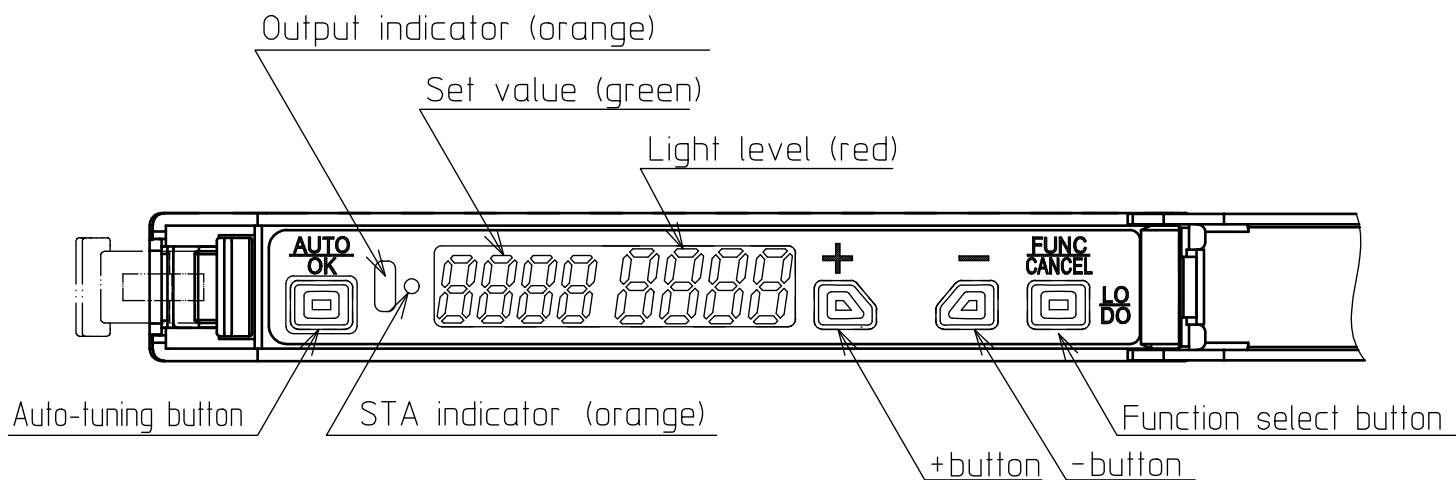


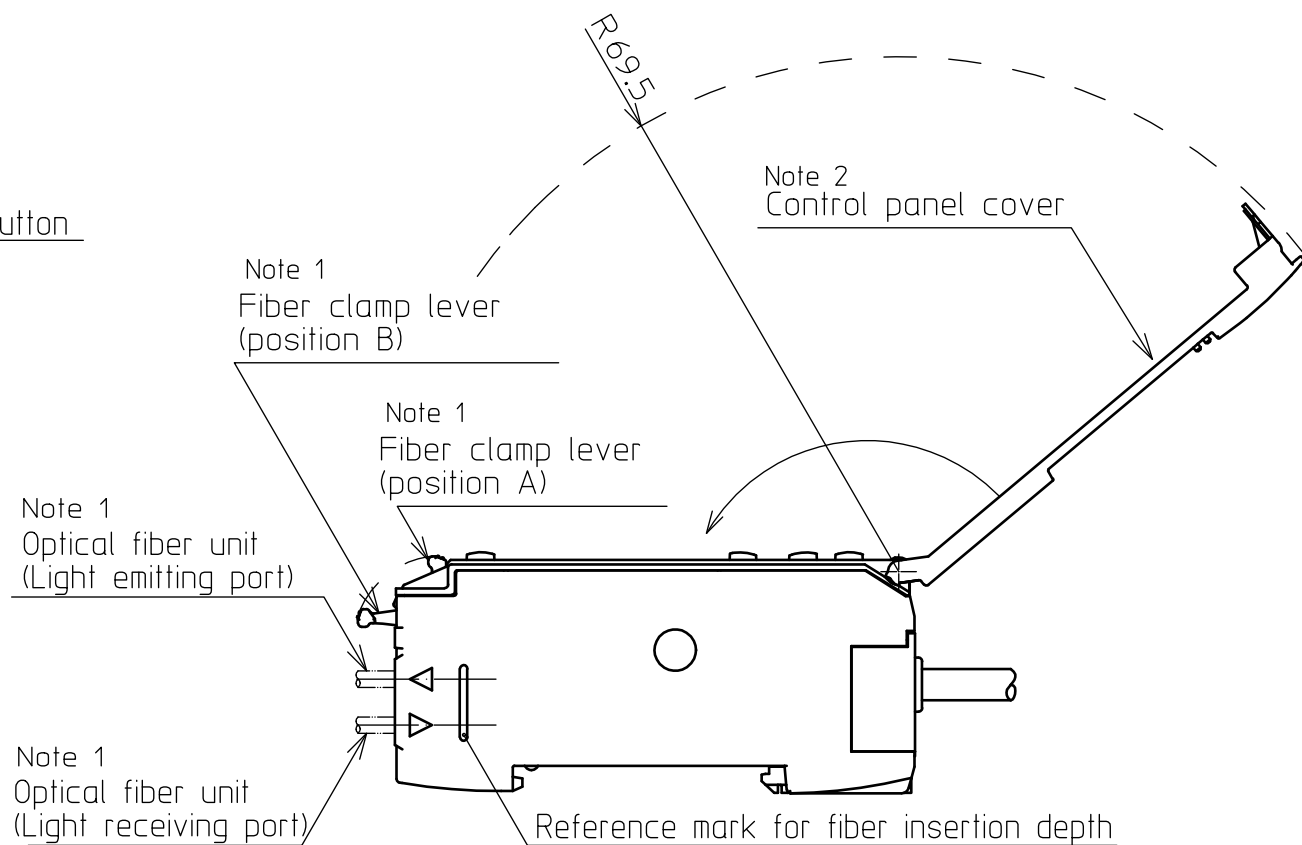
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Catalog listing	Output type	Remote tuning	Wiring type
HPX-EG50-1S	Open collector of NPN transistor	No	Prewired (cable lead-out)
HPX-EG50-2S	Open collector of PNP transistor		
HPX-EG50-1S-CT	Open collector of NPN transistor		connector
HPX-EG50-2S-CT	Open collector of PNP transistor		
HPX-EG51-1S	Open collector of NPN transistor	Yes	Prewired (cable lead-out)
HPX-EG51-2S	Open collector of PNP transistor		
HPX-EG51-1S-CT	Open collector of NPN transistor		connector
HPX-EG51-2S-CT	Open collector of PNP transistor		

Components descriptions



- Note 1 Inserting fiber units to the HPX-EG50/51.
- (1) Open the control panel cover.
 - (2) Move the fiber clamp lever forwards to the position B.
 - (3) Firmly insert the tip of each fiber into the holes on the HPX-EG50/51.
 - (4) Return the lever to the position A.
 - (5) Close the control panel cover.
- 2 After installation, close the cover to the HPX-EG50/51.



