

## 1. Summary

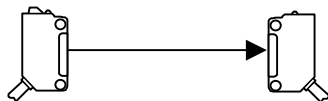
HP7 is a photoelectric switch with built-in amplifier.

Auto adjust button performs sensitivity adjustment automatically.

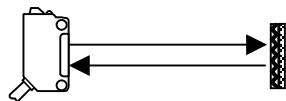
The function which reduces the influence of disturbance lights, such as inverter fluorescent light, is built in.

Mutual interference protection with the different frequency type is prepared for through scan.

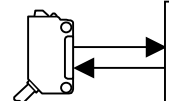
(1) Through scan



(2) Retro-reflective scan



(3) Diffuse scan



## 2. Model number configuration

HP7	-	□	□	□	□
series	-	Scanning type	Scanning distance / Light source	Output mode / Operating mode / Emitter frequency *Note1 *Note2	Connection method *Note3
HP7: Common	-	T: Through scan	1: 15m / Red LED	1: NPN / Dark operate / Standard frequency	■Pre-wired Blank: Cord length 2m min. -L005: Cord length 0.5m min. -L050: Cord length 5m min. ■M12 Pre-wired connector -C003: Cord length 0.3m min. -C005: Cord length 0.5m min. -C010: Cord length 1m min. Quick lock Pre-wired connector -S003: Cord length 0.3m min. -S005: Cord length 0.5m min. -S010: Cord length 1m min. ■M8 connector -T
			2: 15m / Infrared LED	2: PNP / Dark operate / Standard frequency	
			4: 30m / Infrared LED	3: NPN / Light operate / Standard frequency	
			5: 4m / Red LED	4: PNP / Light operate / Standard frequency	
		P: Retro-reflective scan	1: 5m / Red LED	5: NPN / Dark operate / Different frequency	
			5: 3m / Red LED	6: PNP / Dark operate / Different frequency	
		A: Diffuse scan	1: 0.5m / Red LED	7: NPN / Light operate / Different frequency	
			4: 1m / Infrared LED	8: PNP / Light operate / Different frequency	

Note 1 : Operating mode is set at the time of the shipment. It can be changed with the button.

Dark operate: Output is ON when no light is received.

Light operate: Output is ON when light is received.

2 : In case of using through scan type side by side, please use them in the combination of standard frequency and different frequency. Example: Combination of HP7-T11□ and HP7-T15□

3 : List of different connections

Blank : Pre-wired (oil-resistant) / cord length 2m min.

-L\*\*\* : Pre-wired (oil-resistant)

-C\*\*\* : M12 Pre-wired connector

-S\*\*\* : Quick lock Pre-wired connector

-T : M8 connector

\*\*\* : Cord length, Cord length means "\*\*\*. \* (m) min".

作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
日付 DATE	図 番 NO.	AD16695E	改番 REV 03
			1/24

SP.NO.	Azbil Corporation					製品仕様書 SPECIFICATIONS			
	Through scan type Model number								
	Through scan type is a set of Emitter HP7-E□□□ and Receiver HP7-R□□□.								
	Emitter frequency	Scanning distance / Light source	Set		Emitter	Receiver			
	Standard frequency	15m / Red LED	HP7-T11		HP7-E11	HP7-R11			
			HP7-T12			HP7-R12			
			HP7-T13			HP7-R13			
			HP7-T14			HP7-R14			
		15m / Infrared LED	HP7-T21		HP7-E21	HP7-R11			
			HP7-T22			HP7-R12			
HP7-T23			HP7-R13						
HP7-T24			HP7-R14						
30m / Infrared LED		HP7-T41		HP7-E41	HP7-R41				
		HP7-T42			HP7-R42				
		HP7-T43			HP7-R43				
		HP7-T44			HP7-R44				
4m / Red LED		HP7-T51		HP7-E51	HP7-R11				
		HP7-T52			HP7-R12				
		HP7-T53			HP7-R13				
		HP7-T54			HP7-R14				
Different frequency	15m / Red LED	HP7-T15		HP7-E15	HP7-R15				
		HP7-T16			HP7-R16				
		HP7-T17			HP7-R17				
		HP7-T18			HP7-R18				
	15m / Infrared LED	HP7-T25		HP7-E25	HP7-R15				
		HP7-T26			HP7-R16				
		HP7-T27			HP7-R17				
		HP7-T28			HP7-R18				
	30m / Infrared LED	HP7-T45		HP7-E45	HP7-R45				
		HP7-T46			HP7-R46				
		HP7-T47			HP7-R47				
		HP7-T48			HP7-R48				
	4m / Red LED	HP7-T55		HP7-E55	HP7-R15				
		HP7-T56			HP7-R16				
		HP7-T57			HP7-R17				
		HP7-T58			HP7-R18				
					作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
					検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL HP7 series			
					認可 APPD S.Suzuki 4. 20. '12	名 称 NAME Photoelectric switch			
					日付 DATE	図 番 NO. AD16695E		改番 REV. 03	
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.	2 / 24		

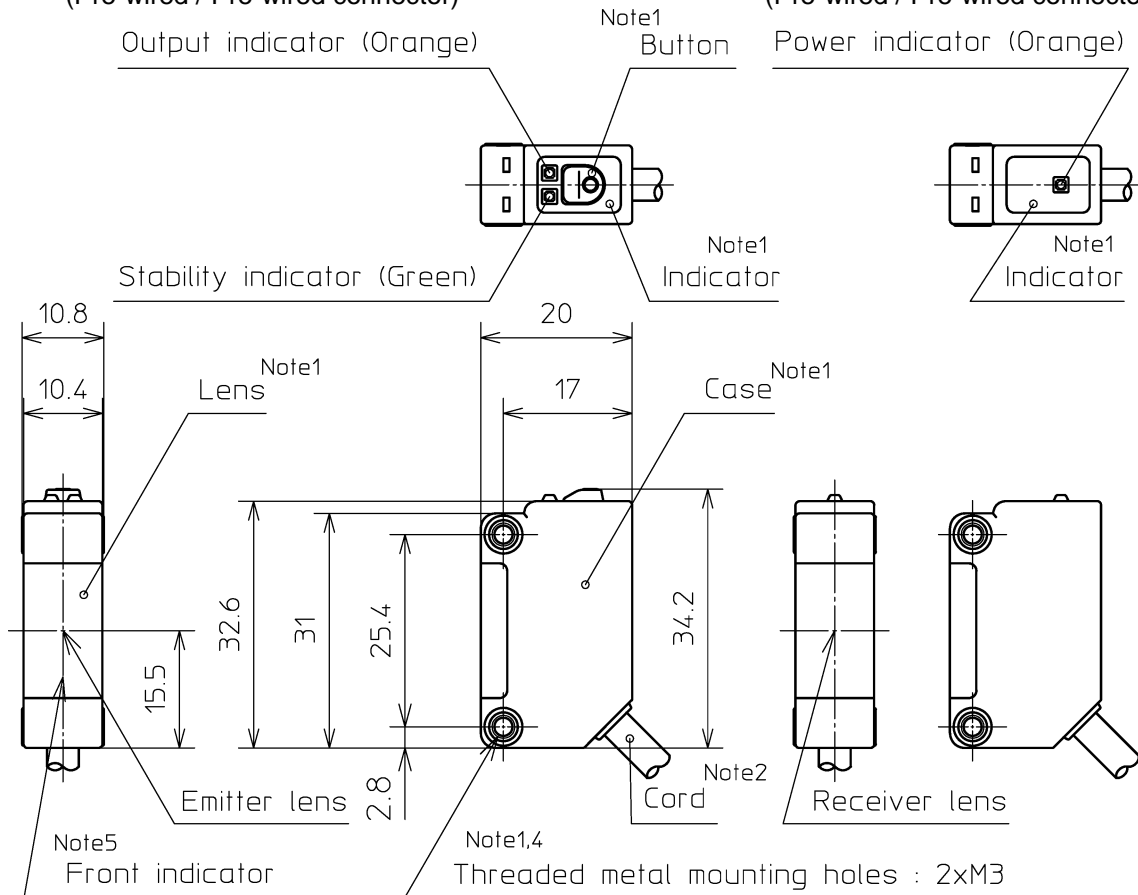
## 3. Dimensions

## (1) Through scan Receiver

(Pre-wired / Pre-wired connector)

## Through scan Emitter

(Pre-wired / Pre-wired connector)



Note 1. Material Case:

PBT / Black (Standard frequency type)  
Gray (Different frequency type)

Lens:

Modified Polyarylate

Indicator:

Modified Polyarylate

Button:

Elastomer / Black

Threaded metal mounting holes:

Brass

## 2. Cord

Outer diameter:

φ 4.2

Rated cross sectional area:

0.2mm<sup>2</sup> (AWG#24)

Sheath:

PVC / Gray (Receiver)

PVC / Black (Emitter)

