

Installer Manual Programmable Thermostats

**PREMIER
SERIES**

4020 Heat Only Hydronic with Freeze Protection

Model number is located on back of thermostat.

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 **Warning** *For installation by experienced service technicians only.*

 **Caution** *Possible electric shock or damage to equipment can occur.
Disconnect power before beginning installation.*

This thermostat requires 24 Volt AC Power or 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.

This manual is for Installer use only - do not leave with end user.

1 SPECIFICATIONS

This thermostat is compatible with:

- Single stage hot water or steam systems
- Single stage in floor heating systems
- 250 – 750 millivolt heating only systems
- 2 or 3 wire hydronic zone systems

Terminations

R, W, V3, C, S1, S2

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° to 90° F (7° to 32° C)
- Temperature Accuracy: +/- 1° F (+/- .5° C)
- Outdoor Temperature Display Range: -40° to 120° F (-40° to 49° C)

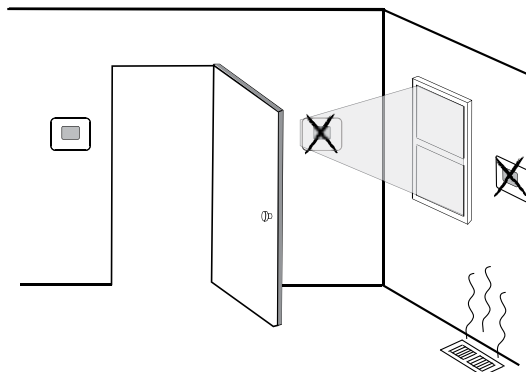
2 INSTALLATION

Warning *Disconnect power before beginning installation.*

Thermostat Location

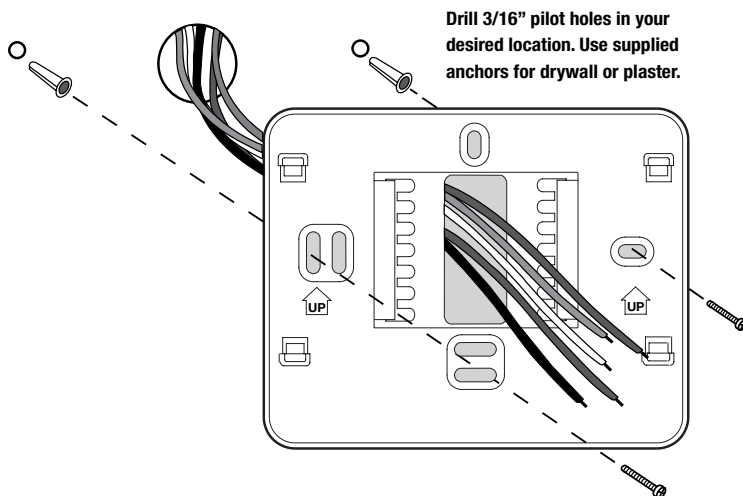
Install the thermostat approximately 5 feet (1.5m) above the floor in an area that has a good amount of air circulation and maintains an average room temperature.

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.



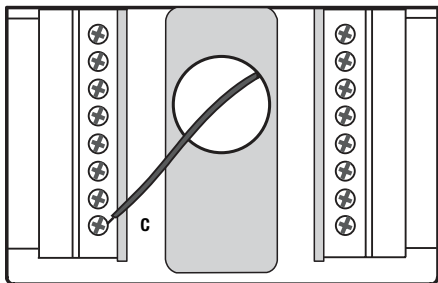
Install the Sub-Base:

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

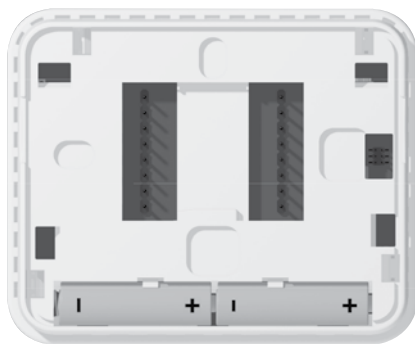


2 INSTALLATION

Provide Power



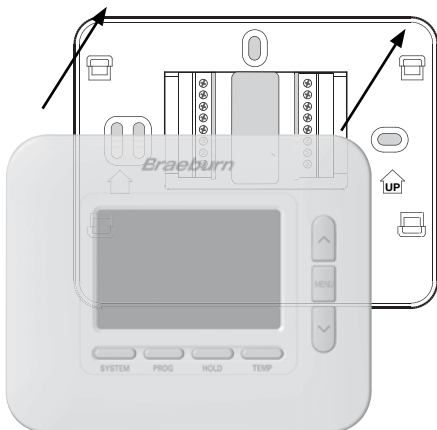
24VAC Power Terminal (C)



