Nest Pro

Nest Learning Thermostat (4th Gen)

Pro Installation and Configuration Guide

Getting started with the Nest Learning Thermostat

If you're referencing this document, you are probably familiar with the Nest Learning Thermostat. However, your customer may not be, or you may be new to a company that offers Nest thermostats. See below for important links and information to help you get a full understanding of the Nest Learning Thermostat.

Beginner's guide to Nest thermostats	Nest Pro support articles
Nest thermostat settings menu	Nest thermostat information menu
How to tell which Nest thermostat you have	What you'll see on a Nest thermostat
Manage homes and products in the Nest app	Troubleshoot Nest thermostat help codes
Learn about the Nest Power Connector	Learn about Nest Learning Thermostat USB Port

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How to Use This Document

What is this document?

This installation and configuration guide includes additional information that a professional installer needs to install and service the Nest Learning Thermostat (4th generation). It's not fully comprehensive, but it covers the most necessary information. It also includes links and resources to additional information.

Who is this document for?

This document is intended for any individual working with Nest thermostats in a professional capacity, with a primary focus on HVAC professionals. However, it may also be useful to professionals in other industries, such as builders, home security, custom integration, energy efficiency, and electrical. This document provides valuable information for a wide range of roles within these industries, including technicians, installers, sales representatives, managers, engineers, architects, support personnel, operations staff, and their respective wholesale partners. However, when we use the term "pro" in this document, we are specifically referring to HVAC technicians or installers.

Tips to get the most out of this document

1. Some section headers are links to Google support pages with more detailed information about the feature or function.
2. The table of contents contains hyperlinks to the pages and sections within the document. Use these to quickly navigate to the section with information you are looking for.
3. There is a glossary at the end of this document that contains links to the pages where these terms are found within the document, as well as links to Google support articles about that term.
4. Save this document as a PDF on your phone or tablet so you can reference it when you need it, and share it with your colleagues and partners who work with Nest thermostats.

Nest Pro Program

What is the Nest Pro Program?

The Nest Pro program is designed to provide great benefits for professional installers, like special pricing, pro-exclusive extended warranties, Nest Pro Rewards, and pro-specific support. A Nest Pro ID, available to registered Nest Pros, also unlocks the HVAC System Health Monitor feature, which helps Nest Pros stay connected to their customers all year round.

What is a Nest Pro ID?

Your Nest Pro ID is your company's unique 6-digit ID. Find it at the top right corner of your Nest Pro dashboard. And make sure your technicians know your Nest Pro ID and enter in on every install to unlock big benefits for you and your customers.

HVAC System Health Monitoring, built into all Nest thermostats, looks out for system issues and lets customers know when something might be wrong. If your technicians enter your Nest Pro ID at each installation, customers will get a System Health Monitoring alert with your company's contact info. So it's easy for them to get in touch when they need you most.

Important: If you haven't already, select "Receive System Health monitoring repair requests from customers" on your settings page to opt in to have your company's contact information surfaced on the alerts.

Other Nest Pro Benefits

Enter your Nest Pro ID at each installation to automatically earn points for each thermostat you install.
For non-thermostat devices, just submit a claim from your Nest Pro dashboard to earn your points. Use reward points to invest in your business with more Nest products to boost your bottom line. Or treat yourself or your employees to name-brand merchandise, theme park tickets, fun experiences, and so much more.

Enter your Nest Pro ID at installation to unlock extended warranties on all Nest thermostats, only available on devices installed by Nest Pros.

How to sign up

Signing up to be a Nest Pro is simple and takes very little time. Visit g.co/nestpro to become a Nest Pro and unlock key tools, tips, training, and more for your business.

Nest Pro Warranty Details

Nest Pro Warranty Eligibility

When a Nest thermostat is purchased from and installed by a registered Nest Pro, it includes an extended pro warranty. The pro-exclusive warranty adds 3 years of additional coverage, totaling 5 years of warranty coverage.

Entering the Pro ID during the installation will activate the customer's extended warranty when the following criteria has been met:

- The thermostat was sold and installed by a registered Nest Pro.
- The Nest Pro ID was inputted during the setup installation.
- The thermostat is connected to Wi-Fi and added to the customer's Google Home or Nest account.

Nest Pro Warranty Process

The customer has the option to submit a warranty claim directly with Google online using the Warranty Checker.

This will require shipping the unit to Google and may leave the customer without a thermostat without a temporary solution. The warranty process may be different depending on the issue reported.

A Nest Pro can also replace Nest thermostats according to the warranty process specific to the wholesaler where they purchased the device. This allows the Nest Pro to replace the thermostat, return the affected device to their wholesaler, and receive credit.

Please reach out to your place of purchase for their specific warranty process.

HVAC System Health Monitor

What is HVAC System Health Monitor?

HVAC System Health Monitor is a feature of Nest thermostats that can help homeowners identify potential issues with eligible heating, ventilation, and air conditioning (HVAC) systems. If a potential issue is detected, Google Nest will send the homeowner an alert via email and/or a Google Home app notification.

How HVAC System Health Monitor Works

Sometimes, HVAC systems show warning signs that they are having issues. For example, if it takes longer than usual to cool a home, there might be a problem with the cooling system (AC). Google Nest may send the homeowner an email alert or a Google Home app notification when if a warning sign is detected.

The alert email or notification will tell the homeowner what their Nest thermostat noticed and which system (heating or cooling) may be affected. If a Pro ID was entered during the setup of a Nest thermostat, the homeowner will also be shown contact information for the contractor company who installed it.

Important: HVAC System Health Monitor is not meant to replace the diagnosis of a qualified HVAC professional. We make no endorsement, representation, or warranty about the health of the HVAC system. There may still be other issues with the HVAC system that may not trigger an alert to the homeowner.

How do you enable HVAC System Health Monitor?

HVAC System Health Monitor will only include the contractor's contact information if they are a registered Nest Pro. A person with legal signing authority for the contractor company can register for a Pro ID at g.co/nestpro. During enrollment, the legal signing authority must opt in to have the company's info surface to the customer. Post enrollment, the administrator of the Nest Pro account can also opt in by adjusting the Settings under "System Health Monitor Repair Requests."

HVAC System Health Monitor alerts will surface the information of a contractor company if they are enrolled in HVAC System Health Monitor and a Pro ID is entered on the thermostat.

If a Google account is used, the homeowner will always get urgent alert notifications, but they can opt out of urgent email alerts, early warning emails, or Google Home app notifications by turning them off within the app.

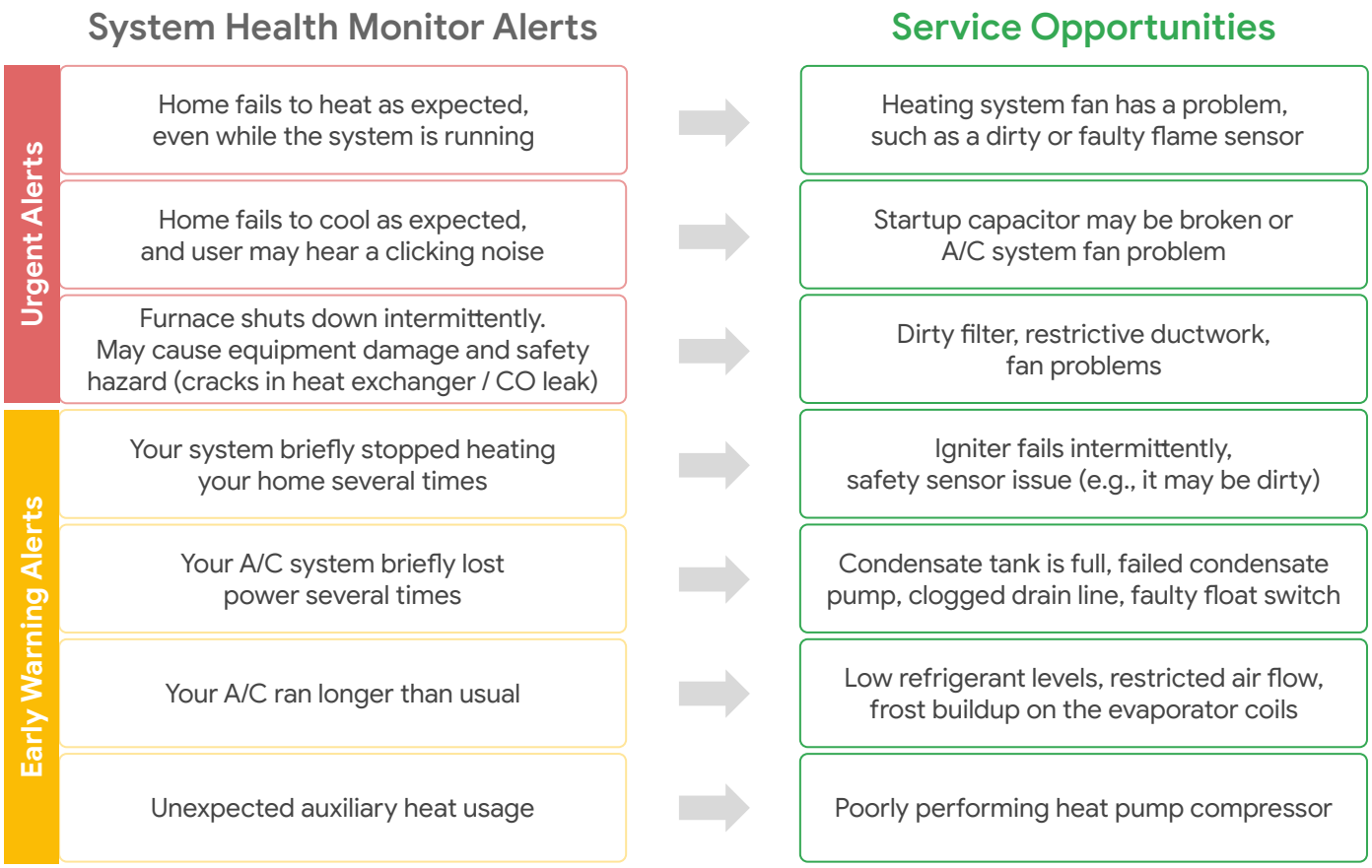
If a homeowner uses a non-migrated Nest Account, they can only get urgent or early warning emails. The homeowner can turn off early warning emails by opting out in the footer of those emails.

However, homeowners cannot opt out of HVAC urgent alerts since they raise serious system issues that they need to be aware of.

Types of Alerts

If a Nest thermostat detects a potential issue that may require immediate attention, Google Nest will send the homeowner an urgent alert as soon as a problem is detected. For example, if a homeowner turns on their heating system but their home became colder, this may indicate a severe HVAC problem.

If Google Nest detects an issue that should be fixed soon, an early warning alert will be sent to the homeowner within a week of detecting the problem. For example, if a homeowner's A/C is running longer than usual, this may indicate that it needs to be serviced.



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Key Features and Functionality

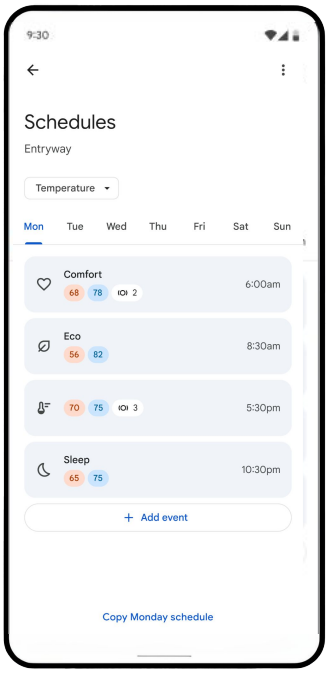
Temperature Schedule

A user can create or adjust the temperature schedule of the thermostat in the Google Home app.

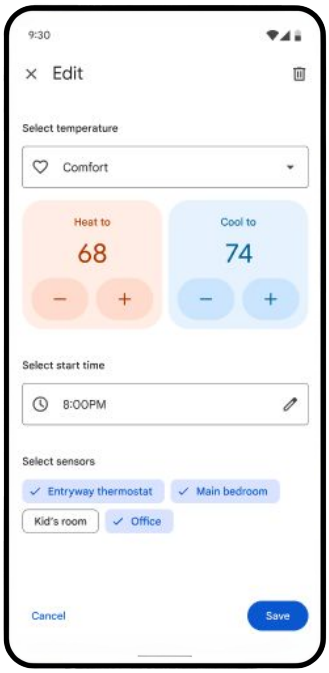
Temperature presets let you customize temperatures for when you're home, away, sleeping, and more.
You can add a preset to the schedule or adjust the temperatures of each preset. You can also set the thermostat to “hold” a specific preset or current custom setpoint or preset for an extended period of time.

There are three ready-made presets that the thermostat will start with; Comfort, Sleep, and Eco. The user can adjust the temperatures of these presets or add their own custom presets when they add the thermostat to the Google Home app.

If a user installs a Nest Temperature Sensor using the Google Home app, they will also be given the option to schedule when the thermostat observes a particular sensor.



Main Schedule page



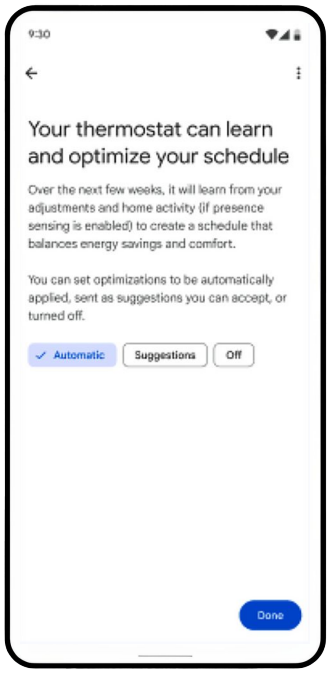
Editing the schedule

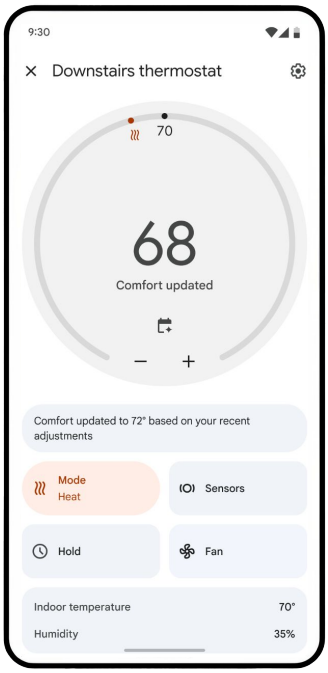
Smart Schedule

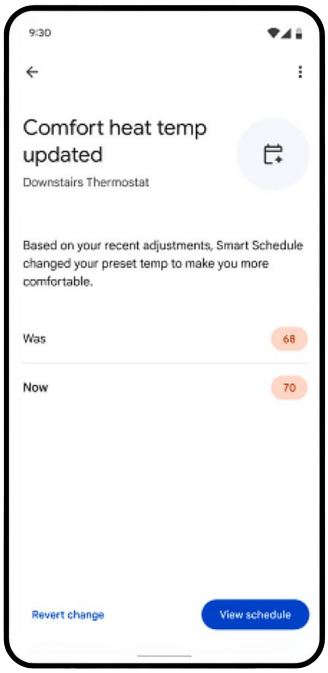
Smart Schedule learns from users' temperature adjustments and presence patterns over time to create a customized temperature schedule. The Nest Learning Thermostat (4th gen) will suggest changes to users' schedules to optimize them for comfort and energy savings. Users can allow the Nest Learning Thermostat (4th gen) to **automatically apply** these changes, **review first,** then accept or reject suggestions, or **disable Smart Schedule** completely. Smart Schedule learns the most during the first week of use, but will never stop learning. Users will always be notified when the thermostat has made a change to their schedule, even if "Automatically Apply" has been chosen. The thermostat will also visually indicate on the thermostat and in the app when it is "learning" from a user's manual temperature adjustment. The user can always check the History tab in the Google Home app to see when a change has been made. A user can reset smart schedule learning if their habits or schedules have changed significantly, and the thermostat will begin to learn their preferences from that point on.

Smart Schedule will only adjust the setpoints or scheduled time of the ready-made presets: Comfort, Sleep, and Eco. In the future we may add the capability to adjust custom presets, too.

Notes:
There are other features mentioned in this document that could change when the thermostat is running or not running. Any Google Home Member can accept a Smart Schedule suggestion. Make sure notifications are enabled for the Google Home App so the user gets notified of any changes.





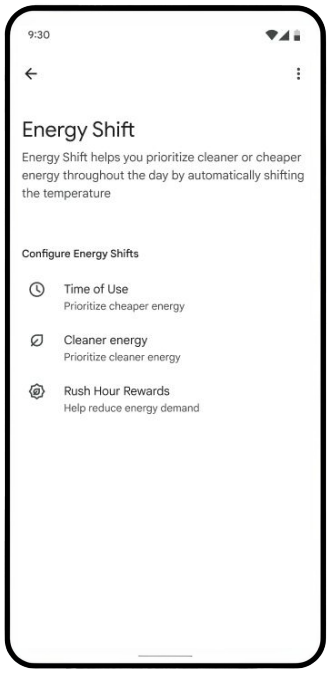


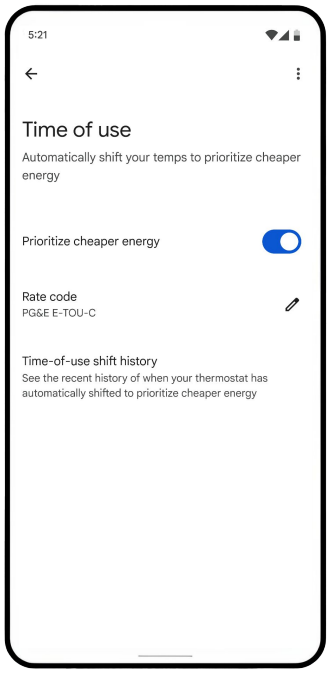
Energy Shift - Time of Use

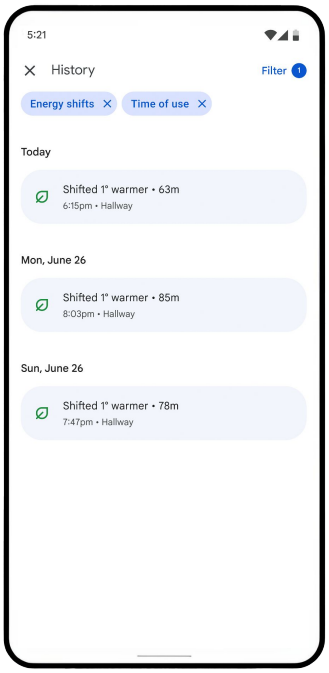
Energy Shift is a combination of features that can allow the thermostat to integrate with energy savings initiatives from their local utility provider. There are three main features combined under Energy Shift – Time Of Use, Cleaner Energy, and Rush Hour Rewards.

“Time of Use” allows a user to prioritize using cheaper energy if their utility provider offers Time of Use rates or billing. The user can add a rate code from their utility directly in the Google Home app, which will inform the thermostat of when the price of energy is more expensive for the user. When enabled, the thermostat can adjust when the system runs to avoid using energy when it is more expensive where possible. The user will be notified of any adjustments to their schedule or setpoints, and they can also see a summary of adjustments in the Time of Use page of the Google Home App.

If a user does not have a Time of Use rate available from their utility, they can still set a manual “Peak Period” for their thermostat to reference. This could be useful for customers with solar or battery systems, or for a utility that hasn’t integrated with Google services yet, but still has a Time of Use rate available to customers.







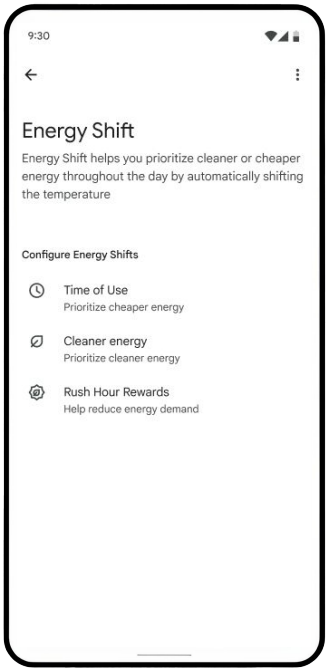
Energy Shift - Prioritize Cleaner Energy and Rush Hour Rewards

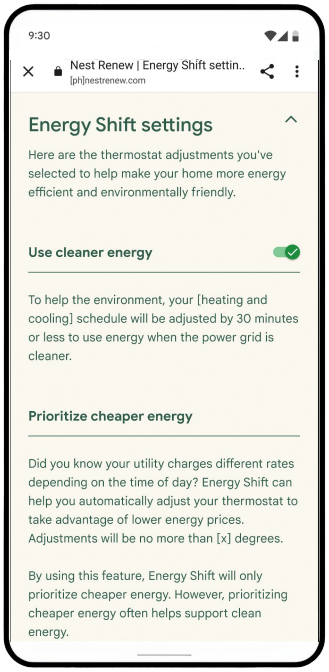
Energy Shift is a combination of features that can allow the thermostat to integrate with Energy Savings initiatives from their local utility provider. There are three main features combined under Energy Shift – Time Of Use, Cleaner Energy, and Rush Hour Rewards.

The “Prioritize Cleaner Energy” feature is available to customers whose utility integrates with the Renew Home services and provides real-time information about the source of power generation. When enabled, the thermostat can adjust the schedule by 30 minutes to prioritize running the HVAC system when the power available on the grid is produced by “cleaner” energy sources like solar and wind.

Rush Hour Rewards is a program available through certain utility companies that allow a user to enroll their thermostat with the utility and give permission to adjust their heating or cooling setpoints if the grid is experiencing a “rush hour” from abnormally high energy consumption. Users who enroll in this program are usually given a rebate or bill credit of some sort, although each utility partner is different. Check out this link for more information.

Note: Users are never locked out from controlling their thermostat and they can always change their temperatures when enrolled in any utility program through a Nest thermostat.

