TriScroll In-line Exhaust Silencer and Vibration Isolation
TriScroll In-line Exhaust Silencer and Vibration Isolation
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
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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.
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TriScroll Vibration Isolation Kit

This document details the installation of Vibration Isolation Kits and optional Exhaust Silencer and Exhaust Muffler Kits for use with TriScroll pumps.

The Vibration Isolation Kit reduces vibration transmitted to the structure on which the rough pump is mounted. This kit, P/N PTSVIBISOKIT, consists of four (4) vibration isolation mounts that replace the standard feet supplied with the pump.

Installation Specific Issues

The Exhaust Silencer Kit - Dry Pump Conversions, P/N PTSREXSLRAB1, uses a cylindrical resonator chamber selected to attenuate the frequencies associated with the exhaust gas pulsation noise. The resonator is then plumbed to the exhaust line. The associated hardware for this connection is included in the kit. This kit generally provides all the noise reduction needed. The cylindrical resonator is installed in the flexible exhaust line included in the standard dry pump conversion kit.

The Exhaust Silencer Kit - Dry Pump Options, P/N PTSREXSLRAB2, also uses the cylindrical resonator but provides additional hardware allowing it to be mounted to instruments originally fitted with dry pumps.

The Exhaust Muffler Kit, P/N PTSREXMUFLAB1, is intended for use in installations where the exhaust line is routed to the inlet of a duct or fume hood. In these installations, a further reduction in exhaust pulsation is often required. This kit includes a filter/muffler, which is installed downstream of the resonator, and then plumbed to the exhaust line. Use the Muffler Kit in conjunction with the Silencer Kit for the maximum possible noise reduction. For maximum noise reduction it is important to make sure the exhaust line supplied with the instrument is replaced with the grey tube supplied with the dry pump conversion kit.

CAUTION

The muffler is intended for noise reduction only, not gas containment (not warranted vacuum tight). If hazardous materials are to pass through the exhaust, route it directly to a house exhaust collection system.

When two rough pumps are used and their exhausts are teed together, install the Silencer Kit(s) and (if used) the Muffler Kit(s) upstream of the tee that joins the two pump exhaust lines. Replace the exhaust line downstream of the tee with the grey hose as above.
TriScroll Vibration Isolation Kit

Table 1-1 list the kits parts.

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty. Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-vibratory, non-skidding mount</td>
<td>4</td>
</tr>
<tr>
<td>Screw, M6 x 1.0 x 25 mm long, SHC, SS</td>
<td>4</td>
</tr>
<tr>
<td>Washer M6 Flat, S/S</td>
<td>4</td>
</tr>
</tbody>
</table>

Installation

To install the unit:

1. Unscrew the M6 screws that secure the standard feet. If the standard feet are not present, go to step 2.

2. Position the flat washer under the screw’s head and place the M6 screw through the mount hole (Figure 1-1).

3. Position the mount with the round surface against the pump’s base and using a 5 mm wrench, screw in the M6 screw into the threaded hole in the base.

4. Carefully position the pump inside instrument cabinet.

5. If two pumps are used, and the inlet tubing between the pumps is a bellows, replace the bellows with the clear reinforced vacuum tubing included in the standard installation kit (1.5" or 1.25" ID depending on the installation). This prevents the pumps from shifting excessively due to compression of the bellows during system evacuation.

Figure 1-1  Vibration Isolation Kit Components
NOTE

Ensure that:

- The pump is vertical during operation and that the mounts are not subjected to side loading once the pump is installed.
- No component of the installation is stretched or compressed so as to prevent free movement of the pump on the mounts.

NOTE

- Although the rubber-covered mount is non-skidding (Figure 1-2), if the application requires additional security, use the two holes in the mount’s flange, using additional screws - not included with this kit.
- Anti-vibratory mounts increase pump height by ¾” (19 mm).

