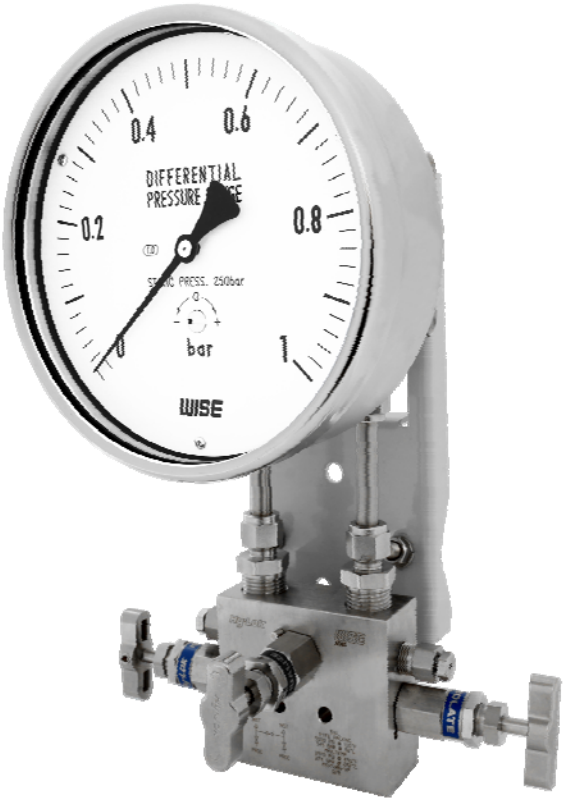
Instruction Manual

ITEM : DIFFERENTIAL GAUGE

MODEL : P620, P630 SERIES



WISE® WISE Control Inc.
www.wisecontrol.com

Instructions for proper and safe operation

For the right use and safety of this product, please read through this manual prior to use.

Handling error may cause device trip, injury, or disaster.

WARNING

1. Do not impose excessive pressure beyond the allowance.
2. Do not use corrosive measuring fluid.
   This may cause pressure measuring element damage or rupture, resulting in measuring spill, eventually human injury or surrounding destruction.
3. Avoid excessive load, vibration, or shock. The glass tube may be broken.
   This may cause product damage or rupture to spill measuring fluid, resulting in human injury or surrounding destruction.
4. Keep the working temperature range.
   In excess of the working temperature range, the measuring part may be damaged to destroy the surroundings.
5. To detach the measuring instrument, be sure to close the valve to block the measuring fluid.
   Measuring fluid spillage may destroy the surroundings.
6. When you are using oxygen for the measuring fluid, rely on the Use No Oil manometer.
   Any oil reside in an ordinary product may react with oxygen, causing fire or explosion.
7. During site installation, be sure to follow this manual.
8. Do not modify the product by all means.
   Be sure to consult with us prior to repair.
9. Be sure to close the valve and shut off the pressure before you open this product case.

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1. Generals

Both P600 Series differential gauge and contact type differential gauge are precision indicating instruments that are using an orifice not only to measure the differential pressure of flowmeters or filters but also to measure the water level of storage tanks.

Figure 1 shows the product appearance.

