

Environmental

S O L U T I O N S

»» Tenney

»» Blue M



www.thermalproductsolutions.com



TPS
Thermal Product Solutions



Products:

- Industrial Ovens
- Conveyor Ovens
- Pharmaceutical Equipment
- Environmental Test Products
- In-line Curing Ovens
- Continuous Process Curing Ovens

Industries:

- Aerospace
- Automotive
- Automotive Components
- Ceramics
- Computer Peripherals
- Defense
- Die Casting
- Electronic Applications
- Environmental Processing
- Fabricated Metal
- Fiber Optics
- Industrial Processing
- Machinery
- Medical Components
- Medical Devices
- Oil and Gas Drilling
- Optical Electronics
- Optics
- Petroleum
- Pharmaceutical
- Photovoltaic
- Precious Metals
- Semiconductor
- Solar Cells

Applications:

- Aging
- Alternative Fuels
- Altitude
- Annealing
- ASTM Tests
- Automotive Component Cure
- Burn-In
- Continuous Cure
- Controlled Atmosphere
- Conveyors
- Curing
- Depyrogenation
- Die Attach Cure
- Die Coat Cure
- Drill Bit Curing
- Drying
- Encapsulation Cure
- Heat Sink Attach Cure
- Ink Mark Cure
- Medical Component Cure
- Mold Cure
- Optics
- Optoelectronic Cure
- Photo Resist
- Post-Mold Cure
- Pre-Heat
- Print Cartridge Cure
- Research
- Shelf Life
- Solar Cells
- Stability
- Steady-State
- Sterilization
- Stress Relief
- Temperature/Humidity
- Thermal Cycling
- Thermal Shock
- Underfill Cure
- Vacuum
- Vivariums

Environmental

S O L U T I O N S



»» Tenney

- Classic Series - Wide-Range Testing Chambers 4
- Standard and Custom Walk-In Rooms 7
- Steady-State Environmental Rooms 10
- Tenney Junior Compact Temperature Test Chambers 12
- T2 Series Wide-Range Temperature and Humidity Test Chambers . . . 14
- ETCU Temperature Humidity Cycling Chambers 16
- Benchmaster Temperature & Humidity Test Chambers 18
- Tenney Strat Altitude Chambers 20
- Tenney Strat Junior Altitude Chambers 22
- ZKG Thermal Vacuum Ovens 23
- Thermal Shock Chambers 25
- Upright Temperature & Humidity Chambers 27
- Steady-State/Stability & Shelf-Life Testing Chambers 29
- C-EVO Environmental Cycling Test Chamber 30

»» Blue M

- Steady-State Food & Drug Stability Chambers 32
- FRP Series Full-Range Programmable Humidity Chambers 34
- HRP Series Continuous High-Temperature/High-Humidity Chambers . 36

Images are for reference only. Some options and accessories may not be included with all configured models.

THERMAL PRODUCT SOLUTIONS



»» Tenney

Walk-In Environmental Rooms

Standard and Custom Walk-In Rooms

Every Tenney environmental room features state-of-the-art equipment that reliably produces required conditions, structural integrity that keeps the room working properly through years of demanding test cycles, and measuring/monitoring equipment that precisely records all test data.

Tenney environmental rooms are used worldwide for many testing applications. Almost every tool, product or component that is used in the home, factory or field is tested with environmental simulation equipment. Tenney's engineering experience can deliver environmental rooms to meet your exact requirements:

► Features

- Temperature range from -65 to +200°C
- Humidity range from 20% to 95% in the dry bulb range of +20 to +85°C, limited by a 3 degree dew point
- Modular panels consist of 4" foam polyurethane insulation
- 16 gauge stainless steel floors that can support 500 lbs. per sq. ft.

Custom and standard environmental rooms to match your application and facility needs.

When your testing requires walk-in rooms, choose Tenney. Our test rooms feature automated process control, energy efficiency, and a vast range of features and options.



Tenney offers walk-in environmental rooms in both standard and custom configurations to meet your process requirements.

Standard Panelized Walk-In Chambers

The interlocking panelized chambers can be quickly shipped and assembled for less cost than a non-panelized chamber. The chamber panels interlock using a tongue-and-groove assembly that can be secured using cam latches and silicone sealant. The latches connect to metal banding links that are embedded in the panels to create a structurally strong chamber.

► Construction

- Temperature range: -73°C to 85°C
- Humidity range: 20% to 95%
- Modular design for easy transport and setup
- 4" (100mm) insulated wall panels
- Interior lighting
- Optional 3" or 6" ports
- Thermally insulated and heated windows
- 36" x 78" door

► Special Features

- Redundant over-temperature protection and alarms
- Heavy-duty floor supports 1000 lb/ft² of equally distributed weight
- Refrigeration taps and pressure gauges
- Optional water demineralization
- Optional external dryers to achieve very low humidity levels
- Optional charts



Controls

The microprocessor-based controller allows the operator to program up to 40 profiles, including the common steps of ramp, soak, and guaranteed soak. The user-friendly 7" touch screen display also includes ports for Ethernet, USB, serial, and SD card connections.

The controller provides data logging, alarm and event monitoring, and remote access from any computer with internet access. The included dual-alarm relays can be programmed as either process or deviation alarms.

Flexibility

Each chamber panel consists of 4" (100mm) thick urethane foam between a stainless steel interior wall and a galvanized exterior wall. After the chamber panels are assembled, the walk-in room is self-supporting, eliminating the need for additional structure supports. The chambers can be ordered with different door sizes, access ports, and options as necessary.

Efficient Tenney Humidity and Conditioning System

- Durable and reliable construction
- High-quality compressors
- Tenney Vapor Flow®
- Easy access panel for maintenance
- Quiet operation

Options

- Flooring
- Floor coverings
- Windows and ports
- Ramps
- Remotely located refrigeration
- Airflow and humidity control
- Temperature control
- Chart recorders
- Test product heat dissipation
- Lighting
- Room air exhaust and fresh air input
- Safety systems (heat overload, fire, gas monitoring, door locks, sound levels)
- Water and air supply conditioning
- CO2 and LN2 Injection
- Insulation
- Extended humidity range
- Rigid hard-walled frame for strength
- Stainless steel interior is hermetically welded

Single & Cascade Refrigeration

SINGLE: -40 to 85°C
 CASCADE: -73 to 85°C

Approximate Maximum Water Requirements Horsepower (GPM)

Customer's Inlet Water Temperature	oF	30HP	25HP	15HP	10HP	7.5HP	5HP	3HP	2HP	1HP
85	65	50	32	23	16	12	7	5	2.5	1.5
75	32	28	18	12	9	7	3.5	2.5	1.5	1
65	22	19	12	9	6	5	2	1.5	1	.75
55	16	14	12	9	4.5	3.5	2	1.5	1	.75
45	13	11.5	7.5	7.5	4	3.5	1.5	1	1	.50

- Water flow in gallons per minute rounded to the nearest .50 GPM.
- Consumption is based upon maximum flow rates. A regulating valve modulates actual required water to cool as needed.
- Minimum pressure recommended is 30 PSI.
- Maximum pressure recommended is 100 PSI.
- Water systems containing glycol require additional flow. Contact factory.
- Cooling performance and usage are dependent upon piping runs, fittings, valves, and vertical runs.
- For cascade refrigeration use the R-404A compressor side only for horsepower. R-404A cools the R-508B (SUVA 95) side.

