

# braeburn 5300 installer manual



## 1 Specifications cont.

• Compatibility: Compatible with low voltage single stage or multi-stage heat/cool systems, including heat pumps with up to two stages of heating and two stages of cooling. This thermostat can also be used on 200ma to 750ma milliwatt heating and cooling systems.  
• Terminations: R, Rc, G, W1, B, Y2, W2, Y1, G, C, L, S1, S2

## 2 Installation

### Replacing Existing Thermostat

**Most existing thermostats have three parts:**

- The cover, which may snap or slide over the existing thermostat.
- The electronics or body, which controls the existing system.
- The sub-base, where the wires attach through the wall to the existing system.

1. Always turn off power to the air conditioning and heating system prior to replacing existing thermostat.
2. Carefully remove the cover and electronics body from the old thermostat sub-base. Depending on the brand, these parts may pull off or need to be unscrewed. The old sub-base should remain wired and on the wall until steps 4 and 5.
3. Label every old wire with the letter of the connection to which the wire is attached. Example letters are R, M, Y, etc. Depending on the brand of the old thermostat, your letters may be different.
4. After labeling the old wires, loosen each connection and remove them from the old sub-base. Secure the wires to prevent them from slipping into the opening in the wall.
5. Remove the old sub-base from the wall, again being careful that the wires do not slip into the opening in the wall.
6. Use the chart below to determine the new thermostat connections. As an example, if the old thermostat had a G or F connection, it goes to G on the new thermostat. It may be helpful to use the chart by circling with a pencil or pen the letter of each wire removed from the old thermostat.

**NOTE:** This thermostat is designed for use on low voltage 24 volt AC single stage or multi-stage systems, including heat pumps with up to two stages of heating and two stages of cooling. Do not use this thermostat on systems with voltage higher than 24 volt AC. This thermostat requires a braeburn common wire for proper installation if used as a hardwired thermostat.

Old Thermostat Wire	New Thermostat Wire	Special Description
R (or Rc) or W1	Rc	24 Volt AC Common for Dual Heat/Cool Systems
G or F	G	Heating Heat Control (Hot Water Heating, Oil or Gas Furnace, or Emergency Heating for 2 Stage Heat Pumps)
Y1 or Y2	Y1	Heating Heat Pumping
Y1 or Y2	Y2	Cooling Heat Pumping
M or B	M	Stage 1 Common
C or B	C	24 Volt AC Transformer Common
S1	S1	System Monitor
S2	S2	Outdoor Remote Sensor

## Installer Guide

Before Installing, Programming or Operating, PLEASE READ ALL INSTRUCTIONS

- 1 Specifications
- 2 Installation
- 3 Quick Reference
- 4 Programming Installer Settings
- 5 Testing Thermostat
- 6 Wiring Diagrams

SEE USER MANUAL FOR TROUBLESHOOTING

## WARNING

**Important Safety Information**

- Always turn off power to the air conditioning or heating system prior to installing, removing, cleaning or servicing thermostat.
- The thermostat is a dual power thermostat and either requires 24 Volt AC Power or has (2) properly installed "AA" Alkaline batteries for normal operation and control of the heating or cooling system.
- Properly installed batteries will allow the thermostat to retain clock settings in the event of loss of AC Power due to power outage or wiring block/short when used as a hardwired thermostat.
- The thermostat should only be used as described in this manual. Any other use is not recommended and will void the warranty.

