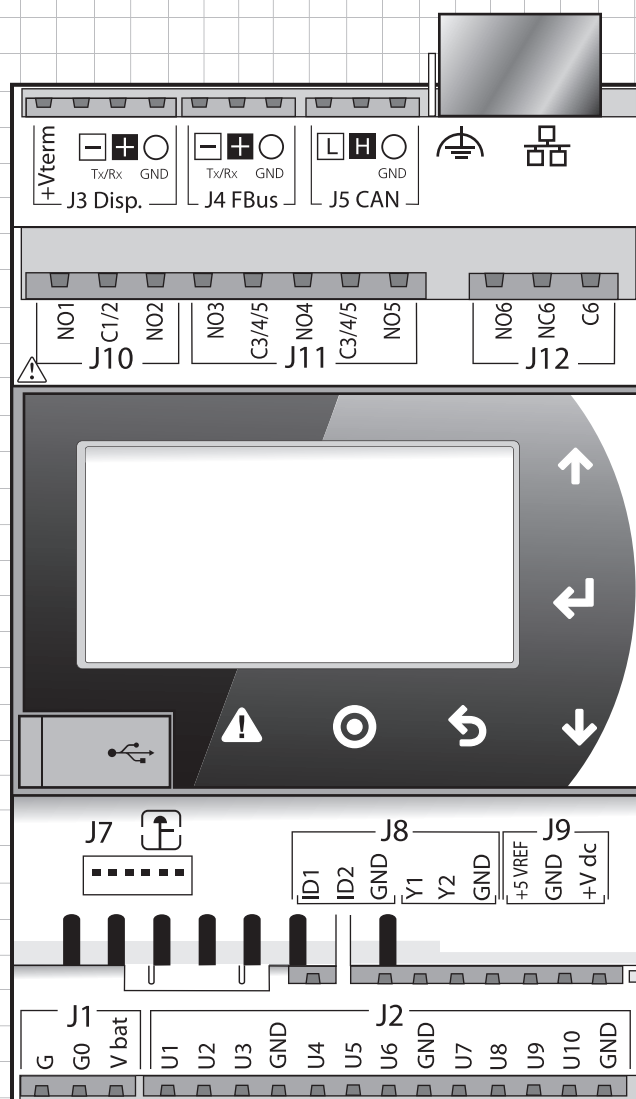




CM3550 Series Controller

Installation and Operation Manual for ER Units

- Backlit LCD User Interface
- Programmed by Desert Aire for dehumidification and temperature control
- Alarm history retention
- Internal time clock for stand alone operation



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 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:

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

TABLE OF CONTENTS

1.	Installation	9
1.1	Control Package	9
1.2	Pool Water Temperature Sensor	9
1.3	Zone Pressurization Sensor	9
1.4	Controller Overview	9
2.	ER Energy Recovery Controller Details	11
2.1	Menu Overview and General Instructions	11
2.2	Main Menu	12
2.2.1.	Status Menu	12
2.2.1.1	Unit Status	13
2.2.1.2	I / O Status	13
2.2.1.2.1	Digital Inputs (Binary)	14
2.2.1.2.2	Analog Inputs	15
2.2.1.2.3	Digital Outputs (Binary)	16
2.2.1.2.4	Analog Outputs	17
2.2.1.3	Network Data	17
2.2.1.4	Pressure Cutouts	18
2.2.2	Pool Setpoint	19
2.2.3	Service Menu	19
2.2.3.1	Pool Settings	20
2.2.3.2	Evaporator Bypass Control	21
2.2.3.3	Enthalpy Settings	22
2.2.3.4	Sensor Offsets	23
2.2.3.5	EC Speed Settings	24
2.2.3.6	System Settings	26
2.2.3.7	BMS Settings	27
2.2.4	Unit Revision	29
3.	Alarms	31
3.1	Low Suction Pressure	32
3.2	High Discharge Pressure	32
3.3	Compressor Motor Overload	32
3.4	Smoke Alarm	32
3.5	Alarm Data Logger	33
4.	Hardware Details	35
4.1	Programmable Controller	35

4.2	Suction Pressure Transducer	35
4.3	Discharge Pressure Transducer	35
4.4	Suction Line Temperature Sensor	36
4.5	Intake Air Temperature and Relative Humidity Sensor	36
4.6	Zone Pressurization Differential Air Pressure Sensor	36
4.7	EC Blower Differential Air Pressure Sensor	36

1. Installation

1.1 Control Package

This Desert Aire system is designed for energy recovery of exhaust air. It features an internally mounted programmable logic controller equipped with an internal display terminal (IDT). The IDT allows you to view and adjust set points and modes of operation. The IDT also indicates the operating status of the major components inside the energy recovery unit. The control system also has the ability to control auxiliary equipment including the pool pump and an auxiliary pool heater.

Most sensors and inputs have been factory-installed and wired inside of the energy recovery unit. In most cases, you need only mount and wire the pool temperature sensor and the zone pressurization sensor. To insure proper operation, an intake air temperature and relative humidity sensor has been factory installed in the internal air stream of the ER unit to protect the compressor. No additional sensors are required to be field installed in the exhaust air stream.

1.2 Pool Water Temperature Sensor

The Desert Aire energy recovery systems require pool water temperature data. This can be purchased as a separate temperature sensor and an immersion well. When networked to a Desert Aire SelectAire™ dehumidifier, ModBus data can provide the pool water temperature data. Using the network data, both the dehumidifier and energy recovery system will more accurately coordinate pool water heating and energy recovery efficiency.

Refer to the ER Installation and Operation Manual to properly install the separate sensor.

1.3 Zone Pressurization Sensor

The Desert Aire energy recovery systems are typically supplied with a zone pressurization sensor to maintain a negative pressure in the pool room by controlling the speed of the exhaust fan. When used in conjunction with a Desert Aire SelectAire™ dehumidifier, the zone pressurization will be controlled by the dehumidifier and the local zone pressurization can be disabled. In this case, no instrumentation for the energy recovery system will be supplied.

