

Revive



TECHNICAL MANUAL



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The following symbol is used throughout this Technical Manual:



Safety First! Take care, risk of personal injury.

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Introduction

This manual is to be used by authorised personnel involved in installing, commissioning and servicing the Stentorfield Revive table-top beverage machine. The technical information contained within this document is for information only and may be changed without prior notice. Crane Merchandising Systems accepts no responsibility for any damage caused to the machine through misinterpretation or misuse of the information contained in this document.

Upon receipt, carefully examine the machine checking for any damage or missing/incorrect parts. Any discrepancy must be reported to Crane Merchandising Systems in writing within three working days.

In accordance with the food hygiene regulations and in compliance with local Public Health Authorities, it is the responsibility of the operator to keep the machine in a thoroughly clean condition.

Important Safeguards

When installing or servicing the Stentorfield Revive, always have this manual available for quick and easy reference and always follow these basic safety precautions:

1. Ensure that the machine is situated on a strong horizontal surface, at a convenient height and in a position where it is not likely to be knocked off.
2. The mains lead should never trail from the machine and should always be kept away from hot surfaces and sharp edges.
3. Allow the machine to cool before handling or moving.
4. Ensure that the mains electricity supply is isolated before removing any of the protective panels or undertaking any major servicing. Working on live equipment should only be undertaken when there is no practical alternative.
5. When servicing the heater tank. The water can reach a temperature of approximately 96° centigrade. Water at this temperature can cause severe burns!
6. Never immerse the machine in water, or any other liquid. This machine must not be installed in an area where a water jet may be used. Never use a water jet to clean this machine.
7. In normal operating conditions the machine should not freeze-up. In the unlikely

event of the machine freezing, turn off the mains water supply, disconnect the machine from the mains electricity supply and contact Crane Merchandising Systems for assistance.

8. Ensure that you are conversant with the 'Health and Safety at Work and Electricity at Work Regulations 1989'.

This machine is for indoor use only and because it is a food machine, should be situated in a clean, hygienic area.

Specifications

	Revive
<i>Height</i>	<i>673 mm</i>
<i>Depth</i>	<i>490 mm</i>
<i>Width</i>	<i>295 mm</i>
<i>Weight</i>	<i>30 kg</i>
<i>Boiler Capacity</i>	<i>3.3 Litres</i>
<i>Number of Canisters</i>	<i>3</i>
<i>Electrical Services</i> (i) <i>Voltage</i> (ii) <i>Current</i> (iii) <i>Frequency</i>	<i>220 - 240v AC</i> <i>13 Amp Fused</i> <i>50 Hz</i>
<i>Water Services</i> (i) <i>Pressure</i> (ii) <i>Stopcock</i>	<i>100 Kpa (1 Bar) - 800 Kpa (8 Bar)</i> <i>15 mm BSP from rising main</i>

All weights and dimensions are approximate and are for guidance only.

Installation and Commissioning

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Installation Procedure



Important!

It is essential that engineers responsible for installing, commissioning and servicing the machine understand the following:

1. The installation and commissioning of the machine should only be carried out by trained and authorised service engineers.
2. All water and electrical services **must** be correctly and safely connected.
3. All covers should be replaced correctly and securely and the machine left in a **safe** condition.

Installing the Machine

1. The machine is suitable for indoor use only, sited in an area with a recommended ambient temperature not below 10° C and not exceeding 40° C.
2. Prior to moving the machine to its location, ensure that there is sufficient access space available via passageways, stairs, lifts, etc and that the table/counter on which the machine is to be located is strong enough to safely support its weight. (Refer to Specifications Table).
3. The machine should be located near the appropriate water and electrical services as detailed in the specification tables.
4. To ensure adequate ventilation, 100 - 150 mm (4 - 6 inches) clearance must be allowed between the back of the cabinet and the wall.
5. Open the cabinet door. Remove all transit packing and the installation kit from the machine. Check for visual signs of damage which may have occurred during transit. Report any problems immediately.
6. The machine should be levelled in both front to back and side to side planes using the four adjustable levelling feet (6 mm thread). Check for correct alignment using a spirit level.

Connecting the Water Supply

1. The machine should be connected to a 15mm (0.5 inch) rising main water supply

which must conform to local and national regulations and be able to supply water at a constant pressure of between 100 Kpa (1 Bar) and 800 Kpa (8 Bar).

2. The supply should preferably be fitted with a stopcock to isolate the supply during service.
3. The outlet should be fitted with BSP connections, sited within 1.5 meters of the vending machine.
4. Connect the flexi-hose to the stopcock. Ensure that the seal supplied is fitted correctly.
5. Flush the system via the stopcock to remove any impurities that may have accumulated in the mains supply.
6. Connect the flexi-hose to the machine inlet valve ensuring that the seal supplied is fitted correctly.
7. Ensure that all water supply fittings are tight. Turn on the supply at the stopcock and check for leaks.

Connecting the Electrical Supply

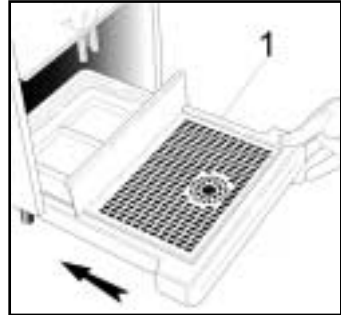


Safety First! THE MACHINE MUST BE EARTHED. ON NO ACCOUNT SHOULD IT BE EARTHED TO THE WATER SUPPLY PIPE

The machine can be connected to a 230 Volt A.C. 13 Amp power supply. If the mains lead is damaged in any way, it must be replaced by a special lead available from the manufacturer.

