



## Product Specification

### Stability Evaluation for Extended Measurement

#### Summary

Hiden Quadrupole Mass Spectrometers (QMS) are often used for continuous monitoring purposes.

It is vital that the system stability and data continuity are good.

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## Introduction

Hidden Quadrupole Mass Spectrometers are sensitive instruments capable of detecting a wide range of gases at varying pressures. A HPR – 20 QIC Quadrupole Mass Spectrometer system was run continuously for 72hrs. The scan was run in “profile” mode (0.4 to 50 amu) from which trend analysis data is extracted. The ratios for several species over nitrogen were calculated and the mean and standard deviations calculated. These values are collected in Table 1 and the scan data illustrated in Figure 1.

<i>Gas Ratio</i>	<i>O<sub>2</sub> : N<sub>2</sub></i>	<i>Ar : N<sub>2</sub></i>	<i>H<sub>2</sub>O : N<sub>2</sub></i>
<b>Ratio Mean,</b>	0.3096	0.0342	0.0183
<b>Standard Deviation,</b>	0.0043	0.0010	0.0055

Table 1: Calculated Statistical Values.

### Peak Ratio

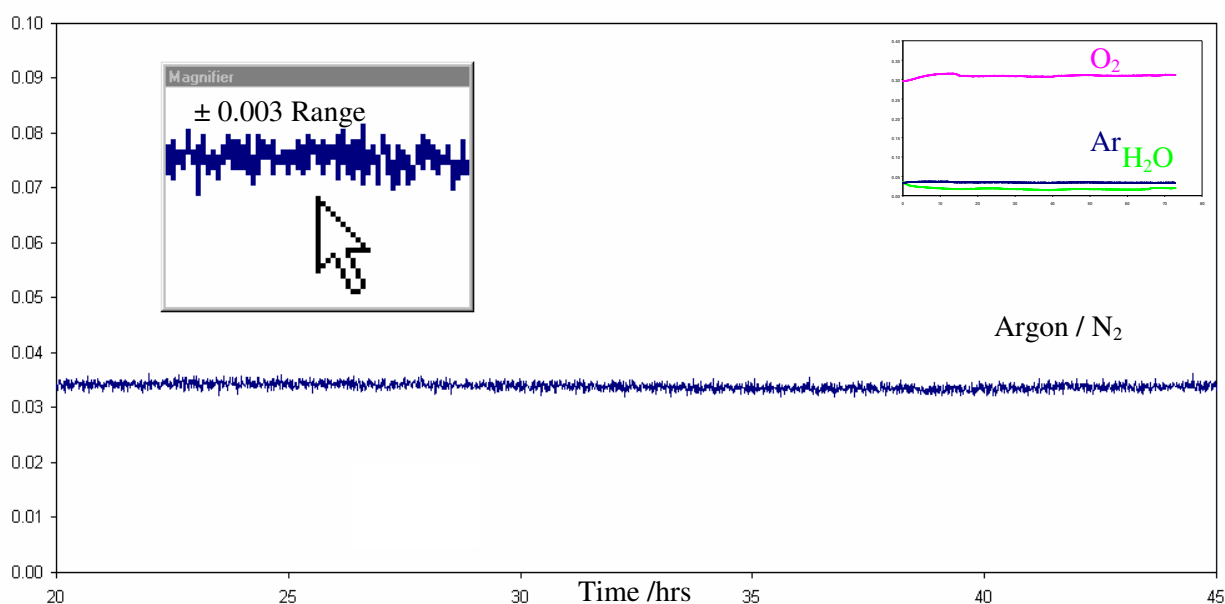


Figure 1: Graph of Ar : N<sub>2</sub> peak ratio for extended Air Analysis (25hour section).

Insert: Graph of O<sub>2</sub> / Ar / H<sub>2</sub>O : N<sub>2</sub> peak ratios for extended Air Analysis (72hour section).

The Ar/N<sub>2</sub> ratio is stable to **within +/- 0.003 for over 25 hours**. The other gas components have a similar small deviation over 72 hours, as seen in Figure 1 insert.