Batteries Installed as Shown

- **Battery Power** - Insert the 2 supplied “AA” type alkaline batteries into the battery compartment located in the rear housing of the thermostat. Make sure to position the Positive (+) and Negative (-) sides of the batteries correctly with the +/- symbols in the battery compartment.
- **Optional 24 Volt AC power** - Connect the common side of the transformer to the C terminal on the thermostat sub-base. In dual transformer installations, the transformer common must come from the cooling transformer.

Attach to Thermostat Sub-Base



Once you complete the wiring in Section 3, attach thermostat to sub-base and then configure the Installer Settings in Section 5.

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

NOTE: This thermostat ships configured for hot water systems (HWTR).

3 WIRING

Conventional Systems - Typical Wiring Configurations

		4020		
		Hot Water Heat <i>System Type: HWTR</i>	Steam Heat <i>System Type: STM</i>	Under Floor Heat <i>System Type: UFLR</i>
Wiring Terminal	Terminal Description			
R	24 VAC Heating Transformer	R	R	R
W	Heat Relay	W	W	W
V3	Zone Valve Power Close	V3 ¹	V3 ¹	V3 ¹
C	24 VAC Transformer Common	C ²	C ²	C ²

¹"System Type" is configured in the Installer Settings - See section 5.

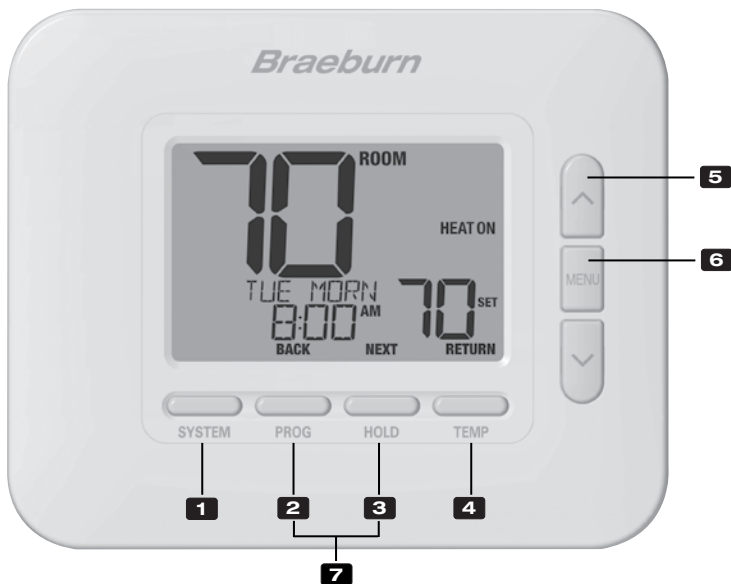
NOTES - Conventional Systems

- 1 Only connect if needed for system
 - 2 Optional 24 VAC transformer common connection
- Provide disconnect and overload protection as required.*

Additional Wiring Options

Wiring Terminal	Terminal Description	Notes
S1	Remote Sensor	These terminals can be used to connect an outdoor or indoor remote sensor or in-floor slab sensor. For remote sensor configuration, refer to installer settings 12-14 in section 5.
S2		

