



Critical Environment Solutions

Installation and Operating Guide Document No. 1800-95

HEPA-Filtered Cleanroom Oven

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HEPA-Filtered Cleanroom Oven

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Safety Notice

A thorough familiarity with all operating guidelines is essential to safe operation of the product. Failure to observe safety precautions could result in poor performance, damage to the system or other property, or serious bodily injury or death.

The following symbols are intended to call your attention to two levels of hazard involved in operation:

The information presented here is subject to change without notice.



CAUTION

Cautions are used when failure to observe instructions could result in significant damage to equipment.



WARNING

Warnings are used when failure to observe instructions or precautions could result in injury or death.

1.0 Introduction

This manual provides information on installing and operating your Terra Universal High-Capacity HEPA-Filtered Cleanroom Oven.

For more information, please visit <https://www.laboratory-equipment.com/laboratory-equipment/hepa-high-capacity-ovens.php>.



IMPORTANT NOTICE

The HEPA-Filtered Cleanroom Oven must be connected to an external exhaust duct for heat and fume removal. Failure to connect the unit to an exhaust system will result in heat, fumes and/or unfiltered air being released into the immediate surroundings.

Consult with your facility safety officer for applicable regulations.

2.0 Description

The High-Capacity HEPA-Filtered Cleanroom Oven performs economical drying, curing, and baking of high-volume samples at a stable, elevated temperature up to 60°C ($\pm 2^\circ\text{C}$). Air flows down through the ceiling HEPA filters, circulating through the process chamber and back through the heating elements, ensuring temperature uniformity and a clean process environment. The equipped HEPA filters capture particles 0.3 microns or larger at 99.99% efficiency.

The blower motor runs continuously when switched on at the main disconnect panel. Operators should follow "lock-out, tag-out" procedures when performing service or maintenance. The temperature controller activates the heating elements as needed to reach the programmed temperature set-point.



A 6" electric damper is provided on top of the oven for connection to an exhaust system for heat and fume removal. When the door of the oven opens, a switch opens the vent to prevent heated air from continuing to flow into the chamber. The damper takes approximately 5 seconds to fully open. An activated charcoal filter below the damper adsorbs a broad range of organic compounds and solvent fumes.



WARNING

In case of an emergency requiring immediate manual shutdown, close the main disconnect switch to cease all operation.

3.0 Installation



CAUTION

Keep the shipping crate upright to avoid damaging the unit.

3.1 Site Preparation

- A. Make sure that the oven will be placed on a level, stable surface, away from damaging chemicals or flammable/explosive materials.
- B. Ensure the installation location allows the following: a minimum of 12" between the top of the unit and the ceiling and at least 6" between the unit and wall surfaces.
- C. Install a dedicated power source near the installation location in compliance with applicable electrical codes. Refer to your order specifications for electrical requirements.
- D. Prepare the existing exhaust system for connection to the vent on top of the oven.

3.2 Unpacking

Carefully remove the crating from around the oven and visually inspect for damage, both inside and out. Be sure not to throw away any accessory components with the packing material. Any damage should be reported according to the terms in the shipping agreement.

3.3 Installation



WARNING

Do not lift the unit by the doors, handles or any other external component. Use a forklift or other lifting mechanism to handle the unit.

- A. Carefully maneuver the oven over to the installation location. Secure the power cable to avoid damaging it.
- B. Adjust the feet to stabilize the oven.
- C. If the activated charcoal filter ships loose, see **Section 5.2** to install the filter below the electric damper.
- D. Connect the 6" damper to the external exhaust system.



- E. If the door does not latch properly, the door handle may need to be adjusted.
- F. Confirm the main disconnect switch is in the OFF position.
- G. Connect the unit to the power supply.

4.0 Operation



WARNING

Operators are responsible for inspecting the general condition of the unit before each use. Any worn or damaged component should be thoroughly examined and a safety evaluation should be performed before placing the unit back into service.

