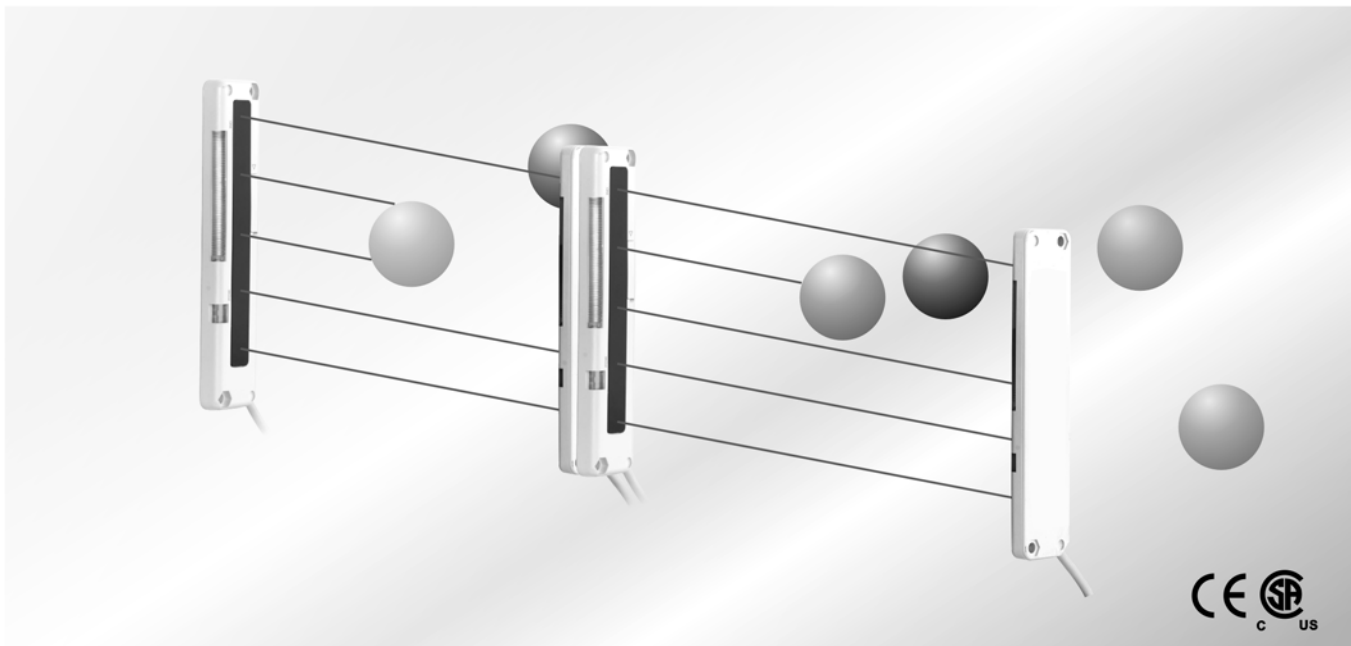


# PHOTOELECTRIC

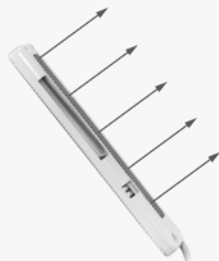
AREA SENSORS

# PAS1 SERIES



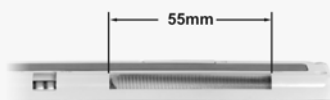
### 10mm Thick: 1/2 of Conventional Model

It fits into a small space, without obstructing normal operation.



### Clearly Visible Job Indicator

Both the emitter and the receiver are incorporated with 55mm wide large job indicators. They can also be used as large size operation indicators if the job indicator input and the sensing output are connected together.



### Long Sensing Range: 3m

Its long sensing range of 3m is sufficient for confirming access to a parts shelf. Further, if the sensor has been set to the Light-ON mode, the output is turned OFF should the cable break.

