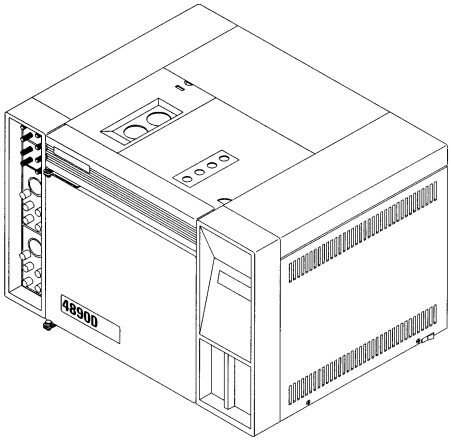
Agilent 4890D Gas Chromatograph

Specification



The Agilent 4890D gas chromatograph (GC) is a version of the 5890 Series II GC configured specifically for either one-or two-channel use.

Safety and Regulatory Certifications

- Conforms to the following safety standards:
  - Canadian Standards Association (CSA): C22.2 No. 1010
  - CSA/Nationally Recognized Testing Laboratory (NRTL): UL 3101
  - International Electrotechnical Commission (IEC): 1010-1
  - 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
  - EN 50082-1
- Designed and manufactured under a quality system registered to ISO 9001
- Declaration of Conformity available
- Usage: Indoor use
- Maximum Altitude: 15,000 feet
- IEC Pollution Degree 2
- IEC Installation Category II
- Clean with damp cloth

Instrument Dimensions and Weight

Height: 18-3/8 in. (465 mm)
Width: 25-7/8 in. (655 mm)
Depth: 20-1/8 in. (511 mm)
Weight: 90 pounds (41 kg)

Environmental

Operating range:

- 0–55 °C ambient (20–27 °C optimum)
- 5–95% humidity (50–60% optimum)

Detector Signal

For external processing by a recorder, integrator, or computer:

Signal Path	Signal Bandwidth	Minimum Peak Width*
0–1 mV analog	~4 Hz**	**
0–1.1 V analog	2.6 Hz	0.50 sec
INET digital	4 Hz	0.32 sec

* Peak width can be calculated accurately by an external measuring device (e.g., integrator) operating at ≥4-Hz bandwidth frequency.

** Actual bandwidth depends on the input impedance of the measuring device. Note: Use of the 4890D GC with an Agilent 3395 integrator in electromagnetic fields greater than 3 volts/meter can result in baseline noise not exceeding 15 mV.

Heated Devices

Five heated zones standard:

- Two detectors
- Two inlets
- One auxiliary

Methods stored: Two

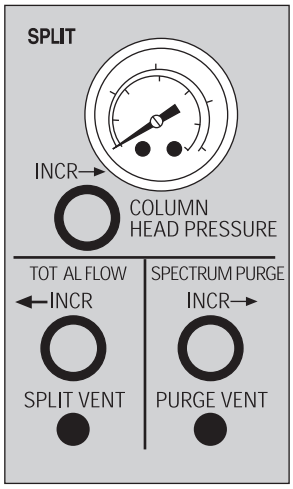
Power Requirements

Voltages: 120/200/220/240
Range: +10%, –10% each
Frequency: 47.5–66 Hz
Consumption: 2,200 VA max
Output: 7,500 Btu/hr max

Standard Inlets on the 4890D GC

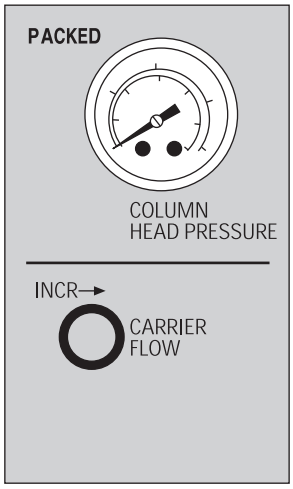
Split/Splitless Capillary

- Range to 400 °C in 1 °C increments
- Back-pressure design permits independent adjustment of split flow rate without affecting column flow, 0–30 psi head pressure gauge, and regulator
- Septum purge built in at 3 mL/min
- Accepts columns up to 1.2-mm od
- Accepts 1/4-in. glass column for on-column injection
- Multimode design includes split and splitless injection
- Air fan built into mainframe to assist in cool-down of inlet
- Splitless purge time variable in 0.01-min elements



