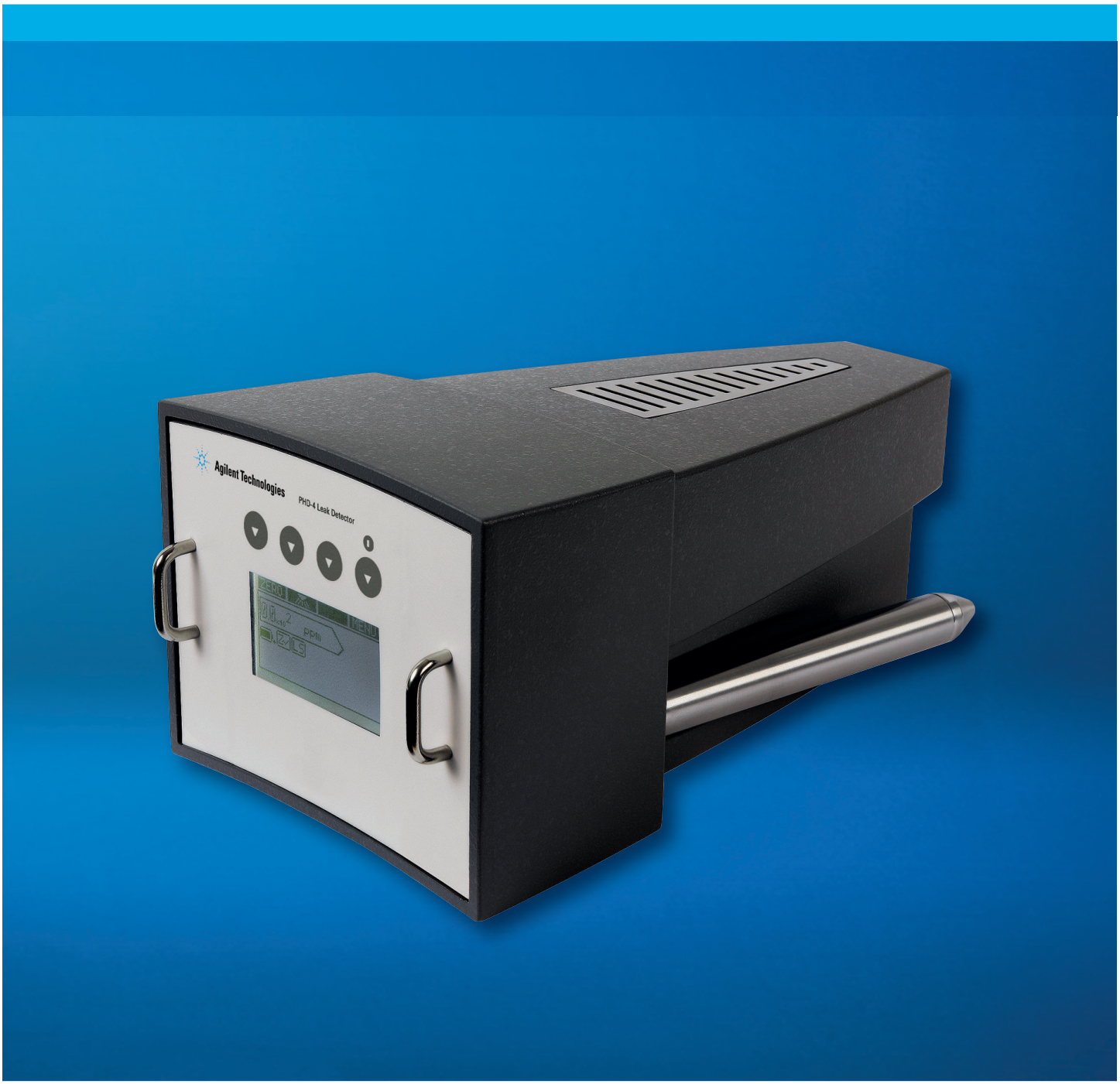
Agilent

Trusted Answers

The PHD-4
Portable Helium Detector

Unmatched portability and sensitivity



The Agilent PHD-4: Maximizing Productivity and Uptime

Global Application Support

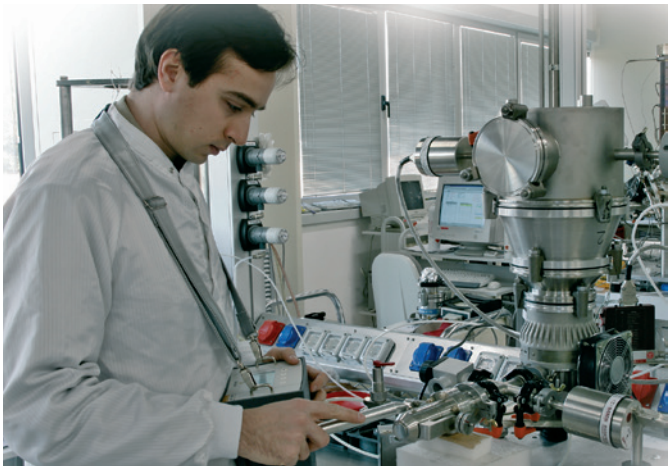
Expertise When & Where You Need It

- Thousands of portable SIPD sniffing helium detectors are in daily use worldwide
- Helium leak testing is the preferred solution in a broad range of applications and industries
- Native language application specialists available locally

High Performance Instruments

Wide Range, PHD-4 Portable Helium Detector

- High Sensitivity to Helium
- Easy to Use
- Truly Portable
- Versatile
- Dependable



Industry Leading Service & Support

Get The Most From Your Investment

- 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

Features and Benefits

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 you to read helium leaks and ignore all other gases
