Area sensor

▣Features

- ●Long detecting distance up to 7M
- ●22 types of products
  (Beam pitch : 20/40mm, Sensing height : 120~940mm)
- ●Increased detection stability by minimizing the non sensing area
- ●Easy identification of the side, front and long distance by the indicator of high illumination, TWIN motions
- ●Self failure diagnosis function incorporated
- ●Polished design & minimum size(W28.6×T22.6×H□)
- ●IP65 protecting structure

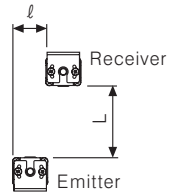
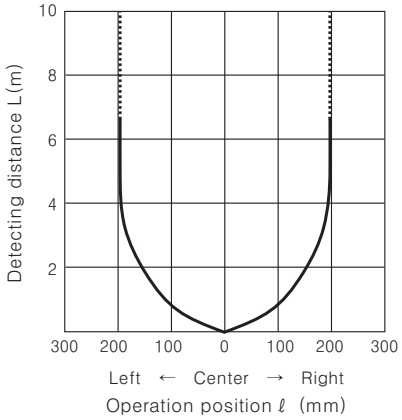
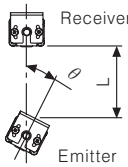
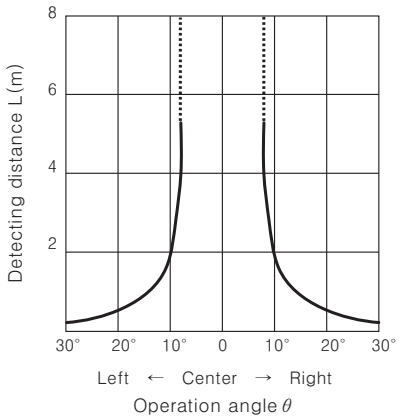
⚠ **Please read "Caution for your safety" in operation manual before using.**

