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ENVIRONMENTAL
EQUIPMENT & TEST LAB

Tenney Series

Test Chambers

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



The Tenney T Series Chambers employ leading edge technology to supply our customers with the most efficient and environmentally friendly test equipment possible. State-of-the-art controllers allow precise, effective monitoring and programming of your unit. An exact blend of insulations ensure efficient chamber operation and maximize floor space by minimizing equipment footprints. Time-proven mechanical refrigeration, in single or cascade systems, allow years of worry-free use. And, environmentally safe refrigerants provide the safety you demand.

Specifications

6, 10, 20, 30 ft³ Models

Overall dimensions in inches/centimeters

Model	Non-humidified	T6S	T6C	T10S	T10C	T20SI.5	T20C-3	T20C-4	T30S	T30C
	Humidified	T6RS	T6RC	T10RS	T10RC	T20RSI.5	T20RC-3	T20RC-4	T30RS	T30RC
Workspace	W	22/56		24/61		30/76			36/91	
	D	21/53		27/69		32/81			40/102	
	H	23/58		28/71		36/91			36/91	
Exterior	W	30/76		30/76		41/104			46/117	
	D	41/104		47/119		55/140			64/163	
	H*	71/180		74/188		84/213			84/213	
Clearance	Width and depth may be reduced up to 3" for clearance by removing hinges and latches.									

Temperature

Low	C°	-34	-70	-40	-73	-40	-73	-73	-40	-73
High	C°	+200	+200	+200	+200	+200	+200	+200	+200	+200

Change rates in minutes

Time starting at Ambient to listed temperature. Based on empty chamber.	200°	30	30	30	30	60	60	60	70	70
	150°	20	20	20	20	40	40	40	50	50
	93°	15	15	15	15	25	25	25	25	25
	65°	10	10	10	10	15	15	15	15	15
	0°	10	5	10	5	40	10	5	40	10
	-18°	30	10	20	10	60	15	10	60	15
	-40°	-34°	20	60	20	90	30	20	90	25
	-54°	within	25	—	25	—	40	25	—	35
	-65°	50 min.	40	—	35	—	50	35	—	50

Live Load capacity in watts (humidity system off)

Temperature °C	+10°	400	1050	600	1275	600	1200	1800	600	1600
	-18°	100	800	450	1000	450	1000	1500	500	1400
	-40°	50	575	100	850	100	850	1275	250	1200
	-54°	at	450	—	600	—	700	1050	—	1000
	-65°	-34°	250	—	400	—	500	750	—	700

Utilities, etc.

Refrigeration		(1) 1HP	(2) 1HP	(1) 1.5 HP	(2) 1.5HP	(1) 1.5 HP	(2) 1.5 HP	(2) 2 HP	(1) 2 HP	(2) 2 HP
Heater Capacity KW		2 KW		2.5 KW		2.5 KW (3 KW If 208 Option)				
Humidifier	KW	1 KW				2KW				
	GPH	.5				1.0				
AMPS @ 230V. IØ		24	28	28	30	32	34	35	34	35
AMPS, Fuse		30	35	35	40		45			
Unit Weight	LBS.	750	800	850	950	1250	1350	1400		1500

Humidity capability: 20% to 98% RH in the dry bulb range of +20°C or +85°C as limited by a 3° dew point. Test data based on 24°C ambient, sea level, 60 Hz. On 50 Hz or higher than 24°C ambient performance may be reduced. Consult factory regarding any special cooling requirements.

*Includes standard casters, which account for 3 1/2" of height.

Note: Heat up rate may be slower with 208V option.

Environmentally Friendly Refrigerants are used on all Tenney Chambers.

Specifications

40, 64 ft³ Models

Overall dimensions in inches/centimeters

Model	Non-humidified	T40S-2	T40C-4	T40C-6	T64S-7.5	T64C-6	T64C-15
	Humidified	T40RS-2	T40RC-4	T40RC-6	T64RS-7.5	T64RC-6	T64RC-15
Workspace	W	40/102			48/122		
	D	44/112			48/122		
	H	40/102			48/122		
Exterior	W	66/168			72/183		
	D	73.5/187			81.5/207		
	H*	80.25/204			91/231		
Clearance	Width and depth may be reduced up to 3" for clearance by removing hinges and latches.						

Temperature

Low	C°	-40	-73	-73	-40	-73	-73
High	C°	+200	+200	+200	+200	+200	+200

Change rates in minutes

Time started at Ambient to listed temperature. Based on empty chamber.	200°	35			45		
	150°	25			30		
	93°	10			15		
	65°	5			10		
	0°	5			5		
	-18°	20	—	—	10	10	—
	-40°	120	—	—	25	30	—
	-54°	—	45	40	—	45	20
	-65°	—	60	50	—	65	35

Live Load capacity in watts (humidity system off)

Temperature °C	+10°						
	-18°	1000	—	—	4500	—	—
	-40°	100	—	—	1000	—	—
	-54°	—	1200	2000	—	1200	4000
	-65°	—	900	1500	—	800	2500

Utilities, etc.

Refrigeration		(1)2HP	(2)2HP	(2) 3HP	(1)7.5HP	(2)3HP	(2)7.5HP					
Heater Capacity KW		6	6	6	8	8	8					
Humidifier	KW	2	2	2	2	2	2					
	GPH	1.0	1.0	1.0	1.0	1.0	1.0					
AMPS		230V. 1Ø	230V. 1Ø	230V. 3Ø	230V. 3Ø	230V. 3Ø	230V. 3Ø					
S & C	RC & RS	41	50	50	38	46	71	80	57	65	71	80
Fuse		50	60	60	60	70	100	110	70	80	100	110
Unit Weight	LBS.	2740					3540					

Standard Features

40, 64 Cubic Feet

Construction: All models feature vapor-tight, continuously welded stainless steel interiors. Structural reinforcement is used at all critical points. Through-wall ports are continuously welded. A combination of fiberglass and polyurethane insulation surrounds the chamber to maximize insulating characteristics, thus ensuring minimal thermal transfer.

