

USER MANUAL

PRODUCT NAME : SOLID FRONT GAUGE

MODEL : PN257, PN359



WISE[®] WISE Control Inc.

Instructions for proper and safe operation

Please read instructions carefully prior to using the instrument for proper and safe operations.

Mishandling could cause device malfunctions and result in disastrous injuries or accidents.

WARNING

1. Do not exceed the pressure range allowed.
2. Do not use it to measure the pressure of corrosive fluid.
Damage or rupture of pressure gauge may cause release of fluid which could lead to bodily injury or destroy surrounding area.
3. Do not apply excessive load, vibration or impact.
Damage or rupture of pressure gauge may cause release of fluid which could lead to bodily injury or destroy surrounding area.
4. Please use within the specified temperature ranges.
Exceeding the temperature range may cause disruption in nearby area due to damage to the temperature indicator.
5. Make sure to turn off the valve to prevent the measuring fluid leak when dismounting the gauge. It may lead to harming the surrounding area.
6. Use a pressure gauge with no oil in an environment with hydrocarbon or oxygen.
Oil contained in the gauge may react with oxygen which may be flammable or explosive.
7. Please always follow the mounting instructions in the manual in cases of field installation.
8. Do not make any modifications to the product or to add more functions.
Please consult with us for any repair.
9. Do not cut open the oil filler cap outside. .
Condensation may occur in rainy weather.
※ Always open the oil filler cap and depressurize when checking pressure.
10. This product is designed so that its back plate to be released in the event of damaged measuring part. Do not apply excessive impact or turn with hands.

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1. Overview

PN257 is pressure gauge of safety pattern type, Stainless Steel Case and cover material is prevent corrosion or chemical attack is an excellent product.

PN359 is a 4-1/2" pressure gauge of safety pattern type. Its liquid end is of corrosion resistant stainless steel. Case is made of thermoplastic resin (PBTB) which is more durable than stainless steel in corrosive environment.

2. Product characteristic

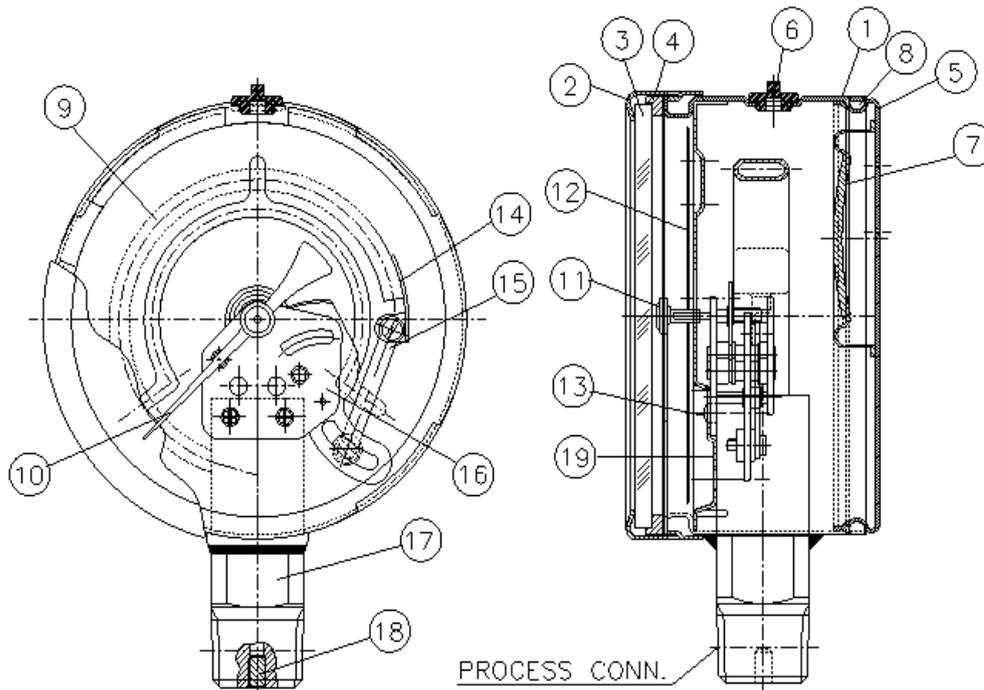
Commonly used pressure gauge often releases measuring fluid from its front when damaged which may cause injury.