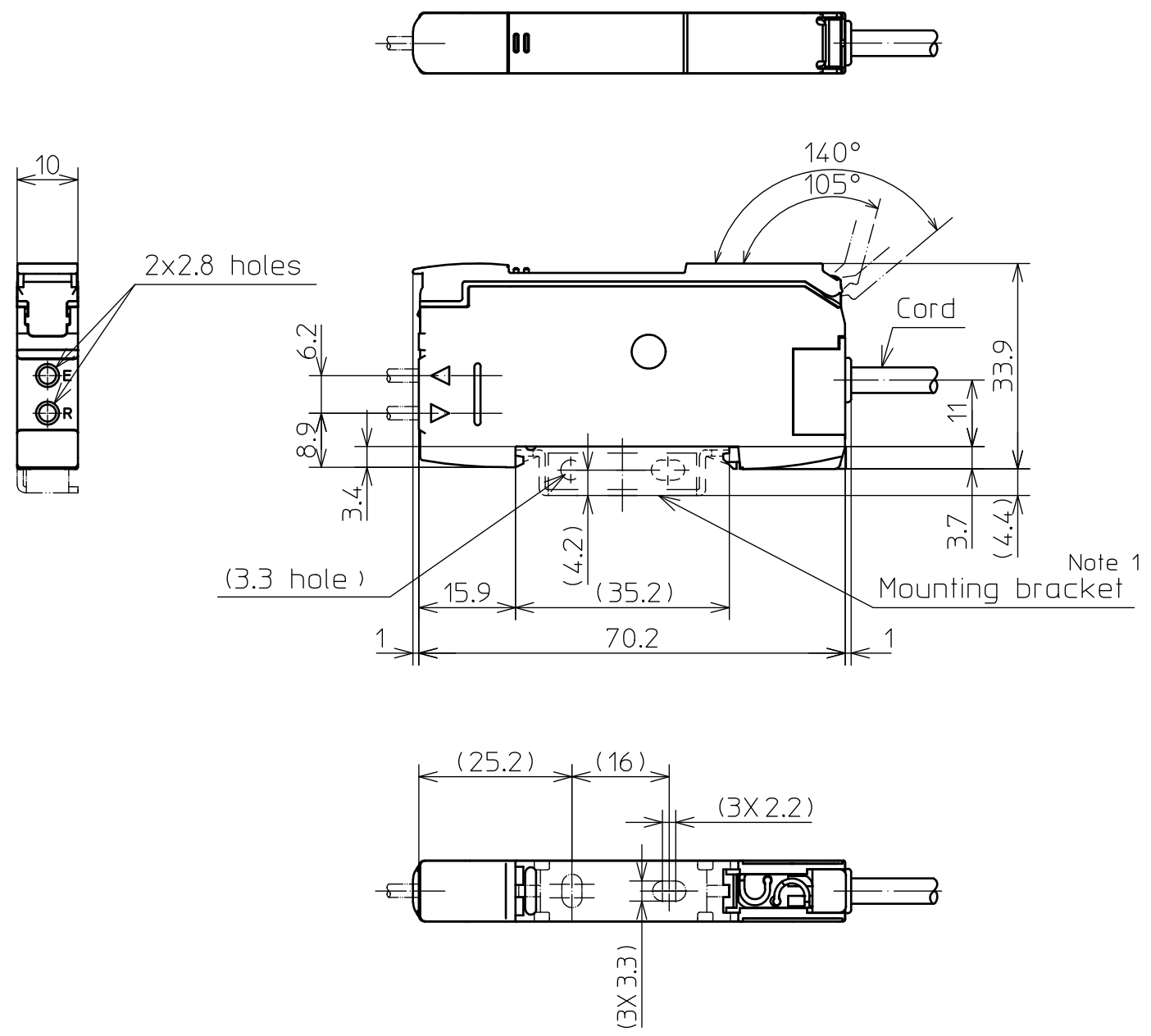
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作成DR. Y.Naozaki Oct.02,'18	照査CHK. S.Nishisaka Oct.02,'18	認可APPD T.Koshi Oct.02,'18	日付DATE	00	CR1811851	Oct.02. '18	Y.N.	S.N.	照査CHK.	尺 寸 SCALE	記 入 の 不 公 差 TOL. UNLESS NOTED
形 番 HPX-EG50-*S Series		MODEL HPX-EG51-*S Series		名 称 NAME		Photoelectric switch		図 番 NO.		CS000280	
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□Dimensions
 ・HPX-EG50-1S / HPX-EG50-2S
 ・HPX-EG51-1S / HPX-EG51-2S



Catalog listing	Cord length
HPX-EG5*-S	1000min.
HPX-EG5*-S-L02	2000min.
HPX-EG5*-S-L05	5000min.

