



model T701DFN-1

Fan Coil Thermostat

2 or 4 pipe systems

Non-Programmable
Thermostat



- Remote sensor ready
- Self-prompting adjustment
- Auto 2-pipe changeover when used with accessory changeover sensor
- Dry contact equipped
- Backlit display
- One For All™ works with most all fan coil systems
- Electric heat ready
- Non-volatile memory
- Dual setpoint with adjustable deadband
- Keypad lockout
- Configurable display
- Display either F or C
- Terminals on backplate

Installation Instructions

TABLE OF CONTENTS

Step #1: Preparation	2
Step #2: Applications	3
Step #3: Wire Connections	4
Step #4: Test Operation	6
Troubleshooting	11
Sample Wiring Diagram	14

CAUTION

Follow Installation Instructions carefully. Disconnect Power to the Heater/Air Conditioner before removing the old thermostat and installing the new thermostat.

**WARNING**

IMPORTANT: The T701DFN-1 and T701DFP-1 Series Thermostat Controllers are intended to provide an input to equipment under normal operating conditions. Where failure or malfunction of the thermostat controller could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn or protect against failure or malfunction of the thermostat controller.

P/N T701DFN-1

© Copyright 2010, All Rights Reserved

Page 1

STEP #1

PREPARATION



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.



Assemble tools.

Flat Blade
Screwdriver



Wire cutter
& Stripper



Drill with 3/16
inch Drill Bit
(when not
using j-box)



Make sure your Heater/Air Conditioner is working properly before beginning installation of the thermostat.



Carefully unpack the thermostat. Save the screws, wall anchors, and instructions.



Turn off the power to the Heating/Air Conditioning system at the main fuse panel.

Installation

Location Considerations

Locate the T701 Series Thermostat Controller:

- on a partitioning wall, approximately 5 ft (1.5 m) above the floor in a location of average temperature.
- away from direct sunlight, radiant heat, outside walls, outside doors, air discharge grills, or stairwells; and from behind doors.
- away from steam or water pipes, warm air stacks, unconditioned areas (not heated or cooled), or sources of electrical interference.

STEP #2

APPLICATIONS

New Applications



Follow the thermostat and E-M (Electro-Mechanical) wiring diagrams supplied with the submittal package, and affixed to the fan coil unit enclosure. Go to pages 6 through 10 for instructions to test operation for the available applications.

Existing Applications



Remove the cover of the old thermostat. If it does not come off easily check for screws.



Loosen the screws holding the thermostat base or subbase to the wall and lift away.



Disconnect the wires from the old thermostat. Tape the ends of the wires as you disconnect them and mark them with the letter of the terminal for easy reconnection to the new thermostat.



Keep the old thermostat for reference purposes until your new thermostat is functioning properly.



CAUTION: Risk of Electric Shock.

Disconnect power supply before making electrical connections to avoid electric shock.



CAUTION: Risk of Property Damage.

Do not apply power to the system before checking all wire connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

IMPORTANT: Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the electrical ratings of the T701 Series Thermostat Controller.

Note: This thermostat is strictly a low voltage control. A compatible relay board **must** be installed to isolate the 24 volt wires from the line voltage to the fan.

STEP #3**WIRE CONNECTIONS**

If the terminal designations on your old thermostat do not match those on the new thermostat, ***refer to the chart below.***

4-PIPE SYSTEMS

Wire from the old thermostat terminal marked	Function	Install on the new thermostat terminal marked
Y1, Y or C	Cooling	Y1
W1, W or H	Heating	W1
Rh, R, M, Vr, A	Power	R
C	Common	C
G, F or LOW	Low Fan Speed	G
MED	Medium Fan Speed	G2
HIGH	High Fan Speed	G3

Note: Be sure to seal any opening through the wall behind the thermostat with fireproof material to prevent improper temperature sensing of the conditioned space.

STEP #3**WIRE CONNECTIONS**

If the terminal designations on your old thermostat do not match those on the new thermostat, ***refer to the chart below.***

2-PIPE SYSTEMS

Wire from the old thermostat terminal marked	Function	Install on the new thermostat terminal marked
Y1, Y or C	Water Valve	Y1
W1, W or H	Strip Heater	W1
Rh, R, M, Vr, A	Power	R
C	Common	C
G, F or LOW	Low Fan Speed	G
MED	Medium Fan Speed	G2
HIGH	High Fan Speed	G3

Note: Be sure to seal any opening through the wall behind the thermostat with fireproof material to prevent improper temperature sensing of the conditioned space.

STEP #4**TEST OPERATION****4-PIPE SYSTEM**

Turn the power on to the Fan Coil Unit.



Press the MODE button repeatedly until the **HEAT** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees above room temperature. The hot water valve will open and the fan will be running.



Press the MODE button repeatedly until the **COOL** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees below room temperature. The cold water valve will open and the fan will be running.



Press the UP button until the setpoint is equal to the room temperature. Press the Fan button repeatedly until a single bar appears next to the Fan icon. Confirm the fan is running on low speed. Press the Fan button again, confirm the fan is running on medium speed. Again, press the Fan button, confirm the fan is running at high speed. Press the Fan button once more, the bars next to the Fan icon should disappear.



