HALO 3 NH$_3$
Trace Ammonia Analyzer

GASES & CHEMICALS	CEMS	ENERGY	SEMI & HB LED	ATMOSPHERIC	LAB & LIFE SCIENCE

Designed for trace ammonia analysis in laboratory and process applications:

- Accuracy traceable to the world's major national reference labs
- Industry-proven technology
- Freedom from the need for span calibrations
- No periodic sensor replacement/maintenance
- Wide dynamic range and no drift, different ranges available
- "Standard Model" for sub-part-per-billion (ppb) detection limit in N$_2$, H$_2$ & CO$_2$
- "N$_2$O Model" for single-digit ppb detection limit in N$_2$O & N$_2$

Versatile, sensitive and hassle-free trace ammonia analysis

Ammonia (NH$_3$) is a key impurity in many applications, ranging from industrial process control to the anlaysis of fuel cell hydrogen. Tiger Optics delivers a powerful analytical tool for the measurement of NH$_3$, based on Cavity Ring-Down Spectroscopy (CRDS). The HALO 3's low detection limit, drift-free operation, and compatibility with many different sample gases makes it an ideal tool for monitoring trace amounts of ammonia, for example, to ensure compliance with SAE J2719, ISO 14687 or similar purity standards for hydrogen used for fuel cell electric vehicles (FCEVs).

Highly specific to the target molecule, CRDS also prevents cross-interferences from distorting your measurement. Plus, there is no need to perform costly and time-consuming zero and span calibrations, saving both time and money with continuous, online service.

Tiger Optics
A Process Insights Company

HALO 3 NH₃
Trace Ammonia 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	< 3 minutes 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*

Wetted materials	316L stainless steel
	10 Ra surface finish
Gas connections	1/4" male VCR inlet and outlet
Leak tested to	1×10^{-9} mbar l / sec
Inlet pressure	10 – 125 psig (1.7 – 9.6 bara)
Flow rate	~1 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	8.73 x 19.0 x 23.6 (222 x 483 x 599)
(fits up to two sensors)	

Weight

Standard sensor	34 lbs (15.4 kg)

Electrical and Interfaces

Platform	Max series analyzer
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
	USB, RS-232, RS-485
	Modbus TCP (optional)
Data storage	Internal or external flash drive
Certification	CE Mark

*Analysis in some specialty gases and certain applications may require a vacuum pump for operation. Please contact us to discuss your specific requirements.

Tiger Optics
A Process Insights Company

HALO 3 NH$_3$
Trace Ammonia Analyzer

Standard Model

Performance, NH$_3$:	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen (Low Range)	0 – 7 ppm	0.4 ppb	0.15 ppb
In Nitrogen (Mid Range)	0 – 35 ppm	2.5 ppb	0.8 ppb
In Nitrogen (High Range)	0 – 130 ppm	9 ppb	3 ppb
In Hydrogen (Low Range)	0 – 6 ppm	0.3 ppb	0.10 ppb
In Hydrogen (Mid Range)	0 – 30 ppm	2.0 ppb	0.7 ppb
In Hydrogen (High Range)	0 – 110 ppm	7 ppb	2.5 ppb
In Carbon Dioxide[†]	0 – 30 ppm	2.5 ppb	0.8 ppb

N$_2$O Model

Performance, NH$_3$:	Range	LDL (3σ)	Precision (1σ) @ zero
In Nitrogen	0 – 150 ppm	7 ppb	2.5 ppb
In Nitrous Oxide (N$_2$O)	0 – 200 ppm	8 ppb[‡] / 40 ppb	3 ppb[‡] / 15 ppb

[†]Cannot be combined with Low or High Range detection in N$_2$/H$_2$
[‡]Dry vacuum pump required

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

Made in U.S.A.

Tiger optics
A Process Insights Company