VENSTAR®

DIGITAL THERMOSTAT

RESIDENTIAL
THERMOSTAT

T1100FS

7-DAY
PROGRAMMABLE

UP TO 2-HEAT & 2-COOL

HEAT COOL **&** HEAT PUMP

- **Mounts Flush with the Wall**
- Back-Lit display
- One For All™ Works with Virtually All Equipment
- Non-Volatile memory
- Keypad lockout
- Single or Dual setpoint with Adjustable Deadband
- 'O' or 'B' Terminal
- Optional: Outdoor Sensor
- Programmable Fan

- Control up to 2 Heat & 2 Cool Stages
- 7-Day Programmable
- 4 Settings/Day
- Auto Changeover
- 5 minute Built-In
- Compressor Protection
- Self-Prompting Programming with Copy Command
- Display Either F°or C°

- Use with most Air Conditioning & Heating Systems including: 1 or 2 Stage Electric Cooling & 2 Stage Gas Heating, Heat Pump, Electric or Hydronic Heat.

energy ENERGY STAR

OWNER'S MANUAL

© **Venstar Inc. 08/07**

Table Of Contents

CAUTION Follow *Installation Instructions* carefully.

DISCONNECT POWER TO THE HEATER - AIR CONDITIONER <u>BEFORE</u> REMOVING THE OLD THERMOSTAT AND INSTALLING THE NEW THERMOSTAT.
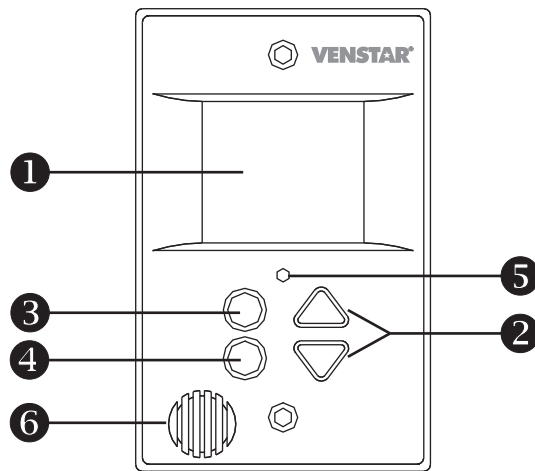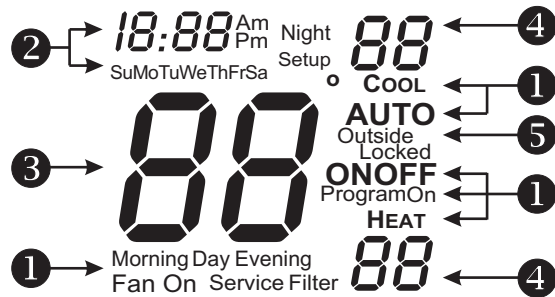
WARNING

Ⓒ **Venstar Inc. 08/07**

P/N T1100FS

Front Panel

❶ **Liquid Crystal Display**
with Thermoglow™

❷ **Up/Down Buttons**

❸ **Mode Button**

❹ **Fan Button**

❺ **Heat or Cool Indicator**
Red = Heat, Green = Cool

❻ **Temperature Sensor**

Display

❶ Mode Indicators - *Page 6*
Selects the operational mode of the equipment.
HEAT - Indicates the heating mode.
COOL - Indicates the air conditioning mode.
AUTO - Indicates the system will automatically changeover between heat and cool modes as the temperature varies.
PROGRAM ON - Indicates the time period program is enabled to run.
OFF - Indicates heating and cooling are turned off.

❷ Clock with Day of the Week - *Page 5*
Indicates the current time and day. This clock is also used to program the time period schedules.

❸ Room Temperature Display
Indicates <u>current</u> room temperature and displays the outdoor temperature when connected (*page 20*).

❹ Desired Set Temperature - *Page 7*
Indicates <u>desired</u> room temperature(s).

❺ **Outside** icon - *Page 20*
Indicates the temperature displayed is from the optional outdoor sensor.

