

General-Use Potentiometer Tuning

HPX Series

High Sensitivity over a Long Scanning Distance of 800 mm (Thru Scan Model), Easy-to-Use Functions/Structure, and High Reliability.



- Quick response (50 s) plus mark detection.
- Self-diagnostic LEDs plus self-diagnostic output.
- Fine-tuning of sensitivity using multi-turn potentiometer with indicator.

AMPLIFIER UNIT ORDER GUIDE

Model	Shape	Supply voltage	Outout mode	Operation mode	Sensitivity adjustment	Stability indication	Self-diagnostic indication	Self-diagnostic output	Timer function	Catalog listing
High sensitivity		10 to 30 Vdc	NPN open collector	Light ON/ Light ON, selectable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HPX-H1
			PNP open collector		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HPX-H2
Low hysteresis			NPN open collector		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HPX-A1
			PNP open collector		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HPX-A2

Amplifier unit accessories

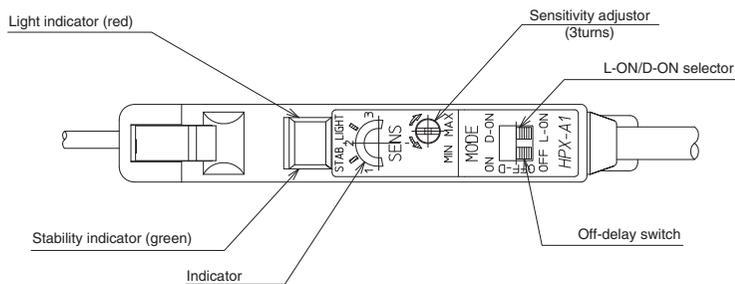
Product name	Appearance	Features / Applications	Model
End plates 2 pcs		End plates used when mounting on a DIN rail. They are not included with the amplifier.	HPX-PA03

AMPLIFIER UNIT SPECIFICATIONS

Specifications

High sensitivity	HPX-H1	HPX-H2
Low hysteresis	HPX-A1	HPX-A2
Light emitter	Red four-element LED	
Power	12–30 Vdc (ripple: 10% max.)	
Output type	NPN open collector	PNP open collector
Current consumption	35 mA max.	
Control output	Switching current	Output : 100 mA max. (resistive load) Self-diagnosis output : 50 mA max.
	Residual voltage	1V max. (at 100 mA load current)
	Output withstand voltage	30V max.
Span adjustment (sensitivity adjustment)	3-turn variable resistor	
Response time	500 μ s max. (Without off-delay)	
Indicator	Red 'ON' with reception of light, Green 'ON' with stable or stablr dark. Green 'BLINK' with self diagnosis.	
Ambient light immunity	Incandescent light: 5,000 lux max. Sunlight: 20,000 lux max.	
Operating temperature	–20 to + 60°C (–20 to +50°C when setting tightly side by side)	
Operating humidity	35–85% RH (without condensation)	
Vibration resistance	10–55 Hz, 1.5 mm peak-to-peak amplitude, 2 hours each in X, Y and Z directions	
Shock resistance	500 m/s ² , 3 times each in X, Y and Z directions	
Protection circuits	Short-circuit protection circuit for power, malfunction prevention circuit at power ON (approx. 100 ms), power reverse connection protection circuit	
Case material	PC/ABS alloy	
Weight	Approx. 55 g	

DETAILED VIEW OF THE OPERATING PANEL



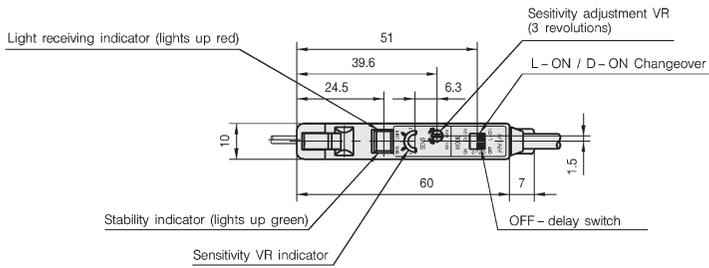
EXTERNAL DIMENSIONS

(unit: mm)

