



RTH8500 Series

Programmable Thermostat

Quick Installation Guide

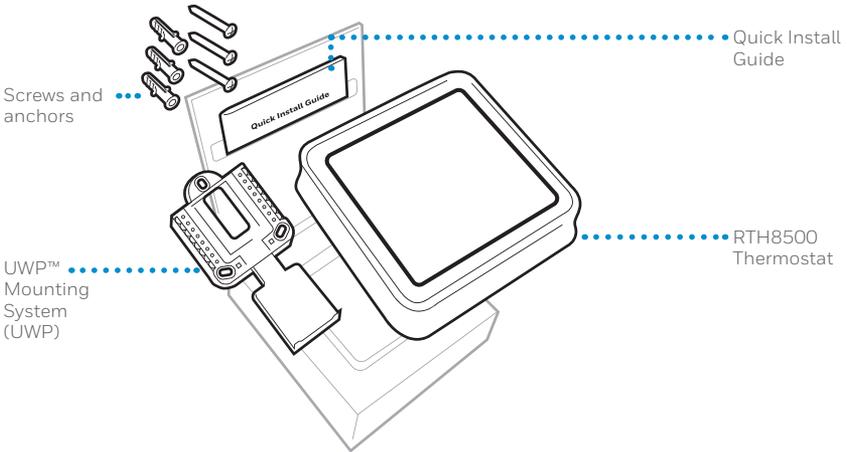
Read and save these instructions.

For help please visit honeywellhome.com



 **Find rebates:** HoneywellHome.com/Rebates

Included in your box



Tools you will need



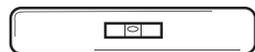
Phillips screwdriver



Small flat head screwdriver



Pencil

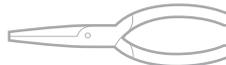


Level

Tools you may need



Wire stripper



Needle-nose pliers

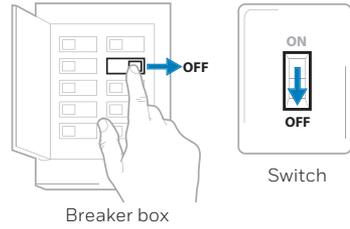


Drill and drill bit

Removing your old thermostat

1 Turn power OFF.

⚠ To protect yourself and your equipment, Turn off the power at the breaker box or switch that controls your heating/cooling system.



2 Check that your system is off.

Change the temperature on your old thermostat. If you don't hear the system turn on within 5 minutes, the power is off.

Note: If you have a digital thermostat that has a blank display, skip this step



3 Remove the old thermostat's faceplate.

On most thermostats, you can take off the faceplate by grasping and gently pulling. Some thermostats may have screws, buttons, or clasps.



⚠ Do not remove any wires from your thermostat at this time!

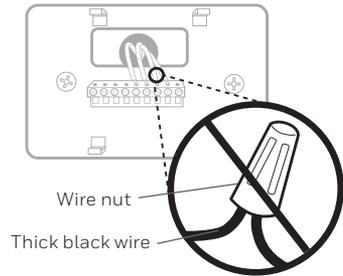
4 Make sure there are no 120/240V wires.

⚠ Do you have thick black wires with wire nuts?

Is your thermostat 120V or higher?

If you answered yes to either of these questions, you have a line voltage system and the thermostat will not work.

If you are unsure visit: honeywellhome.com/support



5 Take a picture of how your wiring looks right now.

Be sure to include the letters next to the terminals where the wires are inserted. This will be a helpful reference when wiring your thermostat.

Tip: If the color of your wires has faded or if 2 terminals have the same wire color, use the wire labels provided in the package to label each wire.



6 Record if you have wires in the following terminals. Do not include jumpers as a part of your count. The thermostat does not need jumpers.

