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Agilent Technologies

Instructions for Calibrated Helium Leak

FIELD INSTRUCTION SHEET

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Varian Field Instruction Sheet

Instructions for Calibrated Helium Leak

INTRODUCTION:

The calibrated helium leak is designed for use in calibrating helium leak detectors. It is equipped with an integral helium reservoir and an isolating valve, and is furnished with either an NW25 or a 1-1/8 inch diameter sealing surface to fit the test port of any Varian Leak Detector.

USE:

The details of tuning and calibration of the leak detector are described in the appropriate section of the leak detector manual. When the calibrated leak is not in use, it should always be left with the valve **open**, and be stored at the same temperature at which it will be used.

PRINCIPLES OF OPERATION:

The helium reservoir consists of the nickel-plated cylinder to which the label adheres. The valve communicates with a hollow pyrex-glass finger which protrudes into the helium reservoir.

Helium atoms permeate through glass, moving through the inter-molecular spaces in the glass. This permeation rate is dependent on the pressure of helium on each side of the glass and on the thickness and temperature of the glass.

If the valve of the calibrating leak is left closed, helium will continue to leak into the glass finger until the helium pressure inside the finger is equal to that in the reservoir (this would take about a year, in fact). As this pressure builds up, however, helium would be absorbed on the metal walls, and the inter-molecular spaces in the glass will become saturated. For both these reasons, a high leak rate will be apparent for some time after re-opening the valve, so it is recommended that the valve be left open.

The leak rate of the calibrated leak is very stable, and is not affected by moisture or dust which can migrate in during periods of disuse. The leak rate is dependant of two effects, however.

A. Depletion.

There is some finite depletion of the reservoir over time. This is a function of the leak rate and the volume of helium in the reservoir. The table below shows typical depletion rates in percent per year for some typical leak rates.

P/N Suffix	-320	-301/-321	-302/-322	-303/-323	-304/-324
Nominal Leak Rate	$10^{-5/6}$	10^{-7}	10^{-8}	10^{-9}	10^{-10}
Depletion % per Year (approx)	**	3%	2.5%	< 0.1%	< 0.1%

**Refer to chart attached to neck of Calibrated Helium Leak.

B. Temperature.

The rate at which helium permeates the pyrex is affected by the temperature of the glass. The actual leak rate increases with increased temperature at 3% per degree (Celsius). About one tenth of this is attributable to increase of the helium pressure with increased temperature.

Technical Assistance

The final page of this document lists all the Varian offices from which you can obtain technical assistance. In the United States, contact Varian Vacuum Technologies Customer Service at 1-800-8Varian or on-line at www.varianinc.com/vacuum.





IMPORTANT Instructions for returning products

Dear Customer,

Please follow these instructions whenever one of our products needs to be returned:

1. Complete the *Request for Return* form on our website (www.varianinc.com) and send it to Varian (see below), taking particular care to identify all products that have pumped or been exposed to any toxic or hazardous materials.
2. After evaluating the information, Varian will provide you with a Return Authorization (RA) number via email or fax, as requested.

Note: Depending on the type of return, a Purchase Order may be required at the time the Request for Return is submitted. We will quote any necessary services (evaluation, repair, special cleaning, eg).

3. **Important steps for the shipment of returning product:**

- ☐ Remove all accessories from the core product (e.g. inlet screens, vent valves).
- ☐ Prior to shipment, drain any oils or other liquids, purge or flush all gasses, and wipe off any excess residue.
- ☐ If ordering an Advance Exchange product, **use the packaging from the Advance Exchange to return the defective product.**
- ☐ Seal the product in a plastic bag, and package the product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
- ☐ Varian, Inc. is not responsible for returning customer provided packaging or containers.
- ☐ **Clearly label package with the RA number.** Using the shipping label provided ensures the proper address and RA number are on the package. Packages shipped to Varian without an RA clearly written on the outside cannot be accepted and will be returned.

4. Return only products for which the RA was issued.
5. **Product being returned under an RA must be received within 15 business days.**
6. **Ship to the location specified on the printable label, which will be sent, along with the RA number, as soon as we have received all of the required information.** Customer is responsible for freight charges on returning product.
7. Return shipments must comply with all applicable **Shipping Regulations** (IATA, DOT, etc.) and carrier requirements.

Return the completed request for return form to your nearest location:

North America:

FAX: 1-781-860-9252

Toll Free: 800-8VARIAN

(800-882-7426

vtl.ra@varianinc.com

Europe:

FAX: 00 39-011-9979125

Fax Free: 00 800 345 345 00

Toll Free: 00 800 234 234 00

vtt.ra@varianinc.com

Pacific Rim:

Please visit our website for individual office information.

<http://www.varianinc.com/vacuum>

Sales and Service Offices

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