

## PECO TW180 THERMOSTAT

Thank you for choosing a PECO® TW180 thermostat. The TW180 thermostat is intended for use in commercial and residential environments. It supports both programmable and non-programmable operation.

Key features include: auto-changeover; optional remote sensor; three levels of keypad lockout with optional PIN access code; a heat/cool Demand Indicator; up to four scheduled events per day, a 365-day calendar, 20 holidays, holiday override and temporary override.

### Applications

The PECO® TW180 applications include fan coil, PTAC and conventional system with a single or multi speed fan operation.

**System Mode Selections:** Off-Heat-Cool-Auto

**Outputs:** 1 Cool and up to 2 Heat

**Fan Control:** Cycling (Auto) or Continuous (On); Up to 3 Speeds or Staged

**Permanent Memory:** All device settings are stored in permanent memory.

**Optional Connections:** Remote Sensor, Pipe Sensor, Fault Detection, Setback, Occupancy and Door Switch

| OUTPUT RATINGS |           |      |                |            |
|----------------|-----------|------|----------------|------------|
| Voltage        | Inductive |      | Resistive Amps | Pilot Duty |
|                | FLA       | LRA  |                |            |
| 24 VAC         | NA        | NA   | NA             | 24 VA      |
| 120 VAC        | 4.4       | 26.4 | 4.5            | 125 VA     |
| 240 VAC        | 2.2       | 13.2 | 4.3            | 125 VA     |
| 277 VAC        | 1.8       | 10.8 | 4.2            | 125 VA     |

COMBINED LOAD CURRENT NOT TO EXCEED 20 AMPS  
MOUNT ONLY TO A GROUNDED METALLIC BOX  
LOW VOLTAGE WIRING IS CLASS 2

## ⚠ WARNING

- READ THESE INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS THERMOSTAT.
- Failure to observe safety information and comply with instructions could result in PERSONAL INJURY, DEATH AND/OR PROPERTY DAMAGE.
- 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.
- Use care to avoid electrostatic discharge.
- To avoid potential fire and/or explosion do not use in potentially flammable or explosive atmospheres.
- Retain these instructions for future reference.
- This product, when installed, will be part of an engineered system whose specifications and performance characteristics are not designed or controlled by PECO®. Review applications and national and local codes to assure that the installation will be functional and safe.

## SPECIFICATIONS

Temperature Control Range: 50 to 90°F (10 to 32°C)

Differential: 1°F

Physical Dimensions: 4.4"H x 5.8"W x 1.1"D

Construction of Control: Independently Mounted

Operating Temperature: 0°F to 120°F (-18° to 49°C)

Shipping/Storage Temperature: -20°F to 130°F (-29°C to 54°C)

Operating Humidity: 5%-95% RH, non-condensing

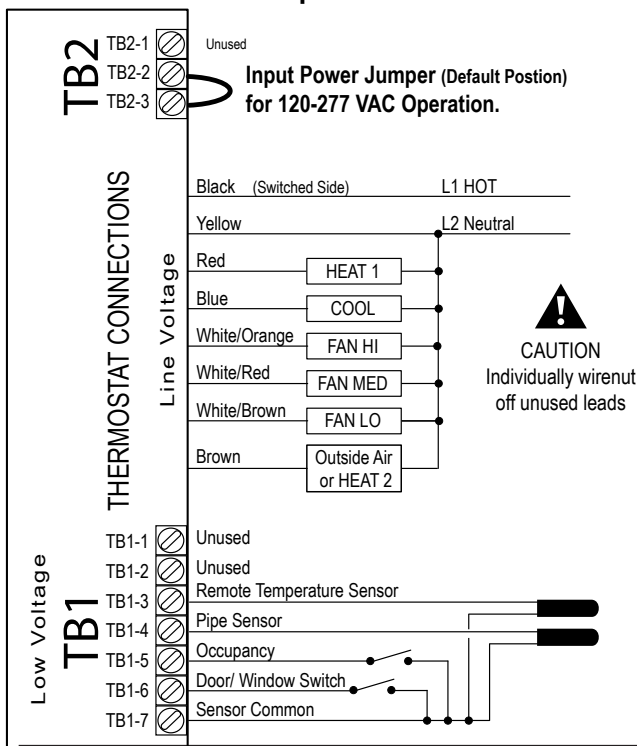
Low Voltage Terminal Connections: 18 -12 AWG

