C184-E050B

SHIMADZU
Excellence in Science

Gas Chromatograph

Brevis GC-2050

Brevis™ GC-2050

Small but Mighty

“Smaller, simpler, and easier to use – without compromising performance.” That’ s the demand from analysts. And that’s why Shimadzu developed the Brevis GC-2050. This new space-saving GC delivers uncompromising analytical performance in a modern yet rugged design, easily meeting the analysis needs of laboratories in a range of industries.

01 Compact without Compromise

02 Built-in Analytical Intelligence

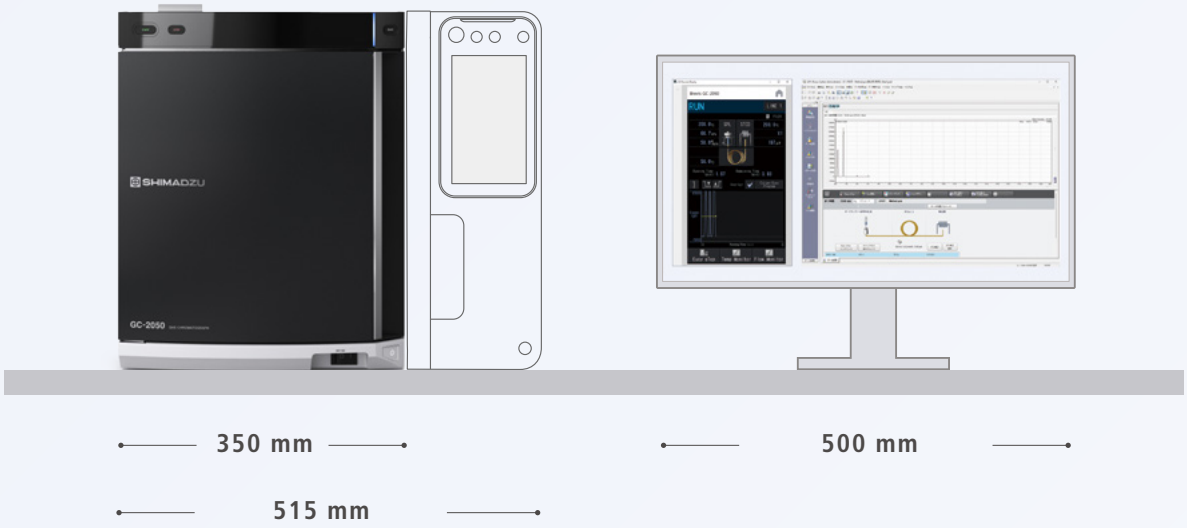
03 Best-in-Class Performance

Compact without Compromise

Standard GC with the Width of a Laptop

The Brevis GC-2050 is 350 mm wide, enabling analysis in a space equivalent to a 15-inch laptop. Compared to the flagship Nexis™ GC-2030, the system's width has been reduced by approximately 35 %. Although the conventional monitoring display has been removed, the GC Remote Display* installed on a PC or smart device allows user to check the instrument status and view daily maintenance procedures and videos.

*An application for Windows® devices, it can be connected simultaneously with workstations such as LabSolutions™.

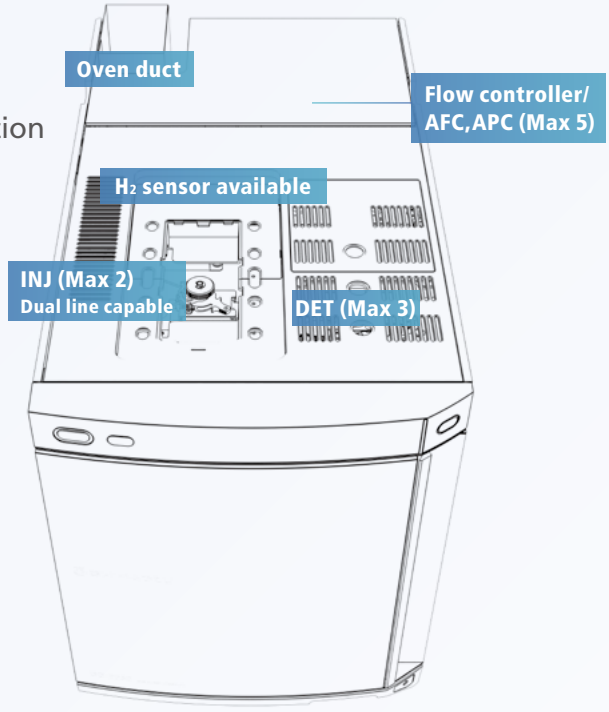


Sufficient Oven Size Fits Two Industry-Standard Columns

Despite Brevis's compact size, the oven is sufficiently large to ensure analysis efficiency. It can accommodate two 7-inch standard capillary columns, enabling simultaneous dual-line analysis.

Building on the Established GC Configuration

Built on nearly 70 years of Shimadzu's gas chromatography expertise, the system supports flexible configurations. Easily transition your existing methods and consumables to the Brevis without configuration constraints.



Highly Expandable to Satisfy Laboratory Needs

Injection Units

SPL / WBI / SINJ / PTV / OCI / SPI

Columns

7 inch standard capillary column/packed colum

Pretreatment Devices

AOC-20 / AOC-30 / GI-30 / HS-20 NX Loop/Trap / HS-10 / AOC-6000 plus / TD-30 / PY-3030D

Detectors

FID / TCD / BID / FTD / FPD / ECD / MS

Options

Low temperature control solenoid valve / Gas selector / Hydrogen sensor / External control relay / Multi position valve

Advanced Flow Technology

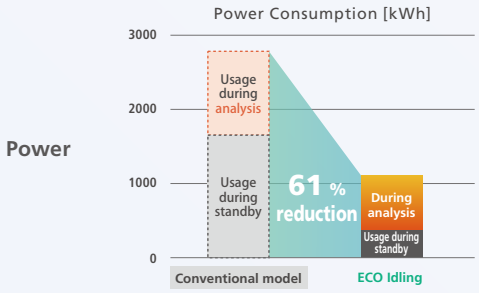
Detector Splitting / BackFlush

ECO Functions, Less Energy, Less Gas

Running Cost Reductions

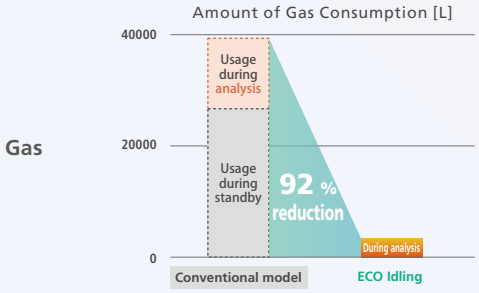
The energy-saving design of the Brevis GC-2050 reduces power consumption by 30 % compared to conventional models even during normal operation. Furthermore, the new ECO Idling function reduces power consumption by approximately 61 % and gas consumption by 92 % [*1] compared to conventional models. The power saving can be converted into a CO_2 reduction equivalent to the annual CO_2 absorption of 86 cedar trees per unit.[*2]

*1 The Eco effectiveness will vary depending on the environment and analytical conditions.
*2 A cedar tree 36-40 years old is estimated to absorb about 8.8 kg of carbon.



