

APPLICATION

These thermostats provide energy saving control for a 24 Vac heating/cooling system as indicated in Table 1, and are powered direct from the control transformer.

As long as thermostat is continuously powered, the thermostat will be compatible with any control system.

These models include a SYSTEM LED, which is on when the thermostat is signaling for heating or cooling. Heat and cool anticipation is fixed in all models; no adjustment is

necessary. Cycle rates are adjustable for highest stage of heating.

Fan operation option switch is included on SUPER TRADELINE model to select fan operation for electric heat application.

12/24 hour clock conversion and °C/°F conversion is available on some models only.

TABLE 1—THERMOSTAT MODELS.

THERMOSTAT	STAGES		SWITCHING		APPLICATION
	HEAT	COOL	SYSTEM	FAN	
T8621A	1	1	HEAT-AUTO-COOL-OFF	ON-AUTO	Single Stage
T8621C	2	1	HEAT-AUTO-COOL-OFF	ON-AUTO	Multistage
T8621D	2	2	HEAT-AUTO-COOL-OFF	ON-AUTO	Multistage
T8621D ^a	2	2	HEAT-OFF-COOL	ON-AUTO	Multistage

^aSUPER TRADELINE model.

INSTALLATION

WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.

2. Check the ratings on the product to make sure the product is suitable for your application.

3. Installer must be a trained, experienced service technician.

4. Allow thermostat to warm to room temperature before operating.

5. After installation is complete, check out product operation as provided in these instructions.

CAUTION

Disconnect power supply to prevent electrical shock or equipment damage.

IMPORTANT

After wiring is complete, push excess wire back into the hole, and plug hole with nonhardening caulk, putty, or insulation to prevent drafts from affecting thermostat operation.

LOCATION

Install thermostat and subbase about 5 ft. [1.5 m] above the floor in an area with good air circulation at room temperature.

Do not install the thermostat where it may be affected by—

- drafts or dead spots behind doors, in corners, or under cabinets.
- hot or cold air from ducts.
- radiant heat from sun or appliances.
- concealed pipes and chimneys.
- unheated (uncooled) areas behind the thermostat, such as an outside wall.

IF REPLACING AN EXISTING THERMOSTAT

Turn power to thermostat off at furnace or boiler. A two transformer system may require turning off two switches or disconnects. Remove any existing wallplate or subbase from wall. Label or write down each wire color with the letter or number on the wiring terminal as the wire is removed, to avoid miswiring later.

IF NEW INSTALLATION

Run cable to a hole at the selected wall location, and pull about 3 in. [76 mm] of wire through the opening. Color-coded, 18 gauge thermostat cable with one conductor for each wiring terminal is recommended. Good service practice recommends selecting cable with one or two more conductors than the immediate application requires.

MOUNTING SUBBASE

IMPORTANT

- The T8621 requires an additional conductor to transformer common to provide continuous 24 V power for thermostat operation.
- Set the system switch in the OFF position before mounting the subbase.

The subbase does not require leveling for proper operation, but for appearance only.

Remove thermostat from subbase (Fig. 1).

The subbase mounts directly onto the wall with the screws and anchors included in the package. If drywall construction, plastic anchors must be used; use the subbase as a template, and with a pencil, mark the two mounting screw positions (Fig. 2). Use 3/16 in. bit to drill holes for anchors. Gently tap anchors into holes until they are flush to the wall surface. Thread wires through the center opening of the subbase. Then, mount the subbase using two screws provided. Gently tighten screws, level top surface of subbase, then securely tighten screws.

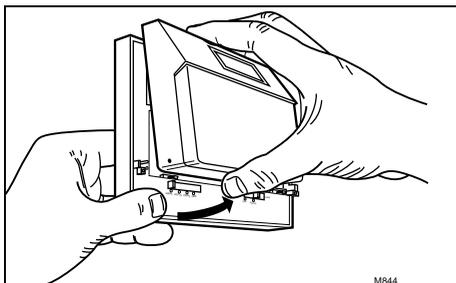


Fig. 1—Removing thermostat from subbase.

