# Picking sensor

## ▣ Features

- Plastic injection case
- Slim body(W30×H140×T10mm)
- Long/Short sensing distance mode
  (sensing distance selection function)
- Mutual interference prevention(frequency switching function)
- Selectable Light ON/Dark ON operation mode by switch
- Picking indicator includes
- Protection structure IP40(IEC standard)

**Please read "Caution for your safety" in operation manual before using.**

## ▣ Specifications

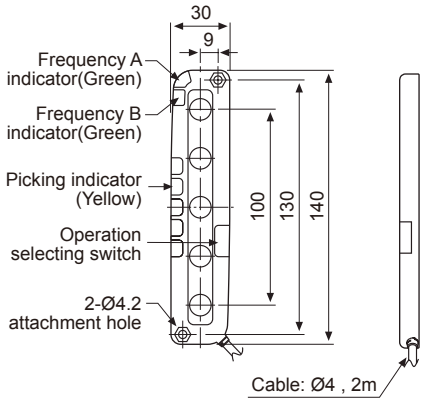
| | | |
|---|---|---|
| Model | NPN open collector output | **BWPK25-05** |
| | PNP open collector output | **BWPK25-05P** |
| Sensing type | | Through-beam |
| Sensing distance | Long distance mode | 0.1 to 3m |
| | Short distance mode | 0.05 to 1m |
| Sensing target | | Opaque materials of Min.Ø35mm |
| Optical axis pitch | | 25mm |
| Number of optical axis | | 5EA |
| Sensing width | | 100mm |
| Power supply | | 12-24VDC ±10%(Ripple P-P : Max. 10%) |
| Current consumption | | Emitter : Max. 60mA, Receiver : Max. 60mA |
| Control output | | NPN or PNP open collector output<br>• Load voltage : Max. 30VDC • Load current : Max. 150mA<br>• Residual voltage - NPN : Max. 1V, PNP : Min.2.5V |
| Operation mode | | Selectable Light ON/Dark ON by switch |
| Response time | | Max. 30ms |
| Light source | | Infrared LED(850nm modulated) |
| Interference protection | | Interference protection by transmission frequency selection |
| Protection circuit | | Reverse power polarity, Output short-circuit(Overcurrent) protection |
| External picking input | | Non-contact or contact input<br>• NPN open collector output : Lighting(0-2V), Light out(5-30V or open)<br>• 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 (received light side illumination) |
| | Ambient temperature | -10 to 55℃, storage : -20 to 60℃ |
| | Ambient humidity | 35 to 85%RH, storage : 35 to 85%RH |
| Insulation resistance | | Min. 20MΩ(at 500VDC megger) |
| Noise resistance | | ±240V the square wave noise (pulse width: 1μs) by the noise simulation |
| Dielectric strength | | 1,000VAC 50/60Hz for 1minute |
| Vibration | | 1.5mm amplitude or 300m/s$^2$ at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour |
| Shock | | 500m/s² (approx. 50G) in each of X, Y, Z directions for 3 times |
| Protection | | IP40(IEC standard) |
| Material | | Case : PC/ABS, Sensing part: PMMA |
| Cable | | Ø4.0mm, 4-wire, Length : 2m(Emitter : Ø4.0mm, 3-wire, Length : 2m)<br>(AWG 22, Core diameter : 0.08mm, Number of cores : 60, Insulator out diameter : Ø1.25) |
| Approval | | CE |
| Unit weight | | Approx. 250g |

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

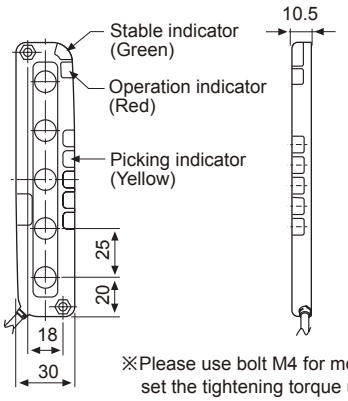
## ▣ Dimensions

(unit: mm)

