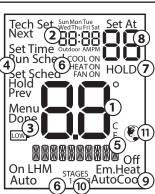


Magnet in door

## **Thermostat Quick Reference**

## Getting to know your thermostat



- (1) Indicates the current room temperature
- (2) Time and day of the week
- (3) Low Battery Indicator: Replace batteries when this indicator is shown.
- (4) Menu Options: Shows different options.
- **5 Program Time Periods:** This thermostat has 4 programmable time periods per day.
- (6) System Operation Indicators: The COOL ON ★★, HEAT ON ♠ or ♣ icon will display when the COOL, HEAT, or ♣ (fan) is on. The compressor delay feature is active if these are flashing.
- **(7)** Hold is displayed when the thermostat program is permanently overridden.
- (8) Setpoint: Displays the selected setpoint temperature.
- (9) System: Indicates current mode of operation.
- (10) **Stages:** +1 will appear in the display when second stage of heat or cool is on. +2 will appear for third stage of heat.
- (11) Globe: Globe is displayed if an energy efficient temperature has been selected.

#### Important

The low battery indicator is displayed when the AA battery power is low. If the user fails to replace the battery within 21 days, the screen will only show the low battery indicator but maintain all functionality. If the user fails to replace the batteries after an additional 21 days (days 22-42 since first "low battery" display) the setpoints will change to 55°F (Heating) and 85°F (Cooling). If the user adjusts the setpoint away from either of these, it will hold for 4 hours then return to either 55°F or 85°F. After day 63 the batteries must be replaced immediately to avoid freezing or overheating because the thermostat will shut the unit off until the batteries are changed.

## **Wiring Diagrams**

#### **Wiring Tips**

5

#### **C** Terminal

Wire Specifications

The C (common wire) terminal does not have to be connected when the thermostat is neurored by batteries

**Installation Tip:** Do not overtighten terminal block screws, as this can damage the terminal block. A damaged terminal block can keep the thermostat from fitting on the subbase correctly or cause system operation issues. **Max Torque = 6in-lbs.** 

#### Power supply

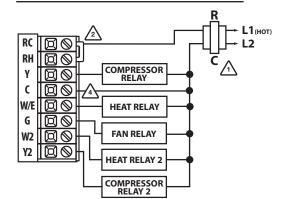
Factory - installed jumper. Remove only when installing on a 2 transformer systems.

Use either O or B terminals for changeover valve.

thermostat is powered by batteries.

Optional 24 VAC common connection when thermostat is used in battery power mode.

#### Typical 2H/2C System: 1 Transformer



#### Note:

In many systems with no emergency heat relay a jumper can be installed between W/E and W2.

# Wiring

## Wiring

- 1. If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the **G** terminal.
- Loosen the terminal block screws. Insert wires then retighten terminal block screws.
- **3.** Place nonflammable insulation into wall opening to prevent drafts.

Caution: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

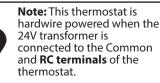


All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

Terminal	2 Heat 2 Cool Conventional System	2 Heat 2 Cool Heat Pump System	3 Heat 2 Cool Heat Pump System
RC	Transformer power (cooling)	Transformer power (cooling)	Transformer power (cooling)
RH	Transformer power (heating)	Transformer power (heating)	Transformer power (heating)
С	Transformer common	Transformer common	Transformer common
В	Energized in heating	Heat pump changeover valve energized in heating	Heat pump changeover valve energized in heating
0	Energized in cooling	Heat pump changeover valve energized in cooling	Heat pump changeover valve energized in cooling
G	Fan relay	Fan relay	Fan relay
W/E	First stage of heat	First stage of emergency heat	First stage of emergency heat
W2	Second stage of heat	Auxiliary heat relay, second stage of heat	Auxiliary heat relay, third stage of heat
Y	First stage of cool	First stage of heat & cool	First stage of heat & cool
Y2	Second stage of cool	Second stage of cool	Second stage of cool & second stage of heat
S1/S2	Remote Sensor	Remote Sensor	Remote Sensor

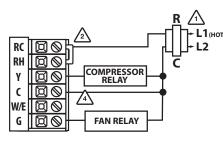
## **Wiring Diagrams**



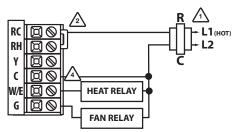


Note: In many systems with no emergency heat relay a jumper can be used between E and W2.

