

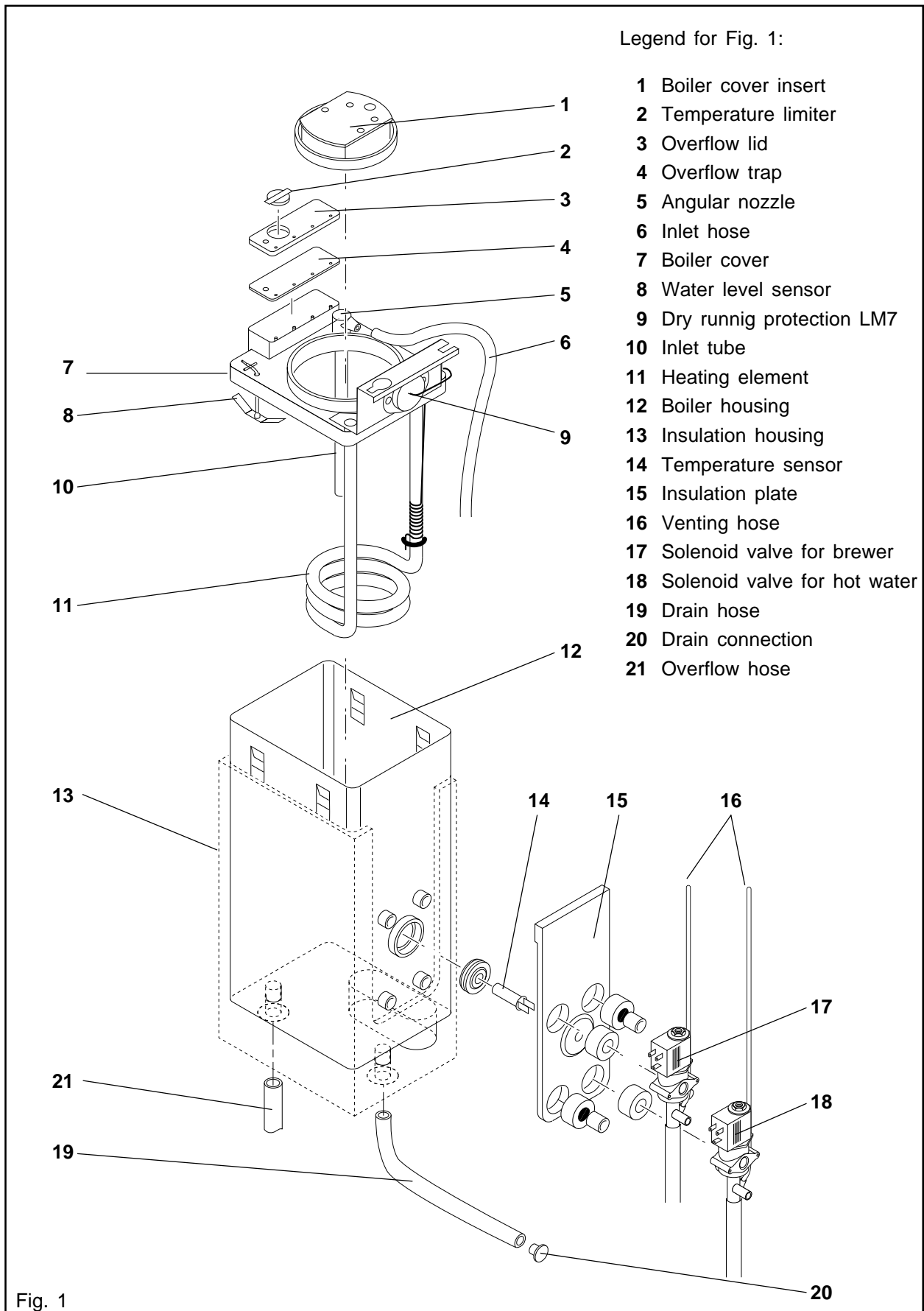
A Water System

A.1 Adjustments

WHAT	HOW
Solenoid valve	see chap. A.2 'Disassembly of the solenoid valve'

A.2 Disassemblies

A.2.1 Overview - Components of the Boiler



A.2.2 Safety Instructions for the Disassemblies of the Boiler

- WARNING:** Risk of being scalded!
Hot water!
Components like solenoid valves are plugged to the boiler.
When working on the boiler there is no protection against accidentally pulling out a component and thereby causing hot water to spill from the boiler.
- CAUTION:** Do not damage the capillary tube of the dry running protection. Do not bend or buckle!
- CAUTION:** The solenoid valves and the temperature sensor are plugged to the boiler.
- CAUTION:** Do not pull the solenoid valves out of the boiler!
- DANGER:** Only replace the cable harnesses as complete original spare parts! Never repair the cable harness of the heating system! Danger of a fire!
- WARNING:** Hold the components when disconnecting electrical connections in order to prevent draining water from the boiler. There is a risk of being scalded!
- WARNING:** For safety reasons the heating element, the dry running protection and heating cable harness may only be replaced with the assembly unit 'boiler' or 'spare part boiler cover'.

A.2.3 Draining Water from the Boiler

- Open the left door.
- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Remove the product container (see chap. Maintenance)
- Open the right door. (remove two screws)
- Remove the top front cover (1) (Fig. 1).

CAUTION: The solenoid valves for the brewer (2) and hot water (3) are plugged to the boiler. (Fig. 2)
Warning: Risk of being scalded.

