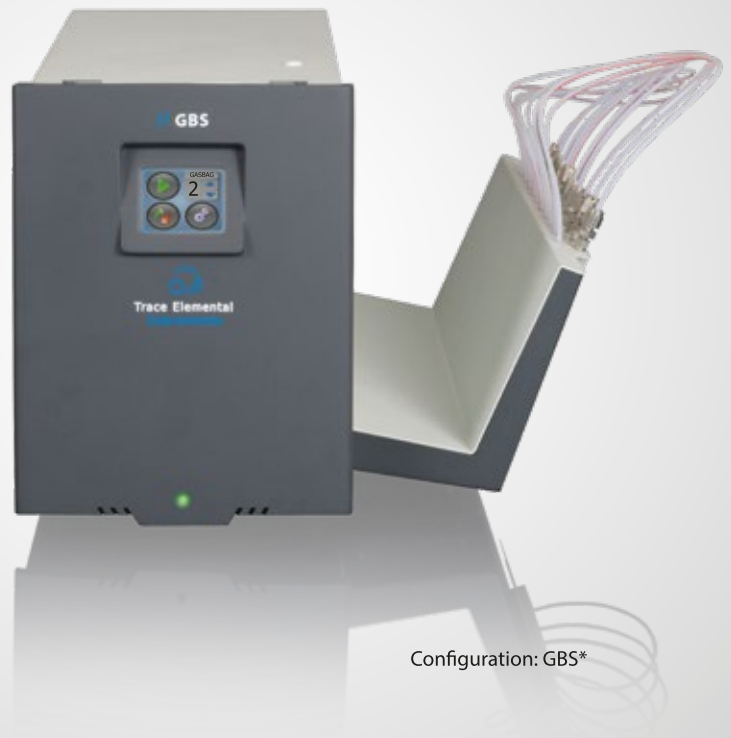




Configuration: GLS with safety lock*



Configuration: GBS*

// GLS & // GBS

TE Instruments' Next Generation Gas & LPG Sampling Systems; the GLS and GBS.

Analyzing gas and liquefied gas is often considered difficult and problematic. The choice of sampling technique and the ability to handle different gases at various pressure levels and physical states present significant challenges.

TE Instruments has developed two innovative sampling systems designed to simplify gas and LPG sampling:

- The GLS (Gas & Liquefied gas Sampling module) for sampling gas and LPG from pressurized cylinders and gas sampling bombs.
- The GBS (Gas Bag Sampling module) for sampling gas from gas bags (e.g. Tedlar™ bags) or balloons.

The GLS and GBS both form a perfect match together with the Xplorer combustion analyzer for the measurement of Total Nitrogen, Total Sulfur, and Total Chlorine and the Xprep C-IC for the analysis of Total Fluorine, Chlorine, Bromine, and Iodine. Both samplers can be combined, as a stand-alone system, with any other combustion analyzer.

Taking Simplicity to The Next Level

- GLS; Pressurized gas & LPG samples

Two integrated loops; one of 10 mL for gas and one with a 50 μ L loop for liquefied gas are the standard built-in sampling loops for the GLS. Simply position the pressurized sample cylinder at the appropriate introduction port and start the combustion analyzer. The chosen analysis method is being executed and the pre-set number of sample loops is run and analyzed. Parameters like evaporation speed, temperature, flow, and pressure are automatically controlled and monitored at all times.



Configuration: GLS with safety lock*

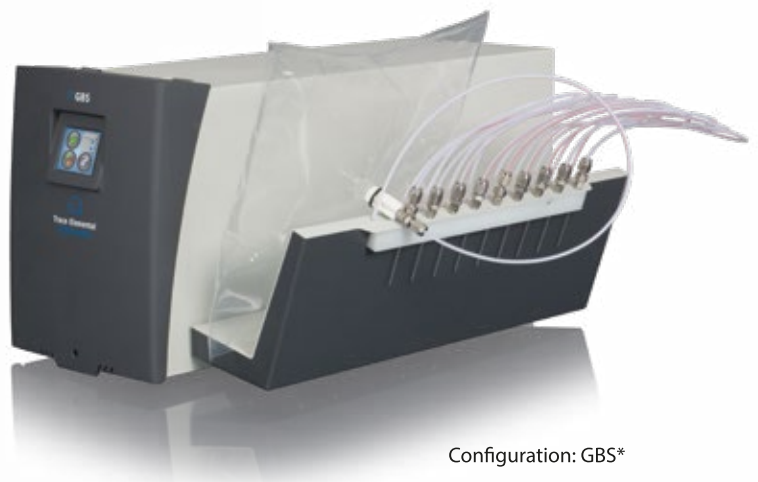
Features GLS

- Safe installation high pressured gas bottles
- Fully automated
- Software controlled
- Integrates with TE Instruments software
- Stand-alone function
- Intuitive touchscreen
- Default & customized methods
- Two separate sample channels for Gas & LPG
- Calibration line from single CRM
- Safety lock
- Heated pressure control & vaporizer

Ease of Use: No Pressure

- GBS; Atmospheric gas samples

Compared to sampling gas using a pressurized gas cylinder, the GBS samples directly from a gas bag, eliminating the need to pressurize the samples and resulting in faster analysis. In addition, the use of gas bags is cost-effective and substantially lower in cost than steel or aluminum cylinders, requiring a protective coating. Traditional gas bag sampling systems were operated manually, sampling only one gas bag per analysis. The GBS can take up to 10 gas bags at the same time and analyze in sequence. This not only provides more productivity but ensures less contamination and therefore more reliable results.



