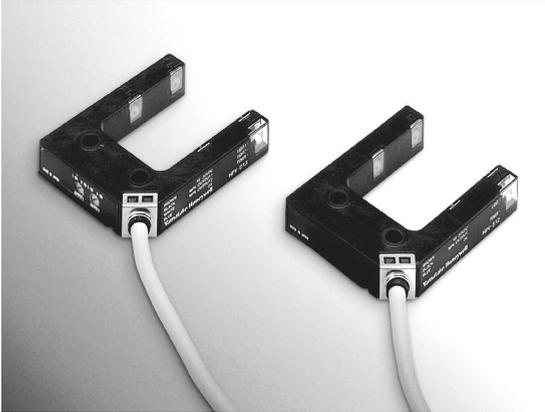


# HPV Series

Sensors with 2 optical axes in an easy-to-use size (vane width 25mm, depth 35mm) save space and reduce wiring.



- **Highly visible indicators** (for power ON and incoming light)
- **Guaranteed down to -25°C** for use in cold-storage warehouses
- **The first optical axis position is located a mere 4mm** from the tip of the sensor
- **Small, light plastic case.** (40 x 50 x 10mm, 60/70g)
- **Sealed to IP64**
- **Operating mode can be set for individual axes with the L.O./D.O. selector switch** (2-optical axis type)
- **Can be gang-mounted**

## TYPICAL APPLICATIONS

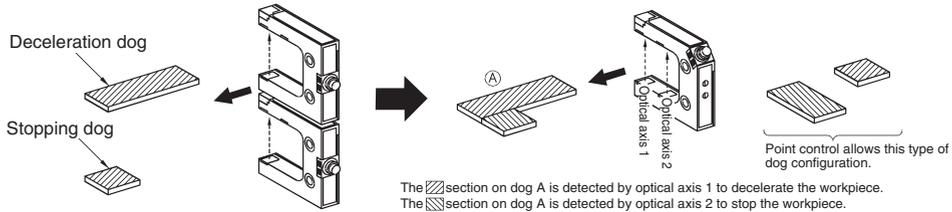
● The 2-optical axis type (HPV-D13) can detect both the deceleration and stop positions on stacker cranes and guided trolleys.

① 1-optical axis vane type photoelectric sensor

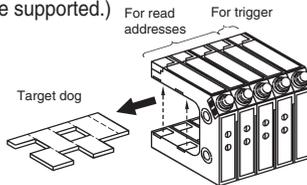
Two sensors are required, one for deceleration and one for stopping.

② HPV 2-optical axis sensor

Just changing the dock shape as shown in ② allows the same application as in ① on the left to be handled by one HPV sensor.



● Sensors with 2 optical axes can be connected in series to read addresses. (In the following example for 8-bit addresses, an application with up to 256 addresses can be supported.)



## CATALOG LISTINGS

● Standard (prelead) type with 2m cable

Type	Detection method	Scanning distance	Operating mode	Input voltage	Output mode	Catalog listing
Optical axis 1	Thru scan (vane type)	Fixed at 25mm	Light-ON	18 to 26.4Vdc	NPN open collector	HPV-S11
			Dark ON			HPV-S12
Optical axis 2			Light-ON/Dark ON selectable			HPV-D13

