

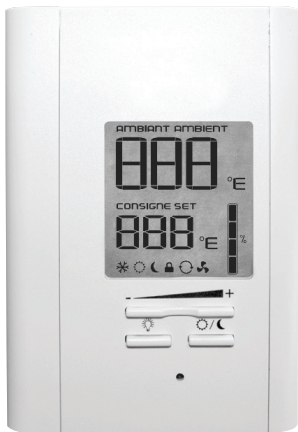


www.sshcinc.com

User's guide

"TSSHC-3DNPSB-16A-115F"

Electronic thermostat



For further information or to consult this guide on line,
please visit our Web site.

www.sshcinc.com

INS-TSSHC-3DNPSB-16A-115F-1210

⚠ WARNING ⚠ WARNING ⚠

Before installing and operating this product, the owner and/or installer must read, understand and follow these instructions and keep them handy for future reference. If these instructions are not followed, the warranty will be considered null and void and the manufacturer deems no further responsibility for this product. Moreover, the following instructions must be adhered to in order to avoid personal injuries or property damages, serious injuries and potentially fatal electric shocks. All electric connections must be made by a qualified electrician, according to the electric and building codes effective in your region. Do NOT connect this product to a supply source other than what the manufacturer specified and do not exceed the load limits specified. Protect the heating system with the appropriate circuit breaker or fuse. You must regularly clean dirt accumulations on the thermostat. Do NOT use fluid to clean thermostat air vent. Do not install thermostat in a wet place. However, installing it in isolated walls is allowed.

1. Description

The TSSHC-3DNPSB-16A-115F non programmable electronic thermostat can be used to control electric heating units such as ENERJOY radiant ceiling panels, electric baseboards, convectors, or aeroconvectors. It keeps the temperature of a room at the requested set point with a high degree of accuracy. The Automatic mode feature allows to this thermostat to be Semi-programmable. This product is designed for installations with electrical current - with a resistive load - ranging from 0 A to 16 A (90 VAC to 240VAC). It possesses a user-friendly interface. Furthermore, it gives you the possibility to control the temperature of a room with great precision.

This Thermostat is not Compatible with the Following Installations:

- electrical current higher than 16 A with a resistive load (3840 W @ 240 VAC, 3330 W @ 208 VAC and 1920 W @ 120 VAC);
- central heating system;
- inductive load higher than 3A.

Parts Supplied:

- one (1) thermostat;
- two (2) mounting screws;
- four (4) solderless connectors suitable for copper wires.

2. Installation


Selection of Thermostat Location

The thermostat must be mounted on a connection box on a wall facing the heating unit, at around 1.2 m (4 feet) above the floor level, on a section of the wall exempt from pipes or air ducts.

Do not install the thermostat in a location where temperature measurements could be altered. For example:

- close to a window, on an external wall, or close to a door leading outside;
- exposed directly to the light or heat of the Sun, a lamp, a fireplace or any other heat source;
- close or in front of an air outlet;
- close to concealed ducts or a chimney; and
- in a location with poor air flow (e.g. behind a door), or with frequent air drafts conditions (e.g. head of stairs).

Thermostat Mounting and Connection

1.  **Cut off power supply on lead wires at the electrical panel in order to avoid any risk of electric shock.**
2. Ensure that the air vents of the thermostat are clean and clear of any obstruction.
3. Using a screwdriver, loosen the screw retaining the mounting base and front part of the thermostat. Remove the front part of the thermostat from the mounting base by tilting it upward.



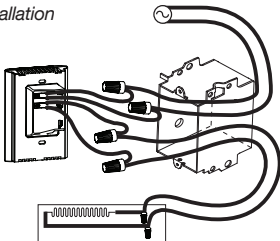
4. Align and secure the mounting base to the connection box using the two screws supplied.



Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable State/Country codes and standards.

5. Take the wires from the wall through the hole at the base of the thermostat and connect them using the supplied solderless connectors. When making the connection with aluminum wire, make sure that you are using connectors identified CO/ALR. Please note that the thermostat wires do not have polarity. Therefore, the way they are connected is not important.

Four-wire installation



6. Reinstall the front part of the thermostat on the mounting base and tighten the screw at the bottom of the unit.

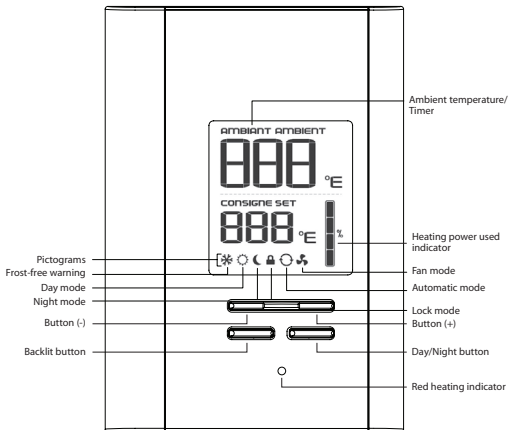


7. Turn on the power.
8. Set the thermostat to the desired setting (see the following section).



Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable State/Country codes and standards.