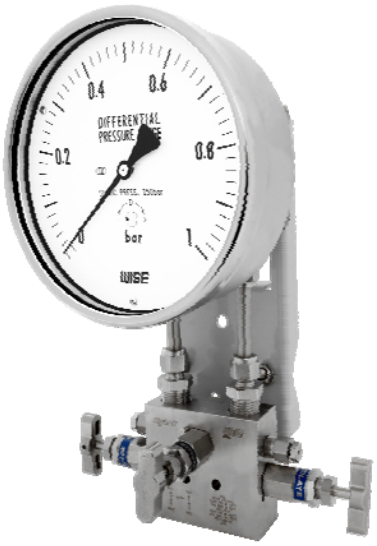


Figure 1

1.1 Spec. and Size

1) Indicating Instrument Size : 100mm, 150mm

2) Precision : ±1.5%(or ±1.0%) of Full Scall

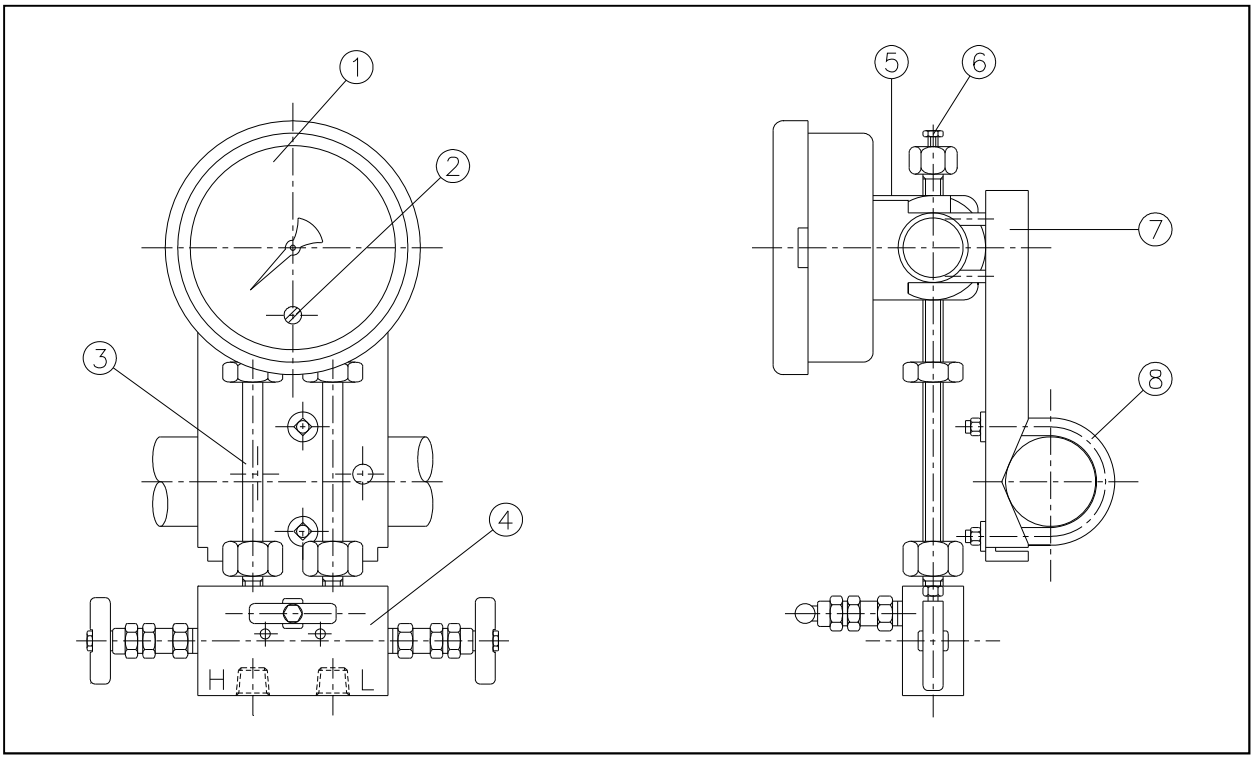
3) Max Working pressure : P620 Series - Max 50bar
P630 Series - Max 250bar

4) Liquid Contact Part Material : Measuring Element - 316SS
Housing - 316SS or MONEL

5) Connection Port Size : NPT1/4"
(But, to fix 3-way valves, you may use PT1/2" and NPT.)

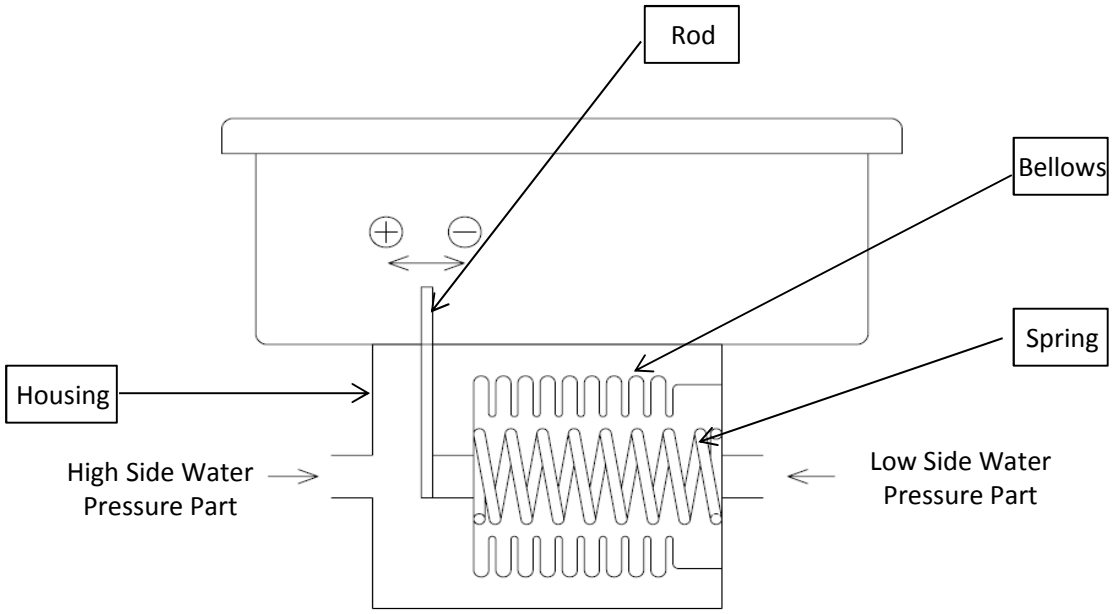
6) Standard Accessories : 3-Way Manifold (316SS)
2" Mounting Bracket (Silver Coating Iron)