Configuration: GBS*

Features GBS

- Easy and fast installation
- Fully automated
- Software controlled
- Integrates with TE Instruments Software
- Stand-alone function
- No sample pressure required
- Default & customized methods
- Up to 10 gasbags automatically
- Calibration line from single CRM

Communication between the analyzer and the GLS or GBS runs via a USB port. Within a few minutes, the sample is measured and the final result is calculated and stored for evaluation. Sample methods in the embedded software can be customized as desired by the operator in the embedded software. Parameters like temperature, flow, and pressure are automatically controlled and monitored at all times.

Safe, Reliable, and Robust

In most cases, the gas being analyzed is highly flammable, posing a potential risk in the laboratory. To ensure the safest possible way of handling, both the GLS and GBS are equipped with a gas leakage sensor which constantly measures the composition of the air inside the sampler. When hydrocarbons are detected, the sampler assumes there is a possible dangerous situation and aborts all activity. The user interface on the gas sampling systems and the analyzer monitor indicates that a situation has occurred and various safety measures are taken. Both the introduction of sampling gas and the carrier gas flow are stopped. After inspection and correction, the reset button on the touch screen can be pressed in order to resume activity.

Safety Lock

The GLS automatic safety mechanism detects pressure in the connection between the sample cylinder and the GLS. As long as pressure is detected, the safety lock will automatically prevent unintended removal of the pressurized sample cylinder. The moment the operator has closed the cylinder and



Configuration: GLS with safety lock*

pressure has been released to the vent, the safety lock will automatically drop for removal of the sample cylinder.

Truly Unique: Calibrating out of a Single CRM

The GLS and GBS are both able to create a calibration line out of a single certified reference material. Using the automatic calibration mode will free up operator time while generating the ideal calibration curve.

The GBS can select different volumes from 10 up to 1000 mL out of a single gas bag and introduce them automatically as individual calibration samples.

The GLS is equipped with standard built-in sample loops. By setting up multiple sample loops with a certified reference material, a calibration line can be created. Up to 100 sample loops can be applied using the built-in interface or through TE Instruments Software (TEIS).

Ultra-low Detection

The GLS is able to handle liquefied gas samples at the same ultra-low level as liquid samples: e.g. 20 ppb sulfur/nitrogen.

Components in gas can usually not be measured at the same low level as liquid or liquefied gas samples because of the physical laws applicable. However, the GLS and GBS handle these samples effectively, with both systems showing a detection limit in the low ppb range and excellent repeatability.

To avoid any cross contamination, the GLS and GBS feature purge and rinse options. In the GBS, the 100 mL gas-tight syringe and flow path are purged with carrier gas, while the GLS uses a pressurized sample.

Stand-alone

When the GLS or GBS is used as a stand-alone sampling system, all settings like customized methods, amount of injection, and purging, can be set on the integrated touch screen.



Configuration: Xplorer with Vectra and GLS*

GBS Specifications

Dimensions (W x H x D)	37.0 x 28.5 x 56.0 cm (14.6 x 11.2 x 22.0 inch)
Weight	15.3 kg (33.7 lbs)
Carrier gas connection	1/8" Swagelok
Carries gas	Argon or Helium (3.5 - 8 bar)
Primary pressure gas sample	Atmospheric pressure
Calibration	Auto calibration single & multi-channel
Sample	Up to 10 sample bags/balloons
Sample volume	10 - 1000 mL
Operation mode	Fully software-controlled (TEIS) or Stand-alone (touchscreen)
Vent gas connection	1/4" Swagelok

GLS Specifications

Dimensions (W x H x D)	30.0 x 28.5 x 56.0 cm (11.8 x 11.2 x 22.0 inch)
Weight	18 kg (39 lbs)
Carrier gas connection	1/8" Swagelok
Carries gas	Argon or Helium (3.5 - 8 bar)
Primary pressure gas sample	Up to 50 bar
Secondary sampling pressure (gas)	2 - 5 bar (29 - 72 psi) gauge; adjustable
Primary pressure liquefied gas	Up to 25 bar (extended version 50 bar)
Secondary sampling pressure (LPG)	Automatically controlled vaporizer
Calibration	Auto calibration from a single CRM
Evaporation Temperature	Range ambient up to 75 °C
Sample loops	10 mL gas; 50 µL liquefied gas (or customized loop)
Operation mode	Fully software-controlled (TEIS) or Stand-alone (touchscreen)
Vent gas connection	1/4" Swagelok

*Used images are examples of configurations which may deviate from ordered configurations.