VENSTAR®

COMMERCIAL
THERMOSTAT
T2900

DIGITAL
THERMOSTAT

7-DAY
PROGRAMMABLE

UP TO 3-HEAT
& 2-COOL

HEAT COOL & HEAT PUMP

- Control up to 3 Heat & 2 Cool Stages
- 3 Configurable Outputs
- Adjustable 2nd & 3rd Stage Timers & Deadbands
- Backlit Display & Button Legends
- Aux Heat Indicator
- Dry Contact Equipped
- Accepts Comfort Call™ Phone Control Accessory

- Outdoor Sensor Ready with High/Low Readouts for the Day
- Set Point Limiting
- Accepts EZ Programmer™
- Economizer Control
- Preoccupancy Fan Purge
- Remote Averaging
- Programmable Output
- Light Activation Equipped
- Accepts Optional Humidity Module: Controls Humidification, Dehumidification and Reheat
- Accepts Optional IR Remote Control

Meets Commercial California Title 24

- Use with most Air Conditioning & Heating Systems including: 1 or 2 Stage Electric Cooling & 3 Stage Gas Heating, Heat Pump, Electric or Hydronic Heat.

OWNER'S MANUAL

© Venstar Inc. 04/08

⚠ **CAUTION**

Follow the Installation Instructions before proceeding. Set the thermostat mode to "OFF" prior to changing settings in setup or restoring Factory Defaults.
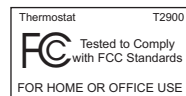
⚠ **CAUTION**

NEVER PUT MORE THAN ONE JUMPER ON THE SAME MISC JUMPER BLOCK!

THIS MAY DAMAGE YOUR THERMOSTAT AND VOID YOUR WARRANTY.

MISC3
OK

MISC3

NOTE: Due to variations in environmental conditions, it is not always possible to achieve the desired humidification or dehumidification setpoint.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

C ⓊL US
LISTED
4Z95

Thermostat   T2900

FC Tested to Comply
    with FCC Standards

FOR HOME OR OFFICE USE

How to Use This Manual

VENSTAR®

The Table of Contents divides the thermostat features into sections making it easier to quickly find information.

The first page of each section contains a more detailed Table of Contents for each section, such as the example page shown below.

SECTION 14
Timers and Deadbands   **VENSTAR®**

Header shows section # and title of section

Section 14 Contents:

Section contents

Visible section tab on the side of the page

Section and page #

Page 14.1

In addition, this manual also has an Index to help you find any information regarding this thermostat quickly.

Page ii

Auto-Changeover: A mode in which the thermostat will turn on the heating or cooling based on room temperature demand.

Configurable Output Jumper: Using jumpers on the thermostat you can configure the MISC1, MISC2, and MISC3 terminals to control humidification, dehumidification, 2nd stage cooling, 3rd stage heating, and a programmable output.

Cool Setpoint: The warmest temperature that the space should rise to before cooling is turned on (without regards to deadband).

Deadband: The number of degrees the thermostat will wait, once setpoint has been reached, before energizing heating or cooling.

Dehumidify: To reduce the amount of moisture in the air.

Differential: The forced temperature difference between the *heat setpoint* and the *cool setpoint.*

Heat Setpoint: The coolest temperature that the space should drop to before heating is turned on (without regards to deadband).

Humidify: To increase the amount of moisture in the air.

Icon: The word or symbol that appears on the thermostat display.

Mode: The current operating condition of the thermostat (i.e. Off, Heat, Cool, Auto, Program On).

Non-Programmable Thermostat: A thermostat that does not have the capability of running the *Time Period Programming.*

Programmable Thermostat: A thermostat that has the capability of running the *Time Period Programming.*

Reheat: Running the cooling and 2nd stage strip heaters at the same time in order to *dehumidify* the air without cooling down the room temperature.

Temperature Swing: *Same as Deadband.*

Time Period Programming: A program that allows the thermostat to automatically adjust the *heat setpoint* and/or the *cool setpoint* based on the time of day.
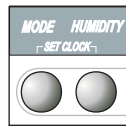
Table of Contents

VENSTAR®

SECTION 1
Quick Start

VENSTAR®

1

Section 1 Contents:

Note: Following the instructions in this section will allow you to operate your thermostat using the factory default settings. These settings are depicted in the illustrations throughout this manual.

MODE HUMIDITY
SET CLOCK

Press the MODE and HUMIDITY buttons at the same time

During Setup & Programming:

Pressing the UP or DOWN buttons will modify the flashing selection.

Setting the Clock

12:00 Am   Setup   1

To adjust the Clock or Day use

Press

MODE

Setting the Day

Mo   Setup   2

Buttons.

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

MODE HUMIDITY
SET CLOCK
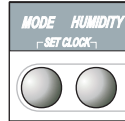
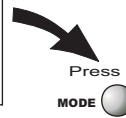**To adjust the time by hours press and hold the FAN button while pressing the UP or DOWN buttons.**
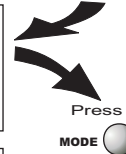
1   *Selecting the Heat or Cool Mode*

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.*
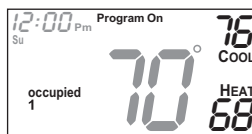
12:00 Pm Su
70° HEAT 68

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 Su
76 COOL
70°

Press
MODE

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

12:00 Pm Su
76 COOL
70°
AUTO
HEAT 68

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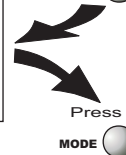
Time Schedule for Heating or Cooling
*The **Program On** setting will activate the time period programming for the cooling or heating setpoint ONLY (Morning, Day, Evening & Night Periods).*

12:00 Pm Su Program On
76 COOL
70°
occupied 1
HEAT 68

Press
MODE

Off
***OFF** indicates both heating and air conditioning systems are turned off.*

12:00 Pm Su
70°
OFF

Page 1.3

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.

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.

Adjust the desired set temperature with the

buttons.

Using the Fan Button

Press

FAN

Fan On indicates constant fan operation. If Fan On is selected the fan will run continuously at all times, except in Off, **and** will only run if there is a heating or cooling demand in Unoccupied periods. Pressing the FAN button toggles this feature on or off.

Page 1.4

Section 2 Contents:

VENSTAR®

Front Panel

Backlit LCD Display

Warmer Button
(glows red)

sometimes referred
to as the UP button

Cooler Button
(glows blue)

sometimes refer-
red to as the
DOWN button

Heat or Cool Demand Indicator
Red = Heat, Green = Cool

Override
Button

**QUICK RELEASE FOR
ACCESSORY PORT**
(pg. 23.1)

MODE   HUMIDITY   FAN   PROGRAM HOLIDAY
└ SET CLOCK ┘   └ OUTDOOR° ┘

Page 2.2

Display Features

2

```
18:88 Am    Program On  Setup 188
        Pm  StartStop          Hi
SuMoTuWeThFrSa  DeHumidify   %
Service Filter                    COOL
Pan UV Light              Outside
AUTO                188   Remote
OFFON —              AuxHEAT
Unoccupied               Lo
    123                    —88
Override
FanOn
```
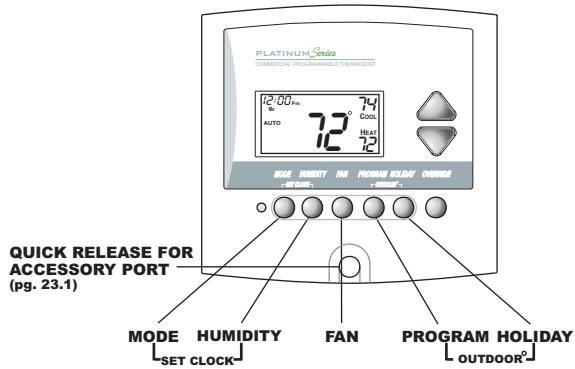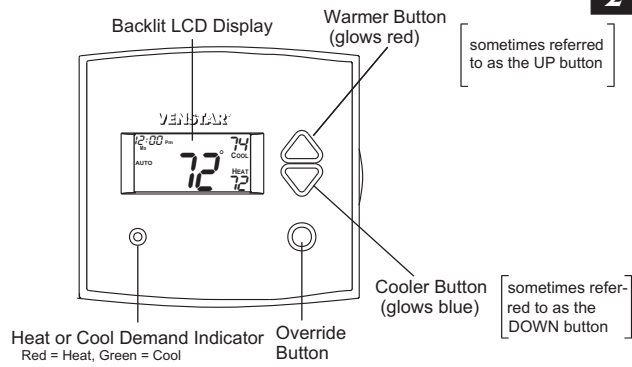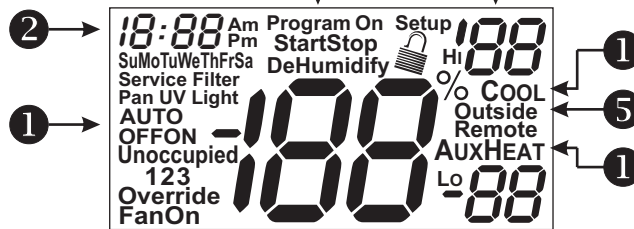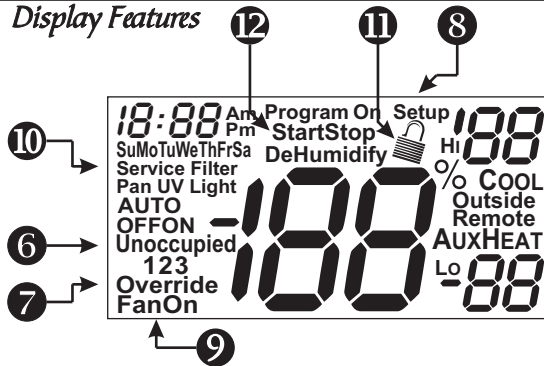
① Mode Indicators - *Section 4*
   Selects the operational mode of the equipment.
   HEAT - Indicates the heating mode.
   COOL - Indicates the air conditioning mode.
   AUTO - Indicates the system will automatically changeover
      between heat and cool modes as the temperature varies.
   OFF - Indicates heating and cooling is turned off.
   PROGRAM ON - Indicates the time period program is enabled to
      run.

② Clock with Day of the Week - *Section 3*
   Indicates the current time and day. This clock is also used to program
   the time period schedules.

③ Room Temperature Display - *Section 5*
   Indicates the <u>current</u> room temperature and displays the outdoor
   temperature when selected.

④ Desired Set Temperature - *Section 4/5*
   Indicates <u>desired</u> room temperature(s). Also displays the highest
   and lowest outdoor temperatures for the day.

⑤ **Outside** icon - *Section 5*
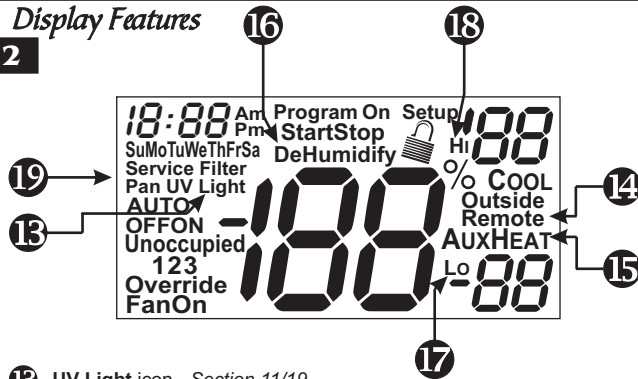   Indicates the temperature displayed is from the optional outdoor
   sensor.

Page 2.3

Display Features

2

⑫ ⑪ ⑧

⑩

I8:88 Am Pm **Program On Setup** *I88*
SuMoTuWeThFrSa **StartStop** Hi
Service Filter **DeHumidify** 🔒 %
Pan UV Light **COOL**
AUTO **Outside**
⑥ OFFON **Remote**
Unoccupied **AUXHEAT**
123 Lo
⑦ Override *88*
FanOn

⑨

⑥ **Occupied** & **Unoccupied** icons - *Section 6*
Indicates the program number: Occupied 1,2,3,or Unoccupied.

⑦ **Override** icon - *Section 6*
Indicates the program is currently being overridden for up to 4 hours.

⑧ **Setup** icon - *Sections 7-20*
Indicates the thermostat is in the setup mode.

⑨ **Fan On** icon - *Section 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.

⑩ **Service Filter** icon - *Section 19*
Appears when the filter should be serviced under normal conditions. Adjustable from 0 - 1950 hours of blower operation.

⑪ 🔒 icon - *Section 8*
Indicates keypad has been locked.

⑫ **StartStop** icon - *Section 6*
Appears when programming occupied time periods.

