Model 1870F Dehumidifier
Installation and Operating Manual

ON/OFF button used to turn dehumidifier on and off

Up/Down buttons used to change humidity setting

Dehumidifer Control

Outlet

MODE button used for optional ventilation feature

Drain

Power Switch

Inlet

Filter Access Door

SAFETY INSTRUCTIONS

⚠ WARNING

1. 120 Volts may cause serious injury from electric shock. Disconnect electrical power before starting installation or servicing. Leave power disconnected until installation/service is completed.
2. Dropping may cause personal injury or equipment damage. Handle with care and follow installation instructions.

⚠ CAUTION

1. Read all instructions before beginning installation.
2. Improper installation may cause property damage or injury. Read instructions before installation, service or maintenance.
3. Do not use in pool applications. Pool chemicals can damage the dehumidifier.
4. Do not use solvents or cleaners on or near the circuit board. Chemicals can damage circuit board components.
5. Wait 24 hours before running the unit if it was not shipped or stored in the upright position
6. Do not use dehumidification to prevent window condensation in the winter. To address window condensation, use ventilation to lower indoor humidity in the winter.

READ AND SAVE THESE INSTRUCTIONS

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SPECIFICATIONS

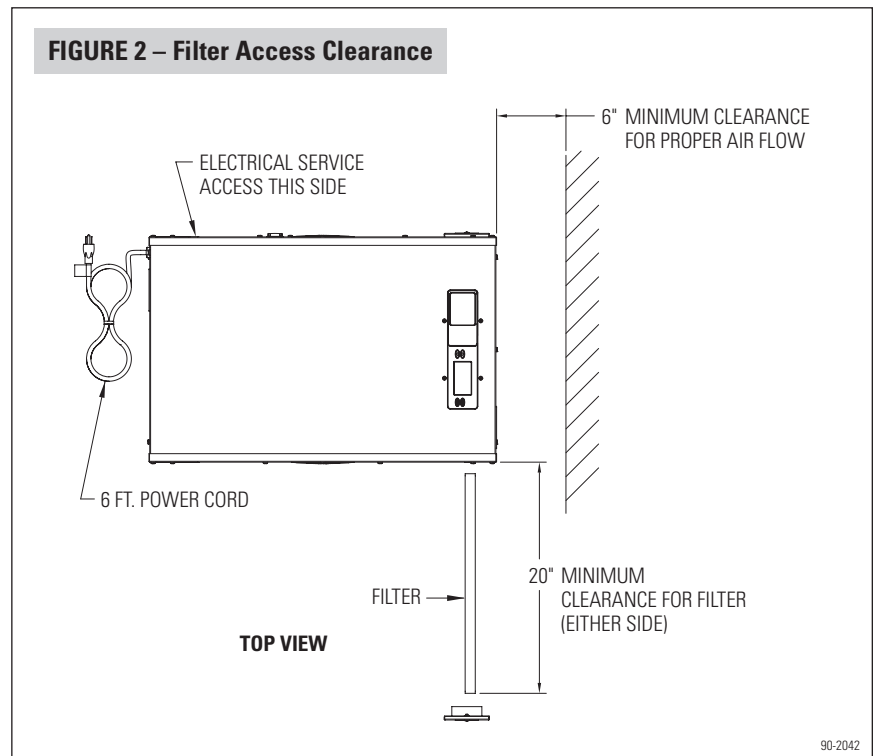|	Model 1870F
Weight	114 lbs.
Capacity AHAM DH-1-2008 80°F, 60% RH Conditions	130 pints per day @ 310 CFM
Power 115 VAC, Single Phase, 60Hz	8.3A operating current
Dehumidifier Inlet Air Conditions	Dehumidification: 50°F – 104°F, 40°F dew point minimum Ventilation: 40°F – 140°F, 0%RH – 99%RH (non-condensing)
Filter	MERV 8, washable
Airflow	310 CFM

SET UP DEHUMIDIFIER FOR INSTALLATION

⚠ **IMPORTANT:** Cut the strap securing the compressor shipping support bracket and remove the strap, shipping bracket screws, and bracket. See **Figure 1**.

