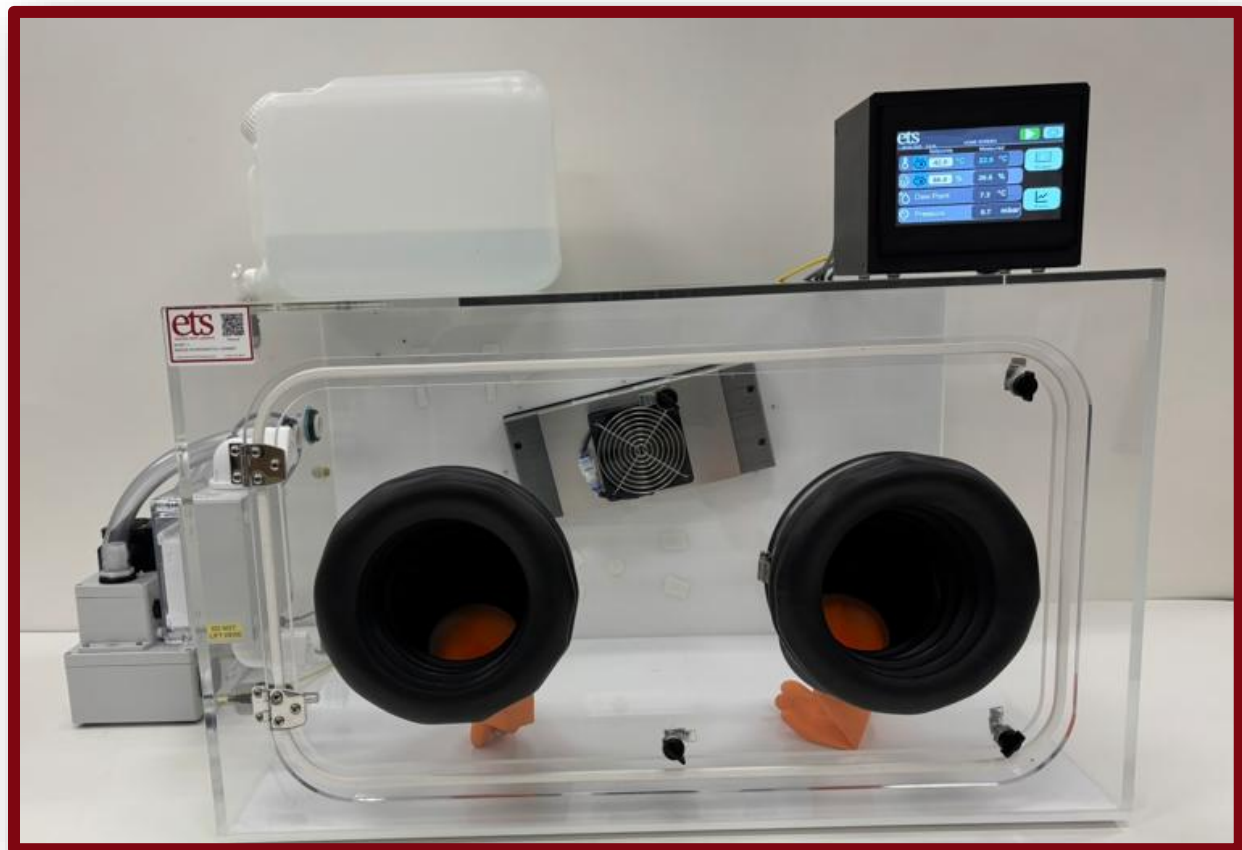




Medium Size Environmental Chamber Model 5507 Operating Manual

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Products described in this manual are designed and assembled in the U.S.A. by
Electro-Tech Systems, Inc.
700 West Park Avenue
Perkasie, PA 18944



I. Important Safety Information



WARNING

This symbol accompanied by the word “WARNING” calls attention to an act or a condition which can lead to serious personal injury or death of operators and bystanders.



CAUTION

This symbol accompanied by the word “CAUTION” indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. The symbol without any warning text indicates potential damage to device when misused.



This symbol indicates the presence of hazardous AC or DC voltages constituting the risk of electric shock.



This symbol indicates a risk of fire due to improper handling or failure of device. For continued protection against risk of fire, when replacing fuses use only fuses of the specified type and current ratings.



This symbol indicates the danger of an electro-static discharge to which equipment may be sensitive. Observe all precautions for handling electrostatic sensitive devices.



These symbols indicate extreme temperature which can cause burns or frostbite. Avoid contact with surface. Failure to follow precautions may result in moderate to severe injury.

SAFETY INSTRUCTIONS

	WARNING Read and fully understand operator's manual before using this machine. Failure to follow operating instructions could result in death or serious injury.	
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The equipment described in this manual is designed and manufactured to operate within defined design limits. Any misuse may result in electric shock or fire. To prevent the equipment from being damaged, the following rules should be observed for installation, use and maintenance. **Read the following safety instructions before operating the instrument.**

POWER



POWER CORD: Use only the power cord specified for this equipment and certified for the country of use. If the power (mains) plug is replaced, follow the wiring connections specified for the country of use. When installing or removing the power plug, **hold the plug, not the cord.**



GROUNDING: The power cord provided is equipped with a **3-prong grounded plug (a plug with a third grounding pin)**. This is both a safety feature to avoid electrical shock and a requirement for correct equipment operation. If the outlet to be used does not accommodate the 3-prong plug, either change the outlet or use a grounding adapter.



FUSES: Replace fuses only with those having the required current rating, voltage, and specified type such as normal blow, time delay, etc. **DO NOT** use makeshift fuses or short the fuse holder. This could cause a shock or fire hazard or severely damage the instrument.

OPERATION

CAUTION



DO NOT OPERATE WITH COVERS OR PANELS REMOVED. Voltages inside the equipment consist of line (mains) that can be anywhere from 100-240VAC.



DO NOT OPERATE WITH SUSPECTED EQUIPMENT FAILURES. If any odor or smoke becomes apparent turn off the equipment and unplug it immediately. Failure to do so may result in electrical shock, fire, or permanent damage to the equipment. Contact the factory for further instructions.



DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE. Operating the equipment in the presence of flammable gases or fumes **constitutes a definite safety hazard**. For equipment designed to operate in such environments the proper safety devices must be used such as dry air or inert gas purge, intrinsic safe barriers and/or explosion-proof enclosures.



DO NOT IMPEDE THE CHAMBER FROM VENTING EXCESS PRESSURE. Available dehumidification systems include open loop systems that pump external air into the chamber. If the chamber is not allowed to vent, pressure can build up and cause serious damage to the chamber.



