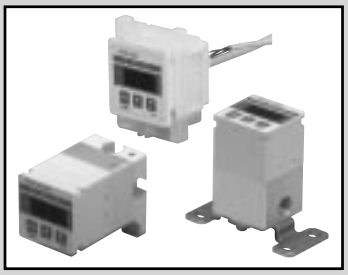
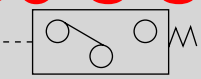


Discontinue

Electronic pressure switch with digital display (pressure switch)

PPD3/PPD3-S Series

PPD3-S Series is still on sale.



CAD Refer to a file list on Ending 88.

Overview

The PPD3 Series is a pressure switch optimum for the pneumatic line.
The various port options allow a variety of applications including base pressure confirmation, suction confirmation and seating confirmation.

Features

- A series of semiconductor pressure sensors and stainless steel diaphragm pressure sensors has been realized with a common mounting structure. The models can be easily replaced when the air line conditions deteriorate or when improvements are needed.
- A resin port with push in joint (6HD, 6HT, H6) is available. Lighter weights and space saving can be achieved.
- A through type port (6T, 6HT, H6) is available. This type is suitable for suction confirmation and seating confirmation. Only the minimum piping space is required.
- Installation and settings can be completed efficiently with convenient functions including the peak hold function, forced switch function and pressure reading function.
- CE marking compliant.

Sensor integrated type/sensor separate type specifications

Descriptions	PPD3			PPD3-S		
	R10	R03	R01	R10	R03	R01
Pressure sensitive element	Diffused semiconductor pressure sensor			Single stainless steel diaphragm pressure sensor		
Applicable fluid Note 2	Air/dry compressed air			Air/compressed air (including moisture/drain) Note 3		
Rated pressure range	-100 to 980kPa	-100 to 300kPa	-100 to 100kPa	-100 to 980kPa	-100 to 300kPa	-100 to 100kPa
Display unit	kPa	kPa	kPa	kPa	kPa	kPa
Display min. unit Note 1	1kPa					
Guaranty withstanding pressure	1.5MPa	0.6MPa	0.2MPa Note 4	2MPa	0.6MPa	0.6MPa
Display accuracy (25 ℃)	±2%F.S.					±3%F.S.
Temperature characteristics (0 to 50 ℃)	±4%F.S.					±5%F.S.
Leakage	1cm^3/min (ANR) or less					
Display	3-digit LED display character height 8mm					
Power voltage	12 to 24VDC ±10%					
Current consumption	50mA or less (sensor separate type is 60mA or less.)					
Switch output type	Sensor Integrated type: N : NPN transistor open collector output 2 points P : PNP transistor open collector output 2 points NA: NPN transistor open collector output 1 point + analog output 1 point PA: PNP transistor open collector output 1 point + analog output 1 point					
	Sensor Separate type: NA: NPN transistor open collector output 2 points + analog output 1 point PA: PNP transistor open collector output 2 points + analog output 1 point					
Switch output current	50mA or less					
Switch output Voltage drop value	2.4V or less					
Switch output response time	Approx. 5msec					
Analog output	1 to 5V ±0.1V					
Set value holding	EEPROM					
Radial lead wire	The body: oil resistance vinyl code 4-conductor (0.3mm^2) 1m (sensor separate type is 5-conductor.) Sensor section of sensor separate type: Oil resistance vinyl code 3-conductor (0.15mm^2) 3m					
Working temperature/humidity	0 to 50℃/0 to 85%RH (without dew condensation.)					
Vibration proof	10 to 55Hz compound amplitude 1.5mm, 2 hours for XYZ directions					
Protective structure	Equivalent to IP65 Note 5 (Equivalent to IP40 for sensor section of sensor separate type)					
Protective circuit Note 6	Power supply and switch output reverse connection protections, switch output load short-circuit protection					

Note 1: This indicates the minimum pressure display unit, and does not guarantee the display accuracy.
Note 2: Only the PPD3-S-*-P70/P80/P90 are ozone resistant.Contact CKD when ozone resistance is required.
Note 3: Contact CKD for applications involving water or other fluids.
Note 4: The pressure is 0.3MPa for the sensor separated type.
Note 5: This applies when the atmosphere introduction port is treated.(Refer to 5 on Page 830.)
Note 6: This product's protective circuit is effective only for specific incorrect connections and load short-circuits, and does not provide protection against all incorrect connections.
Note 7: Do not clean the product's resin sections with an organic solvent such as alcohol.The resin could be impregnated.

Circuit diagram and connection methods

Refer to Page 828 and 829.

How to order

PPD3 - R03 NA D - 6HT - P70

- A Sensor type
- B Pressure range
- C Output type
- D Shape
- E Port type
- F Clean room specifications *1/*2

Symbol		Descriptions
A Sensor type		
PPD3		Semiconductor sensor
PPD3-S		Stainless steel diaphragm sensor
B Pressure range		
R10		-100 to 980kPa
R03		-100 to 300kPa
R01		-100 to 100kPa
C Output type		
N	For sensor integrated type	NPN transistor output 2 points
P		PNP transistor output 2 points
NA		NPN transistor output 1 point + analog output 1 point
PA		PNP transistor output 1 point + analog output 1 point
NA	For sensor separate type	NPN transistor output 2 points + analog output 1 point
PA		PNP transistor output 2 points + analog output 1 point
D Shape		
Blank		Sensor integrated type
D		Sensor separate type
E Port type		
6B	For sensor integrated type	Rc1/8, 2 direction port rear sides, lower outlet
6T		Rc1/8, through port horizontal both sides outlets
6HD		Light weight port with 6mm push in joint (downward)
6HT		Light weight through port with two 6mm push in joints (horizontal both sides)
6	For sensor separate type	R1/8 — For PPD3 (semiconductor sensor)
H6		6mm push in joint — For PPD3 (semiconductor sensor)
H6-B		6mm plugs — For PPD3 (semiconductor sensor)
6B		Rc1/8 — For PPD3-S (stainless steel diaphragm sensor)

Sensor separate type discrete model No.

● Indicator discrete model No.

E.g.) PPD3 - R10 NA D - P70

- A Sensor type
- B Pressure range
- C Output type
- F Clean room specifications

(Select the models for items B and C from the table on the right.)

● Sensor discrete model No.

E.g.) PPD3 - R03 A - H6 - P70

- A Sensor type
- B Pressure range
- E Port type (Compatible only with 6, H6, H6-B and 6B.)
- F Clean room specifications

(Select the models for items A , B , E and F from the table on the right.)

F Clean room specifications	Structure/treatment	Material restriction
P70	Particle occurrence prevention	-
P74	Particle occurrence prevention	Copper-based, silicon-based, halogen-based (fluorine, chlorine, oxalic) unacceptable.
P80	Oil treatment prohibited	-
P84	Oil treatment prohibited	Copper-based, silicon-based, halogen-based (fluorine, chlorine, oxalic) unacceptable.
P90	Stainless steel specifications/ Oil treatment prohibited	-
P94	Stainless steel specifications/ Oil treatment prohibited	Copper-based, silicon-based, halogen-based (fluorine, chlorine, oxalic) unacceptable.

*1: Refer to the following table for the correspondence of options and clean room specifications.
*2: The clean specifications P74, P84 and P94 are special order parts.

