

Photo sensor
PAN series

INSTRUCTION MANUAL

We appreciate you for purchasing HanYoung NUX Co.,Ltd product. Before using the product you have purchased, check to make sure that it is exactly what you ordered. Then, please use it following the instructions below.

MAIN PRODUCTS

- DIGITAL : Temperature Controller, Counter, Timer, Speedmeter, Tachometer, Panel Meter, Recorder
- SENSOR : Proximity Sensor/Photo Electric Sensor, Rotary Encoder, Optical Fiber Sensor, Pressure Sensor
- ANALOG : Timer, Temperature Controller

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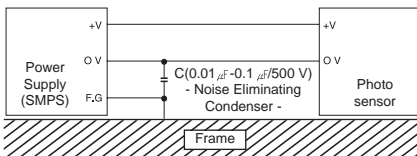
■ Safety Information

⚠ WARNING

- To prevent electric shock or malfunction of product, do not supply the power until the wiring is completed.
- Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.
- Reassemble this product while the power is OFF. Otherwise, it may be a cause of malfunction or electric shock.
- Due to the danger of electric shock, use this product installed onto a panel while an electric current is applied.

⚠ CAUTION

- The contents of this manual may be changed without prior notification.
- If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric shock or fire.
- Make sure that there is no damage or abnormality of the product during delivery.
- Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.
- Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.
- When the product gets wet, the inspection is essential because there is a danger of electric leakage or fire.
- Do not connect anything to the unused terminals.
- After checking the polarity of terminal, connect wires at the correct position.
- For the continuous and safe use of this product, the periodical maintenance is recommended.
- Make its wiring be shorter as possible and wire extension shall be within 100 m.
- Avoid continuously switching the power source On and Off.
- Use a dry cloth to wipe off the substance when cleaning the lens or cases. Never use thinner or organic solvents.
- Do not use this product at any place with much dust, vibration or impact.
- Before inserting power source, make sure that the circuit wiring is properly connected.
- In the case of wiring loaded inductors such as DC Relay and others to output, use diode, varistor and others to prevent surge.
- To avoid malfunction caused by noise, do not put high voltage or power line with sensor wire in a same conduit
- Prevent strong disturbance light such as sunlight and others which directly enter into the directional angle of the sensor by putting a glare shield.
- When using the Switching Power Supply as the power source, earth the Frame Ground (F.G) terminal and be sure to connect the noise-eliminating condenser between 0 V and F.G.



※ If you do not follow the contents described in the safety information then it is possible to be a cause of the product's malfunction so please follow them.

- Each series of [Wide Sensor] isn't a press-safe sensor.
- This product is not equipped with built-in control functions such as disaster prevention or accident prevention functions within the product.
- Please note that the company will not take responsibility for compensation for damages resulting from disasters or accidents on equipments that use this product.

■ Special Features

- Attains detection of the minimum cross section (10 nm) of below the minimum of 17 ∅ and detection of long distance (7 m) with the exclusive IC use (20/40 mm)
- Attains the minimum optical axis pitch of 10mm and the maximum optical axis number of 96 optical axis

- Provides various detection areas with the detection width of 140mm ~ 940 mm
- Mutual Interference Prevention Function for parallel installation (up to 2 sets)
- Allows users to set up in accordance with purposes by providing two types (A/O) of motion mode
- Verification, maintenance, repair and break down detection are easily done through motion indicator and error indicator.

