Data Sheet

Agilent

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Agilent 8860B Gas Chromatograph

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The Agilent 8860B gas chromatograph delivers reliable, repeatable performance for routine analyses, combining proven GC expertise with simplified operation.

A bright color touchscreen provides quick access to system setpoints, configuration details, flowpath information, and live signal plots to easily monitor run progress. For deeper control, the built-in Agilent GC Assist interface—optimized for tablets, PCs, and mobile devices—offers advanced system intelligence, including remote status checks, self-guided diagnostics, maintenance tools, and method and sequence editing.

The 8860B supports full electronic pneumatics control (EPC) or electronic pneumatics regulation (EPR), enabling precise, automated or electronically adjusted gas management. Both EPC and EPR use robust 7th-generation microchannel architecture, designed for superior protection against contaminants and improved long-term reliability.

GC system capabilities

Retention time repeatability: < 0.03% or 0.003 minutes

Area repeatability: < 1.0% RSD

- The 8860B display comes with physical start/stop buttons for manual analysis
- Easy access to maintenance and service modes from the GC Assist interface, including autonomous leak checks
- The GC Assist interface provides remote connectivity enabling you to monitor your smart GC system, check system logs, and perform diagnostics tests, from inside or outside the laboratory
- Atmospheric pressure and temperature compensation are built into every system, so results do not change, even when the laboratory environment does.

Simultaneously supports

- Two inlets
- Three detectors
- Support for up to any combination of three valves total:
  - Up to four heated gas sample valves
  - Up to two liquid sampling valves
- Dual sample introduction capabilities:
  - Supports two 7693A autoinjectors with capacity for 16 sample vials
  - Supports one 7693A autoinjector and automatic sampler tray with capacity for 150 sample vials
  - Supports one 7650A autoinjector with capacity for 50 sample vials with one 7693A with capacity for 16 sample vials
  - Supports one PAL3 autosampler

Instrument dimensions

- **Height:** 49 cm (19.2 in)
- **Width:** 58 cm (22.9 in), 68 cm with side-mounted detector
- **Depth:** 54 cm (21.3 in)
- **Typical weight:** 51 kg (112 lb)

Maintenance and support services

- Integrated early maintenance counters allow planned maintenance and helps eliminate unnecessary downtime
- Instrument events or shutdowns displayed on 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)

Sustainability

- Programmable eco-friendly sleep and wake modes reduce power and gas consumption during periods of inactivity.
- The gas and power usage tracker calculates resource consumption by analytical method.
- Built-in intelligence autonomously monitors the health of the system, alerts the user of potential issues before they affect chromatographic performance, and offers helpful step-by-step guides to resolve issues.
- Helium conservation module, gas saver, and alternative carrier gas solutions can dramatically reduce the amount of helium used (up to 50%), offering flexibility and cost savings.
- The 8860B GC is independently audited for environmental impact throughout the product lifecycle and has received My Green Lab's ACT 2.0 (Accountability, Consistency, Transparency) label.

ACT.
The Environmental Impact Factor Label

Typical Power Consumption	Operating Conditions (kWh)	Sleep/Idle Conditions (kWh)
8860B	0.922	0.140

Column oven

Dimensions	28.0 × 30.5 × 16.5 cm
Operating Temperature	8 °C above ambient to 425 °C
Temperature Setpoint Resolution	0.1 °C
Maximum Temperature Ramp Rate	75 °C/min (see Table 1)
Oven Cool Down	300 to 50 °C in 5.7 minutes (25 °C ambient)
Maximum Run Time	999.99 min
Temperature Programming Ramps	32 (negative allowed) Ambient rejection < 0.01 °C per 1 °C

Table 1. Typical 8860B oven ramp rates.

Temperature (°C)	220 V Oven Rates (°C/min)
50 to 70	75
70 to 115	45
115 to 175	40
175 to 300	30
300 to 425	20

For a 100 V oven, with a typical setpoint of 350 °C, the maximum ramp rate is ~ 30 °C/min.

Electronic pneumatics control (EPC) and electronic pneumatic regulation (EPR)

EPC

Available on all inlets and detectors.

EPR

Available on S/SL and packed column inlets and FID, TCD, and ECD detectors. EPR allows the user to manually adjust pressure and total flow (for S/SL inlet) or flow only (for packed column inlet (PCI) and FID, TCD, and ECD detectors) to a desired value using the GC Assist interface. Makeup flow will not compensate for changes to column flow during oven temperature ramping.

