

Desiccant / Pump Dehumidification System

Model 5471

Operating Manual

6/30/06



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System

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1.0 GENERAL

Many applications require a small volume enclosure (less than 20 cubic feet), such as a sealed glove box, cabinet, etc. to be at a humidity level that is less than room ambient. The Model 5471 Desiccant Dehumidification System is a closed loop system, designed to reduce the relative humidity within a sealed chamber to less than 10%. When used with an Automatic Humidity Controller (such as an ETS 5112), the humidity inside the chamber can be controlled to within $\pm 0.5\%$ RH of the set-point. Using the ETS Model 5100 or Model 5200 Microprocessor Humidity Controllers, the chamber may be maintained to within $\pm 0.1\%$ RH of the set-point.

2.0 DESCRIPTION

The Model 5471 Dehumidification System is housed in a 6" W x 9.5" L x 3.5" H (15.25 x 24.1 x 8.5 cm) plastic enclosure with vibration isolating feet. The power switch and indicator light are located on the front panel of the enclosure. When installed in the ETS Model 5532 Controlled Environment Chamber, the enclosure is not used and power is by the Chamber.

A small, quiet linear air pump is mounted inside the enclosure. A clear plastic column filled with 2.5 lbs. of renewable, indicating Calcium Sulfate desiccant is mounted to the top of the enclosure. The column is easily removable for replacing the desiccant.

The desiccant removes any moisture that is in the air. This dried air is then forced back into the chamber. The desiccant contains an indicator that turns the normally blue colored desiccant pink as it absorbs moisture. When the cylinder is mostly pink, the desiccant should be renewed or replaced. The desiccant can be renewed approximately ten (10) times before having to be replaced.

UNIT SPECIFICATIONS

1. The average flow rate from the unit is 0.54 cfm (15 lpm).
2. The air is dried to a dewpoint of -100°F .
3. Capacity for water vapor up to 100 grams.
4. Power – 115 VAC/60 Hz, 0.35 Amps
230 VAC/50 Hz, 0.18 Amps

5. Desiccant Column is safe for working pressures up to 100 psig.
6. Contents: 2 ½ lbs. of #8 mesh Indicating Desiccant.
7. Connections are for ¼” OD tubing. Hose barb adapters are provided for using ¼” ID tubing as an alternative.
8. Plastic cap is fitted with “O-Ring” gasket.
9. Desiccant coil spring is made of cadmium plated steel.

3.0 SET-UP

When used with most ETS 5500C Series Controlled Environment Chamber, all input / output fittings and circulating fans are already installed. For other installations it is recommended that a 32-110 cfm fan(s) be installed to evenly distribute the air within the chamber.

Follow the Set-Up procedure, shown in **Figures 3.0-1** and **3.0-2**:

1. Place the desiccator column, black lid down, onto the mounting studs on top of the Model 5471 enclosure. The side of the lid marked “IN” (90° fitting) should face forward.
2. Connect the short piece of ¼” OD tubing to the fitting on the lid, to the left of the column. Connect the other end of the tube to the 90° “IN” fitting on the desiccant column.
3. Make sure that all tubing is pushed all the way into the bottom of the fitting to avoid leaks.

To remove tubing - Push down on the fitting collar and pull up on tube.

4. The Output hose barb should face the rear.
5. Connect a piece of tubing between the chamber output fitting and the Model 5471 Air Intake Fitting.
6. Connect a second piece of tubing from the Dry Air Output Fitting to the return fitting on the chamber.
7. Plug the unit power cord into the DECREASE outlet on the rear of the Model 5112, 5100, or 5200 Humidity Controller.

8. Turn the front panel switch to the "ON" position.

NOTE

A 230 VAC system must be used with a Controller configured for 230 Volts. The pump will be fitted with a standard North American 3-prong plug to fit into the DECREASE outlet on the rear panel.

The system is now ready to dehumidify the chamber.

