

Water still instructions

WS81c



WS41c



Australia



Europe



USA and Canada



General Principles of water distillation

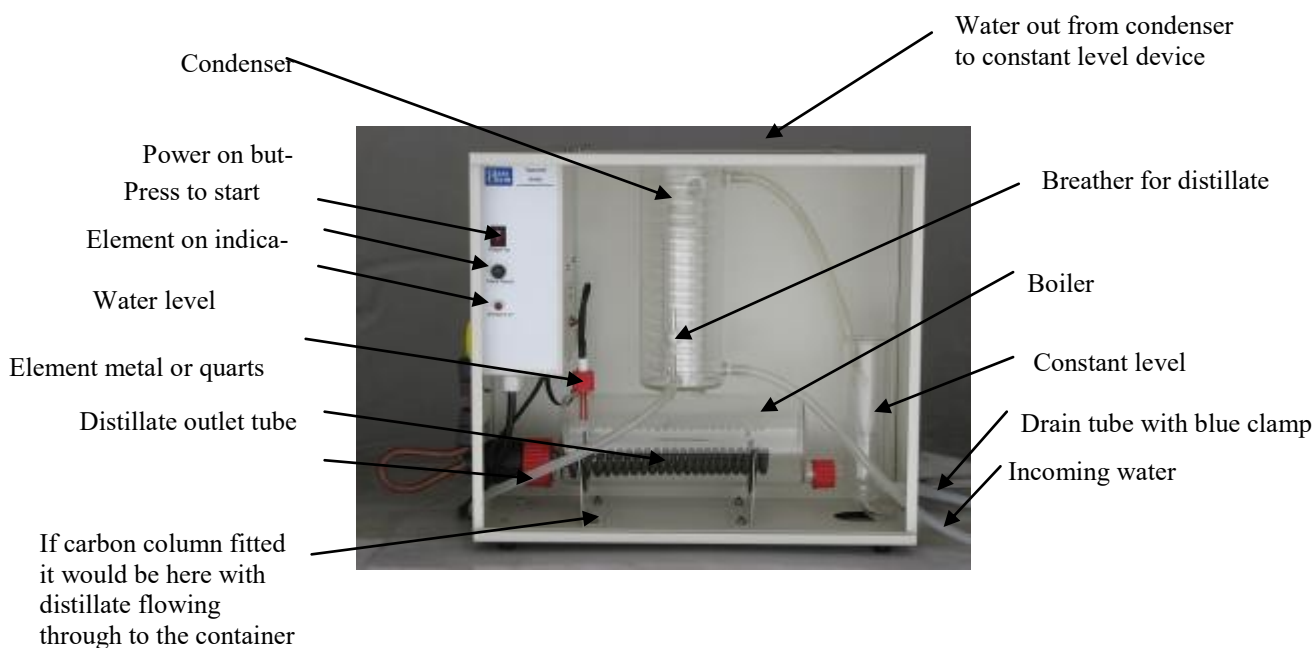
Water is heated to boiling point inside a glass vessel by means of one or two electrically heated elements, which are immersed in the water. The steam produced is then passed through a water cooled glass condenser. When the steam comes into contact with the cold, water-cooled glass coils, condensation occurs; and the distilled water drains through a silicon tube into a container. Due to the design of the instrument, the temperature of the distilled water will be almost the same as that of the cooling water from the supply tap. The single most important prerequisite for efficient operation of the still is a constant supply of cooling water. Failure here will cause the still to work ineffectively. The safety features of the apparatus will nevertheless ensure that it will not be damaged; but it will perform below capacity if the cooling water's flow-rate fluctuates. The still will stop functioning when the minimum flow-rate of cooling water is not maintained, or when the water level in the boiler drops below the required level to cover the heating elements. **Note** that the still **does not** have any protection against sudden surges of water pressure, which might cause the silicone tubing to burst and flooding to occur. Recently we have introduced a water supply system with an automatic water cut out as well as a pressure reducing valve. With this system a constant supply of water can be maintained to the still as long as the supply pressure is maintained above 2 bar. This is an optional extra and not supplied with the still.

