<table>
<thead>
<tr>
<th>Model</th>
<th>Application</th>
<th>For liquids</th>
<th>For glass</th>
<th>For chemical solutions and pure water</th>
<th>For small flow</th>
<th>For large flow</th>
<th>Fluorocarbon resin body</th>
<th>General-purpose resin body</th>
<th>Short length (150 mm or less)</th>
<th>For high temperature fluids</th>
<th>Quick delivery</th>
<th>Alarm contact</th>
<th>SW or VCR connection</th>
<th>Compliant with CE and UL</th>
<th>Availability for unit production</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

Advice on product selection
- Flow rate indication
- Valve position, float reading position, production number, etc.
- Compensation calculation
- Reed switch alarm unit
- PAU optical alarm unit
## ADVICE ON PRODUCT SELECTION

- "Ordering information" for each model includes the following information.
- Example: P-100 series

<table>
<thead>
<tr>
<th>Basic model code</th>
<th>Items to be specified</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-100</td>
<td>Fluid name</td>
</tr>
</tbody>
</table>

Select in the model code table.

- Select an appropriate basic model code in the model code table for each series.
- Contact us if you want to specify special items in the basic model code (usually marked with the code "Z").

**How to specify items → Omit items marked "Need not be specified".**

<table>
<thead>
<tr>
<th>Basic model code</th>
<th>Items to be specified</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fluid name</td>
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<tr>
<td>P-100</td>
<td><em>Specify the fluid name (need not be specified for models P-850 and XP).</em></td>
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<tr>
<td>P-200</td>
<td><em>Specify the fluid name (need not be specified for models P-850 and XP).</em></td>
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<td><em>Specify the fluid name (need not be specified for models P-850 and XP).</em></td>
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<tr>
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<td><em>Specify the fluid name (need not be specified for models P-850 and XP).</em></td>
</tr>
<tr>
<td>XP</td>
<td><em>Specify the fluid name (need not be specified for models P-850 and XP).</em></td>
</tr>
</tbody>
</table>

See the Tips on pages 4 to 8 for details.

*If you want to use a specific scale in models P-850 and XP, specify it.*
FLOW RATE INDICATION

In this catalog, the following fluids are used for the measuring range of each model.

Liquid: Water with a density of 1.0 g/cm³ and a viscosity of 1.0 mPa•s
Gas: Air at 0°C, 0 MPa (1 atm)

If actual operating conditions differ from the above, correct the values with the formulas given below.

When the usage of the meter is changed after delivery, correction is needed.

For gas measurement

Correct the value considering the density, pressure, and temperature of the measuring gas.

1. When the flow rate is indicated in the normal condition:

\[ Q_{\text{N}} = Q_0 \times \sqrt{\frac{p_0}{1.293}} \times \sqrt{\frac{273 + T_0}{273}} \times \sqrt{\frac{0.1013}{0.1013 + p_o}} \]

- \( Q_{\text{N}} \): Corrected flow rate
- \( Q_0 \): Flow rate of the measuring gas in actual conditions
- \( p_0 \): Flow rate in normal conditions: 0°C, 0 MPa
- \( p_o \): Density of the measuring gas (kg/m³ (nor))
- \( T_0 \): Operating temperature (°C)
- \( p_o \): Operating pressure (MPa)

2. When the flow rate is indicated in a standard condition:

\[ Q_{\text{N}} = Q_0 \times \sqrt{\frac{p_0}{1.293}} \times \sqrt{\frac{273 + T_0}{273} + 20} \times \sqrt{\frac{0.1013}{0.1013 + p_o}} \]

- \( Q_{\text{N}} \): Corrected flow rate
- \( Q_0 \): Flow rate of the measuring gas in a standard condition
- \( p_0 \): Flow rate in a standard condition: 20°C, 0 MPa
- \( p_o \): Density of the measuring gas (kg/m³ (nor))
- \( T_0 \): Operating temperature (°C)
- \( p_o \): Operating pressure (MPa)