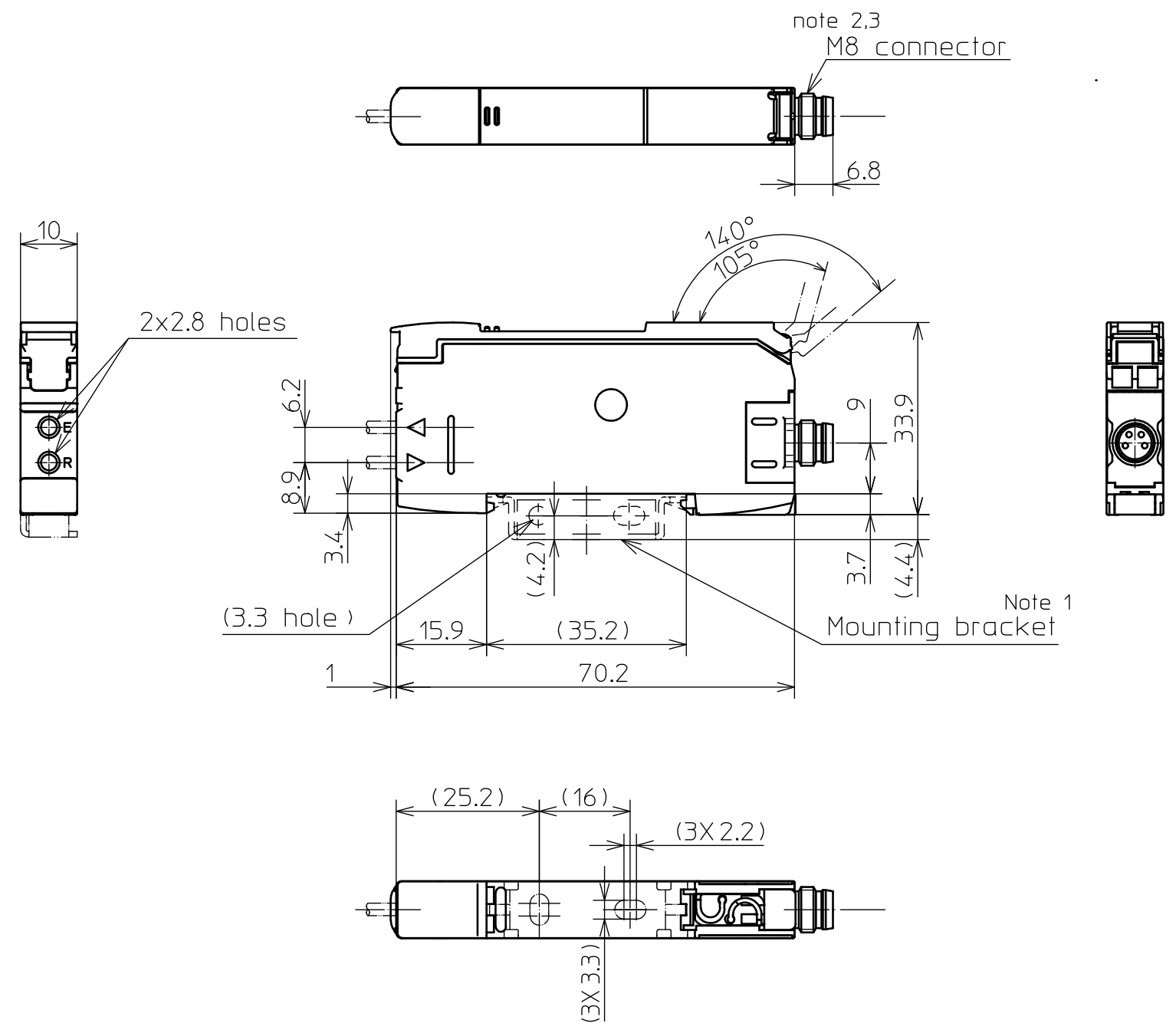
Note 1 Mounting bracket (HPX-PA04) is optional part.
 (Mounting bracket :Stainless steel t1)

≤3	≤6	≤30	≤120
±0.2	±0.3	±0.5	±0.8

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- ・HPX-EG50-1S-CT / HPX-EG50-2S-CT
- ・HPX-EG51-1S-CT / HPX-EG51-2S-CT



- Note 1 Mounting bracket (HPX-PA04) is optional part.
M8 connector's lock ring may be interfered with a nearby wall depend on the sensor mounting position.
(Mounting bracket :Stainless steel t1)
- 2 Please use the M8 connector or $\phi 8$ snap-in connector / female / 4 contacts (IEC 61076-2-101).
 - 3 Screw the coupling by hand.(0.3 to 0.4N·m)
 - 4 If the outside diameter of the attached cable plug is larger than 10mm, multiple units of this product cannot be tightly mounted side by side.

≤3	≤6	≤30	≤120
±0.2	±0.3	±0.5	±0.8

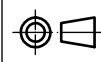
作成DR. Y.Naozaki Oct.02,'18	照査CHK. S.Nishisaka Oct.02,'18	認可APPD T.Koshi Oct.02,'18	日付DATE	00	改番REV.	来歴RECORD	日付DATE	担当BY	照査CHK.	形番MODEL HPX-EG50-*S Series HPX-EG51-*S Series	名称NAME Photoelectric switch	図番NO. CS000280	改番REV. 00	3/
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SP. No.

□Common specifications (all models)

Catalog listing	Standard	HPX-EG50-1S	HPX-EG50-2S	HPX-EG51-1S	HPX-EG51-2S
	M8 connector	HPX-EG50-1S-CT	HPX-EG50-2S-CT	HPX-EG51-1S-CT	HPX-EG51-2S-CT
Scanning type		Fiber optic			
Supply voltage		12 to 24VDC +10% / -15% (ripple 10% max.)			
Power consumption		750mW max. (30mA max. at 24VDC)			
Scanning distance (Max. tuning) (Note 1)	Fast "Ft4"	350mm (Fiber HPF-T003)			
	Semi Fast "SF4"	640mm (Fiber HPF-T003)			
	Normal "nL4"	800mm (Fiber HPF-T003)			
	High Power "HP4"	940mm (Fiber HPF-T003)			
Hysteresis		20% max. of scanning distance			
Operating mode		Convertible light operated / dark operated (selectable)			
Output type		Open collector of NPN transistor (N-MOS FET is used for output device)	Open collector of PNP transistor (P-MOS FET is used for output device)	Open collector of NPN transistor (N-MOS FET is used for output device)	Open collector of PNP transistor (P-MOS FET is used for output device)
Output	Load current	Standard, M8 connector : 100mA max.(resistive load)			
	Output withstand voltage	26.4V			
	saturation voltage (Note 2)	2V max.	3V max.	2V max.	3V max.
	short circuit protection	Yes			
Remote tuning	Tuning ON (Note 3)	0 to 2V DC		7.2 to 26.4V DC	
	Tuning OFF	Open or connect to power supply voltage		Open or connect to 0 to 1V DC	
Response time (Switching ON and OFF)	Fast	250 μs max.			
	Semi Fast (Note 4)	500 μs max.			
	Normal (Note 4)	1ms max.			
	High Power	5ms max.			
Timer function (Note 5)		On-delay / Off-delay (1ms to 10ms (1ms step), 20ms to 100ms (10ms step), 200ms to 1s (100ms step), 2s to 5s (1s step))			

- Note 1 The scanning distance will be decreased by 20% according to the state of connection to amplifier or cutting of the optical fiber.
 2 This is the saturation voltage when the rated load current is flowing.
 3 Short circuit current : 0.1mA max.
 4 These response times are for emission frequency Fr-1.
 If Fr-2 is selected there is a 20 % delay in the response.
 5 Response time is not included.

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照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL	HPX-EG50-*S Series HPX-EG51-*S Series	
認可APPD T.Koshi Oct.02,'18	名称 NAME	Photoelectric switch	
日付DATE	図番 NO.	CS000280	改番REV. 00 / 4
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SP. No.