### Parallel Installation

Setting different emission frequencies for two sensors prevents mutual interference. Use of two sensors together covers a wider detection area.



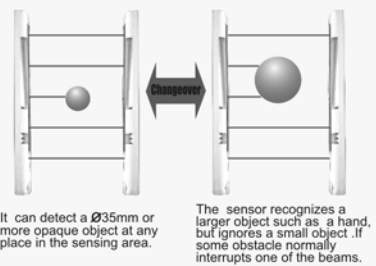
### Lighting Pattern Selectable

The job indicator operation can be selected as either continuous lighting or blinking.

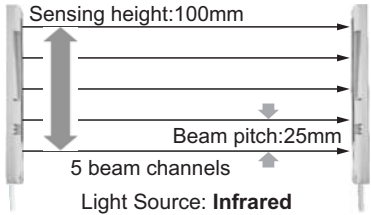
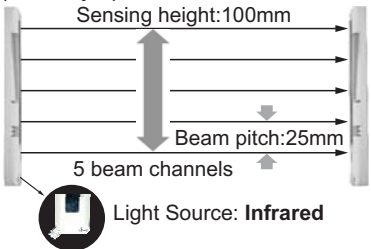
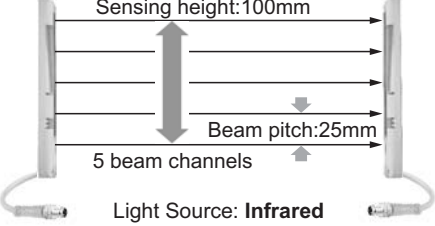
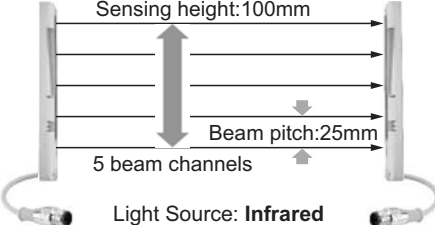


### Detection Operation Selectable

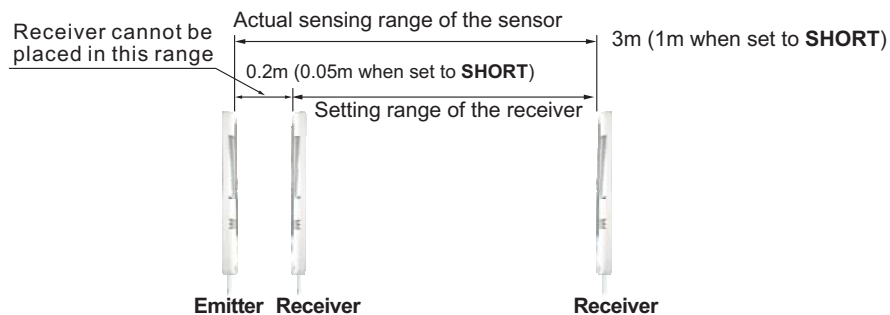
Detection on interruption of either minimum one beam or minimum two beams can be selected to suit the application.



## Area Sensors

Appearance	Sensing Range (Note)	Supply Voltage	Output Mode	Part Number
<b>2 m Cable</b> 	<b>0.2 to 3m</b> (0.05 to 1m when set to <b>SHORT</b> ).	10-30V DC	Emitter	<u>PAS1-T3000D-EY9C3L2-5</u>
			NPN	<u>PAS1-T3000N-CY9C4U2-5</u>
			PNP	<u>PAS1-T3000P-CY9C4U2-5</u>
<b>M8 (Pico-style) connector</b> 	<b>0.2 to 3m</b> (0.05 to 1m when set to <b>SHORT</b> ).	10-30V DC	Emitter	<u>PAS1-T3000D-EY9Q4LP-5</u>
			NPN	<u>PAS1-T3000N-CY9Q4UP-5</u>
			PNP	<u>PAS1-T3000P-CY9Q4UP-5</u>
<b>M8 (Pico-style) Pig tail</b> 	<b>0.2 to 3m</b> (0.05 to 1m when set to <b>SHORT</b> ).	10-30V DC	Emitter	<u>PAS1-T3000D-EY9P4LP-5</u>
			NPN	<u>PAS1-T3000N-CY9P4UP-5</u>
			PNP	<u>PAS1-T3000P-CY9P4UP-5</u>
<b>M12 (Euro-style) Pig tail</b> 	<b>0.2 to 3m</b> (0.05 to 1m when set to <b>SHORT</b> ).	10-30V DC	Emitter	<u>PAS1-T3000D-EY9P4LE-5</u>
			NPN	<u>PAS1-T3000N-CY9P4UE-5</u>
			PNP	<u>PAS1-T3000P-CY9P4UE-5</u>

