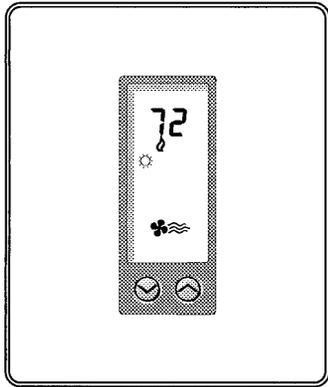




## TC97-MHP

Heat Pump — 2 Compressors with Auxiliary Heat  
OPERATING INSTRUCTIONS



SEE REVERSE FOR INSTALLATION INSTRUCTIONS

Your new thermostat has been designed to provide accurate control and display of room temperature. In addition, it will also display all relevant information pertaining to your system.

The clearly marked buttons and informative display make it extremely easy to understand and simple to use.

Please take a few moments to read the brief instructions and familiarize yourself with the various functions in order to obtain maximum benefit from this truly unique electronic control.

### General Information

The thermostat normally displays room temperature, mode of operation and whether Cooling or Heating is currently on. The six buttons on the front of the unit allow complete control of the equipment.

You may select different heating and cooling setpoints for the system to maintain, eg. 70° in heating and 75° in cooling. Raising or lowering the setpoints in heating or cooling is as simple as pushing a button. In addition, you may choose °F or °C for the display.

The thermostat also allows you to select continuous fan operation, (useful when using an air cleaner) or have the fan come on with the equipment.

### User Controls

#### MODE:

Select the desired mode of operation by repeated pressing of the MODE button:

- controls Cooling system only (the word "Cool" is displayed for 5 seconds).
- controls Heating system only (the word "Heat" is displayed for 5 seconds).
- controls both heating and cooling (auto changeover) (the word "Auto" is displayed for 5 seconds).

ehT- Emergency Heat.

Off - disables thermostat so equipment will not operate.

Avoid using the OFF mode during extremely cold weather to prevent damage from freezing.

#### COOLING:

Select the temperature you want your equipment to maintain while in the cooling mode by pressing and holding the or buttons. The control setpoint temperature is displayed for 5 seconds.

#### HEATING:

Select the temperature you want your equipment to maintain while in the heating mode by pressing and holding the or buttons. The control setpoint temperature is displayed for 5 seconds after releasing the button.

#### FAN:

The fan will come on automatically when the system is operating, but there is no indication of this on the display. To select continuous Fan operation, press the FAN button and the display will show . This is recommended for electronic air cleaners or continuous ventilation requirements.

**NOTE:** The thermostat never allows less than 2°F (1°C) difference between the heating and cooling setpoints.

#### TEMPERATURE ACCURACY

Full temperature accuracy will only be realized after the thermostat has been installed and powered for at least one hour.

#### USER CONTROLS (Cont'd.)

##### OUTDOOR (ODT) BUTTON:

When the outdoor temperature sensor option is connected to your thermostat, you can display the current outdoor temperature by pressing the outdoor button. If the option is not connected, the thermostat will display -- .

##### DAY/NIGHT BUTTON:

When the thermostat is initially installed, the display will show the symbol for your day temperature. By pressing the DAY/NIGHT button or closing the CLK1 and CLK2 terminals on the back of the thermostat (installer connected) you may select an alternate or night temperature. The thermostat will remember this setpoint. Simply press the Day/Night button to alternate between temperature settings.

##### CELSIUS/FAHRENHEIT

Simultaneously press and to switch between Celsius and Fahrenheit temperature display.

#### LIMITED OVERRIDE

When the keyboard is locked, (switch #4 "ON"), the user may override the temperature setpoint for 1 hour by pressing either the or buttons. The range of temperature override is ± 3 °F or °C from the programmed daytime setpoint.

#### CLOCK TERMINALS (OPTION)

CLK1 - CLK2

Your thermostat is equipped with Remote Clock Terminals. By connecting a remote clock/timer (DSP-AT or equivalent) the thermostat can be alternated between the Day/Night setpoints automatically.

