CM3530 Series Controller

Installation and Operations Manual for LC/LV Units

Desert Aire

Backlit LCD User Interface

Custom programming for complex dehumidification temperature & humidity control
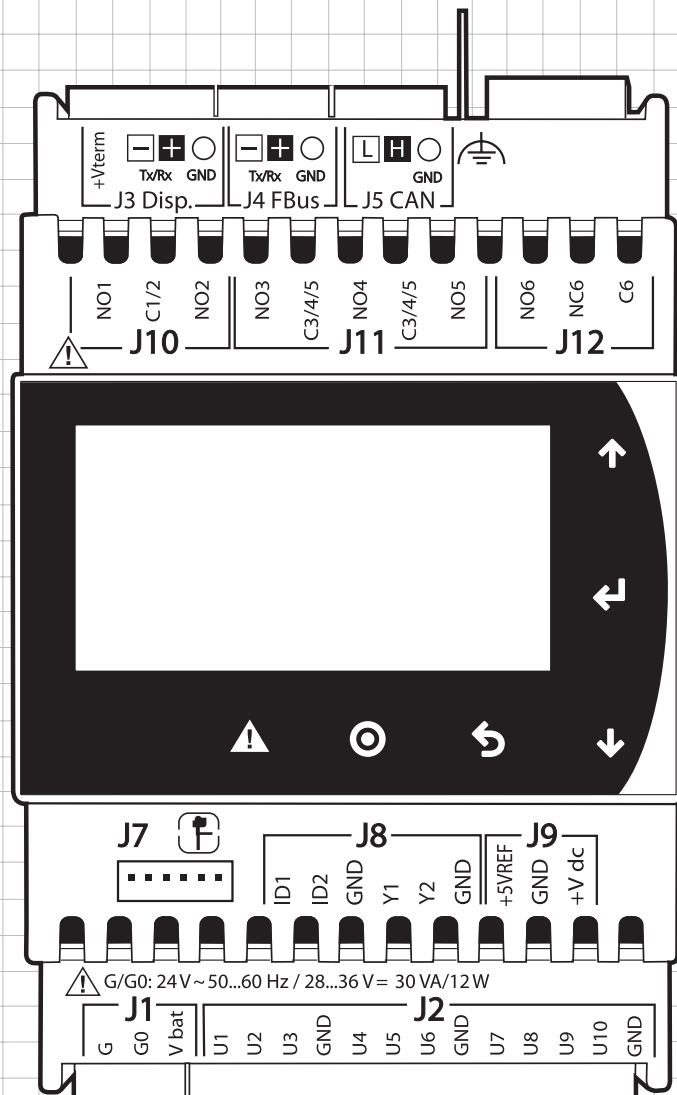
Multiple communication options:

- LonWorks®

- BACnet™ Ethernet

- BACnet™ MS/TP

- Modbus®

Alarm history retention

Integral remote access capability

ETL Listed C US INTERTEK

AHRI MEMBER

+Vterm | Tx/Rx GND | Tx/Rx GND | L H GND
J3 Disp. | J4 FBus | J5 CAN

NO1 C1/2 NO2 | NO3 C3/4/5 NO4 C3/4/5 NO5 | NO6 NC6 C6
J10 | J11 | J12

J7 | J8 | J9
ID1 ID2 GND Y1 Y2 GND | +5VREF GND +Vdc

G/G0: 24V ~ 50...60 Hz / 28...36 V = 30 VA/12 W
J1 | J2
G G0 Vbat | U1 U2 U3 GND U4 U5 U6 GND U7 U8 U9 U10 GND

CM3530 Controller

> ## ⚠ DANGER
>
> ONLY TRAINED, QUALIFIED PERSONNEL SHOULD INSTALL AND/OR SERVICE
>
> DESERT AIRE EQUIPMENT. SERIOUS INJURY, DEATH AND PROPERTY DAMAGE CAN
>
> RESULT FROM IMPROPER INSTALLATION/SERVICE OF THIS EQUIPMENT. HIGH VOLTAGE
>
> ELECTRICAL COMPONENTS AND REFRIGERANT UNDER PRESSURE ARE PRESENT.

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 warrantees beyond this Standard Limited Warranty document. Extended warrantees are only available at the time of the purchase of the original equipment. These extended warrantees 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:

> Desert Aire Corp
> c/o Service Manager
> N120 W18485 Freistadt Road
> Germantown, WI 53022
> PH: (262) 946-7400
> TOLL FREE: (800) 443-5276
> FAX: (262) 946-7401
> E-MAIL: service@desert-aire.com

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

Desert Aire - CM3530 Manual

TABLE OF CONTENTS

1.   Installation

1.1   Introduction

Your Desert Aire controller is designed for precise monitoring and control of air temperature and relative humidity (RH) within a conditioned environment.

This CM3530 control system is easy to install and operate. The controller features an internal display terminal (IDT). This display allows viewing and adjustment of the unit's sensors and setpoints. It also indicates the operating status of major components inside the dehumidifier. The CM3530 controller also has the ability to control auxiliary equipment such as a pool water or tower water pumps and auxiliary heating devices for optimum energy efficiency.

Most sensors and devices have been factory-installed and wired inside the dehumidifier. In most cases, only connection to a remote condenser, electrical power connection and an Ethernet connection to the facilities computer network are required. For units requiring a wall mounted zone air temperature and relative humidity sensor, wiring to the unit will be required. Also, units with a pool condenser will require temperature sensors to be wired in the pool water piping.

The control system includes a web page which allows a virtual display terminal to be accessed from any device on the computer network. Simply browse to the IP address assigned to the dehumidifier, enter the appropriate credentials, [user – Desert-Aire, password – 18485] and select the DISPLAY tab. Logging is also available from this web page.

The CM3530 controller also features optional building automation access. This includes options for network connect ability including LonWorks, BACnet IP, BACnet MS/TP, ModBus RTU and ModBus IP.

1.2   Sensor Installation

The CM3530 control system is normally provided with a unit mounted combination relative humidity and temperature sensor. This sensor provides accurate control without the problems associated with wall mounted sensors, such as faulty readings due to hot spots or drafts. If a pool water condenser has been provided in the dehumidifier, pool water temperature sensors will need to be installed in the water piping.

1.2.1   Unit Mounted Sensor

This sensor is factory mounted in the return air duct upstream of any outdoor air intakes.

1.2.2.   Wall-Mount Humidity and Temperature Sensor

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

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

1.2.3 Water Temperature Sensors

Desert Aire dehumidifiers ordered with the pool water heating option are supplied with two water temperature sensors and two immersion wells.

- Screw the wells into the adapter fittings of the inlet and outlet pool water piping. The wells are equipped with a 1/2" MPT connection.
- Install the sensors upstream and downstream from the dehumidifier or the auxiliary pool water heater.
- The sensors must be installed in a location where they will accurately sense the pool water inlet and outlet temperature conditions. This means you must have continuous water flow at the sensor locations.

1.3 Auxiliary Air Heating Control Wiring

Note: You must use the Desert Aire CM3530 control system to control or interlock with the room heating system. This prevents the heater from trying to heat the room while the dehumidifier is running in cooling mode.

1.3.1 Auxiliary Heating - Dry Contact Closure

The standard Desert Aire CM3530 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 terminals H1 and H2 in the control panel of the dehumidifier. See your wiring schematic for connection details.

Note: Units with an internal electric air heater have an airflow proving switch installed between the heater and the control enclosure. If an air heater is installed external to the unit, provide an external airflow proving switch for protection of the heater.

1.3.2 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 "neutral" 24 VAC input and the "negative" signal input.

The control signal may also be set for reverse-acting or for 2-10 VDC. Contact Desert Aire's service department for recommendations or instructions on how these options can be implemented.

1.4   CM3530 Controller Overview

Desert Aire's CM3530 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.
- Display of alarms for abnormal conditions such as sensor failures or tripped safety controls.
- An optional seven-day occupancy timer which can control outdoor air dampers (if used) to bring in fresh air when the dehumidifier is an occupied state.
- A convenient, easy-to-understand display interface which allows the operator to view and change setpoints and time schedules.

2. LC / LV Controller Details

2.1 Menu Overview and General Instructions (Figure 1)

Your Desert Aire controller is pre-programmed and configured at the factory for use in the application you have specified. The internal display terminal (IDT, see Figure 1) allows the operator to monitor and adjust the setpoints of your Desert Aire system. The IDT has an LCD screen and six keys. These keys are labeled as below:

⚠ - ALARM Key

◎ - PROGRAM (Prg) Key

↩ - ESCAPE (Esc) Key

⇓ - DOWN Key

⇑ - UP Key

↵ - ENTER Key

The Home Screen (Figure 1) displays the Desert Aire logo and shows the dehumidifier status, zone temperature and relative humidity and the operational state of the fan, compressor and air heating. The unit type is displayed in the upper right of the screen indicating either an LC or LV and the tonnage. 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 "Prg → Stpt" indicates that if the **Prg** key is pressed, the setpoints can be changed. The "↑↓ → Help" indicates that if the **UP** or **DOWN** keys are pressed, the help screens will be shown. The **UP** or **DOWN** keys will now scroll through the help screens.

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 setpoints 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.

When an alarm is triggered, the red LED behind the **ALARM** key will light and remain on until the alarm is reset.

To view the alarms from any menu, simply press the **ALARM** key. If no alarm is active, the display will state NO ALARMS. If an alarm is present, it will be displayed along with the date and time it was triggered. The bottom two lines will display two data points recorded when the alarm was triggered.

To reset the alarm, use the **DOWN** key until the reset instructions are shown. Pressing the **ALARM** key for three seconds will reset all active alarms. See Section 3 for further alarm and alarm data logging information.

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.
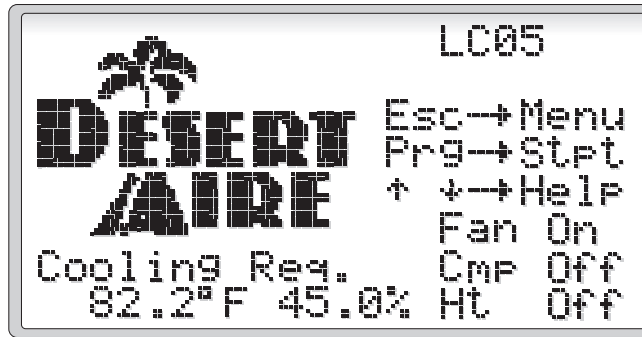
Figure 1

2.2   Zone Setpoints (Figure 2)

Pressing the **Prg** key from the Home Screen displays the ACTIVE ZONE SETPOINTS (Figure 4). This menu displays the current temperature and humidity setpoints specific to the unit. The setpoints displayed are from one of the following options; the standard setpoints adjustable in the unit, the setpoints from a Lead Unit, or the setpoints from a BMS network.

Pressing the **Dwn** key will display one of the screens shown in Figures 3, 4, 5.
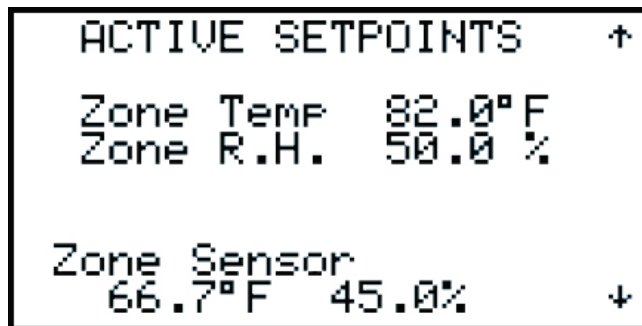
Figure 2

If the unit is set up to use the standard setpoints particular to the unit pressing the **Dwn** key will display the screen in Figure 3. On this screen the Zone Temperature and Humidity Setpoints are adjustable. If Setback has been enabled, the Unoccupied Zone Temperature and Humidity Setpoints are also adjustable on this screen.

```
      ZONE SETPOINTS        ↑

   Zone Temp    82.0° F
   Zone R.H.    50.0 %
 Setback Temp   75.0° F
 Setback R.H.   55.0 %

                            ↓
```
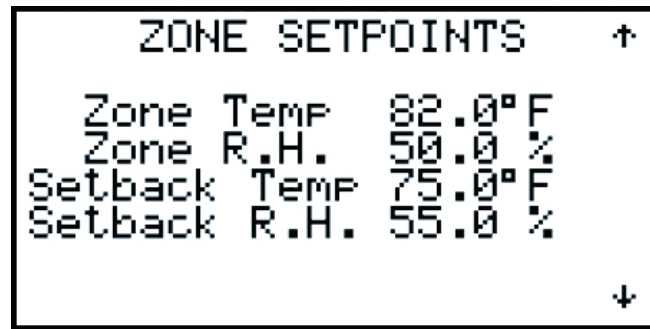
Figure 3

If the unit is set up to use the Lead Unit's setpoints, pressing the **Dwn** key will display the screen in Figure 4. Here the Lead Unit's setpoints are displayed, and can only be changed from the Lead Unit.

```
 LEAD UNIT SETPOINTS ↑


    Zone Temp    75.0° F
    Zone R.H.    55.0 %


                            ↓
```
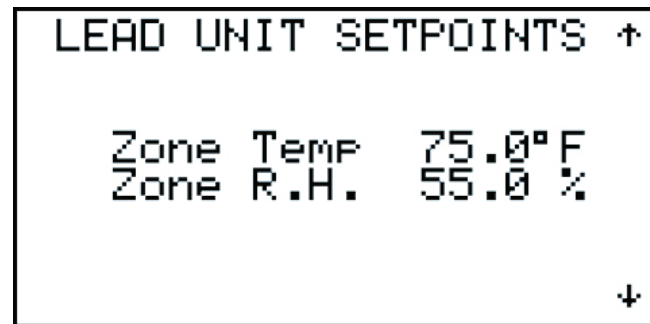
Figure 4

If the unit is set up to use setpoints sent by a BMS system, pressing the **Dwn** key will display the screen in Figure 5. Here the Network Zone Temperature and Humidity Setpoints are adjustable from this screen. If setback has been enabled, the Unoccupied Zone Temperature and Humidity Setpoints are adjustable from this screen. These Setpoints will also be adjustable through Modbus or BACnet protocol depending on the BMS option selected.

```
      BMS SETPOINTS         ↑

   Zone Temp    82.0° F
   Zone R.H.    50.0 %
 Setback Temp   75.0° F
 Setback R.H.   55.0 %

                            ↓
```

Figure 5

If pool heating is included in the unit, the up and down arrow keys will be shown on the right of the screen. Press the **DOWN** key and the screen shown in Figure 3 will appear. Set the pool water temperature set point with the **ENTER** and **UP** and **DOWN** keys and press the **ENTER** key to modify. The Partial Pool and or Surface Temperature set points will be shown in a similar manner when those options are supplied with the dehumidifier.

