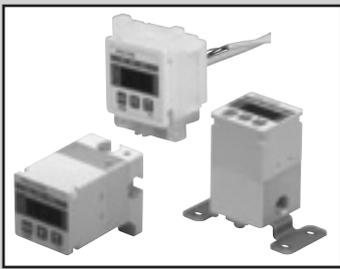


PPD3-S Series



Overview

Pressure switch PPD3 Series is appropriate for pneumatic lines. Due to various port options, in addition to source pressure confirmation, suction confirmation and contact confirmation, etc., are possible.

Features

- Model can be easily replaced according to air line conditions deterioration/improvement.
- Push-in fitting resin port (6HD/6HT/H6) is available. These lightweight ports help save space.
- Through ports (6T/6HT/H6) are available. Ideal for suction and seating confirmation. The product can be installed in minimum space.
- Efficient installation setting by convenience functions; peak hold, forcible switching, pressure reading functions, etc.
- CE marking as standard.

Specifications Sensor integrated/sensor separated

Descriptions	PPD3-S		
	R10	R03	R01
Pressure sensitive element	Single stainless steel diaphragm pressure sensor		
Applicable fluid *2	Air/non-corrosive gas/compressed air (including water and drain) *3		
Rated pressure	-100 to 980 kPa *8	-100 to 300 kPa *9	-100 to 100 kPa *10
Display unit	kPa	kPa	kPa
Min. display unit *1	1 kPa		
Proof pressure	2MPa	0.6MPa	0.6MPa
Indicator accuracy (25°C)	±2% F.S.		±3% F.S.
Temperature characteristics (0 to 50°C)	±4% F.S.		±5% F.S.
Leak rate	1 cm ³ /min (ANR) or less		
Display	3 digit orange LED display character height 8 mm		
Power supply voltage	12 to 24 VDC ±10% (ripple rate 1% or less)		
Current consumption	50 mA or less (60 mA or less for sensor separated type)		
Switch output	Sensor integrated	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	
	Separated	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	50 mA or less		
Switch output voltage drop value	2.4 V or less		
Switch output response time	Approximately 5 msec		
Analog output	1 to 5 V ±0.1 V load impedance: 10 kΩ and over		
Set point holding	EEPROM		
Lead wire	Body: oil resistance vinyl code 4-conductor (0.3 mm ² insulation O.D. ø1.1) 1m (5-conductor 0.2 mm ² , insulation O.D. ø1.0 for sensor separated type) Sensor for sensor separated type: oil resistance vinyl code 3-conductor (0.15 mm ² insulation O.D. ø1.0) 3 m		
Ambient temperature	0°C to 50°C		
Ambient humidity	0 to 85% RH (no dew condensation)		
Mechanical vibration proof	10 to 55 Hz compound amplitude 1.5 mm 2 hours per X, Y, Z direction		
Degree of protection	IP65 equiv. *5 (IP40 or equivalent only for indicator section of sensor separated type)		
Protection circuit *6	Power reverse connection protection switch output reverse connection protection, switch output load short-circuit protection		
Weight	PPD3-S-R□□-6B: Approx. 105 g		

- *1: This indicates min. display unit, and does not guarantee indicator accuracy.
- *2: Only PPD3-S-*P70/P80/P90 are ozone resistance. Contact CKD if required.
- *3: For water and other liquid other than above, contact CKD.
- *4: Sensor separated is 0.3 MPa.
- *5: When an atmosphere inlet port is processed. (Refer to page 1043.)
- *6: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.
- *7: Do not clean resin part of the product with organic solvents including alcohol. There is a risk of affecting the resin.
- *8: -100 kPa to 980 kPa (≈142 psi, 9.8bar)
- *9: -100 kPa to 300 kPa
- *10: -100 kPa to 100 kPa (≈15 psi, 1bar)

Circuit diagram and connection method

Refer to page 1028.

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

STM

STG

STR2

MRL2

GRC

Cylinder switch

MN3E
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R (module unit)

