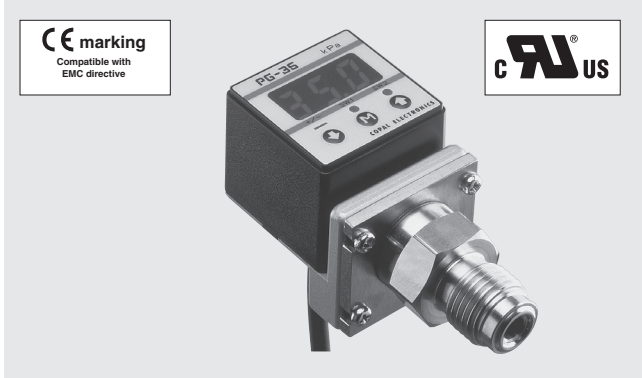


# PRESSURE GAUGES

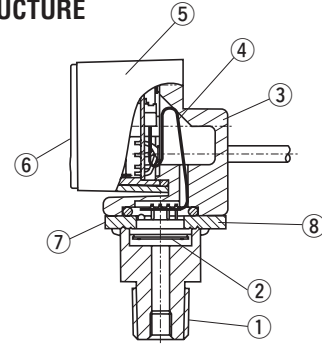
# PG-35



## FEATURES

- **Both absolute pressure type and compound pressure type are available**  
Compound pressure type measures negative and positive gauge pressure.
- **Compact and lightweight general-purpose pressure gauges**  
Innovative general-purpose gauges of compact design (30mm sq.) and drip-proof structure (IP65).
- **Clear indication by LED**  
Easy-to-see LED assures clear readings on the panel and even in a dark place.
- **Various modes and units can be selected according to applications**  
Eight different pressure units  
Three analog output modes  
Eight switch output modes
- **Meet EMC standards**  
EN 55011 (EMI)  
EN 61326-1 (EMS)
- **Low consumption by nondisplay mode**
- **Set data protection by panel lock function**

## INTERNAL STRUCTURE (R 1/4)



Part name		Material
①	Fitting	SUS316L
②	Sensor module	SUS316L
③	Adaptor	Aluminum
④	FPC	Polymide
⑤	Case	PBT (Polybutyleneterphthalate)
⑥	Panel sheet	Polyester
⑦	“O” ring	NBR
⑧	Sensor holder	SUS316L

## MODEL NUMBER DESIGNATION

High corrosion resistance type

P G - 3 5 - 1 0 2 R - N R 2 B

Series name

Pressure range

102R : - 100 ~ 100 kPa (Compound pressure [Negative pressure ~ Positive pressure])  
 102A : 0 ~ 100 kPa (Absolute pressure [Absolute vacuum ~ Barometric pressure])  
 103R : - 100 ~ 1000 kPa (Compound pressure [Negative pressure ~ Positive pressure])

Pressure reference

R : Compound pressure (Negative pressure ~ Positive pressure)  
 A : Absolute pressure (Absolute vacuum ~ Barometric pressure)

Port

Blank : Stem mount  
 B : Back mount

Fitting

R2 : R 1/4 (With M5 female screw)  
 GF : G 3/8 (Flush diaphragm type)  
 G2 : G 1/4 (With M5 female screw)  
 VC : 9/16-18UNF (Gasket joint)

