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■ Summary

This purge sets are composed of metal tube rotameters or glass tube rotameters with constant flow valves, which can be used for the measurement and keep flow rate of gases or liquids constantly output.

Float flowmeter featured with safety and reliable, measuring precise and steady, so that this series purge sets keep flow rates output constantly even when the supply or load pressure changes, which can be widely used for the transmitters cleaning among the industries of petroleum processing, chemical, ethylene, fertilizer, steel, chemical fiber and textile and so on., also can be used among the processing control of differential pressure level measurement.

The design of this series products can be fulfill of the industrial control requirements, installation applicable condition also can be fulfill of the requirements of instrument measuring technology.



■ Features

- ☆ single-path, two-path, multipath (optional);
- ☆ single meter installation, panel mounting, cabinet installation (optional);
- ☆ 1/4" NPT, swagelok, screw, flange connection (optional);
- ☆ 6mm, 8mm, 10mm, 15mm, 25mm pipeline;
- ☆ Switch signal output, 4-20mA signal output (optional);
- ☆ Metal structure, simpleness, hardness, beauty;
- ☆ Can test processing temperature below 200°C;
- ☆ Can test processing pressure below 6.4MPa;
- ☆ Flowrate, pressure (optional) indicate on-site;
- ☆ Adopts to our company LZ series float flowmeter;
- ☆ Precision micro needle valves are optional, convenient, flexible, applicable for flowrate field adjustment.

Working Principle

Learn from the measuring structure diagram(eg:constant inlet pressure) can know that:

The force upward elastic membrane is:
 $P2A+P1a$ _____ (1)

The force upward elastic membrane is:
 $P3A+P2a+F$ _____ (2)

When the pressure is in balance,means that (1)=(2)

$P2A+P1a=P3A+P2a+F$ _____ (3)

As the differential pressure of pressure regulator membrane $P2-P3$,we can get the equation as following:

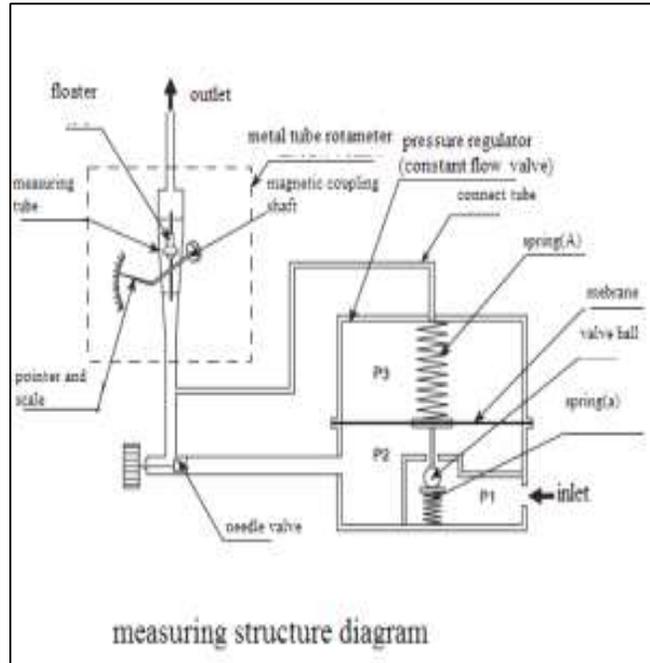
$P2-P3=F/A-a/A(P1-P2)$ _____ (4)

Because of $a < A$,the $a/A(P1-P2)$ can be negligible,as F and A are constant value,so:

$C(\text{constant value})=P2-P3$

When the measuring media is not compressed liquid,RE pressure regulator can be applicable for the outlet pressure changes.Said for (4),as $P1$ is constant, $P3$ is variational,when $P3$ change to: $P3 + \Delta P$, $P2$ change to: $P2 + \Delta P$,so that:

