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# Pressure Gauge Manual

P110  
P111  
P112  
P140  
P163  
P221  
P330  
P335



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## Instruction Manual for Correct and Safe Use

To use the product correctly and safely, please read this manual carefully before operating. Misuse of the product might cause damage and serious injury to the user.

### ■ WARNING

1. Do not apply more pressure than given range.
2. Do not use the product with a corrosive fluid.  
A corrosive fluid can cause the rupture of the measuring elements, and it could lead to injury or destruction.
3. Avoid excessive weight, vibration, and shock on the product.  
These could cause the rupture or damage on the product, and leaked fluid can cause injury to the user and destruction of surroundings.
4. Use the product within the given temperature range.  
Excess use of given temperature range can cause the damage to the product, and leads to the destruction.
5. When removing the products from its operating line, make sure to close the valve before removing to prevent the fluid or other substances to release; it might cause the destruction of surroundings.
6. Use 'use no oil' pressure gauges for the environment where hydrocarbon or oxygen is present.  
General pressure gauges with the left over oil inside can lead to explosion when it touches oxygen or hydrocarbon.
7. When installing the product on site, please follow the instruction manual.
8. Do not modify the product for other purpose. Please consult the manufacturer for repair.
9. Avoid using the product(bourdon tube that welded with brass) on high temperature environment more than 40°C.

## 1. Service Intended

P110 is suitable for general industrial environment. It is low-price but has high quality.

P110 can be used in noncorrosive fluid such as air, oil, gas or water.

P111 is designed to withstand an impact, vibration and pulsation of ammonia equipment for agriculture.

P112 model is designed to withstand an impact, vibration and pulsation of Freon gas line.

P140 model is general type pressure gauge that designed to use on environment that consistently exposed on the air in petrochemical and other chemical treatment process.

P163 model is designed to withstand an impact, vibration and pulsation on heavy duty service environment.

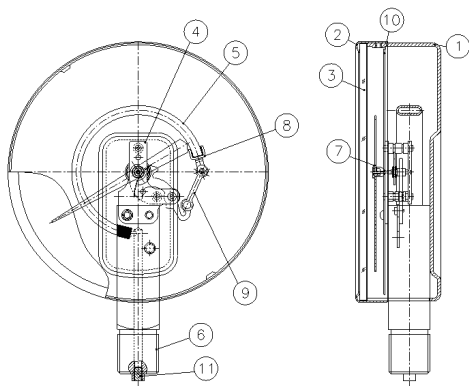
P221 model is suitable for corrosive environment, chemical, petrochemical, refinement, electric and food and beverage industry.

P330 model is designed for petrochemical and other chemical treatment industry.

## 2. Specification and Standard

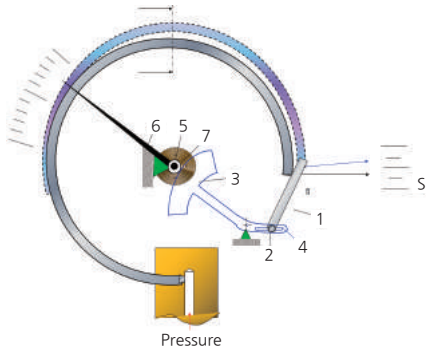
- |                            |  |
|----------------------------|--|
| 1) Standard                | : 40, 50, 60, 75, 100, 150 and 200 mm  |
| 2) Accuracy                | : 40 mm $\pm 3.0$ % of Full Scale<br>50, 60, 75, 100, 150 and 200 mm $\pm 1.5$ % of Full Scale   |
| 3) Working Pressure        | : Steady 75 % of Full Scale<br>Over Range Protection : 130 % of Full Scale   |
| 4) Element Material        | : Brass and Stainless Steel  |
| 5) Process Connection Size | : 40 mm - 1/8"PT, NPT and PF<br>50 mm - 1/8", 1/4"PT, NPT and PF<br>60 mm - 1/4"PT, NPT and PF<br>75 mm - 1/4", 3/8"PT, NPT and PF<br>100, 150 and 200 mm - 1/4", 3/8", 1/2"PT, NPT and PF |
| 6) Working Temperature     | : Ambient -20~65 °C<br>Fluid - Brass Max. -5~40 °C<br>Fluid - Stainless Steel Max. 200 °C  |

### 3. Parts Name and Function



NO.	NAME	NO.	NAME	NO.	NAME
1	CASE	5	BOURDON TUBE	9	ROD
2	COVER	6	SHANK	10	SCALE PLATE
3	SAFETY GLASS	7	POINTER	11	ORIFICE
4	MOVEMENT	8	BOURDON CAP		

## 4. Operating Principle



When pressure is applied to the Bourdon tube, it extends vertically. This vertical movement of Bourdon tube is delivered to the movement, and the movement changes this vertical movement into a rotating motion. Movement consists of lever and gear, and its main role is converting vertical movement into a rotation motion.

Generally, the vertical movement of Bourdon Tube ranges from 3~4mm, and its principle is to point currently applied pressure by using a turn angle 270°.

