

Cirrus 2 Design Overview

Quadrupole mass spectrometers are now widely acknowledged as the preferred solution for many atmospheric pressure gas analysis requirements. They offer fast, on-line analysis with the ability to monitor a large number of different gases and gas mixtures with a single analyzer. Gas composition can be monitored over a wide dynamic range from ppb to percentage levels.

At the heart of every Cirrus 2 system is a precision-built quadrupole analyzer incorporating a closed ion source, a triple mass filter and a dual (Faraday and Secondary Electron Multiplier) detector system. This analyzer configuration is selected to optimize sensitivity and long term stability performance.

The Cirrus 2 analyzer operates inside a stainless steel vacuum chamber, which is pumped by an oil free high compression turbomolecular/diaphragm pump combination. The whole vacuum chamber and inlet interface assembly is housed inside an oven with a radiant heater. The oven may be used to raise the temperature of these components during analysis, thereby preventing sample vapor condensation.

Alternatively, the entire Cirrus 2 vacuum chamber can be baked to reduce residual gas background species and to minimize any memory effects.

The Cirrus 2 internal oven has a removable cover allowing easy access to the inlet interface, vacuum chamber and analyzer ion source. This is particularly helpful for routine maintenance like filament and capillary replacement. A cold cathode gauge is incorporated for independent vacuum pressure measurement and to provide an interlock signal for protection of the mass spectrometer. A temperature sensor also ensures that the electron multiplier detector cannot be switched on at high temperatures. The Cirrus 2 is designed with a lubricant free pumping system and no elastomer seals are used in the sample inlet system or in the high vacuum region of the system.

Gas Inlet

An essential feature of any gas analyzer is that it should not contaminate or alter the gas sample in any way. The Cirrus 2 inlet assembly consists of an inert silica lined capillary, which can be heated to a constant temperature.

The low volume and surface area of the assembly serves to maximize response speed while minimizing memory effects. Cirrus 2 systems can also be configured with inlets for multi-stream sampling, stainless steel capillaries for resistance to fluorine based compounds and a pressure controller inlet to allow sampling from supplies which vary from the nominal 1 bar inlet requirement.

The Cirrus 2 vacuum system utilizes a high compression turbomolecular pump so light gases such as hydrogen and helium can be sampled with no additional expensive pumping requirements.



Eight way multi-stream inlet option

Process Eye™ Professional — Cirrus 2 Control Platform

Cirrus 2 is operated using Process Eye Professional software, a recipe-driven platform that communicates with the system over a TCP/IP network. Process Eye Professional is designed for use with the latest Microsoft® operating systems including 32bit or 64 bit Windows® XP, Vista, Server 2008 and Windows 7.

The features and benefits are as follows:

- Data presented in units relevant to the application
- Allows for fully automated operation and calibration
- User-configurable alarms and warnings
- Can be configured to track data from other process sensors (temperature, pressure, flow, etc.)

Cirrus 2 Special Options

- Multi-stream inlet version (4, 8 or 16 stream)
- Corrosive gas sample version
- Regulated ion source pressure version for samples of varying pressure
- High mass resolution version