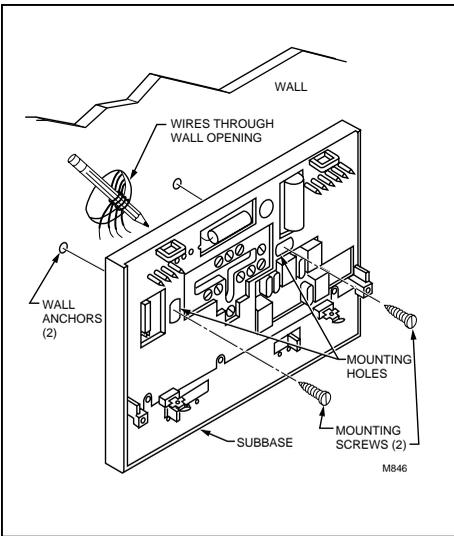


Fig. 2—Mounting subbase on wall.

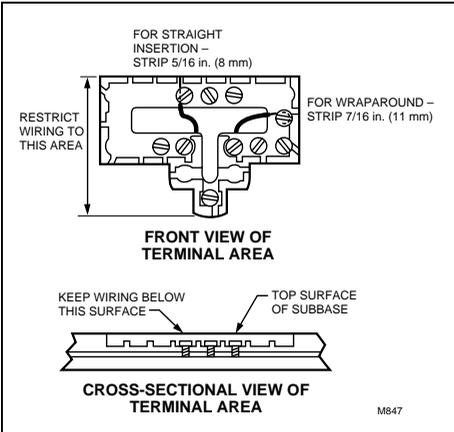


Fig. 3—Restrict wiring to recessed area surrounding terminals.

WIRING

All wiring must comply with local electrical codes and ordinances.

Disconnect power before wiring to prevent electrical shock or equipment damage.

The shape of the terminal barrier permits insertion of straight or conventional wraparound wiring connections. Either method is acceptable.

Push excess wire back into the hole, and plug hole with nonhardening caulk, putty or insulation to prevent drafts from affecting thermostat operation.

Refer to Figs. 4-9 for typical hookups of subbase thermostat.

NOTE: Restrict all wiring to recessed area surrounding terminals (Fig.3) to assure thermostat/subbase contact.

ADJUSTING CYCLE RATE

To custom-tailor the thermostat's cycling performance to different types of heating equipment, cycle rate adjustment screws are provided on the back of the thermostat. Correct setting of these screws will provide optimum room temperature control.

NOTE: MOST APPLICATIONS WILL NOT REQUIRE A CHANGE IN CYCLE RATE.

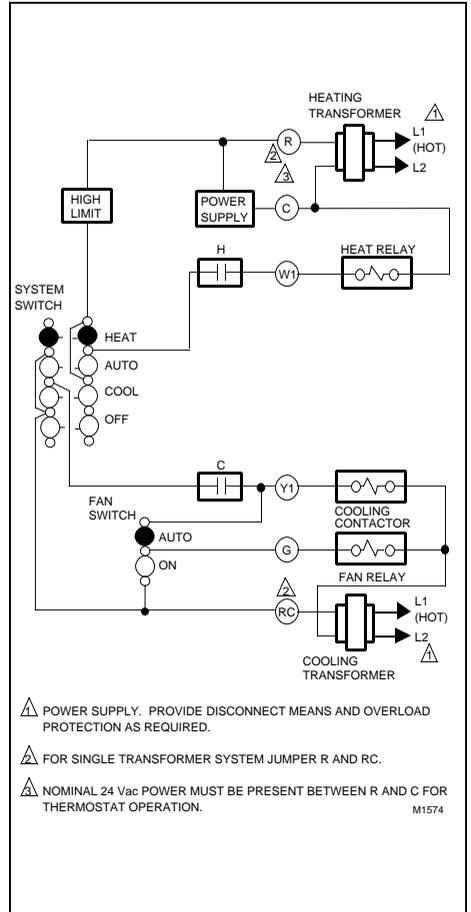


Fig. 4—T8621A 1-stage heat/1-stage cool thermostat with HEAT-AUTO-COOL-OFF system and AUTO-ON fan switching.

