



## Dual Process Mass Spectrometer, Model TwinMS

### Highly Dynamic On-Line Gas Analysis

#### Optimized Dual MS

Consequential developments within the range of analytical equipment offer room for improvements within processes and/or catalytical reactions which then lead towards state of the art engines and lowest possible emissions.

The TwinMS dual mass spectrometer features a unique combination which has been specifically developed in order to measure pre- and post catalyst fast and simultaneously.

The single robust platform consists of two parallel installed Ion Molecule Reaction (IMR) mass spectrometers, each configured with a single heated sample inlet port.

#### Highly Dynamic

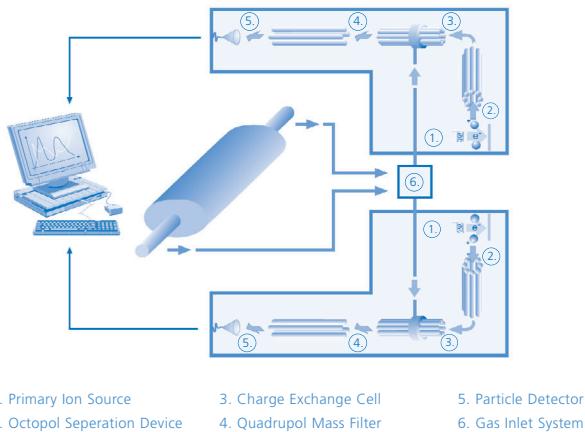
For more than 15 years, engineers around the world working in process control applications or R&D projects within the automotive industry have been highly satisfied using proven and most reliable IMR measurement technique.

The unique IMR features currently known (i.e. for highly selective, wide dynamic range, fast and reliable etc.) have now been further improved by offering even faster gas measurement. We offer either two separate sample streams individually, or a combined sample inlet achieving the highest possible time resolution available in the market today.

#### Proven Technology

Optimised serviceability and minimum operational costs reflecting the more than 15 years of experience and development steps within the IMR-Mass Spectroscopy.

A single and user friendly software package combines both analyzers in terms of all system's set-up and data reporting issues, being driven by either an internal PC-Controller or an external AK- or PLC master. Unlike others, it is not necessary to synchronise measurement routines and data monitoring afterwards.



## Principle of Operation

Targeting the specific needs within the wide range of applications, the series TwinMS is based on two identical, parallel installed Ion Molecule Reaction (IMR) mass spectrometer in one single housing.

The patented IMR technique offers a fast, selective and interference free measurement.

## Features Functions Benefits

- Dual multi component gas analyzer, Optimized time resolution,
  - Highly selective, Fast response, Minimum operational cost,
  - User friendly software combines both MS, Robust and single platform

## Technical Data

Mass range	0 – 500 amu	Precision	< ± 2 % (1ppm Benzene)
Resolution	< 1 amu	Ambient Temperature	20°C – 40°C
Analysis time	10 – 6500 msec/amu	Temperature change	(max. 1°C / h)
Measuring range	10 <sup>4</sup>	Humidity	80 % max. (none condensing)
Cycle time gasflow	≤ 250 msec	Gas Inlet temperature	80 – 190°C
Response time	T90 < 30 msec	Gas consumption	30 – 250 ml/min, adjustable
Lower detection limit	< 1 ppb Benzene	Power	220 V / 50 Hz or 115 V / 60 Hz, 1250 W
Drift	< ± 5% per 12 h (1ppm Benzene)	Dimensions	590 x 650 x 1000 mm
Reproducibility	< ± 3 % (1ppm Benzene)	Weight	125 kg

Unlike others, no fragmentation or overlapping spectra can confuse or damage the interpretation of the detected results.

Ion Molecule Reaction (IMR) means using primary ions with lower energy level between 10 eV and 14 eV to completely ionize the probe gas molecules. The signal noise ratio will be optimized by the integrated octopole separator, focusing the primary ions and filtering out any interferences. The quadrupole mass filter (0-500 amu) then separates the molecules for further detection at the fast pulse counter.

The two separate sample gas inlets ( with temperature and pressure compensation) offer to measure two identified molecules at each of the sample streams at once (pre and post catalyst analysis). Both inlets are designed to avoid any discrimination of the gas and minimise the contamination due to condensation or particulate matters.



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