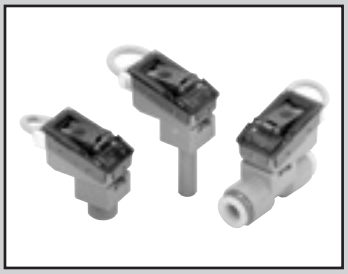


Compact electronic pressure switch (pressure switch)

PPE Series

Overview

Pressure switch PPE Series is trimmer setting semiconductor pressure switch developed for pneumatic/vacuum systems. Usage is flexible due to compact shape and three types of piping connection (R1/8, ø6 plug, ø6 push-in fitting).

Features

- Semiconductor pressure sensor
  Used semiconductor sensor pressure detection, high precision and high reliability are achieved.
- 2-wire
  In 2-wire, wiring man-hours are reduced and both PLC input formats (source and sink) can be used.
- High proof pressure
  Proof pressure of negative pressure (V01) is as high as 0.6 MPa, so the product can withstand vacuum burst by pressurization.
- Reverse connection/overcurrent protection circuit integrated
  A protection circuit for improper wire connection (reverse connection, load short circuit) is integrated.
- Wide port size
  R1/8
  ø6 plug
  ø6 Push-in fitting

Specifications

Model No. / Item	Vacuum	Positive pressure	
	PPE-V01-□ *1	PPE-P01-□ *1	PPE-P10-□ *1
Rated pressure	-101.3 (≈-15 psi) to 0 kPa (≈0 psi)	0 (≈0 psi) to 100 kPa (≈15 psi)	0 (≈0 psi) to 1 MPa (≈150 psi)
Plate color *2	Red	Green	Blue
Pressure sensitive element	Diffusion semiconductor pressure sensor		
Applicable fluid	Air/non-corrosive gas		
Proof pressure	0.6 MPa (≈87 psi, 6 bar)	0.3 MPa (≈44 psi, 3 bar)	1.5 MPa (≈220 psi, 15 bar)
Repeatability	±1% F.S.		
Hysteresis	3% F.S. or less		
Temperature characteristics	±3% F.S.		
Load voltage	10 to 30 VDC		
Load current	5 to 50 mA		
Internal voltage drop	4 V or less		
Leakage current	1 mA or less		
Indicator lamp	Yellow LED lit when ON		
Lead wire length	Standard 3 m (oil resistant vinyl cabtyre cable 2-conductor 0.15 mm^2 insulator outer diameter ø1.0)		
Operating ambient temperature range	0 (32°F) to 50°C (122°F) (no freezing)		
Vibration resistance	10 to 55 Hz compound amplitude 1.5 mm 4 hours per X, Y, Z direction		
Degree of protection	IEC standards IP65 or equivalent		
Piping method	R1/8, ø6 plug, ø6 push-in fitting		
Weight	PPE-□-6/-H6-B: Approx. 37 g, PPE-□-H6: Approx. 42 g		

*1: □ section is matched to piping section. (Refer to How to order)
*2: Name plate color is changed by pressure range. (To prevent improper use when intermixed)

Clean-room specifications

(Catalog No. CB-033SA)

- Anti-dust generation structure for use in cleanrooms

PPE- ..... **-P70**

PPE- ..... **-P80**

How to order

PPE - V01 - 6

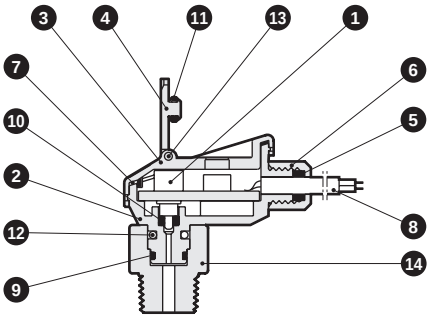
Ⓐ Pressure range

Ⓑ Piping shape

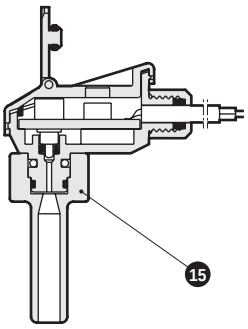
Code	Description
Ⓐ Pressure range	
V01	-101.3 to 0 kPa
P01	0 to 101 kPa
P10	0 to 1 MPa
Ⓑ Piping shape	
6	R1/8
H6-B	ø6 mm plug
H6	In-line of push-in fitting for ø6 (2 pcs.)

