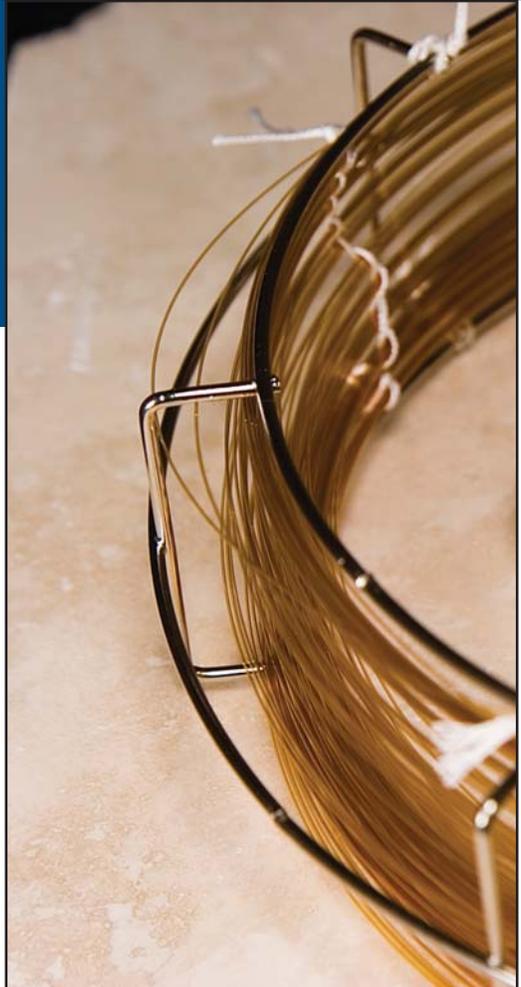


Laboratory Hardware

Custom Gas Chromatography Solutions



Engineered Solutions, Guaranteed Results.



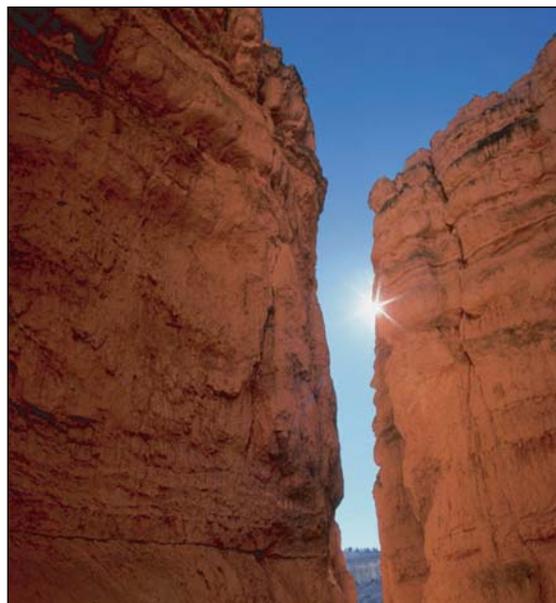
WASSON - ECE
INSTRUMENTATION

Wasson-ECE Instrumentation offers hardware only gas chromatography solutions.

Wasson-ECE Instrumentation, the leader in custom configured GC analyzers, offers hardware only solutions for customers with chromatography experience who would prefer to develop their own analysis methodology. We offer flexible equipment to ensure that our systems will work with your proprietary methodologies.

Customers ordering a hardware only configuration create guidelines for hardware design, select columns, and set operation parameters for the instrument. Wasson-ECE will then configure the hardware to customer specifications, submitting all hardware designs to the customer for final approval.

We're committed to giving customer's the solution they need. Wasson-ECE provides a limited one year warranty on the installed hardware. Our application chemists are also available for consultation to help optimize the system design.



Wasson-ECE offers the following specialty GC hardware systems:

Gas Auto-sampler

Pressurized Liquid Auto-sampler

LPG Vaporizer

Variable Pressure Sampler

Dynamic Blender

Auto-samplers

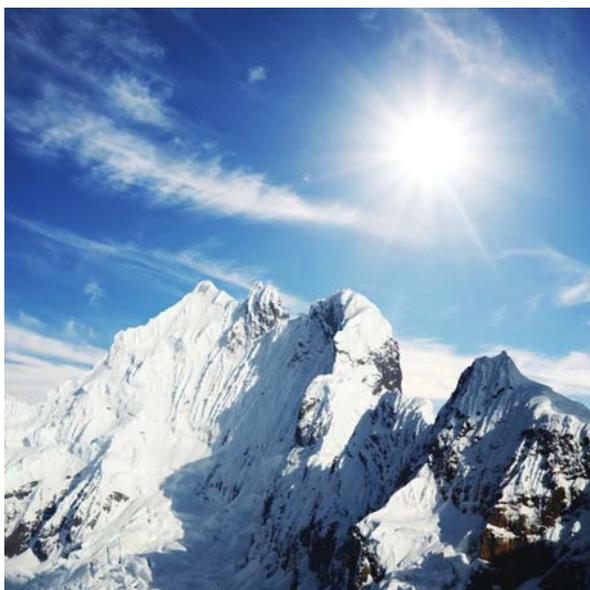
Save time and increase accuracy by adding auto-samplers to your laboratory gas chromatograph. Wasson-ECE instrumentation offers two types of auto-samplers: the [Gas Auto-sampler](#) for heating and injecting pressurized gas phase samples, and the [Pressurized Liquid Auto-sampler](#) for injecting pressurized liquid samples at ambient temperatures.

Gas Auto-sampler

The Wasson-ECE Gas Auto-sampler automates delivery of pressurized gas samples to a GC at atmospheric pressure. The Gas Auto-sampler includes an oven and heated transfer system that can send samples to the GC at temperatures of up to 150°C.

Automated Injection

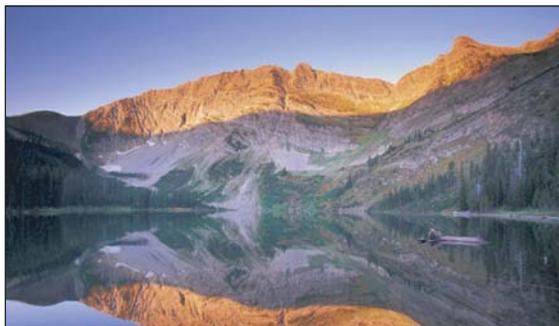
Samples are placed in the Gas Auto-sampler oven, which can hold twelve 500-cc sample cylinders or nine 1-liter cylinders. The shelves of the Gas Auto-sampler can be modified so that they are sloped to prevent injection of any residual liquids. This modification limits the number of cylinders to a maximum of eight 500-cc or six 1-liter. Technicians enter sample information into the Gas Auto-sampler software. This software enables the user to select the time interval between sample injection, set the temperature of the oven, log the sample injection times, and create data reports.



Sample Protection

The Gas Auto-sampler is a stand-alone instrument that sends samples to the GC through a heated bridge, ensuring that samples are injected at oven temperature. This heated pathway is purged with carrier gas between each sample injection, and a vacuum pump ensures an extremely low level of cross-contamination (typically less than 50 ppm).

Gas Auto-sampler



Pressure Regulation

Samples at pressures up to 1200 psig are automatically regulated during the purging sequence so the GC injects all samples and calibration blends at atmospheric pressure. The Gas Auto-sampler can also be configured to automate injection of samples that are already at atmospheric pressure.

Accuracy and Precision

Automating the sample injection process increases efficiency and prevents technicians from having to perform time consuming, repetitive tasks. The Gas Auto-sampler ensures that sample analysis is not only faster, but also more precise, accurate, and consistent.

Compare the GC analysis results for the following 2 mL samples of n-pentane and n-hexane at 100 psig in propane. In the first run, the sample is sent to the GC from the Gas Auto-sampler at ambient temperature; in the second run the Gas Auto-sampler heats the samples to 130°C before injection.

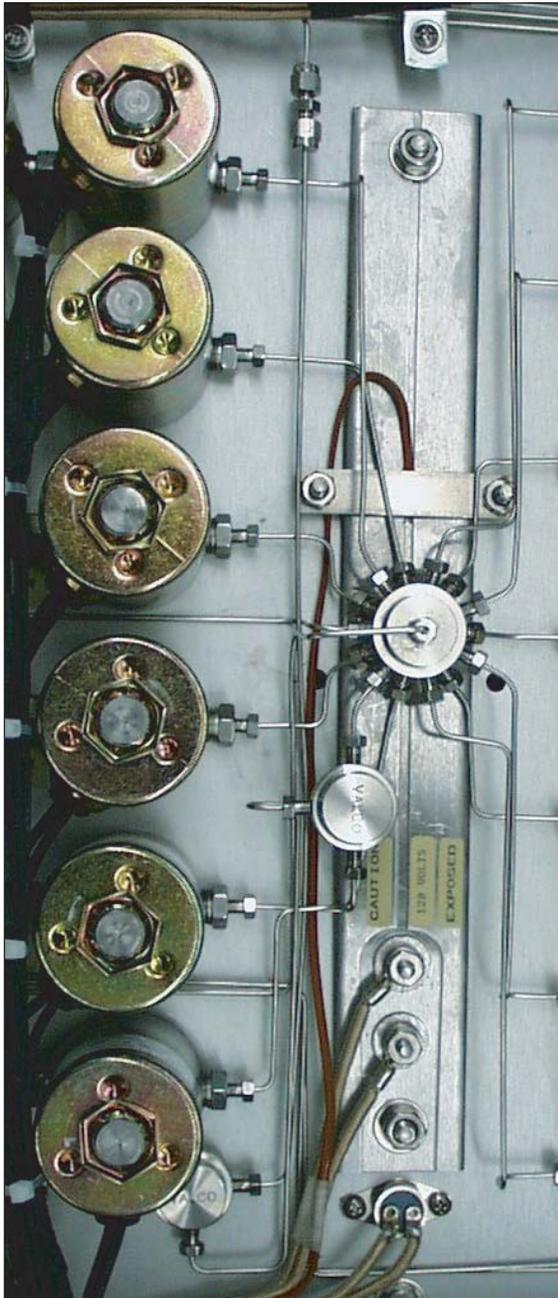
Table 1: Increase in Detector Accuracy and Precision with Heated Gas Auto-sampler

