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SE-Series Environmental Test Chambers

Taking Environmental Product Testing to the Next Level

Thoroughly testing products prior to consumer use is vital to the successof your business.
Thermotron's SE-Series Chambers expose products to a variety of temperatures and humidity levels, offering a complete and comprehensive way to improve product reliability.
SE-Series Chambers provide accurate and reliable test results. With more standard features and better performance capabilities than comparable chambers on the market, SE-Series Chambers improve products through dynamic testing solutions.

Inside the Workspace

- **4" thick door and 4.5" thick walls**
  The chamber is well insulated and stays cool to the touch, protecting the user.
- **Advanced Air Baffle Design**
  Forces air directly over the product for better temperature change rates.
- **Electronic Humidity Sensor**
  Eliminates the need for thermocouple wicks, producing more repeatable, dependable humidity tests with less downtime.
- **Interior Lights**
  Illuminate the workspace during a test and while the door is open.

- **Product Temperature Control (PTC) Thermocouple**
  Attaches to the product under test to control and monitor

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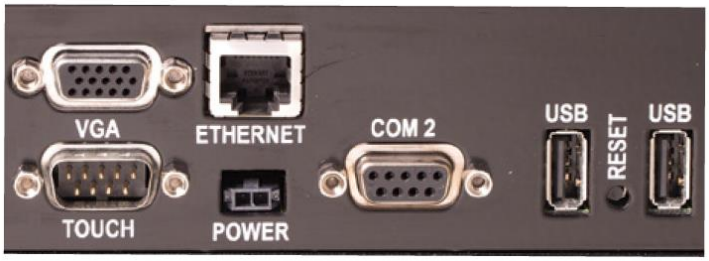
its temperature.

- **ThermAlarm®**
  Prevents temperature from exceeding user-defined limits.•

Serial Communications Panel

Stay connected with the Serial Communications Panel, featuring computer, internet, Ethernet, and USB connections, all while powering the 8800 Controller. The Serial Communications Panel provides the ability to securely export and transfer sensitive test data, including graphs and reports. Included in the serial communications panel are:



• 2 USB Ports

• Ethernet

• RS-232

Optional Features

A Quiet Package
Sound deadening material inside the chamber base incorporated to minimize noise levels.

Additional Access Ports
Allows cables to attach to a product inside the chamber and connect to outside monitoring equipment. A plug is provided to seal the port.

Cable Notch
A recess in the door frame that enables easy cable routing from the product under test to the exterior of the chamber.

Data Acquisition Panel (DAQ)
Collects and monitors product data while it's being tested.

Door Lock
Prevents the chamber door from opening during a test.

E-stop Button
Shuts down the chamber immediately in case of emergency.

Extended Temperature Range
Increases chamber performance to 232°C or below -70°C, with the help of LN_2.

Extended Warranty
Available on the parts and/or labor of your equipment.

Extra Access Ports
Choose from 2", 4", and 6" ports to be placed on the side wall of the chamber.

Extra Heat
Accelerates the chamber's heating capabilities in order to improve air and product temperature change rates.

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Glove Ports
Allows users to safely handle products under test inside the workspace.
Inner Glass Door Ports
Allows product handling without releasing conditioned air.
Liquid Nitrogen (LN_2) Boost
Enables faster temperature pull-downs and provides back-up cooling in the unlikely event of a mechanical refrigeration failure.
Liquid Nitrogen (LN_2)-only Chamber
Availeble in certain models only. Bypasses mechanical refrigeration for a simplified, LN_2-only operation.
Oxygen Monitor
Analyzes ambient oxygen levels outside of the chamber to protect users.
Preventive Maintenance and Calibration Agreements
Keeps equipment in optimal condition, minimizing chamber downtime.
Product Dewpoint Control
Prevents condensation by maintaining the product at a higher temperature than the dewpoint of the surrounding air.
Purge: Dry Air & Gaseous Nitrogen (GN_2)
Minimizes moisture in the workspace.
Reinforced Floors
Supports heavy product loads.
Remote Air-cooled Condenser
Transfers heat from the chamber to outside the facility.
Remote Conditioning Blower
Allows the chamber to condition remote enclosures through the use of a blower in the chamber ceiling.
Shelves
Increases product loading capacity, allowing for more effective use of testing space.
The Universal Port
Located in the side wall of a SE-Series Chamber, diversifies test lab utilization.

