# Two-Stage

# Thermostat Set-Up Guidelines for All-Electric Heat Pumps: Supplement to ecobee<sub>3</sub> Installation Materials

from the North Carolina Electric Cooperatives

The following Advanced Energy recommendations are based on the existence of a Heat Pump system and thermostat operating per manufacturers' instructions prior to the ecobee<sub>3</sub> thermostat installation.

Advanced Energy considers a Two-Stage heat pump to have two outdoor compressor stages (speeds). This is more common on newer, high-efficiency equipment.

As noted in the ecobee<sub>3</sub> installation guide, the installation and set-up of this thermostat should be performed by a licensed HVAC contractor who is knowledgeable in the operations of your HVAC system.

When starting up the ecobee<sub>3</sub>, this should be the first prompt you see.  $\checkmark$  Select Rh Only and  $\checkmark$  select Next.

We	have detection have detection have detected to be a constructed to be constructed to c	ted a wire the Rh terminal.	
Sel	ect which te as connected	rminals have d.	
	Rh Only	Rc and Rh	
		Next	

Select RH Only when your HVAC system has only one transformer to control it. If your system has two transformers installed, you should select Rc and Rh

Make sure the following icons are highlighted on the screen: G Y1 W1 O/B Y2 then  $\sqrt{\text{select}}$  Continue.



Verify that your system is wired to maximize its capabilities and work best with the new thermostat.

You will be prompted with the question: "Do you have one of these accessories installed?" If none are present, √select No and then √select Next to choose your temperature preference setting.

	Accessory	confirm	ation	
	Do you have o accessoriës in - Humidifier - Dehumidifier - Ventilator	ne of the stalled?		
	Yes		No	
	A No.	-		
1000	Back		Next	
	ec	obee		

Verify that your system is wired to maximize its capabilities and work best with the new thermostat. If accessories are installed, identify what is installed and reference the ecobee<sub>3</sub> installation documents to promote optimal performance.

After selecting your temperature preference, you will be directed to the Equipment configuration screen.  $\sqrt{\text{Select 2 stage heat pump.}}$ 



These are the recommended settings for a two-stage all electric heat pump. If you have a single-stage all electric heat pump present, see that guidebook.

# $\checkmark$ Select Air to Air then $\checkmark$ select Next.

	i stage heat	pump	
	What type of h have?		
	Air to Air	Geothermal	
1000	Back	Next	
	eco	obee	

These are the recommended settings for a two-stage all electric air to air heat pump. See ecobee<sub>3</sub> installation documents if any other source of heating (e.g. water, propane, natural gas, etc.) is present.

For O/B Reversing Valve:

for Rheem and Ruud Equipment Only, ✓ Select On Heat

-or-

for all other Equipment,  $\sqrt{\text{Select On Cool then }\sqrt{\text{select Next.}}}$ 

	1 stage heat p	ump	
	How is your O/B energized?		
	On Cool	On Heat	
(Constant)	Back	Next	
	eco	bee	

This will maximize your system's capabilities with the new thermostat.

 $\checkmark$ Select 1 stage auxiliary heating.



Auxiliary heating is a less efficient heating mode your air source heat pump may use at lower outdoor temperatures.

# $\checkmark$ Select Furnace then $\checkmark$ select Next.



This is to tell the thermostat that the heat source for your home also comes from the same components as your cooling.

 $\checkmark$  Select Fan Thermostat (default).  $\checkmark$  Select Thermostat then  $\checkmark$  select Next.

	Fan Thermostat (	default)	
	Do you want th controlled by t your HVAC equ	e fan to be he thermostat or ipment?	
	Thermostat	HVAC	
10.00	Deals	Novt	

Verify that your system is wired to maximize its capabilities and work best with the new thermostat.

Your new ecobee<sub>3</sub> thermostat has been configured to work with your unique HVAC system. Select the following settings for maximum comfort and efficiency. Then once you are back on the home screen,  $\checkmark$  select  $\equiv$ to be directed to the main menu. Scroll down to Settings and  $\checkmark$  select Installation settings.

< Settings		۱
Date & time	<pre>&gt;</pre>	
Preferences	>	
<b>Wi-Fi</b> No Network Selected	>	
Installation settings Advanced Options	>	
Access control Disabled	>	
		/
	<ul> <li>Settings</li> <li>Date &amp; time</li> <li>Preferences</li> <li>Wi-Fi No Network Selected</li> <li>Installation settings Advanced Options</li> <li>Access control Disabled</li> </ul>	Settings       Date & time       Preferences       Wi-Fi       No Network Selected       Installation settings       Advanced Options       Access control       Disabled

# $\checkmark$ Select Equipment then $\checkmark$ select Next.



The following recommended installation settings will help optimize the comfort and efficiency from your equipment

✓ Select Heat Pump.

✓ Select Aux Heat Simultaneous Operation; ✓ select Enable.



This is the recommended setting to maximize efficiency of your air source heat pump before less efficient strip heat comes on to maintain comfort at lower temps.

✓ Select the back arrow "<" two times to get back to the Installation setting screen.

√Select Thresholds.

< Installation settings		
Equipment	>	
Thresholds	>	
Test equipment	>	
ecobee		

✓ Select Auto Heat/Cool.

