

## INSTALLATION & OPERATION INSTRUCTIONS



The **Ultra Aire 98H and 120H** are ventilating dehumidifiers that integrate into the heating and cooling system to provide the ultimate in comfort, health and property protection through:

- + Dehumidification
- + Fresh Air Ventilation (Optional)
- + Air Filtration

Serial Number \_\_\_\_\_

Install Date \_\_\_\_\_

Sold By \_\_\_\_\_



# TABLE OF CONTENTS

<b>Safety Instructions .....</b>	<b>3</b>
<b>Dehumidifier Set Up .....</b>	<b>4</b>
<b>Attaching Duct Collars.....</b>	<b>5</b>
<b>Electrical Requirements .....</b>	<b>6</b>
<b>Drain Installation .....</b>	<b>7</b>
<b>Ducting to HVAC Systems.....</b>	<b>8</b>
Recommended HVAC System Installation.....	9
<b>Fresh Air Ventilation .....</b>	<b>10</b>
Determine Ventilation Requirements .....	11
<b>Controls .....</b>	<b>12</b>
<b>Air Filtration.....</b>	<b>14</b>
MERV Rating Chart .....	15
<b>Service.....</b>	<b>16</b>
<b>Warranty .....</b>	<b>19</b>

Ultra Aire is committed to manufacturing quality products. To maintain our standards, product specifications may change without notice.



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# SAFETY INSTRUCTIONS

**READ THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS CAREFULLY BEFORE INSTALLING AND OPERATING THIS DEVICE. PROPER ADHERENCE TO THESE INSTRUCTIONS IS ESSENTIAL TO OBTAIN MAXIMUM BENEFIT FROM YOUR ULTRA AIRE VENTILATING DEHUMIDIFIER.**

## **⚠ WARNING!**

**THIS SYMBOL MEANS IMPORTANT INSTRUCTIONS. FAILURE TO HEED THEM CAN RESULT IN SERIOUS INJURY OR DEATH.**

## **⚠ CAUTION!**

**THIS SYMBOL MEANS IMPORTANT INSTRUCTIONS. FAILURE TO HEED THEM CAN RESULT IN INJURY OR MATERIAL PROPERTY DAMAGE.**

### **Registrations**



This Ultra Aire dehumidifier conforms to unified standard UL 60335-2-40 and CSA standard C22.2.60335-2-40.

## **⚠ WARNING!**

**120 VOLTS MAY CAUSE SERIOUS INJURY FROM ELECTRIC SHOCK. DISCONNECT ELECTRICAL POWER BEFORE STARTING INSTALLATION OR SERVICING, AND LEAVE POWER DISCONNECTED UNTIL INSTALLATION OR SERVICE IS COMPLETED.**

## **⚠ CAUTION!**

**READ ALL INSTRUCTIONS BEFORE BEGINNING INSTALLATION.**

**ALWAYS USE CAUTION AND WEAR CUT RESISTANT GLOVES WHEN HANDLING SHEET METAL.**

**IMPROPER INSTALLATION MAY CAUSE PROPERTY DAMAGE OR INJURY. INSTALLATION, SERVICE, AND MAINTENANCE MUST BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.**

**DEHUMIDIFIER IS HEAVY. HANDLE WITH CARE AND FOLLOW INSTALLATION INSTRUCTIONS.**

**NEVER OPERATE A UNIT WITH A DAMAGED POWER CORD. IF THE POWER CORD IS DAMAGED, IT MUST BE REPLACED BY THE MANUFACTURER, ITS SERVICE AGENT, OR A SIMILARLY QUALIFIED PERSON IN ORDER TO AVOID A HAZARD.**

**THIS APPLIANCE IS NOT INTENDED FOR USE BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE OR KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION CONCERNING THE USE OF THE APPLIANCE BY A PERSON RESPONSIBLE FOR THEIR SAFETY. CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.**

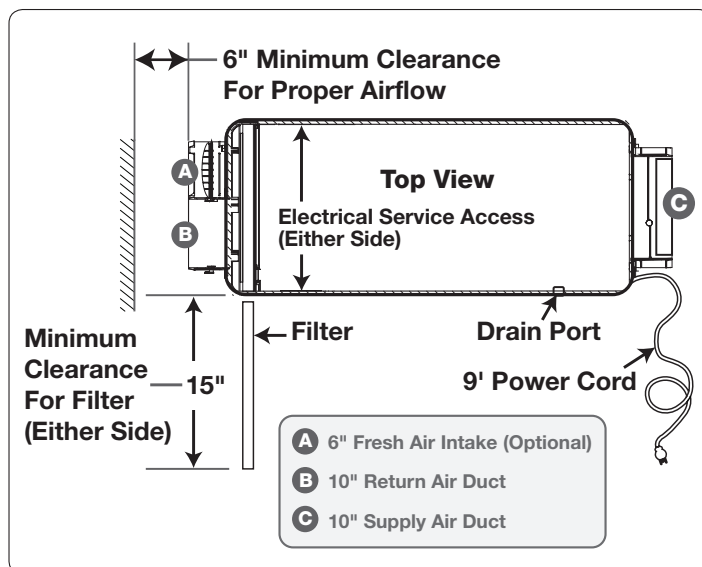
# DEHUMIDIFIER SET UP

## Important Precautions

- The device is designed to be installed indoors in a space that is protected from rain and flooding.
- Install the unit with enough space to access one of the side panels for maintenance and service.
- Avoid directing the discharge air at people. The dehumidifier should be used in the upright position.
- If used near a water source, be certain there is no chance the unit could fall into the water or get splashed and that it is plugged into a dedicated circuit and Ground Fault Circuit Interrupter (GFCI) protected outlet.
- DO NOT use the dehumidifier as a bench or table.
- DO NOT place the dehumidifier directly on structural building members without vibration absorbers or unwanted noise may result. Place the Ultra Aire Dehumidifier on supports to raise the base of the unit.
- A drain pan with a float switch **MUST** be placed under the dehumidifier if installed above a living area or above an area where water leakage could cause damage.

## Location Considerations

- Allow sufficient clearance to handle the unit's overall dimensions as well as the necessary return and supply ductwork to the unit.
- Allow sufficient clearance for filter removal and to prevent airflow obstruction.
- Electrical service access will require the removal of a side panel. Allow sufficient clearance on a side of the unit.
- Locate the dehumidifier in an area where the cord's length (9') easily reaches a 115 VAC electrical outlet with a minimum of a 15 Amp circuit capacity.
- Locate the dehumidifier in an area where field wiring the control (low voltage) to the unit will be possible.
- It is recommended that a backdraft damper be used in the discharge duct of the Ultra Aire Dehumidifier, especially when connecting to the supply ducting system. The backdraft damper prevents supply air from counter flowing through the Ultra Aire Dehumidifier when it is not operating. The dehumidifier's location should be chosen to allow installation of this accessory if necessary.
- The Ultra Aire Dehumidifier may be suspended from structural members with steel hanger straps or a suitable alternative, ensuring the assembly supports the dehumidifier's base in its entirety. DO NOT hang the Ultra Aire Dehumidifier from its cabinet.
- Allow for proper routing and drainage of needed drain pipes.



