



POSITIVE SHUT-OFF CAPILLARY LEAK STANDARDS

PSO Calibrated Leaks for all Gases

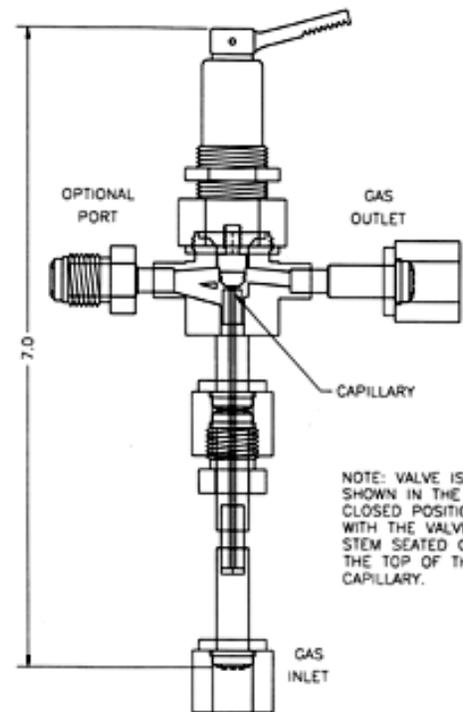
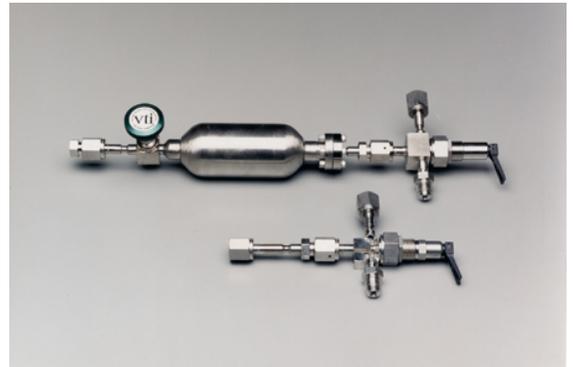
The PSO Model "ZERO-DEAD-VOLUME" CAPILLARY LEAKS FOR ALL GASES

These capillary-type calibrated leaks use VTI's proprietary Positive Shut-Off (PSO) valves to provide instant on-off operation with essentially no dead volume. This eliminates any gas burst when the valve is opened. The valve's dead volume is only 0.0001 cc compared to as much as 1 cc or more in some valves. The PSO-valve Leaks also minimize gas depletion rates and provide longer life even at high flow rates. Their leak-rate control element is a crimped stainless steel capillary suitable for use with all gases.

The Positive Shut-Off Calibrated Leaks are available with an integral gas reservoir and can be provided with any gas. They are also available without a gas cylinder for use with an external gas source. Operation of the valve can be manual, pneumatic or electrical.

The unique features of these proprietary PSO Calibrated Leaks result in their use in a wide variety of applications. They are extensively used for verification tests and calibration of Leak Testing Systems, usually with automated valve operation and usually with an external gas source rather than a reservoir. They are also used frequently to flow gas at a controlled rate into a process chamber or research apparatus, or to "dope" another gas stream. For mass spectrometer analysis of gases that are at high pressures, the PSO-valve Leaks are used to reduce the pressure and provide a sample rapidly with no gas burst.

VTI has also developed a Mass Spectrometer Calibrator using the PSO Calibrated Leak and a reservoir of mixed gas (3% Helium, Krypton, Xenon and Hydrogen, 1.8% Nitrogen and 86% Argon). This Mixed-gas Calibrator provides a convenient and accurate way to tune the peak position and height for masses ranging from 1 to 132 amu. The low dead volume of the valve eliminates any gas burst into the system and conserves the gas mix, thus providing a long operational lifetime.



Drawing of the PSO-valve Leak

Choosing the PSO Leak Standard

- ESSENTIALLY NO DEAD VOLUME – no pressure burst on opening.
- LOW DEPLETION RATES – allows high flow rate applications and use with expensive gases.
- FAST RESPONSE – provides instant on-off operation.
- CRIMPED METAL CAPILLARY LEAK ELEMENT – can use any gas.
- AUTOMATIC OPERATION – available for integration into systems.
- LONG TERM STABILITY – valve is closed except during use.
- MEETS ISO REQUIREMENTS - NIST-traceable, A2LA-accredited Calibration Certification.



VTI's Calibration Laboratory is Accredited by the American Association for Laboratory Accreditation.

Calibration Laboratory
Certificate No. 1707.01

As the major manufacturer of Calibrated Leaks for all gases, all leak rates, and all makes of leak detectors, VTI supplies them worldwide to users, distributors, and other manufacturers.

These Accu-Flow™ Leak Standards are recognized internationally for their superior quality construction and calibration.



