

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 by switch
- 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 sensing height (140 to 380mm)
- Protection structure IP40(IEC standard)



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



■ 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 | 8EA | 12EA | 16EA | 20EA | |
| Sensing width | 140mm | 220mm | 300mm | 380mm | |
| Power supply | 12-24VDC ±10%(Ripple P-P : Max. 10%) | | | | |
| Protection circuit | Built-in | | | | |
| 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 (received light side illumination) | | | |
| | Ambient temperature | -10 to 55°C, storage : -20 to 60°C | | | |
| | Ambient humidity | 35 to 85%RH, storage : 35 to 85%RH | | | |
| Noise resistance | ±240V the square wave noise (pulse width: 1μs) by the noise simulation | | | | |
| Dielectric strength | 1,000VAC 50/60Hz for 1minute | | | | |
| Insulation resistance | Min. 20MΩ(at 500VDC megger) | | | | |
| Vibration | 1.5mm amplitude or 300m/s ² at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour | | | | |
| Shock | 500m/s ² (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 | |

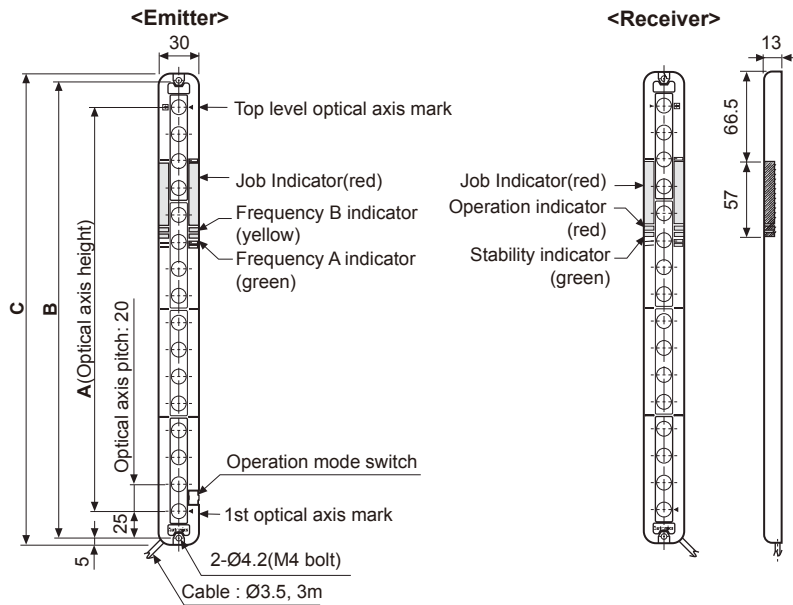
※ The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

| | |
|-----|----------------------------------|
| (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 mode power supply |
| (Q) | Stepper motor& Driver&Controller |
| (R) | Graphic/ Logic panel |
| (S) | Field network device |
| (T) | Software |
| (U) | Other |

BWP Series

Dimensions

(unit: mm)

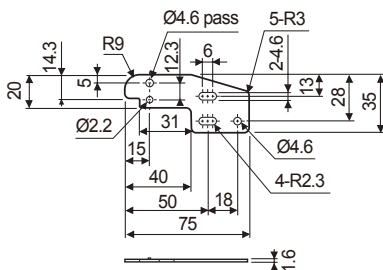


| Model | A | B | C |
|----------|-----|-----|-----|
| BWP20-08 | 140 | 180 | 190 |
| BWP20-12 | 220 | 260 | 270 |
| BWP20-16 | 300 | 340 | 350 |
| BWP20-20 | 380 | 420 | 430 |

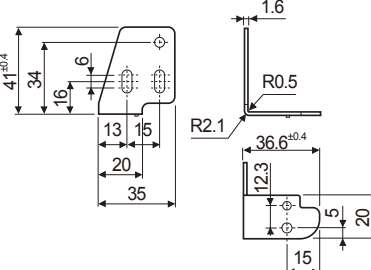
※Use M4 bolt for installing sensor, and tightening torque should be under 20kgf·cm