<Emitter>



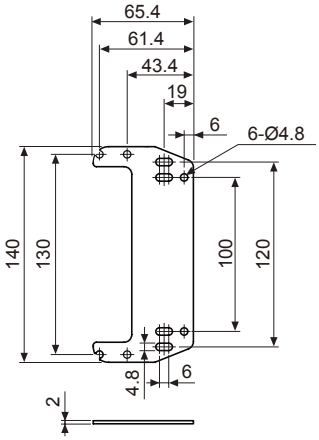

<Receiver>



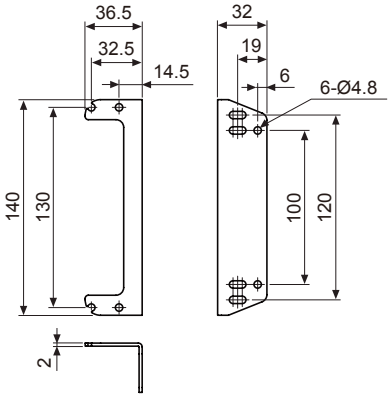

※Please use bolt M4 for mounting of sensor, set the tightening torque under 20kgf·cm.

## ◎ Mounting of bracket

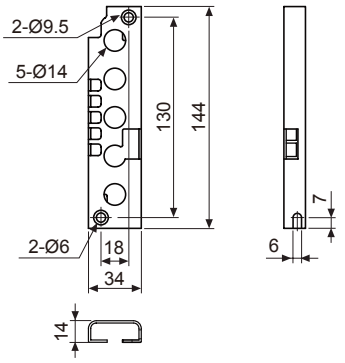
**● Flat bracket(BK-BWPK-ST)**
Sold separately

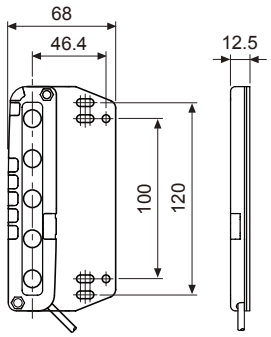


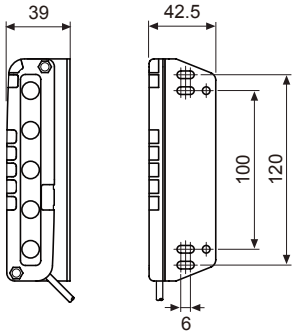

**● L-Shaped bracket(BK-BWPK-L)**
Sold separately

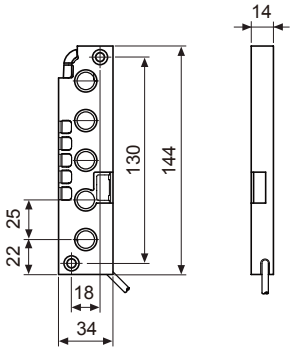



**● Protection bracket(BK-BWPK-P)**
Sold separately

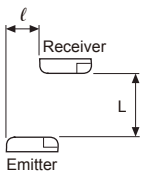
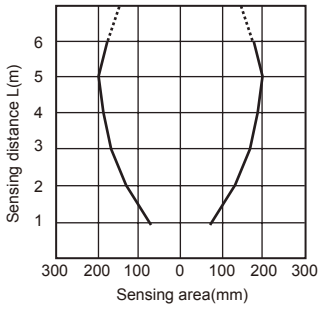
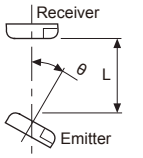
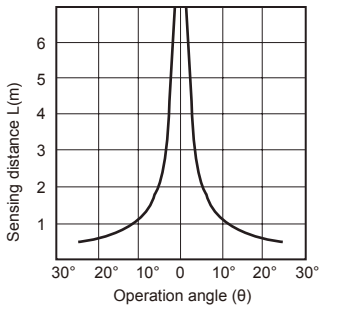


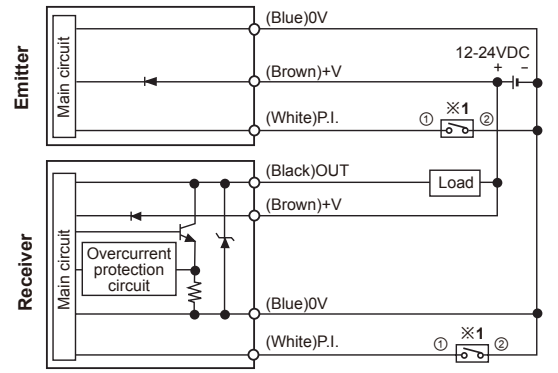
## ▣ Feature data

| Parallel shifting characteristic | | Angle characteristic | |
|---|---|---|---|
| Measuring method | Data | Measuring method | Data |
|  |  |  |  |

