

Photo Sensor PTX series

INSTRUCTION MANUAL

Thank you for purchasing Hanyoung Nux products.
Please read the instruction manual carefully before using this product, and use the product correctly.
Also, please keep this instruction manual where you can see it any time.

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Safety information

Please read the safety information carefully before use, and use the product correctly.
The alerts declared in the manual are classified into **Danger**, **Warning** and **Caution** according to their importance

⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor injury or property damage

⚠ DANGER

The input/output terminals are subject to electric shock risk. Never let the input/output terminals come in contact with your body or conductive substances.

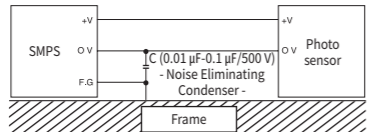
⚠ WARNING

- The contents of this manual may be changed without prior notification.
- If the user use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- If there is a possibility that a malfunction or abnormality of this product may lead to a serious accident to the system, install an appropriate protection circuit on the outside.
- Please do not use outdoor (It may cause of shorten the life of the product or electric shock).
- Do not use in flammable or explosive gas environments. (Please do not use this product at any place where have over specification of vibration and shock.)
- Do not use it in places where there is vibration or shock more than the reference value. (This is a double insulation structure, but the parts may be damaged.)

⚠ CAUTION

- When cleaning the lens and the case, please use a dry cloth and gently wipe the surface. Must not use solvents such as thinner or alcohol.
- The sensor wire should be separate from high voltage line or power line. Having the same pipe for wiring can be cause of malfunction.

- This product has (IP 66) water proof structure but do not use permanent underwater place.
- When extending the cable, please use thick wire (at least thickness mm) and at this moment, please watch out for the voltage-drop.
- When using the sensor under the light such as fluorescent lighting or mercury lamp with high frequency, please block it with a light rap and avoid the lens from facing the light directly.
- When 2 units of through beam type of photo sensor are used, it can be cause of malfunction due to interference. Please make enough space and please install the receiver and emitter positions are crossed.
- In case of use Inductive load (relay, coil), the instantaneous load increases 2 times and it may break TR. So, please set maximum load at half.
- A lot of dusts pollute lens and it may cause of malfunction so please avoid using this product dust area.
- Information in the manual may be changed without prior notification.
- If you do not follow instruction in this manual, injury or damage of property may occur.
- 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 0V and F.G.



Suffix code

Model	Code	Information
PTX	□ □ □ □	Photo sensor
Sensing type and distance	T 15	Through beam type, 15m
	T 30	Through beam type, 30m
	M 7	Retro reflection type, 7m
	R 1	Diffuse reflection type, 1m
Power supply voltage	A	24 - 240 VDC/AC ±10 %, 50/60 Hz (Power)
	B	12 - 24 VDC ±10 % (Lamp)
Timer	None	Normal type
	-T	Timer built-in type

Specifications

Model	Normal type	PTX-T15A	PTX-M7A	PTX-R1A
	Timer built-in type	PTX-T15A-T	PTX-M7A-T	PTX-R1A-T
Sensing type		Through beam type	Retro reflection type	Diffuse reflection type
Sensing distance		15 m	7 m (Note 1)	1 m
Sensing object		Opaque object above Ø20 mm	Opaque object above Ø60 mm	White paper with no gloss 200 mm × 200 m
Power supply voltage		24 - 240 VDC/AC ±10 %, 50/60 Hz		
Power Consumption		Emitter : 2 VA max. Transmitter : 1 VA max.	2 VA max.	
Control output		Relay contact output (Contact composition 1a, 1b), Contact capacity : 30 VDC 5 A / 250 VAC 5 A Resistive load, Rated load life expectancy less than 100,000 times.		
Operating Mode		Light ON/Dark ON are selectable by the selector switch		
Response Time		20 ms max.		
Hysteresis		-		Less than 20 % of sensing distance
Indicator		Output indication : Red LED, Stability indication : Green LED		
Sensitivity adjustment		-		Sensitivity adjusting volume built-in
Protection circuit		Surge protective circuit		
Timer function (Only corresponds to timer built-in type)		Select OFF Delay, ON Delay or One Shot Delay by using the ON/OFF switch. Delay Time : 0.1 - 5 sec adjust by the volume.		
Light source (wavelength)		IR (850 nm)		
Ambient temperature		Operating: -20 to 60 °C, Storage: -25 ~ 70 °C (with no icing nor dew condensation)		
Ambient humidity		35 ~ 85 % RH (with no icing nor dew condensation)		
Degree of protection		IP 66 (IEC standard)		
Insulation resistance		20 MΩ or min (standard on 500 VDC mega)		
Dielectric strength		1500 VAC (1 minute)		
Vibration resistance		10 - 55 Hz, Double amplitude : 1.5 mm, X . Y . Z 2 hours in each direction		
Shock resistance		500 % (approx 50 G), X . Y . Z 3 times in each direction		
Connection method		Terminal		
Material		Case : ABS, Lens : PC		
Weight		Transmission type : Approximately 300 g, Mirror reflection type : about 160 g, Diffuse reflection type : about 150 g		
Accessories	Individual	-	Reflector(HY-M5)	-
	Common	Driver, Bracket, Bolt, Nut, Water-proof rubber, Wire holder		

