Vending Range

Covers Stentorfield Fusion, Optima, Ventura, Riocca & Eclipse and National Vendors Calico

Instant, Freshbrew and B_2C Models

NATIONAL VENDORS

TECHNICAL MANUAL

Part No. PR06651000

Revision C 01/03

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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 technical manual is to be used by all authorised personnel involved in installing, commissioning, programming and servicing Stentorfield **Fusion**, **Optima**, **Ventura**, **Riocca** and **Eclipse** machines and the National Vendors **Calico**.

It is the policy of Crane Merchandising Systems to continue developing its range of vending equipment. The technical information presented within this document is for information only and may be changed without prior notice. Crane Merchandising Systems accepts no responsibility for damage caused to the equipment through misinterpretation or misuse of the information contained in this manual.

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

Ventura and **Riocca** are registered trade marks.

Important Safeguards

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

1. 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.

2. Beware of moving components when servicing the machine.

3. Beware of hand entrapment. Never clean or service the brewer unit whilst it is in motion.

4. Servicing the water heating system. Water in the machine can reach a temperature of approximately 96° centigrade. Water at this temperature can cause severe burns!.

5. Machines fitted with carbonator units. The CO^2 bottle is filled with a gas at a pressure of 800PSI and MUST be stored in an upright position away from sources of heat. In the event of a leak, ventilate the area in the vicinity of the bottle to

remove all traces of gas and contact your supplier.

6. 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. When servicing the machine the door switch safety key does not isolate the cold unit which remains live. The cold unit can be isolated using the switch located on the power supply.

9. 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

	Fusion/Ventura/Optima/Calico	*Riocca*	*Eclipse*
Height	*1830 mm*	*1830 mm*	*1830 mm*
Depth	*760 mm*	*760 mm*	*760 mm*
Width	*660 mm*	*740 mm*	*915 mm*
Weight	*184 kg*	*210 kg*	*260 kg*
Cup Capacity	*600 (when using 7 oz. squat cups)*		
*Cup Type**	*7 oz squat, 7 oz tall and 9 oz tall*		
Electrical Services *(i) Voltage* *(ii) Current* *(iii) Frequency*	*220 - 240 Volts AC* *13 Amp Fused* *50 Hz*		
Water Services *(i) Pressure* *(ii) Stopcock*	*100 Kpa (1 Bar) - 800 Kpa (8 Bar)* *15 mm BSP from rising main*		

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

* Both plastic vending cups (HIPS type) and paper cups (Huhtamaki) can be used in all machines, although modification to the cup drop unit will be required when changing between cup types and sizes.

Water Filter - where fitted

The National Vendors Calico and Stentorfield range of free-standing beverage vending machines may be fitted with an Everpure or Brita filter head and filter cartridge. To maintain optimum drink quality the cartridge should be replaced at approximately six monthly intervals, depending on the number of vends.

IMPORTANT: All bean to cup (B2C) machines ***must*** be fitted with an approved water filter to maintain drink quality and machine performance. Please see page 6, "Connecting the Water Supply" for full details.

Section 1 - 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.

1.1 Installing the Machine

1. The machine is suitable for indoor use only, situated in an area with a recommended ambient temperature not below 10° C and not exceeding 30° C.

2. Prior to moving the machine to its location, ensure that there is sufficient access space available via passageways, stairs, lifts, etc.

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. Unlock and 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 (12 mm thread). Check for correct alignment using a spirit level placed on the floor of the machine.

   Note! Incorrect levelling can result in:

   (a) Door misalignment.

   (b) Coin acceptance reduction.

   (c) Inconsistent cup drop.

7. Remove the door transport plate screwed to the floor of the machine.

1.2 Connecting the Water Supply

1. The machine should be situated within 1 metre of a drinking water supply from a rising main, terminating with a W.R.C. approved 15mm compression stop tap.

2. **Bean to cup machines:** Calico, Fusion and Eclipse B2C machines ***must*** be connected to the water supply via a water filter. This filter must be of food grade quality and able to remove temporary hardness (scale), heavy metals (lead, copper, iron, cadmium), chlorine and any organic pollutants/discolouration. Crane Merchandising Systems recommend and supply the Brita AquaQuell Compact water filter for its bean to cup vending machines.

   Note! If the machine is connected to the water supply and used without a water filter as specified above, the warranty will be void.

   BRITA®
   it's clear from the taste

3. The water supply should comply with both the Statutory Instrument No.1147 - "Water, England and Wales" and The Water Supply (Water Quality) Regulations 1989. Water pressure at the stop tap must be within the limits 1 - 8 Bar (100 Kpa - 800 Kpa).

4. Connect the flexi-hose supplied with the machine to the stop tap. Ensure that the seal supplied is fitted correctly. Flush the system via the stop tap (several gallons) before connecting the water supply to the machine.

5. Connect the flexi-hose to the inlet valve located on the rear of the machine. Ensure that the seal is correctly fitted. Ensure that all water supply fittings are tight.

6. Turn on the water supply at the stop tap and check for leaks. Prime the water filter (where fitted) following the instructions supplied by the filter manufacturer.

1.3 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 must be connected to a 240 Volt 50Hz 13 amp fused switched socket outlet, installed to the latest edition of the IEE regulations, using a 3 pin BS approved 13 amp fused plug.

Important: If the mains lead becomes damaged in any way it must be replaced by a special lead available from the manufacturer.

Note! The machines are dispatched ex-factory with the input transformer connected for a 240 Volt supply. If the electrical supply differs, the alternative input tapping (230V or 220V) should be used.

1.4 Commissioning Procedure

1. Ensure that the machine is level, and that there is at least 100 - 150 mm (4 - 6 inches) clearance between the back of the machine and the wall.

2. Ensure that the electrical and water services to the machine are connected correctly. Turn on the stopcock and check for leaks.

3. Remove the soluble ingredient canisters. Remove the fresh beans canister from bean to cup machines. Do not place the canisters on the floor.

4. Fit the door switch bracket to the door using the two screws provided. Ensure that the bracket will operate the door switch when the door is closed.

5. Load cups into the cup carousel. Referring to the illustration, raise bracket (1) and carefully tilt cup carousel assembly forward as shown.

   Remove the cup carousel lid and fill each of the chambers with one sleeve of cups, avoiding the dispense position. DO NOT TOUCH THE CUPS WITH YOUR HANDS. Ensure that the cups are the correct size for the type of cup turret fitted.

   Note: If paper cups are being loaded, each pack of cups must first be inspected for damage to the cup rims. Damaged cups ***must not*** be used.

   Replace carousel lid. After the machine is powered up the carousel will rotate until the cups have dropped into the cup ring. The empty chamber can now be filled.

6. Insert the safety key into the door switch. The machine is now ***ON***.

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/bucket. Check the system for leaks. Whilst the boiler is filling the LCD will display the message:

   SORRY NOT IN USE
   WATER HEATING

   Note! The machine has a safety cut-out which will only allow the boiler to fill for a maximum of two minutes. If after software power-up the boiler has not filled within this time, the mains supply should be switched off and then on again to reset the boiler time-out.