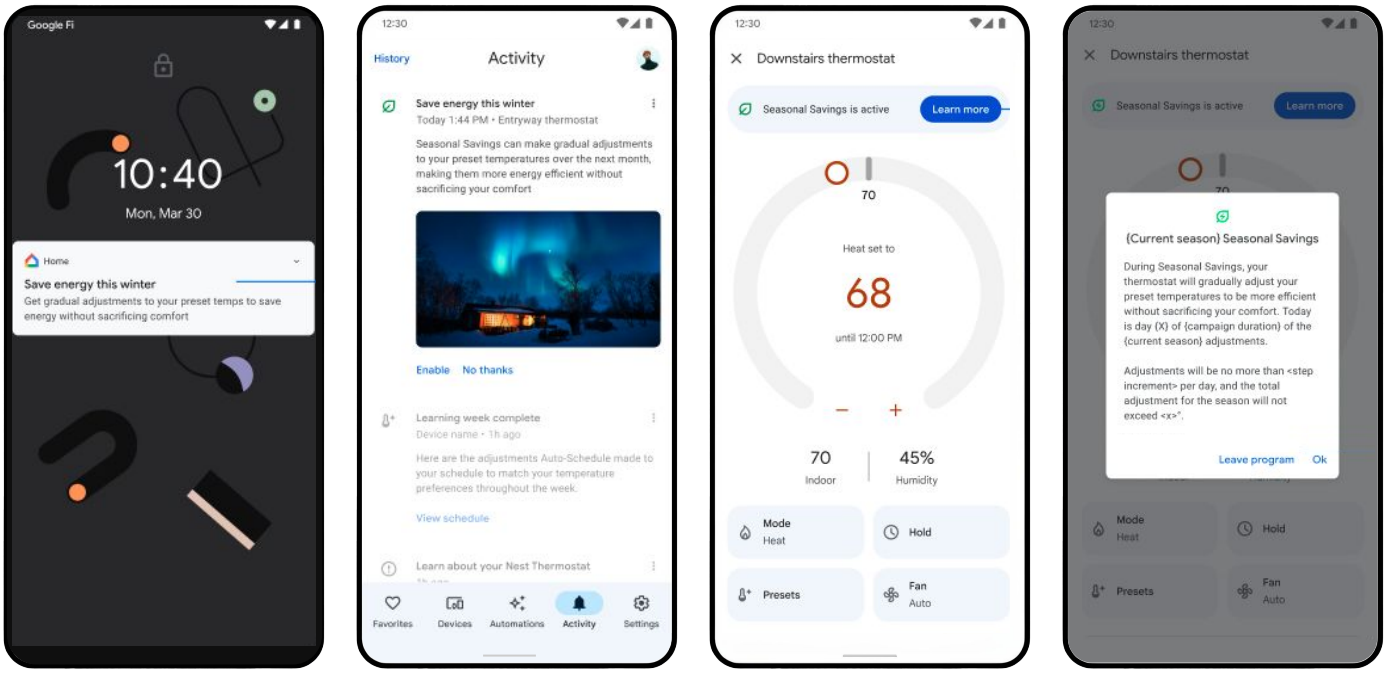




Seasonal Savings

Seasonal Savings is a feature that users may opt into each summer or winter. The goal of Seasonal Savings is to find energy savings without sacrificing comfort. The feature gradually adjusts preset temperatures over a 3-5 week period. After making a small adjustment toward saving energy, Seasonal Savings will wait for the user to experience the new temperature before making another adjustment. If Seasonal Savings detects that users have become uncomfortable (based on the frequency of requests for more heating or cooling) then it will stop making adjustments toward saving energy and return the preset to a comfortable temperature.

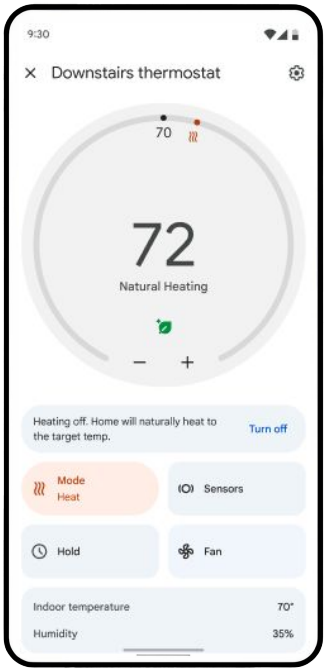
Note: If a device does not have a schedule, and a user opts that device into Seasonal Savings, a basic schedule with only Sleep and Comfort presets will be created.



Natural Heating and Cooling

Natural Heating and Cooling determines when to pause heating or cooling and to allow the temperature to naturally rise or fall. For example, on a sunny morning, the thermostat might pause heating because the sun is helping to keep the house warm. Similarly, on a cool evening, the thermostat might pause cooling and let the temperature fall naturally.

The thermostat uses outdoor temperature data to determine when to activate Natural Heating and Cooling. The feature can be enabled or disabled using the Google Home app. The thermostat will show a Natural Heating/Cooling message when the feature is actively preventing heating or cooling.



Fan and Ventilation Control

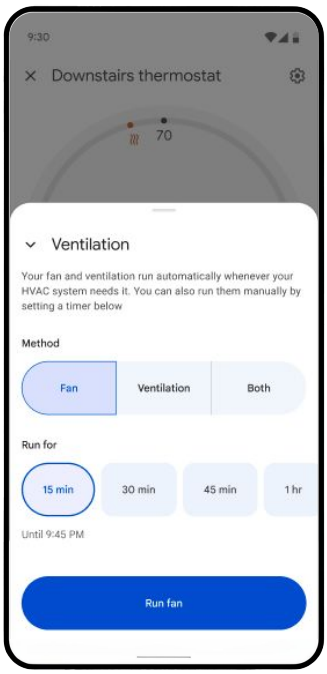
The Nest Learning Thermostat (4th gen) can control the HVAC system fan if there is a wire allowing independent control. The fan can be scheduled to run for 15-60 minutes each hour every day. It can also be manually engaged for a set amount of time. If there is a multi-speed fan, the user will be prompted to choose a fan speed when manually activating the fan.

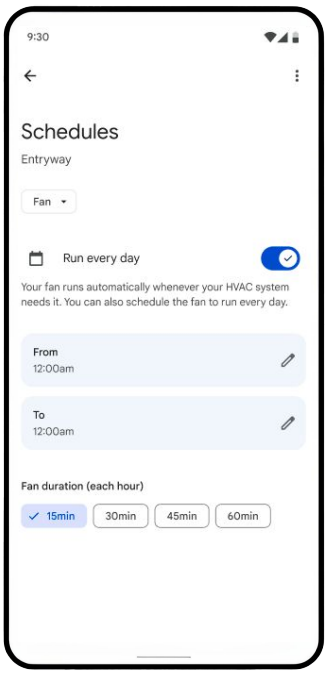
If there is a ventilation system configured on the thermostat, the user will be able to manually activate it with a timer alone or with the system fan. If the ventilation system requires the fan to be activated, the user will only be shown the option to activate the fan or the fan+ventilation.

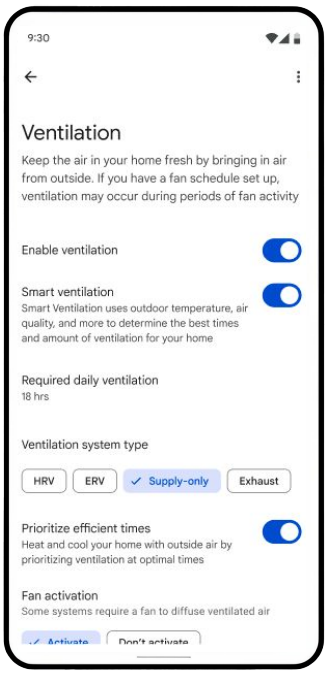
When ventilation is enabled, the user will need to set the “Required daily ventilation” from 2-24 hours. The default for “required daily ventilation” is 18 hours.

Smart Ventilation

The Smart Ventilation feature uses the outdoor temperature, air quality, and user behavior to determine how much ventilation to use and when it should be used. For example, this feature may not run the ventilation system if the outdoor air quality is poor. It can also take outdoor temperatures into account and bring in outdoor air that is warmer or cooler than indoors as necessary rather than running the heating or cooling system. When enabled, this feature will activate a ventilation system at varying times throughout the day while still meeting the “Required Daily Ventilation” threshold set by the user.





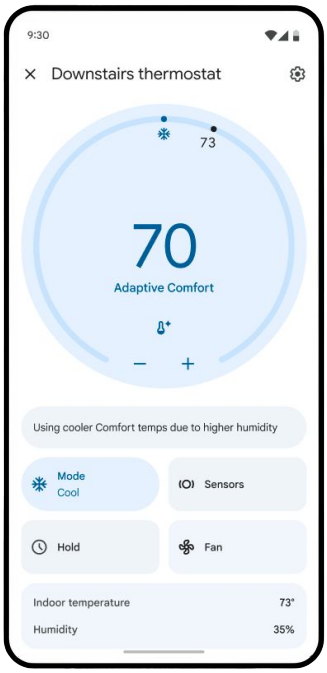


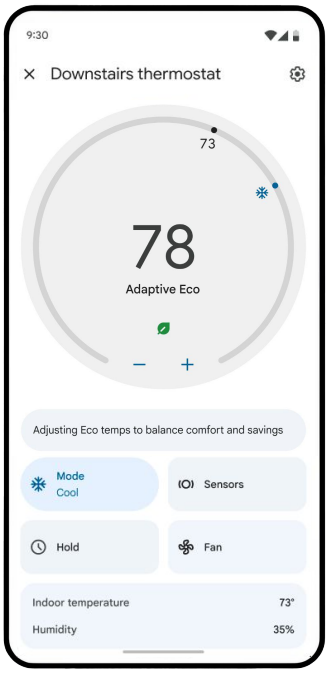
Adaptive Comfort and Adaptive Eco

The Adaptive Eco feature can help a user save energy when they are away without sacrificing their comfort when they return home. Using the home's past heating and cooling performance and the latest forecasted weather, Adaptive Eco can adjust the Eco temperatures to reduce heating and cooling while still allowing the home to quickly return to a comfortable temperature when the user returns home.

Adaptive Eco will only take effect during Auto-Eco periods. Therefore, to use Adaptive Eco, a user must first set up a Home & Away Routines in the Google Home app to set the thermostat to Eco temperatures when they are away.

Adaptive Comfort can dynamically adjust the Comfort temperatures to account for non-temperature conditions like indoor humidity and forecasted weather. This allows the thermostat to respond to changing conditions in order to keep the home comfortable. The user can turn this feature on or off using the Google Home app.





Home/Away Routines

The user can automate home devices and take care of everyday tasks based on their location with Home & Away Routines in the Google Home app or with Google Home for web. If the user has an existing Nest Account and wishes to use this feature, it's recommended that they migrate to a Google Account.

The user can create Routines in the Google Home app or as a scripted automation in Google Home for web that can use presence sensing to automatically adjust their home devices when someone arrives home or when everyone is away.

Presence in the home is determined using input from the user's phone location (if they opt in) and sensors in their smart devices, so they don't have to manually turn their devices on and off or rely on a fixed schedule. The user can decide which devices, including their phone, will determine presence.

The user will need to use the Google Home app to set up Home & Away Routines. They need to migrate their Nest Account to a Google Account, if they have not already done so. The user will then need to set up their smart devices in the Google Home app if needed, and follow the app instructions to set up Home & Away routines.

When the user has Home/Away routines enabled, they can add the Nest Learning Thermostat (4th gen) to the Away routine to automatically set the thermostat to the Eco preset when Presence Sensing determines that everyone is Away. When the user adds the thermostat to the Home routine, it will automatically set the thermostat to the Comfort setpoint when the first person returns.

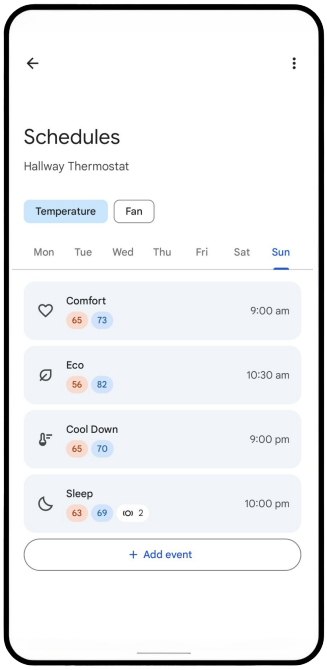
When the thermostat is included in these routines, the thermostat can utilize more intelligent features such as Adaptive Eco and the Return Home preconditioning function of Early On.

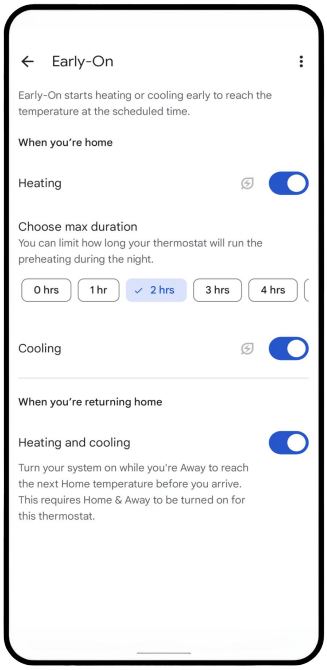
Note: *If the user uses both the Nest app and the Google Home app, Home & Away Routines will work seamlessly with the Nest App's Home/Away Assist. In the Home App, "Home & Away Routines" is the new name for "Home & Away," and "presence sensing" is the new name for "Home/Away Assist," but they work the same way.*

For more information on the differences between Home/Away assist and Home/Away Routines, please click this link.

Early On

This feature allows the user to schedule their thermostat around when they would like to reach a temperature instead of when they want to start running their system. A user can choose to enable Early On for cooling and heating setpoints when the home is occupied. They can also choose how long the thermostat can pre-heat the home overnight. The user can also enable Early On for when they are returning home, which will allow the thermostat to pre-heat or pre-cool while the user is away to reach the next scheduled temperature preset before they arrive. This requires Home & Away Routines to be turned on for the thermostat.





Heat Pump Balance

Heat Pump Balance optimizes how often the thermostat needs to use expensive auxiliary heat. The user will choose if they would like to prioritize more comfort, more savings, BALANCED or OFF, and Heat Pump Balance will automatically adjust when AUX comes on by intelligently adjusting the aux lockout temperature.

Heat Pump Balance will also adjust the aux upstage timer, droop, and minimum delay based on the user's choice of Comfort vs Savings.

Heat Pump Balance must be disabled during Pro Setup in order to manually set the aux lockout temperature, aux upstage timer, droop, and minimum delay. The compressor lockout temperature can be changed even if Heat Pump Balance is enabled.

To use Heat Pump Balance, the thermostat must also be connected to Wi-Fi. If it isn't, the thermostat won't be able to adjust or enforce the aux lockout temp.

If the user has a dual fuel system, they won't be able to use Heat Pump Balance. Instead, the user will have to set a breakpoint temperature and changeover timer manually during Pro Setup.

Sunblock

Direct sunlight can cause a thermostat's temperature sensor to heat up, so it may think that the ambient temperature in the room is higher than it actually is.

With Sunblock enabled, the feature will compensate for the direct sunlight to keep the user's home more comfortable and more true to the real temperature inside.

The user will see the icon above on their thermostat screen and app when Sunblock is active.

Cool to Dry

This feature can be found under the Humidity Helper page in the Temperature Preferences settings page of the Google Home App. This feature allows the compressor and fan to run longer after it has satisfied a cooling setpoint to remove excess humidity from the home.

Cool to Dry can be used with any air conditioner or heat pump, but works differently depending on whether or not the system has its own dehumidification mode.

If the system has a standalone dehumidifier, this option will not appear on the thermostat.

During Pro Setup, the target humidity, minimum indoor temperature, and overcooling limit settings can be adjusted. These settings control when Cool to Dry can start and how far the indoor temperature can go below the cooling setpoint before Cool to Dry should stop. Cool to Dry may not always reach the target humidity before stopping. See the "Configuring complex systems" section for more details.

Smart Humidification

Cold weather can cause condensation on windows and walls if the indoor humidity is too high. With smart humidification enabled, the feature will automatically reduce the target humidity based on the outdoor weather. This feature can be found under the Humidity Helper page in the Temperature Preferences settings page of the Google Home App.

Airwave

Airwave turns the compressor off shortly before reaching the target temperature. Then it runs the fan alone until it reaches the temperature the user wants.

Airwave learns exactly how much cooling can be done with the compressor off. It automatically shuts off the compressor at the right time to help maximize energy savings.

Airwave might not activate if there is excess humidity identified by the built-in humidity sensor in the thermostat (45% RH). In more humid climates, Airwave might never activate.

Nest Leaf

The Nest Leaf icon appears on the thermostat (and in the Google Home app) to tell a user when their thermostat is set to an energy-saving temperature. The Leaf encourages the user to choose energy-saving temperatures that are a little lower or higher than what they might have set in the past.

Time-to-Temp

Estimates how long a user's system takes to heat and cool their home from a manual change to the thermostat, or through the app.

The estimated time to temperature is based on prior heating and cooling cycles, and will continue to learn how the equipment performs during heating and cooling to give the user more accurate estimates.

Time-to-Temp estimates will only appear for temperatures that the user has manually set with the thermostat or the Google Home app.

The Nest Learning Thermostat won't display a Time-to-Temp estimate if continuous heating or cooling is needed to maintain the temperature that has been selected, or if the temperature fluctuates unexpectedly.

Safety Temperatures

Safety Temperatures can protect a user's home during extreme cold or hot weather. With Safety Temperatures, when the home reaches a set temperature limit, the thermostat will turn on heating or cooling even if the thermostat is set to Off. This can help ensure that the pipes won't freeze or the home won't overheat.

Thermostat Lock

Locking the Nest Learning Thermostat prevents people from changing settings or changing the temperature outside of a restricted range with the thermostat.

Anyone who shares access to the user's home with the Home app will still be able to change the temperature and settings or unlock the thermostat with the app. The thermostat can be locked in the Settings menu on the thermostat, or with the Home app. To unlock a thermostat, the user needs to enter the four digit PIN code on the thermostat, or use the app.

When a Nest thermostat is locked, it will still heat or cool to any temperatures in the user's schedule, even if they are outside of the locked temperature range. It will also follow a user's Eco Temperatures.

Air Filter Reminders

Air filter reminders can be enabled in the Notifications section of the thermostat settings. The Nest Learning Thermostat calculates these reminders based on forced air runtimes. The number of hours before sending a reminder can be configured during the Nest Pro Setup process. A user will need to enable them and indicate when they last changed their air filter.

Utility Rebates and Programs

Nest thermostats are eligible for rebates through local utility providers. Some rebates require enrollment in programs and features that work on Nest thermostats, such as Rush Hour Rewards. For more information about Rush Hour Rewards, visit this link. For other energy-saving features and programs, visit this link or check out the glossary for links to specific features.

How do Nest thermostats handle outdoor temps?

We use local weather data for the features dependent on temperature, which can be displayed on the thermostat.

We are able to read outdoor weather data without an additional sensor by connecting the Nest Learning Thermostat to the internet using home Wi-Fi.

Outdoor temperatures are an important factor for compressor lockout temps, aux lockout temps, and dual fuel breakpoint.

Staging:

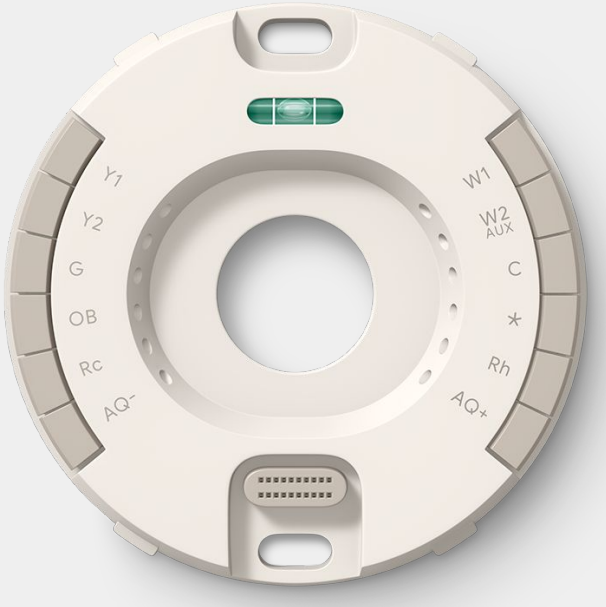
When there is a call for heating/cooling, the thermostat will not engage a second stage unless the temperature goes in the opposite direction within the first 15 minutes.

If the temperature does not go in the opposite direction from the call to heat/cool, the thermostat will wait 60 minutes for conventional heating to upstage, or 2 hours for cooling.

The second stage of heating or cooling will turn on when the user adjusts the set point 3.3°F beyond the current temperature, while the third stage will need a change of at least 7°F to activate.

At the start of a heat cycle, auxiliary heat is disabled due to the aux minimum delay. After the minimum delay, aux may be enabled if the temperature decreases or the aux upstage timer is reached. Aux is disabled if the temperature reaches the droop threshold.

HVAC System Compatibility

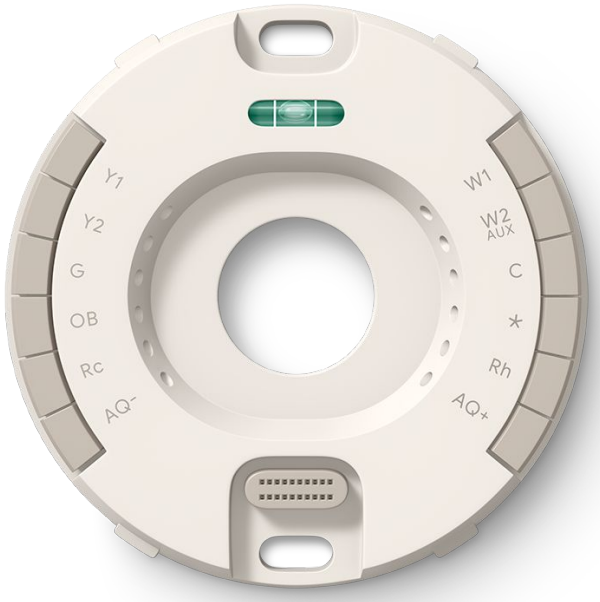


HVAC System Compatibility

System Compatibility

The Nest Learning Thermostat (4th gen) works with most 24V systems, including gas, electrical, oil, forced air, heat pump, and radiant.
Heating: 1, 2 and 3 stages (W1, W2, W3)
Cooling: 1 and 2 stages (Y1, Y2)
Power (C, Rh, Rc)

Fan (including multi-speed) (G or G1,G2,G3)
Humidifier, dehumidifier (HUM, DEHUM)
HRV, ERV, Exhaust Only, Supply ventilation
Heat pump: with auxiliary/alternate and emergency heat (O/B, AUX, ALT, E)



Wire Terminals

- Y1
- Y2
- G
- O/B
- RC
- Rh
- W1
- W2/AUX
- C
- * (star)
- AQ+
- AQ-

Networking Requirements

Wi-Fi is required for software updates and remote control with the Google Home App
Wi-Fi 802.11 b/g/n, 2.4 GHz and 5GHz
Secure: AES-128, SSL/TLS, WEP, WPA/WPA2
For more information about compatible networks, visit this link.

