

## Programmable Thermostats

## Detailed User Guide

### 2000NC

Single Stage Heat / Cool  
Conventional and Heat Pump

### 2200NC

Up to 2 Heat / 1 Cool  
Conventional and Heat Pump

*Model number is located on  
thermostat sub-base*

- |                         |                                 |
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**Warning** Turn off power to the heating or cooling equipment before installation.



**Attention** For installation by experienced service technicians only. Follow applicable codes.

### **Read all instructions before proceeding.**

*This thermostat requires 24 Volt AC Power or two (2) properly installed "AA" Alkaline batteries for proper operation. When connecting 24 Volt AC Power the batteries may be installed as a backup.*

**For use only as described in this manual. Any other use will void warranty.**

## 1 Specifications

### **This thermostat is compatible with:**

- Single stage heat / cool conventional and heat pump systems
- Conventional systems up to 2 heat / 1 cool (2200NC only)
- Single compressor heat pump systems with an auxiliary heat stage (2200NC only)
- 250 – 750 millivolt heat only systems

### **Electrical and control specifications:**

- Electrical Rating: 24 Volt AC
- 1 amp maximum load per terminal
- AC Power: 18 – 30 Volts AC
- DC Power: 3.0 Volt DC (2 "AA" Alkaline Batteries Included)
- Control Range: 45° – 90° F (7° – 32° C)
- Temperature Accuracy: +/- 1° F (+/- .5° C)

### **Terminations**

- 2000NC – Rc, Rh, B, O, Y, W, G, C
- 2200NC – R, O, B, C, Y1, E/W1, G, W2

## 2 About Your Thermostat



- 1 Day of Week**.....Displays the current day of week
- 2 Program Event Indicator**..Indicates the current program event
- 3 Time of Day**.....Displays the current time of day
- 4 System Status Indicator**...Flashes when heat or cool is running
- 5 Low Battery Indicator** .....Indicates when batteries need to be replaced
- 6 Hold Mode Indicator**.....Displays if in HOLD mode
- 7 Room Temperature\*** .....Displays the current room temperature  
**Set Temperature\*** .....Displays the current set point temperature
- 8 Service Filter Indicator**.....Displays a filter service reminder

*\*The room temperature is normally shown. To view the set temperature, briefly press and release the  $\blacktriangle$  button.*



- 1 Arrow Buttons** .....Used to increase or decrease settings
- 2 System Switch**.....Selects Heat, Cool or Off
- 3 PROG Button** .....Selects programming mode
- 4 HOLD Button** .....Enters/Exits the HOLD mode (program bypass)
- 5 RETURN Button** .....Returns to normal from program or setting modes
- 6 DAY/TIME Button** .....Used to set the time and day of week
- 7 Reset Button** .....Resets thermostat clock and program
- 8 Backlight Button** .....Illuminates the display backlight
- 9 Fan Switch**.....Selects the system fan mode
- 10 Battery Compartment**....Stores 2 "AA" Alkaline Batteries

### 3 Installation

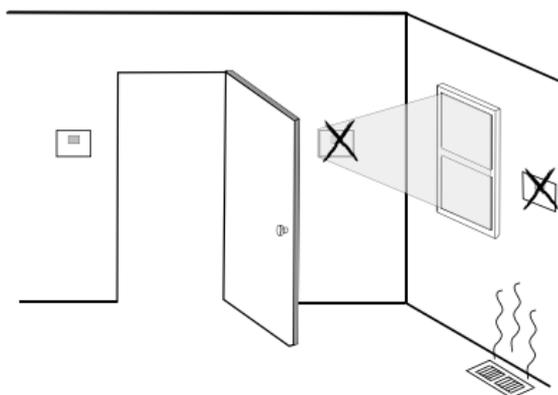


**Warning** *Disconnect power before beginning installation.*

#### Thermostat Location

Install the thermostat approximately 4-5 feet (1.2 - 1.5m) above the floor in an area that has a good amount of air circulation and maintains an average room temperature.