3. Operation



Powering on for the first time

When powering on for the first time, the thermostat is initially set to Day mode. The temperature is displayed in Fahrenheit and is set at 105°F (41°C) by default.

Language (English/ French)

To switch the display from English to French and conversely, press down the backlit button for 20 seconds. The display is set in English by default.

Backlit screen

The backlight screen lights up when you press down a button. If you do not press down any button during 15 seconds, the backlight screen will turn off. It is possible to turn on the backlight screen without modifying anything by pressing down the (+) or (-) button once or by pressing down the Sun or Moon button when the backlight screen is off. You can also turn on the backlight screen by pressing down the backlight screen button.

Temperature set points

The figures displayed below the SET pictogram indicate the temperature set point. It can be displayed in degrees Fahrenheit or Celsius (see “Display in degrees Fahrenheit/Celsius”).

To adjust the set point, just press down the (+) button to increase the value, or the (-) button to decrease it. Set points can be adjusted by increments of 1°F or 1°C. To quickly scroll through the set point values, press and hold down the button. The minimum set point is 37°F (3°C), and the maximum set point is 113°F (45°C).

Day mode and Night mode ☀️ 🌙

The thermostat includes a Day mode (Sun) and a Night mode (Moon), both of them having their own independently adjustable and recorded set point. The ambient temperature is displayed above the set point, in degrees Fahrenheit or Celsius. When switching from one mode to the other, the system will automatically use the temperature set point corresponding to the Day/Night mode selected. The standard factory set point adjustment is 105°F (41°C) for the Day mode, and 90°F (32°C) for the Night mode.

In order to manually switch from one mode to the other, press down the Day or Night button and release it immediately.

In order to totally shut off power to the heater, thermostat has to be in Day mode. Then, lower set point until the screen displays the word 'OFF'. Please note that when the word 'OFF' is displayed, the 'frost-free' minimum temperature feature is disabled.

Night mode timer

The Night mode features a timer that automatically returns to the Day mode after a selectable time period. This timer allows the temporary use of a temperature set point. The standard factory adjustment of the timer is 8 hours. With this adjustment, the thermostat automatically returns to Day mode 8 hours after being switched to the Night mode.

For example, if you want a night temperature lower than the day temperature, both Day/Night modes set points will first have to be set at the desired temperatures. Before bedtime, the Night mode temperature set point will be activated by switching manually to the Night mode. The timer is set for the duration of the night. The thermostat will automatically return to the Day mode at the end of the night, and the Day mode temperature set point, which is higher, will become effective at this time.

Night mode timer adjustment procedure

1. First, switch to the Night mode by pressing down the Day/Night button and releasing it immediately (press it down twice if the backlit screen is off and once if the backlit screen is on).
2. From the Night mode, simultaneously press down the (+) and (-) buttons for more than 3 seconds. Then, the number of programmed hours will be displayed by the three figures at the top of the screen and “HRS” will be displayed instead of the three figures at the bottom of the screen. Then, you can release the buttons.
3. If needed, adjust the timer by pressing down the (+) button to increase the value, or the (-) button to decrease it. The adjustment range is from 1 hour to 999 hours. To quickly scroll through timer values, press and hold down the button.
4. When the adjustment is completed, release the buttons and wait for 5 seconds to exit the adjustment function. Then, the thermostat will automatically switch to the Night mode.

N.B. *The Night mode timer will be automatically reinitialized to the latest recorded value when switching from the Day mode to the Night mode. It is not necessary to readjust the timer every time you switch to the Night mode. The timer is also reinitialized when this value is adjusted.*

Once the timer has completed its cycle and when the thermostat is in the Day mode, you must manually return to the Night mode. If you want to automatically return to the Night mode, the Automatic mode must be selected.

Automatic mode

The Automatic mode, which is associated to the Night mode timer, allows alternating between the Day/Night modes and the two corresponding set points over a 24-hour period. Once activated, this mode allows an automatic return to the Night mode after 24 hours. The Automatic mode allows you to define two periods in a single day with different set points.

For example, if the Automatic mode is activated and the Night mode timer is set at 8 hours, the thermostat will be operating in the Night mode for 8 hours at the night temperature set point. Then, it will return to the Day mode for 16 hours operating at the day temperature set point. At the end of the 24-hour cycle, the thermostat will return to the Night mode, and the cycle will start again. The 24-hour cycle starts with the Night mode as soon as the Automatic mode is activated. The Automatic mode activation should be made when you want to return to the Night mode. The normal course of a cycle in the Automatic mode is as follows:

- 1-Night mode : activated for the duration of the Night mode timer cycle. It returns to the Day mode when the timer cycle is completed.
- 2-Day mode : activated for the remaining time of the 24-hour cycle. It returns to the Night mode at the end of the 24-hour cycle.

