verdant®

VX SERIES
Wireless Thermostat with Occupancy Sensor

INSTRUCTION MANUAL

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Thermostat Installation

BEFORE YOU BEGIN DETERMINE THE APPROPRIATE INSTALLATION LOCATION FOR THE THERMOSTAT. THE THERMOSTAT SHOULD FACE THE BED AREA OF THE ROOM.

After the installation, follow the "Thermostat Configuration" Instructions to correctly configure the thermostat.

For installation of a networking thermostat with remote management, refer to the "Network Installation" manual.

Thermostat Installation

BEFORE YOU BEGIN: Consult PTAC manufacturer's documentation or use a voltmeter to determine if the PTAC unit outputs AC or DC power (24V).

If the PTAC unit outputs AC power, make sure that the jumper on the Wireless Control Card is in the AC position - jumper is connecting "R" and "COM" pins (Default).

If the PTAC unit outputs DC power, make sure that the jumper on the Wireless Control Card is in the DC position - jumper is connecting "COM" and "C" pins.

Installing the Wireless Control Card

- ➤ Unplug the PTAC unit power cord from the electrical outlet;
- ➤ Remove the PTAC cover;
- ➤ Set the PTAC unit to "External Thermostat" (Class 2) mode. Consult the PTAC unit documentation to determine how to set the PTAC unit to "External Thermostat" mode.
- ➤ Connect the wires to screw terminals on the PTAC unit - refer to the Wiring Table to determine proper connections.
- ➤ Mount the control card inside of the PTAC unit.

  Make sure that the Wireless Control Card antenna is not touching any metal components of the PTAC unit.

  Make sure that the contol card is not and cannot fall into the PTAC unit Condensation Pan.

- ➤ Replace the PTAC front cover;
- ➤ Plug in the PTAC unit power cord into an electrical outlet.

Thermostat Installation

Wiring Table - 24V AC

Wire Color	Terminal Letter	Terminal Connection
Black	C	Common
Red	R	24V
Yellow	Y	Compressor
White	W	Heat
Orange	O or B	Reverse Valve
Green	GH	Fan High
Purple	GL	Fan Low

Wiring Table - 24V DC

Wire Color	Terminal Letter	Terminal Connection
Black	R	24V
Red	C	Common
Yellow	Y	Compressor
White	W	Heat
Orange	O or B	Reverse Valve
Green	GH	Fan High
Purple	GL	Fan Low

Mounting the thermostat to the wall

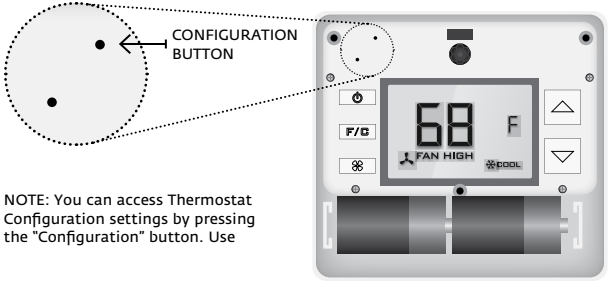
- ➤ Unscrew the fixing screw and remove the thermostat cover;
- ➤ Place the thermostat on the wall in the installation location and mark location for drilling holes for the three (3) mounting screws;
- ➤ Drill three (3) holes in the wall and insert the three (3) wall anchors;
- ➤ Use three (3) screws to securely mount the thermostat to the wall;
- ➤ Insert two (2) C-cell batteries into the thermostat battery compartment;
- ➤ Follow the "Thermostat Configuration" instructions to correctly configure the thermostat.
- ➤ Replace the thermostat cover and screw in the fixing screw;

Thermostat Configuration

Once the thermostat is powered, thermostat configuration settings will appear on the thermostat screen.

In order to properly operate the PTAC unit:

- ➤ Set the thermostat clock;
- ➤ Enter the room number;
- ➤ Configure the equipment settings;
- ➤ Select Energy Savings Preset;



NOTE: You can access Thermostat Configuration settings by pressing the "Configuration" button. Use

- ➤ Use the "Up" and "Down" buttons to change the setting;
- ➤ Press the "Fan" button to advance to the next setting;
- ➤ Press the "F/C" button to advance to the next configuration screen;
- ➤ Press the "Power" button to save and exit configuration;

NOTE: If the thermostat is connected to a network, the equipment settings configured on the thermostat will be ignored and the thermostat settings configured through the network will be applied.

