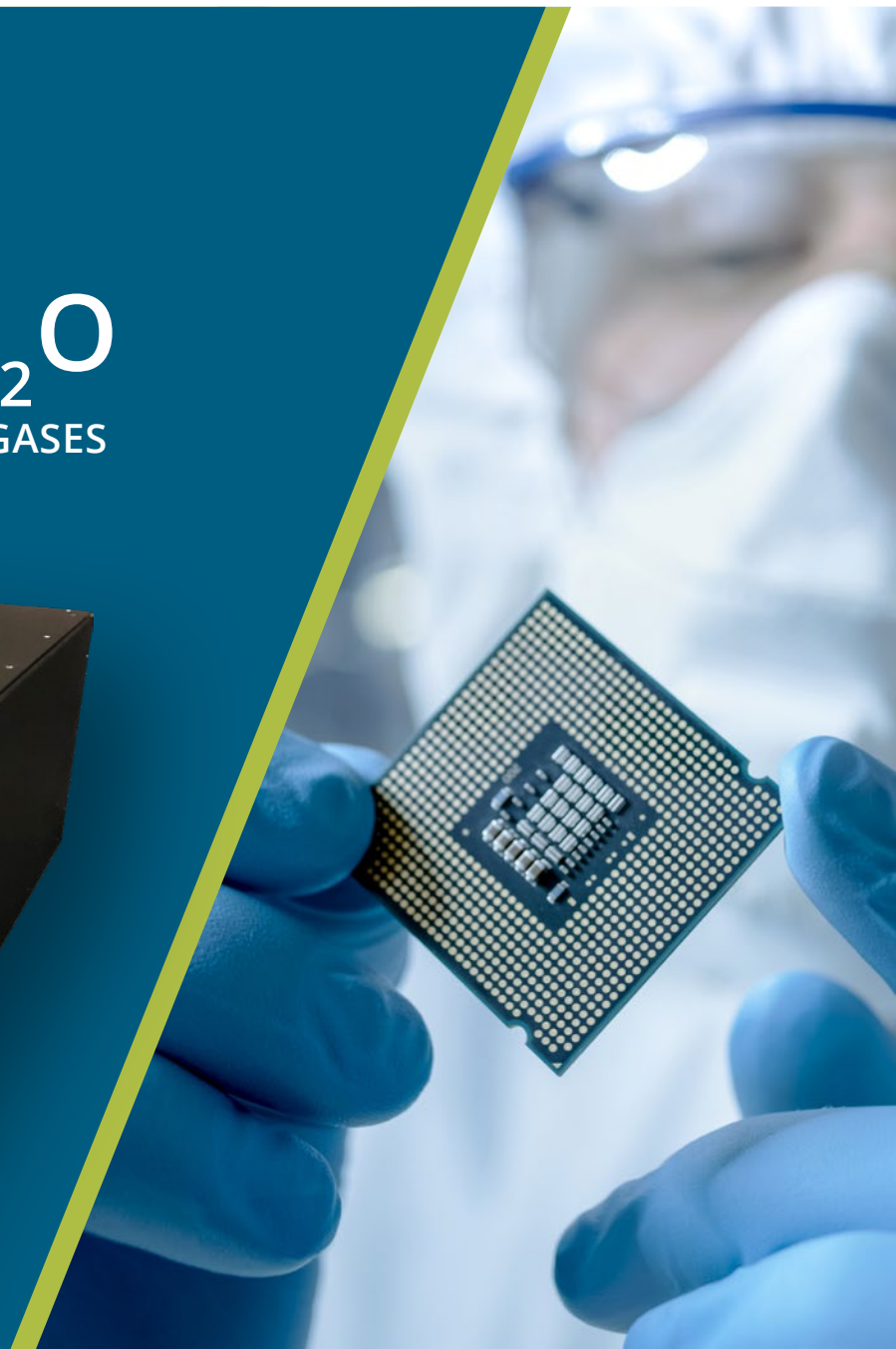


PRODUCT DATASHEET

HALO™ LP H₂O

TRACE MOISTURE IN HYDRIDE GASES



HALO LP H₂O offers:

- Low parts per billion (ppb) moisture detection capability in NH₃, PH₃, and more
- Absolute measurement (freedom from periodic calibration)
- Wide dynamic range – over four orders of magnitude
- Low cost of ownership and operational simplicity
- Clean technology – no external calibration gases required
- Compact analyzer footprint
- User-programmable alarms immediately notify on concentration upsets

Specifications

Performance

Operating range:	See detection performance table on next page
Detection limit (LDL, 3σ/24h):	See detection performance table on next page
Precision (1σ, greater of):	$\pm 1\%$ 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 (corrosive gas version optional), 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)
Outlet pressure:	<10 Torr (13 mbar)
Flow rate:	Up to 1.0 slpm
Sample gases:	NH ₃ , PH ₃ , AsH ₃ & inert matrices
Gas temperature:	Up to 60°C

Dimensions & Weight

Standard sensor (incl. shutoff valves):	H x W x D 8.73 x 8.57 x 26.4 in (222 x 218 x 670 mm)
Sensor rack (fits up to two sensors):	H x W x D 8.73 x 19.0 x 26.4 in (222 x 483 x 670 mm)
Standard sensor weight:	33 lbs (15.0 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. (excluding vacuum pump)
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

*Vacuum source required

Standard Model

Performance, H₂O

	Range	LDL (3 σ)	Precision (1 σ) @ zero
In Ammonia:	0 – 20 ppm	9 ppb	3 ppb
In Phosphine [†] :	0 – 10 ppm	9 ppb	3 ppb
In Nitrogen:	0 – 6 ppm	1.0 ppb	0.3 ppb
In Argon:	0 – 4 ppm	0.8 ppb	0.25 ppb
In Hydrogen [†] :	0 – 6 ppm	1.0 ppb	0.3 ppb
In Helium:	0 – 3 ppm	0.6 ppb	0.2 ppb
In Nitric Oxide [†] :	0 – 100 ppm	16 ppb	6 ppb
In Germane [†] :	0 – 18 ppm	20 ppb	7 ppb
H ₂ O in 5% SiH ₄ /95% N ₂ [†] :	0 – 6 ppm	20 ppb	7 ppb

Arsine Model

Performance, H₂O

	Range	LDL (3 σ)	Precision (1 σ) @ zero
In Arsine [†] :	0 – 10 ppm	5 ppb	2 ppb
In Nitrogen:	0 – 6 ppm	1.0 ppb	0.3 ppb
In Argon:	0 – 4 ppm	1.0 ppb	0.3 ppb
In Hydrogen [†] :	0 – 6 ppm	1.0 ppb	0.3 ppb
In Helium:	0 – 3 ppm	1.0 ppb	0.3 ppb

[†]Low leak rate vacuum pump (safety certified for service in relevant gas) required.

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

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