

T21STK-0 / T21STK-2 SINGLE STAGE THERMOSTAT

1 Heat / 1 Cool single stage thermostat.

T21STK-0 : Non Programmable, **T21STK-2**: 5+2 Programmable

Compatible with heat pump system

Installation and Operation Manual

Specification:-----

Power Supply: 20VAC-30VAC 50-60HZ or Battery powered.

Terminal Load: 1.0A per terminal, 3.0A maximum total load

Set Point Temp. Range: 45°F to 90°F (7°C to 32°C).

Accuracy: +/- 1°F or +/- 0.5°C.

Dimensions: 6.0" W X 4.7" H X 1.1" D

Color: White

FEATURES:-----

- Large LCD display with backlight, continuous backlight option.
- Simultaneous heat and cool set point storage.
- Display of room temperature, set temperature and current time simultaneously.
- Fan switch with ON and AUTO functions.
- Permanent user setting retention during power loss. No batteries are required.*
- Operates from 24VAC, or from 2 size "AA" alkaline batteries.
- Air Filter change Indicator.
- Low Battery Indicator.
- Temperature calibration.
- Batteries required to maintain clock function.

IMPORTANT SAFETY INFORMATION-----

- Always turn off power at the main power source by removing the fuse, or switching the circuit breaker to the off position before installing, removing, cleaning, or servicing this thermostat.
- Read all of the information in this manual before installing this thermostat.
- Use a professional contractor to install this thermostat.
- This is a 24VAC low-voltage thermostat

DO NOT INSTALL ON VOLTAGES HIGHER THAN 30 VAC.

- ALL wiring must conform to local and national building and electrical codes and ordinances.
- Do not short (jumper) across terminals on the gas valve or at the system control to test installation. This will damage the thermostat and void the warranty.
- Do not switch the system to cool if the temperature is below 50°F (10°C). This may damage the air conditioning system.

- Replace batteries when the battery icon indicates the low battery message.
- Change the Air Filter when the Filter Change Icon begins blinking.
- Use this thermostat only as described in this manual.

REMOVE THE OLD THERMOSTAT-----

WARNING ! Electrical Shock Hazard

1. Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.
2. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.
3. Remove the cover of the old thermostat. This should expose the wires.
4. Label the existing wires from the existing thermostat before removing.
5. After labeling the wires, remove the wires from the wire terminals.
6. Remove the existing thermostat from the wall
7. Refer to the following section for instructions on how to install this thermostat.

INSTALL THE THERMOSTAT -----

ATTACH THERMOSTAT BASE TO WALL PULL THE COVER OFF THE BASE.

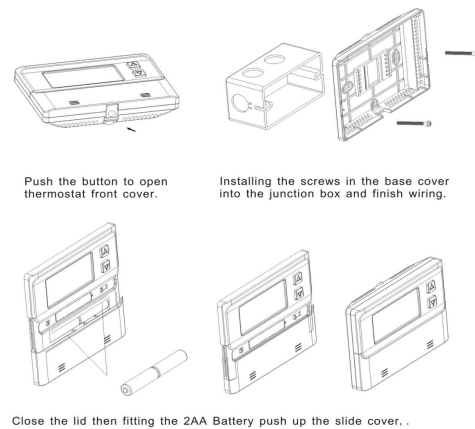


Figure 1

WARNING ! Electrical Shock Hazard

Turn off power at the main service panel by removing the fuse or switching the appropriate circuit breaker to the OFF position before removing the existing thermostat.

1. Turn off power to the heating and cooling system by removing the fuse or switching the appropriate circuit breaker off.
2. Place the system switch (**HEAT/OFF/COOL**) in the **OFF** position.
3. Place the **FAN (ON /AUTO)** switch in the **AUTO** position.
4. Gently pull the cover straight off the base. (See figure 1.)
5. Put the thermostat base against the wall where you plan to mount it. (Be sure the wires will feed through the wire opening in the base of the thermostat.)
6. Mark the placement of the mounting holes.

