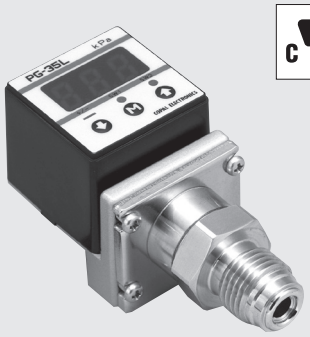
# PRESSURE GAUGES

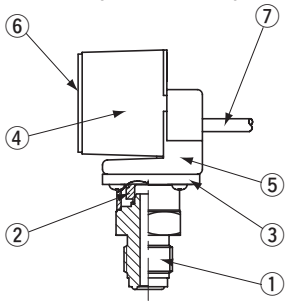
# PG-35L

CE marking
Compatible with EMC directive

cULus



## INTERNAL STRUCTURE (9/16-18UNF)




| | Part name | Material |
|---|---|---|
| ① | Fitting | SUS316L |
| ② | Sensor module (oil less) | |
| ③ | Sensor holder | |
| ④ | Housing (Aluminum coating) | PBT (UL-94-HB) |
| ⑤ | Adapter | ADC 10, 12 |
| ⑥ | Panel sheet | Polyester (UL746) |
| ⑦ | Shielded cable | Vinyl chlorid resin (UL2844) |

## FEATURES

- For high vacuum pressure
- For corrosive gases and liquids compatible with SUS316L stainless steel diaphragm
- Compact • Light weight • Drip-proof structure (30 mm sq • 200 g • IP65)
- Low consumption by nondisplay mode
- Set data protection by panel lock function

## MODEL NUMBER DESIGNATION

P G - 3 5 L - 1 0 2 R - N V C B

Series name

Pressure range
102 : – 100 ~ 100 kPa
103 : – 100 ~ 1000 kPa

Pressure reference
R : Compound pressure (Negative pressure ~ Positive pressure)

Port
Blank : Stem mount
B : Back mount

Fitting
R2 : R 1/4
G2 : G 1/4
VC : 9/16 - 18 UNF (Gusket joint)

Switch output interface
N : NPN open collector
P : PNP open collector

## LIST OF MODEL NUMBERS

| Port | Fitting | Pressure reference: Switch output interface | Pressure reference: Rated pressure range | Gauge: –100 ~ 100 kPa | | Gauge: –100 ~ 1000 kPa | |
|---|---|---|---|---|---|---|---|
| Stem mount | R2 (R 1/4) | NPN | | | PG-35L-102R-NR2 | | PG-35L-102R-NR2 |
| | | PNP | | → | PG-35L-102R-PR2 | → | PG-35L-102R-PR2 |
| | G2 (G 1/4) | NPN | | | PG-35L-102R-NG2 | | PG-35L-102R-NG2 |
| | | PNP | | → | PG-35L-102R-PG2 | → | PG-35L-102R-PG2 |
| | G2 (9/16-18UNF) | NPN | | | PG-35L-102R-NVC | | PG-35L-102R-NVC |
| | | PNP | | → | PG-35L-102R-PVC | → | PG-35L-102R-PVC |
| Back mount | R2 (R 1/4) | NPN | | → | PG-35L-102R-NR2B | → | PG-35L-102R-NR2B |
| | | PNP | | → | PG-35L-102R-PR2B | → | PG-35L-102R-PR2B |
| | G2 (G 1/4) | NPN | | → | PG-35L-102R-NG2B | → | PG-35L-102R-NG2B |
| | | PNP | | → | PG-35L-102R-PG2B | → | PG-35L-102R-PG2B |
| | G2 (9/16-18UNF) | NPN | | → | PG-35L-102R-NVCB | → | PG-35L-102R-NVCB |
| | | PNP | | → | PG-35L-102R-PVCB | → | PG-35L-102R-PVCB |

※ Verify the above model numbers when placing orders.

Marked → is manufactured upon receipt of order basis.

## 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-35L | |
|---|---|---|---|---|
| | | | 102R | 103R |
| General specifications | Pressure reference | | Gauge | |
| | Pressure medium | | SUS 316L Corrosive gases/liquids compatible with SUS 316L | |
| | Rated pressure range | kPa | – 100 ~ 100 | – 100 ~ 1000 |
| | Maximum pressure | kPa | 200 | 1500 |
| | Break-down pressure | kPa | 300 | 2000 |
| | Operating temp. range | °C | – 10 ~ 50 | |
| | Compensated temp. range | °C | 0 ~ 50 | |
| | Operating humidity | %RH | 35 ~ 85 (No condensation) | |
| | Protection grade | | IP65 | |
| | Pressure Port | | R 1/4, G 1/4, VC (9/16 - 18 UNF) | |
| | 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 | | 50 MΩ minimum | |
| | Dielectric strength | | 125 V DC 1 minute | |
| | Vacuum working pressure | | $1.4 \times 10^{-4}$ Pa abs minimum | |
| | 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 |
| | Multiplier settings | | Max. 11 settings | |
| | Display cycle | | Approx. 4 times/s | |
| | Negative pressure display | | "–" LED is ON | |
| | Display accuracy | | ± 1 % | |
| Switch output | Output status | | NPN/PNP | |
| | | | 2-point output (Transistor, Open collector output) | |
| | Output mode | | Separate mode / window comparator mode | |
| | Switching capacity | | 30 V DC 100 mA maximum | |
| | Residual voltage | | 1.2 V maximum (NPN), 2.2 V maximum (PNP) | |
| | 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 | |
| | Response | | Approx. 5, 25, 250, 2500 ms adjustable | |
| Analog output | Output mode | | 3 modes | |
| | Output voltage<br>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. 4.9mV/ Approx.0.123% F.S.) | |

## ENVIRONMENTAL CHARACTERISTICS

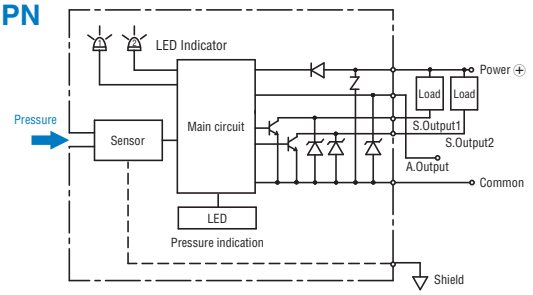
| Test item | Test conditions | Permissible change |
|---|---|---|
| Vibration | 10 ~ 500 Hz, 98.1 m/s² or 1.5 mm P-P, 3 directions for 2 hours each | ※ 1<br>± 2 %F.S. maximum after test<br>Amount of analog output fluctuation is permitted by adding conversion error of 20 mV. |
| Shock | 490 m/s², 3 directions for 3 times each | |
| Pressure cycling | 0 ~ Rated pressure、$10^6$ cycles | |
| Moisture resistance | 40 °C, 90 ~ 95 %RH, 240 hrs. | |
| EMC | EMI : EN55011: 2007, A2 : 2007 Group 1, class B<br>EMS : EN61326-1: 2006 Table 2 | ※ 1<br>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.

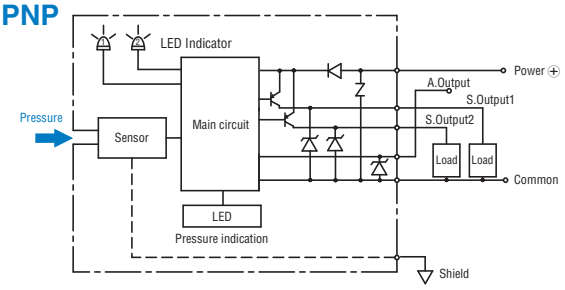
# PG-35L
## PRESSURE GAUGES

## ■ 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 | | | (– Pr ~+ Pr) Pressure range | |
|---|---|---|---|---|
| | | | 102R | 103R |
| Selection code | 1 | × 1 | – 99.9 ~ 99.9 | – 100 ~ 999 |
| | 2 | × 0.0102 | | – 1.02 ~ 9.99 |
| | 3 | × 10.2 | – 999 ~ 999 | |
| | 4 | × 7.501 | – 750 ~ 750 | |
| | 5 | × 102 | | |
| | 6 | × 0.01 | | – 1.00 ~ 9.99 |
| | 7 | × 10 | – 999 ~ 999 | |
| | 8 | × 0.145 | – 14.5 ~ 14.5 | – 14 ~ 145 |
| | 9 | × 0.000145 | | |
| | A | × 0.001 | | – 0.10 ~ 1.00 |
| | b | × 0.2953 | – 29.5 ~ 29.5 | – 29 ~ 29.5 |

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 “A” prior to shipment.

## ■ ANALOG OUTPUT MODE

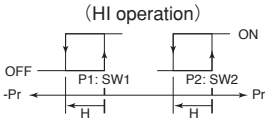
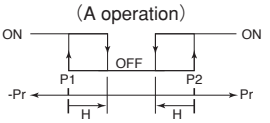
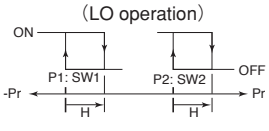
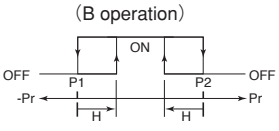
| Display \ Pressure range | | –Pr 0 Pr |
|---|---|---|
| 1 | R モード R mode | 1 V ---------- 5 V |
| 2 | G モード G mode | 1 V ---------- 5 V |

Selection code is set at “G” prior to shipment.

## ■ SWITCH OUTPUT MODE

| Output | SW1 | | | | SW2 | | | |
|---|---|---|---|---|---|---|---|---|
| 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<br>(Upper limit) : Setting 2 | | Setting 2 | | (Lower limit) : Setting 1<br>(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.

| Separate mode | Window comparator mode |
|---|---|
| (HI operation)<br>  | (A operation)<br>  |
| (LO operation)<br>  | (B operation)<br>  |
| P1≦P2 or P1≧P2 | P1≦P2–2H |

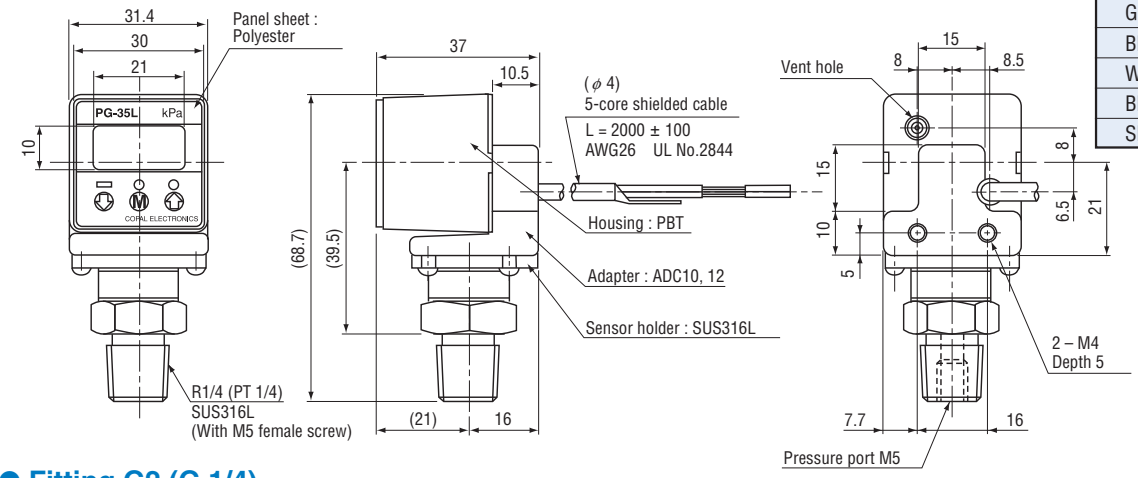
H : Switch hysteresis、
P1=Setting 1、P2=Setting 2

## OUTLINE DIMENSIONS

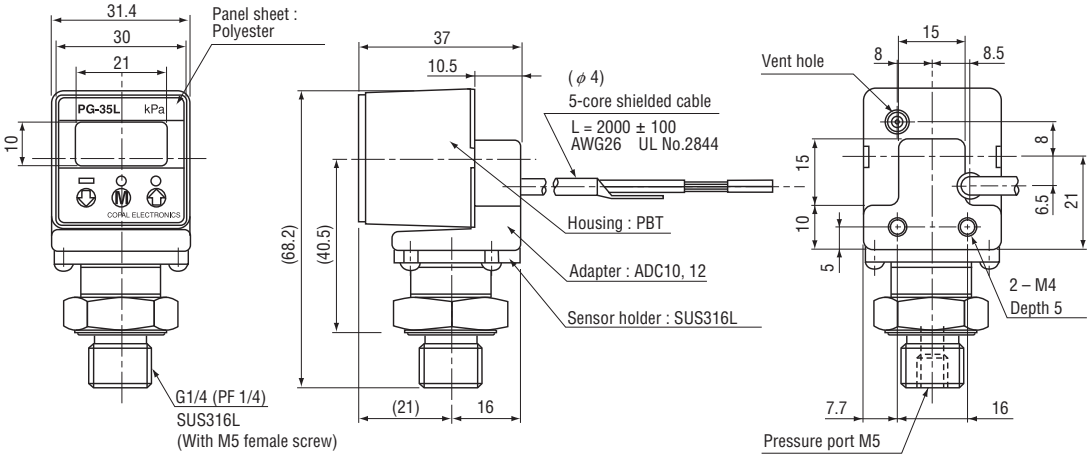
Unless otherwise specified tolerance : ± 0.5 (Unit: mm)

### ● Fitting R2 (R 1/4)

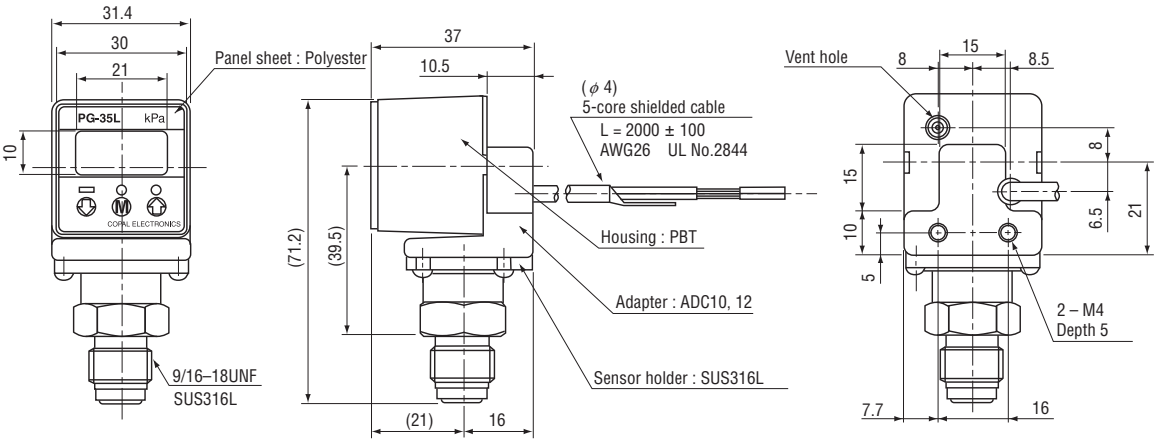
| Wire color | Connection |
|---|---|
| Brown | Power ⊕ |
| Gray | Analog output |
| Black | Switch output 1 |
| White | Switch output 2 |
| Blue | Common |
| Shield | Fitting |




### ● Fitting G2 (G 1/4)




### ● Fitting VC (9/16 - 18 UNF)

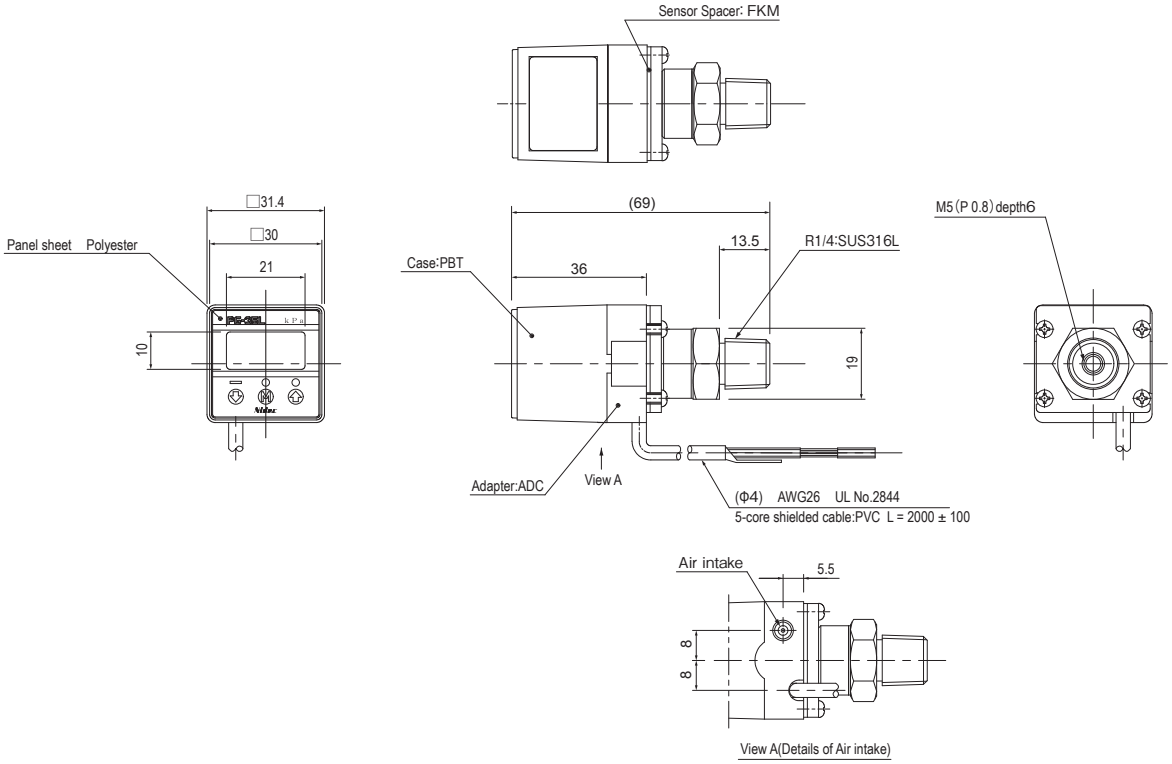


# PG-35L
## PRESSURE GAUGES

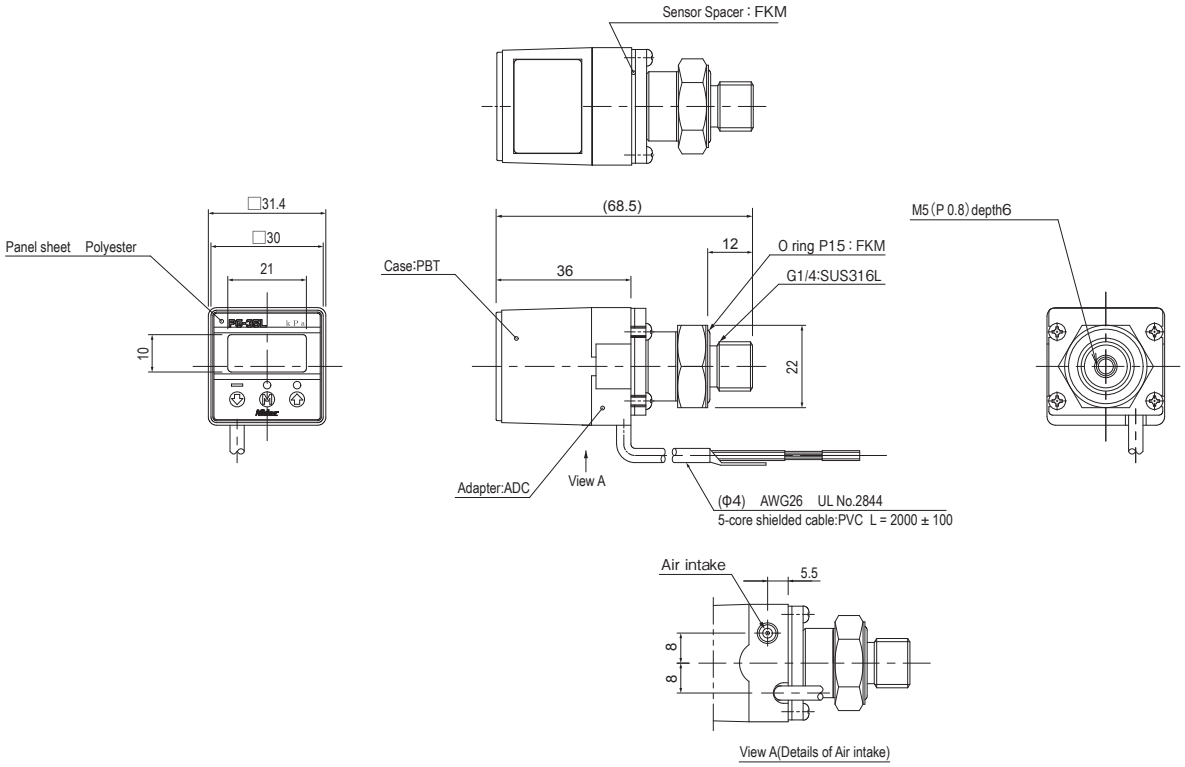
## ■ OUTLINE DIMENSIONS

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

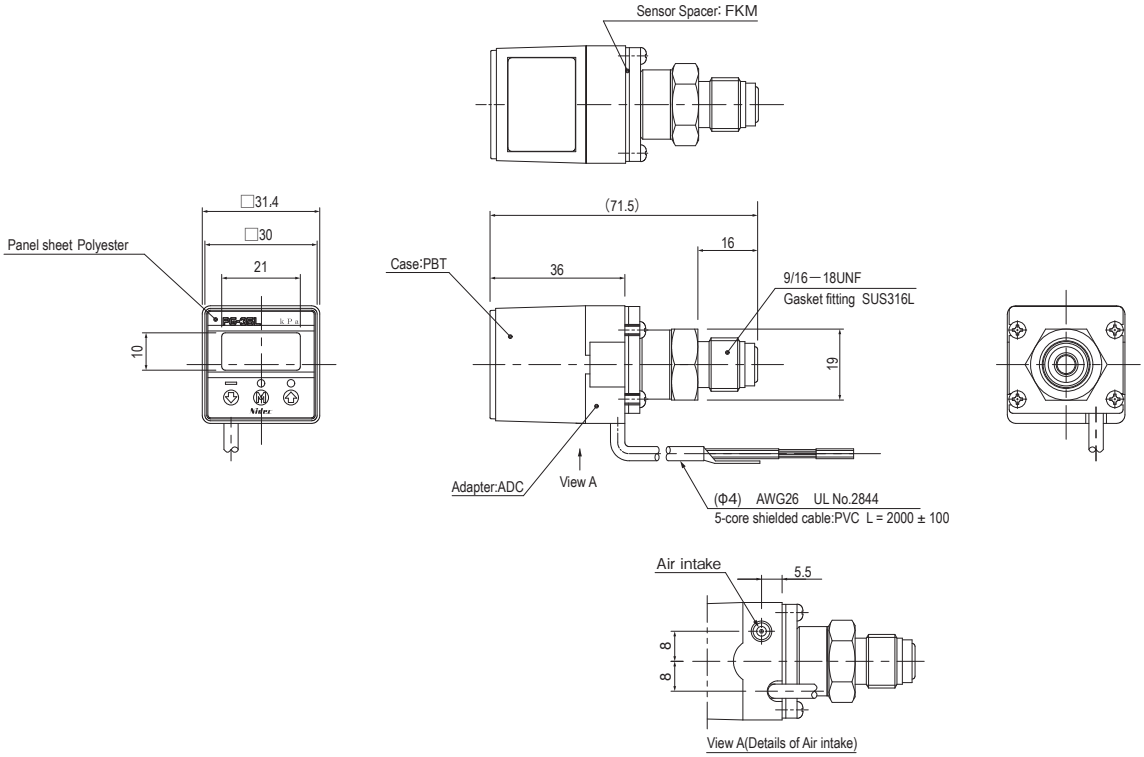
### ● Fitting R2 (R 1/4)　The horizontal installation type




### ● Fitting G2 (G 1/4)　The horizontal installation type



## ● Fitting VC (9/16 - 18 UNF)　The horizontal installation type

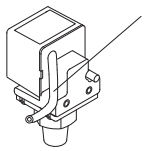


# PG-35L
## PRESSURE GAUGES

## ■ Others

### ● 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 on a hexagon of fitting part. Do not hold the main body when tightening.

## ■ Customization

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

| Model number | Shape and other customization |
|---|---|
| PG 35L-103R-NVC-056 | Use no oil |

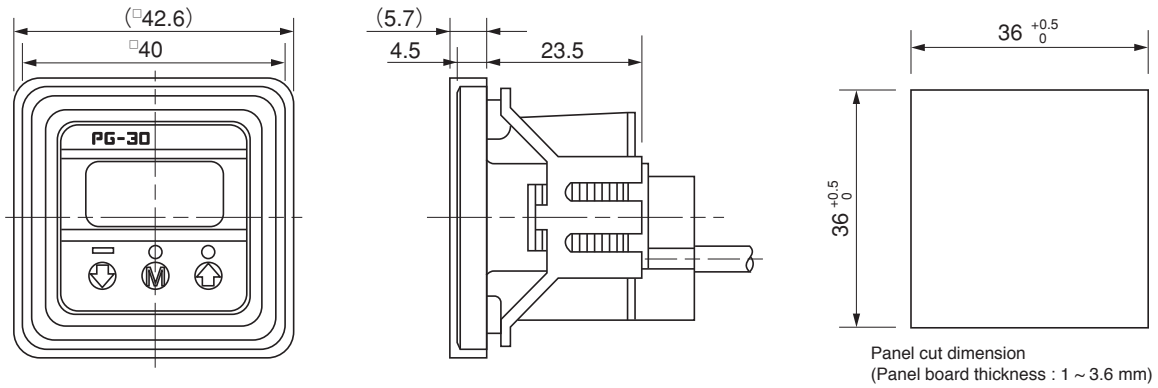
## ■ ACCESSORIES (Sold separately)

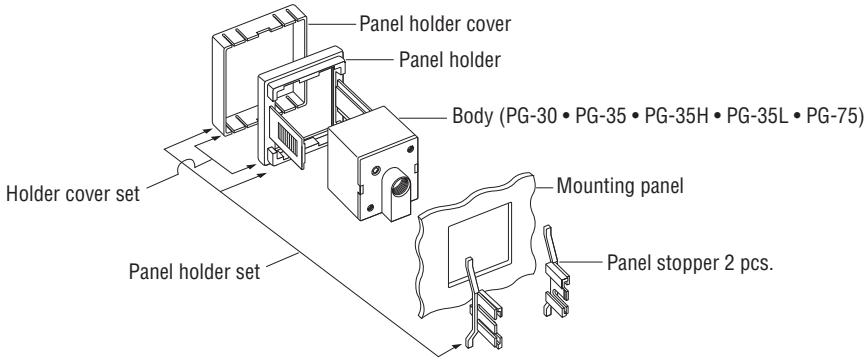
| Name | Series name | Contents | Applicable model |
|---|---|---|---|
| **Panel holder set** | ACPG-003 | Panel holder cover<br>Panel holder<br>Panel stopper (2pcs.) | PG-30 · PG-35 · PG-75 ·<br>PG-35H · PG-35L |
| **Holder cover set**<br>**(For protecting gauge operating panel)** | ACPG-004 | Panel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