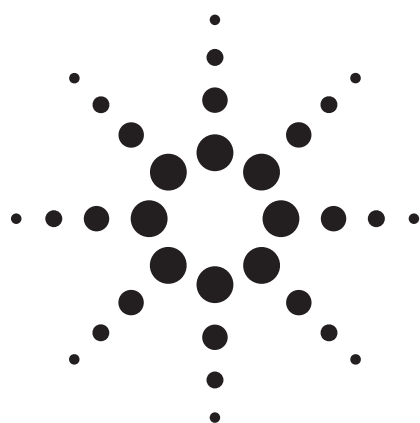


Agilent Low Thermal Mass (LTM) System for Gas Chromatography



Data Sheet

Agilent Low Thermal Mass (LTM) technology addresses the demand for greater productivity required for many gas chromatography applications. This technology uses an LTM column module combining a fused silica capillary column with heating and temperature-sensing components wound around it. The LTM system is designed to work with the LTM column module components to heat and cool the column very efficiently for significantly shorter analytical cycle times as compared to conventional air bath GC oven techniques involving much higher thermal mass.

The Agilent LTM system (except external power supply) is built into a replacement GC oven door, which is mounted as an add-on to an Agilent 7890A GC. A version is also available for the Agilent 6890 GC. The Agilent LTM system is neither available nor supported for operation with an Agilent (HP) 5890 GC or other GCs.

Temperature Control

- LTM column module heating: direct resistive heating using ceramic-insulated heating wire
- Temperature sensing: high-precision temperature sensor combined with capillary GC column
- Temperature accuracy: each column module is factory calibrated to heat within 0.1 °C of a reference; real-time error fluctuations between temperature setpoint and column module temperature are typically less than 1 °C over the entire temperature range at a programming rate of 120 °C/min
- Module calibration drift: temperature drift of a column module is approximately 1 ppm per thermal cycle (50 to 300 °C), resulting in a 1.3 °C temperature drift at 300 °C after 10,000 analysis cycles of the column module
- Operating temperature: 4 °C above ambient to the maximum operating temperature of the GC capillary column; maximum programmable temperature is 400 °C
- Temperature control increments: 1 °C by keypad entry and 0.1 °C by software entry (where available) for method programming; 0.1 °C for instrumental control
- Temperature ramp rate resolution: 1 °C/min
- Maximum temperature ramp rate: $\pm 1,800$ °C/min (achievable ramp rate is dependent on column mass and configuration)
- Temperature programming ramps/plateaus: 7/8
- Maximum individual plateau time: 68.25 min
- Maximum isothermal method time: 9.1 hours
- Negative temperature ramping: very repeatable using heating to achieve a controlled cooling rate that is slower than the convection cooling rate
- Storage of 10 methods
- Simultaneous, synchronous operation of one to four modules; up to four column modules can be operated simultaneously with different temperature programs. The operation of multiple modules requires that a matching number of heater controllers are installed, as well as fan brackets and transfer line modules.
- Asynchronous operation not allowed



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- Simultaneous operation of two or more methods may require a second external power supply. Up to two external power supplies maximum allowed per LTM system. The use of two power supplies will allow a maximum of two 5-inch modules to be run. To operate four modules, they all must be of the 3-inch format.
- Internal diagnostics

Dimensions and Average Weight of LTM Replacement Door

- Height: 36.8 cm (14.5 in)
- Width: 43.2 cm (17.0 in)
- Depth: 25.4 cm (10.0 in); unit project 18.4 cm (7.2 in) forward from original door with modules installed
- Average weight: 6.7 kg (14.7 lb)

Dimensions and Average Weight of External Power Supply

- Height: 10.8 cm (4.2 in)
- Width: 16.4 cm (6.5 in)
- Depth: 29.2 cm (11.5 in); allow additional 10 cm (4.0 in) in front and 5 cm (2.0 in) behind for cable and line cord connections
- Average weight: 2.4 kg (5.2 lb)

Environmental Conditions

- Ambient operating temperature: 15 to 35 °C
- Ambient operating humidity: 5 to 95 percent
- Storage extremes: -40 to 65 °C
- Line voltage requirements: $\pm 5\%$ of nominal

Safety and Regulatory Certifications

Conforms to the following safety standards:

- Canadian Standards Association (CSA): C22.2 No. 1010.1

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- International Electromechanical Commission (IEC): 61010-1
- EuroNorm (EN): 61010-1
- CSA/Nationally Recognized Test Laboratory (NRTL): UL 61010A-1

Conforms to the following regulations on electromagnetic compatibility (EMC) and radio frequency interference (RFI):

- IEC/EN 61326
- Declaration of Conformity available

Host GC Operation

- Constant flow will not operate correctly because the mainframe GC has no knowledge of the column temperature program. Constant pressure mode and pressure programming methods are recommended instead.

Data Communications

- Remote start/stop
- RS-232-C

LTM System Control

- LTM system control is done via a separate keypad interface.
- Agilent does not currently provide LTM system control software for Agilent data systems. An RS-232 communication protocol is available.

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