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)

CE

Protection structure IP40 (IEC standard)

Please read "Safety Considerations" in the instruction manual before using





CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

Specifications

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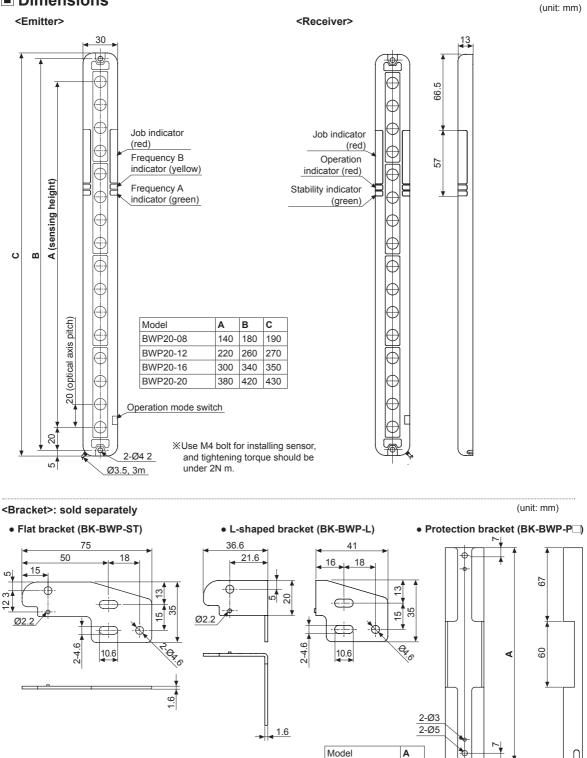
Model	NPN open collector output	BWP20-08	BWP20-12	BWP20-16	BWP20-20	(B) Fiber Optic Sensors	
wodel	PNP open collector output	BWP20-08P	BWP20-12P	BWP20-16P	BWP20-20P	(C) LiDAR	
Sensing type		Through-beam	Through-beam				
Sensing distance		0.1 to 5m				(D)	
Sensing target		Opaque materials of min. Ø30mm				(D) Door/Area Sensors	
Optical axis pitch		20mm				(E)	
Number of opt	tical axis	8	12	16	20	(E) Vision Sensors	
Sensing heigh	ıt	140mm	220mm	300mm	380mm		
Response im	e	Max. 6ms (frequency B selection is max. 7ms)			(F) Proximity		
Power supply		12-24VDC ±10% (ripple P-P: max. 10%)				Sensors	
Current consu	Imption	Emitter: max. 80mA, receiver: max. 80mA			(G)		
Light source		Infrared LED (850nm modulated)			Pressure Sensors		
Opera ion mo	de	Light ON/Dark ON by swi	Light ON/Dark ON by switch			(H)	
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			(I) Rotary Encoders (I) Connectors		
Protection circuit		Reverse power polarity, output short over current protection circuit				Connector (Sensor Dist	
Insulation resistance		Over 20MΩ (at 500VDC megger)			Boxes/ Soc		
Synchroniza i	on type	Synchronized by synchronous line					
Interference p	rotection	Interference protection by transmission frequency selection					
Noise immuni	ty	±240V the square wave noise (pulse width: 1µs) by the noise simulation					
Dielectric stre	ngth	1,000VAC 50/60Hz for 1 min					
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/s ² (approx. 50G) in each X, Y, Z direction for 3 times					
	Ambient illumination	Ambient light: max. 10,0001x (received light side illumination)					
Environment	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		· · · · · · · · · · · · · · · · · · ·	0.08mm, number of c	cores: 40, insulator out dian	neter: Ø1mm)		
Approval		CE	1				
Weight ^{×1}		Approx. 480g (approx. 280g)	Approx. 520g (approx. 320g)	Approx. 620g (approx. 360g)	Approx. 680g (approx. 430g)		

X1: 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.



