



T170 COMMERCIAL THERMOSTAT

SMART ENERGY MANAGEMENT



HIGHLIGHTS

- 24 or 110-277 VAC Supply Voltage Selection
- Auto-Staged Fan Available
- Occupancy HVAC Control Input
- Controlled Off Safety Option
- Key Pad Lockout - Partial or Full
- Setback Capability
- 2-pipe/4-pipe Configuration
- Manual or Auto Changeover
- Local or Remote Sensing
- LCD Display with Backlight
- Fahrenheit or Celsius Display

Temperature and Air Control

The T170 brings smart energy management to the hospitality industry, retirement/care facilities, ADA compliance locations and office/public spaces. The T170 is a microprocessor-based, stand-alone digital control that supplies line or low voltage relay control of heat, cool, outside air and up to three fan speeds.

Broad Range of Adjustments

Various configurations can supply staged fan, cycled fan, continuous fan, controlled off and fan coil operation. Energy saving features include range limit adjustment, staged fan, occupancy and setback control. This control includes design features to meet ADA requirements.



hvacUSA.com
A MechTronics Controls Company

www.hvacusa.com
Phone (877) 632-4876

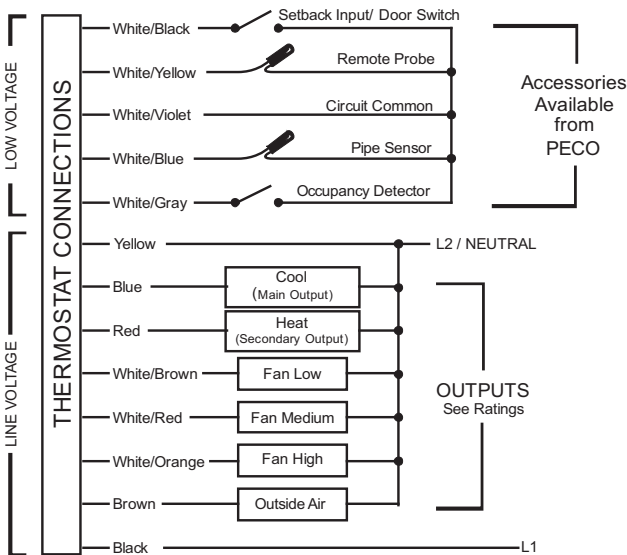
T170 COMMERCIAL THERMOSTAT

TECHNICAL SPECIFICATIONS

Temperature Range	50 to 90°F / 10 to 32°C factory default, adjustable inward
Maximum Ambient	130°F / 54°C
Load Connections	Wire leads
Mounting	Installs on a standard 4" x 4" (101.6mm x 101.6mm) device box with a 2" x 4" (50.8mm x 101.6mm) horizontal mud ring
Agency Approvals	UL, UL Canada



WIRING DIAGRAM



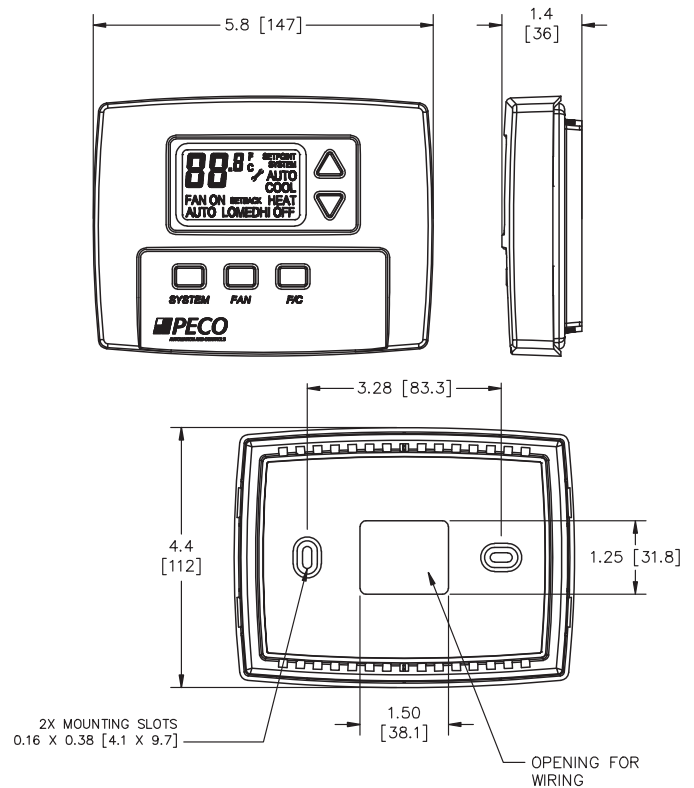
RATINGS

VOLTAGE RATING	INDUCTIVE		RES AMPS	PILOT DUTY	HP
	FLA	LRA			
24 VAC	NA	NA	NA	24 VA	NA
120 VAC	5.8	34.8	6.0	125 VA	1/4
240 VAC	2.9	17.4	5.0	125 VA	1/4
277 VAC	2.4	14.4	4.2	125 VA	1/4

MODEL SELECTION GUIDE

Model	Part Number	Description
TA170-001	68348	Auto-Cool-Heat-Off, 3 Fan Speed
TB170-001	68457	Auto-Cool-Heat-Off, Staged 3 Fan Speed

MOUNTING INSTRUCTIONS



Automation and Controls
Division of PECO, Inc.
PO Box 82189, Portland, OR 97282

Phone: 800-874-8547 / 503-233-6401
Email: sales@pecomanufacturing.com
www.pecomanufacturing.com



TA/TB170 THERMOSTAT

⚠ 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.
- Before installing this control, the Voltage Selection Switch must be placed in the correct position. See instructions.
- 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. You must review your application and national and local codes to assure that your installation will be functional and safe.

⚠ CAUTION

- Use copper wire only, insulate or wire nut all unused leads.
- Care should be used to avoid electrostatic discharge to the T170 thermostat.
- This unit has configuration jumpers. You may need to reconfigure this thermostat for your application.

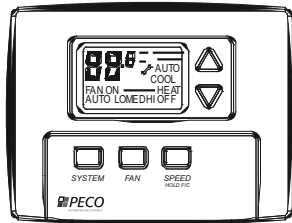
APPLICATIONS AND FEATURES

For 2 or 4 Pipe Fan Coil and On/Off Control Applications

- System Selection: Off-Heat-Cool-Auto-Setback
- 6 Outputs: 1H, 1C, Up to 3 Fan, OA Damper
- Fan Control: 1-3 Speeds
Cycling (Auto) or Continuous (On)
Automatic Fan Speed Staging (*TB170 models only*)

Connections for:

- Fan Coil Pipe Sensor
- Remote Temperature Probe
- Occupancy Control
- Door Switch or Setback
- Condensate Overflow



SPECIFICATIONS

Temperature Set Point Range
Differential
Memory – Back-Up

50 to 90°F / 10 to 32°C
1°
EEPROM, No batteries required,
Stores settings for unlimited
time.
Installs on standard 4" x 4"
device box with a 2" x 4"
horizontal mud ring

Mounting

Physical Dimensions
Agency Approvals
Electrical Ratings

4.4"H x 5.8"W x 1.1"D
UL, UL Canada
(see table below)

Voltage Rating	Switching			
	Inductive		Resistive Amps	Pilot Duty
	FLA	LRA		
24 VAC	NA	NA	NA	24 VA
120 VAC	5.8	34.8	6.0	125 VA
240 VAC	2.9	17.4	5.0	125 VA
277 VAC	2.4	14.4	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

INSTALLATION

New Installations

The thermostat should be used indoors only. It should be mounted on an inner wall in a location with freely circulating air, and where it will be responsive to changes in room temperature. Avoid mounting near heat generating appliances (i.e. TV, heater, refrigerator), or in direct sunlight.

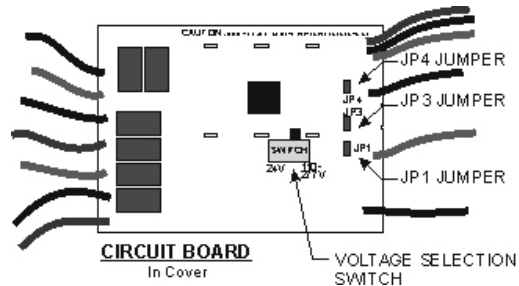
Remove Old Thermostat

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.**
4. Disconnect the wires from the old thermostat one at a time. **Do not let wires fall back into the wall.**

Jumper and Circuit Board Selections

Voltage Selection Switch: This switch must be placed in the appropriate position prior to application of power.

