

Autonics

**Photoelectric Sensor
BJN SERIES**

INSTRUCTION MANUAL



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

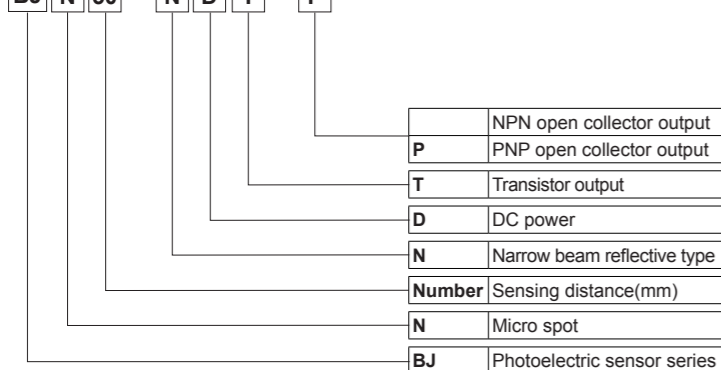
- Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss.** (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in fire, personal injury, or economic loss.
- Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.
- Do not connect, repair, or inspect the unit while connected to a power source.**
Failure to follow this instruction may result in fire.
- Check 'Connections' before wiring.**
Failure to follow this instruction may result in fire.

⚠ Caution

- Use the unit within the rated specifications.**
Failure to follow this instruction may result in fire or product damage.
- Use dry cloth to clean the unit, and do not use water or organic solvent.**
Failure to follow this instruction may result in fire.
- Do not use the unit in the place where flammable/explosive/corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**
Failure to follow this instruction may result in fire or explosion.