Switch output interface

N : NPN open collector  
 P : PNP open collector

## LIST OF MODEL NUMBERS

Pressure medium	Fitting	Port	Switch output interface	Pressure reference Rated pressure range	Gauge		Absolute
					-100 ~ 100 kPa	-100 ~ 1000 kPa	0 ~ 100 kPa abs
Corrosive gases/ liquids compatible with SUS 316L	R 1/4	Stem mount	NPN		PG-35-102R-NR2	PG-35-103R-NR2	PG-35-102A-NR2
		Back mount		➡ PG-35-102R-NR2B	➡ PG-35-103R-NR2B	➡ PG-35-102A-NR2B	
		Stem mount		PNP	PG-35-102R-PR2	PG-35-103R-PR2	PG-35-102A-PR2
		Back mount			➡ PG-35-102R-PR2B	➡ PG-35-103R-PR2B	➡ PG-35-102A-PR2B
	G 3/8	Stem mount	NPN	PG-35-102R-NGF	PG-35-103R-NGF	PG-35-102A-NGF	
			PNP	PG-35-102R-PGF	PG-35-103R-PGF	PG-35-102A-PGF	
	9/16-18UNF	Stem mount	NPN		PG-35-102R-NVC	PG-35-103R-NVC	PG-35-102A-NVC
		Back mount		➡ PG-35-102R-NVCB	➡ PG-35-103R-NVCB	➡ PG-35-102A-NVCB	
		Stem mount		PNP	PG-35-102R-PVC	PG-35-103R-PVC	PG-35-102A-PVC
		Back mount			➡ PG-35-102R-PVCB	➡ PG-35-103R-PVCB	➡ PG-35-102A-PVCB
	G 1/4	Stem mount	NPN	PG-35-102R-NG2	PG-35-103R-NG2	PG-35-102A-NG2	
			PNP	PG-35-102R-PG2	PG-35-103R-PG2	PG-35-102A-PG2	

※ Verify the above model numbers when placing orders.

The products marked ➡ are manufactured upon receipt of order basis.

## ENVIRONMENTAL CHARACTERISTICS

Test item	Test conditions	Permissible change
Vibration	10 ~ 500 Hz, 98.1 m/s <sup>2</sup> or 1.5 mm P-P, 3 directions for 2 hours each	<div style="border: 1px solid black; padding: 5px; display: inline-block;">                     ± 2 %F.S. maximum after test ※ 1                      Amount of analog output fluctuation is permitted                      by adding conversion error of 20 mV.                 </div>
Shock	490 m/s <sup>2</sup> , 3 directions for 3 times each	
Pressure cycling	0 ~ Rated pressure, 10 <sup>5</sup> cycles	
Moisture resistance	40 °C, 90 ~ 95 %RH, 240 hrs.	
EMC	EMI : EN55011: 2007, A2 : 2007 Group 1, class B EMS : EN61326-1 : 2006 Table 2	※ 1 Pressure indication, switch operating pressure and analog output : ± 5 %F.S. maximum during test

※ 1 Change in the pressure indication, switch operating points and analog output.

# PG-35

## PRESSURE GAUGES

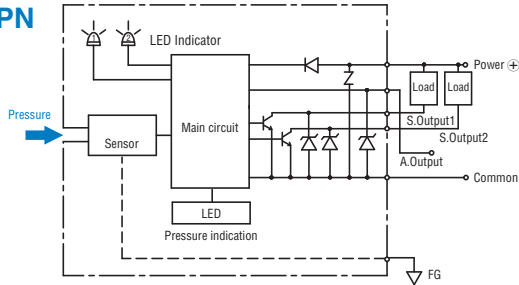
### STANDARD SPECIFICATIONS

● Unless otherwise specified, the specs are defined at an ambient temperature of 25±5 °C and excitation voltage of 12 V DC.