Component	Unheated Sample		Sample at 130 C		Percent change in area	Percent change in rel. std. dev.
	Avg. Peak Area	% Rel. Standard Deviation	Avg. Peak Area	% Rel. Standard Deviation		
Propane	867938	0.22 %	849415	0.23 %	- 2.1 %	+ 0.01 %
n-Pentane	24025	10.2 %	41282	1.35 %	+ 72.0 %	- 8.85 %
n-Hexane	16475	16.7 %	56087	0.80 %	+ 240.0 %	-15.9 %

The Gas Auto-sampler showed a **240%** increase in sensitivity to n-hexane and a **72%** increase in sensitivity to n-pentane when the gas sample was heated. Make sure to get the range and sensitivity needed by using the Gas Auto-sampler heated system!

Pressurized Liquid Auto-sampler

Wasson-ECE offers laboratory automation for pressurized liquid samples such as [liquefied petroleum gas \(LPG\)](#) and [natural gas liquids \(NGL\)](#). Liquid samples at pressures up to 1200 psig are stored in sample cylinders. The [Pressurized Liquid Auto-sampler](#) uses inert gases to maintain pressure so that the sample remains in the liquid state at ambient temperature as it passes to the gas chromatograph for analysis.



Pressurized Liquid Auto-sampler Features

Purges automatically with carrier gas between each sample run

Remote-starts the GC and the data recording software such as ChemStation™

Adds a date/time stamp to all samples

Holds up to nine 3.5 inch-diameter sample cylinders

Works with standard open or floating-piston sample cylinders

Pauses automatically when it detects that the GC is not running or not ready

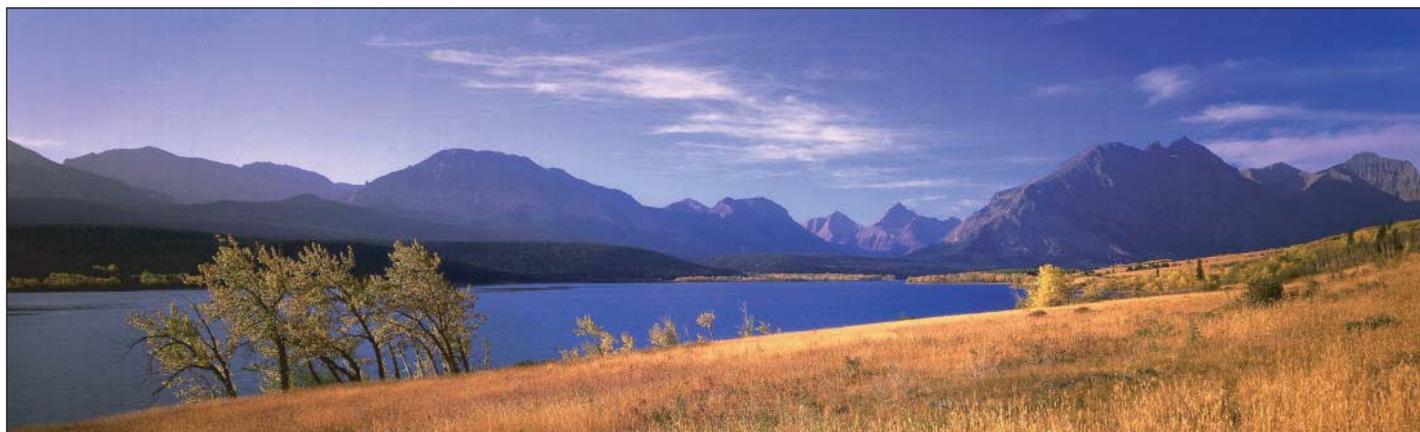
Can interrupt the scheduled sample sequence to process a priority sample

Pressurized Liquid Auto-sampler (cont.)



