

## **Pressure Range Selection**

To insure proper operation and long service life, the proper pressure range should be selected. For applications with constant, steady pressure, the measured pressure should be no more than 75% of the full scale range of the gauge. For applications with fluctuating pressure, the measured pressure should be no more than two-thirds of the full scale range of the gauge.

In general, it is best to choose a range that is roughly 2X the average measured pressure. This gives good over pressure protection and the highest accuracy.

**Pressure Gauge Installation** The pressure gauge should be installed where exposure to heat



and vibration are minimal and where the dial can be easily read. It is also important to install the gauge in a location with undisturbed and continuous flow of the pressure medium.

It is recommended that an isolating device, such as a needle valve or gauge cock, be installed between the process and the pressure gauges. This allows the gauge to be taken out of service without interruption of the process.

Connections with tapered threads, such as NPT, should be sealed by using PTFE tape (or an equivalent sealing compound) on the thread. Metric threads such as G1/4A or 1/4BSP should be sealed by using the appropriate sealing washer.

The gauge should be tightened and loosened using the wrench flats on the gauge socket. Never grasp the case to thread the gauge into the pressure system fitting. Doing so may cause irreparable damage to the gauge. For pressure gauges with flanged connections, care must be taken not to accidentally loosen the bolts that hold the upper and lower housings together.

A pressure gauge should never be removed when it is pressurized. Make sure the pressure system has been fully vented prior to removing a gauge.

Residues from the pressure medium may remain inside the pressure gauge after it has been removed from service. If these residues are hazardous or toxic, take the necessary precautions when handling and storing used gauges.

**Isolating Devices** The isolating device may be either a pressure gauge cock or a needle valve, depending on operating conditions and requirements.

**Pressure Gauge Cocks** Pressure gauge cocks have three handle positions:

OFF The pressure medium is blocked and the pressure gauge system is open to the atmosphere.

ON The pressure gauge is open to the pressure medium.

VENT The pressure gauge is isolated but the pressure system is vented and the medium can escape into the atmosphere. Pressure gauge cocks should be installed so that when vented, the pressure medium is directed away from the operator.

**Pressure Gauge Needle Valves** Needle valves also isolate the pressure gauge from the pressure medium, but they usually do not have any venting capabilities. Needle valves do have the advantage of restricting the flow of the pressure into the gauge which helps reduce damage by pressure spikes.

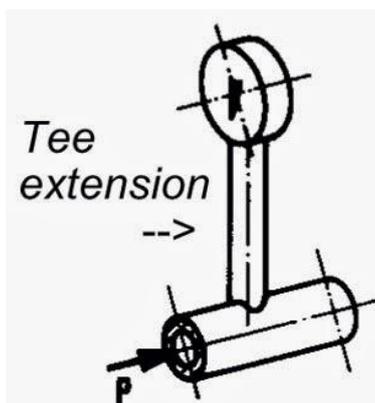
**Pressure Gauge Mounting Options** If the pressure system or tee-extension cannot support the weight of the instrument, then surface or wall mounting brackets or mounting flanges (front flange or rear flange) should be used.

**Vibration Protection for Pressure Gauges** If the pressure gauge is exposed to vibration or pulsating pressure or both, then a liquid filled pressure gauge is recommended. The liquid dampens the effects of vibration making the pointer easier to read.

**Pressure Gauge Temperature Limits** The pressure gauge should not be used outside of its rated temperature limits as noted on the Data Sheet specific to that gauge. At temperatures above or below these limits, the gauge accuracy will be significantly reduced and the possibility of gauge failure may exist.

**Overpressure Limits on a Pressure Gauge** Gauges are generally designed to withstand up to a 130% overpressure without damage to the pressure system. For applications with overpressure spikes, a snubber or restrictor should be used. Snubbers and restrictors reduce the inlet size of the pressure gauge which causes the pressure to increase or decrease more slowly into the gauge. For applications with periods of constant overpressure, an overpressure protector should be used. The overpressure protector isolates the gauge when the pressure reaches a preset pressure value.

### **Tee Extensions Guidelines for Pressure Gauges**



Tee extensions should have a diameter of at least 0.24 in. (6mm) to avoid clogging from solids in the pressure medium. That long, horizontal tee extensions be sloped to about 1:15.

With a gaseous pressure medium, the extension should having a drain plug at its lowest point, while a line with a liquid medium should have an air bleeding valve at its highest point. A filter or separator should be used when the pressure medium contains suspended matter.

If a static head of liquid is acting on the gauge, then this causes a zero offset which affects the reading of the gauge.

The corresponding indication will be lower by the value of  $\Delta p$  if the gauge is mounted above, but higher by the value of  $\Delta p$  if the gauge is mounted below the pressure tapping point.

**Pressure Gauges in Service** Always open isolating devices slowly. Opening them too fast may generate sudden pressure surges that could damage the gauge.

Calibration can be confirmed in larger diameter gauges (> 4") by checking the position of the zero point. To do so, close the isolating device and vent the gauge to zero pressure. The pointer must over the zero box . Unless the gauge temperature is significantly higher or lower than 68°F (20°C), a pointer not returning to zero may indicate that the gauge has been seriously damaged.

**Pressure Gauge Storage** The pressure gauge should remain in its original packing until installation.

Storage temperature should not exceed -4°F (-20°C) or 140°F (60°C) unless specified otherwise. Consult the data sheet pertaining to the pressure gauge model.

Pressure gauges removed from service should be protected from dust and humidity, preferably by using the original packing material. Residue from the pressure medium may remain in the gauge and is susceptible to temperature influences (i.e. freezing). This should be considered when storing the removed pressure gauge.

## **Pressure Gauge Safety** Pressure media such as:

- Oxygen
- Acetylene
- Flammable gases or liquids
- Toxic gases or liquids
- Steam
- Ammonia and other refrigerants

as well as portable or stationary pressure systems like:

- Air compressors
- Welding equipment
- Pressure vessels and boilers
- Life support equipment

may require pressure gauges that have been tested and/or certified to national standards and/or local safety codes.

## **Pressure Gauge Accessories**

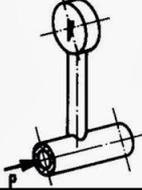
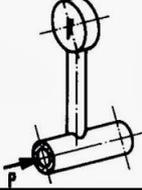
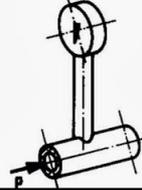


### Over Pressure Protector

1. Throttling (adjustable) Snubber
2. Adaptor for wall mounting bracket
3. Needle Valves
4. Coil Siphon
5. Wall Mounting Bracket
6. Thread Adaptor (1/4" NPT - G1/4A)
7. Pressure Gauge Cock

## Recommended Pressure Gauge Orientation

The table below shows the recommended position for pressure gauges in typical applications.

Contents of tee extension	Liquid media			Gaseous media		
	liquid	liquid with vapor	vapor only	Gas only	Wet gas	Liquid gas condensate
Typically	Condensate	Boiling liquid	LPG	Dry air	Moist air	Steam
Pressure instrument above the process						
Pressure instrument below the process	