IMG100/IM-500
Gauge Tube Rebuild Kit

INSTRUCTION MANUAL

Part No. 699908235
Rev. A
June 2009
IMG 100/IM-500 Gauge Tube Rebuild Kit
Warranty

Products manufactured by Seller are warranted against defects in materials and workmanship for twelve (12) months from date of shipment thereof to Customer, and Seller's liability under valid warranty claims is limited, at the option of Seller, to repair, replacement, or refund an equitable portion of the purchase price of the Product. Items expendable in normal use are not covered by this warranty. All warranty replacement or repair of parts shall be limited to equipment malfunctions which, in the sole opinion of Seller, are due or traceable to defects in original materials or workmanship. All obligations of Seller under this warranty shall cease in the event of abuse, accident, alteration, misuse, or neglect of the equipment. In-warranty repaired or replaced parts are warranted only for the remaining unexpired portion of the original warranty period applicable to the repaired or replaced parts. After expiration of the applicable warranty period, Customer shall be charged at the then current prices for parts, labor, and transportation.

When products are used with toxic chemicals, or in an atmosphere that is dangerous to the health of humans, or is environmentally unsafe, it will be the responsibility of the Customer to have the product cleaned by an independent agency skilled and approved in handling and cleaning contaminated materials before the product will be accepted by Varian, Inc. for repair and/or replacement. Reasonable care must be used to avoid hazards. Seller expressly disclaims responsibility for loss or damage caused by use of its Products other than in accordance with proper operating procedures.

Except as stated herein, Seller makes no warranty, express or implied (either in fact or by operation of law), statutory or otherwise; and, except as stated herein, Seller shall have no liability under any warranty, express or implied (either in fact or by operation of law), statutory or otherwise. Statements made by any person, including representatives of Seller, which are inconsistent or in conflict with the terms of this warranty shall not be binding upon Seller unless reduced to writing and approved by an officer of Seller.

Warranty Replacement and Adjustment

All claims under warranty must be made promptly after occurrence of circumstances giving rise thereto, and must be received within the applicable warranty period by Seller or its authorized representative. Such claims should include the Product serial number, the date of shipment, and a full description of the circumstances giving rise to the claim. Before any Products are returned for repair and/or adjustment, written authorization from Seller or its authorized representative for the return and instructions as to how and where these Products should be returned must be obtained. Any Product returned to Seller for examination shall be prepaid via the means of transportation indicated as acceptable by Seller. Seller reserves the right to reject any warranty claim not promptly reported and any warranty claim on any item that has been altered or has been returned by non-acceptable means of transportation. When any Product is returned for examination and inspection, or for any other reason, Customer shall be responsible for all damage resulting from improper packing or handling, and for loss in transit, notwithstanding any defect or non-conformity in the Product. In all cases, Seller has the sole responsibility for determining the cause and nature of failure, and Seller’s determination with regard thereto shall be final.

If it is found that Seller’s Product has been returned without cause and is still serviceable, Customer will be notified and the Product returned at its expense; in addition, a charge for testing and examination may be made on Products so returned. 3/1/00
This page intentionally left blank.
Preface

Documentation Conventions

This manual uses the following documentation conventions:

**WARNING**
Warnings indicate a particular procedure or practice, which if not followed correctly, could lead to serious injury.

**CAUTION**
Cautions indicate a particular procedure or practice, which if not followed, could cause damage to the equipment.

**NOTE**
Notes contain important information.

Before operating or servicing equipment, read and thoroughly understand all operation/maintenance manuals provided by Vacuum Technologies. Be aware of the hazards associated with this equipment, know how to recognize potentially hazardous conditions, and how to avoid them. Read carefully and strictly observe all cautions and warnings. The consequences of unskilled, improper, or careless operation of the equipment can be serious.

In addition, consult local, state, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to your nearest Vacuum Technologies office.
This page intentionally left blank.
Overview

Over time it is normal for Inverted Magnetron Gauges (IMG) to suffer from internal deposits and erosion of the internal surfaces. How fast and to what extent this occurs depends on the chemicals the gauge is exposed to during operation and the vacuum pressure. When this happens, the gauge often exhibits reading stability problems or may not even start up.

This kit brings the gauge performance nearly back to that of a new gauge. While the parts needed for both the IMG100 and the IM-500 are identical, refer to the appropriate section, as the detailed disassembly and assembly instructions are different.

Parts included in kit (R3427 IMG-100-IM-500):

- O-ring: 660890M01025
- Anode: R3142001
- Pole Piece Inner: R3348001
- Pole Piece Outer: R3347001
- IMG Tube Spacer: R3333001
- Retaining Ring: 699992090

IMG100

It is easiest to perform this maintenance with the magnet removed.

**CAUTION**

Protect the flange surface from scratches during maintenance operations.

Tools Required:

- Clean lint free cotton, nitrile gloves or finger cots
- Hex key or wrench - 1/16"
- 3/16" hex nut driver
- Snap ring pliers for internal type - .047" tip size

The procedure consists of:

- “Disassembly” on page 1-2
- “Cleaning” on page 1-2
- “Assembly” on page 1-3
**Disassembly**

1. Remove the connector/shroud assembly by loosening, but not removing, the three allen key screws.

2. Lift the connector shroud off of the tube.

3. Remove the small O-ring and discard.

4. Remove the magnet.

   **WARNING**
   
   This is a strong magnet; do not place it on a steel shelf, near tools or other small ferrous objects that could be attracted to it. Objects may be attracted to it with enough force to crack the magnet or cause bodily injury.