USE DISTILLED OR DEIONIZED WATER SOURCE FOR HUMIDIFICATION. Build-up of contaminants on the transducer will cause stress to the transducer and electronics and resulting in premature failure and invalidate the warranty.



DO NOT USE IN ANY MANNER NOT SPECIFIED OR APPROVED BY THE MANUFACTURER. Unapproved use may result in damage to the equipment or present an electrical shock or fire hazard.

I. Informations Importantes d'inocuite



Ce symbole accompagné du mot « AVERTISSEMENT » (WARNING) attire l'attention sur un acte ou une condition qui peut entraîner des blessures graves ou la mort des opérateurs et des passants.



Ce symbole accompagné du mot « ATTENTION » (CAUTION) indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, pourra entraîner des blessures mineures ou modérées. Le symbole sans texte d'avertissement indique des dommages potentiels à l'appareil en cas d'utilisation abusive.



Ce symbole indique la présence d'une climatisation dangereuse ou d'un courant continu constituant le risque de choc électrique.



Ce symbole indique un risque d'incendie dû à une mauvaise manipulation ou à une défaillance de l'appareil. Pour une protection continue contre les risques d'incendie, lors du remplacement des fusibles, utilisez uniquement des fusibles du type et des valeurs nominales spécifiés.



Ce symbole indique le danger d'une décharge électrostatique à laquelle l'équipement peut être sensible. Observez toutes les précautions à prendre pour manipuler les appareils sensibles à l'électricité statique.



Ces symboles indiquent une température extrême qui peut causer des brûlures ou des engelures. Éviter le contact avec la surface. Le non-respect des précautions peut entraîner des blessures modérées à graves.

CONSIGNES DE SÉCURITÉ



ATTENTION

Lisez et comprenez bien le manuel de l'utilisateur avant d'utiliser cette machine. Le non-respect des instructions d'utilisation peut entraîner la mort ou des blessures graves



L'équipement décrit dans ce manuel est conçu et fabriqué pour fonctionner dans les limites de conception définies. Toute mauvaise utilisation peut entraîner un choc électrique ou un incendie. Pour éviter que l'équipement ne soit endommagé, les règles suivantes doivent être respectées pour l'installation, l'utilisation et l'entretien. Lisez les consignes de sécurité suivantes avant d'utiliser l'instrument.

POUVOIR



CORDON D'ALIMENTATION : Utilisez uniquement le cordon d'alimentation spécifié pour cet équipement et certifié pour le pays d'utilisation. Si la fiche d'alimentation (secteur) est remplacée, suivez les connexions de câblage spécifiées pour le pays d'utilisation. Lors de l'installation ou du retrait de la fiche d'alimentation, **tenez la fiche, pas le fil.**



MISE À LA TERRE : Le cordon d'alimentation fourni est équipé d'une **fiche à 3 broches avec mise à la terre (une fiche avec une troisième broche de mise à la terre)**. Il s'agit à la fois d'une fonction de sécurité pour éviter les chocs électriques et d'une exigence pour le bon fonctionnement de l'équipement. Si la prise à utiliser n'est pas compatible avec la fiche à 3 broches, changez la prise ou utilisez un adaptateur de mise à la terre.



FUSIBLES : Remplacez les fusibles uniquement par des fusibles ayant le courant nominal, la tension et le type spécifié tels que fusion normale, temporisation, etc. **N'UTILISEZ PAS** de fusibles de fortune ou ne court-circuitez pas le porte-fusible. Cela pourrait entraîner un risque d'électrocution ou d'incendie ou endommager gravement l'instrument..

OPÉRATION

PRUDENCE



NE PAS UTILISER AVEC LES COUVERCLES OU LES PANNEAUX RETIRÉS. Les tensions à l'intérieur de l'équipement consistent en une ligne (secteur) pouvant aller de 100 à 240 VAC.



NE PAS UTILISER AVEC DES PANNES D'ÉQUIPEMENT SUSPECTES. Si une odeur ou de la fumée se dégage, éteignez l'équipement et débranchez-le immédiatement. Le non-respect de cette consigne peut entraîner un choc électrique, un incendie ou des dommages permanents à l'équipement. Contactez l'usine pour plus d'instructions.



NE PAS UTILISER DANS UNE ATMOSPHÈRE EXPLOSIVE. L'utilisation de l'équipement en présence de gaz ou de fumées inflammables constitue un **danger certain pour la sécurité**. Pour les équipements conçus pour fonctionner dans de tels environnements, des dispositifs de sécurité appropriés doivent être utilisés, tels que la purge d'air sec ou de gaz inerte, les barrières de sécurité intrinsèque et/ou les enceintes antidéflagrantes..



NE PAS EMPÊCHER LA CHAMBRE D'ÉVACUER L'EXCÈS DE PRESSION. Les systèmes de déshumidification disponibles comprennent des systèmes en boucle ouverte qui pompent l'air extérieur dans la chambre. Si la chambre n'est pas autorisée à s'aérer, la pression peut s'accumuler et causer de graves dommages à la chambre.



UTILISEZ UNE SOURCE D'EAU DISTILLÉE OU DÉSIONISÉE POUR L'HUMIDIFICATION. L'accumulation de contaminants sur le transducteur causera des contraintes au transducteur et à l'électronique et entraînera une défaillance prématurée et invalidera la garantie.



NE PAS UTILISER D'UNE MANIÈRE NON SPÉCIFIÉE OU APPROUVÉE PAR LE FABRICANT. Une utilisation non approuvée peut endommager l'équipement ou présenter un risque d'électrocution ou d'incendie. Description of Contents

II. Description of Contents



Item	Description
Environmental Chamber	The Model 5507 is an acrylic (Plexiglas) chamber with dimensions of 34" W x 21.5" D x 20" H. The chamber features a 28" x 14" door opening and non-setting gasket. It is constructed of both clear and white acrylic for enhanced visibility and contrast. The chamber can be purchased with or without front glove ports.

Operating Systems that may be included with your system

(Visit www.electrotechsystems.com for additional options)



M 5300-Series EnvrioPro PLC and Sensor

The M 5300-Series Touchscreen Humidity and Temperature Controller: A controller with a touchscreen HMI that can regulate the temperature and humidity when connected to the proper systems to create and hold environmental conditions. systems to reach desired conditions.



M 5482-24 Ultrasonic Humidifier

The M 5482-24 ultrasonic humidifier is a separate unit which sits outside the chamber. The humidifier accepts distilled or deionized water from a water line or tank and generates humidity on demand to humidify up to 95% RH*. A water tank and tubing are included for use in either open-loop or closed-loop configurations.