Catalog listing	Standard	HPX-EG50-1S	HPX-EG50-2S	HPX-EG51-1S	HPX-EG51-2S
	M8 connector	HPX-EG50-1S-CT	HPX-EG50-2S-CT	HPX-EG51-1S-CT	HPX-EG51-2S-CT
Light source	Red LED (660nm)				
Digital display	Receiving light level (red) , Set value (green) , Tuning method and the other (Note 1)				
Indicator	Output indicator (Turn on with output on), STA indicator (lit during STA operation, blinking at the alarm correction limit)				
Protection	False pulse protection (300ms typ.) Reverse polarity protection				
Material	Case	PC resin / black			
	Control panel cover	PC resin / clear gray			
EMC: EMC Directive (2014/30/EU), Applied harmonized standard: EN60947-5-2:2007+A1:2012					
EMS (Electromagnetic susceptibility)					
Electro discharge		Contact:Level3 (6kV), Air:Level3 (8kV) (IEC61000-4-2:2008)			
Radiated RF electromagnetic fields		Level3 (10V/m : 80MHz to 1GHz, 1.4GHz to 2GHz) (IEC61000-4-3:2006+A1:2007+A2:2010)			
Electrical fast transients		DC power ports:Level3 (2kV / 5kHz), Signal ports:Level4 (2kV / 5kHz) (IEC61000-4-4:2012)			
Conducted disturbances induced by RF fields		Level3 (10V : 150kHz to 80MHz) (IEC61000-4-6:2013)			
Power frequency magnetic field		Level4 (30A/m : 50Hz, 60Hz) (IEC61000-4-8:2009)			
EMI (Electromagnetic interference)					
Emission		Group1 ClassA (CISPR11:2009+A1:2010)			
Ambient light	Incandescent light 5000lx max.(Fiber HPF-T003) / Sunlight 20000lx max. (Fiber HPF-T003)				
Operating temperature	-20 to +55℃ (Note 2)				
Storage ambient temperature	-20 to +70℃				
Humidity	35 to 85%RH (no condensation allowed)				
Insulation resistance	20MΩ min, (at 500VDC)				
Dielectric strength	1000VAC 50/60Hz 1 minute				
Vibration	10 to 55Hz, 1.5mm double amplitude, 2 hours in each direction of X,Y,Z				
Shock	500m/s ² , 3 times in each direction of X,Y,Z				
Sealing	IP40 (IEC standard) (Note3)				

Note 1 Make reference to the operation manual.

2 The following ambient temperature ranges are applied when the controls are used in gang-mounting method.

- 1 to 2 units : -20 to +55℃
- 3 units : -20 to +50℃
- 4 to 5 units : -20 to +45℃
- 6 to 16 units : -20 to +40℃

3 Degree of protection of this product is IP40.

Execute an appropriate defence when using it in the environment of 'Pollution degree 3'.

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照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL	HPX-EG50-*S Series HPX-EG51-*S Series	
認可APPD T.Koshi Oct.02,'18	名称 NAME	Photoelectric switch	
日付DATE	図番 NO.	CS000280	改番REV. 00 / 5
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□ Specifications for individual models
 ・ Standard

Catalog listing	HPX-EG50-1S	HPX-EG50-2S	HPX-EG51-1S	HPX-EG51-2S
Mass	Approx. 45g (only sensor with cord 1m)			
Wiring type	Prewired			
Cord	Kind of cord : Oil resist, Outer sheath dia : ϕ 4.2, Color : Gray Lead insulation dia. : ϕ 1.2 \times 3, Conductor cross-section : 0.2mm ²		Kind of cord : Oil resist, Outer sheath dia : ϕ 4.2, Color : Gray Lead insulation dia. : ϕ 1.2 \times 4, Conductor cross-section : 0.2mm ²	

・ M8 connector

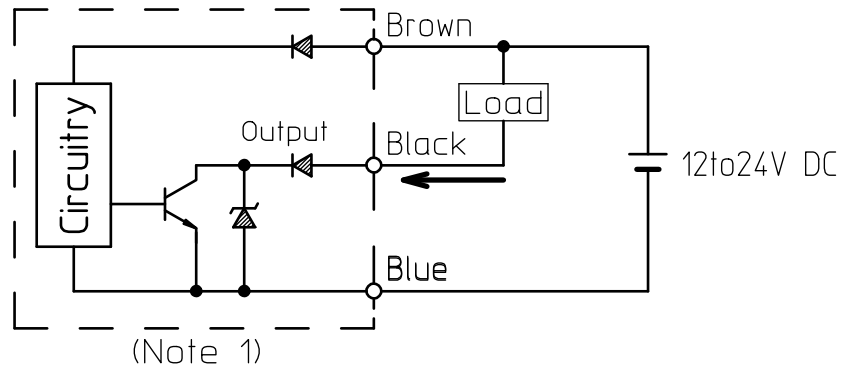
Catalog listing	HPX-EG50-1S-CT	HPX-EG50-2S-CT	HPX-EG51-1S-CT	HPX-EG51-2S-CT
Mass	Approx. 20g (only sensor)			
Wiring type	connector			
Material of connector	Receptacle housing	Ni plated brass		
	Contact	Au plated brass		
Cycle of insertion and pull of connector	50cycles			

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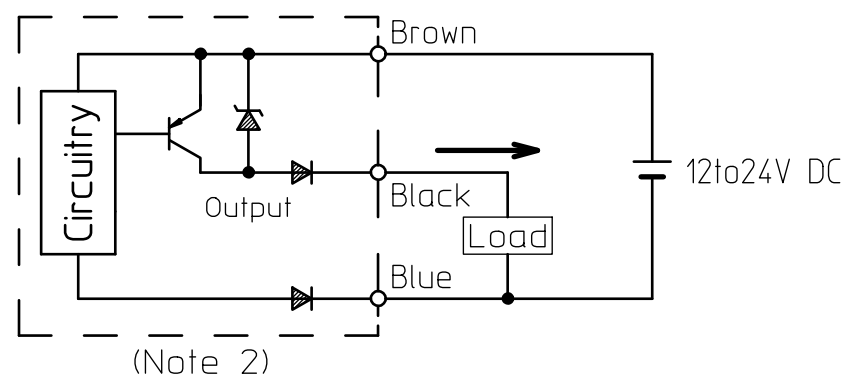
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照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL	HPX-EG50-*S Series HPX-EG51-*S Series	
認可APPD T.Koshi Oct.02,'18	名称 NAME	Photoelectric switch	
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□Connection

