CM3510 Series Controller

Installation and Operation Manual for SA Units

- Backlit LCD User Interface
- Programmed by Desert Aire for dehumidification and temperature control
- Multiple communication interface options:
  - LonWorks®
  - BACnet™ Ethernet
  - BACnet™ MS/TP
  - Modbus®
- Alarm history retention
- Internal time clock for stand alone operation
Desert Aire
Dehumidification Equipment
Standard Limited Warranty

Desert Aire warrants the dehumidifying unit to be free from defects in materials and workmanship subject to the terms, conditions and limitations stated herein.

TERMS
Desert Aire warrants all components (except as noted) for a period of two (2) years from the date of shipment. This warranty shall be limited to the supply of new or rebuilt parts for the part which has failed because of defects in workmanship or material, and does not include the cost for labor, transportation or other costs not herein provided for. Replaced parts are warranted only for the remaining portion of the original warranty period.

CONDITIONS
The warranty is subject to the following conditions:

1. The unit must be properly installed and maintained in accordance with the Desert Aire “Installation and Operation Manual” provided with each unit and/or other documentation provided.

2. The Start-Up Report must be completed and returned to Desert Aire Service for evaluation. If no deficiencies are identified a Warranty Validation Letter will be issued that provides all warranty dates and coverage. If installation or start-up deficiencies are present, these must be corrected and communicated to Desert Aire in order to activate warranty.

3. This warranty shall not apply to any part that has been tampered with, or has been subject to misuse, negligence or accident. A warranty can be obtained for altered equipment but only with written consent from Desert Aire.

4. The following parts and components are excluded from the warranty: belts, filters, driers, fuses and refrigerant.

5. Refrigerant coils or other components that corrode due to improperly balanced pool chemistry or corrosive air quality will not be warranted.

6. All replacements or repairs will be FOB Germantown, WI.

7. This warranty shall be null and void if defects or damages result from unauthorized opening of the refrigerant circuit, tampering with factory set controls, or operating outside the original design conditions.
8. Desert Aire shall not be liable for labor costs incurred in diagnosing the problem, or the removal or replacement of the part or parts being repaired.

9. Desert Aire must preauthorize all warranty coverage described herein.

**Extended Warranty:**
Your Desert Aire unit may have extended warranties beyond this Standard Limited Warranty document. Extended warranties are only available at the time of the purchase of the original equipment. These extended warranties are covered under a separate document and their terms and conditions are separate from this document. It is mentioned in this document for informational purposes only. Any extended warranties will be identified on the Warranty Validation letter.

Any and all incidental or consequential damages are expressly excluded from this warranty. Some states do not allow the exclusion of incidental or consequential damages for personal injury, so the above limitations may not apply to you for certain damages. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. No person or representative is authorized to make any warranty or assume any liability not strictly in accordance with the aforementioned.

Inquiries regarding warranty matters should be addressed to:

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Additional copies of this manual can be purchased for a nominal fee from Desert Aire. Desert Aire also posts the most current revision of our I/O Manuals on our website. For a digital copy of the I/O Manual for your unit revision, please submit request to the contact information listed above.
Product Warning for the State of California:

⚠️ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov
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Overview

The CM3510 operating controller installed in Desert Aire’s SA dehumidifier is designed for precise control and monitoring of air temperature and relative humidity (RH) within the conditioned space. Additionally the control will capture and retain alarm history to aid in equipment troubleshooting.

1. Field Installation of CM3510 Control Sensors

The unit supplied for your project will include either a Duct Mount Sensor Assembly or a Wall Mount Sensor Assembly depending on how the unit was ordered. All sensor installations should be made in a location that will provide an accurate measurement of the area being controlled. Effort should be made to prevent influence on the sensors from external sources.

1.1.1 Duct-Mounted Sensor

Install the duct-mount sensor in the return air duct upstream of any outdoor air intakes.

- Do not mount the sensor in a section of duct where false readings may occur due to dead air regions, solar heat gain, or thermal losses in winter.
- Do not mount the sensor where water is likely to drip on it. Liquid moisture will ruin the humidity sensing element in the sensor.

1.1.2 Wall Mount Humidity and Temperature Sensor

If your dehumidifier was ordered with a wall-mount humidity and temperature sensor, mount the sensor five feet or higher above the pool deck on an interior wall with natural air circulation. Avoid the following locations:

- Do not install in a corrosive or wet environment.
- Hot spots near concealed heating pipes, warm air ducts, supply register outlets, or solar radiation.
- Cold spots due to a cold wall or drafts from stairwells, doors, windows, or supply register outlets.
- Dead spots such as behind doors or in corners where room air cannot circulate freely.

1.1.3 Water Temperature Sensor (Pool Water Heating Option only)

Desert Aire dehumidifiers ordered with the pool water heating option are supplied with a water temperature sensor and an immersion well.

- Screw the well into an adapter fitted into the pool water piping. The well is equipped with a 1/2” MPT connection.
- Install the sensor upstream from the dehumidifier or the auxiliary pool water heater.
The sensor must be installed in a location where it will accurately sense the pool water temperature. Water flow at the sensor location is required for proper operation.

1.2. **Auxiliary Air Heating Control Wiring**

Note: You must use the Desert Aire CM3510 control system to control or interlock with the room heating system. This prevents wide fluctuations in room air temperature. It also prevents the heater from trying to heat the room while the dehumidifier is running in the cooling mode.

1.2.1. **Auxiliary Heating - Dry Contact Closure**

The standard Desert Aire CM3510 Controller provides a dry contact closure to operate the auxiliary space heater. The contact closes to energize a heater (may be supplied by others) which has its own power source.

Install two wires from the thermostat terminal blocks on the heater to the terminal strip on the control panel of the dehumidifier. (See your wiring schematic for connection details.)

1.2.2. **Auxiliary Heating - Proportional Signal**

Desert Aire will provide a proportional 0-10 VDC direct-acting signal to modulate a heating coil control valve or other auxiliary modulating heater. Most proportional valves have either three (3) or four (4) terminals for field-installed wiring.

- Four-terminal valves have two terminals for 24 VAC power and two terminals for the signal input.
- Three-terminal valves have one terminal for the “hot” 24 VAC input, a second terminal for the “positive” signal input and a third, common terminal for the “neutral” 24 VAC input and the “negative” signal input.

You must follow the instructions included with the valve cut sheet. Observe the proper polarity or you may damage both the valve and the controller. (See your wiring schematic for connection details.)

1.3. **CM3510 Controller Overview**

Desert Aire’s CM3510 microprocessor controller is a powerful, flexible controller with many useful features including:

- Display of room air temperature, relative humidity and refrigerant pressures.
- Display of equipment operating status such as dehumidification and cooling.
- Alarm notification and alarm history retention.
- Internal 7 day time clock for occupancy, holiday, and temporary occupancy scheduling.
• A convenient, easy-to-understand display interface which allows the operator to view and change set points and time schedules.

• Optional communication modules for interface to building automation system. Lonworks®, BACnet™ Ethernet, BACnet™ MS/TP, and Modbus® communication modules are available.