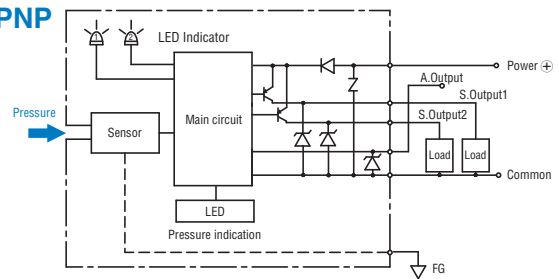
Item / Model number		PG-35			
		102R	103R	102A	
General specifications	Pressure reference	Gauge		Absolute	
	Pressure medium	Corrosive gases/liquids compatible with SUS 316L			
	Rated pressure range	kPa	- 100 ~ 100	- 100 ~ 1000	0 ~ 100 (abs)
	Maximum pressure	kPa	200	2000	200 (abs)
	Break-down pressure	kPa	300	3000	300 (abs)
	Operating temp. range	°C	- 10 ~ 50		
	Compensated temp. range	°C	0 ~ 50		
	Operating humidity	%RH	35 ~ 85		
	Protection grade		In accordance with IEC IP65		
	Pressure Port		R 1/4, G 3/8, G 1/4, 9/16-18UNF		
	Type of mounting		Stem mount, Back mount		
	Material of pressure port attachment		SUS 316L		
	Net weight	g	Approx. 150 (Including 2 m cable)		
	Thermal error		± 3 %F.S. (0 ~ 50 °C)		
	Insulation resistance		100 MΩ minimum (DC500 V)		
	Dielectric strength		AC500 V 1 minute (Leakage current 1 mA maximum)		
Input voltage		10.8 ~ 30 V DC (Including ripple percentage)			
Consumption current		50 mA maximum			
Display	Display element	Full 3-digit LED			
	Rated display range	kPa	- 99.9 ~ 99.9	- 100 ~ 999	0.0 ~ 99.9
	Multiplier settings		Max. 11 settings		
	Negative pressure display		Red LED is ON.		————
	Display accuracy		± 1 %		
Switch output	Output status	NPN/PNP			
	Output mode	2-point output (Transistor, Open collector output)			
	Output mode	Separate mode / window comparator mode			
	Switching capacity	30 V DC 100 mA Short-circuit protection			
	Residual voltage	1.2 V maximum (NPN), 2.2 V maximum (PNP) (At load current of 100 mA)			
	State indication	Output 1 (Green LED), Output 2 (Red LED) Lighted when output is ON.			
	Switch hysteresis	0 ~ 300 counts Adjustable			
	Repeatability	± 0.2 %F.S. ± 1 count (± 0.3 %F.S. maximum)			
Response	Approx. 5, 25, 250, 2500 ms Adjustable				
Analog output	Output mode	3 modes			
	Output voltage V zero : Pin=0, V span : Pin=0 ~ Pin (H)	1 ~ 5 V	G/V mode ZERO : 1 ± 0.2 V, SPAN : 4 ± 0.2 V R mode ZERO : 3 ± 0.2 V, SPAN : 2 ± 0.2 V	103 R (R mode) ZERO : 1.36 ± 0.2 V SPAN : 3.64 ± 0.2 V	
	Impedance	10 kΩ			
	Resolution	1/204(Approx. 20 mV / Approx. 0.5%F.S.)			
	Response	Approx. 5, 25, 250, 2500 ms Adjustable			
Accessories		"O" rings are supplied (G 3/8 : P18, G 1/4 : P15)			

## INTERNAL ELECTRICAL SCHEMATICS

### NPN



### PNP



## SELECTION OF DISPLAY MULTIPLIER

The last digit/letter represents the selection code : **Blinking red LED indicates negative pressure.**

Display multiplier	Pressure range (-Pr ~ +Pr)		
	102R	103R	102A
1 × 1	-99.9 ~ 99.9	-100 ~ 999	0.0 ~ 99.9 (abs)
2 × 0.0102		-1.02 ~ 9.99	
3 × 10.2	-999 ~ 999		0 ~ 999 (abs)
4 × 7.501	-750 ~ 750		0 ~ 750 (abs)
5 × 102			
6 × 0.01		-1.00 ~ 9.99	
7 × 10	-999 ~ 999		0 ~ 999 (abs)
8 × 0.145	-14.5 ~ 14.5	-14 ~ 145	0.0 ~ 14.5 (abs)
9 × 0.000145			
A × 0.001		-0.10 ~ 1.00	
b × 0.2953	-29.5 ~ 29.5	-29 ~ 295	0.0 ~ 29.5 (abs)

Diagonal column: Display multiplier cannot be selected due to resolution and number of digits. (Selection code is not indicated either.) Selection code is set at "1" prior to shipment.