Figure 1-2  Vibration Isolation Kit Installed

Figure 1-3 shows the foot dimensions.
Performance

Vibration level in every direction (axis), transmitted to the surface the pump sits on, is significantly reduced. Typical vibration reduction levels are 75% for the TriScroll 600 pump.

TriScroll Exhaust Silencer Kit

Table 1-2 list the kits parts.

Table 1-2 Exhaust Silencer Kit for Triscroll Pump Conversions: P/N PTSREXSLRAB1

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty. Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tygon hose black .75&quot; OD x .125&quot; w x 36&quot; long</td>
<td>1</td>
</tr>
<tr>
<td>Exhaust Silencer/Resonator Assembly</td>
<td>1</td>
</tr>
<tr>
<td>Hose Clamp</td>
<td>2</td>
</tr>
<tr>
<td>Mount, Adhesive Backed</td>
<td>4</td>
</tr>
<tr>
<td>Tie Wrap</td>
<td>4</td>
</tr>
</tbody>
</table>

Installation

To install the unit:

1. If 1/2" Tygon tubing from pump exhaust is installed from a previous conversion, loosen it at the end away from the pump.

2. Insert the resonator into the exhaust line (Figure 1-4) and attach the included additional 1/2" Tygon tubing to the other end of the resonator. The resonator may be installed in either direction.

Figure 1-4 Exhaust Silencer Kit: Exploded View - For Systems Converted to Triscroll Pumps
3. Cut the 36” supplied 1/2” Tygon tubing to a length convenient for the installation.

4. Reinstall the 1/2” hose barb x 3/8” NPT fitting and the 3/8” NPT x NW25 flange (Figure 1-4).

5. Secure all connections with hose clamps.

6. Reconnect the NW25 flange on the 1/2” Tygon tubing to the NW25 flange on the grey tubing supplied with the conversion kit.

7. Secure the resonator with the supplied mounts and cable ties, if desired.

**TriScroll Exhaust Silencer Kit**

Table 1-3 list the kits parts.

**Table 1-3 Exhaust Silencer Kit for Triscroll Original Installations: P/N PTSREXSLRAB2**

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty. Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tygon hose black .75” OD x .125” w x 36” long</td>
<td>1</td>
</tr>
<tr>
<td>Exhaust Silencer/Resonator Assembly</td>
<td>1</td>
</tr>
<tr>
<td>Hose Clamp</td>
<td>4</td>
</tr>
<tr>
<td>Mount, Adhesive Backed</td>
<td>4</td>
</tr>
<tr>
<td>Tie Wrap</td>
<td>4</td>
</tr>
<tr>
<td>NW25 Clamp</td>
<td>2</td>
</tr>
<tr>
<td>NW25 Centering Ring</td>
<td>2</td>
</tr>
<tr>
<td>Flange, NW25 x 3/8” NPTF</td>
<td>2</td>
</tr>
<tr>
<td>Fitting, 3/8” NPTM x 1/2” hose</td>
<td>2</td>
</tr>
</tbody>
</table>
Installation

To install the unit:

1. Disconnect the house exhaust from the pump exhaust at the NW25 flange.
2. Cut one length of 1/2" Tygon tubing to at least 7 1/2" to go between the pump exhaust and the resonator (Figure 1-5). Cut the remaining length of tubing to any length convenient for the installation.
3. Install the NW25 flange that leads to the resonator to the pump exhaust; connect the other end of the assembly to the house exhaust NW25 flange.
4. Secure the resonator with the supplied mounts and cable ties, if desired.

Figure 1-6 shows the Silencer Kit installed.

Figure 1-6 Triscroll Pump with Silencer Kit Installed Toward Rear of Pump
Figure 1-7 gives pump interface dimensions.

![Pump Interface with NW25 Exhaust Extension](image)

**NOTE**

The TriScroll 300 has an 1/4" NPT on the exhaust fitting, and an NW16 on the extension.

