Service bulletin
Checking and replacing temperature sensors

BOSCH

Introduction

- The inlet and outlet temperature sensors work together to ensure that the set-point temperature on the control board can be reached accurately. Incorrectly placed sensors, corroded sensor connections or defective sensors may result in temperature overshooting/undershooting, fluctuating temperatures and in some cases a lock-out error code on the control board that requires resetting. These error codes are typically A7, A9, E1, E2, and in some cases E9.

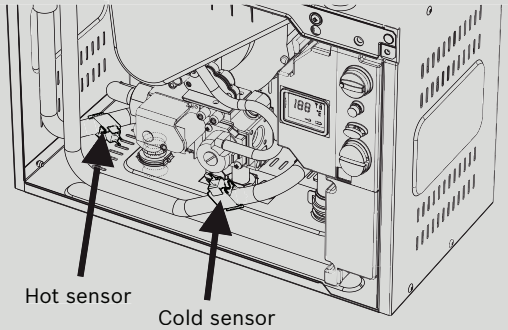
Tools needed:

- Multi-meter
- Thermometer
- Philips head screw driver
- Emery cloth

Preparation

1. Remove the front cover of the water heater. For instructions on removing the front cover, refer to the installation/owner's manual of the water heater.
2. Locate the temperature sensors clipped onto their respective hot and cold ½" copper pipes inside the water heater. The hot water temperature sensor should have two red wires connected from the control board and should be located on the horizontal pipe. The cold water temperature sensor is connected with two blue wires and should be clipped to the diagonal pipe. See below.

Temperature sensor location



3. If the either sensor is not in it's respective location, move to the proper location immediately. Ensure that the sensor is firmly clipped and making good contact with the copper pipe.

Removing, cleaning and/or replacing temperature sensor

1. Remove the wire spade connections on the temperature sensor in question.
2. Unclip temperature sensor from the copper pipe. Wipe the inside of the sensor clean with a pencil eraser where it makes contact with copper pipe. Wipe down the ½" copper pipes where sensors are placed with a clean rag.
3. Clip the cleaned or new temperature sensors firmly onto the pipe. (see Temperature sensor location figure) Make sure sensor is making good contact with copper pipe.
4. Clean and polish spade connections on temperature sensors with emery cloth. Reconnect wire connections to their respective sensor ensuring that the spade connectors are fully seated. **NOTE:** There is no polarity between the sensor connections or wires.
5. Repeat these steps for both sensors as needed.

Testing temperature sensors

1. Turn the on/off switch on the water heater to off. Display should be blank.
2. Remove the wire spade connections on both temperature sensors.
3. Remove the hot water temperature sensor from the outlet pipe and place this directly adjacent to the cold water sensor on the inlet pipe inside the water heater. Make sure that both sensors are seated firmly on the copper pipe.
4. Turn on a hot water fixture such as a sink and allow water to run steadily through the water heater for 5 minutes. Using a thermometer, measure the temperature of the water flowing out of this tap. Continue running water and go back to the water heater.
5. Using a multi-meter set on kilo-ohms (kΩ), measure the resistance between the two connections of each sensor and record readings.
6. Refer to the table below for resistance readings in accordance with water temperature readings. **NOTE:** Readings are approximate. If readings are inconsistent between sensors and/or do not match approximate readings, replace the sensor with improper readings. If sensor readings are accurate according to the table but still give inconsistent temps or an error code, contact Bosch Water Heating Technical Support at 800-642-3111.

Temperature sensor readings

Temperature	Approximate resistance reading
32 °F	40 kΩ
55 °F	22.5 kΩ
65 °F	13.5 kΩ
100 °F	7.5 kΩ
120 °F	4.5 kΩ
140 °F	3.5 kΩ

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