Page 2.4

⑯ ⑱

```
18:88 Am   Program On  Setup
        Pm  StartStop    🔒   Hi 88
SuMoTuWeThFrSa  DeHumidify        %  COOL
Service Filter                       Outside
Pan UV Light       188           Remote
AUTO                             AUXHEAT
OFFON                         Lo 88
Unoccupied
   123
Override
FanOn
```
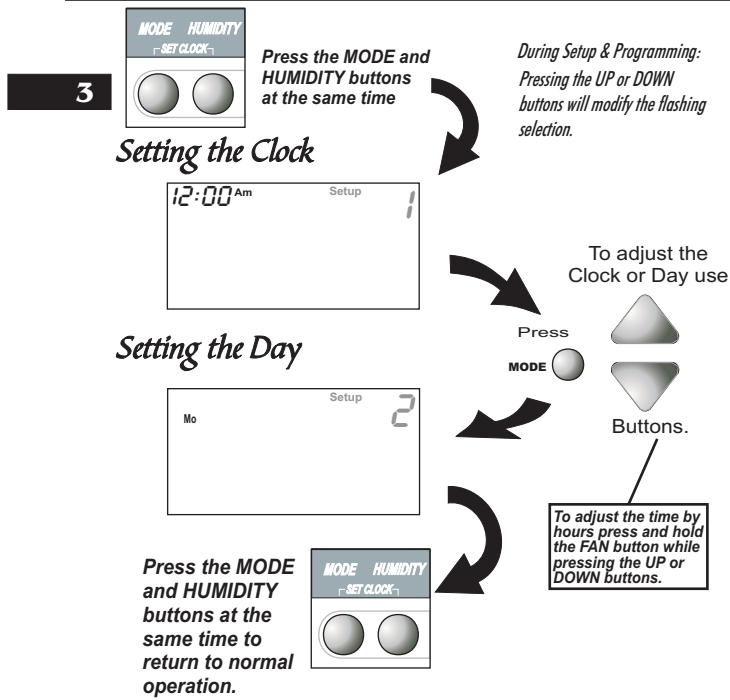
⑲ ⑬ ⑭ ⑮ ⑰

⑬ **UV Light** icon - *Section 11/19*
Appears when the UV bulb should be serviced under normal conditions. Adjustable from 0 - 1950 days of operation.

⑭ **Remote** icon - *Page 22.4*
Indicates the remote sensor reading of the thermostat is being viewed.

⑮ **AuxHeat** icon - *Pages 10.5 & 13.4*
Indicates 2nd stage electric strip heat is being used when the thermostat is programmed for Heat Pump operation. Only the **Aux** icon will appear during Cool to Dehumidify to indicate Reheat operation.

⑯ **Humidify/DeHumidify** icon - *Sections 9-10*
Indicates the system is currently humidifying/dehumidifying the air.

⑰ **Lo** icon - *Section 5*
Indicates the lowest recorded outdoor temperature for the day.

⑱ **Hi** icon - *Section 5*
Indicates the highest recorded outdoor temperature for the day.

⑲ **Service Pan** icon - *Section 16*
Indicates that a sensor (accessory) has detected the condensate drain pan is full and the compressor (Y1) has been locked out.

Page 2.5

SECTION 3
Setting the Clock and Day   **VENSTAR®**

3

Section 3 Contents:

Note: *During setup & programming pressing the UP or DOWN buttons will modify the flashing selection.*

VENSTAR

3

MODE   HUMIDITY
SET CLOCK

Press the MODE and HUMIDITY buttons at the same time

During Setup & Programming: Pressing the UP or DOWN buttons will modify the flashing selection.

Setting the Clock

12:00 Am   Setup   *1*

To adjust the Clock or Day use

Press

MODE

Buttons.

Setting the Day

Mo   Setup   *2*

To adjust the time by hours press and hold the FAN button while pressing the UP or DOWN buttons.

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

MODE   HUMIDITY
SET CLOCK

Page 3.2

4

Section 4 Contents:

Note: During setup & programming pressing the UP or DOWN buttons will modify the flashing selection.

Programmable or Non-Programmable Thermostat

4 When the <u>very simplest</u> operation is desired, this thermostat may be configured to be non-programmable, with or without Auto-Changeover. Follow the step below.

If 'NO' is selected, the thermostat will lockout the Program On screen; only the Off, Heat, Cool, and Auto screens may be accessed by pressing the MODE button.

Select 'YES' if you would like your thermostat to be **programmable**, then the Program mode will be accessible through the use of the MODE button.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

YES

Select Yes if you would like the thermostat to be programmable or No for non-programmable.

NO
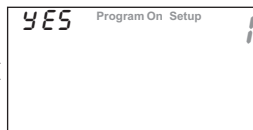
YES   Program On Setup

Press

PROGRAM

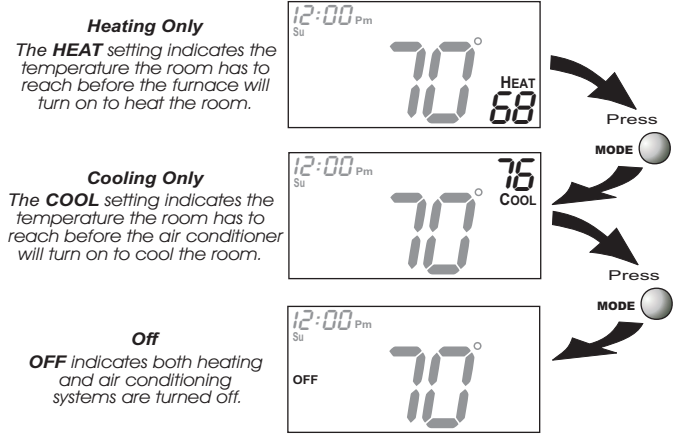Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 4.2

VENSTAR®

Manual or Auto-Changeover Thermostat

When the <u>very simplest</u> operation is desired, this thermostat may be configured to be a manual heat and cool thermostat, with or without time period programmability. Follow the step below.

4

The thermostat may be programmed to function as a Heat Only or Cool Only thermostat by selecting 'NO' in the setup screen below. This will lockout the Auto-Changeover screen and only allow the Off, Heat, Cool, and Program On screens to be accessed.

MODE ⬤ PROGRAM ⬤   ***Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.***

MODE ⬤   ***Press the MODE button repeatedly until this setup screen appears.***

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

YES ▲   Select Yes if you would like the thermostat to be Auto-Changeover or No for a Heat Only and Cool Only Thermostat.

▼ *NO*

```
YES          Setup    2
AUTO
```

Press   PROGRAM ⬤

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 4.3

Operating Mode when the Thermostat is Configured to be:

4

NON-PROGRAMMABLE WITH MANUAL CHANGEOVER - If the thermostat is configured to be a non-programmable thermostat with Manual Changeover, the following screens will be available by pressing the MODE button.

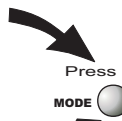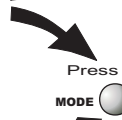## *Select the Mode by Pressing the MODE Button*

Heating Only

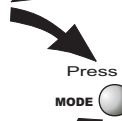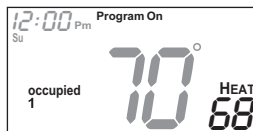*The **HEAT** setting indicates the temperature the room has to reach before the furnace will turn on to heat the room.*

12:00 Pm
Su
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
Su
76
COOL
70°

Press
MODE

Off

***OFF** indicates both heating and air conditioning systems are turned off.*

12:00 Pm
Su
OFF
70°

Page 4.4

VENSTAR®

Operating Mode when the Thermostat is Configured to be:

NON-PROGRAMMABLE WITH AUTO-CHANGEOVER - If the thermostat is configured to be a non-programmable thermostat with Auto-Changeover, the following screens will be available by pressing the MODE button

Select the Mode by Pressing the MODE Button

Heating Only
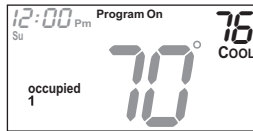The **HEAT** setting indicates the temperature the room has to reach before the furnace will turn on to heat the room.

12:00 Pm
Su
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.

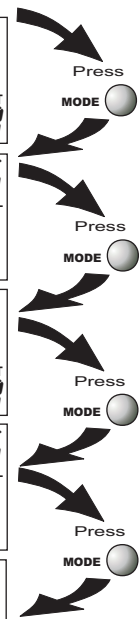*12:00* Pm
Su
76
COOL
70°

Press

MODE

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

12:00 Pm
Su
76
COOL
AUTO
70°
HEAT
68

Press

MODE

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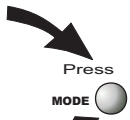
12:00 Pm
Su
OFF
70°

Page 4.5

VENSTAR®

Operating Mode when the Thermostat is Configured to be:

PROGRAMMABLE WITH MANUAL CHANGEOVER - If the thermostat is configured to be a programmable thermostat with Manual Changeover, the following screens will be available by pressing the MODE button.
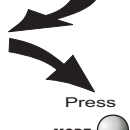
4

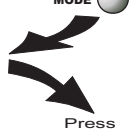## *Select the Mode by Pressing the MODE Button*

Heating Only
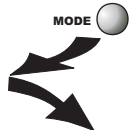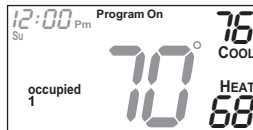The **HEAT** setting indicates the temperature the room has to reach before the furnace will turn on to heat the room.

Cooling Only
The **COOL** setting indicates the temperature the room has to reach before the air conditioner will turn on to cool the room.
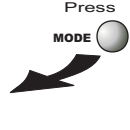
Time Schedule for Heating
The **HEAT Program On** setting will activate the time period program for the heating setpoint ONLY (occupied or unoccupied periods).

Time Schedule for Cooling
The **COOL Program On** setting will activate the time period program for the cooling setpoint ONLY (occupied or unoccupied periods).

Off
OFF indicates both heating and air conditioning systems are turned off.

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Operating Mode when the Thermostat is Configured to be:

PROGRAMMABLE WITH Auto-Changeover - If the thermostat is configured to be a programmable thermostat with Auto-Changeover, the following screens will be available by pressing the MODE button.

Select the 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
Su
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
Su
76
COOL
70°

Press
MODE

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

12:00 Pm
Su
76
COOL
AUTO
70°
HEAT
68

Press
MODE

Time Schedule for Heating or Cooling
***Program On** will activate the time period program for the heating and cooling setpoints. (occupied or unoccupied periods)*

12:00 Pm   Program On
Su
76
COOL
occupied 1
70°
HEAT
68

Press
MODE

Off
***OFF** indicates both heating and air conditioning systems are turned off.*

12:00 Pm
Su
OFF
70°

Press
MODE

Page 4.7

Selecting Your Desired Temperature (adjusting setpoints)

AUTO OR PROGRAM MODE

4

Pressing the UP or DOWN buttons in Auto **or** Program modes will adjust **both** the heat and cool set temperatures simultaneously. For more information on this see page 13.2.

```
 12:00 Pm        76
 Su             ° 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 modes will adjust only the heat **or** cool set temperature.

