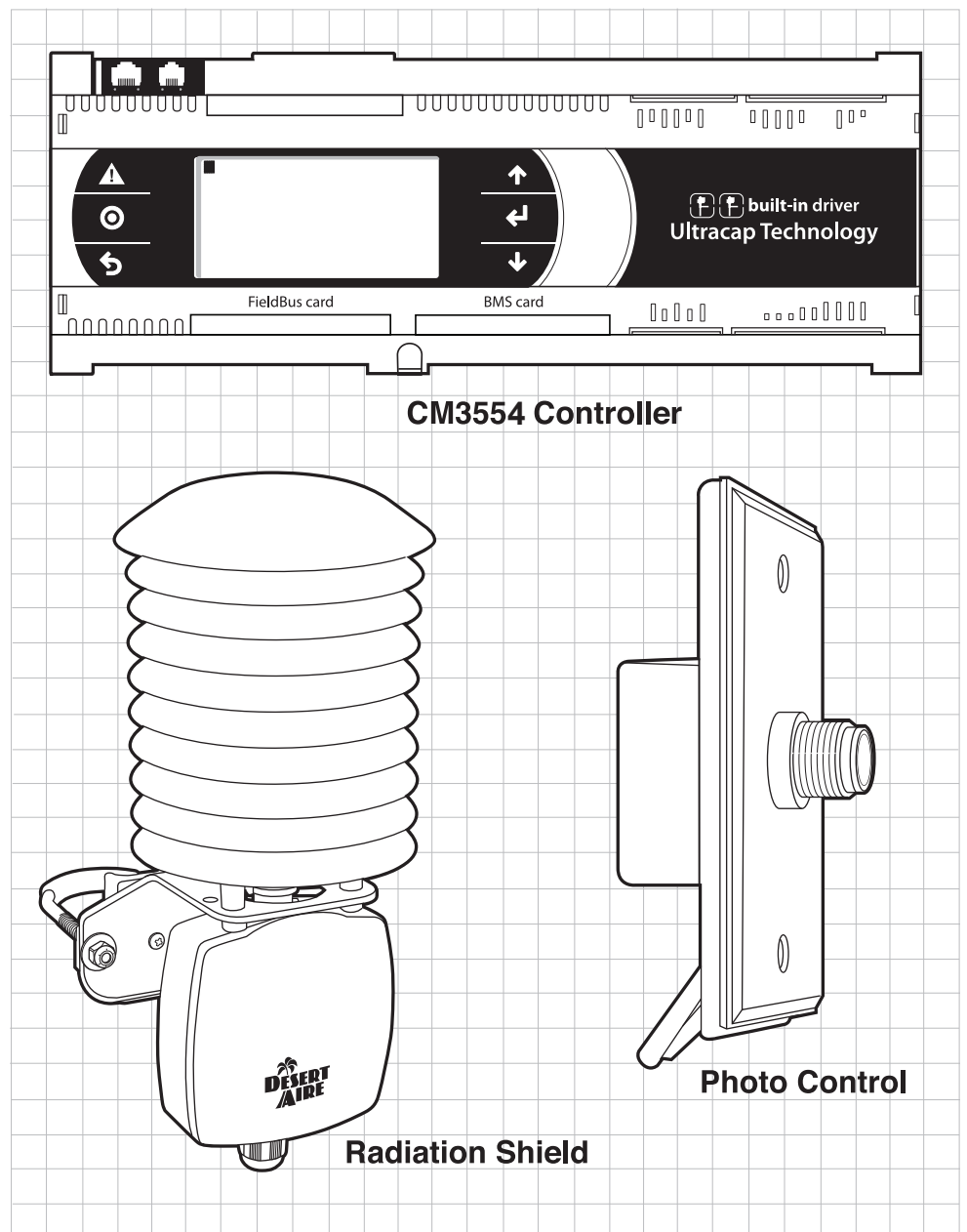




CM3554 Series Controller

Operation Manual for GV Units

- Controls specific to Controlled Environment Agriculture
- Monitoring of temperature, RH, dew point, and VPD
- Photocell input allows for feedback of light cycle
- Optional CO₂ monitoring and automated control
- Capability to link units for coordinated control in a single space
- Cloud-based logging, alarms, and control when used with AireGuard™



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
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	Introduction	9
1.2	Sensor Installation	9
1.3	Auxiliary Air Heating Control Wiring	9
	1.3.1 Auxiliary Heating - Dry Contact Closure	9
	1.3.2 Auxiliary Heating - Dry Contact Closure	10
1.4	CM3554 Controller Overview	10
2.	CM3554 Controller Details	11
2.1.	Menu Overview and General Instructions (Figure 1)	11
2.2.	Active Zone Setpoints (Figures 2-15)	12
2.3	Main Menu (Figure 16)	17
	2.3.1 Unit Status (Figures 17 - 24)	17
	2.3.2 TIME/DATE (Figure 25)	21
	2.3.3 Service Menu (Figures 26 - 27)	22
	2.3.3.1 Commissioning (Figure 28)	23
	2.3.3.1.1 Network Configuration (Figures 29 - 32)	23
	2.3.3.1.2 System Capacity (Figures 33 - 35)	26
	2.3.3.1.3 Timer Settings (Figures 36 - 37)	27
	2.3.3.1.4 Supply Fan Setup (Figures 38 - 43)	28
	2.3.3.1.5 BMS Setup (Figures 44 - 48)	31
	2.3.3.1.6 CO ₂ Settings (Figures 49 - 51)	33
	2.3.3.2 Tuning Menu (Figure 52).....	35
	2.3.3.2.1 Reheat Settings (Figures 53 - 54)	35
	2.3.3.2.2 Air Heat Settings (Figures 55 - 57)	36
	2.3.3.2.3 Ext Heat Settings (Figures 58 - 60)	38
	2.3.3.2.4 Zone Reset Settings (Figures 61 - 76)	40
	2.3.3.2.5 Capacity Control Settings (Figures 77 - 81)	48
	2.3.3.2.6 Condenser (Figures 82 - 86)	51
	2.3.3.3.1 I/O Status (Figure 87)	53
	2.3.3.3.2 Digital Inputs (Binary) (Figures 88 - 90)	54
	2.3.3.3.2 Analog Inputs (Figures 91 - 94)	56
	2.3.3.3.3 Digital Outputs (Binary) (Figures 95 - 97)	58
	2.3.3.3.2 Analog Outputs (Figure 98)	60
	2.3.3.4 Sensor Offsets (Figures 99 - 101)	61
	2.3.3.5 Memory Options (Figures 102 - 105)	62
	2.3.4 Unit Revision (Figure 105)	63
	2.3.5 Grow Schedule (Figures 106 - 108)	63

3. Alarm Menu 65

3.1 System Alarms 66

3.2 EVD Module Alarms 66

3.3 Alarm Log (Figure 112) 66

4. Hardware Details 67

4.1 Programmable Controller 67

4.2 Suction Pressure Transducer 67

4.3 Discharge & Liquid Pressure Transducer 67

4.4 Suction Line, Liquid & Supply Air Temperature Sensor 68

4.5 Zone & Intake Air Temperature & Relative Humidity Sensor 68

4.6 Air Flow Proving Differential Pressure Sensor 68

1 Installation

1.1 Introduction

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

This CM3554 control system is easy to install and operate. The controller itself is installed in the electrical cabinet of the dehumidifier and features an internal display terminal (IDT) and an optional remote display terminal (RDT). This display allows viewing and adjustment of the unit's sensors and set points. It also indicates the operating status of major components inside of the dehumidifier.

Most sensors and devices have been factory-installed and wired inside of the dehumidifier. In most cases, only connection to a remote condenser, electrical power connection, zone and supply air sensors are required. Connection to the facilities computer network or building management system may also be required.

The CM3554 controller features optional building management system access. This includes options for network communication ability including BACnet IP, BACnet MS/TP, ModBus RTU and ModBus IP.

1.2 Sensor Installation

The CM3554 control system requires a zone mounted combination relative humidity and temperature sensor. Mount this sensor in the conditioned space away from any hot spots but in an area that is representative of the zone. Constant air flow across this sensor will help ensure proper readings. A supply air temperature sensor is also required. Mount this sensor in the air duct supplying conditioned air to the zone.

1.3 Auxiliary Air Heating Control Wiring

Note: You must use the Desert Aire CM3554 control system to control or interlock with the room heating system. This prevents wide fluctuations in room air temperature. It also prevents the heater from trying to heat the room while the dehumidifier is running in the cooling mode.

1.3.1 Auxiliary Heating - Dry Contact Closure

The standard Desert Aire CM3554 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 - Dry Contact Closure

Desert Aire will provide a proportional 0-10 VDC direct-acting signal to modulate a heating coil control valve or other auxiliary modulating heater. This signal may be changed to reverse acting. Contact the Desert Aire Service department for assistance with this option.

Most proportional valves have either three (3) or four (4) terminals for field-installed wiring.

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

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

1.4 CM3554 Controller Overview







Desert Aire’s CM3554 microprocessor controller is a powerful, flexible controller with many useful features including:

- Display of zone air conditions and refrigerant pressures.
- Display of equipment operating status such as dehumidification, cooling and heating.
- Display of alarms for abnormal conditions such as sensor failures or tripped safety controls.
- Remote setpoint option as well as lights on and lights off setpoints.
- A convenient, easy-to-understand display interface which allows the operator to view and change setpoints and time schedules.







2 CM3554 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 remote display terminal (RDT) 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 model series, size, unit tag, temperature, relative humidity and the status of the unit. The right side of the display shows “Esc→Menu” which 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 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 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 display will return to the Home Screen.



Figure 1

2.2 Active Zone Setpoints (Figures 2-15)

Pressing the **Prg** key from the Home Screen displays one of the following options for setpoint screens; the local setpoints adjustable in the unit, the setpoints from a lead unit, or the setpoints from a Building Management System (BMS) network. If the unit has a Growcycle schedule active, the setpoints may also come from the Growcycle Scheduler. With local setpoints active, pressing the **Prg** key will display the screens of Figure 2 and Figure 3. In the middle of the screens of Figure 2 and 3 the zone temperature setpoint, and zone relative humidity setpoint are adjustable for lights on and lights off modes. At the bottom of both screens the zone temperature is displayed.

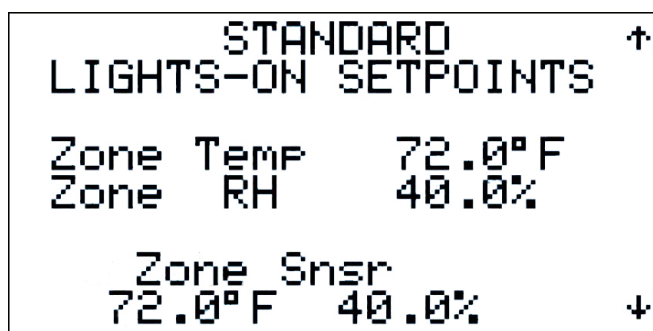


Figure 2

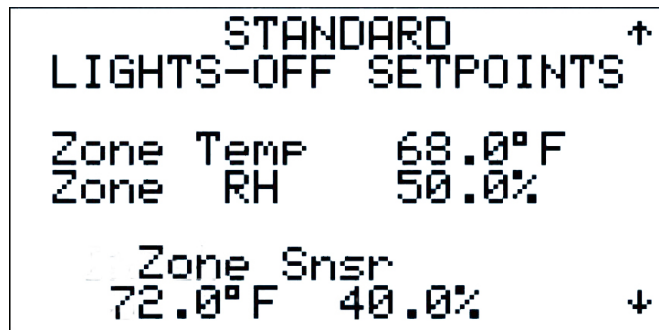


Figure 3

If the unit is set up as a lag unit in a lead-lag system, then pressing the **Prg** key will display the screens of Figure 4 and Figure 5. Here the lead unit's setpoints for lights on and lights off are displayed and can only be adjusted from the lead unit.

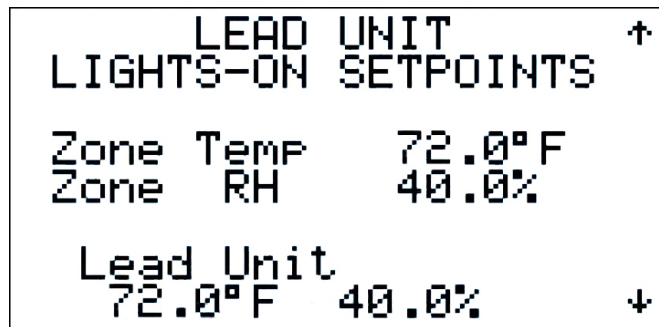


Figure 4

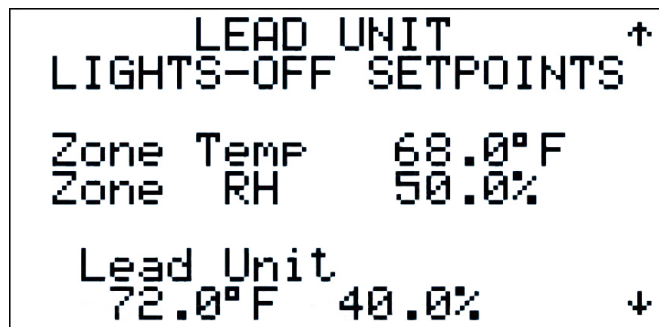


Figure 5

If the unit is setup to use setpoints sent by a BMS system, pressing the **Prg** key will display the screens of Figures 6 and 7. Here the network zone temperature and humidity setpoints are adjustable for both the lights on and lights off mode of operation. These setpoints will also be adjustable through Modbus or BACnet protocol depending on the BMS option selected.