#### Typical Cool-Only System With Fan



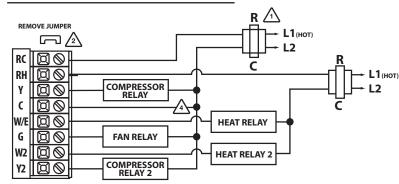
#### Typical Heat Only System With Fan



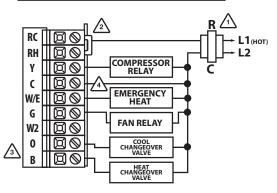
(6)

## **Wiring Diagrams**

#### Typical 2H/2C System: 2 Transformer



## Typical 2H/1C Heat Pump System



## **Features**

## Temporary and Permanent Hold Feature (If using programming)

When cool or heat is turned on, the thermostat will display HOLD and **RUN SCHED** on the left of your screen when you press the + or - button.

Temporary Hold: At this time if you do nothing, the temperature will remain at this setpoint temporarily for 4 hours.

**Permanent Hold**: If you press the **HOLD** key on the left of your screen, you will see **HOLD** appear below the setpoint temperature in the display. The thermostat will now permanently stay at this setpoint and can be adjusted using the + or - keys.

To Return to Running Schedule: Press the RUN SCHED button on the left of your screen to exit either temporary or permanent hold.

#### Filter Change Reminder

**Tech Settings** 

If your installing contractor has configured the thermostat to remind you when the air filter needs to be changed, you will see FILT in the display when your air filter needs to be changed.

Resetting the filter change reminder: When FILT reminder is displayed, you should change your air filter and reset the reminder by holding down the second button from the top left side of the thermostat for 3 seconds.

turn off when 1x the swing is reached. For example, if the swing setting is .5

degrees for heating and the thermostat is set at 70°F, the first stage will turn

on at approximately 69.5°F. The second stage will turn on at 69°F. The second stage will turn off at 69.5°F and the first will turn off at 70.5°F. If the third stage is used, it will turn on at 68.5°F and turn off at approximately 69°F.

	Technicia	n Setup N	lenu		Tech Settings	;	LCD Will Show	Adjustment Options	Default
<ol> <li>This thermostat has a technician setup menu for easy installer configuration. To set up the thermostat for your particular application:</li> <li>Press the <b>MENU</b> button.</li> <li>Press and hold the <b>TECH SET</b> button for 3 seconds. This 3 second delay is designed so that homeowners do not accidentally access the installer settings.</li> </ol>					Heating Swing	The swing setting often called "cycle rate", "differential", or "anticipation" is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles.	HERT SHING	The heating swing setting is adjustable from $0.2^{\circ}$ to $2^{\circ}$ . For example: A swing setting of $0.5^{\circ}$ will turn the heating on at approximate- ly $0.5^{\circ}$ below the setpoint and turn the heating off at $0.5^{\circ}$ above the setpoint.	0.4°
<ul> <li>Configure the installer options as desired using the table below.</li> <li>Use the + or  keys to change settings and the NEXT or PREV key to move from one step to another.</li> <li>Note: Only press the DONE key when you want to exit the</li> </ul>					PTAC Mode	This setting allows the thermostat to operate a PTAC. This will allow for multiple fan speeds selectable in the next two tech settings.	PTRC MODE	Use the 主 and 🗔 buttons to select ON/OFF.	ON
	an Setup options. <b>DONE</b> key to exit.	LCD Will Show	Adjustment Options	Default	PTAC Fan Speeds	This setting allows you to choose the number of fan speeds the thermostat will control.	D	Use the 主 and 🖃 buttons to select , 2 or 3.	2
Filter Change Reminder	This feature will flash a reminder after the elapsed run time to remind the user to change the filter. A setting of "OFF" will		You can adjust the filter change reminder from "OFF" to 2000 hours of runtime in 50 hour increments.	OFF	(Only displayed if PTAC mode is ON)	G = Low Speed Fan B/O = Medieum Speed Fan Y2 = High Speed Fan	FRN SPEEDS	2. Speeds: Low, High, Auto 3. Speeds: Low, Med, High, Auto	2
Room Temperature Calibration	disable this feature. This feature allows the installer to change the calibration of the room temperature display. For example, if the thermostat reads 70° and you would like it to read 72° then select +2.	FILTER	You can adjust the room temperature display to read up to 4° above or below the factory calibrated reading.	0°F	PTAC Medium Fan Speed Terminal (Only displayed if PTAC mode is ON and PTAC fan speeds is set to 3)	This setting will select the terminal for medium fan speed operations. The selected terminal cannot be used for reversing valve operations when heat pump is enabled.		Use the 主 and 🗔 buttons to select O/B terminals.	0
Cooling Swing	The swing setting often called "cycle rate", "differential" or "anticipation" is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles.		The cooling swing setting is adjustable from 0.2° to 2°. For example: A swing setting of 0.5° will turn the cooling on at approximately 0.5° above the setpoint and turn the cooling off at approximately 0.5° below the setpoint.	0.5°	Heat Pump	When turned on the thermostat will operate a heat pump. EM. Heat will show as an option in the system switch tech setting. Use the → and → button to adjust.	HERT PUMP	OFF configures the thermostat for conventional systems. ON configures the thermostat for heat pump systems.	OFF
Swing Sett	ing Tip		the setpoint.		The secon	etting Tip Id stage will turn on at 2x th			