Internal structure and parts list

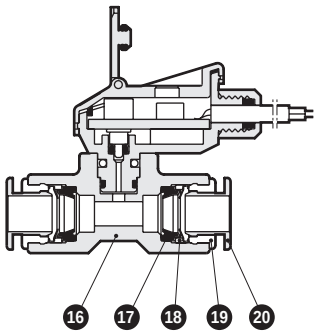
● PPE-□-6



● PPE-□-H6-B



● PPE-□-H6



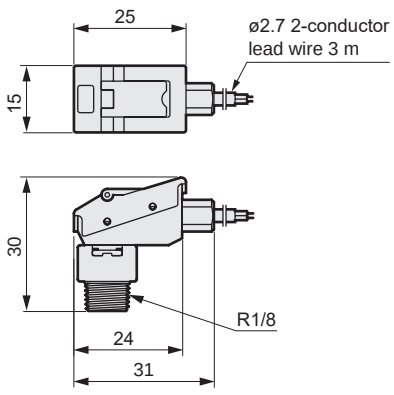
Cannot be disassembled

No.	Part name	Material	No.	Part name	Material
1	Pressure sensor	Diffusion semiconductor strain gauge	11	O-ring	Nitrile rubber
2	Body	Polybutylene terephthalate	12	Stopper	Stainless steel
3	Cover	Polycarbonate	13	Spring pin	Stainless steel
4	Trimmer guard	Polycarbonate	14	R1/8	Polybutylene terephthalate
5	Bush	Nitrile rubber	15	Plug	Polybutylene terephthalate
6	Bush holder	Aluminum	16	Push-in fitting	Polybutylene terephthalate
7	Cover gasket	Silicone rubber	17	Packing	Nitrile rubber
8	Lead wire (3 m)	Polyvinyl chloride	18	Chuck	Copper alloy (electroless nickeling)
9	O-ring	Nitrile rubber	19	Outer ring	Copper alloy (electroless nickeling)
10	O-ring	Nitrile rubber	20	Push ring	Polyacetal

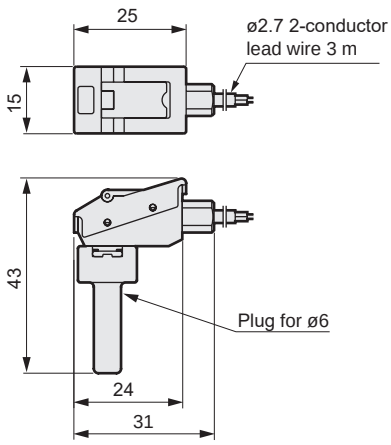
Dimensions

CAD

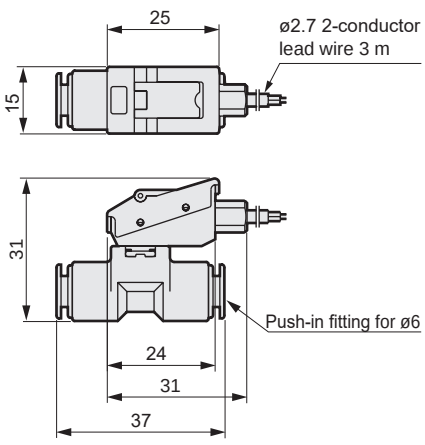
● PPE-□-6



● PPE-□-H6-B



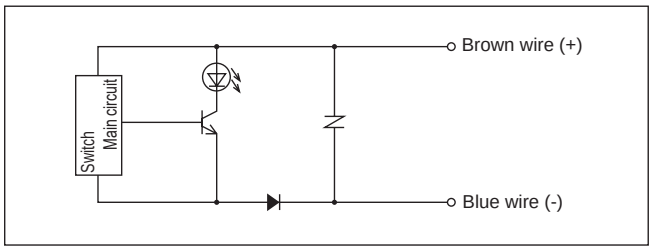
● PPE-□-H6



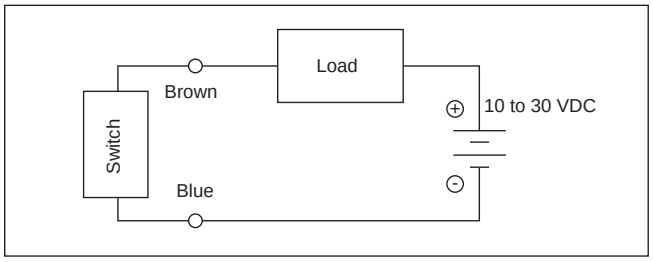
Refer to Safety precautions PPE Series on pages 1220 to 1221 for each component.

