TriScroll™ 600
Dry Scroll Vacuum Pump

TriScroll is a trademark of Agilent.
Loctite and PST are registered trademarks of Loctite Corporation.
Krytox, Teflon and Viton are registered trademarks of E. I. du Pont de Nemours and Company.

Copyright 2003
Agilent, Inc.
Contents

Declaration of Conformity

Preface. .................................................. vi
Safety Considerations ................................. vi
Related TriScroll Manuals ............................ viii
Maintenance and Tool Kits ......................... viii
Factory Service Options .............................. ix
Contacting Agilent ................................. ix

General Information ................................. 1
   Equipment Required to Install Pump Module .... 1
   Tools Required to Install Pump Module .......... 1

Maintenance Tool Kit .............................. 2

TriScroll Disassembly .............................. 4

TriScroll Reassembly ............................... 7
   Pump Conditioning and
   Performance Verification ......................... 12

Request for Return Health and Safety Certification
This page intentionally left blank.
Declaration of Conformity
Konformitätserklärung
Déclaration de Conformité
Declaración de Conformidad
Verklaring de Overeenstemming
Dichiarazione di Conformità

We
Wir
Nous
Nosotros
Wij
Noi

declare under our sole responsibility that the product,
klären, in alleniniger Verantwortung, daß dieses Produkt,
déclarons sous notre seule responsabilité que le produit,
deremos bajo nuestra sola responsabilidad, que el producto,
verklaren onder onze verantwoordelijkheid, dat het product,
dichiariamo sotto nostra unica responsabilità, che il prodotto,

TriScroll Series Vacuum Pump

to which this declaration relates is in conformity with the following standard(s) or other normative documents.
auf das sich diese Erklärung bezieht, mit der/der flogenden Norm(en) oder Richtlinie(n) übereinstimmt.
auquel se réfère cette déclaration est conforme à la (auz) norme(s) ou au(x) document(s) normatif(s).
al que se refiere esta declaración es conforme a la(s) norma(s) u otro(s) documento(s) normativo(s).
waarnaar deze verklaring verwijst, aan de volgende norm(en) of richtlijn(en) beantwoordt.
a cui se riferisce questa dichiarazione è conforme alla/e sequente/l norma/o documento/l normativo/i.

98/37/EEC, Machinery Directive
EN 1012-2:1996 Compressors and Vacuum pumps Safety Reqmts; Part 2 Vacuum Pumps
EN 1050:1996 Safety of machinery - principles for risk assessment
EN 60204-1 Electrical equipment of industrial machines; general requirements

73/023/EEC, Low Voltage Directive
EN 60034 part 1 Rotating electrical machines - Part 1: Rating and performance

89/336/EEC, Electromagnetic Compatibility Directive
EN 61000-4-2 Testing and Measurement Techniques - Electrostatic Discharge Immunity Test

John Ehmann
Operations Manager
Vacuum Products Division
Agilent, Inc.
Lexington, Massachusetts, USA

March 2003
TriScroll 600 Dry Scroll Vacuum Pump

Preface

This manual provides the information you need to successfully perform replacement of the entire module of your Agilent TriScroll™ Dry Vacuum Pump. Module replacement is performed as an alternative to performing a complete overhaul and rebuild (Major Maintenance) and is sold as one of the options recommended when the pump base pressure has risen to an unacceptably high level for your application. If you have questions that are not addressed in this manual, please contact the nearest Agilent service facility listed on the rear cover of this manual.

Safety Considerations

READ THE FOLLOWING INSTRUCTIONS. TAKE ALL NECESSARY PRECAUTIONS.

The following format is used in this manual to call attention to hazards:

**WARNING**  The warning messages are for attracting the attention of the operator to a particular procedure or practice which, if not followed correctly, could lead to serious injury.

**CAUTION**  The caution messages are displayed before procedures, which if not followed, could cause damage to the equipment.