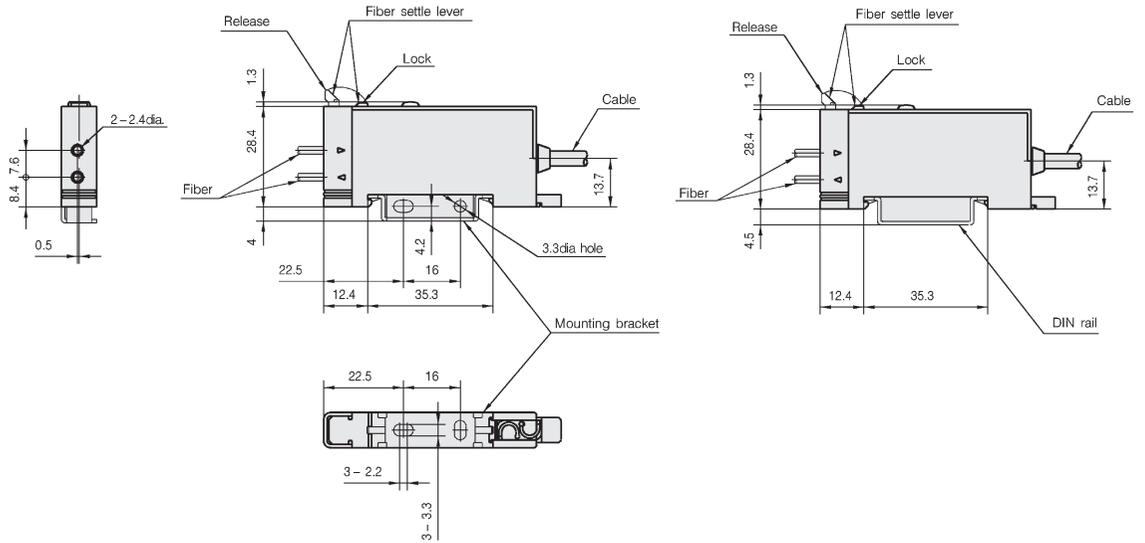
● Amplifier unit

HPX-H, A, F (in common)

When mounted on bracket (attached)

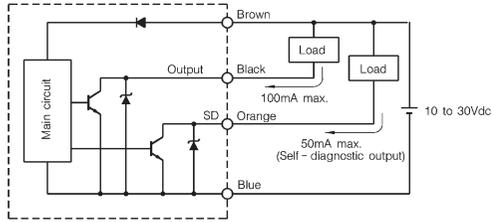


When mounted on DIN rail

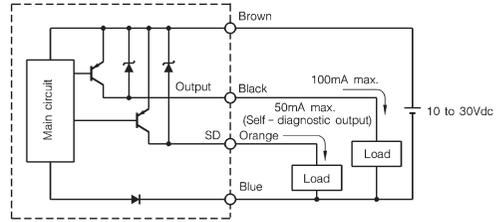


OUTPUT CIRCUIT DIAGRAM

NPN output type

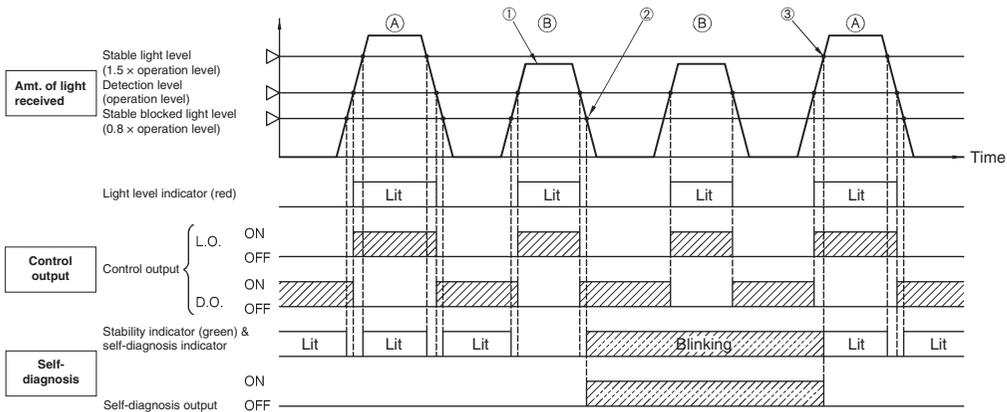


PNP output type



OUTPUT AND INDICATOR OPERATION CHART

In both dark-ON (D-ON) and light-ON (L-ON) modes, if the switch is operating with insufficient light (for example, if the amount of light has decreased due to accumulation of dirt), the user is notified by latched self-diagnosis output and indicator.



(A) : There is no problem. The amount of light is sufficient.