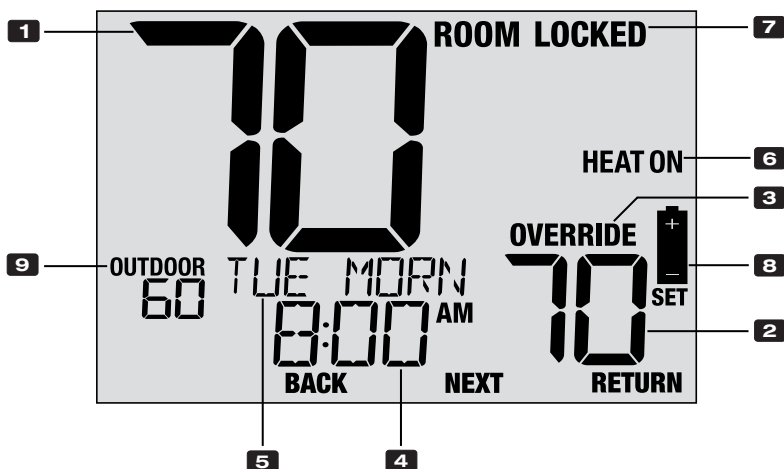
NOTE: Use 18-22 gauge unshielded wire with a 200-foot maximum wire length. Avoid running wire along with 120 VAC wiring or near magnetic ballasts.



Thermostat

- 1** **SYSTEM Button**Selects the system you want to control
- 2** **PROG Button**.....Enters programming mode or hold for 3 seconds to enter SpeedSet® mode
- 2** **BACK Button***Secondary function of the **PROG** button - Moves to previous setting
- 3** **HOLD Button**.....Enters / Exits the **HOLD** mode (program bypass mode)
- 3** **NEXT Button***Secondary function of the **HOLD** button - Moves to next setting
- 4** **TEMP Button**Used to view temperature at remote sensor
- 4** **RETURN Button***.....Secondary function of the **TEMP** button - Exits program or setting modes
- 5** **Up / Down Arrow Buttons**.....Increases or decreases settings (time, temperature, etc.)
- 6** **MENU Button**.....Used to access thermostat User / Installer setting modes
- 7** **Lock / Unlock Thermostat**Access user Lock / Unlock screen by holding **PROG** and **HOLD** together for 5 seconds
- Battery Compartment**.....Located on the back side of thermostat

* **BACK**, **NEXT** and **RETURN** are secondary functions of the **PROG**, **HOLD** and **TEMP** buttons when in programming or configuration modes, **BACK**, **NEXT** and **RETURN** appear in the display screen indicating that the **PROG**, **HOLD** and **TEMP** buttons now function as **BACK**, **NEXT** and **RETURN**.



Thermostat Display

- 1 Room Temperature**Displays the current room temperature
- 2 Set Temperature**Displays the current setpoint temperature
- 3 Override Indicator**Indicates that the current program schedule has been temporarily overridden
- 4 Time of Day**Displays the current time of day
- 5 Message Center**Displays various thermostat status and maintenance information
- 6 System Mode**Displays the system mode and current system status
- 7 Lock Mode Indicator**Indicates if the thermostat is locked
- 8 Low Battery Indicator**Indicates when the batteries need to be replaced
- 9 Outdoor Temperature**If a Braeburn® outdoor sensor is connected, the outdoor temperature will be displayed

5 INSTALLER SETTINGS

The Installer Settings must be properly configured in order for this thermostat to operate correctly. The Installer Settings are menu driven. The portion of these settings that do not apply to your setup will be skipped.

To Enter Installer Settings Menu

- 1 Press and hold down the **MENU** button for 5 seconds.
- 2 Release the **MENU** button after the first installer setting is displayed.
- 3 Change settings as required using the **▲** or **▼** buttons.
- 4 Press **NEXT** (HOLD) or **BACK** (PROG) to move to the next or previous setting.
- 5 Press **RETURN** (TEMP) to exit. Menu will exit automatically after last setting.

*If **UNLOCK 0000** is displayed, you must enter your 4-digit installer lock code to proceed (see Installer Settings 20 and 21).