$C(\text{constant value})=P2-P3$



Technical Parameter

| Meter Type | LZB(equip with glass tube float flowmeter) | LZZ(equip with metal tube float flowmeter) |
|----------------------------|--|--|
| Measuring range(100%valve) | | |
| Water:20°C | 3-100l/h | 25-4000l/h |
| Air:0.1MPa,20°C | 50-3400l/h | 0.7-80m³ /h |
| Measuring range ratio | 10:1 | 10:1 |
| Accuracy grade | 4 | 1.5 |
| Flow scale | Actual flow scale | Actual flow scale |
| Medium pressure | Max.1.0MPa | Max.6.4MPa(special demand can order) |
| Medium temperature | -20°C~100°C | -20°C~200°C |
| Ambient temperature | -20°C~60°C | -20°C~60°C |
| Contact medium pressure | 304,316 | 304,316 |
| Body | Plastic,PVC | Cast aluminium,epoxy resin coating |
| Process connection | | |
| Swagelok | Φ 6mm, Φ 8mm, Φ 10mm | Φ 6mm, Φ 8mm, Φ 10mm |
| Screw | 1/4"NPT,1/2"NPT | 1/4"NPT,1/2"NPT |
| Flange | 1/2"ANSI 150lb,DIN2501,HG,GB | 1/2"ANSI 150lb,DIN2501,HG,GB |
| Special | According to users' demand | According to users' demand |



■ Flowrate table

Calibration Conditions: Water: 20°C; Air: 20°C 0.1013MPa(abs), actual medium measuring range will change according to conditions.

◆ Equip with glass tube float flowmeter

Table 1

| No. | Diameter of valve central spindle | Water l/h(100%) | Air l/h(100%) | Pressure loss(kPa) |
|-------|-----------------------------------|-----------------|---------------|--------------------|
| QF005 | 1.0 | — | 50 | 1.2 |
| QF010 | 1.0 | 3 | 100 | 1.4 |
| QF015 | 1.0 | 5 | 150 | 1.5 |
| QF040 | 2.5 | 10 | 400 | 1.8 |
| QF080 | 2.5 | 25 | 800 | 3.5 |
| QF125 | 2.5 | 40 | 1250 | 6.5 |
| QF200 | 2.5 | 60 | 2000 | 13.0 |
| QF300 | 2.5 | 80 | 2500 | 23.5 |
| QF340 | 4.5 | 100 | 3400 | 40.0 |

◆ Equip with metal tube float flowmeter

Table 2

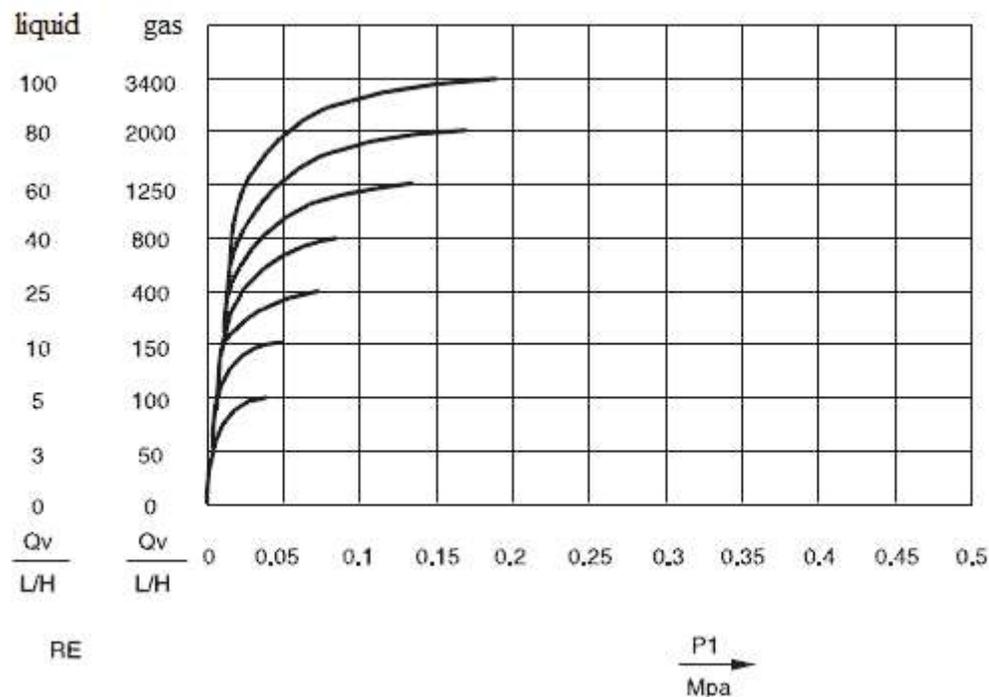
| DN | No. | Water l/h(100%) | Air l/h(100%) | Pressure loss (kPa) |
|----|--------|-----------------|---------------|---------------------|
| 15 | QF15.1 | 25 | 0.7 | 1.5 |
| | QF15.2 | 40 | 1.0 | 1.5 |
| | QF15.3 | 60 | 1.5 | 1.5 |
| | QF15.4 | 100 | 2.2 | 1.5 |
| | QF15.5 | 160 | 3.6 | 1.5 |
| | QF15.6 | 250 | 5.5 | 3.0 |
| | QF15.7 | 400 | 10 | 3.0 |
| | QF15.8 | 630 | 14 | 3.5 |
| 25 | QF25.0 | 630 | 14 | 1.5 |
| | QF25.1 | 1000 | 22 | 1.5 |
| | QF25.2 | 1600 | 35 | 1.5 |
| | QF25.3 | 2500 | 50 | 3.0 |
| | QF25.4 | 4000 | 80 | 3.5 |