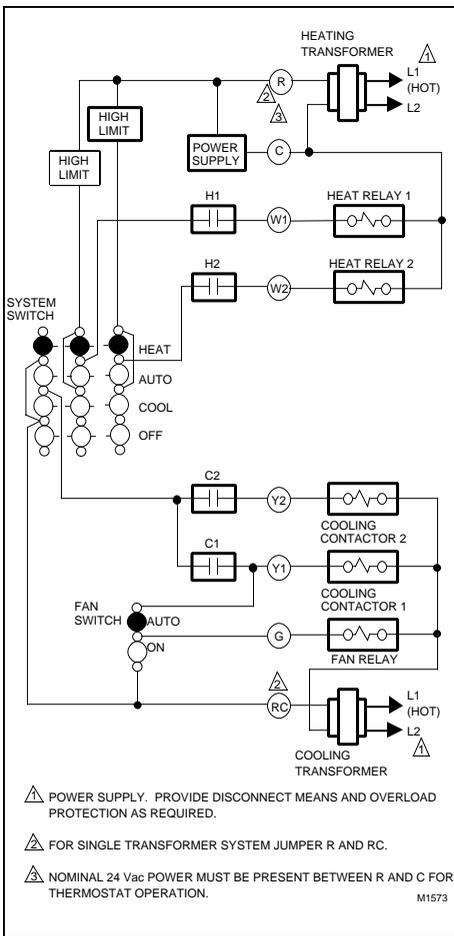


Fig. 5—T8621C,D 2-stage heat/2-stage cool thermostat with HEAT-AUTO-COOL-OFF system and AUTO-ON fan switching. For T8621C, delete second cooling stage.

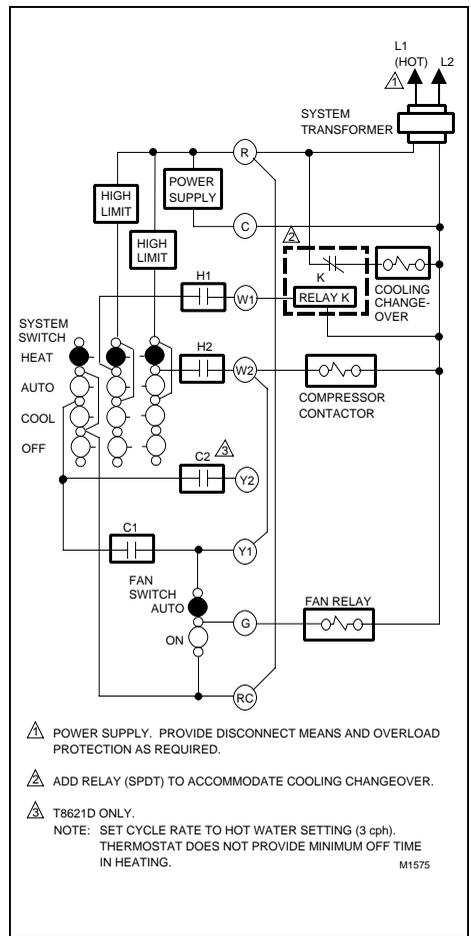


Fig. 6—T8621C,D single-stage heat pump thermostats with cooling changeover. HEAT-AUTO-COOL-OFF system and AUTO-ON fan switching.