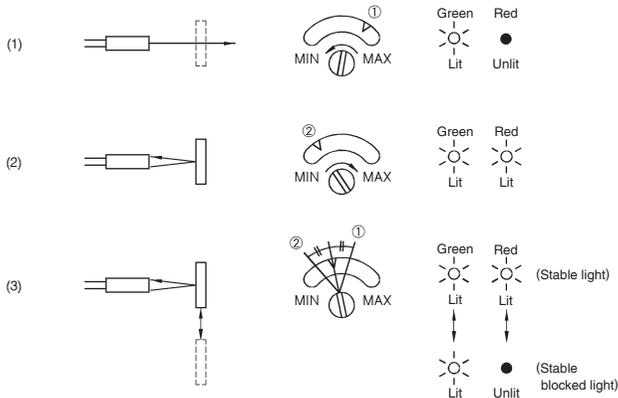
(B) : The amount of light is low. If this state persists, notification is given by self-diagnosis output and by indicator.

●Explanation of the chart

1. After the photoelectric switch operates at a light level that is below the stable light level (point ① in the above figure), when it reaches the stable blocked light level (point ②), the stability indicator starts blinking (self-diagnosis indication). At the same time, the self-diagnosis output turns ON and latches.
2. Afterward, when the amount of light received by the photoelectric switch reaches the stable light level (point ③), the stability indicator (self-diagnosis indication) stops blinking. At the same time, the self-diagnosis output turns OFF and is unlatched.

SENSITIVITY ADJUSTMENT POTENTIOMETER

•For retroreflective switches



Adjustment method

With no target object present, turn the potentiometer counterclockwise from the MAX position and stop at the position where the indicators appear as shown on the left. This is position ①.

If the red indicator is unlit even when the potentiometer is at the maximum position, MAX is position ①.

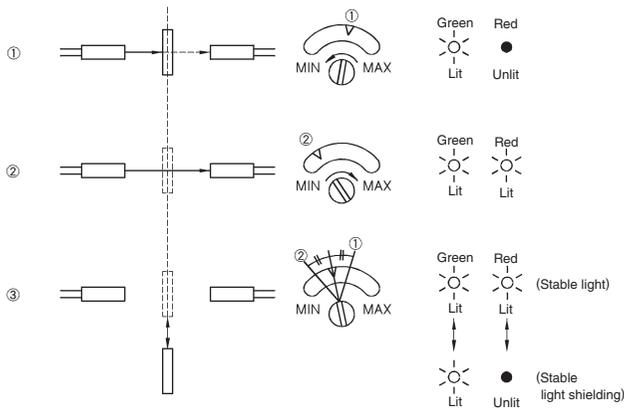
Place a target object in the appropriate position, turn the potentiometer clockwise from the MIN position, and stop at the position where the indicators appear as shown on the left. This is position ②.

Set the potentiometer to the midpoint between ① and ②.

Note: If the potentiometer rotates one revolution or more, adjust it based on the indicator position.

•For thru-scan switches

1) When detecting translucent target objects



Adjustment method

Place a target object in the appropriate position, turn the potentiometer counterclockwise from the MAX position, and stop at the position where the indicators appear as shown on the left. This is position ①.

If the red indicator is unlit even when the potentiometer is at the maximum position, MAX is position ①.

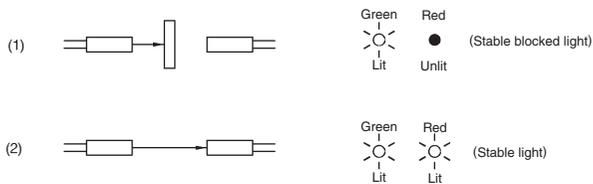
With no target object present, turn the potentiometer clockwise from the MIN position and stop at the position where the indicators appear as shown on the left. This is position ②.

Set the potentiometer to the midpoint between ① and ②.

Note: If the potentiometer rotates one revolution or more, adjust it based on the indicator position.

2) When detecting opaque target objects

In the following two cases, adjust the optical axis and sensitivity so that the indicators appear as shown.



BASIC PRECAUTIONS

● Wiring

- Make sure you connect a photoelectric switch to the power supply and load correctly.
- If a high-voltage or power cable exists near a photoelectric switch lead, isolate the photoelectric switch's lead or lay in another conduit to prevent surge and noise influence.
- Connect the lead securely to the connector using crimp terminal.
- Use a lead of at least 0.3mm² in cross-sectional area for extensions. The lead length should not be over 100m. Consider the influence of noise due to lead extension.
- If a switching power supply is used, ground its frame.
- If capacitive load is used, connect a current limiting resistor so as to limit the rush current to max. 100mA.

● Handling

- Do not swing a photoelectric switch by its lead.
- Do not impact or damage the sensing head.
- Do not pull the lead of a photoelectric switch with excessive force. The tensile strength is about 49N at 50cm from the end of the conduit.

Before use, thoroughly read the "Precautions for use" and "Precautions for handling" in the Technical Guide on pages **A-141** to **A-156** as well as the instruction manual and product specification for this switch.