**NOTE**  The notes contain important information taken from the text.

Maintenance personnel must be aware of all hazards associated with this equipment. They must know how to recognize hazardous and potentially hazardous conditions, and know how to avoid them. The consequences of work performed by unskilled or improperly trained maintenance personnel, or careless operation of the equipment employed in the specified maintenance procedures can be serious. Every maintenance person must read and thoroughly understand the materials discussed and the instructions provided in this manual, as well as any additional information provided by Agilent.

All warnings and cautions must be read carefully, fully understood, and strictly observed. Consult local, state/province, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to the nearest Agilent location.
WARNING Disconnect power from the TriScroll 600 before performing any maintenance procedure.

Allow the pump to cool before performing any maintenance procedure. Approximate cool-down time is one to two hours.

CAUTION Wipe all O-rings clean with a lint-free cloth before installation to ensure that no foreign matter is present to impair the seal.

Do not use alcohol, methanol or other solvents on O-rings. To do so causes deterioration and reduces their ability to hold a vacuum.

If applicable, apply a small amount of Krytox® GPL 224 grease and wipe the O-rings “shiny” dry.

NOTE Agilent recommends replacing all O-rings during routine maintenance or during any maintenance procedure requiring that O-rings be removed.

Unless otherwise stated, apply Loctite® 242 or Loctite PST® 567 to the first few threads only. Apply just enough to obtain a seal.

WARNING The TriScroll 600 weighs 32 kg (70 lbs). To avoid injury, use proper lifting techniques when moving the pump.
Related TriScroll Manuals

Manuals related to the installation and operation, tip seal replacement, and major maintenance for the TriScroll 600 series pumps are listed in the following table:

<table>
<thead>
<tr>
<th>Title</th>
<th>Applicable TriScroll Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Maintenance Manual</td>
<td>All TriScroll 600 Series Models</td>
<td>699904300</td>
</tr>
<tr>
<td>Tip Seal Replacement Manual</td>
<td>All TriScroll 600 Series Models</td>
<td>699904310</td>
</tr>
<tr>
<td>Installation and Operation Manual</td>
<td>All TriScroll 600 Series Models</td>
<td>699904290</td>
</tr>
</tbody>
</table>

Maintenance and Tool Kits

Material and tooling required to perform maintenance on TriScroll pumps is provided in kit form. A description of each kit and ordering information is provided in the following table:

<table>
<thead>
<tr>
<th>Description</th>
<th>Contents</th>
<th>Applicable TriScroll Model</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Maintenance Kit</td>
<td>All bearings, bearing seals, bearing lubricant, O-rings, and tip seals required to rebuild TriScroll 600 Series pumps.</td>
<td>All TriScroll 600 Series models</td>
<td>PTSS0600MK</td>
</tr>
<tr>
<td>Maintenance Tooling Kit</td>
<td>All fixtures and tools required to perform any maintenance on TriScroll 600 Series pumps.</td>
<td>All TriScroll 600 Series models</td>
<td>PTSS0600TK</td>
</tr>
<tr>
<td>Replacement Tip Seal Set</td>
<td>Replacement tip seals and static O-rings for TriScroll 600 Series pumps.</td>
<td>All TriScroll 600 Series models</td>
<td>PTSS0600TS</td>
</tr>
</tbody>
</table>

NOTE: The Maintenance Tool Kit is also required for tip seal replacement.
Factory Service Options

Agilent offers factory-rebuild service or advance exchange of complete TriScroll Pumps or TriScroll Pump Modules. Contact your nearest Agilent sales office for price and availability information. Select your preferred service option from the table below.