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

```
┌─────────────────────────────┐
│  ▦      POOL WATER        ↑  │
│                             │
│     Setpoint  82.0°F        │
│                             │
│                             │
│          Actual             │
│          82.5°F          ↓  │
└─────────────────────────────┘
```
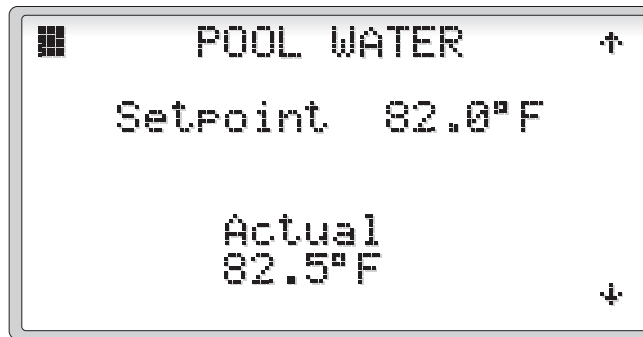
Figure 6

2.3 Main Menu (Figure 7)

Pressing the **Esc** key from the Home Screen displays the MAIN MENU (Figure 7). This menu allows the operator to select the UNIT STATUS, set the Occupancy Schedule, enter the Service Menu and view the Unit Revision.

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

```
┌─────────────────────────────┐
│          MAIN MENU          │
│                             │
│   →UNIT STATUS              │
│     Occupancy Schedule      │
│     Service Menu            │
│     Unit Revision           │
│                             │
└─────────────────────────────┘
```
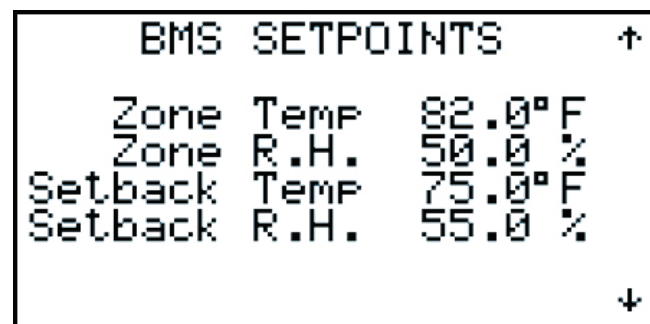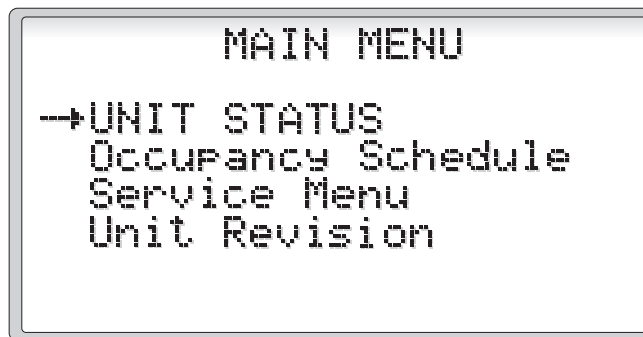
Figure 7

2.3.1 Unit Status (Figure 8)

Selecting Unit Status from the MAIN MENU displays a text explanation of the unit. The ROC Available or ROC Unavailable is shown on the first line of this display. This is based on the state of the digital input #7. A water flow switch or a jumper will determine if a remote condenser is available for heat rejection. The Occupied state (either Occupied or Un-Occupied) is shown on the second line along with the state of the blower. The Unit Status will show one of the following states on the third line.

- Off / Satisfied

- Heating Req.
- Cooling Req.
- Dehum & Heat
- Dehum & Cool
- Low Suct. Pr
- Low Air Flow
- Low DHU Tmp

The fourth line will display the pool flow state if pool heating is required. The fifth line displays if the compressor is on or off. The sixth line will indicate if the compressor is waiting for its non-short cycling timer to time out and the time left before a restart is available.

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


```
        Unit Status
ROC Available
Occupied      Blwr On
Cooling Req.
Pool Flow On
Compressor    On

10/26/17      20:51:03
```
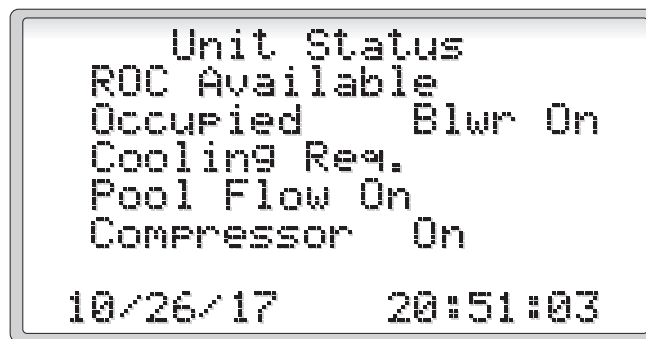
Figure 8

2.3.2   Occupancy Schedule (Figure 9)

Select the OCCUPANCY SCHEDULE from the MAIN MENU to enable a schedule to place the dehumidifier in the occupied mode. See Figure 9. To enable a schedule, select Yes, and press **ENTER**. The schedule will need to be setup before this will be enabled. Pressing the **Prg** key from this menu allows the date and time to be modified.

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


```
  OCCUPANCY  SCHEDULE

Enable?              No




  <Prg> to set Time
```
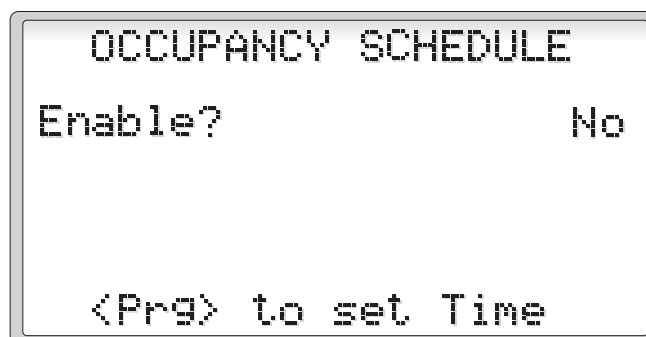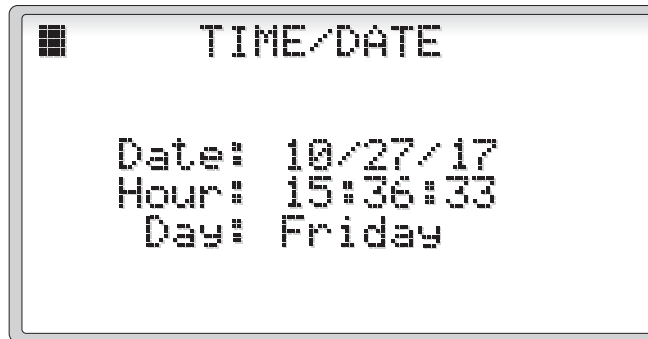
Figure 9

2.3.2.1 Time Settings (Figure 10)

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 accept that value and step to the next item.

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

Figure 10

2.3.2.2 Daily Events (Figure 11)

This is where each day's events are set. Four settings are possible, which will allow two separate occupancy periods. Check the first box by pressing the **UP** key when the cursor is over the check box. Set the time in 24 hour format and then select 'Occupied' or 'Un-Occupied'. Save this data at the bottom of this screen by selecting 'Yes' and pressing **ENTER**.

Once a day is entered, these settings can be copied to any other day by selecting the day to copy, setting the Copy To: the appropriate day, and then selecting Ok? to 'Yes'. Modify these days as appropriate.

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

Figure 11

2.3.2.3 Vacation Periods (Figure 12)

The Vacation Periods will allow three sets of vacation to keep the dehumidifier 'Occupied' or 'Un-Occupied'. Set the range of days that this will occur, the Start Date and the End Date for that holiday.

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

```
┌─────────────────────────────────┐
│      VACATION PERIODS           │
│                                 │
│   Start    End    Status        │
│ □ ---/---  ---/---  -----        │
│ □ ---/---  ---/---  -----        │
│ □ ---/---  ---/---  -----        │
│                                 │
│                                 │
└─────────────────────────────────┘
```
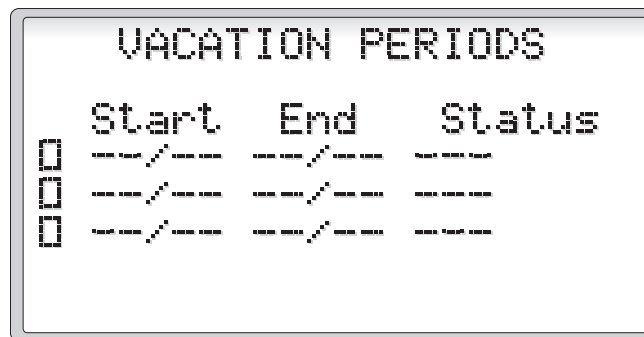
Figure 12

2.3.2.4 Special Days (Figure 13)

Also available are 6 special days where the full day can be set for either 'Occupied' or 'Un-Occupied'.

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

```
┌─────────────────────────────────┐
│ ▦   SPECIAL DAYS                │
│ □ 1  ---/---   -----             │
│ □ 2  ---/---   -----             │
│ □ 3  ---/---   -----             │
│ □ 4  ---/---   -----             │
│ □ 5  ---/---   -----             │
│ □ 6  ---/---   -----             │
└─────────────────────────────────┘
```
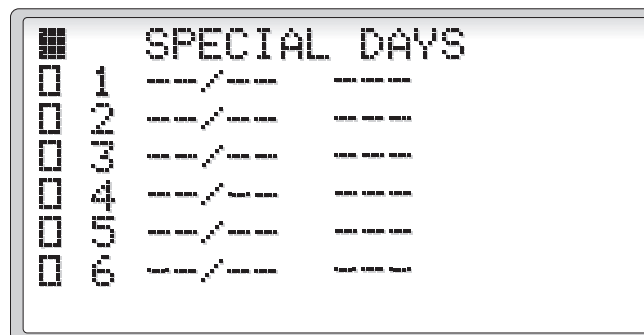
Figure 13

2.3.2.5 Temporary Occupancy (Figure 14)

This screen allows the unit to be manually set to Occupied 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 'Set Override' message. Press the **UP** and **ENTER** keys to set this override to

'On'. The dehumidifier will now be 'Occupied' for this period of time. When the override expires, the screen will again display Set Override, and the dehumidifier will return to its normal state.