Terminal	Wire Color
<input type="checkbox"/> R	_____
<input type="checkbox"/> RH	_____
<input type="checkbox"/> Rc	_____

7 Write down the color of the wires.

Check mark the wires that are connected to terminals. Next to the check mark, write down the color of the wire. **Do not include jumpers as a part of your count.**

Check all that apply (Not all will apply):

Terminal	Wire Color	Terminal	Wire Color
<input type="checkbox"/> Y	_____	<input type="checkbox"/> A or L/A	_____
<input type="checkbox"/> Y2	_____	<input type="checkbox"/> O/B	_____
<input type="checkbox"/> G	_____	<input type="checkbox"/> W2 or AUX	_____
<input type="checkbox"/> C	_____	<input type="checkbox"/> E	_____
		<input type="checkbox"/> W	_____
		<input type="checkbox"/> K	_____

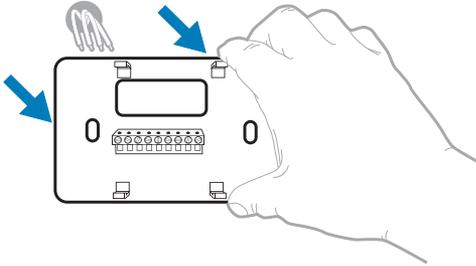
The RTH8500 thermostat does not support S or U terminals.

If there are wires in terminals that are not listed, you will need additional wiring support. Visit honeywellhome.com/support to find out if the thermostat will work for you.

8 Disconnect the wires and remove the old wall plate.

Use a screwdriver to release wires from terminals. Then, use a wire label to identify each wire as it's disconnected. The letter on the wire label should match the letter on the terminal.

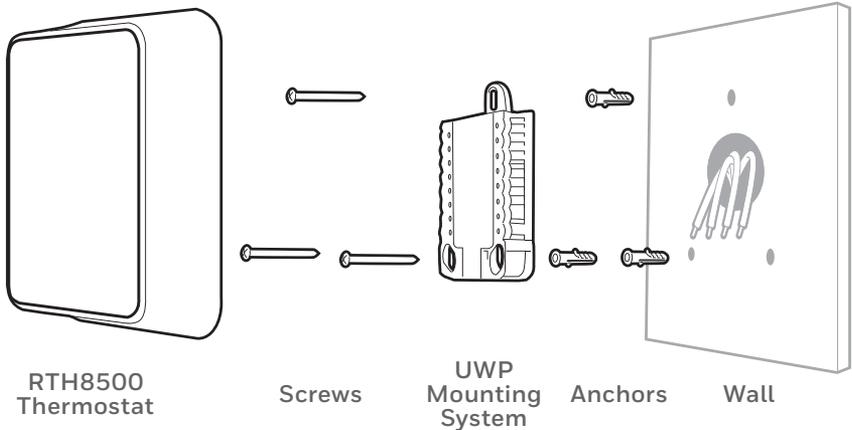
Tip: To prevent wires from falling back into the wall, wrap the wires around a pencil.



Wiring Labels		Étiquettes de fil		Bóbulos para los cables	
Apply these wiring labels to each wire with the appropriate terminal designation as you remove it from the existing thermostat.					
B	B	Y2	Y2	C	C
E	F	F	F	E	F
G	G	H	H	L	L
O	P	P	P	R	R
R	R	RC	RC	RH	RH
T	T	U	U	V/R	V/R
W	W	W1	W1	W2	W2
X	X	X1	X1	X2	X2
Y	Y	Y1	Y1	Y2	Y2

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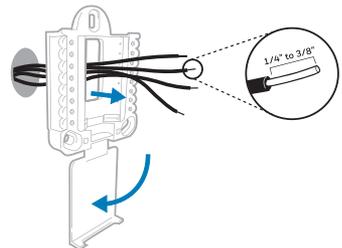
Installing your RTH8500 thermostat



9 Bundle and insert wires through the UWP.

Pull open the UWP and insert the bundle of wires through the back of the UWP.

Make sure at least **1/4-inch** of each wire is exposed for easy insertion into the wire terminals.



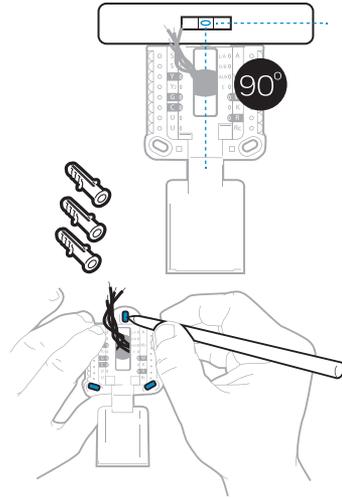
10 Insert the wall anchors.

It is recommended that you use the wall anchors included in the box to mount your thermostat.