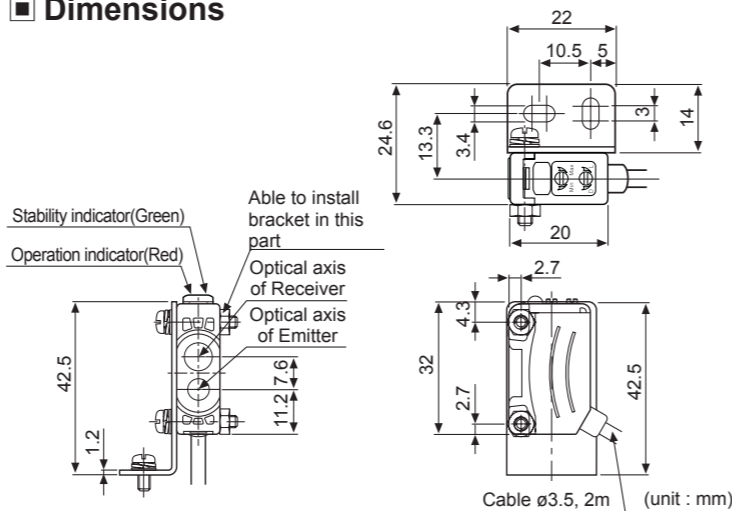
■ Ordering Information

BJ N 50 - N D T - P



※ 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

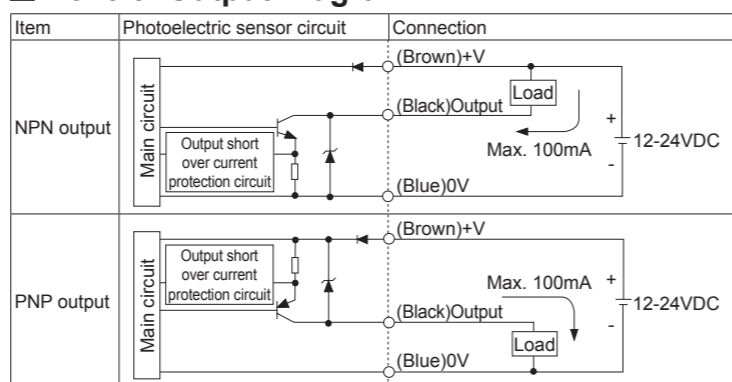


■ Specifications

Sensing type	Narrow beam reflective type	
Model	NPN output	BJN50-NDT BJN100-NDT
	PNP output	BJN50-NDT-P BJN100-NDT-P
Power supply	12-24VDC ±10% (ripple P-P: max. 10%)	
Current consumption	Max. 30mA	
Min. diameter of transmitting SPOT	Approx. ø2.0mm	Approx. ø2.5mm
Min. sensing target	Approx. min. ø 0.2mm (copper wire)	
Sensing target	Translucent, opaque materials	
Sensing distance	30 to 70mm (100×100mm non-glossy white paper)	70 to 130mm (100×100mm non-glossy white paper)
Hysteresis	Max. 25% at sensing distance	Max. 20% at sensing distance
Light source/Wavelength	Red LED (650nm)	
Control output	NPN or PNP open collector output • Load voltage: max. 26.4VDC ± • Load current: max. 100mA • Residual voltage - NPN: max. 1VDC ±, PNP: max. 2.5VDC	
Operation mode	Light ON / Dark ON selectable by switch	
Protection circuit	Reverse polarity protection circuit, output short over current protection circuit, interference prevention function	
Response time	Max. 1ms	
Sensitivity adjustment	Sensitivity adjuster	
Environment	Ambient illumination	Sunlight: max. 11,000lx, incandescent lamp: max. 3,000lx (receiver illumination)
	Ambient temperature	-25 to 55°C, storage: -40 to 70°C
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH
Insulation resistance	Over 20MΩ (500VDC megger)	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm or 300mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock	500m/s² X, Y, Z directions for 3 times	
Protection structure	IP65 (IEC standard)	
Indicator	Operation indicator: red, stability indicator: green	
Material	Case: PC+ABS, sensing part: PMMA, LED CAP: PC	
Cable	ø3.5mm, 3-wire, length: 2m (AWG24, core diameter: 0.08mm, number of cores: 40, insulator diameter: ø1mm)	
Accessory	Mounting bracket, M3 bolt: 2, M3 nut: 2, adjustment screwdriver	
Approval	CE	
Unit weight	Approx. 45g	

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

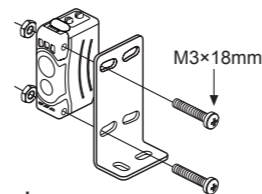
■ Control Output Diagram



※ 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.

■ Mounting and Sensitivity Adjustment

○ For mounting
When using photoelectric sensors closely over three units, it may result in malfunction due to mutual interference.
When installing the product, tighten the screw with a tightening torque of 0.5Nm.

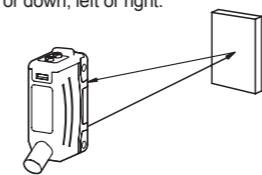


○ Switching of operation mode

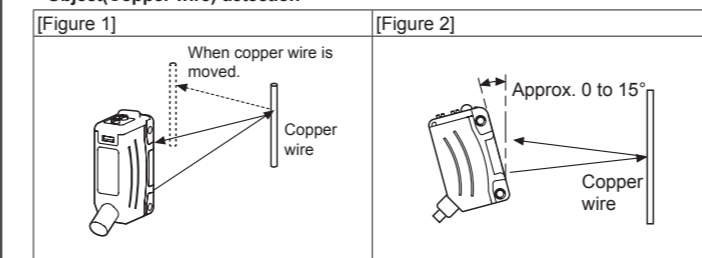
Light ON		Turn the operation switching adjuster to right (L direction), it is set as Light ON.
Dark ON		Turn the operation switching adjuster to left (D direction), it is set as Dark ON.

○ Optical axis adjustment

After place a sensing target, fix it in the middle of position where the indicator is operated adjusting the sensor to up or down, left or right.



