Digital Fiber-Optic Switches

HPX-EG Series

Equipped with an automatic adjustment function for stable detection with easy operation.
*** For product details, contact one of our sales representatives or an Azbil dealer.**

■ **Double digital display**
[Simultaneous display of amount of incoming light and set value]

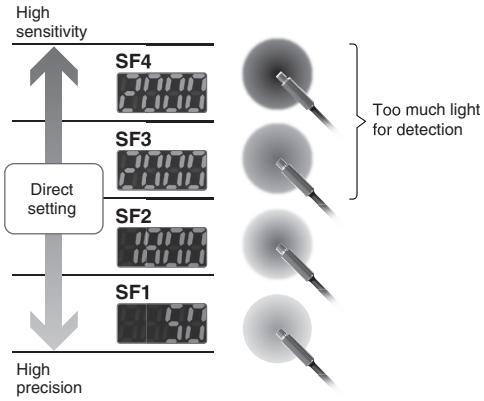
■ **Equipped with usability enhancing functions.**
(Automatic sensitivity switching, threshold tracking)

■ EXPLANATION OF MAJOR FUNCTIONS AND FEATURES

Fuss-free adjustment

Auto sensitivity switch function

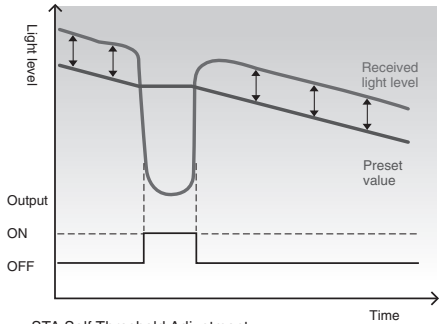
This function automatically optimizes the sensitivity setting during auto tuning, affording easy operation while delivering the highest detection performance.



Sample use:
component top/bottom differentiation

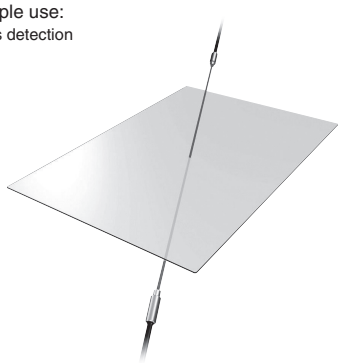
STA (Self Threshold Adjustment) function

This function allows the level of received light to be set as a reference point, enabling the detection threshold to be automatically adjusted by a given ratio in an updating cycle. This ensures the stable detection of target objects, eliminating the effect of fluctuations in the received light level due to environmental changes.



STA:Self Threshold Adjustment

Sample use:
Glass detection



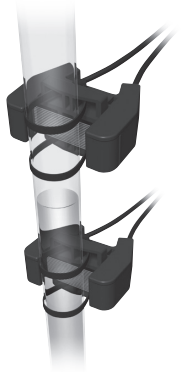
Easy operation

Easy-to-understand excess gain indication

The excess gain indication varies from 0% (dark) to 999% (light), with a preset value of 100%. Variations in the received light indication can be eliminated in the same application.

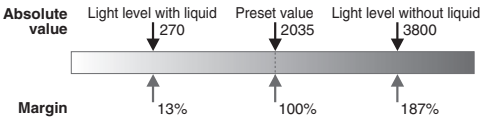
Indication example:

Sample use: Liquid surface detection



	Absolute value indication			Excess gain indication	
	Preset value	Without liquid	With liquid	Without liquid	With liquid
High high limit switch	2035	3800	270	P 187	P 13
High limit switch	1874	3500	248	P 187	P 13

Note: Formula for excess gain indication: received light level / preset value × 100



Performance

Three selectable sensing modes

Three sensing modes can be selected by the desired response speed and sensitivity, according to what is best for your application.

High sensitivity	Sensing mode	Response time	Display maximum
↕	**nL** (normal)	1 ms	4000
↕	**SF** (semi-fast)	500 µs	2000
↕	**FT** (fast)	250 µs	1000
High speed			

High accuracy detection

Note: Numerical values assume optimum conditions

Repeatability
± 5 µm or less (4δ)
With 1 mm core dia.
HPF-T003 standard fiber unit

Smallest detectable object:
5 µm dia.
With 1 mm core dia.
HPF-T003 standard fiber unit

Detectable displacement:
20 µm
With HPF-D034
coaxial fiber unit

Eco-friendly measures

Standardization of code lengths to 1 m

“Shorter codes can do the job” and “Cut codes only end up in the garbage!”
In response to comments like these from our customers, we came to the decision that 1 m codes were sufficient for standard **HPX-EG**s. This reduces the quantity of waste generated, contributing to the protection of our natural environment.

