

## SE-SERIES ENVIRONMENTAL TEST CHAMBERS



### NEXT LEVEL TESTING PERFORMANCE

Thorough environmental testing practices are vital to the success and longevity of your business. Thermotron's SE-Series Chambers offer a complete and comprehensive way to improve product quality and reliability. With more standard features and better performance than comparable chambers on the market, the SE-Series provides strong core capability for any test lab.

## Key Advantages

### Variety of Sizes

SE-Series Chamber workspaces range from 300 to 3,000 liters to accommodate many product sizes.

### Superior Airflow

Direct airflow over the product under test improves product temperature change rates, helping achieve superior testing results.

### Humidity System

Thermotron's humidity system provides a wide range of humidity conditions. Its modular design allows for future upgrades of temperature-only SE-Series Chambers.

### Product Monitoring

Thermotron offers multiple features that assist in monitoring the product under test to maximize test results, including innovative data acquisition and Product Temperature Control.

### Industry Leading Controller

The 8800 Controller is standard on all SE-Series Chamber models. The controller is intuitive, robust, and secure. The controller's hardware and software are designed in-house, specifically for environmental testing.

### Compressor Size Options

By utilizing high-performance compressors in multiple size configurations, SE-Series Chambers can achieve the change rates you require. Thermotron offers cascade (two compressors) and single-stage (one compressor) chamber models.

# CONTENTS

|                                          |    |
|------------------------------------------|----|
| General Specifications .....             | 4  |
| Cascade Performance Specifications ..... | 5  |
| Product Features & Options .....         | 6  |
| 8800 Controller .....                    | 7  |
| Humidity System .....                    | 8  |
| Universal Port .....                     | 9  |
| Enhanced Performance .....               | 10 |
| Worldwide Service & Support .....        | 12 |

For more than 60 years, Thermotron has provided quality environmental test equipment. We've worked to establish a trusted reputation among our peers, and when people hear the name *Thermotron*, they have confidence in the testing of their own product. We've been building our name since 1962; now it's your turn.

**QUALITY. TRUST.  
CONFIDENCE.**  
— BUILD YOURS WITH A —  
**THERMOTRON.**

# SPECIFICATIONS

## Standard model sizes and temperature performance

| Model   | Exterior Dimensions<br>W x D x H       | Interior Dimensions<br>W x D x H            | Volume                          | Cascade<br>Temp. Range*             | Single Stage<br>Temp Range*         | Temperature<br>Uniformity^ |
|---------|----------------------------------------|---------------------------------------------|---------------------------------|-------------------------------------|-------------------------------------|----------------------------|
| SE-300  | 35 x 70 x 78 in<br>89 x 178 x 198 cm   | 24 x 26.25 x 28 in<br>61 x 67 x 71 cm       | 10.2 ft <sup>3</sup><br>289 L   | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) | ±0.5°C (±0.9°F)            |
| SE-400  | 43 x 70 x 78 in<br>109 x 178 x 198 cm  | 32 x 26.25 x 28 in<br>81 x 67 x 71 cm       | 13.6 ft <sup>3</sup><br>385 L   | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |
| SE-600  | 49 x 70 x 83 in<br>124 x 178 x 211 cm  | 40 x 26.25 x 34 in<br>102 x 67 x 86 cm      | 20.7 ft <sup>3</sup><br>586 L   | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |
| SE-1000 | 49 x 83 x 87 in<br>124 x 211 x 221 cm  | 40 x 39.25 x 38.25 in<br>102 x 100 x 97 cm  | 34.8 ft <sup>3</sup><br>986 L   | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |
| SE-1200 | 49 x 83 x 95 in<br>124 x 211 x 241 cm  | 40 x 39.25 x 46 in<br>102 x 100 x 117 cm    | 41.8 ft <sup>3</sup><br>1,184 L | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |
| SE-1400 | 56 x 83 x 87 in<br>142 x 211 x 221 cm  | 48 x 39.25 x 44.25 in<br>122 x 100 x 112 cm | 48.2 ft <sup>3</sup><br>1,366 L | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) | ±0.7°C (±1.3°F)            |
| SE-2000 | 56 x 92 x 95 in<br>142 x 234 x 241 cm  | 48 x 48 x 52 in<br>122 x 122 x 132 cm       | 69.3 ft <sup>3</sup><br>1,965 L | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |
| SE-3000 | 56 x 116 x 95 in<br>142 x 295 x 241 cm | 48 x 72 x 52 in<br>122 x 183 x 132 cm       | 104 ft <sup>3</sup><br>2,945 L  | -70°C to 180°C<br>(-94°F to 356 °F) | -40°C to 180°C<br>(-40°F to 356 °F) |                            |