■ Ordering Information

MODEL	Suffix Code	Description
PAN -	□ □ □ □ □	Photo Area Aluminum Type
Optical axis pitch	20	ex) 20 - 20 mm
Detection	T	Trough Beam
Number of optical axes	16	ex) 16 -16 axes
OUTPUT	N	NPN output type
	P	PNP output type

■ Ratings

TYPE	PAN10-N	PAN20-N	PAN40-N
	PAN10-P	PAN20-P	PAN40-P
Detection	Through-Beam		
Range	2 m	7 m	
Detectable object	opaque object above ∅17 mm	opaque object above ∅32 mm	opaque object above ∅52 mm
Optical axis pitch	10 mm	20 mm	40 mm
Power Supply	12 ~ 24 V DC ±10 % (Ripple P-P : Max. ±10 %)		
Current Consumption	Below 220 mA	Below 170 mA	Below 100 mA
Control Output	NPN Open Collector Output (Loaded Voltage : Below 30 V DC, Loaded Current : Below 100 mA, Residual Voltage : Below 1 V)		
	PNP Open Collector Output (Output Voltage (Power Voltage-Above 2.5 V), Loaded Current : Below 100 mA)		
Operation Mode	Transmitter - M/S MODE Conversion(Master & Slave MODE)		
	Receiver - A MODE : Output ON when all axes has been receiving light O MODE : Output ON when One or more axis has been receiving light		
Response Time	Below 30 ms	Below 15 ms	Below 7 ms
Light source of Emitter	Infrared LED (wave 860 mm)		Infrared LED (wave 950 mm)
	Trns: Power indicator-Green LED, M/S indicator-Red LED Rcvr: Stable light receiving indicator- Green LED, LED Indicator - Red LED, E1 indicator - Red LED, E2 indicator - Blue LED		
Material	CASE : Alum, Front Cover : Acrylic, Lens : Acrylic		
Operation S/W	Trns : M/S Operation conversion S/W, Rcvr : A/O Operation conversion S/W		
Protection	Interference protection (M/S MODE), Output protection		
Ambient light	Sun lights : Below 10,000 lx		
Ambient temperature	During operation : -10 ~ 55 °C (NO icing)		
Ambient humidity	Below 35 ~85 % RH		
Vibration	10 ~ 55 Hz, Double amplitude:1.5 mm, in each direction of X·Y·Z for 2 HR.		
Case protection	IP66		
Dielectric Strength	1000 V AC (for 1 minute between current carry part and case)		
Connect Method	Connector Code type (Code Length : 200 mm, Using Code : 0.5 mm ² × 4P, Apocrypha : ∅5.5 Connector Part)		

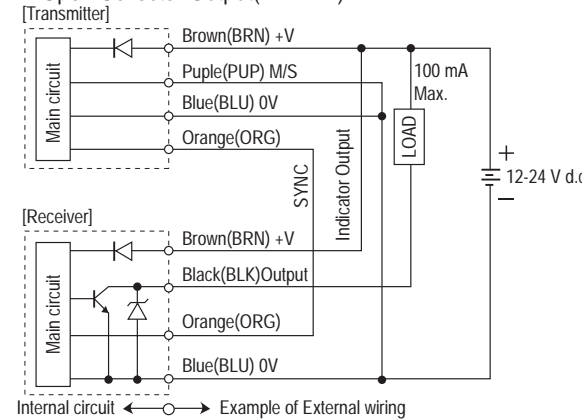
- Please take precautions since the detection distance can vary depending on the size and surface condition of the detected object and the presence of gloss.
- PAN20-TL8 (light projector) and PAN20-TR8N (Receiver) comprise one set of PAN20-T8N.