Thermostat Configuration

Setting the thermostat clock

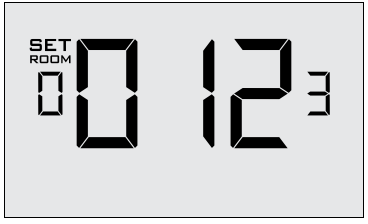
Set the thermostat clock to current time.

- ➤ Use the "Up" and "Down" buttons to set the hours;
- ➤ Press the "Fan" button to set the minutes;
- ➤ Use the "Up" an "Down" buttons to set the minutes;
- ➤ Press the "F/C" button to advance to the next menu;

Setting the clock correctly is crucial for proper operation of the thermostat.

Thermostat Configuration

Entering the room number



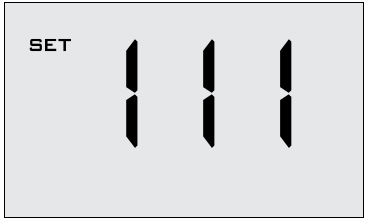
Enter the room number by changing the digits on the screen. Leading zeros "0" preceding other digits will be ignored, i.e. Room number "123" should be entered as "00123".

- ➤ Use the "Up" and "Down" buttons to change the digit;
- ➤ Press the "Fan" button advance to the next digit;
- ➤ Press the "F/C" button to advance to the next menu;

Entering room number correctly is crucial for proper operation of networked thermostats.

Thermostat Configuration

Configuring the Equipment Settings - Compressor Type



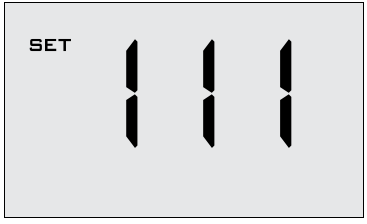
- ➤ Use the "Up" and "Down" buttons to change the compressor type by changing the first digit;

0	No Compressor
1*	Heat Pump
2	Air Conditioner

- ➤ Press the "Fan" button to advance to the next setting;

Thermostat Configuration

Configuring the Equipment Settings - Electric Heat



➤ Use the "Up" and "Down" buttons to change the Electric Heat setting by changing the second digit;

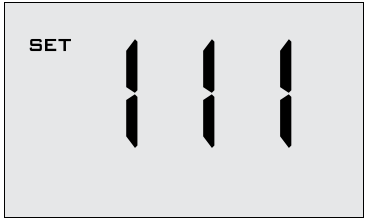
0 No Electric Heat

*1** Electric Heat

➤ Press the "Fan" button to advance to the next setting;

Thermostat Configuration

Configuring the Equipment Settings - Reversing Valve



➤ Use the "Up" and "Down" buttons to change the Reversing Valve setting by changing the third digit;

0 Energizes the PTAC OB valve to COOL;

*1** Energizes the PTAC OB valve to HEAT;

Refer to the PTAC unit documentation to determine the correct OB VALVE setting.

If incorrect OB VALVE Setting is selected, the PTAC unit will turn on the heating when air conditioning is requested and turn on the air conditioning when heating is requested;

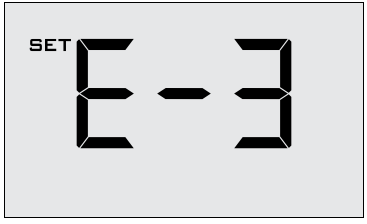
➤ Press the "Fan" button to advance to the next setting;

➤ Press the "F/C" button to advance to the next menu;

NOTE: If the thermostat is connected to a network, the equipment settings configured on the thermostat will be ignored and the thermostat settings configured through the network will be applied.

Thermostat Configuration

Configuring the Energy Saving Settings



➤ Use the "Up" and "Down" buttons to select one of Energy Saving presets;

0 Energy Savings Off - No Temperature Setback;

1 Lowest Energy Savings;

2 Lower Energy Savings;

3* Standard Energy Savings;

4 Higher Energy Savings;

5 Highest Energy Savings - No temperature control if room is unoccupied;

Refer to the APPENDIX 1 for Energy Saving Preset details.

Thermostat Configuration

Testing the thermostat

Following the thermostat configuration, test if the thermostat is controlling the PTAC unit.

➤ Press the "Power" button to save the Thermostat Configuration and start using the thermostat;

➤ Press the "Power" button to turn on the thermostat;

➤ Us the "Up" and "Down" buttons to change the temperature setpoint above and below the current room temperature to test if the thermostat initiates heating and cooling - the PTAC unit should turn heating and air conditioning on and off.