## ⚠ CAUTION!

**REMOVE COMPRESSOR SHIPPING TIE FROM THE UNIT. FAILURE TO REMOVE SHIPPING TIE WILL CAUSE EXCESS VIBRATION TO BE TRANSMITTED TO THE FRAME.**

## Removal of Compressor Shipping Support

The Ultra Aire Dehumidifier uses a compressor to power the refrigeration system. To protect the compressor and refrigeration system during shipping, a plastic tie wrap secures it to the unit's frame. Remove the tie wrap by cutting the tie wrap and pulling from the unit as shown. After removing tie wrap, insert plastic plugs provided into the holes.



# ATTACHING DUCT COLLARS

## Fresh Air Ventilation Duct

Fresh air ventilation is optional. A 6" diameter duct is attached to the unit. The 6" duct should be capped if fresh air is not desired. If setting up the unit to provide fresh air ventilation, see page 10.

## Return Air Inlet

A 10" diameter duct collar is attached to the unit.

## Supply Air Outlet

The back panel of the dehumidifier can be rotated to allow for horizontal flow through or vertical flow through of the supply air.

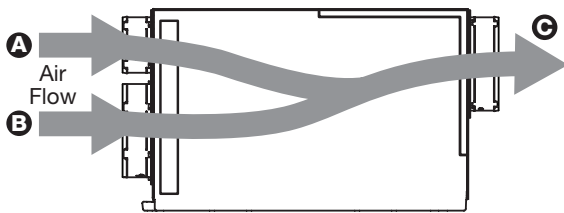
- **Horizontal Flow Through**

The unit ships configured for a horizontal flow through. A 10" diameter duct collar is attached to the unit.

- **Vertical Flow Through**

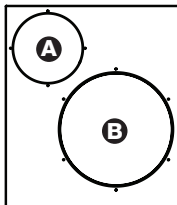
Remove the exhaust panel using a T25 torx bit. Rotate the panel so the exhaust collar is located on the top of the unit. Align screw holes and snap the panel onto the base. Secure the exhaust panel to the base by replacing the six screws.

### Horizontal Flow Through (End Discharge)

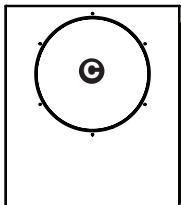


- A 6" Fresh Air Inlet (Optional)
- B 10" Return Air Inlet
- C 10" Supply Air Outlet

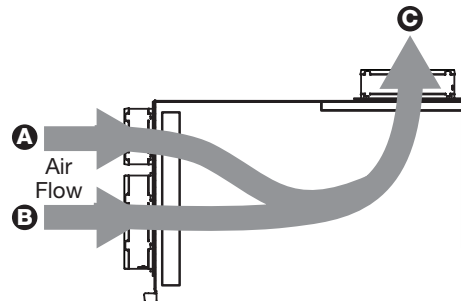
Front View



Rear View

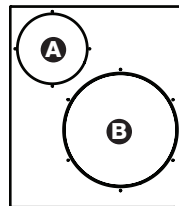


### Vertical Flow Through (Top Discharge)

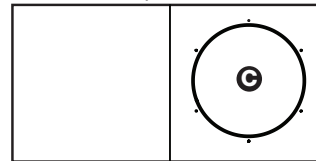


- A 6" Fresh Air Inlet (Optional)
- B 10" Return Air Inlet
- C 10" Supply Air Outlet

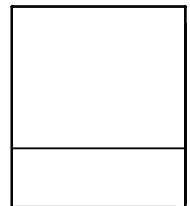
Front View



Top View



Rear View



## ELECTRICAL REQUIREMENTS

The Ultra Aire Dehumidifier plugs into a common grounded 115 VAC outlet. Locate the dehumidifier in an area where the cord's length (9') easily reaches a 115 VAC electrical outlet with a minimum of 15 Amp circuit capacity. If used in an area that may become wet, a GFCI protected circuit is recommended. Consult local electrical codes for further information.

Ultra Aire offers a variety of control devices for use with the Ultra Aire Dehumidifier. The control is to be located remotely from the dehumidifier and placed in the space to be conditioned. A low voltage (24 Volt) control **MUST** be used with the Ultra Aire Dehumidifier and **MUST** be connected with low voltage (18-22 gauge) thermostat wire.

**⚠ WARNING!**

**THE REMOTE CONTROLS OF THE ULTRA AIRE DEHUMIDIFIER ARE POWERED BY A LOW VOLTAGE CIRCUIT (24 VAC) AND MUST NEVER CONTACT OR BE CONNECTED TO A HIGH VOLTAGE CIRCUIT.**

**⚠ CAUTION!**

**DO NOT ALLOW THE 24V TERMINAL TO CONTACT THE COM/DMPR TERMINALS ON THE ULTRA AIRE DEHUMIDIFIER OR DAMAGE TO THE TRANSFORMER WILL RESULT.**

### ⚠ CAUTION!

**SOME OF THE SCREW TERMINALS ON THE ULTRA AIRE DEHUMIDIFIER MAY NOT BE USED WITH CERTAIN CONTROLS AND SHOULD BE LEFT UNCONNECTED.**

## Electrical Precautions

- Do not install the control where it may not accurately sense the relative humidity such as near HVAC supply registers, near exterior doors, on an outside wall, near a window, or near a water source.
- The screw terminals on the Ultra Aire Dehumidifier and the control are labeled to prevent confusion.
- Be sure to consult the electrical schematic in the CONTROLS Section (page 12) of this manual or inside the access panel of the Ultra Aire Dehumidifier before making control connections.

# Ultra Aire 98H Wiring Diagram

115 VAC, 60Hz, Single phase

The diagram illustrates the electrical wiring for the Ultra Aire 98H unit. It features a 115 VAC, 60Hz, single-phase power input. The main power lines are labeled BLK (black) and WHT (white). A ground connection is shown with a GRN (green) wire. The wiring includes a 3A BREAKER, a TRANSFORMER (24 VAC), and various components such as the COMPRESSOR, DEFROST T-STAT, IMPELLER RELAY CONTACTS, IMPELLER, and FAN. The diagram also shows the wiring for the COM (red) and DMPR (red) terminals.

BLK WHT

GRN

COMPRESSOR RELAY CONTACTS

DEFROST T-STAT

COMPRESSOR

YEL

RED

BLK

PUR

AUTO (N.C.)

IMPELLER RELAY CONTACTS

ON (N.O.)