■ Production formation

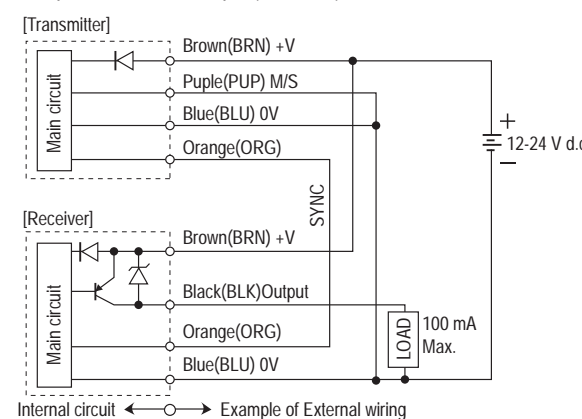
Series	MODEL	Detection Distance	Sensing optical axes	Detecting	Current consumption(Max mA)	Detectable object
PAN10	PAN10-T16	2 m	16 EA	150 mm	90 mA	opaque object above ∅17 mm
	PAN10-T24		24 EA	230 mm	103 mA	
	PAN10-T32		32 EA	310 mm	116 mA	
	PAN10-T40		40 EA	390 mm	129 mA	
	PAN10-T48		48 EA	470 mm	142 mA	
	PAN10-T56		56 EA	550 mm	155 mA	
	PAN10-T64		64 EA	630 mm	168 mA	
	PAN10-T72		72 EA	710 mm	181 mA	
	PAN10-T80		80 EA	790 mm	194 mA	
	PAN10-T88		88 EA	870 mm	207 mA	
PAN10-T96	96 EA	950 mm	220 mA			
PAN20	PAN20-T8	Trough Beam	8 EA	140 mm	70 mA	opaque object above ∅32 mm
	PAN20-T12		12 EA	220 mm	80 mA	
	PAN20-T16		16 EA	300 mm	90 mA	
	PAN20-T20		20 EA	380 mm	100 mA	
	PAN20-T24		24 EA	460 mm	110 mA	
	PAN20-T28		28 EA	540 mm	120 mA	
	PAN20-T32		32 EA	620 mm	130 mA	
	PAN20-T36		36 EA	700 mm	140 mA	
	PAN20-T40		40 EA	780 mm	150 mA	
	PAN20-T44		44 EA	860 mm	160 mA	
PAN20-T48	48 EA	940 mm	170 mA			
PAN40	PAN40-T4	7 m	4 EA	120 mm	50 mA	opaque object above ∅52 mm
	PAN40-T6		6 EA	200 mm	55 mA	
	PAN40-T8		8 EA	280 mm	60 mA	
	PAN40-T10		10 EA	360 mm	65 mA	
	PAN40-T12		12 EA	440 mm	70 mA	
	PAN40-T14		14 EA	520 mm	75 mA	
	PAN40-T16		16 EA	600 mm	80 mA	
	PAN40-T18		18 EA	680 mm	85 mA	
	PAN40-T20		20 EA	760 mm	90 mA	
	PAN40-T22		22 EA	840 mm	95 mA	
PAN40-T24	24 EA	920 mm	100 mA			

■ Output Circuit

■ NPN Open Collector Output(N TYPE)



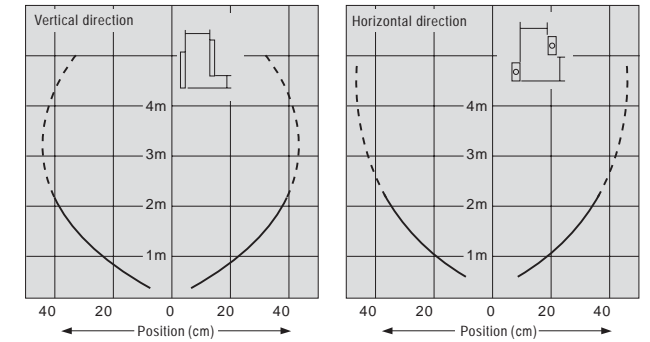
■ PNP Open Collector Output(P TYPE)



