



Turn OFF and disconnect power to the 835 VQM® Controller before beginning this replacement procedure.

The Electron Multiplier and other components of the Mass Spectrometer (MS) Gauge are fragile. Be especially careful during disassembly and reassembly of the gauge.

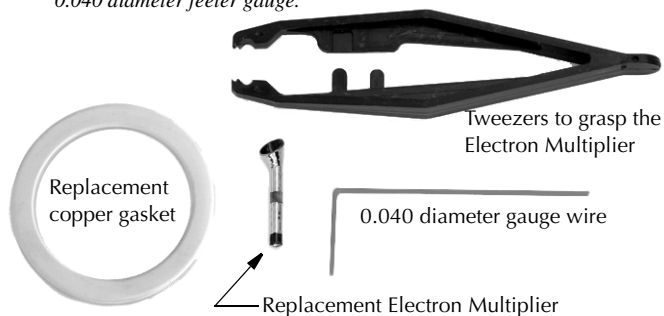
Do NOT scratch the ConFlat knife edge on the gauge.

The components of the Electron Multiplier (EM) replacement kit are UHV compatible – perform the replacement procedure in a proper cleanroom environment.

Components of the Electron Multiplier Replacement Kit

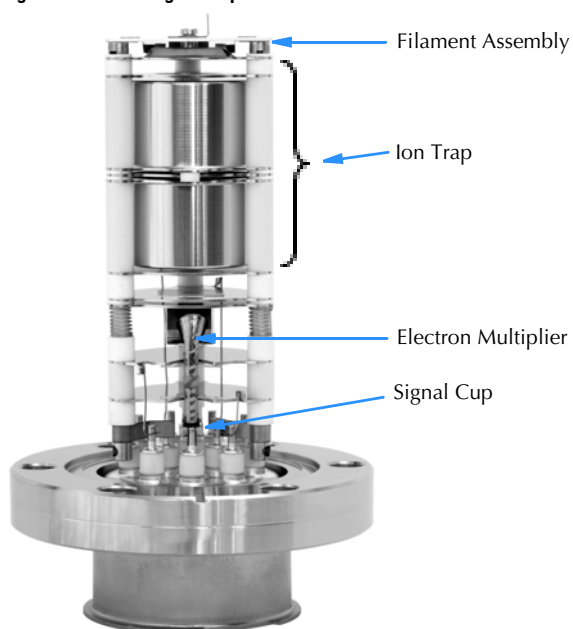
Figure 1 Electron Multiplier Replacement Kit

NOTE: The electron multiplier replacement kit includes a custom pair of tweezers that are notched to grasp the electron multiplier and the 0.040 diameter feeler gauge.



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Figure 3 MS Gauge Components



5. Grasp the new EM with the tweezers, making sure the bell of the EM will face directly to the center of the MS Gauge.
6. Insert the new EM into the signal cup and carefully push the upper part of the EM into the two retaining springs that lock it in place. Make sure the bell of the EM is facing toward the center of the MS Gauge.

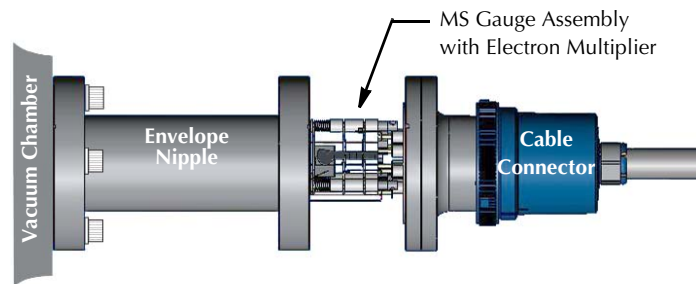
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*Notes: Use clean, vacuum component compatible gloves while replacing the electron multiplier.
If you are replacing the filament assembly at the same time as the electron multiplier, follow the instructions provided with the filament replacement kit.*

Electron Multiplier Replacement Instructions

1. Turn OFF power to the VQM System and vent the chamber to atmosphere. Disconnect the cable from the MS Gauge and remove the 6 bolts that attach the MS Gauge to the envelope nipple. See Figure 2.

Figure 2 Remove the MS Gauge from the Envelope Nipple

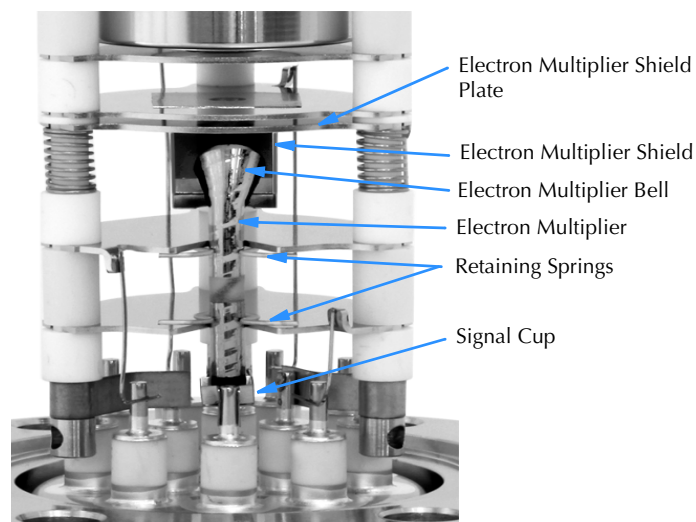


2. **Carefully** remove the MS Gauge from the envelope. Avoid sliding the ceramic insulators of the MS Gauge along the inside of the envelope.
3. Look closely at the MS Gauge and make note of the position of the components as shown in Figure 4.
4. Use the larger notch of the tweezers to remove the EM as shown in Figure 5. Note that the electron multiplier sets into a socket (signal cup) at the bottom. After the EM is disengaged (gently pull outward) from the two retaining springs, lift the EM to remove it from the signal cup.