Quick Connect

When samples enter the laboratory, they are attached to the Pressurized Liquid Auto-sampler, which will transfer pressurized samples to the gas chromatograph. Sample cylinders with 1/4 inch tube fittings, VCO, or "Quick Connect" fittings can be inserted directly into the top plate of the sampler. These fittings will hold the sample cylinders vertically, ensuring that samples are drawn from the bottom of the cylinder. Sample cylinders with smaller tube fittings can be held vertically with an optional cylinder rack.



Variable Pressure Sampler

The **Variable Pressure Sampler (VPS)** works in two ways to ensure the precision and accuracy of gas chromatography results. The first method is **pressure correction**, used to create uniform pressure among all injected samples and the calibration blend. The second method is **multipoint calibration**, which can be used to test the pressure ranges that will deliver accurate results from a calibration blend.



Pressure Correction

The **VPS** pressure correction system is a multistep process that ensures samples and calibration blends are at uniform pressures when they are injected. First, when the calibration blend is run through the GC, the VPS measures and stores the pressure of the calibration blend at the time of injection. Then, as each sample is injected at the stored pressure, the VPS adjusts the pressure of the sample to match the pressure of the calibration blend. The inject pressure of the sample is reported to Agilent Technologies ChemStation software so calculations and quality control operations can be performed.

Multipoint Calibration

Using the **VPS**, calibration samples can be run at various pressures from a single standard. This decreases overall lab costs while ensuring greater accuracy in results.

The multipoint calibration function allows testing for signal linearity at different pressures. With this feature, the user can easily pinpoint the range of pressures which generates the most accurate and meaningful results from the calibration standard.

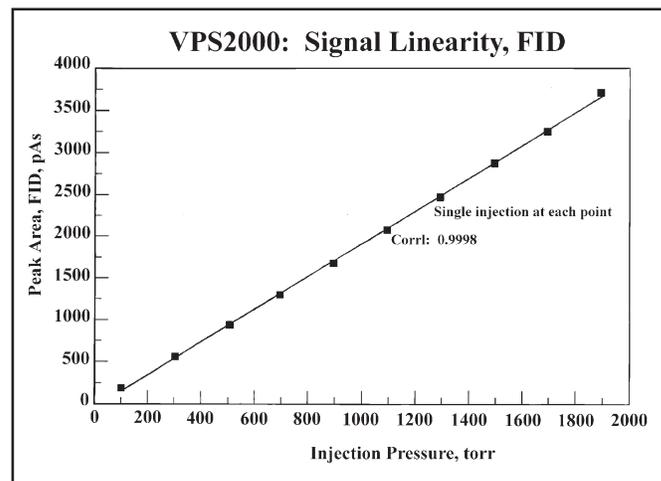


Fig. 1: Example range of linear values for the calibration blend

LPG Vaporizer

The Wasson-ECE Instrumentation **LPG Vaporizer** uses an innovative, proprietary technique to vaporize liquid samples for injection in an existing gas chromatography system. This convenient laboratory system allows flexibility and gives accuracy when switching between gas and liquid samples.

Advantages of the LPG Vaporizer

The Wasson-ECE LPG Vaporizer is not only more convenient than a typical liquid sample valve, it also gives more accurate results. The LPG Vaporizer injects liquid or gas phase samples with a single valve. All liquid samples are vaporized and run at a constant pressure, eliminating sample density changes that cause errors in liquid phase samples. This ensures sharp, easy-to-read peaks for all samples.

Sulfurs and Oxygenates

The LPG Vaporizer is built with sulfinert parts for analyzing trace reactive analytes such as sulfurs and oxygenates.

Consistency and Accuracy

Wasson-ECE's unique, proprietary vaporization technique produces an even and accurate gas sample. Other vaporizers use tubing with too large a volume, causing samples to fractionate when vaporized. This can lead to incomplete sample analysis. The Wasson-ECE LPG Vaporizer controls the injection volume so that all elements in the liquid sample are vaporized and sent to the GC simultaneously, producing a complete and accurate analysis of the sample.