\* Cooling performance is measured using standard refrigerants. Low-GWP refrigerants are available with reduced cooling rates.

Single Stage systems with low-GWP refrigerants are limited to -35°C (-31°F)

^ Standard deviation from mean, measured at -25°C (-13°F) or 100°C (212°F).

Standard Humidity range is 10% to 98%RH (±2.5%RH) within 7°C to 87°C (45°F to 188°F) Dewpoint range on all SE chambers.

Temperature Control: ±0.3°C (±0.5°F)

All standard windows are 15x19 in / 38x48 cm. Custom window sizes are available.

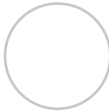
## Exterior color options



Chamber Blue™



Lab Gray™



Custom Colors Available



# THERMOTRON

# CASCADE PERFORMANCE

-70° to 180°C (-94° to 356°F)

|         |                            | Cooling Performance         |              |              | Heating Performance |              |              | Live Load Capacity <sup>+</sup> |                       |
|---------|----------------------------|-----------------------------|--------------|--------------|---------------------|--------------|--------------|---------------------------------|-----------------------|
|         |                            | Measured at the supply air* |              |              |                     |              |              |                                 |                       |
|         |                            | Minutes / °C/Minute         |              |              |                     |              |              | Watts                           |                       |
|         |                            | 180° to -65°C               | 71° to -65°C | 85° to -40°C | -65° to 180°C       | -65° to 71°C | -40° to 85°C | @ 0 °C<br>(32 °F)               | @ -54 °C<br>(-65 °F)) |
| SE-300  | SE-300-4-4                 | 45 / 5.4                    | 26 / 5.2     | 17 / 7.4     | 22 / 11.1           | 9 / 15.1     | 8 / 15.6     | 1500                            | 1000                  |
|         | SE-300-6-6                 | 33 / 7.4                    | 21 / 6.4     | 12.5 / 10.0  | 22 / 11.1           | 9 / 15.1     | 8 / 15.6     | 1500                            | 1000                  |
| SE-400  | SE-400-6-6                 | 42 / 5.8                    | 24 / 5.6     | 15 / 8.3     | 30 / 8.1            | 14 / 9.7     | 12 / 10.4    | 2250                            | 1500                  |
|         | SE-400-10-10 <sup>1</sup>  | 25 / 9.8                    | 15 / 9.0     | 9 / 13.8     | 18 / 13.6           | 7.5 / 18.1   | 6.5 / 19.2   | 2250                            | 1500                  |
|         | SE-400-15-15               | 17 / 14.4                   | 9 / 15.1     | 5 / 25.0     | 9 / 27.2            | 4.5 / 30.2   | 4 / 31.3     | 2250                            | 1500                  |
| SE-600  | SE-600-6-6                 | 50 / 4.9                    | 30 / 4.5     | 22 / 5.6     | 37 / 6.6            | 17 / 8.0     | 16 / 7.8     | 3000                            | 2000                  |
|         | SE-600-10-10 <sup>1</sup>  | 28 / 8.7                    | 17 / 8.0     | 11 / 11.3    | 19 / 12.8           | 9 / 15.1     | 8 / 15.6     | 3000                            | 2000                  |
|         | SE-600-15-15               | 22 / 11.1                   | 13 / 10.4    | 9 / 13.8     | 11 / 22.2           | 7 / 19.4     | 6 / 20.8     | 3000                            | 2000                  |
| SE-1000 | SE-1000-6-6                | 56 / 4.3                    | 36 / 3.7     | 26 / 4.7     | 43 / 5.6            | 20 / 6.8     | 19 / 6.5     | 3000                            | 2000                  |
