

ULTRA 3 BEVERAGE MACHINE



TECHNICAL MANUAL

COFFETek LTD
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TECHNICAL MANUAL

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FOREWORD

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1. The information contained in this technical manual is applicable to the Ultra 3 Beverage Machine. Due to customer requirements some units may vary from the one described in the manual.
2. Personnel who have undergone relevant equipment training must only undertake maintenance of the beverage machine.
3. The Manufacturer reserves the right to make changes, without notice, to the design of the beverage machine, which may affect the information, contained in this manual.
4. The Ultra 3 Beverage Machine is designed for indoor use, in an environment with an ambient temperature range of between 0°C and 40°C.

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Section 1

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Technical Information

Introduction

1. The Ultra 3 Beverage Machine dispenses hot beverages in response to a simple keypad selection. All beverages are dispensed in cup measures. A liquid crystal display provides status indications and user instructions. All operations are microprocessor controlled.
2. A cup is placed under the dispense head and the selection is made on the keypad. The drink is then dispensed in the required quantity. The machine does not accept money, but a feature such as this can be added.
3. The status of the machine may be monitored, and the configuration altered, by accessing a program using the keypad and display. The program offers a menu of options; each consisting of a number of sub-options which can be altered. During programming the keys assume different functions to those displayed on the front panel. After programming they return to their original functions.
4. The Ultra 3 Beverage Machine requires a 230V, 16A single-phase supply.

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FIG 1.1 ULTRA 3 BEVERAGE MACHINE

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SPECIFICATIONS

- 5. (a) Weight: 26kg
- (b) Height: 64cm
- (c) Width: 26cm
- (d) Depth: 46cm
- (e) Temp. Range: 0°C to 55°C (ambient)

SERVICES REQUIRED

Electrical Supply

- 6. (a) Supply voltage: 230V, 50Hz, single phase fused supply
- (b) Current rating: 16A
- (c) The fused electrical supply must be terminated at a safety isolator switch, which provides a contact separation of at least 3mm. The isolator should be located within 1m of the beverage machine.

Water Supply

- 7. (a) 15mm dia. water mains supply, terminating at a convenient stop tap located within 1m of the beverage machine.
- (b) Water Pressure
 - Minimum: 1 bar
 - Maximum: 8 bar
- (c) A 15mm double backcheck valve, with inspection port, should be fitted prior to the flexible hose.

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GENERAL DESCRIPTION

8. The Ultra 3 Beverage Machine is a free standing unit which may be mounted on a secure table, bench, cabinet or food and drink counter.

Cabinet Front

9. A swivel open door provides access to the three plastic ingredient canisters. The keypad and display are fitted to the front panel and are connected to the MPU Controller Board at the rear of the door.
10. A gear driven worm screw located in the base of each canister dispenses ingredients in exact amounts. The ingredient is then mixed with hot water in a mixing bowl prior to the beverage being poured from the dispense head. A plastic agitator, located inside the canisters, ensures a free and consistent flow of powder. Additionally, a whipper unit, located beneath the mixing bowls, ensures that the product and water are properly blended.
11. The machine On/Off switch is located on the lower panel. Access to all other components is either by removal of the motor shelf or side panels.

Cabinet Interior

12. Access to the internal parts of the machine is gained by removal of the ingredient canisters. Access to the boiler is then gained by removal of the boiler cover and lid assembly. Further access to the machine is achieved by removing the left-hand side panel, by lifting it upwards, clear of its keyhole slots. Removing this panel gives access to all internal components.
13. The main water supply enters the machine via a gland at the rear of the cabinet and connects with the inlet valve. A length of tubing then takes the water supply into the top of the boiler. Hot water is directed from the boiler, via the appropriate solenoid operated valve, to the mixing bowl. A length of tubing directs any overflow from the boiler into the drip tray, and another length of tubing facilitates draining of the boiler.
14. The mains electricity supply cable enters the machine via a cable gland at the rear of the machine, where it connects to a terminal block. The supply is then connected via a line filter to the On/Off switch on the front of the machine. The extract fan is located on the base of the machine and exhausts down towards the drip tray.

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Water System

15. The cold water mains supply enters the machine via a gland at the rear of the cabinet. It connects with a solenoid operated inlet valve, which controls the flow of water to the boiler, thus maintaining it at a constant level in response to signals from the Controller Board which, in turn, is prompted by a water level probe.
16. The water is heated to the required temperature by a single heating element. The Controller Board ensures that the temperature is maintained to a predetermined level by controlling the supply to the heater.
17. Hot water from the boiler is fed directly to one of the mixing bowls where it mixes with the dispensed ingredient to produce the selected beverage. Solenoid operated valves distribute the hot water to the selected mixing bowl, the amount of water being determined by the program setting.
18. The temperature of the water is monitored by the Controller Board via a sensor inserted into the tank, thus causing the supply to the heater to be removed when the water in the boiler reaches its required temperature setting.
19. A re-settable temperature sensor attached to the overflow pipe, cuts off the electrical supply to the heater if the water in the boiler starts to over boil.

