



HALO 3 H₂O

Trace Level Moisture Analyzer

GASES & CHEMICALS

CEMS

ENERGY

ATMOSPHERIC

SEMI & HB LED

SYNGAS

LAB & LIFE SCIENCE

Designed for trace level moisture analysis, the HALO 3 H₂O offers:

- Sub parts per billion (ppb) moisture detection capability in an array of 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
- Low gas consumption to conserve rare and costly gas
- Versatility—trace-level detection in various gas matrices

The HALO 3 H₂O analyzer provides users with the unmatched accuracy, reliability, speed of response and ease of operation that users of Tiger Optics analyzers know and expect. Featuring Tiger Optics' powerful Cavity Ring-Down Spectroscopy-based moisture sensor in a very compact and economic analyzer design, this versatile analyzer allows users to measure moisture in most inert, corrosive and toxic gases with just one device. Users also enjoy freedom from requirements

such as periodic sensor maintenance, span calibrations, purifier replacement and pump rebuilds. As a result, the HALO 3 H₂O analyzer is ideally suited to many applications where moisture measurement is extremely critical. These applications include fixed bulk gas continuous quality control, portable mobile analytical carts, process tool monitoring, air separation, gas cylinder quality control and many other demanding applications.

Tigeroptics

21ST CENTURY SPECTROSCOPY

HALO 3 H₂O

Trace Level Moisture Analyzer



| Performance | |
|-------------------------------|--|
| Operating range | See table on next page |
| Detection limit (LDL, 3σ/24h) | See table on next page |
| Precision (1σ, greater of) | ± 0.75% or 1/3 of LDL |
| Accuracy (greater of) | ± 4% or LDL |
| Speed of response | < 1 minute to 90% |
| 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) |
| Flow rate | 0.05 – 1.8 slpm |
| Sample gases | Most inert, toxic, passive and corrosive matrices |
| 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 | 28 lbs (12.7 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) |
| Certification | CE Mark |

HALO 3 H₂O

Trace Level Moisture Analyzer

| Performance, H ₂ O: | | Range | LDL (3σ) | Precision (1σ) @ zero |
|--------------------------------|----------------------------------|--------------------------|----------|-----------------------|
| INERT GASES | In Nitrogen | 0 – 20 ppm | 1.2 ppb | 0.4 ppb |
| | In Helium | 0 – 4 ppm | 0.25 ppb | 0.1 ppb |
| | In Argon | 0 – 9 ppm | 0.6 ppb | 0.2 ppb |
| | In Hydrogen | 0 – 16 ppm | 1.0 ppb | 0.4 ppb |
| OXYGENATED GASES | In Oxygen | 0 – 12 ppm | 0.7 ppb | 0.25 ppb |
| | In Clean Dry Air (CDA) | 0 – 18 ppm | 1.2 ppb | 0.4 ppb |
| | In CO | 0 – 24 ppm | 1.5 ppb | 0.5 ppb |
| | In CO ₂ (low range) | 0 – 25 ppm | 2.0 ppb | 0.7 ppb |
| | In CO ₂ (high range) | 0 – 70 ppm | 8 ppb | 3 ppb |
| RARE GASES | In Neon | 0 – 5 ppm | 0.3 ppb | 0.1 ppb |
| | In Krypton | 0 – 11 ppm | 0.6 ppb | 0.2 ppb |
| | In Xenon | 0 – 13 ppm | 0.8 ppb | 0.3 ppb |
| CORROSIVE GASES | In Cl ₂ | 0 – 25 ppm* | 1.5 ppb | 0.5 ppb |
| | In HCl | 0 – 50 ppm [†] | 3 ppb | 1.0 ppb |
| | In HBr | 0 – 100 ppm [§] | 12 ppb | 4 ppb |
| FLUORINATED GASES | In SF ₆ | 0 – 15 ppm | 1.0 ppb | 0.4 ppb |
| | In NF ₃ | 0 – 20 ppm | 2.5 ppb | 0.9 ppb |
| | In CF ₄ | 0 – 15 ppm | 4 ppb | 1.2 ppb |
| | In C ₂ F ₆ | 0 – 15 ppm | 3 ppb | 1.0 ppb |
| | In C ₃ F ₈ | 0 – 20 ppm | 3 ppb | 1.0 ppb |
| | In C ₄ F ₆ | 0 – 25 ppm | 150 ppb | 50 ppb |
| | In C ₄ F ₈ | 0 – 20 ppm | 3 ppb | 1.0 ppb |

*Corrosive gas version recommended for H₂O concentration that could exceed 10 ppm

[†]Corrosive gas version recommended for H₂O concentration that could exceed 1 ppm

[§]Corrosive gas version required

Contact us for additional analytes and matrices.

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