➤ Change the fan speed by touching the "Fan" button to test if the thermostat is controlling the fan speed.

Thermostat Settings

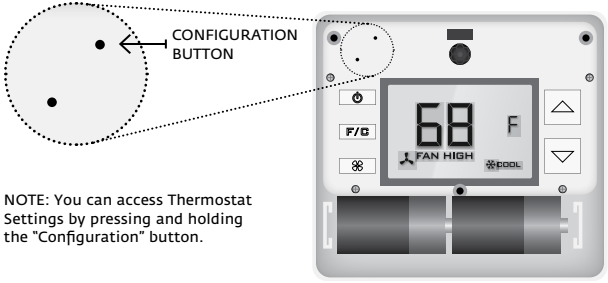
Accessing the Thermostat Settings

Thermostat Settings allow customizing the energy savin settings.

To access the thermostat settings:

➤ Press and hold the "Configuration" button until the first thermostat settings screen ("00") appears on the thermostat.

The thermostat must be turned on to access the thermostat settings.

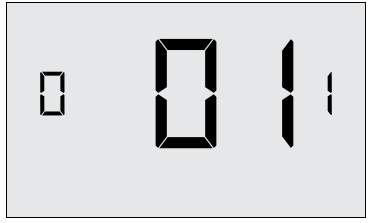


NOTE: You can access Thermostat Settings by pressing and holding the "Configuration" button.

➤ Use the "Up" and "Down" buttons to change the setting;
➤ Press the "F/C" button to advance to the next setting;
➤ Press the "Fan" button to return to the previous setting;
➤ Press the "Power" button to save and exit thermostat settings;

Thermostat Settings

FAN ENERGY SAVINGS



Turn Fan Energy Savings on or off:

00 Fan Energy Savings Off - fan runs continuously unless the thermostat is turned off;

*01** Fan Energy Savings On - fan runs only when there is a demand for heating or air conditioning;

Thermostat Settings

1ST STAGE DIFFERENTIAL - HEAT

02-30 (0.2°F - 3.0°F; 0.5°F*) Select the difference between temperature setpoint and room temperature before 1st STAGE heating is initiated.

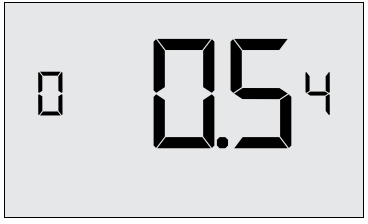
Thermostat Settings

2ND STAGE DIFFERENTIAL - HEAT

10-20 (1.0°F - 2.0°F*) Select the difference between 1st STAGE heating and 2nd STAGE heating initiation.

Thermostat Settings

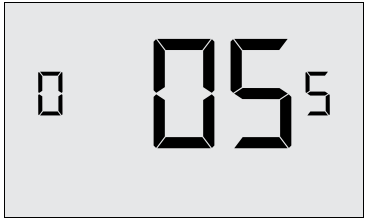
1ST STAGE DIFFERENTIAL - COOL



02-30 (0.2°F - 3.0°F; 0.5°F*) Select the difference between temperature setpoint and room temperature before 1st STAGE cooling is initiated.

Thermostat Settings

INCIDENTAL OCCUPANCY THRESHOLD



00-60 (05*) Select the minimum period of time (in minutes) for which occupancy needs to be detected to enter guest occupancy mode.

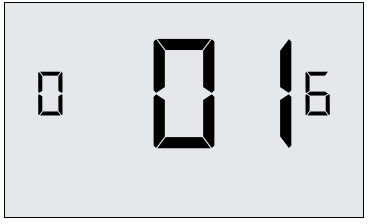
When occupancy is detected, thermostat will switch to occupied mode for a duration of "Incidental Occupancy Threshold" selected here.

If occupancy is detected for a period of time shorter than the "Incidental Occupancy Threshold" selected here, the thermostat will automatically revert to unoccupied mode at the end of the "Incidental Occupancy Threshold" period and continue to observe energy saving functions that were in effect before the room became occupied.

This setting allows ignoring incidental room visits.

Thermostat Settings

NIGHT OCCUPANCY THRESHOLD



00-60 (01*) Select the minimum period of time (in minutes) for which occupancy needs to be detected in order to consider the room occupied during the "Night Occupancy"period.

