

# 701

Installation Manual

This manual covers the following models:

- 701

## Thermostat Applications Guide

Description	
Gas or Oil Heat	Yes
Electric Furnace	Yes
Heat Pump (No Aux. or Emergency Heat)	Yes
Heat Pump (with Aux. or Emergency Heat)	No
Multi-stage Systems	No
Heat Only Systems	Yes
Heat Only Systems - Floor or Wall Furnaces	Yes
Cool Only Systems	Yes
Millivolt	Yes

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## Power Type

Battery Power

Hardwire (Common Wire)

Hardwire (Common Wire) with Battery Backup

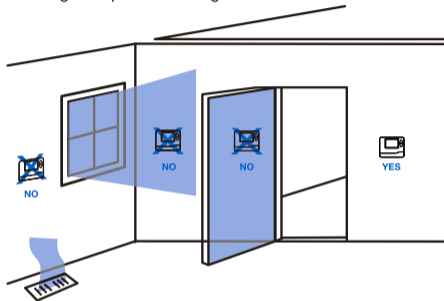
**A trained, experienced technician must install this product.**

Carefully read these instructions. You could damage this product or cause a hazardous condition if you fail to follow these instructions.

# INSTALLATION TIPS

## Wall locations

The thermostat should be installed approximately 4 to 5 feet above the floor. Select an area with average temperature and good air circulation.



**Do not install** thermostat in locations:

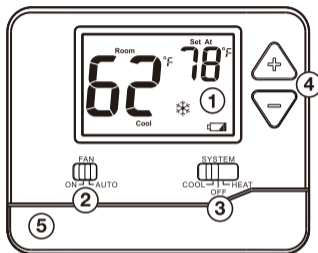
- Close to hot or cold air ducts
- That are in direct sunlight
- With an outside wall behind the thermostat
- In areas that do not require conditioning
- Where there are dead spots or drafts (in corners or behind doors)
- Where there might be concealed chimneys or pipes

### Tip

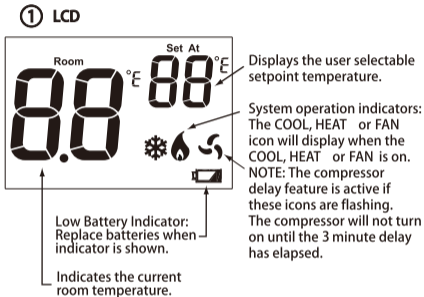
Pick an installation location that is easy for the user to access. The temperature of the location should be representative of the building.

# THERMOSTAT QUICK REFERENCE

## Getting to know your thermostat



- ① LCD Display
- ② Fan Switch
- ③ System Switch
- ④ Temperature Setpoint Buttons
- ⑤ Easy change battery door



# SUBBASE INSTALLATION



## Caution: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.

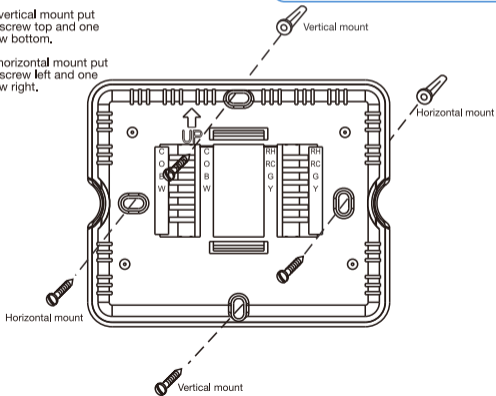


## Mercury Notice:

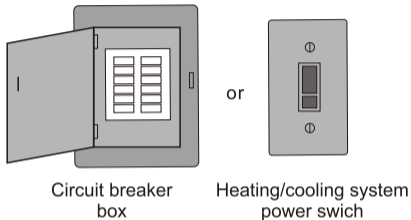
All of our products are mercury free. However, if the product you are replacing contains mercury, dispose of it properly. Your local waste management authority can give you instructions on recycling and proper disposal.