3. When the flow rate is indicated in operating conditions:

\[ Q_{\text{N}} = Q_0 \times \sqrt{\frac{p_0}{1.293}} \times \sqrt{\frac{273 + T_0}{273 + T_o}} \times \sqrt{\frac{0.1013}{0.1013 + p_o}} \]

- \( Q_{\text{N}} \): Corrected flow rate
- \( Q_0 \): Flow rate of the measuring gas in actual conditions
- \( p_0 \): Flow rate in operating conditions: \( T_o \), \( p_o \) MPa
- \( p_o \): Density of the measuring gas (kg/m³ (nor))
- \( T_0 \): Operating temperature (°C)
- \( p_o \): Operating pressure (MPa)

Properties of gases

<table>
<thead>
<tr>
<th>Gas</th>
<th>Formula</th>
<th>Density: kg/m³ (nor) at 0°C, 0 MPa</th>
<th>Viscosity (mPas) at 0°C</th>
<th>Viscosity (mPas) at 20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>NH₃</td>
<td>0.7713</td>
<td>0.0093</td>
<td>0.0100</td>
</tr>
<tr>
<td>Argon</td>
<td>Ar</td>
<td>1.783</td>
<td>0.0212</td>
<td>0.0222</td>
</tr>
<tr>
<td>Nitrous oxide</td>
<td>N₂O</td>
<td>1.988</td>
<td>0.0137</td>
<td>0.0146</td>
</tr>
<tr>
<td>Nitrogen oxide</td>
<td>NO</td>
<td>1.340</td>
<td>0.0179</td>
<td>0.0188</td>
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<tr>
<td>Carbon monoxide</td>
<td>CO</td>
<td>1.250</td>
<td>0.0166</td>
<td>0.0177</td>
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<tr>
<td>Carbon dioxide</td>
<td>CO₂</td>
<td>1.977</td>
<td>0.0138</td>
<td>0.0147</td>
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<tr>
<td>Sulfurous acid</td>
<td>SO₂</td>
<td>2.927</td>
<td>0.0116</td>
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<tr>
<td>Hydrogen chloride</td>
<td>HCl</td>
<td>1.639</td>
<td>0.0131</td>
<td>0.0143</td>
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<tr>
<td>Chloride</td>
<td>Cl₂</td>
<td>3.214</td>
<td>0.0123</td>
<td>0.0132</td>
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<td>(AIR)</td>
<td>1.293</td>
<td>0.0171</td>
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<td>Trioxide</td>
<td>BrO₃</td>
<td>7.139</td>
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<td>0.0153</td>
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<td>He</td>
<td>0.1785</td>
<td>0.0186</td>
<td>0.0196</td>
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</table>

For liquid measurement

When the density of the measuring liquid is not 1.0 g/cm³:

\[ Q_{\text{N}} = Q_0 \times \sqrt{\frac{\rho_o}{\rho_0} \left( \frac{1}{1 + \frac{\rho_o}{\rho_0}} \right)} \]

- \( Q_{\text{N}} \): Corrected flow rate
- \( Q_0 \): Flow rate of the measuring liquid
- \( \rho_o \): Density of the measuring liquid (g/cm³)
- \( \rho_0 \): Density of the float (g/cm³)

Density of typical floats

<table>
<thead>
<tr>
<th>Material</th>
<th>Fluorocarbon resin</th>
<th>Stainless steel</th>
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</thead>
<tbody>
<tr>
<td>Density (g/cm³)</td>
<td>2.2</td>
<td>7.9</td>
</tr>
</tbody>
</table>

Note:
1. Some models have weights in the float to increase the density.
2. The density of floats in models with reed switch alarm contacts differs from the values above because they contain magnets.

