

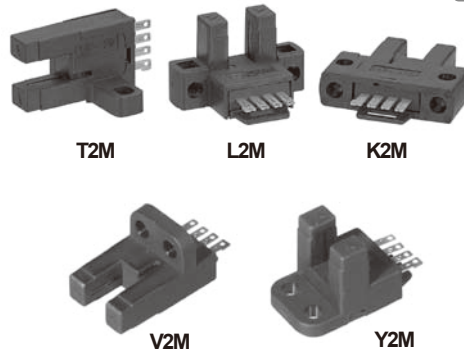
## Micro photo sensor

PNP model

Line-up

### Features

- Ultra compact, Built-in amplifier, NPN/PNP open collector output
- Various selection by installation position (Appearance: K, T, L, Y, V type)
- Light ON / Dark ON selectable by control terminal
- High speed response frequency : 2kHz
- Wide range of power source: 5-24VDC (Easy to connect with various IC, relay, programmable controller etc)
- Dust resistance structure : Protecting by window of emitter/receiver
- Red LED status indication



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



### Ordering information

BS 5 - K 2 M - P

|                  |    |   |   |         |   |   |   |   |  |
|------------------|----|---|---|---------|---|---|---|---|--|
| Item             | BS | 5 | - | K       | 2 | M | - | P |  |
| Sensing distance | 5  |   |   | K       |   | M |   |   |  |
| Appearance       |    |   |   | K       |   | T |   | L |  |
| Connection type  |    |   |   | 2       |   |   |   |   |  |
| Size             |    |   |   | M       |   |   |   |   |  |
| Control output   |    |   |   | No mark |   | P |   |   |  |
|                  |    |   |   | K       |   | T |   | L |  |
|                  |    |   |   | Y       |   | V |   |   |  |
|                  |    |   |   | 5       |   |   |   |   |  |
|                  |    |   |   | BS      |   |   |   |   |  |

### Specifications

| Model                 | NPN open collector output | BS5-K2M   | BS5-T2M   | BS5-L2M   | BS5-Y2M   | BS5-V2M   |
|-----------------------|---------------------------|---|-----------|-----------|-----------|-----------|
|                       | PNP open collector output | BS5-K2M-P   | BS5-T2M-P | BS5-L2M-P | BS5-Y2M-P | BS5-V2M-P |
| Sensing distance      |                           | 5mm fixed   |           |           |           |           |
| Sensing type          |                           | Through-beam(Not modulated)   |           |           |           |           |
| Sensing target        |                           | ø0.8×1mm Opaque materials   |           |           |           |           |
| Hysteresis            |                           | 0.05mm  |           |           |           |           |
| Response time         |                           | Light ON : Max. 20µs, Dark ON : Max. 100µs  |           |           |           |           |
| Response frequency    |                           | 2kHz(refer to the measuring range of frequency response)  |           |           |           |           |
| Power supply          |                           | 5-24VDC ±10%(Ripple P-P : Max. 10%)   |           |           |           |           |
| Current consumption   |                           | Max. 30mA(at 26.4VDC )  |           |           |           |           |
| Light source          |                           | Infrared LED(950nm)   |           |           |           |           |
| Operation mode        |                           | Light ON / Dark ON selectable by control wire   |           |           |           |           |
| Control output        |                           | NPN or PNP open collector output<br>●Load voltage : Max. 30VDC ●Load current : Max. 100mA ●Residual voltage : Max. 1.2V |           |           |           |           |
| Protection circuit    |                           | Reverse power polarity protection, Overcurrent protection   |           |           |           |           |
| Indicator             |                           | Operation Indicator: red LED  |           |           |           |           |
| Connection            |                           | Connector type  |           |           |           |           |
| Insulation resistance |                           | Min. 20MΩ(at 250VDC megger)   |           |           |           |           |
| Noise resistance      |                           | ±240V the square wave noise(pulse width:1µs) by the noise simulator   |           |           |           |           |
| Dielectric strength   |                           | 1,000VAC 50/60Hz for 1minute  |           |           |           |           |
| Vibration             |                           | 1.5mm amplitude or 300m/s <sup>2</sup> at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours             |           |           |           |           |
| Shock                 |                           | 500m/s <sup>2</sup> (approx. 50G) in each of X, Y, Z directions for 3 times   |           |           |           |           |
| Environment           | Ambient illumination      | Fluorescent lamp : Max. 1000lx (Receiver illumination)  |           |           |           |           |
|                       | Ambient temperature       | -20 to 55°C, storage : -25 to 85°C  |           |           |           |           |
|                       | Ambient humidity          | 35 to 85%RH, storage : 35 to 85%RH  |           |           |           |           |
| Protection            |                           | IP50(IEC standard)  |           |           |           |           |
| Material              |                           | PBT   |           |           |           |           |
| Approval              |                           | CE  |           |           |           |           |
| Unit weight           |                           | Approx. 30g   |           |           |           |           |