FIGURE 1 – Remove Shipping Bracket

REMOVE SHIPPING BRACKET

CUT OFF PLASTIC STRAP

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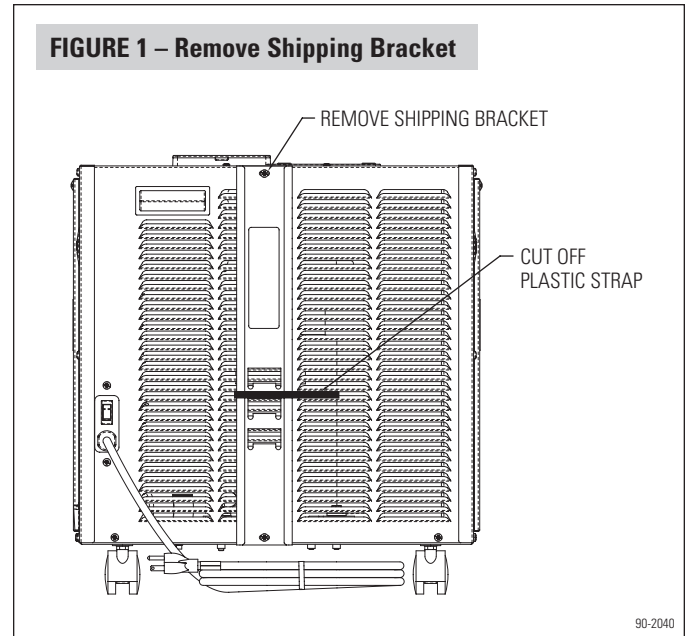
LOCATION CONSIDERATIONS

• Allow sufficient clearance for filter removal and to prevent airflow obstruction

• Electrical service access will require the removal of the side panel shown. Allow sufficient space for service on this side of the unit.

• If locating the unit in an attic or crawl space, a Model 76 Control mounted in the living space is recommended. Refer to Model 76 Installation Instructions and Owner's Manual.

• Always install the dehumidifier in a condensate pan when locating in or over a finished space.

FIGURE 2 – Filter Access Clearance

6" MINIMUM CLEARANCE FOR PROPER AIR FLOW

ELECTRICAL SERVICE ACCESS THIS SIDE

6 FT. POWER CORD

FILTER

20" MINIMUM CLEARANCE FOR FILTER (EITHER SIDE)

TOP VIEW

90-2042

DRAIN INSTALLATION

The drain outlet on the dehumidifier can be hard piped using 3/4" nominal drain tubing or the provided fitting and 1/2" clear PVC tubing can be used to drain the dehumidifier. Always maintain a constant downward slope from the dehumidifier to the drain and do not allow soft tubing to curl up which may result in air lock. **NOTE:** Always use PVC primer and cement when connecting PVC drain line or the provided fitting to the dehumidifier drain outlet.
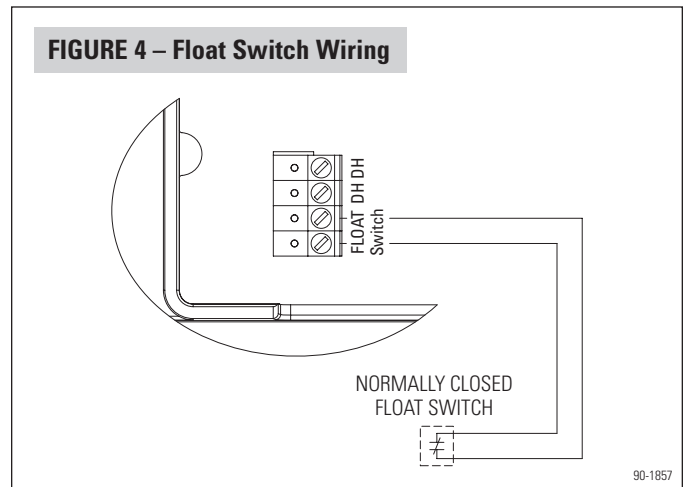
LEVELING

A level surface is required to ensure proper drainage from the dehumidifier.

CONDENSATE PAN, CONDENSATE PUMP AND FLOAT SWITCH

Always install the dehumidifier in a condensate pan when locating in or above a finished space. Adhere to local codes regarding draining of the condensate pan. If a condensate pump is needed, install it in the condensate pan as well.