## 3. Lens Size

6.4x9.2mm

## 4. Please tighten the mounting screw at the torque less than 0.8N·m.

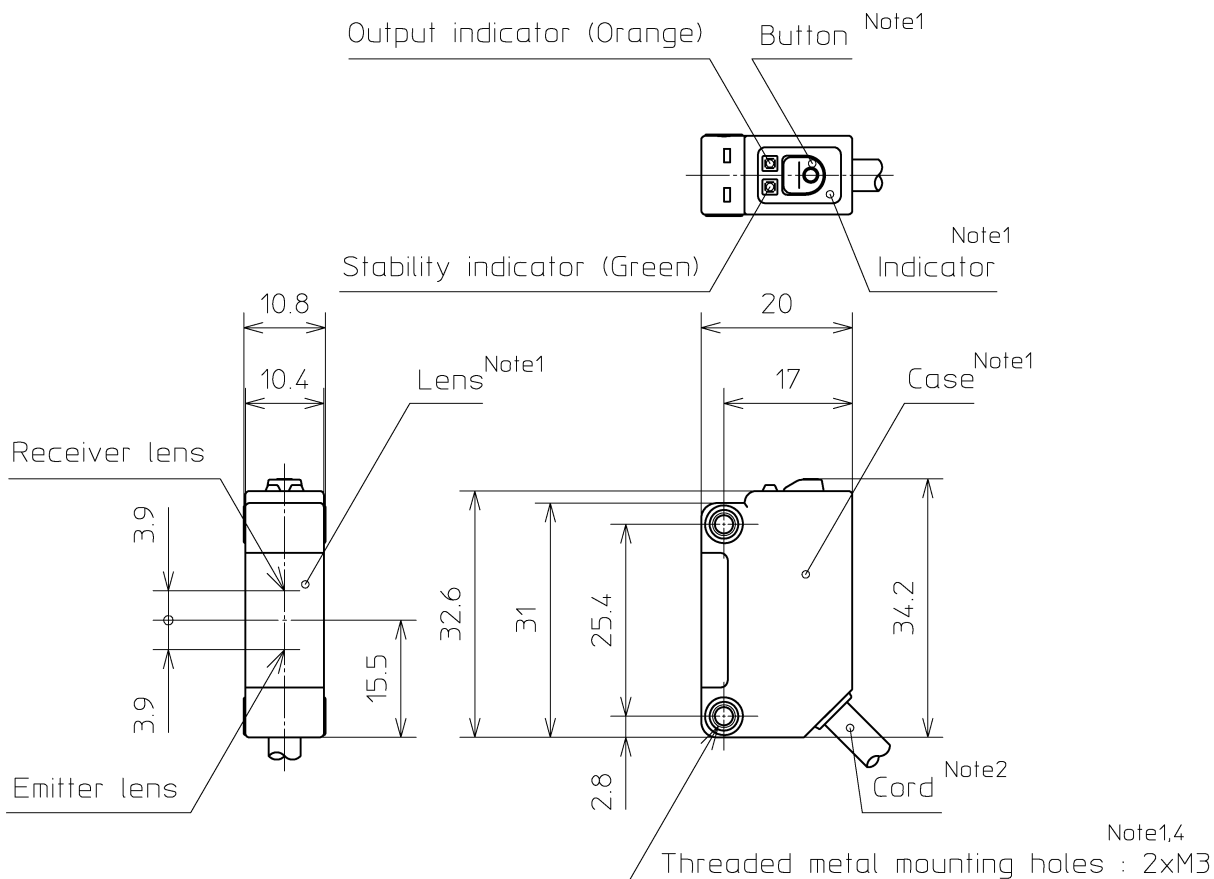
5. Front indicator is carried only in receiver  
(HP7-R4□□) of HP7-T4□□.

Angular	Linear			
~	≤3	≤6	≤30	≤120
±1.5°	±0.2	±0.3	±0.5	±0.8

作成 DR. T.Koike 4. 18. '12	図 1:1	記入のない公差 TOL. UNLESS NOTED See above.
検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series
認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch
日付 DATE	図 番 NO.	AD16695E
改番 REV	改番 REV	3 / 24

SP.NO.

Azbil Corporation

製品仕様書  
SPECIFICATIONS(2) Retro-reflective scan / Diffuse scan  
(Pre-wired / Pre-wired connector)

Note 1. Material Case:

Lens Cover:

Lens:

Indicator:

Button:

Threaded metal mounting holes:

2. Cord

Outer diameter:

Rated cross sectional area:

Sheath:

3. Lens Size

4. Please tighten the mounting screw at the torque less than 0.8N·m.

PBT / Black

PMMA (Retro-reflective scan)

Modified Polyarylate (Diffuse scan)

Modified Polyarylate

Elastomer / Black

Brass

φ4.2

0.2mm<sup>2</sup> (AWG#24)

PVC / Gray

φ7.1 (Retro-reflective scan)

φ9.2 (Diffuse scan)

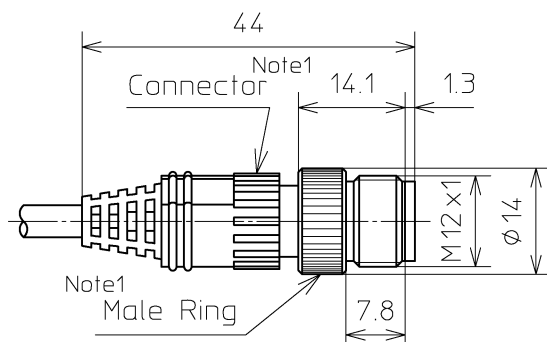
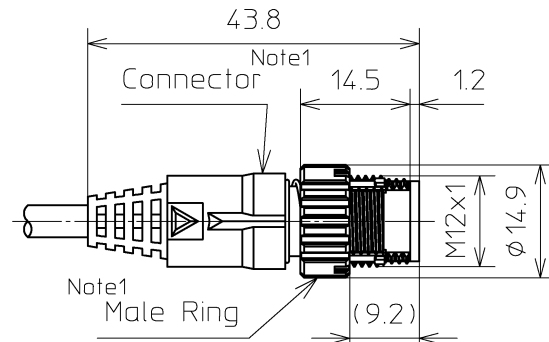
Angular	Linear			
~	≤3	≤6	≤30	≤120
±1.5°	±0.2	±0.3	±0.5	±0.8

作成 DR. T.Koike 4. 18. '12	検図 CHK. M.Tanaka 4. 20. '12	認可 APPD S.Suzuki 4. 20. '12	日付 DATE	図 番 NO.	名称 NAME	形 番 MODEL	HP7 series
尺度 SCALE 1:1				記入のない公差 TOL. UNLESS NOTED See above.			
				Photoelectric switch			
				AD16695E		改番 REV	4 / 24
						03	

頁

改番

改 番  
REV.来 歴  
RECORD日 付  
DATE担当  
BY検 閲  
APPD.

(3) Connector  
HP7-□□□-C\*\*\*  
(M12 Pre-wired connector)HP7-□□□-S\*\*\* Note 5  
(Quick lock Pre-wired connector)

## Applicable cable connector

Applicable cable connector	PA5 series Note 2	PA7 series Note 3, 5
Connection method	Screw connection Note 4	Quick lock connection (Smartclick) / Screw connection Note 4

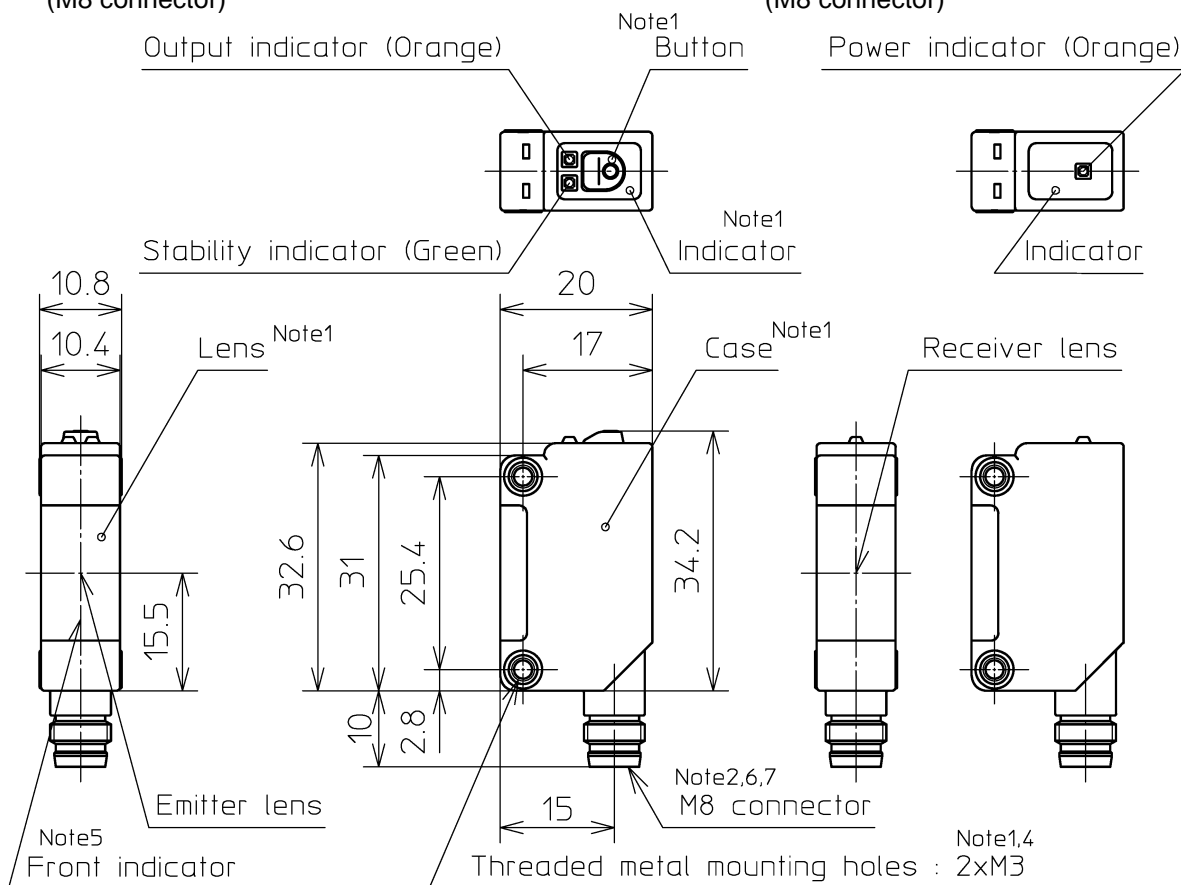
## Note 1. Material

Catalog listing	HP7-□□□-C***	HP7-□□□-S***
Connector	Elastomer / Gray	Elastomer / Gray
Pin	Brass Au Plating	Copper compound metal Au Plating
Male Ring	Brass Ni Plating	Zinc alloy Ni Plating

- For details, please look at the product specification or the PA5 series catalog.
- For details, please look at the product specification or the PA7 series catalog.  
「Smartclick」 is a registered trademark of OMRON Corporation.
- The combination of HP7-□□□-S\*\*\* and PA7 series cable, makes the quick lock connection.  
Other combinations will become screw connections.  
In the case of screw connection, please securely fasten the connector by hand.  
(0.4~0.6N・m)
- Please do not use the connectors in a corrosive environment.  
The corrosion may not allow disconnection.