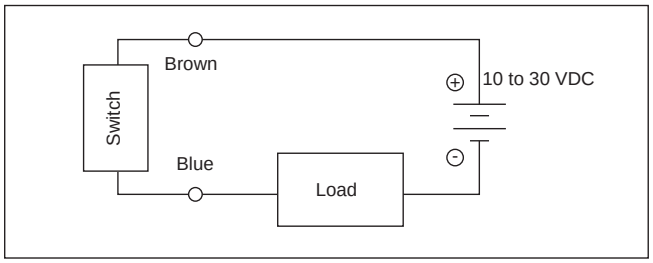
Internal circuit / connection method

● Internal circuit diagram



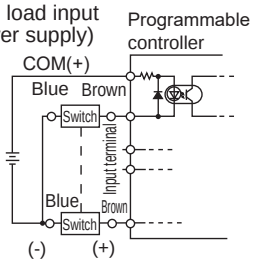
● Connecting the lead wire



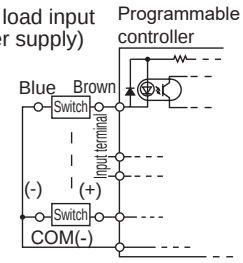


● Connection to programmable controller (PLC)

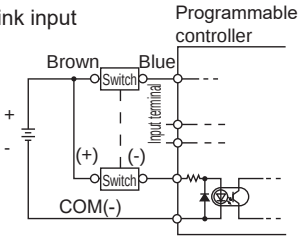
● Connection to source load input (external electric power supply)

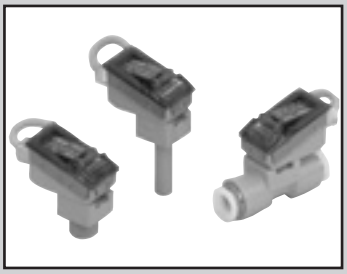


● Connection to source load input (internal electric power supply)



● Connection to sink input





Compact electronic pressure sensor (pressure sensor)
Analog output

PPE-□A Series

Overview

Pressure sensor PPE-A Series is semiconductor pressure sensor developed for pneumatic and vacuum systems. Output proportional to applied voltage: 1 to 5 V (analog output). Usage is flexible due to compact shape and three types of piping connection (R1/8, ø6 plug, ø6 push-in fitting).

Features

- Semiconductor pressure sensor: Used semiconductor sensor pressure detection, high precision and high reliability are realized.
- Analog output : Analog output proportional to applied pressure(1to5V)can be obtained.
- With power supply lamp : When the power supply is energized, green LED lights to show operational status at load short circuit.
- Integrated protection circuit to prevent power reverse connection/load short-circuit Incorrect wiring (Power reverse connection, load short-circuit) protection circuit for .
- Selectable piping connection method: R1/8, ø6 plug, ø6 push-in fitting

Specifications

Model No. / Item	Vacuum	For positive pressure	
	PPE-V01A-□*1	PPE-P01A-□*1	PPE-P10A-□*1
Rated pressure	0 to −100 kPa	0 to 100 kPa	0 to 1 MPa
Plate line color *2	Red	Green	Blue
Pressure sensitive element	Diffusion semiconductor pressure sensor		
Applicable fluid	Air/non-corrosive gas		
Proof pressure	0.3 MPa	0.3 MPa	1.5 MPa
Accuracy	±1% F.S. or less		
Linearity	±0.3% F.S. or less		
Analog output	1 to 5 V (output impedance 1 kΩ)		
Power supply voltage	12 to 24 VDC ± 10% (ripple rate 1% or less)		
Current consumption	10 mA or less		
Display lamp	Green LED lighting when power supply is energized		
Lead wire length	Standard 3 m (oil resistant vinyl cabtyre cable, 3-conductor, 0.15 mm² insulator outer diameter ø1.0)		
Protection circuit	Power reverse connection protection, load short-circuit protection		
Ambient temperature	0 to 50°C(no freezing)		
Temperature characteristics	±0.12% F.S./°C or less		
Insulation resistance	20 MΩ and over at 500 VDC		
Withstand voltage	1000 VAC for 1 minute		
Vibration resistance	10 to 55 Hz compound amplitude 1.5 mm 4 hours per X, Y, Z direction		
Degree of protection	IEC standards IP65 or equivalent		
Piping method	R1/8, ø6 plug, ø6 push-in fitting		
Weight	PPE-□-6/-H6-B: approx. 37 g, PPE-□-H6: Approx. 42 g		