The solid front type is safer since it releases measuring fluid through its back.

3. Specifications and standards

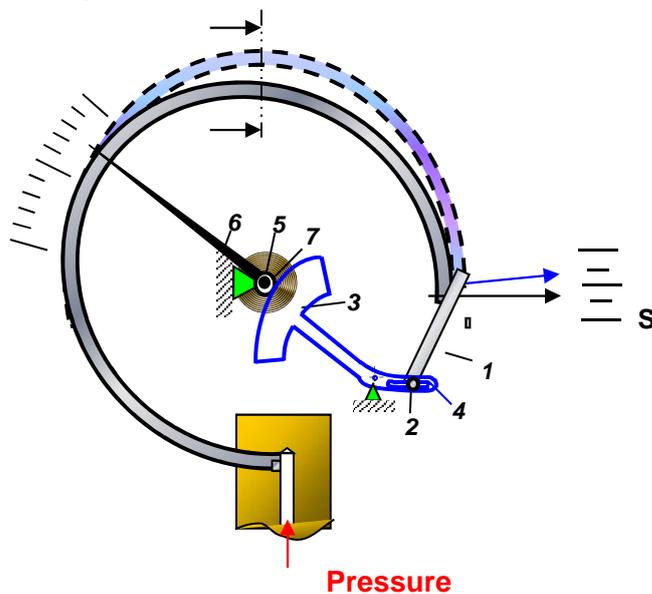
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|--------------------------------|---|
| 1) Nominal diameter | : PN257 : 63, 100, 160mm
PN359 : 4 1/2" |
| 2) Accuracy | : 63mm : $\pm 1.6\%$ of Full Scale
100, 160mm : $\pm 0.5\%$ & $\pm 1.0\%$ of Full Scale
4 1/2" : $\pm 0.5\%$ & ± 1.0 of Full Scale |
| 3) Pressure range | : 63mm : 0 ~ 1000bar
100, 160mm, 4 1/2" : 0 ~ 2000bar |
| 4) Operating pressure | : Steady 75% of Full Scale
: Over Range Protection : 130% of Full Scale |
| 5) Wetted part material | : 316SS or MONEL |
| 6) Contact part specifications | : 63mm : 1/8", 1/4" PT ,NPT & PF
100, 160mm, 4 1/2" : 1/4", 3/8", 1/2"PT ,NPT & PF |
| 7) Operating temperature | : Ambient. -40 ~ +65 °C without liquid filling
-20 ~ +65 °C gauges with glycerine filling
: Fluid : Max. 200°C (Without liquid filling)
-20 ~ 60°C (With liquid filling) |

4. Names and functions of parts



No.	Name	No.	Name	No.	Name
1	CASE	8	O-RING	15	ROD
2	COVER	9	BOURDON TUBE	16	MOVEMENT
3	SAFETY GLASS	10	POINTER	17	SHANK
4	PACKING	11	POINTER HEAD	18	ORIFICE
5	BACK COVER	12	SCALE PLATE	19	FRONT PLATE
6	CAP	13	CONTROL SCREW		
7	PLATE	14	BOURDON CAP		

5. Principles



1. Pull Rod
2. Pull Rod Control Point
3. Toothed Segment
4. Segment Opening
5. Spiral Spring
6. Pointer

Bourdon tube converts the pressure to displacement, significantly exaggerates and changes the linear displacement to rotation by internal devices of lever and gear.

The displacement of Bourdon tube is in the range of 3 to 4mm and is converted to 270° rotational angle to indicate pressure.

The internal devices and Bourdon tube play the most critical roles.

Consequently, machining accuracy and assembly has to be precise.

In order to protect the internal devices where considerable wear will occur with frequent use: selecting oil filling type or dampening preventive measure is necessary.

6. Maintenance and precautions

1) If corrosive fluid is used, diaphragm of proper material should be used to prevent corrosion. (Fig. 1)

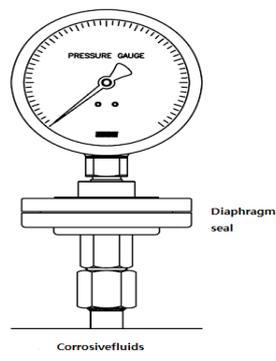
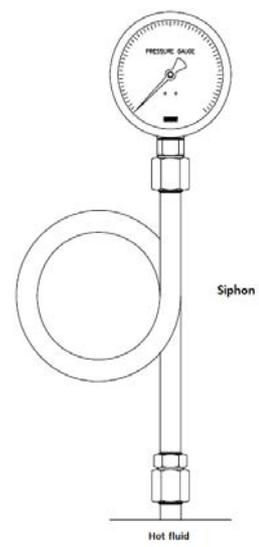


Figure 1

2) In case of remote reading diaphragm type, diaphragm and the gauge has to be installed in the same plane. If not, please calibrate.

