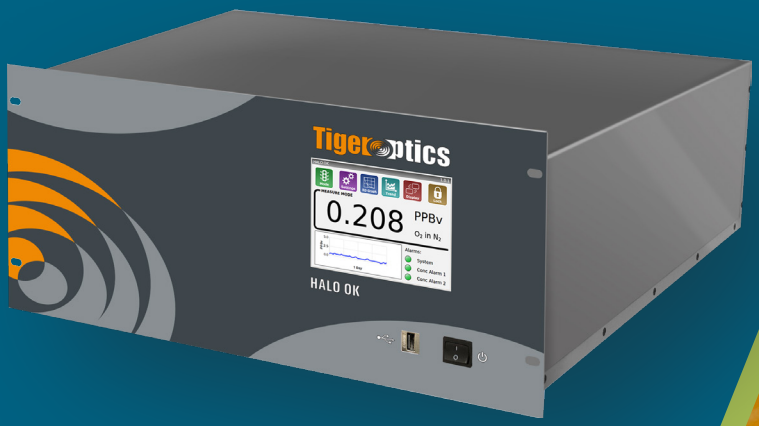
Process Insights™
Premium Insights Into Process

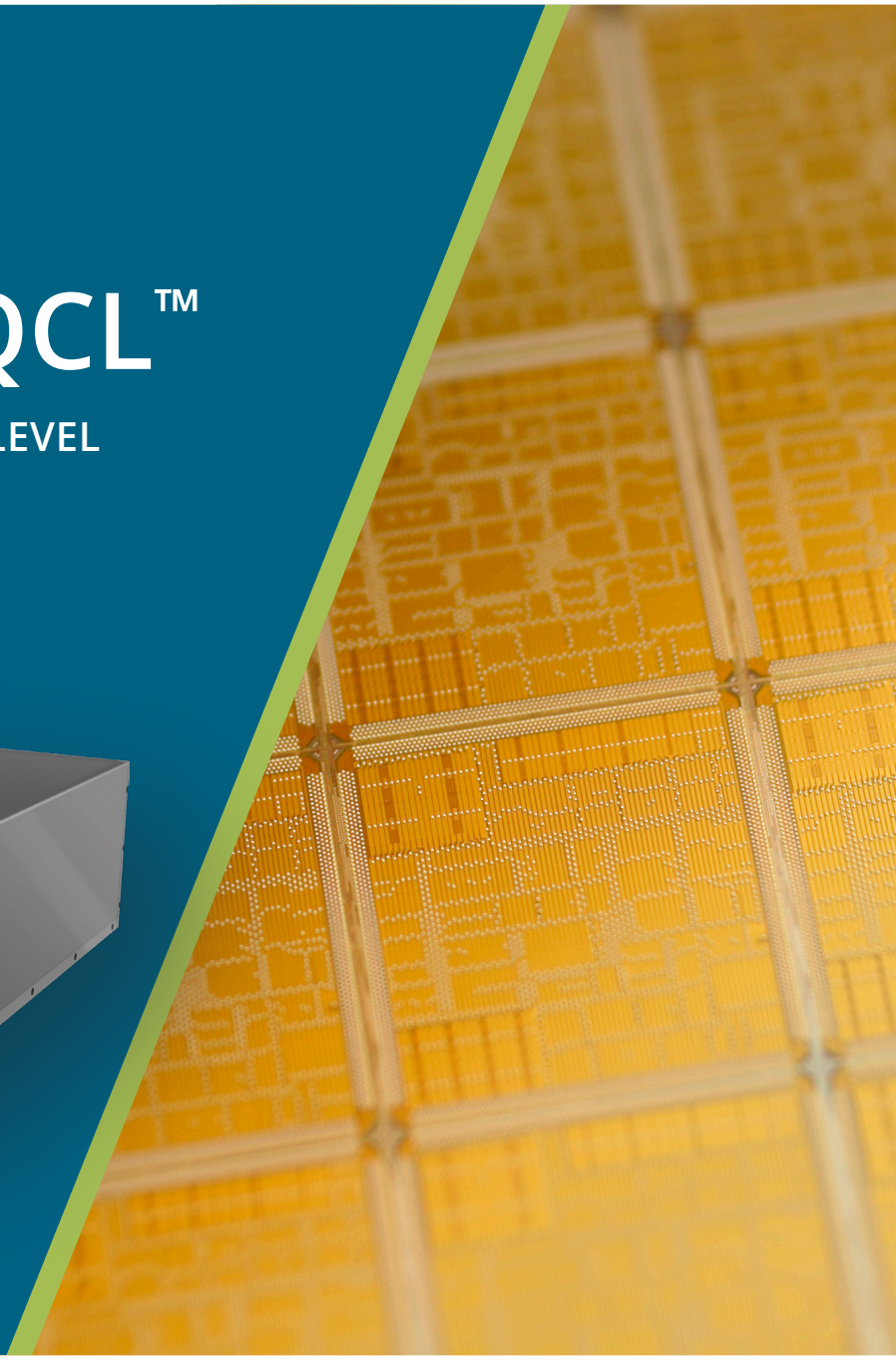
HIGH-PERFORMANCE GAS ANALYZERS

PRODUCT DATASHEET

HALO Max QCL™

QCL-CRDS ANALYZER FOR PPT LEVEL CO AND CO_2 DETECTION





Our first analyzer series based on Quantum Cascade Laser Cavity Ring-Down Spectroscopy (QCL-CRDS), the HALO Max QCL offers:

- Parts-per-trillion (ppt) detection capability for carbon monoxide (CO) and carbon dioxide (CO_2) in UHP bulk gases
- Incorporates mid-infrared QCL technology to achieve the ultimate sensitivity
- Absolute measurement (freedom from calibration)
- Excellent speed of response at ppb levels and below
- Continuous measurement – no batch processing typical with GCs
- Robust design & maximum ease of use

POWERED BY QCL ADVANCED TECHNOLOGY

Specifications

Performance

Operating range:	See gas performance table on the next page
Detection limit (LDL, 3σ/24h):	See gas performance table on the next page
Precision (1σ, greater of):	± 0.75% or see table on the next page
Accuracy (greater of):	± 4% or LDL
Speed of response:	< 1 min 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

Sample gas connections:	1/4" male VCR inlet and outlet
Leak tested to:	1 x 10^{-9} mbar l / sec
Inlet pressure:	6 − 125 psig (1.4 − 9.6 bara)
Flow rate:	<1 slpm in N_2 (gas dependent)
Sample gases:	Most inert and passive gases
Gas temperature:	Up to 60°C
Purge gas (CO_2 only)**:**	Inert gas (e.g. N_2), <1 ppm CO_2, 30 − 150 psig, 4 − 5 slpm
Purge gas connection:	1/8" Swagelok®

Dimensions & Weight

Standard sensor (19" rack-mountable)**:**	H × W × D 8.75 x 19.0 x 25.0 in (222 x 483 x 635 mm)