Power:

Built in rechargeable lithium-ion battery
Uses less than 1 kWh/month
Voltage requirement: 20-30VAC
Startup Current - 4VA
Standby Current - 2VA
Battery Voltage - 3.6V or higher required for Wi-Fi connection and updates

These values can be found in the Technical Information Menu on the thermostat. (Divide VOC and VIN values by 1.414 to get the RMS voltage)

VOC- 24-42V (with or without C wire)
VIN - 24-42V (with or without C wire)
Iin - 150-300 mA (with C wire)
OR
20-300mA (without C wire present)

Sensors:

Temperature
Humidity
Soli sensor (Motion Sense)
Ambient light
Nest utilizes local weather data over Wi-Fi instead of outdoor temperature sensors

Display:

68 mm (2.68 in) diameter circular liquid crystal display
600x600 pixels
PPI - 224

Box contents:

Display
Wiring plate
Nest Temperature Sensor (2nd gen)
Trim kit
Electrical box adapter
Mounting screws
Wire labels
Quick Start Guide
Safety and Warranty Doc

Size and weight:

Display:
Weight = 161.8 g / 5.7 oz
Diameter = 98 mm / 3.9”
Depth = 29 mm / 1.1”
Assembled (Display + Base):
Weight = 195 g / 6.9 oz
Diameter = 98 mm / 3.9”
Depth = 3.0 mm / 1.2”
Trim plate:
Weight = 2.3 oz / 66.5g
Width = 138 mm / 5.4”
Height = 5.5 mm / 0.2”
Length - 168mm / 6.6”

Conventional Connectors		Heat Pump with Aux Heat Connectors		Heat Pump with Dual Fuel Connectors	
Y1	Stage 1 compressor relay	Y1	Stage 1 compressor relay	Y1	Stage 1 compressor relay
Y2	Stage 2 compressor relay, 2nd-speed fan relay	Y2	Stage 2 compressor relay	Y2	Stage 2 compressor relay
G	Fan relay	G	Fan relay	G	Fan relay
O/B	Not used	O/B	Changeover valve relay	O/B	Changeover valve relay
Rc	24VAC power from cooling transformer*	Rc	24VAC power from cooling transformer	Rc	24VAC power from cooling transformer
W1	Stage 1 heat relay	W1	Not used	W1	Stage 1 heat relay
W2/AUX	Stage 2 heat relay	W2/AUX	Auxiliary heat relay	W2/AUX	Stage 2 heat relay
C	24VAC Common wire	C	24VAC Common wire	C	24VAC Common wire
Star*	Stage 3 heat (W3), humidification (HUM), dehumidification (DEHUM), 3rd speed fan relay	Star*	Emergency heat (E), humidification (HUM), dehumidification (DEHUM)	Star*	Emergency heat (E), humidification (HUM), dehumidification (DEHUM)
Rh	24VAC power from heating transformer	Rh	24VAC power from heating transformer	Rh	24VAC power from heating transformer
AQ+	Humidification (HUM), dehumidification (DEHUM), or ventilation	AQ+	Humidification (HUM), dehumidification (DEHUM), or ventilation	AQ+	Humidification (HUM), dehumidification (DEHUM), or ventilation
AQ-	Second wire from equipment in AQ+ (if applicable)	AQ-	Second wire from equipment in AQ+ (if applicable)	AQ-	Second wire from equipment in AQ+ (if applicable)

Key wiring and compatibility notes

Boilers

Must use an external transformer for a source of constant 20-30 VAC when using the power connector. If the boiler is DC powered, you must install a SSR between the transformer and terminal block.

Zone Panels

Nest Thermostats will not work with zoned systems in which the thermostat does the activation and deactivation of the zoned dampers; usually indicated by “L” terminals. Many zone panels will require an upgraded transformer when using a smart thermostat such as the Nest Learning Thermostat. Check the requirements of the specific zone panel or board being used.

Emergency Heat

The Nest Learning Thermostat supports a dedicated wire for emergency heat in the star terminal, but it is not required. When emergency heat is activated, it will either energize the equipment connected to the Star terminal or it will energize Aux heat or Alt heat.

For heat pump systems equipped with auxiliary (Aux) heat, engaging the emergency heat function will activate the Aux heat strips as the primary heat source. The heat pump itself will be temporarily disabled while emergency heat remains active. In systems utilizing an alternate heat source (e.g., gas furnace), activating emergency heat will engage the highest stage of the alternate heat source. This alternate heat source will remain operational until emergency heat is manually deactivated.

Variable Speed Systems

The Nest Learning Thermostat does not modulate voltage; therefore, it cannot control variable speeds on the thermostat side. If the equipment can modulate itself with a non-proprietary 24VAC input, then the Nest Learning Thermostat will work, but will require adjustments to settings to ensure efficient operation of the equipment.

Unsupported Wires

Some common terminals that we do not work with are non-standard HVAC terminals; if you see terminals labeled 1, 2, 3, or A, B, or D, there is a pretty good chance that the Nest Learning Thermostat will not work with the equipment.

There are some terminals that might fall under the standard HVAC terminals that the thermostat can treat a little differently. HVAC equipment that has sensors wired to it usually have an “S” terminal designation. Since the Nest Learning Thermostat does all its sensor data via Wi-Fi and local weather data, it does not need the “S” wire. In this case, if all other terminals are standard HVAC wiring, you can proceed as normal, and you will just cap off the “S” wire and not use it.

Installation Features

Pro Setup

The Pro Setup process allows a technician to install and configure a Nest Learning Thermostat (4th gen) on their own phone using the Google Home app even if there is no Wi-Fi available yet. This process is also significantly faster than the customer install process and allows you to skip through basic instructions. The Pro Setup will prompt you to enter a Nest Pro ID, which will activate an extended warranty and store company contact information on the thermostat and in the user's Google Home App. Once you have input your Pro ID with your Google Home App, it will be automatically filled in on any Nest Learning Thermostats (4th gen) you install in the future.

Advanced Settings

Pro Setup lets Nest Pros configure advanced settings to set up complex systems, including dual-fuel systems, humidifiers/dehumidifiers, multi-speed fans, and ventilation systems. It also allows you to adjust settings like compressor run times, droop, and the maintenance band. Some of these settings are only available during the Pro Setup process and cannot be adjusted by the user after installation.

Silent Relays

The Nest Learning Thermostats uses solid-state switching instead of relays so there's no noise when it switches on or off. You will *not* hear any "clicking" during system testing and activation.

System Match

When you first install the Nest Learning Thermostat, the Google Home App checks to see which wires have been inserted into the base's connectors and will prompt you for additional information where needed.

Multifunctional Connectors

The Nest Learning Thermostat has two multifunctional terminals, Star(*) and AQ+, that can control several different applications. When used, the Google Home App will ask you to select the equipment connected to the terminals. For a list of compatible applications that the multifunctional connectors support, please see the wiring diagrams below or the Equipment terminal details page above.

Backplate LED

The Nest Learning Thermostat features an LED light on the baseplate that indicates that the thermostat is receiving power from the equipment. If the LED is illuminated, this indicates that the baseplate is receiving adequate power from the HVAC system. If the LED remains off, this signifies that the thermostat is not receiving power.

Installation Overview

What is in this section

The next three pages of this document will provide an overview of the physical installation process of the Nest Learning Thermostat. It will also provide tips about how to provide a good experience for a customer.

After the overview section, the document will walk you through the Pro Setup process using the Google Home app. Some screens may look different depending on the equipment being configured. The Pro Setup process will finish with an overview of how the customer will connect the thermostat to their Google Home app and account.

The next portion of the document will explain some of the available settings and important information about configuring complex systems. The last portion of this section is wiring diagrams for compatible equipment.

How to use Pro Setup (high level)

The Nest Learning Thermostat has a dedicated configuration process for Nest Pros in the Google Home app that allows the pro to fully configure the thermostat on their own phone without the use of Wi-Fi or a homeowner needing to be present.

This option will appear after the thermostat QR code is scanned in the Google Home app. This setup process allows a pro to configure more advanced settings such as upstage timers and breakpoint temperatures. As a pro, this allows you to tailor the thermostat to the equipment, the home, the climate, and the user's preferences.

After successful completion of the Pro Setup process, the Nest Learning Thermostat offers basic control of the equipment and is ready to be connected to a homeowner's account. The process the homeowner follows is similar; however, after they scan the QR code, they will select Already Installed. This will connect the thermostat to their account and home network. The homeowner will then be prompted to turn on/off features based on their preferences around scheduling, presence sensing, and additional comfort features.

If the customer is present and there is Wi-Fi available, the Pro Setup process should still be utilized in order to access the advanced configuration options. If a technician or installer needs to use the customer's phone, they can still use the Pro Setup process and then have the customer complete the configuration once they are done. For more detailed steps about this process, see the following pages.

1. **Confirm system compatibility**

   a. Before opening the Nest Learning Thermostat package, check all the wires connected to the current thermostat against the list of available connectors in this guide, or use the Compatibility Checker to quickly verify if the system is compatible. Note that the compatibility checker may suggest checking with a pro. In that case, this guide is the best reference to determine compatibility.

2. **Briefly test the HVAC system**

   a. Test the heating, cooling, fan, and other system features with the current thermostat before installing the Nest Learning Thermostat so you can address any existing issues.

   b. At times, outdoor weather conditions may prohibit testing of heating or cooling. In those cases, inform the customer that you cannot test and ask the customer about the system's operation and performance.

3. **Turn off power to the HVAC system**

   a. Turn off the power to the system to protect yourself and the equipment. Locate the circuit box and check to see if the circuits are labeled or if there is a circuit directory. Turn off all HVAC system circuits.

   b. If you cannot determine which circuits belong to the HVAC system, turn off the main circuit breaker after obtaining permission from your customer. Confirm the power is off by attempting to activate the HVAC system using the existing thermostat.

4. **Remove the old thermostat**

   a. Before removing the old thermostat, take a quick picture of the wiring with your phone in case you need it for reference. Disconnect the wiring and remove the old thermostat. Use the wire labels included in Nest Thermostat Installation Guide if needed. Be sure to leave the original thermostat, hardware, and any jumper wires with the customer. Remember that jumper wires are not needed on Nest thermostats.

5. **Offer the customer installation finishing options**

   a. You may need to cover up holes, old paint, or marks left by the old thermostat. Ask your customer if they prefer to repair the wall themselves or if they want to have the Nest trim plate installed. Let the customer know that the trim plate can be painted to match the wall.

6. **Install the Nest Learning Thermostat**

   a. Run the wires through the center of the Nest Thermostat base and attach it to the wall using the screws provided. Do not use a power drill on the screws. Over-tightening the screws can damage the circuitry in the Nest base. For paneling, plaster-and-lath, or if there is a stud behind the thermostat, pre-drill a hole using a 3/32" bit first.

   b. Use the built-in level for proper alignment. Trim or re-strip any wires as necessary and connect them to their corresponding terminals on the base. Make sure the wire is straight and the connector button stays down after inserting it.

7. **Configure the Nest Learning Thermostat**

   a. Once the thermostat is physically installed, you will need to use the Google Home app to complete the Pro Setup process. Some settings and features are only available during the Pro Setup process.

   b. Ensure that you have consulted equipment manuals for the optimal settings for your equipment configurations.

   c. See the step-by-step instructions for details on how to handle installations where the customer isn't present or there is no Wi-Fi available.

   d. Advanced Settings available during Pro Setup (not exhaustive)

      - Compressor Lockout Time
      - Minimum Compressor On Time
      - Minimum Heat on Time
      - Heat Temperature Difference (heating maintenance band)
      - Cooling Temperature Difference (cooling maintenance band)
      - Aux Heat Upstage Timer
      - Aux Heat Droop
      - Aux Heat Minimum Delay

8. **Test heating and cooling**

   a. This is vital to any installation in order to prevent a callback. After setting up the Nest Learning Thermostat, run each part of the system for a few minutes. This will ensure that the thermostat is installed correctly and there aren't any HVAC compatibility issues.

   b. The thermostat will require Wi-Fi to fully test the equipment and report any errors.

   c. See page 80 for additional details on performing post-installation testing.

10. Help your customer pair the thermostat with the Google Home app

a. If your customer already has a Google Nest product and is using the Google Home app, show them how to add the thermostat to their Google Account. If it's your customer's first Google Nest product, show them how to download the Google Home app, create an account, and then add the Nest Learning Thermostat.

b. The thermostat will display a QR code that the customer can quickly scan when prompted by the Google Home app to pair the thermostat with their app and account.

c. Point the customer to the Welcome Guide they will receive that can help them understand the features and functions of their new Nest Learning Thermostat (4th gen).

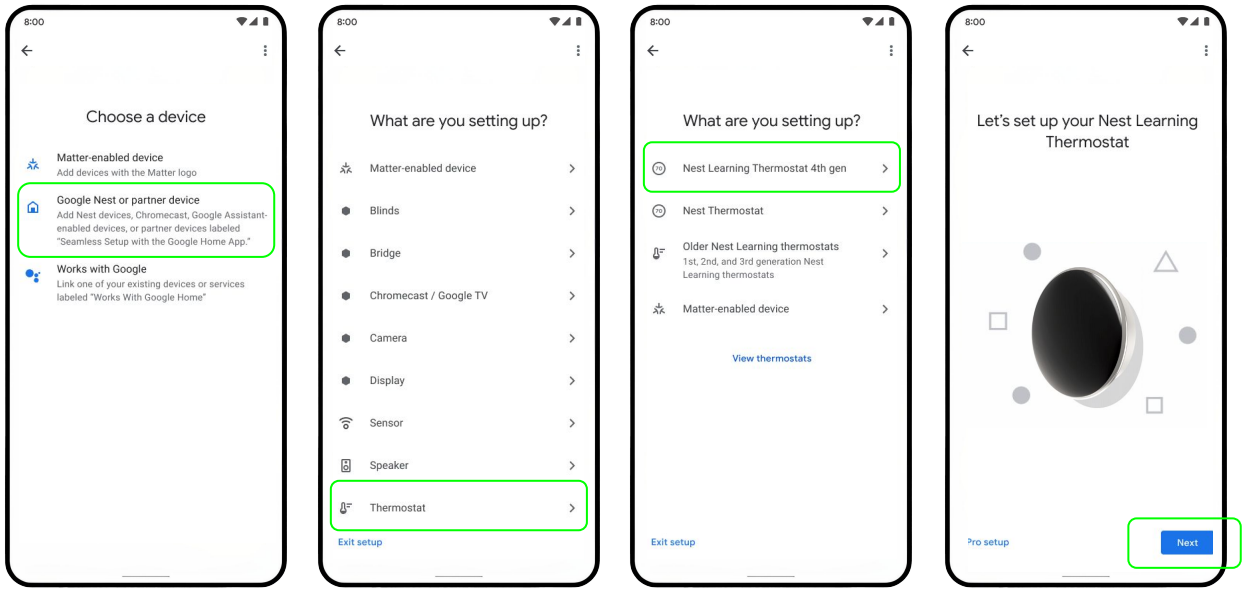
d. Correct configuration of these features will ensure that the system is performing correctly and the customer is comfortable.

e. Until the thermostat has been added to the customer account, it will only be controllable by manually adjusting the thermostat. It can be used in Heat Mode, Cool Mode, Heat/Cool mode, or set to Off. The setpoint can also be manually adjusted on the thermostat.

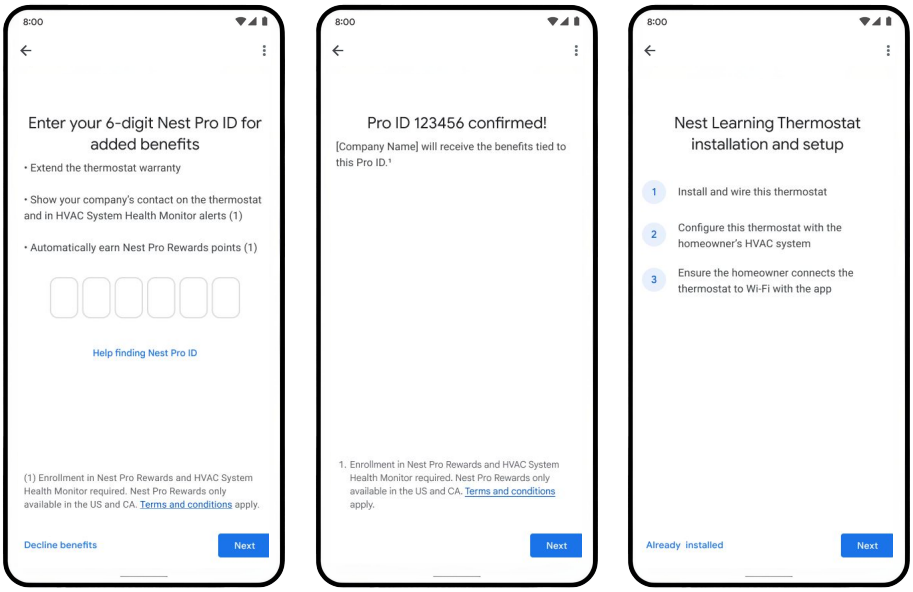
Pro Setup steps - Google Home App

On the Google Home App:

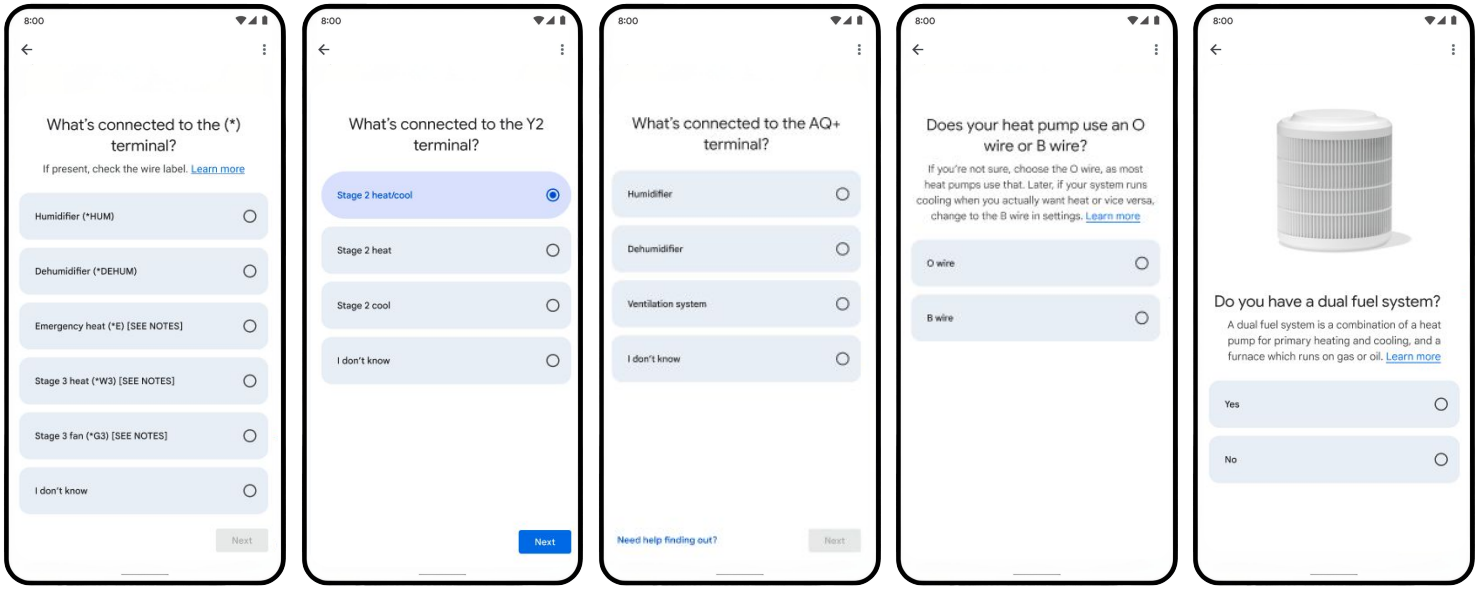
1) **Add product:** Select “Add device” from the Google Home app, choose Nest Learning Thermostat (4th gen), scan the QR code, and select Pro Setup.