**Note:** The sensing range is the possible setting distance between the emitter and the receiver.  
 The sensor can detect an object less than 0.2m (0.05m when set to **SHORT**) away.



**Note:**  
 Coming Soon : Part numbers with underline  
 In Preparation: Part numbers with a line through the middle

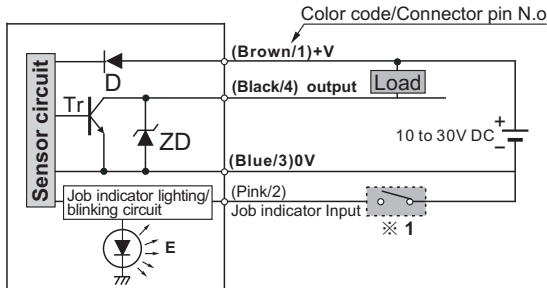
## Specifications

Type		Area sensor	
		NPN output	PNP output
<b>Sensing height</b>	100mm		
<b>Sensing range</b>	0.2 to 3m (0.05 to 1m when set to SHORT)		
<b>Beam pitch</b>	5 beam channels		
<b>Number of beam channels</b>	∅35mm or more opaque object		
<b>Sensing object</b>	10 to 30V DC Ripple P-P 10% or less		
<b>Power consumption</b>	Emitter: 0.5 W or less, Receiver: 0.8 W or less		Emitter: 0.6 W or less, Receiver: 0.9 W or less
<b>Sensing output</b>	<b>NPN</b> open-collector transistor Maximum sink current: 100mA Applied voltage: 30V DC or less (between sensing output and 0V) Residual voltage: 1V or less (at 100mA sink current)		<b>PNP</b> open-collector transistor Maximum source current: 100mA Applied voltage: 30V DC or less (between sensing output and +V) Residual voltage: 1V or less (at 100mA source current)
	<b>Utilization category</b>	DC-12 or DC-13	
	<b>Output operation</b>	ON or OFF when one or more beams are interrupted/ON or OFF when two or more beams are interrupted, selectable by operation mode switch	
	<b>Short-circuit protection</b>	Incorporated	
<b>Response time</b>	10ms or less (when the interference prevention is used, in Light state: 30ms or less, in Dark state: 13ms or less)		
<b>Indicators</b>	<b>Emitter</b>	Power indicator: Green LED ( lights up when the power is ON) Job indicator: Orange LED ( lights up or blinks when the job indicator input is Low (PNP input is High), lighting pattern is selected by operation mode switch)	
	<b>Receiver</b>	Operation indicator: Red LED ( lights up when one or more beams are interrupted, but lights up when two beams or more are interrupted ) in the double-beam-interruption mode Stable incident beam indicator: Green LED (lights up when all beams are stably received) Job indicator: Orange LED (lights up or blinks when the job indicator input is Low (PNP input is High), lighting pattern is selected by operation mode switch)	
<b>Interference prevention function</b>	Incorporated		
<b>Environmental resistance</b>	<b>Pollution degree</b>	3(Industrial environment)	
	<b>Protection</b>	IP62(IEC)	
	<b>Ambient temperature</b>	-10 to +55°C (No dew condensation or icing allowed), Storage: -20 to +70°C	
	<b>Ambient humidity</b>	35 to 85% RH, Storage: 35 to 85% RH	
	<b>Ambient illuminance</b>	Sunlight: 10,000 lx at the light-receiving face Incandescent light: 3,000 lx at the light-receiving face	
	<b>EMC</b>	IEC 60947-5-2, Parts 7.2.6.1.2.3 or RFI > 20V/m (in 30-1000MHZ), EFT > 1KV, ESD > 4KV (contact)	
	<b>Voltage withstandability</b>	1,000V AC for one min. between all supply terminals connected together and enclosure	
	<b>Insulation resistance</b>	20MΩ or more, with 250V DC megger between all supply terminals connected together and enclosure	
	<b>Vibration resistance</b>	IEC 60947-5-2, Part 7.4.2 or 10-55HZ, 1.0mm amplitude In X, Y and Z directions for 30 min	
<b>Shock resistance</b>	IEC 60947-5-2, Part 7.4.1 or 30g, 11ms in X, Y and Z directions for six times each		
<b>Emitting element</b>	Infrared LED (synchronized scanning system)		
<b>Material</b>	Enclosure: Heat-resistant ABS, Len cover: Acrylic, Indicator cover: Acrylic		
<b>Cable</b>	0.3mm <sup>2</sup> 4-core (emitter: 3-core) oil resistant cable, 2m long		
<b>Cable extension</b>	Extension up to total 100m is possible for both emitter and receiver with 0.3mm <sup>2</sup> , or more, cable.		
<b>Pigtail type</b>	See <b>Pigtail Series</b> or our <b>Cable &amp; Connectors catalogue</b> .		
<b>Connector type</b>	M8 (Pico-style) 4pin		
<b>Weight</b>	Emitter: 70g approx., Receiver: 80g approx.		

