Tenney

LR
ENVIRONMENTAL
EQUIPMENT COMPANY INC.

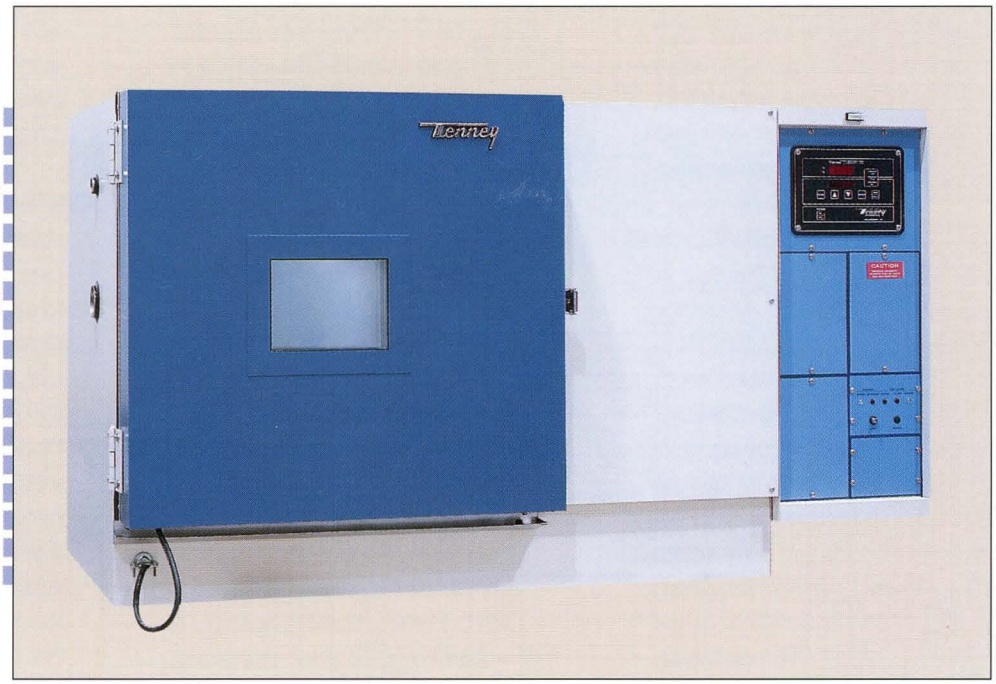
Tenney Test Chamber Model BTS
Tenney Test Chamber Model BTRS
Tenney Test Chamber Model BTC
Tenney Test Chamber Model BTRC

Note: Data Sheet For Reference Only - Actual Chamber Will Vary Depending on Model Year, Options, Controllers, and Individual Configuration

Tenney Benchmaster® Test Chambers

-34°C to +200°C
or
-74°C to +200°C

Temperature or Temperature and Humidity



Benchmaster temperature and humidity test chamber with optional viewing window and optional VersaTenn III control.

These well-received test chambers are capable of simulating a wide range of temperature and humidity conditions.

The Tenney Benchmaster chambers provide a workspace of five cubic feet, readily accommodating equipment as large as a 19" relay rack.

These chambers are ideally suited for electronic, military, and pharmaceutical quality assurance and reliability testing, as well as research testing and production processes. As specified, the chambers are mechanically refrigerated by means of single or cascade systems of time-proven design.

All humidified models are equipped for total programming capabilities of temperature and humidity over time. The VersaTenn control is a proprietary instrument developed specifically for environmental chambers, thus it is easy to use and precisely designed to take complete command of the chamber's conditioning systems. All temperature-only models are standard with 24-step, programmable Watlow 942 controls.

Technical Data

Overall dimensions in inches/centimeters

Model		BTS	BTRS	BTC	BTRC
Workspace	W	20 / 51			
	D	19¼ / 49			
	H	22 / 56			
Exterior	W	57 / 145	62 / 157	57 / 145	62 / 157
	D	34 / 86			
	H	34½ / 88			

Temperature range

Low	°C	-34	-73
High	°C	+200	+200

Change rates in minutes

Ambient to °C Chamber Empty	200°	30	30
	150°	20	20
	93°	15	15
	65°	10	10
	0°	15	5
	-18°	20	10
	-34°	40	12
	-40°	-	15
	-54°	-	25
	-65°	-	40
	-73°	-	Ultimate

Live load capacity in watts (humidity system off)

Temperature °C	+25°	275	1000	900
	+10°	450	900	800
	-18°	350	750	600
	-34°	275	550	450
	-40°	-	500	400
	-54°	-	400	300
	-65°	-	180	150

Utilities, etc.

Refrigeration		(1) 1 HP		(2) 1 HP	
Heater Capacity		2 KW			
Humidifier	WATTS	-	750	-	750
	GPH	-	0.3	-	0.3
AMPS @ 230V, 1Ø		20	24	23	23
AMPS, Fuse		30		35	
Unit Weight	LBS	450		500	

Humidity capability: 20% to 98% RH in the dry bulb range of +20°C to +85°C as limited by a 3° dewpoint. Test data based on 24°C ambient, sea level, 60Hz. On 50 Hz or higher than 24°C ambient, performance may be reduced. Consult factory regarding any special cooling requirements.
Control tolerance: ±0.3°C and ±2% RH typical after stabilization.
CFC - free refrigerants are used exclusively on all Tenney chambers.

Standard Features

Construction: All models feature vapor-tight interiors made of 100% stainless steel that is continuously welded under inert gas. Reinforcement is used at all critical points, and through-wall ports are continuously welded. The workspace is fully insulated with a combination of fiberglass and polyurethane that optimizes the insulating characteristics of each material.