When occupancy is detected while room is considered unoccupied during the "Night Occupancy" period, the thermostat will instantaneously switch to occupied mode for a duration of "Night Occupancy Threshold" selected here.

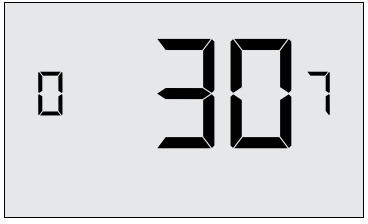
If occupancy is detected for a period of time shorter than the "Night Occupancy Threshold" selected here, the thermostat will automatically revert to unoccupied mode and continue to observe energy saving functions that were in effect before the room became occupied.

If occupancy is detected for a period of time longer than the "Night Occupancy Threshold" selected here, the thermostat will disable the occupancy sensor and consider the room occupied until the end of the "Night Occupancy" period.

This feature ensures that energy saving functions that may affect guest comfort will not come in effect during the "Night Occupancy" period.

Thermostat Settings

FORCED 2ND STAGE HEATING



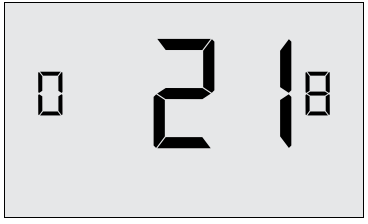
00-60 (30*) Select a number of minutes 1st STAGE heating will run before 2nd STAGE heating is automatically initiated if the temperature setpoint is not reached and the 2nd STAGE heating is not initiated through differential settings.

This feature allows automatically turning on 2nd STAGE heating to avoid excessive compressor use.

Set to *00* to disable the feature.

Thermostat Settings

NIGHT OCCUPANCY START



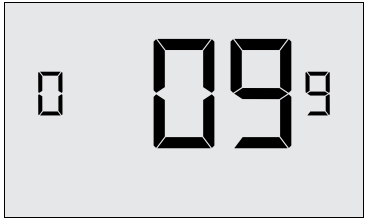
00-23 (21*) Select the start time (in hours - 24-hour clock) for "Night Occupancy"

If occupancy is detected for a period of time longer than the "Night Occupancy Threshold" during "Night Occupancy" period, the thermostat will disable the occupancy sensor and consider the room occupied until the end of the "Night Occupancy" period.

This feature ensures that energy saving functions that may affect guest comfort will not come in effect during the "Night Occupancy" period if room was occupied for a period of time longer than "Night Occupancy Threshold".

Thermostat Settings

NIGHT OCCUPANCY END



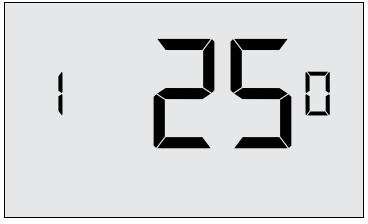
00-23 (09*) Select the end time (in hours - 24-hour clock) for "Night Occupancy"

If occupancy is detected for a period of time longer than the "Night Occupancy Threshold" during "Night Occupancy" period, the thermostat will disable the occupancy sensor and consider the room occupied until the end of the "Night Occupancy" period.

This feature ensures that energy saving functions that may affect guest comfort will not come in effect during the "Night Occupancy" period if room was occupied for a period of time longer than "Night Occupancy Threshold".

Thermostat Settings

TEMPERATURE RECOVERY TIME



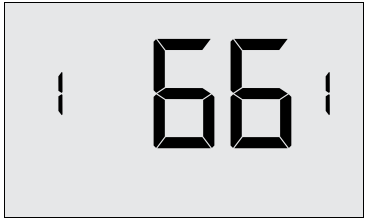
00-60 (25*) Select the maximum time allowed for a PTAC unit to attain temperature as defined by Heat and Cool "Recovery Temperature";

"Temperature Recovery Time" selected here and the actual efficiency of the PTAC unit are used to calculate setback temperatures. Calculated setback temperatures maximize energy savings and at the same time ensure that a comfortable room temperature (defined as Heat and Cool "Recovery Temperature") will be restored within the selected "Temperature Recovery Time".

Setting the "Temperature Recovery Time" to "00", disables temperature recovery. When temperature recovery is disabled, thermostat will use the Minimum and Maximum Setback Temperatures as setback setpoints.

