

# OPERATING MANUAL

T4000 Non-Programmable Models

T4500 Programmable Models



## Performance PRO™ Series



- *Large 4 square inch blue display*
- *365-day, 20 holiday programmability*
- *7-day, 5-1-1, 5-2 programming*
- *Common backplate*
- *Optimized ramp recovery*



Oil



Electric



Gas



Heat Pump

T4000  
Series

## THE PECO PERFORMANCE PRO T4000 SERIES

Thank you for choosing a PECO® Performance PRO™ thermostat. The Performance PRO T4000 Series is intended for use in residential and commercial environments. It is designed for and can support up to 2-HEAT/ 2-COOL configurations in conventional systems and 3-HEAT/ 2-COOL configurations in heat pump applications. The Performance PRO also provides the capability to meet the requirements for ASHRAE 90.1-2004 and California Building Code Title 24 (2008 edition).

The Performance PRO T4000 Series is comprised of the T4000 non-programmable thermostat models and the T4500 programmable thermostat models. The T4000 Series feature a 4 square inch blue backlit display with dynamic menus, accessed using soft keys. All Performance PRO T4000 Series offer the following standard features: auto-changeover, optional remote sensors, occupancy sensors, up to five outputs, three levels of keypad lockout, a PIN access code, filter replacement reminder, and a heat/cool Demand Indicator. In addition, the T4500 programmable models contain four scheduled events per day, temporary override, a 365-day calendar, and 20 holidays.

The T4000 Series can be powered by 24 VAC or batteries (both recommended), control a minimum of 5 outputs, and monitor two external sensors. The T4000 Series mounts onto a common PECO Performance PRO Series wallplate.

## Table of Contents

### T4000 Thermostat

The PECO Performance PRO T4000 Series.....	2
Quick reference: Default Display mode .....	5
Quick reference: Home Display mode & navigation .....	6
Quick reference: Home Display screen .....	7
Key operation.....	8
Set the clock, month, and day .....	11
Select Fahrenheit or Celsius temperature .....	12
Select the fan mode.....	13
Select system mode .....	14
Reset filter timer.....	15

### T4500 Thermostat

Program the thermostat (T4500 models only) .....	16
Program scheduled events .....	17
Program override .....	19
Program holiday .....	20
Set PIN access to Service Menus .....	22
PECO compatible accessories .....	23

<b>T4000 Series Product Specifications.....</b>	<b>24</b>
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## CAUTION!

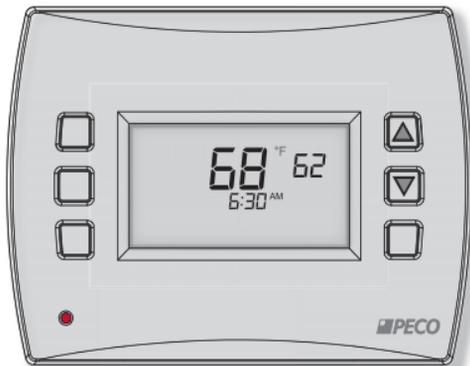
- READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO OPERATE THIS THERMOSTAT.
- FOLLOW THE PERFORMANCE PRO INSTALLATION INSTRUCTIONS BEFORE PROCEEDING.
- Failure to observe safety information and comply with instructions could result in PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.
- Use this thermostat only as described in this manual.
- This is a 24 VAC low-voltage thermostat. Do not install on voltages higher than 30 VAC.
- Contact a qualified service person if at any time the thermostat does not operate properly.
- Use care to avoid static discharge to the thermostat.
- To avoid electrical shock or damage to equipment, disconnect power before installing or servicing and use only wiring with insulation rated for full thermostat operating voltage.
- To avoid potential fire and/or explosion, do not use in potentially flammable or explosive atmospheres.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed nor controlled by PECO.
- All wiring and applications must conform to local and national building codes and ordinances Applications and national codes must be reviewed prior to installation to assure the installation is functional and safe.

**IMPORTANT NOTE:** This thermostat was shipped with factory default settings. The thermostat's installer may have configured the thermostat differently from the factory-default settings, and may have modified or disabled certain features. Contact the installer or a service technician if there are questions about the thermostat's configuration.

