



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

## Trace Level Moisture Analyzer

GASES & CHEMICALS

CEMS

ENERGY

SEMI & HB LED

ATMOSPHERIC

LAB & LIFE SCIENCE

### Designed for trace level moisture analysis, the HALO LP H<sub>2</sub>O offers:

- Low parts per billion (ppb) moisture detection capability in NH<sub>3</sub>, PH<sub>3</sub> and AsH<sub>3</sub>
- 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
- User-programmable alarms immediately notify on high events

### Simple Trace Moisture Detection in Hydride Gases

Semiconductor and High Brightness LED manufacturers rely on ultra-high purity process gases, such as ammonia and phosphine, to build the high-tech products such as smartphones, LED TVs and light bulbs, and CPU and memory chips that consumers desire. Residual moisture in these critical gases degrade device performance, reduce yield, and negatively impact product and corporate profitability. The HALO LP H<sub>2</sub>O analyzer is designed to provide users with a simple, cost-effective, and compact analyzer for ensuring trace levels of moisture in NH<sub>3</sub>, PH<sub>3</sub> and AsH<sub>3</sub> are within the required specifications.

Operating at low pressure, this analyzer allows users to measure moisture in hydride gases with unmatched accuracy, reliability, and speed of response. Evidenced by our global installed base of over 2000 sensors, users enjoy the freedom from requirements such as periodic sensor maintenance, span calibrations, purifier replacement and pump rebuilds that are commonplace with other technologies. As a result, Tiger Optics' HALO LP H<sub>2</sub>O is relied upon as an industry leader in the detection of trace moisture levels in ammonia and phosphine for electronic manufacturers and specialty gas suppliers worldwide.

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

## Trace Level Moisture Analyzer



| Performance                                |  | Dimensions                                | H x W x D [in (mm)]  |
|--|--|---|--|
| Operating range                            | See table on next page   | Standard sensor<br>(incl. shutoff valves) | 8.73 x 8.57 x 26.4 (222 x 218 x 670)   |
| Detection limit (LDL, 3σ/24h)              | See table on next page   | Sensor rack<br>(fits up to two sensors)   | 8.73 x 19.0 x 26.4 (222 x 483 x 670)   |
| Precision (1σ, greater of)                 | ± 1% or 1/3 of LDL   |   |  |
| Accuracy (greater of)                      | ± 4% or LDL  |   |  |
| Speed of response                          | < 3 minutes to 95%   |   |  |
| Environmental conditions                   | 10°C to 40°C<br>30% to 80% RH (non-condensing)                                   |   |  |
| Storage temperature                        | -10°C to 50°C  |   |  |
| <b>Gas Handling System and Conditions*</b> |  | <b>Weight</b>                             |  |
| Wetted materials                           | 316L stainless steel<br>(corrosive gas version optional)<br>10 Ra surface finish | Standard sensor                           | 33 lbs (15.0 kg)   |
| Gas connections                            | 1/4" male VCR inlet and outlet   |   |  |
| Leak tested to                             | 1 x 10 <sup>-9</sup> mbar l / sec  | <b>Electrical and Interfaces</b>          |  |
| Inlet pressure                             | 10 – 125 psig (1.7 – 9.6 bara)   | Platform                                  | Max series analyzer  |
| Outlet pressure                            | <10 Torr (13 mbar)   | Alarm indicators                          | 2 user programmable<br>1 system fault<br>Form C relays   |
| Flow rate                                  | Up to 1.0 slpm   | Power requirements                        | 90 – 240 VAC, 50/60 Hz   |
| Sample gases                               | NH <sub>3</sub> , PH <sub>3</sub> , AsH <sub>3</sub> & inert matrices            | Power consumption                         | 40 Watts max.<br>(excluding vacuum pump)   |
| Gas temperature                            | Up to 60°C   | Signal output                             | Isolated 4–20 mA   |
|  |  | User interfaces                           | 5.7" LCD touchscreen<br>10/100 Base-T Ethernet<br>USB, RS-232, RS-485<br>Modbus TCP (optional) |
|  |  | Data storage                              | Internal or external flash drive   |
|  |  | Certification                             | CE Mark  |

\*Vacuum source required

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## Trace Level Moisture Analyzer

### Standard Model

| Performance, H <sub>2</sub> O: | Range       | LDL (3 $\sigma$ ) | Precision (1 $\sigma$ ) @ zero |
|--------------------------------|-------------|-------------------|--------------------------------|
| In Ammonia                     | 0 – 20 ppm  | 9 ppb             | 3 ppb                          |
| In Phosphine <sup>†</sup>      | 0 – 10 ppm  | 9 ppb             | 3 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   | 0.8 ppb           | 0.25 ppb                       |
| In Helium                      | 0 – 3 ppm   | 0.8 ppb           | 0.25 ppb                       |
| In NO                          | 0 – 100 ppm | 16 ppb            | 6 ppb                          |

### Arsine Model

| Performance, H <sub>2</sub> O: | Range      | LDL (3 $\sigma$ ) | Precision (1 $\sigma$ ) @ zero |
|--------------------------------|------------|-------------------|--------------------------------|
| In Arsine <sup>†</sup>         | 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                        |

<sup>†</sup>Low leak rate vacuum pump required

Contact us for additional analytes and matrices.

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