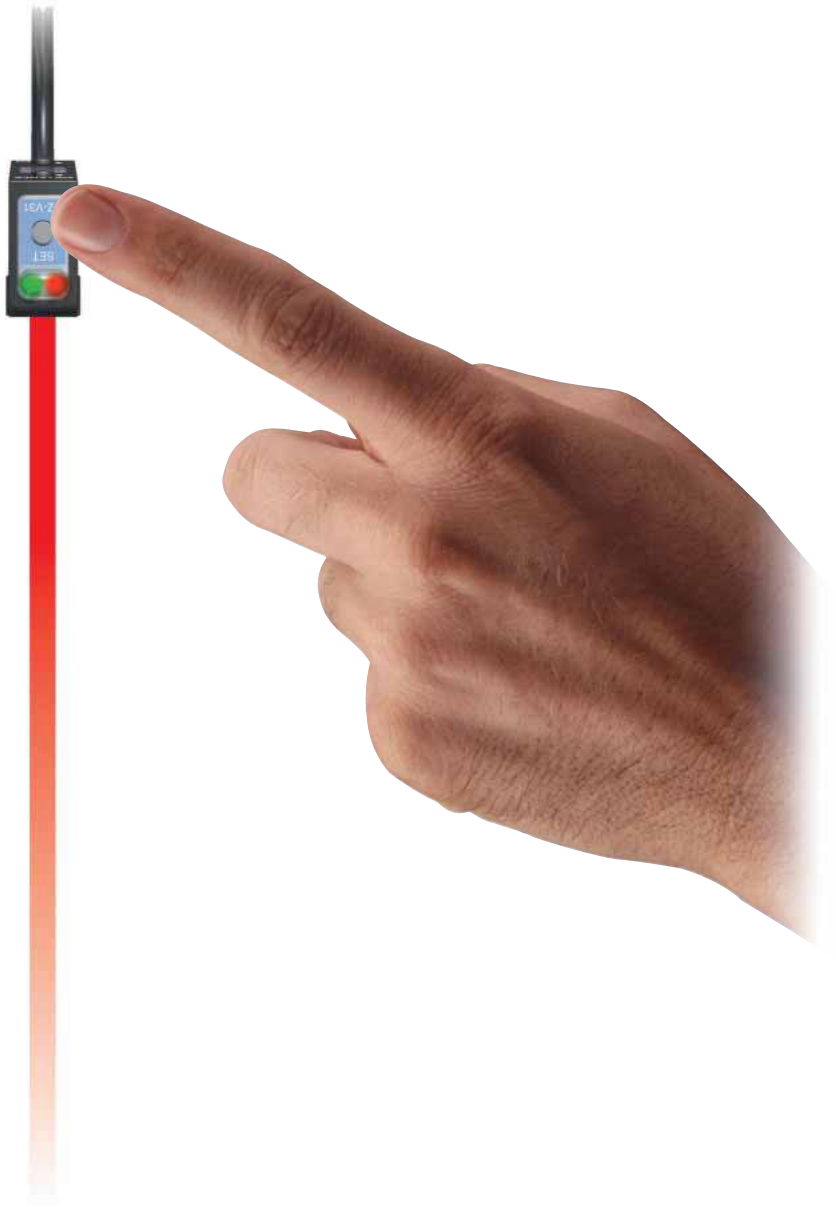
KEYENCE

Self-contained Photoelectric Sensors
PZ-V/M Series

More Stability, Less Trouble

Intelligent Reflective Photoelectric Sensor

One-touch



Can your sensor detect these targets?

CE

Unstable Detection Is Unavoidable with Conventional Photoelectric Sensors

Slanted surfaces will deflect the beam to wrong direction.

Dark colored targets will not reflect the beam.

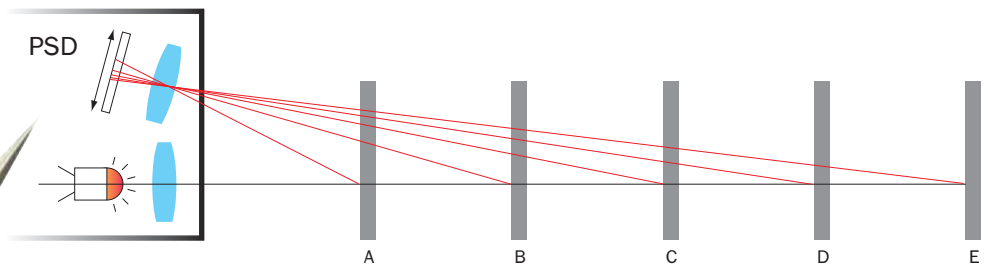
Dirty or oily conditions increase the risk of unstable detection.

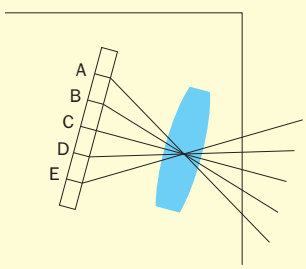
Shiny background causes misdetections without targets.

