

# Non-dispersive Infrared Gas Analyzers

## Series IR7000

**T**eledyne's Series IR7000 features excellent linearity and stability. Using advanced microprocessor technology, these instruments make monitoring a process gas stream quick and accurate.

### Optical Bench — The Heart of the System

The optical bench consists of the IR source, sample cell, and patented detector. The source control circuit provides a current square wave to the infrared source. No mechanical chopper / motor is used, thereby avoiding moving parts. The closed sample path between source and detector eliminates interfering absorption from ambient air. Infrared energy from the source passes through the sample cell where energy at specific wavelengths is absorbed by the sample.

The patented detector consists of two chambers in optical series with a sensitive flow transducer to measure the relative infrared energy absorbed. The advantage of this detector over others is that the signals are balanced to improve sensitivity and selectivity, thereby minimizing background process gas interference.

### Front Panel Ease

All operations are selected through the four front panel buttons. The operator can control calibration gas concentration, automatic calibration frequency, active chart well as manual zero and span calibrations. All operator settings are protected by battery backup.

### Standard Features

- User selected auto-zero, auto-span calibration
- Linearized instrument range, eliminating need for separate instruments to achieve full scale span
- Closed sample path is not exposed to ambient air eliminating the need for periodic purging
- 4 selectable chart recorder ranges
- Modular design for easy maintenance
- Configured to accommodate an optional oxygen channel
- Low power requirements. No heat build up and therefore no premature failure of components.
- No moving parts associated with the optical bench.
- No "tuning" required with optics unlike competitive NDIR methods
- The signal from the detector is digitized making signal processing reliable and flexible
- Thorough self-diagnostics software package
- Easy set up and interface
- CE marked



### Applications

- Chemical and petrochemical processes
- Combustion and flue gas processes
- Pulp and paper
- Vapor recovery systems
- Air separation
- Metals, ceramics and heat treating atmospheres
- Land fill gas power stations
- Carbon dioxide scrubber efficiency
- CO/CO<sub>2</sub>/C<sub>2</sub>H<sub>4</sub> monitoring in oxyhydrochlorination process in EDC manufacturing
- Cement plant applications (CO, CO<sub>2</sub>, O<sub>2</sub>)

### Model Designations

- IR7000* Panel / 19" rack mount - CE mark approved
- IR7010* Split architecture  
(analysis unit - explosion proof)
- IR7000P* Portable
- IR7000T* Trace gas
- IR7000D* Dual bench
- IR7000B* Wall mount

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## Specifications

Measuring method: NDIR single beam  
 Gas measured: User specified  
 Measuring range: Per application  
 Response time (T90): User selectable typically 15 - 60 seconds for nominal flow rates  
 Display: Vacuum fluorescent  
 Alarms: High and low limit, user selectable, 1 A, 60 VDC, 30 VAC  
 Analog output: Selectable 1,5, or 10 volts; optional isolated 4-20mA current loop  
 Max. load impedance: 4-20 mA isolated output 500 ohms  
 Analog ranges: 4, each with adjustable full scale; selectable auto range  
 Cal valve actuation: Isolated triac control. Rated maximum load: 0.6 amp at instrument voltage  
 Power source: 120/240 VAC, 50/60Hz (Portable model includes rechargeable batteries - minimum 6 hours continuous operation)  
 Max. power consumption: 110 VAC supply - 2 amps  
 230 VAC supply - 1 amp  
 Power consumption: 50 watts/channel  
 Materials in sample flow path: Glass, gold, buna-n, lexan, epoxy, sapphire, 304 stainless steel  
 Sample flow: 0.2 to 2.0 liters/minute (Trace gas — 5.0 - 10.0 liters/minute) (Portable — internal sample pump)  
 Sample temp: -10° to +50°C  
 Sample condition: Non-condensing, particulate free  
 Warm-up time: Usable in 60 minutes. Optimum operation in 3 hours.  
 Ambient conditions: Operating: -10° to 50°C (non-condensing) Storage: -10° to 80°C (0° to 50°C for oxygen sensor)  
 Dimensions:  
 Rack mounted and dual bench: 22.5" L x 17.1" W x 5.25" H  
 571mm L x 447mm W x 133mm H (suitable for 19" rack)  
 Portable: 20.0" L x 8.5" W x 5.25" H  
 508mm L x 216mm W x 133mm H

Dimensions (cont.):  
 Wall mount: 24.0" L x 20.0" W x 6.0" D  
 609mm L x 508mm W x 152mm D

Weight:  
 Rack mounted: 38 lbs (17.2kg)  
 Portable: 19 lbs (8.6kg)  
 Wall mount: 43 lbs (19.5kg)

### Standard Ranges - IR7000 / IR7000P

Gas*	Typical Low Range*	Typical Hi Range*
CO	0-100 to 0-1000ppm	0-10% to 0-100%
CO <sub>2</sub>	0-30 to 0-300ppm	0-5% to 0-50%
SO <sub>2</sub>	0-50 to 0-500ppm	0-10% to 0-100%
NO <sub>2</sub>	0-100 to 0-1000ppm	0-10% to 0-100%
N <sub>2</sub> O	0-100 to 0-1000ppm	0-10% to 0-100%
CH <sub>4</sub>	0-300 to 0-3000ppm	0-10% to 0-100%
Propane	0-100 to 0-1000ppm	0-10% to 0-100%

Resolution: 0.1% of full scale  
 Repeatability: +/-0.1% of full scale  
 Noise: +/-0.1% of full scale  
 Accuracy: +/-0.3% of full scale determined on maximum range only and is absolute for all other ranges

### High Sensitivity Ranges - IR7000T

Gas*	Range	Range	Accuracy
CO	0-5 to 0-50ppm	0-20 to 0-200ppm	+/-0.25ppm or better/24 hrs
CO <sub>2</sub>	0-2 to 0-20ppm	0-20 to 0-200ppm	+/-0.1ppm or better/24 hrs

Resolution: 0.01ppm  
 Repeatability: +/-0.25% of full scale  
 Noise: +/-0.1% of full scale  
 Accuracy: +/-0.5% of full scale determined on max range only; is absolute for all other ranges.

\* Four outputs are available from minimum to maximum: Example CO offers 0-5, 0-10, 0-25, 0-50ppm, all represented as 0-1V output  
 \* At maximum range and constant ambient conditions  
 Other gases available by request

### Options

- 0-25% Electrochemical oxygen channel
- RS-232 interface

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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.

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