Commissioning Procedure

1. Ensure that the cabinet is level, and that there is at least 100 - 150 mm (4 - 6 inches) clearance between the back of the cabinet and the wall.
2. Ensure that the electrical and water services to the machine are connected correctly.
3. Referring to the illustration, fit the waste tray (1) to the machine.
4. Open the front door of the machine. Remove the ingredient canisters - DO NOT place ingredient canisters on the floor.
5. Remove the rear cover of the machine. Turn on the stopcock and check for leaks.
6. Switch on the mains electricity supply and the mains on/off switch located on the rear of the machine. The LED on the front panel of the machine will flash red.
7. Check that the boiler fills to the required level determined by the level probe. Ensure that no water overflows from the boiler tank overflow pipe into the waste tray. Check the system for leaks.
8. Ensure that the boiler heats the water to the correct temperature. The LED on the front panel of the machine will change to green.
9. Fill the ingredient canisters with the correct ingredients and re-fit into machine. Close the cabinet door.
10. Check the complete range of machine functions to ensure correct operation. Operate the machine through the complete range of vends to ensure that each vend is delivered correctly.
11. Check the machine for leaks. Re-fit the rear cover and ensure that the machine is left in a clean and safe condition.



Technical Description

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Water Services

The mains water supply provides water for the boiler. Water enters at the rear of the machine through a solenoid operated control valve which opens or closes the water supply as required.

1. Water is heated in the boiler to the required temperature by a heating element rated at 2.375 Kilowatts.
2. The mains voltage required for the element is switched by a solid state relay, controlled by the vending machine controller.
3. Water temperature is monitored by a thermistor which switches a logic level to the controller board. This in turn operates the heater solid state relay.
4. The water level inside the boiler is monitored by a water level probe. When the water drops below the required level, the controller board operates the mains water inlet valve until the required water level is restored.
5. A series of control valves are mounted on the outside of the boiler. These supply heated water to the mixing stations where ingredients are added to make the drink.

Water Supply

1. Should the inlet valve fail (or mains water supply be disabled), the controller board will detect a fault after the inlet valve “open” signal has been active for 2 minutes or the required water level has not been reached.
2. At this point the selection buttons will be disabled and all outputs from the controller board (including the heater element) will be switched off. The LED on the front panel of the machine will flash red to indicate that the machine functions are disabled.
3. To prevent water in the heater tank over heating, a resettable temperature cut-out (connected in-line with the heater element live feed) is located on the heater tank overflow pipe.

Ingredient Dispense

1. The ingredients required for making up a drink are contained in ingredient canisters and are dispensed by means of a motor driven auger located in the base

of each canister.

2. The amount of product dispensed by each canister is controlled by the vending machine controller and may be adjusted via an LCD display. This procedure is detailed in the '**Operating Modes and Programming**' section of this manual.
3. As the ingredient is delivered to the mixing bowl, a high speed whipper (where fitted) blends it with hot water from the heater tank prior to discharge through a dispense pipe.
4. To ensure a free flow of ingredient, it is essential that it is kept completely dry. This is achieved by extracting steam from the mixing system using an extract fan.
5. The electrical supply for the extract fan is 110 Volts AC.

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Electrical/Electronic System

Diagrams illustrating the electrical/electronic components of the machine are located in the **'Figures and Diagrams'** section of this manual.

The machine is powered by a 230 Volt, 13 Amp single phase electricity supply. This is fed via a line filter, solid state relay and a high temperature cut-out to the 2.375 kW element located in the heater tank.

1. Mains Switch

The mains on/off switch isolates the transformer mounted at the back of the cabinet. This enables the operator to clean the front of the machine.

2. 25 Amp Solid State Relay

The 25 Amp relay switches 230 Volts to the 2.375 Kilowatt heater element when required as detailed in the section "Water Services".

3. High Temperature Cut-Out (Manual Reset)

The high temperature cut-out, located in the heater tank overflow pipe, senses the temperature of any water which enters the pipe.

1. Should the boiler over heat due to a control failure, the water will boil over into the overflow pipe. The high temperature of the water will operate the cut-out, which in turn interrupts the electrical supply to the heater element.
2. With the electrical supply disconnected and the control fault rectified, the cut-out can be reset using the small push button.

Transformer

To accommodate for any variations in the mains voltage, the transformer has three separate input tapings - 240 Volts, 230 Volts and 220 Volts. The mains supply is taken to the primary side of the transformer.

There are two output voltages from the transformer. They are as follows:-

1. 24 Volt Output

The 24 Volt A.C. supply is used to power the electronics within the machine.

2. 110 Volt Output

1. The 110 Volt live supply is connected via a 6.3 Amp fuse to the common terminals

of all the valves, solenoids and motors in the machine.

2. The extractor fan is connected across the 110 Volt supply and operates continuously.
3. The neutral side of the 110 Volt supply connects directly to the triac drivers, each of which is connected in turn to one of the 110 Volt components. To operate a component, the triac is switched on. This completes the 110 Volt circuit to that component.
4. Because the triac common is connected to ground and a live feed is present on them at all times, the 110 Volt components may be considered to be 'Neutral Switched'.



Safety First! Care must be taken when servicing the machine as 110 Volts is always present at the triacs when the mains and the on/off switch at the rear of the machine are switched on.

Input Monitoring

The vending machine controller monitors all of the inputs from the machine.

The operation of each input is as follows:

1. Heater Temperature Control (J4, Pins 8 & 9)

An electronic thermostat (thermistor) located in the heater tank monitors water temperature. Adjustment of the water temperature is achieved by using the LCD display.