Conventional GC	2770 kWh / year
ECO Idling function used	
Brevis GC-2050	1180 kWh / year
Savings	1590 kWh / year
Cost Savings	-254 USD / year
Reduction in CO_2 emissions	-715 kg CO_2e / year

Note: Calculated with 0.16 USD/kWh
* Calculated at 0.45 kg-CO_2/kWh



Conventional GC	39312 L / year
ECO Idling function used	
Brevis GC-2050	3026 L / year
Savings	-36286 L / year
Cost Savings	-1089 USD / year

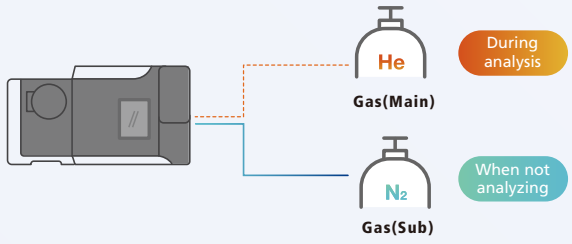
Note: Calculated with approximately 0.03 USD/L

This is an estimate of consumption based on 260 days of operation per year with 8 hours of analysis per day, and the instrument in standby when not in use.

Analytical conditions: Column flow rate 2 mL/min, split ratio 50, injector/detector temperature 270 °C, oven temperature ramp from 50 °C to 250 °C at 10 °C/min followed by a 10 minute hold. Brevis GC-2050 results were obtained using the ECO idling mode, gas saver and gas selector.

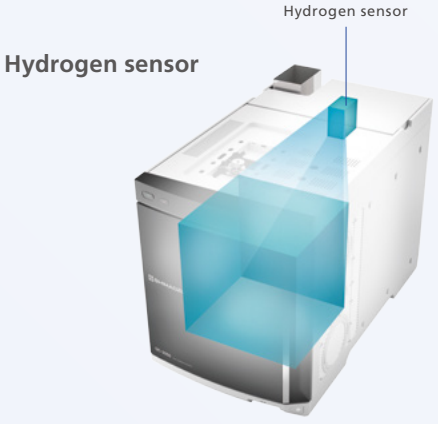
Options Supporting Cost Reductions and Safety

Gas Selector



The carrier gas can be switched from helium to nitrogen except during analysis, therefore minimizing the consumption of helium gas during standby.

Hydrogen sensor

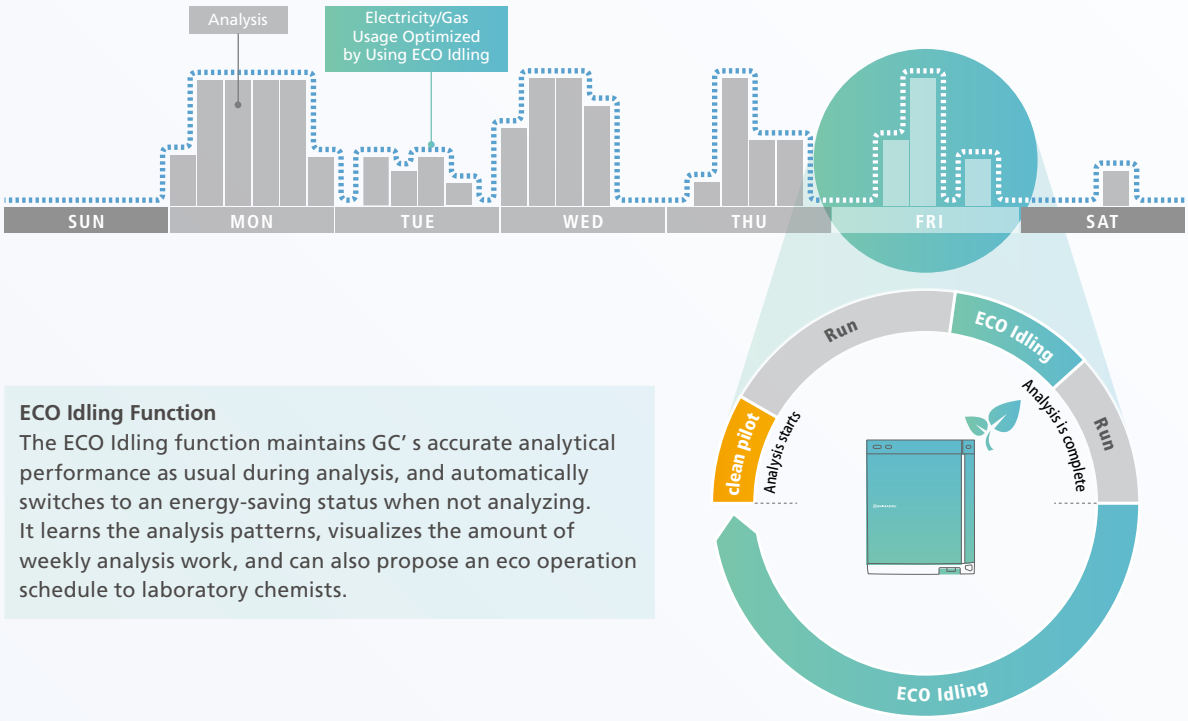


Analysis can be performed with easily acquired hydrogen as the carrier gas, maximizing analytical throughput in laboratories with high-speed analyses.

Eco Design

ECO Idling: Making Your Usual Analysis Eco-Friendly

ANALYTICAL INTELLIGENCE



ECO Idling Function
The ECO Idling function maintains GC' s accurate analytical performance as usual during analysis, and automatically switches to an energy-saving status when not analyzing. It learns the analysis patterns, visualizes the amount of weekly analysis work, and can also propose an eco operation schedule to laboratory chemists.

