



Humidification System

ETS Model 5482 Operating Manual

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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.

DO NOT IMPEDE THE CHAMBER FROM VENTING EXCESS PRESSURE. The humidification and dehumidification systems are open loop systems that pump external air into the chamber. If the chamber is not allowed to vent, pressure could 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.

II. Description of Contents

Included:

Item	Qty.	Description
Ultrasonic Humidifier Base Unit	1	Base unit houses the primary control and operating systems to support humidification.
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.
¼" OD opaque tubing	1	One 10-foot length of tubing is provided to be used for connecting the water tank to water supply port on the Base Unit.
1" OD clear tubing	2	Two 2.5-foot length of tubing are provided to be used for connecting the mist out port and optional closed-loop to the humidification environment.
Fan (voltage specific)	1	One 4" box fan is provided to improve air circulation in the controlled environment.

III. Set-Up Guide

Part 1: Prepare water supply for Base Unit

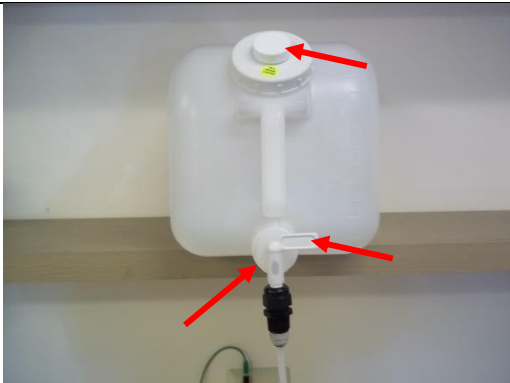
Tools Needed:

- None



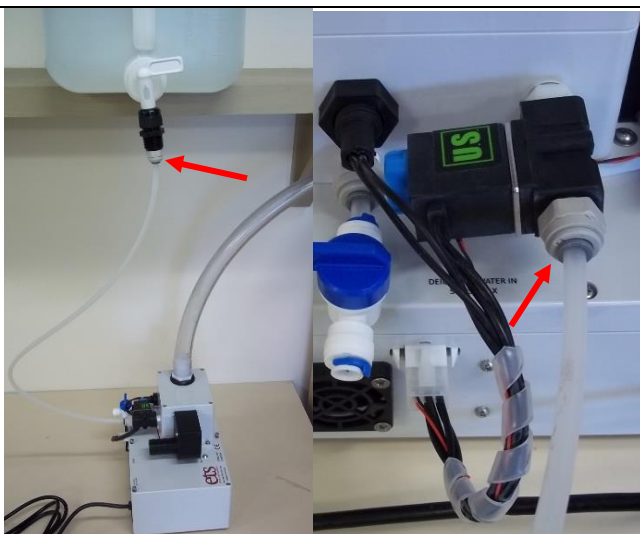
Step 1 – Fill Water Tank

Fill tank up to at least 4 gallons with De-ionized water only. This amount of water will have enough pressure to overcome air bubbles in the feeding tube initially. After that, water will be able to drain freely.



Step 2 – Install Dispensing Cap

Loosen the small white cap to balance the tank pressure. Make sure dispensing flap stays in the “OFF” position [on the right side – see picture]. Hand tight dispensing cap onto water tank. Caution: DO NOT use any tools to tight the cap. Overtightening the cap will damage the gasket and cause water leakage.



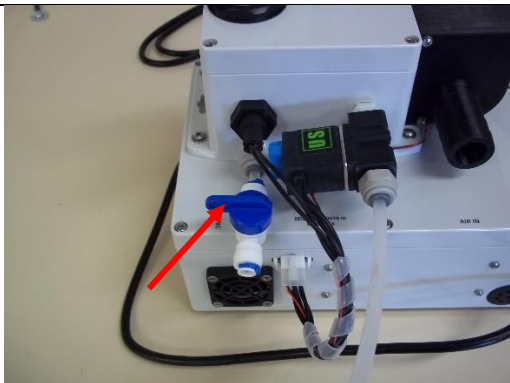
Step 3 – Install Water Feeding Tube

Locate water tank above Base Unit at least one foot from water port to water solenoid. Insert ¼” tubing firmly into the De-ionized water port on Base Unit. Caution: Make sure feeding tube is fully inserted before swinging dispensing flap to the “ON” position [all the way to the left] for water to flow freely.

