

Instruction Guide:

HydroStat Communicating Controller

Installation Instructions

The HydroStat communicating controller is a part of the hydronic heat pump system, and can only be used with Aurora heat pump controls. The HydroStat is designed to work in conjunction with our Aurora control platform and our Geo-Storage tanks because it requires communication of the tank temperature sensor as well as the heat pump temperature sensor. This controller is a human interface and **water tank set point** control device. The controller displays and regulates the water tank temperature, but not the conditioned space. A 2-1/2" x 2-1/2" LCD display and five push button keys serve as the human interface. The five keys are: the up and down keys (▲ and ▼) for changing the selection or temperature, the right and left keys (◀ and ▶) for changing the selection or mode, and the enter key (■) is for accepting and/or saving the selection.

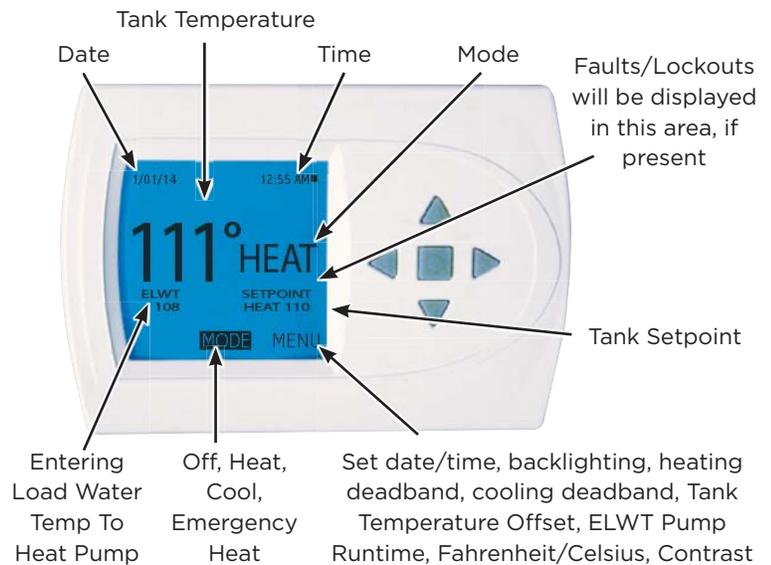
HydroStat Operation

The HydroStat uses two sensor inputs, the thermistor supplied in the Geo-Storage Tank and the thermistor supplied in the entering load water line of the heat pump, to operate load pump sampling and the heat pump. These two sensors must be field wired to the HydroStat. Once a set point temperature is selected it will be monitored by the entering load water temperature sensor (ELWT). The ELWT sensor is factory installed into the entering load water line of the heat pump (both wires will be tied-off for field connection to the HydroStat). The second sensor, the Geo-Storage Tank sensor (TS), will be used to initiate a pump sample. When the Geo-Storage Tank sensor is outside the set point temperature + or - the deadband, based on whether heating or cooling, a pump sample will be initiated. The load pump sampling will operate for a field selectable time of 2, 3 or 4 minutes (default of 3 minutes) to sample the ELWT. At the end of the sampling period the ELWT is measured to determine if the ELWT is outside the set point + or - the deadband. If the ELWT is outside the set point + or - the deadband then the compressor is energized and the load pump continues to operate. If after sampling the ELWT, the temperature is within the set point + or - the deadband then pump sampling is terminated until the Geo-Storage Tank sensor drops another 5°F where sampling is initiated again. The HydroStat controller will also output 24 VDC (HydroStat connection point 'P') to a 24 VDC relay that is factory installed (relay coil field wired) in the heat pump control box to control the load side pump. The heat pump/load pump operation will be terminated when the ELWT reaches set point.

Adjusting Temperature

1. To select a MODE, use the keypad arrows to scroll to MODE. Then, press the enter button on the key pad to enter the operating mode menu.
2. Select the desired mode by scrolling up or down, with the arrows. **Then press the enter button on the keypad to enter into that mode.** The heating mode set point range is 80°F (26.6°C) to 150°F (65.5°C). Heating set points above 130°F (54.4°C) are reserved for OptiHeat products. The cooling setpoint range is 40°F (4.4°C) to 85°F (29.4°C).
3. You are now returned to the Main Screen and Figure 1 is a similar view.
4. To increase the temperature set point, use the arrow up button. To decrease the set point, use the arrow down button. Five (5) seconds after the last button push, the new setpoint is saved.