Options and clean room specifications

		Model	Clean room specifications					
			P70	P74	P80	P84	P90	P94
Sensor integrated type	Semiconductor sensor	PPD3-*-6B/6T	○		○			
		PPD3-*-6HD/6HT	○		○			
	Stainless steel diaphragm sensor	PPD3-S-*-6B/6T	○	○	○	○	○	○
		PPD3-S-*-6HD/6HT	○	○	○	○		
	Bracket/kit	PPD3-KL/KD	○	(Available for P70)				
		PPD3-KC	○	(Available for P70)				
		PPD3-KHS	○	○	○			
Sensor separate type	Semiconductor sensor	PPD3-*D-6	○		○			
		PPD3-*D-H6-B	○		○			
		PPD3-*D-H6	○		○			
	Stainless steel diaphragm sensor	PPD3-S-*D-6B	○	○	○	○	○	○
	Indicator	PPD3-*D	○	(Available for P70)				
		PPD3-*A-6	○		○			
	Semiconductor sensor	PPD3-*A-H6-B	○		○			
		PPD3-*A-H6	○		○			
	Stainless steel diaphragm sensor	PPD3-S-*A-6B	○	○	○	○	○	○
	Bracket/kit	PPD3-KL/KD-D	○	(Available for P70)				
		PPD3-KHS-D	○	(Available for P70)				

Bracket/kit

PPD3 - KL - D - P70

- Ⓐ Model
- Ⓑ Shape
- Ⓒ Clean room specifications

Symbol	Descriptions
Ⓐ Model	
PPD3-KL	Single side foot bracket (radial installation)
PPD3-KD	Both sides foot bracket (axial installation)
PPD3-KC	Operation protective cover *1
Ⓑ Shape	
Blank	Sensor integrated type
D	Sensor separate type
Ⓒ Clean room specifications	
	Structure
P70	Particle occurrence prevention*2

*1 PPD3-K is common for the sensor integrated and separated types so the Ⓑ shape is blank even for the separated type.

*2 The bracket is nickel-plated.
(Model P70 is compatible with the P74, P80, P84, P90 and P94 environment.))

PPD3 - KHS - D - P70

- Ⓐ Model
- Ⓑ Shape
- Ⓒ Clean room specifications *1/*2

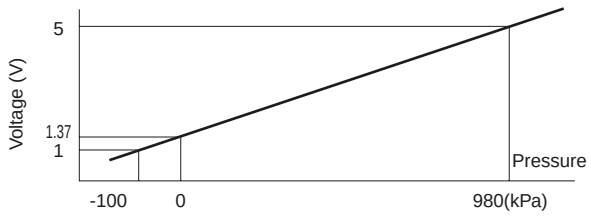
Symbol	Descriptions	
Ⓐ Model		
PPD3-KHS	Panel mount bracket set with cover (ϕ6 push-in joint is attached for integrated type.)	
Ⓑ Shape		
Blank	Sensor integrated type	
D	Sensor separate type	
Ⓒ Clean room specifications		
	Structure/treatment	Material restriction
P70	Particle occurrence prevention	-
P74	Particle occurrence prevention	Copper-based, silicon-based, halogen-based (fluorine, chlorine, oxalic) unacceptable.
P80	Oil treatment prohibited	-

*1 The bracket is nickel-plated.
Designate model P70 for the sensor separate type.
(This is compatible with the P74, P80, P84, P90 and P94 environment.)
Designate P70, P74 or P80 for the sensor integrated type.
(Model P80 is compatible with the P84 environment.)

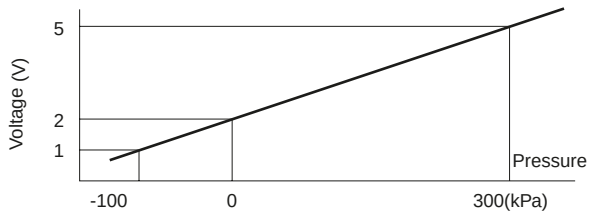
*2 P74 is custom order.

Analog output voltage - pressure characteristics

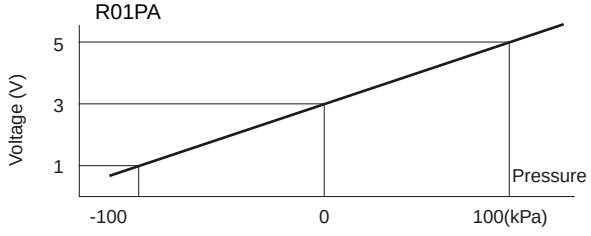
● PPD3 (-S)-R10NA
R10PA



● PPD3 (-S)-R03NA
R03PA



● PPD3 (-S)-R01NA
R01PA



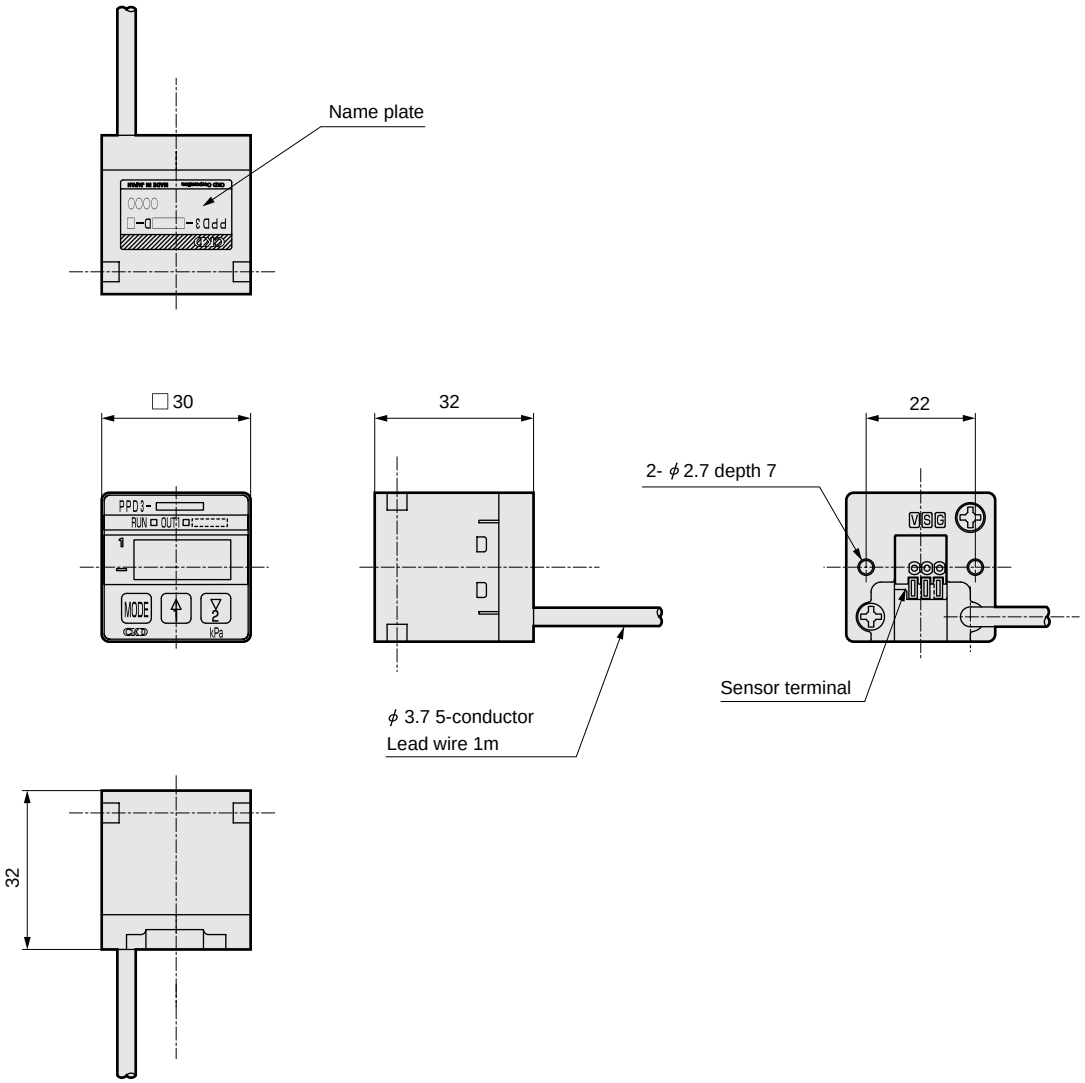
[Precautions]

●The analog output accuracy is affected by the temperature characteristics as well as the heat self-generated when energized. Provide a standby time (5 minutes and over after power ON) when using.

