

# Thermonics News

Volume 1, January 2011

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### T-2500E Product Enhancements

New Test Head

Air Ionizer

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New Air Dryer

Quieter System

Thermonics has been aggressively enhancing our product offerings through our continuous engineering program.

In this newsletter, we reveal several significant upgrades to our T-2500 Product Family. In subsequent issues, we will discuss enhancements to the other product lines and the upcoming release of exciting new products.

The T-2500 series has been improved in several significant ways. These product enhancements benefit our customers by improving the functionality, reliability and safety of the systems; reducing the operating noise level and augmenting the unit's ease-of-service. The specific enhancements include:

- *A new, modular, Thermal Test Head.*
- *Inclusion of a Temperature Failsafe PCB.*
- *Air Ionization included as a standard feature.*
- *Re-design of the Air Dryer system.*
- *Quieting of the system's operational noise level.*

## New, Modular Thermal Test Head

*Thermonics novel test head design reduces service costs, decreases frost and moisture and protects customer's equipment.*

The thermal test head has been redesigned in a modular format that affords the following benefits:

1. Easily serviced design: Modular components are easy to replace.
2. Elimination of internal frost formation.
3. Improved integration of the heater's sensors with the temperature monitoring system.

Key to the design concept, is reduction of the inner surface area along with the additional insulation. The resulting test head provides superior temperature performance and is also capable of long-term cold operation without frost and moisture issues.

The new design helps to protect sensitive test electronics from exposure to damaging moisture, and enables quick and efficient servicing of the unit, if required.

Two new assemblies have been added to the head:

1. A custom failsafe PCB, which prevents over-temperature conditions.
2. Air ionization capability – for ESD control.

These items are discussed on the following pages.

## Custom Failsafe PCB

*Inclusion of a new, functionally independent, Failsafe PCB increases product safety.*

We have added a new safety feature to the PTFS: The over-temperature failsafe board (1B-162-1A). This new board eliminates the use of snap-disks thermostats and provides independent monitoring of the temperature regulating system of the PTFS.

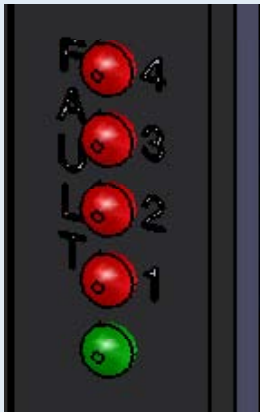
Located inside the thermal test head, the board functions as a fault control mechanism that monitors the status of the heater case and air temperature for all heaters. Its purpose is to prevent over-temperature conditions due to failure of the primary temperature control system and prevent damage to the heater, system components, or the device under test.

Detected faults immediately terminate system operation and display error codes on an LED strip panel, located on the side of the thermal test head.

### How it Works:

The temperature failsafe PCB uses its own thermocouples to monitor the air and case temperatures of the main and purge heaters. Designed to be very quick reacting, the unit halts system operation immediately when a temperature is out of a specified range.

The unit is firmware independent and isolated from the PTFS's software control system, thus it provides



autonomous and redundant temperature monitoring.

Latching LEDs, display the specific subsystem in which the error has occurred and enables diagnosis of error conditions. The board also interfaces with the PTFS's current diagnostic system so that appropriate error messages display on the user interface.

As an additional safety measure, the PTFS will not function if the temperature failsafe module itself becomes non-operational.

## Ionizer Now a Standard Feature

*An air ionization module is now a standard component of the T-2500 series.*

Electrostatic charges, sometimes called triboelectric charges, can form when forcing dry, cold air onto non-conductive surfaces or ungrounded conductive surfaces such as the metal lid on a semiconductor device. Primarily caused by the friction of the air on these surfaces, the charge can be upwards of a thousand volts and can trigger an Electrostatic Discharge Event (ESD) capable of damaging the device under test (DUT).

In the past, Thermonics provided an air ionizer module (T-ION) as an accessory product for the T-2500 series of Precision Temperature Forcing Systems (PTFS). The product was primarily sold to our customers who had a known requirement for ionization. We have now incorporated the module as a standard product feature, enhancing the product lines' ability to help our customers safely test devices.