Main Screen (Figure 1)



Mode Menu

1. From the Main Screen select MODE.
2. Select the operating mode you need and press the enter button ■.
NOTE: If selecting EMERGENCY HEAT, the backlight color will change from blue to red indicating that auxiliary heat is operating instead of the heat pump compressor. Auxiliary/emergency heat is significantly more expensive to operate than the heat pump compressor, and should not be selected unless the heat pump compressor is not operational.

Main Menu

Setting Date And Time

Note: If this HydroStat is installed with an AWL and Time Synchronization is enabled then Date and Time will be updated via the internet and cannot be manually adjusted. If AWL Time Synchronization is disabled or no AWL is installed then follow the steps below for setting Date and Time.

1. From the Main Screen, scroll to MENU and press the enter button ■ on the keypad.
2. Select SET DATE.
3. SET MONTH by using the up and down arrows ▲▼. Then press the enter button ■ on the keypad to save the month.
4. SET DAY by using the up and down arrows ▲▼. Then press the enter button ■ on the keypad to save the day.
5. SET YEAR by using the up and down arrows ▲▼. Then press the enter button ■ on the keypad to save the year.
6. Select SET TIME.
7. SET HOUR by using the up and down arrows ▲▼. Then press the enter button ■ on the keypad to save the hour.
8. SET MINUTE by using the up and down arrows ▲▼. Then press the enter button ■ on the keypad to save the minute.
9. If your area observes daylight savings time, select AUTO DAYLIGHT SAVING; scroll to ON, then press the enter button ■ to save. You will be returned to the SET DATE AND TIME menu. Scroll to SET DATE AND TIME and press the enter button ■ on the keypad.
10. The date and time are now set. You can return to the Main Screen by pressing the left arrow key to return to the previous menu.

Fahrenheit or Celsius

1. From the Main Screen, scroll to MENU and press the enter button ■ on the keypad.
2. Select SCREEN SETTINGS → FAHRENHEIT/CELSIUS.
3. Select which scale you prefer.

12 or 24 Hour Clock

Within this menu option, you can change the time displayed by your thermostat to 24 Hour time (Military Time).

1. From the Main Screen, scroll to MENU and press the center button ■ on the keypad.
2. Select SCREEN SETTINGS → 12 OR 24 HOUR CLOCK
3. Select which time base you prefer.

Contrast Adjustment

You can change the contrast level of your thermostat screen to be displayed to your preference.

1. From the Main Screen, scroll to MENU and press the center button on the keypad.
2. Select SCREEN SETTINGS → CONTRAST
3. Use the up and down arrows ▲▼ to increase or decrease the contrast level.
4. Press the center button to accept the new setting.

Backlight ON Time

The HydroStat has a two color backlight feature. Anytime a button is pressed, the blue backlight stays on for a certain amount of time. A red backlight is visible if you are selecting Emergency Heat mode. You can adjust the amount of time the backlight stays on in the menu options.

1. From the Main Screen, scroll to MENU and press the center button ■ on the keypad.
2. Select SCREEN SETTINGS → BACKLIGHT ON TIME
3. You can change the backlight on time by using the up and down arrows ▼▲. 30, 60, 90, 120, and ON (all the time) are your choices. Press the center button to save the new backlight on time.

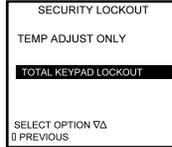
Date Display

With this menu option you can select the format in which the date will be displayed. Use the up and down arrows ▲▼ to select MM/DD/YY or DD/MM/YY. Press the center button ■ to save your selection.

Security Lockout

This thermostat has the option to set security features to lockout everything but the adjustment of the temperature or a total keypad lockout.