All specifications are subject to change without notice.



Drive-in room for vehicle testing.

Automated process controls and data recording.

Tenney rooms offer many safety features.



Modular panelized rooms for easy transport and setup.



»» Tenney

Environmental Rooms

Steady-State Environmental Rooms

The Tenney series of steady-state environmental rooms provide a large, walk-in workspace for temperature and humidity testing.

- Steady-state temperature and humidity testing
- Stability and shelf-life testing
- Cold room labs
- Incubation

Rooms can be designed to include:

- Heating
- Refrigeration
- Humidification
- Dehumidification
- Lighting

Our flexible, interlocking panelized construction can easily accommodate any arrangement and a variety of heights. The strong, lightweight panels provide optimum insulation, the stability to add on or rearrange, and years of worry-free service. Conveniently located control panel allows easy monitoring of all room functions, while state-of-the-art controls provide precise regulation of the simulated environment.



Features

- Textured or smooth aluminum or stainless wall panels with integrated insulation
- Room panels can be easily rearranged, and panels can be added to accommodate expansion to the room
- For heating, cooling, humidification, or dehumidification, air is circulated through a conditioning plenum in both ceiling and wall systems
- Maximum airflow uniformity
- Extremely quiet operation
- Programmable controls, timing devices, chart recorders, and remote access options

Stability Test Chambers

- Meets all present and future ICH guidelines
- A large selection of standard chamber sizes: 10 - 58-cubic-feet
- Available in four temperature or temperature and humidity combinations
- Chambers can be equipped with optional lighting systems for photostability testing
- Assistance with IQ/OQ protocols or complete chamber validation is available
- Optional computer interface with Windows-based software for multiple chamber monitoring
- Ideal for stability, shelf-life, burn-in, and reliability testing; curing; and controlled temperature storage

Forced-Air Ovens

- Offer workspace of 1 - 28-cubic-feet
- Temperatures from 10 degrees above ambient to 300 degrees C
- Timed cycle operation, programmable up to 99 hours
- Stainless steel shelves
- Optional recording instruments, windows, casters, and support stands
- Ideal for shelf-life, stability, burn-in, and reliability testing; drying, curing, and aging





»» Tenney

Tenney Junior Series

Tenney Junior Compact Temperature Cycling Environmental Chambers

These Tenney Junior temperature test chambers are well suited for use in electronic, military, and pharmaceutical quality assurance and reliability testing, as well as research testing and production processes. In keeping with the needs of today's lab, we specifically designed these benchtop and floor chambers to have a compact exterior yet an ample interior workspace to maximize valuable floor space.

► Features

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



Overall dimensions in inches/mm

Model		TJR	TUJR
Workspace	W	16 / 406	
	D	11 / 279	
	H	11.75 / 298	
Exterior	W	37 / 940	25.625 / 650
	D	22.5 / 572	21.875 / 560
	H	31.75 / 807	60 / 1524
Temperature Range			
Low	°C	-75	
High	°C	+200	

Utilities, etc.			
Refrigeration	(2) 1/2 HP		
Heater Capacity	500 W		
Amps@120V / 1Ph / 60Hz	18		
Amps Fuse	20		
Unit Weight lbs/kg	292 / 132	336 / 152	

Change Rates in Minutes - Chamber Empty	
Ambient to 200°C	60 minutes
Ambient to 185°C	50 minutes
Ambient to 160°C	40 minutes
Ambient to 140°C	30 minutes
Ambient to 105°C	20 minutes
Ambient to 70°C	10 minutes
Ambient to 25°C	0 minutes
Ambient to -15°C	10 minutes
Ambient to -40°C	20 minutes
Ambient to -54°C	30 minutes
Ambient to -65°C	40 minutes
Ambient to -73°C	55 minutes
Ambient to -75°C	Ultimate

Live Load Capacity in Watts (humidity system off)		
Temperature	-40°C	170
	-54°C	145
	-65°C	105
	-73°C	60
	-75°C	Ultimate

All specifications are subject to change without notice.

► Options:

- GN2 Purge System
- Dry Air Purge System
- LinkTenn 32 Controller Software
- Tempguard IV Over-temperature Protection
- Viewing windows up to 6" x 8" and thermally insulated
- Interior lighting
- Shelving, adjustable and removable
- Automatic CO2 or LN2 cooling boost system
- Recording instruments
- External dryer for obtaining humidity as low as 5%
- Alternative power supply options for many global current schemes
- Cart system to allow chamber to be moved within a facility
- Stacking option for bench model
- Intrinsically safe interior

All specifications are subject to change without notice.



»» Tenney

T2 - Wide Range, Small Footprint

T2 Series

The Tenney T2 temperature and humidity cycling chamber simulates a wide range of temperature and humidity conditions while utilizing minimal floor space. We specifically designed these environmental chambers to have a compact exterior and an ample interior workspace.

The T2 Temperature and Humidity Cycling Chamber design allocates space within the interior of the cabinet for all standard options. This greatly improves the mobility of the unit as well as the overall appearance.

► Features

- Vapor-tight, continuously welded stainless steel interiors
- Minimum footprint
- Units are mobile
- Touch screen controller provides precise control over chamber operations and monitoring, and is mounted at eye level (VT III and Watlow F4 are not touch screen)
- Low workspace height to ease the loading and unloading of product
- Accurate control and display with minimum maintenance
- Vertical recirculation conditioning system



Model		T2RC	T2C
Workspace inches-(mm)	W	16 (406)	16 (406)
	D	13 (330)	13 (330)
	H	15 (381)	15 (381)
Exterior inches-(mm)	W	26 (660)	27 (685)
	D	26 (660)	27 (685)
	H	67 (1702)	65 (1651)
Temperature Range & Humidity			
Low	°C	-75	-75
High	°C	+200	+200
Change Rates in Minutes			
Ambient to °C Chamber Empty	200°C	90 Minutes	90
	150°C	40 Minutes	40
	100°C	25 Minutes	25
	93°C	17 Minutes	17
	65°C	9 Minutes	9
	2°C	5 Minutes	5
	-7°C	7 Minutes	7
	-12°C	10 Minutes	10
	-40°C	30 Minutes	30
	-54°C	45 Minutes	45
	-65°C	70 Minutes	70
	-73°C	100 Minutes	100
-75°C	Ultimate	Ultimate	
Utilities, etc.			
Refrigeration		(2)1/2 HP + 1/2 HP	(2)1/2 HP + 1/2 HP
Heater Capacity		500 W	500 W
Humidifier	W	500	-
	GPH	0.15	-
AMPS @ 115V, 1Ph		18	18
AMPS Fuse		20	20
Unit Weight	Lbs/Kg	350/158	350/158

► Options:

- IEEE/488 interface
- LinkTenn software for Windows® that permits your computer to control up to 10 chambers
- RS-422, 423, 232 or 485 interface assemblies
- Upgrade to VersaTenn III (standard on T2RC)
- Water reservoir for humidity system (5 gallon)
- Recirculating system for humidity water
- Additional ports
- Event relay board
- Water demineralizer
- Viewing window, 6" x 7", thermally insulated and heated (no manual wiper required)
- Interior light
- Shelving, adjustable and removable
- Automatic CO2 or LN2 cooling boost system
- Automating boost heating system
- GN2 purge system
- Recording instruments
- Redundant thermal protection and alarm system
- External dryer for obtaining humidity as low as 5% (to 20°C)
- Alternate power supply wiring

All specifications are subject to change without notice.