Part 2: Prepare Base Unit before Operating

Tools Needed:

- None



Step 1 – Check Drain Valve position

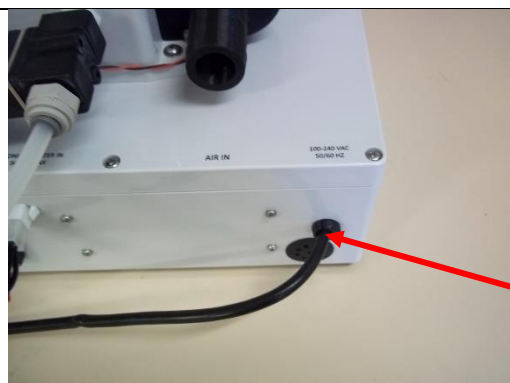
Double-check to make sure the drain valve is set to the “OFF” position [tap turned to 90° from the valve body].

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



Step 2 – Turn on Water Valve

Swing dispensing flap to the “ON” position.



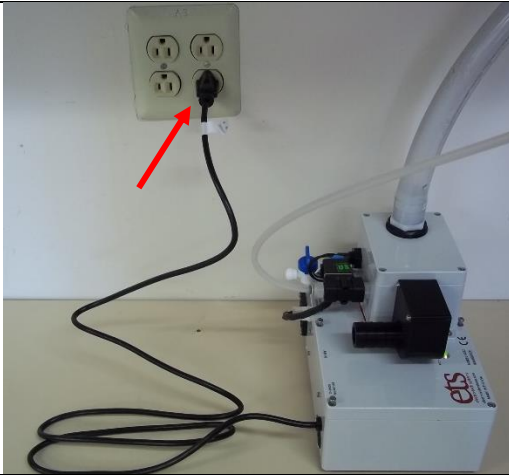
Step 3 – Identify AC line cords

The AC line cord is to be connected to a single-phase AC service that can be from 100VAC to 240VAC.

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

IV. Quick Start Guide

Quick Start Guide



Step 1 – Apply Power

Plug the three-prong AC line cord into an outlet.



Step 2 – Wait for water to fill the basin

The LED is **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.



Continue Step 2 – Water fully filled

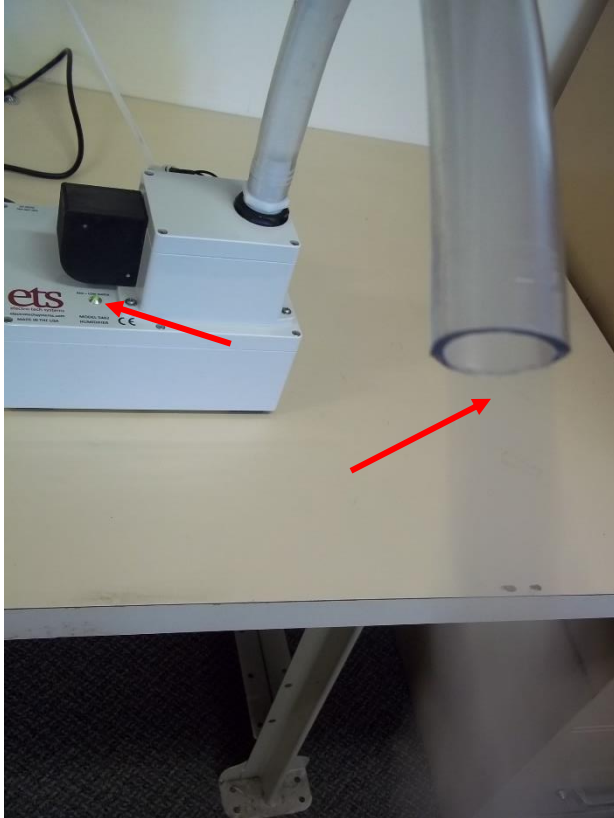
After the water reaches an acceptable level, the LED will turn **green** to indicate system has enough water to produce mist.