OR

BLK

IMPELLER

WHT

BRN

115 VAC

WHT

24V

YEL

3A BREAKER

24 VAC

TRANSFORMER

BLU

DEHU

COMPRESSOR RELAY COIL

IMPELLER RELAY COIL

FAN

GRN

COM RED

DMPR RED

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# Ultra Aire 120H Wiring Diagram

The diagram illustrates the electrical wiring for the Ultra Aire 120H unit. It features a main power section at the top with a ground connection (GRN) and a 24V transformer (XFMR LINE). The wiring is organized into three horizontal sections. The top section includes the Compressor Relay Contacts, Defrost Switch, Compressor, and Compressor Capacitor. The middle section includes the Impeller Relay Contacts, Blower, and Blower Capacitor. The bottom section includes the Power Varistor, Fan, and various control wires (YEL 3, YEL 26, RED 1, RED 5, RED 6, RED 9). The diagram also shows the connection of the 3A Breaker and the 24V transformer. The wiring is color-coded: BLK 7, BLK 18, BLK 12, BLK 8, YEL 3, YEL 26, RED 1, RED 5, RED 6, RED 9, GRY 25, BLU 4, and PNK 2. The diagram is labeled with component names and wire colors/numbers.

**Top Section:**

- BLK 7
- WHT 9
- GRN
- COMPRESSOR RELAY CONTACTS
- DEFROST SWITCH
- BLK 18
- COMPRESSOR
- YEL 19
- RED 21
- COMPRESSOR CAPACITOR

**Middle Section:**

- VIO 17
- VIO 16
- AUTO (N.C.)
- IMPPELLER RELAY CONTACTS
- ORG 15
- ON (N.O.)
- BLK 12
- BLOWER
- WHT 22
- BLOWER CAPACITOR
- BRN 13
- BRN 14

**Bottom Section:**

- POWER VARISTOR
- BLK 8
- XFMR LINE
- WHT 20
- BRN 13
- BRN 14
- R
- YEL 3
- 3A BREAKER
- YEL 26
- COM
- RED 1
- DEHUM
- GRAY 25
- FLOAT
- BLU 4
- VARISTOR
- RED 5
- COMPRESSOR RELAY COIL
- BLOWER RELAY COIL
- FAN
- PNK 2
- RED 6
- RED 9

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# DRAIN INSTALLATION

The Ultra Aire Dehumidifier generates condensate.

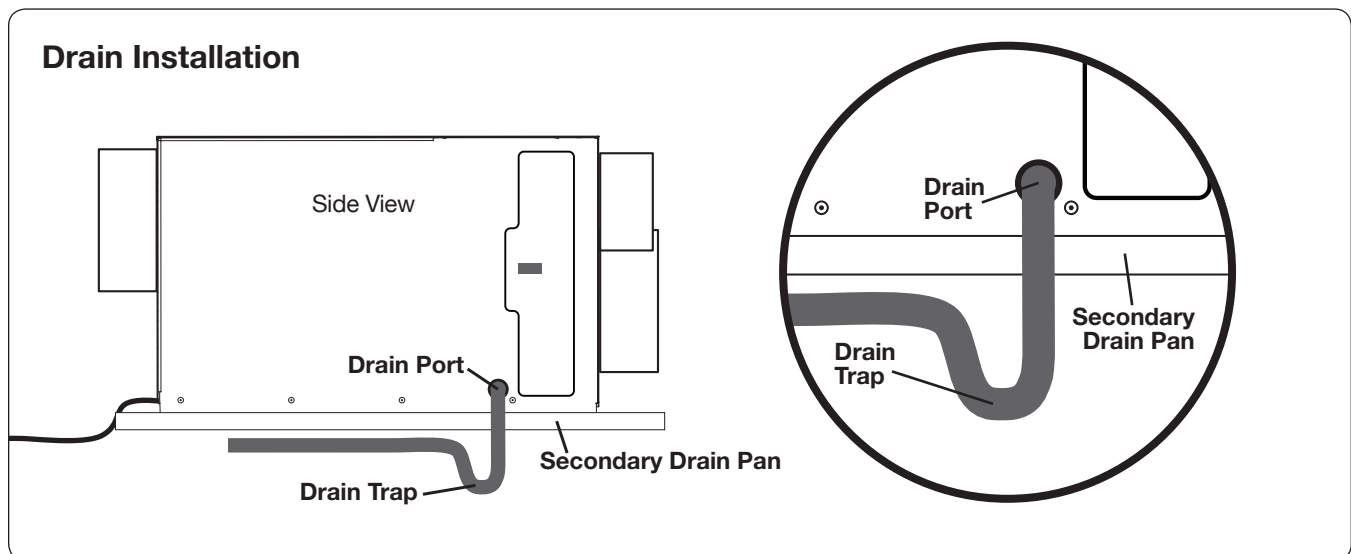
Place a secondary drain pan with a float switch under the dehumidifier if it is suspended above a finished area or above an area where water leakage could cause damage.

A drain trap is required for the dehumidifier to drain properly. Install a 3/4" threaded male NPT adapter to the drain pan. Install a drain pipe assembly utilizing 3/4" PVC pipe to transport the condensate to a drain. Pitch of drain should be 1" per 10'.

An optional condensate pump kit is available for use with the Ultra Aire Dehumidifier and may be installed if lift is required to dispose of condensate. Condensate is automatically pumped to a remote location when the water level in the pump's reservoir rises to close the float switch.

The pump also contains a safety float switch. The white leads from this switch extend from beneath the pump cover. This switch should be installed in series with the field wire that connects to the common lead from the Ultra Aire Dehumidifier to the control panel. If the pump fails, this switch opens the common control circuit and stops water production before the reservoir overflows. Contact a qualified electrician to install the safety float switch to the Ultra Aire Dehumidifier.

**Note:** An optional condensate pump kit can be purchased through your dealer or online.



# DUCTING TO HVAC SYSTEMS

The recommended installation creates a separate return for the Ultra Aire Dehumidifier in a central area of the structure. Duct the supply of the unit to the air supply of the existing HVAC system. Connect an insulated duct from outside to the 6" collar of the Ultra Aire Dehumidifier to provide fresh make-up air.

## CAUTION!

**DO NOT CONNECT WITH A STATIC PRESSURE GREATER THAN OR EQUAL TO +0.5 WG. CONTACT TECHNICAL SUPPORT AT (800) 533-7533 FOR ADDITIONAL DETAILS.**

### Ducting Considerations:

- All flexible ducting connected to the Ultra Aire Dehumidifier should be UL listed.
- A short piece of flexible ducting on all Ultra Aire Dehumidifier duct connections is recommended to reduce noise and vibration transmitted to rigid ductwork in the structure.
- Use a minimum 10" diameter round or equivalent rectangular duct for total duct lengths of up to 25'. Use a minimum 12" diameter round or equivalent rectangular duct for longer lengths.
- Grills or diffusers on the duct ends must not excessively restrict airflow.
- Effective dehumidification may require that ducting be branched to isolated, stagnant air flow areas. When ducting to two or three areas, use 8" or larger diameter branch ducting. When ducting to four or more areas, use 6" or larger diameter branch ducting. Provisions must be made to provide airflow from supply locations to the central return location. Proper air distribution is important to ensure even humidity control and heat distribution throughout the structure.
- DO NOT locate the return in a bathroom or a kitchen.



