PRO1 ® IAQ

TRUE COMFORT ||||

This manual covers the following models:
- **T631W-2**
- Base Module

Thermostat Applications Guide

Description	
Gas or Oil Heat	Yes
Electric Furnace	Yes
Heat Pump (No Aux. or Emergency Heat)	Yes
Heat Pump (with Electric Aux.)	Yes
Heat Pump (with Gas Aux.)	No
Multi-stage Systems	No
Heat Only Systems	Yes
Heat Only Systems - Floor or Wall Furnaces	Yes
Cool Only Systems	Yes
High and Low Fan Speed	Yes
Millivolt	No
Emergency Heat	No
Conventional Single Stage Furnace	Yes
Geothermal	Yes

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.

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Need Help?

For assistance with this product please visit http://www.pro1iaq.com or call Pro1 Customer Care toll-free at 888-Pro1iaq (776-1427) during normal business hours (Mon-Fri 9 AM - 6 PM Eastern)

Una versión española de este manual puede ser descargada en www.pro1iaq.com

Wall locations

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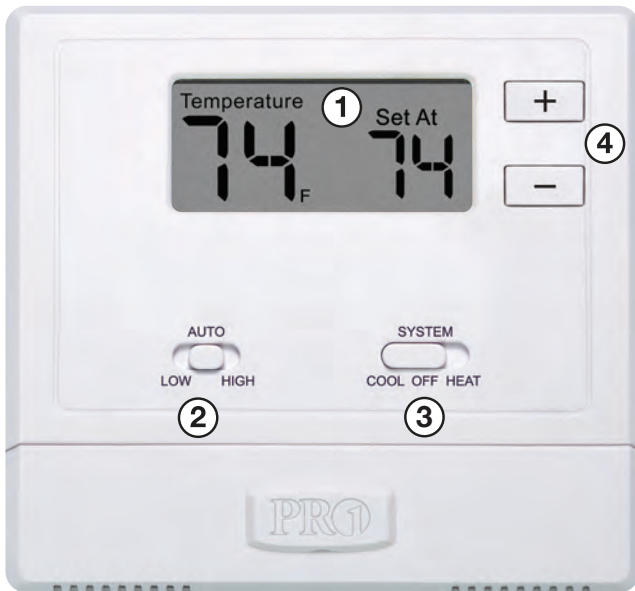Select an area with average temperature and good air circulation.

NO

NO   **NO**   **YES**
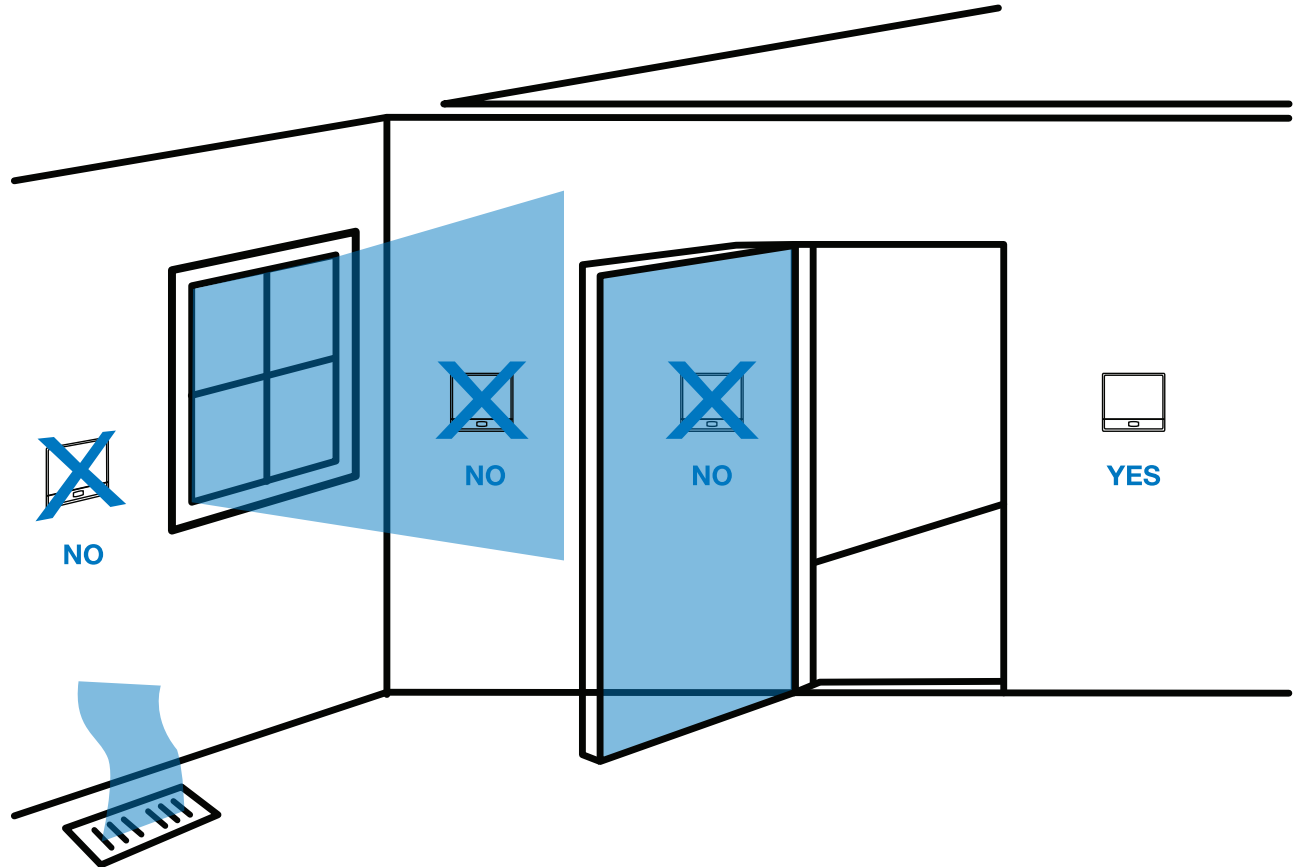
Do not install thermostat in locations:
• Close to hot or cold air ducts
• That are in direct sunlight
• With an outside wall behind the thermostat
• In areas that do not require conditioning
• Where there are dead spots or drafts (in corners or behind doors)
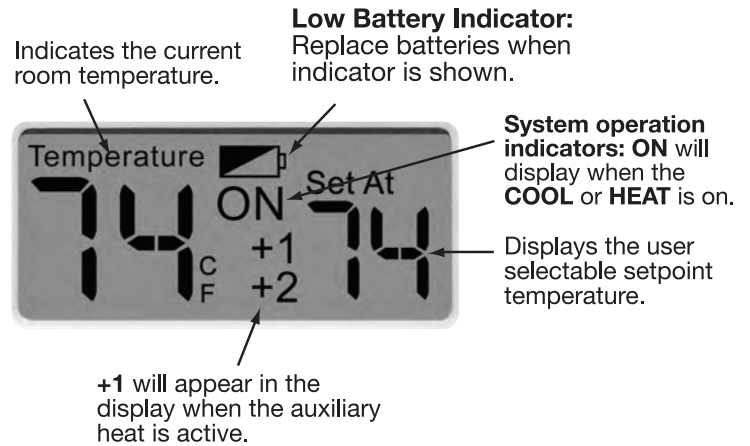• Where there might be concealed chimneys or pipes