Page 3
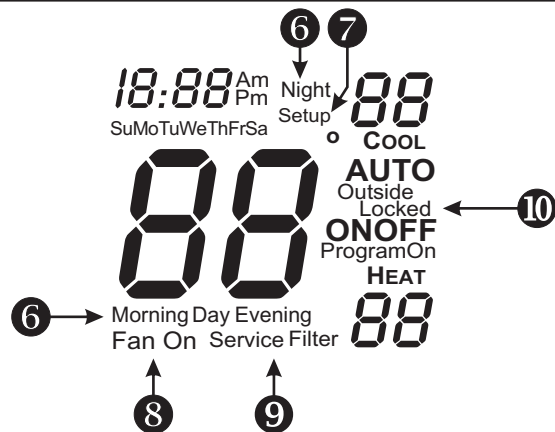
6 **Morning, Day, Evening & Night** icons - *Pages 8-10*
Indicates the day part of the time period program.

7 **Setup** icon - *Pages 12-15*
Indicates the thermostat is in the setup mode.

8 **Fan On** icon - *Page 7*
Indicates constant, continuous fan operation.
When **Fan On** is not lit - indicates the fan will only
operate when necessary to heat or to cool.

9 **Service Filter** icon - *Page 15*
Appears when the filter should be serviced under
normal conditions. Adjustable from 0 - 1950 hours
or blower operation.

10 **Locked** icon - *Page 20*
Indicates the keypad has been locked.

MODE

FAN
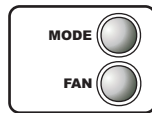
Press the MODE and FAN buttons at the same time for two seconds to enter Setup screens.

During Setup & Programming:

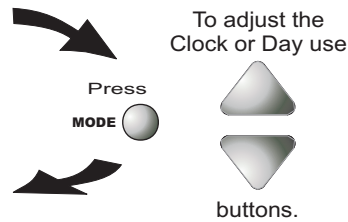*Pressing the UP or DOWN buttons will modify the flashing selection.*
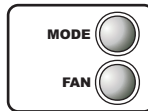
Setting the Clock

12:00 Am   Setup   1

Tip: To change hours quickly, press and hold the FAN button and press the UP or DOWN buttons.

To adjust the
Clock or Day use

Setting the Day

Press

MODE

Mo   Setup   2

buttons.

Press the MODE and FAN buttons at the same time to return to normal operation.

MODE

FAN

The thermostat is preprogrammed from the factory to operate one or two stage equipment* without the need for further programming. To optimize the installation of this thermostat, follow the instructions in the Advanced Setup section.

* The thermostat is not preprogrammed from the factory to operate electric heat or heat pump systems. To control these systems, follow the steps in the Advanced Setup section, pages 12 & 13.

Page 5

Selecting the Heat or Cool Mode

Select Mode by Pressing the MODE Button

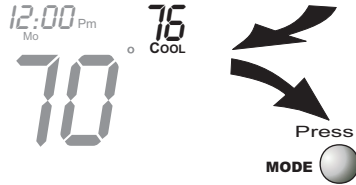**Heating Only**

The **HEAT** setting indicates the temperature the room has to reach before the furnace will turn on to heat the room.
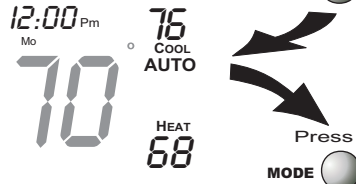
12:00 Pm
Mo
70 °
HEAT
68
Press
MODE
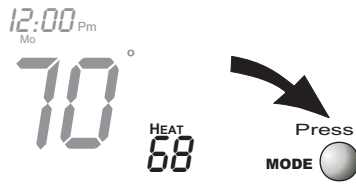
Cooling Only

The **COOL** setting indicates the temperature the room has to reach before the air conditioner will turn on to cool the room.

12:00 Pm
Mo
76
COOL
70 °
Press
MODE

Heating or Cooling

AUTO will automatically select heat or cool based on room temperature demand.

12:00 Pm
Mo
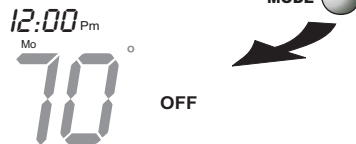76
COOL
AUTO
70 °
HEAT
68
Press
MODE

Time Schedule for Heating or Cooling

The **Program On** setting will activate the time period programming for the cooling or heating setpoint ONLY (Morning, Day, Evening & Night Periods).