### TriScroll Exhaust Muffler Kit

This procedure consists of:

- “1. Installation - Clamp Installation to House Exhaust”
- “2. Installation - Tubing from Exhaust Muffler to House Exhaust” on page 1-9

Table 1-4 list the kits parts.

<table>
<thead>
<tr>
<th>Table 1-4 Exhaust Muffler Kit for Triscroll Pumps:</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N PTSREXMUFLAB1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Qty. Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barb Fitting 3/8&quot; NPT x 1/2&quot; hose</td>
<td>2</td>
</tr>
<tr>
<td>KF25 clamp</td>
<td>2</td>
</tr>
<tr>
<td>KF25 center ring</td>
<td>2</td>
</tr>
<tr>
<td>NW25 to 3/8&quot; NPT adaptor</td>
<td>2</td>
</tr>
<tr>
<td>Exhaust Muffler</td>
<td>1</td>
</tr>
<tr>
<td>Hose Clamp</td>
<td>2</td>
</tr>
<tr>
<td>Mount, Adhesive Backed</td>
<td>4</td>
</tr>
<tr>
<td>Tie Wrap</td>
<td>4</td>
</tr>
</tbody>
</table>
1. Installation - Clamp Installation to House Exhaust

To install the unit:

1. Clamp the inlet of the muffler (NW25) to the NW25 flange on the outlet of the 1/2" Tygon tubing downstream from resonator. The inlet of the muffler has three small holes in the flange (Figure 1-8).

2. Clamp the outlet of the muffler (NW25) to the NW25 flange on the exhaust tubing leading to the house exhaust (replace tubing using tubing provided in standard installation kit); or to the exhaust line tee for installations where two pumps discharge into one exhaust tube.

3. If two pumps discharge into one house exhaust tube, fit each pump with one muffler, and join the lines downstream of the mufflers. This prevents restriction in the exhaust lines during pumpdown of the system.

4. Secure the muffler using adhesive mounts and cable ties.
2. Installation - Tubing from Exhaust Muffler to House Exhaust

To install the unit:

1. Clamp the inlet of the muffler (NW25) to the NW25 flange on the outlet of 1/2" Tygon tubing downstream from resonator. The inlet of the muffler has three small holes in the flange (Figure 1-9).

2. Clamp the outlet of the muffler (NW25) to the NW25 x 3/8" NPT fitting. Screw the 1/2" hose barb x 3/8" NPT fitting into the NW25 x 3/8" NPT fitting. Attach the remaining length of Tygon tubing and secure with a hose clamp.

3. Screw the second 1/2" hose barb x 3/8" NPT fitting into the second NW25 x 3/8" NPT fitting. Insert this into Tygon tubing and secure with a hose clamp.

4. Proceed as in steps (2) ~ (4) in “1. Installation - Clamp Installation to House Exhaust” on page 1-8.

**CAUTION**

The muffler is designed for noise reduction only (not warranted gas tight). If hazardous gas containment is required, do not use this part.
This page intentionally left blank.
1. Return authorization numbers (RA#) **will not** be issued for any product until this Certificate is completed and returned to a Varian, Inc. Customer Service Representative.

2. Pack goods appropriately and drain all oil from rotary vane and diffusion pumps (for exchanges please use the packing material from the replacement unit), making sure shipment documentation and package label clearly shows assigned Return Authorization Number (RA#) VVT cannot accept any return without such reference.

3. Return products(s) to the nearest location:

   - **North and South America**
     - Varian, Inc.
     - 121 Hartwell Ave.
     - Lexington, MA 02421
     - Fax: (781) 860-9252

   - **Europe and Middle East**
     - Varian S.p.A.
     - Via Flli Varian, 54
     - 10040 Leini (TO) – ITALY
     - Fax: (39) 011 997 9350

   For a complete list of phone/fax numbers see [www.varianinc.com/vacuum](http://www.varianinc.com/vacuum)

4. If a product is received at Varian, Inc. in a contaminated condition, **the customer is held responsible** for all costs incurred to ensure the safe handling of the product, and **is liable** for any harm or injury to Varian, Inc. employees occurring as a result of exposure to toxic or hazardous materials present in the product.