# DUCTING TO HVAC SYSTEMS

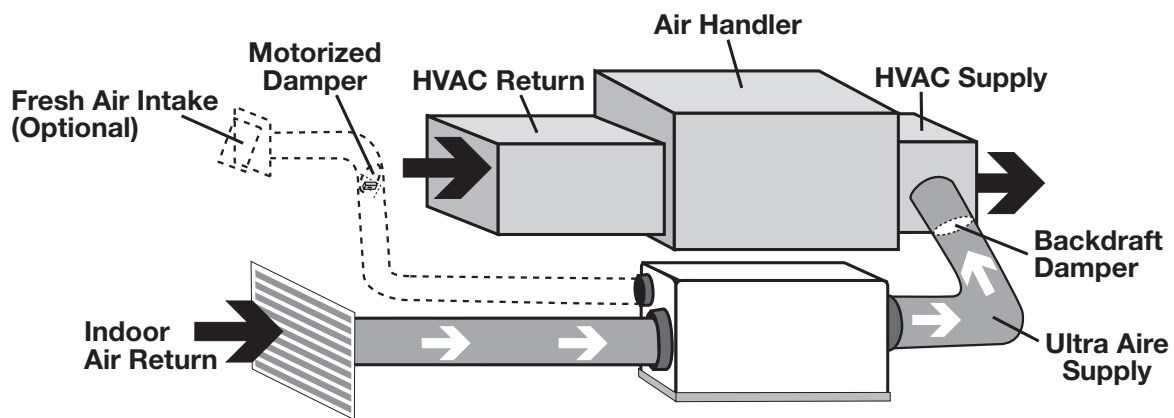
## Recommended HVAC System Installation

The recommended installation draws air from a dedicated indoor air return and ducts the supply of the dehumidifier to the air supply of the existing HVAC system. Utilize the optional fresh air ventilation duct to provide outside air.

- Install a dedicated 10" air return for the Ultra Aire Dehumidifier from a central area of the structure.
- Install an insulated duct from outside to the 6" collar of the Ultra Aire Dehumidifier to provide fresh air ventilation (optional).
- Duct the supply of the Ultra Aire Dehumidifier to the supply of the existing HVAC system with a backdraft damper.
- If the existing system has multiple returns, instead of installing a dedicated return to the Ultra Aire Dehumidifier, it is possible to select one to disconnect from the existing HVAC system and use it for the dedicated Ultra Aire Dehumidifier return. Select a return from a central location in the house that is always open to the rest of the structure. DO NOT use a return from a room where doors are kept closed.
- DO NOT locate return in a bathroom or kitchen.
- Control should be located remotely from the dehumidifier and placed in a central location.

Please visit our website at [www.ultra-aire.com/install-options/](http://www.ultra-aire.com/install-options/) for more installation options.

### Dedicated Ultra Aire Return to HVAC Supply



# FRESH AIR VENTILATION

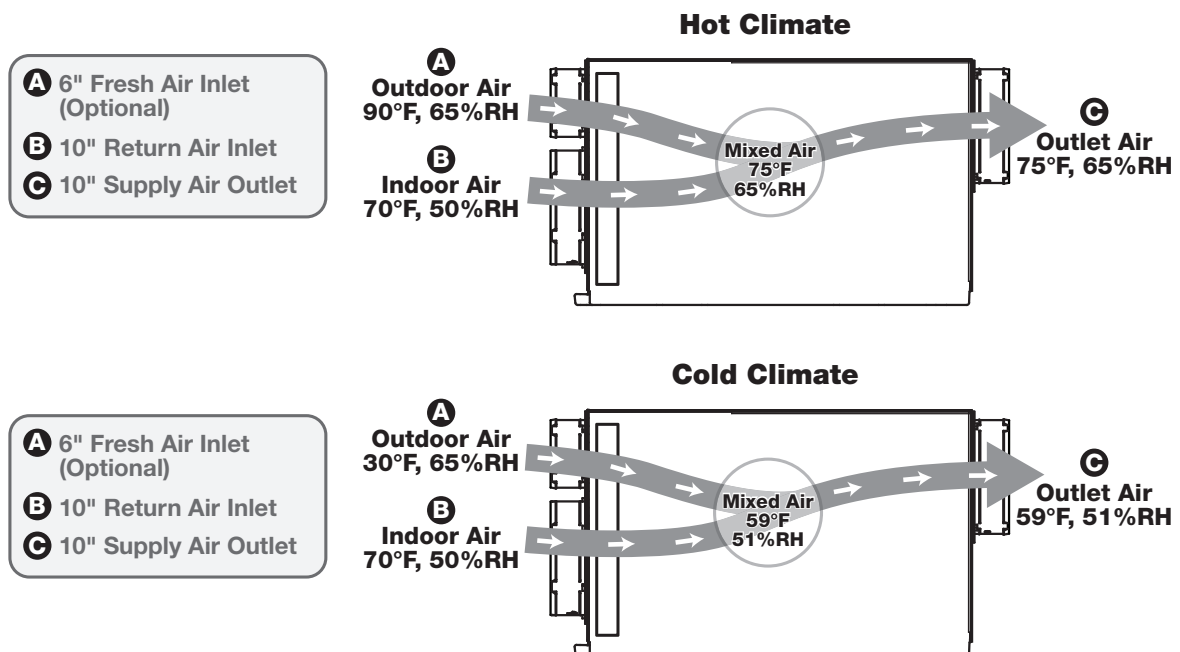
Fresh air ventilation is optional.

Fresh air may be brought into the structure by connecting an insulated duct from outside the structure to the 6" inlet of the Ultra Aire Dehumidifier. A ventilation control is needed to program the time and frequency that the unit introduces outside air. The time and frequency of ventilation should be based on the size and occupancy of the residence.

- The fresh air ventilation duct should be connected to the 6" round collar on the front of the Ultra Aire Dehumidifier.
- An insulated 6" diameter duct can provide up to 75 CFM of outside air.
- If a motorized damper is not being used, fresh air is controlled by the manual damper in the 6" collar of the Ultra Aire dehumidifier.
- Performance of the Ultra Aire Dehumidifier can be impacted by inside and outside air conditions.
- When a 6" motorized damper is used, a digital control is required.
- It may be necessary to use 8" duct work if additional fresh air is required.
- In cold climates or at times when the dew point is low, ventilation can be used to dehumidify the structure, making the Ultra Aire Dehumidifier capable of year-round drying.

## Fresh Air Ventilation With Dehumidifier Off and Fan Only Operation

Outside air mixes with the dehumidifier's return air before being supplied to the home. Outside temperature, inside temperature and relative humidity will impact the combined outlet air conditions.



Note: Temperature and relative humidity may vary depending on duct distribution scheme.