```
 12:00 Pm        76
 Su             ° COOL
         70
```

Adjust the desired
set temperature with the

buttons.

Note: Due to the Random Start feature (see page 16.4) there will be a 2 to 30 second delay before heating or cooling may be energized. This delay helps to keep multiple thermostats from energizing their outputs at the same time after a power outage.

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SECTION 5
Viewing the Temperature and Humidity Sensors

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5

Section 5 Contents:

Page 5.1

Viewing the Outdoor Temperature

Requires an outdoor sensor (optional accessory) to be installed (*see page 15.2 for wiring instructions)*. To read the temperature from the outdoor sensor, press the PROGRAM and HOLIDAY buttons. The display will then show the current outdoor temperature along with the highest and lowest temperatures for the day.

5
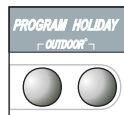
Press the PROGRAM button. While holding PROGRAM, press the HOLIDAY button to view the Outdoor temperature.

The highest and lowest temperatures for the day will be displayed along with the current outdoor temperature.
This reading is from the sensor connected to RS2.

HI
O
92
Outside
83
LO
68

High temperature for the day.

Current outdoor temperature.

Low temperature for the day.

Press the PROGRAM button. While holding PROGRAM, press the HOLIDAY button to leave the Outdoor temperature screen.

PROGRAM HOLIDAY
⌐OUTDOOR²⌐
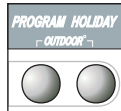
Note: If no sensors are connected 2 dashes [- -] will appear.

Page 5.2

Viewing the Indoor Humidity

Requires the Humidity Module (optional accessory) to be installed. To display the current humidity at the thermostat, press the HUMIDITY button. The display will then show the current indoor humidity along with the humidification setpoint (*Section 9*).

5

Note: The humidity reading will not appear unless the Humidity Module has been installed. If the Humidity Module has not been installed dashes will appear in place of the humidity reading.

HUMIDITY ◯   ***To view the indoor humidity reading, press the HUMIDITY button***

| Current Room Humidity | → 40   Setup   *1* |
| Humidify |
| 0 % |
| rh |

Press

HUMIDITY ◯

Press the HUMIDITY button again to return the display to normal operation.

NOTE: Due to variations in environmental conditions, it is not always possible to achieve the desired humidification or dehumidification setpoint.

Page 5.3

Section 6 Contents:

Programming a Daily Schedule

Press
PROGRAM

Press the PROGRAM button to enter time period programming.

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

Select the maximum # of occupied periods to be used on any one day. Typically most installations use only Occupied 1.
(1,2 or 3)

occupied
1

6
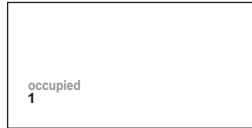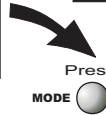
Press
MODE

Adjust the cooling setpoint for Occupied 1.
(35° - 99°, OF)

74
COOL

occupied
1
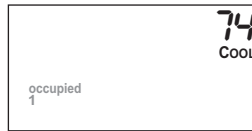
Press
MODE

Adjust the heating setpoint for Occupied 1.
(OF, 35° - 99°)

74
COOL

occupied
1
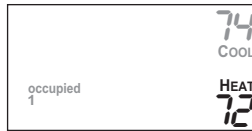
HEAT
72

Press
MODE

Adjust the cooling setpoint for unoccupied periods.
(35° - 99°, OF)

85
COOL

Unoccupied

Press
MODE

Continued

Page 6.2

VENSTAR®

Adjust the heating set-point for Unoccupied periods.

(OF, 35°- 99°)

85
COOL
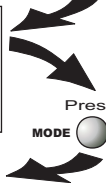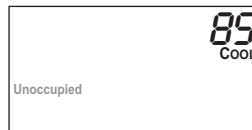
Unoccupied

HEAT
55
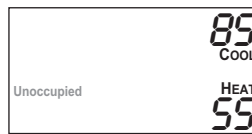
Press
MODE ○

6

Select the day for Occupied 1.

(Mo - Su)
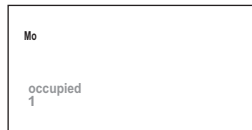
Mo

occupied
1

Press
MODE ○

Adjust the start time for Occupied 1.

7:00 **Am** **Start**
Mo

occupied
1

Press
MODE ○

Adjust the stop time for Occupied 1.

6:00 **Pm** **Stop**
Mo
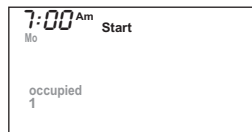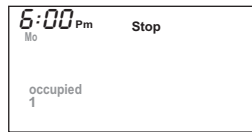
occupied
1

Press
MODE ○

On

Select Occupied 1 to run on this day (On), or not to run on this day (Off).

Off

Mo

ON
occupied
1

Press
MODE ○

Continued

Page 6.3
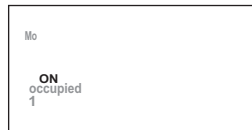
The copy command becomes available after the maximum # of occupied periods are programmed in a day. This example uses only one occupied period.

Yes

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

No

```
no
Tu

COpy
```

If Yes is selected:

If No is selected:

6

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**

Press **MODE**

Select the day for Occupied 1.

(Tu - Mo)

```
Tu


occupied
1
```

Press **MODE**

Adjust the start time for Occupied 1.

```
7:00 Am    Start
Tu


occupied
1
```

Press **MODE**

Adjust the stop time for Occupied 1.

```
6:00 Pm    Stop
Tu


occupied
1
```

Press **MODE**

Continued

Page 6.4

On

Select Occupied 1 to run on this day (On), or not to run on this day (Off).

Off

Tu

ON
occupied
1

6

Yes

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

No If Yes is selected:

NO
We

CO PY

If No is selected:

Press
MODE

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

Press

MODE

If **No** is selected, as in previous steps, flashing prompts will appear to input start and stop times for Occupied 1. If more than one occupied period was selected in the first programming step (*page 6.2*), then the cool and heat setpoints, and start and stop times for each additional occupied period will be prompted.

Press
PROGRAM

After programming for all seven days is complete, press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

PROGRAMMING TIPS

❋ If only the Occupied 1 period is selected in the first programming step (*page 6.2*), Occupied 2 & 3 programming steps are skipped. Further, if Occupied 2 is selected, Occupied 3 programming steps are skipped.

❋ Heat & Cool setpoints for Occupied 1 are the same for every day of the week. If desired, Heat & Cool setpoints for Occupied 2 & 3 can be adjusted differently for each day of the week.

❋ **If the start time is set later in the day than the stop time,** the program will run from the start time to midnight and from midnight to the stop time on the same day. *For example: 9pm start, 8am stop, on Monday. In this example the program will run from 12am Monday to 8am Monday and again from 9pm Monday to 12am Tuesday.*

❋ **Unoccupied Operation:** The unoccupied settings take effect at all times when: (**1**) the program is on **and** (**2**) the current time is outside a preset occupied period. For this reason start and stop times are not necessary for unoccupied time periods.

❋ If the **same** start and stop times are programmed for an occupied period, then it will run 24 hours.

❋ If one occupied period starts and stops within another occupied period the lower occupied # has priority. *For example: If Occupied 3 is programmed to be on 24 hours, and Occupied 2 is programmed to run that day, then the Occupied 2 setting will take over for Occupied 3 between Occupied 2 start and stop times.*

Page 6.5

Overriding the Daily Schedule

The OVERRIDE button may be used to interrupt the normal time schedule programming of the thermostat. Override may only be used when the thermostat is running the time schedule, in Program On mode.

Unoccupied Operation - During programmed, unoccupied periods, pressing the OVERRIDE button will temporarily force the thermostat into Occupied 1 comfort settings for 30 minutes. The remaining Override time will alternate with the clock (refer to the second display below). The Override timer can be set up to a maximum of four (4:00) hours, in increments of 30 minutes. If the timer has been set for the maximum time, the next press of the OVERRIDE button will reset the timer, returning the thermostat to the correct time period program for the day.

Occupied Operation - During programmed, occupied periods, a press of the OVERRIDE button will force the thermostat into an unoccupied period for the remainder of the day. During this forced unoccupied period the OVERRIDE button will operate as described above.

Page 6.6
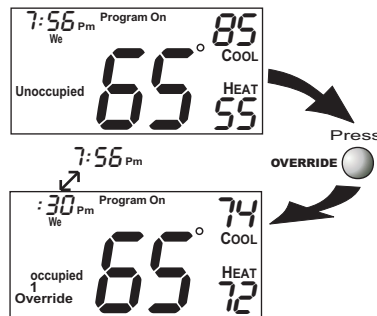
SECTION 7
Programming the Fan Operation

VENSTAR®

Section 7 Contents:

Page 7.1

Using the Fan Button

When the fan is set for automatic operation it will energize any time there is a call for heating or cooling, otherwise the fan will remain off. Pressing the FAN button will energize the fan and display the **FanOn** icon on the thermostat display. To operate the fan in the automatic mode, press the FAN button again and the FanOn icon will disappear.
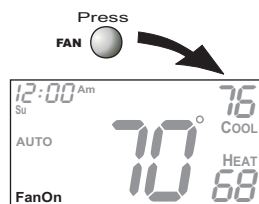
Press

FAN

```
12:00 Am              76
Su                    COOL

AUTO        70°
                      HEAT
FanOn                 68
```

Fan On indicates constant fan operation. If Fan On is selected the fan will run continuously at all times, except in Off, **and** will only run if there is a heating or cooling demand in Unoccupied periods. Pressing the FAN button toggles this feature on or off.

Smart Fan Operation

This feature allows the fan to run continuously during Occupied 1, 2 or 3 and automatically de-energize during Unoccupied, except when necessary to heat or cool. To use this feature, place the thermostat in the Program On mode. Next, press the FAN button to display the **FanOn** icon (*see below*).

Press

FAN