Bean to cup machines: Once the boiler has reached 75° C the B2C module will initialise and the message on the LCD will change to:

B2C MODULE INITIALISING

Once the B2C module has finished initialising the machine reverts to stand-by mode.

8. Fill the soluble ingredient canisters with the correct ingredients and re-fit into machine.

9. **Bean to cup machines:** Fill the fresh coffee beans canister. Ensure that the outlet slide is closed before filling the canister.

   Refit the canister to the machine. Ensure that the outlet slide is opened to ensure correct operation.

10. **Important!** Before a B2C machine is used for the first time carry out the Module Filling Procedure, followed by the Module Calibration Procedure as described on pages 45 - 46.

11. **Fusion and Calico bean to cup machines:** Fill the stick dispenser chute located on the rear of the door. Remove the stirrer weight from the stirrer dispense chute. Referring to the photograph, insert strirrer pack with wrapper into the top of the chute. Tear the wrapper and remove as shown.

    Add additional stirrer packs as necessary to fill the dispense chute. Replace the stirrer weight to ensure correct operation.

(Freshbrew models only - proceed with steps 12 - 15)

12. Load the filter paper roll (provided in the installation kit) onto the support.

13. Press and release the paper feed switch to operate the brewer. When the brewer chamber reaches its fully open position, remove the safety key to switch **off** the power to the machine.

14. Remove the brewer cover and paper/waste ingredient guard. Feed filter paper under the raised chamber and through the feed wheels. Refit the guard and brewer cover and close the machine door. Filter paper will index automatically and the

brewer chamber will return to its closed position. The display will show the message:

BREWER REPOSITIONING
PLEASE WAIT

15. When the machine returns to standby mode, open the door. Insert the safety key into the door switch. The machine is now ***ON***. Operate the paper feed function once more to check for correct operation of the brewer mechanism.

16. Referring to Section 5 of this manual, 'Programming the Machine', use the menu selections available in the Operators and Engineers programs to programme the required settings for correct machine operation.

17. Using the function switches located in a panel inside the top of the door, proceed as follows:-

(i) Press the **Flush** switch (switch no. 3). Check that all of the mixing stations are water tight.

Note: This operation will also flush the bean to cup brewer fitted to B2C machines.

(ii) Press the **Cup Test Switch** (switch no. 7) and check that the cups drop correctly.

(iii) Press the **Park Head** switch (switch no. 9) to ensure that dispense pipes are fitted correctly.

(iv) Using the **Service** switch (switch no. 6), test vend each drink selection.

Fusion and Calico bean to cup machines: Ensure that the stick stirrer mechanism operates correctly for vends dispensed with sugar.

(v) Press the **View Counters** switch (switch no. 5) and record the audit information.

18. If fitted, check that the coin mechanism and cash box operate correctly.

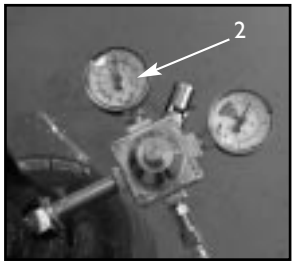
19. Remove the safety key and close the cabinet door. Check for leaks and ensure that the machine is left in a clean and safe condition.

1.5 Carbonator Unit - Where Fitted

1. Open the cabinet door. Fit the seal (1), provided in the installation kit, to the regulator as shown in the photograph. Connect the regulator to the gas bottle.

2. Tighten the locknut. Carefully lift the cylinder into the machine ensuring that the gas supply pipe is not trapped or obstructed in any way.

Safety First! The cylinder may be heavy. Always follow the correct procedure when lifting heavy objects.



3. Turn on the gas supply from the bottle. Ensure that the regulator (2) is indicating a gas pressure of 35 PSI.

4. Remove the carbonator covers. Purge the carbonator of air by lifting the pressure relief valve for approximately 12 seconds.

5. Place the carbonator overflow pipe into the waste bucket. Fill the carbonator water bath with clean cold water until it starts to run from the overflow pipe. Re-fit carbonator covers.

6. Place the syrup containers in the bottom right-hand side of the cabinet and insert the stainless steel dip tubes into the containers ensuring that the correct flavours correspond to the drinks displayed on the selection decals.

7. Switch on the carbonator unit using the carbonator switch located on the power supply.

8. Insert the safety key into the door switch. The machine is now ***ON***. Prime the syrup selections ready for use. Using the function switches (numbered 8, 10 and 12) located in the panel inside the top of the door, press the relevant syrup prime switch to operate the syrup pump for that station.

9. Test vend the carbonated drinks to ensure correct operation of carbonator unit. Check for leaks and ensure that the machine is left in a clean and safe condition. Remove the safety key and close the door. The machine reverts to standby mode.

Section 2 - Programming The Machine

2.1 Programming Mode

To access the Programming Mode you need to enter a sequence of key strokes on the keypad located on the front of the machine. The time between each keystroke must be less than 5 seconds otherwise the machine will return to standby mode.

Programming mode utilises the front panel keypad in order to enter values and commands. The keypad layout is illustrated below.
During programming the keys are used as follows:

0-9 Keys	Used for entering data
'C' Key	Used for correcting data
'Blank' Key	For moving to a higher programme level
▲ (Strong)	For indexing up in a programme, or incrementing data
▼ (Mild)	For indexing down in a programme, or entering data
'Normal' Key	For entering data in a programme, or moving to a lower programme

N.B. In the following programming section, the 'normal' key will be referred to as the access key, the 'strong' key as the up (▲) key and the 'mild' key as the down (▼) key.

2.2 Accessing the Programming Mode

1. Press the program entry switch, mounted in the switch panel located inside the top of the door, followed by the relevant access code - selection button 1 followed by 7 to access the Operators program or selection button 2 followed by 1 to

access the Engineers program. Code entry errors may be erased using the cancel (C) key.

2. With the correct code entered the title of the first sub-program will be displayed on the LCD. In the case of the Engineers program the LCD will display the message:

KEY PAD TEST **SUB PROGRAM**

3. To step through the sub-programs, press either the up (▲) or down (▼) keys.

4. To access a displayed sub-program, press the access (normal) key.

5. When a parameter is displayed that requires changing, press the access key. Numerical data can now be changed in one of two ways:

   (a) Pressing the up (▲) or down (▼) keys increases or decreases the number on each key press.