Thermostat Settings

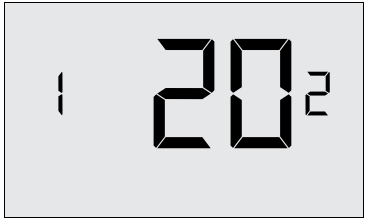
RECOVERY TEMPERATURE - HEAT



62-82 (66°F) Select the room temperature in °F that a PTAC unit will have to attain within the selected "Temperature Recovery Time" when there is a need for heating.

Thermostat Settings

TEMPERATURE SETBACK DELAY - HEAT



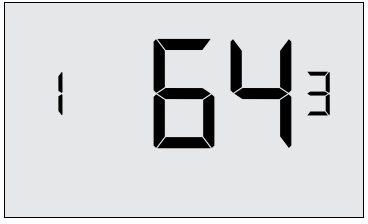
00-120 (20*) Select the time delay (in minutes) before the thermostat will initiate the temperature setback and allow the room temperature to drop to the setback temperature after the room becomes unoccupied.

This feature prevents initiating temperature setback prematurely while the guest is still in the room but in an area where occupancy cannot be detected by the occupancy sensor.

Setting the "Temperature Setback Delay - Heat" to "00", disables the setback in the heat mode. Set to "00" to disable EMS.

Thermostat Settings

MINIMUM SETBACK TEMPERATURE



52-72 (64°F) Select the "Minimum Setback Temperature" in °F.

Setback temperature is calculated by measuring PTAC unit's ability to attain "Recovery Temperature - Heat" within "Temperature Recovery Time".

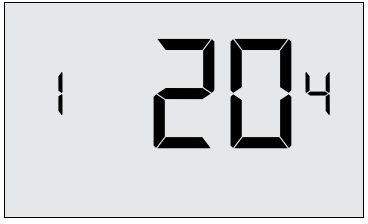
If recovery is disabled ("Temperature Recovery Time" is set to "0") or if setback temperatures have not yet been calculated, the "Minimum Setback Temperature" value will be used as the setback temperature for heating.

If calculated setback temperature for heating is lower than "Minimum Setback Temperature", then the "Minimum Setback Temperature" will be used as setback temperature for heating.

This feature allows defining the minimum temperature in a room when room is unoccupied and the thermostat is in the setback mode.

Thermostat Settings

TEMPERATURE SETBACK DELAY - COOL



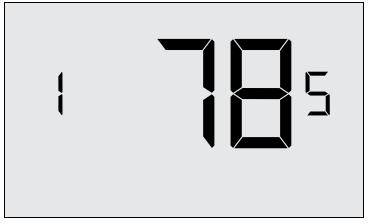
00-120 (20*) Select the time delay (in minutes) before the thermostat will initiate the temperature setback and allow the room temperature to raise to the setback temperature after the room becomes unoccupied

This feature prevents initiating temperature setback prematurely while the guest is still in the room but in an area where occupancy cannot be detected by the occupancy sensor.

Setting the "Temperature Setback Delay - Cool" to "00", disables the setback in the cool mode. Set to "00" to disable EMS.

Thermostat Settings

MAXIMUM SETBACK TEMPERATURE



72-92 (78°F) Select the "Maximum Setback Temperature" in °F.

Setback temperature is calculated by measuring PTAC unit's ability to attain "Recovery Temperature - Cool" within "Temperature Recovery Time".

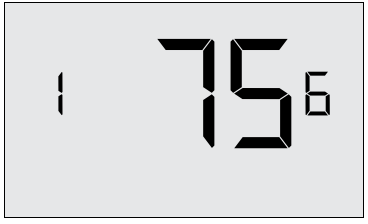
If recovery is disabled ("Temperature Recovery Time" is set to "0") or if setback temperatures have not yet been calculated, the "Maximum Setback Temperature" value will be used as the setback temperature for cooling.

If calculated setback temperature for air conditioning is higher than "Maximum Setback Temperature", then the "Maximum Setback Temperature" will be used as setback temperature for air conditioning.

This feature allows defining the maximum temperature in a room when room is unoccupied and the thermostat is in the setback mode.

Thermostat Settings

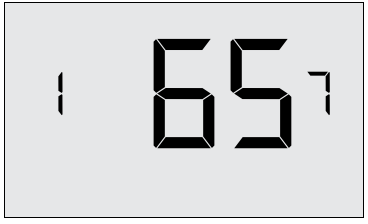
RECOVERY TEMPERATURE - COOL



62-82 (75°F) Select the room temperature in °F that a PTAC unit will have to attain within the selected "Temperature Recovery Time" when there is a need for air conditioning.