P series purgometers can measure liquids with a viscosity of up to 2 mPas.
Contact us if you want to measure high-viscosity liquids. We will perform compensation calculation more precisely.
INDEX & QUICK REFERENCE FOR P SERIES PURGEMETERS

1 Fluid name  
- Specify the name of the fluid to be measured.
  Example: Water, N₂, Air, O₂, H₂, Ar, He, CO₂, C₂H₄, etc.
- Inform us of the fluid density and viscosity (not necessary when your fluid is typical like those listed above).

2 Flow range  
- Specify the maximum flow referring to the standard flow rate table.
  Example: Specify 2 L/min for a flow range of 0.2 — 2 L/min. Specify 10 L/min (nor) for a flow range of 1 — 10 L/min (nor).
- You can select a flow range other than those for the standard flow rates.
- You can select a unit other than those in the list of standard flow rates.
  Example:
  - Liquid: 1000 mL/min = 1 L/min
    1000 mL/h = 1 L/h
  - Gas: 1000 mL/min (nor) = 1 L/min (nor)
    1000 L/h (nor) = 1 m³/h (nor)
    1000 mL/min (std) = 1 L/min (std)
    1000 L/h (std) = 1 m³/h (std)
- When fluid is other than water (with a density of 1.0 g/cm³ and viscosity of 1.0 mPa·s) or air (at 0°C and 0 MPa), use the conversion formula to make compensation and apply it to the relevant flow range.

Conversion formula
For liquids: See the right side of Page 3.
For gases: See the left side of Page 3.

3 Pressure  
- Specify a fluid pressure and its unit.
  Example: 0 MPa (= 1 atm)
  0.1 MPa

4 Temperature  
- Specify a fluid temperature and its unit.
  Example: 20°C

< The international system of units >

In response to the amendment of the Measurement Act of Japan, specifications must indicate values in the international system of units (SI).

- For selecting glass tube type variable area flowmeters
  The following conditions are not suitable.
  1. A line where dynamic pressure (shock pressure) is expected
  2. A line where fluids leaking from a damaged glass tube may cause other damage
     - Toxic fluid (including stimulative and anesthetic ones)
     - Flammable fluid
     - Explosive fluid
  3. A gaseous fluid line where explosion may scatter shards of glass and cause human injury or death
  4. A line where any matter from outside may damage the glass tube
  5. A line where ON/OFF operation raises the float suddenly and its impact will damage the glass tube
  6. A line where thermal shock (rapid cooling and heating) is expected
  7. A line for corrosive liquids such as hydrogen fluoride and caustic soda
## Mounting Tips
- You can specify a mounting method other than standard ones.
- Specify any of the following codes.
- Omit the items marked "Need not be specified" (these are covered by the basic model code).
- If you want to attach set screws to models marked "△", specify it separately.

### Table for selecting a mounting option

<table>
<thead>
<tr>
<th>Mounting method</th>
<th>Lock nut mount on the panel front</th>
<th>Thread mount on the panel front</th>
<th>Panel-rear installation</th>
<th>Bezel installation (trim strip)</th>
<th>Flange mounting (Must be specified except for JIS 10K)</th>
<th>Panel mounting with attached metal fittings</th>
<th>With a stand</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-100</td>
<td>Need not be specified</td>
<td>x</td>
<td>○</td>
<td>○</td>
<td>x</td>
<td>x</td>
<td>○</td>
</tr>
<tr>
<td>P-200</td>
<td>Need not be specified</td>
<td>x</td>
<td>○</td>
<td>○</td>
<td>x</td>
<td>x</td>
<td>○</td>
</tr>
<tr>
<td>P-300</td>
<td>x</td>
<td>x</td>
<td>○</td>
<td>○</td>
<td>x</td>
<td>x</td>
<td>○</td>
</tr>
<tr>
<td>P-400</td>
<td>Need not be specified</td>
<td>x</td>
<td>x</td>
<td>○</td>
<td>x</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>P-510</td>
<td>Need not be specified</td>
<td>Need not be specified</td>
<td>○</td>
<td>△</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>P-520</td>
<td>x</td>
<td>Need not be specified</td>
<td>○</td>
<td>△</td>
<td>○</td>
<td>△</td>
<td>○</td>
</tr>
<tr>
<td>P-530</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>○</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-620</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>○</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-710</td>
<td>Need not be specified</td>
<td>Need not be specified</td>
<td>△</td>
<td>Need not be specified</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-771</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-772</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-773</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-774</td>
<td>x</td>
<td>Need not be specified</td>
<td>△</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>P-810</td>
<td>Need not be specified</td>
<td>x</td>
<td>○</td>
<td>X</td>
<td>x</td>
<td>x</td>
<td>○</td>
</tr>
<tr>
<td>P-820</td>
<td>Need not be specified</td>
<td>x</td>
<td>○</td>
<td>X</td>
<td>x</td>
<td>X</td>
<td>○</td>
</tr>
<tr>
<td>P-830</td>
<td>x</td>
<td>Need not be specified</td>
<td>X</td>
<td>○</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>P-850</td>
<td>○</td>
<td>○</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>P-880</td>
<td>Need not be specified</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>P-900</td>
<td>X</td>
<td>Need not be specified</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>P-060 (body code A)</td>
<td>X</td>
<td>Need not be specified</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>P-060 (body code B)</td>
<td>X</td>
<td>Need not be specified</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>XP</td>
<td>x</td>
<td>Need not be specified</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