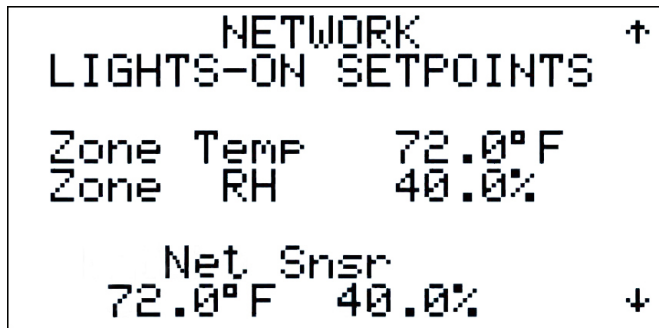


Figure 6

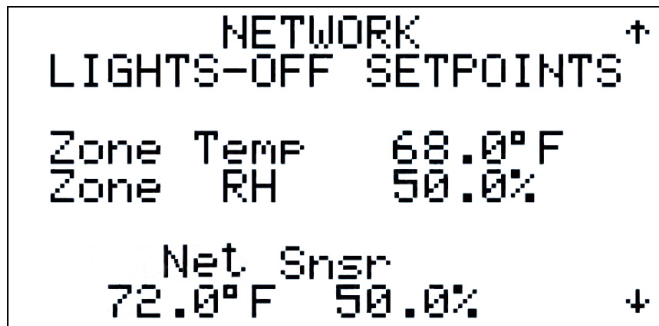


Figure 7

If the unit has a Growcycle schedule enabled, then pressing the **Prg** key will display the screens of Figure 8 and 9. This screen will display the active setpoints from the Growcycle scheduler for lights on and lights off modes. The setpoints will only be adjustable in the Growcycle setpoints menus. The screen will either say “Schedule Active”, “Schedule Ended”, or display which period the schedule is on.

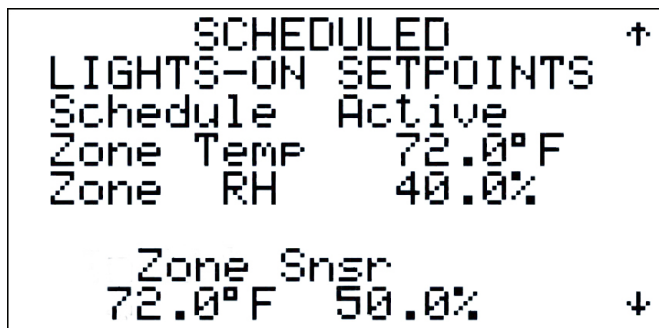


Figure 8

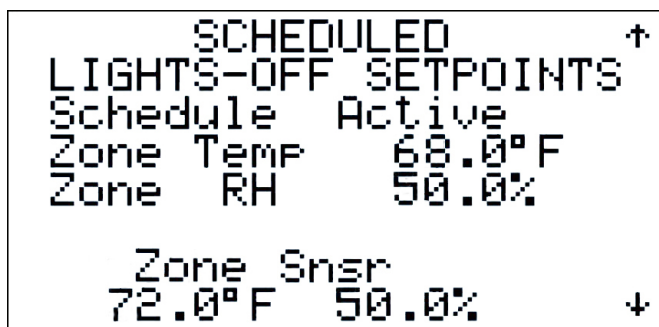


Figure 9

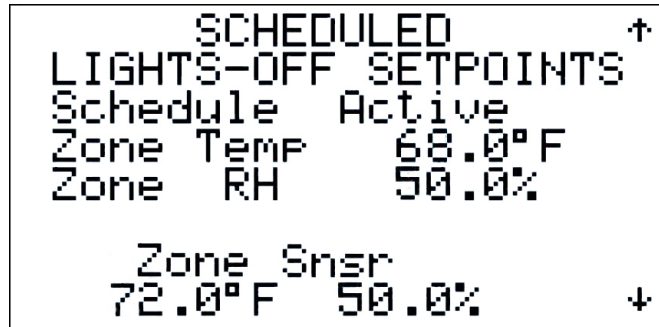


Figure 9

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

If the zone alert option has been enabled, then pressing the **DOWN** key from the zone setpoints screen will display the screen of Figure 10. From this screen the maximum and minimum temperature and humidity values for the zone are all adjustable. If the zone air is measured outside of the maximum and minimum values an alarm will be activated. At the bottom of the screen an alert delay is adjustable. To return to the Home Screen, press the **Esc** key.

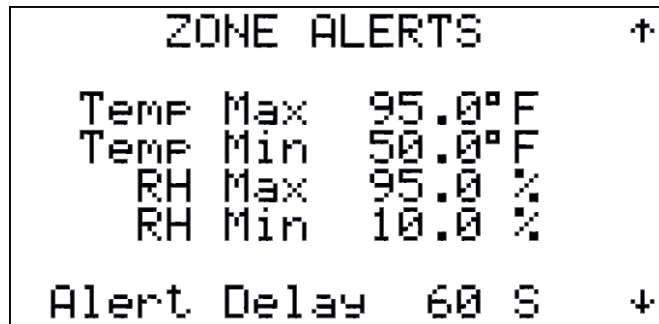


Figure 10

If the air filter option has been enabled, then pressing the **DOWN** key will display the screen of Figure 11. Towards the top of the screen the filter alarm differential air pressure setpoint and differential are adjustable. If the airflow across the filter reads above this setpoint an alarm will be activated. Towards the bottom of the screen the filter differential air pressure is displayed. To return to Home Screen, press **Esc** key.

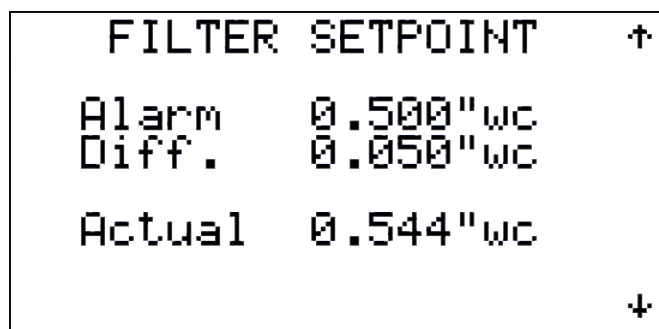


Figure 11

If the damper control option has been enabled, then pressing the **DOWN** key from the zone setpoints screen will display the screens of Figures 12 and 13. From this screen the position for the return air and outdoor air dampers are adjustable for the Unit Off, Lights OFF, and Lights ON modes of operation. The screen of Figure 13 allows access to the diagnostics screens of the damper.

DAMPER SETTINGS ↑		
Unit	OA	RA
Off	0.0%	100.0%
Lights		
Off	10.0%	90.0%
Lights		
On	90.0%	10.0%↓

Figure 12

```

DAMPER SETTINGS ↑
                ↓
Damper Diagnostics
Press <Ent>
                ↓

```

Figure 13

Pressing the **Ent** key on the screen of Figure 13 will display the screens of Figures 14 and 15. From these screens the Relative Position (in percent) and Absolute Position (in degrees) is displayed for the Outdoor Air air and Return Air air dampers. Directly below there is a selection for MANUAL control. This can be activated to TEST SYNC or RESET the damper settings. These should only be adjusted with the assistance of service personnel.

```

OA DAMPER DIAG.
Rel. Pos: 0.0%
Abs. Pos: 0.0°
Manual: Off
Test Damper
Sync Damper
Reset Damper

```

Figure 14

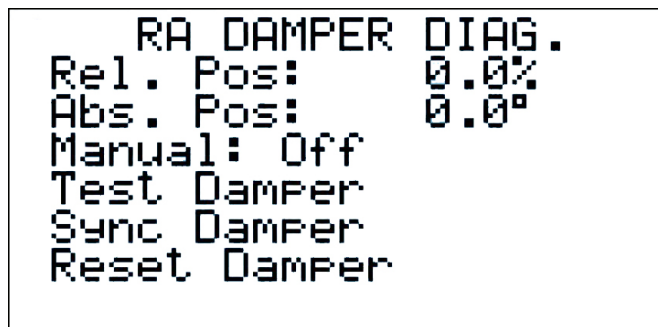


Figure 15

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

2.3 Main Menu (Figure 16)

Pressing the **Esc** key from the Home Screen displays the MAIN MENU (Figure 16). This menu allows the operator to select the UNIT STATUS, SET DATE AND TIME, SERVICE MENU, or UNIT REVISION menus. If a Growcycle schedule is enabled, the SCHEDULE MENU will also be shown.

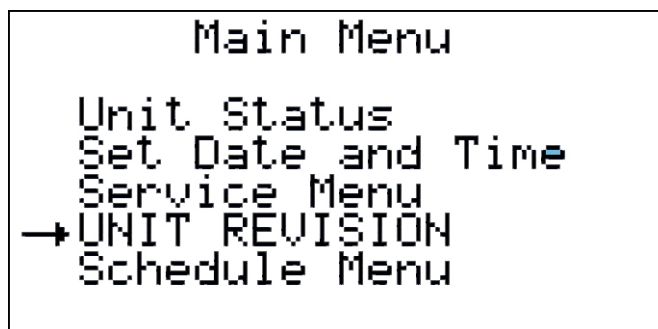


Figure 16

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

2.3.1 Unit Status (Figures 17-24)

Selecting the Unit Status will display the screen shown in Figure 17.

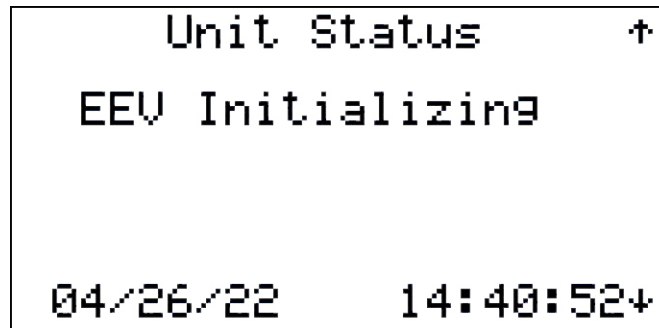


Figure 17

The first line shows one of the following states:

- System Off
- Heating Required
- Cooling Required
- Dehum Required
- Dehum & Heat
- Dehum & Cool
- Low Air Flow
- EVD Initialization
- Standby

The second line will show "Disch Pr Event" if the discharge pressure rises above 530 psi. The third line indicates "Disch Pr Limiting" if the discharge pressure rises above 500 psi. The fourth line will indicate if the BMS has turned the unit off. At the bottom of the screen the time and date are displayed.

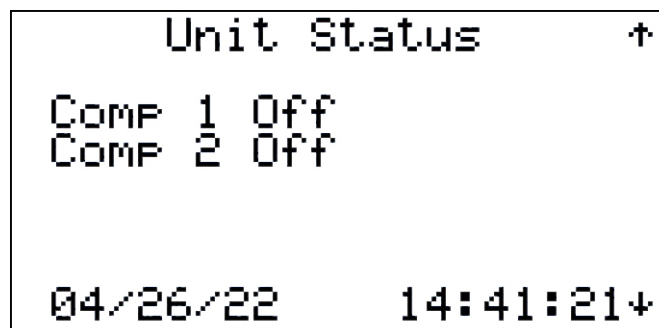


Figure 18

Pressing the **DOWN** key will display the screen of Figure 148. This screen shows the status of the compressors "On"/ "Off". If the unit is dual circuit, then the statuses of compressors 3 and 4 will also be displayed. If the compressor is off due to the compressor timing, the remaining time will be displayed to the right of the on/off status. At the

bottom of the screen the time and date are displayed.

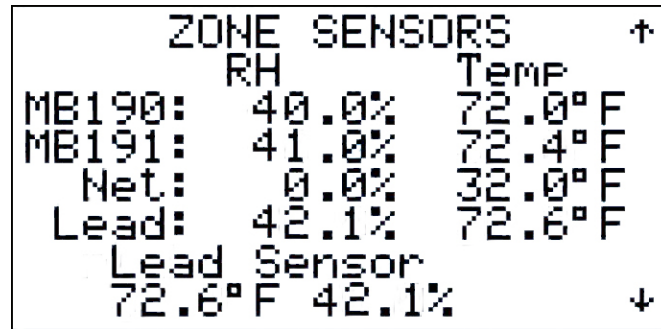


Figure 19

Pressing the **DOWN** key will display the screen of Figure 19. This screen displays the temperature and relative humidity values read for the multiple zone sensor options. MB190 is the zone sensor at Modbus address 190 in the space. MB191 is the intake sensor at Modbus address 191. Net is the value read from an optional BMS system. Lead is the value read from a lead unit in a lead-lag system. Towards the bottom of the screen a status of which sensor is being used by the controller will be displayed along with the values that are being read.

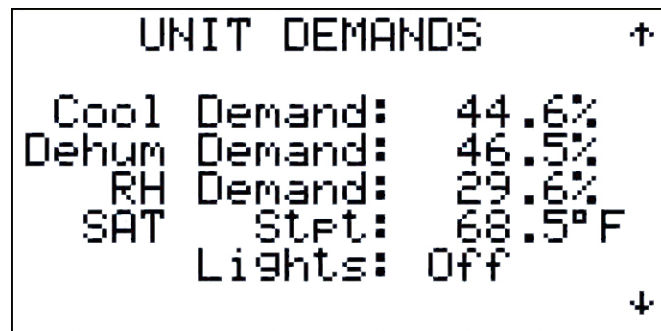


Figure 20

Pressing the **DOWN** key will display the screen of Figure 20. This screen shows the calculated demands on the unit. Towards the top the Cool Demand, Dehum Demand, and RH demand are displayed. Towards the bottom the supply air temperature setpoint and the lights "On"/ "Off" status is displayed.

