INSTRUCTION MANUAL

Programmable Electronic Thermostat

MODEL TH141-HC-28

1. INSTALLATION

1.1 REMOVE THE OLD THERMOSTAT

1 - Cut the power source to your heating or air conditioning system.
2 - Remove the cover of the old thermostat.

Caution: If, upon removing the wall plate, you see that it is mounted on a junction box (similar to the junction box located behind an electrical switch or outlet), this may indicate that it is a 120 V/240 V system. For more security, consult a qualified electrician to check the installation.

1.2 INSTALL THE NEW THERMOSTAT

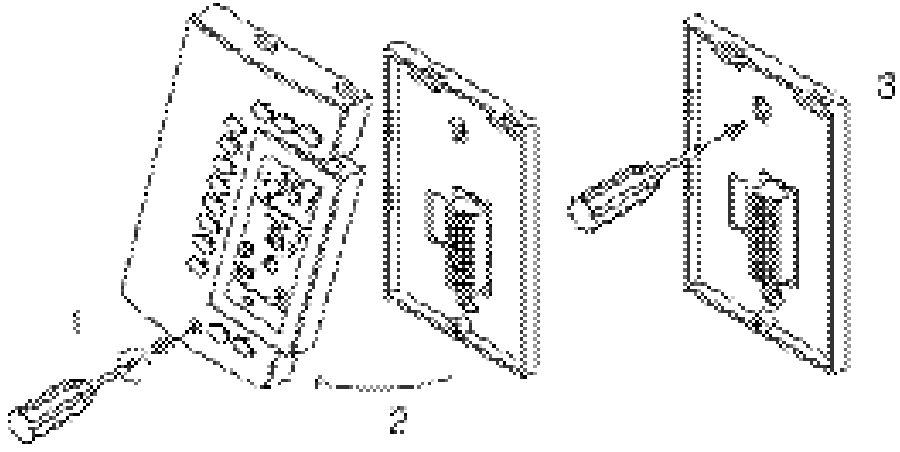
For a new installation, choose a location about 1.5 meters (5 feet) above the floor, with good air circulation. The thermostat must be installed on an inside wall.

Avoid locations where there are:

a) air drafts (top of a staircase, air outlet,...)
b) dead air spots (behind a door,...)
c) direct sunlight
d) concealed chimneys or stove pipes.

1.3 INSTALL AND CONNECT THE THERMOSTAT

1. Remove the screw holding the thermostat mounting plate.
2. Lift the lower part to separate the plate from the thermostat.
3. Mount the plate on the wall using the screws supplied.



1.4 IDENTIFY THE WIRES

1. If the wall plate of your old thermostat has more than two wires coming out of the wall, you will need to label the wires. Start by identifying the letters close to each screw or terminal on which a wire is connected. These terminals may be located on either side of the plate.
2. Disconnect and identify each wire*.
3. You may need to tape the wires to the wall to keep them from falling back into it. If the wall cavity is larger than necessary, fill it with insulating wool in order to prevent the infiltration of warm or cold air behind the thermostat.

* *If your installation is recent, the colour of the wires should match the identification on the mounting plate.*

(Rh) Red	Heating power source
(W) White	Heating relay
(Rc) Blue	Air conditioning power supply
(Y) Yellow	Air conditioning relay
(G) Green	Fan relay

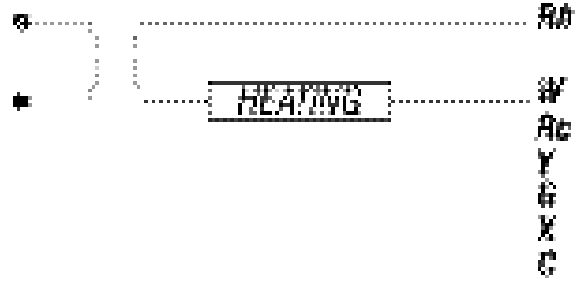
1.5 CONNECT THE LABELLED WIRES TO THE THERMOSTAT

1. Connect the system wires to the thermostat terminals according to the wiring diagram shown in section 1.6.
2. Make sure that the wires are pushed well back into the wall.
3. If you own a CT240 telephone controller, refer to section 6.1 for connection.