Clean F.R

Precision R

Press gauge
Diff. press gauge

Electro-pneumatic R

Speed controller

Auxiliary valve

Fitting/tube

Clean air unit

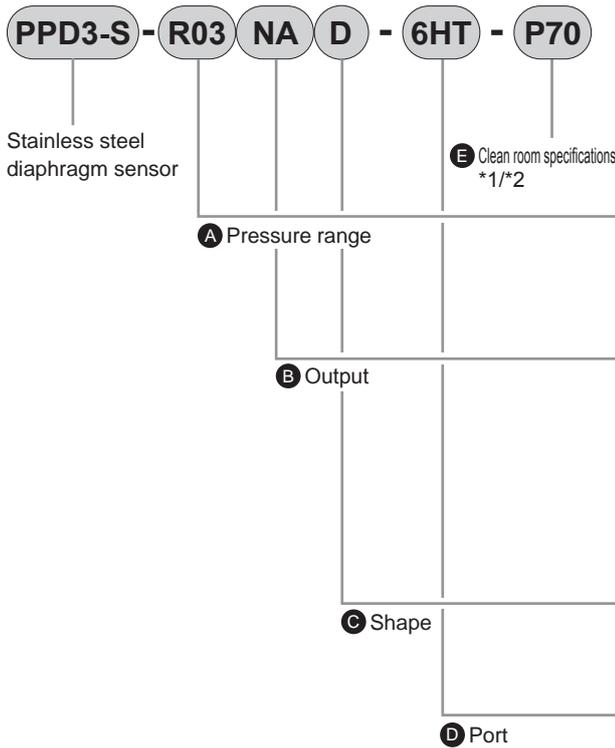
Pressure sensor

Flow rate sensor

Valve for air blow

Ending

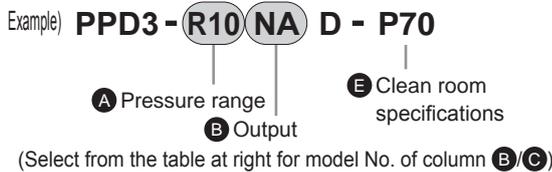
How to order



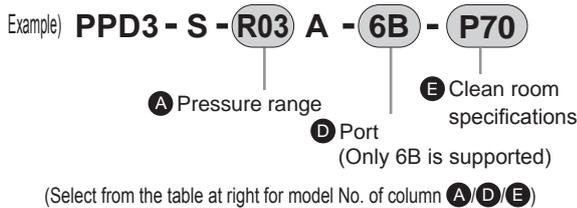
Code		Content
A Pressure range		
R10		-100 to 980 kPa
R03		-100 to 300 kPa
R01		-100 to 100 kPa
B Output		
N		NPN transistor output 2 points
P	For sensor integrated	PNP transistor output 2 points
NA	integrated	NPN transistor output 1 point + analog output 1 point
PA		PNP transistor output 1 point + analog output 1 point
NA	For sensor separated type	NPN transistor output 2 points + analog output 1 point
PA		PNP transistor output 2 points + analog output 1 point
C Shape		
Blank		Sensor integrated
D		Sensor separated
D Port		
6B		Rc1/8, 2 direction port rear side, lower outlet
6T	For sensor integrated	Rc1/8, lateral through port, both sides outlet
6HD	integrated	Lightweight port with 6 mm push-in fitting (downward)
6HT		Lightweight through port with two 6 mm push-in fittings (horizontal both sides)
6B	For sensor separated	Rc1/8
E Clean room specifications		
	Structure/treatment	Material restriction
P70	Dust generation preventing	-
P74	Dust generation preventing	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited
P80	Oil-prohibited	-
P84	Oil-prohibited	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited
P90	Stainless steel material used/Oil-prohibited	-
P94	Stainless steel material used/Oil-prohibited	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited

Sensor separated type discrete model. No.

- Model No. of single indicator



- Discrete sensor model No.



*1: Refer to the table below for supported options and clean room specifications.
 *2: Clean room specifications P74, P84, P94 are custom order products.

Supported options and clean room specifications

	Model No.	Clean room specifications					
		P70	P74	P80	P84	P90	P94
Sensor integrated	Stainless steel diaphragm sensor	PPD3-S-*-6B/6T	○	○	○	○	○
		PPD3-S-*-6HD/6HT	○	○	○	○	○
Mounting brackets/kits		PPD3-KL/KD	○	(Available for P70)			
		PPD3-KC	○	(Available for P70)			
		PPD3-KHS	○	○	○	○	○
Separated	Stainless steel diaphragm sensor	PPD3-S-*D-6B	○	○	○	○	○
	Indicator (discrete)	PPD3-*D	○	(Available for P70)			
		PPD3-*A-6	○	○	○	○	○
	Stainless steel diaphragm sensor (discrete)	PPD3-S-*A-6B	○	○	○	○	○
	Mounting brackets/kits	PPD3-KL/KD-D	○	(Available for P70)			
	PPD3-KHS-D	○	(Available for P70)				

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge
Dif. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

PPD3-S Series

Mounting brackets/kits

PPD3 - KL - D - P70

A Model No.

B Shape

C Clean room specifications

Code	Content
A Model No.	
PPD3-KL	One side mounting foot (L shaped mounting) (set screw attached)
PPD3-KD	Both sides mounting foot (parallel mounting) (set screw attached)
PPD3-KC	Operation protective cover *1
B Shape	
Blank	Sensor integrated
D	Sensor separate
C Clean room specifications	
	Structure
P70	Dust generation preventing *2

*1 PPD3-KC is common for sensors integrated and separated so when selecting the sensor separated, do not indicate a code for item B shape.

*2 Mounting brackets are nickeling.
(Model No. P70 supports P74, P80, P84, P90, P94 environments)

PPD3 - KHS - D - P70

A Model No.

B Shape

C Clean room specifications

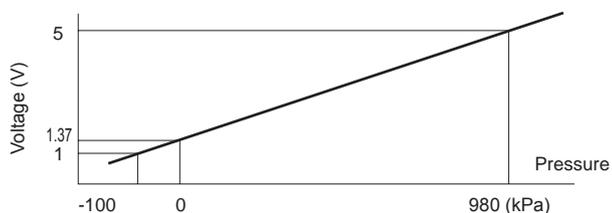
Code	Content	
A Model No.		
PPD3-KHS	Panel mounting bracket set, with guard (ø6 Push-in fitting attached for integrated)	
B Shape		
Blank	Sensor integrated	
D	Sensor separate	
C Clean room specifications		
	Structure/treatment	Material restriction
P70	Dust generation preventing	-
P74	Dust generation preventing	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited
P80	Oil-prohibited	-

*1 Mounting brackets are nickeling.
Sensor separated: Specify Model No. P70.
(supports P74, P80, P84, P90, P94 environments)
Specify either of P70, P74, or P80 for sensor integrated.
(Model No. P80 supports P84 environment)

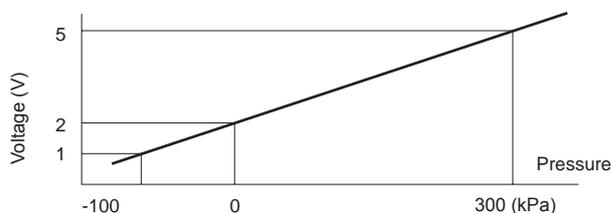
*2 P74 is custom order product.

