installation and start-up instructions
THERMIDISTAT™ CONTROL

TSTAT

Cancels: II TSTAT-0-22 II TSTAT-0-27
8-99

NOTE: Read the entire instruction manual before starting the installation.

This symbol → indicates a change since the last issue.

INDEX

Page

SAFETY CONSIDERATIONS 1
INTRODUCTION 1
INSTALLATION CONSIDERATIONS 1
INSTALLATION 2-7
- Thermidistat Control Location 2
- Set DIP Switches 2
- Install Thermidistat Control 2-3
- Set Thermidistat Control Configuration 3-8
- System Start-Up and Checkout 7-8
- Final Settings 8

PERFECT® HUMIDITY CONTROL FEATURES 8-10
- Humidification 8
- Dehumidification 8-10
- Vacation 10

OPERATIONAL INFORMATION 10-11
THERMIDISTAT CONTROL TROUBLESHOOTING 11
THERMIDISTAT CONTROL CONFIGURATION RECORD.12
WIRING DIAGRAMS ....See Thermidistat Wiring Diagrams

SAFETY CONSIDERATIONS

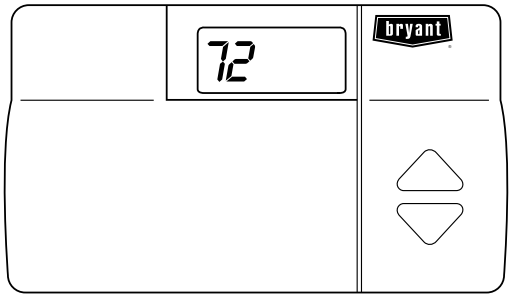
Read and follow manufacturer instructions carefully. Follow all local electrical codes during installation. All wiring must conform to local and national electrical codes. Improper wiring or installation may damage Thermidistat Control.

Recognize safety information. This is the safety-alert symbol ⚠ . When you see this symbol on the equipment and in the instruction manual, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, and CAUTION. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies a hazard which **could** result in personal injury or death. CAUTION is used to identify unsafe practices which **would** result in minor personal injury or product and property damage.

INTRODUCTION

Bryant's 7-day programmable/non-programmable Thermidistat Control is a wall-mounted, low-voltage control which combines temperature and humidity control in a single attractive unit. An extension of Bryant's proven line of thermostats, it provides separate set points for heating and cooling, and now adds humidification and dehumidification. Different heating and cooling set points and times are programmable for 4 periods per day and 7 days per week. The Thermidistat Control can also be field-configured as a non-programmable thermostat. When operating in the non-programmable configuration it will still have both temperature and humidity control. Humidify and dehumidify outputs provide direct control of humidity. Batteries are not used. During power loss an internal memory stores programs and settings for unlimited time, and the clock continues to run for at least 8 hr.



A98427

HEIGHT (IN.)	WIDTH (IN.)	DEPTH (IN.)
4-3/8	7-3/8	1-3/8

Fig. 1—Thermidistat Control

INSTALLATION CONSIDERATIONS

A. Power

Note that this control does not require batteries and is not "power stealing." It does require 24vac (R and C terminals) of the low-voltage transformer to be connected to it for proper operation. It will not operate without these 2 connections.

B. Models

There is a single programmable/non-programmable model for all applications. It can be configured for AC or HP, 1- or 2-speed compressor, and for dual fuel installations, allowing it to be used in place of all Bryant thermostats.

C. Humidify Equipment and Connections

The humidify output connects directly to 24vac operated humidifiers. No other connection or interlock is required. Any of several installer-selectable operating modes are available.

→ ⚠ **WARNING: DO NOT** connect Furnace HUM terminal directly to Thermidistat HUM terminal. This will bypass furnace safety controls. See Low Voltage Wiring Diagrams and notes for proper connection.

D. Dehumidify Equipment and Connections

The dehumidify output connects to the dehumidify input on variable-speed furnaces and fan coils. Additional dehumidification is done by controlling the compressor. A variety of operating modes are available.

E. Outdoor Temperature Sensor

Optimum performance is obtained when an outdoor temperature sensor is used with the Thermidistat Control. Plan installation so that 2 wires can be run from Thermidistat Control to an outdoor location, preferably on the north side of the house **or** refer to Installation Instructions included with the outdoor temperature sensor for simplified connection. Sensor can be mounted to outdoor unit and existing control wires may be used for its connection. Details are provided in sensor instructions.

INSTALLATION

I. THERMIDISTAT CONTROL LOCATION

Thermidistat Control should be mounted:

- Approximately 5 ft (1.5m) from floor.
- Close to or in a frequently used room, preferably on an inside partitioning wall.
- On a section of wall without pipes or duct work.

Thermidistat Control should NOT be mounted:

- Close to a window, on an outside wall, or next to a door leading to the outside.
- Exposed to direct light or heat from a lamp, sun, fireplace, or other temperature-radiating objects which could cause a false reading.
- Close to or in direct airflow from supply registers and return-air registers.
- In areas with poor air circulation, such as behind a door or in an alcove.

II. SET DIP SWITCHES

There is a 4 section DIP switch within the Thermidistat Control which must be properly set by the installer. It is easiest to set these 4 switches before the Thermidistat Control is mounted to the wall, so STOP and complete the following steps:

1. Open hinged Thermidistat Control cover.
2. Remove cover completely by snapping it apart at hinge.
3. Open Thermidistat Control by pressing back half of the right end of plastic case inward while, at the same time, pulling front and back halves apart at the right end. The 2 halves will swing apart.
4. Snap hinge apart to completely separate the 2 halves.
5. Switches are located in upper right corner of circuit board. To change switch position, use corner of a small screwdriver to slide switch to opposite position.
6. After switches have been set, do not reassemble the 2 halves. The rear plastic will first be mounted to the wall.

A. Switch 1—AC/HP Select

Use this switch to select between air conditioner and heat pump systems.

TO SET:
OFF—for air conditioner installations. This is factory default.
ON—for heat pump installations, using either a fan coil or furnace (dual fuel).

B. Switch 2—1 Speed/2 Speed

This switch tells the system whether the compressor is 1 or 2 speed.

TO SET:
OFF—for single-speed compressor. This is factory default.
ON—for 2-speed compressors, whether AC or HP.

C. Switch 3—Smart/Conventional Recovery

Selects between conventional and smart recovery from setback. Conventional recovery changes to new set point at programmed time. Smart recovery, which is active in both heating and cooling, starts 90 minutes earlier and smoothly adjusts set point so room will arrive at programmed temperature at programmed time.

TO SET:
OFF—for smart recovery. This is factory default.
ON—for conventional recovery.

D. Switch 4—Installer Test OFF/ON

Selects a special installer test mode which assists with system startup and checkout. See Step 5, System Startup and Check-out.

TO SET:
OFF—for normal operation. This is factory default.
ON—for installer test mode.

III. INSTALL THERMIDISTAT CONTROL

> ⚠ **WARNING:** Before installing Thermidistat Control, turn off all power to equipment. There may be more than 1 power disconnect. Electrical shock can cause personal injury or death.

