

Model 66343 Temperature Test Chamber

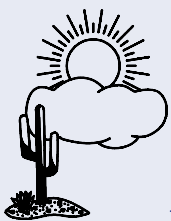
Rectangular Chamber to Measure Larger Electronic Assemblies

Can be supplied with custom measurement fixturing



Features:

- CO₂ , LN₂ Cooled
- 480 x 635 x 455 mm deep
(19" x 25" x 18" deep)
- Horizontal or Vertical Air Flow optional
- Enhanced PID Controller
- RS232 COM port interface
Inter chamber daisy chaining of multiple chambers using RS485.
- Front panel status indicators
- Chamber operates in remote control mode only
- Both hot and cold fail safe temperature settings.
Secondary safety coolant valve.
- Long life shielded heater rod.



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System Features

The PRA Model 66343 is designed to measure larger electronic assemblies. The chamber and air flow are designed to provide good uniformity of temperature with excellent stability of temperature.

Temperature Sensors The chamber uses platinum resistance sensors which are NIST traceable. The system uses 3 sensors. 1) Primary temperature control sensor, 2) fail safe temperature sensor and 3) the optional sensing of the coolant temperature at the coolant injection control valves. The main temperature sensor and the fail safe temperature sensor have identical accuracies.

Controller The controller is a real time embedded system processor. The processor performs the needed interface to the remote control, analog to digital converters, front panel display, coolant valves and heater controls.

The controller has a small serial eePROM which stores the calibration and operating characteristics.

Chamber Heater The heater is controlled by a solid state relay (SSR) which switches the heater across the power mains. The heater is contained in a grounded steel sheath (Calrod™). Accidental DUT ingestion into the heater will not short out or damage the heater.

The heater has a thermal fuse in series. This is set to open the circuit at approximately 175°C. This safety device protects the chamber and heater if the SSR or the circulating fan fails. The thermal fuse is easy to replace.

Coolant Injection and Control The system uses 24V DC operated valves for electrical safety. The chamber has dual injection control valves. The main coolant inject valve is used to speed large temperature excursions, permitting the most coolant injection. The final control valve is used to maintain the temperature control at the set point. The fine control inject permits higher duty cycles, which enhances control and minimizes the temperature transients in the chamber.

The third valve is the Safety Valve or Fail Safe Valve. This valve is in series with the control valves and must be enabled to permit chamber cooling. If the low

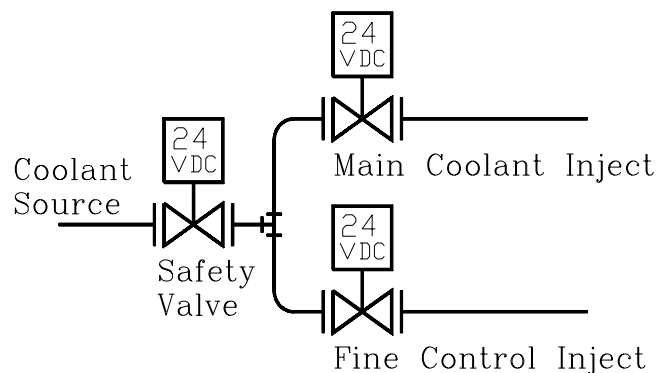
temperature fail safe limit is broached, all valves are closed. The fail safe valve minimizes any chance of a coolant “run away” condition if a control valve fails to close.



Remote Control Interface and Commands

The chamber requires an RS232 serial interface. The command language is a simple SCPI command set. Some of the basic commands are:

- Read chamber temperature
- Set chamber temperature and set the slew rate
- Turn the chamber off
- Set the upper and lower fail safe limits
- Set the number of wheel positions.