- From the Main Menu, scroll to MENU and press the center button ■ on the keypad.
- Select SECURITY LOCKOUT.
- Select whether you want to lockout everything but TEMP ADJUST ONLY or TOTAL KEYPAD LOCKOUT.
- Either selection will bring you to the Enter Pin Number screen.
- Using the up and down arrows ▲▼, select a pin number to lock out the thermostat. The right arrow ► moves you to the next pin digit.
- Once you've entered the 4-digit pin number, press the center button ■ to save the pin. The screen will display LOCKED and return to the main Screen.
- Once you return to the Main Screen, in the upper left of the screen will alternate between LOCKED and the date and time.
- If you selected TEMP ADJUST ONLY, you will only be able to adjust the set point temperature. Any other operation will require the pin number to unlock the thermostat.
- Once unlocked, you'll have to set a pin number again to lockout the thermostat again.
- In the event pin number is lost default is 9999.



Dealer Info

This screen allows the user to view the dealer contact information.

AWL Settings (If Installed)

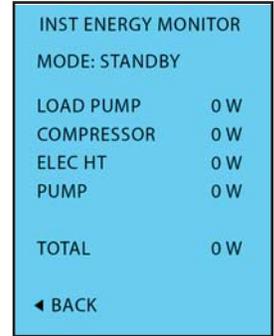
This screen displays the AWL firmware version and provides the current AWL communication status relating to an Aurora WebLink (AWL) device. This screen is available whether an AWL is installed on the system or not.

AWL Time Synchronization - When enabled the AWL will synchronize the HydroStat's date and time with internet time servers. This option by default is disabled. NOTE: setting the proper time zone in the Symphony Portal is necessary for correct operation.

Monitor AWL Status - When enabled, the HydroStat will monitor the AWL's RS485, INTERNET, and SERVER status. The HydroStat will display "AWL Comm Err" when the AWL is not communicating properly with the Aurora Modbus Network, "AWL Internet Err" when the AWL is unable to communicate to the Symphony Servers. This option, by default, is disabled.

Instantaneous Energy Monitoring

Instantaneous Energy Monitoring can be found under the main menu, if the energy monitoring option has been enabled on the Aurora Control System. The screen displays energy usage in real time and the current mode of the heat pump.



Installer Information/Advanced Features Safety Considerations

Improper wiring or installation may damage the controller. Wiring must conform to local and national electrical codes.

Introduction

The controller is a low-voltage communicating controller which maintains Geo Storage tank temperature by controlling the operation of the hydronic heat pump with Aurora controls. Batteries are not required; temperature and mode settings are preserved with the power off. This controller does not regulate temperature in the conditioned space.