Avoid installation in locations where the thermostat can be affected by drafts, dead air spots, hot or cold air ducts, sunlight, appliances, concealed pipes, chimneys and outside walls.



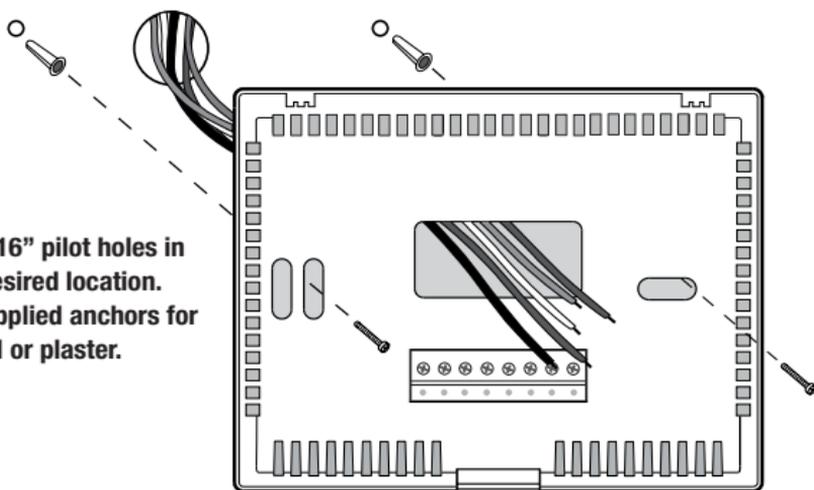
#### Install your new Braeburn thermostat in 5 basic steps:

- 1 Install the Sub-Base
- 2 Provide Power
- 3 Connect Your Wires
- 4 Set Installer Switches
- 5 Attach Thermostat to Sub-Base

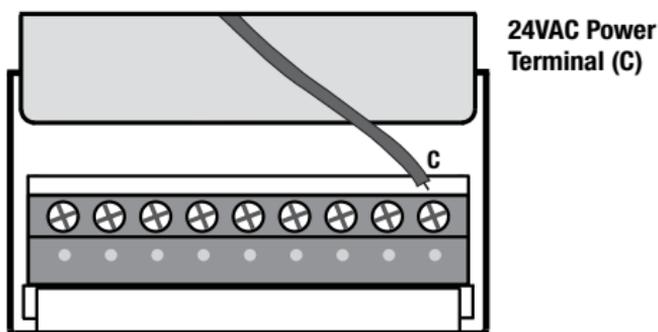
#### 1 Install the Sub-Base:

- Remove the sub-base from the body of the thermostat.
- Mount the sub-base as shown below:

Drill 3/16" pilot holes in your desired location. Use supplied anchors for drywall or plaster.



## 2 Provide Power



- For **24 Volt AC power**, you must connect the common side of the transformer to the C terminal on the thermostat sub-base.
- For **primary or back-up power**, insert the 2 supplied “AA” type alkaline batteries into the battery compartment located on the front of the thermostat, near the bottom. Make sure to position the Positive (+) and Negative (-) sides of the batteries correctly with the +/- symbols in the battery compartment.

## 3 Connect Your Wires

### Wiring Terminations

Terminal	Function	Description
Rc*	Input	24 Volt AC Cooling Transformer (Dual Transformer Systems Only)
Rh*	Input	Power Connection (24 Volt AC Heating Transformer or Millivolt Power Source)
O	Output	Reversing Valve (Cool Active)
B	Output	Reversing Valve (Heat Active)
Y	Output	Compressor Relay (appears as <b>Y1</b> on 2200NC)
G	Output	Fan Control
W	Output	Conventional Heat Relay
C	Input	24 Volt AC Transformer Common

### Additional Terminations (2200NC only)

Terminal	Function	Description
W1/E	Output	(W1) 1st Stage Conventional Heat (E) Emergency Heat Relay
W2	Output	2nd Stage Heat / Auxiliary Heat

\* Appears as R on 2200NC (single transformer).