Two New Technologies Enable PZ-V/M to Detect More Reliably

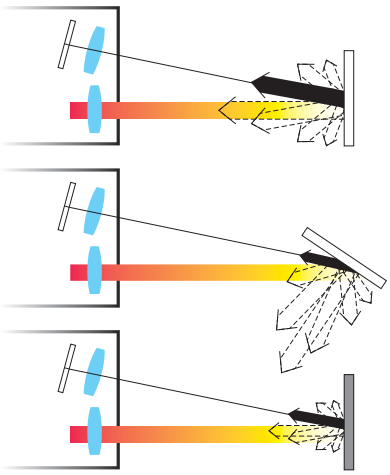
Using P.S.D. & A.P.R. circuit, the PZ-V/M Series is unaffected by a target's color, angle, background,or dirt. The PZ-V/M Series sets a new standard as the most dependable sensor in harsh environments.

P.S.D. (Position Sensitive Detector)





The reflected beam is focused on the position sensitive detector(P.S.D.). The beam spot moves as the target moves. Presence/absence can be determined by detecting the position of the beam spot.



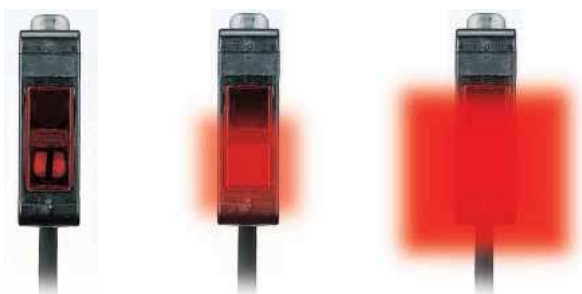
Part of the reflected light beam (shown as black arrows) can reach the receiver.

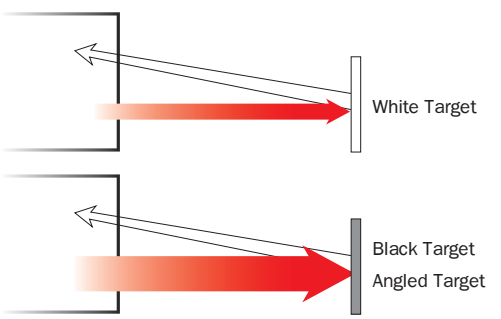
In the case of a target located at an angle, the detectable reflected light beam is shown as black arrows. Even when light beam intensity is decreased, it reaches to the same point on the P.S.D.

Similarly, even when the target color is black, it also reaches to the same point on the P.S.D.

A.P.R. circuit (Automatic Power Reinforcement)

Stable detection is possible due to the A.P.R. circuit which automatically adjusts the amount of light emitted according to the color and angle of the target.



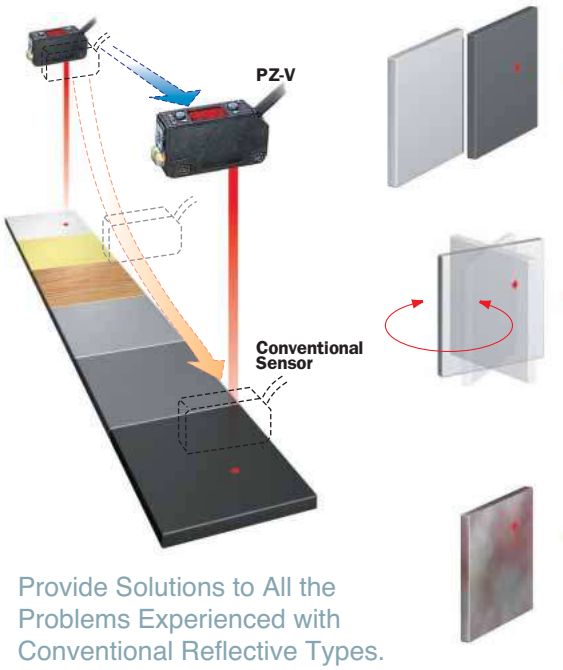


Emitted light intensity is increased when minimum received light intensity cannot be gained.

Only the PZ-V/M Series Provides Reliable Detection Without Re-adjusting the Setting

Unaffected by Angle, Color, or Dirt

Introducing Multi-reflective Photoelectric Sensors



Provide Solutions to All the Problems Experienced with Conventional Reflective Types.

Stable Detection Unaffected by Variations in Color

With conventional reflective type sensors, the detecting distance varies greatly for some dark-colored targets, such as black rubber. However, the PZ-M/V multi-functional reflective type offers almost the same detecting distance for all targets.

Excellent Angle Characteristics

With conventional reflective type sensors, the detecting distance varies greatly when a target is tilted or has a slanted surface. However, the PZ-M/V multi-functional reflective type offers almost the same detecting distance regardless of target orientation.

Excellent Resistance to Dust and Dirt

With conventional reflective type sensors, the detecting distance varies greatly when the sensor head surface becomes dirty due to harsh environments. However, the PZ-M/V multi-functional reflective type sensor offers almost the same detecting distance even when the surface of the sensor head is dirty.

