CONFIGURE-YOUR-OWN

$CO \bullet CO_2 \bullet CH_4 \bullet O_2 \bullet SO_2$

GAS ANALYZERS

ONE COMPONENT ANALYZER

TWO COMPONENT ANALYZER

THREE COMPONENT ANALYZER

California Analytical Instruments, Inc.

FEATURES

- Made in U.S.A.
- Up to 3 Individual Analyzers in 1 Compact Case 5¼″H x 19″W x 23″D

NONDISPERSIVE INFRARED

- CE approved
- From Low ppm to 100%
- Single Beam Optics
- No Optical or Mechanical Adjustments Required
- Microflow Detector
- Unmatched Reliability
- Excellent Stability
- Lowest Sensitivity to Vibration
- Digital Concentration Display
- Linear Output
- Alarms (optional)
- RS-232 (optional)

OXYGEN–Paramagnetic

- Quick Response (2 Sec)
- High Stability
- Temperature Controlled
- Multiple Ranges
- Low Interference to Other Gases
- No Routine Cell Maintenance
- Linear Output
- Digital Concentration Display
- Alarms (optional)
- RS-232 (optional)

OXYGEN–Galvanic Fuel Cell

- Low Cost
- Compact
- Reliable
- Fast Response (5 Sec)
- Multiple Ranges
- Linear Output
- Digital Concentration Display
- Alarms (optional)
- RS-232 (optional)

APPLICATIONS

- EPA Compliance
- Combustion Efficiency Boilers, Incinerators, Furnaces & Commercial Ovens
- Stack Gases CEM
- Vehicle Emissions
- Process Chemical Analysis
- Controlled Atmospheres
- Landfill Emissions (CO_2, CH_4)

DESCRIPTION

NONDISPERSIVE INFRARED (NDIR)

The heart of the CAI Infrared Analyzer Series is the unique optical bench. The single beam design requires no optical alignment. Sample cells have inexpensive, replaceable gold foil liners should sample contamination occur. The highly sensitive and extremely reliable microflow detector provides greater detectability, great stability and a lower sensitivity to vibration than conventional analyzers utilizing solid state or condenser microphone detectors. Couple this optical bench to the electronics and compact case design of the CAI series, and you have a truly customized, state-of-the-art analyzer at an unbelievably low price.

OXYGEN

CAI offers two oxygen analyzer options for the 100, 200, 300 series.

A. Low cost but reliable galvanic fuel cell.
B. High performance compact paramagnetic sensor.

Either option or both can be selected for the series. Both read directly in digital percent oxygen. Both have multiple ranges and multiple linear outputs. They may be configured as a stand-alone analyzer series 100 or teamed with an NDIR bench in the series 200 or 300 to deliver a multicomponent solution to your gas analysis requirements.

METHOD OF OPERATION

NONDISPERSIVE INFRARED (NDIR)

The CAI NDIR analyzer section is based on the infrared absorption characteristics of gases. Using a single infrared beam to measure gas concentrations, this analyzer produces highly stable and reliable results.

A single infrared light beam is modulated by a chopper system and passed through a sample cell of predetermined length containing the gas sample to be analyzed. As the beam passes through the cell, the sample gas absorbs some of its energy. The attenuated beam (transmittance) emerges from the cell and is introduced to the front chamber of a two-chamber infrared microflow detector. The detector is filled with the gas component of interest and, consequently, the beam experiences further energy absorption. This absorption process increases the pressure in both chambers. The differential pressure between the front and rear chambers of the detector causes a slight gas flow between the two chambers. This flow is detected by a mass-flow sensor and is converted into an AC signal. The AC signal is amplified and rectified into a DC voltage signal and ultimately supplied to the output terminal and digital panel meter. The electrical output signal is directly proportional to the concentration of the sample gas.

OXYGEN–Paramagnetic

The CAI oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

The CAI measuring cell consists of a dumbbell of diamagnetic material, which is temperature controlled electronically at 50°C.

The higher the oxygen concentration, the great the dumbbell is deflected from its rest position. This deflection is detected by an optical system connected to an amplifier. Surrounding the dumbbell is a coil of wire. A current is passed through this coil to return the dumbbell to its original position. The current applied is linearly proportional to the percent oxygen concentration in the sample gas. This concentration is displayed on a digital panel meter.

