

## Replacing the heating element

**Only a qualified electrician may carry out the following steps.**

First check whether the mains fuses of the furnace are fully operative.

### 1. Carry out the following tests to check the functional performance of the heating circuits:

- Visually check all heating elements including the heating elements in the furnace bottom (lift bottom plate, see Fig. 5)
- Measure the current consumption with a snap-on ammeter (see Fig. 2)
- Carry out the 5 seconds test: heat up the furnace for only 5 seconds, then switch the furnace off and disconnect the mains plug or switch off the main switch. Check with your hand which heating element (door, rear wall, side walls) has not heated.

**Attention:** Older heating elements can break easily!



Fig. 1

Tools required (from left to right)

- bullet of wood to beat in the ceramic conduits
- hammer
- spanner (8 or 10 mm)
- screw driver
- pointed pliers
- diagonal cutting pliers
- water pump pliers
- snap-on ammeter

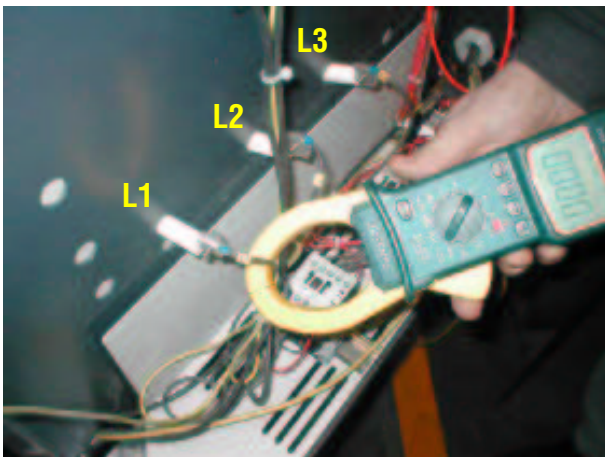


Fig. 2

### Measuring with a snap-on ammeter (in this case N200)

The snap-on ammeter must be held above the corresponding phase. When the furnace heats with a capacity of 100% a similar current must flow through all three phases.

Measure at the same time the voltage between the phases or between the phase(s) and the zero conductor. If the current consumption differs to a considerable extent, the corresponding heating circuit(s) must be exchanged.

Three phases are connected to the furnace shown in the picture on the left (L1, L2, L3).

## 2. Replacing the lateral heating elements



Fig. 3

Switch off the main switch or disconnect the mains plug before replacing the heating elements.

- Remove the rear wall cover as far as possible (do **not** remove the protective conductor).
- Hold the connecting terminal with the water pump pliers and loosen the screws of the terminal with a spanner.



Fig. 4

- Remove the ceramic conduit.
- Clean or replace, if necessary, conduits which are contaminated.

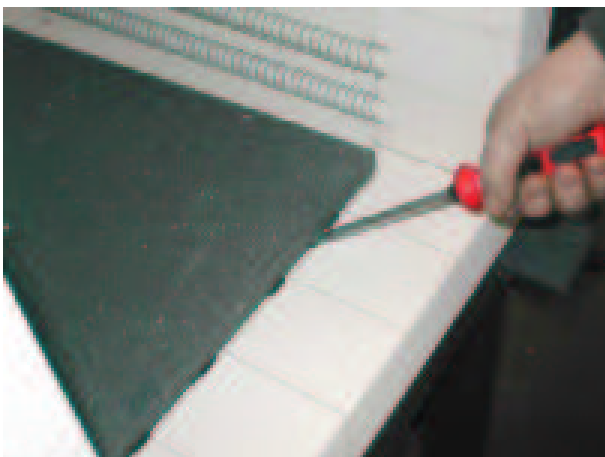


Fig. 5

- Lift the bottom plate with a screw driver and remove the plate through the door opening.
- Replace contaminated bottom plates, if necessary.