Note: Mist will produce at a low intensity for about 3 seconds then automatically switch to maximum intensity. This was designed for tight RH% tolerance or very low RH% setting.



Step 3 – Connect to a Controller

Connect the three-prong AC line cord to a controller. The ETS5482 is now can be controlled to produce mist.



Continue Step 3 – Mist on indicator

The LED will turn **green** when the controller calls for mist.
As long as water level in the basin is at sufficient level, mist can be produced.

V. Operation Guide

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 water below acceptable in the basin. It will turn **green** when the Controller calls for mist to produce.
3. While the bi-color LED is **red**, the water solenoid is open to let de-ionized water fill the basin to acceptable level.
4. The ETS Model 5482 also has an automatic function that holds the mist production at a lower intensity for the first 3 seconds of mist production (while the LED is **green**). This low intensity period was designed to keep a tight RH% tolerance for small controlled environment or very low RH% settings. In order for this function to work, cycle time of the PID controller must be set between 1 and 2 seconds.
5. If the bi-color LED stays **green** for more than 3 seconds, the humidifier will automatically switch to full intensity mist intensity. This high intensity period was designed to handle larger controlled environments or higher RH% settings.

NOTE: The mist intensity switching function was designed so the humidifier would work properly in different conditions such as large versus small environments or low RH% versus high RH% settings.

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.

VI. Calibration and Maintenance

Calibration

Calibration is not required.

Repair

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

Preventative Maintenance

The humidification system utilizes an ultrasonic transducer 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 preventative maintenance after every **500 hours** of operational use.

Basin Maintenance

POWER OFF

Step 1 – Turn off power

Unplug the AC line cord from the AC outlet of controller to remove power from the humidifier.



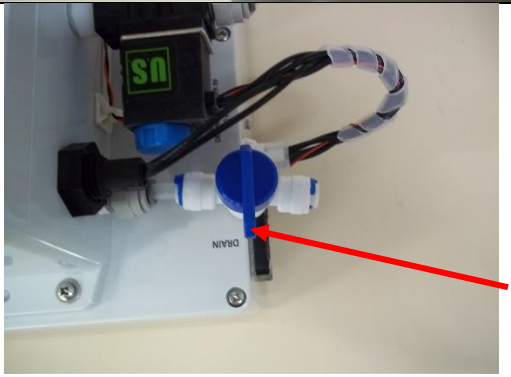
Step 2 – Prepare and drain the basin

The water will need to be drained out of the basin first. First, 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 [tap turned parallel to the valve body]. Wait for the water to stop flowing before proceeding.



Step 3 – Turn on power

Empty the small container, and place back until the drain; leave the drain valve open. Plug the AC line cord in a wall AC outlet to apply constant power to the humidifier.



Step 4 – Flush out contaminants from the basin

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

Step 5 – Return the System to operation

Turn the drain valve to the “OFF” position [tap turned to 90° from the valve body]. Go to “Quick Start Guide” to return the humidifier back into operation again.

VII. Troubleshooting

Troubleshooting Guide		
Problem	Possible Cause	Corrective Action
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
	Faulty wiring resulting in LED not lighting, power supply connection not reaching board, board short circuiting	Check that the humidification set point is above the current humidity
		Contact ETS for unit repair
Red "No 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 air relief on water tank is loose
Power LED is Green, but no mist is being generated after 3 seconds	Faulty wiring is improperly distributing 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.