Dimensions

Sensor separate type (indicator section)

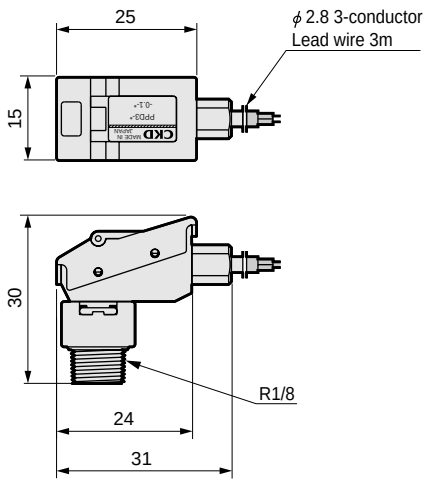
● PPD3-*****-D-P70 (indicator section)



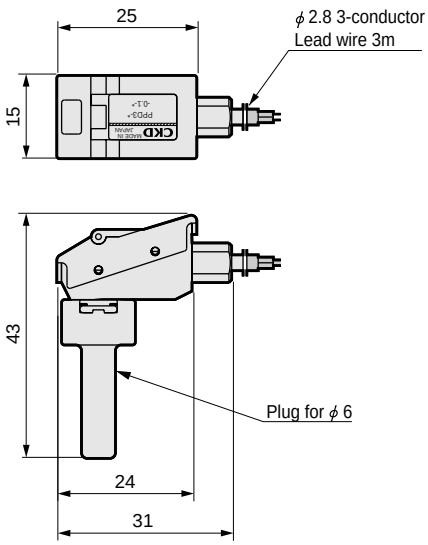
Dimensions

Sensor separate type (semiconductor sensor)

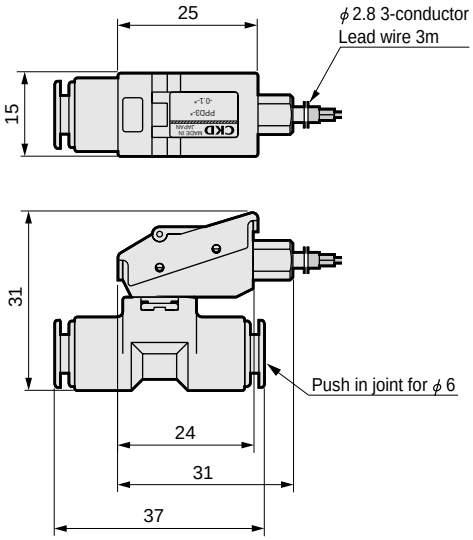
● PPD3-R**D-6-P70/P80/P90



● PPD3-R**D-H6-B-P70/P80/P90

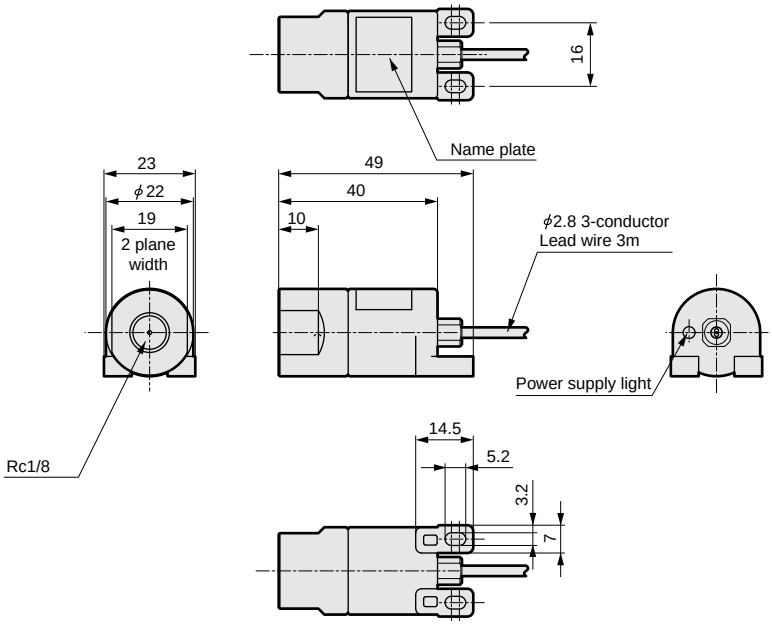


● PPD3-R**D-H6-P70/P80/P90



Sensor separate type (stainless steel diaphragm sensor)