## QUICK REFERENCE: DEFAULT DISPLAY MODE

### Default Display

The factory programmed settings show the time, temperature, and setpoint. This is called the Default Display. The Default Display appears after a short period of inactivity. The Default Display can be custom-configured to show user-selected items only (see Service Menu 520 in “Performance PRO T4000 Series Installation Guide”).

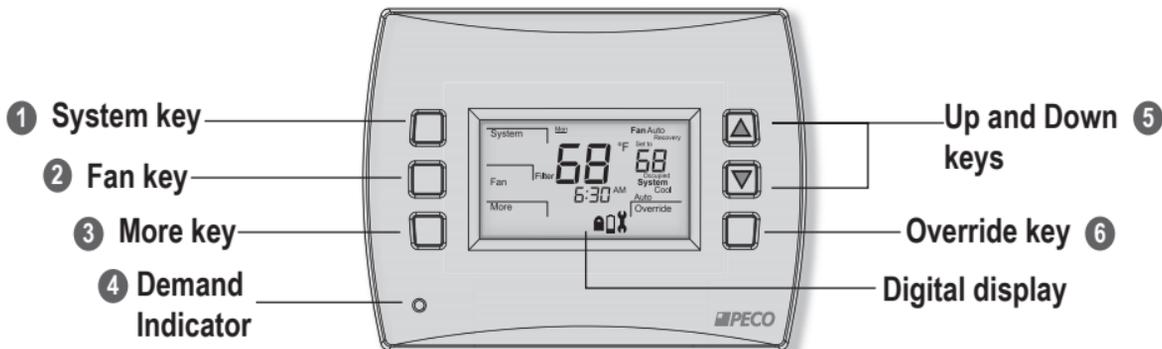


**i Note:** The Battery Indicator, Service Indicator, and Filter Indicator icons appear at bottom of the digital display if user action is required.

## QUICK REFERENCE: HOME DISPLAY MODE & NAVIGATION

### Home Display

The Performance PRO T4000 Series has two ▲ / ▼ (Up and Down) keys and four soft keys (1-3; 6 below). **Press any key to enter Home Display from Default Display.** Press soft keys to enter submenus. Soft keys have multiple functions; available submenus depend on menu navigation.



**Navigate submenu options to customize thermostat settings. Available options are:**

**Next** - Advances to the next menu item in sequence; current selections are held in temporary memory until user completes the menu sequence by pressing “Done.”

**Go Back** - Returns back one step in menu sequence or reverts to Home Display. Changes are not saved if user selects “Go Back” from the first option in sequence.

**Done** - Saves settings and reverts to the Home Display.

**Cancel** - Discards changes and reverts to the Home Display.

## QUICK REFERENCE: HOME DISPLAY SCREEN

### System key

Press to enter system settings: Off/Heat/Cool/Auto (see pp. 8, 14)

### Filter indicator

Appears based on user selection (see pp. 10, 15)

### Fan key

Press to enter fan display (see pp. 9, 13)

### More key

Press to view more options from Home Display (see p. 9)

### Current time

(see p. 11)

### Current day

(see p. 11)

### Current inside temperature

### Program Scheduled Events

(see p. 17)

### Fan

Displays Fan/ Auto mode when activated (see pp. 9, 13)

### Recovery

Indicates thermostat is in recovery mode

### Setpoint Temperature

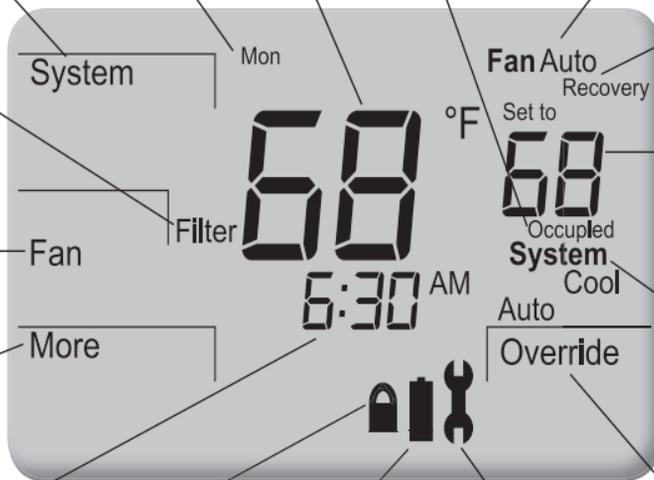
(see pp. 16-19)