1.2 Structure and Function



No.	Name	Function	Remark
1	Differential Gauge	Indicate the gap of pressure gap and flowrate between 2 points.	100, 150mm
2	0 Adjustment Screw	Adjust 0 point by the fixing position.	
3	Impulse Line	Differential gauge housing and 3-way manifold connection pipe.	316SS
4	3-Way Manifold	To protect the differential gauge, it is to open valves one by one at the time of water pressure.	316SS
5	Differential Gauge Housing	A measuring element is fixed to measure the pressure.	316SS
6	Air Outlet	Discharge air in the pipe to the outside at the time of water pressure.	
7	Fixing Metal Part	Attach a differential gauge to a measurement point.	Silver Coating Iron
8	U-bolt	Attach fixing metal parts to the 2" pipe.	

1.3 Working Mechanism



NO	Name	Function	Remark
1	Rod	Transmit the bellows displacement to the differential pressure indication part.	
2	Bellows	Separate the high side from the low side and make the displacement according to the water differential pressure.	
3	Housing	Protect the main water pressure part, providing it with a resistance force.	
4	Spring	Create a certain displacement according to the differential pressure range.	

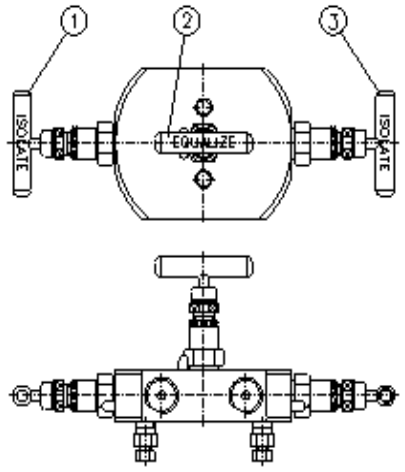
1) When a pressure is imposed both on the high side water pressure part and the low side water pressure part, the bellows will be shrunk by the sum of 2 differential pressures.
   Then, the rod connected to the bellows will move horizontally and the apparatus connected to the differential gauge indication part will rotate the caliber by the amount of displacement to indicate the differential pressure value.
2) A bellows has a low side and a high side to create a certain displacement in combination with the spring according to the differential pressure range.
3) Three kinds of bellows are working whose thickness and appearance are differentiated by their differential pressure range. (0.11t, 0.15t, and 0.25t)
4) A spring is a device to create a certain differential pressure according to the differential pressure range and it has 12 kinds.

2. Use and Operation

2.1 Use

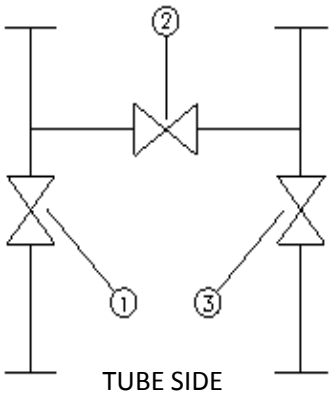
1) To prevent differential gauge measuring set damage, operate the differential gauge along with the 3-way manifold all the time and check both the high and low sides before it is installed on the manifold.
2) The differential gauge should be installed as a higher position than the pressure diffuser during gas differential pressure measurement and lower than it during liquid differential pressure measurement.
3) Connect the measuring tube pressure diffuser in such a way to set the upstream to the high pressure and the downstream to the low pressure. During water level checking, set the lower part to the high side and the upper part to the low side for the pressurizing tank but connect the lower part to the high side and open the low side to the atmosphere for the open tank for atmosphere.
4) In case of corrosive fluid, you must choose anticorrosive diaphragm or side diaphragm.
5) In case you choose a side diaphragm and its high side and low side are not installed at the same point, be sure to conduct zero point adjustment after differential gauge installation. (To conduct zero point adjustment, remove the differential gauge front cover and turn the front zero point adjustment screw until it is adjusted.)
6) In case of operation in hot fluid, use a seal pot to keep the differential gauge incoming fluid under the set temperature.

