HORIBA
Process & Environmental

NEW

TRACE GAS MONITOR

GA-370

Continuous and ultrahigh-sensitivity measurement of trace impurities (CO, CO_2 and CH_4) in high-purity gas

For monitoring quality control of manufactured high-purity gases at air separation and semiconductor plants

GA-370 provides constant, ultrahigh-sensitivity and high-precision monitoring of trace impurities (CO, CO_2 and CH_4) for quality control at gas manufacturing facilities.

Ultra-high Sensitive Measurements

- A cross-flow modulation dual-beam non-dispersive infrared (NDIR) analyzer provides continuous and stable zero drift-free measurements.
- Minimum detection limit (MDL) of 10 ppb which can support applications where high accuracy measurements are required.

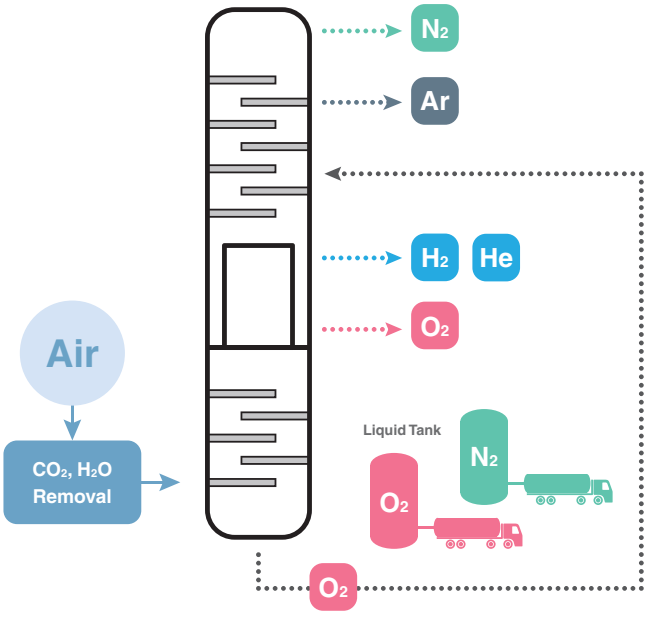
Measurement of trace impurities in a balance gas

- Representative gases such as N_2, O_2, He, Ar, H_2 and Air are supported.
  * For other balance gases, please contact HORIBA.

Easy maintenance-free operation

- Operator friendly screen menus simplify analyzer operation, calibration and measurements.
- No optical alignment ever required.
- A touch color LCD display allows operators to view graphs of accumulated data.

■ Typical Application



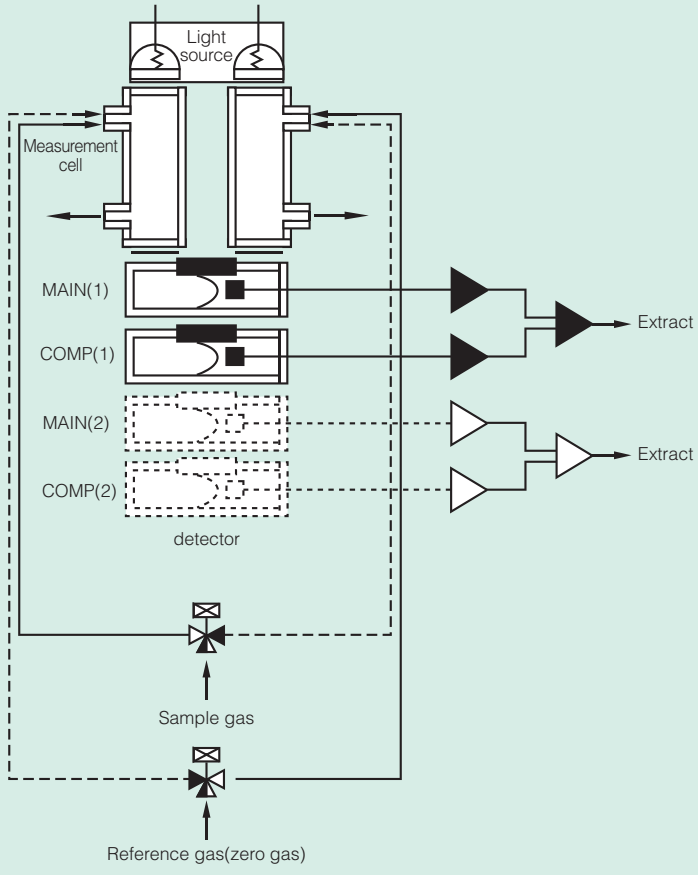
Industrial gases such as oxygen and nitrogen are manufactured by an air separation plant.
First, air that has had moisture (H_2O) and carbon dioxide (CO_2) is removed and separated to manufacture nitrogen (N_2), argon (Ar) and Oxygen (O_2). The separation process is based upon differences in boiling points of each of the constituent gases. Similarly, air separation plants manufacture other rare or inert gases such as Hydrogen (H_2) and Helium (He).