12:00 Pm
Mo
76
COOL
70 °
ProgramOn
HEAT
68
Day
Press
MODE
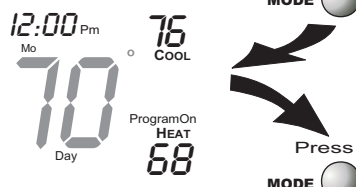
Off

OFF indicates both heating and air conditioning systems are turned off.
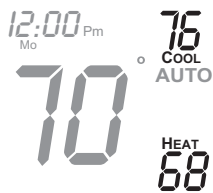
12:00 Pm
Mo
70 °
OFF

Selecting Your Desired Temperature
(adjusting the setpoints)

AUTO OR PROGRAM MODE
Pressing the UP or DOWN buttons in Auto **or** Program mode will adjust **both** the heat and cool set temperatures simultaneously.

12:00 Pm
Mo
o
76
COOL
AUTO
70
HEAT
68

Adjust the desired
set temperature with the

buttons.

HEAT OR COOL MODE
Pressing the UP or DOWN buttons in Heat **or** Cool mode will adjust only the heat **or** cool set temperature.

12:00 Pm
Mo
o
76
COOL
70

Adjust the desired
set temperature with the

buttons.

Using the Fan Button

Press
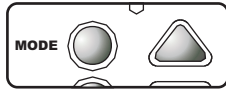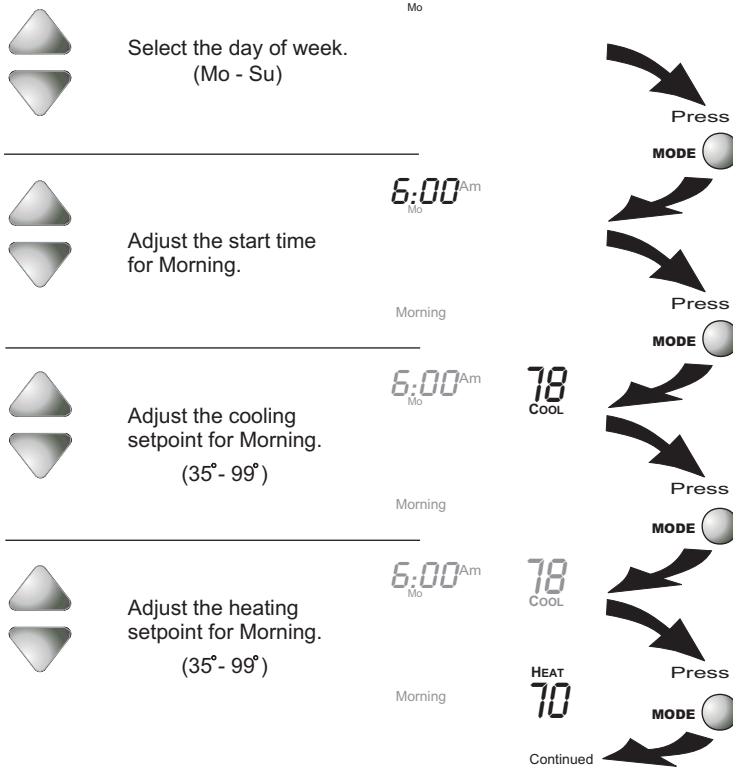FAN

12:00 Pm
Mo
o
76
COOL
70
Fan On

Fan On indicates constant fan operation. You may turn the fan on even if the thermostat is in the **Off** mode. Pressing the FAN button toggles this feature on or off.
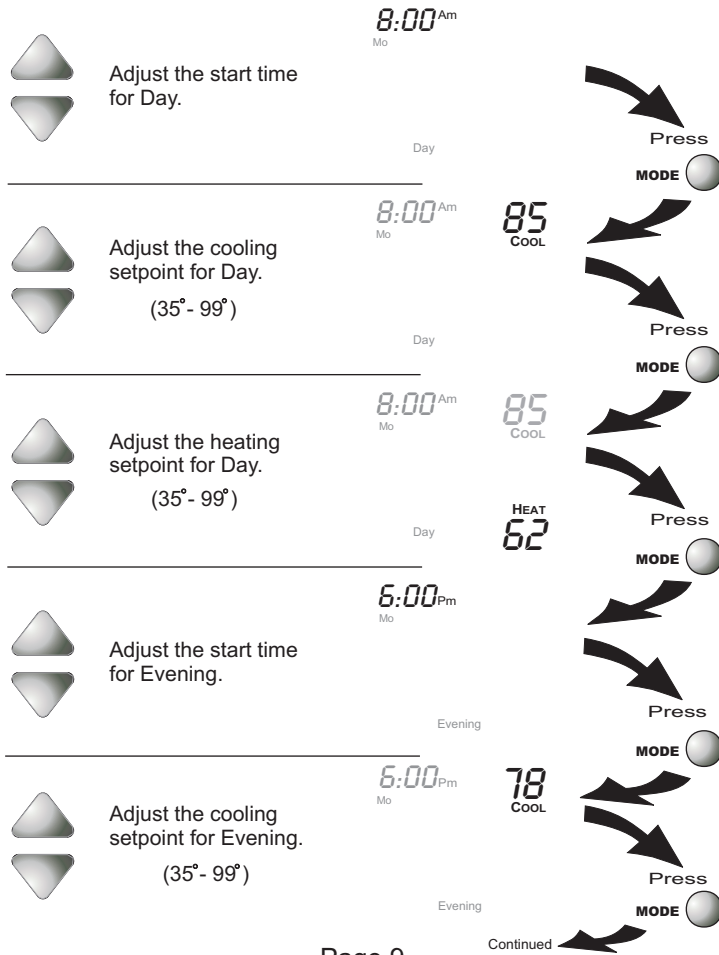
Programming a Daily Schedule

