

Product Flyer

HSense – FC & EC

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V&F
Analyse- und
Messtechnik
GmbH

Process Mass Spectrometer HSense

Dynamic Online Measurement

Highly sophisticated analytical techniques can be a leading factor towards the success in applications such as fuel cell R&D, fuel cell or electrolyzer testing. The series HSense had been introduced to the industry in order to fulfill the demand of a highly dynamic hydrogen and helium analytical instrument.

Proven Technology

Robustness and reliability together with proven components for gas inlet and vacuum system, optimized serviceability and a mini-mum of operational cost reflect more than 40 years of experience within the field of the mass spectroscopy. Combining well proven technology with our unique and highly dynamic sampling system, the HSense offers a reliable low maintenance operation.

Fuel Cell Applications

In fuel cells hydrogen plays an even more crucial role, because it is typically the fuel for the generation of electrical current over the fuel cell stack, as in PEM fuel cells and some SOFCs. Hydrogen concentration is an important parameter to know on the one hand for the anode side of the fuel cell, where usually excess hydrogen is present to drive the reactions.

In some fuel cell systems it is also a crucial parameter on the cathode or exhaust side of the fuel cell, where safety regulations often limit the hydrogen concentration permittable to be emitted by the fuel cell system. Especially in recirculating PEM fuel cells, hydrogen is regularly bled by a valve from the anode side into the exhaust manifold. These short pulses for example can be resolved using HSense analyzers.

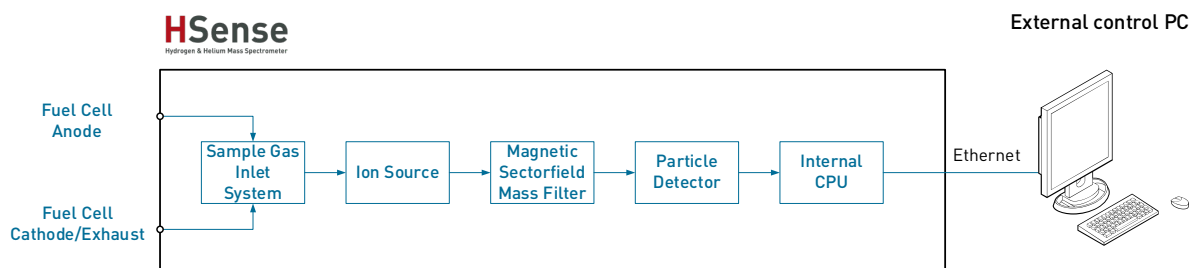


Applications

- Fuel cell or electrolyzer research and development
- Fuel cell or electrolyzer testing

Function principle

The HSense is an online mass spectrometer using an electron impact ionization together with a magnetic sector field mass filter. The analyzer is optimized to measure hydrogen and helium fast and reliably. By using the electron ion source the gas sample ions are energized, focused and separated further on in a magnetic field in order to detect the mass range of 2-4 amu with the overall response time less than 150 msec.



The HSense is available with unique and fully automated gas inlet systems in order to compensate pressure variations, optimize the amount of withdrawn sample gas and thus guarantees the correct measurement. The instrument is equipped with a dual capillary gas inlet. One for the anode side with a low flow configuration in order to reduce the gas withdrawal. The second inlet for the cathode / exhaust side is configured with a standard flow in order to optimize the T90 time.

Features, benefits

- fast, reliable and robust measurement
- proven temperature controlled gas inlet
- high flexibility
- dynamic range
- without sample preparation (wet, ambient air)
- operator interface with 4-button control
- user friendly software package
- 100% automated via the AK interface

Specification, technical data

Technical Data	SF-MS	Technical Data	SF-MS
Mass range	2 – 4 amu	Repeatability	≤ 3 % range full scale
Resolution	< 1 amu	Accuracy / Linearity	≤ 1 % range full scale or ≤ 3 % measurement point in the range 10 – 100 % of range whichever is smaller
Analysis time	≥ 20 msec/amu	Ambient temperature	10°C – 35°C
Measuring range	0 – 50.000 ppm, 0 – 100 Vol%	Humidity max.	80 % (non-condensing)
Response time	T90 < 2 sec @ 4 bar/g on low gas consumption inlet T90 < 200 ms on pumped inlet	Power	230V/50Hz or 115V/60Hz 600 W
Lower detection limit	< 1 ppm for H ₂ , < 20 ppb for He	Dimension (W x H x D)	534 x 743 x 639 mm
Concentration drift	< ± 3% over 24 h	Weight	65 kg



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