



CHOOSING A CALIBRATOR FOR HELIUM LEAK DETECTORS

Unique Vacuum Solutions deals with four models of Calibrated Leak Standards for calibrating Helium Leak Detectors and Leak Testing Systems so that one is sure to meet your particular requirements. Many other models of Leak Standards are available with **Unique Vacuum Solutions**, including some that are specifically for calibrating Sniffer-type Leak Detectors, as detailed in other brochures and a Selection Guide. As the major manufacturer of Calibrated Leaks for all gases and all leak rates for calibrating leak detectors, leak testing systems and various other applications, **Unique Vacuum Solutions** supplies them worldwide to users, distributors and other manufacturers.

The GPP, GPPT, GPC and CLP Model Calibrators compared here have different types of Leak Elements to control the flow rate of Helium, and this results in different features as shown below. Another difference is that the GPP, GPPT and GPC Leaks are "general purpose" models for calibrating leak detectors and systems, and the CLP Leak is a "high-precision" model with an all-metal valve for use in critical applications, use with UHV systems, and use as a Calibration Transfer Standard. It is to be noted, however, that all four models demonstrate long-term flow rate stability, have low depletion rates and last for years without refilling. As an exception, the 10-3 and larger GPC Leaks have higher depletion rates and, therefore, are designed to be conveniently refilled by the user. Also, all four models are simple to operate and are provided with Certifications of the NIST-traceable A2LA-accredited Calibrations.

The differences among these four Helium Detector Calibrators are highlighted in the comparisons below:

GPP model	GPPT model	GPC model	CLP model
<ul style="list-style-type: none"> You need a Calibrator in the leak rate ranges of 10^{-6} to 10^{-9}, especially 10^{-7} and 10^{-8}. You want the glass-permeation leak element that will not clog. It will not be subjected to rough handling that would break the glass leak element. Your facility does not have wide temperature fluctuations, so you are not inconvenienced by the 4% per °C temperature coefficient. 	<ul style="list-style-type: none"> You need a Calibrator in the leak rate ranges of 10^{-4} to 10^{-8}. You want the Teflon®-permeation leak element that will not clog. You want a Calibrator that is unbreakable. You are not inconvenienced by the 3% per °C temperature coefficient 	<ul style="list-style-type: none"> You need a leak rate in the range of 10^{-6} to 10^{-3} and larger, especially 10^{-5} and larger. Your clean environment or large leak rates avoids clogging of the capillary leak element. You want a Calibrator that is unbreakable. Your facility has wide temperature fluctuations so that the very low temperature coefficient (0.2% per °C) is a significant benefit. 	<ul style="list-style-type: none"> You need a Calibrator in the leak rate ranges of 10^{-6} to 10^{-12}, especially 10^{-9} to 10^{-12}. You want the glass-permeation leak element that will not clog. It will not be subjected to rough handling that would break the glass leak element. You are not inconvenienced by the 4% per °C temperature coefficient. You need a model to use as a Transfer Standard for calibrating other Test Leaks. You need a Premium model with an all-metal valve that can be used for critical calibrations and can be baked for UHV applications.



1) GPP model:



These GPP Model Helium Calibrated Leak Standards have glass-permeation type leak elements and are the most common ones used to tune and calibrate helium mass spectrometer leak detectors, leak testing systems and vacuum systems. They are part of a family of Calibrators including the GPPT, GPC and CLP Models that cover leak rates from 10^{-12} up to 10^{-3} atm-cc/sec and larger.

The GPP Accu-Flow™ Calibrated Leaks are based on the principle that helium flows through certain materials at a measurable rate depending on the material thickness, driving pressure and temperature. Depending on the leak rate required in the GPP Leaks, the permeation material is Pyrex or Quartz.