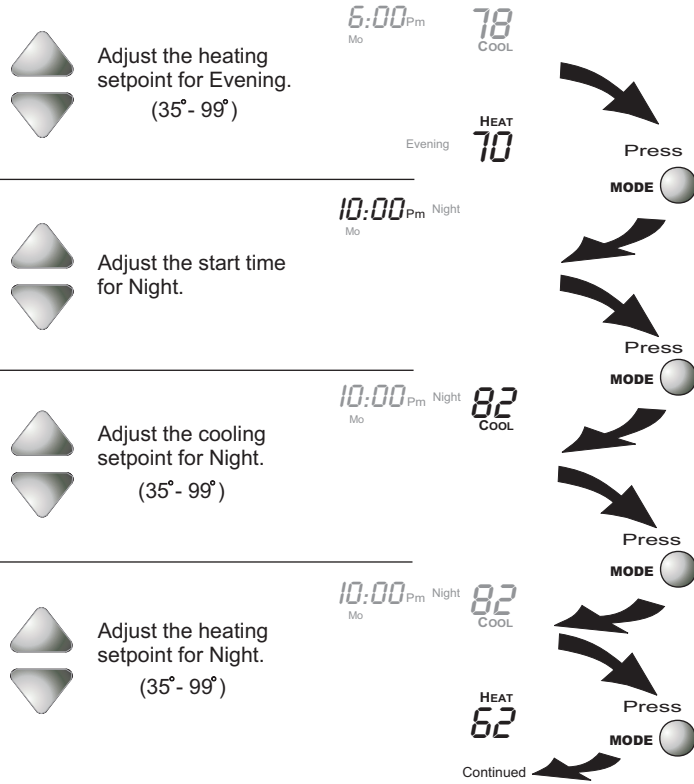*Press the MODE button. While holding MODE, press the UP button for two seconds to enter time period programming.*

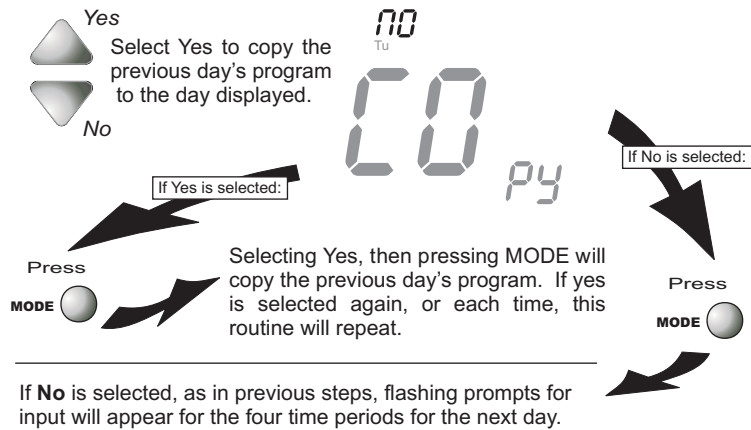*Use the Programming Worksheet on the back cover to help with this section.*

Mo

Select the day of week.
(Mo - Su)

Press

MODE

6:00 Am
Mo

Adjust the start time for Morning.

