

- Do not use corrosive or flammable gas or liquid with this product.
- Please use within the rating pressure range. Do not apply pressure beyond recommended maximum withstand pressure, permanent damage to the pressure sensor may occur.
- Do not drag, hit or allow excessive stress on the sensor. If the switch body appears undamaged, internal components may be broken and can cause malfunction.
- Turn power off before connecting wiring. Wrong wiring or short circuit will damage and / or cause malfunction.
- Do not use in environment containing steam or oil vapor.
- This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
- Wild or higher pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
- For Use on a Flat Surface of a Type 1 Enclosure.

MODEL		PPG-D-R□-□ (Compound Pressure)	PPG-D-V□-□ (Vacuum Pressure)	PPG-D-P□-□ (Positive Pressure)
Rated pressure range		-100.0 to 100.0kPa	0.0 to -101.3kPa	0.000 to 1.000MPa
Set pressure range		-101.0 to 101.0kPa	10.0 to -101.3kPa	-0.100 to 1.000MPa
Withstand pressure		300kPa		1.5MPa
Fluid		Filtered air, Non-corrosive / Non-flammable gas		
Set pressure resolution	kPa	0.1		—
	MPa	—		0.001
	kgf/cm ²	0.001		0.01
	bar	0.001		0.01
	psi	0.01		0.1
inHg		0.1		—
Power supply voltage		12 to 24V DC ±10%, Ripple (P-P) ≤ 10% (UL class 2)		
Current consumption		≤ 40mA (With no load)		
Switch output		2 NPN : open collector 2 outputs Max. load current : 125 mA Max. supply voltage : 24V DC Residual voltage : ≤ 1.5V 2 PNP : open collector 2 outputs Max. load current : 125 mA Max. supply voltage : 24V DC Residual voltage : ≤ 1.5V		
Repeatability		±0.2% F.S. ±1 digit		
	One point set mode	Adjustable		
Hysteresis	Hysteresis mode			
	Window comparator mode			
Response time		≤ 2.5 ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selectable)		
Output short circuit protection		Yes		
LCD display		3 ½ digital, 7 segment LCD display (Red / Green / Orange) (Sampling rate : 5 times / sec.)		
Indicator accuracy		±2% F.S. ±1 digit (ambient temperature: 25 ±3°C) Linearity : ±1% F.S.		
Switch on indicator		Orange Indicator 1 : OUT1 & Orange Indicator 2 : OUT2		
Analog output (Voltage output)		Output voltage : 1 to 5V ±2.5% F.S. (within rated pressure range) Linearity : ±1% F.S. Output impedance: about 1kΩ		
Analog output (Current output)		Output current : 4 to 20mA ±2.5% F.S. (within rated pressure range) Linearity : ±1% F.S. Max.Load Impedance: 2500 at power supply of 12V 6000 at power supply of 24V Min.Load Impedance: 50Ω		
Enclosure		IP65		
Environment	Ambient temp. range	Operation : 0 to 50°C, Storage : -10 to 80°C (No condensation or freezing)		
	Ambient humidity range	Operation / Storage : 35 to 85% RH (No condensation)		
	Withstand voltage	1000V AC in 1-min (between case and lead wire)		
	Insulation resistance	≥ 50MΩ (at 500V DC, between case and lead wire)		
	Vibration	Total amplitude 1.5mm or 10G, 10Hz-55Hz-10Hz scan for 1 minute, 2 hours each in direction of X, Y and Z		
Shock		100 m/s ² (10G), 3 times each in direction of X, Y and Z		
Temperature characteristic		±2% F.S. of detected pressure (25°C) at temp. (Range of 0 to 50°C)		
Port size		6BM-R1/8", M5; 6NM-NPT1/8", #10-32UNF; 6GM-G1/8", M5 6B-Rc1/8"; 6N-NPT1/8"; 6G-G1/8" (x)		
Lead wire		Ø4 PVC - 26 AWG (0.15 mm ²) - 5 cores		
Weight		Port 6BM, 6NM, 6GM approx. 85g; Port 6B, 6N, 6G approx. 114g (each including 2 meter lead wire)		

Measurement mode

Press **SET** for more than 5 seconds.

Hysteresis value setting

Use **▲** or **▼** to adjust the hysteresis value.
*This applies to One-point mode and Window-comparator mode.

Display color setting

Use **▲** or **▼** to select the LCD display color for OUT1 (or OUT2).

