

 **TELEDYNE**  
**ANALYTICAL INSTRUMENTS**

# Series 7500



Non-Dispersive  
Infrared  
Gas Analyzer

**CO2, CO, CH4, SO2, O2**



Teledyne's Series 7500 Infrared (IR) Gas Analyzer is capable of detecting up to three individual IR absorbing components (i.e. CO, CO<sub>2</sub>, CH<sub>4</sub>, SO<sub>2</sub>) on a continuous basis. Packaged in either a 19" rack mount or NEMA-4 wall mount enclosure, the Series 7500 can also be supplied with an oxygen sensor, providing the operator with a space-saving, four in one, cost-effective design. The NEMA-4 enclosure can be X or Z-purged to satisfy hazardous area installation requirements.



A high-sensitivity mass flow sensor is utilized for infrared measurements. By using a single beam, single path design in conjunction with a serial dual-layer transmission detector, the 7500 delivers long-term, drift-free performance. The oxygen concentration in the sample gas can be detected by either a built-in paramagnetic sensor, Micro-fuel cell, or an externally mounted, in-situ-based zirconium oxide sensor.

The concentration of the desired gases is displayed on a large, back-lit LCD. The user interface is intuitive and the menu / mode selection buttons, which are readily accessible, provide the operator with dynamic control and extensive diagnostic capabilities.

## FEATURES

- Simultaneous measurement of up to four components
- Excellent long-term stability
- Slide-out, chassis design to facilitate any optical or maintenance adjustments required to fine tune analyzer performance (7500A)

- In-depth, valuable analyzer functions attainable from the front-panel user interface buttons
  - o Follow & Hold output signal control (during calibration)
  - o Remote range change control
  - o Range ID signals
  - o Auto-calibration with user adjustable frequency and gas flow time setting programming capabilities
    - o Remote auto-calibration initiation
    - o Auto-calibration status contacts
    - o Instrument or calibration error contact outputs

## OPTIONS

- Percent O<sub>2</sub> detector – Paramagnetic, Micro-fuel Cell (built-in) or ZrO<sub>2</sub> externally installed, user preference
- O<sub>2</sub> correction (the conversion of measured CO and SO<sub>2</sub> readings into values at standard O<sub>2</sub> concentration).
- Communication functions:
  - o RS-232C (9 pins D-Sub connector)
  - o Half-duplex bit serial
  - o Modbus protocol

## APPLICATIONS

The Series 7500 is ideally suited for multi-parameter gas analysis requirements for:

- Combustion control within the power, pulp and paper, steel, and cement industries
- Heat treating / Inert gas blanketing atmosphere control
- Bulk-gas impurity analysis within the air separation industry
- Anaerobic digester / Bio-gas / Land-fill gas analysis
- Vent gas analysis of oxyhydrochlorination reactors (EDC)
- Off-gas analysis on PTA and Maleic Anhydride reactors
- Fluid Catalytic Cracker (FCC) regeneration gas analysis
- Ammonia / Fertilizer process gas stream analysis
- Continuous emissions monitoring

## SPECIFICATIONS

Principle of measurement: Non-dispersive infrared (NDIR) absorption method. Single source, dual-layer transmission design.

### Measurable gas components and measuring range:

	Min range	Max range
<b>CO<sub>2</sub></b>	0 - 100 ppm	0 - 100 vol%
<b>CO</b>	0 - 200 ppm	0 - 100 vol%
<b>CH<sub>4</sub></b>	0 - 1000 ppm	0 - 100 vol%
<b>SO<sub>2</sub></b>	0 - 1000 ppm	0 - 5000 ppm
<b>O<sub>2</sub> (built in)</b>	0 - 5 vol%	0 - 100 vol%
<b>O<sub>2</sub> (external zirconia)</b>	0 - 5 vol%	0 - 25 vol%

- Maximum four components measurement including oxygen
- 1 or 2 measuring ranges per component
- Measuring range ratio:  $\leq 1:5$  (except built-in O<sub>2</sub>)  
 $\leq 1:20$  (built in O<sub>2</sub>)

A maximum of four components and two ranges are selectable including an oxygen measurement. Other gases can be measured with the Series 7500. Please contact the factory for details.

Accuracy:	$\pm 1\%$ of FS range
Display:	Digital indication (4 digits – back-lit LCD)
Analog output signal:	4-20 mADC or 0-1 VDC; 550 ohms max for 4-20 mADC and 100k ohms for 0-1 VDC
Analog input signal:	For externally mounted ZrO <sub>2</sub> percent O <sub>2</sub> sensor (purchased separately)
Relay contacts:	250 VAC / 2 Amp; resistive load; all relay contacts are isolated from internal circuits
Contact input:	Non-voltage contact (On / 0V; Off / 5V, 5mA flowing at ON). Contact inputs are not isolated from one another.

