



## Installation and Setup Guide

Color Touchscreen  
Programmable Residential  
Thermostat

**ComfortSense® 5500**

Model: 13H13

507501-01

10/2015

Supersedes 4/2015

## TABLE OF CONTENTS

Shipping and Packing List .....	3	<i>Dealer Information</i> .....	15
ComfortSense® 5500 Residential Thermostat .....	3	<i>Stage 1 Diff</i> .....	15
<b>THERMOSTAT INSTALLATION</b> .....	<b>6</b>	<i>Temperature Offset</i> .....	15
<i>Installing Thermostat</i> .....	6	<i>Compressor Protection</i> .....	15
<i>Wiring Thermostat</i> .....	10	<i>Customer Reminders</i> .....	16
<i>Terminal Designations</i> .....	10	<i>Reset Settings</i> .....	16
<b>SETTINGS (INSTALLER)</b> .....	<b>13</b>	<i>Energy Saving Defaults</i> .....	17
Menu (Installer Settings) .....	13	<i>System Test Modes</i> .....	17
<i>System Setup</i> .....	14	Product Identification .....	18
<i>Residual Cool</i> .....	15	Memory Protection .....	18
<i>Deadband</i> .....	15	Appendix A. Diagnostic Information .....	19
<i>Smooth Set Recovery (SSR)</i> .....	15	Appendix B. Reminder Information .....	21
		Appendix C. Supported Configurations ...	22
		Appendix D. Installation Checklist .....	22

### Shipping and Packing List

- 1 - ComfortSense® 5500 touchscreen, 7-day programmable thermostat with back plate
- 1 - Wall plate
- 2 - Mounting screws (M3.5x25mm self-tapping screws)
- 2 - Wall anchors
- 1 - Warranty certificate
- 1 each - Homeowner and Installer Guides

**NOTE:** *This thermostat is equipped with automatic compressor protection to prevent potential damage due to short cycling or extended power outages. The short cycle protection provides a 5-minute delay between heating or cooling cycles to prevent the compressor from being damaged.*



### IMPORTANT

Read this manual before programming the thermostat.

Use this thermostat only as described in this manual.

### ComfortSense® 5500 Residential Thermostat

The ComfortSense® 5500 thermostat is an electronic 7-day single-stage programmable touch screen thermostat. It also offers enhanced capabilities which include:

- worry-free memory storage feature
- menu-driven touch-screen display
- equipment maintenance reminders
- Supports both 50 and 60Hz operations.

This thermostat supports single-stage non-heat pump units.

#### Dimensions (H x W x D)

Case dimensions: 3-5/16 x 4-5/16 x 7/8 in. (84 x 110 x 22mm)

#### Wall Plate Dimensions (H x W)

Plate dimensions: 4-1/2" x 5-3/4" (114 x 146mm)

#### Compressor Short Cycle Protection

A 5-minute compressor short cycle protection timer begins when a compressor output is de-energized. Also, if a power loss occurs, the

system will go into compressor protection mode and will display a snow flake icon and the word “waiting” next to it if there is a cooling compressor call.



### **WARNING**

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or service agency.



### **CAUTION**

This is a 24VAC low-voltage thermostat. Do not install on voltages higher than 30VAC.

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.



### IMPORTANT

In all applications, the ComfortSense® Model 5500 thermostat can only be used with all residential units and approved commercial split-system matches, and those which meet the following installation criteria:

- installation uses 18 GAUGE thermostat wire or larger,
- thermostat wire run length DOES NOT EXCEED 300' (91m),
- load from any thermostat connection is 1 AMP or LESS.



### CAUTION

Always turn off power at the main power source by switching the circuit breaker to the OFF position before installing or removing this thermostat.

All wiring must conform to local and national building and electrical codes and ordinances.

## THERMOSTAT INSTALLATION

Before beginning installation, note the type of equipment, number of stages, and any accessories being installed. This thermostat is a 24VAC low-voltage thermostat and requires a common wire to the thermostat to operate.

### DO

- Shut off all power to system before installing.
- Read this entire document, noting which instructions pertain to your equipment and system requirements.
- Make sure that all wiring conforms to local and national building and electrical codes and ordinances.
- Ensure load from any thermostat connection is less than 1 AMP.