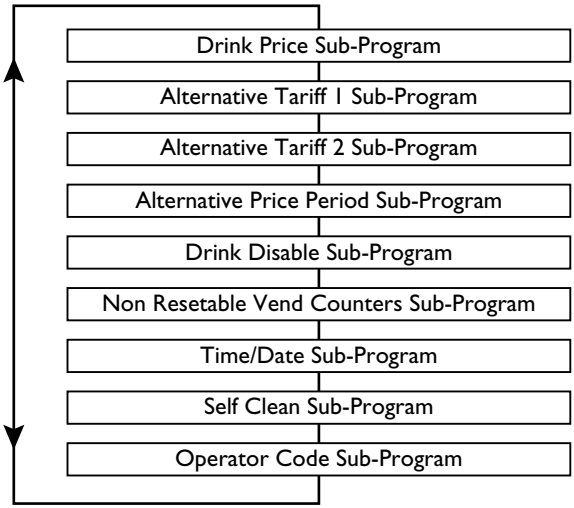
   (b) Keying in the actual digits of the number required. Using this method, the new number will be displayed in place of the current parameter.

6. Once the correct number has been entered, press the access key to overwrite the previous parameter with the new value. to retain the previous parameter press either the 'blank' or cancel (C) key.

   Note: It is not possible to vend a drink whilst in Programming Mode.

2.3 Operators Program

The nine sub-programs within the Operators program are as follows:-



To access a sub program within the Operators Program, enter the programming mode as described previously. To step through the sub programs, press either the up (▲) or down (▼) keys. To enter a displayed sub program, press the access key.

1. Drink Price Sub-Program (Default = 10)

1. The drink price sub-program allows the normal tariff prices to be individually set for each drink.

2. Upon entry into this sub-program, the name of the first drink is displayed, followed by its price. On instant and freshbrew models the LCD will display the following message:

```
TEA
PRICE = 10
```

3. To alter the drink price, press the access key. The LCD will display the following message:

```
TEA
PRICE > 10
```

4. The = symbol changes to a > symbol indicating that it is now possible for new data to be entered. Key in the new price using the keypad and when correct press

access to overwrite the old data.

5. The prices for other drinks can now be set following the sequence described in section 2.2 - Accessing the Programming Mode.

6. On certain machines a **cup discount** price can also be set within this sub program, providing that the feature has been enabled within the Engineers Program. With the cup discount feature enabled, the operator may set a discount price against drink selections.

   When a customer presses the "No Cup" button before selecting a drink, the drink will be dispensed into the customers own cup. The price set for cup discount is then subtracted from the price of the drink selected and change/credit given accordingly.

2. Alternative Tariff 1 Sub-Program (Default = 15)

This sub-program works in exactly the same way as the drink price sub program and has the same appearance. The prices set in this program will be in force during tariff 1 periods.

3. Alternative Tariff 2 Sub-Program (Default = 20)

This is identical to the alternative tariff 1 sub-program except that the prices set here will be in force during tariff 2 periods.

4. Alternative Price Period Sub-Program

This sub-program enables the times to be specified when each of the above tariffs should be in force. There is a four level tariff structure available:

1. **Normal Tariff:**

   This relates to prices set in the drink price sub-program and in force when no alternative price period is currently applicable.

2. **Tariff 1:**

   Prices set in the tariff 1 price sub-program.

3. **Tariff 2:**

   Prices set in the tariff 2 price sub-program.

4. **Tariff 0:**

   Sets the machine into free vend.

The machine is factory set to the normal tariff, with no alternative prices available. To change the tariff period, proceed as follows:-

1. On entry into the sub-program the display will show the message:

P1 = 00:00 - 00:00 **TARIFF - EVERY DAY**

2. This is an empty price period. To enter a price period (e.g. 10:30 - 15:45, Tariff 2, Weekends), press access. The display will now read:

START > 00:00

Note: The arrow symbol (**>**) indicates that it is possible to update the display.

3. Enter the correct start time in hours and minutes using buttons 0 - 9 on the keypad.

Note: To correct any entry errors, press cancel to delete the last digit entered. Pressing cancel with no digits displayed will exit to the Operators program.

4. With the start time entered press access. Enter the finish time as described above and press the access key. The display will now show:

PERIOD 10:30 - 15:45 **TARIFF > 0**

5. To set the tariff period, enter a number between 0 and 2 (or use the up (▲) or down (▼) keys) followed by access. The message will change to:

PERIOD 10:30 - 15:45 **TARIFF 2 > EVERYDAY**

6. Using the up (▲) and down (▼) keys, index the day setting between "Every day", "Weekdays" and "Weekends". When the required day setting is displayed, press the access key to complete the price period data entry. The message on the display will read:

PERIOD 10:30 - 15:45 **TARIFF 2 EVERYDAY**

7. There are a maximum of ten possible price periods available. To enter another price period, use the up (▲) or down (▼) keys to view the periods until an empty

period is displayed. The new period is entered in the same way as described previously.

8. If the start time is entered as being a later time than the finish time, the period will not be accepted by the machine. If periods overlap, the first overlapping period in the list will be the one in force until it has finished. To delete a period, continue as if that period were to be re-programmed, and when the display is requesting the start time to be entered, press cancel.

Drink Disable Sub-Program

This sub-program allows drinks to be either enabled or disabled. The following example illustrates the sequence required to disable the chocolate selection.

1. Enter the drink disable sub-program and scroll up or down using the appropriate arrow key until the message on the LCD display reads:

```
CHOCOLATE
= ENABLED
```

2. Press the access key. The message on the display will now read:

```
CHOCOLATE
> DISABLED
```

3. Press the access key again. The drink is now disabled.

5. Vend Counters Sub-Program

1. When the vend counters sub-program is entered, the first drink counter is displayed:

```
COFFEE
1372
```

2. The up (▲) and down (▼) keys enable the counters for each drink to be viewed, and values noted, but they cannot be altered using the keypad. These counters can only be reset by using the 'reset counters' switch (see page 21).

3. There is one vend counter for each drink, plus counters for jug vends, free vends, total vends and total sales value. The total sales data is displayed in units of 1 penny.

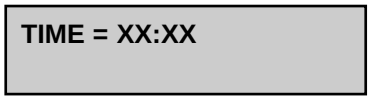
6. Time/Date Sub-Program

The machine maintains a record of the current time and date in 24-hour format. The date is programmed for leap-year roll-over and should not require adjustment.

To set the time and date, proceed as follows:

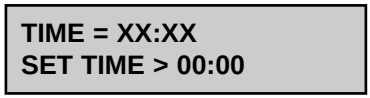
1. The Time/Date sub-program displays the time, date and day of the week. The up (▲) and down (▼) keys are used for viewing the three different messages.

2. To view the time, enter the time/date sub-program. The display will show the message:



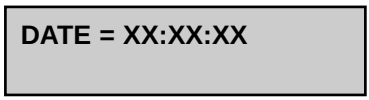
where xx:xx is the current time.

3. To change the time shown, press the access key. The display will now show:



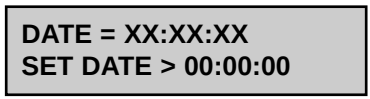
4. Enter the correct time in hours and minutes using buttons 0 - 9 on the keypad.

5. When correct, press access. The time is now set. To view the date, press the up or down key until the display reads:



where xx:xx:xx is the current date.