## 1 Specifications

- Electrical Rating: 24 Volt AC (18-30 Volt AC)
- 3 amp maximum load per terminal
- Control Range: 49° - 99° F (5° C - 37° C)
- Accuracy: +/- 1° F (0.1° C)
- AC Power: 18-30 Volt AC
- DC Power: 3.0 Volt DC (2 "AA" Alkaline batteries included)

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## Book Descriptions:

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This thermostat can also be used on 250 to Depending on the brand of the Model 5300 shown with cover open NOTE This thermostat is designed for use on low voltage 24 volt AC single stage or multistage systems, including heat pumps with up to three stages of heating and two stages of cooling. Installer CLEAR is located on the circuit board. The Installer Options mode is menu driven. This thermostat includes an automatic compressor protection feature to avoid potential damage to the cooling system from short cycling. This thermostat automatically provides an adjustable delay after turning off the cooling system output to protect the compressor. When an indoor Locks out the use of the auxiliary heat stage for outside air temperatures over sensor is detected, you may select between internal sensI, external senseE, installer setting. If the HOLD feature is activated, the current setpoint will be held First Stage Differential until HOLD is released. You should not enter a program in the OFF position. The 52 Day mode has separate Weekday and Weekend Program Groups that allow you to change the daily SYSTEM MOTUWETHFR SA SU Press the SYSTEM button to select HEAT to set heating times and. If installed at setup, the display temperature is either the temperature at the sensor or an and the indicator SET will be displayed. This indicates that the system is turned off at Check current time of day, day of week program settings. Dual Powered Hardwired or Battery. Large Display with Bright Blue Backlight. Simple MenuDriven Programming. Separate Installer and User Setup Modes. Residential or Commercial Program Modes. Programmable Independent Fan Control. MultiLevel Keypad Lockout. NonVolatile Memory to Maintain User Settings. Remote Indoor Sensor Compatible. Recirculating Fan Mode. Residual Cooling Fan Delay. Filter Check Monitor. Adaptive Recovery Mode ARMT. Adjustable 1st and 2nd Stage Temperature Differential. Auxiliary Heat Fossil Fuel Switch. ESD GuardT Electronic Circuitry. <http://anankidsacademy.com/userfiles/cp-x345-manual-pdf.xml>

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Compressor Short Cycle Protection. Compressor Power Outage Protection. Separate Heating and Cooling Program Set Point Times and Temperatures. Temporary Program Override for 4 Hours or Until Next Set Point. Programmable Extended Hold Mode. Front Access Reset Button. Clear Button Returns Settings to Defaults. Gas or Electric Fan Control. Mounts to Vertical or Horizontal Box. Easy Access Front Battery Door. Dual Powered Hardwired or Battery. Easy Access Front Battery Door. Thermostats range from basic, nonprogrammable models to models that enable you to program seven days worth of settings to maximize energy savings. Program your Braeburn thermostat to run your furnace or air conditioner less often when you are away from your house or asleep to save money and energy with little effort. Adjust first the hour, then minutes and the day of the week by pressing the up and down arrows. The current differential setting will appear on the screen. Press the up or down arrows to adjust the setting. The first stage differential determines how much the room temperature must change from the set temperature before heating or cooling must be initiated. Second and third stage differentials can be set on some models using the same method. Her experience ranges from writing policy documents and text panels for museums to technical

writing for a major software company. She holds a Master of Arts in anthropology from McMaster University and a Master of Museum Studies from the University of Toronto. Show Comments. Our Live Chat hours areIf you have problems accessing your account, please contact us at 18887574774 and well help you out. Add item to cart for lowest price.Manufacturers warranty still applies.Join our mailing list to receive exclusive offers and coupons. As part of the Coop Advertising Program, you accrue funds with each purchaseWe scale our programs to find We like to refer to ourselves as the onestopshop of finance.<http://www.rewitex.pl/userfiles/cp-x-940-manual.xml>