No.	Installer Setting	Displayed	Default Setting	Available Settings	Description of Available Settings
1	Residential or Commercial Profile	MODE	RES	RES	Select for Residential profile
				COMM	Select for Commercial profile
				If residential mode is selected, 4 programming events per day are available (MORN, DAY, EVE, NITE). If commercial profile is selected, 2 programming events per day are available (OCC, UNOC).	
2	Programming Mode	PROGRAM DAYS	7	7	Select for 7-day programming mode
				52	Select for 5-2 day programming mode
				NO	Select for non-programmable mode
[Only available if a Residential (RES) profile was selected in setting 1] Selects the programming capabilities of the thermostat, either full 7 individual days, 5-2 day (weekday/weekend) programming or non-programmable.					
3	Clock Format	CLOCK	12HR	12HR	Select for a 12-hour clock
				24HR	Select for a 24-hour clock
Selects either a 12 hour or 24 hour clock format.					
4	Temperature Scale	DEGREE	F	F	Select for Fahrenheit temperature display
				C	Select for Celsius temperature display
Selects a temperature scale of either °F or °C.					
5	System Type	SYSTEM	HWTR	HWTR	Select for hot water systems
				STM	Select for steam systems
				UFLR	Select for under-floor systems
Select the type of equipment you are controlling.					
6	Differential Temperature	DEGREE DIFF	1.0	0.5, 1.0, 2.0	Select a temperature differential of 0.5°, 1° or 2° F (0.2°, 0.5° or 1.0° C)
					Selects a temperature differential which controls the degree of separation between the setpoint temperature and the heating system.

No.	Installer Setting	Displayed	Default Setting	Available Settings	Description of Available Settings
7	AC Power Interrupt Warning	POWER MON	OFF	OFF	Power outage alert is disabled
				ON	Power outage alert is enabled
				[Only available if thermostat is powered with a 24 VAC common (C) wire] When enabled, the thermostat will display NO POWER when AC power to the thermostat is lost. Batteries must also be installed for this feature to operate.	
8	Boiler Minimum Off Time	BOIL MIN OFF	0	5, 4, 3, 2, 1, 0	Select a boiler minimum off time in minutes
					Selects the minimum amount of time that the boiler will remain off after a call for heat ends. During this time, the thermostat will not respond to a heating call. Once the selected time has elapsed, the thermostat will answer heating calls as necessary.
9	Heat Setpoint Upper Limit	HIGH LIM HEAT	90	90 - 45 (32° to 7°C)	Select a Heat Setpoint Upper Limit of 90° to 45°F (32° to 7°C)
					Selects the upper setpoint adjustment limit that cannot be exceeded in heat mode.
10	Heat Setpoint Lower Limit	LOW LIM HEAT	45	45 - 90 (7° to 32°C)	Select a Heat Setpoint Lower Limit of 45° to 90°F (7° to 32°C)
					Selects the lower setpoint adjustment limit that cannot be exceeded in heat mode.
11	Adaptive Recovery Mode (ARM™)	RECOVER	OFF	OFF	Adaptive Recovery Mode is disabled
				ON	Adaptive Recovery Mode is enabled
				[Not available if non-programmable was selected in setting 2] During ARM, room temperature is recovered by turning on the heating up to 2-hours before the end of the set back period. The setpoint temperature is changed to that of the upcoming program temperature.	
12	Remote Sensor Type	SENSOR TYPE	F	A	Select for a remote air sensor
				F	Select for a remote floor (slab) sensor
				0	Select for an outdoor sensor
				[Only available if a Braeburn sensor or AFTS floor sensor is connected] If a Braeburn sensor is connected, the thermostat will automatically detect the sensor. Select the type of remote sensor that was connected. NOTE: Option F for floor (slab) sensor will only appear if the system type was set to UFLR in setting number 5.	
13	Indoor Remote Air Sensor	REMOTE SENS	I	I	Temperature is sensed from thermostat only (Internal)
				E	Temperature is sensed from remote sensor only (External)
				A	Temperature is averaged between thermostat and remote sensor (Average)
				[Only available if Braeburn model 5390 remote indoor sensor is connected and air sensing (A) was selected in setting 12] If a Braeburn indoor remote sensor is connected, the thermostat will automatically detect the sensor. When an indoor sensor is detected, you may select between thermostat only (I), remote sensor only (E) or the average of the thermostat and remote sensor (A).	
14	Floor Remote Sensor Control	FLOOR SENS	A	A	Select for remote air sensing
				F	Select for remote floor (slab) sensing
[Only available if remote sensor type was set to F (floor) in setting 12] Selects how your thermostat will use the connected floor sensor. If A is selected, the thermostat will only use the floor sensor for floor temperature limits. If F is selected, the thermostat will use the floor sensor for heating control instead of the internal temperature sensor.					