One-touch, Fully-Automatic Calibration

Allows Anyone to Adjust the Sensor.

Easy calibration to start operation.

Fully-Automatic Calibration (To calibrate on a moving target)

Calibration does not cause a production delay.

Two-Point Calibration (To calibrate on a stationary target)

Two point calibration is used to make minute sensitivity adjustments that cannot be done with conventional automatic calibration.

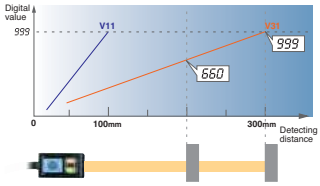
Maximum Sensitivity Setting

The sensitivity is set to the optimum value so that everything other than the background is detected.

Digital display allows a visual check of settings

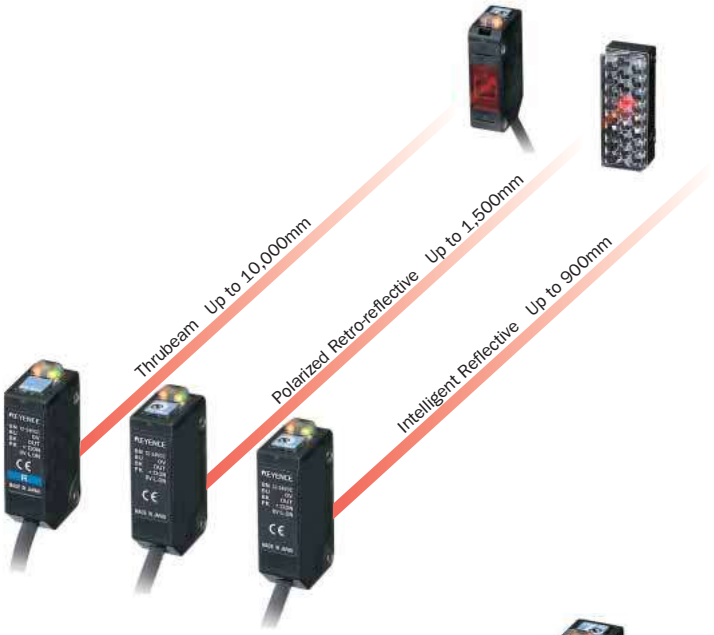
If a problem occurs, the status of the sensor can easily be checked by noting the display value.

Fine sensitivity adjustment is simple.



Available in 36 Models

including thrubeam and retro-reflective types.



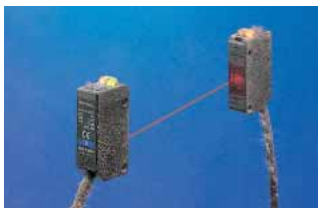
Wide model variation

- NPN/PNP type
- Five types of optional brackets
- Optional slit plate/polarizing filter is available
- M8/M12 connector models available

	Cable Length	Model Name
M8 connector cable	2m	OP-42187
	10m	OP-42188
M12 connector cable	2m	OP-94734
	5m	OP-97491

High-power custom E-max LED

Unbeatable detecting distance of 10m. All models feature a high-power red LED as the light source to achieve radically high power so unaffected by dust.



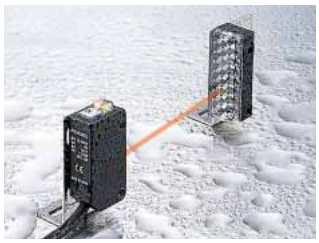
Visible red beam*

Enables quick and easy alignment of optical axis or positioning of beam spot on the target.

Not available on PZ-V7 or PZ-M7* models.

Waterproof

All models of the PZ-M/V, including the reflector of the retro-reflective type conform to IP67. The sensors can be used in harsh environments where they are subjected to water or other liquids.



M3 S.Steel internal thread

To ensure that the device is securely mounted, an M3 thread is integrally moulded within the PZ-V/M in order to double the mounting strength.

High-intensity indicator

The indicator features a large-size smoke lens and high-intensity LED to dramatically improve visibility. The improved visibility allows you to monitor the sensor operation from a remote position.

Sensor Variations

Intelligent Reflective (fully-automatic push button) type: 18 models

Detecting distance	Output	Model	Cable/Connector
100mm	NPN	PZ-V11 PZ-V12 PZ-V13	2m Cable M8 connector M12 connector
	PNP	PZ-V11P PZ-V12P PZ-V13P	2m Cable M8 connector M12 connector
300mm	NPN	PZ-V31 PZ-V32 PZ-V33	2m Cable M8 connector M12 connector
	PNP	PZ-V31P PZ-V32P PZ-V33P	2m Cable M8 connector M12 connector
900mm	NPN	PZ-V71 PZ-V72 PZ-V73	2m Cable M8 connector M12 connector
	PNP	PZ-V71P PZ-V72P PZ-V73P	2m Cable M8 connector M12 connector