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



»» Tenney

ETCU Temperature Humidity Cycling Chambers

ETCU Temperature Humidity Cycling Chambers

The Tenney ETCU Ultimate Series Temperature Humidity Cycling Chamber features scroll compressor technology that provides quiet operation, fast transition rates, and reliable operations.

The chambers incorporate a ceiling plenum to diffuse conditioned air vertically through the chamber. The top-to-bottom air circulation guarantees stable and consistent performance over the testing period.

Multiple heating and cooling systems are available, as well as a diverse list of options that together will create the chamber to accommodate your specific application.

► Features

- Quiet operation
- Fast transition rates
- High reliability refrigeration system
- Temperature and humidity testing
- Versa Tenn V control system
- Automatic humidity vent

► Options

- IEEE488 Interface
- LinkTenn 32 for Windows® that permits your computer to control up to 10 chambers
- 6-Event relay board
- Water demineralizer system
- Circular recording instruments
- Alternate refrigeration and/or heating systems for faster temperature change rates or increased product load-handling capabilities
- Additional ports

Contact Thermal Product Solutions for details and availability. All performance data are for 230 or 460V / 60Hz operations. Chamber operations utilizing 50Hz power utility will derate performance approximately 17%.



Model		ETCU-09			ETCU-16			ETCU-30				ETCU-64			
Interior Volume		9 cu. ft.			16 cu. ft.			30 cu. ft.				64 cu. ft.			
		256 liters			460 liters			850 liters				1,812 liters			
Interior Dimensions		24 x 25 x 26			36 x 26 x 30			40 x 36 x 36				48 x 48 x 48			
WxDxH - inches (mm)		(610 x 635 x 660)			(914 x 660 x 762)			(1016 x 914 x 914)				(1219 x 1219 x 1219)			
Exterior Dimensions		34 x 73 x 78			46 x 74 x 82			50 x 87 x 88				58 x 99 x 100			
WxDxH - inches (mm)		(864 x 1854 x 1983)			(1169 x 1881 x 2084)			(1271 x 2211 x 2237)				(1474 x 2516 x 2542)			
Nominal Horsepower		3.5 x 3.5	6 x 6	10 x 10	3.5 x 3.5	6 x 6	10 x 10	3.5 x 3.5	6 x 6	10 x 10	15 x 15	3.5 x 3.5	6 x 6	10 x 10	15 x 15
Rated Horsepower		2.5 x 2.5	5 x 5	10 x 10	2.5 x 2.5	5 x 5	10 x 10	2.5 x 2.5	5 x 5	10 x 10	15 x 15	2.5 x 2.5	5 x 5	10 x 10	15 x 15
Compressor Type		Scroll			Scroll			Scroll				Scroll			
Noise (dBA)	Heating	60	60	60	60	60	60	60	60	60	60	60	60	60	60
	Cooling	68	75	75	68	75	75	68	75	75	75	68	75	75	75
Heating Elements (Kw)	230/460	6	12	12	6	12	12	6	12	12	24	6	12	12	24
	208V	4.5	9	9	4.5	9	9	4.5	9	9	18	4.5	9	9	18

All specifications are subject to change without notice.

Model	ETCU-09			ETCU-16			ETCU-30				ETCU-64			
Cooling Rate (min)														
190°C to -65°C	49	34	14	78	36	19	155	76	31	20	256	125	52	42
71°C to -65°C	36	26	11	40	28	15	119	59	26	17	197	97	44	33
85°C to -40°C	27	18	8	32	20	12	95	42	21	12	157	69	36	24
Heating Rate (min)														
-65°C to 190°C	35	16	16	32	22	22	60	30	30	20	110	53	53	27
-65°C to 71°C	17	8	8	14	11	11	27	13	13	10	45	23	23	13
-40°C to 85°C	16	8	8	12	10	10	27	13	13	11	45	23	23	14
Water Cooled	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Air Cooled	Y			Y	Y		Y	Y			Y	Y		
208/230V-1 Ph	Y	N/A	N/A	Y	N/A	N/A	Y	N/A	N/A	N/A	Y	N/A	N/A	N/A
208/230V-3 Ph	Y	Y	N/A	Y	Y	N/A	Y	Y	N/A	N/A	Y	Y	N/A	N/A
460V-3 Ph	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Air Delivery (Blower HP)	.5 HP			(2) .5 HP			(2) .75 HP				(2) .75 HP			
Airflow (CFM)	750			1600			1600				1600			
Temp Unif. (Std Dev/9 Pt)	+/-0.5°C/+/-1°C			+/-0.5°C/+/-1°C			+/-0.5°C/+/-1°C				+/-0.5°C/+/-1°C			
Temp Control	+/-0.3°C			+/-0.3°C			+/-0.3°C				+/-0.3°C			

- Single Stage Refrigeration Temperature Range: -35°C to 200°C
- Performance is based upon an empty chamber operating at 24°C (75°F) ambient air and may vary slightly at other ambient temperatures. Voltages below those listed may affect performance. All performance data are for 240 or 480V / 60Hz operation.
- Liquid nitrogen is available as an option on all systems. When liquid nitrogen is provided, the heater kW is automatically upgraded to the maximum for that chamber size. Consult factory for current draw of any liquid nitrogen-equipped chambers.
- Airflow circulation is based on blower wheel performance curves. Actual circulation rate will vary depending on the cooling option selected.
- Temperature uniformity standard deviation from mean, measured at -25°C and 100°C.
- 9 Point: Uniformity measured in accordance with ASTM E145 section 4 at temperatures of -25°C and 100°C. The test chamber performance may be affected by the addition of certain optional accessories.
- Chamber operation utilizing 50Hz power utility will derate performance approximately 17%
- It is Thermal Product Solutions' policy to constantly improve quality, features and performance. Thermal Product Solutions reserves the right to change specifications without notice.



»» Tenney

Benchmaster Temperature & Humidity Test Chambers

Tenney's Benchmaster temperature and humidity test chambers are capable of simulating a wide range of temperature or temperature and humidity conditions. The five-cubic-foot workspace will readily accept equipment as large as a 19" relay rack.

