

## LHP2 Water Source Heat Pump Loop Controller

SUPERSEDES: New

EFFECTIVE: August 21, 2012

Plant ID: 001-4122

**PURPOSE:** This guide is a consolidation of important LHP2 information that can be used when installing, commissioning and setting up the controller. It is not meant to replace any other LHP2 documents or drawings.

**APPLICATION:** The application is for a hydronic loop that supplies conditioned water to heat pumps. Conditioned water is attained by enabling boilers or a cooling tower.

### IMPORTANT FACTS

- If the fan is not being proved with a differential pressure switch or current switch, then the fan proof input must be jumpered.
- There is a 30-second delay after the fan is turned on before the flow proof input is verified.
- Demands are generated to the controller by associated HPU2s or HPU3s.
- If not using lead/lag pumping configuration, the pump outputs must be connected to the same pump.
- If not using a flow sensor or current switch to prove the flow of the pump, a jumper must be placed across the pump flow input.

### INSTALLER/ELECTRICIAN CHECKLIST

Task	Verified Yes/No
Ensure that the 24VAC power source is properly connected to terminals 38 & 39 and that the polarity is correct.	
Ensure that terminal 40 GND is connected to a known good earth ground.	
Ensure that the 3 sets of DIP switches are properly set in accordance with the drawing below, installation or application documents. The DIP switches can be accessed by removing the controllers cover. Note the black square for each position indicates the direction the switch needs to be placed.	
Ensure that the 4 sets of jumpers are properly set in accordance with the drawing and your application. The jumpers can be accessed by removing the controllers cover.	
Ensure that the proper wire is used for inputs and the communication trunk. Analog input wiring must be 18 AWG TSP (can also use multi-conductor). Taco part # Wir-018 (1 Pair + shield). Communication wiring must be Echelon approved cable 22 AWG TP. Taco part # WIR-022.	
Ensure that the shielded input wiring is properly grounded. Remember the shield must only be connected at the controller end, at the sensor end it should be cut even with the wire jacket and taped.	
Ensure that the sensors required for this application are properly installed and wired to the controller. Refer to sensor and controller installation sheets for reference.	
If the LCI is connected and powered up, press the service pin button on the LHP2 so that the controller is recognized and added to the LCI's database. This can be verified by logging into the LCI. The controller appears as Unitx_LHP2, where x is the order in which all controllers' service pin buttons have been pressed.	

## COMISSIONING THE CONTROLLER

After the LHP2 has had all inputs and outputs properly wired, a point-to-point check should be performed to ensure all terminations have been properly made. Use this checklist to verify all inputs are working correctly and reading properly in the LCI; if a point is not used, simply indicate “not used.”

### Steps required for verifying inputs on the LHP2

To verify the inputs and outputs, login to the LCI and perform the following steps:

1. Press **Controllers** button from the Home screen.
2. Select the LHP2 from the list of controllers.
3. Press **Inputs** and verify that there are realistic temperatures. It is recommended that the temperature sensors be warmed up or cooled down so a response can be seen.
4. To verify the outputs, press **All Settings**.
5. From the list of settings, select the various setpoints and set them so that the tower and loop operation can be verified.
6. Verify the outputs are sequencing on, according to the application and temperatures. The outputs can be viewed in the Outputs screen.
7. Verify the physical equipment has turned on.
8. After verification, set the various setpoints to the desired values for this application.

Inputs	Verified/initials	Outputs	Verified/initials
Basin Water Level		Tower Sump/Makeup Valve	
Boiler Flow Proof		Cooling Tower Damper	
Outside Air Temp		Cooling Tower Fan	
Tower Fan Proof		Tower Sump Pump	
Pump Flow Proof		Circulation Pump 2	
HP Return Water Tmp		Circulation Pump 1	
HP Supply Water Tmp		Boiler 1 Enable	
Return Water Temp		Boiler 2 Enable	
Supply Water Temp		Tower VFD	
		Tower Bypass Valve	

