Autonics

Cylindrical type Photoelectric Sensor

BR 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

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 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 dry cloth to clean the unit, and do not use water or organic solvent.**
   Failure to follow this instruction may result in fire.

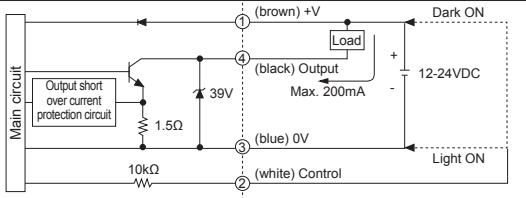
■ Model

Model	Sensing type	Sensing distance	Case	Power supply	Operation mode	Connection	Control output (■: type)
BRP200-DDTN-■	Narrow beam reflective type	200mm	Plastic	12-24VDC	Light ON/ Dark ON (control wire)	Cable type	No mark
BRP200-DDTN-C-■						Connector type	: NPN open collector output
BR200-DDTN-■			Metal			Cable type	P
BR200-DDTN-C-■						Connector type	: PNP open co lector output

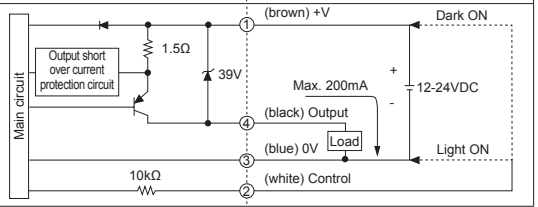
■ Control Output Circuit Diagram

	Photoelectric sensor circuit	Connection

NPN open collector output



PNP open collector output



※Before using this unit, select Light ON/Dark ON with control wire.
(Light ON: connect control wire with 0V/Dark ON: connect control wire with +V)
※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).

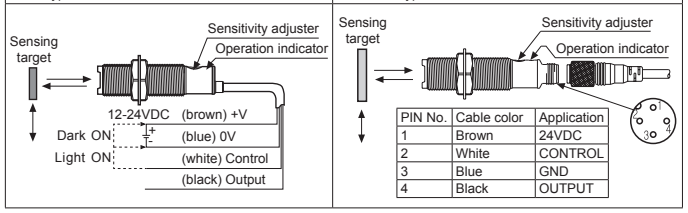
■ Specifications

Model	NPN open collector output	**BRP200-DDTN(-C)**	**BR200-DDTN(-C)**
	PNP open collector output	**BRP200-DDTN(-C)-P**	**BR200-DDTN(-C)-P**
Case		Plastic	Metal
Sensing type		Narrow beam reflective type	
Sensing distance※1		200mm	
Sensing target		Opaque, translucent materials	
Hysteresis		Max. 20% at rated sensing distance	
Response time		Max. 1ms	
Power supply		12-24VDC ±10% (ripple P-P: max. 10%)	
Current consumption		Max. 45mA	
Light source		Infrared LED (850nm)	
Sensitivity adjustment		Sensitivity adjuster	
Operation mode		Selectable Light ON or Dark ON by control wire (white)	
Control output		NPN or PNP open collector output • Load voltage: max. 30VDC • Load current: max. 200mA • Residual voltage - NPN: max. 1VDC , PNP: max. 2.5VDC	
Protection circuit		Power reverse polarity protection circuit, output short over current protection circuit	
Indicator		Operation indicator: red LED	
Connection		Cable type, connector type	
Insulation resistance		Over 20MΩ (at 500VDC megger)	
Noise immunity		±240V the square wave noise (pulse width: 1μs) by the noise simulator	
Dielectric strength		1,000VAC 50/60Hz for 1 min	
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 each X, Y, Z direction for 3 times	
Environment	Ambient illu.	Sunlight: max. 11,000lx, Incandescent lamp: max. 3,000lx (receiver illumination)	
	Ambient temp.	-10 to 60℃, storage: -25 to 75℃	
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH	
Protection structure		IP66 (IEC standard)	
Material		Case: Polyamide (black), Sensing part: Polycarbonate Lens	Case: Brass, Ni-plate, Sensing part: Polycarbonate Lens
Cable	Cable type	Ø5mm, 4-wire, 2m (AWG22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.25mm)	
	Connector type	M12 connector	
Accessory		M18 fixing nut: 2, adjustment screwdriver	M18 fixing nut: 2, washer: 1, adjustment screwdriver
Approval		CE	
Weight※2	Cable type	Approx. 140g (approx. 100g)	Approx. 160g (approx. 120g)
	Connector type	Approx. 70g (approx. 30g)	Approx. 90g (approx. 50g)