Specifications

1. WS4lc = 13 amp / 240 volt WS8lc = 26 amp / 240volt
2. WS4lc = 3000 watt WS8lc = 6000watt
3. WS4lc = 4l/h distillate WS8lc = 8l/h distillate
4. Cooling water : 45 l/h for the ws4lc and 90 l/h for the ws8lc
5. Distillate conductivity : les than 2micro siemens / cm
6. Borosilicate glass
7. Ph : 5-6
8. Dimensions: WS4lc = 430 x 220 x 375 mm WS8lc = 500 x 220 x 400
9. Epoxy coated metal enclosure
10. Quarts elements

Step by step instruction

1. Connect the still to a constant water supply.
2. Connect the still to a 240 V supply which can handle 15amp or 26amp for the WS8lc. If the still was transported clean out the salt crystals inside the condensers with warm water and reconnect the silicone pipes as per page 7
3. Place the water drain pipe (large silicone pipe) inside a drain like a washing basin. Make sure the pipe doesn't make any loops that can cause air locks, since the water is drained by gravity.
4. Place the container collecting the distilled water underneath the still. Make sure that the silicone pipe flows down to the reservoir to prevent water being wasted out of the air breather pipe. The container's highest level must be below the distillate outlet of the condenser.
5. Determine the water flow rate by measuring the time needed to fill a 5 liter vessel. To reach the recommended flow rate of 45 liter/hour, the filling time should be approximately 6 min 45 seconds, and 3 min 20 seconds for the WS8lc. This corresponds to the optimum flow rate. If the flow rate of the cooling water is too low, steam will exit via the breather hole in the condenser outlet. If the flow-rate of the cooling water is too high, the water will push the constant level device upwards - resulting in flooding.
6. Switch the power on, and press the Start/Reset button.
7. On models with the flow control system first switch the toggle switch to start and after the boiler is filled , press to the run condition.
8. The still will start heating up if all the sensors' requirements are met.
9. The distillate will be collected inside the special vessel provided. As soon as the distilled water reaches the top of its container, the float sensor will switch the elements off. Only on the models with the water flow control, the water supply will be switched of .On the other models the water will still continue running after the still is switched off.
10. If any of the 2 safety sensors are activated, the still will switch off, and will restart only after the problem has been rectified and the start/reset button is pressed again.
11. If problems occur, refer to the section on: Problem solving.



Cooling water

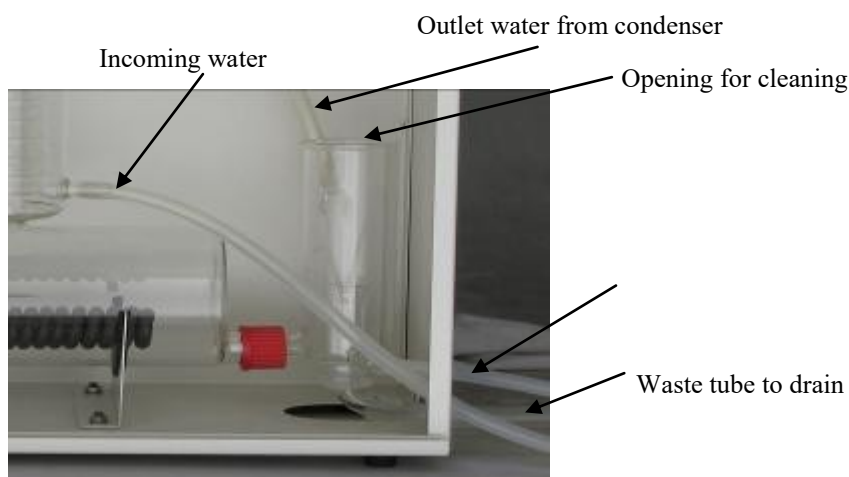
As stated previously in this manual, it is very important for the unit to have a constant water supply. The manufacturer recommends using a cooling water system incorporating a suitable water pressure regulator connected between the supply tap and the control valve of the still. When a constant water supply pressure is maintained by a correct setting of the control valve, the required constant water flow rate will be maintained. Should other users also use water from the same supply line, the flow rate will not change unless the pressure drops below the regulator output pressure.

Cleaning

The still, and its heating elements need to be kept in a good, clean condition always. Then it will operate effectively. Drain the boiler at least once every 24 hours of operating time, or whenever the boiler's water becomes cloudy, should this occur earlier. When this maintenance is done regularly, it will reduce the frequency of major cleaning. Should the boiler start scaling up, it should be cleaned with sulphamic acid. This acid is not volatile, and possible residues will not evaporate into the condenser and contaminate the distillate after the cleaning.