• For BMS Points Lists please send inquiry to service@desert-aire.com and include your model number, serial number and BMS protocol.
2. **SA Controller Details**

![SA Controller Details](image)

2.1. **Menu Overview and General Instructions**

Your Desert Aire CM3510 Controller is factory programmed and configured for use in the application you have specified. The Remote Display Terminal (RDT - Figure 1) allows the operator to monitor and adjust the set points of your Desert Aire SA dehumidifier. The RDT has an LCD screen and 6 keys. The keys on the left hand side of the LCD screen are the **ALARM** key shown as an alarm bell, **PROGRAM** key abbreviated “**Prg**” and the **ESCAPE** key abbreviated “**Esc**.” The keys on the right hand side of the LCD screen are the **UP** key shown as an up arrow, an **ENTER** key shown as a left arrow and a **DOWN** key shown as a down arrow.

The Home Screen, displaying the Desert Aire logo, shows the Occupancy status, the air temperature and the current relative humidity in the zone. The SA18 displayed in the upper right of the screen indicates that the size of the unit is 18 tons. Below this line, “**Esc → Menu**” indicates that if the **Esc** key is pressed, the Main Menu will be displayed. Pressing **Esc** on any other screen will take you back one screen. The **EXV Init Required** under the **Esc → Menu** indicates that the EXV driver is initializing. The valves will be initiated after each power cycle. The compressors are disabled when this message is shown. The message will disappear and the compressors will be enabled after the driver has initialized.

Menu screens allow the user to select from a series of actions. The action that is capitalized on the screen is selected by pressing the **ENTER** key. To cycle through the selections on a menu screen, use the **UP** and **DOWN** keys.

If set points or selections can be altered on a screen, the **ENTER** key will cycle through those items. Once the cursor is over an item, the **UP** and **DOWN** arrow keys will modify the setting. Numeric values require that the **ENTER** key be pressed to accept the value. An “on” or “off” selection is altered as soon as the **UP** or **DOWN** keys are pressed.
To view the alarms from any menu, simply press the **ALARM** key. The **UP** and **DOWN** keys will display any active alarm. When an alarm is triggered, the red LED behind the **ALARM** key will light and remain on until the alarm is acknowledged. Alarm acknowledgement and history instructions are shown on the main Alarm Screen. To escape from the alarm screens, press the **Esc** key and the Home Screen will be displayed.

Screens which display a small up arrow in the upper right and a small down arrow in the lower right are part of a series of screens which can be accessed by pressing either the **UP** or **DOWN** arrow keys. If the operator has not pressed a key for an hour, the remote terminal will return to the Home Screen.

### 2.2. Main Menu

Pressing the **Esc** key from the Home Screen displays the MAIN MENU (Figure 2). This menu allows the STATUS MENU, Unit Setpoints, Occupancy schedule, Service Menu and view the Unit Revision.

![Figure 2](image)

To return to the Home Screen, press the **Esc** key.

#### 2.2.1 Status Menu

Selecting the STATUS MENU from the MAIN MENU allows access to the UNIT STATUS, I/O Status, Pressure Cutouts & EXV Status.
Figure 3

To return to the MAIN MENU, press the Esc key.

2.2.1.1 Unit Status

Selecting Unit Status from the STATUS MENU displays a text explanation of the unit. The Unit Status will show one of the following states on the second line.

- Zone Satisfied/Off
- Heating Required
- Cooling Required
- Dehumidifying
- Dehumid / Heat
- Dehumid / Cool
- Low Air Flow
- EXV Initializing

The state of the air flow switch is shown on the third line of this display. The Occupied state (either Occupied or Un-Occupied) is shown on the fourth line. The fifth line will display the unit air flow mode. The unit air flow mode will be Normal, EventMode, Max O/A or Purge Mode. If a VOC sensor has been included with the unit and the sensor reports an increased VOC level then indication of “VOC High” will appear on the right side of the fifth line. The sixth line will display if the BMS option has been turned on in the Factory Configuration of the unit. Pressing the DOWN key from this menu displays the status of Circuit A.
To return to the STATUS MENU, press the **Esc** key.

Figure 5 displays the current status of circuit A only. The second line displays if the circuit is off or, if on, the current condenser being used by the circuit. The third line displays if the compressor is on or off, and if the compressor is waiting for its non-short cycling timer to time out. The fourth line will display if the remote condenser is available. The sixth line will display the water flow switch status, but only if tower water has been selected. The bottom line displays the current zone air conditions. Pressing the **UP** key displays the Unit Status screen. Pressing the **DOWN** key displays the Circuit B Status screen.
Figure 6 displays the current status of circuit B only. The second line displays if the circuit is off or, if on, the current condenser being used by the circuit. The third line displays if the compressor is on or off, and if the compressor is waiting for non-short cycling timer to time out. The fourth line will display if the remote condenser is available. The fifth line will display the air or water priority, but only if pool heating is available. The sixth line will display the water flow switch status, but only if tower water has been selected. The bottom line displays the current zone air conditions. Pressing the UP key displays the Circuit A Status screen. Pressing the DOWN key displays the Unit Status screen.

![Figure 6](image)

To return to the STATUS MENU, press the Esc key.

### 2.2.1.2 I/O Status

Selecting the I/O Status from the STATUS MENU displays Digital Inputs, Analog Inputs, Digital Outputs and Analog Outputs selection menu. Use the UP or DOWN key to make a selection and press the ENTER key. Please note that this section describes all of the analog and digital inputs and outputs that could possibly be provided on the dehumidifier. Your unit will almost certainly vary. Refer to the unit specific schematic diagrams for the actual devices that have been provided.
To return to the STATUS MENU, press the Esc key.

**2.2.1.2.1 Digital Inputs (Binary)**

The Digital Inputs screen shows the state of the contacts wired into port J5, J7, & J8 of the controller, as well as port J4 of the optional expansion boards. These screens are provided for troubleshooting the control system. Figure 8 shows the first screen in the series of the Digital Inputs screens.

**Figure 7**

**Figure 8**

Water Coil T’Stat – This is only used for freeze protection of a water or steam coil. “On” if the temperature is acceptable, and “Off” if the temperature is low.
Roof/Wall Open – This input can affect the supply and exhaust fan, air heating and ventilation as set in the Service Menu. When the input is “On”, the actions defined in Section 2.2.4.3 will be enabled. When the input is “Off” the unit will run normally.

Cir A Aux – “On” if circuit A lead compressor starter auxiliary contact is closed, and “Off” if this contact is open.

Cir B Aux – “On” if circuit B lead compressor starter auxiliary contact is closed, and “Off” if this contact is open.

The second page of the digital input screen series is shown in Figure 9 and is accessible by pressing the DOWN key.

Figure 9

Occupied Input – The Digital Occupied Contact will show “On” if the contact is closed, and “Off” if the contact is open.

Event Input – The Digital Event Contact will show “On” if the contact is closed, and “Off” if the contact is open.

Purge Input – The Digital Purge Contact will show “On” if the contact is closed, and “Off” if the contact is open.

Exhst Blower OL – The exhaust blower overload contact will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.
Circuit A OL – The A circuit overload will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

The third page of the digital input screen series is shown in Figure 10 and is accessible by pressing the DOWN key.