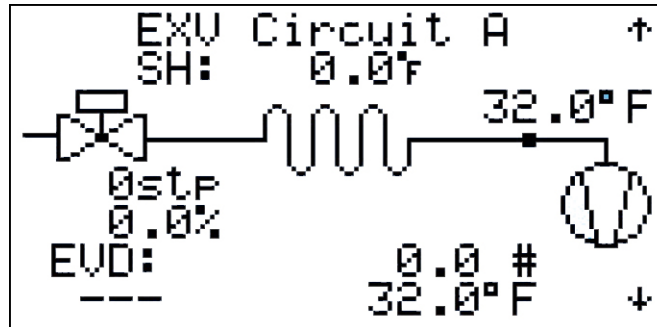


Figure 21

Pressing the **DOWN** key will display the screen of Figure 21. This screen shows the status of the electronic expansion valve. The top middle of the screen displays the calculated superheat. To the right the suction temperature is displayed. On the bottom right the suction pressure and saturated suction temperature is displayed. On the left of the screen the valve steps, valve position (in percent) and the valve status is displayed. If the unit is dual circuit, then pressing the **DOWN** key will display an additional “EXV Circuit B” screen with the same layout and information for circuit B.

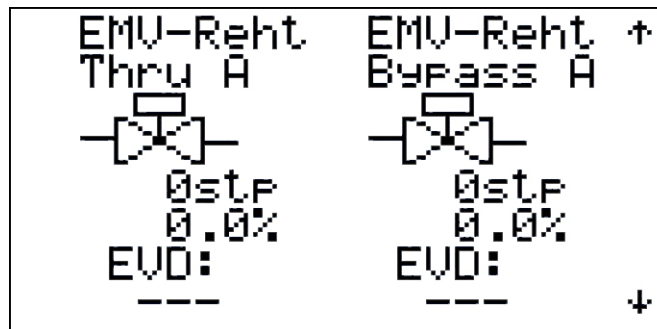


Figure 22

Pressing the **DOWN** key will display the screen of Figure 22. This screen displays the positions and steps for the reheat bypass and through valves with the valve status displayed on the bottom. If the unit is dual circuit, then pressing the **DOWN** key will display the same information for circuit B valves.

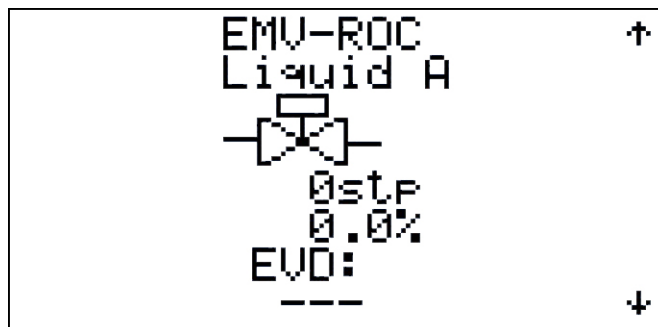


Figure 23

Pressing the **DOWN** key will display the screen of Figure 23. This screen displays the position and steps for the ROC Liquid valve with the valve status displayed on the bottom. If the unit is dual circuit, then pressing the **DOWN** key will display the same information for circuit B.

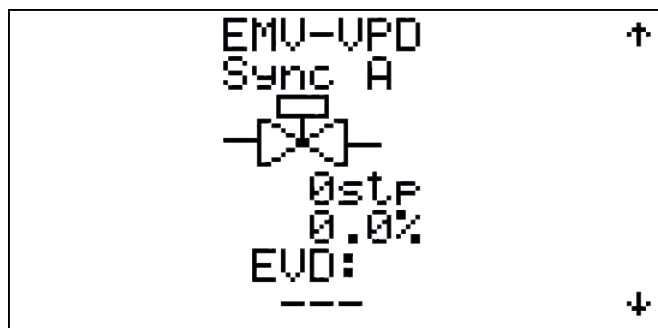


Figure 24

Pressing the **DOWN** key will display the screen of Figure 24. This screen displays the position and steps for the VPD Sync valve with the valve status displayed on the bottom. If the unit is dual circuit, then pressing the **DOWN** key will display the same information for the circuit B.

2.3.2 TIME/DATE (Figure 25)

Selecting Set Time/Date from the Main Menu will display the screen shown in Figure 25. This screen allows the time, date, day of week and the time zone to be set. 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 MAIN MENU, press the **Esc** key.

```
TIME/DATE
Date:  4/26/22
Time:  14:30:08
Day:    Tuesday
Chicago
Update Time Zone? Off
```

Figure 25

2.3.3 Service Menu (Figures 26 - 27)

Selecting the SERVICE MENU will display the Login Screen (Figure 26). Enter the service password, 1234, and press **ENTER**.

```
SERVICE MENU
LOGIN SCREEN

Enter Password
0000
```

Figure 26

The SERVICE MENU allows access to COMMISSIONING, TUNING, I/O STATUS, SENSOR OFFSETS, and MEMORY OPTIONS menus. Use the same method throughout the manual to call out lists from a display screen.

```
SERVICE MENU
→COMMISSIONING
  Tuning
  I/O Status
  Sensor Offsets
  Memory Options
```

Figure 27

To return to the Main Menu, press the **Esc** key. The user remains

logged in for 30 minutes after the password is entered. During this time, the Login screen reads “Still Logged In – Press **Prg** to Enter”. To login without entering the password, while this message is shown, press the **Prg** key.

2.3.3.1 Commissioning (Figure 28)

Selecting COMMISSIONING from the Service Menu displays the COMMISSIONING MENU. This menu allows the operator to access the NETWORK CONFIG, SYSTEM CAPACITY, TIMER SETTINGS, SUPPLY FAN SETUP, and BMS SETUP menus. If enabled, this screen also allows access to the CO₂ SETUP menu.

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

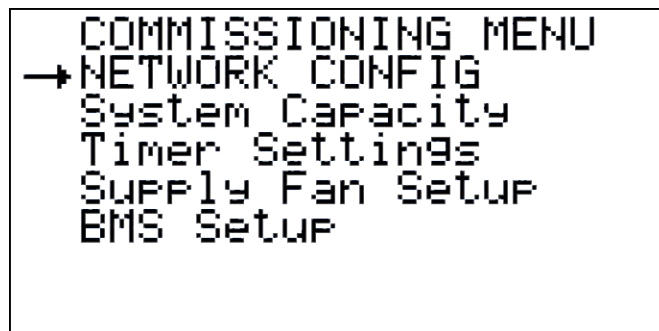


Figure 28

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

2.3.3.1.1 Network Configuration (Figures 29 - 32)

Selecting NETWORK CONFIG from the Commissioning Menu displays the screen shown in Figure 29. This screen allows the network addressing to be set. If a static IP address is required, set DHCP to OFF and enter the Static values. The Mask, Gateway (GW) and DNS addresses need to be set as well. If a DHCP service is available, leave the DHCP setting to On and the service will assign an IP address.

```

NETWORK CONFIG
DHCP: On
IP:    192.168.  1.112
MASK:  255.255.255.  0
GW:    192.168.  1. 14
DNS:   192.168.  1.  3
Update? No

```

Figure 29

```

ENTER UNIT TAG

dhu1

☐ Set Unit Tag
☐ Get Unit Tag

```

Figure 30

Pressing the **DOWN** key will display the ENTER UNIT TAG screen of Figure 30. From this screen a hostname for the unit can be entered. This hostname is an address that will be accessible on a user network. This is defaulted to “dhu1” but it is recommended that the hostname is coordinated with the unit tag on the equipment. Hostnames should be coordinated with the building IT administrator. Once the unit tag (host name) is changed to the desired value, the checkbox “Set Unit Tag” must be checked. This will write the new hostname to the controller. The checkbox “Get Unit Tag” can be checked to confirm that the correct hostname was written to the controller. After changing the unit tag the unit should be power cycled.

```

NETWORK CONFIG      ↑
☐ Lead-Unit Control
☐ Network Sensor

☐ Network Setpoints
☐ Network Lights-On      ↓

```

Figure 31

Pressing the **DOWN** key will display the NETWORK CONFIG screen shown in Figure 31. From this screen the user can make adjustments to the zone sensor and setpoint selections. The first option is “Lead-Unit Control”. If this option is selected the unit will use the lead unit zone sensor, zone setpoints, lights on/off status, and calculated demands/setpoints. If this option is selected the controller must be connected to the network and will need to be adjusted for proper lead unit communication.

The next option is “Network Sensor”. If this is selected the unit will use a zone sensor connected via some BMS network. When network sensor is selected, an option for “Net Heartbeat Enable” will appear. If enabled, the heartbeat delay can be set (in seconds). The heartbeat and heartbeat delay needs to be coordinated with the BMS administrator. The next option is “Network Setpoints”. If this is selected the unit will receive its lights on/off zone temperature and relative humidity setpoints from a BMS network.

The last option is “Network Lights On”. If this option is selected the unit will receive its lights on/off status from a BMS network.

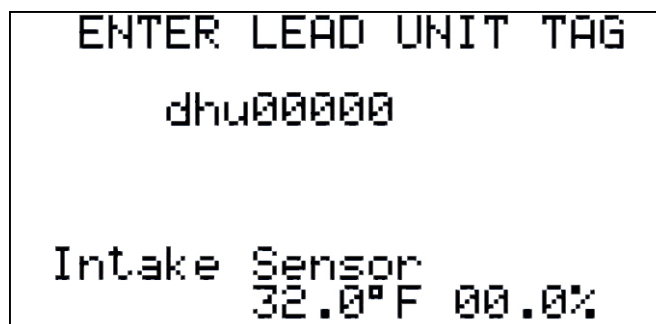


Figure 32

Pressing the **DOWN** key will display the ENTER LEAD UNIT TAG screen of Figure 32. From this screen the user can enter the unit tag (hostname) of the lead unit if applicable. The lead unit will share zone sensor, zone setpoints, lights on/off, and calculated demands/ setpoints with lag units that have a matching unit tag entered here. If no data is sent from the lead unit, the message “Hostname MB FLT” will be displayed. If lead unit data drops out the unit will fall back to a zone sensor if connected, or the intake sensor. Towards the bottom

of the screen the zone temperature and relative humidity are displayed. Above the displayed values will be text that will either say “Zone Sensor”, “Lead Unit Sensor”, “Network Sensor”, or “Intake Sensor” depending on which option has been selected and which sensor is connected and sharing data.

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

2.3.3.1.2 System Capacity (Figures 33 - 35)

Selecting SYSTEM CAPACITY from the Commissioning Menu displays the screen shown in Figure 33. This screen displays the “On” and “Off” calculated demands for the compressors. These values are calculated by the unit, but are also adjustable if desired. If the unit is dual circuit, then the demands for compressors 3 and 4 will be displayed on this screen. At the bottom of the screen the calculated demand is displayed.

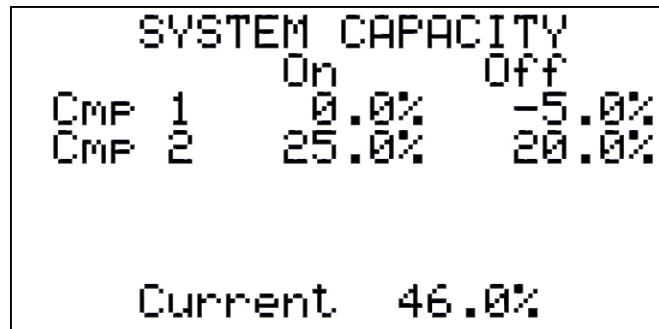


Figure 33

Pressing the **DOWN** key will display the screen of Figure 34. From this screen the unit sizes and unit tags of a lead-lag system can be entered on lead units, and viewed on lag units.

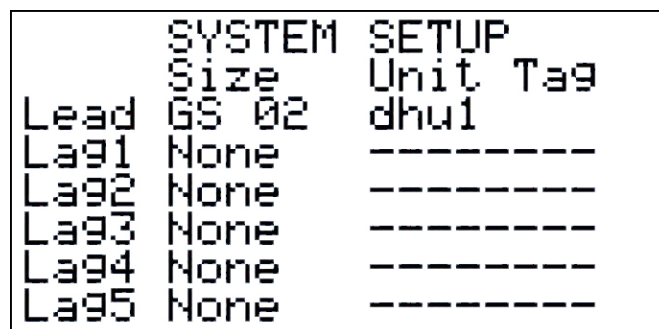


Figure 34

Pressing the **DOWN** key will display the screen of Figure 35. This screen is a continuation of the screen of Figure 34, and allows for setting of the unit sizes and unit tags for lag units 6 through 9.

	SYSTEM	SETUP
	Size	Unit Tag
La96	None	-----
La97	None	-----
La98	None	-----
La99	None	-----

Figure 35

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

2.3.3.1.3 Timer Settings (Figures 36 - 37)

Selecting TIMER SETTINGS from the Commissioning Menu displays the screen shown in Figure 36. From this screen the compressor delay and airflow delay can be adjusted.