Remote Sensor (Option)

RS1 - RS2 - RS+V

The thermostat is designed to accept the Electronic Remote Sensor which will allow you to locate your thermostat in an area away from view.

#### ECONOMY/COMFORT:

In the Economy mode (switch #5 OFF) your thermostat will not allow the equipment to be forced on with a change to the temperature setpoint. In the Comfort mode, the equipment will turn on immediately with a change to the temperature setpoint.

#### ADD-ON HEAT PUMPS:

Your thermostat is equipped to enhance the performance of an Add On heat pump. Your thermostat, in most applications, will perform the function of a fossil fuel kit.

To select Add-on, place switch #1 to the "ON" position. The thermostat will turn the compressor off with a call for Aux. heat. When the switch is set to normal, the thermostat will allow the compressor and the Aux. heat to be on at the same time.

#### POWER FAILURES

Your thermostat employs the latest developments in solid state electronic technology.

One of the unique features of your thermostat is that there is no battery required to maintain your selected setpoints in the event of a power loss as the memory is unaffected by power failures of any duration.

When power is restored, the thermostat will continue operating as if the power had never been off.

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**Schneider Electric**  
1354 Clifford Avenue  
P.O. Box 2940  
Loves Park, IL 61132-2940

[www.schneider-electric.com/buildings](http://www.schneider-electric.com/buildings)

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## Installation Procedures

### LOCATION:

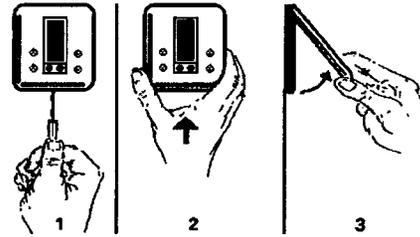
To ensure proper operation, the thermostat should be mounted on an inside wall in a frequently occupied area of the building. In addition, its position must be at least 18" (46 cm) from any outside wall, and approximately 5' (1.5 m) above the floor in a location with freely circulating air of an average temperature.

### BE SURE TO AVOID THE FOLLOWING LOCATIONS:

- Behind doors or in corners where freely circulating air is unavailable.
- Where direct sunlight or radiant heat from appliances might affect control operation.
- On an outside wall.
- Adjacent to, or in line with, conditioned air discharge grilles, stairwells, or outside doors.
- Where its operation may be affected by steam or water pipes or warm air stacks in an adjacent partition space, or by an unheated/uncooled area behind the thermostat.
- Where its operation will be affected by the supply air of an adjacent unit.
- Near sources of electrical interference such as arcing relay contacts.

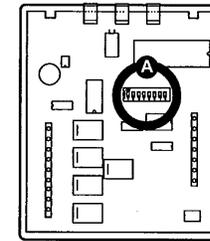
1. Insert a flat blade screwdriver or a coin 1/8" into the slot located in the bottom center of the thermostat case and twist 1/4 turn. When you feel or hear a "click", grasp the case from the bottom two corners and separate from the subbase as shown in the diagram at the right. Some models require more force than others when separating due to the number of terminals on the subbase.
2. Swing the thermostat out from the bottom.
3. Lift the thermostat up and off the subbase.
4. Place the rectangular opening in the subbase over the equipment control wires protruding from the wall and, using the subbase as a template, mark the location of the two mounting holes (exact vertical mounting is necessary only for appearance).
5. Use the supplied anchors and screws for mounting on drywall or plaster; drill two 3/16" (5mm) diameter holes at the marked locations; use a hammer to tap the nylon anchors in flush to the wall surface and fasten subbase using the supplied screws. Do not overtighten!
6. Connect the wires from your system to the thermostat terminals as shown in the wiring diagrams. Carefully dress the wires so that any excess is pushed back into the wall cavity or junction box. Ensure that the wires are flush to the plastic subbase. The access hole should be sealed or stuffed to prevent drafts from the wall affecting the thermostat.