■ Amp built-in type (Type B)

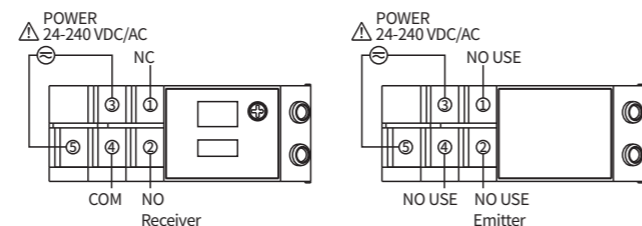
Model	Normal type	PTX-T15B	PTX-T30B	PTX-M7B	PTX-R1B
	Timer built-in type	PTX-T15B-T	PTX-T30B-T	PTX-M7B-T	PTX-R1B-T
Sensing type		Through beam type		Retro reflection type	Diffuse reflection type
Sensing distance		15 m	30 m	7 m (Note1)	1 m
Sensing object		Opaque object above Ø20 mm		Opaque object above ø60 mm	White paper with no gloss 200 mm × 200 m
Power supply voltage		12 - 24 VDC ±10 %			
Power consumption		Emitter : 35 mA max. Transmitter : 20 mA max.		45 mA max.	
Control output		NPN/PNP open collector yield output at the same time. Load current : 150 mA DC (Resistive load) NPN Residual voltage : Max 1 VDC / PNP Residual voltage : Max 2 VDC			
Operation mode		Light ON/ Dark ON Selection by selector switch			
Response Time		1 ms max.			
Hysteresis		-			Less than 20 % of sensing distance
Indicator		Output display : Red LED, Stable display : Green LED			
Sensitivity adjustment		-		Sensitivity adjusting volume built-in	
Protection circuit		Protective circuits for power reverse connection and output break			
Timer function (Only corresponds to timer built-in type)		Select OFF Delay, ON Delay or One Shot Delay by using the ON/OFF switch. Delay Time : 0.1 - 5 sec adjust by the volume.			
Light source (wavelength)		IR (850 nm)			
Ambient temperature		Operation : -20 ~ 60 °C, Storage : -25 ~ 70 °C (with no icing nor dew condensation)			
Ambient humidity		35 ~ 85 % RH (with no icing nor dew condensation)			
Degree of protection		IP 66 (IEC standard)			
Insulation resistance		20 MΩ min (standard on 500 VDC mega)			
Dielectric strength		1500 VAC (1 minute)			
Vibration resistance		10 - 55 Hz, Double amplitude: 1.5 mm, 2hours to each of X, Y, Z directions			
Shock resistance		500 % (approx 50 G), 3 times to each of X, Y, Z directions			
Connection method		Terminal			
Material		Case : ABS, Lens : PC			
Weight		Transmission type : about 280 g, mirror reflection type : about 150 g, diffuse reflection type: about 140 g			
Accessories	Individual	-	Reflector (HY-M5)	-	-
	Common	Driver, Bracket, Bolt, Nut, Water-proof rubber, Wire holder			

Note 1) The sensing distance of PTX-M7A (-T), PTX-M7B (-T) is the distance when using the reflector (HY-M5)
Note 2) The sensing distance may become changed depending on the size, surface condition, glossy, non-glossy of the sensing object

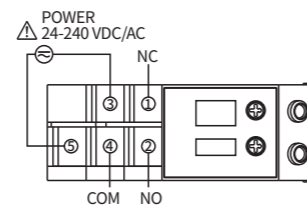
■ Connection diagram

■ Power built-in type (Type A)

- Through beam type (PTX-T15A, PTX-T15A-T)

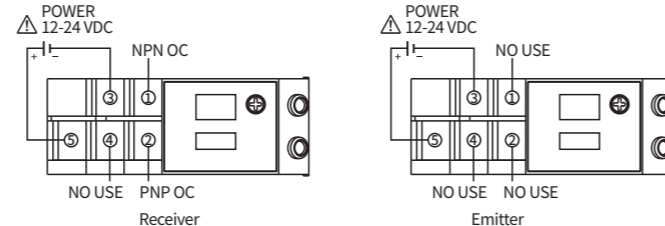


- Retro reflection/Diffuse reflection type (PTX-M7A, PTX-M7A-T, PTX-R1A, PTX-R1A-T)