◆ Equip with micro flowrate metal tube float flowmeter table same as table1

◆ Equip with RE and RA constant flow valve

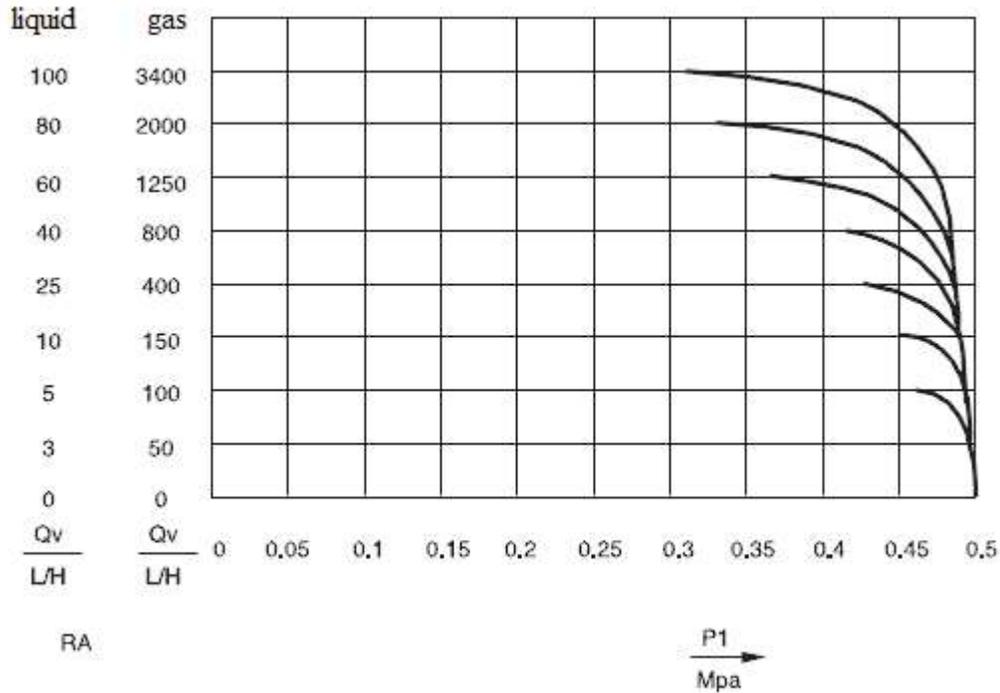
| Constant flow valve model | RE | RA |
|--|---|---|
| Applicable condition | Constant inlet pressure change P1 | Constant outlet pressure change P2 |
| Medium state | Liquid or gas | Liquid or gas |
| Medium temperature | | |
| Standard | 80℃ | 80℃ |
| Special | 150℃ | 150℃ |
| Medium pressure | | |
| Standard | 1.0MPa | 1.0MPa |
| Special | 6.4MPa(changeable according to demand) | 6.4MPa(changeable according to demand) |
| Controllable pressure range | 0.02-0.5MPa | |
| Differential pressure | 0.02-0.045MPa | |
| Control accuracy | 4.0%(equip with glass tube float flowmeter) | 4.0%(equip with glass tube float flowmeter) |
| | 1.5%(equip with metal tube float flowmeter) | 1.5%(equip with metal tube float flowmeter) |
| Min. working pressure | 0.005MPa(see curve table) | 0.005MPa(see curve table) |
| Differential pressure under min.working pressure | 0.002-0.004MPa(see curve table) | 0.003-0.005MPa(see curve table) |