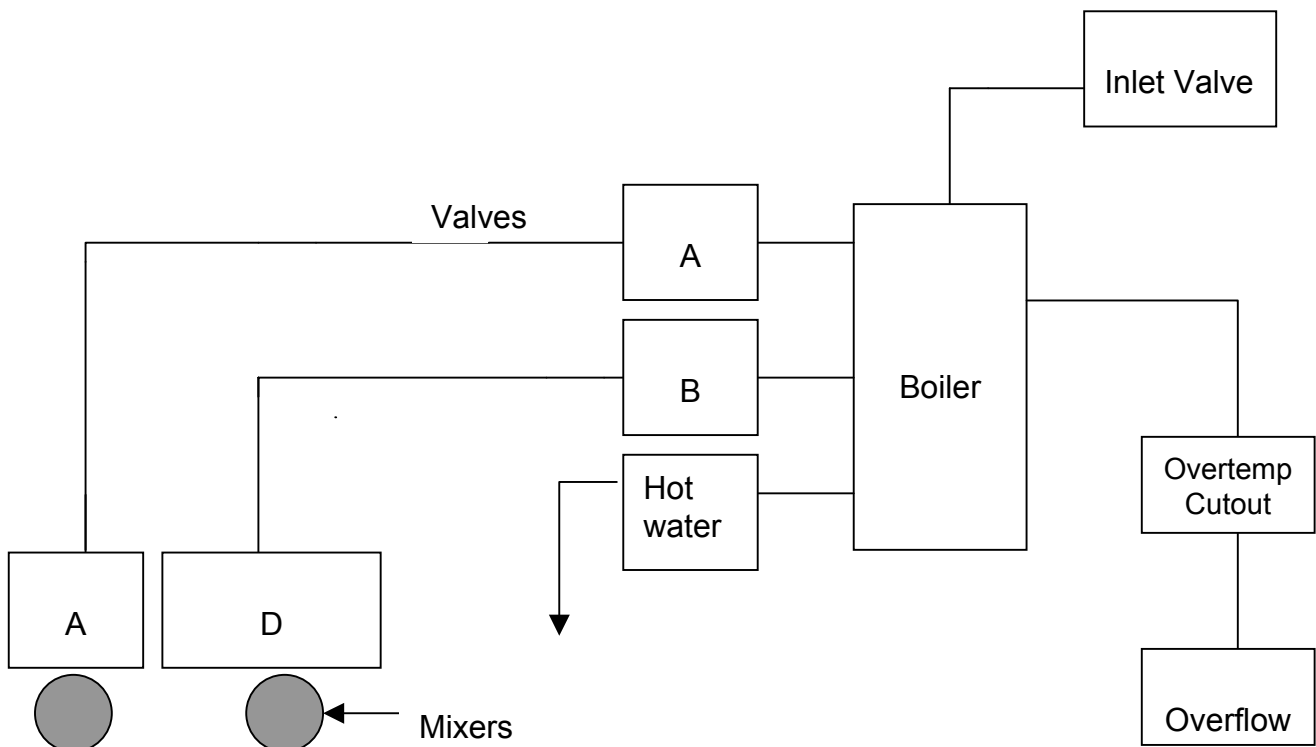


FIG 1.2 WATER SYSTEM - FUNCTIONAL DIAGRAM

ELECTRICAL AND ELECTRONIC SYSTEM

Functional Description

20. The MPU Controller Board employs Microprocessor technology to monitor and control the operation of the beverage machine. The board contains the main System Program, the Operator's Program and the Engineer's Program, each stored in programmable read only memory (EPROM).
21. Variables, such as the amount of ingredients dispensed, are stored in non-volatile random access memory (NVRAM) and are called up by addressing either the Operator's Program or the Engineer's Program as appropriate.
22. The main System Program tasks the microprocessor with continually checking the status of the input devices (keypad, probe, etc) and responding to data received by signalling the output devices (LCD display, motors, whippers, etc) to take the appropriate action. The System Program also requests the microprocessor to interrogate the variable settings in NVRAM and to modify its actions accordingly.
23. Output transistors on the I/O Board convert signals from the Controller's microprocessor circuit to the current drive necessary to operate output devices, i.e. motors, whippers and inlet valve.