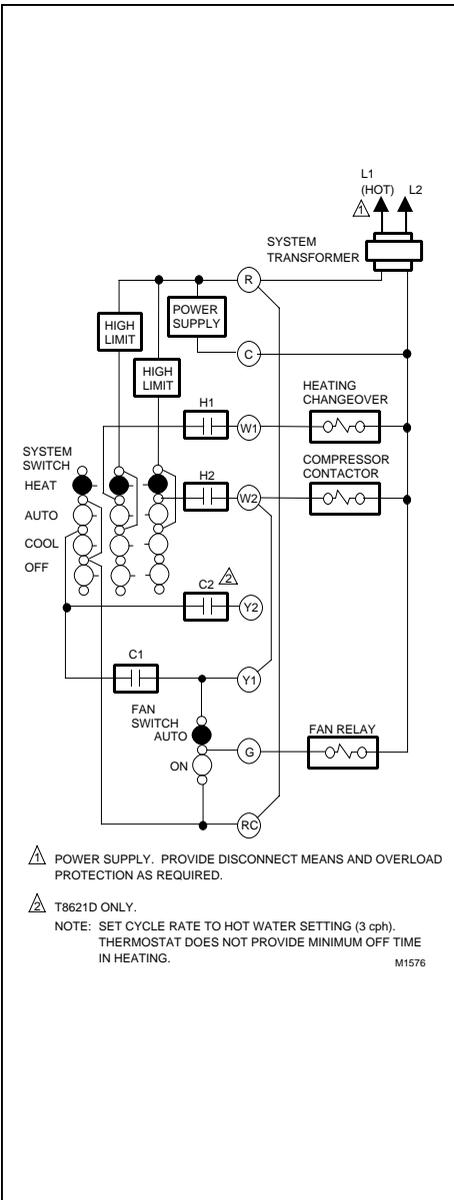


Fig. 7—T8621C,D single-stage heat pump thermostats with heating changeover. HEAT-AUTO-COOL-OFF system and AUTO-ON fan switching.

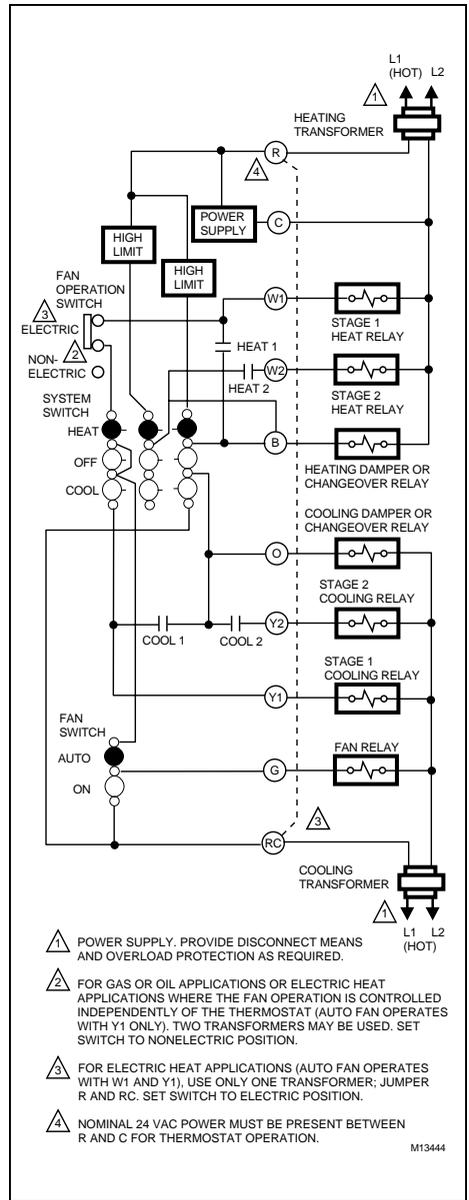


Fig. 8—T8621D 2-stage heat/2-stage cool manual changeover thermostat with auto fan on heat and cool; convertible to auto fan on cool only. HEAT-OFF-COOL system and AUTO-ON fan switching.