Morning

Press

MODE

6:00 Am
Mo

78
COOL

Adjust the cooling setpoint for Morning.
(35° - 99°)

Morning

Press

MODE

6:00 Am
Mo

78
COOL

Adjust the heating setpoint for Morning.
(35° - 99°)

Morning

HEAT
70

Press

MODE

Continued

Programming a Daily Schedule

Adjust the start time for Day.

8:00 Am
Mo

Day

Press

MODE

Adjust the cooling setpoint for Day.

(35° - 99°)

8:00 Am
Mo

85
Cool

Day

Press

MODE

Adjust the heating setpoint for Day.

(35° - 99°)

8:00 Am
Mo

85
Cool

Day

HEAT
62

Press

MODE

Adjust the start time for Evening.

6:00 Pm
Mo

Evening

Press

MODE

Adjust the cooling setpoint for Evening.

(35° - 99°)

6:00 Pm
Mo

78
Cool

Evening

Press

MODE

Continued

Page 9

Programming a Daily Schedule

Adjust the heating setpoint for Evening.
(35˚- 99˚)

*6:00*Pm
Mo

78
COOL

HEAT
70
Evening

Press

MODE

Adjust the start time for Night.

*10:00*Pm Night
Mo

Press

MODE

Adjust the cooling setpoint for Night.
(35˚- 99˚)

*10:00*Pm Night
Mo

82
COOL

Press

MODE

Adjust the heating setpoint for Night.
(35˚- 99˚)

*10:00*Pm Night
Mo

82
COOL

HEAT
62

Press

MODE

Continued

Programming a Daily Schedule

The copy command becomes available after programming the entire previous day.

Yes

Select Yes to copy the previous day's program to the day displayed.

No

∏0
Tu

CO py

If Yes is selected:

If No is selected:

Press

MODE

Selecting Yes, then pressing MODE will copy the previous day's program. If yes is selected again, or each time, this routine will repeat.

Press

MODE

If **No** is selected, as in previous steps, flashing prompts for input will appear for the four time periods for the next day.
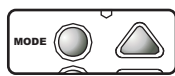
MODE

After programming for all seven days is complete, press the MODE and UP buttons at the same time for two seconds to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Advanced Setup

Press the MODE button. While holding MODE, press the FAN button for for 10 seconds to enter setup screens.

MODE

FAN

NOTE: Each step # is located at the top right corner of the display for easy reference.

12:00 Am   Setup   *1*

Adjust the time of day clock.

Tip: To change hours quickly, press and hold the FAN button in and press the UP or DOWN buttons.

Press

MODE

Mo   Setup   *2*

Select the day of the week.

Press

MODE

On

Setup   *3*

ON = Heat Pump operation
OFF = Gas Electric operation

Off

HP   **OFF**

Press

MODE

Continued

Page 12

Advanced Setup

b Select the reversing valve polarity for Heat Pump operation:

O = Energize in cooling
b = Energize in heating

O *(Step 4 only appears if heat pump is **on** in step 3)*

Setup 4

0

Press

MODE

On

Select Electric Heat operation:
On = 1st stage electric heat
Off = 1st stage gas heat

Off *(Step 5 only appears if heat pump is **off** in step 3)*

Setup 5

EH OFF

Press

MODE

Adjust the deadband for the 1st stage.

(1° - 6°)

db Setup 6

2

Press

MODE

Adjust the minimum *difference* between cooling & heating setpoints.

(0° - 6°)

d IF Setup 7 COOL

2 HEAT

Press

MODE

Select the cycles per hour limit:
d=cycles per hour limit defeated
d1=d + defeat 5 min. compressor lockout

(d1, d, 2 - 6)

Setup 8

6 CY

Press

MODE

Page 13 Continued

Advanced Setup

0:00 Setup 9

Adjust the programmable
fan timer:
0 - 60 minutes
0:00 = off

Fan On

Press

MODE

7:00 Am Setup 10

Adjust the Programmable
Fan start time. (step 10
appears only if step 9
is not 0:00)

ON

Fan On

Press

MODE

9:00 Pm Setup 11

Adjust the Programmable
Fan stop time. (step 11
appears only if step 9
is not 0:00)

OFF

Fan On

Press

MODE

On

Setup 12

Select backlight operation:
ON - Light continuously
OFF - Light for 8 seconds
        after a button press

L I ON

Off

Press

MODE

---

0 Setup 13

Press

FAN

Counts the number of
hours Heat has been
running. Press FAN to
reset the Energy Watch
Heat counter.
        (0 - 1999 hrs.)