#### **Swing Setting Tip**

Temperature swing, sometimes called differential or cycle rate, can be customized for this individual application. For most applications choose a swing setting that is as long as possible without making the occupants uncomfortable.

9

Tech Settings

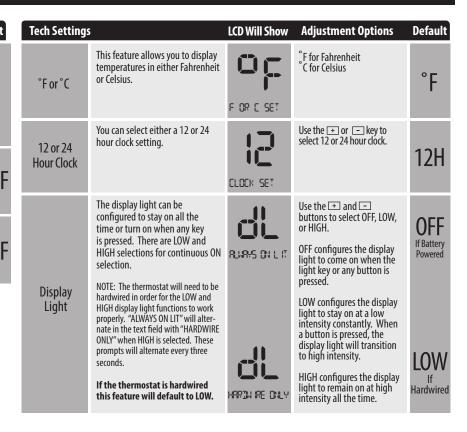
# .....

Tech Setting	5	LCD Will Show	Adjustment Options	Default	Tech Setting	5	LCD Will Show	Adjustment Options	Defa
System Stages	This setting allows you to select the number of heat and cool stages.	2H2C Set Strges	Use the 主 and 🖃 buttons to select 1H/1C, 2H/1C, 2H/2C, 3H/1C, 3H/2C, 4H/2C. Note: Heat and cool choices are limited based on conventional, heat pump, or PTAC system configuration.	2H	Staging Delay (Only displayed if there are more than one stage of heat or cool)	This feature allows a delay to occur if an additional stage is needed. This allows the previous stage extra time to satisfy the setpoint. Note: Will not show if using outdoor sensor with balance point temperature.	STRG ING DELRY	Use the 主 or 🖃 key to select OFF, 5, 10, 15, 30, 45, 60, or 90 minutes.	OF
System Set	You can configure the system switch for the particular application. Heat - Off - Cool, Heat - Off, Cool - Off, Heat - Off - Cool – Auto. Note: Emergency Heat is available in heat pump mode only.	SYSTEM SET AutoOff Em.Heat Cool	Use the + or - buttons until the desired application is flashing. AUTO = (Auto Changeover)	Heat Off Cool	Minimum Compressor On Time	This feature allows the installer to select the minimum run time for the compressor. For example, a setting of 4 will force the compressor to run for at least 4 minutes every time the compressor turns on, regardless of the room temperature.	MIN COMP ON	You can set the minimum compressor run time to "OFF", "3", "4", or "5" minutes. If 3, 4 or 5 is selected, the compressor will run for at least the selected time before turning off. Use the [+] and [-] buttons to change the setting.	OF
Dual Fuel Auxiliary For Heat Pump Only displayed if teat pump is set to ON)	This setting allows the system to run Gas, Oil, Propane or any other types of auxiliary heat. The thermostat will default to electric auxiliary heat in heat pump applications.		Use the 🛨 and 😑 but- tons to select ON/OFF.	OFF	Compressor Short Cycle Delay	The compressor short cycle delay protects the compressor from "short cycling". This feature will not altlow the compressor to be turned on for 5 minutes after it was last turned off.	COMP DELRY	Selecting "ON" will not allow the compressor to be turned on for 5 minutes after the last time the compressor was on. Select "OFF" to remove this delay. Use the 🛨 and 🖃 buttons to change the setting.	10
