SERVOMEX

SERVOPRO
NOx

COMBUSTION AND ULTRA-LOW NOx EMISSIONS TESTING AND MONITORING IN ONE SIMPLE ANALYZER USING A CHEMILUMINESCENCE DETECTOR (CLD) FOR NO ONLY OR SPECIATED AS NO, NO_2 AND NOx

SERVOPRO NOx

The versatile SERVOPRO NOx gas analyzer uses the time-proven chemiluminescence detection method to measure NO or $NO/NO_2/NOx$ concentrations all in one analyzer – perfect for continuous monitoring for industrial stationary sources emissions or ambient air, and fast enough for emissions testing in engines and vehicles.

The analyzer uses ozone (O_3) which reacts with the nitric oxide (NO) in the sample stream, yielding an excited state of NO_2 (NO_2*) plus oxygen (O_2). Excited NO_2* will return to a more stable ground state, and in the process, produces a chemiluminescent light, the intensity of which is proportional to the concentration of NO that was converted into NO_2 within the reaction chamber. A photodiode detector is used to measure the light and reports out a ppmv NO value.

In order to produce a total NOx signal, the sample is first routed through an internal converter that turns any NO_2 in the sample into NO. This stream is then subjected to O_3 gas and the resultant reaction is now directly proportional to the total NOx concentration. The analyzer then makes an internal calculation, deriving the final NO_2 concentration from the NOx converter efficiency.

FLEXIBLE

- Measures 0-3 to 0-3,000ppm full scale $NO/NO_2/NOx$
- Heated version available
- Low flow sampling at 0.6 lpm
- Versatile solution for emissions monitoring and testing

EASY TO USE

- Automatic calibration and full scale autoranging
- Internal converter for NO_2 to NO
- Zero and span with TCP/IP or RS232
- Internal pump included

LOW COST OF OWNERSHIP

- Non-depleting light-based measurement method
- Electronic sample and ozone flow control
- Easy to install and operate

UNRIVALLED PERFORMANCE

- Fast response time
- Accurate reading with high repeatability
- Screen and keypad for easy manual operation
- TCP/IP, RS232, Modbus, four scalable analog 0-10 V / 4-20 mA

BENCHMARK COMPLIANCE

- Conforms to UL STD 61010-1
- Certified to CAN/CSA C22.2 STD 61010.1
- EPA 40 CFR Part 1065/1066, Euro VI HD and Euro 6 LD compliant configurations available

Learn more about the SERVOPRO NOx
Visit servomex.com/NOx

PRODUCT OVERVIEW: SERVOPRO NOx

THE IDEAL SOLUTION FOR NOx EMISSION MONITORING

With the time-proven chemiluminescence detector (CLD) technology to measure NO only or NO/NO_2/NOx concentrations, the SERVOPRO NOx analyzer is a must-have solution for industrial or vehicle emissions applications. Delivering excellent linear analysis from trace levels up to high ppmv concentrations, its non-depleting photodiode measurement system helps provide a low cost of ownership across the lifetime of the product. The analyzer is equipped with a variety of field configurable options including new ranges that can be changed either manual or remotely, making the SERVOPRO NOx the ideal way to tackle any safe-area NOx monitoring application.

FLEXIBLE OPTIONS TO MEET YOUR APPLICATION NEEDS

The highly adaptable SERVOPRO NOx allows for a variety of options which can be configured in the field. Four user-definable measurement ranges for NO and NOx can be set from 0-3ppm up to 0-3,000ppm. These can be changed and recalibrated in the field either manually or remotely. A heated version is also available that allows for "wet/dry" sampling options. The standard product includes a Paramagnetic oxygen analyzer, internal valves for zero/sample/span switching, and an internal sampling pump. Whatever your application requirements, the versatile SERVOPRO NOx can be adapted to meet them.

HIGH PERFORMANCE AT LOW COST OF OWNERSHIP

Providing highly accurate readings with rapid response time of less than two seconds to reach T_{90}, the SERVOPRO NOx analyzer delivers the quality measurement you need while keeping costs as low as possible. No vacuum pump is required and proportional electronic pressure control is used to stabilize the sample and ozone flows, reducing the lifetime cost of ownership. A low-temperature vitreous carbon NOx converter means there is no ammonia interference, while the auto calibration and ranging features ensure ease of use.

ALTERNATIVE PRODUCTS

The Servomex product range features a number of options designed to meet your application needs.

SERVOPRO 4900

A high-performance continuous emissions analyzer designed for multi-gas measurement of NO, NOx, CO and SO_2 pollutants, greenhouse gases and reference oxygen, the 4900 combines impressive monitoring power with low cost of ownership for an attractive analytical package.

SERVOPRO SO_2

Designed for industrial applications that require accurate emissions monitoring of low level sulfur dioxide (SO_2), the robust SERVOPRO SO_2 uses UV Fluorescent technology to deliver a continuous measurement you can rely on.

SERVOPRO HFID

A high-performing on-line heated Flame Ionization Detector based analyzer that provides a robust and high-accuracy solution for THC, NMHC and CH_4 measurements, ensuring real-time gas stream analysis without the need of a gas chromatograph for separation of the methane.