Press the MODE button repeatedly until the **OFF** icon appears on the display. Both valves will be closed and the fan will be off.

STEP #4

TEST OPERATION

2-PIPE, CHANGEOVER SENSOR, NO STRIP HEAT



Turn the power on to the Fan Coil Unit and confirm that the thermostat is programmed correctly in setup steps #3 and #4 on page 11 of the Owner's Manual.



If hot water is available, press the MODE button repeatedly until the **HEAT** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees above room temperature. The hot water valve will open and the fan will be running.



If cold water is available, press the MODE button repeatedly until the **COOL** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees below room temperature. The cold water valve will open and the fan will be running.



Press the UP button until the setpoint is equal to the room temperature. Press the Fan button repeatedly until a single bar appears next to the Fan icon. Confirm the fan is running on low speed. Press the Fan button again, confirm the fan is running on medium speed. Again, press the Fan button, confirm the fan is running at high speed. Press the Fan button once more, the bars next to the Fan icon should disappear.



Press the MODE button repeatedly until the **OFF** icon appears on the display. Both valves will be closed and the fan will be off.

STEP #4**TEST OPERATION****2-PIPE, NO CHANGE OVER SENSOR**

Turn the power on to the Fan Coil Unit and confirm that the thermostat is programmed correctly in setup steps #3 and #4 on page 11 of the Owner's Manual.



If Heat Only, press the **MODE** button repeatedly until the **HEAT** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees above room temperature. The hot water valve will open and the fan will be running.



If Cool Only, press the **MODE** button repeatedly until the **COOL** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees below room temperature. The cold water valve will open and the fan will be running.



Press the UP button until the setpoint is equal to the room temperature. Press the Fan button repeatedly until a single bar appears next to the Fan icon. Confirm the fan is running on low speed. Press the Fan button again, confirm the fan is running on medium speed. Again, press the Fan button, confirm the fan is running at high speed. Press the Fan button once more, the bars next to the Fan icon should disappear.



Press the **MODE** button repeatedly until the **OFF** icon appears on the display. Both valves will be closed and the fan will be off.

STEP #4

TEST OPERATION

2-PIPE, CHANGEVER SENSOR, WITH STRIP HEAT



Turn the power on to the Fan Coil Unit and confirm that the thermostat is programmed correctly in setup steps #3 and #4 on page 11 of the Owner's Manual.



If hot water is available, press the MODE button repeatedly until the **HEAT** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees above room temperature. The hot water valve will open and the fan will be running. **The strip heat will be locked out if hot water is available.**



If hot water is not available, but your unit is equipped with a strip heat system, press the UP or DOWN buttons until the set temperature is 10 degrees below room temperature. The unit should energize the strip heaters and the fan will be running.



If cold water is available, press the MODE button repeatedly until the **COOL** icon appears on the display. Press the UP or DOWN buttons until the set temperature is 10 degrees below room temperature. The cold water valve will open and the fan will be running.

STEP #4**TEST OPERATION****2-PIPE, CHANGEOVER SENSOR, WITH STRIP HEAT**

Press the UP button until the setpoint is equal to the room temperature. Press the Fan button repeatedly until a single bar appears next to the Fan icon. Confirm the fan is running on low speed. Press the Fan button again, confirm the fan is running on medium speed. Again, press the Fan button, confirm the fan is running at high speed. Press the Fan button once more, the bars next to the Fan icon should disappear.



Press the MODE button repeatedly until the **OFF** icon appears on the display. Both valves will be closed and the fan will be off.

TROUBLESHOOTING



SYMPTOM: The fan will not run in all three speeds or switches speeds in an improper order.
CAUSE: Incorrect wiring between the thermostat and the relay board, or between the relay board and the fan wires.

REMEDY: Recheck the wiring (G=low speed, G2=medium speed, G3=high speed).



SYMPTOM: Cold water valve opens for either a cool or a heat demand in a 4-pipe system.

CAUSE: The thermostat has been programmed for the incorrect type of fan coil.

REMEDY: Confirm that you have entered the correct programming for your type of fan coil system (*steps #3 and #4, page 11 of the Owner's Manual*).



SYMPTOM: The water valve does not open at all in 2-pipe configurations.

CAUSE: The thermostat has been programmed for the incorrect type of fan coil system or the fan coil is not wired to the thermostat correctly.

REMEDY: Program the thermostat for a 2-pipe fan coil (*step #3, page 11 of the Owner's Manual*). Also, make certain that the water valve is wired to the Y1 terminal.



SYMPTOM: Parts of the thermostat display are missing.

CAUSE: The thermostat has been programmed for a minimal display.

REMEDY: Program the thermostat for Full Display (*step #1, page 10 of the Owner's Manual*).

TROUBLESHOOTING



SYMPTOM: The thermostat displays large setpoint digits instead of the room temperature.

CAUSE: The thermostat has been programmed to display Single Setpoint.

REMEDY: Program the thermostat to display Dual Setpoint (*step #2, page 10 of the Owner's Manual*).



SYMPTOM: The thermostat display is stuck in Unoccupied.

