Cross-beam Area Sensor

NEW

▣ Features

- 3-point cross-beam netting method minimizes non-sensing area and increases sensing ability
- Long sensing distance 7m
- 7 models of number of optical axies (4 to 20EA) and optical axis pitch(40,80mm), sensing height(120 to 1,040mm)
- Easy installation by installation mode function
- Built-in interference protection, self-diagnosis function
- High luminance indicators for emitter and receiver to check the status at side, front, and long distance
- Protection structure IP65(IEC structure)



⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

▣ Applications

Screen door for subway platform and dangerous industry environment

▣ Ordering information

BWC **40** – **14** **H**

Operation mode	H	Light ON
	HD	Dark ON
Number of optical axes	Number	4 to 20EA
Optical axis pitch	40	40mm pitch
	80	80mm pitch
Item	BWC	Cross-beam area sensor

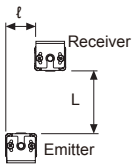
▣ Specifications

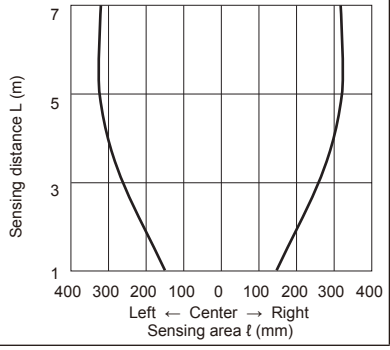
Model		BWC40-□□H	BWC40-□□HD	BWC80-14H	BWC80-14HD
Sensing type		Through-beam type			
Sensing distance		1.0 to 7.0m			
Sensing target		Opaque material of min. Ø50mm		Opaque material of min. Ø90mm	
Optical axis pitch		40mm		80mm	
Number of optical axes		4/10/12/16/18/20EA		14EA	
Sensing height		120 to 760mm		1,040mm	
Beam pattern		3-point cross-beam netting type			
Power supply		12-24VDC ±10%(ripple P-P : max. 10%)			
Reverse polarity protection		Built-in			
Current consumption		Max. 100mA			
Control output		NPN open collector output •Load voltage: max. 30VDC, •Load current: Max. 100mA, •Residual voltage: Max. 1V			
	Operation mode	Light ON	Dark ON	Light ON	Dark ON
	Short-circuit protection	Built-in			
	Response	Max. 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 (received light side illumination)			
	Ambient temperature	-10 to 55℃, storage: -20 to 60℃			
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH			
Protection		IP65(IEC standard)			
Noise resistance		±240V the square wave noise (pulse width: 1μs) by the noise simulation			
Dielectric strength		1,000VAC 50/60Hz for 1 min.			
Insulation resistance		Min. 20MΩ (at 500VDC megger)			
Vibration		1.5mm amplitude or 300m/s^2 at frequency of 10 to 55Hz(for 1 min.) in each of X, Y, Z directions for 2 hour			
Shock		500m/s^2 (approx. 50G) in each of X, Y, Z directions for 3 times			
Material		Case: Aluminum, Sensing part and indicator: Acrylic			
Cable		Ø5, 4-core, length: 300mm, M12 connector			
Accessory		Bracket A : 4EA, Bracket B : 4EA, Fixing bolt: 8EA			
Approval		CE			
Unit weight		Approx. 1.7kg (based on BWC80-14H)			

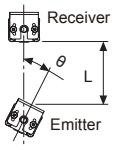
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.

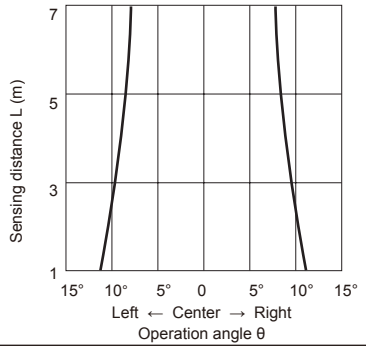
■ Feature data

Parallel shifting characteristic		Angle characteristic	
Measuring method	Data	Measuring method	Data







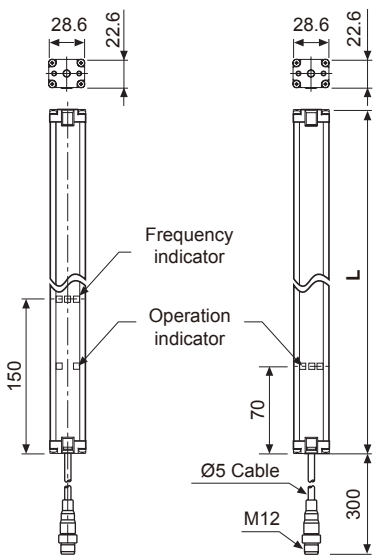


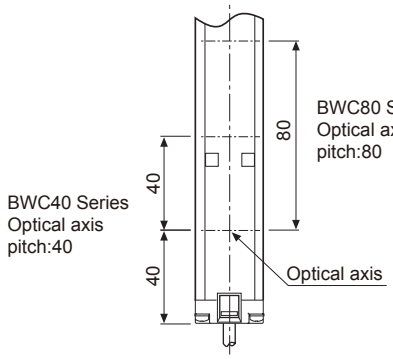
■ Dimensions

(unit : mm)