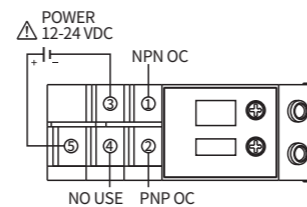


■ Amp built-in type (Type B)

- Through beam type (PTX-T15B, PTX-T15B-T, PTX-T30B, PTX-T30B-T)



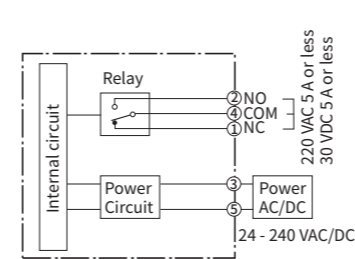
- Retro reflection/Diffuse reflection type (PTX-M7B, PTX-M7B-T, PTX-R1B, PTX-R1B-T)



■ Control output circuit diagram

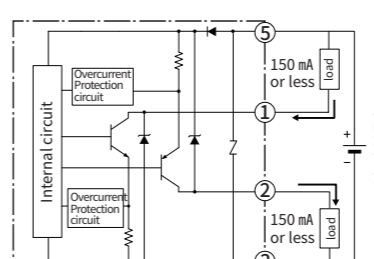
■ Power built-in type (Type A)

(Transmission type is only for receiving unit)



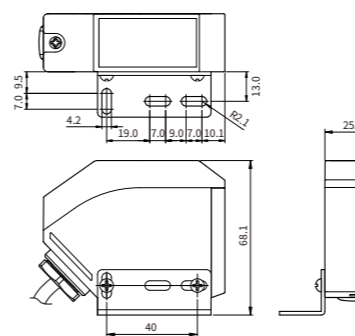
■ Amp built-in type (Type B)

(Transmission type is only for receiving unit)

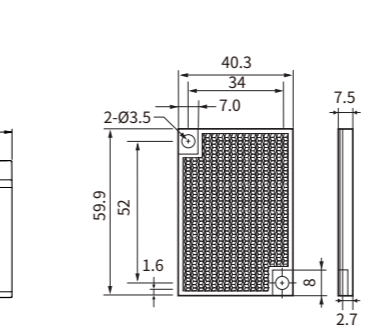


■ Dimensions and reflector dimensions

■ Dimensions

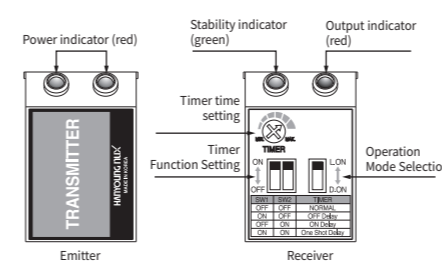


■ Mirror dimension (HY-M5)

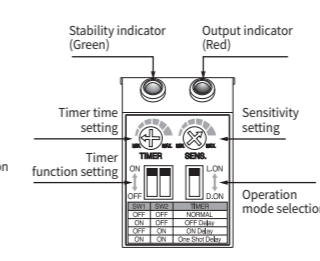


■ Name of each part

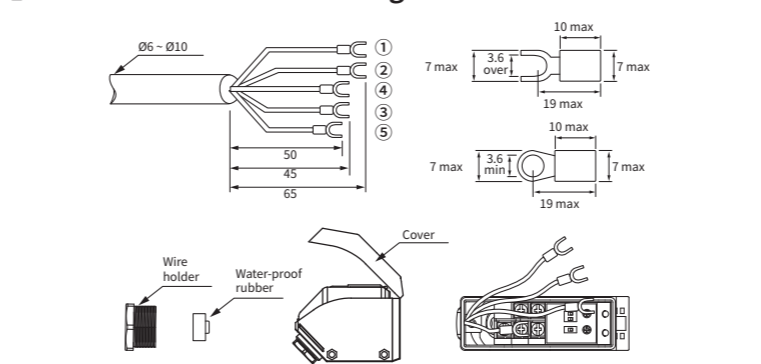
■ Through beam type



■ Retro reflection type / Diffuse reflection type



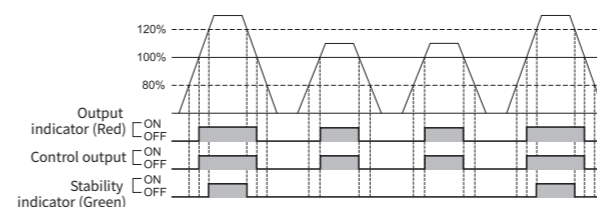
■ Precautions when installing



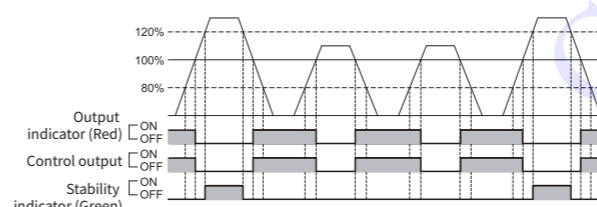
- When connecting wires to each terminal, treat as shown in the figure. When selecting the wiring to maintain the waterproof property, use the wiring of Ø6 - Ø10 and securely tighten the wiring holder with torque of 1.0 - 1.5 N · m.
- When connecting the wiring to the terminal block, tighten with a torque of 0.8 N · m.

