

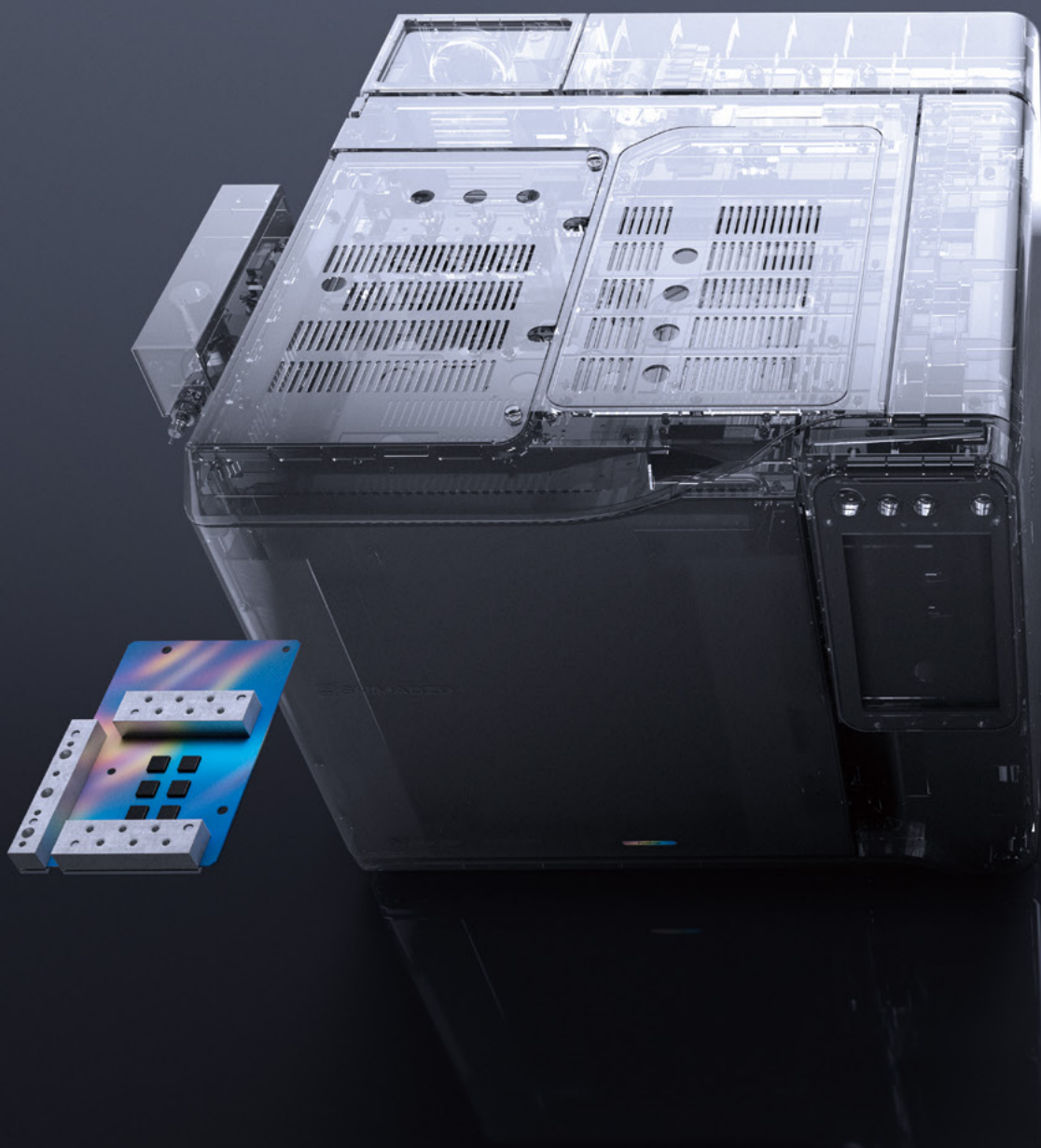
FluxEdge Modules for Gas Chromatograph

FluxEdge GC Systems



FluxEdge GC Systems

Gas Flux Redefined, Analytical Edge Achieved



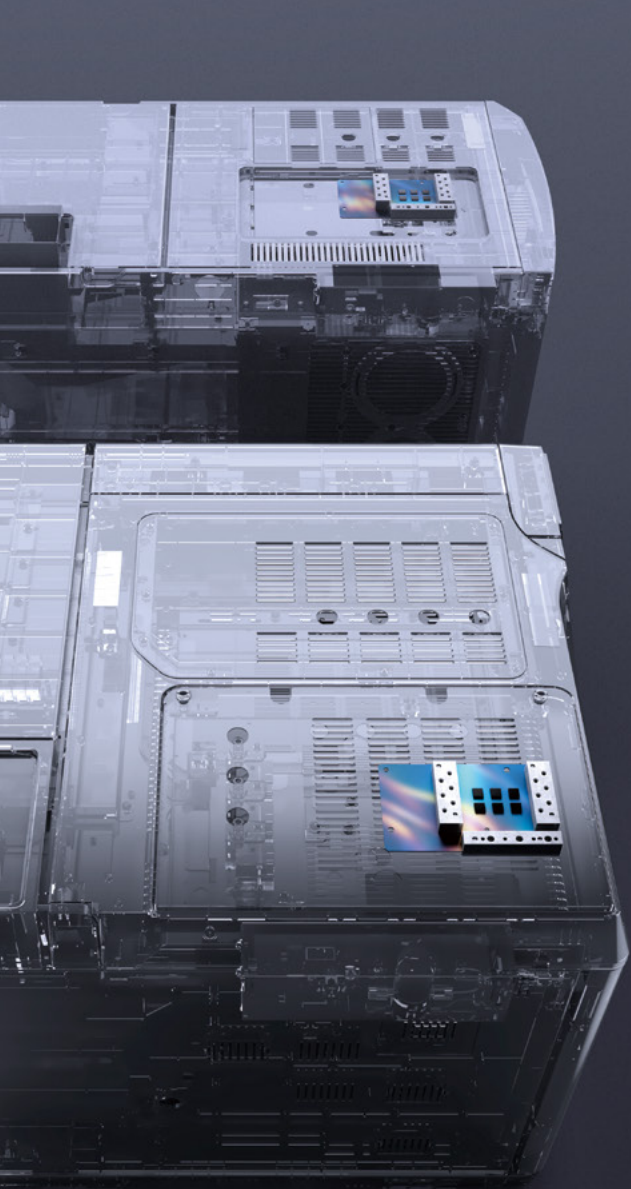
FluxEdge Technology is an innovative solution that takes gas chromatography (GC) gas analysis applications to the next level. Compatible with Shimadzu's latest GC platforms, FluxEdge provides reliable results with minimal maintenance, whether bench-scale analytical testing or continuous data monitoring is required.



Ultra-fast and Reliable Analysis

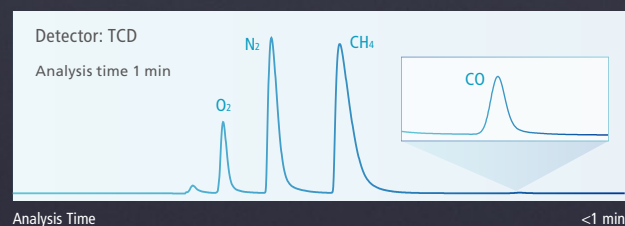
Unmatched Durability and Performance

Versatile Scalability and Ease of Use

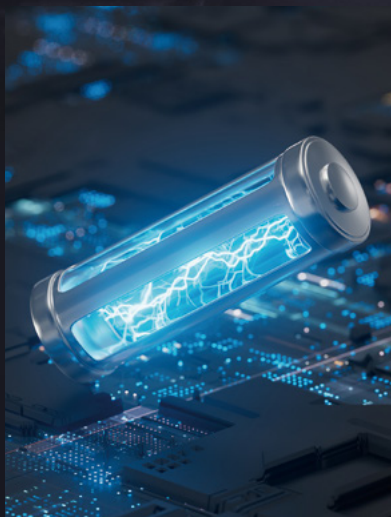


FluxEdge GC System Delivers Solutions

Research, development, and commercialization of various technologies are underway around the world to achieve a carbon-neutral and net-zero society. It is essential for society to implement new energy and materials that use conventional, depletable energy more efficiently, but with a lower environmental impact. The FluxEdge GC system changes the conventional wisdom of gas analysis by GC. The figure below shows an example of gas analysis in new energy research, where fast and accurate data acquisition in less than 60 seconds is possible.



