

***Set Point Board  
Retrofit Kit for  
senTorr™***

*INSTRUCTION MANUAL*

# Set Point Board Retrofit Kit for senTorr™



## **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.

3/1/00

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**Declaration of Conformity**  
**Konformitätserklärung**  
**Déclaration de Conformité**  
**Declaración de Conformidad**  
**Verklaring de Overeenstemming**  
**Dichiarazione di Conformità**



We  
Wir  
Nous  
Nosotros  
Wij  
Noi

Varian, Inc.  
Vacuum Technologies  
121 Hartwell Avenue  
Lexington, MA, 02421-3133 USA

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

**Set Point Board Retrofit Kit for senTorr™**

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/den flogenden Norm(en) oder Richtlinie(n) übereinstimmt.  
auquel se réfère cette déclaration est conforme à la (aux) 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).  
waamaar deze verklaring verwijst, aan de volende norm(en) of richtlijn(en) beantwoordt.  
a cui se riferisce questa dichiarazione è conforme alla/e sequente/I norma/o documento/I normativo/i.

- EN 55011**  
1991 ..... Group 1 Class A ISM emission requirements
- EN 61010-1**  
1993 ..... Safety requirements for electrical equipment for measurement, control, and laboratory use incorporating Amendments Nos 1 and 2.
- EN 50082-2**  
1995 ..... EMC heavy industrial generic immunity standard

A handwritten signature in black ink that reads "Frederick C. Campbell".

Frederick C. Campbell  
Operations Manager  
Vacuum Technologies  
Varian, Inc.  
Lexington, Massachusetts, USA

October 2003



# 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 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.



## EMC Warnings

### EN 55022 Class A Warning

This is a Class A product. In a domestic environment this product may cause radio interference. In such cases, the user will be required to correct the interference at his own expense.

### FCC

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable operation.



*The equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is also likely to cause harmful radio communications interference in which case, the user will be required to correct the interference at his own expense.*

## Contacting Vacuum Technologies

In the United States, you can contact Vacuum Technologies Customer Service at 1-800-8VARIAN.

Internet users:

- Send email to Customer Service & Technical Support at [vpl.customer.support@varianinc.com](mailto:vpl.customer.support@varianinc.com)
- Visit our web site at [www.varianinc.com/vacuum](http://www.varianinc.com/vacuum)
- Order on line at [www.evarian.com](http://www.evarian.com)

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

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# Set Point Board Retrofit Kit for senTorr™

Installation of this kit adds set point capability to any senTorr controller. Included in the kit are the following items:

- Set Point PCB assembly (with four connector mates)
- Connecting cable
- Rear panel with Power Entry module installed
- Required EPROM (one or two depending on model)
- Miscellaneous hardware

Before beginning assembly, check that you have the correct kit for your model senTorr (Table 1-1).

**Table 1-1 Set Point Board Retrofit Kits by senTorr Model**

Kit Number	SenTorr Model
R0044-301	BA with or without Degas
R0044-302	BA2 with or without Degas
R0044-303	BA2C with or without Degas
R0044-304	CC
R0044-305	CC2
R0044-306	CC2C

## Installation

To install the kit:

1. Disassemble the rear panel:

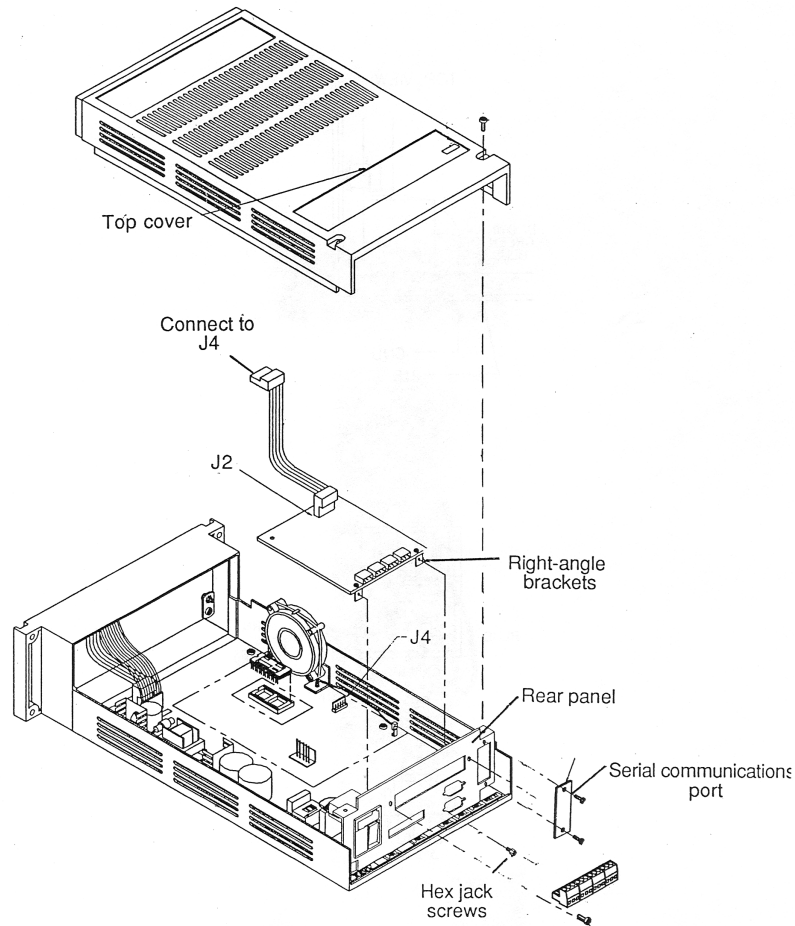
**NOTE**

*Save all hardware for reuse.*



- a. Disconnect the line cord and all other cables from the back of the unit.
- b. Remove two screws at the rear of the top cover (Figure 1-1), slide the cover back an inch and remove the cover.

## Set Point Board Retrofit Kit for senTorr™

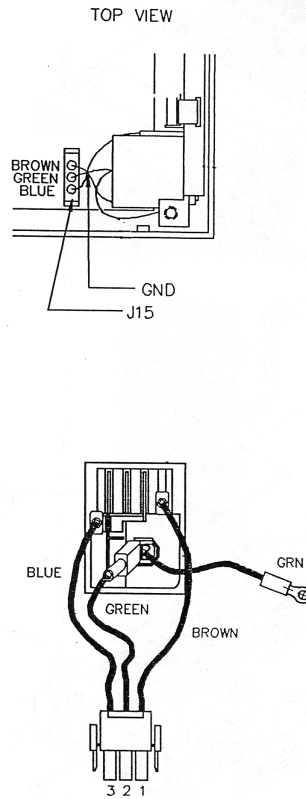


**Figure 1-1 senTorr Controller Exploded View**

- c. Remove the cover plate from the Serial Communications port (if the unit does not have a serial option board, this cover is blank). Do not remove the option board as it is attached to the mother board and need not be removed.
  - d. Unscrew the hex jack screws from the D-sub connectors if your unit has thermocouples or ConvecTorr tube options and remove these options.
  - e. Unplug the main power connection P15 from the motherboard.
  - f. Note the positions of the red and green motherboard wires, for a Cold Cathode model, then unplug them.
  - g. Remove the two screws from the bottom of the chassis and remove the rear panel.
  - h. Use an extraction tool to remove the EPROM; note its type number.
2. Install a new rear panel
    - a. Place a new rear panel to the chassis and secure it with two of the large screws.

## Set Point Board Retrofit Kit for senTorr™

- b. Install the hex jack screws and the Serial Communications port cover.
3. Plug in the main power connector P15 (Figure 1-2). Plug in the red and green wires, for a Cold Cathode model, making sure that the green wire is closest to the rear panel.