Procedure: Take about half a cupful of the white crystals of sulphamic acid, and dissolve it in 1 liter warm water. Lift the outlet of the water drainpipe out of the sink and to a level higher than the still, ensuring that the cleaning solution does not run out. Pour the acid solution into the still via the constant level device; if more cleaning fluid is needed to half fill the boiler, add more. Leave the solution for about 3 hours, and drain by dropping the drainpipe into the basin and then open the drain valve on the constant level device. Repeat if necessary, and rinse with clean water to clean out any acid residues.

Recommendation: Remove the level sensing probe at least once a month and inspect for any deposits of scale. If such deposits are not removable by the acid cleaning, use sandpaper to remove them. Make sure that the silicon sleeving on the prongs are pushed right up into the Teflon bush.



Safety features

1:Water sensing probe in the boiler

This sensor consists of 2 stainless steel prongs fitted into the boiler. It works on the principle that a conductive fluid must cover both pins before the system will switch on. But in cases where the water quality is very high, this probe might not be able to send a high enough electrical current through the water to enable one to switch the still on. In this case, adjusting the liquid level controller inside the electrical box can increase the sensitivity of the probe. This probe needs to be clean in order to operate; a **dirty probe** might not switch on when required to do so, or prevent the elements to switch off when the water supply is insufficient. Refer to the section in the manual under: "Cleaning"

2. Cut-out in the distillate collecting (aspirate)bottle

The float switch inside the plastic screw cap will switch when the distilled water level reaches the top of the aspirator bottle and the still will switch off. This feature on the WS4lc switches the elements off only, and **not** the water supply. This sensor makes it possible to leave the still unattended while the aspirator bottle fills, thereafter switching it off without any loss of distilled water. (The only loss is in cooling water, after the still automatically stopped operating). If, by chance, **all the safety features should fail**, and the elements over heat due to insufficient water in the boiler, simply switch the still off, and leave it to cool down. **Do not let water run on the hot glass surfaces. This will cause the glass to crack.**

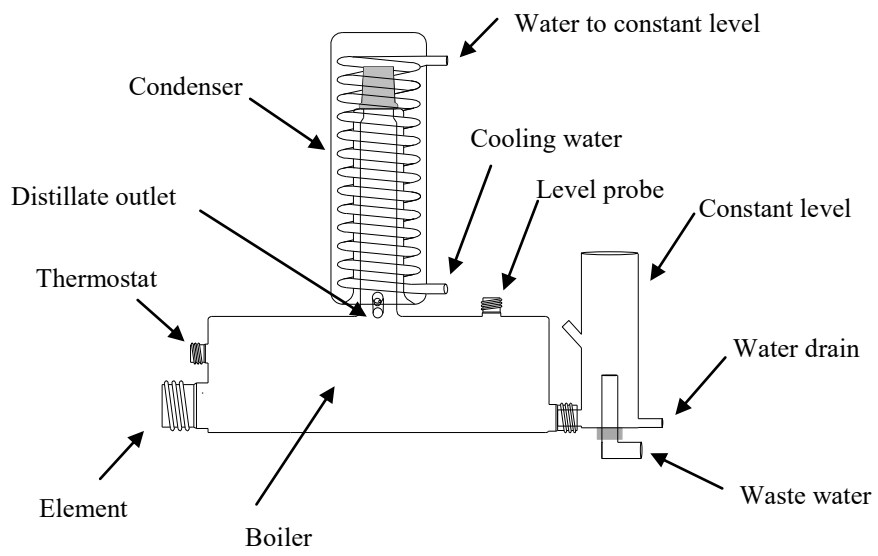
Fault finding

If the still does not switch on:

Check all the sensors and make sure each one is operating. The system will fail to switch on if any one of the two is not in full working order.