## CONFIGURING THE LHP2 SETTINGS

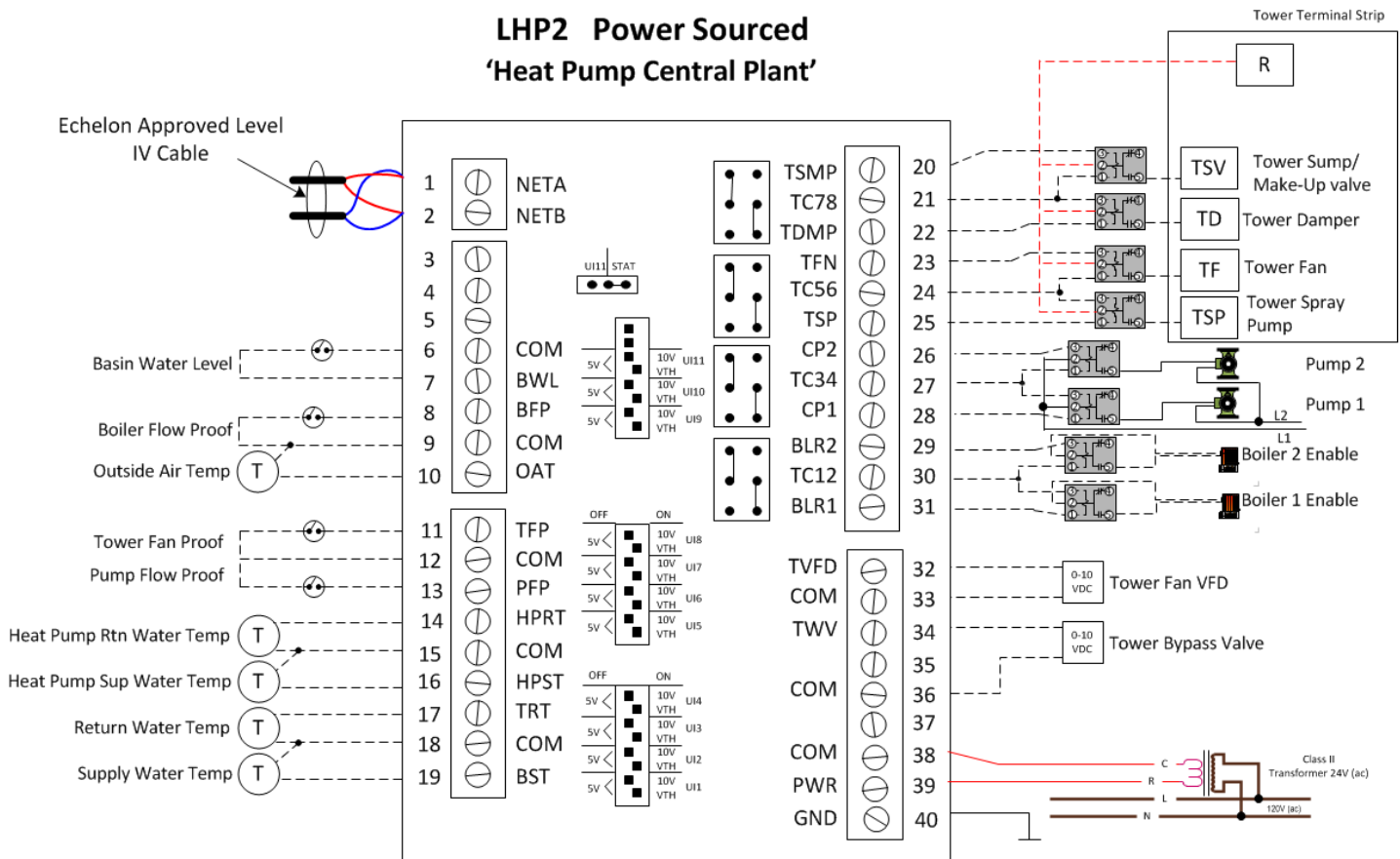
A description of LHP2 settings can be found in the Application Guide on pages 23-26. If a copy of the Application Guide is needed, it can be found at [www.taco-hvac.com](http://www.taco-hvac.com). Once in the web site, select the *Products* tab, and from the drop down list select *iWorx® by Taco Electronic Solutions*. A complete list of links to all documentation is shown on the left side of the web page.