Circuit B OL – The B circuit overload contact will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

Supply Blower OL – The supply blower overload contact will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

System Shutdown – The system shutdown contact, used for the smoke alarm or general building faults, will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

Voltage Monitor – The optional voltage monitor contact will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

The fourth page of the digital input screen is shown in Figure 11 and is accessible by pressing the DOWN key. This is an optional screen and will only be shown when the unit is configurable for pool or tower water condenser.
Pool 1 Flow Sw – The pool 1 flow switch will show “On” when flow is established, and “Off” when flow falls below the switch trip point.

Tower 1 Flow Sw – The tower 1 flow switch will show “On” when flow is established, and “Off” when flow falls below the switch trip point.

The fifth page of the digital input screen series is shown in Figure 12 and is accessible by pressing the DOWN key. This is an optional screen and will only be shown when the unit is configurable for a second pool or second tower water condenser.
Pool 2 Flow Sw – The pool 2 flow switch will show “On” when flow is established, and “Off” when flow falls below the switch trip point.

Tower 2 Flow Sw – The tower 2 flow switch will show “On” when flow is established, and “Off” when flow falls below the switch trip point.

The sixth page of the digital input screen series is shown in Figure 13 and is accessible by pressing the **DOWN** key. This is an optional screen and will only be shown when the unit is configurable for an evacuator or low exhaust system.

![Digital Inputs Screen](image)

**Figure 13**

Evacuator Blwr OL – The evacuator blower overload contact will show “On” if the contact is closed which is normal, and “Off” if the contact is open to indicate a fault.

To return to the I/O Status screen, press the **Esc** key.

2.2.1.2.2 Analog Inputs

The Analog Inputs screen shows the state of the sensors wired to the control system into ports J2, J3, J6 & J29 of the controller, as well as ports J9 and J10 of the optional expansion boards. These screens are provided for troubleshooting the control system. The first Analog Inputs screen, Figure 14, shows the status of the Discharge Pressure in circuits A and B, the Zone Air Relative Humidity and Temperature and the Supply Air Temperature.
The second Analog Inputs screen, Figure 15, shows the status of the optional Pool 1 and Pool 2 temperature sensors and the pressure drop across the reheat condenser.

The third Analog Inputs screen, Figure 16, shows the status of the A circuit suction pressure and temperature as well as the calculated P2T temperature from the suction pressure. The superheat of the circuit and the discharge pressure are also shown.
The fourth Analog Input screen, Figure 17, shows the status of the B circuit suction pressure and temperature as well as the calculated P2T temperature from the suction pressure. The superheat of the circuit and the discharge pressure are also shown.

The fifth Analog Inputs screen, Figure 18, shows the status of the air pressure transducers used in the system.
2.2.1.2.3 Digital Outputs (Binary)

The Digital Outputs screens show the status of the devices wired into ports J12 through J18 of the main controller, as well as ports J5, J6, J7 & J8 of the optional Expansion Boards. These screens are provided for troubleshooting the control system. The first Digital Outputs screen, Figure 20, shows the status of the Compressor and 1-SOL outputs for circuits A and B.
The second Digital Outputs screen, Figure 21, shows the status of the Remote Exhaust, Remote Alarm, 4-SOL outputs for circuits A and B and the Supply Blower included in the unit.

The third Digital Outputs screen, Figure 22, shows the status of the optional expansion board 1 used for the Pool 1 auxiliary heat and pump output, the tower 1 pump output and to enable air heating.
The fourth Digital Output screen, Figure 23, shows the status of the optional expansion board 2 used for the Pool 2 auxiliary heat and pump output and the tower 2 pump output.

The fifth Digital Outputs screen, Figure 24, shows the status of the optional expansion board 3 used for the Low Exhaust Blower.
The sixth Digital Outputs screen, Figure 25, shows the status of the optional expansion board 4 used for the Outdoor Air Pre Heater.

To return to the I/O STATUS screen, press the Esc key.

2.2.1.2.4 Analog Outputs

The Analog Outputs screen shows the status of the devices wired into ports J4 of the main controller, as well as port J2 of the optional Expansion Boards. These screens are provided for troubleshooting the control system. The first Analog Outputs screen, Figure 26, shows the position of the Bypass Damper, Cool Air Damper, Warm Air Damper and Outdoor Air Damper.
The second Analog Outputs screen, Figure 27, shows the status of the auxiliary air heat command, exhaust blower speed command, evacuator speed command and the outdoor air pre heater command.

To return to the I/O STATUS screen, press the Esc key.

To return to the STATUS MENU, press the Esc key.
2.2.1.3 Pressure Cutouts

This screen, Figure 28, displays the High Discharge Pressure and Low Suction Pressure cut-out values for both of the refrigerant circuits. (NOTE: The operator cannot change these settings.)

Figure 28

To return to the STATUS MENU, press the Esc key.

2.2.1.4 EXV Status

Figure 29 displays the EXV Status and control variables that are used for super heat control of circuit A. The super heat, suction temperature, suction pressure and calculated saturation temperature are shown as well as the position of the valve in steps and opening percentage. Figure 30 shows the same data for circuit B.

Figure 29
To return to the STATUS MENU, press the Esc key.

2.2.2 Setpoint Menu

Selecting the Unit Setpoints from the MAIN MENU allows for modifications of the temperature and humidity set points specific to the unit. If no pool heating is configured in the unit, Figure 31 will be displayed. To modify the set points, press the ENTER key and use the arrow keys until the desired setting is shown. Press the ENTER key to accept the set point value.

If pool heating is included in the unit, Figure 32 will be displayed. Select the appropriate item with the UP and DOWN keys and press the ENTER key to select.
Selecting the Pool 1 Temperature or Pool 2 Temperature will display a screen similar to Figure 33. The pool heating set point is displayed, as well as the actual pool water temperature and the state of the pool water flow switch. To modify the pool heating set point, press the ENTER key and use the arrow keys until the desired setting is shown. Press the ENTER key to accept set point value.

To return to the SETPOINT MENU, press the Esc key.

2.2.3 Occupancy Schedule
Select the OCCUPANCY SCHEDULE, from the MAIN MENU to show the OCCUPANCY SCHEDULE MENU. From this menu you can access and adjust the Schedule Options, Temporary Holidays, Annual Holidays, Temporary Occupancy or
Overrides and Time settings.

To return to the MAIN MENU, press the Esc key.

![Figure 34](image)

### 2.2.3.1 Schedule Options

This screen sets the number of active occupancy schedules. Setting at least one active schedule allows the occupancy schedule timing to be set from the Current Schedule Screen. If the number of active schedules is left at zero, no occupancy scheduling will be active. See Figure 35.

To return to the OCCUPANCY SCHEDULE MENU, press the Esc key.

![Figure 35](image)
Pressing the **DOWN** key from the **SCHEDULE OPTIONS** screen will allow you to set the occupancy timing for the selected day of the week (DOW) as shown in Figure 36. Select the schedule to modify the start time and stop time. This is the time span that the unit will be in the occupied mode. All times are set in the 24 hour format. As the DOW is selected, the **UP** and **DOWN** keys allow for Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday and any holiday to be occupied during this time. Up to 10 schedules can be active at any time. These allow for different start and stop times on various days of the week, weekends, or programmed holidays.