### DO NOT

- Install on voltages higher than 30VAC.
- Short (jumper) across terminals on the gas valve or at the system control to test

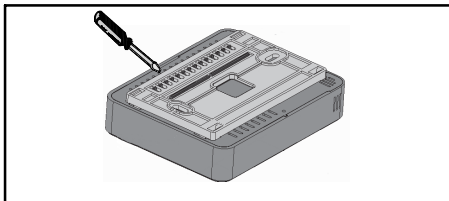
installation. This will damage the thermostat and void the warranty.

- Install on outside walls or in direct sunlight.
- Exceed thermostat wire run length greater than 300 feet (91m).

### Installing Thermostat

1. Unpacked the thermostat and open the case with a thin-blade screwdriver. Place between wall base and unit and twist to separate unit from base.
2. Select a location for the thermostat about 5 feet (1.5m) above the floor in an area with good air circulation at average temperature.
3. Do not install the thermostat where it can be affected by:
  - Drafts or dead spots behind doors and in corners.
  - Not close to entrance or automatic doors.
  - Not close to heat generating equipment such as kitchen equipment.
  - Hot or cold air from ducts.

- Radiant heat from sun or appliances.
- Concealed pipes and chimneys.
- Unheated (uncooled) areas such as an outside wall behind the thermostat.

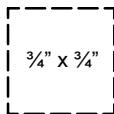


**Figure 1. Removing Back Plate**

4. Use steps **A** through **J** (step **J** applicable when using provided wall plate) to install the thermostat.

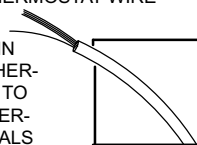
CUT OR DRILL A SMALL HOLE  
FOR THERMOSTAT WIRING

**A**



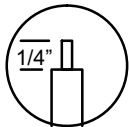
PULL ABOUT 3" OF THERMOSTAT  
WIRE THROUGH OPENING AND RE-  
MOVE OUTER THERMOSTAT WIRE  
JACKET.

THIS WILL HELP IN  
ROUTING THE THER-  
MOSTAT WIRING TO  
THE PROPER THER-  
MOSTAT TERMINALS



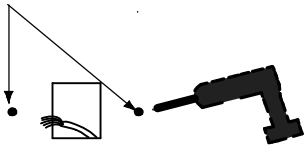
**B**

- C** TRIM 1/4" INSULATION FROM  
END OF EACH WIRE

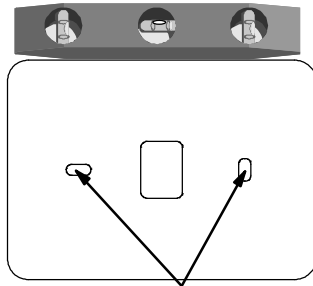


DRILL 3/16" HOLES AT MARKED LOCATIONS  
ON WALL FOR ANCHORS

**E**



(USE A LEVEL) ALIGN WALL PLATE



USE UNIT WALL PLATE AS TEMPLATE TO MARK  
DESIRED MOUNTING HOLE LOCATIONS ON WALL.

NOTE: INSTALLATION OF WALL PLATE IS  
OPTIONAL.

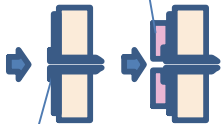


## Thermostat Installation with Wall Plate

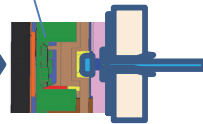
**F** - Place wall plate over holes in wall.



**H** - Attach back plate to wall plate.



**J** - Attach thermostat to back plate.

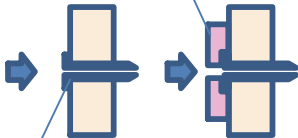


**G** - Insert wall anchors through wall plate into wall.

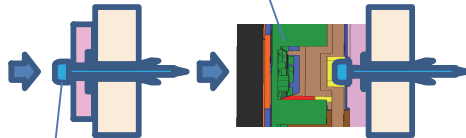
**I** - Insert provided screws through back and wall plates into wall anchors.

## Thermostat Installation without Wall Plate

**G** - Place back plate over wall anchors in wall.



**I** - Attach thermostat to back plate.



**F** - Insert wall anchors through wall plate into wall.

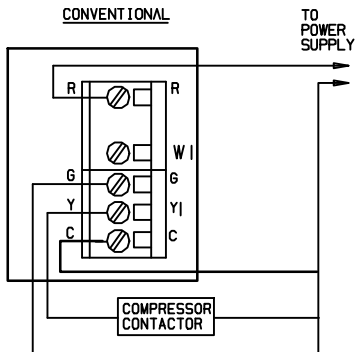
**H** - Insert provided screws through back plate into wall anchors.