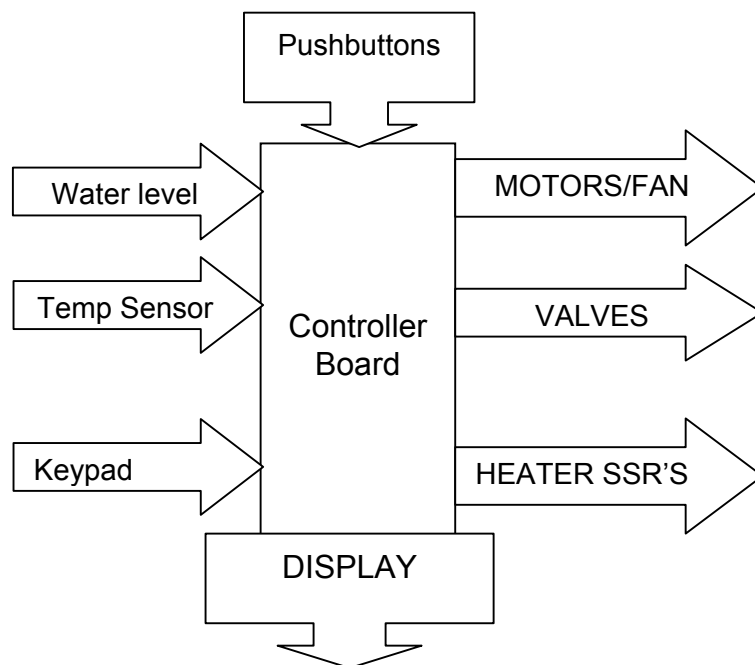


FIG 1.3 ELECTRICAL AND ELECTRONIC SYSTEM - FUNCTIONAL DIAGRAM

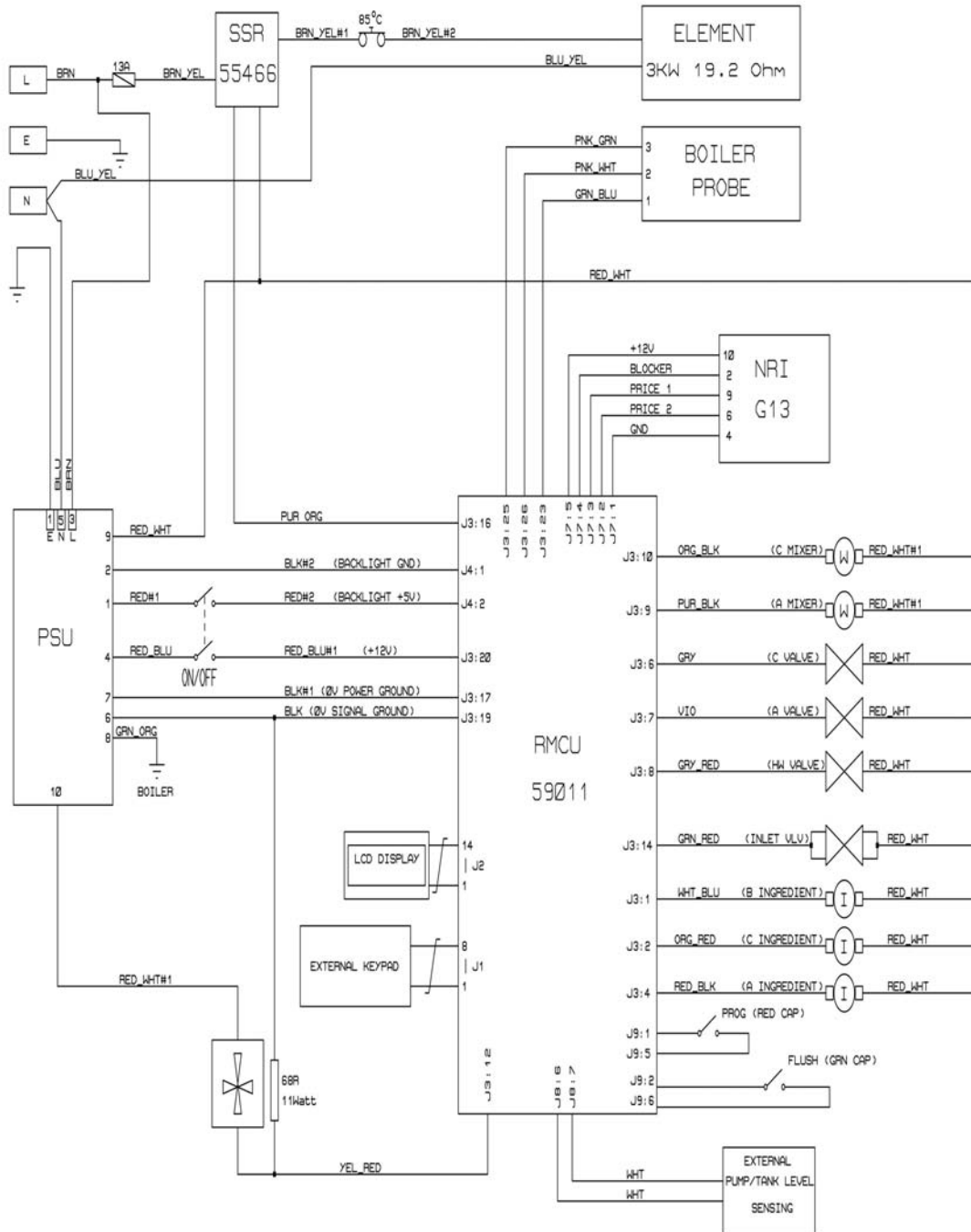
Circuit Description

24. The beverage machine is connected to a 230V single-phase supply that terminates at a terminal block (TBA). From here AC supplies are taken to the heater element and Power Supply PCB.
25. A 15A fuse protects the heater circuit. A solid-state relay (SSR) contact and high temperature cutout are also placed in the heater circuit. The SSR switches the supply to the heater as directed by the MPU Controller in response to data received from the temperature sensor part of the temperature/level probe, thus maintaining the water in the boiler at the correct temperature. However, if the water in the boiler starts to boil, the high temperature cutout removes the supply to the heater. Once operated, the cutout must be reset manually.
26. A 230V ac main supply is taken from the terminal block to the Power Supply PCB via the On/Off switch. The Power Supply PCB provides DC supplies of 24V, 12V and 5V. The 24V-dc output supplies the ingredient motors, whipper motors, extraction fan, SSR and solenoid operated valves. The 12V-dc output supplies the MPU Controller Board and operational coin acceptor (if fitted).
27. The MPU Controller Board continually checks the status of input devices connected to plugs J1 and J3, and responds to any change of state by signaling the operation of the relevant output devices via on-board current drive transistors. Thus, for example, the water level probe controls the operation of the inlet valve and the temperature sensor controls the operation of the SSR.
28. The dispensing of a beverage begins with the keypad selection, which is scanned by the MPU Controller Board via a ribbon connector. Control signals corresponding to the required actions are then generated by the MPU Controller to operate the relevant output devices in the correct sequence and for the specified duration. User data information is then sent in parallel form to the front panel (LCD) display.

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ULTRA 338 ELECTRICAL SCHEMATIC



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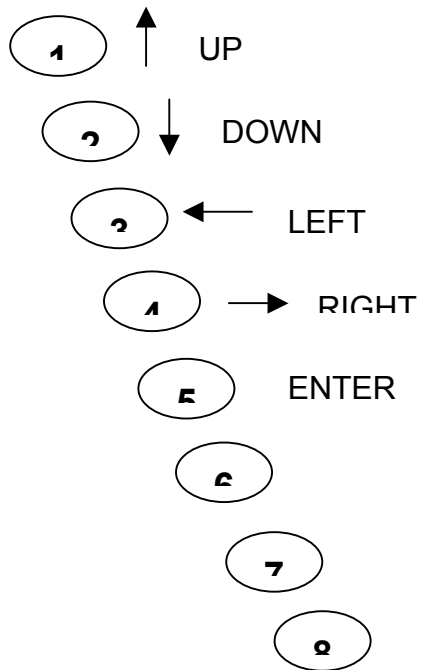
Section 2

Programming

Introduction

29. The Ultra 3 Beverage machine provides two discrete user programs: The Operators program and the Engineers program. The Operators Program is available to both the Operator and the service engineer, but the Engineers program is only available to the service engineer.
30. Both the programs are stored in programmable read only memory (EPROM) on the controller Board. The values and settings (Variables) which the program allows the programmer to alter are stored in NVRAM (non-volatile random access memory).
31. Settings are maintained, with out the need for back-up battery, when the power supply is removed.

Keypad Layout



Key Functions

32. The function assigned to each key depends on the selected mode of operation, of which there are three:

- Normal Mode
- Operator's Program Mode
- Engineer's Program Mode

In Normal Mode, the visible KEYS (1 to 8) are assigned the drink functions shown on the keypad.

The functions assigned to the keypad keys in both the Operator's Program Mode and Engineer's Program Mode are as follows:

Key 1	UP
Key 2	DOWN
Key 3	LEFT
Key 4	RIGHT
Key 5	ENTER

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OPERATOR PROGRAM

Accessing the Operator's Program

33. Pressing the RED BUTTON on the inside of the machine door accesses the Operator's Program. The display will then show:

**PRESS DRINK TO
DISPLAY COUNTER**

Program Options

34. Program options are available as follows:

**DISPLAY COUNTER
TOTAL VENDS
RESET COUNTERS
DISABLE VENDS
VIEW INGREDIENT COUNTERS**

35. Repeated pressing of the RED BUTTON causes the program to scroll through the options in the above sequence. Therefore a specific option is accessed by pressing the RED BUTTON until that option is displayed.

Display Counter

36. The DISPLAY COUNTER option is accessed on entering the Operator's Program. The resettable vend counts may be viewed by pressing each drink key (as shown on the keypad) in turn.

Total Vends

37. Access the TOTAL VEND COUNT option using the RED BUTTON. The display will show the total vend count.

Reset Counters

38. (1) The RESET COUNTERS option allows the Operator to reset the counters.
(2) Press KEY 5 (ENTER). The display will show:

**ARE YOU SURE?
ENTER (Y), MODE (N)**

- (3) Press KEY 5 (ENTER) to clear the counters.

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Disable Vends

39. The machine may be disabled, without switching off the electrical supply, by pressing DISABLE VEND. To enable vends, to-enter Operator Program and press ENABLE VEND.

View Ingredient Counters

40. Access the VIEW INGREDIENT COUNTERS option using the RED BUTTON. Press KEY 5 (ENTER) to display the first counter (ESPRESSO), and then use KEYS 1 and 2 (UP and DOWN) to scroll through the others.

Leaving the Operator's Program

41. There are 3 ways of leaving the Operator's Program and returning to Normal Mode:
 - (1) After accessing the last of the four options, press the RED BUTTON again.
 - (2) After a period of 30 seconds from the last key press, the machine is automatically returned to Normal Mode.

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ENGINEER'S PROGRAM

Accessing the Engineer's Program

42. The Operator's Program must be accessed before the Engineer's Program can be accessed. The key stroke sequence is as follows:

(1) Press the RED BUTTON to access the Operator's Program. The display will show:

PRESS DRINK TO DISPLAY COUNTER

(2) Press the RED BUTTON again. The display will show:

TOTAL VENDS

(3) Press KEY 8 to access the Engineer's Program. The display will show:

**SELECT DRINK
TO MODIFY**

Program Options

43. Fourteen program options are available as follows:

SELECT DRINK TO MODIFY

SELECT DRINK TO TEST

OUTPUT TEST

CHANGE PRICE OR INHIBIT DRINKS

SET INGREDIENT THROW RATE

SET MACHINE SERIAL NUMBER

TANK STATUS

INITIALISE

CHANGE SETTINGS

PRESS DRINK FOR FIXED COUNTERS

EDIT BIN NAMES

SAVE TO HIGH MEMORY BANK

SET FACTORY DEFAULTS

LEAVE ENGINEERS PROGRAM

44. Repeated pressing of the RED BUTTON causes the program to scroll through the options in the above sequence. Therefore a specific option is accessed by pressing the RED BUTTON until that option is displayed. To access any program press KEY 5 (ENTER).

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Select Drink to Modify

Ingredient/Water/Whipper Adjustments Program

45. The program is arranged in sections showing the start and duration of the following: -

<u>Ingredients</u>	Product A – CHOCOLATE Product B – MILK Product C – COFFEE Product D – NOT SET	} NORMAL SETTINGS
<u>Water</u>	Product A – CHOCOLATE/MILK Product C – COFFEE Product D – NOT SET	} NORMAL SETTINGS
<u>Whipper</u>	Product A – CHOCOLATE/MILK Product C – COFFEE Product D – NOT SET	} NORMAL SETTINGS

- (1) The SELECT DRINK TO MODIFY option allows modification of individual drink timings. First select the drink e.g. COFFEE. The display will show:

**DRINK 03 NAME IS
COFFEE** (If name is correct move to step 4)

- (2) Press KEY 5 (ENTER). The display will show:

**COFFEE
KEY 1 (UP), KEY 2 (DOWN), KEY 5 (ENTER)**

- (3) Press KEY 1 (UP) to scroll other drink name options available or Press KEY 2 (DOWN) to return to COFFEE. Press KEY 5 (ENTER) to enter new option.
- (4) If drink name is correct, use KEY 1(UP), KEY 2 (DOWN) to step through program. The display will show:

**USES NOZZLE
000**

This option will enable the machine to Multivend or Singlevend.