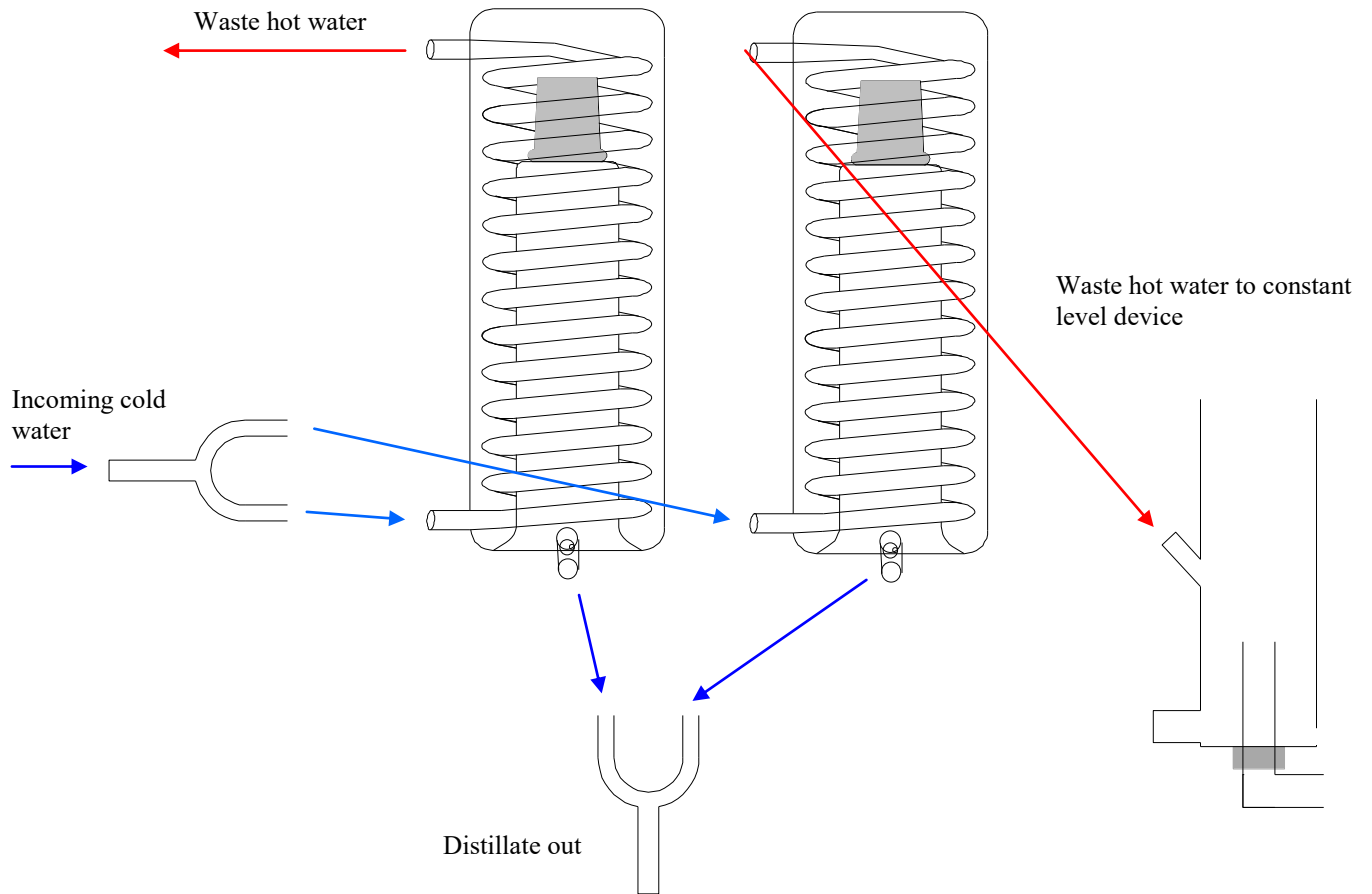
If the elements nevertheless fail to switch on after all the sensors have been checked,

unplug the heating elements and check each for electrical continuity. (Each heating element should have a resistance of about 20 ohm.) Contact the supplier if an element needs to be replaced. Each element carries a one-year guarantee, - provided no excessive scale formed on its covering sheath. (This will cause ineffective heat transfer and cause the element to burn out.)



Carbon column fitted for post distillation.