- Remove the cover (4) and the cash box if necessary (Fig. 2).
- Pull out the drain hose (5).
- Close the drain hose (5) with a hose clamp (Fig. 2).
- Pull out the discharge plug (6), loosen the hose clamp and hold the drain hose into a container (capacity: min. 5 l) (Fig. 2).

WARNING: Do not pull the drain hose out of the boiler.
Warning: hot water, risk of being scalded.

CAUTION: Mounting is done in reverse order.
 Make sure that the drain hose (5) is positioned correctly in the dispenser. (Fig. 2)

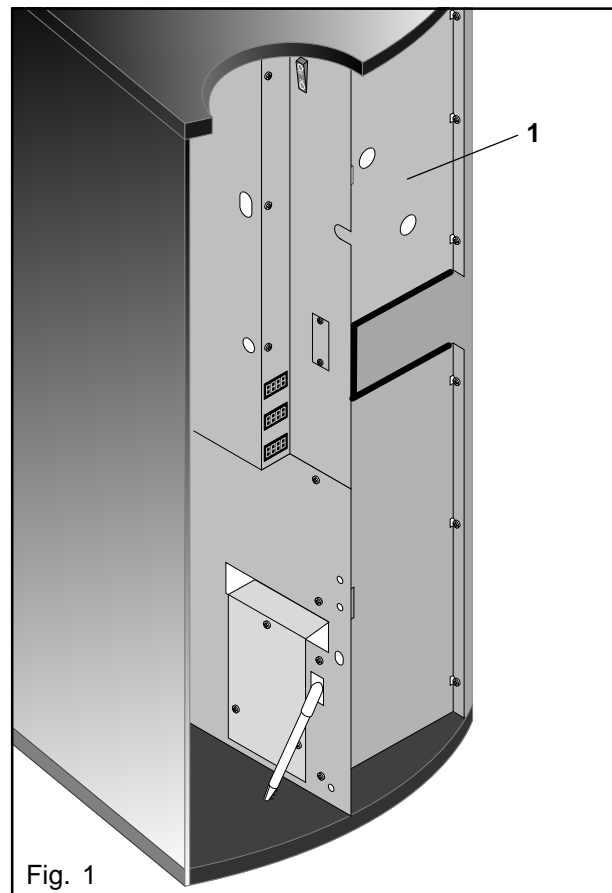


Fig. 1

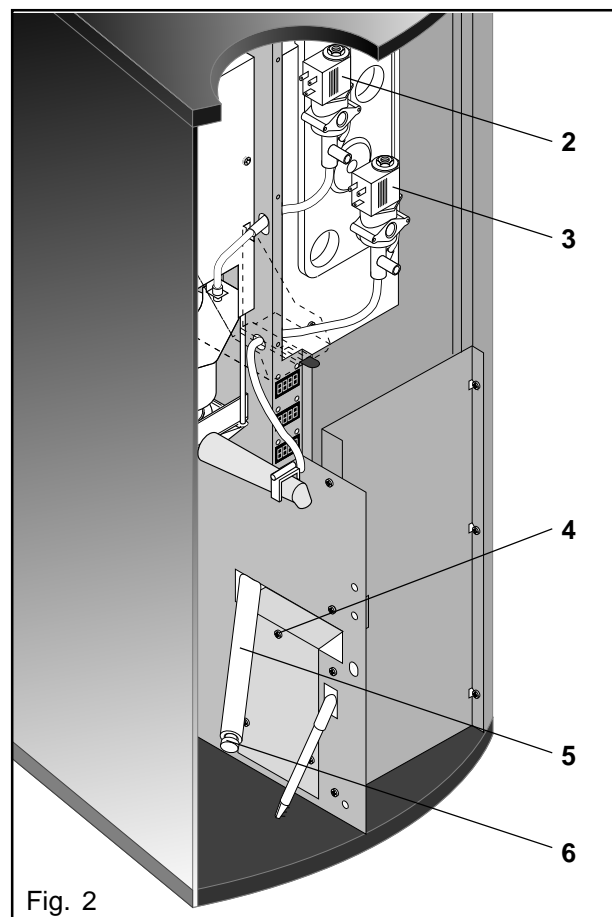


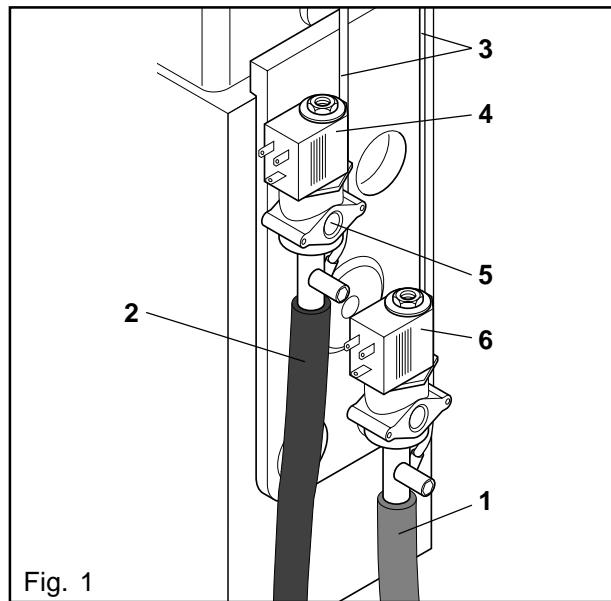
Fig. 2

A.2.4 Dismounting the Solenoid Valves for the Brewer and hot Water

- Drain the water from the boiler (see chap. A.2.3).
- Loosen the hoses for the solenoid valves to be dismantled (hot water (1) and brewer (2)). (Fig. 1)
- Disconnect the electrical connection and pull off the solenoid valve (4) (Fig. 4).