- Helium sensitivity can be adjusted as required to minimize test costs and helium consumption
- Autozero function allows leak detection even in unstable helium background environments

Easy to Use - No training required

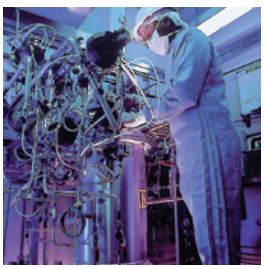
- State-of-the-art microprocessor control allows great simplicity of operation
- Fully automatic start-up with auto-diagnostics
- Ready for test in less than 3 minutes
- Intuitive display screen
- Visual and audio indicators (standard headphone connection)
- No tuning required

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

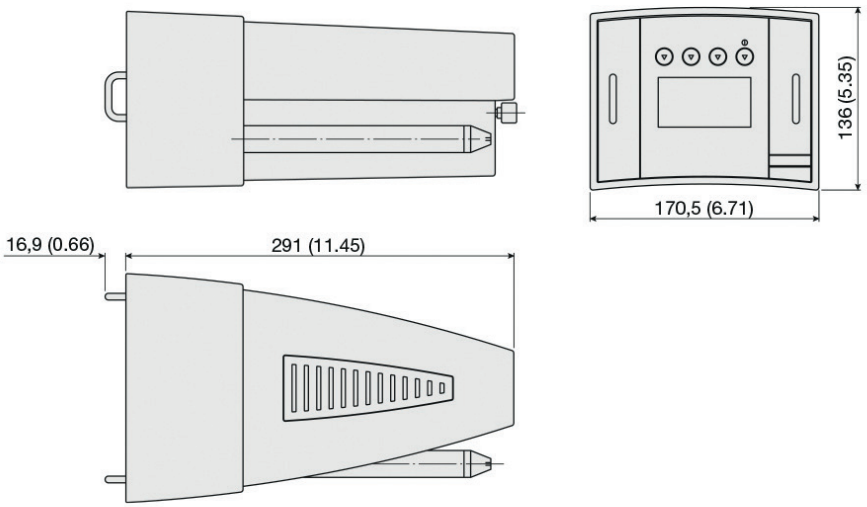
- Wide range of uses: replaces or can be used with existing methods such as bubble test or pressure decay
- Able to detect both very small and large leaks
- Can operate either on battery power or connected to a mains power supply
- Displayed messages can be viewed in several languages (English, French,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