HEAT

Press

MODE

Continued

Page 14

0   Setup *14*
   COOL

Press

◯

FAN

Counts the number of hours Cool has been running. Press FAN to reset the Energy Watch **Cool** counter.

(0 - 1999 hrs.)

Press

MODE ◯

0   Setup *15*

Press

◯

FAN

Reset the counter to 0 to remove the Service Filter icon from the display.

Service Filter

Press

MODE ◯

0   Setup *16*

▲

▼

Adjust the number of hours, in increments of 50, the fan will run before the Service Filter icon appears on the display: 0 = off.

(0 - 1950 hours)

Service Filter

Press

MODE ◯

Setup *17*

▲ *C*

▼ *F*

Select thermostat operation in degrees **F**ahrenheit or **C**elsius.

F

Press

MODE ◯

FAN ◯

After programming is complete, press the MODE and UP buttons at the same time for two seconds to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds. Page 15

Advanced Setup Table

Step #	Description	Range	Factory Default
1	Time of Day	24 hour	12:00 am
2	Day of the Week	Mo - Su	Mo
3	Heat Pump	Off / On	Off
4	Reversing Valve Polarity	O / b	O
5	Electric Heat	Off / On	Off
6	Deadband/Temp. Swing 1st Stage	1°- 6°	2°
7	Minimum Heat/Cool Differential	0°- 6°	2°
8	Cycles Per Hour	d, d1, 2 - 6	6
9	Programmable Fan	0:00 - 0:60	0:00
10	Programmable Fan Start Time	24 Hour	7am
11	Programmable Fan Stop Time	24 Hour	9pm
12	Thermoglow Backlight	Off / On	On
13	Energy Watch - Heat Timer	read only	- -
14	Energy Watch - Cool Timer	read only	- -
15	Reset Service Filter Icon	read only	- -
16	Service Filter Run-Time Set	0 - 1950	0
17	Fahrenheit or Celsius	F / C	F

About Advanced Features & Operation

✻ CALIBRATION - Under normal circumstances it will not be necessary to adjust the calibration of the temperature. If calibration is required, please contact a trained HVAC technician to correctly perform the following procedure.

❶ MODE Place the therm- ostat in the OFF mode.

12:00 Pm
Mo
72° OFF

❸ Press the MODE button once. The thermostat temp- erature will be displayed and may be calibrated using the UP or DOWN buttons.

72°

❷ MODE Press and hold the MODE button. While holding the MODE button, press and hold the DOWN button for 5 seconds. All icons will appear on the display.

18:88 Am Pm Night Setup *88*
SuMoTuWeThFrSa COOL°
  AUTO
  Outside
  Locked
88 ONOFF
  ProgramOn
  HEAT
Morning Day Evening *88*
Fan On Service Filter

❹ MODE After calibration is complete, press the MODE button **once** to save your changes and return to normal operation.

12:00 Pm
Mo
72° OFF

✻ DEADBAND OPERATION - Controls up to two Heat and two Cool stages (please see the diagram on the next page).

The **1st Stage** of heat or cool is turned on when:
(**A**) The temperature spread from the setpoint is equal to or greater than: *the setpoint plus the 1st stage deadband (step #6, page 13).* This 1st stage deadband is adjustable from 1-6 degrees and the default is two degrees.

The **2nd Stage** of heat or cool is turned on when:
(**A**) The 1st Stage has been on for a minimum of *two minutes*.

And

(**B**) The temperature spread from the setpoint is equal to or greater than: *the setpoint plus the 1st stage deadband (step #6, page 13), plus the 2nd stage deadband.* This 2nd stage deadband is fixed at two degrees and is not adjustable.

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About Advanced Features & Operation
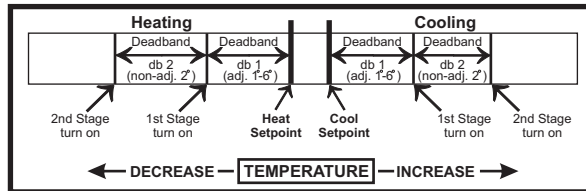
The above figure assumes the minimum on time for the prior stage has been met to allow the next stage to turn on, once the deadbands have been exceeded.