The GPP Leaks feature an all-welded stainless steel construction for reliability. Most leaks require a shut-off "isolation" valve to zero the leak signal during tuning and calibration. **Unique Vacuum Solutions** offers the GPP Leaks both with and without a Teflon®-packed stainless steel shut-off valve. The inlet port of the brand of leak detector or vacuum system determines the termination of the leak. The most common termination of the GPP Leaks is a 1-1/8" diameter tube which mates directly to many Varian, Veeco and VIC leak detectors. All leaks are available with QF (NW, KF) and many other types of fittings.

All GPP Leaks are provided with certifications of the NIST-traceable calibrations performed in our A2LA-accredited Calibration Laboratory.

- **WILL NOT CLOG** - permeation leak element.
- **LONG TERM STABILITY** - Low depletion rate.
- **WIDE LEAK-RATE CHOICE** - 10^{-5} to 10^{-9} range.
- **NEVER NEEDS REFILL** - Lasts for years.
- **SIMPLE TO OPERATE** - minimal user training.
- **MEETS ISO REQUIREMENTS** - NIST-traceable, A2LA- accredited Calibration Certification.

UNIQUE VACUUM SOLUTIONS

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2) *Model – GPPT*



These GPPT Model Helium Calibrated Leak Standards have Teflon®-permeation type leak elements and are widely used to tune and calibrate helium mass spectrometer leak detectors and leak testing systems. They are part of a family of Calibrators including the GPP, GPC and CLP Models offered by **Unique Vacuum Solutions** that cover leak rates from 10^{-12} up to 10^{-3} atm-cc/sec and larger.

The GPPT Accu-Flow™ Calibrated Leaks use a Teflon® membrane as the flow rate control element. The Helium reservoir is under pressure, and the gas permeates through the Teflon® from the pressure side to the exhaust side of the element. This yields a precise, constant flow rate which is then used for calibrating helium leak detectors and other applications.

The GPPT Leaks feature an all-welded stainless steel construction for reliability. Most leaks require a shut-off "isolation" valve to zero the leak signal during tuning and calibration. UVS offers the GPPT Leaks both with and without a Teflon®-packed stainless steel shut-off valve. The inlet port of the brand of leak detector or vacuum system determines the termination of the leak. All leaks are available with QF (NW, KF), Normal Pipe Thread, VCR® and many other types of fittings.

All GPPT Leaks are provided with certifications of the NIST-traceable calibrations performed in A2LA-accredited Calibration Laboratory.

- **WILL NOT CLOG** - permeation leak element.
- **VIRTUALLY UNBREAKABLE** - minimizes repairs.
- **LONG TERM STABILITY** - Low depletion rate.
- **WIDE LEAK-RATE CHOICE** - 10^{-4} to 10^{-9} range.
- **NEVER NEEDS REFILL** - Lasts for years.
- **SIMPLE TO OPERATE** - minimal user training.
- **MEETS ISO REQUIREMENTS** - NIST-traceable, A2LA- accredited Calibration Certification.

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3) *Model – GPC*



The GPC Model Helium Calibrated Leak Standards have crimped stainless-steel capillary leak elements and are widely used to tune and calibrate helium mass-spectrometer leak detectors and leak testing systems. They are part of a family of Helium Calibrators offered by **Unique Vacuum Solutions** including the GPP, GPPT and CLP Models detailed in other brochures. Together they cover a wide range of leak rates from 10^{-12} to 10^{-2} atm-cc/sec and larger.

The GPC Accu-Flow™ Helium Leaks, due to the capillary leak element, can be manufactured for larger leak rates than permeation-type leaks. They are often used therefore in calibrating detectors in the "gross leak" mode. Also, capillary-type leaks have a very low temperature coefficient of 0.2%/ °C, as compared to 3 to 4% for permeation-type leaks. This reduces the possibility of calibration error in applications where ambient temperatures vary widely. As compared to some leaks that are made with glass capillary leak elements, the GPC Leaks with their stainless steel capillaries are unbreakable.