MODEL NUMBER SELECTION

HPX-EG **00** **–1S** **–L02** (typical model number example)

Basic model No.	Model	Output		Code	Features
HPX-EG					
	00				Standard
	01				Remote tuning
		NPN	PNP		
		–1S	**–2S**		Code lead-out
		–3S	**–4S**		Reduced wiring (main unit)
		–5S	**–6S**		Reduced wiring (expansion unit)
				(Blank)	1 m code (standard)
				–L02	2 m code
				–L05	5 m code

Note: Please refer to the compatibility list for compatible cables.
Note: For models that comply with UL and S-mark standards, please contact Azbil Corporation.

Amplifier unit accessories

Product name	Appearance	Features / Applications	Model
Dedicated mounting bracket 1 pc		This dedicated bracket can be used instead of a DIN rail to mount a single amplifier. It is not included with the amplifier.	**HPX-PA04**
End plates 2 pcs		End plates used when mounting on a DIN rail. They are not included with the amplifier.	**HPX-PA03**

For the detection distance, refer to page **A-043.**

SPECIFICATIONS

Specifications

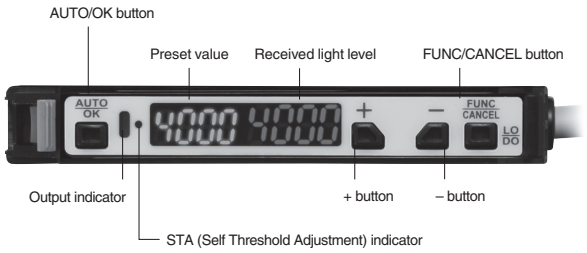
Code lead-out typeType		HPX-EG□□-1S	HPX-EG□□-2S
Reduced wiring type	Main unit	HPX-EG□□-3S	HPX-EG□□-4S
	Expansion unit	HPX-EG□□-5S	HPX-EG□□-6S
Light emitter		Red four-element LED (635 nm)	
Power		12–24 Vdc ±10 % (ripple: 10 % max.)	
Output type		NPN open collector	PNP open collector
Current consumption		750 mW or less (30 mA consumption current with power supply voltage of 24V)	
Control output	Switching current	Code lead-out type Type 100mA or less	
		Reduced wiring type 50 mA or less	
	Residual voltage	2V or less	3V or less
	Output withstand voltage	26.4V	
External input	ON	0–2 Vdc (short-circuit current approx. 0.1 mA)	7.2–26.4 Vdc (short-circuit current approx. 0.1 mA)
	OFF	Open or connection to + side of power supply	Open or connection to positive side of power supply
Response time		250 µs(Fast)/500 µs(Semi Fast)/1 ms(Normal)	
Mutual interference prevention		2 units	
Expansion unit addition		Up to 15 expansion units can be connected.	
Indicator		Output indicator (Turn on with output on)	
Ambient light immunity		Incandescent light: 5,000 lux max. Sunlight: 20,000 lux max.	
Operating temperature		–20 to + 55*1	
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. 300 ms)	
Case material		Body: PC resin. Cover: PC resin	
Weight		Code lead-out typeType: Approx. 75 g Code lead-out typeType: Approx. 45 g Reduced wiring type (main unit): Approx. 30 g	

*1. The operating temperature varies depending on the number of gang-mounted switch units as follows.
1 or 2 units: –20 to +55˚C; 3 units: –20 to +50˚C; 4 or 5 units: –20 to +45˚C; 6 units: –20 to +40˚C

Input/output

Model	HPX-EG00-□□	HPX-EG01-□□
Control output	1 output	1 output
External output	—	1 input