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

(A) Photo electric sensor

(B) Fiber optic sensor

(C) Door/Area sensor

(D) Proximity sensor

(E) Pressure sensor

(F) Rotary encoder

(G) Connector/Socket

(H) Temp. controller

(I) SSR/Power controller

(J) Counter

(K) Timer

(L) Panel meter

(M) Tacho/Speed/ Pulse meter

(N) Display unit

(O) Sensor controller

(P) Switching mode power supply

(Q) Stepper motor& Driver&Controller

(R) Graphic/Logic panel

(S) Field network device

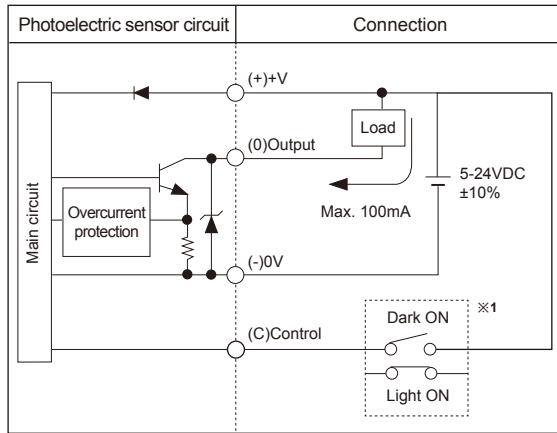
(T) Software

(U) Other

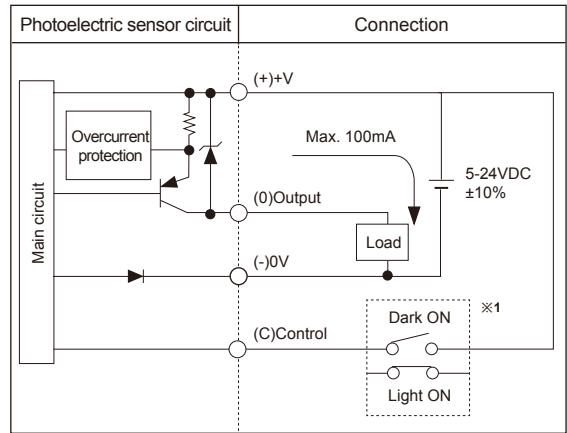
# BS5 Series

## Control output diagram

### • NPN open collector output



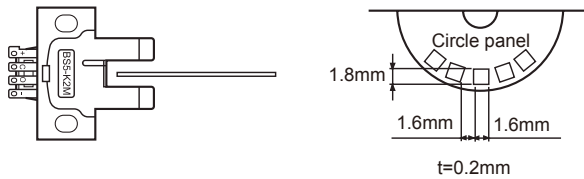
### • PNP open collector output



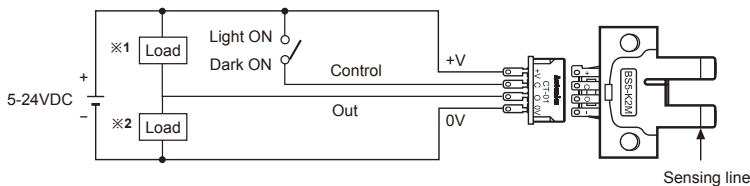
※1: Operation mode selection : Connect Control(C) terminal into terminal +V(+) to operate Light ON mode.  
Dark ON mode is available with disconnection status.

## How to measure response frequency

Response frequency is the value getting from revolving the circle panel below.



## Connections



※1: The load connection of NPN open collector output

※2: The load connection of PNP open collector output

※Connect the unit using socket. If it is soldered on terminal pin directly without socket, it may cause product damage.