PRO1 Tip

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

Getting to know your thermostat

① LCD

Indicates the current room temperature.

Low Battery Indicator: Replace batteries when indicator is shown.

System operation indicators: ON will display when the **COOL** or **HEAT** is on.

Displays the user selectable setpoint temperature.

+1 will appear in the display when the auxiliary heat is active.

② Fan Switch

③ System Switch

④ Setpoint Buttons

⚠ **Important:**
The low battery indicator is displayed when the AA battery power is low. If the user fails to replace the battery within 21 days, the thermostat display will only show the low battery indicator as a final warning before the thermostat becomes inoperable.

Removing the private label badge

Use the bevel on lower ridge

Magnet in door
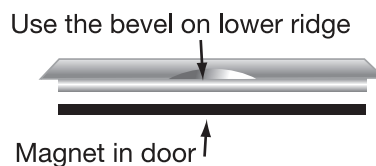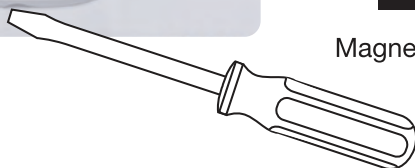
Gently slide a screwdriver into the bottom edge of the badge. Gently turn the screwdriver counter clockwise. The badge is held on by a magnet. The badge should pry off easily. **Do not use force.**
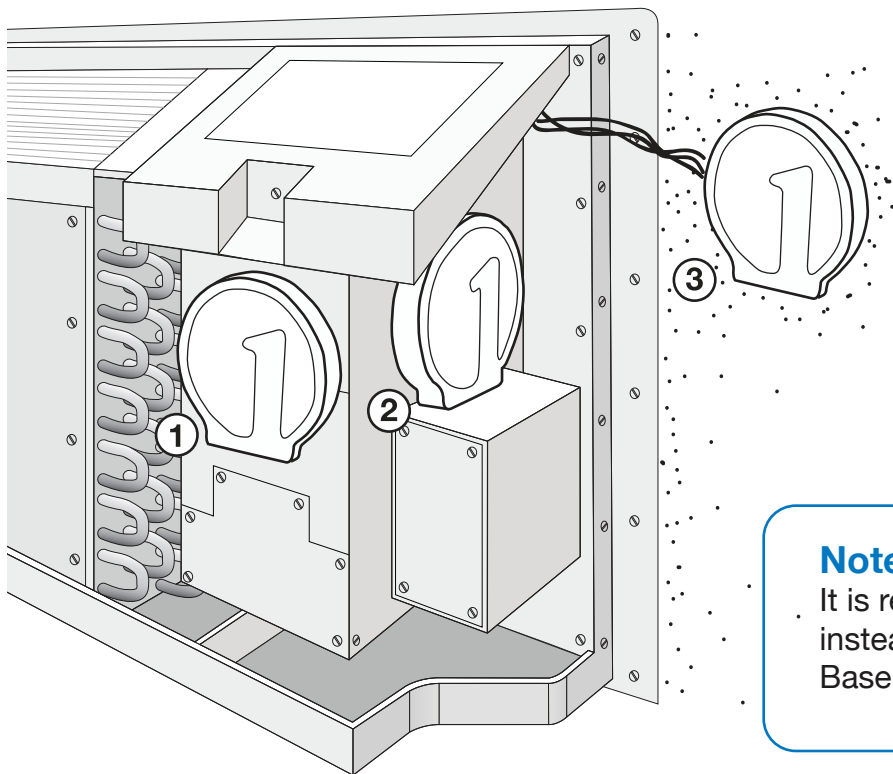
PRO1 Tip

All Pro1 thermostats use the same universal magnetic badge.
Visit our website at www.pro1iaq.com to learn more about our free private label program.