*1: □ section is matched to piping section. (Refer to How to order)
*2: Name plate line is changed by pressure range. (To prevent improper use when intermixed)

Clean-room specifications

(Catalog No.CB-033SA)

- Anti-dust generation structure for use in cleanrooms

PPE-□ A- ····· **P70**

PPE-□ A- ····· **P80**

How to order

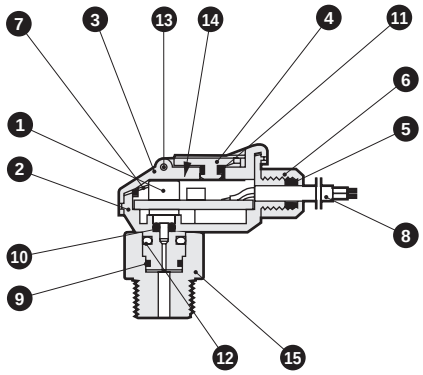
PPE - V01 A - 6

Ⓐ Pressure range
Ⓑ Piping shape

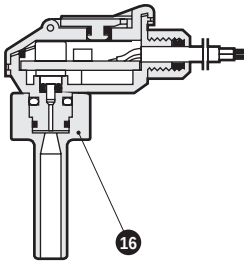
Code	Description
Ⓐ Pressure range	
V01	0 to -100 kPa
P01	0 to 100 kPa
P10	0 to 1 MPa
Ⓑ Piping shape	
6	R 1/8
H6-B	ø6 mm plug
H6	In-line of push-in fitting for ø6 (2 pcs.)

Internal structure and parts list

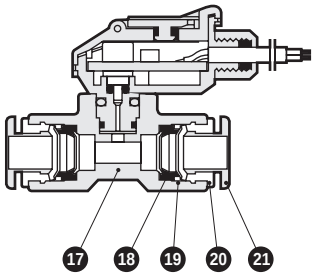
● PPE-□A-6



● PPE-□A-H6-B



● PPE-□A-H6

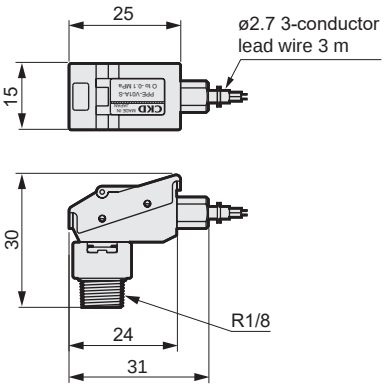


Cannot be disassembled

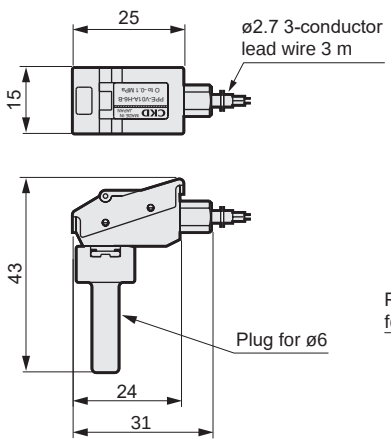
No.	Part name	Material	No.	Part name	Material
1	Pressure sensor	Diffusion semiconductor strain gauge	12	Stopper	Stainless steel
2	Body	Polybutylene terephthalate	13	Spring pin	Stainless steel
3	Cover	Polycarbonate	14	Shield sheet	Aluminum
4	Trimmer guard	Polycarbonate	15	R1/8	Polybutylene terephthalate
5	Bush	Nitrile rubber	16	Plug	Polybutylene terephthalate
6	Bush holder	Aluminum	17	Push-in fitting	Polybutylene terephthalate
7	Cover gasket	Silicone rubber	18	Packing	Nitrile rubber
8	Lead wire (3 m)	Polyvinyl chloride	19	Chuck	Copper alloy (electroless nickeling)
9	O-ring	Nitrile rubber	20	Outer ring	Copper alloy (electroless nickeling)
10	O-ring	Nitrile rubber	21	Push ring	Polyacetal
11	O-ring	Nitrile rubber			