# FRESH AIR VENTILATION

## Determine Ventilation Requirements

The MINIMUM ventilation requirement is calculated using ASHRAE 62.2-2016. Use one or both of the options below to determine your ventilation requirement. Follow all local and national building and safety codes.

### Option 1: Calculating Airflow Requirement Using ASHRAE 62.2-2016 Airflow Equation

ASHRAE Airflow in CFM = [House Area in Sq.Ft. x 0.03] + [(Number of Bedrooms + 1) x 7.5]

**NOTE:** Use 'Number of Bedrooms + 1' or 'Number of Occupants', whichever is larger.

#### Example 1: Number of Bedrooms + 1

1800 square foot house with 3 bedrooms, 4 occupants =  $[1800 \times 0.03] + [(3+1) \times 7.5] = 84$  CFM

#### Example 2: Number of Occupants

1800 square foot house with 3 bedrooms, 5 occupants =  $[1800 \times 0.03] + [5 \times 7.5] = 91.5$  CFM

Record the required CFM \_\_\_\_\_

### Option 2: Calculating Airflow Requirement Using Table 4.1 from ASHRAE 62.2-2016

Ventilation Air Requirements, CFM

Floor Area (ft <sup>2</sup> )	Number of Bedrooms				
	1	2	3	4	5
< 500	30	38	45	53	60
501 - 1000	45	53	60	68	75
1001 - 1500	60	68	75	83	90
1501 - 2000	75	83	90	98	105
2001 - 2500	90	98	105	113	120
2501 - 3000	105	113	120	128	135
3001 - 3500	120	128	135	143	150

Table 4.1 from ASHRAE 62.2-2016

Record the required CFM \_\_\_\_\_

# CONTROLS

A control must be used with the Ultra Aire Dehumidifier. Ultra Aire offers the DEH 3000 proprietary control. The DEH 3000 allows homeowners to monitor and control relative humidity and proper ventilation levels in their home. This control is also available with a remote sensing option.

**Note:** The DEH 3000 is sold separately and can be purchased through your local dealer or online. Other thermostats are compatible with the Ultra Aire Dehumidifier.

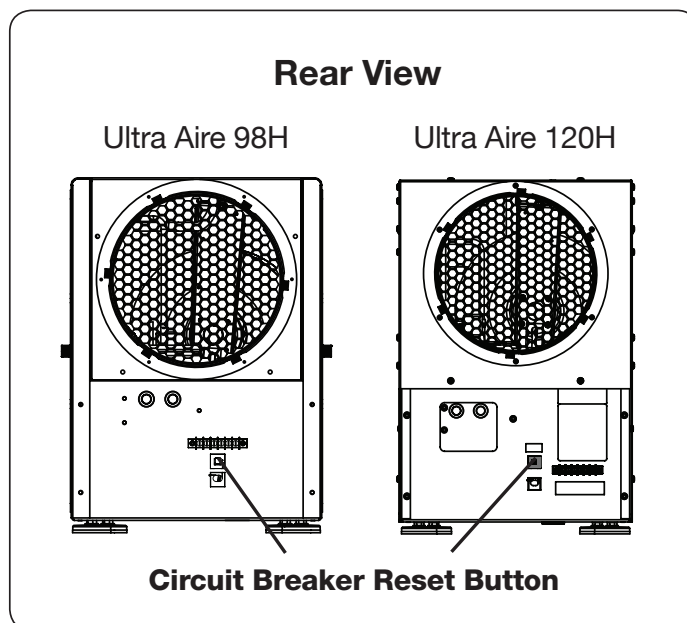
## Wiring Controls

### ⚠ CAUTION!

**DO NOT ALLOW THE 24V TERMINAL FROM THE ULTRA AIRE DEHUMIDIFIER TO CONTACT THE COM TERMINAL ON THE ULTRA AIRE DEHUMIDIFIER OR DAMAGE TO THE TRANSFORMERS WILL RESULT.**

### Circuit Breaker

To prevent damage to the 24 volt control transformer, the Ultra Aire Dehumidifier comes with a resettable circuit breaker. Check wiring for any electrical short and repair before resetting breaker. Resetting the circuit breaker without correcting the electrical short may result in transformer damage. Be sure to check the electrical schematic in this manual or inside the access panel of the Ultra Aire Dehumidifier before making any control connections. The reset button for the circuit breaker can be found on the back of the unit.



# CONTROLS

## Control Connections

The control and the Ultra Aire Dehumidifier are labeled to prevent confusion. Depending on the control, some of the screw terminals on the Ultra Aire Dehumidifier may not be used. Be sure to consult the electrical schematic in this manual or inside the access panel of the Ultra Aire Dehumidifier before making control connections.

A low voltage control must be used with the Ultra Aire Dehumidifier.

### Ultra Aire 98H Terminal Block Control Operation:

<b>COM</b>	<b>24VAC Power Transformer Neutral Side</b>
<b>FAN</b>	<b>Fan Control</b>
<b>24V</b>	<b>Transformer High Side</b>
<b>DEHU</b>	<b>Dehumidification (Fan and Compressor) Control</b>
<b>DMPR</b>	<b>24VAC Power Transformer Neutral Side</b>
<b>*</b>	<b>Spare Terminal (Open)</b>

### Ultra Aire 120H Terminal Block Control Operation:

<b>COM</b>	<b>24VAC Power Transformer Neutral Side</b>
<b>FAN</b>	<b>Fan Control</b>
<b>24V</b>	<b>Transformer High Side</b>
<b>DEHU</b>	<b>Dehumidification (Fan and Compressor) Control</b>
<b>FLOAT</b>	<b>External Low Voltage Float Switch or Water Sensor (Use Normally Closed Switch)</b>
<b>FLOAT</b>	<b>External Low Voltage Float Switch or Water Sensor (Use Normally Closed Switch)</b>

Between the COM lead and the 24V TERMINAL is a 40VA transformer. This low voltage power source powers the relay coils which control the fan and compressors. This 24VAC transformer can also be used to power HVAC accessories external to the dehumidifier.

<b>Compressor ON / Fan ON</b>	<b>Make contact between 24V and DEHU terminals</b>
<b>Compressor OFF / Fan ON</b>	<b>Make contact between 24V and FAN terminals</b>
<b>Power HVAC Accessory</b>	<b>Connect the accessory to the DMPR (OR COM) and 24V terminals</b>

NOTE: 18 gauge wire needed between the Ultra Aire Dehumidifier and the external control.

# AIR FILTRATION

The Ultra Aire Dehumidifier is equipped with a MERV-13 filter. The filter should be checked and replaced every three to six months. Operating the unit with a dirty filter will reduce dehumidifier capacity and efficiency.

DO NOT operate the unit without the recommended filter. Filter non-compliance voids the product warranty.