Analog output voltage - pressure characteristics

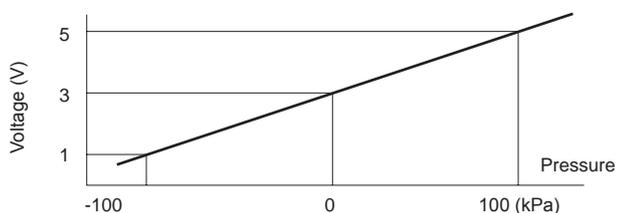
● PPD3-S-R10NA
R10PA



● PPD3-S-R03NA
R03PA



● PPD3-S-R01NA
R01PA



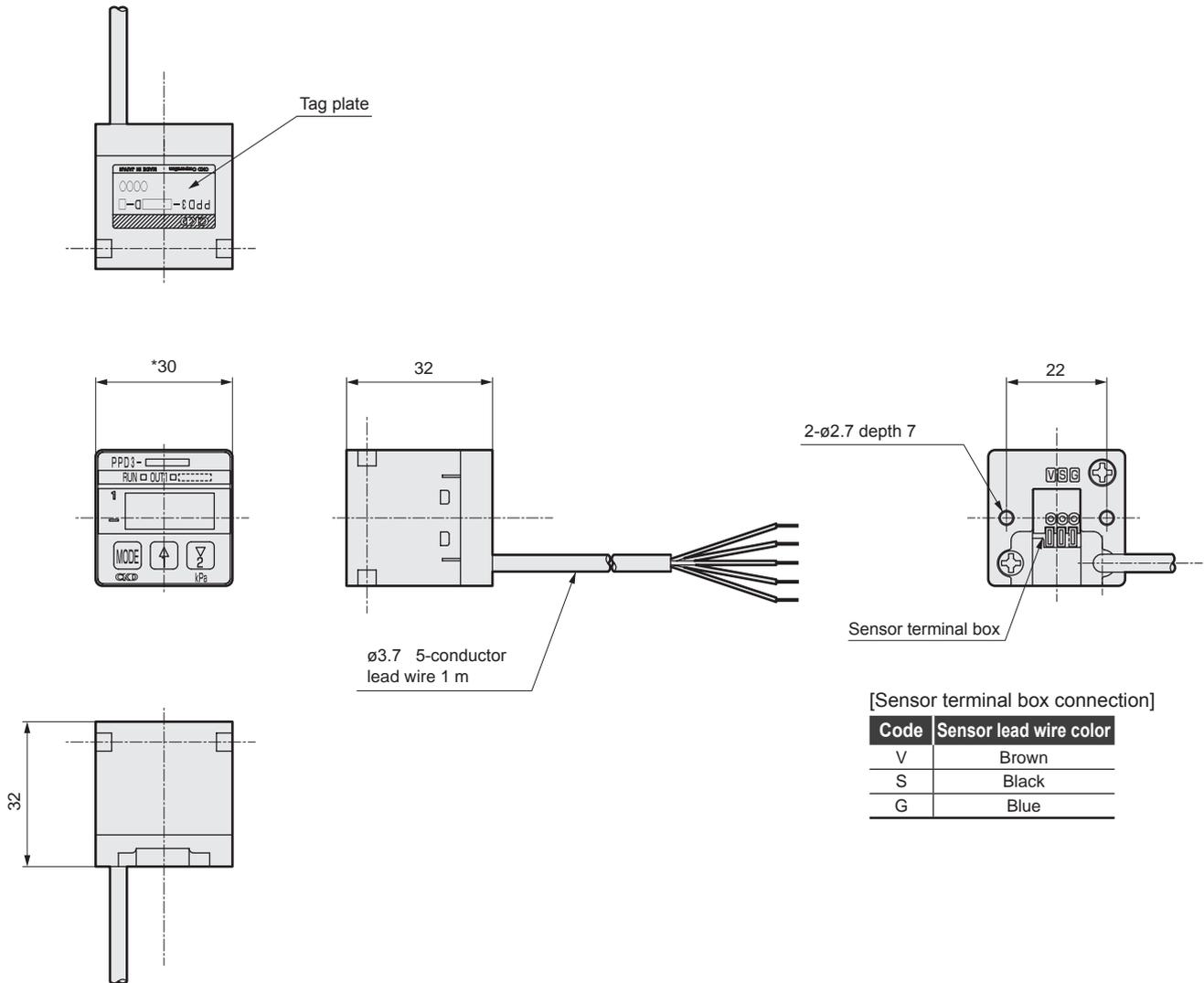
[Caution]

● Analog output accuracy is also affected by self exoergic at energized other than temperature characteristics. Be sure to provide a standby time of 5 minutes and over after power is turned on when using.

Dimensions

Sensor separated (indicator section)

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



[Sensor terminal box connection]

Code	Sensor lead wire color
V	Brown
S	Black
G	Blue

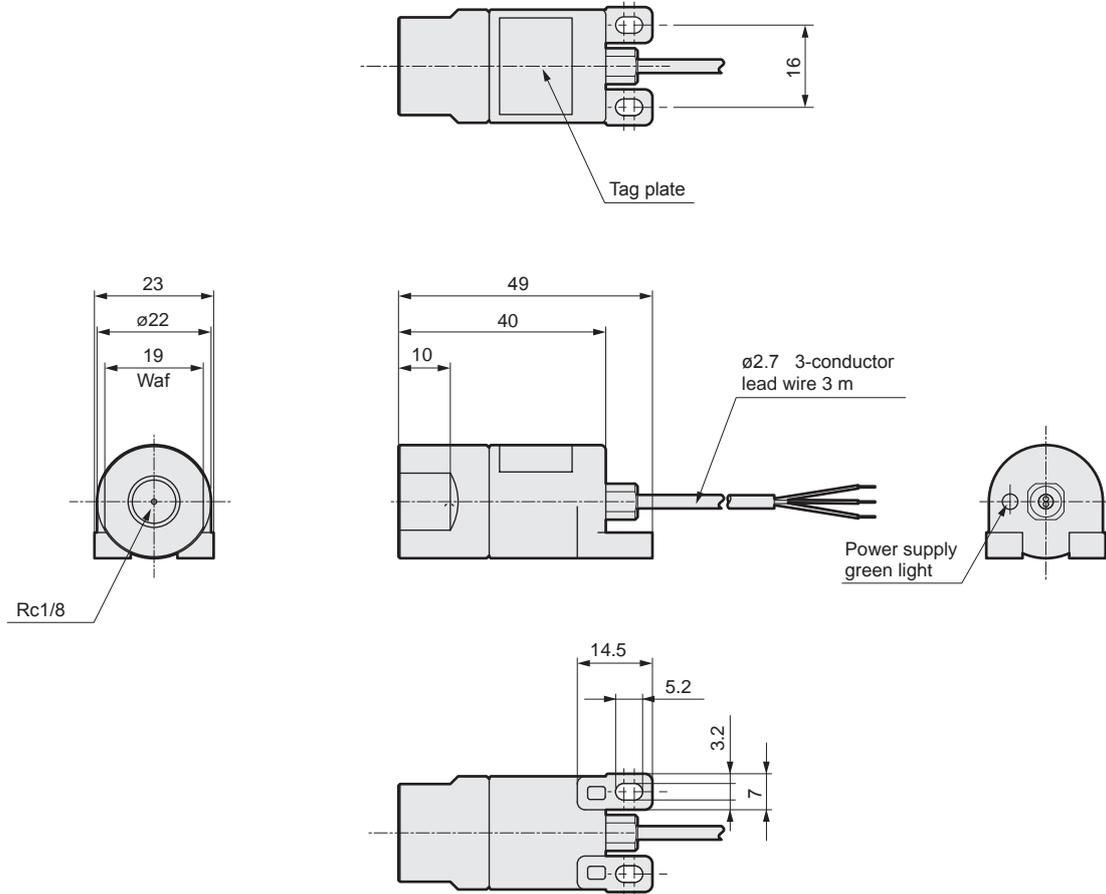
SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge
Dif. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

PPD3/PPD3-S Series

Dimensions

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R (module unit)
Clean F.R
Precision R
Press gauge Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/ tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

