

PICKING SENSOR BWPK 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.
- ⚠ Caution: Injury or danger may occur under special conditions.

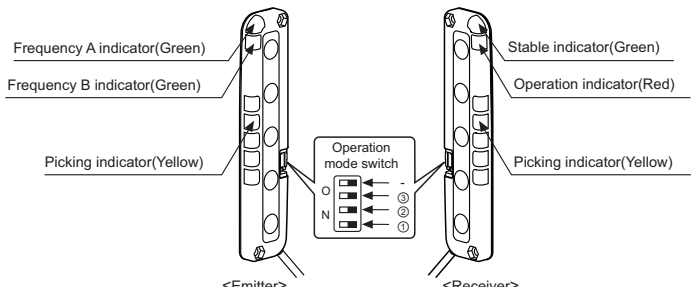
Warning

- In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device. It may cause a fire, human injury or damage to property.
- 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 irruption into the working area regardless of safety.
- Do not use it as safety equipment for the cutter or press.
- This unit does not follow any international safety standard.
- Please check the safety standard of the country the product is used.
- Please note that we do not take any responsibilities for the problem related to overseas' laws or <Product liability(PL)> is happened by using as follows;
 - ① Safety equipment for protecting a hand or other parts of worker at dangerous area.
 - ② Interlock on mechanical equipment.
 - ③ Safety sensor on mechanical equipment for stopping it when detecting a hand or other parts of worker.
 - ④ Using for detecting a hand or other parts of worker at dangerous area and controlling door or window.

Caution

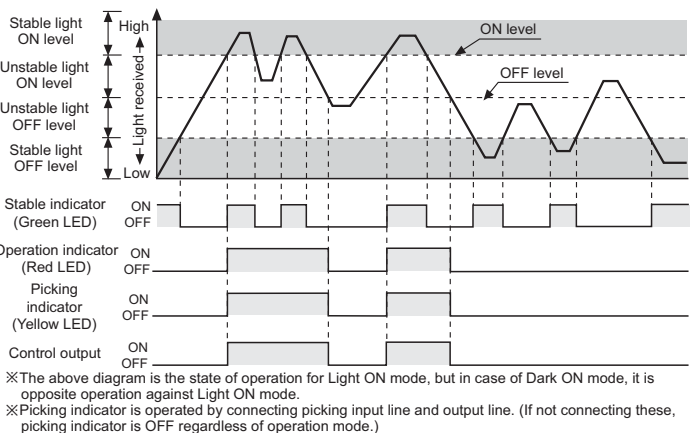
- This unit shall not be used outdoors. It might shorten the life cycle of the product or give an electric shock. Use this product inside only. Do not use the product outdoors or location subject to temperatures or humidity outside. (Ex: rain, dirt, frost, sunlight, condensation, etc.)
- Do not wire this in power ON status. It may cause an electric shock.
- Please use this in the rated specifications. It may cause malfunction or the life cycle shorter.
- Please ground Frame Ground(F.G.) terminal when supplying power by switching power.
- Avoid using this unit where there are fluorescent light with high frequency, high speed start or signal light affecting to sensing ability.
- It may be not able 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 is not transferred to receiver if installed in opposite direction.
- Avoid using this unit where there are severe vibration. 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



| Operation mode switch | | | |
|-----------------------|-------------------------------------|------------------------------------|--------------------|
| No | Function | Switch OFF | Switch ON |
| ① | Selection of transmission frequency | Frequency A | Frequency B |
| ② | Selection of operation indicator | Lighting indicator | Flashing indicator |
| ③ | Emitter | Selection of sensing distance mode | Long mode |
| ④ | Receiver | Selection of operation mode | Light ON mode |

Timing diagram operation



Indicator display

| Item | Emitter | | | Receiver | | | Control output |
|----------------------|---------|-----|-------------------|----------|-----|-------------------|----------------|
| | Green | Red | Picking indicator | Green | Red | Picking indicator | |
| Power supply | ● | ● | — | — | — | — | — |
| FREQ. A operation | ● | ● | — | — | — | — | — |
| FREQ. B operation | ● | ● | — | — | — | — | — |
| Stable light ON | — | — | ● | ● | ● | ● | ON |
| Flashing function ON | — | — | ● | ● | ● | ● | ON |
| Unstable light ON | — | — | ● | ● | ● | ● | ON |
| Unstable light OFF | — | — | ● | ● | ● | ● | OFF |
| Stable light OFF | — | — | ● | ● | ● | ● | OFF |
| Over current | — | — | ● | ● | ● | ● | OFF |

| Display classification list | |
|-----------------------------|-------------------------------------|
| ● | Lighting |
| ● | Light out |
| ⓪ | Flashing by 0.3sec. |
| ⓪⓪ | Flashing simultaneously by 0.3 sec. |

⚠ The operations of 'Operation indicator' and 'Picking indicator(Red)' for stable light ON level, unstable light ON level, unstable light OFF level, and stable light OFF level are for Light ON mode. (In case of overcurrent, control output is OFF regardless of operation mode.)