Intelligent Reflective (manual calibration) type: 12 models

Detecting distance	Output	Model	Cable/Connector
100mm	NPN	PZ-M11 PZ-M12 PZ-M13	2m Cable M8 connector M12 connector
	PNP	PZ-M11P PZ-M12P PZ-M13P	2m Cable M8 connector M12 connector
300mm	NPN	PZ-M31 PZ-M32 PZ-M33	2m Cable M8 connector M12 connector
	PNP	PZ-M31P PZ-M32P PZ-M33P	2m Cable M8 connector M12 connector
900mm	NPN	PZ-M71 PZ-M72 PZ-M73	2m Cable M8 connector M12 connector
	PNP	PZ-M71P PZ-M72P PZ-M73P	2m Cable M8 connector M12 connector

All Models Designed for Toughness

and for ease of use.

Mounting brackets (Optional)

PZ-B41
Standard L-shaped mounting bracket

PZ-B01
Small L-shaped mounting bracket

PZ-B11
Landscape mounting bracket

PZ-B21(Left Type)
PZ-B22(Right Type)
Side-mounting bracket L/R

PZ-B31(Left Type)
PZ-B32(Right Type)
Side-mounting landscape mounting bracket L/R

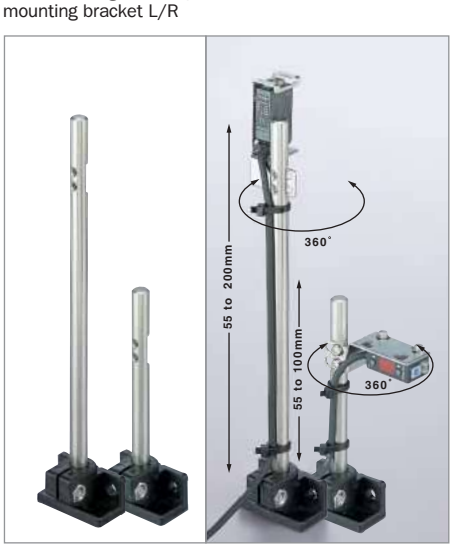
PZ-B51
Reverse L-shaped

PZ-B61
Protective

PZ-B701(for PZ-V/M7∗)
Small L-shaped mounting bracket

PZ-B711(for PZ-V/M7∗)
Landscape mounting bracket

PZ-B761(for PZ-V/M7∗)
Protective



PZ-S10(100mm Type) PZ-S20(200mm Type)
Bracket Support Arm

Polarized Retro-reflective (manual calibration)
type: 6 models

Detecting distance	Output	Model	Cable/Connector
1500mm	NPN	PZ-M61 PZ-M62 PZ-M63	2m Cable M8 connector M12 connector
	PNP	PZ-M61P PZ-M62P PZ-M63P	2m Cable M8 connector M12 connector

Thrubeam (manual calibration)
type: 6 models

Detecting distance	Output	Model	Cable/Connector
10000mm	NPN	PZ-M51 PZ-M52 PZ-M53	2m Cable M8 connector M12 connector
	PNP	PZ-M51P PZ-M52P PZ-M53P	2m Cable M8 connector M12 connector

Specifications

Type		Thrubeam	Polarized retro-reflective	Intelligent reflective					
Model	NPN	**PZ-M51**	**PZ-M61** [1.]	**PZ-M11** [1.]	**PZ-M31** [1.]	**PZ-M71** [1.]	**PZ-V11** [1.]	**PZ-V31** [1.]	**PZ-V71** [1.]
	PNP	**PZ-M51P**	**PZ-M61P**	**PZ-M11P**	**PZ-M31P** [1.]	**PZ-M71P**	**PZ-V11P**	**PZ-V31P** [1.]	**PZ-V71P**
Detecting distance [2.]		10 m 32.8'	0.1 to 1.5 m 0.3' to 4.9' (When **R-5** reflector is used)	5 to 100 mm 0.20" to 3.94" (100 x 100 mm 3.94" x 3.94" white mat paper)	5 to 300 mm 0.20" to 11.81" (100 x 100 mm 3.94" x 3.94" white mat paper)	20 to 900 mm 0.79" x 35.43" (300 x 300 mm 11.81" x 11.81" white mat paper)	5 to 100 mm 0.20" x 3.94" (100 x 100 mm 3.94" x 3.94" white mat paper)	5 to 300 mm 0.20" x 11.81" (100 x 100 mm 3.94" x 3.94" white mat paper)	20 to 900 mm 0.79" x 35.43" (300 x 300 mm 11.81" x 11.81" white mat paper)
Setting distance		–		30 to 100 mm 1.18" x 3.94" (100 x 100 mm 3.94" x 3.94" white mat paper)	40 to 300 mm 1.57" to 11.81" (100 x 100 mm 3.94" x 3.94" white mat paper)	150 to 900 mm 5.91" x 35.43" (300 x 300 mm 11.81" x 11.81" white mat paper)	30 to 100 mm 1.18" x 3.94" (100 x 100 mm 3.94" x 3.94" white mat paper)	40 to 300 mm 1.57" to 11.81" (100 x 100 mm 3.94" x 3.94" white mat paper)	150 to 900 mm 5.91" x 35.43" (300 x 300 mm 11.81" x 11.81" white mat paper)
Light source		Red LED				Infrared LED	Red LED		Infrared LED
Sensitivity adjustment		1-turn trimmer (230°)					Automatic push button		
Response time		1.5 ms max.	1 ms max. (1.2 ms max. with alternate-frequency type, 2 ms max. with M61 only. [1.])						
Operation mode		LIGHT-ON/DARK-ON (switch-selectable)							
Indicators [3.]		Output and power: Orange LED, Stable operation: Green LED							
Digital monitor		–					7-segment, 3-digit red LED		
Control output		NPN: 100 mA (24 V) max./PNP: 100 mA (24 V) max., Residual voltage: 1 V max.							
Protection circuit		Reversed polarity, overcurrent protection, surge absorber							
Power supply		12 to 24 VDC ±10%, Ripple (P-P): 10% max., Class 2							
Current consumption		T: 24 mA max. R: 27 mA max.	34 mA max.	30 mA max.		38 mA max.	37 mA max.		45 mA max.
Enclosure rating		IP67							
Ambient light		Incandescent lamp 5000 lux max. [4.], Sunlight: 20000 lux max.							
Ambient temperature		-20 to +55°C (-4 to +130°F), No condensation							
Relative humidity		35 to 85%, No condensation							
Housing		Glass-fiber reinforced plastic							
Weight (including 2-m 6.6' cable)		T: Approx. 50 g R: Approx. 50 g	Approx. 55 g			Approx. 70 g	Approx. 55 g		Approx. 70 g