Refer to the ER Installation and Operation Manual to properly install the separate sensor.

1.4 Controller Overview

Desert Aire's energy recovery controller is a flexible controller with many useful features including:







- Display of operational status, pool water temperature, intake air conditions including temperature, relative humidity and enthalpy as well as the refrigerant pressures, super heat, and the zone pressure.

- Display of alarms for abnormal conditions such as motor overloads or tripped safety controls.
- A convenient, easy-to-understand display interface which allows the operator to view operating conditions and change set points.
- A remote display can be provided through the internal web page included with the control system. See the appendix for further information.

2. ER Energy Recovery Controller Details

2.1. Menu Overview and General Instructions

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 set points 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 occupancy status and operational state. The ER Series displayed in the upper right of the screen indicates that this product is an Energy Recovery system. 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.

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.

When an alarm is triggered, the red LED behind the **ALARM** key will light and will 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 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. Main Menu (Figure 2)

Pressing the **Esc** key from the Home Screen displays the MAIN MENU (Figure 2). This menu allows the operator to select the STATUS MENU, Pool Setpoint, Service Menu or view the Unit Revision.

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

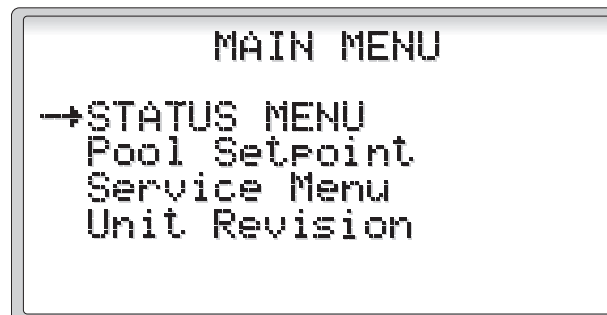


Figure 2

2.2.1 Status Menu (Figure 3)

Selecting the STATUS MENU from the MAIN MENU allows access to the UNIT STATUS, I/O Status, Network Data and Pressure Cutouts screens.

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

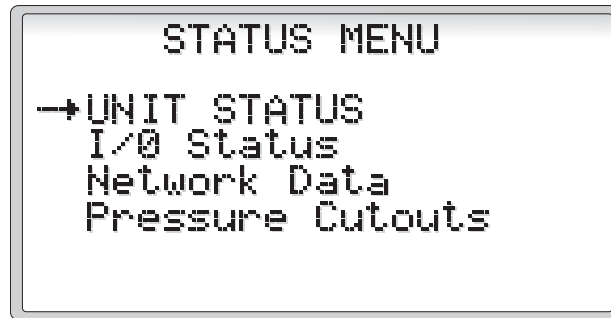


Figure 3

2.2.1.1 Unit Status (Figure 4)

Selecting Unit Status from the STATUS MENU displays a text explanation of the unit. The Occupied state (either Occupied or Un-Occupied) is shown on the first line, along with the blower state. The Unit Status will show one of the following states on the next line.

- Pool Satisfied
- Pool Heat Required
- Energy Recovery
- Enthalpy Lockout
- Low Air Flow
- Low Suct Press
- Compressor Lockout

The next line displays the state of the pool water flow switch. The next line displays the compressor state. The next line displays if the compressor non-short cycling timer is delaying the start of the compressor and the time left on this delay. The current Date and Time are displayed on the bottom line.

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

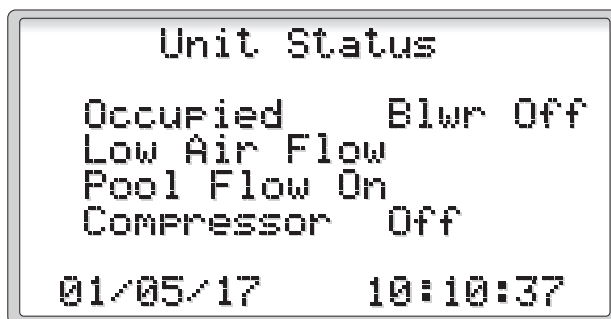


Figure 4

2.2.1.2 I/O Status (Figure 5)

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.

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

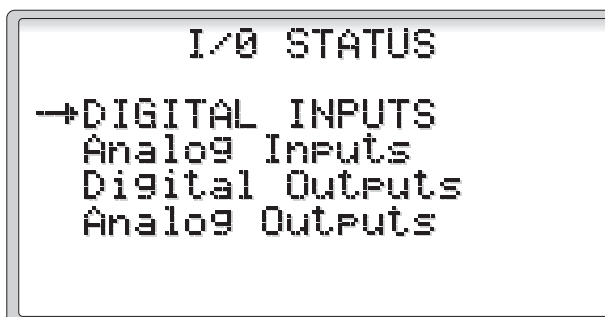


Figure 5

2.2.1.2.1 Digital Inputs (Binary) (Figure 6)

This screen is provided for troubleshooting the control system. The Digital Inputs screen shows the state of the contacts wired into port J4 of the controller.

- The first input will show the status of the compressor motor(s) overload contact(s) – “On” if no overload is present, and “Off” if an overload exists.
- The second input will show the status of the pool water condenser flow switch – “On” if there is water flow, and “Off” if no flow is present.
- The third input will show the status of the smoke alarm contact – “On” if no alarm is present, and “Off” if an alarm condition exists.
- The fourth input will show the status of the Digital Occupied Contact – “On” if this contact is made, and “Off” if this contact is open.