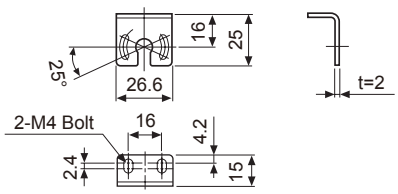
Model	**L**(mm)
BWC40-04H/HD	180mm
BWC40-10H/HD	420mm
BWC40-12H/HD	500mm
BWC40-16H/HD	660mm
BWC40-18H/HD	740mm
BWC40-20H/HD	820mm
BWC80-14H/HD	1140mm

< Emitter > **< Receiver >**

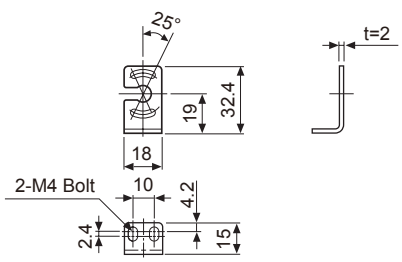




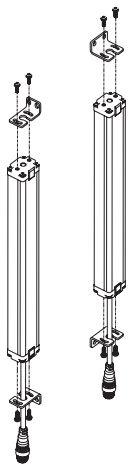
● Bracket A



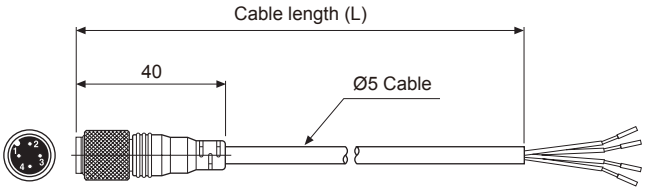
●Bracket B



● Mounting brackets



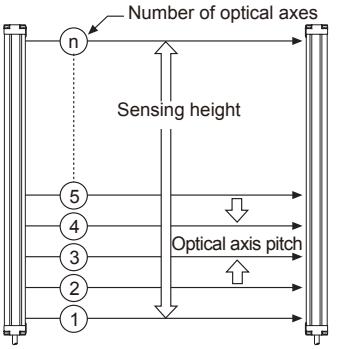
■ Connection cable(sold separately)



※Connection cable is sold separately as one set; each of emitter's and receiver's.

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	

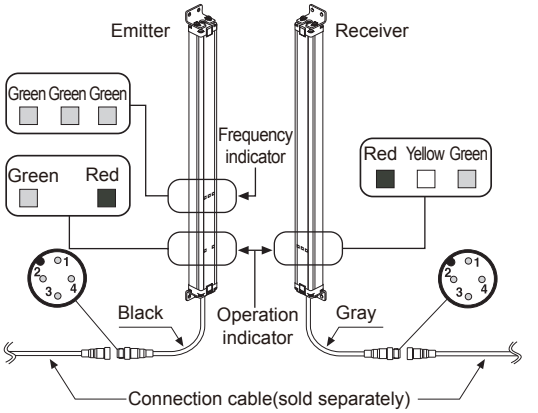
■ Optical axis pitch/Number of optical axes/Sensing height



Model	Optical axis pitch
BWC40-□H/HD	40mm
BWC80-□H/HD	80mm

Model	No. of optical axes	Sensing height
BWC40-04H/HD	4EA	120mm
BWC40-10H/HD	10EA	360mm
BWC40-12H/HD	12EA	440mm
BWC40-16H/HD	16EA	600mm
BWC40-18H/HD	18EA	680mm
BWC40-20H/HD	20EA	760mm
BWC80-14H/HD	14EA	1,040mm