### System mode

Displays current system mode (see pp. 8, 14)

### Override key

Press to override scheduled events (see p. 10)



### Keypad Lockout

(see p. 10)

### Battery Indicator

Appears only when battery is low (see p. 10)

### Service Indicator

(see p. 10)

**1 System key**

Used to control the operating mode of the Performance PRO T4000 Series thermostats. The options available for the System display are specified in the Service Menu (see “Performance PRO T4000 Series Installation Guide”).

System modes are:

HEAT – Select for the system to operate in heating mode only. Only one setpoint is displayed.

COOL - Select for system to operate in cooling mode only. Only one setpoint is displayed.

AUTO – Allows system to control to both the heat and cool setpoints. The system will automatically change over between heating and cooling modes as room temperature varies. Cool Setpoint must always be greater than Heat Setpoint by the deadband value.

OFF – Disables all thermostat outputs; only zone temperature and time are displayed.

**Note:** Deadband is the user-defined minimum difference between the Cool Setpoint and Heat Setpoint (see Service Menu 380).

**2 Fan key**

Used with two different menu options:

ON - Continuous fan operation.

AUTO - Fan is activated only when there is demand for heat or cool, with some exceptions.

**Note:** Several Service Menu options affect the fan operation (See Advanced Configuration in the “Performance PRO T4000 Series Installation Guide.”)

**3 More key**

Used to view more menu options. From the Default Display, press More to show more menu options that may be accessed by pressing the soft keys.

**4 Demand Indicator**

Light emitting diode (LED) on lower left front panel that displays red when heating and green when cooling. Available only when 24 VAC power is connected to the thermostat.

**5 Up and Down keys (▲ /▼ )**

Used in menus to increase or decrease variable settings, or switch to the next input.

**Note:** Pressing ▲ /▼ keys show the Override display unless Holiday mode is set.

## 6 Override key

Used to create a temporary override of current setpoint temperature. Pressing Override will display the “Next” and “Done” options, and the setpoint will begin flashing.

Temporary Override - The active setpoint is taken from setpoints defined in the Override menu. (Override will flash from the Home Display for the duration of the period.)



### Service Indicator

Icon appears to notify the user that the remote temperature sensors are reading out of range.



### Battery Indicator

Icon appears only when the battery level is low and flashes when the battery level is critically low. Two AA Alkaline batteries (2.6 – 3.1VDC) have an approximate 1-year life expectancy.



### Keypad Lockout

Icon appears if any type of keypad lockout is active. Keypad Lockout blocks access to certain features of the thermostat. (See Service Menu 340 to enable key pad lockout).

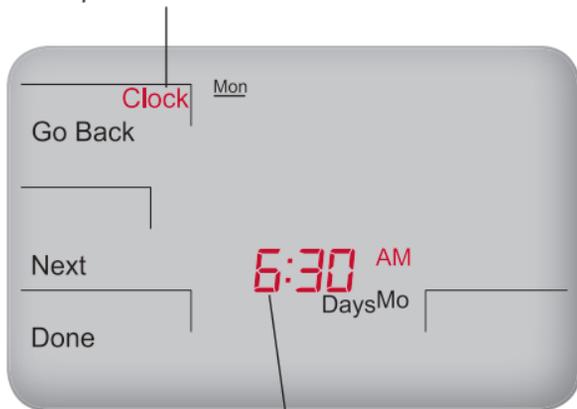
## Filter Filter Indicator

Icon appears in the Default Display when the reminder timer expires (see Service Menu 230). The thermostat will continue to return to the filter menu until the Done key is pressed. After the Filter icon appears, pressing Done will restart the filter timer.

## SET THE CLOCK, MONTH, AND DAY

## PRESS ANY KEY TO BEGIN

After selecting “More,” select “Clock” to choose time format preference.