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

```
▤ TEMPORARY OCCUPANCY

      Select time to
    override schedule.
         00H:00M
      Set Override

         Occupied
```
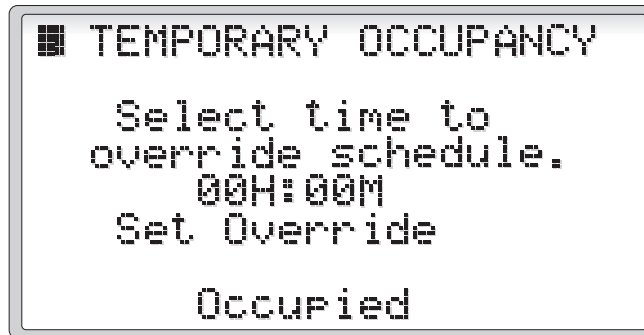
Figure 14

2.3.3   Service Menu (Figures 15 and 16)
Selecting the SERVICE MENU will display the Login Screen (Figure 15). Enter the service password, 1234, and press **ENTER**.

```
         SERVICE MENU
         LOGIN SCREEN

        Enter Password
            0000
```
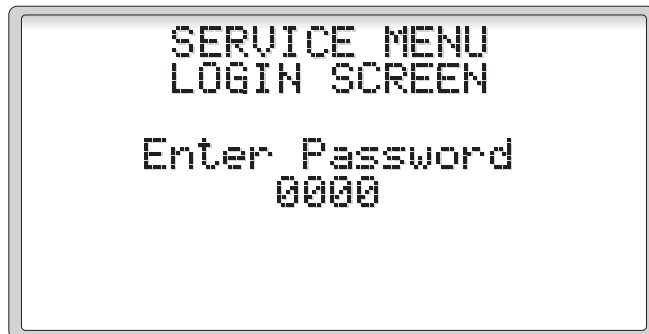
Figure 15

The SERVICE MENU gives access to Commissioning, Tuning, I/O Status, Sensor Offsets, Diagnostics and Memory Options (Figure 16).

To return to the MAIN MENU, press the **Esc** key.
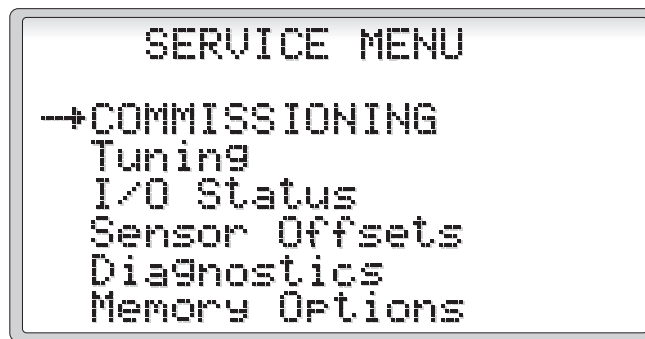
Figure 16

The user remains logged in for 30 minutes after the password is entered. During this time, the Login screen reads "Logged In For" and the seconds left before the password expires. To login without entering the password, while this message is shown, press the **Prg** key.

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

2.3.3.1 Commissioning (Figure 17)

Selecting the COMMISSIONING MENU from the Service Menu displays the COMMISSIONING MENU (Figure 17). This menu allows the operator to select the Configuration, Network Config, Airflow Setup, Current Conditions, Commissioning Test, Motor Phasing and BMS Setup. To return to the Service Menu, press the **Esc** key.

Figure 17

2.3.3.1.1 Configuration – Blower Setup (Figure 18)

Selecting the CONFIGURATION from the Commissioning Menu displays the BLOWER SETUP screen (Figure 18). The blower can be set for either CONTINUOUS or AUTOMATIC. Only set the blower to automatic if a wall mount sensor is used.

Press the **DOWN** key for the next Configuration screen. To return to the Service Menu, press the **Esc** key.

```
      BLOWER SETUP      ↑

ONLY set blower to
AUTOMATIC if a wall
mount sensor is used.
Blower - CONTINUOUS

                        ↓
```
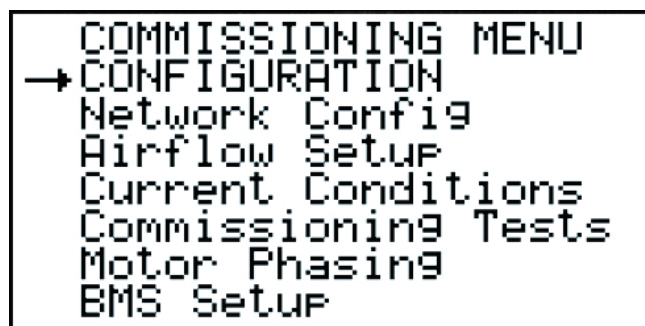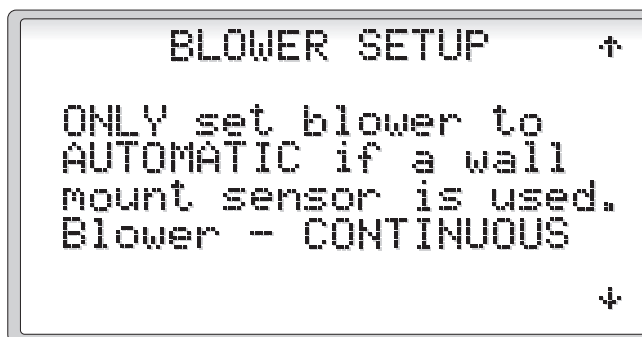
Figure 18

2.3.3.1.2 Configuration – Condenser Setup (Figure 19)

Pressing the **DOWN** key will now display the CONDENSER
SETUP screen (Figure 19). This screen allows a delay in
establishing condenser flow if a tower water condenser is used.
When the condenser is connected to the dehumidifier, check the
ROC Installed box. Checking this box along with the state of digital
input #7 will determine if the ROC is available or unavailable.

Press the **DOWN** key for the next Configuration screen.
To return to the Service Menu, press the **Esc** key.

```
    CONDENSER SETUP   ↑

To enable the ROC,
wire the flow switch
or install jumper.
Flow delay   5 secs.
☑ ROC installed.
                     ↓
```

Figure 19

2.3.3.1.3 Configuration – Zone Sensor Select (Figure 20)

Pressing the **DOWN** key will now display the ZONE SENSOR
SELECT screen (Figure 20). This screen allows the user to select
where the unit will receive its Zone Sensor data. If a zone sensor is
connected directly to the unit all selections should be left
unchecked. If the unit will share a sensor with a Lead Unit, the "Use
Lead Unit Sensor" box must be checked. If communication fails
between Lead & Lag units, a message at the bottom will state "Lead
Unit MB FLT". If the unit will receive zone sensor data from a BMS
system the "Use BMS Sensor" box must be checked.

Figure 20

If BMS sensor is selected an option to enable a BMS Heartbeat and set a Heartbeat Delay will be displayed as shown in Figure 21. The Heartbeat is a BMS Boolean point that will need to be toggled On and Off within the Heartbeat Delay time to verify communication is occurring. If there is a fault with the heartbeat, a message at the bottom of the screen will state "BMS Comm. FLT". The heartbeat function is optional, but recommended. If the heartbeat is not selected and zone sensor data is no longer sent to the unit, the last available sensor data will be used. This can result in runaway temperatures in the zone. If the heartbeat is selected and not actively sent, the unit will default to the locally connected zone sensor (if equipped).
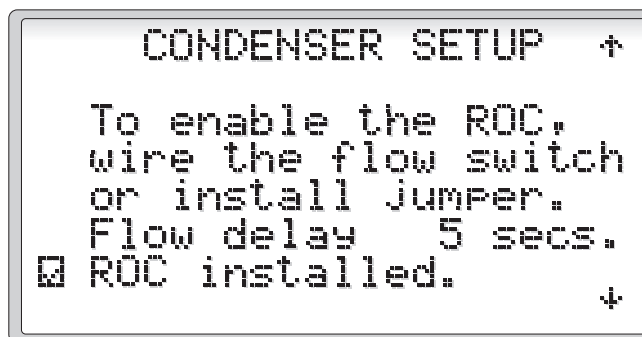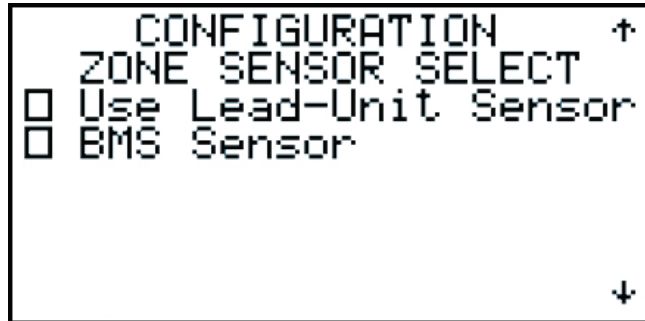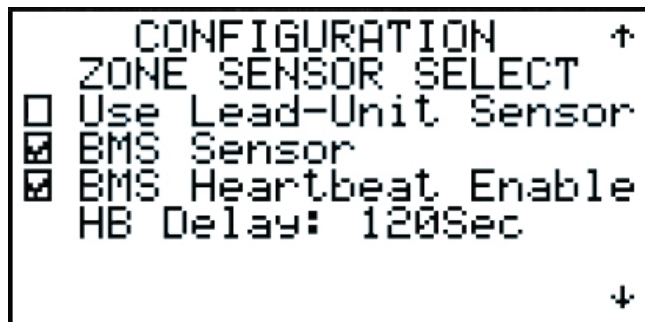

Figure 21

2.3.3.1.4 Configuration – Zone Setpoint Select (Figure 22)

Pressing the **Dwn** key will now display the SETPOINT SELECT screen (Figure 22). This screen allows the user to select where the unit will receive its Zone Temperature and Humidity Setpoints. If the unit will use the setpoints on the Zone Setpoints screen from the local display, all selections towards the top of the screen should be left unchecked.

If the unit will receive setpoints from a Lead Unit, the "Use Lead

Unit Stpts" box must be checked. The unit will then show the set points of the Lead unit. Any adjustments to the setpoints must be done from the Lead unit.

If the unit will use setpoints sent from a BMS communication system, the "Use BMS Stpts" box must be checked. The unit will then receive setpoints from either the BACnet or Modbus protocols. Towards the bottom of the screen a checkbox for Allow Setback is adjustable. If the Allow Setback box is checked the unit will use both Occupied and Unoccupied Zone setpoints.

```
   CONFIGURATION      ↑
   SETPOINT SELECT
☐ Use Lead Unit Stpts
☐ Use BMS Stpts

☐ Allow Setback

                      ↓
```
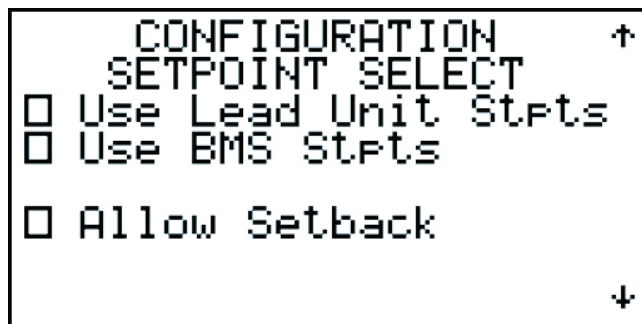
Figure 22

2.3.3.1.5 Configuration – Movable Roof/Wall (Figure 23)

Pressing the **DOWN** key will now display the Movable Roof/Wall screen (Figure 23). This screen displays the state of the Roof open. The Force Open State will manually set the Roof Open state from the controller. To determine what the dehumidifier will do when the Roof is Open, see the next screen.

Press the **DOWN** key for the next Configuration screen. To return to the Service Menu, press the **Esc** key

```
▦ MOVABLE ROOF/WALL   ↑

  Switch is Off
  BMS pt is Off
☐ Force Open State

  Roof is Closed       ↓
```
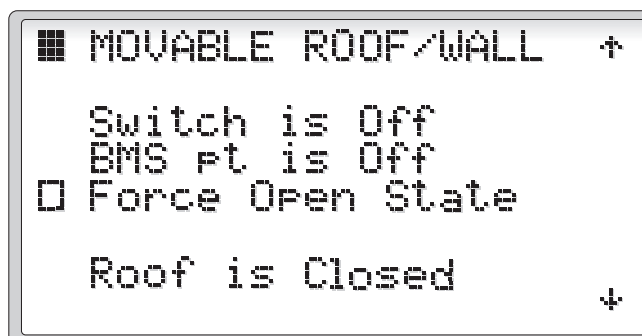
Figure 23

2.3.3.1.6 Configuration – Roof Open Action (Figure 24)

Pressing the **DOWN** key will now display the Action that will be disabled when the roof is open. Check all devices to disable that action when the roof is open.

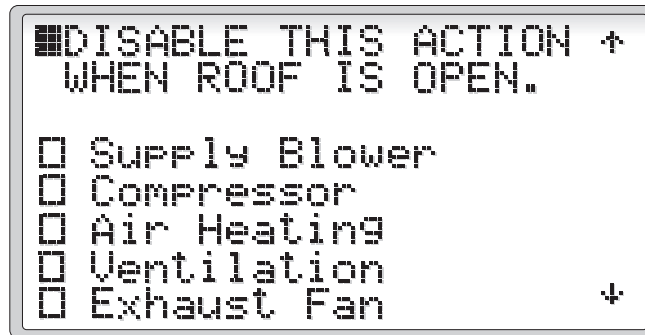To return to the Service Menu, press the **Esc** key.

Figure 24

2.3.3.2 Network Config (Figure 25)

An IP address must be used if the unit will be connected to AireGuard, Modbus IP, BACnet IP or as part of a Lead-Lag setup.