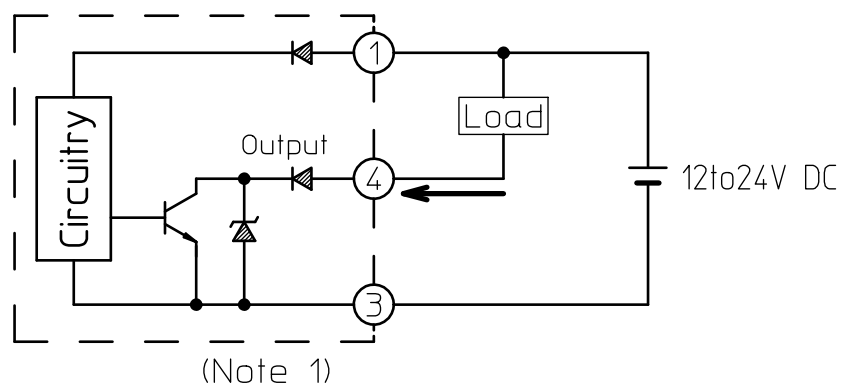
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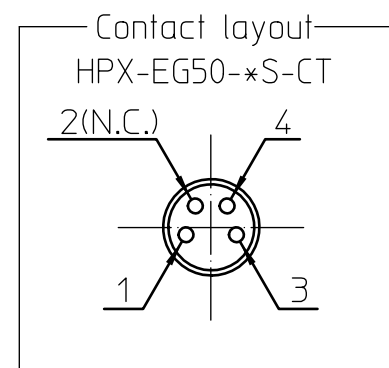
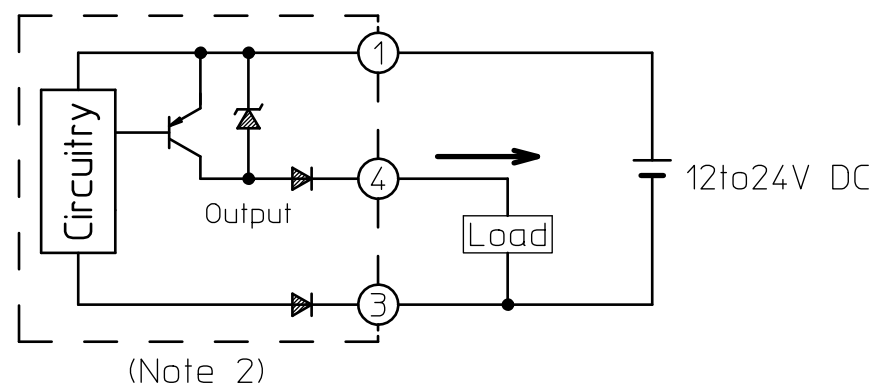
HPX-EG50-2S



HPX-EG50-1S-CT



HPX-EG50-2S-CT



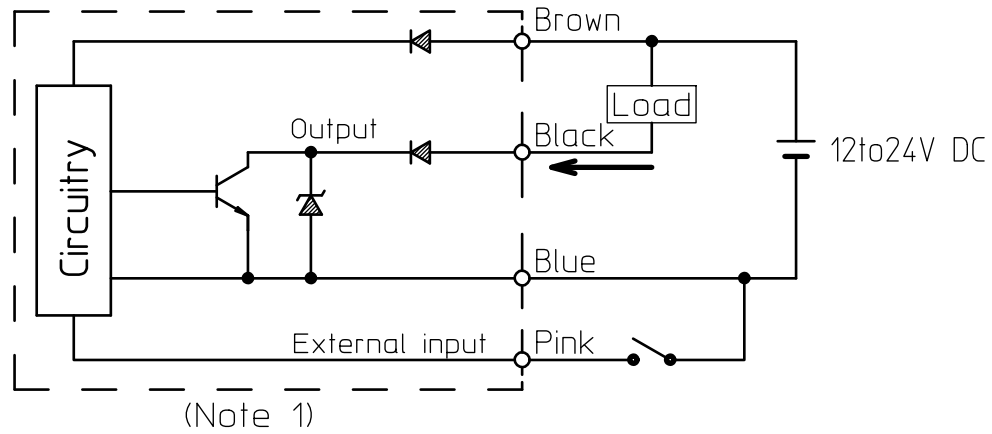
Note 1 N-MOS FET is used for output device.
2 P-MOS FET is used for output device.

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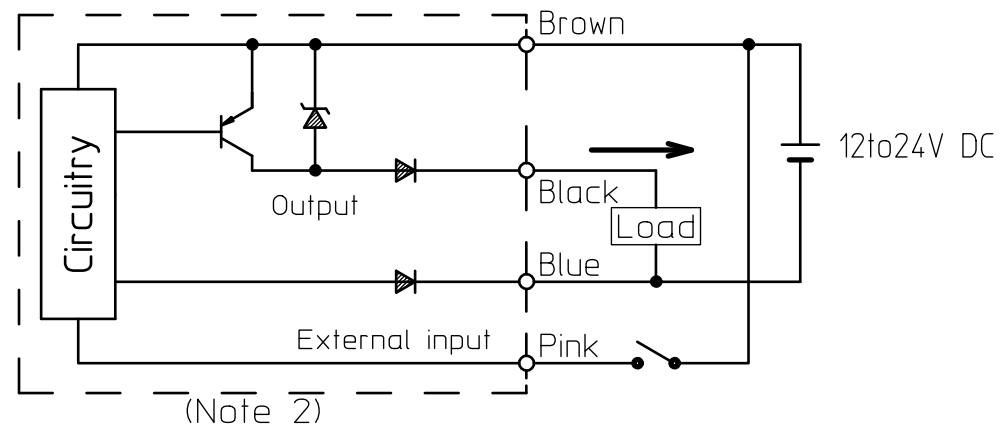
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□Connection