Remote Sensor: 10K NTC Type 2

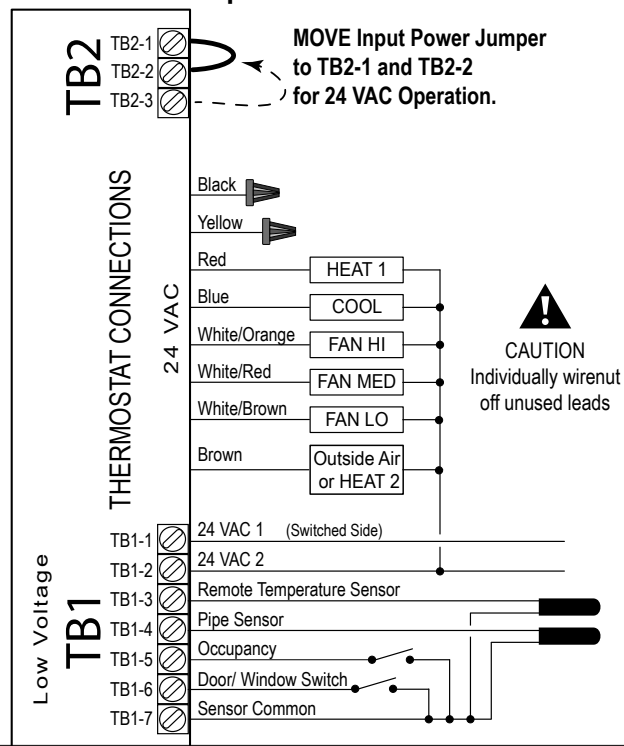
Agency Approvals: UL, UL Canada

## Wiring Diagram

### 120-277 VAC Operation



### 24 VAC Operation



# Installation

This thermostat is intended for indoors use only.

## Select an appropriate thermostat location

Locate the thermostat about four feet (1.2m) above the floor on a wall with good ventilation, average temperature and good response to temperature changes.

Do not locate the thermostat where it can be affected by:

- Direct sunlight
- Drafts or dead areas behind doors
- Radiating heat or cool from appliances or equipment
- Concealed pipes or chimneys
- Outside walls or unheated/uncooled areas

Required components (not included, unless otherwise specified):

- Screws and wall anchors (included)
- Screwdrivers: Phillips (for wallplate); small flathead (for terminal blocks)
- Drill with 3/16" drill bit (or 7/32" for plaster)
- Wire cutter and stripper
- Level

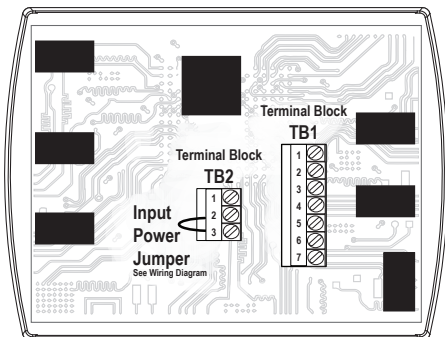
## PART I: REMOVAL OF OLD THERMOSTAT

1. Turn off power to thermostat at main fuse or circuit breaker box. Ensure that ALL power is disconnected. To prevent electrical shock and /or equipment damage, disconnect electrical power to the system at the main fuse or circuit breaker until installation is complete.
2. Remove the front cover of old thermostat. With wires still attached, remove wall plate from the wall. If the old thermostat has a wall mounting plate, remove the thermostat and the wall mounting plate as an assembly.
3. Before removing wires from old thermostat, label each wire with the terminal designation from which it was attached. Take a photo if possible.
4. Disconnect the wires from the old thermostat one at a time. Do not let wires fall back into the wall.

## PART II: MOUNTING THE THERMOSTAT

1. Thermostat mounts to a 4" x 4" box with a 2" x 4" mud ring. Adapter wall plates are available if needed.
2. Pull wires through the hole of the thermostat base.
3. Mount thermostat base to the wall using a level to determine best horizontal mounting.
4. Mark positions of screw holes (two) with a pencil and remove base.
5. Drill holes at pencil-marked locations (3/16" for drywall, 7/32" for plaster).
6. Insert the wall anchors in the holes, tapping them into place.
7. Mount the wall plate onto the wall and insert screws through mounting holes. Assure that all loose wires come through the center opening of the wall plate
8. Verify that the circuit board is firmly snapped into the cover and has not been dislodged during handling.
9. Match and connect equipment wire thermostat using the appropriate wiring diagram. Use onboard terminal connections for sensor wiring. Cap off any unused wires and terminate properly according to local building codes.

**NOTE: Verify that the Input Power Jumper is in the correct position.**



10. Firmly press cover to engage the cover locking snaps. Should the cover need to be removed in the future, use a flat edged tool to put pressure on the base sides. This will release the four side latches.
11. Turn on power to equipment.

## PART III: SET CLOCK, MONTH, AND DAY

When power is first applied to the thermostat, it will activate the clock display. It is recommended that time and day are entered before performing advanced configuration. Setting the clock can also be accessed by selecting MORE then CLOCK. Set clock as follows:

- ▲ / ▼ = Arrows set selection. Note: The flashing option is the default selection.
- NEXT = Advances to next menu.
- Menu selections are: 12 to 24 hour format - Hour - Minutes - Year - Month - Day
- DONE = Press Done when operation is complete.