- (a) To set to Multivend option, set each drink USES NOZZLE at: -

00, 01, 02

- (b) To set Singlevend option, set each drink USES NOZZLE at: -

00

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- (5) Press KEY 1 (UP), KEY 2 (DOWN) to show Ingredient Settings. Display will show:

CHOCOLATE
000 (Start)(Ingredient Start Time)

CHOCOLATE
000 (Duration)(Run Time of Motor)

MILK
000 (Start)

MILK
000 (Duration)

COFFEE
010 (Start)

COFFEE
016 (Duration)

NOT SET
000 (Start)

NOT SET
000 (Duration)

CHOCOLATE WATER
000 (Start)

CHOCOLATE WATER
000 (Duration)

COFFEE WATER
000 (Start)

COFFEE WATER
030 (Duration)

NOT SET
000 (Start)

NOT SET
000 (Duration)

CHOCOLATE WHIPPER
000 (Start)

CHOCOLATE WHIPPER
000 (Duration)

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COFFEE WHIPPER
005 (Start)

COFFEE WHIPPER
040 (Duration)

NOT SET
000 (Start)

NOT SET
000 (Duration)

HOT WATER
020 (Start)

HOT WATER
020 (Duration)

NUMBER OF CYCLES
001 (Example - set to 005 for ½pot option)

SCALE FACTOR

- (6) To adjust the drink, first selection the option, e.g. COFFEE Duration Display will show:-

COFFEE ING
016 DURATION

- (7) Press KEY 5 (ENTER) - display will show: -

COFFEE ING
VALUE = 016 (Flashing Digit)

- (8) Press KEY 1 (UP) to increase or KEY 2 (DOWN) to decrease.

- (9) Press KEY 5 (ENTER) to accept the new value.

- (10) Press KEY 1 (UP) to step through program to adjust other value or Press KEY 6 to return to **SELECT DRINK TO MODIFY** then press KEY 6 again to return to normal operating mode.

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Select Drink to Test

46. The SELECT DRINK TO TEST option allows any selected drink to be dispensed, while still in the Engineer's Program, in order to be tested. This facility is useful for testing a drink that has been modified.
- 46.1 Press COFFEE, for example, to test a change made to the selection in the SELECT DRINK TO MODIFY option.

Output Test

47. The OUTPUT TEST option allows an output device to be operated. All output devices are described as Whipper A/B, D or Motor A, B, D or Valve A/B, D. These components correspond to the position the canisters are located, i.e. from right to left.

MOTOR	MOTOR	MOTOR
D	B	A
WHIPPER	WHIPPER	
D	A/B	

- 47.1 For example, to operate the Ingredient Motor D, select Motor D by pressing KEY 1 (UP) until it appears in the display window, then press KEY 5 (ENTER) to switch the motor ON, then press KEY 5 (ENTER) to switch the motor OFF.
- 47.1 To select other components, press KEY 1 (UP) or KEY 2 (DOWN) to list all other components and repeat the procedure above.

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Change Price of, or Inhibit Drink

48. The CHANGE PRICE OF, OR INHIBIT DRINK option allows individual drinks to be priced or inhibited.

- (1) Press the drink key your require to change (e.g. COFFEE). The display will show:

**COFFEE
FREE**

- (2) To set COFFEE to FREE, press KEY 5 (ENTER), otherwise press KEY 1 (UP) until the option you require is shown in the display, e.g: -

**FREE
PRICE 1
PRICE 2
JUG
INHIBIT**

For Example: To set PRICE 1 press KEY 1 (UP) until PRICE 1 is shown in display, then press KEY 5 (ENTER).

- 48.1 Once a setting has been made by pressing KEY 5 (ENTER), the program exits from the CHANGE PRICE OF, OR INHIBIT DRINK option and returns to the main Engineer's Program.

Set Ingredient Throw Rate

49. The SET INGREDIENT THROW RATE option allows the engineer to alter ingredient throw rates in grams dispensed per second of operation of the ingredient motor for the product usage calculation displayed in Operators Program.

- (1) Press KEY 5 (ENTER). The display will show:

**CHOCOLATE (grams per second)
00006.50**

- (2) To change the value of the Chocolate throw rate, press KEY 5 (ENTER) again. The display will show:

**CHOCOLATE (grams per second)
VAL = 0000.65 (flashing digit)**

- (3) Press KEY 1 (UP) to increase the value or KEY 2 (DOWN) to decrease it.
- (4) Having set the new throw rate, press KEY 5 (ENTER) to enter the new value.
- (5) Press KEY 1 (UP) to display the next ingredient.
- (6) Press KEY 6 to exit from the SET INGREDIENT THROW RATE option.

Set Machine Serial Number

50.

- (1) Press KEY 5 (ENTER).
- (2) Press KEY 1 (UP) to SET SERIAL NUMBER.

Tank Status

51. The TANK STATUS option allows the engineer to view the status of the boiler water level and temperature.

- (1) Press KEY 5 (ENTER) to display the tank status. The display will show:

**PROBE IS WET
89°C 0362 (0,0)**

- (2) The value 89°C is the temperature setting. The 0362 is a number corresponding to the temperature setting from the probe.
- (3) The value (0,0) is the element status.
- (4) Press the RED BUTTON to exit from the TANK STATUS option and access the next Engineer's Program option.

Initialise

52. The INITIALISE option allows the engineer to return the settings saved to HIGH MEMORY.

- (1) Press KEY 5 (ENTER). The display will show:

**ARE YOU SURE?
ENTER (Y) ESC (N)**

- (2) Press KEY 5 (ENTER) to initialise the machine or the RED BUTTON to access the next Engineer's Program option.

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Change Settings

53. CHANGE SETTINGS allows alteration of the following machine settings:

DESIRED TEMP To adjust the desired temperature press KEY 5 (ENTER)

089° (0354)

VALUE = 089 (flashing digit)

(1) Press KEY 1 (UP) or KEY 2 (DOWN) to alter temperature.

(2) Press KEY 5 (ENTER) to confirm.

(3) Press KEY 1 (UP) or KEY 2 (DOWN) to scroll through program.

TEMPERATURE
LOW (1) Press KEY 5 (ENTER)

083°C (0190)

VALUE = 083 (flashing digit)

(2) Press KEY 1 (UP) or KEY 2 (DOWN) to alter temperature.

(3) Press KEY 5 (ENTER) to confirm.

(4) Press KEY 1 (UP) or KEY 2 (DOWN) to scroll through program.

CUP BOOST Allows increase/decrease of temperature boost per cup dispense.

RESERVED 1

RESERVED 2

OUT OF SERVICE Enables machine to be programmed out of service:

0 = On, 1 = Off

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GLOBAL SCALING Adjustment of cup volume of drinks. All aspects of drink are scaled, i.e. product, whipper, water.

