

835 VQM® System >3 meter MS Controller-to-Gauge Interconnect Cable Optimization

Adjustment of the RF Drive Voltage is required to achieve optimum performance when using a Controller-to-Gauge interconnect cable longer than 3 meters. This procedure is intended for those replacing the standard 3 meter cable with a longer cable, but can be used any time RF optimization for a longer cable is needed.

Important System Ground Requirements

See the Safety Chapter and the Hardware Installation Chapter of 835 VQM Instruction Manual for complete requirements list.

Setting Filament Power Limit

Because of the added resistance, cables longer than 3 meters may require an increase in the maximum filament power to keep the controller from shutting off the gauge power at pressures greater than 5×10^{-7} Torr. Use the 835 Utility (see section 8.6.3 of the 835000 Instruction Manual) to adjust the filament power limit.

The utility can also be used to switch the maximum filament power back to the appropriate value for standard cables.

Initial Optimization Procedure

1. Connect the 10 or 20-meter length cable to the VQM Controller and Mass Spec Gauge.
2. Pump down the vacuum chamber to 1×10^{-7} Torr.
3. Turn ON the VQM System, select the Standby mode, and allow the MS Gauge to warm for 45 minutes with power applied. See Section 8.4.2 in Chapter 8 of the 835000 user's instruction manual.
4. Perform the Auto Tune procedure as outlined in Section 8.4.3 of the instruction manual.
5. Using the Tune Screen, set the RF Amp P-P to 0.500 Volts.
6. Set the Averaging Mode to Running with 20 Averages to Collect.

Optimization when Water is the dominate gas

Note: The indicator used in this optimization procedure is a defined ratio of Water (H_2O^+ which is 18 amu) to OH^+ (17 amu).

1. On the Summary screen, ensure H_2O^+ (18 amu) is greater than 90 percent of the gas load in the chamber.

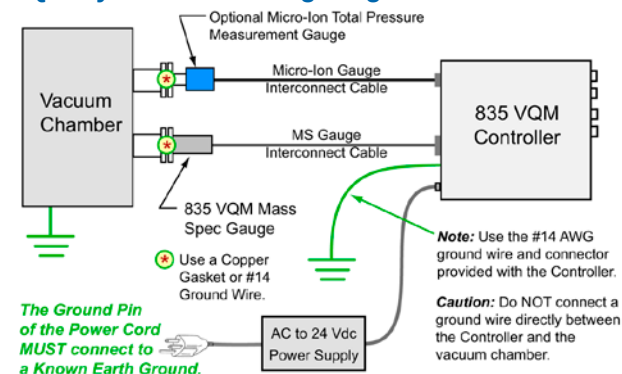
2. On the Tune screen, lower the RF Amp P-P in 0.020 Volt increments until the 17 amu peak is 0.40 on the normalized scale. Look at the grey histogram to determine the level of mass 17.
3. At this point the cable is optimized for use on the VQM System.

Optimization when Nitrogen is the dominate gas

Note: The indicator used in this optimization procedure is a defined ratio of Nitrogen (N_2^+ which is 28 amu) to N^+ (14 amu).

1. Backfill the vacuum chamber to 2.5×10^{-7} Torr of Nitrogen.
2. On the Summary screen, ensure that N_2^+ (28 amu) is greater than 90 percent of the gas load in the chamber.
3. On the Tune screen, lower the RF Amp P-P in .020 Volt increments until the 14 amu peak is 0.16 on the normalized scale. Look at the grey histogram to determine the level of mass 14.
4. At this point the cable is optimized for use on the VQM System.

VQM System Grounding Diagram



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