CE

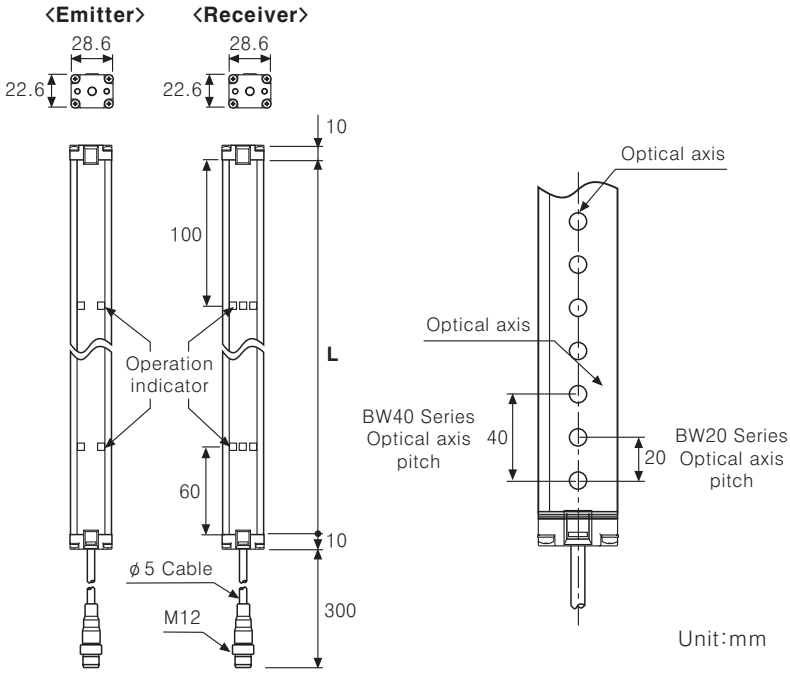
▣Specifications

Model											
	NPN open collector output (Standard type)	**BW20-08**	**BW20-20**	**BW20-32**	**BW20-44**	**BW40-04**	**BW40-10**	**BW40-16**	**BW40-22**		
		BW20-12	**BW20-24**	**BW20-36**	**BW20-48**	**BW40-06**	**BW40-12**	**BW40-18**	**BW40-24**		
		BW20-16	**BW20-28**	**BW20-40**		**BW40-08**	**BW40-14**	**BW40-20**			
	PNP open collector output	**BW20-08P**	**BW20-20P**	**BW20-32P**	**BW20-44P**	**BW40-04P**	**BW40-10P**	**BW40-16P**	**BW40-22P**		
		BW20-12P	**BW20-24P**	**BW20-36P**	**BW20-48P**	**BW40-06P**	**BW40-12P**	**BW40-18P**	**BW40-24P**		
		BW20-16P	**BW20-28P**	**BW20-40P**		**BW40-08P**	**BW40-14P**	**BW40-20P**			
Detecting type		Through-beam type									
Detecting distance		0.1 ~ 7m									
Detecting target		Opaque materials of min. ϕ30mm				Opaque materials of min. ϕ50mm					
Optical axis pitch		20mm				40mm					
Number of optical axes		8~48pcs				4~24pcs					
Detecting width		140~940mm				120~920mm					
Pointing angle		Within ±5° (At over 3m detecting distance)									
Power supply		12-24VDC ±10%(Ripple P-P:Max. 10%)									
Protection circuit		Reverse polarity protection									
Current consumption		Emitter : Max. 80mA, Receiver : Max. 80mA									
Control output		• NPN open collector output ☞ Load voltage:Max. 30VDC, Load current:Max. 100mA, Residual voltage:Max. 1VDC • PNP open collector output ☞ Load current:Max. 100mA, Output voltage:Min.(Power supply-2.5)VDC									
Operation mode		Light ON only									
Short-circuit protection		Built-in									
Response time		Min. 12ms									
Light source		Infrared LED(850nm modulated)									
Synchronization type		Timing method by synchronous line									
Self-diagnosis		Ambient light monitoring, Emitter/Receiver light circuit monitoring, Output circuit monitoring									
Interference protection		Interference protection by master/slave function									
Ambient temperature		-10 ~ +55℃(at non-freezing status)									
Storage temperature		-20 ~ +60℃									
Ambient humidity		35 ~ 85%RH									
Storage humidity		35 ~ 85%RH									
Ambient illumination		Sunlight : Max. 11,000ℓx, Incandescent lamp : Max. 3,000ℓx									
Noise strength		The square wave noise by the noise simulator(Voltage:±240V, Period:10ms, Pulse width:1㎲)									
Dielectric strength		1,000VAC 50/60Hz for 1minute									
Insulation resistance		Min. 20MΩ(500VDC)									
Vibration		1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours									
Shock		500m/s² (50G) in X, Y, Z directions for 3 times									
Protection		IP65(IEC standard)									
Material		• Body : Aluminum • Cover, Rens : Acril									
Accessory		Bracket A : 4EA, Bracket B : 4EA, Bolt : 8EA									
Net weight		Approx. 1.4kg(For 48 optical axis)									

▣Characteristic data

Parallel shifting characteristic		Angle characteristic	
Measuring method	Data	Measuring method	Data
			

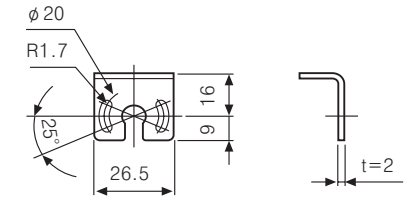
▣Dimensions

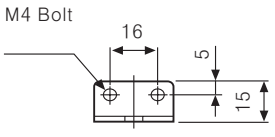


Unit:mm

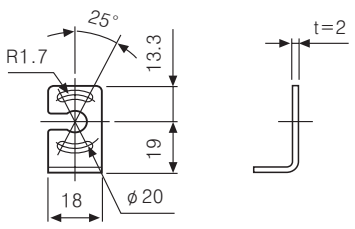
Model	L(mm)	Model	L(mm)
BW20-08(P)	160mm	BW20-32(P)	640mm
BW40-04(P)		BW40-16(P)	
BW20-12(P)	240mm	BW20-36(P)	720mm
BW40-06(P)		BW40-18(P)	
BW20-16(P)	320mm	BW20-40(P)	800mm
BW40-08(P)		BW40-20(P)	
BW20-20(P)	400mm	BW20-44(P)	880mm
BW40-10(P)		BW40-22(P)	
BW20-24(P)	480mm	BW20-48(P)	960mm
BW40-12(P)		BW40-24(P)	
BW20-28(P)	560mm		
BW40-14(P)			

