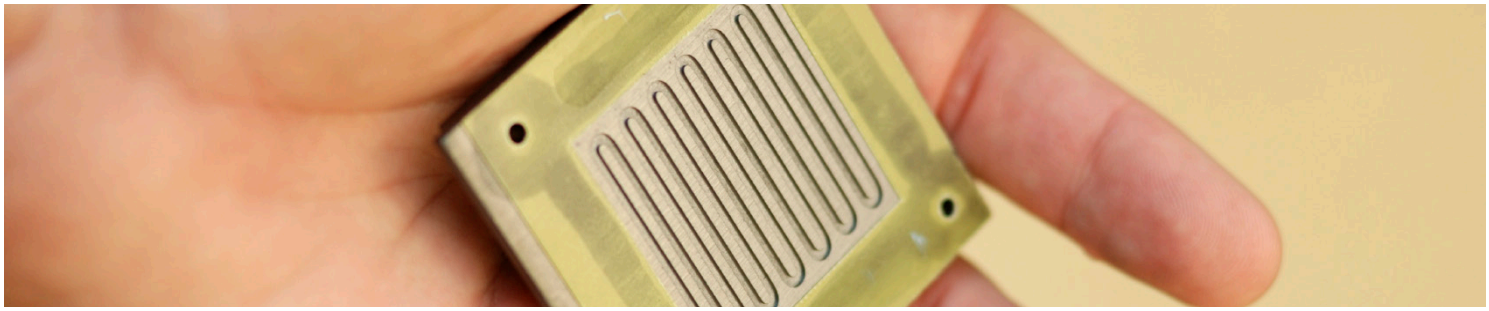

HALO 3 CH_2O
Trace Formaldehyde Analyzer

GASES & CHEMICALS | CEMS | ENERGY | SEMI & HB LED | ATMOSPHERIC | LAB & LIFE SCIENCE

Designed for formaldehyde analysis in laboratory and process applications:

- Accuracy traceable to the world's major national reference labs
- Industry-proven technology
- Freedom from the need for span calibrations
- No periodic sensor replacement/maintenance
- Low ppb detection limit
- Wide dynamic range and no drift

Advancing Accurate, Consistent & Drift-Free CH_2O Measurements

Formaldehyde (CH_2O) is a key impurity in fuel cell hydrogen, where it is responsible for the degradation of the proton exchange membrane, adversely affecting performance. Tiger Optics delivers a powerful analytical tool for the measurement of trace CH_2O for diverse applications. The low detection limit allows monitoring for compliance with SAE J2719, ISO 14687 or similar purity standards and protects fuel cell electric vehicles (FCEVs) from damage.

Based on powerful Continuous-Wave Cavity Ring-Down Spectroscopy (CW-CRDS), with a proprietary laser lock cell, the HALO 3 CH_2O is free of drift, guaranteeing consistent and reliable trace CH_2O detection in nitrogen, hydrogen and other inert gases. Highly specific to the target molecule, CW-CRDS also prevents cross-interferences from distorting your measurement. Plus, there is no need to perform costly and time-consuming zero and span calibrations, saving both time and money with continuous, online service.

The HALO 3 CH_2O gives you unsurpassed speed of response and ease of use. In sum, the HALO 3 analyzer serves a range of applications where trace gas measurement is extremely critical, such as sensor validation, gas standard preparation, and fuel cell hydrogen purity analysis.

Tiger Optics
High-Performance Gas Analyzers

HALO 3 CH_2O
Trace Formaldehyde Analyzer

Performance	
Operating range	See table below
Detection limit (LDL, 3σ/24h)	See table below
Precision (1σ, greater of)	± 0.75% or 1/3 of LDL
Accuracy (greater of)	± 4% or LDL
Speed of response	< 3 min to 95%
Environmental conditions	10°C to 40°C
	30% to 80% RH (non-condensing)
Storage temperature	-10°C to 50°C

Gas Handling System and Conditions	
Wetted materials	316L stainless steel
	10 Ra surface finish
Gas connections	1/4" male VCR inlet and outlet
Leak tested to	1 x 10^{-9} mbar l / sec
Inlet pressure	10 – 125 psig (1.7 – 9.6 bara)
Flow rate	<1 slpm
Sample gases	Nitrogen and hydrogen
Gas temperature	Up to 60°C

Dimensions	H x W x D [in (mm)]
Standard sensor	8.73 x 8.57 x 23.6 (222 x 218 x 599)
Sensor rack	8.73 x 19.0 x 23.6 (222 x 483 x 599)
(fits up to two sensors)	
Weight	
Standard sensor	34 lbs (15.4 kg)

Electrical	
Alarm indicators	2 user programmable
	1 system fault
	Form C relays
Power requirements	90 – 240 VAC, 50/60 Hz
Power consumption	40 Watts max.
Signal output	Isolated 4–20 mA per sensor
User interfaces	5.7" LCD touchscreen
	10/100 Base-T Ethernet
	802.11g Wireless (optional)
	RS-232
	Modbus TCP (optional)
Certification	CE Mark

Performance, CH_2O:	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen	0 – 40 ppm	5 ppb	1.7 ppb
In Hydrogen*	0 – 40 ppm	6 ppb	2.0 ppb

*For fuel cell hydrogen analysis according to ASTM Standard Test Method D7941, the method detection limit (MDL) is **5 ppb**, as determined via U.S. EPA 40 CFR Part 136 Appendix B (95% Confidence Limit).

Contact us for additional analytes and matrices.
U.S. Patent # 7,277,177

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Tigeroptics
High–Performance Gas Analyzers

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