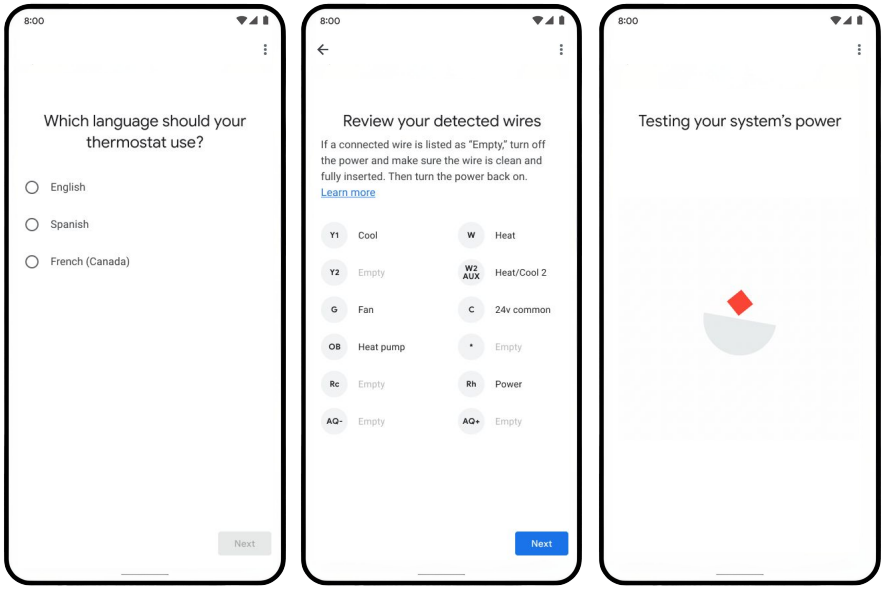
2) **Connect Pro ID to thermostat:** Enter your 6-digit Pro ID. If you do not know it, you can look it up with the link on the screen. Once Pro ID is confirmed, select “Already installed” to skip ahead to equipment setup if the thermostat is already wired and powered on.



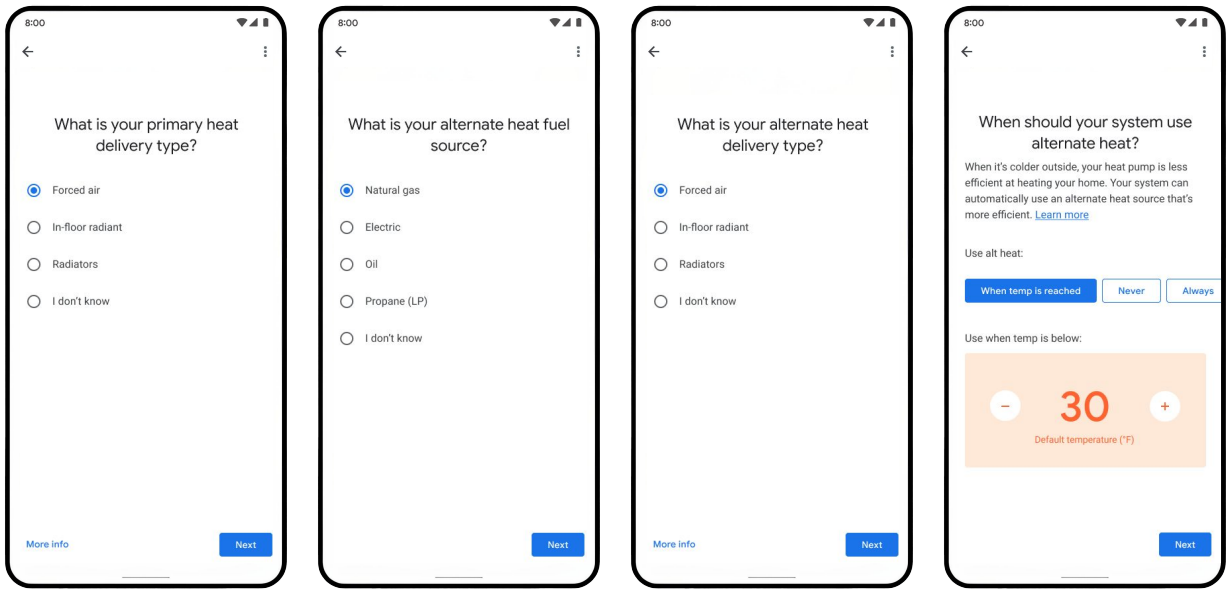
3) **Multifunction wire configuration:** Once you've confirmed your Pro ID, you need to configure what wires are connected to the thermostat if you have a wire in the O/B, Y2, W2, Star (*), or AQ+ to help the thermostat provide the right equipment selection options in future steps.



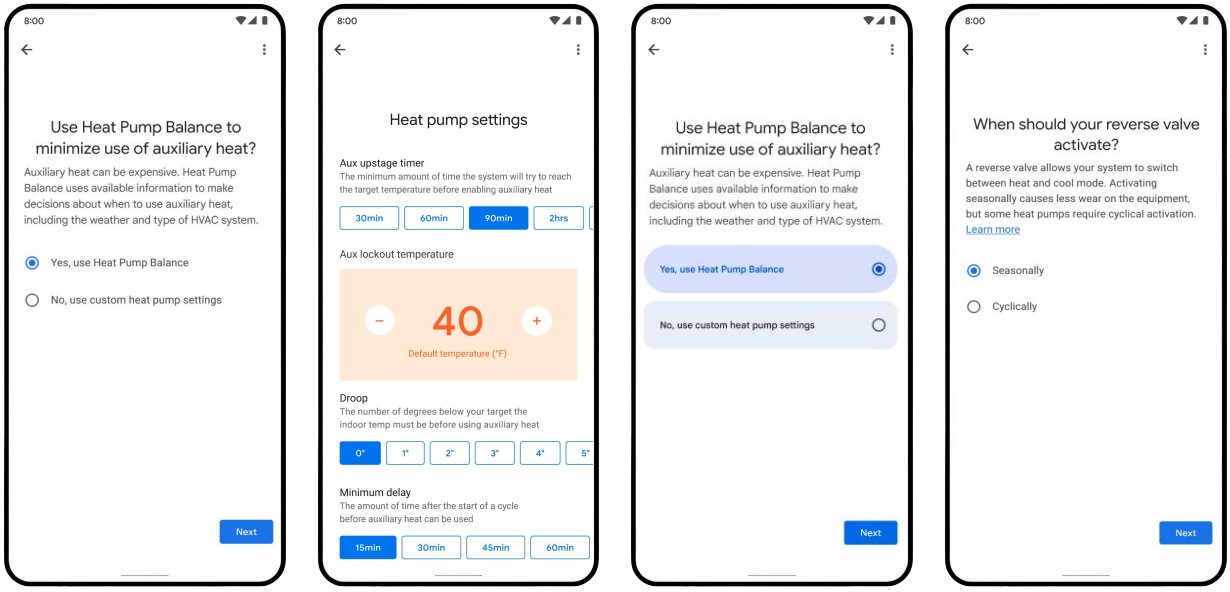
4) **Language, wire review, and power test:** Select the language the thermostat should use, then review connected wires and allow the thermostat to perform a power test.



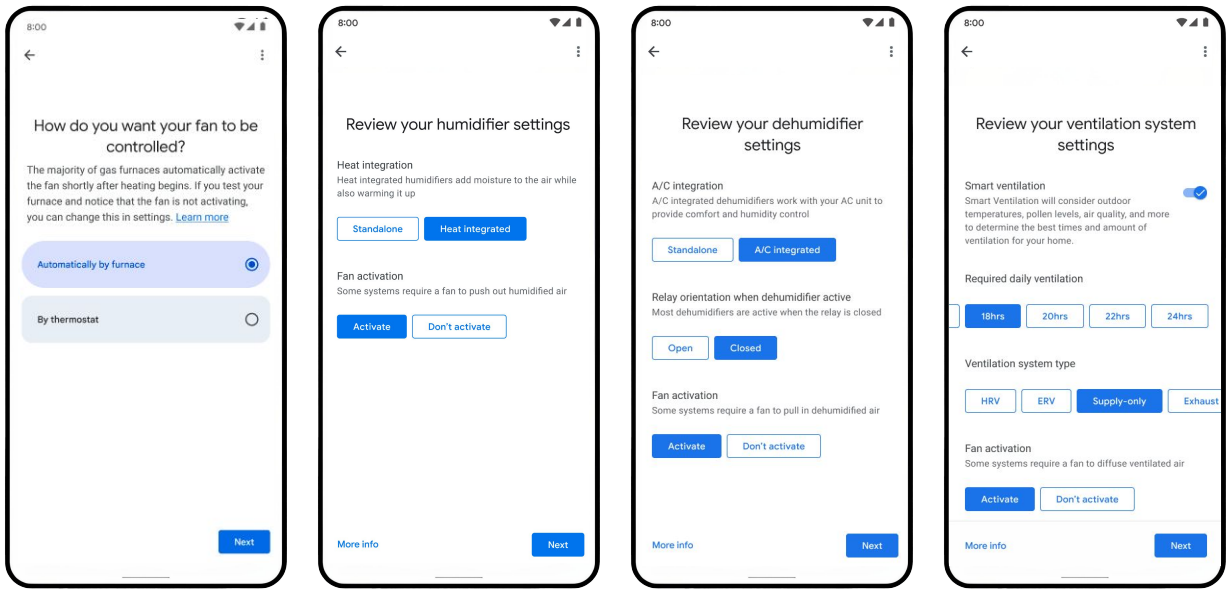
5) **Equipment configuration - Heating:** Now you will configure the equipment connected to your wires, starting with the Heating wires. For a conventional system, you will choose the heat source and delivery type. If you have a heat pump, you will be asked to configure your Primary heat then Alternate heating equipment. As a pro, you will be given the option to configure advanced settings for your heat pump. For more information, see page 37. See the screens below for Conventional Heat and Alternate Heat on a heat pump.



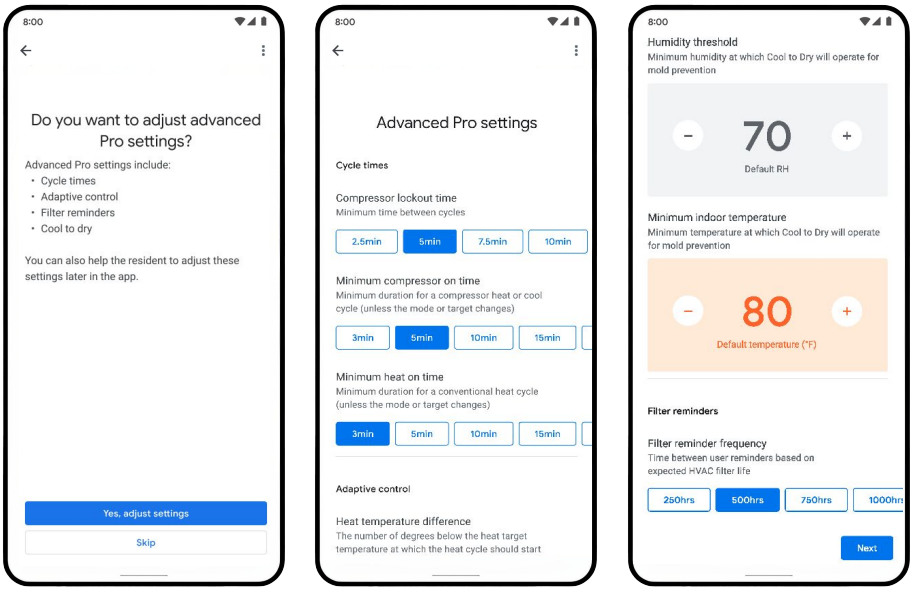
6) **Equipment configuration - Heat Pump:** For Heat Pump systems with Auxiliary heat or Alternate heat, you will choose whether to use Heat Pump Balance or advanced heat pump controls, and when the reversing valve should activate.



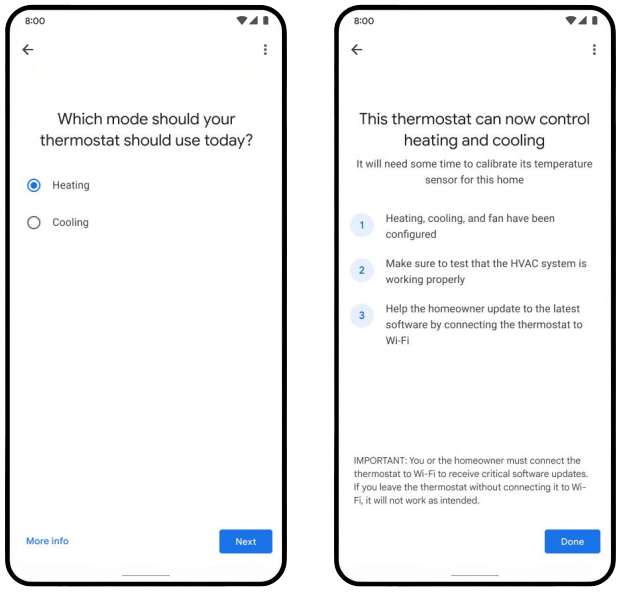
5) **Equipment configuration - Fan, Hum/Dehum, Vent:** The last equipment to configure is the system fan, humidifier or dehumidifier, and ventilation systems.



6) **Equipment configuration - Advanced Settings:** As a pro, you will have the opportunity to adjust some advanced settings for the equipment. Note: These settings can not be accessed or changed after the Pro Setup process, so be sure to consult HVAC equipment manuals and documentation for appropriate settings. If these need to be changed in the future, the thermostat will need to be factory reset and re-configured.

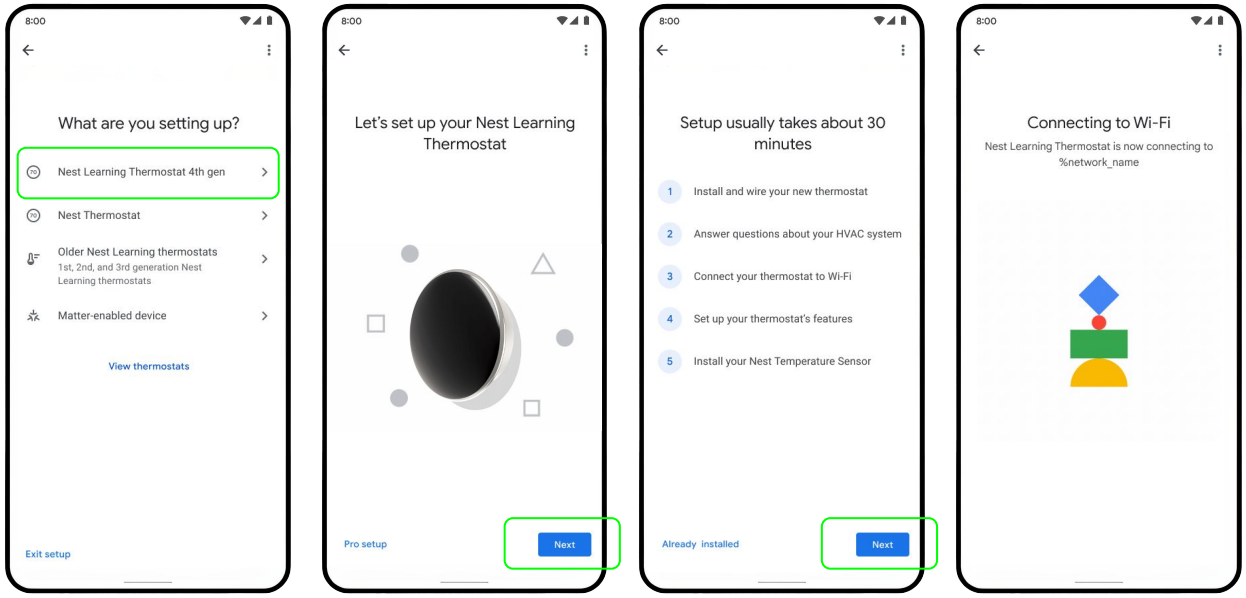


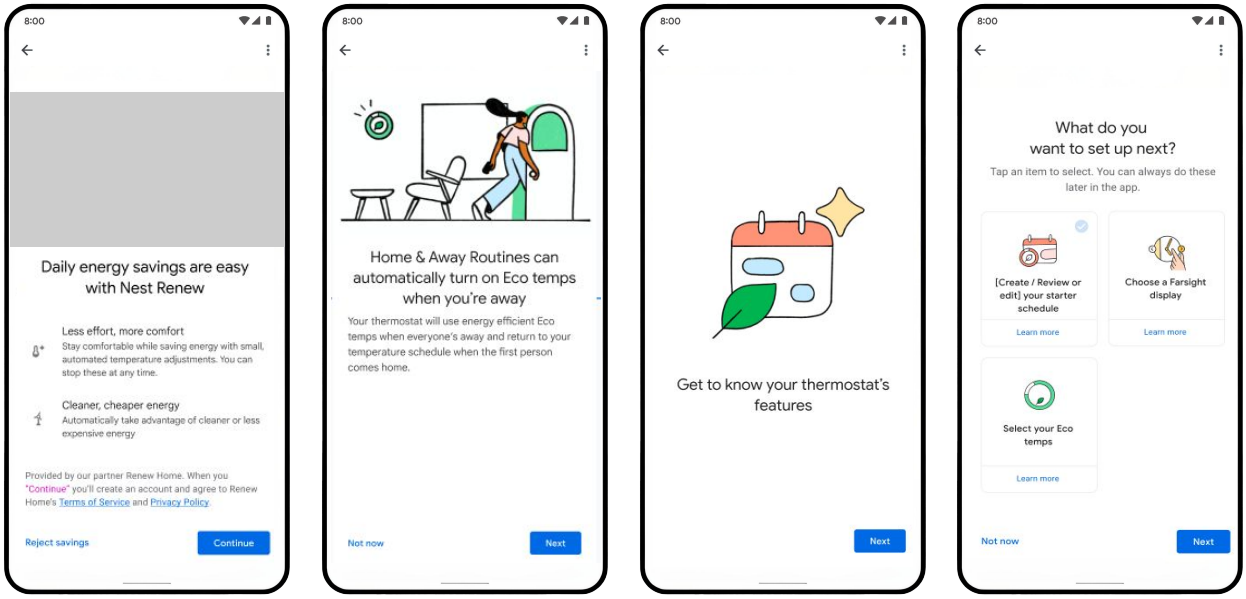
9) **Pro Setup complete:** You will indicate whether the thermostat should begin in heating or cooling mode. Then the Pro Setup process is complete and the thermostat is ready to be added to the user's Google Home app.



10) **End-user configuration:** The thermostat is now ready to be added to the user's Google Home app. Until it is added to an account and Wi-Fi, it will heat or cool to a single setpoint that can be adjusted using the thermostat manually. The thermostat will show a QR code on the screen when initially pressed that can be scanned when prompted by the Google Home app.

10) **End-user configuration - continued:** When the customer is ready to add the thermostat to their Google Home app, they will start by adding a device. This is just like the Pro Setup process, except they will need to select “Already Installed” to skip through installation instructions. They will be prompted to connect the thermostat to Wi-Fi enable features, and create a starter schedule. Make sure customers understand the features of the thermostat listed in the Key Features section of the document so they configure the thermostat for their preferences, home, equipment, and climate.





How to configure complex systems

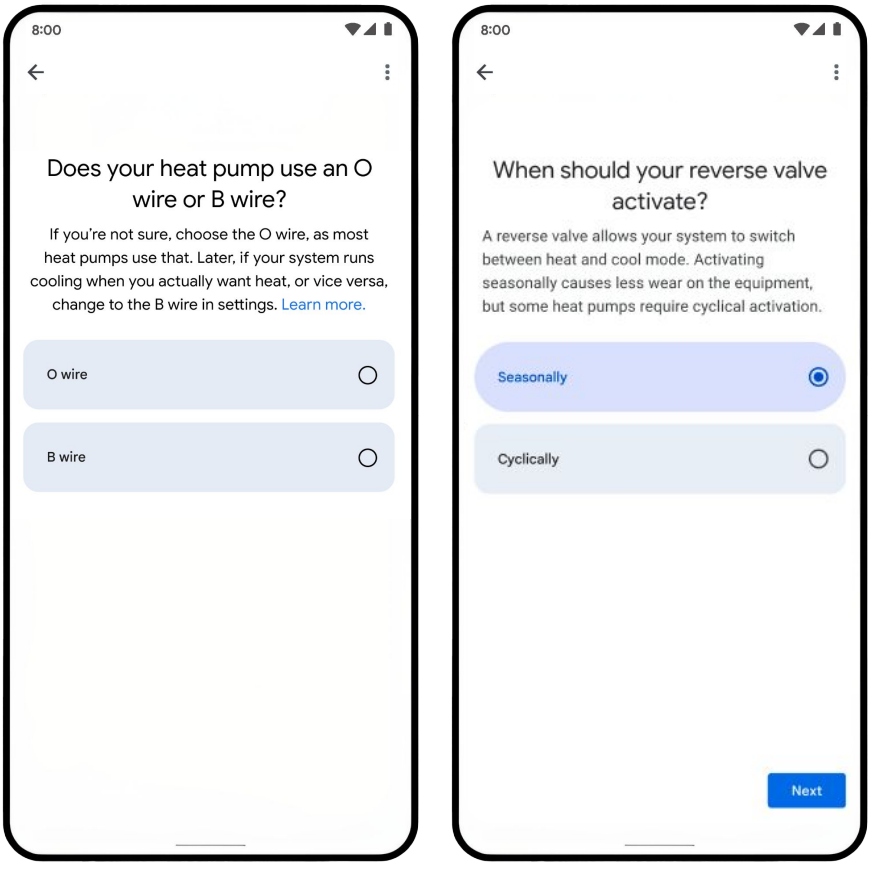
Heat pump systems

Configuring O/B Wire - Orientation and Activation

The majority of heat pumps use an “O” orientation, so when setting up a heat pump, this will be the default orientation during configuration. The O or B orientation will be confirmed during Pro Setup, but it can be adjusted at any time after installation.

You can choose whether to energize the O/B reversing valve “cyclically” during each heating or cooling cycle or “seasonally.” The “seasonally” option will keep the O/B wire energized when the thermostat is in the cooling mode and the orientation is set to “O” and in the heating mode when the orientation is set to “B.” This setting can also be changed in the Google Home app after installation.