Install a condensate overflow safety switch (i.e. float switch) in the condensate pan, remove the factory installed jumper wire between the Float Switch terminals on the control and wire the float switch to the dehumidifier as shown in **Figure 4**. Overflow safety switches on condensate pumps can be wired to the Float Switch terminals in a similar fashion.

FIGURE 4 – Float Switch Wiring

FLOAT DH DH Switch

NORMALLY CLOSED FLOAT SWITCH

90-1857

SETTING THE DESIRED HUMIDITY LEVEL

1. Press the ON/OFF button to turn the dehumidifier control ON. The display will show the current setting, and the dehumidifier blower will turn on to start sampling the air.

2. The UP and DOWN arrow buttons allow the humidity level to be set from 40% to 80% relative humidity. Use the ON/OFF button to turn the dehumidifier ON or OFF.

Set the control at 55%RH when first installed. Allow the dehumidifier to run until it reaches the setting before deciding if you want to change the setting.

- **If you prefer the air to be more dry,** decrease the humidity setting.

- **If you prefer the air to be less dry,** increase the humidity setting.

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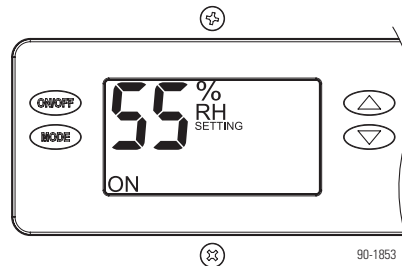
Your comfort is the best measure of how to adjust your setting. When first installed, your dehumidifier has to remove all the moisture that is initially in your home. The home acts like a sponge so the moisture in the materials of your home is at the same level as the air. After drying the air, the materials of the home will release moisture back into the air until they are again at the same level. As a result, it is not uncommon for the dehumidifier to operate for an extended period when first installed.

3. After three (3) minutes of sampling, the measured humidity will be compared to the setting:

   a. If the humidity is above the setting, the dehumidifier compressor turns on and "AIR SAMPLING" will be replaced by "DEHUMIDIFYING". The compressor remains on until the measured humidity falls 3% RH below the setting.

   b. If the measured humidity is below the setting, the blowers turn off and the display returns to showing the RH setting.

4. The dehumidifier will sample again every 60 minutes, or at any time if the humidity setting is lowered.

Your dehumidifier is equipped with two features that protect against unwanted energy consumption. Defrost is a normal operating mode that helps to prevent significant ice formation on the refrigeration system coil. The dehumidifier display will show "DEFROSTING" when operating in this mode. This mode can occur when there is not enough air moving through the dehumidifier or if the temperature and/or humidity of the incoming air is too low. The second protection feature is the E8 code. E8 on the dehumidifier display indicates that the air entering the dehumidifier is below 50°F or above 104°F, or the dew point of the incoming air is below 40°F. There would be a significant reduction in dehumidifier efficiency if the dehumidifier operated outside of these conditions. Low dew point conditions can be seen in some basements or crawl spaces and usually occur in the Winter and Spring months. The dehumidifier continues to monitor the incoming air and when the conditions are within the operating range, E8 will be removed from the display and dehumidification will begin as needed.

MAINTENANCE

CLEAN OR REPLACE THE AIR FILTER

After initial installation the air filter should be checked and cleaned every 6 months.
The CLEAN FILTER service reminder will display on the on-board control screen every 6 months.
To clear the service message, press the UP and DOWN arrows simultaneously for 3 seconds.

Filter Cleaning Procedure

1. Turn the ON/OFF switch OFF.

2. Remove the filter access door from either side of the dehumidifier.

3. Slide the filter out of the dehumidifier.

4. Flush the filter with warm water and a mild detergent solution.

5. Shake off the excess water from the filter.

6. Replace the filter, making sure the filter is secured in both the top and bottom filter rails.

7. Replace the filter access door.

8. Turn the ON/OFF switch ON.

9. Press the UP and DOWN buttons simultaneously for 3 seconds to clear the service message.
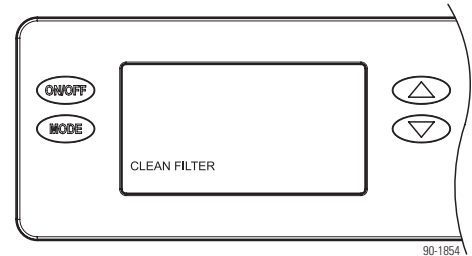
CHECK THE DRAIN

The drain should be checked annually to ensure there are no blockages or air lock in the drain system. If the unit is not draining properly, have it checked by a qualified service professional.


