

## MODEL TH104D

### SUMMARY

#### ◆ OPTIONS SELECTION

- ⇒ To change the temperature from °C to °F and back, maintain DAY button pressed down as RESET button is being pressed on and released. Then release DAY button.
- ⇒ To change the time format from 24 hrs. to 12 hrs. and back, maintain HOUR button pressed down as RESET button is being pressed on and released. Then release HOUR button.
- ⇒ To change the heating control from proportional to ON/OFF and back, maintain MIN button pressed down as RESET button is being pressed on and released. Then release MIN button.

#### ◆ TO SET TIME AND DAY

Press on DAY, HOUR and MIN buttons to adjust time and day.

#### ◆ TO RECORD THE HEATING PROGRAMS

Set the operating mode to AUTO. Use the PGM button to select the program to be recorded or modified. Once the program is selected, use HOUR and MIN buttons to set time and ▲ or ▼ to select temperature setting.

#### ◆ TO RECORD THE ECONO PROGRAMS

Set the operating mode to ECONO. Use the PGM button to select the program to be recorded or modified. Once the program is selected, use DAY, HOUR and MIN buttons to set time and day and ▲ or ▼ to select temperature setting.

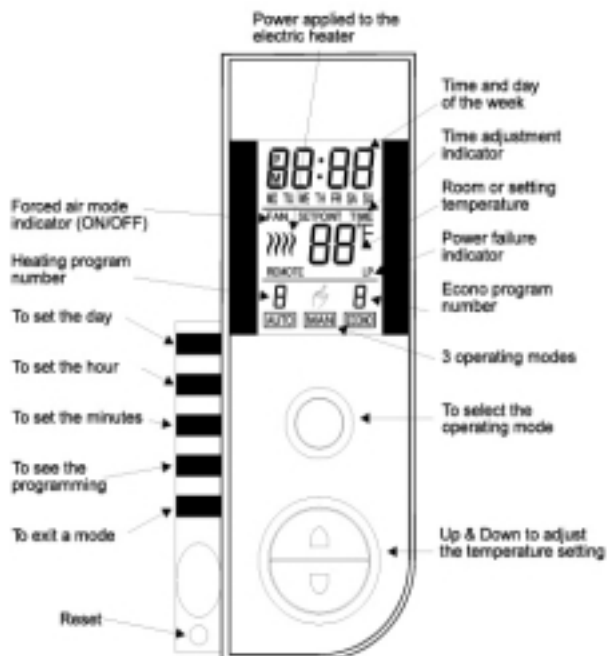
#### ◆ OPERATING MODES

To select an operating mode, use MODE button.

**AUTO:** Runs the programs. ▲ or ▼ shows temperature setting and can override temporary your programming.

**MAN:** Maintains the selected temperature. ▲ or ▼ changes temperature setting.

**ECONO:** Maintains a temperature setting up to the user's pre-programmed day and time. ▲ or ▼ shows temperature setting.



### INSTALLATION

**NOTE:** The "Problems and Solutions" section at the end of this user's guide will help you to correct your problems during the installation.

This thermostat has been designed to operate with any installation which has a RESISTIVE load not exceeding 3500 W @ 240 VAC or 1750 W @ 120 VAC such as electric baseboards, radiant ceilings and floors, electric convectors, etc. It is not compatible with a low voltage controller used by a central heating system or systems using a contactor or a relay whose current is under 1.0 A.

Electricians or experienced technicians should install the thermostat.

This thermostat is designed to be used with a self-protected heating system equipped with thermal cut off and circuit breaker.

#### PARTS INCLUDED

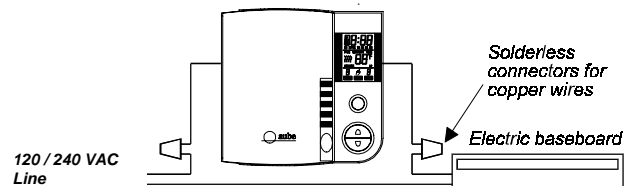
- One (1) TH104D thermostat
- Two (2) 6-32 screws, 1 ¾ inches
- Two (2) solderless connectors

**TURN OFF POWER OF THE HEATING SYSTEM AT THE MAIN POWER PANEL TO AVOID ELECTRICAL SHOCK.** Keep air vents of thermostat clean and free from obstructions.

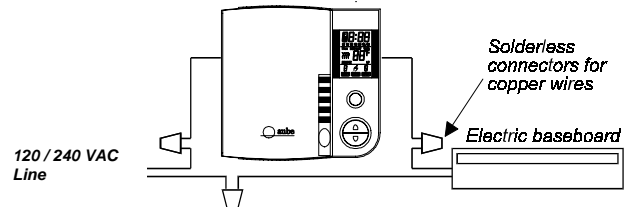
#### 1) Connecting wires and mounting thermostat

Connect the rear thermostat wires to the power supply and to the electric heater wires using solderless connectors for copper wires (**there is no polarity for the wires**). See schematic diagram.