In keeping with the needs of today's lab, we designed these temperature and humidity test chambers to have a compact exterior that maximizes the interior workspace.

► Features

- Vapor-tight interior liners made of 100% continuously welded stainless steel
- Temperature and humidity environmental chambers with humidity capabilities are constructed of 100% non-corroding parts and have a low-water protection system
- Uniform conditions are assured through the use of a vertical-down recirculating conditioning stream
- VersaTenn III Controller on temperature and humidity chambers
- Watlow F4 Controller on temperature only chambers
- One year parts and labor warranty



Overall dimensions in inches/centimeters

Model		BTC	BTRC	UTC	UTRC
Workspace	W	20/51			
	D	19.25/49			
	H	22/56			
Exterior	W	66.25/168.25		37/94	
	D	32/81.28		32/81.28	
	H	40.5/102.87		73.5/186.69	
Temperature Range					
Low	°C	-70			
High	°C	200			
Utilities, etc.					
Refrigeration		(2) 1 HP			
Heater Capacity		2 kW			
Humidifier	Watts		1500		1500
	GPH		0.3		0.3
AMPS@230V, 1 Ph		29	29	29	29
AMPS, Fuse		40			
Unit Weight	Lbs.	500			

Humidity capability: 20% to 95% RH in the dry bulb range of +20°C (68°F) to +85°C (185°F) as limited by a 3 degree dew point.

► Options:

- IEEE/488 interface
- LinkTenn software for Windows® that permits your computer to control up to 10 chambers
- RS-422, 423, 232, or 485 interface assemblies
- Water demineralizer
- Water reservoir for humidity system (5 gallon)
- Recirculating system for humidity water
- Viewing window, 6" x 8", thermally insulated and heated
- Interior light
- Shelving, adjustable and removable
- Automatic CO2 or LN2 cooling boost system
- Automating boost heating system
- GN2 purge system
- Recording instruments
- Redundant thermal protection and alarm system
- External dryer for obtaining humidity as low as 5% (to 20°C)
- Alternate power supply wiring
- Chamber cart with casters

All specifications are subject to change without notice.



»» Tenney

Strat - Altitude Simulation

Tenney Strat Altitude Chambers

Tenney's Tenney Strat Altitude Chambers simulate altitudes up to 200,000 feet. With an overall temperature range of -70°C to +177°C, humidity capabilities of 20% to 98% RH, and workspace sizes ranging from 5- to 64-cubic-feet, this highly developed line of altitude chambers offers one of the broadest selections in the industry.

We are confident that our solid altitude chamber construction and precise operating systems will provide the exacting performance and a high degree of reliability for your altitude testing needs.

► Features

- Continuously welded, stainless steel, vapor-tight interior liners
- Control tolerance is $\pm 0.3^{\circ}\text{C}$ and $\pm 2\%$ RH typical after stabilization
- Linear pressure transducer to measure altitude
- Non-corroding humidity system
- Low-water protection on humidity system
- Vertical-down recirculating conditioning stream



Overall dimensions in inches/centimeters

Model		T5ST	10ST		15ST		27ST			36ST			48ST			64ST		
System Horsepower Size		4	6	15	6	15	6	15	20	6	15	20	15	20	30	15	20	30
Workspace inches (mm)	W	21/53 (533/1346)	24/61 (610/1549)		24/61 (609/1549)		36/91 (914/2311)			36/91 (914/2311)			48/122 (1219/3099)			48/122 (1219/3099)		
	D	21/53 (533/1346)	24/61 (610/1549)		36/91 (914/2311)		36/91 (914/2311)			48/122 (1219/3099)			36/91 (914/2311)			48/122 (1219/3099)		
	H	25/51 (635/1295)	30/76 (762/1930)		30/76 (762/1930)		36/91 (914/2311)			36/91 (914/2311)			48/122 (1219/3099)			48/122 (1219/3099)		
Exterior inches (mm)	W	25/51 (635/1295)	51/130 (1295/3302)		52/130 (1320/3302)		63/160 (1600/4064)			63/160 (1600/4064)			77/196 (1956/4978)			77/196 (1956/4978)		
	D	63/152 (1600/3860)	99/203 (2515/5156)		111/236 (2819/5994)		111/241 (2819/6121)			123/272 (3124/6909)			123½ / 281 (3131/7137)			135½ / 312 (3435/7924)		
	H	78/183 (1981/4648)	84/210 (2134/5334)		84/213 (2134/5410)		90/229 (2286/5817)			90/229 (2286/5817)			91/231 (2311/5867)			91/231 (2311/5867)		
Utilities, etc.																		
Heater Capacity		2	4		6		8			8			16			16		
Humidifier	Watts	1					2					3						
	GPH	1.05					1.0					1.5						
AMPS @ 230V, 33		33(1)	48	81	52	85	63	96	130	63	96	130	120	149	183	120	149	183
AMPS, Fuse		45	70	110	70	120	80	125	175	80	125	175	150	200	250	150	200	250
Cooling Water, 20°C GPM		-	3	6	3	6	3	6	9	3	6	9	6	9	12	6	9	12
Unit Weight Lbs/Kg		1300/590	3150/1429		4850/2200		3150/1429			6550/2971			11,500/5216			13,050/5920		

- Humidity capability: 20% to 98% RH in the temperature range of +20°C to +85°C as limited by a 3-degree dew point.
- Humidity not achieved simultaneously with altitude.
- Add suffix "R" to model number for humidity.
- Vacuum performance: All chambers achieve altitude up to 100,000 feet (8.2 mm Hg) in 35 minutes. Optional features extend altitude capabilities to 200,000 feet (0.17 mm Hg).
- Combined temperature and altitude to 60,000 feet maximum.
- Test data based on a 24°C ambient, sea level, 60 Hz. Performance slightly reduced on 50 Hz. Power requirements based on standard vacuum pump.

All specifications are subject to change without notice.



»» Tenney Tenney Strat Junior Altitude and Vacuum Test Chambers

Tenney Strat Junior

The 1.25-cubic-foot Tenney Strat Junior is a full function temperature and altitude/vacuum test chamber. The unique size, the smallest in the industry, uses the popular Tenney Upright Junior platform, which is specifically modified and reinforced to achieve altitudes up to 40,000 feet.

The ST Junior altitude/vacuum test chamber includes a standard programmable controller, mechanical refrigeration, vacuum pump and a 2" port. A variety of optional accessories is also available including over-temperature alarm, window, light, and computer interfaces.

Based on the most popular test chamber ever built, the Tenney Junior, the ST Junior test chamber combines proven reliability with innovation. Quick delivery and a solid warranty make the ST Junior test chamber the perfect choice for labs, small lot tests, reliability tests, and R&D.



