TECHNICAL GUIDANCE

INDEX & QUICK REFERENCE FOR P SERIES PURGEMETERS

○ Recommended △ Allowable

Application / Model	For liquids	For gases	For chemical solutions and pure water	For small flow	For large flow	Fluorocarbon resin body	General-purpose resin body	Short length (150 mm or less)	Electro-polished internal surface	For high temperature fluids	Quick delivery	Alarm contact	SW or VCR connection	Compliant with CE and UL standards	Availability for unit production
P-100	○	○	△	○				○		△	△	○		○	△
P-200	○	○	△	○						△	△	○		○	△
P-300	○	○	△	○						△	△				△
P-400	○	○	△	○			△			△	△				△
P-510	○	○	△		○		△		△	△	△	○	○	○	△
P-520	○		○		○	△	○				△	○		○	△
P-530	○	○	△		○					△	△	○	○	○	△
P-620	○		△		○		○	○			△	○	△	○	△
P-710	○	○	○	○		△		○			△	○			△
P-771	○		○	○		○		○		△	△	○			△
P-772	○		○		○	○					△	○		○	△
P-773	○		○		○	○		○			△	○		○	△
P-774	○		○		○	○		○		△	△	○		○	△
P-810	△	○	△	○					○	△	△	△	○		△
P-820	△	○	△	○				△	○	△	△	○	○	○	△
P-830	○		△		○			○		△	△	○	△	○	△
P-850	○	○		○				○			△				△
P-880		○		○				○		△	△		○		△
P-900	○	○	△	○				△		△	△				△
P-060	○	○	△	○			○	○			○	△		○	△
XP	○	○	△	○			○	○			○	△			△

Advice on product selection	
Advice on product selection	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

Basic model code	Items to be specified											
P -10 □ - □□ - □□ - □□	① Fluid name	—	② Flow range	—	③ Press.	—	④ Temp.	—	⑤ Mounting option	—	⑥ Other options	
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".

Basic model code	Items to be specified											
Model name	① Fluid name		② Flow range		③ Press.				④ Temp.		⑤ Mounting option	⑥ Other options
P-100 P-200	Specify the fluid name (need not be specified for models P-850 and XP).		Specify the max. flow rate. See the standard flow rate table (need not be specified for models P-773, P-850, and XP).		Specify the fluid pressure.※				Specify the fluid temperature. ※		Specify the mounting method.	Specify other options.
P-300 P-400 P-510 P-520 P-530 P-620 P-710 P-771 P-772 P-773 P-774 P-810 P-820 P-830 P-850 P-880 P-900 P-060 XP	Examples: · Water · Pure water · Other liquids · N_2 · Air · O_2 · H_2 · Ar · He · CO_2 · C_3H_8 · Other gases		Liquid	Gas	Liquid		Gas		Normal temperature (20˚C)	Other than normal temperature (20˚C)	When no item needs to be specified in "Other options" on page 5	When any item needs to be specified in "Other options" on page 5	When no item needs to be specified in "Other options" on page 6	When any item needs to be specified in "Other options" on page 6
					Less than 0.4 MPa	0.4 MPa or more	Basic model with the valve code "L" or atmospheric pressure scale	Basic model with the valve code "U", pressurized scale or negative pressure on the secondary side						
					Need not be specified	Must be specified	Need not be specified Shipped as 0 MPa (1 atm)	Must be specified Specify the pressure on the primary side.	Need not be specified	Must be specified	Need not be specified	Must be specified	Need not be specified	Must be specified
	Example		□□ mL/min, etc. □□ L/min, etc.	□□ mL/min (nor), etc. □□ L/min (nor), etc.	Omit	□□ MPa, etc.	Omit	□□□ MPa, etc.	Omit	□□ ˚C, etc.	Omit	Specify the code in Selection Table.	Omit	Specify the code in Selection 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:

$$Q_{AIR}=Q_0 \times \sqrt{\frac{\rho_0}{1.293}} \times \sqrt{\frac{273+T_0}{273}} \times \sqrt{\frac{0.1013}{0.1013+P_0}}$$

Q_{AIR} : Corrected flow rate
Q_0 : Flow rate of the measuring gas in actual conditions
(Flow rate in normal conditions: 0°C, 0 MPa)
ρ_0 : Density of the measuring gas (kg/m³ (nor))
T_0 : Operating temperature (°C)
P_0 : Operating pressure (MPa)

