

## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

### SAFETY:

“The history of safety with respect to the use of pressure gauges has been excellent. Injury to personnel and damage to property has been minimal. In most instances, the cause of failure has been misuse or misapplication.” The preceding quotation and other text from ASME’s American National Standard on pressure gauges (ANSI B40. 1-1980) emphasizes the need to minimize hazards through careful selection, installation and use of pressure gauges.

In especially hazardous systems careful evaluation and/or consultation with the manufacturer is recommended. The following systems, listed in ANSI B40.1 are considered potentially hazardous.

1. Compressed gas systems.
2. Oxygen systems.
3. Systems containing hydrogen or free hydrogen atoms.
4. Corrosive fluid systems (gas or liquid).
5. Pressure systems containing any explosive or flammable mixture or medium.
6. Steam systems.
7. Non-steady pressure systems.
8. Systems where high overpressure could be accidentally applied.
9. Systems where in interchangeability of gauges could result in hazardous internal contamination or where lower pressure gauges could be installed in higher pressure systems.
10. Systems containing radioactive or toxic fluids (liquid or gases).
11. Systems installed in a hazardous environment.

### INSTALLATION:

Upon receipt of Perma-Cal gauges, the gauge connection will have a thread protector on it. The thread protector also acts to keep debris or contamination out of the gauge fitting and sensor. Therefore, the protector should be left on until immediately prior to installation. This is especially true for gauges cleaned for oxygen service.

Perma-Cal recommends installation with Teflon thread sealant tape if it is compatible with the pressure fluid. Every Perma-Cal gauge stem has an integral hex nut for use of a wrench to tighten the gauge on the system connection. **DO NOT USE THE GAUGE CASE AS A HAND HOLD TO TIGHTEN THE GAUGE INTO THE SYSTEM CONNECTION**, as this may cause serious damage to the gauge.

Perma-Cal gauges are normally calibrated while mounted in a vertical plane and should be mounted vertically in the system to assure best accuracy. Gauges calibrated for mounting in other positions are available if specified when ordered.

For special system conditions, the following options and accessories should be considered.

1. For excessive system pulsations and vibrations; a filter snubber (standard equipment on most Perma-Cal gauges) and special dampening of the sensor and movement.
2. For isolation of the gauge capillary and bourdon tube from system chemicals or particulates; an isolating diaphragm seal.
3. For oxygen service; special cleaning to remove flammable hydrocarbons (oil and grease) should be mandatory for safety.
4. For system fluid temperatures greater than 250°F; a syphon or stand-off to act as a heat sink.
5. If pressure surges greater than 150% of span are possible; a pressure relief (“gauge saver”) device.

#### OPERATION:

Perma-Cal gauges are quite easy to operate, as operation consists of merely reading the data indicated on the dial. The ideal position for an accurate reading, is at eye level and at a 90° angle to the dial face.

Perma-Cal .25% test gauges employ a mirror band and “knife-edged” pointer to assure the most accurate reading (eliminating any parallax errors). To use these features, align the pointer with its mirror image in the mirror band.

#### MAINTENANCE:

The only user control or adjustment on Perma-Cal gauges is a zero adjust screw located at the six o'clock position, just below the dial face. Normally no adjustment is necessary, but occasionally pointer shift from zero occurs during shipment. The zero adjust feature is standard equipment on some models only. If zero adjustment is needed on a gauge without this feature, return the gauge to the factory for adjustment. Do not remove the back cover from the gauge, as there are no user adjustments located there. Tampering with the mechanism inside the back cover will void the warranty.

If adjustment or repair is needed, return the gauge along with a RMA tag explaining the malfunction to your local distributor. Your distributor's name, address and telephone number may be obtained by calling Perma-Cal at (775) 782-1026.