Adjustment procedure of the Automatic mode:

1. When the thermostat is set in Day mode, switch to the Night mode by pressing down the Day/Night button and releasing it immediately (press it down twice if the backlit screen is off and once if the backlit screen is on).
2. From the Night mode, simultaneously press down the (+) and (-) buttons for more than 3 seconds. Then, the number of programmed hours will be displayed by the three figures at the top of the screen and "HRS" will be displayed instead of the three figures at the bottom of the screen. Then, you can release the buttons.

3. Activate the Automatic mode by simultaneously pressing down the (+) and (-) buttons for at least 3 seconds. The Automatic mode icon will appear. If the Automatic mode was already activated, the same procedure should be used to deactivate it.
4. When the adjustment is completed, release the buttons and wait for 5 seconds to exit the adjustment function.

N.B. *It is always possible to manually change the Day/Night mode during a 24-hour cycle. This will not change the 24-hour cycle and the automatic return to the Night mode. However, the automatic mode will be deactivated is the thermostat is set OFF.*

When turning back on after being powered off (because of a power failure, for example), the automatization of the Day/ Night modes is deactivated, and, if previously activated, the icon that corresponds to this mode will blink. The blinking will stop as soon as you press down a button.

Display in degrees Fahrenheit/Celsius

The thermostat can display the ambient temperature and the set point in degrees Fahrenheit (standard factory setting) or Celsius.

Selection procedure for degrees Fahrenheit/Celsius display.

1. From the Day mode, simultaneously press down the (+) and (-) buttons for more than 3 seconds. Then, the set point will blink. Release the buttons.
2. Press down the (+) button to switch from the degrees Fahrenheit to the degrees Celsius, and conversely. The degrees Fahrenheit (F) or Celsius (C) symbol will be displayed.
3. When the adjustment is completed, release the buttons and wait for 5 seconds to exit the adjustment function.

Temperature control

The thermostat controls the temperature of the ambient air with precision. When the heating comes on or shuts off, it is normal to hear a “click” sound. This noise is caused by the relay opening or closing, depending on the situation.

- If the ambient temperature is 2.7°F below the set point, duty cycle is set at 100 %.
- If the ambient temperature is 2.7°F over the set point, duty cycle is set at 0%.
- If the ambient temperature is between: $[\text{SetPoint} - 2.7^{\circ}\text{F}, \text{SetPoint} + 2.7^{\circ}\text{F}]$, duty cycle is given by a PI (proportional-integral) control.

Red Indicator





When the heating comes on, the heating red indicator lights-up.

Programmable heating cycle

This setting allows the length of a heating cycle to be adjusted. To activate this programmable heating cycle setting, the thermostat should be in Day mode and the user must press and hold down the (+) and (-) buttons for 20 seconds. Note that the SET icon will blink after 3 seconds, but you must hold down the buttons until SEC appears at the bottom of the screen. Then, release the buttons. It is important to keep the two buttons pressed down to avoid switching to the Lock, Fan or Celsius/Fahrenheit modes. After the 20 seconds, the three top figures will display the number of seconds for a heating cycle and SEC will be displayed at the bottom of the screen. It's possible to adjust the length of the heating cycle from 480 seconds (8 minutes) to 900 seconds (15 minutes).

Heating power indicator

The level of power used to maintain the temperature at the set point is expressed as a percentage indicated by the number of bars in the thermometer displayed. The heating power used is displayed as follows:

	4 bars = 75% to 100%
	3 bars = 50% to 75%
	2 bars = 25% to 50%
	1 bar = 1% to 25%
	0 bar = no heat

The bars show the ratio between the time heating cycle is ON and the total time of the heating cycle programmed by the user. When Fan mode is ON, heating cycle is 15 minutes (see fan mode section).

Frost-free warning *

The Snowflake icon is displayed when the temperature set point is between 37°F (3°C) and 41°F (5°C). A minimum temperature will be maintained to ensure frost control. Please note that when the word 'OFF' is displayed, the 'frost-free' minimum temperature feature is disabled.

Lock option

It is possible to impose a maximum temperature set point by activating this mode. Then, it becomes impossible to exceed this set point, regardless of the current mode. However, it is still possible to lower the set point at your discretion.

Procedures to activate the Lock mode

1. To activate the Lock option, from the Day mode adjust the day set point to the desired maximum temperature.
2. From the Day mode, simultaneously press down the (+) and (-) buttons for more than 13 seconds (note that the SET icon will blink after 3 seconds, but hold down both button or you will find yourself in the degree adjustment mode or in Fan mode).
3. The Lock icon will appear after 13 seconds, indicating that the Lock mode is activated. Release the buttons.

