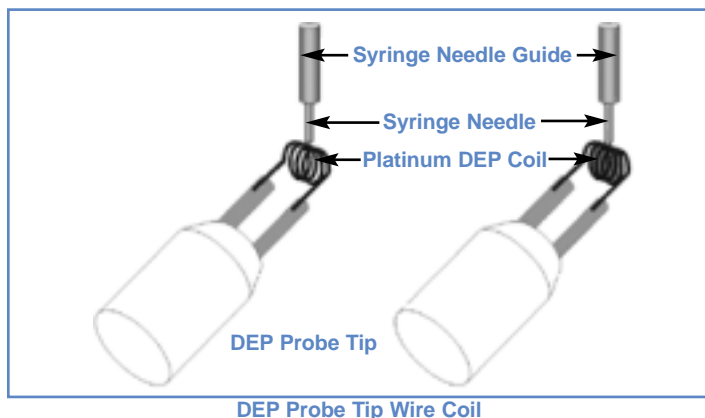


The AutoProbe components are shown below. A CTC liquid autosampler loads samples onto the replaceable probe tip via a syringe. The probe tip is attached to a probe rod attached to a servo linear actuator that automatically drives the probe through an isolation valve and into the mass spectrometer source.

Before (or during) analysis, the operators prepare individual sample vials containing samples dissolved in suitable solvent and place these on the sample tray.

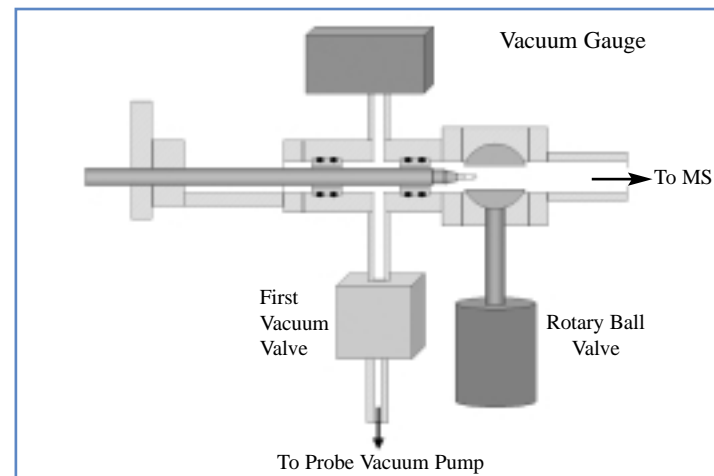
For each sample in an analysis sequence, the autosampler starts by loading 0.125 to 1.0 µl of sample and accurately injects it onto the platinum DEP probe wire filament.



A small initial current is then passed through the DEP filament wire to evaporate the solvent from the sample.

An isolation valve (bottom left) permits the introduction of the probe into the mass spectrometer without compromising the MS vacuum. When the probe is inserted into the first probe seal of the isolation valve, a vacuum valve opens to allow the accessory vacuum pump to evacuate the probe inlet. A vacuum gauge measures this vacuum, and when the vacuum reaches approximately 200 millitorr, the probe is advanced to a second seal. This vacuum gauge acts as a safety feature to prevent the probe from being inserted into the MS source should a vacuum problem occur anywhere in the system. Afterward, a pneumatically controlled ball valve opens to permit the probe to be inserted through the isolation valve and into the mass spectrometer.

Once the probe has been inserted into the mass spec source, a small current (typically 10 to 1000 mA) is passed through the platinum wire to heat the wire and desorb the sample for analysis. This



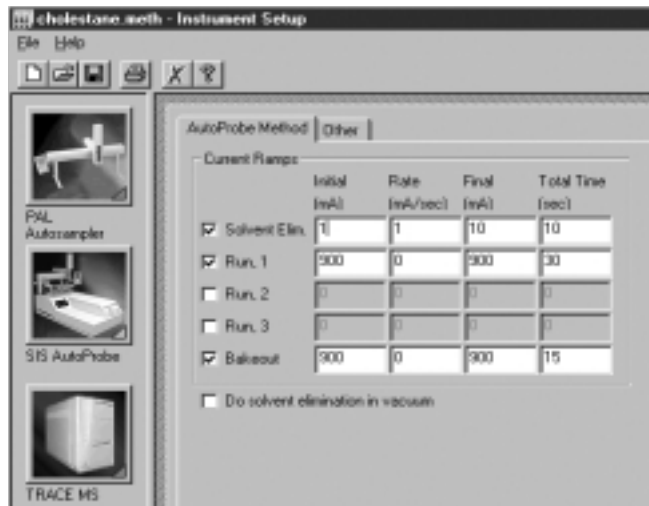
Automated Isolation Valve

DEP probe filament can be set to a constant current, or the current can be programmed in up to three ramp steps to obtain the optimum results depending on the sample being analyzed.

After the sample analysis is complete, the probe tip is retracted slightly from the MS source, and a high filament current is passed through the wire coil to burn off any sample remaining on the filament wire coil. This assures that the filament wire is clean and ready for the next sample.

## AutoProbe Software and PC Control

The AutoProbe is controlled by PC software that is fully integrated within the Thermo™ Xcalibur™ MS software. The AutoProbe operates as any other standard Xcalibur virtual instrument, which means that the AutoProbe is configured, started, stopped and monitored entirely within the Xcalibur user interface. AutoProbe method settings, such as filament current ramps within the three heating steps, are stored within the MS method. (See figure below.)



AutoProbe Method Setup Screen

The AutoProbe may optionally be used in the Xcalibur "Open Access™" mode of operation. This permits the chemist or technician to log samples into the system using a very simple and locked-down interface. With no subsequent user interaction, the samples are analyzed automatically when the system becomes available, and the results are computed and reported back to the chemist in a printout or e-mail. This results in increased productivity from the mass spectrometer lab.



Xcalibur "Open Access" Log In Screen