We strive to support sales marketing with good Our customer portal is accessible via computer or mobile device. Click, call or email. We're ready to help you with all of your Robertshaw product questions and concerns. Easytouse and install, this thermostat is ideally suited for use in residential or light commercial applications. The installer friendly thermostat is designed for many heating and cooling applications, including heat pump systems, auxiliary and emergency heating, gas and oil systems. It has multiple heating and cooling stages for optimal control. The SMART 1000 is manufactured with default settings to reduce installation time. These settings include temperature scale F or C, clock scale 12 or 24 hours, high and low balance points, DIP switch settings, and more. All settings are changed easily. We primarily work with vendors or factories, not individual artist or craftsman. For custom made products, we usually only cater to bulk size order that meets the minimum quantity requirement of a single factory run. Dont be shy. Ask. What we can accomplish may surprise you! Contains W8735ER1000 outdoor reset module and C7089R1013 RedLINK wireless outdoor air sensor. The auxiliary box includes a large number of wiring terminals, for example 16 or more, for connecting to a relatively large number of HVAC control wires. The auxiliary box can include a "train map" type graphic display that is visible to the installer and provides a graphical indication as to which relays or switches are currently open and which are currently closed. A small sleek visually pleasing thermostat is also described that can be connected either directly to an HVAC system or to the auxiliary box, and can automatically detect an purpose the connected wires according to which it is connected to. Peffer et al., "Smart Comfort At Home Design of a Residential Thermostat to Achieve Thermal Comfort, and Save Money and Peak Energy", University of California Berkeley, Mar. 2007, 1 page.

Salus, "SSeries Digital Thermostat Instruction ManualST620 Model No. Retrieved from —6CEC.pdf, 2005, pp. 149. Aprilaire Electronic Thermostats Model 8355 Users Manual, Research Products Corporation, 2000, 16 pages. Braeburn 5300 Installer Guide, Braeburn Systems, LLC, 2009, 10 pages. Braeburn Model 5200, Braeburn Systems, LLC, 2011, 11 pages. Ecobee Smart Si Thermostat Installation Manual, Ecobee, 2012, 40 pages. Ecobee Smart Si Thermostat User Manual, Ecobee, 2012, 44 pages. Lennox ComfortSense 5000 Owners Guide, Lennox Industries, Inc., 2007, 32 pages. Lennox ComfortSense 7000 Owners Guide, Lennox Industries, Inc., 2009, 15 pages. Lennox iComfort Manual, Lennox Industries, Inc., 2010, 20 pages. Lux PSPU732T Manual, Lux Products Corporation, 48 pages. RobertShaw Product Manual 9620, Maple Chase Company, 2001, 14 pages. RobertShaw Product Manual 9825i2, Maple Chase Company, 2006, 36 pages. SYSTXCCUIZ01V Infinity Control Installation Instructions, Carrier Corp, 2012, 20 pages. TBPAC, TBPHP, Base Series Programmable Thermostats, Carrier Corp, 2012, 8 pages. Trane Communicating Thermostats for Fan Coil, Trane, 2011, 32 pages. Trane Communicating Thermostats for Heat Pump Control, Trane, 2011, 32 pages. Trane Install XL600 Installation Manual, Trane, 2006, 16 pages. Trane XL950 Installation Guide, Trane, 2011, 20 pages. Venstar T2900 Manual, Venstar, Inc., 2008, 113 pages. Venstar T5800 Manual, Venstar, Inc., 63 pages. VisionPRO TH8000 Series Installation Guide, Honeywell International, Inc., 2012, 12 pages. VisionPRO TH8000 Series Operating Manual, Honeywell International, Inc., 2012, 96 pages. VisionPRO WiFi Programmable Thermostat, Honeywell International, Inc Operating Manual, 2012, 48 pages. White Rodgers Emerson Model 1F81261 Installation and Operating Instructions, White Rodgers, 63 pages. White Rodgers Emerson Model IF98EZ1621 Homeowners User Guide, White Rodgers, 28 pages.