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7. Use the 0.040 gauge wire to adjust the EM to the proper location as illustrated in Figure 6 and Figure 7. The gauge wire can also be used if slight rotational adjustment is required to make sure the bell of the EM is facing toward the center of the MS Gauge. To do so, slide the wire between the bell and the sides of the EM Shield (see Figure 4).

Figure 4 Close-up of the Electron Multiplier

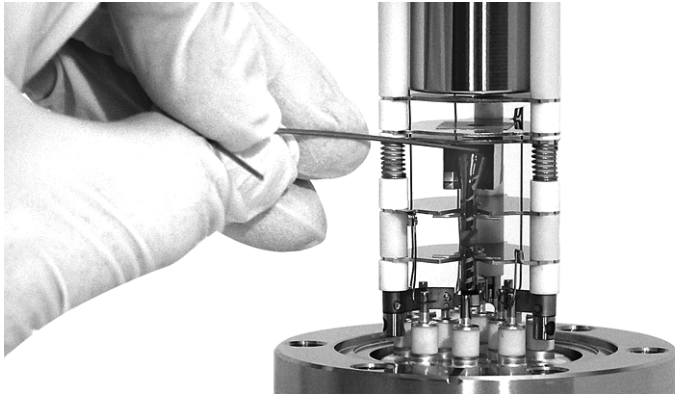


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Figure 5 Remove the Electron Multiplier

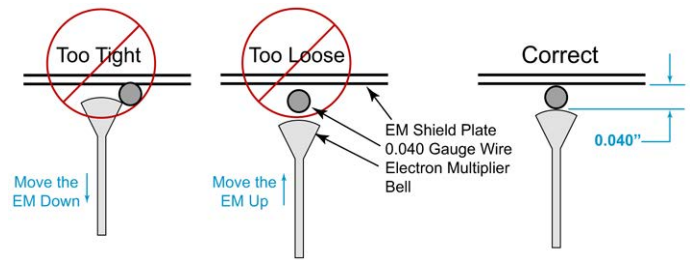


Figure 6 Electron Multiplier Adjustment



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Figure 7 Proper Electron Multiplier Adjustment Setting



CAUTION

Be sure the new copper gasket is in the proper location before installing the bolts that hold the MS Gauge in the envelope nipple.

8. Using the new copper gasket provided in the EM Kit, carefully insert the MS Gauge into the envelope. Avoid sliding the ceramic insulators of the MS Gauge along the inside of the envelope.
9. Install the bolts that were removed in Step 1.
10. Pump down the vacuum chamber to $<1 \times 10^{-5}$ Torr.
11. Connect the interconnect cable from the VQM Controller to the MS Gauge.

CAUTION

Be sure to pump down the vacuum chamber to 1×10^{-5} Torr or lower before turning ON the VQM Controller. The MS Gauge filament may be damaged at system pressures higher than 1×10^{-5} Torr.

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12. Connect the USB cable from the computer with the VQM Viewer Application software to the VQM Controller.
13. Open the Viewer Application software.
14. Press the Power button on the front of the VQM Controller to turn ON power to the VQM Controller, but **do not** apply power to the MASS SPEC at this time.

CAUTION

Before turning ON the MASS SPEC Gauge, the EM Bias Voltage MUST be set to -750V. Failure to do so, especially if it is currently set to a lower (-) voltage, may damage the new electron multiplier.

15. Use the Tune Settings in the VQM Application software to set the EM Bias Voltage to -750V. See "Tune Settings" in Chapter 8 of the VQM Instruction Manual, 835000.
16. Turn ON the MASS SPEC Gauge and perform the (1) Initial Pumpdown, (2) Filament Outgassing, and (3) EM Preconditioning, (4) Auto Tune, (5) EM Gain Adjustment, and (6) Mass Axis Calibration as outlined in Chapter 8, of the Instruction Manual, 835000. The Instruction Manual for the VQM System can be downloaded at www.mksinst.com

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Series 835

Granville-Phillips® VQM® Mass Spectrometer Gauge Electron Multiplier Replacement Instructions



More detailed instructions regarding installation, operation, and service of the Series 835 VQM System are provided in the Instruction Manual (part number 835000) which can be downloaded at: www.mksinst.com

Replacement Instructions

Instruction manual part number 835006
Rev. E - June 2015

Series 835

Granville-Phillips® VQM® Mass Spectrometer Gauge Electron Multiplier Replacement Instructions



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Replacement Instructions

Instruction manual part number 835006
Rev. E - June 2015