When dismantling the solenoid valve (4) for the brewer and hot water make sure whether a reduction below 4 mm Ø for the brewer and 2 mm Ø for hot water has been installed (to prevent dosing errors). When replacing the valves the calibration must be carried out again (see chap. 4)
If necessary install a new gasket before mounting the valve.
Position the valve venting device (3) onto the new solenoid valve.
Solenoid valve for upper position: short valve venting.
Solenoid valve for upper position: long valve venting.



Adjusting the solenoid valves

- The solenoid valves (4) for hot water and the brewer are preadjusted by the manufacturer. (Fig. 1)
- If error "E0" occurs when the water quantity is low (short valve opening time) and the coffee quantity is high (e.g. strong mocha), close the solenoid valve a bit and increase the water quantity (valve opening time) for mocha and coffee (see chap.4)
- **As a spare part solenoid valves with a full opening are delivered.**



When dismantling the solenoid valve for the brewer make sure whether a reduction < 4 mm has been carried out (prevention of error "E0").

Adjusting the solenoid valve (6) for hot water

The adjustment has been carried out for all dispensers by the manufacturer. In case of a replacement the solenoid valve has to be adjusted:

- In this case, close the hot water valve and then open it again (3 turns).

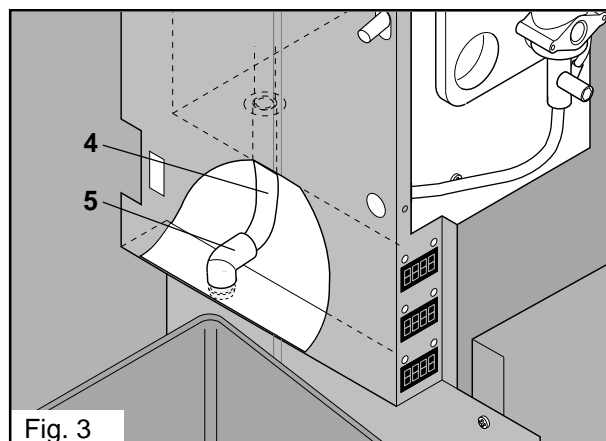
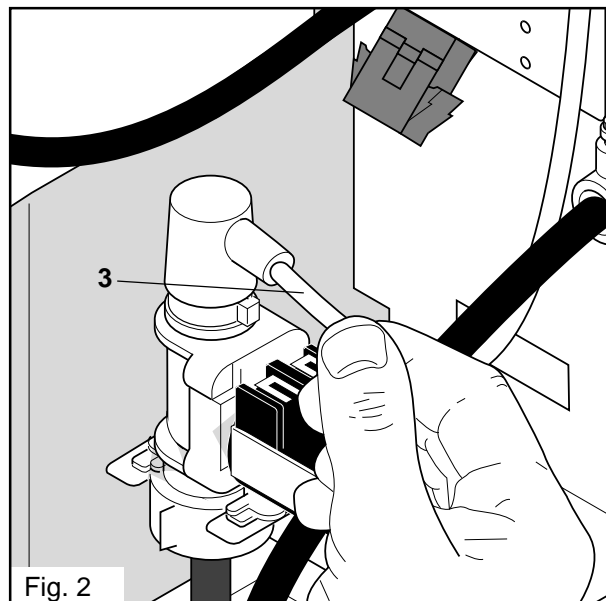
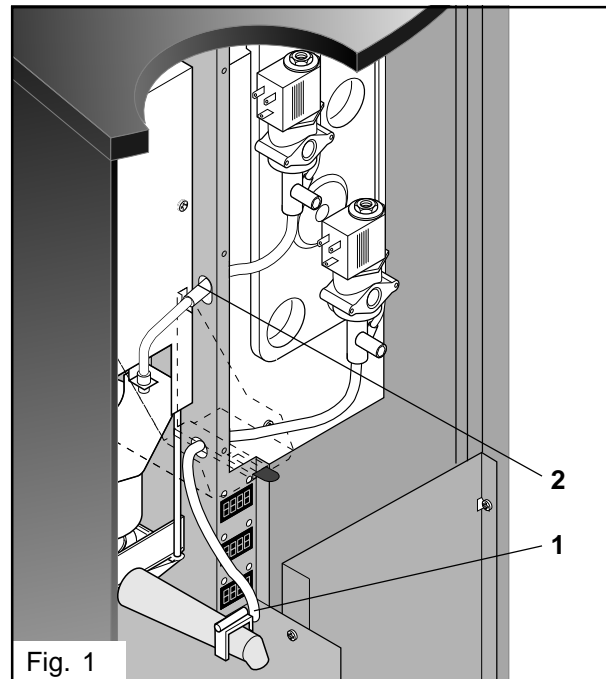
Adjustment of the solenoid valve (4) for the brewer

- For this purpose, close the brewer valve completely and then open it by turning it five times.

A.2.5 Dismounting the Boiler

- Drain the water from the boiler (see chap. A.2.3).
- Remove the hot water hose (1) from the outlet and put it through the separating wall. (Fig. 1)
- Withdraw the angle "water inlet for the brewer" (2) from the brewer and put it through the separating wall. (Fig. 1)
- Remove the top front cover.
- Disconnect the 15-pole plug.
- Disconnect the earthing plug.
- Disconnect the heating cable harness.
- Pull the water inlet hose (3) off the angular nozzle of the inlet valve. (Fig. 2)
- Withdraw the overflow hose (4) from the water outlet bend (5). (Fig. 3)
- Hold the boiler at the top, slightly pull it forwards, tilt it and pull it out to the top.