1.6 WIRING DIAGRAMS

The TH141 thermostat is compatible with most heating and air conditioning systems. Multi-level heating and air conditioning systems, Milivolt control heating systems, heat pumps and baseboard heating units are not compatible with this thermostat. Baseboard units can be connected using a 24 V relay.

1.6.1 2-WIRE HEATING SYSTEM

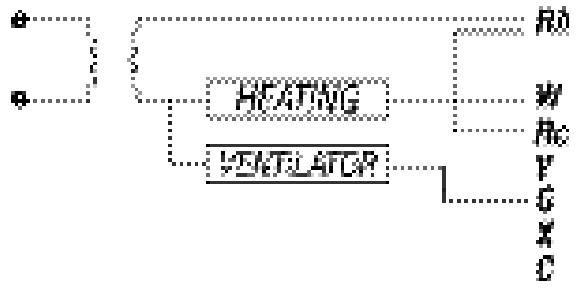


1. Connect the heating relay to terminal W.
2. Connect the 24 V transformer to terminal Rh.

In this case, the order of connection is unimportant.

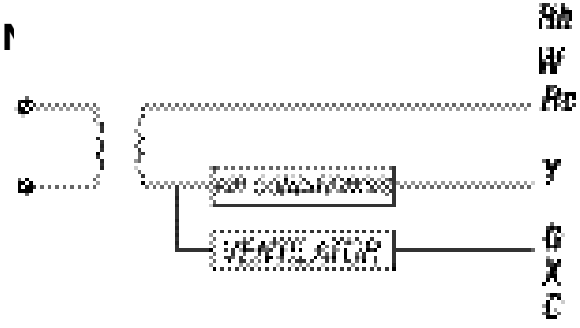
1.6.2 3-WIRE HEATING SYSTEM WITH FAN CONTROL

1. Connect the heating relay to terminal W.
2. Connect the fan relay to terminal G.
3. Connect the 24 V transformer to terminal Rh.
4. Connect a wire between terminals Rh and Rc.



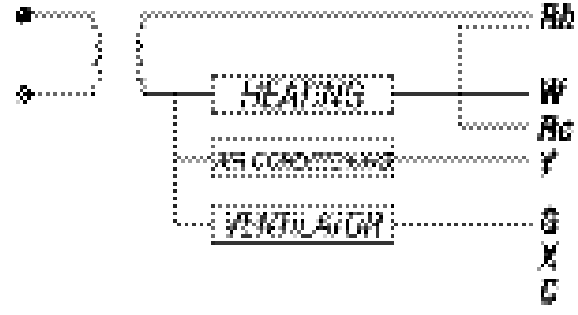
1.6.3 3-WIRE AIR CONDITIONING SYSTEM WITH FAN CO

1. Connect the air conditioning relay to terminal Y.
2. Connect the fan relay to terminal G.
3. Connect the 24 V transformer to terminal Rc.



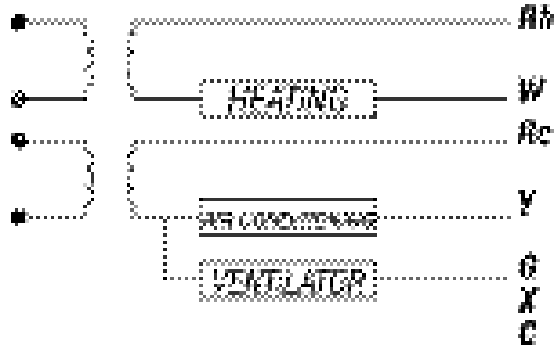
1.6.4 4-WIRE HEATING AND AIR CONDITIONING SYSTEM

1. Connect the heating relay to terminal W.
2. Connect the air-conditioning relay to terminal Y.
3. Connect the fan relay to terminal G.
4. Connect the 24 V transformer to terminal Rh.
5. Connect a wire between terminals Rh and Rc.



