark ON ② ①	It is ON when it is shaded.

◎Switching Steady / Flashing Light of JOB indicator

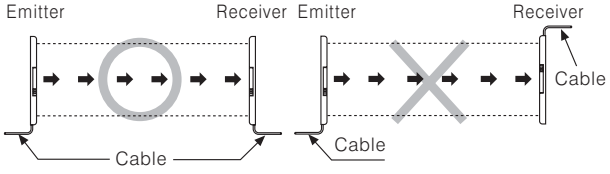
JOB indicator will be lighted and flashed to make out work sensing operation more easily.

Operation mode switch	JOB indicator operation
④ ③ ② ① GLOW	Light on
BLINK ④ ③ ② ①	Flashing

▣Installation

◎For direction of installation

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

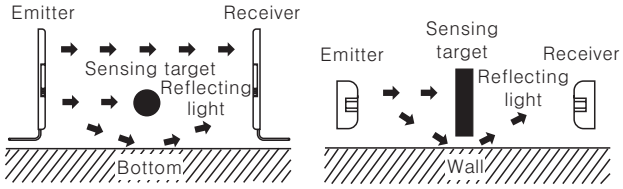


◎Reflective Surface Interference

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.

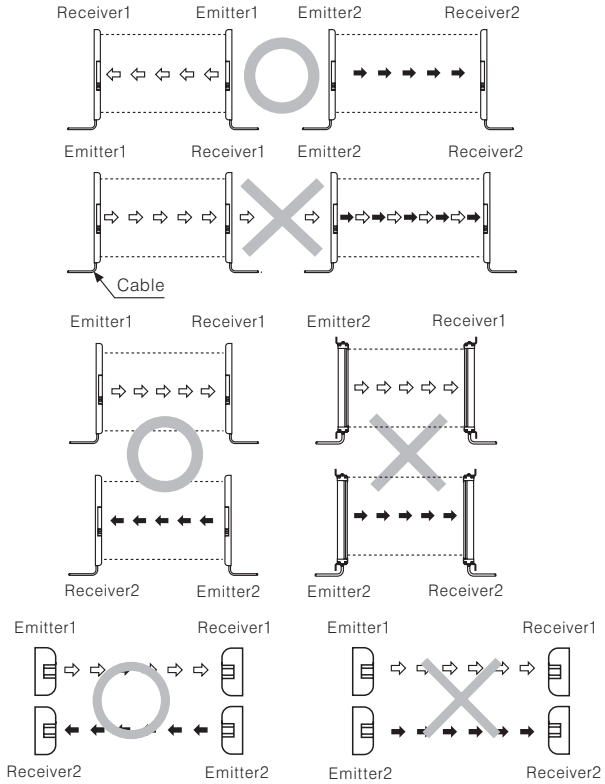
(Interval distance : Min. 0.3m)



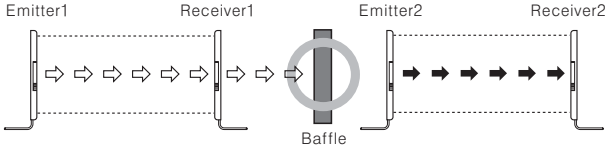
◎**For prevention of interference**

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.

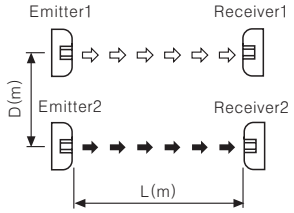
●Transmission direction should be opposited between 2 sets.



●Baffle should be installed between 2 sets.



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



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

※There can be a little difference depending on installing 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	—	—	●	☼	☼	●	OFF
Unstable light ON	—	—	●	●	☼	●	ON
Unstable light OFF			☼	●	●	☼	ON
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.

※'Control output' above is for Light ON mode. For Dark ON mode, they operate in opposite. (When malfunction of synchronous line or overcurrent occurs, control output is OFF in both modes.)

▣Inspection/Treatment for malfunction

Malfunction	Caution	Treatment
Non-operation	Power supply	Supply rated power
	Cable disconnection incorrect connection	Check the wiring
	Rated connection failure	Use within rated sensing distance
Irregular operation	Contamination 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 betwee emitter and receiver	Remove the obstacle
	There is a strong electric wave or noise generated by such as motor, electric generator, high voltage line etc.)	Put away the strong electric wave or noise generator.
LED display for synchronous line malfunction	Synchronous line incorrect connection or disconnection	Check the wiring
	Damage on synchronous circuit of emitter or receiver	Contact us
LED display for overcurrent	Shorted control output line	Check the wiring
	Over load	Check the rated load capacity