



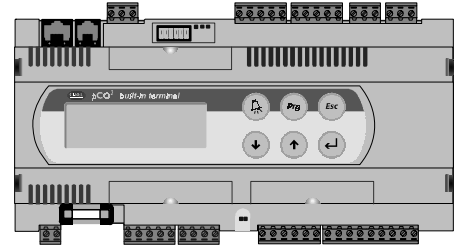
**DDC CONTROLLER  
for ENERGY RECOVERY**

**Installation, Operation and Maintenance Manual**

**MANEUVERING THROUGH THE CONTROLLER**

The DDC controller is located in the control panel on the energy recovery unit. The face of the DDC controller has six buttons allowing the user to perform various tasks such as viewing conditions or changing set points. A brief description of the six buttons is provided. For additional details, refer to the page references included.

Prior to accessing the controller, confirm the functions that were provided with the unit by referencing the DDC Code shown on the controller Start-Up screen.



Greenheck Fan Corp.  
ER DDC v3.##  
  
Code: GY2X000B

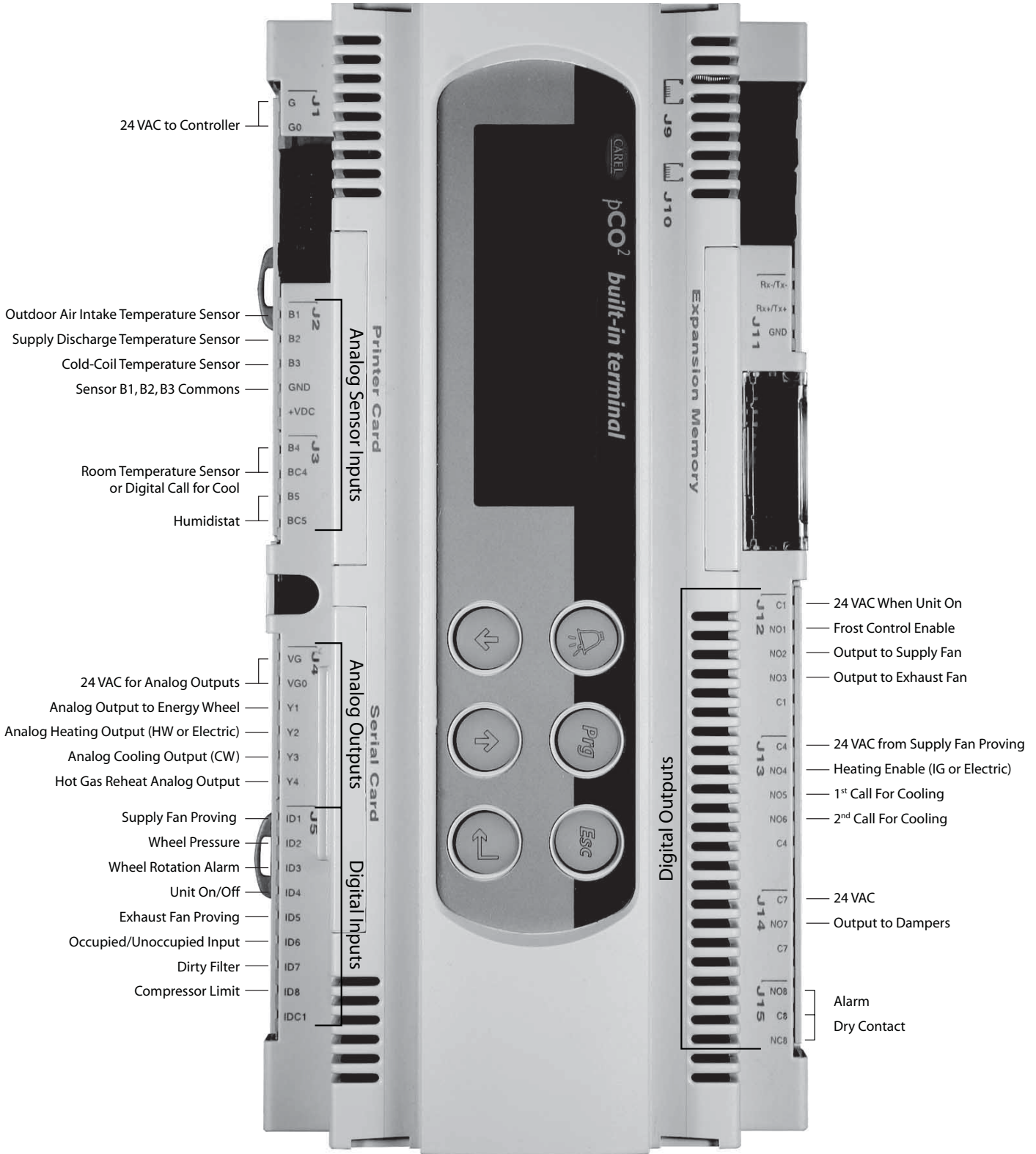
The Start-Up screen appears when power is applied to the controller. The program version and code are shown on this screen. The code shows the user what components and functionality were provided with the unit and also dicates how the program operates. Below is a description of the code.

Name	Heat	Cool	HGRH	Frost	Economizer	UnOccupied Mode	Communications
<b>G</b>	<b>Y</b>	<b>2</b>	<b>X</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>B</b>
GFC	G None – Disable Enable	X None – Disable Y CW PDx 1 stg PDx 2 stg	X None – Disable C On/Off A Mod B	X None – Disable A Timed Off 1 Preheat 2 Modulating 3	0 None – Disable 0 On/Off 1 Modulating 2	0 None – Unit Off 0 Cycle on Room 1	X None M L B BACNet
GFC	Enable	PDx 2 stg	None – Disable	None – Disable	None – Disable	None – Unit Off	BACNet

		Description	Reference
	Alarm	Indicates both visually on the controller (the button lights up) and to the Building Management Systems (BMS) (field-wired) that something is not functioning normally.	Page 3
	Up Arrow	The arrow keys allow the user to scroll through different screens and adjust parameters.	Page 3
	Down Arrow		
	Enter	A. In screens with adjustable parameters, pressing the Enter key moves the cursor from the upper left corner of the screen to the parameter. The arrow keys can then be used to adjust the parameter. B. To move to the next parameter on the same screen, press the Enter button. C. To save the change, press the Enter button until the cursor moves back to the upper left corner of the screen.	Page 3
	Escape	Allows the user access to the Main Menu. The following adjustments can be made: <ul style="list-style-type: none"> <li>• Unit Status</li> <li>• Set Points</li> <li>• Manual Overrides</li> <li>• Analog &amp; Digital Input/Output Setup</li> <li>• Time Clock Setup</li> <li>• Miscellaneous Information</li> <li>• Unit On/Off</li> </ul>	Page 4
	Program	Allows the user access to the Program Menu	Page 17

*NOTE: If this controller needs to be interfaced with a BMS (ie: Lonworks, BACnet or Modbus), please refer to page 23 for an integration points list.*

# DDC Controller for Energy Recovery



## Example of parameter adjustment



### UNIT SET POINTS


\_Supply air low limit alarm  
when supply is less than:  
35.0°F  
Alarm delay: 030s

Supply air low limit alarm  
when supply is less than:  
32.0°F  
Alarm delay: 030s

\_Supply air low limit alarm  
when supply is less than:  
32.0°F  
Alarm delay: 030s

The cursor always begins in the upper left corner of the display.

Use the up  and down  buttons to scroll through the display screens. The cursor must be in the upper left corner of the display to scroll through the screens.

Press  to move the cursor down for parameter adjustment.

Use the   keys to adjust the parameter up or down. Press  to move the cursor to the next parameter, or to the upper left corner.



When finished, make certain the cursor is in the upper left corner. If the cursor is not in the upper left corner, the changes made will not be saved. (The cursor must be in the upper left corner to enable screen advancement).

## Example of alarms

If an alarm occurs, the  button will glow red, and a buzzer will sound if a remote display panel is connected to the controller (if enabled).


\*\*ALARM\*\*  
B1 SENSOR ERROR  
OUTSIDE TEMPERATURE  
ALARMED@-hr:min.mm/dd

...ALARM OPTIONS...  
Press UP to review.  
Press Esc to exit.  
Press ALARM to RESET

- Step 1: Press the Alarm  button once. This will disable the buzzer and display which alarms have occurred.
- Step 2: Scroll down through the alarm screens if more than one has occurred. Use the arrow buttons or alarm button to scroll through the alarms.
- Step 3: Note which alarms occurred and at what time.
- Step 4: Scroll down until the "Alarm Options" screen is displayed.
- Step 5: Press the Esc  button to exit **without resetting** the alarms. In this mode the unit will remain operational, as long as the alarm is non-fatal.

Non-fatal alarms = dirty filters, sensor failure...




Fatal alarms = airflow loss...

- OR** Step 6: Press the Alarm  button to **reset** the alarms. If the alarm button stops glowing red, the alarm has been cleared. No action is required. (Sometimes a sensor can jump out of range for a short period of time, causing an alarm. The sensor is probably OK, as long as the sensor does not continually alarm and the displayed value looks reasonable).
- Step 7: If the alarm signals again, the problem still exists and action needs to be taken. Fix the condition that has caused the alarm.