### Example of specification
If you want to specify Bezel installation for the standard P-100 series with a valve at the inlet for N2 with a flow rate of 1 to 10 L/min (nor):

```
P-10 [Fluid name] [Flow range] [Press. Temp. Mounting option] [Other options] 1 2 3 4 5 6
```

Specify "D" referring to the code in the selection table.

Thus, your ordering format should be:

```
P-100—L0—4N—R2—N2—10 L/min (nor)—D
```

**Standard model with a valve at the inlet**

```
Fluid name Flow range Bezel installation
```

Note: Press. and temp. are omitted because they do not need to be specified.
### Other options

- You can also specify the following options.
- Specify a code relevant to your option.
- Specify all relevant codes if you have multiple options.
- For the details of options, contact us.

#### Other options (Selection Table)

<table>
<thead>
<tr>
<th>Option</th>
<th>Alarm setting on the front</th>
<th>Two-point alarm</th>
<th>Reed switches compatible with UL</th>
<th>Specify terminal position or &quot;No terminal&quot;</th>
<th>Specify the length of the Reed switch lead wire</th>
<th>Dual scale/ special scale</th>
<th>Built-in check valve</th>
<th>Valve lock mechanism (Consult us for details)</th>
<th>With various fittings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>Q</td>
<td>R</td>
<td>S</td>
<td>T</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Optional item</td>
<td>Alarm positions can be set from the front. (Need not be specified for P-773, P-774 and P-830)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model</td>
<td>Two-point alarm such as upper/ lower limit alarm and lower/upper limit alarm can be specified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reed switches are used. (Need not be specified for P-530, P-830 and P-060)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm terminal position (rear, top) or &quot;No terminal&quot; can be specified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 m can be specified for the lead wire length (standard: 50 cm).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual graduation, one-point graduation or percent graduation can be specified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-in check valve type can be specified for preventing counterflow.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A valve with a mechanism to prevent deviation of flow setting values can be specified.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attachments such as SW, VCR, male/female sockets, and hose connector can be specified. (Size and material must be specified).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example of specification

When you want to specify two-point alarm for the standard P-510 series with a reed switch, lower limit open alarm, and outlet valve (thread-mount on the panel front) for water with a flow rate of 2 to 20 L/min at 20°C, 0.3 MPa.

```
P-510 - M - 20 L/min - M
```

Thus, your ordering format should be:

```
P-510 - UA - 4N - R3 - Water - 20 L/min - M
```

Note: Press. and temp. are omitted because they do not need to be specified.
7 Valve position selection guide