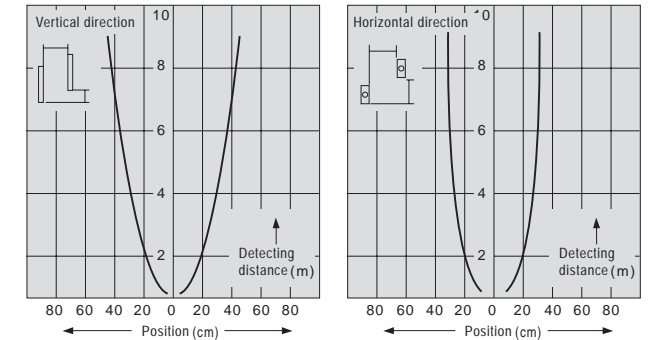
■ Characteristic Graph

■ Parallel Shift Characteristic

● PAN10 series

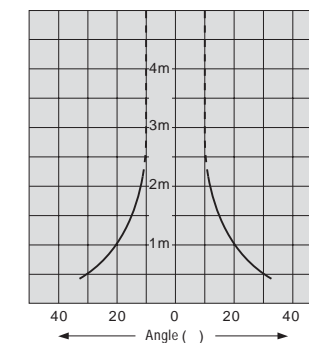


● PAN20/40 series

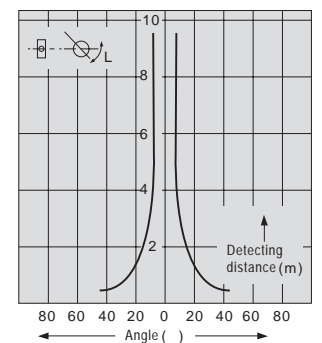


■ Angle Characteristic

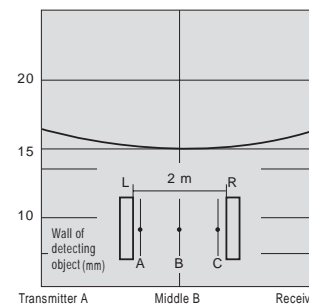
● PAN10 series



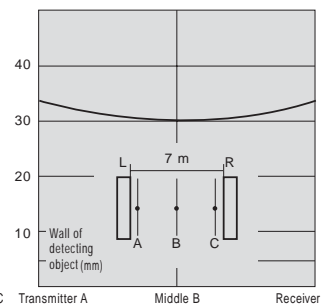
● PAN20/40 series



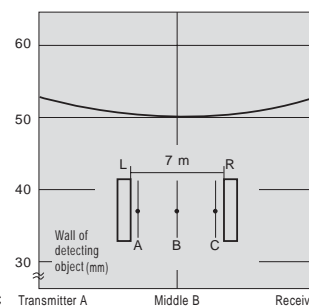
● PAN10 series



● PAN20 series

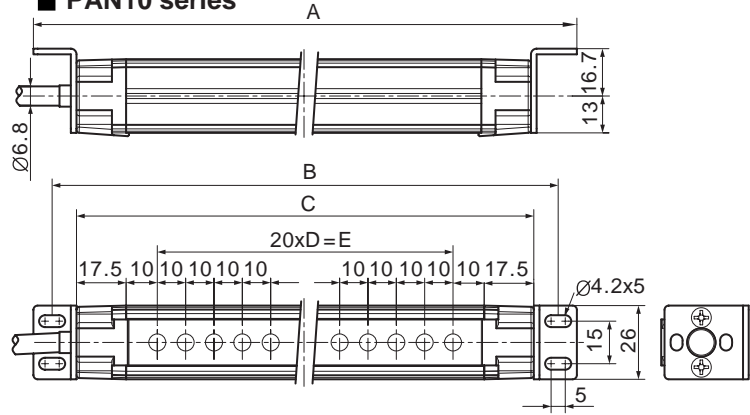


● PAN40 series



■ Demension

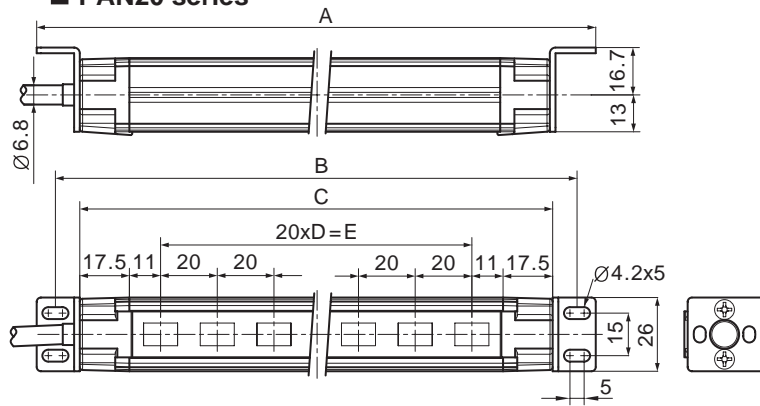
■ PAN10 series



Unit : mm

Type	A	B	C	D	E
PAN10-T16	227	214.2	197	7	140
PAN10-T24	307	294.2	277	11	220
PAN10-T32	387	374.2	357	15	300
PAN10-T40	467	454.2	437	19	380
PAN10-T48	547	534.2	517	23	460
PAN10-T56	627	614.2	597	27	540
PAN10-T64	707	694.2	677	31	620
PAN10-T72	787	774.2	757	35	700
PAN10-T80	867	854.2	837	39	780
PAN10-T88	947	934.2	917	43	860
