

THIN TYPE AREA SENSOR BWP SERIES

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- Please keep these instructions and review them before using this unit.
- Please observe the cautions that follow:
 - Warning** Serious injury may result if instructions are not followed.
 - Caution** Product may be damaged, or injury may result if instructions are not followed.
- The following is an explanation of the symbols used in the operation manual.
 - Warning** Injury or danger may occur under special conditions.

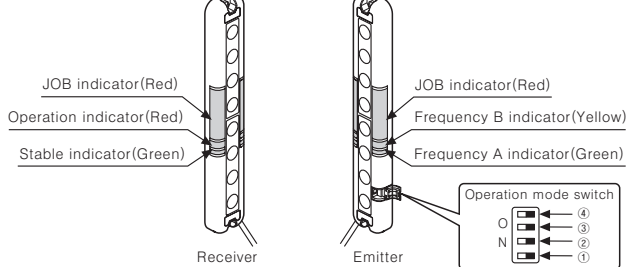
Warning

- This unit is not safety sensor protecting from damages of property or injury from dangerous parts of mechanical equipment, but it is the sensor detecting a normal object or intrusion into the working area regardless of safety.
- Please don't use it as safety equipment for the cutter or press.
- This unit doesn't follow any international safety standard. Please check the safety standard of the country the product will be used.
- Please note that we don't take any responsibilities for the problem related to overseas laws or <Product liability(PL)> is happened by using as follows:
 - Safety equipment for protecting a hand or other parts of worker at dangerous area.
 - Interlock on mechanical equipment.
 - Safety sensor on mechanical equipment for stopping it when detecting a hand or other parts of worker.
 - Using for detecting a hand or other parts of worker at dangerous area and controlling door or window.

Caution

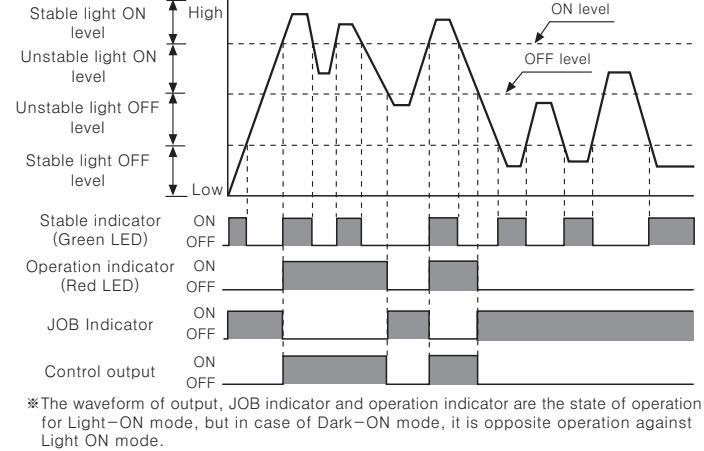
- Please don't do wiring in power ON status. It may cause an electric shock.
- Please use in the rated specifications. It may cause malfunction or the life cycle.
- Please ground F.G.(Frame Ground) terminal when supplying power by switching power.
- Please, avoid fluorescent light with high frequency, high speed start or signal light affecting to sensing ability.
- It may be unavailable to shade the light by reflecting from surface of a wall when installing it in 0.3m from wall or flat parts. Please keep < Installation >.
- It may cause malfunction from interference when using them closely in parallel. Please keep < Installation >.
- Please install emitter and receiver in same direction. The emitting light will not be transferred to receiver if installed in opposite direction.
- Please avoid a frequent vibrating area. It may cause a fire and malfunction.
- In cleaning the unit, do not use water or an oil-based detergent. It may cause an electric shock or fire.
- Please make power and output line shorten as possible, or it may cause malfunction by surge etc.

