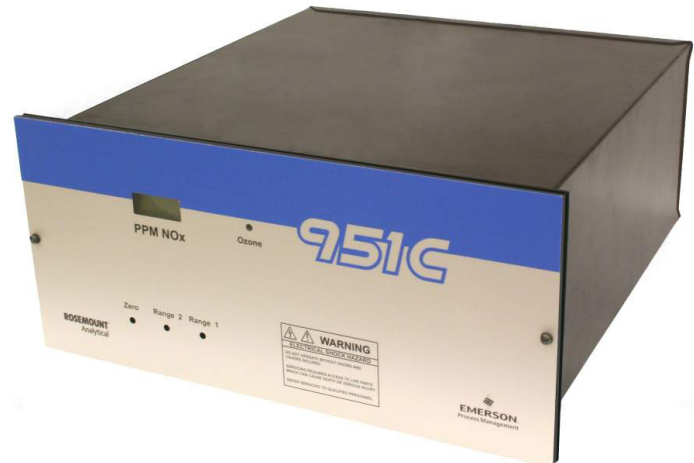


# NO<sub>x</sub> Analyzer

- Measures NO<sub>x</sub> in stationary source monitoring applications
- 0.1 ppm sensitivity
- Standard 19" rack mounting
- 4 field-selectable ranges
- Thermoelectrically-cooled detector and temperature-controlled case
- Atmospheric pressure operation
- Internal UV ozone generation
- Internal sample bypass flow
- Automatic air switch prevents ozone damage
- 4 1/2-digit LCD display in ppm NO<sub>x</sub>
- Meets or exceeds CEMS application needs



## FEATURES

Simplified operation and ease of maintenance are the key design features of Emerson's Rosemount Analytical Model 951C NO<sub>x</sub> Analyzer. Designed for source emissions analysis in Continuous Emission Monitoring Systems (CEMS), the Model 951C delivers top performance and reliability. With the thermoelectrically-cooled photomultiplier tube and temperature-controlled case, the Model 951C offers superior low-range performance.

Featuring precision of 0.5%, the Model 951C NO<sub>x</sub> Analyzer delivers accurate measurement over a wide selection of fullscale ranges. Simplified operation and maintenance of the Model 951C are assured by the convenience of front pull-out access to all serviceable parts and operating controls.

A 4 1/2-digit, backlit LCD display ensures high visibility of concentration reading at all levels of ambient light. Designed for single range operation, the model 951C front panel includes recessed zero and span controls leaving a clean, modern instrument look.

The Model 951C NO<sub>x</sub> Analyzer features a heated, temperature-controlled, carbon-based converter for NO<sub>x</sub> analysis. This unique converter, operating at a relatively low temperature offers prolonged life and freedom from interference that may adversely affect other types of converters. Control of the converter temperature and a heater indicator lamp are provided behind the front panel for simple adjustment.

Since the analyzer's reaction chamber operates at atmospheric pressure, problems normally associated with auxiliary vacuum pumps are eliminated.

To minimize system response time, an internal sample-bypass feature provides high-velocity sample flow through the analyzer.

The Model 951C internally generates reactant ozone by exposing air to ultraviolet (UV) radiation from a source lamp.

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Analytical

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**EMERSON**<sup>™</sup>  
Process Management

The use of UV radiation to produce ozone eliminates the generation of spurious NO normally found in corona discharge type generators. To ensure safety during normal operation, the ozone generator operates at a temperature far below the ignition point of surrounding materials. A pressure activated switch quickly shuts off the ozone generator when reactant air or oxygen is removed thereby preventing lamp and analyzer damage from ozone build-up.

Low installation and maintenance costs are designed into the analyzer. The 19" rack mountable, unitized enclosure has all electrical and signal connections conveniently located behind a rear access panel.

The Model 951C offers four selectable fullscale ranges of 10, 25, 100, 250 ppm NO<sub>x</sub> with electronic zero and span controls for simple calibration adjustment. A mid range option is available including 20, 50, 200 and 500 ppm NO<sub>x</sub>. A high range option is available including 100, 250, 1000 and 2500 ppm NO<sub>x</sub>. Continuous recorder outputs of 0 to 5 VDC and 0/4 to 20 mA are available at rear panel terminals.