```
12:00 Am              76
Su                    COOL

occupied    70°
1                     HEAT
FanOn                 68
```

Page 7.2

Setting the Fan-Off Time Delay

To increase the cooling efficiency of your unit, the thermostat may be programmed to continue running the fan after a call for cooling has been satisfied. This delay may be set for 30, 60, or 90 seconds. If the Fan Off Delay is set for zero seconds, the fan will not energize after a call for cooling has been satisfied.

7

MODE
PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Set the Fan Off Delay to 0, 30, 60, or 90 seconds.

:00   Setup   3

FanOn

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 7.3

VENSTAR®

Fan Purge Operation

When this feature is activated, the fan will turn on during an unoccupied period at a preset amount of time prior to Occupied 1. This preoccupancy fan purge timer may be set from zero to three hours, in 15 minute increments. Zero means this feature is turned off.

7

MODE **PROGRAM** *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

MODE *Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Adjust the preoccupancy fan purge timer.
0 - 3 hours.
0:00 = off

`0:00` Setup `4`

`PU`

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

SECTION 8
Thermostat Display Options   **VENSTAR**®

Section 8 Contents:

8

Page 8.1

Turning On/Off the Backlight

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.
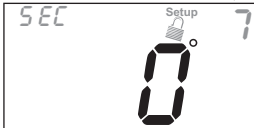
8

Select backlight operation:
AUTO - Light from 6pm to 6am nightly.
ON - Light continuously.
OFF - Light for 8 seconds after a button press.

Setup   5

AUTO   L1

Press

MODE
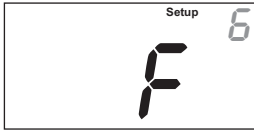
Programming the Thermostat to Display Temperature in Fahrenheit or Celsius

C

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

F

Setup   6

F

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 8.2

Locking/Unlocking the Keypad

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 🔒 icon will appear on the display, then release the buttons.

8

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

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

Page 8.3

VENSTAR®

Programming a Security Level

When a security level has been programmed, the thermostat will allow limited adjustment to the setpoints (*steps #8 and #9*). In security levels 2 and 3, the thermostat is forced into the Program On mode. To disable the security feature, set the value in step #7 to 0; this will cause steps #8 and #9 not to appear.

MODE
HUMIDITY

Press the MODE button. While holding the MODE, press the HUMIDITY button to enter Setup screens.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move back-wards through the setup screens.

8

MODE ***Press the MODE button repeatedly until this setup screen appears.***

Select the security level:
0=No security in effect
1=Setpoint range limited
2=1+ locked in current mode.
3=2 + prohibits setpoint changes

SEC   Setup   7
0

Press

MODE

Step #7 appears only if step #6 is not 0.

Adjust the maximum allowable heat setpoint when security is in effect.
(35°- 99°)

Setup Hi 8
80 HEAT

Press

MODE

Step #8 appears only if step #6 is not 0.

Adjust the minimum allowable cool setpoint when security is in effect.
(35°- 99°)

Setup 9
65 COOL
Lo

Press

HUMIDITY

Press the HUMIDITY button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 8.4

Section 9 Contents:

9

NOTE: The humidification functions described in this section will only be available if a Humidity Module has been properly installed.

Disclaimer:
The manufacturer of this thermostat cannot be liable for misinstallation, improper connection or improper programming of the humidity functions of this thermostat that may result in water damage or mold growth.

Additionally, the manufacturer of this thermostat is not responsible for the fitness of the humidifier and/or installation of said humidifier connected to this thermostat. Furthermore, the maintenance of the humidifier components, including but not limited to, the filters and pads are not the responsibility of the thermostat manufacturer.

The Humidifier Service icon is only a suggestive reminder and should not take the place of the humidifier manufacturer's required maintenance requirements and schedule.

VENSTAR®

Installing the Humidity Module

To install the Humidity Module the thermostat must be detached from the back plate. Plug the Humidity Module into the Humidity Module connector as shown in Figure 2 below. Follow the detailed instructions included with the Humidity Module accessory. Once the Humidity Module has been installed, you must adjust the Humidity jumper setting to HUM as shown in Figure 1 below. This will allow you to access the humidification and dehumidification setup steps.

For proper humidity operation, this jumper must be set for HUM.

Back of T2900

Figure 1

9

HUM

OR

NO HUM

Install the Humidity Module
(see Humidity Module Instruction Sheet for more detailed information).

Figure 2

Humidity Module

Humidity Module Plug located on the Thermostat Circuit Board.

Thermostat Circuit Board.

Page 9.2

VENSTAR®

Setting a Thermostat Jumper for Humidity Operation

To control a MISC output for humidification, place the MISC1, MISC2, or MISC3 jumper on the terminal labeled HUM (*see diagram below*). This will supply 24VAC to the selected MISC terminal based on the humidification programming in the following pages. Only one of the three outputs (MISC1, MISC2, or MISC3) is required to have this jumper. *For more information regarding the MISC1, MISC2, and MISC3 outputs, please see section 21.*

9 *In the diagram below, the MISC3 jumper has been set for HUM (humidify) operation.*
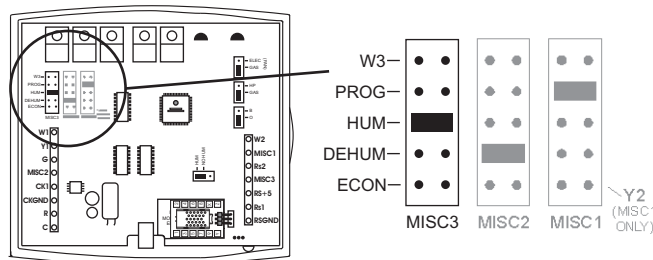
W3 —
PROG —
HUM —
DEHUM —
ECON —

MISC3   MISC2   MISC1

Y2
(MISC1 ONLY)

IMPORTANT CAUTION ⚠

MISC3
OK

MISC3

NEVER PUT MORE THAN ONE JUMPER ON THE SAME MISC JUMPER BLOCK!

THIS MAY DAMAGE THE THERMOSTAT AND VOID YOUR WARRANTY

Page 9.3

Adjusting the Humidification Setpoint

If your HVAC unit is equipped with a humidification system and the Humidity Module has been installed, the thermostat will provide power to the appropriate terminal on the backplate of the thermostat when the humidity in the home falls below the setpoint you have chosen. The value for this setpoint ranges from 0% to 60%.

NOTE: Due to variations in environmental conditions, it is not always possible to achieve the desired humidification or dehumidification setpoint.

HUMIDITY   ○   ***Press the HUMIDITY button to enter the Humidity Setup screen.***

NOTE: *Each step # is located at the top right corner of the display for easy reference.*   **9**

| Current Room Humidity |

Adjust the desired humidification setpoint

(0%-60%)

40   Setup   *I*
        Humidify   %
        0
        rh

Press

HUMIDITY   ○

Press the HUMIDITY button to leave the Humidity Control screens (if no buttons are pressed, the display will leave the Humidity Control screens after 30 seconds).
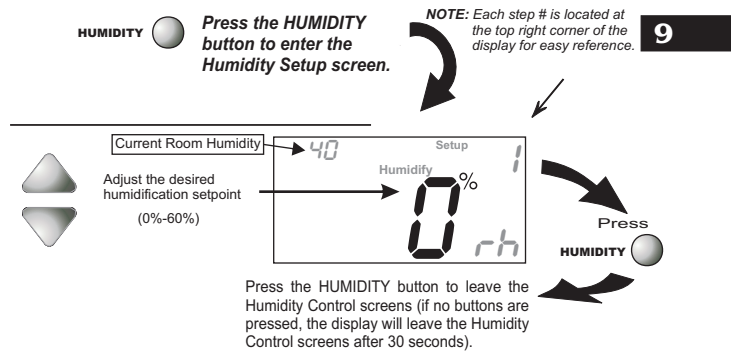
Humidification Notes: *Press the* ▽ *button to set the humidity setpoint to 0% for no humidification operation.*

You cannot set the dehumidify setpoint any lower than the humidify setpoint; a 5% differential is forced between the humidify and dehumidify setpoints.

Page 9.4

SECTION 10
Dehumidification

VENSTAR®

Section 10 Contents:

NOTE: The dehumidification functions described in this section will only be available if a Humidity Module has been properly installed. For instructions on installing the Humidity Module please see page 9.2.

Setting a Thermostat Jumper for Dehumidification Operation

To control a MISC output for dehumidification, install the Humidity Module and place the Humidity Jumper on HUM (*see page 9.2*). Then place the MISC1, MISC2, or MISC3 jumper on the terminal labeled DEHUM (*see diagram below*). This will supply 24VAC to the selected MISC terminal based on the dehumidification programming in the following pages. Only one of the three outputs (MISC1, MISC2, or MISC3) is required to have a jumper. *For more information regarding the MISC1, MISC2, and MISC3 outputs, please see section 21.*

In the diagram below, the MISC2 jumper has been set for DEHUM (dehumidification) operation.

10
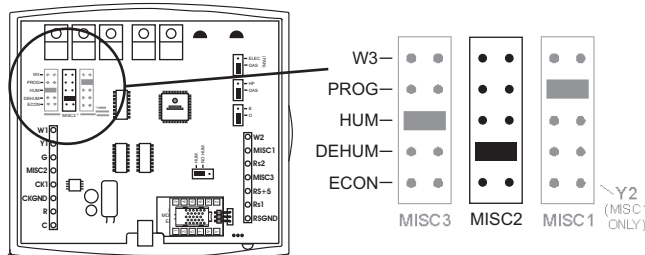
	W3—
	PROG—
	HUM—
	DEHUM—
	ECON—

MISC3   MISC2   MISC1

Y2
(MISC1 ONLY)

IMPORTANT CAUTION ⚠

MISC3
OK

MISC3

NEVER PUT MORE THAN ONE JUMPER ON THE SAME MISC JUMPER BLOCK!

THIS MAY DAMAGE THE THERMOSTAT AND VOID YOUR WARRANTY

Page 10.2

Adjusting the Dehumidification Setpoint

Dehum Terminal: If a MISC terminal selected for DEHUM operation (*see page 10.2)* then the thermostat will provide power to this terminal the when the humidity in the home is above the setpoint you have chosen. See page 10.6 for detailed programming instructions.

Cool to Dehumidify: If the thermostat is programmed for Cool to Dehumidify operation, then the thermostat will energize the cooling system any time the humidity in the home is above the setpoint you have chosen. The thermostat may also be programmed for Reheat operation if available. See pages 10.4 and 10.5 for detailed programming instructions.
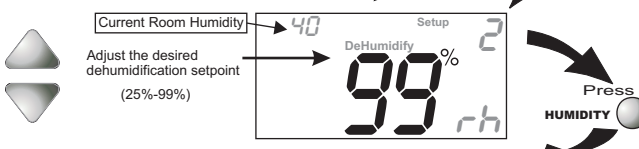
In each case, when the indoor humidity falls below the setpoint you have selected, Cool to Dehumidify and the MISC terminal will be de-energized. The value for this setpoint ranges from 25% to 99%.

10 NOTE: Due to variations in environmental conditions, it is not always possible to achieve the desired humidification or dehumidification setpoint.

HUMIDITY **Press the HUMIDITY button to enter the Humidification Setup screens.**

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

MODE **Press the MODE button once.**

Current Room Humidity → `40`   Setup   `2`

Adjust the desired dehumidification setpoint

(25%-99%)

DeHumidify

`99` % `rh`

Press

HUMIDITY

Press the HUMIDITY button to leave the Humidity Control screens (if no buttons are pressed, the display will leave the Humidity Control screens after 30 seconds).

Dehumidification Notes: *Press the* ⬆ *button to set the dehumidification setpoint to 99% for no dehumidification operation. This will lockout Advanced Setup steps 10, 11, and 12 (see pages 10.4 - 10.5).*

You cannot set the dehumidify setpoint any lower than the humidify setpoint; a 5% differential is forced between the humidify and dehumidify setpoints.

Page 10.3

VENSTAR®

Using Your Air Conditioner to Dehumidify

If Cool to Dehumidify is on and the Humidity Module is installed, the thermostat has the ability to initiate a cooling cycle for advanced dehumidification operation. When the thermostat detects the humidity percentage is above the setpoint for dehumidification, and heating or cooling is not on, the thermostat will force the compressor to run with the fan, thus reducing moisture in the air. The green LED will blink once every eight seconds to indicate this is taking place. This feature will also allow you to adjust the cooling overshoot of the setpoint, from 0° to 5° (adjustable in step #11). *For Example: If the cooling overshoot is set for 3°F and the cooling setpoint is set for 74°F, then as long as the room temperature reads between 71°F and 74°F this feature will energize the compressor and fan to dehumidify the air.*

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

10

Steps 10 and 11 only appear if the Dehumidification setpoint is not 99% (see page 10.3).

On

Off

Select Cool to Dehumidify feature.

AC   Setup   10
        DeHumidify

OFF
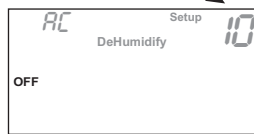
Press

MODE

Step 11 appears only if step 10 is set to "ON"

Adjust the maximum overshoot of the set temperature in Cool to Dehumidify mode.

(0°- 5°)
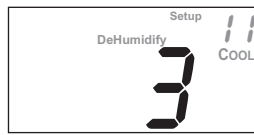
        Setup   11
DeHumidify   COOL

3

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Dehumidification Notes: The thermostat must be in the Cool, Auto, or Program On mode for the Cool to Dehumidify feature to be available.

Page 10.4

Using the Reheat Function

This feature allows the thermostat to turn on Electric Heating (W2) during Cool to Dehumidify to maintain room temperature until the dehumidification setpoint is reached. The cooling cycle will allow for the dehumidification of the air to occur while the Electric Heating will allow for a constant room temperature. If Reheat is enabled the Aux icon will appear on the display during Cool to Dehumidify operation.

MODE *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

PROGRAM

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

10 MODE *Press the MODE button repeatedly until this setup screen appears.*

Step 12 appears only if step 10 is set to "ON" and if the Dehumidification setpoint is not 99% (see page 10.3).

On

If Reheat operation is desired during the dehumidification process select On; otherwise select Off.

Off

| Setup |
| DeHumidify *12* |
| OFF *rE* HEAT |

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

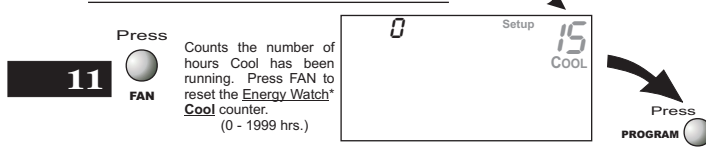**Dehumidification Notes:** *Reheat is only available if Cool to Dehumidify has been set to ON in step #10 (see page 10.4).*

Page 10.5

VENSTAR®