No.	Installer Setting	Displayed	Default Setting	Available Settings	Description of Available Settings
15	Floor Temperature Offset	OFFSET FLR	0	-5 to 5 (-2° to 2.5°C)	Select the floor temperature offset in degrees
					[Only available if remote sensor type was set to F (floor) in setting 12] Select a value to offset the floor temperature reading, from -5 to 5°F (-2.5 to 2.5°C). This offset will be applied to the floor temperature reading used for display and heating control. This offset value does not apply to the air temperature reading.
16	High Floor Temperature Limit	HI FLOOR LIM	85	50 - 95. (10° to 35°C)	Select a High Floor Temperature Limit of 50° to 95°F (10° to 35°C)
					[Only available if floor remote sensor control was set to A (air) in setting 14] Selects a high floor temperature protection limit. When the floor temperature rises above this value, the heating will be shut off. The heating will remain shut off until the floor temperature falls 5°F (3°C) below the limit value. CAUTION - Take care when selecting a value for this setting, as the heat will be shut off when this temperature is reached. This limit will only be observed while the thermostat is in HEAT mode.
17	Low Floor Temperature Limit	LO FLOOR LIMIT	50	40 - 85 (5° to 30°C)	Select a Low Floor Temperature Limit of 40° to 85°F (5° to 30°C)
					[Only available if floor remote sensor control was set to A (air) in setting 14] Selects a low floor temperature protection limit. When the floor temperature falls below this value, the heating will be run continuously until the floor temperature reaches the specified value. CAUTION - Take care when selecting a value for this setting, as the heat will be run continuously until this temperature is reached. This limit will only be observed while the thermostat is in HEAT mode.
18	Floor Freeze Protection Limit	FREEZE PROTECT ACTV	40	40 - 60 (5° to 16°C)	Select a Floor Freeze Protection Limit of 40° to 60°F (5° to 16°C)
					[Only available if remote sensor type was set to F (floor) in setting 12] Selects a floor freeze protection limit. When the floor temperature falls below this value, the heating will be run continuously until the floor temperature reaches the specified value. CAUTION - Take care when selecting a value for this setting, as the heat will be run continuously until this temperature is reached. This limit will only be observed even when the thermostat is in OFF mode.
19	User Lock Security Level	USERLOCK LVL	3	3	If locked, all buttons are disabled
				2	If locked, all buttons except Λ and V are disabled
				1	If locked, only the PROG, HOLD and MENU buttons are disabled
				Selects the level of keypad lockout when the thermostat has been locked by the user. See the User Manual for instructions on setting the 3-digit lock code and locking/unlocking the thermostat.	
20	Installer Lock	INSTLOCK	OFF	ON	Installer Lock disabled
				OFF	Installer Lock enabled
				When enabled, a 4-digit lock code can be entered in setting 21. This lock code will be required the next time the Installer Settings menu is accessed. Select OFF to skip the installer lock.	
21	Installer Lock Code	IL CODE	0000	0-9	Select 0-9 for each digit
					[Only available if Installer Lock was enabled in setting 20] Select a 4-digit lock code (0-9 for each digit) to lock the Installer Settings menu. The code 0000 is not a valid lock code and cannot be used.
22	Installer Clear (factory reset)	CLERR	NONE	NONE	Clear disabled - No changes made
				ALL	Clear enabled - Factory Reset
				Selecting ALL will return thermostat to all factory default settings. Factory reset will take affect upon exiting Installer settings menu.	

Additional options are located in the User Settings – See User Manual.

6 SYSTEM TESTING



Warning *Read Before Testing*

- Do not short (or jumper) across terminals on the gas valve or at the heating system control board to test the thermostat installation. This could damage the thermostat and void the warranty.
- 1 Press the **SYSTEM** button until the thermostat is in HEAT mode.
 - 2 Press the **▲** button to raise the set temperature a minimum of 3 degrees above the current room temperature. The system should start within a few seconds.
 - 3 Press the **SYSTEM** button until the thermostat is in the OFF mode. Allow the heating system to fully shut down.

Limited Warranty

When installed by a professional contractor, this product is backed by a 5 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
- Call us: 866.268.5599
- Write us: Braeburn Systems LLC
2215 Cornell Avenue
Montgomery, IL 60538



Installer - store this manual for future reference

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Technical Assistance: www.braeburnonline.com

Call us toll-free: 866-268-5599 (U.S.)

630-844-1968 (Outside the U.S.)