World's First CO_2 Reduction Visualizing Gas Chromatograph

*As of January 2025, according to a Shimadzu corporation's survey

The amount of of CO_2 reduction and power, gas, and cost saved can also be viewed on the software screen which raises operator awareness of savings and makes the lab more eco-friendly.

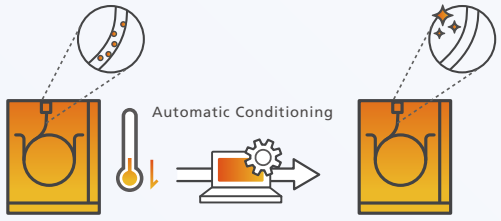
Built-in Analytical Intelligence

Preparing for Analysis

Automating the Procedures of Experienced Analysts, Clean Pilot

ANALYTICAL INTELLIGENCE

Baselines can be unstable during GC startup. The Clean Pilot function performs quick and efficient automatic conditioning of columns, which provides stable analytical results reducing the burden on laboratory personnel.

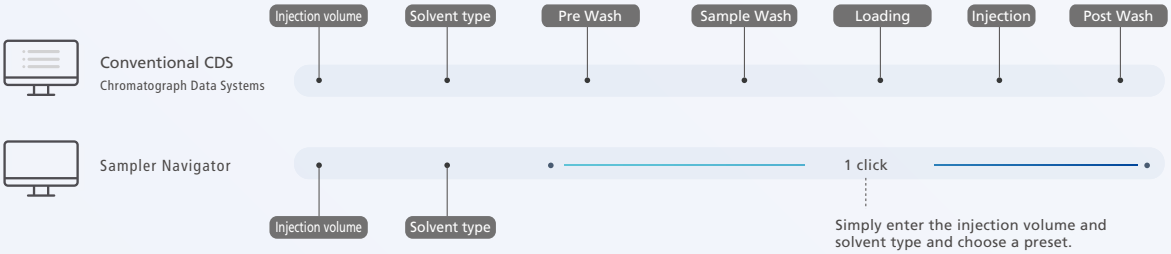


Method Creation

Built-in Injection Expertise, Sampler Navigator

ANALYTICAL INTELLIGENCE

Injection may seem trivial, but in reality it is a very complex process that requires a lot of optimization. The Sampler Navigator reduces the guesswork involved by letting you choose from a carefully curated list of optimized methods, meticulously prepared by experts in gas chromatography. Get up and running with a single click.

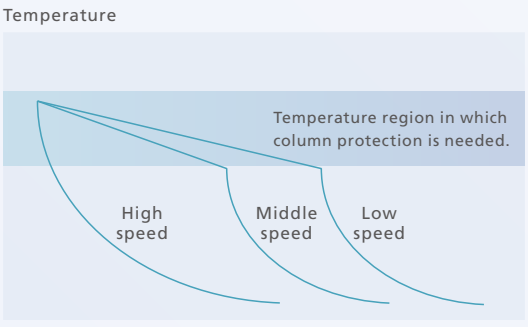


During Analysis

Protecting Columns

ANALYTICAL INTELLIGENCE

Selecting the column oven cooling speed protects columns, which are sensitive to abrupt temperature changes, ensuring a long column operating life and stable data quality.

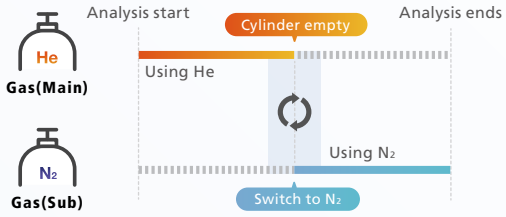


The column oven temperature during cooling

Supply Gas Check

ANALYTICAL INTELLIGENCE

When connecting a main and a spare gas cylinder to the gas selector (option), the gas selector will monitor the main gas cylinder pressure and automatically switch the gas supply to the backup line when the cylinder becomes empty. This prevents column damage and other problems before they occur, allowing you to continue analysis with peace of mind.

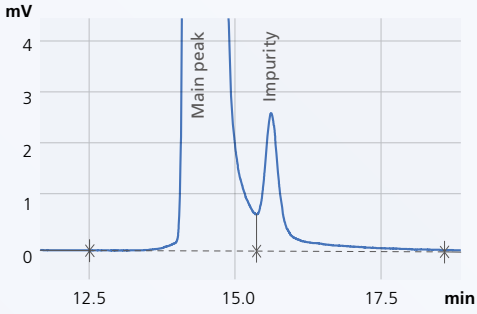


Data Analysis

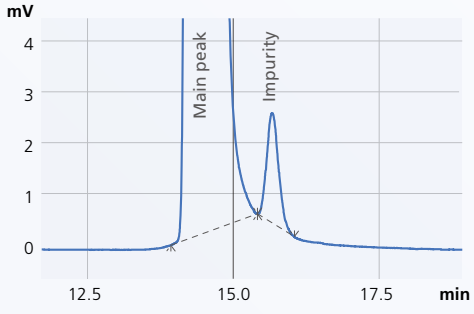
High Precision Data Processing in a Single Step
i-PeakFinder™ Automatic Peak Integration Function

ANALYTICAL INTELLIGENCE

The manual integration of unresolved peaks is a labor-intensive process prone to inconsistent results depending upon the experience level of the user. Shimadzu' s proprietary i-PeakFinder peak integration algorithm is perfect for such situations. i-PeakFinder processes large volumes of data with high precision in a single step, saving time and increasing the consistency of results.