TIMER SETTINGS			↑
Comp Delay	60	S	
Air Flow Delay	15	S	
			↓

Figure 36

Pressing the **DOWN** key will display the screen of Figure 37. This screen allows adjustment of the mode delays for Cool, Dehum, and Heat.

```

TIMER SETTINGS      ↑
Off Delays

Cool Mode    120 S
Dehum Mode   120 S
Heat Mode    120 S

↓

```

Figure 37

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

2.3.3.1.4 Supply Fan Setup (Figures 38 - 43)

Selecting SUPPLY FAN SETUP from the Commissioning Menu displays the screen shown in Figure 38. From this screen the user can adjust the maximum and minimum CFM setpoints. Directly below the maximum and minimum demand values can be adjusted. These values scale the speed from minimum to maximum CFM based on the system demand.

```

SUPPLY FAN SETUP  ↑

Max CFM           4200CFM
Min CFM           1158CFM
Min Cmd Cap       50.0%
Max Cmd Cap       100.0%
Current           0CFM   ↓

```

Figure 38

Max Speed PID		↑
KP-Gain	0.017	
Ki-Int	60.0	
Kd-Der	2.0	
Setpoint	0CFM	
Current	0CFM	
Loop Output	0.0%	↓

Figure 39

Pressing the **DOWN** key will display the screen of Figure 39. From this screen the user can adjust the PID terms for the supply fan control loop towards the top of the screen. Towards the bottom the CFM setpoint is displayed along with the current CFM reading and the current speed command.

MANUAL SETTINGS		↑
Auto Control		
Manual Cmd	0.0%	
Speed Cmd	0.0%	
Current	0CFM	↓

Figure 40

Pressing the **DOWN** key will display the screen of Figure 40. From this screen the user can place the fan in “Manual Control” and adjust the manual speed command. Towards the bottom of the screen the speed command that is being used on the fan, and the current CFM reading are displayed.

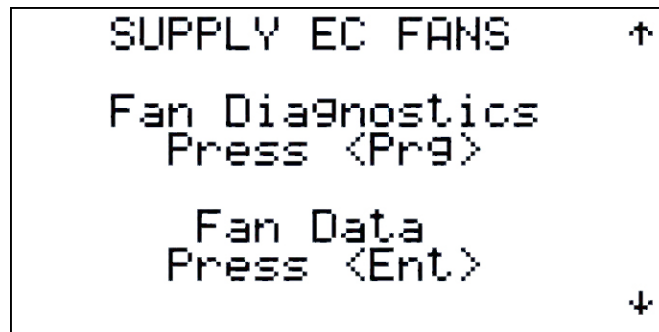


Figure 41

Pressing the **DOWN** key will display the screen of Figure 41. From this screen the user can gain access to the Fan Diagnostics and Fan Data screens.

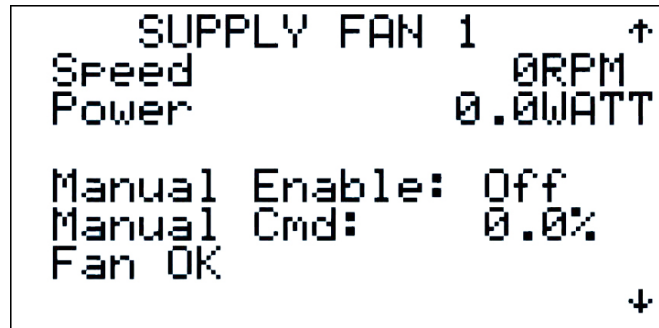


Figure 42

Pressing the **Prg** key will display the screen shown in Figure 42. From this screen the user can view the fan speed (in RPM) and power (in Watts) towards the top of the screen. Towards the middle of the screen an individual fan can be placed in manual mode and a manual speed can be adjusted. Towards the bottom of the screen a fan status is displayed. If the unit is equipped with multiple supply fans this screen will be repeated for the other fans. To return to the SUPPLY EC FANS screen, press the **Esc** key.

```

SUPPLY FAN 1 DATA ↑
Peak Volt      0.0VAC
IGBT Tmp      32.0°F
DC Bus Volt    0.0Vdc
MotorCurrent   0.0A
Internal Tmp   32.0°F
MCU Tmp        32.0°F
↓

```

Figure 43

Pressing the **Ent** key will display the screen of Figure 43. From this screen the user can view the fan data. Depending on the fans supplied with the equipment some of this data may not be present. If the unit is equipped with multiple supply fans this screen will be repeated for the other fans.

To return to the SUPPLY EC FANS screen, press the **Esc** key.

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

2.3.3.1.5 BMS Setup (Figures 44 thru 48)

Selecting the BMS SETUP from the Commissioning Menu will display the screen shown in Figure 44. This determines how the J25 serial port can communicate with other equipment. The port can be set to BACnet MS/TP or to Modbus RTU. Making any changes will require a power cycle to have those changes take effect.

```

BMS SETUP ↑
Set to ModBus RTU

Reboot after changes ↓

```

Figure 44

When the BMS is set for Modbus RTU, pressing the **DOWN** key will display Figure 45. This screen allows the address, baud rate and data parameters for Modbus RTU communication to be set. Making any changes will require a power cycle to have those changes take effect.

```
BMS MODBUS RTU  ↑
Address          7
Baudrate         19200
8 Data Bits
Parity NONE
2 Stop Bits
Reboot after changes  +
```

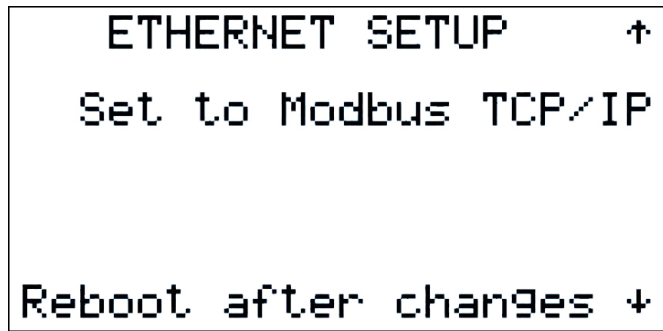
Figure 45

When the BMS is set for BACnet MS/TP, pressing the **DOWN** key will display Figure 46. This screen will allow the BACnet data to be set. Making any changes will require a power cycle to have those changes take effect.

```
BMS BACNET MS/TP  ↑
Station Add.     2
Baudrate         19200
Max Master       127
Device ID        77000
Reboot after changes  +
```

Figure 46

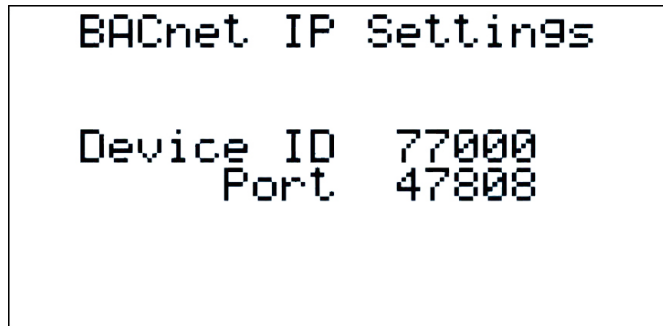
To set the unit for BACnet IP, serial port J25 must be set to Modbus RTU. This will allow the screen shown in Figure 47 to be displayed. The BACnet License can now be assigned to the Ethernet port, by changing from Modbus TCP/IP to BACnet.

A monochrome LCD screen displaying the 'ETHERNET SETUP' menu. The text is arranged vertically: 'ETHERNET SETUP' at the top with a right-pointing arrow, 'Set to Modbus TCP/IP' in the middle, and 'Reboot after changes' at the bottom with a right-pointing arrow.

```
ETHERNET SETUP  →
Set to Modbus TCP/IP
Reboot after changes  →
```

Figure 47

With the Ethernet port set for BACnet IP pressing the **DOWN** key will display the screen of Figure 48. From this screen the user can adjust the Device ID and Port.

A monochrome LCD screen displaying 'BACnet IP Settings'. Below the title, it shows 'Device ID' set to '77000' and 'Port' set to '47808'.

```
BACnet IP Settings
Device ID  77000
Port       47808
```

Figure 48

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

2.3.3.1.6 CO₂ Settings (Figures 49-51)

Selecting the optional CO₂ SETUP from the Commissioning Menu displays the CO₂ VALVE SETUP screen shown in Figures 49. From this screen the user can adjust the valve “On” setpoint and differential towards the top of the screen. The valve “Off” setpoint will be calculated as the “On” setpoint plus the differential displayed below these settings. Towards the bottom of the screen the zone CO₂ reading is displayed as well as the CO₂ valve “On”/“Off” status.

```

CO2 VALVE SETUP ↑
On Stpt:      850.0PPM
Diff:         50.0PPM
Off Stpt:     900.0PPM

Zone CO2:     410.0PPM
CO2 Valve: Off ↓

```

Figure 49

Pressing the **DOWN** key will display the CO2 HIGH ALARM SETUP screen displayed in Figure 50. From this screen the user can adjust the high alarm setpoint and differential towards the top of the screen. Towards the bottom of the screen the zone CO2 is displayed as well as the CO2 high alarm “OK/FLT” status.

```

CO2 HIGH ALARM SETUP ↑
High Alarm:    1500.0PPM
Diff:          500.0PPM

Zone CO2:     410.0PPM
CO2 Level OK  ↓

```

Figure 50

Pressing the **DOWN** key will display the CO2 LOW ALARM SETUP screen displayed in Figure 51. From this screen the user can adjust the low alarm setpoint and differential towards the top of the screen. Towards the bottom of the screen the zone CO2 is displayed as well as the CO2 low alarm “OK/FLT” status.

```

CO2 LOW ALARM SETUP ↑
Low Alarm:  200.0PPM
Diff:       200.0PPM

Zone CO2:   410.0PPM

CO2 Level OK      ↓

```

Figure 51

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

2.3.3.2 Tuning Menu (Figure 52)

Selecting the TUNING MENU from the Service Menu displays the COMMISSIONING MENU. This menu allows the operator access to the REHEAT SETTINGS, AIR HEAT SETTINGS, EXT HEAT SETTINGS, ZONE RESET SETTINGS, and the CAP-CNTL SETTINGS menus. If enabled, this screen also allows access to the CONDENSER SETUP menu.

```

          TUNING MENU
→ REHEAT SETTINGS
  Air Heat Settings
  Ext Heat Settings
  Zone Reset Settings
  Cap-Cntl Settings
  Condenser Setup

```

Figure 52

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

2.3.3.2.1 Reheat Settings (Figures 53 - 54)

Selecting REHEAT SETTINGS from the Tuning Menu displays the REHEAT TRAN screen shown in Figure 53. From this screen the user can adjust the PID terms for the reheat transition control loop.

These PID settings are active for 10 minutes after the

transition between lights on and lights off mode of operations. Towards the bottom half of the screen the supply air temperature, calculated supply air temperature setpoint, and reheat command are displayed.

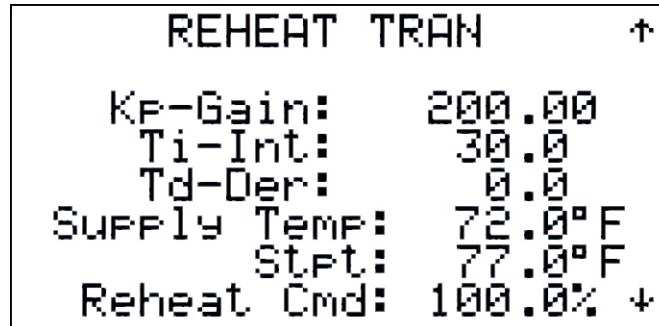


Figure 53

Pressing the **DOWN** key will display the REHEAT RUN screen shown in Figure 54. From this screen the user can adjust the PID terms for the reheat run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the supply air temperature, calculated supply air temperature setpoint, and reheat command are displayed.

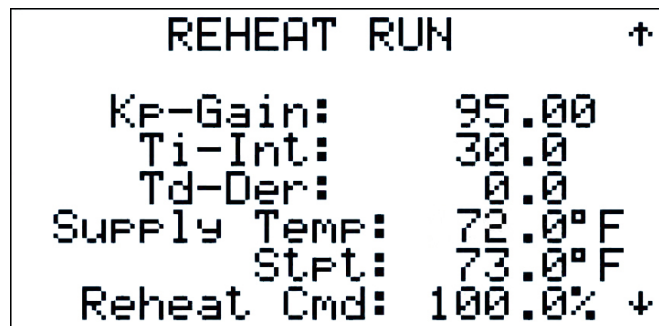


Figure 54

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

2.3.3.2.2 Air Heat Settings (Figures 55 - 57)

Selecting AIR HEAT SETTINGS from the Tuning Menu displays the AUX HEATING screen shown in Figure 55. From this screen the user can invert the heating command by checking the box towards the top. Directly below the heat output

signal can be adjusted from 0-10VDC to 2-10VDC. The calculated supply air temperature setpoint is displayed in the middle of the screen. The heating offset is adjustable towards the bottom of the screen. At the very bottom of the screen is the heating supply air temperature setpoint which is the calculated supply air temperature setpoint plus the heating offset.

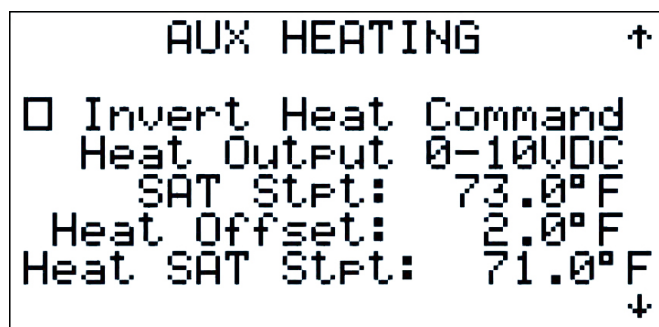


Figure 55

Pressing the **DOWN** key will display the AUX HEATING TRANSITION screen shown in Figure 56. From this screen the user can adjust the PID terms for the auxiliary heating transition control loop. These PID settings are active for 10 minutes after the transition between lights on and lights off mode of operations. Towards the bottom half of the screen the supply air temperature, calculated supply air temperature setpoint, and auxiliary heating command are displayed.