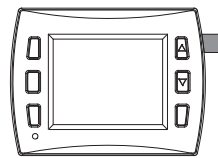
NOTE: Display of Clock is not available when configured for non-programmable operation.

## PART IV: VERIFY THERMOSTAT OPERATION

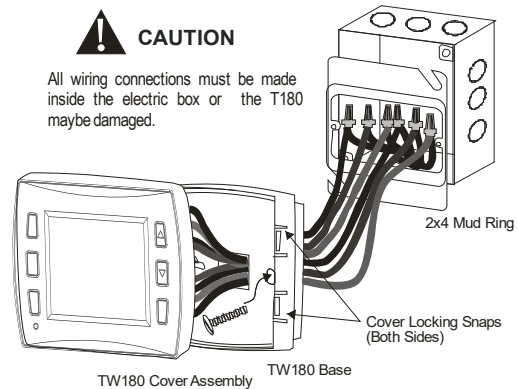
System test verification is highly recommended to verify thermostat operation. After wiring and installation is complete, energize the system. From the service menu select menus 600, 610, 620 to test heating, cooling and fan operation.

For all system tests, press **Next** to continue to the following system test, or next available Service Menu. Press **Done** only if finished performing all system tests. Pressing **Done** exits the Service Menus and turns off all active outputs.

## PART V: REMOVE BATTERY INSULATOR TAB



Remove Insulator Tab after power is applied. This tab protects onboard battery prior to installation. This battery backups up the clock.



## THERMOSTAT PROGRAMMING

This thermostat is easily changed from non-programmable to programmable operation in Service Menu 100. See the Operating Manual for detailed instructions on setting up schedules. In non-programmable mode the thermostat controls to a single setpoint with the dead band used for auto changeover from Heat to Cool.

## FAN AND DAMPER OPERATION

### Damper Operation (Service Menu 111)

A damper output is available when the brown lead is not being used for stage 2 heat. Cycled with demand vs continuous on operation is determined in SM 111.

### Fan Operation (Service Menu 350)

Configures available fan modes. Selections are ON, AUTO or Staged. When staged is selected the user does not have access to fan speed selection.

### Programmable Fan Operation (Service Menu 500)

This feature changes the fan operation to ON (continuous) during scheduled Occupied events. TIP: Disable Fan ON selection in SM 350 to ensure cycled operation in unoccupied scheduled events.

### Intermittent Fan Operation (Service Menus 500, 501, 502)

Provides minimum timed fan operation by cycling the fan on and off.

## OCCUPANCY/ DOOR SWITCH OPERATION

The TW180 occupancy input can be standalone or used with a door switch. When occupancy is detected (contact open) the thermostat will run at the last user setpoint or to the schedule depending on SM100. If no occupancy is detected (contact closed), the thermostat uses the setback values and SM310 and SM320. The fan is automatically set to cycle with demand on transition to setback. Service Menus can be configured for occupied duration (SM 326), setback ramping (SM 327), and nighttime lock and Start Time (SM 328 and SM329).

### SM 325 = 1 Occupancy Sensor Only Sequence of Operation:

- Occupancy sensor detection sets the TW180 to occupied mode.
- The Occupied Timer duration is set per SM326.
- Once the timer expires without detection the unit will return to Setback, based on ramping selection at SM327. The fan will be set to cycle with demand.
- If SM 328, Night Lock On, is enabled and a detection occurs after the time set at SM329, the TW180 will stay in occupied operation until 7:00AM.

### SM 325 = 2 Door/Window Switch Only Sequence of Operation:

- If a door or window is opened a 2-minute timer is started.
- If the timer expires without a door/window closure the thermostat outputs are turned off.
- When the door/window is closed normal thermostat operation will resume.
- A one-time ten minute override of open door / window can be initiated by pressing any thermostat key pad.
- The door state, NO or NC, can be reversed at SM176.

### SM 325 = 3 Occupancy Sensor and Door Switch Sequence of operation:

- On a door open signal the thermostat will initiate occupied mode.
- If the door is not closed within 2 minutes the thermostat will go into setback and fan will be set to cycle with demand.
- Once the door closes, if no occupancy signal is detected within 2 minutes, the TW180 will go into setback.
- If occupancy is detected any time after the door closes, the TW180 is set to occupied mode until the door is opened again.
- Once setback is initiated ramping will follow the selection at SM327.
- The door state, NO or NC, can be reversed at SM176.
- Service Menus 326, 328 and 329 are ignored.