## List of possible alarms

SUPPLY AIR AL:	Indicates a loss of airflow in the supply fan	Alarm & Shutdown
EXHAUST AIR AL:	Indicates a loss of airflow in the exhaust fan	Alarm & Shutdown
DIRTY WHEEL AL:	Indicates a buildup of pressure across the energy recovery wheel	Alarm
WHEEL ROTATION AL:	Indicates a wheel rotation failure	Alarm
DIRTY FILTER AL:	Indicates a buildup of pressure across the filters	Alarm
COMPRESSOR TRIP AL:	Indicates a high or low refrigerant pressure	Alarm & Compressor Shutdown
AC LOCKOUT AL:	Indicates either the low pressure or high pressure switch are open	Alarm & Compressor Shutdown
SUPPLY LOW LIMIT AL:	Indicates a discharge temperature lower than the supply low limit set point	Alarm & Shutdown
MB1 FAIL:	Indicates a failure of the outside air temperature sensor	Alarm
MB2 FAIL:	Indicates a failure of the supply air temperature sensor	Alarm
MB3 FAIL:	Indicates a failure of the after cooling coil air temperature sensor	Alarm

## MAIN MENU / ESC BUTTON

Access the Main Menu by pressing the  key. Scroll through the menu screens using the   keys. All controller menus are accessed through the Main Menu. See below for description of each menu. Refer to the page references for additional details about each menu. For details on the Program Menu, see page 17.

<b>SCREEN DESCRIPTION</b>	<b>ADDITIONAL INFORMATION</b>
<p>Press (ENTER) to go to *UNIT STATUS* menu. Press (down) for more menu options.</p>	<p>The <b>UNIT STATUS</b> menu allows the user to view real time conditions of the unit. Conditions that are displayed include:</p> <ul style="list-style-type: none"> <li>• Temperature Sensors</li> <li>• Fan Operation</li> <li>• Energy Recovery Wheel Operation</li> <li>• Reheat</li> <li>• Heating</li> <li>• Cooling</li> <li>• Compressors</li> <li>• Preheater</li> </ul> <p>For additional information, please refer to page 5</p>
<p>Press (ENTER) to go to *SET POINTS* menu. Press (up or down) for more menu options.</p>	<p>The <b>SET POINTS</b> menu allows the user to make adjustments to set points. The adjustable set points relate to:</p> <ul style="list-style-type: none"> <li>• Heating</li> <li>• Cooling</li> <li>• Dehumidification</li> <li>• Economizer Mode</li> <li>• Supply Air Low Limit</li> <li>• Wheel Defrost</li> </ul> <p>The factory programmed default settings may need to be adjusted to achieve optimum performance for the specific application. For additional information, please refer to page 7</p>
<p>Press (ENTER) to go to *OVERRIDES* menu. Press (up or down) for more menu options.</p>	<p>The <b>OVERRIDES</b> menu is for start-up/commissioning and troubleshooting the unit. Components that can be overridden within the system are:</p> <ul style="list-style-type: none"> <li>• Frost Control Preheater</li> <li>• Heating</li> <li>• Cooling</li> <li>• Energy Wheel</li> <li>• Hot Gas Reheat</li> </ul> <p>For additional information, please refer to page 10</p>
<p>Press (ENTER) to go to */O SETUP* menu. Press (up or down) for more menu options.</p>	<p>The <b>I/O SETUP</b> menu allows the user to view the status of the digital and analog inputs and outputs of the DDC controller. In addition, adjustments can be made to recalibrate sensors and change input and output parameters. For additional information, please refer to page 12</p>
<p>Press (ENTER) to go to *CLOCK SETUP* menu. Press (up or down) for more menu options.</p>	<p>The <b>CLOCK SETUP</b> menu shows the settings for the internal time clock. The Clock Setup menu is capable of:</p> <ul style="list-style-type: none"> <li>• Setting up occupied / unoccupied modes</li> <li>• Adjusting the time and date</li> </ul> <p>For additional information, please refer to page 15</p>
<p>Press (ENTER) to go to *MISC INFO* menu. Press (up or down) for more menu options.</p>	<p>The <b>MISC INFO</b> menu displays the version of the program and the DDC Code programmed. The DDC Code provides details of how the unit was ordered and intended to operate. Both the program version and the DDC Code are required when contacting the factory for assistance. For additional information, please refer to page 16</p>
<p>Press (ENTER) to go to *UNIT ON/OFF* menu. Press (up or down) for more menu options.</p>	<p>The <b>UNIT ON/OFF</b> menu allows the user to turn the unit on and off from the controller. For additional information, please refer to page 16</p>
<p style="text-align: center;">- - End of MAIN MENU - -</p> <p style="text-align: center;">Hrs:min:sec month/day/year</p>	

## UNIT STATUS MENU

Access the UNIT STATUS menu through the Main Menu. Scroll through the menu screens using the   keys. **Screens with a dashed line border are dependent upon an optional accessory and may not always appear.**

"STATUS LINE"  
 System Status  
 hr:min:sec  
 mm/dd/yyyy

---

**THE STATUS LINE DISPLAYS WHICH MODE THE UNIT IS IN.**

---

Possible modes include:

- |                         |                          |
|-------------------------|--------------------------|
| A. Initial Delay        | J. Sys On-Dehumidifying  |
| B. Opening Dampers      | K. Sys On-Dehum & Reheat |
| C. Exhaust Fan Starting | L. Unoccupied-Unit Off   |
| D. Supply Fan Starting  | M. Unoccupied-Heating    |
| E. System On            | N. Unoccupied-Cooling    |
| F. Defrost Mode Active  | O. Manual Override!!     |
| G. Sys On-Economizer    | P. Remote Off            |
| H. Sys On-Heating       | Q. Press Alarm Button!   |
| I. Sys On-Cooling       |                          |

"STATUS LINE"  
 Outside: 000. 0° F  
 Supply: 000. 0° F  
 Cold Coil: 000. 0° F

---

**THE TEMPERATURES ON THIS SCREEN DISPLAY REAL-TIME CONDITIONS FROM THE SENSORS IN THE UNIT.**

---

*After a period of inactivity (approximately 3 minutes), the controller will revert to this screen.*

"STATUS LINE"  
 Room: 000. 0° F

---

**THE TEMPERATURE ON THIS SCREEN REPRESENTS THE REAL-TIME CONDITIONS BASED ON THE SENSOR IN THE ROOM.**

---

*This screen only appears if the room supply temp reset sensor is wired into B4 and BC4 on the controller.*

"STATUS LINE"  
 Supply Fan:On  
 Exhaust Fan:On

---

**THE CONTROLLER DISPLAYS THE RETURN SIGNAL THAT IS BEING RECEIVED FROM THE SUPPLY AND EXHAUST FANS.**

---

On indicates the fan is running. In most modes of operation, both fans will be On. There are three modes in which one fan may be Off while the other is On. 1) Start-up of the unit, 2) Timed exhaust frost control, and 3) Unoccupied, 100% return air mode. Other than these three modes, if one fan is Off and the other is On, there may be a problem.

"STATUS LINE"  
 Energy Recovery  
 Wheel: 000% Speed

---

**ENERGY RECOVERY WHEEL OPERATION IS DISPLAYED AS A PERCENT.**

---

If the unit does not contain a VFD on the wheel motor, then 0% = OFF; 100% = ON. If the unit contains a VFD to modulate the wheel speed for frost control or economizer operation, this screen will display the percentage directly proportional to the 0-10 VDC signal being sent to the wheel VFD

0 VDC = 000%, 10 VDC = 100%

To override: 'MANUAL OVERRIDE' menu >Energy Recovery Wheel Override

"STATUS LINE"  
 Cooling Control:000%  
 Compressor: ##

---

**THIS SCREEN DISPLAYS THE COOLING CONTROL AS A PERCENTAGE.**

---

*This screen only appears if a cooling option is provided.*

**Chilled Water Coil:** The Loop Output % is directly proportional to a 0-10 VDC signal  
 000% = 0 VDC - Full Closed; 100% = 10 VDC - Full Open  
 000% = 2 VDC - Full Closed; 100% = 10 VDC - Full Open

The cooling control valve can either be 0-10 VDC or 2-10 VDC depending upon the valve installed. The user may need to adjust the I/O SETUP menu so that 0-100% cooling correlates with a 2-10 VDC signal (0-10 VDC is default).

To adjust: 'I/O SETUP' menu> Analog Output Y3

**DX Coil:** Cooling Control displays compressor engagement as a percent

- 000% Compressors OFF (1 or 2 compressor system)
- 050% First compressor ON (2 compressor system)
- 100% First & second compressor ON (2 compressor system)
- First compressor ON (1 compressor system)

## UNIT STATUS MENU - *continued*

“STATUS LINE”  
Cooling Control:000%  
Compressor: ##

### ***THIS SCREEN DISPLAYS THE COOLING CONTROL AS A PERCENTAGE (CONTINUED)***

The Compressor line indicates which compressor is ON

- |     |                   |
|-----|-------------------|
| 1   | First compressor  |
| 2   | Second compressor |
| 1 2 | Both compressors  |

To override: 'MANUAL OVERRIDE' menu >Cooling Loop Override

“STATUS LINE”  
Hot Gas Reheat:000%  
Heater Control:000%

### ***THIS SCREEN DISPLAYS THE CURRENT REHEAT AND HEAT OPERATION OF THE UNIT.***

*Hot Gas Reheat only appears if provided with unit.*

Hot Gas Reheat operation is on/off control displayed as a percent.

