

# HALO RP H<sub>2</sub>O

## Trace Level Moisture Analyzer

GASES & CHEMICALS

CEMS

ENERGY

ATMOSPHERIC

SEMI & HB LED

SYNGAS

LAB & LIFE SCIENCE

**Designed for trace level moisture analysis at reduced pressure conditions, the HALO RP H<sub>2</sub>O offers:**

- Low parts per billion (ppb) moisture detection capability in inert, acid, and hydride gases
- Absolute measurement (freedom from calibration gases)
- 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
- CRDS technology, designated by SEMI-F112 06-13 Standard

### Protect Your Product with the HALO RP H<sub>2</sub>O

It's one thing to be monitoring and have high confidence in your high purity bulk and speciality gases at the post-purifier stage but a lot can change as that same gas then travels through the various fab distribution systems and arrives at the equipment or process chamber. Unless you are monitoring close to the substrate or in the process chamber exhaust, there is risk that high partial pressures of moisture are present during processing, resulting in defects causing yield loss and reliability issues.

For example, in semiconductor fabrication, moisture present in low-temperature epitaxy (LTE) can affect the quality and strain of the epi layers. In HB-LED

fabrication, MOCVD processing with high moisture present in NH<sub>3</sub>, can lead to significant reduction in luminescence and yield loss.

This is where Tiger Optics comes in. Able to operate in a pressure range from 50 Torr to 15 psig, the HALO RP H<sub>2</sub>O moisture analyzer provides users with the unmatched accuracy, reliability, speed of response and ease of operation that users of Tiger Optics' analyzers have come to expect.

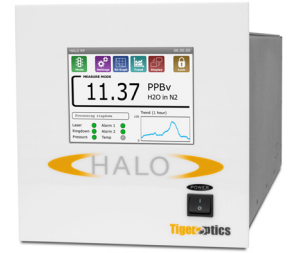
Monitoring for contaminants close to the substrate or in the process chamber exhaust, significantly reduces the risk of process issues that cause product yield losses.

**Tiger**optics

21<sup>ST</sup> CENTURY SPECTROSCOPY

# HALO RP H<sub>2</sub>O

## Trace Level Moisture Analyzer



Performance	
Operating range	See table below
Detection limit (LDL, 24 h peak-to-peak variation)	See table below
Sensitivity (3σ)	See table below
Precision (1σ, greater of)	± 1% or 1/3 of Sensitivity
Accuracy (greater of)	± 4% or 1/2 of 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 (optional Hastelloy®) 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	50 Torr – 15 psig (0.07 – 2 bara)
Outlet pressure	<10 Torr (13 mbar)
Flow rate	Up to 1.0 slpm
Sample gases	H <sub>2</sub> , N <sub>2</sub> , Ar, HCl, and others
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 (fits up to two sensors)	8.73 x 19.0 x 23.6 (222 x 483 x 599)

Weight	
Standard sensor	30 lbs (13.4 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)

Performance, H <sub>2</sub> O:	Range	LDL	Sensitivity
In Hydrogen	0 – 20 ppm	3.5 ppb	2.8 ppb
In Nitrogen	0 – 20 ppm	3.5 ppb	2.8 ppb
In Argon	0 – 20 ppm	2.0 ppb	1.6 ppb
In Helium	0 – 12 ppm	1.0 ppb	0.8 ppb
In HCl†	0 – 25 ppm	4.0 ppb	3.2 ppb

\*Vacuum source required  
 †may require Hastelloy® cell, please contact us for more information  
 Contact us for additional analytes and matrices.  
 U.S. Patent # 7,277,177

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