Figure 2



3) In case the fluid is hot, install siphon to bring down to proper temperature. (Fig. 2)

- 4) Sudden pressure increase or decrease may cause improper operation of the gauge.
- 5) If there is possible pulsating or impact pressure, installed dampener or gauge protector to prevent excessive pressure. (Fig. 3 & 4)

Figure 3

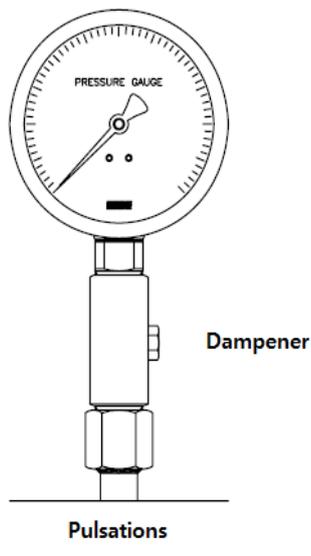
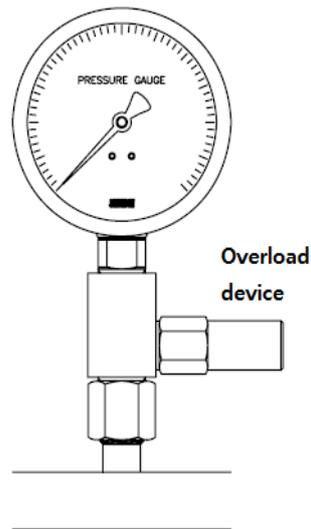
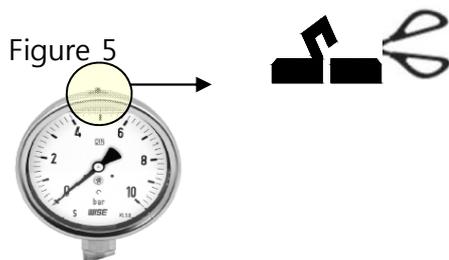


Figure 4



- 6) Inspect regularly once or twice a year to check operational state and attempt.
- 7) If installed outside, do not cut the oil filler cap and release pressure on a regular basis. Condensation may occur in rainy weather. If the oil filler cap has to be cut, do not cut completely but cut rather half way as in Fig. 5 below

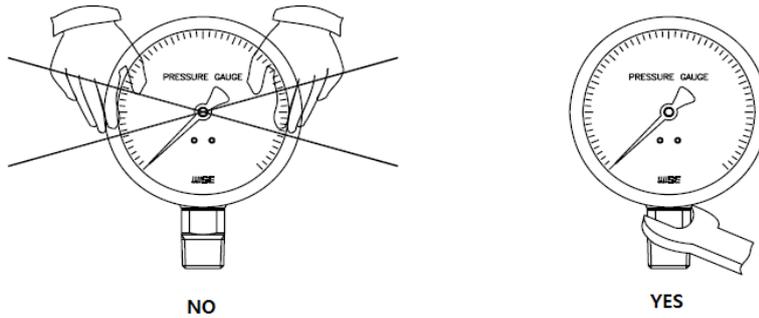


7. Installation

- 1) Avoid places with excessive moisture, vibration, dust or corrosive gas.
- 2) Avoid areas that might exceed the temperature range specified in this manual.
- 3) Protection from lightning or steam should be carefully reviewed & prepared.