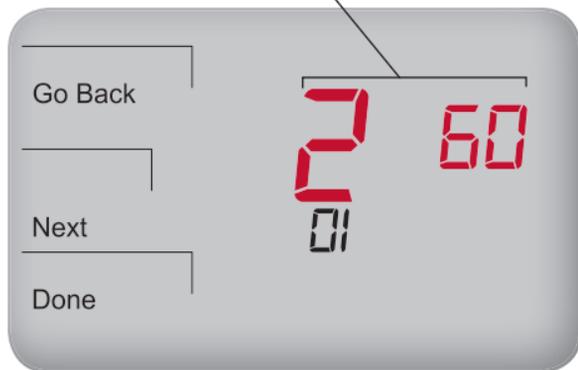
When hour column flashes, press ▲ / ▼ to adjust. Menu advances right to minutes column, flashing.

**i Note:** At any time, press **Go Back** to return to the previous menu, **Next** to advance and view more options, or **Done** to save changes and return home.

1. Press **More** to view menu options.
2. Press **Clock** to access menu options.
3. Press ▲ / ▼ to select 12 or 24 HR mode, then press **Next**.
4. Press ▲ / ▼ to select clock hour, then press **Next**.
5. Press ▲ / ▼ to select clock minutes, then press **Next**.
6. Press ▲ / ▼ to select clock year, then press **Next**.
7. Press ▲ / ▼ to select current month, then press **Next**.  
**Note:** **Mo** (numerical month) appears
8. Press ▲ / ▼ to select current date.  
**Note:** **Days** (numerical day) appears.
9. Press **Done** to finish clock mode.

## SELECT FAHRENHEIT OR CELSIUS TEMPERATURE

After entering the Service Menu mode, press **Next** continuously until menu “**260**” appears.



1. Press the lower left and lower right keys simultaneously until the Service Menu appears (100 appears at top with default value flashing below it.)
2. **Go Back**, **Next**, and **Done** appear as menu options.
3. Press **Next** continuously until menu “**260**” appears.
4. Press ▲ / ▼ to select the desired temperature display:
  - “1” for Fahrenheit (default)
  - “0” for Celsius
5. Press **Done** to complete selection.

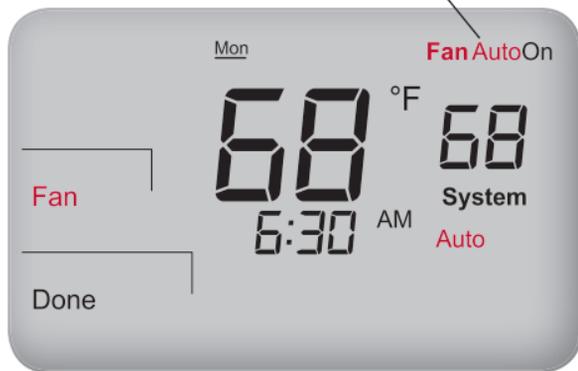
**i Note:** To custom configure thermostat settings, access more Service Menus (See Table 2. Advanced Configuration in the “Performance PRO T4000 Series Installation Guide”).

**i Note:** After completing the instructions, the Home Display shows the selected temperature format.

## SELECT THE FAN MODE

## PRESS ANY KEY TO BEGIN

In Fan mode, press ▲ / ▼ to select desired option.



1. Press **Fan** to set fan operation.
2. Press ▲ / ▼ to select “On,” or “Auto.”  
**Note:** Selected option flashes.
3. Select **Done** to save changes.

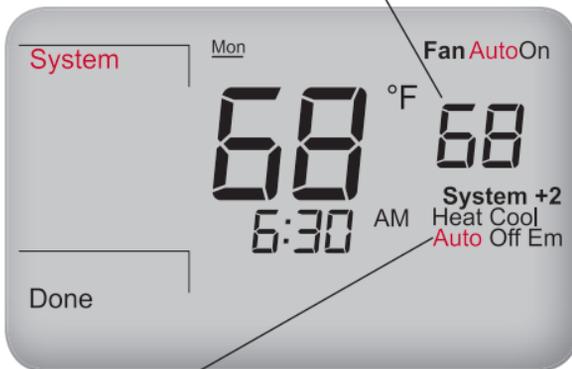
**i Note:** “On” mode indicates continuous output. “Auto” mode indicates that fan is activated only when there is demand for heat or cool. Some exceptions apply (see Advanced Configuration in the “Performance PRO T4000 Series Installation Guide”).