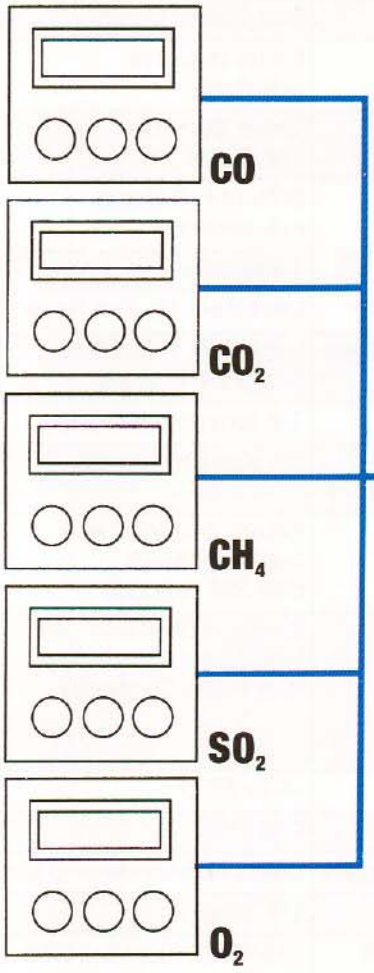
OXYGEN–Galvanic Fuel Cell

The CAI oxygen analyzer utilizes a low cost fuel cell to determine the percent level of oxygen contained in the sample gas. The oxygen level is displayed on a digital panel meter.

CONFIGURE-YOUR-OWN GAS ANALYZER...EASY AS 1, 2, 3!

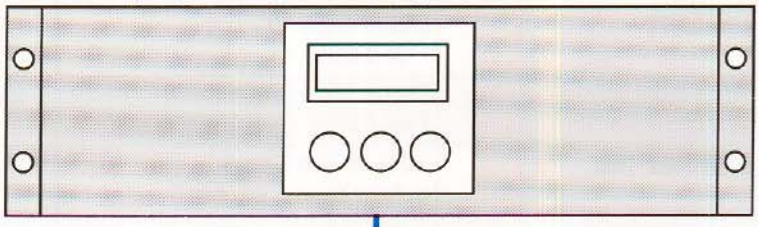
1. Select the Component Analyzer(s) for your specific requirements.
2. Select the case required for the number of Component Analyzers (up to 3).
3. Select the required ranges for each Component Analyzer specified.

1. COMPONENT ANALYZERS

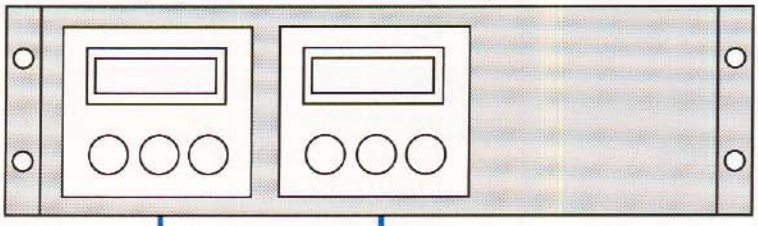


2. RACK MOUNT CABINETS

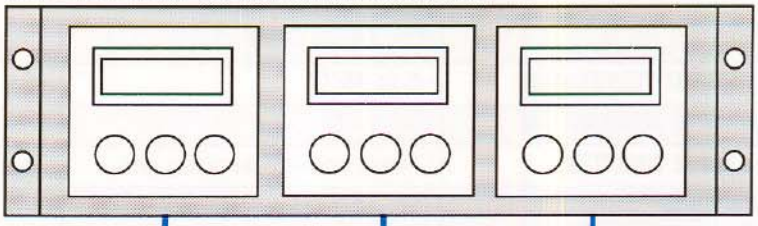
Model 100 (any 1 component analyzer)



Model 200 (any 2 component analyzers)



Model 300 (any 3 component analyzers)