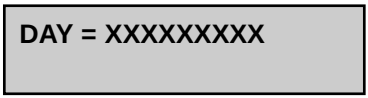
6. To change the date, press the access key. The display will now show:



7. Enter the correct date using the sequence day, month, year using buttons 0 - 9 on the keypad.

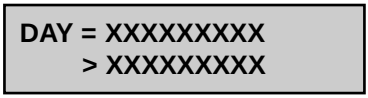
8. When correct, press access. The date is now set.

9. To view the day, press the up or down key until the display reads:



where xxxxxxxxx is the current day of the week.

10. To change the day, press the access key. The display will now show:



11. Use the up or down arrow keys until the required day is displayed. Press the access key. The time, date and day are now programmed.

7. Self Clean Sub Program

1. This sub program allows the operator to define two periods during a day when the machine will automatically flush through the water system.

2. Depending upon the flush setting which will have been pre-programmed via the Engineers Program, the machine will have been set to flush hot system only, cold system only or complete water system.

3. Auto flush periods can be programmed by the operator to occur everyday, weekdays, weekends or never.

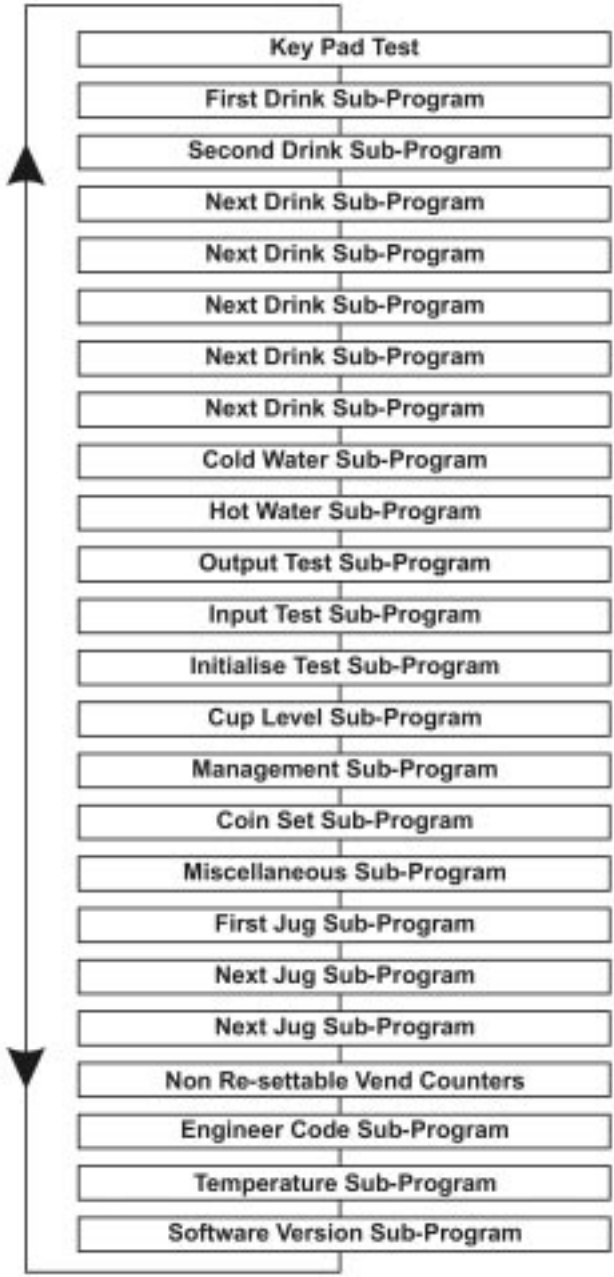
4. To enter auto flush periods, enter the self clean sub program and follow the sequence for setting an alternative price period described on pages 14 - 16.

8. Operator Code Sub-Program (Default 17)

Entry into the Operator code sub-program enables the operator code to be changed. This code may be of any length up to seven digits. Enter a new code at the prompt and when correct press the access key.

2.4 Engineers Program (Default 21)

The sub-programs within the Engineers program are as follows:-



1. Keypad Test Sub-Program

The keypad test sub-program enables the engineer to test each key on the keypad to ensure that it is operating correctly.

1. Whenever a key is pressed, the name of that key will be displayed on the LCD. Because the access key was pressed to enter the sub-program, on entry to this sub-program the LCD will display:

ACCESS KEY

2. For numerical keys, the number will be displayed, such as '1' key or '2' key. For other keys, the name of the key will be displayed, such as 'Strong' or 'Mild'.

3. To exit from this sub-program into the engineer program, press the 'Blank' key.

2. Drink Ingredient Sub-Program

The drink ingredient sub-programs allow the ingredient quantities for each drink to be adjusted to accommodate different ingredient types and taste requirements. Proceed as follows:

1. On entry into the ingredient sub-programs, the first ingredient to be displayed is the ingredient which constitutes the major part of the drink. In the case of tea, this will be:

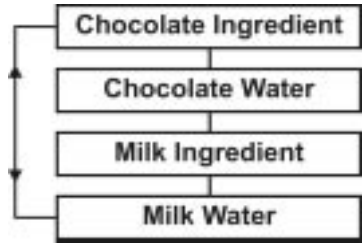
TEA **INGREDIENT = 40**

2. All ingredient quantities are displayed in twentieth of a second increments. Therefore a quantity of 40 actually means that the ingredient is dispensed for forty twentieths, or two seconds thus simplifying the calculation of ingredient quantities. The engineer does not need to consider the exact weight or volume of ingredient and has an immediate idea of the approximate time taken to dispense a sensible quantity.

3. The quantity may be altered in the same way as other parameters are programmed. Depending on the drink type, there may be a number of different ingredient values to be adjusted. For each ingredient value there is an associated water value, again measured in twentieths of a second.

4. The diagram (page 21) illustrates the ingredients that may be involved in the make-up of a drink. The chocomilk sub-program is used as an example. Not all drinks

will involve this amount of ingredient, most will only contain a main ingredient and water.



5. The maximum parameter allowed for any one ingredient quantity is 255 except when programming jug vends

3. Output Test Sub-Program

This sub-program enables the engineer to individually test each output of the machine.

1. On entry into the sub-program the LCD will display the first output (Cup Drop Solenoid), with its present state (off) beneath it.

2. Pressing the arrow keys allows the engineer to cycle through the outputs in turn, displaying the name of each one. In order to test an output, press the '1' key to switch it on, and the '0' key to switch it off.

   The caption at the bottom of the LCD will show the current state of the output. If the output is left 'ON' for more than three seconds the protection circuit will switch it 'OFF', even though the display will still indicate that it is 'ON'. This prevents damage to the motors.

3. When a different output is selected, or the sub-program exited, the previous output is automatically switched 'OFF'.

Note: It is not possible to test the heater using the output test sub-program. Serious damage may occur if there is insufficient water in the boiler when the heater is turned on.

4. Input Test Sub-Program

This sub-program enables the engineer to individually test each of the input lines.