Inlets

- Up to two inlets may be installed
- EPC pressure setpoint and control precision to 0.01 psi or 0.069 kPa
- Display resolution for EPR for pressure is 0.01 psi or 0.069 kPa

Purged packed (EPC)

- Electronic flow control
- Septum purge
- Maximum operating temperature: 400 °C
- Maximum flow rate: 100 mL/min
- Adapters included for 1/8-inch packed columns
- Adapters for 0.530 mm capillary columns

Packed column (EPR)

- Constant flow operation
- 400 °C maximum operating temperature
- Maximum flow 100 mL/min
- Adapters included for 1/8-inch packed columns

S/SL (EPC)

- Electronic pressure/flow control
- Septum purge
- Turn top inlet sealing system
- Includes leak and restriction, pressure decay, and split vent restriction test diagnostics (cap off septum purge)
- Maximum operating temperature: 400 °C
- Pressure setting range: 0 to 100 psi or 0 to 689.47 kPa
- Maximum split ratio: 13,500:1
- Flow setting range: 0 to 600 mL/min N_2, 0 to 1,350 mL/min H_2 or He

S/SL (EPR)

- Constant pressure operation
- Septum purge
- Turn top inlet sealing system
- Maximum operating temperature: 400 °C
- Pressure adjustable range: 0 to 100 psi or 0 to 689.47 kPa
- Maximum split ratio: 13,500:1
- Flow adjustable range: 0 to 600 mL/min N_2, 0 to 1,350 mL/min H_2 or He

PCOC (EPC)

- Maximum operating temperature: 400 °C
- Temperature programming in three ramps or tracking
- Oven sub-ambient control is not available
- Pressure setting range: 0 to 100 psig or 0 to 689.47 kPa
- Electronic septum purge control
- Automatic liquid injection supported directly onto columns ≥ 0.250 mm id

Detectors

- Up to three detectors may be installed.
- A 3rd detector as FPD+ or TCD can be located on top in the middle position, or a 3rd detector as TCD or ECD can be located on the side of the GC.
- EPC with electronic flow control is available for detector gases for all detectors.
- EPR with constant flow operation is available for detector gases for FID, TCD, and ECD.

Flame ionization detector (FID)

- Maximum operating temperature: 425 °C
- MDL < 2 pg C/s as tridecane
- Linear dynamic range: > 10^7 with N_2 carrier and 0.29 mm id jet
- Maximum data acquisition rate: 500 Hz
- Full range digital data path enables peaks to be quantified over the entire 10^7 concentration range in a single run

Thermal conductivity detector (TCD)

- Maximum operating temperature: 400 °C
- MDL < 800 pg tridecane/mL using He carrier (MDL may be affected by laboratory environment)
- Linear dynamic range: 10^5 (±10%)
- Single-filament TCD can provide rapid baseline stabilization from turn on with low drift, and does not require separate reference gas or manual potentiometer adjustment
- The TCD can be mounted as a third detector on the left side of the GC

Electron capture detector (ECD)

- Maximum operating temperature: 400 °C
- Makeup gas types: argon/5% CH_4 or N_2
- Radioactive source: < 15 mCi ^{63}Ni
- MDL: < 9 fg/mL lindane
- Dynamic range: > 10^4 with lindane
- Maximum data acquisition rate: 500 Hz
- Equipped with hidden anode and high-velocity flows for contamination resistance
- The ECD can be mounted as a third detector on the left side of the GC

Nitrogen phosphorous detector (NPD)

- MDL: < 0.3 pg N/s, < 0.04 pg P/s with azobenzene/malathion mixture
- Selectivity: 25,000 to 1 g N/g C, 75,000 to 1 g P/g C with azobenzene/malathion mixture
- Dynamic range: > 10^4 N, > 10^4 P with azobenzene/malathion mixture
- Data acquisition rate: up to 100 Hz
- Blos bead standard (white ceramic bead not supported)
- Maximum operating temperature: 400 °C

Flame photometric detector (FPD) +(Plus)