### The raw profile data:

Data points taken at 0.01amu intervals over the mass range 0.4 to 50 amu form each

profile scan cycle. The data illustrate the stability of the analyser. The peak shape is maintained, indicating that detection remains good. The spectral peak at  $m/z$  40 amu is compared from cycle 85, and from cycle 7037 of the acquisition.

**The mass scale alignment is stable over the 72 hour analysis period.**

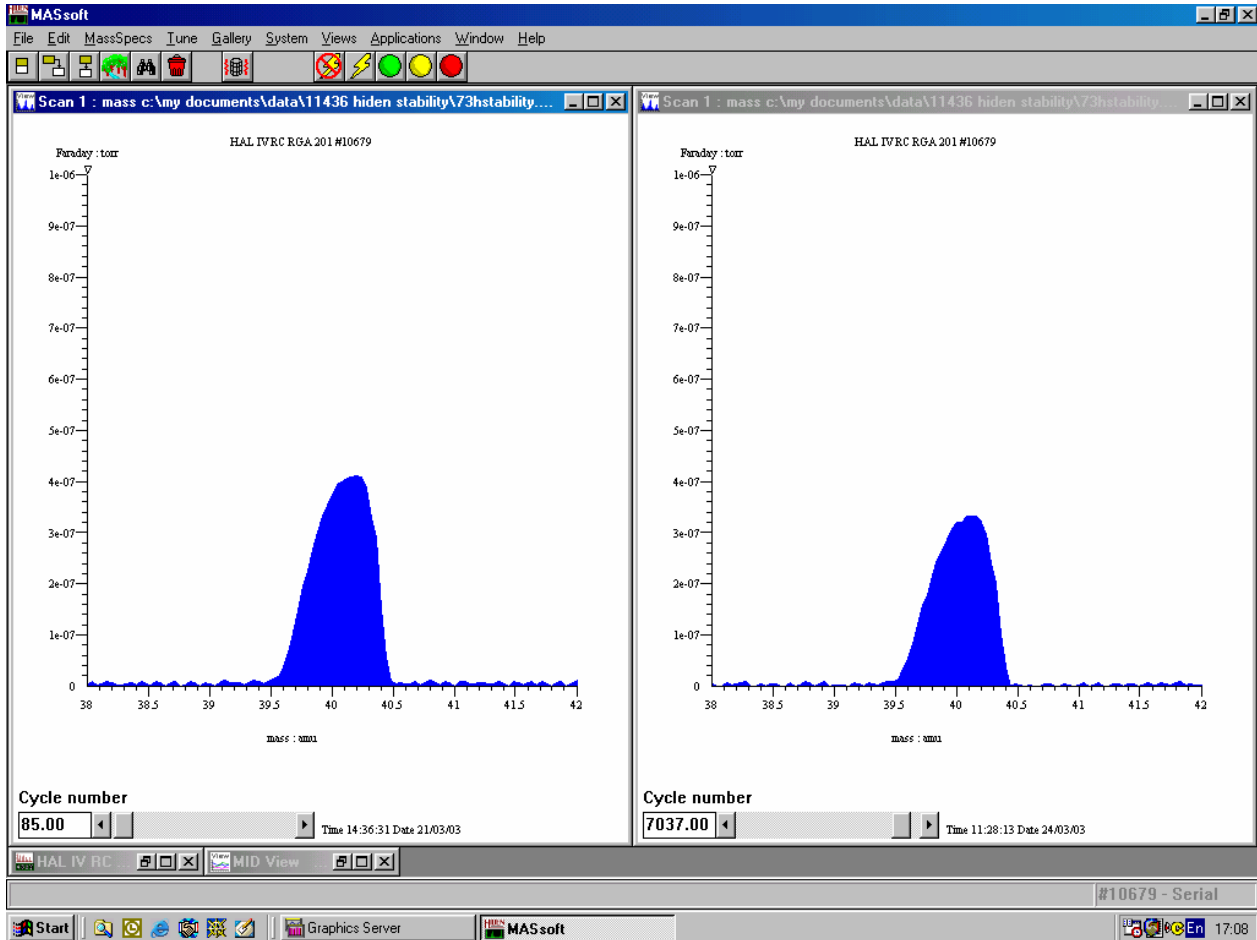


Figure 2: Comparison of Peak Position of a Low and High Cycle Number during continuous analysis.

72 hours of