1. The operation of the input sub-program is similar to the output test sub-program

except that the display shows the name of the input and the caption indicates its' current state:

COIN INPUT 1p OFF

2. As the state of the input changes, so does the caption at the bottom. There is a delay of approximately three-quarters of a second before the display caption changes to ensure that any rapid changes can be seen.

5. Initialise Sub-Program

The initialise sub-program enables the engineer to return all the parameters to their factory settings.

1. Upon entry into the initialise sub-program, the display will show the message:

USE ACCESS KEY FOR INITIALISATION

2. To initialise the machine, press access. The display will now show:

INITIALISED

3. The LCD will flash this message accompanied by an intermittent beep. To return to the Engineers program or standby mode, it is necessary to press the 'cancel' button. This ensures that should the initialise sub-program ever be inadvertently activated, the engineer cannot overlook the fact that the machine has been initialised.

6. Cup Level Sub-Program

1. The cup level sub-program allows the amount of water used in each cup vend to be altered on a percentage basis. This enables different size cups to be used without having to change each drink ingredient quantity. Jug vends remain unaffected.

2. The sub-program will display the percentage cup level which may be altered in the same way as all other parameters. 100% cup level will dispense the exact amount of water set in the drink ingredient sub-programs.

3. A percentage below 100 will dispense less water, and a percentage above 100 will dispense more.

7. Management Sub-Program

The management sub-program informs the controller which hardware aspects of the machine have been selected with respect to the following:

1. **Coin System**
   The "Coin System" program displays the type of coin system selected. To change the selection, press the access key followed by the up (▲) or down (▼) keys to display the required selection. Enter the new selection by pressing the access key. If the machine is not fitted with a coin system, the option "Free Vend Only" should be selected.

2. **Cold Drink Unit**
   Entry into the "Cold Drink Unit" program will display the type of drink system selected, either 'carbonated', 'still' or 'hot only'. To change the selection, press the access key followed by the up (▲) or down (▼) keys to display the required selection. Press the access key to store the new selection.

3. **Flush**
   Entry into the "Flush" program will display which flush option has been selected, either 'hot only', 'cold only' or 'hot and cold'. To change the selection, press the access key followed by the up (▲) or down (▼) keys to display the required selection. Press the access key to store the new selection.

4. **B2C Module Filling - Bean to Cup Machines**
   Whenever a B2C machine is moved, module repaired/replaced or the engineer is unsure of the state of the B2C module, a module fill should be carried out. Before a B2C fill is carried out ensure the water waste container is in position and empty.

   To carry out a B2C fill, press the access key twice. After the first press the LCD will display the message:

   PRESS ACCESS TO FILL B2C MODULE

   Following the second key press approximately 140ml of water will be pumped through the B2C system ensuring the system is free from air.

5. **Calibrate B2C Module - Bean to Cup Machines**
   The following section describes the procedure for calibrating the B2C module. This procedure must always be carried out by the engineer before the B2C vending machine is used for the first time, when the beans are changed or when the module has been removed/repaired.

Proceed as follows:

Important: Before commencing the following procedure, ensure that you have a set of gram scales and a cup with which to catch the coffee. Using the 'tare' function, calibrate the cup with the gram scales.

1. Open the door and insert the safety key. Ensure that the brewer waste bucket/coffee grounds container is in position, the bean hopper is fitted and contains beans and the hopper outlet slide is open. Remove the four screws securing the brewer guard and remove the guard.

2. With the machine at working temperature, press and release the program entry input switch (No1) located in the switch panel on the rear of the door. Key in the Engineers program entry code using the numeric keypad.

3. Press the down (▼) key until the display shows MANAGEMENT SUB-PROGRAM.

4. Press the access (normal) key, followed by the down (▼) key until the display shows MANAGEMENT CALIBRATE B2C MODULE.

5. Press the access key. The display will show CURRENT GRAM THROW IN 4s IS XX.Xg. After 2 seconds the display will change to PRESS ACCESS KEY TO PRIME GRINDER.

6. Press the access key to start the priming process. After 4 seconds the grinder will stop and the brewer will reposition.

7. The display will now show PRESS ACCESS KEY TO CALIBRATE B2C MODULE. Position the calibrated cup with its rim touching the clear plastic pipe that enters at the bottom of the brewer as shown in the photograph. Press the access key. After 4 seconds the grinder will stop and dry, ground coffee will be ejected into the cup. The display will now show ENTER COFFEE WEIGHT IN g > 00.0g. Weigh the coffee in the cup and enter the weight into the machine. If the weight of ground coffee was 10.8grams, enter 1 0 8 on the keypad then press the access key to store the value.

8. Repeat step 7 twice more. Upon completion the display will show CALIBRATION COMPLETE - NEW VALUE IS XX.Xg, where XX.X is the new calibrated value. Press the cancel key to return the machine to stand-by mode. Calibration is now complete.

9. Refit brewer guard and secure with the four fixing screws. Remove the safety key and close the door.

N.B. In order to prevent unrealistic and therefore potentially damaging values being

entered there is a minimum and maximum value of coffee weight that can be entered, they are as follows: - minimum value = 8.00g, maximum value = 14.00g.

6. **Option Drink - Not Available on all Machines**
The "Option Drink" program displays the drink option selected, either 'single ingredient' or 'multi ingredient'. To alter the selection, press the access key followed by the up (▲) or down (▼) keys to display the required selection. Press the access key to store the new selection.

Note: The **Option Drink** program is only active in Stentorfield Fusion freshbrew and 6 canister instant machines when the chocolate cappuccino sub program is enabled within the "Miscellaneous Settings" sub program.

7. **Station 2 Selection - 6 Canister Instant Fusion Machines Only**
This program allows the engineer to set up the second station within instant Fusion machines to dispense either tea or coffee. To change the selection, press the access key followed by the up (▲) or down (▼) keys until the required selection is displayed. Press the access key to store the selection.

Important: Because the product in station 2 has been reconfigured, it will be necessary to initialise the machine in order to reset correct ingredient and water timings and also reset the counters. The **Initialise Sub Program** is detailed on page 22.

8. **Freshbrew Station - Freshbrew Fusion Machines Only**
Entry into this program will display the freshbrew selection currently available. To change the selection, press the access key followed by the up (▲) or down (▼) keys until the required selection is displayed. Press the access key to store the selection.

Important: Because the freshbrew selection has been reconfigured, it will be necessary to initialise the machine in order to reset correct ingredient and water timings and also reset the counters. The **Initialise Sub Program** is detailed on page 22.

9. **Instant Station - Freshbrew Fusion Machines Only**
The "Instant Station" program displays the drink type available from Instant station 1 within freshbrew Fusion machines. To alter the drink selection available from this station, press the access key followed by the up (▲) or down (▼) keys until the required selection is displayed. Press the access key to store the selection.

Important: Because the drink selection assigned to instant station 1 has been reconfigured, it will be necessary to initialise the machine in order to reset correct ingredient and water timings and also reset the counters. The **Initialise Sub Program** is detailed on page 22.

Note: The software installed into Fusion freshbrew machines will not allow both the freshbrew and instant stations outlined above to be set to dispense Tea. One station must always be set to dispense a coffee selection.

