

Slim Plastic Single-Beam Picking Sensors

BWPK Series
INSTRUCTION MANUAL

TCD210008AB

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

For your safety, read and follow the below safety considerations before using.

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

Keep this instruction manual in a place where you can find easily.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ⚠ symbol indicates caution due to special circumstances in which hazards may occur.

⚠ **Warning** Failure to follow instructions may result in serious injury or death.

01. **Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)

Failure to follow this instruction may result in personal injury, economic loss or fire.

02. **Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**

Failure to follow this instruction may result in explosion or fire.

03. **Do not connect, repair, or inspect the unit while connected to a power source.**

Failure to follow this instruction may result in fire.

04. **Check 'Connections' before wiring.**

Failure to follow this instruction may result in fire.

05. **Do not disassemble or modify the unit.**

Failure to follow this instruction may result in fire.

06. **This product is not safety sensor and does not observe any domestic nor international safety standard.**

Do not use this product with the purpose of injury prevention or life protection, as well as in the place where economic loss maybe present.

⚠ **Caution** Failure to follow instructions may result in injury or product damage.

01. **Use the unit within the rated specifications.**

Failure to follow this instruction may result in fire or product damage.

02. **Use a dry cloth to clean the unit, and do not use water or organic solvent.**

Failure to follow this instruction may result in fire.

03. **Do not use a load over the range of rated relay specification.**

Failure to follow this instruction may result in fire, relay broken, contact melt, insulation failure or contact failure.

Cautions during Use

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

Cautions during Installation

- Be sure to install this product by following the usage environment, location, and specified ratings. Consider the listed conditions below.
 - Installation environment and background (reflected light)
 - Sensing distance and sensing target
 - Direction of target's movement
 - Feature data
- If the installation environment has reflected light from the wall or floor, a interval distance of at least 0.3 m is required.
- When installing multiple sensors closely, it may result in malfunction due to mutual interference. Install it by referring to the interference protection and the installation method in the manual.
- Do not use in places where the light-receiving sensor is exposed to direct sunlight or where the ambient illumination is higher than the specification.
- Do not impact with a hard object or bend the cable excessively. That could decrease the product's water resistance.
- Use this product after the test. Check whether the indicator works appropriately for the positions of the detectable object.

Ordering Information

This is only for reference, the actual product does not support all combinations.

For selecting the specified model, follow the Autonics website.

BWPK ① - ② ③

① Optical axis pitch

25: Optical axis pitch (unit: mm)

② Optical axes

05: Optical axes

③ Control output

No-mark: NPN open collector

P: PNP open collector

Product Components

- Product
- Instruction manual

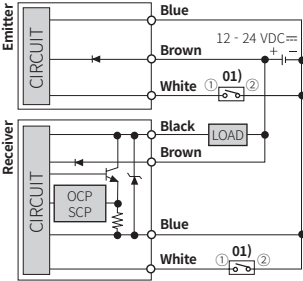
Sold Separately

- Flat bracket (BK-BWPK-ST)
- Protection bracket (BK-BWPK-P)
- L-shaped bracket (BK-BWPK-L)

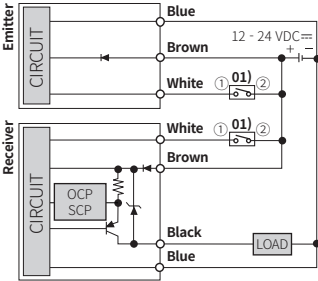
Connections

Blue	0 V	Brown	+V	Black	OUT (receiver)	White	P.I. (emitter / receiver)
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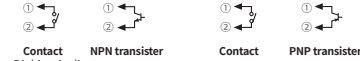
■ NPN open collector output



■ PNP open collector output



01) Picking input (P.I.): Contact or transistor is ON, and picking indicator operates.



- Picking indicator
 - When external picking input (P.I.) is short-circuited with OUT (black), it is operated same as ON/OFF status of control output.
- OCP (over current protection), SCP (short circuit protection)

Setting Switch

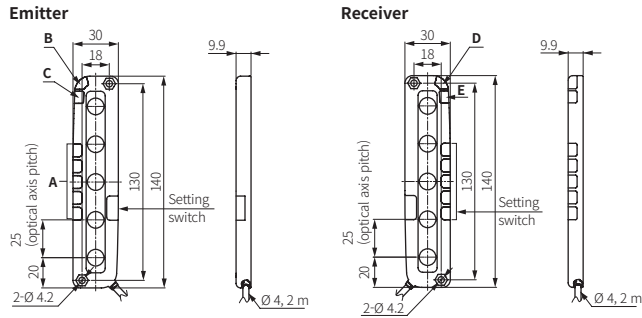
Switch	No.	Function	Setting	
			ON	OFF
	①	[Emitter / receiver] Selection of transmission frequency	Frequency B ⁰¹⁾	Frequency A
	②	[Emitter / receiver] Selection ON / flashing for Picking indicator	Flashing	ON
	③	[Emitter] Sensing distance mode [Receiver] Selection of Operation mode	Short mode Dark ON	Long mode Light ON

01) Frequency A, B indicators turn ON at the same time.

Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.