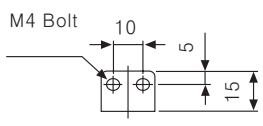
●Bracket A





●Bracket B

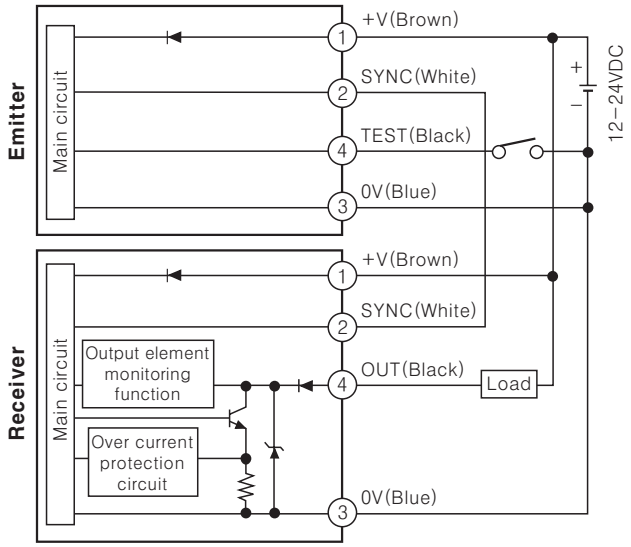




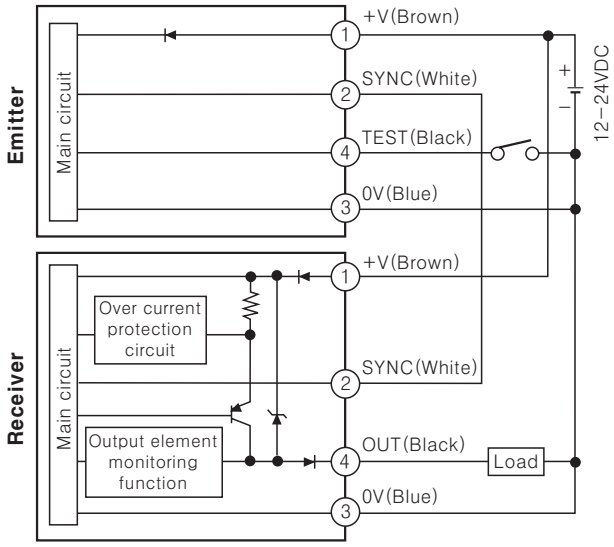
Unit:mm

▣Input/Output circuit and connection diagram

●NPN open collector output type

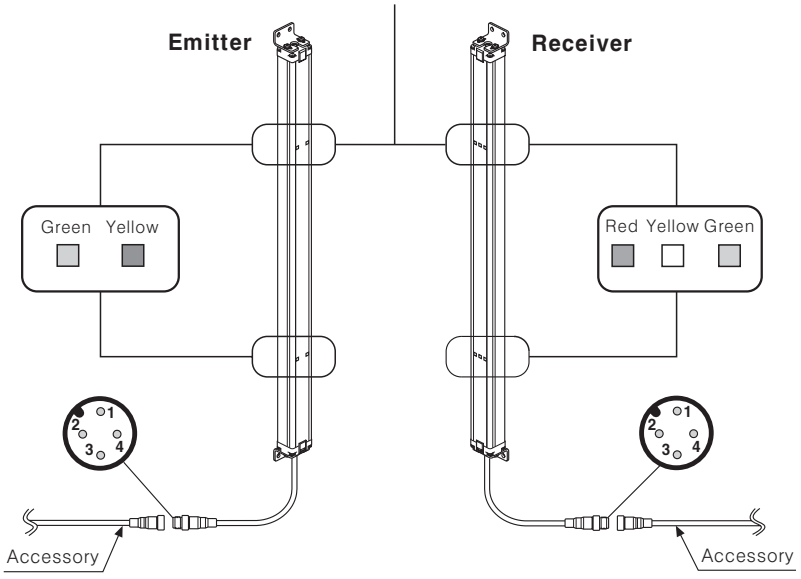


●PNP open collector output type



▣Structure

Upper operation indicator is set additionally in case the number of the optical axes is more than 24pcs in BW20-Series and more than 12pcs in BW40-Series.