7. Move the base out of the way. Drill mounting holes. Use a hammer to tap in the supplied anchors into the mounting holes.
8. Fasten the base loosely to the wall as shown in Figure 1, using two mounting screws. Place a level against the bottom of the base and adjust until level, then tighten the screws. (Leveling is for appearance only, and will not affect thermostat operation.)
9. Insert stripped, labeled wires into matching wire terminals. See "Wiring Diagrams", Figure 2.

CAUTION: Be sure exposed portions of wires do not touch other wires.

10. Tighten screws on terminal block. Gently tug on each wire to be sure of proper connection. Double check that each wire is connected to the proper terminal.

CAUTION: Installing batteries backwards can damage the thermostat.

11. Install two fresh "AA" alkaline batteries in the battery compartment. Be sure to match positive (+) ends of batteries with positive (+) battery terminals in the battery compartment. (The thermostat will operate from 2 size "AA" alkaline batteries or 24VAC power. When operated from 24VAC power, your thermostat will maintain time and continuously display the temperature during a loss of AC power with the batteries installed).
12. Replace the cover on the thermostat by snapping it in place.
13. Turn on power to the system at the main service panel.
14. Test thermostat operation as described in the following section.

Fan operation switch

Read the following information before setting the fan option switch (See figure 3). If you are unsure of your application, contact a qualified service person.

This thermostat is configured from the factory to energize the fan on a call for heat. If your system is an electric heat or heat pump that **REQUIRES** the thermostat to turn on the fan on a call for heat, place the fan option switch in the **ELEC** position. If your system does not require the thermostat to energize the fan on a call for heat such as fossil fuel (gas, oil, etc.), forced air system as well as hydraulic heating systems, place the fan option switch in the **GAS** position.

BATTERY OPERATION

The thermostat will operate from 2 size "AA" alkaline batteries or 24VAC power. When operated from batteries, connection to the "C" (common) or (neutral) terminal is not required.

NOTE: When operated from batteries only, the LCD display backlight will be lighted less than 5 seconds after each button pressed ,when backlight option are set to 2) or 3).

If the battery icon on the display is flashing, it indicates that the batteries need to be replaced. When the thermostat is powered only by battery, the battery icon will flash for approximately 2 months before the batteries are expected to expire.

WIRING DIAGRAM

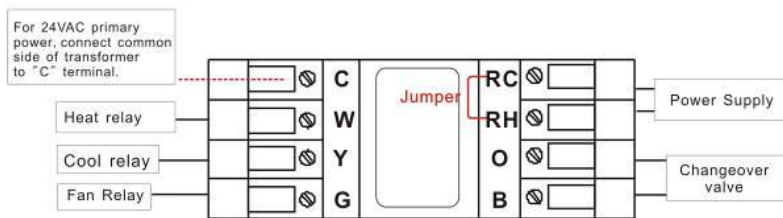


Figure 2

Typical wiring diagram for heat/cool, 5 wire two transformer system.

In heat pump system, first you must select configuration menu 3 item. Or the Y terminal would not activated. In heat pump system, W & Y terminal reverse each other work.

3	▼	HO (0)	0 or 1	Select system heating type, 0 = Gas, oil, or electric heating. 1 = Heat pump heating. Default = 0
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CHECK THERMOSTAT OPERATION-----

If at any time during testing your system does not operate properly, contact a qualified service person.

Turn on power to the system.

Fan Operation

Move the system switch to the OFF position. If your system does not have a “G” (Fan) terminal connection, skip to the Heating System.

1. Move the fan switch to the ON position. The blower should begin to operate.
2. Move the fan switch to the AUTO position. The blower should stop immediately.

Heating system

1. Move the SYSTEM switch to the HEAT position. If the auxiliary heating system has a standing pilot, be sure to light it.
2. When the (FA)st heating cycle rate is selected in the configuration menu, (see configuration menu item 2), the thermostat will call for heat at 0.5°F (0.5°C) below set-point, and turn off at set point. When the (SL)ow heating cycle rate is selected, the thermostat will call for heat at 1.5°F (1.5°C) below set-point, and turn off at set-point. When the thermostat calls for heat, the display will show Heat On. If the Heat On display is flashing, the compressor lockout feature is operating in the heat pump mode.