You can use the **UWP** to mark where you want to place the wall anchors.

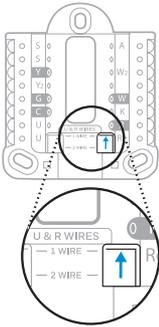
- Level the wall plate.
- Mark the location of the wall anchors using a pencil.
- Drill the holes.
- Insert wall anchors.
- Make sure anchors are flush with wall.

Tip: If your box contains red anchors, drill 7/32" holes.
If your box contains yellow anchors, drill 3/16" holes.

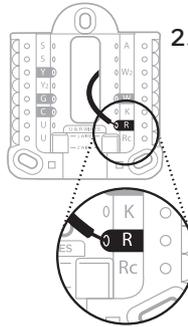
**11 Set R-switch position and insert R-wire or wires.**

Set the R-switch up or down based on your wiring notes in **Step 7**.

▲ Insert wires into the inner holes of the terminals on the UWP. The tabs will stay down once the wire is inserted.

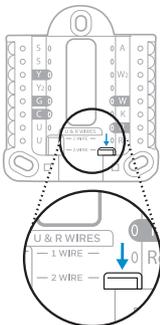
If you have 1 R-wire (R,Rh, or Rc)

1. Set R-switch to the **up position**.

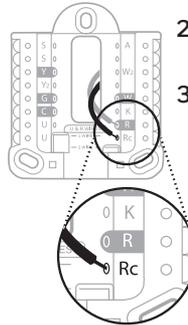


2. Insert your **R-wire (R, Rh or Rc) into R-terminal**.

or

If you have 2 R-wires (R or Rh, and Rc)

1. Set R-switch to the **down position**.



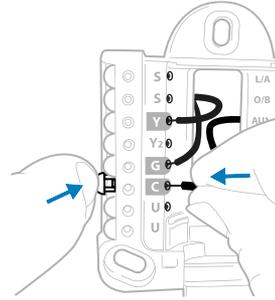
2. Insert your **Rc wire into Rc-terminal**
3. Insert your **R or Rh wire into R-Terminal**.

12 Connect wires from Step 7.

Depress the tabs to put the wires into the inner holes of their corresponding terminals on the UWP (one wire per terminal) until it is firmly in place.

Gently tug on the wires to verify they are secure.

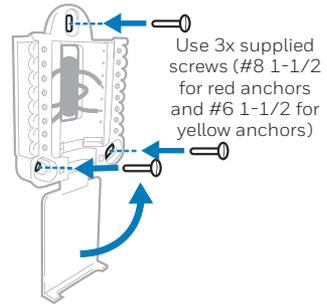
Tip: If you need to release the wires again, push down the terminal tabs on the sides of the UWP.



This wiring is just an example, yours may vary.

13 Mount the UWP and close the door.

Mount the UWP using the provided screws. Install all three screws into the wall anchors for a secure fit on your wall. Close the door after you're finished.



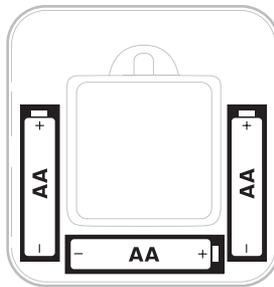
14 Confirm wiring matches snapshot.

Please confirm wiring matches terminals from the photo you took in Step 5.

15 Install batteries.

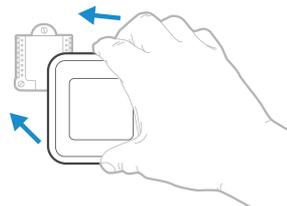
Insert three AA alkaline batteries in the back of the thermostat as shown.

NOTE: The RTH8500 thermostat works in battery mode or normal power mode if a C-wire is available.



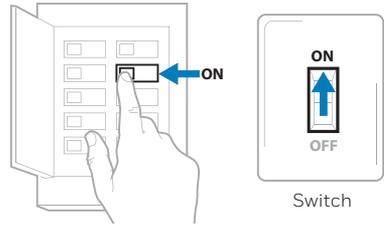
16 Attach your thermostat.

Align the thermostat onto the UWP and firmly snap it into place.



17 Turn your power ON.

Turn on the power at the breaker box or switch that controls the heating/cooling system.