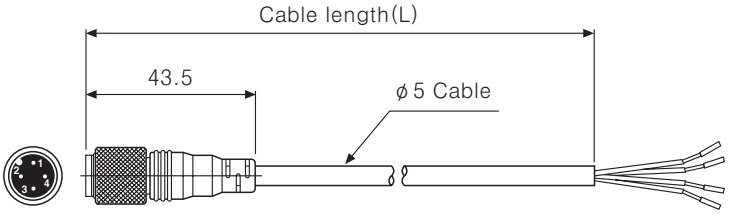
〈Operation indicator〉

LED color	Emitter	Receiver
Green	POWER	ON
Yellow	TEST(M/S)	UNSTABLE
Red	———	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	TEST(M/S)	OUT

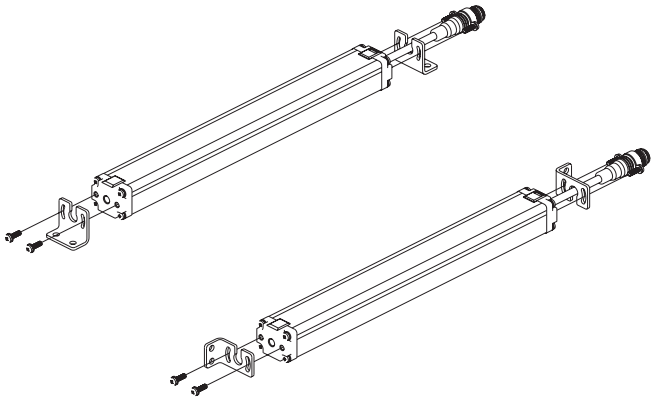
▣Connecting cable(Option)



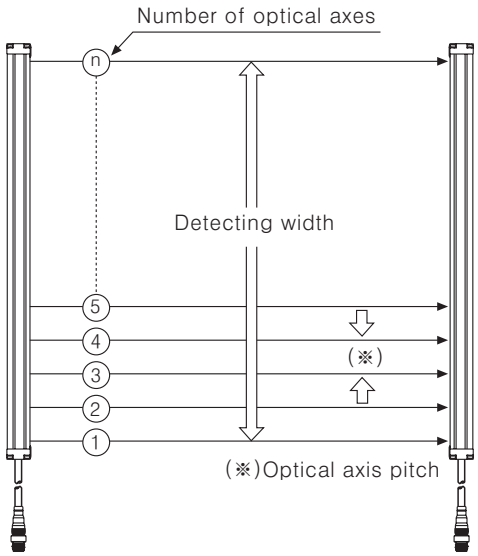
Model	Cable length(L)	Connector color
CID4-3-T CID4-3-R	3m	Emitter(T) : BLACK Receiver(R) : GRAY
CID4-5-T CID4-5-R	5m	
CID4-7-T CID4-7-R	7m	
CID4-10-T CID4-10-R	10m	

※Connecting cable is packed separately.