3. MEASURING RANGES

COMPONENT	RANGE 1		Range 2 (Standard)	Ranges 3 & 4 (Optional)
	LOWEST POSSIBLE	HIGHEST POSSIBLE		
CO	0 to .02% (200ppm)	0 to 100%	Select One: a) 2X Range 1 b) 3X Range 1 c) 4X Range 1 d) 5X Range 1	Select One: a) 2X Range 1 b) 3X Range 1 c) 4X Range 1 d) 5X Range 1
CO_2	0 to .02% (200ppm)	0 to 100%		
CH_4	0 to .01% (1,000ppm)	0 to 100%		
SO_2	0 to .1% (1,000ppm)	0 to 10%		
O_2	Standard fixed ranges (Choose A*, B or C)	A) **Range 1:** 0 to 1%, **Range 2:** 0 to 15%, **Range 3:** 0 to 25%, plus Remote B) **Range 1:** 0 to 5%, **Range 2:** 0 to 10%, **Range 3:** 0 to 25%, plus Remote C) **Range 1:** 0 to 25%, **Range 2:** 0 to 40%, **Range 3:** 0 to 100%, plus Remote		

**Ranges A not available for Galvanic Fuel Cell*

SPECIFICATIONS

SPECIFICATION	NONDISPERSIVE INFRARED (NDIR)	OXYGEN	
	CO | CO_2 | CH_4 | SO_2	O_2	O_2
DETECTOR	Microflow	Paramagnetic	Galvanic Fuel Cell
SAMPLE CONTACT MATERIAL	Stainless steel and Tygon† disposable gold plated cell liner. Window material CaF_2	Platinum, Glass, Stainless Steel, Viton and Tygon†	Stainless Steel and Tygon†
RANGES	See Table, Page 3	See Table, Page 3	See Table, Page 3
LINEARITY	Better than 1% Full Scale	Better than 1% Full Scale	Better than 1% Full Scale
REPEATABILITY	Better than 1% Full Scale	Better than 1% Full Scale	Better than 1% Full Scale
RESPONSE TIME	90% of Full Scale in less than 1 second*	90% of Full Scale in 2 seconds	90% of Full Scale in 5 seconds
SAMPLE FLOW RATE	0.5 to 2 liters/minute	1 liter/minute	1 liter/minute
NOISE	Less than 1% Full Scale	Less than 1% Full Scale	Less than 1% Full Scale
ZERO & SPAN DRIFT	Less than 1% of Full Scale in 24 hours	Less than 1% of Full Scale in 24 hours	Less than 1% of Full Scale in 24 hours
ZERO & SPAN, ADJUSTMENT	Ten turn potentiometer	Ten turn potentiometer	Ten turn potentiometer
DISPLAY	Individual 4½ digit panel meter	3½ digit panel meter	3½ digit panel meter
OUTPUTS	Select: 0-10VDC or 4-20 or 0-20mA (RS-232 optional)	Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)	Select: 0-10VDC and 4-20 or 0-20mA (RS-232 optional)
ALARMS (optional)	2 each Form C-10A SPDT and Form A-5A SPST (Dry Relay Contacts)	Single or Dual SPDT-5A (Dry Relay Contacts)	Single or Dual SPDT-5A (Dry Relay Contacts)
AMBIENT TEMPERATURE	–5 to 45°C	–5 to 45°C	–5 to 45°C
SAMPLE TEMPERATURE	0 to 50°C	0 to 50°C	0 to 50°C
SAMPLE CONDITION	Clean, non-condensing gas	Clean, non-condensing gas	Clean, non-condensing gas
FITTINGS	1/4″ tube	1/4″ tube	1/4″ tube
POWER REQUIREMENTS	115/220/240 VAC, 50/60 Hz, 70 watts/channel	115/220/240 VAC, 50/60 Hz, 70 watts/channel	115/220/240 VAC, 50/60 Hz, 70 watts/channel
DIMENSIONS	5¼″H x 19″W x 23″D 133mm x 483mm x 508mm	5¼″H x 19″W x 15″D 133mm x 483mm x 381mm	5¼″H x 19″W x 15″D 133mm x 483mm x 381mm
RELATIVE HUMIDITY	Less than 90% R.H.**	Less than 90% R.H.**	Less than 90% R.H.**
WEIGHT (single unit)	24 lbs. (approximate) 10.8 Kg	15 lbs. (approximate) 6.8 Kg	10 lbs. (approximate) 4.8 Kg

*Depending on cell length and flow rate **Non-condensing

Specifications are subject to change without notice.

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†Tygon is a registered trademark of the Norton Performance Plastics Corporation