100% is ON and 000% is OFF

To override: 'MANUAL OVERRIDE' menu >Hot Gas Reheat Override

For Modulating Hot Gas Reheat Control:

000% is OFF and 001% HGRH is ON and the airflow damper is modulating between 4 VDC and 10 VDC.

Heater Control displays the real-time percent heater output and is directly proportional to a 0-10 VDC signal provided by the discharge temperature sensor.

To override: 'MANUAL OVERRIDE' menu >Heating Loop Override

Electric Heater: The Heater Control % is directly proportional to a 0-10 VDC signal being sent to the SCR controller in the electric heater's control center.

000% = 0 VDC = 0 kW output

100% = 10 VDC = Maximum kW output

Indirect Gas Furnace: The Heater Control % is directly proportional to a 0-10 VDC signal being sent to the indirect gas furnace control board. The first stage is full ON at a 1% Heater Control. Once the Heater Control reaches 50%, the second stage modulates between 50% and 100% output.

001 – 049% First stage: ON, Second stage: OFF

050 – 100% First stage: ON, Second stage: Modulating between 50% and 100% output

Hot Water Heater: The heating control valve (supplied by others) can either be 0-10 VDC or 2-10 VDC depending upon what valve is installed. The user may have to adjust the 'I/O SETUP' menu so that a 0-100% heating correlates with a 2-10 VDC signal (0-10 VDC is default).

To adjust: 'I/O SETUP' menu >Analog Output Y2

“STATUS LINE”  
Energy recovery  
wheel differential  
pressure is: Normal

### ***THE UNIT CONTAINS A WHEEL PRESSURE DROP SENSOR TO INDICATE WHETHER THE PRESSURE ACROSS THE WHEEL IS **NORMAL** OR **HIGH**.***

*This screen only appears if a frost control method was provided.*

A status of High is an indication of frost accumulation. The pressure set point is adjustable on the wheel pressure switch.

“STATUS LINE”  
Preheat heater: OFF



### ***THIS SCREEN INDICATES WHETHER THE ELECTRIC PREHEAT FROST CONTROL IS ON OR OFF.***

*This screen only appears if Electric Preheat frost control was provided.*

To override: 'MANUAL OVERRIDE' menu >Energy Recovery Wheel Preheater

End of status menu


# SET POINTS MENU

Access the **SET POINTS** menu through the Main Menu. Scroll through the menu screens using the   keys.

\*\*\*ACCESS DENIED\*\*\*

Enter Password:0000  
WRONG PASSWORD

***THIS SCREEN CAN BE LOCKED TO PREVENT TAMPERING WITH THE SETTINGS. FROM THE FACTORY, ACCESS IS NOT PASSWORD PROTECTED TO ALLOW QUICKER START-UP.***

To set the password, go to the 'PROGRAM' menu by pressing the  button. Once there, scroll down until you arrive at the Change Password screen. The 'Level 1' password protects the 'SET POINTS' menu.

Unit Set Points

Supply set pt  
is currently=###.##°F  
This set pt is reset  
up/down by the DDC.

***THIS SCREEN DISPLAYS THE CURRENT DISCHARGE SET POINT FOR THE UNIT, WHICH IS THE TEMPERATURE THE UNIT IS TRYING TO DISCHARGE.***

If there is no room temperature sensor (nothing wired to terminals B4 and BC4 on controller), the controller changes the supply air discharge temperature of the unit based on the outdoor air temperature (refer to outdoor air reset function below). With no room temperature sensor, a BMS can override the controller and input directly the desired supply temperature for the unit.

If a room temperature sensor is connected to terminals B4 and BC4 on the DDC controller, then the supply temperature of the unit is adjusted based on the difference between the actual room temperature (reading from the room temperature sensor) and the desired room temperature which is programmed into the controller (refer to **Room Set Point** screen below). With a room temperature sensor connected to the controller, a BMS can override the controller and input directly the desired room set point. This new desired room set point will be used for comparing with the actual room temperature. To activate the BMS override temperatures, refer to the **Program Menu** and change the **Set Point Source** screen to BMS Interface.

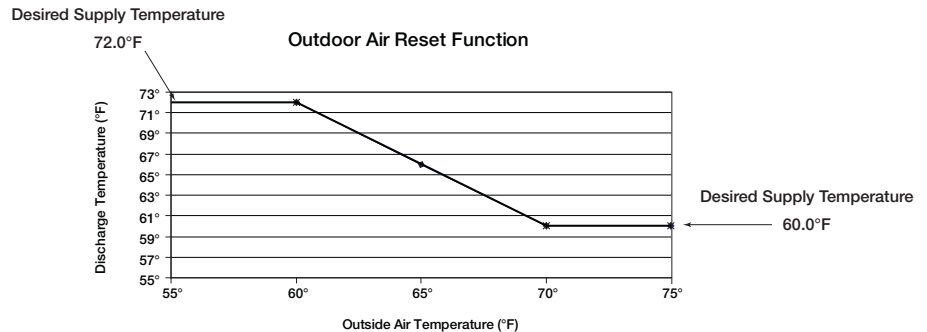
### Supply Air Reset

Outside	Supply
060.0°F --->	072.0°F
070.0°F --->	060.0°F

***THESE PARAMETERS DICTATE THE OPERATION OF THE OUTDOOR AIR RESET FUNCTION IN THE CONTROLLER.***

*This screen does not appear when the room supply temp sensor is wired into terminals B4 and BC4 on the controller.*

The unit monitors the outdoor air temperature and adjusts the desired supply temperature accordingly. For example, when the outdoor air is below 60.0°F, the controller will change the Supply set pt to 72.0°F. If the outdoor air is above 70.0°F, the controller would change the Supply set pt to 60.0°F. If the outdoor air temperature is between 60.0°F and 70.0°F, the Supply discharge temperature changes according to the outdoor air reset function. A visual representation of the outdoor air reset function is shown.



## SET POINTS MENU - continued

Room Set Point  
Local set pt:72.0°F

---

### ***THIS SCREEN DISPLAYS THE SPACE TEMPERATURE SET POINT.***

---

*This screen only appears if the room supply temp sensor is wired into terminals B4 and BC4 on the controller.*

The unit will reset the unit discharge temperature up and down to maintain the local set point. If a BMS is interfaced with the controller, the user has the capability to dictate the desired Room set point through the BMS. The screen will show a BMS set point and an Active set point. The Active set point is the room temperature the controller is currently trying to maintain.

Supply Reset Limits  
Supply Min:055.0°F  
Supply Max:090.0°F

---

### ***THIS SCREEN DISPLAYS THE MINIMUM AND MAXIMUM SUPPLY AIR TEMPERATURE.***

---

*This screen only appears if the room supply temp sensor is wired into terminals B4 and BC4 on the controller.*

The supply air temp will integrate SLOWLY down (PI loop) towards this minimum set point to maintain room temperature. The supply air temp will integrate SLOWLY up (PI loop) towards this maximum set point to maintain room temperature.

Cold coil set point  
Normal Mode:55.0°F  
Dehumidify:50.0°F  
Active set pt:55.0°F

---

### ***THIS SCREEN DISPLAYS THE TEMPERATURE SET POINTS FOR THE COOLING COILS.***

---

*This screen only appears if a Cooling option was provided with the unit.*

The Normal Mode set point is the after coil temperature the unit will maintain under standard operation. If a Humidistat was provided with the unit, the Dehumidify set point is the temperature the cooling coil will discharge on a call for dehumidification from a humidistat.

The Active set pt is the temperature that the unit is currently trying to maintain off the coil.

Unit will energize  
to maintain unocc  
room set points.  
Differential:5.0°F

---

### ***THIS SCREEN DISPLAYS THE DIFFERENTIAL SET POINT FOR THE HEATING AND COOLING MODES.***

---

*This screen only appears if the 7th character in the DDC Code is set to 1, meaning the "Cycle on Room" unoccupied mode was chosen. Operation in "Cycle on Room" unoccupied mode requires the room sensor be wired into terminals B4 and BC4, and a night setback damper in the unit.*

This differential acts as a hysteresis to keep the heating and cooling from cycling too often. For example, on a call for heating (room temp. set point - differential, 65.0°F-5.0°F=60.0°F) supply fan cycles on. Unit cycles off when the room temperature reaches the Unoccupied room set point (65.0°F, adjustable). For cooling, the differential is added to the Unoccupied room set point (85.0°F+5.0°F=90.0°F) to cycle supply fan on. Unit cycles off when the room temperature reaches Unoccupied room set point (85.0°F).

Unoccupied room set  
point  
Heating:65.0°F  
Cooling:85.0°F

---

### ***THIS SCREEN DISPLAYS THE ROOM SET POINTS WHICH DICTATE THE UNIT HEATING AND COOLING OPERATION DURING UNOCCUPIED MODE.***

---

*This screen only appears if the "Cycle on Room" unoccupied mode was chosen for the unit. A room sensor temp. must be wired into terminals B4 and BC4 on the controller, and the unit must have a night setback damper.*

In Unoccupied Mode when the temperature falls below the room Heating set point (hysteresis = 5°F), the supply fan and unit heating will turn on. Unit will discharge the Supply Max temperature per the 'Supply Reset Limits' screen above until the room set point is satisfied. Unit will then shut down. In Unoccupied Mode when the temperature rises above the Cooling set point (hysteresis = 5°F), the supply fan and unit cooling will turn on. Unit will discharge the Supply Min temperature per the 'Supply Reset Limits' screen above until the room temperature set point is satisfied. Unit will then shut down.