|         | SE-1000-10-10 <sup>1</sup> | 34 / 7.2                    | 21 / 6.4     | 13 / 9.6     | 21 / 11.6           | 10 / 13.6    | 9 / 13.9     | 3000                            | 2000                  |
|         | SE-1000-15-15              | 27 / 9.1                    | 16 / 8.5     | 11 / 11.3    | 12 / 20.4           | 8 / 17.0     | 7 / 17.8     | 3000                            | 2000                  |
| SE-1200 | SE-1200-6-6                | 62 / 3.9                    | 40 / 3.4     | 30 / 4.1     | 47 / 5.2            | 22 / 6.1     | 21 / 5.9     | 3000                            | 2000                  |
|         | SE-1200-10-10 <sup>1</sup> | 37 / 6.6                    | 23 / 5.9     | 15 / 8.3     | 23 / 10.6           | 11 / 12.3    | 10 / 12.5    | 3000                            | 2000                  |
|         | SE-1200-15-15              | 29 / 8.4                    | 18 / 7.5     | 12 / 10.4    | 13 / 18.8           | 9 / 15.1     | 8 / 15.6     | 3000                            | 2000                  |
| SE-1400 | SE-1400-6-6                | 66 / 3.7                    | 42 / 3.2     | 32 / 3.9     | 49 / 5.0            | 23 / 5.9     | 22 / 5.7     | 4500                            | 3000                  |
|         | SE-1400-10-10 <sup>1</sup> | 39 / 6.2                    | 24 / 5.6     | 16 / 7.8     | 24 / 10.2           | 11 / 12.3    | 10 / 12.5    | 6000                            | 4000                  |
|         | SE-1400-15-15              | 30 / 8.1                    | 19 / 7.1     | 12 / 10.4    | 14 / 17.5           | 8 / 17.0     | 7 / 17.8     | 6000                            | 4000                  |
|         | SE-1400-20-20              | 21 / 11.6                   | 12 / 11.3    | 7 / 17.8     | 15 / 16.3           | 8 / 17.0     | 7 / 17.8     | 6000                            | 4000                  |
| SE-2000 | SE-2000-6-6                | 70 / 3.5                    | 44 / 3.0     | 34 / 3.6     | 51 / 4.8            | 24 / 5.6     | 23 / 5.4     | 4500                            | 3000                  |
|         | SE-2000-10-10 <sup>1</sup> | 41 / 5.9                    | 25 / 5.4     | 17 / 7.4     | 25 / 9.8            | 12 / 11.3    | 11 / 11.3    | 6000                            | 4000                  |
|         | SE-2000-15-15              | 31 / 7.9                    | 20 / 6.8     | 12 / 10.4    | 14 / 17.5           | 8 / 17.0     | 7 / 17.8     | 6000                            | 4000                  |
|         | SE-2000-20-20              | 23 / 10.6                   | 13 / 10.4    | 8 / 15.6     | 16 / 15.3           | 8 / 17.0     | 7 / 17.8     | 6000                            | 4000                  |
| SE-3000 | SE-3000-6-6                | 85 / 2.9                    | 54 / 2.5     | 42 / 2.9     | 64 / 3.8            | 31 / 4.3     | 29 / 4.3     | 4500                            | 3000                  |
|         | SE-3000-10-10 <sup>1</sup> | 50 / 4.9                    | 30 / 4.5     | 21 / 5.9     | 30 / 8.1            | 14 / 9.7     | 13 / 9.6     | 6000                            | 4000                  |
|         | SE-3000-15-15              | 38 / 6.4                    | 25 / 5.4     | 16 / 7.8     | 17 / 14.4           | 9 / 15.1     | 8 / 15.6     | 6000                            | 4000                  |

\* Air temperature (empty chamber) using standard refrigerants. Low-GWP refrigerants are available with reduced cooling rates.