![Figure 36](image)

To return to the **OCCUPANCY SCHEDULE MENU**, press the **Esc** key.

### 2.2.3.2 Temporary Holidays

The Temporary Holiday settings are for holidays that change dates from year to year, such as Memorial Day or Thanksgiving. See Figure 37. Up to 10 different temporary holidays can be set from this screen. Select the number to assign to the Annual Holiday and then select the Start Date and the End Date for that holiday.
2.2.3.3 Annual Holidays

The Annual Holiday settings are for holidays with dates that remain constant year to year, such as New Years Day and the 4th of July. See Figure 38. Up to 10 different annual holidays can be set from this screen. Select the number to assign to the Annual Holiday and then select the Start Date and the End Date for that holiday.
2.2.3.4 Temporary Occupancy

This screen allows the unit to be set to the occupied mode for a preset amount of time. Press the **ENTER** key and enter the hours you would like the unit to be temporarily in the occupied mode. Press the **ENTER** key again and enter the minutes you would like the unit to be temporarily in the occupied mode. Press the **ENTER** key again and the cursor will begin blinking over the “Press Prg to set” message. Pressing the **Prg** key will override the schedule and allow the unit to be temporarily occupied. The screen will now show “Override On.” To clear this occupied override, set the hours and minutes to zero and press the **Prg** key. The screen will now show “Override Off.”

![Figure 39](image)

To return to the MAIN MENU, press the **Esc** key.

2.2.3.4.1 Temporary Overrides

If TEMPORARY OVERRIDES is shown in the Occupancy Schedule menu instead of TEMPORARY OCCUPANCY it is because the Event Mode or the Purge mode or both have been enabled. In this case, a menu screen similar to Figure 40 will be shown. Selecting any of these options will allow an override to be active for that mode. The override of the event or purge modes work in the same manner as detailed in section 2.2.3.4 for the temporary occupancy.
2.2.3.5 Set Time

This screen sets the time, date and day of week. To modify these settings, press the ENTER key until the cursor is over the appropriate item and use the arrow keys until the desired setting is shown. All times are set in the 24 hour format. Pressing the ENTER key will step to the next item. If any item was modified, the message “Enter to Set” will be shown. Press the ENTER key to accept the time and date values.
2.2.4 Service Menu

Selecting the SERVICE MENU will display the Login Screen. Enter the service password, 1234, and press ENTER. The screen in Figure 42 will be shown. The SERVICE MENU gives access to the Tmp/RH/Pool Settings, Aux Heat Settings, Condenser Settings, Sensor Offsets, Airflow Settings and the optional Economizer Settings.

To return to the Unit Revision Screen, press the Esc key. The user remains logged in for 10 minutes after the password is entered. During this time, the Login screen reads “Still Logged In, Press PRG to Enter.” Within this 10 minutes log-in, the service menu may be re-entered by simply pressing the Prg key.

2.2.4.1 Tmp/RH Settings

Selecting the Tmp/RH/Pool Settings (shown with all options selected in Figure 42) allows you to select the Deadbands, Differentials, Energy Recovery, Pool 1 Settings or Pool 2 Settings. The Energy Recovery Settings will only be shown if an SA unit with an Exhaust mode is provided and the Pool settings screen will only be shown if pool heating is provided.
To return to the SERVICE MENU, press the **Esc** key.

### 2.2.4.1.1 Deadbands

The default settings for the Deadbands can be modified on the screen shown in Figure 44. The Heating Deadband value is subtracted from the Zone Temperature Set point from section 2.2.2. This value is the heating set point that enables the auxiliary air heating output, and is the process variable for the Air Heating PID loop. The Cooling Deadband value is added to the Zone Temperature Set point. This value is the cooling set point. When the zone temperature exceeds this calculated value, circuit A is enabled for zone cooling. The Clg Stage Deadband is then added to the calculated cooling set point. This value is then used as the set point to enable circuit B for zone cooling. The RH Stage Deadband is added to the Zone Humidity Set point and is used to enable circuit B for zone dehumidification. To modify settings, press the **ENTER** key until the desired set point is selected and use the arrow keys until the desired value is shown. Press the **ENTER** key to accept set point value. See Graphic in Figure 45 and Figure 46 for an illustration of the operation of the compressor circuits and damper actuators. Figure 45 shows the operation of an SA unit without an exhaust fan or an SA unit with an exhaust fan & in unoccupied mode. Figure 46 shows the operation of an SA unit in occupied mode.
Specified system action occurs when within Deadbands

<table>
<thead>
<tr>
<th>#</th>
<th>Circuit A</th>
<th>Circuit B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Circuit A is OFF</td>
<td>Circuit B is OFF</td>
</tr>
<tr>
<td>2</td>
<td>Circuit A is in Dehumidification Mode</td>
<td>Circuit B is OFF</td>
</tr>
<tr>
<td>3</td>
<td>Circuit A is in Dehumidification Mode</td>
<td>Circuit B is in Dehumidification Mode</td>
</tr>
<tr>
<td>4</td>
<td>Circuit A is in Cooling Mode</td>
<td>Circuit B is OFF</td>
</tr>
<tr>
<td>5</td>
<td>Circuit A is in Cooling Mode</td>
<td>Circuit B is in Dehumidification Mode</td>
</tr>
<tr>
<td>6</td>
<td>Circuit A is in Cooling Mode</td>
<td>Circuit B is in Cooling Mode</td>
</tr>
</tbody>
</table>

SA w/o Exhaust Fan or SA w/Exhaust Fan & in Unoccupied Mode

Figure 44

Figure 45
To return to the TMP/RH/POOL SETTINGS Menu, press the Esc key.

2.2.4.1.2 Air Differentials

This screen shows the Cooling and Humidity Switch Differentials. This differential is the range between the making and breaking of the switch. The range of the Cooling Differential is 0.0° F to 9.9° F. The range of the Humidity Differential is 0.0% to 9.9%. To modify the differentials, press the ENTER key and use the arrow keys until the desired setting is shown. Press the ENTER key to accept set point value.
To return to the TMP/RH/POOL SETTINGS Screen press the **Esc** key.

### 2.2.4.1.3 Energy Recovery

This screen shows the Energy Recovery deadband and differential, as well as the Low RH set point and differential. This screen will only be shown for an SA unit with an exhaust option. The energy recovery feature provides heating from circuit A to the zone when the zone temperature drops below the zone set point minus the energy recovery deadband. Circuit A will not be allowed to provide energy recovery if the RH in the zone drops below the Low RH Set point. Refer to Figure 46 for the affect these settings have on an SA unit in occupied mode. To modify the deadband or differential, press the **ENTER** key and use the arrow keys until the desired setting is shown. Press the **ENTER** key to accept the set point value.