- 24V = 24 VAC
- 110-277 V = 120, 240 or 277 VAC



JP1 Jumper Selection – Remote Temperature Sensor:

- Local Sensing – Install JP1
- Remote Sensing – Remove JP1 – Accessory sensors are available in standard 60" lengths but can be extended to meet application requirements.



JP3 Jumper Selection – HVAC Setback Systems: The JP3 jumper allows the T170 to be configured for Setback, Occupancy Detection or Door Switch Only Occupancy Operations. For further descriptions of these conditions please see the Technical/Application Section.

- Setback Operation - Remove JP3
- Occupancy Detection - Install JP3
- Door Switch Only - Install JP3

JP4 Jumper Selection – 2 or 4 Pipe Operation: Connection of a pipe sensor will change the operation of the outputs as shown in the table below. (See Technical Notes for further information on Pipe Sensor Operation)

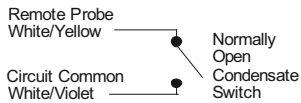
- 2-Pipe Operation - Install JP4 - The thermostat will permanently disable the Secondary Output and disables system and fan invalid modes.
- 4-Pipe Operation - Remove JP4 - Both the Main Output (COOL) and Secondary Output (HEAT) will be available.

JP4 Selection	Pipe Sensor Water Temp	Aqua Stat	Main Output (Blue Wire)	Secondary Output (Red Wire)
2-Pipe JP4-ON	COLD	Open	Cooling ONLY	Disabled
	HOT	Closed	Heating ONLY	Disabled
4-Pipe JP4-OFF	COLD	Open	Cooling	Heating
	HOT	Closed	Heating ONLY	Disabled

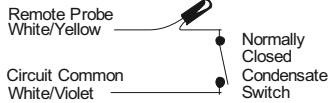
* Fan will not cycle on for disabled modes.

Condensate Overflow Interrupt - The remote probe input can be used with a condensate overflow interrupt switch (CO), either in conjunction with a remote probe (normally closed CO switch) or with local sensing (normally open CO switch). When the condensate switch activates, the T170 will display the service wrench and disable all outputs

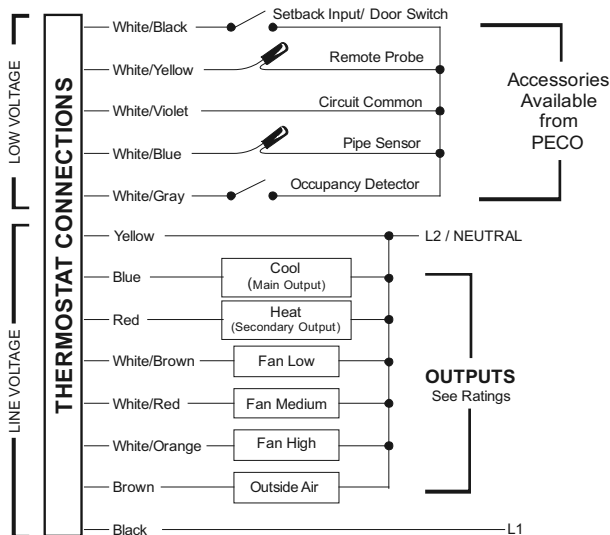
Local Sensor Installation



Remote Probe Installation



WIRING DIAGRAM

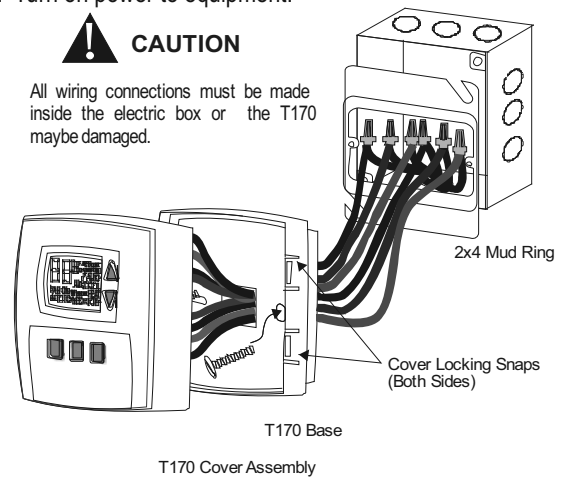


Mounting Thermostat

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 the enclosed mounting screws. Tighten screws evenly but do not over tighten.
4. Verify that the circuit board is firmly snapped into the cover and has not been dislodged during handling.
5. Match and connect equipment wire thermostat using the appropriate wiring schematic as shown at the bottom of the page on the left-hand side.
6. Wire nut all unused wires or terminate properly according to local building codes.
7. Mount the base to the mud ring and install the cover assembly. 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.
8. Turn on power to equipment.



CAUTION
All wiring connections must be made inside the electric box or the T170 maybe damaged.



System Check-out

1. After wiring and installation is complete, energize the system.
2. Set fan to ON. Select each fan speed (TA170 Models) to verify operation.
3. Set the System button to AUTO, or available selection.
4. Using the UP arrow, adjust temperature more than 5°F above the room temperature to cycle on heating.
5. Using the DOWN arrow adjust the temperature to 5°F below room temperature to cycle on cooling.

Note: If the thermostat is set to utilize a time-based purge cycle (Service menu 16), the thermostat will conduct a 3-min purge on initial start-up if a pipe sensor is connected.

THERMOSTAT CONFIGURATION / SERVICE MENU

To enter the Service Menu press the UP and DOWN arrows simultaneously for five (5) seconds. The current display icon will be turned off. Service menu numbers 1 through 17 are available. Push the SYSTEM button to move to the next Service Menu number. The UP and DOWN arrow keys will scroll through your range of options for each feature. The selection that is flashing is the one you are selecting. All changes to the Service Menu are automatically saved when the system times out. Please refer to the service menu table on page three.

Menu #	Feature	Range	Std. Model Default	Increment	Description / Comments
1	F / C	°F or °C	°F	°F	Determines temperature displays in Fahrenheit or Celsius.
2	Default Display	Zone Temp Set Point	Zone Temp	-	Choose if you want the Set-Point or Zone (room) temperature to be the primary display on the thermostat.
3	Fan Off Delay	0 – 255 Seconds	0	1 Second	The amount of time (in seconds) the lowest available fan speed will run after the thermostat outputs are disabled.
4	Range Low	50 - 90°F, 10 - 32°C	50°F	1°F, .5°C	The lowest selectable temperature Set-Point value.
5	Range High	50 - 90°F, 10 - 32°C	90°F	1°F, .5°C	The highest selectable temperature Set-Point value.
6	Setback Low	OFF 50 - 82°F, 11- 27°C	55°F	1°F, .5°C	The temperature Set-Point value you want the thermostat to Heat to when the T170 is in the Setback mode.
7	Setback High	OFF 58 - 90°F, 15 - 31°C	90°F	1°F, .5°C	The temperature Set-Point value you want the thermostat to Cool to when the T170 is in the Setback mode.
8	Zone Temp Offset	+/- 9°F, +/- 4.5°C	0°F	1°F, .5°C	Zone Temperature offset adjusts the sensed Zone Temperature reading from the A to D converter, allowing calibration in the field.
9	Keypad Lock	ON 1 ON 2 OFF	OFF	-	Allows you to choose what the occupant can access. The Service Menu is still available if Key Pad Lock Out is ON. ON1 = Disables Sys/FAN/Status ON 2 = Disables all buttons OFF = No keypad lock out.
10	Fan Mode	FAN ON FAN AUTO FAN ON or AUTO	ON or AUTO	-	ON = Fan is always on, regardless of demand. AUTO = Fan is only on with heating or cooling demand. ON or AUTO = User can choose either selection.
11	Fan Speeds	1 - High 2 - Low and High 3 - Low, Med, High	3	-	1 Speed = Fan High 2 Speed = Fan Low and Fan High 3 Speeds = Fan Low, Medium, and High
12	System Mode	Off, Auto Off, Heat, Cool, Auto Off, Heat, Cool Heat, Cool, Auto	Off, Heat, Cool, Auto	-	Allows you to determine what system modes the occupant can select.
13	Controlled Off or Off Override	ON - Enable OFF - Disable	OFF	-	When ON, the unit will control to the Setback Set-Points and override the user mode setting of OFF if the room temperature is equal to or above the Cool Setback Set-Point or equal to or below the Heat Setback Set-Point.
14	Front Panel Setback Control	ON - Enable OFF - Disable	OFF	-	When enabled / ON, SETBACK is shown as an available System mode selection. If SETBACK mode is selected, the thermostat will control to the current Setback Heat and Setback Cool Set Points.
15	Cycled Outside Air (OA) Damper	ON - Continuous OFF - Cycles	OFF Cycles with Demand	-	OFF - Cycled = OA output cycles with active heat or cool demand. ON - Continuous = OA output is active anytime the thermostat is out of the OFF mode.
16	Temp Based Purge Cycle	ON = Temp. Based OFF = Time Based	OFF Time Based	-	Determines if the Purge Cycle will be Temperature or Time based.
17	Dead Band Adjustment	3 to 10°F, 1.5 to 5°C	3°F	1°F, .5°C	A changeover deadband value prevents short cycling between Heating and Cooling modes. The value is adjustable to meet various HVAC system requirements.

