Owner's Manual

PROGRAMMABLE DIGITAL THERMOSTAT 53DFS250-FS

Carrier

Front Panel
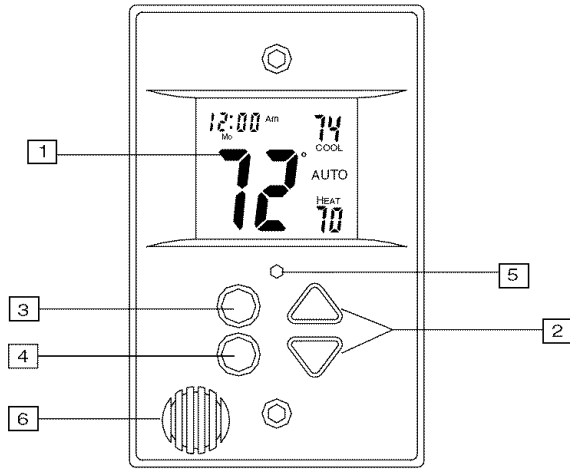
1 | **Liquid Crystal Display**
with *Thermoglow™ Backlight*

2 | **Up/Down Buttons**

3 | **Mode Button**

4 | **Override Button**

5 | **Heat or Cool Indicator**
Heat = Red, Cool = Green

6 | **Temperature Sensor Bubble**

Table of Contents

IMPORTANT: Follow *Installation Instructions* before proceeding.

⚠ **CAUTION:** SET THERMOSTAT TO MODE "OFF" PRIOR TO CHANGING SETTINGS IN SETUP OR RESTORING FACTORY DEFAULTS.

- 7-Day Programmable
- 3 Occupied periods and 1 Unoccupied period
- Auto Changeover
- Large, Easy To Read Display
- Thermoglow™ Backlight
- Remote Sensor Ready
- Dry Contact Equipped
- Energy Saving Smart Fan
- Fan Purge, IAQ Feature
- Meets California Title 24

Display
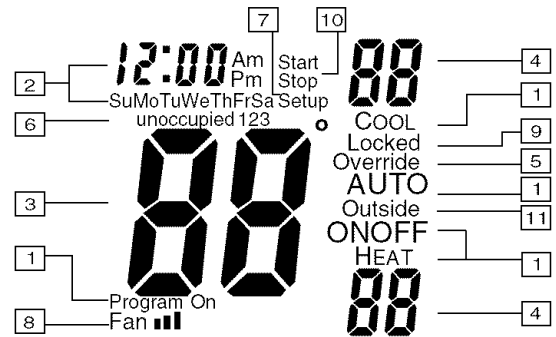
1 | Mode Indicators
Selects the operation mode of the equipment.
HEAT — indicates the heat mode.
COOL — indicates the air conditioning mode.
AUTO — indicates the system will automatically changeover between the heat and cool modes as the temperature varies.
OFF — indicates the entire system is turned off.
PROGRAM ON — indicates the stored program is enabled to run. *See page 2.*

2 | Clock with Day of the Week
Indicates the current time and day. This clock is also used to program the timer periods. *See page 2.*

3 | Room Temperature Display
Indicates the <u>current</u> room temperature.

4 | Desired Set Temperature
Indicates <u>desired</u> room temperature(s). *See page 2.*

5 | Override Indication
Indicates the current program is currently being overridden for up to 4 hours. *See pages 2 and 5.*

6 | Occupied or Unoccupied Indication
Indicates the program number: Occupied 1, 2, 3, or Unoccupied. *See pages 3 and 4.*

Display

7 Setup Indication
Indicates the thermostat is in the programming mode.
See page 4.

8 Fan Operation Indication — 3 Speed
Fan — indicates constant continuous fan operation.

3 speed indicators appear as:

1 bar   **❙**   = low speed
2 bars **❙❙** = medium speed
3 bars **❙❙❙** = high speed

When **Fan** is not lit — indicates the fan is in Auto mode. The fan will operate at the speed which will help meet room temperature conditions. *See page 4.*

9 Locked Indication
Locked appears after the right combination of buttons are pressed, rendering the buttons inoperative.
See page 5.

10 Start/Stop Indication
Start or Stop appears when programming timer functions. *See page 3.*

11 Outside Indication
Indicates the temperature displayed is from the optional outside sensor. *See page 6.*

Quick Start   *Set the Clock and Go*

MODE ◯
OVERRIDE ◯

Press the Mode button. While holding the Mode, press the Override button for 2 Seconds to enter Setup screens.
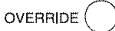
During Setup and Programming:
Pressing the Mode button selects different flashing items. (Represented in **dark black**).