⚠ **CAUTION**

Do not use spray solvents or cleaners on or near the inlet side of the dehumidifier.
If desired, apply cleaner to a cloth and use to clean the cabinet.

MODEL 76 – EXTERNAL CONTROL OR CRAWL SPACE/SEALED ATTIC CONTROL AND WIRING

When the dehumidifier is located in a crawl space, sealed attic, or other hard to access area, a Model 76 can be installed in the living space and will operate as a remote control. Refer to the Model 76 Installation Instructions and Owner's Manual for installation and operating instructions.

NOTE: Use 18-22 AWG wire for control wiring.

Model 76 Control
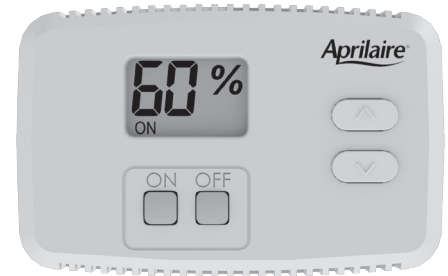
TROUBLESHOOTING

Technical Support is available Monday through Friday, 7:00 a.m. to 5:00 p.m. CST, at (800) 334-6011. Use the guides on the following pages to identify and correct system faults. Contact Technical Support before replacing the unit or any components and for additional troubleshooting.

DIAGNOSTIC CODES

When an error occurs, the Diagnostic Code along with SERVICE REQUIRED will be displayed on the control screen.
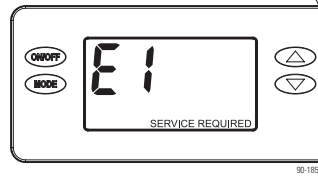
| TABLE 1 – Diagnostic Codes			
Diagnostic Code	Failure Mode	Action	Reset
E1	Internal Humidity or Temperature Sensor Open or Shorted	1. Check the connection between the sensor board and control board. 2. If connection okay, replace sensor board, Part No. 5460.	Cycle Power
E2	High Refrigeration Pressure	1. Verify that the fan works, and that there is nothing restricting air flow. 2. If the fault persists, call Technical Support.	Cycle Power
E3	Model 76 Remote Control Communication Loss	1. Check connections between Model 76 and dehumidifier control board. Terminals should be fully inserted and secured in the control board and Model 76 control terminals. 2. If connections are correct and secure, turn off the dehumidifier and remove the Model 76. Use a short section of 4-wire cable to reconnect the Model 76 to the control board. Turn the dehumidifier back on and increase the dryness level setting on the Model 76. If the dehumidifier turns on, the problem is with the wiring between the dehumidifier and control. 3. If the dehumidifier does not turn on, call Technical Support.	Self-Correcting
E4	Insufficient Capacity	1. Check the frost sensor connection at the power board. Terminal should be fully seated on the power board pins. 2. Remove the side access panel and verify that the sensor is secured to the suction line. 3. If the sensor is connected and secured to the refrigeration line proceed to the next step. 4. Reset the fault by cycling power to the dehumidifier. 5. Turn the humidity setting down (below room/home humidity level) to make a dehumidification call. 6. Allow the fan and compressor to run for approximately 10-15 minutes and then enter diagnostic test mode by simultaneously pressing the UP ARROW and MODE buttons for 3 seconds. The LCD will display the temperature measured by the internal sensor while also displaying AIR SAMPLING and ON, the humidity measured by the internal sensor while also displaying %RH and ON, and the frost sensor temperature while also displaying ON. Scroll through these values and by using the UP/DOWN arrow buttons. 7. Record values and call Technical Support.	Cycle Power
E5	High Temperature Thermistor Failure	1. Check the high temperature sensor connection at the power board. Terminal should be fully seated on the power board pins. 2. Remove the side access panel and verify the sensor is not damaged and connected to the refrigeration line coming from the compressor. 3. If the sensor is connected and secured to the refrigeration line, it may need to be replaced with Part No. 5456 – contact Technical Support to confirm.	Cycle Power
E6	Low Temperature Thermistor Failure	1. Check the low temperature sensor connection at the power board. 2. Remove the side access panel and verify the sensor is not damaged and connected to the suction line. 3. If the sensor is connected and secured to the refrigeration line, it may need to be replaced with Part No. 5455 – contact Technical Support to confirm.	Cycle Power