1. The alternate-frequency type is indicated by replacing "1" at the end of model name with "5". The models are **PZ-M65**, **M15**, **M35**, **M75**, **V15**, **V35** and **V75**.
2. The detecting distance is obtained with the maximum sensitivity.
3. The transmitter of the **PZ-M51** features a power indicator only.
4. 3000 lux max. for **PZ-M71P/V71P**.

Slit A-4 (Optional)

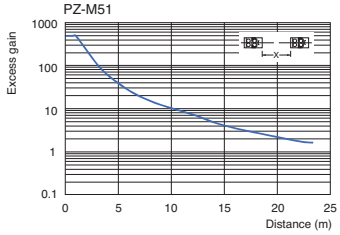
An optional slit plate and/or polarizing filter is available for the thrubeam type sensors (PZ-M51). Model No.: A-4 (Set of 3 types of slit plates and a polarizing filter)

	Slit plate		
Slit width (mm)	0.5	1	2
Detecting distance (mm)	500	1000	2000
Target size (mm)	0.5 X 5	1 X 5	2 X 5

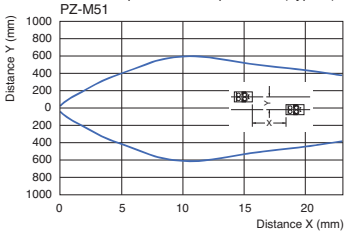
	Slit plate and polarizing filter			
Slit width (mm)	——	0.5	1	2
Detecting distance (mm)	4000	200	600	1300
Target size (mm)	6 X 6	0.5 X 5	1 X 5	2 X 5

Characteristics

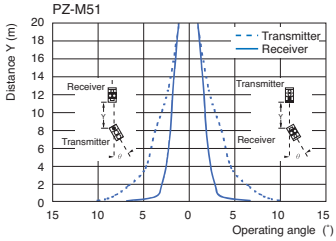
Receiver excess gain vs. distance (Typical)
PZ-M51



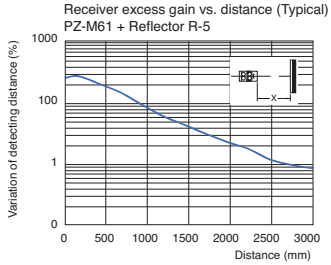
Parallel displacement of optical axis (Typical)
PZ-M51



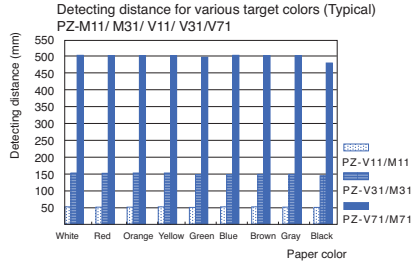
Angle characteristics (Typical)
PZ-M51



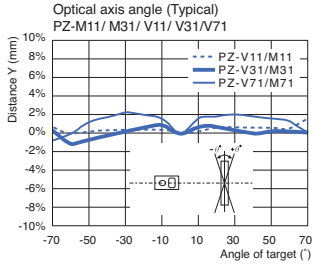
Receiver excess gain vs. distance (Typical)
PZ-M61 + Reflector R-5