- (1) To change the GLOBAL SCALING setting, for example, press KEY 5 (ENTER). The display will show:

**GLOBAL SCALING %
100**

- (2) To alter the GLOBAL SCALING percentage value (from 100), press KEY 5 (ENTER). The display will show:

**GLOBAL SCALING %
VALUE = 100**

- (3) The cursor will be flashing on the last digit of the number 100.
- (3) Alter the GLOBAL SCALING percentage value, as required, using KEY 1 (UP), KEY 2 (DOWN), KEY 3 (LEFT) and KEY 4 (RIGHT).
- (4) Press KEY 5 (ENTER) to enter the new setting or press KEY 6 to leave the original setting.

DRY VEND FLAG Enables product only operation:

0 = Water On, 1 = Water Off

CREDIT LOCK Disables all access to machine programs:

0 = Credit Lock disabled (default setting)
1 = Credit Lock active

When Credit Lock is set to 1, only Tank Status and Fixed Counters can be viewed. To disable the Credit Lock after it has been set, see below.

Disabling the Credit Lock

To disable the CREDIT LOCK after it has been set, proceed as follows:

- (1) Enter CHANGE SETTINGS and set the Dry Vend Flag to 42.
- (2) Press KEY 5 (ENTER), display will show desired temperature.
- (3) Press KEY 1 (UP) until you reach Credit Lock, press KEY 5 (ENTER).
- (4) Set the Credit Lock to 0, press KEY 5 (ENTER).
- (5) Press KEY 6, set Dry Vend Flag to 000

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SERIAL NUMBER 000 enter the last 3 digit of serial number

CREDIT DEVICE Selects cash system.

To change Credit Device press KEY 5 (ENTER).

Press KEY 1 (UP) to select the required credit option, press KEY 5 (ENTER) to confirm option.

MS330 – Ver 212
Register Board
Token
MDB Mech
Coin Mech
Codax
Control
G13 Marscard
Digicard
Free

BEHAVIOUR CODE Standard.

(1) To change BEHAVIOUR CODE press KEY 5 (ENTER) : -

= CHANGE BEHAVIOUR CODE
= STANDARD

(2) Press KEY 1 (UP) or KEY 2 (DOWN) to view list: -

BEHAVIOUR 1
FLUSH TIME OUT
BEHAVIOUR 3
COLD WATER OUT
EXTERNAL PUMP – LEVEL CONTROL
INGREDIENT MONITOR

(3) Select the required option by pressing KEY 5 (ENTER).

(4) Press KEY 6.

COINAGE TYPE Pounds

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Press Drink for Fixed Counters

54. The PRESS DRINK FOR FIXED COUNTERS option allows the engineer to view the resettable vend counters associated with a selected drink.

- (1) Press the drink selection key on the keypad.
- (2) Press the RED BUTTON to exit from the PRESS DRINK FOR FIXED COUNTERS option and access the next Engineer's Program option.

Edit Bin Name

55.

- (1) Press ENTER. Display will show: -

Flashing Digit → **C** **B** **A**
 X **X**

- (2) Press KEY 3 (LEFT) and KEY 4 (RIGHT) to scroll to soup canister required to change.
- (3) Press KEY 5 (ENTER)
- (4) Press KEY 1 (UP) or KEY 2 (DOWN) to find new canister name.
- (5) Press KEY 5 (ENTER) to confirm.

Save to High Memory Bank

56. The Save to High Memory option allows the engineer to save the programmed setting of the machine.

- (1) Move the link on LK1 to the centre and left hand position on the MPU, then press KEY 5 (ENTER). The display will show:

ARE YOU SURE?
ENTER (Y), MODE (N)

- (2) Press KEY 5 (ENTER). The display will show:

SAVE TO HIGH MEMORY

- (3) Press KEY 6 to return to normal operating mode.
- (4) Keeping the machine switched on, move the link on LK1 to the centre and right hand position on the MPU. These new settings are retained in High Level Memory. The machine setting can be adjusted but if the machine is initialised, the machine will return to High Level Memory.

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Set Factory Defaults

57. The Factory Default option will allow the engineer to initialise a new MPU board with default settings.

(1) Press KEY 5 (ENTER), the display will show:

**ARE YOU SURE?
ENTER (Y), MODE (N)**

(2) Press KEY 5 (ENTER) to select FACTORY PRESET options.

(3) Press KEY 5 (ENTER) to confirm option.

Leave Engineer Program

58.

(1) Press KEY 5 (ENTER).

Section 3

Installation and Maintenance

Introduction

59. The information given in this Section covers installation, commissioning and maintenance procedures for the Ultra 3 Beverage Machine. These procedures must be carried out by authorised personnel who are fully conversant with the equipment, using only manufacturer's approved parts.
60. Servicing personnel must be familiar with the SAFETY WARNINGS, as detailed, before undertaking any installation, commissioning or maintenance procedure on the beverage machine. Any procedure which is found to be impracticable, inadequate or inaccurate should be reported to the Management for further investigation.
61. The requirements of proper hygiene in respect of food products must be ensured at every level of contact with the beverage machine and the ingredients associated with it.
62. In compliance with current regulations, the materials used in the manufacture of the beverage machine are non-corrosive, non-tainting and do not support the growth of bacteria. Refer to Statutory Instrument 1987 No.1523, and to The Model Water Bylaws 1986, Statutory Instrument 1987, No.1147 Non-metallic materials in Contact with drinking water comply with the requirements of BS6920: Part 1: 1988. Therefore, only manufacturer's parts must be used.

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SAFETY WARNINGS

1. Maintenance of the beverage machine is only to be undertaken by trained personnel who are fully aware of the dangers involved and who have taken adequate precautions.
2. Lethal voltages are exposed when the mains electrical supply to the beverage machine is available and any of the following items are removed:
 - Lid and cover assembly
 - Motor shelf
 - Side panels

Maintenance personnel must ensure that the machine is isolated from the mains electrical supply before removing any of these items.
3. Replacement of the Type Y mains cable requires special tools. Should the cable become damaged, a trained person from an approved service agent must only carry out replacement.
4. THIS APPLIANCE MUST BE EARTHED.
5. Ensure that the connection to the water system is compliant with the pertinent national and local legislation. In the UK the Model Water Bylaws 1986 Statutory Instrument (SI) No.1147 are applicable.
6. Ensure that the unit is positioned such that the plug connecting the unit to the mains supply is accessible.
7. The beverage machine is designed for indoor use, in an environment with an ambient temperature range of between 0°C and 40°C. The machine should be located close to the appropriate electrical and water services with a minimum of 100mm (4in) clearance between the rear of the cabinet and the wall to allow adequate ventilation, and, if in a corner location, not closer to the right hand wall than 400mm (16in) to accommodate opening of the door.
The unit should not be situated in an area where a water jet could be used.
8. The beverage machine is a heavy item. Care must be taken when lifting it.
9. The water in the boiler, and the boiler itself, are hot enough to scald or burn, even some time after the machine has been switched off. The boiler must be drained, filled with cold water and drained again before any attempt is made to handle it or any of its associated parts.
10. children, the aged and the infirm should not be allowed to operate the beverage machine unsupervised, in order to protect them from the risk of being scalded by hot beverages.

FROST WARNING

1. Care must be taken to protect the beverage machine from frost. Do not attempt to operate the machine if it becomes frozen. Contact the nearest service agent immediately. Do not restore the machine to operational use until it has been checked and approved for use by the service agent.