M 5477-250 Thermoelectric Heater & Cooler

The M 5477-250 Thermoelectric Heating and Cooling system provides a complete temperature solution. Utilizing Peltier elements and air-to-air conditioning, the thermoelectric can maintain temperatures from 10°C to 50°C at ambient conditions*. A universal voltage power supply and thermal channel controller are included.

*Temperature and Humidity range is valid for the M 5507 chamber with an ambient temperature of 22°C $\pm$ 3°C and relative humidity of 25% to 70% RH. Lower humidities down to 2-5% RH can be achieved with increased temperatures and/or extended conditioning times.



M 5461-24 Molecular Sieve Dehumidifier

The M 5461-24 Desiccant Dehumidification System is a separate unit which sits outside of the chamber. It utilizes renewable indicating desiccant in a closed-loop configuration to dehumidify to as low as 5% RH.



M 5465-24 Dry Gas Dehumidification System

The M 5465-24 Dry Gas Dehumidification system is a separate unit which attaches to the chamber. It requires a customer supply of dry gas (e.g. nitrogen gas) to dehumidify to as low as 5% RH. The Model 5465-24 operates in an open-loop configuration. Tubing is included.



M 5478-24 Regenerative Dehumidification System

The M 5478-24 Self-Regenerating Dehumidifier is a separate unit which sits outside of the chamber. It utilizes a dual-column desiccant recharging mechanism to dehumidify as low 5% RH without need for maintenance. Operates in an open-loop configuration and requires 50-100 psi house air. Tubing is included.



Gloves

A pair of rubber gloves for installation in the chamber 8" glove ports.

III. Setup Guide

TOOLS NEEDED:   

Part 1: Chamber Unpacking and Initial Setup



Step 1-1

 **Note:** DO NOT use any of the chamber fittings or the glove ports as a grip or for leverage. Lift the chamber by gripping around the outside of the chamber.

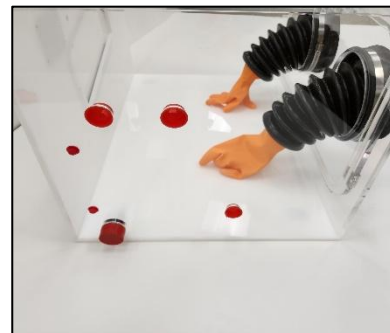
Unpack the Main Chamber Unit and inspect for visible damage. If no damage is observed, then proceed to the next step.



Step 1-2

Place the chamber on a clean, level bench area. If ordered with gloves, verify gloves are secured firmly to the chamber ports.

 If the unit was ordered with a heating/cooling unit installed, it is recommended to allow for at least 6 inches of open space behind the chamber. Insufficient ventilation will impact heating and cooling performance.



Step 1-3

Unpack the accessories and applicable operating systems shipped with the chamber.

Operating System connections are located on the left side of the chamber. Place operating systems near the connections.



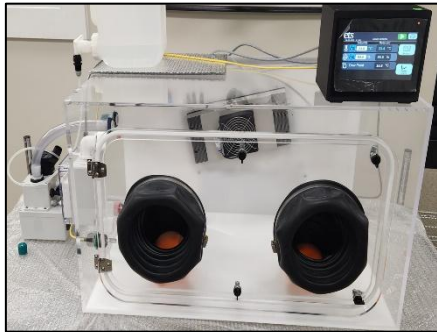
Step 1-4

Refer to above image and table for color-coded operating system input locations and descriptions. Color codes are also listed alongside compatible operating systems in Section II. Description of Contents. Your chamber will only feature relevant color indicators for purchased operating systems.

	Sensor Input
	Humidifier Output
	Humidifier Return
	Dehumidifier Output
	Removeable Hole Plug

Part 2: Operating System Setup

Part 2a. Controller: M 5300-24 EnviroPro PLC and Sensor



Step 2a-1

Place the controller in an accessible, convenient location. Ensure all front panel switches are in the off position (0).



Step 2a-2

On the rear of the ENVIROPRO PLC, ensure the “POWER” switch is in the off position (0).

Plug the Sensor cable into the “SENSOR” connector.



Note: Plugging in the sensor while the controller is powered on may result in damage to the sensor.



Step 2a-3

Ensure the sensor and its cable are firmly connected.

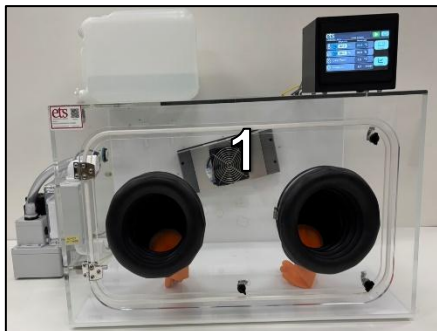
Locate the sensor cord grip fitting on the left chamber wall. It features the **GREEN** color-indicator ring.

Loosen the fitting from the inside of the chamber and insert the sensor from the outside.



Tighten the fitting from the inside to secure the sensor in place. Tighten by hand only, DO NOT use tools.

Part 2b. Heating & Cooling: M 5477-250 Thermoelectric Heating/Cooling System



Step 2b-1

The Model 5477-250 Thermoelectric Heating and Cooling system will be mounted to the chamber if ordered.

The system consists of two components – the Thermoelectric (1) and Power Supply NEMA 1 enclosure. (2). These will be mounted on the rear of the chamber.



Step 2b-2

On the rear of the chamber, perform a quick visual check for any disconnected wires.



Step 2b-3

Connect the 7-pin cable to the power socket marked “POWER” on back of controller then connect the 7-pin socket to the power supply NEMA 1 enclosure.

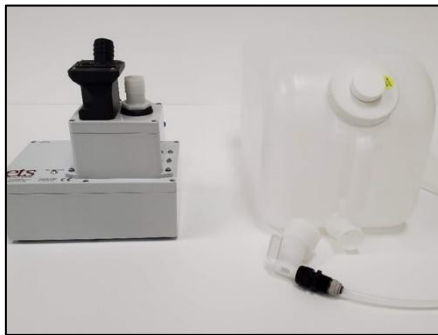


Step 2b-4

Locate the power supply NEMA 1 enclosure and plug the AC power cable from the Power Supply NEMA 1 enclosure into a standard wall outlet.

Note: The thermoelectric fans act as circulation fans for the system and will turn on when needed during use. The system will only heat and cool upon demand if not the system will switch off until needed.

