electro-tech systems, inc.

Humidification System

Model 5482 Operating Manual

Table of Contents

I. Important Safety Information.....3
II. Description of Contents.....4
III. Set-Up Guide.....5
IV. Quick Start Guide.....7
V. Functionality.....9
VI. Repair and Maintenance.....11
VII. Troubleshooting.....13
VIII. Warranty.....14

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Products described in this manual are designed and assembled in the U.S.A. by

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I. Important Safety Information

SAFETY INSTRUCTIONS

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.**

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.

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

II. Description of Contents

Item No.	Item	Qty.	Description
1	Ultrasonic Humidifier	1	The ultrasonic humidifier features a primary control base unit and top-mounted mist generation basin.
2	Water tank	1	One 5-gallon water tank is included as standard. Optionally, the humidification system can be connected directly to a DI water supply.
3	Water tank spout adapter	1	One adapter is included to neatly allow for 1/4” tubing to quickly connect and disconnect from the water tank.
4	1/4” OD polyethylene tubing	1	One 10-foot length of tubing is provided to connect the water tank to water supply inlet on the humidifier.
5	1” ID flexible PVC tubing	2	Two 1.5-foot lengths of tubing are provided to be used for connecting the mist out port and closed-loop to the humidification environment.

III. Set-Up Guide

Part 1: Prepare water supply

Step 1 – Fill Water Tank

Remove cap with spigot attachment, and fill tank up to intended level, up to five gallons, with **de-ionized or distilled water only**.

Use of tap water will cause build-up of contaminates and cause stress to the mist-generating elements, which may result in premature failure.

Step 2 – Install Dispensing Cap

Hand-tighten dispensing cap onto water tank. **Caution:** 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.

Loosen the small white cap to allow water to flow freely.

Step 3 – Install Water Feeding Tube

Place water tank above humidifier.

Insert 1/4” OD tubing firmly into the **“DEIONIZED WATER IN”** port on the humidifier. Test the connection by gently tugging on the tubing.

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

Part 2: Prepare Unit for Operation

Step 1 – Check Drain Valve position

Ensure the drain valve is set to the “OFF” position with the tap lever turned 90° from the drain valve inlet and outlet.

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

Step 2 – Turn on Water Valve

Ensure feeding tube is fully inserted.

Switch the water tank tap lever to the “ON” position (to the left) for water to flow freely.

Loosen the small white cap to allow water to flow freely.

Step 3 – Identify AC line cords

The AC line cord is to be connected to 100VAC - 240VAC single-phase AC.

Note: This AC line cord is normally plugged in the humidity AC outlet of a controller to regulate mist output.

IV. Quick Start Guide

Quick Start Guide

Step 1 – Apply Power and Fill Water Basin

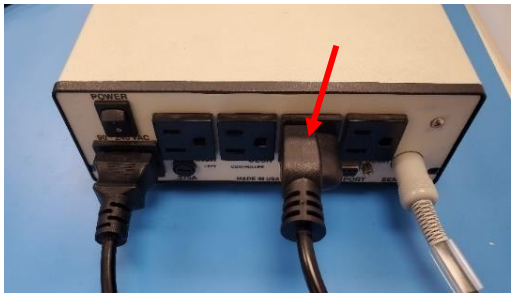
Plug the three-prong AC line cord into a standard wall outlet to test the functionality of the humidifier.

The humidifier LED turns red while the water fills the unit to an acceptable level. This process should take between 1 to 2 minutes.

Note: Base Unit **must** be placed on a level surface with no more than 5° tilt.

Step 2 – Mist Generation

After the water reaches an acceptable level, the LED will turn green to indicate system has enough water to produce mist.



Step 3 – Connect to Controller

Concluding the function test, remove the three-prong AC line cord from the wall outlet and connect the cord to a controller in the appropriate operating system outlet, labeled “HUMIDITY”.

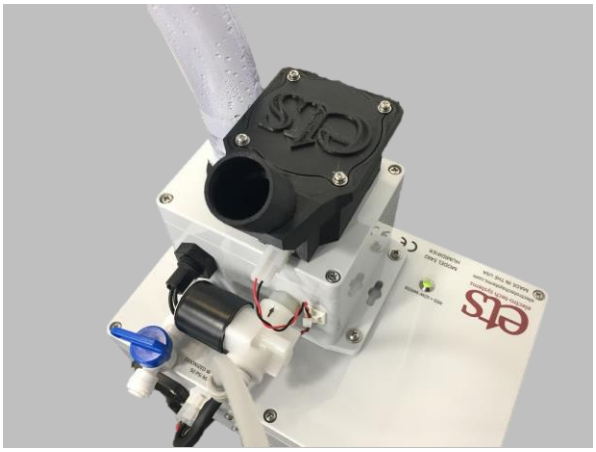
The Model 5482 can now be controlled to produce mist and raise humidity.

Step 4a – Closed-Loop Humidification

Connect the two 1.5-foot sections of 1” ID tubing to the humidifier. Connect one tube to the white humidity outlet barb. Connect the other tube to the black air inlet barb.

Connect the other ends of the tubing to the environmental chambers input and output barbs.