8. Coin Set Sub-Program

The coin set sub-program enables the coin set to be changed to suit the coin mechanism which has been connected to the machine. Although the actual coin set used by the coin mechanism is totally transparent to the controller, this will ensure that the displayed message in the standby mode correctly indicates which coins may be entered.

The possible coin sets are:

1p - 20p	5c - 20c
1p - 50p	5c - 50c
1p - 100p	5c - 1
5p - 50p	5c - 2
5p - 100p	
5p - 200p	

These are selected in the same way as parameters in the "management sub-program".

Note: This sub-program is not accessible if "Free Vend Only" or "Card System" is selected in the management sub-program.

9. Miscellaneous Settings Sub-Program

The miscellaneous settings sub-program allows various delays and timings to be set which will affect all of the drinks in the machine. These settings may be viewed and changed in the same manner as the parameters in the ingredient sub-programs.

1. **Cup Drop To Water Start Delay**
   The cup drop to water start delay defines the time between the cup drop solenoid operating and water starting to dispense. This ensures that the cup is allowed to fall into its correct position before water reaches the dispense head.

2. **Water Start To Ingredient Start Delay**
   The water start to ingredient start delay defines the time between water starting to be dispensed and the ingredient starting to be dispensed. If ingredient reaches the mixing bowl before the water, it may stick to the sides of the bowl. This delay ensures that ingredient is always dispensed into a bowl already containing water.

3. **Water Stop To Whipper Stop Delay**
   The water stop to whipper stop delay defines the length of time that the whipper will continue to run after the water valve has closed. This ensures that the whipper

operates whenever there is water in the mixing bowl.

4. **Strong Increase**
   This defines the amount of extra ingredient to be dispensed for a "strong" drink and is added to the amount of ingredient set in the ingredient quantity sub-programs.

5. **Mild Decrease**
   The mild decrease defines the amount of ingredient to be subtracted from the amount set in the ingredient quantity sub-programs when a "mild" drink is requested.

6. **Water Flush Time**
   This setting is the period of time that a hot dispense valve is opened during a flush cycle. It is generally set slightly higher than the period set for a vend to ensure that the mixing bowl is filled further than during a vend. Care should be taken to ensure that the period set does not cause the bowl to overflow.

7. **Carbonator Flush**
   This defines the period of time that each cold water valve operates during the carbonator flush cycle.

8. **Brewer Delay**
   The brewer delay allows the brewer to stop part way through its cycle enabling a drink to brew for a longer period before the cycle continues.

9. **No-Cup Button Enable**
   This program allows the no-cup button to be enabled or disabled as required. When enabled, should the no-cup button be pressed, a cup will not be dispensed with the drink. If a drink is not selected within fifteen seconds of pressing the no-cup button, the option will be cancelled.

10. **Electronic Waste Probe**
    This sub-program enables the engineer to disable the electronic waste probe should the machine be fitted with a waste bucket pressure switch.

11. **Cup Discount - Not Available on all Machines**
    This program allows the cup discount feature to be enabled or disabled as required. To ensure that this feature operates correctly both "Cup Discount" and "No-Cup Button" must be set to enable. With "Cup Discount" enabled, when a customer presses the "No Cup" button before selecting a drink, the drink will dispensed without a cup. The price set for "Cup Discount" in the drink price sub program is then subtracted from the price of the drink selected and change/credit given accordingly.

10. Jug Ingredient Sub-Programs

The jug ingredient sub-programs determine the ingredients for jug vends. Since instant jug vends are always black with no sugar, the only quantities which need to be entered are ingredient and water. The maximum quantity allowed for each is 1499.

For freshbrew jug vends the number of cups for each jug is entered.

11. Non-Resettable Vend Counters Sub-Program

1. When the vend counters sub-program is entered, the first drink counter is displayed:

2. Pressing the up (▲) or down (▼) keys enables the counters for each drink to be viewed, but they do not allow the counters to be altered.

3. There is one vend counter for each drink, plus counters for each jug vend, total vends and total sales vends. Additionally, an "Engineer Entry" counter is incremented each time the Engineers program is accessed. These counters cannot be reset and will remain intact for the service life of the controller board.

12. Engineer Code Entry Sub-Program (Default 21)

Entry into the engineer code entry sub-program allows the engineer code to be changed. This code may be of any length up to seven digits. Enter a new code at the prompt and when correct, press access.

Note: If a zero code is entered, the machine will remain in the Engineers program continually, so the zero code will have to be withdrawn. A code of zero is also entered if the engineer attempts to alter the code and then exits the sub-program without entering any number.

13. Temperature Sub-Program

The temperature sub-program allows the parameters controlling boiler temperature and temperature display to be altered. There are four parameters which may be altered.

1. **Maximum Temperature**

   This is the maximum temperature to which the water will be heated and maintained at and must be set to a value greater than the minimum temperature.

2. **Minimum Temperature**

   This is the minimum water temperature at which a drink may be dispensed. If an attempt is made to vend a drink with the temperature below this value when minimum temperature is enabled, the following message will be displayed:

   SORRY NOT IN USE
   WATER HEATING

3. **Minimum Temperature Enable / Disable**

   This feature allows the engineer to enable or disable the vending of drinks below the minimum temperature.

4. **Temperature Display**

   Allows the actual temperature to be displayed (free vend only).

14. Software Version Sub-Program

The software version sub-program displays the serial number of the software version running on the machine and is for information only.

2.5 Vend Counters

1. The vend counters record the number of drinks/jug vends dispensed and the prices charged for them. Each drink type has a separate counter with an additional counter for each jug vend. A "Total Vend" counter keeps a record of the number of vends dispensed and is incremented each time a drink is dispensed.

2. The counters are accessible from within both the operator's and engineer's programs. From the operator's program they may be reset using the "Reset Counters" function or the "Engineers Initialise Sub-Program". When accessed from within the Engineers program, the counters are non resettable. This ensures that a cumulative record is kept throughout the service life of the controller board.

3. Each time the Engineers program is entered, an "Engineer Entry" counter is incremented. This acts as a security feature, ensuring that the Engineers code may not be used without leaving evidence that the program has been entered.

2.6 Pre-Set Values

The tables on the following pages illustrate the pre-set values for all of the parameters which may be changed in the Operators or Engineers programs. These are the values with which the machine leaves the factory.

If the "Initialise" sub-program is activated, each one of these values will be restored into the memory of the controller.