1. Turn off all power to equipment.
2. If an existing thermostat is being replaced:
   a. Remove existing thermostat from wall.
   b. Disconnect wires from existing thermostat, 1 at a time.
   c. As each wire is disconnected, record wire color and terminal marking.
   d. New or additional wire may be needed to accommodate added humidity outputs.
   e. Discard or recycle old thermostat.

NOTE: Mercury is a hazardous waste and MUST be disposed of properly.

3. Select Thermidistat Control rear plastic. (If it is not separated from the remainder of the Thermidistat Control, refer to Step 2 above.)
4. Route wires through large hole in rear plastic. Level rear plastic against wall (for aesthetic value only—Thermidistat Control need not be leveled for proper operation) and mark wall through 2 mounting holes.
5. Drill two 3/16-in. mounting holes in wall where marked.
6. Secure rear plastic to wall with 2 screws and anchors provided. Additional mounting holes are available for more secure mounting if needed. Make sure all wires extend through hole in mounting base.
7. Adjust length and routing of each wire to reach proper connector block and terminal on rear plastic with 1/4-in. extra length. Strip only 1/4 in. of insulation from each wire to prevent adjacent wires from shorting together when connected.
8. Match and connect equipment wires to proper terminals of each connector block. (See Low Voltage Wiring Diagram Reference Chart and Figs. 1 through 28 in separate Wiring Diagram literature). Remember R and C **must** be connected for proper operation.

> ⚠ **CAUTION:** Improper wiring or installation may damage Thermidistat Control. Check to make sure wiring is correct before proceeding with installation or turning on power.

9. Push any excess wire into wall and against rear plastic. Seal hole in wall to prevent air leaks. Leaks can affect operation.
10. Reattach Thermidistat Control body to rear plastic by first reattaching hinge.
11. Close Thermidistat Control assembly, making sure pins on back of circuit board align with sockets in connector.
12. Turn on power to equipment.

On power up, all display segments will light for 5 sec. For the next 5 sec, a 2-digit code appears on large display which identifies Thermidistat Control configuration:

1. AC—for 1-speed air conditioner

2. HP—for 1-speed heat pump
3. A2—for 2-speed air conditioner
4. H2—for 2-speed heat pump
5. dF—for 1-speed dual fuel
6. d2—for 2-speed dual fuel
7. HS—for 1-speed heat pump with Intelligent Heat Staging (3- stage auxiliary heat with 40FK, FK4C or FV4A Series fan coils.)

When this identifier disappears, normal operation begins. The MODE control should be set to OFF and FAN control to AUTO, so equipment does not start until further configuration and check-out is completed.

IV. SET THERMIDISTAT CONTROL CONFIGURATION

Configuration options, like DIP switch settings, are intended to be selected at installation and normally are not modified by the homeowner. These options are not discussed in the homeowner's manual and therefore must be made as part of the installation. A special procedure allows entry into the configuration mode. While in configuration mode, up to 17 selections can be made. A description of each selection and how to use the configuration mode follows.

A. Configuration Options — Summary:

Option 1—Anticipator adjustment

Option 2—Clean filter timer adjustment

Option 3—English/Metric selection

Option 4—Fan (G) ON with W selection

Option 5—Variable-speed blower present selection

Option 6—Cooling lockout below 55° selection

Option 7—Variable-speed super dehumidification selection (only available when variable-speed blower is used)

Option 8—Auxiliary heat lockout temperature setting (only available when heat pump is used)

Option 9—Intelligent Heat Staging Selection (only available when single-speed heat pump is used)

Option 10—Dual Fuel selection (only available when heat pump is used)

Option 11—Balance Point Setting (only available when dual fuel is selected)

Option 12—Defrost heat selection (only available when heat pump is used)

Option 13—Room temperature offset adjustment

Option 14—Heat/cool dead band adjustment

Option 15—Enable AUTO mode

Option 16—Enable Perfect Heat mode

Option 17—Non-Programmable selection

B. To Enter Configuration Mode:

Press and hold FAN button for approximately 10 sec until COOL set point display indicates a flashing 1. The Thermidistat Control is now in configuration mode. It will automatically exit this mode if no button is pressed for 3 minutes. Pressing END button will exit configuration mode immediately.

C. While in Configuration Mode:

The upper small (COOL set point) display indicates selected option number and large display indicates selection made within that option. One of these will be flashing. The up and down buttons are used both to move between available options and to make selection for each option. When option number (small display) is flashing, up and down buttons adjust it, moving between available option numbers. After desired option number has been selected, press SET TIME/TEMP button once. The large display will now flash, indicating that up and down buttons now control available choices within that option. Each press of TIME/TEMP button switches between available option (small display) and available selections within each option (large display).

D. Configuration Options — Selection:

OPTION 1—ANTICIPATOR ADJUSTMENT

This adjustment controls sensitivity and cycle rate of Thermidistat Control. Higher numbers decrease sensitivity and slow cycle rate. Lower numbers increase sensitivity and cycle rate. However, a limiting feature will not allow more than 4 cycles per hr, regardless of setting. Anticipator values can range from 1 to 9. Factory default is 3. This default selection provides optimum performance in nearly all installations. Try it first. Do not change setting unless there is evidence of need to do so.

Unlike conventional anticipators, this setting is not determined by current draw. There is no need to measure, know, or compensate for current draw. There is also no droop with this Thermidistat Control. Regardless of setting and number of stages, both heating and cooling will control to their respective set points.

TO ADJUST:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." The upper small (COOL set point) display will be flashing 1. If not, use up and down buttons to move it to 1.
2. Press SET TIME/TEMP button once to flash current selection of 1, 2, 3, 4, 5, 6, 7, 8, or 9 on large display. Factory default is 3.
3. Use up and down buttons to move between available choices.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 2—CLEAN FILTER TIMER

Select hours of blower operation (heating, cooling, or fan) before CLEAN FILTER icon is displayed. With OFF selected, icon will never come on, disabling this feature. Time selection can range from 400 to 3600 hr by selecting numbers 1 through 9. (Time is 400 X number selected.) Factory default is 2 (800 hr). Recommended selections are: disposable filter—400 to 800 hr, media filter—1200 to 1600 hr, or electronic air cleaner—1600 to 2400 hr of blower operation.

TO SELECT OR ADJUST:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 2.
2. Press SET TIME/TEMP button once to flash current selection of OF, 1, 2, 3, 4, 5, 6, 7, 8, or 9 on large display. Factory default is 2.
3. Use up and down buttons to move between available choices.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 3—ENGLISH/METRIC

Select between Fahrenheit and Celsius operation. Factory default is Fahrenheit.

TO SELECT OR ADJUST:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 3.
2. Press SET TIME/TEMP button once to flash current selection of F or C. Factory default is F.