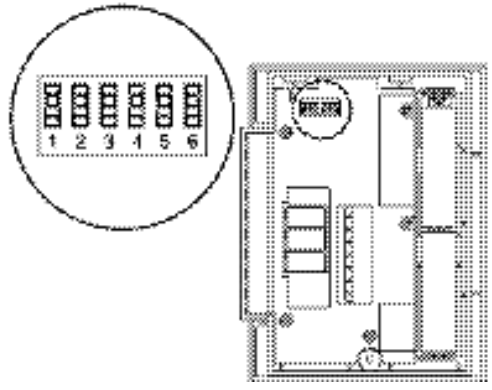
1.6.5 5-WIRE HEATING AND AIR-CONDITIONING SYSTEM

1. Connect the heating relay to terminal W.
2. Connect the air-conditioning relay to terminal Y.
3. Connect the fan relay to terminal G.
4. Connect the 24 V transformer to terminal Rh.
5. Connect the 24 V air conditioning transformer to terminal Rc.

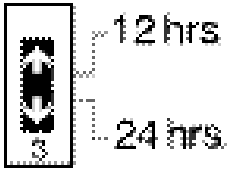


1.7 THERMOSTAT CONFIGURATION

Before mounting the thermostat on the wall, configure it using the switch bank on the back side of the unit.

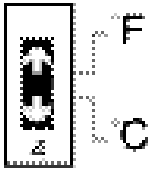


a) 24 hrs. or 12 hrs. Display



The TH141 offers a 12 hrs. or 24 hrs. mode display. Default configuration of the display is in the 12 hrs. mode. If you prefer a 24 hrs. display, push #3 switch down.

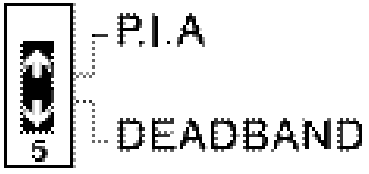
b) Temperature in °C or °F



Default configuration of the TH141 is in °F. If you wish to change the temperature to °C, push #4 switch down. Please note that if you change-from °F to °C, your comfort and economy settings will need to be reconfigured as well.

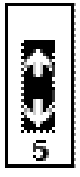
c) Regulation Modes

You have a choice between two regulation modes:



- Proportional adaptive
- Conventional with anticipation

1. Proportional adaptive mode



If you want the proportional adaptive mode, push #5 switch up.

This mode analyses previous cycles in order to define the length of the up coming cycle. This operating mode guarantees optimal regulation based on the capacity of your system. To avoid cycles that are too short for the heating or air-conditioning units, minimum On and Off duration is limited to 10% of the period (1.5 minutes for a 15 minute cycle).

Ideal for:

- Radiant or convection electrical heating system
- Circulator control in a hot water system
- Electrical hot air furnace
- Hot air, gas or fuel conventional furnace
- Air-conditioning system

Not recommended for:

- Gas or fuel furnace or boiler with wall chimney, if they include a combustion gas purging cycle exceeding 30 seconds. To verify this point, check the duration of the delay between the heating command sent by the thermostat and the moment when the burner actually goes on.

- Multi-zone systems, where several thermostats command a single heating or air-conditioning unit.

In the last two cases, the conventional mode is recommended.

Regulation Cycles

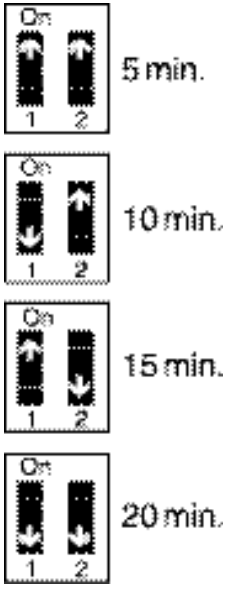
In proportional adaptive mode, the TH141 adapts the regulation cycles to your system capacity. When cycles are very short, the temperature variation in the room is very low and the comfort level very high. However, very short cycles can generate premature wear of your system.

It is therefore important to adjust the cycles to your type of installation.

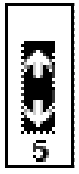
In general, the bigger your heating or air-conditioning unit, the longer the cycles should be. The TH141 offers the possibility of programming regulation periods of 5, 10, 15 or 20 minutes using switches 1 and 2 at the back of the unit.