Breaker box

Switch

18 Return to the thermostat

Return to the thermostat. Confirm the screen shows **START SETUP**.

If your thermostat does not show **START SETUP**, please contact Honeywell Home support.

**19 Start setup.**

Touch **START SETUP** to begin

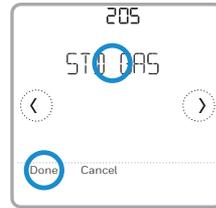
20 Navigate and edit setup options.

Use the ◀ or ▶ to navigate through all the setup options. To see a list of all setup options, go to pages 9-10.

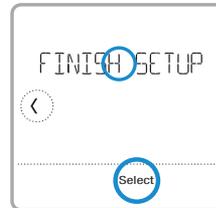
To edit an option, touch **Edit** or touch text area.

The value is now blinking. Use ◀ or ▶ to select the correct value.

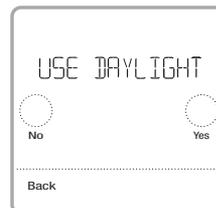
Touch **Done** or touch text area once the correct value is selected

**21 Finish setup.**

Touch ◯ until you see **FINISH SETUP**. Touch **Select** or touch text area.

**22 Set time and date.**

Set daylight saving time if you are in an area that follows daylight saving time. Set date, clock format, and time on the next screens.

**23 Your thermostat is now setup.**

Refer to page 8 for more information about basic operation.

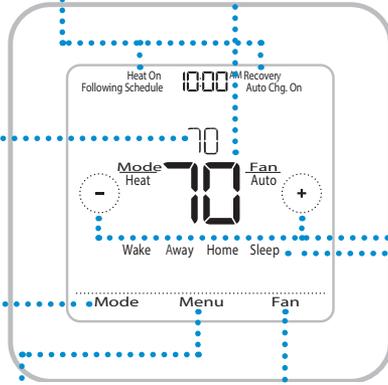
Key features

Desired temperature
Displays desired indoor temperature.

System status information
Cool On, Heat On Emergency Heat On, Recovery, or Auto Changeover On.
NOTE: Heat On/Cool On may flash for 5 minutes for compressor delay.

Indoor Temperature
Displays current indoor temperature.

Adjust temperature
Touch + or - to set your desired indoor temperature.



Mode
Select system mode Auto/Heat/Cool/Off/EM Heat (emergency heat).

Menu
Contains features: schedule, screen lock, clean screen, and other thermostat settings.
NOTE: Long press of Menu button for 5 seconds to access Advanced Menu options.

Fan
Select Fan mode Auto/On/Circulate.

Schedule period
Shows schedule period: Wake/Away/Home/Sleep.

System Setup options

To access all system options in the table below, press and hold **MENU** for 5 seconds. Touch  or  to scroll through the list.