<table>
<thead>
<tr>
<th>Usage</th>
<th>Conditions</th>
<th>Valve position</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>For liquid</td>
<td>None in particular</td>
<td>&quot;Top&quot; recommended (&quot;Bottom&quot; allowable)</td>
<td>&quot;Top&quot; recommended to ensure float stability</td>
</tr>
<tr>
<td>For gas</td>
<td>Pressurized gas</td>
<td>Top (outlet side)</td>
<td>Shipped with the tapered tube at your specified pressure</td>
</tr>
<tr>
<td></td>
<td>Negative pressure on the secondary side</td>
<td></td>
<td>If a valve is set on the inlet side, the tapered tube will become a vacuum and hunting will occur to the float.</td>
</tr>
</tbody>
</table>

1) Specify the inlet and outlet pressure for purgers with a valve.
2) If not designated, the valve will be designed for a differential pressure of 0.05 MPa.
3) Consult us for details if you want to specify a differential pressure under 0.05 MPa.
4) For gas applications with a valve at the lower part (inlet) and the pressure condition of atmospheric pressure of 0 MPa, the pressure at the outlet will be 0 MPa. For details, contact us.
5) Depending on the relation between the flow rate and differential pressure specified, some purgers cannot be manufactured. In this case, we may ask you for details on your specifications.

8 Density of gases

- A list of properties of major gases is available on page 3 for your flow rate conversion.

9 Float reading position

- To get the flow rate, read the graduation on the glass tube and float position. The reading position differs depending on the float shape.

The following shows general reading positions according to float profiles. For details, see the Instruction Manual of each product.

10 When you want the same model as your existing model

- Let us know the serial number of your meter.

We will manufacture and ship the same model referring to the production record.

The serial number is indicated at the bottom of the tapered tube (Example: F14-123456-7).
Quick model selection

Tips

INDEX & QUICK REFERENCE* on page 1 is useful.

Compensation calculation

Tips

An indication error will occur to the purgrometer due to the measurement principle if the specifications and physical property values of the measuring fluid are different from those of the design conditions.

1) For measuring liquids

\[ C_p = \frac{\sqrt{\left[ \rho_d (\rho_f - \rho) \right] / \left[ \rho (\rho_f - \rho_d) \right]} }{C_p} \]

\( C_p \) : Conversion coefficient
\( \rho_d \) : Design density (See the approval drawing.)
\( \rho \) : Design liquid density (density of the liquid to be measured)
\( \rho_f \) : Density of the float section

Example of compensation calculation

When alcohol (density: 0.8 g/cm\(^3\)) is flowed into the flow meter for water (density: 1.0 g/cm\(^3\)), and the flow meter indicates 10 L/min (float material: stainless steel):

Actual flow rate of alcohol =

\[ 10 \times \sqrt{\left[ 1.0 \times (7.9 - 0.8) \right] / 0.8 \times (7.9 - 1.0) } \]

= 11.34 L/min

Errors may also occur when measuring liquids with a viscosity that is considerably different from the design conditions.

In this case, different compensation must be applied depending on the design conditions of individual flow meters. Contact us for details.

2) For measuring gases

- Density conversion

\[ C_p = \frac{\rho_d}{\rho} \]

\( C_p \) : Density conversion coefficient
\( \rho_d \) : Design density (kg/m\(^3\) (nor)) (See the approval drawing.)
\( \rho \) : Density of measuring gas (kg/m\(^3\) (nor))

- Pressure conversion

When a graduation is indicated with either "(nor)" or "(std)"

\[ C_p = \sqrt{\frac{P+0.1013}{P_d+0.1013}} \]

When a graduation is for operating indication:

\[ C_p = \sqrt{\frac{P+0.1013}{P+0.1013}} \]

\( C_p \) : Pressure conversion coefficient
\( P_d \) : Design pressure (MPa) (See the approval drawing.)
\( P \) : Operating pressure (MPa)

- Temperature conversion

When a graduation is indicated with either "(nor)" or "(std)"

\[ C_t = \sqrt{\frac{t+273}{t+273}} \]