## Connection Diagrams

### NPN Output Type

I/O circuit diagram



**Note :** The emitter is not incorporated with the output.

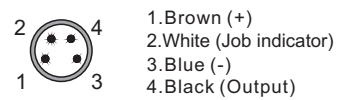
**Symbol...**D : Reverse supply protection diode  
 ZD: Surge absorption zener diode  
 Tr : NPN output transistor  
 E: Job indicator

### Connector pin position

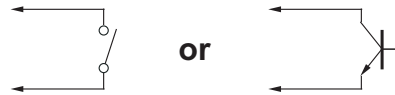
#### Euro-style



#### Pico-Style



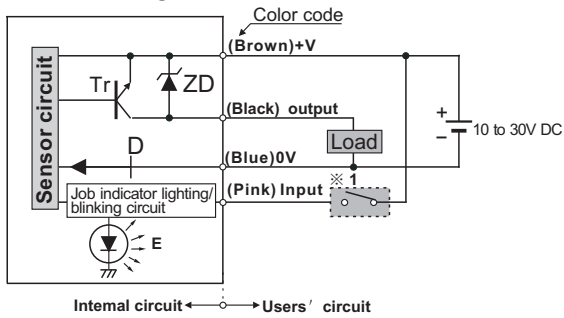
※ 1 : Non-contact voltage or NPN open-collector transistor



Low (0 to 2V): Lights up or Blinks  
 High (5 to 30V, or open): Lights off

### PNP Output Type

I/O circuit diagram



**Note :** The emitter is not incorporated with the output.

**Symbol...**D : Reverse supply protection diode  
 ZD: Surge absorption zener diode  
 Tr : NPN output transistor  
 E: Job indicator

### Connector pin position

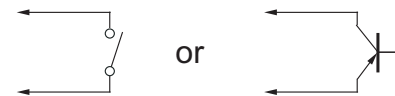
#### Euro-style



#### Pico-Style



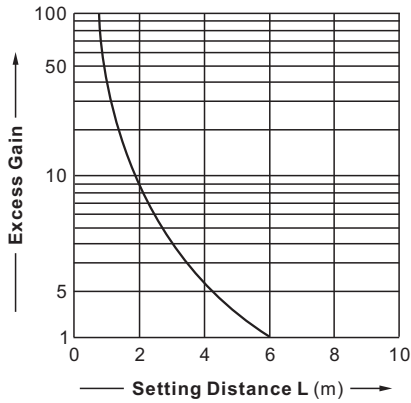
※ 1 : Non-contact voltage or PNP open-collector transistor