To return to the TMP/RH/POOL SETTINGS Screen, press the **Esc** key.
2.2.4.1.4 Pool 1 or 2 Settings

If the unit has been configured to provide for pool heating, the settings for Pool 1 and/or Pool 2 can be modified from these screens. The pool heat switch differential and the deadband to allow auxiliary pool heating can be modified here. If the output for the pool pump is used, the pump minimum on and off times can also be modified from this screen. The flow switch delay time, which provides a delay to allow the pool pump to initiate the pool water flow, can be modified here as well. To modify these settings, press the ENTER key and use the arrow keys until the desired setting is shown. Press the ENTER key to accept set point value. See Graphic in Figure 50 for an illustration of the operation of the pool temperature control.

![Figure 49](image1)

![Figure 50](image2)
To return to the TMP/RH/POOL SETTINGS Screen, press the Esc key.

2.2.4.2 Aux Heat Settings

Selecting the Aux Heat Settings will display the screen shown in Figure 51 if the heat setting in the Factory Configuration is set for Staged Heat. This screen displays the state of the heating enable contacts on line three, the Zone Set point on line 5, the Heating Set point on line 6 and current Zone and Supply Air temperatures on lines 7 and 8. The Zone Set point can be modified from this screen. Please note that this will modify cooling set point as well as the heating set point, as this is the temperature set point for the unit.

![Figure 51](image)

To return to the SERVICE MENU, press the Esc key.

Selecting the Aux Heat Settings will display the screen shown in Figure 52 if the heat setting in the Factory Configuration is set for Modulating. This screen displays the state of the heating enable contacts on line three, the Zone Set point on line 4, the Heating Set point on line 5 and the percentage of the modulating heat loop which will disable the heat contacts if the loop is less than this value for the time period shown. The current Zone Air Temperature and Supply Air Temperature are shown on line 8. The Zone Set point, loop percentage and the time period are settable on this screen.
Pressing the **DOWN** key will display the **AUX HEAT SETTINGS** screen, Figure 53, which allows the Air Heat PID Gain (or Proportional Band), Reset (or Integral) and the Rate (or Derivative) to be modified for loop tuning. The range of the Gain is 0.0° to 999.9°F. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The zone temperature, the state of the heating contact and the output of this control loop are displayed at the bottom of this screen for reference.

To return to the **SERVICE MENU**, press the **Esc** key.
Pressing the **DOWN** key from this screen will display the screen shown in Figure 54. The ZONE RESET SETTINGS screen allows the Zone Reset PID Gain (or Proportional Band), Reset (or Integral) and the Rate (or Derivative) to be modified for loop tuning of the calculated heating set point. The range of the Gain is 0.0° to 999.0°F. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The zone temperature, the state of the heating contact and the output of this control loop are displayed at the bottom of this screen for reference.

![Figure 54](image)

To return to the SERVICE MENU, press the **Esc** key.

Pressing the **DOWN** key from this screen or the Staged Aux Heat screen will display the screen shown in Figure 55 if the purge has been enabled. The PURGE HEATING screen allows the Air Heat Set point while in the Purge mode to be modified. The range of this set point is 45.0° to 90.0°F. The state of the heating enable contacts as well as the unit airflow mode is also shown on this screen.
To return to the SERVICE MENU, press the Esc key.

2.2.4.3 Cond/Roof Settings

The Condenser Settings screen, Figure 56, displays the remote condenser jumper settings. If the unit has been configured without either circuit having a remote condenser, this screen will display the message “Nothing to Set.” After the remote condenser piping has been installed to the dehumidifier, modify the Cir RC Jumper setting to “On.” If the RC Jumper remains as “Off”, the controller will operate as if no remote condenser is available by shutting the circuit off when zone cooling is required, as no condenser is available for heat rejection. To modify these settings, press the ENTER key and use the arrow keys until the desired setting is shown. Press the ENTER key to accept the set point values.
Pressing the **DOWN** key will now display the screen shown in Figure 57. Figure 57 allows the Keypad to set the position of the Movable Roof or Wall. Press the **ENTER** key and the **UP** or **DOWN** key until the correct position of the Roof or Walls is shown. This screen also shows the state of the Roof/Wall Switch as well as the BMS point. If any of these three settings are open, the action defined in the next section will be active. The last line of this screen will show the state that the Roof/Wall is in.

![Figure 57](image)

Pressing the **DOWN** key will now display the screen shown in Figure 58. Figure 58 defines the action taken if the Roof/Wall switch is set. All five of the selections can be set to Enable or Disable. If the Supply Fan is set to Disable, the supply fan will be forced off when the Roof/Wall switch is closed and the next four selections will be removed from the screen. If the Supply Fan is set to Enable, the next four selections can be modified. If the Compressor is set to disable, the compressor will not be active when the Roof/Wall switch is closed. If the Air Heating is set to disable, then the air heating will not be active when the Roof/Wall switch is closed. If the Ventilation is set to disable, then the outside air damper will be closed when the Roof/Wall switch is closed. If the Exhaust Fan is set to disable, then the exhaust fan output will set to 0% when the Roof/Wall switch is closed.

To return to the SERVICE MENU, press the **Esc** key.
2.2.4.4 Sensor Offsets

Five screens allow the control values of the analog input points to be adjusted if calibration shows these devices to be inaccurate. The range of these offsets is -99.9 to 99.9 for the refrigerant pressures, temperatures and humidity. The range for the air pressure sensors is -999 to 999 in thousandths of an inch of water column. Care must be used when applying an offset to an analog value as erratic operation can result. To modify the offsets, press the ENTER key until the desired offset is selected and use the arrow keys until the desired setting is shown. Press the ENTER key to accept the offset value. Pressing the DOWN key will display the Expansion Board Offsets.

To return to the SERVICE MENU, press the Esc key.
2.2.4.5 Airflow Menu

The Airflow Menu allows the selection of the Airflow Setup, the Airflow PID Loops, the Max OA Settings and the Low Exhaust Settings. Please note that the Airflow PID Settings will only be shown in the unit if it is provided with a means of exhaust. Also, the Max OA Settings and the Low Exhaust Settings will only be shown if these functions have been enabled from the Factory Configuration Menu.

Any time an exhaust option has been selected in the Factory Configuration, the second screen in this string will be the EXH. EC CFM SETTINGS screen as shown in Figure 61. The CFM setpoints for these air status modes can be modified from this screen. These set points will work concurrently with the zone pressurization. The PID loop of the CFM or Zone Pressurization that has the lowest output will drive the exhaust blower.

To return to the Service Menu, press the Esc key.
2.2.4.5.1 Airflow Setup

Selecting the Airflow Setup will display the screen shown in Figure 62. This screen displays a means to override the unit into an un-occupied mode to check the airflow settings, the pressure drop across the reheat condenser and the minimum setting used for the low airflow condition.

![Figure 62](Image)

To return to the Airflow Menu, press the Esc key.

Pressing the DOWN key from this screen will continue the Airflow Setup. The DAMPER SETTINGS screen will be shown if "No Exhaust" has been selected in the Factory Configuration. The outside air damper position is set based upon the settings shown in Figure 63. The Event, Max O/A and Purge positions will be shown on this screen if these options have been selected in the Factory Configuration of the dehumidifier. All settings can be modified from 0.0% to 100.0%. To modify these set points, press the ENTER key and use the arrow keys until the desired setting is shown. Pressing the ENTER key will now change the set point. The Unit Override can be set to “Auto”, “Unocc”, “Occ”, “Event”, “Max OA” or “Purge”. This will allow testing of the damper position in all applicable modes.
To return to the Airflow Menu, press the Esc key.