The pre-sets for the parameters found in the Operators program are:

Vend Counters

Drink Type	Counter Pre-Set
Drink Counters	0000000
Jug Counters	0000000
Free Vends	0000000
Total vends	0000000
Total Drink Value	0000000

Time and Date

Parameter	Setting
Time (24 Hr. Clock)	00:00
Date	1: 1: 90
Day of the Week	Monday

Drink Prices

Drink Type	Normal Tariff	Tariff One	Tariff Two
Hot Water	0	0	0
Cold Water	0	0	0
All Other Drinks	10	15	20

Self Clean Sub-Program

Period	Time	Day
One	07:30	Everyday
Two	19:30	Everyday

Alternative Price Periods

Period	Start Time	End Time	Tariff	Day Type
One	00:00	00:00	-	Every Day
Two	00:00	00:00	-	Every Day
Three	00:00	00:00	-	Every Day
Four	00:00	00:00	-	Every Day
Five	00:00	00:00	-	Every Day
Six	00:00	00:00	-	Every Day
Seven	00:00	00:00	-	Every Day
Eight	00:00	00:00	-	Every Day
Nine	00:00	00:00	-	Every Day
Ten	00:00	00:00	-	Every Day

The pre-sets for the parameters found in the Engineers program are:

Instant Selections - All machines except Fusion & Calico

Ingredient	Decaff. Coffee	Coffee	Option*	Tea	Coffee Jug	Decaff Jug
Main Ingredient	20	20	20	4	150	150
Main Water	80	80	80	80	1000	1000
Milk Ingredient	15	15	15	8	N/A	N/A
Extra Milk Ingredient	22	22	22	12	N/A	N/A
Sugar Ingredient	22	22	22	12	N/A	N/A
Extra Sugar Ingredient	30	30	30	15	N/A	N/A
Milk/Sugar Water	80	80	80	80	N/A	N/A

* If "Option" is set to single ingredient, only main ingredient and main water settings apply.

Speciality Drinks	Choc Ingr.	Choc Water	Coffee Ing.	Coffee Water	Topp. Ing.	Topp. Water	Sugar Ing.	Milk Ing.	Mlk/Sgr Water
Cappuccino			40	50	30	80	20		35
Caffe Mocha	55	65	20	30	17	36			
Chocolate	55	150							
Chocomilk	55	85			17	55			
Espresso			30	80					

	Ingredient	Water
Option	30	150
Hot Milk	30	150
Hot Water	0	150

Instant Selections - Fusion & Calico Machines

Ingredient	Decaff. Coffee	Coffee	Option*	Tea	Coffee Jug	Decaff Jug
Main Ingredient	20	20	14 (30)	4	150	150
Main Water	80	80	80 (150)	80	1000	1000
Milk Ingredient	15	15	15	8	N/A	N/A
Extra Milk Ingredient	22	22	22	12	N/A	N/A
Sugar Ingredient	22	22	22	12	N/A	N/A
Extra Sugar Ingredient	30	30	30	15	N/A	N/A
Milk/Sugar Water	80	80	80	80	N/A	N/A

* Figures in brackets () denote single ingredient option.

Speciality Drinks	Choc Ingr.	Choc Water	Coffee Ing.	Coffee Water	Topp. Ing.	Topp. Water	Sugar Ing.	Milk Ing.	Mlk/Sgr Water
Cappuccino (i)	20	35	15	45			12	30	50
Cappuccino (ii)			40	50	30	80	20		35
Caffe Mocha (i)	55	65	20	30				30	36
Caffe Mocha (ii)	55	65	20	30	17	36			
Chocolate	55	150							
Chocomilk (i)	55	85						30	55
Chocomilk (ii)	55	85			17	55			
Espresso			30	80			10		20

(i) Settings with Chocolate Cappuccino enabled.
(ii) Settings with Chocolate Cappuccino disabled.

	Ingredient	Water
Option	30	150
Hot Milk	30	150
Hot Water	0	150

Freshbrew Selections - where applicable

Ingredient	Freshbrew Coffee	Freshbrew Decaf. Coffee	Freshbrew Tea
Main Ingredient	50	50	30
Main Water	150	150	150
Milk Ingredient	15	15	5
Extra Milk Ingredient	22	22	10
Sugar Ingredient	10	10	10
Extra Sugar Ingredient	20	20	20
Milk/Sugar Water	40	40	40
Cups Per Jug	6	6	6

Speciality Drinks	Choc Ingr.	Choc Water	Coffee Ing.	Coffee Water	Topp. Ing.	Topp. Water	Sugar Ing.	Milk Ing.	Mlk/Sgr Water
Cappuccino (i)	15	15	60	80			2	25	30
Cappuccino (ii)			40	50	30	80	20		35
Caffe Mocha (i)	45	55	40	60				25	36
Caffe Mocha (ii)	55	65	20	30	17	36			
Chocomilk (i)	55	85						30	55
Chocomilk (ii)	55	85			17	55			
Espresso (i)			50	80			10		20
Espresso (ii)			50	80					

(i) Settings with Chocolate Cappuccino enabled - Fusion/Calico machines only.
(ii) Standard settings for all freshbrew machines and Fusion/Calico machines with Chocolate Cappuccino disabled

B2C Selections - Bean To Cup Machines

Fusion, Calico and Eclipse

Drink	Choc Ingr.	Choc Water	Coffee Ing.	Coffee Water	Topp. Ing.	Topp. Water	Sugar Ing.	Milk Ing.	Mlk/Sgr Water	Extra Water
Fresh Coffee			8.7g	100			20	15	40	
Espresso			8.7g	60			20		25*	
Americano			8.7g	60			20			80
Cappuccino			9.5g	80	28	40	20		25*	
Caffe Latte			7.8g	80	40	60	20		25*	
Caffe Mocha	24	24	7.8g	80	28	28				

* Fusion/Calico Machines: Sugar is dispensed dry therefore value is set to 0.

Minimum coffee setting = 7.3g Maximum coffee setting = 16.0g

Miscellaneous Settings

Parameter	Setting
Cup Drop to Water Stop	20
Water to Ingredient Start Delay	20
Water to Whipper Stop Delay	50
Strong Increase	10
Mild Decrease	6
Flush Water Time	100
Carbonator Flush	200
Tea Brewer Delay	10
Coffee Brewer Delay	0
No Cup Button	Disabled
Electronic Waste Probe	Enabled

Cold Drink Sub-Program

Cold Drink 1	
Syrup 1	20
Cold Water	125
Carb. Water	140

Cold Drink 2	
Syrup 1	20
Cold Water	125
Carb. Water	140

Cold Drink 3	
Syrup 1	20
Cold Water	125
Carb. Water	140

Cold Water	
Water	140
Carb. Water	150

General Parameters

Cup Level	100%
Coin System	Change-giver
Coin Set	1 - 50p
Cold Drink Unit	Carbonator
Flush	Hot & Cold

Temperature Sub-Program

Max. Temperature	90° C
Min. Vend Temperature	75° C
Min. Temperature	Disabled
Temperature Display	Disabled

Section 3 - The Vend Cycle

3.1 Standby Mode

In standby mode the machine is idle, awaiting action from the keypad or switch/key inputs. The display will show one of a number of messages indicating the credit mechanism of the machine, the coin set, the time and if appropriate, which alternative tariff is in force. The messages displayed are determined by the type of coin system which has been programmed in the management sub-program.