USER OPERATION

- All changes are saved when the thermostat times out.
- Fan and System user selectable options are determined in the Service Menu.

Room Temp. and Adjustable Set Point (desired) Temp.: Unless adjusted in the Service Menu, the thermostat displays the current room (Zone) temperature. To adjust the desired room temperature (set point value), press either the UP or DOWN arrow key.

System Button Operation: Continue to press the System button to change the current (flashing) system mode.

- OFF: All thermostat outputs are disabled.
- HEAT: The thermostat operates as a Heating only thermostat.
- COOL: The thermostat operates as a Cooling only thermostat.
- AUTO: The thermostat automatically selects the appropriate Heat or Cool mode depending upon the Set Point (Desired Temp) and Zone Temperature (Actual Temp).
- SETBACK: If enabled in Service Menu 14, SETBACK will display as an available mode selection. This mode is an energy saving feature that minimizes heating and cooling when the room is not occupied. The thermostat will control to the SETBACK Heat

and Cool Set Points, rather than the standard Set Points. When a demand for heating and cooling exists, the fan will run at the lowest speed. When in SETBACK, the display will show the room temperature along with the SETBACK icon. Key presses will have no effect on the Setback operation except for the System Switch Selection button, which allows the user to exit this mode.

Fan Button Operation: Continue to press the Fan button to change the current (flashing) fan mode.

- ON: Fan is on continuously, even if no demand for heating or cooling exists.
- AUTO: Fan cycles with active demand for heating and cooling.

Speed or F/C Operation:

- SPEED: For units with a speed button (TA170 Models), the user can choose the desired fan speed by pressing the speed button. If you are operating a TA170 configured with only 1 speed fan, this button is disabled.
- F/C HOLD: On units with F/C HOLD below the SPEED icon (TA170 Models), hold button for 5 seconds to toggle the display between Fahrenheit and Celsius readings.
- F/C: Push button to toggle between Fahrenheit and Celsius scale

TECHNICAL / APPLICATION NOTES

Pipe Sensor Operation: A pipe sensor can be connected when the thermostat is configured for either 2-pipe or 4-pipe fan coil operation (see JP4 jumper configuration). The Pipe sensor is used to determine the water temperature in the Main Coil. The Pipe Sensor should be mounted on the Main Coil supply and wrapped with insulating material.

Pipe Sensor Input: 10K PECO Remote Probe or a standard On-Off Aqua-stat can be used for summer /winter changeover. ON (closed) is winter heating mode and OFF (open) is summer cooling mode.

Purge Cycle Operation: With a pipe sensor connected, this thermostat will initiate a purge cycle if the sensed water temperature is ambiguous (not adequately hot or cold). The purge cycle algorithm can be either temperature or time based, depending on the configuration of Service Menu 16.

Temperature-Based Purge:

- When an Ambiguous mode is detected and a demand exists, a 3 minute purge timer begins and the Main Output is opened.
- After the 3 minute purge cycle, the thermostat checks again to see if the water temperature is more than 15°F from set point, or above 80°F or below 60°F.
- If Winter or Summer mode is determined, normal HVAC operation occurs. If still ambiguous, the thermostat checks to see if the COIL temperature is below 60°F or above 80°.
 - Coil < 60°F = Summer Mode.
 - Coil > 80°F = Winter mode.
- Purge Cycle is repeated until a non-ambiguous condition is sensed.

NOTE: If at any time the demand goes away, the thermostat will abort the purge cycle.

Time-Based Purge: (Default)

- The time-based purge cycle will start a 3-min purge cycle and enable the Main Output if any of the following conditions occur: transition from OFF to AUTO mode, Reset event, power cycle, and/or 1-hour timer expires.
- After the 3 min purge cycle, a pipe sensor reading says:
 - Pipe is 15°F+ below the zone temp = Summer mode
 - Pipe is 15°F+ above the zone temp = Winter mode
 - Pipe is within 15°F of zone temp = still Ambiguous
- If a Winter or Summer mode is determined, the appropriate heating/cooling occurs. The thermostat will purge and check pipe temperatures again after 1-hour.
- If step 2 is still ambiguous, all thermostat outputs are disabled for 1 hour.
- After 1 hour, the purge cycle resumes at step 1.

HVAC Setback Systems

Setback Operation - Remove JP3

This is a low level input that is normally open. When switch is closed, the T170 heating and cooling setback limits are used as temperature control points. Fan operation in setback is cycled with demand. Pressing any button will override setback for 1 hour. Setback will override any user setting unless control is turned to OFF.

Intelligent Occupancy Sensors like the SD200-001 and SD200-002 can be used with this input to set the HVAC system to control at setback limits.

Occupancy Operation – Install JP3

The T170 can be used with PECO S200 series occupancy detection equipment. The occupancy and switch inputs are designed to connect to the SB200 slave sensor and SE200 door switch.

- The Occupancy Sensor is a low-level switch that is open when there is occupancy and closed when unoccupied.
- The Door Switch is a low-level switch that is open when the door is open and closed when the door is closed. This system requires both an Occupancy Sensor and a Door Switch.

Operation From an Occupied Mode:

1. The T170 operates normally and looks for a door close. A door close signal initiates an occupancy status detection.
2. If occupancy is detected, the T170 will maintain normal HVAC control. It then waits for a door open signal before determining occupancy again.
3. If no occupancy signal is detected within 2 minutes, the T170 changes to unoccupied mode and controls at setback temperature values.

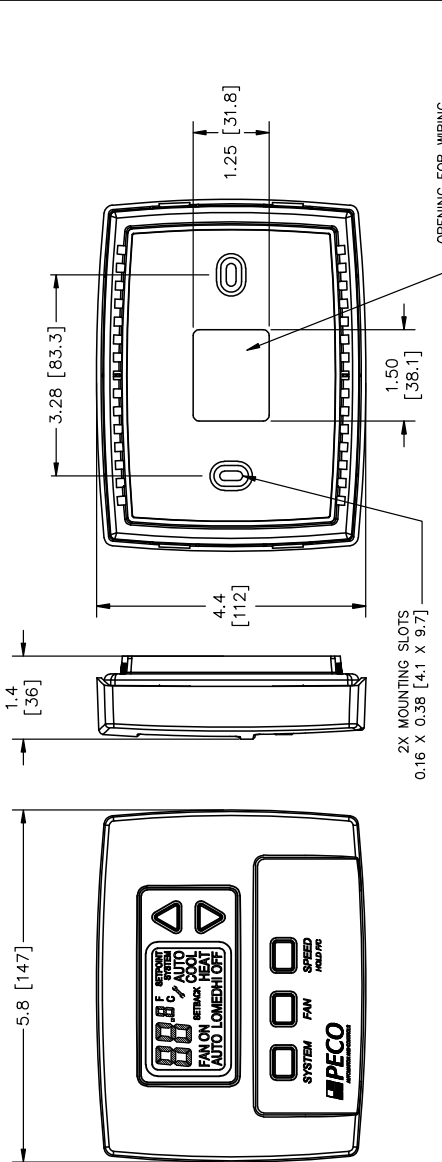
Operation From an Unoccupied Mode:

1. In an Unoccupied State, the T170 sets heating and cooling set points to setback values, as determined in the service menu. In this mode, the fan is automatically set to cycle with demand.
2. The T170 will continually monitor the room for occupancy.
3. Any occupancy detection, including door open, will set the operation to occupied mode.

In either mode, if the door is left open for more than 2 minutes the T170 will disable the HVAC system. A one-time ten minute override can be initiated by pressing any thermostat key pad.

Door Switch Only Operation - Install JP3. A stand alone door or window switch can be connected to the T170 to disable the HVAC system (outputs) if a door or window is left open for more than 2 minutes. A one-time ten minute override can be initiated by pressing any thermostat key pad.

