

GC-2010

Shimadzu Capillary Gas Chromatograph System

**Best-in-Class FID Sensitivity
New release!!**

The GC-2010 meets all customer needs in all fields and every situation. Delivering fast analysis, high sensitivity, and easy operation; the GC-2010 can dramatically improve throughput and productivity.



GC-2010/AOC GCsolution Ver.2



New FID-2010

**Minimum detection quantity
(MDQ): 1.5pgC/sec**

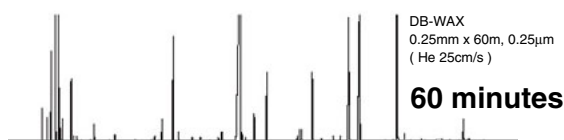
Achieves the world's highest sensitivity!*

High-speed analysis

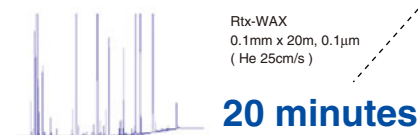
The GC-2010 is equipped with the tools for high-speed analysis, providing labor savings and improving throughput.

The AFC (Automatic Flow Controller) easily supports fast analysis (Max. pressure: 970 kPa, Max. flow rate: 1200mL/min). High performance oven completes the package.

Analysis time by the previous model



Analysis time by GC-2010

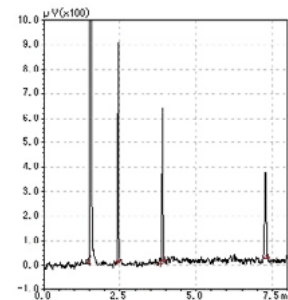
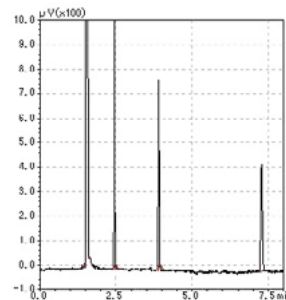


High-speed analysis of a coffee-flavor sample

High-sensitivity FID

Introducing a new high-sensitivity FID, enabling the GC-2010 to conduct ultra trace analysis.

The highest quality electrical connectors and cables inside of the FID-2010 have been employed to bring you a significant S/N improvement that is 2 times higher sensitivity than the previous model. Up to 4 detectors can be installed.



Detector lineup

Inorganic gas, high-density organic compounds:

Thermal conductive detector TCD-2010

Halogen compounds:

Electron capture detector ECD-2010

Organic sulfur compounds, Organic phosphorus compounds:

Flame photometric detector FPD-2010

Organic nitrogen compounds, Organic phosphorus compounds:

Flame thermionic detector FTD-2010

GC-2010 Specifications

■ Column Oven

Temperature range: room temperature + 4°C to 450°C (using liquid CO₂ gas*: -50°C to 450°C)
Dimensions: 280 (w) x 280 (H) x 175 (D) mm
Oven volume: 13.7 L
Temperature accuracy: set value (K) ± 1% (calibration at 0.01°C)
Temperature deviation: <2°C max. (on 200 mm dia. circumference 30 mm from rear, 115V model)
Temperature variation coefficient: <0.01°C/°C
Temperature program steps: Up to 20 (cooling program possible)
Programmed rate setting range: -250 to 250°C/min.
Total time for all steps: 9999.99 minutes max.
* Optional parts are required to use liquid CO₂ gas.

■ Injection Port

Maximum 3 independently temperature controlled injector units (The quantity that can be mounted simultaneously depends on the injector type) are provided.
Injection port unit: Split/splitless injection unit provided as standard.

Split/Splitless Injection Unit (SPL-2010)

Temperature range: room temperature + 5°C to 450°C

Direct Injection Unit (WBI-2010)

Temperature range: room temperature + 5°C to 450°C

On-column/Programmable Temperature Vaporizer Injection Unit (OCI/PTV-2010)

Temperature range: room temperature + 5°C to 450°C
Heating rate: 50°C to 450°C within 3 minutes
Cooling rate: 450°C to 50°C within 8 minutes (for 50°C column temperature)
Heating program: max. heating rate 250°C/minute, heating in 7 steps
Switching possible between on-column and programmable temperature vaporizer injection units (requires split piping re-connection between OCI and PTV)

To keep instrument specifications, max. 2 injection ports shall be heated simultaneously.

