The New PHD – 4 Portable Helium Detector

SPECIAL FEATURES:

- High Sensitivity to Helium
- Easy to Use
- Truly Portable
- Versatile
- Dependable
- The system is designed to allow easy replacement of
- sampling line components in the field
- Exchange units are available for rapid field replacement
- Support programs can be tailored to
- meet your most demanding needs

The PHD-4 is a portable compact leak detector which includes a battery for autonomous use in the field and uses helium as a tracer gas. It allows detection of very small leaks in objects where a slight helium pressure has been introduced.

Principle of operation

The PHD-4 principle of operation is based on a Varian patented technology, Selective Ion Pump Detection (SIPD).
The sensor incorporates a quartz capillary tube maintained under high vacuum by an ion pump. The quartz tube is heated with a platinum filament and becomes permeable to helium. As the partial pressure of helium in the ion pump increases, so does the current drawn by the ion pump, proportional to the pressure, indicating the helium concentration present inthe test probe of the PHD-4.

WHY USE HELIUM AS A TRACER GAS?

Helium is a superior choice as tracer gas for a number of reasons:
• It is inert, non-toxic and non-flammable
• It can pass easily through leaks due to its small atomic size, allowing the detection of very small leaks
• It is present in the atmosphere at only 5 ppm, thus reducing the possibility of false readings
• It is highly mobile, allowing rapid desorption and short measurement times

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High Sensitivity to Helium - Can detect very small leaks

• High Sensitivity (2 ppm) to helium, three orders of magnitude better than industry standard, due to SIPD (proprietary and patented Selective Ion Pump Detection)
• Excellent selectivity for helium allows to read helium leaks and ignore other gases
• Helium sensitivity can be adjusted as required to minimize test costs & helium
• Autozero function allows leak detection even in high helium background environment

Easy to Use - No training required

• State-of-the-art microprocessor control allows great simplicity of operation
• Fully automatic start-up
• Ready for test in less than 3 minutes
• Intuitive display
• Visual and audio indicators (standard headphone connection)
• No tuning required

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Truly Portable - Compact and light

• The PHD-4 weighs only 2,6 Kg (5.7 lbs) including the battery
• Its compact size allows it to be easily carried anywhere
• Its ergonomic design allows comfortable use for extended periods

Versatile - Suitable for many different applications

• Wide range of uses: replaces or can be used with existing methods such as bubble test or pressure decay
• Able to detect both very small and large leaks
• Can operate either on battery power or connected to an outlet
• Displayed messages can be viewed in several languages (English, French, German, Italian).
• Standard Analog and RS232 Serial output.

Dependable - Long term operation

• Automatic backflow valve prevents helium saturation, ensuring fast response times as well as long life of sensing element.
• CE, CSA/US approved for global standardization.

Applications:

Large Vessels and Bioreactors

The PHD-4 offers unmatched accuracy and repeatability, presenting a unique solution that it is cost effective and very well suited for the leak range specifications of this application. Biotech and pharmaceutical industries used to rely on pressure decay and bubble test methods for finding leaks in their large bioreactors. The PHD-4 has established a new standard of quality, significantly increasing production yields.
• **Fermenters • Sterilizers • Freeze Dryers**

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Underground Pipes and Storage Tanks

The portability and light weight of the PHD-4 plays a major role in this application. Underground pipes and storage tanks (UST) are slightly pressurized with helium which, due to its high mobility, can escape through small leaks and migrate to the surface, where it can be easily detected by the PHD-4. The accuracy, portability and light weight of this unit greatly simplifies this process, particularly in difficult construction sites or rough terrain.

• Gas distribution lines • Under and above ground containers and storage tanks
• Telecommunication and high voltage underground cables

Water Heating and Cooling Pipes

The PHD-4 allows leak location without interruption of the normal operation, by mixing helium with the water in the circuit. Until recently, the precise and rapid location of leaks in buried pipes has been very difficult.
In the event of a leak, helium desorbs from the fluid and diffuses to the surface, where it is easily detected. Leaks in pipeline systems such as district heating systems, drinking or chilled water systems and steam pipe networks incur high costs due to losses and corrosion damage.
• Heater exchangers and steam condensation lines • Water pipes
• Radiant heating systems

Airplane Fuel Tanks and Lines

PHD-4 technology is approved worldwide by airplane manufacturers and operators as the standard for the location of leaks in aircraft fuel tanks and in oxygen distribution lines. For this purpose, helium is injected from the outside into the tank to be checked and the helium probe is used inside the wings to locate any leaks.
• Fuel tanks • Oxygen distribution lines

Other Applications

The PHD-4 is in daily use in many other applications. Virtually any object requiring any level of leak tightness can be simply tested with this instrument. Here is a partial list of other applications:
• Components and systems for the Chemical and Petrochemical Industries
• Components for the Automotive industry
• Process gas delivery lines in Semiconductor fabrication industry

TECHNICAL SPECIFICATION:

Lowest Detectable Helium Concentration	: 2 ppm (parts per million)
Lowest Detectable Helium leak	: 5 x 10-6 mbar l/s
	5 x 10-6 atm cc/s
	5 x 10-7 Pa m3/s
Response Time	: < 2 sec
Recovery Time	: <10 sec (from 50 ppm to 0 ppm)
Start up time, including self check-up	: 3 min approx.

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Power Supply	: • 12 Vdc, 1.2 A Rechargeable Battery included • 110-240 V 50-60 Hz Transformer/Battery Charger included
Battery operation Time	: 4 hours
Maximum Signal Drift	: 10 ppm/10 min
Operating Conditions Temperature	: +5°C to +35°C
Humidity	: 90% maximum relative humidity
Storage Conditions Temperature	: -20°C to +60°C
Weight	: 2,6 Kg (5.7 lbs)
Compliance to Norms	: CE approved, CSA/US approved

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