

## Flat 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 axis (8 to 20) and sensing height (140 to 380mm)
- Protection structure IP40 (IEC standard)



**⚠ Please read "Safety Considerations" in the instruction 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		8	12	16	20
Sensing height		140mm	220mm	300mm	380mm
Response time		Max. 6ms (frequency B selection is max. 7ms)			
Power supply		12-24VDC± ±10% (ripple P-P: max. 10%)			
Current consumption		Emitter: max. 80mA, receiver: max. 80mA			
Light source		Infrared LED (850nm modulated)			
Operation mode		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: Max. 2.5VDC			
Protection circuit		Reverse power polarity, output short over current protection circuit			
Insulation resistance		Over 20MΩ (at 500VDC megger)			
Synchronization type		Synchronized by synchronous line			
Interference protection		Interference protection by transmission frequency selection			
Noise immunity		±240V the square wave noise (pulse width: 1μs) by the noise simulation			
Dielectric strength		1,000VAC 50/60Hz for 1 min			
Vibration		1.5mm amplitude or 300m/s <sup>2</sup> at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours			
Shock		500m/s <sup>2</sup> (approx. 50G) in each X, Y, Z direction for 3 times			
Environment	Ambient illumination	Ambient light: 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			
Protection structure		IP40 (IEC standard)			
Material		Case: Polycarbonate/Acrylonitrile butadiene styrene, Sensing part: Polymethyl methacrylate			
Cable		Ø3.5mm, 4-wire, 3m (AWG 24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1mm)			
Approval		CE			
Weight <sup>※1</sup>		Approx. 480g (approx. 280g)	Approx. 520g (approx. 320g)	Approx. 620g (approx. 360g)	Approx. 680g (approx. 430g)

※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.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

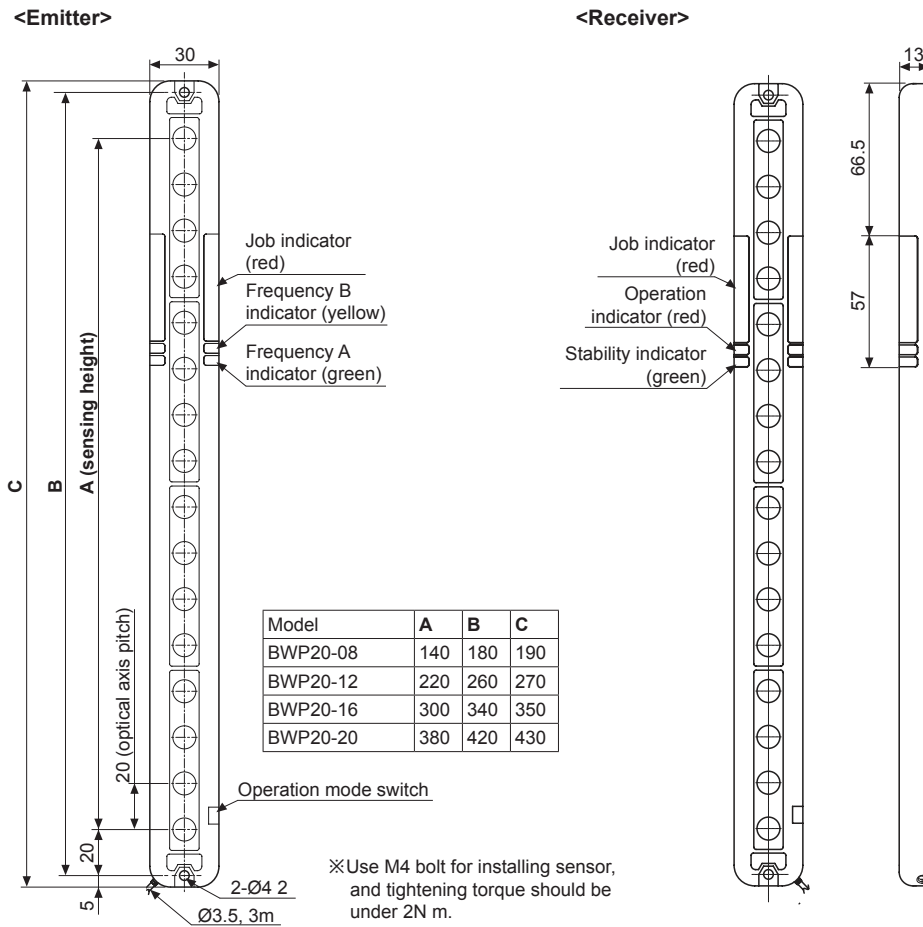
(H) Rotary Encoders

(I) Connectors/Connector Cables/Sensor Distribution Boxes/ Sockets

# BWP Series

## ■ Dimensions

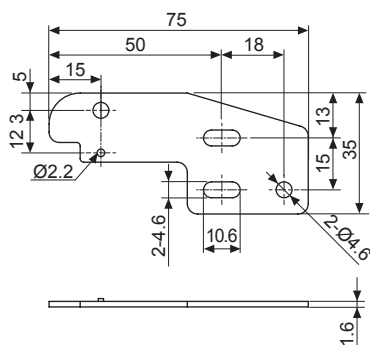
(unit: mm)



