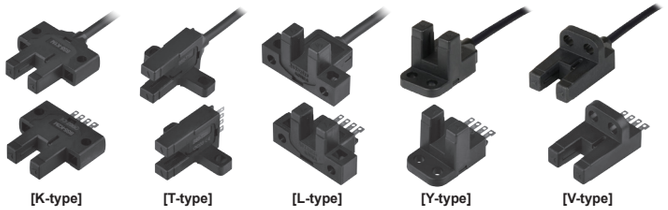
Autonics PHOTOMICRO SENSOR BUILT AMPLIFIER

BS5 SERIES

M A N U A L



[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.

※Safety considerations are categorized as follows.
⚠**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.

※The symbols used on the product and instruction manual represent the following
⚠ symbol represents caution due to special circumstances in which hazards may occur.

⚠ 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, fire, or economic loss.
2. **Do not disassemble or modify the unit. Please contact us if necessary.**
   Failure to follow this instruction may result in electric shock or fire.

⚠ Caution

1. **Check the polarity of the power before wiring the unit.**
   Failure to follow this instruction may result in product damage. Check the cable position and power voltage range. Cut off the power for wiring cables.
2. **Do not use the unit where flammable or explosive gas may be present.**
   Failure to follow this instruction may result in fire or explosion.
3. **Do not use water or oil-based detergent when cleaning the unit.**
   Failure to follow this instruction may result in electric shock or fire.

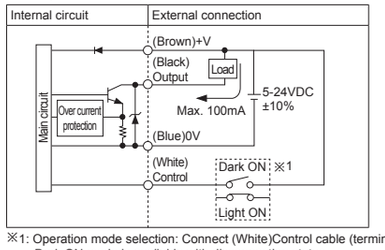
▣ Ordering Information

BS 5 – K 1 M – P

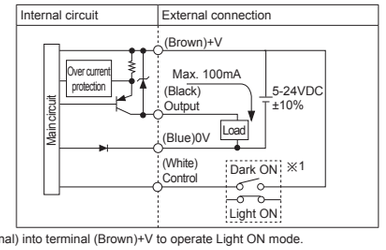
Control output	**No mark**	NPN open collector output
	P	PNP open collector output
Size	**M**	Middle
Connection	**1**	Cable Type
	2	Connector Type
Appearance	**K**	K-Type
	T	T-Type
	L	L-Type
	Y	Y-Type
	V	V-Type
Sensing distance	**5**	Unit: mm (fixed)
Item	**BS**	Photoelectric sensor series

▣ Control Output Circuit Diagram

●NPN open collector output

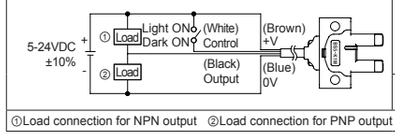
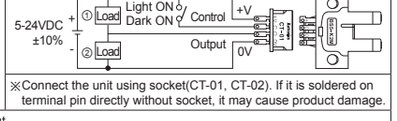


●PNP open collector output



※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.

▣ 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.	

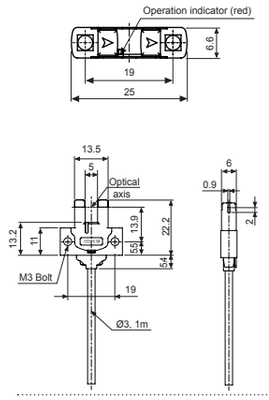
①Load connection for NPN output ②Load connection for PNP output

※The above specifications are subject to change and some models may be discontinued without notice.

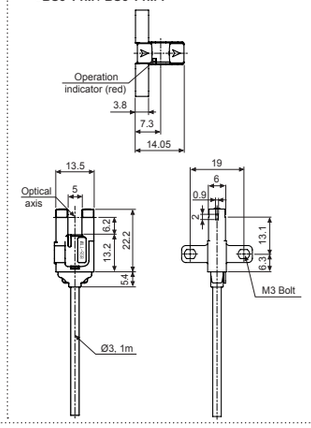
▣ Dimensions

(unit: mm)