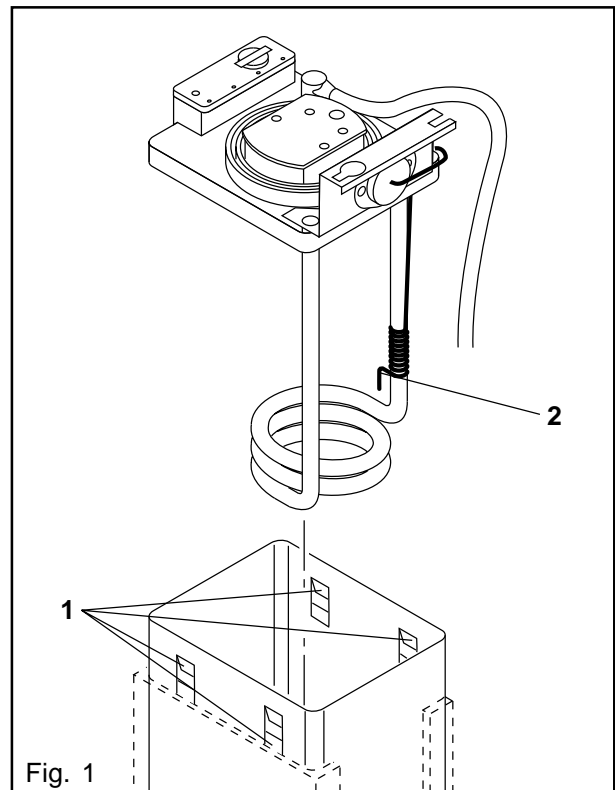
CAUTION: When re-installing the boiler: If a cable or a plug appears to be brittle (visual check) the whole assembly unit boiler or boiler cover must be replaced (electrical safety). Make sure that the earth connections are connected properly.



A.2.6 Dismounting the Boiler Cover

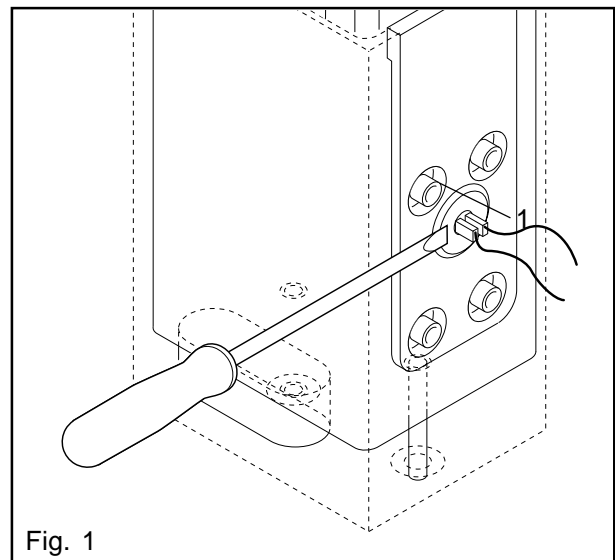
- Dismount the boiler (see chap. A.2.5).
- Slightly press 4 clips (1) to the outside and remove the boiler cover towards the top (Fig. 1)

CAUTION: Do not damage the capillary tube (2).



A.2.7 Dismounting the Temperature Sensor

- Dismount the boiler (see chap. A.2.5).
- Dismount the solenoid valves for the brewer and hot water. (see chap. A.2.4)
- Dismount the boiler cover. (see chap. A.2.6)
- Disconnect the two flat plugs, hold the temperature sensor with a screw driver while doing this (to prevent the insulation from breaking). (Fig. 1)
- Remove the insulation plate (1) (adhesive tape). (Fig. 1)
- Press the temperature sensor out of the boiler by turning it from the inside. Check the sensor bush for tears and brittleness, replace it if necessary.



If the temperature sensor is not properly connected, the heating element will not be switched off when the dispenser is switched on (boiling over).

A.2.8 Dismounting the Boil Over Sensor

- Open the left door.
- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Drain the boiler (see chap. A.2.3).

WARNING: Hot water, risk of being scalded. Wait until the water has cooled down.

- Remove the top front cover.
- Slightly pull the boiler forwards.
- Pull the boil over sensor (1) out of the boiler (Fig. 1)
- Disconnect the electrical connection.

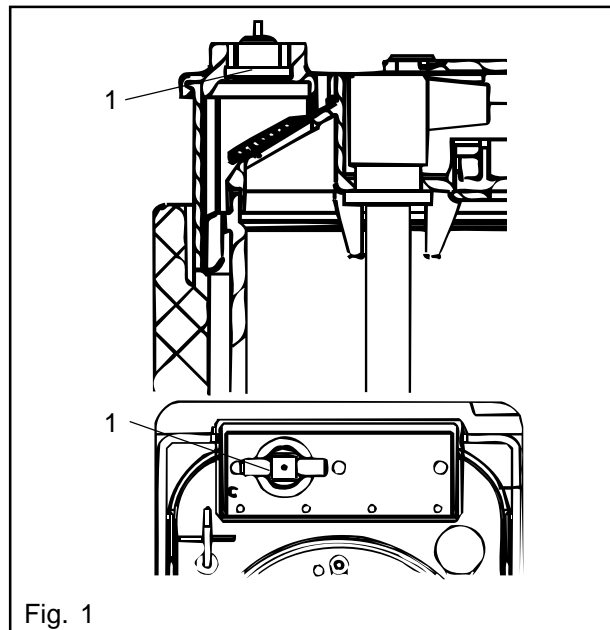


Fig. 1

A.2.9 Resetting the Dry Running Protection

- Open the left door.
- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Remove the service cover (1 screw) (Fig. 1).