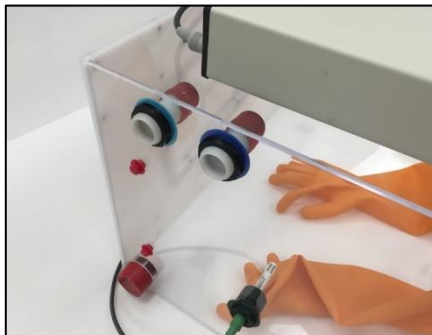
Part 2c. Humidification: M 5482 Ultrasonic Humidifier



Step 2c-1

If ordered, the M 5482 Ultrasonic Humidification System is supplied as a standalone unit.

The system consists of a humidifier unit, a 5-gallon water tank, a 10 ft length of 1/4" OD semi-flexible polyethylene tubing, and two 1-1/2 ft lengths of 1" ID flexible PVC tubing.

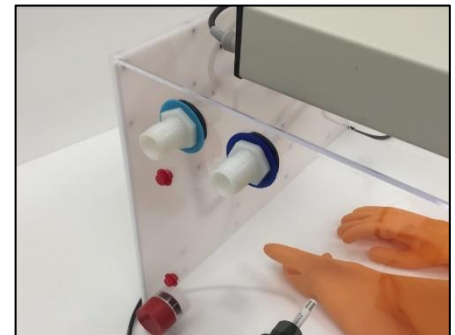


Step 2c-2

Locate the two barb fittings on the top-left of the left chamber wall. The barbs are inverted to protect during shipping and must be reversed.

Unscrew the two locknuts and swap the direction of the fittings so that the barbs face outward.

Tighten the set of barbs and locknuts by hand until secured.

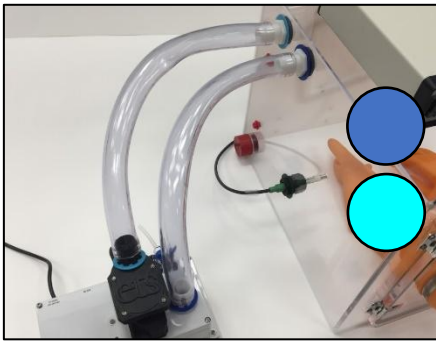


Step 2c-3

Ensure the **Light Blue/Cyan** color-indicator ring is on the barb closer to the rear of the chamber.

Ensure the **Blue** color-indicator ring is on the barb closer to the front door of the chamber.

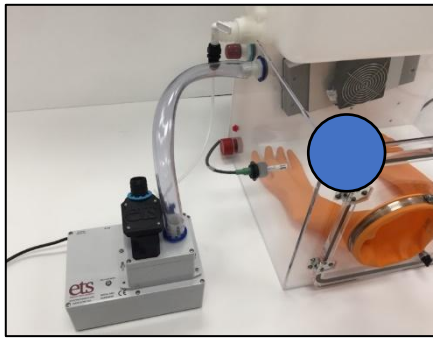
Remove the rubber caps from the chamber barbs and set aside.



Step 2c-4

Closed-Loop Humidifier Setup:

- **Humidifier Connection:** Attach the tube with the **blue** indicator to the humidifier's humidity output barb. Attach the other tube with the **cyan** indicator to the humidifier's air inlet barb.
- **Chamber Connection:** Connect the other ends of the tubing to the corresponding input and return bars on the chamber, matching the colors from the humidifier



Step 2c-5

Open-Loop Humidifier Setup:

- **Humidifier Connection**
Attach one 1.5-foot section of 1" ID tubing to the **blue** color-coded humidity output barb. Leave the **cyan** color-coded air inlet barb uncapped to draw in external air.
- **Chamber Connection**
Connect the other end of the tubing to the corresponding **blue** color-coded hose barb on the chamber. Place a rubber cap over the remaining **cyan** hose barb on the chamber.



Step 2c-6

Remove the top cap of the water tank to reveal the spigot attachment. Unscrew the spigot to separate the attachment from the cap.



Step 2c-7

 Hand-tighten the spigot attachment onto water tank. **DO NOT** use any tools, over-tightening the cap will damage the gasket and cause water leakage.

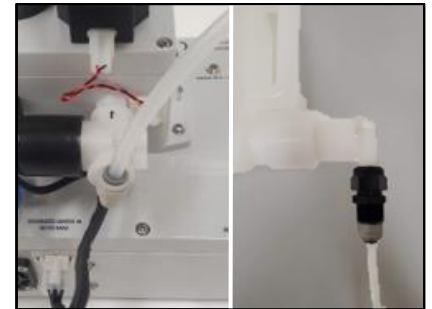
Ensure the water tank tap lever is pointed right in the "OFF" position, as depicted.



Step 2c-8

Fill the tank to intended level, up to five gallons, with de-ionized or distilled water only. Hand-tighten the top cap back onto the tank.

 *Note: Use of tap water will cause build-up of contaminants and cause stress to the mist-generating elements, which may result in premature failure*



Step 2c-9

Place water tank at a height above the humidifier.

Insert 1/4" OD semi-rigid tubing firmly into the "DEIONIZED WATER IN" port on the humidifier.

Cut the tubing to length and insert the other end into the water tank spigot fitting.

Test the connections by gently tugging on the tubing.

 Optionally, utilize a water line in place of the water tank. Water line pressure cannot exceed 50 psi.



Step 2c-10

Ensure the drain valve on the humidifier unit is set to the "OFF" position with the tap lever turned 90° from the drain valve.



Ensure humidifier is placed on a level surface with no more than 5° tilt.



Step 2c-11

Ensure water supply tube is fully inserted on both ends.

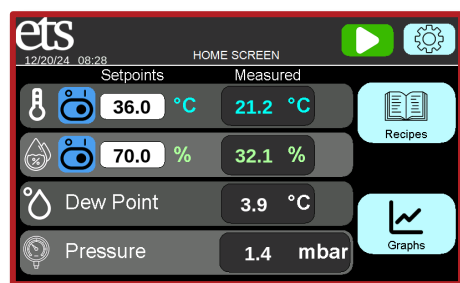
Loosen the small white cap on the water tank top cap to allow water to flow freely.

Switch the water tank tap lever to the "ON" position (to the left) for water to begin flowing.



Step 2c-12

Utilizing an included 4-pin cable, plug the 4-pin cable into the "HUMIDIFY" socket on the rear of the controller and connector on the humidifier.



Step 2c-13

Input the RH% Setpoint. Tap the white entry fields to enter the desired setpoints for the systems you have installed.



Step 2c-14

The humidifier LED turns red while filling with water. This process should take about a minute.



Step 2c-15

When the water is full, the LED will turn green to indicate the system has enough water to operate.

Mist will begin to be produced and will ooze out of the white barb on the top of the unit.