Mounting of bracket

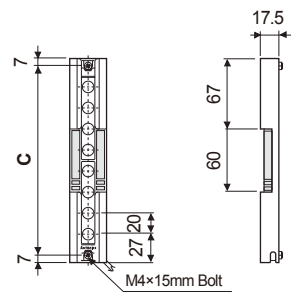
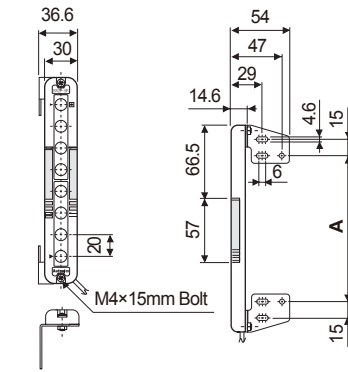
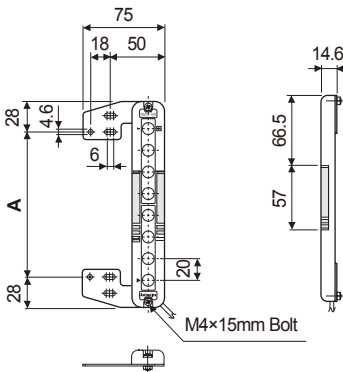
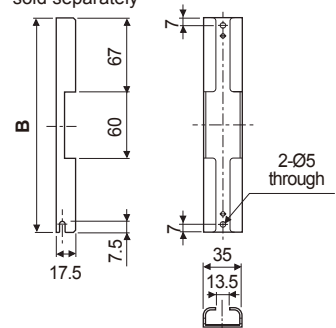
Flat bracket(BK-BWP-ST) sold separately



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



Protection bracket(BK-BWP-P) sold separately



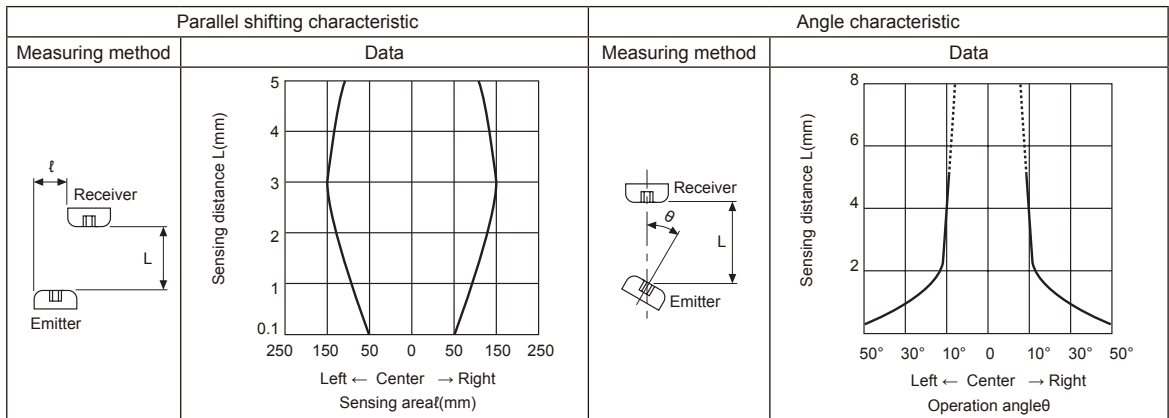
※It is able to mount parallel or L-shaped bracket together.

| 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)

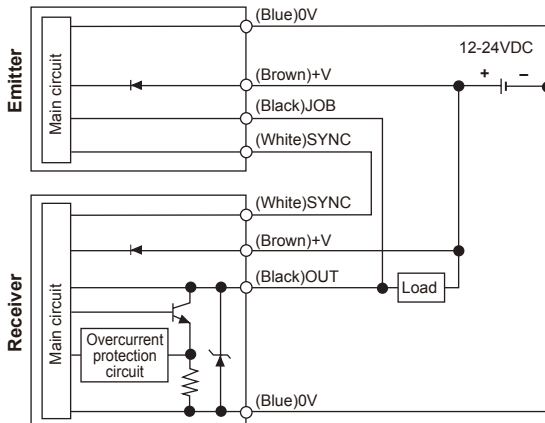
※Bracket is sold separately.