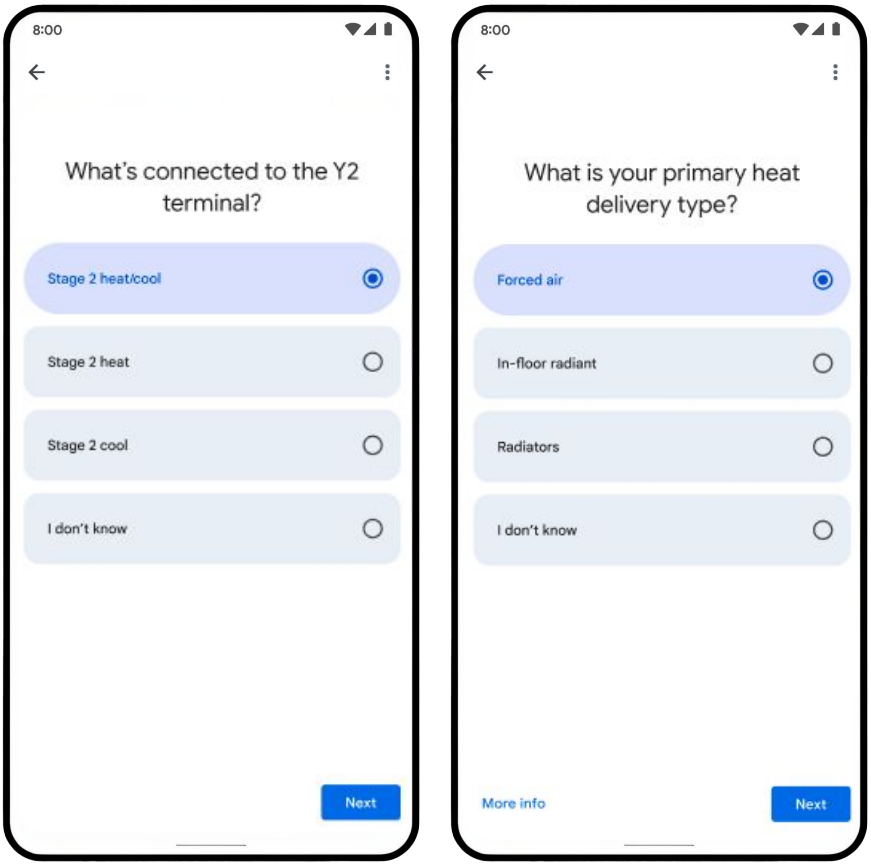
The Nest Learning Thermostat defaults to energizing seasonally to help reduce wear and tear on the reversing valve, but can be configured to be energized each cycle.



Two-stage heat pumps

The Nest Learning Thermostat will automatically recognize your customer's system as a two-stage heat pump if you've connected Y1, Y2, and O/B wires. The thermostat assumes the Y1 wire will be used to activate 1st stage heating and cooling for your heat pump.

Using the Pro Setup in the Google Home app, you can then configure the Y2 wire to be used for 2nd stage heating and cooling, 2nd stage cooling only, or 2nd stage heating only. You will also specify the delivery mechanism (such as forced air or radiant).

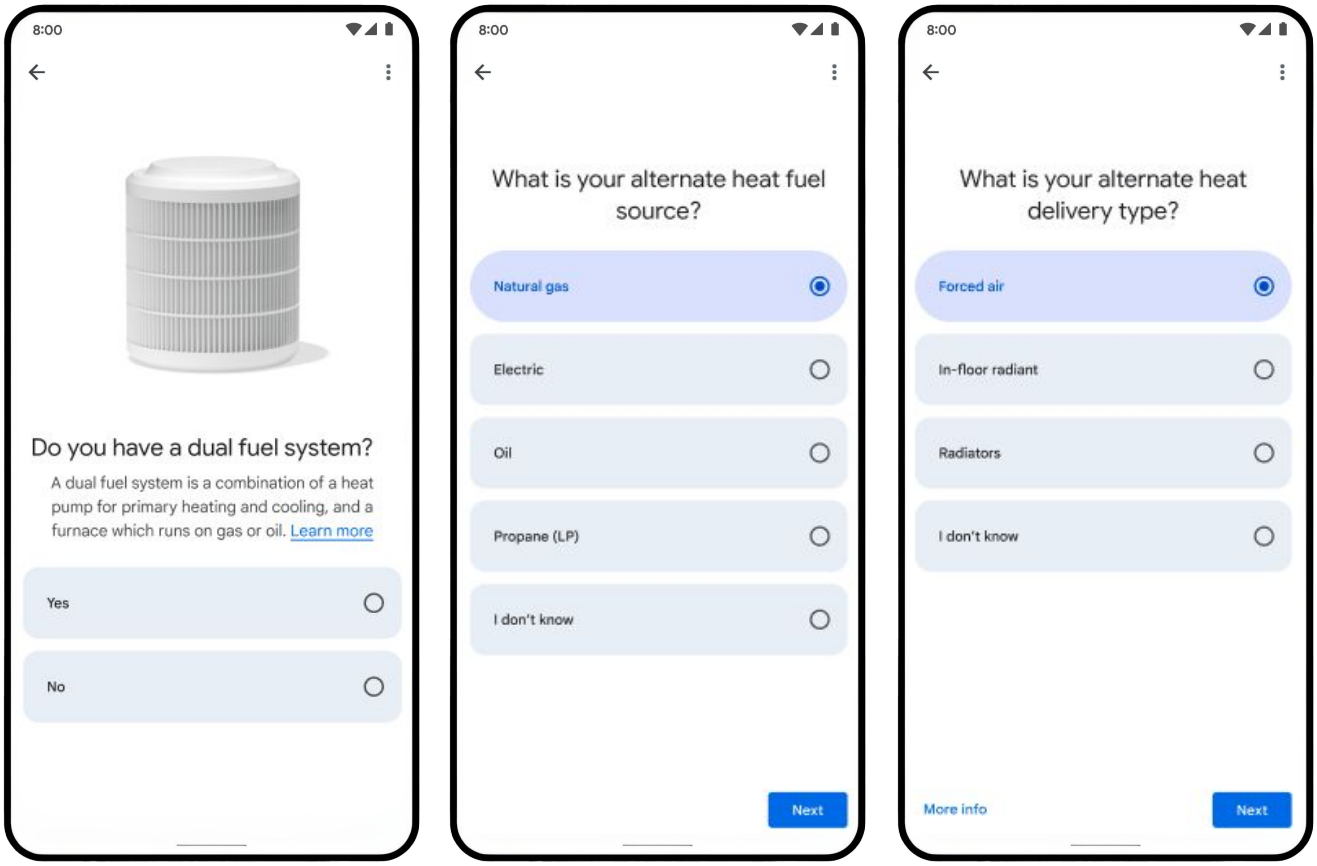


Duel fuel systems - configuring equipment

If there's an O/B wire and one or more W wires connected to the Nest Learning Thermostat, Pro Setup will ask if the heating system is dual fuel or single fuel.

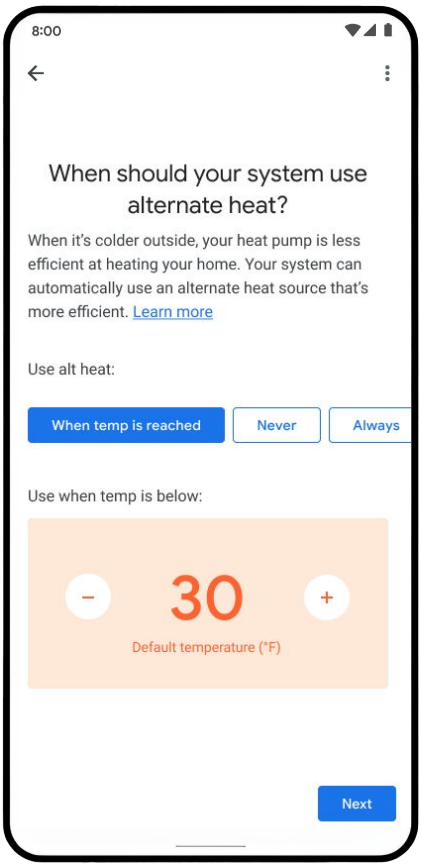
For single fuel, any wires inserted into the W1, W2/AUX connectors will be treated as auxiliary heat that will be used simultaneously with the heat pump when needed. Only one auxiliary heating wire is supported.

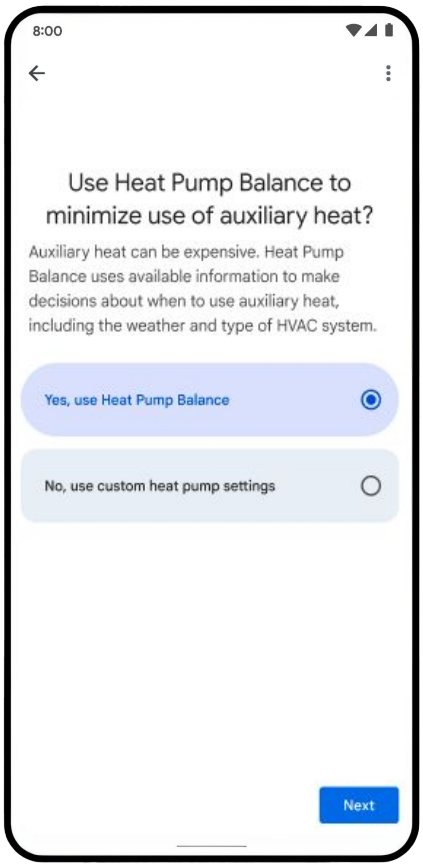
For dual fuel, any wires inserted into the W1, W2/AUX connectors will be treated as alternate heat that will be used instead of the heat pump when needed. Use Pro Setup to indicate the source (gas, electric, geothermal, etc.) as well as the delivery mechanism (forced air, radiant, etc.) for each of the W wires connected. The Nest Learning Thermostat supports up to two wires for alternate heat; additional alternate heat wires are not supported.

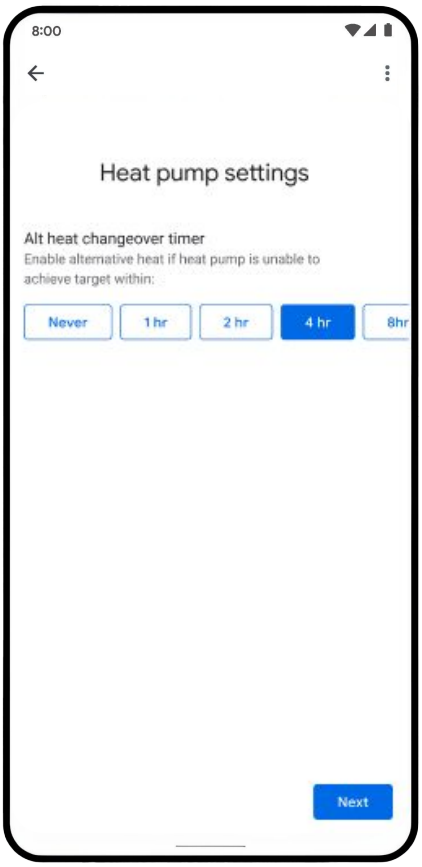


Duel fuel systems - Activating alternate heat and advanced settings

Unlike auxiliary heat, which may run simultaneously with the heat pump heating, dual fuel systems always run alternate heat independently from heat pump heating. The settings available to activate alternate heat are either based on temperature or time. You will need to decide if alternate heat should always be used for heating, never used for heating, or activated when the outdoor temperature is below the “Breakpoint temperature.” You will configure the breakpoint temperature unless you choose “Never” or “Always.”There is also an additional option for “Alternate heat changeover time” available only during the Pro Setup process. This setting will allow you to choose the maximum amount of time the heat pump will run in a heating cycle without achieving the target temperature before switching over to alternate heat. You will need to select “Use custom heat pump settings” when prompted in order to set the “Alternate Heat changeover time.”





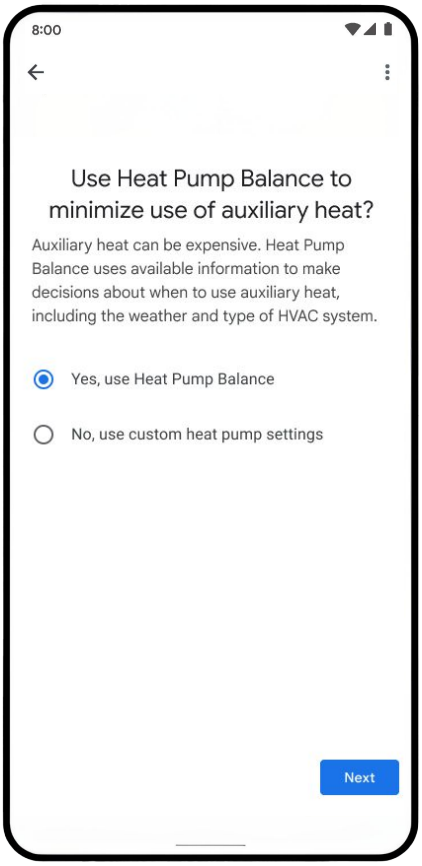


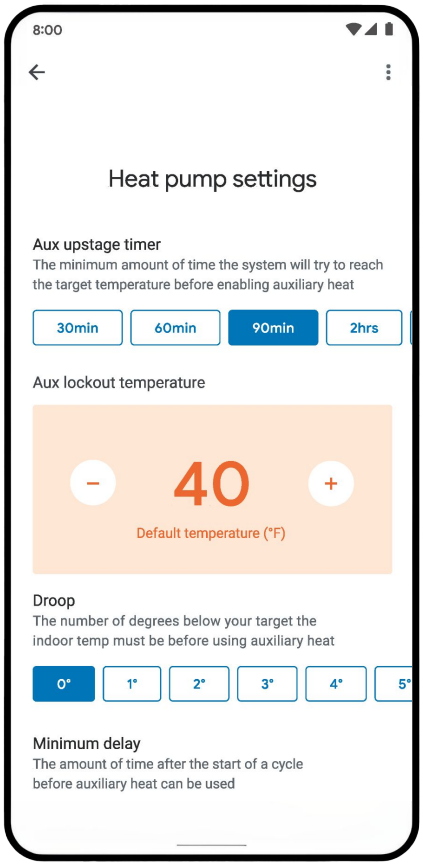
Advanced heat pump controls - Auxiliary heat

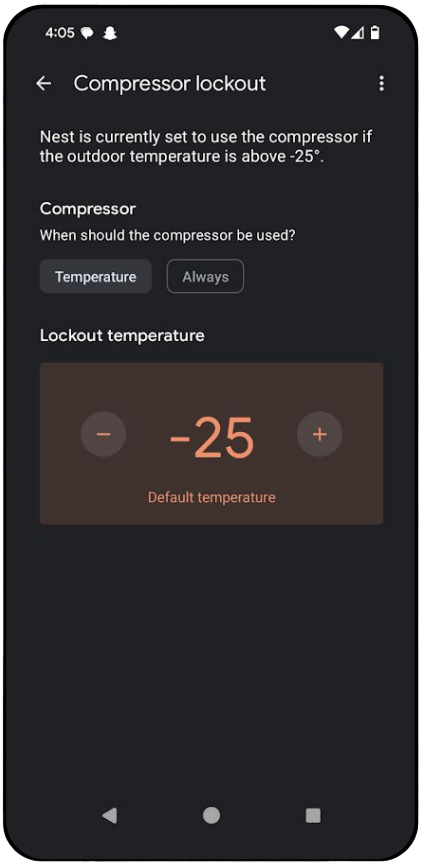
On the Nest Learning Thermostat (4th gen) there are advanced controls available for heat pump systems. In order to adjust these settings, you will need to use the Pro Setup process. There is a choice to use Heat Pump Balance or custom heat pump settings during the Pro Setup process. The custom settings are only available when Heat Pump Balance is disabled.

Advanced heat pump settings:

Aux Upstage Timer - How long the thermostat uses heat pump heating to reach the target before engaging auxiliary heat.
Aux Lockout Temperature - If the outdoor temperature is above this temperature, auxiliary heat cannot be used.
Droop - How far the indoor temperature must be below the target before auxiliary heat can be used.
Minimum Delay - The minimum amount of time after the start of a heating cycle before auxiliary heat can be used.







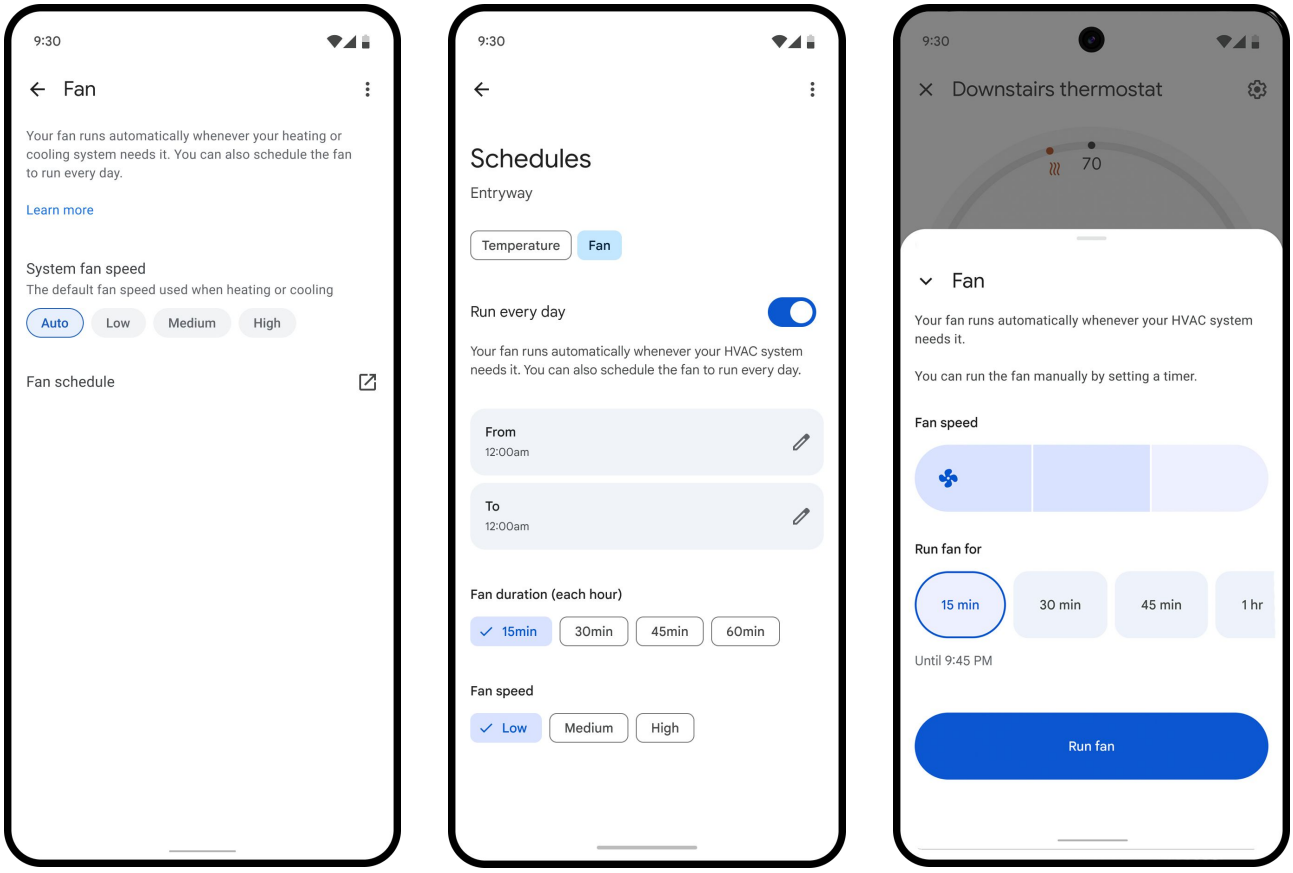
Multi-speed fans

The Nest Learning Thermostat is compatible with most multi-speed fans (up to 3 speeds) on systems that use standard 24 volt wiring. It will control the fan differently depending on how many fan wires are connected.

If your customer has a multi-speed fan with a single wire, the system will control the fan speed, not the Nest thermostat. This means they'll be able to use the Nest Learning Thermostat to adjust the temperature and turn the fan on or off, but they won't be able to manually control the fan speed.

If there's more than one fan wire installed, the Nest Learning Thermostat will automatically set the fan speed. Your customer will also be able to select a speed in the Fan menu.

When using multiple fans speeds, some HVAC functions will become unavailable.



Humidifiers and dehumidifiers

The Nest Learning Thermostat supports whole-home humidifiers and dehumidifiers that connect to it with one or two low voltage wires. There are multiple Pro Setup options for wires in the Star or AQ+ connectors to control a humidifier or dehumidifier. If you have a humidifier and a dehumidifier, one can be connected to the Star(*) terminal, and the other can be connected to the AQ+ terminal.

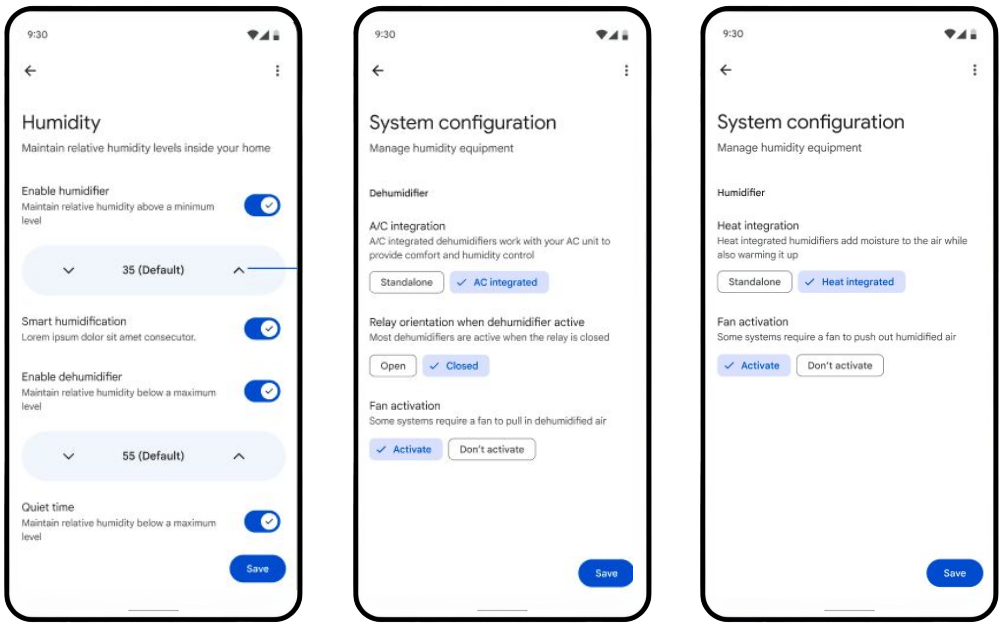
Compatible wires have one of the following labels:

- H, Hum, Hum1, H2, Hum2
- D, DH, Dhum, Dehum, D2, DH2, Dhoom2, Dehum2

Regardless of whether your customer's humidifier or dehumidifier has one wire or two, you will need to figure out if it can be activated on its own or if it requires heating or cooling to be running at the same time. You'll also need to determine other settings, such as whether the fan is required during operation.

