AMETEK®
PROCESS INSTRUMENTS

MEASURES: H_2, CO, CO_2, CH_4, NHMC

PRODUCT DATA SHEET

ta5000 Gas Analyzers

Trace level gas monitoring for bulk gas, environmental and research laboratory applications

The ta5000 range is a family of instruments designed to monitor trace levels of specific impurities in bulk gases, environmental applications and research applications. All ta5000 instruments include a dedicated sample processing system, a single high-sensitivity detector, and on-board analysis electronics.

There are two models of the ta5000:

ta5000R – Reduction gas detector (RGD)
- Detects hydrogen (H_2), carbon monoxide (CO) and unsaturated hydrocarbons

ta5000F – Flame ionization detector (FID)
- Detects carbon dioxide (CO_2), methane (CH_4) and non-methane hydrocarbons

Advanced detector technology

The ta5000 gas analyzer is an isothermal gas chromatograph (GC) configured with either a RGD or FID. The chromatographic hardware of the ta5000 is available in several configurations, each of which enables the instrument to perform a highly specialized task.

Unique system combination

The primary strengths of the ta5000 detectors are extreme sensitivity from parts per million (ppm) down to low parts per billion (ppb) levels and negligible matrix effects from permanent gases. This sensitivity, combined with the separating power of GC, makes for a truly unique system.

Effective monitoring technology

The ta5000 is designed for continuous operation. Configured for a traditional 19-inch industrial rack installation, its sturdy construction also makes it suitable for transport to the field for surveys and spot tests. The ta5000 can also monitor several sampling points when interfaced with the Sigma4000 Multipoint Stream Selector. The on-board microprocessor controls the stream selector, stored calibration parameters and processes data in a variety of formats. Trace viewer software formats data, reports, alarm status and stores chromatograms on a local PC. The MGB1000 Micro Gas Blender is a complementary accessory for low concentrations and analyzer performance validation.

KEY BENEFITS

- High sensitivity
- Broad detection range
- Cost-efficient maintenance and operation
- Best value and performance
- Expandable with multipoint stream selector

APPLICATIONS

- Reduction gas detector
- Trace level detection of CO in the atmosphere
- Measurement of dissolved H_2 in water (H_2O)
- Bulk gas certification
- Monitoring of ethylene (C_2H_4) in ambient air
- Measuring safe levels of ethylene oxide (C_2H_4O) in air
- Certification of gas purifier efficiency
- Flame ionization detector
- Trace CH_4, CO_2 and non-methane hydrocarbons in inert gas streams
- Measurement of hydrocarbons in air
- Hydrocarbons in H_2O head space
- Monitoring hydrocarbon impurities in oxygen (O_2) or clean dry air (CDA)

KEY MARKETS

- Air separation
- Semiconductor manufacturing
- LCD/LED display manufacturing
- Polyethylene/polypropylene

PERFORMANCE SPECIFICATIONS

ta5000R and ta5000F specifications

ta5000R Specifications	Applications	Lower detection limit	Analysis time
	N_2	3 ppb CO; 3 ppb H_2	6 mins.
	Ar	3 ppb CO; 3 ppb H_2	6 mins.
	He	3 ppb CO; 3 ppb H_2	6 mins.
	O_2	3 ppb CO; 3 ppb H_2	6 mins.
	Dissolved H_2 in H_2O headspace	5 ppb H_2	2 mins.
	CO in air	3 ppb CO	2.5 mins.
	CO in ethylene/propylene/propane	5 ppb CO	7.2 mins.
ta5000F Specifications	**Applications**	**Lower detection limit**	**Analysis time**
	N_2	4 ppb CO_2; 3 ppb CH_4; 7 ppb NMHC	10 mins.
	Ar	5 ppb CO_2; 5 ppb CH_4; 8 ppb NMHC	10 mins.
	He	5 ppb CO_2; 5 ppb CH_4; 8 ppb NMHC	10 mins.
	O_2	7 ppb CO_2; 6 ppb CH_4; 10 ppb NMHC	10 mins.
	H_2 (CO only)	5 ppb CO	10 mins.
	H_2	5 ppb CO_2; 5 ppb CH_4; 8 ppb NMHC	10 mins.

Performance	
Precision	±1 x LDL or ± 10% of reading, whichever is greater
Accuracy	±1 x LDL or ± 10% of reading, whichever is greater
Range	0 to 3 ppmv (ta5000R); 0 to 5 ppmv (ta5000F) (higher is available as an option)
Response time	2 to 10 minutes to 99% response (varies with application). Response time is independent of sample concentration
Ambient operating temperature	16 to 32°C (50 to 90°F)
Sample compatibility	Specific models available for various applications
Resolution/display	0.1 ppb
Resolution/communication parts	0.01 ppb
Carrier gas inlet pressure range	70 to 90 psig (4.8 to 6.2 bar)
Carrier gas inlet pressure stability	±2%, regulator required
Carrier gas return pressure	Atmospheric vent is optimal, ±0.5 psig (±0.035 bar) max.
Carrier gas flow consumption	50 sccm minimum, bypass at 50 sccm
Temperature	16 to 38°C (60 to 100°F), optimum when maintained ±2°C (±3.6°F)
Carrier gas maximum impurity levels	<1 ppb, all impurities
Carrier gas	N_2 (typical)
Carrier gas purity	99.999999% (external purifier may be required)
FID air purity	<1 ppm hydrocarbons, dewpoint <-40°C (-40°F)
FID H_2 fuel purity	Hydrocarbons, CO, CO_2 <1ppm
Sample inlet	1/16-inch VICI compression
Carrier	1/16-inch VICI compression
Actuator gas	1/8-inch VICI compression
FID H_2	1/16-inch VICI compression
FID air	1/16-inch VICI compression
Sample vent	1/16-inch VICI compression
Aux	1/16-inch VICI compression
FID shut-off	1/8-inch VICI compression
Sample gas flow rate	20-100 sccm minimum
Sample gas inlet pressure stability	±2%, UHP regulator required
Sample gas vent pressure	Atmospheric pressure vent is optimal, ±0.5 psig (±0.035 bar) max.
Calibration gas inlet fitting	Sample gas inlet (1/16-inch VICI compression fitting)
Calibration gas cylinder concentration	Depends on application
Calibration gas blender recommendation	AMETEK's Trace Analytical MGB1000 Micro Gas Blender
Dimensions (W x H x D)	430 x 180 x 670 mm (7 x 16.8 x 26.5 in.)
Weight	15.9 kg (35 lb.)
Power	100-120 VAC, 50/60 Hz; 200-240 VAC, 50/60 Hz

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