The PHD-4 is complete with a rechargeable battery and related Power Supply. Always recharge the battery in a safe area.

Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Do not cover or obstruct the ventilation slots on the top part of the PHD-4 and the rear discharge duct.

Operative suggestions to perform a GOOD LEAK CHECK:
- Limit background of He
- Sweep slowly on suspected areas starting from lower parts
- If the background is variable use AZ mode
- Operate in environments with stable room temperature
- Periodically check Reading precision

Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME:
- Begin Leak Checking with LOW SENS
- Always use SAFETY SET-POINT
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Operative suggestions to perform SAMPLING AUTODAUL and BATTERY CARE:
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME:
- Begin Leak Checking with LOW SENS
- Always use SAFETY SET-POINT
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Operative suggestions to perform SAMPLING AUTODAUL and BATTERY CARE:
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME:
- Begin Leak Checking with LOW SENS
- Always use SAFETY SET-POINT
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Operative suggestions to perform SAMPLING AUTODAUL and BATTERY CARE:
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.
Sampling Pump: Removal and Replacement

Clean filter with grease remover and dry with compressed air.

Sintered Filter: Maintenance

Disconnect air tubes. Disconnect Pump electrical connector. Remove the pump. Reverse procedure for new pump.

Internal Filter: Removal and Replacement


Battery Pack: Removal and Replacement

Holding Filter cartridge turn fitting on the top by 1/4 of turn. Release discharged battery. Unplug discharged battery connector. Connect new battery connector and fasten it.

Technique Maintenance

Sampling Pump: Removal and Replacement

Disconnect air tubes. Disconnect Pump electrical connector. Remove the pump. Reverse procedure for new pump.

Sintered Filter: Maintenance

Clean filter with grease remover and dry with compressed air.

FRONT PANEL DISPLAY

I/O - RS232 INTERFACE

Graphic display

Multi-function keypad

Exhaust Gas outlet

Key “D” - CRV

Headset connector

Power connector

Routine Maintenance

Internal Filter: Removal and Replacement

Pin number Signal
1 Analog out (+)
2 RS232 TX
3 Rs232 RX
4 Remote IN
5 RS232 GND
6 Analog out (-)
11 Relay 1 N.O.
12 Relay 2 N.O.
13 Relay 3 N.O.
14 Relay 4 N.O.
15 Relay common

Skinny text:

Routine Maintenance

Click and rotate. The enclosure will be released.

Battery Pack: Removal and Replacement

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released.

Use only Agilent-provided power supply with a grounded connection. (90 - 240 Vac / 50-60 Hz).

START UP

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released.

BATTERY LEAK DETECTOR

Use only Agilent-provided power supply with a ground connection. (90 - 240 Vac / 50-60 Hz).

START UP

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released.

Use only Agilent-provided power supply with a grounded connection. (90 - 240 Vac / 50-60 Hz).

START UP

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released.

FRONT PANEL DISPLAY

I/O - RS232 INTERFACE

V.S. Leak Detector

Use only Agilent-provided power supply with a ground connection. (90 - 240 Vac / 50-60 Hz).

START UP

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released.

Use only Agilent-provided power supply with a grounded connection. (90 - 240 Vac / 50-60 Hz).

START UP

Press (and hold down 3 sec) the “D” key. Self test will start giving following results:
- V: Test OK.
- !: Test fail.
- R: Test must be repeated.
- PS: No battery or battery fail.
Sampling Pump: Removal and Replacement
Clean filter with grease remover and dry with compressed air

Sintered Filter: Maintenance

Internal Filter: Removal and Replacement

Sintered Filter: Removal and Replacement
Disconnect air tubes
Disconnect Pump electrical connector
Remove the pump
Reverse procedure for new pump

Battery Pack: Removal and Replacement
Click and rotate. The enclosure will be released
Release discharged battery
Staking discharged battery connector
Connect new battery connector and fasten it

Routine Maintenance

PIN 1-6 ANALOG VOLTAGE

INTERNAL FILTER: REMOVAL AND REPLACEMENT

TECHNICAL DATA

Minimum detectable He concentration 2 PPM
Minimum detectable N concentration 2x10^-6 Pa
Operating conditions - temperature range -4 to +20 °C
Humidity 90 % RH (non cond.)