**i Note:** At any time, press **Go Back** to return to the previous menu, **Next** to advance and view more options, or **Done** to save changes and return home.

## SELECT SYSTEM MODE

**PRESS ANY KEY TO BEGIN**

Setpoint is displayed in the upper-right area.



Press ▲ / ▼ to scroll through options for system preferences. The selected option flashes.

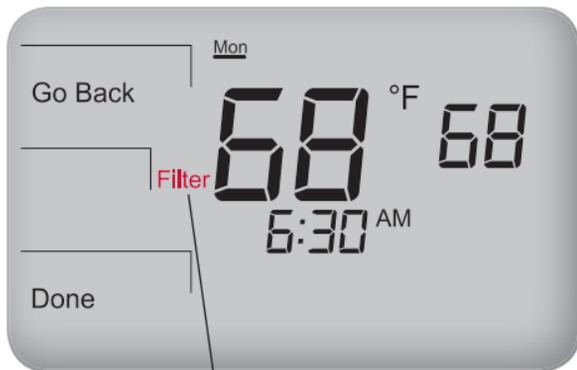
**i Note:** System modes available are dependent upon which system type is selected in Service Menus.

1. Press **System** to select system preferences.  
**Note:** Selected option flashes.
2. Press ▲ / ▼ and select **Heat, Cool, Auto, Off, or Em (Emergency)**.
3. Press **Done** to save changes.

In “Heat” and “Cool” modes, only one setpoint is displayed for each, and only the selected mode (e.g., Heat) is applied. “Auto” mode switches automatically between Heat and Cool. Auto controls the room’s temperature to the programmed Heat and Cool Setpoints. “Off” mode disables all thermostat outputs; and only the zone temperature and clock are displayed. If Emergency (Em) heat is enabled in a Heat Pump system, Emergency acts as the primary heat source.

## RESET FILTER TIMER

**PRESS ANY KEY TO BEGIN**



*When the filter timer expires, the default Home Display will automatically show the **Filter** icon.*

The Filter icon serves as a reminder to change the furnace filter (see note below). When the filter timer expires, the Filter icon will be lit continuously.

1. From the Default Display, press any key to enter the **Filter** mode (**Filter**, **Go Back** and **Done** appear).
2. Press **Done** to reset the filter timer. Note: Pressing Done restarts filter timer with previous time value selected.
3. Press **Go Back** to bypass the reminder and return to the Home Display.

**i Note:** The thermostat will return to the Filter menu from the Default Display until **Done** is selected (see Service Menu 230 in the “Performance PRO T4000 Series Installation Guide”).

## PROGRAM THE THERMOSTAT (T4500 MODELS ONLY)

Each day has two or four scheduled events (Occupied1, Occupied2, Unocc1, and Unocc2) per day, depending on Service Menu configuration. Each one of these events can be programmed with a start time and Heat and Cool Setpoints. Heat Setpoint controls system heating during cold weather. Cool Setpoint controls the cooling system during hot weather. The T4500 is preprogrammed with factory default settings for seven days of the week as follows:

Time Period	Start Time	Heat Setpoint Temperature	Cool Setpoint Temperature
Occupied1	8:00 am	70° F (21° C)	75° F (24.0° C)
Unocc1	10:00 pm	55° F (10° C)	85° F (29.5° C)
Occupied2	—	—	—
Unocc2	—	—	—

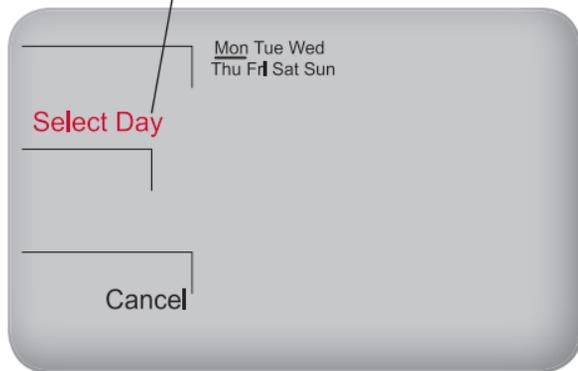
**i Note:** To change the preprogrammed times and/or setpoint temperatures, follow the instructions under “Program scheduled events.”