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

$$Q_{AIR}=Q_0 \times \sqrt{\frac{\rho_0}{1.293}} \times \sqrt{\frac{273+T_0}{273+20}} \times \sqrt{\frac{0.1013}{0.1013+P_0}}$$

Q_{AIR} : Corrected flow rate
Q_0 : Flow rate of the measuring gas in a standard condition
Flow rate in a standard condition: 20°C, 0 MPa
ρ_0 : Density of the measuring gas (kg/m³ (nor))
T_0 : Operating temperature (°C)
P_0 : Operating pressure (MPa)

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

$$Q_{AIR}=Q_0 \times \sqrt{\frac{\rho_0}{1.293}} \times \sqrt{\frac{273}{273+T_0}} \times \sqrt{\frac{0.1013+P_0}{0.1013}}$$

Q_{AIR} : Corrected flow rate
Q_0 : Flow rate of the measuring gas in actual conditions
Flow rate in operating conditions: T_0°C, P_0 MPa
ρ_0 : Density of the measuring gas (kg/m³ (nor))
T_0 : Operating temperature (°C)
P_0 : Operating pressure (MPa)

For liquid measurement

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

$$Q=Q_0 \times \sqrt{\frac{\rho_0(\rho_1-1)}{(\rho_1-\rho_0)}}$$

Q : Corrected flow rate
Q_0 : Flow rate of the measuring liquid
ρ_0 : Density of the measuring liquid (g/cm³)
ρ_1 : Density of the float (g/cm³)

Density of typical floats

Material	Fluorocarbon resin	Stainless steel
Density (g/cm³)	2.2	7.9

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 purgemeters can measure liquids with a viscosity of up to 2 mPa•s.
Contact us if you want to measure high-viscosity liquids. We will perform compensation calculation more precisely.

Properties of gases

	Gas	Formula	Density: kg/m³ (nor) at 0° C, 0 MPa	Viscosity (mPa•s) at 0 ℃	Viscosity (mPa•s) at 20 ℃
Inorganic compounds	Ammonia	NH_3	0.7713	0.0093	0.0100
	Argon	Ar	1.783	0.0212	0.0222
	Nitrous oxide	N_2O	1.988	0.0137	0.0146
	Nitrogen oxide	NO	1.340	0.0179	0.0188
	Carbon monoxide	CO	1.250	0.0166	0.0177
	Carbon dioxide	CO_2	1.977	0.0138	0.0147
	Sulfurous acid gas	SO_2	2.927	0.0116	0.0126
	Hydrogen chloride	HCℓ	1.639	0.0131	0.0143
	Chloride	$C\ell_2$	3.214	0.0123	0.0132
	Air	(AIR)	1.293	0.0171	0.0181
	Oxygen	O_2	1.429	0.0192	0.0203
	Cyanogen	C_2N_2	2.335	0.0093	-
	Hydrogen bromide	HBr	3.645	0.0170	-
	Bromine	Br_2	7.139	0.0146	0.0153
	Hydrogen	H_2	0.08994	0.0084	0.0088
	Nitrogen	N_2	1.251	0.0166	0.0175
	Fluorine	F_2	1.696	-	-
	Hydrogen sulfide	H_2S	1.539	0.0117	0.0124
	Helium	He	0.1785	0.0186	0.0196

	Gas	Formula	Density: kg/m³ (nor) at 0° C, 0 MPa	Viscosity (mPa•s) at 0 ℃	Viscosity (mPa•s) at 20 ℃
Organic compounds	Acetylene	C_2H_2	1.171	0.0096	0.0102
	Acetone	C_3H_6O	2.593	0.0066	-
	Isobutane	C_4H_{10}	2.595	0.0069	0.0074
	Isopropyl alcohol	C_3H_8O	2.683	0.0070	-
	Ethanol	C_2H_6O	2.057	0.0075	-
	Ethane	C_2H_6	1.356	0.0086	0.0092
	Ethyl ether	$C_4H_{10}O$	3.309	0.0068	-
	Ethylene	C_2H_4	1.260	0.0094	0.0101
	Ethyl chloride	$C_2H_5C\ell$	2.880	0.0094	-
	Methyl chloride	$CH_3C\ell$	2.308	0.0098	0.0106
	Methylene chloride	$CH_2C\ell_2$	3.792	0.0091	0.0099
	Chloroform	$CHC\ell_3$	5.329	0.0093	0.0100
	Butane	C_4H_{10}	2.703	0.0069	0.0074
	Propane	C_3H_8	2.020	0.0075	0.0080
	Propyl alcohol	C_3H_8O	2.683	0.0068	-
	Propylene	C_3H_6	1.879	0.0078	0.0084
	Hexane	C_6H_{14}	3.847	0.0059	-
	Benzene	C_6H_6	3.488	0.0068	0.0074
	Pentane	C_5H_{12}	3.221	0.0062	-
	Methanol	CH_4O	1.430	0.0087	-
	Methane	CH_4	0.7168	0.0102	0.0108
	Methyl ether	C_2H_6O	2.057	0.0085	0.0091
	Utility gas	13A	0.8407	-	0.0105