Selecting NETWORK CONFIG from the Commissioning Menu displays the NETWORK CONFIG screen shown in Figure 25. From this screen, the unit IP address can be set to either DHCP On (default) or to a static IP address. The settings here should be coordinated with the building controls contractor.
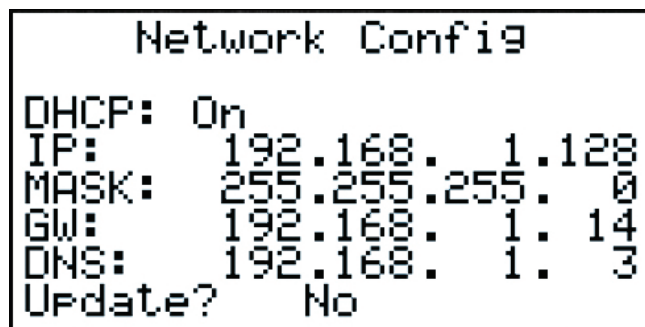
Figure 25

Pressing the **DOWN** key at the top of the Network Config screen will show the HOSTNAME screen of Figure 26. The HOSTNAME screen allows the user to adjust the unit's hostname (defaulted to "dhu1"). Each unit on a network should have a unique hostname. It is recommended that this hostname be the same as the unit tag or other unique identifier already associated with the specific unit.

The hostname appears at the top of the screen, and can be adjusted to any 8-character series of numbers or letters. (Note – Capital letters and special characters are excluded from the hostname). Once the hostname is adjusted to the desired value the "Set Hostname" box must be checked. After the checkbox clears, the "Get Hostname" box must be checked to verify that the controller has been set to the adjusted hostname. The current hostname of the unit will be displayed towards the bottom of the screen.
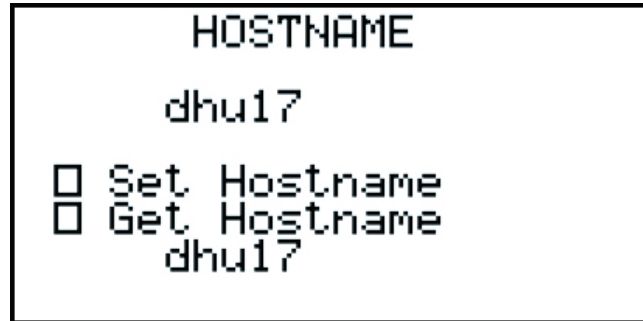
Figure 26

Pressing the **DOWN** key when at the top of the HOSTNAME screen will take you to the LEAD UNIT HOSTNAME screen of Figure 27. The LEAD UNIT HOSTNAME screen allows the user to enter the hostname of the lead unit. If the current unit is a lead unit or will not have Lead-Lag operation, this screen is not applicable and should not be adjusted. The 8-character string at the top of the screen is adjustable and must be set to the Lead Unit hostname. Directly below is an indication of the lead unit hostname for this controller.

To return to the Commissioning Menu, press the **Esc** key.
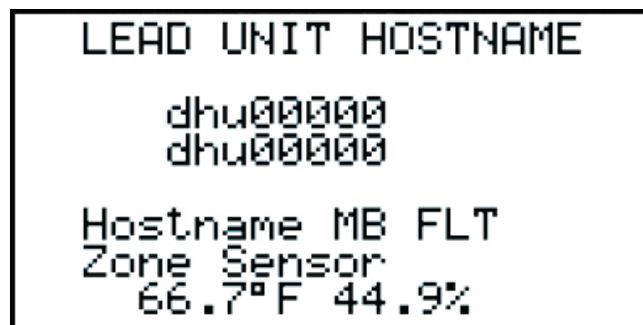
Figure 27

2.3.3.3 Airflow Setup (Figure 28)

Selecting the AIRFLOW SETUP from the Commissioning Menu will display either the screen shown in Figure 28 or Figure 29.

If the unit has a centrifugal housed blower the screen of Figure 29 will be displayed. The Standard CFM, Standard Differential Pressure, and Altitude are all adjustable towards the top half of the screen. Standard CFM is the target airflow rate of the unit. Standard DP is the differential pressure of the reheat coil when Standard CFM at sea level is achieved. These values are programmed at the factory for the specific model size.

The Altitude programmed and the actual Reheat DP measured are used to calculate the current CFM reading. The CFM reading can be used for air

balancing. Although corrections to the Standard CFM and DP are possible at the time of air balancing, it is recommended that Desert Aire Service be consulted before adjustment.

```
┌─────────────────────────────┐
│     STD AIRFLOW SETUP       │
│                             │
│ Static CFM:        950.0    │
│  Static DP:     0.260"wc    │
│   Altitude:       1013ft    │
│  Reheat DP:     0.873"wc    │
│        CFM:      1770.2      │
│                             │
└─────────────────────────────┘
```

Figure 28

If the unit has a plenum fan, the screen of Figure 29 will be displayed. From the Airflow Setup screen the K Factor, Altitude, and Number of Fans are all adjustable towards the top half of the screen. Although corrections to the K-factor and number of fans are possible at the time of air balancing, it is recommended that Desert Aire Service be consulted before adjustment.

The Fan Differential Pressure, and Calculated CFM are displayed towards the bottom of the screen. To return to the Commissioning Menu, press the **Esc** key.

```
┌─────────────────────────────┐
│      EC AIRFLOW SETUP       │
│                             │
│   K Factor:        883.0    │
│   Altitude:       1013ft    │
│  # of Fans:         1       │
│    Blwr DP:     0.873"wc    │
│        CFM:       840.1      │
│                             │
└─────────────────────────────┘
```
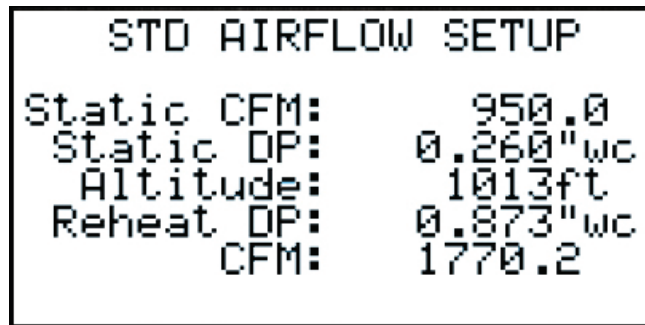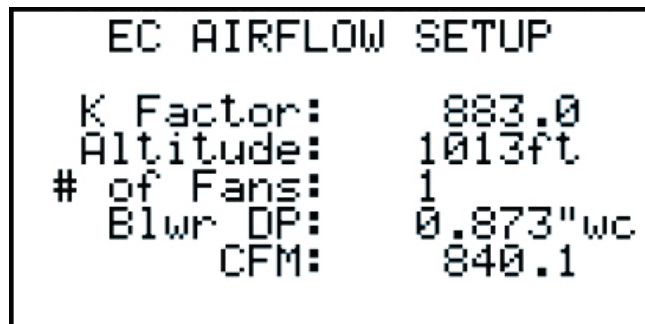
Figure 29

Pressing the **Dwn** key will display the screen of Figure 30. This screen will display the evaporative coil differential air pressure. When an Outdoor Air box is installed in the dehumidifier, the O/A Occ and O/A Unocc positions of the O/A damper can be set here. An override is also provided to allow the Occupied or Un-Occupied modes to be forced. This allows for the Damper positions to be set for the required air flow of the dehumidifier in either state.

```
AIRFLOW SETUP

Evap DP   0.639"wc

O/A    Occ   10.0%
O/A Unocc    0.0%

Override Disabled
```
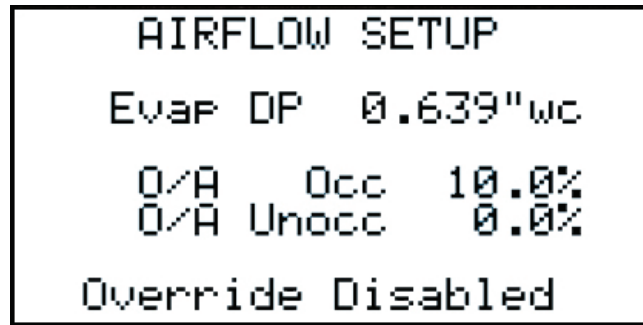
Figure 30

2.3.3.2.1 Current Conditions (Figure 31)

Selecting the CURRENT CONDITIONS from the Commissioning Menu displays the CONDITIONS screen (Figure 31). This screen displays the zone air conditions, and the pool water temperatures, if a pool water condenser is provided. This screen allows for these conditions to be viewed before the commissioning test are done while staying in the Commissioning section of the Service Menu.

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

```
CONDITIONS

Zone Air   87.8°F
Zone  RH   54.0%

Pool  Inlet   78.8°F
Pool Outlet   79.0°F
Partial/Spa 102.0°F
```
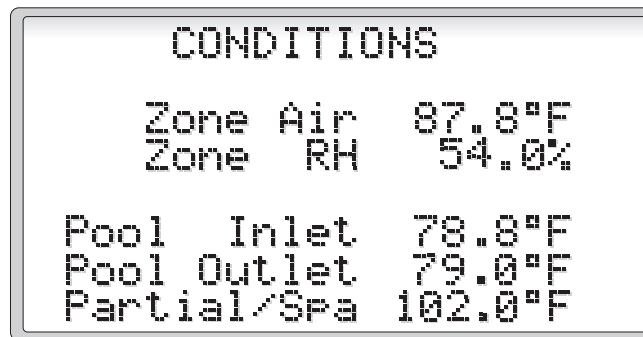
Figure 31

2.3.3.2.2 Commissioning Tests (Figure 32 and 33)

Selecting the COMMISSIONING TESTS from the Commissioning Menu displays the COMMISSIONING TEST screens (Figure 32). Every condenser used by the dehumidifier will have a separate screen. Select the condenser to test and override it by setting the Override to 'On'. Confirm that the superheat is stable before starting the test. Select 'Start Test' by pressing the **UP** key with the cursor over the Start Test text. After 5 minutes, the average refrigeration data can be shown by pressing the **Prg** key. The average superheat as well as the high and low readings of superheat during this test

are found by pressing the **UP** and **DOWN** key. Record this data on the startup form.

Pressing the **DOWN** key will cycle through the available condenser to test. The last screen shown will be the Air Heating screen, Figure 33. This screen allows the air heat to be forced 'On' and a manual percentage to be forced. This allows for stable conditions for the amperage to be recorded on the startup form.

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

```
  COMMISSIONING TEST ↑
REHEAT CONDENSER
   Override Off
   Superheat   18.1°F
Start Test


                      ↓
```

Figure 32

```
   COMMISSIONING TEST ↑
  AIR HEATING
    Override Off
Manual Cmd    0.0%
  Heat Cmd    0.0%

  Record data when
   heat is stable.   ↓
```
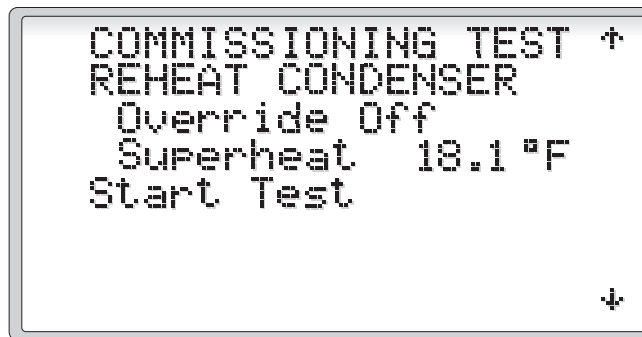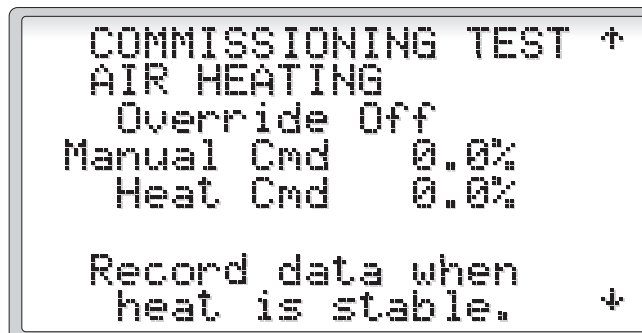
Figure 33

2.3.3.2.3 Motor Phasing (Figure 34)

Selecting the MOTOR PHASING from the Commissioning Menu displays the MOTOR PHASING screen to be shown, (Figure 34). Turning the Blower on will run the blower for 1 second to allow for the motor rotation to be checked. This is required for units connected to 3 phase electrical power. Turning the compressor on will run the compressor for 3 seconds. The discharge and suction pressure are shown on this screen for a check of the current compressor rotation.