2. Flush Switch (J2, Pin 8)

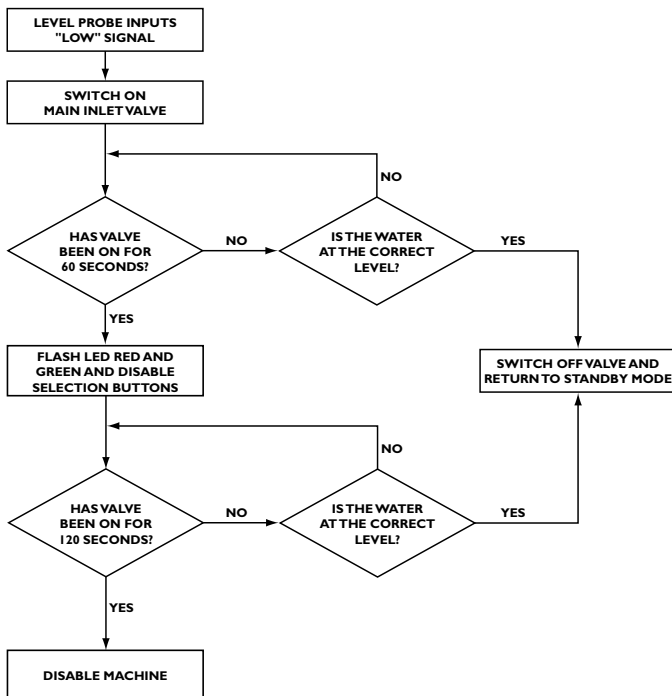
This is a single pole, normally open, biased switch, which when pressed and held (for a minimum 5 seconds), flushes the mixing system. Each valve is operated in sequence and 'rattled' to remove any build up of limescale. The corresponding whipper (if fitted) is also operated.

3. Heater Tank Level Control (J4, Pins 4 & 5)

1. A level control circuit on the controller board is connected between the body of the boiler and the level probe. This sends a signal to the microprocessor dependent upon the level of the water with respect to the level probe.

2. If the level circuit indicates low water, the controller switches on the inlet valve. When the water reaches the level probe, the controller continues to fill the boiler for two seconds, ensuring that the tip of the level probe is completely immersed.
3. After filling for sixty seconds, the selection buttons will be disabled and the LED indicator located on the front panel of the machine will flash red and green.
4. Should the boiler still be filling after a further sixty seconds, the inlet valve will be switched off and the LED will turn to a continuous red signal. The machine is now completely disabled as illustrated by the flow chart below.
5. If the water level in the boiler is low when the machine is switched on, the LED will turn red and flash. The boiler will fill as described above and when the correct water level is reached, the machine will enter “Standby” mode.

Note: In a situation of low mains water pressure and a very low boiler level at power-up, the boiler may require more than two minutes to fill. This will cause the machine to be disabled before the boiler is full. Under these circumstances, the machine can be switched ‘off’ and then ‘on’ again to reset the boiler time-out.



Operating Modes and Programming

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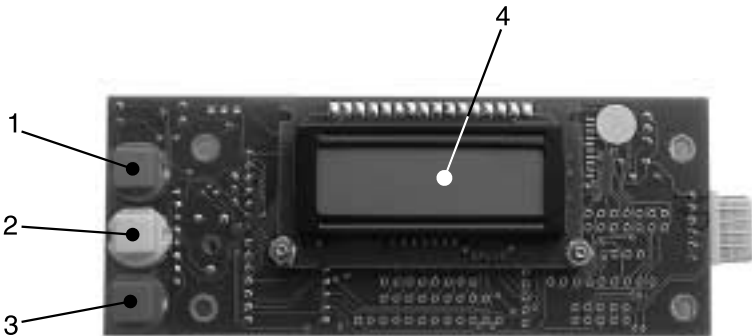
Modes of Operation

The machine has three modes of operation:

1. **Standby Mode:** When in standby mode, the machine is idle, ready to make a vend. This is indicated by the LED on the front panel of the machine being green.
2. **Boiler Filling/Heating Mode:** The boiler filling/heating mode is indicated by the LED flashing red.
3. **Low Water Mode:** The low water mode, indicated by the LED glowing red, occurs when the boiler fill routine has timed out due to insufficient mains water supply.

Programming the Machine

Programming is carried out using the red, yellow and green push buttons located on the LCD Board. Access to the board is achieved by removing the panel fitted to the rear of the door. The layout of the board is shown below.



Button Description (Refer to Photograph)

Button '1' - Green: When pressed this button allows the engineer to access sub-programs and scroll data “up” after program entry.

Button '2' - Yellow: When pressed this button allows the engineer to access sub-programs and scroll data “down” after program entry.

Button '3' - Red: When pressed this button allows the engineer to access the audit sub-program.

Pressing two of the buttons simultaneously allows the engineer to access additional functions as follows:

Button '1' and Button '2' (Green and Yellow): Zero's any program data currently displayed.

Button '2' and Button '3' (Yellow and Red): Provides access to the drink sub-program.

Selecting Temperature Display - Fahrenheit/Centigrade

Proceed as follows:-

1. Press the yellow button (2) until either Fahrenheit or Centigrade is displayed in the LCD display (4).
2. Press either yellow or green button (1) to select temperature display.
3. When required temperature is displayed, press the red button (3) once. Temperature display is now in operation.

Dispense Settings

Proceed as follows:-

1. Press the yellow (2) and red (3) buttons simultaneously. LCD display (4) will change to 'Drink 1'.
2. Press the red button until the required sub-program is displayed, e.g. 'Drink 2', 'Heater' etc.
3. Press either the yellow or green (1) button to access the chosen sub-program.
4. Increase or decrease the setting if required using the yellow or green buttons.
5. When correct setting has been entered, press the red button to store the setting in the machines memory.
6. Repeat the above sequence to set other required parameters. When all required settings have been entered, press the red button until the machine returns to stand-by (indicated by the green LED located on the front panel of the machine).

Audit Display

Proceed as follows:-

1. Press the red button (3) to access the audit program.
2. Press either the yellow (2) or green (1) button to enter the audit sub-program.
3. Press the yellow or green button to view button 1 audit.