Therefore, Bourdon Tube and movement are the most important, and these parts must be well assembled in the pressure gauge because of the precise machining accuracy.

NO.	NAME	NO.	NAME
1	PULL ROD	4	SEGMENT OPENING
2	PULL ROD CONTROL POINT	5	SPIRAL SPRING
3	TOOTHED SEGMENT	6	POINTER

## 5. Repaire and Caution

- 1) If the fluid contains any corrosive agents, it will directly deliver to the Bourdon Tube, and it could damage the tube. Therefore, it is recommended that the user chose "Diaphragm Seal Type" pressure gauge. (Figure. 1)
- 2) For a remote seal type pressure gauge, a remote seal must be installed on the same line as the pressure gauges is installed. If this is not the case, then Zero adjustment process must be performed on the gauge.
- 3) If the gauge is dealing with a high temperature fluid, then Syphon tube is required so the adequate temperature can be delivered to the gauge. (Figure. 2)
- 4) Sudden pressurized or reduce pressure could cause breakdown.
- 5) In case of pressure pulsation or impulsive pressure is applied to the gauge, please use after install gauge protector. (Figure. 3, 4)
- 6) Periodical inspection must perform one or twice a year to check its operation status.
- 7) Bourdon tube and socket that made of brass is fragile high temperature over 40 °C if the gauge is dealing with high temperature fluid syphon tube is required.

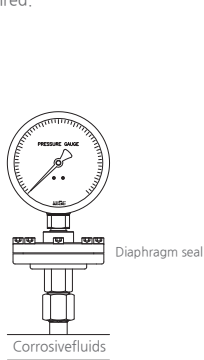


Figure. 1

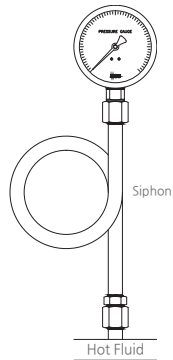


Figure. 2

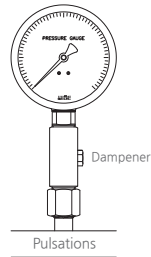


Figure. 3

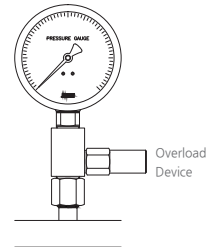


Figure. 4

## 6. How to Install

- 1) Avoid the place where humidity, vibration, dust and corrosive gas are present.
- 2) Avoid the place where the temperature is higher than the recommended ambient temperature indicated in this manual.
- 3) Be prepared to protect the gauge from a lightning or a steam.
- 4) Avoid direct rays of the sun.
- 5) When installing a gauge on the wall by using an attachment groove, it is recommended to use M5 nut and when installing a gauge by using a metal attachment, install firmly.
- 6) When installing a gauge on the pressurized pipe, it is recommended to use a flexible tube.
- 7) When installing a gauge on the pipe, do not turn the gauge by holding its case; please use proper spanner. (Figure. 5)
- 8) When you select pressure gauge make sure 75% of full scale must be the operating pressure.

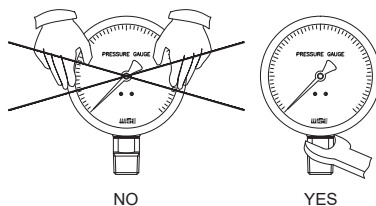


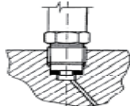
Figure. 5



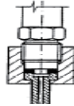
## 10) How to Install a Pressure Gauge



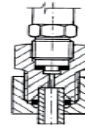
Pressure joint shall be made on this face only  
by means of the correct type sealing washer



Direct mounting



Union nut and tailpipe connection

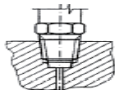


Compression fitting adaptor

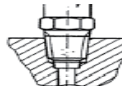
### Parallel thread connection



Pressure joint shall be made on the thread only.  
A suitable jointing material may be applied to the threads.



Direct mounting flat  
bottom hole



Direct mounting through hole



Compression fitting adaptor

### Taper thread connections

## 7. How to Use

- 1) First install valve before the first installation of pressure gauge for easy detach.
- 2) Check there are vibration or pursation or pulsation of fluid and install suitable accessories. (Figure. 6)
- 3) Check zero point of pressure gauge before installation.
- 4) Install delecately using teflon taple or gasket to screw.
- 5) Open the valve and check steady indication of pressure gauge after installation. (Figure. 7)

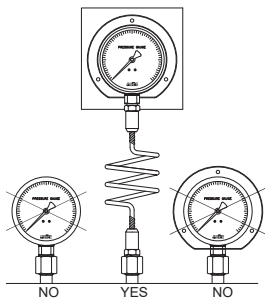


Figure. 6

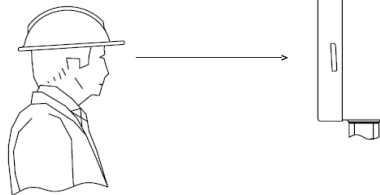


Figure. 7

**WISE**<sup>®</sup> WISE Control Inc.  
[www.wisecontrol.com](http://www.wisecontrol.com)