



## ExQ Quantitative Gas Analyser

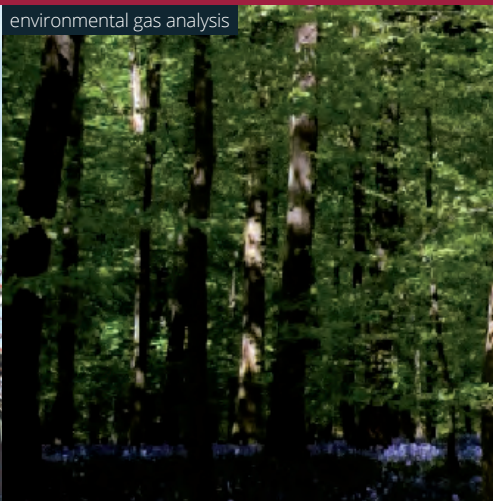
► A compact bench-top system for real-time gas and vapour analysis

# Detailed product information / introduction

mud logging (oil exploration)



environmental gas analysis



fermentation off-gas analysis



**The Hiden ExQ quantitative gas analysis system is configured for continuous analysis of gases and vapours at pressures near atmosphere in standard form. Inlet accessories are available to configure the system for sampling from low to high pressures, up to 30 bar.**

## Applications:

- ▶ mud logging (oil exploration)
- ▶ gas reaction studies
- ▶ catalysis
- ▶ reaction kinetics
- ▶ TPD
- ▶ thermal analysis mass spectrometry
- ▶ gas purity analysis/contamination studies
- ▶ process characterisation
- ▶ fermentation off-gas analysis
- ▶ environmental gas analysis
- ▶ combustion studies
- ▶ CVD/MOCVD

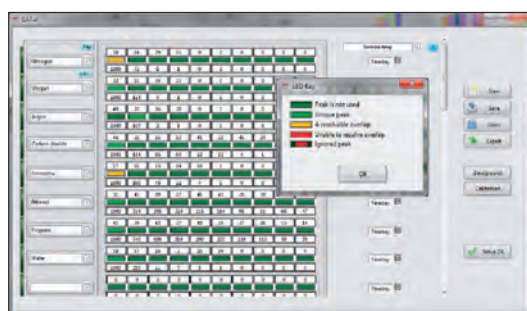
## Key Features

- ▶ determination of fracking zones, rock porosity, rock layer boundaries and trapped hydrocarbons in mud logging applications
- ▶ multiple gas and vapour analysis – 200 amu mass range, 300 amu option
- ▶ 2 metre continuous sampling heated capillary inlet
- ▶ gas sample flow rate 16 atm. cc/min standard. 1 atm. cc/min option
- ▶ quantitative data output and data export
- ▶ high sensitivity: detection to 100 ppb
- ▶ <300 ms response time to changes in gas concentration
- ▶ fast data acquisition: up to 500 measurements per second
- ▶ automatic subtraction of spectral overlaps
- ▶ integrated CO analyser option for the analysis of low level CO in the presence of N<sub>2</sub> and CO<sub>2</sub>
- ▶ soft ionisation for reduced spectral fragmentation and simplified data interpretation
- ▶ broad range of sampling accessories
- ▶ custom designed interfaces available to suit a wide range of TGA instruments for evolved gas analysis

# Software



QGA Professional main screen



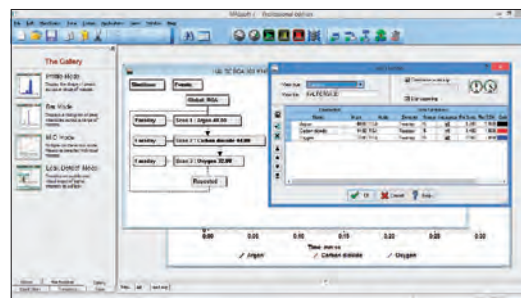
Automatic mass spectral analysis setup

## QGA Professional

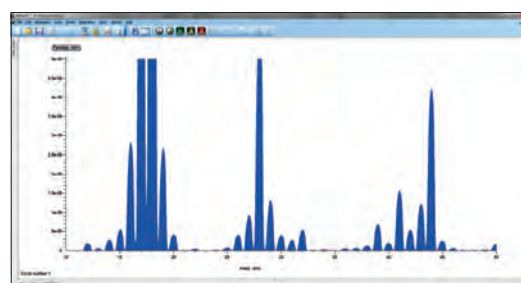
An application specific software package for quantitative gas and vapour analysis providing real-time continuous analysis of up to 32 species with concentrations measured in the range 0.1 ppm to 100%.

