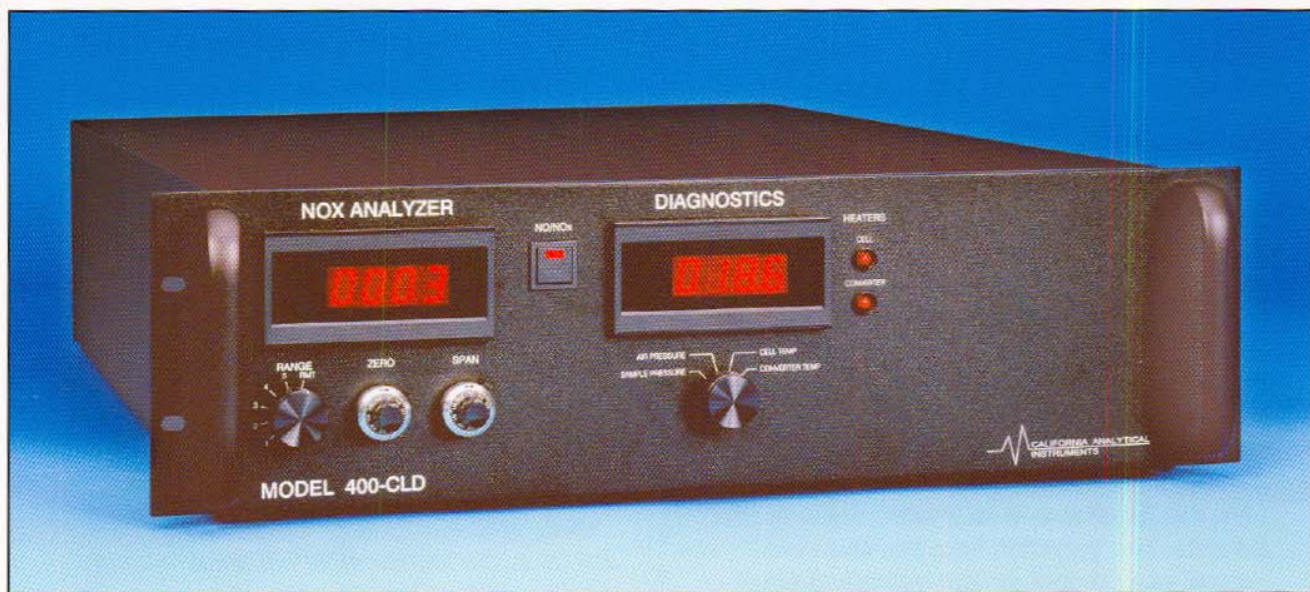


# CHEMILUMINESCENT NO/NO<sub>x</sub> ANALYZER



## Model 400 CLD

### FEATURES

- Sensitivity to 3 ppm NO/NO<sub>x</sub> Full Scale
- Automatic High Voltage Shutdown with Loss of Ozone Air
- Complete Digital Presentation Including Sample & Air Pressure (No Gauges)
- Five Ranges
- Remote Operation Capability
- Sample Pump (Optional)
- CE Approved

### CLD OPTIONS

- 19 Inch Rack Mount Slides
- Remote In-line Sample Filter
- Built-in Sample Pump

### APPLICATIONS

- Stack Gases (CEM)
- Source Monitoring
- Scrubber Efficiency
- Process Chemical Gas Analysis
- Personnel Safety
- Power Plant Stack De-Nitrification
- Vehicle Emissions
- Low NO<sub>x</sub> Applications

 **California Analytical Instruments, Inc.**

## Model 400 CLD CHEMILUMINESCENT NO/NO<sub>x</sub> ANALYZER

### DESCRIPTION

The Model 400 CLD NO/NO<sub>x</sub> Analyzer is designed to continuously measure the total concentration of oxides of nitrogen within a gaseous sample. The gaseous sample can be ambient air, exhaust gases from an internal combustion engine, or exhaust gases from a combustion process.