Feature data

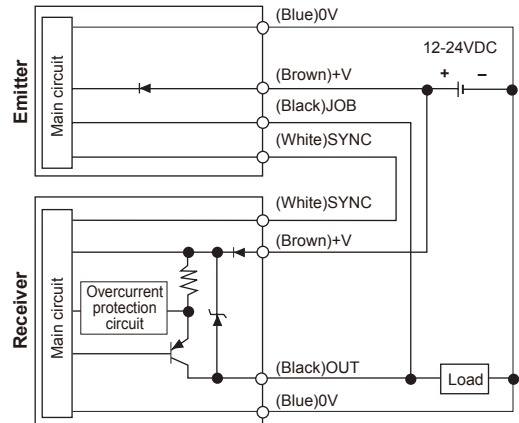


Input/Output circuit and connection diagram

• NPN open collector output

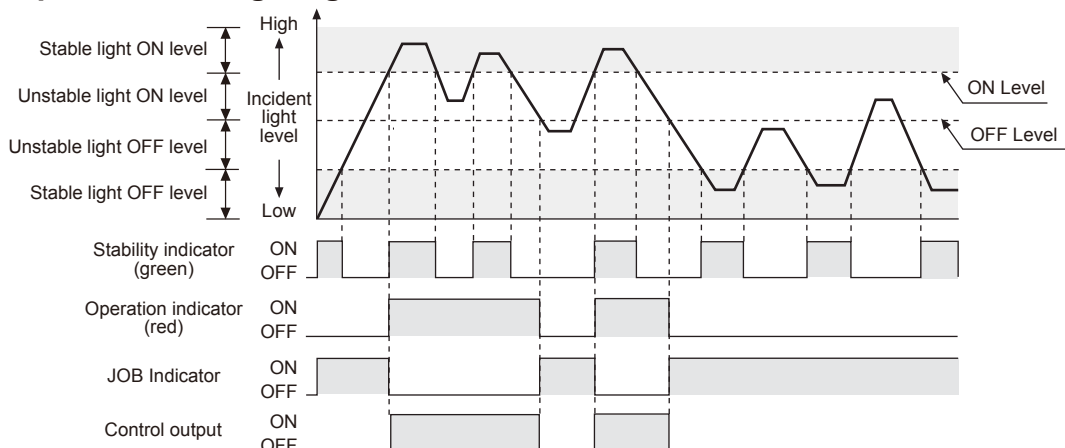


• PNP open collector output



※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.

(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 mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/ Logic panel

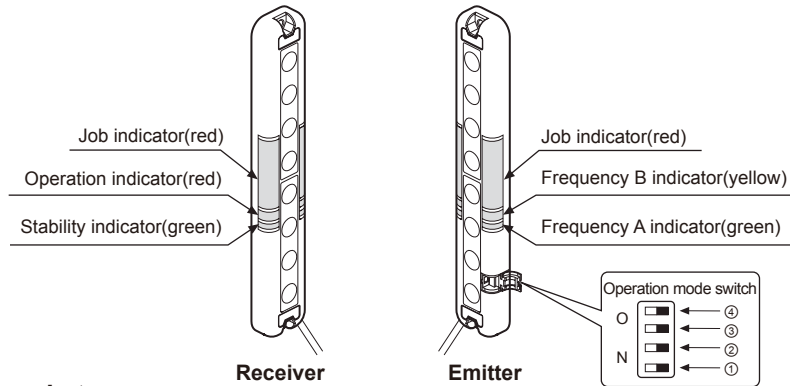
(S) Field network device

(T) Software

(U) Other

BWP Series

■ Structure



◎ Mounting of bracket

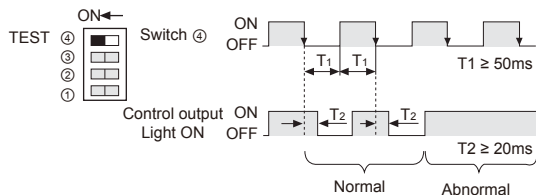
| No | Function | Switch OFF | Switch ON |
|----|--|---------------------------------|-----------------------------------|
| ① | Transmission frequency selection | Frequency A | Frequency B |
| ② | Light ON/Dark ON selection | Light ON operation | Dark ON operation |
| ③ | Steady/flashing light of Job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