■ Structure



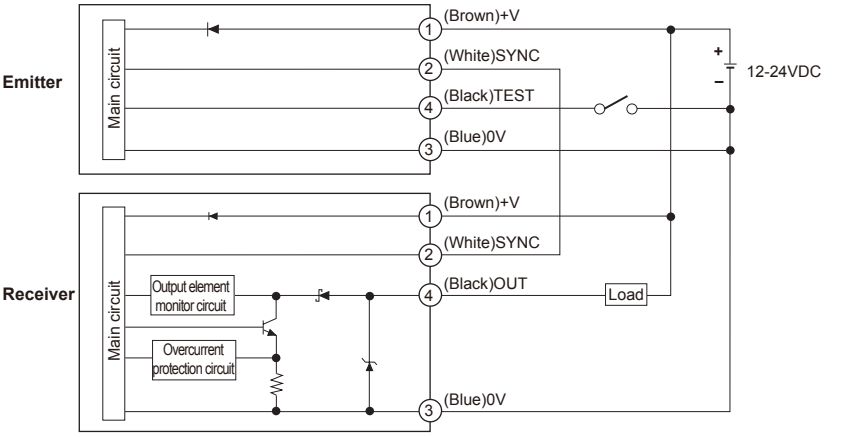
< Operation indicator>

LED color	Emitter	Receiver
Green	Power	Stable light ON
Yellow	—	Unstable area
Red	Installation mode	Stable light OFF

<Wiring connection>

Pin No	Cable color	Emitter	Receiver
1	Brown	12-24VDC	12-24VDC
2	White	Sync	Sync
3	Blue	0V	0V
4	Black	Mode	OUT

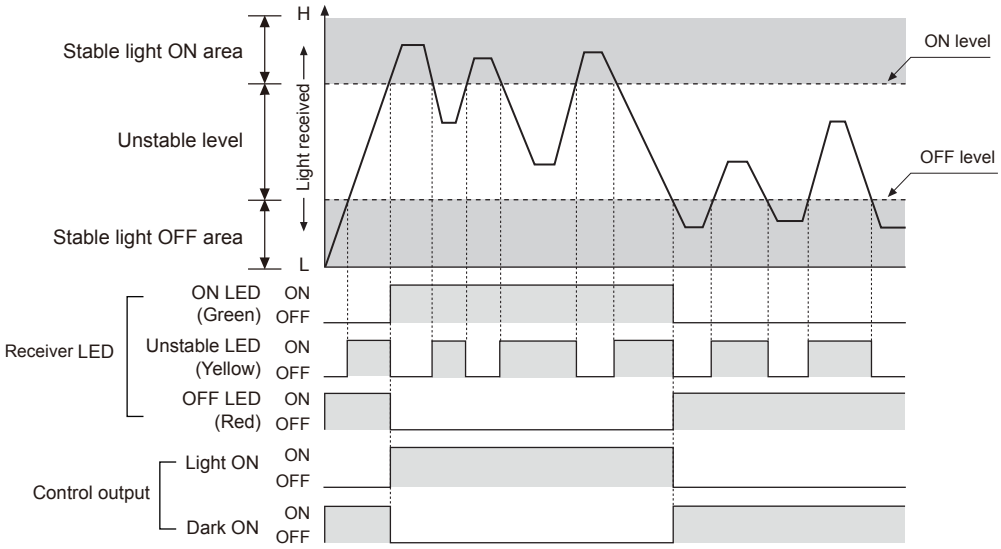
■ Control output circuit



■ Operation mode

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

■ Operation timing diagram



■ Functions

◎ Interference protection

You can change transmitted light frequency to prevent interference from several units.
To change transmitted light frequency, input 0V to no. 4 terminal (black) MODE (for over 1 sec.) of Emitter during normal operation.
Frequency type is displayed by the frequency indicator.

☼ : ON, ● : OFF

Transmitted light frequency	Frequency indicator		
	Green 1	Green 2	Green 3
Frequency A	☼	●	●
Frequency B	●	☼	●
Frequency C	●	●	☼
Frequency D	☼	●	☼
Frequency E	☼	☼	☼

◎ Installation mode

This function is for stable installation.
To enter installation mode, supply the power with inputting 0V to no. 4 terminal (black) MODE of Emitter.

☼ : ON, ● : OFF, ◑ : Flash

Item	Emitter		Receiver			Control output
	Green	Red	Green	Yellow	Red	
Normal installation	●	◑	☼	●	◑	OFF
Hysterisis section	●	◑	●	☼	◑	OFF
Abnormal installation	●	◑	●	●	◑	OFF

◎ Self-diagnosis

If there is malfunction during normal operation by regular self-diagnosis, control output turns OFF and operation indicator displays the state.

●Diagnosis items

① Break of light emitting element
② Break of Emitter
③ Break of adjacent emitting elements more than 2EA
④ Break of receiver
⑤ Emitter failure
⑥ Malfunction of synchronous cable

※ For more information about operation indication display, refer to "■ **Operation indicator DISPLAY**" at C-20 page.

■ Installation

For the first installation, enter installation mode.

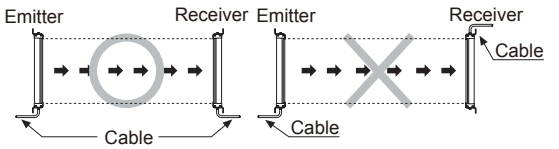
① Entry method for installation mode: Supply the power with inputting 0V to no. 4 terminal (black) MODE of Emitter.