(Note: See Configuration menu item 8).

Cooling System

CAUTION: To prevent compressor and/or property damage, if the outdoor temperature is below 50°F (10°C), DO NOT operate the cooling system.

1. Move the SYSTEM switch to the COOL position.
2. When the (FA)st cooling cycle rate is selected in the configuration menu, (see configuration menu item 2), the thermostat will call for cooling at 0.5°F (0.5°C) above set-point, and turn off at set point. When the (SL)ow cool cycle rate is selected, the

thermostat will call for cooling at 1.5°F (1.5°C) above set-point, and turn off at set-point. When the thermostat calls for cooling, the display will show COOL On. If the COOL On display is flashing, the compressor lockout feature is operating. (Note: See Configuration menu item 8). If all functions operate properly, the thermostat is installed correctly.

THERMOSTAT LCD DISPLAY

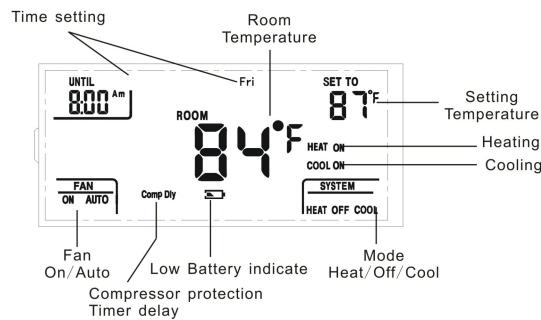


Figure 3

THERMOSTAT BUTTONS AND SWITCHES

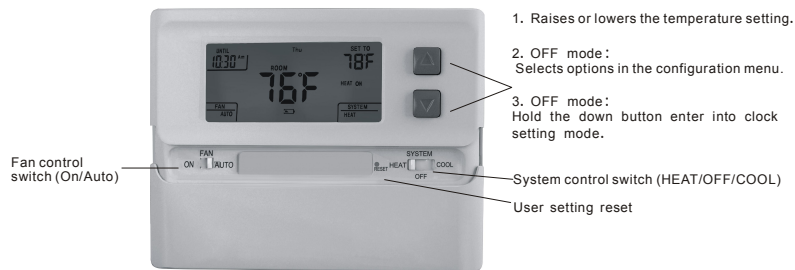


Figure 4

THERMOSTAT OPERATION-----

1. Setting the thermostat

This thermostat is very easy to operate. Set the **SYSTEM** switch to either **HEAT** or **COOL**, then press the ▲ or ▼ buttons until the temperature you want to maintain is shown on the right side of the display. If you want to turn the system off, just move the **SYSTEM** switch to the **OFF** position and the **FAN** switch to the **AUTO** position.

2. Time and day setting

Move the SYSTEM switch to the OFF position, then press and hold the ▼ buttons for 5 seconds to enter the clock setting mode. The display will show the HOUR setting first . Use the ▲ button to select each user setting. Press the ▼ button to shift to the next menu item (MINUTES,WEEK DAY). Use the ▲ button to select each user setting also.

Move the SYSTEM switch to the HEAT or COOL position to exit the setting menu. If no buttons are pressed within 15 seconds , the thermostat will exit the configuration menu.

3. Filter review

Move the SYSTEM switch to the HEAT or COOL position, then press and hold the ▲ and ▼ buttons for 5 seconds to review filter running days.

To exit the review menu press the ▲ or ▼ buttons one time. Or If no buttons are pressed within 15 seconds, the thermostat will exit the configuration menu. **In review mode, press and hold the ▲ and ▼ 15 sec. to clean the filter warning. It will show “dEF” blink.**

Troubleshooting-----

If a voltage spike or static discharge blanks out the display or causes erratic thermostat operation, you can reset the thermostat by pressing the reset button (See Figure 4). If the thermostat has power, and has been reset and still does not function correctly, contact your heating/cooling service contractor .

1. Select cooling cycle rate

The FA setting is used to produce shorter cooling cycles. The SL setting produces a longer cooling cycle. Both settings produce very accurate temperature control and can be set to your personal preference. FA cycles the system at a 0.5°F (0.5°C) differential, and SL cycles the system at 1.5°F (1.5°C).