Power-save mode

Use **▲** or **▼** to turn on or off the Power-save mode. (×1)

Copy function setting

Use **▲** or **▼** to select the copy function.
***On**: This function automatically locks the slave sensor when copying is finished.
*Only PPG-D-ENC-□ and PPG-D-PC-□ models have the option to use this function. (×2)

Factory default setting

Use **▲** or **▼** to reset or not to reset the settings.

Fine adjustment mode

Use **▲** or **▼** to adjust or not adjust the displayed pressure. (×3)

Measurement mode

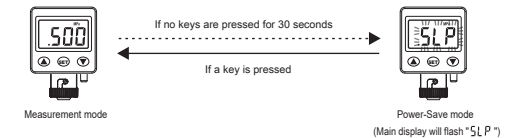
【NOTE :】

×1. When set to "**on**", the Power-save mode will start.
See section " " in this manual for details.

×2. When set to "**on**" or "**onL**", the selected copy function will start.
See section " " in this manual for details.

×3. When set to "**on**", the Fine adjustment mode screen will be displayed.
See section " " in this manual for details.

- ⦿ During Power-Save mode is set to [on], the main display will turn off if no keys are pressed for 30 seconds.
- ⦿ During Power-Save mode, the main display may not synchronize with the output. This is normal and will not affect output operation.
- ⦿ Press any key to temporarily display the Measurement mode.



PPG-D-□NV-□
2 NPN+Analog(Voltage) output(1-5V)

PPG-D-□PV-□
2 PNP+Analog(Voltage) output(1-5V)

PPG-D-□NA-□
2 NPN+Analog(Current) output(4-20mA)

PPG-D-□PA-□
2 PNP+Analog(Current) output(4-20mA)

PPG-D-□NC-□
2 NPN+Copy function

PPG-D-□PC-□
2 PNP+Copy function

PPG-D-KD

① Pressure Range

R: Compound pressure (-100.0 to 100.0kPa)
V: Vacuum pressure (0.0 to -101.3kPa)
P: Positive pressure (0.000 to 1.000MPa)

② Output Specifications

NV: 2 NPN + Analog(Voltage) output (1 - 5V)
NA: 2 NPN + Analog(Current) output (4 - 20mA)
NC: 2 NPN + Copy function
PV: 2 PNP + Analog(Voltage) output (1 - 5V)
PA: 2 PNP + Analog(Current) output (4 - 20mA)
PG: 2 PNP + Copy function

③ Pressure Port

6BM: R1/8", M5 6B: Rc1/8"
6NM: NPT1/8", #10-32UNF 6N: NPT1/8"
6GM: G1/8", M5 6G: G1/8"

Optional Parts

PPG-D-KD : Parallel mounting bracket (for Pressure Port 6BM, 6NM, 6GM)
PPG-D-KL : L-type mounting bracket (for Pressure Port 6BM, 6NM, 6GM)
PPG-D-KA : Parallel mounting bracket (for Pressure Port 6B, 6N, 6G)
PPG-D-KLA : L-type mounting bracket (for Pressure Port 6B, 6N, 6G)
PPG-D-KHS : Panel adapter
PPG-D-KHSCB : Panel adapter + Front protective cover

Refer to the instruction manual in your language supplied with this English document for ④.

Figure 1-1: Dimensions of the main unit.

The diagram shows a rectangular device with a width of 30 and a height of 30. The device features a 2-Color Main Display showing '10.000' and '2'. Above the display is a Pressure Unit Indicator. Below the display are three buttons: (▲)Key, SET Key, and (▼)Key. Labels on the left indicate 'OUT1(Output 1) Indicator' and 'OUT2(Output 2) Indicator'.

① One-point mode:

Use ▲ or ▼ to change the value.

* If OUT 1, " *" is "1".
* If OUT 2, " *" is "2".

② Hysteresis mode/
Window-comparator mode:

Use ▲ or ▼ to change the value.

1) One-point mode:

Normally Open (NO) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

P-1 P-2

Positive Pressure Vacuum Pressure

Normally Closed (NC) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

P-1 P-2

Positive Pressure Vacuum Pressure

2) Hysteresis mode:

Normally Open (NO) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

L-1 H-1 L-2 H-2

Positive Pressure Vacuum Pressure

Normally Closed (NC) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

L-1 H-1 L-2 H-2

Positive Pressure Vacuum Pressure

3) Window-comparator mode:

Normally Open (NO) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

L-1 H-1 L-2 H-2

Positive Pressure Vacuum Pressure

Normally Close (NC) mode

Positive/Compound Pressure (PPG-D-P, PPG-D-R) Vacuum Pressure (PPG-D-V)

ON OFF

L-1 H-1 L-2 H-2

Positive Pressure Vacuum Pressure

[NOTE :]

① If hysteresis is set to 2 digits or less, the switch output may chatter if the input pressure fluctuates near the set point (pressure).