Water connections on WS81c



Distillate tank included with the still

Water re-circulator for waterstills

Level indicator—reservoir

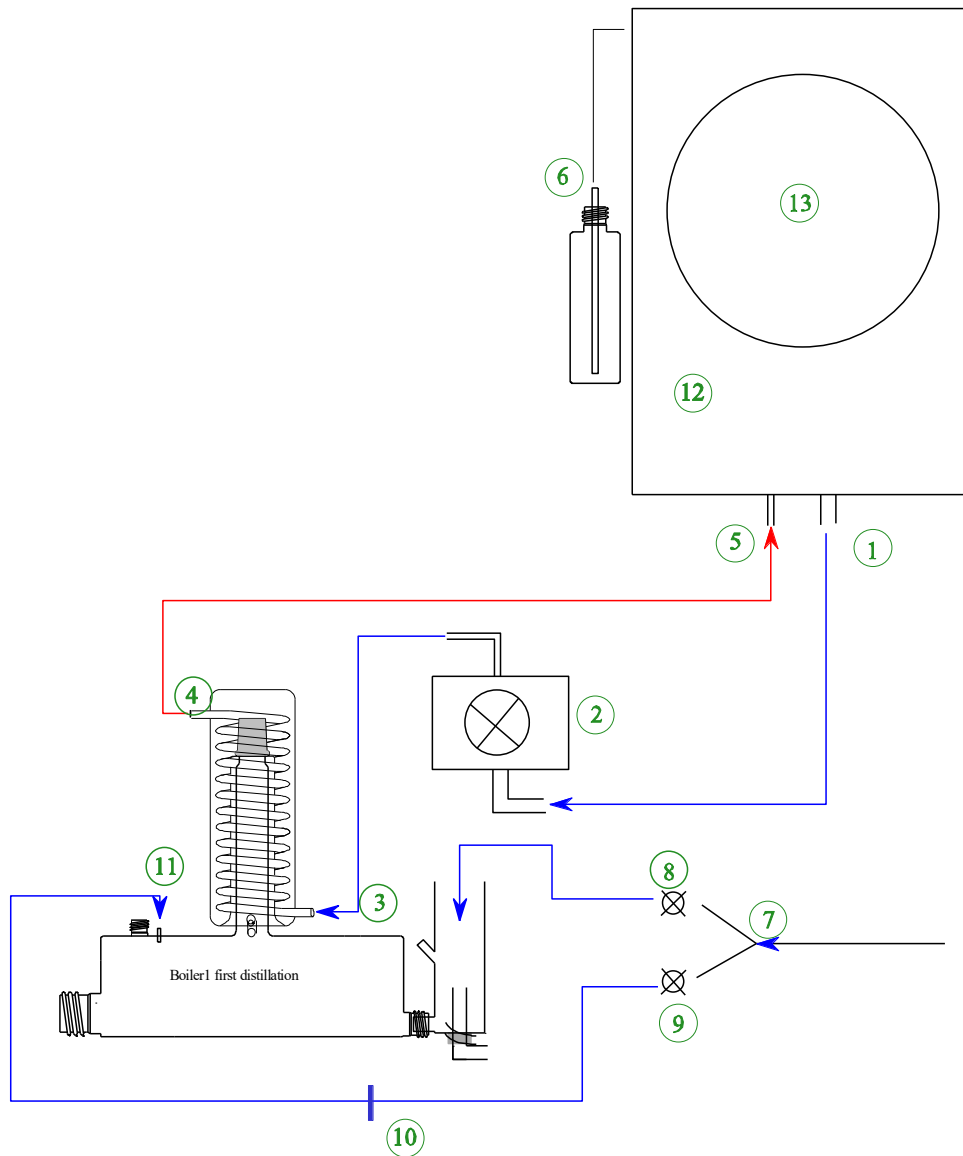


Cold water out to
distiller