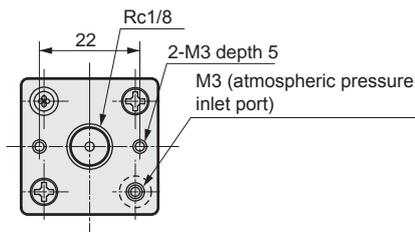
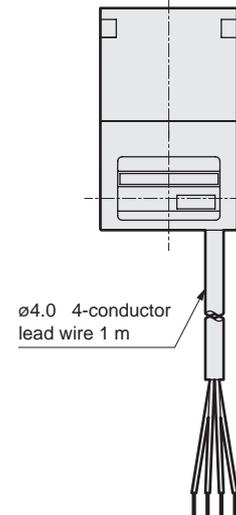
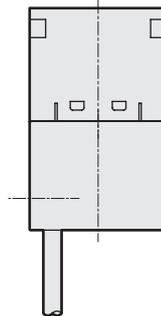
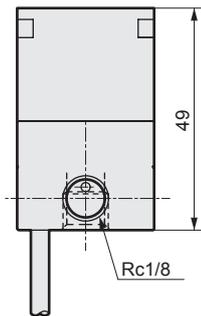
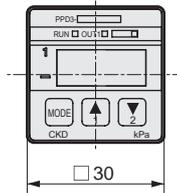
- Sensor separated
- PPD3-S-R**D-6B-P7*/P8*/P9*
 - PPD3-S-R**A-6B-P7*/P8*/P9* (discrete sensor model No.)



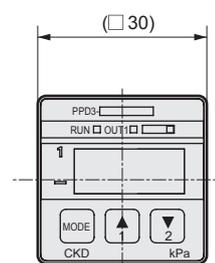
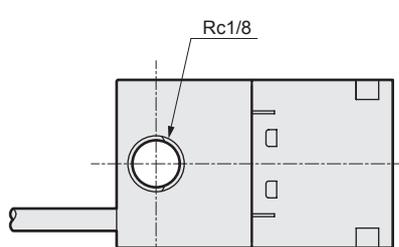
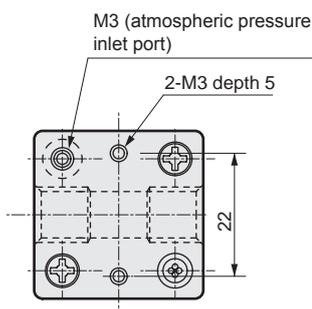
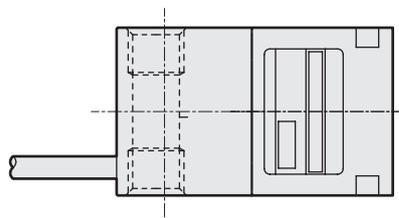
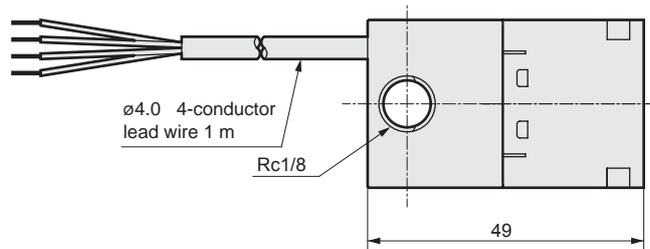
Dimensions

Sensor integrated

● PPD3-S-*****-6B-P7*/P8*/P9*



● PPD3-S-*****-6T-P7*/P8*/P9*



 Refer to Safety precautions of PPD3-S Series on pages 1042 to 1044 for wiring method and precautions.

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge Dif. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

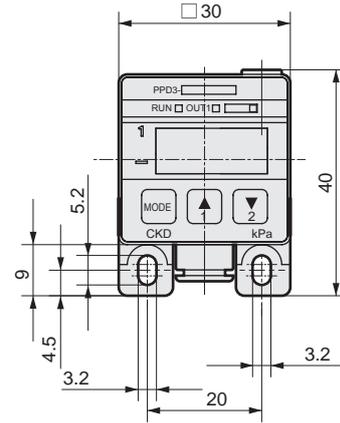
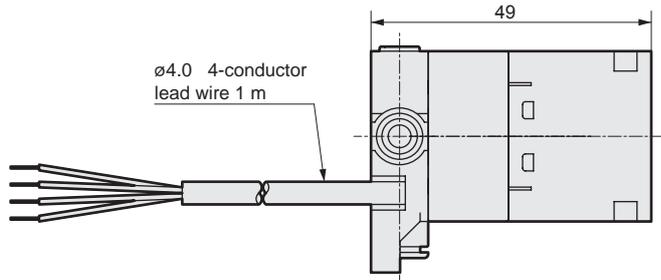
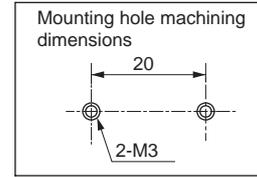
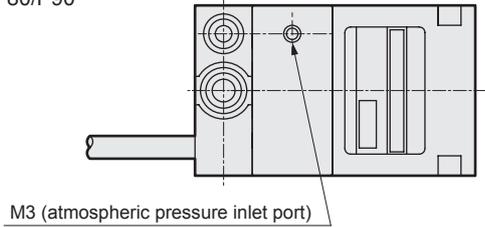
PPD3-S Series



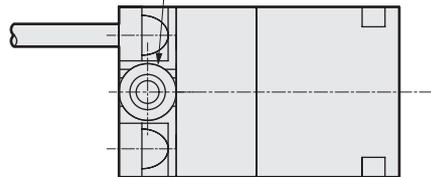
Dimensions

Sensor integrated

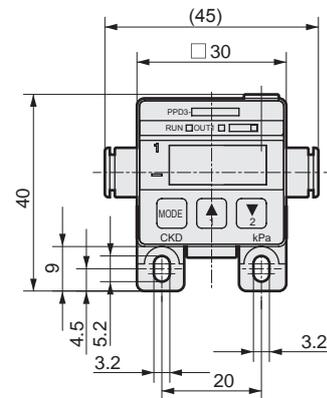
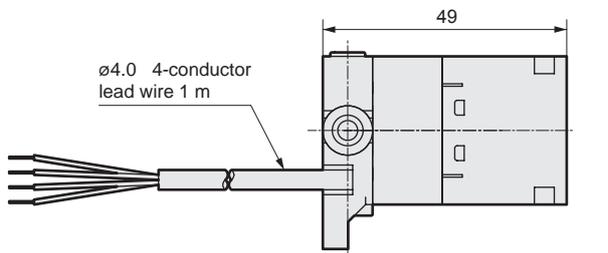
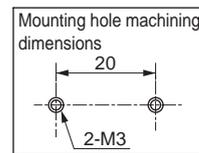
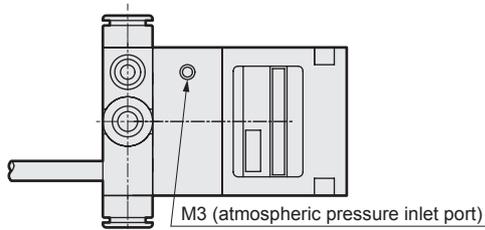
● PPD3-S-*****-6HD-P70/P80/P90



