

Specifications/General Description

For More Information On This
Unit - Please Contact Us At:
800-574-2748 323-770-0634
LRE.com

Model Number: SL-1500-25-25

This is a temperature/humidity testing chamber with 1,500 cubic liters of test space. The chamber provides cooling, heating, humidity. The chamber provides automatic control from its instrument console. The following paragraphs describe the chamber's specifications and systems.

Specifications

CAUTION: Operating the chamber beyond the specifications shown here can damage the chamber.

NOTE: See the engineering drawings for the electrical, air, and water supply requirements. All engineering drawings are located in Section E of this manual.

Temperature range	-70°C to +180°C
Humidity range	10% to 98% RH limited by a +7°C minimum dew point, a +88°C maximum dew point, and a dry bulb temperature range of +7°C to +87°C.
Temperature performance	The chamber, with mechanical refrigeration and resistive type heaters, shall be capable of the following performance:
<i>Cooling w/empty chamber</i>	+180°C to -65°C in 20 minutes; +71°C to -65°C in 12 minutes; +85°C to -40°C in 7.5 minutes.
<i>Heating w/empty chamber</i>	-65°C to +180°C in 14 minutes; -65°C to +71°C in 6.5 minutes; -40°C to +85°C in 6 minutes.
Humidity control	±2.5% RH.
Extended dew point	-10°C.

NOTE: This chamber is designed for use under normal laboratory conditions of 23°C and 50% relative humidity. For other applications, please consult factory.

Chamber Electrical Systems

The electrical systems consist of the electrical compartment, and the control transformer. Refer to electrical schematic E-33114-1(B).

- The electrical compartment contains the power panel, which distributes the main power to the chamber. The power panel contains the main disconnect switch, circuit breakers, fuses, contactors, and other electrical components that protect the electrical system and the operator.
- The control transformer steps down the main power to the power required by the instrumentation and control circuits.

HUMIDITY SUPPLY WATER REQUIREMENTS

It is your responsibility to provide the proper supply for your chamber's humidity system. Improper supply water can damage the humidity system.

NOTE: *Any failures due to improper supply water are not covered under warranty.*

To make sure your chamber's humidity supply water is adequate, you must determine the water's resistance in ohm-centimeters. The supply water must be clean and fall within the following resistances:

- 50k ohms to 1M ohms with no demineralizer
- 2k ohms to 50k ohms with a demineralizer

If you use a demineralizer, you must follow the limits listed in the following table to avoid damaging your chamber's humidity system.

Water Requirement Guidelines				
Demineralizer Cartridge Type	Supply Water Resistance	Cartridge Water Capacity*	Humidity Generator	Maximum Humidity Water Usage**
Custom Products Guidelines				
Barnstead D0803 (1,725 grains)	10,000 ohm-cm	590 gallons	4.5 kilowatt-hours	1.5 gallons/hour
	5,000 ohm-cm	294 gallons	6 kilowatt-hours	2 gallons/hour
	2,000 ohm-cm	118 gallons	9 kilowatt-hours	3 gallons/hour
			12 kilowatt-hours	4 gallons/hour
MIL-SPEC 810D, E Guidelines				
Barnstead D0809 (760 grains)	10,000 ohm-cm	260 gallons	4.5 kilowatt-hours	1.5 gallons/hour
	5,000 ohm-cm	129 gallons	6 kilowatt-hours	2 gallons/hour
	2,000 ohm-cm	52 gallons	9 kilowatt-hours	3 gallons/hour
			12 kilowatt-hours	4 gallons/hour
* All gallons are approximate and based on 25°C water temperature.				
** Based on 85°C and 95% RH operation.				

NOTE: *Refer to Section A (Installation) and Section C (Preventive Maintenance) for additional information.*

NOTE: *All low humidity chambers must first be operated in a temperature-only mode to evaporate any water condensation from inside the chamber before low humidity specifications can be met.*

Chamber Environmental Systems

The chamber's environmental systems are described below.

Air Circulation System

Two $\frac{3}{4}$ -horsepower chamber circulators provide air circulation through the test space. Refer to electrical schematic E-33114-1(B). The circulators operate whenever the 7800 programmer/controller enables the control system.

Heating System

Nichrome heating coils provide heat to the chamber. The 7800 provides two stages of control to the heaters through digital outputs 1 and 2 of the control module. Refer to electrical schematic E-33114-1(B), control schematic E-33114-2(B), and instrument wiring schematic E-33114-3(B).

Cooling Systems

Cooling is provided by a cascade refrigeration system—a 25-horsepower R-404A system combined with a 25-horsepower R-23 system. The 7800 provides two-stage cooling control to the system through solid-state relays 14 and 15 of the control module. Refer to control schematic E-33114-2(B), instrument wiring schematic E-33114-3(B), and refrigeration schematic R-33114(B).

The refrigeration systems' condensing unit maintains pressure and removes heat from the chamber. The R-23 compressor circulates refrigerant through the evaporator coils inside the chamber plenum to remove heat from the test space. The "hot" refrigerant circulates through the cascade condenser inside the machinery section. The R-404A compressor circulates refrigerant through the cascade condenser to remove heat from the R-23 refrigerant. The R-404A refrigerant then circulates through the remote air-cooled condenser for cooling. The air removes heat from the refrigerant, returning the R-404A to the liquid state.

Humidity System

The humidity system provides humidity and dehumidify control to the chamber. Refer to control schematic E-33114-2(B), refrigeration schematic R-33114(B), and humidity schematic H-33114(B). A vapor generator tank heats water to provide water vapor to the chamber.

DEHUMIDIFY solenoids allow refrigerant to flow through the dehumidify coils to condense water out of the chamber air. The water flows out through the drains on the bottom of the chamber.

The dehumidify duty cycle timers switch the dehumidify control between the two dehumidify coils' solenoids. This allows one coil to defrost while the other coil provides dehumidification.

Dry Air Purge System

The purge system provides clean, dry air to the chamber's interior. The 7800 controls the purge system through solid-state relay 9 of the control module. Refer to control schematic E-33114-2(B) and instrument wiring schematic E-33114-3(B). The purge system can be programmed on or off in manual mode or during each programmed interval. Use the purge system just before and during a temperature pull-down to help keep moisture from condensing and freezing on the evaporator coils.

Chamber Plenum

The chamber plenum provides the heating, cooling, humidity control, and air circulation to the test space. Refer to the plenum layout drawing.

For More Information On This Unit - Please Contact Us At: 800-574-2748 323-770-0634 LRE.com