

**Tenney**  
ENGINEERING, INC.

**LR**  
ENVIRONMENTAL  
EQUIPMENT COMPANY INC.

Refurbished Units Available  
at LR Environmental

[LRE.com](http://LRE.com)  
800-574-2748

# Benchmaster<sup>®</sup>

## Temperature and Temperature/Humidity Benchtop Test Chambers

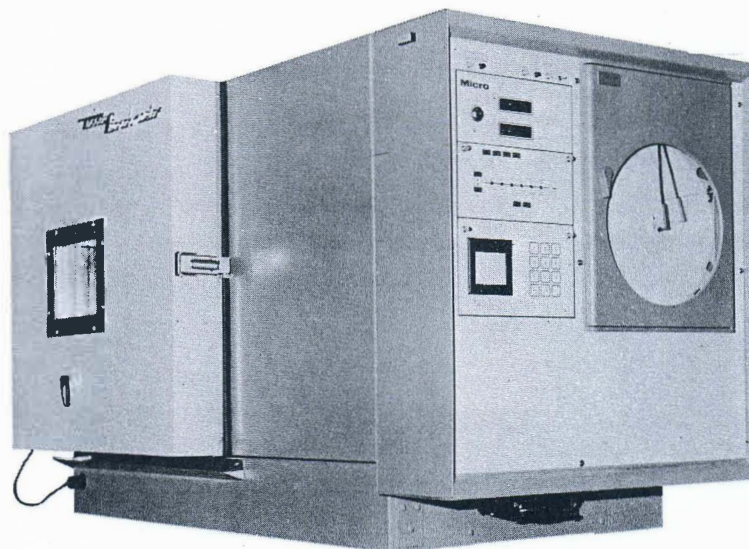
MODEL BTS: -34°C to +200°C without humidity

MODEL BTRS: -34°C to +200°C with humidity

MODEL BTR: -73°C to +200°C with humidity

MODEL BTC: -73°C to +200°C without humidity

This mechanically refrigerated series of benchtop test chambers is ideally suited for military, electronic, pharmaceutical, quality assurance, reliability and research testing as well as production processes. They are efficient, offer high performance and provide a full five cubic feet of workspace in a compact, attractive cabinet. Benchmaster's working volume readily accommodates equipment sized to fit a 19" relay rack.



Refer to LRE Quotations for Actual  
Placement and Models of Controls and  
Other Options.



## CONSTRUCTION

Benchmaster utilizes a heavy gauge, reinforced heliarc welded stainless steel interior for strength and durability. The insulated workspace area is constructed with mass type fiber glass for low heat transfer and vapor weld walls for impermeability to moisture.

Heavy gauge exterior offers an attractive two-tone blue, washable finish. Units feature a 2" diameter accessory port, a six foot grounded electrical cord with plug, and an interior light. All wiring connections are made at numbered terminal strips and are in accordance with NEC. Full opening lap-type door, with two concentric thermal gaskets for vapor-tight sealing, is provided. This door is hinged and removable, offering quick and easy loading and unloading.

## FEATURES WILL VARY DEPENDING ON UNIT

- TennTrol II is a total digital instrumentation control system. It includes push-to-set multi-turn potentiometers and 3½ digit LED display that indicates setpoint and actual conditions. Temperature in °C, humidity in direct %RH, when applicable. Automatic logic functions are built-in to select the proper operating modes, selecting refrigeration, heating and humidity modes, as required, to achieve the desired chamber environment. Also, built-in (for humidity models only) is state-of-the-art logic circuits that automatically select humidity and dehumidify operating modes. This is accomplished thru a signal conditioner that converts dry/wet bulb signals to direct % RH. Self diagnostic interrogation to display percentage output of heating, cooling and humidity. Temperature alarm circuit, with push-to-set adjustments (high/low) and visual and audible alarms. The digital display will read the alarm setpoints and actual temperature. Contacts are also available to deenergize test items. Multiplexed BCD output connector for external control of computer, data logger, etc.
- Hot gas mullion heater to retard frost on door gasket.
- RFI free instrument.
- Unitized instrumentation and control panel.
- Vapor-Flo® (humidity models), a humidification system which precisely regulates moisture in the chamber by controlling vapor migration between the humidity generator and the cabinet.
- Tenneyairesweep, a system which uniformly conditions the environment within the insulated enclosure. The system draws air from near the bottom of the workspace and conditions it to the proper temperature and humidity. The air is discharged through a grille work at ceiling level of the chamber and a uniform air flow pattern is achieved throughout the chamber.
- Hermeticool®, an accessible hermetic refrigeration system incorporating accurately calibrated capillary tubes in lieu of mechanical expansion valves.
- Nichrome heaters, designed to provide rapid response to instrument demand.
- Cascade refrigeration system (BTR and BTC models only). Sequential starting of compressors reduces starting current.
- Interior light.
- Thermal pane viewing window.
- Circuit breakers are used throughout.
- Tenney one-year warran