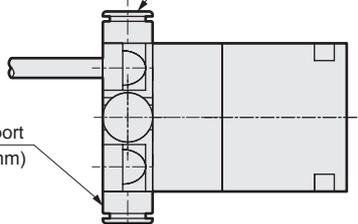
Measuring pressure port
(Push-in fitting for 6 mm)



● PPD3-S-*****-6HT-P70/P80/P90



Measuring pressure port
(Push-in fitting for 6 mm)



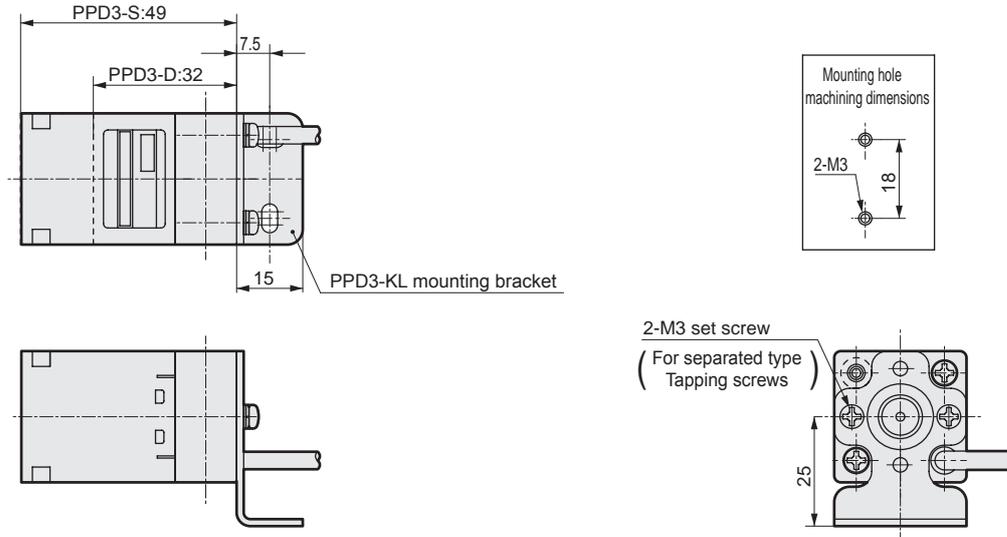
Measuring pressure port
(Push-in fitting for 6 mm)



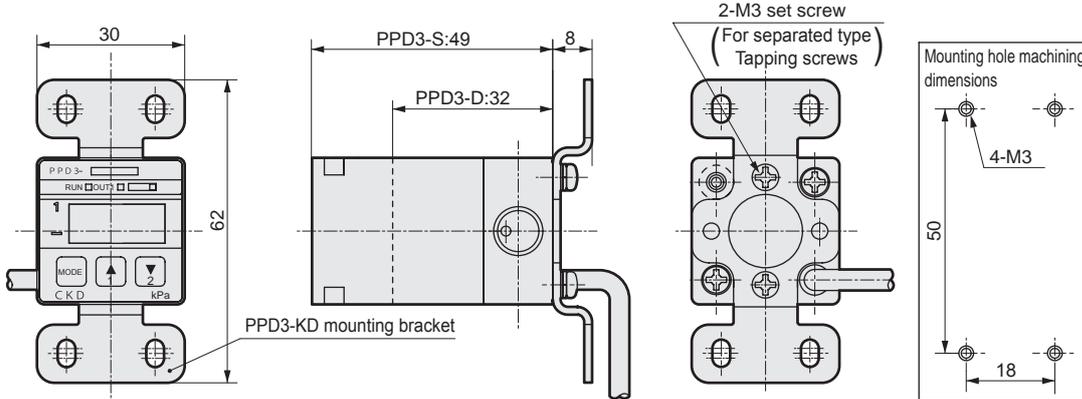
Refer to Safety precautions of PPD3-S Series on pages 1042 to 1044 for wiring method and precautions.

Dimensions: Mounting bracket

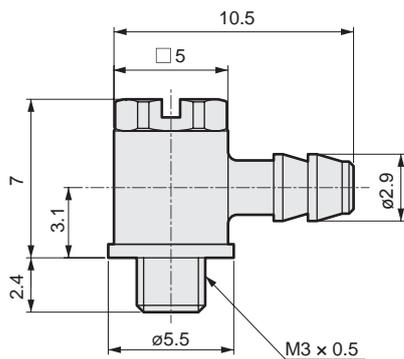
● PPD3-KL(-D)-P70 assembly drawing



● PPD3-KD(-D)-P70 assembly drawing Note: For this installation, use CKD miniature fitting FTL4-M3 for atmospheric inlet port. (Sensor integrated only)



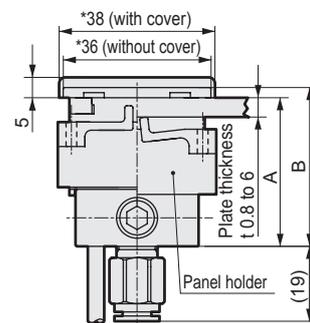
● Miniature fitting FTL4-M3-P70



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

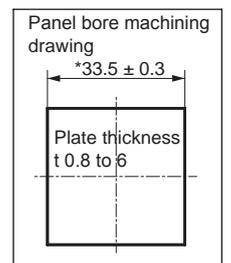
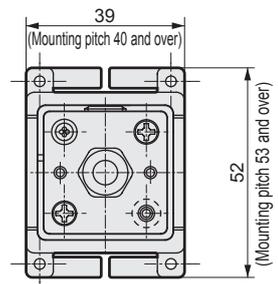
Note: Push-in fitting is not attached to PPD3-KHS-D.

Combinations with PPD3-R****-6B



Mounting dimensions for each model

Model No.	A	B
PPD3-S	46.5	49
PPD3-D	29.5	32



Refer to Safety precautions of PPD3-S Series on pages 1042 to 1044 for wiring method and precautions.

