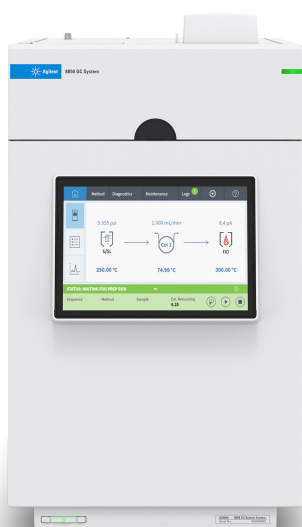


Agilent 8850 Gas Chromatograph



The Agilent 8850 gas chromatograph is the smallest high-performance benchtop GC on the market, designed and engineered to maximize productivity, efficiency, and uptime by offering:

- **Compact size.** The 8850 GC takes just half the space of traditional benchtop instruments.
- **High performance.** Featuring the same electronic pneumatic control (EPC), inlets, and detectors found in the Agilent 8890 GC, the 8850 GC delivers the same industry-leading repeatability, precision, and sensitivity.
- **Fast GC.** A small air-bath oven enables fast temperature ramps and short cool-down times.
- **Energy efficiency.** Using less power than other GCs, the 8850 helps your lab reduce energy costs and meet sustainability goals.
- **Powerful intelligence features.** Diagnostics and remote connectivity allow 8850 users to monitor system health, plan maintenance, troubleshoot issues, and manage method development from anywhere in the world. Guided maintenance helps even novice users perform tasks right the first time.

Agilent GC systems are known for their reliability, ruggedness, and long life. The Agilent 10-year use guarantee provides assurance throughout the life of the instrument.

Chromatographic performance*

- Retention time repeatability: < 0.008% or < 0.0008 minutes
- Area repeatability: < 0.5% RSD

The 8850 GC is a state-of-the-art gas chromatograph that uses advanced sixth-generation Agilent EPC modules and high-performance GC oven temperature control.

The combination of precise pneumatic and temperature control provides optimal chromatography, including peak symmetry, retention time repeatability, and retention index accuracy.

* Using the 8850 with EPC (splitless), automatic liquid sampling (ALS), and Agilent OpenLab CDS for analysis of tetradecane (2 ng to the column). Results may vary with other samples and conditions.

System capabilities

- Supports simultaneously:
 - One inlet
 - One detector
 - Up to eight detector/diagnostic signals
- State-of-the-art detector electronics and the full-range digital data path enable peaks to be quantified over the entire concentration range of the detector (10^7 for the FID) in a single run.
- Full EPC is available for all inlets and detectors. Control range and resolution are optimized for the specific inlet or detector module.
- Up to three EPC modules can be installed.
- Pressure setpoint and control precision to 0.001 psig provide more retention time locking precision for low-pressure applications.

- EPC with capillary columns provides four column flow control modes: constant pressure, ramped pressure (three ramps), constant flow, or ramped flow (three ramps). Column average linear velocity is calculated.
- Atmospheric pressure and temperature compensation is standard, so results do not change, even when the laboratory environment does.
- Serial port interface.
- One-button access to maintenance and service modes from the touchscreen and browser interface.
- Preprogrammed leak tests.
- ALS and headspace sampling with the Agilent 8697 are fully integrated into mainframe control.
- Setpoint and automation control can be done from the touchscreen or through a networked data system. Clock-time programming can be initiated from the front panel to initiate events (on/off, method start, etc.) at a future date and time.
- A run time deviation log is created for each analysis to ensure that all method parameters were achieved and maintained.
- 550 timed events.
- Display of all GC, ALS, and 8697 HSS setpoints at the GC or data system.
- Context-sensitive online help.
- Programmable, eco-friendly sleep mode reduces power

and gas consumption during periods of inactivity, while wake mode readies the system for high-throughput operation.

- The 8850 GC has advanced built-in capabilities to monitor system resources, including counters, electronic logs, and diagnostics. Integrated early maintenance feedback that tracks either the number of injections or time of use allows for planned maintenance to eliminate unnecessary down-time.

Column oven

- Dimensions: 21 × 20 × 10 cm. Accommodates up to one 105 m × 0.530 mm id capillary column, or one 20-ft stainless steel packed column (1/8 in od).
- Operating temperature range suitable for all columns and chromatographic separations. Ambient temperature +4 °C to 350 °C.
- Temperature setpoint resolution: 0.1 °C.
- Supports 32 oven ramps with 33 plateaus. Negative ramps are allowed.
- Maximum temperature ramp rate: 300 °C/min (standard 120 V oven units are limited to 120 °C/min, see Table 1).
- Maximum run time: 999.99 min (16.7 hours).
- Oven cooldown (22 °C ambient) 350 to 50 °C in < 2.5 minutes.
- Ambient rejection: < 0.01 °C per 1 °C.

Table 1. Typical Agilent 8850 GC oven ramp rates.

