

## 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<sub>2</sub>O Measurements

Formaldehyde (CH<sub>2</sub>O) 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<sub>2</sub>O 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 Cavity Ring-Down Spectroscopy (CRDS), with a proprietary laser lock cell, the HALO 3 CH<sub>2</sub>O is free of drift, guaranteeing consistent and reliable trace CH<sub>2</sub>O detection in nitrogen, hydrogen and other inert gases.
Highly specific to the target molecule, 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<sub>2</sub>O 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.



## HALO 3 CH<sub>2</sub>O

## Trace Formaldehyde Analyzer



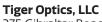
Performance			
Operating range	See table below		
Detection limit (LDL, 3σ/24h)	See table below		
Precision (1σ, greater of)	± 0.75% or 1/3 of LDL		
Accuracy (greater of)	± 4% or LDL		
Speed of response	< 3 min to 95%		
Environmental conditions	10°C to 40°C		
	30% to 80% RH (non-condensing)		
Storage 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 <sup>-9</sup> 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 and Interfaces		
Platform	Max series analyzer	
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	
	USB, RS-232, RS-485	
	Modbus TCP (optional)	
Data storage	Internal or external flash drive	
Certification	CE Mark	

Performance, CH <sub>2</sub> O:	Range	LDL (3σ)	Precision (1ơ) @ zero
In Nitrogen	0 – 40 ppm	5 ppb	1.7 ppb
In Hydrogen	0 – 40 ppm	6 ppb	2.0 ppb

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



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