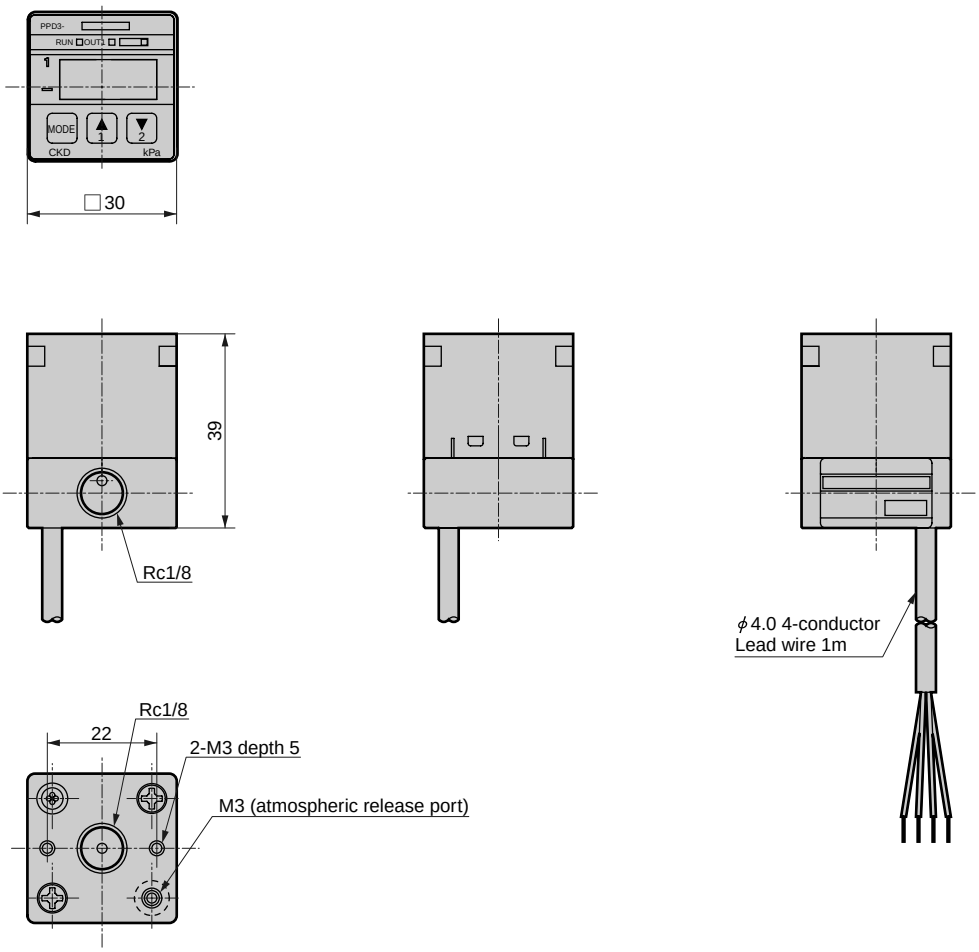
● PPD3-S-R**D-6B-P7*/P8*/P9*



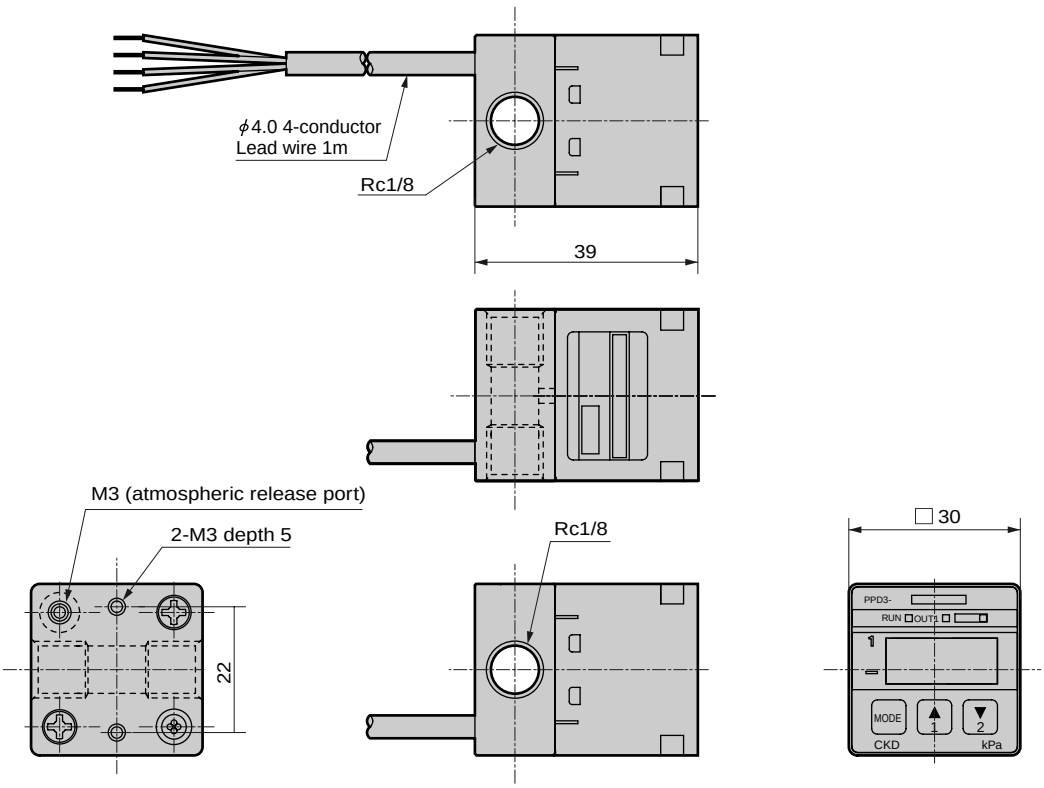
Dimensions: PPD3

Sensor integrated type (semiconductor sensor)

● PPD3-*****-6B-P70/P80/P90



● PPD3-*****-6T-P70/P80/P90

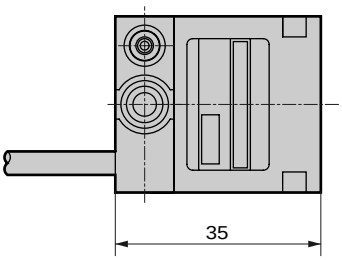


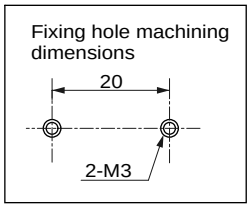
Refer to Page 828 to 831 for wiring method and precautions.

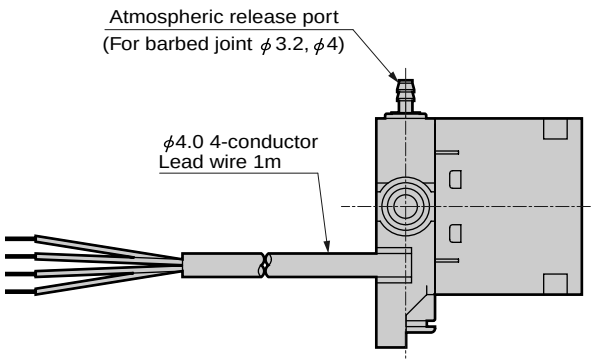
Dimensions : PPD3

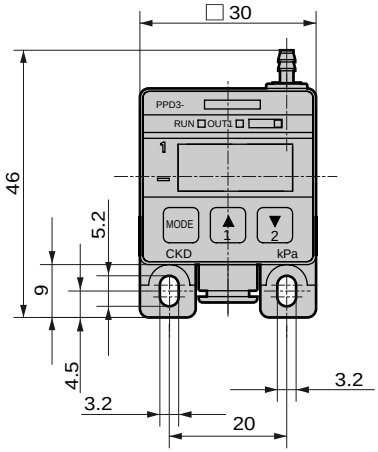
Sensor integrated type(semiconductor sensor)