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

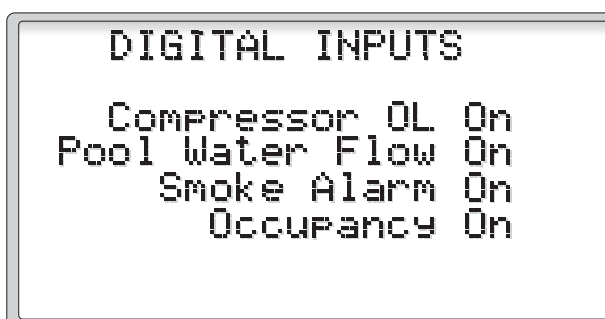


Figure 6

2.2.1.2.2 Analog Inputs (Figures 7, 8 and 9)

These screens are provided for troubleshooting the control system. The Analog Inputs screen in Figure 7 shows the current readings of the zone conditions including the Intake Air Temperature, Intake Air Humidity and the calculated enthalpy of the zone. To view the next screen, press the **DOWN** key.

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

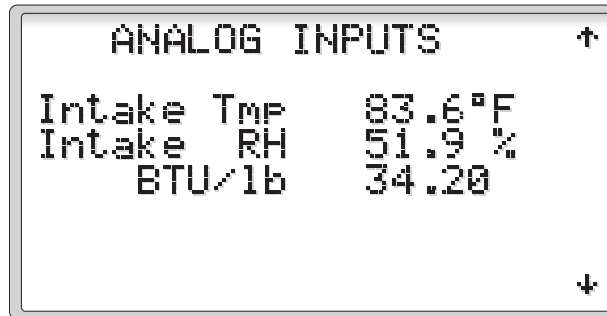


Figure 7

Analog Inputs screen in Figure 8 shows the current readings of the refrigeration system. This includes the Discharge Pressure, Suction Pressure, Suction Line Temperature and calculated superheat. To view the next screen, press the **DOWN** key.

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

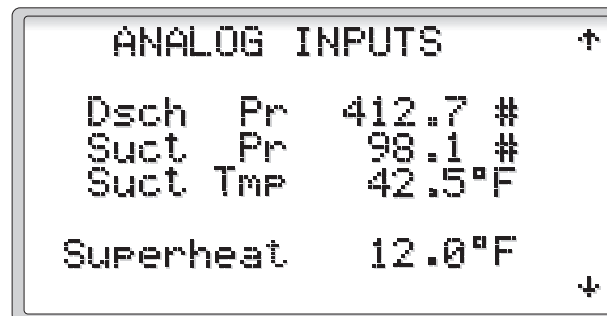


Figure 8

Analog Inputs screen in Figure 9 shows the current readings for the Pool Temperature and the EC blower differential pressure sensor and zone differential pressure sensor. To view the next screen, press the **DOWN** key.

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

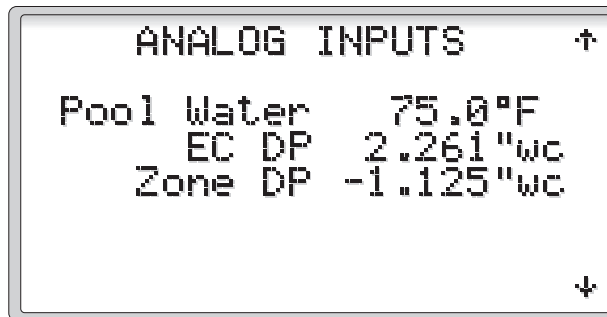


Figure 9

2.2.1.2.3 Digital Outputs (Binary) (Figure 10)

This screen is provided for troubleshooting the control system. The Digital Output screen in Figure 10 will show the devices wired into ports J12, J13 and J14 of the main controller.

- The first output will show the state of the compressor contactor – “On” if the compressor is running, “Off” if the compressor is not running.
- The second output will show the state of the liquid solenoid – “On” if the liquid solenoid is open, “Off” if the liquid solenoid is closed.
- The third output will show the state of the pool pump dry contact – “On” if the pool pump is required to run, “Off” if the pool pump is not required.
- The fourth output will show the state of the alarm indications – “On” if no alarm is present, “Off” if an alarm is present. This is done to indicate an alarm if power is lost to the control system, as this contact will be off in this case.
- The fifth output will show the state of the auxiliary pool heat dry contact – “On” if pool heating is required, “Off” if pool heating is not required.

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

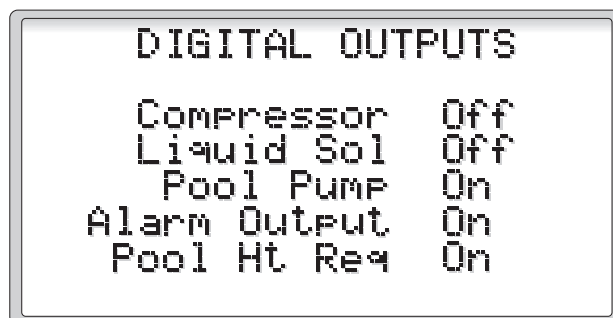


Figure 10

2.2.1.2.4 Analog Outputs (Figure 11)

This screen is provided for troubleshooting the control system. The Analog Outputs screen shows the following:

- The first output is the evaporator bypass damper actuator command. This will show the current position of the damper.
- The second output is the exhaust blower speed command. This will show the current speed of the blower in with 0.0% indicating the blower is off, and 100% indicating the blower is running at 60 hertz.

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

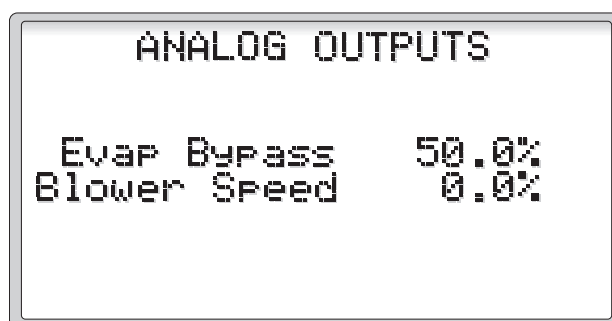


Figure 11

2.2.1.3 Network Data (Figures 12 and 13)

This screen displays any network data that could be sent from a Desert Aire SelectAire™ dehumidifier. Figure 12 will show the data from the dehumidifier at ModBus address 4 and Figure 13 will show the data from the dehumidifier at ModBus address 5. The third line of these screens will display either Network Offline or ModBus Online, depending upon the ModBus network status. (NOTE: The operator cannot change these settings.)