WARNING: Hot water, risk of being scalded. Wait until the water has cooled down.

- Remove the cover for the carber from the boiler cover insert.
- Check the filling level of the boiler.
- Check the electrical connection of the dry running protection for tight fastening and conductivity.
- If necessary press the reset button (1). (Fig. 2) The dry running protection is defective if it is difficult to actuate the reset button or when it jumps back out.

CAUTION: Replace the assembly unit boiler or boiler cover. (spare part boiler cover)

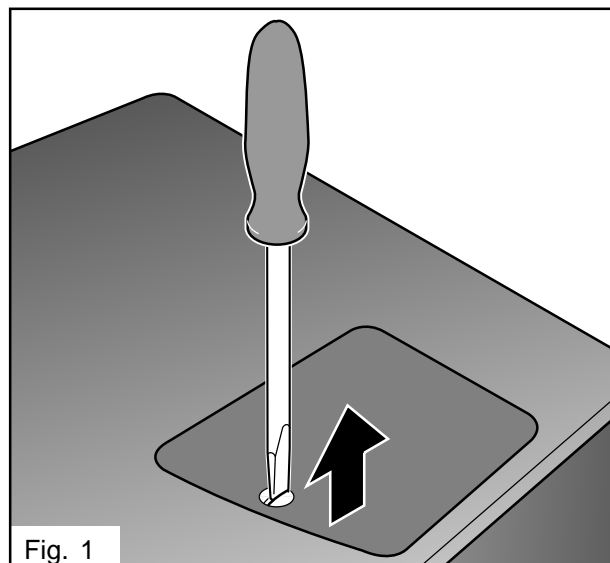


Fig. 1

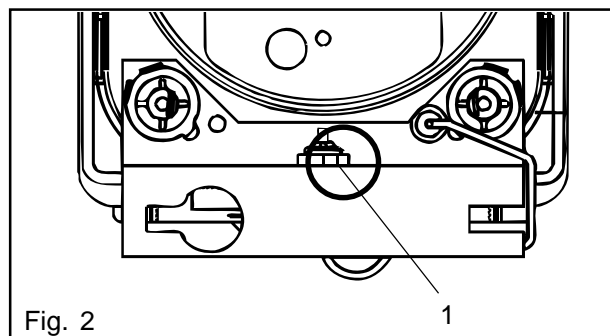


Fig. 2

A.2.10 Resetting the Boil Over Sensor

- Open the left door.
- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Remove the service cover (1 screw) see A.2.9).

WARNING: Hot water, risk of being scalded.
Wait until the water has cooled down.

- Check the temperature adjustment.
- Check the cable connection to the boil over sensor for tight fastening.
- If the boil over sensor has been triggered the water has boiled over or the dispenser has been moved and the sensor was triggered by sloshing water.
 - Empty the drip tray.
 - Dry the drip tray sensor.



The boiler and/or the temperature sensor could be calcified (decalcify if necessary).

- Press the reset button (1) on the boil over sensor. (Fig. 1)

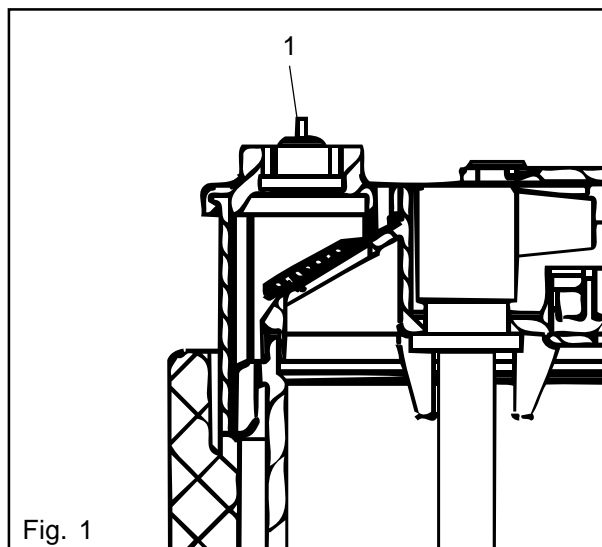


Fig. 1

A.2.11 Dismounting the Water Level Sensor

If necessary clean or replace the water level sensor (1) (Fig. 1).

WARNING: Hot water, risk of being scalded!

- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Open the service cover (1 screw).

WARNING: Hot water, risk of being scalded!

- Remove the boiler cover insert from the boiler.
- Screw out the old sensor (hold the floater screen, do not let it fall into the boiler).



When re-installing, please observe: mount the new sensor, do not insert it completely. Fasten the floater screen by turning the sensor (Fig. 2).