Conventional peak integration method

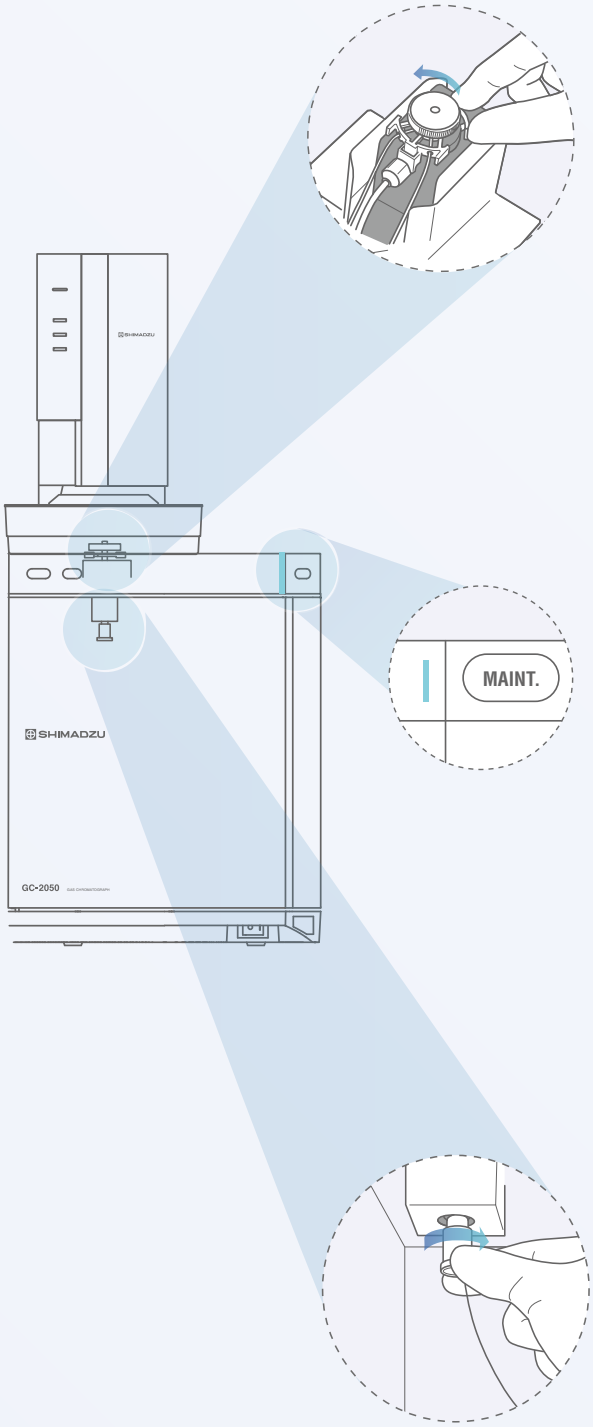


i-PeakFinder

ANALYTICAL INTELLIGENCE

Analytical Intelligence is a new approach to analytical instruments proposed by Shimadzu. The system and software perform operations on par with experienced experts, and automatically make judgments regarding the quality of status and results, thereby providing the user with feedback and resolving problems. Additionally, the system compensates for differences in knowledge and experience with respect to the analysis instrument, ensuring the reliability of the data.

Easier, Faster, Expert-Level Maintenance



One-Touch Inlet Maintenance

The injection port can be opened or closed without tools by simply sliding the ClickTek™ Nut lever. Replace the insert, slide the lever, and feel the click to ensure leak-free performance.

Easy sTop

ANALYTICAL INTELLIGENCE

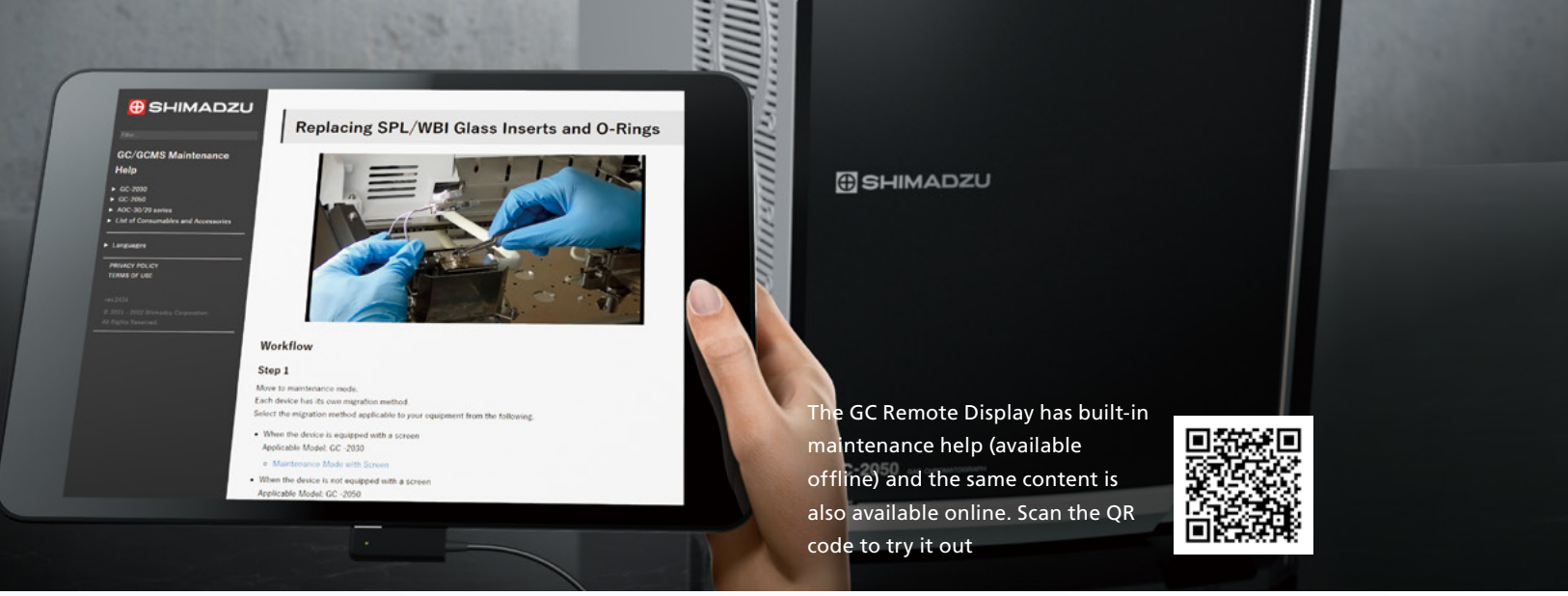
Clicking the MAINT. (Maintenance) button on the GC will start lowering the temperature of the GC inlet and oven, and stop the gas supply automatically.* After maintenance of the inlet, clicking the button again will return the instrument to standby after an automatic leak check. Routine maintenance procedures can be further simplified.

Note: Disabling the automatic gas supply shutdown to protect the MS detector is possible.

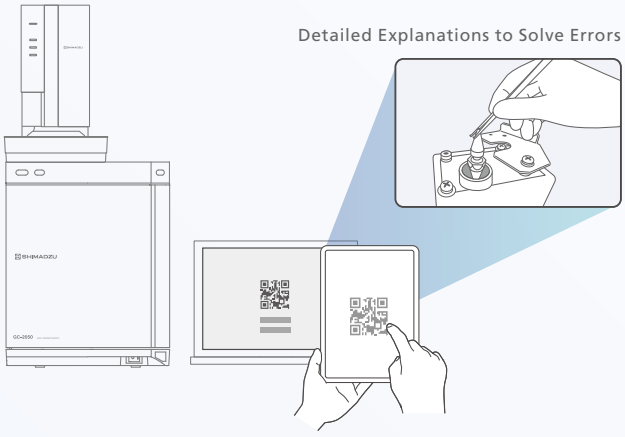
Tool-Less Column Installation

The ClickTek™ Connector (option) makes column attachment a one-touch operation. A noticeable clicking sensation signals a secure column connection, putting the user at ease.