## **Wiring Thermostat**

1. Connect wiring between thermostat, indoor unit, and outdoor unit as shown in the appropriate wiring diagram.
2. Seal the hole in the wall with a suitable material to prevent drafts from entering the thermostat case.
3. Configure thermostat and equipment for system type (gas or electric heat), program the thermostat, and test system.

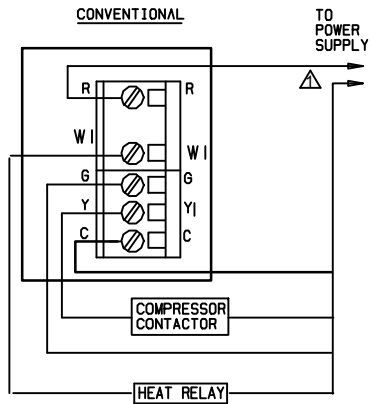
## **Terminal Designations**

- C - Common 24 VAC
- G - Fan relay
- W1 - 1st stage heating (electric or gas heat)
- Y1 - 1st stage cooling
- R - 24VAC power

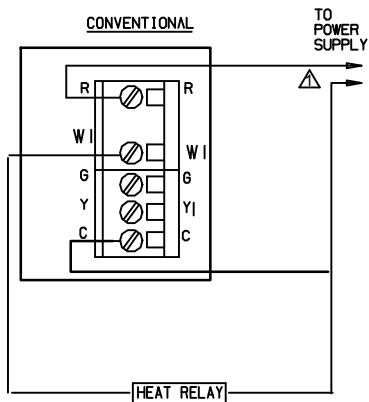


**TYPICAL COOL ONLY SYSTEM**

⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS  
AND OVERLOAD PROTECTION AS REQUIRED



**TYPICAL CONVENTIONAL SINGLE-STAGE  
HEAT / COOL SYSTEM**



⚠ POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED

## Settings (Installer)

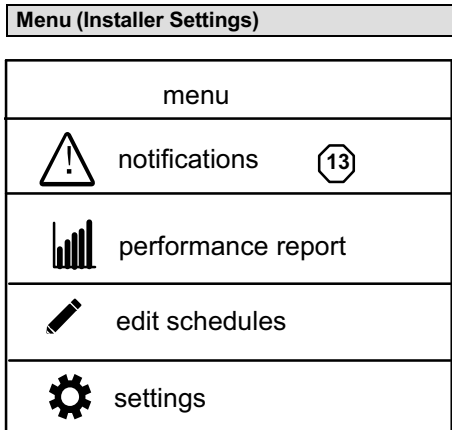
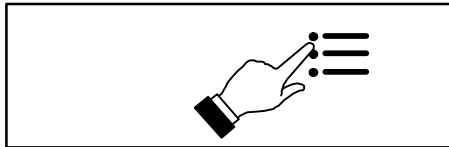


Figure 2. Installer Menu Screen

1. Touch **menu** option from the home screen.



2. Touch and hold the **settings** option on the menu. This will display the **installer settings** confirmation screen. Touch **confirm** to continue.

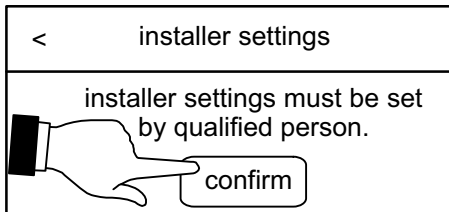


Figure 3. Installer Menu Screen Confirmation

3. Available options are as follows:

<	installer settings	>
	system setup	>
	residual cool	>
	dead band	>
	smooth set recovery	>
	contact information	>
	stage 1 diff	>
	temperature offset	>
	compressor protect	>
	custom reminder	>
	reset setting	>
	energy saving default	>
	system test mode	>

## System Setup

Sets the thermostat heat options.