## KEYPAD LOCK OUT

The keypad lockout function blocks access to features by hiding them from the user's view/selectability. Service Menu 340 has 3 levels of lock out. If a PIN is used to enter the Service Menu, all key pad lockouts will be disabled for a period of five minutes.

## FAN COIL 2-PIPE/ 4-PIPE OPERATION

When used on a fan coil system the TW180 can be configured to switch between summer and winter using either a PECO pipe temperature sensor or a controller like an aquastat that is open for summer and closed for winter. Service Menu 171 sets 2-pipe or 4-pipe fan coil operation.

| 2-Pipe Operation | Wire Color | Summer (Cold Water or Open Input) | Winter (Hot Water or Closed Input) |
|------------------|------------|-----------------------------------|------------------------------------|
| Cool             | Blue       | Cool                              | Heat                               |
| Stage 1 Heat     | Red        | Disabled                          | Disabled                           |

- 2-pipe operation disables the HEAT 1 output. The COOL output is used for cool in summer and first stage of heat in winter.

| 4-Pipe Operation | Wire Color | Summer (Cold Water or Open Input) | Winter (Hot Water or Closed Input) |
|------------------|------------|-----------------------------------|------------------------------------|
| Cool             | Blue       | Cool                              | Heat                               |
| Stage 1 Heat     | Red        | Heat                              | Disabled                           |

- 4-pipe operation uses both COOL and first stage HEAT 1 when chilled water is available (Summer). When hot water is available (Winter) the HEAT 1 output is disabled and the COOL output is used for first stage of heating. Second stage HEAT 2 may be available, depending on the system type.

## PIPE SENSOR: SEASONAL CHANGE OVER

This feature is enabled when 2-pipe or 4-pipe operation is selected in Service Menu 171. With a pipe sensor connected to the TW180, the system will automatically change from Summer (cold water) to Winter (hot water) operation based on water temperature in the main piping riser. This input is looking for a valid temperature reading when using a pipe sensor, or a contact open/close if using an aqua-stat type device.

- Summer operation is enabled if the input is open or if the sensed temperature is below the threshold selection in SM 172.
- Winter operation is enabled if the input is closed or if the sensed temperature is above the threshold selection in SM 173.

If the water temperature sensed is between selections in SM 172 and SM 173 the water temperature is considered Ambiguous. The COOL output will be opened for 3-minutes. After the 3 minute purge cycle, the thermostat checks again to see if the water temperature is Summer or Winter. If yes, the thermostat will transition to normal operation. If no, the operation is based on selection at Service Menu 174. NOTE: If at any time the demand goes away, the thermostat will abort the purge cycle.

## SYSTEM FLUSH FOR FAN COIL VALVES

Enable a periodic opening of valve(s) to flush valves and reduce sediment buildup using Service Menus 375, 376 and 377.

## FAULT DETECTION

**Fault detection can be used when not using a remote probe.** Connect fault detection relay between terminal block TB1-3 and TB1-7. See Service Menu 175

## ADVANCED CONFIGURATION SERVICE MENUS

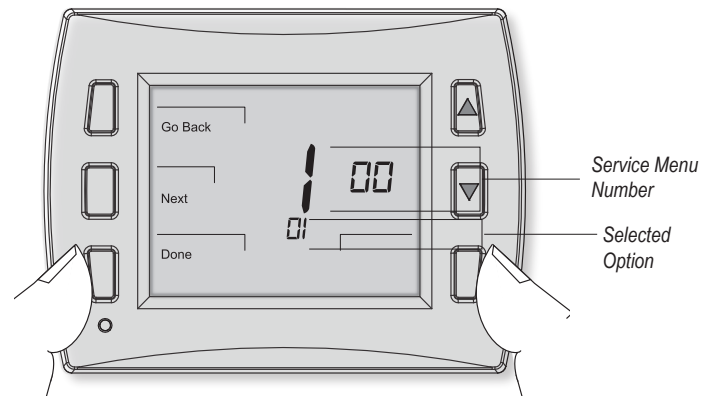
### CONFIGURE SERVICE MENUS

The following Service Menus (SM) commonly require configuration. Please verify that these are set for your specific application. Additional configuration may be required.