DATE	REV	DESCRIPTION	DR.	CK.
3/7/08	7	ECN 2816 CORRECT NOTE 3 - FAN OPERATION	SEM	SR



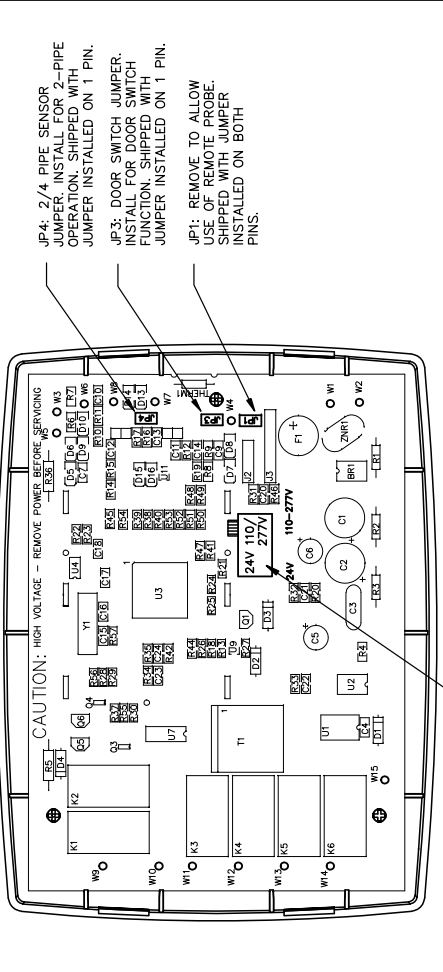
- NOTES:**
- CONFIGURATION: AUTO CHANGE OVER, HEATING/COOLING THERMOSTAT WITH DEADBAND. 6 NORMALLY OPEN RELAY OUTPUTS. SEE WIRING CONNECTIONS TABLE BELOW FOR OUTPUT FUNCTIONS. PIPE SENSOR INPUT FOR AUTO SUMMER/WINTER OPERATION. SETBACK AND OCCUPANCY SENSOR INPUTS FOR UNOCCUPIED OPERATION.
 - TEMPERATURE SENSING: INTEGRAL TEMPERATURE SENSOR AND WIRE LEADS FOR EXTERNAL THERMOSTAT PROBE. REMOVE JP-1 TO ALLOW USE OF EXTERNAL TEMPERATURE PROBE.
 - OPERATION: WITH THE THERMOSTAT OPERATING IN THE MODE "OFF", AND THE OFF OVERRIDE DISABLED, ALL OUTPUTS ARE DISABLED. IN THE MODE "COOL", CONTROL FUNCTIONS AS A COOLING THERMOSTAT. IN THE MODE "HEAT", CONTROL FUNCTIONS AS A HEATING THERMOSTAT. IN THE MODE "AUTO", THE THERMOSTAT SELECTS THE PROPER FUNCTION DEPENDING ON ZONE TEMPERATURE AND SETPOINT. HEAT AND COOL OUTPUTS HAVE A 1F (6°C) DIFFERENTIAL TO PREVENT SHORT CYCLING. FAN OPERATION (CYCLING VS. CONTINUOUS) IS USER SELECTABLE. HI, MED, AND LO FAN SPEEDS ARE USER SELECTABLE. SEE INSTRUCTION SHEET FOR COMPLETE OPERATION AND CONFIGURATION INFORMATION.
 - MATERIALS: BASE AND COVER ARE MOLDED FROM WHITE RIGID VINYL. ELASTOMERIC KEYPAD IS COLOR MATCHED TO PANTONE 421C. PRINTING IS COLOR MATCHED TO PANTONE 424C.
 - MOUNTING: INSTALLS WITH TWO FURNISHED MOUNTING SCREWS TO A STANDARD 4" X 4" X 2-1/8" [102 X 102 X 54] DEVICE BOX WITH A HORIZONTALLY MOUNTED 2" X 4" [51 X 102] ADAPTER RING.
 - ELECTRICAL CONNECTIONS: LOAD LEADS ARE 600V, #18 STRANDED COPPER WITH THERMOPLASTIC INSULATION RATED 105°C (221°F) MINIMUM. BLACK LEAD (W15) IS #14. FREE LEAD LENGTH IS 6" [152] WITH A 0.5" [13] STRIP LENGTH.
 - ELECTRICAL RATINGS:

VOLTAGE	INDUCTIVE		RES AMPS	PILOT DUTY	HP
	FLA	LEA			
24 VAC	NA	NA	NA	24 VA	NA
120 VAC	5.8	34.8	6.0	125 VA	1/4
240 VAC	2.9	17.4	5.0	125 VA	1/4
277 VAC	2.4	14.4	4.2	125 VA	1/4

COMBINED LOAD CURRENT NOT TO EXCEED 20 AMPS.
LOW VOLTAGE WIRING IS CLASS 2.

- PACKING: INDIVIDUALLY BOXED WITH MOUNTING HARDWARE, INSTRUCTION SHEET. 25 UNITS PER MASTER CARTON.
- UL LISTED TO U.S. AND CANADIAN SAFETY STANDARDS.
- UL FILE NUMBER E50023.

WIRE	COLOR	FUNCTION
W1	YELLOW	L2
W2	N/A	NOT USED
W3	WHITE-BLACK	SETBACK
W4	WHITE-YELLOW	REMOTE PROBE
W5	WHITE-VIOLET	CIRCUIT COMMON
W6	WHITE-BLUE	PIPE SENSOR
W7	WHITE-GRAY	OCCUPANCY SENSOR
W8	N/A	NOT USED
W9	BLUE	MAIN OUTPUT
W10	RED	SECONDARY OUTPUT
W11	WHITE-BROWN	FAN LO OUTPUT
W12	WHITE-RED	FAN MED OUTPUT
W13	WHITE-ORANGE	FAN HI OUTPUT
W14	BROWN	OUTSIDE AIR OUTPUT
W15	BLACK	L1



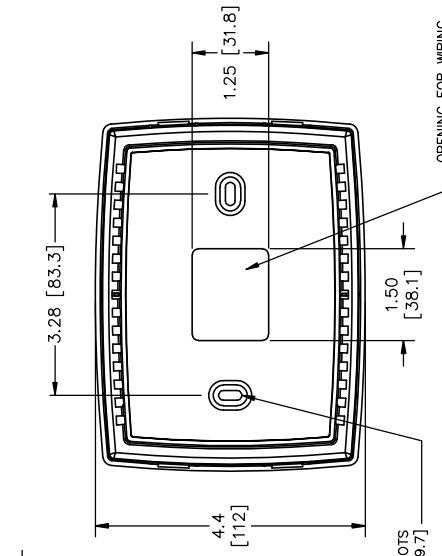
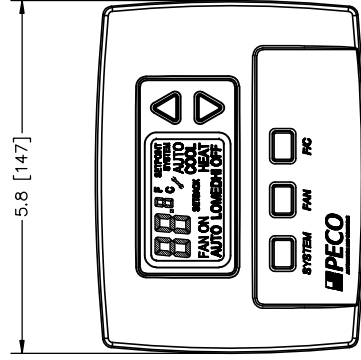
TOLERANCES EXCEPT AS NOTED	PECO, INC. PORTLAND, OR, USA	
INCH [METRIC]	PART NUMBER	SCALE
.Xmm	68348	HALF
.XXmm		
ANGULAR	TITLE	
	STAT ASSY, TA170-001	
DO NOT SCALE DRAWING. DIMENSIONS ARE CONTROLLING	SIZE	DRAWING NUMBER
	B	TA170-001

SERVICE MENU	FEATURE	FACTORY DEFAULT
1	F/°C DISPLAY	F
2	DEFAULT DISPLAY	ZONE TEMP
3	FAN OFF DELAY	0 SEC
4	RANGE LIMIT LOW	50°F (10°C)
5	RANGE LIMIT HIGH	90°F (32°C)
6	SETBACK LOW (HEAT)	55°F (13°C)
7	SETBACK HIGH (COOL)	90°F (32°C)
8	ZONE TEMP OFFSET	0°F (0°C)
9	KEYPAD LOCK OUT	OFF
10	FAN MODES	ON, AUTO
11	FAN SPEEDS	LO, MED, HI
12	SYSTEM MODES	OFF, HEAT, COOL, AUTO
13	OFF OVERRIDE	DISABLED
14	FRONT PANEL SETBACK CONTROL	DISABLED
15	CYCLED DAMPER	DISABLED
16	TEMP BASED PURGE	DISABLED
17	DEADBAND ADJUST	3°F (1.5°C)

FEATURE	CONFIGURATION
JUMPER JP1	INSTALLED
JUMPER JP3	REMOVED
JUMPER JP4	REMOVED
FAN STAGED	DISABLED

SWITCH 5: FOR 24 VAC USE SWITCH MUST BE IN 24V POSITION (SHIPPED IN 110-277V POSITION)