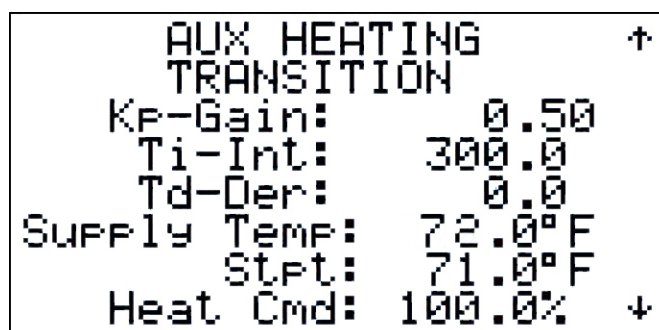


Figure 56

Pressing the **DOWN** key will display the AUX

HEATING RUN screen shown in Figure 57. From this screen the user can adjust the PID terms for the auxiliary heating run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the supply air temperature, calculated supply air temperature setpoint, and auxiliary heating command are displayed.

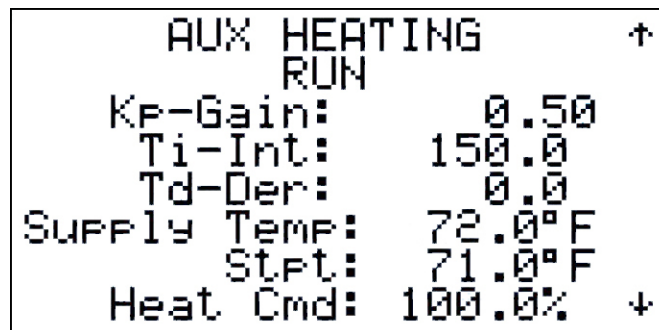


Figure 57

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

2.3.3.2.3 Ext Heat Settings (Figure 58-60)

Selecting EXT HEAT SETTINGS from the Tuning Menu displays the EXTENDED HEAT SETUP screen shown in Figure 58. From this screen the user can enable the extended heat by checking the box towards the top of the screen. The extended heat delay can be adjusted directly below. This delay is the amount of time before the equipment will transition from the reheat mode of operation to the extended heat. Towards the bottom the max and min choke can be adjusted. The max choke is the minimum position the valve can close to during extended heat, whereas the min choke is the most open the valve can be during extended heat.

```

EXTENDED HEAT SETUP ↑
□ Enable Ext Heat
Ext Heat Delay: 300Sec

Max Choke: 10.0%
Min Choke: 80.0%
↓

```

Figure 58

Pressing the **DOWN** key will display the EXT HEAT SETTINGS screen shown in Figure 59. From this screen the user can adjust the PID terms for the extended heat control loop. Towards the bottom of the screen the supply air temperature, calculated supply air temperature setpoint, and extended heat command are displayed.

```

EXT HEAT SETTINGS ↑

Kp-Gain: 5.00
Ti-Int: 300.0
Td-Der: 0.0
Supply Temp: 72.0°F
          Stpt: 73.0°F
Ext Ht Cmd: 45.0% ↓

```

Figure 59

Pressing the **DOWN** key will display the CIR A EXT HEAT STATUS screen shown in Figure 60. At the top of the screen the extended heat command is displayed. Directly below the discharge pressure limit control is displayed. The discharge pressure limit control will override the extended heat command when the discharge pressure increases outside normal operation. Towards the bottom the on/off status of extended heat is displayed as well as the valve command. If the unit is dual circuit, then the screen of Figure 60 will be repeated for circuit B.

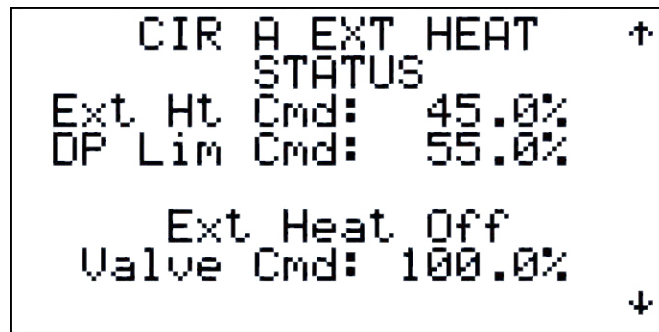


Figure 60

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

2.3.3.2.4 Zone Reset Settings (Figures 61-76)

Selecting ZONE RESET SETTINGS from the Tuning Menu displays either the ZONE AIR TEMP RESET TRANSITION screen shown in Figure 61 if “reactive” transition zone control is selected, or the ZONE AIR TEMP RESET screen shown in Figure 63 if “static” or “adaptive” transition zone control is selected, or the LEAD UNIT ZONE RESET VALUES shown in Figure 76 if the unit is a lag unit. With reactive transition zone control the unit will use a transition and a run PID control loop. With adaptive or static transition zone control a recorded or settable transition output will override the PID control loop for a settable amount of time after a lights on or lights off transition before using the PID control loop. From the screen of Figure 61 the user can adjust the PID terms for the zone air temperature reset transition control loop. These PID settings are active for 10 minutes after the transition between lights on and lights off mode of operations. Towards the bottom half of the screen the zone air temperature, zone air temperature setpoint, and calculated supply air temperature setpoint are displayed.

```

ZONE AIR TEMP RESET ↑
      TRANSITION
Kp-Gain:      0.33
Ti-Int:      40.0
Td-Der:      0.0
Zone Temp:   72.0°F
      Stpt:   68.0°F
Calc SAT:    73.0°F ↓

```

Figure 61

Pressing the **DOWN** key will display the ZONE AIR TEMP RESET RUN screen of Figure 62. From this screen the user can adjust the PID terms for the zone air temperature reset run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the zone air temperature, zone air temperature setpoint, and calculated supply air temperature setpoint are displayed.

```

ZONE AIR TEMP RESET ↑
      RUN
Kp-Gain:      0.17
Ti-Int:      80.0
Td-Der:     100.0
Zone Temp:   72.0°F
      Stpt:   68.0°F
Calc SAT:    73.0°F ↓

```

Figure 62

With adaptive or static transition control selected there is only one PID control loop for the zone reset controls. From the ZONE AIR TEMP RESET screen shown in Figure 63 the user can adjust the PID terms for the zone air temperature reset control loop. Towards the bottom half of the screen the zone air temperature, zone air temperature setpoint, and calculated supply air temperature setpoint are displayed.

```

ZONE AIR TEMP RESET ↑
  KP-Gain:      0.17
  Ti-Int:       80.0
  Td-Der:      100.0
  Zone Temp:    72.0°F
  Stpt:         68.0°F
  Calc SAT:     73.0°F
                                     ↓

```

Figure 63

Pressing the **DOWN** key will display the SAT SETPOINT BAND SETUP screen shown in Figure 64. From this screen the lights on high band and low band offsets are adjustable towards the top of the screen. The low band and high band offsets are added to or subtracted from the zone temperature setpoint to calculate the low band and high band for the calculated supply air temperature setpoint. Towards the center of the screen the lights off high band and low band offsets are adjustable. Towards the bottom of the screen the zone temperature setpoint, and calculated supply air temperature setpoint are displayed.

```

SAT SETPOINT BAND SETUP ↑
On-HighBand      2.0°F
On-LowBand      -40.0°F
Off-HighBand      5.0°F
Off-LowBand      -5.0°F
Zone T Stpt:     68.0°F
SAT Stpt:        73.0°F ↓

```

Figure 64

If transition PID control is selected pressing the **DOWN** key will display the COOLING DEMAND TRANSITION screen shown in Figure 65. From this screen the user can adjust the PID terms for the cooling demand transition control loop. These PID settings are active for 10 minutes after the transition between lights on and lights off mode of operations.

Towards the bottom half of the screen the zone air temperature, zone air temperature cooling demand setpoint, and calculated cooling demand are displayed.

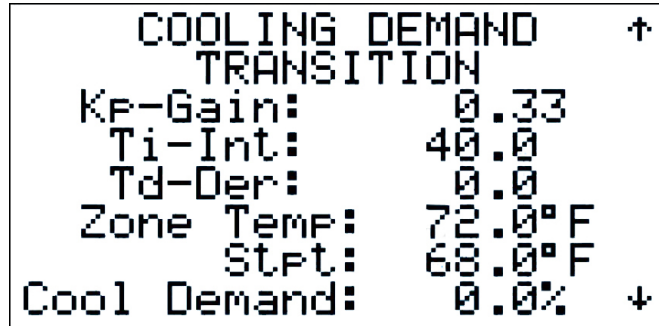


Figure 65

Pressing the **DOWN** key will display the COOLING DEMAND RUN screen of Figure 66. From this screen the user can adjust the PID terms for the cooling demand run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the zone air temperature, zone air temperature cooling demand setpoint, and calculated cooling demand are displayed.

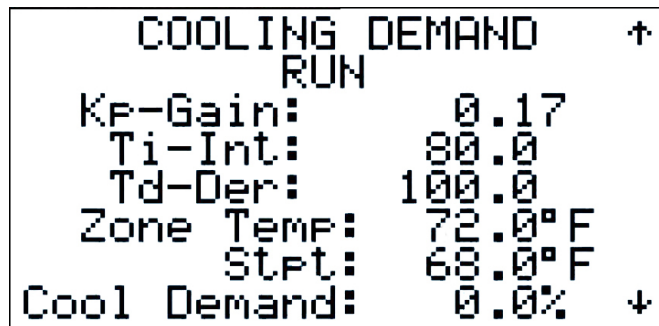


Figure 66

If adaptive or static transition control is selected, then pressing the **DOWN** key will display the COOLING DEMAND screen shown in Figure 67. From this screen the user can adjust the PID terms for the cooling demand control loop. Towards the bottom half of the screen the zone air temperature, zone air

temperature cooling demand setpoint, and calculated cooling demand are displayed.

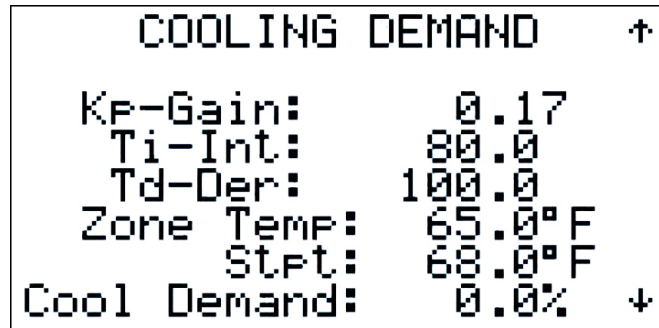


Figure 67

Pressing the **DOWN** key will display the COOLING DEMAND SETPOINT screen shown in Figure 68. The zone air temperature setpoint is displayed at the top of the screen. Directly below the cool offset is adjustable. In cool only mode the unit will add this offset to the setpoint to calculate the cooling setpoint displayed at the bottom of the screen.

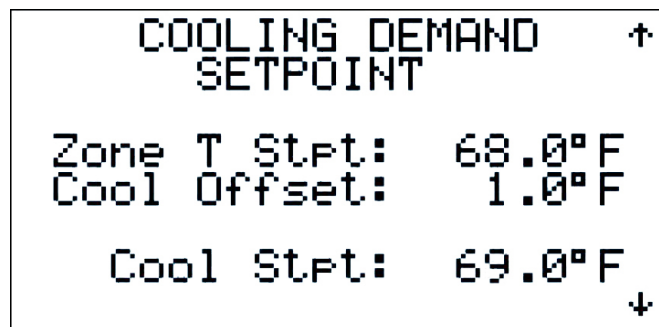


Figure 68

If transition PID control is selected pressing the **DOWN** key will display the DEHUM DEMAND TRANSITION screen shown in Figure 69. From this screen the user can adjust the PID terms for the dehum demand transition control loop. These PID settings are active for 10 minutes after the transition between lights on and lights off mode of operations. Towards the bottom half of the screen the zone air dewpoint, zone air dewpoint setpoint, and calculated dehum demand are displayed.


```

DEHUM DEMAND      ↑
TRANSITION
Kp-Gain:          1.00
Ti-Int:           300.0
Td-Der:           0.0
Zone Dwpt:        42.0°F
Stpt:             48.7°F
Dehum Demand:     0.0% ↓

```

Figure 69

Pressing the **DOWN** key will display the DEHUM DEMAND RUN screen of Figure 70. From this screen the user can adjust the PID terms for the dehum demand run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the zone air dewpoint, zone air dewpoint setpoint, and calculated dehum demand are displayed.

```

DEHUM DEMAND      ↑
RUN
Kp-Gain:          0.25
Ti-Int:           90.0
Td-Der:           0.0
Zone Dwpt:        42.0°F
Stpt:             48.7°F
Dehum Demand:     0.0% ↓

```

Figure 70

If adaptive or static transition control is selected, then pressing the **DOWN** key will display the DEHUM DEMAND screen shown in Figure 71. From this screen the user can adjust the PID terms for the dehum demand control loop. Towards the bottom half of the screen the zone air dewpoint, zone air dewpoint setpoint, and calculated dehum demand are displayed.

