

PHD-4 capillary leak

Model 969-3540

**1. GENERAL**

The Agilent PHD-4 capillary leak model no. 969-3540 has been designed to allow a fast, simple and effective way to check the calibration of the Agilent HPD-4 leak detector.

The PHD-4 capillary leak contains a crimped stainless steel capillary to regulate the helium flow. The leak element is attached to a 110 cc stainless steel reservoir with an adapter that mates with the PHD-4 probe.

The reservoir has a pressure gauge for adjusting the driving pressure behind the capillary leak element in order to change the helium flow rate. The gauge measures the pressure up to 11 bar (160 psig).

The calibration is obtained by comparing the Helium concentration generated by the capillary leak in the provided calibration chamber with the actual reading of PHD-4 and correcting this one if necessary.

The value of the Helium concentration is of the order of 100 ppm (for a reservoir pressure of 100 PSI, 7 bar), and is specified in the calibration curve supplied with each unit.

NOTE

The supplied calibration curves are valid for PHD-4 devices equipped with the standard length probe.

2. DESCRIPTION

The PHD-4 capillary leak package is shown in figure 1;

it includes the following parts:

- 1) PHD-4 capillary leak;
- 2) Nylon bag containing O-ring Parker 2-120 BUNA (2 pcs.);
- 3) Instruction manual.

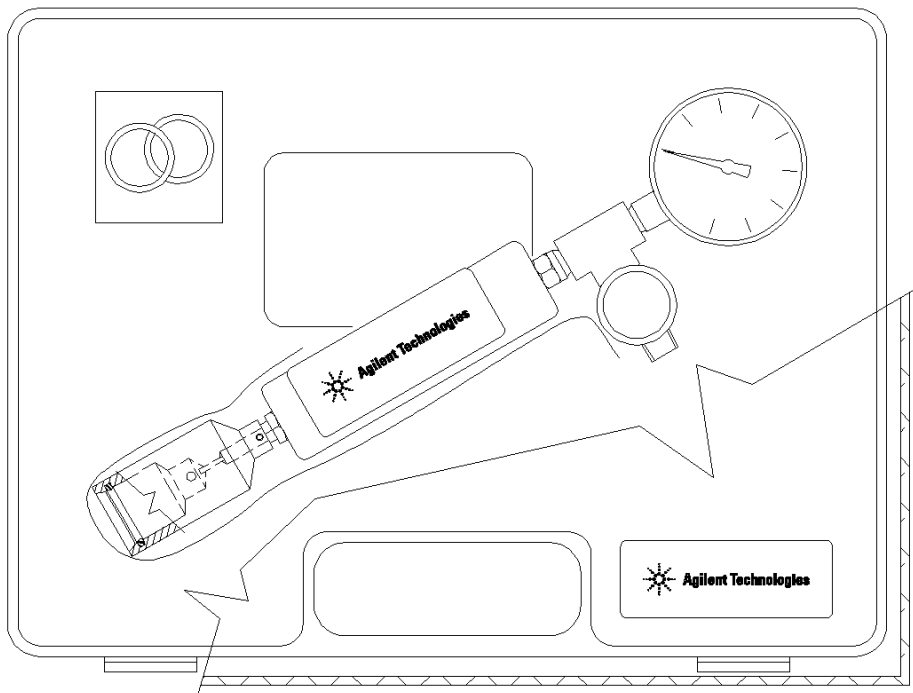


Figure 1

The PHD-4 capillary leak consists of the following main parts (see figure 2):

- 1) Capillary leak;
- 2) Rechargeable Helium reservoir;
- 3) Pressure gauge (from 0 to 11 bar/160 psi);
- 4) Helium recharging valve (connections: Gc 1/4).
- 5) Calibration curves
- 6) Calibration chamber
- 7) O-ring

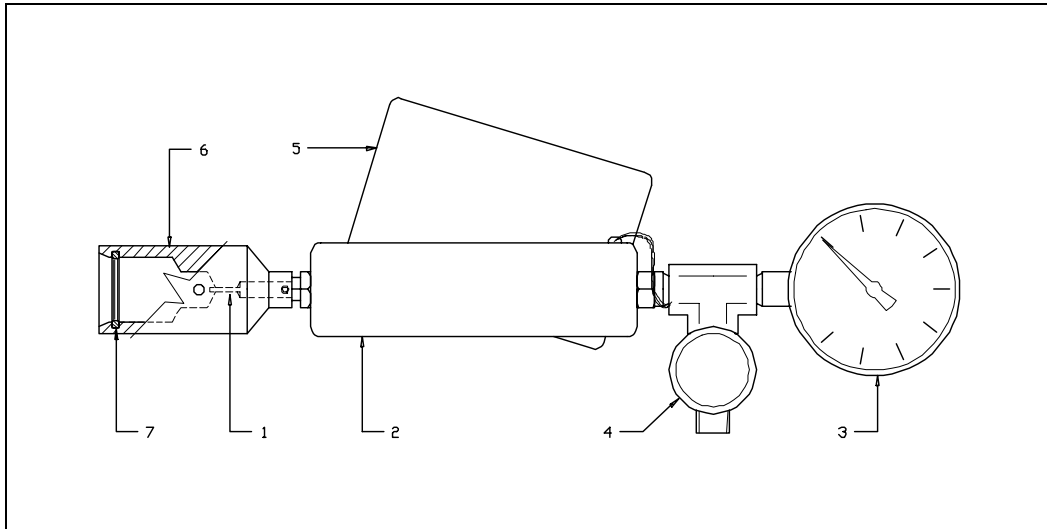


Figure 2

3. OPERATION

The calibration is done according to the following steps:

- 1) First of all, move the PHD-4 and probe away from Helium sources;
- 2) Set the unit to Fixed Zero operation;
- 3) Check the zero level;
- 4) Press simultaneously the SENS and MODE pushbuttons for more than 2 seconds;
- 5) Insert the PHD-4 probe in the calibration chamber (see figure 3); the display show:

-	-	>	C	a	i	b	r	a	t	i	o	n	
			P	L	E	A	S	E	W	A	I	T	*

and after a few seconds the display will be as show:

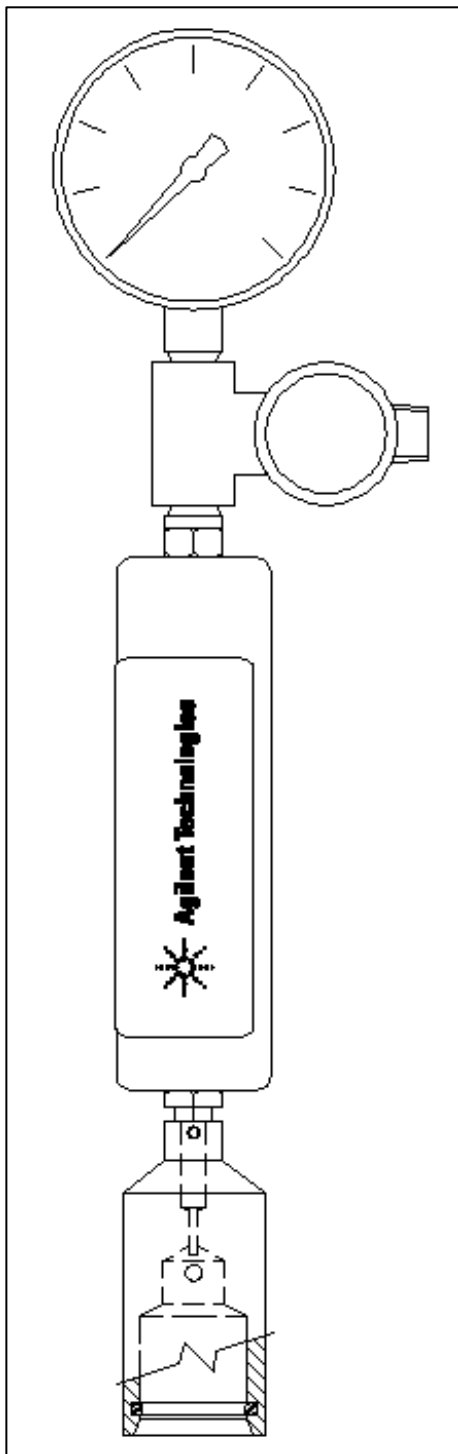
.	.	.	.	.	.	.	.	.	.	.	0	
			<	-	C	A	L	-	>			*

- 6) Read on the capillary leak gauge the actual Helium pressure in the bottle;
 - 7) Using the pressure/concentration curve (attached to the Helium bottle neck), determine the actual concentration value in ppm;
- N.B.: Use the pressure/concentration curve plotted for your PHD-4 typology.
- 8) Pressing SENS (down button) or MODE (up button) pushbuttons, correct PHD-4 reading as necessary;
 - 9) Press the SENS and MODE pushbutton simultaneously to exit the calibration routine and memorize the new setting.

For any other information about the Calibration procedure refer to the *PHD-4 instruction manual, Section IV, §4-2.*

NOTE

The PHD-4 capillary leak is shipped with the reservoir filled with helium at low pressure. To operate it, a helium refilling should be performed, according to paragraph 4.



4. REFILLING THE HELIUM RESERVOIR

When the reservoir pressure goes down to approx 30psi (2 bar), the capillary leak needs to be refilled with pure Helium.

Refilling steps:

- 1) Attach a clean line from pure helium bottle to the fill valve of the leak, but do not tighten the connection;
- 2) Flow helium through the line to purge the remaining air from the line;
- 3) Tighten the connection to the valve;
- 4) Open the fill valve;
- 5) Fill the leak to 11 bar (160 psig);
- 6) Loosen the connection from the helium source;
- 7) Open the fill valve and vent the leak to 2 bar (approximately 30 psig);
- 8) Repeat steps 3-7 three times to assure gas purity;
- 9) Fill to the pressure indicated on the label to obtain the desired flow rate.



CAUTION

To avoid clogging of the capillary, the line from your helium source must be clean and free of moisture. Copper or stainless steel lines are recommended. A rubber hose should NOT be used.

5. STORAGE

Capillary leaks are subjected to clogging and must be kept clean and dry. Store in an air-tight container when not in use. Care should be taken that the end of the capillary tube is not exposed to oil and dirt.

Recalibration of the gauge is recommended on an annual or biannual basis depending on the severity of the environment in which the leak is being used.

DISPOSAL

Meaning of the "WEEE" logo found in labels

The following symbol is applied in accordance with the EC WEEE (Waste Electrical and Electronic Equipment) Directive.

This symbol (**valid only in countries of the European Community**) indicates that the product it applies to must NOT be disposed of together with ordinary domestic or industrial waste but must be sent to a differentiated waste collection system.

The end user is therefore invited to contact the supplier of the device, whether the Parent Company or a retailer, to initiate the collection and disposal process after checking the contractual terms and conditions of sale.