► Features

- Altitude: Site level to 40,000 feet
- Temperature: 0 (32°F) to 100°C (212°F)
- Exterior dimensions: 28"W x 20"D x 65"H
- Workspace: 16"W x 11"D x 12"H
- Weight: 280 lbs.
- 1/2 HP refrigeration system
- 500 W heater capacity
- Mechanical vacuum pump
- Amps @ 115 V, 1Ø: 18A
- 20 Amp fuse
- Versa Tenn 5 controllers
- 2" Port



TPS
Thermal Product Solutions

»» Tenney

Thermal Vacuum Ovens

Thermal Vacuum Ovens

Tenney's ZKG Vacuum Oven provides a reliable oven for drying materials that require a vacuum to be applied during the drying process. Applications for these ovens include the drying of chemicals, electronics and chips, plastics and pharmaceuticals.

The ovens are efficient and incorporate important safety features and offer condensation-free drying in a homogenous vacuum environment.

► General Specifications

- Stainless steel interior with painted, cold-rolled steel pressure vessel
- Galvanized steel exterior with powder coating
- Electric plate heating, located inside pressure vessel
- Double rotary vane vacuum pumps to ensure high vacuum
- High or low temperature drying, with and without vacuum
- Large insulated, tempered glass window

**Not designed for volatile, explosive, or battery applications.
Please consult factory for these applications.**



Model	Interior Volume	Exterior Dimensions			Interior Dimensions			Temperature Range	Control Tolerance	Heating Rate	Heating	Ultimate Vacuum
		D	W	H	D	W	H					
ZKG-025	8.5 Cubic Feet	37.2"	35.8"	66"	23"	23"	27"	Ambient to +200°C	< 1°C	> 2°C/minute (Nominal Temp. to Max. Temp.)	Electric Plates Located Inside Pressure Vessel	8mm/hg (8.28 Torr or 100,000 ft.)

Vacuum Pump	Control Interface	Power Supply	Amps	Standard Accessories
Double Rotary Vane Vacuum Pump and Others Optional	Watlow F4, Yokogawa Overtemp	208/230V 3Ph/60Hz	30	2 Shelves

All specifications are subject to change without notice.



TPS
Thermal Product Solutions

»» Tenney

Thermal Shock Chambers

Thermal Shock Chambers

The Tenney T-Shock Junior is a bench-top thermal shock chamber with a 1/4-cubic-foot carriage capacity. It's designed to accommodate pilot runs and smaller production quantities of sophisticated, discrete components.

The T-Shock Junior provides a cost-effective alternative to larger capacity units.

► Features

- Vapor-tight interior liners made of 100% continuously welded stainless steel
- Control system provides fully automatic, PID, chamber control through a user-friendly alpha-numeric display
- Available in horizontal or vertical configurations
- Available in two- or three-zone operations
- Carriage transport is automatically positioned and includes a large wire mesh stainless steel product basket



Carriage Capacity		Product Load	Refrigeration	Heat	Dimensions W x H x D inches (cm)		Model	Wt. lbs.
Ft ³	W x H x D inches (cm)	Lbs.	HP	kW	Horizontal Model	Vertical Model		
TSJR Model (Air Cooled)								
.25	10.5 x 6 x 6.125 (26.7 x 15.2 x 15.6)	3	½ + ½ + LN2	2.5/5	63 x 41 x 22 (160 x 104.1 x 55.9)	N/A	TSJR	700
TS2 Models - Two Zone: Hot/Cold (Water Cooled)								
2	15 x 15 x 15 (38.1 x 38.1 x 38.1)	15	4 + LN2	9/2	88 x 57 x 74 (223.5 x 144.8 x 188)	89 x 72 x 58 (226.1 x 182.9 x 147.3)	TS2.02.04B	3700
2		11	10				TS2.02.10	4000
8	25 x 23 x 25 (V) (63.5 x 58.4 x 63.5)	35	6 + LN2	21/4	99 x 75 x 88 (251.5 x 190.5 x 223.5)	97 x 89 x 75 (246.4 x 226.1 x 190.5)	TS2.08.06B	4200
8	23 x 25 x 25 (H) (58.4 x 63.5 x 63.5)	35	30				TS2.08.30	4700

► Thermal Shock Chambers Features

- Vapor-tight interior liners made of 100% continuously welded stainless steel
- Control system provides fully automatic, PID, chamber control through a user-friendly alpha-numeric display
- Available in horizontal or vertical configurations and two- or three-zone operation
- Carriage transport is automatically controlled and positioned and includes a large wire mesh stainless steel product basket

All specifications are subject to change without notice.



TPS
Thermal Product Solutions

»» Tenney

Upright Temperature and Humidity Test Chamber

Tenney UTC

The Upright Test Chamber (UTC™) is designed to occupy a smaller footprint. The new chamber has a vertical configuration to take up less floor space and falls within the same price range as other test chamber models. The UTC's compact design meets a growing need in interior laboratory environments. Despite its space-saving qualities, the UTC has a wide range of both temperature and humidity conditions to meet a variety of today's testing needs.

► Features

- Simulates a wide range of temperature or temperature and humidity conditions
- 5 cu ft chamber with optional viewing window
- Vapor-tight interior liners made of 100% continuously welded stainless steel
- Interior constructed of 100% non-corroding parts
- Features a low-water protection system (on RH models)
- Uniform conditions are assured through the use of a vertical-down recirculating conditioning stream
- Watlow F4 Controller
- Optional recording instruments
- Optional over/under temperature protection
- Compact vertical footprint maximizes workspace
- Cost-efficient alternative to standard benchtop chambers
- Temperature Range: -70°C to +200°C
- Humidity Capability: 20% to 98% RH in the dry bulb range of +20°C to +85°C, limited by a 3° dewpoint



Overall dimensions in inches/centimeters

Model		UTC	UTRC	BTC	BTRC
Workspace	W	20/51			
	D	19.25/49			
	H	22/56			
Exterior	W	37/94	66.25/168.25		
	D	32/81.28	32/81.28		
	H	73.5/186.69	40.5/102.87		
Temperature Range					
Low	°C	-70			
High	°C	200			
Utilities, etc.					
Refrigeration		(2) 1 HP			
Heater Capacity		2 kW			
Humidifier	Watts	1500		1500	
	GPH	0.3		0.3	
AMPS@230V, 1 Ph		29	29	29	29
AMPS, Fuse		40			
Unit Weight	Lbs	500			

Humidity capability: 20% to 95% RH in the dry bulb range of +20°C (68°F) to +85°C (185°F) as limited by a 3 degree dew point.

All specifications are subject to change without notice.



»» Tenney

Steady-State Testing Chambers

Steady-State/Stability & Shelf-Life Testing Chambers

These steady-state test chambers have a large workspace, with standard capacities of 10, 20 and even 30-cubic-feet and can maintain both temperature and humidity conditions for extended periods of time. A highly efficient design with a horizontal airflow system provides maximum uniformity, while air intake and exhaust tubes vent undesirable process moisture and vapors for accurate product testing.