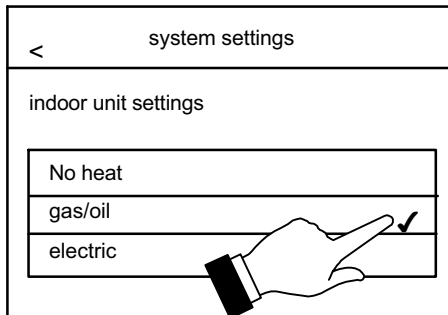


Figure 4. System Setup

## **Residual Cool**

Default is 0 seconds. This is the time, in seconds, that the fan runs after a call for cooling is satisfied in order to deliver any residual cooling ability from the coil and ductwork into the conditioned space. Options are 0, 30, 60, 90 and 120 minutes. Touch < to return to previous menu.

## **Deadband**

Default is 3°F (2°C). The deadband setting is the minimum difference between the cooling and heating set points. This setting is used in cool/heat mode to ensure smooth equipment operation. The deadband is adjustable from 3 to 8°F. Use the + or - option to select desired deadband. Touch < to return to previous menu.

## **Smooth Set Recovery (SSR)**

Options are enable or disable. Default is Disabled. When enabled, smooth set recovery begins recovery up to two hours before the programmed time so that the programmed temperature is reached at the corresponding programmed event time. Assume 12°F per hour for gas/electric

heating and 6°F per hour for first stage compressor based cooling. With Smooth Set Recovery disabled, the control will start a recovery at the programmed time.

## **Dealer Information**

This allows the installer to add dealer name, address, phone, email, website and number.

Touch < to return to previous menu.

## **Stage 1 Diff**

The default is 1.0°F but can be programmed between 0.5° and 8.0°F in 0.5°F increments. Touch < to return to previous menu.

## **Temperature Offset**

Default is 0°F. This setting can be used to offset the displayed space temperature by up to +/- 5°F. This offset also applies to the control temperature. Touch < to return to previous menu.

## **Compressor Protection**

Default is ON and it can be turned OFF, however only for one compressor cycle and then it will revert back to ON.

If the system is running in compressor protection, the home screen displays “WAIT” only if there is cooling call for the compressor (Y1).

If compressor protection is running and there is a demand for electric heating, the system waits for the compressor protection timer to expire.

### Customer Reminders

Two custom reminders may be rename on this screen to the desired name (name is limited to 19 characters). After entering the new name, touch the done key to return to the customer reminder screen.

To set a reminder go to the User Settings screen and select **reminders**. The reminder setting screen will appear and a list all of the predefined reminders plus the two custom reminders will appear at the end of the list.

Scroll to CUSTOM REMINDER 1 or 2 (or renamed titles). Touch the title to select the reminder. By default all reminders are set to disabled. Touch disable to choose from 3mon, 6mon, 12mon, 24mon or custom date.

When finished, touch < to return to previous menu.

### Reset Settings

To reset the thermostat to factory defaults, scroll to RESET SETTINGS and touch to select. Read the message and to continue touch **CONFIRM**.



#### IMPORTANT

**RESET SETTINGS** erases all programming and returns the thermostat to the factory conditions, including the installer settings. Use this only as a last resort.



## Energy Saving Defaults

Energy saving recommended set points for heating and cooling can help save energy. The time and temperatures reference in table 1 are pre-programmed into the thermostat to achieve energy savings.

Scroll to ENERGY SAVING DEFAULT and touch to select. Read the message on the screen and to continue, touch **CONFIRM**.

**Table 1. Energy Saving Set Points**




Time	Heating	Cooling
Wake	70°F (21°C)	78°F (25°C)
Leave	62°F (17°C)	85°F (29°C)
Return	70°F (21°C)	78°F (25°C)
Sleep	62°F (17°C)	82°F (28°C)

## System Test Modes

After the thermostat has been installed and set-up, the installer may run a system test function (accessed through the installer settings menu). Test include cooling, heating and fan outputs.

Select system test mode. A pop-up will be displayed indicating all equipment will be stopped. Touch **confirm** to continue.

Touching the **OFF** button next to the desired option will change the status to **ON** and will enable the relay for that terminal. Touching again will turn **OFF** the relay. Touch the left arrow (<) to exit the system test mode.

system test mode	
Y1	
W1	
G	



## NOTICE

Risk of equipment damage.

Can cause compressor failure.

All HVAC components can be tested to confirm the signals between thermostat and unit are being sent and were received.

*NOTES: After 5 minutes without a test being initiated, the test modes is disabled and system goes back to the normal mode (i.e. HOME screen).*

*When in SYSTEM TEST MODE, the compressor minimum off timer is bypassed.*

### Product Identification

A label on the back of the thermostat is visible through an opening in the back of base plate. This identifies the Lennox Catalog Number, Part

Number and Serial Number. Separate the base plate from the thermostat to see additional manufacturing information.