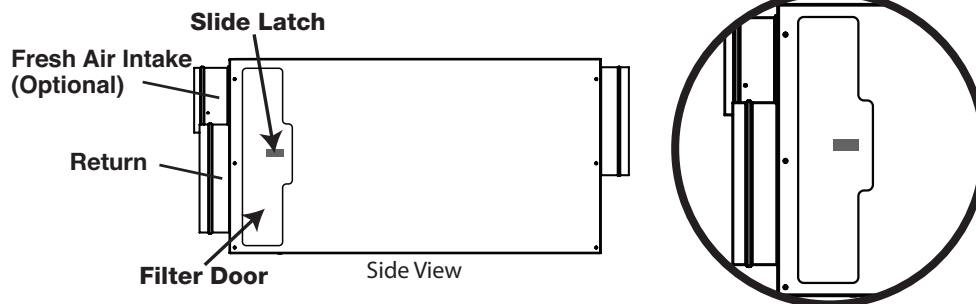
## ⚠ CAUTION!

MAKE SURE UNIT IS OFF BEFORE CHANGING THE FILTER.

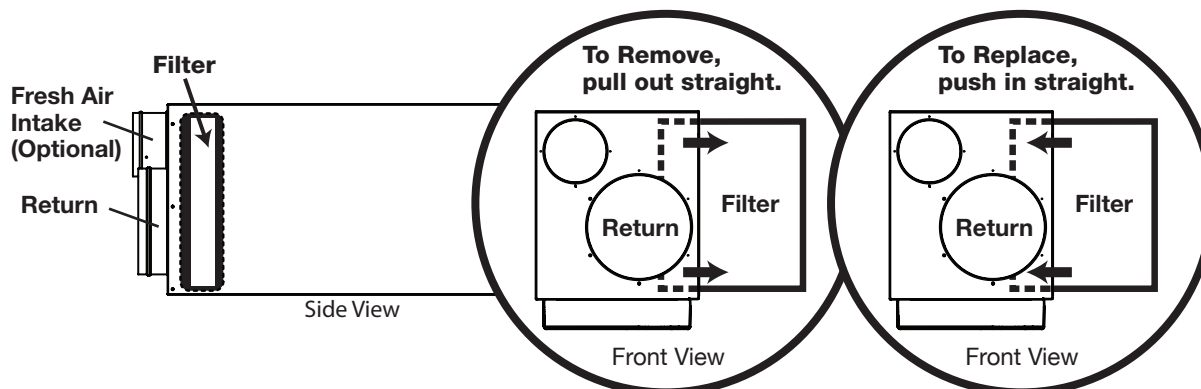
### Changing the Filter

For greatest filtration and efficiency of the Ultra Aire Dehumidifier, it is recommended the air filter be replaced every three to six months with a MERV-13 filter.

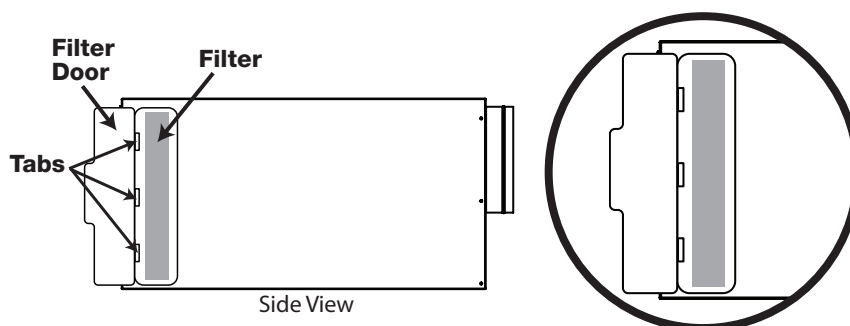
**Step 1:** Pull back slide latch to swing filter door open.



**Step 2:** Remove the filter by gently pulling it straight out of the unit. Insert new filter by gently pushing it straight into the unit. Make sure the AIR FLOW arrow on the filter is pointing into the unit.



**Step 3:** Insert filter door into tabs and swing door closed to lock the latch into place.



# AIR FILTRATION

## MERV Rating Chart

Standard 52.5 Minimum Efficiency Reporting Value	Dust Spot Efficiency	Arrestance	Typical Controlled Contaminant	Typical Applications and Limitations	Typical Air Filter/Cleaner Type
20	n/a	n/a	< 0.30 pm Particle Size	Cleanrooms	>99.999% eff. On .10-.20 pm Particles
19	n/a	n/a	Virus (unattached)	Radioactive Materials	Particles
18	n/a	n/a	Carbon Dust	Pharmaceutical Man.	Particulates
17	n/a	n/a	All Combustion Smoke	Carcinogenic Materials	>99.97% eff. On .30 pm Particles
16	n/a	n/a	.30-1.0 pm Particle Size	General Surgery	Bag Filter - Nonsupported
15	>95%	n/a	All Bacteria	Hospital Inpatient Care	microfine fiberglass or synthetic media, 12-36 in. deep, 6-12 pockets.
14	90-95%	>98%	Most Tobacco Smoke	Smoking Lounges	Box Filter - Rigid Style Cartridge Filters 6 to 12" deep may use lofted or paper media.
13	89-90%	>98%	Proplet Nuceli (Sneeze)	Superior Commercial Buildings	
12	70-75%	>95%	1.0-3.0 pm Particle Size Legionella	Superior Residential	Bag Filter - Nonsupported microfine fiberglass or synthetic media, 12-36 in. deep, 6-12 pockets.
11	60-65%	>95%	Humidifier Dust Lead Dust	Better Commercial Buildings	Box Filter - Rigid Style Cartridge Filters 6 to 12" deep may use lofted or paper media.
10	50-55%	>95%	Milled Flour Auto Emissions	Hospital Laboratories	
9	40-45%	>90%	Welding Fumes		
8	30-35%	>90%	3.0-10.0 pm Particle Size	Commercial Buildings	Pleated Filters - Disposable, extended surface area, thick with cotton-polyester blend media, cardboard frame.
7	25-30%	>90%	Mold Spores Hair Spray	Better Residential	Cartridge Filters - Graded density viscous coated cube or pocket filters, synthetic media.
6	<20%	85-90%	Fabric Protector Dusting Aids	Industrial Workplace	Throwaway - Disposable synthetic panel filter.
5	<20%	80-85%	Cement Dust Pudding Mix	Paint Booth Inlet	
4	<20%	75-80%	>10.0 pm Particle Size	Minimal Filtration	Throwaway - Disposable fiberglass or synthetic panel filter.
3	<20%	70-75%	Pollen Dust Mites	Residential	Washable - Aluminum Mesh.
2	<20%	65-70%	Sanding Dust Spray Paint Dust		Electrostatic - Self charging woven panel filter.
1	<20%	<65%	Textile Fibers Carpet Fibers	Window A/C Units	


Table Data Source: United States Environmental Protection Agency

# SERVICE

## Troubleshooting

### CAUTION!


TROUBLESHOOTING SHOULD BE PERFORMED BY A QUALIFIED HVAC TECHNICIAN.