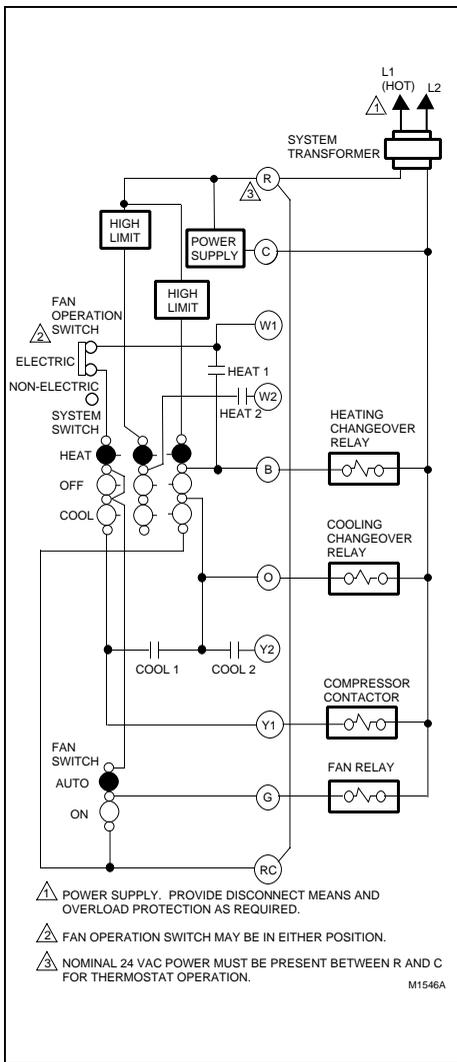


Fig. 9—T8621D single-stage manual changeover heat pump thermostat. HEAT-OFF-COOL system and AUTO-ON fan switching.

The room air temperature will normally vary slightly from the comfort temperature setting with the cycling of the furnace or air conditioner.

The heating cycle rate of this thermostat is factory-set for gas/oil warm air heating. The cooling cycle rate cannot be adjusted. The heating cycle rate can be adjusted by turning one or both cycle rate adjustment screws located on the back of the thermostat. In multistage heat systems, the cycle rate adjustment applies to stage 2 only; stage 1 is fixed. See Fig. 10.

TIME/TEMPERATURE CONVERSION (SOME MODELS)

The display readout may be converted between 12 and 24 hour clock or °C and °F using screws 2A and 2B as indicated in Fig. 10.

FAN OPERATION OPTION SWITCH

The SUPER TRADELINE model includes a fan operation option switch on the subbase, visible before the thermostat is mounted on the subbase. The switch should be in electric heat position for electric heating systems that do not have independent fan control.

INSTALLING BATTERIES

Three AAA alkaline batteries are provided as backup to prevent program loss in case of power outage. Batteries are included with thermostat. Install batteries in back of thermostat as shown in Fig. 11.

Without battery backup, the program will remain about 30 seconds in event of power loss.

IMPORTANT

When batteries are first installed, the display will flash 1:00 PM and 32° or 0°. The temperature display will stay at 32° or 0° until the thermostat is powered from the system wiring.

SYSTEM	1A	1B	CYCLES PER HOUR	TIME/TEMP DISPLAY	2A	2B
GRAVITY AIR/WATER	OUT 1/2 TO 1 TURN	OUT 1/2 TO 1 TURN	1	24 HR	IN	—
HOT WATER	OUT 1/2 TO 1 TURN	IN	3	12 HR	OUT 1/2 TO 1 TURN	—
GAS/OIL WARM AIR	IN (FACTORY SETTINGS)	IN	6	°C	—	IN
ELECTRIC WARM AIR	IN	OUT 1/2 TO 1 TURN	9	°F	—	OUT 1/2 TO 1 TURN

▲ SCREWS 2A, 2B ONLY AVAILABLE ON SOME MODELS. M311A

Fig. 10—Cycle rate adjustment.

BATTERY PLACEMENT (NOTE CORRECT PLUS AND MINUS DIRECTION) M372A

Fig. 11—Battery placement.

When the batteries are low, the display will flash REPL BAT. The building owner will have 20-30 seconds to install new batteries after removing old batteries from thermostat. After 20-30 seconds, it will be necessary to reprogram. REPL BAT indication will disappear when thermostat is mounted back on the subbase.

If batteries are completely dead, the display will go blank. After replacing the battery in this case, reprogramming will be necessary.

POWER OUTAGES

Backup batteries will hold the programming and keep

the display on during most power outages. Once the power is restored, the system will resume normal operation.

If the display goes off when power is lost, either the backup batteries need to be replaced or are not installed. When power is restored, the display will flash 1:00 PM to remind you to reprogram.

MOUNTING THE THERMOSTAT

Hang the thermostat on the tabs at the top of the base (Fig. 12a). Swing down and press on lower edge until thermostat snaps in place (Fig. 12b). Open cover, and tighten the captive mounting screws (Fig. 12c).