## ANALOG OUTPUT MODE

		圧力範囲 Pressure range	
表示 Display		-Pr	Pr
1	Rモード R mode	←————— 0 —————→	
2	Gモード G mode	1 V	5 V
3	Vモード V mode	5 V	1 V

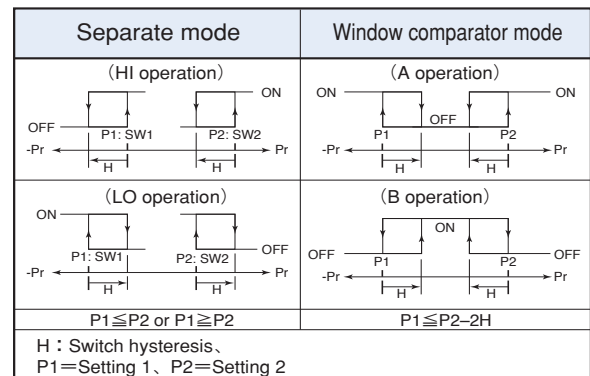
When shipped from our factory : 102R : V mode is set at "3" and 102A, 103R : G mode is set at "2". In case of 102R and 103R, R/G/V mode can be set at "1", "2" or "3" (However, the accuracy at V mode of 103R can't be guaranteed). 102A : Only G mode can be set.

## SWITCH OUTPUT MODE

Output	SW1		SW2	
	Separate	Window comparator	Separate	Window comparator
Mode	Separate	Window comparator	Separate	Window comparator
Operation	HI LO	A B	HI LO	A B
S-1	○		○	
S-2	○		○	
S-3		○		○
S-4		○		○
C-5				○
C-6		○		○
C-7				○
C-8		○		○
Pressure setting (Operating point)	Setting 1	(Lower limit) : Setting 1 (Upper limit) : Setting 2	Setting 2	(Lower limit) : Setting 1 (Upper limit) : Setting 2

Note 1. In the Separate Mode, setting 1 corresponds to SW1, and Setting 2 corresponds to SW2.

Note 2. In the Window Comparator Mode, the minimum value for SW1 and SW2 corresponds to Setting 1 and the maximum value corresponds to Setting 2.