- SM 100 = Programmable or Nonprogrammable
- SM 110 = System Type
- SM 120 = Fan Control for Heating
- SM 135 = W1 Heat Output NO or NC
- SM 170 = Remote Sensors
- SM 240 = Number of Programmable Events per Day
- SM 395 = Override Duration for Programmable Operation
- SM 340 = Keypad Lock Out


### SERVICE MENU ACCESS

1. Hold lower right and lower left keys for five seconds.
2. Press Next or Go Back button to select a Service Menu.
3. Press ▲ / ▼ to select option.
4. Press Done when complete.



| Menu | Feature                           | Option  | Description  |
|------|-----------------------------------|---|--|
| 100  | Schedule Format                   | 0 = Nonprogrammable (Default)                                     | Selects the schedule format. In non-programmable mode all scheduling functions are removed from the display.   |
|      |                                   | 1 = Programmable  |  |
|      |                                   | 2 = 5-1-1 Schedule Mode   |  |
|      |                                   | 3 = 5-2 Schedule Mode   |  |
| 101  | Daylight Savings                  | 0 = Disabled (Default)  | When enabled daylight savings time follows the US 2007 format. (Begins second Sunday of March at 2AM and ends on the first Sunday of November at 2AM.  |
|      |                                   | 1 = Enabled (2007 US Format)                                      |  |
| 110  | System Type                       | 1   1 Stage Heat /1 Stage Cool (Default)                          | Heat Stage 2 takes the place of this outside air damper output.  |
|      |                                   | 2   2 Stage Heat /1 Stage Cool                                    |  |
|      |                                   | 3   1 Stage Heat Only   |  |
|      |                                   | 4   1 Stage Cool Only   |  |
| 111  | Outside Air Damper Configuration  | 0 = Damper Continuous   | Damper output is not available when being used as a fan speed.<br>0: Output runs continuously when thermostat is not in System OFF Mode.<br>1: Output cycles with a heat or cool demand.   |
|      |                                   | 1 = Damper Cycled with Demand (Default)                           |  |
| 120  | Fan Control (Heating)             | 0 = OFF for Heating (Gas/Oil Heat)                                | 0: The thermostat will Not activate the fan with a heating demand.<br>1: The thermostat will activate the fan with heat demand.  |
|      |                                   | 1= Electric Furnace (Default)                                     |  |
| 121  | Fan Speeds                        | 1 = Single Speed Fan  | Single Speed - White/Orange Lead<br>2-Speeds - White/Orange & White Brown Leads<br>3-Speeds - White/Orange, White/Red & White Brown Leads  |
|      |                                   | 2 = 2-Speed Fan   |  |
|      |                                   | 3 = 3-Speed Fan (Default)   |  |
| 134  | Cool Output Configuration         | 0 = NC: Normally Closed Operation (Default)                       | Reverses the ON/OFF operation for the heat output. NC operation powers on with a demand. NO operation powers off with a demand and will be on with no demand unless main power is removed from the thermostat.   |
|      |                                   | 1 = NO: Normally Open Operation                                   |  |
| 135  | W1 Heat Output Configuration      | 0 = NC: Normally Closed Operation (Default)                       | Reverses the ON/OFF operation for the first stage heat output. NC operation powers on with a demand. NO operation powers off with a demand and will be on with no demand unless main power is removed from the thermostat.   |
|      |                                   | 1 = NO: Normally Open Operation                                   |  |
| 170  | Remote Sensor Input               | 0= No Remote Sensors (Default)                                    | 0: Remote temperature sensing is disabled.<br>1: The TW180 uses the remote sensor only for temperature sensing.<br>2: The TW180 averages the local and remote sensor for temperature sensing.<br>When using a remote sensor an open or short will turn off outputs and display either 2Ero(open) or 2Erc (closed). Fault detection settings are not used.            |
|      |                                   | 1= Remote Indoor Sensor Connected                                 |  |
|      |                                   | 2 = Remote Sensor Connected And Sensor Averaging                  |  |
| 171  | Pipe Sensor                       | 0 = Disabled (Default)  | Enables fan coil pipe sensor operation. Connect a PECO pipe sensor or dry switch closure for change over from Summer (cold water) to Winter (hot water) on COOL output (blue wire). 2-pipe operation uses the COOL output for heating and cooling. Heat 1 is disabled. 4-pipe operation allows heat 1 in summer mode of operation.<br>Available when SM 110 = 1 or 2 |
|      |                                   | 1 = Two Pipe Operation  |  |
|      |                                   | 2 = Four Pipe Operation (use for 2-pipe with electric heat relay) |  |
| 172  | Pipe Sensor Threshold for Cooling | 50F to 72F (Default 60F)  | Available when SM 171 = 1 or 2. Changes to Cool when pipe temp is below threshold.   |
| 173  | Pipe Sensor Threshold for Heating | 75F to 90F (Default 80F)  | Available when SM 171 = 1 or 2. Changes to Heat when pipe temp is above threshold.   |

