



Agilent Technologies

Vacuum Products Division

Cold Cathode Tube Maintenance

*FIELD INSTALLATION
INSTRUCTIONS*

Part Number L8771
Rev. E
September 2012

Cold Cathode Tube Maintenance

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Agilent Field Instruction Sheet

Cold Cathode Tube Maintenance

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)		Earth (Ground) Terminal
	ON Supply (Power)		Caution, Hot Surface
	AC – Alternating Current		Caution, Risk of Electrical Shock
	Warning, Risk of danger		Protective Conductor Terminal
	Frame or chassis 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 Agilent. 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 Agilent office

All cold cathode gauges require periodic maintenance for lime due to contamination of the cathode by pump oils, dirt, oxidation, and sputtering of the cathode. Maintenance is indicated whenever performance becomes erratic or the tube either takes excessive time to or fails to strike. This may be accomplished by either cleaning or replacing the cathode. While cleaning may be successful initially, eventually the cathode will have to be replaced. The length of time a given gauge tube operates before requiring maintenance is strongly dependent upon the application.

Refer to "Kit Replacement Numbers" on page 4 for the correct maintenance kit.

A. To disassemble the cathode:

1. Remove the tube from the vacuum system.
2. If your tube has a baffle, remove it.
3. Loosen and remove the nut at the hi voltage connector.
4. For:
 - Older style 525:
 - a. Remove and discard the compression washer and O-ring (Figure 1: Older Style 525).
 - b. Push the connector /cathode assembly out of the gauge tube through the vacuum side of the tube.

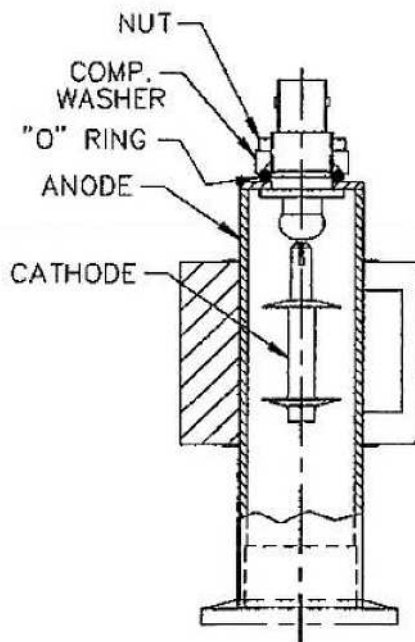


Figure 1: Older Style 525

- Older Style 525 Cleaning or Replacing Cathode
 - a. Push the connector/cathode assembly out of the gauge tube through the vacuum side of the tube (Figure 2: Older Style 525 Cleaning or Replacing Cathode).
 - b. Remove and discard O-ring.

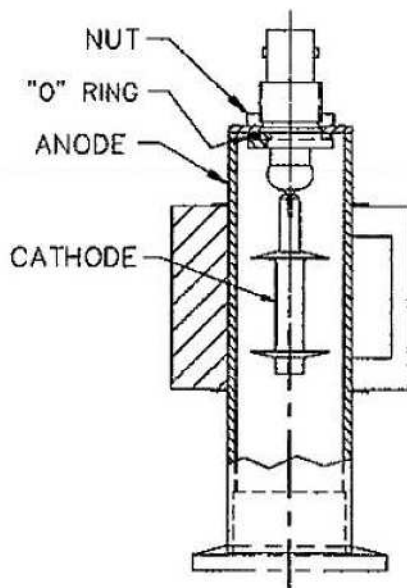


Figure 2: Older Style 525 Cleaning or Replacing Cathode

- For 524 or new style 525 unscrew cathode with a flat blade screwdriver (Figure 3: Newer Style 525 Cleaning or Replacing Cathode).