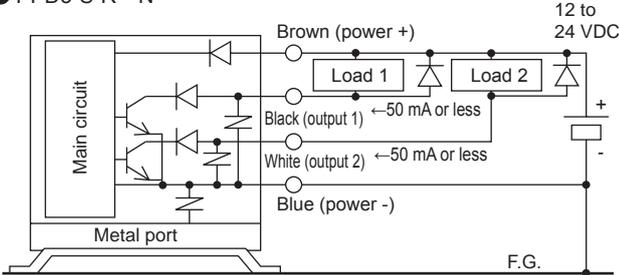
- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM
- STG
- STR2
- MRL2
- GRC
- Cylinder Switch
- MN3E
MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R.(module unit)
- Clean F.R
- Precision R
- Press gauge
Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending

Internal circuit/connection method

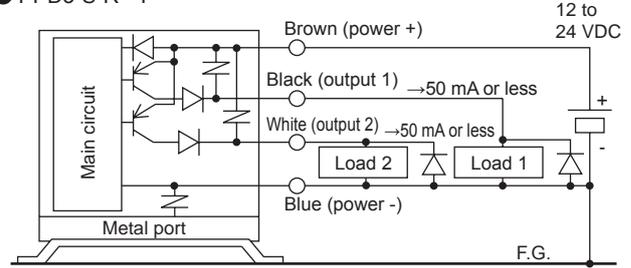
[Circuit and connection method]

Sensor integrated

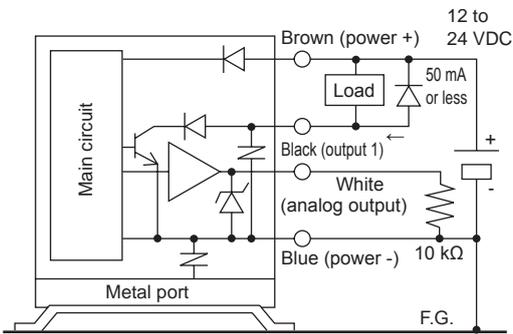
● PPD3-S-R**N



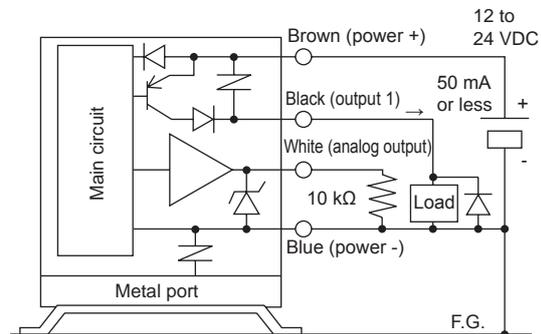
● PPD3-S-R**P



● PPD3-S-R**NA



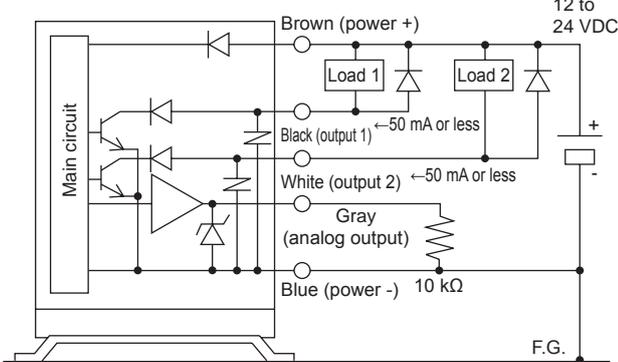
● PPD3-S-R**PA



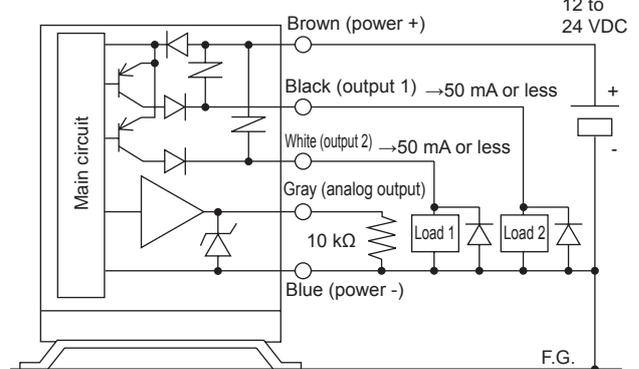
[Circuit and connection method]

Sensor separated

● PPD3-S-R*NAD

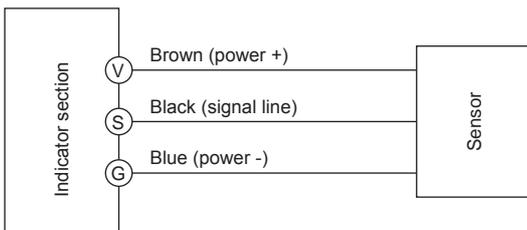


● PPD3-S-R*PAD

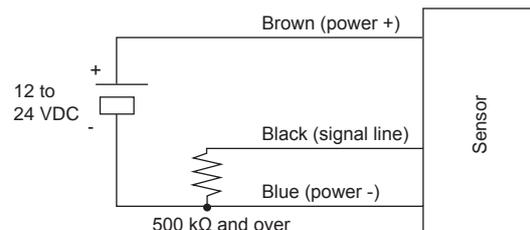


Sensor section connection method

● PPD3-S-R*D



● PPD3-S-R*A Connection method when single sensor is used



MEMO

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

STM

STG

STR2

MRL2

GRC

Cylinder
Switch

MN3E
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R.(module
unit)

Clean
F.R

Precision
R

Press gauge
Diff. press gauge

Electro-
pneumatic R

Speed
controller

Auxiliary
valve

Fitting/
tube

Clean
air unit

**Pressure
sensor**

**Flow rate
sensor**

Valve for
air blow

Ending

PPD3-S Series

Display and function

Lamp state
 ☉: Stable lamp
 ⚡: Flicker

Overflow LED
 ☉: Indicates the 4th digit

RUN LED
 ☉: Normal pressure display (not lit when set)
 ⚡: When using peak hold function

Switch output lamp (OUT1, OUT2)
 ☉: Each switch output ON
 ⚡: During overcurrent protection (There is no OUT2 when an analog output is provided)

Minus sign (-) LED
 ☉: A minus value is indicated.

3 digit LED
 ● Displays pressure, various switch setting, and machine status

MODE Key
 ● To enter various setting modes
 ● To advance setting mode
 ● To return to pressure display
 ● To cancel peak hold operation

Key 1
 ● When pressure is displayed = sequentially displays CH1 data
 ● During peak hold operation = displays max. value
 ● When selecting a mode = sets the mode
 ● During data setting = increases the value, etc.

Key 2
 ● When pressure is displayed = sequentially displays CH2 data
 ● During peak hold operation = displays min. value
 ● When selecting a mode = sets the mode
 ● During data setting = decreases the value, etc.

LED display

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

Rated pressure	980 kPa	300 kPa	100 kPa
Model No.	R10	R03	R01
Pressure code	J0 JO	L0 LO	H0 HO

Model No. display	JO n
-------------------	------

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

Output	NPN output	PNP output
Model No.	N, NA	P, PA
Output code	N n	P p

Confirming setting values

CH1 data display
Hold down

CH2 data display
Hold down

By pressing each key during pressure display, the switch data ON setting/OFF setting/operation waveform, zero point adjustment value, pressure range, and output can be confirmed. Switch operation is not affected during the following operations.

