

Autonics

Cross-beam Area Sensor BWC Series

INSTRUCTION MANUAL



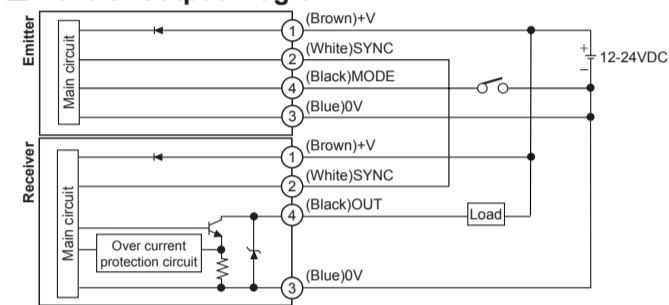
Thank you for choosing our Autonics product.
Please read the following safety considerations before use.

Specifications

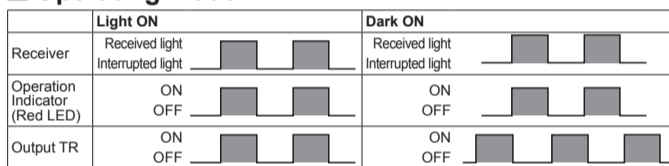
Model	BWC40-□□H	BWC40-□□HD	BWC80-14H	BWC80-14HD
Sensing method	Through-beam			
Sensing distance	1.0 to 7.0m			
Sensing target	Opaque material of min Ø50mm		Opaque material of min Ø90mm	
Optical axis pitch	40mm		80mm	
Number of optical axes	4/10/12/16/18/20pcs		14pcs	
Sensing height	120 to 760mm		1,040mm	
Beam pattern	3 Point cross beam netting type			
Power supply	12-24VDC±10%(Ripple P-P: Max. 10%)			
Reverse polarity protection circuit	Built-in			
Current consumption	Max. 100mA			
Control output	NPN open collector output • Load voltage: max. 30VDC • Load current: max. 100mA • Residual voltage: max. 1VDC			
Operation mode	Light ON	Dark ON	Light ON	Dark ON
Short-circuit protection	Built-in			
Response	Within 50ms			
Light source	Infrared LED(850nm modulated light type)			
Synchronization type	Timing method by synchronous cable			
Self-diagnosis	Transmitted-received light monitoring, Direct light monitoring, Output circuit monitoring			
Interference protection	Interference protection by frequency changing setting			
Environment	Ambient illumination	Ambient light: Max. 100,000lx		
	Ambient temperature	-10 to 55°C, Storage: -20 to 60°C		
	Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH		
Protection	IP65(IEC standard)			
Noise strength	±240V the square wave noise (pulse width 1µs) by the noise simulator			
Dielectric strength	1,000VAC 50/60Hz for 1minute			
Insulation resistance	Over 20MΩ(at 500VDC megger)			
Vibration	1.5mm amplitude at frequency of 10 to 55Hz(for 1 min.) in each X, Y, Z direction for 2 hours			
Shock	500m/s ² (approx. 50G) in each X, Y, Z direction for 3 times			
Material	Case: Aluminum, Sensing part and indicator: Acrylic			
Accessory	Bracket A: 4ea, Bracket B: 4ea, Fixing bolt: 8ea			
Cable	Ø5mm, 4-wire, length: 300mm, M12 connector			
Approval	CE			
Weight	Approx. 2.1kg (Approx. 1.7kg) (based on BWC80-14H)			

※Environment resistance is rated at no freezing or condensation.
※1: The weight includes packaging. The weight in parenthesis is for unit only.