LPG Vaporizer Features

Inject liquid and gas samples with a single valve

High sample throughput

Purging technique reduces cross-contamination

Stop sample flow to the GC at any time

Controlled injection volume

Dynamic Blender

Dynamic Blender

The **Dynamic Blender** is a portable blending device that dilutes a sample or a certified standard with a matrix gas of choice. An inert flow path and heated bridge eliminate adsorption and condensation problems when blending gas standards that include sulfur, nitrogen, and other reactive compounds. The samples are fed directly to a gas chromatograph, eliminating the need to store multiple gas cylinders.

The Dynamic Blender contains a digital flow controller that allows the diluent gas flow to be controlled digitally.

Gas chromatographic analysis often requires that samples or standards be diluted to low levels. Some analytes are quite expensive or difficult to purchase at low levels due to reactivity, adsorption, or large molecular weight. One certified standard with concentrations at the upper limit of the desired calibration curve can be diluted to the lower level (up to 4 orders of magnitude lower) to create a full calibration curve from just one standard. There is no need to purchase several concentrations of the same mixture, and no need to find storage in the laboratory for those cylinders. The Dynamic Blender provides an easy and cost effective solution for gas phase calibration needs.

The Wasson-ECE Dynamic Blender provides reliable point-of-use calibration blends.



Custom Sample Systems

Wasson-ECE has extensive experience building custom sample systems. Systems can be purged and rated for use in Class I, Division 2, Groups B, C, and D areas. They contain block and bleed valves to eliminate sample cross-contamination, and in-line sample filters. The sample boxes maybe heated and can employ specialized tubing and components to prevent trace analyte adsorption.

Custom Design

The sample system is designed to meet your specific needs and is custom built to order. This includes custom cabinet design, purging, temperature control, and valves. The systems are built to work with your existing systems and automation.

Sample System Features

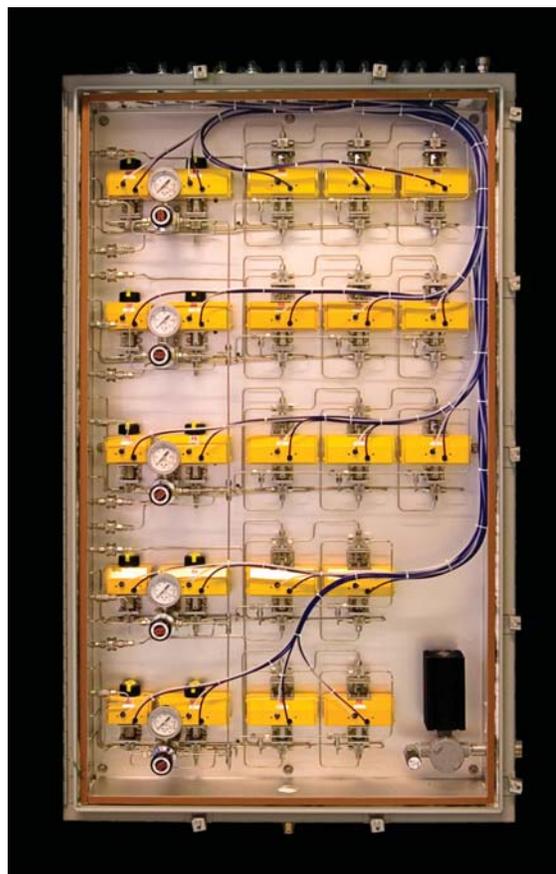
Class I Division 2
Groups B, C, and D enclosures

Liquid and gas sampling systems

Temperature controlled cabinets

Custom valves and plumbing to
customer specifications

One year warranty



Wasson-ECE Instrumentation

Engineered Solutions, Guaranteed Results.

Wasson-ECE Instrumentation specializes in configuring and modifying new or existing gas chromatographs exclusively from Agilent Technologies to become guaranteed, turn-key analytical systems. Our customers describe their objectives and their samples: analytes, concentration ranges, phases, temperature, throughput, and any special needs. From this dialog we configure a task specific instrument. We add extra ovens, valves, plumbing, flow control, columns, electronics, and software to yield a complete solution. This saves our clients valuable time and delivers instruments that are state-of-the-art and ready for use upon installation.

The complete analytical method is developed, tested, and documented utilizing our experience working with numerous companies with similar needs and goals. The resulting chromatograms and reports are inspected by our application chemists and you, to ensure system performance and design quality. Our field engineers then install each system and provide training. After installation, and throughout the life of the chromatograph, our support chemists are ready to help. We can assist with application details, questions, training, calibration, maintenance, and on-site service. Wasson-ECE brings experience and efficiency to your project, giving you confidence in the quality of your results.



Please contact us for more information.



Engineered Solutions, Guaranteed Results.