⚠ The above specification are changeable without notice anytime.

Ordering information

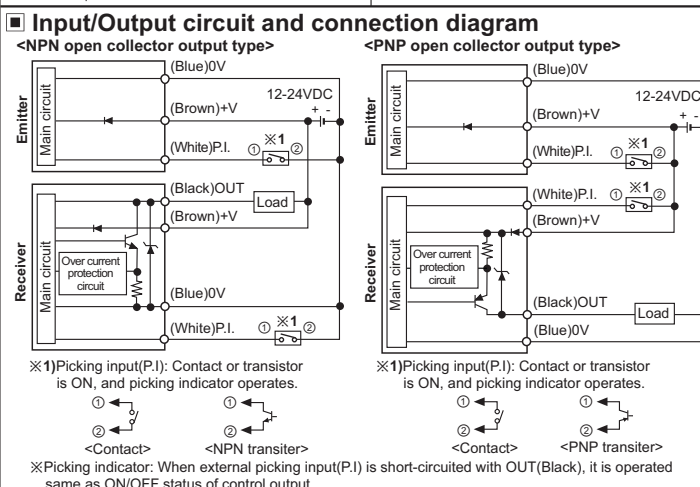
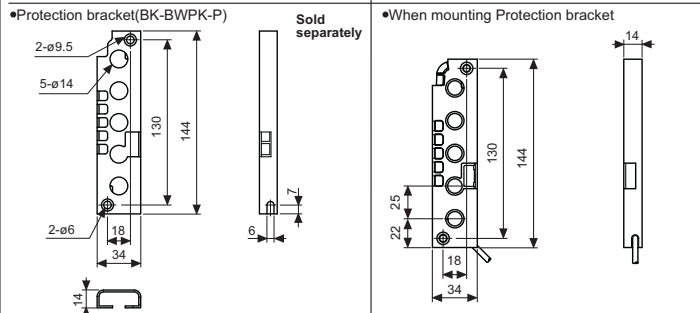
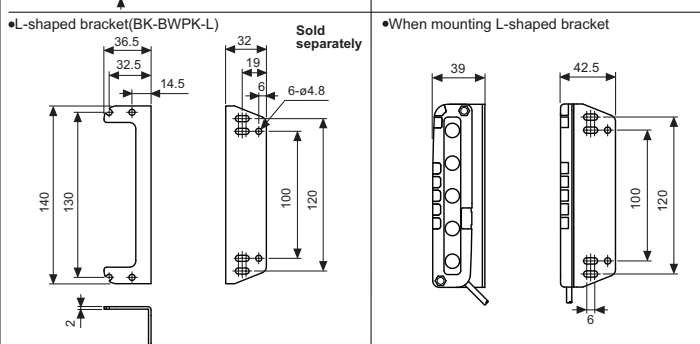
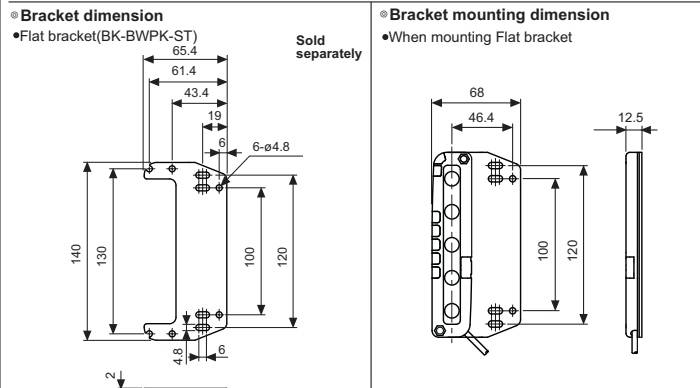
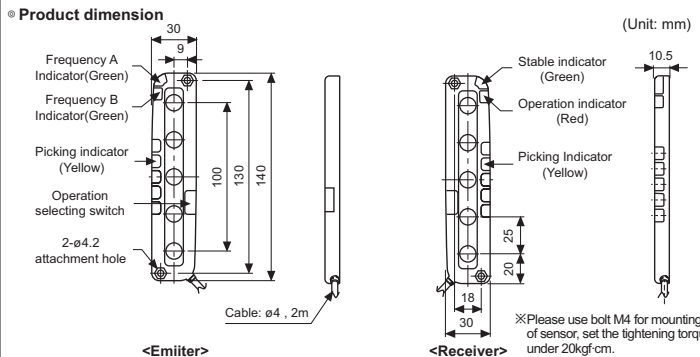
| | | | |
|------------------|------------------------|----|---------------------------|
| BWPK 25 - 05 T P | Output | P | NPN open collector output |
| | Appearance | T | Emitter |
| | | R | Receiver |
| | Number of optical axis | 05 | 5 pcs |
| | Optical axis pitch | 25 | 25mm pitch |
| | Picking sensor | | |