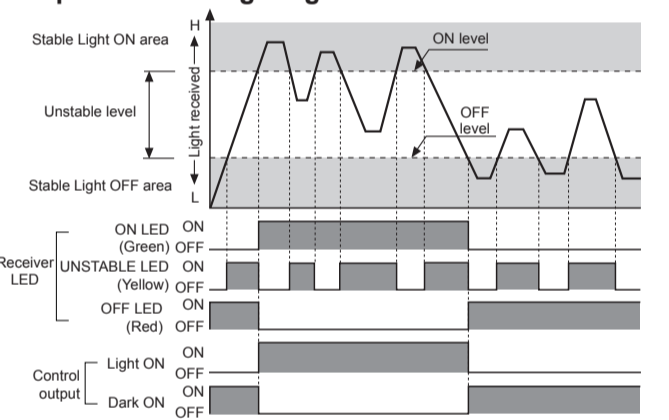
Control Output Diagram



Operating Mode

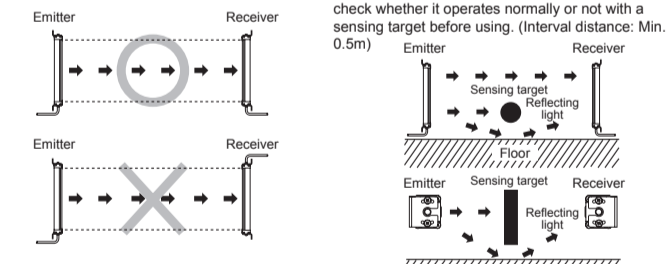


Operation Timing Diagram

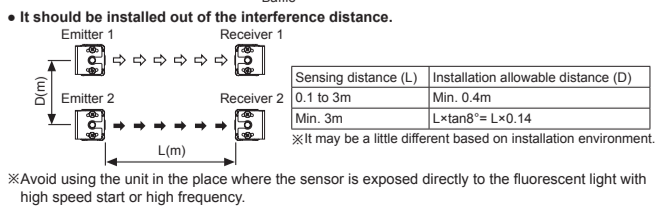
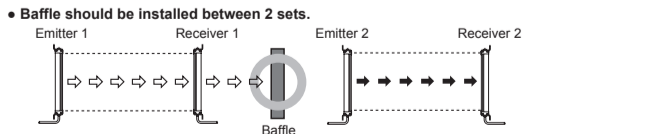
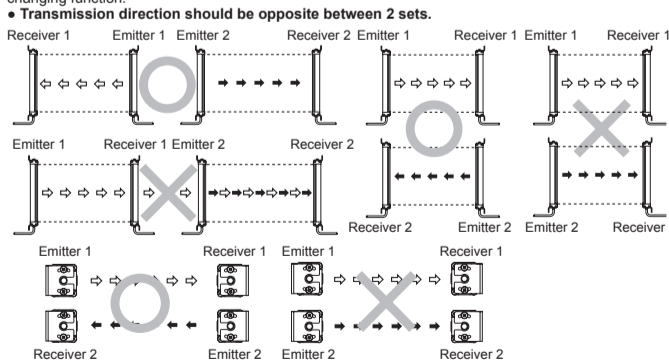


Installations

For the first installation, enter installation mode.
①Entry method for installation mode: Supply power with inputting 0V to 4th terminal (Black) MODE.
②After entering installation mode, install the unit at the position where green LED of receiver operation indicator turns ON.
③After installation, re-supply power to the unit.
○ For Direction Of Installation
Emitter and receiver should be installed in same up/down direction.
○ For Reflection From The Surface Of Wall And Flat
When installing it as below, the light reflected from the surface of wall and flat is not shaded. Please check whether it operates normally or not with a sensing target before using. (Interval distance: Min. 0.5m)