Note: The ClickTek connector is optional.



The GC Remote Display has built-in maintenance help (available offline) and the same content is also available online. Scan the QR code to try it out



Error Solution Navigation

When a smart device reads the code or clicks the URL link on a PC, a solution, including procedures or videos, is presented for a quick recovery.

Remote Operation and Monitoring

LabSolutions Direct, a standard feature of LabSolutions, allows you to monitor instrument status and chromatographic signals, start and stop the instrument, and start the analysis from a web browser on a PC or smart device at a remote location.

Early Detection of Malfunctions

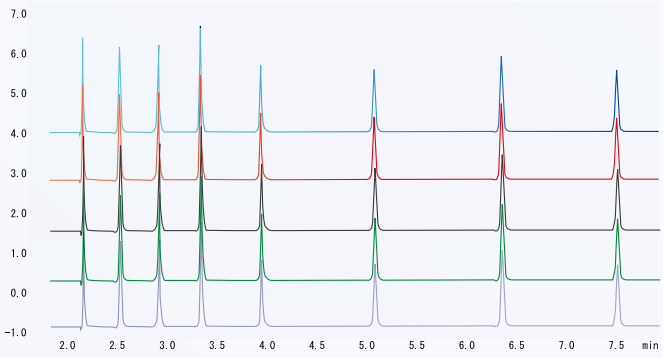
You can remotely monitor the system's operational status. The early detection of errors or miscues prevents downtime and eliminates valuable sample loss.


SHIMADZU
GC-2050

Best-in-Class Performance

Outstanding Analytical Reproducibility

The Brevis GC-2050 achieves high area and retention time reproducibility. The figure below shows continuous analysis results when using the AOC-30i auto-injector.



Continuous analysis of a Grob Test Mixture

Analytes	Area RSD(%)	Rt RSD(%)	Rt (⊿min)
n-decane	0.209	0.005	0.0001
n-octyl alcohol	0.211	0.006	0.0002
2,6-Dimethyl phenol	0.232	0.006	0.0002
n-undecane	0.211	0.007	0.0002
2,6-Dimethyl aniline	0.230	0.007	0.0003
methyl n-nonanoate	0.249	0.007	0.0003
methyl n-caprate	0.274	0.006	0.0003
methyl n-laurate	0.278	0.006	0.0003
dicyclohexylamine	0.253	0.006	0.0004

Application examples

Brevis GC-2050 enables analysis with He, N_2 and H_2 as the carrier gas.

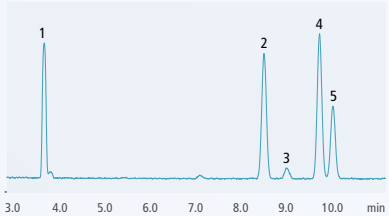
Pharmaceutical

Application

Residual solvent analysis in pharmaceuticals according to USP <467> using H_2 carrier gas

Shown here are the results from an analysis of a standard solution for operating method A (water-soluble samples). In the analysis of carbon tetrachloride, which requires sensitivity confirmation, against residual solvents in Class 1, a good S/N ratio was achieved. Furthermore, excellent separation is possible for Methyl Isobutyl Ketone (MIBK), which has been added to the Class 2 list.

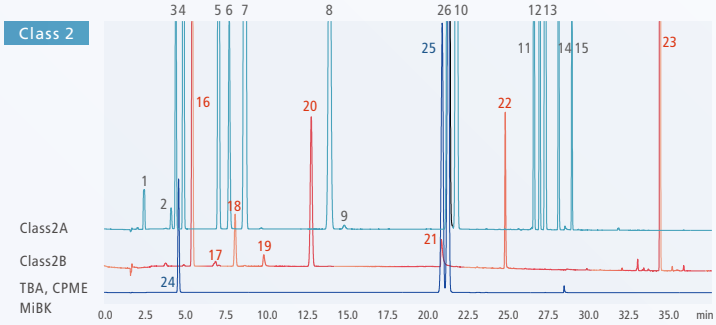
Class 1



1 1,1-Dichloroethane
2 1,1,1-Trichloroethane
3 Carbon tetrachloride
4 Benzene
5 1,2-Dichloroethane

S/N(CCl4): ≥10

Class 2

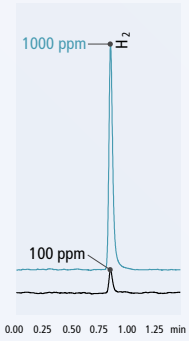


1 Methanol
2 Acetonitrile
3 Methylene chloride (DCM)
4 trans-1,2-Dichloroethylene
5 cis-1,2-Dichloroethylene
6 Tetrahydrofuran
7 Cyclohexane
8 Methyl cyclohexane
9 1,4-Dioxane
10 Toluene
11 Chlorobenzene
12 Ethylbenzene
13 m,p-Xylene
14 o-Xylene
15 Cumene
16 Hexane
17 Nitromethane
18 Chloroform
19 1,2-Dimethoxyethane
20 Trichloroethene
21 Pyridine
22 Methyl butyl ketone
23 Tetraline
24 tert-Butyl alcohol (TBA)
25 Cyclopentylmethyl ether (CPME)
26 Methyl isobutyl ketone (MiBK)

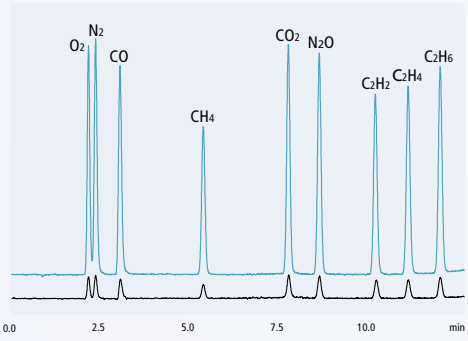
GX (Green Transformation)

Analysis of Inorganic Gases and Light Hydrocarbons Using GI-30 Auto Gas Sampler

The redesigned new Thermal Conductivity Detector (TCD) and Shimadzu's unique Barrier Discharge Ionization Detector (BID) allow the analysis of compounds from trace to high concentrations (sub-ppm to percentage levels). Combined with the new GI-30 auto gas injector, it supports various gas analysis needs. The GI-30's features to prevent adsorption and maintain temperature ensure high accuracy. The chromatogram below shows results using the GI-30 and TCD detector on the Brevis.