Using the Dehum Terminal

If you configure a MISC output jumper for DEHUM, it may be programmed to operate in one of two ways:

1) **Normally Closed** (NC): The thermostat will de-energize the DEHUM terminal to allow the fan to run in low speed when there is a call for 1st stage cooling and the room humidity is greater than the dehumidification setpoint.

2) **Normally Open** (NO): The thermostat will energize the DEHUM terminal to allow the fan to run in low speed when there is a call for 1st stage cooling only and the room humidity is greater than the dehumidification setpoint.

10

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

NC Normally Closed (NC) = DEHUM deenergized for low speed fan.

Normally Open (NO) = DEHUM energized for *NO* low speed fan.

Setup

DeHumidify *13*

NC

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Dehumidification Notes: The DEHUM terminal will "release" and allow the fan to operate normally if there is call for 2nd stage cooling or if the call for Cooling and/or Dehumidification has been satisfied.

Page 10.6

SECTION 11
Viewing Equipment Run-Times

VENSTAR®

Section 11 Contents:

11

VENSTAR®

Viewing the Heat Run-Time - Energy Watch

This display will track the number of hours that your heating system has been operating. Press the FAN button to reset the counter.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Press

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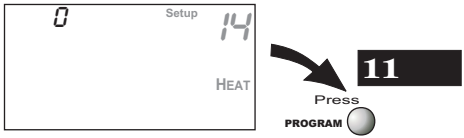
Counts the number of hours Heat has been running. Press FAN to reset the <u>Energy Watch</u>* <u>Heat</u> counter.
(0 - 1999 hrs.)

0   Setup   *14*

HEAT

11

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

* ***Energy Watch:*** *This feature enables you to closely monitor your energy usage by keeping track of the number of hours your heating system has been operating.*

Page 11.2

Viewing the Cool Run-Time - Energy Watch

This display will track the number of hours that your cooling system has been operating. Press the FAN button to reset the counter.
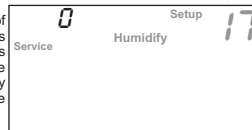
MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

11

Press

FAN

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

0   Setup   *15*
                       COOL

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

* *Energy Watch:* *This feature enables you to closely monitor your energy usage by keeping track of the number of hours your cooling system has been operating.*

Page 11.3

Viewing the Override Operation Run-Time

This display will track the number of hours that your thermostat has been operating in the Override mode (*see page 6.6*). Press the FAN button to reset the counter.

MODE

HUMIDITY

Press the MODE button. While holding the MODE, press the HUMIDITY button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Press

FAN

Counts the number of hours Override has been active. Press FAN to reset the Override Run-Time counter.

0   Setup   *16*

Override

11

Press

HUMIDITY

Press the HUMIDITY button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 11.4

Viewing the Humidification Run-Time

After your humidification system has been operating for the number of days set in step #17 below, the Service Humidify icon will appear. This counter keeps track of the number of days since the Service Humidify icon was reset.

MODE
PROGRAM
Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

MODE
Press the MODE button repeatedly until this setup screen appears.

11 Press   Counts the number of days the humidifier has been running. Press FAN to reset the Service Humidify counter and remove the icon from the display.

FAN

0   Setup   *17*
Service   Humidify

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 11.5

VENSTAR®

Viewing the UV Light Run-Time

After the UV light has been operating for the number of days set in step #18 below, the Service UV Light icon will appear. This counter keeps track of the number of days since the UV light icon was last reset.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

11

Press

FAN

Counts the number of days since the UV Light was last reset. Press FAN to reset the Service UV Light counter and remove the icon from the display.

0   Setup   *18*

Service
UV Light

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 11.6

SECTION 12
Electric Heat and Heat Pump Operation

VENSTAR®

Section 12 Contents:

12

Viewing the Heat Pump and Reversing Valve Jumper Settings

Steps 19 and 20 are 'Read Only' and may only be set with the jumpers on the circuit board of the thermostat (*see page 5.4 of the Installation Instructions*).

MODE
PROGRAM — *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

MODE — *Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

ON = Heat Pump operation
OFF = Gas Electric operation

Setup *19*
OFF *HP*

12

Indicates that the thermostat jumper is set for an **O** reversing valve (energize in cooling) or a **b** reversing valve (energize in heating).

Setup *20*
O

Press
MODE

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Viewing the Electric Heat Jumper Setting

Placing the jumper on ELEC 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.

Step 21 is 'Read Only' and may only be set with the jumpers on the circuit board of the thermostat (*see page 5.3 of the Installation Instructions*).

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

12

ON indicates that the thermostat jumper is set for Electric Heat operation, or **OFF** for Gas/Electric or Heat Pump operation.

Setup

21

OFF

EH

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 12.3

Using Emergency Heat

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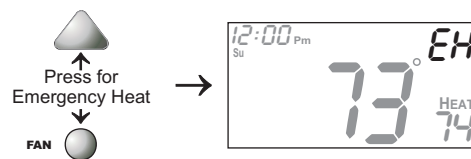
OPERATION: During Emergency Heat operation the thermostat will turn on the fan and the 2nd stage of heat when there is a demand for heat. Also during Emergency Heat the 1st stage of heating or cooling will be unavailable.

12

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.

Page 12.4

SECTION 13
Timers and Deadbands   **VENSTAR®**

Section 13 Contents:

VENSTAR®

Adjusting the Heat/Cool Differential

The Heat and Cool setpoints will not be allowed to come any closer to each other than the value in this step. This minimum difference is enforced during Auto-Changeover operation.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

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

(0° - 6°)

d IF   Setup 22
        COOL
    2   HEAT
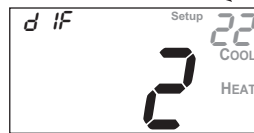
Press

PROGRAM **13**

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Note: To increase the spread between the heating and cooling setpoints, press the MODE button until only the heat setpoint is displayed. Adjust the desired setpoint. Wait two seconds after adjusting the set point so the thermostat can accept the change. Press the MODE button until only the cool setpoint is displayed. Adjust the desired setpoint. Wait two seconds after adjusting the set point so the thermostat can accept the change. Press the MODE button again to enter the Auto-Changeover mode where both the heat and cool setpoints are displayed.

Page 13.2

Adjusting the Cycles Per Hour

The Cycles Per Hour setting may limit the number of times per hour your HVAC unit may energize. For example, at a setting of 6 cycles per hour the HVAC unit will only be allowed to energize once every 10 minutes. The Cycles Per Hour limit may be overridden and reset by pressing the UP or DOWN buttons on the thermostat.

MODE ◯ PROGRAM ◯ *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

MODE ◯ *Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

13

△ ▽ Select the cycles per hour limit.
d=cycles per hour limit defeated.
d1=d + defeat 5 min. compressor lockout.
(d1, d, 2 - 6)

Setup 23
6 cy

Press
PROGRAM ◯

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 13.3

Adjusting the Deadband

MULTI-STAGE OPERATION - Controls up to three Heat and two Cool stages.
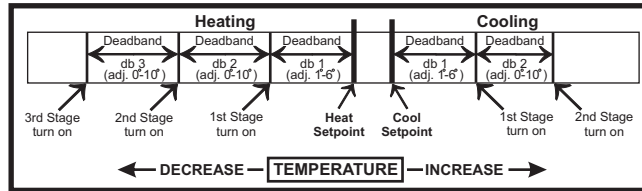
The **2nd Stage** of heat or cool is turned on when:
(**A**) The 1st Stage has been on for the time required (*step #27, page 13.6*). It is adjustable from 0-60 minutes and the default is two minutes.
And
(**B**) The temperature spread from the setpoint is equal to or greater than: *the setpoint plus the 1st stage deadband (step #24, next page), plus the 2nd stage deadband (step #25, next page).* This 2nd stage deadband is adjustable from 0-10 degrees and the default is two degrees.

The **3rd Stage** of Heat is turned on when:
(**A**) The 2nd stage has been on for the time required (*step #28, page 13.6*). It is adjustable from 0-60 minutes and the default is two minutes.
And
(**B**) The temperature from the setpoint is equal to or greater than: *the setpoint plus the 1st stage deadband (step #24, next page), plus the 2nd stage deadband (step #25, next page) plus the 3rd stage deadband (step #26, next page).* This 3rd stage deadband is adjustable from 0-10 degrees and the default is two degrees.

13

Heating				Cooling		
Deadband	Deadband	Deadband		Deadband	Deadband	
db 3 (adj. 0-10°)	db 2 (adj. 0-10°)	db 1 (adj. 1-6°)		db 1 (adj. 1-6°)	db 2 (adj. 0-10°)	
3rd Stage turn on	2nd Stage turn on	1st Stage turn on	**Heat Setpoint**	**Cool Setpoint**	1st Stage turn on	2nd Stage turn on

← DECREASE — TEMPERATURE — INCREASE →

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.

Page 13.4

Adjusting the Deadband

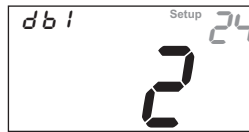For more detailed information, please see the explanation on the previous page.

MODE
PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

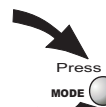*Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

13

Adjust the deadband for the 1st stage.

$(1° - 6°)$

d b 1   Setup 24

2

Press
MODE

Adjust the deadband for the 2nd stage.

$(0° - 10°)$

d b2   Setup 25

2

Press
MODE

Adjust the deadband for the 3rd stage.

$(0° - 10°)$
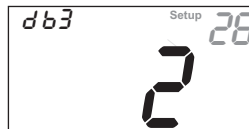
d b3   Setup 26

2

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 13.5

VENSTAR®

## *Adjusting the Minutes of Run-Time Before the Next Stage*

For more detailed information, please see the explanation on page 13.4.

MODE
PROGRAM
Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE
***Press the MODE button repeatedly until this setup screen appears.***

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Adjust the amount of time stage 1 must be on before stage 2 turns on.
(0 - 60 min.)

`0:02`   Setup `27`
`2` `nd`
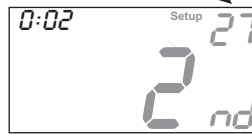
Press
MODE

Adjust the amount of time stage 2 must be on before stage 3 turns on.
(0 - 60 min.)
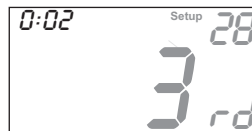
`0:02`   Setup `28`
`3` `rd`

13

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Selecting 2nd Stage Turn Off Temperature

If ON is selected, the second stage of cooling or heating will remain energized until the thermostat reaches the setpoint on the thermostat display.

If OFF is selected, the second stage of cooling or heating will turn off after reaching the 1st stage deadband (*see page 13.4 for more information).*

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

13

On

Select On or Off:
On - 2nd stage will remain on until setpoint is reached.
Off - 2nd stage will turn off after reaching 1st stage deadband.

Off

Setup   *29*

OFF   *2*

nd

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 13.7

SECTION 14
Using the Programmable Output

VENSTAR®

Section 14 Contents:

14

Page 14.1

VENSTAR®

## *Setting a Thermostat Jumper for Programmable Output Operation*

To control one of the MISC outputs using time, temperature, or phone based operation, place the MISC1, or MISC2, or MISC3 MISC3 jumper on the terminal labeled PROG (*see diagram below*). This extra output will supply 24VAC to the selected MISC terminal based on the programming described in the following pages. Only one of the three outputs (MISC1, MISC2, or MISC3) is required to have this jumper. *For more information regarding the MISC1, MISC2, and MISC3 outputs, please see section 21.*

In the diagram below, the MISC1 jumper has been set for PROG operation.
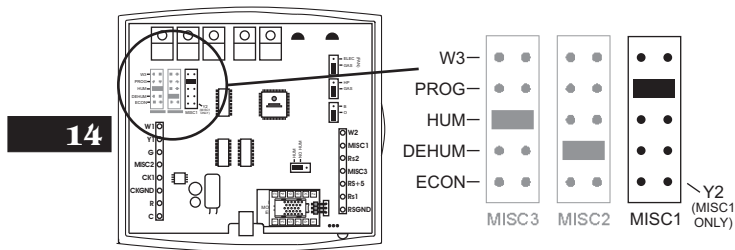
14

W3—
PROG—
HUM—
DEHUM—
ECON—

MISC3   MISC2   MISC1

Y2
(MISC1 ONLY)

IMPORTANT CAUTION ⚠

MISC3
OK

MISC3

NEVER PUT MORE THAN ONE JUMPER ON THE SAME MISC JUMPER BLOCK!

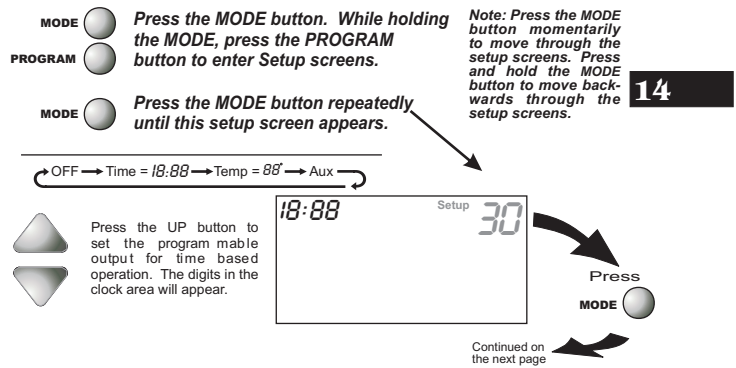*THIS MAY DAMAGE THE THERMOSTAT AND VOID YOUR WARRANTY*

Page 14.2
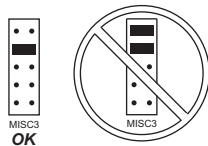
Time-Based Control of the Programmable Output

To operate one of the MISC outputs using time-based operation, set Advanced Setup step #30 (*below*) for Time *18:88*. This extra output will supply 24VAC to the selected MISC terminal, which is especially useful for devices that require a start and stop time. Refer to page 14.4 - 14.5 for more details on programming this output.

Possible **TIME** scenarios:

1) An exterior lighting system that needs to be energized every day between the hours of 8pm and 1am.

2) A sprinkler system that needs to be energized every day between the hours of 2am and 4am.

MODE *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

PROGRAM

MODE *Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