TROUBLESHOOTING (CONTINUED)

TABLE 1 – Diagnostic Codes (continued)			
Diagnostic Code	**Failure Mode**	**Action**	**Reset**
E7	Float Switch Open	1. Empty the condensate pan. 2. Check the float switch connection at the control board. 3. If not using a float switch, verify jumper is between float switch terminals on dehumidifier control board. 4. If the problem persists, replace the float switch.	Self-Correcting
E8	Inlet Air Temperature Out of 50°F – 104°F range, or dew point below 40°F	1. If temperature is out of range, no action, normal operation. 2. If air temperature is between 50°F – 104°F with a dewpoint above 40°F, contact Technical Support.	Self-Correcting

TABLE 2 – Troubleshooting Guide		
Symptom	**Possible Reason**	**Troubleshooting Procedure**
Dehumidifier does not turn on/run.	No power to unit.	• Check that the dehumidifier is plugged in. • Check that the power switch is turned ON. • Check that the control is turned ON. • Check that the circuit breaker has not tripped.
Dehumidifier blower is running but with little or no airflow.	Pressure drop across dehumidifier is higher than 0.6"w.c.	• Check dehumidifier air filter and wash or replace.
Dehumidifier blower is running but compressor is not.	Float switch open.	• If float switch installed, check connections at control board and empty condensate pan. • If no float switch installed check that the jumper is installed at the float switch terminals on the control board.
	Coil frosting.	• Lack of or reduced airflow. Check dehumidifier air filter and wash or replace. • Check that there is nothing blocking the inlet or outlet of the dehumidifier. • Inlet air conditions below 60°F. Increase the humidity setting.
	Inlet air temperature is outside of the 50°F – 104°F range or the dew point is below 40°F and there is a demand for dehumidification.	• No action. The compressor will not run if inlet conditions are out of range.
Dehumidifier is not draining properly.	Drain line blocked or unit not level.	• Verify that the unit is level. • Check the drain line blockages and for a continuous downward slope.
Dehumidifier is producing hot air.	Normal function.	• Air is reheated across the condenser coil, resulting in a temperature rise between inlet and outlet.