Hydrogen analysis with TCD
(Carrier gas: Nitrogen)

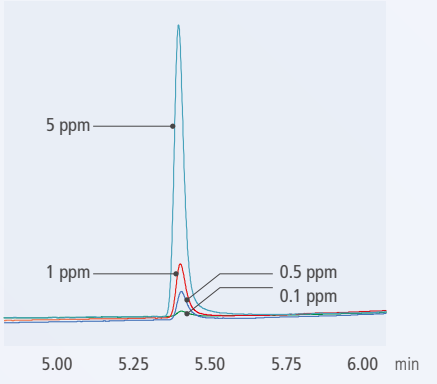


Inorganic gases and light hydrocarbons analysis with TCD
(Carrier gas: Helium)

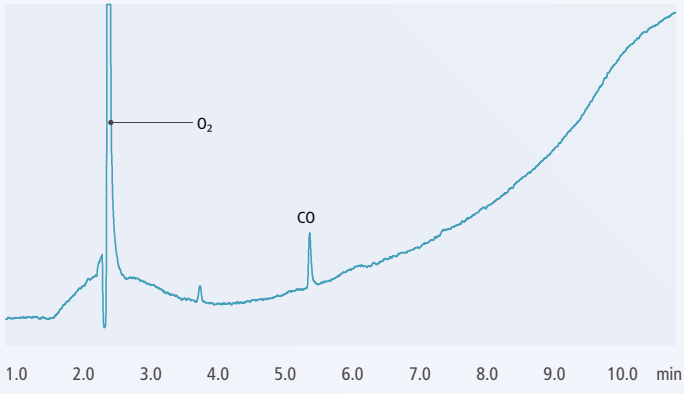
Analysis of Trace Carbon Monoxide (CO) in Hydrogen Fuel Using Jetanizer™

The Jetanizer is an FID nozzle methanizer that can convert CO and CO_2 to CH_4. Using the Brevis GC-2050 and the Jetanizer, Carbon Monoxide (CO), an impurity in hydrogen fuels, can be analyzed and detected with high sensitivity at 0.2 ppm, the concentration permitted in the ISO 14687-2019.

Appearance of the Jetanizer™



Chromatogram of CO in H_2



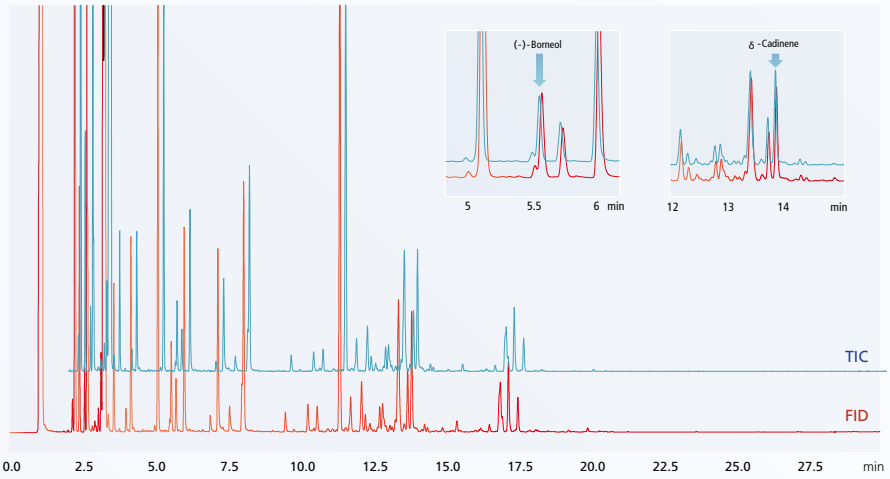
Chromatogram of 0.2 ppm CO in H_2

Chemicals, Fragrances, and Food Products

Application

Simultaneous MS and FID Analysis of Cypress Oil Using a Detector Splitting System

The detector splitting system allows you to obtain data from multiple detectors simultaneously in a single measurement. By analyzing hinoki oil with the MS and FID detector splitting system, we monitored key components using the FID, which provides excellent linearity, and identified other unknown components with the MS.

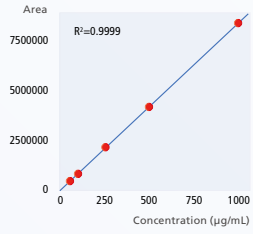


Cypress Oil (Shimadzu) FID and TIC Chromatograms

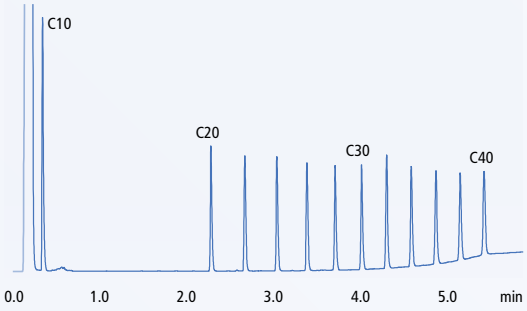
Environmental

Fast analysis of Total Petroleum Hydrocarbon (TPH) using H_2 carrier gas with dual injectors

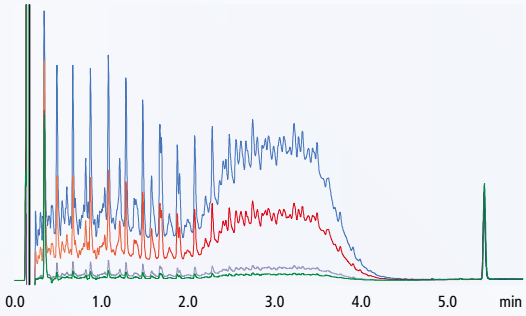
Despite its compact body, the Brevis GC-2050 is capable of simultaneous dual-line analysis. In this example, dual-line, high-speed TPH analysis was performed to maximize analytical throughput with a single GC.



Calibration curve of Mineral Oil



Chromatogram of n-alkane mixture samples



Overlaid chromatograms of QC standard solutions

Optimal Analysis System For Your Needs

AOC-6000 Plus Multifunctional Autosampler System

The system can accommodate a variety of sample injection methods including liquid injection, headspace injection, and solid-phase micro extraction. Further, the system is also capable of automatic sample dilution, automatic addition of internal standards, and automatic creation of calibration curve samples.