Thermostat Settings

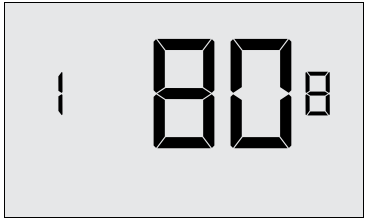
MINIMUM SETPOINT



64-84 (65°F) Select the minimum setpoint in °F that a guest can select.

Thermostat Settings

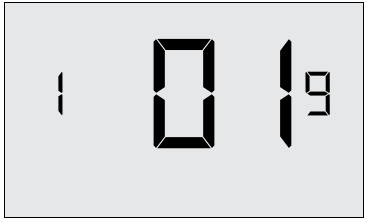
MAXIMUM SETPOINT



60-82 (80°F) Select the maximum setpoint in °F that a guest can select.

Thermostat Settings

AUTO CHANGEOVER SETPOINT OFFSET

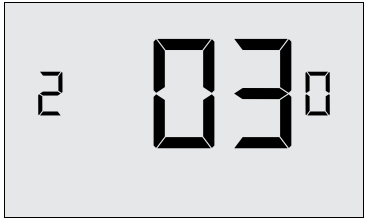


00-04 (01°F*) Select the difference between the guest-selected setpoint and the heat and cool setpoints.

This feature allows to configure the minimum difference between heat and cool setpoints in order to avoid excessive use of the compressor.

Thermostat Settings

SETBACK SETPOINTS / AUTO-RESTORE



00 When room is unoccupied and the thermostat is in the setback mode or turned off, it will NOT maintain the temperature between heat and cool setpoints;

When guest enters the room, the thermostat will be turned off - it will not automatically restore the most recent guest settings;

01 When room is unoccupied and the thermostat is in the setback mode or turned off, it will maintain the temperature between heat and cool setpoints;

When guest enters the room, the thermostat will be turned off - it will not automatically restore the most recent guest settings;

02 When room is unoccupied and the thermostat is in the setback mode or turned off, it will NOT maintain the temperature between heat and cool setpoints;

When guest enters the room, the thermostat will automatically restore the most recent guest settings;

*03** When room is unoccupied and the thermostat is in the setback mode or turned off, it will maintain the temperature between heat and cool setpoints;

When guest enters the room, the thermostat will automatically restore the most recent guest settings.

Set the "Conditional Control / Auto Restore" to "00", to disable EMS.

Troubleshooting

Thermostat is not controlling the PTAC unit.

Verify the status of the red light on the Wireless Control Card;

➤ The red light is off

The control card is not powered. Verify the Wireless Control Card is properly wired to the PTAC unit;

➤ If the red light is blinking with one (1) flash

The Wireless Control Card is powered but it is not connected to the thermostat, turn the thermostat off and on to re-initiate the linking procedure.

➤ The red light is blinking with three (3) flashes.

The Wireless Control Card is connected to the thermostat - check the wireless control card wiring and the thermostat configuration.

Troubleshooting

Error Codes

ERR1 Thermostat Temperature Sensor Hardware Defect

ERR2 Thermostat Radio Hardware Defect

ERR3 Thermostat Radio Software Defect

ERR4 No link with the Wireless Control Card

ERR5 Thermostat Memory Defect

APPENDIX 1

	Level 0	Level 1	Level 2	Level 3	Level 4	Level 5
Fan Operation Mode	Auto	Auto	Auto	Auto	Auto	Auto
Minimum Setpoint	64°F	65°F	66°F	67°F	68°F	68°F
Maximum Setpoint	84°F	82°F	80°F	78°F	76°F	74°F
Deadband	2°F	2°F	2°F	2°F	2°F	2°F
1st Stage Heat	0.5°F	0.5°F	0.5°F	0.5°F	0.5°F	0.5°F
2nd Stage Heat	1°F	1°F	1°F	2°F	2°F	2°F
1st Stage Cool	0.5°F	0.5°F	0.5°F	0.5°F	0.5°F	0.5°F
Heat Boost	30'	30'	30'	30'	30'	30'
Temp Recovery Time	0'	15'	20'	25'	30'	0'
Minimun Setpoint Cool	72°F	73°F	74°F	75°F	76°F	77°F
Minimum Setpoint Heat	69°F	68°F	67°F	66°F	65°F	64°F
Maximum Setpoint Cool	73°F	75°F	77°F	79°F	81°F	92°F
Maximum Setpoint Heat	67°F	66°F	65°F	64°F	63°F	52°F
Setback Delay Heat	0'	30'	25'	20'	15'	10'
Setback Delay Cool	0'	30'	25'	20'	15'	10'
Occupancy Threshold	0'	5'	5'	5'	5'	5'
Night Occupancy Threshold	0'	1'	1'	1'	1'	1'
Night Occupancy Start	0h	19h	20h	21h	22h	23h
Night Occupancy End	0h	11h	10h	9h	8h	7h
Autorestore	Off	On	On	On	On	On
Setback Setpoints	Off	On	On	On	On	Off