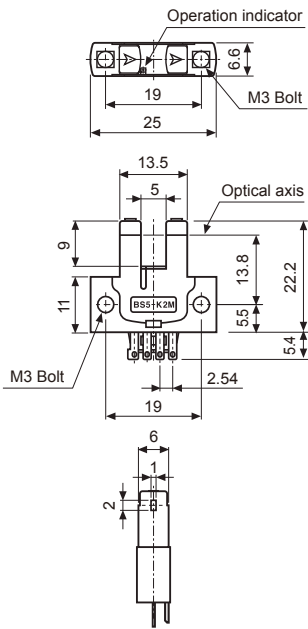
## Operation mode

| Operation mode                | Light ON                          | Dark ON                           |
|-------------------------------|-----------------------------------|-----------------------------------|
| Receiver operation            | Received light  Interrupted light | Received light  Interrupted light |
| Operation indicator (red LED) | ON  OFF                           | ON  OFF                           |
| Transistor output             | ON  OFF                           | ON  OFF                           |

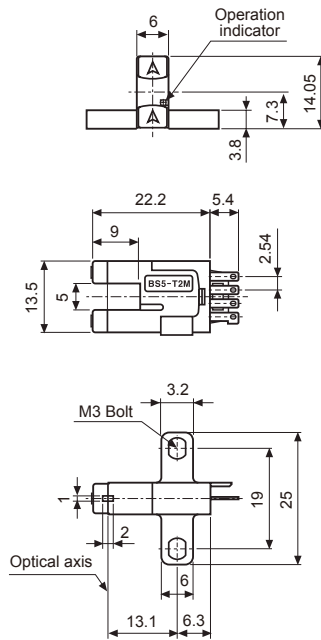
※If the control output terminal is short-circuited or overcurrent condition exists, the control output turns OFF due to protection circuit.

## ■ Dimensions

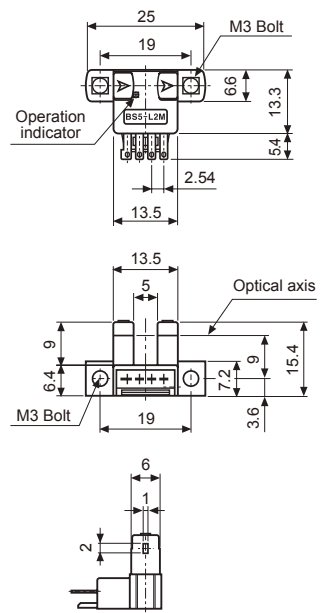
### ● BS5-K2M / BS5-K2M-P



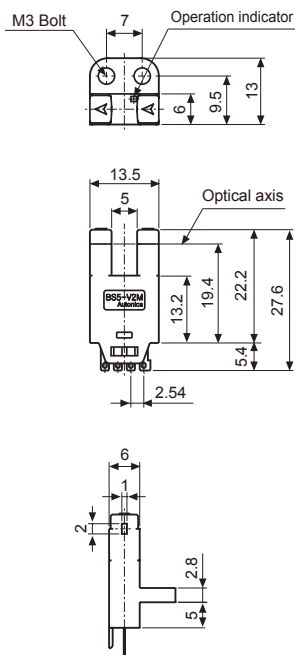
### ● BS5-T2M / BS5-T2M-P



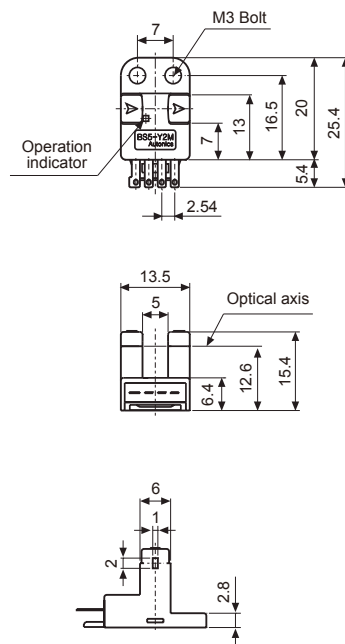
### ● BS5-L2M / BS5-L2M-P



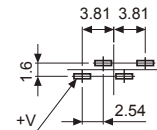
### ● BS5-V2M / BS5-V2M-P



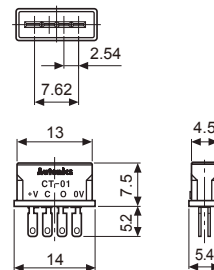
### ● BS5-Y2M / BS5-Y2M-P



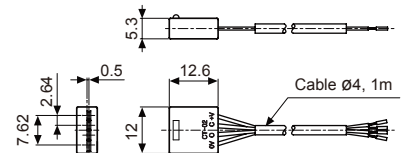
### ● PCB mounting hole



### ● Socket: CT-01(sold separately)



### ● Socket: CT-02(sold separately)



※Cable: ø4, 4-wire, Length: 1m  
 (AWG22, Core wire diameter: 0.08mm,  
 No. of core wire: 60, Insulator out diameter:  
 ø1.2)  
 ※Cable length is available to option.

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