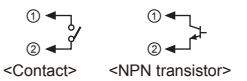


## ▣ Input/Output circuit and connection diagram

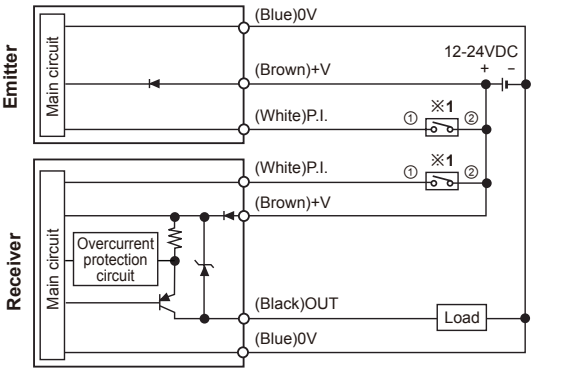
### ● NPN open collector output



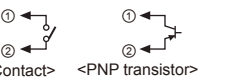

※1: Picking input(P.I) : Contact or transistor is ON, and picking indicator operates.




### ● PNP open collector output

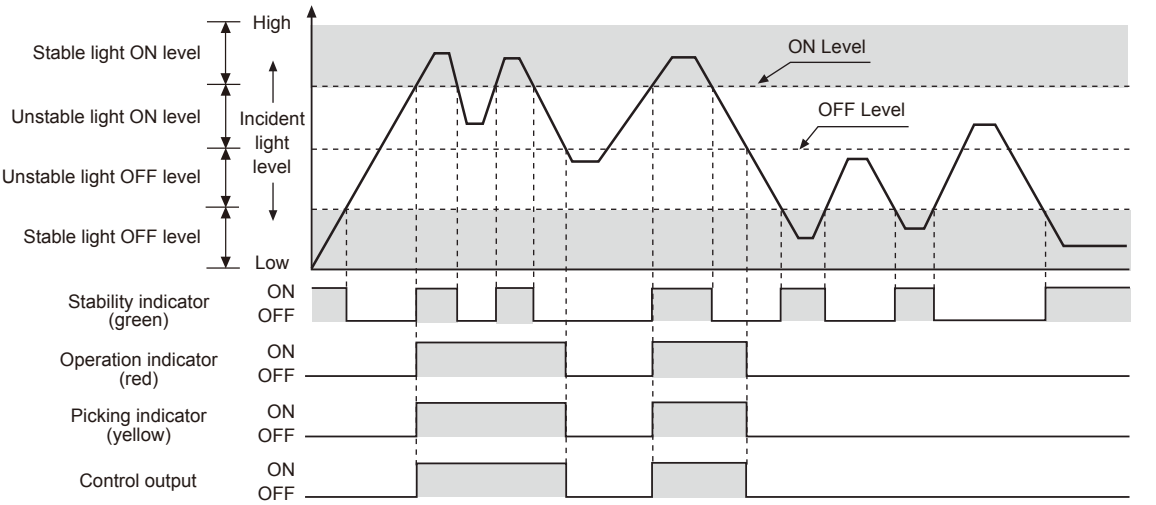



※1: Picking input(P.I) : Contact or transistor is ON, and picking indicator operates.




※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.

## ▣ Operation timing diagram




※The above diagram is the state of operation for Light ON, but in case of Dark ON, it is opposite operation against Light ON.
※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

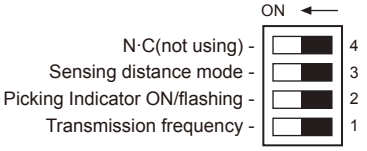
| Item | Emitter | | | Receiver | | | |
|---|---|---|---|---|---|---|---|
| | Indicator | | | Indicator | | | Control output |
| | Green | Green | Picking indicator(yellow) | Green | Red | Picking indicator(yellow) | |
| Power on | ☼ | ● | – | – | – | – | – |
| FREQ. A operation | ☼ | ● | – | – | – | – | – |
| FREQ. B operation | ☼ | ☼ | – | – | – | – | – |
| Stable light ON | – | – | ☼ | ☼ | ☼ | ☼ | ON |
| Flashing function ON | – | – | ◑ | ☼ | ☼ | ◑ | ON |
| Unstable light ON | – | – | ☼ | ● | ☼ | ☼ | ON |
| Unstable light OFF | – | – | ● | ● | ● | ● | OFF |
| Stable light OFF | – | – | ● | ☼ | ● | ● | OFF |
| Overcurrent | – | – | ● | ◑◑ | | ● | OFF |

| Display classification list | |
|---|---|
| ☼ | Light ON |
| ● | Light OFF |
| ◑ | Flashing by 0.3 sec. |
| ◑ ◑ | Flashing simultaneously by 0.3 sec. |