## PRINCIPLE OF OPERATION

The chemiluminescence detection technique is based on the principle that nitric oxide (NO) reacts with ozone (O<sub>3</sub>) to produce nitrogen dioxide (NO<sub>2</sub>), 10% electronically excited nitrogen dioxide (NO<sub>2</sub><sup>\*</sup>) and oxygen. Following the NO-O<sub>3</sub> reaction, the NO<sub>2</sub> molecules immediately revert to NO<sub>2</sub>. This process creates a light emission directly proportional to the NO concentration in the sample. The intensity of the resulting light emission is then measured by a photomultiplier tube and associated electronics. An NO<sub>2</sub> to NO converter is used for NO<sub>x</sub> (NO + NO<sub>2</sub>) analysis.

## SPECIFICATIONS\*

### Ranges:

**Low Range:** 0 to 10, 0 to 25, 0 to 100, 0 to 250 ppm NO<sub>x</sub>

**Mid Range:** 0 to 20, 0 to 50, 0 to 200, 0 to 500 ppm NO<sub>x</sub>

**High Range:** 0 to 100, 0 to 250, 0 to 1000, 0 to 2500 ppm NO<sub>x</sub>

**Repeatability:** Within 0.1 ppm or 1% of fullscale, whichever is greater

**Zero/Span Drift:** Less than ±0.1 ppm or ±1% of fullscale, whichever is greater, in 24 hours at constant temperature

Less than ±0.2 ppm or ±2% fullscale, whichever is greater, over any 10°C interval from 4 to 40°C

