

# Troubleshooting Guide for Temperature Reading Jumping Around

Version 1.2 (May 2022)

## Symptoms

The temperature reading on the PID controller becomes unstable or jumps around fast. Sometimes the issue appears when the espresso machine and the PID controller are just powered on. The sensor reading may jump lower than the room temperature or even below the freezing point. Sometimes the issue appears when the boiler temperature has reached the brew set temperature, causing incorrect output to the heater or even trip the thermal protection fuse. The controller may sometimes even show “EEEE” error code, which means signal out of range or no sensor connected. This issue can be intermittent. And the issue may appear or disappear if a key on the controller is pressed or the controller is being tapped.

## Possible Causes

1. The wires attached to the pin 6, 7, and 8 on the PID controller might be loose or broken. See Figure 1 for the sensor wiring. This is the most probable cause for a newly installed kit.
2. The temperature sensor ([RTDstat](#) or [PT100M4](#)) has become defective.
3. The temperature sensor is not in good contact with the boiler. Either the sensor is not firmly mounted or there is a poor thermal conduction between the sensor and the boiler.
4. The PID controller has become defective.

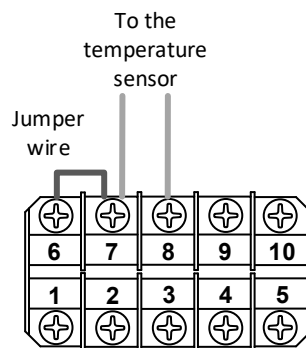


Figure 1. The sensor wires are attached to pin 7 and 8. The short jumper wire is attached to pin 6 and 7.

## Tools Needed

A Phillips screw driver and a flat head screw driver.

A multimeter for measuring resistance.

## Troubleshooting Steps

First, turn on the coffee machine, and try to wiggle the controller left and right, up and down by holding its front frame, to see if the temperature reading will be affected. If the temperature reading changes, more likely it is wires connected to pin 6, 7, and 8 have become loose. Then turn off the coffee machine and disconnect its power cord.

Please remove the four screws on the front plate of the metal box of the PID controller. Gently pull the PID controller with the front plate forward to access the screws on the back of the controller. You might need to open the espresso machine to cut loose a cable tie if there was a cable-tie that holds all the wires together.

1. Check the wire connection on pin 6, 7, and 8. If any of the screw pin is loose, there can be a high contact resistance between the wire and the screw pin on the PID, which will introduce error to the temperature reading. Please make sure the metal conductor of each wire is firmly compressed by the screw, no stray strands are left out, and no wire insulation is caught in-between.
2. Check the resistance of the RTD sensor.
  - To test the sensor, please find a multimeter and turn to the resistance measuring function. Please remove one of the sensor wires from either pin 7 or pin 8 on the PID controller, and measure the resistance between the two sensor leads. When it is under room temperature, the resistance should be around 110 ohms and the reading should be stable.
  - The resistance of the jumper wire, which is connected to pin 6 and pin 7, should be zero ohm.
3. Check if the RTD sensor is making a good contact with the boiler and if there is any heat transfer compound between the sensor and the boiler surface.
  - If you have an RTDstat sensor, please check whether the two screws that hold the mounting bracket are tight. The RTDstat sensor should be firmly pressed against the boiler. Apply some fresh heat transfer compound if the old compound has become dry.
  - If you have a PT100M4 screw sensor, gently turn the screw sensor clockwise with a small wrench or a pair of pliers. Please do NOT over-tighten it.  
**Note:** If you want to remove the PT100M4 screw sensor to apply heat transfer compound, more steps are involved and please be very careful. You'll need to remove the sensor wires from the PID controller first. Turning the screw sensor with wires still attached to the PID may result in twisting and breaking the wires inside the tip of the screw sensor.)
4. If all you have checked all the steps above and still have the problem, please [contact us](#) to either send in the PID controller for inspection/repair, or to purchase a replacement controller.

Please [contact us](#) for any question during the troubleshooting process.

(End)

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