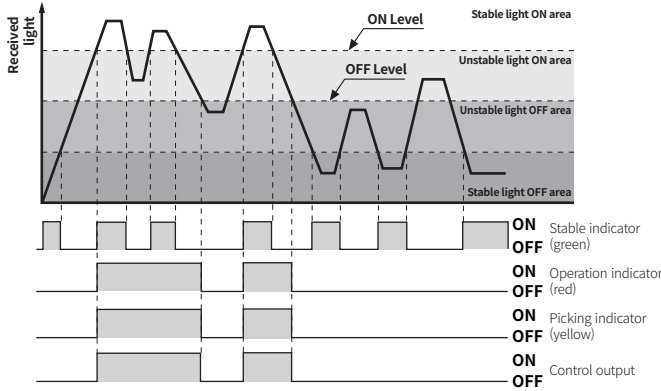
A	Picking indicator (yellow)	B	Frequency A indicator (green)	C	Frequency B indicator (green)
D	Stable indicator (green)	E	Operation indicator (red)		



Model	Product length (L)	Number of optical axis	Sensing height
BWPK25-05(P)	140 mm	5	100 mm

Operation Timing Chart

■ Light ON mode



- In Dark ON mode, the waveforms are reversed.
- Picking indicator is operated by connecting picking input line and output line. (If not connecting these, picking indicator is OFF regardless of operation mode.)

Operation Indicator

☀ ON	● OFF	🕒 Flashing at 0.3 sec interval	🕒 Flashing simultaneously at 0.3 sec interval
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Item	Emitter indicator			Receiver indicator			Control output
	Green	Green	Picking indicator	Green	Red	Picking indicator	
Power ON	☀	●	-	-	-	-	-
Frequency A operation	☀	●	-	-	-	-	-
Frequency B operation	☀	☀	-	-	-	-	-
Stable light ON	-	-	☀	☀	☀	☀	ON
Unstable light ON	-	-	☀	●	☀	☀	ON
Unstable light OFF	-	-	●	●	●	●	OFF
Stable light OFF	-	-	●	☀	●	●	OFF
Flashing func. ON	-	-	🕒	☀	☀	🕒	ON
Over current	-	-	●	🕒🕒	🕒🕒	●	OFF

- 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.
- Malfunction of synchronous line and over current, control output is OFF regardless of the mode.

Specifications

Model	BWPK25-05(P)
Sensing method	Through-beam
Light source	Infrared LED (850 nm modulated light)
Sensing distance	Long / Short mode (switch)
Long mode	0.1 to 3.0 m
Short mode	0.05 to 1.0 m
Sensing target	Opaque material
Min. sensing target	≥ Ø 35 mm
Number of optical axes	5
Sensing height	100 mm
Optical axis pitch	25 mm
Response time	≤ 30 ms
Operation mode	Light ON / Dark ON (switch)
Functions	Selection for sensing distance, selection for operation mode, Picking indicator ON / flashing
Interference protection	Interference protection by transmission frequency selection
Synchronization type	Timing method by synchronous line
External picking input	Non-contact or contact input NPN open collector output: lighting (0 ~ 2 V), light out (5 ~ 30 V or open) PNP open collector output: lighting (4 ~ 30 V), light out (0 ~ 3 V or open)
Indicator	Emitter / receiver: opeation indicator (red, green, yellow)
Approval	CE RoHS
Weight (packaged)	≈ 180 g (≈ 220 g)
Power supply	12 ~ 24 VDC≒ (ripple P-P: ≤ 10 %)
Current consumption	Emitter / receiver: ≤ 60 mA
Control output	NPN / PNP open collector output model
Load voltage	≤ 30 VDC≒
Load current	≤ 150 mA
Residual voltage	NPN: ≤ 1 VDC≒, PNP: ≤ 2.5 VDC≒
Protection circuit	Reverse power protection circuit, output short overcurrent protection circuit
Insulation resistance	≥ 20 MΩ (500 VDC≒ megger)
Noise immunity	± 240 V the square wave noise (pulse width: 1μs) by the noise simulator
Dielectric strength	Between the charging part and the case : 1,000 VAC ~ 50 / 60 Hz for 1minute
Vibration	1.5 mm double amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Shock	500 m/s ² (≈ 50 G) in each X, Y, Z direction for 3 times
Ambient illum. (receiver)	Sunlight: 10,000 lx, incandescent lamp: 3,000 lx
Ambient temp.	-10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation)
Ambient humi.	35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation)
Protection rating	IP40 (IEC standard)
Cable spec.	Ø 4 mm, 4-wire, 2 m (emitter: 3-wire)
Wire spec.	AWG 22 (0.08 mm, 60-core), insulator diameter: Ø 1.25 mm
Material	Case: PC / ABS, sensing part: PMMA

Troubleshooting

Malfunction	Cause	Troubleshooting
Non-operation	Power supply	Supply the rated power.
	Cable incorrect connection, or disconnection	Check the wiring connection.
	Out of rated sensing distance	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 the rated sensing distance	Use it within the rated sensing distance.
	There is an obstacle to cut off the emitted light between emitter and receiver.	Remove the obstacle.
	There is strong electric wave or noise generator such as motor, electric generator, or high voltage line, etc.	Put away the strong electric wave or noise generator.
LED displays for over current	Control output line is shorted out.	Check the wiring connection.
	Over load	Check the rated load capacity.