3. Use up and down buttons to move between F and C on large display.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 4—FAN (G) ON WITH W

This selection determines whether fan (G) output is to be ON or OFF when any W (furnace or strip heat) output is ON. Most furnaces and fan coils manage their own blowers and do not require separate G signal. For these applications, select OFF. Some auxiliary heaters require separate G signal to turn on blower. In this case, select ON. Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 4.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 5—VARIABLE-SPEED (ICM) BLOWER

If furnace or fan coil contains a variable-speed (ICM) blower, set this option to ON. For normal (PSC) blowers, set to OF. This selection enables system to use special features available only in units with an ICM blower. Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 5.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 6—COOLING LOCKOUT BELOW 55°F

This option disables cooling when outdoor temperature is below 55°F. It requires an outdoor temperature sensor. Set to OF to allow cooling below 55°F. Set to ON to prevent cooling below 55°F. Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 6.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 7—VARIABLE-SPEED SUPERDEHUMIDIFY

This option requires prior selection of variable-speed (ICM) blower (Option 5). When selected, this option operates blower at further reduced airflow from that of normal dehumidification when there is a dehumidification demand without a cooling demand, achieving maximum humidity removal with minimum cooling. It is done by supplying blower with a Y signal and no G signal on a call for cooling. Not all products with ICM blowers have this feature. Check Installation Instructions for ICM air handler used. Select OF for normal operation (Y and G supplied on a cooling call). Select ON for super dehumidification (Y with no G on a dehumidify only call). Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 7.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 8—AUXILIARY HEAT LOCKOUT SETTING

This option requires prior selection of heat pump (DIP switch 1--ON). It allows selection of an outdoor temperature of 5° through 55°F. (or equivalent values in C), or OF (off). Auxiliary heat (furnace in Dual Fuel applications) is prevented from operating for outdoor temperatures above selected temperature. If OF (off) is selected, auxiliary heat (furnace if Dual Fuel) operation is allowed at all outdoor temperatures. If selected, emergency heat (EHEAT) overrides this feature. Factory default is OF (off). This setting can only be equal to or above the setting choice made for Option 11. Moving this setting lower may 'push' Option 11 setting downward.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 8.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to move between OF, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, or 55 on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 9—INTELLIGENT HEAT STAGING

This option requires prior selection of single-speed heat pump (DIP switch 1—ON, DIP switch 2—OF). It provides 3 stages of electric heat from W1 and W2 by sequencing W1 only, then W2 only, then both W1 and W2. See FK or FV Series Fan Coil Installation Instructions for further information. For 3-stage heat, select ON. For normal 1- or 2-stage heat, select OF. Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 9.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 10—DUAL FUEL EQUIPMENT

> ⚠ **CAUTION:** All dual fuel installations must be equipped with a high pressure switch to turn off compressor under a high indoor coil pressure condition.

The high pressure switch protects compressor and indoor coil from overpressure which would occur if a failure or wiring error resulted in the heat pump and furnace operating at the same time. High Pressure Switch Kit includes required switch and instructions for proper operation. For all dual fuel installations, outdoor temperature sensor must be attached. If not, E3 error message will appear. See "Error Codes."

This option requires prior selection of heat pump (DIP switch 1—ON), and must be selected in dual fuel installations. It prevents simultaneous operation of both furnace and heat pump, and prevents direct transition from heat pump to furnace operation. When system is dual fuel (heat pump and furnace), set to ON. When system contains fan coil, set to OF. Factory default is OF (off).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 10.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to alternate between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 11—BALANCE POINT SETTING

This option is for **dual fuel installations only**. It requires prior selection of heat pump (DIP switch 1 -- ON) and dual fuel equipment (Option 10 -- ON). It allows selection of an outdoor temperature of 5°F. through 55°F. (or equivalent values in C.), or OF (off). Heat pump is prevented from operating for outdoor temperatures below selected temperature. If OF (off) is selected, heat pump operation is allowed at all outdoor temperatures. Factory default is OF (off). This setting can only be equal to or below the setting choice made for Option 8. Moving the setting higher may 'push' Option 8 setting upward.

If the outdoor temperature is above the "balance point setting", the heat pump will energize first to try to satisfy the indoor temperature demand. If the heat pump does not make a sufficient improvement within a reasonable time period (i.e. 15 minutes), then the gas furnace will come on to satisfy the indoor temperature demand. If the outdoor temperature is below the "balance point setting" the heat pump will not be allowed to operate (i.e. locked out), and the gas furnace will be used to satisfy the indoor temperature.

There are three separate concepts which are related to selecting the final "balance point setting". Read each of the following carefully to determine the best "balance point setting" in a dual fuel installation:

1. Capacity Balance Temperature:

This is the point where the heat pump cannot provide sufficient capacity to keep up with the indoor temperature demand because of declining outdoor temperature. At or below this point, the furnace is needed to maintain proper indoor temperature.

2. Economic Balance Temperature:

Above this point, the heat pump is the most cost efficient to operate, and below this point, the furnace is the most cost efficient to operate. This can be somewhat complicated to determine and it involves knowing the cost of gas and electricity, as well as the efficiency of the furnace and heat pump. For the most economical operation, the heat pump should operate above this temperature (assuming it has sufficient capacity), and the furnace should operate below this temperature.

3. Comfort Balance Temperature:

When the heat pump is operating below this point, the indoor supply air feels uncomfortable (i.e. too cool). This is purely subjective and will depend on the homeowner's idea of comfort. Below this temperature, the gas furnace should operate in order to satisfy the desire of indoor comfort.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 11.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to move between OF, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, or 55 on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 12—DEFROST HEAT SELECT

This option allows installer to select the amount of heat provided by Thermidistat Control during a heat pump defrost cycle. This can be very helpful in maintaining a comfortable leaving air temperature during defrost. The Thermidistat Control senses when defrost is in progress by monitoring voltage placed on the O line by the heat pump while defrosting. It responds by turning on selected combination of W1 and W2 during defrost. Note that this is very different from the operation of an ordinary thermostat, which cannot sense defrost in progress and only turns on its W outputs in response to a temperature demand. Combinations of W1 and W2 are selected via the following:

TABLE 1—W1 / W2 OUTPUTS

SELECTION	DEFINITION
0	Neither W1 or W2 is turned on. This is factory default.
1	Only W1 is turned on.
2	Both W1 and W2 turned on.
3	Only W2 turned on (available only if 3-stage heat is selected).

The selection procedure is given below. If 0 is selected, operation is like that of an ordinary thermostat, and a wire is required between W2 of outdoor unit and a selected W on indoor unit. When selection 1, 2, or 3 is made, no wire should be connected from outdoor W2 because this connection may override selection made. Obviously the heater must be in 2 sections, and fan coil jumper must be removed between W1 and W2 for there to be a difference between selections 1, 2, and 3. For most heaters, W1 is lower wattage heater, and W2 is higher, although some have equal elements for W1 and W2. Consult fan coil/heater combination for the actual wattage connected to each of W1 and W2.

In dual fuel applications, above selection choices apply and can be used to select low or high heat if furnace is 2 stage. W1 will produce low heat. W1 and W2 together produce high heat. This option provides no value with single-stage furnaces because only 1 value of heat is available.

The selection choices guarantee selected outputs will be on during defrost. If room temperature demand requires additional heat, it will be supplied, resulting in additional outputs being turned on. If room overheats, specified outputs will not turn off, guaranteeing a sufficiently warm leaving air temperature during defrost. Temperature overshoot during defrost can occur, but is almost never noticeable because of the short duration of the defrost cycle (4 minutes typical, 10 minutes maximum).