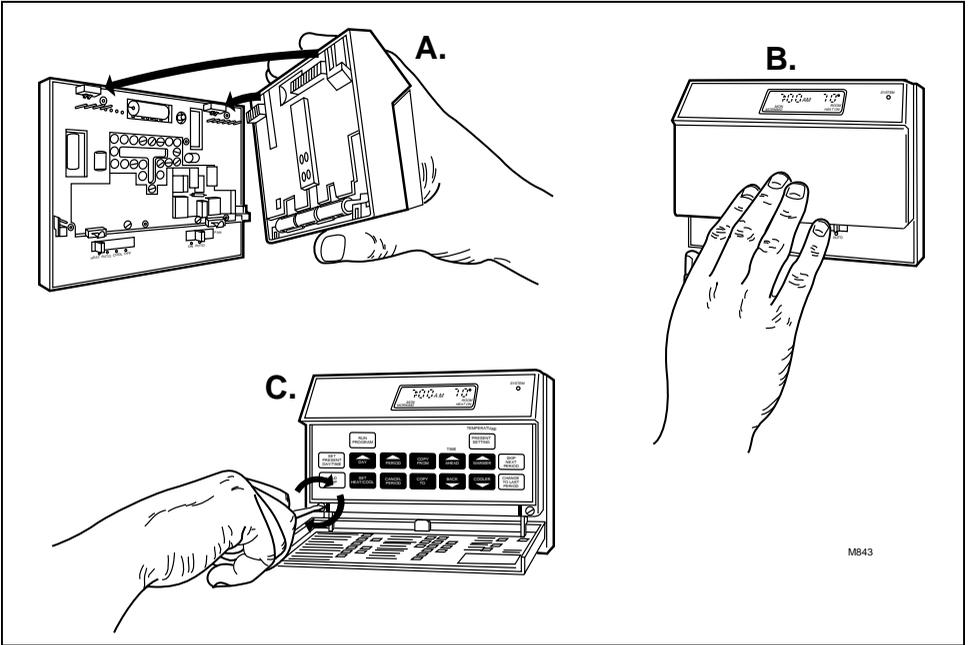


Fig. 12—Mounting thermostat on subbase.

SETTING DAY AND TIME

Restore 24 V power to the thermostat. When power is applied to the thermostat, the display will read 1:00 PM and room temperature. It will go off for a few seconds, then begin to flash on and off. Set present day and time.

Press .

Press  to set the current day. Each press of the DAY key advances the display one day.

Press TIME  or  to set the current time.

If the display will not come on—

- check mounting of thermostat to subbase. If loose or misaligned, remove thermostat and reinstall on the subbase, making sure it is firmly attached.
- check to see that heat or cool system power is on.
- check voltage between R and C; should be 24 to 30 Vac.

CHECKOUT

HEATING

NOTE: When heating setting is changed, thermostat will wait up to 5 minutes before turning on the heating equipment. This delay protects the compressor.

Move the system switch to HEAT and the fan switch to AUTO. Press WARMER key until the setting is about 10° F [6° C] above room temperature. Heating should start (both stages if multistage), and the fan should run (may be a short

delay on gas or oil forced air systems). Press COOLER key until the setting is about 10° F [6° C] below room temperature. The heating equipment should shut off, followed by the fan.

NOTE: On an AUTO changeover thermostat, the cooling temperature must be set at least 3° F [2° C] above the heating temperature, or display will flash.

COOLING

CAUTION

Do not operate cooling if outdoor temperature is below 50° F [10° C]. Refer to manufacturer's recommendations.

NOTE: When cooling setting is changed, thermostat will wait up to 5 minutes before turning on the cooling equipment. This delay protects the compressor.

Move the system switch to COOL and the fan switch to AUTO. Press COOLER key until the setting is about 10° F [6° C] below room temperature. The cooling equipment and fan should start. Press WARMER key until the setting is about 10° F [6° C] above room temperature. The cooling equipment and fan should stop.

NOTE: On an AUTO changeover thermostat, the heating temperature must be set at least 3° F [2° C] below the cooling temperature, or display will flash.

FAN

Move the system switch to OFF, and the fan switch to ON. The fan should run continuously. When the fan switch is in the AUTO position, fan operates directly with the cooling system, and also with heating system on some models.