14

OFF → Time = *18:88* → Temp = *88°* → Aux

18:88 Setup *30*

Press the UP button to set the program mable output for time based operation. The digits in the clock area will appear.

Press

MODE

VENSTAR®

NC Programmable Output Polarity:
NC = Normally Closed to turn off
between the start and stop times
in steps 34 and 35.
NO = Normally Open to operate
between the start and stop times
NO in steps 34 and 35.

Setup *31*

no

Press

MODE

7-Day
Select 7-Day or 1-Day
Programming:
7-Day = Different program
for each day.
1-Day = Same program
1-Day every day.
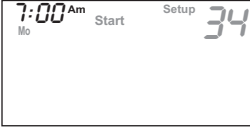
Setup *32*

Day **7**

Press

MODE

*If Step 32 is set for **1-Day**, then Day of the Week and Copy functions do not appear or apply.*
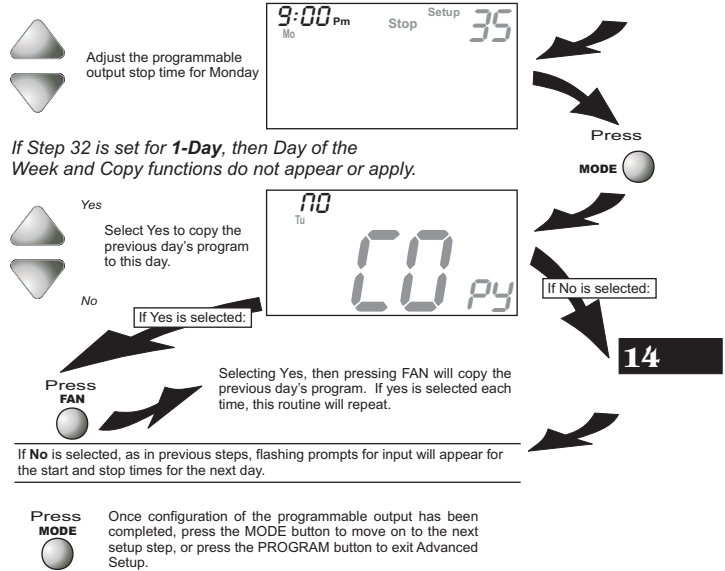
14

Select the day of
the week

Mo   Setup *33*

Press

MODE

Adjust   the   program-
mable output start time
for Monday.

(24 Hours)

7:00 Am   Start   Setup *34*
Mo

Press

MODE

Continued on
the next page

Page 14.4

Time-Based Control of the Programmable Output

$9{:}00$ Pm
Mo   Stop   Setup 35

Adjust the programmable output stop time for Monday

Press

MODE

*If Step 32 is set for **1-Day**, then Day of the Week and Copy functions do not appear or apply.*

Yes

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

no
Tu

CO py

No

If Yes is selected:

If No is selected:

14

Press
FAN

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

If **No** is selected, as in previous steps, flashing prompts for input will appear for the start and stop times for the next day.

Press
MODE

Once configuration of the programmable output has been completed, press the MODE button to move on to the next setup step, or press the PROGRAM button to exit Advanced Setup.

Temperature-Based Control of the Programmable Output

To operate a MISC output using temperature-based operation, program advanced setup step #30 (*below*) for temperature $88°$. This extra output will supply 24VAC to the selected MISC terminal based on the temperature of RS1 and the setpoint in step #36 (*below*).
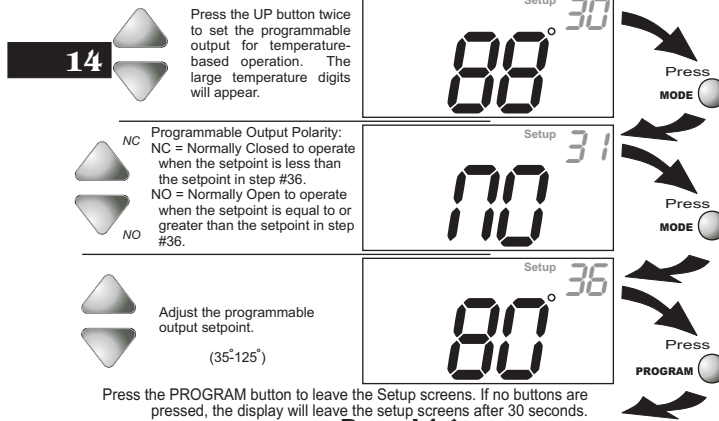
Possible **TEMPERATURE** scenario:
1) An exhaust fan in the attic of a store that needs to be energized when the attic temperature is above 85 degrees.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

OFF → Time = $18:88$ → Temp = $88°$ → Aux

Press the UP button twice to set the programmable output for temperature-based operation. The large temperature digits will appear.

Setup 30

$88°$

Press

MODE

Programmable Output Polarity:
NC = Normally Closed to operate when the setpoint is less than the setpoint in step #36.
NO = Normally Open to operate when the setpoint is equal to or greater than the setpoint in step #36.

NC

NO

Setup 31

no

Press

MODE

Adjust the programmable output setpoint.

$(35°-125°)$

Setup 36

$80°$

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.
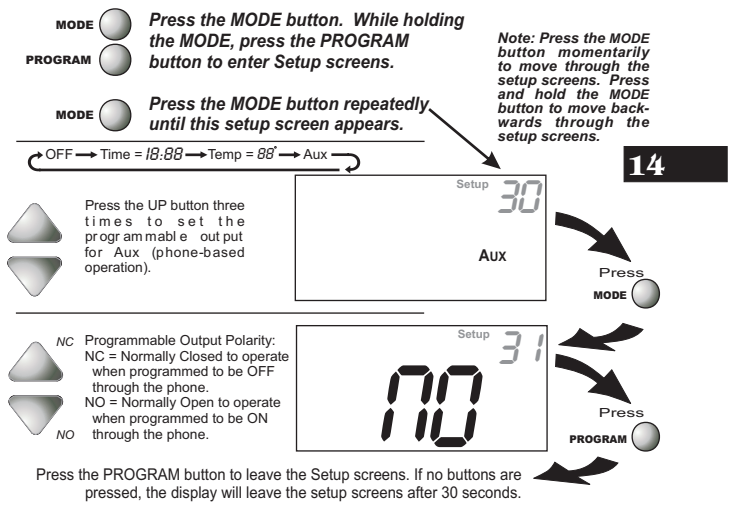
14

Phone Control of the Programmable Output

To operate a MISC output using phone-based operation, program advanced setup step #30 for Aux (*below*). This terminal is especially useful for devices that can be energized via the phone.

Possible **AUX** scenarios:

1) Arm the alarm system in your home after you have left for the day.
2) Turn on your spa before arriving home.
3) Turn on your interior lights while you're away.

MODE
PROGRAM
Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE
Press the MODE button repeatedly, until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

OFF → Time = *18:88* → Temp = *88°* → Aux

14

Press the UP button three times to set the programmable output for Aux (phone-based operation).

Setup *30*

AUX

Press
MODE

NC Programmable Output Polarity:
NC = Normally Closed to operate when programmed to be OFF through the phone.
NO = Normally Open to operate when programmed to be ON
NO through the phone.

Setup *31*

no

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 14.7

SECTION 15
Programming Remote Sensor Operation

VENSTAR®

Section 15 Contents:

15

Page 15.1

Installing the Remote Sensors

The Remote Sensor measures indoor air temperature and sends this information to the thermostat; it measures temperature with a range of 32° to 99°F.

The Remote Sensor is equipped with an OVERRIDE button which will place the thermostat into the override mode for up to four hours (*see page 6.6*).

The Remote 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 Remote 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 not use shielded wire. Do not run sensor wiring in the same conduit as the 24VAC thermostat wiring. Electrical interference may cause the sensor to give incorrect temperature readings.

15

With the T2900 thermostat, you can connect up to eight wired remote sensors. Each of these sensors must be wired in a linear or daisy chain fashion; do not use stub connections or form a star Network. The thermostat must be wired to the first remote sensor, which is then wired to the second remote sensor, which is then wired to the third remote sensor, and so on.

See the Remote Sensor instructions for further details.

Controlling or Reading the Remote Temperature (RS1)

The thermostat may be programmed to only READ the remote sensor or CONTROL to the remote sensor. Refer to advanced setup step #37 below.

Read Only Sensor (RS1): If step #37 is set to only READ to the remote sensor, the thermostat will not use this sensor for temperature control. This sensor may be viewed by pressing the OUTDOOR° button on the thermostat and then pressing the MODE button.

Control Sensor (RS1): If step #37 is set to CONTROL to the remote sensor, the thermostat will ignore the reading of its internal temperature sensor and only display the temperature reading from the remote sensor. The degree icon on the thermostat will blink once per second to indicate that a remote sensor reading is being displayed.

MODE — *Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.*

15

PROGRAM

MODE — *Press the MODE button repeatedly until this setup screen appears.*

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

YES

Optional Remote Sensor:
YES = Control to Remote Sensor RS1.
NO = Read only Remote Sensor RS1.

NO

YES   Setup 37   Remote

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 15.3

Averaging the Remote Sensor (RS1) with the Thermostat Sensor

If step #37 is set to control to the remote sensor, the thermostat will ignore the reading of its internal temperature sensor and only display the temperature reading from the remote sensor. The degree icon on the thermostat will blink once per second to indicate that a remote sensor reading is being displayed.

If step #38 is set to ON (*see below*), the thermostat will average its internal sensor with the wired temperature sensor connected to RS1. The temperature displayed will be the average of the thermostat's internal sensor and the remote (RS1) sensor.

MODE ⬤   ***Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.***

PROGRAM ⬤

MODE ⬤   ***Press the MODE button repeatedly until this setup screen appears.***

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

15

On ▲   Optional Remote Sensor Operation:
ON = Averages thermostat sensor with Remote Sensor 1.
OFF = Does not average thermostat sensor with Remote Sensor 1.

Off ▽

Setup *38*

OFF   Remote

Press

PROGRAM ⬤

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 15.4

Section 16 Contents:

16

Dry Contact Operation

If the dry contact is going to be used, select YES in step #39. If the dry contact is not going to be used, select NO in step #39 below.

DRY CONTACT POLARITY - The terminals may be set to be Normally Open (NO) or Normally Closed (NC) in step #40. If NO is selected the dry contact will operate when it is forced closed. If NC is selected, the dry contact will operate until it is forced open.

MODE
PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

YES

Set to YES if the dry contact will be used. Set to NO if the dry contact will not be used.

NO

no   Setup   *39*

dc

Press
MODE

Step 40 appears only if step 39 is "YES".

16

NC

Dry Contact Polarity: Normally Closed (NC). Normally Open (NO)

NO

Setup   *40*

no *dc*

Press
PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 16.2

Dry Contact Programming

OCCUPIED 1 OR SERVICE THE CONDENSATE DRAIN PAN - If Occupied 1 is selected in step #41 (*below*), when the dry contact is energized the thermostat will be forced into Occupied 1 setpoints and the Occupied 1 icon will blink (Section *6*). The thermostat must be in Program On mode for this feature to have any effect. If Service Pan is selected, when the dry contact is energized the thermostat will lockout Y1 (compressor) and write Service Pan on the display.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.
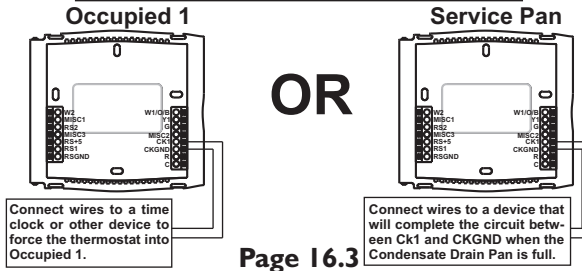
Step 41 appears only if step 39 is "YES".
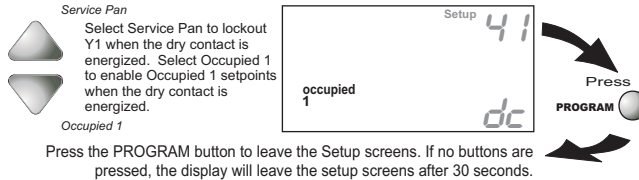
Service Pan

Select Service Pan to lockout Y1 when the dry contact is energized. Select Occupied 1 to enable Occupied 1 setpoints when the dry contact is energized.

Occupied 1

Setup **41**

occupied 1

dc

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

16

NOTE: *If Service Pan is selected and the dry contact was closed at least once, the Service Pan icon will remain on the display to alert the user that a problem has occurred. This icon will be cleared once a button is pressed.*

Occupied 1

Service Pan

OR

Connect wires to a time clock or other device to force the thermostat into Occupied 1.

Connect wires to a device that will complete the circuit between Ck1 and CKGND when the Condensate Drain Pan is full.

Page 16.3

Random Start Operation

This feature allows a 2 to 30 second delay before energizing the thermostat outputs after any of these events:

Loss of Power to the thermostat: When power to the thermostat is interrupted and then restored, Random Start will lockout the outputs of the thermostat for a random amount of time. This delay helps to keep multiple thermostats from energizing their outputs at the same time after a power outage.

Changing from an Unoccupied time period to an Occupied time period: If the thermostat is running in the Program On mode and the start time for an Occupied period forces the thermostat from Unoccupied to Occupied 1, Random Start will lockout all outputs of the thermostat for a random amount of time. This delay helps to keep multiple thermostats from energizing their outputs at the same time each day.

Closure of the Dry Contact to force Occupied 1 time period: If step #41 (*previous page*) is programmed for Occupied 1, then Random Start will lockout all outputs of the thermostat for a random amount of time when a Dry Contact closure occurs (*depending on step #40*). This delay helps to keep multiple thermostats from energizing their outputs each time the Dry Contact is used.

16

Sensing of a light source by the Light Sensor to force Occupied 1 time period: If step #42 (*page 17.2*) is programmed YES for Light Activated operation, Random Start will lockout the outputs of the thermostat for a random amount of time when a light source forces the thermostat into Occupied 1. This delay helps to keep multiple thermostats from energizing their outputs each time the lights are turned on.

SECTION 17
Light Activated Operation　　**VENSTAR®**

Section 17 Contents:

17

Setting up the Thermostat for Light Activated Operation

A light sensor is provided on the thermostat for light activation. If the thermostat is set up to be light activated, the thermostat will enter Occupied 1 and blink the Occupied 1 icon when a light source is detected. When the thermostat is set up to be light activated, the time period programming for each day should be set to OFF (*Section 6*). The thermostat must be in Program On mode for light activation to have any effect. Page 17.3 explains how to adjust the light sensitivity for this type of operation.

NOTE: Light activation does not work in Holiday mode (Section 21).

MODE **Press the MODE button. While holding**
the MODE, press the PROGRAM
PROGRAM **button to enter Setup screens.**

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

MODE **Press the MODE button repeatedly**
until this setup screen appears.

YES Select YES if the thermostat should be Light Activated. Select NO to allow only Time Period Programming (*Section 6*). *NO*
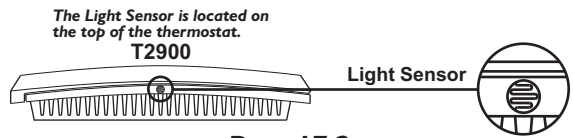
no   Setup   42

17

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

The Light Sensor is located on the top of the thermostat.
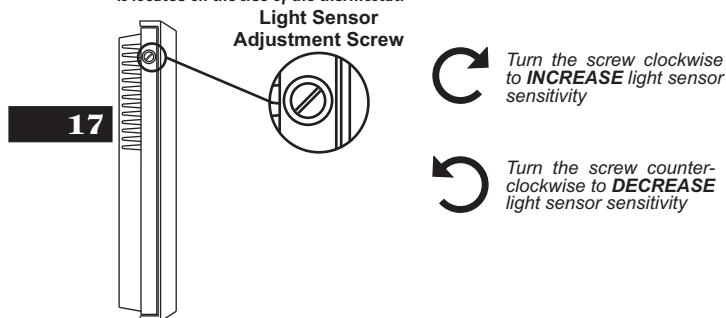**T2900**

Light Sensor

Page 17.2

VENSTAR®

Adjusting the Light Sensor

The light sensor can be adjusted for variable degrees of sensitivity. The sensitivity adjustment screw is located on the side of the thermostat, as illustrated below. Turning the screw clockwise increases the sensitivity of the sensor to light.

To check for correct sensitivity, place the thermostat in the Program On mode. When the lights are on the thermostat should enter Occupied 1 and the Occupied 1 icon will blink on the display. If the thermostat does not enter Occupied 1 while the lights are on, use the supplied screwdriver to turn the light sensor screw clockwise until the Occupied 1 icon appears on the display.