Dimensions



BK-BWP-P08

BK-BWP-P12

BK-BWP-P16

BK-BWP-P20

194

274

354

434

35

13.5

17.5

Sensors

(B) Fiber Optic Sensors

(C) LiDAR

(D) Door/Area

(E) Vision Sensors

(F) (r) Proximity Sensors

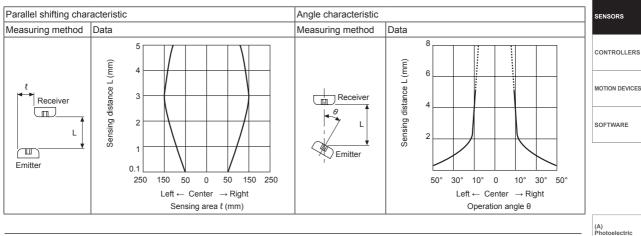
(G) Pressure Sensors

(H) Rotary Encoders

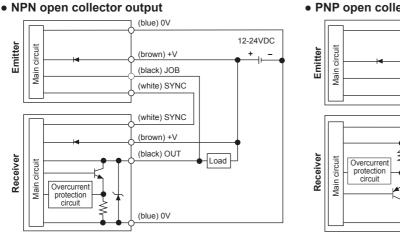
Boxes/ Sockets

(I) Connectors/ Connector Cables/ Sensor Distribution

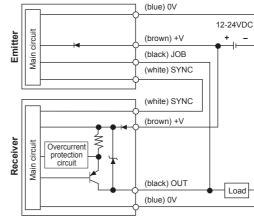
Feature Data



Input/Output Circuit and Connection Diagram

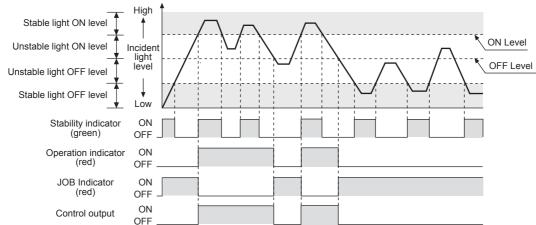


• PNP open collector output



※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.

BWP Series

Structure Emitter Receiver r Job indicator (red) Job indicator (red) Operation indicator (red) Frequency B indicator (yellow) Stability indicator (green) Frequency A indicator (green) Operation mode switch 4 0 3 2 White Black Ν Ō

O Mounting of bracket

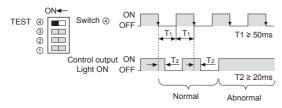
No	Func ion	Switch OFF	Switch ON
1	Transmission frequency selection	Frequency A	Frequency B
2	Light ON/Dark ON selection	Light ON operation	Dark ON operation
3	Steady/flashing light of Job indicator selection	Job indicator with Steady light	Job indicator with Flashing light
4	Job/TEST selection	Normal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

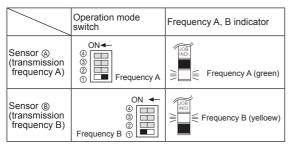
Control output pulse for TEST input



◎ 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.



© 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 □ □ Light ON	It is ON when \ it is light ON.	
Dark ON	ON ← ④ □ □ ③ □ □ Dark ON ① □ □	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.

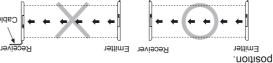
Operation mode switch	JOB indicator operation	
ON ← ④ □ □ ↓ ④ □ □ ↓ ↓ Lighting	Lighting indicator	
ON ← € □ □ Flashing ③ ■ □ ② □ □	Flashing indicator	

Area Sensor

Installation

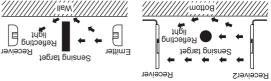
○ For direction of installation

Emitter and receiver should be installed as same up/down



○ For reflection from the surface of wall and flat

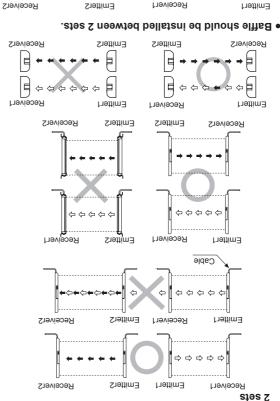
(mc.0 .nim :esing. (interval distance: min. 0.3m) whether it operates normally or not with a sensing target surface of wall and flat will not be shaded. Please, check When installing it as below the light reflected from the



erevention of interference

interference protection function. the sensor, please install as following figures and use the sets of the sensor. In order to avoid the interference of It may cause interference when installing more than 2