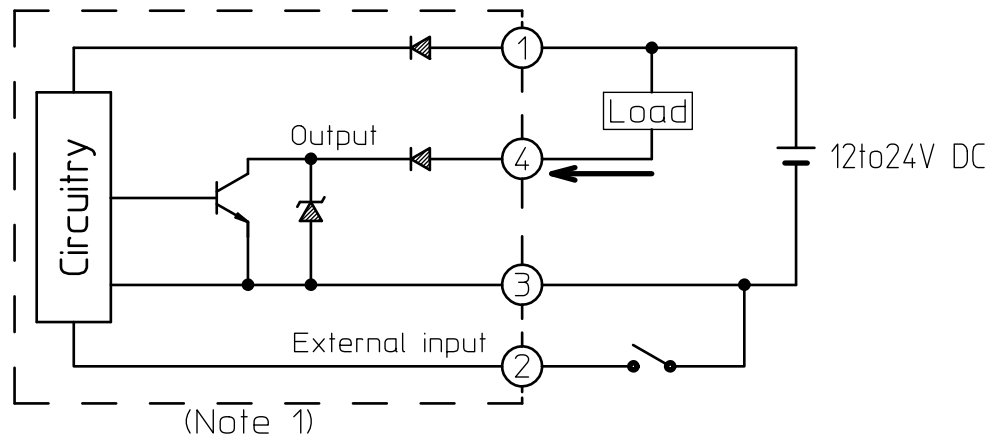
HPX-EG51-1S



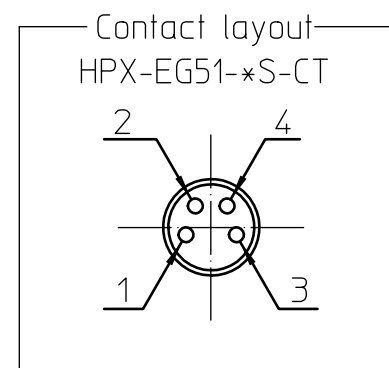
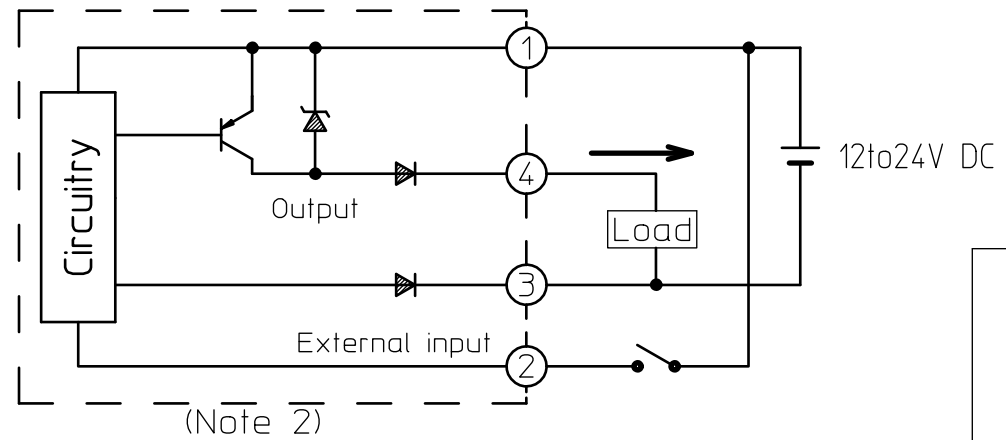
HPX-EG51-2S



HPX-EG51-1S-CT



HPX-EG51-2S-CT



Note 1 N-MOS FET is used for output device.
2 P-MOS FET is used for output device.

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□Functions

Basic instructions for functions such as tuning modes and output timer are given below.
For details, refer to the operation manual.

[Operation mode]

Light-ON or dark-ON can be selected.

[Sensing types]

Sensing types are a combination of a response time and a sensitivity level. There are 4 response times (Ft/SF/nL/HP) and 4 incoming light sensitivity levels (4/3/2/1 in descending order of sensitivity); therefore there are 16 sensing types. If configuration is not possible due to incoming light saturation caused by close-range detection, etc., use a lower sensitivity sensing type (**3/**2/**1) and then do an operational check. (Here "**" stands for Ft, SF, nL, or HP)

- "Ft"
Response time is less than 250 μ s for both operation and recovery.
The display varies from 0 to 1000 depending upon the incoming light level.
- "SF"
Response time is less than 500 μ s for both operation and recovery.
The display varies from 0 to 2000 depending upon the incoming light level.
- "nL"
Response time is less than 1ms for both operation and recovery.
The display varies from 0 to 4000 depending upon the incoming light level.
- "HP"
Response time is less than 5ms for both operation and recovery.
The display varies from 0 to 8000 depending upon the incoming light level.

[Tuning modes]

Tuning mode can be selected from manual tuning, in which settings are changed directly by button operation, 3 types of auto-tuning, and remote tuning. Target detection continues to function during manual tuning, but control output turns OFF during auto-tuning (remote-tuning).

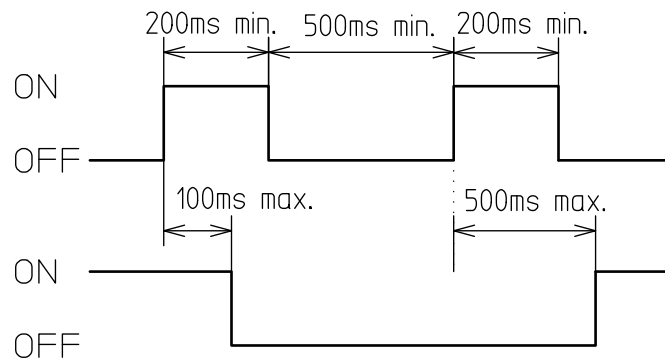
- Manual tuning
Changes the setting by pushing the '+' or '-' button.
(This performs the same tuning operation as the sensitivity adjustment potentiometer on previous models.)
Also, note that manual fine tuning of the sensitivity setting can be done after auto-tuning.
- Auto-tuning
Auto-tuning can be selected from 3 types: 2-point tuning, BGS tuning (maximum sensitivity setting), and percent tuning. During auto-tuning, the optimal sensitivity level for the incoming light is automatically set by the automatic sensitivity switching. However, if a fixed sensitivity is desired for auto-tuning, the automatic sensitivity switching can be disabled by the Option setting.
- 2-point tuning
After detection with the workpiece present and absent, the middle point between the 2 is used as the set value.
When the difference in received light level between the 2 points is small or when absolute light level is low, a setting error may occur. In this case, check the sensor installation conditions, and then carry out the auto tuning again.
- BGS tuning (maximum sensitivity setting)
For a diffuse-scan fiber unit with no workpiece present, the maximum value at which the background is not detected is used as the set value. If BSG tuning is executed for a diffuse scan fiber unit without a background or target object present, or a thru-scan fiber unit with a target object present, the value can be set at the low limit (maximum sensitivity setting).
- Percent tuning
Uses a specified percentage (10% to 200%) of the incoming light level as the set value.
If setting at the specified percentage is not possible, a setting error will occur. In this case, change the sensor's installation conditions or the specified percentage, and then carry out the auto tuning again.

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• Remote tuning (HPX-EG51 only)
Auto-tuning can be executed by an external remote input signal. The result of auto-tuning will be the same as for the most recent button-operated auto-tuning operation. If the remote tuning function is not needed, cut the external input cable or connect it to the plus (+) terminal of the power supply (NPN output models), or connect it to the minus (-) terminal of the power supply (PNP output models).

2-point tuning

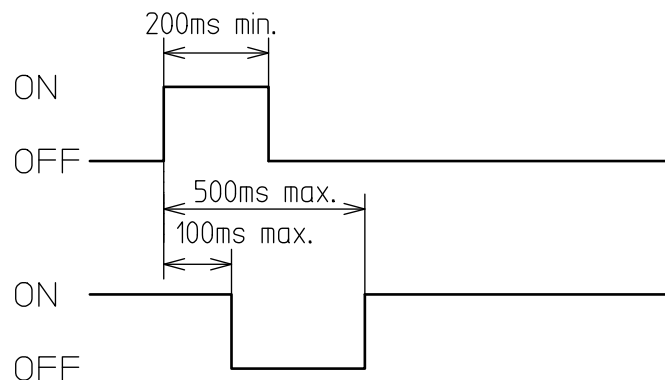
• Remote tuning input signal



• Control output
(When the target is detected always)

BGS tuning (maximum sensitivity setting)
Percent tuning

• Remote tuning input signal



• Control output
(When the target is detected always)

[Self Threshold Adjustment (STA)]

This function automatically adjusts the detection threshold using a given ratio of the threshold to the incoming light level. The auto-adjustment of the threshold is carried out at regular intervals (approx. every 3 s). When STA is enabled, the STA indicator is lit. If the threshold is not adjusted due to the incoming light level falling below the limit, the indicator blinks. When STA is enabled, neither manual tuning nor auto-tuning (remote tuning) is possible. If STA will be used, check its operation in advance. If the incoming light level fluctuates due to a combination of the sensor and a diffuse scan fiber unit or a slow workpiece speed, STA may fail to adjust the threshold to the expected one.