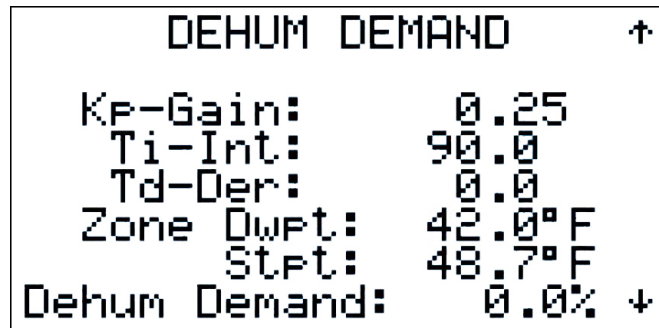


Figure 71

If transition PID control is selected pressing the **DOWN** key will display the RH DEMAND TRANSITION screen shown in Figure 72. From this screen the user can adjust the PID terms for the RH demand transition control loop. These PID settings are active for 10 minutes after the transition between lights on and lights off mode of operations. Towards the bottom half of the screen the zone air relative humidity, zone air relative humidity setpoint, and calculated RH demand are displayed.

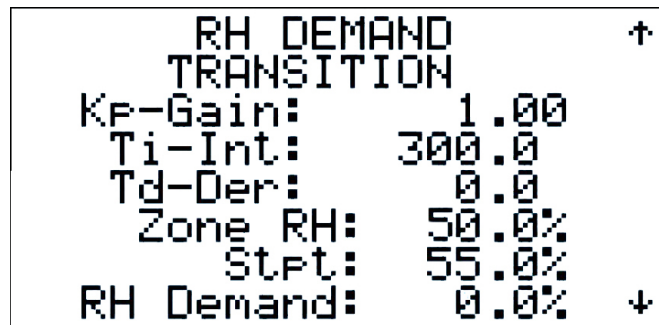


Figure 72

Pressing the **DOWN** key will display the RH DEMAND RUN screen of Figure 73. From this screen the user can adjust the PID terms for the RH demand run control loop. These PID settings are active after 10 minutes have passed from a transition between lights on and lights off mode of operation. Towards the bottom half of the screen the zone air relative humidity, zone air relative humidity setpoint, and calculated RH demand are displayed.



Figure 73

If adaptive or static transition control is selected, then pressing the **DOWN** key will display the RH DEMAND screen shown in Figure 74. From this screen the user can adjust the PID terms for the RH demand control loop. Towards the bottom half of the screen the zone air relative humidity, zone air relative humidity setpoint, and calculated RH demand are displayed.

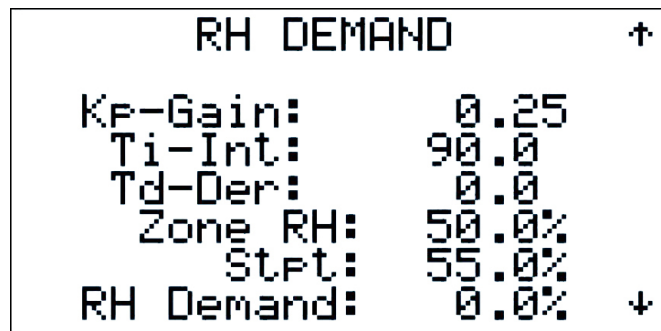


Figure 74

Pressing the **DOWN** key will display the RH DEMAND SETPOINT screen shown in Figure 75. Towards the top of this screen the zone air relative humidity setpoint is displayed. Directly below the RH demand setpoint offset is adjustable. The RH demand setpoint is calculated by adding the RH offset to the zone air relative humidity setpoint, and is displayed directly below the offset. Towards the bottom of the screen the RH differential off and on are both adjustable. These differentials are added to and subtracted from the zone air relative humidity setpoint. These values are used to send the unit into dehumidification mode if the zone air relative humidity rises too far above setpoint with no call for dehum demand.

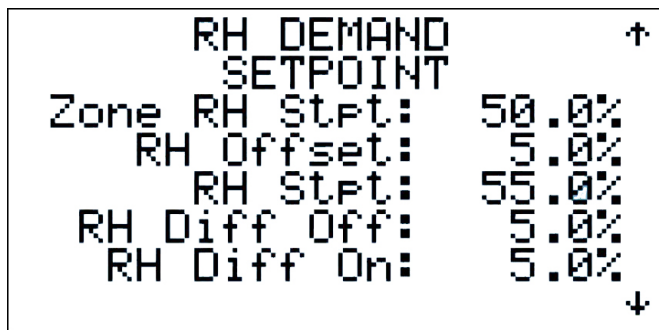


Figure 75

If the unit is a lag unit, then the only screen available will be the LEAD UNIT ZONE RESET VALUES screen shown in Figure 76. From this screen the lead unit's calculated supply air temperature setpoint, cool demand, dehum demand, and RH demand are all displayed. No adjustments to the zone reset controls can be made from the lag unit, and must be made from the lead unit.

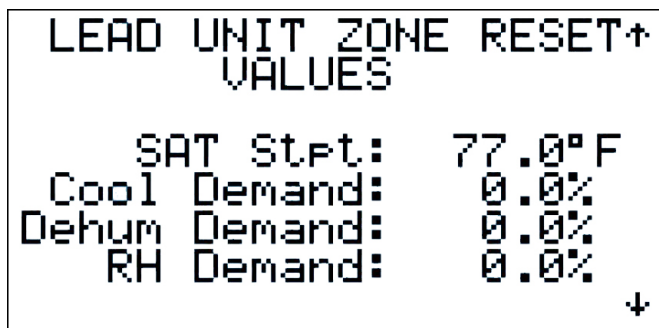


Figure 76

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

2.3.3.2.5 Capacity Control Settings (Figures 77 - 81)

Selecting CAP-CNTL SETTINGS from the Tuning Menu displays the SAT SUCT TEMP SETPOINTS screen shown in Figure 77. There are three setpoints settable on this screen, the maximum, minimum, and middle saturated suction temperature setpoints. As demand increases the unit will move from the maximum saturated suction temperature setpoint towards the minimum with a reset occurring as each compressor comes on within the system. At the

bottom of the screen is an adjustable control delay which delays the action of the VPD sync PID control loop after the refrigerant circuit has a call to turn on.

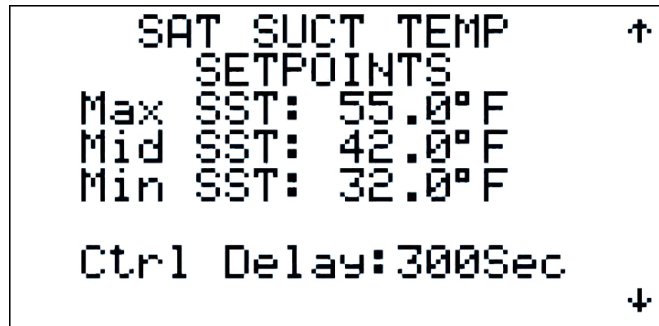


Figure 77

Pressing the **DOWN** key will display the CIR A SST SETPOINT screen shown in Figure 78. The maximum and minimum saturated suction temperature setpoints on this screen come from the values set on the screen of Figure 77, but can be adjusted per circuit on the screen of Figure 78. The associated system demand is also adjustable. The system demand displayed towards the bottom is input into a scaler with the minimums and maximums set above, and the output is the saturated suction temperature setpoint used for the VPD sync PID control loop displayed at the bottom. If the unit is dual circuit, the screen of Figure 78 will be repeated for circuit B.

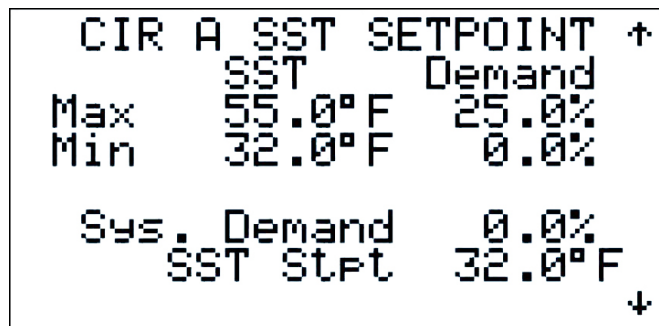


Figure 78

Pressing the **DOWN** key will display the CIR A VPD SYNC screen shown in Figure 79. From this screen the user can adjust the PID terms for the circuit A VPD synchronization control loop. Towards

the bottom the saturated suction temperature, saturated suction temperature setpoint, and VPDsync PID loop output are displayed. If the unit is dual circuit the screen of Figure 79 will be repeated for circuit B.

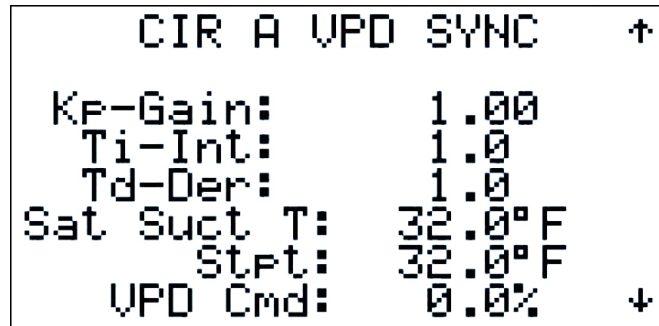


Figure 79

Pressing the **DOWN** key will display the CIR A HGBP screen shown in Figure 80. From this screen the user can adjust the PID terms for the circuit A hot gas bypass control loop. Towards the bottom of the screen the circuit A suction pressure, circuit A hot gas bypass suction pressure setpoint, and circuit A hot gas bypass control loop output is displayed. If the unit is dual circuit the screen of Figure 80 will be repeated for circuit B.

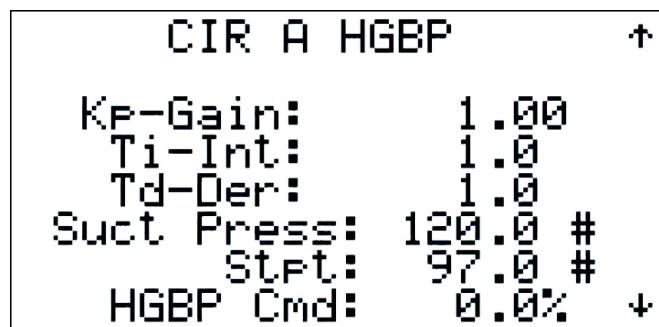


Figure 80

Pressing the **DOWN** key will display the CIR A CAPACITY CTRL VALVE screen shown in Figure 81. This screen displays the VPD sync control loop command and hot gas bypass control loop demand towards the top of the screen. The valve command displayed towards the bottom of the screen will be the larger of the two commands shown above. If the unit

is dual circuit this screen will be repeated for the circuit B capacity control valve.

```

      CIR A CAPACITY  ↑
      CTRL VALVE
      UPD Cmd:    0.0%
      HGBP Cmd:   0.0%
      Valve Cmd:  0.0%
                                     ↓

```

Figure 81

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

2.3.3.2.6 Condenser (Figures 82 - 86)

Selecting CONDENSER SETUP from the Commissioning Menu displays the CONDENSER SETTINGS screen shown in Figure 82. From this screen the PID terms for the air cooled remote condenser control loop are adjustable towards the top of the screen. Towards the bottom of the screen the discharge pressure, condenser discharge pressure setpoint, and condenser fan speed command are displayed. If the unit is dual circuit, the discharge pressure will be the maximum discharge pressure between circuits A and B.

```

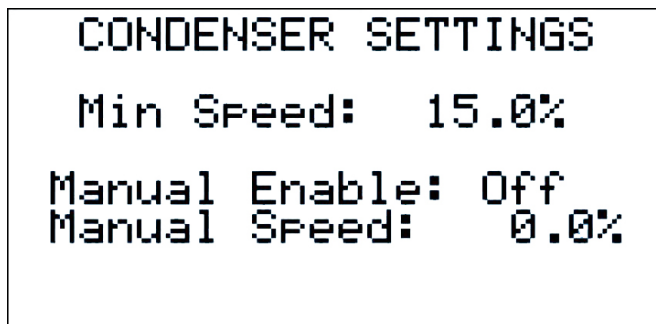
      CONDENSER SETTINGS
      Ke-Gain:    0.10
      Ti-Int:     10.0
      Td-Der:     0.0
      Disch Press: 300.0 #
                  Stpt: 375.0 #
      Speed Cmd:  15.0%

```

Figure 82

Pressing the **DOWN** key will display the CONDENSER SETTINGS screen shown in Figure 83. From this screen the minimum condenser fan speed is adjustable towards the top of the screen.