PAN10-T96	1027	1014.2	997	47	940

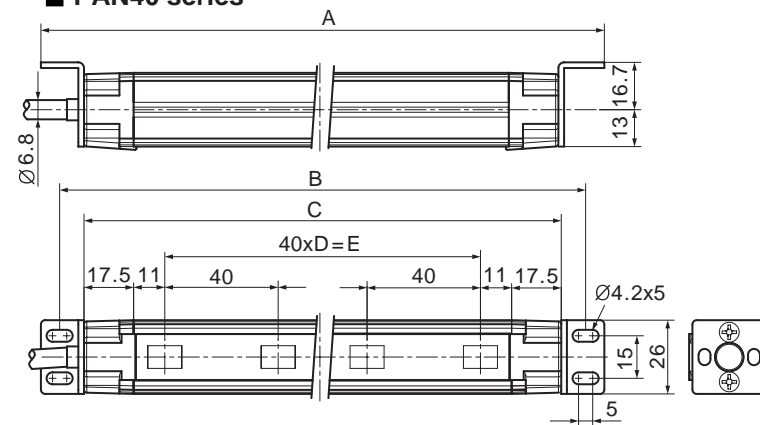
■ PAN20 series



Unit : mm

Type	A	B	C	D	E
PAN20-T8	227	214.2	197	7	140
PAN20-T12	307	294.2	277	11	220
PAN20-T16	387	374.2	357	15	300
PAN20-T20	467	454.2	437	19	380
PAN20-T24	547	534.2	517	23	460
PAN20-T28	627	614.2	597	27	540
PAN20-T32	707	694.2	677	31	620
PAN20-T36	787	774.2	757	35	700
PAN20-T40	867	854.2	837	39	780
PAN20-T44	947	934.2	917	43	860
PAN20-T48	1027	1014.2	997	47	940

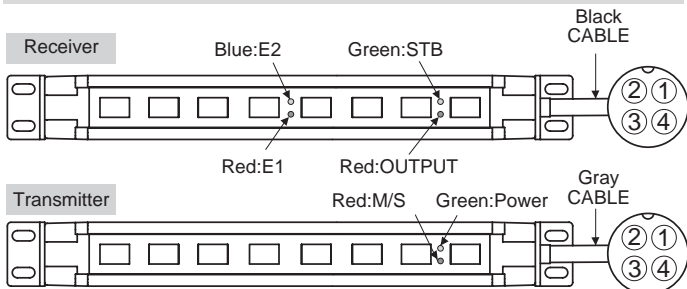
■ PAN40 series



Unit : mm

Type	A	B	C	D	E
PAN40-T4	207	194.2	177	3	120
PAN40-T6	287	274.2	257	5	200
PAN40-T8	367	354.2	337	7	280
PAN40-T10	447	434.2	417	9	360
PAN40-T12	527	514.2	497	11	440
PAN40-T14	607	594.2	577	13	520
PAN40-T16	687	674.2	657	15	600
PAN40-T18	767	754.2	737	17	680
PAN40-T20	847	834.2	817	19	760
PAN40-T22	927	914.2	897	21	840
PAN40-T24	1007	994.2	977	23	920

