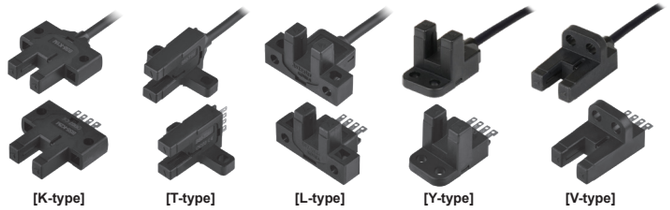
Autonics

Photomicro Sensor with Amplifier
BS5 SERIES
INSTRUCTION MANUAL



[K-type] [T-type] [L-type] [Y-type] [V-type]

Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

■ Safety Considerations

※Please observe all safety considerations for safe and proper product operation to avoid hazards.
※⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ **Warning** Failure to follow these instructions may result in serious injury or death.
⚠ **Caution** Failure to follow these instructions may result in personal injury or product damage.

⚠ Warning

1. **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.
2. **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.
3. **Do not disassemble or modify the unit.**
   Failure to follow this instruction may result in fire.
4. **Do not connect, repair, or inspect the unit while connected to a power source.**
   Failure to follow this instruction may result in fire.
5. **Check 'Connections' before wiring.**
   Failure to follow this instruction may result in fire.

⚠ Caution

1. **Use the unit within the rated specifications.**
   Failure to follow this instruction may result in fire or product damage.
2. **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.

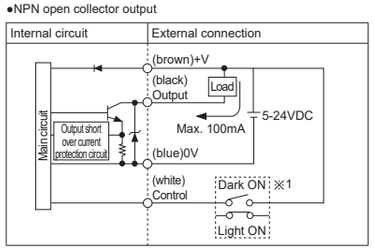
■ Ordering Information

BS 5 – K 1 M – P

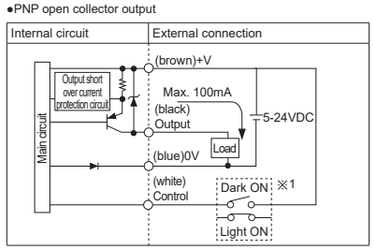
Item	BS	Photoelectric sensor series
Sensing distance	5	Unit: mm (fixed)
Appearance	K	K-Type
	T	T-Type
	L	L-Type
	Y	Y-Type
	V	V-Type
Connection	1	Cable Type
	2	Connector Type
Size	M	Middle
Control output	No mark	NPN open collector output
	P	PNP open collector output

■ Control Output Circuit Diagram

●NPN open collector output



●PNP open collector output



※1: Operation mode selection: Connect (white)Control cable (terminal) into terminal (brown)+V to operate Light ON mode.
Dark ON mode is available with disconnection status.
※If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

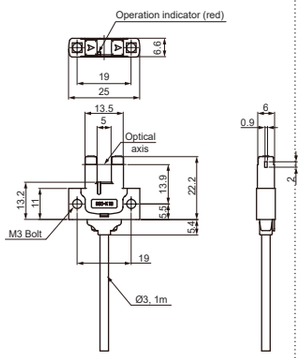
※The above specifications are subject to change and some models may be discontinued without notice.
※Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

■ Dimensions

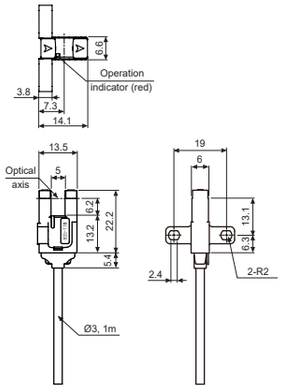
※When using photoelectric sensors closely over two units, it may result in malfunction due to mutual interference.
※When installing the product, tighten the screw with a tightening torque of 0.49N·m.

(unit: mm)