① Fluid name Tips

・Specify the name of the fluid to be measured.
Example: Water,N_2,AIR,O_2,H_2,Ar,He,CO_2,C_3H_8, etc.
・Inform us of the fluid density and viscosity (not necessary when your fluid is typical like those listed above).

② Flow range Tips

・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 m^3/h (nor)
	1000 mL/min (std) = 1 L/min (std)
	1000 L/h (std) = 1 m^3/h (std)

・When fluid is other than water (with a density of 1.0 g/cm^3 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 Tips

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

④ Temperature Tips

・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.

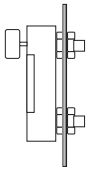
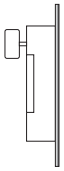
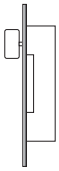
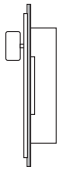
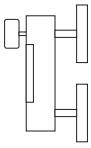
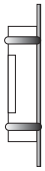
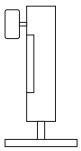
1. A line where dynamic pressure (shock pressure) is expected
2. A line where fluids leaking from a damaged glass tube may cause other damage
   ・Toxic fluid (including stimulative and anesthetic ones)
   ・Flammable fluid
   ・Explosive fluid
3. A gaseous fluid line where explosion may scatter shards 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

⑤ 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

○: Recommended △: Allowable ×: N/A

Mounting method	Lock nut mount on the panel front	Thread mount on the panel front	Panel-rear installation	Bezel installation (trim strip)	Flange mounting (Must be specified except for JIS 10K)	Panel mounting with attached metal fittings	With a stand
Code	A	B	C	D	E	F	G
Model							
P-100	Need not be specified	×	○	○	×	×	○
P-200	Need not be specified	×	○	○	×	×	○
P-300	×	×	×	×	○	○	×
P-400	Need not be specified	×	×	×	○	×	○
P-510	Need not be specified	Need not be specified	△	○	○	×	○
P-520	×	Need not be specified	○	×	×	×	×
P-530	×	Need not be specified	△	○	×	×	×
P-620	×	Need not be specified	×	×	×	×	×
P-710	×	Need not be specified	Need not be specified	×	×	×	×
P-771	×	Need not be specified	△	×	×	×	×
P-772	×	Need not be specified	△	×	×	×	×
P-773	×	Need not be specified	△	×	×	×	×
P-774	×	Need not be specified	×	×	×	×	×
P-810	Need not be specified	×	×	○	×	×	○
P-820	Need not be specified	×	×	○	×	×	○
P-830	×	Need not be specified	×	×	×	×	×
P-850	○	○	○	×	×	×	×
P-880	Need not be specified	×	×	×	×	×	×
P-900	×	Need not be specified	×	×	×	×	×
P-060 (body code A)	×	Need not be specified	×	×	×	×	×
P-060 (body code B)	Need not be specified	×	×	×	×	×	×
XP	×	Need not be specified	×	×	×	×	×

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□-□□-□□-□□ — ① Fluid name — ② Flow range — ③ Press. — ④ Temp. — ⑤ Mounting option — ⑥ Other options

⇩

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.