### How it Works:

The air ionizer uses a corona-based design to provide a balanced flow of positive and negative ions into the thermal air stream, neutralizing the formation of the triboelectric charge. The ionizer also removes any previously existing static charges from the test/device surfaces.

Proprietary, built-in technology ensures the ion balance and eliminates the need for customers to calibrate the ionizer.

The ionizer is capable of reducing an existing charge of  $\pm 1500$  volts to under  $\pm 20$  volts in 10 seconds or less. Testing for compliance was performed with a charge plate monitor in accordance with ionization standard ANSI/ESD STM3.1-2000 of the ESD Association.

*(Continued on next page)*

Notably, the performance specifications of the Thermonics T-2500 series are not impacted by the addition of the T-ION module.

**Note – product exceptions:**

Ionization is not available on units with the basic output hose (T-2500BE) & (T-2500HFB), or high temperature units (T-2500E/300).

## New Air Dryer Design

*Easily-serviced design improves air dryer functionality and quiets system operation.*

Thermonics' redesign of the air dryer improves the functionality of the air dryer unit, reduces the amount of servicing, and due to a clever new modularity, provides for faster and easier servicing of the unit. Additionally, the new design reduces the noise level of the PTFs by quieting the pneumatics during operation of the air dryer.

The following specific changes have been made:

1. Tanks changed from a coaxial design to a single, unitary tank design. Air flow is in one direction within the tank.
2. The number of pneumatic fittings has been reduced. Additionally, the fittings have been replaced by quick disconnect and swivel fittings which provides easier servicing. All compression fittings have been eliminated.
3. The Air Dryer filter assembly has been physically integrated into the air dryer assembly so that the entire system is now a completely self-contained assembly.
4. The air path from the main solenoid assembly to the muffler has been changed so that the noise generated by tank switching is reduced.
5. Changes to the tanking clamping mechanism makes tank removal quick and easy.

**Note:** The new air dryer is now standard for all product families. (With the exception of the T-2800 unit.)

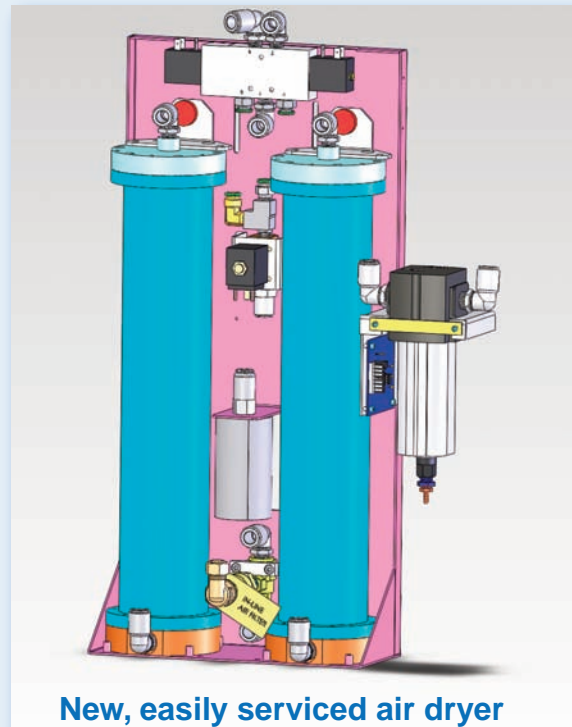
### How it Works:

The air dryer component of the PTFs conditions the customer's compressed air supply to create an appropriate environment for temperature testing electronic components.

The main components of the air dryer are: filters that purify the air, valves for directing air flow, and desiccant-filled tanks for drying the air. Because the desiccant has a high affinity for water, the air that emerges is very dry and thus has a very low dew point (-80C). The end-product is air that is suitable for use in temperature-testing electronic components.

After a period of operation (usually three years) the air dryer system may require servicing due to breakdown or contamination of the desiccant.

The changes we have implemented with this new design, enable the air dryer to be serviced very quickly and easily.



**New, easily serviced air dryer**