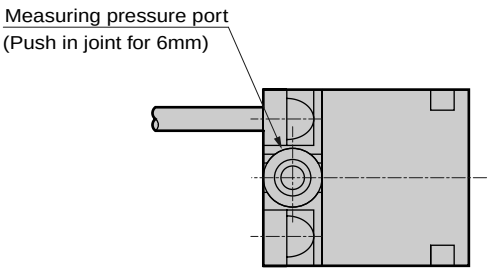
● PPD3-*****-6HD-P70/P80/P90



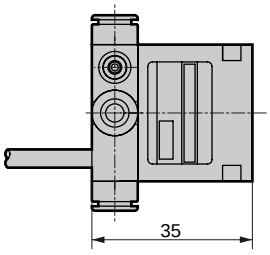


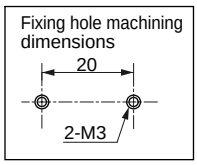


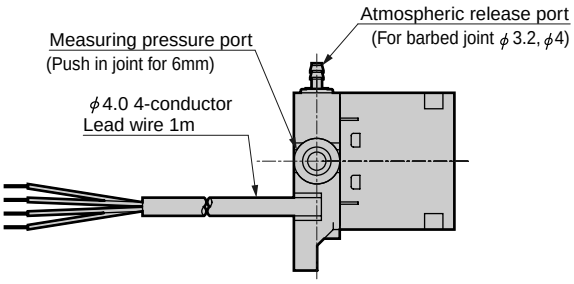


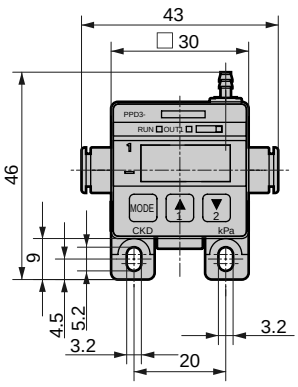


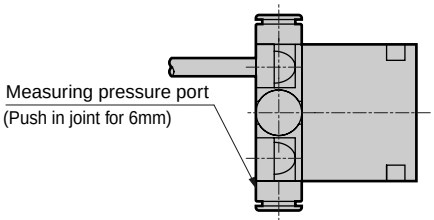
● PPD3-*****-6HT-P70/P80/P90









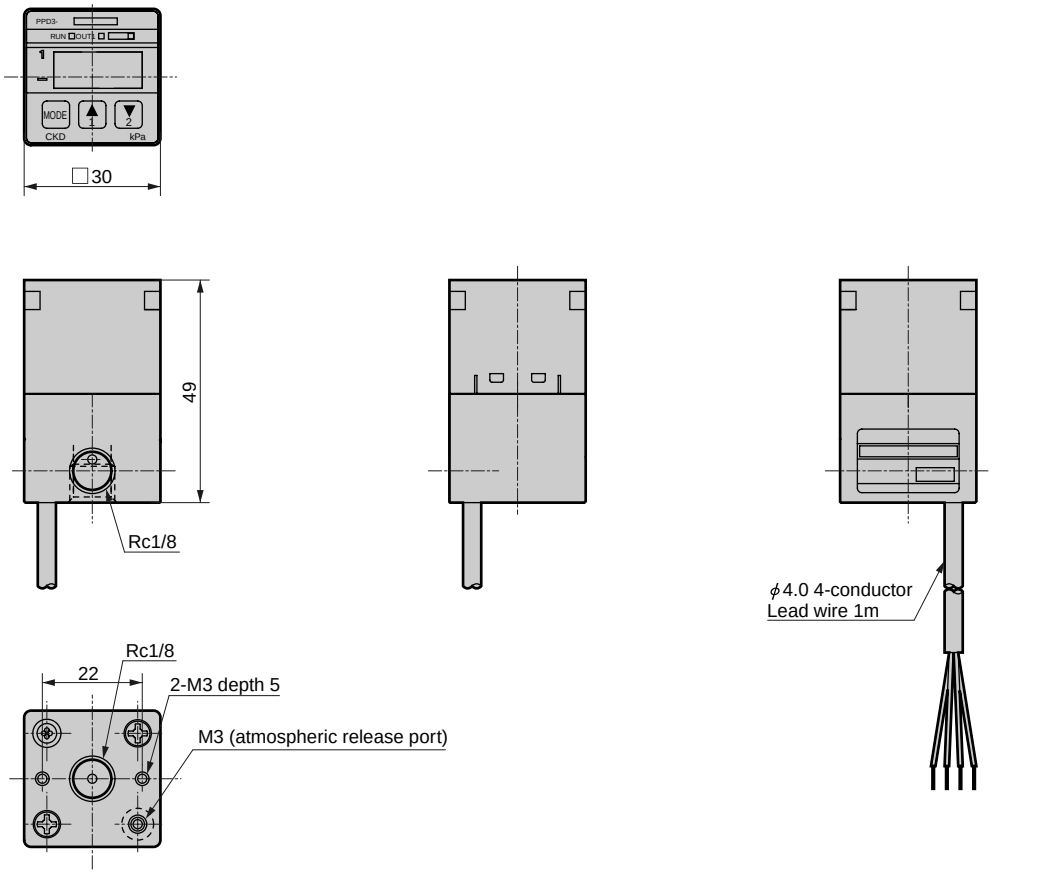


Refer to Page 828 to 831 for wiring method and precautions.

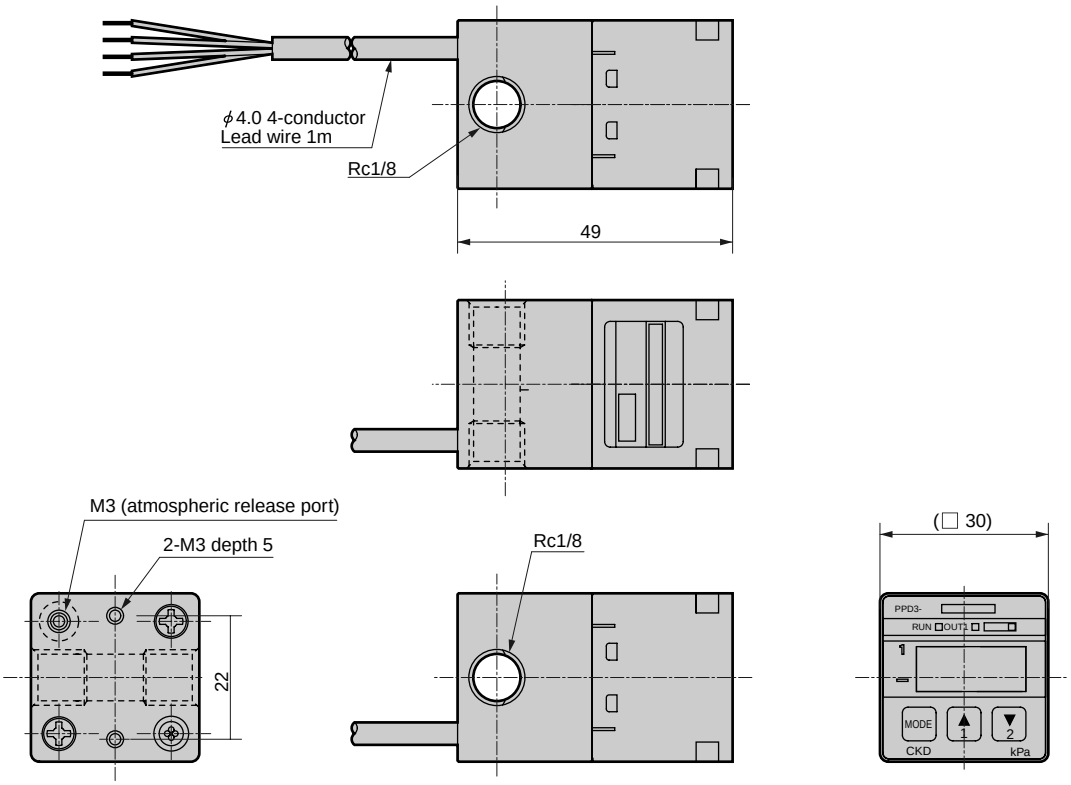
Dimensions: PPD3-S

Sensor integrated type (stainless steel diaphragm sensor)

● PPD3-S-*****-6B-P7*/P8*/P9*



● PPD3-S-*****-6T-P7*/P8*/P9*

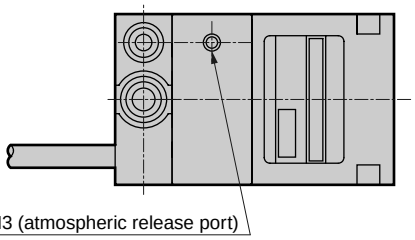


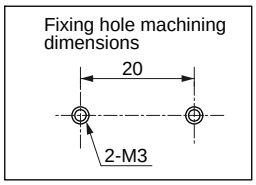
Refer to Page 828 to 831 for wiring method and precautions.

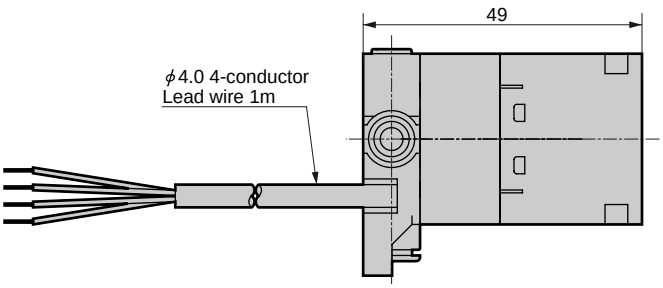
Dimensions: PPD3-S

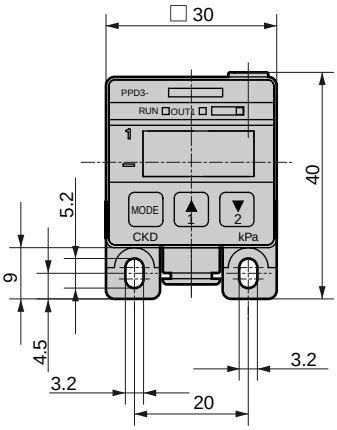
Sensor integrated type (stainless steel diaphragm sensor)