• STA reset
The detection threshold can be adjusted at any time by button operation or by external input signals (HPX-EG51 only). During STA reset, if the incoming light level is below the limit, STA reset will not work properly. In this case the STA indicator will blink. In addition, during STA reset, the optimal incoming light sensitivity is automatically applied by the automatic sensitivity switching function.

[Timer]

Two output timer functions are available: on-delay and off-delay. The time range for each timer is from 1ms to 5 s.

[Incoming light level display]

Two methods of displaying incoming light level on the digital display can be selected.

- Normal display (initial mode)
Displays the current incoming light level (red) and the set value (green).
- Stability safety margin indication
The letter P (green) and the ratio (in %) of the incoming light level (red) to the detection threshold are displayed.

[Inverting the display direction]

This function flips the digital display upside down. Set it as appropriate for the mounting direction.

[Emission frequency switching]

The emitter LED frequency can be selected from Fr-1 and Fr-2 (when "nL*" or "SF*" is selected). Even if fiber units are next to each other, mutual interference can be prevented for up to 2 units by selecting different frequencies. However, the response time of Fr-2 is slower than that of Fr-1 by 20 %. In addition, if there is mutual interference, the response time may not meet the specifications.

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照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL HPX-EG50-*S Series HPX-EG51-*S Series	名称 NAME Photoelectric switch	図番 NO.	CS000280	改番REV.	00	10/
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[Option]

Option settings allow a combination of automatic sensitivity switching, saving to EEPROM, and enabling/disabling STA reset.

- EEPROM storage
Settings modified by remote tuning and STA are stored in EEPROM. When the function is enabled, settings are stored in EEPROM. When the function is disabled, settings are not stored in EEPROM. If writing to EEPROM would be very frequent, select "disabled."
(Durability: approx. 200,000 erase-write cycles)
- STA reset upon power-up
STA reset upon power-up is reset when the power is turned on.

	Automatic sensitivity switching	EEPROM storage	STA reset upon power-up
Option 1	Valid	Valid	—
Option 2	—	Valid	—
Option 3	Valid	—	—
Option 4	—	—	—
Option 5	Valid	—	Valid
Option 6	—	—	Valid

[Monitor sleep]

This function turns off the digital display to reduce the power consumption if no button is pushed for more than 20s.

[Key lock]

This function disables the buttons to prevent accidental changes in the settings. External input signals can be used when the key lock is ON.

[Initialization]

All settings can be restored to their default values before shipment from the factory.

▫Amplifier cautions

- Output is disabled upon power-up for approx. 300ms so the unit can stabilize.
- Use a hood or change the mounting direction to ensure the sensor's correct operation if interference from ambient light is considerable.
- Care should be taken so that organic solvents, such as paint thinner, water, oil, or grease, do not splash the amplifier directly.
- The detection distance or display value may vary depending on variations in the individual amplifier, installation circumstances, and/or type of fiber unit.
- When using a commercially available switching regulator, ground the FG (frame ground) and G (ground) terminals. Otherwise switching noise may cause incorrect operation.
- When using a load which generates an inrush current, connect a currentlimiting resistor between the load and the output terminal to avoid activating the short-circuit protection.
- Set the incoming light level so that it will be below the saturation point.
- This device has an IP40 seal. If it is used at Pollution degree 3, take appropriate protective measures.
- While shutting down the power supply the output pulse may occur. Therefore, cut out the load or cut off the load side power supply beforehand.
- Degree of protection of this product is IP40. Execute an appropriate defence when using it in the environment of 'Pollution degree 3'

▫Wiring cautions

- Do not apply a voltage exceeding the rated power of this product.
- The cord may break if it is pulled with over 50N.
- Do not bend the part of the cord nearest to the amplifier with less than a minimum bend radius of 30mm, and avoid continuous bending stress.
- If an extension of the cable is necessary, use a wire that is at least 0.3mm² in cross-sectional area with a maximum length of 30m.
- Route the wires of the sensor separately from power lines or through an exclusive conduit. Otherwise induction may cause incorrect operation or damage.

						作成DR. Y.Naozaki Oct.02,'18		尺度SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
						照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL	HPX-EG50-*S Series HPX-EG51-*S Series		
						認可APPD T.Koshi Oct.02,'18	名称 NAME	Photoelectric switch		
00						日付DATE	図番 NO.	CS000280	改番REV. 00	11
改番 REV.	来歴 RECORD	日付 DATE	担当 BY	照査 CHK.						

S.P.No.

Product revision change record

	Date	Catalog listing	Product rev. No.	Content of change
1	Oct. 02, '18	All	01	New issue

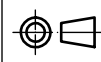
Product revision

The 2-digit product revision number is shown after the country of origin on the case.

Example: MADE IN JAPAN 01
 └──────────┬──┘ Product revision number
 └──────────┘ Country of origin

Catalog listing	Product rev. No.
HPX-EG5 0-1S (-L*)	01
HPX-EG5 0-2S (-L*)	01
HPX-EG5 0-1S-CT	01
HPX-EG5 0-2S-CT	01
HPX-EG5 1-1S (-L*)	01
HPX-EG5 1-2S (-L*)	01
HPX-EG5 1-1S-CT	01
HPX-EG5 1-2S-CT	01

00	~		
改番 REV.	来歴 RECORD	: 日付 DATE	担当 BY 照査 CHK.

作成DR. Y.Naozaki Oct.02,'18		尺度SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
照査CHK. S.Nishisaka Oct.02,'18	形番 MODEL	HPX-EG5 0-*S Series HPX-EG5 1-*S Series	
認可APPD T.Koshi Oct.02,'18	名称 NAME	Photoelectric switch	
日付DATE	図番 NO.	CS000280	改番REV. 00 12/

		SPEC		ページ	
名称		番号		改番	

Terms and Conditions

We would like to express our appreciation for your purchase and use of Azbil Corporation's products.

You are required to acknowledge and agree upon the following terms and conditions for your purchase of Azbil Corporation's products (system products, field instruments, control valves, and control products), unless otherwise stated in any separate document, including, without limitation, estimation sheets, written agreements, catalogs, specifications and instruction manuals.

1 Warranty period and warranty scope

1.1 Warranty period

Azbil Corporation's products shall be warranted for one (1) year from the date of your purchase of the said products or the delivery of the said products to a place designated by you.

1.2 Warranty scope

In the event that Azbil Corporation's product has any failure attributable to azbil during the aforementioned warranty period, Azbil Corporation shall, without charge, deliver a replacement for the said product to the place where you purchased, or repair the said product and deliver it to the aforementioned place.