An additional feature of Thermidistat Control defrost is that it always allows defrost cycle to run to completion. The Thermidistat Control leaves the Y output on as long as outdoor unit holds voltage on the O line, even if it is satisfied. This prevents premature termination of defrost cycles, which occur with normal thermostats.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 12.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to move between 0, 1, 2, or 3 (if available) on large display. See Table 1 for effect of these choices. Factory default is 0.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 13—ROOM TEMPERATURE OFFSET ADJUST

This option allows calibration (or deliberate miscalibration) of room temperature sensor. There are various reasons why homeowners may want to have displayed temperature adjusted to a higher or lower value. The selected number is number of degrees fahrenheit, plus or minus, which will be added to actual temperature. The numbers can range between -5 and +5. Factory default is 0. This adjusted value will be used as actual temperature for both display and control action. For example, if 2 is selected, 72°F actual will read 74°F. If set point is 72°F, the room will control to an actual temperature of 70°F which will be displayed and acted upon as if it were 72°F. The effect is that a positive number selection will make the room temperature lower and vice versa. The Thermidistat Control is calibrated within an accuracy of plus or minus 1°F when shipped from the factory, so this adjustment will provide the best accuracy when set to 0.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 13.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to move between -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, or 5 on large display. Factory default is 0.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 14—HEAT/COOL DEAD BAND ADJUSTMENT

This option selects the minimum difference between heat and cool set points. A larger difference saves energy and a smaller difference decreases temperature difference between heating and cooling. Factory default is 2, which means cooling set point must be a minimum of 2° above heating set point. An attempt to move them closer will result in one "pushing" the other to maintain the required difference.

Depending on set points, moving dead band closer than 2° may result in regular cycling between heat and cool when AUTO mode is selected. However, this cycling cannot occur more often than 1 transition every 20 minutes. The system has a built-in requirement that it cannot switch between heat and cool without a 20 minute "off" time between the 2 operations. Specifically, to switch from 1 mode to the other, there must be no demand for the old mode and a demand for the new mode, and this must exist continually for 20 minutes before transition to the new mode will occur.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 14.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up or down buttons to move between 0, 1, 2, 3, 4, 5, or 6 on large display. Factory default is 2.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 15—ENABLE AUTO MODE

This option allows the installer to enable or disable AUTO mode (automatic changeover between heat and cool). When disabled, AUTO icon does not appear when successive presses of MODE button are used to move between OFF, HEAT, COOL, and EHEAT (in heat pump systems). Factory default is ON (AUTO enabled).

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 15.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up and down buttons to move between OF and ON on large display. Factory default is ON (AUTO enabled).
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 16—ENABLE PERFECT HEAT *PLUS* MODE

→ This option requires prior ON selection of heat pump (DIP switch No. 1) and Configuration Option No. 5 (Select Variable-Speed Blower). Perfect Heat *Plus* mode, is part of the Perfect Heat Pump system, which comprises a selected combination of Thermidistat Control, Variable Speed Fan Coil, and 3-stage electric heater to provide superior heat pump leaving air temperatures under all conditions. This option selection modifies heat pump blower and auxiliary heat operation to contribute to comfortable leaving air temperature. Specifically, this selection provides:

- Reduced heat pump airflow for outdoor temperatures between 12° and 40°F.
- At least 1 stage of electric heat ON for all heating below 12°F.

→ While outdoor air temperature is between 12 and 40°F, the Thermidistat Control removes the G signal during heat pump heating. The FK4C and FV4A Variable-Speed Fan Coils respond by reducing their airflow in the absence of the G signal, raising leaving air temperature. For any heating demand below 12°F, G and W/W1 are turned ON, assuring at the least 1 stage of electric heat is on, and also increasing leaving air temperature.

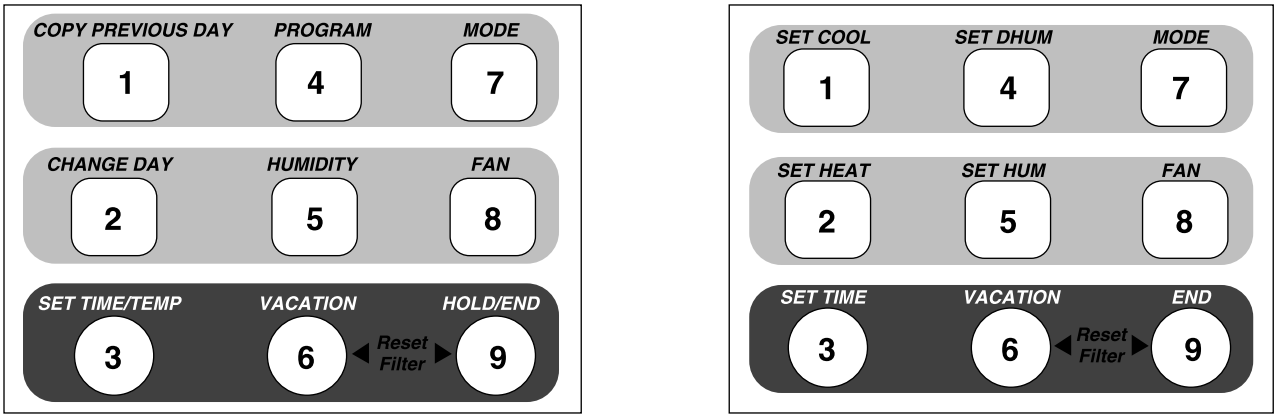
As part of the Perfect Heat pump system, Configuration Option No. 9 (Intelligent Heat Staging) should also be set to ON if the heat pump is single stage and a 3-stage heater is present.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 16.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up and down buttons to move between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

OPTION 17—ENABLE NON-PROGRAMMABLE OPERATION

This option converts the programmable Thermidistat Control to a non-programmable control for those users who do not want programmability. The clock is retained, but the days of the week



A99059

Fig. 2—Programmable/Non-Programmable Keypad Labels

and the daily schedules have been eliminated, making it operate as if HOLD were permanently ON. Some of the buttons (used in programming only and now not needed) are redefined to simplify the non-programmable operation. To match these redefined buttons, a new keypad label, included with the Thermidistat, must be placed over the original keypad label. Fig. 2 shows both the original keypad label and the non-programmable keypad label. When this option is selected, the new keypad label must be applied over (or in place of) the original. Because these adhesive-backed keypad labels are not designed to be removed, this conversion should be considered permanent. Once the change to non-programmable operation is done, a procedure is not provided to easily change it back. Should this change be needed, it is best to trade the Thermidistat for one which has not been converted.

Both programmable and non-programmable versions of the Homeowner's Manual are available. Be sure to leave only the correct version of the Homeowner's Manual with the homeowner.

Once it has been determined that a particular installation is to be made non-programmable, the only changes required are:

- Attach non-programmable keypad label over original programmable one.
- Attach non-programmable start up instructions sticker to back of door.
- Set Configuration Option No. 17 to ON.
- Leave non-programmable homeowner's manual with homeowner.

