Thermocouple Gauge Replacement for VS Series Leak Detectors

Part Number 699909995
Rev. B
March 2006
Thermocouple Gauge Replacement for VS Series Leak Detectors

Preface

Documentation Standards

This manual uses the following documentation standards:

NOTE Notes contain important information.

CAUTION Cautions appear before instructions, which if not followed, could cause damage to the equipment or data loss.

WARNING Warnings appear for a particular procedure or practice which, if not followed correctly, could lead to serious injury or death.

Hazard and Safety Information

The common international symbols used in this manual and on the equipment are defined below.

- OFF Supply (Power)
- ON Supply (Power)
- AC – Alternating Current
- Warning, Risk of danger
- Frame or chassis Terminal
- Earth (Ground) Terminal
- Caution, Hot Surface
- Caution, Risk of Electrical Shock
- Protective Conductor Terminal
Operators and service 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 unskilled, improper, or careless operation of the equipment can be serious. Every operator or service person must read and thoroughly understand operation/maintenance manuals and any additional information provided by Varian. All warning and cautions must be read carefully and strictly observed. Consult local, state, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to your nearest Varian office.

**Solvents**

**WARNING**

The mechanical components of leak detectors may be cleaned with one of the recommended solvents. When heated, sprayed, or exposed to high-temperature equipment, these solvents become flammable and explosive, causing serious injury or death. Do not use these solvents near a high-temperature source. Ventilate the working area with a blower and work in a large, well-ventilated room.

Solvents are irritants, narcotics, depressants and/or carcinogens. Their inhalation and/or ingestion may produce serious side effects. Prolonged or continued contact with the skin results in absorption through the skin and moderate toxicity. Always ensure that cleaning operations are carried out in large, well-ventilated rooms, and wear eye shields, gloves, and protective clothing.

Due to the effective cleaning nature of VacuSolv solvent and its residue-free properties, Varian' Component and Spectrometer Cleaning Kit (Part Number 670029096), used in accordance with the kit instructions, is recommended for cleaning spectrometer components. The kit can also be used for fine cleaning of other parts in the leak detector's vacuum system such as valves and fittings. No rinsing steps or high-temperature drying is required following cleaning with VacuSolv. Although appropriate precautions are advised, VacuSolv is compatible with most materials and does not contain toxic chemicals or CFCs (chlorofluorocarbons). Other acceptable solvents are isopropyl alcohol (IPA) or Dow Corning® OS-20.

To clean the leak detector plastic enclosure, the LCD display and Front Panel buttons, use only a soft cloth slightly dampened with water or a mild soap. Do NOT use excess water or cleaning solvents of any kind.

Avoid splashing any cleaning solvents into the unit through the ventilation openings or Front Panel buttons. Wipe the surface with a dry lint-free cloth.

**Vacuum Equipment and Cleanliness**

Cleanliness is vital when servicing the leak detector or any vacuum equipment. There are some techniques that are more important in leak detector servicing than in general vacuum work:

**CAUTION**

Wear non-powdered, ESD-safe Nitride or equivalent gloves to prevent skin oils from getting on spectrometer internal components.
O-ring Care

When removing, checking or replacing O-rings, keep in mind the following:

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

**CAUTION**
Remove O-rings carefully with your fingers. Do not use metal tools for this task; this prevents scratching of any sealing surfaces.

- 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 grease or any other substance on O-rings that will come in contact with the vacuum surfaces.
- Do not use alcohol, methanol or other solvents on O-rings. Doing so causes deterioration and reduces their ability to hold a vacuum.
- Varian does not recommend the use of vacuum grease. If applicable, apply a small amount of Apiezon® L grease and wipe the O-rings shiny dry.

Metal Seal Care

**CAUTION**
Metal Seals must be replaced any time a spectrometer is opened. All fasteners must be installed and torqued per assembly procedure specifications. Remove Metal Seals carefully with your fingers or a soft tool. Metal tools scratch sealing surfaces.

- Metal Seals are supplied in pre-cleaned condition. No cleaning is required. If necessary, Metal Seals can be cleaned using the recommended solvents. Wipe Metal Seals clean with a lint-free cloth before installation to ensure that no foreign matter impairs the seal.
- Do not use grease or any other substance on Metal Seals that will come in contact with the spectrometer.

Spectrometer

**CAUTION**
Store the Ion Source/Preamplifier sub-assembly in a cool, dry area in a tightly sealed, ESD protected container. Wear non-powdered, ESD-safe Nitride or equivalent gloves when handling the spectrometer. Wash hands thoroughly after handling the spectrometer filaments and especially before smoking or eating.

The spectrometer and PCB's are static sensitive devices. Wear a grounding strap when performing any maintenance on these units and especially when performing maintenance of static sensitive parts.

**CAUTION**
The spectrometer operates at a very high vacuum produced by the high vacuum turbomolecular pump. Service of the spectrometer requires that this vacuum be vented to the atmosphere.
**Equipment Required**
- Extended Length M5 Allen Wrench
- Metric Allen Wrench Set

**Installation Procedure**
For clarity, some items have been omitted from views.

**WARNING**
Disconnect power from the unit before performing any maintenance procedure that requires physically disconnecting any part of the system.