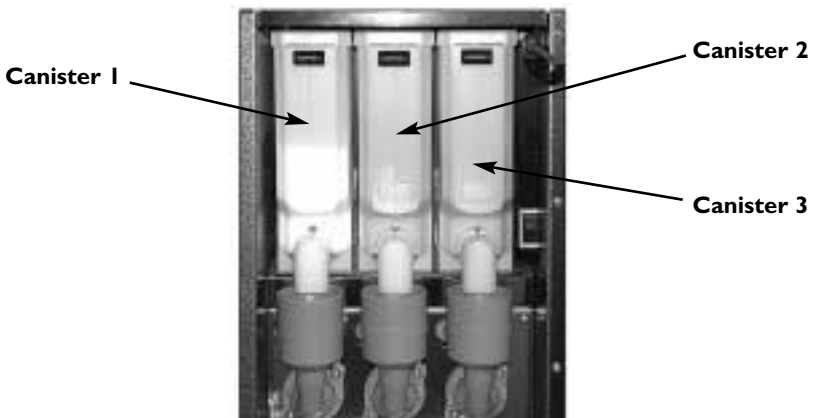
4. Step through the program using the red button. To view required audit data, press the yellow or green button.
5. To exit from the program, press the red button until the machine returns to stand-by (indicated by the green LED located on the front panel of the machine).

Canister and Selection Button Layout

The machine has 7 vend buttons situated on the front panel. The buttons are designated 1 - 7, with button 1 located on the left as shown in the photograph below.



The three ingredient canisters are designated 1 - 3, with canister 1 located on the left. (See photograph below).



The machine can be configured (using the push buttons located on the LCD board) to allocate any one, two or all three ingredient canisters to any of the vend selection buttons.

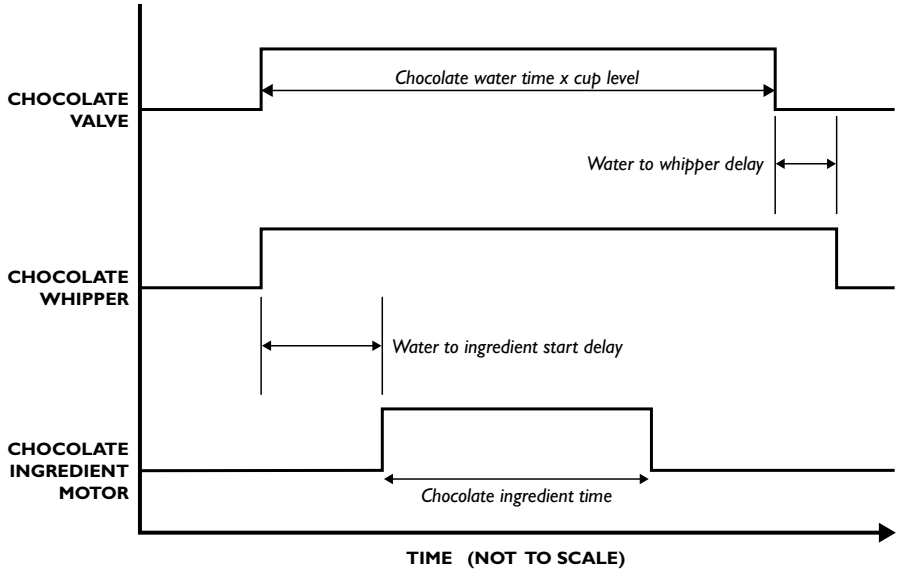
Example Vend

The following description outlines the sequence of events required to vend a chocolate drink.

1. Vending machine is in standby mode.
2. Customer selects chocolate drink.
3. The chocolate water valve is opened.
4. The chocolate whipper motor is started.
5. The controller waits for the time specified in the water to ingredient start delay.
6. The chocolate ingredient motor is started.
7. The chocolate ingredient time is read from the LCD settings.
8. The controller waits until each time period has elapsed before turning off the motor and valve.
9. The controller waits for the time specified in the water to whipper stop delay after the valve has closed.
10. The whipper is switched off.
11. The machine returns to standby mode indicated by the green LED.

The **timing diagram** shown opposite is a graphic representation of the example vend.

Timing Diagram



Maintenance

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Boiler Removal and Descaling

Removing the Boiler

1. Switch off the machine at the mains electrical supply.
2. Remove the machine rear cover.
3. Drain the boiler. Lower the boiler drain tube into a bucket and remove the bung located in the end of the tube. Allow all the water to empty from the tank.



Safety First! Ensure that the water in the boiler has cooled sufficiently before emptying.

4. Re-fit the tube bung and switch the machine back on at the mains electrical supply. Allow the tank to refill with cold water in order to cool it further.
5. Switch the machine off at the mains electrical supply.
6. Repeat step 3 to drain the tank.
7. Disconnect the boiler valve harness plug from the mains harness.
8. Disconnect the live (brown) and neutral (blue) supply wires, from the heating element.
9. Remove and label the silicone feed pipes connected to the water dispense valves, noting the position of each one.
10. Disconnect the boiler overflow and cold fill pipes located on the top left-hand side of the tank.
11. Remove and clean the thermistor located behind the ingredient canisters.
12. Unscrew the three locating screws fixing the boiler to the machine cabinet.
13. Lift the boiler, then withdraw it from the rear of the machine.

Descaling the Tank

1. Remove the dispense valves and silicone mounts from the boiler.
2. Unscrew the six boiler lid fixing screws. Remove the lid and sealing gasket.
3. Descale the inside of the tank either by scraping it with a flat blunt scraper or using a suitable descaling solution. Thoroughly clean and rinse the tank with clean water.
4. Refit the sealing gasket and boiler lid.
5. Refit the silicone mounts and dispense valves to the boiler.