2-Wire installation:



4-Wire installation:



Push the excess wire back into the electrical box to prevent interference with the thermostat. Secure the thermostat using two (2) 6-32 screws 1 ¾ inches long. Once the thermostat is properly installed, return power to heating system.

**Note 1:** All cables and connections must conform to the local electrical code.

**Note 2:** In normal use at full capacity (3500 W), the housing temperature of the thermostat can reach 35 to 40 °C.

**WARNING:** Special CO/ALR solderless connectors must be used when connecting with aluminum conductors.

#### 2) Options selection

Some options have been factory set. Those default settings are:

- ◆ The temperature is in °C, the heating control is proportional and the time format is 24 hours.

##### 2.1 Temperature displayed in °C or °F

To change the temperature from °C to °F and back, maintain DAY button pressed down as RESET button is being pressed on and released. Then release DAY button.

##### 2.2 Time format displayed in 24 hours or 12 hours

To change the time format from 24 hours to 12 hours and back, maintain HOUR button pressed down as RESET button is being pressed on and released. Then release HOUR button.

### 2.3 Proportional or ON/OFF heating control

This thermostat has been factory set to proportionally control electric baseboards, radiant systems and convectors. Since proportional control uses a fast commutation rate, it is not compatible with fan equipped systems (see characteristics). Also, this control mode could occasionally create light flickering, especially in rural area.

**You can change the control mode to make it compatible with fan equipped systems or to eliminate the light flickering.**

To do so, maintain MIN button pressed down as RESET button is being pressed on and released. Then release MIN button. Following this operation, the display will show the FAN indicator. To return to proportional control, repeat the same operation.

### 3) Memory backup

In the event of a power failure, an internal circuit will maintain the programming. The display will stay on for 15 minutes. An indicator "LP" will be shown on the display. Beyond this period, the display will turn off. Only the time will have to be set if power failure is more than six hours. The thermostat will return to the same operating mode as set before the power failure.

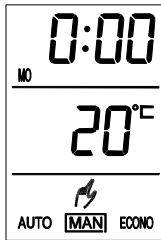
### 4) First power-up

When power is applied for the first time, the display must show the day and hour as follows:

0:00 MO (Monday)

The active operating mode is the framed MAN mode, the temperature setpoint is 20 °C and the ambient temperature is displayed.

If the display is different, maintain PGM button pressed down as RESET button is being pressed on and released. Then release PGM button.



### 500 WATTS INSTALLATION OR LESS

During the 30 minutes period following the installation or a long power failure (more than 6 hours), the light intensity of the display decreases when a button is pressed on while the thermostat is in the heat mode. This problem will disappear when the accumulator for the memory backup will be charged.

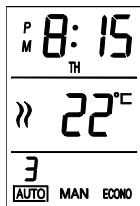
## OPERATING MODES

The TH104D thermostat has three (3) operating modes:

AUTO, MAN and ECONO.

They are selected through the MODE button. On display, the active mode is framed. The frame moves on to the next mode each time the MODE button is pressed on.

AUTO

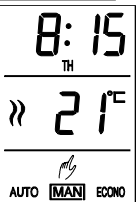


The AUTOMATIC mode runs in sequence (hourly) the programs recorded by the user.

By pressing once on ▲ or ▼, the display shows the temperature setting. All subsequent pressures will override your programming up to the next program.

To see the weekday and weekend programs, select the AUTO mode and press successively on PGM button to see the programs appear on the display.

MAN



The MAN mode allows the user to override the programming.

The first time the ▲ or ▼ is pressed on, the temperature setting is displayed. For all subsequent times pressed on, the temperature setting will change 1 °C.



The ECONO mode has two (2) programs in which the day, the time and the setpoint has to be programmed. For instance, this operating mode can be used for a cottage installation where the user goes only on weekends.

Program 1: Friday 3:00 PM, 21 °C

Program 2: Friday 8:00 PM, 15 °C

The temperature will be maintained at 21 °C Friday from 3:00 PM to 8:00 PM, and maintained at 15 °C the rest of the week.

This gives you a comfortable temperature at your arrival and if you are not going to your cottage for the weekend, there will be only a minimal heating period.

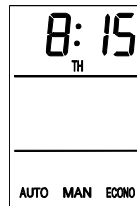
To see the ECONO programs, select the ECONO operating mode and press on PGM button successively to see programs 1 and 2 appear on the display. In ECONO mode, pressing on the ▲ or ▼ displays the temperature setting.