Number	Description	Options (factory default in bold)
120	Scheduling Options	0 = Non-Programmable 1 = 1-Week Programmable 2 = 5-2 Programmable 3 = 5-1-1 Programmable 4 = 7-Day Programmable <i>Note: You can change default MO-FR, SA-SU schedule here. To edit periods during days, temperature setpoints, or to turn Schedule On/Off, touch MENU and go to SCHEDULE.</i>
125	Temperature Indication Scale	0 = Fahrenheit 1 = Celsius
200	Heating System Type	1 = Conventional Forced Air Heat 2 = Heat Pump 3 = Radiant Heat (Boiler) 5 = None (Cool Only) <i>Note: This option selects the basic system type your thermostat will control.</i>
205	Heating Equipment Type	<i>Conventional Forced Air Heat:</i> 1 = Standard Efficiency Gas Forced Air 2 = High Efficiency Gas Forced Air 3 = Oil Forced Air 4 = Electric Forced Air 5 = Hot Water Fan Coil <i>Heat Pump:</i> 7 = Air to Air Heat Pump 8 = Geothermal <i>Radiant Heat:</i> 9 = Hot Water Radiant Heat 12 = Steam <i>Note: This option selects the equipment type your thermostat will control. Note: This feature is NOT displayed if feature 200 is set to Cool Only.</i>
218	Reversing Valve O/B	0 = 0 (O/B in Cool) 1 = B (O/B in Heat) <i>Note: This option is only displayed if the Heat Pump configured. Select whether reversing valve O/B should energize in cool or in heat.</i>
220	Cool Stages / Compressor Stages 200=Conv / 200=HP	0, 1 , 2 <i>Note: Select how many Cool or Compressor stages of your equipment the thermostat will control. Maximum of 2 Cool/Compressor Stages. Set value to 0 if you do not have Cool Stage/Compressor Stage.</i>
221	Heat Stages / Backup Heat Stages Heat Stages	Heat Stages: 1 , 2 Backup Heat Stages: 0, 1 <i>Note: Select how many Heat or Aux/E stages of your equipment the thermostat will control. Maximum of 2 Heat Stages for conventional systems. Maximum of 1 Aux/E stage for systems with more than 1 heating equipment type. Set value to 0 if you do not have Heat Stage/Backup Heat Stage.</i>
230	Fan Control	1 = Equipment 2 = Thermostat <i>Note: This ISU is only displayed if ISU 205 is set to Electric Forced Air or Fan Coil.</i>
300	System Changeover	0 = Manual 1 = Automatic <i>Note: Thermostat can automatically control both heating and cooling to maintain the desired indoor temperature. To be able to select "automatic" system mode on thermostat home screen, turn this feature ON. Turn OFF if you want to control heating or cooling manually.</i>
303	Auto Differential	0 °F to 5 °F or 0.0 °C to 2.5 °C <i>Note: Differential is the minimum number of degrees rise or fall required during off cycle to switch from the last active mode (heat or cool) to the opposite mode when the thermostat is in auto-changeover. Differential is NOT deadband. The deadband temperature between when heating (or cooling) cycles on and cycles off to maintain setpoint is not adjustable. Honeywell Home uses an algorithm that fixes deadband at 0 °F.</i>

System operation settings

- 1 Press the **Mode** button to cycle to the next available System mode.
- 2 Cycle through the modes until the required System mode is displayed and leave it to activate.

NOTE: Available System modes vary by model and system settings.

System modes:

- **Auto:** Thermostat selects heating or cooling as needed.
- **Heat:** Thermostat controls only the heating system.
- **Cool:** Thermostat controls only the cooling system.
- **Em Heat (only for heat pumps with auxiliary heat):** Thermostat controls Auxiliary Heat. Compressor is not used.
- **Off:** Heating and cooling system is off. Fan will still operate if fan is set to On or Circulate.



Fan operation settings

- 1 Press the **Fan** button to cycle to the next available Fan mode.
- 2 Cycle through the modes until the required Fan mode is displayed and leave it to activate.

NOTE: Available Fan modes vary with system settings.

Fan modes:

- **Auto:** Fan runs only when the heating or cooling system is on.
- **On:** Fan is always on.
- **Circ:** Fan circulates randomly about 33% of the time.



Program Schedule

You can program four time periods each day, with different settings for weekdays and weekends. We recommend the pre-set settings (shown in the table below), since they can reduce your heating/cooling expenses.

Wake - Set to the time you wake up and the temperature you want during the morning, until you leave for the day.

Away - Set to the time you leave home and the temperature you want while you are away (usually an energy-saving level).

Home - Set to the time you return home and the temperature you want during the evening, until bedtime.

Sleep - Set to the time you go to bed and the temperature you want overnight (usually an energy-saving level).

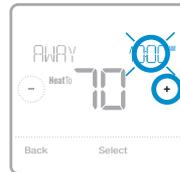
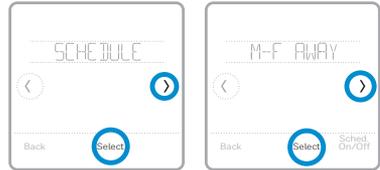
	Heat	Cool
Wake (6:00 am)	70°	78°
Away (8:00 am)	62°	85°
Home (6:00 pm)	70°	78°
Sleep (10:00 pm)	62°	82°

The above table is only an example.

NOTE: To temporarily or permanently override any of the above program schedules, see page 13.