The chamber's condition settings are housed conveniently in a Watlow F4 Controller and can be programmed for hands-free, scheduled operation. A high/low limit alarm will alert users of extreme or inadequate testing conditions, limiting unwanted and inaccurate results.



► Features

- Meet ICH Q1A Pharmaceutical Standards
- High/low limit alarms
- High capacity (10, 20 and 30-cubic-foot workspaces)
- Door locks with keys or electronic locking with remote access
- High performance:
 - -20°C to 200°C Temperature range
 - ±0.3° after stabilization
 - 20% to 95% Relative humidity
 - ±2% for Relative humidity
- ICH Q1A Stability testing:
 - Long term performance: 25°C/60% RH or 30°C/60% RH
 - Intermediate performance: 30°C/65% RH
 - Accelerated performance: 40°C/75% RH

Model	Temp Range	Inside Dimensions In.			Overall Dimensions In.			Relative Hum. Range	Electrical Requirements	Weight (lbs.)
SS-10	-20° C to 200° C	24	27.5	28	34	60	74	20% to 95%	230/240 V~ / 1PH / 60 Hz	1000
SS-20	-20° C to 200° C	30	32	36	45	64	77	20% to 95%	230/240 V~ / 1PH / 60 Hz	900
SS-30	-20° C to 200° C	36	40	36	51	72	77	20% to 95%	230/240 V~ / 1PH / 60 Hz	900



»» Tenney

C-EVO Environmental Cycling Test Chamber

C-EVO

Since 1932 Tenney has pioneered the design and manufacturing of environmental testing equipment.

Designed for value, reliability and performance, C-EVO is a world class environmental cycling test chamber loaded with standard features and advanced technological upgrades:

- Largest temperature and humidity range in the industry
- Smallest equipment footprint in the industry
- Superior heat capacity (kW), cooling capacity (HP/BTU) and air flow capacity (CFM) deliver the best temperature change rates and uniformity in the industry
- Redundant user and equipment safety features are standard

► Features

- VersaTouch™ controller
- Ethernet port
- USB port
- Heated viewing glass window
- Chamber light
- Two 3" cable ports
- Solid-state humidity sensor
- Platinum RTD temperature sensor
- Heavy-duty leveling casters
- Nichrome wire air heater
- Solid-state pressure switches
- Thermal expansion valves
- FM approved safety OTP
- Backup safety thermal cutoff
- Main electrical disconnect LOTO
- Chamber vent port
- One shelf standard
- UL 508A compliant



Overall dimensions in inches/centimeters

Model	C10S	C10C	C10RS	C10RC	C20S	C20C	C20RS	C20RC	C30S	C30C	C30RS	C30RC
Cubic Feet	10				20				30			
Liters	283				566				850			
Work Space (W x D x H)	24" x 26" x 28" / 61cm x 66cm x 71cm				30" x 32" x 36" / 76cm x 81cm x 91cm				36" x 40" x 36" / 91cm x 102cm x 91cm			
Exterior (nominal) (W x D x H)	32" x 58" x 68" / 81cm x 147cm x 173cm				38" x 64" x 76" / 97cm x 163cm x 193cm				44" x 72" x 76" / 111cm x 183cm x 193cm			
Unit Weight (LBS)	1000	1154	1000	1154	1100	1254	1100	1254	1250	1350	1250	1350
Temperature Range	-35°C	-73°C	-35°C	-73°C	-35°C	-73°C	-35°C	-73°C	-35°C	-73°C	-35°C	-73°C
	200°C	200°C	200°C	200°C	200°C	200°C	200°C	200°C	200°C	200°C	200°C	200°C
Humidity Range *	-	-	10% - 95%RH	10% - 95%RH	-	-	10% - 95%RH	10% - 95%RH	-	-	10% - 95%RH	10% - 95%RH
Cooling Rate (empty chamber) Min (C/Min)												
180C to -65C		72 (3.4)		72 (3.4)		111 (2.2)		111 (2.2)		136 (1.8)		136 (1.8)
125C to -40C		37 (4.5)		37 (4.5)		53 (3.1)		53 (3.1)		63 (2.6)		63 (2.6)
85C to -20C	22 (4.8)		22 (4.8)		33 (3.2)		33 (3.2)		40 (2.6)		40 (2.6)	
85C to -40C		30 (4.1)		30 (4.1)		45 (2.8)		45 (2.8)		54 (2.3)		54 (2.3)
ambient to -40C		15 (4.3)		15 (4.3)		23 (2.8)		23 (2.8)		28 (2.3)		28 (2.3)
ambient to -68C		40 (2.3)		40 (2.3)		66 (1.4)		66 (1.4)		85 (1.1)		85 (1.1)
Heating Rate (empty chamber) Min (C/Min)												
-65C to 180C		42 (5.9)		42 (5.9)		64 (3.8)		64 (3.8)		84 (2.9)		84 (2.9)
-40C to 125C		28 (6)		28 (6)		42 (3.9)		42 (3.9)		50 (3.3)		50 (3.3)
-20C to 85C	18 (6)		18 (6)		26 (4)		26 (4)		32 (3.3)		32 (3.3)	
-40C to 85C		21 (6)		21 (6)		31 (4)		31 (4)		38 (3.3)		38 (3.3)
-34C to ambient	10 (6.2)	10 (6.2)	10 (6.2)	10 (6.2)	14 (4.2)	14 (4.2)	14 (4.2)	14 (4.2)	17 (3.5)	17 (3.5)	17 (3.5)	17 (3.5)
-68C to ambient		15 (6.2)		15 (6.2)		22 (4.2)		22 (4.2)		27 (3.5)		27 (3.5)
Live Load Watts @ -18C	1200	1700	1200	1700	1160	1650	1160	1650	1120	1610	1120	1610
Live Load Watts @ -40C	-	1400	-	1400	-	1330	-	1330	-	1260	-	1260
Live Load Watts @ -54C	-	1100	-	1100	-	1010	-	1010	-	940	-	940
Temperature Control	±0.3°C				±0.3°C				±0.3°C			
Temperature Uniformity	±2°C @ 65°C				±2°C @ 65°C				±2°C @ 65°C			
Humidity Control	-	-	±2% RH	±2% RH	-	-	±2% RH	±2% RH	-	-	±2% RH	±2% RH
Air Flow Rate	500 CFM				500 CFM				500 CFM			
Heat Capacity	3kW				3kW				3kW			
Humidifier Capacity	-	-	2kW	2kW	-	-	2kW	2kW	-	-	2kW	2kW
Refrigeration	2 HP	(2) 2 HP	2 HP	(2) 2 HP	2 HP	(2) 2 HP	2 HP	(2) 2 HP	2 HP	(2) 2 HP	2 HP	(2) 2 HP
Condenser	Air Cooled - Std Water Cooled - Option				Air Cooled - Std Water Cooled - Option				Air Cooled - Std Water Cooled - Option			
Power	208V - 230V 1P 60Hz				208V - 230V 1P 60Hz				208V - 230V 1P 60Hz			
Amp - Fuse	40	60	50	60	40	60	50	60	40	60	50	60
Amp - Under Load	32	45	40	45	32	45	40	45	32	45	40	45
Power	460V 1P 60Hz				460V 1P 60Hz				460V 1P 60Hz			
Amp - Fuse	20	30	30	30	20	30	30	30	20	30	30	30
Amp - Under Load	16	23	20	23	16	23	20	23	16	23	20	23

Performance estimates based on 230v 1P 60Hz

*Humidity Range: based on temperature range 20°C to 85°C limited by 3°C dewpoint

All specifications are subject to change without notice.