*Note: Only M3.5 screw terminals are used for signal inputs and outputs*

Power supply:	100 VAC – 240 VAC; 50/60 Hz
Power consumption:	70 VA max
Operating conditions:	-5 to 45° C

### Model 7500A - Steel casing (19" rack design for indoor use)

- Dimensions: 7" H x 19.0" W x 19.4" D  
177 x 483 x 493 mm
- Weight: Approx 25 lbs (configuration dependent)

### Model 7500B - NEMA-4 enclosure (wall mount design)

- Dimensions & Weight: Application dependent
- X & Z-Purge: Configurations available for hazardous area installations

### Wetted parts

- Inlet / Outlet fittings: SUS304 NPT ¼ internal thread or Rc 1/4
- Sample cell: SUS304 / Neoprene Rubber
- Cell windows: CaF<sub>2</sub>
- Internal tubing: Application dependent (Std = Toaron tubing)

### Standard sample gas conditioning requirements

- Flow rate: 1L / min,  $\pm 0.5$  L / min
- Gas temperature: 0 to 50° C
- Pressure: 10 kPa or less (1.5 psig); sample gas should vent to atmospheric pressure.
- Dust: 100ug / Nm<sup>3</sup> or less in particle size of 0.3um or less.
- Moisture: Below the point at which saturation occurs at ambient temperature.

## EC DIRECTIVE COMPLIANCE

The product conforms to the requirements of the Low Voltage Directive 73/23/EEC and EMC directive 89/336/EEC (as amended by Directive 92/31/EEC), both as amended by Directive 93/68/EEC. It conforms to following standards for product safety and electromagnetic compatibility:

**EN61010-1:** 2001 Safety requirements for electrical equipment for measurement, control and laboratory use.

“Installation Category II”

“Pollution Degree 2”

**EN61326-1:** 1997, A1: 1998, A2: 2001

Electrical equipment for measurement, control and laboratory use — EMC requirements.

# Series 7500 Infrared Gas Analyzers



## PERFORMANCE

**Repeatability:**  $\pm 0.5\%$  of full scale

**Linearity:**  $\pm 1\%$  of full scale

**Zero drift:**  $\pm 2\%$  of full scale / week

**Span drift:**  $\pm 2\%$  of full scale / week

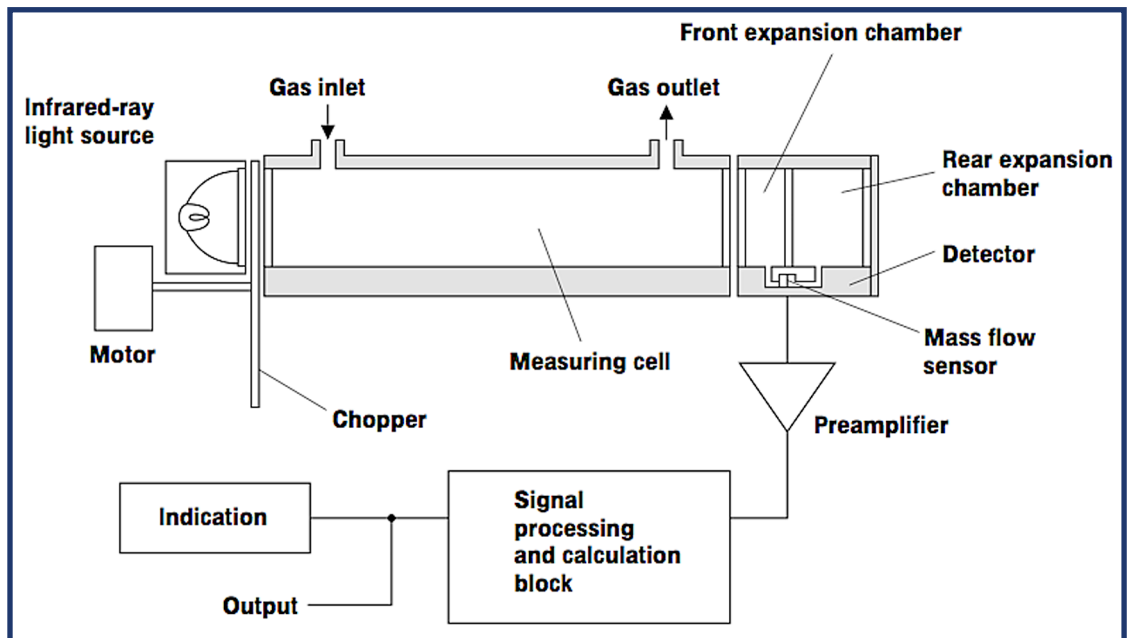
**Response time (for 90% FS response):**

One or two component measurement: within 15 seconds including replacement time of sample gas.

More than three components measurement: within 30 seconds including replacement time of sample gas.

*Model 7500B serves as the explosion proof configuration of the series. The NEMA-4 enclosure can be X or Z-purged to satisfy hazardous area installation requirements.*

**Principle diagram of NDIR type measurement (for CO<sub>2</sub>, CO, CH<sub>4</sub>, SO<sub>2</sub>)**



## **TELEDYNE ANALYTICAL INSTRUMENTS**

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## Warranty

Instrument is warranted for 1 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.