Low (4V or more): Lights up or Blinks  
 High (0 to 0.6V, or open): Lights off

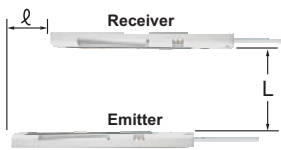
## Sensing Characteristics (Typical)

### Correlation between setting distance and excess gain

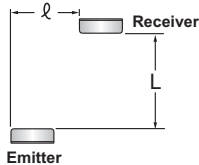


### Parallel deviation

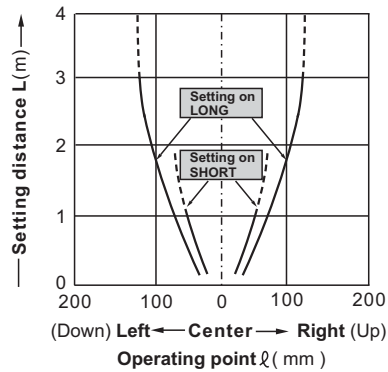
#### 1. Vertical direction



#### 2. Horizontal direction



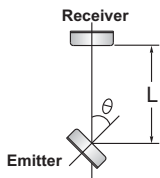
Common for both horizontal and vertical directions



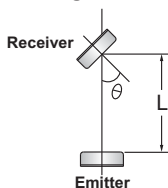
Ax: PAS1 SERIES

### Angular deviation

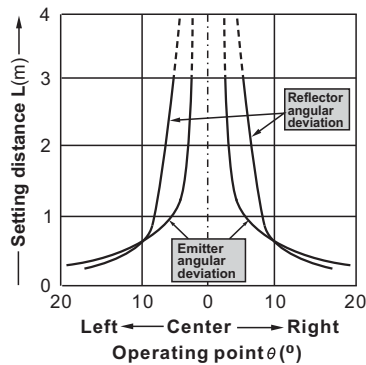
#### 1. Emitter angular direction



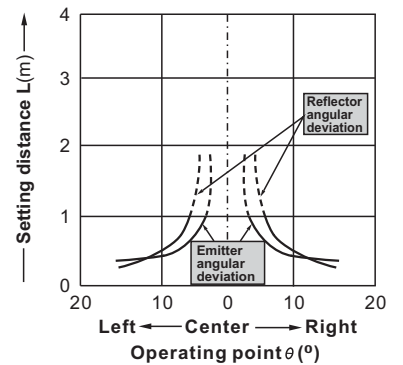
#### 2. Receiver angular direction



Setting on LONG



Setting on SHORT



## Precautions For Proper Use

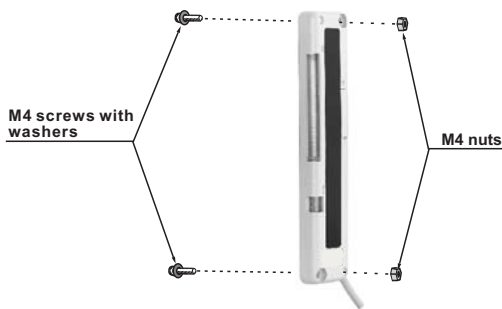


This sensor is not for press machine safeguard. Do not use this sensor for any press machine. This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

Area sensors conforming to standards are available. For details, please contact our office.