Heater Lockout  
Lockout heater when  
outside air >:70.0°F  
Hysteresis=02.0°F

---

### ***THIS CONTROLLER WILL LOCK THE HEATING SECTION OFF WHEN THE OUTDOOR AIR TEMPERATURE IS ABOVE THE SET POINT (FACTORY DEFAULT = 70°F).***

---

*This screen only appears if a Heating option was provided with the unit.*

A Hysteresis of 2°F helps to avoid short cycling of the heater. The hysteresis is similar to a deadband above and below the Lockout heater set point. (Example: If Lockout = 70°F, heating is locked out for outside air conditions above 72°F and enabled below 68°F).



## SET POINTS MENU - *continued*

Cooling Lockout  
Lockout cooling when  
outside air <:55.0°F  
Hysteresis=02.0°F

***THIS CONTROLLER WILL LOCK THE COOLING SECTION OFF WHEN THE OUTDOOR AIR TEMPERATURE IS BELOW THE COOLING LOCKOUT SET POINT (FACTORY DEFAULT = 55°F).***

*This screen will only appear if Cooling was provided with the unit.*

There is a built in hysteresis of 2°F which prevents the compressors from short cycling. The hysteresis is similar to a deadband above and below the lockout set point. (Example: If Lockout = 55°F, cooling is locked out below 53°F and end enabled above 57°F outside air temp).

Lockout dehumidification until outside air is:10.0°F above cold coil set point

***THIS SCREEN DISPLAYS THE TEMPERATURE DIFFERENCE AT WHICH THE DEHUMIDIFICATION ON THE UNIT IS LOCKED OUT (FACTORY DEFAULT = 10°F).***

*This screen will only appear if cooling was provided with the unit.*

This setting prevents the unit from operating in dehumidification mode when outdoor air conditions are relatively cool. For example, if the cold coil set point is 55°F, dehumidification mode cannot operate until the outdoor air is at least 65°F.

Economizer Lockout  
Lockout econo when  
outside air <:40.0°F  
Hysteresis=02.0°F

***ECONOMIZER LOCKOUT PREVENTS THE UNIT FROM GOING INTO ECONOMIZER MODE WHEN OUTDOOR AIR CONDITIONS ARE TOO COLD.***

*This screen only appears if economizer was provided with the unit.*

The lockout prevents outdoor air from 1) entering the space at too cold of a temperature or 2) entering heating and cooling coils at conditions that could freeze the coils. Built-in hysteresis of 2°F. The hysteresis is similar to a deadband above and below the lockout set point. (Example: If Lockout = 40°F, economizer is locked out below 38°F and enabled above 42°F outside air temp)

Supply air low limit  
alarm when supply is  
less than: 35.0°F  
Alarm delay:300s

***THIS SCREEN DISPLAYS WHAT THE LOW TEMPERATURE LIMIT IS FOR THE UNIT.***

If the unit supply discharge temperature falls below Supply Air Low Limit set point (factory default 35F) for a period of time (factory default 300 sec) the unit will shut down and an alarm will be signaled. The purpose of the Discharge Freeze Protection is to protect the building and contents from low temperature supply air. It is NOT designed to protect the Energy Recovery unit.

If the Energy Recovery unit does not have CW or HW coils (has only no heat, IG heat, electric heat, no cooling, or Dx cooling) it should not need additional protection from freezing. If the Energy Recovery unit does have CW or HW coils, please contact the factory for more details.

Defrost  
Allow wheel defrost  
mode when outside  
is less than: 05.0°F



***THIS SCREEN DISPLAYS THE TEMPERATURE AT WHICH THE UNIT WILL BEGIN FROST CONTROL MODE.***

*This screen only appears if a frost control method was provided with the unit.*

The energy wheel transfers both latent and sensible energy at relatively similar efficiencies. Therefore, in most applications where indoor moisture levels are below 35% RH, frost typically will not occur on the energy wheel until outdoor air temperatures are below 5°F. Consult the factory if you have any concerns regarding your specific application.

End of Set Points

## MANUAL OVERRIDE MENU

Access the **OVERRIDES** menu through the Main Menu. Scroll through the menu screens using the   keys.

\*\*\*ACCESS DENIED\*\*\*

Enter Password:0000  
WRONG PASSWORD


Manual override of  
control loops  
(Unit must be ON)

Energy recovery  
wheel override  
Wheel:AUTO  
Wheel:OFF

Energy recovery  
wheel override  
Wheel:AUTO  
% Speed:000%

Cooling loop  
override.  
Cooling:AUTO  
Loop output:000%

***THIS SCREEN CAN BE LOCKED TO PREVENT TAMPERING WITH THE SETTINGS. FROM THE FACTORY, ACCESS IS NOT PASSWORD PROTECTED TO ALLOW QUICKER START-UP.***

To set the password, go to the 'PROGRAM' menu by pressing the  button. Once there, scroll down until you arrive at the Change Password screen. The 'Level 1' password protects the 'OVERRIDES' Menu.

***THE OVERRIDE MENU IS USED FOR MANUAL OVERRIDE OF THE CONTROL LOOP.***

*To manually override a function, change the status "AUTO" to "MANUAL".*

***THE USER CAN OVERRIDE THE ENERGY RECOVERY WHEEL OPERATION.***

*This screen only appears if there is not a VFD operating the energy wheel.*  
When the wheel is in MANUAL mode, use the arrow buttons to turn the wheel ON or OFF.

***THE USER CAN OVERRIDE THE ENERGY RECOVERY WHEEL OPERATION.***

*This screen only appears if the Modulating Wheel Frost Control or Modulating Wheel Economizer was provided with the unit.*  
When the wheel is in MANUAL mode, use the arrow buttons to change the % Speed to vary the wheel rotational speed. The % Speed is directly proportional to a 0-10V signal being sent to the energy wheel VFD.

***THE USER CAN OVERRIDE THE COOLING LOOP OPERATION.***

*This screen only appears if a cooling option was provided with the unit.*  
When the cooling loop override is in MANUAL mode, use the arrow buttons to vary the % output.

**Chilled Water Coil:** Loop Output % is directly proportional to a 0-10 VDC or 2-10 VDC signal.

000% = 0 VDC = Full Closed; 100% = 10 VDC = Full Open  
000% = 2 VDC = Full Closed; 100% = 10 VDC = Full Open

**2 Stage DX Coil:** Loop Output displays compressor engagement as a percent.

000% Compressor OFF  
050% First Compressor ON  
100% First & Second Compressor ON

Second stage will NOT disengage until Loop Output is below 50%

First stage will NOT disengage until Loop Output is 0%

**1 Stage DX Coil:** Loop Output displays compressor engagement as a percent.

000% Compressor OFF  
100% Compressor ON

In a single stage DX cooling system, the compressor engages when the Loop Output is 100%. Once the compressor is engaged, it will not disengage until the Loop Output is 0%.

**Note:** Damage can occur to compressors from short-cycling, therefore the controller has built-in time delays which are effective upon each engagement of a compressor.

## MANUAL OVERRIDE MENU - *continued*

Heater loop  
override.  
Heating:AUTO  
Loop output:000%

### **THE USER CAN OVERRIDE THE HEATING OPERATION.**

*This screen only appears if a Heating option was provided with the unit.*

To manually override the heating, adjust the Heating status from AUTO to MANUAL. When the Heating loop override is in MANUAL mode, use the arrow buttons to vary the % output.

**Hot Water Coil:** The Loop Output % is directly proportional to a 0-10 VDC or 2-10 VDC signal being set to the hot water valve.

000% = 0 VDC = Full Closed; 100% = 10 VDC = Full Open  
000% = 2 VDC = Full Closed; 100% = 10 VDC = Full Open

**Electric Heater:** The Loop Output % is directly proportional to a 0-10 VDC signal being sent to the SCR controller in the electric heater's control center.

000% = 0 VDC = 0 kW output  
100% = 10 VDC = Maximum kW output

**Indirect Gas Furnace:** The Heater Control % is directly proportional to a 0-10 VDC signal being sent to the indirect gas furnace control board. Where the first stage is full ON at a 1% Heater Control. Once the Heater Control reaches 50%, the second stage modulates between 50% and 100% output.

001% - 049%: First stage: ON, Second stage: OFF  
050% - 100% First stage: ON, Second stage: Modulating between 50% and 100% output

Hot gas reheat loop  
override  
Hot gas: AUTO  
Hot gas: OFF

### **THE USER CAN OVERRIDE THE HOT GAS REHEAT OPERATION.**

*This screen only appears if the On/Off Hot Gas Reheat option was provided with the unit.*

To manually override the Hot gas reheat loop, adjust the Hot gas status from AUTO to MANUAL. When the Hot Gas Reheat loop is in MANUAL mode, use the arrow buttons to open or close the HGRH valve (ON = Open, OFF = Closed).