<table>
<thead>
<tr>
<th>Factory Service Options</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advance Exchange TriScroll 600 Single Phase</td>
<td>EXPT06001</td>
</tr>
<tr>
<td>Advance Exchange TriScroll 600 Three Phase</td>
<td>EXPT06003</td>
</tr>
<tr>
<td>Advance Exchange TriScroll 610 Single Phase</td>
<td>EXPT06101</td>
</tr>
<tr>
<td>Advance Exchange TriScroll 610 Three Phase</td>
<td>EXPT06103</td>
</tr>
<tr>
<td>Advance Exchange TriScroll 600 Pump Module Only</td>
<td>EXPT0600SC</td>
</tr>
<tr>
<td>Advance Exchange TriScroll 610 Pump Module Only</td>
<td>EXPT0610SC</td>
</tr>
<tr>
<td>Service/Rebuild TriScroll 600 Pump (Single or Three Phase)</td>
<td>PTS0600KMA</td>
</tr>
<tr>
<td>Service/Rebuild TriScroll 610 Pump (Single or Three Phase)</td>
<td>PTS0610KMA</td>
</tr>
<tr>
<td>Service/Rebuild TriScroll 600 Pump Module Only</td>
<td>PTS0600SCR</td>
</tr>
<tr>
<td>Service/Rebuild TriScroll 610 Pump Module Only</td>
<td>PTS0610SCR</td>
</tr>
</tbody>
</table>

Contacting Agilent

In the United States, you can contact Agilent Customer Service at 1-800-882-7426. See the back cover of this manual for a listing of our sales and service offices.

This page intentionally left blank.
General Information

Agilent TriScroll 600 series pumps are designed to provide years of trouble-free service if maintenance procedures and intervals are observed. Bearing grease replenishment and tip seal replacement is recommended when the pump base pressure has risen to an unacceptably high level for your application. Bearings, rotary seals and O-rings should also be replaced if the pump exhibits humming or grinding noises from the bearings. Main bearing life may be shortened if your application requires the pumping of high quantities of water vapor. Use of the bearing purge will keep this water from impacting bearing life.

Equipment Required to Install Pump Module
- Pump Module

Tools Required to Install Pump Module
- 4 MM Hex key
- 5 MM Hex key
- 6 MM Hex key

Included in Maintenance Tool Kit: #PTSS0600TK (page 2)
Maintenance Took Kit

Gloves

Cooling Stand

Orbiting Plate Bearing Fixture

Bypass Plug Installation Tool

Snap Ring Pliers

Locking Nut Wrench
Maintenance Took Kit (continued)
TriScroll Disassembly

1. Remove the two M5x16 screws from the intake assembly.

2. Remove the intake assembly from the top of the pump.

3. Remove and discard the O-ring from the groove on the underside of the intake fitting.
4. Remove the three M5x16 screws that attach the cowling to the module.
5. Remove the cowling.

6. Remove the four M6x16 screws that attach the pump module to the frame.

7. Remove pump module from the frame.
8. Remove M8x12 screw and washer attaching fan assembly to crankshaft.

9. Remove fan assembly from crankshaft.
10. Remove key from slot in crankshaft.
TriScroll Reassembly

Tool required:
- Allen wrench
- Krytox® GPL 224 grease

Locate the following items shown in the photos on the left:
1. Pump Module Assembly
2. Fan Assembly
3. M6x16 screws (4)
4. Spider Coupling
5. Washer
6. Key
7. M8x12 screw
8. Cowling
9. Intake Fitting Assembly
10. M5x16 screws (5)

O-ring (2-127), included in pump module replacement kit (not shown in photo)
TriScroll Reassembly (continued)

1. Install key in slot on crankshaft.

2. Slide fan assembly onto crankshaft engaging key and against seal spacer.

3. Secure fan assembly to crankshaft with M8x12 screw and washer previously removed in step 8 on page 6.
TriScroll Reassembly (continued)

4. Insert spider in motor coupling.

5. Install pump module on frame, aligning fingers on fan assembly with fingers on coupling. Assure proper fit of dowel pins on mating holes in frame.

**NOTE**  Exhaust fitting in the downward position.
6. Secure pump module to frame with four M6x16 screws.

7. Install cowling over pump module. Secure with three M5x16 screws.
8. Lightly grease the 2-127 O-ring and insert it into the groove on the intake fitting.
9. Place the intake assembly into the top of the pump.