For vertical mount put one screw top and one screw bottom.

For horizontal mount put one screw left and one screw right.



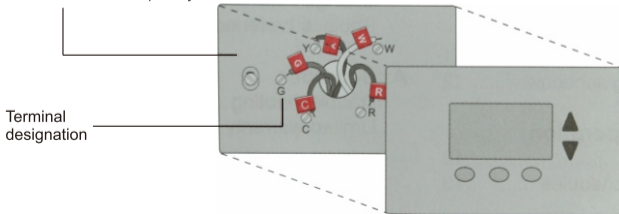
## 1 Turn Off Power to Heating/Cooling System



## 2 Remove Old Thermostat

Remove old thermostat but leave wallplate with wires attached.

Do not remove wallplate yet

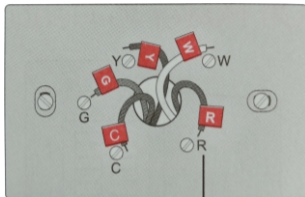


## 3 Label Wires with Tags

Label the wires using the supplied wire labels as you disconnect them.

Wiring Labels		Étiquettes de fils		Rótulos para los cables					
Apply these wiring labels to each wire with the appropriate terminal designation as you remove it from the existing thermostat.		Lorsque vous retirez les fils des bornes du thermostat existant, collez ces étiquettes sur chaque fil correspondant à la lettre de la borne.		Coloque estos rótulos, con la designación de las terminales, en cada cable al remover los cables del termostato actual.					
B	B	Y2	Y2	C	C	E	E	F	F
G	G	H	H	L	L	O	O	P	P
R	R	RC	RC	RH	RH	T	T	U	U
V/VR	V/VR	W	W	W1	W1	W2	W2	W3	W3
X	X	X1	X1	X2	X2	Y	Y	Y1	Y1
AUX	AUX								

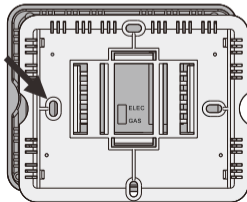
Wire Labels



Terminal designation

## 4 Separate Wallplate from New Thermostat

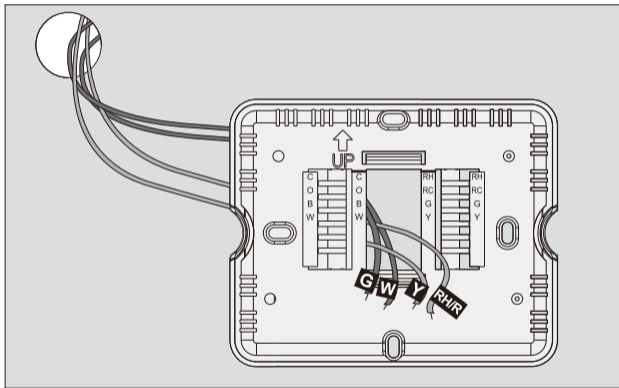
Remove wallplate from the new thermostat and mount onto wall.



Wallplate

## 5 Separate Wallplate from New Thermostat

Mount the new wallplate using the included screws and anchors.