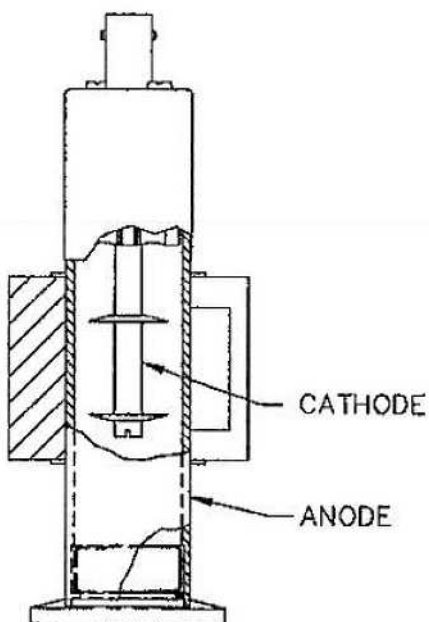


Figure 3: Newer Style 525 Cleaning or Replacing Cathode

B; To clean the cathode:

1. Clean off surface contamination and debris using an abrasive cleaner (i.e.: steel wool, abrasive pad. etc., sandblasting is not recommended).
2. Wash with soap and water, rinse with clean water.
3. Let dry thoroughly. A final rinse in reagent grade alcohol shortens the drying time.
4. For older style 525: Carefully inspect the glass seal and the knife edges. If the glass shows any evidence of cracking, if the knife edges are significantly rounded, or if there is excessive pitting on any of the cathode surfaces, discard and replace with a new one (Figure 2: Older Style 525 Cleaning or Replacing Cathode).

C: To reassemble or Install new cathode assembly:

- For older style 525 (Figure 2: Older Style 525 Cleaning or Replacing Cathode):
 1. Push the supplied O-ring over the connector as far down as possible. It may not stay all the way down. If you are installing a cleaned cathode use the extra ring supplied with your gauge and grease it with a little Apiezon or similar vacuum grease. The O-ring dimensions are .489 ID x .070, Buna, 70 durometer if you buy one.
 2. Push the cathode assembly up through the *D* hole from the vacuum side of the tube. Align the flat with the flat of the hole and push in place. Do not apply excessive force.
 3. Install the nut and tighten on anode surface.
 4. Leak check the gauge tube before installation onto your vacuum system. The leak spec is less than 2×10^{-9} atm cc/sec on a helium leak detector.
 5. Install baffle, as removed using retaining ring to hold in place.
- For 524 or new style 525 (Figure 3: Newer Style 525 Cleaning or Replacing Cathode):
 1. Screw cathode into feedthru.
 2. Install baffle, as removed using retaining ring to hold in place.

Kit Replacement Numbers

Tube	Kit Number
524	0591-F4381-301
Older Style 525	0581-K9440-301
Older Style 525	0591-F4381-301

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, eg).
- 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:

EUROPE:

Fax: 00 39 011 9979 330
Fax Free: 00 800 345 345 00
Toll Free: 00 800 234 234 00
vpt-customer@agilent.com

NORTH AMERICA:

Fax: 1 781 860 9252
Toll Free: 800 882 7426, Option 3
vpl-ra@agilent.com

PACIFIC RIM:

please visit our website for individual office information
<http://www.agilent.com>



Please read important policy information on Page 3 that applies to all returns.

1) CUSTOMER INFORMATION

Company Name:		Contact Name:	
Tel:	Email:	Fax:	
Customer Ship To:		Customer Bill To:	
Europe only: VAT reg. Number:		USA/Canada only: <input type="checkbox"/> Taxable <input type="checkbox"/> Non-taxable	

2) PRODUCT IDENTIFICATION

Product Description	Agilent P/N	Agilent S/N	Original Purchasing Reference

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:



**Vacuum Products Division
Request for Return Form
(Health and Safety Certification)**

Please use these Failure Mode to describe the concern about the product on Page 2.

TURBO PUMPS and TURBO CONTROLLERS

APPARENT DEFECT/MALFUNCTION	POSITION	PARAMETERS
- Does not start - Does not spin freely - Does not reach full speed - Mechanical Contact - Cooling defective - Noise - Vibrations -Leak -Overtemperature -Clogging	- Vertical -Horizontal -Upside-down -Other:	Power: Rotational Speed: Current: Inlet Pressure: Temp 1: Foreline Pressure: Temp 2: Purge flow: OPERATING TIME:

ION PUMPS/CONTROLLERS

- Bad feedthrough - Vacuum leak - Error code on display - Poor vacuum - High voltage problem - Other

VALVES/COMPONENTS

- Main seal leak - Solenoid failure - Damaged sealing area - Bellows leak - Damaged flange -Other
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LEAK DETECTORS

- Cannot calibrate - Vacuum system unstable - Failed to start -No zero/high background - Cannot reach test mode - Other
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INSTRUMENTS

- Gauge tube not working - Communication failure - Error code on display - Display problem - Degas not working - Other

SCROLL AND ROTARY VANE PUMPS

- Pump doesn't start - Doesn't reach vacuum - Pump seized - Noisy pump (describe) - Over temperature - Other

DIFFUSION PUMPS

- Heater failure - Doesn't reach vacuum - Vacuum leak - Electrical problem - Cooling coil damage - Other

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.