RE inlet pressure change constant flow valve characteristic curve



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RA outlet pressure change constant flow valve characteristic curve



■ Typical Application

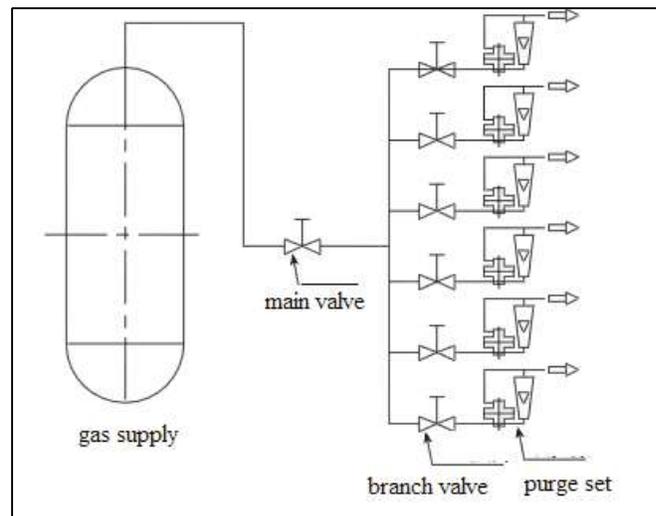
◆ Typical applications on the conditions of gas supply pressure change

As shown to the right:According to needs separate the main pipeline supplied gas into many branches. When close or adjust some of branches gas flow can cause the change of supply gas pressure in main pipeline. The single-path purge set fixed in branch can measure flow precisely and keep the output flow constantly.

Recommended products model:

LZB-()DK/RE ... Equip with glass tube flowmeter purge set

LZZ-()/RE ... Equip with metal tube flowmeter purge set



◆ **Typical applications on the conditions of outlet pressure change—**

liquid level measurement

As shown to the right: when A with constant flow gas, the gas will discharge the medium insert in liquid pipeline and form into steady bubble, meanwhile the pressure between pipe A and B will be equal with liquid pressure on port B.

If the pressure of B is P_1 , air pressure is P_0 ,

So: $P_1 - P_0 = \Delta P$, meanwhile

$P_1 = \gamma h + P_0$, so

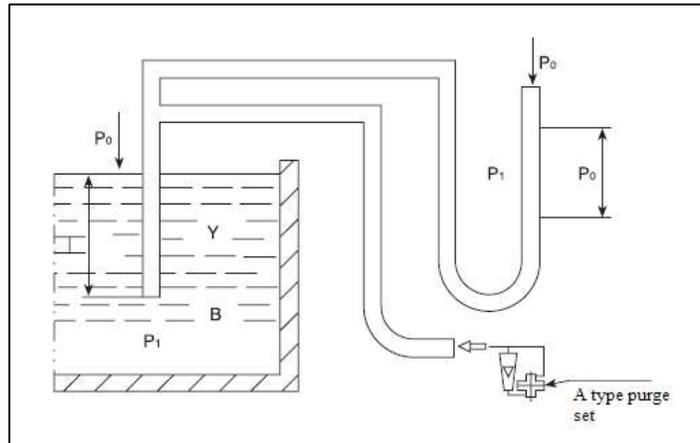
$P_1 - P_0 = \gamma h = \Delta P$

So on the condition of knowing medium density measure ΔP with differential pressure transmitter or pressure meter, then can measure the liquid level h .

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LZZ-()RA ... Equip with metal tube flowmeter purge set



