

Product Flyer

FuelSense

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V&F
Analyse- und
Messtechnik
GmbH

Process Mass Spectrometer FuelSense

Online Oil Dilution Measurement

Dilution of the engine oil by ethanol-containing fuels e.g. Super E10 and diesel fuels containing biodiesel e.g. B7 can significantly alter the lubricating properties and in turn cause engine damage. Due to ethanol having a higher enthalpy of evaporation and a lower vapor pressure fuels with higher ethanol contents tend to yield unfavorable mixtures compared to conventional gasoline especially during the cold start and warm-up phases of the engine. Thus, fuel ingress into the oil in these engine states becomes very likely. For diesel engines the post-injection states initiating DPF (Diesel Particulate Filter) regeneration are of particular interest. Though the chemical and physical properties of biodiesel and diesel components are similar biodiesel fuels also lean towards diluting the engine oil during DPF regeneration.

Proven Technology

The FuelSense mass spectrometer with its patented Ion Molecule Reaction (IMR) cell is derived from the renowned AirSense IMR-MS. It offers an unmatched response time, a wide dynamic measurement range and lowest detection limits in combination with high selectivity. After more than 30 years of consistent further development excellent flexibility and user friendliness are guaranteed while operating costs are minimized. State-of-the-art manufacturing capabilities and the exceptional technological proficiency of V&F itself ensure that the FuelSense in combination with the V&F LubeSampler is the perfect choice for online oil dilution measurements.

High operating comfort

An easy-to-use software package - the V&F Viewer program - comprises system controls and measurement configurations, data acquisition from the analyzer via TCP/IP network using the Microsoft.NET framework. Alternatively, the analyzer can be operated via AK protocol. Functions for matrix correction and calibration are integrated in the V&F Viewer program. These features allow for high accuracy and reproducibility. Graphical representation of all important data enables the user to quickly assess the quality of the measurement as well as the overall instrument performance.



Application

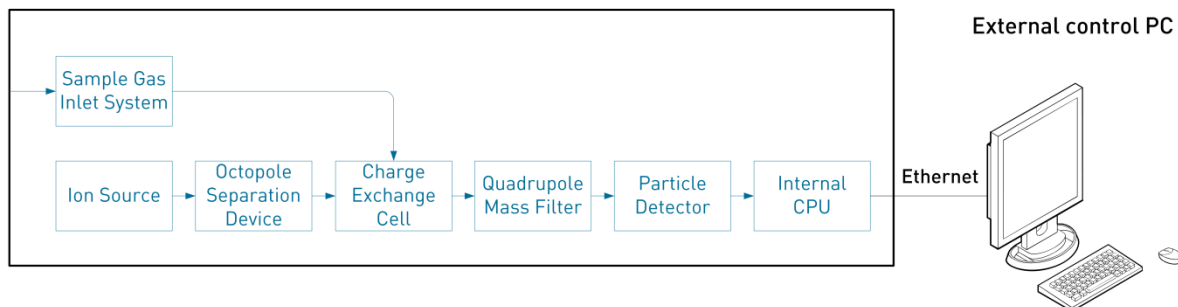
- Engine oil dilution measurement

Function principle

The FuelSense is a mass spectrometer based on the patented Ion-Molecule Reaction (IMR-MS) concept. The IMR technique elegantly combines the inherent advantages of online mass spectrometry such as the fast measuring speed with the selectivity needed for the quantification. Unlike other ionization techniques, IMR-MS causes significantly lower fragmentation of the analytes.

FuelSense

Ion-Molecule Reaction - Mass Spectrometer



IMR means the use of primary ions with low energy level (10 eV to 14 eV) 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. The temperature- and pressure compensated sample gas inlet guarantees correct measurements and avoids any discrimination of the gas. Any contamination due to condensation or particulate matters is minimized.

Features, benefits

- wide dynamic range with lowest detection limits
- robust and reliable
- online oil dilution measurements on diesel, gasoline and CNG engines
- high in sensitivity and selectivity
- automatic pressure regulation ranging from 0.75 to 2 bar(a)
- integrated matrix – correction – calculation and auto-calibration
- temperature controlled gas inlet
- user friendly software package - operator interface with 4-button control
- minimized service- and operation costs

Specification, technical data

Technical Data	IMR-MS	Technical Data	IMR-MS
Mass range	7 – 519 amu	Ambient temperature	20 °C – 35 °C
Resolution	< 1 amu	Humidity max.	80 % (non-condensing)
Analysis time	>= 1 msec/amu	Gas consumption	30 – 150 ml/min
Measuring range	10 ⁴	Gas inlet temperature	50 °C – 190 °C adjustable
Lower detection limit	0.2% oil dilution	Gas inlet pressure	0.75 – 2 bar(a)
Concentration drift	< ± 5 % over 24 h	Power	230V/50 Hz or 115V/60 Hz 800 W
Reproducibility	< ± 3 %	Dimension (WxHxD)	534 x 743 x 639 mm
Accuracy	< ± 2 %	Weight	87 kg



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