Battery operative range 4 h
Battery auto discharging 0.1% max. / day at +20 °C
Relay contacts data: 24 Vac/cc 1 A (resistive load)
0.3 A (inductive load)

Protection set-point levels Low sens. High sens.
MINIMUM VALUE 200 PPM 2 PPM
DEFAULT VALUE 400 PPM 100 PPM
MAXIMUM VALUE 600 PPM 250 PPM

PIN 1-6 ANALOG VOLTAGE
Resolution 0.1 V/ppm

Technical data base unit
General Information - Electrical connection

FRONT PANEL DISPLAY

1/O - RS232 INTERFACE

GRAPHIC DISPLAY

Multi-function keypad
Key “D” or “D”

Graphic display

Headset connector
Power connector
Exhaust gas outlet
Exhaust gas inlet
Analogue Filter
Headset connector

FRONT PANEL DISPLAY

I/O - RS232 INTERFACE

GRAPHIC DISPLAY

Multi-function keypad
Key “D” or “D”

Graphic display

Headset connector
Power connector
Exhaust gas outlet
Exhaust gas inlet
Analogue Filter
Headset connector

Routine Maintenance

FRONT PANEL DISPLAY

I/O - RS232 INTERFACE

GRAPHIC DISPLAY

Multi-function keypad
Key “D” or “D”

Graphic display

Headset connector
Power connector
Exhaust gas outlet
Exhaust gas inlet
Analogue Filter
Headset connector

Routine Maintenance
Sampling Pump: Removal and Replacement

Clean filter with grease remover and dry with compressed air.

Sintered Filter: Maintenance

Disconnect air tubes.
Disconnect Pump electrical connector.
Remove the pump.
Reverse procedure for new pump.

Internal Filter: Removal and Replacement

Release discharged battery.
Standing discharged battery connector.
Contact new battery connector and fasten it.

Sintered Filter: Maintenance

Disconnect air tubes.
Disconnect Pump electrical connector.
Remove the pump.
Reverse procedure for new pump.

Routine Maintenance

Technical Data

Minimum detectable He concentration: 2 PPM
Minimum detectable He leak rate: 5x10^-6 mbar l/s
Operating conditions: - temperature +5 °C to +35 °C
- humidity 90 % RH (non cond.)
Battery operative range: 4 h
Battery auto discharging: 0.1% max. / day +20 °C
Battery life: > 500 charge/discharge cycles (IEC standards)
Relay contacts data: 24 Vac/cc
1 A (resistive load)
0.3 A (inductive load)
Protection set-point levels:
- Low sens.
- High sens.
MINIMUM VALUE: 200 PPM   2 PPM
DEFAULT VALUE: 400 PPM 100 PPM
MAXIMUM VALUE: 600 PPM 250 PPM
Resolution for analog voltage: 0.1 V/ ppm
Sampling Pump: Removal and Replacement

Clean filter with grease remover and dry with compressed air.

Sintered Filter: Maintenance

Disconnect air tubes Disconnect Pump electrical connector

Remove the pump Reverse procedure for new pump

Release discharged battery Unplug discharged battery connector

Connect new battery connector and fasten it

Internal Filter: Removal and Replacement

Holding Filter cartridge turn fitting on the top by 1/4 of turn

Remove saturated filter Position new filter and lock sampling line fitting

Battery Pack: Removal and Replacement

Click and rotate. The enclosure will be released

Battery operative range: 4.5 V

Battery auto discharging: 0.1% min. / day +20 °C

Battery life: +50% charge/discharge cycles (IEC standard)

Battery contacts data: 24 Vac/cc

- 1 A (resistive load)
- 0.3 A (inductive load)

Protection set-point levels Low sens. High sens.

- MINIMUM VALUE 200 PPM  2 PPM
- DEFAULT VALUE 400 PPM  100 PPM
- MAXIMUM VALUE 600 PPM  250 PPM

Sintered Filter: Maintenance

Glass filter with grease remover and dry with compressed air.