Hot gas reheat loop  
override  
Hot gas: AUTO  
Loop output:000%

### **THE USER CAN OVERRIDE THE HOT GAS REHEAT OPERATION.**

*This screen only appears if the Modulating Hot Gas Reheat option was selected with the unit.*

To manually override the Hot gas reheat loop, adjust the Hot gas status from AUTO to MANUAL. When the Hot Gas Reheat loop is in MANUAL mode, press the up and down arrow to vary the Loop output %. The Loop output % is directly proportional to a 0-10 VDC signal being sent to the HGRH controller.

000% = 0 VDC = Full Closed  
100% = 10 VDC = Full Open

Energy recovery wheel  
preheater  
Preheater:AUTO  
Preheater:OFF

### **THE USER CAN OVERRIDE THE ENERGY RECOVERY WHEEL PREHEATER.**

*This screen only appears if the Electric Preheat Frost Control option was provided with the unit.*

To manually override the Electric Preheater, adjust the Preheater status from AUTO to MANUAL. When the Energy Recovery wheel preheater is in MANUAL mode, use the arrow buttons to turn the Electric Preheater ON or OFF.

End of manual  
overrides

## I/O SETUP MENU

Access the **I/O SETUP** menu through the Main Menu. Scroll through the menu screens using the   keys.


**Sensor Calibration:** Measure the actual temperature and find the difference from the Sensor Temp (uncalibrated). This difference becomes the Offset and once the Offset is input to the controller, the Actual Temp should match the actual measured temperature.

\*\*\*ACCESS DENIED\*\*\*  
  
Enter Password:0000  
WRONG PASSWORD

---

***THIS SCREEN CAN BE LOCKED TO PREVENT TAMPERING WITH THE SETTINGS. FROM THE FACTORY, ACCESS IS NOT PASSWORD PROTECTED TO ALLOW QUICKER START-UP.***

---

To set the password, go to the 'PROGRAM' menu by pressing the  button. Once there, scroll down until you arrive at the Change Password screen. The 'Level 2' password protects the 'I/O SETUP' menu.

---

Setups for DDC  
Analog & Digital  
Inputs/Outputs

---

***THE 'I/O SETUP' MENU IS USED TO SET UP THE ANALOG & DIGITAL INPUT/OUTPUTS.***

---

***NOTE: The wiring terminal for each I/O is displayed in the respective screens.***

*Sensor Temp* is the sensor's uncalibrated output.

*Offset* is for calibrating the sensor.

*Actual Temp* is the new calibrated sensor output.

---

B1 Outside:NTC  
Sensor Temp: 000.0°F  
Offset = 00.0°F  
Actual Temp: 000.0°F

---

***THIS SCREEN DISPLAYS THE OUTSIDE AIR TEMPERATURE ENTERING THE UNIT.***

---

B2 Supply:NTC  
Sensor Temp: 000.0°F  
Offset = 00.0°F  
Actual Temp: 000.0°F

---

***THIS SCREEN DISPLAYS THE SUPPLY DISCHARGE TEMPERATURE.***

---

B3 Cold Coil:NTC  
Sensor Temp: 000.0°F  
Offset = 00.0°F  
Actual Temp: 000.0°F

---

***THIS SCREEN DISPLAYS THE AFTER COOLING COIL TEMPERATURE.***

*This screen only appears if a cooling system was selected.*

---

B4 Room Temp:NTC  
Sensor Temp: 000.0°F  
Offset = 00.0°F  
Actual Temp: 000.0°F

---

***THIS SCREEN DISPLAYS THE ROOM TEMPERATURE.***

*This screen only appears if the room supply sensor is wired between B4 and BC4 on the controller.*

---

B4 Input  
Max cooling demand.  
Input Status:Open

---

***THIS SCREEN DISPLAYS THE STATUS OF THE DIGITAL INPUT TO TERMINAL B4.***

*This screen only appears if the room supply sensor is NOT wired between B4 and BC4 on the controller.*

When the Input Status is Open, the unit will operate normally and adjust the discharge temperature based on outdoor air temperature. When the Input Status is Closed (in the case of a digital input, ie. Thermostat), this indicates that a digital call for cool is being received by the controller. The controller then overrides the outdoor air temperature discharge control and sends the supply temperature set point to the supply reset minimum temperature (Max cooling: 55°F,adj. in 'SET POINTS' menu).

## I/O SETUP MENU - continued

B5 Dehumidify:ON/OFF  
Input Status:Open

### ***THIS SCREEN DISPLAYS THE STATUS OF THE DEHUMIDIFICATION MODE.***

*This screen only appears if there is a humidistat wired to terminals B5 and BC5 on the controller.*

When the Input Status is Open, there is no call for dehumidification. When the Input Status is Closed, the cold-coil set point is reset for further dehumidification.

### **ANALOG OUTPUTS - PARAMETERS**

The Analog Output screens allow the user to adjust the analog outputs for the energy recovery wheel, heating, cooling, and hot gas reheat operation. The factory defaults are provided in the screens shown and are designed to operate with any factory supplied components. Chilled water valves, hot water valves, DX distributors, or HGRH valves provided by others may require adjustments to the following screens to properly operate the components.

Analog output Y1  
Energy Recovery Wheel  
Output 0% --> 100%  
SIGNAL 00.0V 10.0V

### ***THIS SCREEN DISPLAYS THE CORRELATION BETWEEN THE ANALOG OUTPUT % AND THE VOLTAGE SIGNAL FOR THE ENERGY RECOVERY WHEEL.***

**\*\*\*DO NOT ADJUST THIS SETTING\*\*\***

This screen may relate to on/off or modulating control depending upon what accessories were ordered with the unit. The energy recovery wheel is factory-installed and programmed.

Analog output Y2  
Heater  
Output 0% --> 100%  
SIGNAL 00.0V 10.0V

### ***THIS SCREEN DISPLAYS THE CORRELATION BETWEEN THE ANALOG OUTPUT % AND THE VOLTAGE SIGNAL FOR THE HEATING (IE. 60% = 6 VDC).***

*This screen only appears if Heating was provided with the unit.*

The Output and SIGNAL will provide the appropriate control of a hot water coil, electric heater, or indirect gas furnace. User can change the SIGNAL range if required. Factory defaults are 0-10 VDC.

NOTE: This is where the user would adjust for a Heating Control Valve that is 2-10 VDC rather than 0-10 VDC.

Analog output Y3  
Cooling  
Output 0% --> 100%  
SIGNAL 00.0V 10.0V

### ***THIS SCREEN DISPLAYS THE CORRELATION BETWEEN THE ANALOG OUTPUT % AND THE VOLTAGE SIGNAL FOR THE HEATING (IE. 60% = 6 VDC).***

*This screen only appears if Chilled Water was provided with the unit.*

The Output and SIGNAL will provide the appropriate control of a chilled water coil. User can change the SIGNAL range if required. Factory defaults are 0-10 VDC.

NOTE: This is where the user would adjust for a Cooling Control Valve that is 2-10 VDC rather than 0-10 VDC.

Analog output Y4  
Hot Gas Reheat  
Output 0% --> 100%  
SIGNAL 00.0V 10.0V

### ***THIS SCREEN DISPLAYS THE CORRELATION BETWEEN THE ANALOG OUTPUT % AND THE VOLTAGE SIGNAL FOR THE HOT GAS REHEAT (IE. 60% = 6 VDC).***

*This screen only appears if HGRH was provided with the unit.*

The Output and SIGNAL will provide the appropriate control of a on/off or modulating hot gas reheat coil. User can change the SIGNAL range if required. Factory defaults are 0-10 VDC.

### **DIGITAL INPUTS - PARAMETERS**

#### **WARNING!**

The following screens show the factory defaults for each parameter. Do **NOT** change parameters unless you are absolutely certain the parameter needs to be modified. Unit will not function properly and damage may occur to the unit if the parameters do not match the contact requirements of the components.

Digital Input (ID1)  
Supply proving switch  
Alarm: Open  
Status:Closed

### ***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE SUPPLY PROVING SWITCH.***

When the Supply proving switch alarm is triggered, the fan is not seeing airflow and the unit will shutdown and alarm. The Alarm parameter allows the user to select Open or Closed for the contact position that will trigger the alarm. Status displays the real time status (Open/Closed) of the digital input.

NOTE: The controller is only monitoring the contact position -- Not the actual operation of the fan.