**i Note:** See Service Menu 240 to enable four scheduled events per day.

## PROGRAM SCHEDULED EVENTS

**PRESS ANY KEY TO BEGIN**

Press **Select Day** to underline highlighted day to which a scheduled event will be applied.



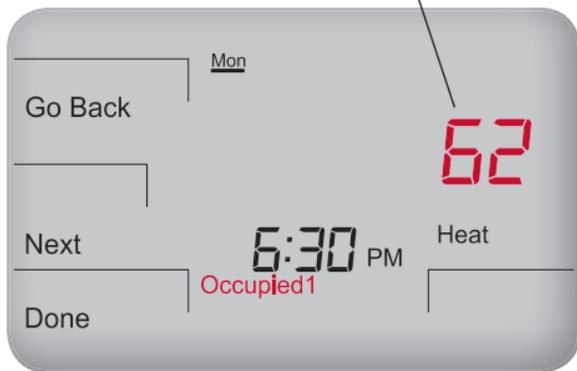
**i Note:** To enter the same scheduled events for multiple days continue pressing **Select Day** (to underline highlighted day/s) in Step 6, then select a block of days to be programmed.

Schedule two or four events per day:  
Occupied1, Occupied2, Unocc1, and Unocc2.

1. Press **More** to view options.
2. Press **Schedule** to enter main menu.
3. Press **▲ / ▼** to highlight day.  
Note: Selected day flashes (Optional: Select **View** to modify existing event).
4. Press **Edit** to apply scheduled events for the selected day(s).
5. Press **Select Day**. **Note:** Selected day flashes (continue pressing **▲ / ▼** and **Select Day** to select multiple days).
6. Press **▲ / ▼** to highlight the day(s) to be programmed. **Note:** Selected day(s) for scheduled events must be underlined.
7. Press **Next** to advance to event.

## PROGRAM SCHEDULED EVENTS (CONT).

Press ▲ / ▼ to select a desired Heat Setpoint for the currently selected scheduled event.



**i Note:** To return to the menu of scheduled events and continue programming, select **Next** after Step 12.

**i Note:** To program 5-1-1 day or 5-2 days, see Service Menu 100 (“Performance PRO T4000 Series Installation Guide”). Block-programmed days flash as a group.

8. Press ▲ / ▼ to select a scheduled event (e.g., Occupied1, etc.), then **Next**.
9. Press ▲ / ▼ to schedule *start time* for event (in 15-minute periods), then **Next**.

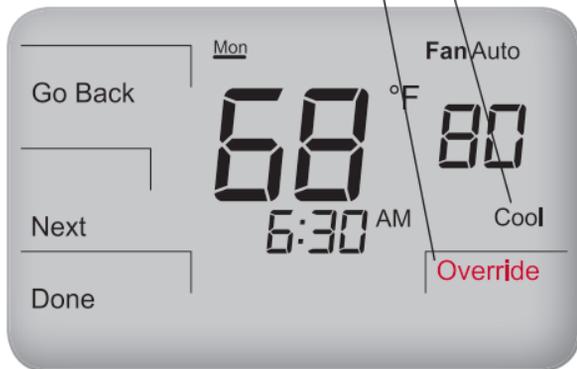
Now select a Heat Setpoint and/ or Cool Setpoint for the scheduled event (available options depend upon system type selected).

10. Press ▲ / ▼ to select desired Heat Setpoint, then press **Next**.
11. Press ▲ / ▼ to select desired Cool Setpoint, then press **Next**. **Note:** The next event (e.g., Unocc1) begins flashing after **Next** is selected. Complete steps 2-11 for each scheduled event.
12. Press **Done** to exit schedule mode. **Note:** Pressing **Go Back** after step 11 will show **Select Day** on display.