<sup>+</sup> 'Live load' heat removal capacity is based on a combination of airflow and refrigeration capacity in relationship to the temperature rise of powered products in the workspace

<sup>1</sup> 10 HP compressors and larger require a water-cooled condenser. If additional performance is required in an air-cooled system, 7.5 HP compressors are available. Consult a sales representative for more information.

Performance is based upon laboratory ambient conditions of 23.9°C, and may vary slightly.

Thermotron equipment is not designed to process hazardous materials. Consult an application engineer if hazardous materials are involved.

Additional accessories may impact performance. Specifications subject to change without notice.

# FEATURES



## Inside the Workspace

### 4.5" thick door and 4" 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 (humidity models)

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 its temperature.

### ThermAlarm®

Prevents chamber's interior temperature from exceeding user-defined limits.

## Optional Features

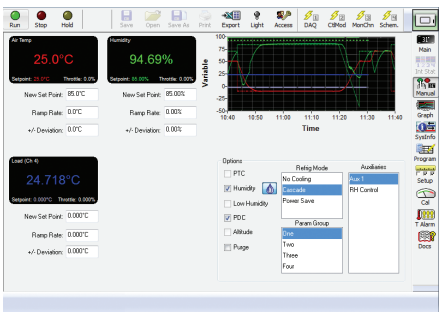
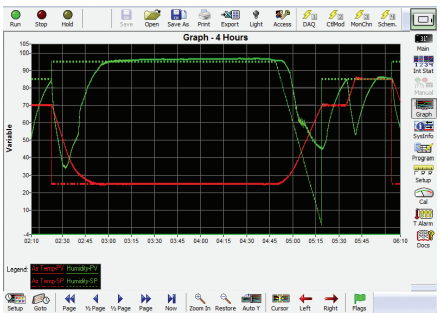
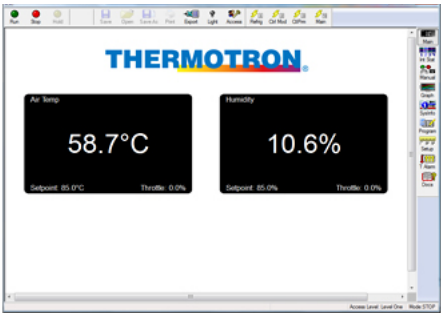
- Additional Access Ports
- Cable Notch
- Data Acquisition Panel (DAQ)
- Door InterLock
- Dry Air Purge
- E-Stop Button
- Extended Temperature Range
- Extended Warranty
- Extra Heat
- Glove Ports
- GN<sub>2</sub> Purge
- Inner Glass Door Ports
- LN<sub>2</sub> Boost
- LN<sub>2</sub>-Only Chamber
- Low GWP Refrigerants (ramp rates reduced)
- Minimal Spark
- Oxygen Monitor
- Preventative Maintenance and Calibration Agreements
- Product Dewpoint Control
- Quiet Package
- Reinforced Floors
- Remote Air-Cooled Condenser
- Remote Conditioning Blower
- Shelves
- Universal Port

# Intuitive. Robust. Secure.

Thermotron's exclusive Windows®-based 8800 Controller, with a 12" color touchscreen, makes chamber operation and data collection easy and reliable. Quick navigation buttons provide shortcuts to user-selected screens. The 8800 Controller is standard on all SE-Series Chambers and includes:

-  **Multi-level Password Protection** strongly secures system and protects data
-  **Test Data** can be downloaded to spreadsheets, charts, and other useful formats
-  **Activity logs** are capable of recording and retaining 15+ years of chamber history
-  **Product Temperature Control** improves product change rates by over-compensating the air temperature to control the product temperature
-  **System Monitor** detects excessive refrigeration pressures and temperatures, notifies users when problems occur
-  **Product Dewpoint Control** prevents condensation by maintaining the product at a higher temperature than the dewpoint of the surrounding air (*optional*)

-  **ThermoTrak II™** will connect up to 32 controllers to one PC (*optional*)

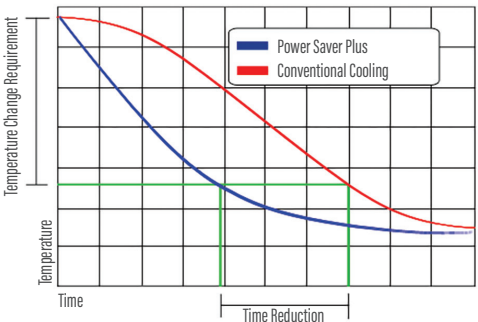


Visit [thermotron.com/resources-main/controller-demos](http://thermotron.com/resources-main/controller-demos) for an interactive demo

## Power Saver Plus (*optional*)

Power Saver Plus 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. A sophisticated control logic enables switching between single-stage and cascade refrigeration systems, thus increasing cooling ramp times by up to 30%, all while reducing power consumption.



## Build a unique test environment

SE-Series temperature-humidity models include a patented, 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.

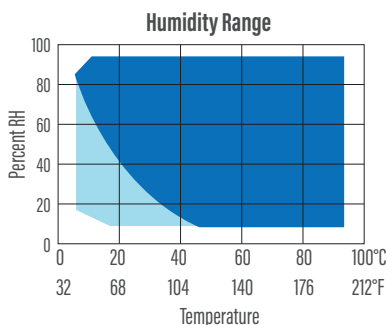
The humidity system can be configured with a direct-feed facility hook-up or a self-contained refillable water reservoir. If using the water reservoir, the humidity water purification and recirculation system is recommended to keep the water within the working limits of the chamber. Additionally, a demineralizer 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, eliminating the two major 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 test results.

Humidity test numbers can be viewed, monitored, and controlled through the 8800 Controller. If you have a temperature-only chamber, a modular humidity system can be added as a field retrofit.



Lower backside of standard SE-Series humidity system



Standard Humidity Range

-10°C (14°F) Dewpoint

### Full-Range Humidity Specifications\*

|                               |                             |
|-------------------------------|-----------------------------|
| Humidity Range <sup>1</sup>   | 10% to 98% RH               |
| Dry Bulb Temperature Range    | 7°C to 88°C (45°F to 190°F) |
| Dewpoint Temperature Range    | 7°C to 87°C (45°F to 188°F) |
| Extended Dewpoint Condition   | -10°C (14°F)                |
| Humidity Control <sup>2</sup> | ±2.5% RH                    |

\*Relative humidity indication at or near the physical limits may be affected by sensor accuracy and control tolerance. An optional humidity package can be added for applications requiring humidity levels lower than those covered by the full-range humidity system.

<sup>1</sup> Limited by a 7°C (45°F) minimum dewpoint temperature and a maximum dry bulb temperature of 88°C (190°F).

<sup>2</sup> At a dry bulb temperature above 20°C (68°F).

# UNIVERSAL PORT

Thermotron's 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.