■ Functions

◎ TEST(stop transmission)

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



◎ 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 | | It is ON when it is light ON. |
| Dark ON | | It is ON when it is light OFF. |

◎ Interference prevention

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 ① (Transmission frequency A) | | |
| Sensor ② (Transmission frequency B) | | |

◎ Lightening/Flashing JOB indicator

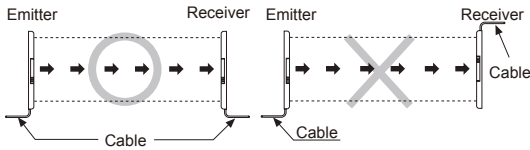
JOB indicator will be lighted and flashed to make out work sensing operation more easily.

| Operation mode switch | JOB indicator operation |
|-----------------------|-------------------------|
| | Lighting indicator |
| | Flashing indicator |

■ Installation

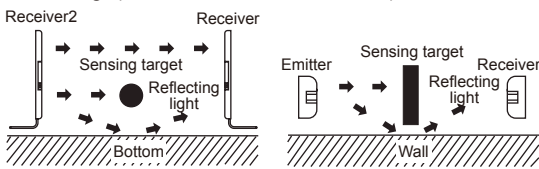
◎ For direction of installation

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



◎ For reflection from the surface of wall and flat

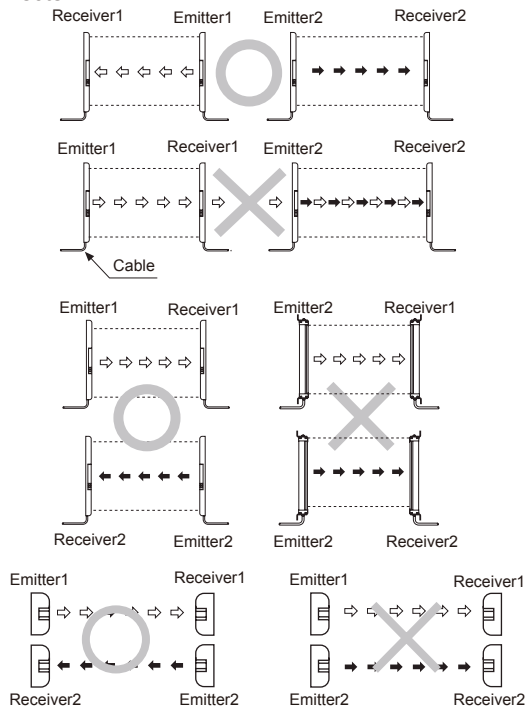
When installing it as below the light reflected from the surface of wall and flat will not be shaded. Please, check whether it operates normally or not with a sensing target before using. (Interval distance : Min. 0.3m)



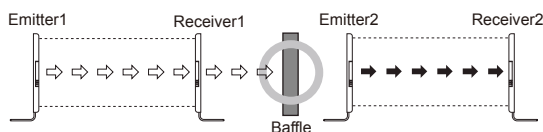
◎ For prevention of interference

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.

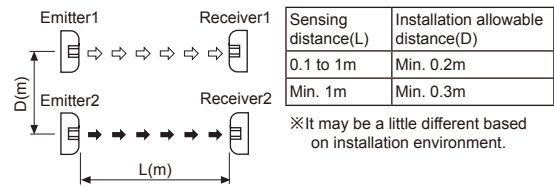
● Transmission direction should be opposite between 2 sets



● Baffle should be installed between 2 sets.



● It should be installed out of the interference distance



■ Operation indicator

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

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