⑥ Other options Tips

- 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)

○: Recommended △: Allowable ×: N/A

Option	Alarm setting on the front	Two-point alarm	Reed switches compatible with UL	Specify terminal position or "No terminal".	Specify the length of the reed switch lead wire.	Dual scale/ special scale	Built-in check valve	Valve lock mechanism (Consult us for details)	With various fittings
Code	L	M	N	O	P	Q	R	S	T
Optional item / Model	Alarm positions can be set from the front. (Need not be specified for P-773, P-774 and P-830)	Two-point alarm such as upper/ lower limit alarm and lower/lower limit alarm can be specified.	Reed switches are used. (Need not be specified for P-530, P-830 and P-060)	Alarm terminal position (rear, top) or "No terminal" can be specified.	"2 m" can be specified for the lead wire length (standard: 50 cm).	Dual graduation, one-point graduation or percent graduation can be specified.	Built-in check valve type can be specified for preventing counterflow.	A valve with a mechanism to prevent deviation of flow setting values can be specified.	Attachments such as SW, VCR, male/female sockets, and hose connector can be specified. (Size and material must be specified).
P-100	×	×	○	×	○	○	○	○	○
P-200	×	△	○	×	○	○	○	○	○
P-300	×	×	×	×	×	○	×	×	○
P-400	×	×	×	×	×	○	○	×	○
P-510	○	△	○	○	○	○	×	×	○
P-520	×	△	○	○	○	○	×	×	○
P-530	×	×	Need not be specified	×	Need not be specified	○	×	×	○
P-620	○	×	○	×	○	○	×	×	○
P-710	×	×	×	×	×	○	×	×	○
P-771	×	×	×	×	×	○	×	×	×
P-772	×	△	○	×	○	○	×	×	×
P-773	Need not be specified	×	○	×	○	○	×	×	×
P-774	Need not be specified	×	○	×	○	○	×	×	×
P-810	×	×	×	×	×	○	×	×	○
P-820	×	△	○	×	○	○	×	×	○
P-830	Need not be specified	×	Need not be specified	×	Need not be specified	○	×	×	○
P-850	×	×	×	×	×	×	×	×	○
P-880	×	×	×	×	×	×	×	×	○
P-900	×	×	×	×	×	○	×	×	○
P-060 (body code A)	×	×	Need not be specified	×	Need not be specified	×	×	×	×
P-060 (body code B)	×	×	Need not be specified	×	Need not be specified	×	×	×	×
XP	×	×	×	×	×	×	×	×	×

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 -51 □ - □□ - □□ - □□ — ① Fluid name — ② Flow range — ③ Press. — ④ Temp. — ⑤ Mounting option — ⑥ Other options

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

Thus, your ordering format should be:

P—510—UA—4N—R3— Water — 20 L/min — M

Standard type with alarm (code A) and a valve at the outlet | Fluid name | Flow range | Two-point alarm

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

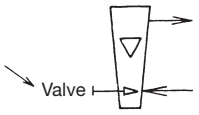
⑦ Valve position selection guide Tips

Usage	Conditions	Valve position	Application
For liquid	None in particular	"Top" recommended ("Bottom" allowable)	"Top" recommended to ensure float stability
For gas	Pressurized gas	Top (outlet side)	Shipped with the tapered tube at your specified pressure
	Negative pressure on the secondary side		If a valve is set on the inlet side, the tapered tube will become a vacuum and hunting will occur to the float.

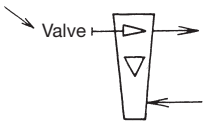
1) Specify the inlet and outlet pressure for purgemeters with a valve.
2) If not designated, the valve will be designed for a differential pressure of 0.05 MPa.
3) Consult us for details if you want to specify a differential pressure under 0.05 MPa.
4) For gas applications with a valve at the lower part (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 purgemeters cannot be manufactured. In this case, we may ask you for details on your specifications.

Note: valve position
1. For liquid, the valve can be set at either the inlet or outlet side.

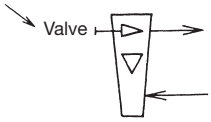
2. For gas,
(1) When the measuring gas has a pressure of 1 atm:



(2) When the measuring gas is pressurized:



(3) When the measuring gas is vacuum:

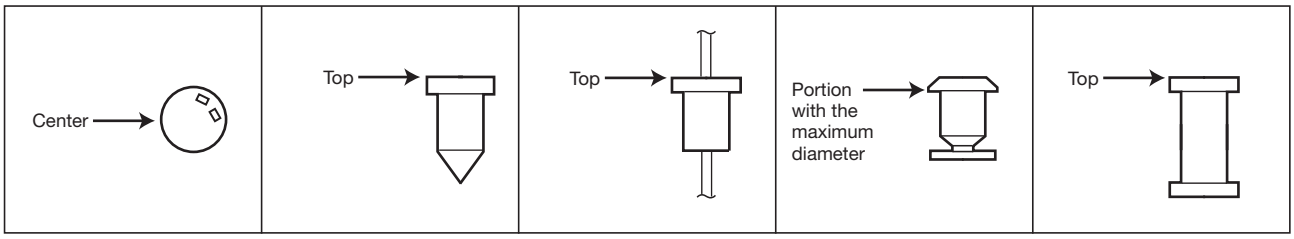


⑧ Density of gases Tips

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

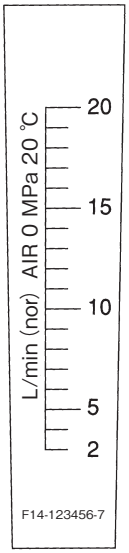
⑨ Float reading position Tips

・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 Tips

・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).



⑪ Quick model selection Tips

・"INDEX & QUICK REFERENCE" on page 1 is useful.

⑫ Compensation calculation Tips

・An indication error will occur to the purgemeter 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

$$C\rho=\sqrt{[\rho_d(\rho_f-\rho)]/[\rho(\rho_f-\rho_d)]}$$

C_ρ : Conversion coefficient
ρ_d : Design density (See the approval drawing.)
ρ : Design liquid density (density of the liquid to be measured)
ρ_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 =
$10\times\sqrt{[1.0\times(7.9-0.8)]/[0.8\times(7.9-1.0)]}$
=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

$$C\rho=\sqrt{\rho_d/\rho}$$

C_ρ : Density conversion coefficient
ρ_d : Design density (kg/m^3 (nor)) (See the approval drawing.)
ρ : Density of measuring gas (kg/m^3 (nor))

● Pressure conversion

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

$$Cp=\sqrt{(P+0.1013)/(P_d+0.1013)}$$

When a graduation is for operating indication:

$$Cp=\sqrt{(P_d+0.1013)/(P+0.1013)}$$

Cp : 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)" :

$$Ct=\sqrt{(t_d+273)/(t+273)}$$

When a graduation is for operating indication:

$$Ct=\sqrt{(t+273)/(t_d+273)}$$

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

・Example of compensation calculation

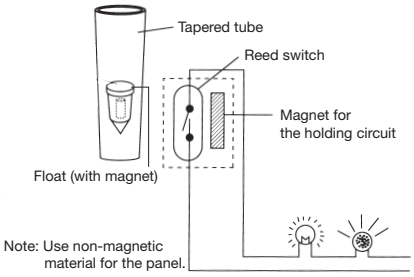
The flow meter designed under the conditions of 1.293 kg/m^3 (nor) of air at 20°C and 0.3 MPa indicates 10 L/min (nor) when carbon dioxide of 1.977 kg/m^3 (nor) is fed at 40°C and 0.6 MPa.

Actual flow rate of carbon dioxide $=10\times C\rho\times Cp\times Ct$
$=10\times\sqrt{1.293/1.977}$
$\times\sqrt{(0.6+0.1013)/(0.3+0.1013)}$
$\times\sqrt{(20+273)/(40+273)}$
=10.34 L/min (nor)

Alarm Output Unit

REED SWITCH TYPE Purgemeter with alarm Code A B C D

P series purgemeters 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 VAAC, 10 WDC
Max. voltage: 125 VAC, 100 VDC
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).

Reset span

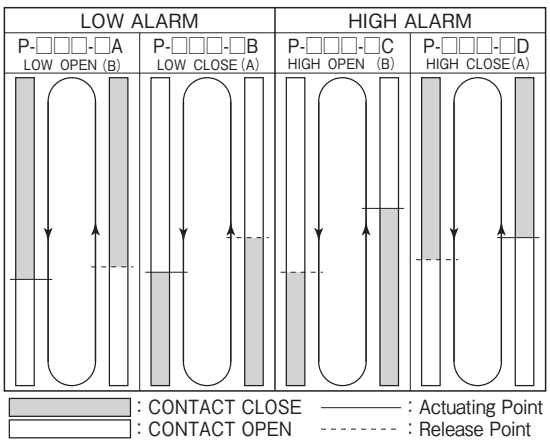
Model	Reset-Span※ (%F.S.)
P-100,P-200,P-821	25
P-510,P-520,P-530,P-620,P-772, P-773,P-774,P-823,P-830,P-060	20

※Depends on the scale length.