In applications where these capillary-type leaks are exposed to dirt, water or oil vapor, clogging of the leak element can be a problem, particularly for leak rates of 10^{-6} atm-cc/sec and smaller. For this reason, the shut-off valve on the leak should be closed when not in use, especially when venting the vacuum system or detector to which it is attached. While GPC Leaks can be made without shut-off valves, it is not usually recommended.

As with all of our Helium Calibrators, the GPC Model Leaks are available with QF (NW, KF), pipe thread and many other types of attachment fittings, and are provided with Certifications of the NIST-traceable Calibrations performed in A2LA Calibration Laboratory.

- **LOW TEMPERATURE COEFFICIENT** - 0.2%/ °C.
- **WIDE LEAK-RATE CHOICE** - 10^{-3} to 10^{-6} range.
- **LONG TERM STABILITY** - Low depletion rate.
- **UNBREAKABLE** - stainless steel leak element.
- **NEVER NEEDS REFILL** - Lasts for years.
- **CLOGGING POSSIBLE** - in unclean environments.
- **MEETS ISO REQUIREMENTS** - NIST-traceable, A2LA- accredited Calibration Certification.

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4) *Model – CLP*



The CLP Helium Calibrated Leaks are high-precision Standards for use in critical calibrations of leak detectors and systems, in Ultra-High Vacuum systems, and as Transfer Standards for calibrating other Helium Leaks. They feature all-welded stainless steel construction, a premium all-metal shut-off valve, a glass-permeation leak element, and are bakeable for UHV applications.

These models cover leak rates from 10^{-12} up to 10^{-3} atm-cc/sec and larger, as detailed in other brochures. The CLP Model is available with leak rates of 10^{-6} to 10^{-12} and is the only model made for the very low rates of 10^{-10} to 10^{-12} atm-cc/sec.

The CLP Accu-Flow™ Calibrated Leaks are based on the principle that helium flows through certain materials at a measurable rate depending on the material thickness, driving pressure and temperature, and use Quartz or Pyrex as the permeation material for the leak element. These leaks are available with or without the leak shut-off valve, but the latter is rare, and with many types of attachment fittings such as QF (NW,KF), Conflat®, VCR® and others.

All CLP Leaks are provided with Certifications of the NIST-traceable calibrations performed in A2LA-accredited Calibration Laboratory.

- **WILL NOT CLOG** - permeation leak element.
- **LONG TERM STABILITY** - Low depletion rate.
- **WIDE LEAK-RATE CHOICE** - 10^{-6} to 10^{-12} range.
- **BAKEABLE FOR UHV USE** - all metal valve.
- **NEVER NEEDS REFILL** - Lasts for years.
- **SIMPLE TO OPERATE** - minimal user training.
- **MEETS ISO REQUIREMENTS** - NIST-traceable, A2LA-accredited Calibration Certification.

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RECALIBRATION SERVICE :



Unique Vacuum Solutions offers a convenient recalibration service to help users of calibrated leaks to maintain all of their Leaks in Certified and peak condition, regardless of the original manufacturer. All makes of Leaks for all makes of Leak Detectors can also be repaired if required.

Because of their rugged design, **Unique Vacuum Solutions** Calibrated Leaks will rarely, if ever, require refurbishment. However, annual recalibration will maintain the full benefits of their high precision performance.

Unique Vacuum Solutions offers recalibration and repair services for all brands of calibrated leaks, all gases and all leak rates.

- Primary NIST-traceable calibrations for leak standards of all gasses (Certified)
- NIST-traceable comparison calibrations of helium leaks (Certified)
- Helium leak calibrations w/o certification
- NIST-traceable calibrations of sniffer-type helium leaks, and Refrigerant Leak Standards and GE/Yokagawa's LS-20 Refrigerant Leaks
- Refill of calibrated leak standards for all gases to restore the original leak rate
- Replacement of broken glass element in leaks
- Repair of both permeation and capillary type leaks with replacement parts as required
- Calibration to customer's special QA specifications and "ISO" requirements

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