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Installation

- WARNINGS**
- (1) THE BEVERAGE MACHINE IS A HEAVY ITEM. CARE MUST BE TAKEN WHEN LIFTING IT.
 - (2) THE BEVERAGE MACHINE MAY TOPPLE IF THE MOUNT IS WEAK OR INSECURE. ENSURE THAT THE MOUNT IS SECURE AND THAT IT CAN SUPPORT THE WEIGHT OF THE MACHINE.
 - (3) ENSURE THAT THE MAINS ELECTRICAL SUPPLY IS ISOLATED BEFORE CONNECTING THE SUPPLY CABLE TO THE MACHINE.

Location

63. The beverage machine is designed for indoor use, in an environment with an ambient temperature range of between 0°C and 40°C. The machine should be located close to the appropriate electrical and water services with a minimum of 100mm (4in) clearance between the rear of the cabinet and the wall to allow adequate ventilation, and, if in a corner location, not closer to the right hand wall than 400mm (16in) to accommodate opening of the door.

The unit should not be situated in an area where a water jet could be used.

Levelling

64. The machine should be levelled both fore and aft and side-to-side by adjustment of the four leveling feet, using a spirit level on the cabinet floor to check for level.

The unit must be mounted within 10° of the vertical for safe operation.

Securing

65. The Ultra 3 Beverage Machine is a free-standing unit which can be mounted on a secure table, bench, cabinet or food and drink counter.

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Connecting the Water Services

**Refer to the current requirements of The Model Water Bylaws 1986
Statutory Instrument (SI) No.1147.**

66. The water supply should be taken from a 15mm rising main at a pressure of between 1 to 8 bar and should be fitted with a stopcock to isolate the supply during servicing. A 15mm double backcheck valve, with inspection port, should be fitted to the flexible hose.
67. The outlet should be fitted with BSP connections and must be positioned within 1.5m of the machine to ensure correct fitting of the hose. If possible, the outlet should be located behind the machine to prevent misuse.
68. Before connecting the machine hose to the mains outlet, flush the system, via the stopcock, to remove any impurities that may have accumulated in the mains supply pipe.
69. Connect the machine hose to the mains outlet using the seals supplied and ensure that all fittings are tight. Turn on the water supply at the stopcock and check for leaks, both behind and inside the machine.

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Connecting the Electrical Services

WARNINGS THE MACHINE MAINS CABLE MUST BE CONNECTED TO THE SUPPLY VIA A SAFETY ISOLATOR SWITCH WHICH PROVIDES A CONTACT SEPARATION OF AT LEAST 3mm.

REPLACEMENT OF THE Y TYPE MAINS CABLE REQUIRES SPECIAL TOOLS. SHOULD THE CABLE BECOME DAMAGED, REPLACEMENT MUST ONLY BE CARRIED OUT BY A TRAINED PERSON FROM AN APPROVED SERVICE AGENT.

ENSURE THAT THE SUPPLY TO THE ISOLATOR SWITCH IS ISOLATED BEFORE MAKING ANY CONNECTIONS TO IT.

ENSURE THAT THE SUPPLY TO THE BEVERAGE MACHINE IS ISOLATED BEFORE MAKING ANY CONNECTIONS TO THE TERMINAL BLOCK AT THE REAR OF THE MACHINE.

THE BEVERAGE MACHINE MUST BE EARTHED.

70. Connect the beverage machine, via a safety isolator switch with a contact separation of at least 3mm, to a 230V, 50Hz, 13A supply. Refer to Fig 1.4 for connection details. Note that replacement of the Y Type mains cable requires special tools. Should the cable become damaged, replacement must only be carried out by a trained person from an approved service agent.
71. Preferably, the isolator switch should be located behind the machine to prevent accidental damage or misuse.

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Descaling The Tank

WARNING

ENSURE THAT THE TANK IS FLUSHED WITH COLD WATER BEFORE ATTEMPTING TO HANDLE IT.

72. If the tank requires descaling, proceed as follows:

- (1) Isolate the machine from the electrical supply.
- (2) Flush the tank with cold water.
- (3) Remove the tank, taking note of the connections, which have been removed.
- (4) Remove the solenoid operated valves and the thermostat probe from the tank.
- (5) Check the heater element for signs of deterioration. Replace if necessary.
- (6) Descale the tank in the approved manner.
- (7) After descaling, flush the tank thoroughly with cold water, refit the solenoid operated valves and thermostat probe, and install and reconnect the tank to the machine.
- (8) Restore the electrical supply to the machine and carry out a test of the quality of each beverage before returning the machine to operational use.

Commissioning

- WARNINGS** (1) TO AVOID EXPOSURE TO HAZARDOUS VOLTAGES, DO NOT LEAN INTO THE MACHINE OR TOUCH ANY EXPOSED LIVE POINTS WHEN THE MAINS SUPPLY IS AVAILABLE TO THE MACHINE AND ANY OF THE FOLLOWING ITEMS ARE REMOVED: INGREDIENT CANISTER ENCLOSURE, LID AND COVER ASSEMBLY, MOTOR SHELF, SIDE PANELS.
- (2) THE WATER IN THE BOILER IS HOT. AVOID CONTACT WITH WATER LEAKING FROM THE BOILER OR FROM ANY OF ITS ASSOCIATED VALVES, TUBES AND PIPES.

73. It is essential that the Service Engineer responsible for installing and commissioning the machine ensures that:

- (1) all electrical and water supplies are correctly and safely connected;
- (2) all covers, panels or access doors are in place and secured, and the machine is left in a SAFE condition;
- (3) the Operator is familiar with the SAFETY PRECAUTIONS for the machine;
- (4) the importance of hygiene and regular cleaning is fully appreciated by the Operator.

74. With the water and electrical supplies connected to the machine, proceed as follows:

- (1) Set the On/Off switch on the machine to OFF.
- (2) Isolate the electrical supply from the machine.
- (3) Open the cabinet door and locate the waste tray.
- (4) Ensure that the overflow pipes are not trapped.
- (5) Restore the electrical supply to the machine.
- (6) Set the On/Off switch on the machine to ON.
- (7) Check that the boiler fills with water and that the water supply cuts off when the correct level is reached, i.e. no water overflows into the waste tray. (The machine may have to be switched OFF and ON several times in order to fill the tank.)
- (8) Check that the heater heats the water to the correct temperature.
- (9) Select the Engineer's Program and run through the Output Test to check that all components are functioning correctly.

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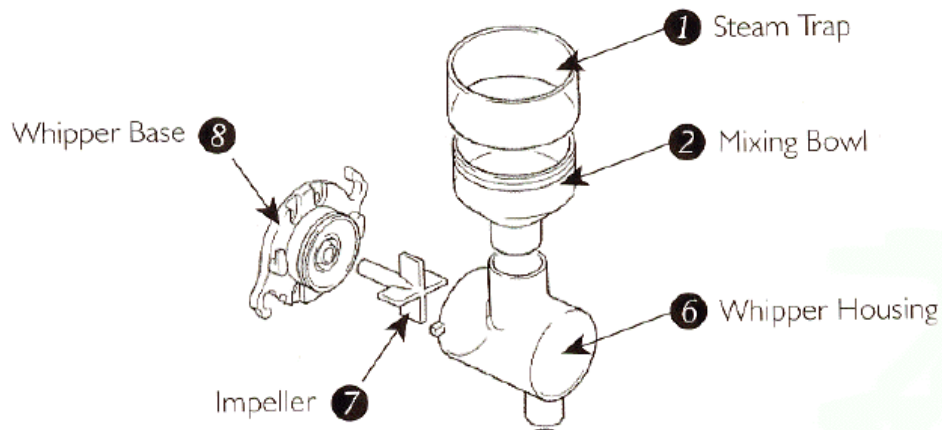
- (10) Fill the ingredient canisters.
- (11) Check the complete range of machine operations.
- (12) If required, select the Engineer's Program and change the pre-set values to suit customer requirements.
- (13) Set the On/Off switch on the machine to OFF.
- (14) Isolate the electrical supply from the machine.
- (15) Check all hose connections for leaks.
- (16) Clean the interior and exterior of the cabinet.
- (17) Restore the electrical supply to the machine.
- (18) Set the On/Off switch on the machine to ON.
- (19) Operate the machine through the complete range of dispense operations and check that each one is correct.