Jectric or Gas an Operation Duly displayed if teat pump is set	Select GAS to have the system control the fan during a call for heat, select Electric to have the thermostat control the fan during a call for heat. Note: If heat pump is set to "ON" this step will not show, and will default	DURL FUEL	Use 主 and lbuttons to change the setting.	GAS	Cooling Fan Delay	The cooling fan delay setting will delay the fan from coming on in cool mode and keep it running after the compressor shuts off for a short time to save energy in some systems.		You can set the cooling fan delay to OFF, 10, 30, 60 or 90 seconds. If 10, 30, 60, or 90 is selected the fan will not turn on for that many seconds when there is a call for cool and will run for that many seconds after satisfying a call for cool.	OF
to ON) Satisfy Setpoint Staging	to ELECTRIC. This feature allows the thermostat to keep multiple stages of heat or cool energized until the setpoint is satisfied.	FRN SET	Use the 🛨 or 🖃 buttons to turn on of off.	OFF	Program Options	You can configure this thermostat to have 7 Day, 5+1+1 programming or non programmable.	5d PROS	Use the $[+]$ and $[-]$ key to select <b>7d</b> for 7 Day, <b>5d</b> for 5+1+1, or <b>0d</b> for non programmable.	50
(Only displayed f there are more nan one stage of heat or cool)		SS STRG ING							

## **Tech Settings**

Tech Settings		LCD Will Show	Adjustment Options	Default
Pro Recovery	This feature will start heating and cooling early to bring the building temperature to its programmed setpoint by the beginning of the WAKE, RETURN and OCCUPIED time periods.	PRO RECOVERY	Use the $\boxdot$ or $-$ key to select on or off.	ON
Heat Setpoint Limit	This feature allows you to set a maximum heating setpoint limit. The setpoint temperature cannot be raised above this value.	HERT LIM IT	Use the 主 or 🖃 key to select the maximum heat setpoint and the minimum cooling setpoint.	90°F
Cool Setpoint Limit	This feature allows you to set a minimum cooling setpoint limit. The setpoint temperature cannot be lowered below this value.		Use the + br - key to select the minimum cooling setpoint.	44°F

## **Tech Settings**



#### **Contractor Call Number Note**

If contractor call number is selected ON, the phone number entered will show in the display if there has been a continuous call for heating or cooling for 24 hours or if the light button is held down for 3 seconds. To remove the phone number from the display, hold the light button down for 3 seconds.