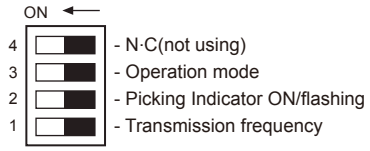
※The operations of 'Operation indicator' and 'Picking indicator(Red)' for stable light ON level, unstable light ON level, unstable light OFF level, and stable light OFF level are for Light ON. (In case of overcurrent, control output is OFF regardless of operation mode.)

## ▣ Operation mode switch

**<Emitter>**




**<Receiver>**




### ●Transmission frequency (interference prevention)

| Switch | Function |
|---|---|
| ON OFF 1 | Frequency A |
| ON OFF 1 | Frequency B |

### ●Picking Indicator ON/flashing

| Switch | Function |
|---|---|
| ON OFF 2 | Picking Indicator ON operation |
| ON OFF 2 | Picking Indicator flashing operation |

※Emitter and receiver should be set the same selection of transmission frequency and picking indicator ON/flashing. If not, it does not operate properly.

### ●Sensing distance mode(emitter)

| Switch | Function |
|---|---|
| ON OFF 3 | Sensing distance Long mode : 0.1 to 3m |
| ON OFF 3 | Sensing distance Short mode : 0.05 to 1m |

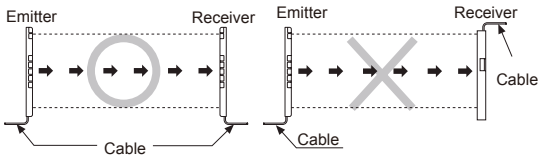
### ●Operation mode(receiver)

| Switch | Function |
|---|---|
| ON OFF 3 | Light ON |
| ON OFF 3 | Dark ON |

## ▣ Installation

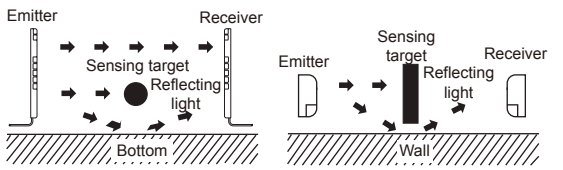
### ◎ For direction of installation

Emitter and receiver should be installed as same up/down position.




### ◎ For reflection from the surface of wall and flat

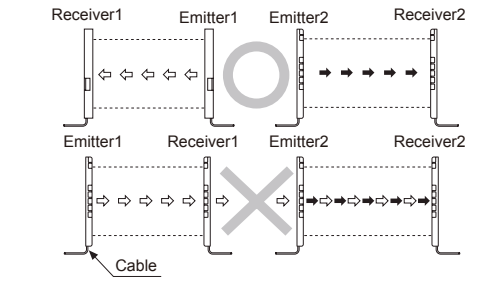
When installing it as below the light reflected from the surface of wall and flat will not be shaded. Please, check whether it operates normally or not with a sensing target before using. (Interval distance : Min. 0.3m)

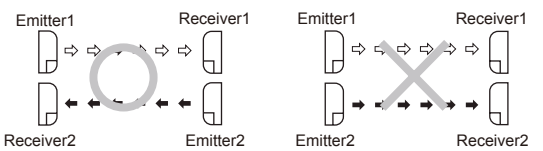



### ◎ For prevention of interference

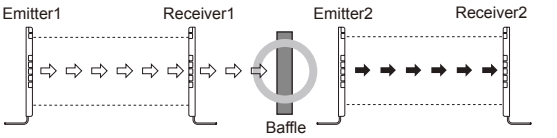
It may cause interference when installing more than 2 sets of the sensor. In order to avoid the interference of the sensor, please install as following figures and use the interference protection function.