## Conventional Systems

### Typical Wiring Configurations

**NOTE:** The “Installer Switch” option will be configured in the next step.

#### Heat Only or Millivolt

Set Installer Switch to **NORM**

<b>Rh*</b>	Power Connection
<b>W</b>	Heat Relay (appears as <b>W1/E</b> on 2200NC)
<b>G</b>	Fan Relay <b>[note 4]</b>
<b>C</b>	24 Volt AC Transformer Common <b>[note 1]</b>

#### 1 HEAT / 1 COOL Single or Dual Transformer

Set Installer Switch to **NORM**

<b>Rh*</b>	24 Volt AC Power (heating transformer) <b>[note 2]</b>
<b>Rc*</b>	24 Volt AC Power (cooling transformer) <b>[note 2]</b>
<b>W</b>	Heat Relay (appears as <b>W1/E</b> on 2200NC)
<b>Y</b>	Compressor Relay (appears as <b>Y1</b> on 2200NC)
<b>G</b>	Fan Relay
<b>C</b>	24 Volt AC Transformer Common <b>[note 1, 3]</b>

#### 2 HEAT / 1 COOL Single Transformer (2200NC Only)

Set System Type to **NORM**

<b>R</b>	24 Volt AC Power
<b>W1</b>	Heat Relay Stage 1
<b>W2</b>	Heat Relay Stage 2
<b>Y1</b>	Compressor Relay Stage 1
<b>G</b>	Fan Relay
<b>C</b>	24 Volt AC Transformer Common <b>[note 1]</b>

### NOTES - Conventional Systems

- [1]** If batteries are installed the 24 Volt AC common connection is optional.
- [2]** Remove factory installed jumper for dual transformer systems.
- [3]** In dual transformer systems, transformer common must come from cooling transformer.
- [4]** If needed for system.

*Provide disconnect and overload protection as required.*

\* Appears as R on 2200NC (single transformer).

## Heat Pump Systems

### Typical Wiring Configurations

**NOTE:** The "Installer Switch" option will be configured in the next step.

#### 1 HEAT / 1 COOL - No Auxiliary Heat

Set Installer Switch to **HP**

<b>Rh*</b>	24 Volt AC Power
<b>Rc*</b>	Connected to Rh with supplied Jumper Wire
<b>O or B</b>	Changeover Valve <b>[note 2]</b>
<b>Y</b>	Compressor Relay (appears as <b>Y1</b> on 2200NC)
<b>G</b>	Fan Relay
<b>C</b>	24 Volt AC Transformer Common <b>[note 1]</b>

\* Appears as R on 2200NC (single transformer).

#### 2 HEAT / 1 COOL - Including Auxiliary Heat (2200NC only)

Set Installer Switch to **HP**

<b>R</b>	24 Volt AC Power
<b>O or B</b>	Changeover Valve <b>[note 2]</b>
<b>Y1</b>	Compressor Relay (1st stage heating/cooling)
<b>W2</b>	Auxiliary Heat Relay (2nd stage heating) <b>[note 3]</b>
<b>E</b>	Emergency Heat Relay <b>[note 3]</b>
<b>G</b>	Fan Relay
<b>C</b>	24 Volt AC Transformer Common <b>[note1]</b>

### NOTES - Heat Pump Systems

**[1]** If batteries are installed the 24 Volt AC common connection is optional.

**[2]** Select **O** for cool active or **B** for heat active.

**[3]** Install a field supplied jumper between the **W2** and **E** terminals if there is no separate emergency heat relay installed.

*Provide disconnect and overload protection as required.*

## 4 Set Installer Switches

The Installer switches are located on the back of the thermostat and must be properly configured for this thermostat to operate properly.

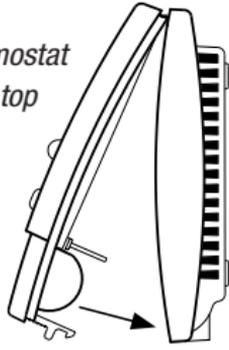
Switch	Factory Default	Setting Options	Comments
NORM / HP	CONV	NORM	Select for conventional systems
		HP	Select for heat pump systems
F / C	F	F	Select for fahrenheit temperature scale
		C	Select for celsius temperature scale
HE / HG	HG	HG	Select for gas heat
		HE	Select for electric heat

**NOTE:** The reset button must be pressed after making any changes to these switches.

## 5 Attach Thermostat to Sub-Base

1. Line up the thermostat body with the sub-base.
2. Carefully push the thermostat body against the sub-base until it snaps into place.