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

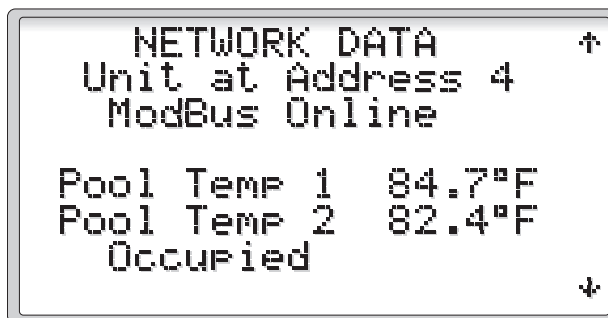


Figure 12

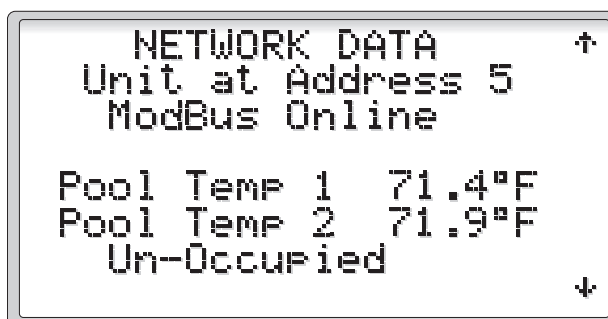


Figure 13

2.2.1.4 Pressure Cutouts (Figure 14)

This screen displays the High Discharge Pressure and Low Suction pressure cut-out values for the refrigerant circuit. (NOTE: The operator cannot change these settings.)

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

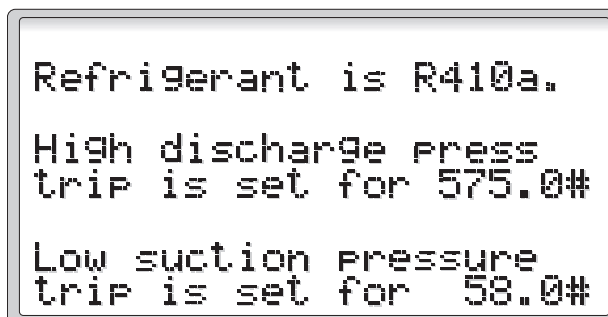


Figure 14

2.2.2 Pool Setpoint (Figure 15)

Selecting the Pool Setpoint from the MAIN MENU allows for modifications of the pool water temperature set point which runs the refrigeration system. When running, the refrigeration system will recover the heat in the exhaust air stream and return it to the pool. The range of the Pool Water Setpoint is 70.0°F to 104.0°F.

To modify the set point, 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. The current pool water temperature is also displayed on the bottom line of this screen.

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

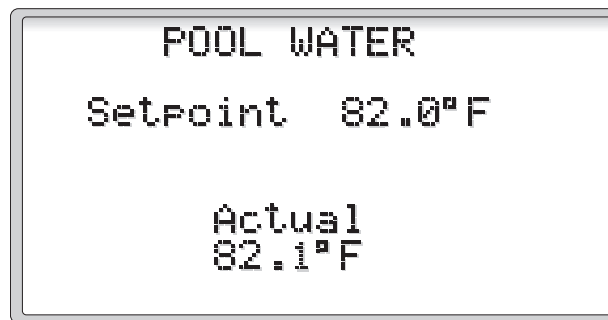


Figure 15

2.2.3 Service Menu (Figures 16 and 17)

Selecting the SERVICE MENU will display the Service Login screen (Figure 16). Enter the service password, 1234, and press **ENTER**.

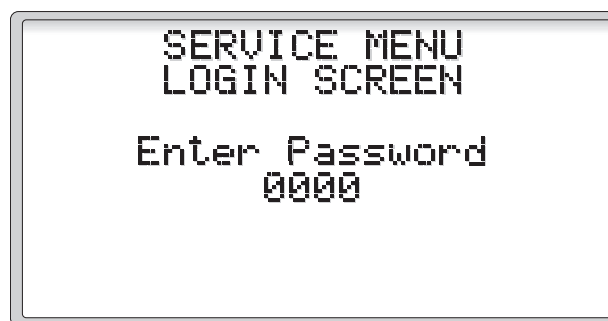


Figure 16

The SERVICE MENU (Figure 17) will now be shown. This screen allows access to the POOL SETTINGS, Evap Bypass Control, Enthalpy Settings, Sensor Offsets, EC Speed Settings, System Settings and BMS Settings.

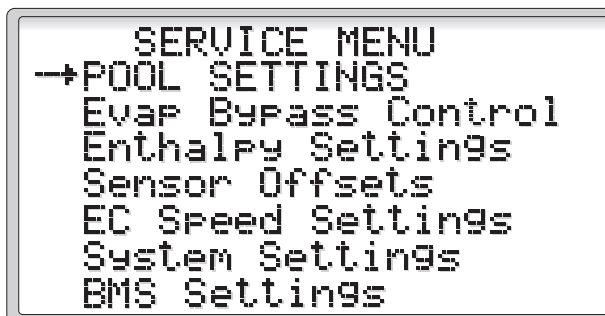


Figure 17

To return to the Main Menu, press the **Esc** key. The user remains logged in for 4 minutes after the password is entered. During this time, the Login screen reads "Logged In for xxx s, Press <PRG> to Enter." Within this 10 minute log-in, the service menu may be re-entered by simply pressing the **Prg** key when this message is displayed. The xxx is the number of seconds before the password expires.