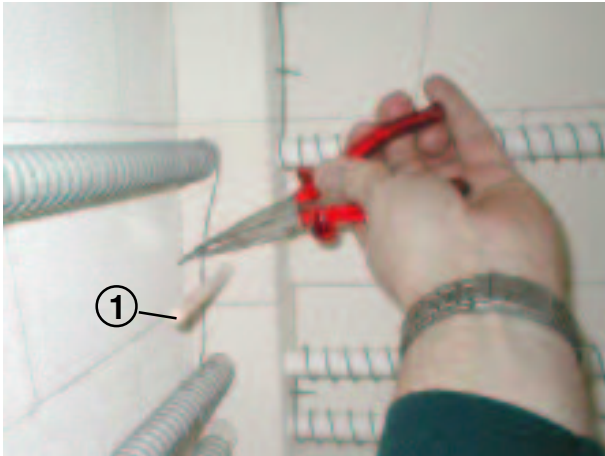


Fig. 6

- Pull out the cramps or the ceramic tubes that secure the heating elements using the pointed pliers and take out the supporting tubes on the front at the collar brick (when the heating elements are installed on the sides).

**Attention:**

The old cramps can break easily. If a cramp should break the residues are to be removed. Take care not to damage the thermocouple (1) when doing so.

### 3. Installing a new heating element



Fig. 7

- Spread out the new heating elements on an even surface, so that the supporting tubes can be inserted without any difficulties (the supporting tubes in the bottom can be longer than those in the sides).

**Attention:**

Only use clean supporting tubes and replace the tubes if necessary.

- On new heating elements the twisted ends are protected by a grommet. Before installing the heating elements cut off these grommets with a pliers.



Fig. 8

- Before installing the heating elements make sure that the distance between the supporting tubes is the same as the distance between the holes in the furnace. Beginning at the top, insert the twisted end in the opening provided therefor. Turn the twisted end slightly (if necessary) so that it protrudes at the back.
- Hang in the supporting tubes one by one from top to bottom.

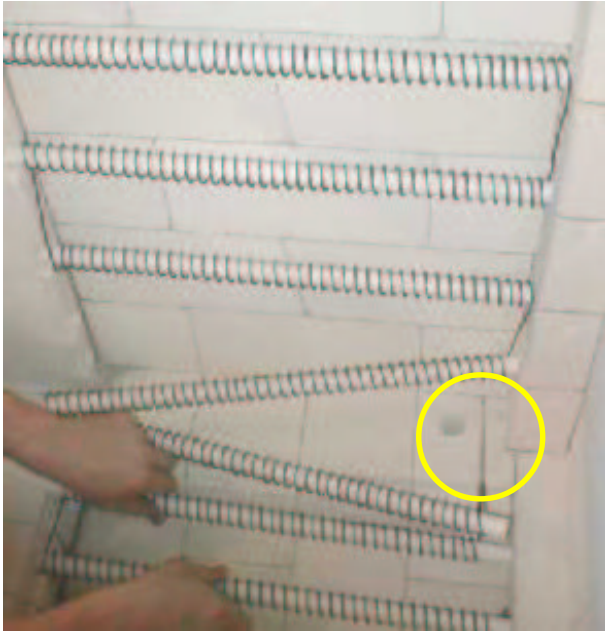


Fig. 9

**Attention:**

Make sure that the wire junction from the side walls in the bottom is inserted into the groove (to be seen on the right side in the figure) and does not have any contact lateron to the SIC bottom plate. It is important to fasten the wire junctions with cramps (see Fig. 14).



Fig. 10

- Put a small quantity of insulating wool into the opening.
- Put the conduit over the twisted ends.



Fig. 11

- Beat the tube, together with the cotton wool, carefully in the opening using a bullet of wood.
- The twisted end should protrude by appr. 30 mm.



Fig. 12

- Cut off the twisted end so that it is only a little bit longer than the width of the terminal (abt. 2 - 3 cm).

**Attention:**

If the twisted end is too long, it may have contact to the cover box.



Fig. 13

- Insert the cable in the terminals and tighten.

**Attention:**

Use only the new terminals included in the scope of supply. Take care that the end of the connection lead is clean and is placed correctly under the terminal.

- Hold the connecting terminal with the water pump pliers and tighten the screws of the terminal with a spanner.



Fig. 14

- Beat in the new cramps at all junctions to prevent that the wire is drawn inwards. Depending on the furnace model, ceramic tubes are used instead of the cramps.

**Attention:**

Never beat in the new cramps in the old holes to prevent problems with the Fi switch (if installed).

- Insert the bottom plate (if the plate is heavily contaminated, replace the bottom plate by a new one).
- Screw down the cover box (if it has been removed) and connect the protective conductor of the cover box.