**NOTE:** The thermostat hinges from the top and latches at the bottom.



## 4 System Testing



### **Warning** Read Before Testing

- Do not short (or jumper) across terminals on the gas valve or at the heating or cooling system control board to test the thermostat installation. This could damage the thermostat and void the warranty.
- Do not select the COOL mode of operation if the outside temperature is below 50° F (10° C). This could possibly damage the controlled cooling system and may cause personal injury.
- This thermostat includes an automatic compressor protection feature to avoid potential damage to the compressor from short cycling. When testing the system, make sure to take this delay into account.

**NOTE:** The compressor delay can be bypassed by pressing the reset button on the front of the thermostat. All user settings will be returned to factory default.

- 1 Move the **SYSTEM** switch to HEAT mode.
- 2 Press **▲** to raise the set temperature a minimum of 3 degrees above the current room temperature. The system should start within a few seconds. With a gas heating system, the fan may not start right away.
- 3 Move the **SYSTEM** switch to the OFF mode. Allow the heating system to fully shut down.
- 4 Move the **SYSTEM** switch to the COOL mode.
- 5 Press **▼** to lower the set temperature a minimum of 3 degrees below the current room temperature. The system should start within a few seconds (unless compressor short cycle protection is active – See note above).
- 6 Move the **SYSTEM** switch to the OFF mode. Allow the cooling system to fully shut down.
- 7 Move the **FAN** switch to the ON mode. The system fan should start within a few seconds.
- 8 Move the **FAN** switch to the AUTO mode. Allow the system fan to turn off.

## 5 Setting User Options

### Advanced User Options

User options allow you to customize some of your thermostat's features. Most users will not need to make any changes to the settings in this section.

**To access the User Options menu, hold down the RETURN button for approximately 3 seconds until the screen changes and displays the first User Option.**

Press the **▲** or **▼** button to change the setting for the displayed User Option. After you have made your desired setting, press **RETURN** to advance to the next User Option.

The thermostat will return to normal mode after your last user option is made or after no keys have been pressed for 5 seconds.

### Table of User Options

No.	User Options	Factory Default	Setting Options	Comments
1	1st stage differential	0.5	0.5, 1.0, 2.0	Select a 1st stage temperature differential of 0.5°, 1.0° or 2.0°F (0.2°, 0.5° or 1.0°C)
2	2nd stage differential (2200NC Only)	2.0	1.0, 2.0, 3.0, 4.0, 5.0, 6.0	Select a 2nd temperature differential of 1°, 2°, 3°, 4°, 5° or 6°F (0.5°, 1°, 1.5°, 2°, 2.5° or 3°C)
3	Extended Hold Period	LG	LG	Selects long (permanent) hold mode
			SH	Selects 24 hr. (temporary) hold mode
4	Filter Service Monitor	000	000	Disables filter service monitor feature
			30, 60, 90, 180	Selects a number of days before the thermostat will flash a Service Filter reminder in the display.
5	Adaptive Recovery Mode(ARM™)	REC OFF	REC OFF	Disables adaptive (early) recovery mode
			REC ON	Enables adaptive (early) recovery mode

### Detailed Explanation of User Options:

#### Temperature Differential

##### (User Option 1 and 2)

The differential setting is the temperature control range that your thermostat will provide. The smaller the setting, the tighter your range of temperature control and comfort will be. The 2nd stage differential is only for systems with a second stage of heating (auxiliary heat).

## Extended Hold Period

### (User Option 3)

The Extended Hold Period lets you select the period your thermostat will hold the temperature when the HOLD mode is activated (See “Temperature Adjustment”). When LG is selected the thermostat will stay in hold mode until turned off. When SH is selected, the thermostat will hold your temperature for 24 hours and then return to the current program at that time.