6. To refit the boiler into the machine, reverse the removal sequence.

Servicing the Dispense Valves

1. Remove the stainless steel breather tube and plastic tube from the valve body.
2. Remove the four clips from the valve body.
3. Remove the dispense outlet from the main valve body. **DO NOT** remove the 'O' ring seal.
4. Remove the fixing nut and separate the coil assembly from the valve body.
5. Remove the two fixing screws securing the dispense plunger to the valve body. Remove the plunger taking care not to lose the seals and springs.
6. Thoroughly clean and descale all parts of the valve assembly. Check the seals and replace any which are worn or damaged.
7. Reassembly of the valve is the reverse sequence to dismantling.

Extract Fan Servicing

Removing the Extract Fan

1. Switch off the mains supply to the machine.
2. Remove the rear cover.
3. Remove the hose from the fan.
4. Disconnect the electrical connections from the fan assembly.
5. Remove the fan fixing screws located on the underside of the heater tank support bracket. Remove fan from machine.
6. Refitting the fan is the reverse operation to removal.

Cleaning the Extract Fan

1. Remove all deposits and dust from the inside of the fan unit using a stiff brush.

Do not use a liquid type cleaning agent on the fan unit.

Removing the Ingredient Motor

1. Switch off the mains supply to the machine.
2. Remove the ingredient canisters from the machine and place them on a clean surface. **DO NOT** place them on the floor.
3. Remove the mixing system and extract tray from the machine.

4. Unscrew the four M4 fixing screws securing the whipper plate to the cabinet and remove the plate from the machine. If the machine is fitted with whipper motors, remove the plate carefully because the motors will be connected to the main loom.
5. Unscrew the two M4 screws which secure the extract pipe boss to the module top panel.
6. Disconnect the electrical connector from the ingredient motor. Remove the two M5 screws securing the motor and withdraw the motor downwards and out.
7. Refitting is the reverse of the above procedure.

Power Supply Removal

1. Switch off the mains power supply to the machine.
2. Remove the rear cover. Unscrew the four M4 screws securing the plate holding the mains cable gland.
3. Remove the two M4 screws securing the power supply to the base of the machine. Pull the complete power supply out of the machine. Access will now be available to the transformer and solid state relay.
4. Refitting is the reverse of the above procedure.

Inlet Valve Removal

1. Switch off the mains power supply to the machine.
2. Turn off the mains water supply at the stopcock and disconnect the flexi-hose.
3. Remove the rear cover.
4. Carefully cut and remove the cable tie securing the hose to the extract fan. Remove the hose from the fan.
5. Disconnect the electrical connections from the fan assembly. Remove the fan assembly fixing screws located on the underside of the heater tank support bracket.
6. Remove the water outlet pipe from the inlet valve.
7. Unscrew the two M4 screws securing the inlet valve and remove the valve assembly from the machine.
8. Refitting the inlet valve is the reverse of the previous procedure.

Removing the Controller Board

1. Switch off the mains supply to the machine.
2. Remove the ingredient canisters from the machine and place them on a clean surface. DO NOT place them on the floor.
3. Remove the processor cover located on the right hand side wall of the cabinet.
4. Carefully disconnect the wiring connections to the board.



Safety First! Observe precautions for handling electrostatic sensitive components. Before removing wiring connections touch some metal part of the machine.

5. Unscrew and remove the earth braid located above the processor.
6. Remove the controller board from the machine
7. Refitting the controller board is the reverse of the above procedure.

Whipper Motor Removal - Where Fitted

1. Switch off the mains supply to the machine.
2. Remove the ingredient canisters from the machine and place them on a clean surface. DO NOT place them on the floor.
3. Remove the mixing system and extract tray from the machine.
4. Unscrew the four M4 fixing screws locating the whipper plate to the cabinet and remove the plate from the machine. Remove the plate carefully because the motors will be connected to the main loom.
5. Disconnect the three moxex housings from the main loom noting the position of each one. Remove the two fixing screws locating the whipper motor to the plate and remove the motor
6. Refitting is the reverse of above procedure.

Fault Finding and Repair

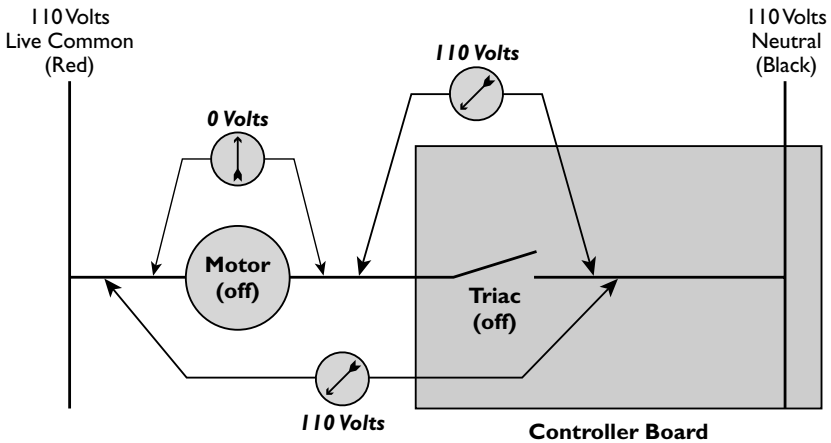
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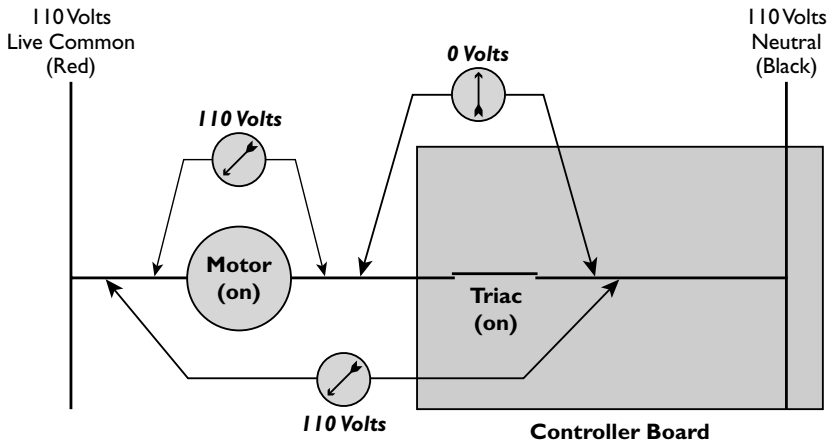
Output Operation

This section of the manual is intended to assist the engineer in locating faults in the input and output circuitry of the machine.