Tech Settings

Tech Settings	Tec	h Se	ettii	ngs
---------------	-----	------	-------	-----

Tech Settings	;	LCD Will Show	Adjustment Options	Default	Tech Settings	1		LCD Will Show	Adjustment Op	otions	Default
Contractor Call Number	This feature allows you to put your phone number in the display. You can choose ON or OFF. Notes: If contractor call number is selected ON, the phone number entered will show in the display if there has been a continuous call for heating or cooling	96	If selected ON, you will see the input screen after pressing NEXT STEP. Use the + or _ button to select the desired number and the FAN or SYSTEM key to move from one character to another. See note below for operation.	OFF	Number of Indoor Remotes (Only displayed if remote sensor setting is set to 1)	Enables the use of indoor sensors R2! only show Remote to 1 and Local Tem set to on.	51S. Note: Will Sensor is set op Sensor is	I Numzer Rehote	You can use 1, 4, 9, c indoor sensors. Refe R251S Install Manua tailed connection in	r to the al for de-	1
	for 24 hours or if the light button is held down for 3 seconds. To remove the phone number from the display, hold the light button down for 3 seconds.	PHONE NUMBER			Dual Fuel Balance Point	An outdoor tempe balance point will thermostat to ene terminal(s) only ir An outdoor tempe	cause the rgize the Y 1 calls for heat.		Use the 主 and 🗖 to select OFF, 10, 1 30, 35, 40, 45, 50 d	5, 20, 25,	
Remote Sensor Operation (Only displayed if a sensor is	You can configure the thermostat for one of three remote sensor applications: 0 No Sensor, 1 Indoor, 2 Outdoor, 3 Floor.		Use the left and right arrows to select one of three options. View the S1/ S2 terminal chart on next page for an explanation of these options.	0	(Only displayed if remote sensor setting is set to 2 and Dual Fuel AUX = On)	balance point will thermostat to ene terminal only in ca	cause the rgize the W2	ILIT			OFF
connected to S1 and S2 terminals)		Remote Mode					S1 / S2	Terminal			
Local Temp	You can disable the sensor on the T855SH thermostat. At least		ON enables local T855SH sensor. OFF disables local T855SH sensor.		Option	s Mode	I	Description		Require	es
Sensor	one R251S indoor remote sensor must be connected to disable the		וואווא חכרכטו.	ON	1	Indoor T	he local and ren	note temperatur	es are averaged.	R251S	
(Only displayed if remote sensor	local T855S sensor. Note: Will only show if remote sensor is set to 1.			UN	2	Outdoor	The outdoor te	emperature is fla	shed in clock.	R250S	
setting is set to 1)		LOCAL TEMP			3	Floor	The floor ter	mperature is sho	wn in tech.	R250S	

17					(
Tech Set	ttings				Programming
Tech Settings	S	LCD Will Show	Adjustment Options	Default	Set Time
Balance Point Run Time (Only displayed if remote sensor setting is set to 2)	Balance point run time will allow the W2 auxiliary terminal to ener- gize even if outdoor temperature is above selected balance point temperature. If enabled, auxiliary will energize for the current cycle after the balance point run time has expired. Note: Only shows if Balance Point is set to an outdoor temperature.	BP RUN I ME	Off, 15, 30, 45, 60, 75, 90	OFF	<ol> <li>With system switch set to OFF, press the MENU button</li> <li>Press SET TIME</li> <li>Day of the week will be flashing. Use the + or  key to select the current day of the week.</li> <li>Press NEXT STEP</li> <li>The current hour is flashing. Use the + or  key to select the current hour. When using 12-hour time, make sure the correct a.m. or p.m. choice is selected.</li> </ol>
Floor Temperature (Only displayed if remote sensor setting is set to 3)	The temperature of the floor sensor will be displayed. Note: Only shows when REOP is set to 3. Use 🛨 and 🖃 buttons to adjust.	75	N/A	N/A	<ul> <li>6. Press NEXT STEP</li> <li>7. Minutes are now flashing. Use the + or  key to select current minutes.</li> <li>8. Press DONE when completed.</li> <li>Programming</li> </ul>
Floor High Limit (Only displayed if remote sensor setting is set to 3)	This setting allows you to set a maximum floor temperature limit for heat. Heat will be locked out when the floor temperature is above this value. Note: Only shows when REOP is set to 3.	RECOR TEMP	Use the 🛨 or 🖃 buttons to select the High Limit for the floor sensor.35 - 120	86	All of our programmable thermostats are shipped with an energy saving pre-program. You can customize this default program by following the steps on the next page. There are four time periods for each program (WAKE, LEAVE, RETURN, SLEEP).
Floor Low Limit (Only displayed if remote sensor setting is set to 3)	This setting allows you to set a minimum floor temperature limit for heat. Heat will turn on automatically when the floor temperature is below this value. Note: Only shows when REOP is set to 3.	<b>50</b>	Use the 主 or 🖃 keys to select the Low Limit for the floor sensor. 35 - 120	50	A Note About Auto Changeover: In Auto you have the ability to switch between Auto Heat or Auto Cool by pressing the system key. This can be done once the current mode has reached its setpoint. For example: if in Auto Heat, the heat setpoint must be satisfied before the thermostat will allow you to switch to Auto Cool. You can switch out of Auto by holding down the system key. To get back into Auto, you must toggle the system key to Auto.