**Figure 1-2 Electrical Connections**

4. Using an insertion tool, install the supplied EPROM so that the orientation mark is closest to the front panel of the unit.  
  
If the senTorr is a BA model, check to determine if it has the Degas option installed by looking at the type number on the old EPROM label. If it is either *xxBA3xxx* or *xxBA5xxx*, the unit has the Degas option. Replace the *xxBA3xxx* EPROM with the *xxBA6xxx* or replace the *xxBA5xxx* with the *xxBA7xxx* EPROM.
5. Install the two right angle brackets to the Set Point PCB Assembly (PN # L9132-001) using two of the small screws (Figure 1-1). Attach the supplied cable to connector J2 on the PCB Assembly.
6. Install the PCB Assembly to the rear panel and secure it with the remaining two small screws. Plug the loose end of the cable into connector J4 on the motherboard near the fan.
7. Install the top cover and secure it with the two remaining large screws. Reattach the transducer cables then the power cord.

The four connectors are used to attach the set point relays to an external system.

## Set Point Board Retrofit Kit for senTorr™

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The installation is now complete. Recalibrate the thermocouples or ConvecTorr<sup>s</sup> as necessary and reprogram any other parameters (gas correction, sensitivity, etc.) that may have changed. Refer to the instruction manual for instructions on using the set points.



# Request for Return Health and Safety Certification



- 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.
- 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.
- Return product(s) to the nearest location:

**North and South America**

Varian, Inc.  
Vacuum Technologies  
121 Hartwell Ave.  
Lexington, MA 02421  
Fax: (781) 860-9252

**Europe and Middle East**

Varian S.p.A.  
Via F.lli Varian, 54  
10040 Leini (TO) – ITALY  
Fax: (39) 011 997 9350

**Asia and ROW**

Varian Vacuum Technologies  
Local Office

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

- 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.

<i>CUSTOMER INFORMATION</i>		
Company name: .....		
Contact person: Name: .....	Tel:.....	
Fax: .....	E-mail: .....	
Ship method: .....	Shipping Collect #: .....	P.O.#: .....
Europe only: VAT Reg Number: .....	USA only: <input type="checkbox"/> Taxable <input type="checkbox"/> Non-taxable	
Customer ship to: .....	Customer bill to: .....	
.....	.....	
.....	.....	

**PRODUCT IDENTIFICATION**

Product Description	Varian, Inc. Part Number	Varian, Inc. Serial Number

**TYPE OF RETURN (check appropriate box)**

<input type="checkbox"/> Paid Exchange	<input type="checkbox"/> Paid Repair	<input type="checkbox"/> Warranty Exchange	<input type="checkbox"/> Warranty Repair	<input type="checkbox"/> Loaner Return
<input type="checkbox"/> Credit	<input type="checkbox"/> Shipping Error	<input type="checkbox"/> Evaluation Return	<input type="checkbox"/> Calibration	<input type="checkbox"/> Other

**HEALTH and SAFETY CERTIFICATION**

<b>VACUUM TECHNOLOGIES CANNOT ACCEPT ANY BIOLOGICAL HAZARDS, RADIOACTIVE MATERIAL, ORGANIC METALS, OR MERCURY AT ITS FACILITY. CHECK ONE OF THE FOLLOWING:</b>		
<input type="checkbox"/> I confirm that the above product(s) has (have) <b>NOT</b> pumped or been exposed to any toxic or dangerous materials in a quantity harmful for human contact.		
<input type="checkbox"/> 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 ( <u>Must be filled in</u> ):		
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 #: .....