**Response Time:** Electronic + flow: 90% of fullscale response in less than 60 seconds

**Sensitivity:** Less than 0.1 ppm or 1% of fullscale, whichever is greater

**Detector Operating Pressure:** Atmospheric

**Total Sample Flow Rate:** 1 liter per minute, typical at 20 psig

**Sample Pressure:** 20 psig (138 kPa)

**Support Gas:** Breathing grade air, typical at 20 psig

**Ambient Temperature Range:** 40° to 104°F (4° to 40°C)

### Analog Output:

**Potentiometric:** 0 to +5 VDC, 2000 Ω minimum load

**Isolated current:** Field-selectable 0 to 20 or 4 to 20 mA; 700 Ω maximum load

**Display:** Digital, 4 1/2-digit LCD, backlit readout in engineering units

**Power Requirements:** 115/230 VAC ±10%. 50/60 Hz ±3 Hz, 570 W maximum

**Enclosure:** General purpose for installation in weather protected areas

**Overall Dimensions:** 8 11/16 inches (221 mm) H

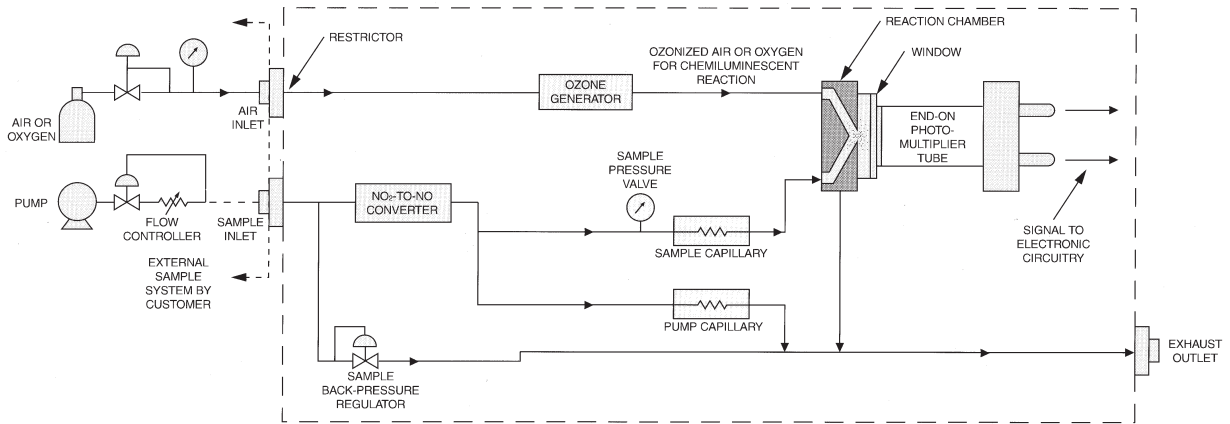
19 inches (483 mm) W

19 inches (483 mm) D

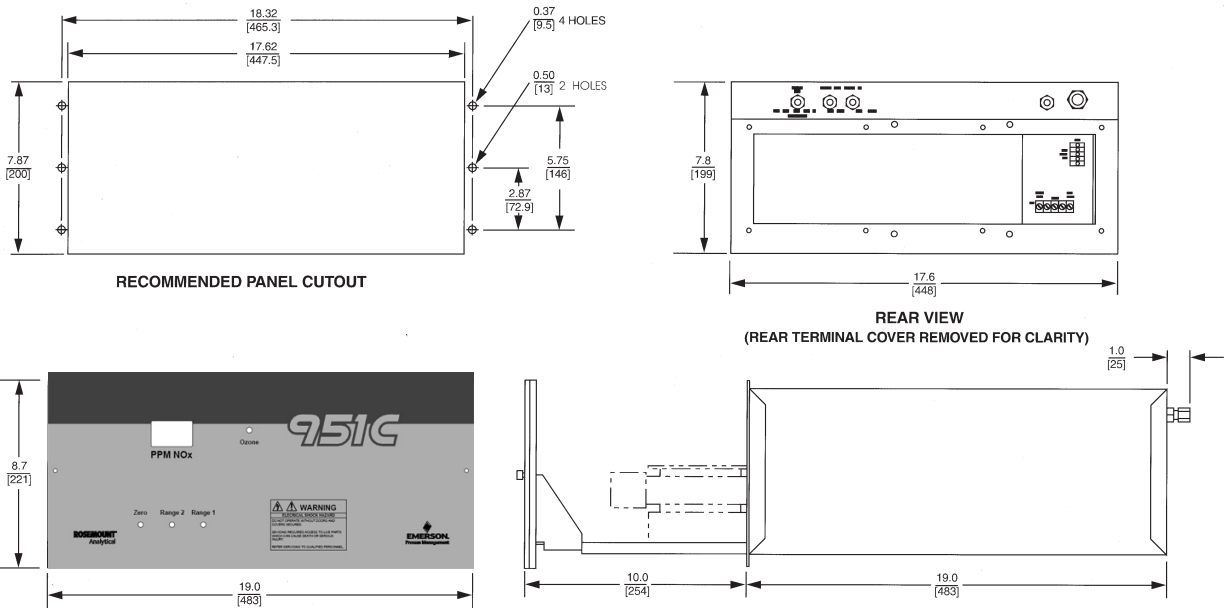
**Weight:** 60 lbs. (27 kg) approx.

\* Performance specifications based on ambient temperature shifts of less than 10°C per hour.

## SCHEMATIC FLOW DIAGRAM



## PANEL CUTOUT



## ORDERING INFORMATION

MODEL	DESCRIPTION
951C	Process Chemiluminescence NO <sub>x</sub> Analyzer (19" Rack Mount) (951C)

Level 1	Ranges
01	Low Ranges: 0-10, 0-25, 0-100, 0-250 ppm NO <sub>x</sub>
02	High Ranges: 0-100, 0-250, 0-1000, 0-2500 ppm NO <sub>x</sub>
04	Mid Ranges: 0-20, 0-50, 0-200, 0-500 ppm NO <sub>x</sub>

Level 2	Output
01	Selectable: 0-5 VDC, 0/4-20 mA

Level 3	Case
01	Standard

Level 4	Spare
00	None

Level 5	Sample Restrictor
01	Standard sample inlet, restrictor included
02	User controlled sample flow (no sample restrictor included)

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