Angular	Linear			
~	≤3	≤6	≤30	≤120
±1.5°	±0.2	±0.3	±0.5	±0.8

作成 DR. T.Koike 4. 18. '12	検図 CHK. M.Tanaka 4. 20. '12	認可 APPD S.Suzuki 4. 20. '12	日付 DATE	図番 NO.	形番 MODEL	名称 NAME	改番 REV	5/24
尺度 SCALE 1:1				記入のない公差 TOL. UNLESS NOTED See above.				
				HP7 series				
				Photoelectric switch				
				AD16695E				
				03				

(4) Through scan Receiver  
(M8 connector)Through scan Emitter  
(M8 connector)

Note 1. Material

Case:

PBT / Black (Standard frequency type)  
Gray (Different frequency type)

Lens:

Modified Polyarylate

Indicator:

Modified Polyarylate

Button:

Elastomer / Black

Threaded metal mounting holes:

Brass

2. M8 Connector

Connector:

Brass Ni Plating

Pin

Brass Au Plating

3. Lens Size

6.4x9.2mm

4. Please tighten the mounting screw at the torque less than 0.8N·m.

5. Front indicator is carried only in receiver (HP7-R4□□) of HP7-T4□□.

6. Applicable cable connector: M8 connector or  $\phi 8$  snap locking connector / female / 4pins  
(IEC61076-2-104 : 2008)

Recommending cable connector: PA8 series

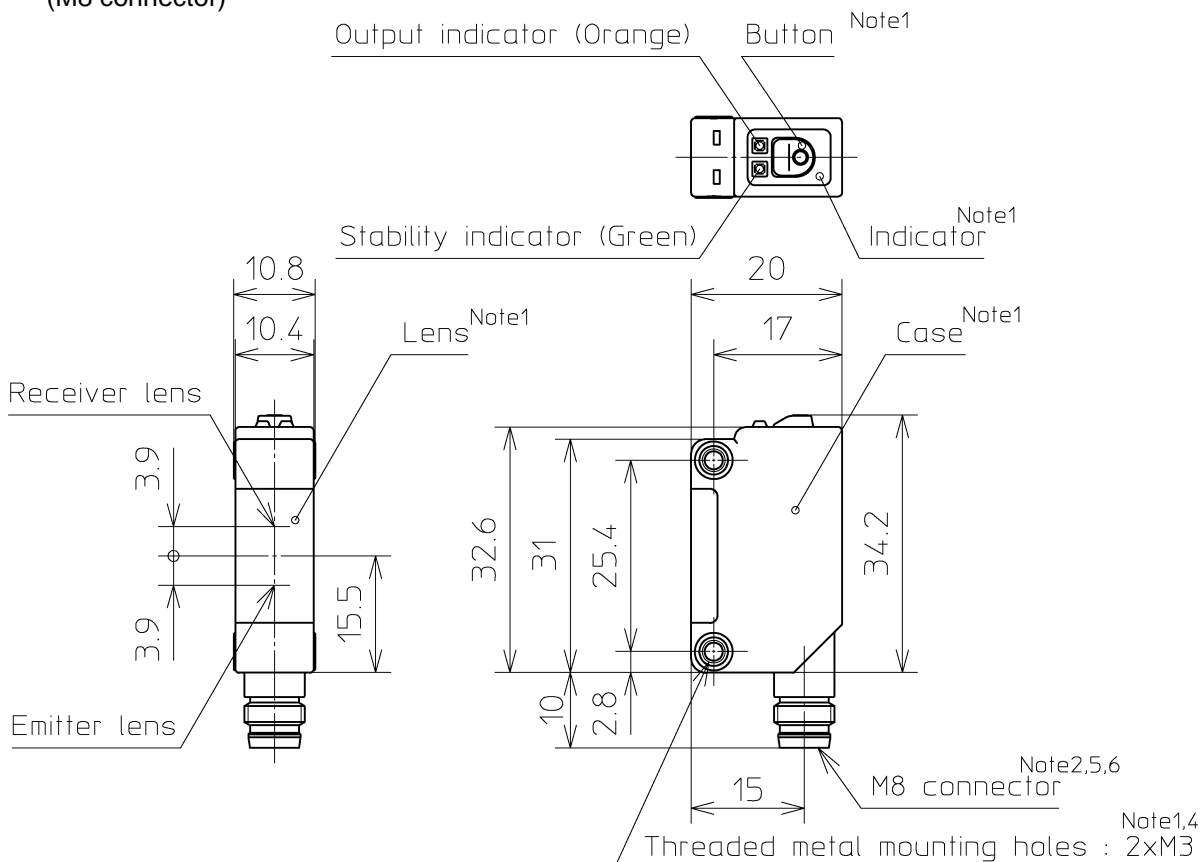
7. Please securely fasten the connector by hand.  
(0.3~0.4N·m)

Angular	Linear			
~	$\leq 3$	$\leq 6$	$\leq 30$	$\leq 120$
$\pm 1.5^\circ$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$

作成 DR. T.Koike 4. 18. '12	図 1:1	記入のない公差 TOL. UNLESS NOTED See above.
検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series
認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch
日付 DATE	図 番 NO.	AD16695E
改番 REV	改番 REV	6 / 24

SP.NO.

Azbil Corporation

製品仕様書  
SPECIFICATIONS(5) Retro-reflective scan / Diffuse scan  
(M8 connector)

## Note 1. Material

Case:

PBT / Black

Lens Cover:

PMMA (Retro-reflective scan)

Lens:

Modified Polyarylate (Diffuse scan)

Indicator:

Modified Polyarylate

Button:

Elastomer / Black

Threaded metal mounting holes:

Brass

## 2. M8 Connector

Connector:

Brass Ni Plating

Pin

Brass Au Plating

## 3. Lens Size

 $\phi 7.1$  (Retro-reflective scan) $\phi 9.2$  (Diffuse scan)

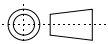
## 4. Please tighten the mounting screw at the torque less than 0.8N·m.

5. Applicable cable connector: M8 connector or  $\phi 8$  snap locking connector / female / 4pins  
(IEC61076-2-104 : 2008)

Recommending cable connector: PA8 series

6. Please securely fasten the connector by hand.  
(0.3~0.4N·m)

Angular	Linear			
~	$\leq 3$	$\leq 6$	$\leq 30$	$\leq 120$
$\pm 1.5^\circ$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$

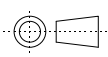
作成 DR. T.Koike 4. 18. '12		尺度 SCALE 1:1	記入のない公差 TOL. UNLESS NOTED See above.	
検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series		
認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch		
日付 DATE	図 番 NO.	AD16695E		改番 REV 03
				7 / 24

頁

改番

改番  
REV.来歴  
RECORD日付  
DATE担当  
BY検閲  
APPD.

SP.NO.	Azbil Corporation					製品仕様書 SPECIFICATIONS																		
	4. Specifications																							
	4.1. Individual specifications																							
	(1) Through scan																							
	Model number	HP7-T1□□		HP7-T2□□		HP7-T4□□		HP7-T5□□																
	Scanning type	Through scan																						
	Scanning distance	15m			30m			4m																
	Target	Opaque materials more than $\phi 12$																						
	Operating angle	2~20°																						
	Current consumption	25mA max. Emitter: 12mA max. Receiver: 13mA max.		30mA max. Emitter: 17mA max. Receiver: 13mA max.		32mA max. Emitter: 17mA max. Receiver: 15mA max.		22mA max. Emitter: 9mA max. Receiver: 13mA max.																
Light source	Red LED (wavelength 645nm)		Infrared LED (wavelength 860nm)				Red LED (wavelength 645nm)																	
Front indicator	No				Yes		No																	
(2) Retro-reflective scan																								
Model number	HP7-P1□□			HP7-P5□□ *Note																				
Scanning type	Retro-reflective scan																							
Scanning distance	0.05~5m (Reflector: FE-RR22)				0.05~3m (Reflector: FE-RR8)																			
Target	Opaque materials more than $\phi 80$ (Reflector: FE-RR22)				Opaque materials more than $\phi 80$ (Reflector: FE-RR8)																			
Operating angle	The main body: 0.5~10°																							
Current consumption	14mA max.																							
Light source	Red LED (wavelength 645nm)																							
Note: Using this type when detecting highly reflective objects or objects that disrupt polarization (ex.: object covered with transparent film).																								
(3) Diffuse scan																								
Model number	HP7-A1□□			HP7-A4□□																				
Scanning type	Diffuse scan																							
Scanning distance	0.5m			1m																				
Target	White paper 200x200mm (90% of reflectance)																							
Hysteresis	20% max.																							
Current consumption	14mA max.				17mA max.																			
Light source	Red LED (wavelength 645nm)				Infrared LED (wavelength 860nm)																			
<table border="1"> <tr> <td>作成 DR. T.Koike 4. 18. '12</td> <td></td> <td>尺度 SCALE ~</td> <td>記入のない公差 TOL. UNLESS NOTED ~</td> </tr> <tr> <td>検図 CHK. M.Tanaka 4. 20. '12</td> <td colspan="3">形 番 MODEL HP7 series</td> </tr> <tr> <td>認可 APPD S.Suzuki 4. 20. '12</td> <td colspan="3">名 称 NAME Photoelectric switch</td> </tr> <tr> <td>日付 DATE</td> <td>図 番 NO. AD16695E</td> <td>改番 REV 03</td> <td>8 / 24</td> </tr> </table>									作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL HP7 series			認可 APPD S.Suzuki 4. 20. '12	名 称 NAME Photoelectric switch			日付 DATE	図 番 NO. AD16695E	改番 REV 03	8 / 24
作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~																					
検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL HP7 series																							
認可 APPD S.Suzuki 4. 20. '12	名 称 NAME Photoelectric switch																							
日付 DATE	図 番 NO. AD16695E	改番 REV 03	8 / 24																					
頁 改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.																			