Any time an exhaust option has been selected in the Factory Configuration, the second screen in this string will be the Exhaust Airflow Setup screen as shown in Figure 64 in place of the Damper Setting screen. This screen will enable the setup of the exhaust blower speed by allowing the Unit override to be set to “Auto”, “Unocc”, “Occ”, “Event”, “Max OA” or “Purge” and the Modes to be set to “Warm Exhaust” or “Cool Exhaust”. The maximum speed, in percentage, of the Exhaust blower is set here as well as an override to run the Exhaust blower in “Auto” or “Max”. The last two lines of this screen are indicators of the Occupancy mode, Unit mode, Exhaust mode, and the actual positions of the warm and cool exhaust damper actuators.
Pressing the **DOWN** key from this screen will continue the Airflow Setup. Anytime an exhaust option has been selected in the Factory Configuration and the Low Exhaust has been enabled, the screen shown in Figure 65 will be available and allow an override to unoccupy the unit and determine the Unocc OA Stpt. This is set in % open of the OA damper actuator, typically this will be 0% to 3%.

Please note that in some cases a CFM reading may not be the proper means to setup the airflow. This will be determined at the factory. In these cases the differential air pressure drop will be displayed instead of the CFM for Figure 65 through 69.

![Figure 65](image)

To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will continue the Airflow Setup. Anytime an exhaust option has been selected in the Factory Configuration the screen shown in Figure 66 will be available and allow an override to occupy the unit and determine the OA CFM Stpt, which will be set in CFM. The current calculated OA CFM will be shown below this, with the actuator position will be shown at the bottom of this screen.
To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will continue the Airflow Setup. Any time an exhaust option has been selected in the Factory Configuration and the Event is enabled, the screen shown in Figure 67 will be available and allow an override to Event Mode and determine the OA CFM Stpt for Event Mode, which will be set in CFM. The current calculated OA CFM will be shown below this, with the actuator position shown at the bottom of this screen.

To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will continue the Airflow Setup. Any time an exhaust option has been selected in the Factory Configuration and the Max OA is enabled, the screen shown in Figure 68 will be available and allow an override to the Max OA Mode and determine the OA CFM Stpt for Max OA Mode, which will be set
in CFM. The current calculated OA CFM will be shown below this, with the actuator position shown at the bottom of this screen.

Figure 68

To return to the Airflow Menu, press the Esc key.

Pressing the DOWN key from this screen will continue the Airflow Setup. Any time an exhaust option has been selected in the Factory Configuration and the Purge is enabled, the screen shown in Figure 69 will be available and allow an override to the Purge Mode and determine the OA CFM Stpt for Purge Mode, which will be set in CFM. The current calculated OA CFM will be shown below this, with the actuator position shown at the bottom of this screen.

Figure 69

To return to the Airflow Menu, press the Esc key.
Pressing the **DOWN** key from this screen will continue the Airflow Setup. Any time the extended OA box exhaust option has been selected in the Factory Configuration the screen shown in Figure 70 will be available. This screen allows the override of the unit to the Occupied mode, an override of the exhaust mode to “Auto”, “Warm”, “Cool” exhaust mode and on override of the VFD speed from “Auto” to “Manual”. When the VFD Man(ual) is selected, a setting equal to the total 0 – 100% range of the VFD can be set. Care should be taken to insure the VFD is not current limiting at the upper end of the manual setting. The cool exhaust set point can be set from this screen with a range of 0.000”wc to 1.999”wc. The last three lines of this screen are indicators of the actual Exhaust pressure drop, Occupancy mode, Unit mode, Exhaust mode and the actual positions of the warm and cool exhaust damper actuators.

![Figure 70](image)

To return to the Airflow Menu, press the **Esc** key.

**2.2.4.5.2 Airflow PID Loops**

The Airflow PID Loops are displayed in the Airflow Menu if a means of exhaust has been selected. The EC ZONE SETTINGS will be the first screen shown. This screen allows the EC ZONE PID Gain (or Proportional Band), Reset (or Integral), Rate (or Derivative) and the Set point to be modified for loop tuning. The range of the Gain is 0 to 32767. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. The range of the Set point is from 0.0”wc to - 0.999”wc. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The actual zone differential air pressure and the Speed Cmd are displayed at the bottom of this screen for reference.
To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will show the next Airflow PID screen. The EC CFM SETTINGs screen will be shown anytime an exhaust option has been selected in the Factory Configuration. This screen allows the EC CFM PID GAIN (or Proportional Band), Reset (or Integral) and Rate (or Derivative) to be modified for loop tuning. The range of the Gain is 0 to 32767. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point.

The EXHAUST VFD PID and the EC CFM PID work concurrently to control the speed of the exhaust blower. The lowest calculated loop output of these loops will be the speed used to drive the exhaust blower.
Pressing the **DOWN** key from this screen will show the next Airflow PID screen. The OUTSIDE AIR DAMPER screen will be shown any time an exhaust option has been selected in the Factory Configuration. This screen allows the Outside Air Damper PID Gain (or Proportional Band), Reset (or Integral) and Rate (or Derivative) to be modified for loop tuning. The range of the Gain is 0 to 32767. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The current O/A Set point, the actual O/A differential pressure and the damper position are displayed at the bottom of this screen for reference.

![Figure 73](image)

To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will show the next Airflow PID screen. The COOL EXHAUST DAMPER screen will be shown any time the extended OA box has been selected in the Factory Configuration. This screen allows the Cool Air Exhaust Damper PID Gain (or Proportional Band), Reset (or Integral), Rate (or Derivative) and Set point to be modified for loop tuning. The range of the Gain is 0 to 32767. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. The range of the Set point is from 0.0"wc to 1.999"wc. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The actual Exhaust differential air pressure and the damper position are displayed at the bottom of this screen for reference.
To return to the Airflow Menu, press the **Esc** key.

Pressing the **DOWN** key from this screen will show the next Airflow PID screen. The WARM EXHAUST DAMPER screen will be shown any time the extended OA box has been selected in the Factory Configuration. This screen allows the Warm Air Exhaust Damper PID Gain (or Proportional Band), Reset (or Integral), Rate (or Derivative) and Set point to be modified for loop tuning. The range of the Gain is 0 to 32767. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. The range of the Set point is from 0.0"wc to 1.999"wc. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The actual Exhaust differential air pressure and the damper position are displayed at the bottom of this screen for reference.
To return to the Airflow Menu, press the Esc key.

2.2.4.5.3 Max O/A Settings
The Max O/A Settings will only be shown if this function has been enabled. Selecting the MAX O/A SETTINGS from the Airflow Menu will display the screen shown in Figure 76. Whenever the VOC sensor reading is higher than the Set point, the Max O/A mode will be initiated. Note that the BMS can also set the Max O/A mode remotely, even if the VOC sensor is low. The VOC reading will have to fall below the set point minus the differential amount to return to the normal air flow mode. The VOC set point can be modified from 0 ppm to 2000 ppm. The Diff can be modified from 0 ppm to 999 ppm. To modify these set points, press the ENTER key and use the arrow keys until the desired setting is shown. Pressing the ENTER key will now change the set point.