② When using the Window-comparator mode, the difference between two set points must be greater than the fixed hysteresis; otherwise, it will cause the switch output to malfunction.

Applicable pressure ranges for analog output range of 1 to 5V or 4 to 20mA are shown below.

(Compound Pressure)	(Vacuum Pressure)	(Positive Pressure)
Analog output(V) 102.0 (Low) 0.0 102.0 (High)	Analog output(V) 0.0 (Low) -101.3 (High)	Analog output(V) 0.000 (Low) 0.005 (High)

41.3 30 30.7 45.2 200

6BM: R 1/8", M5
6NM: NPT 1/8", #10-32UNF
6GM: G 1/8", M5

Hex flat 12

44 (3.55)

41.3 30 30.7 45.2 200

6B: Rc 1/8"
6N: NPT 1/8"
6G: G 1/8"

20 20

Unit:mm

① Mounting bracket

PPG-D-KD

M3

Parallel mounting bracket

PPG-D-KDA

M4

Parallel mounting bracket

PPG-D-KL

M3

L-type mounting bracket

PPG-D-KLA

M4

L-type mounting bracket

② Panel Mounting

Front protective lid

Panel adapter

$36 \times 36 \pm 0.3 \text{ mm}$

$t \leq 4.5$

Panel adapter

Unit:mm

③ Accessory

Dustproof protector

Caution / Attention !
This device must be installed to maintain IP 65 (Dust and splash proof) enclosure rating.

④ Accessory for pressure port 6B.6N.6G

Bolt(screw)

This product has two inlet pressure ports, select the one most convenient for installation.

Please plug the unused inlet port with supplied port plug. Use seal tape to prevent pressure leak.

Press  and  simultaneously until "00" is displayed.
Release the keys to end the Zero-point setting.



N. MAX & MIN DISPLAY MODE

① Maximum value display mode: ② Minimum value display mode:

Measurement mode

Press  for more than 3 seconds.

Maximum displayed value 000

①

Measurement mode

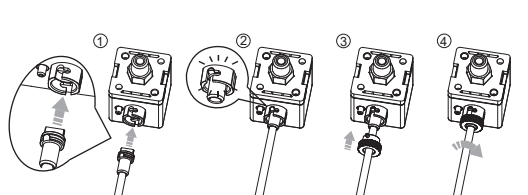
Press  for more than 3 seconds.

Maximum displayed value -000

②

Install the lead wire according to the following steps.

- Hold the terminal so that its protruding section faces up. (See figure ①)
- Install the protruding section to the groove of the pressure sensor.
(See figure ②)
- Attach the terminal cover to the product. (See figure ③)
- Turn the terminal cover to lock it. (See figure ④)



【 NOTE: 】 Do not plug and unplug more than 20 times.

To	kPa	MPa	kgf/cm ²	psi	bar	inHg
1 kPa	1	0.001	0.000101	0.000145	0.0001	0.000295
1 MPa	1000.000	1	0.001010	145.038	0.0100	0.2953
1 kgf/cm ²	98066.5	0.980665	1	14.5038	1.0	2.95298
1 psi	6895	0.006895	0.07031	1	0.06895	2.03607
1 bar	100000	1.00000	1.01972	14.5038	1	29.5298
1 inHg	3386.388	0.003386	0.034530	49.1141	0.033863	1

Measurement mode

Press **SET** for more than 3 seconds.

OUT1 Operation mode setting

Alarm/dis-
play

0PS
(oPS)
One-point
mode

HYS
Hysteresis
mode

u in
Window-
comparator
mode

Use $\blacktriangle$ or $\blacktriangledown$ to select the OUT1 operation mode.

OUT1 output mode setting

Alarm/dis-
play

no

nc

Use $\blacktriangle$ or $\blacktriangledown$ to select the OUT1 output mode.

OUT2 Operation mode setting

Alarm/dis-
play

oFF
oFF mode

0PS
(oPS)
One-point
mode

HYS
Hysteresis
mode

u in
Window-
comparator
mode

Use $\blacktriangle$ or $\blacktriangledown$ to select the OUT2 operation mode.