▣Bracket mounting



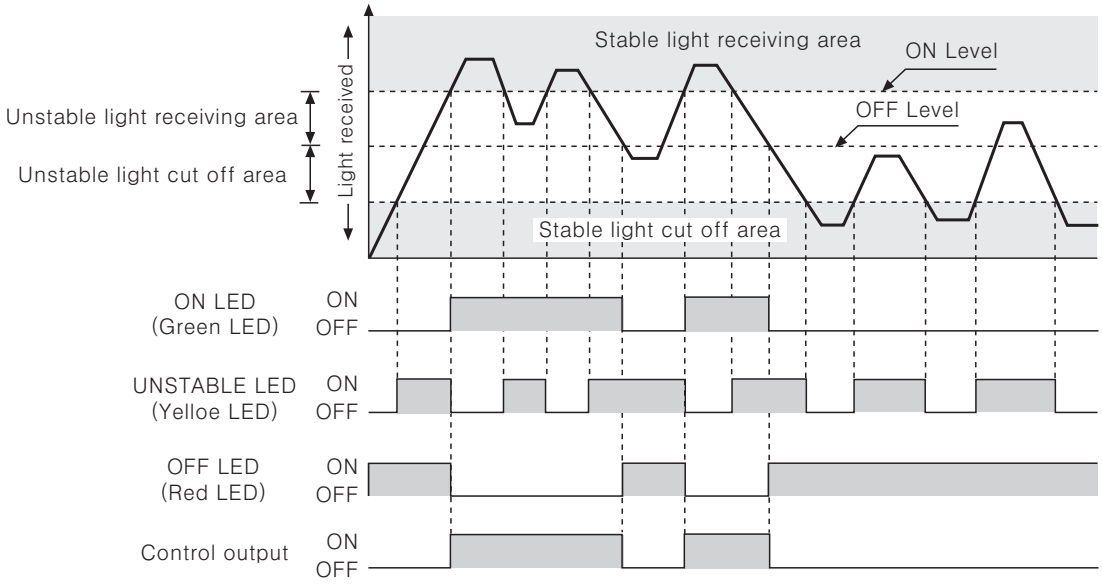
▣Optical axis pitch/Number of optical axes/Detecting width



Model	Optical axis pitch
BW20-□□(P)	20mm
BW40-□□(P)	40mm

Model	Number of optical axes	Detecting width	Model	Number of optical axes	Detecting width
BW20-08(P)	8	140mm	BW40-04(P)	4	120mm
BW20-12(P)	12	220mm	BW40-06(P)	6	200mm
BW20-16(P)	16	300mm	BW40-08(P)	8	280mm
BW20-20(P)	20	380mm	BW40-10(P)	10	360mm
BW20-24(P)	24	460mm	BW40-12(P)	12	440mm
BW20-28(P)	28	540mm	BW40-14(P)	14	520mm
BW20-32(P)	32	620mm	BW40-16(P)	16	600mm
BW20-36(P)	36	700mm	BW40-18(P)	18	680mm
BW20-40(P)	40	780mm	BW40-20(P)	20	760mm
BW20-44(P)	44	860mm	BW40-22(P)	22	840mm
BW20-48(P)	48	940mm	BW40-24(P)	24	920mm

▣Operating mode

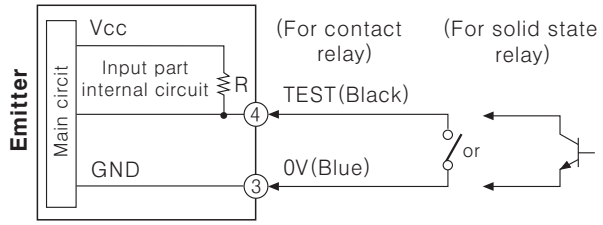


▣Function

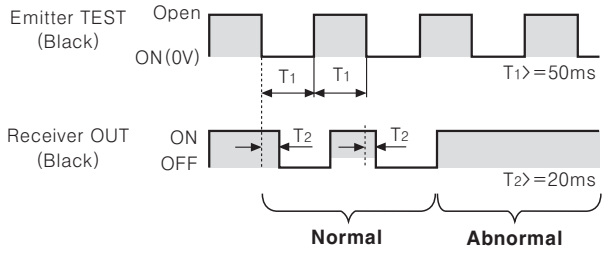
◎Light emitted stop function(External diagnosis function)

Light emitted will be stopped and yellow LED is flickered if supplying 0V to test input on the emitter. It is for checking malfunction of the sensors during TEST input on the emitter is 0V. (Control output of the receiver is OFF as it becomes light cut off when the light emitted is stopped)

●Connections for TEST input



●Control output pulse by TEST input



◎Self-diagnosis function

Control output will be OFF and operating indicator is ON when malfunction is checked by self-diagnosis regularly in normal operation.