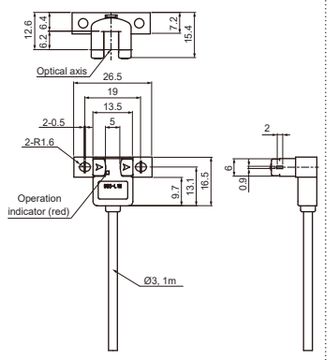
●BS5-K1M / BS5-K1M-P



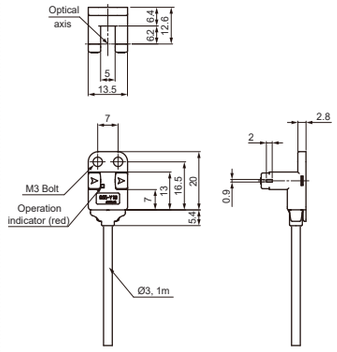
●BS5-T1M / BS5-T1M-P



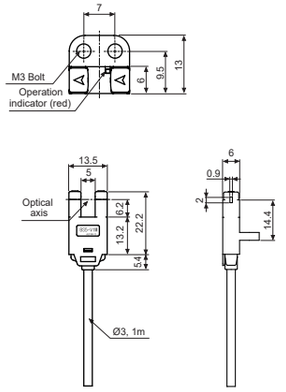
●BS5-L1M / BS5-L1M-P



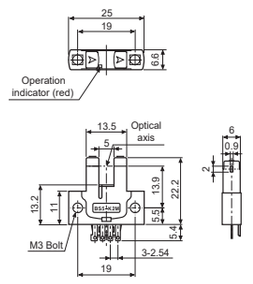
●BS5-Y1M / BS5-Y1M-P



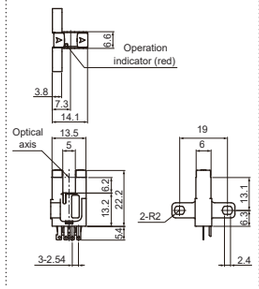
●BS5-V1M / BS5-V1M-P



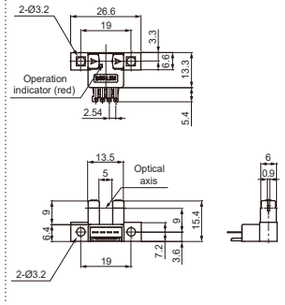
●BS5-K2M / BS5-K2M-P



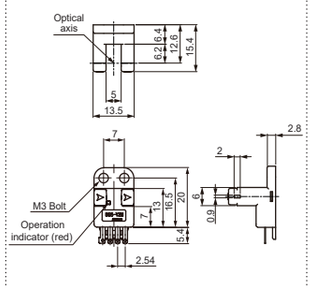
●BS5-T2M / BS5-T2M-P



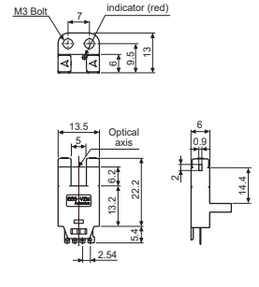
●BS5-L2M / BS5-L2M-P



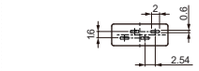
●BS5-Y2M / BS5-Y2M-P



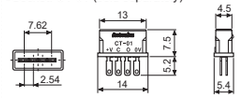
●BS5-V2M / BS5-V2M-P



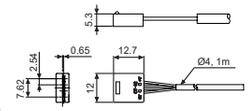
●Hole cut-out when inputting socket on PCB



●Socket: CT-01 (sold separately)



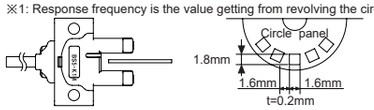
●Socket: CT-02 (sold separately)



■ Specifications

Model	NPN open collector output	BS5-K1M	BS5-T1M	BS5-L1M	BS5-Y1M	BS5-V1M	BS5-K2M	BS5-T2M	BS5-L2M	BS5-Y2M	BS5-V2M
	PNP open collector output	BS5-K1M-P	BS5-T1M-P	BS5-L1M-P	BS5-Y1M-P	BS5-V1M-P	BS5-K2M-P	BS5-T2M-P	BS5-L2M-P	BS5-Y2M-P	BS5-V2M-P
Sensing type		Through-beam (not modulated)									
Sensing distance		5mm fixed									
Sensing target		0.8×2mm Opaque materials									
Hysteresis		0.05mm									
Response time		Light ON: max. 20μs, dark ON: max. 100μs									
Response frequency※1		2kHz									
Power supply		5-24VDC⎓ ±10% (ripple P-P: max. 10%)									
Current consumption		Max. 30mA (at 26.4VDC)									
Light source		Infrared LED (940nm)									
Operation mode		Light ON / Dark ON selectable by control wire					Light ON / Dark ON selectable by control terminal				
Control output		NPN or PNP open collector output • Load voltage: max. 30VDC⎓ • Load current: max.100mA • Residual voltage: max. 1.2VDC⎓									
Protection circuit		Reverse power polarity protection circuit, output short overcurrent protection circuit									
Indicator		Operation Indicator: red LED									
Connection		Cable type					Connector type				
Insulation resistance		Over 20MΩ (at 250VDC megger)									
Noise immunity		±240V the square wave noise (pulse width: 1μs) by the noise simulator									
Dielectric strength		1,000VAC 50/60Hz for 1 minute									
Vibration		1.5mm amplitude at frequency of 10 to 55Hz (for 1 min.) in each X, Y, Z direction for 2 hours									
Shock		500m/s² (approx. 50G) in X, Y, Z directions for 3 times									
Environment	Ambient illumination	Fluorescent lamp: max. 1,000lx (receiver illumination)									
	Ambient temperature	-20 to 55℃, storage: -25 to 85℃									
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH									
Protection structure		IP50 (IEC standard)									
Material		PBT									
Cable		Ø3mm, 4-wire, 1m (AWG28, core diameter: 0.08mm, number of cores: 19, insulator out diameter: Ø0.88mm)					—				
Approval		CE									
Weight※2		Approx. 50g (approx. 30g)									

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



※2: The weight includes packaging. The weight in parentheses is for unit only.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

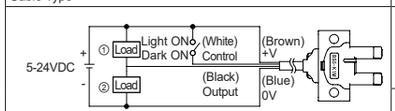
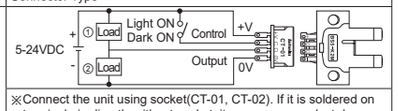
■ Operation Mode

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

■ Caution during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. Use the product, 0.5 sec after supplying power.
   When using separate power supply for the sensor and load, supply power to sensor first.
3. 5-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
4. Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
5. When using sensor with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground F.G. terminal of the equipment.
6. This unit may be used in the following environments.
   ①Indoors (in the environment condition rated in 'Specifications') ②Altitude max. 2,000m
   ③Pollution degree 2 ④Installation category II

■ Connection

Cable Type	Connector Type
	
	※Connect the unit using socket(CT-01, CT-02). If it is soldered on terminal pin directly without socket, it may cause product damage.

①Load connection for NPN output ②Load connection for PNP output

■ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connectors/Sockets
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System(Fiber, CO_2, Nd:YAG)
- Laser Welding/Cutting System
- Temperature Controllers
- Temperature/Humidity Transducers
- SSRs/Power Controllers
- Counters
- Timers
- Panel Meters
- Tachometers/Pulse(Rate)Meters
- Display Units
- Sensor Controllers

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