Symptom	Possible Reason	Troubleshooting Procedure
Neither fan nor compressor running. Dehumidification is being called for.	<ol style="list-style-type: none"> <li>1. Dehumidifier unplugged or no power to outlet.</li> <li>2. Humidity control set too high.</li> <li>3. Loose connection in internal or control wiring.</li> <li>4. Defective compressor relay.</li> <li>5. Defective control transformer.</li> <li>6. Open circuit between FLOAT terminals.</li> </ol>	<div>  <b>WARNING!</b>  <b>ELECTRICAL SHOCK HAZARD:</b>  <b>ELECTRICAL POWER MUST BE PRESENT TO PERFORM SOME TESTS. THESE TESTS SHOULD BE PERFORMED BY A QUALIFIED SERVICE PERSON.</b> </div> <p><b>Troubleshooting Procedure for Control Related Issues</b></p> <p>This method of diagnosis will test the 3 main components of the control circuit individually to indicate any potential problems. This is to be used when the control will not activate the main unit.</p> <ol style="list-style-type: none"> <li>1. Detach field control wiring connections from the terminals on the main unit.</li> <li>2. Connect the 24V and FAN terminals together; only the fan should run. Disconnect the terminals.</li> <li>3. Connect the 24V and DEHU terminals together; fan and compressor should run. Disconnect the terminals.</li> <li>4. If this test works, the main unit is working correctly from a control standpoint.</li> <li>5. Reconnect field control wiring to the terminals on the main unit.</li> <li>6. Remove the control panel cover and detach the field wiring from the control connections.</li> <li>7. Connect the 24V and FAN terminals together; only the fan should run. Disconnect the terminals.</li> <li>8. Connect the 24V and DEHU terminals together; fan and compressor should run. Disconnect the terminals.</li> <li>9. If this test works, then the field control wiring is ok.</li> <li>10. If the problem persists, then the control is most likely faulty.</li> </ol>
Compressor is not running. Dehumidification is being called for. Fan is running.	<ol style="list-style-type: none"> <li>1. Defective compressor run capacitor.</li> <li>2. Loose connection in compressor circuit.</li> <li>3. Defective compressor overload.</li> <li>4. Defective compressor.</li> <li>5. Defrost thermostat open.</li> </ol>	
Compressor cycles on and off. Dehumidification is being called for.	<ol style="list-style-type: none"> <li>1. Low ambient temperature and/or humidity causing unit to cycle through defrost mode.</li> <li>2. Defective compressor overload.</li> <li>3. Defective compressor.</li> <li>4. Defrost thermostat defective.</li> <li>5. Dirty air filter(s) or air flow restricted.</li> <li>6. Defective fan or relay.</li> </ol>	



# SERVICE

## Troubleshooting (Continued)


Symptom	Possible Reason	Troubleshooting Procedure
Fan is not running. Dehumidification or fan is being called for.	<ol style="list-style-type: none"> <li>1. Loose connection in fan circuit.</li> <li>2. Obstruction prevents fan impeller rotation.</li> <li>3. Defective fan.</li> <li>4. Defective fan relay.</li> </ol>	<div>  <b>WARNING!</b>  <b>ELECTRICAL SHOCK HAZARD:</b>  <b>ELECTRICAL POWER MUST BE PRESENT TO PERFORM SOME TESTS. THESE TESTS SHOULD BE PERFORMED BY A QUALIFIED SERVICE PERSON.</b> </div>
Low dehumidification capacity (evaporator is frosted continuously). Dehumidification is being called for.	<ol style="list-style-type: none"> <li>1. Defrost thermostat loose or defective.</li> <li>2. Low refrigerant charge.</li> <li>3. Dirty air filter(s) or air flow restricted.</li> <li>4. Excessively restrictive ducting connected to unit.</li> </ol>	<p><b>Troubleshooting Procedure for Performance Related Issues</b></p> <p>This method of diagnosis is used to function check the internal components in the dehumidifier. This is to be used when a performance issue is suspected.</p> <ol style="list-style-type: none"> <li>1. Set the humidity controller all the way to the most humid setting or off position – Did the unit shut off?</li> <li>2. If yes, turn the fan setting to the ON position – does the fan start?</li> <li>3. If fan starts, leave in the fan ON position and set the humidity all the way to driest setting. May have to wait 5 minutes for the compressor to start.</li> <li>4. Listen for a distinct buzzing/humming sound of a compressor starting up – do you hear this noise?</li> <li>5. If compressor is running and continues to run, after about 15 minutes you should feel a slight increase in air temperature being discharged out of the discharge air side of the unit.</li> <li>6. If so, depending on your environmental conditions (temp/Rh%), you should see some water production out of the hose within 30 minutes or so. (<i>Note: If the room temperature is 55 degrees or below and/or in area of low relative humidity, the dehumidifier will produce little to no water.</i>)</li> <li>7. Collecting the water removed in a 24 hour period will give a measurement of performance.</li> </ol>
No ventilation. Ventilation is being called for.	<ol style="list-style-type: none"> <li>1. Loose connection in ventilation control circuit.</li> <li>2. Loose connection in damper power circuit.</li> <li>3. Defective fresh air damper.</li> </ol>	
Dehumidifier removes some water, but not as much as expected.	<ol style="list-style-type: none"> <li>1. Air temperature and/or humidity have dropped.</li> <li>2. Humidity meter and or thermometer used are out of calibration.</li> <li>3. Unit has entered defrost cycle.</li> <li>4. Dirty air filter(s) or air flow is restricted.</li> <li>5. Defective defrost thermostat.</li> <li>6. Low refrigerant charge.</li> <li>7. Air leak such as loose cover or ducting leaks.</li> <li>8. Defective compressor.</li> <li>9. Restrictive ducting.</li> </ol>	

# SERVICE

## Troubleshooting (Continued)

### CAUTION!

TROUBLESHOOTING SHOULD BE PERFORMED BY A QUALIFIED HVAC TECHNICIAN.

Symptom	Possible Reason	Troubleshooting Procedure
Control not powering dehumidifier.	<ol style="list-style-type: none"> <li>1. No power to dehumidifier.</li> <li>2. 24 volt circuit breaker tripped or faulty transformer.</li> <li>3. Loose or missed wired control wires at humidity control.</li> <li>4. Loose or missed wired control wires at unit.</li> <li>5. Humidity control defective.</li> </ol>	<div>  <b>WARNING!</b>  <b>ELECTRICAL SHOCK HAZARD:</b>  <b>ELECTRICAL POWER MUST BE PRESENT TO PERFORM SOME TESTS. THESE TESTS SHOULD BE PERFORMED BY A QUALIFIED SERVICE PERSON.</b> </div> <ol style="list-style-type: none"> <li>1. Verify power to the unit at power outlet.</li> <li>2. Look for short in control wiring.</li> <li>3. Check wire connections at control and unit.</li> <li>4. Reset circuit breaker button on dehumidifier.</li> </ol>

## Refrigerant Charging

### WARNING!

**SERVICING THE ULTRA AIRE DEHUMIDIFIER WITH ITS HIGH PRESSURE REFRIGERANT SYSTEM AND HIGH VOLTAGE CIRCUITRY PRESENTS A HEALTH HAZARD WHICH COULD RESULT IN DEATH, SERIOUS BODILY INJURY, AND/OR PROPERTY DAMAGE. SERVICE MUST BE PERFORMED BY A QUALIFIED SERVICE TECHNICIAN.**

If the refrigerant charge is lost due to service or a leak, the leak should be repaired and a new charge must be accurately weighed in. If any of the old charge is left in the system, it must be recovered before weighing in the new charge. Refer to the unit nameplate for the correct charge weight and refrigerant type.