❀ ELECTRIC HEAT - Selecting Electric Heat *(step #5, page 13)*, will cause the thermostat to turn on the fan immediately any time there is a heat demand. Since most gas furnaces control the fan, this feature should be off unless it is necessary for the thermostat to energize the fan with first stage heat.

❀ EMERGENCY HEAT - Only available if you have a Heat Pump installed. To initiate the Emergency Heat feature, press the FAN button. While holding the FAN button press the UP button. The Cool setpoint display will read 'EH' (emergency heat).

Operation - During Emergency Heat operation the thermostat will turn on the fan and the 2nd stage of heat when there is a demand for heat. Also during Emergency Heat, the 1st stage of heating or cooling will be unavailable.

Exit Emergency Heat - Follow the same steps as entering Emergency Heat by pressing the FAN and UP buttons. During Emergency Heat, only OFF and HEAT modes are available by pressing the MODE button.

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About Advanced Features & Operation

❋ FACTORY DEFAULTS - If, for any reason, you desire to return all the stored settings back to the factory default settings, follow the instructions below.

WARNING: This will reset all Time Period and Advanced Programming to the default settings. Any information entered prior to this reset will be permanently lost.

❶ **MODE** ⬤
Place the thermostat in the OFF mode.

12:00 Pm
Mo
72° OFF

❸ **FAN** ⬤
After all of the icons appear, release the MODE and DOWN buttons. Then press and hold the FAN button for 5 seconds.

Fd

❷ **MODE** ⬤ ▽
Press and hold the MODE button. While holding the MODE button, press and hold the DOWN button for 5 seconds. All icons will appear on the display.

18:88 Am Pm Night Setup
SuMoTuWeThFrSa 88° COOL
AUTO
Outside
Locked
ONOFF
ProgramOn
HEAT
Morning Day Evening 88
Fan On Service Filter 88

❹ **MODE** ⬤
After the letters **Fd** appear on the display (Factory Default), release the FAN button. Press the MODE button **twice** to return to normal operation.

12:00 Pm
Mo
72° OFF

❋ HEAT/COOL DIFFERENTIAL - The Heat and Cool setpoints will not be allowed to come any closer to each other than the value set in Advanced Setup *step #7, on page 13*. This minimum difference is enforced during Auto changeover and Program On operation.

Note: To increase the spread between the heating and cooling setpoints, press the MODE button until only the heat setpoint is displayed; adjust to the desired setpoint. Press the MODE button until only the cool setpoint is displayed; adjust to the desired setpoint. Press the MODE button again to enter the Auto-changeover mode where both the heat and cool setpoints are displayed.

❋ MEMORY BACKUP - In the event of a power loss, the thermostat will retain the stored program settings without external power or batteries.

❋ PROGRAMMABLE FAN - This timer will start the fan at the top of each hour and the fan will run for the number of minutes selected in step #9 on page 14. Steps 10 & 11 restrict the hours during which the programmable fan may operate; step #10 is the start time and step #11 is the stop time. Selecting the same start and stop times will cause the fan to operate 24 hours a day.

About Advanced Features & Operation

❉ KEYPAD LOCKOUT - To prevent unauthorized use of the thermostat, the front panel buttons may be disabled. To disable, or 'lock' the keypad, press and hold the MODE button. While holding the MODE button, press the UP and DOWN buttons together. The LOCKED icon will appear on the display, then release the buttons.

Press all three buttons in the order outlined above for keypad lockout

12:00 Pm
Mo
° *76* COOL

72

Locked

ProgramOn
HEAT
68

Fan On   Day
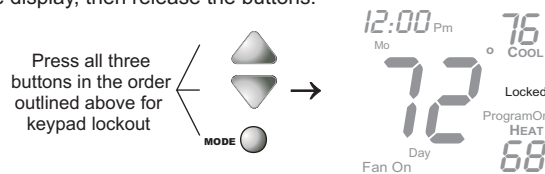
MODE

To **unlock** the keypad, press and hold the MODE button. While holding the MODE button, press the UP and DOWN buttons together. The LOCKED icon will disappear from the display, then release the buttons.

❉ OUTDOOR SENSORS **(Optional Accessory)** - One wired or wireless Outdoor sensor can be installed to read the outdoor temperature. To view this sensor, press and hold the MODE button for two seconds. Press any button to exit the outdoor temperature display.

The Outdoor Sensor measures outdoor air temperature and sends this information to the thermostat; it measures temperature with a range of -40° to 127°F.