## PROGRAM OVERRIDE

**PRESS ANY KEY TO BEGIN**

Example shows how to select a Cool Setpoint for a 12-hour period in System Auto mode.



- i Note:** Setpoints available depend on the system mode selected (see “Select System Preferences”). Override display options can be defined in Service Menus.
- i Note:** The installer setup can limit the length of time for an override to 1, 2, 3 or 4 hours beyond the current time.

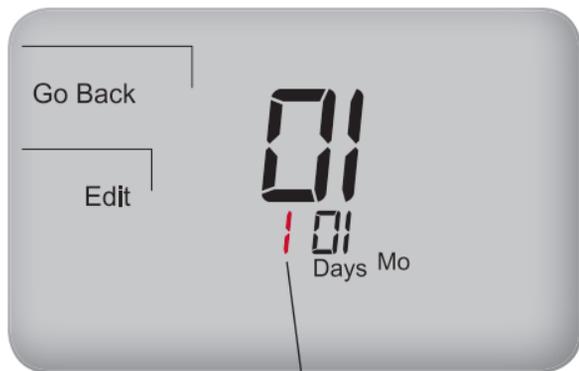
Override allows application of temporary heat or cool settings.

1. Press **Override**, or ▲ / ▼ key.  
**Note:** Setpoint flashes. “Hold until” time appears and is changed to show length of override (up to the maximum hold time specified in Service Menu 395).
2. Press ▲ / ▼ to select a Cool Setpoint, then press **Next**.
3. Press ▲ / ▼ to select a Heat Setpoint, then press **Next**.
4. Press ▲ / ▼ to adjust time (in 15-minute periods) until override remains in effect.
5. Press **Done** to save changes and exit.  
**Note:** **Override** remains (flashing) in effect until the time period ends.  
**Note:** Press **Cancel** to exit Override.

## PROGRAM HOLIDAY

## PRESS ANY KEY TO BEGIN

20 Holidays may be programmed. System type shown supports 1-HEAT and 1-COOL.



Press ▲ / ▼ to select a month (e.g., 1) for the holiday number.

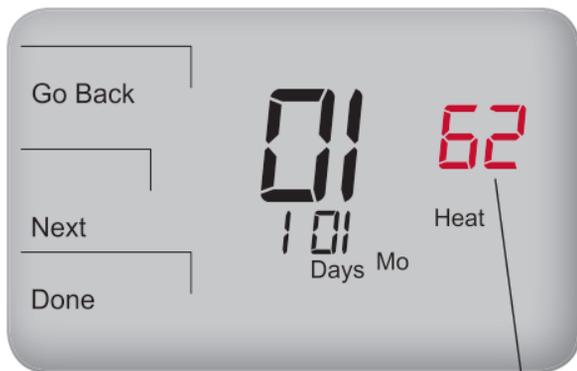
**i Note:** Performance PRO supports up to 20 holidays, leap years, and daylight-saving time.

**i Note:** Press **Override** to access Holiday mode.

1. Press **More** to view more options.
2. Press **Holiday** to enter menu.
3. Press ▲ / ▼ to select holiday number (1-20). **Note:** Month number and day of month appear below in clock area.
4. Press **Edit** to select holiday month (“**Mo**” icon will flash).
5. Press ▲ / ▼ to select a month (numerical), then press **Next**.
6. Press ▲ / ▼ to select day (numerical) that holiday starts (**Days** icon will flash), then press **Next**.
7. Press ▲ / ▼ to select holiday length, which is number of days that the holiday period lasts (1-99), then press **Next**.

## PROGRAM HOLIDAY (CONT.)

## PRESS ANY KEY TO BEGIN



Press ▲ / ▼ to select Heat Setpoint for holiday 1.

**i Note:** After selecting the duration of days that the holiday period lasts, select the Heat Setpoint and the Cool Setpoint for the holiday.