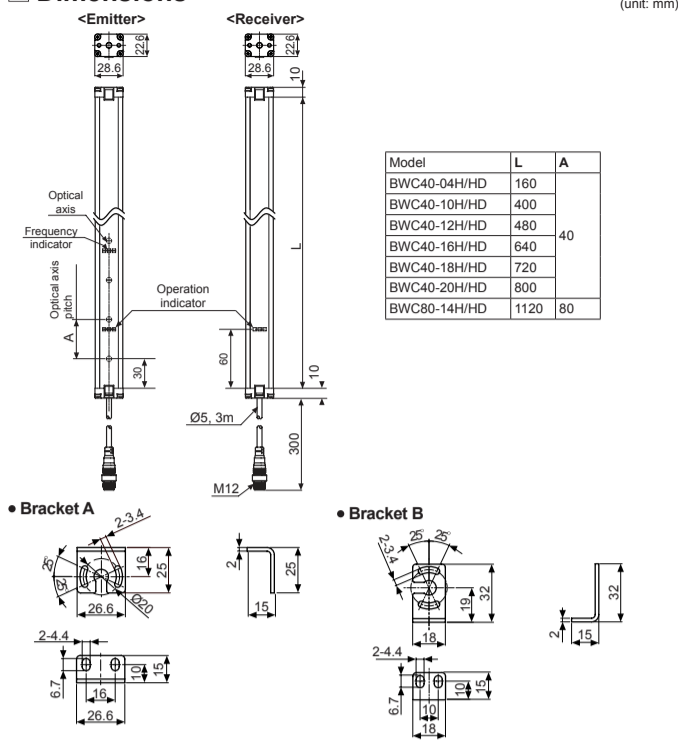


○ For Protection Of Interference
It may cause interference when installing more than 2 sets of the sensor. In order to avoid the interference of the sensor, please install as following figures and use the transmitted light frequency changing function.
• Transmission direction should be opposite between 2 sets.



※Avoid using the unit in the place where the sensor is exposed directly to the fluorescent light with high speed start or high frequency.

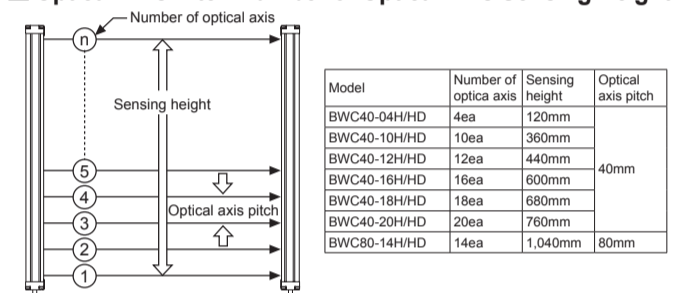
Dimensions



Bracket Mounting



Optical Axis Pitch/Number of Optical Axis/Sensing Height



Indicator Display

Item	Emitter Indicator		Receiver Indicator		Control output		Indicator table
	Green	Red	Green	Yellow	Light ON	Dark ON	
Power supply	ON	OFF	ON	OFF	ON	OFF	● Lighting
Break of emitter	ON	OFF	ON	OFF	ON	OFF	● Flashing by 0.5sec.
Break of light emitting element	ON	OFF	ON	OFF	ON	OFF	● Flashing simultaneously by 0.5sec.
Break of adjacent emitting element more than 2ea.	ON	OFF	ON	OFF	ON	OFF	● Cross-flashing by 0.5sec.
Stable light ON	ON	OFF	ON	OFF	ON	OFF	● Sequence-flashing by 0.5sec.
Unstable light ON	ON	OFF	ON	OFF	ON	OFF	
Unstable light OFF	ON	OFF	ON	OFF	ON	OFF	
Stable light OFF	ON	OFF	ON	OFF	ON	OFF	
Break of receiver	ON	OFF	ON	OFF	ON	OFF	
Control output over current	ON	OFF	ON	OFF	ON	OFF	
Synchronous line malfunction	ON	OFF	ON	OFF	ON	OFF	
Emitter failure(Time out)	ON	OFF	ON	OFF	ON	OFF	

