ABB MEASUREMENT & ANALYTICS

CL3020 CLD NOx analyzer

Solid. Simple. Superior.

CL3020

Next generation solid-state chemiluminescence NOx analyzer

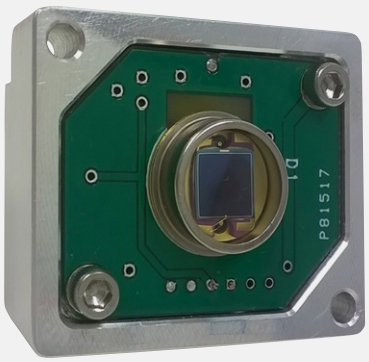
— 01 Solid-state detector
— 02 NOx cell reaction chamber with detector

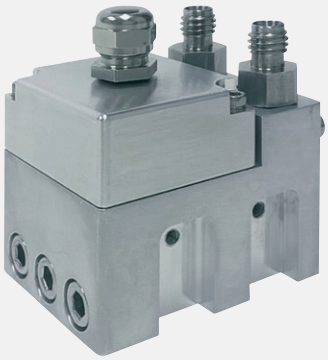
ABB's CL3020 CLD NOx analyzer utilizes next generation solid-state detection technology to measure low and ultra-low NOx in combustion applications.

It is so compact that two NOx cells may be mounted inside a single housing allowing continuous NOx speciation or NH_3 measurement.

The simplicity of the design also leads to much greater reliability. No more high voltage power supplies, exposed thermoelectric cooling or fragile optical components means fewer things that can go wrong.

Measurement made easy.





— 01 — 02

The advantages to you:

Solid.

Optimized for low ppm NOx

- Designed around EPA Method 7E and PS-2
- Third generation solid-state detector
- Removes unnecessary complexity
- Optional zirconia oxygen sensor
- Precise, stable and reliable performance

Simple.

Clean and user-friendly inside and out

- Compact and tightly integrated NOx cell
- Combined $NO_2 \rightarrow NO$ converter and ozone scrubber
- Single board approach reduces spare parts
- Minimal internal piping, wiring and fittings
- Intuitive touch-screen user interface
- Carefully designed for care-free maintenance

Superior.

Peace of mind, money in your pocket

- Less parts that can go wrong
- Longer lifetime critical components
- Optionally mount two detectors inside one housing
- Most cost effective solution for DeNOx control
- Efficient solution lowers cost of ownership

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Did you know?

The CLD NOx analyzer CL3020 supplements ABB's extensive CEMS offering, including the EL3000 and AO2000 series and market leading NDIR, NDUV, paramagnetic O_2 and FID sensors installed more than 60,000 times worldwide.

CL3020

For gas-powered utilities and other combustion sources

How it works – measuring principle
Chemiluminescence is a chemical reaction that produces light. When nitric oxide (NO) molecules react with ozone they are oxidized to NO_2 in an excited state [◊]:

$$NO + O_3 \rightarrow NO_2[◊] + O_2$$

A small fraction of molecules in this excited state decay by emitting a photon (for example giving off light) in the near infrared (NIR). The amount of light produced is measured using a solid-state photodiode and is directly proportional to the amount of NO present in the sample.

An NO_2 to NO converter allows an analyzer that measures only NO to determine total NOx by converting the NO_2 in the sample to NO prior to measurement.

Differential NH_3 slip measurement
The sample may be split into two streams at the probe and a heated catalyst mounted at one of the outlets to convert NH_3 to NO. The sample line includes an additional tube for transporting the NH_3 converted sample. Both streams pass through the NO_2 to NO converter and are simultaneously measured by two independent NOx detectors within the same enclosure.

Continuous NO/NO_2 speciation
It is often important to quantify both NO and NO_2 concentrations. The sample may be split into two prior to the NOx analyzer with one stream routed directly to NOx detector 1 (unconverted) and the other passing through the NO_2 to NO converter (converted) to NOx detector 2. This eliminates complex valve switching and provides continuous NO and NO_2 measurement.

Mechanical specifications

Criteria	Specification
Inlet pressure	Atmospheric
Flow rate	0.5 SLPM
Instrument air	Requires clean, dry air for ozone generator

Performance specifications

Criteria	NOx/NH_3	O_2
Measuring ranges	0 to 5/200 ppm 0 to 25/1000 ppm (configurable)	0 to 10/25 Vol% (configurable)
Detection limit	≤ 5ppb	
Zero drift (24 hours)	≤ 0.1ppm or 0.1% F.S.	≤ 0.1% O_2
Span drift (24 hours)	≤ 1% of reading	≤ 0.1% O_2
Linearity error	≤ 2% F.S.	≤ 2% F.S.
Response time	T_{90} ≤ 5 s	T_{90} ≤ 30 s
Converter material	Molybdenum	
Converter efficiency	≥ 95%	

General data

Criteria	Specification
Dimensions	EIA 19-in. rack mount enclosure, 11 in. deep, 3 rack units (5.25 in.) tall
Weight	24 lbs. (11 kg)
Power supply	120 VAC, 4 A
Ambient temp.	40 to 100 °F (5 to 37 °C)
Outputs	4 to 20 mA or 0 to 10 V (selectable) Modbus TCP/IP

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