- Single wavelength
- MDL: < 4.5 pg S/s, < 120 fg P/s with methylparathion
- Dynamic range: > 10^3 S, 10^4 P with methylparathion
- Selectivity: 10^6 g S/g C, 10^6 g P/g C
- Data acquisition rate: up to 500 Hz
- Maximum operating temperature: 400 °C

Sulfur chemiluminescence detector (SCD) (Model 8355)

- Highest sensitivity and selectivity for sulfur-containing compounds
- MDL: Typical < 0.5 pg(S)/sec
- MDL (SCD/FID Tandem): Typical < 5.0 pg(S)/sec
- Selectivity: > 2 × 10^7 (g S/g C^2)
- Linearity: > 10^4
- Repeatability: < 2% RSD 2 hours, < 5% RSD 24 hours

Nitrogen chemiluminesence detector (Model 8255)

- Highest selectivity for nitrogen-containing compounds
- MDL: Typical < 3 pg(N)/sec
- MDL (SCD/FID Tandem): Typical < 30 pg(N)/sec
- Selectivity: > 2 × 10^7 (g S/g C^2)
- Linearity: > 10^4
- Repeatability: < 1.5% RSD 8 hours, < 2% RSD 18 hours

Note: See Agilent Sulfur Chemiluminescence Detector and Nitrogen Chemiluminescence Detector Specification Guide for additional information regarding performance and physical and environmental specifications.

Mass spectrometer

Agilent 5977 Series MSD

Auxiliary EPC devices

The 8860B has six total slots for EPC devices. If two inlets and two detectors are used, then two auxiliary slots are available. If two inlets and three detectors are used, then one auxiliary slot is available. Purged GC capillary flow devices are not supported.

Auxiliary EPC module

- Three channels of pressure control
- Psig (gauge) pressure control
- Forward pressure regulated 0 to 100 psig
- Maximum of one auxiliary EPC module per GC

Pneumatics control module (PCM)

- Two channels for operation
- PCM may be located in either/both inlet positions and in auxiliary position
- Maximum of three PCMs per GC

  First channel:

  - Pressure or flow control (psig (gauge))
  - Forward pressure regulated 0 to 100 psig
  - Forward flow regulated 0 to 200 mL/min

  Second channel:

  - Pressure control
  - Forward pressure or back pressure regulated
  - Psig (gauge) and psia (absolute) pressure control

Additional specifications

Data communications

- Two analog output channels (1 V and 10 V output available) as standard
- Remote start/stop
- LAN
- Binary code decimal input for a stream selection valve

Environmental conditions

- Ambient operating temperature: 15 to 35 °C
- Ambient operating humidity: 15 to 90% (noncondensing)
- Storage extremes: –40 to 70 °C
- Operating altitude: 4,600 m

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

  Electromagnetic compatibility (EMC) and radio frequency interference (RFI) regulation conformity:

  - CISPR 11/EN 55011 Group 1, Class A
  - IEC/EN 61326-1
  - AS/NZS CISPR 11
  - This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme à la norme NMB-001 du Canada. ISM 1-A.

  Designed and manufactured under a quality system registered to ISO 9001. The Declaration of Conformity is available.

Other specifications

- Support for up to 8 valves:
  - Valves 1 to 4, Current Source 24 VDC, 13 watts, pneumatic valve control
  - Valves 7 and 8, 48 VDC or 48 VAC rms, control an external current source
  - Valves 9 and 10, Current source 24 VDC, 100 mA relays and low power devices
- Four internal 24-volt connections (up to 150 mA)
- Two on/off contact closures (48 V, 250 mA max)
- Six independent heated zones, not including oven (two inlets, two detectors, and two auxiliary). Third detector can use any available auxiliary zones.
- 400 °C maximum operating temperature for auxiliary zone

Software

Agilent software choices:

- OpenLAB CDS, OpenLab Client/Server, and OpenLAB CDS Workstation Plus
- OpenLAB CDS VL Workstation and OpenLAB CDS VL Workstation Plus
- OpenLAB CDS ChemStation Edition or EZChrom Edition
- OpenLAB CDS ChemStation VL or EZChrom VL
- Includes Agilent retention time locking (RTL) support for 8860B GC with EPC
- Optional RTL databases/libraries are not supported with 8860B GC
- OpenLAB CDS EZChrom Compact
- DA Express (optional data analysis accessible from 8860B GC)

For more information

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

www.agilent.com/gc/8860b

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