Pressing the Up and Down buttons will modify the flashing selection.

To adjust the clock or Day use

△
▽

buttons.

Press both Mode and Override buttons as above to return to normal operation.

MODE ◯
OVERRIDE ◯

The thermostat is preprogrammed from the factory to operate without the need for further programming. To optimize the installation of this thermostat, follow the instructions in the Advanced Setup section, or in the Occupied/Unoccupied periods section.

NOTE: The thermostat is not programmed to operate heat pump systems.

Basic Operation

Select Mode

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

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

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

***Program On** will activate the stored timer operation. (Occupied and Unoccupied periods.)*

***OFF** indicates the system is turned off.*

Select Desired Temperature

In any mode, adjust the desired Set Point Temperature with

△
▽

buttons.

Pressing the up/down buttons in Auto mode will adjust **both** the heat and cool set point temperatures simultaneously.

Pressing the up/down buttons in Heat **or** Cool modes will adjust only the heat or cool set point temperature.

Override

Press
OVERRIDE ◯

During programmed, unoccupied periods pressing the Override button will force the thermostat into Occupied 1 comfort settings, temporarily.

With each successive push of the Override button, the override timer will add 30 minutes, until the maximum of 4 hours is reached. Then the next press will zero out the override timer, returning to unoccupied if there are no further button presses.

When in Override, the Override icon and the Occupied 1 icon appear on the display.

The time of day clock alternates with the time remaining in override.

During Override, the set points are adjustable, provided the keypad is not locked.

Programming Occupied and Unoccupied Periods

Important — Before you Begin

When using unoccupied modes, Auto fan speed must be selected. Manual fan speed should not be used for unoccupied operation. Auto Fan speed must be used to prevent the system from entering the coil freeze protection cycle or in heating, the high-pressure protection cycle. (See Advanced Setup section for fan speed selection.)
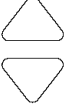
If different heating and/or cooling temperature set points are desired Monday through Friday at different times of the day, two occupied periods must be programmed. To adjust set points and times for the two occupied periods:

If the space to be controlled should have a designated temperature from 7:00 a.m. to 5:00 p.m. Monday through Friday and for the remainder of the day have an alternate or setback temperature set point set to stop at 5:00 p.m., program the Occupied 2 mode at 12:00 a.m. to 12:00 a.m. at the alternate temperature set point.
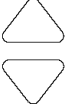
NOTE: If one occupied period starts and stops within another occupied period the lower occupied number has priority.
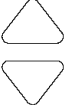
If additional setback is desired for Saturday and Sunday, program Occupied 1 from 12:00 a.m. to 12:00 a.m. for both Saturday and Sunday at the desired temperature.

MODE ◯ — Press the Mode button. While holding the Mode button, press the Up button for 2 seconds to enter time period programming.

Select the maximum number of occupied periods to be used on any one day.
(1,2 or 3)

occupied 1

Adjust the cooling set point for occupied 1.
(35 to 99 F)
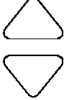
occupied 1 **74** COOL

Adjust the heating set point for occupied 1.
(35 to 99 F)

occupied 1 **74** COOL **72** HEAT

Adjust the cooling set point for unoccupied periods.
(35 to 99 F)

unoccupied **85** COOL
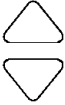
Adjust the heating set point for unoccupied periods.
(35 to 99 F)

unoccupied **55** HEAT

NOTE: If no Unoccupied Mode will be used, press the Mode button and proceed to the next step.

Select the day for Occupied 1.
(Mo - Su)

Mo *occupied 1*

Adjust the start time for occupied 1.

7:00 Am Start
Mo *occupied 1*

Adjust the stop time for occupied 1.

5:00 Pm Stop
Mo *occupied 1*

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

Mo *occupied 1*   ON

The copy command becomes available after the maximum number of occupied periods are programmed in a day. This example uses 1 as the maximum occupied periods ever programmed in one day.

Yes
Select Yes or No to copy the previous day's program to this day.
No

NO
Tu

COPY

Selecting Yes, then pressing Mode will copy the previous day's program and then will ask the same copy question again. If yes is selected each time, this routine will repeat until Saturday is copied to Sunday. After Saturday is copied to Sunday, the copy command is unavailable.