- **Transmission direction should be opposite between 2 sets**

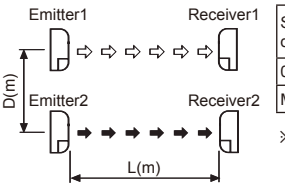



- **Baffle should be installed between 2 sets.**




- **It should be installed out of the interference distance**




| Sensing distance(L) | Installation allowable distance(D) |
|---|---|
| 0.1 to 1m | Min. 0.1m |
| Min. 1m | Min. 0.2m |

※It may be a little different based on installation environment.

## ▣ Troubleshooting

| Malfunction | Cause | Troubleshooting |
|---|---|---|
| Non-operation | Power supply | Supply rated power. |
| | Cable incorrect connection or disconnection | Check the wiring. |
| | Rated connection failure | 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 rated sensing distance | Use within rated sensing distance. |
| | 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 generated by 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. |

# Slim Plastic Single-Beam Area Sensors

## BWP Series

CATALOG

**For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.**
The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

## Features

- Flat body (13 mm) area sensors with Fresnel lens
- High strength PC / ABS plastic body
- High-speed response time under 7ms
- 4 configurations (optical axis : 8 to 20, detection area : 140 to 380 mm)
- Operation test (emitter stop) function, mutual interference prevention function, Job indicator ON/FLASHING switch, Light ON/Dark ON operation mode switch
- Bright LED indicators on emitter and receiver
- IP40 protection structure (IEC standard)

## Ordering Information

This is only for reference, the actual product does not support all combinations.
For selecting the specified model, follow the Autonics website.

| BWP | 20 | - | ❶ | ❷ |
|---|---|---|---|---|

**❶ Number of optical axes**
Number: Number of optical axes

**❷ Control output**
No-mark: NPN open collector output
P: PNP open collector output

## Product Components

- Product
- Instruction manual

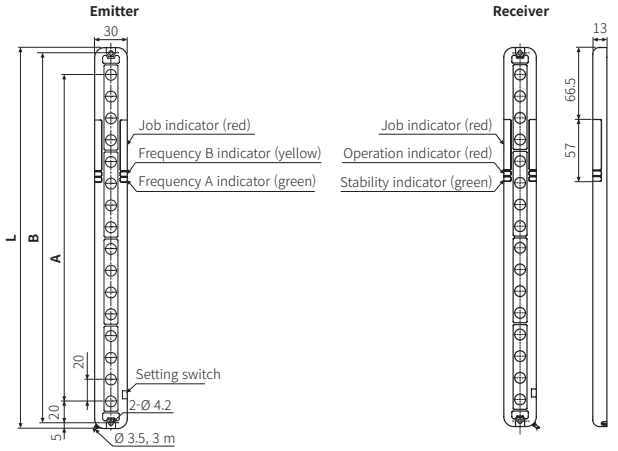
## Specifications

| Model | BWP20-08(P) | BWP20-12(P) | BWP20-16(P) | BWP20-20(P) |
|---|---|---|---|---|
| **Sensing method** | Through-beam | | | |
| **Light source** | Infrared LED (850 nm modulated light) | | | |
| **Sensing distance** | 0.1 to 5.0 m | | | |
| **Sensing target** | Opaque material | | | |
| **Min. sensing target** | ≥ Ø 30 mm | | | |
| **Number of optical axes** | 8 | 12 | 16 | 20 |
| Sensing height | 140 mm | 220 mm | 300 mm | 380 mm |
| Optical axis pitch | 20 mm | | | |
| **Response time** | ≤ 6 ms (frequency B: ≤ 7 ms) | | | |
| **Operation mode** | Light ON / Dark ON (switch) | | | |
| **Functions** | Emitter OFF, operation mode change, Job indicator ON / flashing | | | |
| **Interference protection** | Interference protection by transmission frequency selection | | | |
| **Synchronization type** | Timing method by synchronous line | | | |
| **Indicator** | Emitter: frequency A indicator (green), frequency B indicator (yellow)<br>Receiver: operation indicator (red), stable indicator (green)<br>Emitter / receiver: Job indicator (red) | | | |
| **Approval** | CE EAC | | CE EAC | |
| **Weight (packaged)** | ≈ 280 g<br>(≈ 480 g) | ≈ 320 g<br>(≈ 520 g) | ≈ 360 g<br>(≈ 620 g) | ≈ 430 g<br>(≈ 680 g) |