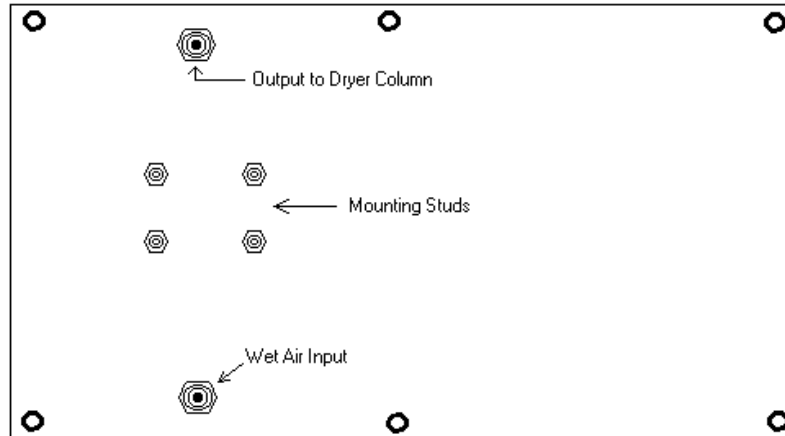


Figure 3.0 - 1

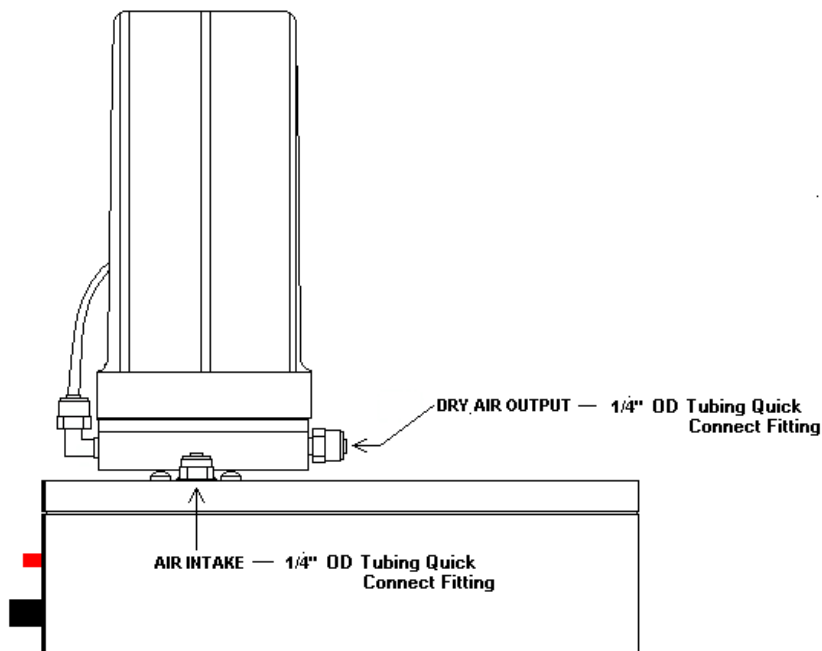


Figure 3.0 - 2

4.0 OPERATION

The user does not have to do anything else to operate the system. Total operation will be under the control of the Automatic Humidity Controller. The system operates as follows:

1. Air is drawn (from the chamber) into the input hose barb (mounted to the lid), passed through the pump and comes out through the bulkhead fitting on the opposite side of the lid.
2. The bulkhead fitting is attached to the column with a short length of tubing. The air passes through the tubing, into the “IN” fitting on the column lid.
3. The air is forced to the bottom of the column. It then passes through the desiccant as it returns to the “OUT” fitting on the column lid.
4. The dried air is then sent back to the chamber.
5. Both input and output have filter pads to cut down on desiccant dust.
6. Input and output fittings may be hose barbs and/or quick disconnect fittings.

5.0 CHANGING THE DESICCANT

1. Disconnect the short length of tubing.
2. Lift the column straight up and off of the box.
3. Turn the column over, lid up, and slowly unscrew the lid.
4. Remove the filter pad and spring on top of the desiccant.
5. When refilling, tap the column gently on a table to help settle the desiccant.
6. Replace the filter pad, spring and lid.
7. Replace the column and tubing onto the box.

6.0 RENEWING THE DESICCANT

The desiccant can be renewed approximately ten (10) times before having to be replaced. The granules should be removed from the drying column and spread evenly, one granule deep on the tray. The desiccant should then be heated for approximately one (1) hour at about 400° F (200° C), or until all the granules are blue. It should be allowed to cool in an airtight container before refilling the plastic column.

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7.0 Warranty

Electro-Tech Systems, Inc. warrants its equipment, accessories and parts of its manufacture to be and remain free from defects in material and workmanship for a period of one (1) year from date of invoice and will, at the discretion of Seller, either replace or repair without charge, F.O.B. Glenside, similar equipment or a similar part to replace any equipment or part of its manufacture which, within the above stated time, is proved to have been defective at the time it was sold. All equipment claimed defective must be returned properly identified to the Seller (or presented to one of its agents for inspection). This warranty only applies to equipment operated in accordance with Seller's operating instructions.

Seller's warranty with respect to those parts of the equipment which are purchased from other manufacturers shall be subject only to that manufacturer's warranty.

The Seller's liability hereunder is expressly limited to repairing or replacing any parts of the equipment manufactured by the manufacturer and found to have been defective. The Seller shall not be liable for damage resulting or claimed to result from any cause whatsoever.

This warranty becomes null and void should the equipment, or any part thereof, be abused or modified by the customer or if used in any application other than that for which it was intended. This warranty to replace or repair is the only warranty, either expressed or implied or provided by law, and is in lieu of all other warranties and the Seller denies any other promise, guarantee, or warranty with respect to the equipment or accessories and, in particular, as to its or their suitability for the purposes of the buyer or its or their performance, either quantitatively or qualitatively or as to the products which it may produce and the buyer is expected to expressly waive rights to any warranty other than that stated herein.

ETS must be notified before any equipment is returned for repair. ETS will issue an RMA (Return Material Authorization) number for return of equipment.

Equipment should be shipped prepaid and insured in the original packaging. If the original packaging is not available, the equipment must be packed in a sufficiently large box (or boxes if applicable) of double wall construction with substantial packing around all sides. The RMA number, description of the problem along with the contact name and telephone number must be included in formal paperwork and enclosed with the instrument. Round trip freight and related charges are the owner's responsibility.

WARNING

WOODEN CRATES MUST NOT BE USED. PACKAGING OF DELICATE INSTRUMENTS IN WOODEN CRATES SUBSTANTIALLY INCREASES THE CONTENT'S SUSCEPTIBILITY TO SHOCK DAMAGE. DO NOT PLACE INSTRUMENTS OR ACCESSORIES INSIDE OTHER INSTRUMENTS OR CHAMBERS. ELECTRO-TECH SYSTEMS, INC. WILL NOT ASSUME RESPONSIBILITY FOR ADDITIONAL COST OF REPAIR DUE TO DAMAGE INCURRED DURING SHIPMENT AS A RESULT OF POOR PACKAGING.