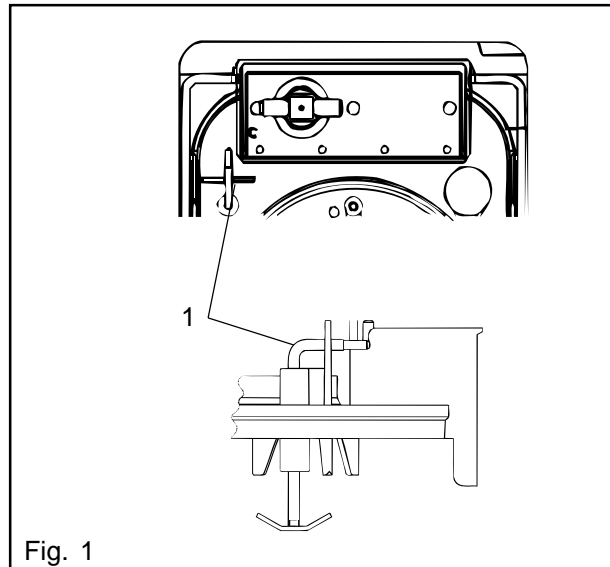


Fig. 1

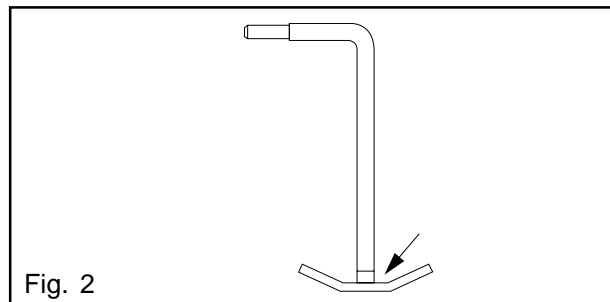


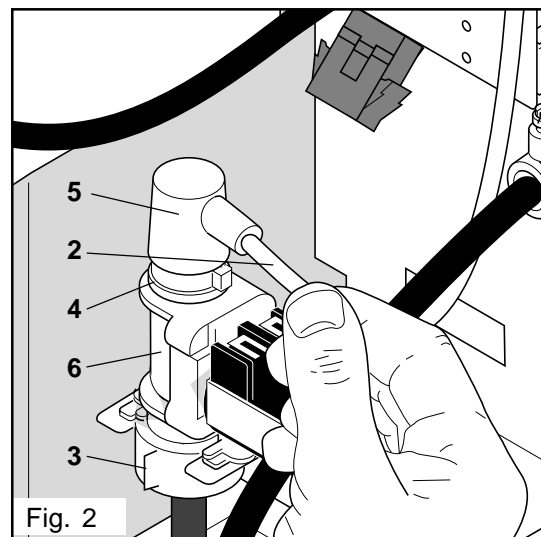
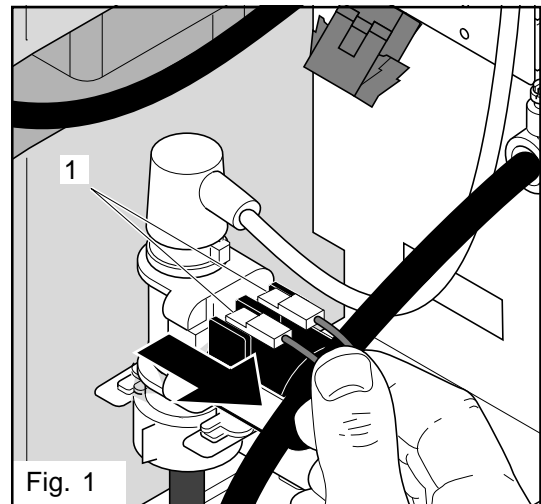
Fig. 2

A.2.12 Dismounting the Inlet Valve

- Open the left door.
- Switch off the main switch, disconnect the power supply plug and close the water cock.
- Open the right door.
- Drain the water from the boiler.

WARNING: If the water is not drained from the boiler it will flow out of the hose (2) as soon as the hose is taken off the angular nozzle on the inlet valve. There is a risk of being scalded.

- Disconnect the plug connection (1) on the valve (Fig. 1).
- Pull the hose (2) off the angular bracket (Fig. 2).
- Loosen the swivel nut (3) and take off the supply hose (Fig. 2).
- Remove the cable fastening strip (4) and take off the angular nozzle (5) (Fig. 2).
- Pull the valve (6) off its support in the power supply unit (Fig. 2).
- Mounting is done in reverse order. Use a new cable fastening strip.