The Nest Learning Thermostat Star (*) and AQ+ terminals are powered terminals. If you're connecting a 2-wire humidifier/dehumidifier, connect the wires to AQ+ and AQ-. Consult humidifier/dehumidifier installation manual for wiring requirements.

Important note: In dual transformer installations (installations with both Rc and Rh wires) it's important to note that different wires attached to the thermostat will use different power sources. The Rc wire will provide power to the Y1, Y2, G, and O/B terminals and AQ+ if AC- is not connected. The Rc wire will also charge the thermostat using the C terminal. The Rh wire will provide power to W1, W2/AUX, and Star connectors. Never connect wires from dual transformer systems to connectors from the opposite transformer.



Humidifier settings

There are two different configurations for humidifiers, standalone and Heat Integrated. You will also need to choose whether to activate the system fan when running the humidifier. When enabled, the user can choose the minimum relative humidity the thermostat will maintain. They can also enable the Smart Humidification feature, which uses outdoor weather to automatically reduce the humidity setpoint to prevent condensation forming on indoors. The last available setting is Quiet Time, which will prevent the humidifier from running during the specified hours. The user can choose a relative humidity to maintain between 10% RH and 60% RH.

Dehumidifier settings

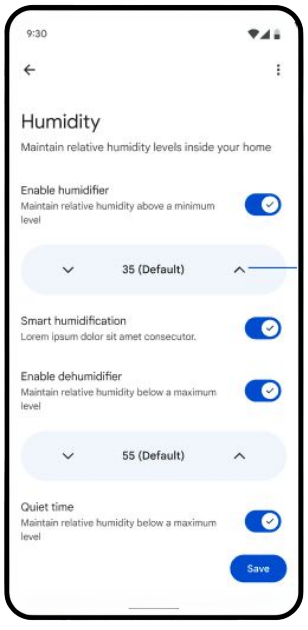
Dehumidifiers can be configured as a Standalone or A/C integrated system. You will need to choose whether to run the fan when running the dehumidifier and whether the equipment is activated when the relay is open or closed.

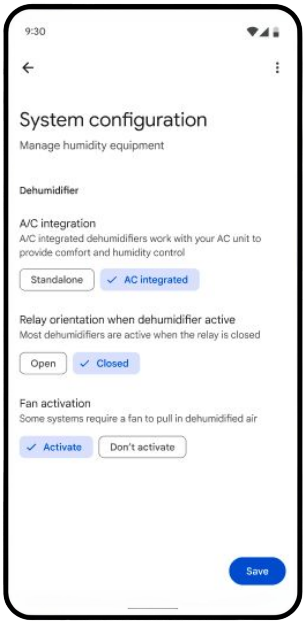
A/C integrated humidifiers will use the Cool to Dry feature to maintain humidity. A standalone humidifier will have the option to maintain a specific relative humidity percentage. The user can choose a target percentage between 30% RH and 80% RH.

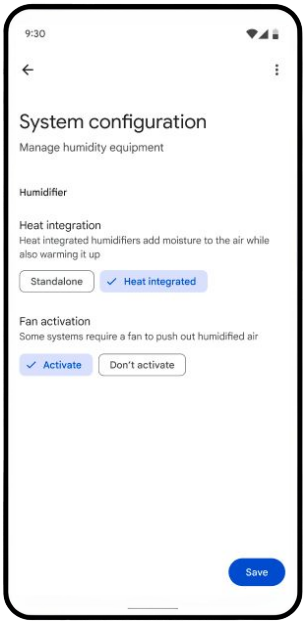
During Pro Setup, you can adjust Cool to Dry settings on the Advanced Settings page at the end of the setup process. You can adjust the Overcooling limit from 1-5°F, the Humidity Threshold at which Cool to Dry will turn on from 55% RH to 80% RH. You can also adjust the minimum indoor temperature for when the thermostat will enable Cool to Dry from 68-85°F. For more information on Cool to Dry, see page 18 in the Key Features section.

Combined humidifier/dehumidifier settings

When both a humidifier and dehumidifier are connected to the thermostat, you will be able to set a range of relative humidity the thermostat should maintain. The humidification target must be 15% RH below the dehumidification target.







Standard presets and feature ranges

Function	Notes
Compressor Lockout Timer*	Options: **2.5 min (default)**, 5 min, 7.5 min, 10min
Minimum Compressor On Timer*	Options: 3 min, **5 min (default)**, 10min, 15min, 20min, 25min, 30min
Minimum Conventional Heat On Timer*	Options: **3 min (default)**, 5 min, 10 min, 15 min, 20 min, 25 min, 30min
Heat Temperature Difference*	**Intelligently set between 0.3 and 1 degree Fahrenheit (default)** F Options: Auto, 0.3, 0.5, 0.7, 1, 1.5, 2 C Options: 0.2, 0.3, 0.4, 0.5, 0.8, 1
Cool Temperature Difference*	**Intelligently set between 0.3° and 1° degree Fahrenheit (default)** °F Options: Auto, 0.3°, 0.5°, 0.7°, 1°, 1.5°, 2° °C Options: 0.2°, 0.3°, 0.4°, 0.5°, 0.8°, 1°
Equipment Upstage Timer	1 hour for non-heat pump heating 2 hours for cooling
Cool To Dry*	Overcooling limit: °F Options: 1°, 2°, **3° (default)**, 4°, 5° °C Options: 0.5°, 1°, **1.5° (default)**, 2°, 2.5° Humidity Threshold: 55%RH, 60%RH, 65%RH, **70%RH (default)**, 75%RH, 80%RH Minimum Indoor Temperature: F Options: 68° - 85°, **80°F (default)** C Options: 20° - 29°, **27°C (default)**
Filter Reminder Frequency*	Options: 250 hrs, **500 hrs (default)**, 750 hrs, 1000 hrs, 1500 hrs, 2000 hrs

***Can be set manually during Pro Setup.**

Standard presets and feature ranges cont.

Function	Notes
Humidifier and Dehumidifier Setpoints Only available with a standalone Hum or Dehum	Dehumidifier: 30%-80% **55% Default** Humidifier: 10%-60% **35% default** Humidifier and Dehumidifier: **Hum target must be 15% below Dehum**

Heat pump presets and feature ranges

Function	Notes
Heat Pump Balance*	Heat Pump Balance Default Setting: Balanced Options: Max Comfort, Max Savings, Balanced, Off
Auxiliary Heat Lockout Temperature*	Based on Heat Pump Balance setting °F Range: 0°F -70°F, **40°F (default)** °C Range: -18°C - 21°C, **4.5°C (default)**
Droop*	Intelligently set between 0 and 2 degrees Fahrenheit °F Options: **0°F (default),** 1°F, 2°F, 3°F, 4°F, 5°F °C Options: **0°C (default),** 0.5°C, 1°C, 1.5°C, 2°C, 2.5°C
Aux Minimum Delay*	Based on Heat Pump Balance setting Options: **15 min (default)**, 30 min, 45 min, 60min
Aux Upstage Timer*	Based on Heat Pump Balance setting Options: 30 min, 60 min, **90 min (default)**, 2 hr, 3 hr, 5 hr, 8 hr, 12h

***Can be set manually during Pro Setup.**

Heat pump presets and feature ranges cont.

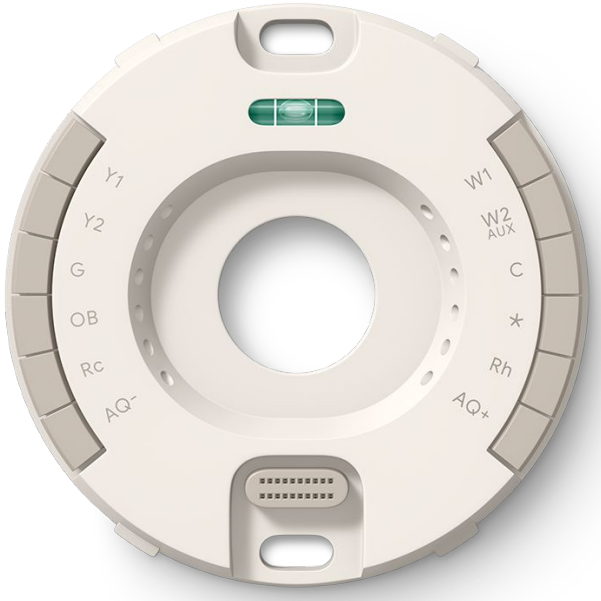
Function	Notes
Compressor Lockout Temperature Only Available for Single Fuel Heat Pump Systems	Compressor Lockout Default Temp: -25°F Range: -25°F to 32°F OR Always
Dual Fuel Breakpoint* *Switchover temp*	Dual Fuel Breakpoint Default Temp: 30°F Range: 10°F to 50°F, Always or Never
Dual Fuel Changeover Timer*	Options: Never, 1 hr, 2 hr, **4 hr (default)**, 8 hr, 12 hr
Safety Temps	Heat Default Temp: 40°F Heat Range: 35-45 Cool Default Setting: Off Cool Range: 95-105
Eco Temps	Heat Default Temp: 56°F Heat Range: 40°F to 70°F Cool Default Temps: 82°F Cool Range: 76°F to 95°F

***Can be set manually during Pro Setup.**

Wiring Diagrams - Conventional

Conventional 1-stage heating

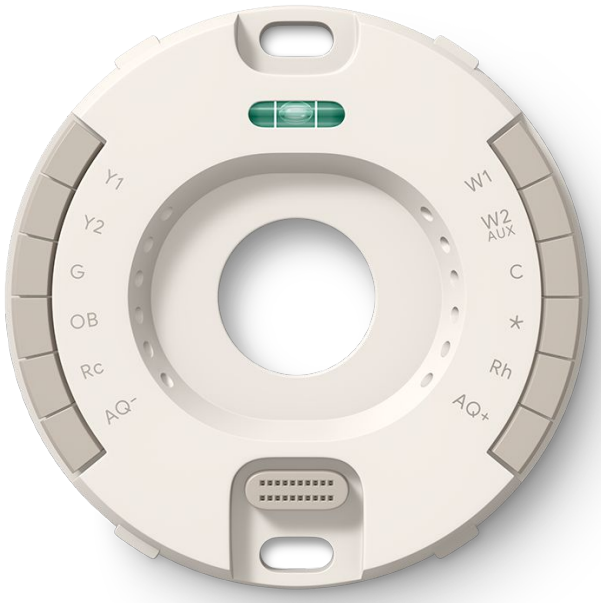
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	Heat Relay (Stage 1)
W2/AUX	
C	24VAC Common Wire
*	
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 2-stage heating

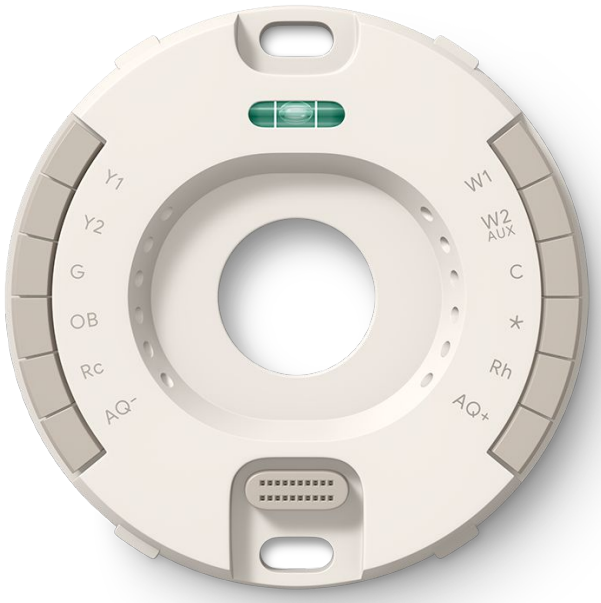
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 3-stage heating

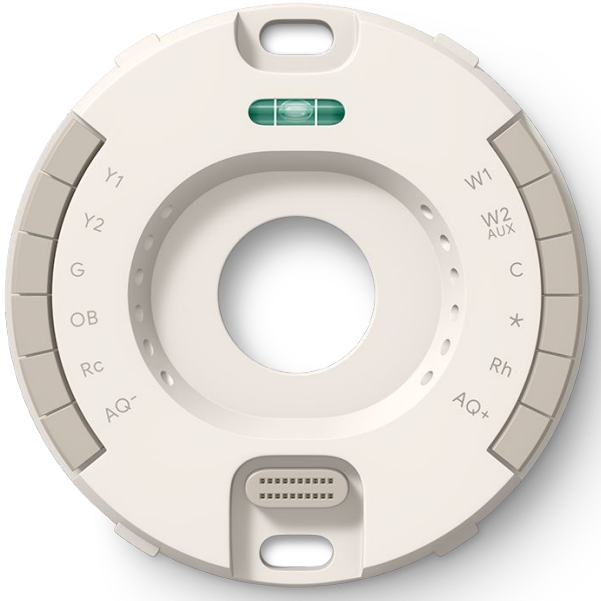
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	Heat Relay (Stage 3)
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 1-stage heating, 1-stage cooling

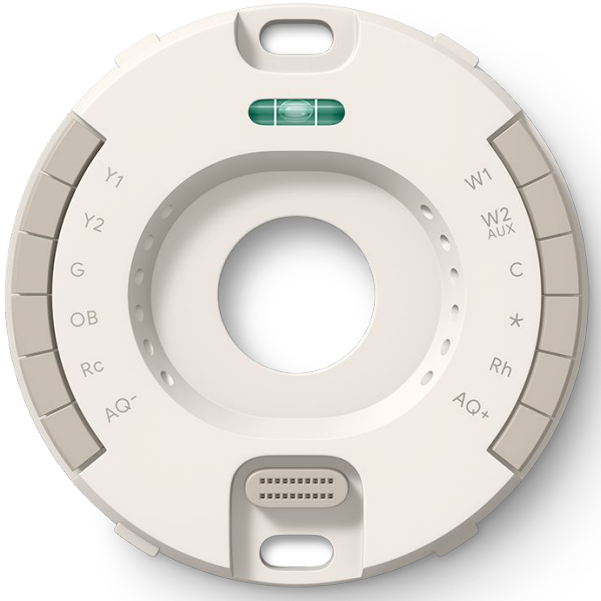
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 2-stage heating, 1-stage cooling

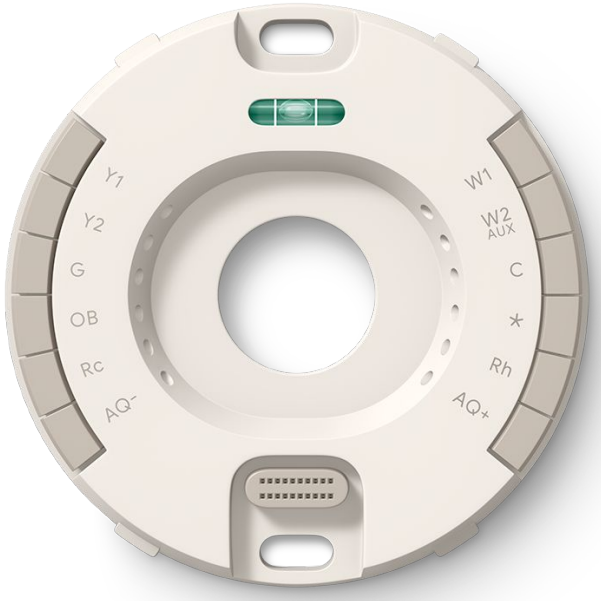
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 2-stage heating, 2-stage cooling

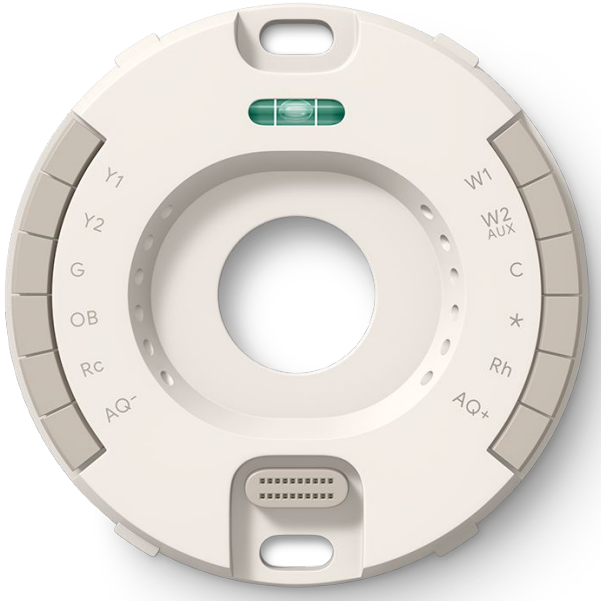
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 3-stage heating, 2-stage cooling

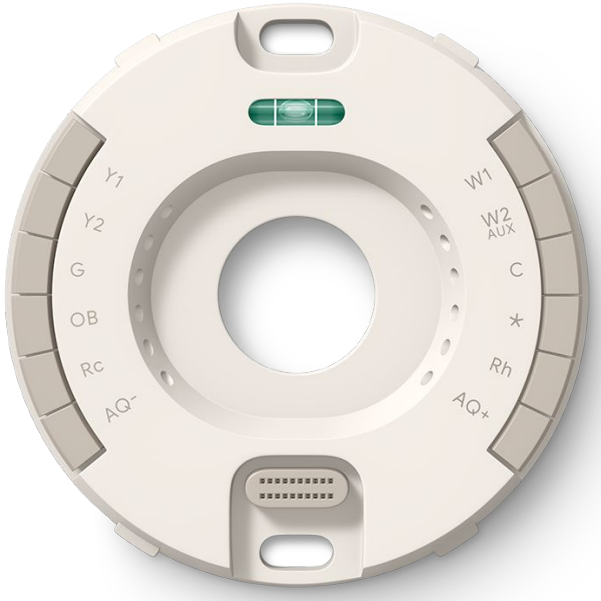
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	Heat Relay (Stage 3)
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Conventional 1-stage heating, 2-stage cooling

Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	

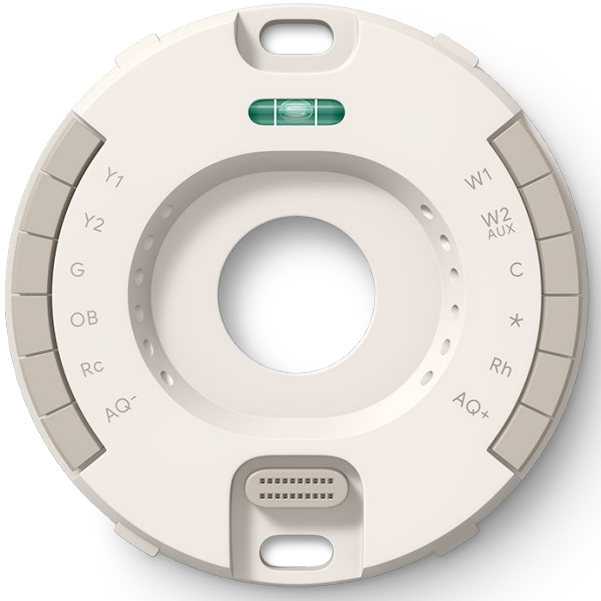


Install Notes: *Use for personal/or system notes*

Heat Pumps

1-stage heat pump

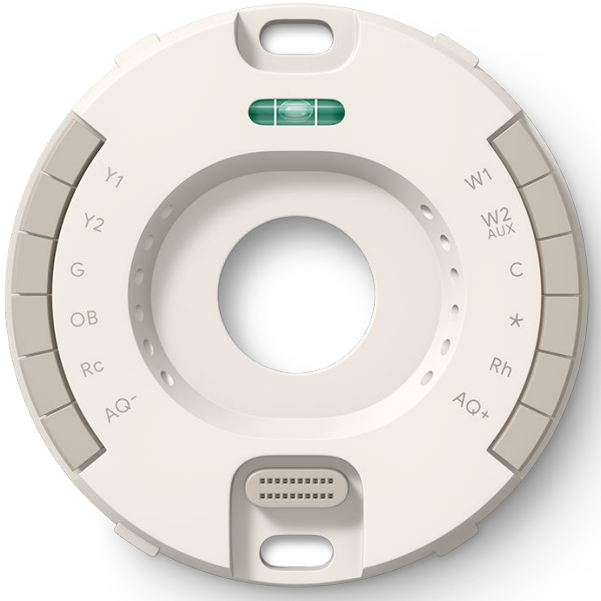
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

1-stage heat pump with Aux heat

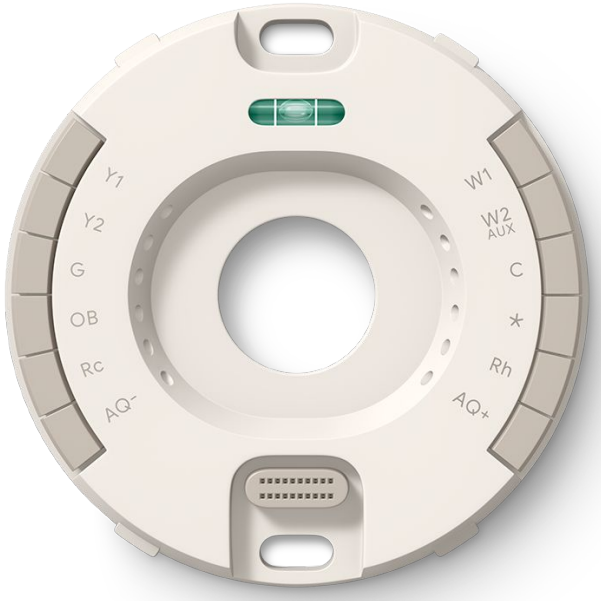
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	Auxiliary Heat Relay
C	24VAC Common Wire
*	Heat Relay (Stage 3)
Rh	24VAC power from heating transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