Select the day for Occupied 1.
(Tu - Mo)

Tu *occupied 1*

Adjust the start time for occupied 1.

9:00 Am Start
Tu *occupied 1*

Adjust the stop time for occupied 1.

5:00 Pm Stop
Tu *occupied 1*

Programming Occupied and Unoccupied Periods

On

△
▽

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

Tu
occupied 1

ON

Off

Yes

△
▽

Select Yes or No to copy the previous day's program to this day.

No

NO
We

CO PY

Selecting Yes, then pressing mode will copy the previous day's program and then will ask the same copy question again. If yes is selected each time, this routine will repeat until Saturday is copied to Sunday. After Saturday is copied to Sunday, the copy command is unavailable.

If no is selected, as in previous steps, flashing prompts for input will appear for start and stop times for Occupied 1. If more than one occupied period was selected in Step 1 on page 3, then cool/heat set points, and start/stop times for additional occupied periods will be prompted.

PROGRAMMING NOTES

- If only one Occupied period is selected in Step 1 on page 3, Occupied 2 and 3 programming steps are skipped. Further, if only 2 occupied periods are selected, Occupied 3 programming steps are skipped.
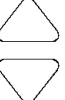- Heat and Cool set points for Occupied 1 are the same for every day of the week. Heat and Cool set points for Occupied 2 and 3 can be adjusted differently for weekdays and weekends, if desired.
- **If the start time is set later in the day than the stop time**, the program will run from the start time to midnight and from midnight to the stop time on the same day. *For example: 9:00pm start, 8:00am stop, on Monday. In this example the program will run from 12:00am Monday to 8:00am Monday and again from 9:00pm Monday to 12:00pm Monday.*
- 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.
- If the **same** start and stop times are programmed in for an occupied period, then it will run 24 hours.
- If one occupied period starts and stops within another occupied period the lower occupied number has priority. *For example: If Occupied 3 is programmed to be "on" 24 hours, and Occupied 2 is programmed to run that day, then Occupied 2 settings will take over from Occupied 3 between Occupied 2 start and stop times.*

Advanced Setup

MODE ○
OVERRIDE ○

Press the Mode button. While holding the Mode, press the Override button for 10 seconds to enter Setup screens.

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

△
▽

Adjust the time of day clock.

12:00 Am   Setup

1

Tip: To change hours quickly, press and hold the override button in and press the up or down buttons.

△
▽

Select the day of the week.

Mo   Setup

2

△
▽

Select fan operation, Fan ▮▮▮ or Fan Auto.
▮ = Low Speed Fan
▮▮ = Medium Speed Fan
▮▮▮ = High Speed Fan

Setup

3

AUTO

Fan

△
▽

On

Select Heat Pump, On or Off.

Off

HP   Setup

4

OFF

△
▽

Adjust the deadband from 1 to 6 degrees F.

db   Setup

2

5

△
▽

Adjust the minimum **difference** between cooling and heating set points.
(0° to 6 F)

dif   Setup

2

6

Cool

Heat

△
▽

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

6   Setup

7

CY

△
▽

Select the security level:
0=no security in effect
1=set point range limited
2=1+ program on all times
3=2 + prohibits set point changes

SEC   Setup

0

8

Locked

△
▽

Adjust the maximum allowable heat set point when security is in effect. (Step 8 only appears if Step 9 is not 0.)
(35 to 99 F)

HI   Setup

80

9

Locked

Heat

Advanced Setup

Adjust the minimum allowable cool set point when security is in effect. (Step 10 only appears if Step 8 is not 0.)
(35 to 99 F)

LO **65** *Setup* **10** Cool Locked

C Select thermostat operation in degrees **Fahrenheit** or **Centigrade**. *F*

F *Setup* **11**

On Select the display backlight always **On**, or **Off** after 8 seconds. *Off*

Setup **12** ON

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

0:00 **PU** *Setup* **13**

Select the unit ID for 'Soft Start'. This is used in multiple installs to stagger equipment turn on times. 0 = off. Each increment = 30 second delay.
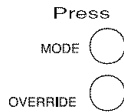(0 to 99)

SOF **0** Start Setup **14**

Yes Select the sensor type:
Yes = Outside or Duct sensor
No =Automatic Detection of Remote Sensor
No

NO *Setup* **15** Outside

To view Outside or Duct temperature press and hold Mode 2 seconds, min. The thermostat will not control to Outside or Duct Sensors.
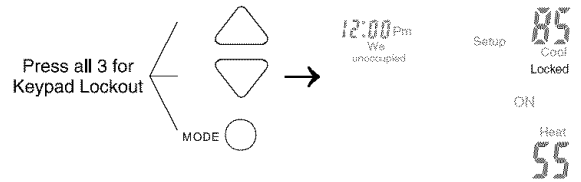
Press
MODE ○
OVERRIDE ○

Press the Mode button. While holding the Mode, press the Override button leave the Setup screens. If no buttons are pressed, the display will leave the set screens after 30 seconds.