ENHANCED PERFORMANCE

Air Baffle

Maximizing airflow in the workspace is critical to a successful test.
Repeat tests and maintain consistent, accurate results with Thermotron's innovative air baffle. It is designed to evenly and forcefully distribute air directly over the product,* ensuring the entire product is conditioned.
The superior airflow the air baffle provides enhances product temperature change rates, tightens temperature gradients, and improves uniformity throughout the chamber's entire workspace.

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Product Temperature Control

Product Temperature Control (PTC) is a software and thermocouple system used to increase product temperature ramp rates with user-defined temperature offsets. This feature is set up and controlled through the 8800 Controller.
During conventional environmental testing, the workspace air temperature setpoint is achieved before the product temperature reaches it. The product temperature will lag behind and approach the air temperature at an exponentially decreasing rate.
PTC reduces product ramp times by up to 50% by over-driving the chamber's conditioning system until the product temperature achieves the desired setpoint.
In the above example, the workspace air temperature reaches 65°C and holds until the desired product temperature setpoint of 55°C is achieved. Once the product temperature approaches the setpoint, the air temperature converges with the product temperature so both are at 55°C. This ensures accurate test results for your product during environmental testing. PTC works for both heating and cooling.

Power Saver Plus (optional)

This innovative feature boosts cooling performance and reduces chamber energy consumption. The Power Saver Plus mode works with the 8800 Controller to determine whether to operate in single-stage or cascade mode, based on temperature setpoint, humidity mode, and cooling throttle.
Single-stage refrigeration systems perform faster in higher temperature ranges, while cascade refrigeration systems perform faster in lower temperature ranges. Power Saver Plus combines the benefit of both systems. It uses a sophisticated control logic to enable switching between systems, thus increasing cooling ramp times by up to 30%, all while reducing power consumption.

Boost Cooling and Heating (optional)

Additional features enhance the chamber's cooling and heating performance.

LN_2 Boost and CO_2 Boost

Liquid nitrogen (LN_2) boost and carbon dioxide (CO_2) boost are cooling injection systems that enable faster pull-downs and dissipation of heat from the product under test.

Extra Heat

This add-on feature accelerates the chamber's heating capabilities to improve air and product temperature change rates.

8800 CONTROLLER

Intuitive, Robust, Secure

Thermotron's exclusive Windows®-based 8800 Controller, with 12" color touchscreen, makes chamber operation and data collection easy and reliable. Quick navigation buttons provide shortcuts to user-selected screens.

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The 8800 Controller is standard on all SE-Series Chambers. With this Controller, receive:
• Multi-level, password-based security system to protect data
• Test data that can be downloaded to spreadsheet formats
• An Activity Log: record and retain 15+ years of chamber history
• Product Temperature Control to improves product change rates by over-compensating the air temperature to control the product temperature
• The System Monitor to detect excessive refrigeration pressures and temperatures and notify users when problems occur
• The Product Dewpoint Control to prevent condensation by maintaining the product at a higher temperature than the dewpoint of the surrounding air (optional)
• ThermoTrak II™ to connect up to 32 controllers to one PC (optional)

MODULAR HUMIDITY SYSTEM

Temperature-humidity

SE-Series Chamber models include a patented, modular, full-range humidity system.
Precise uniformity and tight control characterize the high-performance specifications of this humidity system.
With excellent low-humidity accuracy, the electronic humidity sensor (located in the workspace) eliminates the need for thermocouple wicks and float tanks. A steam generator achieves high volumes of moisture with consistent water vapor levels and more repeatable test results.
The humidity system can be configured with a direct-feed facility hook-up or a self-contained refillable water reservoir. If using the water reservoir, the humidity water purification and recirculation system is recommended to keep the water within the working limits of the chamber.
A demineralizer cartridge viewing window allows users to see the cartridge without opening the doors.
The low humidity option incorporates dry air purge and a bubbler humidity system to control humidity at ultra-low dewpoints.
This eliminates the two problems associated with adding hot steam to a cold environment: heat that needs to be taken out of the system and steam generator oscillation, both of which negatively affect the test results.
Humidity test numbers can be viewed, monitored, and controlled through the 8800 Controller. If you have a temperature-only chamber, the modular humidity system can be added as a field retrofit.