Customized System for Gas Analysis

The Brevis GC-2050 can be customized for specific gas analysis applications. The newly developed multi position valve can be controlled by LabSolutions, to achieve high-accuracy, high-sensitivity, and high-separation analysis, with stable performance across extended periods of consecutive analyses without human intervention.

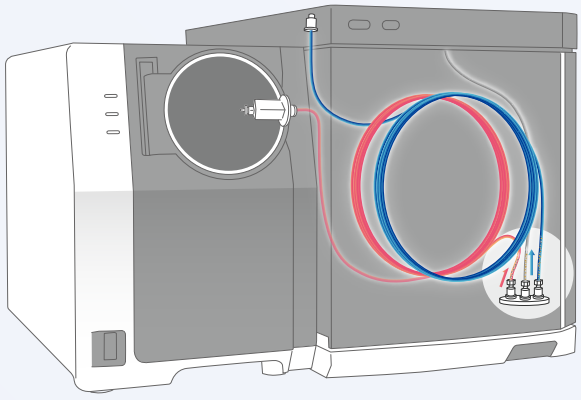
TD-30 Thermal Desorption System

This thermal desorption system can measure sorbent tubes that have sampled organic gases. It supports the analysis of compounds across a wide range of boiling points, from low to high.

Pyrolysis Analysis System

High-polymer compounds undergo pyrolysis at temperatures of 500 °C or higher, and the thermal degradation products obtained are analyzed. This enables the identification of the high polymers and better analysis of the higher order structure.

Options to Boost Analysis Efficiency



Multiple Chromatograms from a Single Analysis

Detector Branching (2 Detectors/3 Detectors)

This system splits analytes into different detectors, allowing you to obtain multiple chromatograms simultaneously. It supports up to three detector signals in a single analysis, such as FID, MS, and Polyarc FID, saving both cost and time while enhancing productivity.

Shorten Analysis Time to Half

Back Flush (Post/Middle point)

This system reverses the carrier gas flow to remove leftover compounds from the column through the split line, reducing analysis time and boosting productivity. It is essential for analyzing high boiling point compounds containing sample.

Injection Ports

The Brevis can simultaneously accommodate up to two injection ports.

Split/Splitless Injection Unit (SPL)*1

Direct Injection Unit (WBI)

On Column Injection Unit (OCI)

Program Heating Injection Unit (PTV)

Packed Column Injection Unit (SINJ)*2

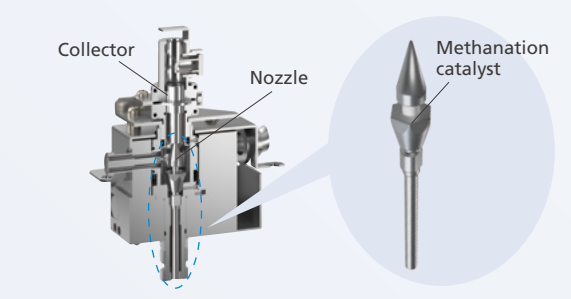
Split Injection Unit for Gas (SPI)

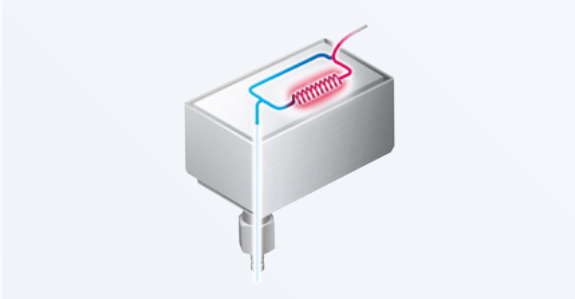
*1 Inert option available

*2 Glass/SUS packed columns can be connected

Detectors

The Brevis can simultaneously accommodate up to three detectors.



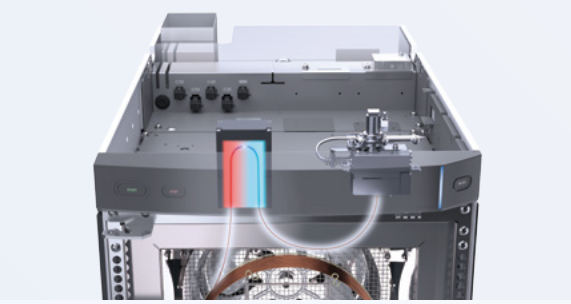


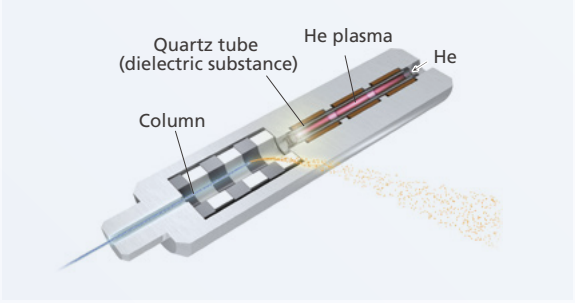
FID / Jetanizer

FID nozzle and collector structures have been optimized to provide improved response in comparison to conventional models. Further, the FID with Jetanizer is capable of high-sensitivity detection of CO and CO_2 from less than 1 ppm to 100 %.

Newly Designed TCD

In comparison to conventional models, the newly designed TCD can significantly shorten the time from startup to stabilization, enabling high-sensitivity analysis of inorganic gases and light hydrocarbons.





Polyarc

Polyarc converts all organic compounds to methane molecules before detection by FID, so that a uniform response is obtained with the FID. This reduces difficult, time-consuming calibration.

BID

This universal detector offers high-sensitivity analysis by using a low-frequency dielectric barrier discharge plasma for ionization. A wide variety of compounds other than He and neon (Ne) are detected with high sensitivity.

Electron Capture Detector (ECD)

This detects electrophilic compounds such as organic halide and organometallic compounds.

Flame Photometric Detector (FPD)

This detects phosphorus, sulfur, and organotin compounds.