Structure



No	Function	Switch OFF	Switch ON
①	Selection of transmission frequency	Frequency A	Frequency B
②	Light-ON/Dark-ON selection	Light-ON operation	Dark-ON operation
③	Selection light/flickering of JOB indicator	Job Indicator light	Job Indicator flickering
④	Selection of JOB/TEST	Normal mode	TEST mode

Operation mode



Indicator display

Item	Emitter		Receiver		Control output
	Indicator	Indicator	Indicator	Indicator	
Power on	Lighting	Lighting	Lighting	Lighting	ON
FREQ. A operation	Lighting	Lighting	Lighting	Lighting	ON
FREQ. B operation	Lighting	Lighting	Lighting	Lighting	ON
TEST	Lighting	Lighting	Lighting	Lighting	OFF
Stable light ON	Lighting	Lighting	Lighting	Lighting	ON
Unstable light ON	Lighting	Lighting	Lighting	Lighting	ON
Unstable light OFF	Lighting	Lighting	Lighting	Lighting	OFF
Stable light OFF	Lighting	Lighting	Lighting	Lighting	OFF
Flickering function ON	Lighting	Lighting	Lighting	Lighting	OFF
Synchronous line malfunction	Lighting	Lighting	Lighting	Lighting	OFF
Over current	Lighting	Lighting	Lighting	Lighting	OFF

Display classification list	
Lighting	Lighting
Light out	Lighting
Flickering by 0.3sec.	Lighting
Flickering simultaneously by 0.3sec.	Lighting
Cross-flickering by 0.3sec.	Lighting

*The operation of 'Operation indicator(Red)', 'JOB indicator(Red)', 'Control output' is for Light ON mode, it is operated as reverse for Dark ON mode. (In case, malfunction of synchronous line and over current, control output is OFF regardless of the mode.)

*The above specification is changeable at anytime without notice.

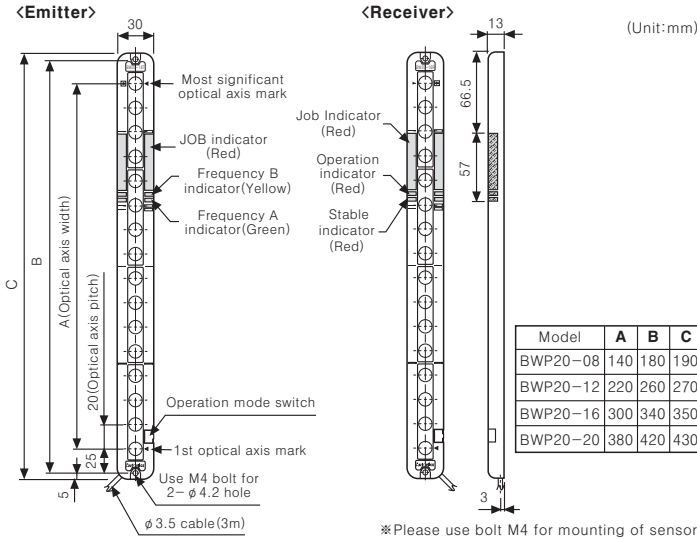
Ordering information

Model	Output	Appearance	Number of optical axis	Optical axis pitch	Plastic case Area sensor
BWP 20 - 08 T P	NPN open collector output	T	08-20	20	
	PNP open collector output	R	8-20 optical axis	20mm pitch	