Drill 3/16-in. holes for drywall

Drill 3/16-in. holes for plaster

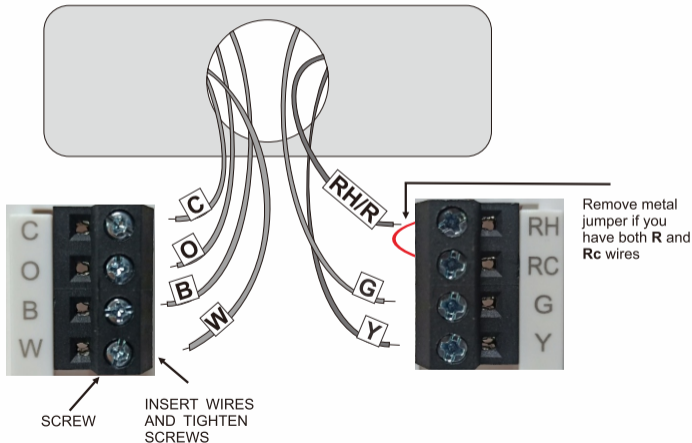


# WIRING

## 6 Connect Wires

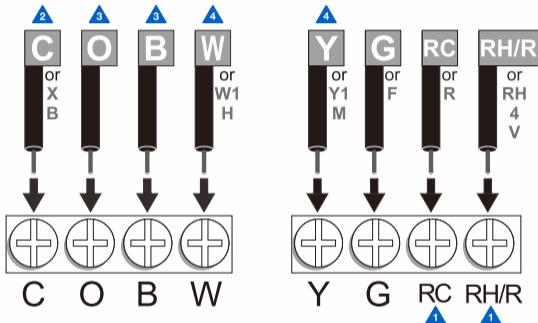
Simply match wire labels.

If labels do not match letters on the thermostat, check "Alternate Wiring (Conventional Systems)" on page 9 and connect to terminal as shown (see notes, below).



## Alternate Wiring (Conventional Systems)

If labels do not match letters on the thermostat, check the chart below and connect to terminal as shown here (See notes, below).



- 1 If wires will be connected to both **RC** and **RH/R** terminals, remove metal jumper.
- 2 If there has **C** or **X** wire available then you can connect with **C** terminal, if there is no **C** or **X** wire then no need to connect with **C** terminal.
- 3 If you have a **heat pump** without auxiliary/backup heat connect **O** or **B**, not both. If you do not have a **heat pump**, do not connect **B**. Wrap bare end of wire with electrical tape.
- 4 Place a jumper (piece of wire) between **Y** and **W** if you are using a heat pump without auxiliary/backup heat



## Caution: Electrical Hazard

Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.



## Warning:

All components of the control system and the thermostat installation must conform to Class II circuits per the NEC Code.

## Wiring

1. If you are replacing a thermostat, make note of the terminal connections on the thermostat that is being replaced. In some cases the wiring connections will not be color coded. For example, the green wire may not be connected to the **G** terminal.
2. Loosen the terminal block screws. Insert wires then retighten terminal block screws.
3. Place nonflammable insulation into wall opening to prevent drafts.

## Tips:

### RH & RC terminals

For single transformer systems, leave the jumper wire in place between RH and RC. Remove jumper wire for two transformer systems.

### Heat pump systems (With No AUX or Emergency Heat)

If wiring to a heat pump, use a small piece of wire (not supplied) to connect terminals W and Y.

## Terminal Designations

- W** Heat relay   **G** Fan relay   **Y** Compressor relay
- O** Heat pump changeover valve energized in cooling
- RC** Transformer power for cooling
- RH** Transformer power for heating
- B** Heat pump changeover valve energized in heating
- C** Common wire from secondary side of cooling system transformer or for heat only system transformer

### Wire specifications

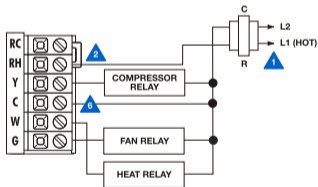
Use shielded or non-shielded 18 - 22 gauge thermostat wire.

### C terminal

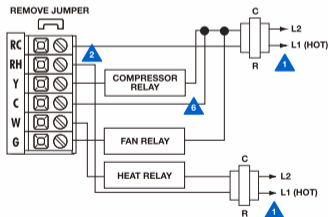
The C (common wire) terminal does not have to be connected when the thermostat is powered by batteries.