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Service & Support

North America

Agilent Technologies
121 Hartwell Avenue
Lexington, MA 02421 USA
Tel.: +1 781 861 7200
Toll-Free: +1 800 882 7426
Fax: +1 781 860 5437
vpl-customerservice@agilent.com

Benelux

Agilent Technologies Netherlands B.V.
Herculesweg 8
4338 PL Middelburg The Netherlands
Tel: +31 118 671570
Fax: +31 118 671569
Toll free: 00 800 234 234 00

China

Agilent Technologies (China) Co. Ltd
No.3, Wang Jing Bei Lu, Chao Yang Dis-
trict, Beijing, 100102 China Tel.: +86 (10)
6439 7888
Fax: +86 (10) 6439 1318
Toll-Free: 800 820 8266
vpc-customerservice@agilent.com

France

Agilent Technologies France
7 avenue des Tropiques
Z.A. de Courtaboeuf - B.P. 12
91941 Les Ulis cedex France
Tel.: +33 (0) 1 69 86 38 84
Fax: +33 (0) 1 69 86 29 88
Toll free: 00 800 234 234 00
vpf.sales@agilent.com

Germany & Austria

Agilent Technologies
Lyoner Str. 20
60 528 Frankfurt am Main Germany
Tel.: +49 69 6773 43 2230
Fax: +49 69 6773 43 2250
Toll free: 00 800 234 234 00

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Published in USA, October, 2011

India

Agilent Technologies India Pvt. Ltd.
G01. Prime corporate Park,
230/231, Sahar Road,
Opp. Blue Dart Centre,
Andheri (East), Mumbai – 400 099. India
Tel: +91 22 30648287/8200
Fax: +91 22 30648250
Toll Free: 1800 113037
cag_india@agilent.com

Italy

Agilent Technologies Italia S.p.A.
via F.lli Varian 54
10040 Leini, (Torino) ITALY
Tel.: +39 011 997 9111
Fax: +39 011 997 9350
Toll-Free: 00 800 234 234 00
vpt.sales@agilent.com
vpt-customerservice@agilent.com

Japan

Agilent Technologies Japan, Ltd.
8th Floor, Sumitomo Shibaura Building
4-16-36 Shibaura Minato-ku
Tokyo 108 JAPAN
Tel.: +81 3 5232 1253
Toll-Free: 0120 655 040
Fax: +81 3 5232 1710
vpj-customerservice@agilent.com

Korea

Agilent Technologies
Shinsa 2nd Bldg. 2F
966-5 Daechi-dong
Kangnam-gu, Seoul KOREA 135-280
Tel.: +82 2 3452 2455
Toll-Free: 080 222 2452
Fax: +82 2 3452 2451
vpk-customerservice@agilent.com

Singapore

Agilent Technologies Singapore Pte. Ltd
No.1 Yishun Avenue 7 Singapore 768923
Tel: +65 6215 8045
Fax : +65 6754 0574
Toll-Free: 1 800 2762622
vps-customerservice@agilent.com

Southeast Asia

Agilent Technologies Sales Sdn Bhd
Unit 201, Level 2 uptown 2,
2 Jalan SS21/37, Damansara Uptown
47400 Petaling Jaya, Selangor, Malaysia
Tel : +603 7712 6106
Fax: +603 6733 8121
Toll-Free: 1 800 880 805
vps-customerservice@agilent.com

Taiwan

Agilent Technologies Taiwan Limited
20 Kao-Shuang Rd., Pin-Chen City, 324
Taoyuan Hsien, Taiwan, R.O.C. Tel. +886
34959281
Toll Free: 0800 051 342
vpw-customerservice@agilent.com

UK & Ireland

Agilent Technologies
6 Mead Road
Oxford Industrial Park
Yarnton, Oxford OX5 1QU UK
Tel.: +44 (0) 1865 291570
Fax: +44 (0) 1865 291571
Toll free: 00 800 234 234 00
vpt-customerservice@agilent.com

Learn more:

www.agilent.com/chem/vacuum



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