DATE	REV	DESCRIPTION	DR.	CHK.
12/19/07	7	7690 EON ADD. METRIC CONVERSION (S)	SEM	SR



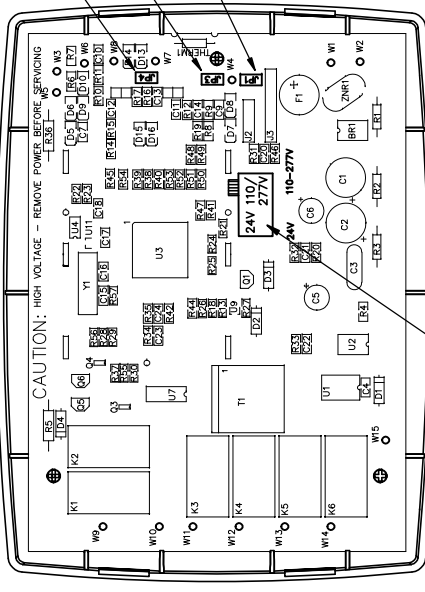
- NOTES:
- CONFIGURATION: AUTO CHANGE OVER, HEATING/COOLING THERMOSTAT WITH DEADBAND. 6 NORMALLY OPEN RELAY OUTPUTS. SEE WIRING CONNECTIONS TABLE BELOW FOR OUTPUT FUNCTIONS, PIPE SENSOR INPUT FOR AUTO SUMMER/WINTER OPERATION, SETBACK AND OCCUPANCY SENSOR INPUTS FOR UNOCCUPIED OPERATION.
 - TEMPERATURE SENSING: INTEGRAL TEMPERATURE SENSOR AND WIRE LEADS FOR EXTERNAL THERMISTOR PROBE. REMOVE JP-1 TO ALLOW USE OF EXTERNAL TEMPERATURE PROBE.
 - OPERATION: WITH THE THERMOSTAT OPERATING IN THE MODE "OFF", AND THE OFF OVERRIDE DISABLED, ALL OUTPUTS ARE DISABLED. IN THE MODE "COOL", CONTROL FUNCTIONS AS A COOLING THERMOSTAT. IN THE MODE "HEAT", CONTROL FUNCTIONS AS A HEATING THERMOSTAT. IN THE MODE "AUTO", THE THERMOSTAT SELECTS THE PROPER FUNCTION DEPENDING ON ZONE TEMPERATURE AND SETPOINT. HEAT AND COOL OUTPUTS HAVE A 1°F (6°C) DIFFERENTIAL TO PREVENT SHORT CYCLING. THREE SPEED STAGED FAN OPERATION (CYCLING VS. CONTINUOUS) IS USER SELECTABLE. SEE INSTRUCTION SHEET FOR COMPLETE OPERATION AND CONFIGURATION INFORMATION.
 - MATERIALS: BASE AND COVER ARE MOLDED FROM WHITE RIGID VINYL ELASTOMER. KEYPAD IS COLOR MATCHED TO PANTONE 421C. PRINTING IS COLOR MATCHED TO PANTONE 424C.
 - MOUNTING: INSTALLS WITH TWO FURNISHED MOUNTING SCREWS TO A STANDARD 4" X 4" X 2-1/8" [102 X 102 X 54] DEVICE BOX WITH A HORIZONTALLY MOUNTED 2" X 4" [51 X 102] ADAPTER RING.
 - ELECTRICAL CONNECTIONS: LOAD LEADS ARE 600V, #18 STRANDED COPPER WITH THERMOPLASTIC INSULATION RATED 105°C (221°F) MINIMUM. BLACK LEAD (W15) IS #14. FREE LEAD LENGTH IS 6" [152] WITH A 0.5" [13] STRIP LENGTH.
 - ELECTRICAL RATINGS:

VOLTAGE	OUTPUT RATINGS			PILOT DUTY	HP
	INDUCTIVE FLA	RES LRA	AMPS		
24 VAC	NA	NA	NA	24 VA	NA
120 VAC	5.8	34.8	6.0	125 VA	1/4
240 VAC	2.9	17.4	5.0	125 VA	1/4
277 VAC	2.4	14.4	4.2	125 VA	1/4

COMBINED LOAD CURRENT NOT TO EXCEED 20 AMPS. LOW VOLTAGE WIRING IS CLASS 2.

- PACKING: INDIVIDUALLY BOXED WITH MOUNTING HARDWARE, INSTRUCTION SHEET, 25 UNITS PER MASTER CARTON.
- UL LISTED TO U.S. AND CANADIAN SAFETY STANDARDS.
- UL FILE NUMBER E50023.

WIRE	COLOR	FUNCTION
W1	YELLOW	L2
W2	N/A	NOT USED
W3	WHITE-BLACK	SETBACK
W4	WHITE-YELLOW	REMOTE PROBE
W5	WHITE-VIOLET	CIRCUIT COMMON
W6	WHITE-BLUE	PIPE SENSOR
W7	WHITE-GRAY	OCCUPANCY SENSOR
W8	N/A	NOT USED
W9	BLUE	MAIN OUTPUT
W10	RED	SECONDARY OUTPUT
W11	WHITE-BROWN	FAN LO OUTPUT
W12	WHITE-RED	FAN MED OUTPUT
W13	WHITE-ORANGE	FAN HI OUTPUT
W14	BROWN	OUTSIDE AIR OUTPUT
W15	BLACK	L1



SWITCH 5: FOR 24 VAC USE, SWITCH MUST BE IN 24V POSITION (SHIPPED IN 110-277V POSITION)

DIMENSIONS IN [] ARE IN MILLIMETER

TOLERANCES EXCEPT AS NOTED	PECO, INC. PORTLAND, OR, USA	
DECIMAL	PART NUMBER	SCALE
.XXmm	68457	HALF
ANGULAR	TITLE	
±	STAT ASSY, TB170-001	
ACAD FILE	SHEET SIZE	DRAWING NUMBER
TB170001	B	TB170-001

FEATURE	CONFIGURATION
JUMPER JP1	INSTALLED
JUMPER JP3	REMOVED
JUMPER JP4	REMOVED
FAN STAGED	ENABLED

- JP4: 2/4 PIPE SENSOR. JP4 MUST BE INSTALLED FOR OPERATION. SHIPPED WITH JUMPER INSTALLED ON 1 PIN.
- JP3: DOOR SWITCH JUMPER. INSTALL FOR DOOR SWITCH FUNCTION. SHIPPED WITH JUMPER INSTALLED ON 1 PIN.
- JP1: REMOVE TO ALLOW USE OF REMOTE PROBE. SHIPPED WITH JUMPER INSTALLED ON BOTH PINS.



4707 SE 17th Avenue
 PO Box 82189
 Portland, OR 97282
 Tel (503) 233-6401 / Fax (503) 233-6407

TA/B170 Application Guide

Revised: 12/5/05
 Written: Marcia Christiansen

PRODUCT	TA170, TB170 - all models
---------	---------------------------

General Description

The PECO Automation and Controls T170 microprocessor thermostat is a stand alone digital controller that supplies relay control of heat, cool, outside air and up to three fan speeds.

Various configurations can supply staged fan operation, cycled fan, continuous fan, controlled off and fan coil operation. Energy saving features include Occupancy Detection, Setback Operation and Door Switch Only Operation.

Ratings

Voltage Rating	Output Ratings				
	Inductive		Resistive Amps	Pilot Duty	HP
	FLA	LRA			
24 VAC	5.8	34.8	6.0	24 VA	NA
120 VAC	5.8	34.8	6.0	125 VA	¼
240 VAC	2.9	17.4	5.0	125 VA	¼
277 VAC	2.4	14.4	4.2	125 VA	¼
COMBINED LOAD CURRENT NOT TO EXCEED 20 AMPS MOUNT ONLY TO A GROUNDED METALLIC BOX LOW VOLTAGE WIRING IS CLASS 2					

Low voltage I/O connections are 3.5 VDC

Thermostat Operation

User Interface

System Button Selection

- OFF All thermostat outputs are off.
- AUTO The thermostat automatically selects heating or cooling mode depending upon the set point and room temperature. The appropriate HEAT or COOL indicator is enabled if demand exists. A 3°F dead-band is provided to prevent short cycling between heating and cooling modes. After changeover the control point automatically shifts so that the control off point equals the set point temperature.
- COOL The thermostat operates as a cooling only thermostat.
- HEAT The thermostat operates as a heating only thermostat.

UP / DOWN Button Selection

The UP / Down arrows are used for increasing and decreasing the control set point.

Fan Button Selection

In ON the fan outputs are continuously on. In AUTO the fan outputs cycle on and off with a demand. Some models are available with controlled off and/ or fan staging.



4707 SE 17th Avenue
 PO Box 82189
 Portland, OR 97282
 Tel (503) 233-6401 / Fax (503) 233-6407

Speed Button Selection

Fan speed is determined by manual selection of HI, MEDIUM or LO. If this button is held in for 5 seconds it will toggle the display scale from Fahrenheit and Celsius. Cycled or continuous operation is determined by setting FAN ON or FAN AUTO. This feature applies to TA170 models only. TB170 models have the staged fan feature.