Sampling Pump: Removal and Replacement

Disconnect air tubes Disconnect Pump electrical connector

Remove the pump Remove pump

Reverse procedure for new pump

Front Panel Display

I/O - RS232 INTERFACE

TECHNICAL DATA

Minimum detectable He concentration: 1 PPM

Minimum detectable He leak rate: 5x10^-6 mbar l/s

Operating conditions:
- temperature: +5 °C to +35 °C
- humidity: 90% RH (non cond.)

Battery operative range: 4 h

Battery auto discharging: 0.1% max. / day +20 °C

Battery life: +50% charge/discharge cycles (IEC standard)

Battery contacts data: 24 Vac/cc

- 1 A (resistive load)
- 0.3 A (inductive load)

Pin number Signal

1 Analog out (+)
2 RS232 TX
3 Rs232 RX
4 Remote IN
5 Relay 1 N.O.
6 Analog out (-)
7 Relay 2 N.O.
8 Relay 3 N.O.
9 Relay 4 N.O.
10 RS232 GND
11 Relay common
12 Headset connector
13 Power connector
14 Enclosure fast unlock device
15 Exhaust Gas outlet
16 Analogy Pin

Exhaust Gas outlet

Technical data base unit

General Information - Electrical connection
The PHD-4 is complete with a rechargeable battery and related Power Supply. Always recharge the battery in a safe area.

Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked EEX ia IIAT4), the PHD-4 must be positioned outside the areas with a risk of explosion.

Do not cover or obstruct the ventilation slots on the top part of the PHD-4 and the rear discharge duct.

Operative suggestions to perform a GOOD LEAK CHECK:
- Limit background of He
- Sweep slowly on suspected areas starting from lower parts
- If the background is variable use AZ mode
- Periodically check Reading precision

OPERATIVE SUGGESTIONS TO GET SHORT RECOVERY TIME AND LONG PHD-4 LIFETIME:
- Begin Leak Checking with LOW SENS
- Always use SAFETY SET-POINT
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Avoid overflow of He
- Do not perform SPM or battery tests
- Periodically check Leakage precision

User Interface

Large Size Measurement Screen Page

ENABLING:
Mask SETUP/□ LARGE SCREEN ON

ACTIVATION:
Automatic (5 sec delay)

DEACTIVATION:
Temporary (Button "OFF" or "MENU"

INFORMATION:
Leak rate data
Unit of Measurement
Battery status
Zero Status
Measurement trend
Unit of Measurement

Status icons

Options
- Language
  - English
  - Italian
  - French
  - Deutsch
- Unit of Measure
  - PPM
  - %
  - %vol
  - cm³/min
  - cfm
  - L/min
  - SCFM
  - M³/min
  - Kph R12
  - g/year R12
- Housing
  - Mix value displaying
  - Auto setting

Communications
- Remote control
- Analog control
- RS232 control
- Data rate
- 1200
- 2400
- 4800
- 9600
- 19200

Maintenance
- Sensitive Check-up
- Battery
- Battery maintenance
- Charge level
- Reading adjustment
- PHD-4 Info
- Part number
- Serial number
- Firmware release
- Working time

Leaking
- Enable leak protection
- Change user password

NOTE

Always recharge the battery in a safe area.

Operative suggestions to get SHORT RECOVERY TIMES and LONG PHD-4 LIFETIME:

- Begin Leak Checking with LOW SENS
- Always use SAFETY SET-POINT

Checking Method:
- Use low the concentration in tracer gas (e.i. 1%He/N2)
- Use low tracer gas pressure (e.i. 0.5 Bar)
- Avoid sniffing oil, dust or water
- Avoid overflow of He
- Do not perform SPM or battery tests