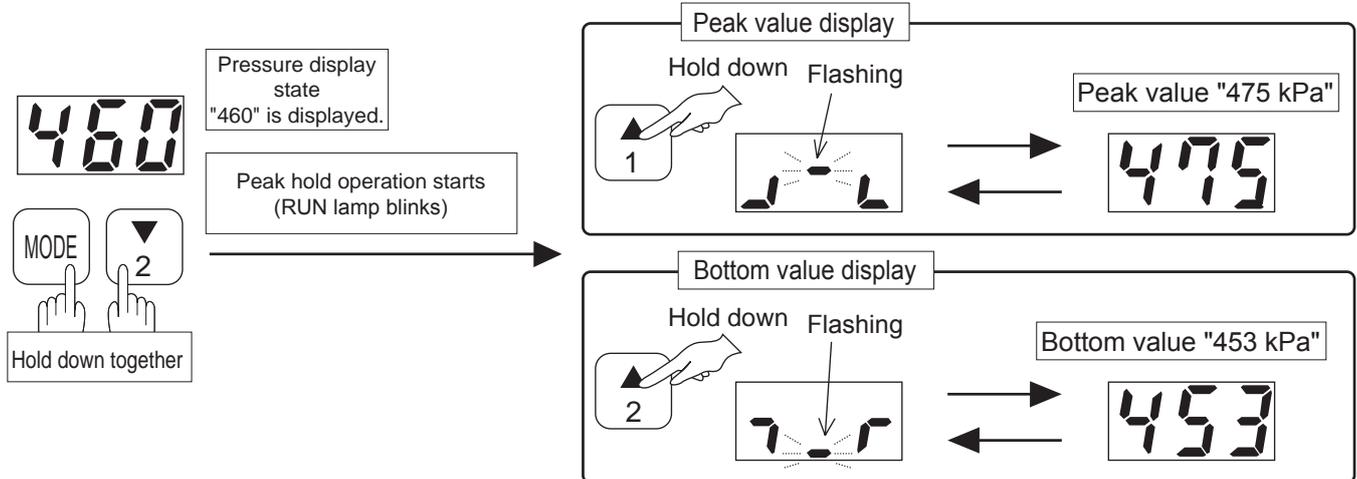
Zero point adjustment value/model No. display

The zero point adjustment value and model number are alternately displayed. The switch operation is not affected during this operation.

Using each function

Peak hold function

The pressure value for a set period is displayed to see the max. and min. values. Use this to check the stability of main pressure and working pressure etc. Peak holding does not affect this product's basic functions such as switch operations or pressure display.



Switch output function

Refer to following page for operation method.

The PPD3-S has a 2-point or 1-point switch output, and operates in 4 operation modes and stopping operation. The switch is started by setting the required operation mode (refer to the switch operation mode in page 1017) and by making two settings, ON and OFF, that specify the operation pressure.

Determine the required operation mode and ON and OFF setting values before making settings. Select and set the following data to operate the switch.

CH1: operation mode

CH1: ON setting value

CH1: OFF setting value

CH2: operation mode

CH2: ON setting value

CH2: OFF setting value

(There is no CH2 when an analog output is provided. Nothing can be output even if set)

Switch output test function

Refer to following page for operation method.

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

Note 1: Use this test function to check the wiring connection and input device operation. Avoid using this function instead of actual signals when executing the sequence program while the machinery and equipment are operating. (Refer to Precautions of caution "During use & maintenance" on page 1044.)

Zero point adjustment function

Refer to following page for operation method.

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. Before this operation, stop the machinery and equipment that use this product and confirm that safety can be ensured in case of problems or incorrect display. Using this function while the machinery and equipment are operating could cause problems or incorrect display.

Note 3: To avoid incorrect operation, all keys must be held down for a set time to select the mode.

SCPD3

SCM

SSD2

MDC2

SMG

LCM

LCR

LCG

LCX

STM

STG

STR2

MRL2

GRC

Cylinder Switch

MN3E
MN4E

4GA/B

M4GA/B

MN4GA/B

F.R.(module unit)