Dimensions CAD

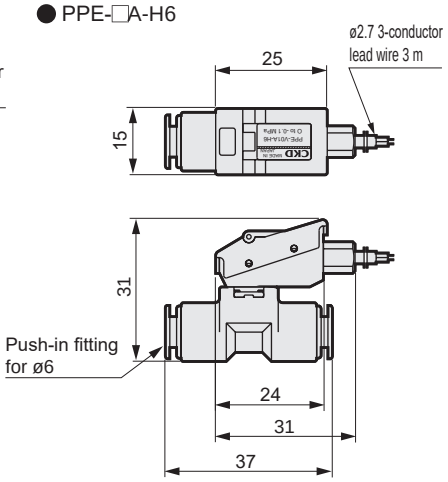
● PPE-□A-6



● PPE-□A-H6-B



● PPE-□A-H6

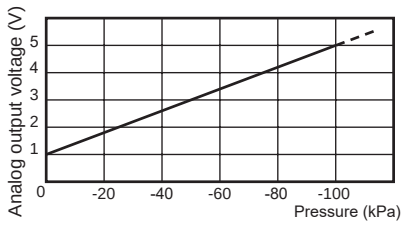


Caution

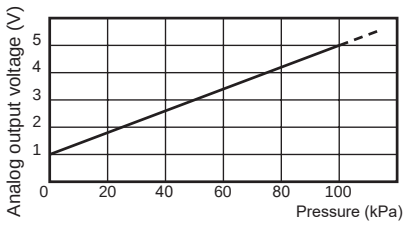
- Analog output accuracy is affected by temperature characteristics and heat generated when energized. Provide sufficient stand-by time (5 minutes or more after energizing) before use.
- Refer to Safety precautions in PPE-□A Series on pages 1222 to 1223.

Analog output voltage - pressure characteristics

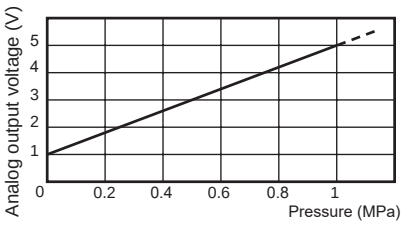
● PPE-V01A-□



● PPE-P01A-□



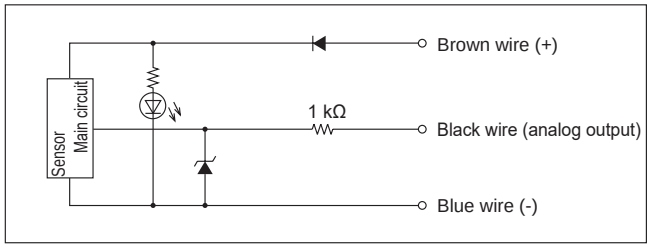
● PPE-P10A-□



Internal circuit / connection method

[Circuit diagram and connection method]

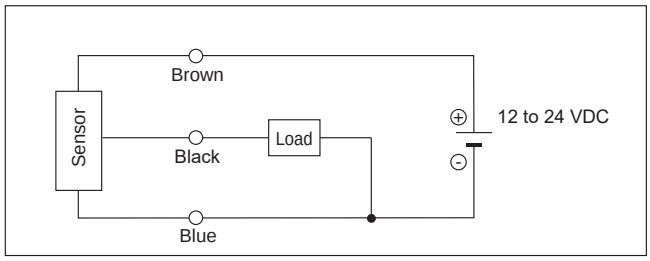
● Internal circuit diagram



● Lead wire color and description

Line color	Description
Brown	Power supply 12 to 24 VDC
Black	Analog output (1 to 5 V)
Blue	0 V(GND)

● Connecting the lead wire



Electronic compact pressure sensor

PPEV-□A Series

Overview

The electronic compact pressure sensor PPEV-A Series is a semiconductor pressure sensor for pneumatic and vacuum systems.
Output proportional to applied voltage: 1 to 5 V (analog output).
Compact with a width of 10mm, it can be connected to small Components such as pneumatic valves for use in output confirmation, etc.