CAUSE: The sensor connected to the Dry Contact terminals of the thermostat, is active, forcing the unit into 'Unoccupied.'

REMEDY: Verify proper wiring between the thermostat and the occupancy sensor and verify that the wiring is not shorted.

If no sensor is connected, program the Dry Contact polarity for Normally Open (*step #11, page 13 of the Owner's Manual*).

TROUBLESHOOTING



SYMPTOM: The thermostat will only allow Heat or Off in 2-pipe installations, even though chilled water is available.

CAUSE: Faulty, improperly wired, or improperly installed H2O changeover sensor.

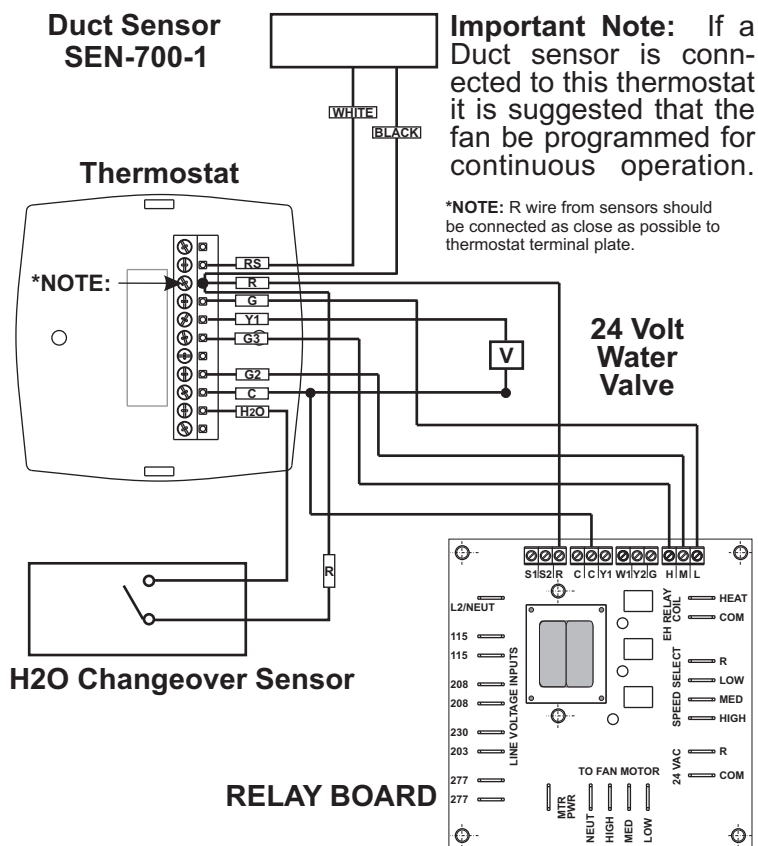
REMEDY: Confirm proper wiring of the changeover sensor (between R and H2O). Confirm proper placement of the sensor (good mechanical coupling for temperature transfer).

Test the changeover sensor as follows:

1. Remove power from the fan coil system.
2. Disconnect the wire between the sensor and the H2O terminal.
3. Place an ohmmeter between R and the wire just disconnected from the sensor.
4. A good sensor will show continuity whenever the water temperature is confirmed to be at or below 65 degrees. If the sensor is open when the water temperature is confirmed to be at or below 65, replace the sensor.

SAMPLE WIRING DIAGRAM

2-Pipe, Low Voltage Valve, H2O Changeover Sensor



TECHNICAL SPECIFICATIONS

T701 Series Thermostat Controllers

Power Requirements		20 - 30 VAC 50/60 Hz, 3 VA @ 24V nominal.
Output Rating (fan or valve outputs)		0.4A max, 0.01A min, 3A inrush, 20 - 30 VAC
Digital Inputs	H2O	voltage free contacts, closed to signal CHILLED water supply
	CK1	voltage free contacts, closed to alter setpoints
Local Temperature Sensor Type		solid state temperature sensor, 10 mV / degF
Remote Temperature Sensor Type		solid state temperature sensor, digital communications over two wires, 5 ft cable supplied, accurate to 1 degF
Wire Size		16 AWG (100 ft max) to 24 AWG (36 ft max)
Temperature Adjustment Range		35 to 99 degF (2 to 36 degC)
Accuracy		35 to 65 degF +/- 3 degF, greater than 65 to less than 80 degF +/- 2 degF, 80 to 99 degF +/- 3 degF, greater than 99 to 104 degF +/- 5 degF
Deadband		Adjustable 1 to 6 deg first stage, fixed 1 degree for med/hi fan speeds
Ambient Conditions	Operating	35 to 104 degF (2 to 40 degC), 5 – 95% RH non-condensing, 86 degF max dew point
	Storage	-22 to 122 degF (-30 to 50 degC), 5 – 95% RH non-condensing, 86 degF max dew point
Compliance		UL/CUL listed, file E107041, NEC Class 2
Dimensions		3.14" H x 3.14" W x 1.1" D
Shipping Weight		0.25 kg

North American Emissions Compliance

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.
Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.



P/N 88-823
Rev. 1L