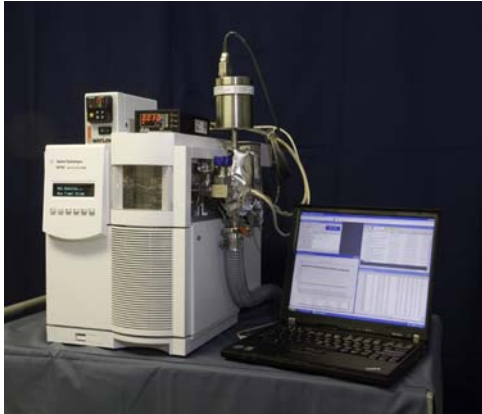




The Diablo Analytical 5000A Real-Time Gas Analyzer



Diablo's 5000A Real-Time Gas Analyzer bridges the gap between low-performance Residual Gas Analyzers (RGAs), and high-performance laboratory mass spectrometers. The 5000A combines Agilent Technologies proven 5975 Mass Selective Detector technology, a specially designed process-sampling interface, and Diablo's MS Sensor 3.0 process analysis software providing *Real-time chemical measurement for continuous improvement.*

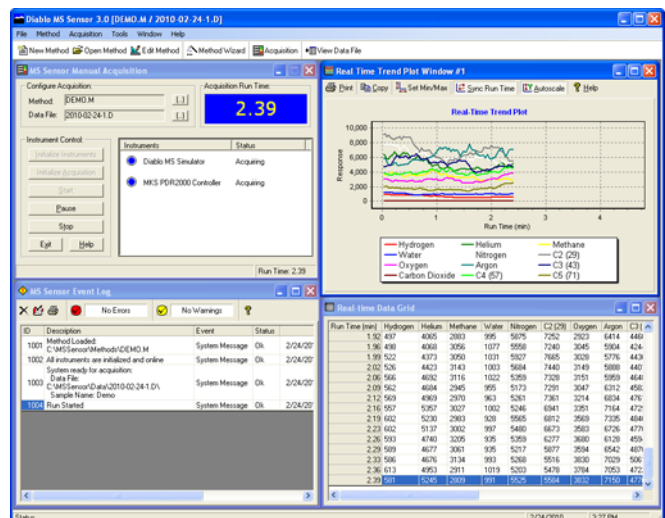
Based on the Agilent Technologies 5975 Mass Selective Detector (MSD)

The Diablo 5000A RTGA is based on the Agilent Technologies 5975 MSD – the industry-standard bench-top mass spectrometer. The benefits of this technology include:

- Fast, real-time response to process changes
- Flexible, rugged, fast responding, direct process sampling interface
- Easy conversion of 5975 MSD to standard GC-MS configuration
- Linear response and stable, reliable quantitative analysis
- The 5975 MSD can be serviced by the Agilent Technologies service organization worldwide
- Special hardware and software enhancements allow detection of hydrogen with the 5975 MSD

Featuring Diablo's MS Sensor 3.0 Process Analysis Software

- Enables the Agilent Technologies 5975 MSD to be used for continuous process analysis
- Simple user interface – greatly simplifies operation of the 5975 MSD.
- Integrates signals from the MSD with sample pressure for real-time pressure compensation
- Results are displayed in real-time engineering trend plots



Overview of the Diablo Analytical 5000A RTGA

The industry-standard bench top mass spectrometer, the Agilent Technologies 5975 MSD, has been converted into an on-line mass spectrometer, the Diablo Analytical 5000A Real-Time Gas Analyzer. The use of the 5975 MSD allows users to access the excellent mass axis stability, mass resolution, and sensitivity for which the 5975 is known in a format suitable for process monitoring. This instrument offers customers a real-time response of 2-5 seconds for multiple components with sensitivity in the parts-per-billion range possible and a typical dynamic range of four to five orders of magnitude. And the selectivity of this mass spectrometer – capable of discriminating less than 1 amu – provides confidence in each reported value and largely overcomes the compound/matrix interferences often observed with other less selective detection systems and sensors.

Although other instruments can provide multiple component analyses for steady-state operations, the Real-Time Gas Analyzer is ideal for monitoring multiple component mixtures with concentration transients. In addition, special developments allow this instrument to be used for both very low molecular weight gases (such as hydrogen) in addition to larger molecular weight gases (such as tetrahydrothiophene).

The MS Sensor software is simple to use and displays the real-time data both in graphical and in CSV formats, enabling easy import of the results into popular third party spreadsheets, statistical analysis and/or modeling packages for off-line analysis.

The Real-Time Gas Analyzer is ideal for applications where very fast analysis is required, such as monitoring for transients and continuous reactions. As such, this instrument can be used for fuel cell gas analyses, fermentation monitoring, determination of volatile solvent residues, and monitoring of petrochemical process streams.

Example Applications of the Diablo Analytical 5000A RTGA

- **Fuel Cell & Energy R&D** – Quantitative, real-time monitoring of impurities in fuels to prevent damage to fuel cell catalysts. Real-time monitoring of fuel cell conversion efficiency. Monitor Syngas generation and use for engineering development.
- **Specialty Gas Analysis** – Quantitative, real-time monitoring of impurities in specialty gases. Monitoring performance of point-of-use purification technology.
- **Pharmaceutical R&D** – Monitor trace organic solvents in drying processes used in the production of active pharmaceutical ingredients and intermediates. Monitor solvent exchange processes. Evaluate reaction mechanisms and monitor reaction products and byproducts for process optimization and safety.
- **Catalyst Research** – Quantitative, real-time monitoring of catalyst efficiency and impurity poisons.
- **Petrochemical Process R&D** – Quantitative, real-time monitoring of mini-plant and micro-reactor processes.