A.3 Functional Descriptions

A.3.1 Total Overview Water System

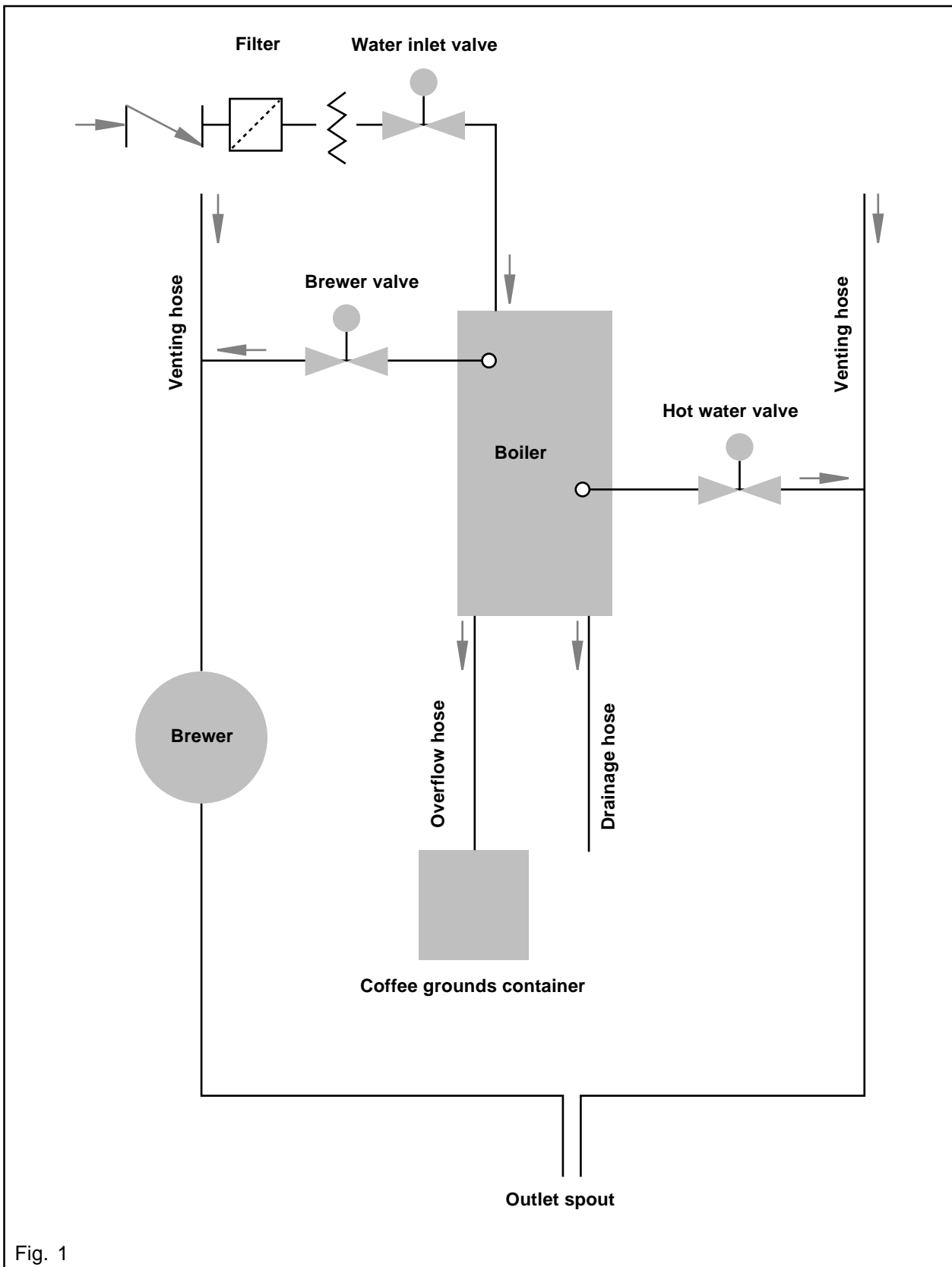


Fig. 1

A.3.2 Function: Boiler

- If the water level sensor (1, Fig. 1) does not detect any water the water inlet valve is opened until the water level sensor detects that the boiler is filled. A short time after that (can be programmed) the water inlet valve closes. The microprocessor monitors the sensors so that possible leaks in the boiler can be detected. When the microprocessor detects a leak the error message "E1" is displayed.
- For a continuous hot water delivery the hot water valve is opened as long as the hot water button is pressed. If a time of 90 sec. is exceeded the error message «E9» is displayed.



Continuous hot water delivery can lead to a low water temperature in the boiler.

- For a portioned delivery the brewer valve or the hot water valve are opened until a certain water quantity has been delivered (can be programmed). The water quantity for the rinsing process can also be programmed.
- The heating element is switched on when the resistor value of the temperature sensor (NTC) exceeds a pre-adjusted value. The temperature of the water that is delivered is approx. 1.5 °C higher than the adjusted temperature. For temperatures under a certain value the display shows "LO" and the delivery is blocked.
- The dry running protection (1) (capillary tube with membrane sensor) (Fig. 2) in the boiler prevents overheating of the heating element (dry running). When the heating element overheats the fluid in the capillary tube expands and activates the membrane switch.
- The bimetal switch of the overboil sensor (1, Fig. 3) is triggered when the temperature in the overflow exceeds 85 °C. The sensor must be reset manually to its original position. The boil over sensor and the dry running protection switch off the 24 V supply of the safety protector (safety circuit).
- Water from the boiler overflow is led via the coffee grounds container into the drip tray. The drip tray sensor triggers the error "E6" when the drip tray is full.