We recommend the following options:

- 5 minute cycle — Not recommended for central units
- 10 minute cycle for — Radiant or convection electric heating
- 15 minute cycle for — Central heating and air-conditioning unit
- 20 minute cycle for — Commercial unit



2.Conventional mode with anticipation

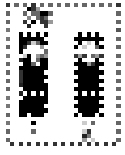


If you want the conventional mode with anticipation, push #5 switch down.

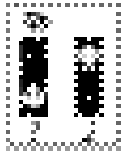
This mode commands the system's On and Off cycles when the temperature read by the thermostat reaches pre-set levels. This mode is compatible with all heating or air-conditioning systems.

Programmable Span

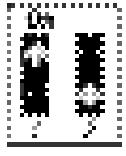
When the thermostat is in conventional mode with anticipation, it is possible to program a span, that is temperature variations between ON and OFF orders of your system. These variations are programmable between 0.3 and 0.6 °C (0.5 and 1.1 °F) and they correspond to the following positions of switches #1 and #2:



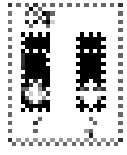
0.3 °C/0.5 °F



0.4 °C/0.7 °F



0.5 °C/0.9 °F



0.6 °C/1.1 °F

We recommend the following options:

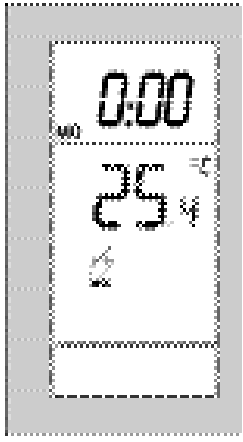
VARIATIONS	HOT-WATER HEATING	HEATING AND AIR-CONDITIONING
0.3 °C/ 0.5 °F	Not recommended for furnaces	Not recommended for central units
0.4 °C/ 0.7 °F	Gas or electric wall furnace	Radiant or convection electric heating *
0.5 °C/ 0.9 °F	Fuel or gas floor furnace	Central heating or air-conditioning unit
0.6 °C/ 1.1 °F	Commercial unit	Commercial unit

* 240 volt heating with relay (baseboard, convector, radiant ceiling, etc.)

d) Heating Fan Control

This function determines whether the heating system fan is operated by the thermostat or by the plenum's temperature of the heating unit. In general, the fan is operated by the heating unit. However, if the fan does not turn on and the thermostat requires heating for more than one minute, push #6 switch up.

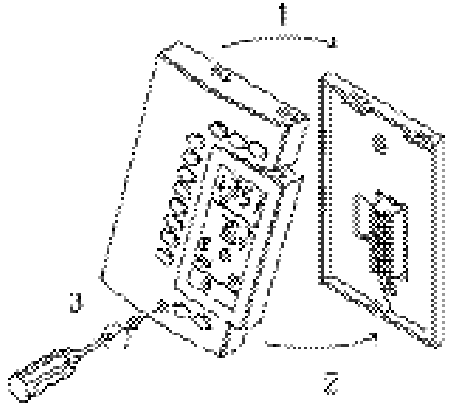
1.8 BATTERY INSTALLATION



When you first install the batteries in the TH141, the unit runs a sequence of tests and a complete reset to zero, which last approximately 5 seconds. The screen should display the time and the day, as well as the current temperature as follows:

It is normal for the displayed temperature to be higher than the room temperature if your are holding the TH141 in your hands, It will return to normal about one hour after installation on the wall.
Mount the thermostat on the wall plate and screw it in place.

Even if the thermostat indicates that the batteries are good, it is recommended to replace them once a year, at the beginning of the cold season.



2. ENTRY OF BASIC DATA

You may program the thermostat while holding it in your hands or once it is mounted on the wall.

2.1 PROGRAMMING THE TIME AND DAY

1. Set the time using the Hour and Minute buttons.
2. Set the date using the Day button.

2.2 PROGRAMMING THE COMFORT, ECONOMIC AND VACATION SETTINGS

The Comfort , Economic and Vacation settings respectively represent the temperatures that you wish to have during the day , at night or while you are away at work or while you are away for an extended period . Since your thermostat controls both heating and air-conditioning, and since the economic settings are the opposite in both cases (reduction for heating temperature, increase for air-conditioning), you must program the settings for heating and then for air-conditioning.