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

Figure 34

2.3.3.4 BMS Setup (Figures 35 through 39)
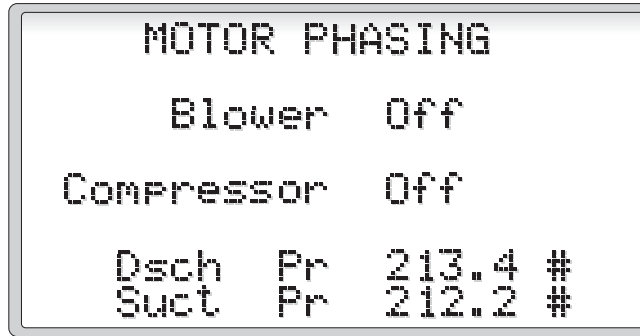
Selecting the BMS SETUP from the Commissioning Menu displays a set of screens which determine how the J3 serial port and the Ethernet port will communicate. The J3 port can be set to drive a remote PGD display terminal, communicate via Modbus RTU, LON or BACnet MS/TP. The Ethernet port can be set to send data via Modbus TCP/IP or BACnet IP.

When the J3 port is set for Modbus RTU, pressing the **DOWN** key will display Figure 35. This screen will allow the address, baud rate and data parameters to be set. If J3 is set for BACnet MS/TP, pressing the **DOWN** key will display Figure 36. This screen will allow the BACnet data to be used.

Pressing the **DOWN** key will also display the Ethernet protocol selection, Figure 38. Setting the Ethernet port for BACnet IP will allow the screen in Figure 39 to be displayed. This allows the Device ID and Port to be set.

Making any changes to the J3 or Ethernet ports will require a power cycle to have those changes take effect.
While BACnet can be selected for the J3 or Ethernet port, a license file will need to be loaded into the controller in order for BACnet communication to be allowed.

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

```
         PORT J3 SETUP        ✛

    Set to PGD Display




 Reboot after changes    ↓
```

Figure 35

```
▨J3 MODBUS RTU SETUP  ✛

    Address         1
    Baudrate 19200
     8 Data Bits
      Parity NONE
     2 Stop Bits
 Reboot after changes  ↓
```

Figure 36

```
▨     J3 BACNET MS/TP    ✛

    Station Add.    1
    Baudrate   19200
    Max Master    127
    Device ID  77000

 Reboot after changes  ↓
```
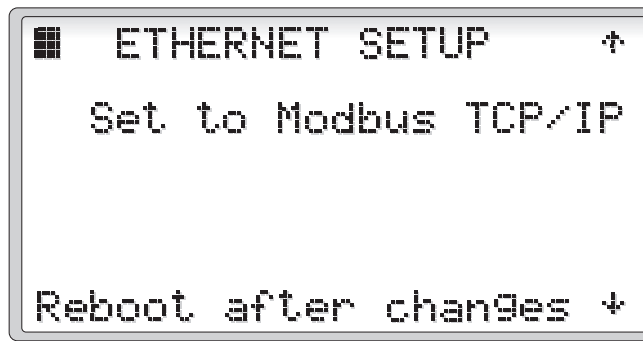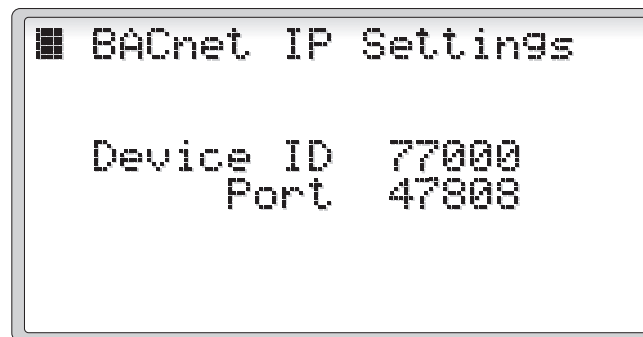
Figure 37

Figure 38

Figure 39

2.3.3.5 Tuning – Deadbands (Figure 40 through 43)

Selecting TUNING from the SERVICE MENU displays the DEADBANDS screen, (Figure 40). The default settings for the dead bands can be modified on this screen. The Heating Deadband value is subtracted from the Zone Temperature Setpoint from Section 2.2. This value is the heating setpoint that enables the aux heating output. It is also the heating setpoint for the Air Heating PID loop. The Cooling Deadband value is added to the Zone Temperature setpoint from Section 2.2. This value is the cooling setpoint. When the zone temperature exceeds this value, the compressor is required to be used for zone cooling.

If the Pool Heating or Partial Pool options are enabled in the factory configuration, the Pool Deadband will be displayed. This setting is subtracted from the Pool Setpoint from Section 2.2. This value will then be used as the setpoint to enable the auxiliary pool heating output.

To modify settings, press the **ENTER** key until the desired setpoint is selected and use the arrow keys until the desired value is shown. Press the **ENTER** key to accept setpoint value. See the graphs in Figures 41 through 43 for an illustration of the operation of the deadbands and differentials. Figure 41 details the humidity control. Figure 42 details the heating and cooling control. Figure 43 details the pool heating control.

Press the **DOWN** key for the next Tuning screen. To return to the Service Menu, press the **Esc** key.

Figure 40

LC/LV Humidity Control

Setpoint: 50% RH
Differential: 1% RH

Compressor is required when RH is over 50%. Compressor is off under 49% RH, but between 50% & 49% a requirement for the compressor depends on a rising or sinking RH.

Figure 41

Zone Temperature Control
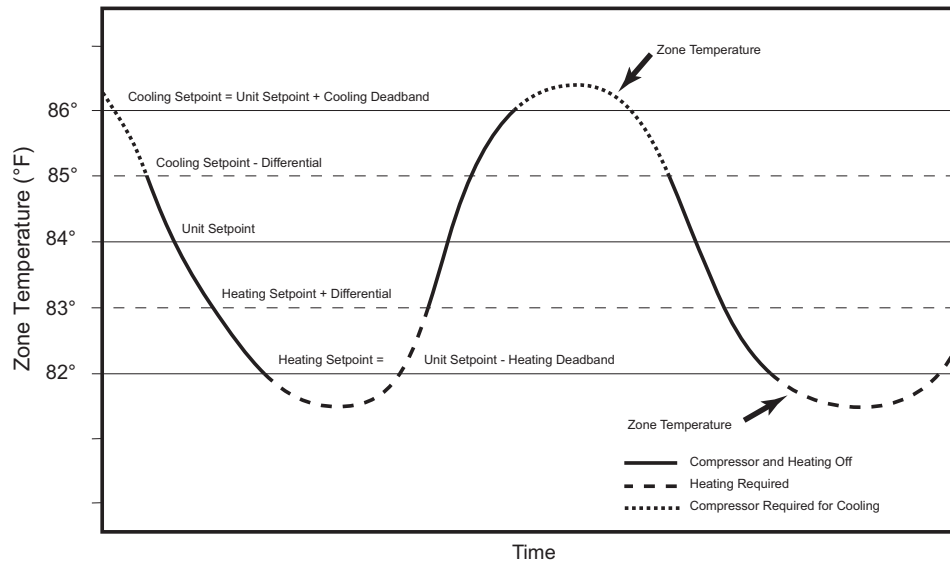
Unit Setpoint: 84° F
Cooling Deadband: 2° F   Heating Deadband: 2° F
Cooling Differential: 1° F   Heating Differential: 1° F

The cooling requirement is on above (84° F + 2° F) or 86° F and the cooling requirement is off below (86° F - 1° F) or 85° F.

The heating requirement is on below (84° F - 2° F) or 82° F and the heating requirement is off above (82° F + 1° F) or 83° F.

Figure 42

Pool Water Temperature Control
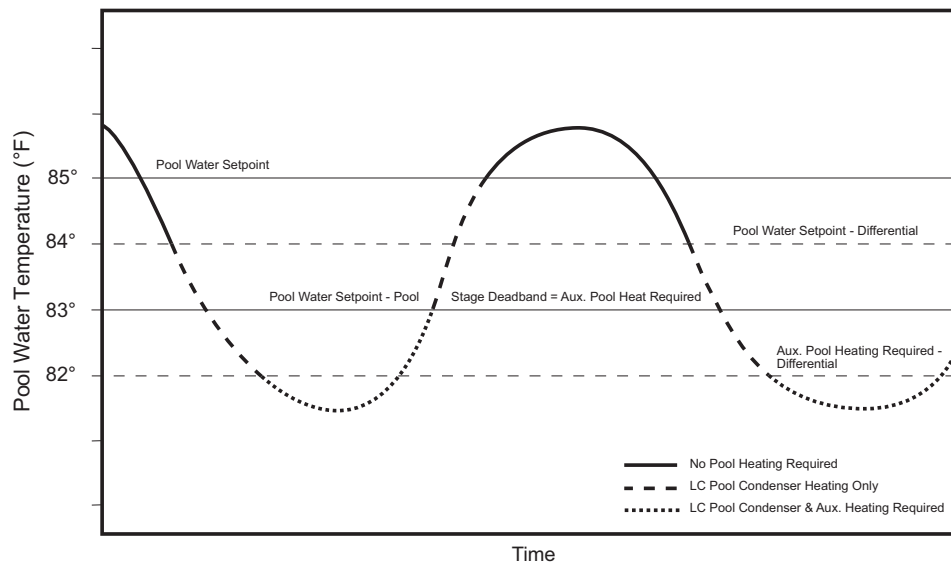
Pool Water Setpoint: 85° F
Pool Differential: 1° F
Pool Stage Deadband: 2° F

The LC pool condenser is used below the pool water set point and the aux. pool heat is required below the pool water set point minus the pool stage deadband.

Figure 43

2.3.3.5.1 Tuning – Differentials (Figure 44)

Pressing the **DOWN** key will now display the DIFFERENTIALS screen (Figure 44). This screen shows the Cooling, Heating and Humidity Switch Differentials. This differential is the range between the making and breaking of the switch. The range of the Cooling and Heating Differential is 0.0°F to 9.9°F. The range of the Humidity Differential is 0.0% to 9.9%.

If the Pool Heating or Partial Pool options are enabled in the factory configuration, the Pool and Partial Pool switch differentials are also displayed. The range of the Pool and Partial Pool Differentials are 0.0°F to 9.9°F.

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 setpoint value. See the graphs in Figures 32 through 34 for an illustration of the operation of the heating, cooling, dehumidification and pool heating modes.

Press the **DOWN** key for the next Tuning screen. To return to the Service Menu, press the **Esc** key.

```
┌─────────────────────────────────┐
│      DIFFERENTIALS        ✛      │
│                                 │
│   Cooling Diff    2.0°F         │
│   Heating Diff    2.0°F         │
│  Humidity Diff    5.0 %         │
│                                 │
│      Pool Diff    1.0°F         │
│   Partial Diff    2.0°F✛        │
└─────────────────────────────────┘
```
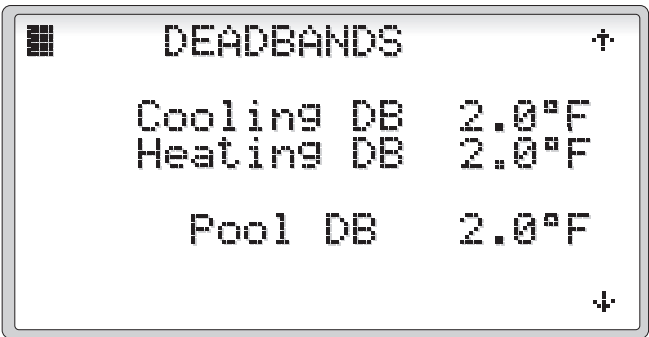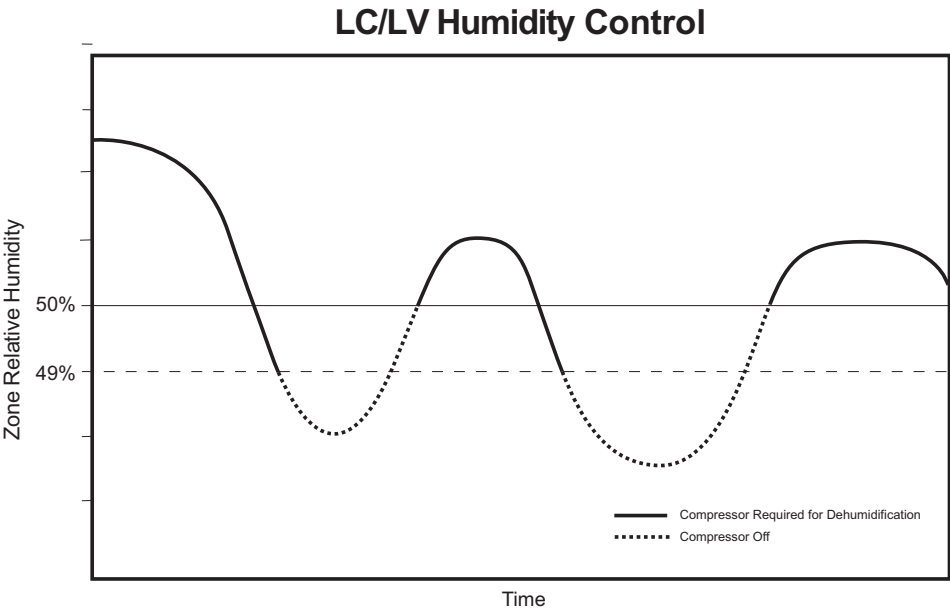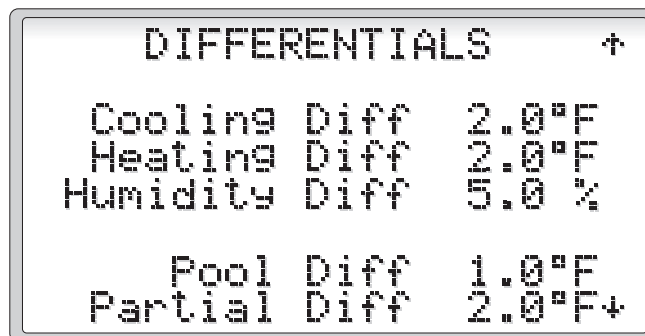
Figure 44

2.3.3.5.2 Tuning – Air Heat (Figure 45)

Pressing the **DOWN** key will now display the AIR HEAT screen (Figure 45). This screen shows the state of the air heat and the associated setpoints and temperatures. The Zone setpoint is settable from this screen. Press the **DOWN** key for the next Tuning screen.