Features

- Semiconductor pressure sensor: Used semiconductor sensor pressure detection, high precision and high reliability are realized.
- Compact and lightweight: Just 10mm wide and g lightweight.
- Connector connection: Uses a connector in the sensor connection part, enabling easy pressure sensor replacement.
- Pneumatic valve output confirmation: 4GR and 3QR Series and In combination, confirm output and vacuum suctionbefore use.

Specifications

Item		Positive pressure	Negative pressure
		PPEV-P10A-□	PPEV-V01A-□
Working pressure		0 to 1.0 MPa	-100 kPa to 0
Service voltage		10.8 to 30.0 VDC	
Current consumption		5 mA (24 VDC, no load)	
Pressure detection method		Diffused semiconductor pressure switch	
Applicable fluid		Compressed air	
Proof pressure		1.5 MPa	0.5 MPa
Ambient temperature		0 to 55°C	
Analog output	Output voltage	1 to 5V	
	Zero point voltage	1±0.1V	
	Linearity	±0.5% F.S. max	
	Temperature characteristics	±2% F.S. max	
	Output current	0.5 mA max. (load resistance 10 kΩ)	
Indicator		None	
Wiring method		Connector connection	
Wire length		1000 mm	
Insulation resistance		20 MΩ and over at 500 VDC	
Withstand voltage		1000 VAC for 1 minute	
Shock resistance		300m/s^2 or less	
Vibration resistance		50m/s^2 or less	
Degree of protection		Dust-proof	
Piping method		M5, ø4 plug, ø6 plug	
Weight *1		PPEV-□-M5:11.2g, PPEV-□-H-4B:10.7g, PPEV-□-H-6B:11.1g	

*1: Weight includes the connector wiring.

How to order

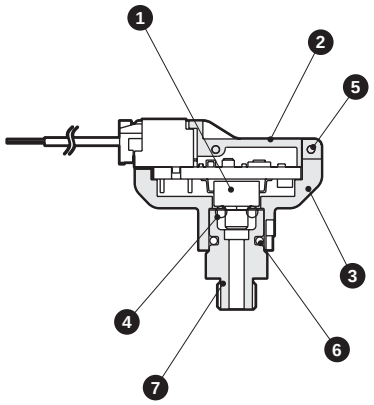
PPEV – P10A – H4-B

- PPEV: Model No.
- P10A: Pressure range
- H4-B: Port size

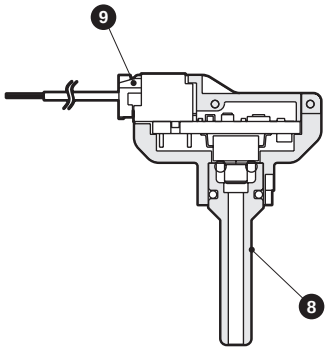
Code	Description	
Pressure range		
P10A	0 to 1 MPa	●
V01A	-100 to 0 kPa	-
Port size		
H4-B	ø4 mm plug	●
H6-B	ø6 mm plug	●
M5	M5	●

Internal structure

PPEV-□A-M5



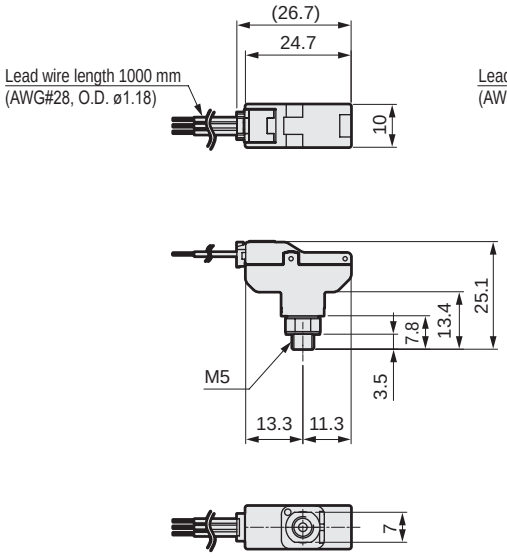
PPEV-□A-H4 (H6)