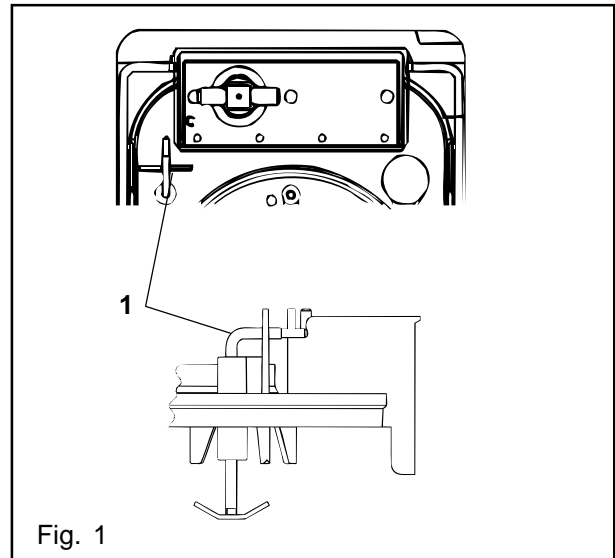


Fig. 1

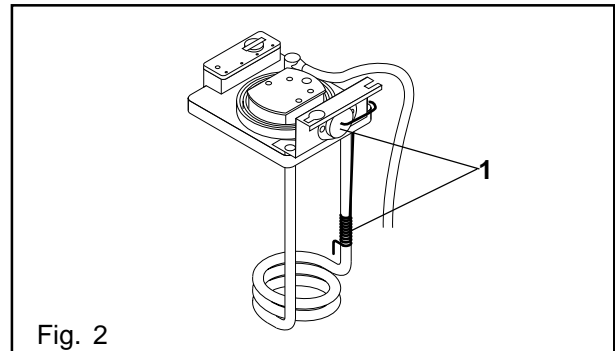


Fig. 2

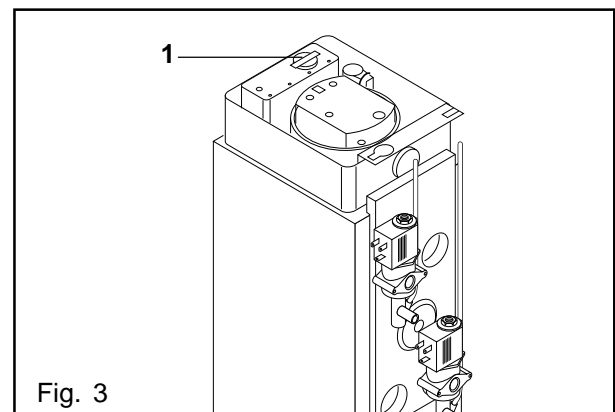


Fig. 3

A.3.3 Function: Heating Control

- The water in the boiler has always brewing temperature. It is controlled by a temperature sensor in the boiler. The temperature sensor reports to the microprocessor whether the boiler must be switched on and whether the temperature in the boiler is sufficiently high. If the water temperature sensor is more than 10 °C beneath the normal temperature (95–97 °C), water dosing is stopped until the normal temperature has been reached. Simultaneously the display shows "LO".
- If water dosing is stopped during a pot delivery, the delivery process is continued as soon as the normal temperature has been reached. If a cup delivery has been selected the selection has to be repeated after the interruption.

A.3.4 Function: Safety System

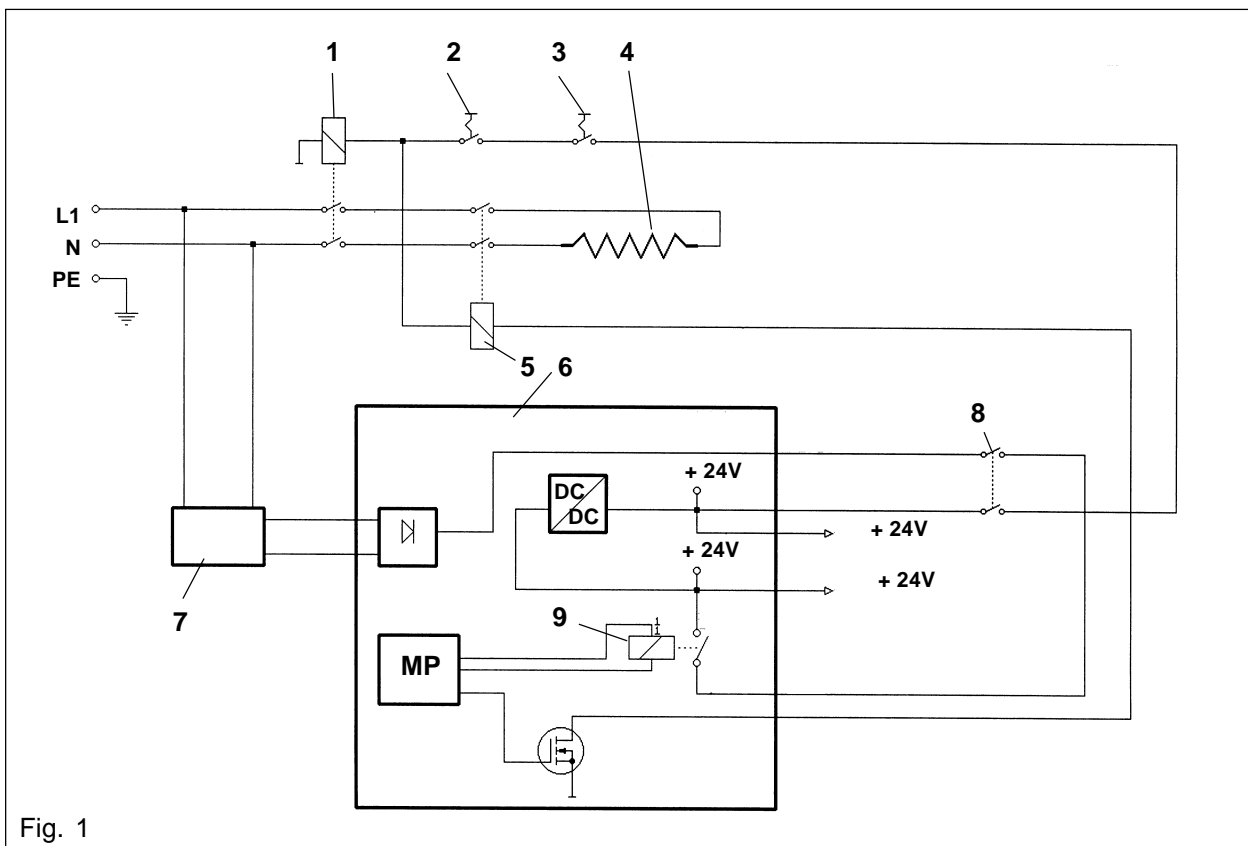


Fig. 1

The safety circuit fulfills the following functions:

1. Protection against injuries caused by mechanically moving parts (brewer) when the door is open.
2. Protection against electrical shocks when touching the mains voltage if the door is open.
3. Protection against overheating of the boiler when the heating regulation fails.

Elements of the safety circuit (Fig. 1):

1. Safety protector
2. Boil over sensor
3. Dry running protection
4. Heating
5. Heating protector
6. Electronic control (VMC board)
7. Power supply unit
8. Safety switch
9. Watchdog relay