5. Turn the gauge tube so that you are looking down the vacuum port.

6. Remove the internal snap ring using the snap ring pliers. Discard.

7. Allow the pole pieces and spacer to slide out and discard the parts.

8. Using the hex nut driver, remove the anode pin and discard.

**Cleaning**

Clean the inside of the tube:

1. Soak the tube with acetone.

2. Rinse the tube with alcohol.

3. Air-dry the tube.
For certain contaminants and deposited debris, more aggressive cleaning may be necessary. For specific chemical residues:

1. Soak the tube with the recommend solvent for the specific chemical.

   **NOTE**
   Contact the chemical manufacturer for information on appropriate solvents and recommended cleaning procedures for vacuum applications.

2. Follow the instructions above for tube cleaning.

For hard residues and contaminants:

These types of deposits and residues appear flaky, or look like splatters.

1. Clean the inside surface of the tube using a mild abrasive, such as Scotch-Brite or equivalent.

   **CAUTION**
   Do not use sand paper, emery cloth, or glass beading, as the media particles are difficult to remove.

2. Follow the instructions above for tube cleaning.

**Assembly**

1. Install the new anode from the kit; do not over-tighten.
2. Install the new inner pole piece (the one with a single hole). The proper orientation is shown in Figure 1-1 on page 1-2.
3. Install the spacer from the kit.
4. Install the outer pole piece from the kit.
5. Install the snap ring from the kit; ensure that it is fully seated in the groove.
6. Re-install the magnet.
7. Drop the new O-ring from the kit on top of the magnet (see Figure 1-1 on page 1-2).
8. Re-install the connector/shroud assembly. Ensure that the O-ring is evenly seated under it and that the screws engage the body v groove. Tighten all three screws.
It is easiest to perform this maintenance with the magnet removed.

**CAUTION**  Protect the flange surface from scratches during maintenance operations.

Tools Required:
- Clean lint free cotton, nitrile gloves or finger cots
- Hex key or wrench - 1/16"
- 3/16" hex nut driver
- Snap ring pliers for internal type - .047" tip size
- #2 Philips head screw driver

The procedure consists of:
- “Disassembly”
- “Cleaning” on page 1-5
- “Assembly” on page 1-6

**Disassembly**

1. Remove the cover by loosening the two Philips head screws and D-sub hex standoffs (Figure 1-2).

2. Loosen the four retaining screws using the Allen key wrench (see Figure 1-2).
3. Lift the electronics assembly off of the tube.
4. Remove the small O-ring and discard.
5. Remove the magnet.

**WARNING**

This is a strong magnet; do not place it on a steel shelf, near tools or other small ferrous objects that could be attracted to it. Objects may be attracted to it with enough force to crack the magnet or cause bodily injury.

6. Turn the gauge tube so that you are looking down the vacuum port.
7. Remove the internal snap ring using the snap ring pliers and discard.
8. Allow the pole pieces and spacer to slide out and discard the parts.
9. Using the hex nut driver, remove the anode pin and discard.

**Cleaning**

Clean the inside of the tube:

1. Soak the tube with acetone.
2. Rinse the tube with alcohol.
3. Air-dry the tube.

For certain contaminants and deposited debris, more aggressive cleaning may be necessary. For specific chemical residues:

1. Soak the tube with the recommend solvent for the specific chemical.

**NOTE**

Contact the chemical manufacturer for information on appropriate solvents and recommended cleaning procedures for vacuum applications.

2. Follow the instructions above for tube cleaning.

For hard residues and contaminants:

These types of deposits and residues appear flaky, or look like splatters.

1. Clean the inside surface of the tube using a mild abrasive, such as Scotch-Brite or equivalent.

**CAUTION**

Do not use sand paper, emery cloth, or glass beading, as the media particles are difficult to remove.

2. Follow the instructions above for tube cleaning.
Assembly

1. Install the new anode from the kit; do not over-tighten.
2. Install the new inner pole piece (the one with a single hole). The proper orientation is shown in Figure 1-2 on page 1-4.
3. Install the spacer from the kit.
4. Install the outer pole piece from the kit.
5. Install the snap ring from the kit; ensure that it is fully seated in the groove.
6. Re-install the magnet.
7. Drop the new O-ring from the kit on top of the magnet (see Figure 1-2 on page 1-4).
8. Re-install the electronics assembly. Ensure that the O-ring is evenly seated under it and that the retaining screws engage the body v groove. Securely tighten the four screws.
9. Install the cover and line up the mounting holes. Re-install the hex standoffs and the two Philips head mounting screws and tighten securely.
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, e.g.).

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 gases, 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:

<table>
<thead>
<tr>
<th>North America:</th>
<th>Europe:</th>
<th>Pacific Rim:</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAX: 1-781-860-9252</td>
<td>FAX: 00 39-011-9979125</td>
<td>Please visit our website for individual office information.</td>
</tr>
<tr>
<td>Toll Free: 800-8VARIAN (800-882-7426)</td>
<td>Fax Free: 00 800 345 345 00</td>
<td><a href="http://www.varianinc.com/vacuum">http://www.varianinc.com/vacuum</a></td>
</tr>
<tr>
<td><a href="mailto:vtl.ra@varianinc.com">vtl.ra@varianinc.com</a></td>
<td><a href="mailto:vtt.ra@varianinc.com">vtt.ra@varianinc.com</a></td>
<td></td>
</tr>
</tbody>
</table>

Sales and Service Offices

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 43 15
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.lili 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.
Shinsa 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.lili 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: 1 (800) 882-7426 (toll-free)
vlt.technical.support@varianinc.com

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

Worldwide Web Site,
Catalog and On-line Orders:
www.varianinc.com

Representatives in most countries