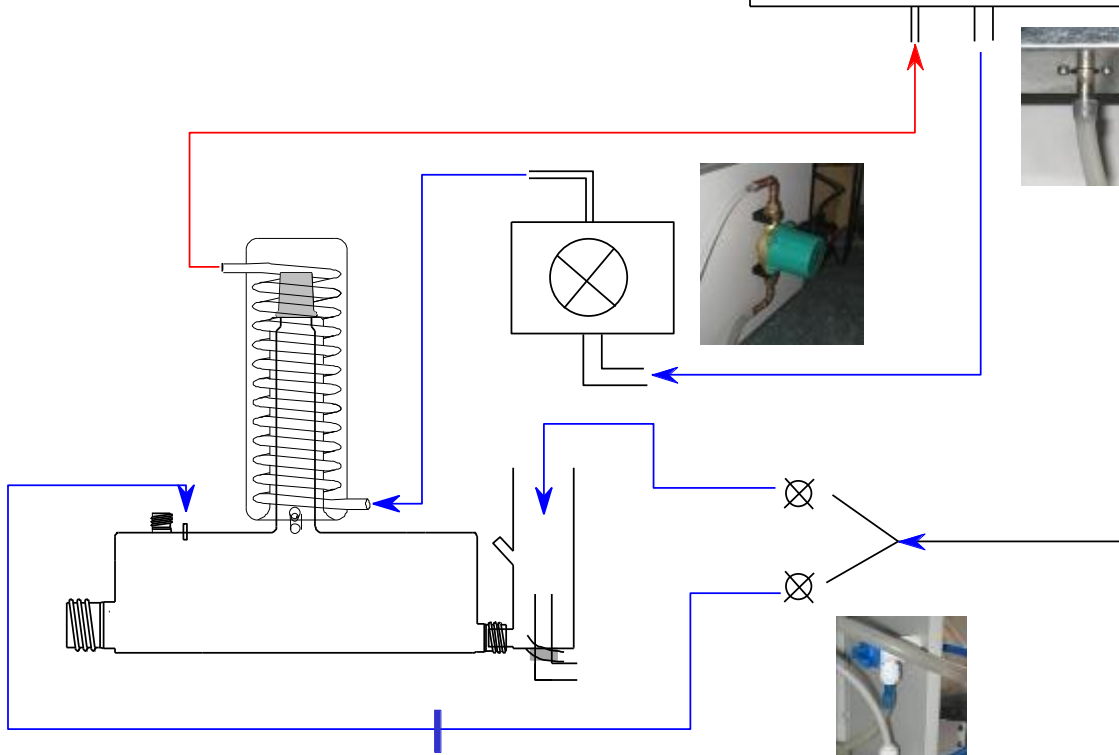
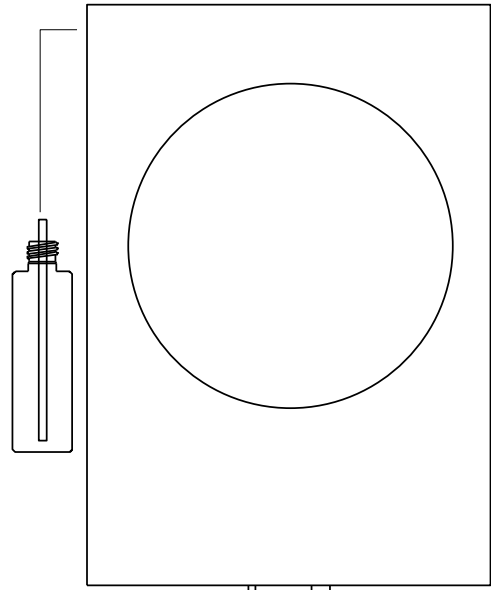
Hot water to circulator

Power supply
220 V ac

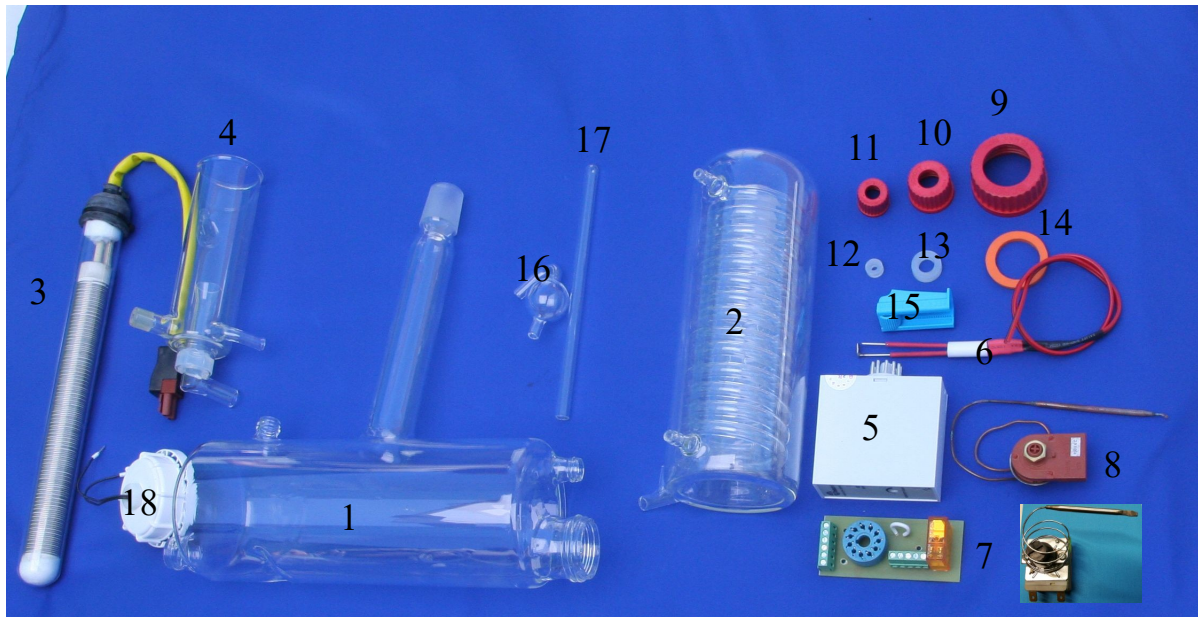
Radiator system mounted outside above level of still