### CUSTOMER INFORMATION

- **Company name:**
- **Contact person:** Name: ________________________________ Tel: ________________________________
- **Fax:** ________________________________ E-mail: ________________________________
- **Ship method:** Shipping Collect #: ________________________________ P.O.#: ________________________________
- **Europe only:** VAT Reg Number: __________
- **USA only:**
  - ☐ Taxable
  - ☐ Non-taxable

### PRODUCT IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Varian, Inc. Part Number</th>
<th>Varian, Inc. Serial Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TYPE OF RETURN (check appropriate box)

- ☐ Paid Exchange
- ☐ Paid Repair
- ☐ Warranty Exchange
- ☐ Warranty Repair
- ☐ Loaner Return
- ☐ Credit
- ☐ Shipping Error
- ☐ Evaluation Return
- ☐ Calibration
- ☐ Other

### HEALTH and SAFETY CERTIFICATION

**VARIAN, INC. CANNOT ACCEPT ANY BIOLOGICAL HAZARDS, RADIOACTIVE MATERIAL, ORGANIC METALS, OR MERCURY AT ITS FACILITY. CHECK ONE OF THE FOLLOWING:**

- ☐ I confirm that the above product(s) has (have) **NOT** pumped or been exposed to any toxic or dangerous materials in a quantity harmful for human contact.
- ☐ I declare that the above product(s) has (have) pumped or been exposed to the following toxic or dangerous materials in a quantity harmful for human contact (**Must be filled in**):

  Print Name: ________________________________
  Signature: ________________________________
  Date: ________________________________

---

**PLEASE FILL IN THE FAILURE REPORT SECTION ON THE NEXT PAGE**

Do not write below this line

Notification (RA#): ________________________________
Customer ID #: ________________________________
Equipment #: ________________________________
**Request for Return**

**Health and Safety Certification**

**FAILURE REPORT**

(Please describe in detail the nature of the malfunction to assist us in performing failure analysis):

<table>
<thead>
<tr>
<th>TURBO PUMPS AND TURBOCONTROLLERS</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>Vibration</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>❑ Operation Time</td>
</tr>
</tbody>
</table>

Describe Failure:

Turbocontroller Error Message:

<table>
<thead>
<tr>
<th>ION PUMPS/CONTROLLERS</th>
<th>Valve/Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ Bad feedthrough</td>
<td>❑ Main seal leak</td>
</tr>
<tr>
<td>❑ Vacuum leak</td>
<td>❑ Bellows leak</td>
</tr>
<tr>
<td>❑ Error code on display</td>
<td>❑ Solenoid failure</td>
</tr>
</tbody>
</table>

Describe failure:

Customer application:

<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>
</tbody>
</table>

Describe failure:

Customer application:

<table>
<thead>
<tr>
<th>ALL OTHER VARIAN, INC.</th>
<th>DIFFUSION PUMPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ Pump doesn’t start</td>
<td>❑ Heater failure</td>
</tr>
<tr>
<td>❑ Doesn’t reach vacuum</td>
<td>❑ Electrical problem</td>
</tr>
<tr>
<td>❑ Pump seized</td>
<td>❑ Doesn’t reach vacuum</td>
</tr>
</tbody>
</table>

Describe failure:

Customer application:
Sales and Service Offices

Canada
Central coordination through: Varian, Inc.
121 Hartwell Avenue
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Fax: +86 (10) 6310 0141

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Fax: +33 (0) 1 69 86 29 88

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Toll Free: 0800 051 342
Fax: +886 2 2698 96782

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Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437

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Italy
Tel: (39) 011 997 9 111
Fax: (39) 011 997 9 350

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vtk.technical.support@varianinc.com

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

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

Representatives in most countries