SP.NO.	Azbil Corporation					製品仕様書 SPECIFICATIONS					
	4.2. General specifications										
	Item		Specifications								
	Power supply voltage		10.2 to 26.4VDC (ripple 10% max.)								
	Output mode		Please also refer to section 2, the model number configuration. Open collector of NPN transistor (Section 5-1) (N-MOS FET is used for output element) Open collector of PNP transistor (Section 5- 2) (P-MOS FET is used for output element)								
	Load current		Pre-wired / Pre-wired connector: 100mA max. (Resistive load) M8 connector: 50mA max. (Resistive load)								
	Saturation voltage		2V max. (at 100mA/50mA load current) 1.1V max. (at 10mA load current)								
	Output withstand voltage		30V								
	Off-state current		Less than 0.1mA								
	Response time *Note1		HP7-□□1□,HP7-□□2□, HP7-□□3□, HP7-□□4□: 1ms max. HP7-T□5□, HP7-T□6□, HP7-T□7□, HP7-T□8□: 3ms max.								
Indicator		Except HP7-E□□□:Orange 'ON' with output / Green 'ON' with stable light and stable dark HP7-R4□□:Front indicator orange 'ON' with light receiving HP7-E□□□:Orange 'ON' with power on									
Ambient light		Incandescent 10,000 lx max. / Sunlight 40,000 lx max. HP7-T□□□,HP7-P□□□: More than incidence angle 5° HP7-A□□□: More than incidence angle 15°									
Operating temperature		-30 to +55°C (without condensation) *Note2									
Humidity		35 to 85%RH (without condensation)									
Storage temperature		-40 to +70°C (without condensation) *Note2									
Insulation resistance		20MΩ min. (at 500VDC)									
Dielectric strength		1000VAC 50/60Hz 1minute (between all terminals connected together and case)									
Vibration		10 to 55Hz 1.5mm double amplitude 2hours in each direction of X,Y,Z									
Shock		500m/s <sup>2</sup> 10times in each direction of X,Y,Z									
Degree of protection		IP67 (IEC standard)									
Protection		False pulse protection (60ms max) Reverse wiring protection Output short circuit protection									
Mass		Approximately 55g (only sensor 2m) Through scan type is simple substance mass of Emitter and Receiver (Total approximately 110g)									
<p>Note 1: For through scan type sensors, the response time may be affected when the mutual interference occurs.</p> <p>2: Standard cord might get hardened under 0°C. Do not bend or apply shock/vibration under 0°C.</p>											
						作成 DR. T.Koike 4. 18. '12		 尺度 SCALE ~		記入のない公差 TOL. UNLESS NOTED ~	
						検図 CHK. M.Tanaka 4. 20. '12		形 番 MODEL		HP7 series	
		03		ECOP13-0937		6.7. '13		T.K.		M.T.	
		02		ECOP13- 0082		3.1. '13		T.K.		M.T.	
		01		ECOP12- 2758		11. 26. '12		T.K.		M.T.	
								認可 APPD S.Suzuki 4. 20. '12		名 称 NAME	
								日付 DATE		図 番	
										NO.	
頁 改番		改 番 REV.		来 歴 RECORD		日 付 DATE		担 当 BY		検 閲 APPD.	
										改番 REV	
										9 / 24	
										AD16695E	
										03	

## 製品仕様書 SPECIFICATIONS

### 4.3. Standard

## EMC Directive

EMC: EMC Directive (2004/108/EC), Applied harmonized standard: EN60947-5-2: 2007

EMS (Electromagnetic susceptibility)

Electro discharge	Contact: 6kV, Air: 8kV (IEC61000-4-2: 1995 + A1: 1998 + A2: 2000)
Radiated RF electromagnetic fields	10V/m: 80MHz to 1GHz, 3V/m: 1.4GHz to 2GHz (IEC61000-4-3: 2006 + A1: 2007)
Electrical fast transients	DC power ports: 2kV/5kHz, Signal ports: 2kV/5kHz (IEC61000-4-4: 2004)
Conducted disturbances induced by RF fields	10V: 150kHz to 80MHz (IEC61000-4-6: 2003 + A1: 2004 + A2: 2006)
EMI (Electromagnetic interference)	
Emission	Group 1 Class A (CISPR11: 2009)

UL Listed Product

UL File No.	E252012	
Enclosure Type	12	
Electrical Ratings	Input	Class2, 10.2-26.4VDC, 120mA (Except HP7-E□□□, HP7-□□□-T) Class2, 10.2-26.4VDC, 70mA (HP7-□□□-T except HP7-E□□□-T) Class2, 10.2-26.4VDC, 20mA (HP7-E□□□)
	Output	Calss2, 30VDC, 100mA, Resistive (Except HP7-E□□□, HP7-□□□-T) Calss2, 30VDC, 50mA, Resistive (HP7-□□□-T except HP7-E□□□-T)
Maximum Ambient temperature	55°C (Pre-wired, M8 connector) 50°C (M12 Pre-wired connector, Quick lock Pre-wired connector)	

In case using as UL Listed Product, please use under the above conditions.

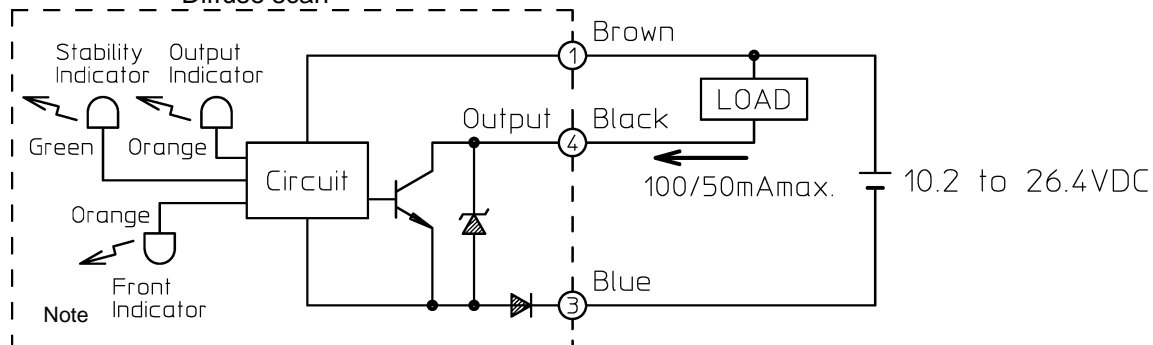
							作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
							検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
		03	ECOP13-0937	6.7. '13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
		02	ECOP13- 0082	3.1. '13	T.K.	M.T.	日付 DATE	図 番 NO.	改番 REV 03	10 / 24
		01	ECOP12- 2758	11. 26. '12	T.K.	M.T.				
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.			AD16695E	

## 5. Wiring

(1) NPN type Through scan receiver

Retro-reflective scan

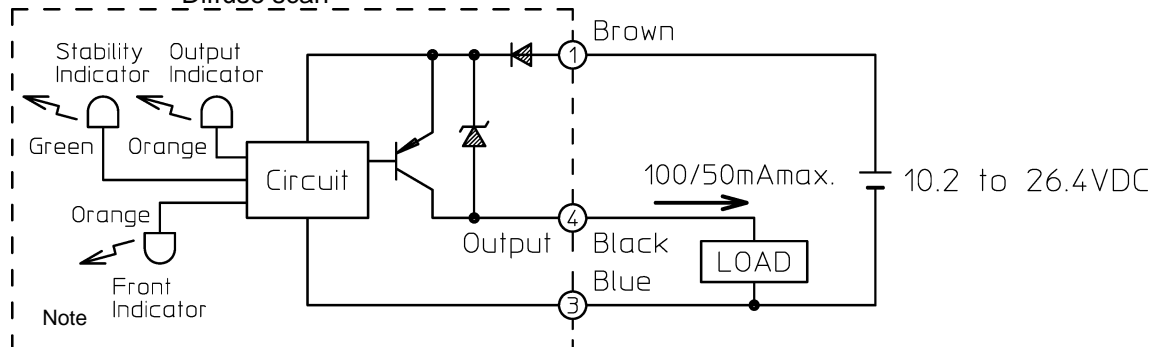
Diffuse scan



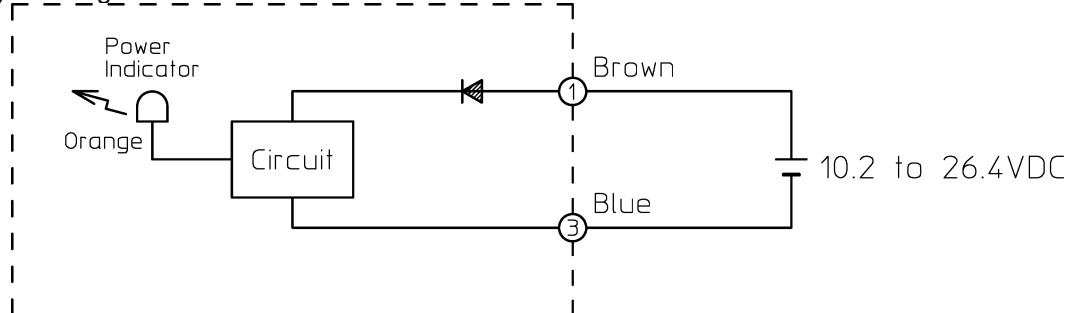
(2) PNP type Through scan receiver

Retro-reflective scan

Diffuse scan

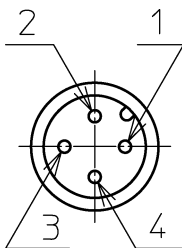
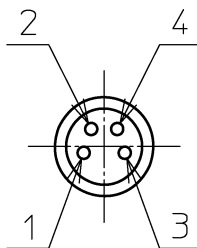


(3) Through scan emitter



Note: Front indicator is carried only in receiver (HP7-R4□□) of HP7-T4□□.

						作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
						検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
						認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
						日付 DATE	図 番 NO.	AD16695E	改番 REV 03
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.			