2.2.3.1 Pool Settings (Figures 18 and 19)

The default setting for the Pool Stage Deadband and the Pool Switch Differential can be modified on this screen. The Pool Stage Deadband value is subtracted from the Pool Temperature Setpoint from section 2.2.2. This value is the set point that enables the auxiliary pool heat required output. This output will be active to indicate pool heating is required when in the occupied or un-occupied modes or in any alarm condition so the auxiliary pool heater can heat the pool. The Pool Switch Differential is subtracted from both the Pool Temperature set point and the auxiliary pool heating set point to reduce short cycling. See Figure 19 for a graphical indication of the Pool Setpoint, Stage Deadband and Switch Differential. The range of both the Pool Stage Deadband and the Pool Switch Differential is 0.0°F to 9.9°F.

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.

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

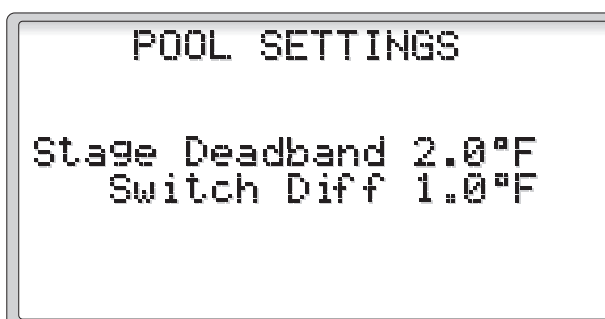


Figure 18

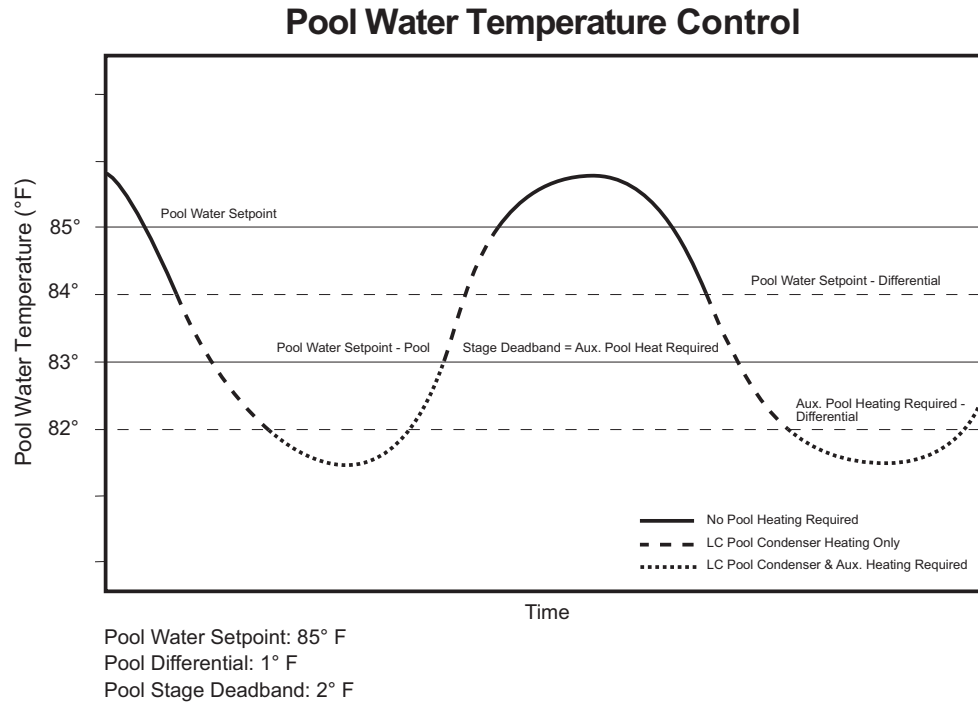


Figure 19

2.2.3.2 Evaporator Bypass Control (Figures 20 and 21)

These two screens allow modification to the evaporator bypass damper actuator PID control loop. Figure 20 allows the control of the damper position to be set to manual control and a manual position to be set. This is used for commissioning and service of the system. The control should not be left in the manual mode during normal operation.

Figure 21 allows the proportional band, integration and derivative time as well as the suction pressure set point to be set. The current suction pressure, as well as the current loop output (actuator command) value is shown on this screen 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.

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

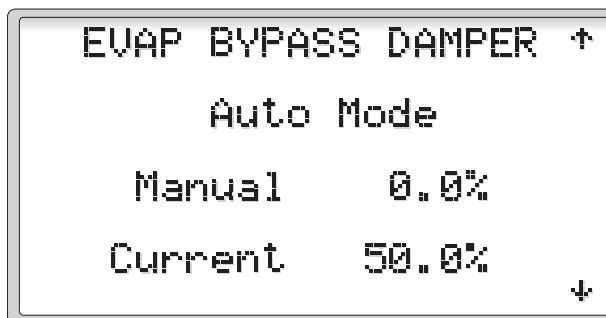


Figure 20

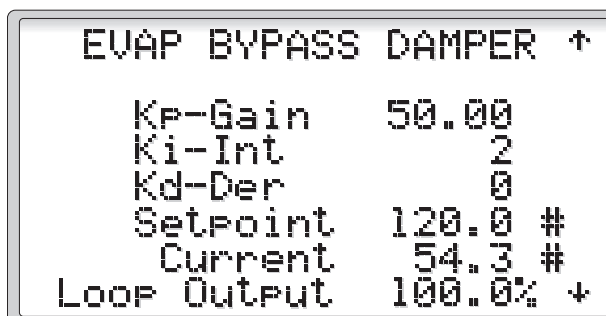


Figure 21

2.2.3.3 Enthalpy Settings (Figure 22)

The Enthalpy Settings screen allows modification of the intake air enthalpy points at which the refrigeration circuit will be disabled and enabled. Any intake air enthalpy value above the Enable setting will allow the refrigeration circuit to run. If the intake air enthalpy falls below the Disable setting, the refrigeration circuit will not be allowed to run until the intake air enthalpy rise above the Enable setting.

