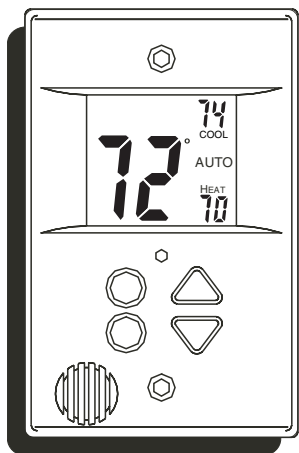




# Installation Instructions

## DIGITAL THERMOSTAT 53DFS250-FS

### Heat Cool and Cooling Only



### PROGRAMMABLE

#### Table of Contents

<b>STEP #1 PREPARATION</b>	1
<b>STEP #2 WIRE CONNECTIONS</b>	1
<b>SAMPLE WIRING DIAGRAM</b>	2
<b>STEP #3 TEST OPERATION</b>	2
<b>ADVANCED SETUP</b>	2
<b>ABOUT ADVANCED FEATURES AND OPERATION</b>	3
<b>TROUBLESHOOTING</b>	4
<b>CALIBRATION</b>	4

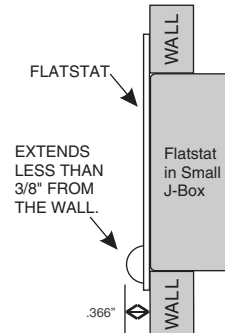
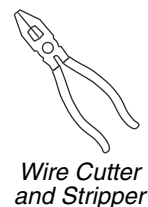
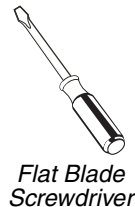
**IMPORTANT:** Follow *Installation Instructions* carefully.

**CAUTION:** DISCONNECT POWER TO THE SYSTEM BEFORE REMOVING THE OLD THERMOSTAT AND INSTALLING THE NEW THERMOSTAT. SERIOUS PERSONAL INJURY COULD RESULT.

This device complies with Part 15 of the FCC rules. Operation is subject to the following 2 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.

#### STEP #1 PREPARATION

- A. Proper installation of the thermostat will be accomplished by following these step by step instructions. If you are unsure about any of these steps, call a qualified technician for assistance.
- B. Assemble tools and recommended junction box.



For best operation, install the thermostat in a junction box that is free from drafts that originate inside the wall.

- C. Carefully unpack the thermostat. Save the screws, bracket, and instructions.
- D. Power to the system should be off for installation or replacement.

#### STEP #2 WIRE CONNECTIONS

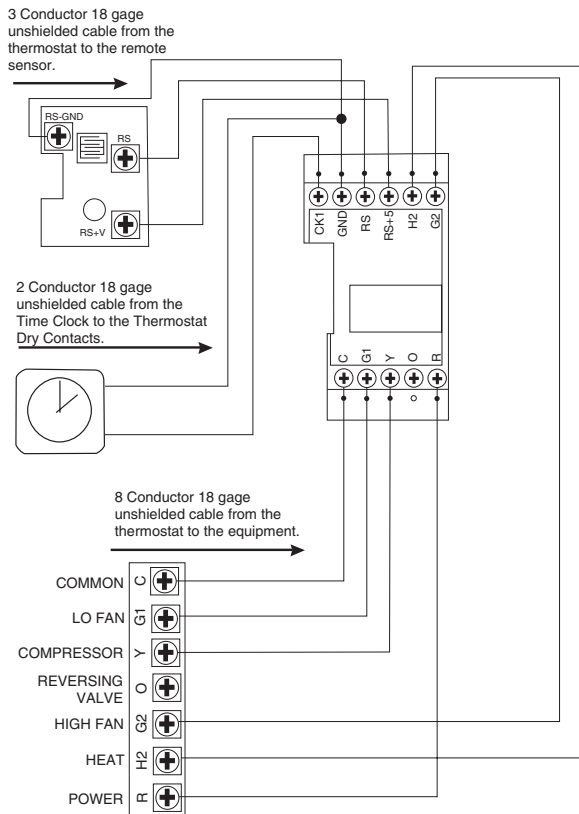
Refer to the chart below, or the wiring diagram that follows.

FUNCTION	INSTALL ON THE CONNECTOR MARKED
Lo Fan	G1
Compressor	Y
Heating	H2
24 v Power	R
Common	C
Rev. Valve	O*
Hi Fan	G2
Remote Sensor +5vdc	RS+5
Remote Sensor Signal	RS
Remote Sensor Ground	RS GND
Dry Contact Switch 1	CK1
Dry Contact Switch 2	CK2

\*Not applicable for use with Duct-Free Splits heat pump systems.

## Sample Wiring Diagram

## HEAT-COOL/ COOLING ONLY



NOTE: H2 connection is not required for cooling only systems.