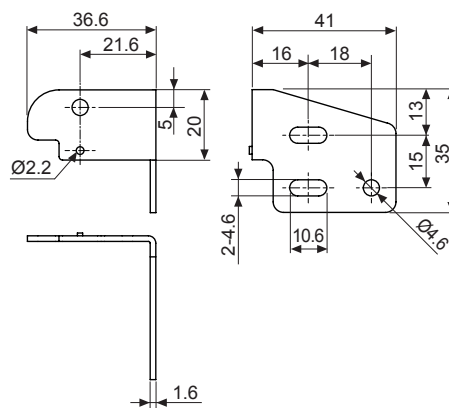
**<Bracket>: sold separately**

(unit: mm)

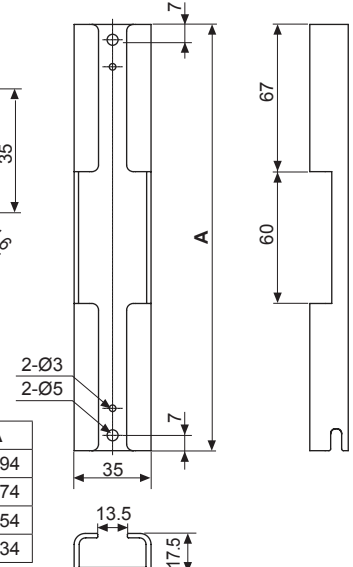
• Flat bracket (BK-BWP-ST)



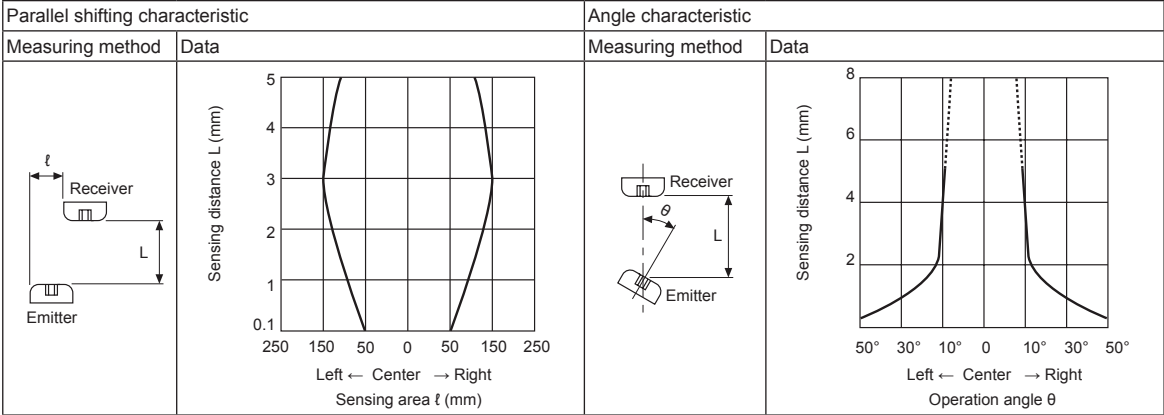
• L-shaped bracket (BK-BWP-L)



• Protection bracket (BK-BWP-P□)