1. To program your heating settings

a) Set your thermostat to the heating mode  using the Heat/Cool button.

b) To program the Comfort temperature, select the desired degree using the ▲ ▼ buttons and press the button  until the  con is displayed (app. 3 seconds).

c) To program the Economic temperature, select the desired degree using the ▲ ▼ buttons and press the  button until the the  icon is displayed (app. 3 seconds).

d) To program the Vacation temperature, select the desired degree using the ▲ ▼ buttons and press on the  button until the  icon is displayed (app. 3 seconds). This setting is used by the telephone remote control.

e) Press the Manual/Auto button to exit this function and return to the normal operating mode.

2.3 PROGRAM THE AIR-CONDITIONING SETTINGS

Set your thermostat to the air-conditioning mode  using the Heat/Cool button and repeat operations b) to e).

3. OPERATING MODES

The TH141 offers two operating modes.

3.1 MANUAL ( )

This mode allows you to maintain a constant temperature in the house.

1. To activate this mode, press the Manual/Auto button to display the icon.
2. Set the desired temperature using the ▲ ▼ buttons or select the pre-programmed , or settings.

3.2 AUTOMATIC ( )

This mode executes your own programming. To activate this mode, press the Manual/Auto button to display the icon. The or icon indicates that the program setting is active.

3.2.1 SCHEDULE PROGRAMMING

The TH141 allows 4 setting changes for each day of the week. There are no pre-set programs. The programs are tailored to perfectly adapt to your life style.
The principle is very simple. For each day, enter the time at which you wake up (P1), the time you leave for work (P2), the time you arrive back home (P3) and the time you go to bed (P4).

Program	Mode	Time
1		Wake-up time
2		Leaving time
3		Return time
4		Bed time

Note: For temperature increases (Prog. 1 and 3), allow at least 15 minutes per °C. If you have lowered the temperature by 3 °C during the night and you wake up at 7 AM, change the setting at 6:15 AM.

For savings to be obtained, you must lower the temperature for a period of 2 to 3 times the delay required to bring the temperature back to your comfort level.

Example: *If your system takes one hour to go from your saving temperature level to your comfort temperature level, it is useless to lower the temperature for a period of 2 to 3 hours.*

a) To Program your Schedule

1. Press the Program button to access the programming mode.
2. Press the Day button to select the day to be programmed. You can select all days of the week by pressing on the Day button for 3 seconds.

3. Press the Program button to select program 1, 2, 3 or 4.
4. Press the Hour and Minute buttons to program the time.
5. When you have completed your programming, press the Manual/Auto button to exit this function.

b) To Erase a Program

Select the program using the Program and Day buttons, and press the Clear button. The time zone displays --:-- when the program is inactive.

c) Example 1: Comfort period from 7:00 AM to 10:30 PM
Economy period from 10:30 PM to 7:00 AM
Identical schedule for all days of the week.

1. Press the Program button to access the programming mode.
2. Press the Day button (3 seconds) to select every day of the week.
3. Press the Hour button to enter 7:00 AM, Prog. 1  .
4. Press the Program button again to select Prog. 2  , and press the Hour and Minute buttons to enter 10:30 PM.

5. Press the Manual/Auto button to exit this function.

d) Example 2: Comfort period: Monday to Friday from 6:15 AM to 8:15 AM and from 5:00 PM to 10:00 PM.

Shedule/Day	Mon.	Tues.	Wed.	Thu.	Fri.	Sat.	Sun.
PROG. 1 ☼	6h15 AM	6h15 AM	6h15 AM	6h15 AM	6h15 AM	7h30 AM	7h30 AM
PROG. 2 ☾	8h15 AM	8h15 AM	8h15 AM	8h15 AM	8h15 AM	---- ----	
PROG. 3 ☼	5h00 PM	5h00 PM	5h00 PM	5h00 PM	5h00 PM	---- ----	
PROG. 4 ☾	10h00 PM	10h00 PM	10h00 PM	10h00 PM	10h00 PM	11h00 PM	11h00 PM

Note: *It is faster to program the same schedule for every day and then modify the exception days.*

1. Press the Program button to access the programming mode.
2. Press the Day button (3 seconds) to select every day of the week.
3. Press the Hour and Minute buttons to enter 6:15 AM (Prog. 1☼).
4. Press the Program button to select Prog. 2 and the Hour and Minute buttons to enter 8:15 AM.
5. Repeat step 4 to enter Prog. 3 (5:00 PM) and Prog. 4 (10:00 PM).