### METHOD OF OPERATION

The California Analytical Instruments Model 400 CLD Analyzer utilizes the principle of chemiluminescence for analyzing the NO or NO<sub>x</sub> concentration in a gaseous sample. In the NO mode, the chemiluminescence reaction between ozone and nitric oxide (NO) yields excited nitrogen dioxide (NO<sub>2</sub><sup>\*</sup>) and oxygen. Approximately 10% of the NO<sub>2</sub><sup>\*</sup> produced from this reaction is in an electronically excited state. The transition from this state to a normal state produces light intensity proportional to the mass flow rate of NO<sub>2</sub> into the temperature controlled reaction chamber. The light is measured by means of a photodiode and associated amplification electronics. In the NO<sub>x</sub> mode, NO plus NO<sub>2</sub> is determined. The sample is first routed through the internal NO<sub>2</sub> to NO converter which converts the NO<sub>2</sub> in the sample to NO. The converter is preconditioned vitreous carbon; operating at relatively low temperatures of 130-200°C. Has an operating life of 10<sup>6</sup> ppm hours or one year. NO<sub>2</sub> concentrations can be converted in the entire range of the analyzer.

### SPECIFICATIONS

**ANALYSIS METHOD:** Chemiluminescence (CLD)  
Photodiode Detector

**MULTIPLE RANGE CAPABILITY:** 5 Ranges Select  
Group A, B, C, or D  
A: 0-3, 10, 20, 50, 100 ppm  
B: 0-5, 10, 25, 50, 100 ppm  
C: 0-10, 30, 100, 300, 1000 ppm  
D: 0-30, 100, 300, 1000, 3000 ppm

**RESOLUTION:** 0.02 ppm NO/NO<sub>x</sub>  
**NOISE:** Less than 0.5% of Full Scale  
**LINEARITY:** ±0.5% of Full Scale  
**REPEATABILITY:** Better than 0.5% of Full Scale  
**ZERO & SPAN DRIFT:** Less than ±0.5% of Full Scale per Week  
**ZERO & SPAN ADJUSTMENT:** Ten Turn Potentiometer  
**DISPLAY:** 4-1/2 Digit Panel Meter. Selectable 0-100% Full Scale of Direct Reading  
**DIAGNOSTICS:** 3 1/2 Digit Panel Meter with 4-Position Switch

1. Sample Pressure
2. Air Pressure
3. Cell Temperature
4. Converter Temperature

**RESPONSE TIME:** Adjustable from 1.5 to 10 Seconds to 90% of Full Scale  
**ANALOG OUTPUT:** 0-10 VDC & 4-20 mADC  
**OZONE SOURCE:** Ultraviolet Lamp  
**FLOW CONTROL:** (Sample & Ozone) Electronic Proportional Pressure Control  
**SAMPLE FLOW RATE:** 3.0 L/min. ±0.5 L/min. (pump optional = 2.5 psig); span 20-25psig  
**AIR OR O<sub>2</sub> REQUIREMENTS:** Zero grade; less than 0.1 ppm NO<sub>x</sub> at 250-650 cc/min. @ 25 psig  
**O<sub>3</sub> CONTROL:** Automatic Shutdown with Loss of Air or Oxygen Pressure  
**CONVERTER:** Vitreous Carbon material @ 200°C (130-210°C); 98 to 100% Efficiency  
**INTERFERENCES:**  
CO<sub>2</sub> @ 1% with 10% CO<sub>2</sub>  
H<sub>2</sub>O @ 1% with 3% H<sub>2</sub>O  
CO 1000 ppm not measurable  
NH<sub>3</sub> 139 ppm not measurable  
HCN 28 ppm not measurable  
N<sub>2</sub>O 201 ppm not measurable  
SO<sub>2</sub> 500 ppm not measurable  
**NO/NO<sub>x</sub> SELECTION:** Manual Push Button or Remote  
**AMBIENT TEMPERATURE:** 0-40°C  
**SAMPLE TEMPERATURE:** 0-65°C  
**WARM-UP TIME:** 1 Hour  
**FITTINGS:** 1/4" Tube, Compression  
**POWER REQUIREMENTS:** 115/230 (±10%) VAC @ 50/60 Hz, 160 watts  
**DIMENSIONS:** 5 1/4"H x 19"W x 23"D  
**RELATIVE HUMIDITY:** Less than 90% RH  
**WEIGHT:** 38 lbs.



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