## Programming

## Programming

All of our programmable thermostats are shipped with an energy saving pre-program. You can customize this default program by following the steps on page 16.

# There are four time periods for each program (WAKE, LEAVE, RETURN, SLEEP).

	Fa	actory Default	Program	
Day of the Week	Events	Time	Setpoint Temperature (HEAT)	Setpoint Temperature (COOL)
	Wake	6 AM	70°F (21°C)	75°F (24°C)
Westeler	Leave	8 AM	62°F (17°C)	83°F (28°C)
Weekday	Return	6 PM	70°F (21°C)	75°F (24°C)
	Sleep	10 PM	62°F (17°C)	78°F (26°C)
	Wake	6 AM	70°F (21°C)	75°F (24°C)
Caturday	Leave	8 AM	62°F (17°C)	83°F (28°C)
Saturday	Return	6 PM	70°F (21°C)	75°F (24°C)
	Sleep	10 PM	62°F (17°C)	78°F (26°C)
	Wake	6 AM	70°F (21°C)	75°F (24°C)
Cunday	Leave	8 AM	62°F (17°C)	83°F (28°C)
Sunday	Return	6 PM	70°F (21°C)	75°F (24°C)
	Sleep	10 PM	62°F (17°C)	78°F (26°C)

## Programming

## Set Program Schedule 5+1+1 or 7 Day

To customize your program schedule, follow these steps:

- 1. Select **HEAT** or **COOL** with the system switch. **Note:** You have to program heat and cool each seperately.
- 2. Press the MENU button (If menu does not appear first press RUN SCHED)
- **3.** Press **SET SCHED**. Note: Monday-Friday or (**Monday if in 7 Day**) is displayed and the **WAKE** icon is shown. You are now programming the wake time period for that day.
- 4. Time is flashing. Use the + or + key to make your time selection for that day's **WAKE** time period. Note: If you want the fan to run continuously during this time period, select **ON** with the **FAN** key
- 5. Press NEXT STEP
- 6. The setpoint temperature is flashing. Use the + or key to make your setpoint selection for that day's **WAKE** time period.
- 7. Press NEXT STEP
- 8. Repeat steps 4 thru 7 for that day's LEAVE time period, RETURN time period, and SLEEP time period.

**If in 5+1+1 Programming:** Repeat steps 4 thru 8 for the Saturday + Sunday time periods.

**If using 7- Day Programming:** Use these same steps for every individual day.

# 21

## Programming

You can use the table below to plan your customized program schedule.

	Factory Default Program						
Day of the Week	Events	Time	Setpoint Temperature (HEAT)	Setpoint Temperature (COOL)			
	Wake	6 AM	70°F (21°C)	75°F (24°C)			
Wooldov	Leave	8 AM	62°F (17°C)	83°F (28°C)			
Weekday	Return	6 PM	70°F (21°C)	75°F (24°C)			
	Sleep	10 PM	62°F (17°C)	78°F (26°C)			
	Wake	6 AM	70°F (21°C)	75°F (24°C)			
Caturday	Leave	8 AM	62°F (17°C)	83°F (28°C)			
Saturday	Return	6 PM	70°F (21°C)	75°F (24°C)			
	Sleep	10 PM	62°F (17°C)	78°F (26°C)			
	Wake	6 AM	70°F (21°C)	75°F (24°C)			
Cundau	Leave	8 AM	62°F (17°C)	83°F (28°C)			
Sunday	Return	6 PM	70°F (21°C)	75°F (24°C)			
	Sleep	10 PM	62°F (17°C)	78°F (26°C)			

## Specifications

#### Specifications

The display range of temperature 41°F to 95°F (5°C to 35°C) The control range of temperature 44°F to 90°F (7°C to 32°C)
Load Rating
Swing (cyclo rate or differential) Maximum all terminals combined
Swing (cycle rate or differential) Heating is adjustable from 0.2° to 2.0° Cooling is adjustable from 0.2° to 2.0° Power source
Power source
for hardwire Battery power from 2 AA Alkaline
batteries
Operating ambient
Operating humidity