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Find the *Vici Metronics 500-13V-DV* at our website: ***Click HERE***

Calibration gas standards

PERMEATION DEVICES AND CALIBRATION GAS GENERATORS

from VICI Metronics

VICI Metronics, Inc. in Poulsbo, Washington is the leading manufacturer of devices and instruments that are used in the generation of calibration gas standards, including Dynacal® and G-Cal permeation tubes and Dynacalibrator® and G-Cal calibration gas generators. In addition, Metronics is the leading provider of explosives, narcotics, and chemical warfare dopants for TSA airport security (ammonia, DCM, and BHT), law enforcement, border patrol, military, and other trace detection industry professionals. The product line also includes gas purifiers, contaminant traps, and GC Industries oxygen and toxic gas monitors.

Calibration gas standards

The purpose of a calibration gas standard is to establish a reference point for the verification of an analysis. Permeation tube rates can be certified using standards traceable to NIST by the most basic and accurate laboratory procedure – measuring the gravimetric weight loss over a known period of time at a known temperature. Permeation rate data is already established for hundreds of different compounds, and rates for new compounds can be easily certified using NIST-traceable standards.

Advantages

Calibration devices from VICI Metronics offer several advantages over cylinder-supplied gas calibration standards. Multi-component gas mixtures can be easily generated with NIST traceability employing established EPA and ASTM protocols by using the appropriate combination of permeation devices. This technique also allows the removal of a single component from a gas mixture by simply removing the appropriate permeation device. A wide range of concentrations can easily be generated by simply varying the dilution flow rate.

By contrast, bottled trace level (ppb and ppm) standards can be very expensive, and calibrations requiring multiple components over a wide range of concentrations require a large number of gas cylinders, consuming valuable lab space. Problems can also arise from degradation of the standard within the cylinder, from changes in cylinder pressure, and from interaction of calibration components and surfaces.

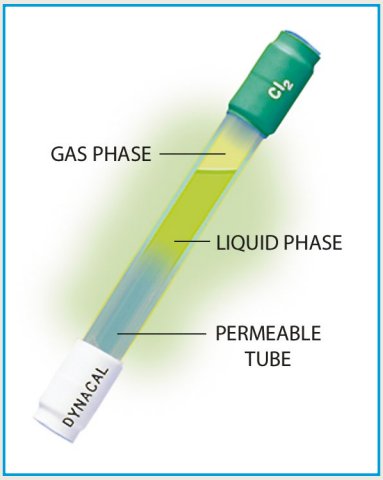
TO ORDER

For prices or more information about specific compounds available in permeation devices, contact VICI Metronics:

Toll-free 877–737–1887
Tel 360–697–9199
Fax.....360–697–6682

vicimetronics.com





- Ideal for lab environments
- Smaller than G-Cal devices
- More accurate than G-Cal devices
- Require a temperature-controlled environment
- Inexpensive calibration solution

Dynacal permeation devices are small, inert capsules containing a pure chemical compound in a two phase equilibrium between its gas phase and its liquid or solid phase. At a constant temperature, the device emits the compound through its permeable portion at a constant rate. Devices are typically inserted into a carrier flow to generate test atmospheres for calibrating gas analyzer systems, testing hazardous gas alarms, or conducting long-term studies of effects on materials or biological systems – in short, any situation requiring a stable concentration of a specific trace chemical.

Tubular device



The tubular device, or "perm tube", is a sealed permeable cylinder containing the desired permeant reference material. Release of the chemical occurs by permeation through the walls of the PTFE tube for the entire length between the impermeable plugs. A wide range of rates – typically from 5 ng/min to 50,000 ng/min – can be achieved by varying the length and thickness of the tube. These are the most widely used of the various permeation devices.

Extended life tubular device



Our unique extended life tubular (XLT) device is essentially a standard perm tube coupled to an impermeable stainless steel reservoir. This design offers a range of permeation rates corresponding to a tubular device, but has a significantly enhanced lifetime – by a factor of 3 for a 5 cm (active length) device or a factor of 12 for a 1 cm device.

Wafer device



Wafer devices have only a small permeable window, or wafer, so permeation rates are typically lower than rates for tubular devices. Since permeation occurs only through the polymeric wafer, the permeation rate is controlled by varying the wafer material, the thickness of the wafer, and the diameter of the permeation opening. Gases whose high vapor pressure at normal permeation temperatures prevent their containment in a tubular device can be contained in a wafer device. Wafer devices are available in different styles to allow use in calibrators made by various manufacturers.

COMPOUNDS AVAILABLE IN DYNACAL PERM DEVICES

Literally hundreds of compounds are available in our permeation devices. This list is merely representative of the range we offer. Contact us if you don't see what you're looking for.