## Service Filter Monitor

### (User Option 4)

The Service Filter Monitor is a user selectable service monitor that will display a reminder for a required air filter replacement by flashing the FILT segment in the display. When the time has expired, and required cleaning or replacement has been performed, touch the **RETURN** button to reset the timer and reset the service monitor.

Select 000 (off) or a set number of days before the reminder will appear.



## Adaptive Recovery Mode (early recovery)

### (User Option 5)

During Adaptive Recovery Mode (ARM™), room temperature is recovered gradually by turning on the heating or cooling before the end of the set back period. The set point temperature is changed to that of the upcoming program temperature.

# 6 Setting Your Program Schedule

## Setting the Time and Day

1. In normal operating mode, press the **DAY/TIME** button. The display will switch to the day/time setting mode and the hour will be flashing.
2. Press **▲** or **▼** to adjust the hour. Press **DAY/TIME**.
3. Press **▲** or **▼** to adjust the minute. Press **DAY/TIME**.
4. Press **▲** or **▼** to adjust the day of the week. Press **RETURN** to exit.



## Tips Before Setting Your Program Schedule

- Make sure your current time and day of the week are set correctly.
- When programming, make sure the AM and PM indicators are correct.
- Your NIGHT event cannot exceed 11:50 PM.

This thermostat comes pre-programmed with a default energy saving program. The following table outlines the pre-programmed times and temperatures for heating and cooling in each of your 4 daily weekday and weekend events. If you wish to use these settings then no further programming is necessary:

5-2 Day Programming– Weekday/Weekend <i>Factory Settings</i>		
4 Event	Weekday	Weekend
MORN	Time: 6:00 am Heat: 70° F (21° C) Cool: 78° F (26° C)	Time: 6:00 am Heat: 70° F (21° C) Cool: 78° F (26° C)
DAY	Time: 8:00 am Heat: 62° F (17° C) Cool: 85° F (29° C)	Time: 8:00 am Heat: 62° F (17° C) Cool: 85° F (29° C)
EVE	Time: 6:00 pm Heat: 70° F (21° C) Cool: 78° F (26° C)	Time: 6:00 pm Heat: 70° F (21° C) Cool: 78° F (26° C)
NIGHT	Time: 10:00 pm Heat: 62° F (17° C) Cool: 82° F (28° C)	Time: 10:00 pm Heat: 62° F (17° C) Cool: 82° F (28° C)

## Programming a 5-2 Day Schedule

The 5-2 day programming mode allows you to program Monday - Friday with one 4 event schedule and then allows you to change Saturday and Sunday with a different 4 event schedule.

1. Press the **PROG** button. The display will switch to programming mode. The days M, TU, W, TH, and F will be displayed and the hour will be flashing.
2. Move the **SYSTEM** switch to either the HEAT or COOL position.
3. Press the **▲** or **▼** to adjust the hour for the MORN (morning) event. Press **PROG**.
4. Press **▲** or **▼** to adjust the minute for the MORN event. Press **PROG**.
5. Press **▲** or **▼** to adjust the temperature for the MORN event. Press **PROG**.
6. Repeat steps 3-5 for the DAY, EVE and NIGHT events.
7. Repeat steps 3-6 for the weekend (S, SU) program.
8. If needed, repeat steps 2-7 to program the opposite mode (HEAT or COOL).
9. Press **RETURN** to exit.



## 7 Operating Your Thermostat

### Setting the System Control Mode

The System Control has several modes of operation that can be selected by moving the SYSTEM switch to one of three positions.

**COOL** Only your cooling system will operate

**OFF** Heating and cooling systems are off

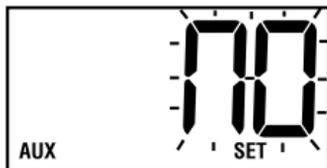
**HEAT** Only your heating system will operate



### Additional System Control Mode (Model 2200NC Only):

**EMER** Operates a backup heat source (Emergency Heat) for heat pump systems only

**NOTE:** If your model 2200NC was set to a conventional system (NORM) then you will not have the EMER (emergency heat) option and "NO AUX SET" will flash in the display if EMER is selected with the system switch.