## I/O SETUP MENU - continued

Digital Input (ID2)  
Wheel pressure switch  
High pressure=Closed  
Status:Open

---

***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE ENERGY RECOVERY WHEEL PRESSURE SWITCH.***

---

When the Wheel pressure switch alarm is triggered, the wheel has excessive frost or dirt build-up. The High pressure parameter allows the user to select Open or Closed for the contact position that will trigger the alarm. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID3)  
Wheel rotation alarm  
Alarm:Closed  
Status:Open

---

***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE ENERGY RECOVERY WHEEL ROTATION SENSOR.***

---

When the Wheel rotation alarm is triggered, the wheel has stopped rotating. Refer to 'PROGRAM' menu for wheel rotation alarm delay. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID4)  
Unit ON/OFF control  
Unit ON when:Closed  
Status:Open

---

***THIS SCREEN DISPLAYS THE STATUS MODE OF THE REMOTE INPUT FOR UNIT ON/OFF CONTROL.***

---

The Unit ON when parameter allows the user to select Open or Closed for the contact position that will energize the unit. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID5)  
Exhaust proving switch  
Alarm:Open  
Status:Closed

---

***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE EXHAUST FAN.***

---

When the Exhaust proving switch alarm is triggered, the fan is not seeing airflow and the unit will shutdown and alarm. The Alarm parameter allows the user to select Open or Closed for the contact position that will trigger the alarm. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID6)  
Occupied/Unoccupied  
Occupied when:Open  
Status:Closed

---

***THIS SCREEN DISPLAYS THE ALARM STATUS OF THE OCCUPIED/UNOCCUPIED OPERATION.***

---

While in Input ID6 mode, (refer to 'PROGRAM' menu) the input from ID6 will send the unit into occupied or unoccupied mode. If in BMS or Time Clock mode, a 24 VDC input from ID6 will override the system operation from unoccupied (refer to 'TIME CLOCK' menu for actual override time period) to occupied (but not occupied to unoccupied) mode for a specific override. The Occupied when parameter allows the user to select Open or Closed for the contact position that will indicate Occupied operation. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID7)  
Dirty filter switch  
Alarm:Closed  
Status:Open

---

***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE DIRTY FILTER SWITCH.***

---

The Alarm parameter allows the user to select Open or Closed for the contact position that will trigger the alarm. Status displays the real time status (open/closed) of the digital input.

Digital Input (ID8)  
Compressor limits  
Alarm:Open  
Status:Closed

---

***THIS SCREEN DISPLAYS THE ALARM STATUS MODE OF THE COMPRESSORS.***



---

*This screen only appears if DX cooling was provided in the unit.*

The Alarm parameter allows the user to select Open or Closed for the contact position that will trigger the alarm. Status displays the real time status (open/closed) of the digital input. Based on factory defaults, the DX staging will lockout and alarm when the Status is Open.

End of I/O setups

## TIME CLOCK MENU

Access the **CLOCK SETUP** menu through the Main Menu. Scroll through the menu screens using the   keys.


**IMPORTANT!** User must select one of the three options for the Source in the Unoccupied mode setup screen in the 'PROGRAM' menu. The Source represents the means by which Occupied and Unoccupied modes are determined.

- Option 1: Input ID6 – typically used with a remote time clock (Default)
- Option 2: BMS – can be overridden by a separate input to ID6
- Option 3: Internal Time Clock – can be overridden by a momentary input to ID6

\*\*\*ACCESS DENIED\*\*\*

Enter Password:0000  
WRONG PASSWORD

**THIS SCREEN CAN BE LOCKED TO PREVENT TAMPERING WITH THE SETTINGS. FROM THE FACTORY, ACCESS IS NOT PASSWORD PROTECTED TO ALLOW QUICKER START-UP.**

To set the password, go to the 'PROGRAM' menu by pressing the  button. Once there, scroll down until you arrive at the Change Password screen. The 'Level 1' password protects the 'TIME CLOCK' menu.

CLOCK  
hr:min:sec  
(Day of week)  
mm/dd/yyyy

**THE CLOCK SETUP MENU ALLOWS THE USER TO ADJUST THE TIME, DATE, AND OCCUPIED/UNOCCUPIED MODE SETTINGS.**

User can also override the current occupied/unoccupied mode for a designated period of time.

Time/Date/Day Setup  
Press ENTER to reset  
the internal clocks  
time, date & day

Reset clock  
Time-00:00:00  
Date: 00/00/00 (m/d/y)  
Day-NA

Set the time, date & day here. All three must be set/reset at the same time. When the cursor is in the upper left corner, press up or down to return to the clock menu.

Occ-Unocc Override  
Current Mode:Occ  
Override Time:060min  
Override:No

**CURRENT MODE DISPLAYS WHETHER THE UNIT IS IN OCCUPIED MODE OR UNOCCUPIED MODE. (OCC = OCCUPIED, UNOCC = UNOCCUPIED)**

*This screen will only appear if the Occupied/Unoccupied ID6 function has been set to 'ON' in the PROGRAM menu under Binary Input Enables.*

The controller will allow the user to override from Unoccupied to Occupied mode, but not vice versa. This can be performed by changing this screen to Yes, or it can also be done through a momentary 24 VDC input to terminal ID6. After the Override Time expires, the clock returns to the 7-day schedule.

**The following screens only appear if Option 3, the Internal Time Clock function, has been enabled in the Program Menu.**

Enable Occ/Unocc  
Mon:Yes Tue:Yes Fri:Yes  
Wed:Yes Thu:Yes Sat:Yes  
Sun:Yes

**THIS SCREEN ALLOWS THE USER TO ENABLE/DISABLE UNOCCUPIED MODE FOR EACH DAY OF THE WEEK.**

Selecting 'No' means the unit will operate in an Occupied mode only. Selecting 'Yes' means the unit will operate in an Occupied mode and an Unoccupied mode.

Occupied Unoccup  
Mon 06:00 18:00  
Tue 06:00 18:00  
Wed 06:00 18:00

Enter the desired Occupied/Unoccupied start times for each day (24 hour time scale).

Occupied Unoccup  
Thu 06:00 18:00  
Fri 06:00 18:00

Enter the desired Occupied/Unoccupied start times for each day (24 hour time scale).

## TIME CLOCK MENU - continued

Occupied Unoccup  
Sat 06:00 18:00  
Sun 06:00 18:00

Enter the desired Occupied/Unoccupied start times for each day (24 hour time scale).

Holidays  
Holiday = unoccupied  
mode for 24 hrs.  
# of holidays:00

Enter the number of holidays you wish to schedule (up to 15 days can be entered).  
**Holidays must be updated every year!**

Holiday #1  
Month:01  
Day:01  
Unoccupied for 24hrs

The internal clock will index into unoccupied mode as long as the date is equal to a date entered as a holiday (always a 24 hour period).  
Example: New Years Day, January 1

End of Clock setup

## MISC INFO MENU

Access the **MISC INFO** menu through the Main Menu. Scroll through the menu screens using the   keys.

Greenheck Fan Corp.  
ER DDC1 v3.00  
DDC Code: GY2A211X



***THIS SCREEN DISPLAYS THE VERSION OF THE PROGRAM INSTALLED IN THE CONTROLLER.***

If contacting the factory for assistance, record the version of the program and the DDC Code displayed on this screen.

The DDC was supplied with  
a user manual - if missing,  
visit [www.greenheck.com](http://www.greenheck.com)

End of Information  
menu

## UNIT ON/OFF MENU

Access the **UNIT ON/OFF** menu through the Main Menu. Scroll through the menu screens using the   keys.

Press (ESC) to exit  
Command unit on or  
off below.  
Command Unit:ON

***THE 'UNIT ON/OFF' MENU ALLOWS THE USER TO TURN THE UNIT ON AND OFF FROM THE CONTROLLER, PROVIDED THE R TO G CONTACT IN THE UNIT CONTROL CENTER IS CLOSED.***

Press Enter to highlight ON/Off in the lower right corner.




Press the the   buttons to turn unit ON or OFF.

A remote ON/OFF switch may also be wired into ID4

End of Information  
menu



## PROGRAM MENU

Access the **PROGRAM** menu by pressing  key. Scroll through the menu screens using the   keys. The program button is used to setup the control loops for economizer, defrost, heating, cooling, and reheat along with defaults for staging, supply reset, time delays, occupied mode, communications, set point source, temperature scale, and changing passwords. Adjustments to these parameters should be performed by a qualified technician. (A Level 2 password must be entered to alter any of the factory programming; factory default is 9998).

\*\*\*ACCESS DENIED\*\*\*

Enter Password:0000  
WRONG PASSWORD

Factory Setup

Consult factory  
before altering

Economizer Controller

Integration:300s  
Control Band:20°F

Economizer Setup  
Econo on/off times  
Minimum ON:300s  
Minimum OFF:300s

Supply fan cycling  
defrost setup.  
Fan off time:005min  
Fan on time:030min


Cooling Controller

Integration:300s  
Band:20°F

---

***THIS SCREEN CAN BE LOCKED TO PREVENT TAMPERING WITH THE SETTINGS. FROM THE FACTORY, ACCESS IS NOT PASSWORD PROTECTED TO ALLOW QUICKER START-UP.***

---

To set the password, go to the 'PROGRAM' menu by pressing the  button. Once there, scroll down until you arrive at the Change Password screen. The 'Level 2' password protects the 'Program' menu.

---

***THIS SCREEN ALLOWS THE INTEGRATION TIME FOR THE PI CONTROL OF THE ECONOMIZER AND THE TEMPERATURE BAND AROUND THE SUPPLY SET POINT TO BE ADJUSTED.***

---

*This screen will only appear if an Economizer mode was selected with the unit.*

This controller uses a Proportional + Integral type control. The integration time programmed into the controller is to provide a smooth reaction to conditions, allowing for less sporadic changes in discharge temperature. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments, and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between.

Range of Integration = Supply set pt  $\pm$  Band. ie: 50° F  $\pm$  20° F

---

***THIS SCREEN ALLOWS ADJUSTMENT FOR THE MINIMUM ON/OFF TIMES FOR THE ECONOMIZER.***

---

*This screen only appears if ON/OFF economizer was provided with the unit.*

These minimum ON and OFF times prevent the energy wheel motor from short cycling during economizer mode.

