

Agilent 7820A Gas Chromatograph System

Data Sheet

The Agilent 7820A gas chromatograph, inheriting Agilent's legendary expertise in GC and proven quality as industry leader, generates reliable results with minimized complexity for customers' routine analyses, run after run, day after day.

The simplified GC front panel keys and display provide sequence information, instrument conditions, and run status. Full electronic pneumatics control (EPC), available for all inlets and detectors, automates control of gas pressures/flows to predefined set points, and allows pressure and flow programming.

Electronic pneumatics regulation (EPR) is available for select inlets and detectors. EPR provides a digital measurement and display of gas pressure/flow and allows the user to manually adjust these gas pressures/flows, electronically, using the 7820A software keypad on the user's PC, avoiding use of mechanical regulators. This provides constant pressure operation for the Split/Splitless inlet, and constant flow operation for the Packed Column inlet and the detectors with EPR. If desired, EPR actual pressure and flow can be saved as additional signals with any OpenLAB CDS software to record its operation for each GC run.

EPC and EPR are compensated for barometric pressure and ambient temperature changes, which results in more stable retention times and detector baselines.

Configurable with a range of optional automated sample injectors and samplers.

A flexible software choice is available designed to help you make the most of every run, and every workday, from:

- OpenLAB CDS Workstation* and OpenLAB CDS Workstation Plus*
 - OpenLAB CDS VL Workstation* and OpenLAB CDS VL Workstation Plus*
 - OpenLAB CDS ChemStation Edition* (C.01.05 or higher) or EZChrom Edition* (A.04.05 or higher)
 - OpenLAB CDS ChemStation VL* or EZChrom VL*
- *Includes Agilent RTL (Retention Time Locking) support for 7820A GC with EPC
Optional RTL databases/libraries are not supported with 7820A GC
- OpenLAB CDS EZChrom Compact
 - DA Express (Data Analysis for 7820A GC (China, Russia only))



Agilent Technologies

Safety and Regulatory Certifications

Safety Standards

Canadian Standards Association (CSA)	C22.2 No. 61010
CSA/Nationally Recognized Test Laboratory (NRTL)	UL61010
International Electrotechnical Commission (IEC)	61010
EuroNorm (EN)	EN61010

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

CISPR 11/EN 55011	Group 1, Class A
IEC/EN 61326	

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

System Overall Performance*

* Using 7820A with EPC (splitless), ALS, and Agilent Data System for analysis of tridecane (2 ng to the column). Results may vary with other samples and conditions.

Retention time repeatability	< 0.06%
Peak area repeatability	< 2%

Power Requirements

100 V (+10%, -10%)	
120 V (+10%, -10%)	
200 V (+10%, -10%)	
220 V (+10%, -10%)	
230 V (+10%, -10%)	
240 V (+10%, -10%)	
Frequency	47.5-63 Hz
1,500 W (max) at 100 V, 2,250 W (max) at all other voltages	

Column Oven

Dimensions	28.0 × 30.5 × 16.5 cm
Operating temperature	8 °C above ambient to 425 °C
Temperature setpoint resolution	1 °C
Maximum temperature ramp rate	75 °C/min (see Table 1)
Maximum run time	999.99 min
Temperature programming ramps	5
Ambient rejection	< 0.01 °C per 1 °C
Oven temperature ramp	≤ 2%
Programming temperature repeatability	≤ 1%

Typical heating-up profile and cooldown rate are shown in Figures 1 and 2.

Heated Zones

- Five independent heated zones, not including oven (two inlets, two detectors, and one auxiliary)
- 350 °C Maximum operating temperatures for auxiliary zone
- Support up to two heated valves
- Support for a 3rd valve, which is non-heated and timed events synchronized with the first valve

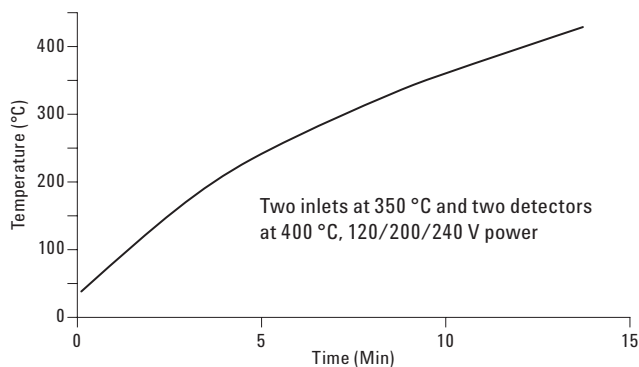


Figure 1. Typical oven heat up profile.

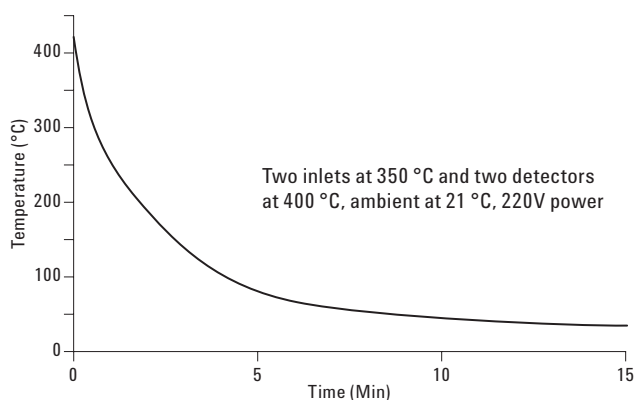


Figure 2. Typical oven cooldown profile.