WEEKLY HYGIENE

Cleaning

WARNING

The unit must not be cleaned using a water jet or spray.
The enclosure is not waterproof and damage may occur if excessive volumes of water are used in the cleaning process.



Whipper and Mixing Bowl Assembly

- Set the on/off switch on the machine to off and isolate the mains electrical supply from the machine. Unlock and open the cabinet door.
- Rotate the canister nozzles then remove the ingredient canisters. Wipe clean the exterior surfaces of the canister assembly and dry thoroughly.
- Disconnect the pipes from the mixing bowls and remove the dispense nozzles from the dispense head. Wash and dry these items.
- Rotate and remove the steam trap ①, then remove the mixing bowl ②. Remove the whipper housing ⑥ by turning to the right and then pulling towards you.
- Remove the whipper impeller ⑦ by pulling toward you. Finally turn the whipper base ⑧ to the right and pull off.
- Clean all the whipper parts in hot water using the recommended sterilising agent and dry them thoroughly.
- Remove the extract chamber from the canister shelf. Wash and dry the cover.

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- Clean all accessible inner and outer surfaces of the machine using a damp cloth and wipe dry.
- Replace the cleaned parts.
- Replace the ingredient canister after filling with product and rotate the canister nozzle downwards.
- Switch on the machine and set on/off switch to on.
- Flush the machine by pressing green button on back of door to ensure there are no leaks and everything is working correctly.
- Remove waste tray and grille and empty contents.
- Clean waste tray and grille and replace.

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Filling Procedure

- Open door of machine with key provided.
- Turn ingredient chutes to ensure that product is not trailed over the counter.
- Lift out the product canister. Remove lid of canister and fill with correct ingredients to within 3cm of top of canister. Do not overfill canister or compress the product in canister.
- Wipe the exterior of the canister with a clean damp cloth using the recommended cleaning agent. Dry the canister with a clean dry cloth or paper towel.
- Return the canister to the machine. Remember to turn the ingredient chutes back to a downward facing position.
- Always ensure that the canisters are located in the correct position. The ingredient name is written on the rear of the machine to assist you.
- Check that the auger at the rear of the canister is correctly aligned with the cogs at the back of the machine.

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FAULT FINDING GUIDE

FAULT	POSSIBLE CAUSE		ACTION	
FATAL I ² C ERROR Displayed	(a)	Electrical noise	(a)	Check motors
	(b)	MPU Board fault	(b)	Replace MPU Board
	(c)	Software error	(c)	Reset power
Keypad does not bleep	(a)	Keypad damaged	(a)	Replace keypad
	(b)	Keypad disconnected	(b)	Reconnect
	(c)	MPU Board fault	(c)	Replace MPU Board
Drinks cold	(a)	Heater fuse blown	(a)	Check and replace
	(b)	Thermal cut-out tripped	(b)	Reset trip
	(c)	Desired temperature incorrectly set	(c)	Check desired temperature setting
	(d)	Excessive scaling in heater tank	(d)	Check tank and descale if necessary
	(e)	Solid state relay fault	(e)	Check relay
	(f)	Low cut-out in program incorrectly set	(f)	Reset low cut-out setting
	(g)	Temperature probe wet	(g)	Dry probe and check for leaks.
No motor operation	(a)	Jammed motor	(a)	Check motor operation
	(b)	Power Supply failure safety trip	(b)	Reset power
Machine inoperable; no display	(a)	Power Supply failure	(a)	Replace Power Supply Board

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FAULT	POSSIBLE CAUSE		ACTION	
Heater tank not filling	(a)	Low water pressure	(a)	Check water pressure
	(b)	Inlet valve fault	(b)	Check inlet valve
	(c)	MPU Board fault	(c)	Replace MPU Board
Heater tank boiling over	(a)	Incorrect desired temperature setting	(a)	Reset desired temperature setting
	(b)	Temperature probe fault	(b)	Replace probe
	(c)	MPU Board fault	(c)	Replace MPU board
	(d)	Short on solid state relay	(d)	Replace relay
Heater tank Overfilling	(a)	Probe open circuit	(a)	Check probe circuit
	(b)	Inlet valve fault	(b)	Check inlet valve and replace if necessary
	(c)	Level probe incorrectly positioned	(c)	Reposition probe
Bearding of ingredient	(a)	Extractor fan fault	(a)	Check fan
	(b)	Steam hoods missing from mixing bowls or incorrectly positioned	(b)	Fit steam hoods to mixing bowls and position correctly.
Machine floods	(a)	Dispense pipes incorrectly fitted to dispense head	(a)	Reposition pipes
	(b)	Mixing bowls incorrectly fitted	(b)	Reposition mixing bowls
	(c)	Whipper seals missing	(c)	Check seals
	(d)	Overflow pipe incorrectly fitted	(d)	Refit overflow pipe