■ Detectors

Four detectors can be installed simultaneously and individually temperature controlled. Detector gas is electronically controlled by APC (Advanced Pressure Control).*(The quantity that can be mounted simultaneously depends on the detector type)

Flame Ionization Detector (FID)

Temperature range: to 450°C
Minimum detected quantity: 1.5 pgC/s (dodecane)
Dynamic range: 10⁷

Thermal Conductivity Detector (TCD)

Temperature range: to 400°C
Sensitivity: 20000 mV·mL/mg (decane)
Dynamic range: 10⁵

Electron Capture Detector (ECD)

Temperature range: to 400°C

Minimum detected quantity: 8 fg/s (γ-BHC)

Dynamic range: 10⁴

Flame Photometric Detector (FPD)

Temperature range: to 350°C
Minimum detected quantity: P 0.2 pgP/s (tributyl phosphate)
S 4 pgS/s (dodecane thiol)
Dynamic range: Phosphorus mode: 10⁴
Sulfur mode: 10³

Flame Thermionic Detector (FTD, also called NPD or TSD)

Temperature range: to 450°C
Minimum detected quantity: N 0.3 pgN/s (azobenzene)
P 0.03 pgP/s (malathion)

Dynamic range: N, P 10³

To keep instrument performance, max. 2 detectors shall be operated simultaneously.

■ Flow Control Unit

Advanced Flow Controller (AFC)

Split/splitless mode

Pressure setting range: 0 to 970 kPa
Programmable steps: 7 (cooling program possible)
Programmed rate setting range: -400 to 400 kPa/min.
Split ratio setting range: 0 to 9999.9
Total flowrate setting range: 0 to 1200 mL/min.
Column average linear velocity can be kept constant while temperature is increasing.

Direct injection mode

- Pressure mode
Pressure setting range: 0 to 970 kPa
Programmable steps: 7
Programmed rate setting range: -400 to 400 kPa/min.
- Flow mode
Flow setting range: 0 to 1200 mL/min.
Programmable steps: 7
Programmed rate setting range: -400 to 400 mL/min/min.
Column average linear velocity can be kept constant while temperature is increasing.

■ Display

240 x 320-dot graphics display (30 columns x 16 lines)

■ Dimensions, Weight, Power Requirements (GC main unit)

Dimensions: 515 (w) x 440 (H) x 530 (D) mm
Weight: 30 kg (FID model)
Power requirements: AC100V/115V230V ±10%, 1800VA (Normal oven type) or 2600VA (High power oven type), 50/60Hz

GCsolution Ver. 2 Specifications

■ Software Specification

Compatible with Windows XP/2000/NT4.0
32-bit application (long-filename compatible), graphical user interface (Assistant Bar, etc.)

■ Instrument Control

Controls GC-2010, GC-2014, GC-17A, GC-14B, AOC-20i/s, AOC-5000*.
Controls up to four GC units (9 detectors simultaneously).
Supports dual injection system with four detectors (GC-2010) or two detectors (non-GC-2010).
*Control of AOC-5000 requires optional software.

■ Data Acquisition

4 ms minimum sampling time, snapshot function, supports single analysis and batch analysis, Batch Table Wizard, add or insert analyses, supports extended analysis time, automatic data file creation, QA/QC (statistical) functions, batch auto-stop function, run user program function, supports pre-run programs, OLE automation compatibility (batch analysis, etc.)

■ Data Processing and Data Analysis

Peak integration manipulation, identification (supports multiple relative retention times and grouping), quantitation (percentage area method, corrected percentage area method, internal standard method, external standard method, standard addition method, index calculation, manual coefficient input), calibration points and levels (16 levels x 10 points), manual calibration curve creation, column performance calibration, data comparison functions.

■ Report Generation

Over ten types of report item (sample information, environment settings, methods, chromatograms, peak tables, calibration curves, grouping results, diagrams, text, etc.), OLE object compatibility, layout customization and preview functions, summary report

■ Files

Data Explorer for file management, All-In-One file structure File conversion (CLASS-GC10 format, CLASS-VP4 format, AIA ANDI format, textformat), file searching, template functions

■ Hardware Functions

GC automatic stop/automatic start, system check (GC self-diagnosis), status log

■ GLP/GMP-related

Audit trail, software validation, security, Part11 compatibility

■ Network Compatibility

Post-run application software (option, secondary right of use), GC-LAN connectivity (option)

■ Other

Maintenance guide (GC-2010, GC-2014, GC-17A, GC-14A/B, AOC-20i)

PC Requirements for GCsolution

- (1) CPU: 1.3GHz or faster,
RAM: 128 MB or greater
HDD: 40 GB or greater
24x speed CD-R/RW, OADG keyboard
100BASE-TX/10BASE-T LAN interface
- (2) Software
Windows XP Professional
- (3) Display
- (4) 1 x RS-232C cable 2m for connecting to GC-2010

Founded in 1875, Shimadzu Corporation, a leader in the development of advanced technologies, has a distinguished history of innovation built on the foundation of contributing to society through science and technology. We maintain a global network of sales, service, technical support and applications centers on six continents, and have established long-term relationships with a host of highly trained distributors located in over 100 countries. For information about Shimadzu, and to contact your local office, please visit our Web site at www.shimadzu.com



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