# WARRANTY

**Limited Warranty.** Therma-Stor, LLC (“Therma-Stor”) warrants as follows: (i) the Ultra Aire dehumidifier dehumidifier (“Product”) will be free of material defects in workmanship or materials for a period of two (2) years (“Two-Year Warranty”) following the date of initial purchase of such Product by an original customer purchasing from Therma-Stor or an authorized reseller (“Customer”); and (ii) the Product’s components will be free of material defects in workmanship or materials for a period of **six (6) years** following the date of initial purchase of such Product by a Customer.

**Limitation of Remedies.** CUSTOMER’S SOLE AND EXCLUSIVE REMEDY UNDER THE ABOVE LIMITED WARRANTY AND THERMA-STOR’S ENTIRE LIABILITY THEREUNDER, SHALL BE, AT THE SOLE OPTION OF THERMA-STOR, REPLACEMENT OR REPAIR OF SUCH PRODUCT OR ITS COMPONENTS (“COMPONENTS”) BY THERMA-STOR OR THERMA-STOR’S AGENTS ONLY. REFRIGERANT, PIPING, SUPPLIES, TRANSPORTATION COSTS, LABOR COSTS INCURRED IN REPAIR OR REPLACEMENT OF SUCH COMPONENTS ARE NOT INCLUDED. THIS DISCLAIMER AND EXCLUSION SHALL APPLY EVEN IF THE EXPRESS WARRANTY AND LIMITED REMEDY SET FORTH HEREIN FAILS OF ITS ESSENTIAL PURPOSE. CUSTOMER ACKNOWLEDGES THAT NO REPRESENTATIVE OF THERMA-STOR OR OF ITS AFFILIATES OR RESELLERS IS AUTHORIZED TO MAKE ANY REPRESENTATION OR WARRANTY ON BEHALF OF THERMA-STOR OR ANY OF ITS AFFILIATES OR RESELLERS THAT IS NOT IN THIS AGREEMENT. Notwithstanding the above, during the term of the Two-Year Warranty only, Therma-Stor will provide, free of charge to Customer, all Components and labor (except costs related to removal and installation of Product) required to fulfill its obligations under such Two-Year Warranty.

**Disclaimer of Warranties.** EXCEPT FOR ABOVE LIMITED WARRANTY, WHICH IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED WITH RESPECT TO THE PRODUCT AND ITS COMPONENTS, THERMA-STOR HEREBY DISCLAIMS ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

**Warranty Limitations.** The foregoing limited warranty extends only to a Customer and shall be null and void upon attempted assignment or transfer. A “defect” under the terms of the limited warranty shall not include problems resulting from Customer’s or Customer’s employees’, agents’, invitees’ or a third party’s misuse, improper installation, improper design of any system in which the Product is included, abuse, lack of normal care, failure to follow written instructions, tampering, improper repair, or freezing, corrosion, acts of nature or other causes not arising out of defects in Therma-Stor’s workmanship or material. If a Product or Component is replaced while under warranty, the applicable limited warranty period shall not be extended beyond the original warranty time period. The limited warranty does not cover any costs related to changes to a Product or Component that may be required by any codes, laws, or regulations that may become effective after initial purchase of the Product by Customer.

**Customer Responsibilities.** As a further condition to obtaining warranty coverage hereunder, the Customer must send a valid warranty claim to Therma-Stor such that Therma-Stor receives such claim prior to the end of the applicable warranty period. Therma-Stor shall have no obligation hereunder with respect to any claim received by Therma-Stor after the expiration of the applicable warranty period. As a further condition to obtaining warranty coverage hereunder, the Customer must present forms of invoices evidencing proof of purchase of a Product. If such invoices do not clearly indicate the date of initial purchase by a Customer, the applicable Product’s date of manufacture will be used instead of the date of initial purchase for the purpose of calculating the commencement of the applicable warranty period. Warranty service must be performed by Therma-Stor or a servicer authorized by Therma-Stor. In order to obtain warranty service, the Customer should call Therma-Stor at 1-800-533-7533 and ask for the Therma-Stor Products Service Department, which will then arrange for applicable warranty service. Warranty service will be performed during customary, daytime working hours. If the Product must be shipped for service, Customer shall be solely responsible for properly packaging the Product, for all freight charges, and for all risk of loss associated with shipment.

**Limitation of Liability.** IN NO EVENT SHALL THERMA-STOR, IN CONNECTION WITH THE DESIGN, SALE, INSTALLATION, USE, REPAIR, REPLACEMENT OR PERFORMANCE OF ANY PRODUCT, COMPONENT, PART THEREOF OR WRITTEN MATERIAL PROVIDED THEREWITH, BE LIABLE, TO THE EXTENT ALLOWED UNDER APPLICABLE LAW, UNDER ANY LEGAL THEORY FOR ANY SPECIAL, DIRECT, INDIRECT, COLLATERAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. NOTWITHSTANDING THE ABOVE LIMITATIONS AND WARRANTIES, THE SOLE AND EXCLUSIVE LIABILITY OF THERMA-STOR, REGARDLESS OF THE NATURE OR THEORY OF THE CLAIM, SHALL UNDER NO CIRCUMSTANCES EXCEED THE PURCHASE PRICE OF THE PRODUCT, COMPONENT OR PART UPON WHICH THE CLAIM IS PREMISED.

**Applicable Law and Venue.** ANY ARBITRATION, ENFORCEMENT OF AN ARBITRATION OR LITIGATION RELATED TO THE PRODUCT WILL BE BROUGHT EXCLUSIVELY IN DANE COUNTY, WISCONSIN, AND CUSTOMER CONSENTS TO THE JURISDICTION OF THE FEDERAL AND STATE COURTS LOCATED THEREIN, SUBMITS TO THE JURISDICTION THEREOF AND WAIVES THE RIGHT TO CHANGE VENUE. CUSTOMER FURTHER CONSENTS TO THE EXERCISE OF PERSONAL JURISDICTION BY ANY SUCH COURT WITH RESPECT TO ANY SUCH PROCEEDING.

**Miscellaneous.** If any term or condition of this Limited Warranty is found by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable, the same shall not affect the other terms or conditions hereof or thereof or the whole of this Limited Warranty. Any delay or failure by Therma-Stor to exercise any right or remedy will not constitute a waiver of Therma-Stor to thereafter enforce such rights.



**ULTRA-AIRE**™  
DEHUMIDIFIERS

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