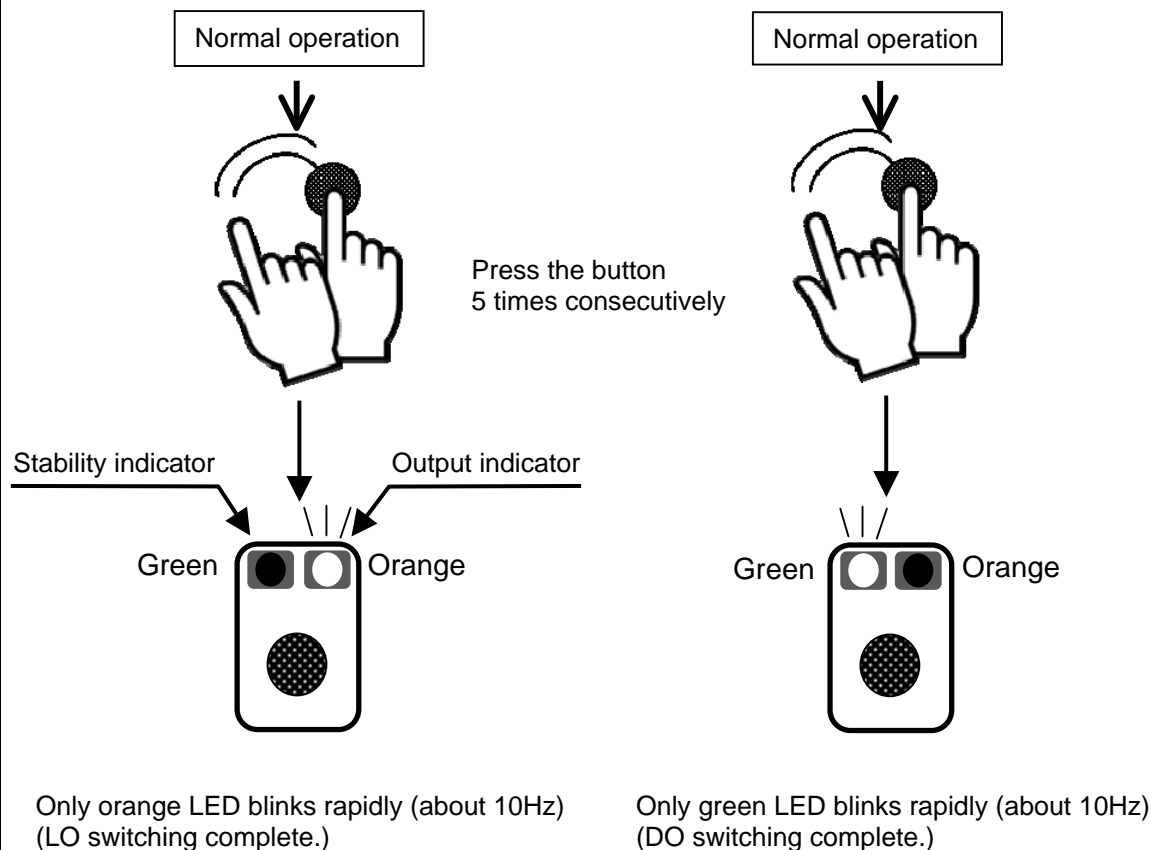
SP.NO.	Azbil Corporation				製品仕様書 SPECIFICATIONS			
	Connector pin layout HP7-□□□-C***、HP7-□□□-S***				HP7-□□□-T			
								
<b>6. Functions</b> This section provides the details of operation.  Operation of Light operate / Dark operate setting 6.1. Light operate / Dark operate switching 6.6. Light operate / Dark operate setting status check Operation of sensitivity adjustment 6.2. Tuning without a workpiece 6.3. 2-point Tuning 6.4. Position tuning 6.5. Default setting (maximum sensitivity) Others 6.7. Solution when indicator flashes repeatedly 6.8. When confused								

## 6.1. Light operate / Dark operate switching

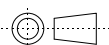
The operating mode is set to default at the factory, but can be changed as outlined below.  
Light operate changes to Dark operate, and Dark operate changes to Light operate.

From Dark operate to Light operate

From Light operate to Dark operate



Setup is complete.  
Normal operation will be restored automatically (in about 2 seconds).

					作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~				
					検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series					
03	ECOP13-0937	6.7.'13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch					
02	ECOP13- 0082	3.1. '13	T.K.	M.T.								
01	ECOP12- 2758	11. 26. '12	T.K.	M.T.								
改 番 REV.	来 歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.	日付 DATE	図 番 NO.	AD16695E			改番 REV	13 / 24	

## 6.2. Tuning without a workpiece

The factory default setting is maximum sensitivity. If the target is not detected consistently at this setting, adjust the sensitivity using the button as described below.

After tuning, check sensor operation with a workpiece.

(1) Through scan

If the target is translucent or has holes or openings that light can pass through, or if indirect sensor beam presents, the target object may not be able to block the sensor beam properly. By following the set up below, the sensitivity is automatically adjusted to trigger the sensor at approximately half the intensity of the light received when there is no target object present.

For through scan, the light intensity may be too strong at the short distances noted below.

This may cause the indicator lamp to flash repeatedly, as described under Indicator lamp flashes repeatedly.

HP7-T1□□, HP7-T2□□: 1 m      HP7-T5□□: 0.3 m

## (2) Retro-reflective scan

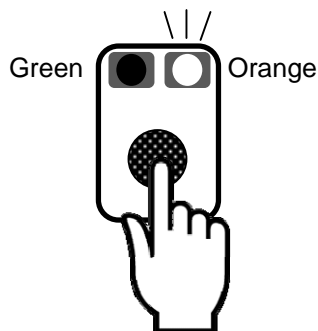
If the target is translucent or has holes or openings that light can pass through, or if indirect sensor beam presents, the target object may not be able to block the sensor beam properly.

By following the set up below, the sensitivity is automatically adjusted to trigger the sensor at approximately half the intensity of the light received when there is no target object present.

(3) Diffuse scan

Use the button in situations where reflection from background is too strong to detect a target.

The sensitivity is automatically adjusted to trigger the sensor at approximately twice the intensity of the light received when there is no target object present.



### Step 1: Entering the sensitivity tuning mode

Press down the button for approximately 2 seconds until the orange LED starts blinking fast (about 10 Hz), and release.



Step 2: Without a target, give the button a short press.

Both LEDs turn OFF.



Setup is complete.

Normal operation will be restored automatically. \*Note1

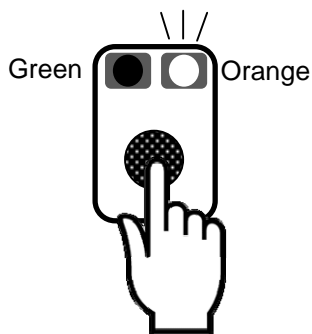
Note1: If the LEDs blink, see 6.7 “Solution when indicator flashes repeatedly”.

							作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
							検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series		
		03	ECOP13-0937	6.7.'13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch		
		02	ECOP13- 0082	3.1. '13	T.K.	M.T.	日付 DATE	図 番 NO.	AD16695E	改番 REV 03	14 / 24
		01	ECOP12- 2758	11. 26. '12	T.K.	M.T.					
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.					

**6.3. 2-point Tuning**

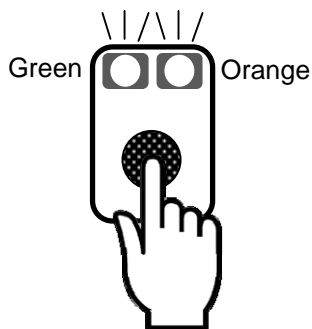
2-point tuning is used in situations when tuning without a workpiece does not provide a stable detection. 2-point tuning automatically sets the light sensitivity to a value mid-way between the state when the target is present and when the target is absent.

After tuning, check sensor operation with a workpiece.



Step 1: Entering the sensitivity tuning mode

Press the button approximately 2 seconds until the orange LED starts blinking fast (about 10Hz), and release.



Step 2: Without a target, press the button approximately 2 seconds until both LEDs start blinking, and release. \*Note1  
(The light intensity without the target is measured.)

Step 3: With a target in place, give the button a short press. \*Note1  
(The light intensity with the target is measured and the 2-point Tuning is done.)

Setup is complete.  
Normal operation will be restored automatically. \*Note2

Note 1: It is OK to reverse the order of the two states (target present / target absent).

2: If the LEDs blink, refer to section 6.7 "Solution when indicator flashes repeatedly".

						作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~		
						検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series			
		03	ECOP13-0937	6.7.'13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch		
		02	ECOP13- 0082	3.1. '13	T.K.	M.T.					
		01	ECOP12- 2758	11. 26. '12	T.K.	M.T.					
頁	改番	改 番 REV.	来歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.	日付 DATE	図 番	AD16695E	改番 REV/ 03	15 / 24
								NO.			

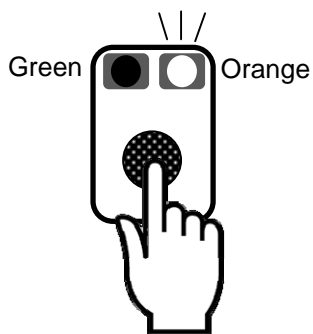
**6.4. Position Tuning (For diffuse scan)**

Position tuning is the procedure for configuring a diffuse scan sensor to detect a target at a specific position. Position tuning has a maximum 15% tolerance.

Applicable distance range:

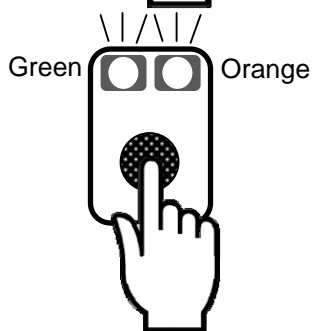
HP7-A1□□: 200mm to 500mm、HP7-A4□□: 200mm to 1000mm

After tuning, check sensor operation with a workpiece.

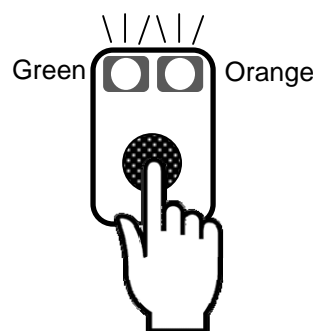


Step 1: Entering the sensitivity tuning mode

Press the button approximately 2 seconds until the orange LED starts blinking fast (about 10Hz), and release.



Step 2: With a target, press the button approximately 2 seconds until both LEDs start blinking fast (about 10Hz), and release.



Step 3: With a target in place, give the button a short press. Both LEDs blink slowly (about 1Hz) \*Note 1

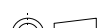


Please give the button a short press.



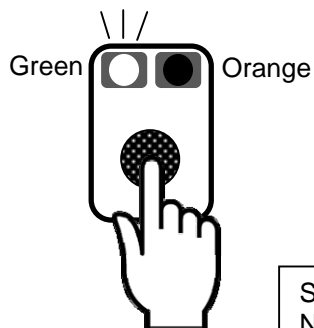
Setup is complete.  
Normal operation will be restored automatically.

Note 1: If only orange LED blinks, refer to section 6.7 "Solution when indicator flashes repeatedly".

					作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~			
					検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series				
03	ECOP13-0937	6.7.'13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch				
02	ECOP13- 0082	3.1. '13	T.K.	M.T.							
01	ECOP12- 2758	11. 26. '12	T.K.	M.T.							
改 番 REV.	来 歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.	日付 DATE	図 番 NO.	AD16695E		改番 REV 03	16 / 24	

**6.5. Default setting (maximum sensitivity)**

The factory default setting is maximum sensitivity. This procedure is used to restore the factory default setting, which may be useful for resolving confusion during the setting procedure. This procedure will restore sensitivity to the factory default setting from any state (irrespective of how the indicator is flashing).