F/C Button Selection

Models with staged fan do not have user access of fan speed setting. On these model the button function becomes a Fahrenheit / Celsius toggle.

Thermostat Inputs

Zone Temperature Remote Probe Input

This input allows remote location of temperature. When using this feature jumper JP1 must be pulled.

Pipe Sensor Input (Summer/ Winter Changeover)

This input will connect to a standard On-Off Aqua-stat or a 10K thermistor for installation in valve applications (fan coil). Refer to the Pipe Sensor Application Guide for more detailed information on this feature.

HEAT and COOL Output Operation based on Season

Table 1 and 2 show which outputs are active based on 2 or 4 pipe configuration. Table 3 shows the modes that are available by season. Fan and auxiliary heat outputs may cycle on and off, see the application guides for the specific model thermostat.

2-PIPE CONFIGURATION

	Winter	Summer	Ambiguous
Main Output	Heat	Cool	Cool
Secondary Output	Disabled	Disabled	Disabled

Table 1

4-PIPE CONFIGURATION

	Winter	Summer	Ambiguous
Main Output	Heat	Cool	Cool
Secondary Output	Disabled	Heat	Heat

Table 2

	MODES AVAILABLE BY SEASON	
	2-Pipe Operation	4-Pipe Operation
Ambiguous	OFF-AUTO-COOL or OFF-AUTO-HEAT	OFF-AUTO-HEAT-COOL
Summer	OFF-COOL	OFF-AUTO-HEAT-COOL
Winter	OFF-HEAT	OFF-AUTO-HEAT

Table 3

Aqua-stat Operation

When an Aqua-stat is use it should be connected so that the input is open for Summer Mode and closed Winter Mode.

Pipe Sensor (Thermistor) Operation

With a 10K Thermistor connected the thermostat is looks for either Summer Mode (cold water) or Winter Mode (hot water) when there is a call for heating or cooling. Winter mode is either 15F above the set point or 80F. Summer mode is either 60F or 15F below the set point.

Summer Mode is the default operation and enables both Main (Cool) and Secondary (Heat) Output. Winter mode disables the Secondary Output and changes the Main Output to a Heat.



4707 SE 17th Avenue
PO Box 82189
Portland, OR 97282
Tel (503) 233-6401 / Fax (503) 233-6407

Should the thermostat call for heating or cooling, and the pipe sensor reading is within 15°F of the ambient zone temperature, the mode is Ambiguous (not Summer and not Winter). The thermostat will start a three-minute purge timer and open the Main Output.

If mode is still ambiguous after the purge cycle (the ambient zone temperature is within 15°F of the pipe sensor temperature reading), the thermostat checks to see if the coil temperature is below 60°F or above 80°F.

- If yes, the unit has detected a non-ambiguous condition and will select either Summer (coil <60) or Winter (coil > 80) mode and resume normal operation.
- If no (the coil temperature is between 60 and 80°F) the thermostat will repeat the purge cycle until a non-ambiguous condition is sensed.

After detecting a non-ambiguous condition, the thermostat will wait for a 1 hour time period before checking and allowing another purge cycle to occur. The intent of this feature is to allow the pipe sensor of a two-way valve system to be up to 25 feet from the supply riser thus eliminating the need for 3 way valves.

Application Exceptions

Ambient conditions at the pipe sensor above 80F or below 60F can cause the control to enter an invalid season. This could occur with a pipe sensor located away from the thermostat in an uncontrolled plenum where the ambient at the pipe sensor is in excess of 15F of the thermostat sensed zone temperature.

If an invalid season is initiated, the occupant must create a heat or cool set point that causes the valve to open. For some applications this may require creating a heating demand when the occupant desires cooling.

If during the purge cycle the demand ceases to exist the purge cycle will be aborted.

Upon a change of season, the system mode of operation will be set to the last mode of operation for the new season and the current mode of operation will be saved for restoration to the old season. This ensures that the system mode of operation is always restored to the previous mode of operation for the particular season.

Purge Cycle Operation Sequence

1. Thermostat has a call for heat or cooling, a demand.
2. Thermostat checks the pipe sensor to verify water temperature.
3. If water is beyond 15F of set point, normal HVAC control occurs.
4. If water is not beyond 15F of set point the thermostat checks to see if the water is above 80F or below 60F.
5. If yes, normal HVAC control Occurs.
6. If no, thermostat opens main output (COOL) for three minutes.
7. After the three-minute purge cycle occurs the thermostat checks to see if the water temperature is more than 15F from set point, or above 80F or below 60F.
8. If Yes, Normal HVAC operation occurs.
9. If no, the valve is left open and the thermostat continues to look for a valid reading.

Conditions:

If at any time the demand goes away the thermostat will stop the purge cycle.

2-Pipe / 4-Pipe Operation

Normal operation is to have both the Main (Cool) and Secondary (Heat) outputs enabled for 4-Pipe configuration. Placement of a jumper will disable the Secondary output and change the thermostat operation to 2-Pipe configuration.



4707 SE 17th Avenue
 PO Box 82189
 Portland, OR 97282
 Tel (503) 233-6401 / Fax (503) 233-6407

2-Pipe Operation: A jumper should be placed on JP4 for 2-Pipe operation. In this configuration the thermostat will permanently disable the Secondary Output and disable the fan from cycling in an invalid mode. The Main Output configuration is dependent on the Pipe Sensor Input. With a pipe sensor connected the thermostat will automatically select heating or cooling depending on the sensed water temperature. If the Pipe Sensor Input is open (unconnected) the main output will cool only. If the pipe sensor input is shorted the main output will heat only. Normal thermostat default is for 4-pipe operation.

4-Pipe Operation: The JP4 Jumper should be removed for 4-pipe operation. In this configuration both the Main Output (COOL) and the Secondary Output (HEAT) are available. These will both cycle on depending on the mode of the thermostat. If the Pipe Sensor Input is open (unconnected) the thermostat will allow both heating and cooling functions. If the pipe sensor input is shorted the main output will heat only and the secondary output is disabled.

Pipe Sensor Operation for 2/4-Pipe Operation- a pipe sensor can be connected to either a 2 or 4 pipe configuration. The Pipe sensor is used to determine the water temperature in the Main coil, which should be connected to the Primary output. Following is a table that shows the output operation depending on the sensed water temperature:

Configuration	Water Temperature	Output Operation	
		Main Output (Blue Wire)	Secondary Output (Red Wire)
2-PIPE	Cold	Cooling ONLY The fan will not cycle on with a Heating demand	Disabled
	Hot	Heating ONLY The fan will not cycle on with a cooling demand.	Disabled
4-PIPE	Cold	Cooling	Heating
	Hot	Heating ONLY The fan will not cycle on with a cooling demand.	Disabled

Occupancy Sensor and Door Switch Inputs

Install jumper JP3 for this feature to operate. This feature is primarily a hotel room system for reducing HVAC operation when a room is unoccupied.

The Occupancy sensor is a low-level switch that is open when there is occupancy and closed when unoccupied. The Door Switch is a low-level switch that is open when the door is open and closed when the door is closed.

Occupancy will be determined by the use of an Occupancy Sensor and a Door Switch.

OCCUPANCY OPERATION is as follows:

In an Occupied State the thermostat operates normally and looks for a door Close.

On a Door Close the thermostat starts a two-minute timer in which to look for occupancy. If the occupancy sensor remains unoccupied and the timer expires, the thermostat enters into the unoccupied state. If the occupancy sensor transitions from unoccupied to occupied while the timer is running the thermostat will remain in Occupied State.

In the Unoccupied State the thermostat sets heating and cooling set points to setback values, as determined by factory or user settings. In this mode the fan is automatically set to cycle with demand. Thermostat continues to monitor the occupancy sensor and will go to the occupied state if it sees occupancy. Any occupancy detection, including a door open, will set the operation to occupied.



4707 SE 17th Avenue
PO Box 82189
Portland, OR 97282
Tel (503) 233-6401 / Fax (503) 233-6407

On a door open signal the thermostat waits for a door close. If the door is open for more than 2 minutes the thermostat turns the HVAC system outputs to OFF. During this two-minute period, if a button is pressed on the keypad, the time delay is extended to 10 minutes. The time delay can only be extended once. Once the HVAC outputs are transitioned to off, a door closure is required to re-enable the outputs.