1-stage heat pump with Aux and Emergency heat

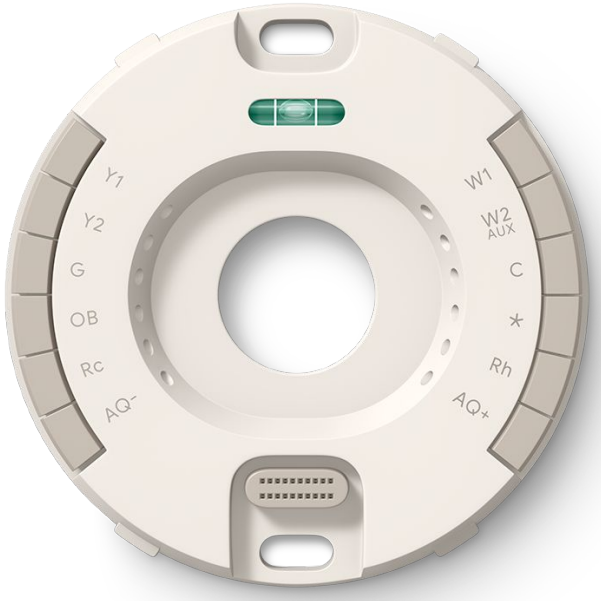
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	Auxiliary Heat Relay
C	24VAC Common Wire
*	E Heat
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump

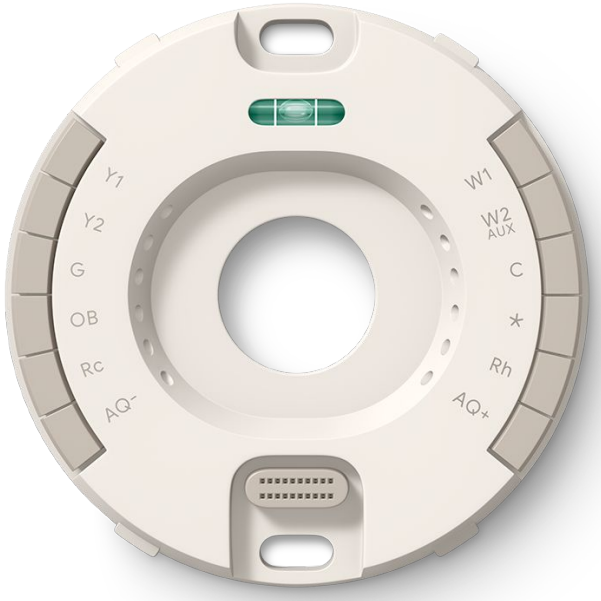
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump with Aux heat

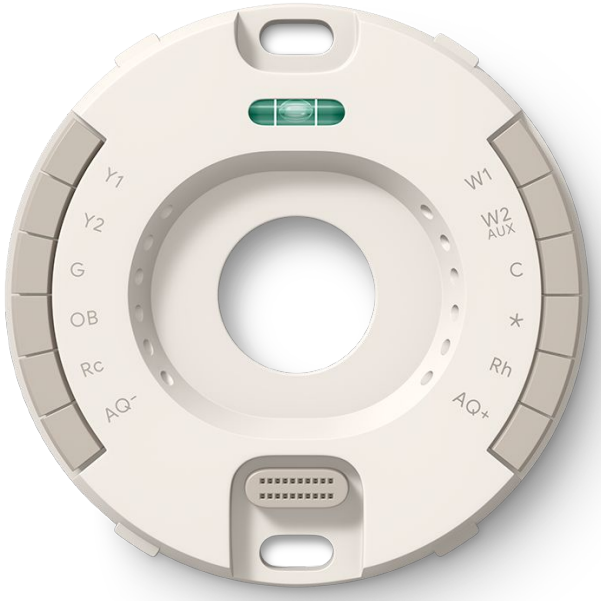
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	Auxiliary Heat Relay
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump with Aux and Emergency heat

Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	
W2/AUX	Auxiliary Heat Relay
C	24VAC Common Wire
*	E Heat
Rh	
AQ+	
AQ-	

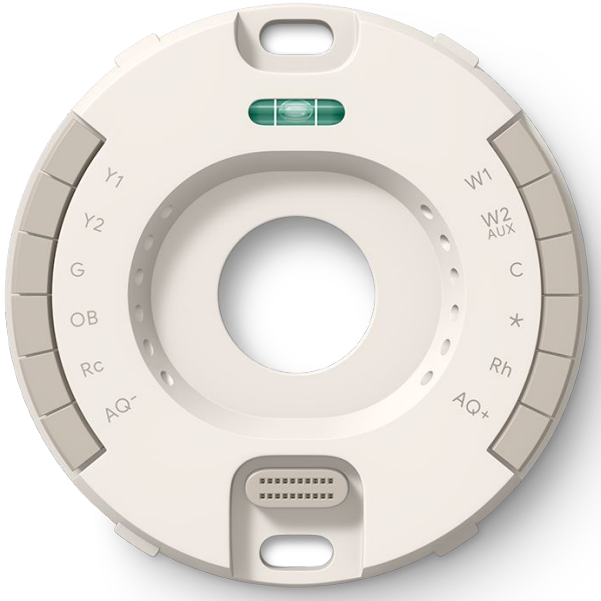


Install Notes: *Use for personal/or system notes*

Dual Fuel

1-stage heat pump, 1-stage heat

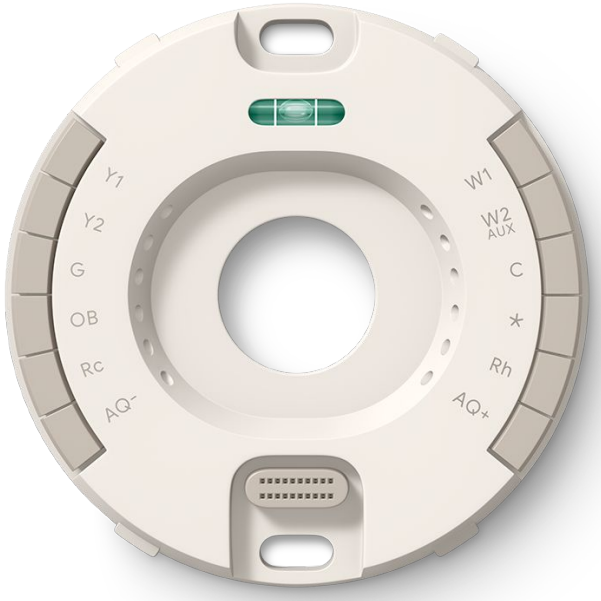
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump, 1-stage heat

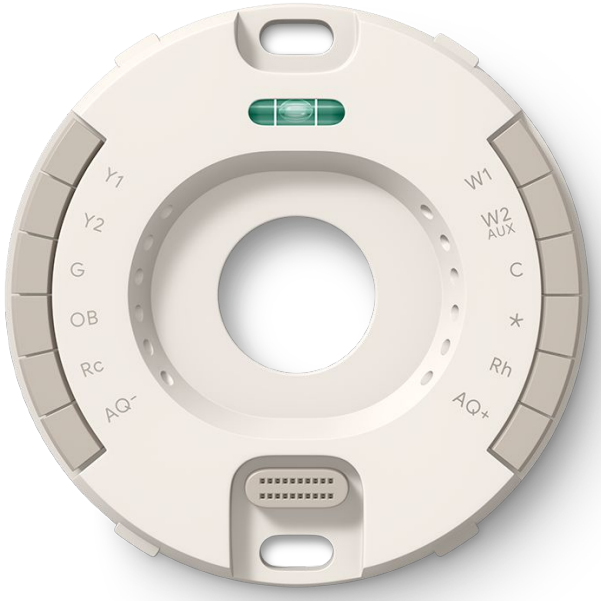
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

1-stage heat pump, 2-stage heat

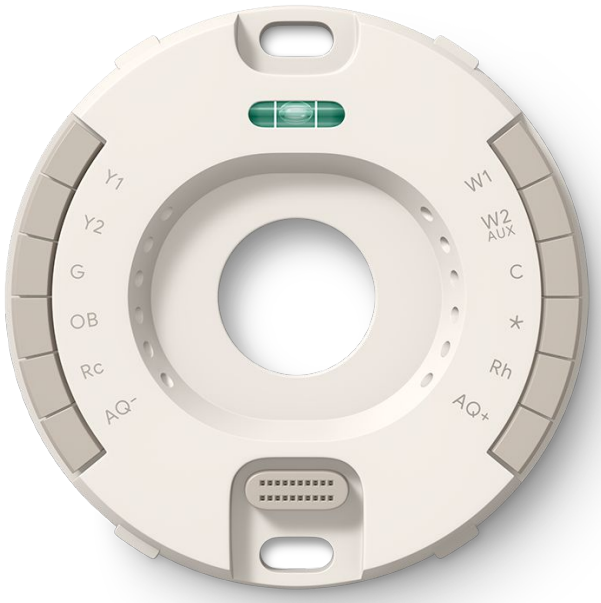
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Cooling Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump, 2-stage heat

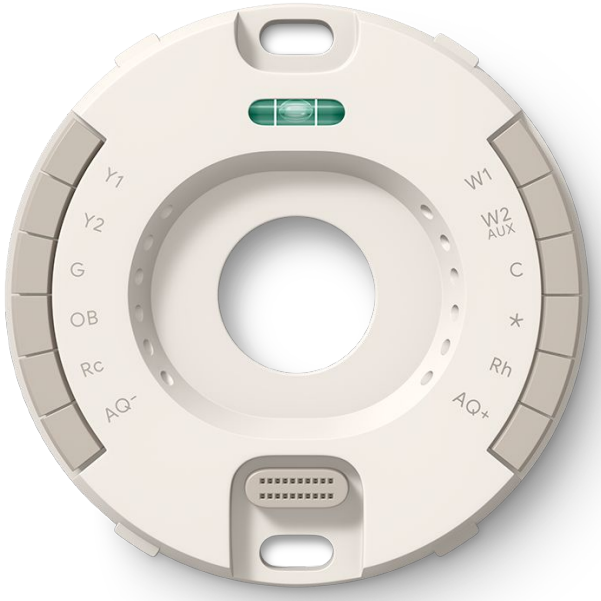
Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Heating Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-stage heat pump, 2-stage heat with Emergency heat

Wire Label	Function
Y1	Compressor Relay (Stage 1)
Y2	Compressor Relay (Stage 2)
G	Fan Relay
O/B	Heat Pump Changeover Valve
Rc	24VAC Power from Heating Transformer
W1	Heat Relay (Stage 1)
W2/AUX	Heat Relay (Stage 2)
C	24VAC Common Wire
*	E Heat
Rh	
AQ+	
AQ-	

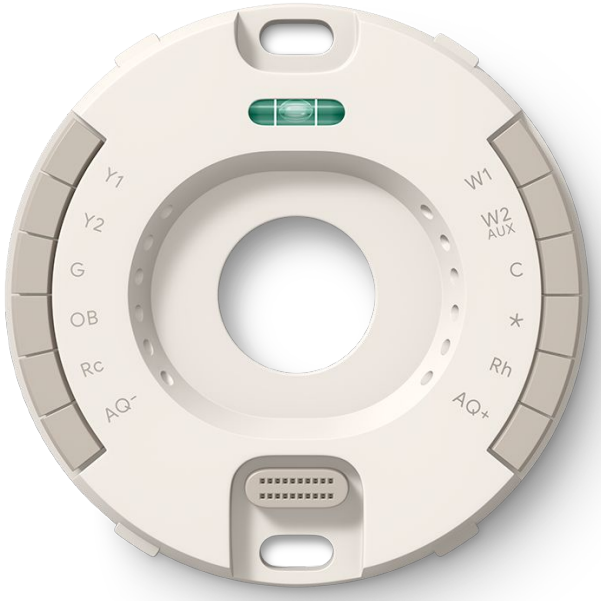


Install Notes: *Use for personal/or system notes*

Fan Control

2-speed fan

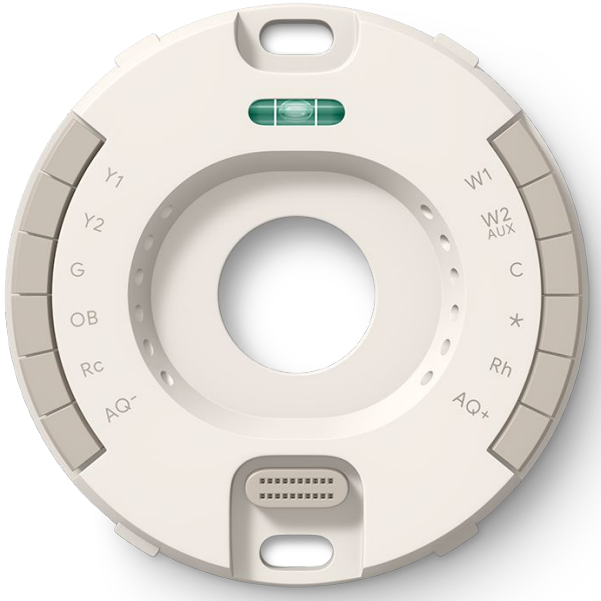
Wire Label	Function
Y1	
Y2	2nd-Speed Fan Relay
G	Fan Relay
O/B	
Rc	24VAC Power from Heating Transformer
W1	
W2/AUX	
C	24VAC Common Wire
*	
Rh	
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

3-speed fan

Wire Label	Function
Y1	
Y2	2nd-Speed Fan Relay
G	Fan Relay
O/B	
Rc	24VAC Power from Heating Transformer
W1	
W2/AUX	
C	24VAC Common Wire
*	3rd-Speed Fan Relay
Rh	
AQ+	
AQ-	

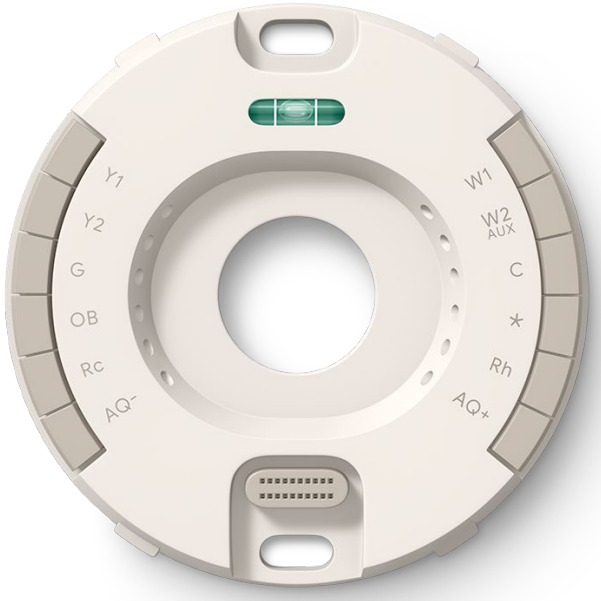


Install Notes: *Use for personal/or system notes*

Hum or Dehum

Hum or dehum- 1 Wire

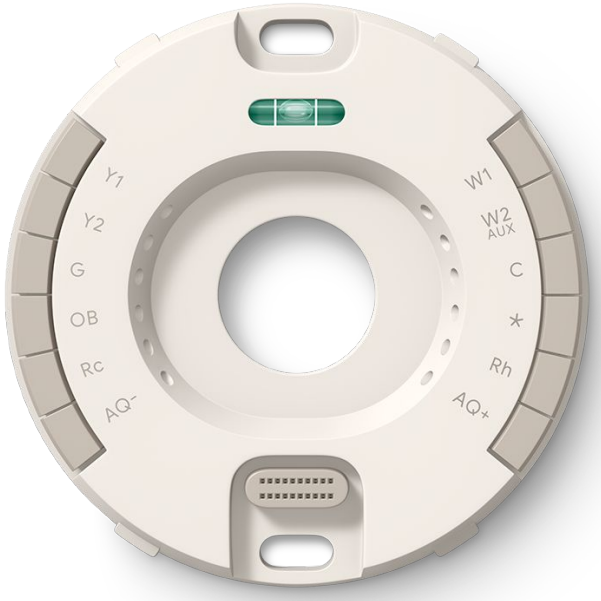
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Hum or dehum- 2 Wire

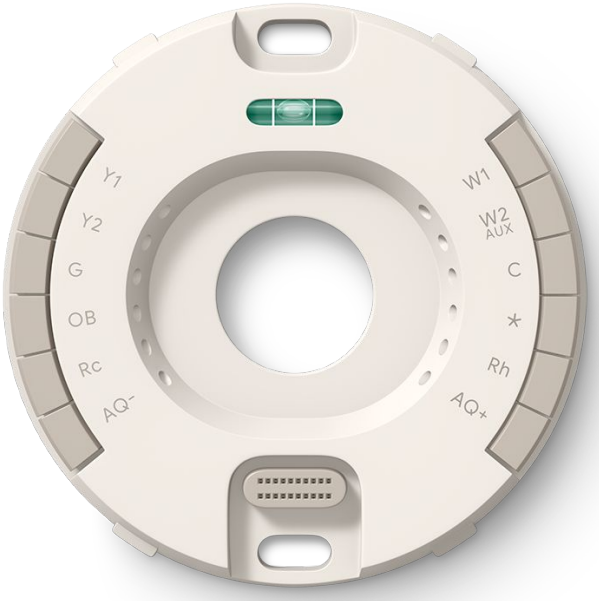
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Hum and dehum - 2-wire hum, 1-wire dehum

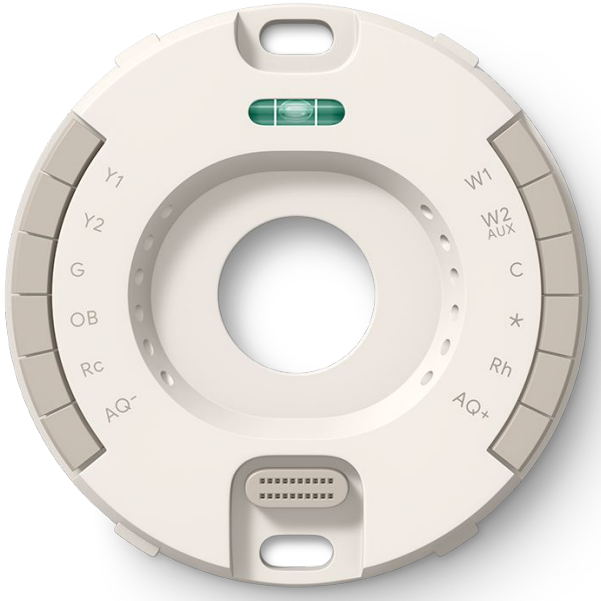
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Hum and dehum - 1-wire hum, 2-wire dehum

Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	

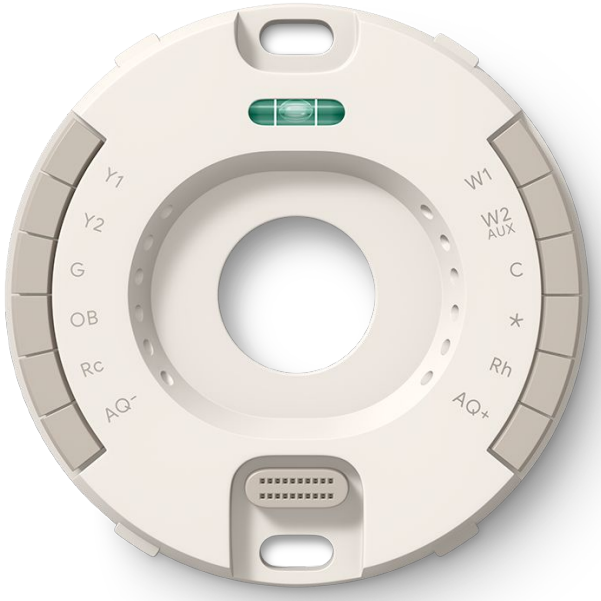


Install Notes: *Use for personal/or system notes*

Ventilation Systems

1-wire ventilation system

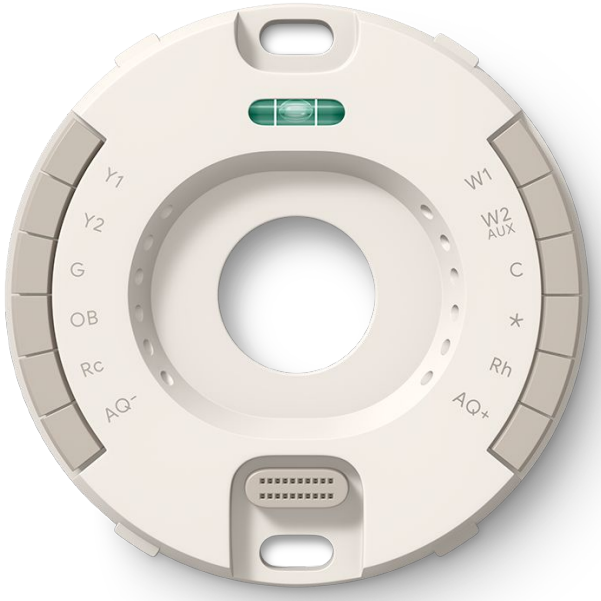
Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

2-wire ventilation system

Wire Label	Function
Y1	
Y2	
G	
O/B	
Rc	
W1	
W2/AUX	
C	24VAC Common Wire
*	HUM/DHUM
Rh	24VAC Power from Heating Transformer
AQ+	
AQ-	



Install Notes: *Use for personal/or system notes*

Troubleshooting

Handling Unusual Thermostat Wiring

When a B or X wire is a common wire

Most thermostat manufacturers use C to designate the connector for the common wire. However, there are some Trane, American Standard, and York thermostats that use B for the common wire.