## OPTIONAL FEATURES

- MicroTenn®, microprocessor programmer-controller, automatically signals chamber to perform time-related programs. Replaces cams and punched tape devices.
- TempGard® III redundant temperature alarm system. Guards against out-of-tolerance temperatures in a test chamber. Protects chamber and test specimen.
- Recording instruments.
- Manual window wiper.
- Transport cart with rubber casters.
- Thermocouple or electrical terminals.
- Special connectors.
- Additional or larger ports, or glove ports.
- Removable shelves.
- Mineral deionizer.
- Sump tank (1 gallon).
- Humidity water recirculator.
- Automatic CO<sub>2</sub> or LN<sub>2</sub> booster system.

## SAFETY FEATURES

- Concealed air circulating fan.
- High temperature cutout.
- Freeze protection on wet wick pan and wet wick controls.
- Low water protection on Vapor-Flo® units.
- Refrigeration system pressure relief.
- Humidifier fail safe.
- Grounded electrical plug & cord.

## SPECIFICATIONS AND PERFORMANCE DATA

| MODEL  |           | BTS   | BTRS   | BTR             | BTC             |
|--|-----------|---|--|-----------------|-----------------|
| Temperature Range  |           | -34°C to +200°C   | -34°C to +200°C  | -73°C to +200°C | -73°C to +200°C |
| Humidity Capability  |           | No  | Yes  | Yes             | No              |
| Humidity Range   |           |   | 20% to 98% in the dry bulb range of +20°C to +85°C, limited by +3°C dewpoint |                 |                 |
| Control Tolerance  |           | Temperature ±0.2°C / Relative Humidity ±2.0%  |  |                 |                 |
| Temperature pull down from +24°C ambient (time in minutes) Empty Chamber   | to 0°C    | 15  | 15   | 5               | 5               |
|  | to -18°C  | 20  | 20   | 10              | 10              |
|  | to -34°C  | 35  | 35   | 15              | 15              |
|  | to -54°C  |   |  | 30              | 30              |
|  | to -73°C  |   |  | 60              | 60              |
| Temperature heat-up from +24°C ambient (time in minutes) Empty Chamber   | to +65°C  | 10  | 10   | 15              | 15              |
|  | to +93°C  | 15  | 15   | 25              | 25              |
|  | to +150°C | 30  | 30   | 35              | 35              |
|  | to +200°C | 45  | 45   | 45              | 45              |
| Capacity for holding live loads (dissipation in watts during temperature performance)                              | at +85°C  | 700   | 700  | 600             | 600             |
|  | at +65°C  | 650   | 650  | 575             | 575             |
|  | at +25°C  | 275   | 275  | 400             | 400             |
|  | at +10°C  | 450   | 450  | 900             | 900             |
|  | at -18°C  | 350   | 350  | 600             | 600             |
|  | at -34°C  | 275   | 275  | 500             | 500             |
|  | at -54°C  |   |  | 295             | 295             |
|  | at -73°C  |   |  | 100             | 100             |
| Fuse Requirements AMPS. 230V, 1 PH, 60 HZ (Other Voltages Optional)  |           | 20  | 20   | 35              | 35              |
| Interior Dimensions W×H×D  |           | 20¼"×22"×19½"<br>51cm×56cm×50cm   |  |                 |                 |
| Exterior Dimensions W×H×D (Options such as water reservoirs, transformers, etc. may alter overall size of chamber) |           | 59"×35½"×32¼"<br>150cm×90cm×82cm<br>Will fit thru 30" (76cm) opening with door removed. |  |                 |                 |
| Shipping Weight Uncrated (Approx.)   |           | 590 Lbs. (268 Kg)   |  |                 |                 |