

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 CH₂O Measurements

Formaldehyde (CH₂O) 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 CH₂O 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 CH₂O is free of drift, guaranteeing consistent and reliable trace CH₂O 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 CH₂O 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 CH₂O

Trace Formaldehyde Analyzer



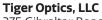
| Performance | | | |
|---|--------------------------------|--|--|
| Operating range | See table below | | |
| Detection limit (LDL, 3σ/24h) | See table below | | |
| Precision (1 _o , greater of) | ± 0.75% or 1/3 of LDL | | |
| Accuracy (greater of) | ± 4% or LDL | | |
| Speed of response | < 3 min 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 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 ₂ 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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