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

```
        AIR HEATING      ↕

       Heating is Off

  Zone Stpt       82.0°F
  Heat Stpt       80.0°F
  Zone Temp       81.0°F
  S/A  Temp       90.5°F  ↓
```
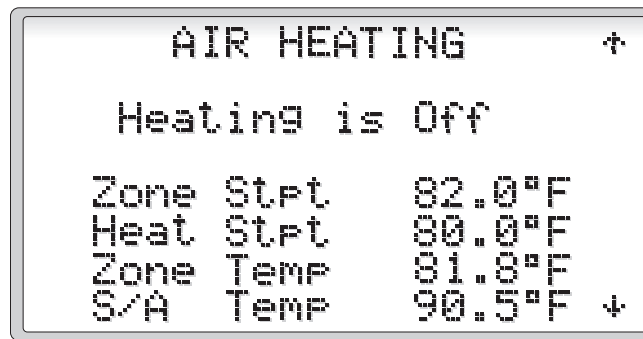
Figure 45

2.3.3.5.3 Tuning – Air Heating (Figure 46)

Pressing the **DOWN** key will now display the settings of the Air Heating PID loop. These settings control the modulating signal. The Gain, Integral and Derivative terms can be set here as well as the percentage to disable the digital heat contact and the time required for this to occur.

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

```
▓      AIR HEATING      ↑

   Kp-Gain        0.10
   Ki-Int           50
   Kd-Der            1
  Disable if loop 1.0%
  or less for 30 sec.
  Loop Output     0.0%  ↓
```

Figure 46

2.3.3.6 I/O Status (Figure 47)

Selecting the I/O Status from the STATUS MENU displays Digital Inputs, Analog Inputs, Digital Outputs and Analog Outputs selection menu. Use the **UP** and **DOWN** key to make a selection and press the **ENTER** key.

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

```
        I/O STATUS

-→DIGITAL  INPUTS
   Analog Inputs
   Digital Outputs
   Analog Outputs
```

Figure 47

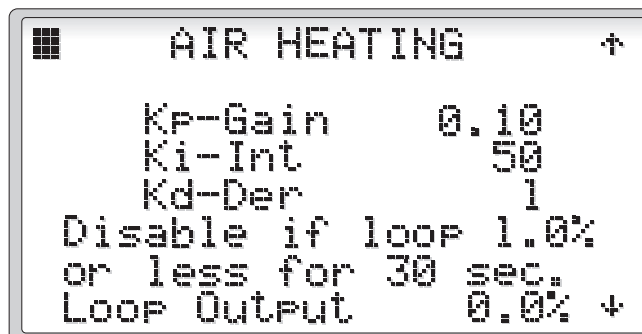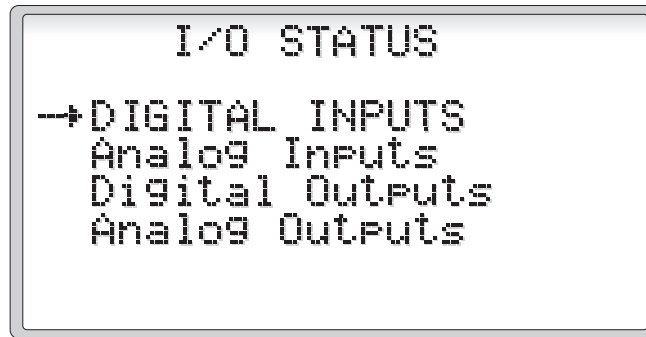## 2.3.3.6.1 Digital Inputs (Binary) (Figure 48 and 49)

The Digital Inputs Screen shows the state of the digital contacts used by the control system. The first page shows the state of the contacts wired into port J2 and J8 of the controller. These screens are provided for troubleshooting the control system.

- The first line will show the status of U8, the supply blower motor starter overload contact. "OK" if the contact is closed, and "Flt" if an overload exists.
- The second line will show the status of U9, the compressor motor starter overload contacts – "OK" if no overload is present, and "Flt" if an overload exists.
- The third line will show the status of U10, the System On/Off switch, "On" and "Off".
- The fourth line will show the status of ID1, the smoke alarm contact – "OK" if this contact is made, and "Flt" if this contact is open.
- The fifth line will show the status of the Occupancy contact – "On" for Occupied, and "Off" for Un-Occupied.

```
▦    DIGITAL INPUTS    ⭥

      Blower OL OK
   Compressor OL OK
   System On/Off On
      Smoke Alarm OK
         Occupancy Off
                        ⭳
```
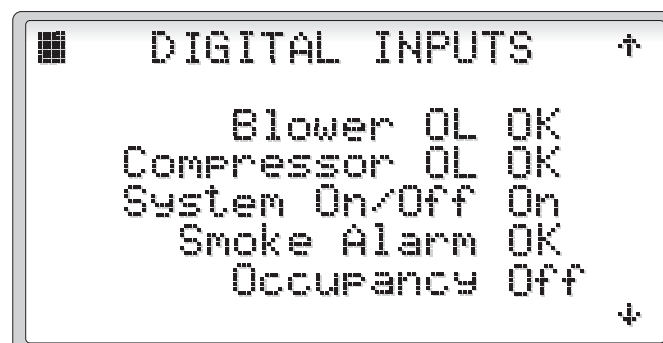
Figure 48

The second page of the Digital Inputs shows the status of the contacts wired to J2 of the expansion module.

- The first line will show the status U5, the condenser flow switch, or jumper, "On" if there is flow, and "Off" if no flow is present.
- The second line will show the status of U6. Units without pool water heating will show this as a Spare Input. Units with pool water heating will show the pool water flow switch, "On" if there is flow, and "Off" if no flow.
- The third line will show the status of U7. Units without partial pool water heating will show this as a Spare Input. Units with partial pool water heating will show the partial pool flow switch, "On" if there is flow, and "Off" if no flow is present. This input may also be used as a low voltage monitor or filter alarm switch, if partial pool heating is not selected. These options can be used by modifying the factory configuration.
- The fourth line will show the status of U8, the Roof Switch, "On" or "Off". This input may also be used as a low voltage monitor or filter alarm switch. These options can be used by modifying the factory configuration.
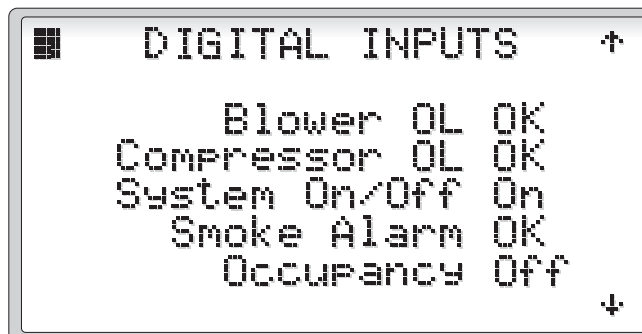
Figure 49

2.3.3.6.2 Analog Inputs (Figure 50 through 54)

The Analog Inputs Screens shows the state of the sensors used by the control system. The first page shows the zone sensor RH and Temperature conditions. Note that this sensor is a communicating device wired to serial port J4.
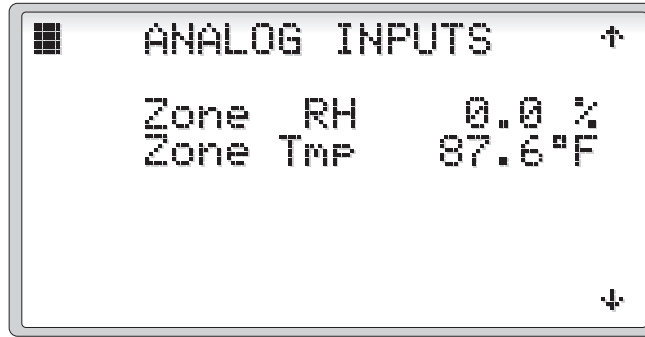
Figure 50

The second page of Analog Inputs shows the readings of the air differential pressure sensors for the drop across the reheat condenser and the drop across the evaporator. The interior dehumidifier temperature (DHU temperature) is also shown here.
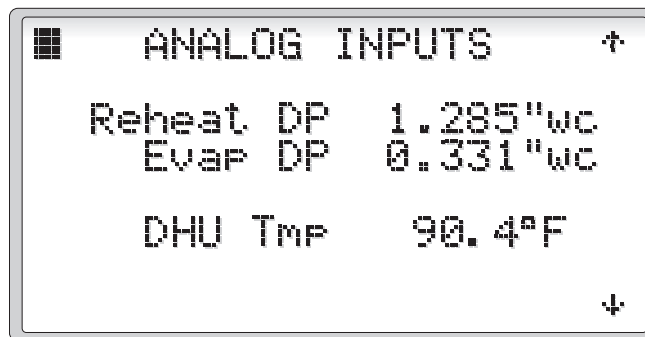
Figure 51

The third page of Analog Inputs shows the readings of the suction pressure and temperature and discharge pressure. The superheat shown is a calculated value derived from the suction temperature less the P2T of the suction pressure sensor.

Figure 52

The fourth page of Analog Inputs shows the readings of the liquid pressure and temperature. The Liquid P2T is also shown. The subcooling shown is a calculated value derived from the P2T less the liquid temperature.

```
■      ANALOG  INPUTS      ↑

       Liq  Pr   261.9 #
       Liq Tmp    50.3°F
       Liq P2T    86.7°F

       Subcooling  36.4°F  ↓
```
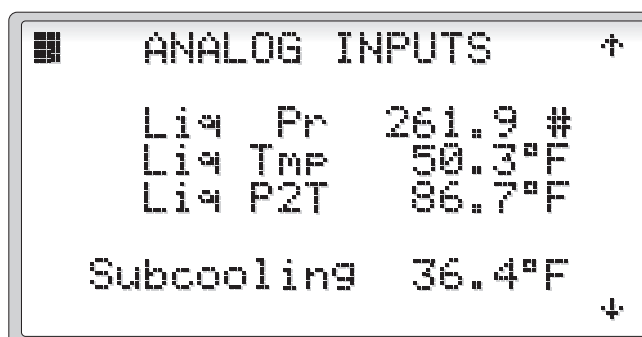
Figure 53

The fifth page of Analog Inputs shows the readings of the pool temperature sensors. This screen will only be shown if a pool condenser is supplied.

```
       ANALOG  INPUTS      ↑

       Pool  In  76.0°F
       Pool Out  79.0°F
       Prtl Pool  63.6°F

                           ↓
```
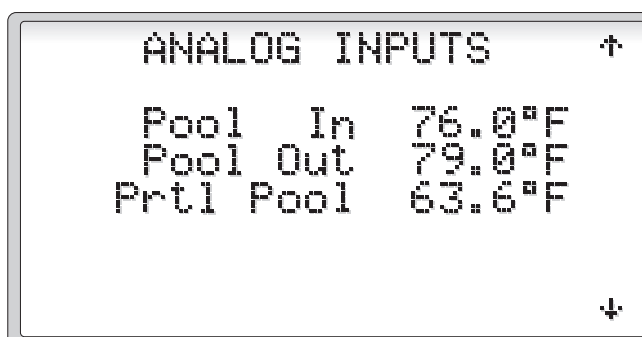
Figure 54

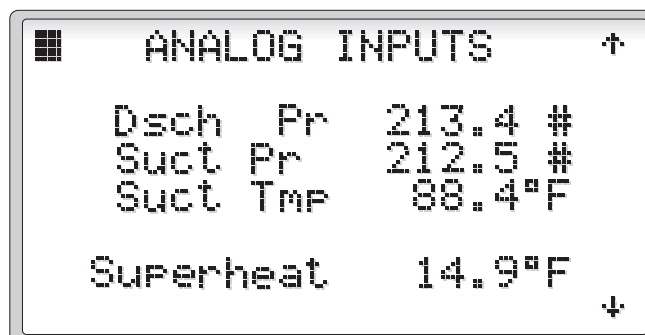To return to the I/O STATUS screen, press the **Esc** key.

