Instructions for Calibrated Helium Leak
This page intentionally left blank.
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 dependent 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.

<table>
<thead>
<tr>
<th>P/N Suffix</th>
<th>Nominal Leak Rate</th>
<th>Depletion % per Year (approx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-320</td>
<td>10^{-5}/6</td>
<td>**</td>
</tr>
<tr>
<td>-301/-321</td>
<td>10^{-7}</td>
<td>3%</td>
</tr>
<tr>
<td>-302/-322</td>
<td>10^{-8}</td>
<td>2.5%</td>
</tr>
<tr>
<td>-303/-323</td>
<td>10^{-9}</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>-304/-324</td>
<td>10^{-10}</td>
<td>&lt; 0.1%</td>
</tr>
</tbody>
</table>

**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 (Celcius). 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.
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, etc).

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:  Europe:  Pacific Rim:
FAX: 1-781-860-9252    FAX: 00 39-011-9979125  Please visit our website for individual office information.
Toll Free: 800-8VARIAN  Fax Free: 00 800 345 345 00
(800-882-7426          Toll Free: 00 800 234 234 00
vtt.ra@varianinc.com   vtt.ra@varianinc.com  http://www.varianinc.com/vacuum
```
Canada
Central coordination through: Varian, Inc.
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel.: +1 781 861 7200
Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437

China
Varian Technologies China, Ltd.
Room 1648
Central Tower South Wing
Beijing Junefield Plaza
No. 10 XuanWuMenWai Street
Beijing 100052
P. R. China
Tel.: +86 (10) 6310 8550
Toll-Free: 800 820 6556
Fax: +86 (10) 6310 0141

France
Varian s.a.
7 avenue des Tropiques
Z.A. de Courtaboeuf - B.P. 12
91941 Les Ulis cedex
France
Tel.: +33 (0) 1 69 86 38 84
Fax: +33 (0) 1 69 86 29 88

Benelux
Varian Vacuum Technologies
Herculesweg 8
4338 PL Middelburg
The Netherlands
Tel.: +31 118 671570
Fax: +31 118 671569

Germany & Austria
Varian Deutschland GmbH
Alsfelder Strasse 6
Postfach 11 14 35
64289 Darmstadt
Germany
Tel.: +49 (0) 6151 703 353
Fax: +49 (0) 6151 703 302

India
Varian India Pvt. Ltd.
205-A, “A” wing of Galleria
2nd floor, Hiranandani Gardens
Powai, Mumbai-400 076
India
Tel.: +91 22 2570 8595/8597
Fax: +91 22 2570 8599
Mobile: +91 98 679 55969

Italy
Varian, Inc.
via F.lli Varian 54
10040 Leini, (Torino)
Italy
Tel.: +39 011 997 9111
Toll-Free: 00 800 234 234 00
Fax: +39 011 997 9350

Japan
Varian Technologies Japan, Ltd.
8th Floor
Sumitomo Shibaura Building
4-16-36 Shibaura Minato-ku
Tokyo 108
Japan
Tel.: +81 3 5232 1253
Toll-Free: 0120 655 040
Fax: +81 3 5232 1710

Korea
Varian Technologies Korea, Ltd.
Shinha 2nd Bldg. 2F
966-5 Daechi-dong
Kangnam-gu, Seoul
Korea 135-280
Tel.: +82 2 3452 2452
Toll-Free: 080 222 2452
Fax: +82 2 3452 2451

Mexico
Varian, S. de R.L. de C.V.
Concepcion Beistegui No 109
Col Del Valle
C.P. 03100
Mexico, D.F.
Tel.: +52 5 523 9465
Fax: +52 5 523 9472

Taiwan
Varian Technologies Asia, Ltd.
14F-6, No. 77, Hsin Tai Wu Road, Sec. 1
Hsi chih, Taipei Hsien
Taiwan, R.O.C.
Tel.: +886 2 2698 9555
Toll Free: 0800 051 342
Fax: +886 2 2698 96782

UK & Ireland
Varian Ltd.
6 Mead Road
Oxford Industrial Park
Yarnton, Oxford OX5 1QU
UK
Tel.: +44 (0) 1865 291570
Fax: +44 (0) 1865 291571

United States
Varian, Inc.
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel.: +1 781 861 7200
Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437

Other Countries
Varian Vacuum Technologies
via F.lli Varian 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9 111
Fax: (39) 011 997 9 350

Customer Support and Service:

North America
Tel: (800) 882-7426 (toll-free)
vtl.technical.support@varianinc.com

Europe
Tel: 00 (800) 234 234 00 (toll-free)
vtt.technical.support@varianinc.com

Japan
Tel: (81) 3 5232 1253 (dedicated line)
vjt.technical.support@varianinc.com

Korea
Tel (82) 2 3452 2452 (dedicated line)
vtk.technical.support@varianinc.com

Taiwan
Tel: 0 (800) 051 342 (toll-free)
vkw.technical.support@varianinc.com

Worldwide Web Site,
Catalog and On-line Orders:

www.varianinc.com

Representatives in most countries