UNIVERSAL PORT

The patented Universal Port can be installed in the side wall of SE-Series Chambers, expanding their capabilities by diversifying equipment utilization, increasing lab productivity, and reducing capital investment costs.
The Universal Port interfaces with interchangeable modules and accessories that characterize different stress testing and simulation techniques, allowing the chamber to serve multiple purposes. With the Universal Port, a temperature chamber can become a HALT chamber, thermal shock chamber, or a remote conditioner without needing to purchase an additional chamber.
The height of the Universal Port, modules, and accessories are consistent across all SE-Series Chamber models. The stainless steel port reduces moisture migration and heat leak. A full-sealing structural plug fills the portal with a pressurized fit when the port is not in use.

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		Cooling Performance						Heating Performance						IEC Performance+		Cooling Product Temp		Heating Product Temp	
		Measured at the supply air*														Measured on the product**			
		Minutes & °C/Minute						Minutes & °C/Minute						°C/Minute		Minutes			
		180° to -65°C		71° to -65°C		85° to -40°C		-65° to 180°C		-65° to 71°C		-40° to 85°C		Cooling	Heating	71° to -65°C	85° to -40°C	-65° to 71°C	-40° to 85°C
SE-300	SE-300-2-2	75	3.2°C	48	2.8°C	35	3.5°C	36	6.8°C	17	8°C	16	7.8°C	3.6	6.5	90	72	40	38
	SE-300-4-4	45	5.4°C	26	5.2°C	17	7.4°C	22	11.1°C	9	15.1°C	8	15.6°C	6.2	10.5	52	36	33	31
	SE-300-6-6	33	7.4°C	21	6.4°C	12.5	10°C	22	11.1°C	9	15.1°C	8	15.6°C	8.7	10.5	39	28	33	31
	SE-300-10-10	20	12.3°C	13	10.5°C	6	20.8°C	11	22.3°C	5	27.2°C	4	31.3°C	15.4	22	36	26	32	30
SE-400	SE-400-6-6	42	5.8°C	24	5.8°C	15	8.3°C	30	8.1°C	14	9.7°C	12	10.4°C	6.6	8.0	42	33	30	28
	SE-400-10-10	25	9.8°C	15	9°C	9	13.8°C	18	13.6°C	7.5	18.1°C	6.5	19.2°C	11.7	12.5	27	23	25	24
	SE-400-15-15	17	14.4°C	9	15.1°C	5	25°C	9	27.2°C	4.5	30.2°C	4	31.3°C	22.0	28.0	24	21	24	23
SE-600	SE-600-3-3	68	3.6°C	41	3.3°C	28	4.4°C	37	6.8°C	17	8°C	16	7.8°C	3.8	5.8	60	48	40	38
	SE-600-6-6	50	4.9°C	30	4.5°C	22	5.8°C	37	6.8°C	17	8°C	16	7.8°C	5.5	5.8	48	40	40	38
	SE-600-7.5-7.5	40	6.1°C	26	5.2°C	18	6.9°C	19	12.8°C	9	15.1°C	8	15.6°C	6.6	13.3	42	35	26	25
	SE-600-10-10	28	8.7°C	17	8°C	11	11.3°C	19	12.8°C	9	15.1°C	8	15.6°C	10.0	13.3	30	25	26	25
	SE-600-15-15	22	11.1°C	13	10.4°C	9	13.8°C	11	22.2°C	7	19.4°C	6	20.8°C	13.3	22.0	26	23	24	23
SE-1000	SE-1000-3-3	78	3.1°C	50	2.7°C	35	3.5°C	43	5.8°C	20	6.8°C	19	6.5°C	3.1	4.9	68	53	44	41
