Data Sheet

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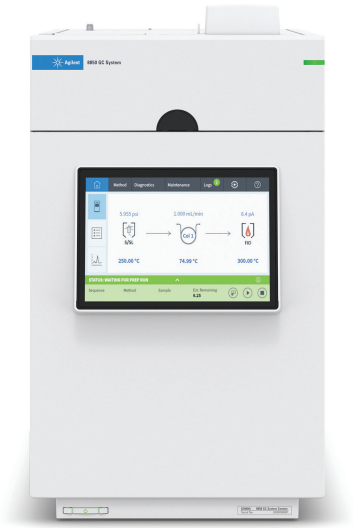
Agilent 8850 Gas Chromatograph



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 pneumatics control (EPC), inlets, and detectors found in the Agilent 8890 GC, the 8850 GC delivers the same industry-leading repeatability, precision, and sensitivity.
- **Fast analysis.** A small air-bath oven enables fast temperature ramps and short cool-down times.
- **Energy efficiency.** Using 45% 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.

Note: Information in this data sheet pertains to 2nd generation 8850 instruments shipped in October of 2025 or later. 2nd generation systems are denoted by the serial number, with the 7th character being G.

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 touch screen 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 touch screen or through a networked data system. Clock-time programming can be set up 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 downtime.

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 450 °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 (see Table 1).
- Maximum run time: 999.99 min (16.7 hours).
- Oven cooldown (22 °C ambient) 450 °C to 50 °C in < 2.8 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)	240 V Fast (°C/min)
50 to 75	120	200	300
75 to 115	95	160	300
115 to 175	65	130	250
175 to 300	45	90	200
300 to 450	25	50	100

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, H_2, N_2, 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: < ± 2% full scale
  Repeatability: < ± 0.05 psi
  Temperature coefficient: < ± 0.01 psi/°C
  Drift: < ± 0.1 psi/6 months
- **Flow sensors:**
  Accuracy: < ± 5% depending on the carrier gas
  Repeatability: < ± 0.35% of setpoint
  Temperature coefficient: < ± 0.20 mL/min (NTP)* per °C for He or H_2; < ± 0.05 mL/min NTP per °C for N_2 or Ar/CH_4
  * NTP = 25 °C and 1 atmosphere
- **Detector modules:**
  Accuracy: < ± 3 mL/min NTP or 7% of setpoint
  Repeatability: < ± 0.35% of setpoint

Inlets

- Maximum of one inlet installed.
- EPC compensated for atmospheric pressure and temperature variation.
- Inlets available:
  - Purged packed inlet (PPI)
  - Multimode inlet (MMI)
  - 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 µm to 530 µm 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: 400 °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 N_2; 0 to 1,250 mL/min H_2 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.

MMI

- Provides the flexibility of a standard Agilent split/splitless inlet, combined with programmable temperature vaporizer capability, enabling large-volume injections. Also supports cool injections for improved signal response.
- Temperature control: LN_2 (to –20 °C), LCO_2 (to –20 °C), air cooling (to ambient +10 °C with oven temperature < 50 °C). Due to high consumption, air cooling with cylinders is not advised. Temperature programming of up to 10 ramps at up to 900 °C/min. Maximum temperature: 450 °C.
- Injection modes:
  - Hot or cold split/splitless
  - Pulsed split/splitless
  - Solvent vent
  - Direct
- Suitable for all capillary columns (50 to 530 µm).
- EPC pressure range (psig): 0 to 100 psig.
- Split ratio: up to 12,500:1 to avoid column overload. Setting split ratios (particularly low split ratios) is limited by column parameters and control of system flows (particularly low system flows).
- Splitless mode for trace analysis. Pressure pulsed splitless is easily accessible for improved performance.
- Electronic septum purge flow control.
- Compatible with Merlin Microseal septum.
- Setup of parameters facilitated with Agilent Solvent Elimination Calculator.
- Total flow setting range: 0 to 500 mL/min N_2; 0 to 1,250 mL/min H_2 or He; 0 to 200 mL/min argon/methane

- Turn-top inlet sealing system is built-in standard with each 8850 multimode inlet for quick, easy injector liner changes.

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: 450 °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.
- 400 °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.
- EPC and electronic on/off for all detector gases.
- EPC compensated for atmospheric pressure and temperature variation.
- Detectors available:
  - Flame ionization detector (FID)
  - Thermal conductivity detector (TCD)
  - Mass spectrometers (MS)

FID

- FID that responds to most organic compounds.
- Minimum detectable level (for tridecane): < 1.2 pg C/s.
- Linear dynamic range: > 10^7 (± 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 EPC for three gases:
  Air: 0 to 800 mL/min
  H_2: 0 to 100 mL/min
  Makeup gas (N_2 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.
- 450 °C maximum operating temperature.

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 ± 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: 400 °C.
- Standard EPC for two gases (He, H_2, N_2, or argon/methane matched to carrier gas type).
- Make-up gas: 0 to 12 mL/min.
- Reference gas: 0 to 100 mL/min.

MS

- See specifications for:
  - 5977 series GC/MSD
  - 7000 series triple quadrupole GC/MS
  - 7010 series triple quadrupole GC/MS

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 pneumatics 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.

Backflush

Agilent proprietary Purged Ultimate Unions (PUU) provide reliable, leak-free, in-oven capillary connections to help analyze complex samples and provide gains in productivity.

Agilent PUUs require one channel from an auxiliary EPC, PCM, or PSD module. An auxiliary EPC or PCM can be used for backflushing, but a PSD module is preferred. By reversing column flow immediately after the last compound of interest has eluted, you can eliminate long bake-out times for highly retained (or high-boiling) contaminants, thereby shortening cycle times and protecting the column and detector. As backflush occurs after peaks of interest have eluted, the chromatographic method for peaks of interest does not need to change. Backflush is available when the column is attached to a split/splitless (SSL) or multimode (MMI) inlet.

The GC firmware has been optimized for backflush operation:

- Displays positive and negative flows
- Inlet/outlet pressures settable to the limits of the controlling EPC devices
- EPC can be introduced at any column or restrictor connection
- Capillary flow configuration of up to six columns/restrictors

For users running Chemstation and MassHunter, Backflush Wizard software provids a step-by-step procedure for configuring the backflush hardware and column plumbing. The chromatogram must have three well separated peaks.

Automated sample injectors and samplers

- An Agilent ALS interface on the 8850 provides power and communications for one Agilent 7693A or one Agilent 7650A automatic injector tower. Injector installs easily without the need for alignment.
- The 8850 also supports sample introduction using the Agilent 7697A, 8697, and 8697-XL headspace samplers.
- The Agilent PAL injector on the 8850 has specialized software controls available on OpenLab CDS, ChemStation, and EZChrom editions, MassHunter, and MSD Productivity ChemStation.

Data communications

- LAN
- Two analog output channels (1 V, and 10 V output available)
- Remote start/stop
- Touch screen 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 touch screen display or data system.
- Remote diagnostics.
- Performance verification services.

Touch screen and browser interface

The 8850 7-inch capacitive touch screen interface provides real-time access to instrument status, configuration, and flow path 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. 50 timed events using the GC touch screen.
- Support for one gas sampling valve or one liquid sampling valve in a heated compartment.
- Four independent heated 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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