- 1 Power supply
- 2 Factory-installed jumper. Remove only when installing on 2-transformer systems.
- 3 Use either O or B terminals for changeover valve
- 4 Use a small piece of wire (not supplied) to connect W and Y terminals
- 5 Set fan operation switch to electric
- 6 Optional 24 VAC common connection when thermostat is used in battery power mode

## Typical 1H/1C system: 1 transformer

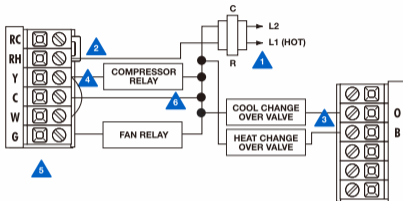


## Typical 1H/1C system: 2 transformer

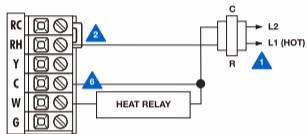


# WIRING

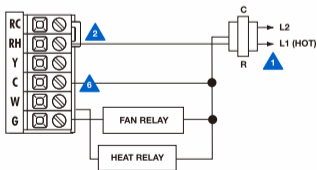
## Typical 1H/1C heat pump system



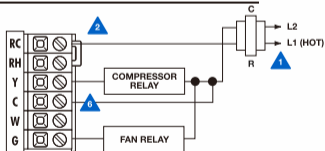
## Typical heat-only system



## Typical heat-only system with fan



## Typical cool-only system

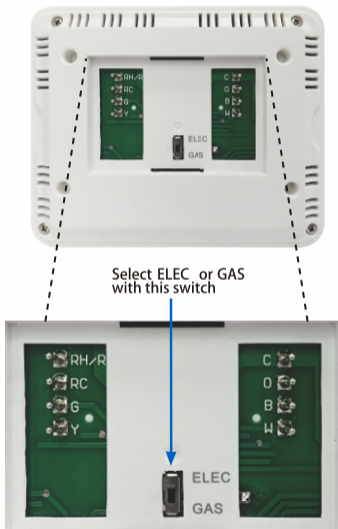


## Gas or Electric Setup

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**Gas:** For systems that control the fan during a call for heat, put the fan operation switch to the **GAS** position.





**Electric:** The thermostat operation switch should be put in the **ELEC** position. This setting allows the thermostat to operate the fan when the fan relay is connected to the **G** terminal.



# TECHNICIAN SETUP

## Adjusting the Temperature Swing

The swing setting, often called CYCLE RATE, DIFFERENTIAL or ANTICIPATION is adjustable. A smaller swing setting will cause more frequent cycles and a larger swing setting will cause fewer cycles. There are separate swing settings for heat and for cool. Follow the steps below to adjust the SWING setting for heat or cool:








1. Select HEAT or COOL with the system switch.
2. Hold down the  and  keys together for 3 seconds.
3. Use the  or  key to adjust the swing. The swing is adjustable from  $\pm 0.2^\circ$  F to  $\pm 2^\circ$  F. For example: A swing setting of  $0.5^\circ$  F will turn the cooling on at approximately  $0.5^\circ$  F above the setpoint and turn the cooling off at approximately  $0.5^\circ$  F below the setpoint. The factory default for cooling is  $0.5^\circ$  F and  $0.4^\circ$  F for heating.
4. Wait approximately 10 seconds for the thermostat to return to normal operation.

## Tip

Temperature swing, sometimes called differential or cycle rate, can be customized for this individual application. For most applications choose a swing setting that is as long as possible without making the occupants uncomfortable.