To attach the provided non-programmable keypad label, carefully peel off its backing and apply it over the original keypad label. PLEASE HEED: Once the new keypad label makes contact, it will stick firmly in place and adjustments cannot be made. CAREFULLY locate an edge of the keypad label, making sure its position and orientation are correct. Then, from the attached edge, smooth the rest of the keypad label over the original. Make sure the new keypad label does not interfere with the motion of the buttons which it surrounds.

TO SELECT:

1. Enter configuration mode if not already there. See Step 4 "To Enter Configuration Mode." Use up and down buttons to make small (now flashing) display indicate 17.
2. Press SET TIME/TEMP button once to flash large display.
3. Use up and down buttons to move between OF and ON on large display. Factory default is OF.
4. Press SET TIME/TEMP button again to flash upper small display for selection of another option, or press END to exit configuration mode.

Redefinition of Buttons

Fig. 2 shows the original (programmable) button labels on the left and the redefined (non-programmable) buttons on the right. In the figure, the buttons are numbered for easy reference. They are not numbered on the actual product. Six of the buttons (numbers 1 through 5 and 9) have been redefined.

Button 3 originally alternated between time, cool set point, and heat set point with each press. Now, button 1 selects the cool set point, button 2 selects the heat set point, and button 3 selects time, now used only to set the clock. Note that the days of the week are gone.

Button 5 used to alternate between humidify and dehumidify. Now button 4 selects dehumidify and button 5 selects humidify.

Button 9 now loses the HOLD label, making it END only. This button is only used to END the humidity screen and the configuration mode.

These changes both simplify operation for the homeowner and find use for the buttons which are no longer needed when programmability is removed.

V. SYSTEM START-UP AND CHECKOUT

The Thermidistat Control is designed with a built-in installer test capability. It allows easy operation of equipment without delays or set point adjustments to force heating or cooling.

To enable installer test mode, move DIP switch No. 4 to ON position. To access this switch, open case as described in Step 2. Use the corner of a small screwdriver to slide switch No. 4 to ON position.

While in installer setup mode, clock will display "InSt," FAN button will control fan, and MODE button will control heating and cooling.

A. To Test Fan:

Fan button switches FAN icon between AUTO and ON. While ON is displayed, G output will be on, turning fan on. Allow up to 10 sec after button is pressed for fan to turn on and off. On some fan coils, fan continues to operate for 90 sec after G signal is removed.

B. To Test Cooling and Dehumidification:

Press MODE button until COOL icon turns on. Cooling begins within 10 sec and remains on for 4 minutes. If system is 2-speed, low speed comes on for first 2 minutes, followed by high speed for second 2 minutes. At the end of 4-minute run, cooling stops, and MODE reverts back to OFF. At any time during 4-minute run time, cooling may be turned off by pressing MODE button until OFF appears. While cooling is on, successive presses of HUMIDITY button turn dehumidify output on and off. While this output is active, "dh" appears in cool set point display. Equipment outputs for different equipment types are listed in Table 2.

TABLE 2—EQUIPMENT OUTPUTS

	1-SPEED AC	2-SPEED AC	1-SPEED HP	2-SPEED HP
Cool—0 to 2 minutes	Y, G	Y1, G	Y, G, O	Y1, G, O
Cool—2 to 4 minutes	Y, G	Y1, Y2, G	Y, G, O	Y1, Y2, G, O
Heat—0 to 2 minutes	W1	W1	Y, G	Y1, G
Heat—2 to 4 minutes	W1, W2	W1, W2	Y, G	Y1, Y2, G
Eheat—0 to 2 minutes	---	---	W1	W1
Eheat—2 to 4 minutes	---	---	W1, W2†	W1*

* Two-stage heat not available

NOTE: For Y—use terminal Y/Y2, for Y1—use terminal Y1/W2, for W2—use terminal O/W2, for O—use terminal O/W2, for W1—use terminal W/W1, for W2†, use terminal Y1/W2

C. To Test Primary Heating and Humidification:

Press MODE button until HEAT icon turns on. Primary heating begins within 10 sec and remains on for 4 minutes. This will be furnace or electric heat in AC system and heat pump heating in heat pump system. If system has 2 stages of primary heat, first stage will be on for 2 minutes followed by second stage for 2 minutes. At the end of 4-minute run, heating stops, and MODE reverts back to OFF. At any time during 4-minute run time, heating may be turned off by pressing MODE button until OFF appears. While heating is on, successive presses of HUMIDITY button turn humidify output on and off. While this output is active, "hu" appears in heat set point display. Equipment outputs for different equipment types are listed in Table 2.

D. To Test Auxiliary Heating:

Auxiliary heating only exists in heat pump systems. To test, press MODE button until EHEAT icon turns on. This will be electric heat in standard heat pump systems and furnace in dual fuel systems. Auxiliary heating begins within 10 sec and remains on for 4 minutes. If there are 2 stages of auxiliary heat, first stage comes on for 2 minutes followed by second stage for 2 minutes. At the end of 4-minute run, heating stops and MODE reverts back to OFF. At any time during 4-minute run time, heating may be turned off by pressing MODE button until OFF appears. Actual outputs for different equipment types are listed in Table 2.

VI. FINAL SETTINGS

Be sure to return DIP switch No. 4 back to OFF position to exit installer setup mode. Assuming system is to be left in operation after installation is complete, use MODE button to select between HEAT, COOL, or AUTO to provide desired operation of heating, cooling, or both.

The default set points and programmed schedule conform to the Energy Star® requirements of the U.S. Department of Energy for both heating and cooling. These provide energy saving temperature settings. Refer to Table 3.

TABLE 3—ENERGY STAR DEFAULT SCHEDULE

SCHEDULE	HEAT	COOL
Wake 6:00 AM	68°F	78°F
Day 8:00 AM	60°F	85°F
Evening 5:00 PM	68°F	78°F
Sleep 10:00 PM	60°F	82°F

If programmed schedule is to be used, make sure HOLD icon is off. This feature is turned on and off by HOLD button.

If fixed temperatures are desired, use HOLD button to turn on HOLD icon. This will maintain set points, not allowing them to change with programmed schedule.

The FAN button may be used to select between AUTO (fan on only with equipment) and FAN (fan on continuously) fan modes.

For further information on temperature selection and programming, refer to Homeowner's Guide.

PERFECT HUMIDITY® CONTROL FEATURES

The various humidity control features of the Thermidistat Control are explained below. They are grouped into 2 sections: humidification and dehumidification. At the end of each section, instructions on how to select each feature are given.

A. Perfect Humidity Humidification

The Thermidistat Control directly connects to a standard 24-vac humidifier to control humidification in the home. A humidify set point between 10 and 45 percent relative humidity is selected by the homeowner, or all humidification can be turned off. When humidity in home drops below set point, humidifier will be turned on to raise humidity level. Humidification can only occur in heating mode (HEAT or AUTO/HEAT). Five different humidification selections are available and are described below.

1. Normal Humidify

   In normal humidify, humidifier will be on if there is a humidity demand and any heating equipment is on. This will include furnace, heat pump, or auxiliary heat. In heat pump applications, this is an improvement over using an external humidistat, which only supplies humidity when auxiliary heat is on.