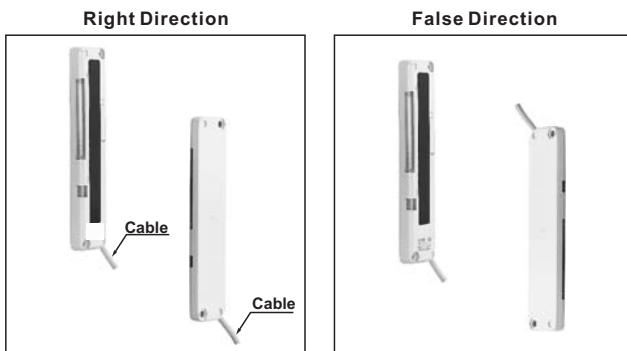
### Mounting

- Use M4 screws with washers and M4 nuts. The tightening torque should be 0.5N·m or less. (Please arrange the screws and nuts separately.)



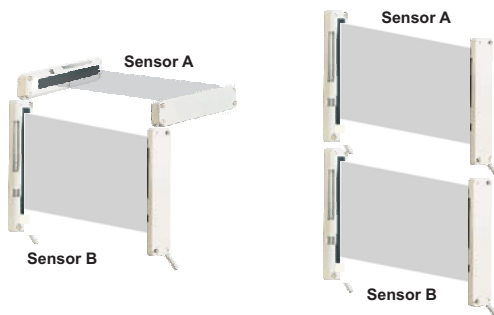
### Orientation

- The emitter and the receiver must face each other correctly. If they are set upside down, the sensor does not work.



### Interference prevention function

- By setting different emission frequencies, two units of PAS1-5 can be mounted close together, as shown in the figure below.



### LONG/SHORT selection switch (incorporated on the emitter)

- Select the switch setting according to the setting distance between the emitter and the receiver as given below. (The switches must be set with the power supply off. The operation mode does not change if the switch setting is changed with the power supplied)

Setting distance	Operation mode switch
0.05 to 1m	LONG  SHORT
1 to 3m	LONG  SHORT

### Selection of output operation

- The output operation mode is selected by the operation mode switch on the receiver. (The switches must be set with the power supply off. The operation mode does not change if the switch setting is changed with the power supplied.)

Output operation	Operation mode switch
ON when one or mode beams are interrupted.	SINGLE D/ON  DOUBLE L/ON
OFF when one or mode beams are interrupted. (ON when all beams are received).	SINGLE D/ON  DOUBLE L/ON
ON when any two or mode beams are interrupted.	SINGLE D/ON  DOUBLE L/ON
OFF when any two or mode beams are interrupted.	SINGLE D/ON  DOUBLE L/ON

### Job indicator operation selection

- Lighting/Blinking is selected by the operation mode switch on the emitter and the receiver.

	Operation mode switch			
	Emitter		Receiver	
Lighting	LIGHT	FLASH	LIGHT	FLASH
Blinking	LIGHT	FLASH	LIGHT	FLASH

### Others

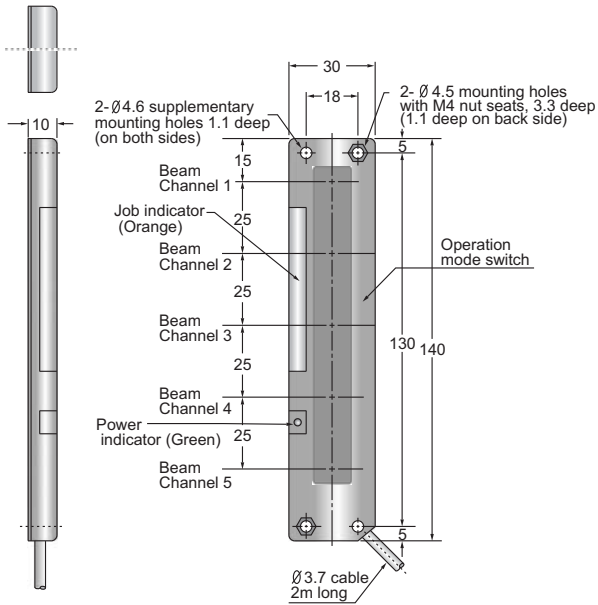
- Do not use during the initial transient time (0.5 secondary.) After the power supply is switched on.