② After entering installation mode, install the unit at the position where green LED of receiver operation indicator turns ON.

③ After installation, re-supply the power to the unit.

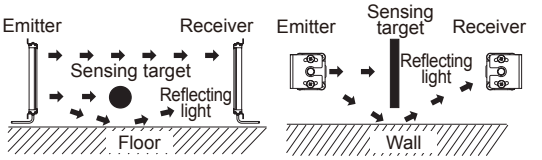
◎ For direction of installation

Emitter·Receiver should be installed in same up/down direction.



◎ For reflection from the surface of wall/flat

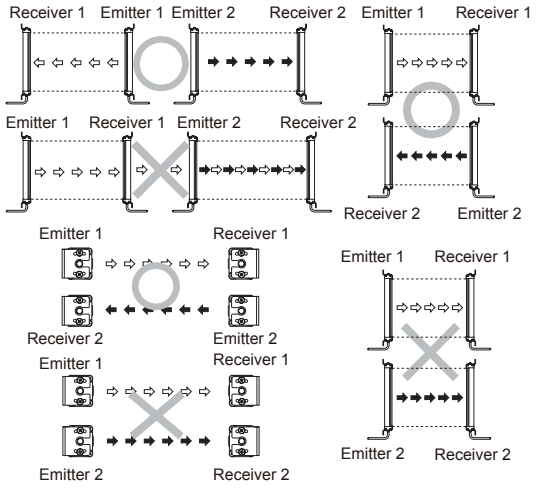
When installing it as below, the light reflected from the surface of wall and flat is not shaded. Please check whether it operates normally or not with a sensing target before using. (interval distance: min. 0.5m)



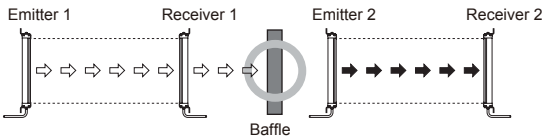
◎ For protection of interference

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 interference protection function

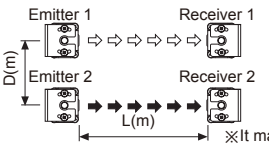
< Transmission direction should be opposite between 2 sets >



< Baffle should be installed between 2 sets>



<It should be installed out of the interference distance>



Sensing distance(L)	Installation allowable distance(D)
0.1 to 3m	Over 0.4m
Over 3m	L×tan8°=L×0.14

※It may be different by installation environment.

■ Operation indicator DISPLAY

Item	Emitter		Receiver				
	Indicator		Indicator			Control output	
	Green	Red	Green	Yellow	Red	Light ON	Dark ON
Power supply	☼	●	—	—	—	—	—
Break of emitter	◑◑	◐◐	—	—	—	—	—
Break of light emitting element	◑	◑	◐	◑	◑	OFF	ON
Break of adjacent emitting elements more than 2EA	◑	◑	◑	◑	◑	OFF	ON
Stable light ON	—	—	☼	●	●	ON	OFF
Unstable light ON	—	—	☼	☼	●	ON	OFF
Unstable light OFF	—	—	●	☼	☼	OFF	ON
Stable light OFF	—	—	●	●	☼	OFF	ON
Break of receiver	—	—	◑◑	●	◐◐	OFF	ON
Control output over current	—	—	◑	◐	☼	OFF	ON
Synchronous line malfunction	—	—	◑	●	◑	OFF	ON
Emitter failure (time out)	—	—	◑	◑	◑	OFF	ON

Indicators	
☼	Lighting
●	Light out
◑	Flashing by 0.5 sec.
◑ ◑ or ◑ ◑ ◑	Flashing simultaneously by 0.5 sec.
◑ ◐	Cross-flashing by 0.5 sec.
◑ ◑ ◑	Cross-flashing by 0.5 sec.

■ Troubleshooting

Malfunction	Causes	Troubleshooting
Non-operation	Power supply	Supply the rated power.
	Cable incorrect connection or disconnection	Check the wiring connection.
	Out of rated sensing distance	Use it within rated sensing distance.
Non-operation in sometimes	Pollution by dirt of sensor cover	Remove dirt by soft brush or cloth.
	Connector connection failure	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	Use it within the rated sensing distance.
	There is an obstacle to cut off the emitted light between emitter and receiver	Remove the obstacle.
	There is strong electric wave or noise generator such as motor, electric generator, or high voltage line, etc.	Separate the strong electric wave or noise generator.
Operation indicator displays break of emitter	Break of emitter	Contact our service center.
Operation indicator displays break of receiver	Break of receiver	
Operation indicator displays break of light emitting elements	Break of light emitting element	
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.	Check the wiring connection.
	Over load	Check the rated load capacity.