## TROUBLESHOOTING & TECHNICAL TIPS

Problem	Solution
Controller is not running and Status LED is not illuminated.	No power to controller. Verify the voltage on the controller's power connector (24 VAC).
Fan cycles on for 30 seconds then turns off.	The controller requires proper connection of the equipment status for proper operation. Ensure that your equipment status is working and properly wired to the controller.
The fan will not cycle on after the input fault has been corrected.	If the equipment was previously in a equipment status fault condition, the controller must be reset before proper operation can be restored.
How do I reset the controller?	The controller can be reset by the LCI, or you can cycle power to the controller. Refer to the LCI documentation for more information on resetting the controller using the LCI.
The 10K thermistor is reading at either its maximum or minimum.	The input is either shorted or open.
Can my iWorx® system contain multiple LHP2 controllers?	No, the system can only recognize one.
Thermistor readings fluctuate rapidly, sometimes by several degrees.	The controller is not properly grounded. The controller's ground (GND) pin (T40) must be connected to earth ground. Also ensure that the controller's digital inputs are dry contacts and that no voltage is being applied or switched to the inputs.
How do I associate my other controllers with the Water Source Heat Pump Loop Controller?	Use the Water Source Heat Pump Loop Controller's grouping mechanism, specifically <b>Members</b> on the Water Source Heat Pump Loop Controller <i>HVAC Setup</i> screen of the LCI. Only HPU controllers may be associated with the Water Source Heat Pump Loop Controller.
What is <b>Save</b> for in the <b>Members</b> page, and when do I press it?	This button stores network information into the Water Source Heat Pump Loop Controller about the controllers in its group. Press this button when you have made any changes to the member grouping.
What controllers can be part of the LHP2's group?	Only HPU2 controllers can be part of the LHP2's group and demand cooling or heating from it.
Several controllers are requesting cooling or heating, but the circulation pump has not been enabled.	The "Zone Limit" setting may be set higher than the number of zones that are currently requesting cooling or heating. The circulation pump will not be enabled until the number of zones requesting cooling or heating is greater than zone limit. If the number of controllers requesting cooling or heating exceeds the zone limit but the circulation pump is still not enabled, the outside air temperature may be less than the "Outdoor Air Temp low limit." See the outside air temperature on LCI input screen.
I only have one circulation pump and/or boiler; how can I disable lead/lag operation?	The lead/lag function is built into the controller and cannot be disabled. However, you can wire both circulation pump outputs in parallel from the controller to the existing pump and the system will operate normally. Do the same for the boiler if the system only has one boiler.
The cooling tower staging does not follow the setpoints that are defined.	Verify that the tower bypass setpoint is lower than the cooling tower setpoints. Remember, staging will not occur until the tower bypass valve has reached the 100% open position. If staging is turning off before the defined OFF setpoints, the tower bypass valve is most likely not fully open.
Does the LHP2 require a reset if a single pump fails?	No, only a dual pump failure requires a reset.
Under what conditions does the LHP2 require a reset for normal operation?	There are four conditions that require a reset: <ul style="list-style-type: none"> <li>– Dual pump failure</li> <li>– Tower fan failure</li> <li>– Dual boiler failure</li> <li>– OAT sensor failure</li> </ul>

# TYPICAL LHP2 WIRING

## LHP2 Power Sourced 'Heat Pump Central Plant'

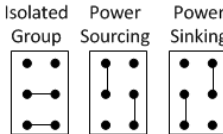


Note: All equipment proof inputs must be populated. Jump out if no device is connected

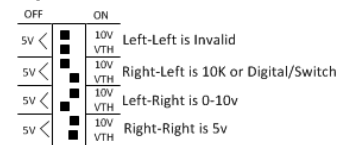
### Symbols

- 10 K ohm Precon Type III thermistor
- 24VAC pilot relay or contactor coil
- 0-10 VDC signal

### Output Jumper Positions



### Dip Switch Positions



## CONTROLS MADE EASY®

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