GENERAL:
- Periodically perform SAMPLING AUTODAJ and BATTERY CARE

**NOTE**

**USER INTERFACE**

**LARGE SIZE MEASUREMENT SCREEN PAGE**

**ENABLING:** Mask SETUP/□ LARGE SCREEN ON

**ACTIVATION:** Automatic (5 sec delay)

**DEACTIVATION:** Temporary (Button "OFF" or "MENU")

**INFORMATION:**
- Leak rate data
- Unit of Measurement
- Battery status
- Zero Status
- Measurement trend

**Status icons**

**Options**
- Language
  - English
  - Italian
  - French
  - Deutsch
- Unit of Measure
  - PPM
  - %
  - %vol
  - cm³/min
  - cfm
  - L/min
  - SCFM
  - M³/min
  - Kph R12
  - g/year R12
- Housing
  - Mix value displaying
  - Auto setting

**Communications**
- Remote control
- Analog control
- RS232 control
- Data rate
- 1200
- 2400
- 4800
- 9600
- 19200

**Maintenance**
- Sensitive Check-up
- Battery
- Battery maintenance
- Charge level
- Reading adjustment
- PHD-4 Info
- Part number
- Serial number
- Firmware release
- Working time

**Leaking**
- Enable leak protection
- Change user password

**NOTE**

**PHD-4 PORTABLE HELIUM DETECTOR QUICK REFERENCE CARD**

**Code:** 87-900-126-01

(A) 05/2011
Operative suggestions to perform a GOOD LEAK CHECK:

- Limit background of He.
- Sweep slowly on suspected areas starting from the lower part.
- If the background is variable use AZ mode.
- Periodically check reading precision.

Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME:

- Begin Leak Checking with LOW SENS.
- Always use SAFETY SET-POINT.

CHECKING METHOD:

- Use low tracer gas concentration (e.g., 5% He/N2).
- Avoid high flow rate of He.
- Avoid sniffing oil, dust or water.

GENERAL:

- Periodically perform SAMPLING AUTODAJL and BATTERY CARE.

The PHD-4 is complete with a rechargeable battery and related Power Supply. Always recharge the battery in a safe area.

Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked EEX ia IIAT4), the PHD-4 must be positioned outside the area with a risk of explosion.

Do not cover or obstruct the ventilation slots on the top part of the PHD-4 and the rear discharge duct.

User Interface

Large Size Measurement screen Page

Enable: Menu SETUP/LARGE SCREEN ON

ACTIVATION: Automatic (5 sec delay)

INFORMATION:

- Leak rate data
- Battery status
- Zero Status
- Measurement trend
- Unit of Measurement
- High Sensitivity activated
- Low Sensitivity activated
- Fixed / automatic zero
- Back-light ON/OFF
- PHD-4 OFF

Options:

- Language
  - English
  - Italian
  - French
  - German
- Unit of Measure
  - ppm
  - mbar/sec
  - mmHg
  - Torr
-beck
- KPa
- g/year
- mbar
- Mix data displaying
- Auto setting

Communications:

- Remote control
- Analog control
- RS232 control
- Serial number
- Firmware release
- Working time

Maintenance:

- Sneeze Check-up
- Battery maintenance
- Charge level

Reading adjustment:

- PHD-4 Info
  - Part number
  - Serial number
  - Firmware release
  - Working time

Leaking:

- Enable protection
- Change user password

User Interface Notes:

1. Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME.
2. Operative suggestions to perform a GOOD LEAK CHECK.
3. Operative suggestions to perform a GOOD LEAK CHECK.
4. PHD-4 Portable Helium Detector Quick Reference Card.
**Operative suggestions to perform a GOOD LEAK CHECK:**

- Limit background of He
- Sweep slowly on suspected areas starting from lower parts
- If the background is variable use AZ mode
- Operate in environments with stable room temperature
- Periodically check Reading precision

**Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME:**

- **PHD-4 SETTING:**
  - Begin Leak Checking with LOW SENS
  - Always use SAFETY SET-POINT

- **CHECKING METHOD:**
  - Use low tracer gas pressure (e.i. 0.5 Bar)
  - Avoid sniffing oil, dust or water

**NOTE**

- Periodically perform SAMPLING AUTODAJ and BATTERY CARE

**NOTE**

- Do not use the PHD-4 in environments containing potentially flammable gases or vapors. If the PHD-4 is used in combination with sampling safety devices (only if marked IECX IIAT4), the PHD-4 must be positioned outside the areas with risk of explosion.