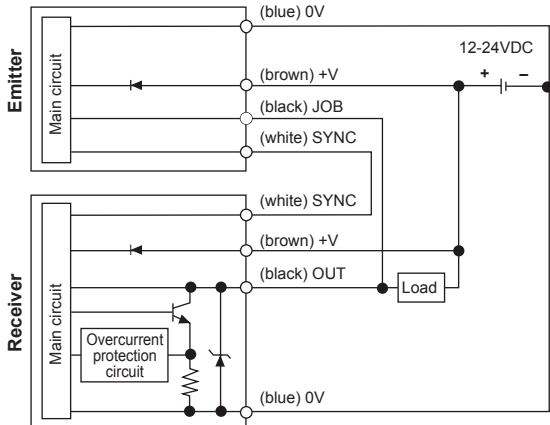


Feature Data

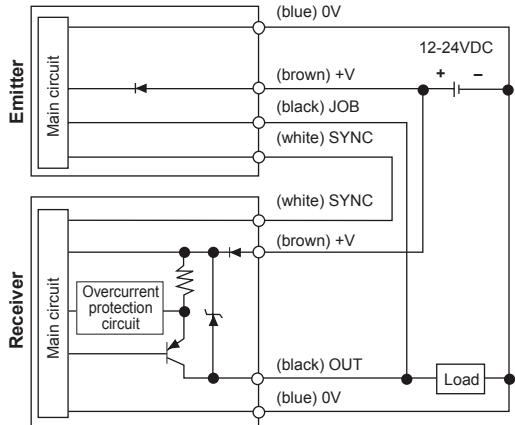


Input/Output Circuit and Connection Diagram

• NPN open collector output

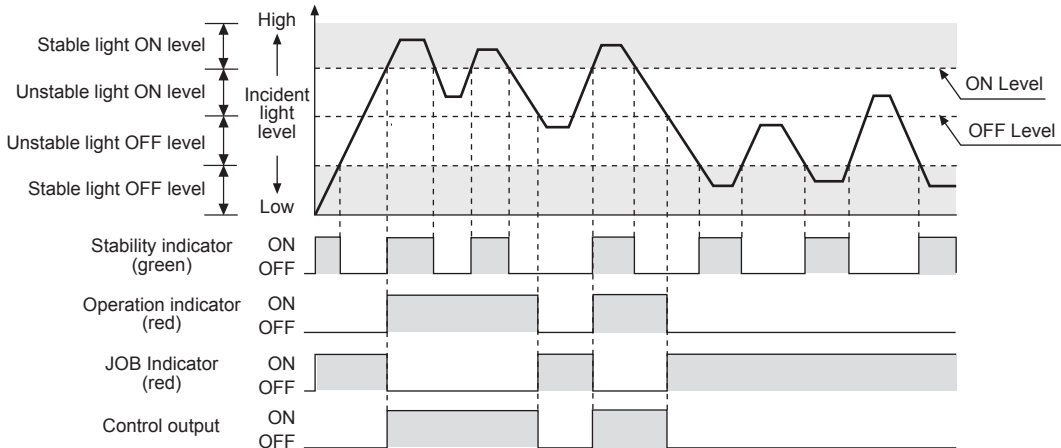


• PNP open collector output



※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.

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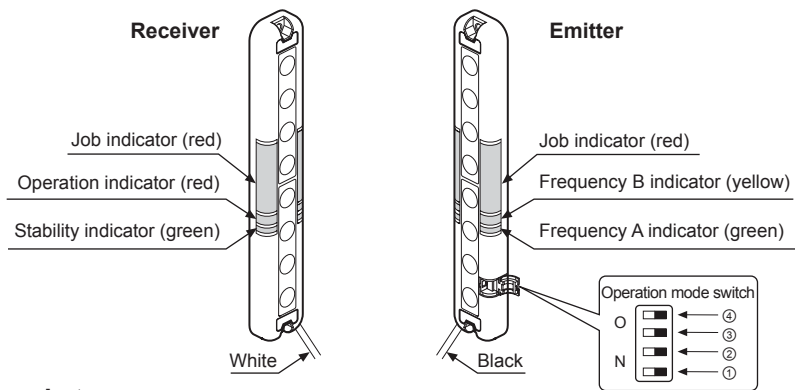
(G) Pressure Sensors

(H) Rotary Encoders

(I) Connectors/  
Connector Cables/  
Sensor Distribution  
Boxes/ Sockets

# BWP Series

## ■ Structure



## ◎ Mounting of bracket

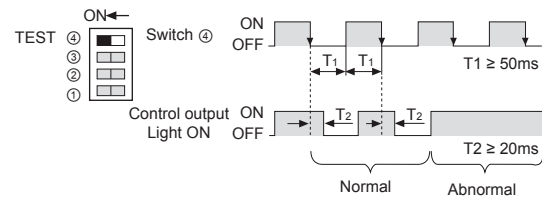
No	Func ion	Switch OFF	Switch ON
①	Transmission frequency selection	Frequency A	Frequency B
②	Light ON/Dark ON selection	Light ON operation	Dark ON operation
③	Steady/flashing light of Job indicator selection	Job indicator with Steady light	Job indicator with Flashing light
④	Job/TEST selection	Normal 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	ON ④ ③ ② ① Light ON	It is ON when \ it is light ON.
Dark ON	ON ④ ③ ② ① Dark ON	It is ON when it is light OFF.

### ◎ Interference prevention

In case of using 2 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)	ON ④ ③ ② ① Frequency A	JOB INDI Frequency A (green)
Sensor ② (transmission frequency B)	ON ④ ③ ② ① Frequency B	JOB INDI Frequency B (yellow)

### ◎ 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 ④ ③ ② ① Lighting	Lighting indicator
ON ④ ③ ② ① Flashing	Flashing indicator

## position.

Emitter and receiver should be installed as same up/down

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whether it operates normally or not with a sensing target

Receiver2  
Receiver

the sensor, please install as following figure

- Transmission direction should be opposite between



Green	Yellow	JOB	G
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※Avoid using the unit in the place where the sensor is exposed

※ it may be a little different based

Cable incorrect  
connection or

mode.)

※The operation of 'Operation indicator (red)', 'Job indicator (red)',

Light ON	
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disconnection

## ■ Proper Usage

1. Follow instructions in 'Proper Usage'.  
Otherwise, It may cause unexpected accidents.
2. 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
3. Use the product, 1 sec after supplying power.  
When using separate power supply for the sensor and load, supply power to sensor first.
4. When using switching mode power supply to supply the power, ground F.G. terminal and connect a condenser between 0V and F.G. terminal to remove noise.
5. When connecting a DC relay or other inductive load, remove surge by using diodes or varistors.
6. Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise.
7. This unit may be used in the following environments.
  - ①Indoors (in the environment condition rated in 'Specifications')
  - ②Altitude max. 2,000m
  - ③Pollution degree 2
  - ④Installation category II