Part 2d. Dehumidification Systems

Multiple dehumidification operating systems are available for purchase, depending on preference and available lab amenities. Options include the M 5461-24 Desiccant System, the M 5465-24 Dry Nitrogen Valve, and the M 5478-24 Regenerating Desiccant System. Information on each of these systems can be found at www.electrotechsystems.com/product-category/environmental-control/operating-systems/. Refer to the following setup steps for only relevant dehumidification systems.

The M 5461-24 Dehumidification system is closed-loop and desiccant-based. It is fan based, operates by pulling air from the chamber through an PC reducing elbow before it returns to the chamber. This system is self-contained and requires no external resources to operate. It comes with 800cc of renewable desiccant.

The M 5465-24 Dry Gas System is an open-loop system. It operates by injecting dry gas into the chamber to displace any moist air. It requires a separate, customer-supplied nitrogen source (or other dry gas). The M 5465-24 requires an included pressure sensor which monitors the internal pressure of the chamber and cuts power to the dry gas valve in the event of pressure buildup.

The M 5478-24 Self-Regenerating Dehumidification System is an open-loop system. It is a fully contained system that uses desiccant to dry the chamber without need for maintenance or recharging. It requires a separate, customer-supplied 90 psi house air. The M 5478-24 requires an included pressure sensor which monitors the internal pressure of the chamber and cuts power to the system in the event of pressure buildup.

Dehumidification: M 5461-24 Molecular Sieve Desiccant System



Step 2d-1 (M 5461-24)

If ordered, the M 5461-24 Molecular Sieve Dehumidifier is supplied as a standalone unit.

The desiccant dehumidification system consists of a built-in fitting, locking nut design, desiccant basket, and filter. Filled with 800cc of rechargeable indicating desiccant, with a 4-pin cable, and caps to cover inlet and outlet

Additional rechargeable indicating desiccant refills can be purchased separately.



Step 2d-2 (M 5461-24)

The M 5461-24 system will have been installed on the inside of the chamber for shipping purposes.

The desiccant box will need to be removed and reinstalled on the outside of the chamber.

Remove the two large, triangular lock nuts on the outside of the chamber using the provided tool. The desiccant box can then be removed from the inside of the chamber and reinstalled on the outside.



Step 2d-3 (M 5461-24)

Firmly grasp the desiccant system by the Top and Bottom elbows and remove the system from the inside of the chamber wall.



Step 2d-4 (M 5461-24)



Step 2d-5 (M 5461-24)



Step 2d-6 (M 5461-24)

Maintaining the same orientation of the desiccant box (connector and fan should be on the top side), reinsert the desiccant fittings through the two holes from the outside the chamber.

Reinstall the locking nuts using the provided tool. Note that there is a top and bottom locking nut. The locking nuts are marked.

Reinstall each locking nut by lining up the dot/ arrow on the locking nut to be oriented at approximately 9 o'clock and then install by turning clockwise.

Firmly hand tighten such that the dot/arrow are oriented to be at 12 o'clock.

Reinstall the locking nuts. Note that there is a top and bottom locking nut. The locking nuts are marked.

Reinstall each locking nut by lining up the dot/ arrow on the locking nut to be oriented at approximately 9 o'clock and then install by turning clockwise using the provided tool.

Firmly hand tighten such that the dot/arrow are oriented to be at 12 o'clock.

Install Power / Signal Cable Assembly to the dehumidification system.

Plug the 4 Pin Connector into the 4 Pin Receptacle on the top of the dehumidification system.

Dehumidification: M 5465-24 Dry Gas System



Step 2d-7 (M 5465-24)

If ordered, the M 5465-24 Dry Nitrogen Gas System is supplied as a standalone unit.

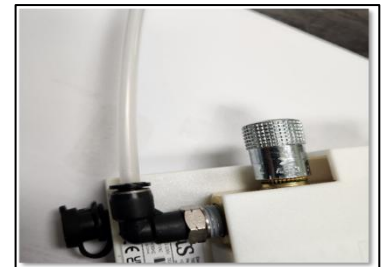
The system consists of a gas valve with flow control, and pressure sensor mounted to the chamber, 16 inches of flexible PVC tubing, and a 10 ft length of 1/4" OD semi-rigid polyethylene tubing.



Step 2d-8 (M 5465-24)

Install 1/4" Tubing to Air Output
Firmly insert one end of the pre-cut 16-inch 1/4" Polyethylene Tubing into the Fitting with the Yellow color-coded ring AIR OUTPUT.

Run the tube from the M 5465-24 to the 1/4" Fitting with the matching Yellow color-coded on the Chamber.

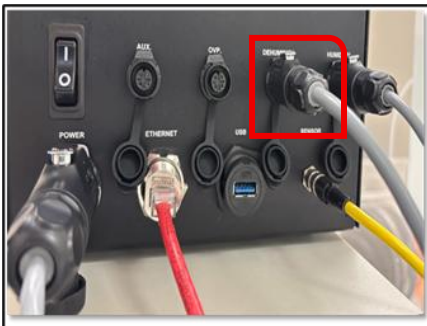


Step 2d-9 (M 5465-24)

Install 1/4" Tubing to Air Input
Run 1/4" Polyethylene Tubing from a nearby Compressed Air or Dry Gas Source to the M 5465-24. Firmly insert the 1/4" Polyethylene Tubing into the other Elbow Fitting on the M 5465-24 AIR INPUT.

WARNING:

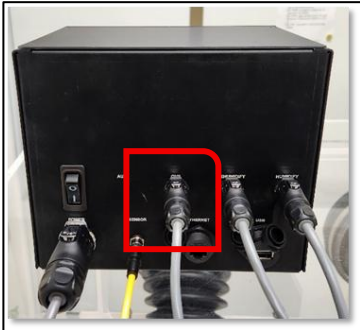
The Air Pressure from the Compressed Air Source must be in the range of 50 – 100 psi for safe & effective operation.



Step 2d-10 (M 5465-24)

Install Power / Signal Cable Assembly to M 5465-24

Plug the 4 Pin Connector into the 4 Pin Receptable on the side of the dehumidification system.



Step 2d-11 (M 5465)

Install Power / Signal Cable Assembly to M 5465-24

Plug the 4 Pin Connector into the 4 Pin Receptable labeled DEHUMIDIFY on the PLC and connect to the sole connector on the M 5465-24.

Step 2d-12 (90001848)

Plug the 4 Pin Connector into the 4 Pin Receptable on the side of the Pressure Sensor.

Step 2d-13 (M 5465)

Install Power / Signal Cable Assembly to 90001848

Plug the 4 Pin Connector into the 4 Pin Receptable labeled SENSOR on the PLC and connect to the sole connector on the 90001848.