	Operation mode switch			
	Emitter		Receiver	
Sensor A (FREQ.A)	FREQ.A	FREQ.B	FREQ.A	FREQ.B
Sensor B (FREQ.B)	FREQ.A	FREQ.B	FREQ.A	FREQ.B

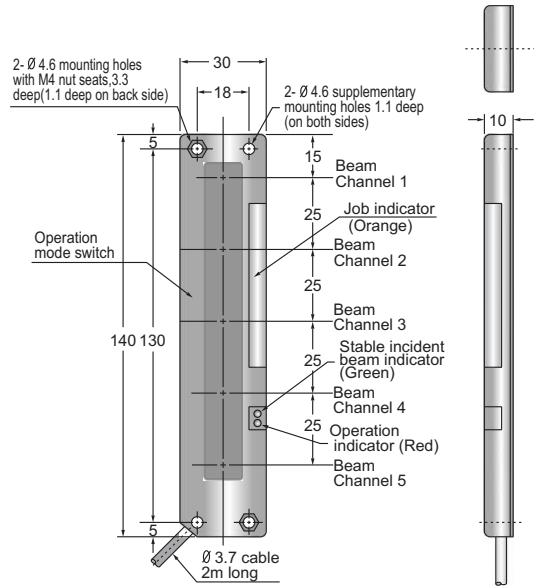
## Dimensions (Unit: mm)

### Sensor Type

#### Emitter

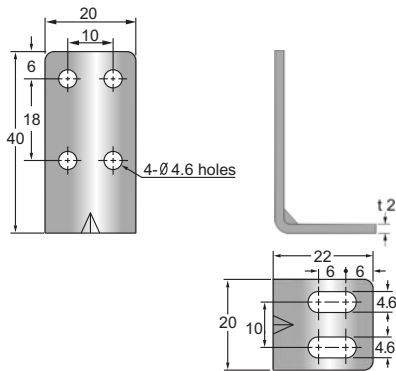


#### Receiver



Ax: PAS1 SERIES

### MB-4020 (Sensor mounting bracket-Optional)



#### Material:

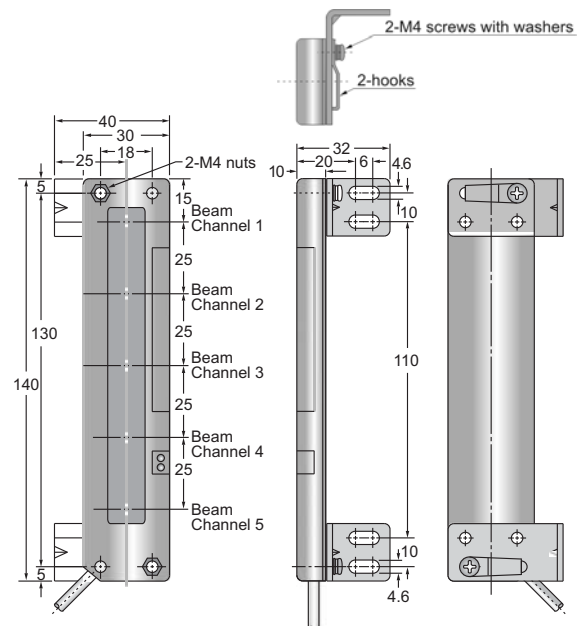
Cold rolled carbon steel (SPCC)(Uni-chrome plated)

#### Four bracket set

Four M4 (length 15mm) screws with washers, eight nuts, four hooks and eight M4 (length 18mm) screws with washers are attached. [ M4 (length 18mm) screws with washers are not used for PAS1-5.]