2. Fan Humidify

   This configuration allows a humidify demand to turn on fan and humidifier together, even if there is no heat demand. It is particularly useful when the furnace is oversized, resulting in short heating cycles. It allows the humidifier to run longer, supplying more humidity to the home. Note that fan hours will increase, using more electricity. Also, the humidifier delivers less moisture to cooler air than it does to heated air.

3. Auto Humidify

   This feature is designed to eliminate the problem of sweating windows in very cold weather. When selected, the set point is automatically reduced by 1 percent for every drop of 2°F in outdoor temperature between 50°F and 0°F. The set point may be changed at any time, and it will continue to track outdoor temperature from the new set point and current outdoor temperature. The adjusted set point range is still limited to between 10 and 45 percent relative humidity. To use this feature, an outdoor temperature sensor MUST be attached. If not, E3 error message will be displayed.

4. Auto and Fan Humidify

   The 2 choices of AUTO and FAN can be selected together. This provides both functions simultaneously.

5. Humidify Off

   The humidify function can be turned off completely. This does not require changing existing set points.

TO SELECT HUMIDIFICATION (BETWEEN NORMAL, FAN, AUTO, FAN AND AUTO, OR OFF) (SEE TABLE 4.)

Press HUMIDITY button to bring up humidity select screen. It is indicated by "hu" or "dhu" in clock display. Successive presses will change between "hu" and "dhu" in clock display. Select "hu" for humidity functions. The large display shows actual humidity level. The smaller display (in heat set point location) shows humidify set point or OF (off). When humidify set point value is displayed, its value can be changed with up and down buttons. Successive presses of MODE button will move between 5 choices described above and each will be indicated as shown in Table 4.

TABLE 4—HUMIDIFICATION SELECTIONS

SELECTION	MODE DISPLAY	FAN DISPLAY	HUMIDIFY SET POINT DISPLAY
Normal Humidify	Blank	Blank	Humidify Set Point Value
Fan Humidify	Blank	FAN	Humidify Set Point Value
Auto Humidify	AUTO	Blank	Humidify Set Point Value
Auto and Fan	AUTO	FAN	Humidify Set Point Value
Humidify Off	Blank	Blank	OF

To exit humidity select screen, press END button.

ADDITIONAL HUMIDIFY COMMENTS

The humidifier is actually turned on when humidity is 2 percent below set point and turned off when it reaches 2 percent above set point. This built-in hysteresis prevents humidify output from toggling on and off when humidity level is near set point.

The vacation mode provides some additional humidification functions. These are specially designed to provide protection for an unoccupied home while simultaneously minimizing energy use. Refer to "Vacation" section for additional information.

B. Perfect Humidity Dehumidification

Dehumidification is done only during cooling. Depending on type of equipment used, compressor speed, blower speed, set point adjustment, and equipment cycling are modified to provide added dehumidification. A dehumidification set point (separate from humidification set point) is available to the homeowner. It can range from 50 to 90 percent relative humidity. When actual humidity is higher than set point, a dehumidification demand exists. The Thermidistat Control responds by activating its dehumidify output. It may also control the compressor and blower, depending on equipment type and dehumidify selection choice. The 3 available selections are described below.

The amount of extra dehumidification available is very dependent on the type of equipment in the home. Without a variable-speed blower, the system's ability to adjust dehumidification is very limited.

1. Normal Dehumidify Operation

   When normal dehumidify is selected, the compressor will not turn on without a cooling demand. If dehumidify demand exists while cooling, dehumidify output will also be active (24vac removed). This output commands variable-speed blowers to reduce their airflow, which improves water removal from the cooled air.

2. Cool to Dehumidify

   The cool to dehumidify selection tells the system to operate the compressor, within limits, when there is a dehumidify demand even if there is no cooling demand. The limits are that the system may overcool up to 3°, but no more, while attempting to satisfy a dehumidify demand. Within this 3° range, there is an additional balance between overcooling and humidity satisfaction. When overcooling must occur, the dehumidify set point is adjusted upward by 2 percent per degree of overcooling. For example, a cooling set point of 76°F and a dehumidify set point of 60 percent is equivalent to a cooling set point of 75°F and a dehumidify set point of 62 percent. This dehumidify set point change is internal to the Thermidistat Control and is not shown on the display.

   During cool-to-dehumidify demand, the compressor runs a maximum of 10 minutes on, followed by 10 minutes off. When the compressor turns off, the fan (G output) is also turned off immediately. The immediate fan shutoff prevents re-evaporation of water on the coil, improving dehumidification. If fan is set to continuous, the G (fan on) signal is removed for 5 minutes starting when compressor turns off. In most furnaces and fan coils, the blower operates for 90 sec after both Y and G disappear. This 90-sec delay should be removed, if possible, for maximum dehumidification performance. Consult furnace or fan coil Installation Instructions to see if delay can be disabled.

3. Dehumidify Off

   Dehumidification can be turned off completely. This can be done without changing existing set points.

TO SELECT DEHUMIDIFICATION (BETWEEN NORMAL, COOL TO, AND OFF)

Press HUMIDITY button to bring up humidity selections. Successive presses will show "hu" or "dhu" in clock display. Select "dhu" for dehumidify selections. The large display shows actual humidity level. The smaller display (in cool set point location) shows dehumidify set point or OF (off). When dehumidify set point value is displayed, its value can be changed with up and down buttons. Successive presses of MODE button moves between 3 choices above and each will be indicated as in Table 5.

SUPER DEHUMIDIFY (WITH COOL TO DEHUMIDIFY)

This selection only affects cool-to-dehumidify operation. It is part of the installer setup (see Configuration Option No. 7) and must be made by installer. The Homeowner's Guide does not cover this selection. A requirement is the use of a variable-speed indoor unit with superdehumidify capability. During cool-to-dehumidify call, it provides maximum dehumidification by reducing airflow to a minimum. The actual superdehumidify command from Thermidistat Control to the indoor unit is a Y signal without a G signal in addition to dehumidify signal. The indoor unit responds to this combination by reducing the airflow to a minimum. All other characteristics of cool to dehumidify are the same.

ADDITIONAL DEHUMIDIFY COMMENTS

Dehumidification can be enhanced (with some efficiency loss) by turning blower off immediately at the end of each cooling cycle (eliminating normal 90 sec blower off delay). Where maximum humidity removal is desired, this should be done, if possible. Fan coils have the capability of removing this off delay, furnaces do not. On FK or FV Fan Coils, set delay tap to 0/0. On standard fan coils, a jumper can be cut to disable off delay. Refer to fan coil Installation Instructions for details. If FAN is set for continuous operation (fan ON icon displayed), G output is turned off for 5 minutes at the end of each cooling cycle as long as dehumidify demand exists.

Like humidify, dehumidify actions are initiated when humidity is 2 percent above set point and are terminated when humidity drops to 2 percent below set point. This prevents unnecessary toggling of dehumidify actions when humidity is near set point.

The vacation mode contains additional dehumidify features designed to protect an unoccupied home. Refer to the "Vacation" section for additional information.