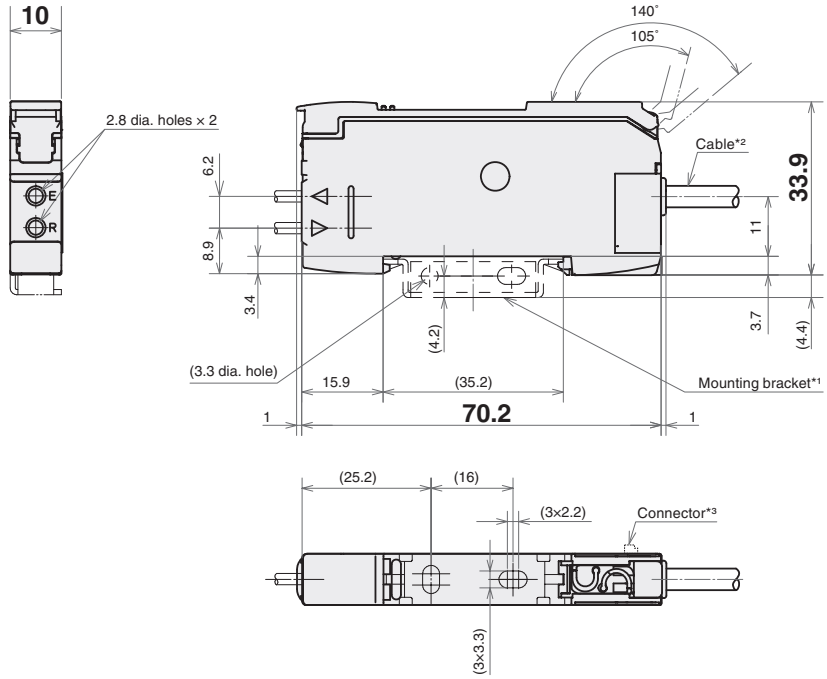
DETAILED VIEW OF THE OPERATING PANEL



EXTERNAL DIMENSIONS

(unit: mm)

HPX-EG



*1. Mounting bracket sold separately (catalog listing: **HPX-PA04**).

*2. **HPX-AG00-5S/6S** and **HPX-AG07-5S**
HPX-EG00-5S/6S
Outer diameter: 2.6;
insulator diameter: 1.2;
nominal cross-section: 0.2 mm²

Models other than the above
Outer diameter: 4.2;
insulator diameter: 1.2;
nominal cross-section: 0.2 mm²

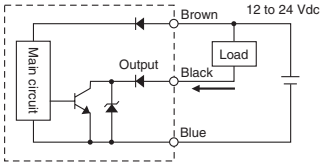
*3. The reduced-wiring type expansion unit has a connector structure (male) for attaching additional units.

WIRING DIAGRAM FOR AMPLIFIER

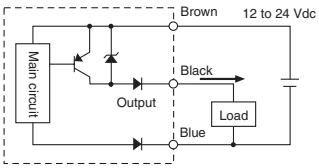
The output switching device is FET.
Reduced wiring type expansion units are not equipped with a power wires (brown and blue) since power is supplied through the main unit.

