

NITROGEN OXIDES NO, NO₂, NO_x

NOx 2000G, SERES' CONTRIBUTION TO ENVIRONMENT QUALITY SURVEILLANCE,

- On line, continuous analysis,
- U.V. chemiluminescence,

FOR NITROGEN OXIDES CONTROL IN AIR.

NOx 2000G benefits :

- ✓ Easy operation
- ✓ Fast & reliable measurement
- ✓ Flexible : control of nitrogen monoxides, dioxides, ...
- ✓ Ambient or emission air analysis

NOx 2000G is one of SERES' Series 2000G line of air analysers using the same modular electronics. This advanced design monitor incorporates the latest achievements in continuous measurement of Nitrogen Oxides.



Non contractual

APPLICATIONS

Nitrogen Oxides :

- Commonly known as **NO_x** and gathering all forms of mono-nitrogen oxides such as NO, NO₂.
- Resulting from the reaction of nitrogen & oxygen in air during combustion
- Polluting compounds, toxic at high levels and with a definite negative impact on **human health & environment** : increase of respiratory diseases & ozone precursor .

They originate from a variety of sources & applications :

- **Motor vehicle traffic** : nitrogen present in engine fuels oxidize in high temperature conditions.
- **Combustion processes** (thermal power stations, central heating plants,...), **indoor air** (where nitrogen-bearing fuel or gas devices are used).
- **Summer heatwaves & thunderstorms**, presence of nitrogen in air leads to the formation of ozone, greenhouse gases and acid rain.

ADVANTAGES

Efficient & robust monitor

Measurement by U.V. chemiluminescence

User-friendly interface

Internal ozone generator

**Optimum response time,
Stable signal & negligible drifts**

Automatic, dynamic zero

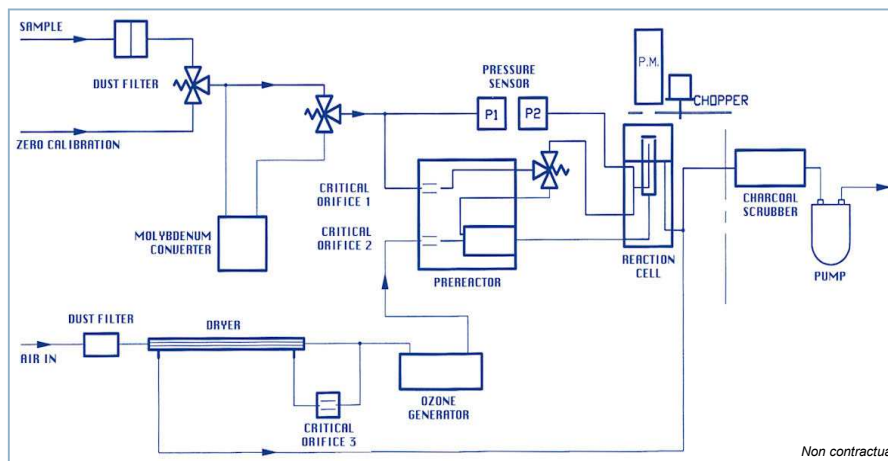
**Compliance with EN 14211:2005
US EPA approval**

**Turnkey projects : rack system integration,
data processing, ...**

PRINCIPLE - U.V. CHEMILUMINESCENCE

NO and NOx are detected using the **chemiluminescent** reaction between O₃ and NO. A photomultiplier measures the light intensity emitted at a known wavelength. If **O₃** concentration is fixed, the quantity of light is proportional to the **NO** concentration in the reaction cell : **NO + O₃ > NO₂ + O₂ + Photons**. The analyser carries out two direct measurements (NO and NOx upon conversion of NOx into NO) on the same sample in alternating sequences : **NOX (= NO + NO₂)** and **NO** concentrations are achieved while negative NO₂ values are avoided. **NO₂** present in the sample is not directly measured : it is first chemically reduced into NO before entering the reaction cell via a molybdenum converter and further calculated from the difference between NOx and NO.

- ✓ Every 80 sec. the sample is led in the pre-reactor before entering the reaction cell.
- ✓ The whole NO is quickly oxidized into NO₂ before actual measurement providing **dynamic zero compensation**.
- ✓ Light interference resulting from fluorescence of the reaction cell wall or presence of hydrocarbons is reduced and need for zero adjustments is eliminated.



TECHNICAL SPECIFICATIONS

CONSTRUCTION & ENVIRONMENT

Dimensions	Rack 19" - 4U : 480 x 180 x 540 mm (W x H x D)
Weight	18 kg
Material	Steel epoxy paint
Protection & Environment	Installation in safe area, protected from weather conditions, dust & corrosive atmosphere
Working T°	0 to 40°C (5 to 35°C recommended)
Humidity	0 to 96% non condensing

POWER SUPPLY & CONSUMPTION

Power supply	230 VAC - 50 Hz (other on request)
Consumption	450 VA (mean consumption)

ANALYSIS

Method & Parameter	Chemiluminescence U.V. NO, NO ₂ , NOx
Results	Permanent display of NO, NO ₂ or NOx, air, pressure, flow, range, zero offset
Range	100 - 500 - 1000 - 5000 - 10000 - 20000 ppb
Unit	ppb or µg/Nm ³
Min. detectable	< 1 ppb
Response time	30 sec. for 90% change
Linearity	+/- 1.0% end of range
Zero drift	< 1% per week
Span drift	< 1% per week
Zero	Automatic, internal

SAMPLING & OPERATION

Sampling	External sampling pump
Sample flow	30 l/h
Ozone generator	Internal generator : Ozone is produced from ambient air dried over "PERMA-PURE" filter
Sample / Zero	Solenoid valves for span / zero gas (manual or remote)

COMMUNICATION & ALARMS

User interface	Display 4 x 40 characters and keyboard (16 keys)
Data storage	Internal memory storage 1/4 hourly measurements over 40 days (others on request)
Analog output	4 - 20 mA (others on request)
Digital output	RS 232C with transmission of status
Dry contacts	Fault, threshold, calibration ongoing
Other interfaces	Modem output, Jbus/Modbus interface(option), Serial interface for external printer (printer option on request)

COMPLIANCE

Standards	Compliance with EN14211:2005 US EPA certification
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ENGINEERING / TURNKEY PROJECTS (on request)

Rack cabinet integration - Teletransmission interface - Data acquisition system
Flameproof adaptor for sampling in ATEX area - Heated line
Other options on request