

Heating Element Replacement

TRONIC 5000C Pro Models: WH17, WH27, WH36 (serial numbers \geq FD108)



BOSCH

Introduction



WARNING:

Electricity is extremely dangerous. Take extra precautions and ensure all circuit breakers are off before performing any work on the heater.



WARNING:

The following procedure must be performed by a licensed electrician.

Tools Required

- ▶ Electrical meter
- ▶ Phillips head screwdriver
- ▶ Small flat head screwdriver
- ▶ Heat sink paste
- ▶ Socket wrench with extension bar and 8mm socket (torque wrench preferred)



DO NOT use power tools of any kind due to danger of stripping screw threads.

Preparation

1. Turn off circuit breakers supplying power to the water heater.
2. Close installer supplied shutoff valves. If shutoff valves have not been installed, shut off water to the property.
3. Open a hot water fixture to allow water to drain from the heater.
4. Remove the four cover screws and retain, lift off the cover and store safely.
5. Using an electrical meter, confirm power is off the the heater.

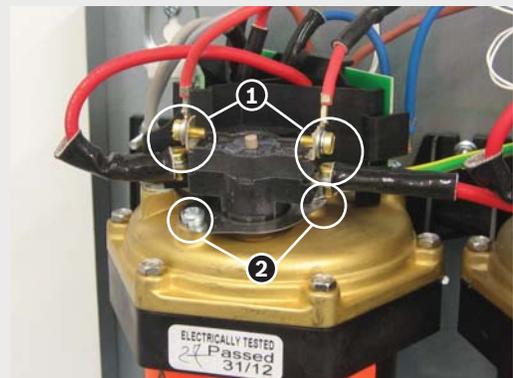
Removing the thermal cut-out (TCO)



Take note of all wires connections. Taking pictures for reference is recommended.

1. Unscrew the red wire connections to the thermal cut-out (Fig. 1, pos. 1). There are 2 screws on the 17kW; 4 screws on the 27kW & 36kW. Retain the screws and washers.
2. Remove the two mounting screws with washers and green/yellow ground wire attached to the TCO (Fig. 1, pos. 2). Remove TCO and retain all parts for reinstallation. Wiring can be lifted out of the working area to keep it clear. Secure with adhesive tape as needed.

Fig. 1



Removing the wiring

1. Remove the thin white signal wires (Fig. 2) from the triac printed circuit boards by gently bending the locking tab on the connector with a small flat head screwdriver so that the plug can be removed. These cables can be moved out of the working area.

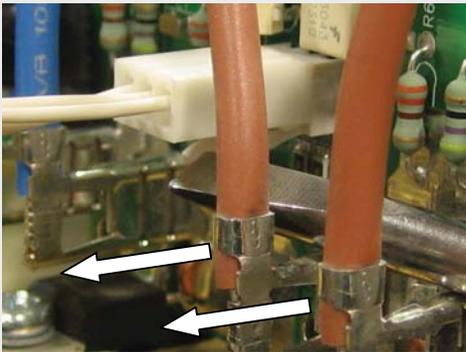
Fig. 2



2. Unplug the ¼" push on connectors for the black, brown, and grey (grey is only for 27/36kW units) wires connected to the triac boards on the top of the heating module (Fig. 3). These are the wires that go from the white terminal block on the right side of the unit to the triac boards mounted on the brass top of the module. Wiring can now be placed out of the working area.

i On the 36kW, the triac printed circuit board on the right hand module uses ring terminals retained by large screws. These can be removed with a Phillips head screwdriver and saved for reassembly.

Fig. 3



3. Unplug the short colored wires that are attached to the elements and plugged into the triac boards on top of the module.

Removing the triac printed circuit boards

1. Using a Phillips head screwdriver (magnetic bit recommended), undo the one or two triac clamping screws (Fig. 4). Retain screws and washers for reassembly.

i The white paste on these parts is normal and is used to transfer heat from the triac to the brass head. Remove old paste as new heat transfer paste will be applied during reassembly. Avoid getting it onto clothing and wipe / wash from hands before eating or drinking.

Fig. 4



2. Lift up and remove the moulding complete with the printed circuit boards (Fig. 5). Feed the 3 or 5 wires through the holes, noting which color wires go through the large and small holes for reassembly.

Fig. 5



Removing the heating element

1. Using an 8mm (5/16") hex socket, carefully remove the 6 hex head screws securing the brass head to the top of the black polymer heating module (Fig. 6).

Fig. 6



i Place a cloth or absorbent paper under the heating module to catch any water that leaks from the vessel when the brass head is removed.

2. Remove the brass head and element from the polymer module. It may be necessary to use a flat head screwdriver to carefully pry them apart (Fig. 7).

Fig. 7



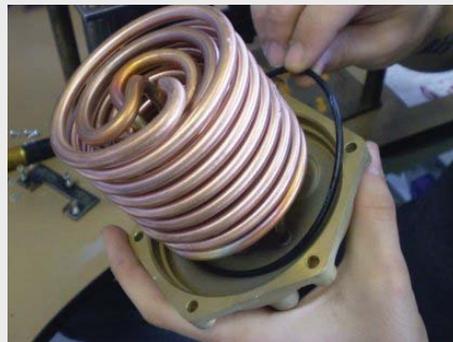
3. Inspect the elements for scale buildup. If scale is present, water supply must be treated to prevent damage to the elements. Consult local water treatment professional for recommendations.
4. If only removing the element for cleaning, remove scale with regular white vinegar and a soft brush.

i Scale build up is NOT a defect or warranty issue but is related to water hardness (mineral content).

