

## Trace Gas Analyzer Systems

- Turnkey analyzer for lab or process
- Fully stand-alone operation
- Secure telemetry for remote view/control
- Highly configurable modular design
- MDQs for most analytes < 1 ppb

### Turnkey Analyzer

VICI Trace Gas Analyzer Systems (TGAS) are fully configured and tested gas chromatographs designed for use in high purity and ultra high purity analysis. Each instrument is fully configured and tested per user requirements. A full documentation package delivered with each instrument includes a method validation report, capability data, bill of materials, and method parameters.

Configurations for most bulk, specialty, and electronics gases are available. Standard configurations include He, H<sub>2</sub>, N<sub>2</sub>, Ar, O<sub>2</sub>, CO, CO<sub>2</sub>, CH<sub>4</sub>, C<sub>2</sub>H<sub>4</sub>, C<sub>3</sub>H<sub>6</sub>, CF<sub>4</sub>, C<sub>2</sub>F<sub>6</sub>, C<sub>3</sub>F<sub>8</sub>, NF<sub>3</sub>, HBr, AsH<sub>3</sub>, PH<sub>3</sub>, SiF<sub>4</sub>, and SiH<sub>4</sub>.

The TGAS can be set up to run automatically, or user-configured for single run analysis. This makes the TGAS an ideal option for benchtop applications in the lab or for continuous duty in a process. With the optional sampling system, the instrument can do batch or individual analysis from a fill manifold or trailer fill stanchion.

### Stand-Alone Operation

The VICI TGAS is a complete stand-alone solution for autonomous chromatographic analysis, from sample prep to final report. Everything is included in the TGAS housing, from the computer with all the necessary software and hardware to the touch-enabled wide screen display. A wireless mouse and keyboard are optional.

The TGAS can be configured to select the sample and associated method, introduce the sample, run the analysis, store the data, integrate the chromatogram, and calculate the results.



Results data can be printed via a network printer or to a local user-provided printer. The same results can be output to an analog signal for DCS and other control schemes, or to the OPC server for database or spreadsheet updates. Functionality for copper-based LAN connection and secured WIFI make the instrument available and data accessible.

### Secure Telemetry

While the TGAS is a fully functional standalone GC, there are those times when a brief check is all that is needed. Why put on your PPE and walk out into the plant or waltz across the lab to see if the analysis of that batch of samples has finished? Just point your PC browser to the TGAS secured web service, provide the proper user name and password, and access a fully configurable interface to the TGAS. There's not even any software to install!

The system can be configured for various levels of access:

- **View Only** – User has access to integration and reports.
- **Select/Start Analysis** – User can load a sample and initiate a run, a batch of runs, or a sequence.
- **Calibration Update** – User can update or modify calibrations.
- **Method Change** – User can manipulate the method, valve timing, flows, integration parameters, and temperature programs.

With appropriate IT approval/assistance, the TGAS can be accessed through a secure connection from the internet, allowing a technician to provide needed assistance without a road trip for a service call. A real time and money saver!

## Modular Design

The design of the TGAS allows a very wide range of applications to be run on a single instrument. The TGAS can be configured with a single detector or as many as four, depending on the application. The PDHID can be run in three modes – Helium Ionization, Photo Ionization, or Electron Capture. In 2016 a Micro TCD will be added, extending the range capability for applications from < 1 ppb to > 99%.

In addition to the wide dynamic range and low level sensitivity, the TGAS can be configured for redundancy so that there is always a hot backup for any two channel method. Or, two channels can be configured for one or more gas method(s), with the other two channels available for an entirely different method or gas type. There are lots of possibilities with the modular design.

If higher throughput or the need to clear heavy compounds or contamination from a sample is required, there are modular Fast Temperature Programmed ovens which can drastically reduce analysis time. As an added benefit, the FTP ovens improve peak shape and height for an even greater reduction in detection limits.

Depending on the analysis, the sample preparation required can be configured as an easy-to-access module, simplifying service and replacement if there is ever a need. The modular design also allows a path for upgrades that are much easier to accomplish than reconfiguring an entire instrument.

The standard modules are:

- **Detectors:** PHID, PDPID, PDECD, and MicroTCD (in 2016).
- **Oven/Temperature Zones:** Support for 12 programmable thermal zones and up to four Fast Temperature Programmed (FTP) zones. FTP zones can be micropacked columns, metal open tubular columns, capillary columns, programmable rate injectors, vaporizers, retention gap, or absorbers/concentrators.
- **Valve Controls:** Support for up to 16 two position and four multiposition air actuated valves and 4 two position electrically actuated valves.

## MDQs < 1 ppb

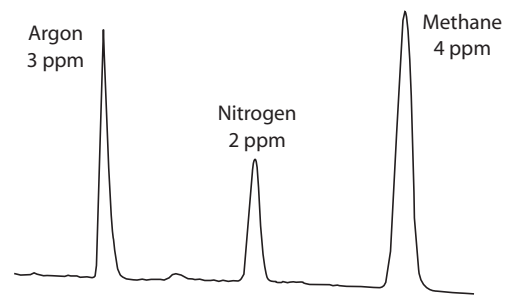
Currently our conservative guarantee for method detection with a reasonable RSD is 10 ppb for atmospheric components, day-in and day-out. But some of our customers find that once the analyzer is installed and running continuously in ultra high purity applications, TGAs are able to routinely integrate and quantify at levels of less than 1 ppb.

## Unparalleled VICI Expertise

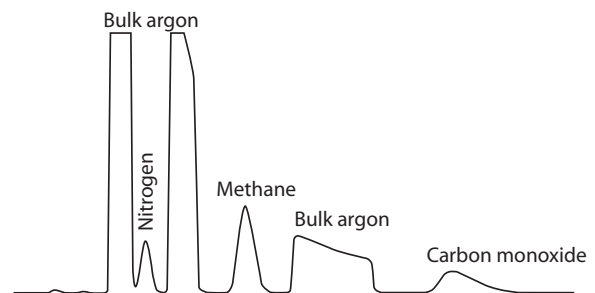
While the TGAS embodies the latest improvements in the VICI Trace Gas Analyzer product line, we have been a standard for analysis in the pure gas industry for more than 35 years. We continue to be the primary manufacturer of every major component in our systems, from valves and detectors to electrometers and Fast Temperature Programmers. We know that specifications and requirements in high purity gas supply are getting tougher, and are continuously working to improve the core products which have kept the TGA in demand over the decades.

For more information, please provide a detailed list of the requirements for your application. We will work diligently to prepare a quote in a timely fashion.

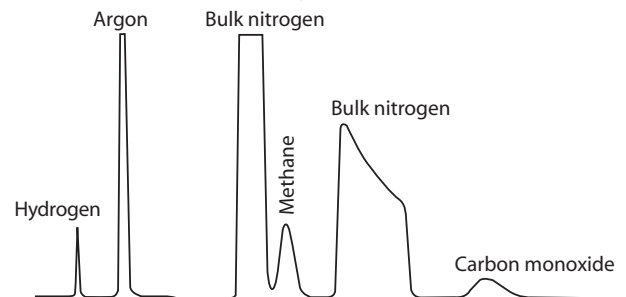
### Trace impurities in oxygen



### Trace impurities in argon



### Trace impurities in nitrogen



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