■ Indicator & Wiring diagram



■ LED Indicator

LED Indicator	Transmitter
RED	MASTER/SLAVE Display
GREEN	Power (12 ~ 24 V DC)

LED Indicator	Receiver
RED	Indicator
GREEN	Stable light received indicator
RED	E1(SYNC signal)
BLUE	E2(Ambient light)

■ Wiring description

PIN NO.	Wire Color	Transmitter
1	Brown	Power (12 ~ 24 V DC)
2	Orange	SYNC
3	Blue	GND
4	Purple	M/S

PIN NO.	Wire Color	Receiver
1	Brown	Power (12 ~ 24 V DC)
2	Orange	SYNC
3	Blue	GND
4	Black	Output

■ Detecting Condition

Operation MODE	Detecting condition	Light received	Stable area Operating area
Output ON When entire optical axis receive Light	Operating indicator (RED LED)	ON	OFF
	Control Output (Green LED)	ON	OFF
Ambient Light	Ambient light	ON	OFF
	E2 Indicator (Blue LED)	ON	OFF
	E2 Indicator (Blue LED)	OFF	ON

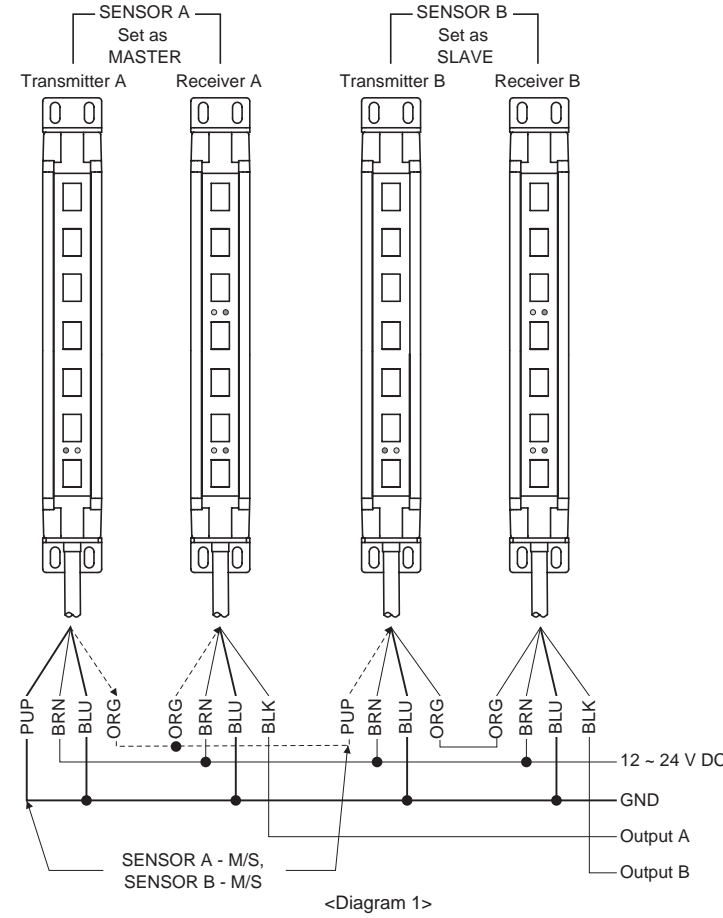
(Cautions) Green LED of light source is the power indication.

- E1 light (red LED) on the detector is put out when the baseline is short-circuited.
- E2 light (blue LED) on the detector is put out under the outer light such as sunlight and fluorescent light. (Please be cautious since there is possibility of malfunction when E2 light is put out.)

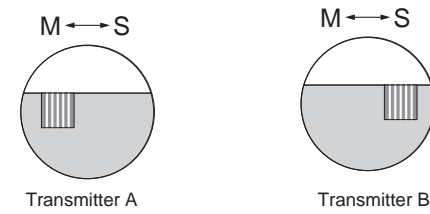
Refer to Motion Mode

■ MASTER/SLAVE Circuit

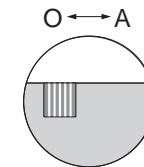
- Please set up as shown in the following diagram in case of using the sensor of Group 2 in the proximity. Connect Sensor A and Sensor B in accordance with the connection method of <Diagram 1>.