Follow facility safety guidelines and wear the designated PPE when working in or around the oven.

4.1 Initial Start-Up






- A. Once the unit is powered up, the blower will immediately begin operation. The temperature controller will flash RESET on the display and then proceed to RUN mode.
- B. When the controller is powered up, it displays its firmware version for 3 seconds, after which the controller starts normal operation. The value of **Measured Temperature** in red and **Set Point** in green is displayed.
- C. Press  up or  down to select the **Set Point**.
- D. Press and hold the **P** key for 2 seconds, until the display shows **Atun**.
- E. Press  up or  down to select either **FAST** or **FULL**. Press  to go back to the previous option.
- F. The **FAST** option performs the tuning in the minimum possible time, 10 - 30 minutes while the option **FULL** gives priority to accuracy over speed and may take a few hours.
- G. **TUNE** remains lit during the whole tuning phase. The user must wait for the tuning to be completed before using the controller. During auto tuning, the temperature will oscillate around the programmed set point and controller output will switch on and off many times.
- H. If the tuning does not result in a satisfactory control, refer to the Novus 1040 manual
- I. Once the oven is on, make sure to stand away from the opening when opening the door.



Figure 1. Temperature Controller



4.2 Display

The controller's front panel can be seen in Fig. 02:

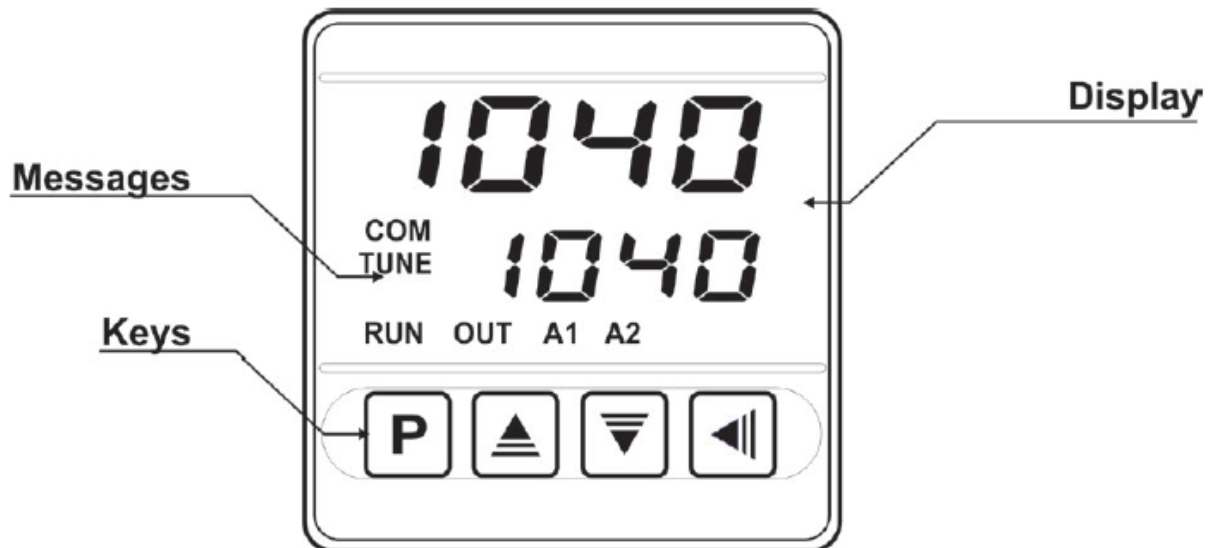


Fig. 02 - Identification of the parts referring to the front panel

Display: Displays the measured variable, symbols of the configuration parameters and their respective values/conditions.



COM Indicator: Flashes to indicate communication activity in the RS485 interface.


TUNE Indicator: Stays ON while the controller is in tuning process.

OUT Indicator: For relay or pulse control output; it reflects the actual state of the output.