● **HPX-EG00**

NPN open collector output

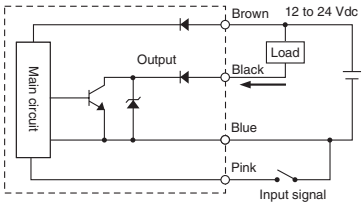


PNP open collector output

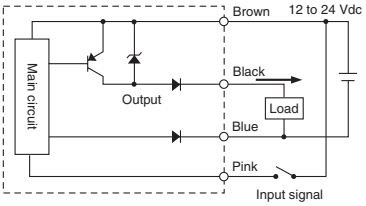


● **HPX-EG01**

NPN open collector output



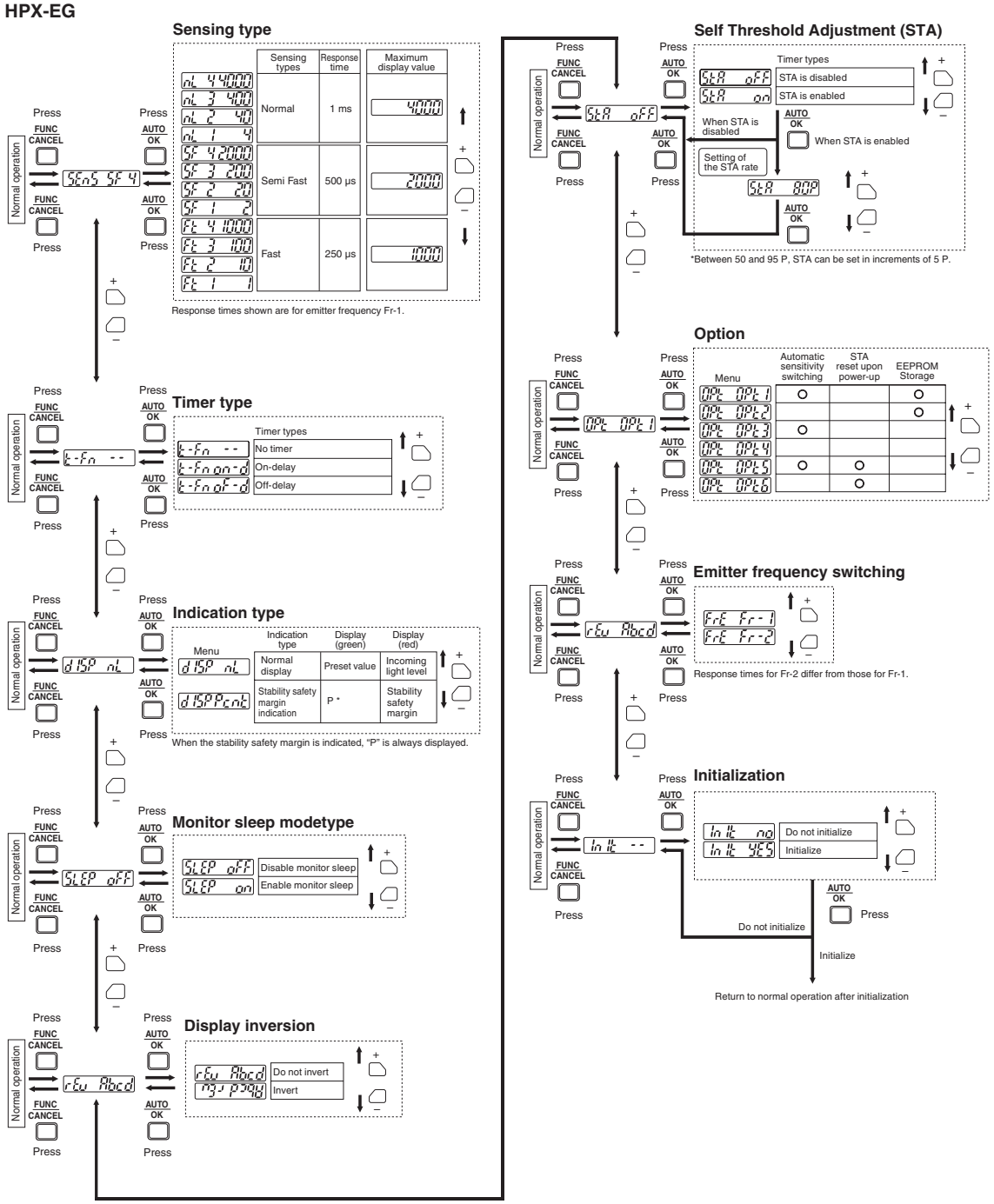
PNP open collector output



Model	Input signal (pink)
EG01	External input

OPERATION

HPX-EG



HANDLING

1. Precautions for wiring

- If it is necessary to extend the cable, use wire with a cross-sectional area of 0.3 mm^2 or more that is no longer than 100 m.
- If the wiring for the photoelectric switch is run through the same conduit as high-voltage or power lines, induction may cause malfunction or damage. Route the wiring in a different conduit or in its own conduit.
- When using an off-the-shelf switching regulator, ground the frame ground and the ground terminal. Otherwise, switching noise may cause malfunction.
- When a load such as a capacitive load or an incandescent lamp is connected which results in an inrush current that exceeds the switching capacity, connect a current-limiting resistor between the load and the output terminal. (Otherwise, the output short-circuit protection may be activated.)

2. Precautions for handling

- About 200 ms is required for switch operation to stabilize after power is supplied.
- When the switch is used in a dusty environment, take measures to prevent dust from accumulating on the sensing surface, such as putting the fiber unit in a sealed case and using an air purge.
- If the switch is used where there is strong ambient light, block the light with a hood, etc., or change the orientation of the switch and then check to be sure that the switch does not malfunction.
- Although oil-resistant cables are used, do not use the switch where the cable is always exposed to or could become immersed in water or oil. Also, prevent the ends of the cable from coming into contact with water or oil.
- If water or oil gets on the sensing surface, the switch may malfunction. Install a shielding plate or the like to protect it.
- Do not use the switch where it may be affected by chemical fumes (organic solvents, acids, alkalis, etc.).
- When the sensing surface of the fiber becomes dirty, lightly wipe the dirt off with a soft clean cloth. Do not to use an organic solvent such as benzene or thinner.
- Pulling the cable with excessive force may cause a disconnection. Force should be less than 50 N.
- The bending radius of the cable where it exits the amplifier unit must be 30 mm or more. Also, do not use the cable in a manner that repeatedly subjects it to bending stress.
- The detection distance or indicated value may differ from case to case due to variations between individual units, installation conditions, and the type of fiber unit.

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.