	SE-1000-6-6	56	4.3°C	36	3.7°C	26	4.7°C	43	5.8°C	20	6.8°C	19	6.5°C	4.6	4.9	53	46	44	41
	SE-1000-7.5-7.5	47	5.2°C	32	4.3°C	22	5.7°C	21	11.6°C	10	13.6°C	9	12.8°C	5.4	10.5	46	39	27	26
	SE-1000-10-10	34	7.2°C	21	6.4°C	13	9.8°C	21	11.6°C	10	13.6°C	9	12.8°C	7.7	10.5	32	26	27	26
	SE-1000-15-15	27	9°C	16	8.5°C	11	11.3°C	12	20.4°C	8	17°C	7	17.8°C	11.7	20.0	28	24	25	24
SE-1200	SE-1200-3-3	84	2.9°C	55	2.4°C	40	3.1°C	47	5.2°C	22	6.1°C	21	5.9°C	2.8	4.4	72	56	48	44
	SE-1200-6-6	62	3.9°C	40	3.4°C	30	4.1°C	47	5.2°C	22	6.1°C	21	5.9°C	4.0	4.4	56	49	48	44
	SE-1200-7.5-7.5	52	4.7°C	35	3.9°C	25	5°C	23	10.8°C	11	12.3°C	10	12.5°C	4.9	9.5	48	41	28	27
	SE-1200-10-10	37	6.6°C	23	5.9°C	15	8.3°C	23	10.8°C	11	12.3°C	10	12.5°C	6.9	9.5	34	27	28	27
	SE-1200-15-15	29	8.4°C	18	7.5°C	12	10.4°C	13	18.8°C	9	15.1°C	8	15.6°C	10.5	18.0	29	25	26	25
SE-1400	SE-1400-3-3	95	2.6°C	61	2.2°C	43	2.9°C	49	5°C	23	5.9°C	22	5.7°C	2.5	4.2	76	59	50	46
	SE-1400-6-6	66	3.7°C	42	3.2°C	32	3.9°C	49	5°C	23	5.9°C	22	5.6°C	3.7	4.2	58	51	50	46
	SE-1400-7.5-7.5	55	4.5°C	37	3.7°C	27	4.6°C	24	10.2°C	11	12.3°C	10	12.5°C	4.5	9.0	50	43	29	28
	SE-1400-10-10	39	6.2°C	24	5.6°C	16	7.8°C	24	10.2°C	11	12.3°C	10	12.5°C	6.4	9.0	36	29	29	28
	SE-1400-15-15	30	8.1°C	19	7.1°C	12	10.4°C	14	17.5°C	8	17°C	7	17.8°C	9.5	18.0	30	26	27	26
SE-2000	SE-2000-3-3	100	2.4°C	65	2°C	45	2.7°C	51	4.8°C	24	5.6°C	23	5.4°C	2.3	4.0	79	62	52	48
	SE-2000-6-6	70	3.5°C	44	3°C	34	3.6°C	51	4.8°C	24	5.6°C	23	5.4°C	3.3	4.0	60	53	52	48
	SE-2000-7.5-7.5	58	4.2°C	39	3.5°C	29	4.3°C	25	9.8°C	12	11.3°C	11	11.3°C	4.0	8.7	52	45	30	29
	SE-2000-10-10	41	5.9°C	25	5.4°C	17	7.4°C	25	9.8°C	12	11.3°C	11	11.3°C	6.4	8.7	37	31	30	29
	SE-2000-15-15	31	7.9°C	20	6.8°C	12	10.4°C	14	17.5°C	8	17°C	7	17.8°C	8.3	16.6	31	27	28	27
SE-3000	SE-3000-6-6	85	2.9°C	54	2.5°C	42	2.9°C	64	3.8°C	31	4.3°C	29	4.3°C	2.8	3.3	70	61	58	54
	SE-3000-7.5-7.5	70	3.5°C	47	2.9°C	35	3.6°C	30	8.1°C	14	9.7°C	13	9.6°C	3.4	7.1	60	51	34	32
	SE-3000-10-10	50	4.9°C	30	4.5°C	21	5.9°C	30	8.1°C	14	9.7°C	13	9.6°C	5.2	7.1	42	35	34	32
	SE-3000-15-15	38	6.4°C	25	5.4°C	16	7.8°C	17	14.4°C	9	15.1°C	8	15.6°C	6.6	13.3	35	31	31	30
SE-3300	SE-3300-6-6	90	2.7°C	57	2.4°C	45	2.8°C	68	3.6°C	33	4.1°C	31	4°C	2.7	3.2	73	63	61	57
	SE-3300-7.5-7.5	74	3.3°C	50	2.7°C	38	3.3°C	32	7.6°C	15	9.1°C	14	8.9°C	3.2	6.6	63	53	36	34
	SE-3300-10-10	53	4.6°C	32	4.3°C	23	5.4°C	32	7.6°C	15	9.1°C	14	8.9°C	5.0	6.6	44	37	36	34
	SE-3300-15-15	40	6.1°C	27	5°C	17	7.4°C	18	13.6°C	10	13.6°C	9	13.9°C	6.4	12.5	36	32	32	31
	SE-3300-20-20	30	8.2°C	17	8°C	11	11.4°C	19	12.9°C	10	13.6°C	9	13.9°C	10.5	11.7	33	29	32	31

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