Warranty

Hardware
Verdant Environmental Technologies Inc. ("Verdant") warrants the original end user ("Customer") that new Verdant branded products will be free from defects in workmanship and materials, under normal use, for one (1) year from the original purchase date.

Software
Verdant warrants to Customer that the Verdant thermostat software will perform in substantial conformance to its program specifications for a period of one (1) year from the date of the original purchase.

Exclusions
This warranty excludes (1) physical damaVerdant to the surface of the product, including cracks or scratches on the touch-screen or outside casing; (2) damaVerdant caused by misuse, neglect, improper installation, unauthorized attempts to open, repair, or modify the product, or any other cause beyond the ranVerdant of intended use; (3) damaVerdant caused by accident, fire, power changes, other hazard, or Acts of God; or (4) use of the product with any device if such device causes the problem.

Exclusive Remedies
Should a covered defect occur during the warranty period and Customer notifies GE, Customer's sole and exclusive remedy will be, at GE' sole option and expense, to repair or replace the product. Replacement products or parts may be new or reconditioned or a comparable version of the defective item. Verdant warrants any replaced product or part for a period of ninety (90) days from shipment, or through the end of the original warranty, whichever is longer.

Obtaining Warranty Service
Before returning product, customer must contact Verdant for Return Material Authorization ("RMA") number. If it is determined that the product may be defective, Customer will be issued an RMA number and instructions for product return. The RMA is valid for 30 days. Customer must return product to Verdant within the applicable warranty period to obtain warranty service. An unauthorized return, i.e. one for which an RMA number has not been issued or one for which an RMA has expired, will not be accepted. Authorized returns are to be shipped prepaid (including all duties, taxes, and shipping charges) and insured to the address on the RMA in an approved shipping container. All product returns will be subject to incoming inspection. Dated proof of original purchase will be required. Verdant will not be responsible for Customer's memory data contained in, stored on, or integrated with any products returned to Verdant for repair, whether under warranty or not.

Warranty Exclusive
THE FORGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED BY Verdant AND ITS SUPPLIERS.

Disclaimer
NEITHER Verdant NOR ITS SUPPLIERS SHALL BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE OR USE OF THIS PRODUCT, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE) OR ANY OTHER THEORY, EVEN IF Verdant HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. GE' ENTIRE LIABILITY SHALL BE LIMITED TO REPLACEMENT OR REPAIR OF THE PRODUCT.

Technical Specifications

	Thermostat	Wireless Control Card
Case Dimensions (Imperial)	5.125 x 4.6875" x 1.25"	3.875" x 2.125" x 0.75"
Case Dimensions (Metric)	130mm x 119mm x 32mm	98mm x 54mm x 19mm
Screen Dimensions (Imperial)	3.625" x 2.125"	N/A
Screen Dimensions (Metric)	92mm x 54mm	N/A
Operating Voltage	3V DC - 2 "C" Cell Batteries	24V AC (PTAC Unit)
Control Outputs		Fan High (GH)
		Fan Low (GL)
		Compressor (Y)
		Heat Pump (OB)
		Electric Heat (W2)
Occupancy Sensor Beam Width	±85° (170°)	N/A
Wireless Frequency	900MHz	900MHz
Temperature Accuracy	±1°F	N/A
FCC ID	XEYVX	XEYV8ACCC
IC	8410A-VX	8410A-V8ACCC

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

PURSUANT TO PART 15.21 OF THE FCC RULES, ANY CHANGES OR MODIFICATIONS TO THIS EQUIPMENT NOT EXPRESSLY APPROVED BY VERDANT ENVIRONMENTAL TECHNOLOGIES, INC. MAY VOID VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.