2.3.3.6.3 Digital Outputs (Binary) (Figure 55 through 57)

The Digital Outputs Screens shows the state of the devices turned on and off by the control system. The first page shows the state of the relay contacts on the controller ports J10 and J11.

- The first line will show the status of C1, the air heat contact, "On" and "Off".
- The second line will show the status of C2, the tower pump contact, "On" and "Off".
- The third line will show the status of C3, the Supply Blower Starter, "On" and "Off".

- The fourth line will show the status of C4, the Compressor Starter, "On" and "Off".
- The fifth line will show the status of C5, the Cooling Condenser 3 way solenoid, 1Sol, "On" and "Off".

```
▦    DIGITAL OUTPUTS    ⬍

        Air Heat  On
      Tower Pump  Off
   Supply Blower  On
      Compressor  On
     Reheat 1Sol  Off
                         ⬇
```
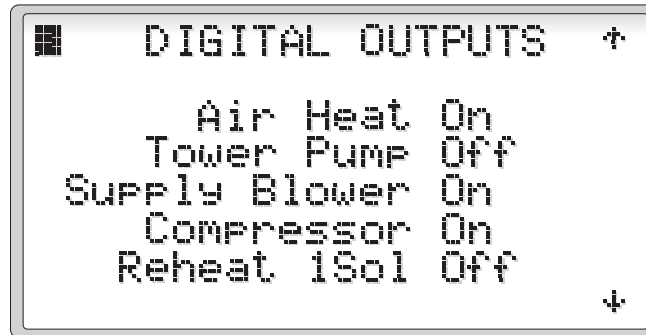
Figure 55

The second page shows the state of the relay contacts on the expansion module controller ports J10 and J11.
- The first line will show the status of C1, the Occupied contact, "On" and "Off".
- The second line will show the status of C2, the Alarm contact, "On" and "Off".
- The third line will show the status of C3, the Bleed Solenoid, 5Sol, "On" and "Off".

```
     DIGITAL OUTPUTS    ⬍

       Occupied  On
          Alarm  Off
     Bleed 5Sol  On


                         ⬇
```

Figure 56

The third page shows the state of the relay contacts for the pool heating control on the main controller J12 and the expansion module controller ports J11 and J12.
- The first line will show the status of the Auxiliary Pool Heater contact, "On" and "Off" on main controller.

- The second line will show the status on the expansion board the Pool Pump contact, "On" and "Off".
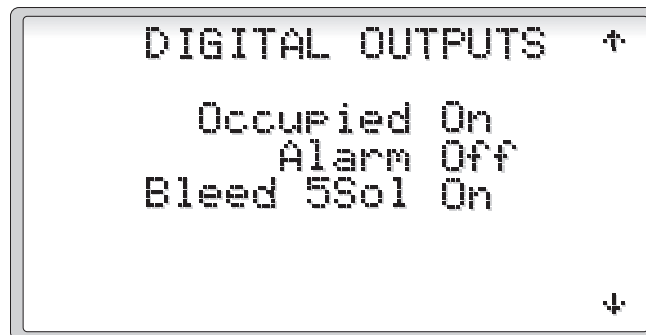- The third line will show the status of C3, the Pool Water 3 way solenoid, 3Sol, "On" and "Off".
- The fourth line will show the status of C4, the Partial Pool Water 3 way solenoid, 9Sol, "On" and "Off".

```
▦    DIGITAL OUTPUTS    ✛

   Pool Aux Ht On
      Pool Pump On
      Pool 3Sol Off
Partial 9Sol On


                         ↓
```
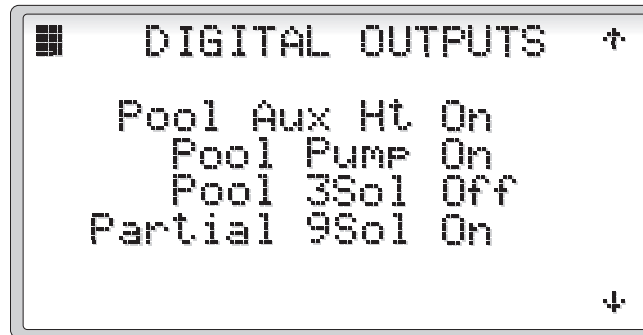
Figure 57

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

2.3.3.6.4 Analog Outputs (Figure 58)

This screen is provided for troubleshooting the control system. The Analog Outputs Screen shows the following:
- Evap Bypass Damper Command
- Air Heat Modulating Command
- Outdoor Air Damper Command

```
    ANALOG OUTPUTS


 Evap Bypass    50.0%
Air Heat Cmd    75.0%
   O/A Damper    25.0%

```
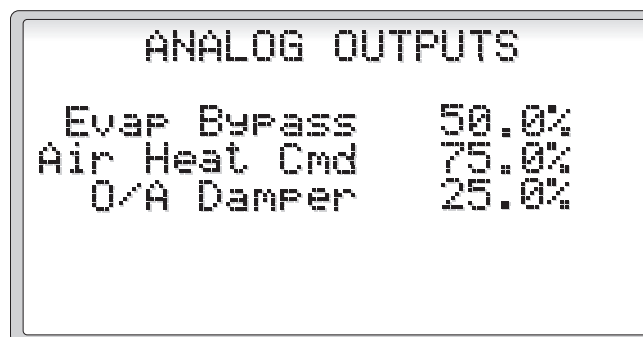
Figure 58

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

2.3.3.7 Sensor Offsets (Figures 59 through 61)

These 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. 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.

```
▦    SENSOR OFFSETS       ☩

     Zone  RH     0.00
     Zone Tmp     0.00
     Suct  Pr     0.00
     Disch Pr     0.00
      Liq  Pr     0.00
                           ↓
```

Figure 59

```
▦    SENSOR OFFSETS       ☩

     Suct Tmp     0.00
      Liq Tmp     0.00
     S/A  Tmp     0.00
      Evap DP     0.000

                           ↓
```

Figure 60

```
     SENSOR OFFSETS       ☩

     Pool  In     0.00
     Pool Out     0.00
     Prtl Pool    0.00
     Airflow DP   0.000

                           ↓
```
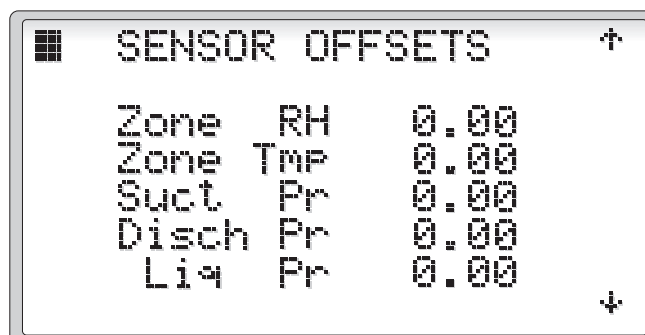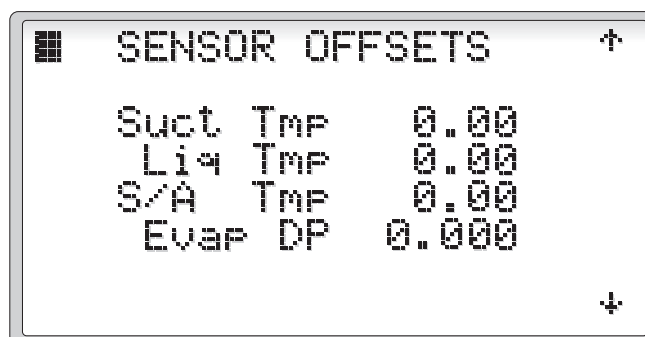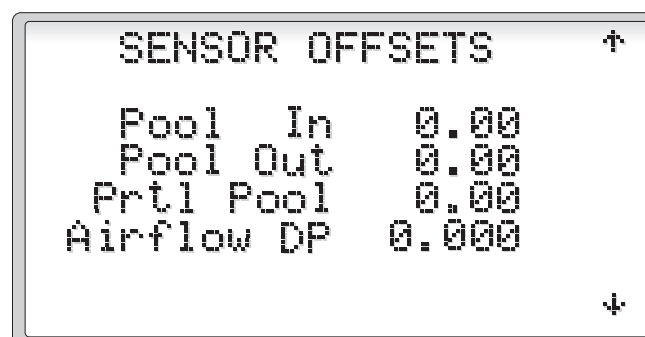
Figure 61

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

2.3.3.8 Diagnostics (Figures 62 and 63)

These screens allow the refrigerant pressure, superheat and subcooling values to be watched while a specific condenser is selected for use. Turn the override on to use that condenser.

```
   COOLING CONDENSER   ⭡
      Override Off

 Suction Pr    212.5 #
   Disch Pr    213.4 #
  Liquid Pr    261.9 #
  Superheat     15.4°F
    Subcool     36.4°F  ⭣
```
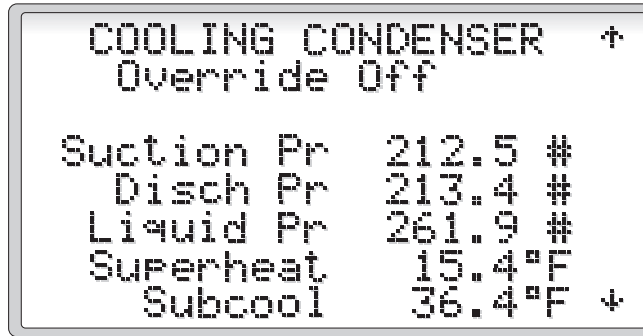
Figure 62

The Air Heating screen allows for the heater to be put into a manual mode for troubleshooting. Turn the override on to use and set a manual command.
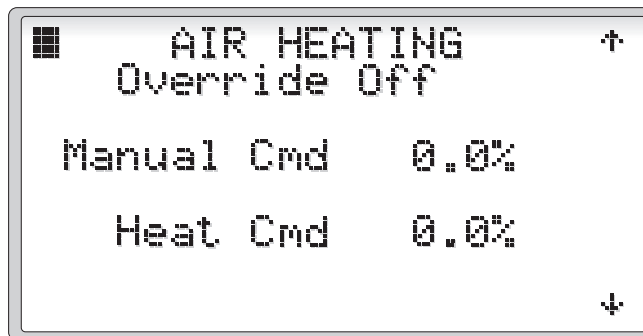
```
 ▣     AIR HEATING     ⭡
      Override Off

 Manual Cmd     0.0%

   Heat Cmd     0.0%

                      ⭣
```

Figure 63

2.3.3.9 Memory Options (Figures 64 through 66)

These screens allow the logging files to be written to a portion of the internal memory space on the controller or a USB Storage Drive. To use, select the memory to write to, if USB Storage Drive, insert a USB Storage Drive and with the cursor over the 'Press UP to Write' field, press the **UP** key. Wait for the screen to say "Completed" before removing the drive. This may take a few minutes. The files written are the Alarm Log.csv and the Data Log.csv. Both of this can be opened in Excel. The Alarm Log takes a snapshot of the conditions whenever an Alarm is triggered. The Data Log records values every minute of operation for the past month.