Nr	Description
1	Water out from radiator system
2	Circulating pump
3	Water in on glass condenser
4	Hot water out back to radiator system
5	Inlet port on radiator system
6	Cooling liquid level indication vessel
7	Supply water from tap, in excess of 2 bar
8	Quick fill tap for boiler
9	Running water supply to boiler
10	Precise flow device
11	Inlet of boiler fill water
12	Radiator system
13	Radiator fan



Glasschem Waterstill parts



Nr	Code	Description
1	WS-1001	Boiler , For the WS8lc the boiler code is WS-2001
2	WS-1002	Condenser
3	WS-1003	Element
4	WS-1004	Constant level
5	WS-1005	Liquid level controller
6	WS-1006	Level probe
7	WS-1007	PCB
8	WS-1008	Thermostat
9	WS-1009	G145 open cap
10	WS-10010	G125 open cap
11	WS-10011	G118 open cap
12	WS-10012	G1 18 washer
13	WS-10013	G125 washer
14	WS-10014	G145 washer
15	WS-10015	Tube clamp
16	WS-10016	Air vent
17	WS-10017	Thermostat pocket
18	WS-10018	Float switch mounted in cap

Fault finding on Glasschem waterstills

The Glasschem waterstills all have the same level detection and electronic cut-out system. The following models have this system, WS4lc, WS8lc and WS4lcd.

The system works on detecting the water level inside the boiler and checking whether the float switch in the receiving container is not activated by the top water level. If there is water in the boiler, and the water level is below the top level in the receiving container, the still can be switched on by manually pressing the “START” button. If the still does not switch on during this process, its time to fault find.

1. If the still switches on but immediately switches off after the start button is pressed, the following must be done to test for the error. Start by taking out the level probe[6] and pressing the two legs against one another. If the still starts during this procedure and stays on, the water conductivity is too low and a small amount of table salt can be added to the boiler. This can also be tested by placing the probe inside a beaker with water and salt added, until it switches.
2. During this test make sure the float switch [18] is hanging vertically and the float is hanging down on the shaft. If this still does not work, short circuit the float switch at the connection close to the container cap.
3. If the level probe is shorted and the float is shorted, and the unit still does not want to switch on, it is most probably the electronic level device[5] which is faulty. Replace this unit.
4. If by pressing the “START” button and the red light brights up and stays on, but the still does not want to stay on, it is the thermostat[8] that needs resetting. This is done by making sure the boiler has cooled down to room temperature, and then pressing the small red button outside of the control box. This should never occur and is only the last bit of safety in the system. Make sure you know why this happened, since the level detection should have switched the still off before overheating could occur.
5. If all the above is done and you are satisfied not sensor is faulty, and the still does not boil the water, the element is then most probably broken. Test the element by measuring the resistance on the two wires exiting the element to the two way plug. If the resistance is not between 16—18 ohms, the element is probably faulty.
6. The most important aspect of the proper use of these stills, is a good constant water supply. This can be done by either a supply cistern tank, or a pressure regulator and flow switch on the supply water line. Please contact Glasschem should you have queries in this regard.