※1: Non-glossy white paper 100×100mm.
※2: The weight includes packaging. The weight in parenthesis is for unit only.
※Tightening torque for connector is 0 39 to 0.49N m.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

■ Connections

Cable type	Connector type



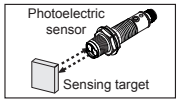
PIN No.	Cable color	Application
1	Brown	24VDC
2	White	CONTROL
3	Blue	GND
4	Black	OUTPUT

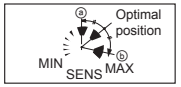
■ Installation and Sensitivity Adjustment

Install the sensor to the desired place and check the connections. Supply the power to the sensor and adjust the optical axis and the sensitivity as following.
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 0.39N·m for BRP and to 14.7N·m for BR.

1. The sensitivity should be adjusted depending on a sensing target or mounting place.
2. Set the target at a position to be detected by the beam, then turn the Sensitivity adjuster until position ⓐ where the operation indicator turns ON from min. position of the Sensitivity adjuster.
3. Take the target out of the sensing area, then turn the Sensitivity adjuster until position ⓑ where the operation indicator turns ON.
   If the indicator dose not turn ON, max. position is ⓑ.
4. Set the Sensitivity adjuster at the center of two switching position ⓐ, ⓑ.

※Be sure that it can be different by size, surface and gloss of target.

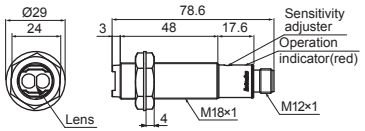




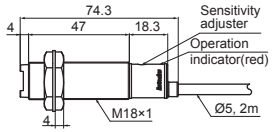
■ Dimensions

(unit: mm)

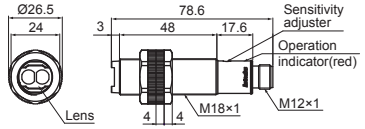
● **BR200-DDTN-C(-P)**



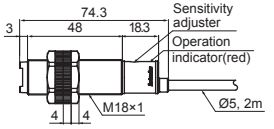
● **BR200-DDTN(-P)**



● **BRP200-DDTN-C(-P)**

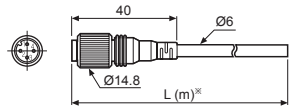


● **BRP200-DDTN(-P)**

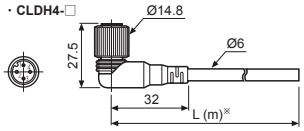


● **Connection cable (sold separately)**

· **CIDH4-□**

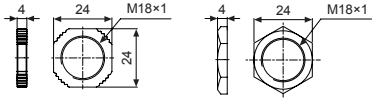


· **CLDH4-□**



※Specification of Connector Cable: Ø6mm, 4-wire, 2m/3m/5m/7m
(AWG22, core diameter: 0 08mm, number of cores: 60, insulator out diameter: Ø1.65mm)

● **M18 fixing nut**



■ Operating 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

※The transistor output will be held OFF for 0.5 sec after supplied power in order to prevent malfunction of this photoelectric sensor.

■ Cautions during Use

1. Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
2. When connecting a DC relay or other inductive load to the output, remove surge by using diodes or varistors.
3. Use the product, 0.5 sec after supplying power.
   When using separate power supply for the sensor and load, supply power to sensor first.
4. 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
5. Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
6. 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.
7. When using sensor with the equipment which generates noise (switching regulator, inverter, servo motor, etc.), ground F.G. terminal of the equipment.
8. This unit may be used in the following environments.
   ⓘIndoors (in the environment condition rated in 'Specifications')
   ⓙAltitude max. 2,000m
   ⓚPollution degree 2
   ⓛInstallation category II

■ 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
- Tachometer/Pulse (Rate) Meters
- Display Units
- Sensor Controllers