The HORIBA GA-370 Trace Gas Analyzer is a useful tool for measuring impurities that may be in the separated gas for quality control purposes.

■ Principle of Measurement

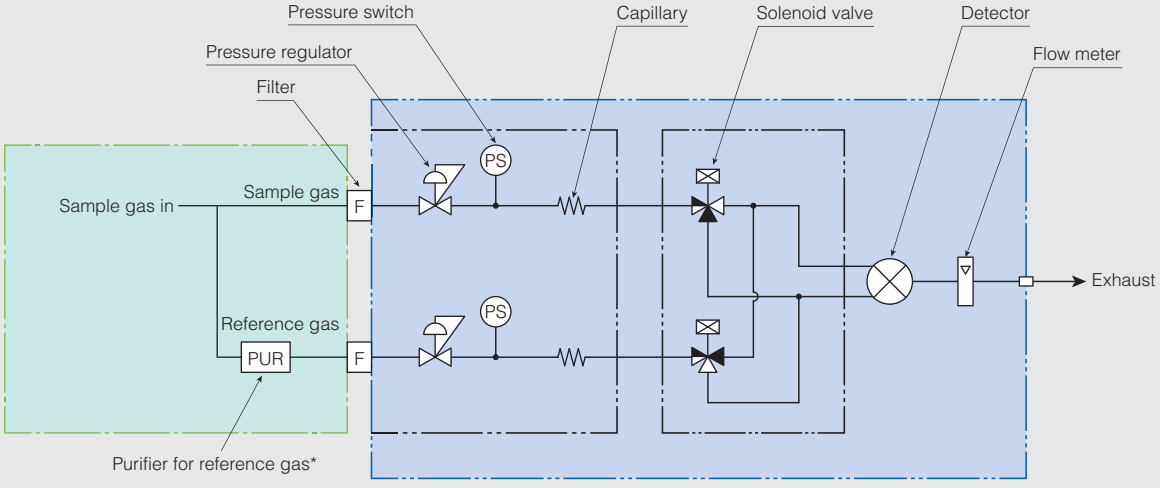
Cross-flow modulation dual-beam non-dispersive infrared analyzer

The GA-370 Trace Gas Analyzer uses an infrared beam in that passes through the cell to the detector. During measurement, a solenoid valve alternately directs the sample gas and the reference gas to the cells within the analyzer.
The presence of CO, CO_2 and/or CH_4 in the sample gas generates a difference in the intensity of light reaching the detector when the cell is filled with sample gas as compared to when the cell is filled with reference gas. The differences in absorption by the detector of the light from the two gases results in deflection of the detector's membrane to oscillate. This measurement technique eliminates any need for an optical chopper or optical adjustments as it eliminates zero drift and enhances sensitivity.



●The figure above is an example of CO, CH_4 analyzer.
●The CO_2 analyzer is not equipped with the COMP(2).