To adjust program schedules

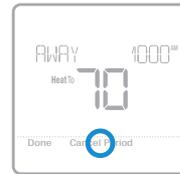
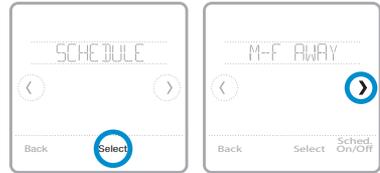
- 1 Touch **Menu** on the thermostat home screen.
- 2 Touch the ⏪ or ⏩ arrows until you see **SCHEDULE**, then touch **Select**.
- 3 Touch the ⏪ or ⏩ arrows to select a period in a day or set of days, then touch **Select** on the period you want to edit. (You can only edit a period of days according to the schedule type selected. To change schedule type, see setup # 120 on page 9.)
- 4 Touch the time area, then touch + or - to adjust when the period starts. Touch **Select** to confirm.
- 5 Touch the temperature area, then touch + or - to adjust your preferred temperature for the mode that's currently active (either heating or cooling). Touch **Select** to confirm. Then touch + or - to adjust your preferred temperature for the inactive mode. Touch **Select** to confirm.



- 6 Edit the next period or use the  until you see **Done**, then press **Select** to save changes and go to the home screen.



NOTE: To temporarily cancel a schedule period (such as Saturday–Sunday Away, for example, because you'll be home), go to the **SCHEDULE** option and touch the  or  arrows to select a period. Touch **Select** on the period you want to cancel, then touch **Cancel Period**. To reactivate the period you cancelled, touch **Cancel Period** again to select period start time and preferred temperature.



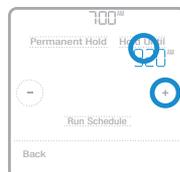
Schedule overrides

Hold Until (temporary hold): Overrides the current temperature setpoint for a maximum of 12 hours. You might use this feature to hold a temperature until a specific time.

Permanent hold: Overrides the current temperature set point permanently until you manually change it or reactivate a schedule.

Program schedule override (temporary)

- 1 Touch  or  on the thermostat home screen to set your desired temperature. **Hold Until** will appear together with the time the hold will end.
- 2 To change when the hold will end, touch the time and wait until the time starts blinking. Then, touch  or  to set when you want the hold to end. Touch **Hold Until** once more to confirm changes and return to the home screen.



NOTE: After the hold period ends, the thermostat will automatically return to the program schedule. If you want to cancel the hold, touch **Hold Until** and then touch **Run Schedule**.

Program schedule override (permanent)

- 1 Touch **+** or **-** on the thermostat home screen to reach your desired temperature. Hold Until will appear together with the time you want the hold to end.
- 2 Touch **Hold Until**. Permanent Hold will appear on screen. Touch **Permanent Hold** to hold this temperature until you manually change it.



NOTE: To end permanent hold and return to the program schedule, touch **Permanent Hold** and then touch **Run Schedule**.

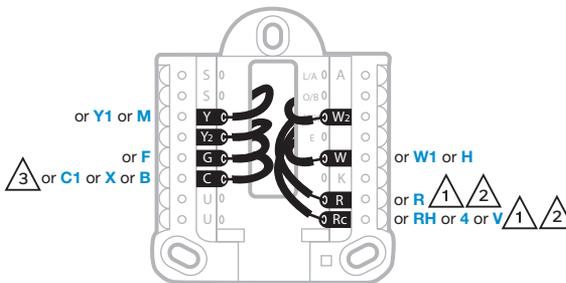
Wiring—conventional systems

Alternate wiring (conventional systems)

If labels do not match terminals, connect wires as shown below (see notes, below).

NOTES:

1. If you must connect both **R** and **Rc** wires, set the R Slider Tab to the **down** position (2 wires).
2. If your old thermostat had both **R** and **RH** wires, set the R Slider Tab to the **down** position (2 wires). Then connect the **R** wire to the **Rc** terminal, and the **RH** wire to the **R** terminal.
3. If your old thermostat had only 1 **C** or **C1** wire, connect it to the **C** terminal. If your old thermostat had 2 **C** or **C1** wires, wrap each separately with electrical tape and do not connect them.



Smart Response® Technology

This feature allows the thermostat to “learn” how long the furnace and air conditioner take to reach programmed temperature settings, so the temperature is reached at the time you set. For example: Set the Wake time to 6 am, and the temperature to 70°. The heat will come on before 6 am, so the temperature is 70° by the time you wake at 6. The message “Recovery” is displayed when the system is activated before a scheduled time period.