## PROGRAMMING

### 1) Adjustment of time and day

Note: Select your OPTIONS before adjusting your time. Because using the RESET button will set the time back to default 0:00 MO (Monday).

Example of setting: Thursday 8:15 AM



DAY

Use DAY, HOUR and MIN buttons to set the time.

HOUR

MIN

RET

Once set, press on RET button to exit the time and day adjustment mode.

**Note 1:** Time indicator is showing you that the time must be set.

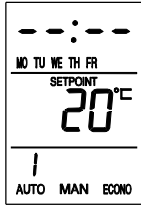
**Note 2:** The thermostat has an automatic return. When such functions as time recording, programs recording, etc., are not completed by pressing on RET button, the thermostat will automatically exit the mode after 60 seconds.

### 2) Typical suggested programs

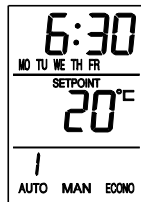
This thermostat can store up to four (4) daily programs for weekdays and four (4) daily programs for the weekend. Also, there is two (2) programs for the ECONO mode. To practice programming use the following example.

Program number	Time	Temperature setting
<b>Weekday programs (Mon...Friday)</b>		
Program 1	6:30 AM	20 °C
Program 2	8:30 AM	15 °C
Program 3	4:30 PM	20 °C
Program 4	11:00 PM	15 °C
<b>Weekend programs (Sat &amp; Sun)</b>		
Program 1	7:00 AM	20 °C
Program 2	8:30 AM	15 °C
Program 3	4:30 PM	20 °C
Program 4	11:00 PM	15 °C
<b>ECONO mode programs (weekend cottage)</b>		
Program 1	Friday 3:00 PM	21 °C
Program 2	Friday 8:00 PM	15 °C

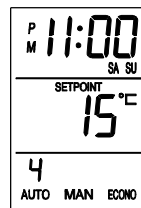
### 3) Recording the heating programs



- PGM** Select the AUTO mode.
- Press on PGM button once.
- The default values or the last recording of program 1 will be displayed.
- The default values are:
  - ◆ 20 °C and the time -- -- : -- -- .
- The days Monday to Friday are displayed to show that this program is for weekdays.



- HOUR** Press on HOUR and MIN buttons until 6:30 AM is displayed.
- MIN**
- Press on ▲ or ▼ until 20 °C is displayed.
- The first program is recorded.

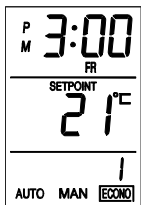


- PGM** Press on PGM button again to record or modify weekday programs 2, 3 and 4 and weekend programs 1, 2, 3 and 4.
- HOUR** Use HOUR, MIN, ▲ or ▼ buttons to modify the time and setpoint of programs.
- MIN** Programming is now completed. Press on RET button or wait for the "automatic return" to exit the programming mode.
- ▲ ▼ *Note: A program time left at -- -- : -- -- is considered inactive.*

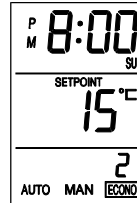
To reset a program, use PGM button to select the program, then press on MODE button.

To review programs, press on PGM button successively to see the programs one after the other and make modifications if required.

### 4) Recording the ECONO programs



- PGM** Select the ECONO mode.
- Press on PGM button once.
- DAY** The default values or the last recording of program 1 will be displayed.
- HOUR** The default values are:
  - ◆ 10 °C and the time -- -- : -- -- .
- MIN** Use DAY, HOUR, MIN and ▲ or ▼ buttons to record the day, the time and the setpoint of program 1.
- ▲ ▼



- PGM** Press a second time on PGM button.
- The default values or the last recording of program 2 will be displayed.
- DAY**
- HOUR** Use DAY, HOUR, MIN and ▲ or ▼ buttons to modify the day, time and setpoint of program 2.
- MIN**
- RET** Programming is now completed. Press on RET button or wait for the "automatic return" to exit the programming mode.

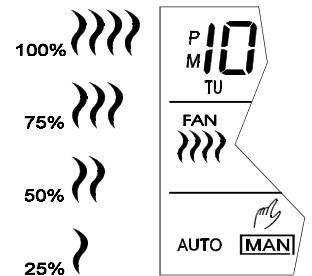
## CHARACTERISTICS

### 1) Proportional and on/off controls

This thermostat works differently than the conventional electro-mechanic one. The latter can have a differential of temperature up to 4 °C while this electronic thermostat has one of only 0.3 °C. This slight oscillation eliminates the discomfort often found with conventional electro-mechanic thermostats.

The proportional controller determines the amount of power required by the electric heating system to maintain the exact ambient temperature of the temperature setting.

To see this process, the display shows, in real time, the percentage of power applied to the electric heating system.