| Menu | Feature  | Option  | Description  |
|------|--|---|--|
| 174  | Pipe Sensor Purge  | 0 = Time (Default)                              | Available when SM 171 = 1 or 2<br>TEMP: Purge continues until a non-ambiguous condition is sensed.<br>TIME: A 3-minute purge is started. When complete thermostat returns to season operation or if ambiguous mode all thermostat outputs are disabled for 1 hour. See Pipe Sensor: Seasonal Chage Over. |
|      |  | 1 = Temp  |  |
| 175  | Fault Detection/ Setback<br>(Requires SM170=0)<br>No Remote Sensor | 0 = Disabled (Default)                          | Disabled. When not 0 connect dry switch between TB1-3 and TB1-7.   |
|      |  | 1 = Active On Open                              | Displays "Door" in clock location, turn outputs OFF, blink red LED   |
|      |  | 2 = Active On Open                              | Displays "Fdd" in clock location, outputs function normally  |
|      |  | 3 = Active On Close                             | Displays "Err" on clock location, turn outputs OFF blink red LED   |
| 176  | Door/Window Switch   | 0 = Open when door is closed (default)          | Configure door switch to match door closed state.  |
|      |  | 1 = Closed when door is closed                  |  |
| 240  | Number of Program Events   | 2 or 4 Events (DEFAULT = 2)                     | When the TW180 is set up as programmable this sets the number of events per day. Events are OCC1, UNOCC1, OCC2, UNOCC2   |
| 250  | Clock Format   | 12 or 24 Hrs (Default = 12)                     | This service menu sets the clock format.   |
| 260  | F or C   | 0 = Celsius                                     | Determines temperature displays in Fahrenheit or Celsius   |
|      |  | 1 = Fahrenheit (Default)                        |  |
| 270  | Fan Off Delay Heat   | 0-99 Seconds (0-Default)                        | The amount of time (in seconds) the lowest available fan speed will run after the thermostat heating outputs are disabled  |
| 280  | Fan Off Delay Cool   | 0-99 Seconds (0-Default)                        | The amount of time (in seconds) the lowest available fan speed will run after the thermostat cooling outputs are disabled  |
| 290  | Range Low  | 50-90 F or 10-32C (50F- Default)                | The lowest selectable temperature setpoint value   |
| 300  | Range High   | 50-90 F or 10-32C (90F- Default)                | The highest selectable temperature setpoint value  |
| 310  | Setback Low  | Off, 50-90 F or 10-32C (67F- Default)           | Accessed from Wi-Fi or by occupancy sensor detection. "Off" turns heating setpoint off.  |
| 320  | Setback High   | Off, 50-90 F Or 10-32C (78F - Default)          | Accessed from Wi-Fi or by occupancy sensor detection. "Off" turns cooling setpoint off.  |
| 325  | Occupancy Sensor/ Door Switch                                      | 0 = Disabled                                    | See Occupancy Sensor and Door Switch Operation   |
|      |  | 1 = Occupancy Sensor Only                       |  |
|      |  | 2 = Door Switch Only                            |  |
|      |  | 3 = Occupancy and Door Switch                   |  |
| 326  | Occupied Timer Duration  | 30 min, 1, 2 (default), 4, 6, 8, 16, 20, 24 hrs | Sets the time required to go into setback mode after occupancy detection.  |
| 327  | Setback Ramping  | 0 = Economy (No Delay)                          | Determines how fast the thermostat will go to the setback values.  |
|      |  | 1 = Comfort 1 (1 degree per hour) (Default)     |  |
|      |  | 2 = Comfort 2 (2 degrees per hour)              |  |
| 328  | Nighttime Lock   | 0 = Disabled (default)                          | Locks the thermostat into Occupied mode if occupied at time set in Service Menu 329.   |
|      |  | 1 = Enabled                                     |  |
| 329  | Nighttime Lock Start Time  | 10 PM (Default)                                 | Sets the time of when nighttime lock becomes active.   |
| 330  | Zone Temp Offset   | +/-9F or +/-4.5C (0F- Default)                  | Zone Temperature offset adjusts the sensed Zone Temperature displayed, allowing calibration in the field   |
| 340  | Keypad Lockout   | 0- No Key Pad Lockout (Default)                 | This function blocks access to certain features of the device. The Service Menu is still available if the key pad lockout is enabled.  |
|      |  | 1- Disables Schedule and System Keys            |  |
|      |  | 2 - Disables Schedule, System, And Fan Keys     | If PIN is entered keypad lockout is overridden for 5 minutes.  |
|      |  | 3 - Disables All Keys                           |  |
| 341  | Enable Pin Access  | 0=Disable, 1= Enable (Default = 0)              | Applies a 3-digit access code to enter service menu 342  |
| 342  | Set Pin  | 000-999 (Default 000)                           | Selects pin access three-digit code.   |