| | |
|---|---|
| **Power supply** | 12 - 24 VDC⎓ (ripple P-P: ≤ 10 %) |
| **Current consumption** | Emitter / receiver: ≤ 80 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** | 1,000 VAC~ 50 / 60 Hz for 1minute |
| **Vibration** | 1.5 mm double amplitude at frequency of 10 to 55 Hz (for 1 min) in each X, Y, Z direction for 2 hours |
| **Shock** | 500 m/s² (≈ 50 G) in each X, Y, Z direction for 3 times |
| **Ambient illumination (receiver)** | Ambient light: ≤ 100,000 lx |
| **Ambient temperature** | -10 to 55 °C, storage: -20 to 60 °C (no freezing or condensation) |
| **Ambient humidity** | 35 to 85 %RH, storage: 35 to 85 %RH (no freezing or condensation) |
| **Protection rating** | IP40 (IEC standard) |
| **Cable spec.** | Ø 3.5 mm, 4-wire, 3 m |
| **Wire spec.** | AWG 24 (0.08 mm, 40-core), insulator diameter: Ø 1 mm |
| **Material** | Case: PC / ABS, sensing part: PMMA |

## Dimensions

- Unit: mm, For the detailed drawings, follow the Autonics website.
- When installing, use M4 bolts for mounting screws and tighten with a torque of 2 N m or less.




| Model | Sensing height (A) | B | Product length (L) |
|---|---|---|---|
| BWP20-08(P) | 140 | 180 | 190 |
| BWP20-12(P) | 220 | 260 | 270 |
| BWP20-16(P) | 300 | 340 | 350 |
| BWP20-20(P) | 380 | 420 | 430 |

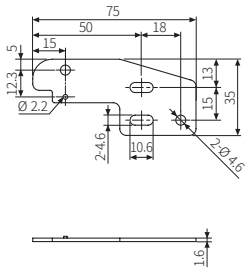
## Sold Separately

- Flat bracket (BK-BWP-ST)
- L-shaped bracket (BK-BWP-L)
- Protection bracket (BK-BWP-P□)

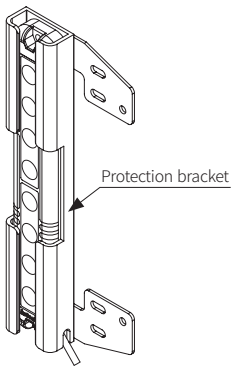
## Sold Separately: Bracket

- Unit: mm, For the detailed drawings, follow the Autonics website.
- When using the flat bracket or L-shaped bracket, use the protection bracket first. When mounting the protection bracket, it is possible to install the flat / L-shaped bracket, close mounting is available.
- Flat / L-shaped brackets are sold as a set of two each emitter and receiver. (with M4 bolt × 8)

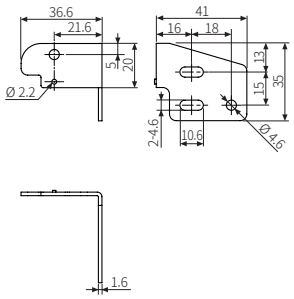
### ■ Flat bracket (BK-BWP-ST)



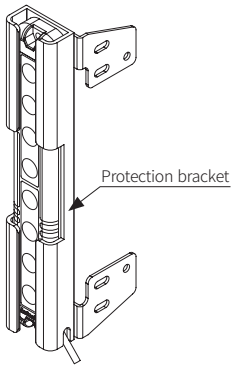

• Mounting




### ■ L-shaped bracket (BK-BWP-L)

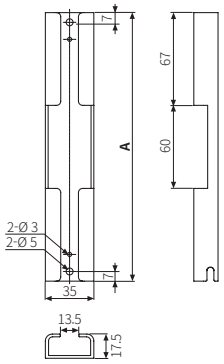



• Mounting




### ■ Protection bracket (BK-BWP-P□)

- Mount it from top to bottom of the product.
- The protection bracket is sold as a set of one each for emitter and receiver. (with M4 bolt × 4)




| Model | A |
|---|---|
| BK-BWP-P08 | 194 |
| BK-BWP-P12 | 274 |
| BK-BWP-P16 | 354 |
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