◆ **Typical applications on the conditions of outlet pressure change—**

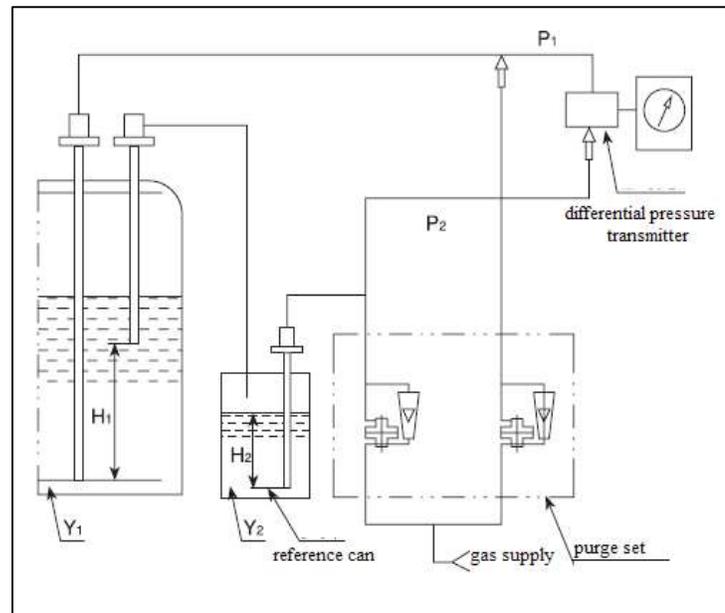
density measurement

As show to the right: If have known the measuring medium liquid level H_1 and reference medium liquid level H_2 , also know reference medium density γ_2 , measure differential pressure with differential pressure transmitter, then can measure the medium density γ_1 .

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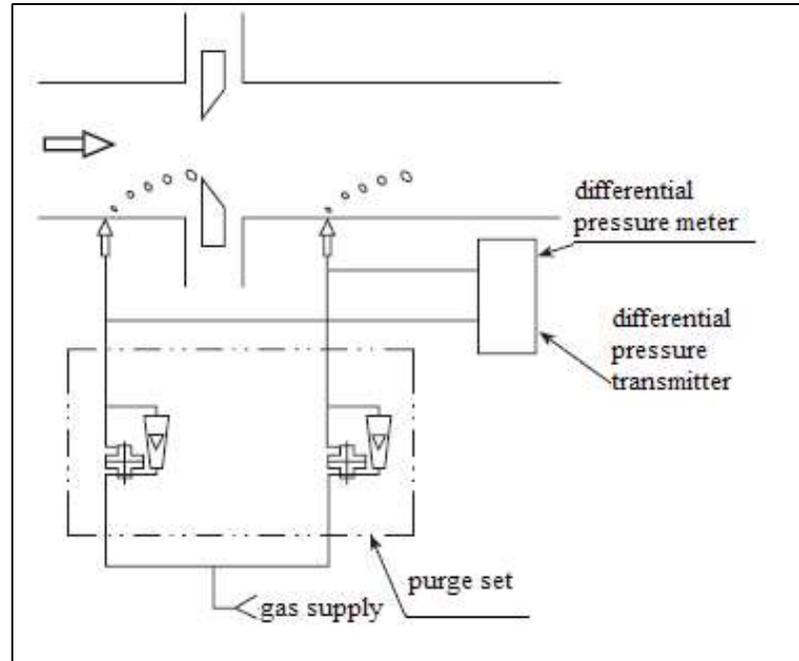
◆ Typical application when measure flow with differential pressure transmitter

When measure corrosive liquid or liquid with solid particle or gas flow with dust, the lead pressure capillary may be clogged. Adopt with dual-circuits purge set to wash the two pressure ports, which can make sure the solid particle or dust will not clog the pressure port or lead pressure tube.