2. Select heating cycle rate

The FA setting is used to produce shorter heating cycles. The SL setting produces a longer heating cycle. Both settings produce very accurate temperature control and can be set to your personal preference. FA cycles the system at a 0.5°F (0.5°C) differential, and SL cycles the system at 1.5°F (1.5°C).

3. Select system heating type

Users can select the system heating type according to their heating system. Select 0 for gas, oil, or electric heating systems.

Select 1 for a heat pump heating system.

4. Select display backlight

The display backlight improves display contrast in low lighting conditions. Select 1 for NO backlight display. Select 2 for the backlight to come on for approximately 30 seconds when any button of the thermostat is touched. Select 3 for the backlight to remain on continuously.

NOTE: When operated from batteries only, the LCD display backlight will be illuminated less than 5 seconds after each button pressed ,when backlight option are set to 2) or 3). Options 2) & 3) will operate the same when terminal “C” is not connected.

5. Select filter replacement run time

The thermostat will display the Filter Alarm after a set time of operation. This is a reminder to change or clean your air filter. This time can be set from 0 to 12 months in 1 month increments. Selection of 00 WILL CANCEL THIS FEATURE. When Filter Alarm is displayed, you can clear it by pressing the ▲ and ▼ buttons. This resets the timer and starts counting the days until the next filter change.

6. Select °F or °C readout

Changes the display readout to Centigrade or Fahrenheit as required.

7. Select temperature recalibration

This feature allows you to adjust the displayed room temperature up to 4° higher or lower. Your thermostat can be accurately calibrated to match your previous thermostat. The current or adjusted room temperature will be displayed on the display.

8. Select compressor lockout delay 0,1,2,3,4,5

To protect the compressor from short cycling, you can select compressor off-time cycle between 0 to 5 minutes. When the thermostat compressor time delay occurs, the Cool On or Heat On display will flash during compressor lockout.

CONFIGURATION AND OPERATION

The configuration menu allows you to set certain thermostat operating characteristics to your system or personal requirements. Move the SYSTEM switch to the OFF position, then press and hold the ▲ and ▼ buttons for 5 seconds to enter the configuration menu. The display will show the first item in the configuration menu. Press the ▼ button to shift to the next menu item. Use the ▲ button to select each user setting. To exit the configuration menu and return to normal operation, move the SYSTEM switch to the HEAT or COOL position. If no buttons are pressed within 2 minutes, the thermostat will exit the configuration menu. The configuration menu chart summaries the configuration options. An explanation of each option follows.

Step	Press Buttons	Displayed (Factory Defaults)	Press ▲ or ▼ to select	Description
1	▲ & ▼ 5 seconds	CC (FA)	FA or SL	Select (FA)st or (SL)ow cooling cycles Default = FA
2	▼	HC (FA)	FA or SL	Select F(ast) or (S)low Heating cycles. Default = FA
3	▼	HO (0)	0 or 1	Select system heating type, 0 = Gas, oil, or electric heating. 1 = Heat pump heating. Default = 0
4	▼	bL (2)	1 – 3	Select display backlight (1) = OFF, (2) = 30 seconds on any button push, (3) = ON. Default = 2. Option (3) can be activated only if the common is used.

5	▼	FL (00)	00, 1 thru 12	Select filter time in months. Default = 00. A selection of "00" deactivates the filter feature.
6	▼	FC (F)	F or C	°F or °C display. Default = F
7	▼	CL (0)	+4 TO -4	Select temperature calibration point up to 4° higher or 4° lower. Default = 0
8	▼	CP (5)	0 or 5	Compressor Lockout delay. 0 = none, 1 = 1 Min'; 2 = 2 Min'; 3 = 3 Min', 4 = 4 Min', 5 = 5 Minutes. Default = 5

Mark: RESET function.

This function can help operator to recovery system when fault happened, display out of order or system halted. Please use a pin to insert in button RESET hole till sounded click, then loosen it. Switch on thermostat and observe it, if there still have troubles, please don't hesitate to contact with local agency for warranty.