10. Secure the fitting with two M5x16 screws.
TriScroll Reassembly (continued)

This figure illustrates a fully reassembled TriScroll 600 Series Pump.

Pump Conditioning and Performance Verification

Pump Module conditioning and performance verification has been performed at Agilent factory. Further conditioning or performance verification is not necessary.
Vacuum Products Division
Instructions for returning products

Dear Customer:

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

1) Complete the attached Request for Return form and send it to Agilent Technologies (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, Agilent Technologies 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, **please use the packaging from the Advance Exchange to return the defective product.**
   - Seal the product in a plastic bag, and package product carefully to avoid damage in transit. You are responsible for loss or damage in transit.
   - Agilent Technologies is not responsible for returning customer provided packaging or containers.
   - **Clearly label package with RA number.** Using the shipping label provided will ensure the proper address and RA number are on the package. Packages shipped to Agilent without a 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 a 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>EUROPE:</th>
<th>NORTH AMERICA:</th>
<th>PACIFIC RIM:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fax: 00 39 011 9979 330</td>
<td>Fax: 1 781 860 9252</td>
<td>please visit our website for individual office information</td>
</tr>
<tr>
<td>Fax Free: 00 800 345 345 00</td>
<td>Toll Free: 800 882 7426, Option 3</td>
<td><a href="mailto:vpl-qa@agilent.com">vpl-qa@agilent.com</a></td>
</tr>
<tr>
<td>Toll Free: 00 800 234 234 00</td>
<td>Toll Free: 800 882 7426, Option 3</td>
<td><a href="mailto:vpt-customer-care@agilent.com">vpt-customer-care@agilent.com</a></td>
</tr>
</tbody>
</table>

http://www.agilent.com
1) CUSTOMER INFORMATION

<table>
<thead>
<tr>
<th>Company Name:</th>
<th>Contact Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Tel:</td>
<td>Email:</td>
</tr>
<tr>
<td>Customer Ship To:</td>
<td>Customer Bill To:</td>
</tr>
</tbody>
</table>

Europe only: VAT reg. Number:xxxxxxxxxxxxxxxx
USA/Canada only: ☐ Taxable ☐ Non-taxable

2) PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Agilent P/N</th>
<th>Agilent S/N</th>
<th>Original Purchasing Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3) TYPE OF RETURN  (Choose one from each row and supply Purchase Order if requesting a billable service)

3A. ☐ Non-Billable ☐ Billable ☒ New PO # (hard copy must be submitted with this form):

3B. ☐ Exchange ☐ Repair ☐ Upgrade ☐ Consignment/Demo ☐ Calibration ☐ Evaluation ☐ Return for Credit

4) HEALTH and SAFETY CERTIFICATION

AGILENT TECHNOLOGIES CANNOT ACCEPT ANY PRODUCTS CONTAMINATED WITH BIOLOGICAL OR EXPLOSIVE HAZARDS, RADIOACTIVE MATERIAL, OR MERCURY AT ITS FACILITY.
Call Agilent Technologies to discuss alternatives if this requirement presents a problem.

The equipment listed above (check one):
☐ HAS NOT pumped or been exposed to any toxic or hazardous materials. OR
☐ HAS pumped or been exposed to the following toxic or hazardous materials. If this box is checked, the following information must also be filled out. Check boxes for all materials to which product(s) pumped or was exposed:

☐ Toxic ☐ Corrosive ☐ Reactive ☐ Flammable ☐ Explosive ☐ Biological ☐ Radioactive

List all toxic/hazardous materials. Include product name, chemical name, and chemical symbol or formula:

________________________________________________________________________________________________________

NOTE: If a product is received at Agilent which is contaminated with a toxic or hazardous material that was not disclosed, the customer will be held responsible for all costs incurred to ensure the safe handling of the product, and is liable for any harm or injury to Agilent employees as well as to any third party occurring as a result of exposure to toxic or hazardous materials present in the product.

