



Product Specification

Ultimate Sensitivity Quadrupole Mass Spectrometer Detection

Summary

The detector is an important part of the Quadrupole Mass Spectrometer (QMS) gauge. A selection between the various possibilities offered by Hiden can be made on the sensitivity of detection, if the application demands such. An experiment was set up to directly compare two similar gauges with different detectors fitted.

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Introduction

A comparison of detector in similar Quadrupole Mass Spectrometers (QMS) was performed. An analogue 301/3F gauge and a pulse ion counting 301/3F PIC gauge were compared. Single Scan and Scan accumulate modes were used to find the ultimate sensitivity.

| Detector Type | Sensitivity | Scan type |
|---------------|---|---------------------------|
| SEM | 5×10^{-14} Torr | Single cycle |
| | 3.5×10^{-14} Torr | Accumulate over 20 cycles |
| PIC | 6 count/sec $\equiv 3.5 \times 10^{-14}$ Torr | Single cycle |
| | 1 count/sec $\equiv 5 \times 10^{-15}$ Torr | Accumulate over 20 cycles |

In both these cases, an accumulate mode could be performed over a greater number of cycles to detect species at even lower levels.

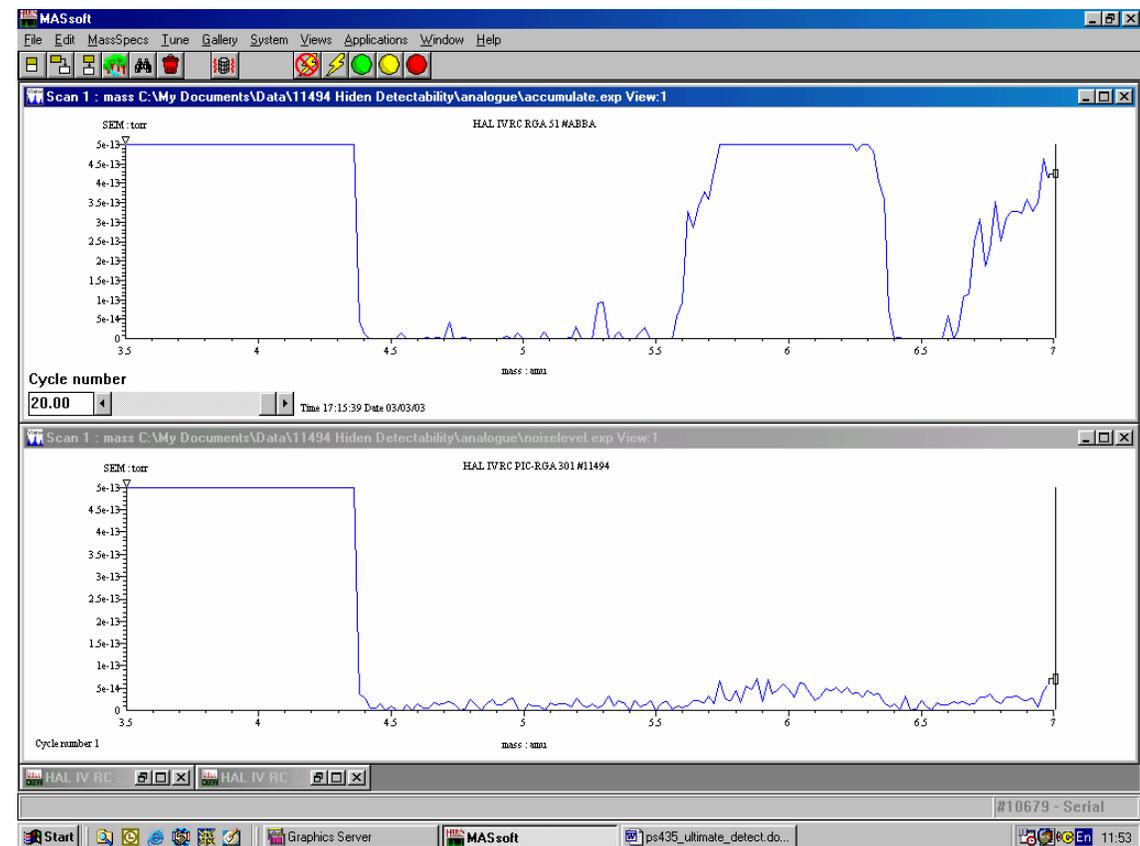


Figure 1: MASsoft screenshot of HAL 301/3F gauge using SEM detector.