In the first example below, voltages (indicated by a voltmeter) are shown at the relevant points when a motor is switched off by the triac and is operating correctly.



In the second illustration, voltages (indicated by a voltmeter) are shown at the relevant points with a motor operating correctly, switched on by the triac.



Fault Finding Tables

Water System

Fault	Possible Cause	Remedy
Cold or no water in heater tank (Indicated by red LED)	Blown heater fuse	Replace with 12 amp HRC ceramic fuse. N.B. The correct fuse must be used
	Incorrect temperature set in LCD	Access program and set correct temperature
	Faulty thermistor	Check thermistor and replace if necessary
	Thermal trip activated	Reset trip in overflow pipe and investigate cause
	Faulty solid state relay	Check and replace
	Faulty heater element	Check and replace
	Low water level in heater tank	Ensure water supply and inlet valve are turned on. Check that filter and level probe are operating correctly. Check heater tank for leaks
Water in heater tank boiling	Faulty thermistor	Check thermistor and replace if necessary
	Solid state relay permanently on	Check relay drive and circuit
Water leaking	Heater tank overfilling	Replace inlet valve and seal
	Leaking inlet valve or valve seal	Replace inlet valve and seal
	Split in heater tank	Replace heater tank
Heater tank overfilling	Scale build up on level probe	De-scale probe
	Open circuit on level probe	Check input circuit and rectify

Drink Dispense

Fault	Possible Cause	Remedy
Product tunneling in canister	Incorrect canister fitted	Ensure canister is fitted with product agitator
Ingredient “bearding”	Steam extract system blocked	Remove fan assembly and clean extract system
	Extract fan not operating	Check and replace fan as necessary
	Water temperature too high	Access ‘temperature program’ and adjust water temperature
	Machine situated too close to wall	Re-position machine to allow 150 mm air space around cabinet
Incorrect drinks dispensed	Ingredient canisters fitted incorrectly	Remove and refit canisters correctly
Leaking from dispense area	Mixing bowls/chambers fitted incorrectly	Remove and refit correctly
	Whipper seals damaged	Replace seals
Incorrect water quantity dispensed	Water quantity set incorrectly in ‘drinks program’	Access ‘drinks program’ and adjust water setting
Incorrect ingredient quantity dispensed	Incorrect ingredient quantity set in ‘drinks program’	Access ‘drinks program’ and adjust ingredient setting

Controller Board

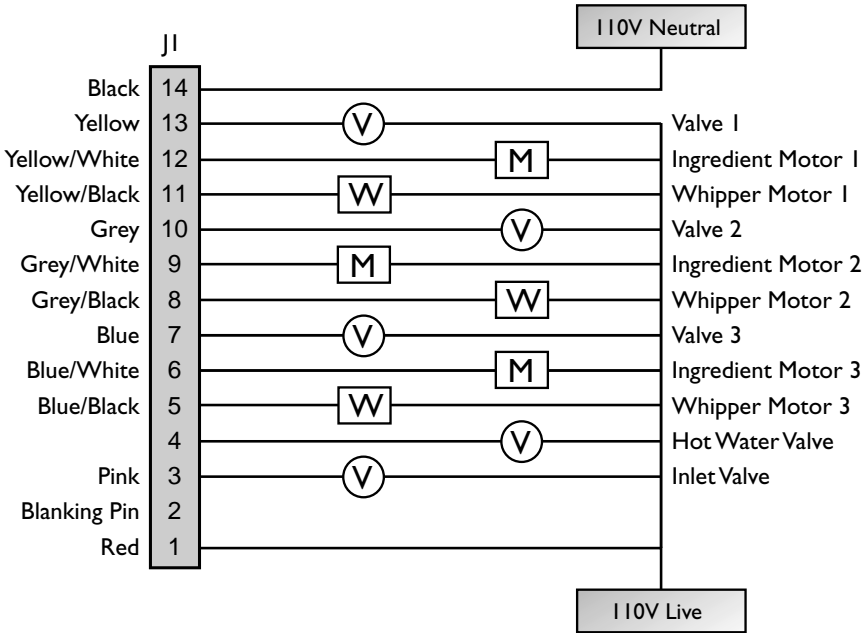
Fault	Possible Cause	Remedy
LED not lit	24 volt fuse blown	Replace with correct 0.5 amp fuse
	Faulty controller board	Replace controller board
No outputs switched by controller board	110 volt supply fuse blown	Check and replace with correct 6.3A fuse
	Faulty controller board	Replace controller board