---

***THIS SCREEN DISPLAYS THE ON/OFF FAN CYCLE TIMES FOR THE TIMED EXHAUST FROST CONTROL AND ALLOWS THE USER TO ADJUST THESE PARAMETERS.***

---

*This screen only appears if Timed Exhaust Frost Control was provided with the unit.*

These ON and OFF times prevent the buildup of frost when the unit is in Timed Exhaust frost control mode.

---

***THIS SCREEN DISPLAYS THE INTEGRATION TIME FOR THE PI CONTROL OF THE COOLING MODE, AND THE TEMPERATURE BAND AROUND THE SUPPLY SET POINT.***

---

*This screen only appears if a Cooling option was provided with the unit.*

This controller uses a Proportional + Integral type control. The integration time programmed into the controller is to provide a smooth reaction to conditions, allowing for less sporadic changes in discharge temperature. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments, and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between.

Range of Integration = Supply set pt  $\pm$  Band. ie: 50° F  $\pm$  20° F

## PROGRAM MENU - continued

Compressor Setup  
# of stages:2  
Minimum ON:030s  
Minimum OFF:180s

**THIS SCREEN DISPLAYS THE NUMBER OF STAGES PROVIDED WITH THE UNIT AND SHOWS THE COMPRESSOR MINIMUM ON AND OFF TIMES (IN SECONDS).**

*This screen only appears if DX cooling was provided with the unit.*

The purpose of having minimum ON/OFF times is to prevent the compressor from short cycling.

⚠ *Do not change the defaults shown without consulting the factory.*

Compressor Setup  
Between stages:240s  
Lead-Lag:YES  
Lead-Lag Time:100hrs

**THIS SCREEN DISPLAYS THE DELAY TIME BETWEEN STAGES, ALONG WITH THE LEAD-LAG TIME PROGRAMMED FOR THE COMPRESSORS.**

*This screen only appears if 2-stage DX cooling (2 compressors) was provided with the unit.*

Between Stages is the time delay (in seconds) between the first and second compressors engaging. Lead-Lag governs whether the stages will reverse operation order after some period of time designated by the Lead-Lag Time setting (Factory Default: YES, 100hrs.). The Lead-Lag Time is the duration of time the unit will operate before reversing the DX staging. In other words, based on the factory default, Compressor 1 will engage before Compressor 2 for 100 hours of operation. After 100 hours, the order reverses and Compressor 2 will engage first. This cycle will continue indefinitely.

Stage1:ON@050%OFF00%  
Stage2:ON@100%OFF50%

**THIS SCREEN SHOWS WHEN EACH COMPRESSOR IN A SINGLE OR TWO STAGE DX UNIT WILL ENGAGE AND DISENGAGE.**

*This screen only appears if DX cooling was provided with the unit.*

Each compressor will engage and disengage based upon the percentage of cooling that the user inputs (refer to Cooling Loop Override screen on the 'MANUAL OVERRIDE' menu).

Lead-Lag Note  
Stage:12  
Compressor Lead:12  
Compress Lag:21

**THIS SCREEN ALLOWS FOR ADJUSTMENTS TO BE MADE TO THE ORDER OF WHICH COMPRESSORS WILL ENGAGE.**

*This screen only appears if 2-stage DX cooling was provided with the unit.*

This screen shows the order in which the compressors will engage when operating in the lead-lag setup.

Compressor will lockout if  
safety switches (ID8) trip  
3 times in:120 min

**IF THE CONTROLLER DETECTS THREE (3) ALARMS IN THE TIME PERIOD SHOWN, IT WILL SHUT OFF THE COMPRESSORS AS A SAFETY MEASURE.**

*This screen only appears if DX cooling was provided with the unit.*

The safety lockout screen monitors the safety loop of the DX system, including high limit, low limit, and ambient temps. If the controller detects three (3) trips within 120 minutes, the controller will shut down the DX system. (Example: If the low limit switch trips, automatically resets, and then trips two more times within 120 minutes, the DX system will shut down). If there is a fatal trip, such as a high limit pressure switch trip, the DX system will not run and the controller will signal an alarm after trying three times unsuccessfully to start the DX cooling process.

Heater Controller

Integration:300s  
Band:20°F

**THIS SCREEN DISPLAYS THE INTEGRATION TIME FOR THE PI CONTROL OF THE HEATING MODE AND THE TEMPERATURE BAND AROUND THE SUPPLY SET POINT.**

*This screen only appears if a Heating option was provided with the unit.*

This controller uses a Proportional + Integral type control. The integration time programmed into the controller is to provide a smooth reaction to conditions, allowing for less sporadic changes in discharge temperature. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments, and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between.

Range of Integration = Supply set pt ± Band. ie: 50° F ± 20° F

## PROGRAM MENU - *continued*

Will heater be used  
for reheat during  
dehumidification?  
Reheat:Enable

**THIS SCREEN ALLOWS THE USER TO *ENABLE THE HEATER FOR REHEAT PROCESS.***

*This screen only appears if a Heating option was provided with the unit and the unit does NOT have hot gas reheat.*

If it is desired that the heater be used to reheat the air off the cooling coil when in dehumidification, adjust this screen so the Enable is displayed.

Will heater be used for  
reheat along  
with the hot gas?  
Heater:Disable

**THIS SCREEN ALLOWS THE USER TO *ENABLE THE HEATER TO PROVIDE ADDITIONAL REHEAT.***

*This screen only appears if Hot Gas Reheat and a Heating option was provided with the unit.*

Setting the Heater parameter to Enable allows the Heating option to provide additional reheat above and beyond what the Hot Gas Reheat can provide. This would typically only be used if the discharge temperature off the Hot Gas Reheat coil was too cold for the space.

Hot Gas Controller

Integration:300s  
Band:20°F

**THIS SCREEN DISPLAYS THE INTEGRATION TIME FOR THE *PI* CONTROL OF THE HOT GAS REHEAT MODE AND THE TEMPERATURE BAND AROUND A SET POINT.**

*These parameters may be adjusted if necessary. This screen only appears if a Hot Gas Reheat option was provided with the unit.*

This controller uses a Proportional + Integral type control. The integration time programmed into the controller is to provide a smooth reaction to conditions, allowing for less sporadic changes in discharge temperature. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments, and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between.

Range of Integration = Supply set pt  $\pm$  Band. ie: 50° F  $\pm$  20° F

Hot Gas reheat coil  
minimum on/off  
time 10 minutes

**THIS SCREEN ALLOWS THE USER TO *ADJUST THE MINIMUM ON/OFF TIME FOR THE HOT GAS REHEAT COIL.***

*This screen only appears if ON/OFF Hot Gas Reheat was provided with the unit.*

This is the minimum on/off time operation for the Hot Gas Reheat coil. The factory programmed time prevents short-cycling of the coil, which allows for better oil distribution through the DX system.

⚠ Use caution when altering the on/off time as damage may occur to the system if set too low. Consult the factory for information.

Supply Reset Control

Integration:300S  
Band:20°F

**THIS SCREEN DISPLAYS THE INTEGRATION TIME AND TEMPERATURE RANGE FOR THE *PI* CONTROL OF THE *SUPPLY RESET TEMPERATURE.***

*These parameters may be adjusted if necessary. This screen only appears if a Room Supply Temp sensor is wired between B4 and BC4 on the controller.*

This controller uses a Proportional + Integral type control. The integration time programmed into the controller is to provide a smooth reaction to conditions, allowing for less sporadic changes in discharge temperature. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments, and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between.

Range of Integration = Room set pt  $\pm$  Band. ie: 72° F  $\pm$  20° F

## PROGRAM MENU - *continued*

Time delay between heating, cooling, &/or economizer modes.  
Delay:600s

---

***THIS SCREEN ALLOWS FOR THE USER TO ADJUST THE DELAY TIME BETWEEN MODES.***

---

This time delay prevents short-cycling between heating, cooling and/or economizer modes.

Unoccupied mode setup.  
Type:Cycle Supply Fan  
Source: Input ID6

---

***THIS SCREEN DISPLAYS WHAT THE UNIT WILL DO IN UNOCCUPIED MODE.***

---

Setting the Type to Cycle Supply Fan will engage the unit to maintain space temperature. However, the room supply temp sensor must be wired between B4 and BC4 on the controller. If desired, the Source offers three options that can be used to operate unoccupied/occupied modes:

Option 1: Input ID6 – typically used with a remote time clock (Default)

Option 2: BMS – can be overridden by a separate input to ID6

Option 3: Internal Time Clock – can be overridden by a separate input to ID6

Without the room supply temp sensor, the Type will say Unit Off, and thus the unit will be off during unoccupied mode.

Allow the dampers to open for:10 seconds before starting the fans.

---

***THIS SCREEN ALLOWS FOR THE USER TO PROGRAM THE TIME FOR THE DAMPERS TO OPEN PRIOR TO THE FAN ENGAGING.***

---

This allows for a smoother startup of the system and prevents the fans from having to overcome the higher pressures when dampers are just beginning to open. Since dampers have a slow reaction time, the default is 10 seconds which allows enough time for them to fully open.