Print Name:Authorized Signature: Date:

5) FAILURE INFORMATION:

Failure Mode (REQUIRED FIELD. See next page for suggestions of failure terms):

Detailed Description of Malfunction: (Please provide the error message)

Application (system and model):

I understand and agree to the terms of Section 6, Page 3/3.

Print Name: Authorized Signature: Date:
### Please use these Failure Mode to describe the concern about the product on Page 2.

<table>
<thead>
<tr>
<th>APPARENT DEFECT/MALFUNCTION</th>
<th>POSITION</th>
<th>PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Does not start</td>
<td>- Noise</td>
<td>- Vertical</td>
</tr>
<tr>
<td>- Does not spin freely</td>
<td>- Vibrations</td>
<td>- Horizontal</td>
</tr>
<tr>
<td>- Does not reach full speed</td>
<td>- Leak</td>
<td>- Upside-down</td>
</tr>
<tr>
<td>- Mechanical Contact</td>
<td>- Overtemperature</td>
<td>- Other:</td>
</tr>
<tr>
<td>- Cooling defective</td>
<td>- Clogging</td>
<td></td>
</tr>
</tbody>
</table>

| Power: Rotational Speed: |
| Current: Inlet Pressure: |
| Temp 1: Foreline Pressure: |
| Temp 2: Purge flow: OPERATING TIME: |

<table>
<thead>
<tr>
<th>APPARENT DEFECT/MALFUNCTION</th>
<th>POSITION</th>
<th>PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Bad feedthrough</td>
<td>- Poor vacuum</td>
<td></td>
</tr>
<tr>
<td>- Vacuum leak</td>
<td>- High voltage problem</td>
<td></td>
</tr>
<tr>
<td>- Error code on display</td>
<td>- Other:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ION PUMPS/CONTROLLERS</th>
<th>VALVES/COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cannot calibrate</td>
<td>- Main seal leak</td>
</tr>
<tr>
<td>- Vacuum system unstable</td>
<td>- Bellows leak</td>
</tr>
<tr>
<td>- Failed to start</td>
<td>- Solenoid failure</td>
</tr>
<tr>
<td>- Error code on display</td>
<td>- Damaged flange</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LEAK DETECTORS</th>
<th>INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Cannot calibrate</td>
<td>- Gauge tube not working</td>
</tr>
<tr>
<td>- Vacuum system unstable</td>
<td>- Display problem</td>
</tr>
<tr>
<td>- Failed to start</td>
<td>- Communication failure</td>
</tr>
<tr>
<td>- Error code on display</td>
<td>- Degas not working</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DIFFUSION PUMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Pump doesn’t start</td>
</tr>
<tr>
<td>- Doesn’t reach vacuum</td>
</tr>
<tr>
<td>- Vacuum leak</td>
</tr>
</tbody>
</table>

Section 6) ADDITIONAL TERMS

Please read the terms and conditions below as they apply to all returns and are in addition to the Agilent Technologies Vacuum Product Division – Products and Services Terms of Sale.

- Customer is responsible for the freight charges for the returning product. Return shipments must comply with all applicable Shipping Regulations (IATA, DOT, etc.) and carrier requirements.
- Customers receiving an Advance Exchange product agree to return the defective, rebuildable part to Agilent Technologies within 15 business days. Failure to do so, or returning a non-rebuildable part (crashed), will result in an invoice for the non-returned/non-rebuildable part.
- Returns for credit toward the purchase of new or refurbished Products are subject to prior Agilent approval and may incur a restocking fee. Please reference the original purchase order number.
- Units returned for evaluation will be evaluated, and a quote for repair will be issued. If you choose to have the unit repaired, the cost of the evaluation will be deducted from the final repair pricing. A Purchase Order for the final repair price should be issued within 3 weeks of quotation date. Units without a Purchase Order for repair will be returned to the customer, and the evaluation fee will be invoiced.
- A Special Cleaning fee will apply to all exposed products per Section 4 of this document.
- If requesting a calibration service, units must be functionally capable of being calibrated.
This page intentionally left blank.