Figures and Diagrams

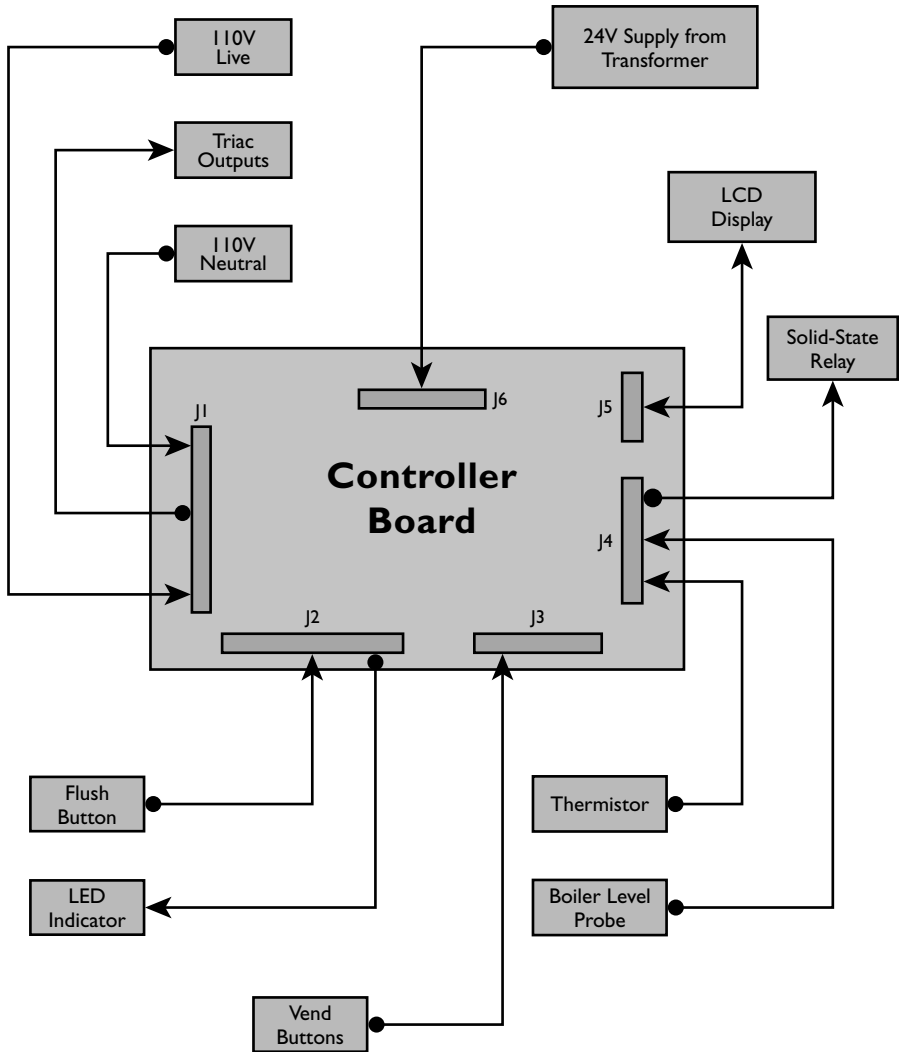
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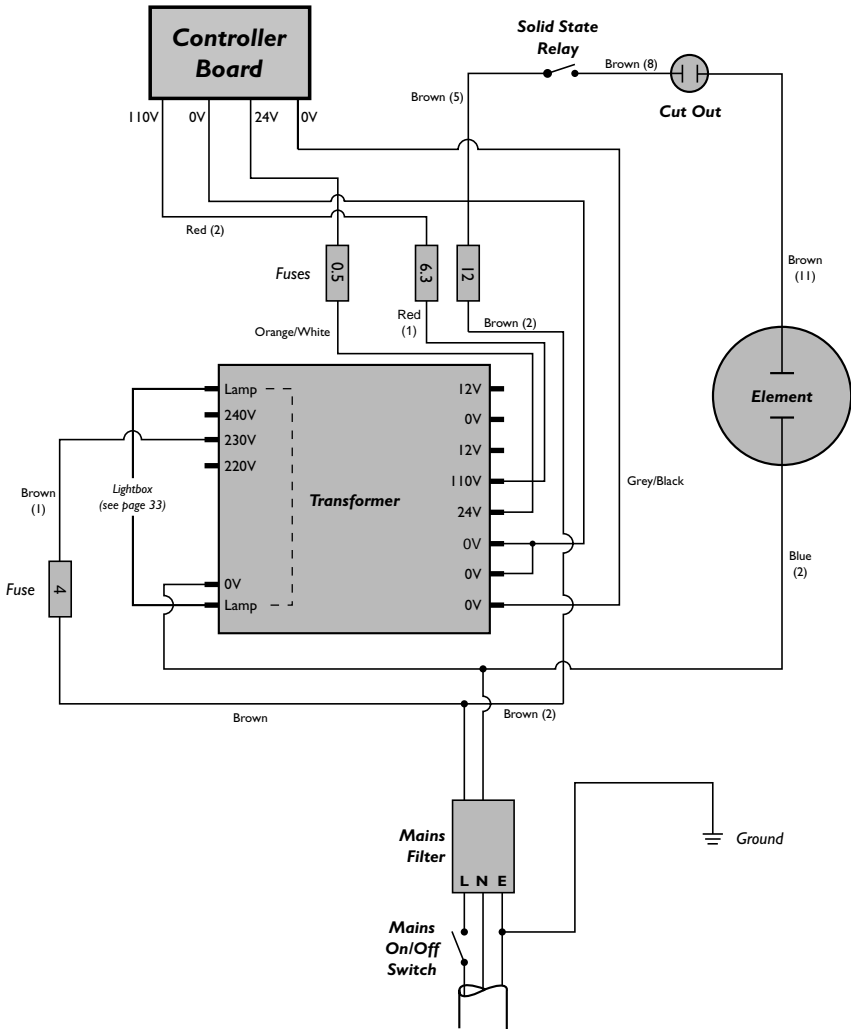
Output Circuit



