

AMS Vacuum Start-Up Procedure

This Procedure assumes a starting condition where the AMS vacuum system is fully powered down, ie. no turbo pumps are running, the MD1 pump is off and both the inlet valve and the MD1 valve are closed. All power is off but all units are plugged into AC power.

- 1) Turn on the switch for the AMS Electronics and set the 6-position selector switch to "Pressure (torr)" position. Verify that the 3-way Whitey valve connecting the 10 Torr Baratron gauge is in the "inlet" position. Obtain a reading of the vacuum chamber pressure. Note that a display of ~12 indicates that the gauge is over range, this is a 10 torr range gauge. Is the base pressure below 10 torr? If not, this suggests that there is likely a small leak which may or may not be significant.
- 2) Turn on the Diaphragm pump via the AMS Power Supply Box. Verify that the pump is spinning. Open the MD1 valve to start rough pumping out the chamber. Note that the DC current to the MD1 pump should decrease as the pressure decreases. Typical MD1 operating current is 1-1.5 amps. Monitor the chamber pressure until it is <10 torr.
- 3) After the pressure drops below 10 torr turn on the Turbo Pump power on the AMS Power Supply Box. Turn on the Alcatel pump and let it reach 100% speed. Next turn on pump #2 (V301) and let it reach full speed. Note that this pump will reach >7 amps at full power load. Next turn on all other pumps and verify that they reach full speed. Pump #5 (V301) will be the last to reach 100% speed. This is normal.
- 4) After all pumps are at full speed turn on the Balzer Quadrupole power supply and the vaporizer power.
- 5) Let the system pump for at least 1 hour. Record and compare pump speeds and currents.
- 6) After pumping for ~1 hr, start the AMS program and enter the MS mode of operation. Press Shft-B and turn on the filament to the lowest setting (0.01 mA). Verify that the filament turns on. At this point it is useful to briefly turn on the multiplier switch and verify that a mass spectrum is observed. This just indicates that all systems are ok.
- 7) Over the course of ~2 hrs step the filament current up from 0.01, 0.02, 0.05, 0.1, 0.25 mA in 20-30 min intervals. This sequence is not set in stone...
- 8) Once an emission current of 0.25 mA is reached the system should ideally pump overnight before use. A calibration done before ~24hrs of pumping will likely be different than one performed after several days. A gradual increase in performance (increase in IE and AB values) is usually observed over a week long period.