Base Module - PTAC Installation

Wireless Range

Range between the T631W-2 and the base module is up to 100 feet with no obstructions and up to 50 feet through standard building materials. To optimize the range try placing the base unit higher if in a basement or further away from large metal objects.

The base module is designed to be mounted behind the front grille of a packaged terminal air conditioner (PTAC). Refer to the PTAC manufacturer s manual for instruction to remove the front grille. Check clearance to ensure the fit of front grille after base module installation. Ensure if mounting with screws that wires and lines are not damaged. See below for a few suggested options to mount the base module.

① **Front Mount:**
Inside PTAC Housing

② **Side Mount:**
Inside PTAC Housing

③ **Wall Mount:**
Outside PTAC Housing

Note:
It is recommended to use an adhesive instead of screws when mounting the Base Module inside the PTAC housing.

PRO1 Tip

Do not install the base module in locations:
• That are behind a chimney
• That require the signal to pass through significant metal or concrete blocks
• Where temperature could exceed 150ºF
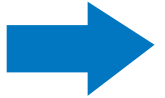• Where rain or snow or extreme hot or cold is possible

Caution:
Electrical Hazard
Failure to disconnect the power before beginning to install this product can cause electrical shock or equipment damage.
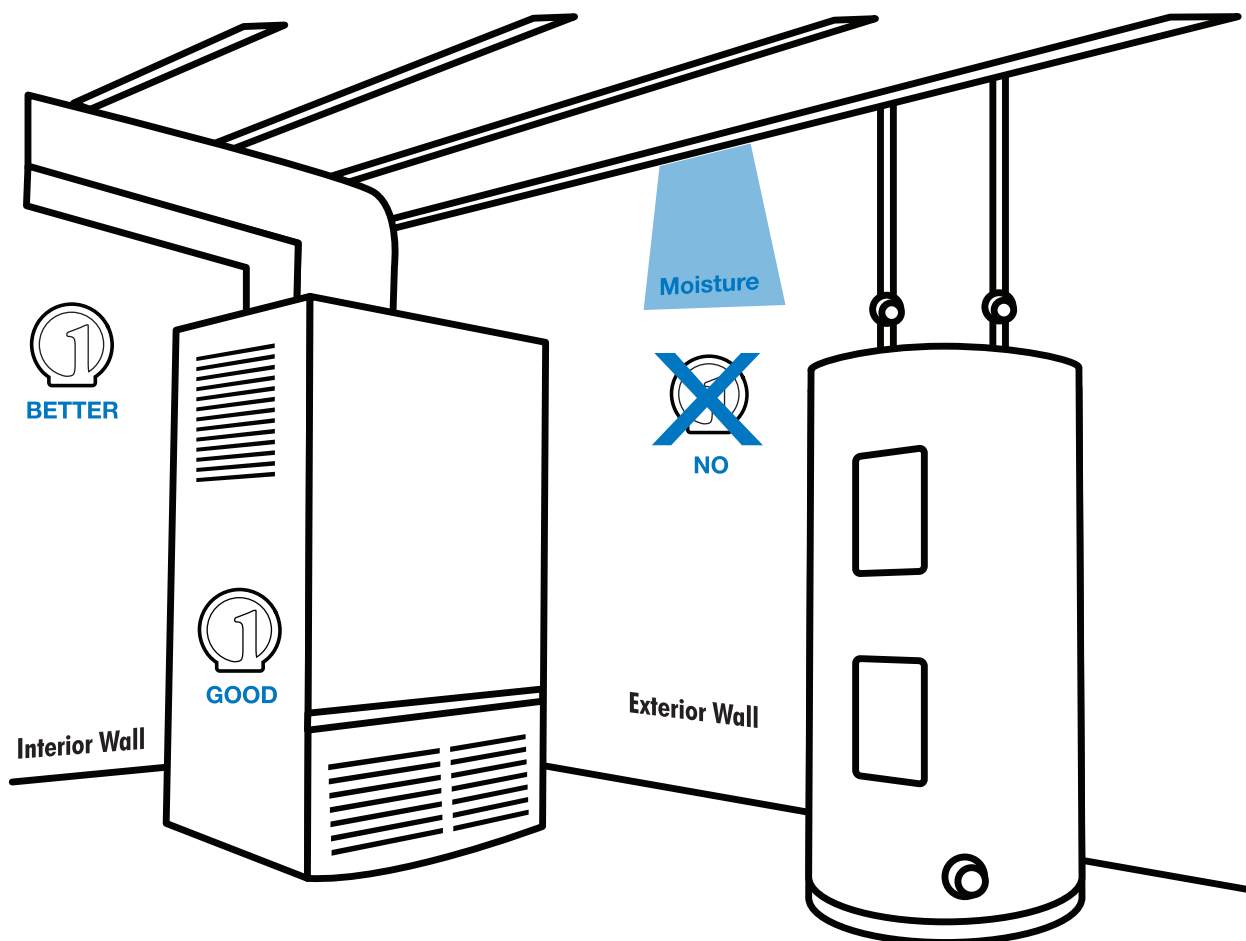
BASE MODULE TIPS

Base Module - Basement Installation

Wireless Range

Range between the T631W-2 and the base module is up to 100 feet with no obstructions and up to 50 feet in standard residential metal, brick, and concrete construction. To extend the range try placing the base unit higher if in a basement or further away from large metal objects.

BETTER

Moisture

NO

GOOD

Exterior Wall

Interior Wall

PRO1 Tip

Do not install the base module in locations:
• That are behind a chimney
• Where temperature could exceed 150°F
• Where rain or snow or extreme hot or cold is possible

NOTE: The base module is NOT weatherproof.