Procedures to deactivate the Lock mode

1. To deactivate the Lock mode, start by cutting thermostat power at circuit breaker and wait at least 20 seconds.
2. Turn thermostat power back on and the Lock icon will blink for a maximum of 5 minutes, indicating that it is possible to deactivate the Lock mode.
3. Simultaneously press down the (+) and (-) buttons for more than 13 seconds. (Note that the SET icon will blink after 3 seconds, it is important to hold down the two buttons to avoid switching to the adjustment or Fan mode). After 13 seconds, the Lock icon will disappear, indicating that the Lock mode is deactivated. Release the buttons.

Fan mode

The activation of the Fan mode is similar to the Celsius/Fahrenheit adjustment. To activate or deactivate the Fan mode, you must press down the (+) and (-) buttons simultaneously for at least 3 seconds while in Day mode. Once the 3 seconds have passed, the SET icon will blink. At this point, release the buttons. You must then press down the (-) button to activate or deactivate the Fan mode. The Fan icon will turn on or off depending on the case.

When Fan mode is activated, the heating cycle is established at 15 minutes. The deactivation of the Fan mode will cause the thermostat to go back to the heating cycle previously programmed. Once the adjustment finished, we can exit the Fan mode by not pressing on any button for 5 seconds.

Parameters saving and power failures

The thermostat saves some parameters in a non-volatile memory to be able to recover them after being shut off (a power failure, for example). These parameters are the Day/Night settings, the automatization of the Day/Night modes, the state of the Lock mode, the maximum setting of the Lock mode, the Celsius/Fahrenheit mode, the number of hours on the night time-switch, the language, Fan mode, the number of minutes associated to a heating cycle, the number of hours remaining on the night time-switch and the current Day/Night mode. These parameters are saved every minute if any changes are made, except for the Day/Night mode and the remaining time left on the time-switch. These are saved only if the automatization of the Day/Night mode had not been activated.

Please note that the automatization of the Day/Night modes is not automatically reactivated when the thermostat is turned on. The icon for the automatization of the Day/Night modes blinks to warn the user that the mode was previously activated when thermostat was shut off but is no longer active.

After a power failure, if the automatic mode wasn't active before this happens, the existing Day/Night mode is recovered. In this case, if the thermostat was in Night mode before power failure occurs, time remaining at the night timer at the moment of the power failure will elapsed before going back to Day mode. After a power failure, if the automatic mode was active before power failure happens, the Day mode is automatically reactivated. The power failure make the thermostat lost his 24 hours periodicity. So, in this case, users have to reactivate the automatic mode at the proper time of the day. The Lock mode is also reactivated if it was activated before the being shut off. However, the icon will blink for 5 minutes, during which it is possible to deactivate the lock mode as it was described in Procedures to deactivate the Lock mode. If this is not done, the Lock mode will stay activated and the icon will stop blinking.

4. Troubleshooting

Problem	Solution
The thermostat is hot.	In normal operating conditions, the thermostat housing can reach nearly 104°F (40°C) at maximum load. It is normal and will not affect the operation of the thermostat.
Heating does not run even if the thermostat indicates it is on.	Check if the Load is correctly connected. Refer to the installation section.
The display does not come on.	Check if the thermostat is correctly connected. Refer to the installation section. Check the power supply at the electrical panel.
The displayed ambient temperature is incorrect.	Check the presence of an air stream or a heat source near the thermostat, and correct the situation.
The display indicates E1 or E2.	Faulty thermal sensor. Contact customer service.
Weak luminosity of the display.	Possibility of a bad contact. Check thermostat wirings. Refer to the installation section.

N.B. If you are unable to solve the problem after having verified these points, please communicate with our customer service.

5. Technical specifications

Supply voltage :

90 VAC to 240 VAC, 60 Hz

Maximum electrical current with a resistive load :

16 A

3840 W @ 240 VAC

3330 W @ 208 VAC

1920 W @ 120 VAC

Temperature display range :

37°F to 140°F (3°C to 60°C)

Temperature display resolution :

1 °F (1 °C)

Temperature set point range :

37°F to 113°F (3°C to 45°C)

Temperature set point increments :

1 °F (1 °C)

Storage temperature :

-22 °F to 185 °F (-30 °C to 85 °C)

Limited Warranty

This unit has a 1 year warranty. If at any time during this period the unit becomes defective, return it to its place of purchase with a copy of the invoice, or contact our customer service department (with a copy of the invoice in hand). ***In order for the warranty to be valid, the unit must be installed and used according to instructions.*** If the installer or the user modifies the unit, they will be held responsible for any damage resulting from this modification. The warranty is limited to the factory repair or the replacement of the unit, and does not cover the cost of disconnection, transport, and installation.

Customer service

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