Advanced Setup Table

| STEP NO.	DESCRIPTION	RANGE	FACTORY DEFAULT
1	Time of day clock set	24 hour	12:00 Am
2	Day of the week	Su - Sa	Mo
3	Fan Mode	Auto / ▮▮▮	Auto
4	Heat Pump On or Off	Off / On	Off
5	Deadband or Temperature swing	1 - 6	2
6	Forced minimum difference heat/cool	0 - 6	2
7	Cycles per hour	d, d1, 2 - 6	6
8	Security Levels	0 - 3	0
9	Maximum allowable Heat set point	35 - 99 F	80 F
10	Minimum allowable Cool set point	35 - 99 F	65 F
11	Fahrenheit or Centigrade	F / C	F
12	Thermoglow™ Backlight	Off / On	On
13	Fan Purge timer	0:00 - 3:00	0:00
14	Soft Start	0 - 99	0
15	Remote Sensor	Yes / No	No

About Advanced Features and Operation

- CLOCK BACKUP — In the event of a power loss, the thermostat internal clock will continue to keep proper time for a minimum of 48 hours without external power or batteries.

- MINIMUM HEAT/COOL SET POINT DIFFERENCE — The Heat and Cool set points will not be allowed to come any closer to each other than the value set in Advanced Setup *Step 6, on page 4*. This minimum difference is enforced during Auto changeover and Program On operation.

- ENERGY SAVING SMART FAN — If Fan On is selected, the fan will run continuously at all times. If fan is in Off Mode it will only run if there is a heating or cooling demand during programmed unoccupied periods.

- OVERRIDE — As explained on *page 2*, pressing the Override button during a programmed, Unoccupied period will force the thermostat into Occupied 1, temporarily, up to 4 hours. If the Override button is pressed during an Occupied period, the thermostat will be forced into Unoccupied and the occupied period *(1,2 or 3)*, it was forced out of will be turned off, only for that day.

- During Override periods the set points may be adjusted, but they will not be remembered after Override ends.

- FAN PURGE TIMER — When this feature is activated, the fan will turn on during Unoccupied at a preset amount of time prior to Occupied 1. This preoccupancy fan purge timer may be set as instructed on *this page, Step 13*, from 0 to 3 hours. 0 = this feature turned off.

- KEYPAD LOCK — 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, simultaneously press the Up and Down buttons. **Locked** will appear on the display.

Press all 3 for Keypad Lockout
△ ▽ MODE ○ →
12:00 Pm We unoccupied *Setup* **85** Cool Locked ON Heat **55**

To *unlock* the buttons, again press and hold the Mode button. While holding the Mode button, simultaneously press the Up and Down buttons. **Locked** will disappear from the display.

- DRY CONTACT SWITCH — The terminals are 'normally open'. Closing or completing the circuit will cause the thermostat to enter Occupied 1. This feature allows an external device such as a central time clock, occupancy sensor, or a telephone-activated device to force one or more thermostats into Occupied 1. For the Dry Contact to work the thermostat must be in **Program On**. *Set Occupied 1 to Off for all 7 days*, so the Contact closure will be in control. When the thermostat is forced into Occupied 1 via the Dry Contact closure, the icon **Occupied 1** will blink.

CK1
GND
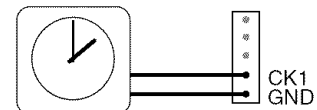
- HOLIDAY MODE — This feature forces the thermostat into Unoccupied for a preset duration, up to 99 days. The Holiday setup display is entered as follows:

① △ MODE ○

Press the Mode button. While holding Mode, press the Up button for 2 seconds to enter the time period programming setup.

↓

② ○ OVERRIDE

The first step on the display prompts for maximum number of Occupied periods. Ignore this prompt and press the Override button.