Base Module - Attic Installation

When performing an attic installation, instead of placing the base module in the attic, locate the closet nearest to the air conditioning unit. Then mount the base module high on the wall inside the closet or on the ceiling of the closet. This location will insure the base module is below the 150ºF maximum ambient temperature specification.
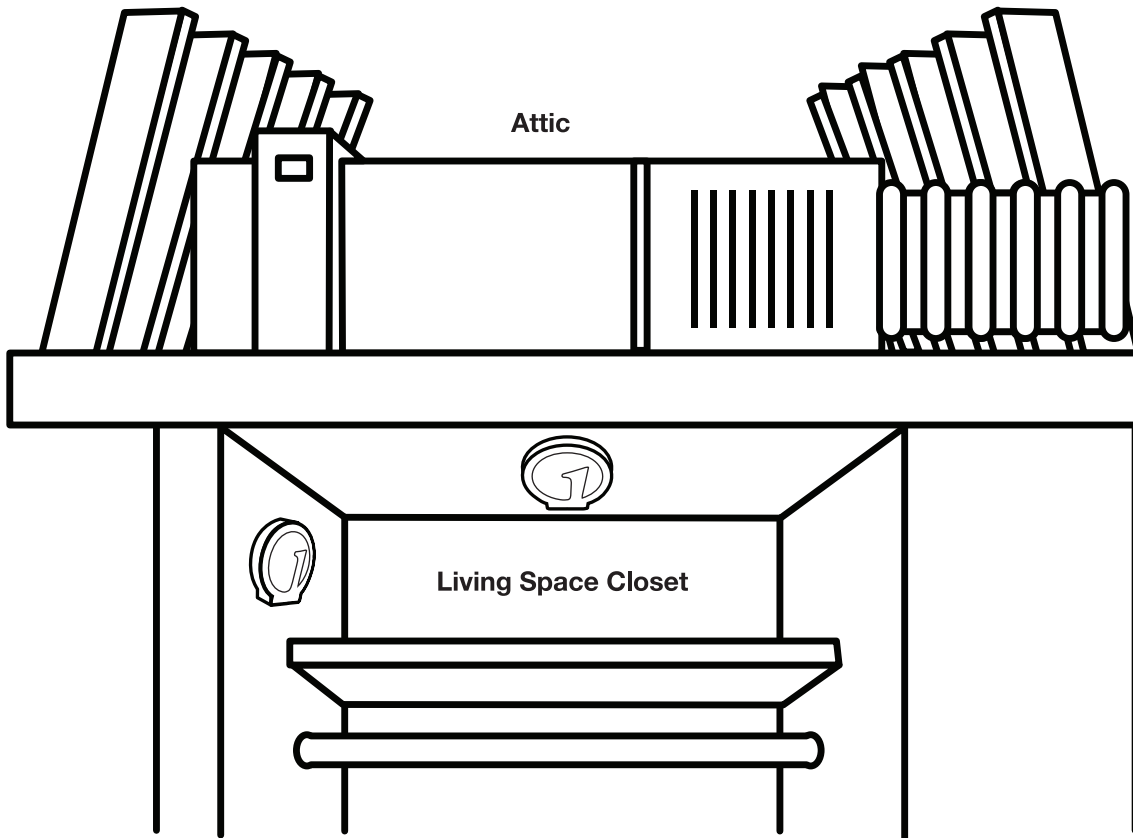

PRO1 Tip

Do not install the base module in locations:
• That are behind a chimney
• Where temperature could exceed 150°F
• Where rain or snow or extreme hot or cold is possible

NOTE: The base module is NOT weatherproof.

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 Pro1's 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.

