HS-16 Electrical Box and Heater Retrofit Kit

For HS-16 diffusion pumps manufactured before 1990
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, replace, 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.

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 Customer’s expense; in addition, a charge for testing and examination may be made on Products so returned.

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Preface

Hazard and Safety Information

This product must only be operated and maintained by trained personnel.

This manual uses the following standard safety protocols:

**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 Varian. 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 Varian office.
Contacting Varian

See the back cover of this manual for a listing of our sales and service offices.

Please contact Varian Customer Care for assistance:

**In North America:**
Toll-Free: 1-800-882-7426  
Hours: 8:00 AM to 7:00 PM Eastern U. S. time  
Fax: 1-781-860-5405  
vtl.customer.service@varianinc.com  
vtl.technical.support@varianinc.com  
Language: English

**Product Return Authorizations**  
vtl.ra@varianinc.com

**In Europe and other countries:**
Toll-Free: 00 800 234 234 00  
Fax: (39) 011 997 9 350  
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vtt.customer.service@varianinc.com  
vtt.technical.support@varianinc.com  
Languages: French, German, Italian, English

**In Japan:**
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vtj.customer.service@varianinc.com  
vtj.technical.support@varianinc.com  
Languages: Japanese, English

**In Korea:**
Toll-Free: 080 222 2452  
Fax: (82) 2 3452 2451  
Hours: 08:00 to 18:00 Korea Standard time  
vtk.customer.support@varianinc.com  
vtk.technical.support@varianinc.com  
Languages: Korean, English

**In Taiwan:**
Toll-Free: 0 (800) 051 342  
Fax: (886) 2 2698 9678  
Hours: 08:00 to 18:00 Chinese Standard time  
vtw.customer.service@varianinc.com  
vtw.technical.support@varianinc.com  
Languages: Chinese, English

**In China:**
Toll-free: 800 820 6556  
Fax: (86) 10 6310 0141  
Hours: 08:00 to 18:00 Chinese Standard time  
vtc.technical.support@varianinc.com  
Languages: Chinese, English
HS-16 Electrical Box and Heater Retrofit Kit

Replacement Procedure

**WARNING**
High voltages can kill; disconnect all power to the diffusion pump.

1. Remove the heater cover plate and the insulation.
2. Remove and discard the heaters and crush plates; retain the clamping plates.
3. Remove the duplex box from the side of the junction box. Remove the junction box containing the power feed for the heaters and associated hardware (Figure 1-1).

![Figure 1-1 Junction Box Configuration](image)

4. Enlarge the existing hole in the body shell to a 1-3/4" hole (Figure 1-1). Deburr the hole.
5. Locate the conduit elbow through the enlarged hole and secure it loosely in place using the 1-3/4" threaded bushing inside the pump.

6. To protect the cooling coils, slide a steel plate behind the existing junction box bracket before drilling (see step 7).

7. Position the new, preassembled junction box on the bracket and drill clearance holes through for the four 1/4" mounting screws. Remove the protective plate.

8. Secure the junction box with the 1/4-20 screws and nuts provided. Place 1/4" washers between the bracket and the junction box, two for each hole, to prevent heat transfer from the pump body to the junction box. Secure the conduit elbow by tightening the 1-3/4" threaded bushing inside the pump.

9. Install the terminal block strip inside the junction box.

10. Tack-weld the three retaining clips to the pump body as shown in Figure 1-2, or drill and tap No. 8-32 holes.

11. Assemble each heater segment by:
   a. Applying anti-seize compound (such as Loctite C5-A to the studs, as required.
b. Feeding the heater leads through the holes in a crush and clamping plate.
c. Installing the heater and plates as a unit over the studs as shown in Figure 1-3. Push the unit against the boiler plate and secure it with hardware, finger-tight.
d. Repeating steps b and c for the remaining heaters.
e. Torquing the hex nuts alternately to 250 inch—pounds.

Figure 1-3  Heater Element Assembly

12. Label the heater leads according to the appropriate wiring diagram: Figure 1-4 on page 1-4 or Figure 1-5 on page 1-5.
Figure 1-4 Wiring Diagram: 200/240/400/430/440/480 V
13. Place the insulation blanket over the heaters. Orient the insulation so that the six heater leads line up with the six cuts provided in the insulation. Feed the leads through the cuts and out to the periphery of the pump, over the insulation. Secure the leads to the walls using the retainer clips assembled in step 10.

14. Feed all heater leads through the conduit into the junction box.

15. Connect the leads as shown on the wiring diagram: Figure 1-4 or Figure 1-5.

16. Stuff some insulation in the remaining opening in the top of the conduit to prevent heat from traveling up the pipe into the junction box.

17. Reinstall the heater cover plate.
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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, 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 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:

<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>
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<tr>
<td><a href="mailto:vtl.ra@varianinc.com">vtl.ra@varianinc.com</a></td>
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Representatives in most countries

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