



**TELEDYNE**  
ANALYTICAL INSTRUMENTS  
Everywhere you look™

Model  
**9110T Series**  
NO / NO<sub>2</sub> / NO<sub>x</sub> Analyzers  
Chemiluminescence Technology

### FEATURES

- Ranges: 0-50 ppb to 0-20 ppm (9110T) or 0-5 ppm, 0-5,000 ppm (9110TH), user selectable
- Large, vivid, and durable color graphics display with touch screen interface
- Independent ranges for NO, NO<sub>2</sub>, and NO<sub>x</sub>
- Front panel USB connections for peripheral devices and firmware upgrades
- Integral permeation dryer and catalytic ozone scrubber
- Temperature and pressure compensated
- Optional oxygenator for O<sub>2</sub>-free samples – optimal for CO<sub>2</sub> purity analysis



# 9110T Series - NO / NO<sub>2</sub> / NO<sub>x</sub> Analyzers - Chemiluminescence Technology

The Model 9110T uses the proven chemiluminescence detection principle, coupled with state-of-the-art microprocessor technology to provide the sensitivity, stability and ease of use needed for ambient or dilution CEM requirements for monitoring levels of oxides of nitrogen. The analyzer uses multi-tasking software which allows complete control of all functions while providing online indication of important operating parameters. Measurements are automatically compensated for temperature and pressure changes. In addition, stability is enhanced by an auto-zero circuit that continuously provides a true zero reference. The result is sensitive, accurate, and provides dependable performance under the harshest operating conditions.

Teledyne's Model 9110TH analyzer uses the same field-proven chemiluminescent technique for monitoring high levels of oxides of nitrogen. User-selectable ranges of 0 - 5000 ppm make it ideal for a wide variety of applications including CEM, stack testing, cement kiln inlet for clinker quality control, and process control. A choice of NO<sub>2</sub> to NO converters handles tough applications such as thermal DeNO<sub>x</sub> and stack testing. Selectable measurement

modes (NO only, NO<sub>x</sub> only, NO/NO<sub>x</sub> switching), auto ranging, and remote range control customizes the 9110TH for the end user. The modular design offers top-mounted access to all components while hinged front and rear panels simplify module replacement. The unique modular sealed ozone generator provides improved voltage coefficient, safety and reliability. A standard permeation dryer on the ozone generator means there is no desiccant to replace. In addition, the excess ozone is removed by catalytic reaction, eliminating the need for frequent charcoal scrubber replacement. The 9110TH combines rugged construction, ease of use, powerful diagnostics, and outstanding performance for higher range applications.

Both 9110T models offer an advanced color display, capacitive touch screen, intuitive user interface, flexible I/O, and built-in data acquisition capability. All instrument set up, control and access to stored data and diagnostic information is available through the front panel, or via RS232, Ethernet, or USB com ports either locally or by remote connection using the included APIcom™ software.

## AVAILABLE OPTIONS

### Calibration Options:

- Ambient zero and ambient span
- Ambient zero and pressurized span
- Zero scrubber and 2 pressurized spans
- Zero air scrubber for Z/S valves

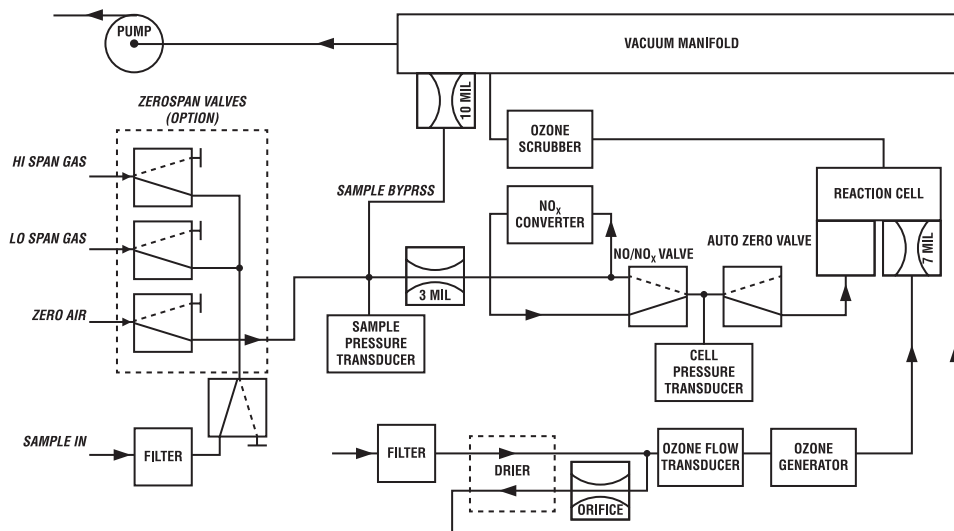
### Other Options:

- Paramagnetic O<sub>2</sub> Sensor
- CO<sub>2</sub> Sensor
- Internal moly converter with O3 killer, instead of mini-hicon

### Mounting Options:

- Rack mount brackets with chassis slides
- Rack mount brackets only
- Handle
- Concentration alarm relays
- Expendables kit

## 9110TH SCHEMATIC



# 9110T Series - NO / NO<sub>2</sub> / NO<sub>x</sub> Analyzers - Chemiluminescence Technology

## SPECIFICATIONS

General	9110T	9110TH
<b>Ranges</b>	Min: 0-50 ppb Full scale Max: 0-20,000 ppb Full scale (selectable, independent NO, NO <sub>2</sub> , NO <sub>x</sub> ranges and auto ranging supported)	Min: 0-5 ppm Full scale Max: 0-5,000 ppm Full scale (selectable, independent NO, NO <sub>2</sub> , NO <sub>x</sub> ranges and auto ranging supported)
<b>Measurement Units</b>	ppb, ppm, µg/m <sup>3</sup> , mg/m <sup>3</sup> (selectable)	ppm, mg/m <sup>3</sup> (selectable)
<b>Zero Noise</b>	< 0.2 ppb (RMS)	< 20 ppb (RMS)
<b>Span Noise</b>	< 0.5% of reading (RMS) above 50 ppb	< 0.2% of reading (RMS) above 20 ppm
<b>Lower Detectable Limit</b>	0.4 ppb	40 ppb
<b>Zero Drift</b>	< 0.5 ppb/24 hours	< 20 ppb/24 hours
<b>Span Drift</b>	< 0.5% of full scale/24 hours	< 0.5% of reading/24 hours
<b>Lag Time</b>	20 seconds	20 seconds
<b>Rise and Fall Time</b>	< 60 seconds to 95%	< 60 seconds to 95% (in switching mode)
<b>Linearity</b>	1% of full scale	1% of full scale
<b>Precision</b>	0.5% of reading above 50 ppb	0.5% of reading above 5 ppm
<b>Sample Flow Rate</b>	500 cm <sup>3</sup> /min ±10%	290 cm <sup>3</sup> /min ±10%
<b>ELECTRICAL</b>		
<b>Power Requirements</b>	100V-120V, 220V-240V, 50/60 Hz	100V-120V, 220V-240V, 50/60 Hz
<b>Analog Output Ranges</b>	10V, 5V, 1V, 0.1V (selectable)	10V, 5V, 1V, 0.1V, (selectable)
<b>Recorder Offset</b>	±10%	±10%
<b>COMMUNICATIONS</b>		
<b>Included I/O</b>	1 x Ethernet: 10/100Base-T 2 x RS232 (300-115,200 baud) 2 x USB device ports 8 x opto-isolated digital outputs 6 x opto-isolated digital inputs 4 x analog outputs (3 x 4-20mA current outputs)	1 x Ethernet: 10/100Base-T 2 x RS232 (300-115,200 baud) 2 x USB device ports 8 x opto-isolated digital outputs 6 x opto-isolated digital inputs 4 x analog outputs (3 x 4-20mA current outputs)
<b>Optional I/O</b>	1 x USB com port 1 x RS485 8 x analog inputs (0-10V, 12-bit) 4 x digital alarm outputs Multidrop RS232	1 x USB com port 1 x RS485 8 x analog inputs (0-10V, 12-bit) 4 x digital alarm outputs Multidrop RS232
<b>PHYSICAL</b>		
<b>Operating Temperature Ranges</b>	5 - 40°C	5 - 40°C
<b>Dimensions (HxWxD)</b>	7" x 17" x 23.5" (178 x 432 x 597 mm)	7" x 17" x 23.5" (178 x 432 x 597 mm)
<b>Weight</b>	Analyzer: 40 lbs (18 kg) External pump: 15 lbs (7 kg)	Analyzer: 40 lbs (18 kg) External pump: 15 lbs (7 kg)



 **TELEDYNE ANALYTICAL INSTRUMENTS**  
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**Warranty**

Instrument is warranted for one year against defects in material or workmanship

**NOTE:** Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