Packed with Septum Purge

- Range to 400 °C in 1 °C increments
- Flow control/forward-pressure design, 0–100 psi head pressure gauge
- Septum purge built in at 1.5 mL/min
- On-column injection available with configuration A, 1/4-in. od glass columns
- Individual liners for use with 1/8- and 1/4-in. metal columns as well as for Series 530-µm columns
- Liners available for use with replaceable glass inserts
- Air fan built into mainframe to assist cool-down of inlet

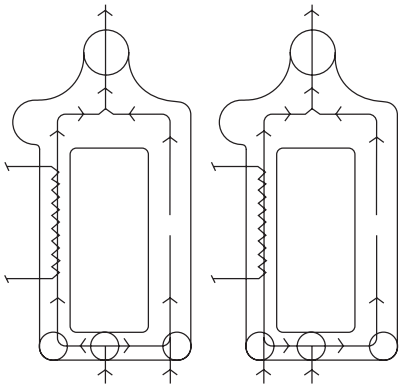


Detectors

Thermal Conductivity Detector

- Range to 400 °C
- Single-filament (single-column) design has fluidic switching of reference and analytical carrier flows; a passivated tungsten-rhenium filament is used in a 3.5-µL cell operating at a constant temperature difference relative to the detector block temperature
- Minimum detectable: <400 pg/mL carrier—equivalent to <1 ppm of neon in 1 mL of air (may be adversely affected by acoustic noise in the laboratory environment)
- Linear dynamic range: <±5% over 10^5 range
- Digital gain setting time–programmable through the keyboard

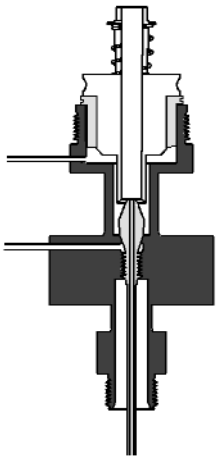
Conditions: detector 100 °C, 45 mL/min switching and 30 mL/min analytical flow of helium, propane sample



Flame Ionization Detector

- Range to 450 °C
- Grounded jet and current limited design for operator safety
- Push-button flame ignition
- Fused silica columns insert within 2 mm of the jet tip
- Sensitivity:
  - – >18 mCoul/g carbon: nitrogen carrier, 0.018-in. id jet
  - – >15 mCoul/g carbon: helium carrier, 0.018-in. id jet
  - – >22 mCoul/g carbon: nitrogen carrier, 0.011-in. id capillary jet
  - – >18 mCoul/g carbon: helium carrier, 0.011-in. id capillary jet
- Minimum detectable: <5 pg carbon/sec, nitrogen carrier at S/N=2
- Linear dynamic range: <±10% over a 10^7 range with 0.018-in. id jet

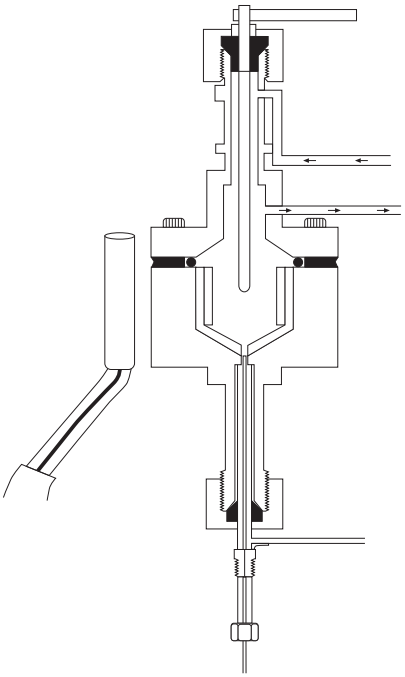
Conditions: column flow 50 mL/min, 45 mL/min H_2, 650 mL/min air, propane sample



