

PRODUCT BROCHURE

HALO H2™

TRACE-LEVEL HYDROGEN ANALYZER



Designed for trace-level hydrogen analysis, the HALO H2 offers:

- Low parts-per-billion (ppb) detection capability with Standard Model
- **NEW:** Low-Range Model with parts-per-trillion (ppt) detection limits in inert gases
- Extremely fast speed of response
- Wide dynamic range
- Absolute measurement (freedom from need for calibration gases)
- Low maintenance and cost of ownership
- Direct measurement in many matrices, including oxygen

Leading Choice for Ultra-high Purity Gas Users

Detect gas quality upsets before they damage your process. Using Tiger Optics' HALO H2 hydrogen analyzer, you can verify H₂ impurity levels with high accuracy, drift-free stability and instantaneous response. You will find our system exceptionally easy and fast to install, and effortless to maintain, with built-in zero verification. Its robust design—free of moving parts—results in an analyzer that has a high Mean Time Between Failure (MTBF) rate and a very low Cost of Ownership (CoO).

With its patented catalytic conversion technique, utilizing a minute amount of oxygen to cleanly and safely convert hydrogen to moisture, the HALO H2 offers a fully laser-based solution for continuous quality control of your process.

Specifications

Performance

Operating range:	See table on next page
Detection limit (LDL, 3σ/24h):	See table on next page
Precision (1σ, greater of):	$\pm 0.75\%$ or 1/3 of LDL
Accuracy (greater of):	$\pm 4\%$ or LDL
Speed of response:	< 3 minutes 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
Leak tested to:	1 x 10 ⁻⁹ mbar l / sec
Gas connections:	1/4" male VCR
Sample inlet pressure:	10 – 125 psig (1.7 – 9.6 bara)
Sample flow rate:	0.5 slpm ($\pm 20\%$)
Sample gases:	Most inert matrices
Gas temperature:	Up to 60°C
Utility gas supply	See below for required gas, ~15 sccm, 20 – 125 psig

Dimensions & Weight

Standard sensor:	H x W x D 8.73 x 19.0 x 23.6 in (222 x 483 x 599 mm)
Standard sensor weight:	45 lbs (20.4 kg)

Electrical and Interfaces

Platform:	Max Series analyzer
Alarm indicators:	2 user programmable, 1 system fault, Form C relays
Power requirements:	100 – 240 VAC, 50/60 Hz
Power consumption:	450 Watts max.
Signal output:	Isolated 4–20 mA
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

Standard Model (requires 1% O₂, 99% N₂ mixture or CDA utility gas*)

Performance, H ₂	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen:	0 – 500 ppm	8.0 ppb	3.0 ppb
In Argon:	0 – 200 ppm	6.0 ppb	2.0 ppb
In Helium:	0 – 125 ppm	4.0 ppb	1.5 ppb
In Neon:	0 – 140 ppm	4.0 ppb	1.5 ppb

CDA Model (requires pure N₂ diluting/utility gas[†])

Performance, H ₂	Range	LDL (3σ)	Precision (1σ) @ zero
In Clean Dry Air (CDA):	0 – 5000 ppm	80 ppb	30 ppb

Low-Range (LR) Model

Performance, H ₂	Range	LDL (3σ)	Precision (1σ) @ zero
Inert Gas (requires 1% O ₂ , 99% N ₂ mixture or CDA utility gas ^{*,‡})			
In Nitrogen:	0 – 20 ppm	0.3 ppb	0.1 ppb
In Argon:	0 – 9 ppm	0.13 ppb	0.05 ppb
In Helium:	0 – 4.0 ppm	0.10 ppb	0.04 ppb
Oxygenated Gas (requires pure N ₂ diluting/utility gas ^{‡,§})			
In Oxygen:	0 – 1000 ppm	15 ppb	5 ppb
In Clean Dry Air (CDA):	0 – 1000 ppm	15 ppb	5 ppb

*Gas supply purity requirements: <10 ppm H₂O, <0.1 ppm H₂

†Gas supply purity requirements: <1 ppm H₂O, <1 ppb H₂

‡Requires inert-gas-specific Zero Gas Panel and Linear Fit Mode

§Requires oxygenated-gas-specific Zero Gas Panel, Bypass Flow Gas Panel, and Linear Fit Mode

Contact us for additional analytes and matrices.
U.S. Patent # 7,277,177 • U.S. Patent # 7,255,836

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