Note*: When making modifications, make sure that you are in the right program.*

To modify the Saturday and Sunday schedules:

6. Press the Day button until SA or SU is displayed.
7. Press the Program button to select Prog. 1 and the Hour and Minute buttons to enter 7:30 AM.
8. Press the Program button to select Prog. 2 and than press the Clear button to erase it.
9. Press the Program button to select Prog. 3 and then the Clear button to erase it.
10. Press the Program button to select Prog. 4 and then the Hour and Minute buttons to enter 11:00 PM.
11. Press the Manual/Auto button to exit this function.

3.2.2 TEMPORARY OR PERMANENT TEMPERATURE BYPASS

This operation allows you to temporarily modify the room temperature while you are in the automatic mode. Simply press the ▲ ▼ buttons to select the desired temperature, or the ☼ or ☾ button to select the Comfort or Econo settings you have programmed.This temperature will be maintained until the beginning of the next programmed schedule.

You can also switch to the Vacation setting for a prolonged absence by pressing the button. In that case, the derogation is permanent. To return to the normal operating mode, press the Manual/Auto button. If you wish to immediately return to the programmed settings, press the Manual/Auto button twice.

4. SELECT THE HEATING, AIR CONDITIONING, OR MIXED MODE

Use the Heat/Cool button to select one of the following modes:

Heating:	Controls the heating unit according to the displayed setting.
Air-conditioning:	Controls the air-conditioning unit according to the displayed setting.
Mixed:	The TH141 analyzes the temperature pattern and automatically alternates from the comfort mode to the air-conditioning mode.

To avoid needless switching, the automatic mode change will take at least 2 minutes if it is required by a manual setting change and at least 15 minutes if it is due to a quick temperature change.

Furthermore, to protect your heating and air-conditioning system, it is impossible to shut down and restart the system within a period equal to 10% of the cycle.

5. FAN CONTROL

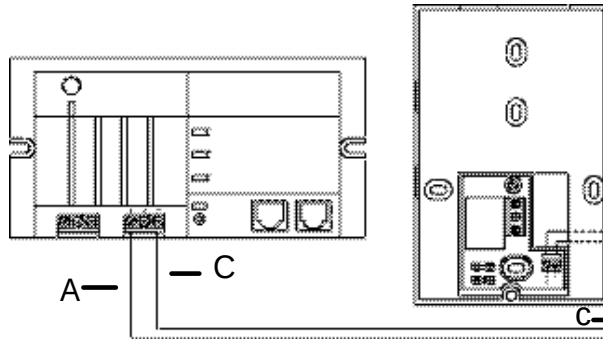
Use the Fan ON/OFF button to force continuous air circulation (icon ON) or to synchronize the fan with the heating or air-conditioning demand (icon ON).

Please note that if you set the TH141 in Vacation mode using the telephone controller or a house automation system, the continuous air circulation will be automatically deactivated during your absence.

6. TELEPHONE CONTROLLER ( )

The TH141 incorporates a telephone controller interface which allows you to switch from the normal operating mode to the Vacation setting ( ), and vice versa, using the telephone keypad (stationary or portable). You can, for example, heat your country house from your office on Friday, or your house from the airport or from your car on your way back from vacation.

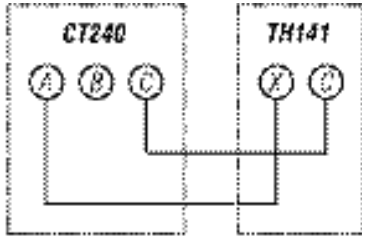
6.1 CONNECTION TO THE CT240



The TH141 is designed to connect directly to the CT240 telephone controller. This combination allows the activation and deactivation of the Vacation mode from the CT240 or the telephone.