Specification

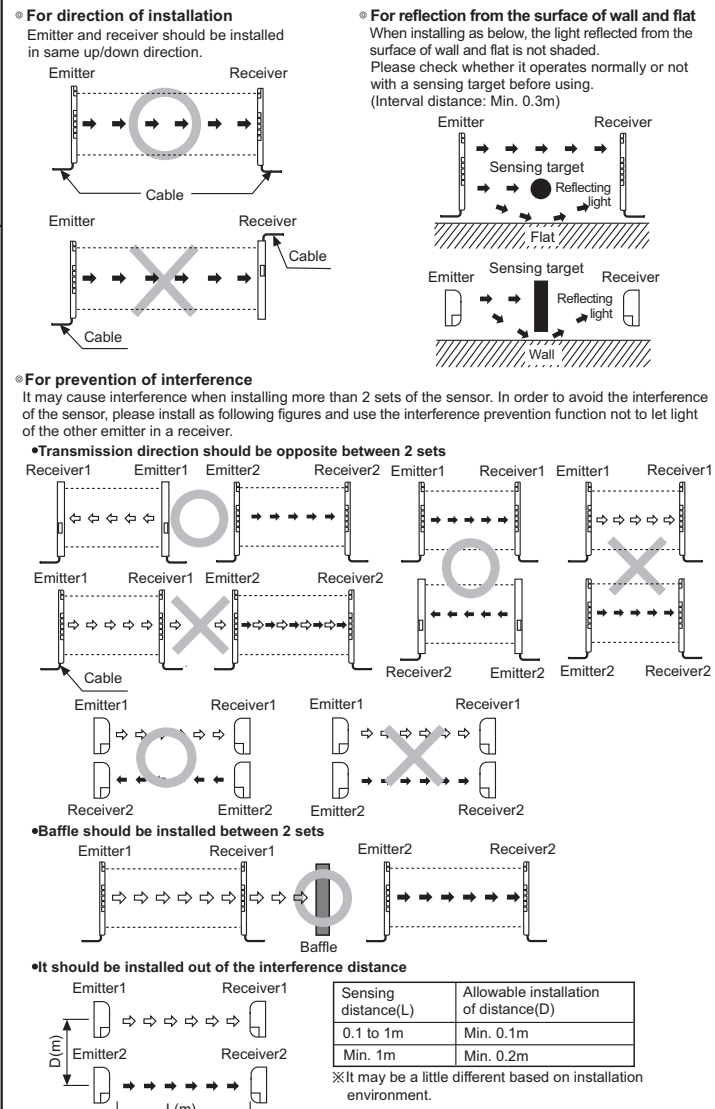
| | | |
|--------------------------|---|--|
| Model | BWPK25-05 / BWPK25-05P | |
| Sensing type | Transmitted beam type | |
| Sensing distance | Long mode | 0.1 to 3m |
| | Short mode | 0.05 to 1m |
| Sensing target | Opaque materials of min. ø35mm | |
| Optical axis pitch | 25mm | |
| Number of optical axis | 5pcs | |
| Sensing width | 100mm | |
| Power supply | 12-24VDC ±10%(Ripple P-P: Max. 10%) | |
| Protection circuit | Built-in | |
| Current consumption | Emitter: Max. 60mA, Receiver: Max. 60mA | |
| 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 | Switching of Light ON/Dark ON | |
| Short-circuit protection | Built-in | |
| Response time | Max. 30ms | |
| Light source | Infrared LED(850nm modulated) | |
| Interference protection | Interference protection by transmission frequency selection | |
| External picking input | Non-contact or contact input | |
| | •NPN open collector output: Lighting(0-2V), Light out(5-30V or open) | |
| | •PNP open collector output: Lighting(4-30V), Light out(0-3V or open) | |
| Environment | Ambient illumination | Sunlight: Max. 10,000lx, Incandescent lamp: Max. 3,000lx |
| | Ambient temperature | -10 to +55°C, Storage: -20 to +60°C |
| | Ambient humidity | 35 to 85%RH, Storage: 35 to 85%RH |
| Noise strength | The square wave noise by the noise simulator (Voltage: ±240V, Period: 10ms, Pulse width: 1µs) | |
| Dielectric strength | 1,000VAC 50/60Hz for 1minute | |
| Insulation resistance | Min. 20MΩ (at 500VDC megger) | |
| Vibration | 1.5mm amplitude at frequency of 10 to 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 | Case: PC/ABS, Lens: PMMA | |
| Cable | Emitter: ø4.0mm, 3P, 2m / Receiver: ø4.0mm, 4P, 2m (AWG 22, Core wire diameter: 0.08mm, No. of core wire: 60, Insulator out diameter: ø1.2mm) | |
| Accessory | Flat bracket 2pcs, L-shaped bracket 2pcs, Protection bracket 2pcs | |
| Unit weight | Approx. 0.25kg | |