Replacing the heating element

1. Remove the old o-ring from around the black polymer module and discard it. Using a clean cloth or absorbent paper wipe the silicon grease and any water debris from the lip of the module. This surface MUST be clean and dry to seal properly when reassembled, do not use abrasive cleaners.
2. Turn the brass head upside down so the element coils face you. Generously apply lubricant to the new o-ring, inner lip of the new element assembly and outer lip of polymer module. We recommend using Dow Corning 111 Valve Lube and Seal (Bosch part number DOWLUBE).
3. Insert the new o-ring into the top of the brass element head, ensuring it is even and fully seated on the ledge approximately 1cm (3/8") in from the mating surface (Fig. 8). Do not install o-ring on the black polymer module.

Fig. 8



4. Install the brass head element assembly into the polymer module. Orient the assembly with the thermal cut-out mounting towards the front of the module. Grip both sides of the brass head and push onto the black module keeping the brass head flat (Fig. 9). This will require a significant amount of force as it will compress the rubber o-ring seal. If the head tilts or the o-ring is pinched it may not seal properly.

Fig. 9

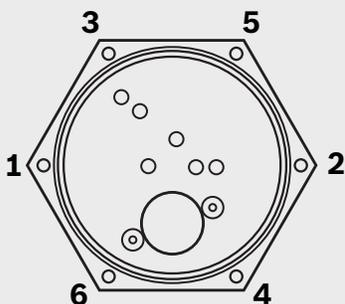


- Carefully, and as straight as possible, reinstall the 8mm (5/16 hex nut) hex head screws and only tighten by hand until snug. Using an 8mm (5/16") hex socket, screw each of the screws down by half a turn at a time in the sequence shown (Fig. 10). This will tighten the head onto the black module, keeping it flat and using the screws to provide the force to compress the o-ring.

NOTICE:

Due to danger of stripping the screw threads, DO NOT overtighten or use power tools. No more than 2 foot pounds of torque should be used.

Fig. 10



- Open a hot water fixture and slowly turn on the water supply to the heater and check for leaks. Turn off the water supply. If no leaks occur, proceed to the next step. If there are leaks of any kind, remove the element assembly and ensure the o-ring is seated properly.

Reattaching the triac circuit boards

- Ensure the metal underside of each of the triac switch is clean of old transfer paste. Using new heat transfer paste, apply a small amount (approx. 1/4" diameter) of the paste onto the metal underside of each of the triac switches. Do not apply more than the recommended amount of paste as this will affect heat transfer. (Fig. 11).

NOTICE:

An inadequate amount of heat sink paste can lead to triac failure and overheating, causing the thermal cut-out to trip.

Fig. 11



- Reattach the moulding and printed circuit boards to the brass head threading the wires through the large and small holes. The thick RED wire goes through the small right hand hole and all the other wires go through the left hand hole. Insert the screw with lock washer through each of the triac switches and lightly engage the thread (Fig. 12). Insert all screws (2 or 3) before tightening. Do not over tighten screws but ensure contact between triac base and the brass head is sufficient.

Fig. 12



Reconnecting the wiring

- Use the wiring diagram found in the installation manual for reference. Reconnect the 1/4" connectors for the black, brown, and grey (grey is only for 27/36kW units) wires connected to the triac boards on the top of the heating module (Fig. 3). Use a flat blade screwdriver to push the connectors on if required after aligning for straight engagement.
- Reconnect the thin white signal wires; the three wire connector goes to the printed circuit board mounted nearest the back. The two wire cable goes to the printed circuit board on the left hand side of the head on the 27kW & 36kW units.

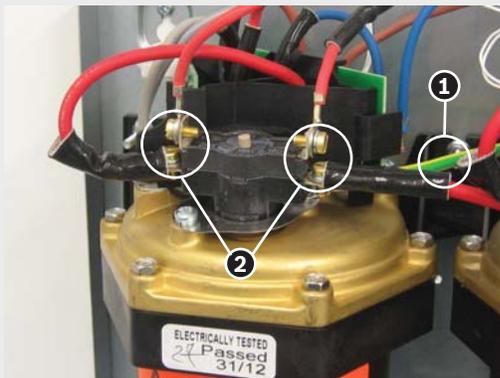
Fig. 13



Reattaching the thermal cut-out (TCO)

1. Align the thermal cut-out with the two threaded holes in front of the printed circuit boards. Install screws complete with spring lock washers remembering to fit the Green / Yellow ground wire (Fig. 14, pos. 1) underneath the right hand screw. Tighten both screws hand tight without damaging the screw head.
2. Reconnect the red wires back onto the sides of the thermal cut-outs (Fig. 14, pos. 2), refer to wiring diagram. It is essential that these connections are tight and that the spring washers are compressed. Care MUST be exercised to avoid bending or damaging the TCO tabs as this may affect the component function. On the 27kW & 36kW units there are two sets of connections. The lower level connections must be completed before the upper connections are started.

Fig. 14



Commissioning the water heater

1. Before commissioning the water heater perform a once over check:
 - ▶ Are all connections correct according to the wiring diagram found in the installation manual for this model?
 - ▶ Are all connections tight?
 - ▶ Is there evidence of the heat transfer paste being squeezed out from under each of the triac switches where they have been clamped?
2. Reattach the cover using the 4 screws ensuring that no wires are trapped.
3. Turn on a hot water fixture and open shut off valves to heater to allow water to flow through the heater to purge the air from the lines.
4. After the water has been flowing for at least 30 seconds, turn on circuit breakers. The light should come on and water should heat.



WARNING:

DO NOT turn on the electricity until all air is purged and the unit is full of water as this will damage the unit.



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