### Setting the Fan Control Mode

The Fan Control has 2 modes of operation – AUTO and ON. The mode can be selected by moving the FAN switch.

**AUTO** The system fan will run only when your heating or cooling system is running

**ON** The system fan will stay on.



### Temperature Adjustment

**Temporary Adjustment** – Press and hold the **▲** or **▼** button to adjust the current set point temperature.

**Extended Adjustment** – Press the **HOLD** button so that HOLD appears in the display screen. Press **▲** or **▼** to adjust the current set temperature (See "Extended Hold Period", page 8).

## Status Indicators

Status indicators appear in the display to let you know if your system is heating, cooling or off.

**HEAT** If flashing, indicates that your heating system is running.

**COOL** If flashing, indicates that your cooling system is running.



**FILT** Indicates that a service reminder has expired. (see “Service Filter Monitor”, page 8).

### Additional status indicators (Model 2200NC Only):

**AUX** Indicates that the auxiliary stage of heating is running (multi-stage systems only) or that the emergency heating system is running (heat pump systems only).

## Program Event Indicators

Program Event Indicators appear in the display to let you know what part of your current program is active. The 4 different program event indicators are MORN, DAY, EVE and NIGHT.

MORN, DAY, EVE or NIGHT will flash if a temporary set point change is made. The flash will stop at the next program event.

**Note:** MORN, DAY, EVE or NIGHT will not show while in HOLD Mode.

## Resetting the Thermostat

This thermostat provides you with a reset button that will erase all of your user settings and programming.

To reset the thermostat, use a small object such as a tooth pick or paperclip and gently press the button located inside the small hole on the front of the thermostat housing labeled “reset”.

# 8 Additional Operation Features

## Compressor Protection

This thermostat includes an automatic compressor protection delay to avoid potential damage to your system from short cycling. This feature activates a short delay after turning off the system compressor.

## 9 Thermostat Maintenance

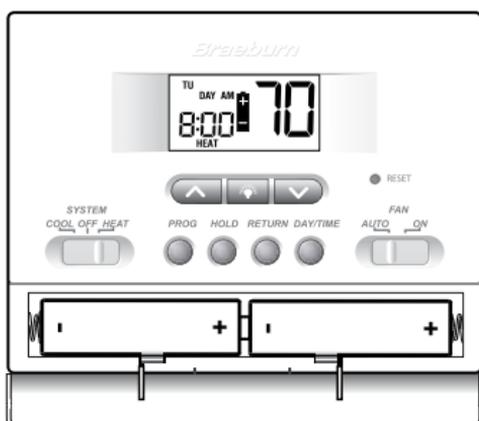
### Changing the Batteries

Depending on your particular installation, this thermostat may be equipped with two (2) "AA" type alkaline batteries.

**If batteries are installed and they become low, a low battery indicator will appear in the display.**

You should change your batteries immediately when you see the low battery signal by following these instructions.

1. Open the battery door located on the bottom of the thermostat.
2. Remove old batteries and replace with new batteries.
3. Make sure to correctly position the (+) and (-) symbols.
4. Close the battery door.



**NOTE:** We recommend replacing the thermostat batteries annually or if the thermostat will be unattended for an extended period of time.

### Thermostat Cleaning

Never spray any liquid directly on the thermostat. Using a soft damp cloth wipe the outer body of the thermostat. Never use any abrasive cleansers to clean your thermostat.

**Store this manual for future reference.**

### Limited Warranty

When installed by a professional contractor, this product is backed by a 2 year limited warranty. Limitations apply. For limitations, terms and conditions, you may obtain a full copy of this warranty:

- Visit us online: [www.braeburnonline.com/warranty](http://www.braeburnonline.com/warranty)
- Phone us: 866.268.5599
- Write us: Braeburn Systems LLC  
2215 Cornell Avenue  
Montgomery, IL 60538



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