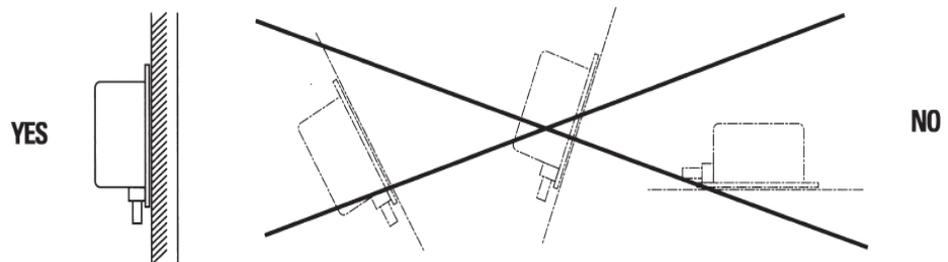
- 4) Avoid areas with direct sun light.
- 5) Use M5 nut if installed on a panel or wall using mounting groove.
If mounting bracket is used, install it firmly.
- 6) Use flexible tube in impulse pipes not to stress the pressure gauge.
- 7) Do not hold the casing to turn. Always use specified wrench as in Fig. 6.

Figure 6



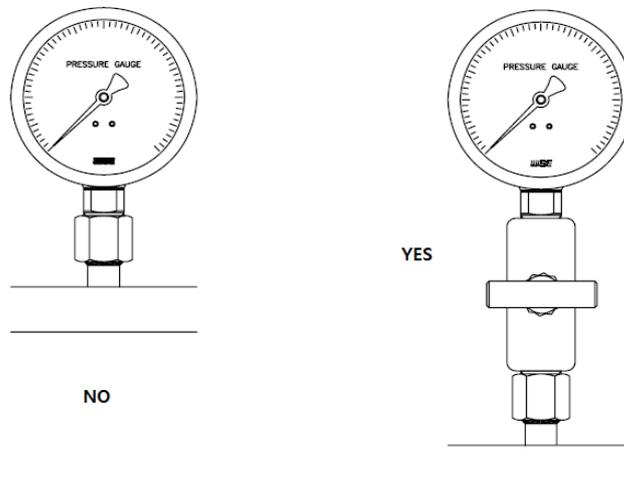
- 8) The pressure gauge operates in vertical position. Always install in vertical position to calibrate. (Fig. 7)

Figure 7



- 9) Install valve when the pressure gauge is first installed so that it is easily dismantled. (Fig. 8)

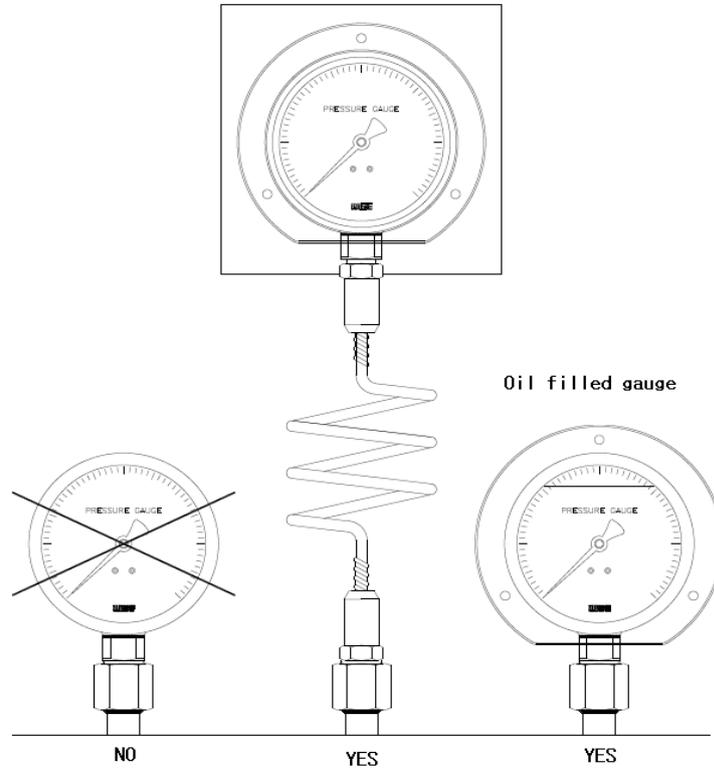
Figure 8



8. Operating instructions

- 1) Check presence of vibration, pulsation or heat in pipe lines and determine whether to use accessory, or select products with capillary or other oil types.

Figure 9



- 2) Always make sure the gauge is calibrated to zero prior to installation.
- 3) Use Teflon tape or gasket on screws for extra firmness.
- 4) Open the valve slowly to check if the pressure is proper after the installation.
- 5) The line of vision should be in line with the gauge when checking the pressure (Fig. 10).

Figure 10