Electron Capture Detector

- Range to 400 °C
- A coaxial design with a 15 mCi source (555 MBq) of Ni–63 plated on the interior of the lower block
- Constant current mode of operation features switch selection of pulse parameters for using either nitrogen, hydrogen, helium, or argon/methane carrier gas
- Minimum detectable level: <0.04 pg/sec lindane
- Dynamic range: $>10^4$ for lindane

Conditions: detector 250 °C, 60 mL/min nitrogen carrier



Column Oven

- Usable volume:
  - 11 in. × 12 in. × 6.5 in. (h × w × d)
  - 279 mm × 305 mm × 165 mm (h × w × d)
- Column span: 228.5 mm, 9 in. (coil size)
- Automatic cooling under processor control
- Operating range: 4 °C above ambient to 450 °C: 80 to 450 °C with cryogenic cooling
- Setpoint entry:
  - 1 °C for temperatures
  - 0.1 °C for program rates
- Programming:
  - Rates 0.1 to 70 °C* per min
  - 650 min maximum run time
  - Three ramps with initial/final holds

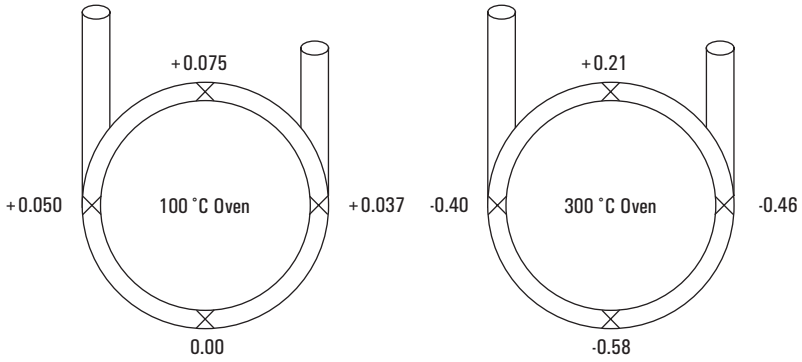
Technical Performance

- Accuracy (true temperature relative to setpoint)

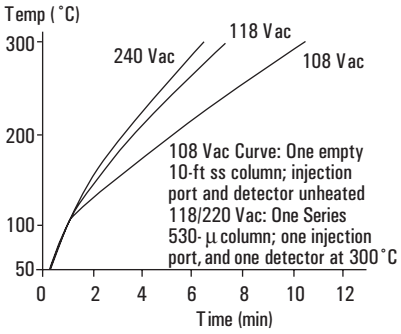
  Specification: +1% (°K) from 4 °C above ambient to 450 °C
- Stability (effect of ambient change on actual temperature)

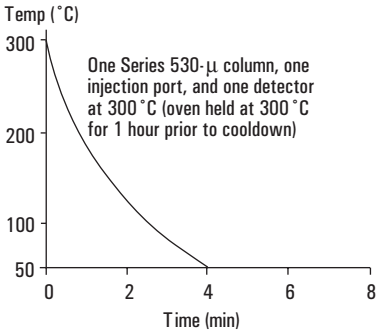
  Specification: <0.01 °C for 1 °C ambient change
- Calibration (setting true temperature at a setpoint)

  Oven can be recalibrated to ±0.01 °C with appropriate instrumentation



Oven Heating Profiles





- Gradients (temperature variations within a column)

  Specification: less than 2 °C within a 9-in. coil anywhere within the operating range

*Achievable rates depend on zone temperature, voltage, and columns.

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