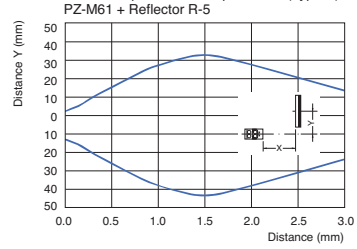
Detecting distance for various target colors (Typical)
PZ-M11/ M31/ V11/ V31/V71



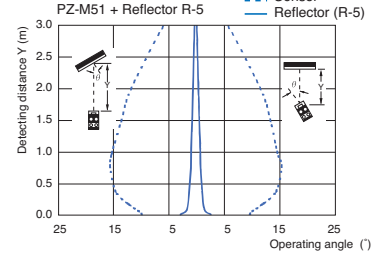
Optical axis angle (Typical)
PZ-M11/ M31/ V11/ V31/V71



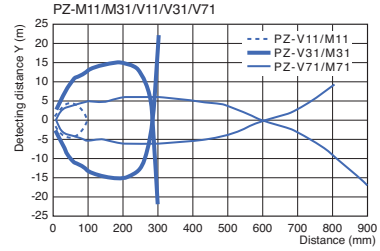
Parallel displacement of optical axis (Typical)
PZ-M61 + Reflector R-5



Angle characteristics (Typical)
PZ-M51 + Reflector R-5

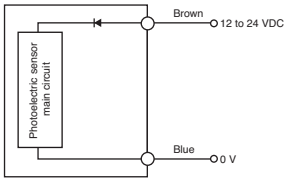


Operating distance (Typical)
PZ-M11/M31/V11/V31/V71

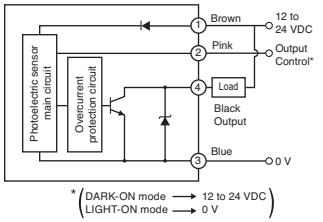


Input/output circuits

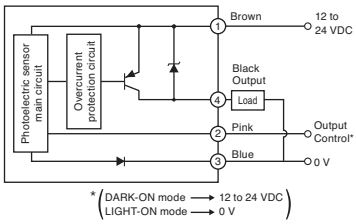
PZ-M51(P) (Transmitter)



PZ-M51 (Receiver) /M61/M11/M31/V11/V31/V71/M71

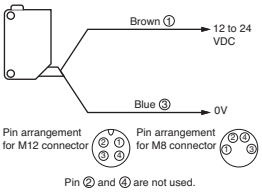


PZ-M51P (Receiver) M61P/M11P/M31P/V11P/V31P/V71P/M71P



Main circuit

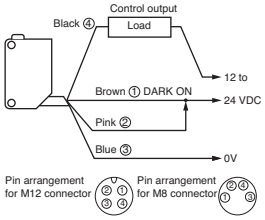
PZ-M51(P) (Transmitter)



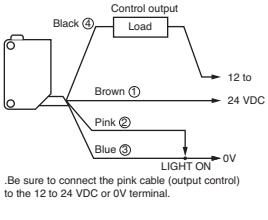
Pin ② and ④ are not used.

PZ-M51(Receiver) /M61/M11/M31/V11/V31/V71/M71

1.DARK-ON mode



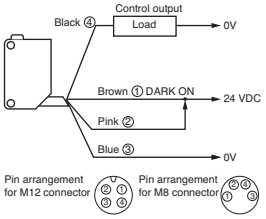
2.LIGHT-ON mode



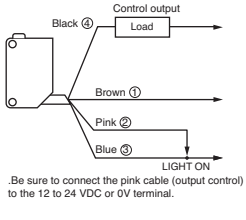
.Be sure to connect the pink cable (output control) to the 12 to 24 VDC or 0V terminal.

PZ-M51P(Receiver) /M61P/M11P/M31P/V11P/V31P/V71P/M71P

1.DARK-ON mode



2.LIGHT-ON mode

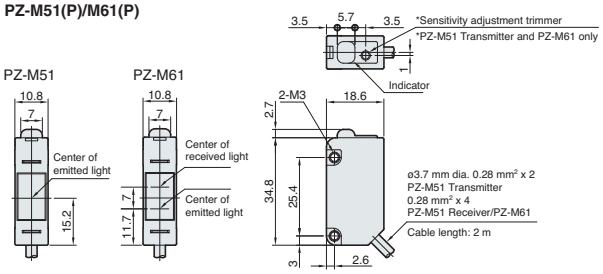


.Be sure to connect the pink cable (output control) to the 12 to 24 VDC or 0V terminal.