Temperature Range (°C)	120 V Standard (°C/min)	120 V Fast (°C/min)	200 to 240 V Fast (°C/min)
50 to 75	120	240	300
75 to 115	95	190	300
115 to 175	65	130	300
175 to 300	45	90	200
300 to 350	35	70	100
350 to 50	< 2.5 min	< 2.5 min	< 2.5 min

Electronic pneumatics control (EPC)

- Compensation for barometric pressure and ambient temperature changes is standard.
- Pressure has typical control of ± 0.001 psi for the range of 0 to 150 psi. Pressure setpoints may be adjusted in increments of 0.001 for the range 0.000 to 99.999 psi; 0.01 psi for the range 100.00 to 150.00 psi.
- User may select pressure units as psi, kPa, or bar.
- Pressure/flow ramps: three maximum.
- Carrier and makeup gas settings are selectable for He, H₂, N₂, and argon/methane.
- Constant flow mode is available when capillary column dimensions are entered into the 8850.
- Split/splitless inlet has flow sensors for the control of the split ratio.

Inlet modules

- **Pressure sensors:**
Accuracy: $< \pm 2\%$ full scale
Repeatability: $< \pm 0.05$ psi
Temperature coefficient: $< \pm 0.01$ psi/°C
Drift: $< \pm 0.1$ psi/6 months
- **Flow sensors:**
Accuracy: $< \pm 5\%$ depending on the carrier gas
Repeatability: $< \pm 0.35\%$ of setpoint
Temperature coefficient: $< \pm 0.20$ mL/min (NTP)* per °C for He or H₂; $< \pm 0.05$ mL/min NTP per °C for N₂ or Ar/CH₄.
* NTP = 25 °C and 1 atmosphere
- **Detector modules:**
Accuracy: $< \pm 3$ mL/min NTP or 7% of setpoint
Repeatability: $< \pm 0.35\%$ of setpoint

Inlets

- Maximum of one inlet installed.
- EPC compensated for atmospheric pressure and temperature variation.
- Inlets available:
 - Purged packed inlet (PPI)
 - Standard, high pressure, and inert flow path split/splitless capillary inlets (S/SL)
 - Temperature-programmable cool on-column (PCOC)

S/SL

- Suitable for all capillary columns (50 μ m to 530 μ m id).
- Split ratios up to 12,500:1 to avoid column overload.
- Splitless mode for trace analysis. Pressure-pulsed splitless is easily accessible for best performance.
- Maximum temperature: 375 °C.
- EPC available in two pressure ranges: 0 to 100 psig (0 to 680 kPa) for best control for columns ≥ 0.200 mm diameter; 0 to 150 psig for columns < 0.200 mm diameter.
- Gas saver mode to reduce gas consumption without compromising performance.
- Electronic septum purge flow control to eliminate "ghost" peaks.
- Total flow setting range: 0 to 500 mL/min N₂; 0 to 1,250 mL/min H₂; or He 0 to 200 mL/min argon/methane
- Turn top inlet sealing system is built in standard with each 8850 S/SL inlet for quick, easy, injector liner changes.
- Optional inert S/SL inlet includes chemical deactivation process for weldment and weldment insert.

PCOC

- Direct injection onto cool capillary column ensures quantitative sample transfer with no thermal degradation.
- Automatic liquid injection supported directly onto columns ≥ 0.250 mm id.
- Maximum temperature: 375 °C. Temperature programming in three ramps or tracking oven.
- Electronic pressure control range: 0 to 100 psig.
- Electronic septum purge flow control.

PPI

- Direct injection onto packed and wide-bore capillary columns.
- Electronic flow/pressure control: 0 to 100 psig pressure range, 0.0 to 200.0 mL/min flow range. Ranges are chosen to provide optimum performance over normal packed column setpoint ranges.
- Electronic septum purge flow control.
- 375 °C maximum operating temperature.
- Adapters are included for 1/8 in packed columns and 0.530 mm capillary columns.

Detectors

- Maximum of one detector installed.
- Electronic pneumatics control and electronic on/off for all detector gases.
- EPC compensated for atmospheric pressure and temperature variation.
- Detectors available:

FID:

- Flame ionization detector (FID) that responds to most organic compounds.
- Minimum detectable level (for tridecane): < 1.2 pg C/s.

- Linear dynamic range: $> 10^7$ ($\pm 10\%$). Full-range digital data path enables peaks to be quantified over the entire 10^7 concentration range in a single run.
- Data rates up to 1,000 Hz accommodate peaks as narrow as 5 ms at half height.
- Standard electronic pneumatic control for three gases:
Air: 0 to 800 mL/min
H₂: 0 to 100 mL/min
Makeup gas (N₂ or He): 0 to 100 mL/min
- Optimized for capillary columns. An adapter is available for 1/8 in packed columns.
- Flameout detection and automatic reignition.
- 375 °C maximum operating temperature.