# PG-35

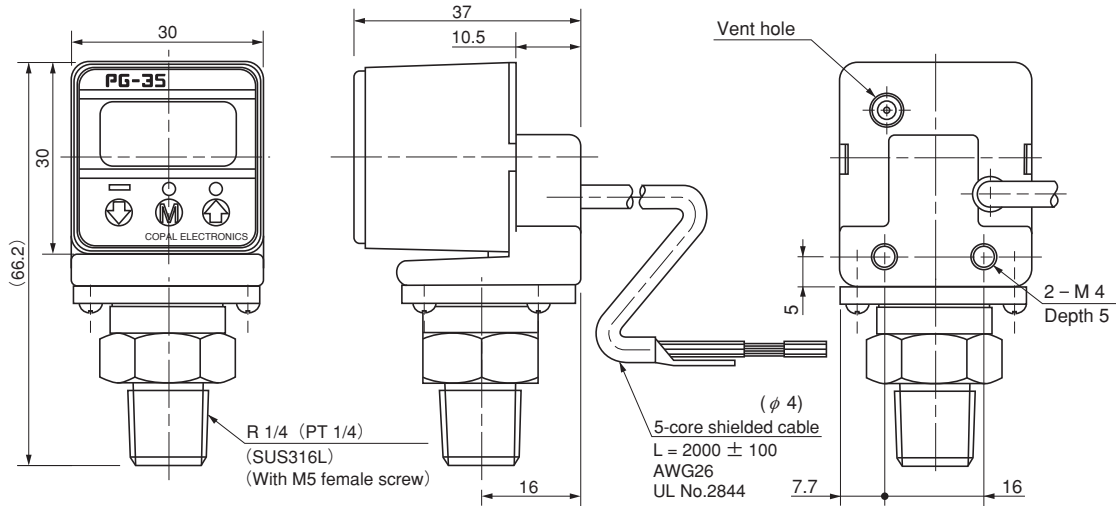
## PRESSURE GAUGES

### OUTLINE DIMENSIONS

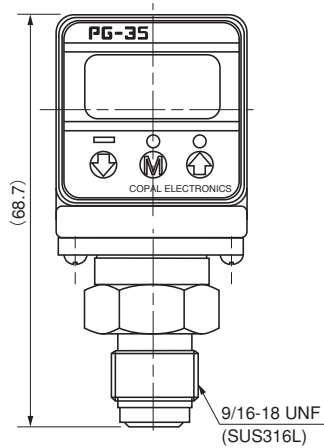
#### PG-35

Unless otherwise specified tolerance : ± 0.5 (Unit: mm)

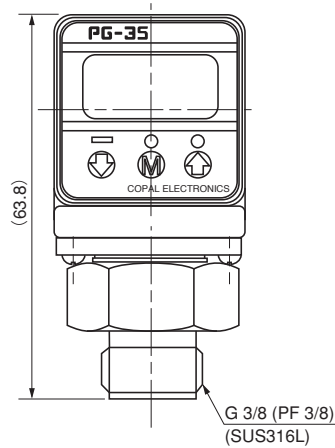
Configurations of joint R2 type



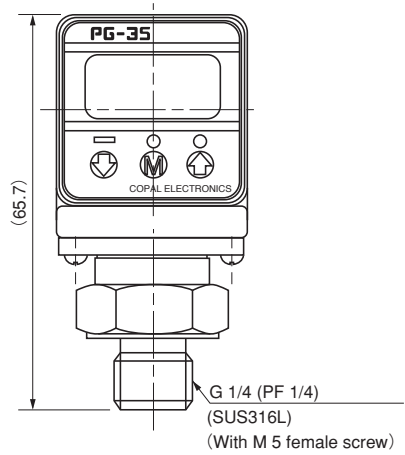
Configurations of joint VC type



Configurations of joint GF type



Configurations of joint G2 type



Extra care should be taken with the diaphragm part. Do not touch the diaphragm directly to avoid damaging the diaphragm.

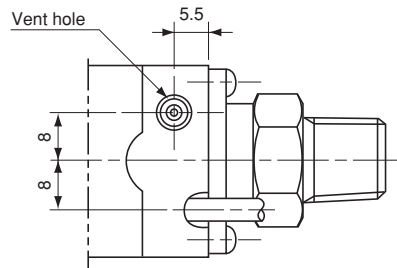
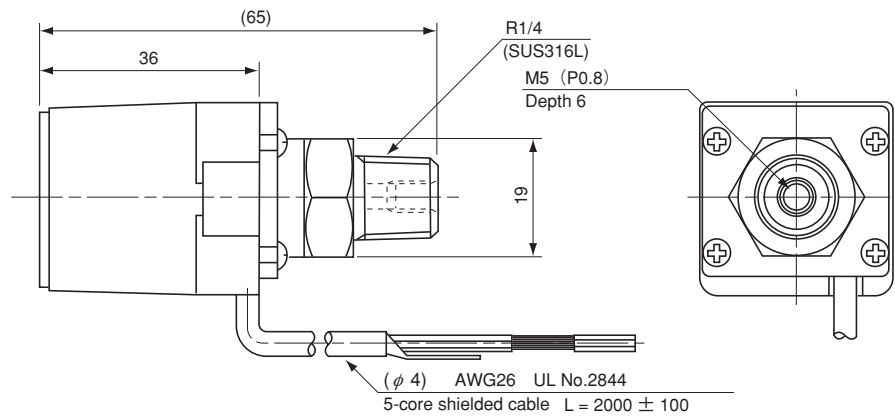
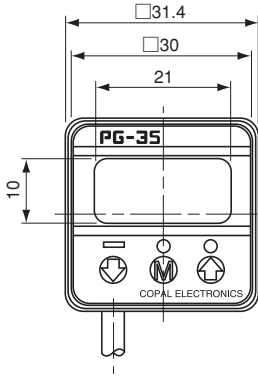
Wire color	Connection
Brown	Power ⊕
Gray	Analog output
Black	Switch output 1
White	Switch output 2
Blue	Common
Shield	Fitting