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

Dimensions



Installations



Function

| Switching function of Long/Short mode (Selectable sensing distance) | Operation mode switch(Emitter) | Rated sensing distance |
|---|--|-----------------------------------|
| Long mode | ① Long | 3m |
| Short mode | ② Short | 1m |
| Interference protection function | Operation mode switch (Emitter+Receiver) | Frequency A, B indicator(Emitter) |
| Sensor (A) (Transmission frequency A) | ① FREQ.A | Frequency A(Green) |
| Sensor (B) (Transmission frequency B) | ② FREQ.B | Frequency B(Green) |
| Switching function of Light ON/Dark ON | Operation mode switch(Receiver) | Control output operation |
| Light ON | ① Light ON | It is ON when it is light ON. |
| Dark ON | ② Dark ON | It is ON when it is light OFF. |
| Switching function of Lighting /Flashing of Picking indicator | Operation mode switch (Emitter+Receiver) | Picking indicator operation |
| Lighting | ① Lighting | Lighting indicator |
| Flashing | ② Flashing | Flashing indicator |

Troubleshooting

| Malfunction | Cause | Troubleshooting |
|---|--|---|
| Non-operation | Power | Supply rated power. |
| | Cable incorrect connection or disconnection | Check the wiring. |
| Non-operation in sometimes | Rated connection failure | Use it within rated sensing distance. |
| | Pollution by dirt of sensor cover | Remove dirt by soft brush or cloth. |
| Control output is OFF even though there is not a target object. | Connector connection failure | Check the assembled part of the connector. |
| | Out of rated sensing distance | Use it within rated sensing distance. |
| LED displays for over current | There is an obstacle to cut off the light emitted between emitter and receiver | Remove the obstacle. |
| | There is a strong electric wave or noise generator such as motor, electric generator, high voltage line etc. | Put away the strong electric wave or noise generator. |
| LED displays for over current | Control output line is shorten | Check the wiring. |
| | Over load | 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 occurring by the emitter of another set when using emitter/receiver more than 2 sets closely.
 - Please install this sensor at proper height(Min. approx. 0.3m) from flat part because malfunction may be caused due to certain amount of light received by reflecting light when installing it close to flat part.
 - Avoid using this where there are 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.
 - Avoid using this unit where there are 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 surge etc.
 - Please clean the sensor cover with dry cloth when it is stained by dirt etc., but do not use organic materials such as thinners.
 - When using switching power supply as the source of supplying power, Frame Ground(F.G.) terminal shall be grounded and a condenser for removing noise shall be installed between 0V and F.G. terminal.
 - Installation environment
 - ① It shall be used indoor
 - ② Altitude max. 2,000m
 - ③ Pollution degree 2
 - ④ Installation category II
- ⚠ It may cause malfunction if above instructions are not followed.

Major products

- Proximity sensors
- Area sensors
- Door/Door side sensors
- Counters
- Rotary encoders
- Power controllers
- Panel meters
- Temperature controllers
- Switching power supplies
- Temperature/Humidity transducers
- Tachometer/Pulse(Rate) meters
- Stepping motors/drivers/motion controllers
- Laser marking system(CO₂, Nd:YAG)
- Laser welding/soldering system
- Photoelectric sensors
- Fiber optic sensors
- Pressure sensors
- Timers
- Display units
- Sensor controllers
- Graphic/Logic panels
- Field network devices

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