Fan/airflow proving alarm delay:030s  
  
(inputs ID1 & ID5)

---

***THIS SCREEN ALLOWS FOR THE USER TO DELAY AN ALARM SIGNAL FROM THE FAN AIRFLOW PROVING SWITCH WHICH SHUTS THE UNIT DOWN.***

---

Since the unit is only part of a complete system, the airflows may momentarily change (ie. If a downstream damper closes). This delay is intended to prevent false alarms (the factory recommends that at least 30 seconds be programmed into the controller).

Time delay between starting of supply & exhaust fans.  
Fan delay:005s

---

***THE TIME DELAY BETWEEN THE STARTING OF THE SUPPLY AND EXHAUST FANS THAT REDUCES THE STARTUP AMP DRAW OF THE UNIT.***

---

Also, the exhaust fan engages first, allowing the wheel to see space temperature conditions prior to the supply fan engaging. This allows the energy recovery wheel the opportunity to provide maximum preconditioning of the outdoor air. This also minimizes the potential of extreme outdoor air temperatures being supplied to the space prior to the cooling and or heating sections engaging.

## PROGRAM MENU - *continued*

Wheel rotation alarm  
delay:030s  
  
(input ID3)

***THIS SCREEN ALLOWS FOR THE USER TO CHANGE THE TIME DELAY UNTIL THE CONTROLLER WILL SHOW AN ALARM.***

*This screen appears whether the wheel rotation alarm was provided or not. If provided, there will be a wire in ID3 on the controller.*

Similar to the Fan/airflow proving switch alarm, the Wheel rotation alarm delay allows time to elapse prior to the controller showing an alarm. The delay prevents a false alarm from occurring if the sensor does not pickup the wheel rotation for a second or two.

Communications Setup  
Press ENTER to setup the  
communication parameters

The communications setup allows the user to program the type of BMS system (BACnet, LonWorks, pcoWEB, or MODBUS), and where required, the Identification # and Baud numbers needed to operate the controller. Screens displaying the communication options available with this unit are shown.

Communications Setup  
Comm Type:None

Communications Setup  
Comm Type:BACnet

Communications Setup  
Comm Type:LonWorks

Communications Setup  
Comm Type:pcoWEB

Communications Setup  
Comm Type:PlantVisor  
Identification #:001

Communications Setup  
Comm Type:Modem  
Identification #:001

Communications Setup  
Comm Type:MODBUS  
Identification #:001  
Baud:9600

## PROGRAM MENU - continued

--Set Point Source--  
Use local set point,  
or BMS interface set  
point?:Local

**USERS CAN CHOOSE EITHER THE CONTROLLER OR THE BMS TO DETERMINE SUPPLY DISCHARGE SET POINT DURING OPERATION.**

*This screen only appears if a BMS is wired into the controller.*

Local means the controller set point will be used during operation, and BMS Interface means that Supply Discharge set point can be inputted to the controller from the BMS.

Temperature Scale  
Select:Fahrenheit  
Display Buzzer  
Select:Enable

**THIS SCREEN ALLOWS THE USER TO ADJUST WHAT TEMPERATURE UNITS THE CONTROLLER SHOULD OPERATE IN, AND WHETHER THE BUZZER SHOULD BE ENABLED OR DISABLED.**

The temperature can be either Fahrenheit or Celsius. The buzzer is only applicable when there is a remote interface panel attached to the controller. If an alarm were to occur, the remote display panel would begin buzzing loudly (if the buzzer was enabled) and it would show the alarm status.

Select DDC configuration code here.

Code:GYCA210X

**THIS SCREEN DISPLAYS AND ALLOWS FOR ADJUSTMENTS TO BE MADE TO THE CODE FOR THE UNIT.**

This code is set from the factory to operate the components selected with the unit. Refer to front page for code description. When troubleshooting, be sure to verify that the code matches the components provided with the unit.

If the code needs to be modified, press Enter (↵) and the cursor will move to the first character. Use the (↑) (↓) keys to adjust. Press Enter (↵) to move to the next character. To finish, press Enter (↵) until the cursor moves to the upper left corner of the screen.

Change Passwords

LEVEL 1:0000  
LEVEL 2:0000

**THIS SCREEN DISPLAYS THE PASSWORDS WHICH PROTECT THE CONTROLLER FROM TAMPERING.**

Passwords must be greater than zero to be activated.

LEVEL 1 password locks out the following menus:

- SET POINTS
- TIME CLOCK
- MANUAL OVERRIDES

LEVEL 2 password locks out the following menus:

- PROGRAM
- I/O SETUP menus.

End of Program menu

Carel		Modbus-RTU (RS485) Network Address: 1		BACnet IP / BACnet Ethernet / BACnet MSTP Device Instance: 77000 (default)		Lonworks FT-10A			Type	Read (Unit to BMS signal) Write (BMS to Unit signal)	Description
Address	Address	Name	Units	Address	Name NV	Type NV					
1	40002	A001	° F	1	nvoOutsideTemp	105		Analog	R	Outside Air Temp (###.#F)	
2	40003	A002	° F	2	nvoSupplyTemp	105		Analog	R	Supply Air Temp (###.#F)	
3	40004	A003	° F	3	nvoColdCoilDisch	105		Analog	R	Cooling Coil air Temp (###.#F)	
4	40005	A004	° F	4	nvoRoomTemp	105		Analog	R	Room Air Temp (if installed) (###.#F)	
11	40012	A011	° F	11	nv(O/I)TempSetPt	105		Analog	R/W	Temperature Set Pt (read/write) (###.#F) (Please refer to Controller IOM)	
1	40130	I001	no-units	1	nvoStatus	81		Integer	R	Note 1	
2	40131	I002	percent	2	nvoHeating	81		Integer	R	Heater output (0-100%)	
3	40132	I003	percent	3	nvoCooling	81		Integer	R	Cooling output (0-100%)	
4	40133	I004	percent	4	nvoWheel	81		Integer	R	Energy recovery wheel speed (5 speed) (defrost & economizer)	
5	40134	I005	percent	5	nvoHotGasReheat	81		Integer	R	Hot Gas reheat output (0-100%)	
			Inactive_Text		Active_Text						
1	10002	D001	Off	1	nvoOnOffStat	95		Digital	R	Unit ON/Off	
2	10003	D002	Off	2	nvoSupplyFan	95		Digital	R	Supply fan status	
3	10004	D003	Off	3	nvoExhaustFan	95		Digital	R	Exhaust fan status	
4	10005	D004	Unoccupied	4	nvoOccupancyStat	95		Digital	R	Occupancy Status (0=Unoccupied, 1=Occupied)	
5	10006	D005	Off	5	nvoCompressor1	95		Digital	R	Compressor #1 status	
6	10007	D006	Off	6	nvoCompressor2	95		Digital	R	Compressor #2 status	
7	10008	D007	Off	7	nvoDefrostMode	95		Digital	R	Defrost mode status	
10	10011	D010	Stop	10	nv(O/I)StartStop	95		Digital	R/W	Unit start/stop command	
11	10012	D011	Don't Reset	11	nv(O/I)ResetAlarms	95		Digital	R/W	Reset alarms command	
12	10013	D012	Occupied	12	nv(O/I)OcclNocc	95		Digital	R/W	Occupied/unoccupied command (0=unoccupied, 1=unoccupied)	
20	10021	D020	Off	20	nvoGlobalAlrm	95		Digital	R	Global alarm indication (active when there is at least one alarm)	
21	10022	D021	Off	21	nvoSupplyFanAlm	95		Digital	R	Supply air proving alarm	
22	10023	D022	Off	22	nvoWhipPressurAlm	95		Digital	R	High Wheel pressure (high airflow or dirty wheel)	
23	10024	D023	Off	23	nvPWhiRotateAlm	95		Digital	R	Wheel rotation alarm	
24	10025	D024	Off	24	nvoExhaustFanAlm	95		Digital	R	Exhaust air proving alarm	
25	10026	D025	Off	25	nvoFilterAlm	95		Digital	R	Dirty filter alarm	
26	10027	D026	Off	26	nvoCompTripAlm	95		Digital	R	Compressor trip alarm	
27	10028	D027	Off	27	nvoCompLockedAlm	95		Digital	R	Compressor locked out alarm	
28	10029	D028	Off	28	nvoSupplyTempAlm	95		Digital	R	Supply air temperature low limit alarm	
29	10030	D029	Off	29	nvoB1Alm	95		Digital	R	Sensor#1 out of range (outside air temperature)	
30	10031	D030	Off	30	nvoB2Alm	95		Digital	R	Sensor#2 out of range (supply air temperature)	
31	10032	D031	Off	31	nvoB3Alm	95		Digital	R	Sensor#3 out of range (cold coil leaving air temperature)	

Note: 1) Unit status index: 0=system off; 1=initial delay; 2=opening dampers; 3=exhaust fan starting; 4=supply fan starting; 5=system on; 6=defrost mode active; 7=system on-economizer; 8=system on-heating; 9=system on-cooling; 10=system on dehumidifying; 11 system on-dehumidifying & reheat; 12=unoccupied-unit off; 13=unoccupied-heating; 14=unoccupied-cooling; 15=Manual override; 16=remote off; 17=Alarm

Date	Time	Notes:

**Warranty**

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid.

Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*