Battery replacement

Batteries are required to provide power when common wire is not used. Batteries are recommended to provide backup power if common wire is used. Install fresh batteries immediately when the low battery icon appears. The icon appears about two months before the batteries are depleted.



Even if the low battery icon does not appear, you should replace batteries once a year, or before leaving home for more than a month.

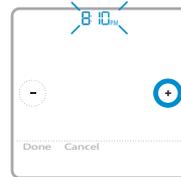
If batteries are inserted within two minutes, the time and day will not have to be reset. All other settings are permanently stored in memory, and do not require battery power.

NOTE: When replacing batteries, alkaline batteries are recommended.

Setting the time and date

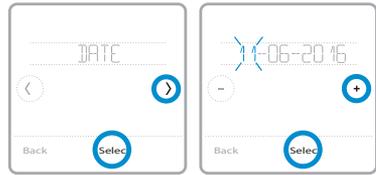
Setting the time

- 1 Touch **Menu** on the thermostat home screen.
- 2 Touch the ⏪ or ⏩ arrows until you see **CLOCK**, then touch **Select**.
- 3 Touch the ⏪ or ⏩ arrows until you see **SET TIME**, then touch **Select**.
- 4 Press + or - to set the time (or press and hold the buttons to move more quickly). Touch **Done** when finished.
- 5 Set clock format (12 hours or 24 hours) and daylight saving time in the same **CLOCK** sub-menu.



Setting the date

- 1 Touch **Menu** on the thermostat home screen.
- 2 Touch the ⏪ or ⏩ arrows until you see **DATE**, then touch **Select**.
- 3 Touch **+** or **-** to set the month, then touch **Select** to confirm.
- 4 Continue to set day and year in the same way. Touch **Select** to save your changes.



Choosing Fahrenheit or Celsius

To select a temperature scale, follow the steps below.

- 1 Touch **Menu** on the thermostat home screen.
- 2 Touch the ⏪ or ⏩ arrows until you see **TEMP SCALE**, then touch **Select**.
- 3 Touch the ⏪ or ⏩ arrows to select **FAHRENHEIT** or **CELSIUS** then touch **Done** to save your changes.
- 4 Touch **Back** to return to the thermostat home screen.



Alerts and maintenance reminders

- 1 Touch **Menu** on the thermostat home screen, then you'll see the **ALERTS** sub-menu. (The ALERTS sub-menu will only be available when there's an active alert.)
- 2 Touch **Select** to view the alert. A 3-digit alert code will appear by the thermostat's clock and a description of the alert will scroll on the screen.
- 3 If the alert is non-critical, you'll have the option to Snooze or Dismiss it. If you have multiple alerts, touch the ⏪ or ⏩ arrows to page through the list of active alerts and follow steps 1 and 2 above.

To see what each 3-digit alert code means and the action you should take, refer to the chart below.

Number	Alert/Reminder	Definition
170	Internal Memory Error	The memory of the thermostat has encountered an error. Please replace the thermostat.
173	Thermostat Temperature Sensor Error	The sensor of the thermostat has encountered an error. Please replace the thermostat.
181	Replace Air Filter (1)	Replace air filter (1). Reset the timer by touching the "dismiss" button on thermostat screen after it is replaced.
405	Low Battery Alert	The batteries are getting low. Replace them within two months.
407	Critical Low Battery	The batteries are almost depleted and should be replaced as soon as possible.

Troubleshooting

If you have difficulty with your thermostat, please try the following suggestions. Most problems can be corrected quickly and easily.