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Suite 2800, Atlanta, GA, 30309, US When connecting to a thermostat to some types of modern residential HVAC systems there are sometimes quite a few wires used. In some cases there can be as many as 16 wires. In designing a sleek thermostat that is visually pleasing when wall mounted in a home, it is desirable that the thermostat is not overly large. Thus, there exists a design problem as to how to connect a large number of HVAC control wires to a relatively small thermostat. Additionally, in some cases the circuitry required to generate some types of control signals can use a relatively large amount of space on the thermostat. For example, in some systems where a "V" wire is used for variable control of fan speed, a relatively large amount of circuitry may be used within the thermostat to generate the signal. In some cases adding a common wire between the HVAC system and the thermostat is a costly endeavor. It is to be appreciated that although exemplary embodiments are presented herein for the particular context of HVAC system control, there are a wide variety of other resource usage contexts for which the embodiments are readily applicable including, but not limited to, water usage, air usage, the usage of other natural resources, and the usage of other i.e., nonHVACrelated forms of energy, as would be apparent to the skilled artisan in view of the present disclosure. Therefore, such application of the embodiments in such other resource usage contexts is not outside the scope of the present teachings. SUMMARY According to one or more embodiments, a thermostat adapted for either direct connection to an HVAC system or to an intermediate auxiliary HVAC control unit is described.

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The thermostat includes a plurality of wiring terminals each adapted to make electrical connection with one of a plurality of control wires running between a first location where the thermostat is installed and a second location where an HVAC system is installed; and processors and circuitry configured and programmed to communicate with an auxiliary unit if installed at the second location via one or more of the plurality of control wires connected to one or more of the wiring terminals, the auxiliary unit being directly electrically connected to an installed HVAC system via a plurality of HVAC control wires. The processors and circuitry are further configured and programmed to control the HVAC system directly without an auxiliary unit when the plurality of control wires are connected directly to both the plurality of wiring terminals and to the HVAC system. According to some embodiments the communication between the thermostat and the auxiliary unit is bidirectional. According to some embodiments, automatic detection of connection to an auxiliary unit is provided, for example based on an assessment of which of the one or more wiring terminals have wires connected thereto. When the connection to an auxiliary unit is detected the wires are automatically repurposes to communicate with and receive electrical power from an auxiliary unit. According to some embodiments the auxiliary unit is mounted in close proximity e.g. within 5 meters of an air mover or furnace of the HVAC system, and may be directly on a housing of the air mover or furnace. The number of wires used for connection between the wiring terminals and the auxiliary unit, is preferably substantially fewer than would be used for a connection from the wiring terminals directly to the HVAC system. According to some embodiments only 3 or 4 wires are used to interconnect the thermostat to the auxiliary unit.

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According to some embodiments, the auxiliary unit is capable of controlling an HVAC system having variable fan speed using a pulsedwidthmodulated control signal. The thermostat when mounted on a wall preferably occupies no more than 100 square centimeters, and the plurality of wiring terminals are configured for toolfree wire connection. According to some embodiments, an auxiliary HVAC control unit for controlling an HVAC system is described. The unit includes a first set of wiring terminals each adapted to make electrical connection with one of a first plurality wires running

between a first location where a thermostat is installed and a second location where the auxiliary unit the HVAC system is installed; a second set of wiring terminals each adapted to make electrical connection with one of second plurality of wires running between the auxiliary unit and the HVAC system; and a graphic display visible to a human viewing the display, the display indicating to the human which of the second set of wiring terminals are currently electrically connected to each other. According to some embodiments the unit also includes a plurality of relays used to open and close connections between conductors leading to the second set of wiring terminals, and the graphic display includes a plurality of visible LEDs that indicate status of one or more of the relays. It will be appreciated that these systems and methods are novel, as are applications thereof and many of the components, systems, methods and algorithms employed and included therein. Several illustrative embodiments are described below. While several embodiments are described, it should be understood that the inventive body of work is not limited to any one embodiment, but instead encompasses numerous alternatives, modifications, and equivalents.