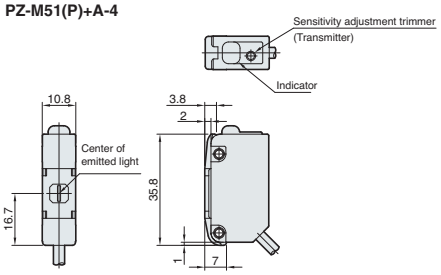
Dimensions

Sensors

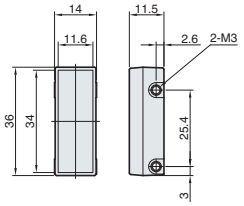
PZ-M51(P)/M61(P)



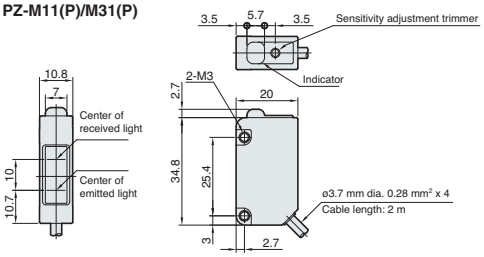
PZ-M51(P)+A-4



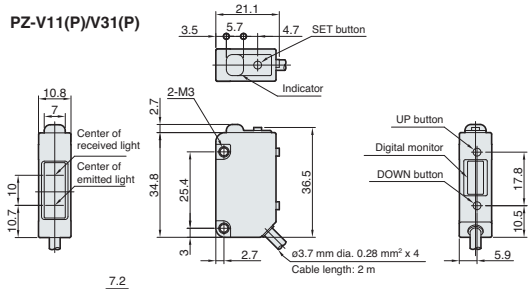
Reflector R-5
(accessory for PZ-M61)



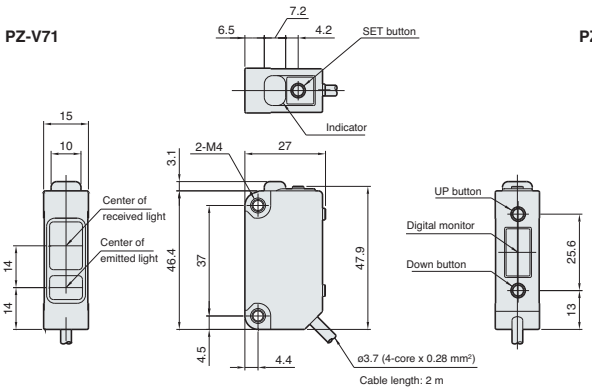
PZ-M11(P)/M31(P)



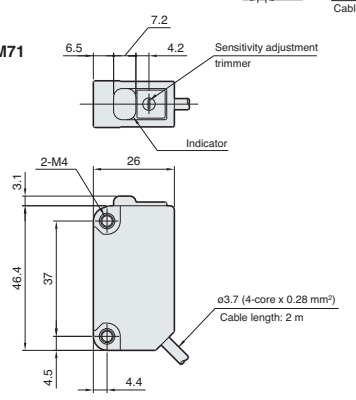
PZ-V11(P)/V31(P)



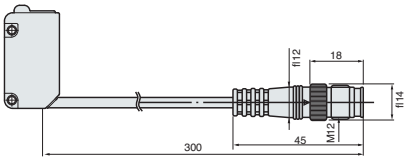
PZ-V71



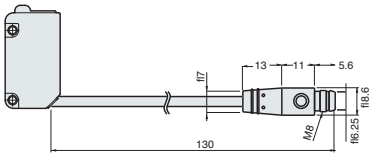
PZ-M71



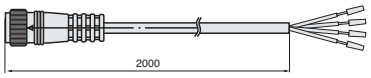
M12 Connector type



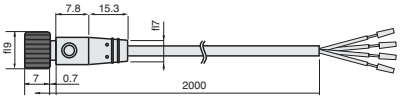
M8 Connector type



M12 Connector Cable
OP-94734
(Optional)

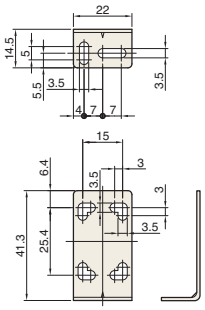


M8 Connector Cable
OP-42187
(Optional)

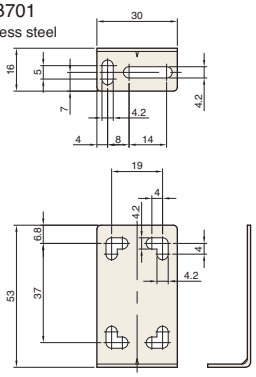


Mounting bracket (Optional)