Application Examples



Next-Generation Lithium Battery

Lithium Batteries



Carbon Neutrality / Catalysis Research

Biomass / Chemical Recycling



Green Energy

Hydrogen / Ammonia / Fuel Cell /
Artificial Photosynthesis

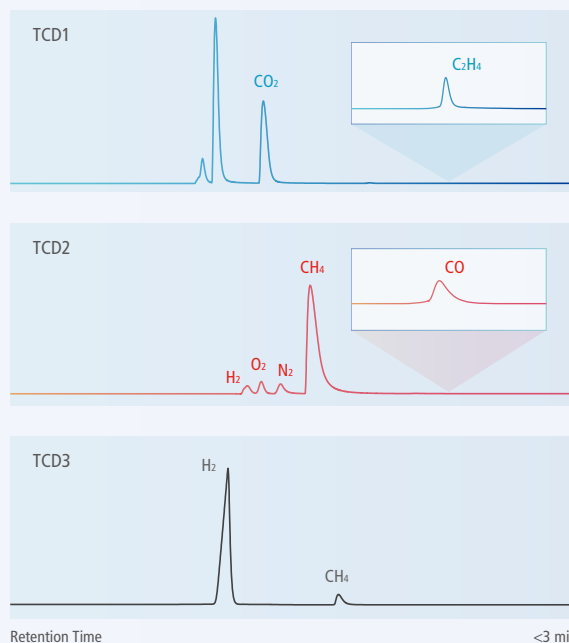
Ultra-fast and Reliable Analysis

The key advantage of FluxEdge is its speed. The analytical flow path, from the sample introduction to the column, is designed to be inert and minimal, achieving faster analysis. With FluxEdge's high-speed continuous analysis, it is possible to monitor reaction compounds in decarbonization research, such as artificial photosynthesis and catalyst studies, providing continuous and rapid analytical results. This significantly enhances laboratory productivity.

Simultaneous Analysis of Inorganic and Organic Gases in Hydrogen



	Compound	Concentration range (example chromatogram)
1	H ₂	0.1 % — 100 % (Balance)
2	O ₂	0.01 % — 1 % (1 %)
3	N ₂	0.01 % — 1 % (1 %)
4	CH ₄	0.01 % — 20 % (20 %)
5	CO	0.01 % — 10 % (0.05 %)
6	CO ₂	0.1 % — 10 % (10 %)
7	C ₂ H ₄	0.01 % — 100 % (0.05 %)

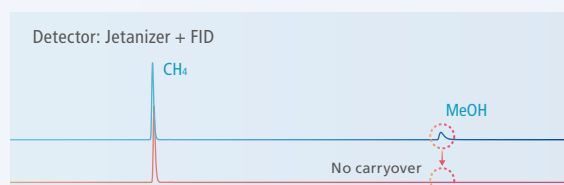


Minimal sample volume

Conventional GC gas analysis can require more than 100 mL of gas sample to obtain accurate results. FluxEdge optimizes the sample flow path, allowing for precise and reliable analysis without wasting valuable samples. Depending on the analytical conditions, analysis is possible with a sample volume of just a few milliliters or less.

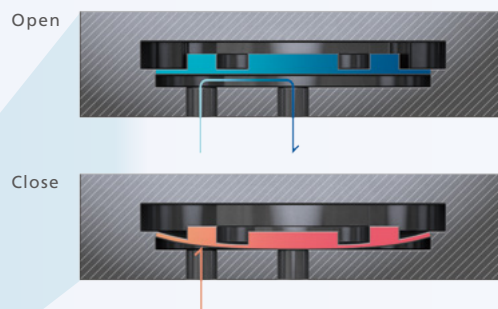
Low carryover

In addition to supporting minimal sample volumes, FluxEdge minimizes carryover from previous samples, reducing the risk of sample contamination between analyses. The example in the figure on the right shows that there is no methanol carryover between analyses.