Press the button approximately 7 seconds until the green LED starts blinking fast (about 10Hz).  
(The sensor is set to the default setting.)

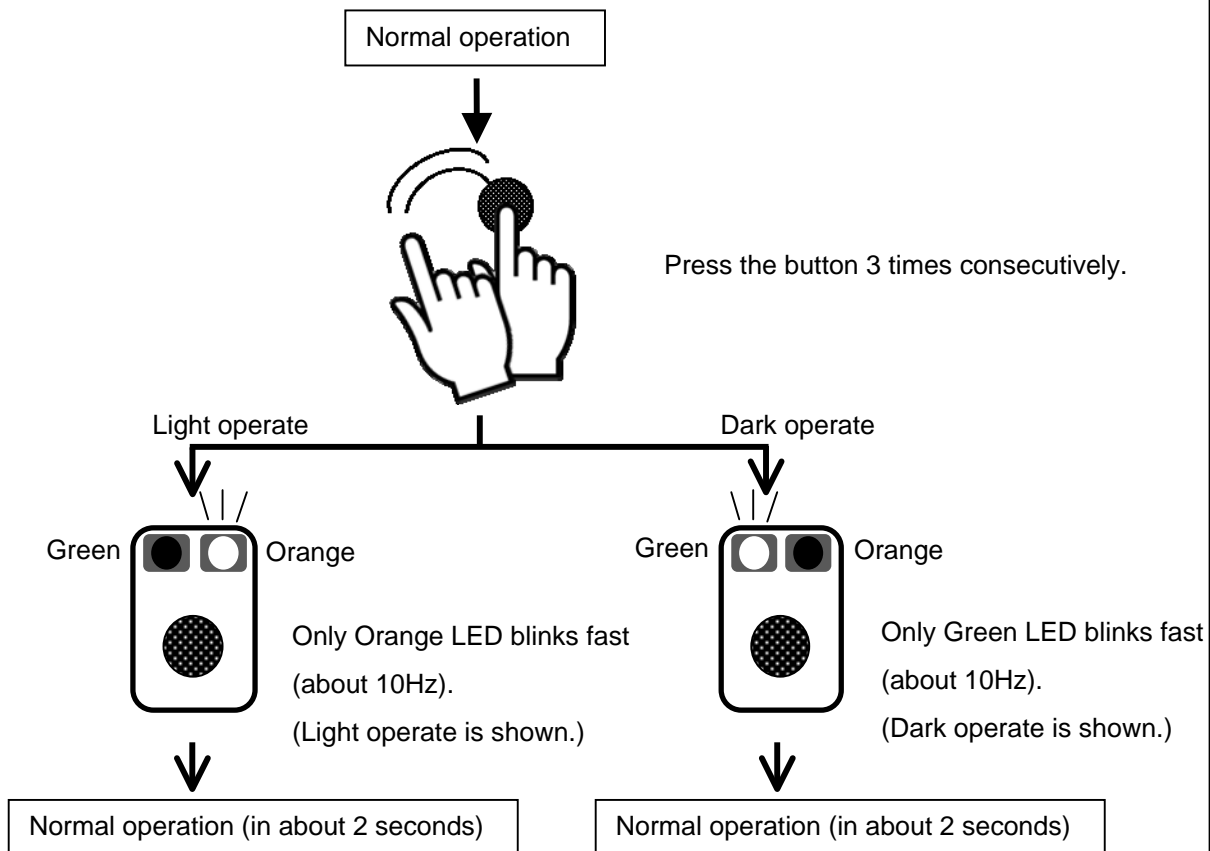


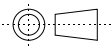
Setup is complete.  
Normal operation will be restored automatically.

				作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
				検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
				認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
				日付 DATE	図 番 NO.	AD16695E	改番 REV 03
頁	改番	改 番 REV.	来歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.	17/24

## 6.6. Light operate / Dark operate setting status check

To check the current status of sensor's output mode, execute the following operation.

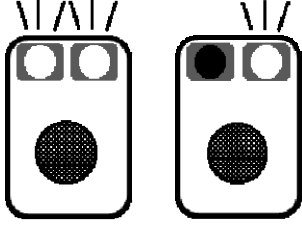



						作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
						検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
						認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
						日付 DATE	図 番 NO.	AD16695E	改番 REV 03
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.			

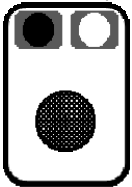
## 6.7. Solution when indicator flashes repeatedly

If the indicators continuously blink, please refer to the following procedures for the status and its corrective actions.

## 6.7.1. Through scan

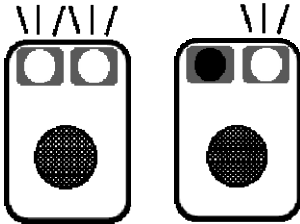
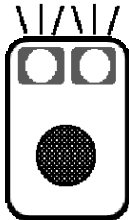


Indicator	Status	Solution
<p>Green Orange</p>  <p>Orange LED blinking or both LEDs blink fast. (at about 10Hz)</p>	Tuning in progress.	<p>Press the button approximately 7 seconds until the green LED starts blinking.</p> <p>The sensor is set to the default sensitivity (maximum sensitivity).</p>
 <p>Both LEDs blinking slowly. (at about 1Hz)</p>	<p><b>Tuning without a workpiece</b></p> <p>Setup is done, but light intensity is too high.</p> <p>Sometimes a workpiece may not be detected.</p>	<p>Press the button once to revert to normal operation based on the tuning results.</p> <p>Use a workpiece to verify that the sensor works properly.</p> <p>(In case a workpiece is not detected, reduce the light intensity by using an optional slit or adjusting the optical axis, and re-tune.)</p>
	<p><b>Tuning without a workpiece</b></p> <p>Setup is done, but light intensity is too low.</p> <p>Stability indicator may not light up.</p>	<p>Press the button once to revert to normal operation based on the tuning results.</p> <p>Use a workpiece to verify that the sensor works properly.</p> <p>(In case a workpiece is not detected, re-adjust the optical axis, and re-tune.)</p>
	<p><b>2-point Tuning</b></p> <p>Setup is done, but sometimes a workpiece may not be detected.</p> <p>(Not enough difference in light intensity between the two points.)</p>	<p>Press the button once to revert to normal operation based on the tuning results.</p> <p>Use a workpiece to verify that the sensor works properly.</p>

## 製品仕様書 SPECIFICATIONS

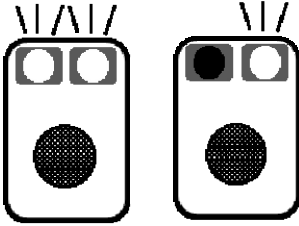
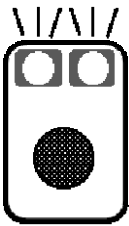

Indicator	Status	Corrective actions
 <p>Orange LED blinks slowly. (at about 1Hz)</p>	<b>Tuning without a workpiece</b> Tuning failed. (Insufficient light.)	Press the button once to revert to normal operation at the pre-tuning sensitivity. Adjust the optical axis, and re-tune.
	<b>2-point Tuning</b> Tuning failed. (Insufficient light at both points.)	Press the button once to revert to normal operation at the pre-tuning sensitivity. Adjust the optical axis, and re-tune.
	<b>2-point Tuning</b> Tuning failed. (The set distance is too close, light is excessive in both two points.)	Press the button once to revert to normal operation at the pre-tuning sensitivity. (Reduce the amount of light by using slits or tilting the optical axis, and re-tune.)

							作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
							検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series		
		03	ECOP13-0937	6.7.'13	T.K.	M.T.	認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch		
		02	ECOP13- 0082	3.1. '13	T.K.	M.T.					
		01	ECOP12- 2758	11. 26. '12	T.K.	M.T.					
頁	改番	改 番 REV.	来 歴 RECORD	日 付 DATE	担当 BY	検閲 APPD.	日付 DATE	図 番 NO.	AD16695E	改番 REV 03	20 / 24

SP.NO.

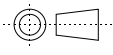
Azbil Corporation					製品仕様書 SPECIFICATIONS				
6.7.2. Retro reflective scan									
Indicator			Status			Corrective actions			
<div></div> <p>Orange LED or both LEDs blinking fast. (at about 10Hz)</p>			Tuning in progress.			Press the button approximately 7 seconds until the green LED starts blinking. The sensor is set to the default sensitivity (maximum sensitivity).			
<div></div> <p>Both LEDs blink slowly at the same time. (at about 1Hz)</p>			<b>Tuning without a workpiece</b> Setup is done, but light intensity is too low. Stability indicator may not light up.			Press the button once to revert to normal operation based on the tuning results. Use a workpiece to verify that the sensor works properly. (In case a workpiece is not detected, re-adjust the optical axis, and re-tune.)			
<div></div> <p>Orange LED blinks slowly. (at about 1Hz)</p>			<b>2-point Tuning</b> Setup is done, but sometimes a workpiece may not be detected. (Not enough difference in light intensity between the two points.)			Press the button once to revert to normal operation based on the tuning results. Use a workpiece to verify that the sensor works properly.			
			<b>Tuning without a workpiece</b> Tuning failed. (Insufficient light.)			Press the button once to revert to normal operation at the pre-tuning sensitivity. Adjust the optical axis, and re-tune.			
<div></div> <p>Orange LED blinks slowly. (at about 1Hz)</p>			<b>2-point Tuning</b> Tuning failed. (Insufficient light at both points)			Press the button once to revert to normal operation at the pre-tuning sensitivity. Adjust the optical axis, and re-tune.			