Ammonia
Benzene
Carbon disulfides
Carbon tetrachloride
Chlorine
Dichloromethane
Dimethyl sulfide
Ethanol
Ethylene oxide
Freon
Formaldehyde
Hydrogen cyanide
Hydrogen fluoride
Hydrogen sulfide
Iodine
Isopropyl alcohol
Mercury
Methanol
Methyl bromide
MTBE
Nitrogen dioxide
Octane
Sulfur dioxide
Sulfur hexafluoride
Thiophene
Toluene
Vinyl acetate
Water
Xylenes

MORE INFORMATION

G-Cal perm tubes. . .p. 232

CALIBRATION GAS STANDARDS

- Deliver precise concentrations from ppb to high ppm
- Use Dynacal® permeation devices as the trace gas source, with front panel access to the permeation chamber
- Proprietary constant temperature system controls chamber temperature at a set point with ±0.01°C accuracy
- Choice of plumbing and flow configurations

VICI Metronics Dynacalibrators allow you to verify the accuracy of analytical data from air pollution monitoring, industrial hygiene surveys, odor surveys, and other instruments measuring gas concentration. All models enable calibrations traceable to NIST standards for almost any gas analyzer, in the lab or in the field.

The design takes full advantage of all the conveniences inherent in our Dynacal® permeation devices to generate and deliver precise concentrations ranging from ppb to high ppm for hundreds of different compounds. Standard features on all our models, from the most basic Model 150 to the most fully-equipped Model 500, facilitate accurate, reproducible, trouble-free calibrations time after time.

Model 120 (Non-CE) Portable Dynacalibrators®

- Completely portable
- Pump powered by rechargeable battery or a 12 VDC source (inverter with cigarette lighter plug provided)
- Available temperature control from 5°C above ambient to 100°C
- Utilizes permeation devices – no bulky cylinders

Standard features on Model 120 include a glass or PTFE permeation chamber with screw cap access, solid state proportional temperature controller with digital readout of set point and chamber temperature, heater switch with LED indicator, flowmeter and flow control valve, span and overflow outlets, 12 VDC internal pump, activated charcoal scrubber, and molded fiberglass case.

Non-CE, use restricted within the EU.



Model 120

Model 150 Dynacalibrators®

- Temperature control with an accuracy of ±0.01°C from 5°C above ambient to 110°C
- Ultra compact
- PPB to high PPM range

At only 6" wide x 15" deep x 7" high and 10.5 pounds, the Dynacalibrator Model 150 is a compact calibrator capable of delivering the precise concentrations you require. A passivated glass-coated stainless steel permeation chamber houses the permeation device(s). (Carrier and dilution flow rates must be supplied and measured externally.) The digital temperature controller maintains the chamber temperature at a set point with an accuracy of ±0.01°C, traceable to NIST standards. The wide range of temperature settings (5°C above ambient to 110°C) means the end user can generate a wide range of volumetric concentrations for both low and high vapor pressure chemical compounds, establishing or changing the desired volumetric concentration by simply varying the carrier flow.



Model 150

Model 230 Dynacalibrators®

With a flexible flow metering system to maintain a constant carrier flow through the permeation chamber, the Model 230 allows the dilution flow to be varied over a wide range, generating the spectrum of concentrations required for checking analyzer linearity. Like all Dynacalibrators, its permeation chamber is big enough to accomodate several permeation devices for higher output concentrations or multi-component mixtures.



Model 230

Model 340 Dynacalibrators®

The Model 340 adds a front panel mode control switch to select between zero or span calibration modes. In the zero mode, scrubbed air is delivered to the span outlet, allowing the end user to establish zero before sampling.



Model 340

Model 450 Dynacalibrators®

Ordinarily, the plumbing connections between the sample manifold, analyzer, and calibrator must be changed for each calibration. The Model 450's unique "through-port" feature eliminates this chore. The mode control switch selects among standby, zero, span 1 (low concentration), and span 2 (high concentration) modes.



Model 450

Model 500 Dynacalibrators®

This innovative design features two separate permeation chambers with independent temperature control systems. The chambers can be used independently, or together to combine concentrations of trace components. Separate solenoid valves allow the carrier flows to be switched from the dilution stream to a vent port.