A1 and A2 Indicators: Signalize the occurrence of alarm situation.

P Key: Used to walk through the menu parameters.

 **Increment key** and  **Decrement key:** Allow altering the values of the parameters.

 **Back key:** Used to go back to the previous menu.



5.0 Maintenance



WARNING

Shut off the main disconnect switch and follow lock-out, tag-out procedures before performing any maintenance, repairs or service. Always disconnect the power cable from the power supply. Failure to observe these precautions could lead to exposure to high voltage electrical current.



CAUTION

Take care when cleaning to avoid excessive spraying, particularly when using conductive liquids, which can damage the electronic connections and components. Cleaning should be accomplished through controlled application of cleaning agents or pre-dampened wipers.



NOTE

Always check material compatibility before selecting a cleaning agent.

5.1 Cleaning

Stainless steel should be cleaned with alcohol (or similar cleaning agent), used to dampen a non-shedding wiper.

When used in a cleanroom environment, Terra recommends use of knitted polyester wipers or spun-lace, non-woven blends of cellulose and polyester manufactured and packaged specifically for cleanroom use. These products are manufactured under tightly controlled conditions that restrict the use of binders or chemical treatments that can outgas, and cleanroom packaging and strict lot control ensure optimal cleanliness. Less critical environments (ISO 6 – 8 / Class 1000 – 100,000) generally tolerate more absorbent materials made of 100% cotton twill or cellulose.

Clean surfaces with clean, lukewarm water with or without a mild, non-abrasive detergent. In critical cleanroom applications, DI water may be required.

Avoid cleaning with a circular motion, which rubs dirt or grit into the surface. Using mild pressure, wipe in one direction, from top to bottom or side to side, in slightly overlapping strokes. Fold the wiper between strokes, and replace with a clean wiper often.

5.2 Charcoal Filter Replacement

Use appropriate PPE for handling the substances that may have been adsorbed by the charcoal filter.

- A. Remove the nuts around the base of the electric damper.
- B. Slowly lift the damper up to access the charcoal filter. If necessary, disconnect the wiring to the damper switch to more easily lift the filter housing out of the way.
- C. Dispose of the used charcoal filter and insert a new one.
- D. Reinstall the electric damper.

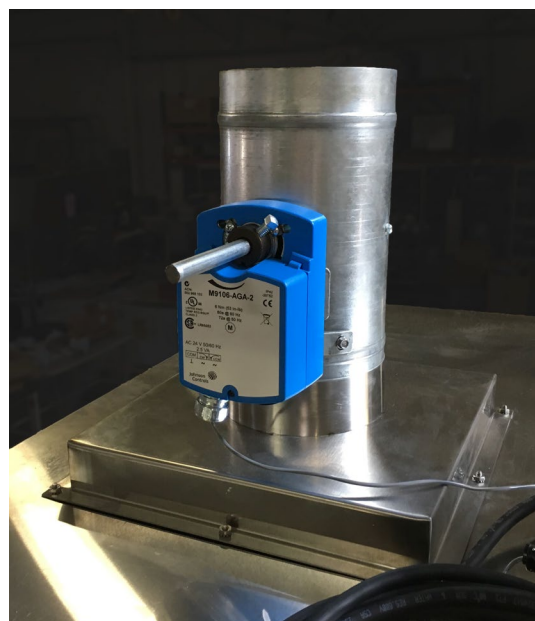


Figure 2. Electric Damper (square filter inside base)



5.3 HEPA Filter Replacement

Replacement intervals depend on frequency of use and particle load in the ambient environment. As the filter loads, fan operation will become noisier and the air speed will diminish. A recommended filter monitoring protocol is to measure the air speed approximately 6" below the filter face using a hand-held anemometer. When the air speed drops below 70 feet/minute, a filter change is recommended.