The unit will recirculate and humidify a controlled volume of air within a sealed environment.

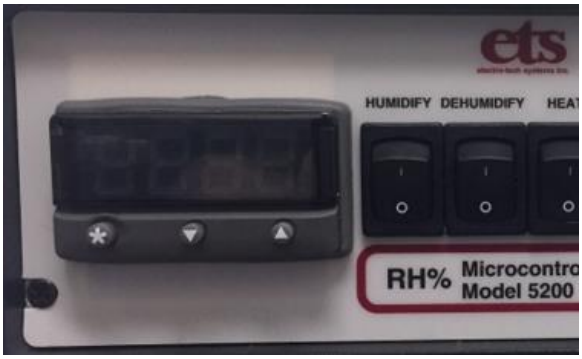


Step 4b – Optional Open-Loop Configuration

The humidifier can optionally be run in an open-loop configuration, if desired.

Utilize one 1.5-foot section of 1” ID tubing and connect from the white humidity outlet barb to the intended environmental conditioning location.

The unit will pull external air to provide humidity to an environment.



Step 5 – Humidity Setpoint

Install a relative humidity sensor within an environmental chamber and plug into the rear sensor socket of a Series 5000 controller. With the sensor properly installed, on the rear of the controller switch the back panel power switch to on.

Create a set point by holding down the “✱” star key on the controller and using the “▲” increase / “▼” decrease buttons to enter the desired humidity.

Switch the front panel “HUMIDIFY” switch to ON. The controller will request humidification as needed.

Consult the Operating Manual for the 5000 Series Controller for more details.

Step 6 – Humidity Indicator

The LED will turn green when the controller calls for humidity.

As long as water level in the basin is at sufficient level, mist can be produced.

V. Functionality

1. The ETS Model 5482 Ultrasonic Humidification System requires a single-phase AC power supply. It works with voltages from 100VAC to 240VAC.
2. The LED is a bi-color LED. It will turn red when de-ionized or distilled water falls below the acceptable level in the basin. It will turn green when the Controller calls for humidity production.
3. While the bi-color LED is red, the water solenoid is open to let de-ionized or distilled water fill the basin to acceptable level.

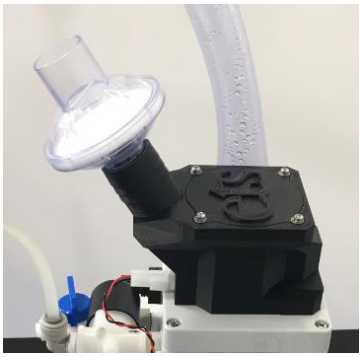
CAUTION: IF RED LED IS STAYS ON FOR MORE THAN 3 MINUTES, UNPLUG THE AC LINE CORD AND RE-FILL WATER TANK BEFORE RE-STARTING THE BASE UNIT.

Specifications

PERFORMANCE:
Humidification Rate: >125 mL/hour
Droplet Size: 5 microns
MECHANICAL
External Dimensions: 9.5” W x 7.0” D x 10.0” H
Material: Polycarbonate Construction
Weight: 4 lbs.
HARDWARE PORTS:
Two ¼ Inch Quick Connect
Two 1 Inch Hose Barbs
ELECTRICAL
Voltage: 100VAC to 240VAC, 50 to 60 Hz
Current: 1 Amp maximum
COMPATIBILITY
ETS Model 5100 or 5200 Series Controllers

Optional features and Accessories

The Model 5482 humidifier may optionally be purchased with in-line particulate filtering for desired applications. The particulate filter serves to prevent contaminant build-up in the humidifier basin and increase unit lifespan. Filter specifications include 99.999+% Bacterial Filtration Efficiency (BFE), 99.999+% Viral Filtration Efficiency (VFE), and a flow resistance of 1.5cm/H_2O at 60 LPM.


The model 5482 humidifier can be optionally purchased with increased output capacity. The model 5482-8595 high-capacity humidifier features dual outlet ports and hoses to rapidly humidify an environment or to sufficiently humidify a large volume of air.

VI. Repair and Maintenance

To return equipment to ETS for repair 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**.

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 contaminates in the basin through the drain valve for at least 2 minutes.
	**Step 3 – 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 IV. Quick Start Guide** to return the humidifier back into standard operation.

VII. Troubleshooting

Troubleshooting Guide		
Problem	**Possible Causes**	**Corrective Actions**
Power LED does not light up	Unit is not receiving power	Plug unit into controller
		Set “humidification increase” switch on controller to “on” position
		Check that the controller is turned on
		Check that the humidification set point is above the current humidity
	Electrical issue resulting in LED not lighting	Contact ETS for unit repair
	Power supply connection not reaching board	
	Board short circuiting	
Red “**LOW WATER**” light stays on	Water basin is empty	Check if water tank latch is turned to “on” position
		Check if basin drain is turned to “closed” position
		Check if water tank has at least 1 gallon of water
		Ensure that water tank is located above basin
		Ensure that small white cap on water tank is loose
Power LED is Green, but no mist is being generated after 3 seconds	Electrical issue resulting in improper distribution of power in unit	Contact ETS for unit repair

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.