■ Operation chart

■ Light ON



■ Dark ON

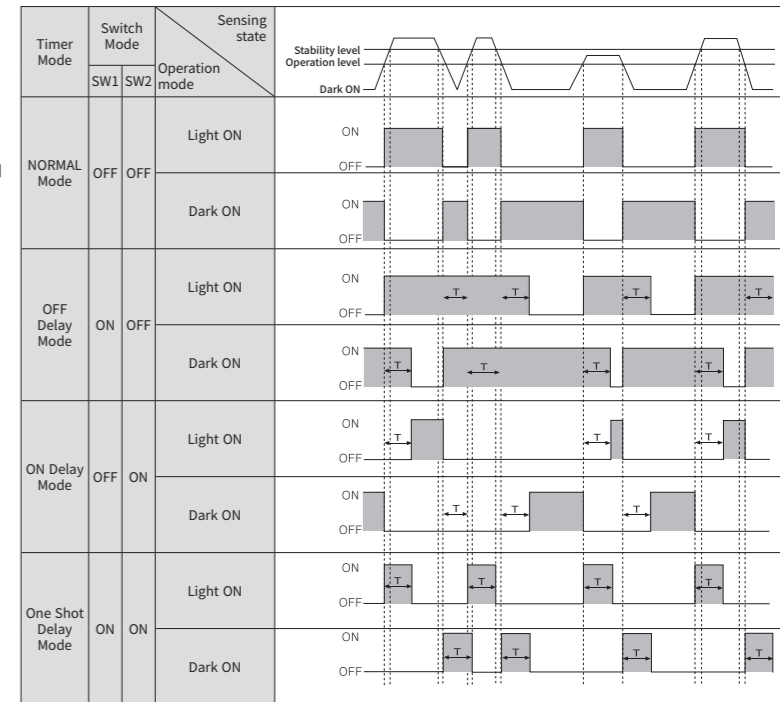


※ Stability indicator becomes ON when an amount of light exceed the operation level and becomes 120% (stable L.ON area). It can be used as the environmental change after setup or level down during operation and initial operation check.

■ Characteristic

Contact method	Convenient wiring by terminal connection
Power supply voltage	Wide Power Specifications (24 - 240 VDC/AC, 12 - 24 VDC)
Sensing distance	Long distance sensing
Timer function	Delay time: 0.1 - 5sec (adjust to volume)
Control output	In case of DC power supply, NPN/PNP open collector output at the same time
Protection circuit	Protective circuit for power reverse connection and output break
Degree of protection	IP 66 (IEC standard)

■ Timer function



■ Installation and Adjustment

■ Through-beam type

Sequence	How to install	Picture
1	Supply in the power after placing the transmitter and receiver face to face each other.	
2	Fix either the transmitter or receiver and check for the range where the operation indicator becomes turned ON or turned OFF by controlling in the direction of up, down, left and right. After finishing the confirmation, place it in the middle and fix it.	
3	Place the sensing object within the setting range and confirm the condition of proper operation.	

■ Retro-reflective type

Sequence	How to install	Picture
1	Supply in the power after placing the sensor and mirror face to face each other in the straight line.	
2	Fix either the sensor or mirror and check for the range where the operation indicator becomes turned OFF by controlling in the direction of up, down, left and right. After finishing the confirmation, place it in the middle and fix it.	
3	Place the sensing object within the setting range and confirm the condition of proper operation and once the confirmation is finished, fix the sensor. ※ Please refer to the How to install for the diffuse reflection type. Regarding the sensitivity adjustment, please refer to the 'How to install' for the diffuse reflection type	

■ Diffuse-reflective type

Sequence	How to install	Picture	Sensitivity Volume
1	After removing the sensing object, turn sensitivity volume gradually to the max direction and once indicator lights up, that position will be referred as 'A' from now on. (If indicator does not get turned ON (OFF) even in the position of maximum then it is indicating the max position).		
2	Place the sensing object in the desirable setting position and gradually turn the sensitivity volume from 'A' to the 'min' direction and once the indicator gets to turned OFF than that position will be referred as 'B'.		
3	Place the sensitivity volume in the middle of the sensitivity A and B. And then confirm the operation condition of sensing object that occurs within the setting range.		