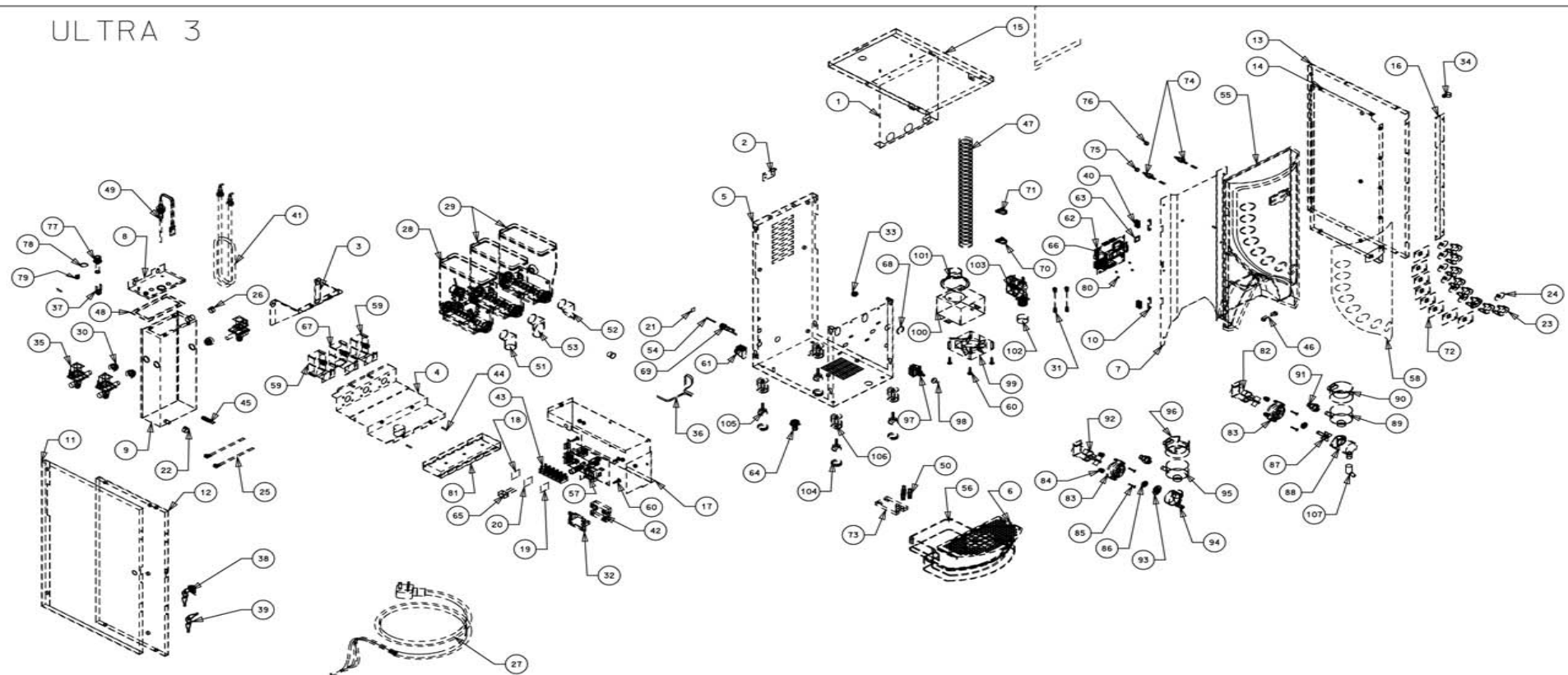
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FAULT	POSSIBLE CAUSE		ACTION	
No display	(a)	Display connector loose	(a)	Refit connector
TEMP LOW displayed	(a)	Thermal cut-out tripped	(a)	Reset cut-out
	(b)	Heater fuse blown	(b)	Check fuse
	(c)	Incorrect temperature setting	(c)	Check program setting

Section 4
Exploded Parts Diagram



ULTRA 3



24-05-05

ULTRA 3

NO.	QTY.	DESCRIPTION	PART NUMBER	NO.	QTY.	DESCRIPTION	PART NUMBER
1	1	Boiler cover	65922	58	1	Coffetek ultra 3 picture	56542
2	1	Rear lid holder	66150	59	2	Ing motor/gearbox 24V 140	59002
3	1	Motor holder	66709	60	8	Pobs black psu dc micro	59004
4	1	Canister shelf	67060	61	1	Cable gland DC micro	59010
5	1	Main body 338 pl door	68086	62	1	Rmcu dc control board	59011
6	1	Ultra 338 drip tray grill	67963	63	1	Eprom psd 312b-15j (Stat	59014
7	1	Ultra 338 door backer	67990	64	1	Bowl adaptor	59041
8	1	Boiler lid	68081	65	1	Rifa mains capacitor EMC	59052
9	1	Boiler	68085	66	1	LCD display red 338/64-12	59064
10	2	Magnetic catch	69028	67	1	Ing motor gear box 80 rpm	59207
11	1	L/h side panel 338 ultra	68087	68	1	Grommet 20mm	71026
12	1	L/h side panel insert	68088	69	1	16 amp fuseholder bussman	71101
13	1	R/h side panel 338 ultra	68089	70	1	Snapper clip no 10	71740
14	1	Right hand side panel in	68090	71	1	Snapper clip no 12	71745
15	1	Cabinet lid 338 ultra	68091	72	8	Ultra 3 pcb	56358
16	1	Door hinge 338 ultra	68092	73	1	Dispense head ultra 3	56452
17	1	Electrics box ultra 338	68093	74	2	Flush switch with cap	54378
18	1	Live terminal label	10008	75	1	Switch cap red shut off	54382
19	1	Neutral terminal label	10009	76	1	Flush switch cap in green	54379
20	1	Earth terminal label	10010	77	1	Re-set button	56457
21	1	F15 sticker	22022	78	1	'O' ring for reset button	56459
22	1	Cobra clip 15mm normal	54012	79	1	Spring 110dx12x5x5.1	56469
23	8	Button cap	54041A	80	4	Circuit board spacer	56175
24	8	Striker plate	54041B	81	1	Extract duct	66711
25	2	Cable tie for boiler	22102	82	1	Whipper mtr long shaft	89001
26	1	Cobra clip 14mm normal	54011	83	2	Whipper base grey	54034
27	1	UK mains lead with 13A p	54416	84	4	Whipper clip grey	54126
28	1	Can 220mm wire auger + a	54434	85	4	Whipper screw ds416	56198
29	2	Can 220mm Plastic augtagi	54436	86	2	Large red whipper seal	54699
30	3	Swaged port valve seal	54543	87	1	Impellor cafe 3/4/5/6/ser	56291
31	2	Interlink dc valve conne	54545	88	1	Whipper chamber 12mm out	55410
32	1	S S R Terminal cover	54552	89	1	Mixing bowl restrict grey	56165
33	1	16mm hole diaphragm grom	54604	90	1	Steam trap grey	55903
34	1	P clip NX4	54790	91	2	Mixing bowl skt/sonic we	55372
35	3	Outlet valve 8mm 24V DC	55003	92	1	Whipper mtr 24v DC short	59001S
36	1	Sub loom whale pump	55150	93	1	Impellor disc small whip	56145
37	1	Thermal cutout 95 degrees	55250	94	1	Whiper chamber horiz mid	55898
38	1	Mini camlock & cam 2 keys	55337	95	1	Mixing bowl unrest 3.8 br	59407
39	1	Key(s)	55337K	96	1	Steam trap double clear	56164
40	2	Door magnet	55341	97	1	Toggle switch	55462
41	1	Element 3KW 240V SID/TID	55430	98	1	Switch cover	55463
42	1	SS relay 240v	55466	99	1	Extract fan sounan	55239
43	1	Terminal block strip 32A	55517	100	1	Fan box	66390
44	2	4mm pin bullet	55639	101	1	Extract fan funnel	55930
45	1	Hose bung flangeless plug	55692	102	1	Dust cover for inlet val	20014A
46	1	Cuplocator	55745	103	1	Inlet valve 24v DC doub	59235
47	1	Hose 1 1/4 extra flex	55770	104	4	Foot cover non slip	55226
48	1	Boiler seal	55781	105	4	Small feet black m8 x 25	55223
49	1	Boiler probe assembly	94543	106	4	Foot spacer 8mm tapped	56311
50	3	Beverage spout	55983	107	1	Pipette	55520
51	1	Ingredient chute central	56028	108	0.1m	Heat shrink 12.7mm	54132
52	1	R/h chute	56032	109	0.6m	Tube 9x15 dispense/inlet	55428
53	1	L/h chute	56037	110	0.6m	Tube 11x18 overflow	55438
54	1	15A fuse	56114	111	0.5m	Tube 6x10mm	55683
55	1	Ultra 3 door silver	56248	112	1	Keypad loom ultra 3	56443
56	1	Ultra 338 drip tray	56316	113	1	Main loom ultra 3	56455
57	1	Psu gourmet micro	56365	114	1	Flush loom ultra 3	56482
				115	0.6m	Tube 8x12mm	59070