THE PHD-4
PORTABLE HELIUM DETECTOR

WIDE RANGE, HIGH PERFORMANCE SYSTEM

EDITION 1/2014

GCE druva™
Security in action

THE PHD-4 PORTABLE HELIUM DETECTOR THE druva ADVANTAGE

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.

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

MAXIMIZING PRODUCTIVITY AND UPTIME

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

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 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

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
- Two levels of sensitivity are available for application dependent use
- 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

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**

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.

We work with an exclusive distributor for aircraft applications. Please contact us for more information.

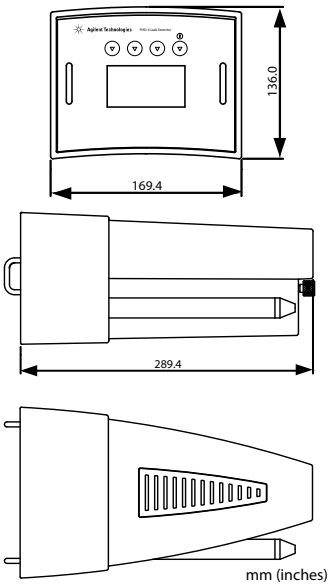
- **Fuel tanks**
- **Oxygen distribution lines**

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 industryPart**

THE PHD-4 PORTABLE HELIUM DETECTOR



mm (inches)

TECHNICAL DATA

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 m^3/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:	
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

ORDERING INFORMATION

Art.-Nr.	Type	Includes
9694640	PHD-4 Complete Package	PHD-4 Basic Unit, Spare Battery, Transformer/Battery
	(Travel case)	Charger (110-240V), Carrying Strap, Probe Set, 15-pin I/O
		connector, CD Instruction Manua, Probe adapter
9694600	PHD-4 Basic Package	PHD-4 Basic Unit, Transformer/Battery Charger (110-240V),
		Carrying Strap, 15-pin I/O connector, CD Instruction Manual,
		Probe adapter
9694660	PHD-4 Replacement Part Kit	Sampling Pump with Fittings, Probe with Sampling Line,
		Tip Probe Filter, Internal Filter (Kit of 5 units)

ACCESSORIES

Art.-Nr.	Type
9693515	Probe Set
9693540	Capillary leak with refillable reservoir and gauge
9693525	Probe with 10 meter (30') maximum Sampling Line
9693520	Telescoping Extension Probe

INDIVIDUAL REPLACEMENT PARTS

Art.-Nr.	Type
SR 03.702609	Spare Battery
SR 03.702888	Transformer/Battery Charger (110-240V)
SR 03.702513	Sampling Pump with Fittings SR
SR 03.702538	Probe with Sampling Line
SR 28.900012-01	Tip Probe Filter
SR 03.702959	Internal Filter (Kit of 5 units)
SR 03.702791	Carrying Strap
SR 03.702894	15-pin I/O connector
SR 03.702890	Travel Case
SR 03.703054	PHD-4 Probe adapter
VSPHD4BAG	Protective Bag (pictured at left)

Contact Druva for Rack mounting or specific application requirements.

GCE WORLDWIDE - WE ARE CLOSE TO YOU

EUROPE

CZECH REPUBLIC
GCE Trade s.r.o.
Zizkova 381
CZ-583 01 Chotebor
Phone: +420 569 661 122
Fax: +420 569 661 107
sales.cz@gcegroup.com

FRANCE
GCE S.A.S.
70, rue du Puits Charles
BP N° 40110
FR-58403 La Charité-sur-Loire
Phone: +33/3 86 69 46 00
Fax: +33/3 86 70 09 81
sales.fr@gcegroup.com

GERMANY
GCE GmbH
Weyherser Weg 8
36043 Fulda
Phone: +49 (0)661-8393-0
Fax: +49 661 8393 25
sales.de@gcegroup.com

HUNGARY
GCE Hungária Kft.
II. Rákóczi Ferenc út 68.
H-2314 Halásztelek
Phone: +36 (24) 521 200
Fax: +36 (24) 521 201
sales.hu@gcegroup.com

ITALY
GCE Mujelli spa
Via F. Ili Cervi, 11
37036 S. M. Buon Albergo (VR)
Phone: +39 045 878 0 525
Fax: +39 045 878 0 750
sales.it@gcegroup.com

POLAND
GCE Sp z o.o.
ul. Drapińska 12
03-581 Warszawa
Phone: +48 22 511 23 57
Fax: +48 22 677 70 90
sales.pl@gcegroup.com

PORTUGAL
GCE Portugal
Rua do FeiraPark,50, Piso 2, sala 8
PT-4520-632 São João de Vêr
Phone: +351 256 373 682
Fax: +351 256 378 260
sales.pt@gcegroup.com

ROMANIA
GCE Romania S.R.L
22, Al.Puskin Street, Ap.1,
Bucharest 1, 011996
Phone: +40 21 316 76 72
Fax: +40 21 316 76 74
sales.ro@gcegroup.com

RUSSIA (Moscow)
GCE Krass OOO
Russian Federation
129343, Moscow,
Urzhumskaya Street, no 4
Phone: +7 495 745 26 99
Fax: +7 495 745 26 90
sales.ru@gcegroup.com

RUSSIA (Sankt Petersburg)
GCE Krass OOO
Russian Federation
194100, Sankt Petersburg
Kantemirovskaya, 12A
Phone: +7 812 323 86 39
Fax: +7 812 323 86 49
sales.ru@gcegroup.com

SPAIN
GCE Ibérica, S.L.U.
Avda. de la Democracia,
7 - Of. 311
ES-28031 Madrid
Phone: +34 91 571 1470
Fax: +34 91 571 2756
sales.es@gcegroup.com

SWEDEN
GCE Norden AB
Box 21044
Källvattengatan 9
200 21 Malmö
Phone: +46-40-388300
Fax: +46-40-388353
sales.se@gcegroup.com

UNITED KINGDOM & IRELAND
GCE Ltd.
Yew Tree Way, Stone Cross Park
Golborne, Warrington WA3 3JD
Phone: +44 (0)1942 29 29 50
Fax: +44 (0)1942 29 29 77
sales.gb@gcegroup.com

ASIA

CHINA
GCE Gas Control Equipment Co., Ltd.
No.4 Building, 318 Xiao Wan Road
Fengxian District, Shanghai 201401
P.R. China
Phone: +86-21-37198408
Fax: +86-21-37198617
sales.cn@gcegroup.com

INDIA (Bangalore)
GCE India Pvt. Ltd.
1st floor, 59 Millers Road,
Benson Town,Bangalore
560046, Karnataka, India
Phone: +9180 2363 1685
Fax: +9180 2363 1685
sales.in@gcegroup.com

INDIA (Mumbai)
GCE India Representation
Offices No. 44 & 45, 2nd Floor,
Crystal Plaza,
Hiranandani Complex,
Sector - 7, Kharghar,
Navi Mumbai 410 210,
Maharashtra, India
Mobile:+91-9987026546
sales.in@gcegroup.com

AMERICA

LATIN AMERICA
GCE Latín America
Po.Box: 0843-01211
Panamá
Republica de Panamá
Phone: +507 317 61 68
Fax: + 507 317 65 00
sales.pa@gcegroup.com

MEXICO
GCE Gas Control Equipment SA de CV
Po.Box: 0843-01211
Panamá
Republica de Panamá
Phone: +507 317 61 68
Fax: + 507 317 65 00
sales.pa@gcegroup.com

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