*Universal Port is available on SE-600 models and larger.*

*Universal Port Size: 32"H x 18"W. Custom sizes available.*



## Universal Port Module and Accessory Options

Adding the Universal Port to your chamber diversifies your capital equipment purchase and allows you to be prepared for future growth and ever-changing testing needs. The following modules and accessories are currently available for purchase with your SE-Series Chamber featuring a:

- RSL-16 Portable Shaker
- Remote Blower Package
- Thermal Shock Module
- Workspace Add-on Module
- Workspace Extension Module
- Bulkhead ESS Connector Plate
- Workspace Extension Enclosures
- Additional Window
- Glove Ports
- Test Station Platform



SE-600 with RSL-16 Portable Shaker

## Patented Air Baffle Design (*standard*)



Maximizing airflow in the workspace is critical to a successful test. Thermotron's innovative air baffle is designed to evenly and forcefully distribute air directly over the product, ensuring the entire product is conditioned and providing consistent, accurate results over repeated testing.

The SE Chamber's superior airflow enhances product temperature change rates, tightens temperature gradients, and improves uniformity throughout the chamber's entire workspace.

## Cooling and Heating Boost (*optional*)



### LN<sub>2</sub> Boost and CO<sub>2</sub> Boost

Liquid nitrogen (LN<sub>2</sub>) boost and carbon dioxide (CO<sub>2</sub>) 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.

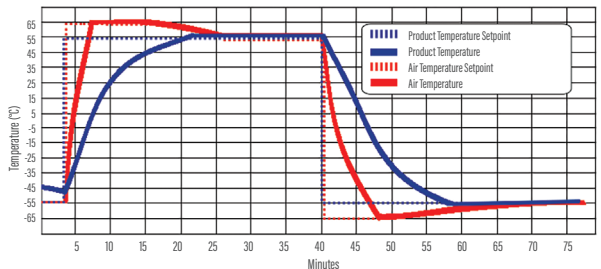
## Proven Performance

Thermotron is trusted by many of the world's leading manufacturers in the automotive, aerospace, defense, and technology industries.

## 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. PTC is set up and controlled through the 8800 Controller and works for both the heating and cooling process.

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 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, ensuring accurate test results.



## We're always there for you

Thermotron's comprehensive service department supports your equipment purchase for years after the sale.

### Field Service

Factory-trained Field Service Engineers are located across the United States and throughout the world to assist with equipment start-up, after-delivery service, and preventive maintenance and calibration agreements. Thermotron provides field calibrations accredited to the ISO 17025 and ANSI/NCSL Z-540-1 calibration standards by A2LA under certificate number 191701.

### Factory Support

Our parts department is available for regular and overnight delivery of important parts for your equipment, while technical advisors will answer questions and offer advice regarding start-up, service, operation, troubleshooting, and repair of your equipment.

### Service Seminar

Each May dozens of testing professionals gather at our headquarters in Holland, MI on the shore of Lake Michigan for three days of training on chamber operation, maintenance and troubleshooting. Whether you are brand new to environmental testing or a veteran looking to grow, Service Seminar connects you to expert advice and training tailored to your needs.

*[Visit thermotron.com/service-2/service-seminar](https://thermotron.com/service-2/service-seminar)*



## Worldwide Service & Support

Thermotron's comprehensive service department supports your equipment purchase for years after the sale. Our worldwide service professionals are available and ready to help over the phone or in person.

Technical advisors are available to answer questions and offer advice regarding start-up, service, operation, troubleshooting, and repair of your equipment.

Factory-trained Field Service Engineers are located across the United States and throughout the world to assist with equipment start-up, after-delivery service, preventive maintenance, and calibration contracts. From phone support to overnight parts delivery, Thermotron can support you for the life of your equipment. Call +1(800)272-2589.



## Click or Call to Receive a Free Quote

Contact your regional sales rep, visit us online, or call us direct at the numbers listed below for fast, friendly service.

[Visit thermotron.com](https://thermotron.com)

For more than 60 years, Thermotron has provided quality environmental test equipment. We've worked to establish a trusted reputation among our peers, and when people hear the name *Thermotron*, they have confidence in the testing of their own product. We've been building our name since 1962; now it's your turn.

**QUALITY. TRUST.  
CONFIDENCE.**  
— BUILD YOURS WITH A —  
**THERMOTRON.**