

# Troubleshooting Common Thermostat Problems

## *Signature/Star Series*

(Except for P374-0000, 0100, 0200, 0300)

- 1) Clock losing time
  - 2) Display goes blank or shows "PF" when starting cooling or heating
  - 3) Unit running backwards – cooling on heat demand, heating on cool demand
  - 4) Unit runs both heat and cool at the same time
  - 5) Display blanks out during heating
  - 6) Wireless thermostat won't turn on heat or cool
  - 7) Batteries die rapidly in wireless stat
  - 8) Setup – can't get into advanced setup or can't get past step 2**
  - 9) Buttons don't work
  - 10) Temperature inaccurate
  - 11) Fan doesn't come on with the heat
  - 12) Thermostat settings change or scramble when supplemental heat comes on
  - 13) Remote sensors show wrong temperature
  - 14) Thermostat doesn't respond to changes in room temperature
  - 15) Erratic operation, partial display, or fluctuating temperature
  - 16) Switches won't move, or door won't close properly
- 1) Clock losing time**

This almost always caused by the furnace tripping on high temperature limit, or some other safety limit. When the temperature limit is exceeded, the furnace shuts off the burners and the 24VAC to the thermostat. When the stat loses power, the clock stops. The furnace blower remains on, so the homeowner may never notice a problem, and when the temperature is back within limits, the burners come back on, and the power to the stat is restored. The clock will be slow by however many minutes the power was off to the thermostat. Correction: Find the cause of the high temperatures – dirty filter, etc.
  - 2) Display goes blank or shows "PF" when starting cooling or heating** – The thermostat only does this when there is no common wire. If the common wire is present, check it for continuity, look for a short, a broken wire, or a bad connection. If the equipment is a heat pump, or heat only or cool only, you **MUST** have a common wire. If the equipment is gas/electric, the stat will work without a common, but if it goes blank when starting the heat or cool, add the resistor (included with the thermostat) at the equipment side (not at the thermostat!) between W and C.
  - 3) Unit running backwards** – cooling on heat demand, heating on cool demand – the heat pump setting is wrong – go to setup step 3 and change the heat pump setting. If the unit is a commercial heat pump, it may not require a heat pump thermostat, so step 3 should be turned OFF. In this case, electric heat (setup step 5) may have to be turned ON.
  - 4) Unit runs both heat and cool at the same time** – the heat pump setting is wrong – go to setup step 3 and turn HP to OFF.
  - 5) Display goes blank during heating** – most likely the furnace is tripping on high limit or some other safety limit. The furnace will shut off the burners AND break the R leg to the thermostat, so the thermostat has no power and will go blank. Solution – identify the cause of the limit trips.
  - 6) Wireless thermostat won't turn on heat or cool** – check the house code on the thermostat and on the receiver. They must match. The house code on the receiver is set using dip switches, the house code on the thermostat is set in the thermostat setup, step 4. Check setup step 3 (zoning), it should be always be set to no. Also, check batteries – these thermostats require AA Lithium batteries, alkalines will not work correctly.
  - 7) Batteries die rapidly in wireless stat** – make sure the batteries are AA Lithium batteries. Regular alkaline batteries will die rapidly and cause erratic thermostat operation. Also check the thermostat backlight setting in setup step 9. If the backlight is ON, the batteries will run down very rapidly. If the customer really wants the backlight on all the time, use the optional transformer part # P474-0800 to plug the thermostat into a wall outlet.
  - 8) Setup – can't get into advanced setup or can't get past step 2** – to get into setup on any of the 4 button thermostats, hold Mode and Fan (or Mode and Override) for **SEVEN** seconds. If you only hold the buttons two seconds, you can only get to step two. You must hold the buttons SEVEN seconds, even though the display will say setup after two seconds.

- 9) **Buttons don't work** – most likely the keypad is locked. Press Mode, Up and Down simultaneously to unlock the buttons.
- 10) **Temperature inaccurate** – Calibrate the thermostat. On 4 button models, press Mode and Down for two seconds, the whole display will light up. Press Mode, and the room temperature will appear. Use the Up or Down buttons to adjust the temperature. Press Mode to exit. On 8 button models (with a door), hold Mode and Fan for 5 seconds, the whole display will light up. Press Up and Down simultaneously once, then again. Room temperature will appear. Use Up or Down to adjust temperature, press Mode to exit.
- 11) **Fan doesn't come on with the heat** – Turn electric heat on, setup step 5.
- 12) **Thermostat settings change or scramble when supplemental heat comes on** – Some heat pumps create a large voltage spike when the unit goes in to defrost and/or when the supplemental heat comes on. This large voltage spike can cause the microchip in the thermostat to reset, changing settings. Settings can be restored with a factory reset (see below), but if the problem is re-occurring, replace the thermostat with a flush-mount model, a P474-1050, -2050, or -2150, a 33CSSP2-WC, or with a newer Signature or Debonair with a date code later than 1499, all of which have additional high voltage protection.
- 13) **Remote sensors don't show correct temperature** – Check that the degree symbol on the thermostat is flashing – if it is not flashing, the remote sensor is not connected correctly. Check wiring and make sure that you are not using shielded wire, as this will throw temperature off. Do not reverse RS+5 and RS GND as this may damage the sensor! Note: Do not use an ohmmeter to test the sensor – these are digital sensors, not thermistors, and they can be damaged by an ohmmeter.
- 14) **Thermostat doesn't respond to changes in room temperature** – this happens when there is air blowing through the thermostat from the wall behind it. Insulate the hole behind the thermostat with insulation, spray foam, or even duct tape – whatever will stop the airflow from behind the wall.
- 15) **Erratic operation, partial display, or fluctuating temperature** This can be caused by poor pin connections between the backplate and the thermostat, almost always because the backplate is flexed against an uneven wall. Loosen the screws that attach the backplate to the wall, allowing the backplate to flatten out, then snap thermostat back onto the backplate.
- 16) **Switches won't move, or door won't close properly** – this is a mechanical problem caused by tightening the backplate screws too tight on a non-flat wall, which warps the backplate. Loosen the mounting screws to allow the backplate to straighten out.

### **General Tips:**

**Wireless thermostats:** Make sure the model number of the thermostat matches the model number of the receiver (i.e., P474-1100RF goes with P474-1100REC, not with P474-2300REC.) If the model numbers do not match, the stat and receiver will not be compatible. When replacing a Venstar T100RC with a Totaline wireless stat, you must replace the receiver with a Totaline as well. Also, at this time the Zone setting in wireless thermostat setup is not used. It should always be set to No.

**Voltage outputs:** To check your voltage outputs you must have a load on the thermostat outputs and measure between R and the specific output. Your readings should be between 0.5 volts and 1.1 volts AC if the output is on, and between 21 and 30 volts if off. Also, you cannot read temperature from a remote sensor using an ohmmeter.

**Dry Contacts:** When CK1 and CK2 are energized, the thermostat is forced into Occupied 1 (if the stat is in Program On mode – in any other mode, the dry contact is ignored). When CK1 and CK2 are de-energized, the thermostat will revert to its regular program. On the 33CS071-01 and the P374-2100 operation of the CK1 and CK2 terminals is configurable to normally open or normally closed, and operates in all modes except OFF.

**Ck1 and Ck2:** Programmable stats - only works if the Thermostat is in Program On mode. Non-programmable stats – works in all modes except OFF.

**Resistor:** The resistor that is included with the thermostat should ONLY be used if there is no common wire AND the thermostat is not operating correctly (see number 2 in troubleshooting). Otherwise, the resistor is NOT USED.