POSITIVE SHUT-OFF CAPILLARY LEAK STANDARDS

PSO Calibrated Leaks for all Gases

ORDERING INFORMATION

For an order or quotation request for a PSO Leak, please provide the Part Number constructed from the codes provided, and also confirm the Fittings by name and function to avoid errors. In addition, please describe the Gas or Gas Mix to be used. Any dimensional requirements should also be noted.

For the PSO Leaks with a Reservoir, please also specify the specific Leak Rate requested and your preferred leak-rate units. For PSO Leaks without a reservoir to be used at one leak rate and pressure, please provide the specific Leak Rate requested, plus the Inlet Pressure that you will use from your gas line (corresponding to that Leak Rate). In either case, the Outlet Pressure should be stated as "Flow into Vacuum" (the usual) or "Flow into Atmosphere" (1 atm.). Also, the Manufacturing Variance ("Tolerance") that you can allow on that Leak Rate should be specified as +/- 40% (the normal allowance), or as +/- 15% (the "Special-Range Variance"), for which there is an additional cost and an "-SR" added to the part number. An example specification is 2.0×10^{-5} atm-cc/sec +/- 40%. In both cases, the leak rate provided will be as close as we can make it to your specified rate, and the actual rate, as calibrated, will be recorded on the Calibration Tag and the Certifications.

PSO Leaks without a reservoir can also be calibrated at multiple inlet pressures to provide a range of adjustable leak rates, for example covering values from 1 to 9×10^{-5} atm-cc/sec using three pressures from 15 to 200 psig. VTI provides a curve of Leak Rate vs. Pressure based on the calibrations. This allows the leak rate to be changed by changing your pressure and allows exact leak rates to be selected without the limitation of the manufacturing variance. For these adjustable-rate PSO Leaks, VTI can advise on the leak-rate range achievable based on your available pressure range.

PART NUMBER BUILD-UP

The PSO Part Numbers are constructed as follows:

For leaks without a reservoir:

PSOT-X-NA-BB-YYYY-ZZZZ-OOOO

For leaks with a reservoir:

PSOT-X-NA-BB-YYYY-ZZZZ-RRRR-FVO

where **T** = operation type (**M**=Manual, **A**=Air, **S**=Solenoid).

where **X** = the code for the Leak Rate Range required.

where **N** = the code for the number of calibration points.

Where **A** = calibration method (**C** for He, **P** for other gases)

where **BB** = the code for the Gas to be used

where **YYYY** = the code for the INLET fitting required.

where **ZZZZ** = the code for the OUTLET fitting required

where **OOOO** = the code for the optional port fitting,

where **RRRR** = the code for the reservoir,

and **FVO** = Fill Valve Option: **WV** or **MFV** (Bakeable)

EXAMPLE PART NUMBERS

PSO-valve Leak with a Reservoir

Part No.: PSOM-6-AR-4FVCR-4MVCR-300DOT-MFV

An Argon leak with manual valve operation, one specified leak rate in the range of 10^{-6} atm-cc/sec, VCR fittings, 300cc reservoir, and all-metal fill valve.

EXAMPLE GASES and CODES – (BB)

Please contact us with other gas requirements.

Helium (**HE**), Argon (**AR**), Nitrogen (**N2**), Hydrogen (**H2**), Carbon Dioxide (**CO2**), Oxygen (**O2**), Air (**AIR**), Methane (**CH4**), Sulphur Hexafluoride (**SF6**), Refrigerants ("R"#), Xenon (**XE**), Deuterium (**D2**), Mixed gases (**MIX**).

EXAMPLE FITTINGS and CODES

Contact VTI for other fitting requirements.

Code:	Description:
4FVCR	1/4" Female VCR
4MVCR	1/4" Male VCR
MCFF	1.33" OD Mini Conflat Flange
2CFF	2.75" OD Conflat Flange
KF16	3/4" OD ISO Flange
KF25	1" OD ISO Flange

OTHER ORDERING CODES

X Code: Leak Rate Range:

2	1.0 to 9.9×10^{-2} amt-cc/sec
3	1.0 to 9.9×10^{-3} amt-cc/sec
4	1.0 to 9.9×10^{-4} amt-cc/sec
5	1.0 to 9.9×10^{-5} amt-cc/sec
6	1.0 to 9.9×10^{-6} amt-cc/sec

R Code: Reservoir Size:

150DOT	150cc Reservoir tested per DOT
300DOT	300cc Reservoir tested per DOT
1000DOT	1000cc Reservoir tested per DOT

Other leak rates and reservoir sizes available!

PSO-valve Leak without a Reservoir

Part No.: PSOA-5-3C-HE-4FVCR-4FVCR-4FVCR

A Helium leak with an air-operated valve, calibrations at 3 rates/pressures in the 10^{-5} leak rate range, and VCR fittings.

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