Control system for Humidified units: Proprietary VersaTenn provides fully automatic chamber control through a user-friendly alpha-numeric display. The control is bi-directional, proportional for heating, cooling, humidification, and dehumidification. The proportional band and the reset are operator-adjustable. Logic circuits automatically select cooling, heating, and humidify modes as required.

- 99 step programming capability with step-interval length of 99 hours.
- Ability to store up to 10 resident programs.
- Looping and nested-loop capability. Loops can be repeated up to 255 times. Infinite looping is possible.
- Time intervals are programmable in seconds, minutes, and hours.
- Time-of-day start and delayed-start functions up to two weeks.
- Non-volatile memory for up to 5 years of power-off protection of RAM.
- Digital selection and indication of actual conditions. Temperature is measured and displayed in °C or °F, and humidity in %RH.

Control system for Temperature-only units: The Watlow 942 controller provides 24-step programming, or may be used as a non-ramping manual controller. Features include data output that sends information directly to a serial printer; time-proportioned output; and zero voltage switching.

Resolution: Setpoint and chamber temperature are displayed with 0.1°C or 0.1°F resolution, and 0.1% RH on humidified units.

Sensors: A platinum RTD sensor measures temperature. Humidity is measured by an electronic, capacitive sensor that requires no wet wick or water supply. The sensors provide excellent control and display accuracy with minimum maintenance.

Refrigeration system: [Tenney Hermeticool®] Air-cooled, readily accessible hermetic system uses accurately calibrated capillary tubes rather than mechanical expansion valves. This simplifies the system and reduces the likelihood of leaks. Sequential starting is used to reduce initial amp draws on cascade systems (C suffix units).

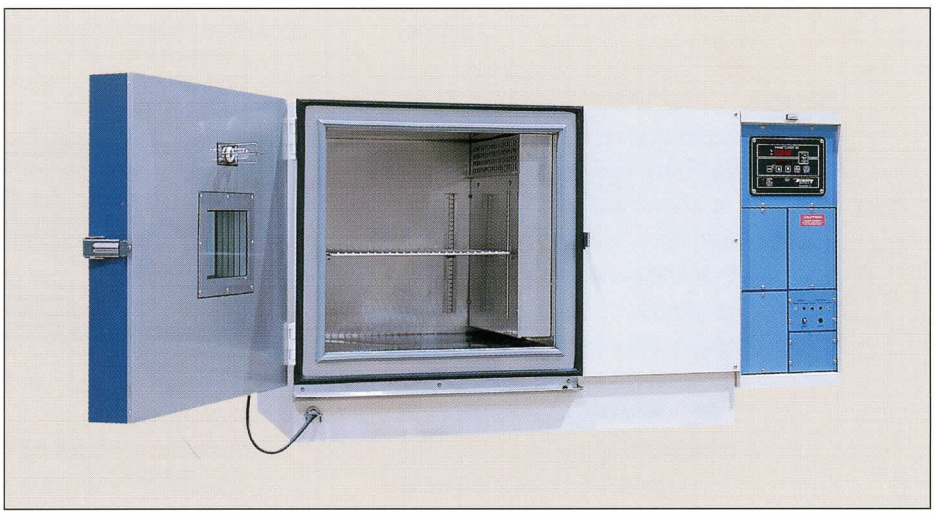
Humidity system: [Tenney VaporFlo®] The humidity system is constructed of 100% non-corroding parts and is equipped with its own low-water protection system. A transparent Pyrex vessel permits easy inspection and affords easy clean out and maintenance. The system operates at atmospheric pressure and is specially vented to prevent unwanted siphoning.

Heating system: Low-mass nichrome, open wire heating elements are used to reduce thermal lag and provide rapid response to instrument demand. The heating elements are isolated from the workspace to reduce radiant influence on the test item.

Electrical: All wiring complies with NEC. Circuit breakers are used throughout the electrical system and are located, along with other electrical components, in a readily accessible, integral control panel. For installation convenience, a six foot electrical cord and matched plug, receptacle, and cover plate are supplied with all units.

Conditioning system: Uniform conditions are assured through the use of a vertical-down recirculating conditioning stream. The system draws air through the bottom of the workspace, conditions it as required, and discharges it through a grille at the ceiling level. The compact design of the conditioning plenum allows the Tenney Benchmaster to offer a larger proportional area of interior volume to exterior volume than afforded by conventional chambers.

Door: Because the chamber liner is sealed by continuous welding, the door remains as the final sealing surface. All doors are equipped with double gaskets that trap air for the purpose of insulation, as well as atmosphere integrity. A unique, energy-efficient system circulates hot gas from the refrigeration system to provide automatic defrost for the door gaskets. This both extends gasket life and assures pliable gasket conditions.



The Benchmaster chamber shown here is equipped with optional interior lighting and optional shelving that is both adjustable and removable.

Optional Features

- IEEE/488 interface
- LinkTenn computer software
- RS232, 422, 423, or 485 interface assembly
- 6-event relay board @ 1 amp each
- Water demineralizer
- Water reservoir for humidity system (5 gallon)
- Recirculating system for humidity water
- Viewing window, thermally insulated and heated
- Window wiper, manually operated
- Interior lighting
- Shelving, adjustable and removable
- Alternate power supply wiring
- Automatic CO_2 or LN_2 cooling boost system
- Additional ports, gloves, etc.
- Thermocouple or electrical feedthrough terminals
- Special connectors
- GN_2 purge system
- Refrigeration taps and pressure gauges
- Recording instruments
- Redundant thermal protection and alarm system
- Touch screen, color display, programming, control, and monitoring system
- External dryer for obtaining humidity as low as 5% (to 20°C)
- Chamber cart with casters

Note: Certain options change chamber dimensions. Consult the sales department.

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