1. Turn off the power switch located on the back of the unit and unplug.
2. Wait 30 seconds for the high voltage to dissipate.
3. Using an extended length M5 Allen wrench, remove the four screws holding the rear plastic cover (Figure 1: Rear and Front Cover Screws) and detach the rear plastic cover from the unit.
4. Remove the four screws holding the front plastic cover and detach the cover from the unit. Two screws are situated at the front of the unit (not shown) and two screws are positioned inside the unit (Figure 1: Rear and Front Cover Screws).
5. Disconnect the fan cable and remove the fan assembly by unfastening two wing nuts and one M4 socket head cap screw (Figure 2: Fan and TC Gauge Assemblies).

6. Detach the TC gauge cable plug from the mother board PCB and disconnect the ground cable from the chassis.

7. Remove the TC gauge cable from the cable ties.

8. Using an M4 Allen wrench remove the TC gauge and cable assembly from the valve block. Retain the two screws and the two washers. Discard the TC gauge and cable assembly (Figure 3: TC Gauge Location).
CAUTION  Take extreme care to avoid damaging the TC GAUGE when handling and installing the device.

9. Install the replacement TC gauge and O-ring in the valve block and loosely install existing hardware.
10. Install the ground lug between the washer and the screw (Figure 4: Alignment Mark and Ground Lug).
11. Ensure that the alignment mark is positioned to the center of the screw as shown in Figure 4: Alignment Mark and Ground Lug, then tighten the two screws.
12. Route the TC cable back through the assembly in the same position as the removed cable.
13. Attach the TC gauge cable plug and chassis ground to the location shown in Figure 2: Fan and TC Gauge Assemblies.
14. Attach the fan assembly (Figure 2: Fan and TC Gauge Assemblies) by fastening the two wing nuts and one M4 socket head cap screw. Then connect the fan cable to the unit.
15. Attach the front cover and secure to the frame using existing hardware.
16. Leak test the TC gauge to ensure a leak free joint.
17. Attach the rear cover and secure to the frame using existing hardware.
18. Connect the power cord and power up the unit.
19. Watch the Home screen to verify that the Spectube Pressure Wait message progresses to Stabilization Wait and System Ready within ten minutes. Refer to the operator’s manual if the system fails to reach the System Ready mode.
20. Refer to the TC gauge calibration section of the user's manual for the correct calibration procedure for the TC gauge.
21. Varian recommends a full calibration of the unit prior to leak test operations.
Sales and Service Offices

Canada
Central coordination through:
Varian, Inc.
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel: (781) 861 7200
Fax: (781) 860 5437
Toll Free: (800) 882 7426

China
Varian Technologies - Beijing
Room 1201, Jinyu Mansion
No. 129A, Xuanwumen Xidajie
Xicheng District
Beijing 1000031
P.R. China
Tel: (86) 10 6608 1031
Fax: (86) 10 6608 1541

France and Benelux
Varian s.a.
7 avenue des Tropiques
Z.A. de Courttaboeuf – B.P. 12
Les Ulis cedex (Orsay) 91941
France
Tel: (33) 1 69 86 38 13
Fax: (33) 1 69 28 23 08

Germany and Austria
Varian Deutschland GmbH
Alsfelder Strasse 6
Postfach 11 14 35
64289 Darmstadt
Germany
Tel: (49) 6151 703 353
Fax: (49) 6151 703 302

India
Varian India PVT LTD
101-108, 1st Floor
1010 Competent House
7, Nangal Raya Business Centre
New Delhi 110 046
India
Tel: (91) 11 5548444
Fax: (91) 11 5548445

Italy
Varian, Inc.
Via F.Ili Varian, 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9 111
Fax: (39) 011 997 9 350

Japan
Varian, Inc.
Sumitomo Shibaura Building, 8th Floor
4-16-36 Shibaura
Minato-ku, Tokyo 108
Japan
Tel: (81) 3 5232 1253
Fax: (81) 3 5232 1263

Korea
Varian Technologies Korea, Ltd.
Shinsa 2nd Building 2F
966-5 Daechi-dong
Kangnam-gu, Seoul
Korea 135-280
Tel: (82) 2 3452 2452
Fax: (82) 2 3452 2451

Mexico
Varian S.A.
Concepcion Beistegui No 109
Col Del Valle
C.P. 03100
Mexico, D.F.
Tel: (52) 5 523 9465
Fax: (52) 5 523 9472

Russia
Central coordination through:
Varian, Inc.
via F.Ili Varian 54
10040 Leini, (Torino)
Italy
Tel: (39) 011 997 9 252
Fax: (39) 011 997 9 316

Taiwan
Varian Technologies Asia Ltd.
18F-13 No.79, Hsin Tai Wu Road
Sec. 1, Hsi Chih, Taipei Hsien
Taiwan, R.O.C.
Tel: (886) 2 2698 9555
Fax: (886) 2 2698 9678

UK and Ireland
Varian Ltd.
28 Manor Road
Walton-On-Thames
Surrey KT 12 2QF
England
Tel: (44) 1932 89 8000
Fax: (44) 1932 22 8769

United States
Varian, Inc.
121 Hartwell Avenue
Lexington, MA 02421
USA
Tel: (781) 861 7200
Fax: (781) 860 5437

Other Countries
Varian, Inc.
Via F.Ili 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)
vkt.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