Table 1. Typical 7820A GC 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 100 V oven, the maximum temperature is 350 °C with a maximum ramp rate of 30 °C/min.

Electronic Pneumatics Control (EPC)

Available on all inlets and detectors

Electronic Pneumatics Regulation (EPR)

Available on S/SL and Packed Column inlets and FID and TCD detectors. EPR allows the user to manually adjust pressure and either total or purged flow (for S/SL inlet) or flow only (for Packed Column inlet (PCI) and FID and TCD detectors) to a desired value using the 7820A software keypad on the user's PC. 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
- 400 °C maximum operating temperature
- Maximum flow < 100 mL/min
- Adapters included for 1/4-inch and 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 1/4-inch and 1/8-inch packed columns.

S/SL (EPC)

Electronic pressure/flow control

Septum purge

Maximum operating temperature	400 °C
Pressure setting range	0 to 100 psi or 0 to 689.47 kPa
Maximum split ratio	250:1
Flow setting range	0 to 200 mL/min N ₂ 0 to 500 mL/min H ₂ or He

S/SL (EPR)

Constant pressure operation

Septum purge

Maximum operating temperature	400 °C
Pressure adjustable range	0 to 100 psi or 0 to 689.47 kPa
Maximum split ratio	250:1
Flow adjustable range	0 to 200 mL/min N ₂ 0 to 500 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 two detectors may be installed.
- Electronic pneumatic control (EPC) with electronic flow control available for detector gases for all detectors.
- Electronic pneumatic regulation (EPR) with constant flow operation available for detector gases for FID and TCD.

FID (flame ionization detector)

Maximum operating temperature	425 °C
MDL	< 3 pg carbon/s as tridecane
Linear dynamic range	> 10 ⁷ range with N ₂ carrier and 0.29-mm id jet
Maximum data acquisition rate	100 Hz

TCD (thermal conductivity detector)

Maximum operating temperature	400 °C
MDL	< 800 pg propane/mL using He carrier (MDL may be affected by laboratory environment)
Linear dynamic range	10 ⁵ (± 10%)

Micro-ECD* (electron capture detector)

Equipped with hidden anode and high-velocity flows for contamination resistance

Maximum operating temperature	400 °C
Makeup gas types	argon/5% methane or nitrogen
Radioactive source	< 15 mCi ⁶³ Ni
MDL	< 0.02 pg/mL lindane
Dynamic range	> 10 ⁴ with lindane

50 Hz maximum data acquisition rate

*ECD not supported in Japan

NPD (nitrogen phosphorous detector)

Maximum operating temperature	400 °C
MDL	< 0.4 pg N/s, < 0.2 pg P/s with azobenzene/malathion mixture
Selectivity	25,000 to 1 gN/gC, 75,000 to 1 gP/gC with azobenzene/malathion mixture
Dynamic range	> 10 ⁴ N, > 10 ⁴ P with azobenzene/malathion mixture
Data acquisition rate	up to 100 Hz

FPD and FPD + (Plus) (flame photometric detector)

Single wavelength	
MDL FPD	< 200 fg P/s, < 6 pg S/s with methylparathion
MDL FPD + (Plus)	< 120 fg P/s, < 4.5 pg S/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 200 Hz
Maximum operating temperature	FPD 250 °C
Maximum operating temperature	FPD + (Plus) 375 °C

Optional Automated Sample Injectors and Samplers

Supports one 7693A autoinjector with capacity for 16 sample vials

or

Supports one 7693A autoinjector and automatic sampler tray with capacity for 150 sample vials

- Heater/mixer/bar code reader not supported
- All 5975E/5977E Series MSD bundles (MSD with 7820A GC) support the 150 sample vial sampler tray
- Only 7820A GCs ordered after June 1, 2015 support the 150 sample vial sampler tray

or

Supports one 7650A autoinjector with capacity for 50 sample vials

or

Supports one PAL3 Autosampler

Data Communications

- One analog output channel (1 mV, 1 V, and 10 V output available) as standard
- Remote start/stop
- LAN

Dimensions and Weight

Height	49 cm
Width	56 cm
Depth	51 cm
Average weight	50 kg

GC Front Panel Display

Available in English, Simplified-Chinese, Japanese, or Russian (Russian requires minimum 7820A GC firmware version A.01.18.003 or higher)

GC Software Keypad (Remote Control Panel)

Available in English, Simplified-Chinese, or Japanese

Environmental Conditions

Indoor use

Ambient operating temperature	15 to 30 °C
Ambient operating humidity	30 to 70%
Storage extremes	-40 to 70 °C
Operating altitude	3,100 m

For More Information

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

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