### Key Features – QGA Professional Software

- ▶ automatic calibration with background correction
- ▶ automatic subtraction of spectral overlaps
- ▶ quantitative analysis of up to 32 gases
- ▶ 10 peak spectral library with intelligent library scan feature
- ▶ automatic triggering of analysis from an external input
- ▶ x-axis can display time or an external input, e.g. temperature



MASsoft Professional – overview



Mass scan – profile

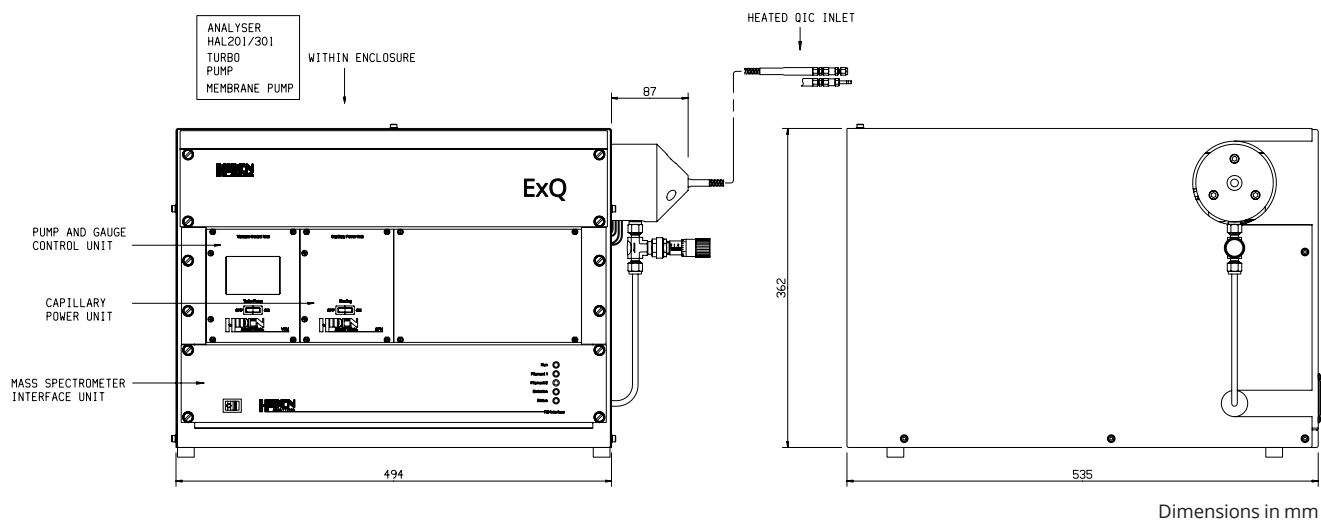
## MASsoft Professional

A multi-level software package allowing both simple control of mass spectrometer parameters and complex manipulation of data plus control of external devices.

### Key Features – MASsoft Professional Software

- ▶ profile, bar and multiple ion detection (MID) modes
- ▶ mass spectrometer ionisation energy control for soft ionisation of complex mixtures
- ▶ export data to NIST MS database for analysis of unknowns
- ▶ export to external data analysis software, e.g. Excel, Origin
- ▶ control of external devices e.g. MFCs, gas switching/sampling valves and furnace PID controllers
- ▶ output data as percentage or ppm values
- ▶ real-time subtraction of overlapping peaks
- ▶ scan templates for fast setup of scans
- ▶ user selected alarm facilities

# Technical Data



**Mass ranges, amu:**

1-200 / 1-300 amu

**Sensitivity:**

100% to 100 ppb subject to spectral interference

**Speed:**

Maximum measurement speed is 500 measurements/second

**Response time:**

300 ms

**Software:**

MASsoft Professional & QGA Professional

Windows 7/8/10 compatible

**Dimensions (L x W x H), mm:**

581 x 535 x 362 mm

**Power requirement:**

100-240 V AC, 50-60 Hz, 1.0 kVA

**Interface:**

Ethernet/USB/serial (RS-232) connections

**Gas consumption rate:**

16/8/3.2/0.8 sccm (user configurable)