## Adjusting Room Temperature Calibration, Fahrenheit/Celsius Display and Compressor Delay

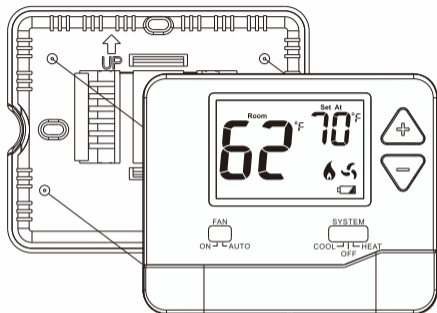
This feature allows the installer to change the calibration of the room temperature display. For example: If the thermostat reads  $70^\circ$  and you would like it to read  $72^\circ$  then select +2. You can adjust the room temperature display to ready  $-4^\circ$  F to  $+4^\circ$  F above or below the factory calibrated reading. Follow the steps below to adjust the temperature reading:

1. Select OFF with the system switch.
2. Hold down the  and  keys together for 3 seconds.
3. Use the  key - to adjust the room temperature display.
4. Then press  to access the F (Fahrenheit) or C (Celsius) setting, use  to select.
5. Press  again to access the DELAY selection, the compressor delay will not allow the compressor to be turned on for 3 minutes after the last time the compressor was on. Use the  to select ON or OFF (ON: the Y terminals will turn off for at least 3 minutes). Wait approximately 15 seconds or slide the system switch to return to normal operation.

# MOUNT THERMOSTAT & BATTERY INSTALLATION

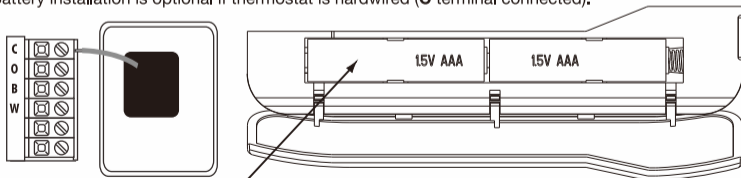
## Mount Thermostat

Align the 4 tabs on the subbase with corresponding slots on the back of the thermostat, then push gently until the thermostat snaps in place.



## Battery Installation

Battery installation is optional if thermostat is hardwired (C terminal connected).



Insert 2 AAA Alkaline batteries.



# SPECIFICATIONS & CONTACT INFORMATION

## Specifications

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The display range of temperature . . . . .	41°F to 95°F (5°C to 35°C)
The control range of temperature . . . . .	44°F to 90°F (7°C to 32°C)
Load rating . . . . .	1 amp per terminal, 1.5 amp maximum all terminals combined
Display accuracy . . . . .	± 1°F
Swing (cycle rate or differential) . . . . .	Heating is adjustable from 0.2°F to 2.0°F Cooling is adjustable from 0.2°F to 2.0°F
Power source . . . . .	18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire (common wire) Battery power from 2 AAA Alkaline Energizer batteries
Operating ambient . . . . .	32°F to +105°F (0°C to +41°C)
Operating humidity . . . . .	90% non-condensing maximum
Dimensions of thermostat . . . . .	4.72"W x 3.86"H x 0.98"D

# Operation Manual

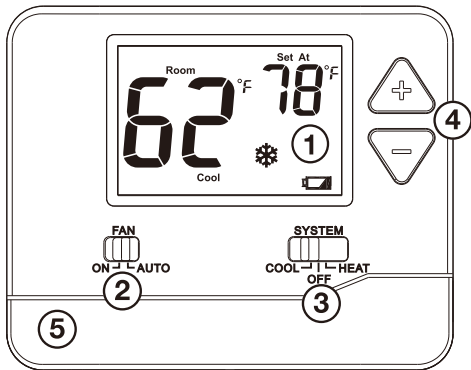
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**Caution**

Equipment damage hazard. Do not operate the cooling system if the outdoor temperature is below 50 °F (10 °C) to prevent possible compressor damage.