To modify these settings, press the **ENTER** key and use the arrow keys until the desired setting is shown. Pressing the **ENTER** key will now change the setting. The current intake air temperature, humidity and enthalpy are displaying at the bottom of this screen for reference.

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

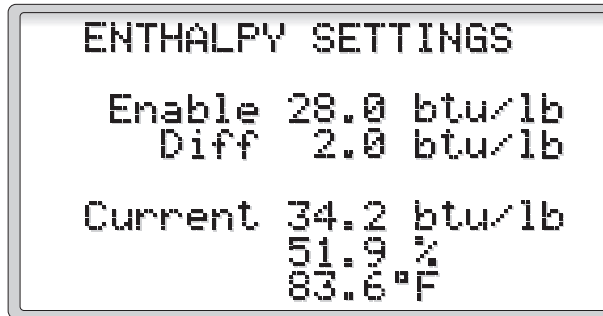


Figure 22

2.2.3.4 Sensor Offsets (Figures 23 and 24)

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.

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

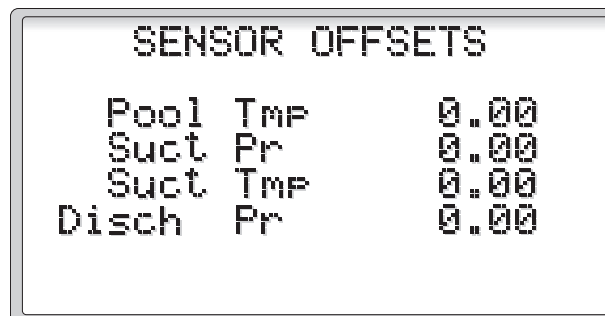


Figure 23

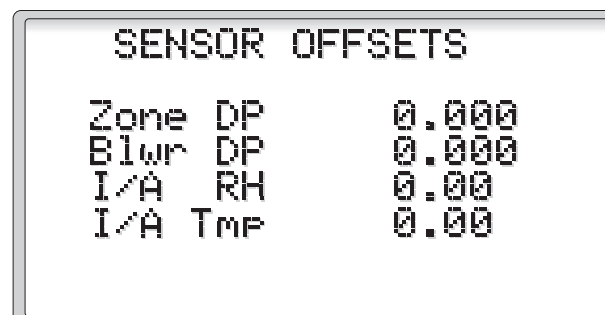


Figure 24

2.2.3.5 EC Speed Settings (Figures 25, 26, 27 and 28)

The EC Speed Settings screen allows modification of the exhaust fan control. Figure 25 details the CFM settings in the un-occupied, the occupied, the Event, the Max OA and the Purge mode. Please note that the Event, Max OA and Purge may not be used on all energy recovery units. The minimum CFM of the unit is also set here. The current CFM is shown for reference at the bottom of this screen.

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.

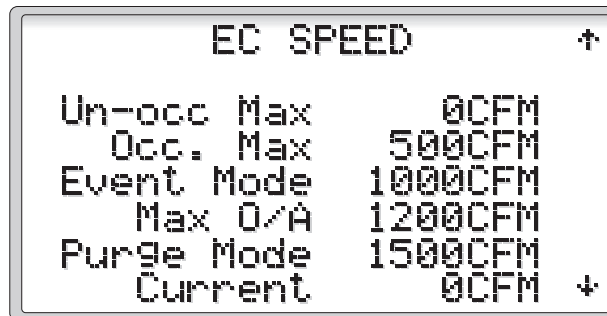


Figure 25

Pressing the **DOWN** key allows modifications to the Zone Pressurization loop. This loop will determine the speed of the EC exhaust blower used to maintain the pressurization set point. Figure 26 allows the proportional band, integration and derivative time as well as the zone set point to be set. The current zone pressure, as well as the current loop output (EC speed command) value is shown on this screen 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.

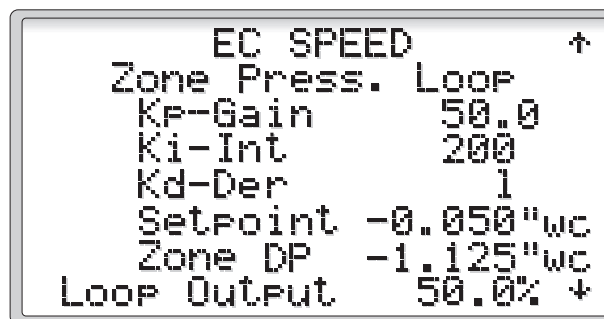


Figure 26

Pressing the **DOWN** key allows modification to the EC Speed CFM loop. This loop will determine the speed of the EC exhaust blower used to maintain the CFM set point for the current mode the unit is in. Figure 27 allows the proportional band, integration and derivative time as well as the CFM set point to be set. The current CFM, as well as the current loop output (EC speed command) value is shown on this screen 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.

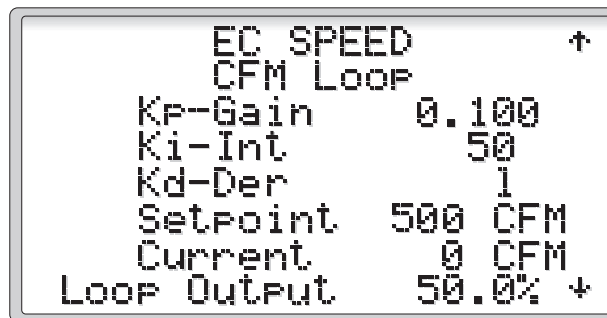


Figure 27

Pressing the **DOWN** key will now display Figure 28. This screen is for reference only. No modifications can be done on this screen.

Figure 28 displays all pertinent information for the EC exhaust blower. As the EC exhaust blower will have a CFM setting for each mode and also try to maintain a zone pressurization, the minimum loop output for each of these two conditions will determine the speed of the blower. In most cases, the CFM loop will determine the EC blower speed, with the zone pressure acting as a high limit, if the zone pressure set point is exceeded. For units working in conjunction with a Desert Aire SelectAire™ dehumidifier, the Zone Pressurization control may be disabled. In these cases the dehumidifier will control the zone pressurization and the energy recovery unit will work from the CFM set points only.