**Capillary operating temperature, °C:**

up to 200 standard/300/350/400/450 options

**Detector:**

Dual Faraday/Channeltron Electron Multiplier

**Analogue input:**

8x (optional)/16 bit

**Analogue output:**

16x (optional)/14 bit

**Digital input:**

8x

**Digital output:**

8x, 24V

# System Configuration & Options

| ITEM                            | DESCRIPTION                                                                                                                                                                                                                                                                            | PARTCODE   |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| SYSTEM                          | ExQ Bench-top Gas Analysis System including HAL 201 RC mass spectrometer with Faraday/Multiplier detector. Mass range 200 amu. Includes diaphragm pump. QGA Professional & MASsoft Professional included as standard. Includes standard QIC capillary inlet for operation up to 200°C. | 305115     |
| OPTIONS & ACCESSORIES           | Extended mass range. 300 amu mass range (in place of standard 200 amu mass range)                                                                                                                                                                                                      | 305113     |
|                                 | Corrosion resistant upgrade                                                                                                                                                                                                                                                            | 303604     |
|                                 | CO Analyser 0 - 10.000 ppm range                                                                                                                                                                                                                                                       | 303595     |
| SPARES KIT                      | QIC heated capillary inlet filter (2 µm)                                                                                                                                                                                                                                               | 303576     |
|                                 | Recommended spares kit<br><ul style="list-style-type: none"> <li>► Replacement capillary liner</li> <li>► Replacement Platinum leak orifice</li> <li>► Twin filament</li> </ul>                                                                                                        | 303147     |
| GAS INLET OPTIONS               | QIC HT 250 high temperature capillary inlet - 250°C                                                                                                                                                                                                                                    | 303561     |
|                                 | QIC HT 450 very high temperature capillary inlet - 450°C                                                                                                                                                                                                                               | 303568     |
|                                 | LP-SSC Low pressure capillary - 25 mbar to 250 mbar                                                                                                                                                                                                                                    | 303564     |
|                                 | VLP-GLC very low pressure sampling capillary - 1 mbar to 10 mbar                                                                                                                                                                                                                       | 303558     |
|                                 | QIC inlet adapters for TA-MS - Custom designed interfaces to suit a broad range of TGA instruments for evolved gas analysis                                                                                                                                                            | 303580-585 |
| MULTI-STREAM SELECTOR MANIFOLDS | MSV 8-way multi-stream valve                                                                                                                                                                                                                                                           | 303688     |
|                                 | 20-way Proteus multi-stream valve                                                                                                                                                                                                                                                      | 303650     |
|                                 | 40-way Proteus multi-stream valve                                                                                                                                                                                                                                                      | 303660     |
|                                 | 80-way Proteus multi-stream valve                                                                                                                                                                                                                                                      | 303670     |
| SOFTWARE OPTIONS                | EGASoft - application specific software program for evolved gas analysis, TA-MS and TPD studies                                                                                                                                                                                        | 800295     |



# HiddenAPPLICATIONS

Hidden's quadrupole mass spectrometer systems address a broad application range in:

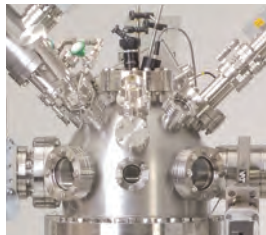
## GAS ANALYSIS

- ▶ dynamic measurement of reaction gas streams
- ▶ catalysis and thermal analysis
- ▶ molecular beam studies
- ▶ dissolved species probes
- ▶ fermentation, environmental and ecological studies



## SURFACE ANALYSIS

- ▶ UHV TPD
- ▶ SIMS
- ▶ end point detection in ion beam etch
- ▶ elemental imaging – 3D mapping



## PLASMA DIAGNOSTICS

- ▶ plasma source characterisation
- ▶ etch and deposition process reaction kinetic studies
- ▶ analysis of neutral and radical species



## VACUUM ANALYSIS

- ▶ partial pressure measurement and control of process gases
- ▶ reactive sputter process control
- ▶ vacuum diagnostics
- ▶ vacuum coating process monitoring



# HIDDEN

ANALYTICAL

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