OUT2 output mode setting

Alarm/dis-
play

no

nc

Use $\blacktriangle$ or $\blacktriangledown$ to select the OUT2 output mode. (※1)

Response time setting

Alarm/dis-
play

2.5 25 100 250
2.5ms 25ms 100ms 250ms

1500 1000 500
1500ms 1000ms 500ms

Use $\blacktriangle$ or $\blacktriangledown$ to select the response time.

Display color setting

Alarm/dis-
play

SoG ON:Green
OFF:Red

SoR ON:Red
OFF:Green

Grn ON/OFF:
Green

rEd ON/OFF:
Red

Use $\blacktriangle$ or $\blacktriangledown$ to select the display color.

Unit setting

Alarm/dis-
play

Pa (kPa)(MPa)
($\times 2$)

GF (kgf/cm²)

bAr (bar)

PS (psi)

inHg ($\times 3$)

Use $\blacktriangle$ or $\blacktriangledown$ to select the desired pressure unit.

Measurement mode

【NOTE :】

※1. This screen will not appear if OUT2 operation mode is set to OFF mode.

※2. Pressure unit is MPa for Positive pressure model and kPa for Vacuum and Compound pressure models.

※3. This applies only to Vacuum and Compound pressure models.

The pressure value of the master sensor can be copied to a slave sensor using this function.

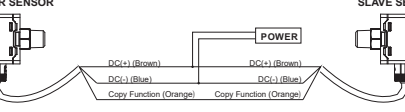
Before copying, confirm the model No. of the pressure sensors. This function can only be used between sensors of the same model.

The function copies from the master sensor to one slave sensor at a time.

[Steps for Setting the Copy Function]

1. Set the Copy function to **[Cn]** or **[Cn2]** to prepare the master sensor for copying. See section H in this manual.
2. Turn off the power of the master sensor and the slave sensor.
3. Connect the master sensor and the slave sensor according to the following diagram.

MASTER SENSOR



DC(+) (Brown) DC(-) (Blue) Copy Function (Orange)

DC(+) (Brown) DC(-) (Blue) Copy Function (Orange)

SLAVE SENSOR

4. Turn on the power of the master sensor and the slave sensor simultaneously.
5. Wait 5 seconds for data transfer to complete. When complete, the master sensor will alternately display [CPY] and [Gd] the slave sensor will alternately display [SLV] and [Gd]
6. If data transfer (copy) fails, the master sensor will alternately display [CPY] and [Gd] the slave sensor will display [Er8]
7. Turn off the power of the sensors and disconnect the wire connection. Not disconnecting the wire connection may damage the sensors.

To copy to another slave sensor, repeat steps ③ to ⑤.

Only PPG-D-DNC-□ and PPG-D-DPC-D models have the option to use this function.

Fine adjustment mode

Press **SET**

Displayed value: **FSE** | **100**

Present measured value

Use **DOWN** or **UP** to change the set value.

Press **SET** when finished, or make no key operation for more than 3 seconds after changing the set value to exit.

Press **SET**

Displayed value: **FSE** | **00**

Adjusted value (Percent)

Press **SET**

Measurement mode

This function eliminates slight differences in the output values and allows uniformity in the numbers displayed.

Displayed values of the pressure sensor can be calibrated to within $\pm 2.5\%$ R.D.

Graph: Displayed pressure value vs. Applied pressure. Tolerance band: $\pm 2.5\%$ R.D.

Legend:
 - Factory default setting is 0.
 - Calibration range

R.D. (Reading)

1. Setting resolution is $\pm 0.1\%$ R.D.
2. The analog output will change

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	Err1	Output 1 load current is more than 125 mA	Turn off the power and check the cause of overload current; or, lower the current load to less than 125 mA and then restart.
	Err2	Output 2 load current is more than 125 mA	
Residual pressure error	Err3	During zero reset, the pressure value is over ±3% F.S.	Change input pressure and perform zero reset again.
Applied pressure error	HHH	Supply pressure exceeds the upper limit of the pressure setting.	Adjust the pressure to within the operating pressure range.
	LLL	Supply pressure exceeds the lower limit of pressure setting.	
System error	Err4	Internal system error	Turn off the power and then restart. If the error condition remains, contact CKD.
	Err5	Internal system error	
	Err6	Internal data error	
	Err7	Internal data error	
Copy data error	Err8	Copy data error	Check the model No. and wire connection. Restart. If it does not return to the normal condition, contact CKD.