Clean F.R

Precision R

Press gauge
Diff. press gauge

Electro-pneumatic R

Speed controller

Auxiliary valve

Fitting/tube

Clean air unit

Pressure sensor

Flow rate sensor

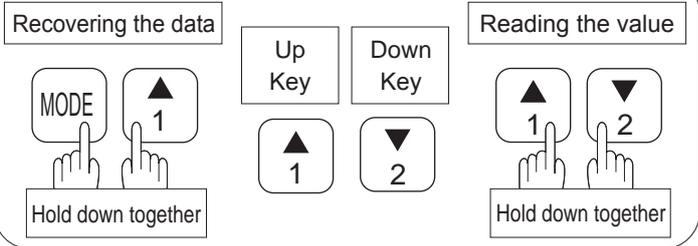
Valve for air blow

Ending

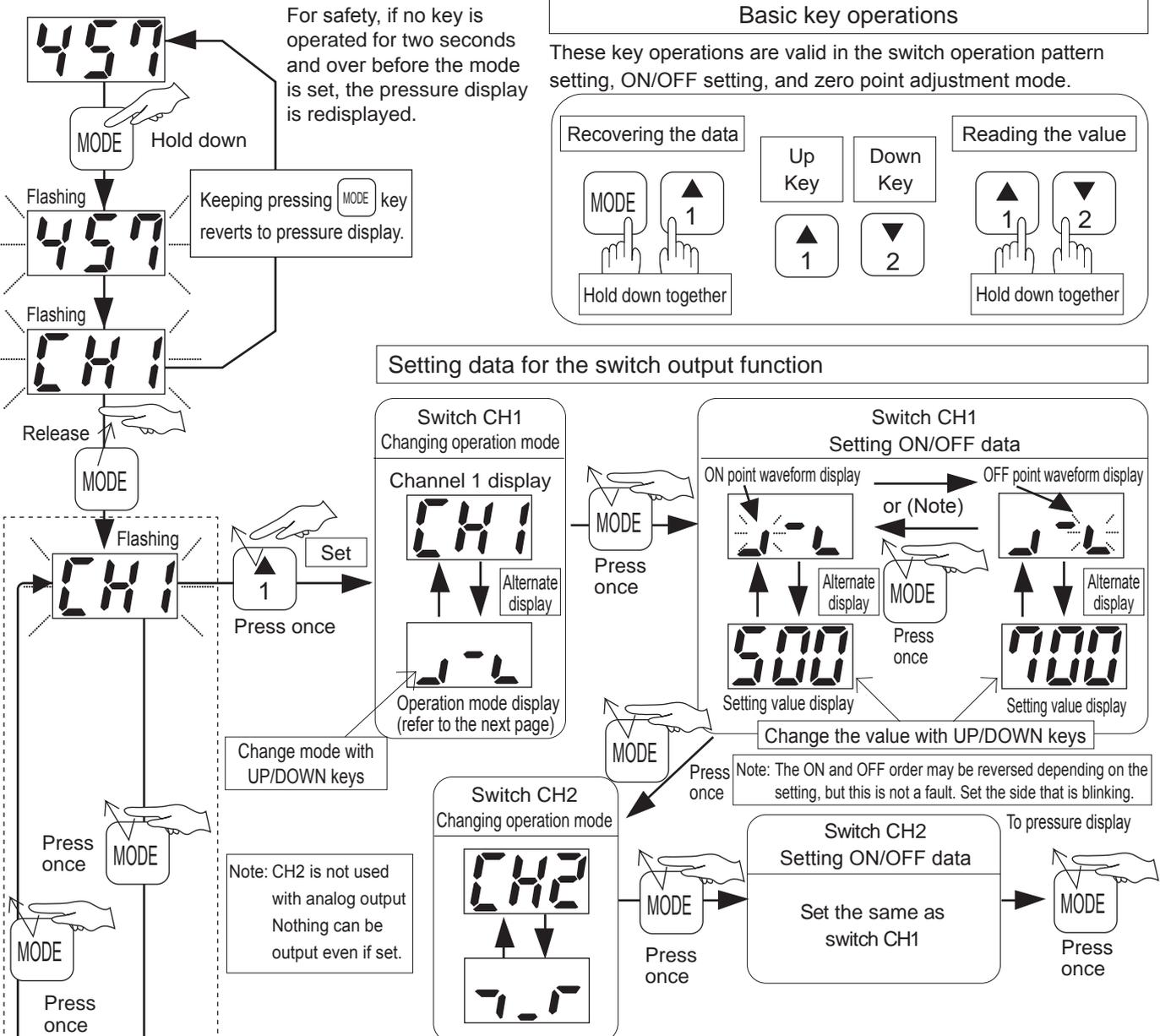
Operation chart for switch output function/forced output function/zero point adjustment function

Basic key operations

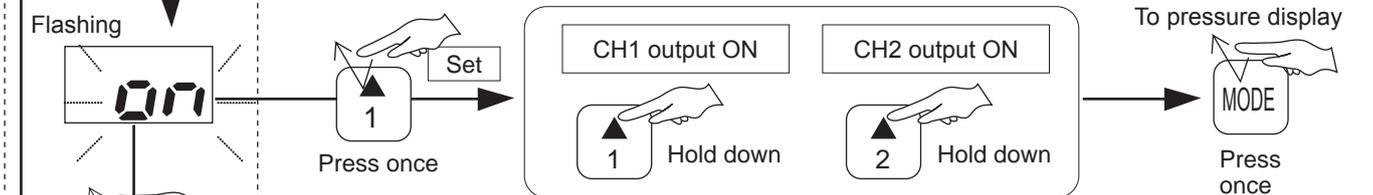
These key operations are valid in the switch operation pattern setting, ON/OFF setting, and zero point adjustment mode.



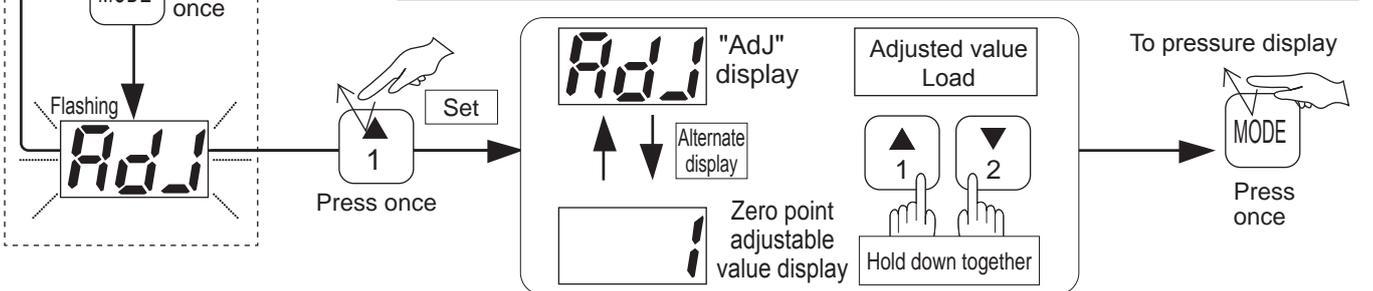
Setting data for the switch output function



Switch output forced ON mode

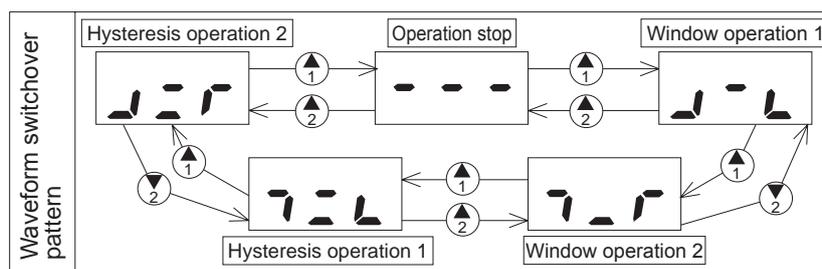


Zero point adjustment mode



Switch operation mode

Operation mode name	Operation waveform	LED operation waveform display	Examples
1 Window operation 1 (ON when inside 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 is 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 is output if the workpiece is suctioned and suction pressure has sufficiently dropped (vacuum).
4 Hysteresis operation 2 (ON at high pressure)			When used to confirm contact, the ON signal is output if the workpiece is held and pressure is sufficiently increased.
5 Operation stop			When not using the switch output, stop operation to prevent damage and accidents.



- Note 1: When using for a winding operation, provide an interval of 3% F.S. and over 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. and over between the 2 set values.
 If the two settings are the same, operation may not take place or may be unstable.
- Note 3: The left face of the operation waveform indicates negative pressure, and the right side indicates 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. As this product gives priority to the specified operation mode, it automatically judges the magnitude relation of two setting values when they are input and assigns them as ON and OFF setting values accordingly. Thus, even if ON and OFF setting values are input the other way by mistake, they will be corrected and the specified operation mode will be performed.

- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM
- STG
- STR2
- MRL2
- GRC
- Cylinder Switch
- MN3E
- MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R.(module unit)
- Clean F.R
- Precision R
- Press gauge
- Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending