

# Diaphragm-Seal type Pressure Gauge



## OUTLINE

This is a Diaphragm seal type pressure instrument in which liquid as a pressure transmitting media is filled between a diaphragm seal parts and bourdon tube as an element.

In this catalogue, General type of Indicator, Pressure gauge with Electric contact, Pressure Switch, Differential Pressure Gauge, Differential Pressure Gauge with contact and Differential Pressure Switch are introduced.

Diaphragm and the lower flange as wetted parts can be selected according to applications, so these instruments are appropriate for the measurement of highly corrosive fluid, high viscosity fluid, fluid which contains solid materials or fluid to be easily solidified

## FEATURES

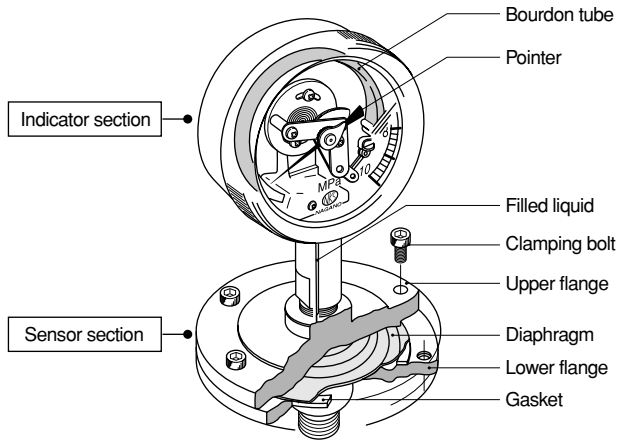
- Because the high-corrosion resistant diaphragm can be used at the pressure receiving portion, this pressure gauge can be used for the measurement of highly corrosive measuring fluid.
- For a pressure gauge in which a diaphragm is attached by welding, the surface of a diaphragm can be easily cleaned (by loosening the casing bolts.)
- A zero-adjusting pointer has been applied, so calibration required due to errors of temperature, elevation, etc. can be easily preformed.
- With the application of a welded diaphragm the application for leakage of filled liquid has been decreased. (diaphragms made of some materials are excluded.)

| Classification                   | General pressure gauge                               |                                     | Pressure gauge with electric contact |                                     | Pressure switch                                   |                                     |                              | Differential pressure gauge   | Differential pressure switch  |
|----------------------------------|--|-------------------------------------|--------------------------------------|-------------------------------------|---|-------------------------------------|------------------------------|---|---|
|                                  | General type, weather-proof type (conforming to JIS) | Glycerin filled type                | Micro switch                         | Electronic type                     | Pressure switch (Explosion-proof pressure switch) |                                     |                              | Differential pressure gauge (Differential switch with electric contact) | Differential pressure switch (Explosion-proof differential pressure switch) |
|                                  | AC, AE, AG, BC, BE, BG                               | GV42                                | JM□□                                 | JD1□                                | CD30  | CQ30                                | CB13, CB33, CD75             | DG9□  | CL71, CD71  |
| Measured fluid Temperature range | -30 ~ 230°C  | -5 ~ 100°C                          | -30 ~ 230°C                          | -5 ~ 100°C                          | -30 ~ 230°C                                       | -30 ~ 230°C                         | -30 ~ 100°C                  | -5 ~ 100°C  | -5 ~ 100°C  |
| Appearance                       |  |                                     |                                      |                                     |   |                                     |                              |   |   |
| Type                             | Direct type<br>Remote type (option)                  | Direct type<br>Remote type (option) | Direct type<br>Remote type (option)  | Direct type<br>Remote type (option) | Remote type                                       | Direct type<br>Remote type (option) | Remote type                  | Remote type   | Remote type   |
| Pressure range                   | 0 ~ 0.05 MPa<br>0 ~ 15 MPa                           | 0 ~ 0.1 MPa<br>0 ~ 15 MPa           | 0 ~ 0.1 MPa<br>0 ~ 5 MPa             | 0 ~ 0.2 MPa<br>0 ~ 15 MPa           | 0 ~ 0.2 MPa<br>0 ~ 15 MPa                         | 0 ~ 0.2 MPa<br>0 ~ 15 MPa           | 0.04 ~ 0.4 MPa<br>1 ~ 10 MPa | 0 ~ 0.05 MPa<br>0 ~ 0.5 MPa   | 0.01 ~ 0.05 MPa<br>0.2 ~ 1 MPa  |
|                                  | Vacuum gauge/<br>compound pressure gauge             | -0.1 ~ 0 MPa<br>-0.1 ~ 2 MPa        | -0.1 ~ 0 MPa<br>-0.1 ~ 2 MPa         | -0.1 ~ 0 MPa<br>-0.1 ~ 2 MPa        | -0.1 ~ 0.1 MPa<br>-0.1 ~ 2 MPa                    | -0.1 ~ 0 MPa<br>-0.1 ~ 2 MPa        |                              | -0.1 ~ 0.2 MPa<br>-0.1 ~ 2 MPa  |   |
| Diaphragm dia.                   | φ40, φ60,<br>φ80, φ110                               | φ40, φ60,<br>φ80, φ110              | φ60, φ80,<br>φ110                    | φ40, φ60,<br>φ80                    | φ40, φ60,<br>φ80, φ110                            | φ40, φ60,<br>φ80, φ110              | φ60, φ110                    | φ110  | φ110  |

\* In addition to these, pressure gauges with electric contacts or other combinations, for example, with electronic pressure transmitters or pneumatic pressure/differential pressure transmitters are available. Please contact the nearest NAGANO KEIKI office.

## CONSTRUCTION

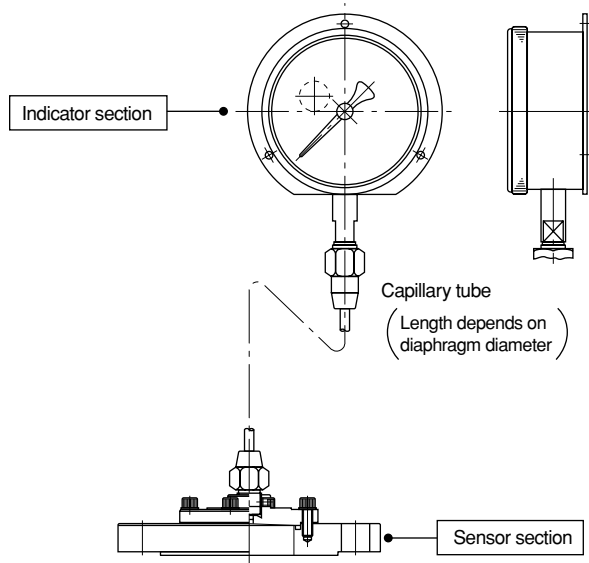
### Direct type :



[Screw type]

Liquid is filled between the diaphragm and the Bourdon tube. The pressure which is received by the diaphragm is transmitted to the Bourdon tube by the filled liquid as pressure transmitting medium, and the Bourdon tube is deformed under the pressure to rotate the pointer.

### Remote type :



Indicator section and sensor section are connected by a capillary tube in which liquid is filled.

- \* For diaphragm-seal type pressure gauges, a "bellows type" which is not filled liquid (unfilled type) is also available. This type is especially suited to the food processing industry or other applications where no droplets of filled liquid are allowed to mix in with the object fluid.

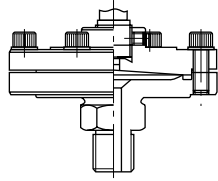
## SENSOR SECTION 1

### Mounting

[Screw Type]

Model 100 · Screw Type

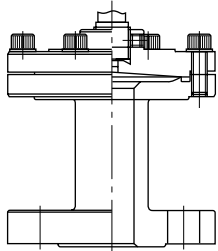
(Model : SC10)



[Flange type]

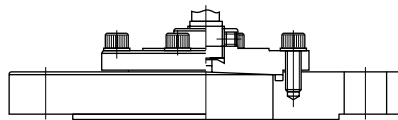
Model 200 · Flange Type

(Model : SC2□)



Model 300 · Flange Type

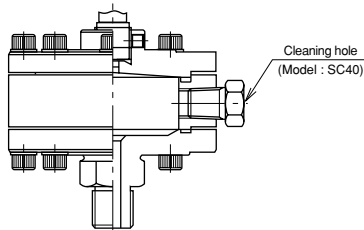
(Model : SC3□)



### Special models

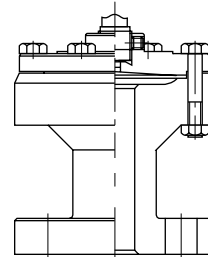
Model 410 · Screw type with middle flange

(Model : SC40)



Application: When fluid is stuck on the diaphragm, the inside of the flange can be cleaned through the cleaning hole without removing the lower flange.

Model 210 · Non-metal flange type



For non-metal flange type

Flange material: Rigid polyvinyl chloride, polypropylene

Flange face: FF (flat face)

Flange manufacturing range: JIS10K15A ~ 40A  
ANSI 150LB3/4B ~ 1 1/2B

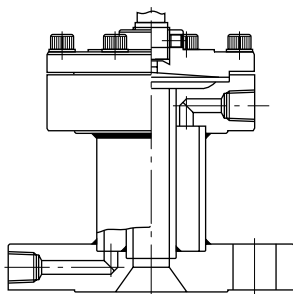
(Diaphragm diameter: only  $\phi 60$  and  $\phi 80$ )

Maximum pressure:  $\phi 60$ ...1MPa or less  
 $\phi 80$ ...0.4MPa or less

Working temperature: 0 to 60°C

Model 220 · with steam jacket

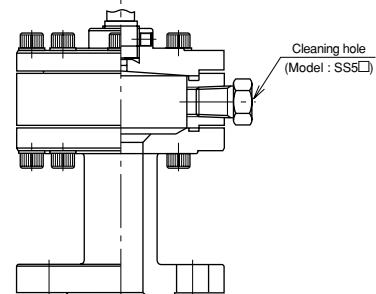
(Model : SJ2□)



Application: In order to prevent freezing or to increase viscosity, steam is let through the jacket to warm the fluid flowing in the inner pipe.

Model 500 · Middle flange type

(Model : SC5□)



Application: When fluid is stuck on the diaphragm, the inside of flange can be cleaned through the cleaning hole without removing the lower flange.

## SENSOR SECTION 2

### Connecting screw/flange:

| Screw type (SC10) | Flange type (SC2□ · 3□) |  |
|-------------------|-------------------------|--|
|                   | Nominal pressure        | Nominal size   |
| G3/8B (PF)        | JIS10K, JIS16K,         | 10A, 15A, 20A,                                       |
| G1/2B (PF)        | JIS20K, JIS30K,         | 25A, 32A, 40A,                                       |
| R3/8 (PT)         | JIS40K, JIS63K,         | 50A, 65A, 80A,                                       |
| R1/2 (PT)         | ANSI150, ANSI300,       | 100A   |
| 3/8NPT            | ANSI600, ANSI900,       | 3/8", 1/2", 3/4",                                    |
| 1/2NPT            | ANSI1500                | 1", 1 1/4", 1 1/2",<br>2", 2 1/2", 3",<br>3 1/2", 4" |

### Material:

#### Standard type (Model: SC□□)

| Upper flange        | Diaphragm   | Lower flange   |  | Gasket   | Clamping bolt |
|---------------------|---|--|--|--|---------------|
|                     |   | Screw type   | Flange type  |  |               |
| S25C<br>(Ni plated) | SUS316,<br>SUS316L,   | S25C,<br>SUS316,<br>SUS316L,   | S25C,<br>SUS316,<br>SUS316L,   | Less than 200°C<br>PTFE<br>200°C or higher<br>Asbestos<br>(Only when<br>temperature is<br>specified) | SUS305        |
| SUS316              | Monel,<br>TP35C (Titanium),<br>Hastelloy B,<br>Hastelloy C-276,<br>TaP (Tantalum),<br>Nickel,<br>SUS316<br>+Neoprene lining, <sup>*1</sup><br>SUS316<br>+ FEP lining, <sup>*1</sup><br>SUS316<br>+FEP coating <sup>*1</sup> | Monel,<br>TB35C (Titanium),<br>Hastelloy B,<br>Hastelloy C-276,<br>NAS305 (Carpenter 20) | S25C +Lining,<br>(Glass, PTFE, Neoprene,<br>crude rubber)<br>S25C +FEP coating,<br>SUS316 +Lining,<br>(PTFE, Neoprene,<br>Crude rubber)<br>SUS316 +FEP coating,<br>Rigid polyvinyl chloride<br>(PVC), <sup>*2</sup><br>Polypropylene <sup>*2</sup> |  |               |

#### High withstand pressure type (Model: HH□□ · HD□□)

| Upper flange          | Diaphragm                            | Lower flange           |                      | Gasket  | Clamping bolt |
|-----------------------|--------------------------------------|------------------------|----------------------|---|---------------|
|                       |                                      | Screw type             | Flange type          |   |               |
| S25C<br>(Ni plated)   | SUS316,<br>SUS316L,                  | S25C<br>(HD□□ only),   | S25C<br>(HD□□ only), | Less than 200°C<br>PTFE<br>200°C or higher<br>Asbestos<br>(temperature is<br>specified) | SUS305        |
| (HD□□ only)           | SUS316<br>+FEP lining, <sup>*1</sup> | SUS316,<br>SUS316L     | SUS316,<br>SUS316L   |   |               |
| SUS316<br>(HD□□ only) | SUS316<br>+FEP coating <sup>*1</sup> | SUS316<br>(HD□□ only), | (HD□□ only),         |   |               |

#### High withstand pressure welding end type (Model: HE□□)

| Upper flange   | Diaphragm | Lower flange |             |
|--|-----------|--------------|-------------|
|  |           | Screw type   | Flange type |
| SUS316   | SUS316,   | SUS316,      | SUS316,     |
| SUS316L  | SUS316L   | SUS316L      | SUS316L     |
| Upper flange<br>comes into<br>contact with<br>liquid |           |              |             |

\* 1 When diaphragm material is FEP or Neoprene, the maximum working temperature of sensor section is 100°C.

\* 2 When the material of the lower flange is rigid polyvinyl chloride (PVC), polypropylene or other resin, a problem may arise involving heat resistance, weather resistance, strength or durability. Please use metal flange as much as possible.  
(Rigid polyvinyl chloride (PVC) flanges are manufactured by bonding, not by machining.)

Note 1: Can be used as a vacuum gauge of specified accuracy when pressure is 2.7 kPa abs. or higher.

Note 2: When the product is used to measure high-pressure gas, NAGANO KEIKI can provide a strength calculation report conforming to the High-Pressure Gas Safety Act. Request it to us when necessary.

Note 3: When the material of diaphragm is monel, nickel or coating, the flange may not be welded.  
In case of FEP, SUS316 is welded on the upper flange and then FEP is lined on the connected side.  
However, for vacuum or compound pressure gauges, please specify "FEP coating."

# Diaphragm-Seal Type Pressure Gauges

## FABRICATION SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Direct type, Remote type (option)

**Mounting method :**

Screw type, Flange type

**Accuracy :**

$\pm 1.5\% \text{F.S.} / 20^\circ\text{C} \pm 10^\circ\text{C}$

(JIS) JIS B7505-1994-conforming (Bourdon tube pressure gauges) diaphragm-seal type pressure gauges are also available. However, their accuracy is  $\pm 1.6\% \text{F.S.} / 20^\circ\text{C} \pm 10^\circ\text{C}$ .



## INDICATOR SECTION

**Pressure indicator :**

General type pressure gauge (Model : A□1□)

Weather-proof type pressure gauge

(Equivalent to drip-proof II type) (Model : B□1□)

Glycerin filled type (Model : GV42)

**Dial size :**

$\phi 75, \phi 100, \phi 150$

**Mounting :**

Stem (Type A, Type B)

**Material of main parts :**

Socket YBsC3

Bourdon tube C6872T, SUS316

**Case material and finish :**

Aluminum alloy, Bakelite (black)

(Glycerin filled type SUS304 · natural)

**Construction :**

Indoor type, weather-proof type,

(Equivalent to drip-proof II type)

\* For details, see the catalog for the desired pressure gauge.

## SENSOR SECTION · FILLED LIQUID

**Diaphragm diameter :**

$\phi 40, \phi 60, \phi 80, \phi 110$

\* Determined by pressure range and the temperature of measured fluid.

**Material of diaphragm :**

For the material of upper/lower flange and diaphragm, see the page for SENSING PART 2.

**Filled Liquid :**

Silicone oil

$-30 \sim 230^\circ\text{C}$

Note: For vacuum and compound pressure gauges, only those for  $-30$  to  $100^\circ\text{C}$  temperature range are available.

\* Pressure gauges filled with Daifloil, glycerin water solution or ethylene glycol are also available. For details, please inquire at the nearest NAGANO KEIKI office. (Note that working temperature range changes according to the filled liquid type and that using as a vacuum or compound pressure gauge is possible only when low-temperature silicone oil is filled.)

**Maximum length of capillary tube :**

For remote type (option)

$2\text{m} \sim 10\text{m}$  (depends on pressure range)

## MANUFACTURING SPECIFICATION

**Relationship between pressure range, temperature range and diaphragm diameter :** (Maximum length of capillary tube: For remote type (option))

| Filled liquid<br>Temperature range of measured fluid | Low-temperature silicone oil |                                  |                    |                                  | Middle-temperature silicone oil |                                  |
|--|------------------------------|----------------------------------|--------------------|----------------------------------|---------------------------------|----------------------------------|
|  | Less than -30 to -5°C        |                                  | -5 to 100°C *      |                                  | Higher than 100 to 230°C        |                                  |
| Pressure range MPa                                   | Diaphragm diameter           | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter              | Maximum length of capillary tube |
| 0~ 0.05 (GV42 is not available)                      | φ110                         | 6m                               | φ110               | 6m                               | φ110                            | 6m                               |
| ~ 0.07 (GV42 is not available)                       | φ110                         | 6m                               | φ110               | 6m                               | φ110                            | 6m                               |
| ~ 0.1  | φ110                         | 6m                               | φ80                | 6m                               | φ110                            | 6m                               |
| ~ 0.16   | φ110                         | 6m                               | φ80                | 6m                               | φ110                            | 6m                               |
| ~ 0.2  | φ110                         | 6m                               | φ80                | 6m                               | φ110                            | 6m                               |
| ~ 0.25   | φ80                          | 4m                               | φ80                | 6m                               | φ80                             | 4m                               |
| ~ 0.3  | φ80                          | 4m                               | φ80                | 6m                               | φ80                             | 4m                               |
| ~ 0.4  | φ80                          | 6m                               | φ80                | 8m                               | φ80                             | 6m                               |
| ~ 0.6  | φ80                          | 6m                               | φ60                | 6m                               | φ80                             | 6m                               |
| ~ 1  | φ80                          | 6m                               | φ60                | 10m                              | φ80                             | 6m                               |
| ~ 1.5  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 1.6  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 2  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 2.5  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 3.5  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 4  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 5  | φ60                          | 2m                               | φ60                | 10m                              | φ60                             | 2m                               |
| ~ 6  | φ40                          | 2m                               | φ40                | 2m                               | φ40                             | 2m                               |
| ~ 7  | φ40                          | 2m                               | φ40                | 2m                               | φ40                             | 2m                               |
| ~10  | φ40                          | 2m                               | φ40                | 2m                               | φ40                             | 2m                               |
| ~15  | φ40                          | 2m                               | φ40                | 2m                               | φ40                             | 2m                               |
| ~16  | φ40                          | 2m                               | φ40                | 2m                               | φ40                             | 2m                               |
| -0.1~0MPa  | —                            | —                                | φ110<br>φ80        | 6m<br>3m                         | —                               | —                                |
| ~0.05 (GV42 is not available)                        | —                            | —                                | φ110               | 6m                               | —                               | —                                |
| ~0.07 (GV42 is not available)                        | —                            | —                                | φ110               | 6m                               | —                               | —                                |
| ~0.1   | —                            | —                                | φ80                | 6m                               | —                               | —                                |
| ~0.16  | —                            | —                                | φ80                | 6m                               | —                               | —                                |
| ~0.2   | —                            | —                                | φ80                | 6m                               | —                               | —                                |
| ~0.25  | —                            | —                                | φ80                | 6m                               | —                               | —                                |
| ~0.3   | —                            | —                                | φ80                | 6m                               | —                               | —                                |
| ~0.4   | —                            | —                                | φ80                | 8m                               | —                               | —                                |
| ~0.6   | —                            | —                                | φ60                | 6m                               | —                               | —                                |
| ~1   | —                            | —                                | φ60                | 10m                              | —                               | —                                |
| ~1.5   | —                            | —                                | φ60                | 10m                              | —                               | —                                |
| ~1.6   | —                            | —                                | φ60                | 10m                              | —                               | —                                |
| ~2   | —                            | —                                | φ60                | 10m                              | —                               | —                                |
| ~2.5   | —                            | —                                | φ60                | 10m                              | —                               | —                                |

\* For glycerin filled type (GV42), only those for the temperature range of -5 to 100°C are available.

\* Specify the length of capillary tube by the meter.

☐ Shading means the pressure ranges conforming to JIS B7505-1994.

**Relationship between the size of flange/screw and the diameter of diaphragm :**

| Mounting method    | Flange type      |                  |                  |                  |                  |                  |                  |                  | Screw type   |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|
| Diaphragm diameter | φ40              |                  | φ60              |                  | φ80              |                  | φ110             |                  | φ40, φ60, φ80, φ110                                |
| Nominal size       | Model 200 (SC2☐) | Model 300 (SC3☐) | Model 200 (SC2☐) | Model 300 (SC3☐) | Model 200 (SC2☐) | Model 300 (SC3☐) | Model 200 (SC2☐) | Model 300 (SC3☐) | Model 100 (SC1☐)                                   |
| 10A (3/8")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                | G3/8B<br>G1/2B<br>R3/8<br>R1/2<br>1/2NPT<br>3/8NPT |
| 15A (1/2")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |
| 20A (3/4")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |
| 25A (1")           | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |
| 32A (1 1/4")       | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |
| 40A (1 1/2")       | —                | ○                | —                | ○                | ○                | —                | ○                | —                |  |
| 50A (2")           | —                | ○                | —                | ○                | —                | ○                | ○                | —                |  |
| 65A (2 1/2")       | —                | —                | —                | ○                | —                | ○                | ○                | —                |  |
| 80A (3")           | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |
| 100A (4")          | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |

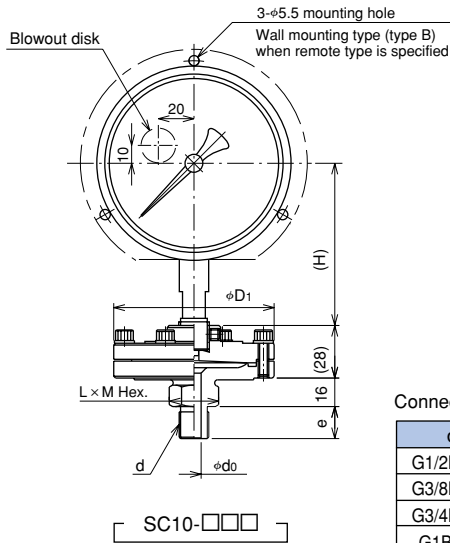
# Diaphragm-Seal Type Pressure Gauges

## DIMENSIONS

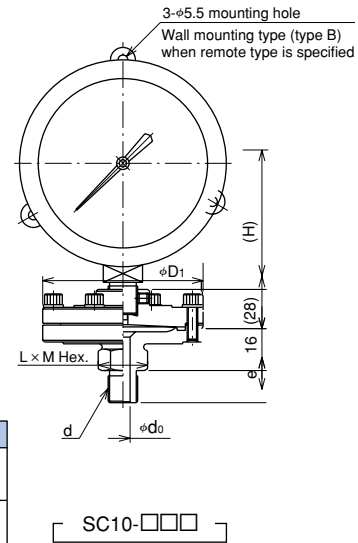
Standard type (Model : SC□□)

[Screw type] Model 100 · Screw

General type · Weather-proof type pressure gauge



Glycerin filled type

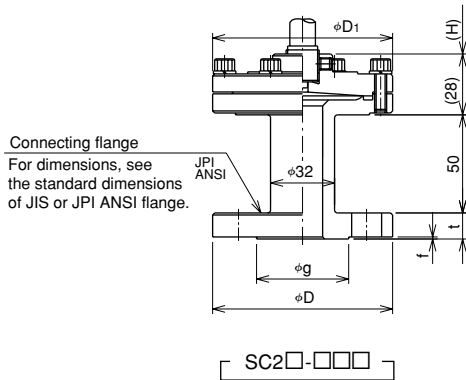


Connecting screw size

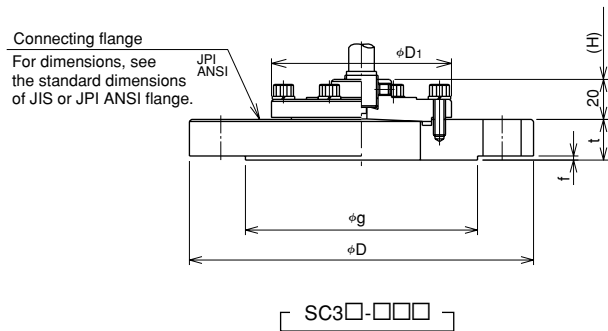
| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |

[Flange type]

Model 200 · Flange



Model 300 · Flange



Dimensions of indicator section  
(general type, weather-proof type)

| Case material | Size | H   | Type No. (indicator section) |             |
|---------------|------|-----|------------------------------|-------------|
|               |      |     | Direct type                  | Remote type |
| Metal         | 75   | 56  | AC10-1□□                     | AC10-2□□    |
|               |      |     | BC10-1□□                     | BC10-2□□    |
|               | 100  | 94  | AE10-1□□                     | AE10-2□□    |
|               |      |     | BE10-1□□                     | BE10-2□□    |
|               | 150  | 109 | AG10-1□□                     | AG10-2□□    |
|               |      |     | BG10-1□□                     | BG10-2□□    |
| Plastic       | 75   | 56  | BC12-1□□                     | BC12-2□□    |
|               | 100  | 94  | BE12-1□□                     | BE12-2□□    |
|               | 150  | 109 | BG12-1□□                     | BG12-2□□    |

Glycerin filled type  
Dimensions of indicator section

| Case material | Size | H  | Type No. (indicator section) |             |
|---------------|------|----|------------------------------|-------------|
|               |      |    | Direct type                  | Remote type |
| SUS304        | 100  | 72 | GV42-1□□                     | GV42-2□□    |

Outside diameter of sensor section (φD<sub>1</sub>)

| Diaphragm dia. | φD <sub>1</sub> |
|----------------|-----------------|
| φ40            | φ70             |
| φ60            | φ90             |
| φ80            | φ110            |
| φ110           | φ140            |

\* For the dimensions of remote type (option), please inquire at the nearest NAGANO KEIKI office.

\* For detailed outside dimensions of indicator section, see the catalog.

# Diaphragm-seal type pressure gauges with electric contact

## MANUFACTURING SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Direct type, Remote type (option)

**Mounting method :**

Screw type Flange type

**Accuracy :**

$\pm 1.5\% \text{F.S.} / 20^\circ\text{C} \pm 10^\circ\text{C}$

## INDICATOR SECTION

**Pressure indicator :**

Pressure gauge with micro switch (Model : JM□□)  
Pressure gauge with electronic contact (Model : JD1□)

**Size :**

$\phi 100, \phi 150$

**Mounting :**

Stem (Type A or type B), Flush type

**Material of main parts :**

Socket YBsC3, SUS316 or SCS14  
Bourdon tube C6872T, SUS316

**Number of contacts :**

1 or 2

**Setting method :**

Internal adjustment type

**Case material and finish :**

ADC12 or AC7A  
· Black or two-tone (blue/gray)

**Construction :**

Equivalent to drip-proof II type or drip-proof type (IP43)

\* For details, see the catalog for the desired pressure gauge with switch.

## SENSOR SECTION · FILLED LIQUID

**Diaphragm diameter :**

Pressure gauge with micro switch  
 $\phi 60, \phi 80, \phi 110$   
Pressure gauge with electronic contact  
 $\phi 40, \phi 60, \phi 80$   
\* Determined by pressure range and the temperature of measured fluid.

**Material of diaphragm :**

For the material of upper/lower flange and diaphragm, see the page for SENSOR SECTION 2.

**Filled liquid :**

Silicone oil  
-30 to 230°C  
Note : For vacuum and compound pressure gauges, only those for -30 to 100°C temperature range are available.  
\* Pressure gauges filled with Daifloil, glycerin water solution or ethylene glycol are also available. For details, please inquire at the nearest NAGANO KEIKI office. (Note that working temperature range changes according to filled liquid and that using as a vacuum or compound pressure gauge is possible only when low-temperature silicone oil is filled.)

**Maximum length of capillary tube :**

For remote type (option)  
2m ~ 15m (depends on pressure range)



# Diaphragm-seal type pressure gauges with electric contact

## MANUFACTURING SPECIFICATION

**Relationship between pressure range, temperature range and diaphragm diameter :** (Maximum length of capillary tube : For remote type (option))

| Filled liquid                       | Low-temperature silicone oil |                                  |                    |                                  |                    |                                  |                    |                                  |                    |                                  | Middle-temperature silicone oil |                                  |                    |                                  |
|-------------------------------------|------------------------------|----------------------------------|--------------------|----------------------------------|--------------------|----------------------------------|--------------------|----------------------------------|--------------------|----------------------------------|---------------------------------|----------------------------------|--------------------|----------------------------------|
|                                     | Less than -30 to -5°C        |                                  |                    |                                  | -5 to 100°C        |                                  |                    |                                  |                    |                                  | Higher than 100 to 230°C        |                                  |                    |                                  |
| Temperature range of measured fluid | 1                            |                                  | 2                  |                                  | 1                  |                                  | 2                  |                                  | JD□□               |                                  | 1                               |                                  | 2                  |                                  |
| Number of contacts                  | 1                            |                                  | 2                  |                                  | 1                  |                                  | 2                  |                                  | JD□□               |                                  | 1                               |                                  | 2                  |                                  |
| Indicator (model)                   | JM□□                         |                                  | JM□□               |                                  | JM□□               |                                  | JM□□               |                                  | JD□□               |                                  | JM□□                            |                                  | JM□□               |                                  |
| Pressure range MPa                  | Diaphragm diameter           | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter              | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube |
| 0~ 0.1                              | φ110                         | 6m                               | φ110               | 6m                               | φ110               | 6m                               | φ110               | 6m                               | —                  | —                                | φ110                            | 6m                               | φ110               | 6m                               |
| ~ 0.2                               | φ110                         | 6m                               | φ110               | 6m                               | φ80                | 4m                               | φ110               | 6m                               | φ80                | 6m                               | φ110                            | 6m                               | φ110               | 6m                               |
| ~ 0.3                               | φ110                         | 6m                               | φ110               | 6m                               | φ80                | 4m                               | φ80                | 4m                               | φ80                | 6m                               | φ110                            | 6m                               | φ110               | 6m                               |
| ~ 0.4                               | φ80                          | 2m                               | φ110               | 6m                               | φ80                | 8m                               | φ80                | 8m                               | φ80                | 6m                               | φ80                             | 2m                               | φ110               | 2m                               |
| ~ 0.6                               | φ80                          | 2m                               | φ80                | 2m                               | φ80                | 8m                               | φ80                | 8m                               | φ60                | 6m                               | φ80                             | 2m                               | φ80                | 2m                               |
| ~ 1                                 | φ80                          | 2m                               | φ80                | 2m                               | φ80                | 8m                               | φ80                | 15m                              | φ60                | 10m                              | φ80                             | 2m                               | φ80                | 2m                               |
| ~ 1.5                               | φ80                          | 2m                               | φ80                | 2m                               | φ60                | 6m                               | φ80                | 15m                              | φ60                | 10m                              | φ80                             | 2m                               | φ80                | 2m                               |
| ~ 2                                 | φ80                          | 2m                               | φ80                | 2m                               | φ60                | 6m                               | φ60                | 6m                               | φ60                | 10m                              | φ80                             | 2m                               | φ80                | 2m                               |
| ~ 2.5                               | φ60                          | 2m                               | φ80                | 2m                               | φ60                | 6m                               | φ60                | 6m                               | φ60                | 10m                              | φ60                             | 2m                               | φ80                | 2m                               |
| ~ 3.5                               | φ60                          | 2m                               | φ60                | 2m                               | φ60                | 6m                               | φ60                | 6m                               | φ60                | 10m                              | φ60                             | 2m                               | φ60                | 2m                               |
| ~ 5                                 | φ60                          | 2m                               | φ60                | 2m                               | φ60                | 6m                               | φ60                | 6m                               | φ60                | 10m                              | φ60                             | 2m                               | φ60                | 2m                               |
| ~ 7                                 | —                            | —                                | —                  | —                                | —                  | —                                | —                  | —                                | φ40                | 2m                               | —                               | —                                | —                  | —                                |
| ~10                                 | —                            | —                                | —                  | —                                | —                  | —                                | —                  | —                                | φ40                | 2m                               | —                               | —                                | —                  | —                                |
| ~15                                 | —                            | —                                | —                  | —                                | —                  | —                                | —                  | —                                | φ40                | 2m                               | —                               | —                                | —                  | —                                |
| —0.1~0MPa                           | —                            | —                                | —                  | —                                | φ110               | 3m                               | φ110               | 3m                               | —                  | —                                | —                               | —                                | —                  | —                                |
| ~0.1                                | —                            | —                                | —                  | —                                | φ110               | 6m                               | φ110               | 6m                               | φ80                | 6m                               | —                               | —                                | —                  | —                                |
| ~0.2                                | —                            | —                                | —                  | —                                | φ80                | 4m                               | φ110               | 4m                               | φ80                | 6m                               | —                               | —                                | —                  | —                                |
| ~0.3                                | —                            | —                                | —                  | —                                | φ80                | 4m                               | φ80                | 4m                               | φ80                | 6m                               | —                               | —                                | —                  | —                                |
| ~0.4                                | —                            | —                                | —                  | —                                | φ80                | 8m                               | φ80                | 8m                               | φ80                | 6m                               | —                               | —                                | —                  | —                                |
| ~0.6                                | —                            | —                                | —                  | —                                | φ80                | 8m                               | φ80                | 8m                               | φ60                | 6m                               | —                               | —                                | —                  | —                                |
| ~1                                  | —                            | —                                | —                  | —                                | φ80                | 8m                               | φ80                | 15m                              | φ60                | 10m                              | —                               | —                                | —                  | —                                |
| ~1.5                                | —                            | —                                | —                  | —                                | φ60                | 6m                               | φ80                | 15m                              | φ60                | 10m                              | —                               | —                                | —                  | —                                |
| ~2                                  | —                            | —                                | —                  | —                                | φ60                | 6m                               | φ60                | 6m                               | φ60                | 10m                              | —                               | —                                | —                  | —                                |

\* For pressure gauges with electronic contact (JD1□), only 2-contact type for -5°C~100°C temperature range is available.

\* Specify the length of capillary tube by the meter.

**Relationship between the size of flange/screw and the diameter of diaphragm :**

| Mounting method    | Flange type      |                  |                  |                  |                  |                  |                  |                  | Screw type   |  |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|--|
|                    | φ40              |                  | φ60              |                  | φ80              |                  | φ110             |                  | φ40, φ60, φ80, φ110                                |  |
| Diaphragm diameter | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 100 (SC1□)                                   |  |
| Nominal size       | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 100 (SC1□)                                   |  |
| 10A (3/8")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                | G3/8B<br>G1/2B<br>R3/8<br>R1/2<br>1/2NPT<br>3/8NPT |  |
| 15A (1/2")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |  |
| 20A (3/4")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |  |
| 25A (1")           | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |  |
| 32A (1 1/4")       | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |  |
| 40A (1 1/2")       | —                | ○                | —                | ○                | ○                | —                | ○                | —                |  |  |
| 50A (2")           | —                | ○                | —                | ○                | —                | ○                | ○                | —                |  |  |
| 65A (2 1/2")       | —                | —                | —                | ○                | —                | ○                | ○                | —                |  |  |
| 80A (3")           | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |  |
| 100A (4")          | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |  |

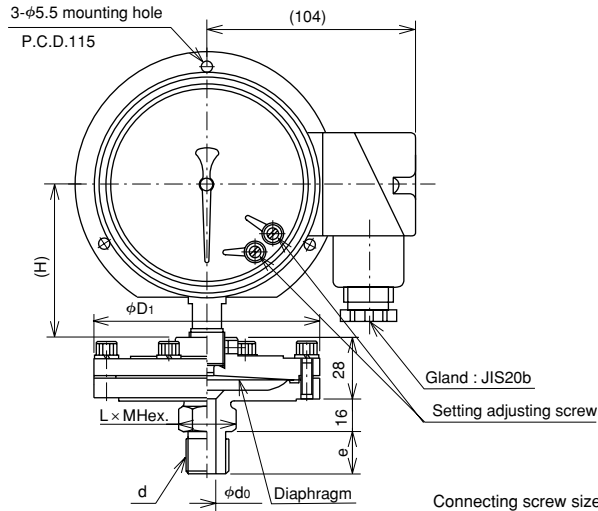
## OUTSIDE DIMENSIONS

Standard type (Model : SC□□)

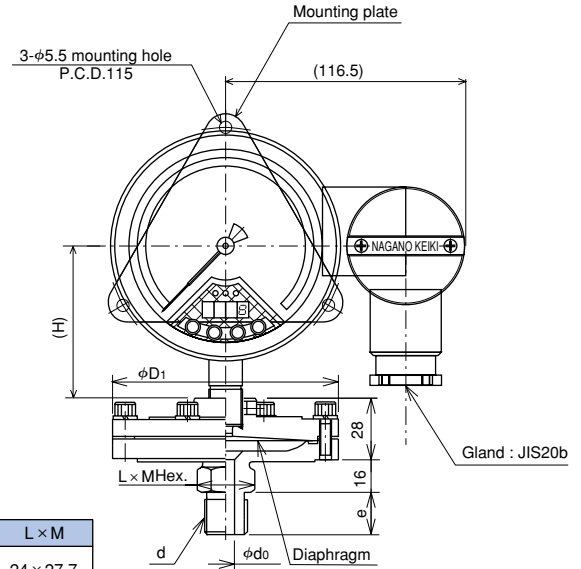
[Screw type]

Model 100 · Screw

Pressure gauge with micro switch



Pressure gauge with electronic contact



Connecting screw size

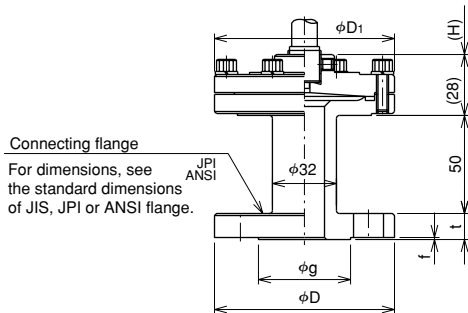
| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |

SC10-□□□

SC10-□□□

[Flange type]

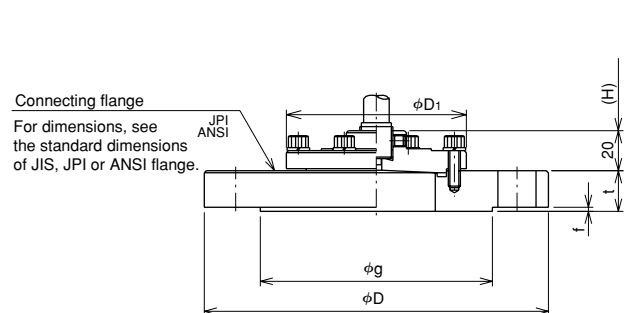
Model 200 · Flange



Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.

SC2□-□□□

Model 300 · Flange



Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.

SC3□-□□□

Dimensions of indicator section

| Case material | Size | H   | Type No. (indicator section) |
|---------------|------|-----|------------------------------|
| Metal         | 100  | 74  | JM11-□□□                     |
|               |      |     | JD10-2□□3                    |
|               | 150  | 107 | JM21-□□□                     |

Outside diameter of sensor section (φD<sub>1</sub>)

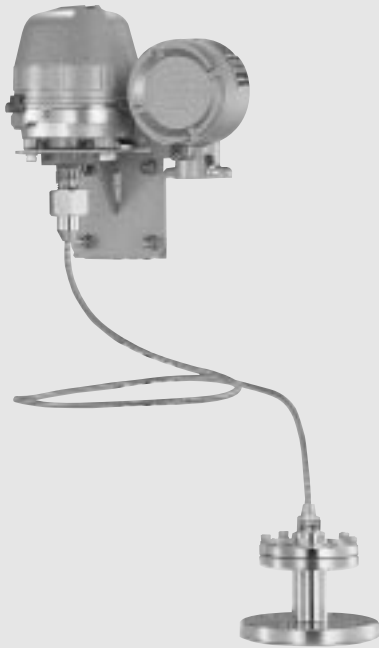
| Diaphragm diameter | φD <sub>1</sub> |
|--------------------|-----------------|
| φ40                | φ70             |
| φ60                | φ90             |
| φ80                | φ110            |
| φ110               | φ140            |

\* For the dimensions of remote type (option), please inquire at the nearest NAGANO KEIKI office.

\* For detailed outside dimensions of indicator section, see the catalog.

# Diaphragm-Seal Type Pressure Switch

(CQ30/CD30: Bourdon tube type)



## MANUFACTURING SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Remote type, Direct type (option)

**Mounting method :**

Screw type, Flange type

**Accuracy :**

±1.0%F.S./Room temperature (constant)

**Working temperature range :**

CQ30 -20 to 60°C

CD30 -5 to 40°C

## INDICATOR SECTION

**Pressure switch :**

Pressure switch (Model : CQ30)

Explosion-proof pressure switch (Model : CD30)

**Mounting :**

Panel mounting, 2B pipe mounting

**Material of main parts :**

Socket SCS14

Bourdon tube SUS316

**Case material and finish :**

ADC12

• Crystalline gray paint or blue-gray two-tone acid-proof paint

**Construction :**

Waterproof, drip-proof or outdoor type

\* For details, see the catalog for the desired pressure switch.

## SENSOR SECTION & FILLED LIQUID

**Diaphragm diameter :**

φ40, φ60, φ80, φ110

\* Determined by pressure range and the temperature of measured fluid.

**Material of diaphragm :**

For the material of upper/lower flange and diaphragm, see the page for SENSOR SECTION 2.

**Filled liquid :**

Silicone oil

-30 to 230°C

Note : For vacuum and compound range, only those for -30 to 100°C temperature range are available.

\* Filled with Daifloil, glycerin water solution or ethylene glycol are also available. For details, please inquire at the nearest NAGANO KEIKI office. (Note that working temperature range changes according to the filled liquid.)

**Maximum length of capillary tube :**

For remote type

2m ~ 10m (depends on pressure range)

## MANUFACTURING SPECIFICATION

**Relationship between diaphragm diameter and withstand pressure or temperature coefficient (for reference only)**

| Diaphragm diameter | Withstand pressure of diaphragm part (MPa) | Temperature coefficient of switch part (%F.S./°C) | Temperature coefficient of capillary tube part (Pa/°C/m) | Temperature coefficient of welded parts (Pa/°C) |
|--------------------|--|---|--|---|
| φ110               | 0.5  | -0.2  | 15   | 50  |
| φ80                | 1.5  | -0.2  | 30   | 100   |
| φ60                | 5  | -0.1  | 150  | 250   |
| φ40                | 15   | -0.1  | 1500   | 5000  |

\* When low-strength material such as titanium is used or when the temperature of the welded parts is high, the withstand pressure of the diaphragm part may be lower than these figures.

\* Whichever is lower of the withstand pressure of pressure switch part (1.5 times the pressure range) and that of diaphragm part becomes the withstand pressure of the entire pressure gauge.

**Relationship between pressure range, temperature range and diaphragm diameter (figures of maximum capillary length are for remote type)**

| Temperature range of measured fluid  | Less than -30 to -5°C |                                  | -5 to 100°C        |                                  | Higher than 100 to 230°C |                                  |
|--------------------------------------|-----------------------|----------------------------------|--------------------|----------------------------------|--------------------------|----------------------------------|
|                                      | Diaphragm diameter    | Maximum length of capillary tube | Diaphragm diameter | Maximum length of capillary tube | Diaphragm diameter       | Maximum length of capillary tube |
| 0 ~ 0.2                              | φ110                  | 6m                               | φ80                | 6m                               | φ110                     | 6m                               |
| ~ 0.4                                | φ80                   | 6m                               | φ80                | 8m *                             | φ80                      | 6m                               |
| ~ 0.6                                | φ80                   | 6m                               | φ60                | 6m                               | φ80                      | 6m                               |
| ~ 1                                  | φ80                   | 6m                               | φ60                | 10m                              | φ80                      | 6m                               |
| ~ 1.5                                | φ60                   | 2m                               | φ60                | 10m                              | φ60                      | 2m                               |
| ~ 2                                  | φ60                   | 2m                               | φ60                | 10m                              | φ60                      | 2m                               |
| ~ 2.5                                | φ60                   | 2m                               | φ60                | 10m                              | φ60                      | 2m                               |
| ~ 3.5                                | φ60                   | 2m                               | φ60                | 10m                              | φ60                      | 2m                               |
| ~ 5                                  | φ60                   | 2m                               | φ60                | 10m                              | φ60                      | 2m                               |
| ~ 7                                  | φ40                   | 2m                               | φ40                | 2m                               | φ40                      | 2m                               |
| ~10                                  | φ40                   | 2m                               | φ40                | 2m                               | φ40                      | 2m                               |
| ~15                                  | φ40                   | 2m                               | φ40                | 2m                               | φ40                      | 2m                               |
| -0.1 ~ 0<br>(Only CD30 is available) | —                     | —                                | φ110<br>φ80        | 6m<br>3m                         | —                        | —                                |
| ~ 0.2                                | —                     | —                                | φ80                | 6m                               | —                        | —                                |
| ~ 0.4                                | —                     | —                                | φ80                | 8m *                             | —                        | —                                |
| ~ 0.6                                | —                     | —                                | φ60                | 6m                               | —                        | —                                |
| ~ 1                                  | —                     | —                                | φ60                | 10m                              | —                        | —                                |
| ~ 1.5                                | —                     | —                                | φ60                | 10m                              | —                        | —                                |
| ~ 2                                  | —                     | —                                | φ60                | 10m                              | —                        | —                                |

\* 6 m for CQ30.

\* Specify the length of capillary tube by the meter.

**Relationship between the size of flange/screw and the diameter of diaphragm.**

| Mounting method    | Flange type      |                  |                  |                  |                  |                  |                  |                  | Screw type   |
|--------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|--|
|                    | φ40              |                  | φ60              |                  | φ80              |                  | φ110             |                  |  |
| Diaphragm diameter | φ40              |                  | φ60              |                  | φ80              |                  | φ110             |                  | φ40, φ60, φ80, φ110                                |
| Nominal size       | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 200 (SC2□) | Model 300 (SC3□) | Model 100 (SC1□)                                   |
| 10A (3/8")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                | G3/8B<br>G1/2B<br>R3/8<br>R1/2<br>1/2NPT<br>3/8NPT |
| 15A (1/2")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |
| 20A (3/4")         | ○                | —                | ○                | —                | ○                | —                | ○                | —                |  |
| 25A (1")           | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |
| 32A (1 1/4")       | —                | ○                | ○                | —                | ○                | —                | ○                | —                |  |
| 40A (1 1/2")       | —                | ○                | —                | ○                | ○                | —                | ○                | —                |  |
| 50A (2")           | —                | ○                | —                | ○                | —                | ○                | ○                | —                |  |
| 65A (2 1/2")       | —                | —                | —                | ○                | —                | ○                | ○                | —                |  |
| 80A (3")           | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |
| 100A (4")          | —                | —                | —                | ○                | —                | ○                | —                | ○                |  |

# Diaphragm-Seal Type Pressure Switch (Bourdon tube type)

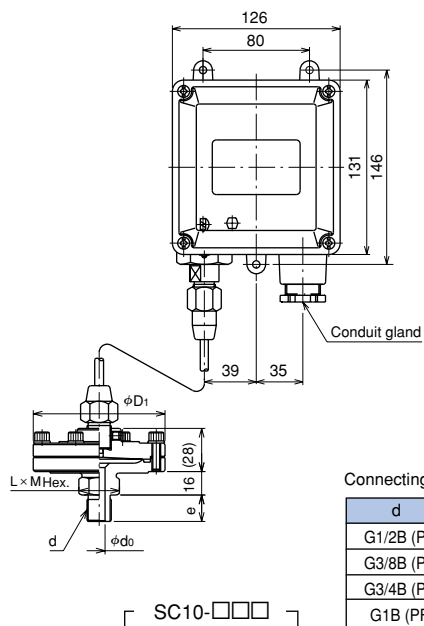
## OUTSIDE DIMENSIONS

Standard type (Model : SC□□)

[Screw type]

Model 100 · Screw

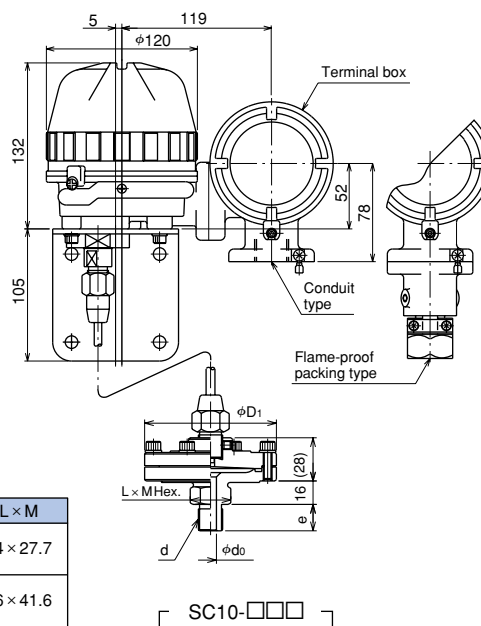
CQ30 Pressure indicator



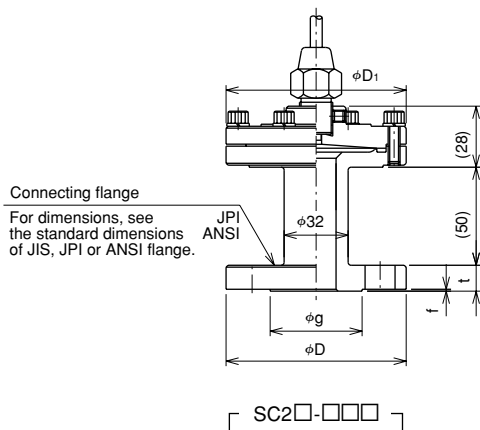
Connecting screw size

| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |

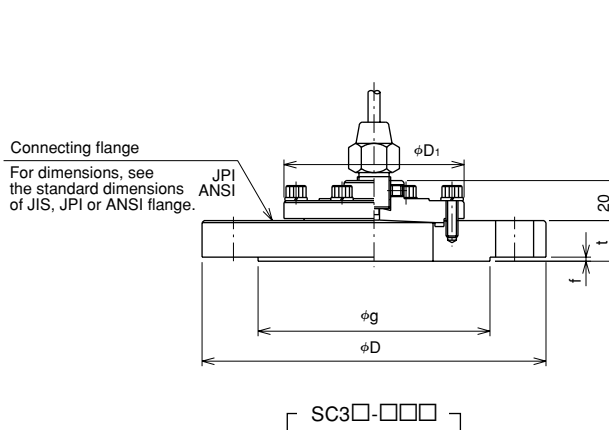
CD30 Explosion-proof pressure switch



[Flange type] Model 200 · Flange



Model 300 · Flange



Dimensions of indicator section

| Type No. (indicator section) | Mounting         |
|------------------------------|------------------|
| CQ30-□□3                     | Panel mounting   |
| CD30-□□3                     | Panel mounting   |
|                              | 2B pipe mounting |

Outside diameter of sensor section (φD<sub>1</sub>)

| Diaphragm diameter | φD <sub>1</sub> |
|--------------------|-----------------|
| φ40                | φ70             |
| φ60                | φ90             |
| φ80                | φ110            |
| φ110               | φ140            |

\* For the dimensions of CQ30 direct type (option), please inquire at the nearest NAGANO KEIKI office.  
\* For detailed outside dimensions of indicator section, see the catalog.

# Diaphragm-Seal Type Pressure Switch

(CB13 · 33, CD75 Bellows type for low- and middle-pressure ranges)



## MANUFACTURING SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Remote type

**Mounting method :**

Screw type, Flange type

**Accuracy :**

±0.5%F.S./Room temperature (constant)

**Response speed :**

Within 15 seconds

**Working temperature range :**

-5 to 40°C

## INDICATOR SECTION

**Pressure switch :**

Pressure switch (Model : CB13 · 33)

Explosion-proof pressure switch (Model : CD75)

**Mounting :**

Panel mounting, 2B pipe mounting

**Material of main parts :**

Socket SUS316

Bellows SUS316L

**Number of contacts :**

1 or 2

**Setting method :**

Internal adjustment type

**Explosion-proof pressure switch :**

ADC12 or AC7A

· Crystalline gray paint or blue-gray two-tone paint.

**Construction :**

Drip-proof or outdoor type

\* For details, see the catalog for the desired pressure gauge with switch.

## SENSOR SECTION · FILLED LIQUID

**Diaphragm diameter :**

φ60, φ110

\* Determined by pressure range and the temperature of measured fluid.

**Material of diaphragm :**

For the material of upper/lower flange and diaphragm, see the page for SENSOR SECTION 2.

**Filled liquid :**

Silicone oil

-30 to 100°C

**Maximum length of capillary tube :**

2m to 8m (depends on pressure range)

# Diaphragm-Seal Type Pressure Switch (Bellows type)

## MANUFACTURING SPECIFICATION

**Pressure range · Diaphragm diameter · Relationship between diaphragm diameter and withstand pressure and temperature coefficient (for reference only) :**

| Pressure range MPa | Diaphragm diameter | Withstand pressure of diaphragm part (MPa) * | Maximum length of capillary tube | Ambient temperature coefficient of pressure switch part (including capillary tube) (%max. P./°C) | Temperature coefficient of wet part (Pa/°C) |
|--------------------|--------------------|--|----------------------------------|--|---|
| 0.04 ~ 0.4         | φ110               | 3  | 2m                               | -0.1   | -50   |
| 0.06 ~ 0.6         | φ110               | 3  | 3m                               | -0.1   |   |
| 0.1 ~ 1            | φ110               | 3  | 8m                               | -0.1   |   |
| 0.15 ~ 1.5         | φ110               | 3  | 8m                               | -0.07  |   |
| 0.2 ~ 2            | φ110               | 3  | 8m                               | -0.07  |   |
| 0.3 ~ 3            | φ110               | 3  | 8m                               | -0.07  |   |
| 0.5 ~ 5            | φ60                | 15   | 5m                               | -0.07  | -250  |
| 0.7 ~ 7            | φ60                | 15   | 5m                               | -0.07  |   |
| 1 ~ 10             | φ60                | 15   | 5m                               | -0.07  |   |

\* When low-strength material such as titanium is used or when the temperature of the part coming in contact with liquid is high, the withstand pressure of diaphragm part may be lower than these figures.

\* Whichever is lower of the withstand pressure of pressure of pressure switch part (1.5 times the pressure range) and that of the diaphragm part becomes the withstand pressure of the entire pressure gauge.

\* Specify the length of capillary tube by the meter.

**Relationship between the size of flange/screw and the diameter of diaphragm :**

| Mounting method    | Flange type      |                  |                  |                  | Screw type   |
|--------------------|------------------|------------------|------------------|------------------|--|
| Diaphragm diameter | φ60              |                  | φ110             |                  | φ60, φ110  |
| Nominal size       | Model 200 (HH2□) | Model 300 (HH3□) | Model 200 (HH2□) | Model 300 (HH3□) | Model 100 (HH1□)                                   |
| 10A (3/8")         | ○                | —                | ○                | —                | G3/8B<br>G1/2B<br>R3/8<br>R1/2<br>1/2NPT<br>3/8NPT |
| 15A (1/2")         | ○                | —                | ○                | —                |  |
| 20A (3/4")         | ○                | —                | ○                | —                |  |
| 25A (1")           | ○                | —                | ○                | —                |  |
| 32A (1 1/4")       | ○                | —                | ○                | —                |  |
| 40A (1 1/2")       | ○                | —                | ○                | —                |  |
| 50A (2")           | ○                | —                | ○                | —                |  |
| 65A (2 1/2")       | —                | ○                | ○                | —                |  |
| 80A (3")           | —                | ○                | ○                | —                |  |
| 100A (4")          | —                | ○                | ○                | ○ *              |  |
| 125A (5")          | —                | ○                | —                | ○                |  |
| 150A (6")          | —                | ○                | —                | ○                |  |

\* Nominal size 100A is available only for 30k or higher nominal pressure.

# Diaphragm-Seal Type Pressure Switch (Bellows type)

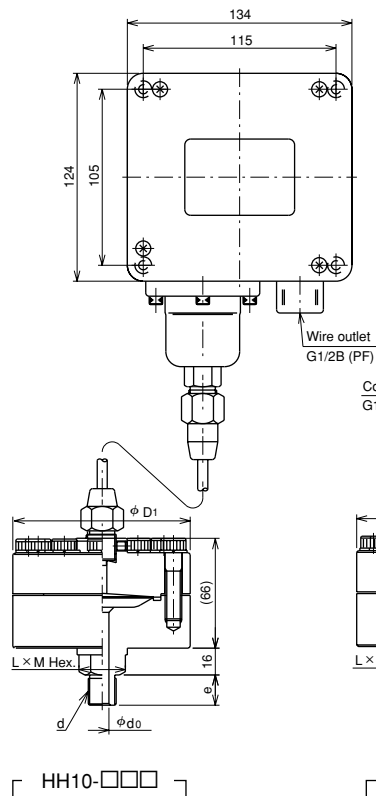
## OUTSIDE DIMENSIONS

High withstand pressure type (Model : HH□□)

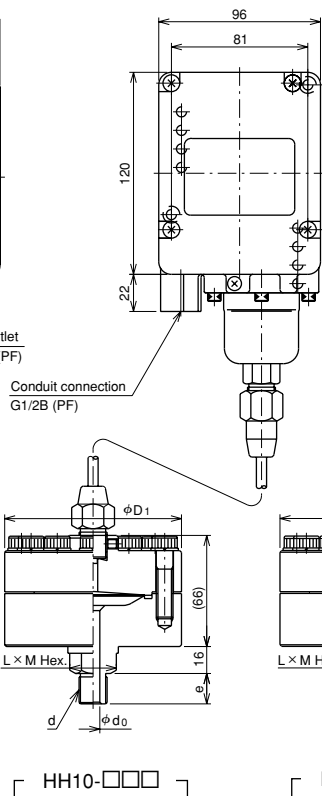
[Screw type]

Model 100 · Scerw

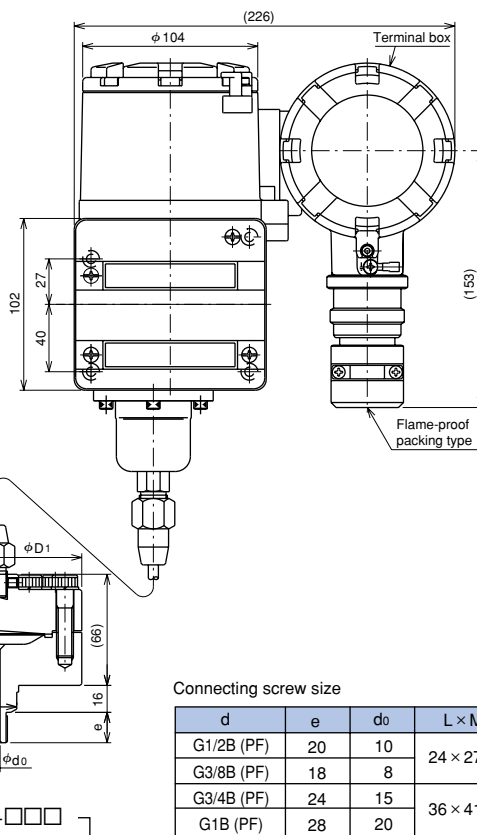
CB13 Pressure switch



CB33 Pressure switch

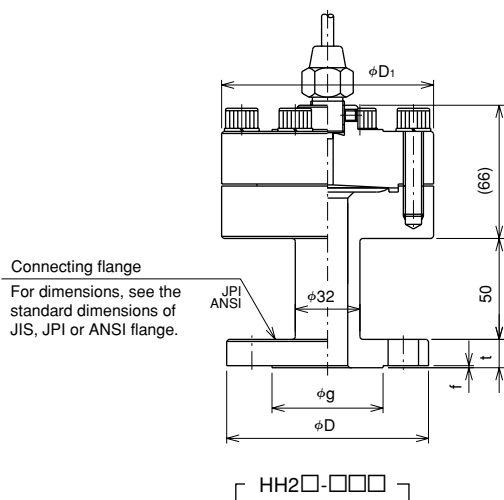


CD75 Explosion-proof pressure switch

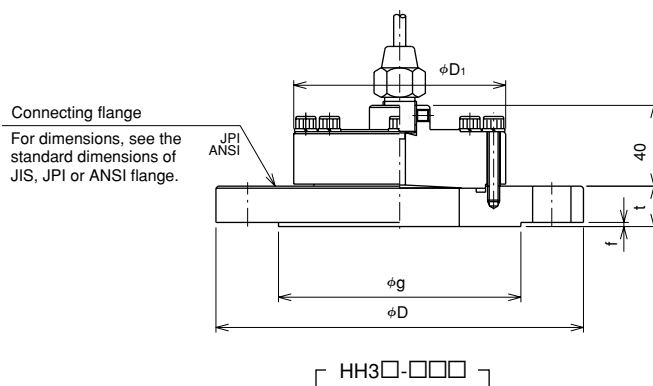


[Flange type]

Model 200 · Flange



Model 300 · Flange



Dimensions of indicator section

| Type No. (indicator section) | Mounting         |
|------------------------------|------------------|
| CB13-□□3                     | Panel mounting   |
| CB33-□□3                     | Panel mounting   |
| CD75-3□□                     | Panel mounting   |
| CD75-7□□                     | 2B pipe mounting |

Outside diameter of sensor section (φD1)

| Diaphragm dia. | φD1  |
|----------------|------|
| φ60            | φ105 |
| φ110           | φ155 |

\* For detailed outside dimensions of indicator section, see the catalog.



# Diaphragm-Seal Type Differential Pressure Gauges (with Electric Contact)

## MANUFACTURING SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Remote type

**Mounting method :**

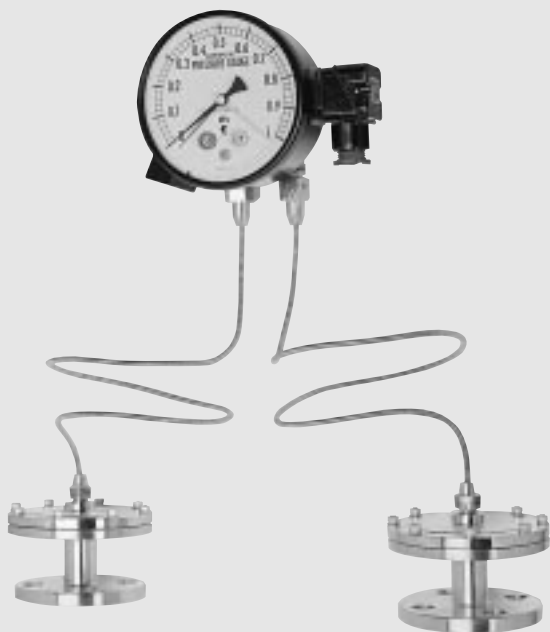
Screw type, Flange type

**Accuracy :**

±1.5%F.S./Room temperature (constant)

**Working temperature range :**

-5 to 40°C



## INDICATOR SECTION

**Pressure indicator :**

General differential pressure gauge ( Model : DG95 · 96)  
Differential switch with electric contact ( Model : DG97 · 98)

**Size :**

φ100, φ150

**Stem :**

Surface mounting type, 2B pipe mounting

**Material of main parts :**

Body                SCS14  
Bellows            SUS316L

**Number of contacts :** (DG97 · 98)

1 or 2

**Setting method :** (DG97 · 98)

External adjustment type

**Case material/finish :**

ADC12 or AC7A · Black

\* For details, see the catalog for the differential pressure gauges.

## SENSOR SECTION · FILLED LIQUID

**For diaphragm type, select according to the pressure (Maximum working pressure)**

Standard type (0.5MPa) ( Model : SC□□ )  
High pressure-proof type (2MPa) ( Model : HD□□ )  
High pressure-proof and welded type  
(5MPa) ( Model : HE□□ )

**Diaphragm dia. :**

φ110

**Material :**

For the material of upper/lower flange and diaphragm, see the page for SENSOR SECTION 2.

**Filled liquid :**

Silicone oil  
-5 ~ 100°C

**Maximum length of capillary tube :**

1m or 2m

**Note :**

- To minimize temperature error, the diaphragm part needs to be installed on both H and L sides.
- H- and L-side diaphragm parts must be at the same level. (A difference in their level leads to a difference in head, resulting in incorrect indication of differential pressure.)

## FABRICATION SPECIFICATION

**Relationship between differential pressure range, one-side withstand differential pressure, and temperature coefficient (for reference only) :**

| Differential pressure range<br>MPa | One-side withstand pressure (withstand differential pressure)<br>(MPa) | Temperature coefficient of indicator section (including capillary tube)<br>(%F.S./°C) | Temperature coefficient of diaphragm part (when both H and L sides are at same temperature) (Pa/°C) |
|------------------------------------|--|---|---|
| 0~0.05                             | 0.2  | ±0.15   | ±50   |
| ~0.07                              | 0.2  | ±0.15   |   |
| ~0.1                               | 0.2  | ±0.1  |   |
| ~0.15                              | 1.2  | ±0.1  |   |
| ~0.2                               | 1.2  | ±0.1  |   |
| ~0.3                               | 1.2  | ±0.1  |   |
| ~0.4                               | 1.2  | ±0.1  |   |
| ~0.5                               | 1.2  | ±0.1  |   |

**Relationship between the size of flange/screw and the diaphragm diameter**

| Mounting method | Flange type   |  |   |  | Screw type  |
|-----------------|---|--|---|--|---|
| Mounting        | Model 200   |  | Model 300   |  | Model 100   |
| * Type          | Standard type (SC2□)<br>High pressure-proof type (HD2□) | High pressure-proof and welded type (HE2□) | Standard type (SC3□)<br>High pressure-proof type (HD3□) | High pressure-proof and welded type (HE3□) | Standard type (SC1□)<br>High pressure-proof type (HD1□)<br>High pressure-proof and welded type (HE1□) |
| Nominal size    |   |  |   |  |   |
| 10A (3/8")      | ○   | ○  | —   | —  | G3/8B<br>G1/2B<br>R3/8<br>R1/2<br>1/2NPT<br>3/8NPT  |
| 15A (1/2")      | ○   | ○  | —   | —  |   |
| 20A (3/4")      | ○   | ○  | —   | —  |   |
| 25A (1")        | ○   | ○  | —   | —  |   |
| 32A (1 1/4")    | ○   | ○  | —   | —  |   |
| 40A (1 1/2")    | ○   | ○  | —   | —  |   |
| 50A (2")        | ○   | ○  | —   | —  |   |
| 65A (2 1/2")    | ○   | ○  | —   | —  |   |
| 80A (3")        | —   | ○  | ○   | —  |   |
| 100A (4")       | —   | ○  | ○   | —  |   |
| 125A (5")       | —   | —  | ○   | ○  |   |
| 150A (6")       | —   | —  | ○   | ○  |   |

\* For diaphragm seal type, select according to the pressure (base pressure + differential pressure).

- Standard type (Model : SC□□) : Maximum working pressure: 0.5 MPa
- High pressure-proof type (Model : HD□□) : Maximum working pressure: 2 MPa
- High pressure-proof and welded type (Model : HE□□) : Maximum working pressure: 5 MPa

# Diaphragm-Seal Type Differential Pressure Gauges (with Electric Contact)

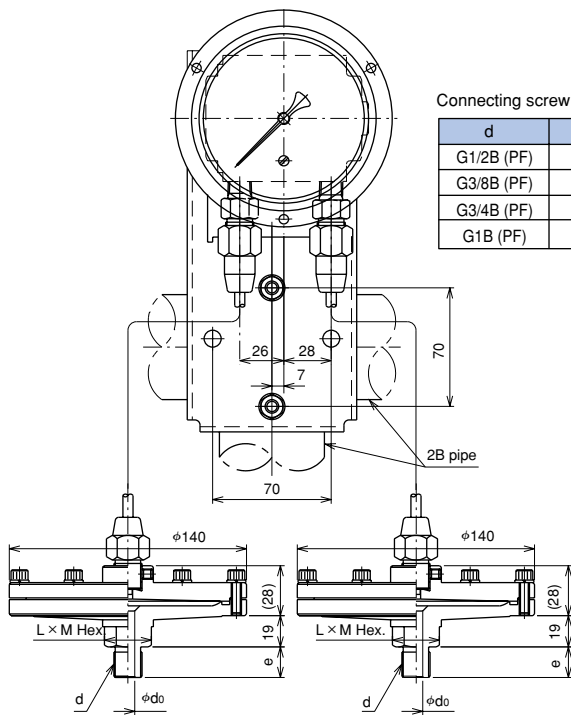
## OUTSIDE DIMENSIONS 1

Standard type (Model : SC□□□)

[Screw type] Model 100 · Screw

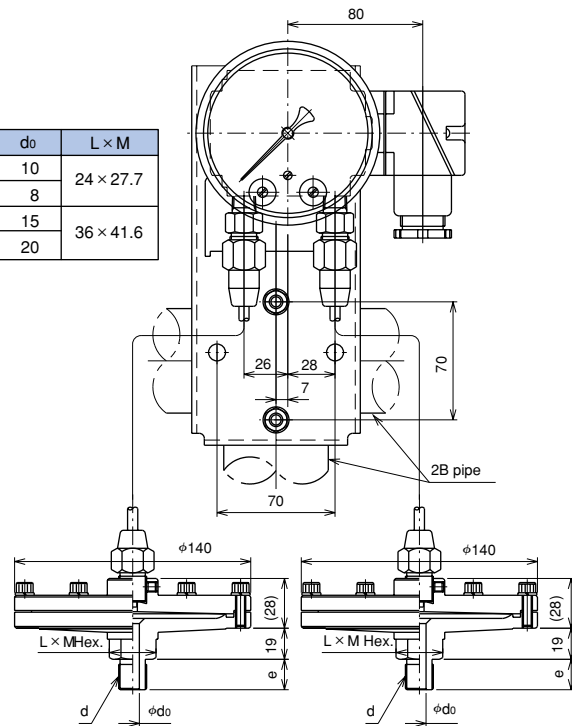
DG95 · 96 General differential pressure gauge

DG97 · 98 Differential pressure switch with electric contact



Connecting screw size

| d          | e  | do | L × M     |
|------------|----|----|-----------|
| G1/2B (PF) | 20 | 10 | 24 × 27.7 |
| G3/8B (PF) | 18 | 8  |           |
| G3/4B (PF) | 24 | 15 | 36 × 41.6 |
| G1B (PF)   | 28 | 20 |           |

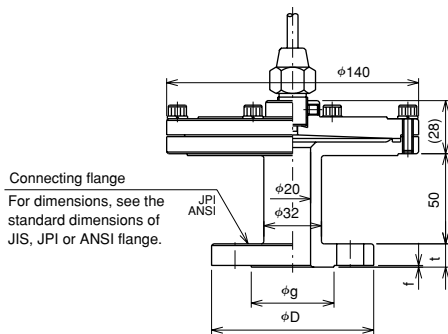


SC10-□□□

SC10-□□□

[Flange type] Model 200 · Flange

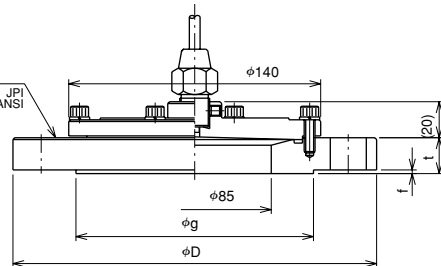
Model 300 · Flange



Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.

SC2□-□□□

Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.



SC3□-□□□

### Dimensions of indicator section

|   | Mounting              | Size | Type No. (indicator section) |
|---|-----------------------|------|------------------------------|
| General differential                      | 2B pipe mounting      | 100  | DG95-1□3                     |
|   |                       | 150  | DG96-1□3                     |
| Differential switch with electric contact | 2B pipe mounting      | 100  | DG97-1□3                     |
|   |                       | 150  | DG98-1□3                     |
|   | Surface mounting type | 100  | DG97-2□3                     |
|   |                       | 150  | DG98-2□3                     |

\* For detailed outside dimensions of indicator section, see the catalog of differential pressure gauge.

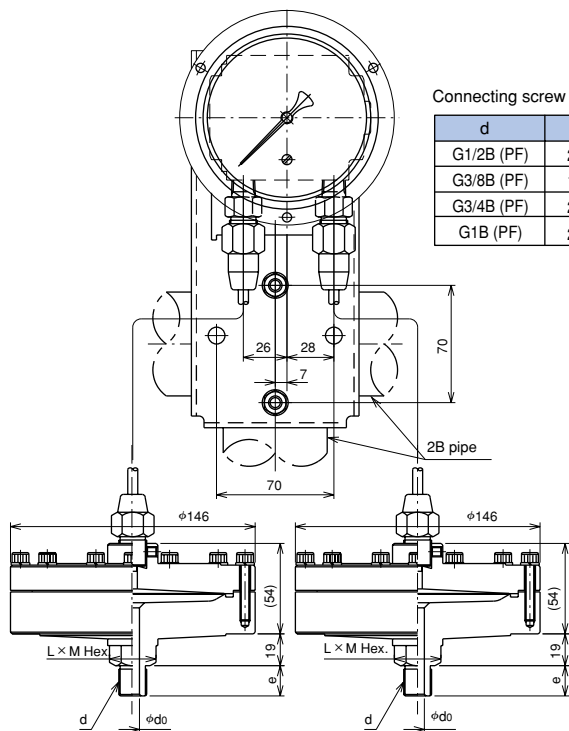
## OUTSIDE DIMENSIONS 2

High pressure-proof type (Model : HD□□)

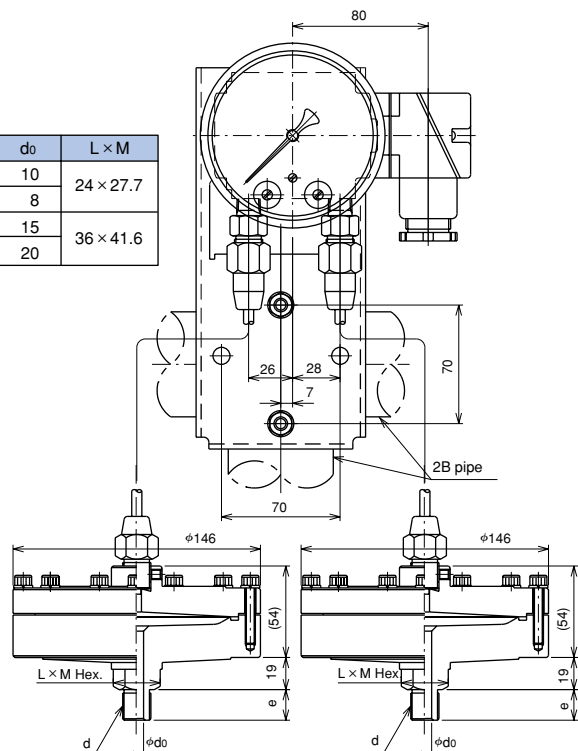
[Screw type] Model 100 · Screw

DG95 · 96 General differential pressure gauge

DG97 · 98 Differential pressure switch with electric contact



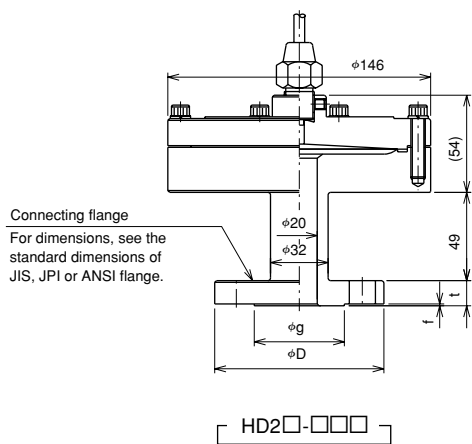
HD10-□□□



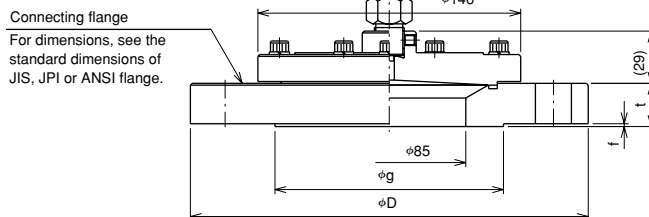
HD10-□□□

[Flange type] Model 200 · Flange

Model 300 · Flange



HD2□-□□□



HD3□-□□□

### Dimensions of indicator section

|   | Mounting           | Size | Type No. (indicator section) |
|---|--------------------|------|------------------------------|
| General differential                      | 2B pipe mounting   | 100  | DG95-1□3                     |
|   |                    | 150  | DG96-1□3                     |
| Differential switch with electric contact | 2B pipe mounting   | 100  | DG97-1□3                     |
|   |                    | 150  | DG98-1□3                     |
|   | Wall mounting type | 100  | DG97-2□3                     |
|   |                    | 150  | DG98-2□3                     |

\* For detailed outside dimensions of indicator section, see the catalog of differential pressure gauge.

# Diaphragm-Seal Type Differential Pressure Gauges (with Electric Contact)

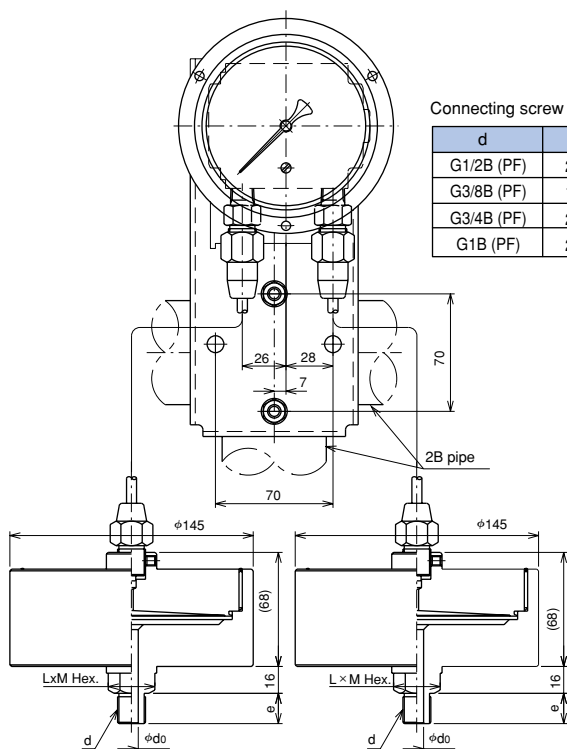
## OUTSIDE DIMENSIONS 3

High pressure-proof and welded type (Model : HE□□)

[Screw type] Model 100 · Screw

DG95 · 96 General differential pressure gauge

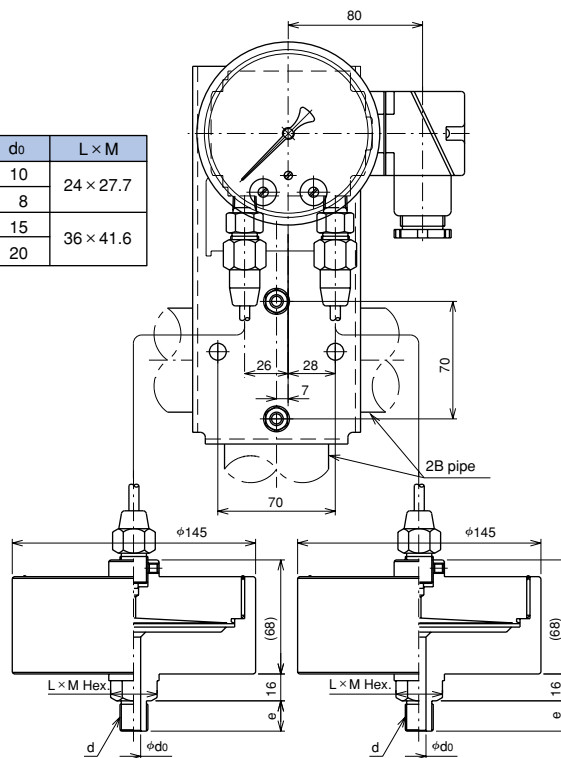
DG97 · 98 Differential switch with electric contact



HE10-□□□

Connecting screw size

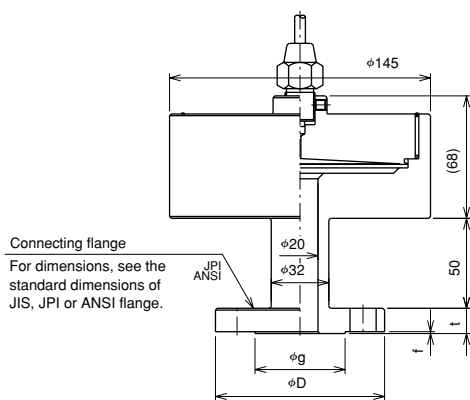
| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |



HE10-□□□

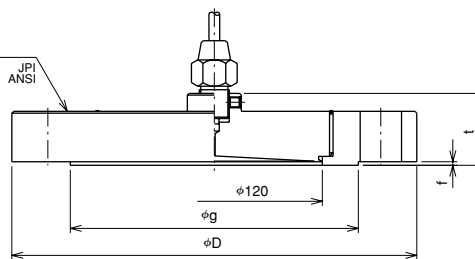
[Flange type] Model 200 · Flange

Model 300 · Flange



HE2□-□□□

Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.



HE3□-□□□

### Dimensions of indicator section

|   | Mounting           | Size | Type No. (indicator section) |
|---|--------------------|------|------------------------------|
| General differential                      | 2B pipe mounting   | 100  | DG95-1□3                     |
|   |                    | 150  | DG96-1□3                     |
| Differential switch with electric contact | 2B pipe mounting   | 100  | DG97-1□3                     |
|   |                    | 150  | DG98-1□3                     |
|   | Wall mounting type | 100  | DG97-2□3                     |
|   |                    | 150  | DG98-2□3                     |

\* For detailed outside dimensions of indicator section, see the catalog of differential pressure gauge.

# Diaphragm-Seal type Differential Pressure Switch

## MANUFACTURING SPECIFICATION

**Measured fluid :**

Highly corrosive fluid, High-viscosity fluid

**Type :**

Remote type

**Mounting method :**

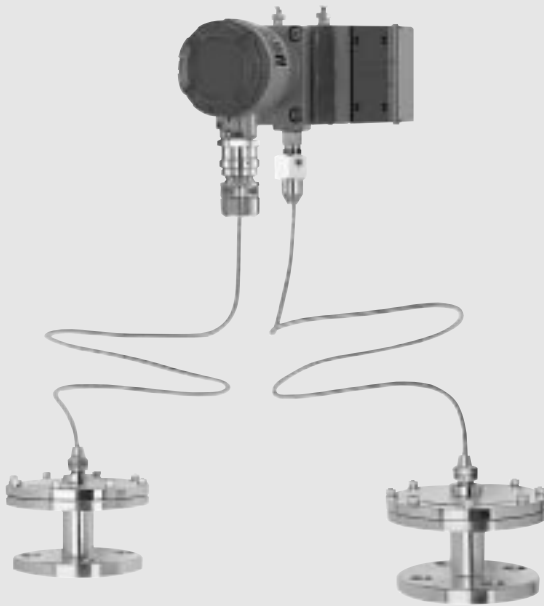
Screw type, Flange type

**Accuracy :**

$\pm 1.5\% \text{F.S.} / 20^\circ\text{C} \pm 10^\circ\text{C}$

**Working temperature range :**

-5 to 40°C



## INDICATOR SECTION

**Differential pressure switch :**

Differential pressure switch (Model : CL71)

Explosion-proof differential pressure switch (Model : CD71)

**Mounting :**

Panel mounting, 2B pipe mounting

**Material of main parts :**

Diaphragm SUS316+NBR (Buna B)

Main body SCS14

**Number of contacts**

1 or 2 (to be set simultaneously)

**Setting method :**

Internal adjustment type

**Case material and finish :**

ADC12 · blue-gray two-tone paint

Acid-proof paint.

**Construction :**

IP65

\* For details, see the catalog for differential pressure switch.

## SENSOR SECTION 2 · FILLED LIQUID

**For diaphragm type, select according to the pressure  
(Maximum working pressure)**

Standard type (0.5MPa) (Model : SC□□)

High pressure-proof type (2MPa) (Model : HD□□)

High pressure-proof and welded type  
(5MPa) (Model : HE□□)

**Diaphragm dia. :**

φ110

**Material :**

For the material of upper/lower flange and diaphragm, see the page for SENSOR SECTION 2.

**Filled liquid :**

Silicone oil

-5 ~ 100°C

**Maximum length of capillary tube :**

1m or 2m

**Note :**

- To minimize temperature error, the diaphragm part needs to be installed on both H and L sides.
- H- and L-side diaphragm parts must be at the same level. (A difference in their level leads to a difference in head, resulting in incorrect indication of differential pressure.)

# Diaphragm-seal type differential pressure switches

## FABRICATION SPECIFICATION

Relationship between differential pressure range, and temperature coefficient (for reference only) :

| Differential pressure range MPa | Differential pressure switch part, Temperature coefficient of indicator section (including capillary tube) (%max. P./°C) | Temperature coefficient of wetted part (when both H and L sides are at same temperature) (Pa/°C) |
|---------------------------------|--|--|
| 0.01~0.05                       | ±0.2   | ±50  |
| 0.02~0.1                        | ±0.15  |  |
| 0.04~0.2                        | ±0.1   |  |
| 0.06~0.3                        | ±0.1   |  |
| 0.08~0.4                        | ±0.1   |  |
| 0.1 ~0.5                        | ±0.1   |  |
| 0.12~0.6                        | ±0.07  |  |
| 0.16~0.8                        | ±0.07  |  |
| 0.2 ~1                          | ±0.07  |  |

Relationship between the size of flange/screw and the diameter of diaphragm

| Mounting method | Flange type |   |  |   | Screw type                                 |   |
|-----------------|-------------|---|--|---|--|---|
|                 | Mounting    | Model 200   |  | Model 300   |  | Model 100   |
| Nominal size    | * Type      | Standard type (SC2□)<br>High pressure-proof type (HD2□) | High pressure-proof and welded type (HE2□) | Standard type (SC3□)<br>High pressure-proof type (HD3□) | High pressure-proof and welded type (HE3□) | Standard type (SC1□)<br>High pressure-proof type (HD1□)<br>High pressure-proof and welded type (HE1□) |
|                 | 10A (3/8")  |   | ○  | ○   | —  | —   |
| 15A (1/2")      |             | ○   | ○  | —   | —  |   |
| 20A (3/4")      |             | ○   | ○  | —   | —  |   |
| 25A (1")        |             | ○   | ○  | —   | —  |   |
| 32A (1 1/4")    |             | ○   | ○  | —   | —  |   |
| 40A (1 1/2")    |             | ○   | ○  | —   | —  |   |
| 50A (2")        |             | ○   | ○  | —   | —  |   |
| 65A (2 1/2")    |             | ○   | ○  | —   | —  |   |
| 80A (3")        |             | —   | ○  | ○   | —  |   |
| 100A (4")       |             | —   | ○  | ○   | —  |   |
| 125A (5")       |             | —   | —  | ○   | ○  |   |
| 150A (6")       |             | —   | —  | ○   | ○  |   |

\* For diaphragm seal type, select according to the pressure (base pressure + differential pressure).

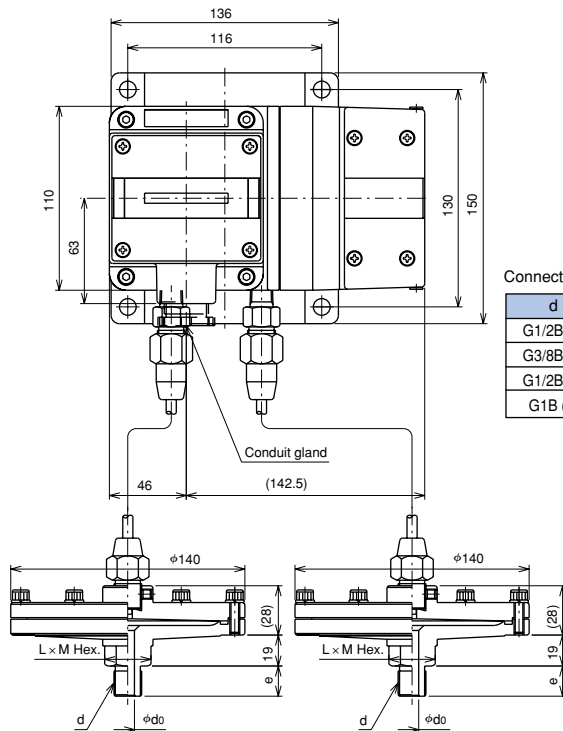
- Standard type (Model : SC□□) : Maximum working pressure: 0.5 MPa
- High pressure-proof type (Model : HD□□) : Maximum working pressure: 2 MPa
- High pressure-proof and welded type (Model : HE□□) : Maximum working pressure: 5 MPa

## OUTSIDE DIMENSIONS 1

Standard type (Model : SC□□)

[Screw type] Model 100 · Screw

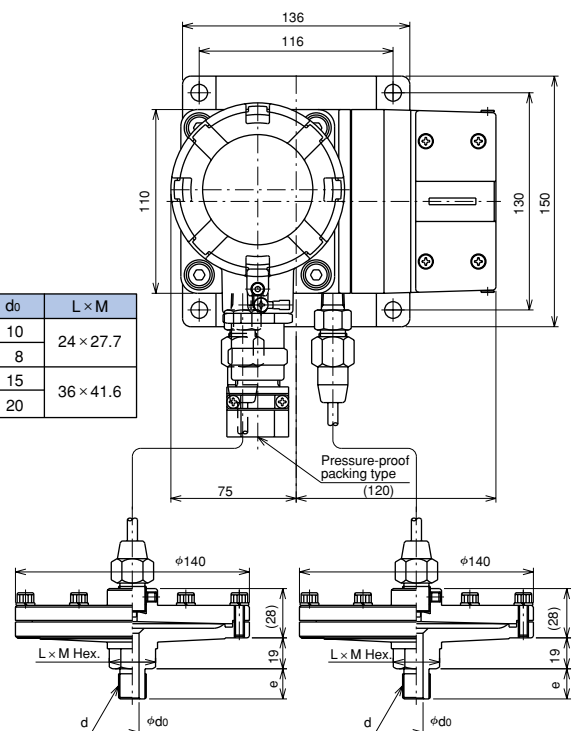
CL71 Differential pressure switch



Connecting screw size

| d          | e  | do | L × M     |
|------------|----|----|-----------|
| G1/2B (PF) | 20 | 10 | 24 × 27.7 |
| G3/8B (PF) | 18 | 8  |           |
| G1/2B (PF) | 24 | 15 | 36 × 41.6 |
| G1B (PF)   | 28 | 20 |           |

CD71 Explosion-proof pressure switch

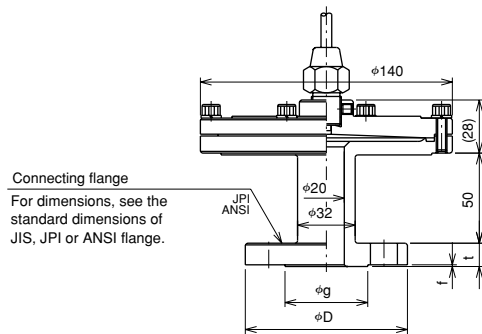


SC10-□□□

SC10-□□□

[Flange type]

Model 200 · Flange

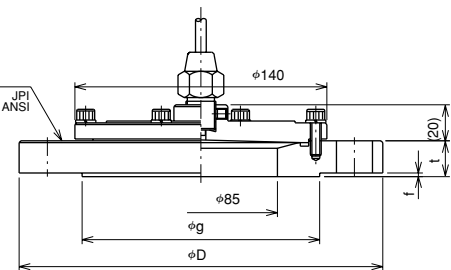


Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.

SC2□-□□□

Model 300 · Flange

Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.



SC3□-□□□

| Type No.         | Mounting         |
|------------------|------------------|
| CL71-173<br>-273 | Panel mounting   |
| CL71-373<br>-473 | 2B pipe mounting |
| CL71-373<br>-473 | Panel mounting   |
| CL71-773<br>-873 | 2B pipe mounting |

\* For detailed outside dimensions of indicator section, see the catalog.



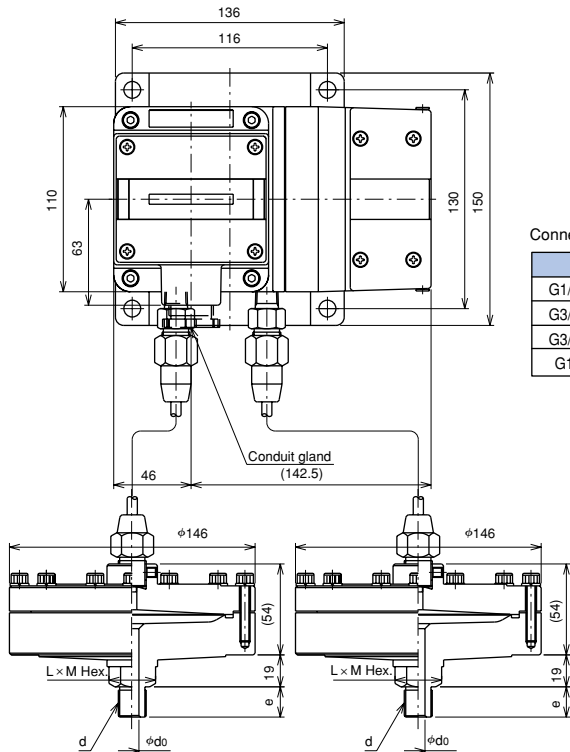
# Diaphragm-seal type differential pressure switches

## OUTSIDE DIMENSIONS 2

High pressure-proof type (Model : □□)

[Screw type] Model 100 · Screw

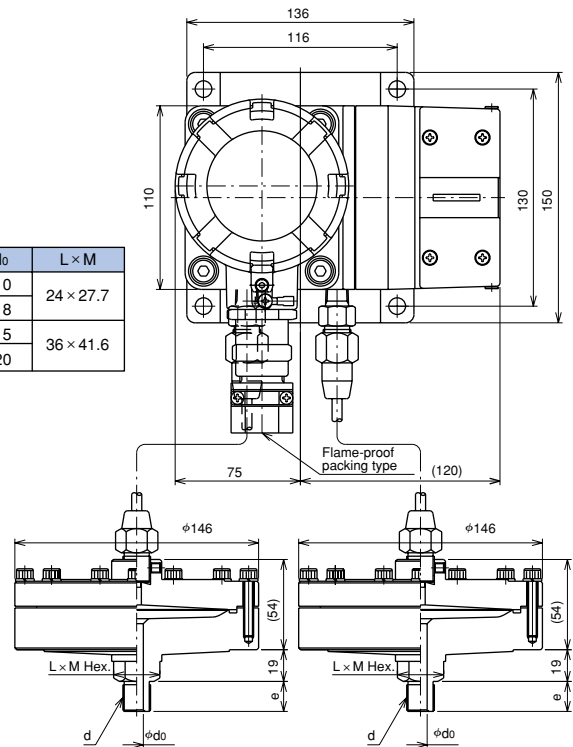
CL71 Differential pressure switch



Connecting screw size

| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |

CD71 Explosion-proof differential pressure switch

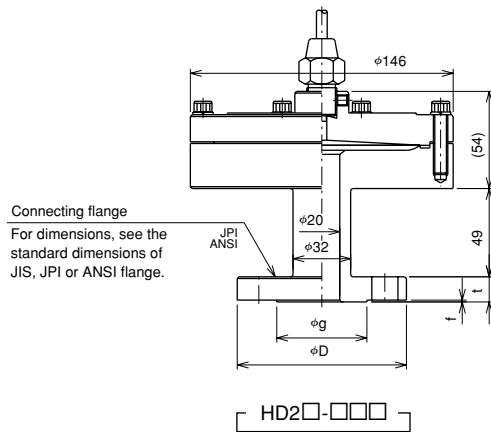


HD10-□□□

HD10-□□□

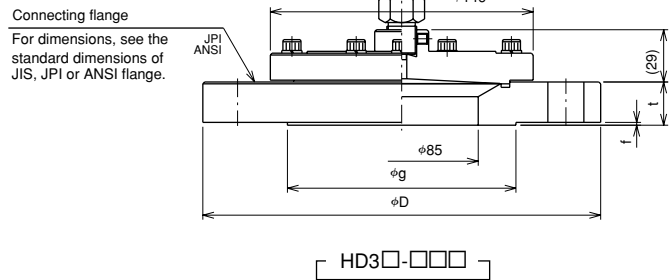
[Flange type]

Model 200 · Flange



HD2□-□□□

Model 300 · Flange



HD3□-□□□

| Type No.         | Mounting         |
|------------------|------------------|
| CL71-173<br>-273 | Panel mounting   |
| CL71-373<br>-473 | 2B pipe mounting |
| CL71-373<br>-473 | Panel mounting   |
| CL71-773<br>-873 | 2B pipe mounting |

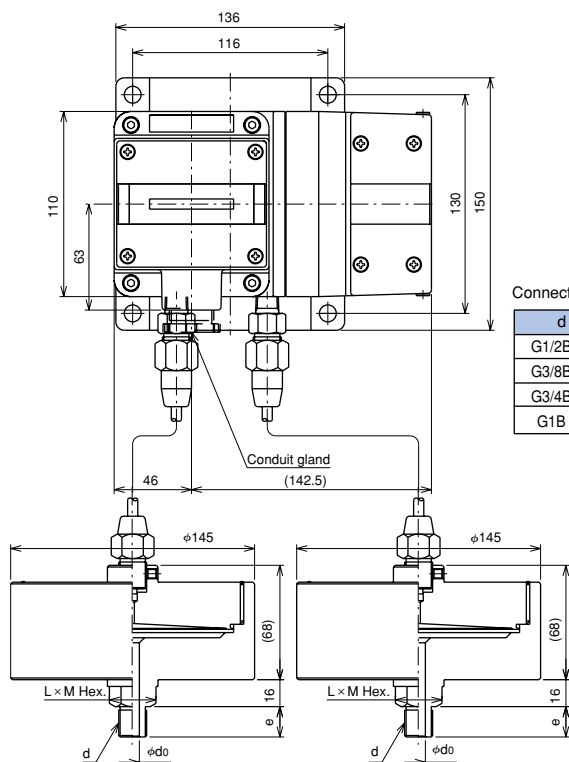
\* For detailed outside dimensions of indicator section, see the catalog.

## OUTSIDE DIMENSIONS 3

High pressure-proof and welding type (Model : HE□□)

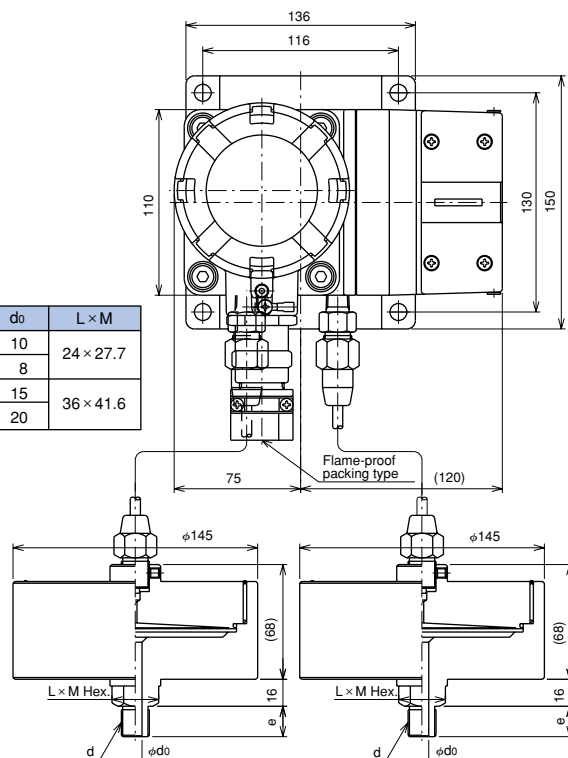
[Screw type] Model 100 · Screw

CL71 Differential pressure switch



HE10-□□□

CD71 Explosion-proof differential pressure switch

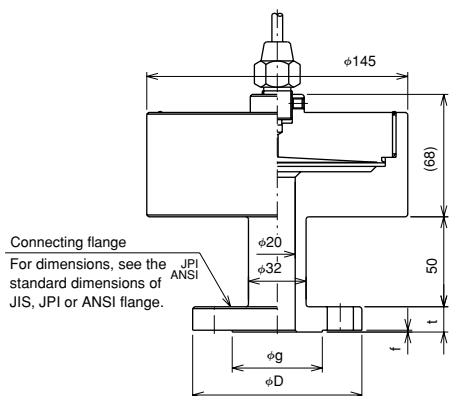


HE10-□□□

Connecting screw size

| d          | e  | d <sub>0</sub> | L × M     |
|------------|----|----------------|-----------|
| G1/2B (PF) | 20 | 10             | 24 × 27.7 |
| G3/8B (PF) | 18 | 8              |           |
| G3/4B (PF) | 24 | 15             | 36 × 41.6 |
| G1B (PF)   | 28 | 20             |           |

[Flange type] Model 200 · Flange



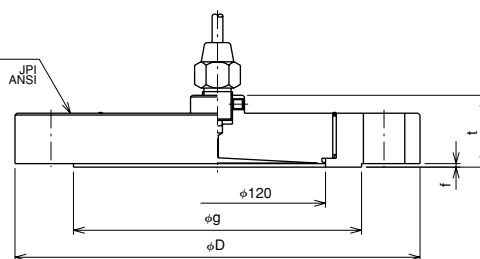
Connecting flange  
For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.

HE2□-□□□

Model 300 · Flange

Connecting flange

For dimensions, see the standard dimensions of JIS, JPI or ANSI flange.



HE3□-□□□

| Type No.         | Mounting         |
|------------------|------------------|
| CL71-173<br>-273 | Panel mounting   |
| CL71-373<br>-473 | 2B pipe mounting |
| CL71-373<br>-473 | Panel mounting   |
| CL71-773<br>-873 | 2B pipe mounting |

\* For detailed outside dimensions of indicator section, see the catalog.

**Type No. construction** Please specify the type No., each specification and pressure (differential pressure) range when ordering.

9 10 11 12 Indicators

|       |      |   |
|-------|------|---|
| AC 10 | φ75  | General type pressure gauge                           |
| AE 10 | φ100 | General type pressure gauge                           |
| AG 10 | φ150 | General type pressure gauge                           |
| BC 10 | φ75  | Weather-proof type pressure gauge                     |
| BC 12 | φ75  | Weather-proof type pressure gauge                     |
| BE 10 | φ100 | Weather-proof type pressure gauge                     |
| BE 12 | φ100 | Weather-proof type pressure gauge                     |
| BG 10 | φ150 | Weather-proof type pressure gauge                     |
| BG 12 | φ150 | Weather-proof type pressure gauge                     |
| GV 42 | φ100 | Glycerin filled type                                  |
| JM 11 | φ100 | Pressure gauge with micro switch (Stem)               |
| JM 16 | φ100 | Pressure gauge with micro switch (Flush type)         |
| JM 21 | φ150 | Pressure gauge with micro switch contact (Stem)       |
| JM 26 | φ150 | Pressure gauge with micro switch contact (Flush type) |
| JD 10 | φ100 | Pressure gauge with electronic contact                |
| CQ 30 |      | Pressure switch                                       |
| CD 30 |      | Explosion-proof pressure switch                       |
| CB 13 |      | Pressure switch                                       |
| CB 33 |      | Pressure switch                                       |
| CD 75 |      | Explosion-proof pressure switch                       |
| DG 95 | φ100 | Differential pressure gauge                           |
| DG 96 | φ150 | Differential pressure gauge                           |
| DG 97 | φ100 | Differential switch with electric contact             |
| DG 98 | φ150 | Differential switch with electric contact             |
| CL 71 |      | Differential pressure switch                          |
| CD 71 |      | Explosion-proof differential pressure switch          |

When you need a special indicator section other than those listed above, please consult the nearest NAGANO KEIKI office.

Model of indicator section

Model 100 Screw type

**SC10**

Type No.

High pressure-proof type (Model : HD10 · HH10)  
High pressure-proof and welded type (Model: HE10)  
Basic specification is the same as high withstand pressure type.

1 Screw size

- 3 G3/8B
- 4 G1/2B
- G R3/8
- H R1/2
- L 3/8NPT
- M 1/2NPT

2 Screw

- 0 Screw type

3 Wetted parts material (Lower flange)

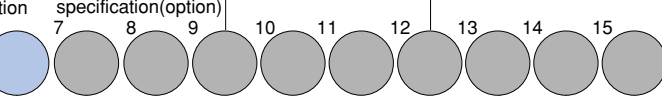
- 2 S25C
- 3 SUS316
- 4 SUS316L
- 5 Monel
- 6 TB35C (Titanium)
- 7 Hastelloy B
- 8 Hastelloy C-276
- A NAS305 (Carpenter 20)
- B SUS304

4 Diaphragm diameter

|   | A□10<br>B□1□<br>GV42 | JM□□ | JD10 | CQ30<br>CD30 | CB13<br>CB33<br>CD75 | DG9□<br>CL71 |
|---|----------------------|------|------|--------------|----------------------|--------------|
| 4 | φ40                  | ○    | —    | ○            | —                    | —            |
| 6 | φ60                  | ○    | ○    | ○            | ○                    | —            |
| 8 | φ80                  | ○    | ○    | ○            | —                    | —            |
| 9 | φ110                 | ○    | ○    | ○            | ○                    | ○            |

\* Please indicate pressure range, dampener and radiator piping separately.

Additional specification(option)



13 Material of indicator section elements

- 0 Nil
- 1 General (except GV42 and JD)
- 2 Corrosion resistant

14 Construction

- 0 Nil
- 1 Direct type
- 2 Remote type (Specify type and length of lead by the meter.)

8 Treatment

- 0 Nil
- 1 Use no oil
- 2 Use no water
- 3 Use no oil & water

7 Middle-temperature

- 0 Nil (Low-temperature)
- B Middle-temperature (Higher than 100 to 230°C)

6 Upper flange material

- 2 S25C
- 3 SUS316

5 Diaphragm material

- 1 SUS316 + FEP lining
- 2 SUS316 + FEP coating
- 3 SUS316
- 4 SUS316L
- 5 Monel
- 6 TP35C (Titanium)
- 7 Hastelloy B
- 8 Hastelloy C-276
- A TaP (Tantalum)
- D Nickel
- J SUS316 + Neoprene lining

15 Document

- 0 Nil
- 1 To be provided (Please specify your requirements in a separate form.)  
Drawing, instruction manual, inspection procedure, standard inspection record (one copy per item), traceability system diagram, calibration certificate, standard inspection record, strength calculation, witnessed inspection record.

**Type No. construction** Please specify the type No., each specification and pressure (differential pressure) range when ordering.

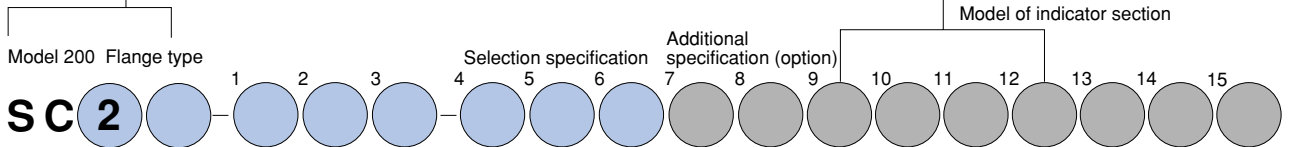
|   |   |   |   |           |
|---|---|---|---|-----------|
| S | C | 2 | A | JIS 5K    |
| S | C | 2 | 1 | JIS 10K   |
| S | C | 2 | 2 | JIS 16K   |
| S | C | 2 | 3 | JIS 20K   |
| S | C | 2 | 4 | JIS 30K   |
| S | C | 2 | 5 | JIS 40K   |
| S | C | 2 | B | JIS 63K   |
| S | C | 2 | 6 | ANSI 150  |
| S | C | 2 | 7 | ANSI 300  |
| S | C | 2 | 8 | ANSI 600  |
| S | C | 2 | E | ANSI 1500 |
| S | C | 2 | G | JPI 150   |
| S | C | 2 | H | JPI 300   |
| S | C | 2 | K | JPI 600   |

Model Flange standard

9 10 11 12 Indicators

|       |      |   |
|-------|------|---|
| AC 10 | φ75  | General type pressure gauge                   |
| AE 10 | φ100 | General type pressure gauge                   |
| AG 10 | φ150 | General type pressure gauge                   |
| BC 10 | φ75  | Weather-proof type pressure gauge             |
| BC 12 | φ75  | Weather-proof type pressure gauge             |
| BE 10 | φ100 | Weather-proof type pressure gauge             |
| BE 12 | φ100 | Weather-proof type pressure gauge             |
| BG 10 | φ150 | Weather-proof type pressure gauge             |
| BG 12 | φ150 | Weather-proof type pressure gauge             |
| GV 42 | φ100 | Glycerin filled type                          |
| JM 11 | φ100 | Pressure gauge with micro switch (Stem)       |
| JM 16 | φ100 | Pressure gauge with micro switch (Flush type) |
| JM 21 | φ150 | Pressure gauge with micro switch (Stem)       |
| JM 26 | φ150 | Pressure gauge with micro switch (Flush type) |
| JD 10 | φ100 | Pressure gauge with electronic contact        |
| CQ 30 |      | Pressure switch                               |
| CD 30 |      | Explosion-proof pressure switch               |
| CB 13 |      | Pressure switch                               |
| CB 33 |      | Pressure switch                               |
| CD 75 |      | Explosion-proof pressure switch               |
| DG 95 | φ100 | Differential pressure gauge                   |
| DG 96 | φ150 | Differential pressure gauge                   |
| DG 97 | φ100 | Differential switch with electric contact     |
| DG 98 | φ150 | Differential switch with electric contact     |
| CL 71 |      | Differential pressure switch                  |
| CD 71 |      | Explosion-proof differential pressure switch  |

When you need a special indicator section other than those listed above, please consult the nearest NAGANO KEIKI office.



High pressure-proof type (Model : HD20 · HH20)  
High pressure-proof and welded type (Model: HE20)  
Basic specification is the same as high withstand pressure type.

1 Flange size

|   |              |
|---|--------------|
| A | 10A (3/8")   |
| 1 | 15A (1/2")   |
| 2 | 20A (3/4")   |
| 3 | 25A (1")     |
| 4 | 32A (1 1/4") |
| 5 | 40A (1 1/2") |
| 6 | 50A (2")     |
| 7 | 65A (2 1/2") |
| 8 | 80A (3")     |
| B | 90A (3 1/2") |
| C | 100A (4")    |

\* Available flange size changes with the type of indication part and the diameter of diaphragm. For details, see fabrication specification.

2 Flange type

|   |                      |
|---|----------------------|
| 1 | RF                   |
| 2 | FF                   |
| 3 | MF                   |
| 4 | GF                   |
| 5 | TF                   |
| 6 | FMF                  |
| 8 | Serration processing |

3 Wetted parts material (Lower flange)

|   |                              |
|---|------------------------------|
| 2 | S25C                         |
| 3 | SUS316                       |
| 4 | SUS316L                      |
| E | S25C + Glass lining          |
| F | S25C + PTFE lining           |
| G | S25C + FEP coating           |
| J | S25C + Neoprene lining       |
| K | S25C + Crude-rubber lining   |
| S | Rigid polyvinyl chloride*    |
| T | Polypropylene *              |
| X | SUS316 + PTFE lining         |
| Y | SUS316 + FEP coating         |
| a | SUS316 + Neoprene lining     |
| b | SUS316 + Crude-rubber lining |

\* Available only for φ60 and φ80 diameter diaphragms, flange mounting FF, and JIS 10K 15A to 40A and ANSI 150LB 3/4B to 1 1/2B flanges.

13 Material of indicator section elements

|   |                              |
|---|------------------------------|
| 0 | Nil                          |
| 1 | General (except GV42 and JD) |
| 2 | Corrosion resistant          |

14 Construction

|   |   |
|---|---|
| 0 | Nil   |
| 1 | Direct type   |
| 2 | Remote type (Specify type and length of lead by the meter.) |

8 Treatment

|   |                    |
|---|--------------------|
| 0 | Nil                |
| 1 | Use no oil         |
| 2 | Use no water       |
| 3 | Use no oil & water |

7 Middle-temperature

|   |   |
|---|---|
| 0 | Nil (Low-temperature)                         |
| B | Middle-temperature (Higher than 100 to 230°C) |

6 Upper flange material

|   |        |
|---|--------|
| 2 | S25C   |
| 3 | SUS316 |

5 Diaphragm material

|   |                          |
|---|--------------------------|
| 1 | SUS316 + FEP lining      |
| 2 | SUS316 + FEP coating     |
| 3 | SUS316                   |
| 4 | SUS316L                  |
| 5 | Monel                    |
| 7 | TP35C (Titanium)         |
| 7 | Hastelloy B              |
| 8 | Hastelloy C-276          |
| A | TaP (Tantalum)           |
| D | Nickel                   |
| J | SUS316 + Neoprene lining |

4 Diaphragm diameter

|   | A□10<br>B□1□<br>GV42 | JM□□ | JD10 | CQ30<br>CD30 | CB13<br>CB33<br>CD75 | DG9□<br>C□71 |
|---|----------------------|------|------|--------------|----------------------|--------------|
| 4 | φ40                  | ○    | —    | ○            | ○                    | —            |
| 6 | φ60                  | ○    | ○    | ○            | ○                    | —            |
| 8 | φ80                  | ○    | ○    | ○            | ○                    | —            |
| 9 | φ110                 | ○    | ○    | —            | ○                    | ○            |

\* Please indicate pressure range, dampener and radiator piping separately.

15 Document

|   |   |
|---|---|
| 0 | Nil   |
| 1 | To be provided<br>(Please specify your requirements in a separate form.)<br>Drawing, instruction manual, inspection procedure, standard inspection record (one copy per item), traceability system diagram, calibration certificate, standard inspection record, strength calculation, witnessed inspection record. |

**Type No. construction** Please specify the type No., each specification and pressure (differential pressure) range when ordering.

|   |   |   |   |      |      |
|---|---|---|---|------|------|
| S | C | 3 | A | JIS  | 5K   |
| S | C | 3 | 1 | JIS  | 10K  |
| S | C | 3 | 2 | JIS  | 16K  |
| S | C | 3 | 3 | JIS  | 20K  |
| S | C | 3 | 4 | JIS  | 30K  |
| S | C | 3 | 5 | JIS  | 40K  |
| S | C | 3 | B | JIS  | 63K  |
| S | C | 3 | 6 | ANSI | 150  |
| S | C | 3 | 7 | ANSI | 300  |
| S | C | 3 | 8 | ANSI | 600  |
| S | C | 3 | E | ANSI | 1500 |
| S | C | 3 | G | JPI  | 150  |
| S | C | 3 | H | JPI  | 300  |
| S | C | 3 | K | JPI  | 600  |

Flange standard

Model

Model 300 Flange type

**SC3**

Type No.

High pressure-proof type (Model: HD30·HH30)  
High pressure-proof and welded type (Model: HE30)  
Basic specification is the same as high withstand pressure type.

1 Flange size

|   |              |
|---|--------------|
| 3 | 25A (1")     |
| 4 | 32A (1 1/4") |
| 5 | 40A (1 1/2") |
| 6 | 50A (2")     |
| 7 | 65A (2 1/2") |
| 8 | 80A (3")     |
| B | 90A (3 1/2") |
| C | 100A (4")    |
| D | 120A (5")    |
| E | 150A (6")    |

\* Available flange size changes with the type of indication part and the diameter of diaphragm. For details, see fabrication specification.

2 Flange type

|   |                      |
|---|----------------------|
| 1 | RF                   |
| 2 | FF                   |
| 3 | MF                   |
| 4 | GF                   |
| 5 | TF                   |
| 6 | FMF                  |
| 8 | Serration processing |

3 Wetted parts material (Lower flange)

|   |  |
|---|--|
| 2 | S25C   |
| 3 | SUS316   |
| 4 | SUS316L  |
| E | S25C + Glass lining<br>Available only for flange mounting FF.          |
| G | S25C + FEP coating<br>Available only for flange mounting FF.           |
| J | S25C + Neoprene lining<br>Available only for flange mounting FF.       |
| K | S25C + Crude-rubber lining<br>Available only for flange mounting FF.   |
| Y | SUS316 + FEP coating<br>Available only for flange mounting FF.         |
| a | SUS316 + Neoprene lining<br>Available only for flange mounting FF.     |
| b | SUS316 + Crude-rubber lining<br>Available only for flange mounting FF. |

9 10 11 12 Indicators

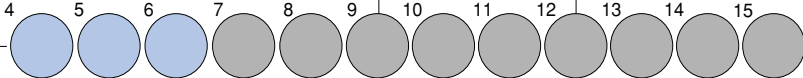
|      |      |   |      |  |
|------|------|---|------|--|
| AC10 | φ75  | General type pressure gauge                   | CQ30 | Pressure switch                                |
| AE10 | φ100 | General type pressure gauge                   | CD30 | Explosion-proof pressure switch                |
| AG10 | φ150 | General type pressure gauge                   | CB13 | Pressure switch                                |
| BC10 | φ75  | Weather-proof type pressure gauge             | CB33 | Pressure switch                                |
| BC12 | φ75  | Weather-proof type pressure gauge             | CD75 | Explosion-proof pressure switch                |
| BE10 | φ100 | Weather-proof type pressure gauge             | DG95 | φ100 Differential pressure gauge               |
| BE12 | φ100 | Weather-proof type pressure gauge             | DG96 | φ150 Differential pressure gauge               |
| BG10 | φ150 | Weather-proof type pressure gauge             | DG97 | φ100 Differential switch with electric contact |
| BG12 | φ150 | Weather-proof type pressure gauge             | DG98 | φ150 Differential switch with electric contact |
| GV42 | φ100 | Glycerin filled type                          | CL71 | Differential pressure switch                   |
| JM11 | φ100 | Pressure gauge with micro switch (Stem)       | CD71 | Explosion-proof differential pressure switch   |
| JM16 | φ100 | Pressure gauge with micro switch (Flush type) |      |  |
| JM21 | φ150 | Pressure gauge with micro switch (Stem)       |      |  |
| JM26 | φ150 | Pressure gauge with micro switch (Flush type) |      |  |
| JD10 | φ100 | Pressure gauge with electronic contact        |      |  |

When you need a special indicator section other than those listed above, please consult the nearest NAGANO KEIKI office.

Model of indicator section

Selection specification

Additional specification (option)



13 Material of indicator section elements

|   |                              |
|---|------------------------------|
| 0 | Nil                          |
| 1 | General (except GV42 and JD) |
| 2 | Corrosion resistant          |

14 Construction

|   |   |
|---|---|
| 0 | Nil   |
| 1 | Direct type   |
| 2 | Remote type (Specify type and length of lead by the meter.) |

8 Treatment

|   |                    |
|---|--------------------|
| 0 | Nil                |
| 1 | Use no oil         |
| 2 | Use no water       |
| 3 | Use no oil & water |

7 Middle-temperature

|   |   |
|---|---|
| 0 | Nil (Low-temperature)                         |
| B | Middle-temperature (Higher than 100 to 230°C) |

6 Upper flange material

|   |        |
|---|--------|
| 2 | S25C   |
| 3 | SUS316 |

5 Diaphragm material

|   |                          |
|---|--------------------------|
| 1 | SUS316 + FEP lining      |
| 2 | SUS316 + FEP coating     |
| 3 | SUS316                   |
| 4 | SUS316L                  |
| 5 | Monel                    |
| 6 | TP35C (Titanium)         |
| 7 | Hastelloy B              |
| 8 | Hastelloy C-276          |
| A | TaP (Tantalum)           |
| D | Nickel                   |
| J | SUS316 + Neoprene lining |

4 Diaphragm diameter

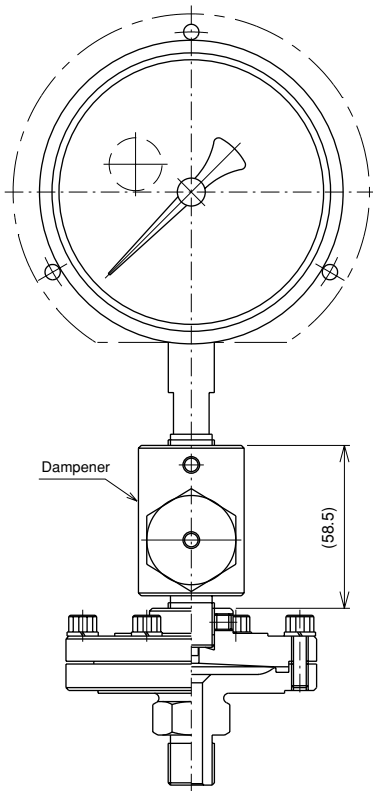
|   |                      |      |      |              |                      |              |
|---|----------------------|------|------|--------------|----------------------|--------------|
|   | A□10<br>B□1□<br>GV42 | JM□□ | JD10 | CQ30<br>CD30 | CB13<br>CB33<br>CD75 | DG9□<br>C□71 |
| 4 | φ40                  | ○    | —    | ○            | —                    | —            |
| 6 | φ60                  | ○    | ○    | ○            | ○                    | —            |
| 8 | φ80                  | ○    | ○    | ○            | —                    | —            |
| 9 | φ110                 | ○    | ○    | —            | ○                    | ○            |

15 Document

|   |   |
|---|---|
| 0 | Nil   |
| 1 | To be provided<br>(Please specify your requirements in a separate form.)<br>Drawing, instruction manual, inspection procedure, standard inspection record (one copy per item), traceability system diagram, calibration certificate, standard inspection record, strength calculation, witnessed inspection record. |

\* Please indicate pressure range, dampener and radiator piping separately.

## DAMPENER

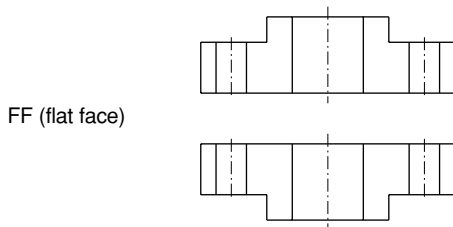


When your pressure gauge is subjected to high pulsating pressure or surge pressure, please install the dampener to protect the gauge.

The dampener has a variable throttle, which can be adjusted according to pressure variation.

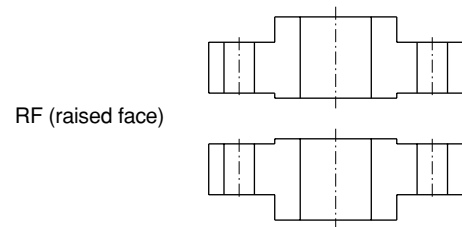
When installed in diaphragm-seal type pressure gauges, the dampener throttles only the filled liquid, eliminating the danger of clogging due to foreign matter. In addition, stable throttling effect is ensured, thanks to the excellent characteristic of filled liquid where viscosity hardly changes with temperature.

## FLANGE TYPE



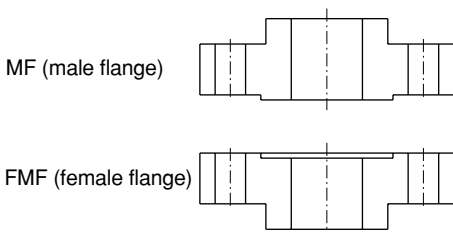
FF (flat face)

Application: Cast iron or copper alloy flanges of 16K or lower nominal pressure.



RF (raised face)

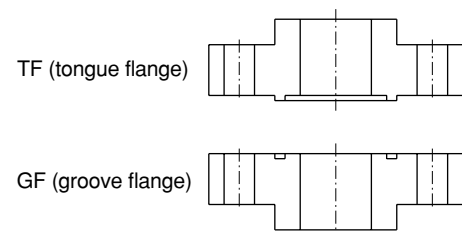
Application: Flanges of 63K or lower nominal pressure.



MF (male flange)

FMF (female flange)

Application: 16K or higher nominal pressure requiring airtightness.



TF (tongue flange)

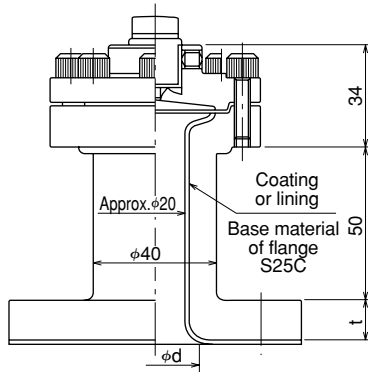
GF (groove flange)

Application: 16K or higher nominal pressure using dangerous fluid or requiring airtightness.

\* Names in ( ) are JIS, [ ] are JPI.

## LINING & COATING

### Lined or coated flange



Available flange type: FF only  
Dimension "t" does not include the thickness of coating or lining.

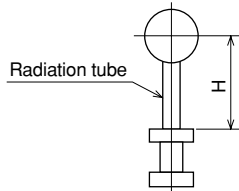
| Name                | Thickness (mm) | Working temperature range |
|---------------------|----------------|---------------------------|
| Glass lining        | 0.4 ~ 0.8      | -30 ~ 230°C               |
| Neoprene lining     | 2              | -20 ~ 100°C               |
| Crude-rubber lining | 2              | -15 ~ 80°C                |
| PTFE lining         | 2              | -20 ~ 150°C               |
| FEP coating         | 0.2 ~ 0.3      | -30 ~ 180°C               |

There is a case where "φd" is bigger than the standard dimension, so please pay attention to gasket size.

## RADIATION TUBE

For middle temperature pressure gauges (over 100°C, below 230°C) or direct mounting type, or when the temperature of sensing part becomes 180°C or higher, we recommend to use the radiation tube as shown below to minimize the influence of temperature on the indication part. Please specify the temperature of measured fluid. Remote type has similar effect.

### Model 200 with radiation tube



#### H length

| Height | Weather-proof type φ100 | Weather-proof type φ150 |
|--------|-------------------------|-------------------------|
| H      | 213                     | 228                     |

#### Material

|                |       |        |
|----------------|-------|--------|
| Upper flange   | S25C  | SUS316 |
| Radiation tube | SS400 | SUS316 |

The content of this catalog is subject to change without notice.

**NAGANO KEIKI CO., LTD.**



Ueda Factory (measuring instrument) (JQA-0794)  
Maruko Factory (electronic equipment) (JQA-0789)

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