Display is blank	<p>Make sure fresh AA alkaline batteries are properly installed (see page 6).</p> <p>If powered by common (C-wire), verify circuit breaker and furnace switch are turned on.</p> <p>Verify furnace door is securely closed.</p>
Cannot change system setting to Cool	<p>Check System Setup Option 220 to make sure the options are set to either 1 or 2 (see page 9).</p>
Fan does not turn on when heat is required	<p>Check System Setup Option 205 to make sure it is set to match your heating equipment (see page 9).</p>
Heating system is running in cool mode	<p>Check System Setup Option 200 or 218 to make sure it is set to match your heating and cooling equipment (see page 9).</p>
Heating or cooling system does not respond	<p>Press System to set system to <u>Heat</u>. Make sure the temperature is set higher than the Inside temperature.</p> <p>Press System to set system to <u>Cool</u>. Make sure the temperature is set lower than the Inside temperature.</p> <p>Check circuit breaker and reset if necessary.</p> <p>Make sure power switch at heating & cooling system is on.</p> <p>Make sure furnace door is closed securely.</p> <p>Wait 5 minutes for the system to respond.</p>
Heat On / Cool On flashing on the screen	<p>Compressor protection feature is engaged. Wait 5 minutes for the system to restart safely, without damage to the compressor.</p>
Heat pump issues cool air in heat mode, or warm air in cool mode	<p>Check System Setup Option 200 or 218 to make sure it is set to match your heating and cooling equipment (see page 9).</p>
Aux heat runs in cooling	<p>For heat pump systems, verify there is not a wire attached to W on UWP systems. See “Wiring—heat pump” on page 15.</p>
Cool runs with a call for heat	<p>For heat pump systems, verify there is not a wire attached to W on UWP systems. See “Wiring—heat pump” on page 15.</p>

1-year limited warranty

Resideo warrants this product, excluding battery, to be free from defects in workmanship or materials, under normal use and service, for a period of one (1) year from the date of first purchase by the original purchaser. If at any time during the warranty period the product is determined to be defective due to workmanship or materials, Resideo shall repair or replace it (at Resideo's option).

If the product is defective,

(i) return it, with a bill of sale or other dated proof of purchase, to the place from which you purchased it; or

(ii) call Resideo Customer Care at 1-800-468-1502. Customer Care will make the determination whether the product should be returned to the following address: Resideo Return Goods, 1985 Douglas Dr. N., Golden Valley, MN 55422, or whether a replacement product can be sent to you.

This warranty does not cover removal or reinstallation costs. This warranty shall not apply if it is shown by Resideo that the defect was caused by damage which occurred while the product was in the possession of a consumer.

Resideo's sole responsibility shall be to repair or replace the product within the terms stated above. RESIDEO SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE OF ANY KIND, INCLUDING ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING, DIRECTLY OR INDIRECTLY, FROM ANY BREACH OF ANY WARRANTY, EXPRESS OR IMPLIED, OR ANY OTHER FAILURE OF THIS PRODUCT.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so this limitation may not apply to you.

THIS WARRANTY IS THE ONLY EXPRESS WARRANTY RESIDEO MAKES ON THIS PRODUCT. THE DURATION OF ANY IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IS HEREBY LIMITED TO THE ONE YEAR DURATION OF THIS WARRANTY. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state. If you have any questions concerning this warranty, please write Resideo Customer Care, 1985 Douglas Dr, Golden Valley, MN 55422 or call 1-800-468-1502.

**CAUTION: ELECTRICAL HAZARD**

Can cause electrical shock or equipment damage. Disconnect power before beginning installation.

**CAUTION: MERCURY NOTICE**

If this product is replacing a control that contains mercury in a sealed tube, do not place the old control in the trash. Contact your local waste management authority for instructions regarding recycling and proper disposal.

Electrical Ratings

Terminal	Voltage (50/60Hz)	Running Current
W Heating	20-30 Vac	0.02-1.0 A
W2 (Aux) Heating	20-30 Vac	0.02-1.0 A
E Emergency Heat	20-30 Vac	0.02-0.5 A
Y Compressor Stage 1	20-30 Vac	0.02-1.0 A
Y2 Compressor Stage 2	20-30 Vac	0.02-1.0 A
G Fan	20-30 Vac	0.02-0.5 A
O/B Changeover	20-30 Vac	0.02-0.5 A
L/A Input	20-30 Vac	0.02-0.5 A

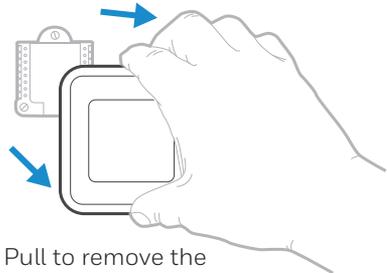
NOTE: Not for use with 250, 500, or 750 MV systems.

Customer assistance

For assistance with this product, please visit

<http://honeywellhome.com>

Or call Customer Care toll-free at **1-800-468-1502**.



Pull to remove the thermostat from the UWP.

**resideo**

www.resideo.com

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