## 6.7.3. Diffuse scan

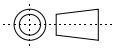
Indicator	Status	Corrective actions
 <p>Orange LED or both LEDs blink fast. (at about 10Hz)</p>	Tuning in progress.	<p>Press the button approximately 7 seconds until the green LED starts blinking.</p> <p>The sensor is set to the default sensitivity (maximum sensitivity).</p>
 <p>Both LEDs blink slowly at the same time. (at about 1Hz)</p>	<p><b>Tuning without a workpiece</b> Setup is done, but light intensity is too high. Stability indicator may not light up. (Reflected light from the background is excessive.)</p> <p><b>2-point Tuning</b> Setup is done, but sometimes a workpiece may not be detected. (Not enough difference in light intensity between the two points.)</p>	<p>Press the button once to revert to normal operation based on the tuning results. Use a workpiece to verify that the sensor works properly. (Please reduce the amount of reflected light from a background or eliminate it by painting black, and re-tune.)</p> <p>Press the button once to revert to normal operation based on the tuning results. Use a workpiece to verify that the sensor works properly.</p>
 <p>Orange LED blinks slowly. (at about 1Hz)</p>	<p><b>2-point Tuning</b> Tuning failed. (Insufficient light at both points.)</p>	<p>Press the button once to revert to normal operation at the pre-tuning sensitivity.</p> <p>Not possible to detect under this condition.</p>

## 6.8 When confused.

When confusing during the tuning procedure, press the button approximately 7 seconds and sensitivity returns to the factory default setting (maximum sensitivity). The procedure is described in section 6.5.

					作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~
					検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL	HP7 series	
					認可 APPD S.Suzuki 4. 20. '12	名 称 NAME	Photoelectric switch	
					日付 DATE	図 番 NO.	AD16695E	改番 REV 03
頁	改番	改 番 REV.	来 歴 RECORD	: 日 付 DATE	担当 BY	検閲 APPD.	22/24	

SP.NO.	Azbil Corporation					製品仕様書 SPECIFICATIONS																																																																																																																																																																																																											
	7. Product version record																																																																																																																																																																																																																
	Product revision																																																																																																																																																																																																																
	The 2-digit product revision number is shown after the country of origin on the case.																																																																																																																																																																																																																
	Example: <u>    Made in Japan    </u> <u>    01    </u> <div style="display: flex; justify-content: space-around; width: 100%;"> <div style="text-align: center;">             ↑ Country of origin           </div> <div style="text-align: center;">             ↑ Product revision number           </div> </div>																																																																																																																																																																																																																
	As For through scan, product revision number is applied on each emitter (HP7-E□□□) and receiver (HP7-R□□□).																																																																																																																																																																																																																
	Revision number is not applied on set model number (ex. HP7-T□□□).																																																																																																																																																																																																																
	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Model number</th><th>Product Rev. No.</th><th>Model number</th><th>Product Rev. No.</th><th>Model number</th><th>Product Rev. No.</th><th>Model number</th><th>Product Rev. No.</th></tr> </thead> <tbody> <tr><td>HP7-E11(-L***)</td><td>03</td><td>HP7-E11-C***</td><td>03</td><td>HP7-E11-S***</td><td>03</td><td>HP7-E11-T</td><td>03</td></tr> <tr><td>HP7-E15(-L***)</td><td>03</td><td>HP7-E15-C***</td><td>03</td><td>HP7-E15-S***</td><td>03</td><td>HP7-E15-T</td><td>03</td></tr> <tr><td>HP7-E21(-L***)</td><td>03</td><td>HP7-E21-C***</td><td>03</td><td>HP7-E21-S***</td><td>03</td><td>HP7-E21-T</td><td>03</td></tr> <tr><td>HP7-E25(-L***)</td><td>03</td><td>HP7-E25-C***</td><td>03</td><td>HP7-E25-S***</td><td>03</td><td>HP7-E25-T</td><td>03</td></tr> <tr><td>HP7-E41(-L***)</td><td>03</td><td>HP7-E41-C***</td><td>03</td><td>HP7-E41-S***</td><td>03</td><td>HP7-E41-T</td><td>03</td></tr> <tr><td>HP7-E45(-L***)</td><td>03</td><td>HP7-E45-C***</td><td>03</td><td>HP7-E45-S***</td><td>03</td><td>HP7-E45-T</td><td>03</td></tr> <tr><td>HP7-E51(-L***)</td><td>03</td><td>HP7-E51-C***</td><td>03</td><td>HP7-E51-S***</td><td>03</td><td>HP7-E51-T</td><td>03</td></tr> <tr><td>HP7-E55(-L***)</td><td>03</td><td>HP7-E55-C***</td><td>03</td><td>HP7-E55-S***</td><td>03</td><td>HP7-E55-T</td><td>03</td></tr> <tr><td>HP7-R11(-L***)</td><td>03</td><td>HP7-R11-C***</td><td>03</td><td>HP7-R11-S***</td><td>03</td><td>HP7-R11-T</td><td>03</td></tr> <tr><td>HP7-R12(-L***)</td><td>03</td><td>HP7-R12-C***</td><td>03</td><td>HP7-R12-S***</td><td>03</td><td>HP7-R12-T</td><td>03</td></tr> <tr><td>HP7-R13(-L***)</td><td>03</td><td>HP7-R13-C***</td><td>03</td><td>HP7-R13-S***</td><td>03</td><td>HP7-R13-T</td><td>03</td></tr> <tr><td>HP7-R14(-L***)</td><td>03</td><td>HP7-R14-C***</td><td>03</td><td>HP7-R14-S***</td><td>03</td><td>HP7-R14-T</td><td>03</td></tr> <tr><td>HP7-R15(-L***)</td><td>03</td><td>HP7-R15-C***</td><td>03</td><td>HP7-R15-S***</td><td>03</td><td>HP7-R15-T</td><td>03</td></tr> <tr><td>HP7-R16(-L***)</td><td>03</td><td>HP7-R16-C***</td><td>03</td><td>HP7-R16-S***</td><td>03</td><td>HP7-R16-T</td><td>03</td></tr> <tr><td>HP7-R17(-L***)</td><td>03</td><td>HP7-R17-C***</td><td>03</td><td>HP7-R17-S***</td><td>03</td><td>HP7-R17-T</td><td>03</td></tr> <tr><td>HP7-R18(-L***)</td><td>03</td><td>HP7-R18-C***</td><td>03</td><td>HP7-R18-S***</td><td>03</td><td>HP7-R18-T</td><td>03</td></tr> <tr><td>HP7-R41(-L***)</td><td>03</td><td>HP7-R41-C***</td><td>03</td><td>HP7-R41-S***</td><td>03</td><td>HP7-R41-T</td><td>03</td></tr> <tr><td>HP7-R42(-L***)</td><td>03</td><td>HP7-R42-C***</td><td>03</td><td>HP7-R42-S***</td><td>03</td><td>HP7-R42-T</td><td>03</td></tr> <tr><td>HP7-R43(-L***)</td><td>03</td><td>HP7-R43-C***</td><td>03</td><td>HP7-R43-S***</td><td>03</td><td>HP7-R43-T</td><td>03</td></tr> <tr><td>HP7-R44(-L***)</td><td>03</td><td>HP7-R44-C***</td><td>03</td><td>HP7-R44-S***</td><td>03</td><td>HP7-R44-T</td><td>03</td></tr> <tr><td>HP7-R45(-L***)</td><td>03</td><td>HP7-R45-C***</td><td>03</td><td>HP7-R45-S***</td><td>03</td><td>HP7-R45-T</td><td>03</td></tr> <tr><td>HP7-R46(-L***)</td><td>03</td><td>HP7-R46-C***</td><td>03</td><td>HP7-R46-S***</td><td>03</td><td>HP7-R46-T</td><td>03</td></tr> <tr><td>HP7-R47(-L***)</td><td>03</td><td>HP7-R47-C***</td><td>03</td><td>HP7-R47-S***</td><td>03</td><td>HP7-R47-T</td><td>03</td></tr> <tr><td>HP7-R48(-L***)</td><td>03</td><td>HP7-R48-C***</td><td>03</td><td>HP7-R48-S***</td><td>03</td><td>HP7-R48-T</td><td>03</td></tr> </tbody> </table>									Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.	HP7-E11(-L***)	03	HP7-E11-C***	03	HP7-E11-S***	03	HP7-E11-T	03	HP7-E15(-L***)	03	HP7-E15-C***	03	HP7-E15-S***	03	HP7-E15-T	03	HP7-E21(-L***)	03	HP7-E21-C***	03	HP7-E21-S***	03	HP7-E21-T	03	HP7-E25(-L***)	03	HP7-E25-C***	03	HP7-E25-S***	03	HP7-E25-T	03	HP7-E41(-L***)	03	HP7-E41-C***	03	HP7-E41-S***	03	HP7-E41-T	03	HP7-E45(-L***)	03	HP7-E45-C***	03	HP7-E45-S***	03	HP7-E45-T	03	HP7-E51(-L***)	03	HP7-E51-C***	03	HP7-E51-S***	03	HP7-E51-T	03	HP7-E55(-L***)	03	HP7-E55-C***	03	HP7-E55-S***	03	HP7-E55-T	03	HP7-R11(-L***)	03	HP7-R11-C***	03	HP7-R11-S***	03	HP7-R11-T	03	HP7-R12(-L***)	03	HP7-R12-C***	03	HP7-R12-S***	03	HP7-R12-T	03	HP7-R13(-L***)	03	HP7-R13-C***	03	HP7-R13-S***	03	HP7-R13-T	03	HP7-R14(-L***)	03	HP7-R14-C***	03	HP7-R14-S***	03	HP7-R14-T	03	HP7-R15(-L***)	03	HP7-R15-C***	03	HP7-R15-S***	03	HP7-R15-T	03	HP7-R16(-L***)	03	HP7-R16-C***	03	HP7-R16-S***	03	HP7-R16-T	03	HP7-R17(-L***)	03	HP7-R17-C***	03	HP7-R17-S***	03	HP7-R17-T	03	HP7-R18(-L***)	03	HP7-R18-C***	03	HP7-R18-S***	03	HP7-R18-T	03	HP7-R41(-L***)	03	HP7-R41-C***	03	HP7-R41-S***	03	HP7-R41-T	03	HP7-R42(-L***)	03	HP7-R42-C***	03	HP7-R42-S***	03	HP7-R42-T	03	HP7-R43(-L***)	03	HP7-R43-C***	03	HP7-R43-S***	03	HP7-R43-T	03	HP7-R44(-L***)	03	HP7-R44-C***	03	HP7-R44-S***	03	HP7-R44-T	03	HP7-R45(-L***)	03	HP7-R45-C***	03	HP7-R45-S***	03	HP7-R45-T	03	HP7-R46(-L***)	03	HP7-R46-C***	03	HP7-R46-S***	03	HP7-R46-T	03	HP7-R47(-L***)	03	HP7-R47-C***	03	HP7-R47-S***	03	HP7-R47-T	03	HP7-R48(-L***)	03	HP7-R48-C***	03	HP7-R48-S***	03	HP7-R48-T	03
	Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.																																																																																																																																																																																																									
	HP7-E11(-L***)	03	HP7-E11-C***	03	HP7-E11-S***	03	HP7-E11-T	03																																																																																																																																																																																																									
HP7-E15(-L***)	03	HP7-E15-C***	03	HP7-E15-S***	03	HP7-E15-T	03																																																																																																																																																																																																										
HP7-E21(-L***)	03	HP7-E21-C***	03	HP7-E21-S***	03	HP7-E21-T	03																																																																																																																																																																																																										
HP7-E25(-L***)	03	HP7-E25-C***	03	HP7-E25-S***	03	HP7-E25-T	03																																																																																																																																																																																																										
HP7-E41(-L***)	03	HP7-E41-C***	03	HP7-E41-S***	03	HP7-E41-T	03																																																																																																																																																																																																										
HP7-E45(-L***)	03	HP7-E45-C***	03	HP7-E45-S***	03	HP7-E45-T	03																																																																																																																																																																																																										
HP7-E51(-L***)	03	HP7-E51-C***	03	HP7-E51-S***	03	HP7-E51-T	03																																																																																																																																																																																																										
HP7-E55(-L***)	03	HP7-E55-C***	03	HP7-E55-S***	03	HP7-E55-T	03																																																																																																																																																																																																										
HP7-R11(-L***)	03	HP7-R11-C***	03	HP7-R11-S***	03	HP7-R11-T	03																																																																																																																																																																																																										
HP7-R12(-L***)	03	HP7-R12-C***	03	HP7-R12-S***	03	HP7-R12-T	03																																																																																																																																																																																																										
HP7-R13(-L***)	03	HP7-R13-C***	03	HP7-R13-S***	03	HP7-R13-T	03																																																																																																																																																																																																										
HP7-R14(-L***)	03	HP7-R14-C***	03	HP7-R14-S***	03	HP7-R14-T	03																																																																																																																																																																																																										
HP7-R15(-L***)	03	HP7-R15-C***	03	HP7-R15-S***	03	HP7-R15-T	03																																																																																																																																																																																																										
HP7-R16(-L***)	03	HP7-R16-C***	03	HP7-R16-S***	03	HP7-R16-T	03																																																																																																																																																																																																										
HP7-R17(-L***)	03	HP7-R17-C***	03	HP7-R17-S***	03	HP7-R17-T	03																																																																																																																																																																																																										
HP7-R18(-L***)	03	HP7-R18-C***	03	HP7-R18-S***	03	HP7-R18-T	03																																																																																																																																																																																																										
HP7-R41(-L***)	03	HP7-R41-C***	03	HP7-R41-S***	03	HP7-R41-T	03																																																																																																																																																																																																										
HP7-R42(-L***)	03	HP7-R42-C***	03	HP7-R42-S***	03	HP7-R42-T	03																																																																																																																																																																																																										
HP7-R43(-L***)	03	HP7-R43-C***	03	HP7-R43-S***	03	HP7-R43-T	03																																																																																																																																																																																																										
HP7-R44(-L***)	03	HP7-R44-C***	03	HP7-R44-S***	03	HP7-R44-T	03																																																																																																																																																																																																										
HP7-R45(-L***)	03	HP7-R45-C***	03	HP7-R45-S***	03	HP7-R45-T	03																																																																																																																																																																																																										
HP7-R46(-L***)	03	HP7-R46-C***	03	HP7-R46-S***	03	HP7-R46-T	03																																																																																																																																																																																																										
HP7-R47(-L***)	03	HP7-R47-C***	03	HP7-R47-S***	03	HP7-R47-T	03																																																																																																																																																																																																										
HP7-R48(-L***)	03	HP7-R48-C***	03	HP7-R48-S***	03	HP7-R48-T	03																																																																																																																																																																																																										
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>作成 DR. T.Koike 4. 18. '12</td> <td></td> <td>尺度 SCALE ~</td> <td>記入のない公差 TOL. UNLESS NOTED ~</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>検図 CHK. M.Tanaka 4. 20. '12</td> <td colspan="3">形 番 MODEL                      <b>HP7 series</b></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>認可 APPD S.Suzuki 4. 20. '12</td> <td colspan="3">名 称 NAME                      <b>Photoelectric switch</b></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>日付 DATE</td> <td colspan="2">図 番 NO.                      <b>AD16695E</b></td> <td>改番 REV 03      23/24</td> </tr> </table>																					作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~					検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL <b>HP7 series</b>							認可 APPD S.Suzuki 4. 20. '12	名 称 NAME <b>Photoelectric switch</b>							日付 DATE	図 番 NO. <b>AD16695E</b>		改番 REV 03      23/24																																																																																																																																																																	
				作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~																																																																																																																																																																																																										
				検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL <b>HP7 series</b>																																																																																																																																																																																																												
				認可 APPD S.Suzuki 4. 20. '12	名 称 NAME <b>Photoelectric switch</b>																																																																																																																																																																																																												
				日付 DATE	図 番 NO. <b>AD16695E</b>		改番 REV 03      23/24																																																																																																																																																																																																										
頁	改番	改番 REV.	来歴 RECORD	日付 DATE	担当 BY	検閲 APPD.																																																																																																																																																																																																											