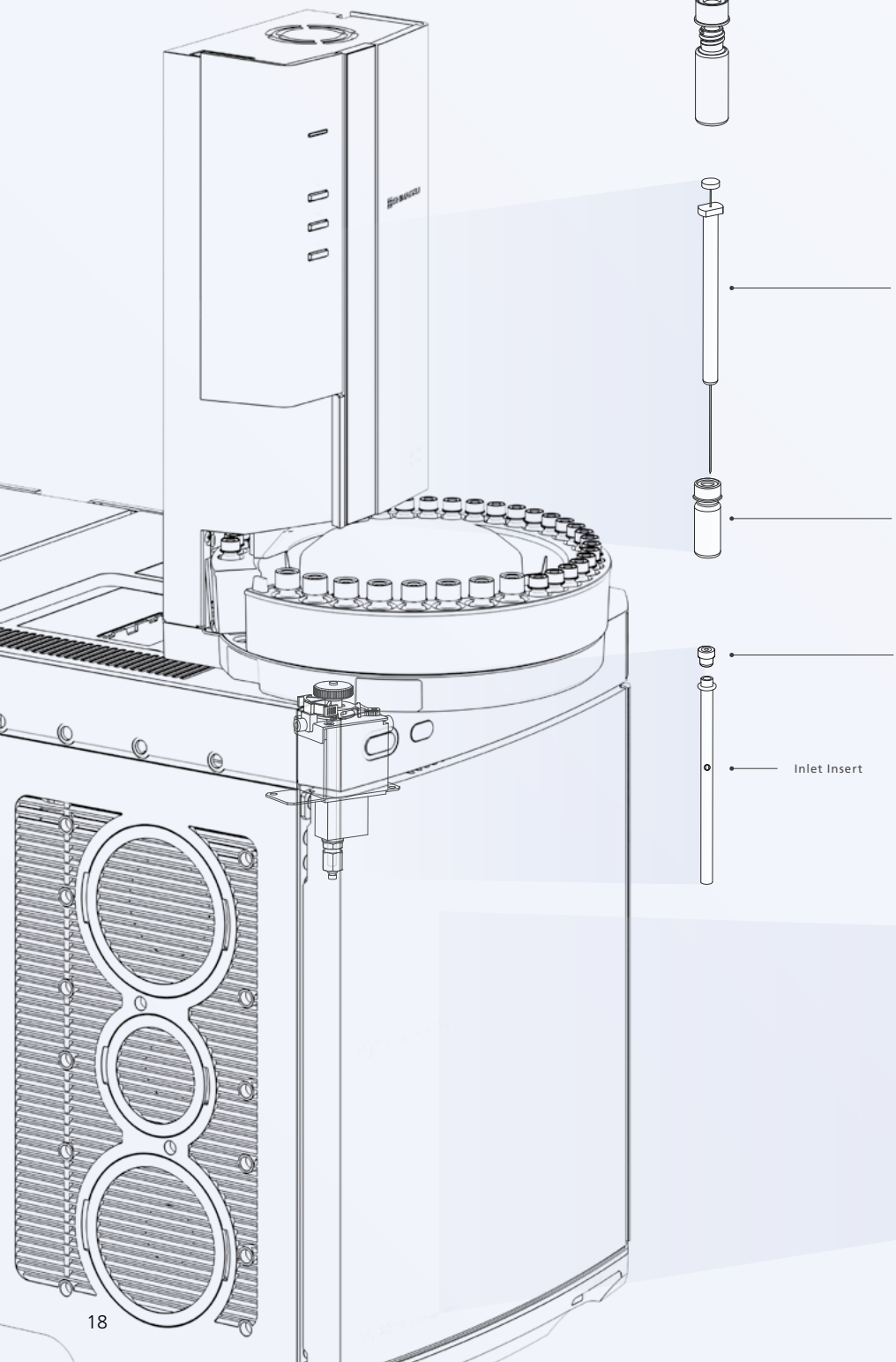
Thermal Ionization Detector (FTD)

This detects organic nitrogen compounds, and inorganic and organic phosphorus compounds.

Tested & Proven Consumables

Genuine Consumables of Reliable Quality

Proven quality consumables are critical to getting the right analysis results and minimizing downtime. Shimadzu offers a wide range of consumables to maximize the performance of GC/GCMS systems.



Xtra Clean Conical Cap

Xtra Life Microsyringe

Certified Quality (CQ) Vial

Xtra Life Inlet Septum

Shimadzu SH Series Column

Data Management

Providing Reliable Data Management and a Comfortable Analysis Environment, LabSolutions™

Centralized Management of Data and User Information

LabSolutions offer rich features to help meet FDA 21 CFR Part 11 and the Japanese Ministry of Health, Labour and Welfare guidelines on electronic records and electronic signatures. They also include functions for data integrity to prevent data falsification and replacement. User information and operation histories are managed in a database, allowing optimal user management based on roles, such as system administrator and analyst.

Connected to Your Current Software, GC Drivers

Using the GC driver, the Brevis GC-2050 and other Shimadzu GC instruments can be connected to other companies' CDS (Chromatographic Data System), such as OpenLab™, Chromeleon™, Empower™, etc. Shimadzu GCs can be operated without changing your instrument control or analysis environment.

(For details, please check the latest GC driver compatibility status separately.)

System

Size and Weight

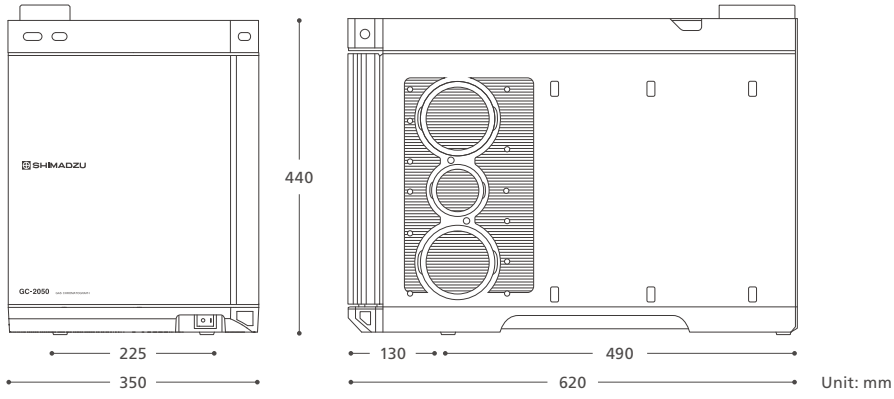
Height : 440 mm
Width : 350 mm
Depth : 620 mm
Weight : 29.8 kg

Note: This is the value for the SPL/FID model (excluding protrusions).

Certifications

- IEC61010-1, IEC61010-2-010
- CE marking (compliant with EU standards)
- EMC (EN 61326-1)
- EU RoHS/Chinese RoHS
- KC mark certification (Korea EMC)

Note: Depends on the area and product model



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