

Improved Methods for High Pressure Pneumatic Calibrations in the Field

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Are you tired of dragging a nitrogen bottle and dead weight tester out to the field to perform pneumatic high pressure calibrations? Does it trouble you to use a hydraulic pump or dead weight tester for your gas gauges every time you have to go above 600 psi? This application note details the limitations to traditional methods and provides a solution to calibration of gas gauges up to 3,000 psi (200 bar) with a field-ready calibration tool.

Limitations with Traditional Methods

Traditional methods for performing high pressure gas gauge calibrations in the field require the use of a controller or comparison systems and a nitrogen bottle. This solution typically provides the performance needed to do the job but adds a considerable inconvenience in having to transport several pieces of heavy equipment to the calibration site. Not to mention the time and effort in setting up the system. Dead weight testers and hydraulic pumps have also been used as a solution. Hydraulic pumps are problematic for this application as the liquid can damage the gas gauge you are attempting to calibrate. It is common that these hydraulic comparison pumps also lack the stability and resolution required to calibrate many gas gauges. Dead weight testers typically have the accuracy required but will require a gas supply for high pressure pneumatic applications. If the dead weight tester uses hydraulic fluid as the medium it will achieve much higher pressures but has similar drawbacks as hydraulic pumps.

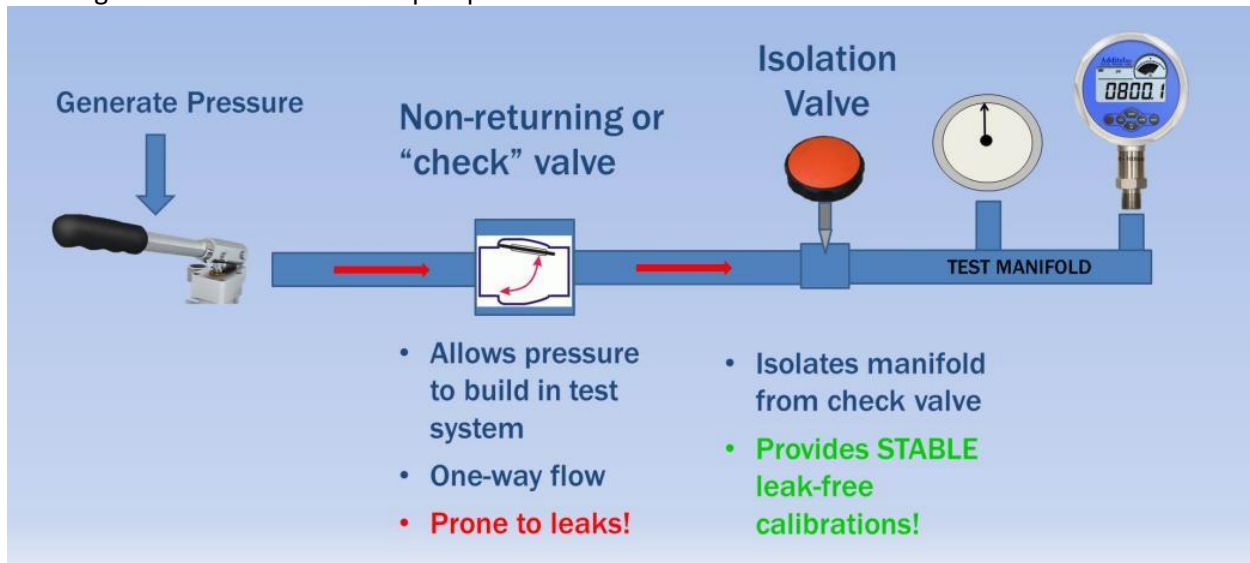
A More Practical Solution

Additel developed their high pressure pneumatic pumps specifically to address high pressure gas calibrations in the field. The Additel 919A goes to 2,000 psi (140 bar) and the 920 goes to 3,000 psi (200 bar) without the use of hydraulic fluids or the need for a gas supply. Each pump can also generate to 95% of vacuum. The ADT920 will generate 3,000 psi (200 bar) in 40 seconds and the pump weighs about 14 lbs (6.5 kg) which makes it easy to take to the field.

The high pressure range, portability, and speed to pressure are not the only things that make this series of pumps unique. The Additel pneumatic pump design allows for high stability and resolution to 0.001 psi (0.1 mbar). Like many pumps on the market, the ADT919A and the ADT920 use a check valve, also referred to as a non-returning valve, to protect the pump from contaminants that could cause damage. However, we've seen with most pumps on the market that the check valve tends to lose its seal over time which causes unstable measurements. The Additel design incorporates a high-quality isolation valve and screw press which allows for you to isolate the calibration volume from the check valve and achieve very stable measurements and resolution to 0.001 psi (0.1 mbar).



The diagram below illustrates the pump construction.



The method of operation is as follows: To generate pressure, use the pump handle on top of the unit. When you've generated 70% - 80% of the desired pressure with the pump handle, then close the isolation valve (this isolates the calibration volume from the pump handle and check valve). Next, use the fine-adjust screw press to generate the remaining pressure. Each pump comes with two hand-tight, quick-connect pressure ports that do not require the use of PTFE tape or wrenches. Combine this pump with any of our digital pressure gauges and you have an accurate, portable and practical field calibration solution for gas calibrations up to 3,000 psi (200 bar).

Conclusion

Traditional solutions for high pressure gas calibrations are not convenient or practical for field applications or they require the use of hydraulic fluids which could damage the sensor being tested. The Additel 919A and 920 pneumatic pressure pumps solve many of the problems that exist with traditional solutions and provide a reliable, field-ready, accurate and affordable solution to meet your needs!

For more information please contact us (PH: 1-714-998-6899, E: sales@additel.com) or visit us on the web at www.additel.com