Notwithstanding the foregoing, any failure falling under one of the following shall not be covered under this warranty:

- (1) Failure caused by your improper use of azbil product
(Noncompliance with conditions, environment of use, precautions, etc. set forth in catalogs, specifications, instruction manuals, etc.);
- (2) Failure caused for other reasons than Azbil Corporation's product;
- (3) Failure caused by any modification or repair made by any person other than Azbil Corporation or Azbil Corporation's subcontractors;
- (4) Failure caused by your use of Azbil Corporation's product in a manner not conforming to the intended usage of that product;
- (5) Failure that the state-of-the-art at the time of Azbil Corporation's shipment did not allow Azbil Corporation to predict; or
- (6) Failure that arose from any reason not attributable to Azbil Corporation, including, without limitation, acts of God, disasters, and actions taken by a third party.

Please note that the term "warranty" as used herein refers to equipment-only-warranty, and Azbil Corporation shall not be liable for any damages, including direct, indirect, special, incidental or consequential damages in connection with or arising out of Azbil Corporation's products.

2 Ascertainment of suitability

You are required to ascertain the suitability of Azbil Corporation's product in case of your use of the same with your machinery, equipment, etc. (hereinafter referred to as "Equipment") on your own responsibility, taking the following matters into consideration:

- (1) Regulations and standards or laws that your Equipment is to comply with.
- (2) Examples of application described in any documents provided by Azbil Corporation are for your reference purpose only, and you are required to check the functions and safety of your Equipment prior to your use.

(3) Measures to be taken to secure the required level of the reliability and safety of your Equipment in your use
Although azbil is constantly making efforts to improve the quality and reliability of Azbil Corporation's products, there exists a possibility that parts and machinery may break down.

You are required to provide your Equipment with safety design such as fool-proof design, *1 and fail-safe design *2 (anti-flame propagation design, etc.), whereby preventing any occurrence of physical injuries, fires, significant damage, and so forth. Furthermore, fault avoidance, *3 fault tolerance, *4 or the like should be incorporated so that the said Equipment can satisfy the level of reliability and safety required for your use.

- *1. A design that is safe even if the user makes an error.
- *2. A design that is safe even if the device fails.
- *3. Avoidance of device failure by using highly reliable components, etc.
- *4. The use of redundancy.

3 Precautions and restrictions on application

Azbil Corporation's products other than those explicitly specified as applicable (e.g. azbil Limit Switch For Nuclear Energy) shall not be used in a nuclear energy controlled area (radiation controlled area).

Any Azbil Corporation's products shall not be used for/with medical equipment.

The products are for industrial use. Do not allow general consumers to install or use any Azbil Corporation's product. However, azbil products can be incorporated into products used by general consumers. If you intend to use a product for that purpose, please contact one of our sales representatives.

In addition, you are required to conduct a consultation with our sales representative and understand detail specifications, cautions for operation, and so forth by reference to catalogs, specifications, instruction manual, etc. in case that you intend to use azbil product for any purposes specified in (1) through (6) below.

Moreover, you are required to provide your Equipment with fool-proof design, fail-safe design, anti-flame propagation design, fault avoidance, fault tolerance, and other kinds of protection/safety circuit design on your own responsibility to ensure reliability and safety, whereby preventing problems caused by failure or nonconformity.

- (1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals
- (2) For use of specific purposes, such as:
 - * Nuclear energy/radiation related facilities
[For use outside nuclear energy controlled areas]
[For use of Azbil Corporation's Limit Switch For Nuclear Energy]
 - * Machinery or equipment for space/sea bottom
 - * Transportation equipment
[Railway, aircraft, vessels, vehicle equipment, etc.]

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- * Antidisaster/crime-prevention equipment
 - * Burning appliances
 - * Electrothermal equipment
 - * Amusement facilities
 - * Facilities/applications associated directly with billing
- (3) Supply systems such as electricity/gas/water supply systems, large-scale communication systems, and traffic/air traffic control systems requiring high reliability
 - (4) Facilities that are to comply with regulations of governmental/public agencies or specific industries
 - (5) Machinery or equipment that may affect human lives, human bodies or properties
 - (6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety

4 Precautions against long-term use

Use of Azbil Corporation's products, including switches, which contain electronic components, over a prolonged period may degrade insulation or increase contact-resistance and may result in heat generation or any other similar problem causing such product or switch to develop safety hazards such as smoking, ignition, and electrification.

Although acceleration of the above situation varies depending on the conditions or environment of use of the products, you are required not to use any Azbil Corporation's products for a period exceeding ten (10) years unless otherwise stated in specifications or instruction manuals.

5 Recommendation for renewal

Mechanical components, such as relays and switches, used for Azbil Corporation's products will reach the end of their life due to wear by repetitious open/close operations.

In addition, electronic components such as electrolytic capacitors will reach the end of their life due to aged deterioration based on the conditions or environment in which such electronic components are used.

Although acceleration of the above situation varies depending on the conditions or environment of use, the number of open/close operations of relays, etc. as prescribed in specifications or instruction manuals, or depending on the design margin of your machine or equipment, you are required to renew any Azbil Corporation's products every 5 to 10 years unless otherwise specified in specifications or instruction manuals.

System products, field instruments (sensors such as pressure/flow/level sensors, regulating valves, etc.) will reach the end of their life due to aged deterioration of parts. For those parts that will reach the end of their life due to aged deterioration, recommended replacement cycles are prescribed. You are required to replace parts based on such recommended replacement cycles.

6 Other precautions

Prior to your use of Azbil Corporation's products, you are required to understand and comply with specifications (e.g., conditions and environment of use), precautions, warnings/cautions/notices as set forth in the technical documents prepared for individual Azbil Corporation's products, such as catalogs, specifications, and instruction manuals to ensure the quality, reliability, and safety of those products.

7 Changes to specifications

Please note that the descriptions contained in any documents provided by azbil are subject to change without notice for improvement or for any other reason.

For inquires or information on specifications as you may need to check, please contact our branch offices or sales offices, or your local sales agents.

8 Discontinuance of the supply of products/parts

Please note that the production of any Azbil Corporation's product may be discontinued without notice.

For repairable products, we will, in principle, undertake repairs for five (5) years after the discontinuance of those products. In some cases, however, we cannot undertake such repairs for reasons, such as the absence of repair parts. For system products, field instruments, we may not be able to undertake parts replacement for similar reasons.

9 Scope of services

Prices of Azbil Corporation's products do not include any charges for services such as engineer dispatch service. Accordingly, a separate fee will be charged in any of the following cases:

- (1) Installation, adjustment, guidance, and attendance at a test run
- (2) Maintenance, inspection, adjustment, and repair
- (3) Technical guidance and technical education
- (4) Special test or special inspection of a product under the conditions specified by you

Please note that we cannot provide any services as set forth above in a nuclear energy controlled area (radiation controlled area) or at a place where the level of exposure to radiation is equivalent to that in a nuclear energy controlled area.

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