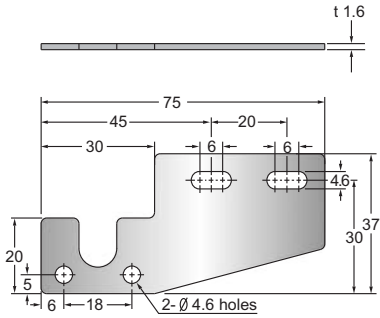
#### Assembly dimensions

Mounting drawing with the receiver



## Dimensions (Unit: mm)

### MB-7537 (Sensor mounting bracket-Optional)



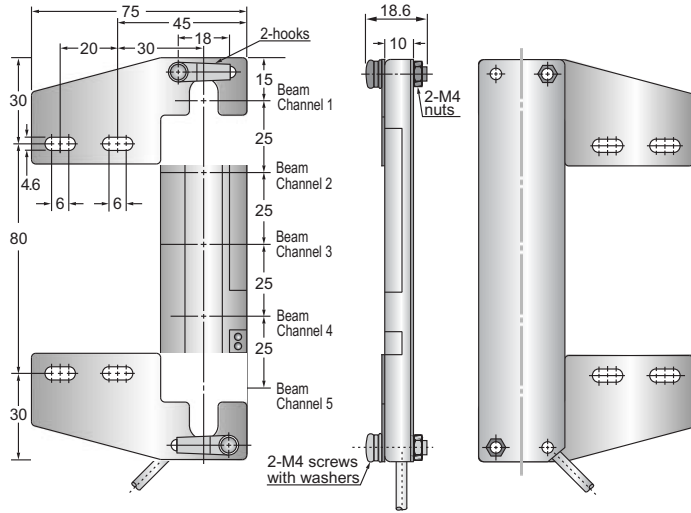
**Material:**

Cold rolled carbon steel (SPCC)(Uni-chrome plated)

**Four bracket set**

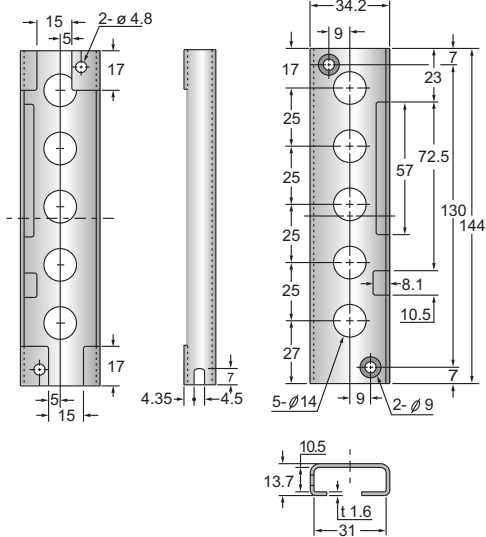
Four M4 (length 15mm) screws with washers, eight nuts, four hooks, four spacers and eight M4 (length 18mm) screws with washers are attached.

**Assembly dimensions**  
Mounting drawing with the receiver

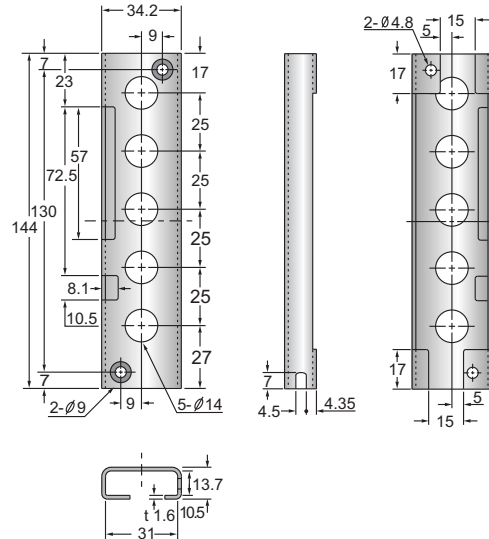


### PB-14434 (Sensor protective bracket-Optional)

**For Receiver**



**For Emitter**



**Material:**

Cold rolled carbon steel (SPCC) (Chrome plated)

**Two bracket set:**

For M4 (length 15mm) screws with washers, and four nuts are attached.