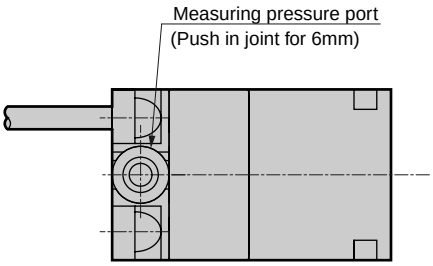
● PPD3-S-*****-6HD-P70/P80/P90



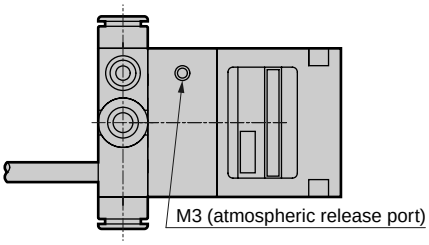


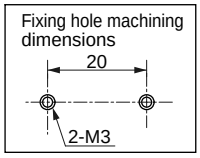


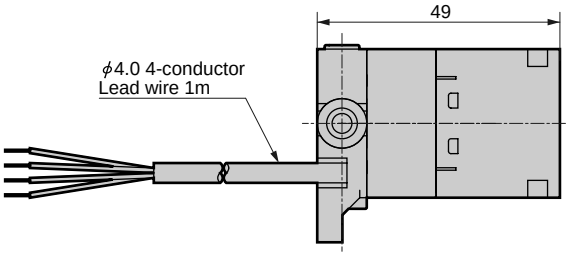


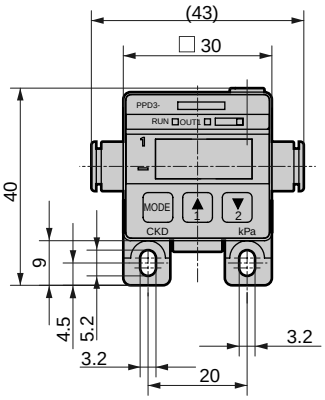


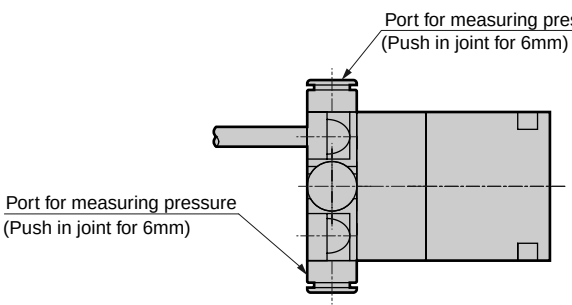
● PPD3-S-*****-6HT-P70/P80/P90







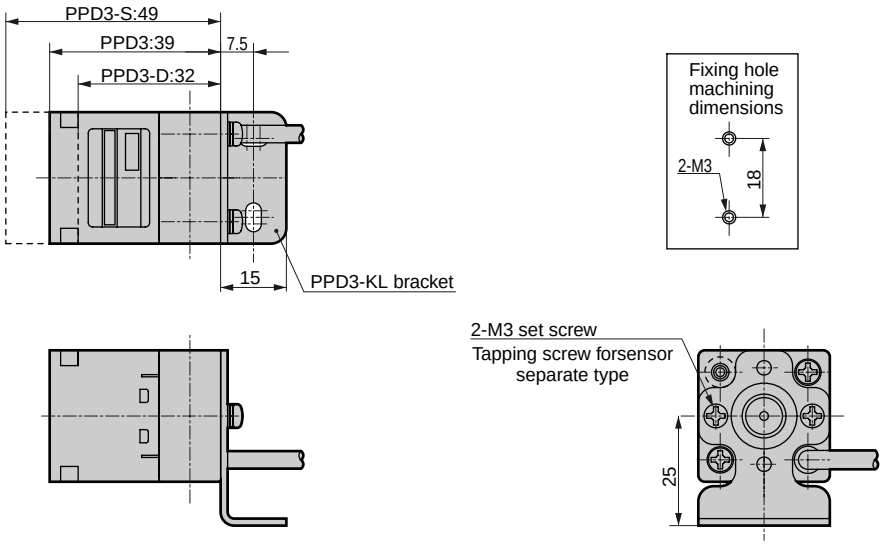




Refer to Page 828 to 831 for wiring method and precautions.

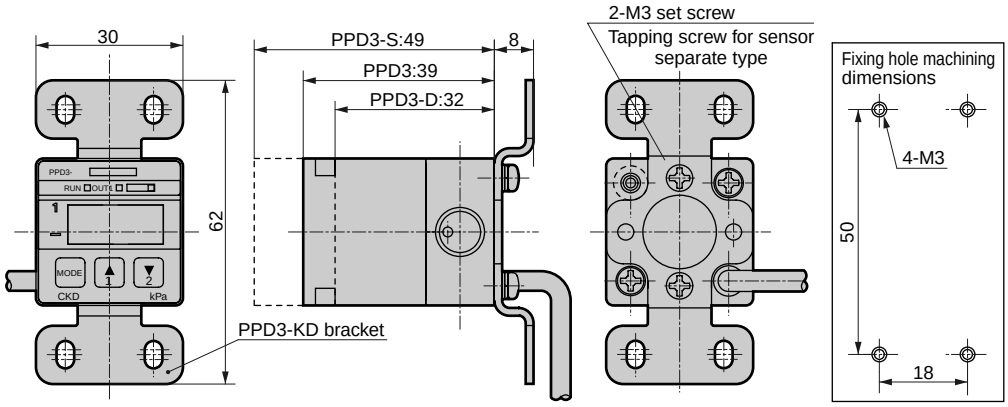
Dimensions: Bracket

● PPD3-KL (-D)-P70 assembly drawing

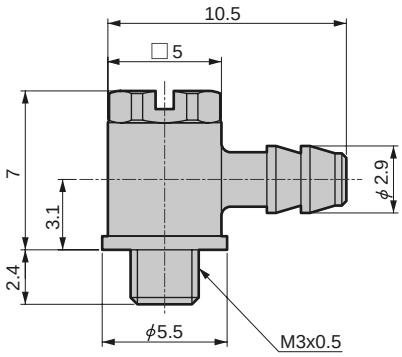


● PPD3-KD (-D)-P70 assembly drawing

Note: With this installation, use the CKD miniature joint FTL4-M3-P70 for the atmospheric pressure introduction port joint. (Only sensor integrated type)



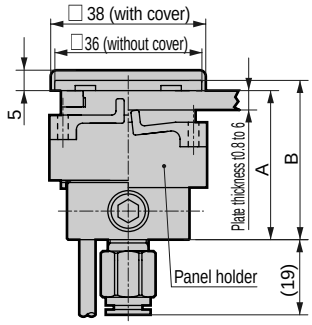
● Miniature joint FTL4-M3-P70



Refer to Page 828 to 831 for wiring method and precautions.

● PPD3-KHS (-D)-P7*/P8* assembly drawing

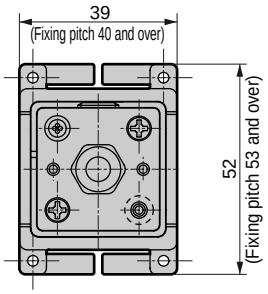
Combination with PPD3-R*****-6B

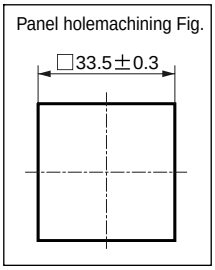


Note: The push in joint is not enclosed with the PPD3-KHS-D.