## Thermostat Operation



- 1** LCD Display
- 2** Fan Switch
- 3** System Switch
- 4** Temperature Setpoint Buttons
- 5** Easy change battery door

- 1 LCD Display**

See page 6 for details about this display read out.
- 2 Fan Switch**

Select **ON** or **AUTO**. **ON** will run the fan continuously. **AUTO** will cycle the fan on only when the heating or cooling system is on.
- 3 System Switch**

Selects the operation mode on your HVAC system. Selecting **HEAT** turns on the heat mode. Selecting **COOL** turns on the cool mode. Selecting **OFF** turns both heating and cooling off.
- 4 Temperature Setpoint Buttons**

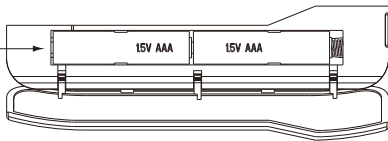
Press the + or - buttons to select the desired room temperature.
- 5 Easy Change Battery Door**

See page 4 for details.

# Thermostat Quick Reference

## Battery Door Information

Replace with 2x AAA Alkaline Batteries. High quality Alkaline batteries are recommended.



Use the finger bevel on the lower portion of the thermostat to open the easy access battery door.



### Caution:

When the battery icon  appears replace your 2x AAA batteries immediately. Failure to do so may result in your heating & cooling system becoming inoperable. Freezing or overheating can occur.



### **Important:**

The low battery indicator is displayed when the 2x AAA battery power is low.

Restore factory Settings: press and hold the "-" key , install the battery, release the button when the display is normal.

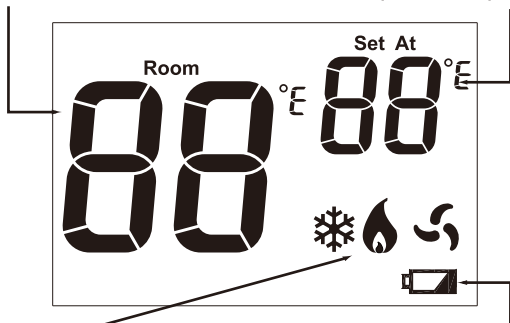
# Thermostat Quick Reference

## Room Temperature:

Indicates the current room temperature.

## Setpoint Temperature:

Displays the selected setpoint temperature.



## System Operation Indicators:

The  ,   
or  icon will display  
when the COOL, HEAT  
or  (fan) is on.

**NOTE:** The compressor delay feature is active if these icons are flashing. The compressor will not turn on until the 3 minute delay has elapsed.

## Low Battery Indicator:

Replace batteries when indicator is shown.



## Adjusting the Temperature Swing

### ●HEAT SWING

Select HEAT with the system switch, hold down the + and - buttons together for 3 seconds to access the HEAT SWING setting. Use the + or - key to adjust the swing from  $\pm 0.2^{\circ}\text{F}$  to  $\pm 2^{\circ}\text{F}$ . Wait approximately 10 seconds or slide the system switch to return to normal operation.

### ●COOL SWING

Select COOL with the system switch, hold down the + and - buttons together for 3 seconds to access the COOL SWING setting. Use the + or - key to adjust the swing from  $\pm 0.2^{\circ}\text{F}$  to  $\pm 2^{\circ}\text{F}$ . Wait approximately 10 seconds or slide the system switch to return to normal operation.

## Installation Setting

Select OFF with the system switch, hold down the + and - buttons together for 3 seconds to access the CALIBRATION setting. Use the + to adjust the temperature from  $-4^{\circ}\text{F}$  to  $+4^{\circ}\text{F}$ .

Then press - to access the F(Fahrenheit) or C(Celsius) setting, use + to select.

Press - again to access the DELAY selection, the compressor delay will not allow the compressor to be turned on for 3 minutes after the last time the compressor was on. Use the + to select ON or OFF (ON: the Y terminals will turn off for at least 3 minutes). Wait approximately 15 seconds or slide the system switch to return to normal operation.

## Terminal Designations

RH----- ----24VAC(system power supply)HEAT=RH TO W

RC-----COOL= RC to Y FAN=RC TO G

C-----Common24VAC (system power supply)

W----- HEAT

Y----- COOL

G-----FAN

B-----REV VALVE HEAT

O-----REV VALVE COOL

# Operation Manual