INSTALLER SELF-TEST (optional)

IMPORTANT

- AC power must be present on thermostat to conduct self-test. Relays will not toggle, codes will not be present and thermostat will not manually exit self-test without ac power.
- Five-minute time delay on cooling does not function during self-test.

Perform the following test as a check of all thermostat functions. If thermostat does not respond as indicated, thermostat must be replaced.

1. Press AHEAD and BACK keys at the same time. While holding keys down, all segments of the display should be on (Fig. 13).

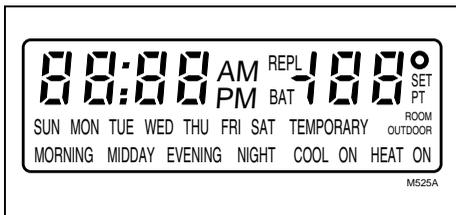


Fig. 13—All segments on display.

2. Set system switch to OFF. Press AHEAD and BACK and PRESENT SETTING keys at the same time to enter self-test.

3. Press each key as listed below, and look for response listed as key is held down and released.

SYSTEM SWITCH POSITION	PRESS THIS KEY	LOOK FOR THIS RESPONSE KEY DOWN	KEY RELEASED
OFF		03	Blank
		07	Blank
		15	Blank
COOL or AUTO (with fan in AUTO)		15	1st stage cooling, fan and SYSTEM LED on.
		15	2nd stage cooling also on.
		15	2nd stage cooling off.
		15	1st stage cooling, fan and SYSTEM LED off.

NOTE: If single-stage cooling system, press key twice instead of 4 times; once to turn cooling, fan and SYSTEM LED on, second time to turn off.

OFF		06	Blank
		02	Blank
		05	Blank
		04	Blank
		01	Blank
		00	Blank
(CHECK EACH POSITION)		12	See note Ⓐ
OFF		08	Blank
		13	Microprocessor mask no. and revision no.
		09	Blank
		14	Blank
	HEAT or AUTO ⚠		14
		14	2nd stage heating also on.
		14	2nd stage heating off.
		14	1st stage heating and SYSTEM LED off.

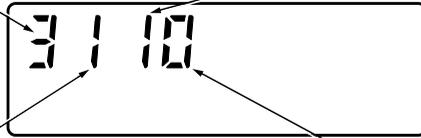
NOTE: If single-stage heating system, press key twice instead of 4 times; once to turn heating and SYSTEM LED on, second time to turn off.

OFF		10	Blank
		11	Normal operating display.

- ⚠ For electric heat fan operation—The fan will operate with the heating system when fan switch is in AUTO.
- Ⓐ HEAT displayed when system switch is in HEAT, COOL when in COOL, HEAT and COOL when in AUTO, neither when in OFF. Also, a four-digit code is displayed, with each digit explained below.

FIRST DIGIT	CYCLE RATE SETTING (CPH at 50% on time for stage 1 on 1-heat models, stage 2 on 2-heat models)
0	1
1	3
2	9
3	6

THIRD DIGIT	MANUAL OR AUTO CHANGEOVER	SYSTEM SWITCH POSITION
0	Manual	HEAT or OFF
1	Auto	HEAT or OFF
3	Auto	AUTO
4	Manual	COOL
5	Auto	COOL



M13443

SECOND DIGIT	STAGES OF	
	HEAT	COOL
0	2	1
1	2	2
2	1	1
3	1	2
4	0	2
5	1	0
6	2	0

FOURTH DIGIT	DEGREES	CLOCK (HRS)	SYSTEM SWITCH POSITION
0	F	12	COOL, AUTO or OFF
1	F	24	COOL, AUTO or OFF
2	F	12	HEAT
3	F	24	HEAT
4	C	12	COOL, AUTO or OFF
5	C	24	COOL, AUTO or OFF
6	C	12	HEAT
7	C	24	HEAT

This equipment is a Class B digital apparatus which complies with Canadian Radio Interference Regulations, CRC c. 1374.

Honeywell Inc.
U.S.A.: 1885 Douglas Drive N.
 Golden Valley, MN 55422-4386
CANADA: 740 Ellesmere Road
 Scarborough, Ontario M1P 2V9

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