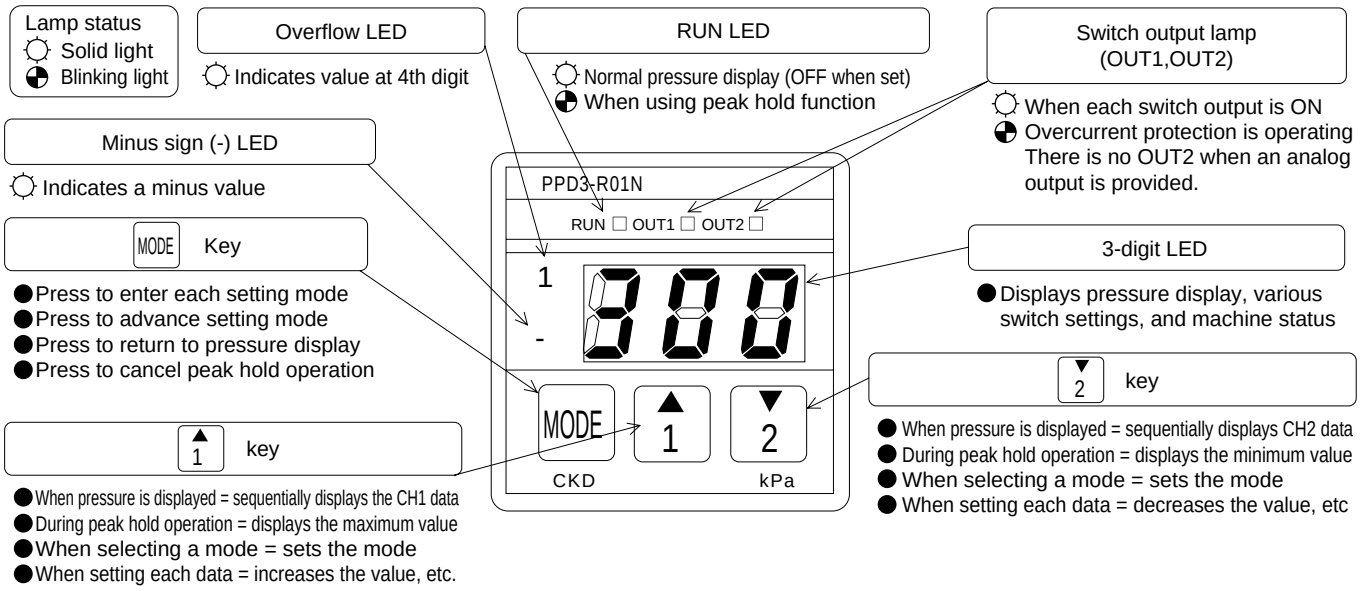
Installation dimensions

Model	A	B
PPD3	36.5	39
PPD3-S	46.5	49
PPD3-D	29.5	32





Display and operation section



LED displays

Numbers and alphabetic characters are displayed with a combination of LED displays.

Number	0	1	2	3	4	5	6	7	8	9
Display	0	1	2	3	4	5	6	7	8	9

Character	A	B (b)	C	D (d)	H	I (i)	J	L	N (n)	O (o)	P
Display	A	b	C	d	H	i	J	L	n	o	P

Rated pressure	980kPa	300kPa	100kPa
Model No.	R10	R03	R01
Pressure symbol	JO	LO	HO

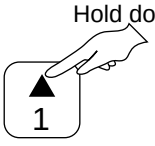
Model display

Output type	NPN output	PNP output
Model No.	N, NA	P, PA
Output format symbol	N n	P p

Checking the setting

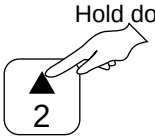
Displaying CH1 data

Hold down

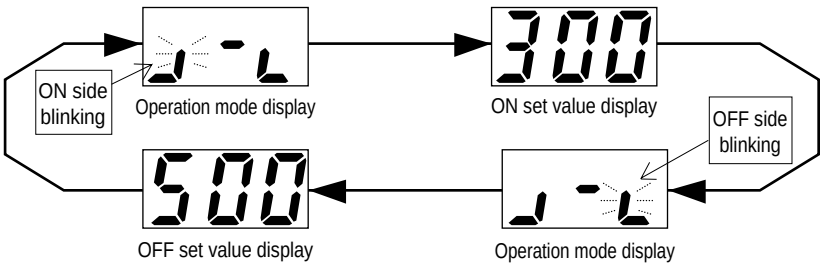


Displaying CH2 data

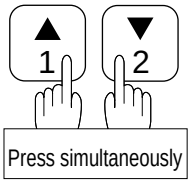
Hold down



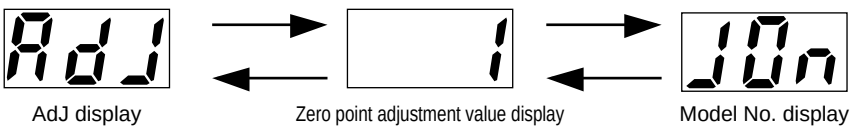
When each key is pressed while pressure is displayed, the switch data ON set value, OFF set value, and operation waveform, zero adjustment value, pressure range, and output format can be displayed and confirmed.
Switch operation is not affected during the following operations:



Displaying the zero point adjustment value and model No.



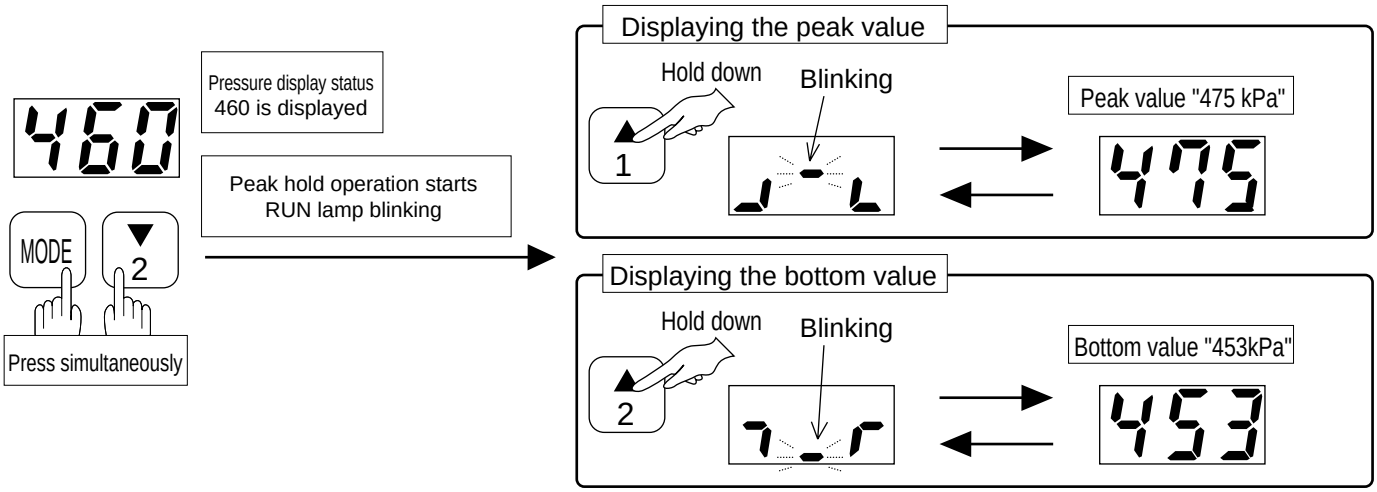
The zero point adjustment value and model No. are displayed alternately.
Switch operation is not affected even during operation.



How to operate each function

Peak hold function

The pressure value for a set period is displayed to see the maximum and minimum values.
Use this to check the stability of main pressure and supply pressure, etc.The peak hold operation does not affect this product's basic functions such as switch operations or pressure display.



Switch output function

Operations are shown on the next page

The PPD3 (-S) has a 2-point or 1-point switch output, and operates in 4 operation modes and stopping operation.The switch function is started by setting the required operation mode (refer to the P833 switch operation mode) and by setting 2 set values (ON set value and OFF set value) which specify operation pressure.
Determine the operation mode to be used, and the ON set value and OFF set value before making settings.
Select and set the following data to operate the switch:

CH1: Operation mode	CH1: ON set value	CH1: OFF set value
CH2: Operation mode	CH2: ON set value	CH2: OFF set value

CH2 is not used with analog output.Nothing is be output even if set.)

Switch output test function

Operations are shown on the next page

Use this function to forcibly turn the switch output ON and confirm the wiring connection or initial operation of the input unit.

Note 1. Use this test function to check the wiring connection and the input unit's operation. Avoid using this function instead of actual signals when executing the sequence program while the machine or device is operating.
Refer to the individual precautions for the pressure switch , WARNINGs and CAUTIONs in "During use and maintenance" from page 820.