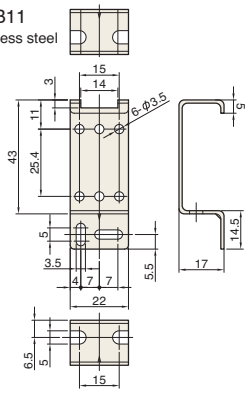
PZ-B01
Stainless steel
t=1.2



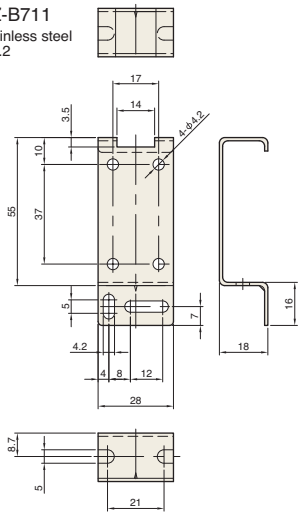
PZ-B701
Stainless steel
t=1.2



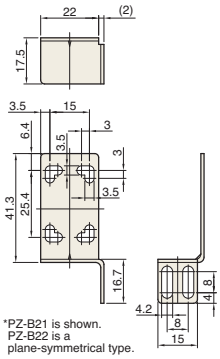
PZ-B11
Stainless steel
t=1.2



PZ-B711
Stainless steel
t=1.2

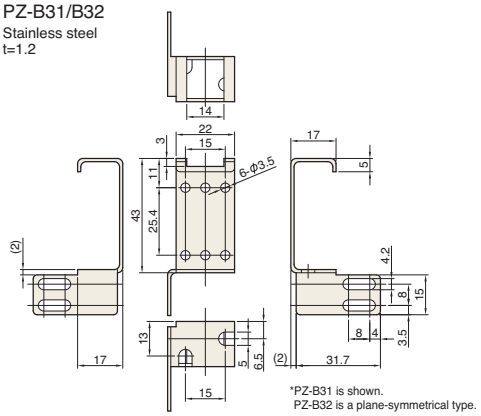


PZ-B21/B22
Stainless steel
t=1.2



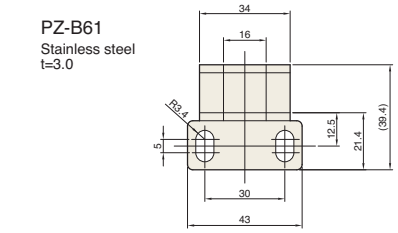
*PZ-B21 is shown.
PZ-B22 is a plane-symmetrical type.

PZ-B31/B32
Stainless steel
t=1.2

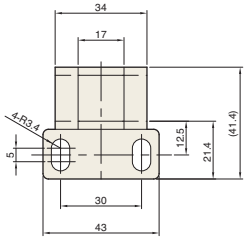


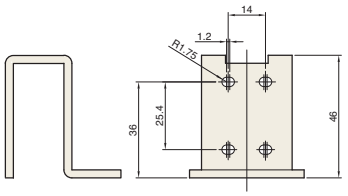
*PZ-B31 is shown.
PZ-B32 is a plane-symmetrical type.

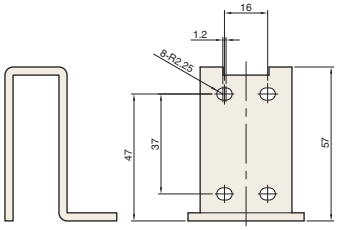
PZ-B61
Stainless steel
t=3.0



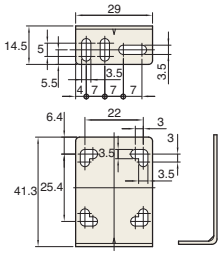
PZ-B761
Stainless steel
t=3.0



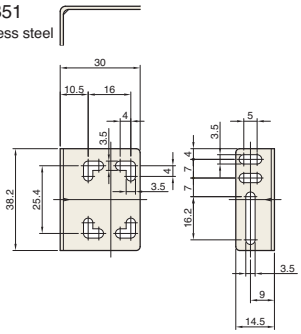




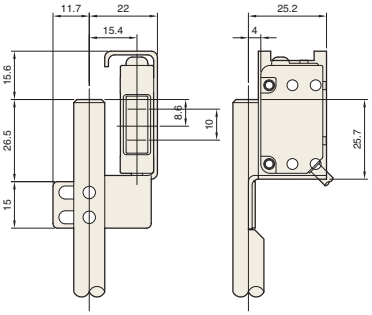
PZ-B41
Stainless steel
t=1.2

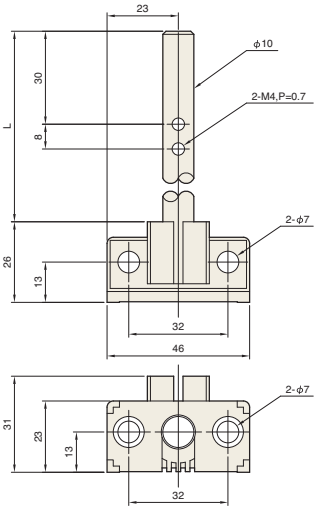


PZ-B51
Stainless steel
t=1.2

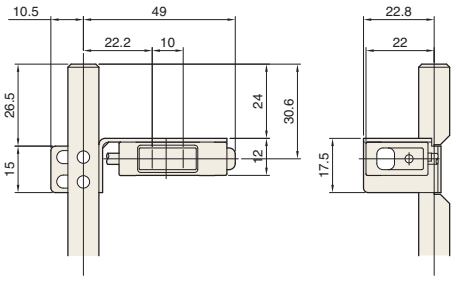


PZ-S□□+PZ-B32
When PZ-V11/V31 are mounted
L=100mm/PZ-S10
L=200mm/PZ-S20





PZ-S□□+PZ-B31
When PZ-V11/V31 are mounted
L=100mm/PZ-S10
L=200mm/PZ-S20



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