Vertical mount

UP

Horizontal mount

Horizontal mount

Vertical mount
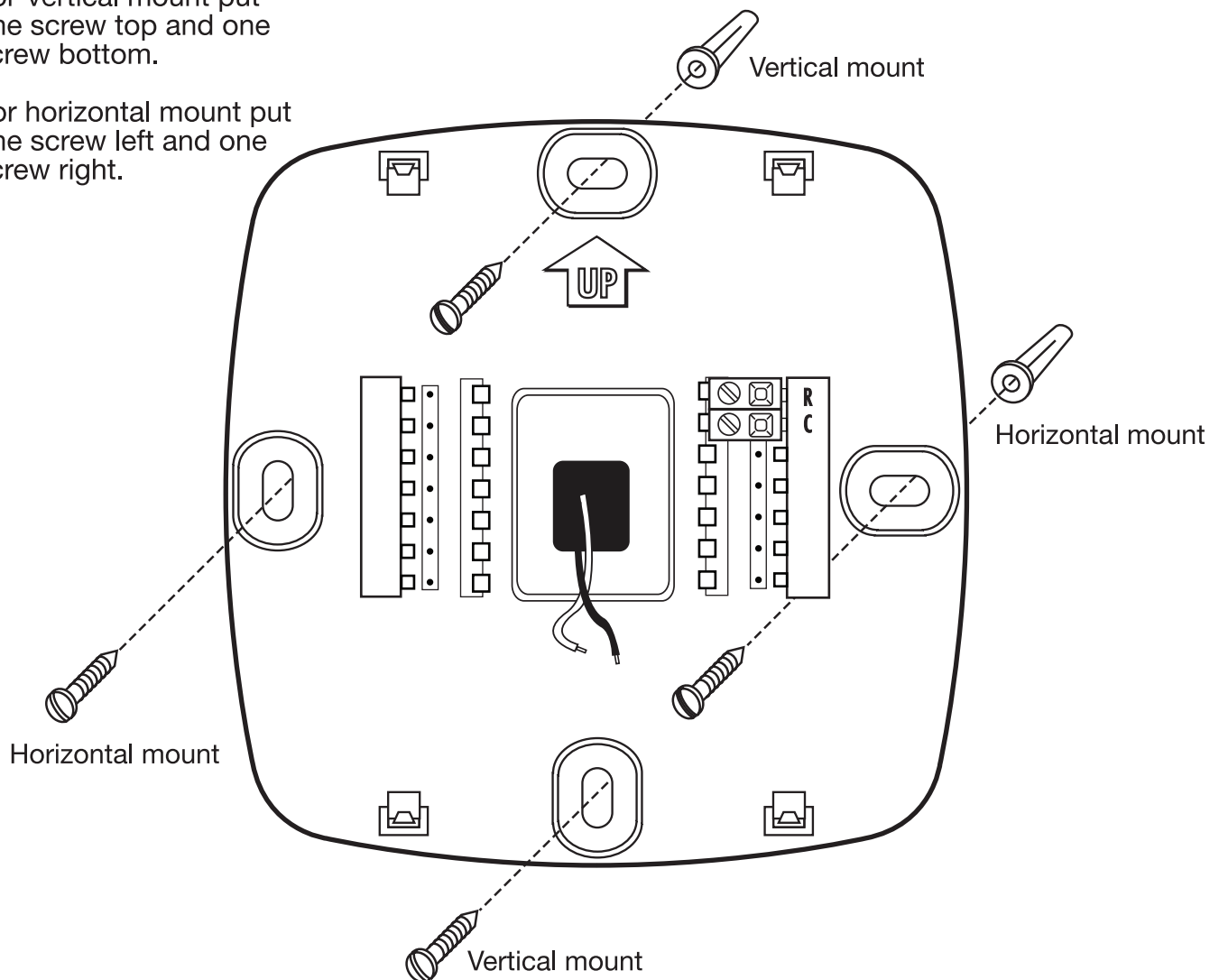
PRO1 Tip

It is recommended that the thermostat be hardwired, however, it is not required. Batteries should be checked annually if 24V power is not connected.

Wiring Note:
Wire the base module's sub-base the same way you would wire a hardwired thermostat subbase.

Note:
To connect the base module to master thermostat, refer to the directions on page 11 of this manual.

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

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

Vertical mount

Horizontal mount

UP

C
Y
O/B
GH

R
W
GL

Horizontal mount

Vertical mount
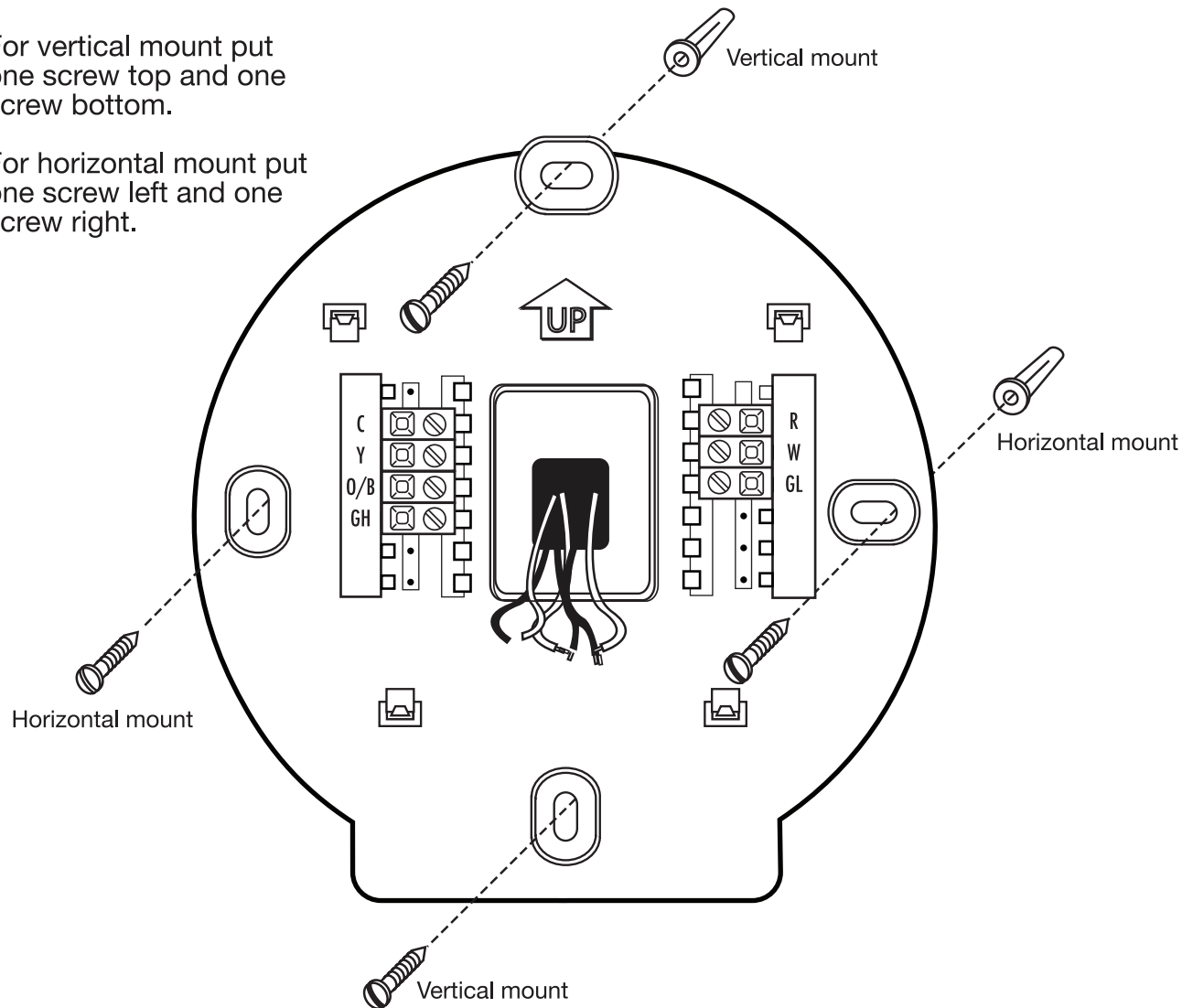
Note:
When mounting to a PTAC, ensure screws will not damage wires or coils.