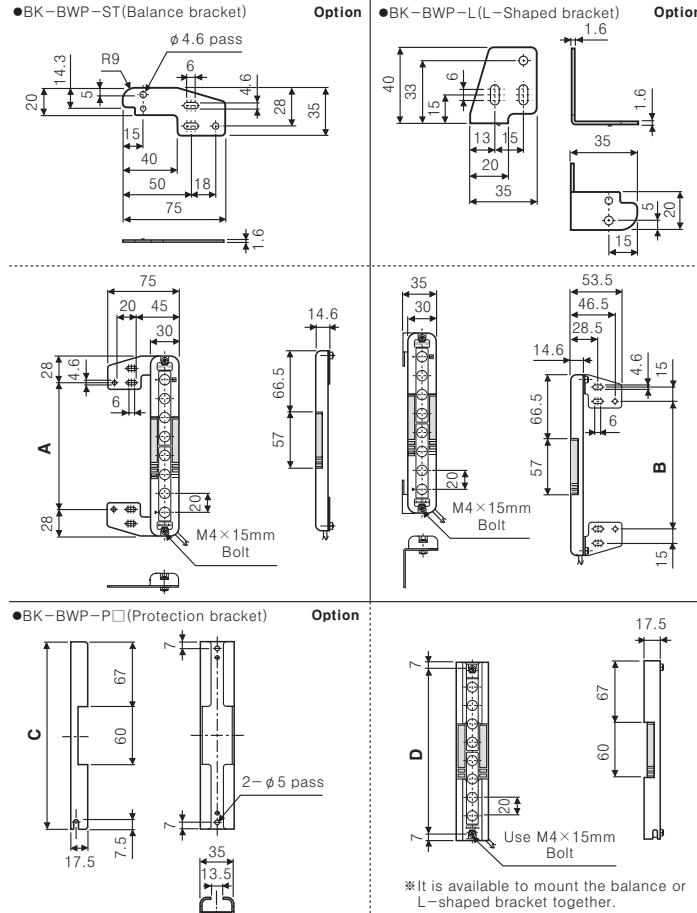
Specifications

Model	BWP20-08(P)	BWP20-12(P)	BWP20-16(P)	BWP20-20(P)
Sensing type	Transmitte 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
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 open collector output Load current : Max. 150mA(Max. 30VDC), Residual voltage : Max. 1V PNP open collector output Load current : Max. 150mA, Output voltage : Min. (Power supply-2.5)V			
Operation mode	Light-ON/Dark-ON switching			
Short-circuit protection	Built-in			
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			
Ambient temperature	-10 to +55°C(non-freezing condition)			
Storage temperature	-20 ~ +60°C			
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 : 1μs)			
Dielectric strength	1,000VAC/50/60Hz for 1 minute			
Insulation resistance	Min. 20MΩ(500VDC)			
Vibration	1.5mm amplitude at frequency of 10-55Hz in each of X, Y, Z directions for 2 hours			
Shock	500m/s ² (50G) in X, Y, Z directions for 3 times			
Protection	IP40(IEC standard)			
Material	Body : PC/ABS, Lens : PMMA			
Cable	Emitter : φ3.5mm, 4P, 3m / Receiver : φ3.5mm, 4P, 3m			
Unit weight	Approx. 0.43kg(For 20 optical axis)			

Dimensions



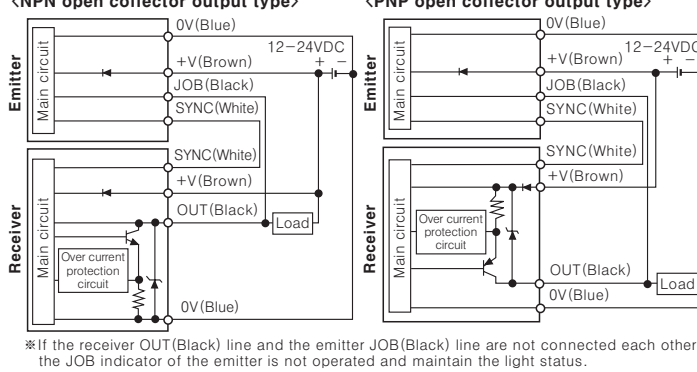
Mounting of bracket



Model	A[mm]	B[mm]	BK-BWP-P		
			Bracket model	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

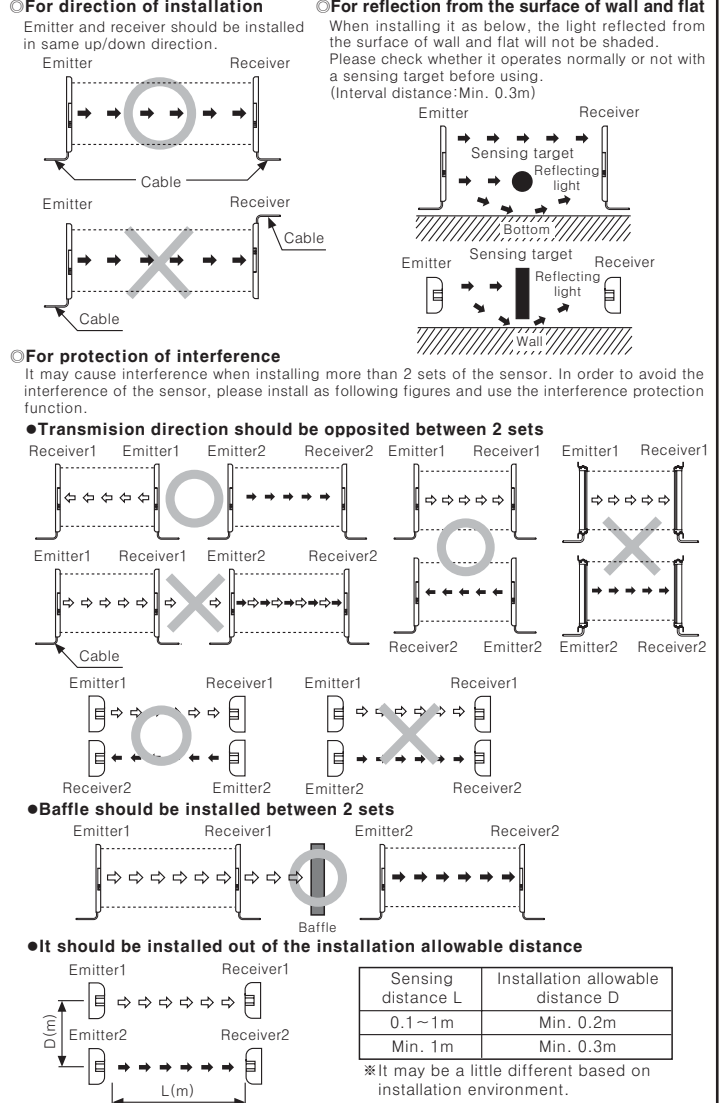
*Bracket is an option.