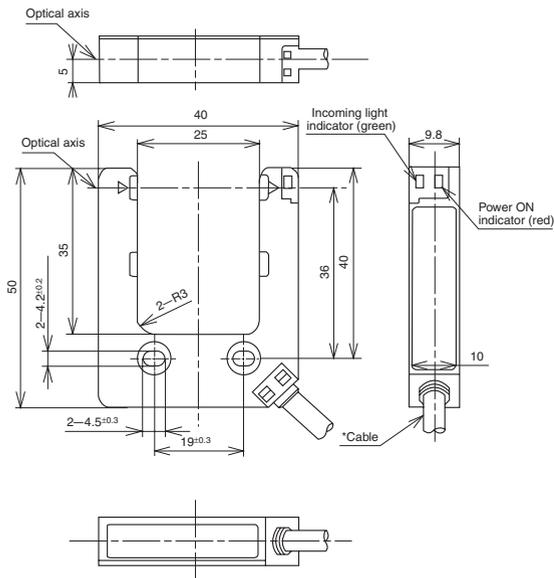
## SPECIFICATIONS

Detection method	Thru scan (vane type)		
Number of optical axes	1		2
Catalog listing	HPV-S11	HPV-S12	HPV-D13
Input voltage	18 to 26.4Vdc (ripple 10% max.)		
Current consumption	30mA max.		40mA max.
Scanning distance	25mm (fixed)		
Target object	Opaque object 1mm min.		
Operating mode	Light-ON	Dark-ON	Light-ON/dark-ON selectable by switch
Output mode	NPN transistor open collector		
Control output	Switching current: 100mA max. (resistive load). Dielectric strength: 26.4V max. Voltage drop: 1V max. (at 100mA switching current).		
Response time	1ms max. for operation and recovery		
Light emitter	Infrared LED		
Indicators	Power (red when power ON). Incoming light (green when receiving).		
Ambient light immunity	Incandescent lamp: 3,000 lux max. Sunlight: 10,000 lux max.		
Operating temperature	-25 to +50°C		
Storage temperature	-30 to +70°C		
Humidity range	45 to 85% RH (condensation not allowed)		
Insulation resistance	Min. 20MΩ(at 500Vdc)		
Dielectric strength	1,000Vac (50/60Hz) for 1 minute between case and electrically live metal		
Vibration resistance	10 to 55Hz, 1.5mm peak-to-peak amplitude, 2hrs each in X, Y and Z directions		
Shock resistance	500m/s <sup>2</sup> , 10 times each in X, Y and Z directions		
Protective structure	IP64 (IEC standard)		
Wiring type	Prelead 2m		
Weight	Approx. 60g (with 2m cable)		Approx. 70g (with 2m cable)
Circuit protection	Reverse connection protection circuit, Load short-circuit protection circuit		
Case material	PC/ABS alloy (black)		

## EXTERNAL DIMENSIONS

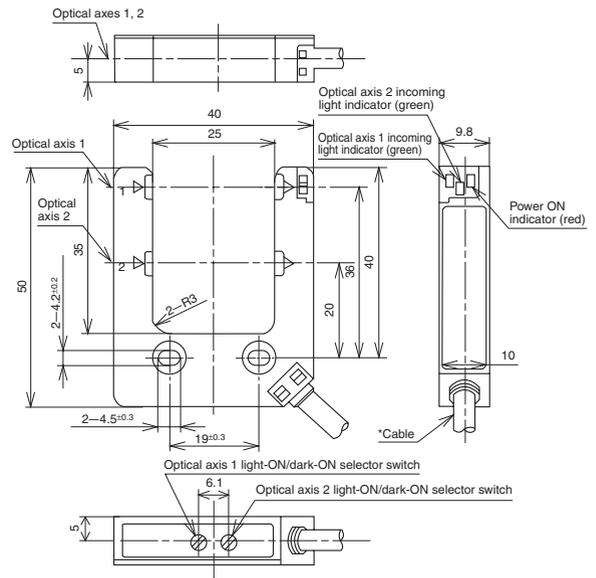
(unit: mm)

### ● 1-optical axis type (HPV-S11, S12)



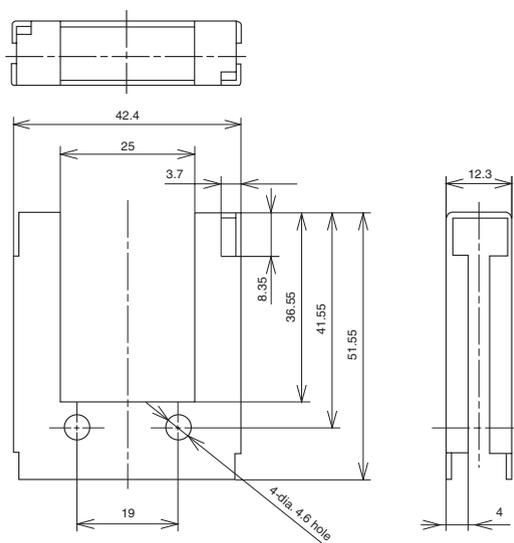
\*Cable specifications: oil-proof, O.D. 4.2mm, 3-core, nominal cross-sectional area 0.2mm<sup>2</sup>, sheath color gray.