In addition, while numerous specific details are set forth in the following description in order to provide a thorough understanding of the inventive body of work, some embodiments can be practiced without some or all of these details. Moreover, for the purpose of clarity, certain technical material that is known in the related art has not been described in detail in order to avoid unnecessarily obscuring the inventive body of work. As used herein the terms power “harvesting,” “sharing” and “stealing” when referring to HVAC thermostats all refer to thermostats that are designed to derive power from the power transformer through the equipment load without using a direct or common wire source directly from the transformer. An example of a cooling system that would be considered residential would have a cooling capacity of less than about 5 tons of refrigeration. The depicted smart home environment includes a structure 150, which can include, e.g., a house, office building, garage, or mobile home. It will be appreciated that devices can also be integrated into a smart home environment that does not include an entire structure 150, such as an apartment, condominium, or office space. Indeed, several devices in the smart home environment need not physically be within the structure 150 at all. For example, a device controlling a pool heater or irrigation system can be located outside of the structure 150. The depicted structure 150 includes a plurality of rooms 152, separated at least partly from each other via walls 154. The walls 154 can include interior walls or exterior walls. Each room can further include a floor 156 and a ceiling 158. One or more intelligent, multisensing, networkconnected entryway interface devices 106, which can be termed a “smart doorbell”, can detect a persons approach to or departure from a location, control audible functionality, announce a persons approach or departure via audio or visual means, or control settings on a security system e.g.

[queuemanagementsystems.com/wp-content/plugins/formcraft/file-upload/server/content/files/1627042ac4845c---boss-loop-pedal-manual.pdf](http://queuemanagementsystems.com/wp-content/plugins/formcraft/file-upload/server/content/files/1627042ac4845c---boss-loop-pedal-manual.pdf)

, to activate or deactivate the security system. In some instances, light switches 108 can further or alternatively control a power state or speed of a fan, such as a ceiling fan. Each of a plurality of intelligent, multisensing, networkconnected wall plug interfaces 110 can detect occupancy of a room or enclosure and control supply of power to one or more wall plugs e.g., such that power is not supplied to the plug if nobody is at home. While descriptions of FIG. 1 can identify specific sensors and functionalities associated with specific devices, it will be appreciated that any of a variety of sensors and functionalities such as those described throughout the specification can be integrated into the device. In addition to containing processing and sensing capabilities, each of the devices 102, 104, 106, 108, 110, 112, 114 and 116 can be capable of data communications and information sharing with any other of the devices 102, 104, 106, 108, 110, 112, 114 and 116, as well as to any cloud server or any other device that is networkconnected anywhere in the world. For example, a first device can communicate with a second device via a wireless router 160. A device can further

communicate with remote devices via a connection to a network, such as the Internet 162. Through the Internet 162, the device can communicate with a central server or a cloudcomputing system 164. The central server or cloudcomputing system 164 can be associated with a manufacturer, support entity or service provider associated with the device. For one embodiment, a user may be able to contact customer support using a device itself rather than needing to use other communication means such as a telephone or Internetconnected computer. Further, software updates can be automatically sent from the central server or cloudcomputing system 164 to devices e.g., when available, when purchased, or at routine intervals. By virtue of network connectivity, one or more of the smarthome devices of FIG.

1 can further allow a user to interact with the device even if the user is not proximate to the device. For example, the user can view a current setpoint temperature for a device and adjust it using a computer. The user can be in the structure during this remote communication or outside the structure. The smart home can further include a variety of partially communicating legacy appliances 142, such as IRcontrolled wall air conditioners or other IRcontrolled devices, which can be controlled by IR signals provided by the hazard detection units 104 or the light switches 108. FIG. 2 illustrates a networklevel view of an extensible devices and services platform with which the smart home of FIG. 1 can be integrated, according to some embodiments. Each of the intelligent, networkconnected devices from FIG. 1 can communicate with one or more remote central servers or cloud computing systems 164. The central server or cloudcomputing system 164 can collect operation data 202 from the smart home devices. For example, the devices can routinely transmit operation data or can transmit operation data in specific instances e.g., when requesting customer support. The central server or cloudcomputing architecture 164 can further provide one or more services 204. The analyzed data can be stored as derived data 208. Results of the analysis or statistics can thereafter be transmitted back to a device providing ops data used to derive the results, to other devices, to a server providing a webpage to a user of the device, or to other nondevice entities. The results or statistics can be provided via the Internet 162. In this manner, processing engines 206 can be configured and programmed to derive a variety of useful information from the operational data obtained from the smart home. A single server can include one or more engines.