Dehumidification: M 5478-24 Self-Regenerating Desiccant System



Step 2d-14 (M 5478-24)

If ordered, the M 5478-24 Self-Regenerating Desiccant System is supplied as a standalone unit, consisting of the main unit with flow control, an over-pressure module mounted to the chamber, and a 10 ft length of semi-rigid tubing.



Step 2d-15 (M 5478-24)

Firmly insert one end of the 1/4" Polyethylene Tubing into the Fitting with the Yellow color-coded ring, labeled AIR OUTPUT.

Cut tubing to the length required to run the tube from the M 5478-24 to the 1/4" Fitting with the matching Yellow color-coded on the Chamber.

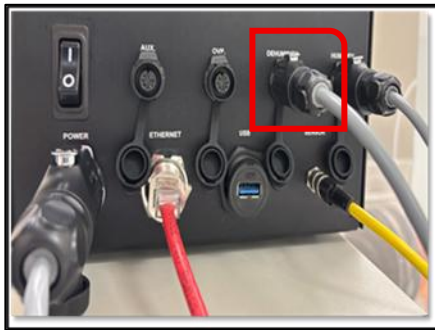
If this fitting is not installed yet, use the 1/4" Tubing to 1/4" MNPT Adapter supplied with the M 5478-24.



Step 2d-16 (M 5478-24)

Install Power / Signal Cable Assembly to M 5478-24

Plug the 4 Pin Connector into the 4 Pin Receptable on the side of the dehumidification system.



Step 2d-17 (M 5478-24)

Install Power / Signal Cable Assembly to M 5478-24

Plug the 4 Pin Connector into the 4 Pin Receptable labeled DEHUMIDIFY on the PLC and connect to the sole connector on the M 5478-24.

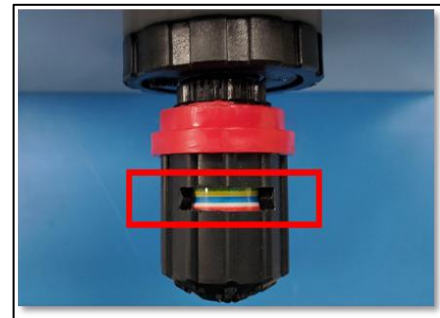


Step 2d-18 (M 5478-24)

With the remaining length of semi-rigid tubing, firmly insert the tubing into the "Air Input" fitting on the top of the M 5478-24.



Cut to length and connect the other end to a 50-100 psi compressed air supply. Do not exceed pressure rating.

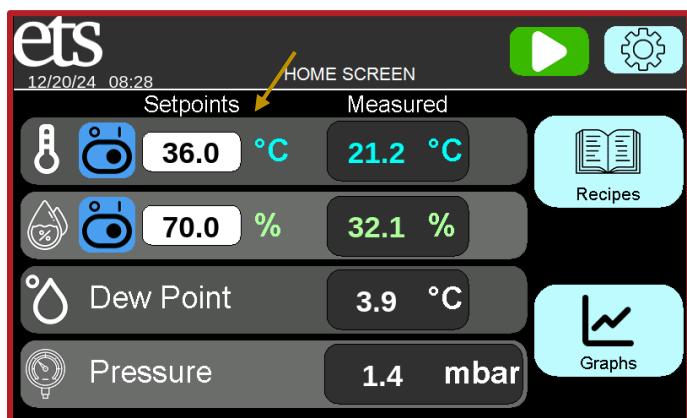


Step 2d-19 (M 5478-24)

Flow regulator on M 5478-24 is factory set for 90psi 120 SCFH flow.

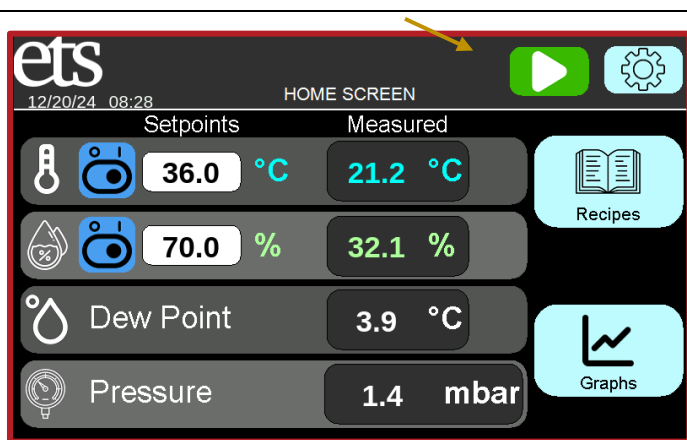
IV. Quick Start Guide

Quick Start Guide



Step 1 – Input the Setpoints

Tap the white entry fields to enter the desired setpoints for the systems you have installed.



Step 2 – Start the System

Tap the green “play” button on the upper right side to start the system. The button will turn into an orange “stop” button which can be used to stop the system. The various operating systems (e.g., heating, cooling, humidification, and/or dehumidification) should turn on within 10 seconds.

The controller will begin regulating the environment inside the chamber to achieve the desired setpoint.

V. Functionality

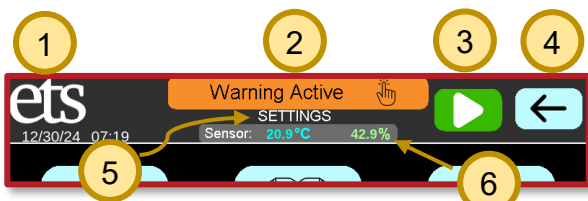
Depending on the systems installed, the [M 5300 EnviroPro Series](#) can regulate an environment to achieve and maintain the desired temperature and/or humidity.

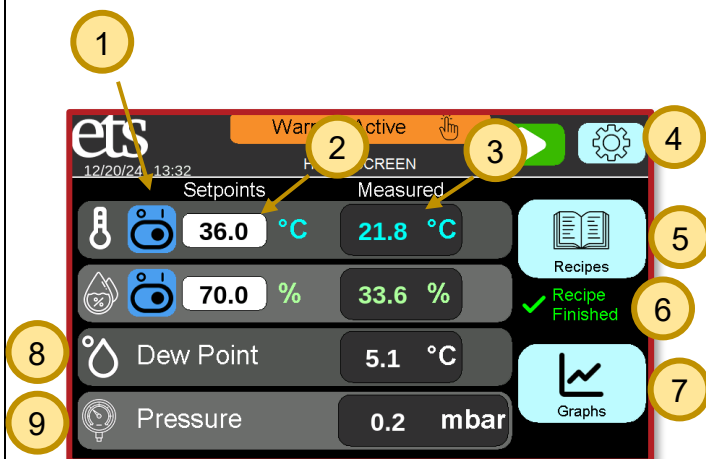
The controller can do the following:

- Graphically display environmental data
- Save and execute up to ten recipes that the user can create and edit
- Prevent equipment damage using built-in safety measures
- Display in English, French or Chinese
- Run a self-diagnostic test if the controller is not performing properly
- Log data which can later be exported to a USB drive
- Be remote controlled through a network via Virtual Network Computing
- Receive updated software through its USB connection
- Act as a Modbus TCP Server via its Ethernet port

Screen Overview

The EnviroPro PLC displays many different screens depending on user input and the state of the system. Below is a list of all the screens with explanations of their features:

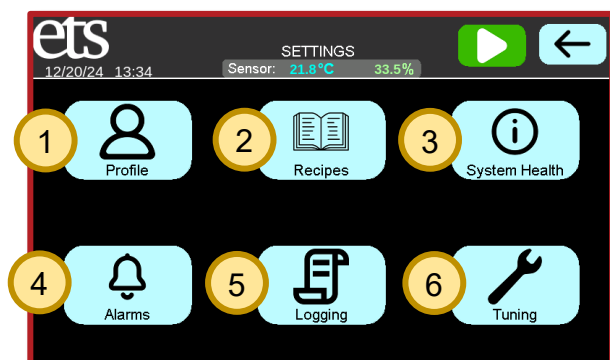
Picture of Screen	Screen Details
	Top Bar – Visible on Most Screens 1. <u>ETS Logo</u>: Navigates back to the Home screen when tapped. 2. <u>Alarm/Warning Banner</u>: Navigates to the Alarms/Warnings screen when tapped. • <i>The banner only appears when an alarm or a warning is raised.</i> 3. <u>Start/Stop Button</u>: Starts or stops controlling the chamber environment. 4. <u>Back Button</u>: Navigates to the previous screen. • <i>On the Home screen, this button instead takes you to the Settings screen.</i> 5. <u>Screen Name</u>: Displays the name of the current screen. 6. <u>Sensor Readings</u>: Displays the current readings from the environmental sensor



Home Screen

The screen allows the user to easily interact with the basic functionality of the controller. Depending on what systems the user has installed, the home screen may look slightly different.

1. System Enable Switches: Allows the user to temporarily enable/disable systems.
2. Setpoints: Tap these fields to change the setpoints.
3. Measurements: These are the current measurements as reported by the sensor(s).
4. Settings Button: This button will navigate to the Settings screen.
5. Recipes Button: This button will navigate to the Recipe Select screen.
6. Recipe Status Indicator: Displays the status of the current recipe.
7. Graphs Button: This button will navigate to the Graphs screen.
8. Dew Point: Displays the calculated dew point based on the current temperature and humidity.
9. Pressure Reading: If the pressure sensor is installed, its reading will be displayed here.



Settings Screen

This screen allows the user to navigate to the various submenus for adjusting the settings of the controller.

1. Profile: If the user is not logged in, this navigates to the login screen. If the user is logged in, this navigates to the Profile screen.
2. Recipes: Navigates to the Recipe Select screen.
3. System Health: Navigates to the System Health screen.
4. Alarms: Navigates to the Alarms screen.
5. Logging: Navigates to the Data Logging screen.
6. Tuning: Navigates to the Tuning Selection screen.
 - *The Tuning button only appears if the user is logged in.*

For additional details on utilizing the controller, visit the [M 5300 EnviroPro Series](https://www.electrotechsystems.com) product page on www.electrotechsystems.com or scan the QR code found on the controller's product label.

VI. Specifications

M 5507 Chamber

Mechanical	
Material	Clear and White Acrylic
Internal Volume	~7.726 cu. Ft. (218.7L)
Internal Dimensions	33.29" W x 20.79" D x 19.29"H (84.5cm x 52.8cm x 48.9cm)
External Dimensions	34" W x 21.5" D x 20"H (86.3cm x 54.6cm x 50.8cm)
Weight	82 lbs. (21.7 kg) w/ Full Systems NEMA 1/Thermoelectric, 58 lbs. (25.5 kg) for base chamber

Access	
Front Opening	28" W x 14" H (71.1cm x 35.5cm)
Front Door	1/2" (6mm) clear acrylic
Door Latches	3/4-Turn latches
Door Gasket	1/4" non-setting silicone
Glove Ports (optional)	Pair of 8" (20cm) ports
Gloves, pair (optional)	0.018" (0.5mm) latex, size 10
Cable Pass-Through	1-1/2" diameter

Connections (if included)	
1/4" Push-to-connect fitting, 1/4 NPT	Qty. 2
0.2" to 0.49" OD Compression Fitting, 3/4 NPT	Qty. 1
1" ID Hose Barb, 1 NPT	Qty. 2
3/32" ID Hose Barb, 1/8 NPT	Qty. 1
1 x 1-1/2" Cable Passthrough Grommet, TPU	Qty. 1

Temperature Heat / Cool (if included)	
Thermoelectric System	Model 5477-250
Temperature Max.	55°C
Temperature Min.	10°C
Temp. ramp 22°C to 10°C typ.	< 60 minutes
Temp. ramp 22°C to 50°C typ.	< 60 minutes

Humidification (if included)	
Ultrasonic Humidifier	M 5482-24
RH% Max	100%
RH% ramp 50% to 90% typ.	< 10 minutes