The screenshot of MASsoft clearly illustrates the extra sensitivity obtained when accumulate mode is used. In the first run, the mass 6 amu peak is visible just above the

background. In the second accumulate run, the peak is clearly visible gauge. The PIC detector works slightly differently, so that background is accumulated also. However, a real peak still accumulates more than the background and is visible at an equivalence of 1 counts/sec.

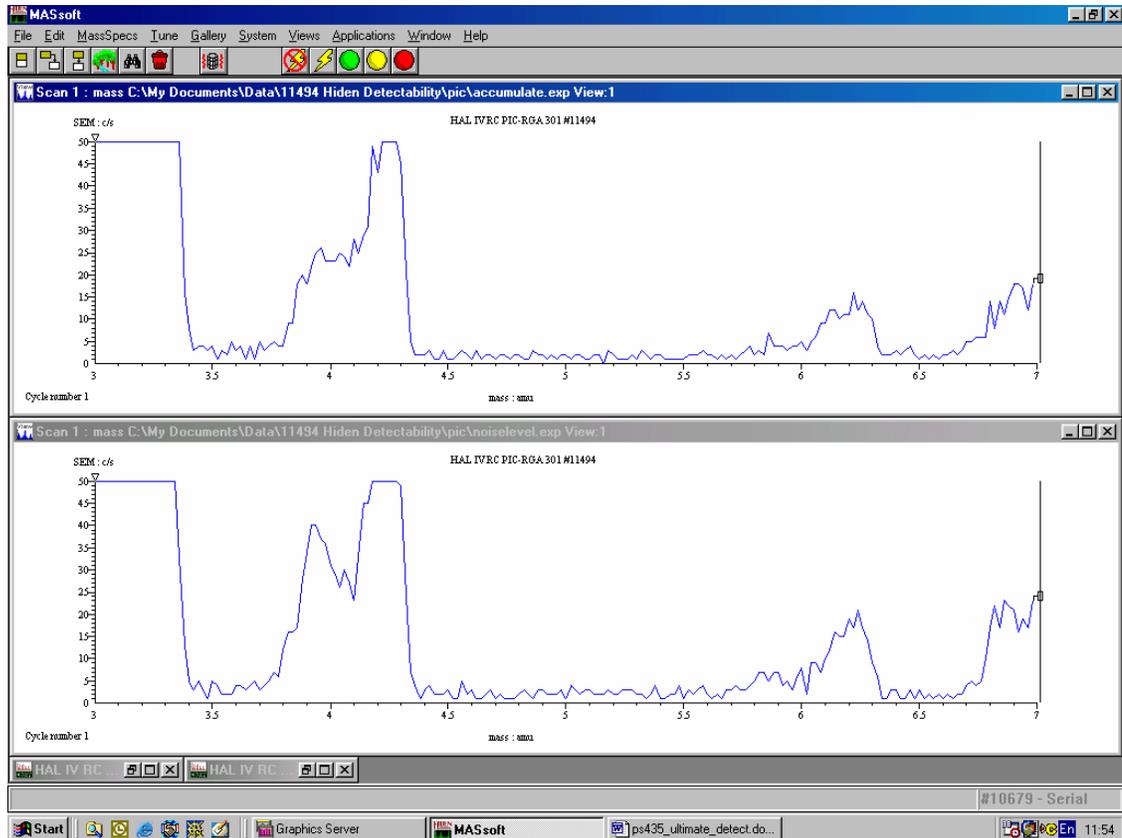


Figure 2: MASsoft screenshot of HAL 301/3F gauge using PIC detector.

Please contact your local Hiden representative for more details of the Hiden range of instruments and Hiden QMS gauges.