**FAILURE REPORT**

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

**TURBO PUMPS AND TURBOCONTROLLERS**

Claimed Defect	Position	Parameters
<input type="checkbox"/> Does not start <input type="checkbox"/> Does not spin freely <input type="checkbox"/> Does not reach full speed <input type="checkbox"/> Mechanical Contact <input type="checkbox"/> Cooling defective <input type="checkbox"/> Noise <input type="checkbox"/> Vibrations <input type="checkbox"/> Leak <input type="checkbox"/> Overtemperature <input type="checkbox"/> Clogging	<input type="checkbox"/> Vertical <input type="checkbox"/> Horizontal <input type="checkbox"/> Upside-down <input type="checkbox"/> Other .....	Power:                      Rotational Speed: Current:                    Inlet Pressure: Temp 1:                      Foreline Pressure: Temp 2:                      Purge flow: Operation Time:
Describe Failure:		
Turbocontroller Error Message:		

**ION PUMPS/CONTROLLERS**

<input type="checkbox"/> Bad feedthrough <input type="checkbox"/> Vacuum leak <input type="checkbox"/> Error code on display <input type="checkbox"/> Poor vacuum <input type="checkbox"/> High voltage problem <input type="checkbox"/> Other .....
Describe failure:
Customer application:

**VALVES/COMPONENTS**

<input type="checkbox"/> Main seal leak <input type="checkbox"/> Solenoid failure <input type="checkbox"/> Damaged sealing area <input type="checkbox"/> Bellows leak <input type="checkbox"/> Damaged flange <input type="checkbox"/> Other .....
Describe failure:
Customer application:

**LEAK DETECTORS**

<input type="checkbox"/> Cannot calibrate <input type="checkbox"/> Vacuum system unstable <input type="checkbox"/> Failed to start <input type="checkbox"/> No zero/high background <input type="checkbox"/> Cannot reach test mode <input type="checkbox"/> Other .....
Describe failure:
Customer application:

**INSTRUMENTS**

<input type="checkbox"/> Gauge tube not working <input type="checkbox"/> Communication failure <input type="checkbox"/> Error code on display <input type="checkbox"/> Display problem <input type="checkbox"/> Degas not working <input type="checkbox"/> Other .....
Describe failure:
Customer application:

**ALL OTHER VARIAN, INC.**

<input type="checkbox"/> Pump doesn't start <input type="checkbox"/> Doesn't reach vacuum <input type="checkbox"/> Pump seized <input type="checkbox"/> Noisy pump (describe) <input type="checkbox"/> Overtemperature <input type="checkbox"/> Other .....
Describe failure:
Customer application:

**DIFFUSION PUMPS**

<input type="checkbox"/> Heater failure <input type="checkbox"/> Doesn't reach vacuum <input type="checkbox"/> Vacuum leak <input type="checkbox"/> Electrical problem <input type="checkbox"/> Cooling coil damage <input type="checkbox"/> Other .....
Describe failure:
Customer application:





## Sales and Service Offices

### Argentina

#### Varian Argentina Ltd.

Sucursal Argentina  
Av. Ricardo Balbin 2316  
1428 Buenos Aires  
Argentina  
Tel: (54) 1 783 5306  
Fax: (54) 1 786 5172

### Benelux

#### Varian Vacuum Technologies

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3956 CP Leersum  
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Fax: (31) 343 469961

### Brazil

#### Varian Industria e Comercio Ltda.

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Sao Paulo 04548 005  
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### Canada

#### Central coordination through:

Varian Vacuum Technologies  
121 Hartwell Avenue  
Lexington, MA 02421  
USA  
Tel: (781) 861 7200  
Fax: (781) 860 5437  
Toll Free: (800) 882 7426

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#### Varian Technologies - Beijing

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### France and Wallonie

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7 avenue des Tropiques  
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Fax: (49) 6151 703 302

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1010 Competent House  
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### Korea

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Korea 135-280  
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Fax: (82) 2 3452 2451

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Fax: (52) 5 523 9472

### Taiwan

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Fax: (886) 2 2698 9678

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#### North America

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vtl.technical.support@varianinc.com

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vtl.technical.support@varianinc.com

#### Japan

Tel: (81) 3 5232 1253 (dedicated line)  
vtj.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



**VARIAN**