KEY APPLICATIONS

- Continuous emissions monitoring (CEMs)
- Ambient air monitoring
- Scrubber efficiency
- Combustion efficiency
- Turbine/generator feedback control
- Process gas analysis
- Vehicle emissions
- Engine testing
- SCR / SNCR feedback control

SERVOMEX TECHNOLOGIES

ZIRCONIA | GAS FILTER CORRELATION | CALORIMETRY | THERMAL CONDUCTIVITY

UV FLUORESCENCE | ALUMINUM OXIDE | CHEMILUMINESCENCE | PARAMAGNETIC

PRODUCT DATA: SERVOPRO NOx

SPECIFICATIONS	DESCRIPTION	ADDITIONAL INFORMATION
Detector technology	Chemiluminescence photodiode detector	Thermally stabilized with Peltier cooler
Gas	NO/NO_2/NOx	Calculated NO_2 derived from the NOx converter efficiency
Model	Two variants	Standard or Heated (HCLD)
Range	Four user-definable	User-definable from 0-3 to 0-3,000ppm
Response time	<2 seconds to 90% full scale	
Repeatability	Better than 0.5% of full scale	
Linearity	Better than 1% of full scale	
Noise	Less than 0.5% of full scale	
Zero and span drift	Less than 1% of full scale per 24 hours	
Zero and span adjustment	Via front panel, TCP/IP or RS-232	
Oxygen methodology	Paramagnetic	0-25% standard, 0-100% optional
Interference Effects	NH_3 (10 ppm), HCN (28 ppm) and SO_2 (500ppm), CO (1,000 ppm), N_2O (200 ppm)	No interference detectable
CO_2 effect	Less than 2% with 10% CO_2	
H_2O effect	Less than 1% with 1% H_2O	
Sample flow rate	Typically 0.6 liters per minute	
Output options	TCP/IP, RS232 (using AK Protocol), Modbus, four scalable analog 0-10 V / 4-20 mA	
Converter	Vitreous carbon material @ 205C > 95% efficiency	
Flow control	Electronic proportional pressure controller	
Air or O_2 requirement	Less than 0.01ppm NOx at 240 cc/min @ 25 psig	≤-10°C Dew point
NO/NOx control	Manual/remote/auto cycle	
Ambient humidity	Less than 90% RH non-condensing	
Warm-up time	1 hour (typical)	
Fittings	1/4" (6.35mm) tube	
Power requirements	115/230 (+/- 10%) VAC, 50/60Hz, 560W	
Dimensions	133.35mm (5.25") hide x 482.6mm (19") wide x 584.2mm (23") deep	
Weight	21.8kg (48lb)	

PRODUCT DATA:
SERVOPRO NOx

DEVICE SPECIFICATION

Size:

- 133.35mm (5.25") high x 482.6mm (19") wide x 584.2mm (23") deep

Weight:

- 21.8kg (48lb)

Operating Temperature:

- 5-40°C (41-104°F)

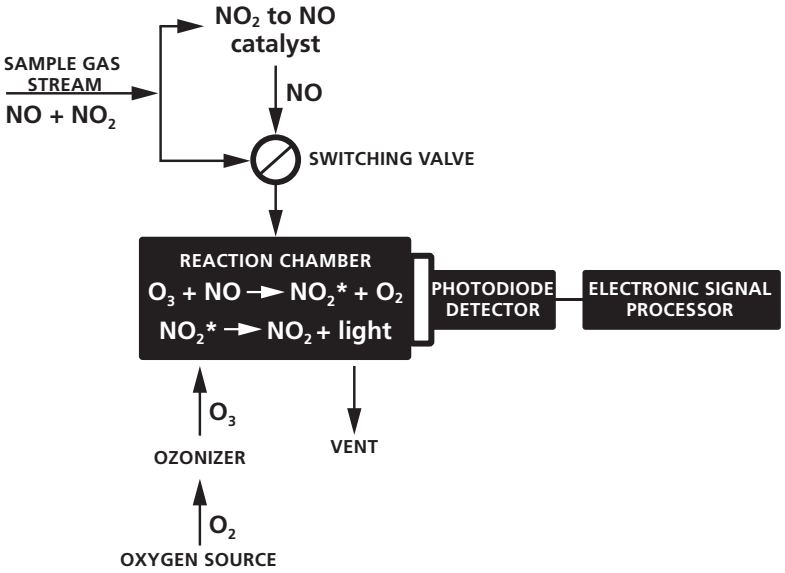
Compliance:

- Conforms to UL STD 61010-1
- Certified to CAN/CSA C22.2 STD 61010.1
- EPA 40 CFR Part 1065/1066, Euro VI HD and Euro 6 LD compliant configurations available

SENSING TECHNOLOGY

Chemiluminescence (CLD)

Servomex CLD analyzers use a thermally-stabilized photodiode to measure the intensity of the light produced by the reaction of nitric oxide (NO) with ozone (O_3). The light intensity is directly proportional to the concentration level of NO that was converted to NO_2 by the reaction.



The analyzer can also convert the NO_2 in the gas stream to NO, which is then passed to the O_3 reaction chamber, resulting in the total NOx value that was present, allowing the analyzer to speciate the concentrations of NO, NO_2 and total NOx with the same analyzer.

PBNOx Rev.0 Date: 06/17

These analyzers are not intended for any form of use on humans and are not medical devices as described in the Medical Devices Directive 93/42EEC.

Please note: *This document was updated in APRIL 2017. While every effort has been made to ensure accuracy, no responsibility can be accepted for errors or omissions. Data may change, as well as legislation, and you are strongly advised to obtain copies of the most recently issued regulations, standards and guidelines. This document is not intended to form the basis of a contract.*