The derived data can be highly beneficial at a variety of different granularities for a variety of useful purposes, ranging from explicit programmed control of the devices on a perhome, perneighborhood, or perregion basis for example, demandresponse programs for electrical utilities, to the generation of inferential abstractions that can assist on a perhome basis for example, an inference can be drawn that the homeowner has left for vacation and so security detection equipment can be put on heightened sensitivity, to the generation of statistics and associated inferential abstractions that can be used for government or charitable purposes. For example, processing engines 206 can generate statistics about device usage across a population of devices and send the statistics to device users, service providers or other entities e.g., that have requested or may have provided monetary compensation for the statistics. As specific illustrations, statistics can be transmitted to charities 222, governmental entities 224 e.g., the Food and Drug Administration or the Environmental Protection Agency, academic institutions 226 e.g., university researchers, businesses 228 e.g., providing device warranties or service to related equipment, or utility companies 230. These entities can use the data to form programs to reduce energy usage, to preemptively service faulty equipment, to prepare for high service demands, to track past service performance, etc., or to perform any of a variety of beneficial functions or tasks now known or hereinafter developed. FIG. 3 illustrates an abstracted functional view of the extensible devices and services platform of FIG. 2, with particular reference to the processing engine 206 as well as the devices of the smart home.

Even though the devices situated in the smart home will have an endless variety of different

individual capabilities and limitations, they can all be thought of as sharing common characteristics in that each of them is a data consumer 302 DC, a data source 304 DS, a services consumer 306 SC, and a services source 308 SS. Advantageously, in addition to providing the essential control information needed for the devices to achieve their local and immediate objectives, the extensible devices and services platform can also be configured to harness the large amount of data that is flowing out of these devices. For example, FIG. 3 shows processing engine 206 as including a number of paradigms 310. Processing engine 206 can include a managed services paradigm 310 a that monitors and manages primary or secondary device functions. The device functions can include ensuring proper operation of a device given user inputs, estimating that e.g., and responding to an intruder is or is attempting to be in a dwelling, detecting a failure of equipment coupled to the device e.g., a light bulb having burned out, implementing or otherwise responding to energy demand response events, or alerting a user of a current or predicted future event or characteristic. Services, promotions, products or upgrades can then be offered or automatically provided to the user. For example, a users status as reported to their trusted contacts on the social network could be updated to indicate when they are home based on light detection, security system inactivation or device usage detectors. As another example, a user may be able to share deviceusage statistics with other users. Processing engine can integrate or otherwise utilize extrinsic information 316 from extrinsic sources to improve the functioning of one or more processing paradigms. Extrinsic information 316 can be used to interpret operational data received from a device, to determine a characteristic of the environment near the device e.g.

, outside a structure that the device is enclosed in, to determine services or products available to the user, to identify a social network or socialnetwork information, to determine contact information of entities e.g., publicservice entities such as an emergencyresponse team, the police or a hospital near the device, etc., to identify statistical or environmental conditions, trends or other information associated with a home or neighborhood, and so forth. An extraordinary range and variety of benefits can be brought about by, and fit within the scope of, the described extensible devices and services platform, ranging from the ordinary to the profound. While this is, of course, a very advantageous capability accommodated by the described extensible devices and services platform, there can be substantially more “profound” examples that can truly illustrate the potential of a larger “intelligence” that can be made available. By way of perhaps a more “profound” example, the same data bedroom occupancy data that is being used for fire safety can also be “repurposed” by the processing engine 206 in the context of a social paradigm of neighborhood child development and education. Thus, for example, the same bedroom occupancy and motion data discussed in the “ordinary” example can be collected and made available for processing properly anonymized in which the sleep patterns of schoolchildren in a particular ZIP code can be identified and tracked. Localized variations in the sleeping patterns of the schoolchildren may be identified and correlated, for example, to different nutrition programs in local schools. FIG. 4A is a schematic diagram of an HVAC system connected directly to a thermostat 102, according to some embodiments. For carrying out the heating function, heating coils or elements 442 within air handler 440 provide a source of heat using electricity or gas via line 436.