SP.NO.	Azbil Corporation				製品仕様書 SPECIFICATIONS			
	Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.	Model number	Product Rev. No.
	HP7-P11(-L***)	02	HP7-P11-C***	02	HP7-P11-S***	02	HP7-P11-T	02
	HP7-P12(-L***)	02	HP7-P12-C***	02	HP7-P12-S***	02	HP7-P12-T	02
	HP7-P13(-L***)	02	HP7-P13-C***	02	HP7-P13-S***	02	HP7-P13-T	02
	HP7-P14(-L***)	02	HP7-P14-C***	02	HP7-P14-S***	02	HP7-P14-T	02
	HP7-P51(-L***)	02	HP7-P51-C***	02	HP7-P51-S***	02	HP7-P51-T	02
	HP7-P52(-L***)	02	HP7-P52-C***	02	HP7-P52-S***	02	HP7-P52-T	02
	HP7-P53(-L***)	02	HP7-P53-C***	02	HP7-P53-S***	02	HP7-P53-T	02
	HP7-P54(-L***)	02	HP7-P54-C***	02	HP7-P54-S***	02	HP7-P54-T	02
	HP7-A11(-L***)	02	HP7-A11-C***	02	HP7-A11-S***	02	HP7-A11-T	02
	HP7-A12(-L***)	02	HP7-A12-C***	02	HP7-A12-S***	02	HP7-A12-T	02
	HP7-A13(-L***)	02	HP7-A13-C***	02	HP7-A13-S***	02	HP7-A13-T	02
	HP7-A14(-L***)	02	HP7-A14-C***	02	HP7-A14-S***	02	HP7-A14-T	02
	HP7-A41(-L***)	02	HP7-A41-C***	02	HP7-A41-S***	02	HP7-A41-T	02
	HP7-A42(-L***)	02	HP7-A42-C***	02	HP7-A42-S***	02	HP7-A42-T	02
	HP7-A43(-L***)	02	HP7-A43-C***	02	HP7-A43-S***	02	HP7-A43-T	02
HP7-A44(-L***)	02	HP7-A44-C***	02	HP7-A44-S***	02	HP7-A44-T	02	
Product revision change record								
	Date	Model number	Product Rev. No.	Content of change				
1	4.18.'12	All	01	New issue				
2	11.26.'12	HP7-□□□-T HP7-P5□□	01 01	New issue				
3	3.1.'13	All	02	UL compliance				
4	6.7.'13	HP7-E□□□ HP7-R□□□	03 03	Eliminate distance limit of the mutual interference prevention function. / Case color change of the different frequency type.				
				作成 DR. T.Koike 4. 18. '12		尺度 SCALE ~	記入のない公差 TOL. UNLESS NOTED ~	
				検図 CHK. M.Tanaka 4. 20. '12	形 番 MODEL HP7 series			
				認可 APPD S.Suzuki 4. 20. '12	名 称 NAME Photoelectric switch			
				日付 DATE	図 番 NO. AD16695E		改番 REV 03	
頁	改番	改 番 REV.	来歴 RECORD	日 付 DATE	担 当 BY	検 閲 APPD.	24/24	

SP.NO.	Azbil Corporation				製品仕様書 SPECIFICATIONS	
	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.						
頁	改番	改番 REV.	来歴 RECORD	日付 DATE	担当 BY	照査 CHK.

SP.NO.	Azbil Corporation		製品仕様書 SPECIFICATIONS	
	<div><div>(1) For use under such conditions or in such environments as not stated in technical documents, including catalogs, specification, and instruction manuals</div><div>(2) For use of specific purposes, such as:<div>* 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.] * Antidisaster / crime-prevention equipment * Burning appliances * Electrothermal equipment * Amusement facilities * Facilities / applications associated directly with billing</div></div><div>(3) Supply systems such as electricity / gas / water supply systems, large-scale communication systems, and traffic / air traffic control systems requiring high reliability</div><div>(4) Facilities that are to comply with regulations of governmental / public agencies or specific industries</div><div>(5) Machinery or equipment that may affect human lives, human bodies or properties</div><div>(6) Other machinery or equipment equivalent to those set forth in items (1) to (5) above which require high reliability and safety</div></div> <div><div>4    <b>Precautions against long-term use</b></div><div>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.</div></div> <div><div>5    <b>Recommendation for renewal</b></div><div>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.</div></div> <div><div>6    <b>Other precautions</b></div><div>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.</div></div> <div><div>7    <b>Changes to specifications</b></div><div>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.</div></div> <div><div>8    <b>Discontinuance of the supply of products / parts</b></div><div>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.</div></div> <div><div>9    <b>Scope of services</b></div><div>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:<div><div>(1) Installation, adjustment, guidance, and attendance at a test run</div><div>(2) Maintenance, inspection, adjustment, and repair</div><div>(3) Technical guidance and technical education</div><div>(4) Special test or special inspection of a product under the conditions specified by you</div></div><div>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.</div></div></div> <div><div>頁    改番</div><div>改番 REV.</div><div>来歴 RECORD</div><div>日付 DATE</div><div>担当 BY</div><div>照査 CHK.</div></div> <div>AAS-511A-014-04</div>			