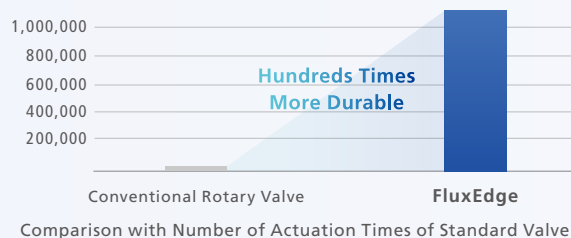


Unmatched Durability and Performance

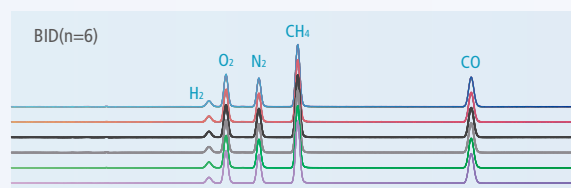
FluxEdge uses a microvalve with a diaphragm structure developed by combining microfabrication technology from semiconductor manufacturing with Shimadzu's cutting-edge inert Technology. This provides durability hundreds of times greater than conventional rotary valves used in gas analysis.



FluxEdge Micro Valve Cross-Section Diagram



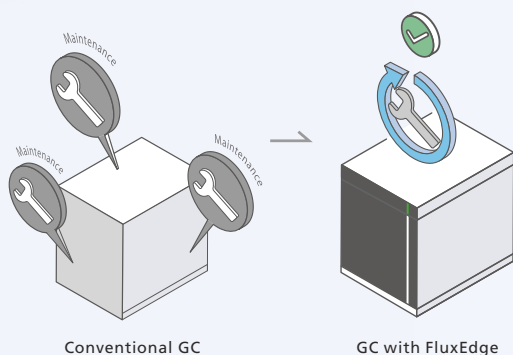
High Analytical Repeatability



The chromatograms overlaid from 6 consecutive analyses show excellent reproducibility, with an area repeatability of 0.2 % RSD for all target components.

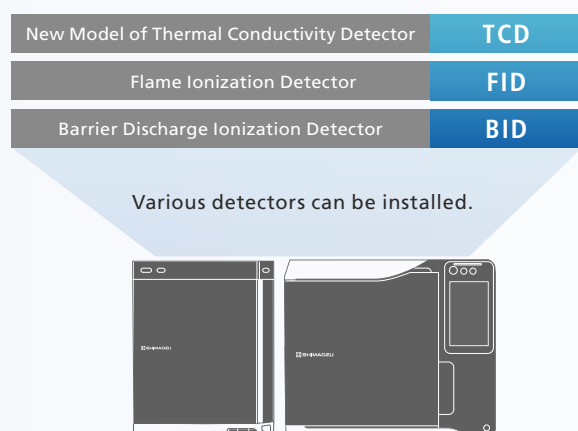
High Durability and Maintenance-Free Design

FluxEdge offers exceptional durability, with a heat resistance of up to 100 °C, supporting a wide range of gas analysis applications. This robust valve design, which is hundreds of times more durable than traditional rotary valves, ensures that the valve itself requires no maintenance throughout the GC system's lifespan.



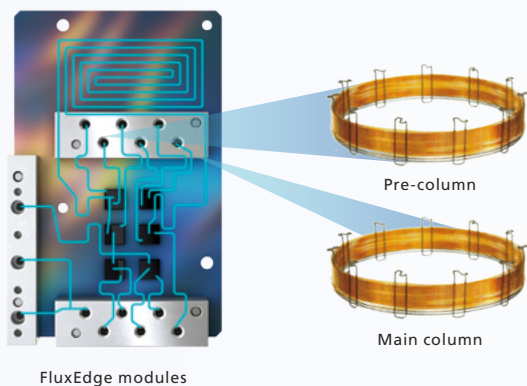
Versatile Scalability and Ease of Use

The combination of FluxEdge with Shimadzu's latest GC platform further enhances workflow in gas analysis. Since FluxEdge can be installed on the latest lab GC platforms, Nexis™ and Brevis™, you can build a gas analysis system to suit your purpose from Shimadzu GC detectors with world-class performance, including FID, BID as well as TCD, and industry-standard capillary columns.