# PG-35 PRESSURE GAUGES

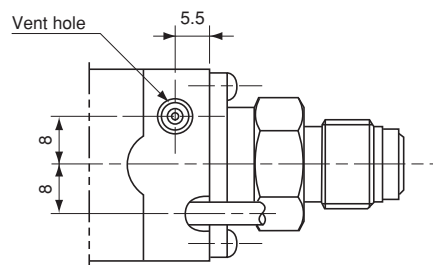
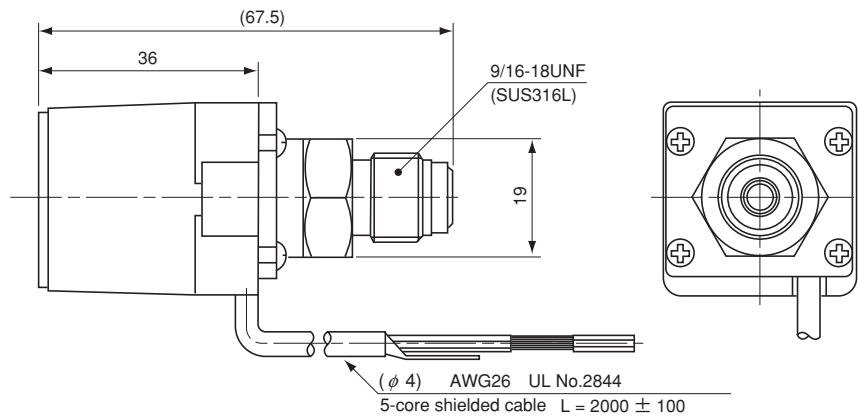
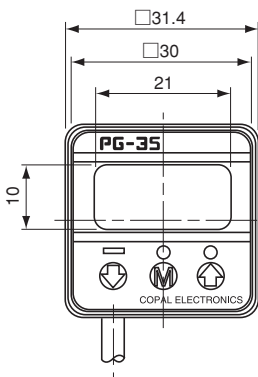
## OUTLINE DIMENSIONS

Unless otherwise specified tolerance :  $\pm 0.5$  (Unit: mm)

### PG-35-B (R2)



### PG-35-B (VC)



# PG-35

## PRESSURE GAUGES

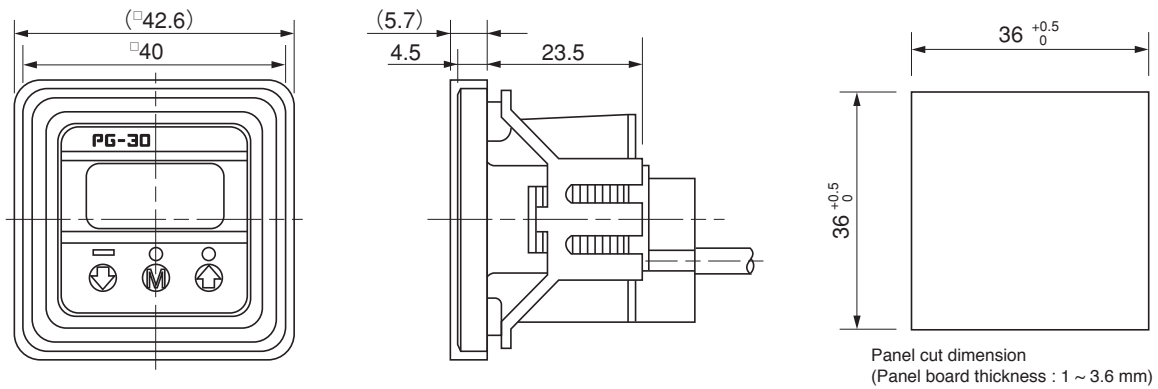
### ACCESSORIES (Sold separately)