### Memory Protection

The thermostat stores all the information concerning its programming (state, mode, program information, last temperature measured) in a nonvolatile memory.

This function avoids the loss of the state of the thermostat when a power-down occurs. The only thing that might be lost is the clock and date information, however, a lithium battery will remember clock / date information for as long as it has a charge (approximately 24 hours). When power down occurs (due to a power outage) the thermostat is able to switch off all relays. When power is restored the thermostat will be in heat /cool mode so either mode can run to re-satisfy the temperature setting in the home. Day and time (schedules) may be off due to battery power loss.

## Appendix A. Diagnostic Information

Error Code	Screen Text	Priority 0:high 1:middle 2:low	Message Type	Condition	System Action	Action to Clear / Recovery Condition
4	high temperature protection	0	critical	High temperature protection when outdoor ambient temperature exceeds 96°F (35.6°C).	All stages of heat are turned off by safety relay. This error is displayed on notification screen.	Once temperature drops below 96°F (35.6°C), the system resume operation.
5	temperature sensor error	0	critical	Local temperature sensor is out of range -40°F to 158°F. There is a finite difference between main thermostat and sub-thermistor which is greater than 5°F.	Indoor temp is displayed as "--" on the home screen. This will STOP all temperature related operation. All stages of heat are turned off by safety relay. This error is displayed on notification screen.	Either thermostat will have to be replace or if the sensor returns to normal operating range, the error message will automatically clear and the system will resume operation.

<b>Error Code</b>	<b>Screen Text</b>	<b>Priority</b> 0:high 1:middle 2:low	<b>Message Type</b>	<b>Condition</b>	<b>System Action</b>	<b>Action to Clear / Recovery Condition</b>
7	memory error	0	critical	EEPROM error (Power ON)	System will restore using to Energy Star defaults and resume operations. This error is displayed on notification screen.	Thermostat will need to be replaced.
8	memory error	0	critical	EEPROM error (Operating)	System will operate in normal mode operation until power off. This error is displayed in notification screen.	

## Appendix B. Reminder Information

Error Code	Screen Text	Message Type	Action to Clear / Recovery Condition
12	replace media filter	reminder	Touch either <b>done</b> to clear the reminder or <b>remind later</b> button.
13	replace UV lamp		
14	replace humidity pad		
15	routine system check-up		
16	replace metal insert for pure air		
17	user editable		
18	user editable		

## Appendix C. Supported Configurations

This thermostat supports air conditioner systems only with single speed compressors.

	Backup/ Indoor Heat	Comp. stages	Indoor Heat Stages	Heat Stages	1st Heat Stage	Cool Stages	1st Cool Stage
Non HP	GAS/OIL OR ELEC.	1	1	1	W1	1	Y1
Non HP	NONE	1	0			1	Y1

## Appendix D. Installation Checklist

Item Number	Item	Yes	No
1	Is the thermostat level where mounted on the wall?		
2	Is the thermostat installed away from direct sunlight or discharge air vents?		
3	Has the thermostat been wired correctly based on the type of equipment installed (air handler, outdoor unit and accessories)?		
4	Is the thermostat wiring secured tightly to the terminals?		
5	Is the common wire (terminal C) connected?		
6	Has the System Test Mode located under the installer settings been used to verify proper operation?		

# INDEX

## C

Checklist, 22

Compressor Short Cycle Protection, 3

## D

Diagnostic Information, 19

Dimensions

*Thermostat*, 3

*Wall Plate*, 3

## I

Installer Settings

*Compressor Protect*, 15

*Custom Reminders*, 16

*Deadband*, 15

*Dealer Information*, 15

*Energy Saving Default*, 17

*Reset Settings*, 16

*Residual Cool*, 15

*Smooth Set Recovery (SSR)*, 15

*Stage 1 Diff*, 15

*System Setup*, 14

*System Test Modes*, 17

*Temperature Offset*, 15

## M

Memory Protection, 18

Mounting Screws, 3

## P

Product Identification, 18

## R

Reminder Information, 21

## S

Supported Configurations, 22

## T

Thermostat Installation, 6

## **W**

Wall Anchors, 3

Wiring Diagrams, 11, 12

Wiring Thermostat, 10