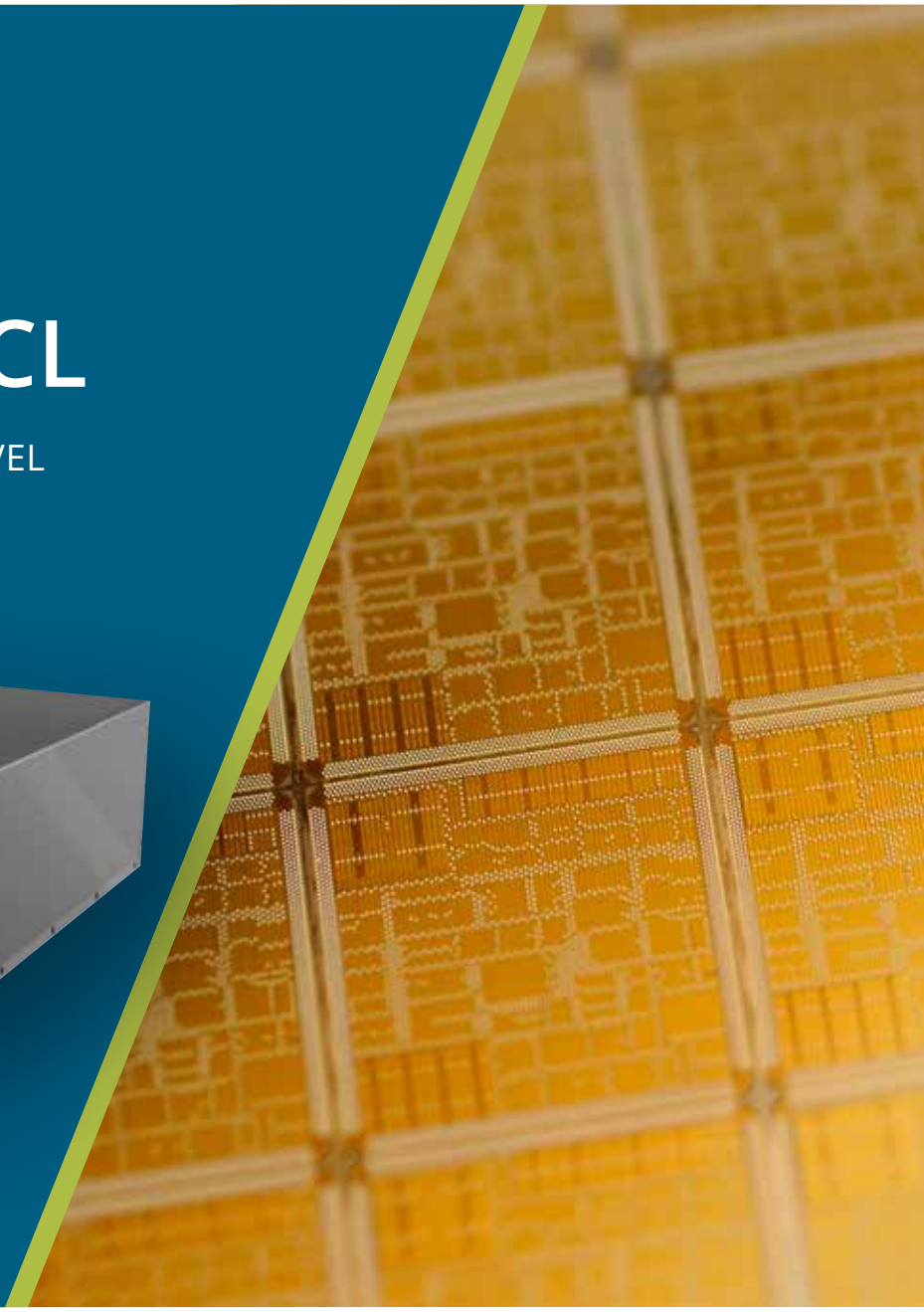
Process Insights™
Premium Insights Into Process

REAL-TIME 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 below
Detection limit (LDL, 3σ/24h):	See gas performance table below
Precision (1σ, greater of):	± 0.75% or see table below
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 24.0 in (222 x 483 x 610 mm)
Standard sensor weight:	40 lbs (18 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

HALO Max QCL			
Performance, CO	**Range***	**LDL (3σ)**	**Precision (1σ) @ zero**
In Nitrogen:	0 – 0.4 ppm	200 ppt	70 ppt
In Helium:	0 – 0.4 ppm	180 ppt	60 ppt
In Argon:	0 – 0.4 ppm	150 ppt	50 ppt
In Oxygen:	0 – 0.4 ppm	180 ppt	60 ppt
In Clean Dry Air (CDA):	0 – 0.4 ppm	200 ppt	70 ppt

Arsine Model			
Performance, CO_2	**Range**	**LDL† (3σ)**	**Precision (1σ) @ zero**
In Nitrogen:	0 – 0.4 ppm	100 ppt	35 ppt
In Helium:	0 – 0.4 ppm	90 ppt	30 ppt
In Argon:	0 – 0.4 ppm	90 ppt	30 ppt
In Oxygen:	0 – 0.4 ppm	90 ppt	30 ppt
In Clean Dry Air (CDA):	0 – 0.4 ppm	100 ppt	30 ppt

*Higher range is available upon request.
†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.
U.S. Patent # 7,277,177

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Get the most reliable, precision analytical technologies available on the market today. We will work to match your needs and budget, and provide the optimal, and most stable process analysis solution for your application.

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