The Outdoor Sensor should be connected to the thermostat using solid conductor CAT 5, CAT 5e, or CAT 6 type network communication cable. This is an unshielded cable with four twisted pairs of 24 gauge solid wire; *DO NOT use stranded cable*. The cable length should not exceed 250 feet. If less than 75 feet of cable is required to connect the thermostat to the Outdoor Sensor, a three conductor thermostat cable (18-24 gauge) may be used; this cable is NOT suitable for any length greater than 75 feet.

IMPORTANT: Do no use shielded wire. Do not run run sensor wiring in the same conduit as the 24VAC thermostat wiring. Electrical interference May cause the sensor to give incorrect temperature readings.
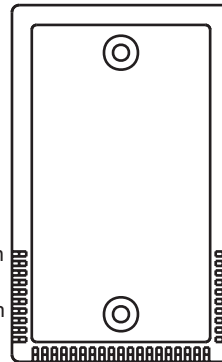
See the Outdoor Sensor instructions for further details.

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Warranty

One-Year Warranty - This Product is warranted to be free from defects in material and workmanship. If it appears within one year from the date of original installation, whether or not actual use begins on that date, that the product does not meet this warranty, a new or remanufactured part, at the manufacturer's sole option to replace any defective part, will be provided without charge for the part itself provided the defective part is returned to the distributor through a qualified servicing dealer.

THIS WARRANTY DOES NOT INCLUDE LABOR OR OTHER COSTS incurred for diagnosing, repairing, removing, installing, shipping, servicing or handling of either defective parts or replacement parts. Such costs may be covered by a separate warranty provided by the installer.

THIS WARRANTY APPLIES ONLY TO PRODUCTS IN THEIR ORIGINAL INSTALLATION LOCATION AND BECOMES VOID UPON REINSTALLATION.

LIMITATIONS OF WARRANTIES – ALL IMPLIED WARRANTIES (INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY) ARE HEREBY LIMITED IN DURATION TO THE PERIOD FOR WHICH THE LIMITED WARRANTY IS GIVEN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE MAY NOT APPLY TO YOU. THE EXPRESSED WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MAY NOT BE ALTERED, ENLARGED, OR CHANGED BY ANY DISTRIBUTOR, DEALER, OR OTHER PERSON WHATSOEVER. ALL WORK UNDER THE TERMS OF THIS WARRANTY SHALL BE PERFORMED DURING NORMAL WORKING HOURS. ALL REPLACEMENT PARTS, WHETHER NEW OR REMANUFACTURED, ASSUME AS THEIR WARRANTY PERIOD ONLY THE REMAINING TIME PERIOD OF THIS WARRANTY.

THE MANUFACTURER WILL NOT BE RESPONSIBLE FOR:

1. Normal maintenance as outlined in the installation and servicing instructions or owner's manual, including filter cleaning and/or replacement and lubrication.
2. Damage or repairs required as a consequence of faulty installation, misapplication, abuse, improper servicing, unauthorized alteration or improper operation.
3. Failure to start due to voltage conditions, blown fuses, open circuit breakers or other damages due to the inadequacy or interruption of electrical service.
4. Damage as a result of floods, winds, fires, lightning, accidents, corrosive environments or other conditions beyond the control of the Manufacturer.
5. Parts not supplied or designated by the Manufacturer, or damages resulting from their use.
6. Manufacturer products installed outside the continental U.S.A., Alaska, Hawaii, and Canada.
7. Electricity or fuel costs or increases in electricity or fuel costs for any reason whatsoever including additional or unusual use of supplemental electric heat.
8. ANY SPECIAL INDIRECT OR CONSEQUENTIAL PROPERTY OR COMMERCIAL DAMAGE OF ANY NATURE WHATSOEVER. Some states do not allow the exclusion of incidental or consequential damages, so the above may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

DAY	PERIOD	START TIME	COOL	HEAT	
MONDAY	Morning				
	Day				
	Evening				
	Night				
TUESDAY	Morning				*Copy Mon → Tue*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				
WEDNESDAY	Morning				*Copy Tue → Wed*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				
THURSDAY	Morning				*Copy Wed → Thu*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				
FRIDAY	Morning				*Copy Thu → Fri*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				
SATURDAY	Morning				*Copy Fri → Sat*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				
SUNDAY	Morning				*Copy Sat → Sun*
	Day				☐ *No*
	Evening				☐ *Yes*
	Night				