When a graduation is for operating indication:

\[ C_t = \sqrt{\frac{t+273}{t+273}} \]

\( C_t \) : Temperature conversion coefficient
\( t_d \) : Design temperature (°C) (See the approval drawing.)
\( t \) : Operating temperature (°C)

Example of compensation calculation

The flow meter designed under the conditions of 1.293 kg/m\(^3\) (nor) of air at 20°C and 0.3 MPa indicates 10 L/min (nor) when carbon dioxide of 1.977 kg/m\(^3\) (nor) is fed at 40°C and 0.6 MPa.

Actual flow rate of carbon dioxide = 10 × \( C_p \times C_t \times 0.6 \times 1.977 \)

= 10 × \( \sqrt{\frac{1.293}{1.977}} \times \sqrt{\frac{0.6+0.1013}{0.3+0.1013}} \times \sqrt{\frac{20+273}{40+273}} \)

= 10.34 L/min (nor)
Alarm Output Unit

REED SWITCH TYPE  Purge meter with alarm  Code ABCD

P series purge meters can be equipped with a reed switch contact for flow alarms. In addition to indicating instantaneous flow rates, the float works as a lower or upper limit flow alarm contact. This is ideal for monitoring flow interruption in various purging processes, limiting inflow, and other control. Besides the general type, UL-approved reed switches are also available to suit worldwide applications. Note that the reed switch contact is not always applicable to all flow ranges and models.

# STANDARD SPECIFICATIONS

- **General type reed switch**
  - Applicable models: P-100, P-200, P-510, P-520, P-530, P-620, P-772, P-773, P-774, P-820, P-830, P-060
  - Number of alarm points: 1 (High or Low)
  - Although two-point alarm is also available, there are some limitations on the scale ranges and setting points. Consult us for details.
  - Alarm setting range: 20 to 80% of full scale (High: 50 to 80%, Low: 20 to 50%)
    - The flow range of the alarm-setting-on-the-front type is different from the standard. Consult us for details.
  - **Contact**:
    - Reed switch (self-holding type)
      - Max. contact capacity: 10 VA AC, 10 W DC
      - Max. voltage: 125 V AC, 100 V DC
      - Max. current: 0.5 A
  - **Connection**:
    - Lead wire connection (50 cm) (2 m is also available.)
    - You can specify “no terminal required” for models P-510 and P-520 (use the “other options” code).

<table>
<thead>
<tr>
<th>Reset span</th>
<th>Model</th>
<th>Reset-Span (%F.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-100, P-200, P-821</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>P-510, P-520, P-530, P-620, P-772, P-773, P-774, P-823, P-830, P-060</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

- **Class**: IP67 (dust proof/immersion proof) except for the ends of lead wires
  - Amb. temp.: −10 to 60°C
  - Storage temp.: −20 to 80°C
  - Note: Do not install meters close together, as they may give false readings due to interference by the magnets in the floats of other meters. If you want to install them within 100 mm apart, consult us.

- **Contact actuation**
  - **LOW ALARM**
    - P-100: LOW OPEN (a)
    - P-200: LOW CLOSE (a)
    - P-510: LOW OPEN (B)
    - P-520: LOW CLOSE (B)
  - **HIGH ALARM**
    - P-100: HIGH OPEN (B)
    - P-200: HIGH CLOSE (B)
  - **Actuating Point**
    - P-510: CONTACT CLOSE
    - P-520: CONTACT OPEN
  - **Release Point**
    - P-510: CONTACT OPEN

- **UL-approved reed switch**
  - Alarm contacts with a UL-approved reed switch are available.
    1. File No.: E179569
    2. Category: NRNT2/NRNT8
    3. UL standards: UL508
    4. Specifications
      - **Switch model**: RS-803HS-06 and TS2-SH
      - Max. operating voltage: 24 VDC
      - Max. contact capacity: 10 WDC
      - Range of operating current: 10 µADC to 0.5 ADC
      - Connection: 2-m reed wire (attached)
      - Construction: IP67 (dust proof/immersion proof) except for the ends of lead wires
      - Ambient temperature: 0 to 50°C
  - Any purge meters that can be equipped with the general type reed switch can also accept a UL-approved reed switch.

