

VALUE RANGE LCD AUTOFILL COUNTER TOP WATER BOILERS

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Introduction :

The 1500LCD & 3000LCD counter top water boilers are an offshoot of our powerful Thousand series boilers. They have less comprehensive diagnostic features, but offer substantial initial draw offs and excellent hourly output at a highly competitive price.

This manual has been designed to be a guide for service engineers. It includes descriptions of all serviceable parts and an exploded drawing of a complete machine, sub-assemblies and wiring diagrams.

Both models are constructed in the same way, but are different in size.

Principle of Operation :

When the machine is switched on, the indicator lamp on the front panel will glow orange. This means that the water is filling the machine to the bottom probe. When the bottom probe has been reached, the indicator lamp will change to red to show that the machine is heating. When the water has reached the correct temperature the light will change and remain green. The machine will then heat and fill until it reaches the top probe where it will go into "idle" mode. The heating element is pulsed periodically to maintain temperature.

Technical Specification:

Size (mm) :

1500LCD

Height : 592

Width : 235

Depth : 335 (plus 130mm for drip tray)

3000LCD

Height : 600

Width : 285

Depth : 335 (plus 130mm for drip tray)

Electrical Loading (kw) :

1500LCD : 3

3000LCD : 3

Heat Up From Cold (mins) :

1500LCD : 35

3000LCD :52

Average Standby Power Consumption (kw/hour) :

1500LCD : 0.1

3000LCD : 0.1

The Tank :

The tank lid is secured using M4 stainless steel screws and is sealed with a rubber gasket. Silicone sealant secures the gasket to the tank, and the lid is sealed with silicone grease. There are two level sensing probes inside the tank, the bottom probe is the minimum water level and the top the maximum water level.

The Thermistor :

IMPORTANT : The position of the thermistor on the tank is level with the top leg of the element.

To remove the old thermistor, chip it off using the tip of screwdriver.

To ensure that the new thermistor is correctly fitted to the tank, the metal-set compound must be thoroughly mixed. To do this, fold the compound between your fingers for at least one minute. Place the thermistor into the mixed compound and apply the compound onto the cold tank , * ensuring that the head of the thermistor is completely covered. The metal-set should completely harden in approximately 5 minutes.

* It is strongly advised that the tank should be cool before application of Metal-Set.

The Potentiometer :

The potentiometer controls the temperature of the water. It is mounted on the P.C.B. and can be adjusted with a small electrical screwdriver. To adjust - clockwise to increase.

The Heating Element :

See Drawing D32

The heating element is made from an Incoloy material. It is sealed by two blue silicone washers and held into the tank by two ¼" lock-nuts.

The element should have a resistance of between 19 and 20 ohms and will draw between 10 and 11 amps.

If the element has blown it will have an open circuit. To test this use a simple PAT test.

The Triac :

The triac is a device to switch the heating element on via a control signal from the P.C.B. The triac generates heat, which has to be dissipated. This is done by bolting it to the aluminium panel using heat-sink compound between the surface of the triac and the panel. The triac used on the 1500/3000 boilers is the XE851/L. If the triac fails, in 90% of cases it will fail in the closed position. This causes the heating element to remain on. If this happens, the machine will overheat. When steam enters the air-vent pipe, the safety cut-out will detect a rise in temperature and switch all functions of the machine off except for the red L.E.D. If the triac has failed in the closed position there will be continuity between the live element terminal and the live into the triac (Grey wire).

To test if the triac has failed (closed circuit), re-set thermal cut-out (if necessary), leave machine plugged in and turn off at the ON/OFF switch (front panel). If the machine continues to heat when switched off, the triac is faulty. If not, refer to faultfinding "over-boiling".

Main P.C.B. :

This P.C.B. (XE150B) controls the main functions of the machine, monitoring the water level, water temperature, water supply etc. If a fault is detected the user is warned via the L.E.D. Some faults render the machine inoperative (*see solenoid valve*) whilst others only give warning flashes (See chart on page 12 for details).

** Refer to wiring diagram for connections **

Thermal cut-outs :

This will switch the machine off if the temperature exceeds the specified limits. To re-set it the back must be removed and the red button pressed. (*Machines from March 2001 have automatic re-set thermal cut-outs which have to be re-set by switching the power off and letting the machine cool for 10 minutes before switching back on*).

The heating element also has a thermal cut-out which will switch the machine off if it boils dry.

The Solenoid Valve :

Disconnect machine from electrical supply before replacing. The valve can operate between 2 bar (28 psi) and 7 bar (100 psi) pressure. The only serviceable part on the valve is the coil.