SERVICE PARTS
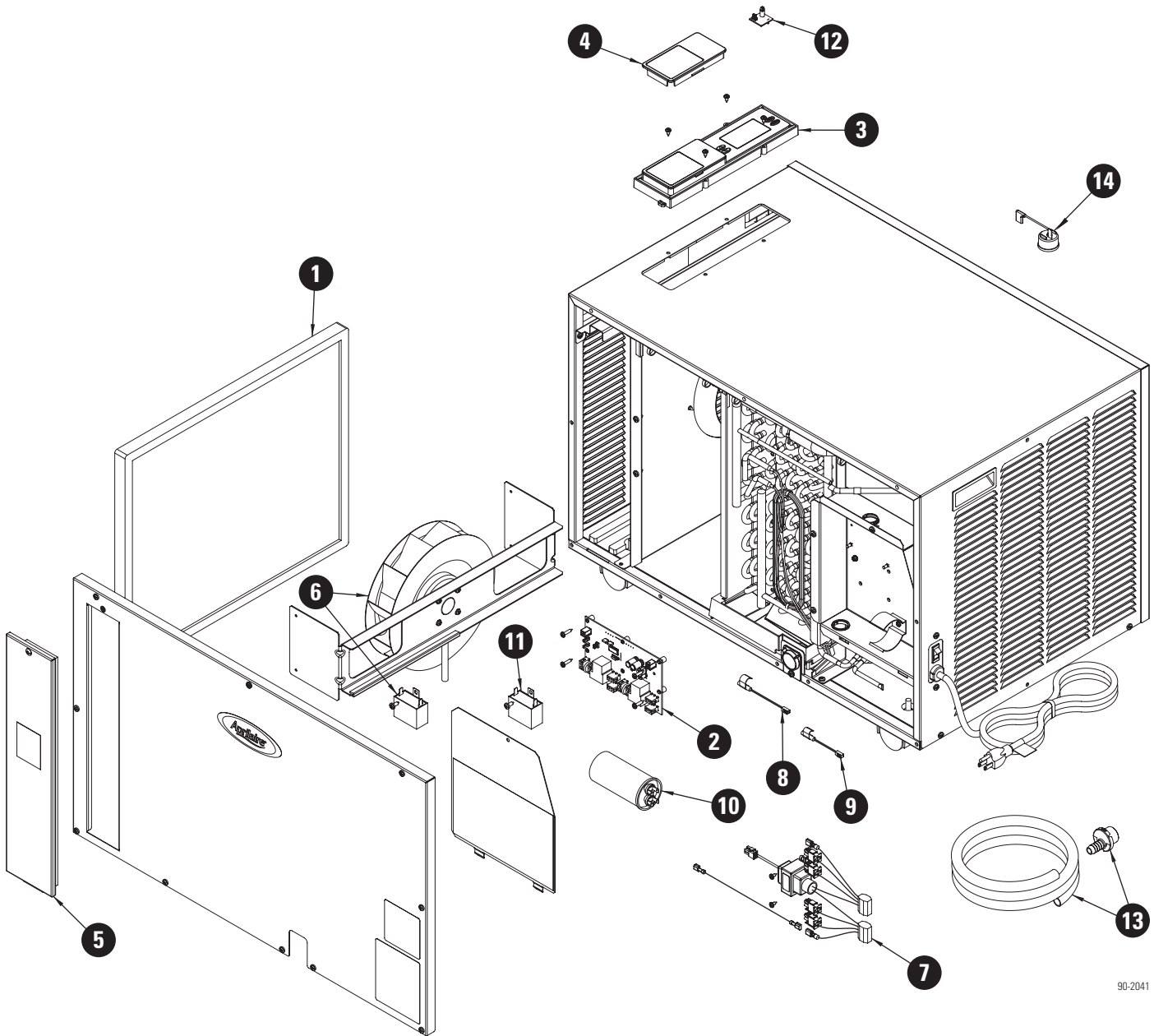
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No.	Part Description	Part No.
1	Filter, 16" x 19" x 1" EZK	5570
2	Internal Control Board, Deh	5444
3	User Interface Assembly, Deh	5445
4	Wiring Access Door, AA Deh	5446
5	Door, Filter Access, AA Deh	5571
6	Fan, 130pt Deh, with 8MFD Capacitor	5588
7	Wire Harness, Power, Deh	5454

No.	Part Description	Part No.
8	Sensor, Low Temperature, Deh	5455
9	Sensor, High Temperature, Deh	5456
10	Capacitor, 50MFD, 370VAC, (compressor)	5594
11	Capacitor, 8MFD, 450VAC, Deh, (fan)	5459
12	RH Sensor, Deh	5460
13	Drain Tube + Fittings	5585
14	Compressor Overload Switch	5574

LIMITED WARRANTY

Your Research Products Corporation Aprilaire® Dehumidifier is expressly warranted for five (5) years from date of installation to be free from defects in materials or workmanship.

Research Products Corporation's exclusive obligation under this warranty shall be to supply, without charge, a replacement for any component which is found to be defective within such five (5) year period and which is returned not later than thirty (30) days after said five (5) year period by you to either your original supplier or to Research Products Corporation, Madison, Wisconsin 53701, together with the model number and installation date of the dehumidifier.

THIS WARRANTY SHALL NOT OBLIGATE RESEARCH PRODUCTS CORPORATION FOR ANY LABOR COSTS AND SHALL NOT APPLY TO DEFECTS IN WORKMANSHIP OR MATERIALS FURNISHED BY YOUR INSTALLER AS CONTRASTED TO DEFECTS IN THE DEHUMIDIFIER ITSELF.

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Visit us on-line at **www.aprilaire.com** to register your Aprilaire product. If you do not have on-line access, please mail a postcard with your name, address, phone number, email address, product purchased, model number, date of purchase and dealer name and address to:

Research Products Corporation, P.O. Box 1467, Madison, WI 53701

Your Warranty Registration information will not be sold or shared outside of this company.

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