With any dehumidify selection, if the system has a 2-speed compressor (DIP switch No. 2 is ON) and does NOT have a variable-speed blower (Configuration Option No. 5 set to OFF), all cooling will be done at high speed while dehumidify demand exists. This is because the combination of 2-speed compressor without variable-speed blower generally has poor water removal on low speed.

TABLE 5—DEHUMIDIFICATION SELECTIONS

SELECTION	MODE DISPLAY	FAN DISPLAY	DEHUMIDIFY SET POINT DISPLAY
Normal Dehumidify	Blank	Blank	Dehumidify Set Point Value
Cool to Dehumidify	COOL	Blank	Dehumidify Set Point Value
Dehumidify OFF	Blank	Blank	OF

DEHUMIDIFY OUTPUT AND EQUIPMENT CONNECTIONS

When there is a dehumidify demand, dehumidify output is activated, which means that a 24-vac signal is removed from the DHUM output terminal. In other words, dehumidify output logic is reversed — output is turned ON when no dehumidify demand exists and is turned OFF when demand exists. This logic reversal has come about from historical use of a standard humidistat to do dehumidification. The humidistat contacts open on high humidity, thus removing a 24-vac signal to initiate dehumidification. Equipment has been designed to operate in this manner, so the Thermidistat Control must now accommodate the existing equipment.

Bryant FK and FV Series Variable-Speed Fan Coils, all 333BAV and 333JAV 80% Variable-Speed Furnaces, and 355MAV 90% Variable-Speed Furnaces with the DE connection have dehumidify inputs which connect directly to Thermidistat Control DHUM output. They are compatible with the reverse logic output and will reduce their cooling CFM by approximately 20 percent when a dehumidify demand is present.

The FK and FV Variable-Speed Series Fan Coils have a terminal marked DH which should be connected to the Thermidistat Control DHUM output. Jumper J1 on fan coil MUST be removed. It is located behind the DH terminal. Additionally blower delay tap on fan coil should be set to 0/0 (no ON delay and no OFF delay) when using cool to dehumidify. With this selection, the blower stops when G signal is removed, preventing re-evaporation of water from the coil which would occur during the normal 90 sec blower off delay. (See Wiring Diagram Reference Chart and Fig. 5 through 8 in Wiring Diagram literature).

On 333BAV and 333JAV Furnaces, a green wire marked DHUM is connected to a spade lug that is connected to the G input terminal. Unplug spade lug, cut off spade receptacle from wire end, and splice a wire between green DEHUM wire and Thermidistat Control DHUM terminal. (See Wiring Diagram Reference Chart and Fig. 17 through 20 in Wiring Diagram literature).

Bryant 355MAV Furnaces also have a DEHUM input. The DEHUM input acts differently depending on which style of variable-speed furnace control you have. The older style variable-speed furnace control DOES NOT have a DE connection while the newer style variable-speed furnace control has a DE connection. Both of these variable-speed furnace controls function the same except the DEHUM logic is reversed.

On the older style variable-speed furnace controls, a field-supplied relay is required between the Thermidistat Control and furnace. The relay coil is connected between DHUM output on the Thermidistat Control and COM terminal on the furnace control. Its normally closed contact is connected between R and DEHUM terminals on the furnace control, where the DEHUM terminal is a spade lug located next to the transformer secondary connections. (See Wiring Diagram Reference Chart and Fig. 21 through 24 in Wiring Diagram literature). When a dehumidify demand exists, relay is de-energized, and normally closed contacts supply 24vac to the furnace DEHUM terminal. As a result the furnace control reduces the blower airflow by 15 percent.

On newer style variable-speed furnace controls, a field-supplied relay IS NOT required. The DHUM output on the Thermidistat Control is instead connected directly to the DEHUM terminal on the furnace control, where the DEHUM terminal is a spade lug located next to the transformer secondary connections. In addition the DE jumper located next to the DEHUM terminal must be removed to enable the DEHUM input. (See Wiring Diagram Reference Chart and Fig. 25 through 28 in Wiring Diagram literature). When a dehumidify demand exists the furnace control reduces the blower airflow by 21 percent.

C. Vacation

A vacation selection is available specifically for times where the home will not be occupied for an extended period. For convenience, 1 button selects vacation mode which is indicated by OUT icon on display. Vacation mode also has an automatic hold, meaning that set points are not affected by the programmed schedule. While in vacation mode, the system provides temperature and humidity protection for the home in all seasons, but not comfort.

VACATION SET POINTS

A special set of temperature and humidity set points exists which are active in vacation mode. They are adjustable by the homeowner, are exclusively for vacation mode, and are remembered from 1 vacation selection to the next. These set points will be higher for cool and dehumidify and lower for heat and humidify than those of occupied mode.

VACATION HUMIDIFICATION

Normal humidify is available, using vacation set points. Humidification by fan only is not available as vacation selection. Auto humidification is available, adjusting its set point with outdoor temperature the same as when occupied. The maximum humidity set point can be adjusted separately from the occupied value, but it must always be less than occupied value. This allows humidification to track outdoor temperature identically, whether occupied or vacation, but allows maximum humidification to be less when unoccupied. Vacation humidification can be turned off independently of occupied humidification.

VACATION DEHUMIDIFICATION

Normal Dehumidify, Cool to Dehumidify, and Dehumidify OFF, are all available in vacation mode, and selection of 1 of these can be different from that of occupied. Vacation dehumidification selection and set points are remembered the next time vacation is used.

Cool to dehumidify operates slightly differently, allowing the home to be cooled to as low as 70°F when trying to achieve dehumidify set point. The balance between dehumidify and temperature set point adjustments is 1 percent set point increase per degree of overcooling for temperatures below 76°F. For example, at 74°F dehumidify set point is raised 2 percent, and at 72°F dehumidify set point is raised 4 percent. At temperatures above 76°F, dehumidify set point is not changed.

Under no conditions will the house be cooled below 70°F, regardless of dehumidify demand.

OPERATIONAL INFORMATION

A. Five-Minute Compressor Timeguard

This timer prevents compressor from starting unless it has been off for at least 5 minutes. It can be defeated for 1 cycle by simultaneously pressing FAN button and INCREASE TEMPERATURE button.

B. Fifteen-Minute Cycle Timer

This timer prevents the start of a heating or cooling cycle until at least 15 minutes after the last start of the same cycle. Its function is to assure that equipment is not cycled more than 4 times per hr.

THERMIDISTAT CONTROL TROUBLESHOOTING

SYMPTOM	WHAT TO CHECK
No display	Open Thermidistat Control. Check for 24vac between R and C at screw terminals on mounting base. Reassemble, making sure pins on board engage sockets in mounting base. If display does not appear, replace Thermidistat Control.
"--" in place of room temperature	Thermidistat Control cannot properly read room temperature. Replace Thermidistat Control.
"E3" or "--" in place of outdoor temperature	Thermidistat Control cannot properly read outdoor temperature. Check outdoor sensor and its wiring.
"E4" or "E5"	Internal failure. Replace Thermidistat Control.
"E6"	System is stuck in defrost. Check wiring and heat pump defrost control board.
"Clean Filter" icon displayed	Filter timer has expired. Clean or replace filter and then press VACATION and HOLD/END buttons together to reset.
Cooling or heating will not come on	See Installer Setup to force heating or cooling. Check for 24vac at equipment terminals. If not present, check wiring.
Humidify or dehumidify will not come on	See Installer Setup to force HUM or DEHUM. Check for 24vac at equipment terminals. If not present, check wiring.