To replace the HEPA filters:

- A. Remove the screws holding the top panel to the upper housing.
- B. Slowly tilt the panel up on one end, taking care not to disconnect any of the internal wiring. Secure the panel in the lifted position or have an assistant hold it up.
- C. Detach the brackets holding the HEPA filters in place by loosening the two screws. Do not touch the face of the HEPA filter. Only handle the filters by the aluminum frame.
- D. Replace the old HEPA filters with the new ones and reinstall the brackets. Slowly tighten the brackets down until the filter is correctly positioned in the opening and snug against the surface.
- E. Reinstall the top panel.

Speak with Terra customer service to order replacement filters (two required).

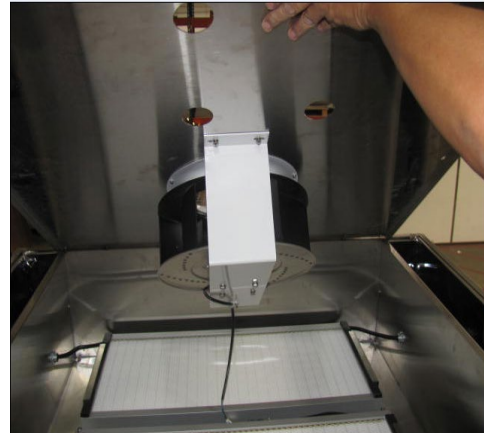


Figure 3. Tilt up the top panel to expose the filters

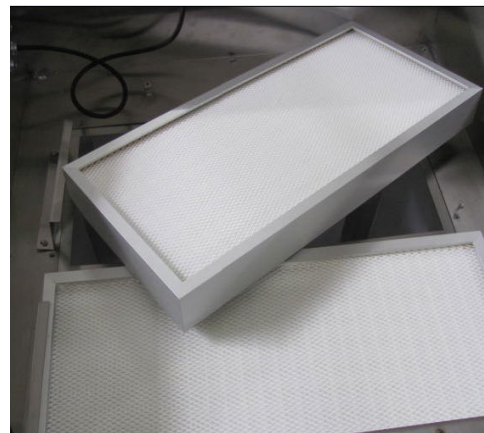


Figure 4. Detach the retaining brackets to remove the old filters and carefully insert the new HEPA filters

5.4 RTD Sensor Replacement

Temperature sensors can be replaced by following the steps above to access the upper housing. Locate the two sensors, disconnect the wire, and loosen the nut that secures the sensor.

5.5 Replacing Door Gaskets

The door gaskets used are extremely durable but can still be damaged. The one-piece gasket is mechanically fastened around the door frame with screws.

Speak with Terra customer service to order a replacement door gasket.



6.0 Warranty

Products Manufactured by Terra: Terra Universal, Inc., warrants products that it manufactures to be free from defects for a period of 12 months for parts and 90 days for labor, commencing from the date of shipment. Terra's sole responsibility is to repair or replace, at its option, any part of the product that proves defective or malfunctioning during this time limit. In some cases, components incorporated in Terra Universal products are covered by additional warranties from component manufacturers; obtain specific information from Terra sales representatives. This warranty is void if the equipment is abused or modified by the customer, is operated outside Terra's operating instructions or specifications, or is used in any application other than that for which it is specified. This warranty does not include routine maintenance or service procedures, breakage of quartz baths after 60 days, shipping damage, nor damage from misuse, intentional or unintentional abuse, neglect, natural disasters, or acts of God.

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Generally, customers can improve the chance of collecting on a freight claim by following these procedures: 1) formally requesting that the carrier inspect the shipment immediately upon suspecting damage or shortage to verify condition; 2) notifying the carrier upon discovery of concealed damage and requesting an inspection within 15 days of receipt, both in person or phone and following up via mail; 3) keeping the shipment as intact as possible, including retaining original packaging materials and keeping the product as close to the original receiving location as possible; 4) holding salvage for disposition by the carrier.

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*Thank you for ordering from
Terra Universal!*