The sub-base may be mounted using adhesive tape, such as double-sided tape or hook and loop strips when drilling is not practical.

The base module must be hardwired (C and R terminals connected to 24V power).

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.

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

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

Terminal Designations on Base Module

This thermostat is shipped from the factory to operate a conventional heating and cooling system. This thermostat will also operate a heat pump system. See the "heat pump" configuration step on page 10 of this manual to configure the thermostat for heat pump applications.

| Terminal	1 Heat 1 Cool Conventional System	1 Heat 1 Cool Heat Pump System	2 Heat 1 Cool Heat Pump System
R	Transformer power	Transformer power	Transformer power
C	Transformer common	Transformer common	Transformer common
B	Energized in heating	Heat pump changeover valve energized in heating	Heat pump changeover valve energized in heating
O	Energized in cooling	Heat pump changeover valve energized in cooling	Heat pump changeover valve energized in cooling
GL	Fan relay, Low	Fan relay, Low	Fan relay, Low
GH	Fan relay, High	Fan relay, High	Fan relay, High
W	First stage of heat	NA	Second stage of heat
Y	First stage of cool	First stage of heat & cool	First stage of heat & cool

Terminal Designations on T631W-2 Master Thermostat

| Terminal	1 Heat 1 Cool Conventional System	1 Heat 1 Cool Heat Pump System	2 Heat 1 Cool Heat Pump System
R	24 VAC Transformer power	24 VAC Transformer power	24 VAC Transformer power
C	Transformer common	Transformer common	Transformer common

Connecting to a PTAC:

When connecting the Base Module to a PTAC, refer to the PTAC manufacturer instructions to enable remote thermostat operation.

1 Power supply

2 Jumper (not supplied) to connect GL and GH terminals

3 The thermostat must be set to O or B to match the changeover valve, O is cool changeover valve, B is heat changeover valve.

4 The Aux Heat Relay is energized as the second stage of heat.
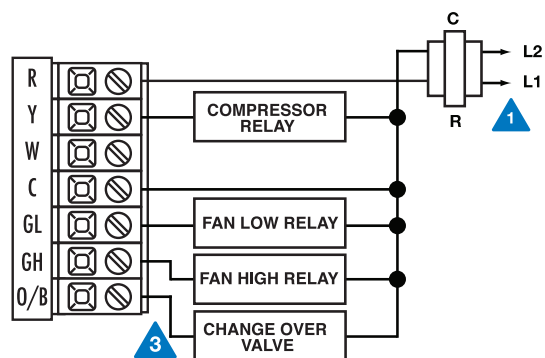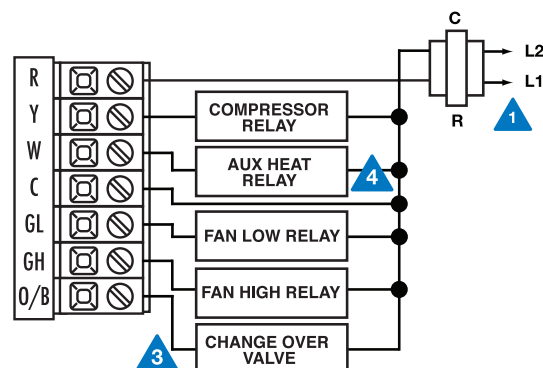
Typical 1H/1C system: 2 speed fan
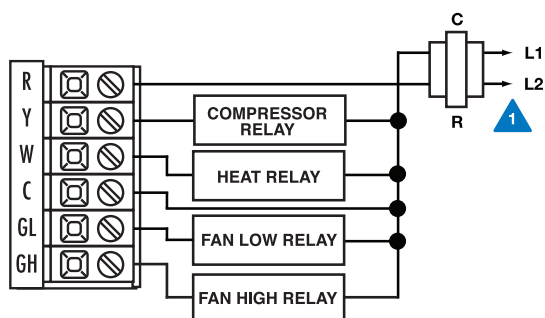
Typical 1H/1C system: 1 speed fan
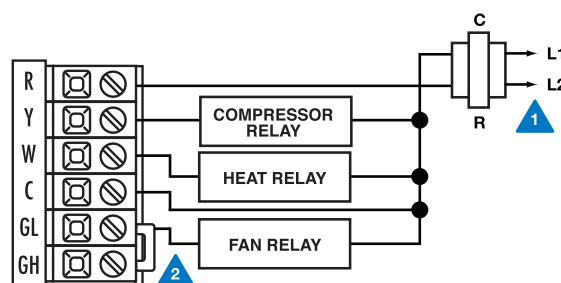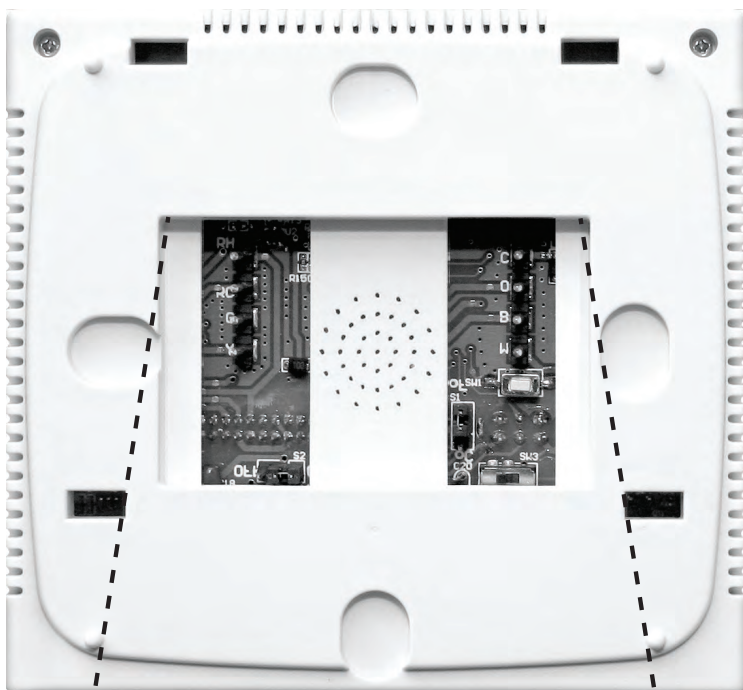

