

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

PREMIUM INSIGHTS – GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights' products and solutions deliver innovative and differentiated analysis and measurement solutions and technologies that add high value to our customers and protect the environment.

Our commitment is to deliver smart and affordable innovation that optimizes process, improves safety, and transforms our world.



OUR PREMIUM GLOBAL BRANDS

AQ ALPHA OMEGA
INSTRUMENTS

ATOM
INSTRUMENT

extrel

MBW calibration

COSAXENTAUR

HYGROCONTROL

LAR
THE TOC COMPANY

Tiger optics