- Perform temperature calibration
- Do operation diagnostics

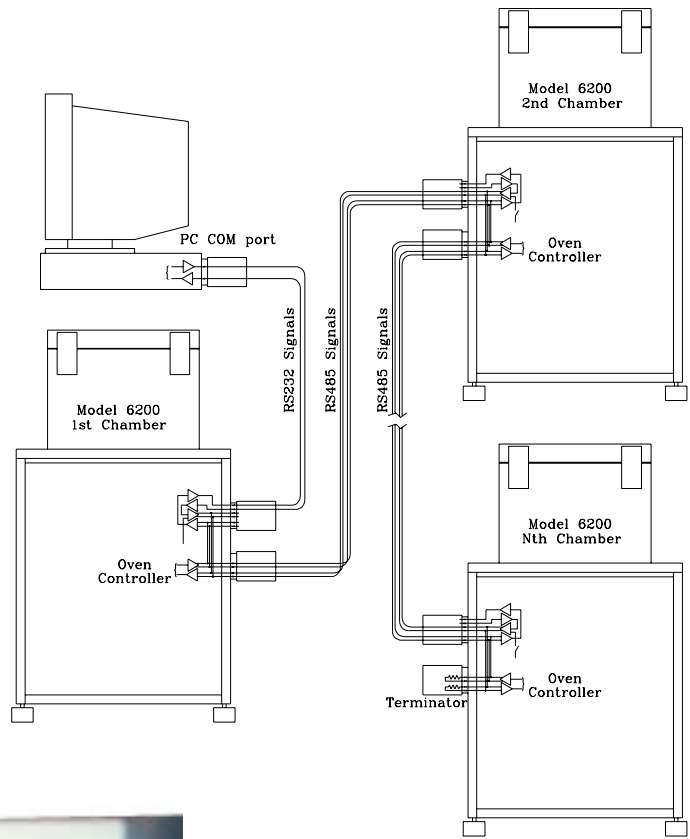
The signals that daisy chain the chambers together are dual differential RS485 level signals. Each chamber is assigned an address and the command protocol permits party line operation. The cables and terminations are supplied with the system.

66343 Versions:

Add letters as suffixes to the model number

- H Horizontal air flow
- V Vertical air flow

- A CO₂ cooled (-65°C to 175°C)
- B LN₂ cooled (-65°C to 175°C)



Chamber with optional shelves

Specification

Test chamber range:	Depends on version
Chamber set point:	User setting to 0.01°C resolution User sets the new temperature and the slew rate to follow to the new set temperature.
Accuracy:	Absolute accuracy: $\pm 0.25^{\circ}\text{C}$ Stability: $\pm 0.20^{\circ}\text{C}$ Repeatability: $\pm 0.10^{\circ}\text{C}$ (based on identical loading)
Test Cavity size:	480mm (19") wide 635mm (25" high 455mm (18") deep The outside 25mm (1") of the chamber should not contain devices to test)
Heater:	Long life, grounded sheath heater
Controller:	Microprocessor controlled chamber. Calibration and setup parameters are stored in protected serial eePROM. Temperature control using the enhanced PID algorithm to minimize stabilization time and minimize overshoot.
Fail Safe:	The user sets the high and low temperature limits (last settings are permanently stored in the controller). Exceeding the limits automatically turns the heater, coolant valves (all 3) and circulating air fan OFF. Safety coolant valve for additional protection from valve failures. Upper temperature limit also controlled by a Thermal Fuse (user replaceable).
Front panel status indicators:	LEDs show chamber operation status.
	Coolant: Indicates if enabled, if the fine control valve is open or if the coarse control valve is open. Heater: Indicates if the heater is on Fan: If the fan is on Communication: If the chamber is receiving control commands
Remote Control:	Control is by an RS232 serial interface 9600 baud, 8 bit, no parity Up to 16 chambers can be daisy chained to one PC COM port using RS485.
Power:	190 to 260 VAC 50/60 Hz 6.5 KVA maximum for cryogenic Operates phase to neutral on the power mains in Europe, PRC, UK and countries with similar power utilities. Operates phase to phase on the power mains in Canada, Japan, Korea, Taiwan, USA and countries with similar power utilities.

NOTE: PRA Inc. reserves the right to make changes to the product contained in this data sheet in order to improve the design or performance and to supply the best possible product. PRA Inc. reserves the right to make these changes without notice.

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