Typical 1H/1C Heat Pump system: 2 speed fan
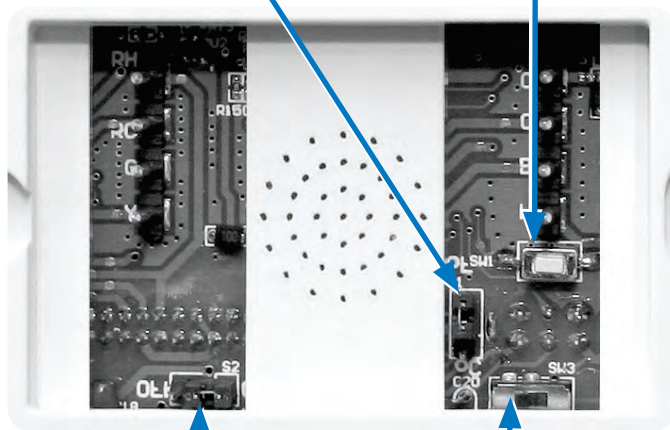

Typical 2H/1C Heat Pump system: 2 speed fan

Note:
Most PTAC systems support two speed fan operation. In a single speed fan PTAC system or conventional single speed fan system, a jumper should be installed between GL and GH.

Select **F** or **C** with the jumper pin   Reset button

Select delay **ON** or **OFF** with the jumper pin

Select **ELEC** or **GAS** with this switch

⚠️ **Important:**
The **RESET** button must be pressed after changing any switch or jumper pin setting. Batteries must be installed for this operation.

Gas or Electric Setup

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. Most PTAC systems will require ELEC fan relay.

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

Fahrenheit/Celsius Display

Select **F** or **C** with the jumper pin on the back of the thermostat.

Compressor Short Cycle Delay

The compressor short cycle delay protects the compressor from "short cycling". This feature will not allow the compressor to be turned on for 5 minutes after it was last turned off.

Using the jumper on the back of the thermostat, selecting **ON** will not allow the compressor to be turned on for 5 minutes after the last time the compressor was on. Selecting **OFF** will remove this delay.

Technician Setup Menu

This thermostat has 3 different setup configurations. To setup the thermostat for your particular application:

1. Set the thermostat system switch to **OFF**.

2. Press and hold ⎣ − ⎦ and ⎣ + ⎦ together for 3 seconds. This 3 second delay is designed so that users do not accidentally access installer settings.

3. Configure the installer options as desired using the table below.

    Use ⎣ − ⎦ and ⎣ + ⎦ to change settings.

    Tap ⎣ − ⎦ and ⎣ + ⎦ together to move to the next step.

    NOTE: When you want to exit Tech Setup options, move the system switch to **HEAT** or **COOL**.

Tech Setup Options

| Room Temperature Calibration	Change Over Valve Selection	Heat Pump	Heating Temperature Setpoint Limit	Cooling Temperature Setpoint Limit	Link Establish	Cooling Swing (SYSTEM COOL)	Heating Swing (SYSTEM HEAT)
This feature allows the installer to change the calibration of the room temperature display. For example, if the thermostat reads 70° and you would like it to read 72° then select +2.	Select **0** for a changeover valve that energizes in cooling. Select **b** for a change over valve that energizes in heating.	When turned on the thermostat will operate a heat pump. Y will be first stage of heat & cool, W will be second stage heat.	This feature allows you to set a maximum heat setpoint value. The setpoint temperature cannot be raised above this value.	This feature allows you to set a minimum cool setpoint value. The setpoint temperature cannot be lowered below this value.	This step is used to connect T631W-2 to Base Module. Refer to page 13 for connection instructions.	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.	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.
LCD Will Show							
CA 0	CO 0	HU OF	HE 90	CL 45	LE	08	08
Adjustment Options							
You can adjust the room temperature display to read -4°F to +4°F above or below the factory calibrated reading.	**0** for cooling changeover valve **b** for heating changeover valve	OFF configures the thermostat for non heat pump systems. ON configures the thermostat for heat pump systems.	45.0 ºF - 90.0 ºF	45.0 ºF - 90.0 ºF	NA	The cooling swing setting is adjustable from ±0.2°F to ±2°F. For Example: A swing setting of 0.5°F will turn the cooling on at approximately 0.5°F above the setpoint and turn the cooling off at approximately 0.5°F below the setpoint.	The heating swing setting is adjustable from ±0.2°F to ±2°F. For Example: A swing setting of 0.5°F will turn the heating on at approximately 0.5°F below the setpoint and turn the heating off at approximately 0.5°F above the setpoint.
Factory Default Settings							
0 ºF	0	OFF	90 ºF	45.0 ºF	NA	0.8 ºF	0.8 ºF