| Menu | Feature                           | Option  | Description  |
|------|-----------------------------------|---|--|
| 350  | Fan Mode                          | 1 = On  | ON: Fan is always on, regardless of demand.<br>User selections are: ON HI, ON MED, ON LO based on the number of fan speeds.  |
|      |                                   | 2 = Auto  | Auto- Fan is only on with heating or cooling demand User selections are: AUTO HI, AUTO MED, AUTO LO based on the number of fan speeds.   |
|      |                                   | 3 = ON Or Auto (Default)  | ON or Auto user can choose either selection. User selections are: AUTO HI, AUTO MED, AUTO LO, ON HI, ON MED, ON LO based on the number of fan speeds.  |
|      |                                   | 4 = Staged Only   | Fan speed selected from available speeds by thermostat per Fan Access section. User selections are: AUTO or ON.  |
|      |                                   | 5 = On Or Staged - Hotel Mode   | ON- Fan is always on at user selected speed, regardless of demand<br>AUTO Staged- Thermostat stages available speeds. Fan cycles off with demand.  |
| 360  | System Mode                       | 0 = Off, Auto   | Sets the system modes the occupant is able to select   |
|      |                                   | 1 = OFF, Heat, Cool, Auto (Default)                                     | Hotel operation - For ease of use change available System modes to ON-AUTO SM360=02  |
|      |                                   | 2 = OFF, Heat, Cool   |  |
|      |                                   | 3 = Heat, Cool, Auto  |  |
| 361  | Controlled Off                    | 0 = Disable (default)   | When enabled, the unit will control to the Setback setpoints while in "off" mode.  |
|      |                                   | 1 = Enable  |  |
| 375  | System Flush Enable               | 0 = No Flush (Default)  |  <b>WARNING:</b> Service Menu 375 may disable fan operation during valve flush. Enables the flush function for fan coil systems. This feature should be set to 0 (zero) unless outputs are connected to hydronic heating or cooling valves. Failure to follow this instruction can result in damage to equipment and/or property. |
|      |                                   | 1 = W1 Flush  |  |
|      |                                   | 2 = Y1 Flush  |  |
|      |                                   | 3 = W1 & Y1 Flush   |  |
| 376  | Flush Duration                    | 1 To 3 Minutes (Default 1)  | Defines how long to open the valve to perform the flush function   |
| 377  | Flush Frequency                   | 0 = Every 24 Hrs (Default 0)<br>1 = Every 12 Hours<br>2 = Every 6 Hours | Defines how often the flush is performed when output has remained inactive   |
| 380  | Minimum Dead band Adjustment      | 3F (Default)  | A changeover dead band value prevents short cycling between heating and cooling modes. The value is adjustable to meet various HVAC system requirements.   |
|      |                                   | 1-10F, 1.5-5C   |  |
| 390  | Pre-Occupancy Purge               | 0 Hours (Default)   | Energizes the lowest fan available for selected number of hours (0-3) prior to events Occ 1 and Occ 2. This feature applies to Programmable thermostat operation.  |
|      |                                   | 0-3 Hours   |  |
| 395  | Temporary Occupied Duration Limit | 0-4 Hours (Default = 3)   | This set the duration of a user override for programmable operation.<br>0: Will override the schedule until the next programmed event.<br>1,2,3,4: Sets the number of allowed hours of override after user adjustment. User can adjust override duration up to this limit of hours.  |
| 480  | Minimum Off Time                  | 0-10 Minutes (Default 1 Minutes)  | Sets the minimum off time for both the heat and cool output.   |
| 500  | Programmable/ Intermittent Fan    | 0 = Disable (Default)   | In programmable mode the fan will operate continuously during occupied periods or with demand during unoccupied/setback periods. In intermittent fan will operate based on the on and off times set in menus 501 and 502 whenever there is demand for fan.   |
|      |                                   | 1 = Programmable Fan  |  |
|      |                                   | 2 = Intermittent Fan  |  |
|      |                                   | 3 = Intermittent Fan During Occupied Periods Only                       |  |
| 501  | Intermittent Fan On Time          | 5 Minutes (Default)   | Defines the duration in which fan low will be on. Fan On will be activated after Fan Off time has passed.  |
|      |                                   | 1-60 Minutes  |  |
| 502  | Intermittent Fan Off Time         | 25 Minutes (Default)  | Defines the duration in which fan low will be off. Fan Off will be activated after Fan On time has passed. A selection of 0 will result in continuous Fan.   |
|      |                                   | 0-60 Minutes  |  |
| 520  | Default Display Icons             | 0 = Time, Temp, SP (Default)  | Icons that will be displayed in the default state.<br><br>NOTE: Setpoint will not be displayed if TW180 System Mode is OFF.  |
|      |                                   | 1 = Time, Temp  |  |
|      |                                   | 2 = Time  |  |
|      |                                   | 3 = Temp  |  |
|      |                                   | 4 = None  |  |
|      |                                   | 5 = Set Point Only  |  |
| 530  | Revision                          | Displays Current Revision Information                                   |  |
| 540  | Factory Default Reset             | 0 = Disable (Default)   | When enable is selected he device will return to factory default settings.   |
|      |                                   | 1 = Enable  |  |
| 600  | Cooling System Output Test        | 0 = Disable (Default)   | Cool operation is enabled and the associated outputs based on Service Menu 110. The output is activated for 10 minutes. The outputs will automatically turn on.  |
|      |                                   | 1 = Cooling   |  |