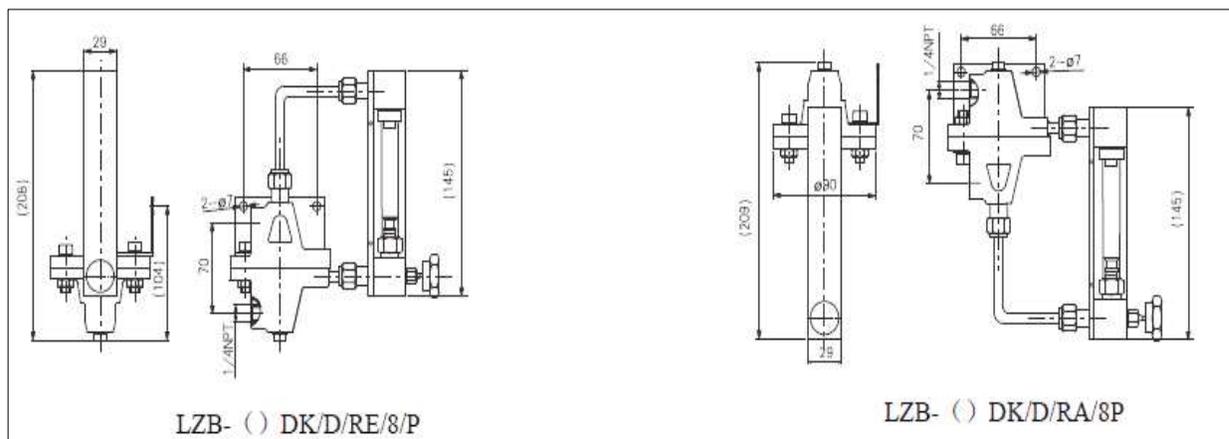
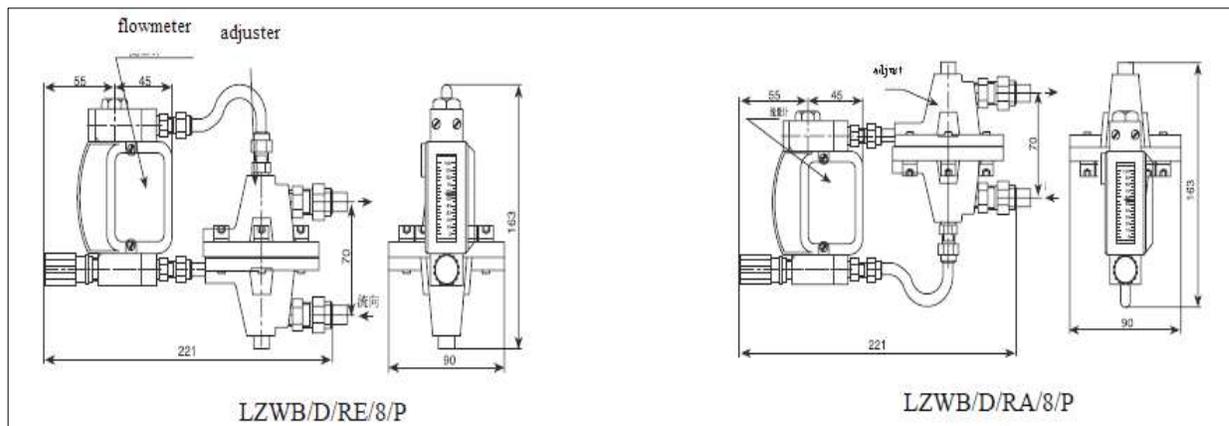
Recommended products model:

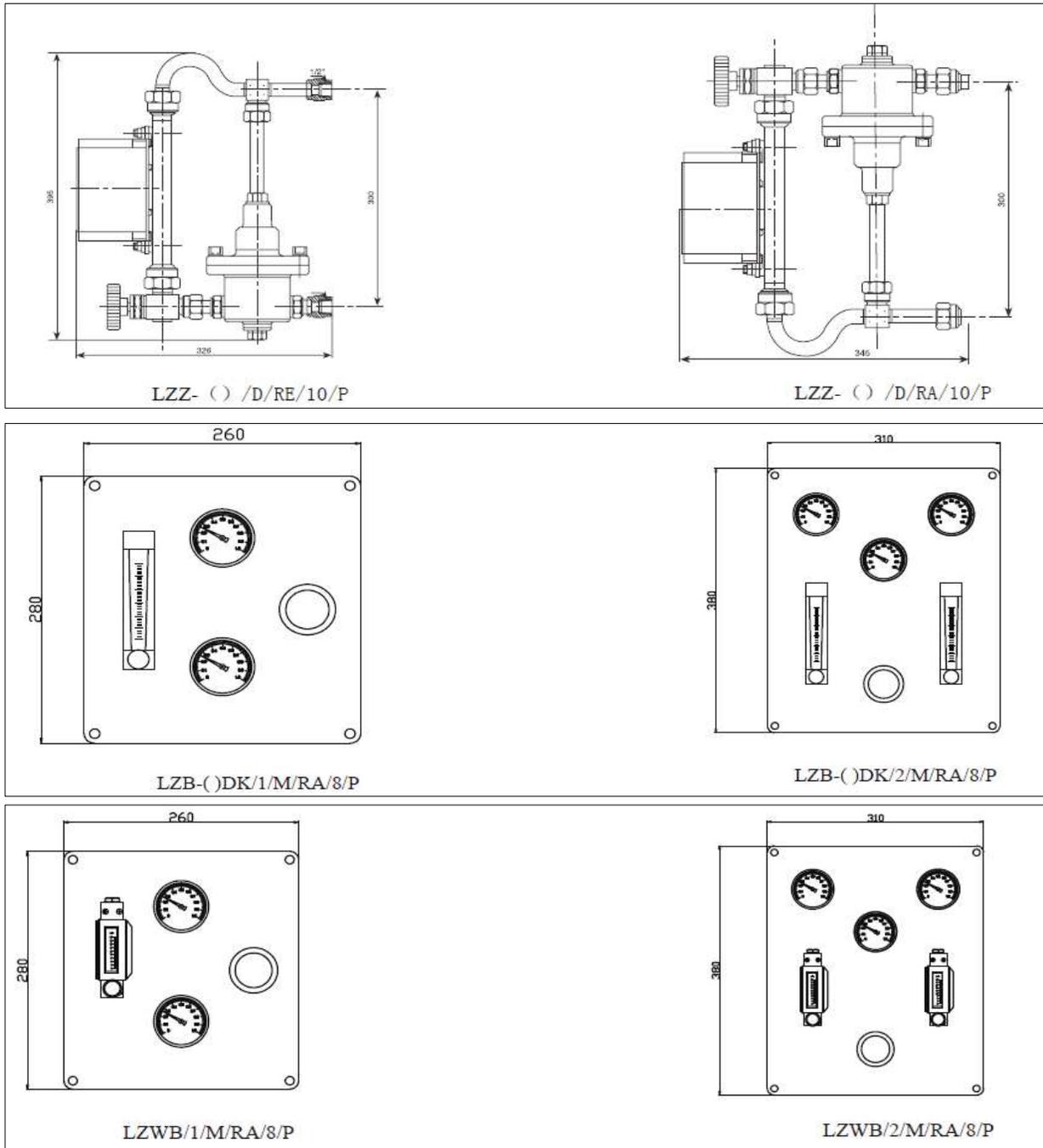
LZB-()DK/RE ... Equip with glass tube flowmeter purge set

LZZ-()/RE ... Equip with metal tube flowmeter purge set



■ Overall Size





■ Installation Precautions

- Please instal purge set in proper position,to make sure that debug,clean and repair conveniently.
- Because of instal magnetic coupling transfer system in purge set floater,to make sure that the disturbing magnetic field from other equipment during operation will not influence the flowmeter measuring result.
 - When instal,please add fixed support in proper position in order to keep the purge set steady.
 - Install size shall not exceed the given size more or less,to avoid the pressure from stretch or



compress work in purge set.

- When there are iron magnetic particles in liquid medium,must filter the magnetic particles before installing purge set.
- Must make sure the flow direction of medium same as the requirement of flow purge set,when instal flowmeter please close all of the fine-tune needle valves.
- Before operation,please empty and clean pipeline to avoid impact force,shall open valve slowly adjust to working pressure,shall change flowrate from adjust open of valves,avoid impact force to floater which can cause measuring parts damage.

■ Type Selection

| LZ series purge set | | | |
|--|--|--|--|
| 1.Flowmeter model:LZ | | | |
| 2.Class model | | | |
| B | Equip with glass tube flowmeter(select DK series in general) | | |
| Z | Equip with metal tube flowmeter | | |
| WB | Equip with micro flow metal tube flowmeter | | |
| 3.Purgig form(If one meter,this code shall not select) | | | |
| 1 | Single-way purge | | |
| 2 | Double-way purge | | |
| 3 | Multi-way purge(Special demand can order) | | |
| 4.Instal type | | | |
| D | Single meter type | | |
| M | Faceplate type | | |
| 5.Pressure adjustment | | | |
| RE | Inlet pressure adjustment | | |
| RA | Outlet pressure adjustment | | |
| 6.Procedure connection | | | |
| F | Flange connction | | |
| S | Screw connection | | |
| 6 | Φ 6mm sleeve chuck | | |
| 8 | Φ 8mm sleeve chuck | | |
| 10 | Φ 10mm sleeve chuck | | |
| Others | According to customers' demand | | |
| 7.Materials | | | |
| P | 304 | | |
| R | 316 | | |
| others | According to buyers' demand | | |
| 8.Others | | | |
| L | With pressure indicator | | |
| G | With magnetic filter | | |