

# Product Flyer

## CombiSense

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**V&F**  
Analyse- und  
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GmbH

# Process Mass Spectrometer CombiSense

## Unique Combination

Research and development have come up with more and more complex technologies that require a flexible analysis which can only be achieved through a useful combination of various analytical procedures. Unlike others using a number of single analyzers, the real time parallel measurement of limited and unlimited gas components has been achieved by combining two mass spectrometers in one single housing, called the CombiSense. Targeting the specific needs within R&D applications, the synchronized double mass spectrometer consists of the Ion-Molecule Reaction (IMR) principle combined with the Electron Impact Ionization principle (EI) in which the complete system is now covering a unique and enhanced application range.

## Proven Technology

Flexibility and user friendly handling are achieved by combination of well proven technology and state of the art manufacturing capabilities. The IMR mass spectrometry offers a unique fast response time, a wide dynamic range, selective measurements and lowest detection limits. The EI mass spectrometer enables to measure the main components in the Vol% range, e.g. H<sub>2</sub>, He, Ne, N<sub>2</sub>, O<sub>2</sub>, CO<sub>2</sub>, Ar, simultaneously with the trace gases.

## High operating comfort

A user friendly software package - the V&F Viewer program - contains system controls and measurement configurations, data reporting and data transfer by via a TCP/IP network using the highly approved technology Microsoft.net. Integrated functions for correlations, matrix correction and calibration allow a selective analysis with high measuring accuracy and reproducibility. Assessment of measuring data is already possible while viewing online.



## Typical Applications

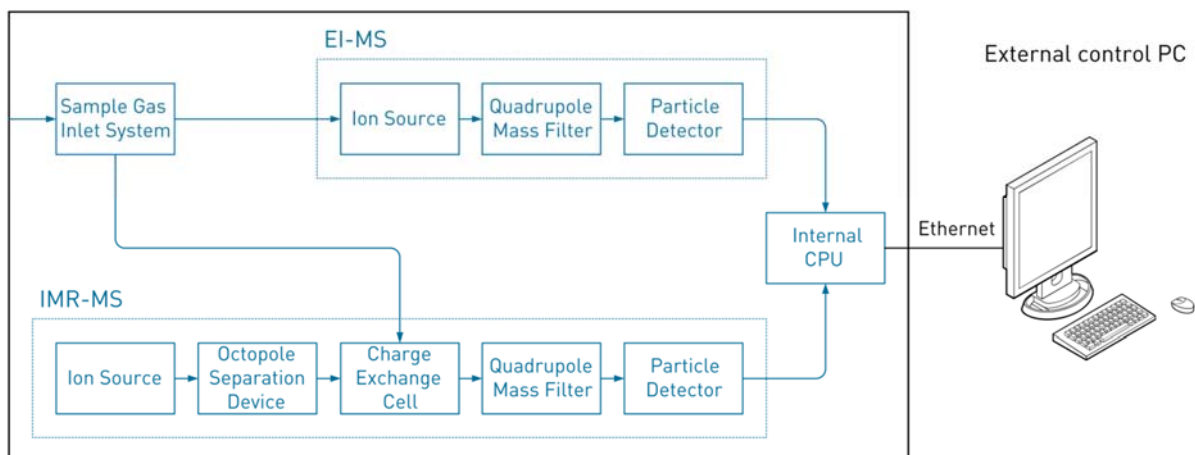
- Automotive Applications
- Food, Beverages & Tobacco Applications
- Environmental Applications
- Medical Applications
- Applications in various Industries

## Function principle

The CombiSense is a combination of the IMR-MS and the EI-MS technology in one single housing. By using IMR technique, the measurement becomes fast, selective and free of any interference. Unlike others, no fragmentation or overlapping spectra can damage the interpretation of the detected results. The use of primary ions with low energy levels (10 eV to 14 eV) allows to completely ionize the probe gas molecules. The signal/noise ratio is optimized by the integrated octopole separator, focusing the primary ions and filtering out any interference. The quadrupole mass filter (7-519 amu) separates the molecules for further detection at the fast pulse counter.

### CombiSense

Ion-Molecule Reaction & Electron Impact - Mass Spectrometer



The ionisation in the EI-MS takes place at 70 eV and the mass range is from 1 to 100 amu with a resolution of 1 amu. The temperature- and pressure compensated sample gas inlet guarantees correct measurements and avoids any discrimination of the gas.

## Features, benefits

- online measurement of raw gas and trace analysis within a wide dynamic range with lowest detection limits
- highest possible flexibility together with a unique fast response time
- high in sensitivity and selectivity, no sample preparation needed
- automatic pressure regulation ranging from 0.75 to 2 bar(a), temperature controlled gas inlet
- user friendly software package, minimized service- and operation costs

## Specification, technical data

Technical Data	IMR-MS	EI-MS	Technical Data	IMR-MS & EI-MS
Mass range	7 – 519 amu	1 – 100 amu	Ambient temperature	20°C - 35°C
Resolution	< 1 amu	< 1 amu	Humidity	max. 80 % (non-condensing)
Analysis time	>= 1 msec/amu	>= 5 msec/amu	Gas consumption <sup>2</sup>	30 – 3000 ml/min
Measuring range <sup>1</sup>	10 <sup>5</sup>	0 – 100 Vol%	Gas inlet temperature	50°C – 190°C adjustable
Response time <sup>1</sup>	T90 < 20 msec	T90 < 20 msec	Gas inlet pressure <sup>2</sup>	0.75 – 2 bar(a)
Lower detection limit <sup>1</sup>	0.4 ppt	> 0.01Vol%	Power	230V/50Hz or 115V/60Hz 1000 W
Concentration drift	< ± 5% over 24 h		Dimension (WxHxD)	534 x 806 x 639 mm
Reproducibility	< ± 3%		Weight	100 kg
Accuracy	< ± 2%			

<sup>1</sup> depending on the measured components, system setup and the settings

<sup>2</sup> depending on the type of gas inlet system



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