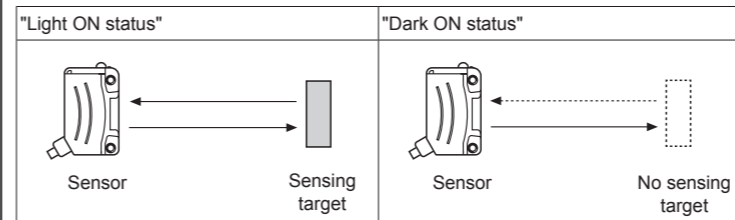
● Object (Copper wire) detection



※ Mount sensor slanted at an angle ranged 0 to 15° shown above as [Figure 2] for stable detection to detect as shown in [Figure 1].

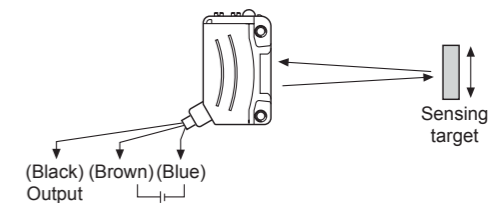
○ Sensitivity adjustment

Order	Sensitivity adjuster	Description
1		Turn the sensitivity adjuster to the right of min. and check position (A) where the indicator is turned on in "Light ON status".
2		Turn the sensitivity adjuster more to the right of position (A), check position (B) where the indicator is turned on. And turn the adjuster to the left, check position (C) where the indicator is turned off in "Light OFF status". ※ If the indicator is not lighted although the adjuster is turned to the max. position, the max. position is (C).
3		Set the adjuster at the center of (A) and (C). To set the optimum sensitivity, check the operation and lighting of stable indicator with sensing target or without it. If the indicator is not lighted, please check the sensing method again because sensitivity is unstable.



※ Please set adjuster as sensitivity adjustment is executed in stable Light ON area and the reliability of environment (temperature, voltage, dust, etc.) is increased after the mounting in a stable area.
※ It may cause breakdown when the sensitivity adjuster or the operation switching adjuster is turned by force.

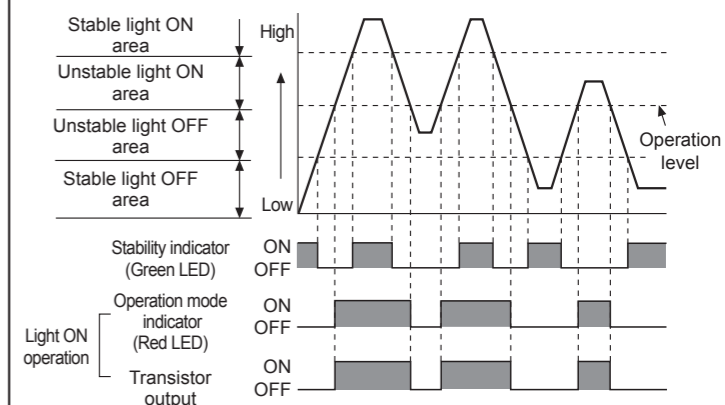
■ Connections



■ Operation Mode

Operation mode	Light ON	Dark ON
Receiver	Received light Interrupted light	
Operation indicator (Red LED)	ON OFF	
Transistor output	ON OFF	

■ Operation Timing Diagram



※ The waveform of "Operation mode indicator" and "Transistor output" is for Light ON, it is operated as reverse in Dark ON.

■ Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- When connecting a DC relay or other inductive load to the output, remove surge by using diodes or varistors.
- Use the product, 0.5 sec after supplying power.
When using separate power supply for the sensor and load, supply power to sensor first.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- When using switching mode power supply to supply the power, ground F.G. terminal and connect a condenser between 0V and F.G. terminal to remove noise.
- When using sensor with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground F.G. terminal of the equipment.
- This unit may be used in the following environments.
 - ① Indoors (in the environment condition rated in 'Specifications')
 - ② Altitude max. 2,000m
 - ③ Pollution degree 3
 - ④ Installation category II

■ 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, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse(Rate) meters
- Display units
- Sensor controllers