### ● 2-optical axis type (HPV-D13)



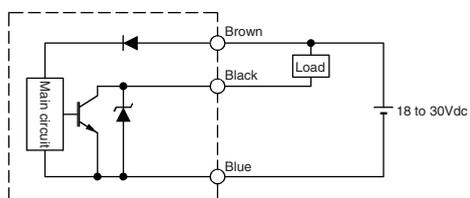
\*Cable specifications: oil-proof, O.D. 4.2mm, 4-core, nominal cross-sectional area 0.2mm<sup>2</sup>, sheath color gray.

● Bracket (HPV-B01) · · · order separately

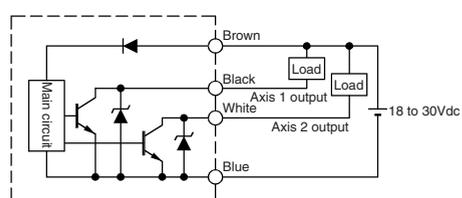


■ OUTPUT CIRCUIT

● 1-optical axis type (HPV-S11, S12)



● 2-optical axis type (HPV-D13)



■ LIGHT-ON/DARK-ON SELECTOR SWITCH

On a 2-optical axis sensor (HPV-D13), light ON and dark ON can be set independently for each optical axis.

\* The default is dark-ON mode for both optical axes.

\* Set the desired mode by the selector switches on the bottom of the case using the provided screwdriver.



## BASIC PRECAUTIONS

### 1. Mounting

Firmly fix the case in place with two M4 screws tightened to a maximum torque of 0.5N·m.

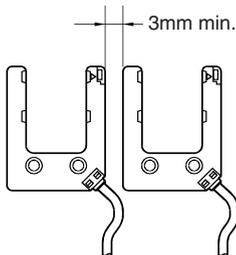
The sensors can be gang-mounted as shown below.



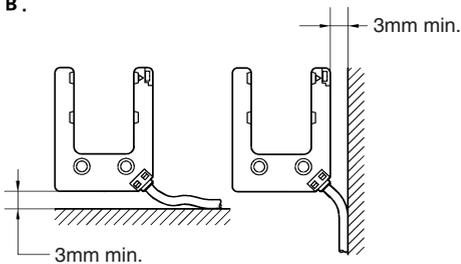
### 2. Mounting Space

When mounting the HPV, allow at least 3mm of space for leading in the cable, as shown in figures A and B below. When mounting the HPV, allow at least 3mm of space for leading in the cable, as shown in figures A and B below.

A.



B.



### 3. Wiring Precautions

- Be sure to wire the power supply and load for the photoelectric sensor correctly.
- This photoelectric sensor may be influenced by current surge or electrical noise if high-voltage lines or power lines are located near the photoelectric sensor cable. To prevent this, route the cable separately from power lines, or put it in a separate conduit.
- Connect the leads securely using crimped terminals or the like.
- If extending the cable, use at least 0.3mm<sup>2</sup> wire. Keep the cable length to within 100m. Consider the influence of additional electrical noise caused by a longer cable.
- If a switched-mode power supply is used, ground the frame ground terminal on the power supply before use.
- When connecting a capacitive load, insert a current-limiting resistor to keep inrush current to 100mA or less.

### 4. Handling Precautions

- Do not swing the photoelectric sensor by its cable.
- Do not tug the photoelectric sensor cable with excessive force. The maximum pullout strength of the cable is 50N.
- Prevent objects from bumping against or scratching the sensor head.
- Do not use this sensor in a wet or oily place, or outdoors, or where exposed to chemicals (organic solvent, acid or alkali) atmospheres.
- Bends in the cable should have a radius of at least 30mm.