This timer is defeated for 1 cycle when desired temperature is manually changed. It can also be defeated for 1 cycle by simultaneously pressing FAN button and INCREASE TEMPERATURE button.

C. Fifteen-Minute Staging Timer

In multistage heating or cooling, this timer prevents any higher stage from turning on until preceding stage has been on for 15 minutes. This timer is defeated if temperature error is greater than 5°F (usually due to a large change in desired temperature).

D. Three-Minute Minimum On Time

In normal operation, when a stage turns on, it will not turn off for a minimum of 3 minutes. If the set point is changed, this timer is automatically canceled, allowing the equipment to turn off immediately when the demand is removed.

E. Heat/Cool Set points (Desired Temperature)

A minimum difference of 2° is enforced between heating and cooling desired temperatures. This is done by allowing 1 setting to "push" the other, to maintain this difference. This difference is adjustable via Configuration Option 14.

F. Equipment ON Indicators

When cooling equipment is on, a COOL icon preceded by a small triangle is displayed below cool set point. While cooling equipment turn on is delayed by a staging or cycle timer, triangle will flash. The same is true for HEAT icon and its preceding triangle located under heat set point. These 2 arrows are also used to indicate state of humidify and dehumidify outputs. See next section.

G. Humidify and Dehumidify Indicators

The humidity screen (selected by pressing the HUMIDITY button) uses the same triangles referenced in the above paragraph to indicate the state of the HUM and DHUM outputs. When humidification or dehumidification is active, the triangle under its set point is turned on.

H. Auto Changeover

When auto changeover mode is selected, a change from heat to cool (or vice versa) will not occur until an opposite mode demand has existed for 20 minutes. If set point is changed, 20-minute requirement is deleted.

I. Emergency Heat Mode

When Thermidistat Control is configured as a heat pump and emergency heat is selected, all Y signals are locked out, and W becomes energized upon a call for heat.

J. Power On Check

When AC power is first applied, all segments of display are turned on for a few seconds. Following this, temperature display indicates model/configuration via following 2-digit code:

AC—1-speed air conditioner, HP—1-speed heat pump, A2—2-speed air conditioner, H2—2-speed heat pump, HS—1-speed heat pump with 3-stage auxiliary heat, dF—dual fuel, d2—dual fuel with 2-speed.

K. Error Codes

"--" — If Thermidistat Control cannot properly read room temperature, display will indicate -- and all outputs (except fan if on) will turn off.

E1, E2 — There is no E1 or E2 error message.

E3 — If Thermidistat Control cannot properly read outdoor temperature, and it is needed for proper operation, display will indicate E3.

E4 — If Thermidistat Control's internal memory fails, E4 will be displayed. Replace Thermidistat Control.

E5 — If Thermidistat Control cannot properly read humidity, E5 will be displayed. Replace Thermidistat Control.

E6 — If defrost cycle continues for longer than 15 minutes. E6 will be displayed. Check heat pump wiring or for failed heat pump defrost control.

L. Smart Recovery

With Smart Recovery selected, transition out of setback begins a fixed time period before selected recovery time and gradually adjusts room temperature so desired temperature will be achieved at selected recovery time. The fixed time period is 1.5 hr. It operates in both heating and cooling. This only applies to programmable operation.

Cut and Save for Customer File

THERMIDISTAT CONTROL CONFIGURATION RECORD

Date _____

Owner/Operator _____ Thermidistat Model No. _____

A) Hardware Configuration
- Switch A ____ AC/HP Select. (OFF = AC)
- Switch B ____ 1 or 2-Speed Compressor. (OFF = 1-Speed)
- Switch C ____ Smart Recovery. (OFF = Enable)
- Switch D ____ Installer Test. (OFF = Disable)

B) Mode Settings
- ___ Hold (On or Off)
- ___ Mode (Off, Heat, Cool, Auto, Eheat)
- ___ Heating Set Point Value
- ___ Cooling Set Point Value
- ___ Fan (Auto or On)

C) Configuration Options

1	_____	Anticipator (1-9: factory default = 3)
2	_____	Clean Filter Timer (Off or 1-9: factory default = 2)
3	_____	Fahrenheit or Celsius (F or C: factory default = F)
4	_____	Fan On with W (Off or On: factory default = Off)
5	_____	Variable Speed ICM Motor (Off or On: factory default = Off)
6	_____	Cooling Lockout Below 55°F (Off or On: factory default = Off)
7	_____	Variable Speed Superdehumidify (Off or On: factory default = Off, or Not Available)
8	_____	Auxiliary Heat Lockout Setting (Off or 5-55°F: factory default = Off, or Not Available)
9	_____	Intelligent Heat Staging Selection (Off or On: factory default = Off, or Not Available)
10	_____	Dual Fuel Equipment Selection (Off or On: factory default = Off, or Not Available)
11	_____	Balance Point Setting (Off or 5-55°F: factory default = Off, or Not Available)
12	_____	Defrost Heat Select (0, 1, 2, 3: factory default = 0, or Not Available)
13	_____	Room Temperature Offset (-5 to +5: factory default = 0)
14	_____	Heat/Cool Dead Band (0 to 6: factory default = 2)
15	_____	Enable Auto Mode (On or Off: factory default = On)
16	_____	Enable Perfect Heat *Plus* Mode (Off or On: factory default is Off, or not Available)
17	_____	Enable Non-Programmable Operation (nP or P: factory default is P for programmable)

D) Schedule

	WAKE			DAY			EVE			SLEEP		
	TIME	HEAT	COOL	TIME	HEAT	COOL	TIME	HEAT	COOL	TIME	HEAT	COOL
Mon												
Tue												
Wed												
Thu												
Fri												
Sat												
Sun												

E) Humidity Settings

Heat Mode

Selection	Set Point%	Display
Normal Humidify	_____	(hu)
Fan Humidify	_____	(hu, Fan)
Auto Humidify	_____	(hu, AUTO)
Auto and Fan Humidify	_____	(hu, AUTO, Fan)
Humidify Off	no set point	(hu, OF)

Cool Mode

Selection	Set Point%	Display
Normal Dehumidify	_____	(d hu)
Cool to Dehumidify	_____	(d hu, COOL)
Dehumidify Off	no set point	(d hu, OF)

E) Vacation Humidity Settings

Heat Mode

Selection	Set Point%	Display
Normal Humidify	_____	(hu, OUT)
Auto Humidify	_____	(hu, OUT,AUTO)
Auto and Fan Humidify	_____	(hu, OUT,AUTO, Fan)
Humidify Off	no set point	(hu, OUT, OF)

Cool Mode

Selection	Set Point%	Display
Normal Dehumidify	_____	(d hu, OUT)
Cool to Dehumidify	_____	(d hu,OUT,COOL)
Dehumidify Off	no set point	(d hu, OUT,OF)

A99014

Printed in U.S.A. tstat027 Catalog No. 13TS-TA17