■ Flow Schematic



Customers are requested to provide components in the bulk gas.

* When it is impossible to secure the purity of reference gas in Table 1, a reference gas purifier is required.

Table 1: List of reference gases (balance gas is to be same as the sample gas)

Measured Gas	Allowable concentrations of impurities (ppb)			
	H_2O	CO	CO_2	CH_4
CO analyzer	5000	10	1000	1000
CO_2 analyzer	5000	1000	10	1000
CH_4 analyzer	5000	1000	1000	10

■ GA-370 Specifications

Model	GA-370
Gases measured	CO, CO_2, and CH_4
Bulk gases	N_2, O_2, He, Ar, H_2, Air
Number of measurement components	1 component or 2 components (specify a measuring balance gas)
Measuring principle	Cross-flow modulation non-dispersive infrared (NDIR) absorption method
Measurement ranges	0 to 1/2/5/10 ppm
Lowest detection limit (2σ)	10 ppb
Repeatability	≤±2% of full scale
Indication error	≤±2% of full scale
Zero Drift	≤±0.02 ppm/day, ≤±0.03 ppm/week
Span Drift	≤±2% of full scale/day, ≤±3% of full scale/week
Response time (T_{90})	≤180 s

Gas flow rate *		Sample gas: approx. 3.5 L/min, reference gas: approx. 3.5 L/min, span gas: approx. 3.5 L/min Note: A delivery pressure of 50-100 kPa is recommended for both sample and reference gas.
Analog output		Max. 2 channels isolated output (2 components) Select one from 0 to 1 V, 0 to 10 V, 0 to 16 mA, 4 to 20 mA, or 0 to 20 mA Current output: Allowable load resistance 750Ωor less
Installation conditions	Ambient temperature	0 to 40˚C
	Ambient relative humidity	≤85%
	Dust	Less than environmental standard
	Vibration	≤0.29 m/s², at ≤100 Hz
"External dimensions, weight"		430(W) × 221(H) × 555(D) mm (excluding protrusions), approx. 18 kg
Power supply		100 to 240 V AC, ≤±10%(max. voltage: 250 V AC)
Power consumption		Approx. 100 VA

* Note 1) Customers are required to provide reference and span gases. The purity of the measured bulk gas must equal to or lower than 0.1% of the analyzer's minimum range. A 9 ppm span gas is recommended for most applications.
* Note 2) The GA-370 Trace Gas Analyzer is not intrinsically safe. When measurements are made in an explosive gas such as H_2, the customer is required to implement proper precautions by locating the analyzer within a purged enclosure to avoid explosive conditions.

■ Related Products

Portable Gas Analyzer PG-300 Series

Measurement of max. 5 different components by single portable, lightweight and robust unit. Used for emission monitoring, R&D(fuel cell), stack cross check.

NOx | SO_2 | CO | CO_2 | O_2 | CH_4

Air Pollution Monitor AP-370 Series

Monitoring of ambient air pollutants: harmful oxides and particulate. Used for ambient air, clean room, indoor air and trace gas monitoring.

O_3 | SO_2 | NOx | CO | NH_3 | H_2S | THC | NMHC | CH_4 | SPM | $PM_{2.5}$ | PM_{10}

Multi-Component Gas Analyzer VA-5000 Series

Supports diverse needs from environmental problems to energy development support. Up to 4 components can be measured by one unit.

CO | CO_2 | N_2O | CH_4 | SO_2 | NO | NOx | O_2 | NH_3

IMS The HORIBA Group adopts IMS (Integrated Management System) which integrates Quality Management System ISO9001, Environmental Management System ISO14001, and Occupational Health and Safety Management System OHSAS18001.
We have now integrated Business Continuity Management System ISO22301 in order to provide our products and services in a stable manner, even in emergencies.

Please read the operation manual before using this product to assure safe and proper handling of the product.

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