●Diagnosis items

- Emitter : ①Break of light emitting element
  ②Break of light emitting circuit
  ③Malfunction of MASTER/SLAVE line(Operation in MASTER)
- Receiver : ①Break of light receiving circuit
  ②Break of output circuit
  ③Over current at output part
  ④Synchronous line malfunction
  ⑤Ambient light received

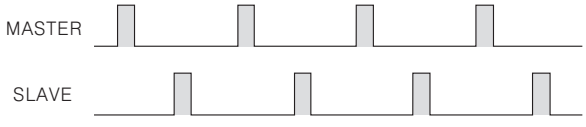
●See J-80Page, "▣Operation indicator" for the display operation of diagnosis.

◎Interference protection function

In case of using 2pcs of sensor in parallel in order to extend detecting width the detection will be failure because as light interference.

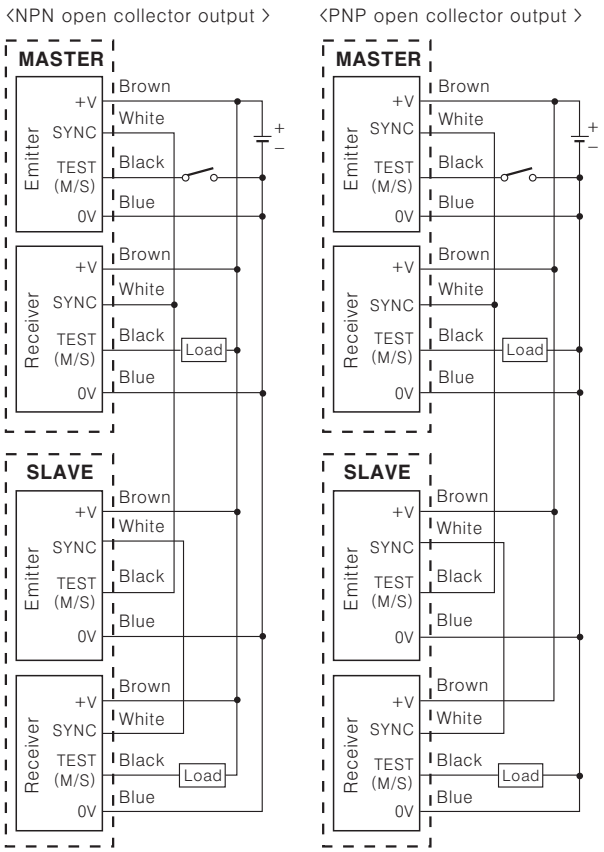
This function is to avoid the light interference as operating a sensor in MASTER and another sensor in SLAVE to protect these kinds of failures.

●Time chart for MASTER/SLAVE light emitting pulse



●MASTER/SLAVE connections

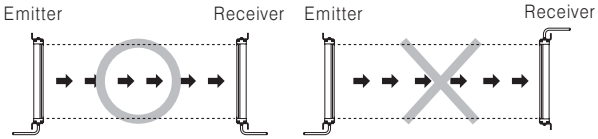
<NPN open collector output> <PNP open collector output>



▣Installation

◎For direction of installation

Emitter and receiver should be installed in same up/down
direction.

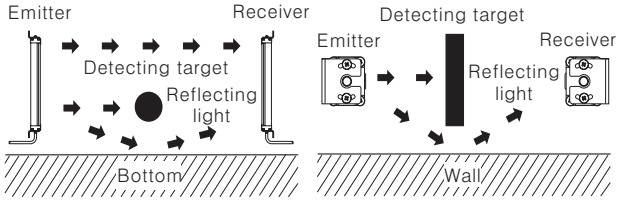


◎For reflection from the surface of wall and flat

When installed as below the light reflected from the surface of wall and flat will not cut off.

Please, check whether it operates normally or not with a detecting target before using.