Thermal conductivity detector (TCD):

- TCD, a universal detector that responds to all compounds, excluding the carrier gas.
- Minimum detectable level: 400 pg tridecane/mL with He carrier. (This value may be affected by laboratory environment).
- Linear dynamic range: $> 10^5 \pm 5\%$.
- Unique fluidic switching design provides rapid stabilization from turn-on, low-drift performance.
- Signal polarity can be run-programmed for components that have higher thermal conductivity than the carrier gas.
- Maximum temperature: 375 °C.
- Standard EPC for two gases (He, H₂, N₂ or argon/methane matched to carrier gas type).
- Makeup gas: 0 to 12 mL/min.
- Reference gas: 0 to 100 mL/min.

Auxiliary EPC devices

The 8850 GC has one position for an auxiliary EPC device, which can be either an auxiliary EPC, pneumatics control module (PCM), or pneumatic switching device (PSD).

Auxiliary EPC module

- Three channels of pressure control.
- EPC compensated for atmospheric pressure and temperature variation when connected to a user-defined capillary column.
- Psig (gauge) and psia (absolute) pressure control.
- Forward-pressure regulated.

PCM

- Two channels for operation.
- EPC compensated for atmospheric pressure and temperature variation when connected to a user-defined capillary column.
- First channel:
 - Pressure or flow control.
 - Psig (gauge) pressure control.
 - Forward-pressure regulated.
- Second channel:
 - Pressure control.
 - Psig (gauge) and psia (absolute) pressure control.
 - Forward-pressure or backpressure regulated.

PSD

- EPC compensated for atmospheric pressure and temperature variation when connected to a user-defined capillary column.
- Forward-pressure regulated.
- Integrated purge for rapid pressure control adjustments.

Automated sample injectors and samplers

- An Agilent ALS interface on the 8850 provides power and communications for one Agilent 7693A or one Agilent 7650 automatic injector tower. Injector installs easily without the need for alignment.
- The 8850 also supports sample introduction using the Agilent 7697A and 8697 headspace samplers.

Data communications

- LAN
- Two analog output channels (1 V, and 10 V output available)
- Remote start/stop
- Touchscreen control of the ALS or 8697 Headspace Sampler
- Binary-coded decimal input for a stream selection valve
- Serial port interface

Maintenance and Support Services

- Integrated early maintenance counters allow planned maintenance and help eliminate unnecessary downtime.
- Instrument events or shutdowns are displayed on the touchscreen display or Data System.
- Remote diagnostics.
- Performance verification services.
- Easy parts identification and part number finder software (standalone software, does not require Agilent CDS).

Touchscreen and browser interface

The 8850 7-inch capacitive touchscreen interface provides real-time access to instrument status, configuration, and flowpath information. A signal plot confirms that analyses are running as intended. Additional tabs provide quick access to key functions such as editing method parameters, diagnostics, maintenance, logs, and help screens.

- The browser interface may be used to view setup information, access troubleshooting, initiate diagnostic and performance tests, pause and start sample runs, and manage method development.
- A browser interface optimized for mobile viewing on either iOS or Android phones provides status information, including remaining run time and a static plot of the last 20 minutes of detector data.

Environmental conditions

- Ambient operating temperature: 15 °C to 35 °C
- Ambient operating humidity: 5% to 90% (noncondensing)
- Storage extremes: –40 °C to 70 °C
- Power requirements
 - Line voltage: 100/120/200/220/230/240 V ±10% of nominal
 - Frequency: 50/60 Hz

Safety and regulatory certification

Conforms to the following safety standards:

- Canadian Standards Association (CSA) C22.2 No. 61010-1
- Nationally Recognized Test Laboratory (NRTL): ANSI/UL 61010-1
- International Electrotechnical Commission (IEC): 61010-1, 61010-2-010, 61010-2-081
- EuroNorm (EN): 61010-1

Conforms to the following regulations on Electromagnetic Compatibility (EMC) and Radio Frequency Interference (RFI):

- CISPR 11/EN 55011: Group 1 Class A
- IEC/EN 61326-1
- AUS/NZ CISPR 11
- This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada.
- Designed and manufactured under a quality system registered to ISO 9001, Declaration of Conformity available.
- This product complies with the EU RoHS Directive 2011/65/EU and conforms to EN 50851.

Other specifications

- Height: 49.2 cm (19.4 in).
- Width: 28.3 cm (11.1 in).
- Depth: 58.5 cm (23.0 in).
- Typical weight: 27.3 kg (60.2 lb).
- Four internal 24-volt connections (up to 150 mA).
- Two external 24-volt connections (up to 150 mA).
- Two on/off contact closures (48 V, 250 mA maximum).
- 550 timed events using the data system. Fifty timed events using the GC touchscreen.
- Support for one gas sampling valve or one liquid sampling valve in a heated compartment.
- Four independent headed zones, not including the oven (one inlet, one detector, and two auxiliary).
- Maximum operating temperature for auxiliary zones: 375 °C.

References

1. A Guide to Interpreting Detector Specifications for Gas Chromatography. *Agilent Technologies technical note*, publication number 5989-3423EN, **2005**.
2. The Importance of Area and Retention Time Precision in Gas Chromatography. *Agilent Technologies technical note*, publication number 5989-3425EN, **2005**.

For more information

For more information on our products and services, visit our website at www.agilent.com.

www.agilent.com/gc/8850

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