Input/Output circuit and connection diagram



*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.

Installations



Functions

TEST(Stop transmission function) functions

When selecting TEST mode, emit is stopped and Green & Yellow LED of emitter flickers. It is available to check whether sensor operates properly with stopping the transmission in TEST mode. It is changed to dark status when emit the transmission stopped, control output will be OFF in Light-ON mode and ON in Dark-ON mode.

Control output pulse by TEST input

Interference protection function

In case of using 2pcs of sensor in serial or parallel in order to extend sensing height, the sensing will be failure because as 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
④ ③ ② ①	FREQ. A Frequency B(Yellow) Frequency A(Green)
④ ③ ② ①	FREQ. B Frequency B(Yellow) Frequency A(Green)

Switching function of Light-ON /Dark-ON

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

Switching function of Lighting/ Flickering of JOB indicator

Operation mode switch	Job indicator operation
④ ③ ② ①	GLOW Lighting or Light-out
④ ③ ② ①	BLINK Flickering or Light-out

Inspection/Treatment for malfunction

Malfunction	Caution	Treatment
Non-operation	Power supply Cable disconnection incorrect connection Rated connection failure	Supply rated power Check the wiring Use within rated sensing distance
Non-operation in sometimes	Pollution by dirt of sensor cover Connector connection failure	Remove dirt by soft brush or cloth Check the assembled part of the connector
Control output is OFF even though there is not a target object.	Out of rated sensing distance There is an obstacle to cut off the light emitted between emitter and receiver There is a strong electric wave or noise generator such as motor, electric generator, high voltage line etc.)	Use within rated sensing distance Remove the obstacle Put away the strong electric wave or noise generator.
LED displayed for synchronous line malfunction	Synchronous line incorrect connection or disconnection Break of synchronous circuit of emitter or receiver	Check the wiring Contact our company
LED display for over current	Control output line shorted Over load	Check the wiring Check the rated load capacity

Caution for using

- Please make the interval enough between 2 sets or exchange the positions of emitter and receiver in order to remove interference as occurring interference by the emitter of another set when using emitter/receiver more than 2sets closely.
- Please install this sensor at proper height(Min. approx. 0.3m) from flat part as malfunction may be caused due to certain amount of light received by light reflected when installing it close to flat part.
- Please avoid fluorescent light with high frequency, high speed start or signal light affecting to sensing ability.
- Please use a single conduit or separated wiring as it may cause malfunction or mechanical problem when installing the wiring of the sensor with high voltage lines.
- Please avoid places with corrosive gas or dust, or it may cause malfunction.
- Please make power and output line shorten as possible, or it may cause malfunction by surges etc.
- Please clean the sensor cover with dry cloth when it is stained by dirt etc., but don't use organic materials such as thinners.
- Please earth F.G terminal as following figure and install the condenser for removing noise between 0V and F.G terminal when using switching power supply.

Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHO/LINE SPEED/PULSE METER
- DISPLAY UNIT
- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER
- LASER MARKING SYSTEM(CO₂, Nd:YAG)

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Satisfiable Partner For Factory Automation

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