Model 500

TO ORDER
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CALIBRATION GAS STANDARDS

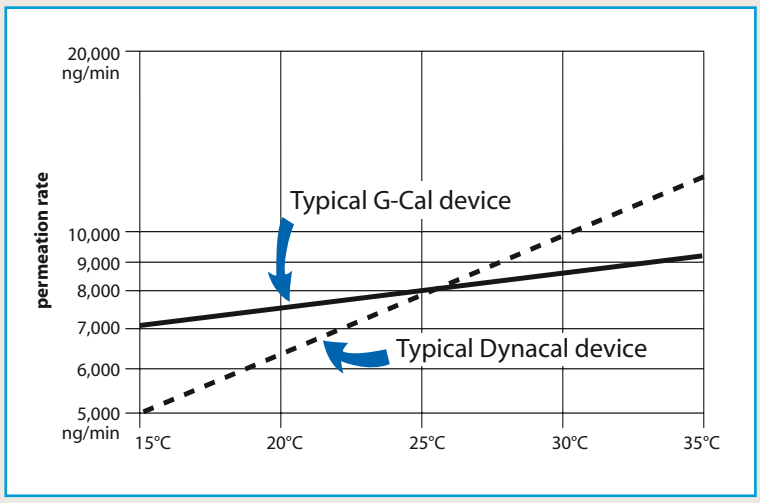
- Excellent for use in the field
- Can be operated at room temperature
- Can handle Arsine and Phosphine
- Longer lifetime than Dynacal® devices

G-Cal permeation tubes offer a proven and repeatable means of generating desired gas or vapor concentrations. The permeant gas escapes through the proprietary membrane system and mixes with a carrier gas (nitrogen is the most common) at a controlled flow rate to obtain a known mixture in ppm or ppb. Applications include calibration of gas monitoring systems and chromatographs, accuracy check of gas detectors, and generation of known test atmospheres for a specific application.

G-Cal devices exhibit the lowest temperature sensitivity among available similar products. The permeation rate through the polymeric membrane used in G-Cal devices changes only 1-3% per degree C, eliminating the need for a temperature-controlled chamber. Most G-Cal devices are guaranteed for 12 months operating life.



Over 100 different substances are available, including Arsine, Phosphine, and gas phase devices such as CO, NO, and Methane. Available permeation rates range from less than 100 ng/min to 50,000 ng/min. Each G-Cal device is individually calibrated and verified to generate a given mass output per unit time (ng/min) at a set point temperature. A graph which shows an estimated permeation rate vs. temperature from 0 to 50°C is included with each device.



Comparison of G-Cal permeation devices and Dynacal PTFE permeation devices

COMPOUNDS AVAILABLE IN G-CAL PERM TUBES

Literally hundreds of compounds are available in our permeation devices. This list is merely representative of the range we offer. Contact us if you don't see what you're looking for.

Ammonia
Arsine *
Benzene
Carbon Dioxide *
Carbon Monoxide *
Carbonyl Sulfide
Chloroform
DMMP
Dichloromethane
Dimethyl Sulfide
Dimethyl Formamide
Ethyl Chloride
Ethyl Mercaptan
Ethylene Oxide
Freons
Hydrogen Fluoride
Hydrogen Sulfide
Methane *
Methanol
Methyl Mercaptan
Nitric Oxide *
Nitrogen Dioxide
Nitrous Oxide *
Phosphine *
Propylene Oxide
Sulfur Dioxide
Sulfur Hexafluoride
Thiophene
Toluene
Vinyl Chloride
Water
Xylenes

** Available only in G-Cal permeation devices.*

MORE INFORMATION

Dynacal perm tubes.....p. 229



- Portable and rugged – ideal for field use
- Ambient temperature from 15°C to 45°C
- Built-in pump
- Carrier gas flow rates from 100-1000 or 200-4000 cc/min
- Models with oven for constant temperature control at cold field sites

G-Calibrators are rugged portable units specifically designed to be used with our patented Series 23 G-Cal permeation devices to generate known concentrations (ppb to ppm) of various gases and liquid vapors. This combination offers the easiest method of calibrating toxic gas detection equipment, gas analyzers, and chromatographs commonly used in chemical, petrochemical, paper, power, and related industries.

Due to its unique permeation technology, the permeation rate of a G-Cal device remains fairly stable when exposed to changing temperatures. For most applications, this feature eliminates the need for the temperature-controlled oven.

Models with an oven have a single fixed temperature point (35° - 50°C). Models powered by a 12 VDC NiCad rechargeable battery also include a 110 VAC external charger. All G-Calibrators have stainless steel fittings and FEP tubing throughout.

G-Calibrators

Non CE. Use restricted in EU

Non-CE, use restricted within the EU.

Flow range	*Oven*	*Battery*	*Prod No.*
100-1000 cc/min	no	1.5 VDC	2301
	no	12 VDC NiCad	2310-10
	yes	12 VDC NiCad	2330-10
200-4000 cc/min	no	12 VDC NiCad	2310-20
	yes	12 VDC NiCad	2330-20

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