Standard sensor weight:	HALO Max QCL CO: 72 lbs (33 kg) HALO Max QCL CO_2: 77 lbs (35 kg)

Electrical and Interfaces

Alarm indicators:	2 user programmable, 1 system fault Form C relays
Power requirements:	90 − 240 VAC, 50/60 Hz
Power consumption:	100 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

HALO Max QCL CO

Performance, CO	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen:	0 – 0.5 ppm	200 ppt	70 ppt
In Helium:	0 – 0.35 ppm	130 ppt	45 ppt
In Argon:	0 – 0.4 ppm	150 ppt	50 ppt
In Hydrogen:	0 – 0.5 ppm	200 ppt	70 ppt
In Oxygen:	0 – 0.45 ppm	170 ppt	60 ppt
In Clean Dry Air (CDA):	0 – 0.5 ppm	200 ppt	70 ppt
In Xenon:	0 – 0.45 ppm	170 ppt	60 ppt

HALO Max QCL CO_2

Performance*, CO_2	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen:	0 – 2.5 ppm	100 ppt	35 ppt
In Helium:	0 – 2 ppm	90 ppt	30 ppt
In Argon:	0 – 2 ppm	80 ppt	25 ppt
In Hydrogen:	0 – 4 ppm	180 ppt	60 ppt
In Oxygen:	0 – 2 ppm	90 ppt	30 ppt
In Clean Dry Air (CDA):	0 – 2.5 ppm	100 ppt	35 ppt
In Xenon:	0 – 2 ppm	75 ppt	25 ppt

*Due to the high abundance of CO_2 in air, purging of the analyzer housing is required to achieve specified LDL (see previous page for purge gas requirements).

Contact us for additional analytes and matrices.

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GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights delivers premium analytical sensors, analyzers, instrumentation, software and solutions that are mission-critical to keep your operations, personnel, and the environment safe. Our commitment to customer satisfaction is evident through our diverse range of products, programs, and services, designed to accommodate various budgets and application needs.

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