Control system for Humidified units: Proprietary VersaTenn provides complete 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 humidity 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.
- Guaranteed soak feature.
- Non-volatile memory for up to 5 years of power-off protection of RAM.
- Digital selection and display of actual conditions.

Control system for Temperature-only units:

The Watlow Controls provide 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
- Zero voltage switching

Control tolerance: $\pm 0.3^{\circ}\text{C}$ and $\pm 2\%$ RH typical after stabilization.

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:

Semi-hermetic (serviceable) compressors, protected with over current and thermal devices are provided for long term reliability.

- Vapor tanks are ASME certified.
- Vibration isolators are installed in refrigeration lines to minimize vibration.
- All interconnecting piping is hand soldered. The inside of the tubing is purged with dry nitrogen during the soldering process to prevent oxidation. All cold lines are insulated and vapor sealed.
- Compressors operate continuously (non-cycling) when cooling is required.
- Systems are water or air-cooled. Water-cooled systems are equipped with water modulating valves.
- Non-explosive, non-toxic refrigerants are used. The refrigerants and system components are standard items and are commercially available.

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. The chamber is protected via a fusible link for heater shutdown in the event of high temperature runaway.

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.

Conditioning System:

Uniform conditions are assured through the use of a vertical-down recirculating conditioning stream. The system draws air from the bottom of the workspace, conditions it as required, then discharges the air through a grille at the ceiling level. The compact design of the conditioning plenum allows the Tenney Series to offer the largest possible proportional interior to exterior volume.

Door: Since the unit's chamber is continuously welded, the door remains as the final sealing surface to maintain atmosphere integrity. All doors are equipped with double gaskets that trap air for the purpose of insulation. A unique, energy-efficient system circulates hot gas from the refrigeration system to provide automatic defrost for the door gaskets, thus ensuring pliable gasket conditions and extending gasket life.

Standard Features

6, 10, 20, 30 Cubic Feet

Construction: All models feature vapor-tight, continuously welded stainless steel interiors. Structural reinforcement is used at all critical points. Through-wall ports are continuously welded. A combination of fiberglass and polyurethane insulation surrounds the chamber to maximize insulating characteristics, thus ensuring minimal thermal transfer.

Control system for Humidified units: Proprietary VersaTenn controller provides complete 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 humidity 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.
- Guaranteed soak feature.
- Non-volatile memory for up to 5 years of power-off protection of RAM.
- Digital selection and display of actual conditions.

Control system for Temperature-only units:

Watlow Controls provide 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
- Zero voltage switching

Control tolerance: $\pm 0.3^{\circ}\text{C}$ and $\pm 2\%$ RH typical after stabilization.

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 on model numbers).

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 enables easy clean out and maintenance. The system operates at atmospheric pressure and is specially vented to prevent undesired 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, an electrical cord and plug are supplied with the T6 and T10 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, then discharges the air through a grille at the ceiling level. The compact design of the conditioning plenum allows the Tenney Series to offer a larger proportional area of interior volume to exterior volume afforded by conventional chambers.

Door: Since the unit's chamber is continuously welded, the door remains as the final sealing surface to maintain atmosphere integrity. All doors are equipped with double gaskets that trap air for the purpose of insulation. A unique, energy-efficient system circulates hot gas from the refrigeration system to provide automatic defrost for the door gaskets, thus ensuring pliable gasket conditions and extending gasket life.

Tenney Quick Facts

Standard Features at a Glance:

S = Standard on all models
H = Units with humidity
T = Temperature only units

Proprietary VersaTenn control system	H
Tenney VaporFlo® humidity system	H
Vapor tight interior made of 100% stainless steel	S
Non-settling, asbestos-free insulation	S
Control tolerance of ±0.3°C and ±2% RH typical after stabilization	S
Platinum RTD temperature sensor	S
Humidity sensor which requires no wet wick or water supply	S
Semihermetic refrigeration system	S
Low mass nichrome, open wire heating system	S
NEC wiring compliance	S
Vertical-down recirculating conditioning system	S
Double silicon gaskets on doors	S
Automatic defrost for door gaskets	S
2" steel casters	S
Watlow control	T

Options: 6, 10, 20, 30 ft³ 40 & 64 ft³
A = Available Option

IEEE interface	A	A
LinkTenn software for Windows®95 that permits your computer to control up to 10 chambers	A	A
RS422, 423, 232 or 485 interface assemblies	A	A
6-event relay board @ 1 amp each	A	A
Water demineralizer	A	A
Water reservoir for humidity system (5 gallon)	A	A
Recirculating system for humidity water	A	A
Viewing window, thermally insulated and heated	A	A
Interior lighting	A	A
Shelving, adjustable and removable	A	A
Water-cooled refrigeration system	A	A
Alternate power supply wiring	A	A
Automatic CO ₂ or LN ₂ cooling boost system	A	A
Additional ports, gloves, etc.	A	A
Rubber tire casters: 5" or 6" (2" steel are standard)	A	A
Thermocouple or electrical feed through terminals	A	A
Special connectors	A	A
GN ₂ purge system	A	A
Refrigeration taps and pressure gauges	A	A
Remote console for instrumentation	A	A
Recording instruments	A	A
Redundant thermal protection and alarm system	A	A
External dryer for obtaining humidity as low as 5% (to 20°C)	A	A
Air cooled refrigeration system	A	A
Alternate refrigeration and/or heating systems for faster temperature change rates or increased product load handling capabilities.		A