

How to calibrate a pressure gauge between 600 psi and 3000 psi without causing contamination

Most pumps used for calibration above 600 psi tend to be hydraulic. Since hydraulic pumps use fluids to generate pressure, liquid contamination of the system being calibrated is a definite risk. To avoid liquid contamination gas is used instead. The old-fashioned way to supply gas pressure above 600 psi is with a gas cylinder. However, working with a gas cylinder is both a burden and a safety risk. For field calibration the best solution is a pneumatic pump designed for pressures up to 3000 psi. Here is an example of how to use the 700HPPK Pneumatic Pressure Pump to supply pressures up to 3000 psi in the field to calibrate pressure gauges without the risk of liquid contamination.

Procedure

- 1 Attach the UUT (external) line to the port [1] towards the lower end of the calibration manifold.
- 2 Close the vent valve [3].
- 3 Pump the product [5] to generate pressure.
- 4 Once the applied pressure comes near the targeted pressure, close the inlet valve [2] on the calibration manifold. This will help to stabilize the pressure faster.
- 5 Use the black variable-volume knob [4] on the calibration manifold to adjust the pressure and achieve exact target pressure (cardinal point) on the reference gauge.
- 6 Take readings from both reference and UUT pressure gauges for calibration.
- 7 Repeat the above steps to take all readings at the predetermined pressure points.
- 8 Upon completion of the tests, open the vent valve [3] to release all pressure inside the calibration manifold. The inlet valve needs to be opened to release any pressure built up in the pump.

Tech Tips

- Use 700HPF-NPT High Pressure Premium Fittings for quick connect without using PTFE tape.
- Before making any gauge mode measurements, make sure that the reference gauge shows zero pressure at atmosphere. If not, open the vent valve on the calibration manifold and zero the reference gauge manually.
- For maximum efficiency, use full pump strokes. Generally, 21 MPa (3000 psi) can be generated within 20 seconds when full strokes are used (for volumes of approximately 10 cm³)
- Use the vent valve on the calibration manifold to slowly reduce pressure. Use the pump to increase pressure to move to the next pressure reading. Keep the inlet valve closed if the pump is not being used.