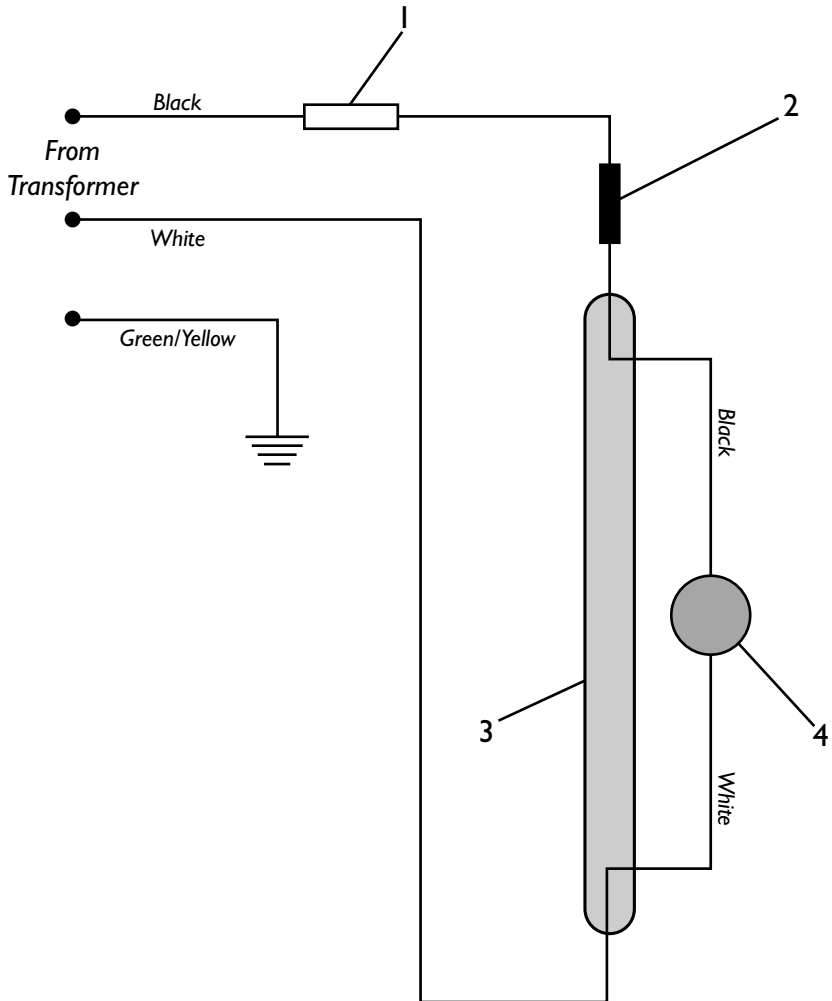
Route Diagram



Power Circuit

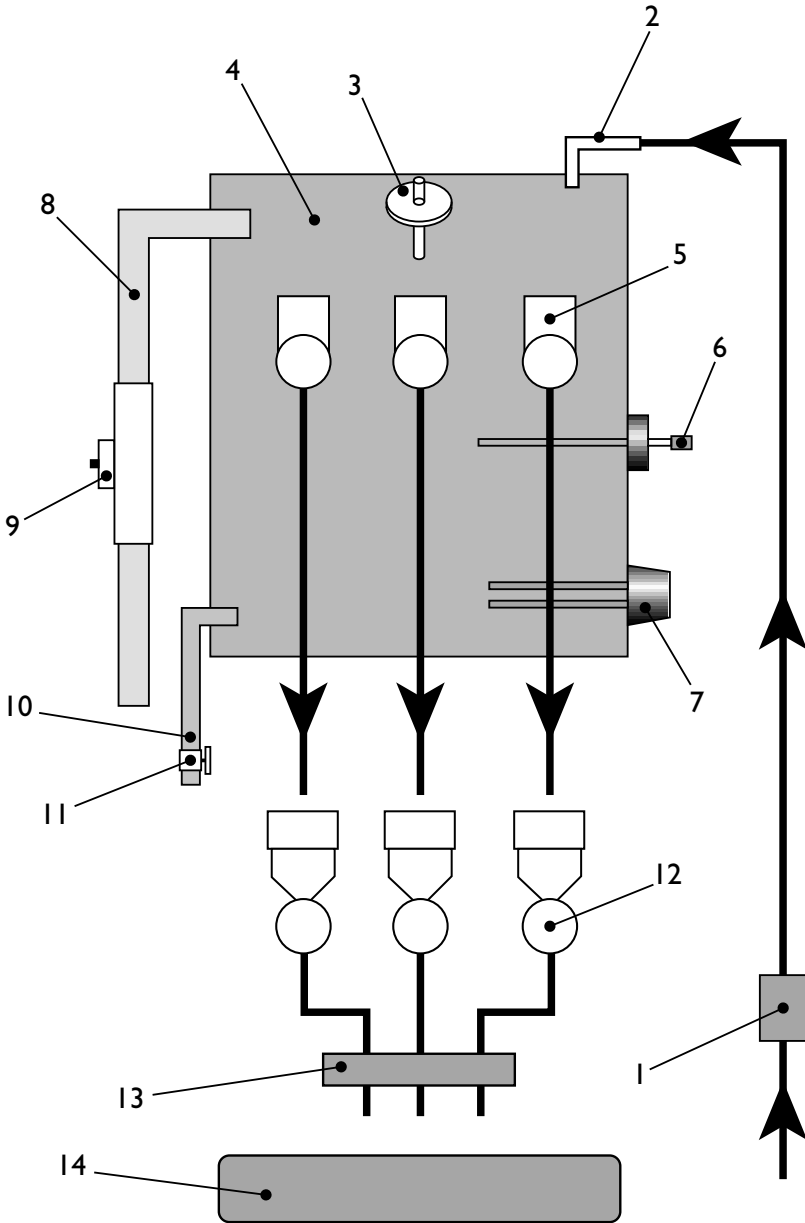


Light Box Circuit



Ref. No.	Description
1.	1A Fuse
2.	Ballast
3.	Tube
4.	Starter

Water Flow Diagram



Water Flow Diagram

Ref. No.	Description
1.	Inlet Valve
2.	Boiler Inlet Pipe
3.	Water Level Probe
4.	Boiler
5.	Dispense Valves
6.	Thermistor Probe
7.	Heating Element
8.	Overflow Pipe
9.	High Temperature Cut-Out
10.	Boiler Drain Pipe
11.	Drain Pipe Bung
12.	Ingredient Mixing Stations
13.	Dispense Head
14.	Waste Tray

Notes

Notes

Notes



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