Transmission direction should be opposite between



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LED displays for over current	over load	Check the wiring. Check the rated load capacity.	
LED displays for over	Control output line is shorten		
LED displays for synchronous line malfunction	incorrect connection or disconnection Break of synchronous circuit of emitter or receiver	Check the wiring. Contact our company.	
.tool a target object.	There is a strong electric wave or noise generated by motor, high electric generator, high voltage line etc. Synchronous line	Put away the strong electric wave or noise generator.	
Control output is OFF even though there is	There is an obstacle to cut off the light emitted between emitter and receiver	Remove the obstacle.	
	distance	distance.	
	failure Out of rated sensing	the connector. Use within rated sensing	
Non-operation in sometimes	Pollution by dirt of Sensor cover Connector connection	Remove dirt by soft brush or cloth. Check the assembled part of	
	Rated connection failure	Check the wiring. Use it within rated sensing distance.	
Non-operation	Cable incorrect connection or disconnection		
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Synchronous line

FIGht OFF

Flashing function ON

JTO Instable light OFF

FREQ. B operation

FREQ. A operation

frequency.

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Emitter2

Fnitter1

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Unstable light ON

Stable light ON

TEST

Power on

mət

Cable

Display classification list

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:(uondno		
Check the rated load capacity.	Over load	current
_	shorten	LED displays for over
Check the wiring.	Control output line is	, , , , , , , , , , , , , , , , , , , ,
	receiver	
Contact our company.	circuit of emitter or	
	Break of synchronous	malfunction
	disconnection	synchronous line
Check the wiring.	incorrect connection or	LED displays for
	Synchronous line	
	voltage line etc.	
	electric generator, high	
wave or noise generator.	generated by motor,	
Put away the strong electric	electric wave or noise	
	There is a strong	not a target object.
	receiver	even though there is
Remove the obstacle.	between emitter and	Control output is OFF
eloctado edt evorrea	cut off the light emitted	
	There is an obstacle to	
distance.	distance	
Use within rated sensing	Out of rated sensing	
the connector.	failure	
Check the assembled part of	Connector connection	in sometimes
cloth.	SENSOL COVEL	Non-operation
Remove dirt by soft brush or	Pollution by dirt of	
distance.	Rated connection failure	
Use it within rated sensing	ending acito agree peted	
_	disconnection	Non-operation
Check the wiring.	connection or	
	Cable incorrect	
Supply rated power.	Power supply	
Troubleshooting	Cause	Malfunction

line and over current, control output is OFF regardless of the 'Control output' is for Light ON, in case of Dark ON, it is opposite operation against Light ON. (In case, maifunction of synchronous

*The operation of 'Operation indicator (red)', 'Job indicator (red)', Cross-Flashing by 0 3 sec

Flashing simultaneously by 0.3 sec

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Indicator

10B

directly to the fluorescent light with high speed start or high XAvoid using the unit in the place where the sensor is exposed

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Receiver2

Receiver1

It should be installed out of the interference distance

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volley

Flashing by 0.3 sec

Light OFF

NO 1461

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Indicator

Emitter

Operation Indicator

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Soxes/ Sockets Sensor Distribution

Encoders Rotary

Sensors Sressure

suosuag roximity

Vision Sensors

D) DoorlArea Stor

C) RADI

siosuag iber Optic

suosuas

hotoelectric (A)

SOFTWARE

NOTION DEVICES

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Indicator

JOB

on installation environment.

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Installation allowable

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Receiver

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Connector Cables/ Connectors/ (j)

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