Troubleshooting

Malfunction	Cause	Troubleshooting
Non-operation	Power supply Cable incorrect connection, or disconnection	Supply the rated power. Check the wiring connection
Non-operation in sometimes	Out of rated sensing distance Pollution by dirt of sensor cover Connector connection failure	Use it within rated sensing distance. Remove dirt by soft brush or cloth. Check the assembled part of the connector
Control output is OFF even though there is not a target object.	Out of the rated sensing distance There is an obstacle to cut off the emitted light between emitter and receiver. There is strong electric wave or noise generator such as motor, electric generator, or high voltage line, etc.	Use it within the rated sensing distance. Remove the obstacle. Put away the strong electric wave or noise generator.
Operation indicator displays break of emitter	Break of emitter	Contact our company.
Operation indicator displays break of receiver	Break of receiver	Contact our company.
Operation indicator displays break of light emitting element	Break of light emitting element	Contact our company.
Operation indicator displays emitter failure	Emitter failure Bad wiring connection of synchronous cable in emitter and receiver.	Check the wiring connection in emitter and receiver.
Check the wiring connection in emitter and receiver.	Control output line is shorted out. Over load	Check the wiring connection. Check the rated load capacity.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- 12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the product, 1 sec after supplying power.
When using separate power supply for the sensor and load, supply power to sensor first.
- 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 connecting a DC relay or other inductive load, remove surge by using diodes or varistors.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent surge and inductive noise.
- 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

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., 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

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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

- 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 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.
- Do not disassemble or modify the unit.**
Failure to follow this instruction may result in fire.
- This product is not safety sensor and does not observe any domestic nor international safety standard.**
Do not use this product with the purpose of injury prevention or life protection, as well as in the place where economic loss maybe present.

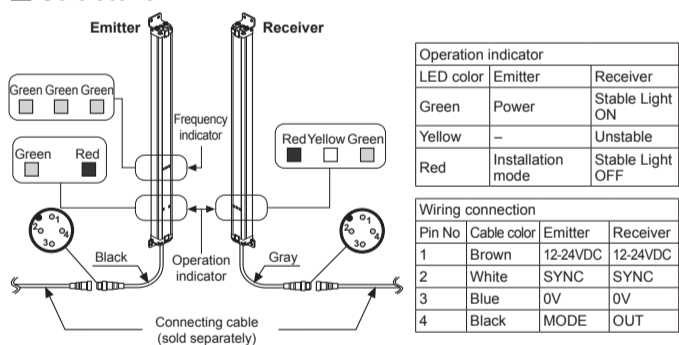
Caution

- 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.
- Do not use a load over the range of rated relay specification.**
Failure to follow this instruction may result in insulation failure, contact melt, contact failure, relay broken, or fire.

Ordering Information

BWC	40	-	14	H
Operation mode	H	Light ON	HD	Dark ON
Number of optical axes	Number	4 to 20pcs		
Optical axis pitch	40	40mm pitch	80	80mm pitch
Item	BWC	Area sensor		

Structure



Connection Cable(sold separately)

Type	Model	L	Cable color
For emitter	CID4-3T	3m	Black
	CID4-5T	5m	
	CID4-7T	7m	
	CID4-10T	10m	
For receiver	CID4-3R	3m	Gray
	CID4-5R	5m	
	CID4-7R	7m	
	CID4-10R	10m	

Function

○ Interference Protection Function
You can change transmitted light frequency to prevent interference from several units.
To change transmitted light frequency, input 0V to 4th terminal (Black) MODE (for over 1 sec) during normal operation.
Frequency type is displayed by frequency indicator.

Installation Mode Function

This function is for stable installation.
To enter installation mode, supply power with inputting 0V to 4th terminal (Black) MODE.

Self-Diagnosis Function

If there is checked malfunction during normal operation by regular self-diagnosis, control output turns OFF and operation indicator displays the state. (Refer to 'Indicator Display'.)

Diagnosis item

- ① Break of light emitting element
- ② Break of emitter
- ③ Break of adjacent emitting element more than 2ea.
- ④ Break of receiver
- ⑤ Emitter failure
- ⑥ Malfunction of synchronous cable

※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).