7. Before the thermostat is re-installed on the subbase, install the optional clock/timer, indoor remote sensor and outdoor remote sensor, if used. Refer to the installation instructions supplied with each option. Also, check the position of the slide switches on the back of the thermostat.



## Replacing The Thermostat On The Subbase

1. Position the thermostat on the hinged tabs located at the top of the subbase.
2. Gently swing the thermostat down and press on the bottom center edge until it snaps in place.



Thermostat Body, Rear View

### DETAIL A



#### DIP Switch in the OFF position

1. Normal
2. Not Used\*
3. 4 Minute (Min. ON)
4. Keypad Unlocked
5. Economy
6. Single Stage
7. LED #1 + No Icon
8. LED #2 + No Icon

#### DIP Switch in the ON position

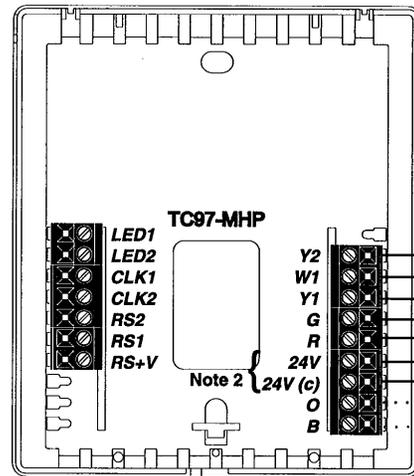
1. Add On
2. Not Used\*
3. 2 Minute (Min. ON)
4. Keypad Locked
5. Comfort
6. Multi Stage
7. LED #1 + Filter Icon
8. LED #2 + Fault Icon

\*NOTE: Switch #2 must be left in the OFF position. The BLACK rectangle denotes factory setting.

## Specifications

Rated Voltage	20-30 Vac, 24 nominal
Rated A.C. Current	.050 Amps to 0.75 Amps continuous per output with surges to 3 Amp Max.
Rated D.C. Current @ 'R'	0 Amps to 0.75 Amps continuous per output with surges to 3 Amp Max.
Control Range	Heating: 38 to 88°F in 1° steps, 5 to 30°C in 1° steps Cooling: 60 to 108°F in 1° steps, 16 to 40°C in 1° steps
Thermostat Measurement Range	28 to 124°F or 0 to 48°C
O.D.T. Measurement Range	-40 to 124°F or -40 to 48°C
Control Accuracy	±.5°C at 20 °C, ±1°F at 68°F
Minimum Deadband	(between heating and cooling) 2°F or 1°C

**Note:** This thermostat contains electronic circuitry replacing the conventional mechanical anticipator.



**Note 1:** If jumper is removed, a dedicated transformer is required at the 'R' terminal to power the loads.

**Note 2:** This thermostat may be used with 24 Volt DC. The negative side of the DC supply must be wired to the 24V (c) terminal.

Remove connection if separate transformer used

## Output Terminal Functions

W1	Auxiliary Heat is energized as back-up or Emergency Heat
Y1	Compressor energized with a call for heating and cooling
Y2	Compressor is energized for 2nd stage heating or cooling (if multistage selected)
G	Fan is energized with a call for heating or cooling or selected by fan button
R	Independent switching voltage
24 Vac	24 Vac
24 Vac (c)	24 Vac (Common)
O	Energizes the reversing valve continuously in Cooling Mode
B	Energizes the reversing valve continuously in Heating and Off mode
LED1, LED2	Free lights for status or function indication
LED3	Auxiliary heat Indicator
CLK1, CLK2	Use with remote clock/timer for alternate setpoints.
RS2, RS1, RS+V	Use to connect Outdoor Temperature Sensor option and/or Indoor Remote Sensor option. Refer to the instructions included with the sensors.

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