The coil is susceptible to water damage from steam or water leaks. This can lead to P.C.B. problems, e.g. blown fuses or electronic components.
For example, it is possible for the board-mounted triac to blow as a result of a failed solenoid coil.

NOTE : Always check solenoid coil before replacing P.C.B.

The Water Draw Off Tap :

The tap washer and/or spring will occasionally require replacement.

To replace the tap washer.(Part No. TP1001/L)

- switch machine off.
- drain off water.
- Unscrew bonnet and remove the upper tap assembly out of the tap body.
- Remove the old washer from the tap spindle and firmly push the new washer onto the spindle.
- Screw the upper assembly back onto the body.

To replace the tap spring.(Part No. TP1007/L)

- Switch machine off.
- Drain off water.
- Push the pin out of the tap handle.(the pin has a bend in the middle)
- Unscrew the plastic bonnet to replace broken spring.(Small diameter down)
- Replace bonnet and handle.

De-scaling - Including cleaning the probes :

- Disconnect the machine from the power supply.
- Remove the lid
- Remove tank lid.
- Pull gauze retainer off overflow pipe (Important - remember to replace during re-assembly).
- Remove baffle plates.
- Remove as much loose scale as possible by hand. Any hard scale coating the level sensing probes and holders, should be cleaned off using a non-metallic scouring pad.
- Use a good de-scaler such as "Renegite" (Part No. ACC303) to remove hard scale deposits. Mix 2-3 packets in hot water and pour into tank. Leave for approximately 20 minutes.
- Flush tank out with water, ensuring that all traces of de-scaler are removed before re-assembly.

Service Warning Codes :

Normal operation with non-critical error, this should be attended to as soon as possible.

L.E.D. Colour	Meaning
Flashing Green	The bottom probe is scaled up
Flashing Orange	The machine cannot obtain water from supply

Critical fault which prevents operation of machine.

L.E.D. Colour	Meaning
Flashing Orange	Cannot fill boiler to bottom probe.
Flashing Red	The heating element, Triac or Thermistor have failed.

Alternate Red/Green Flash	The Thermistor has failed, become disconnected or it's wires are damaged.
Solid Red Changing to Flashing Red.	Safety cut-out has tripped (due to over-temperature) To re-set see page 4

Fault Finding :

This section contains a list of faults and causes that the machine may encounter.

MACHINE SYMPTOM	CAUSE
Dead	Thermal cut-out tripped - See over boiling (Red L.E.D. on, but machine dead in all other respects) P.C.B. faulty - (250mA fuse or transformer) No mains input (installation or outside interference fault) On/Off switch faulty unsound terminal connection Blown fuse in plug Bad connection in plug (mains lead fault)
L.E.D's Flashing	See chart on page 6
Overfilling	Water pressure too low or high (See page 5) Contaminant sticking valve open Water connected to overflow outlet (installation problem)
Not Filling	Blocked inlet elbow Blocked solenoid filter Water turned off Kinked inlet hose Water pressure too low or high Solenoid coil failed (See page 5) Scaled up top probe top probe wire shorted out Faulty element (See not heating)
No Draw Off	Tap spring or washer fault (See page 5)
Over Boiling	Potentiometer set too high or faulty (See page 3) Faulty thermistor (See page 3) Faulty triac (See page 4) Machine not filling (See Page 7) Machine scaled up (See page 6) Faulty element (See page 3)
Not Heating	Thermal cut-out tripped (See page 4) Potentiometer set too low (See page 3) Faulty element (See page 3) Faulty triac (See page 4) Faulty P.C.B. (See page 4) Unsound connection on element or triac
P.C.B. Blown	Steam (See over boiling) or water damage Element blown (fuse on board) Triac blown (See page 4) Solenoid coil blown (See page 5)
Taste Problems	Washing machines or dish washer on same feed BLUE or RED hoses on same feed Outside interference Expired filter on feed Foreign body in boiler

Appendix

Elements

Boil Dry Element Protection All machines from March 2002 have boil dry protection on the elements. This consists of a new type element (Part No: XEN175) and 115^ thermal cut-out (Part No: XETR5). This element looks similar to the existing one, but has a brass mount brazed onto it. This is where the thermal cut-out is mounted. This cut-out will trip if the water level falls below the element to prevent it overheating. See table below for Serial No's.

Model Type	Date Range	Serial Number Range	Element Type
1500LCD	Mar 2007- onwards	W6138 - W9385	XEN175 or XEN100
3000LCD	Mar 2007- onwards	W9386 - onwards	XEN175
1500/			