HOL
0

When active the display counts down remaining days blinking. Unoccupied also appears.

③ △ ▽

Press the Up or Down buttons to select the number of days the thermostat will be in Holiday mode. 0 = Off. To exit Holiday setup, press the Mode button.

The thermostat will enter the Holiday mode when the clock crosses midnight.

During Holiday mode Unoccupied set points are enforced.

The Override button is active during Holiday mode. It will override to Occupied 1 settings up to 4 hours then return to Holiday mode. The Dry Contact Switch is ignored.

The thermostat will exit Holiday mode at midnight of the final programmed day. To terminate Holiday immediately, enter the Holiday setup screen and select 0.

- SOFT START — This feature is utilized in multiple thermostat installations controlled by the Dry Contact terminals. Assigning a unique Soft Start number to each thermostat will stagger the turn on times, even though the Dry Contact closes for all the thermostats connected at the same time. Each Soft Start number represents a multiple of 30 seconds from the Dry Contact closure. For example, 1 = turn on 30 seconds after Dry Contact closure, 2 = turn on 60 seconds after closure, 3 = turn on 90 seconds after closure, and so on. See *page 5, Step 14,* to configure the thermostat for Soft Start.

- DUAL SETPOINT BEHAVIOR — The adjustable set point range is: 35 to 99 degrees in Fahrenheit and 7 to 35 degrees in Centigrade. When in the modes Heat or Cool, this adjustable range is unhampered.

  When adjusting any Auto mode, including programming Occupied and Unoccupied periods, the thermostat will not allow the Heat set point to get closer to the Cool set point than the value programmed as the minimum difference in *Step 6, page 4.*

When entering the Auto mode from Cool, the Heat and Cool set points will remain spread apart by the amount that they were adjusted, prior to entering Auto.

For example: If the Cool set point was set to 80 while in the Cool mode and the Heat set point was adjusted to 70 while in the Heat mode, upon entering the Auto mode the Heat and Cool set points would be 80 and 70. **Both** set points would then move up and down together, (in this example spread by 10 degrees), by pressing the up or down buttons.

To move the Heat and Cool set points closer together, enter the Cool or Heat mode by pressing the Mode button, then adjust the set point(s) closer together. Heat is limited to how close it can come to Cool by *Step 6, page 4.*

- REMOTE SENSORS **(Optional Accessory)** — When connected to terminals RS+5, RS, and GND on the back of the thermostat, the thermostat will read the temperature from the Remote Sensor and ignore the temperature sensor inside the thermostat. The thermostat automatically recognizes when a Remote Sensor is connected. When reading the temperature from the remote, the degree icon above the room temperature blinks once a second.

Optional Sensor

Optional Remote Sensor
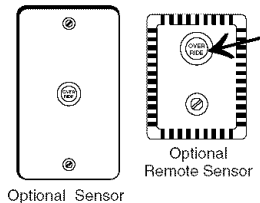
The Override button on the Remote Sensor works slightly different than the Override button on the front panel. Each press of the 'External' Override button adds 2 hours to the override timer. If the timer was already active, the first button press will round the runtime to either 2:00 or 4:00.

Subsequent button presses will not wraparound as the Override button on the thermostat does, so the second or greater button press will set the runtime to 4:00. The Locked feature has no effect on the external Override button. The *wired* Remote Sensor is connected to the thermostat with **up to 500 ft of 20 ga. or 300 ft of 18 ga. thermostat wire.** *See the Remote Sensor instructions for further details.*

- FACTORY DEFAULTS — Before restoring factory defaults, set thermostat to OFF mode. If, for any reason it is desirable to return all stored settings back to the factory default settings, press the Mode button. While holding the Mode button in, press the Down button for 2 seconds. All icons will appear. Press and hold in the Override button until **Fd** appears. This resets all factory settings. **To calibrate room temperature,** press the Mode button once more. At this point use the Up and Down buttons to calibrate room temperature, if needed. Press the Mode button to return to normal operation.

Warranty

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

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

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

LIMITATIONS OF WARRANTIES — ALL IMPLIED WARRANTIES (INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY) ARE HEREBY LIMITED IN DURATION TO THE PERIOD FOR WHICH THE LIMITED WARRANTY IS GIVEN. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE MAY NOT APPLY TO YOU. THE EXPRESSED WARRANTIES MADE IN THIS WARRANTY ARE EXCLUSIVE AND MANY 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 owners 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 from 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.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

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