2.2 Operation



Layout

3-WAY MANIFOLD



① high side valve

② neutral side valve

③ low side valve

(Fig. 2)

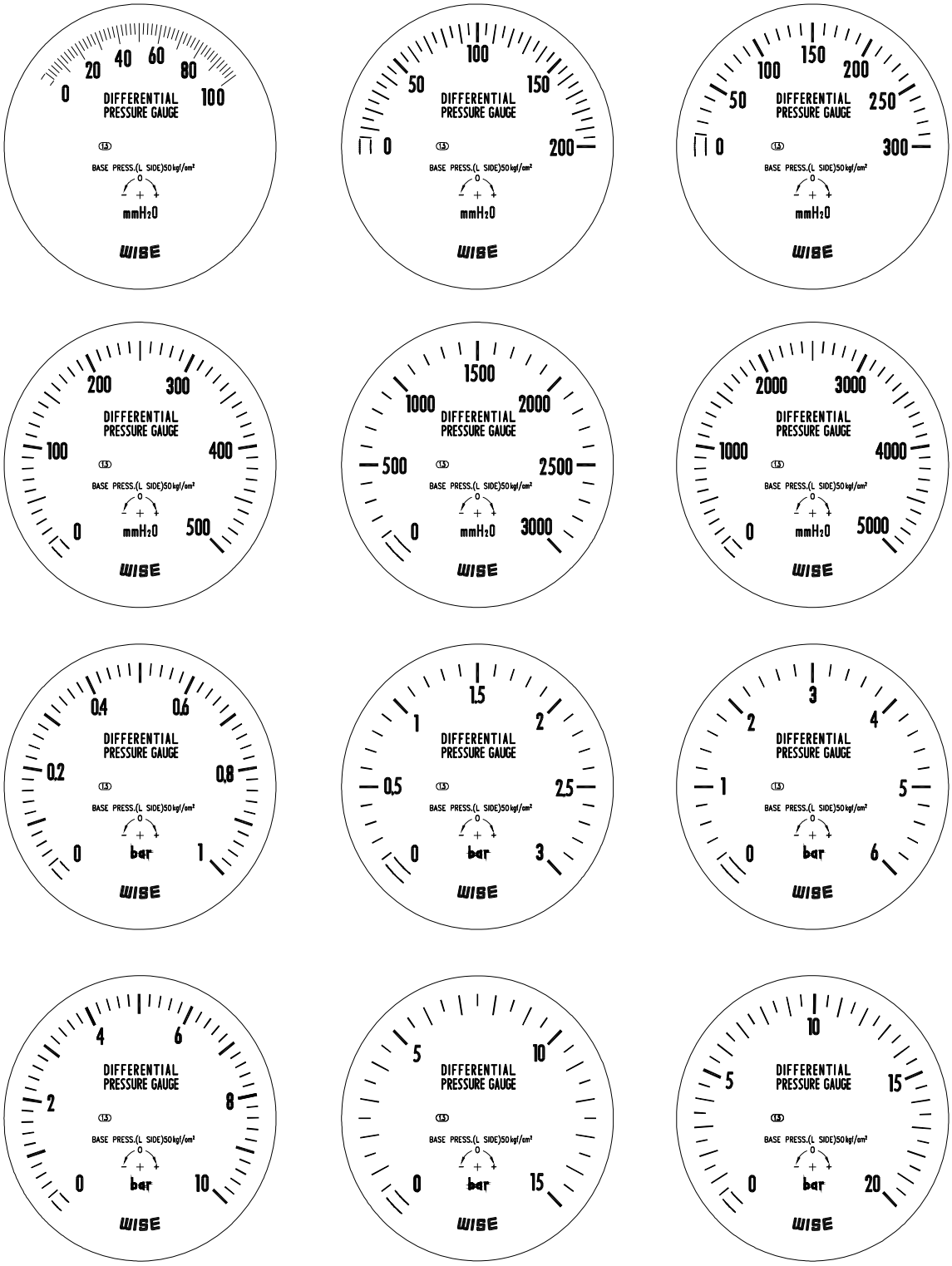
1) Prior to initial installation of differential gauges, all the 3 way valves shall be closed.

2) Upon installation, ② Open the equalizing valve for the first time and ① open the high pressure valve.

   At this time, make sure the caliber is set to 0. In case of an error, retry zero point adjustment.

3) Prior to the next valve handling, be sure to open the air outlet on top of the differential gauge so that the air inside the pipe or differential gauge housing is fully discharged. The air normally creates an differential gauge indication error.

4) Next, ③ open the low side valve, ② close the equalizing valve, and check if the indicating instrument reading is normal before main operation.

5) If you want to remove a differential gauge from the tube due to its trip, ② open the equalizing valve, ③ close the low side valve and ① close the high side valve, ② close the equalizing valve, and release the remaining pressure in the differential gauge to the atmosphere through the air outlet, and then remove the differential gauge or stop main operation.

2.3 Standard Alphabetical Keypad Drawing