»» Blue M

Stability and Shelf-Life Chambers

Steady-State Food & Drug Stability Chambers

Blue M's steady-state chambers are available in four convenient sizes. With workspace sizes of 8, 16, 32, and 58-cubic-feet and a variety of temperature and humidity combinations, these chambers provide the flexibility for a wide range of uses.

Watlow F4 Controller allows remote and unattended operation in setting up programs and setpoints. The F4 also allows easy control over both temperature and humidity settings in one controller. Common design elements of the chambers allow shelves to be interchanged among different models. Streamlined design allows Thermal Product Solutions to ship chambers customized to the customer's needs in far less time than previous product lines. Customers with several CEO chambers, even if different sizes, now have consistent controls, utility requirements, and heat output, so plant management issues are greatly reduced.

► Applications Include

- International Committee of Harmonization (ICH) applications
- Accelerated shelf-life studies
- Steady-state testing
- Stability testing
- Burn-in
- Curing
- Controlled temperature storage
- Clean room processes
- Bio-medical research

► Features

- Remote and unattended operation in setting up programs and setpoints
- Easy control over both temperature and humidity settings
- Non-ramping, manual mode
- Serial communications capabilities via the EIA-232 and EIA-485 standards
- Modbus RTU protocol
- Direct printing to a serial printer
- Direct connection to a PLC, or computer workstation



- High-definition LCD display with four digital input lines
- Two alarm outputs and eight digital event outputs
- Installation has also been improved with the addition of new combination casters/leveling legs

THERMAL PRODUCT SOLUTIONS

»» Blue M »» Gruenberg »» Lindberg/MPH »» Tenney

Model	Non-humidified	CEO 908-2		CEO 916-2		CEO 932-2		CEO 958-2	
	Humidified		CEO 908-4		CEO 916-4		CEO 932-4		CEO 958-4
Workspace inches/cm	W	33/84		33/84		33/84		60/152	
	D	28/71		28/71		28/71		28/71	
	H	15/38		30/76		60/152		60/152	
Exterior inches/ cm	W	39/99		39/99		39/99		70/178	
	D	32/81		32/81		32/81		32/81	
	H	46/117		61/155		91/231		91/231	
No. of Shelves		1		2		4		8	
No. of Shelf Guides		4		9		19		38	
Temperature Range	Low	0							
	High	99°C							
Utilities	Refrigeration (HP)		2-Jan					4-Mar	
	Heater Capacity		2 kW					6 kW	
	Humidifier	kW	1.5					3	
		GPH	0.5					1	
AMPS @ 208/230, 3-WIRE, 1Ph-60Hz		20	24	20	24	20	24	43	56
AMPS Breaker		30	30	30	30	30	30	60	70
Over-current protection recommended									
Unit Weight	Lbs.	375	400	425	450	524	550	1850	1900

Humidity capability: above ambient to 20% to 96% RH on -4 models. Based on ambient conditions of 22°C and 50% RH, limited by a 5°C dew point temperature.

Control tolerance: ±0.3°C and ±2% after stabilization.

All specifications are subject to change without notice.



»» Blue M FRP Series Full-Range Programmable Humidity Chambers

FRP Series Full-Range Programmable Humidity Chambers

The FRP Series of humidity chambers is truly the workhorse of the Blue M line of humidity chambers, offering an unequalled performance in MIL-STD testing. Its sophisticated yet easy-to-use control system allows versatility to go beyond military testing, tapping into a vast array of temperature and humidity capabilities while offering traditionally superior Blue M quality.

Blue M humidity chambers can be used for military standard test 883, method 1004 and 202, method 106 moisture-resistance tests. Also the 810, method 507.2 electronic subassembly and component qualification, packaging studies and moisture studies can be implemented on the FRP Series of humidity chambers.



Model # -15 to +93°C	Inside Dimensions Inches (cm)			Overall Dimensions Inches (cm)			Full Load Amps	Voltage 60Hz AC	Cubic Feet Capacity (Liters)
	W	D	H	W	D	H			
FRP-09B	25 (64)	25 (64)	25 (64)	64 (160)	39 (99)	71 (180)	40	208V/1Ph	9 (262)
FRP-09C	25 (64)	25 (64)	25 (64)	64 (160)	39 (99)	71 (180)	40	230V/1Ph	9 (262)
FRP-13B	37 (94)	25 (64)	25 (64)	75-1/2 (191)	39 (99)	71 (180)	45	208V/1Ph	13 (385)
FRP-13C	37 (94)	25 (64)	25 (64)	75-1/2 (191)	39 (99)	71 (180)	45	230V/1Ph	13 (385)
FRP-27B	36 (91)	36 (91)	36 (91)	75 (190)	83 (210)	48 (121)	45	208V/1Ph	27 (68)
FRP-27C	36 (91)	36 (91)	36 (91)	75 (190)	83 (210)	48 (121)	45	230V/1Ph	27 (68)

All specifications are subject to change without notice.



»»Blue M HRP Series Continuous High-Temperature/High-Humidity Chambers

HRP Series Continuous High-Temperature/High-Humidity Chambers

Blue M HRP Series Chambers provide high-range steady-state humidity. These chambers are designed to deliver large volume high-temperature/high-humidity conditions. HRP chambers incorporate horizontal airflow and a one-pass airflow system for an easy-to-use, highly effective, temperature/humidity system. This air system uses room ambient air for cooling, dehumidification and chamber exhaust. The system controls the input of room temperature air, the mixing of room air and chamber air, and the exhaust volume.

Processing silicone rubber compounds and other products requires a high moisture content for thorough, rapid curing. These chambers are also used to test rigid and flexible membranes and for aggressive high-temperature, high-humidity tests such as 85°C (185°F)/85% humidity.