**Complete measurement screen page**

- **ACTIVATION:**
  - Default at startup

**INFORMATION:**

- Leak rate data
- Battery status
- Fixed /automatic zero
- Backlight ON/OFF
- Status icons

**Options**

- Language
- English
- Italian
- French
- German

- Unit of Measure
- PPM
- mbar/sec
- mbar
- Atmosphere
- Pa
- Feet/sec
- Kph/R2
- g/metre R2

- Helenx
- Mix value displaying
- Auto setting

**Communications**

- Remote control
- Analog control
- RS232 control

**Set point**

- Set point 1
- Set point 2
- Set point 3
- Set point 4
- Safety Set point

**Leaking**

- Enable leak protection
- Change user password

**Maintenance**

- Sensor Clean-up
- Battery maintenance
- Charge level

**Reading adjustment**

- PHD-4 Info
- Part number
- Serial number
- Firmware release
- Working time

**Status icons**

- High sensitivity activated
- Low sensitivity activated

**Enabling**

- Menù SETUP/LARGE SCREEN ON

**Deactivating**

- Temporary (Button "OFF" or "MENU")

**Overview**

- The PHD-4 is complete with a rechargeable battery and related Power Supply. Always recharge the battery in a safe area.

- Operative suggestions to perform a GOOD LEAK CHECK.

- Operative suggestions to get SHORT RECOVERY TIME and LONG PHD-4 LIFETIME.

**User Interface**

- Set-up
- High Sensitivity On
- Pump On
- Automatic
- Backlight On
- Large screen On
- Switch-off

- Set-up
- Low Sensitivity
- Auto zero

**Large Size Measurement screen Page**

- **ENABLING:**
  - Menù SETUP/LARGE SCREEN ON

- **ACTIVATION:**
  - Automatic (5 sec delay)

- **DEACTIVATION:**
  - Temporary (Button "OFF" or "MENU")

**INFORMATION:**

- Leak rate data
- Battery status
- Zero Status
- Measurement trend

**Options**

- Language
- English
- Italian
- French
- German

- Unit of Measure
- PPM
- mbar/sec
- mbar
- Atmosphere
- Pa
- Feet/sec
- Kph/R2
- g/metre R2

- Helenx
- Mix value displaying
- Auto setting

**Communications**

- Remote control
- Analog control
- RS232 control

**Set point**

- Set point 1
- Set point 2
- Set point 3
- Set point 4
- Safety Set point

**Leaking**

- Enable leak protection
- Change user password

**Maintenance**

- Sensor Clean-up
- Battery maintenance
- Charge level

**Reading adjustment**

- PHD-4 Info
- Part number
- Serial number
- Firmware release
- Working time

**Status icons**

- High sensitivity activated
- Low sensitivity activated

**User Interface**

- Set-up
- High Sensitivity On
- Pump On
- Automatic
- Backlight On
- Large screen On
- Switch-off

- Set-up
- Low Sensitivity
- Auto zero

**Communications**

- Remote control
- Analog control
- RS232 control

**Set point**

- Set point 1
- Set point 2
- Set point 3
- Set point 4
- Safety Set point

**Leaking**

- Enable leak protection
- Change user password

**Maintenance**

- Sensor Clean-up
- Battery maintenance
- Charge level

**Reading adjustment**

- PHD-4 Info
- Part number
- Serial number
- Firmware release
- Working time

**User Interface**

- Set-up
- High Sensitivity On
- Pump On
- Automatic
- Backlight On
- Large screen On
- Switch-off

- Set-up
- Low Sensitivity
- Auto zero

**Communications**

- Remote control
- Analog control
- RS232 control

**Set point**

- Set point 1
- Set point 2
- Set point 3
- Set point 4
- Safety Set point

**Leaking**

- Enable leak protection
- Change user password

**Maintenance**

- Sensor Clean-up
- Battery maintenance
- Charge level