PRO1 Tip

The second stage will turn on at 2x the swing setting. The second stage will turn off when 1x the swing is reached. For example, if the swing setting is 0.8º for heating and the thermostat is set at 70ºF, the first stage will turn on at approximately 69.2ºF. The second stage will turn on at 68.4ºF. The second stage will turn off at 69.2ºF and the first will turn off at 70.8ºF.

Establishing Communication between T631W-2 and the Base Module

Easy, Two Step Communication Link

To set up the initial link between the Thermostat and the base module please follow the steps below:

1. Press and hold the **base module** button for 3 seconds. The **Blue LED** will flash when ready to receive initial signal from **T631W-2**. (Base module must be powered by 24V. **Blue LED** will be continuously on when 24V power is present.)

2. Set the thermostat system switch to OFF. Press and hold ⌐−⌐ and ⌐+⌐ for 3 seconds. Tap ⌐−⌐ and ⌐+⌐ together until LE is displayed. Press and hold ⌐+⌐ until LE flashes 3 times, the Blue LED on the base module will stop flashing after communication has been established between base module and T631W-2.

Blue LED

Step 1.
LED Relay Indicators

Base Module Button
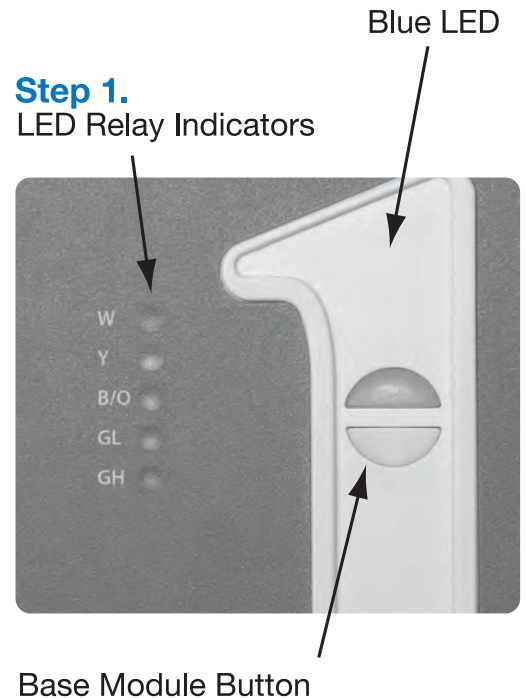
> **Note:**
> The **Blue LED** on the **base module** will be on when power is present. The **Blue LED** will flash 3 times every time it receives a signal from **T631W-2**. When a relay is on the corresponding LED relay indicator will be on.

Step 2.

> **Note:**
> If the base module does not receive a signal from the **T631W-2** for 15 minutes it will turn off all relays until communication is reestablished. The **Blue LED** on the base module will also turn off to show communication has been lost.

> **Important:**
> **DO NOT** hold the ⌐+⌐ button when **LE** is displayed after **Step 2**, above has been completed. This will break the communication link and the base module button will need to be pressed again to reestablish communication.

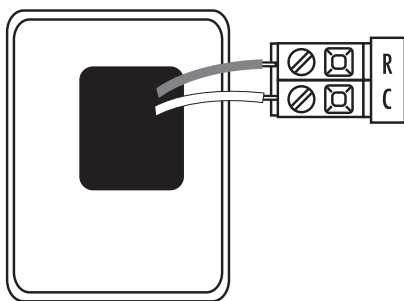# MOUNT THERMOSTAT & BATTERY INSTALLATION

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 (R and C terminal connected to 24v power).

Insert 2 AA Alkaline batteries (included).

Specifications

T631W-2 Thermostat

The display range of temperature .... 41ºF to 95ºF (5ºC to 35ºC)
The control range of temperature .... 44ºF to 90ºF (7ºC to 32ºC)
Load rating .... 1 amp per terminal, 1.5 amp maximum all terminals combined
Display accuracy .... ± 1ºF
Swing (cycle rate or differential) .... Heating is adjustable from 0.2ºF to 2.0ºF
Cooling is adjustable from 0.2ºF to 2.0ºF
Power source .... 18 to 30 VAC, NEC Class II, 50/60 Hz for hardwire (common wire)
Battery power from 2 AA Alkaline batteries
Operating ambient .... 32ºF to +105ºF (0º to +41ºC)
Operating humidity .... 90% non-condensing maximum
Dimensions of thermostat .... 4.7"W x 4.4"H x 1.1"D
Frequency .... 916 MHz

Base Module

Load rating .... 1 amp per terminal, 1.5 amp maximum all terminals combined
Power source .... 18 to 30 VAC, NEC Class II, 50/60 Hz
Operating ambient .... 32ºF to +150ºF (0º to +65ºC)
Operating humidity .... 90% non-condensing maximum

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