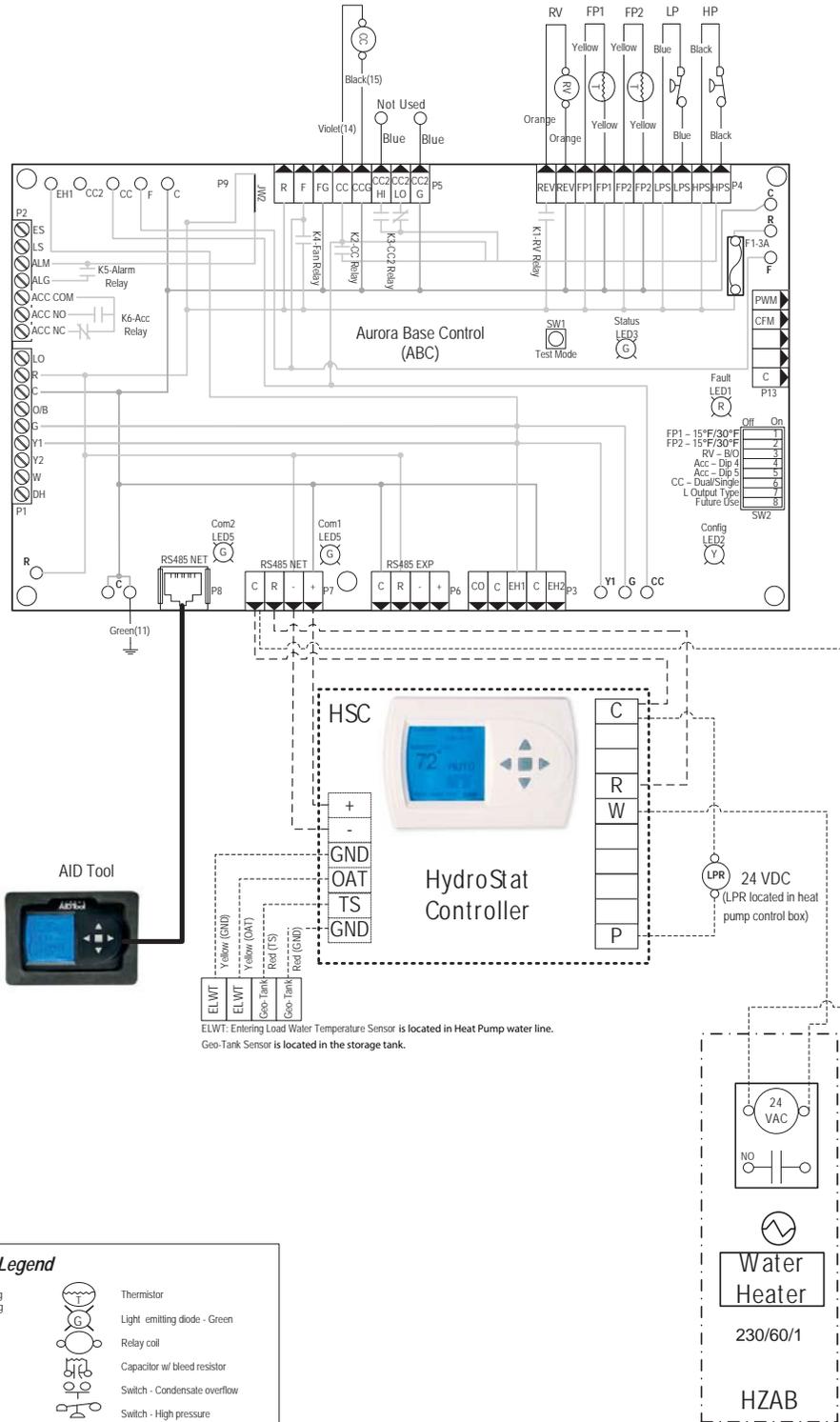
HydroStat Installation

- Turn off all power to unit.
- Separate the front and back pieces of the HydroStat.
- Mount the base of the HydroStat.
- Connect wires to proper terminals per the wiring diagram
- Replace the cover on the base.
- Turn on power to the unit.

The HydroStat is a 4-wire Modbus communicating tank



Wiring Diagrams



Notes

- HydroStat wiring schematic only, refer to schematic supplied with unit for complete wiring information.
- Reversing Valve wires not installed on heating only option
- FP2 is replaced with a resistor on heating only option
- Low voltage wiring is Class 2

Wiring Diagrams cont.

set point controller. This controller requires no batteries. The controller is not a power stealing device and **MUST** have both R and C connected. Minimum 20 AWG wire is recommended.

Connections:

- (C) = 24v common for controller
- (R) = 24v supply for controller
- (+) = Modbus RS485 positive
- (-) = Modbus RS485 negative
- (W) = Emergency heat (HZAB kit optional)

Sensor Connections:

- (OAT) = ELWT sensor located in the entering load waterline inside heat pump cabinet
- (GND) = ELWT sensor located in the entering load waterline inside heat pump cabinet
- (TS) = Geo-Storage Tank sensor located behind lower cover of the tank
- (GND) = Geo-Storage Tank sensor located behind lower cover of the tank

Load Pump Low Voltage Connections:

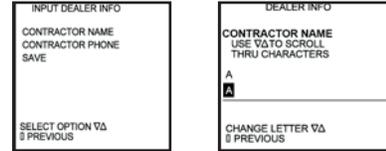
- (P) = Used along with (C) common to energize the coil of relay 'LPR' located inside the heat pump control box for load pump control (note: LPR is a 24vdc coil.)