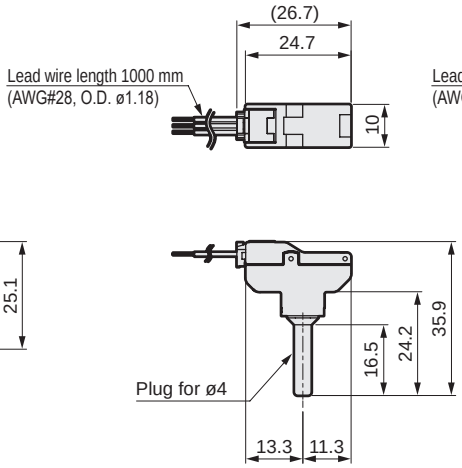
No.	Part name	Material	No.	Part name	Material
1	Pressure sensor	Diffusion semiconductor strain gauge	6	Fixing clip	Stainless steel
2	Cover	Resin	7	M5 piping adapter	Aluminum
3	Case	Resin	8	ø4 piping adapter	Resin
4	O-ring	Nitrile rubber	9	Connector	-
5	Spring pin	Stainless steel			

Dimensions

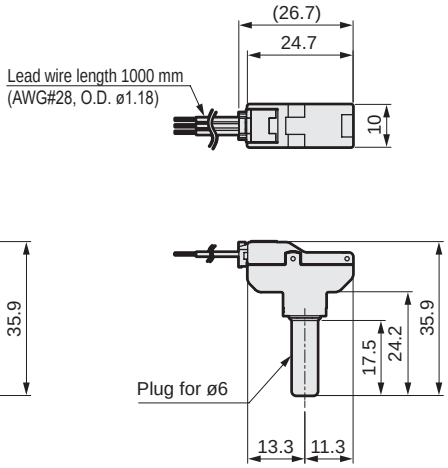
PPEV-□A-M5



PPEV-□A-H4



PPEV-□A-H6

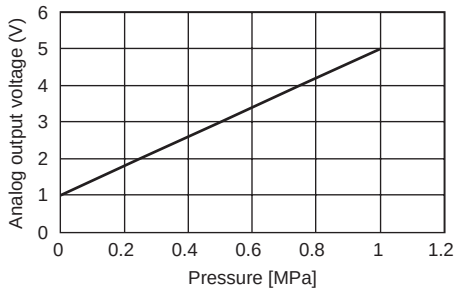


Precautions

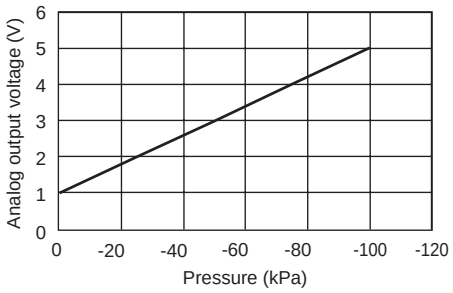
- Analog output accuracy is affected by temperature characteristics and heat generated when energized. Provide sufficient stand-by time (5 minutes or more after energizing) before use.

Analog output voltage - pressure characteristics

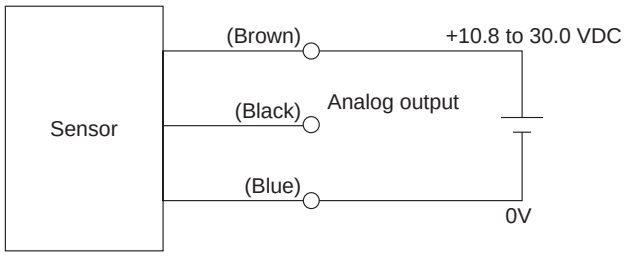
● PPEV-P10A



● PPEV-V01A



Circuit diagram and wiring method



Lead wire color and description

Line color	Description
Brown	Power supply (10.8 to 30.0 VDC)
Black	Analog output (1 to 5 V)
Blue	GND (0 V)

*The analog output impedance is 10 Ω. When connecting a load resistor, use 10 kΩ or more.

$$\text{Output value} = \left(1 - \frac{R_0}{R_0 + R_x}\right) \times 100\%$$

$$\text{Output value} = \left(1 - \frac{10}{10+10000}\right) \times 100\% = 99.9\%$$

Output value error
approx. 0.1%

Pressure sensor impedance: R_0 = 10 Ω
Load internal impedance: R_x = 10 kΩ