General Specifications

- Temperature range: 15°C (59°F) above ambient to +150°C (+302°F)
- Humidity range: 10% to 98%
- Control system: Steady state recorder/controller



Model #	Inside Dimensions Inches (cm)			Overall Dimensions Inches (cm)			Full Load Amps	Voltage 60Hz AC	Cubic Feet Capacity (Liters)
	W	D	H	W	D	H			
HRP-09B	25 (64)	25 (64)	25 (64)	63 (160)	37 (94)	71 (180)	28	208V/1Ph	9 (262)
HRP-09C	25 (64)	25 (64)	25 (64)	63 (160)	37 (94)	71 (180)	31	240V/1Ph	9 (262)
HRP-13B	37 (94)	25 (64)	25 (64)	75 (191)	37 (94)	71 (180)	32	208V/1Ph	13 (385)
HRP-13C	37 (94)	25 (64)	25 (64)	75 (191)	37 (94)	71 (180)	36	240V/1Ph	13 (385)
HRP-27E	36 (91)	36 (91)	36 (91)	75 (191)	48 (122)	83 (211)	34	208V/3Ph	27 (734)
HRP-27F	36 (91)	36 (91)	36 (91)	75 (191)	48 (122)	83 (211)	37	240V/3Ph	27 (734)
HRP-27G	36 (91)	36 (91)	36 (91)	75 (191)	48 (122)	83 (211)	19	208V/3Ph	27 (734)
HRP-64E	48 (122)	48 (122)	48 (122)	89 (226)	60 (152)	98 (249)	50	208V/3Ph	64 (1816)
HRP-64F	48 (122)	48 (122)	48 (122)	89 (226)	60 (152)	98 (249)	56	240V/3Ph	64 (1816)
HRP-64G	48 (122)	48 (122)	48 (122)	89 (226)	60 (152)	98 (249)	28	208V/3Ph	64 (1816)

15°C above ambient to 150°

All specifications are subject to change without notice.

► Standard Oven Options

- Nickel-plated wire rod or stainless steel slotted shelves
- Door switch
- Motorized intake damper (two-position or proportional)
- Welded and sealed inner chamber
- 24-hour, 7-day digital process timer
- Circular chart recorder
- Reverse door hinge
- Glass observation panel(s)
- Floorstands
- Safety airflow switch on single-phase models
- Casters
- Comm-Link RS-485 to RS-232 converter

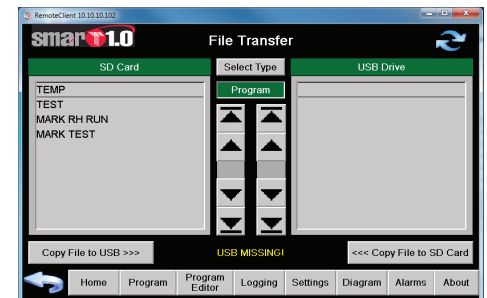
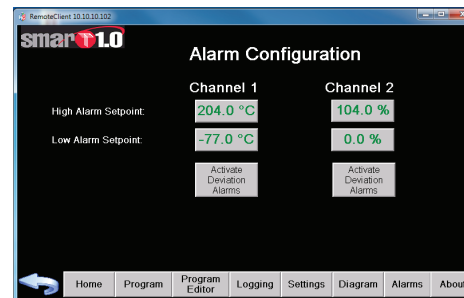
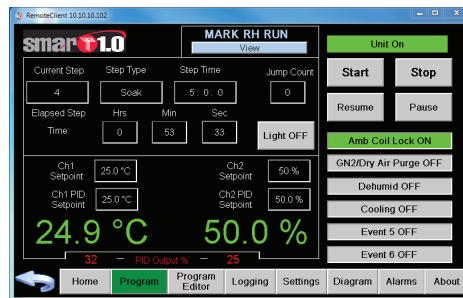
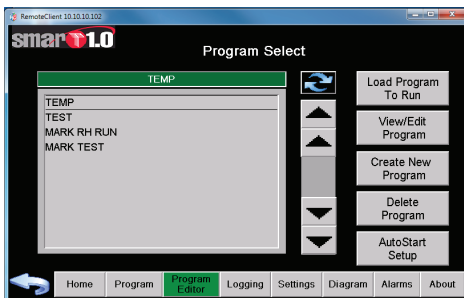
► Additional Options

- Additional lead-in ports
- Interior light
- Oversized one-pass airflow system for faster cool down
- Redundant over-temperature protection
- Rear access door(s)
- All stainless steel exterior construction
- Special control systems
- Vertical airflow
- Space-saving stack oven design
- Trace solvent safety package



smar 1.0 Control System

- Stunning High Resolution 7" Color Touch Screen
- Intuitive User Friendly Navigation With Built-In Help System
- Built-In USB Port for Data Logging
- Capable of Performing up to 400 Steps
- Real-Time Color Graph Displays
- Remote Networking
- Built-In Ethernet with 3 Serial Ports
- Data Logging Stored as CSV File
- Intuitive Alarm & Program Management
- Stores up to 20 Test Profiles
- 1 Extra Event Output
- Intuitive Password Protected Security



Cabinet Options:

- Additional shelves
- 6" sub ports

Instrumentation Options:

- Honeywell 1 pen recorder
- Honeywell 2 pen recorder
- Truline 1 pen recorder
- Truline 2 pen recorder
- Specview software

Operational Options:

- LN2 cooling boost
- CO2 cooling boost
- Boost Heat
- GN2 system
- Dry Air system
- Dehumidity dry air system
- Pump to drain
- Water reservoir systems
- Dionizer
- Maintenance kits
- Charcoal absorber water filter

** The addition of options and/or accessories may impact performance.*

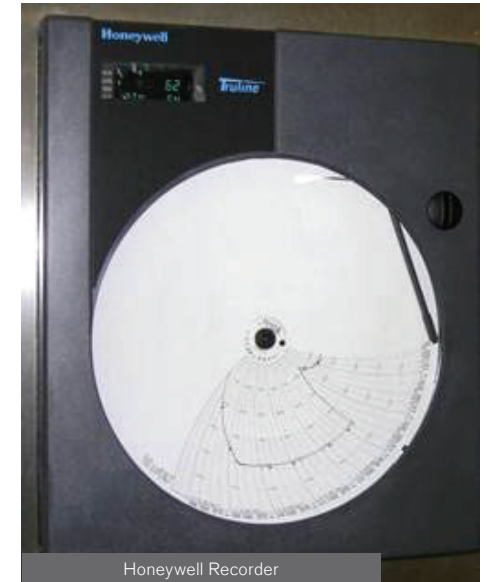
QUALITY

Thermal Product Solutions is a pioneer in the design and manufacturing of environmental test equipment. The Tenney Brand has been an industry leader since 1932. Our decades of experience, processes and procedures ensure quality and reliability of every piece of equipment we manufacture. Rest assured that you are purchasing a world-class piece of equipment built to perform and last.

SERVICE

We back our equipment with a comprehensive service organization. Factory trained, courteous and knowledgeable technicians provide on-site installation, maintenance and repair. In-house service technicians and a parts & service department stand ready to assist you. Contact our service department to inquire on preventive maintenance programs, extended warranties, calibrations services and more.

Need an option not listed? Contact Your Sales Rep.



»» Tenney

»» Blue M



Gruenberg, Blue M, Tenney

Mailing Address: P.O. Box 150 | White Deer, PA 17887-0150 | USA |

Phone: (570) 538-7200 | Fax: (570) 538-7380

Physical Address: 2821 Old Route 15 | New Columbia, PA 17856-9396

info@thermalproductsolutions.com

Specifications and Product Information are subject to change without notice.