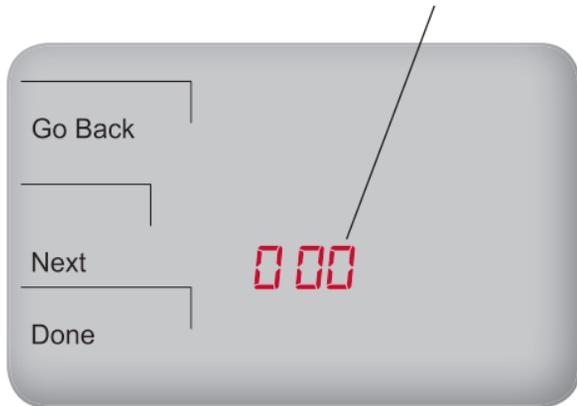
Now select the Heat and Cool Setpoints for the same holiday number (e.g., “1”).

8. Press ▲ / ▼ to select the Heat Setpoint, then **Next**.
9. Press ▲ / ▼ to select the Cool Setpoint, then **Next**.
10. Press **DONE** to complete the holiday display mode.

**i Note:** If “Heat” or “Cool” flashes during process, the deadband value will be enforced; the opposing Heat or Cool Setpoints will be automatically adjusted (for an explanation of deadband value, see Key operation).

## SET PIN ACCESS TO SERVICE MENUS

In Service Menu 342, press ▲ / ▼ to create a three-digit PIN. Scroll to choose the desired PIN number.



**i Note:** Creating a PIN access code allows the user to restrict access to Service Menus. PIN access must first be enabled in Service Menu 341; then, a three-digit code must be created in Service Menu 342.

1. Press the lower left and lower right keys simultaneously for about five seconds.
2. Press **Next** until Service Menu 341 appears. **Note:** Default "00" appears.
3. Press ▲ to select 1 (enable), then **Next**.
4. In Service Menu 342, press ▲ / ▼ to create a three-digit PIN access code. **Write down/save the PIN access code.**
5. Press **Done** when finished.

### Verification of PIN Number

1. Press the lower left and lower right keys simultaneously for about five seconds.
2. Enter PIN: Press ▲ / ▼ to change right-hand column value, then press **Next**.
3. Moving right to left, change each value.
4. Press **Done**. **Note:** Display shows Service Menu 100, default value below.

## PECO COMPATIBLE ACCESSORIES

The following T4000 Series compatible sensors are available from PECO. Using information found on the last page of this document, contact a service representative to learn more about PECO sensors or to place an order.

PECO PRODUCTS	Model Number	Part Number	Terminal	T4000	T4500
Indoor Remote Sensor	SP155-017	69308	S1	✓	✓
Occupancy Sensor	SB200-001	68375	S2	✓	✓
Locking Cover for T4000 Thermostat	N/A	70210	N/A	✓	✓

For a complete description of sensors, terminal connections, and wiring diagrams, see the “Performance PRO T4000 Series Installation Guide.”

## T4000 SERIES PRODUCT SPECIFICATIONS

Temperature Control Range:	50° to 90° F (10° to 32° C)
Differential:	1° F (0.5°C)
Input Power:	24 VAC (20-30 VAC) 50/60Hz (+/-10%) or AA alkaline batteries (both recommended); 5mm terminals accept 14-24 AWG stranded/solid wire.
Output Ratings:	20-30 VAC 0.02-1.0A per terminal; W1 (B/O), W2 (AUX), G, A, E, Y1, Y2. Note: Collectively, total current draw must not exceed 2.5A.
Operational Temperature:	0° to 120° F (-17° to 48°C)
Shipping Temperature:	-20° to 130°F (-29° to 54°C)
Operating Humidity:	5% to 95% RH, non-condensing
Physical dimensions:	T4000/T4500 Thermostat: 4.3" H x 5.7" W x 1.3"D with 2.7" x 1.5" / 4.05 square inch liquid crystal display (LCD)



**Automation and Controls**

Division of PECO, Inc.

PO Box 82189, Portland, OR 97282 [www.pecomanufacturing.com](http://www.pecomanufacturing.com)

Phone: 503-233-6401 | 800-874-8547

E-mail: [sales@pecomanufacturing.com](mailto:sales@pecomanufacturing.com)