- **CE marking**
  - Purge meters with a reed switch can be made exempt from CE marking by the following measures:
    1. Make the rating of the reed switch satisfy the UL standard.
    2. Make sure that your load is compatible with the EMC directive and that there is no source of electromagnetic wave noise around the installation site.

< Reasons for exemption >

1. **EMC directive (2004/108/EC)**
   - Purge meters with a reed switch have no substrate with electronic components, and so do not generate electromagnetic noise. Note that we cannot determine the effects of extrinsic noise because it depends on your load and installation conditions.

2. **Low voltage directive (2006/95/EC)**
   - By making the rating of the reed switch satisfy the UL standard, it will be exempt from the low voltage directive (50 to 1000 VAC or 75 to 1500 VDC).
Reed switch type

Standard dimensions of purgemeeters with reed switch alarm

P-100-U□-4N-R2
P-200-U□-4N-R2

P-510-L□-4N-R3

P-823-3□-6F-R2

For high alarm, the lead wire should be routed from the bottom.
For low alarm, the lead wire should be routed from the top.
Alarm output unit

PAU  OPTICAL ALARM UNIT  Code E

■ OUTLINE

Almost all purgers can be equipped with the PAU optical sensing type alarm unit. This highly reliable optical system ensures flow interruption alarm and verifies working flow. Simply adding this unit to direct-reading purgers will upgrade from the local indication to the remote flow monitoring at low cost.

■ STANDARD SPECIFICATIONS

Applicable purgers
Models : P-100, P-200, P-510, P-520, P-710, P-771, P-772, P-773, P-810, P-820, XP
Output : Open collector (NPN)
Rating : Max. 80 mA (30 VDC)
Operation : “Dark On” (The open collector turns on when the light is cut off.)
Response time : 0.5 msec or less
Power supply : .24 VDC±10% (power ripple: max. 10%)
Current consumption : 15 mA or less for the light source
                   : 30 mA or less for the receiver
Photosensitive adjustment knob : Provided
Operation display : Red LED for operation indication
                   : Green LED for tolerance indication
Connection : Pull-out cord (ø2.8 mm)
            : 0.15 mm² × 2C for the light source (gray, 2 m)
            : 0.15 mm² × 3C for the receiver (black, 2 m)
Construction : IP64 (dust proof/splash proof)
Material : Liquid crystal polyester filled with polypropylene for the case
           : Acryl for the lens
Ambient illumination : 3,000 lx or less
Ambient temperature : －25 to ＋55°C (without freezing)
Ambient humidity : ＋85%RH or less (without dew condensation)

■ USAGE EXAMPLE

● No flow alarm
For processes where problems will occur if the flow is interrupted, such as cooling water supply or air flow into incubators

Install the PAU at the bottom of the tapered tube.

While the fluid is flowing normally, the light passes to the receiver and the alarm is not activated.

When the flow is interrupted, the float lowers and cuts off the light, activating the alarm. A lamp or buzzer can be used to notify the interruption.

● Flow change alarm
For processes which need a constant flow of fluid

Install the PAU on the tapered tube where it corresponds to the normal flow.

Normal flow keeps cutting off the light, activating alarm.

Increase or decrease in the flow moves the float up or down, which allows the light to pass to the receiver. This will turn off alarm. A lamp or buzzer can be used to notify changes in flow.

● Leakage alarm
For processes which need the monitoring of leakage such as nitrogen purge or inert gas purge

Install the PAU at the top of the tapered tube.

Normal flow allows the light to pass to the receiver, which does not activate the alarm.

Any leakage moves the float up and cuts off the light, activating the alarm. A lamp or buzzer can be used to notify flow leakage.