| Menu | Feature                    | Option                     | Description   |
|------|----------------------------|----------------------------|---|
| 610  | Heating System Output Test | 0 = Disable (Default)      | Heat Operation is enabled and the associated outputs based on Service Menu 110. The output is activated for 10 minutes. The outputs will automatically turn on. |
|      |                            | 1 = First Stage Heat       |   |
|      |                            | 2 = Stage 2 Heat or Damper |   |
| 620  | Fan System Output Test     | 0 = Disable (Default)      | If enabled is selected it will activate Based On Service Menu 110. The output will be enabled for 10 minutes. The outputs will automatically turn on.           |
|      |                            | 1 = Enable HI Fan Output   |   |
|      |                            | 2 = Enable MED Fan Output  |   |
|      |                            | 3 = Enable LO Fan Output   |   |

## TROUBLESHOOTING & FREQUENTLY ASKED QUESTIONS

In case of difficulty, try one of the following suggestions below.

| Symptom   | Potential Cause(s)  | Solution   |
|---|---|--|
| If display screen is blank  | • Thermostat is not being powered   | • Check to assure proper wiring of power to the thermostat.<br>• Check power to verify that there is power (24-277 VAC) available.   |
|   | • Default Display is set to "4" (None)  | • Check Service Menu 520.  |
| If keys do not allow manual entry   | • Keypad Lockout may be enabled   | • Access Service Menu 340. Within this menu, select option "0" to assure there is no keypad lockout (so manual entry is enabled).  |
| Service Menu does not display   | • PIN access is enabled<br>• Buttons were not pressed simultaneously  | • Access requires the three digit code set by the installer.<br>• Wait for unit to return to default display and retry.  |
| SETBACK is in the Display   | • System is in setback  | • Your thermostat has an occupancy detection system connected.<br>• Check connections between TB1-5, TB1-6, TB1-7  |
| Dashes in the Temperature Display   | • Remote Probe Error  | • For remote probe use allow 5 minutes for thermostat temperature to stabilize.<br>• Check Service Menu 170 for correct selection.   |
| Err In Clock Display  | • Indicates a service fault input   | • Indicates service is required.   |
| Door in Clock Display   | • Door or window is open  | • Close door and /or window to clear fault.  |
| Fdd in Clock Display  | • Indicate an economizer or other system fault  | • Indicates service is required.   |
| If no heating or cooling is running, but there is a call for heat or cool (Heat/Cool appears on display) in Auto mode | • Heating or cooling equipment is not operating<br>• Minimum off time has not been met<br>• Power Jumper is not located properly at terminal TB2. | • Check Service Menu 110 to assure that the correct option is selected to match the system type.<br>• Check wiring, using output tests to verify (see Service Menus 600, 610, 620).<br>• Verify that the Power Jumper is in the correct position for your system voltage. CAUTION: Do not move the Power Jumper to 24VAC position if your system is running at line voltage. |
| If heating or cooling system doesn't respond  | • System type selection is incorrect  | • Check Service Menus 110 and 120 to assure that the correct option is selected to match the system type.  |
| If heating and cooling equipment are running at the same time   | • System type selection is incorrect  | • Check Service Menu 110 to assure that the correct option to match the system type is selected  |
|   | • Verify wiring connections   | • Separate the heating and cooling wires, using output tests to verify (see Service Menus 600, 610, 620).  |
| If Demand Indicator light is red  | • Heating is occurring  | • No action is required.   |
| If Demand Indicator light is green  | • Cooling system is running   | • No action is required.   |
| Fan outputs turned off after 3-minutes  | • Pipe sensor is connected and water temperature between hot water and cold water set points  | • Building Boiler or Chillers may be turned off.<br>• See Service Menus 171, 172, 173 & 174  |
| Menu Item Not available   | • Some service menus are disabled when not in use or feature is not available.  | • Verify system type selection and feature selection is correct.   |
| Red LED is Flashing and a code is displayed in the clock location   | • Fault is present on TB1-3 and TB1-7<br>• Probe is not wired correctly or is wrong value.  | • Check SM175 for code<br>• If using a remote sensor, verify probe wiring and type.  |

UL60730-1 Required Information:

Purpose of control: Operating Control, Room Thermostat

Type 1.C Action

Pollution Degree 2

Impulse Voltage: 2500 V