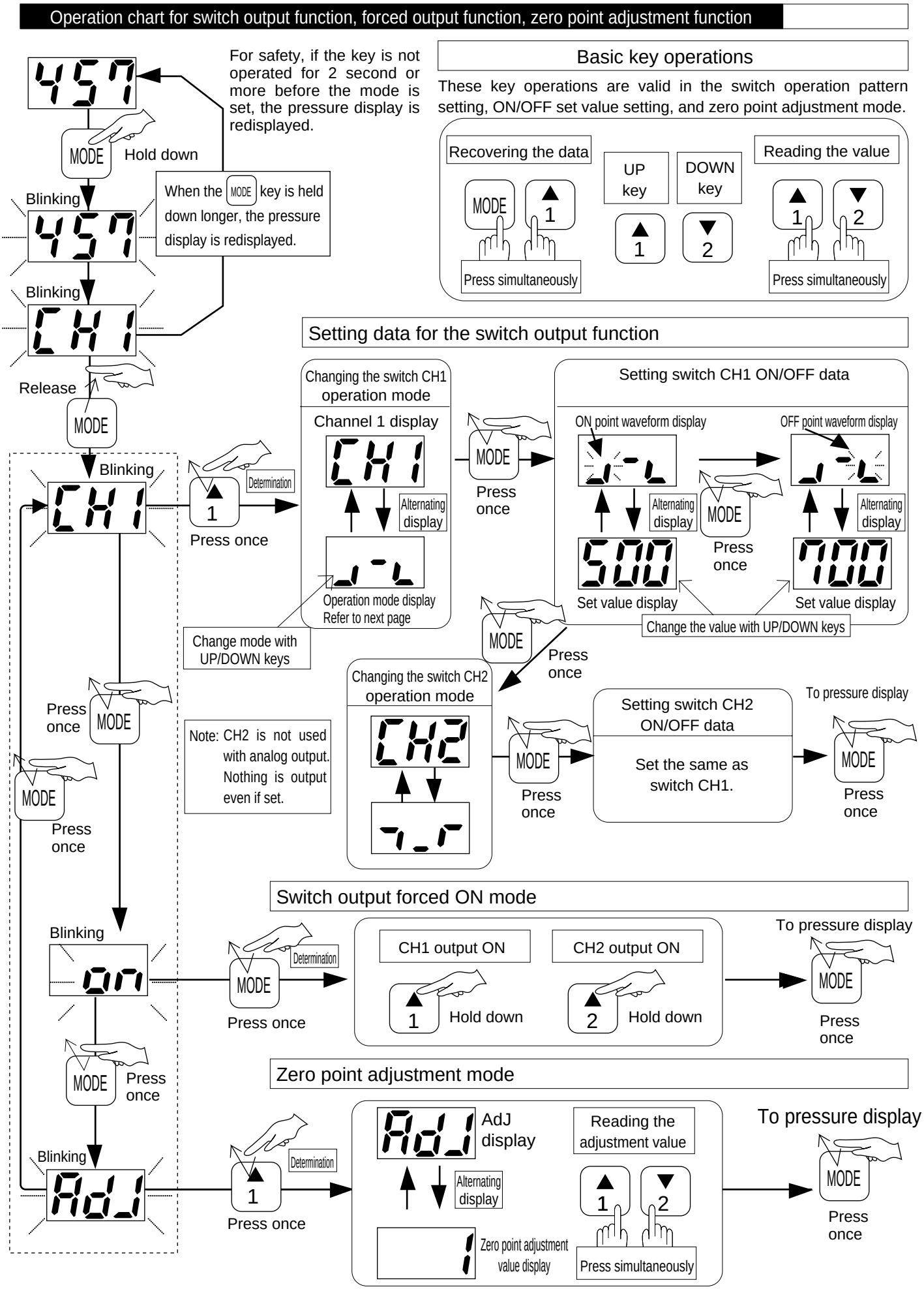
Zero point adjustment function

Operations are shown on the next page

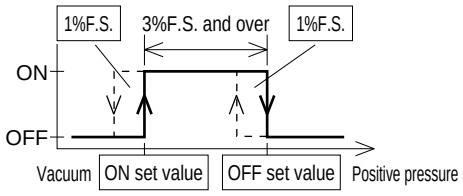
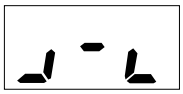
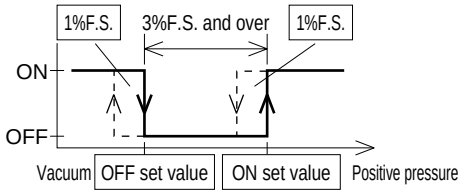
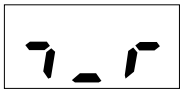
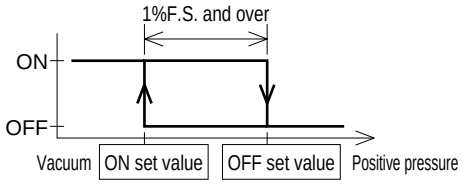
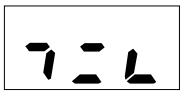
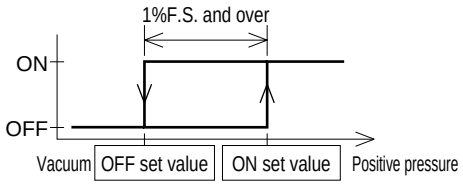
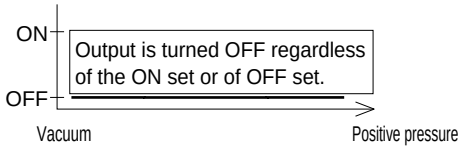
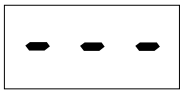
Deviation of the display from the zero point is compensated in the atmospheric pressure pressurized state.

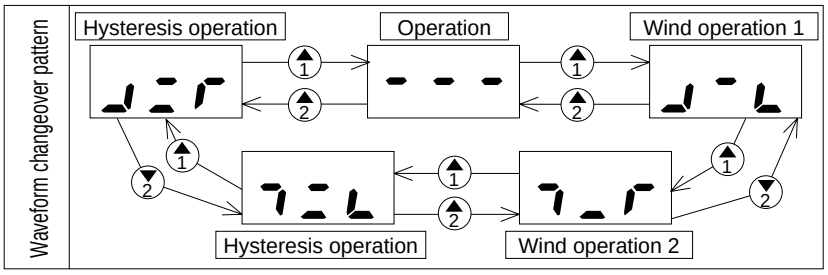
Note 2. The above settings and test greatly affect the output signal and display value.Stop the machine and devices using this product, and confirm that safety is ensured even if malfunction or an incorrect display occurs before operating.Using this function while the machine or device is operating could result in unforeseen malfunction or incorrect displays.
Note 3. As a measure to avoid malfunctions, all keys must be held down for a set time to select the mode.

Operation chart for switch output function, forced output function, zero point adjustment function



Switch operation modes

Operation mode name	Operation waveform	LED operation waveform display	Applications
1 Window operation 1 (ON when within range)			When used to confirm main pressure, the ON signal is output as the normal signal if main pressure is within the appropriate range.
2 Window operation 2 (ON when outside range)			When used to confirm main pressure, the ON signal will be output as the error signal if main pressure is abnormal.
3 Hysteresis operation 1 (ON at low pressure)			When used to confirm suction, the ON signal will be output if suction pressure for picking up the workpiece has sufficiently dropped (attained a vacuum).
4 Hysteresis operation 2 (ON at high pressure)			When used to confirm seating, the ON signal is output if the workpiece is held and pressure has sufficiently increased.
5 Operation stop			When not using the switch output, stop operation to prevent damage and accidents.



Note 1. When using for a window operation, provide an interval of 3%F.S. or more between the 2 set values. A 1% F.S. hysteresis is automatically added to the ON side and OFF side.

Note 2. When using for a hysteresis operation, provide an interval of 1%F.S. or more between the 2 set values. If there is no difference between the 2 set values, operation may not take place or may be unstable.

Note 3. The left side of the operation waveform indicates negative pressure, and the right side indicate positive pressure.

Note 4. The magnitude relation of the ON set value and OFF set value is determined when the operation mode is determined, and a reverse magnitude relation cannot be attained.With this product, however, operation of the designated operation pattern takes priority.When the 2 set values are input, the magnitude relation is automatically determined, and each is judged and processed appropriately as the ON set value and OFF set value. In other words, even if the ON set value and OFF set value are input in reverse, input values are recognized as the correct ON set value and OFF set value, and operation takes place with the designated operation mode.