- Open the cover of the connector side on the lower part of the light projector and set the motion mode switch as in <Diagram 2> below. Set the light projector of Sensor A at M (Master) and the light projector of Sensor B at S (Slave).
- Product is set at M (Master) at the time of dispatch.

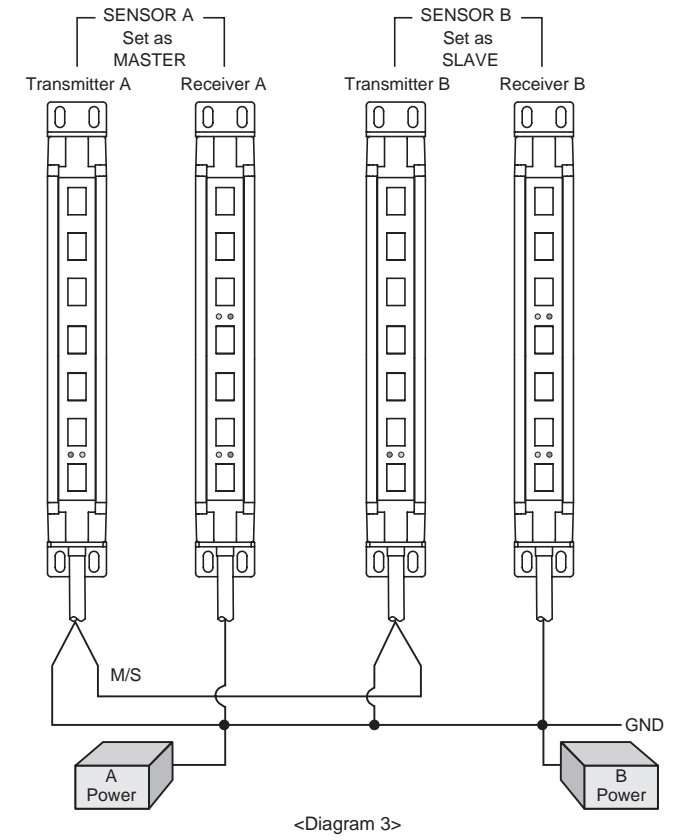


■ Operation Mode



- Open the cover of the connector side on the lower part of the detector (use straight screwdriver) and use after changing the motion mode switch to the mode that is suitable to motion conditions.
 - Entire optical axis of side A is set at ON motion at the time of dispatch.
- A Motion Mode: Light On of entire optical axis - Output ON
 O Motion Mode: Light On of more than 1 optical axis - Output ON
 Motion (Light Off of entire optical axis - Output OFF)

- Connect M/S (violet) of one light projector from the sensors of Group 2 to the power line GND (blue). In this case, the sensor operates at Master Mode (M Mode).
- Connect M/S (violet) of another light projector from the sensors of Group 2 to the baseline (orange) on the opposite side. In this case, the sensor operates at Slave Mode (S Mode).
- In the case of using different power on the light Transmitter and the Receiver, or Master and Slave, must have GND (0V) as common connection as shown in <Diagram 3>.



- Please verify the M/S light of the light projector after the power input. Light Projector A (M Motion): M/S Light On
Light Projector B (S Motion): M/S Light Off

⚠ CAUTION

- In case of using the set of two, distribute the wires so that both won't be either M Mode motion or S Mode motion at the same time.
- Please do not mutually connect the baseline (orange) of Sensor A and Sensor B.

■ Panel & Optical Axis Adjustment

- Verify the lighting of power light (green) of the light projector after verifying the connection condition and power input.
- Move the light projector to the directions of left, right, up and down to turn on the Light On Stable Light (green) of Receiver.