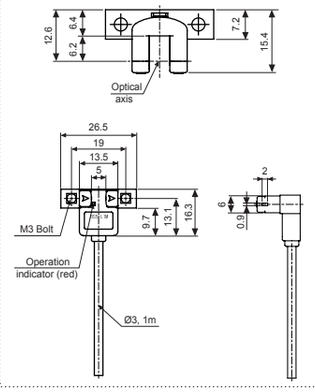
●BS5-K1M / BS5-K1M-P



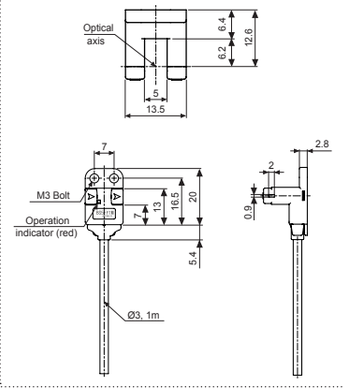
●BS5-T1M / BS5-T1M-P



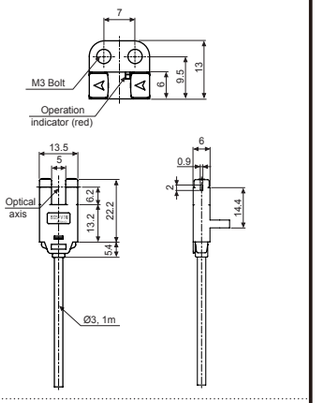
●BS5-L1M / BS5-L1M-P



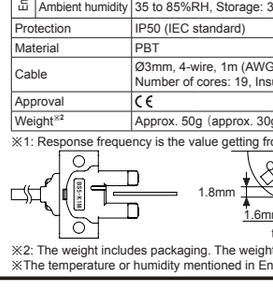
●BS5-Y1M / BS5-Y1M-P



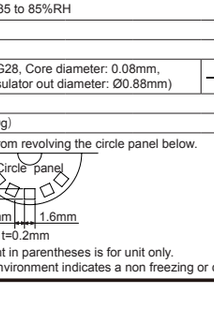
●BS5-V1M / BS5-V1M-P



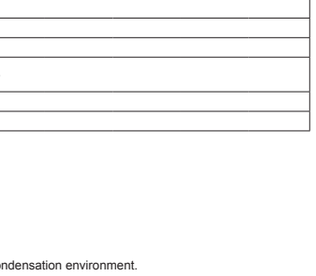
●BS5-K2M / BS5-K2M-P



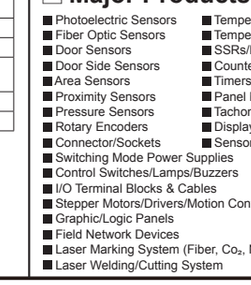
●BS5-T2M / BS5-T2M-P



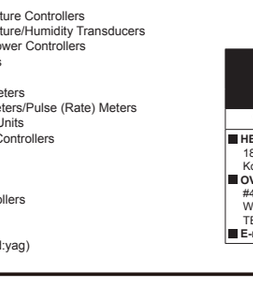
●BS5-L2M / BS5-L2M-P



●BS5-Y2M / BS5-Y2M-P

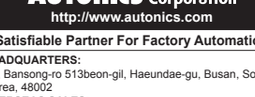


●BS5-V2M / BS5-V2M-P



●Hole cut-out when inputting socket on PCB

●Socket: CT-01 (sold separately)

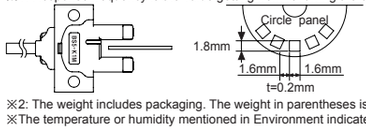


●Socket: CT-02 (sold separately)

▣ Specifications

Model		BS5-K1M	BS5-T1M	BS5-L1M	BS5-Y1M	BS5-V1M	BS5-K2M	BS5-T2M	BS5-L2M	BS5-Y2M	BS5-V2M
NPN 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
PNP open collector output											
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%)									
Power supply		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. 1.2V									
Protection circuit		Reverse power polarity protection, Overcurrent protection									
Indicator		Operation Indicator: red LED									
Connection		Cable type					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 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		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. There is no protection of external light source in this unit which is for built-in, please intercept external light source from the receiver.
2. When wiring the photoelectric sensor with high voltage line, power line in a same conduit, it may cause malfunction or mechanical problem, please do wire separately or use different conduit.
3. If there are machines generating noise at surrounding photomicro sensor (Switching regulator, inverter motor etc.), be sure to earth F.G. terminals of machines.
4. For soldering on the connector type terminals, keep the temperature max. 260℃ and do not heat for more than 3 sec. Solder 1.5mm away from terminal source part.
5. Use M3 screws and tighten with max. 0.49N·m (5.0kgf·cm) torque. When screwing, use a flat washer (Ø6). Be sure that sensing part is not to be touched by any objects. If the sensing part is damaged, it may cause malfunction.
6. If the sensor is installed at place where there are a lot of dust and humidity, clear the receiver and the emitter with dry cloth. Pollution of the receiver and the emitter can occur malfunction of the sensor.
7. Do not install the unit at the below environment to prevent from product malfunction or damage.
   ①Place where heavy steam, or dust may be present.
   ②Place where water, oil, or chemicals (oil-based detergent, acid alkali, aromatic hydrocarbon, etc.) is directly contacted.
   ③Outdoor or place where the ray of the sun is directly contacted.
8. This unit may be used in the following environments.
   ①Indoors ②Altitude: under 2,000m ③Pollution degree 2 ④Installation category II

※Failure to follow these instructions may result in product damage.

▣ Major Products

- Photoelectric Sensors
- Fiber Optic Sensors
- Door Sensors
- Door Side Sensors
- Area Sensors
- Proximity Sensors
- Pressure Sensors
- Rotary Encoders
- Connector/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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