Sequence of operation:

FROM UNOCCUPIED MODE

1. From un-occupied mode any occupancy detection will change the mode to Occupied Mode.
2. On a Door Open HVAC System is turned On.
3. A 2-minute Door Open Timer is started.
4. If Door Open Timer expires the HVAC system is turned off until there is a door closure.
5. On a door closure a 2-minute occupancy timer is started during which time the system looks for occupancy.
6. If occupancy detection occurs the system will go to occupied mode.
7. If there is no occupancy detection the system remains in the unoccupied mode.
8. The HVAC system uses the setback limits to regulate heating and cooling.

FROM OCCUPIED MODE

1. During occupied mode the system regulates at the user set point values.
2. The system waits for a door open.
3. On a Door Open a 2-minute Door Open Timer is started.
4. If Door Open Timer expires the HVAC system is turned off until there is a door closure.
5. On a door closure a 2-minute occupancy timer is started during which time the system looks for occupancy.
6. If occupancy detection occurs the system will stay in or return to the occupied mode.
7. If there is no occupancy detection the system is change to unoccupied mode.

Door Switch Only Operation

Install jumper JP3 for this feature to operate. Install a Door and/ or series Window Switch to the door switch input. The thermostat will disable the HVAC outputs if this input circuit is open for longer than 2-minutes.

Setback Input

Jumper JP3 must be removed from the circuit board for this feature to operate.

This input is a low-level On-Off switch. In the open position no action is taken. If this input is closed the thermostat Heat and Cool Set Point Limits are used for thermostat control functions. These values are configurable in the Service menu. The Fan is set to Cycle with demand at the lowest available speed. Setback differential is 3F.

Setback can be factory configured as minimum heating and cooling levels. This setback condition is called Controlled Off. In this configuration thermostat off is disabled if the ambient temperature falls below the setback heat or cool set point.

In setback the digit will override the Continuous Set point Display and display the ambient temperature along with the setback icon.

In Controlled Off Setback, no setback input, the display stays in the default display.

Any key press will override the Setback Input for 1 hour and return to current thermostat settings. Key presses will not affect the Controlled Off operation



4707 SE 17th Avenue
PO Box 82189
Portland, OR 97282
Tel (503) 233-6401 / Fax (503) 233-6407

Setback Set Points

Setback set points are factory default of 55F Heating and 90F cooling. The range is 50-90F. There will be a forced 8F separation between heating and cooling so that as one value is changing the other is pushed to maintain the separation. In setback, fan cycles on with demand regardless of user setting.

Humidity Input

Provision has been made for one 0-5 VDC humidity input. This feature is currently under development.

Thermostat Outputs

Six relay outputs are provided for control as follows:

- Heat Output - This output is enabled with a demand for heating.
- Cool Output - This output is enabled with a demand for cooling.
- Fan High, Medium and Low Outputs - These outputs are enabled by manual user selection or through Auto Fan Selection microprocessor operation.
- Outside Air Output - This output is enabled anytime the thermostat is on, including in fan only operation. This output is OFF if the control is in setback.

Fan Operation

Fan operation can be either continuous or cycled with demand. User selection of continuous only, cycled only or cycled and continuous is available. High, Medium and Low are available for three speed versions. High and Low are available for two speed versions. No fan speed will be displayed for single fan speed models. On models configured for staged fan the fan speed button becomes an F/C toggle.

The selections available are determined at thermostat configuration.

Standard Fan Configuration

User may have any or all of the following selections available:

- Fan On for fan continuous
- Fan Auto for fan cycled
- Fan High
- Fan Medium
- Fan Low
- Fan Off

Staged Fan Configuration

User may have any or all of the following selections available:

- Fan On for fan continuous
- Fan Auto for fan cycled
- Fan Off

See the staging operation diagram below.

With FAN ON selected fan operation is continuous. In low fan speed, fan is not cycled with demand.

With FAN AUTO selected fan operation cycles off with demand.

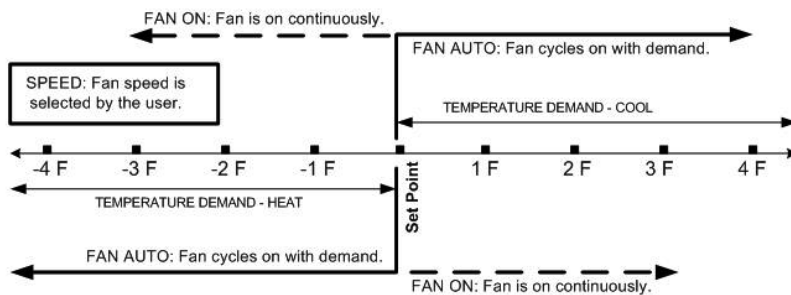
If only two fan speeds are available High speed will operate beyond 4F of set point. Low fan speed default will be set to continuous operation. If FAN AUTO is enabled and selected then Low speed is cycled off with demand.

Fan speed will increase if the set point is not obtained within 10 minutes. Once it has increased it will stay in higher speed until set point is reached.

T170 STANDARD and STAGED FAN OPERATION

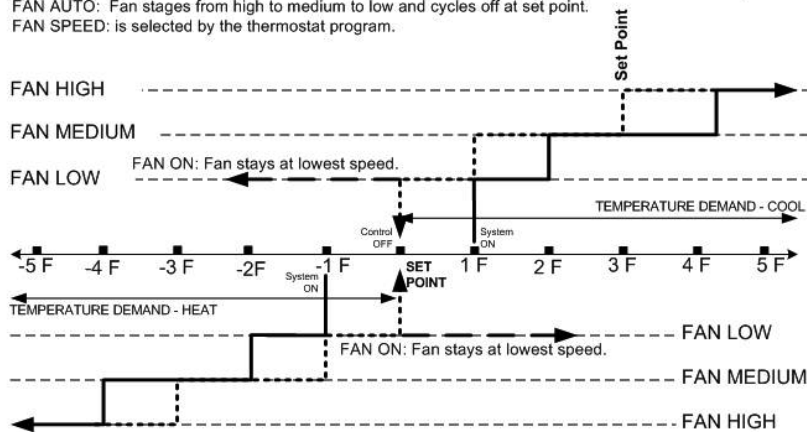
Standard Fan Operation

FAN ON: Fan is on continuously and is not dependant on a heat or cool demand.
 FAN AUTO: Fan cycles on with a heat or cool temperature demand and cycles off with the heat or cool output.
 FAN SPEED: High, medium or low is selected by the user.



Staged Fan Operation

With Temperature Demand:
 FAN ON: Fan stages from high to medium to low and stays continuously on in the lowest available speed.
 FAN AUTO: Fan stages from high to medium to low and cycles off at set point.
 FAN SPEED: is selected by the thermostat program.



Sunne Controls/ MAC 4/12/04

Thermostat Controlled Off

This thermostat can be factory configured for Controlled Off. In this configuration the control will allow the user to select OFF but will override OFF if temperature drifts beyond the setback set points. This control will function in the Setback mode until temperature is within the heating and cooling setback set points.



4707 SE 17th Avenue
 PO Box 82189
 Portland, OR 97282
 Tel (503) 233-6401 / Fax (503) 233-6407

Range Limits

Set point range limits are factory set at 50 – 90 F and can be changed by user selection or factory configuration. If the low value is increased beyond the current high value, the high value is reset to the current low value. If the high value is decreased beyond the current low value, the low value is reset to the current high value. Both values are allowed to be the same.

Non Volatile Memory:

The sensor will have non-volatile memory for storage of operation modes, last programmed user set point(s), and product configurations.

Fan Power Up

Anytime the fan is energized it should transition through high speed for 0.25 seconds.

Output Operation

T170 OUTPUT OPERATION BY SYSTEM SETTING						
State	Fan Switch	System Switch	Heat/ Cool Operation	Fan Operation	OA Damper Operation #1 (standard)	OA Damper Operation #2 (optional)
1	ON	AUTO	H/C cycles with demand	Fan ON continuous	OA damper ON	OA damper cycles ON with demand
2	AUTO	AUTO	H/C cycles with demand	Fan cycles with demand		
3	ON	HEAT	Heat cycles with demand	Fan ON continuous		
4	AUTO	HEAT	Heat cycles with demand	Fan Cycles with demand		
5	ON	COOL	Cool cycles with demand	Fan ON continuous		
6	AUTO	COOL	Cool cycles with demand	Fan Cycles with demand		
7	ON	OFF	H/C OFF	Fan ON continuous	OA damper OFF	OA damper OFF
8	AUTO	OFF	H/C OFF	Fan OFF		



4707 SE 17th Avenue
PO Box 82189
Portland, OR 97282
Tel (503) 233-6401 / Fax (503) 233-6407

SERVICE MENU

Access to the Service Menu:

- Hold the UP Arrow and DOWN Arrow buttons down for 5 seconds.
- Current display icon will be turned off.
- Service Menu numbers 1 through 9 are available. The SYSTEM button is used to scroll to the item to be changed.
- The UP and DOWN buttons adjust the selection.