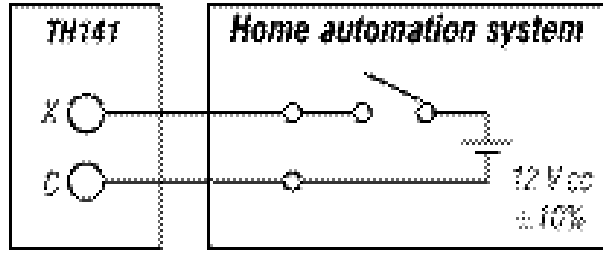
Connect the CT240's terminals A and C to the TH141's terminals X and C respectively. You must respect the polarity.

For details on operating the telephone controller, refer to the CT240's Instruction Manual.



6.2 CONNECTION TO A HOUSE AUTOMATION SYSTEM

The Vacation setting can also be activated from a house automation system.



6.3 OPERATING THE TELEPHONE INTERFACE

You can activate the Vacation setting using the Vacation button of the telephone controller or using the telephone itself.

1 - To activate the Vacation setting, press the Vacation button of the CT240. The Vacation setting will be displayed during 5 seconds and the  icon will flash on the screen. You no longer have access to the TH141 keypad if this function is activated by the telephone controller.

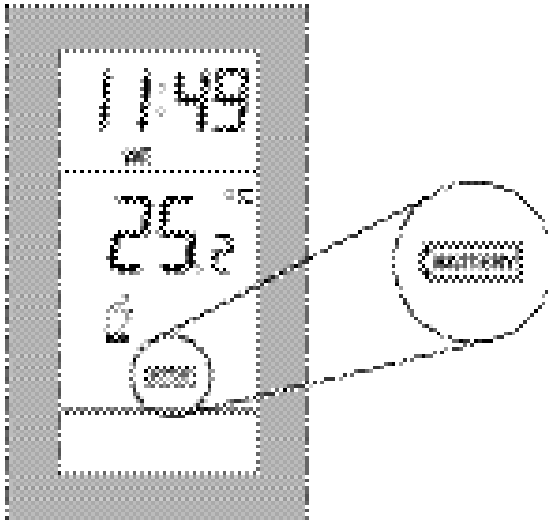
2 - To deactivate the function and return to the previous mode, press the Vacation button of the telephone controller again. The red light will go off and the  icon will disappear within a maximum of 5 seconds.

To modify the Vacation setting, refer to section 2.2.

7. BATTERY REPLACEMENT

The TH141 will display an icon indicating that the batteries must be replaced. This icon will flash for 60 days. After this delay, the thermostat will shut down your heating unit. During battery replacement, the data is kept for of 15 seconds. The time and the programs will not be lost.

After this delay, the TH141 runs a sequence of tests and a complete reset to zero as for the initial installation of the batteries.



Even if the thermostat indicates that the batteries are good, it is recommended to replace them once a year.

8. TECHNICAL SPECIFICATIONS

Model:	TH141A-HC-28
Power supply:	2 AA size alkaline batteries
Connection:	2, 3, 4 or 5 wires
Maximum charge:	1.5 A/30 VAC per output
Auxiliary input:	12 VAC ± 10%, 20 mA
Number of programs:	4 prog./day, 28 programs total
Heating setting range:	5 °C to 27 °C (40 °F to 80 °F)
Air-conditioning setting range:	18 °C to 35 °C (65 °F to 95 °F)
Anticipation:	Electronic anticipation independent from the charge.
Regulation:	Proportional or conventional
Regulation periods:	5, 10, 15 or 20 minutes

WARRANTY

This product is guaranteed against workmanship defects for a two-year period following the initial date of purchase in an authorized retail store. During this period, Energy Automation Inc. will repair or replace, at its option and without charge, any defective product which has been used under normal conditions.

The warranty does not cover delivery costs and does not apply to products badly installed or damaged by accident.

This warranty cancels and replaces any other manufacturer's express or tacit warranty as well as any other company commitment. Energy Automation Inc. cannot be held liable for related or random damages following the installation of this product.

The defective product as well as the purchase invoice must be returned to the place of purchase or mailed, prepaid and insured, to the following address:

Energy Automation Inc. 7 First Ave, Orangeville, ON Canada L9W 1H7