If you have programmed the heating control to ON/OFF to control a fan equipped system, the display will show the fan indicator and 100% when the heating system will turn ON and 0% when it will turn OFF. In this case, the temperature regulation will be  $\pm 0.5$  °C around the setpoint.

### 2) Characteristics

- Model: TH104D
- Electronic programmable line voltage thermostat (2 wires non polarized)
- Supply: 120/240 VAC, 50/60 Hertz
- Load: 14.6 A maximum, 1.0 A minimum (Resistive only)
- Power: 3500 W @ 240 VAC or 1750 W @ 120 VAC
- Power consumption (off): 860 mW
- Approvals: CSA / UL
- Display range: 0 to 99 °C (0 to 99 °F)
- Setting range: 5 to 27 °C (40 to 80 °F)
- Storage: -20 to 50 °C (-4 to 120 °F)
- Temperature regulation: 0.3 °C (proportional),  $\pm 0.5$  °C (ON/OFF)
- Precision:  $\pm 0.5$  °C (3500 W) of temperature setting
- 10 programs: 4 weekday programs, 4 weekend programs and 2 ECONO programs

**NOTE :** In normal use at full capacity (3500 W), the housing temperature of the thermostat can reach 35 to 40 °C.

## WARRANTY

### ONE (1) YEAR LIMITED WARRANTY

This product is warranted against material defects and workmanship in normal use for a period of one year, from the date of the original purchase from authorized dealers. During this period, ENERGY AUTOMATION INC. will repair or replace the product with a new or of equivalent quality at our option, without charge, any product proven defective in normal use.

Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse or accidental damage. This warranty does not cover the cost of installation, removal or reinstallation.

This limited warranty is in lieu of all other warranties, obligations or liabilities expressed or implied by the company. In no event shall Energy Automation Inc. be liable for consequential or incidental damages resulting from installation of this product. Some states or provinces do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

The defective product and the original sale receipt must be returned to the original dealer or shipped pre-paid, insured and addressed to:

Energy Automation Inc.  
Customer Service  
7 First Avenue  
Orangeville, ON  
L9W 1H7  
www.energyautomationinc.com  
save@energyautomationinc.com

If you have any questions concerning the installation or programming of this product, please call our technical assistance at 1-800-838-7435 from Monday to Friday between 8:30 AM and 5:00 PM Eastern time.

## PROBLEMS AND SOLUTIONS

PROBLEMS	CAUSES	SOLUTIONS
No display	<ul style="list-style-type: none"> <li>— Circuit breaker is open</li> <li>— Power failure more than 15 minutes</li> </ul>	<ul style="list-style-type: none"> <li>— Check 240 VAC presence at the thermostat.</li> </ul>
The thermostat is hot	<ul style="list-style-type: none"> <li>— In normal use at full capacity (3500 W), the housing temperature of the thermostat can reach 35 to 40 °C</li> </ul>	
The thermostat is losing the time but not the programming	<ul style="list-style-type: none"> <li>— Power failure more than 6 hours</li> </ul>	
Room temperature shown is wrong	<ul style="list-style-type: none"> <li>— A draft is near the thermostat</li> </ul>	<ul style="list-style-type: none"> <li>— Eliminate the draft.</li> </ul>
Heating system always on	<ul style="list-style-type: none"> <li>— Bad installation</li> </ul>	<ul style="list-style-type: none"> <li>— Check installation.</li> <li>— Maintain PGM button pressed down as RESET button is being pressed and released. Then release PGM button.</li> </ul>
The thermostat displays heating but heating system is not turned on	<ul style="list-style-type: none"> <li>— Bad installation</li> <li>— Power failure ("LP" indicator shown on display)</li> </ul>	<ul style="list-style-type: none"> <li>— Check installation.</li> <li>— Check 240 VAC presence at the thermostat.</li> </ul>
Programs do not change as you want	<ul style="list-style-type: none"> <li>— Incorrect programming hours</li> <li>— Wrong programming mode selected</li> </ul>	<ul style="list-style-type: none"> <li>— Check actual time in AM &amp; PM as well as program times (AM is not displayed).</li> <li>— Make sure operating mode is set to AUTO.</li> </ul>
The lights of the house flicker	<ul style="list-style-type: none"> <li>— Flickering lights are due to the fast commutation of current through the baseboard controlled by the thermostat</li> </ul>	<ul style="list-style-type: none"> <li>— Use the ON/OFF control mode. Maintain MIN button pressed down as reset button is being pressed and released. Then release MIN button.</li> </ul>
Erratic or dim display		<ul style="list-style-type: none"> <li>— Maintain PGM button pressed down as RESET button is being pressed on and released.</li> <li>— For a 500 W or less installation, the display could be dim after the first power-up or a long power failure when the thermostat is in heat mode. See first power-up section.</li> </ul>