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

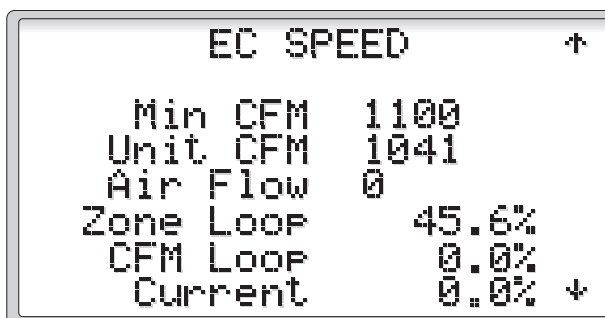


Figure 28

Figure 29 allows the air status to be set manually. The first line of the screen, as shown, runs the ER unit in the air status that is sent by the occupied input or the modbus command from the dehumidifier it is communicating to. This line can be set to Manual Air Status. The ER unit will then run in the mode that indicated on the next line. This can be “Un-Occupied, Occupied, Event Mode, Max OA Mode or Purge Mode”. The bottom of this screen shows the current status that the ER unit is using.

The Manual or Auto Air Status will be retained when leaving this menu to allow the unit to becommissioned. Cycling the power to the unit will force the air status back to the automatic mode.

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

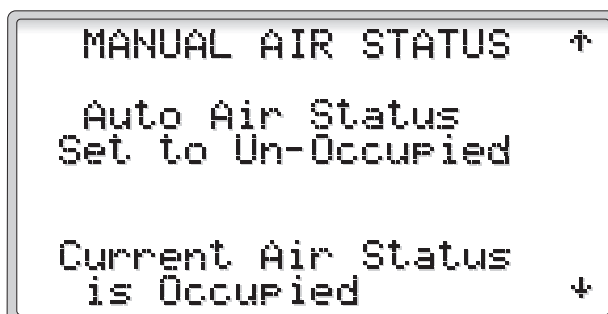


Figure 29

2.2.3.6 System Settings (Figure 30)

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.

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

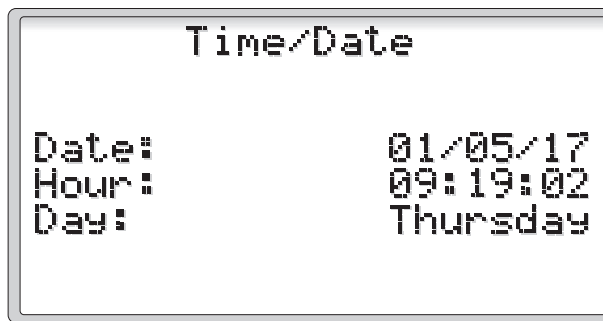


Figure 30

2.2.3.7 BMS Settings (Figures 31 through 36)

Selecting the BMS SETTINGS from the Commissioning Menu displays a set of screens which determine how the J3 series port and the Ethernet port will communicate. The J3 port can be set to drive a remote PGD display terminal, communicate via Modbus RTU 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 32. 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 33. This screen will allow the BACnet data to be set.

Pressing the **DOWN** key will also display the Ethernet protocol selection, Figure 34. Setting the Ethernet port for BACnet IP will allow the screen in Figure 35 to be displayed. This allows the Device ID and Port to be set. Pressing the **DOWN** key once more displays the ethernet Network Configuration, Figure 36. The unit default is DHCP.

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 Service Menu, press the **Esc** key.

```
PORT J3 SETUP      ↑  
  
Set to PGD Display  
  
Reboot after changes ↓
```

Figure 31

```
■ J3 MODBUS RTU SETUP ↑  
  
Address      1  
Baudrate 19200  
8 Data Bits  
Parity NONE  
2 Stop Bits  
Reboot after changes ↓
```

Figure 32

```
■ J3 BACNET MS/TP ↑  
  
Station Add.  1  
Baudrate      19200  
Max Master    127  
Device ID     77000  
Reboot after changes ↓
```

Figure 33

```
■ ETHERNET SETUP ↑  
  
Set to Modbus TCP/IP  
  
Reboot after changes ↓
```

Figure 34

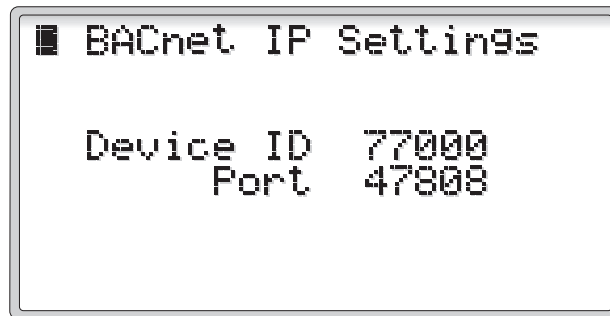


Figure 35

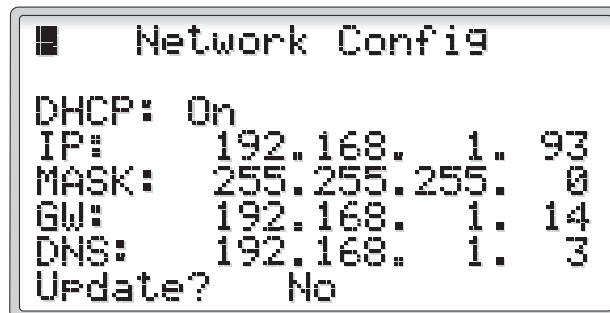


Figure 36

2.2.4 Unit Revision (Figure 37)

The Unit Revision screen shows the version of the application program that is running along with the release date of the software. See Figure 37. This information should be passed to Desert Aire in the event of a service call is necessary.