The second and third screens allow for the file Setpoint.txt to either be saved or loaded. After the dehumidifier has been commissioned and is stable, saving the setpoints allows for these to be reloaded if anything happens to the controller. To use, select the memory to write to, if USB Storage Drive, insert a USB Storage Drive and with the cursor over the 'Press UP to Import' or 'Press UP to Export' field, press the **UP** key. Wait for the screen to say "Completed" before removing the drive.

```
   MEMORY OPTIONS      ⬆

 Write log files to
 USB Pen Drive

 Press UP to write

    Completed          ⬇
```

Figure 64

```
▦    MEMORY OPTIONS     ⬆

 Write Setpoint.txt to
 Internal Flash

 Press UP to Export

                        ⬇
```

Figure 65

```
   MEMORY OPTIONS      ⬆

 Read Setpoint.txt from
   Internal Flash

 Press UP to Import

                        ⬇
```
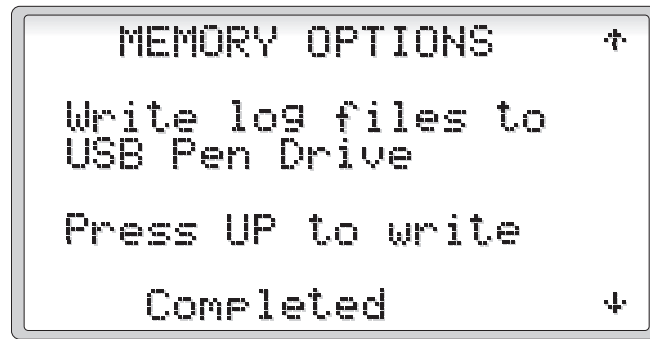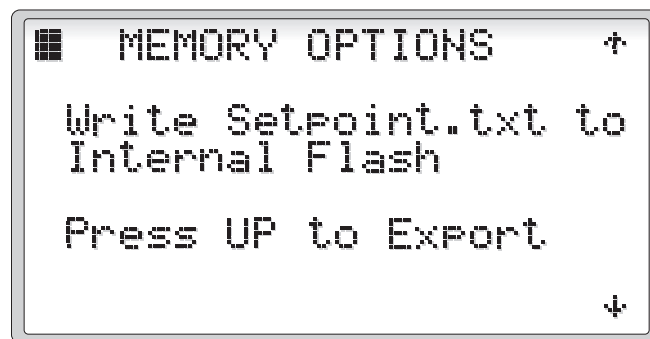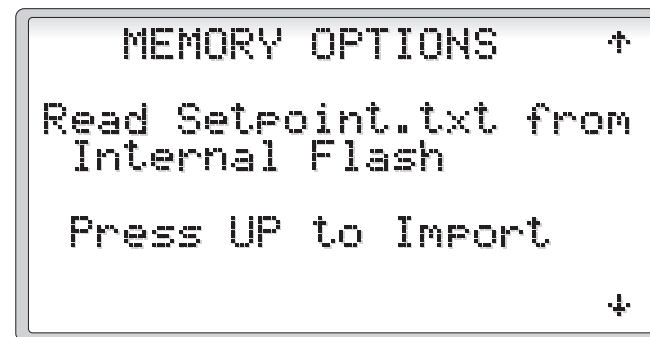
Figure 66

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

2.3.4   Unit Revision (Figure 67)

The Unit Revision Screen shows the version of the application program that is running along with the release date of the software (Figure 67). This information should be passed to Desert Aire in the event a service call is necessary.

```
┌─────────────────────────────────────┐
│        UNIT REVISION                │
│                                     │
│   LC 3.1.5                          │
│   Release Date                      │
│   Oct. 22nd, 2021                   │
│                                     │
│                                     │
└─────────────────────────────────────┘
```

Figure 67

3   Alarm Menu (Figures 68 through 70)

To view the alarms from any menu, simply press the **ALARM** key. If no alarm is active, the display will state NO ALARMS ARE ACTIVE. See Figure 68.


```
NO ALARMS ARE ACTIVE




     Press ENTER to
   view DATA LOGGER
```
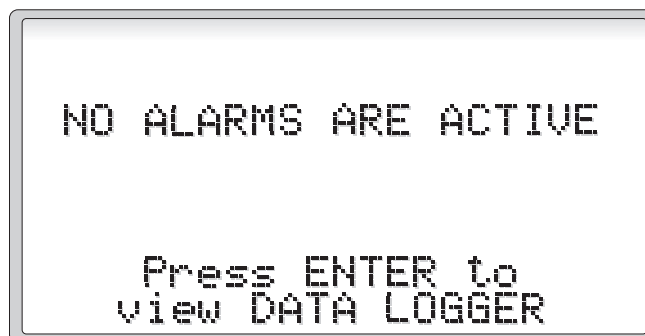
Figure 68

When an alarm is triggered, the red LED behind the **ALARM** key will light and will remain on until the alarm is reset. If an alarm is present, pressing the **ALARM** key will display a screen similar to Figure 69. The triggered alarm will be displayed along with the time and date. The bottom lines will display two pertinent data point values when the alarm occurred.


```
   ACTIVE ALARMS 01 01
              10/27/17
              22:49:20
Compressor Overload


Suction Pr        212.34
Discharge Pr      213.29
```
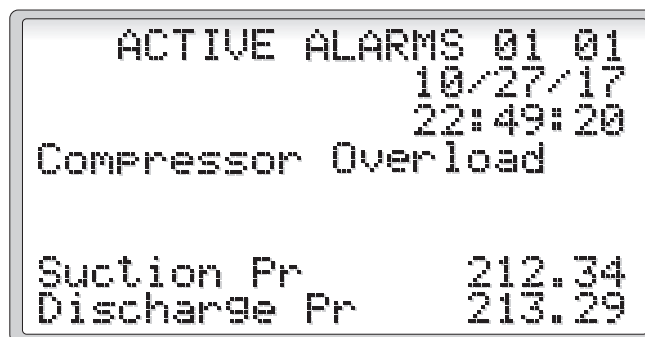
Figure 69

To reset the alarm, use the **DOWN** key until the reset instructions are shown. See Figure 70. Pressing the **ALARM** key for three seconds will reset all active alarms.

```
         ALARM RESET

   To reset the ALARMS,
   press ALARM key 3S.



        Press ENTER to
      view ALARM LOGGER
```
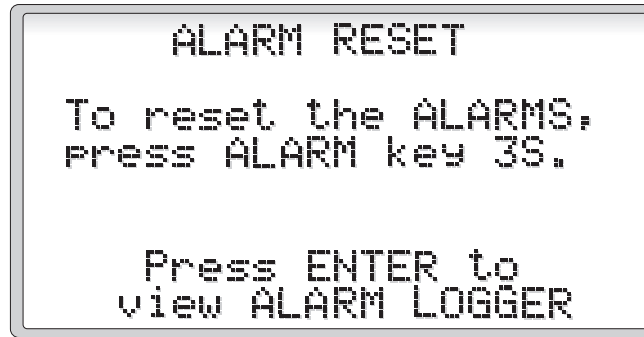
Figure 70

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 parameter 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.

To return to the home screen, press the **Esc** key.

3.1   Mult Suction Pr

This is a Manual Reset Alarm. The Mult Suction Pr will only be activated when the suction pressure falls below the suction pressure cutout point three times in a one hour period. The refrigeration circuit will stop and not restart until the suction pressure rises above 106.0 psig and the alarm is reset manually. The red Alarm LED on the display will stay lit until the alarm is reset.

The suction pressure trip setpoint is normally 58.0 psig. When the compressor is started and for the first 90 seconds of the compressor running, the suction pressure trip setpoint is set to 22.0 psig. This is to avoid any nuisance tripping due to low ambient conditions. The first and second conditions of the suction pressure falling below the suction pressure trip setpoint in a one hour period will stop the compressor but not activate the alarm. The compressor will restart when the suction pressure rises above 106.0 psig.

3.2   Discharge Pressure

This is a Manual Reset Alarm. The Discharge Pressure is activated when the discharge pressure rises above the high pressure cutout point, 575 psig. The refrigerant circuit will stop and not restart until the alarm condition is reset manually. The red Alarm LED on the display will stay lit until the alarm is reset.

3.3 Compressor Overload

This is a Manual Reset Alarm. The Compressor Overload is activated when the compressor motor overload device indicates an overloaded condition. In this state, the refrigerant circuit will stop and not restart until the alarm condition is reset manually. Typically, the motor starting hardware will need to be reset along with a control system reset. The red Alarm LED on the display will stay lit until the alarm is reset.

3.4 Smoke Alarm

This is an Automatic Reset Alarm. The Smoke Alarm is activated if the alarm contact wired to digital input ID1 is opened. In this state, the unit will stop and not restart until the smoke alarm contact closes. The red Alarm LED on the display will stay lit until the alarm is acknowledged, even after the alarm condition is cleared, to alert the operator the alarm occurred.

3.5 c.pCOe Comm Fault

This is an Automatic Reset Alarm. The c.pCOe is the expansion module. Check the expansion module power and communication link. The red Alarm LED on the display will stay lit until the alarm is reset.

3.6 c.pCOe Cnfg Fault

This is an Automatic Reset Alarm. The c.pCOe is the expansion module. Check the expansion module power and communication link. The red Alarm LED on the display will stay lit until the alarm is reset.

3.7 Modbus Sensor Fault

This is an Automatic Reset Alarm. Check the communication wiring to the sensor when this fault occurs. The red Alarm LED on the display will stay lit until the alarm is reset.

3.8 Blower Overload

This is a Manual Reset Alarm. The Blower Overload is activated when the blower motor overload device indicates an overload condition. In this state, the dehumidifier will stop and not restart until the alarm condition is reset manually. Typically, the motor starting hardware will need to be reset along with a control system reset. The red Alarm LED on the display will stay lit until the alarm is reset.

3.9 Too many mem writings or Retain mem write error

These are Automatic Reset Alarms. These alarms occur when there is an issue with the controller memory itself. If this fault cannot be reset, new controller hardware may be required. The red Alarm LED on the display will stay lit until the alarm is reset.

3.10   Alarm Log (Figure 71)

The Alarm Data Logger Screen is accessible from the Alarm Reset screen (see Figure 62) by pressing the **ENTER** key. This screen shows records of the alarm log. The bottom two lines will show the pertinent data that was recorded when the alarm occurred. Use the **UP** and **DOWN** keys to view other records.
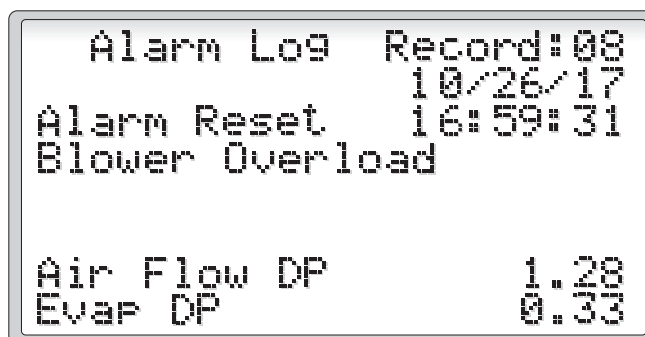
```
   Alarm Log  Record:08
               10/26/17
Alarm Reset    16:59:31
Blower Overload


Air Flow DP        1.28
Evap DP            0.33
```

Figure 71

To return to the home screen, press the **Esc** key.

4   Hardware Details

4.1   Programmable Controller

The programmable controller is preprogrammed by Desert Aire for the control of your unit. The Desert Aire replacement part number for this controller is available by calling our service department.

4.2   Suction Pressure Transducer

The Suction Pressure Transducer is a 0.5 – 4.5 VDC to 0 – 250 psig ratio metric 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 (0-250 psig).

$$\text{Pressure (psig)} = (62.5) * (V) - 31.25$$
Example, if V is 2.50 VDC, then;
$$\text{Pressure (psig)} = (62.5) * (2.50) - 31.25$$
$$= 156.25 - 31.25$$
$$= 125 \text{ psig}$$

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

4.3   Discharge Pressure Transducer

The Discharge Pressure Transducer is a 0.5 – 4.5 VDC to 0 – 652 psig ratio metric 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 (0-652 psig).

$$\text{Pressure (psig)} = (163) * (V) - 81.5$$
Example, if V is 2.50 VDC, then;
$$\text{Pressure (psig)} = (163) * (2.50) - 81.5$$
$$= 407.5 - 81.5$$
$$= 326 \text{ psig}$$

The Desert Aire replacement part number for the Discharge Pressure Transducer is available by calling our service department.

4.4   Suction Line, Liquid & DHU Temperature Sensor

These temperature sensors are a resistive NTC Bulb type device with a 10 foot cable. The temperature range is -58.0°F 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.

4.5   Zone Air Temperature and Relative Humidity Sensor

This sensor is a communicating device which sends Modbus data out from address 190. If communication is lost from this device, an alarm is activated. The Desert Aire replacement part number for the Zone Air Temperature and Relative Humidity Sensor is available by calling our service department.

4.6   Reheat Condenser and Evaporator Bypass Differential Air Pressure Sensors

These sensors have a range of 0.0"wc to 2.0"wc. The output of this device is a 0.25 VDC at 0.0"wc and 4VDC at 2.0"wc. The Desert Aire replacement part number is available by calling our service department.

4.7   EC Blower Differential Air Pressure Sensor

The EC Blower Differential Air Pressure Sensor has a range of either 0-10.0" wc, or 0-25" wc. The output of this device is a 0.25 VDC at 0.0" wc and 4 VDC at either 10.0" wc or 25.0" wc. The Desert Aire replacement part number is available by calling our service department.

5   Appendix

5.1   Internal Web Page

The programmable controller is preprogrammed by Desert Aire to include a web page allowing a virtual remote display to be used from any node on the facilities computer network. Simply attach an Ethernet cable from your facilities computer network to the RJ45 port of the controller. Always check with your IT department before connecting this device to your network.

The Ethernet port of the controller has a factory default of DHCP for the TCP/IP address. To obtain the current address, see Section 2.3.3.3 for the Ethernet port setup, Figure 29. A static TCP/IP address can be set from this screen. Refer to your IT department to obtain a static TCP/IP address. Browse the IP address assigned to the dehumidifier, enter the appropriate credentials, [user – Desert-Aire, password – 18485] and select the DISPLAY tab. Logging is also available from this web page. Wait a few moments for initialization and use your mouse to click the keys. Key combinations are defined on the bottom of this web page.

DESERT AIRE

OPTIMIZING SOLUTIONS THROUGH SUPERIOR DEHUMIDIFICATION TECHNOLOGY