SERVICE MENU FUNCTIONS

1 - F/C DISPLAY SELECTION

At this feature the F and C icons are illuminated. The selected icon will be flashed. The Up or Down Arrow button can be depressed to toggle between F or C.

2 - CONTINUOUS SET POINT DISPLAY

At this feature, either the F or C icon, current digits and the SETPOINT icon will be displayed. If the Continuous set point display is enabled the SETPOINT icon will flash. The Up or Down Arrow button will toggle between continuous display of set point and display of zone temperature.

3 - FAN OFF DELAY

The FAN, OFF and digits are displayed. Digits represent the number of seconds the fan will stay on after the heating and cooling outputs are turned off. The Up or Down Arrow button can be depressed to increase / decrease value from 0-255 seconds.

4 - RANGE LIMIT LO

The display reads the current minimum range setting, SETPOINT icon and LO icon. The Up or Down Arrow button can be depressed to increase / decrease value.

5 - RANGE LIMIT HIGH

The display reads the current maximum temperature range adjustment, SETPOINT icon and LO icon. The Up or Down Arrow button can be depressed to increase / decrease value.

6 - SETBACK HEAT

The display reads current temperature range adjustment, the SETBACK icon and the HEAT icon. The Up or Down Arrow button can be depressed to increase / decrease value.

7 - SETBACK COOL

The display reads current Cool setback value, the SETBACK icon and the COOL icon. The Up or Down Arrow button can be depressed to increase / decrease value.

8 - ZONE TEMPERATURE OFFSET

The display reads ones and tenths (0.0) with leading minus sign. The Up or Down Arrow button can be depressed to increase / decrease value +/- 9F. Increments are made in 1F and 0.5C.

9 - KEYPAD LOCKOUT

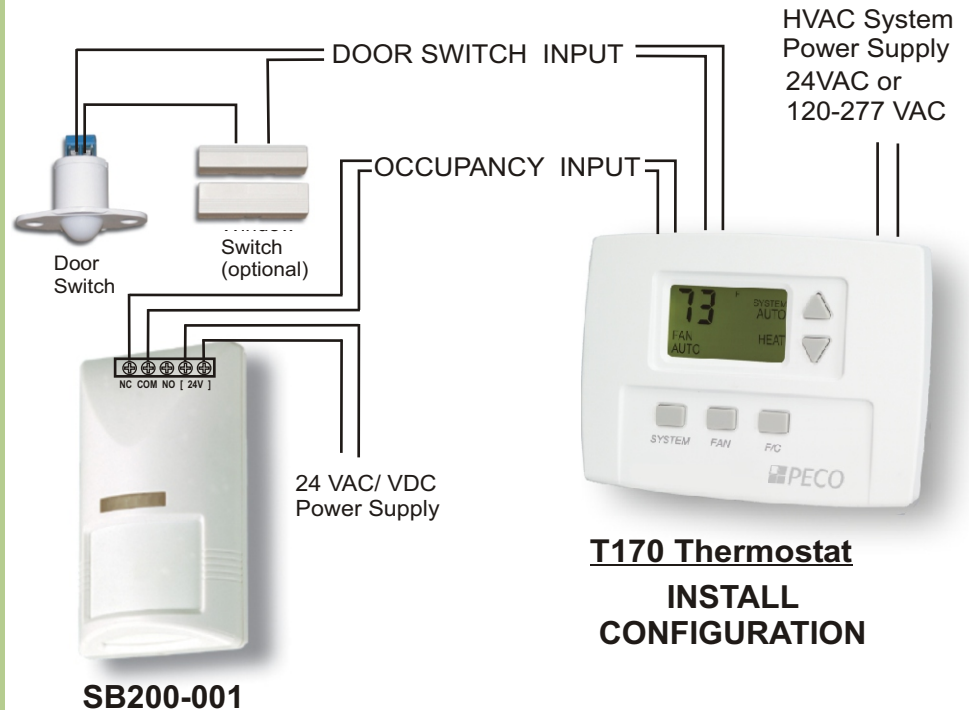
The ON and OFF icons are displayed. The enabled icon is flashing. OFF is the default. ON disables the keypad except for entry into the service menu. The Up or Down Arrow button can be depressed to increase / decrease the value.

Note: These values are stored and recalled in the event of a power failure.

TROUBLE SHOOTING GUIDE

Coming Soon....

The T170/SB200 energy management system captures energy savings by setting back HVAC operation. Internal High and Low temperature setback limits can be set to assure adequate recovery times, assuring occupant comfort. Applications include hotel guest rooms, meeting rooms, vacation rentals, military lodging and dormitories.



T170 / SB200
Energy Management System
Intelligent Thermostat Operation

T170/SB200 Occupancy Operation

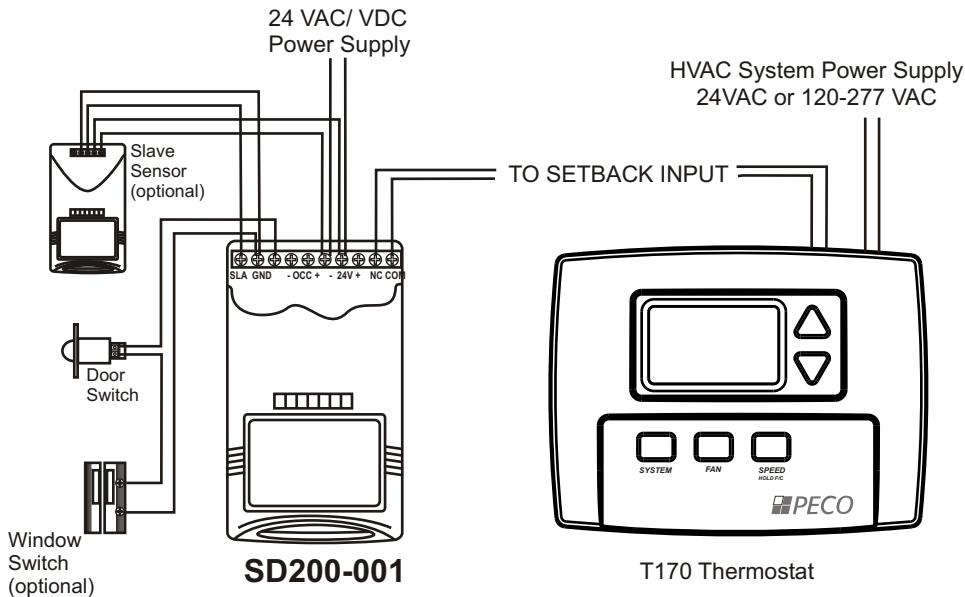
The SB200 Occupancy sensor switch is open in occupied mode and closed in unoccupied mode. The Door Switch open when the door is open and closed when the door is closed.

In an occupied mode the thermostat operates normally and looks for a door open signal. When the door opens (door open signal) the thermostat waits for a door close. If door is open for more than 2-minutes the thermostat turns the HVAC system outputs to OFF. During this two minute period, if a button is pressed on the keypad, the time delay is extended to 10 minutes. The time delay can only be extended once. Once the HVAC outputs transition to off, a door closure is required to re-enable the outputs.

On a door close the thermostat starts a two-minute timer and looks for an occupancy detection. If the timer expires and no occupancy is detected, the thermostat transitions to unoccupied state. If occupancy is detected while the timer is running the thermostat will remain in the occupied state

In the unoccupied state the thermostat sets heating and cooling set points to setback values, as determined by factory or user settings. In this mode the fan is automatically set to cycle with demand. Thermostat continually monitors the occupancy sensor and will go to the Occupied State if occupancy is detected.

If the installation is only using a Door/ Window Switch the thermostat will disable the HVAC outputs if this output is open for longer than 2 minutes. This application requires a jumper between the Occupancy input.



SD200-001 HVAC Energy Management

The SD200-001 and a DS-100 Door Switch use advanced microprocessor logic to determine occupancy. A door open signal will initiate occupancy status detection. If the room sensor determines that a room is occupied it will allow normal HVAC control. It waits for another door open signal before determining occupancy again. If the system is set to unoccupied, the sensor continually monitors the room. Any occupancy detection will set the operation to occupied. The window switch and slave sensor are optional.

**For Applications using the Setback Input:
INSTALL CONFIGURATION JUMPER JP3**

SD200-002 HVAC Time Based Detection

The SD200-002 is a stand alone sensor. An OFF delay is started with each occupancy detection. This delay can be set for up to 30 minutes. This system provides basic room setback and is ideal for control of HVAC in commercial spaces. Programmable high-low setback limits can be set to assure adequate HVAC recovery.