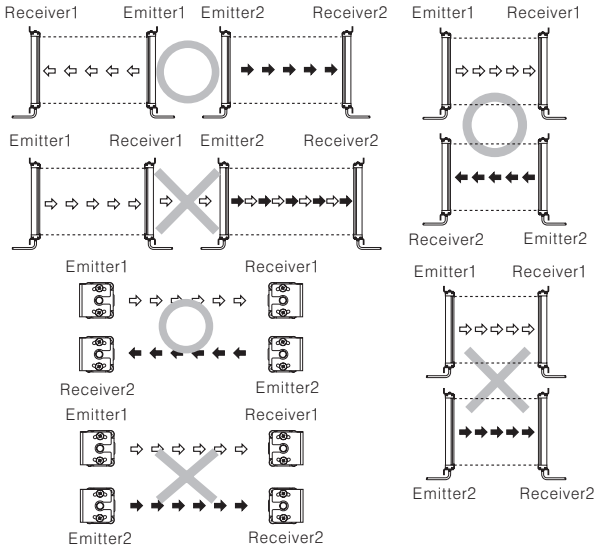
(Interval distance : Min. 0.5m)



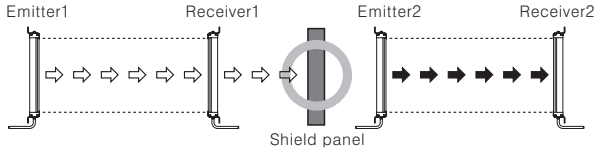
◎For protection of interference

It may cause interference when installing more than 2sets of the sensor. In order to avoid the interference of the sensor please install as following figures and use the interference protection function.

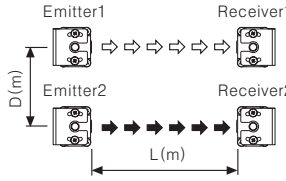
〈Light emitting direction should be opposite between 2 sets〉



〈Shield panel should be installed between 2 sets〉



〈It should be installed out of the installation allowable distance〉



Detecting distance(L)	Installation allowable distance(D)
0.1~3m	Min. 0.4m
Min. 3m	L×tan8°=L×0.14 min.

※It may be a little different based on installation environment.

▣Operation indicator

Item	Emitter		Receiver			
	Indicator		Indicator			Control output
	Green	Yellow	Green	Yellow	Red	
Power supply	☼	●	—	—	—	—
MASTER operation	☼	●	—	—	—	—
SLAVE operation	☼	☼	—	—	—	—
Test input	☼	◑	—	—	—	—
Break of light emitting element	▶	◀	—	—	—	OFF
Break of light emitting circuit	◑	◑	—	—	—	OFF
Stable light received	—	—	☼	●	●	ON
Unstable light received	—	—	☼	☼	●	ON
Unstable light cut off	—	—	●	☼	☼	OFF
Stable light cut off	—	—	●	●	☼	OFF
Break of light receiving circuit	—	—	●	▶	◀	OFF
Break of output element	—	—	▶	◀	●	OFF
Synchronous line malfunction	—	—	▶	●	◀	OFF
Over current	—	—	◑	◑	◑	OFF
Ambient light received	—	—	●	◑	◑	OFF
Emitter failure	—	—	▶	▶	▶	OFF

Display classification list	
☼	Light ON
●	Light OFF
◑	Flickering by 0.5 sec.
◑ ◑ or ◑ ◑ ◑	Flickering simultaneously by 0.5 sec.
▶ ◀	Cross-Flickering by 0.5 sec.
▶ ▶ ▶	Sequence-Flickering by 0.5 sec.

▣Inspection/Treatment for malfunction

Malfunction	Caution	Treatment
Non-operation	Power	Supply rated power
	Cut-off line, wiring failure	Check the wiring
	Rated connection failure	Use within rated detecting 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 rated detecting distance	Use within rated detecting distance
	There is an obstacle to cut off the light emitted between emitter and receiver	Remove the obstacle
	There is a strong electric wave or noise generator such as motor, electric generator, high voltage line etc.)	Put away the strong electric wave or noise generator.
Break of light emitting element LED displayed	Break of light emitting element	Contact our company
Break of light emitting circuit LED displayed	Break of light emitting circuit	
Break of light receiving element LED displayed	Break of light receiving element	
Break of output element LED displayed	Break of output element	
Synchronous line malfunction LED displayed	Synchronous line connection failure or cut off	Check the wiring
	Break of synchronous circuit of emitter or receiver	Contact our company
Over current LED displayed	Control output line shorted	Check the wiring
	Over load	Check the rated load capacity
Ambient light receiving LED displayed	Ambient light received to receiver	Remove the ambient light
Emitter malfunction LED displayed	Emitter malfunction	Treat after checking the emitter display LED