The NEMA standard designated the B wire as one of the change-over wires for some heat pump manufacturers. This is a simple issue to address:

1. If you're installing a Nest thermostat to control a heat pump system and the current thermostat has both an B and a C, connect B to the Nest O/B connector and connect the C to the Nest C connector.
2. If you're installing a Nest thermostat to control a heat pump system and the current thermostat has both an O and a B, connect O to the Nest O/B connector and connect the B to Nest's C connector.
3. If you're installing a Nest thermostat to control a heat pump system and the current thermostat only has a B wire, connect B to the Nest O/B connector.
4. If you're installing a Nest thermostat to control a conventional system (non heat pump) and you see a B wire connected to the current thermostat, that B is a common wire and should be connected to the C connector on the Nest base.

Important Note: If you have a B wire that is actually a common wire, not following the rules above can lead to blowing a fuse on your HVAC controller board and, most likely, damaging the Nest thermostat.

When X, W1, or W2 is an AUX wire

Some heat pump installations may have the auxiliary heat connection labelled as X, W1, or W2 on the thermostat.

You should verify that the X wire on the old thermostat is not a common wire. Once you're sure, you can assume that the X is the auxiliary heat and should be inserted into the AUX/W2 connector on the Nest thermostat.

Compressor and Auxiliary Heat Lockout Temperatures for Heat Pumps Require Wi-Fi

The lockout temperatures are only enforced when the Nest thermostat is connected to Wi-Fi so it can track outdoor temperatures. If Wi-Fi is not enabled, auxiliary heat will come on automatically when it takes longer than expected to reach the current target temperature.

Search nest.com/support for auxiliary heat for more details.

If the Nest thermostat isn't getting enough power from W or Y and there is no Common (“C”) wire

Understanding Power Sharing - The Nest Learning Thermostat (4th gen) can get power from equipment wires even if there is not a common wire through a Patented Power Sharing process. When there is not a common wire, the thermostat will draw a small amount of power from the Y and or W wire when they are active or inactive. The Nest Learning Thermostat (4th gen) has improved power sharing in a few ways. This thermostat has a built-in battery like the Nest Learning Thermostat (3rd gen), but it uses less power to run the thermostat. It can also draw more power over the Y wire without activating the equipment. These new Power Sharing “states” can be identified and understood through the power readings on the next page.

We find that in the vast majority of homes, the Nest Learning Thermostat can charge its built-in battery by power sharing from the regular heating and cooling wires. But in some cases, a common wire is needed to deliver consistent power to the Nest Learning Thermostat while allowing normal operation of the heating and cooling system. If there is a common (C) wire installed, the Nest Learning Thermostat will not power share.

If a system can’t deliver consistent power to the thermostat to keep its battery charged or correctly control heating and cooling, users may experience one or more of these symptoms:

- Reduced thermostat battery life
- Thermostat display won’t turn on
- Thermostat motion sensing is disabled
- Thermostat occasionally disconnects from Wi-Fi
- System unexpectedly turns on or off
- System is making strange noises: chattering, stuttering, clicking, or thumping
- Heating or cooling is always on, and won’t turn off
- Heating or cooling repeatedly turns on and off in a short period
- A “Delayed” or “Starts in” message often appears on the thermostat’s screen (for example: “Heating is delayed for 2:30 mins”)
- The system fan is always running or won’t turn on
- The system fan turns on and off repeatedly in a short period
- User gets an N410 error

See page 77 for detailed power requirements and how to interpret them.

There are four options to solve a power issue:

1. Use the Nest Power Connector to provide constant power.
2. Use a spare wire as a common wire.
3. Add a resistor to an existing Y or W wire.
4. Pull a new common wire.

See page 78 for details and instructions about these four solutions.

Power requirements and details

Battery - The preferred voltage of the stat is 3.9v. If the thermostat drops below 3.8v, it will enter a “Power Saver” mode where some features and functions will be disabled. You will see this on the thermostat under the Power Info settings page. If the voltage drops below 3.6v, the thermostat will disconnect from Wi-Fi and if it drops below 3.7v, other features such as the Wake On Approach of the thermostat will be disabled.

Appropriate power readings - *Can be found on the thermostat under Settings> Equipment> Power Info*

Value Found on Thermostat	With Common or Power Connector	Without Common or Power Connector
VIN (Voltage input)	24 to 42V	24 to 42V
Iin (Current Intensity input)	150 to 300 mA	20 to 300 mA
Note: These values are not RMS voltage. You can divide the Voc or VIN by 1.414 to get an approximate RMS voltage the stat is reading. Always confirm voltage with a multimeter.		

Iin readings and what they mean

Iin is the input current limit the thermostat is using now. The letter next to the Iin value indicates the method of power sharing. The value should be above 20mA for full functionality. Some of the letters may be combined to provide more detail; for example, WA means that we are actively sharing power from the W wire.
Note: The thermostat will power share less frequently during the first 5 minutes of a call or heating or cooling when in the A or T mode.

- SY - Improved power sharing function being used on the Y wire.
- W - W is used for power sharing.
- Y - Y is used for power sharing.
- P - Drawing power from the Nest Power Connector. Note: this will confirm the Power Connector is installed and functioning correctly.
- T - Taco valve detected and utilizing a specific power sharing method for Wax Actuated Valves.
- A - Sharing power from an active wire, either W or Y.

PS values and what they mean.

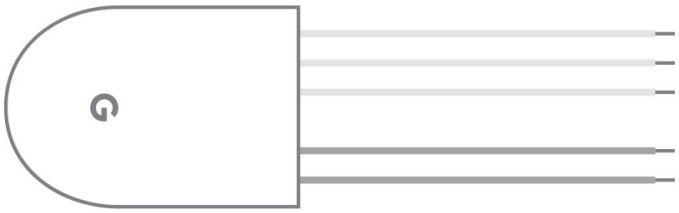
PS values are stats for the available methods of power sharing. These will provide more details, but will likely only be relevant when calling Pro Support.

- C - Maximum current draw on C-wire. Note: this will verify C wire functionality.
- Y, W, or YW - Maximum current draw on Y, W or Y+W wires when the thermostat is not activating them.
- YA or WA - Maximum current draw on Y or W wires when the thermostat is activating them.
- YP or WP - Metric to assess Power Connector presence on Y/W wires (greater than 12 typically means Power Connector is present, but there are other conditions that also need to be met for it to be detected).

1. Nest Power Connector

If your thermostat has power-related issues, like the battery draining too quickly or Wi-Fi constantly disconnecting, you can typically fix them by connecting a common wire (C wire) or by installing the Nest Power Connector. Either one will provide a stable power source for your Nest thermostat when your system can't deliver enough consistent power to it.

Please Note: *A Power Connector is needed for each thermostat in a Zoned system.*



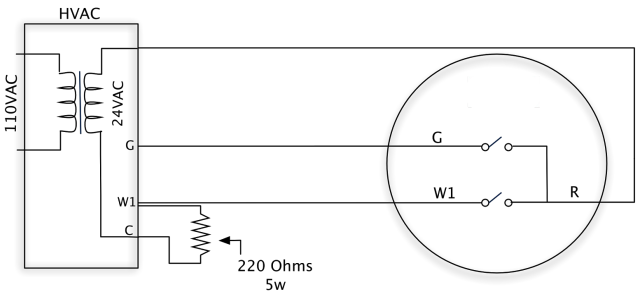
2. Use a spare wire as common wire

The easiest way to solve the problem is by using a spare wire in the thermostat wire as a common wire. Simply connect one end of the the unused wire to the Common ("C") terminal in the HVAC controller and the other end to the thermostat's C terminal.

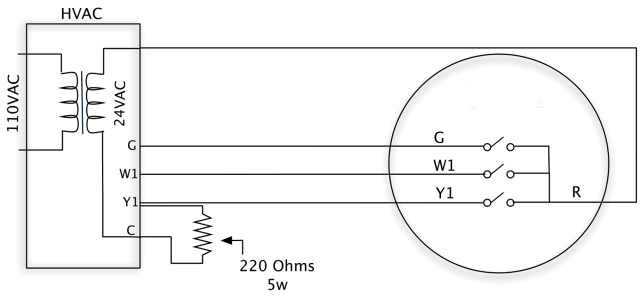
3. Add a resistor to an existing Y or W wire

We've found that many Y and W wire circuits that cannot supply enough power can be strengthened by bridging the Common terminal at the HVAC equipment to W or Y through a 220-ohm, 5W resistor.

In a heat-only system, you need to bridge from common (C) to W. In a HVAC system with a Y wire, you must bridge from common (C) to Y. In a system with both W and Y, you should bridge from common (C) to Y.



Heat only systems



Heating and cooling systems

4. Pull a new C wire

Replace the thermostat wiring bundle to provide an extra wire to be used as common. Advise your customer that this will require extra work and therefore an additional cost.

Reference Materials

“How To” Quick Reference Guide

Action:	Steps:
Tips on providing a good customer experience	Demonstrate how to use the Nest Learning Thermostat: • Basic temp changes • Home/Eco mode manual switching • Switching between heat/cool modes, etc. • Changing the temperature schedule • Running the fan Explain key functions of the thermostat • Explain rebates and rewards offers in your area • Explain Smart Schedule behavior and the initial learning period • Explain features like Energy History and Home Report • Explain how to add additional family members
How to check the power information on the thermostat	How to access key power information on the thermostat 1) Press the thermostat to access the Menu 2) Turn the ring and select SETTINGS 3) Turn the ring and select EQUIPMENT 4) Turn the ring and select POWER INFO

Action:	Steps:
Testing the basic operation after installation	Use System Test function in Equipment settings You can use the System Test function in the Equipment settings to engage each individual equipment component. If the thermostat is not connected to Wi-Fi, you will need to manually activate equipment by following the steps below. Activate heating and cooling Simply turn the ring to set the current set point above or below the current ambient temperature in the room. You’ll need to switch to and from heating and cooling modes as you do this. Switching modes To switch to and from heating and cooling modes, follow these steps: 1) Press the ring to bring up the menu 2) Select the Heating and Cooling icon 3) Turn the ring to select HEAT or COOL 4) Press the ring again to select **Note:** *To protect the heating and cooling systems it controls, the Nest Learning Thermostat’s default minimum on-off times for manual temperature adjustments are 2.5 minutes for heat pumps and air conditioning systems.*
Testing second stage or auxiliary heat after installation	Conventional Heating Before the Nest Learning Thermostat activates Time-to-Temperature, second stage heat will turn on when the setpoint is 4°F or greater than the room’s ambient temperature. Heat Pumps Auxiliary heat will turn on when the setpoint is 4°F and the outdoor temperature is below 50°F, the default auxiliary heat lockout temperature. Auxiliary lockout can be turned off in the Heat Pump section of Equipment Settings in order to test auxiliary heat. To test second stage or auxiliary heat at installation, just raise the temperature 4°F in heating mode with the auxiliary lockout turned off. Once Time to Temperature is activated, the Nest Learning Thermostat will use this feature to manage second stage and auxiliary heat.

Action:	Steps:
Switch between Heating, Cooling, and Range modes	To switch to and from heating and cooling modes, follow these steps: 1) Press the thermostat face to bring up the menu 2) Select the Mode Icon 3) Turn the ring to select HEAT, COOL, HEAT • COOL, or OFF 4) Press the ring again to confirm the mode selection
Heat pump: Setting compressor and auxiliary lockout temperatures	Both auxiliary and compressor lockout temperatures can be changed in the Equipment Settings menu of the Google Home app. By default, the Nest Learning Thermostat will lock out the auxiliary heater when the outdoor temperature is above 40°F but will not lockout the compressor at any temperature. The lockout temperatures are only enforced when the Nest Learning Thermostat is connected to Wi-Fi so it can track outdoor temperatures. To access the Heat Pump section of Equipment settings: 1) Navigate to the thermostat in the Google Home app 2) Select settings in the top right 3) Select “Thermostat” 4) Scroll down to “Equipment” 5) Select and adjust Lockout Temperatures
Heat pump: Change heat pump valve orientation	Follow these steps: • Navigate to the thermostat in the Google Home app • Select settings in the top right • Select “Thermostat” • Scroll down to “Equipment” • Select Heat Pump • Select O wire or B Wire under Heat Pump Wire

Action:	Steps:
Adjust Eco heating and cooling temperatures	These temperatures are set as the final step during the setup interview. To adjust: 1) Navigate to the thermostat in the Google Home app 2) Select Settings in the top right 3) Select “Temperature Preferences” 4) Select “Temperature Presets” 5) Adjust “Eco”
Adjust Safety Temperatures	No matter the schedule, the Nest Learning Thermostat will never let the home go above or below the safety temperatures. To adjust them, follow these steps: 1) Navigate to the thermostat in the Google Home app 2) Select Settings in the top right 3) Select “Temperature Preferences” 4) Adjust “Safety Temps”

Action:	Steps:
Setting fan speeds for systems with multi-speed fans	Follow these steps: 1) Press the ring to bring up the menu 2) Select the Fan icon 3) Choose System fan speed 4) Select the fan speed you’d like to use when your system is heating or cooling your home. You can choose Low, Medium, High or Auto, depending on your system’s wiring. 5) Choose Done to set your system's fan speed
How to engage Emergency Heat	Follow these steps on the Google Home app: 1) Navigate to the thermostat in the Google Home app 2) Select Settings in the top right 3) Select “Emergency Heat” 4) Toggle “User Emergency Heat” to On Follow these steps on the Thermostat: 1) Press the thermostat to access the menu 2) Turn the ring and navigate to SETTINGS 3) Turn the ring and select EMERGENCY HEAT 4) Turn the ring and select YES
How to add or verify that your Pro ID is linked to the thermostat	Follow these steps: 1) Press the thermostat ring to bring up the Quick View menu. 2) Go to Settings Nest settings icon and then Nest Pro 3) If your Nest Pro information is visible, it has been linked to the thermostat 4) If it hasn’t been added during installation, select, “Enter Nest Pro ID” 5) Enter your 6-digit Pro ID which can be found in the top right of your Nest Pro dashboard 6) If another Nest Pro’s contact information is already on the thermostat, you will have the option to replace it with yours. **Tip:** Customers can view your contact information by navigating to the Nest Pro section in the settings menu. They can also find it in the Google Home app in the Support section of the Settings Tab.

Action:	Steps:
Pairing Nest with the Google Home app	To pair the Nest Learning Thermostat to the Google Home app, follow these steps: 1) Download the Google Home app on your customer’s phone or tablet from the Apple App Store or Google Play 2) Open the Google Home app and sign in with a Google Account 3) Read and agree to Google’s Terms of Service 4) Add a Device in the Devices Tab or the home screen if this is the first device 5) Select Made by Google Device, then Thermostat and Nest Learning Thermostat (4th gen) 6) Scan the QR code on the thermostat and follow remaining instructions
Factory reset thermostat	You need to factory reset the thermostat if the wiring has changed or Advanced Settings available during Pro Setup need to be adjusted. Follow these steps to access the Factory Reset settings: 1) Press the ring to bring up the menu 2) Turn the ring and select Settings 3) Turn the ring and select Factory Reset
Re-configure Wi-Fi Network	Follow these steps to update the Wi-FI network: 1) Navigate to Settings tab of the thermostat 2) Select Device Information 3) Choose Wi-Fi, then press “OK” to begin changing network
Disconnect thermostat from account If the user wants to delete their account from the thermostat but keep the equipment settings. Useful when moving and leaving the thermostat behind.	Follow these steps to disconnect the thermostat from an account: 1) Press the ring to bring up the menu 2) Turn the ring and select SETTINGS 3) Turn the ring and select ACCOUNT 4) Confirm and disconnect the account

Wiring error quick reference guide

If the Nest Learning Thermostat senses a problem with the wiring, you'll receive an "E" error. These errors must be fixed before setup can continue. "N" errors are not as critical and setup will continue, but certain features may not work.

"E" errors related to wires not being detected can be the result of a wire not being fully inserted into the connector or terminal. Ensure that all wires are fully inserted and the connector buttons are in the down position before performing additional troubleshooting.

Important Note: *These errors may change with future software updates. Visit support.google.com for the latest information.*

Error #	Description:	What's going on?
N401	Power wire Rc detected. Not connected to equipment.	The Nest Learning Thermostat isn't electrically detecting the Rc wire, but one is connected to the Nest base.
N402	Power wire Rh detected. Not connected to equipment.	The Nest Learning Thermostat isn't electrically detecting the Rh wire, but one is connected to the Nest base.
N403	No power to W1 wire detected.	The Nest Learning Thermostat isn't electrically detecting the W1 wire, but one is connected to the Nest base.
N404	No power to Y1 wire detected.	The Nest Learning Thermostat isn't electrically detecting the Y1 wire, but one is connected to the Nest base.
N405	No power to W2/AUX wire detected.	The Nest Learning Thermostat isn't electrically detecting the AUX/W2 wire, but one is connected to the Nest base.
N406	No power to G wire detected.	The Nest Learning Thermostat isn't electrically detecting the G wire, but one is connected to the Nest base.
N407	No power to O/B wire detected.	The Nest Learning Thermostat isn't electrically detecting the O/B wire, but one is connected to the Nest base.

Wiring error quick reference guide - Continued

Important Note: *These errors may change with future software updates. Visit support.google.com for the latest information.*

Error #	Description:	What's going on?
N408	No power to Y2 wire detected.	The Nest Learning Thermostat isn't electrically detecting the Y2 wire, but one is connected to the Nest base
N409	No power to (star) wire detected.	The Nest Learning Thermostat isn't electrically detecting the * wire, but one is connected to the Nest base.
N410	A C wire or Nest Power Connector is recommended for your thermostat.	There is insufficient power from Y1 and W1 to power the thermostat.
N411	Low power to C wire.	The Nest Learning Thermostat detected abnormally low power available from the C wire.
N412	Your HVAC system needs maintenance.	Power availability from the Y wire declined to below what the thermostat needs to run.
N413	In extremely cold weather (i.e. blizzard), no power to Y1 wire detected.	The Nest Learning Thermostat has shut down the compressor due to cold weather and thus is no longer receiving power from Y1.
N414	No power to AQ+ wire detected.	The Nest Learning Thermostat isn't electrically detecting the AQ+ wire, but one is connected to the Nest base.
N415	AQ- requires AQ+.	The Nest Learning Thermostat is physically detecting an AQ- wire but not an AQ+ wire that is required for 2-wire ventilators, humidifiers, or dehumidifiers.
E421	E (emergency heat) wire without O/B wire.	The Nest Learning Thermostat is physically detecting a * (E) wire but not an O/B wire. O/B is a heat pump wire, and Nest only supports the use of emergency heat with heat pump systems.
E443	G2 and O/B wire conflict.	The Nest Learning Thermostat has detected a G2 (fan) wire in the Y2 connector, and a wire in the O/B connector. This wiring indicates a multi-speed fan and a heat pump. The Nest Learning Thermostat doesn't support multi-speed fans on heat pump systems.

Wiring error quick reference guide - Continued

Important Note: *These errors may change with future software updates. Visit support.google.com for the latest information.*

Error #	Description:	What's going on?
E440	G2 wire detected. Remove W2/AUX wire.	The Nest Learning Thermostat is physically detecting a wire in the W1 connector, a wire in the AUX/W2 connector, and a G2 (fan) wire in the Y2 connector. This indicates you have more than one stage of heat and more than one fan speed. The Nest Learning Thermostat does not support multiple stages of heat and multiple fan speeds at the same time.
E439	G2 detected. G1 wire is also required.	The Nest Learning Thermostat is physically detecting a G2 (fan) wire in the Y2 connector, but it's not detecting a wire in the G connector. Both wires are required for a multi-speed fan.
E442	G3 wire detected. G1 and G2 also required.	The Nest Learning Thermostat is physically detecting a G3 (fan) wire in the connector, but it isn't detecting a G2 (fan) wire in the Y2 connector or a wire in the G connector. All three wires are required for a three speed fan.
E419	Y2 wire without Y1 wire.	The Nest Learning Thermostat is physically detecting a Y2 wire, but not a Y1 wire that is required for 2-stage conventional cooling systems or 2-stage heat pumps.
E450	AQ and star wire conflict.	The Nest Learning Thermostat has detected a wire in the AQ connector and a wire in the * connector, both of which are configured as humidifiers (or dehumidifiers). The Nest Learning Thermostat doesn't support connecting 2 humidifiers or 2 dehumidifiers at the same time.
E448	No system power.	The Nest Learning Thermostat does not detect power. If a C wire is present, then power is not detected on the C wire. If a C wire is not present, and this is a single transformer system, then power is neither detected on Y1 nor on W1, or if this is a dual transformer system, then power is not detected on Y1.

Troubleshooting Quick Reference Guide:

Symptom:	What's going on:	Steps to fix:
Nest doesn't turn on after installation **Solid Amber light**	The internal battery is low and needs to charge.	If you leave it where it is, it will slowly charge and eventually turn on. This can take an hour or two. If you have a USB-C cable and wall charger, you can charge it more quickly over USB.
Nest doesn't turn on after installation **LED on backplate is off**	The power was never turned back on.	Use normal electrical troubleshooting techniques to isolate the issue to either the fuse/breaker box or a fuse on the HVAC controller board.
Unit seems to be running backwards (heat pump)	If it is heating when it is supposed to be cooling and visa versa, the orientation of the heat pump is probably incorrect.	Follow these steps to change the heat pump orientation: 1) Navigate to the thermostat in the Google Home app 2) Select settings in the top right 3) Select "Thermostat" 4) Scroll down to "Equipment" 5) Select Heat Pump 6) Select O wire or B Wire under Heat Pump Wire
Forgot lock code	Customer has forgotten the lock code to their Nest Learning Thermostat.	The Nest Learning Thermostat can be remotely unlocked by logging onto the Google Home app paired with their device.

Troubleshooting Quick Reference Guide:

Symptom:	What's going on:	Steps to fix:
Fan doesn't come on	Either there is an issue with the air handler or with the Nest Learning Thermostat.	First, check the wiring to make sure the wires are in the right place and the wire tips are straight and fully inserted into the connectors. If that doesn't work, turn off HVAC breakers and pull out the Rh and the G wires. Carefully hold them together with the copper ends touching for 10-20 seconds. If the fan turns on, there may be a hardware issue with the device, so please contact Pro Support. If the fan does not turn on, there is an issue with the heating and cooling system unrelated to the Nest thermostat.

Glossary