## STEP #3 TEST OPERATION

- Turn the power on to the system.
- Press the Mode button until the **HEAT** icon appears on the display. Press the Up or Down buttons until the set point temperature is 10 degrees above room temperature. The unit will turn on.
- Press the Mode button and the **COOL** icon appears on the display. Press the Up or Down buttons until the set point temperature is 10 degrees below room temperature. The unit will turn on.  
*NOTE: Most equipment has a time delay between cool and heat cycles.*

## Advanced Setup

Follow the steps below to complete advanced setup.

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

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

Adjust the time of day clock.

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

Select the day of the week.

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

On  
Select Heat Pump, On or Off.  
Off

Adjust the deadband from 1 to 6 degrees F.

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

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

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

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)

## Advanced Setup (cont)

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)

Select thermostat operation in degrees Fahrenheit or Centigrade.

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

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

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)

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

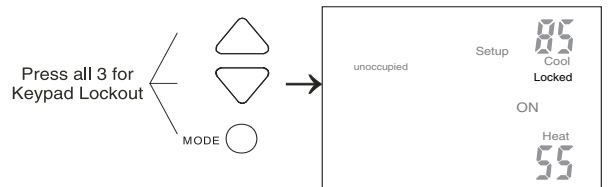
To view Outside or Duct temperature press and hold Mode 2 seconds, min. The thermostat will not control to outside or duct sensors.



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

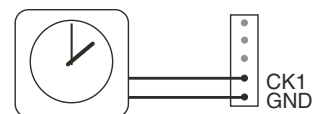
## About Advanced Features and Operation

- 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 2. 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, except in Off mode, and will only run if there is a heating or cooling demand.
- OVERRIDE** — Press the Override button during a programmed, unoccupied period to force the thermostat into the Occupied 1 period, 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 the Unoccupied period at a preset amount of time prior to the Occupied 1 period. This preoccupancy fan purge timer may be set as instructed in *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.  
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.

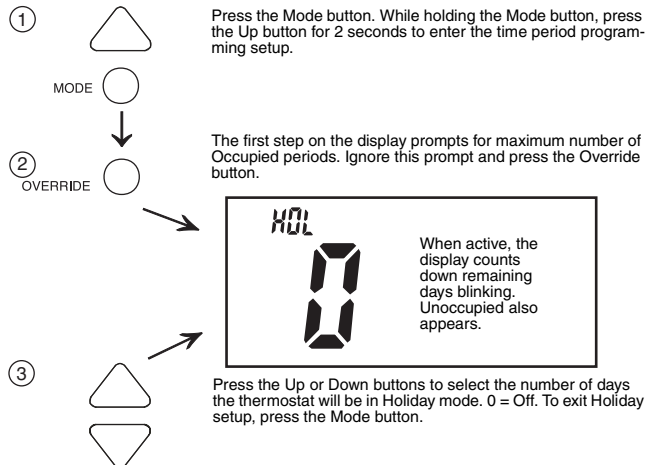
**IMPORTANT:** For control of multiple thermostats by one source, refer to Potential Phasing Problems (document part no. 88-173) prior to installing.



## 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

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



The thermostat will enter Holiday mode when the clock passes 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 mode 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 3, Step 14*, to configure the thermostat for soft start.
- **DUAL SET POINT 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.

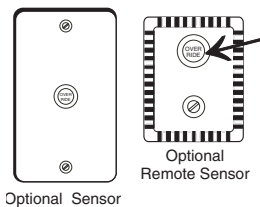
When adjusting any Auto mode, including programming Occupied and Unoccupied set points, the thermostat will not allow the Heat set point to get closer to the Cool set point than the value programmed as the minimum difference in *Step 6, page 2*.

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 mode.

For example: If the Cool set point was set to 80 F while in the Cool mode and the Heat set point was adjusted to 70 F while in the Heat mode, upon entering the Auto mode the Heat and Cool set points would be 80 F and 70 F. **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 2*.

- **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.



**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 wrap around as the Override button on the thermostat does, so the second or subsequent button presses 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 450 ft of 22 gage, 300 ft of 20 gage or 150 ft of 18 gage 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**, see the Calibration section below.

## TROUBLESHOOTING

SYMPTOM	CAUSE	REMEDY
The air conditioning does not attempt to turn on.	The compressor timer lockout may prevent the air conditioner from turning on for a period of time.	Consult the Owner's Manual in the setup section to defeat the cycles per hour and compressor time guard.
The display is blank.	Lack of proper power.	Make sure power is turned on; confirm 24 vac between <b>R</b> and <b>C</b> .

## CALIBRATION

**CALIBRATION:** Every thermostat is calibrated before it leaves the factory. Under normal circumstances there will never be a need to recalibrate the thermostat. To accommodate *special needs*, the thermostat may be recalibrated following these steps:

1. While holding the Mode button in, press the down button for 5 seconds. After all the icons in the display appear, release the buttons.
2. Press the Mode button.
3. Press the up or down buttons until the flashing number equals the current room temperature.
4. Press the Mode button to return to normal operation.