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



P-510 purgemeter with a reed switch

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-803SH-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℃

Any purgemeters that can be equipped with the general type reed switch can also accept a UL-approved reed switch.

CE marking

Purgemeters 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 >

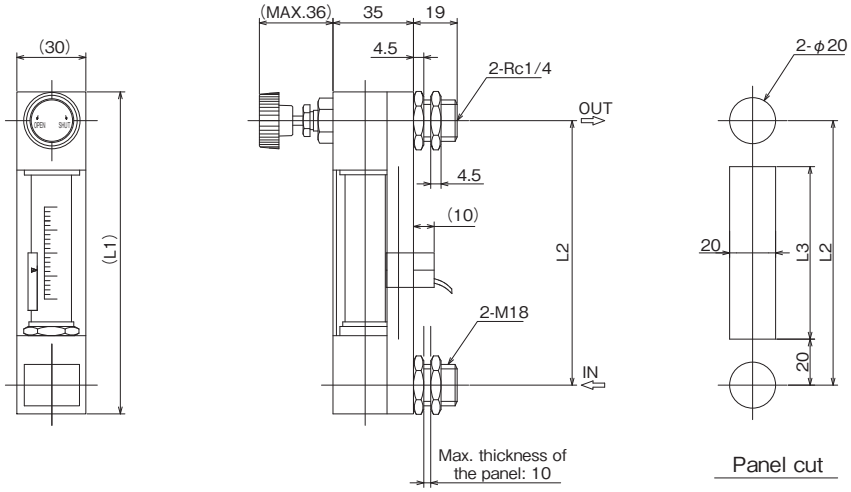
1. EMC directive (2004/108/EC)
   Purgemeters with a reed switch have no substrate with electronic components, and so do not generate electromagnetic noise. Note that we cannot determine the effects of extrinsic noise because it depends on your load and installation conditions.
2. Low voltage directive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

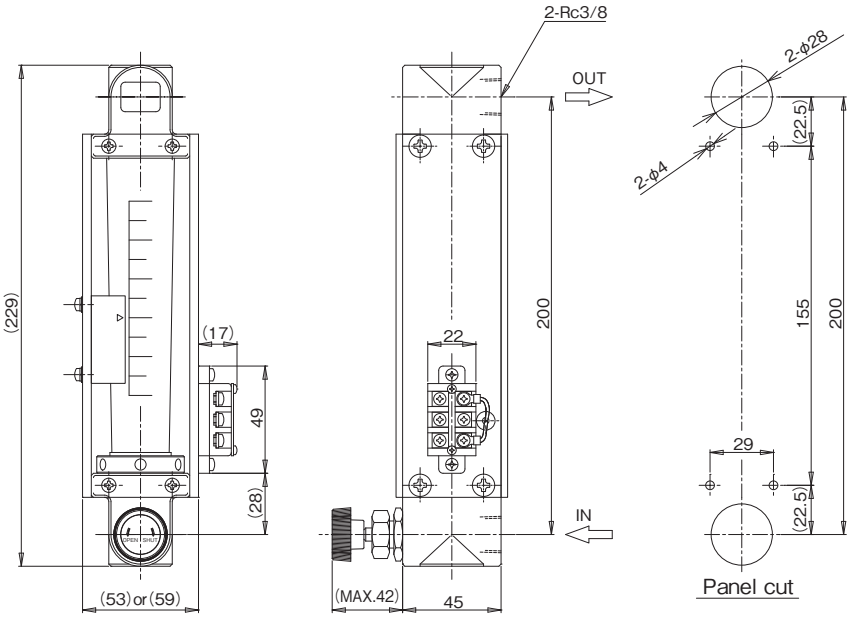
Standard dimensions of purgemeters with reed switch alarm