![Figure 76](image_url)

To return to the Airflow Menu, press the Esc key.

2.2.4.5.4 Low Exhaust Settings
The Low Exhaust Settings will only be shown if this function has been enabled. Selecting the LOW EXHAUST SETTINGS from the Airflow Menu will display the screen shown in Figure 77. The settings shown will be the percentage of the VFD reference signal sent to the VFD for the low exhaust blower. This blower will run whenever the supply air blower is on. The Event, Max O/A and Purge set points will be shown on this screen when these modes are selected in the configuration of the dehumidifier. All settings can be modified from 0.0% to 100.0%. To modify these set points, press the ENTER key and use the arrow keys until the desired setting is shown. Pressing the ENTER key will now change the set point.
To return to the Airflow Menu, press the Esc key.

2.2.4.6 Economizer Settings

The Economizer Settings will only be shown if the economizer sensor has been installed and the economizer function has been enabled. Selecting the ECONOMIZER SETTINGS from the Service Menu will display the screen shown in Figure 78. The Low Limit Band can be modified from this screen with a range of 0.0°F to 20.0°F. The status of the economizer is shown on this screen as well as the outdoor air condition.

Pressing the DOWN key will display the PID settings for the outside air damper position controlled by the outside air temperature. The PID Gain (or Proportional Band), Reset (or Integral) and Rate (or Derivative) can be modified from this screen. The range of the Gain is 0.0 to 3276.7. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the ENTER key and use the arrow keys until the desired setting is shown. Pressing the ENTER key will now change the set point. The actual outside
air temperature and damper position are displayed at the bottom of this screen for reference.

Figure 79

Pressing the **DOWN** key will display the PID settings for the outside air damper position controlled by the outside air relative humidity. The PID Gain (or Proportional Band), Reset (or Integral) and Rate (or Derivative) can be modified from this screen. The range of the Gain is 0.0 to 3276.7. The range of the Reset is 0 to 999. The range of the Rate is 0 to 999. To modify these set points, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the set point. The actual outside air relative humidity and damper position are displayed at the bottom of this screen for reference.

Figure 80

To return to the Service Menu, press the **Esc** key.
2.2.5 Unit Revision

The Unit Revision Screen shows the version of the application program that is running along with the release date of the software (Figure 81). This information should be communicated to Desert Aire in the event a service call is necessary.

Figure 81

To return to the MAIN MENU, press the Esc key.

2.3 Alarms

Alarms are either Automatic Reset or Manual Reset. Automatic reset alarms are alarms that allow the unit and/or circuit to return to operation once the operating parameters has been returned to acceptable operating conditions. The unit and/or circuit will restart automatically; however, the red Alarm LED will remain illuminated until acknowledged to alert the operator the alarm occurred. Manual Reset Alarms are alarms that stop the unit and/or circuit and do not restart until the alarm is acknowledged and the alarm condition is reset manually on the Alarm screen. The red Alarm LED will stay illuminated until the alarm is acknowledged AND the alarm condition is reset.

2.3.1 Alarm Screen

The ALARM MENU can be accessed anytime by pressing the ALARM button. The main alarm screen includes the instructions for viewing and resetting the alarms, as well as a means to access the alarm history page. Pressing the ENTER button while viewing this alarm screen or the active alarm will reset any alarm that has returned to its safe state. Any active alarm can be viewed by pressing the DOWN key from this page. Only active alarms are shown. To view the Alarm History Screen, press the ALARM button.
2.3.2 Low Suction Pressure Circuit A or Circuit B
This is an Automatic Reset Alarm. The Low Suction Pressure Alarm is activated when the Suction Pressure falls below the Low Suction Pressure Cutout (see Section 2.2.1.3). The circuit will stop and the Low Suction Pressure Alarm will be activated. The circuit will restart when the Suction Pressure rises to 48 psi above the Low Suction Pressure Trip set point.

2.3.3 High Discharge Pressure Circuit A or Circuit B
This is a Manual Reset Alarm. The High Discharge Pressure Alarm is activated when the Discharge Pressure rises above the High Discharge Pressure Cutout (see Section 2.2.1.3). The circuit will stop and the High Discharge Pressure Alarm will be activated. The circuit will not restart until the operator acknowledges the High Discharge Pressure Alarm AND manually resets it.
2.3.4 Supply Air Temperature Sensor Failure
This is a Manual Reset Alarm. The Supply Air Temperature Sensor Failure Alarm is activated when the Supply Air Temperature Sensor is in a shorted or open condition. The circuit will stop and the Supply Air Temperature Sensor Failure Alarm will be activated. The circuit will not restart until the operator acknowledges the Supply Air Temperature Sensor Failure Alarm AND manually resets it.

2.3.5 Zone Air Temperature Sensor Failure
This is a Manual Reset Alarm. The Zone Air Temperature Sensor Failure Alarm is activated when the Zone Air Temperature Sensor is in a shorted or open condition. The circuit will not restart until the operator acknowledges the Zone Air Temperature Sensor Failure Alarm AND manually resets it.

2.3.6 Supply Blower or Exhaust Blower Motor Overload
This is a Manual Reset Alarm. The Blower Motor Overload Alarm is activated when the Blower Motor device indicates an overload condition. The unit will stop and the Blower Motor Overload Alarm will be activated. The unit will not restart until the operator acknowledges the Blower Motor Overload Alarm AND manually resets it.

2.3.7 Compressor A or B Motor Overload
This is a Manual Reset Alarm. The Compressor Motor Overload Alarm is activated when the Compressor Motor Overload device indicates an overload condition. The circuit will not restart until the operator acknowledges the Compressor Motor Overload AND manually resets it.

2.3.8 System Shutdown
This is an Automatic Reset Alarm. The System Shutdown Alarm is activated when digital input ID13 is opened. The unit will stop and the System Shutdown Alarm will be activated. The unit will restart when the digital input ID13 is closed.
2.3.9 Low Supply Air Temperature
This is an Automatic Reset Alarm. The Low Supply Air Temperature Alarm is activated when the supply air temperature falls below 40°F. The Outdoor Air damper will close and the Low Supply Air Temperature Alarm will be activated. The unit will return to normal operation when the supply air temperature rises above 45°F.

2.3.10 Low Voltage (optional Low Voltage Monitor needed to activate alarm)
This is an Automatic Reset Alarm. The optional Low Voltage Monitor is required to activate this alarm. The Low Voltage Alarm is activated when the Low Voltage Monitor senses 10% below nominal voltage in the unit – low enough to damage the electrical equipment. The unit will stop and the Low Voltage Alarm will be activated. The unit will restart and return to normal operation when the Low Voltage Monitor does not indicate low voltage.

2.3.11 Low Air Flow
This is an Automatic Reset Alarm. The Low Air Flow Alarm is activated when the air flow value is less than 80% of the air flow minimum value (see Section 2.2.4.5) 10 seconds after the blower has started. The air flow must be at least 90% of the minimum value to allow heating, cooling and dehumidification. The supply and exhaust blowers will continue to run in the low flow condition.