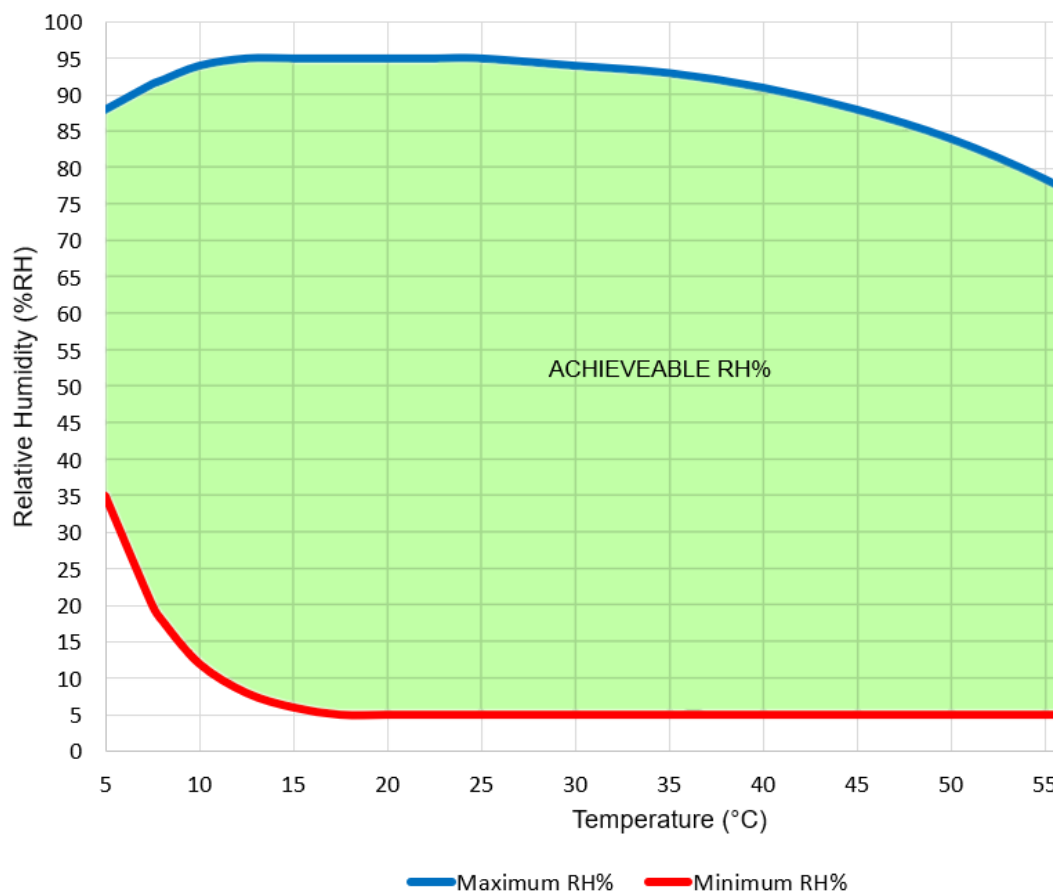
Dehumidification (if included)	
Molecular Sieve Desiccant	M 5461-24
Dry Gas Valve	M 5465-24
Regenerating Desiccant	M 5478-24
RH% Min.	5% (10% with M 5461)
RH% ramp 50% to 10% typ.	< 60 minutes

Control (if included)	
Model 5300-24	EnviroPro PLC
Display	152mm x 91mm
Display Resolution	800 x 480
Sensor	HMP110 Series
Sensor Accuracy, RH%	At 0... +40°C ±1.5% RH (0-90% RH) ±2.5% RH (90-100% RH)
	At -40... 0°C ±3.0% RH (0-90% RH) ±4.0% RH (90-100% RH)
Sensor Accuracy, Temp.	At +15... +25 °C 1. ±0.1 °C
	At 0... +15 °C and +25... 40°C 2. ±0.15 °C
	At -40... 0 °C and +40...+80°C 3. ±0.4 °C

Power (for full operating system options)	
Voltage	
	115 VAC @ 8 Amps, or 230 VAC @ 4 Amps, 50 / 60Hz, Single Phase

Chamber temperature performance of 10°C to 50°C and humidity performance of 5% to 95% RH assumes ambient conditions of 22°C and 30% to 60% RH.

The entire humidity range cannot be obtained at all temperatures due primarily to dew point considerations. The graph below depicts an approximation of achievable relative humidity at varying temperatures.



VII. Repair and Maintenance

Calibration

For consistency of performance, annual manufacturer conducted calibration is required. ETS recommends the Model 5000-Series controller and Model 556 Sensor be calibrated annually. Only the controller and sensor need to be returned for calibration, do not return the chamber.

To return equipment to ETS for calibration it is first necessary to obtain a RMA number, please call 215-887-2196 or email service@ets2.com

Preventive Maintenance

The humidification system utilizes a pair of ultrasonic transducers that has an estimated lifespan of at least 3000 hours of run time after which it may need to be replaced. The ultrasonic transducer is not user-replaceable. Please contact ETS for assistance with repair/replacement.



To maximize the life of the transducer, use an appropriate water supply (deionized water or distilled water) and perform regular preventive maintenance after **every 500 hours** of operational use.



Any time the humidifier is not being used for more than a week, drain the water completely out of the basin.



Accessory filters have limited lifespan. It is recommended to replace the filter regularly to avoid degradation in humidification capability or contamination (e.g. mold). In closed-loop, high-humidity conditions, filters may become oversaturated with moisture and resist the flow of air. It is recommended to replace over-saturated filters. Filter lifespan is highly variable based on each specific application, however, to maximize the humidification capability of the Model 5482 it is recommended to replace the in-line filter **monthly**.

Humidification System Preventive Maintenance



Step 1 – Power OFF and Drain the Basin

Unplug the humidifier AC line cord from the “HUMIDITY” AC outlet of the controller.

Place the unit above a small container at the end of the drain valve to collect drained water.

Turn the drain valve to ON position with the tap lever turned parallel to the shutoff valve inlet and outlet and wait until draining is complete.



Step 2 – Flush out the Basin

Empty the small drain container. Plug the humidifier AC line cord into a wall AC outlet to ensure constant power to the unit.

Turn the 5-gallon water tank valve to the “ON” position to let fresh deionized water from the tank flush out contaminants in the basin through the drain valve for at least 2 minutes.



Step 3 (Optional) – Replace Accessory Filter

If utilizing humidifier accessory filters, replace filters monthly at most. Certain applications will require more frequent replacements.

Dispose of old filter.



Step 4 – Return System to Operation

Turn the drain valve to the “OFF” position with the shutoff valve tap lever turned 90° from the valve inlet and outlet.

Refer to **Section III. Set-Up Guide** and **Section IV. Quick Start Guide** to return the humidifier to standard operation.

Repair

To return equipment to ETS for calibration it is first necessary to obtain a RMA number, please call 215-887-2196 or email service@ets2.com

VIII. Warranty

Limited Warranties. Seller warrants that all goods manufactured and delivered hereunder shall (a) conform to any samples, drawings, specifications, or other written documents provided to Seller by Buyer or approved by Buyer to Seller and (b) be free from all defects in workmanship and material. Buyer's sole remedy against Seller for breach of either of the specifically mentioned warranty shall be the repair or replacement, at Seller's sole option, of the defective workmanship or material. Seller expressly disclaims all other warranties, express and/or implied, including but not limited to those of merchantability and fitness for a particular purpose. In no event shall Seller be liable, under either warranty or otherwise, to Buyer in excess of the purchase price of the products paid to Seller by Buyer. In no event shall Seller be liable for any loss or damage arising directly or indirectly from the use of the product or for consequential or incidental damages. Seller's specified warranties will expire and lapse (i) for renewable items (such as gloves, iris ports and desiccants), sixty (60) days from date of shipment and (ii) for all standard equipment and otherwise nonrenewable items, one year from date of shipment.