If you would like your HVAC system to **automatically** switch between heating and cooling,  $\checkmark$  select Enable. -or-

If you would like to **manually** change the system from heating to cooling,  $\checkmark$  select Disable.



✓ Select Compressor Min Cycle Off Time. ✓ Select 900.

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Cor Of 900	mpress f Time ) second	or Min (	Cycle	~	
The con bet	amount npressor ween cy	of time t remains cles:	he off		
00	800	900			
Co Ou	mpréss tdoor T	or Min empera	ature	~	

This is a recommended setting to save energy and increase equipment durability. After the unit cycles off, it will not come back on for 15 minutes. ✓ Select Compressor Min Outdoor Temperature. ✓ Select Disabled.

C Thresholds	
00 800 900	
Compressor Min	
Disabled	
Disabled O°F	
AC Overcool Max 🗸	
Disabled	
 Disabled	

To maximize efficiency of your air source heat pump before less efficient strip heat comes on to maintain comfort at lower temperatures.

 $\checkmark$ Select Aux Heat Max Outdoor Temperature.  $\checkmark$ Select between 32-40 then  $\checkmark$ select Save.



This temperature range is recommended to maximize efficiency of air source heat pump before less efficient strip heat comes on to maintain comfort at lower temperatures

# $\checkmark$ Select Heat Differential Temperature. $\checkmark$ Select 1.0°F.



A 71°F set point will turn the heat on at 70°F. Selecting 0.5°F may increase energy usage and reduce durability of system through more frequent on-off cycles, as compared to 1.0°F or higher.

✓ Select Heat Dissipation Time. ✓ Select 60.



Sixty seconds will maximize the distribution of remaining heat in the system, but not circulate cool air if set for longer.

# ✓ Select Aux Min On Time. ✓ Select 1 min.



This setting regulates the electric heat run time which maximizes energy savings and increases durability of the system.

# √Select Cool Differential Temperature. √Select 1.0°F.



A 74°F set point will turn the cooling on at 75°F. Selecting 0.5°F may increase energy usage and reduce durability of system through more frequent on-off cycles, as compared to 1.0°F or higher.

# ✓ Select Cool Dissipation Time. ✓ Select 0.



This maximizes the amount of humidity removed during cooling mode.

# ✓ Select Compressor Min On Time. ✓ Select 3 min.



This maximize energy savings and increases durability of the system.

# ✓ Select Compressor Reverse Staging. ✓ Select On.

	C Thresholds		
	Compressor Min On Time 1min	~	
	Compressor Reverse Staging On	^	
	On Off		
	Compressor Stage 2 Temperature Delta Invalid	~	
france.		~	
	ecobee		

√Select Compressor Stage 2 Temperature Delta. √Select 3°F.

Thresholds		
On Staging		
Compressor Stage 2 Temperature Delta 3°F	^	
The minimum number of de from the desired temperat before engaging the 2nd s of the compressor.		
1°F 2°F 3°F 4°F		
Compréssor Stage 1 Max Runtime	~	

# $\checkmark$ Select Compressor to Aux Temperature Delta. $\checkmark$ Select 6°F.

	C Thresholds		
	Max Runtime	~	
	Compressor to Aux Temperature Delta 6°F The minimum number of degr from the desired temperatur	rees. e	
	tore engaging the auxiliar tore 5°F 6°F 7°F	8°F	
1	Compréssor to Aux Runtime Not Used	$\sim$	

This is to maximize efficiency of your air source heat pump before less efficient strip heat comes on to maintain comfort at lower temps.

✓ Select Aux Reverse Staging. ✓ Select Off.

C Thresholds	
Aux Reverse Staging	~
On Off	
Temperature Correction +0°F	~
Humidity Correction	~
Thermal Protect	~

This is to maximize efficiency of your air source heat pump when less efficient strip heat comes on to maintain comfort at lower temps.

# $\checkmark$ Select Temperature Correction. $\checkmark$ Select +0°F.

	K Thresholds	
	Temperature Correction +0°F	
	Adjust the temperature display by this value:	
	1°F -0.5°F +0°F +0.5°F →	-1°I
	Humidity Correction	/
100	Thermal Protect	~ /
	ecobee	

Leaving this setting at 0°F does not adjust what temperature the thermostat displays versus what it actually is. If you want to adjust the temperature displayed, you can do so with this setting.

✓ Select Humidity Correction. ✓ Select +0%.



Leaving this setting at 0% does not adjust what humidity the thermostat displays versus what it actually is.

# √Select Thermal Protect. √Select 10°F.



This maximizes system efficiency and minimizes a situation where a poorly located sensor may throw off thermostat functionality.

When complete, √select the "<" symbol in the upper left corner at which time you will get a Warning message that states, "Compressor min Outdoor Temperature for air to air Heat Pumps should not be disabled. ecobee<sub>3</sub> recommends 35°F." The manufacturer of your HVAC equipment does not recommend disabling the outdoor compressor nor does ACCA Manual H. √Select Cancel to acknowledge this warning, save your settings and get back to the installation setting menu.



This maximizes system efficiency and minimizes a situation where a poorly located sensor may throw off thermostat functionality.