The thermostat should enter an unoccupied period when the lights are off. If the sensor does not enter an unoccupied period when the lights are turned off, use the screwdriver to turn the light sensor screw counterclockwise until the Unoccupied icon appears on the display, with the lights off.

The Light Sensor Adjustment Screw is located on the side of the thermostat.

Light Sensor Adjustment Screw

17

*Turn the screw clockwise to **INCREASE** light sensor sensitivity*

*Turn the screw counter-clockwise to **DECREASE** light sensor sensitivity*

Due to varying lighting conditions, light activation may not be suitable for all installations.

Page 17.3

How to Use the Energy Save Feature

If the thermostat is configured to be programmable (*Section 4),* and Energy Save has been selected in step #43 (*below*), the room will attempt to reach the selected comfort temperature at the exact time programmed into the thermostat. Energy Save, or more commonly known as Smart Recovery, only works when the thermostat enters the Morning mode from the Night mode. For example, if the Night program is set for 11pm at 65°F heating and 85°F cooling, and the Morning program is set for 6am at 72°F heating and 75°F cooling, the thermostat will turn the system on before 6am in an effort to bring the temperature to its correct setting at exactly 6am.

The T2900 learns from experience, so please allow 4-8 days after a program change or after initial installation to give Energy Save time to adjust to local weather, the construction of your home, and your heating and cooling system.

MODE
PROGRAM
Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

MODE
Press the MODE button repeatedly until this setup screen appears.

On

Select Energy Save on or off.

Off

ES   Setup 43

OFF

Press

PROGRAM

18

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.
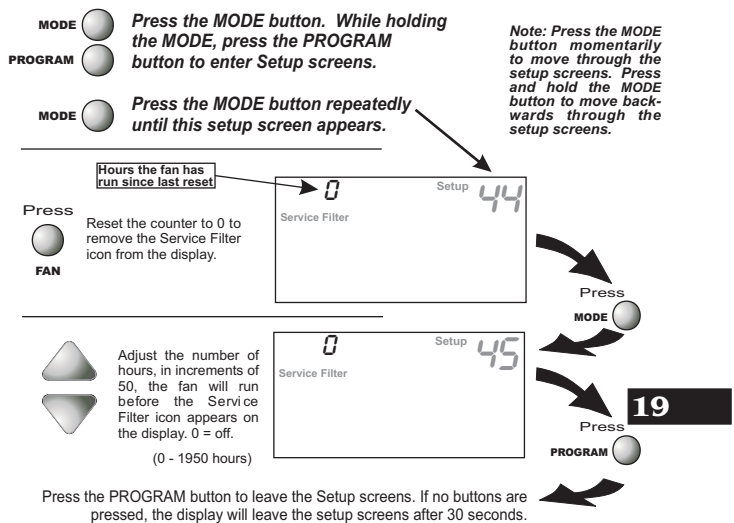
Page 18.1

Section 19 Contents:

19

VENSTAR®

How to Set and Reset the Service Filter (Fan Run-Time) Alert

This counter keeps track of the number of hours of fan run-time whether the fan is energized in the Heating or Cooling modes, or in stand alone fan operation. The Service Filter icon will appear after the preset number of hours of fan run-time in step #45 (*below*) has been achieved. Setting this counter to zero in step #45 will prevent the Service Filter icon from ever appearing.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move back-wards through the setup screens.

Hours the fan has run since last reset

Press

FAN

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

0   Setup **44**
Service Filter

Press
MODE

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)

0   Setup **45**
Service Filter

Press
PROGRAM

19

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 19.2

How to Set and Reset the UV Light Run-Time Alert

This counter keeps track of the number of days since the UV Light counter has been reset. The UV Light icon will appear after the number of days has been achieved, as shown in step #46 (*below*). Setting the counter to zero in Step #46 will prevent the Service UV Light icon from ever appearing.

MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Days since the UV Light icon has been reset

Press

Reset the counter to 0 to remove the Service UV Light icon from the display.

FAN

`0    Setup  18`

`Service UV Light`

MODE

Press the MODE button repeatedly until this setup screen appears.

19

Adjust the number of days in increments of 10 before the UV Light icon appears on the display. 0 = off.

(0 - 1990 days)

`0    Setup  46`

`Service UV Light`

Press

PROGRAM

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

Page 19.3

How to Set and Reset the Humidifier Run-Time Alert

This counter keeps track of the number of days since the Service Humidify icon was last reset; this icon will appear after the number of days set in step #47 (*below*) has elapsed. Setting this counter to zero in step #47 will prevent the Service Humidify icon from ever appearing.
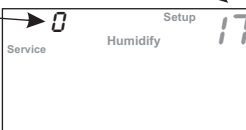
MODE

PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

MODE

Press the MODE button repeatedly until this setup screen appears.

Days since the last reset of the Service Humidify counter.

Press

FAN

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

0   Setup   *17*
Service   Humidify

MODE

Press the MODE button repeatedly until this setup screen appears.

Adjust the number of days in increments of 10 before the Service Humidify icon appears.
0 = Off

(0 - 1990 days)

0   Setup   *47*
Service   Humidify

Press

PROGRAM   **19**

Press the PROGRAM button to leave the Setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

⚠ *The humidifier run-time alert does not take the place of any humidifier manufacturer's recommended maintenance plan plan; it only serves as a helpful reminder.*

Page 19.4

SECTION 20
Programming Holiday Mode **VENSTAR®**

When the thermostat is programmed for a Holiday mode, it will take effect at 12:00 am of the next day. *In order for the Holiday mode to take effect the thermostat must be in the Program On mode.* The thermostat will control to the Unoccupied cooling and heating set-points set in Section 6, pages 6.2 and 6.3.

Holiday setpoints will be enforced for the number of days specified in step #1 (0 - 99 days).

Press

HOLIDAY ◯

Press the HOLIDAY button to enter the Holiday programming setup steps.

Select the number of days that the Holiday schedule will be in effect. A value of 0 disables Holiday mode.

(0 - 99 days)

Setup *1*

0 *dY*

Press

HOLIDAY ◯

Press the HOLIDAY button to exit the setup screens. If no buttons are pressed, the display will leave the setup screens after 30 seconds.

20

You cannot set the Heat setpoint any higher than the Cool setpoint minus the deadband setting in Advanced Setup step #22 on page 13.2.

Programming Holiday Mode (*continued*)

HOLIDAY DISPLAY - When the thermostat is placed into the Holiday mode, the thermostat will display the screen shown below.
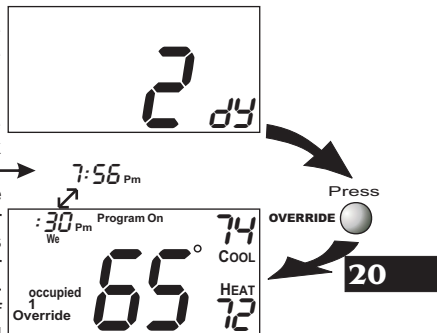
2 dY

To return the thermostat to normal operation from Holiday mode, press the HOLIDAY button and adjust the number of days in step #1 to zero (*see previous page*).

Press the HOLIDAY button to return to normal operation.

Overriding the Holiday Mode

Pressing the OVERRIDE button during Holiday Mode will temporarily force the thermostat into Occupied 1 comfort settings for 30 min. The remaining Override time will alternate with the clock display.

The Override timer can be set up to a maximum of four (4:00) hours, in increments of 30 minutes. If the timer has been set for the maximum time, the next press of the OVERRIDE button will reset the timer, returning the thermostat to the correct time period program for the day.

2 dY

7:56 Pm

:30 Pm Program On
We

Press
OVERRIDE

74
COOL

65°

20

occupied
1
Override

HEAT
72

Page 20.2

# Section 21 Contents:

21

Configuring the Jumpers

For additional flexibility, your thermostat has three configurable outputs. These outputs are designed to have different functions depending on how the jumpers are set (*below*). Each output, labeled MISC1, MISC2, and MISC3 may be set for one of the five choices available.

In the diagram below, the MISC3 jumper has been set for HUM* (humidification) operation, the MISC2 jumper has been set for DEHUM* (humidification) operation, and the MISC1 jumper has been set for Y2 (2nd stage cooling) operation.

W3—
PROG—
HUM—
DEHUM—
ECON—

MISC3   MISC2   MISC1

Y2
(MISC1 ONLY)
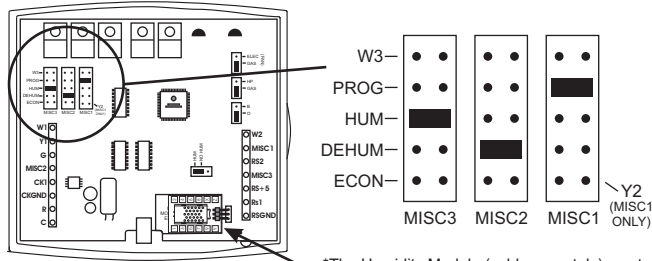
*The Humidity Module (sold separately) must be installed to operate a humidification and/or dehumidification system.

⚠ **CAUTION**

NEVER PUT MORE THAN ONE JUMPER ON THE SAME MISC JUMPER BLOCK!

DOING SO MAY DAMAGE YOUR THERMOSTAT AND VOID THE WARRANTY.

MISC3
OK

MISC3

21

Page 21.2
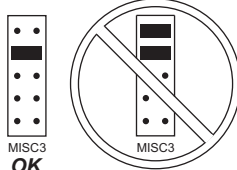
Explanation of Jumper Settings

W3 JUMPER SETTING

If the jumper for MISC1, MISC2, or MISC3 is set to W3, the corresponding MISC screw terminal on the backplate will control a third stage of heat.
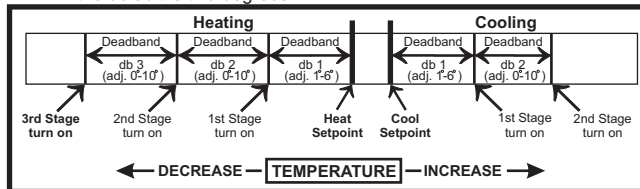
W3 MULTI-STAGE OPERATION EXPLAINED - *Section 13*

The **3rd Stage** of Heat is turned on when:

(A) The 1st and 2nd stages have been on for the time required (*steps #27 and #28, page 13.6)*. It is adjustable from 0-60 minutes and the default **And** is two minutes.

(B) The temperature from the setpoint is equal to or greater than: *the set-point plus the 1st stage deadband (step #24, 13.5), plus the 2nd stage deadband (step #25, 13.5) plus the 3rd stage deadband (step #26, 13.5)*. This 3rd stage deadband is adjustable from 0-10 degrees and the default is two degrees.

	Heating			Cooling	
	Deadband	Deadband	Deadband	Deadband	Deadband
	db 3 (adj. 0°-10°)	db 2 (adj. 0°-10°)	db 1 (adj. 1°-6°)	db 1 (adj. 1°-6°)	db 2 (adj. 0°-10°)
3rd Stage turn on	2nd Stage turn on	1st Stage turn on	Heat Setpoint	Cool Setpoint	1st Stage turn on	2nd Stage turn on

← DECREASE — | TEMPERATURE | — INCREASE →

PROG JUMPER SETTING

If the jumper for MISC1, MISC2, or MISC3 is set to PROG, the corresponding MISC screw terminal on the backplate will control a pilot relay or other accessory.

PROGRAMMABLE OUTPUT - *Section 14*

This jumper setting allows the MISC outputs to control a pilot relay by time, temperature, or a signal from the Phone. The following are three possible scenarios:

21

By **Time**: A device that requires a start and stop time. For example, an exterior lighting system that needed to be energized every day between the hours of 8pm and 1am.

By **Temperature**: An exhaust fan that needs to energize whenever the temperature from RS1 rises above 90 degrees F.

By **Remote**: Remotely arming a security system through the phone.

Page 21.3

Explanation of Jumper Settings *(continued)*

HUM JUMPER SETTING
If the jumper for MISC1, MISC2, or MISC3 is set to HUM, the corresponding MISC screw terminal on the backplate will control a humidification system.

HUMIDIFICATION OPERATION - *Section 9*

If your HVAC unit is equipped with a humidification system the thermostat will provide power to the MISC1, MISC2, or MISC3 terminal of the thermostat when the humidity in the home falls below the humidity setpoint you have chosen. The value for this setpoint ranges from 0% to 60%. If no humidity is desired or if a humidification system has not been installed, set the value to 0%.

DEHUM JUMPER SETTING
If the jumper for MISC1, MISC2, or MISC3 is set to DEHUM, the corresponding MISC screw terminal on the backplate will be connected to the dehumidification terminal of a furnace board. NOTE: Not all furnaces have a dehumidification terminal.

DEHUMIDIFICATION OPERATION - *Section 10*

If your HVAC unit is equipped with a dehumidification system the thermostat will operate in one of two ways.

1) **Normally Closed** (NC): The thermostat will **de-energize** the MISC1, MISC2, or MISC3 terminal of the thermostat (this MISC terminal is connected to the DEHUM terminal on your furnace) to allow the fan to run in low speed when the humidity in the home is above the dehumidify setpoint you have chosen and there is a call for 1st stage cooling.

2) **Normally Open** (NO): The thermostat will **energize** the MISC1, MISC2, or MISC3 terminal of the thermostat (this MISC terminal is connected to the DEHUM terminal on your furnace) to allow the fan to run in low speed when the humidity in the home is above the dehumidify setpoint you have chosen and there is a call for 1st stage cooling.

21

Explanation of Jumper Settings (continued)

ECON JUMPER SETTING

If the jumper for MISC2 or MISC3 is set to ECON, the corresponding MISC screw terminal on the backplate will be connected to an economizer.

ECONOMIZER OPERATION - If your HVAC unit is equipped with an economizer system, the thermostat will provide power to the MISC2 or MISC3 terminal of the thermostat when the thermostat is in an occupied time period. The MISC2 or MISC3 terminal will be de-energized when the thermostat is in an unoccupied time period.

Y2 JUMPER SETTING

If the jumper for MISC1 is set to Y2 the MISC1 screw terminal on the backplate will control a second stage of cooling.

Y2 OPERATION - *Section 13*

Control up to two Cool stages.
The **2nd Stage** of heat or cool is turned on when:
(**A**) The 1st Stage has been on for the time required (*step #27, page 13.6).* It is adjustable from 0-60 minutes and the default is two minutes.

And

(**B**) The temperature spread from the setpoint is equal to or greater than: *the setpoint plus the deadband (step #24, page 13.5), plus the 2nd deadband (step #25, page 13.5).* This 2nd deadband is adjustable from 0-10 degrees and the default is two degrees.

21

Page 21.5
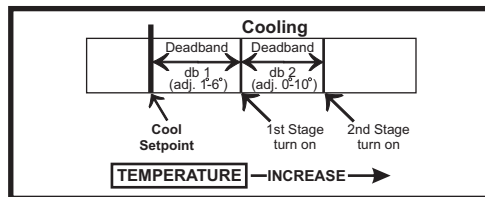
Section 22 Contents:

22

Resetting the Thermostat to the
Factory Default Settings *(for default values see page 24.1)*

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 may be permanently lost.

❶

MODE ◯   Place the thermostat in the OFF mode.