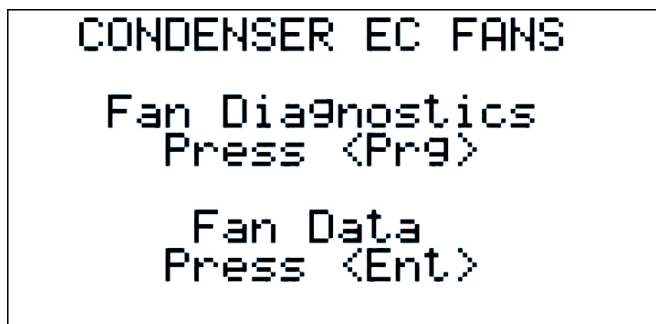
Towards the bottom a manual override for the condenser fans can be turned on or off, and a manual command can be adjusted directly below.



```
CONDENSER SETTINGS  
Min Speed: 15.0%  
Manual Enable: Off  
Manual Speed: 0.0%
```

Figure 83

Pressing the **DOWN** key will display the CONDENSER EC FANS screen shown in Figure 84. This screen allows access to the condenser fan diagnostics, and condenser fan data screens.



```
CONDENSER EC FANS  
Fan Diagnostics  
Press <Pr9>  
Fan Data  
Press <Ent>
```

Figure 84

Pressing the **Prg** key from the screen of Figure 84 will display the CONDENSER FAN 1 screen shown in Figure 85. Towards the top of this screen the speed and power of condenser fan 1 are displayed. Towards the bottom half of the screen a manual enable for condenser fan 1 can be turned on or off, and a manual command can be adjusted directly below. At the very bottom of the screen a condenser fan status is shown. This screen will be repeated for the total number of condenser fans equipped with the unit. To return to the CONDENSER EC FANS screen, press the **Esc** key.


```

CONDENSER FAN 1 ↑
Speed           0RPM
Power           0.0WATT

Manual Enable: Off
Manual Cmd:     0.0%
Fan OK

↓

```

Figure 85

Pressing the **Ent** key from the screen of Figure 84 will display the CONDENSER FAN 1 DATA screen shown in Figure 86. From this screen the user can view the fan data. Depending on the fans supplied with the equipment some of this data may not be present. This screen will be repeated for the total number of condenser fans equipped with the unit. To return to the CONDENSER EC FANS screen, press the **Esc** key.

```

CONDENSER FAN 1 DATA↑
Peak Volt       0.0VAC
IGBT Temp       32.0°F
DC Bus Volt     0.0Vdc
MotorCurrent    0.0A
Internal Tmp    32.0°F
MCU Tmp         32.0°F

↓

```

Figure 86

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

2.3.3.3 I/O Status (Figure 87)

Selecting I/O STATUS from the SERVICE MENU will display the I/O STATUS menu screen shown in Figure 87. From this screen the user can select DIGITAL INPUTS, ANALOG INPUTS, DIGITAL OUTPUTS, or ANALOG OUTPUTS.

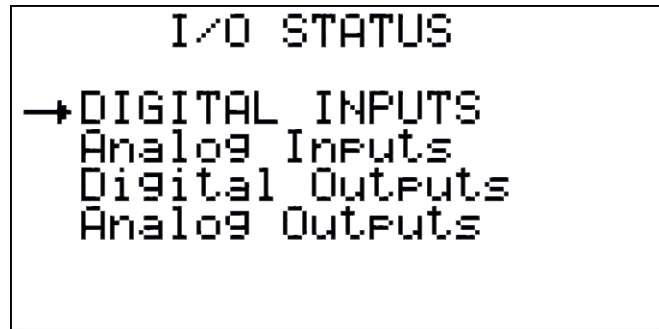


Figure 87

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

2.3.3.3.1 Digital Inputs (Binary) (Figure 88 – 90)

Selecting the DIGITAL INPUTS Screen shows the state of the digital contacts used by the control system. The first page shows the state of the first four inputs. If a dual circuit unit is provided, two additional contacts are shown. These screens are provided for troubleshooting the control system.

- The first line will show the status of ID1, the Lights On Switch, “On” if the contact is closed, and “Off” if the contact is open.
- The second line will show the status of ID2, the supply fan motor starter overload contacts, “Ok” if no overload is present, and “Flt” if an overload exists.
- The third line will show the status of EVD1 DI1, compressor 1 motor starter overload contacts, “Ok” if no overload is present, and “Flt” if an overload exists.
- The fourth line will show the status of EVD1 DI2, compressor 2 motor starter overload contacts, “Ok” if no overload is present, and “Flt” if an overload exists.
- The fifth line will show the status of EVD4 DI1, compressor 3 motor starter overload contacts, “Ok” if no overload is present, and “Flt” if an overload exists. Only for Dual circuit units.
- The sixth line will show the status of EVD4 DI2, compressor 4 motor starter overload contacts, “Ok” if no overload is present, and “Flt” if an overload exists. Only for Dual circuit units.

```

DIGITAL INPUTS ↑
Lights On Switch Off
Supply Fan OL OK
Comp 1 OL OK
Comp 2 OL OK
↓

```

Figure 88

The second page of the Digital Inputs shows the status of the next 6 contacts wired to the controller.

- The first line will show the status ID5, the Voltage Phase Monitor, or jumper, “Ok” if the level is normal, and “Flt” if the level is high.
- The second line will show the status of ID6, the condensate level switch, or jumper, “Ok” if the level is normal, and “Flt” if the level is high.
- The third line will show the status of ID7, the water flow switch, “On” for flow and “Off” for no flow.
- The fourth line will show the status of ID8, the Smoke Alarm/General Fault input, “OK” when the contact is closed and “Flt” when the contact is open.
- The fifth line will show the status of the ID13, the system switch. “On” if the switch is on and “Off” if the switch is off.
- The sixth line will show the status of the ID14, the Photo Cell. “On” if the switch is on and “Off” if the switch is off.

```

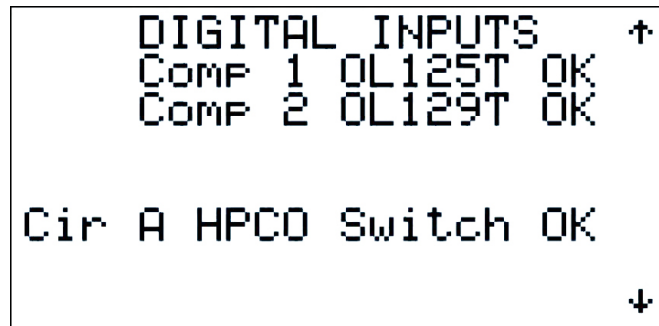
DIGITAL INPUTS ↑
Low Voltage OK
Condensate Switch OK
Water Flow Switch OK
Smoke Alarm OK
System Switch Off
Photo Cell On ↓

```

Figure 89

The third page of the Digital Inputs shows the status of the next 6 contacts wired to the controller. If dual circuit is provided three extra contacts will be shown.

- The first line will show the status ID3, the compressor 1 motor thermal overload contact, “Ok” if no overload is present, and “Flt” if an overload exists.
- The second line will show the status ID4, the compressor 2 motor thermal overload contact, “Ok” if no overload is present, and “Flt” if an overload exists.
- The third line will show the status ID9, the compressor 3 motor thermal overload contact, “Ok” if no overload is present, and “Flt” if an overload exists. Only for dual circuit units.
- The fourth line will show the status of ID10, the compressor 4 motor thermal overload contact, “Ok” if no overload is present, and “Flt” if an overload exists. Only for dual circuit units.
- The fifth line will show the status of ID11, the circuit A high pressure cut out switch contact, “Ok” if the contact is closed, “Flt” if the contact is open.
- The sixth line will show the status of ID12, the circuit B high pressure cut out switch contact, “Ok” if the contact is closed, “Flt” if the contact is open. Only for dual circuit units.



```
DIGITAL INPUTS ↑
Comp 1 OL125T OK
Comp 2 OL129T OK

Cir A HPCO Switch OK
↓
```

Figure 90

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

2.3.3.3.2 Analog Inputs (Figure 91 - 94)

Selecting the Analog Inputs Screens shows the state

of the sensors used by the control system. The first page shows the zone and intake air sensors relative humidity, temperature and dew point readings.

ANALOG INPUTS			↑
Zone RH	50.0	%	
Zone Air	72.0	°F	
Zone Dwpt	52.0	°F	
Intake RH	50.0	%	
Intake Air	72.0	°F	
Intake Dwpt	52.0	°F	↓

Figure 91

The second page shows the readings of the suction pressure and temperature sensors, the calculated P2T value of the suction pressure sensor, the super heat and the off evaporator air temperature sensor values of circuit A. For dual circuit units the screen of Figure 92 will be repeated for circuit B.

ANALOG INPUTS			↑
Circuit A			
Suct. Press	179.8	#	
Suct. Temp	73.2	°F	
Suct. P2T	63.1	°F	
Superheat	10.1	°F	
Off Evap	64.0	°F	↓

Figure 92

The third page shows the readings of the discharge pressure, liquid pressure and liquid temperature sensors, the calculated P2T value of the liquid pressure sensor and the Subcooling values of circuit A. For dual circuit units the screen of Figure 93 will be repeated for circuit B.

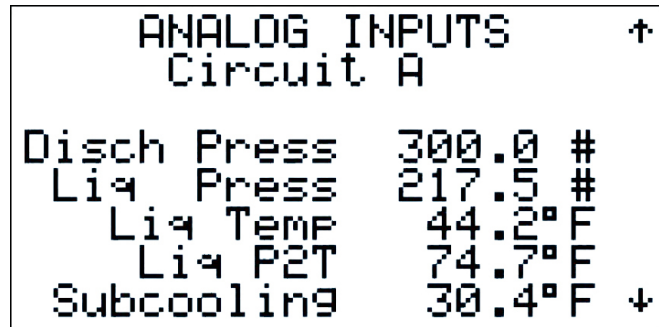


Figure 93

The fourth page of Analog Input shows the supply fan differential air pressure, and the supply air temperature. If enabled this screen will also show the filter differential air pressure, and water inlet and outlet temperatures.

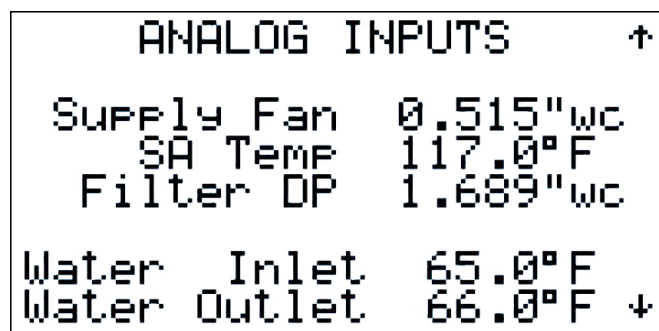


Figure 94

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

2.3.3.3.3 Digital Outputs (Binary) (Figures 95 - 97)

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 first 4 relay outputs of the controller.

- The first line will show the status of Compressor 1 motor starter, "On" and "Off".
- The second line will show the status of Compressor 2 motor starter, "On" and "Off".
- The third line will show the status of Compressor 3 motor starter, "On" and "Off". This will only be shown for dual circuit units.

- The fourth line will show the status of Compressor 4 motor starter, “On” and “Off”. This will only be shown for dual circuit units.

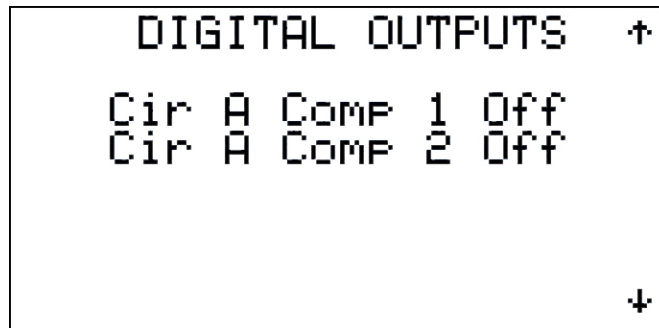


Figure 95

The second page shows the state of the last 4 outputs of the controller.

- The first line will show the status of Auxiliary Heater, “On” and “Off”.
- The second line will show the status the Alarm contact, “On” and “Off”.
- The third line will show the status of Supply Fan output. This output will only be used for units with a VFD controlling the supply fan.
- If enabled the fourth line will show the status of the water pump, “On” and “Off”.

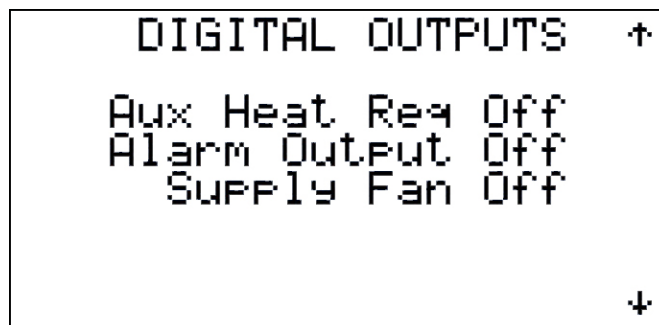


Figure 96

The third page is shown only if the CO₂ option is selected for the unit.

- The first line will show the status of the CO₂ valve.
- The second line will show the status the CO₂ Alarm.

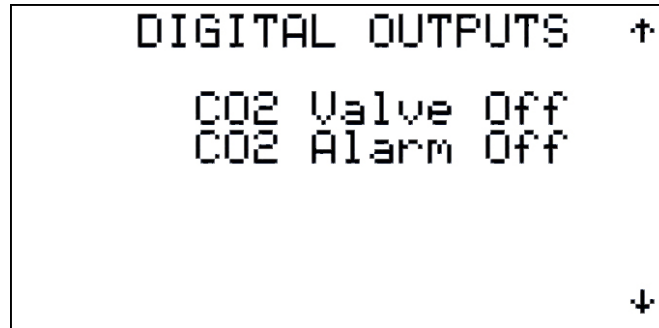


Figure 97

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

2.3.3.3.4 Analog Output (Figure 98)

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

- Supply Fan Speed Command
- Air Heat Modulating Command
- If enabled the Condenser Fan Speed Command
- If enabled the Outdoor Air Damper Position Command
- If enabled the Return Air Damper Position Command

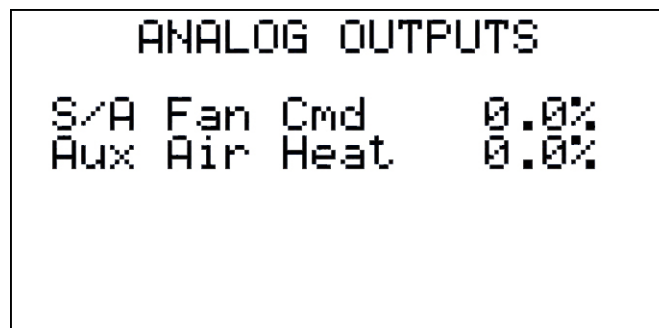


Figure 98

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

2.3.3.4 Sensor Offsets (Figure 99 - 101)

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 most of these offsets is from -99.99 to 99.99. 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.