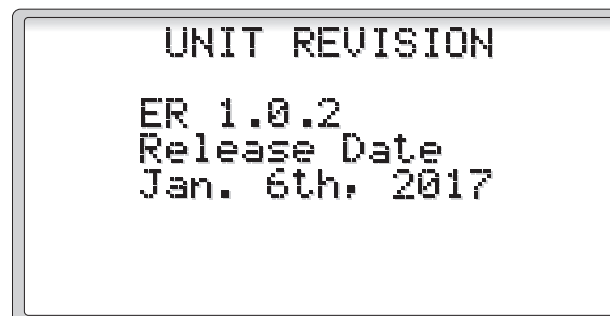


Figure 37

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

3 Alarms (Figures 38, 39, and 40)

To view the alarms from any menu, simply press the **ALARM** key. If no alarm is active, the display will state NO ALARMS. See Figure 38. 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 39. 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.



Figure 38

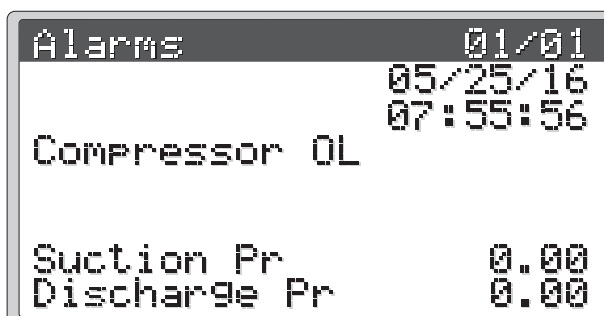


Figure 39

To reset the alarm, use the **DOWN** key until the reset instructions are shown. See Figure 40. Pressing the **ALARM** key for three seconds will reset all active alarms.

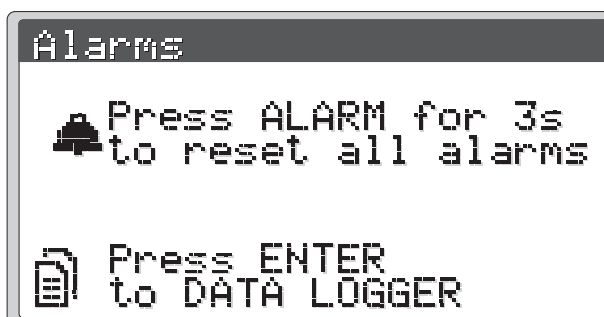


Figure 40

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 has 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 Low Suction Pressure

This is a Manual Reset Alarm. The Low Suction Pressure Alarm will only be activated when the Suction Pressure falls below the Low Suction Pressure Cutout (see section 2.2.1.4) 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 Low Suction Pressure Trip Set point is normally 58.0 psig. When the compressor is started and for the first 90 seconds of the compressor running, the Low Suction Pressure Trip Set point 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 Low Suction Pressure Trip Set point 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 High Discharge Pressure

This is a Manual Reset Alarm. The High Discharge Pressure Alarm is activated when the Discharge Pressure rises above the High Pressure Cutout point (see section 2.2.1.4). 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 Motor Overload

This is a Manual Reset Alarm. The Compressor Motor Overload Alarm 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 the control system. 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 Alarm Data Logger (Figures 41 and 42)

The Alarm Data Logger screen is accessible from the Alarm Reset screen (see Figure 38) by pressing the **ENTER** key. This screen shows record 1 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. Use the **ENTER** key to cycle to a screen showing more recorded data when the alarm occurred. This will include the Pool Temperature, EC Blower Differential Pressure, Suction Temperature, Superheat, Intake Temperature and Intake Relative Humidity. Press the **ENTER** key to toggle back to the alarm record.

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



Figure 41

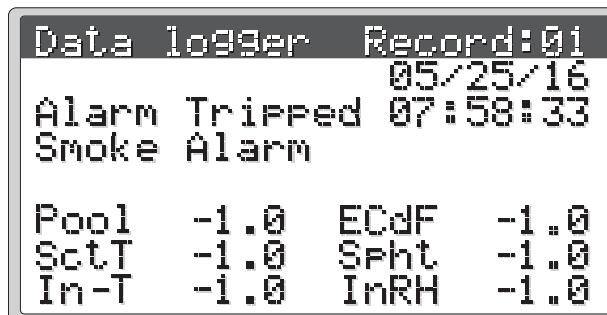


Figure 42

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 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 (0-250psig).

$$\text{Pressure (psig)} = (62.5) * (V) - 31.25$$

Example, if V is 2.50 VDC, then;

$$\begin{aligned}\text{Pressure (psig)} &= (62.5) * (2.50) - 31.25 \\ &= 156.25 - 31.25 \\ &= 125 \text{ psig}\end{aligned}$$

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 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).

$$\text{Pressure (psig)} = (163) * (V) - 81.5$$

Example, if V is 2.50 VDC, then;

$$\begin{aligned}\text{Pressure (psig)} &= (163) * (2.50) - 81.5 \\ &= 407.5 - 81.5 \\ &= 326 \text{ psig}\end{aligned}$$

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

4.4 Suction Line Temperature Sensor

The Suction Line 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.

4.5 Intake Air Temperature and Relative Humidity Sensor

The Intake Air Temperature and Relative Humidity Sensor is installed internal to the unit in the exhaust air stream. The failure mode of the temperature sensor internal to 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. A reading of 0.0% humidity indicates a failure of the RH sensor. The Desert Aire replacement part number for the Zone Air Temperature and Relative Humidity Sensor is available by calling our service department.

4.6 Zone Pressurization Differential Air Pressure Sensor

The Zone Pressurization Differential Air Pressure Sensor has a total range of -1.0" wc to + 1.0" wc. The output of this device is a 0.25 VDC at -1.0" wc and 4 VDC at +1.0" 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.



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N120 W18485 Freistadt Road • Germantown, WI 53022 • E-mail: info@desert-aire.com

Ph: (262) 946-7400 • Fax: (262) 946-7401 • Website: www.desert-aire.com