Name	Series name	Contents	Applicable model
Panel holder set	ACPG-003	Panel holder cover Panel holder Panel stopper (2pcs.)	PG-30 · PG-35 · PG-75 · PG-35H · PG-35L
Holder cover set (For protecting gauge operating panel)	ACPG-004	Panel holder cover Panel holder	PG-30 · PG-35 · PG-75 · PG-35H · PG-35L

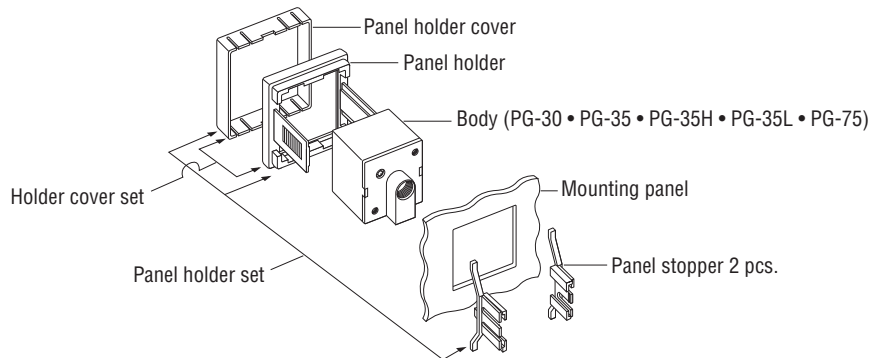
### HOW TO MOUNT OPTIONAL ACCESSORIES (Sold separately)

(Unit: mm)

#### PG-30 · PG-35 · PG-35H · PG-35L · PG-75 Panel cut holder set & holder cover set



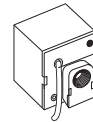
#### Panel holder cover set



## ■ Installation

### ● Tube at atmospheric pressure intake

If there is any possibility that the sensor may become wet with oil or water, which may enter the case through the air intake, connect a silicon tube, or similar, to the intake and position the end of the tube in a suitably safe place. Be sure not to bend the tube or block the end of the tube.



Example of a tube with external diameter of  $\phi 4$  and internal diameter of  $\phi 2.5$

### ● Piping

Use a wrench (13mm) on the aluminum die-casting. Do not hold the plastic case when tightening. Apply sealing tape at the male screw area to protect against air leaks. If mounting with an angled bracket, the maximum torque of the M3 screws should be less than  $0.3\text{N}\cdot\text{m}$ .

When using the accessories sealing or fitting screw, bind up the seal tape around the sealing screw one and a half or two turns, and screw it in the pressure port by hand without damaging the screw thread. After then, tighten the screw sufficiently with wrench. (Recommended torque: Plastic screw  $3.0\text{N}\cdot\text{m}$ , Metal screw  $10.0\text{N}\cdot\text{m}$ )

## ■ Customization

We also offer customized solutions. Please contact your local sales office for details.

Model number	Shape and other customization
PG-35-102R-NR2-011	Bracket (mounting plate) supplied
PG-35-102R-NR2-105	Default mode (X 1 <multiplier factor>, V mode <analog output>, separate mode <switch output>), Pressure setting (P1:30kPa / P2 :50kPa, 10ms<hysteresis>, 0 (digital filter))
PG-35-102R-NR2B-128	Panel holder set (ACPG-003) separately packed and supplied
PG-35-102R-PR2-021	Tube for vent hole supplied. Measures against coolant intrusion (application of epoxy around a cable bush, and protection cover for panel sheet)
PG-35-103R-NS2	Fitting : 1/4 Swagelok tubing