Installer Settings

NOTE: These options are intended to be used by the installer. End users are not advised to change or modify any of these settings. Doing so may make your equipment stop working properly and/or may void the warranty of the thermostat as well as the equipment connected to the thermostat. Once the HydroStat is added to the Aurora system via the AID Tool enter the installer setting menu at the thermostat. To access the installer setting menu, the mode must be set to OFF. Then, press both the up and down arrows keys at the same time for at least 5 seconds to enter the installer screen.

Input Dealer Info

Contractors are able to input Contractor Name, and Contractor Phone number into these screens. The model and serial number are communicated from the unit. This way, the owner could give this information to the contractor so that he would know what system the owner has prior to the service visit.



1. Scroll to the info you want to enter and press the center button ■.
2. Enter the information by scrolling through the characters using the up & down arrows ▲▼. Once the character you want is set, press the right arrow ► to move to the next space and begin entering another character.
3. Once you've completed filling out the field, press the center button ■ to save the entry and return to the INPUT DEALER INFO screen. Repeat this process for all fields you want saved.
4. Once all fields have been entered, scroll to SAVE and press the center button ■.

Reversing Valve Option

Option of the reversing valve (O output) being on when in cooling or heating. Default is COOLING.

Restore Defaults

This will allow you to revert to the factory default settings.

Display Option

Display Aux Heat - Allows option to display Aux Heat on the main screen when it's energized.

Display Error Code - Allows option of Error Code only or Description with Error Code to be displayed on the main screen during fault/lockout.

Service Information

MENU → SETTINGS → SERVICE INFO

These screens help an installer or contractor to have a good understanding of what problems might be occurring before arriving for service.



WARNING: Before installing HydroStat, turn off all power to unit. There may be more than one power disconnect. Electrical shock can cause personal injury or death.

Tank Temperature Offsets

This option allows calibration (or deliberate miscalibration) of the tank temperature sensor. There are various reasons why the displayed temperature would be adjusted to a higher or lower value. NOTE: Do not adjust for 30 minutes after installation to allow system to stabilize. The selected number is the number of degrees, plus or minus, which will be added to actual temperature. The numbers can range between -5° and +5°. Default values are set to 0° offset.

Heating Deadband

Use the UP ▲ and DOWN ▼ keys to adjust deadband from 5°F to 15°F in one degree increments. Default is 10°F. When tank temperature decreases by the amount of the selected deadband the Load Pump will be energized to sample the tank temperature.

Cooling Deadband

Use the UP ▲ and DOWN ▼ keys to adjust deadband from 5°F to 15°F in one degree increments. Default is 10°F. When tank temperature increases by the amount of the selected deadband the Load Pump will be energized to sample the tank temperature.

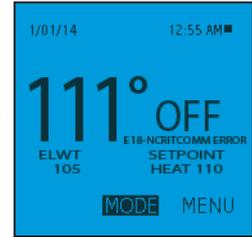
ELWT Pump Runtime

Select the amount of runtime for the Load Pump to operate to sample the tank temperature. Options are 2, 3, and 4 minutes with 3 minutes being the default setting.

Faults

Non-Critical Faults

Non-critical faults are displayed below the temperature on the main screen. These faults will clear themselves if the fault condition corrects itself. Your dealer should be informed when either a critical or non-critical fault occurs.



Lockout/Critical Faults

Critical faults will change the screen to the service needed screen and turn the backlight color to red. The system can be reset by pressing the left arrow key on the thermostat. Some of the faults will clear themselves if the fault condition corrects itself. Your dealer should be informed when either a critical or non-critical fault occurs.



Fault Reference

Fault Code	Fault Description
1	Inputs Error (O and W)
2	High Pressure
3	Low Pressure
4	Freeze Detection (FP2)
5	Freeze Detection (FP1)
7	Condensate Overflow
8	Over/Under Voltage
9	Air Flow/RPM
10	Compressor Monitor
11	FP1 Sensor Error
15	Hot Water Limit
18	Non Critical Communication Error
19	Critical Communication Error

NOTE: For a complete list of fault codes, please reference the unit’s manual.

NOTES

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