```
12:00 Pm
Su

OFF            72°
```

❷

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

```
18:88 Am Program On Setup  188
      Pm StartStop        Hi
SuMoTuWeThFrSa DeHumidify     188
Service Filter               %  COOL
Pan UV Light                    Outside
AUTO                            Remote
OFFON        188           AUXHEAT
Unoccupied
  123                      Lo 88
Override
FanOn
```

❸

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

```
Fd
```

❹

22 MODE ◯   After the letters **Fd** appear on the display (Factory Default), release the FAN button. Press the MODE button **once** to return to normal operation.

```
12:00 Pm
Su

OFF            72°
```

Page 22.2

VENSTAR®

Calibrating the Temperature and Humidity Sensors

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

❶

MODE — Place the thermostat in the OFF mode.

12:00 Pm
Su
OFF   72°

❷

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

❸ PRESS / TWICE

THERMOSTAT SENSOR

Press the UP and DOWN buttons at the same time twice. The thermostat temperature will be displayed and may be calibrated using the UP or DOWN buttons.

72°   CALIBRATE

❹ MODE

REMOTE SENSOR (RS1)

Press the MODE button once. The remote sensor temperature will be displayed and may be calibrated using the UP or DOWN buttons. If a remote sensor is not installed, a temperature reading of -127 degrees will appear.

74° Outside   CALIBRATE

❺ MODE

HUMIDITY SENSOR

Press the MODE button once. The relative humidity at the thermostat will be displayed and may be calibrated using the UP or DOWN buttons.

35%   CALIBRATE

22

After calibration is complete, press the MODE button **once** to return to normal operation.
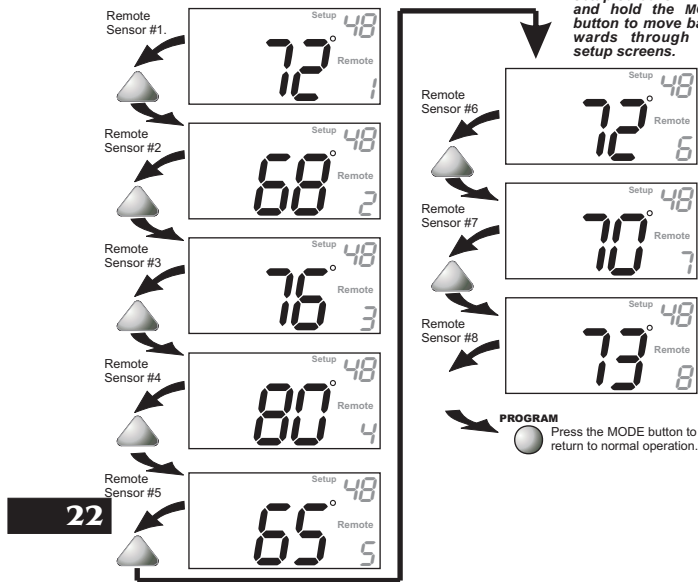
Page 22.3

Viewing the Remote Temperature Sensors

Each sensor is programmed with a "hard-coded" address that the thermostat "scans" in order from lowest to highest. Therefore, in order to determine which sensor corresponds to the number on the setup screen you will need to disconnect each sensor from the group in order to determine which sensor number reads dashes.

MODE
PROGRAM

Press the MODE button. While holding the MODE, press the PROGRAM button to enter Setup screens.

MODE

Press the MODE button repeatedly until setup step #48 appears.

Note: Press the MODE button momentarily to move through the setup screens. Press and hold the MODE button to move backwards through the setup screens.

Remote Sensor #1.

Setup 48
72° Remote
1

Remote Sensor #2

Setup 48
68° Remote
2

Remote Sensor #3

Setup 48
76° Remote
3

Remote Sensor #4

Setup 48
80° Remote
4

Remote Sensor #5

Setup 48
65° Remote
5

Remote Sensor #6

Setup 48
72° Remote
6

Remote Sensor #7

Setup 48
70° Remote
7

Remote Sensor #8

Setup 48
73° Remote
8

PROGRAM
Press the MODE button to return to normal operation.

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ACCESSORY PORT - The RJ11 Jack is used to connect the T2900 to the IR Receiver (ACC0431) for wireless communication or the EZ Programmer (ACC0432) for easy downloading or uploading of thermostat information.

The Accessory Port is located on the bottom of the thermostat.

RJ11 Type Jack

IR RECEIVER / REMOTE CONTROL (optional accessory) - When the IR Receiver is connected, the thermostat can be controlled using an IR Remote Control. The thermostat may also interface with other wireless systems in your home. For more information see the manual for the IR Receiver (ACC0431).

EZ PROGRAMMER (optional accessory) - When the EZ Programmer is connected, the thermostat Time Period Programming and Advanced Setup Programming can be stored into the EZ Programmer's memory. This information can then be uploaded to other T2900 thermostats. For more information see the manual for the (ACC0432).

COMFORT CALL (optional accessory) - When Comfort call is connected, the thermostat's Heating and cooling functionality may be accessed and controlled through the phone. For more information see the manual for Comfort Call (ACC0433).

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SECTION 24
Advanced Setup Table

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Step#	Description	Pg#	Range	Df*	Step#	Description	Pg#	Range	Df*
1	Programmable Thermostat	4.2	Yes/No	Yes	27	Minutes Between Stage 1 & 2	13.6	0-60min	2
2	Auto-Changeover Thermostat	4.3	Yes/No	Yes	28	Minutes Between Stage 2 & 3	13.6	0-60min	2
3	Fan Off Delay	7.3	0, 30, 60, 90	0	29	2nd Stage turn off at setpoint	13.7	On/Off	Off
4	Fan Purge	7.4	0 - 3 hrs.	0	30	Programmable Output	14.3	Off/Time/Temp/Aux	Off
5	Thermoglow Backlight	8.2	Auto/On/Off	Auto	31	Programmable Output Polarity	14.4	NO/NC	NO
6	F or C	8.2	F/C	F	32	7 Day/1 Day Programmable Output	14.4	7Day/1Day	7
7	Security Level	8.4	0 - 3	0	33	Programmable Output Output Day of the Week	14.4	Mo - Su	Mo
8	Max Heat Setpoint	8.4	35°- 99°	80°					
9	Min Cool Setpoint	8.4	35°- 99°	65°	34	Programmable Output Start Time	14.4	24 Hour	7am
10	Cool to Dehumidify	10.4	On/Off	Off					
11	Maximum Dehum Overshoot	10.4	0°- 5°	3°	35	Programmable Output Stop Time	14.5	24 Hour	9pm
12	Reheat Operation	10.5	On/Off	Off	36	Programmable Output Temp. Setpoint	14.6	35°-125°	80°
13	DEHUM Terminal Polarity	10.6	NO/NC	NC					
14	Energy Watch - Heat Timer	11.2	read only	- -	37	Thermostat control to RS1?	15.3	Yes/No	No
15	Energy Watch - Cool Timer	11.3	read only	- -	38	Thermostat Sensor Averaging	15.4	On/Off	Off
16	Override Run-Time	11.4	read only	- -	39	Dry Contact Operation	16.2	Yes/No	Yes
17	Reset Service Humidify Icon	11.5	read only	- -	40	Dry Contact Polarity	16.2	NO/NC	NO
18	Reset UV Light Icon	11.6	read only	- -	41	Dry Contact Programming	16.3	Occ. 1/Service Pan	Occ. 1
19	Heatpump Jumper Setting	12.2	read only	- -					
20	Reversing Valve Jumper Setting	12.2	read only	- -	42	Light Activated	17.2	Yes/No	No
21	Electric Heat	12.3	read only	- -	43	Energy Save	18.1	Off/On	Off
22	Minimum Heat/Cool Differential	13.2	0°- 6°	2°	44	Reset Service Filter Icon	19.2	read only	- -
23	Cycles Per Hour	13.3	d1, d, 2-6	6	45	Service Filter Run Time Set	19.2	0 - 1950	0
24	Deadband/Temp. Swing 1st Stage	13.5	1°- 6°	2°	46	UV Light Run-Time Set	19.3	0 - 1990	0
25	Deadband/Temp. Swing 2nd Stage	13.5	0°- 10°	2°	47	Service Humidify Run-Time Set	19.4	0 - 1990	0
26	Deadband/Temp. Swing 3rd Stage	13.5	0°- 10°	2°	48	Viewing the Remote Sensor Temperature(s)	22.4	- -	- -

*Df = Factory Default Setting

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Section 26
Warranty

VENSTAR®

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.

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Programming Worksheet   *see Section 6*

DAY	PERIOD	START TIME	COOL	HEAT	
MONDAY	Unoccupied				
	Occupied 1				
	Occupied 2				
	Occupied 3				
TUESDAY	Unoccupied				*Copy Mon → Tue*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				
WEDNESDAY	Unoccupied				*Copy Tue → Wed*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				
THURSDAY	Unoccupied				*Copy Wed → Thu*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				
FRIDAY	Unoccupied				*Copy Thu → Fri*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				
SATURDAY	Unoccupied				*Copy Fri → Sat*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				
SUNDAY	Unoccupied				*Copy Sat → Sun*
	Occupied 1				☐ *No*
	Occupied 2				☐ *Yes*
	Occupied 3				