Various GC Detectors Available

In addition to the commonly used TCD for gas analysis, a variety of GC detectors can be selected depending on the analytical purpose. For instance, combining FID with Shimadzu's proprietary Jetanizer™ allows high-sensitivity measurement of compounds like CO, CO₂, and formic acid. Furthermore, the BID, which utilizes helium plasma, enables high-sensitivity detection of compounds other than He and Ne.



Wide Range of Column Options

FluxEdge modules can accommodate both pre-columns and main columns. By separating target components from others in the pre-column and introducing only the target components to the main column, the main column's lifespan is extended, and column maintenance frequency is reduced. Additionally, a wide variety of industry-standard capillary columns can be selected, including PLOT (M sieve 5A, Q-BOND, U-BOND, Al₂O₃), 1, 5, WAX, Amine, Sulfur (supported columns will be expanded sequentially).

Easy operation with LabSolutions™ and Remote Display

Instrument control and data analysis of the FluxEdge GC System are performed using the integrated software, LabSolutions. The GC Remote Display supported by the latest Nexis and Brevis GCs can also be used to check device status and view daily maintenance procedures and videos.



Specifications

Max. Pressure	400 kPa
FluxEdge Module Max. Operating Temp.	Brevis GC-2050 + FX-40-SB-T: 100 °C (independent temperature control) GC column oven maximum operating temperature: 350 °C Nexis GC-2030 (FX-TTT): 60 °C (controlled by GC column oven)
Sample Type	Gas

Lineup

A maximum of 3 FluxEdge modules can be installed on one GC.

Model	Max. Number of Modules Installed
Nexis GC-2030	3
Brevis GC-2050	1

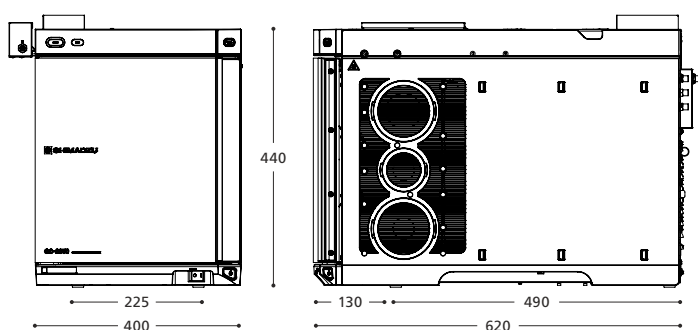
Instrument

Brevis GC-2050 + FX-40-SB-T

Size and Weight

Height	440 mm
Width	400 mm
Depth	620 mm
Weight	30 kg

This is information for when the FX-40-SB-T is installed on the GC-2050.
Projections are excluded.



Unit: mm

Certifications

- Safety standards: IEC 61010-1, IEC 61010-2-010
- CE marking (complies with EU standards)
- EMC (EN 61326-1)
- Complies with European RoHS and Chinese RoHS

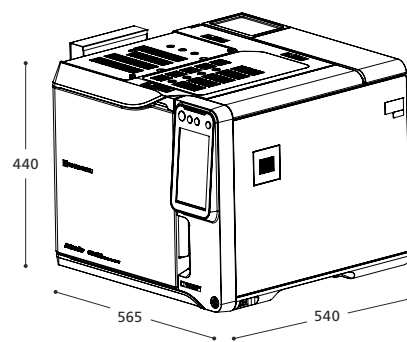
Varies depending on the region/product model.

Nexis GC-2030 (FX-TTT)

Size and Weight

Height	440 mm PICD Model 500 mm
Width	565 mm
Depth	540 mm
Weight	50 kg

This information excludes piping at the rear of the instrument.



Unit: mm

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