Cool air is drawn from the enclosure via return air duct 446 through filter 470, using fan 438 and is heated through heating coils or elements 442. The heated air flows back into the enclosure at one or more locations via supply air duct system 452 and supply air registers such as register 450. In cooling, an outside compressor 430 passes a refrigerant gas through a set of heat exchanger coils and then through an expansion valve. The gas then goes through line 432 to the cooling coils or evaporator coils 434 in the air handler 440 where it expands, cools and cools the air being circulated via fan 438. A humidifier 454 may optionally be included in various embodiments that returns moisture to the air before it passes through duct system 452. Although not shown in FIG. 4A, alternate embodiments of HVAC system 103 may have other functionality such as venting air to and

from the outside, one or more dampers to control airflow within the duct system 452 and an emergency heating unit. Overall operation of HVAC system 103 is selectively actuated by control electronics 412 communicating directly with thermostat 102 using a number of wires 448. The number of control wires depends on what types of components are included HVAC system 103, ranging from 2 wires for a basic single stage heating HVAC system to up to 8 or 10 wires 448 in the case of more complex systems. FIG. 4B is a schematic diagram of an HVAC system 103 A being controlled by thermostat 102 through an auxiliary HVAC control unit, according to some embodiments. In this case the thermostat 102 is connected to the auxiliary HVAC control unit AHCU 460 via a small number of for example 3 or 4 wires 480 and the AHCU 460 is connected to the HVAC system using a larger number of wires for example up to 16 490, to HVAC system 103 A via the HVAC control electronics 412.

Note that the HVAC system 103 A can be identical or similar to HVAC system 103, or it could be considerably more complex, making use of many more wires for controlling. According to some embodiments the AHCU can also be used to communicate with a number of additional sensors, such as outdoor temperature sensor 472 connected via wire 482 and return air temperature sensor 474 via wire 484, located in return air duct 446. Note that the AHCU 460 is installed very close to the HVAC system. By locating the AHCU directly on or very close to the HVAC system furnace or air mover, and communicating and supplying power to the thermostat 102 using only a few wires e.g. 3 or 4 wires 480 , a sleek relatively small thermostat that is visually pleasing when wall mounted in a home even with an HVAC system that benefits from a large number of wire connections. Thus, as shown in FIGS. 4A and 4B, according to some embodiments, the same thermostat unit 102 is capable of connecting either directly to an HVAC system in as in FIG. 4A, through an AHCU, as in FIG. 4B. According to some embodiments, the thermostat 102 is capable of automatically detecting whether it is connected directly to an HVAC system or through an AHCU. Unlike many prior art thermostats, thermostat 102 has a sleek, simple, uncluttered and elegant design that does not detract from home decoration, and indeed can serve as a visually pleasing centerpiece for the immediate location in which it is installed. Moreover, user interaction with thermostat 102 is facilitated and greatly enhanced over known conventional thermostats by the design of thermostat 102. The thermostat 102 includes control circuitry and is electrically connected to an HVAC system 103, such as is shown in FIGS. 14. Thermostat 102 is wall mountable, is circular in shape, and has an outer rotatable ring 512 for receiving user input. Thermostat 102 is circular in shape in that it appears as a generally disklike circular object when mounted on the wall.

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