2.3.12 Freeze Stat Alarm (Units Equipped with Hot Water Coil Option Only)
This is an Automatic Reset Alarm. A Freeze Stat Alarm is activated when temperature downstream of the hot water coil drops below 38°F. In this condition, the outside air damper closes and a 5 minute timer starts. After 5 minutes, if the temperature downstream of the hot water coil is still below 38°F the supply and exhaust blowers will stop, the Freeze Stat Alarm will activate, and the heat output of the water valve will be set to its maximum. The unit will return to normal operation when the temperature downstream of the hot water coil is above 38°F.

2.3.13 Evacuator VFD Overload
This is an Automatic Reset Alarm. The Evacuator VFD Overload Alarm is activated when the VFD indicates an overload condition. The unit will continue to run in this condition. The Evacuator Overload Alarm will be activated and the red Alarm LED will stay illuminated until the alarm is acknowledged.

2.3.14 Alarm History Screen
The Alarm History Screen is accessible from the Alarm Screen by pressing the ALARM button. This screen lists a history of the last 100 alarms, by time and date. The most recent alarm will be displayed as 001 along with the Zone Air Temperature, Zone Relative Humidity, Supply Air Temperature, Circuit A & B Suction and Discharge Pressure and the status of the unit when the alarm occurred. To access the history of alarms, press the DOWN key. The last 100 alarm conditions are saved in this history with the 101st being overwritten.
3 Hardware Details

3.1 Programmable Controller
The controller is factory programmed by Desert Aire for your unit. Replacement controllers are only available through Desert Aire or authorized Desert Aire sales representatives. If replacement is necessary please have the model number and serial number of the unit available when you contact us.

3.2 Suction Pressure Transducer
The Suction Pressure Transducer is a 0.5 - 4.5 VDC to 0 - 250 psig ratiometric device. The body is brass with a 1/4 SAE female refrigerant connection. This transducer must be supplied with 4.5 to 5.5 VDC power. A display reading of 0.0 psig for the transducer indicates the device is disconnected or defective. For this device to function, 5.0 VDC must be present from the black to green wires on the transducer. To verify the output of the transducer, measure the DC voltage (should read between 0.5 to 4.5 VDC) from the white to the green wires on the transducer and use this voltage in the following formula to determine the pressure (0-250 psig).

\[
\text{Pressure (psig)} = (62.5) \times (V) - 31.25
\]

Example, if \( V = 2.50 \) VDC, then;
\[
\text{Pressure (psig)} = (62.5) \times (2.50) - 31.25
\]
\[
= 156.25 - 31.25
\]
\[
= 125 \text{ psig.}
\]

The Suction Pressure Transducer’s replacement part number is available from Desert Aire by calling our service department.

3.3 Discharge Pressure Transducer
The Discharge Pressure Transducer is a 0.5 - 4.5 VDC to 0 - 652 psig ratiometric device. The body is brass with a 1/4 SAE female refrigerant connection. This transducer must be supplied with 4.5 to 5.5 VDC power. A display reading of 0.0 psig for the transducer indicates the device is disconnected or defective. For this device to function, 5.0 VDC must be present from the black to green wires on the transducer. To verify the output of the transducer, measure the DC voltage (should read between 0.5 to 4.5 VDC) from the white to green wires on the transducer and use this voltage in the following formula to determine the pressure (0-652psig).

\[
\text{Pressure (psig)} = (163) \times (V) - 81.5
\]

Example, if \( V = 2.50 \) VDC, then;
\[
\text{Pressure (psig)} = (163) \times (2.50) - 81.5
\]
\[
= 407.5 - 81.5
\]
\[
= 326 \text{ psig.}
\]

The Desert Aire replacement part number for the Discharge Pressure Transducer is available by calling our service department.
3.4 **Differential Air Pressure Transducer**
The Supply Air, Evaporator Air, Outdoor Air, Zone Air and optional Exhaust Air Pressure Transducers are 0.25 – 4.00 VDC to 0 – 2” WC devices.

3.5 **Temperature Sensor**
The Supply Air and Suction Temperature Sensor is a resistive NTC Bulb type device with a 10 foot cable. The temperature range is -58.0° to 212.0°F and the environmental rating is IP67. The failure mode of this device will display a reading of -623.3°F if the sensor is open, and display a reading of 687.3°F if the sensor is shorted. The Desert Aire replacement part number for the Supply Air Temperature Sensor is available by calling our service department.

3.6 **Zone Air Temperature and Relative Humidity Sensor**
The Zone Air Temperature and Relative Humidity Sensor is provided as either a duct or wall mount device. The failure mode of the temperature sensor internal to this device will display a reading of 137.6°F if the sensor is open and display a reading of -42.4°F if the sensor is shorted. This may seem reversed, but is accurate, as the readings have been scaled internally in the program and the device has a negative temperature coefficient. A reading of 0.0% humidity in the program and the device has a negative temperature coefficient. A reading of 0.0% humidity indicates a failure of the RH sensor or a mis-wired connection. The Desert Aire replacement part number for the Intake Air Temperature and Relative Humidity Sensor is available by calling our service department.
4 Appendix

4.1 Remote Communication

4.1.1 BACnet Ethernet

Setting IP Address Via the PGD

• Hold the alarm button and the enter button for 5 seconds. The following screen will appear.

![Figure 86]

• Select OTHER INFORMATION and the following screen will appear.

![Figure 87]

• Select PCOWEB/NET CONFIG and the following screen will appear.
• Select PCOWEB settings and the screen will prompt you to set the DHCP and the IP address. DHCP should be set to off. Set IP address as instructed by Controls contractor.

• After the IP address has been set the screen will switch to the following page. Set the Netmask as well as the Gateway addresses. The Netmask and the Gateway addresses will be provided by the Controls contractor.
• After this is complete the screen will switch to the following page. If multiple DNS addresses are required they would be entered here. This is not common. The Controls contractor would also need to provide these addresses.

• Next you will see the BACnet ID and BACnet Type screen. This is also very rarely used however, if necessary, needs to be provided by the Control contractor. Set appropriately.
• The controller will then prompt you to save the changes. Select YES and hit enter.

• The controller will then verify that the update was complete and ask you to reboot the pCOnet. Cycle power to the dehumidifier.
4.1.2 BACnet MS/TP

Setting MS/TP Addressing Via the PGD

- Hold the alarm button and the enter button for 5 seconds. The following screen will appear.

• Select OTHER INFORMATION and the following screen will appear.
• Select PCOWEB/NET CONFIG and the following screen will appear.

• Select PCONET settings and the screen will prompt you to set the Device Instance and Baud Rate. Set as instructed by Controls contractor.
• After the baud rate has been set the screen will switch to the following page. Set the BACnet MAC address as well as the Max Master and Max Info Frames. The MAC address will be provided by the Controls contractor. Default values for the Max Master is 127 and Max Frames is 20.

• The controller will then prompt you to save the changes. Select YES and hit enter.
• The controller will then verify that the update was complete and ask you to reboot the pCONet. Cycle power to the dehumidifier.

• Addressing is now complete