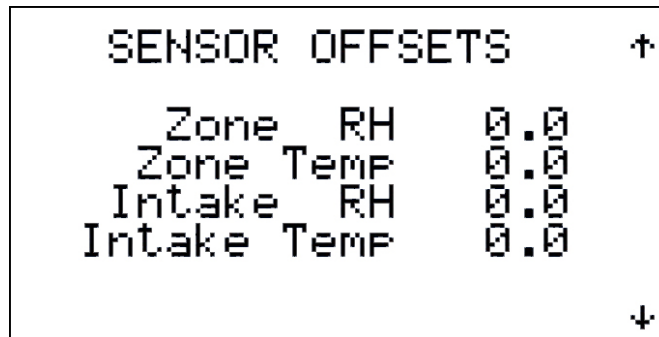


Figure 99

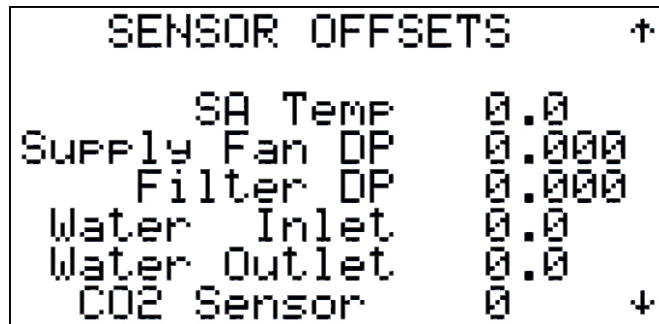


Figure 100

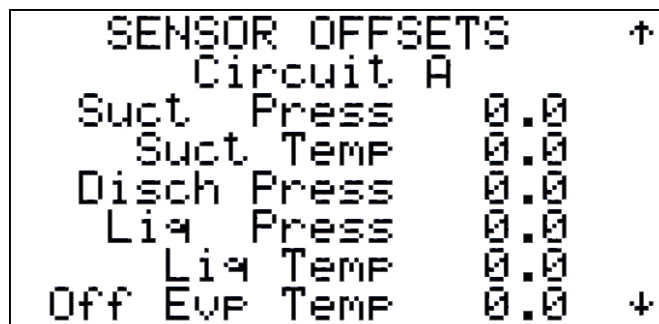


Figure 101

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

2.3.3.5 Memory Options (Figures 102 - 104)

These screens allow the logging files to be written to a portion of the internal memory space on the controller or a USB Pen Drive. To use, select the memory to write to, if USB Pen Drive, insert a USB Pen 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 Pen Drive, insert a USB Pen 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.

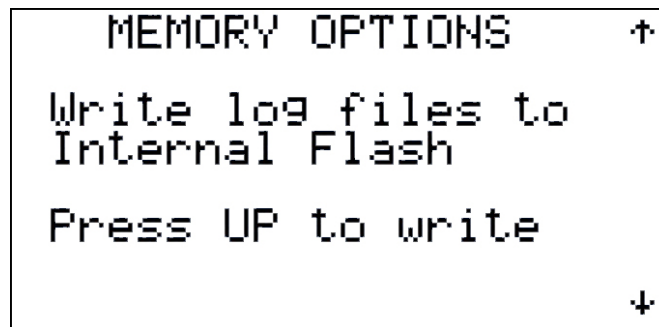


Figure 102

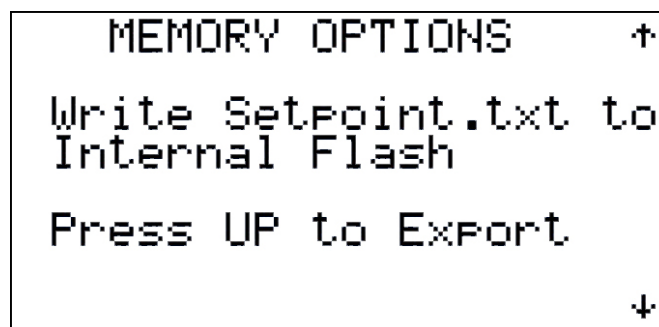


Figure 103

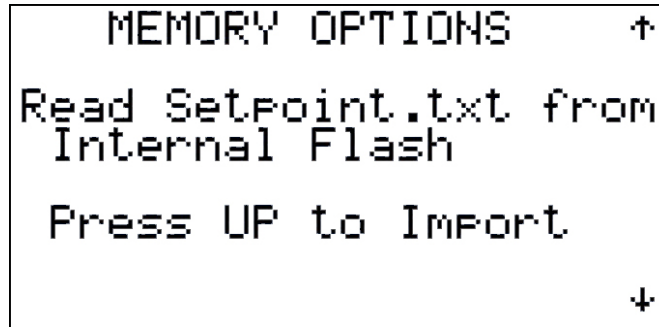


Figure 104

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

2.3.4 Unit Revision (Figures 105)

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

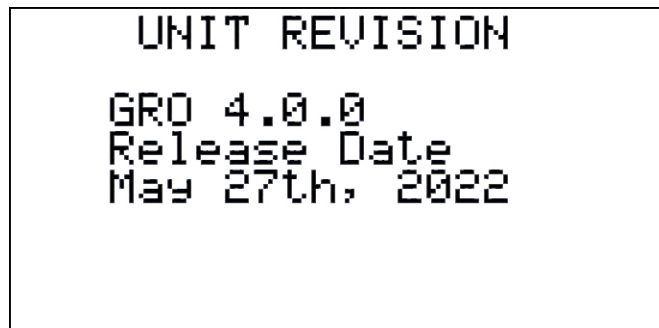


Figure 105

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

2.3.5 Grow Schedule (Figures 106 - 108)

Selecting Schedule Menu from the MAIN MENU displays the screen shown in Figure 106. These screens allow the setting of a growing schedule by setting a number of grow periods, the start date and the length of time the grow period is active.

Pressing the **Dwn** key will show the screen in Figure 107. If 4 periods are selected, 4 of the Period Settings screens will be shown. The Period Settings screens allow the parameters of that grow period to be set. These include the duration in days of that period and the Lights On and Lights Off setpoints for temperature and relative humidity. The dates shown on the period screens are for reference.

The screen shown in Figure 108 will reset the grow schedule to 1 day and the transition time to 23 hours.

```
GROWCYCLE SCHEDULER ↑
No. of Periods:      4
Day 1:              00/00/2022
Set Day 1 for Today?
→Set
Set Time for Period
Transition:         23:00 ↓
```

Figure 106

```
PERIOD 1 SETTINGS ↑
Duration           1 Days
Start              05/11/2022
End                05/12/2022
Lights On          SetPoints
Temp 72.0°F RH    40.0%
Lights Off          SetPoints
Temp 72.0°F RH    40.0%↓
```

Figure 107

```
RESET SCHEDULE ↑
Reset will overwrite
all durations to 1
day, set Day 1 to
today, and transition
time to 23:00.

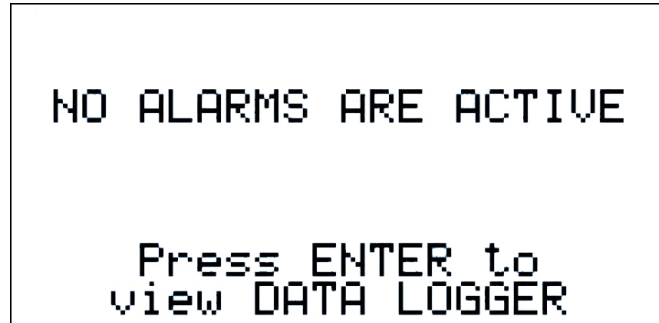
→Reset ↓
```

Figure 108

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

3 Alarm Menu

To view the alarms from any menu, simply press the **ALARM** key. If no alarms are active, the display will state NO ALARMS ARE ACTIVE. See Figure 109.

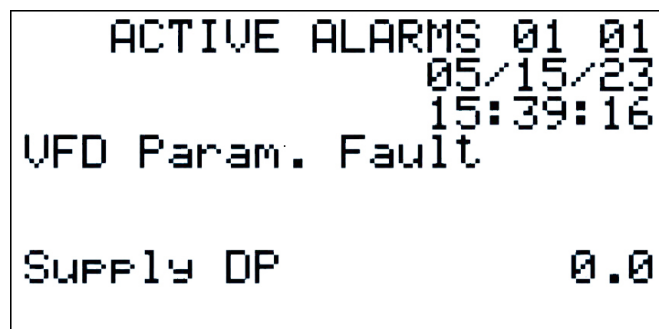


```
NO ALARMS ARE ACTIVE

Press ENTER to
view DATA LOGGER
```

Figure 109

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 110. The triggered alarm will be displayed along with the time and date.

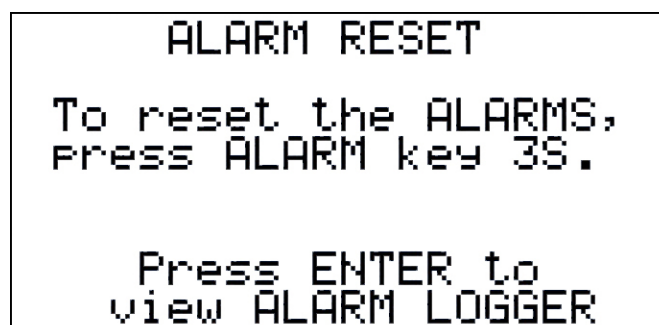


```
ACTIVE ALARMS 01 01
                05/15/23
                15:39:16
UFD Param. Fault

Supply DP      0.0
```

Figure 110

To reset the alarm, use the **DOWN** key until the reset instructions are shown. See Figure 111. 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 111

Alarms are either Automatic Reset or Manual Reset. Automatic Reset Alarms are alarms that can occur and be reset without any action by the operator. Manual reset alarms require an operator action to reset the alarm. For system alarms, listed below, the red Alarm LED will remain illuminated until acknowledged to alert the operator the occurred. For EEV alarms, listed below, the alarm is Automatic Reset and provided to display information of the valve driver but do not affect operation of the unit. The red Alarm LED will be turned off when the EEV alarm clears, without action by the operator. To return to the home screen, press the **Esc** button.

3.1 System Alarms

The system alarms include: low suction pressure, very low suction pressure, high discharge pressure, zone and o/a sensor fault, motor overloads, smoke alarm, voltage/phase monitor, high condensate level, clogged filter, airflow, low water flow, zone temperature and RH alerts, CFM Fault, EVD module alarms as well as CO₂ High, Low and Sensor alarms. The red ALARM LED on the display will stay lit until the alarm is reset.

3.2 EVD Module Alarms

The EVD Module alarms are automatically generated internally from the electronic valve drives. Any active alarm for these drivers are shown in the driver menus. Contact the Desert Aire service department for instructions on how to view these alarms. These alarms do not affect the operation of the unit and are shown for informational trouble shooting only. These include EVD Offline, Low SH A, Low SH B, LOP A, LOP B, MOP A, MOP B, EEV A, EEV B, Low Suction A, Low Suction B, Hi T Cond, S1, S2, S3, S4, Battery, EEPROM, Incomplete Closing, Emergency Closing, FW Compatible Err, Config Err, Retain and Error Retain Write. The red ALARM LED on the display will stay lit until the alarm is cleared internally.

3.3 Alarm Log (Figure 112)

The Alarm Data Logger Screen is accessible from the Alarm Reset screen (See Figure 112) 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. To return to the home screen, press the **Esc** button.

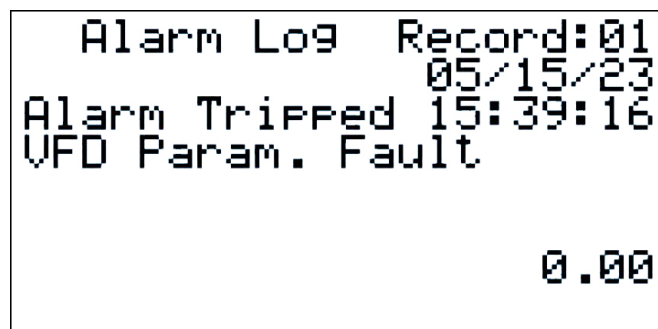


Figure 112

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 ¼ 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 $V = 2.50$ 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 & Liquid Pressure Transducer

The Discharge & Liquid Pressure Transducers are 0.5 - 4.5 VDC to 0 - 652 psig ratio metric devices. The body is brass with a ¼ 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 $V = 2.50$ 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 or Liquid Pressure Transducer is available by calling our service department.

4.4 Suction Line, Liquid & Supply Air Temperature Sensor

These temperature sensors are 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 Zone & Intake Air Temperature & 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 Air Flow Proving Differential Pressure Sensor

This sensor has a range of -1.0"wc to 1.0"wc, 0.0"wc to 2.0"wc, 10.0"wc or 25.0"wc. The output of this device is a 0.25 VDC at the low range and 4 VDC at the high range. The Desert Aire replacement part number is available by calling our service department.



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462 2023/05