P-100-U□-4N-R2
P-200-U□-4N-R2

	L1	L2	L3
P-100-U □ -4N-R2	140	115	75
P-200-U □ -4N-R2	225	200	160



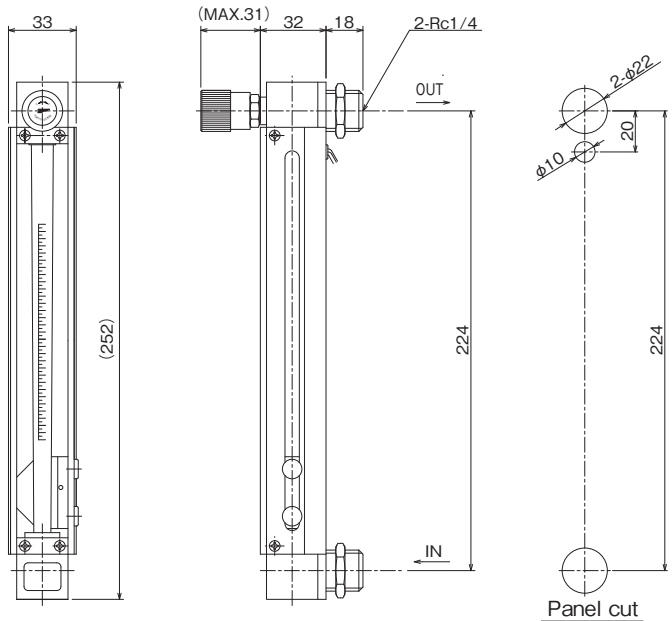
P-510-L□-4N-R3



P-823-3□-6F-R2

High: open (off)
Low: close (on)

High: close (on)
Low: open (off)



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 purgemeters 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 purgemeters will upgrade from the local indication to the remote flow monitoring at low cost.

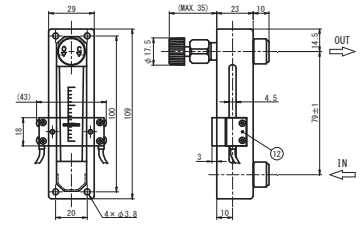
■ STANDARD SPECIFICATIONS

Applicable purgemeters
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)

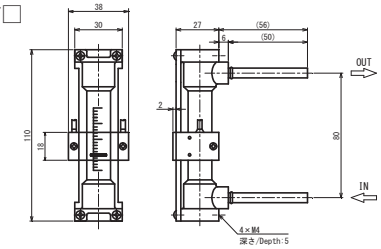
● Optical alarm unit type

Dimensions of purgemeters with alarm

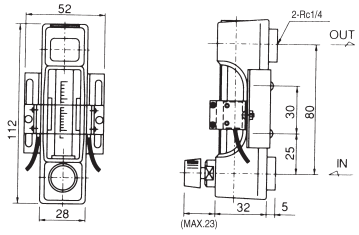
P-710-UE-GT-R1



P-771-0E-TW-T□



XP-□□-LE

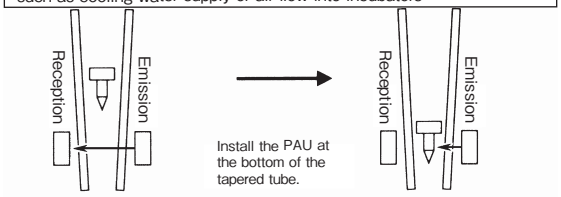


P-771 purgemeter equipped with the optical alarm unit

■ 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



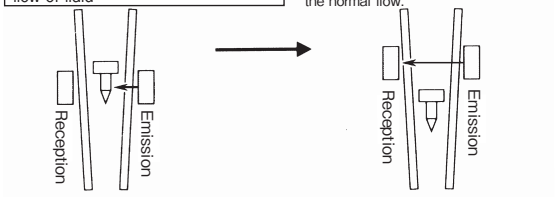
While the fluid is flowing normally, the light passes to the receiver and the alarm is not activated.

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.

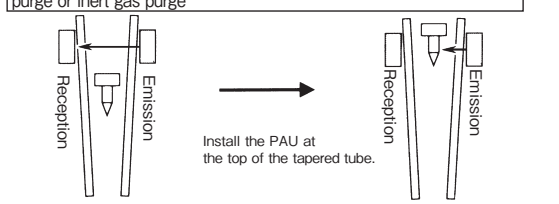


Normal flow keeps cutting off the light, activating alarm.

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



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.

* Specification is subject to change without notice.

TOKYO KEISO CO., LTD.

Head Office : Shiba Toho Building, 1-7-24 Shibakoen, Minato-ku, Tokyo 105-8558
Tel : +81-3-3431-1625 (KEY) ; Fax : +81-3-3433-4922
e-mail : overseas.sales@tokyokeiso.co.jp ; URL : https://www.tokyokeiso.co.jp