Dependable - Long term operation

- Automatic backflow valve helps prevent helium saturation, ensuring fast recovery time as well as long life of sensing element.
- CE, CSA/US approved for global standardization

The PHD-4 Portable Helium Detector



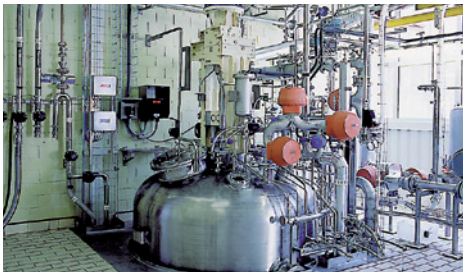
Dimensions: millimeters (inches)

Technical Specifications	
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.
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 Storage Conditions	Temperature: +5°C to +35°C Humidity: 90% maximum relative humidity Temperature: -20°C to +60°C
Weight	2,6 Kg (5.7 lbs)
Compliance to Norms	CE approved, CSA/US approved

Ordering Information	Part Number
PHD-4 Complete Package **Travel Case includes:** – PHD-4 Basic Unit – Spare Battery – Transformer/Battery Charger (110-240V) – Carrying Strap – Probe Set – 15-pin I/O connector – CD Instruction Manual	9694640
PHD-4 Basic Package **Includes:** – PHD-4 Basic Unit – Transformer/Battery Charger (110-240V) – Carrying Strap – 15-pin I/O connector – CD Instruction Manual	9694600
PHD-4 Replacement Part Kit **Includes:** – Sampling Pump with Fittings – Probe with Sampling Line – Tip Probe Filter – Internal Filter (Kit of 5 units)	9694660
Accessories – Probe Set – Capillary leak with refillable reservoir and gauge – Probe with 10 meter (30') maximum Sampling Line – Telescoping Extension Probe	 9693515 9693540 9693525 9693520
Individual Replacement Parts – Spare Battery – Transformer/Battery Charger (110-240V) – Sampling Pump with Fittings – Probe with Sampling Line – Tip Probe Filter – Internal Filter (Kit of 5 units) – Carrying Strap – 15-pin I/O connector – Travel Case (metal) – PHD-4 Probe adapter – Protective Bag (canvas, see picture below)	 SR 03.702609 SR 03.702888 SR 03.702513 SR 03.702538 SR 28.900012-01 SR 03.702959 SR 03.702791 SR 03.702894 SR 03.702890 SR 03.703054 VSPHD4BAG

Contact Agilent for Rack mounting or specific application requirements.

Applications



Large Vessels and Bioreactors

The PHD-4 offers unmatched accuracy and repeatability, presenting a unique solution that 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

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

Courtesy of Fraunhofer UMSICHT, Germany

Water Heating and Cooling Pipes

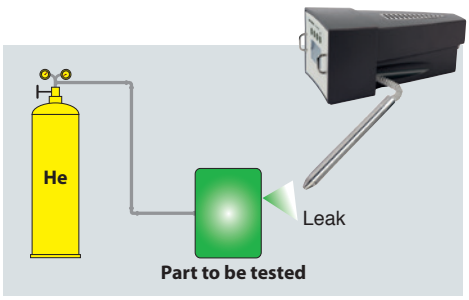
The PHD-4 allows leak location without interruption of the normal operation, by mixing helium with the water in the circuit. Until recently, the precise and rapid location of leaks in buried pipes has been very difficult. In the event of a leak, helium desorbs from the fluid and diffuses to the surface, 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. Agilent works with an exclusive distributor for aircraft applications. Please contact your local Agilent office for more information.

• Fuel tanks • Oxygen distribution lines



Other Applications

The PHD-4 is in daily use in many other applications. Its portability makes it ideal for factory and field maintenance. Here is a partial list of other applications:

• Components and systems for the Chemical and Petrochemical Industries

• Compressed air components and delivery systems

• Process gas delivery lines in Semiconductor fabrication industry

The PHD-4 Portable Helium Detector

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 an Agilent 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 in the 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
- When used properly, it is the most economical and allows the highest sensitivity, of all trace gases

Learn more:
www.agilent.com/chem/phd-4

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