

PRODUCT DATASHEET

HALO Max QCL

QCL-CRDS ANALYZER FOR PPT LEVEL
CO AND CO₂ 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 (CO₂) 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

Specifications

Performance

Operating range:	See gas performance table below
Detection limit (LDL, 3σ/24h):	See gas performance table below
Precision (1σ, greater of):	$\pm 0.75\%$ or see table below
Accuracy (greater of):	$\pm 4\%$ 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 x W x 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 (3 σ)	Precision (1 σ) @ 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, CO₂

	Range	LDL [†] (3 σ)	Precision (1 σ) @ 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	35 ppt

*Higher range is available upon request.

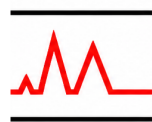
[†]Due to the high abundance of CO₂ in air, purging of the analyzer housing is required to achieve specified LDL (see previous page for purge gas requirements).

Contact us for additional analytes and matrices.
U.S. Patent # 7,277,177

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Equipamientos Analíticos S.A

DESDE 1989 | BRINDANDO SOLUCIONES

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AQ ALPHA OMEGA
INSTRUMENTS

ATOM
INSTRUMENT

extrel

MBW calibration

COSAXENTAUR

HYGROCONTROL

LAR
THE
TOC
COMPANY

Tiger optics