The credit mechanism is indicated by one of the following prompts:

1. **'Free Vend'** - indicates that a free vend tariff is in force.
2. **'Please Insert Card'** - indicates that a card system is attached.
3. **'Please Insert Coins'** - indicates that a coin mechanism is connected.
4. **'Please Insert Key'** - indicates that the machine is fitted with a key system.

In addition, the prompts 'Exact Change Please' or 'No Change Given' inform the customer whether change is available.

If the mechanism is set to acceptor, the 'No Change Given' message will always be displayed. If the mechanism is set to change-giver, the prompt will depend upon how full the change tubes are. For more information please refer to the manual supplied with the change-giver. The coin set accepted by the coin mechanism is displayed. This is pre-set in the controller and outlined in the section covering the programming of the coin set in the Engineers program. The alternative tariff will be indicated by either the "Alternative Prices" or "Free Vend" messages.

An example of the display in standby mode for a change-giver with full tubes, and alternative tariff 1 in force at 10:30 a.m. would be:

Message No. 1:

PLEASE INSERT COINS
1 - 50p TIME 10:30

Message No. 2

CHANGE GIVEN

Message No. 3

ALTERNATIVE PRICES
NOW AVAILABLE

Each message will be displayed in turn for approximately 2½ seconds.

3.2 Drink Numbering

Each drink available from the machine has its own unique number which must be entered from the keypad. Drink numbering and prices are displayed to the customer by a set of polycarbonate or self adhesive decals depending on machine type. Separate, self adhesive decals are applied to the main decal to indicate the drink prices.

The numbering sequence is illustrated in the following tables:

1. Instant and Freshbrew Machines

Attributes		*Instant Coffee*	*Freshbrew Coffee*	*Instant Decaff Coffee*	*Instant & Freshbrew Tea*	*Freshbrew Decaff Coffee*
Milk	Sugar	10	20	20	30	90
Milk	Extra Sugar	11	21	21	31	91
Milk	No Sugar	12	22	22	32	92
Extra Milk	Sugar	13	23	23	33	93
Extra Milk	Extra Sugar	14	24	24	34	94
Extra Milk		15	25	25	35	95
	Sugar	16	26	26	36	96
	Extra Sugar	17	27	27	37	97
	No Sugar	18	28	28	38	98
	Jug	19	29	29	39	99

Note: Instant Decaffeinated Coffee selections are numbered 90 - 99 in Fusion and Calico machines.

Selections	
Chocolate	40
Option 1	41
Option 2	42
Cappuccino (+ Sugar)	50
Cappuccino (No Sugar)	51
Espresso	52
Espressochoc	53
Milk	54
Chocomilk	55
Hot Water	82
Hot Water (No Cup)	83

Cold Drink Selections	
Drink 1 (Still)	60
Drink 1 (Carbonated)	61
Drink 2 (Still)	70
Drink 2 (Carbonated)	71
Drink 3 (Still)	72
Drink 3 (Carbonated)	73
Cold Water (Still)	80
Cold Water (Carbonated)	81

2. Fusion, Calico and Eclipse Bean to Cup Machines

Attributes		*Instant Coffee*	*Fresh Coffee From Beans*	*Instant/Freshbrew Tea*
Milk	Sugar	10	20	30
Milk	Extra Sugar	11	21	31
Milk	No Sugar	12	22	32
Extra Milk	Sugar	13	23	33
Extra Milk	Extra Sugar	14	24	34
Extra Milk		15	25	35
	Sugar	16	26	36
	Extra Sugar	17	27	37
	No Sugar	18	28	38
	Jug	19	29	39

Selections	
Chocolate	40
Option	41
Espresso	90/91
Americano	92/93
Cappuccino	94/95
Caffe Latte	96/97
Caffe Mocha	98

Cold Drink Selections	
Drink 1 (Still)	60
Drink 1 (Carbonated)	61
Drink 2 (Still)	70
Drink 2 (Carbonated)	71
Drink 3 (Still)	72
Drink 3 (Carbonated)	73
Cold Water (Still)	80
Cold Water (Carbonated)	81

3.3 Replacing/Updating Drink Selection Decals

To update drink pricing or replace drink description decals, proceed as follows:

1. Riocca, Eclipse & Calico Machines

1. Ensure that the machine is switched ***off*** and disconnected from the mains electricity supply. Open the cabinet door.

2. Remove the two fixing nuts situated either side of the cup turret that secure the drop down front graphic panel.

3. Moving to the front of the door, carefully pull down the hinged top graphic panel. Remove the relevant decal(s) from the slide in pocket and update as appropriate.

4. Close the hinged graphic panel and secure using the fixing nuts. Close the front door and switch ***on*** the power to the machine.

2. Fusion Machines

1. Ensure that the machine is switched ***off*** and disconnected from the mains electricity supply. Open the cabinet door.

2. Unscrew the two knurled fixing sleeves located either side of the cup turret and carefully remove the decal carrier plate from the front of the machine.

3. Remove the transparent window and printed decal carrier from the decal carrier plate. Remove the relevant decal strip(s) from the slide in pockets and update as required.

4. Refit the printed decal carrier and transparent window to the decal carrier plate. Replace the decal carrier plate to the front of the machine and secure with the knurled fixing sleeves.

5. Close the front door and switch ***on*** the power to the machine.

3. Ventura and Optima Machines

1. Ensure that the machine is switched ***off*** and disconnected from the mains electricity supply. Open the cabinet door and lower the cup turret.

2. Carefully push the relevant transparent decal holder(s) out of the moulding. Remove old decal from holder and replace/update as required. Refit holder(s) to moulding.

3. Close the front door and switch ***on*** the power to the machine.

3.4 Drink Selection

Drink selections are made by entering the two digit number for the drink required as shown in the previous tables. Any numerical entry errors may be corrected using the 'C' key. This will cancel the last digit displayed on the LCD. In this section, we shall use the example of vending a drink number 20, with the machine in "Free Vend Mode".

1. Immediately a numerical key is pressed (in this case number 2), the controller will exit standby mode and display:

DRINK 2
CREDIT 0.00

2. On entering the second digit (0) the message on the display will change to:

DRINK 20 STRENGTH?
CREDIT 0.00

3. The 'strong', 'mild' or 'normal' buttons should now be pressed to select the drink strength. Pressing one of these buttons activates the controller and the specified drink is dispensed. If the drink selected does not have a strength option, the 'strength' prompt will not be displayed.

4. If a button is not pressed within five seconds of the drink number being entered, a normal strength drink will be dispensed. The five second delay is to enable the user to alter an incorrectly entered drink number.

5. While the drink is being vended, the display will show the message:

DRINK 20 PLEASE WAIT
CREDIT 0.00

6. After dispensing the drink, the machine will display the message shown below before returning to background mode:

THANK YOU FOR
YOUR CUSTOM

7. Assuming that the same sequence of operations is carried out when the machine is not in "Free Vend Mode", on pressing a strength button, the display will show:

INSUFFICIENT CREDIT
PRICE ?? / CREDIT 0.00

- where ?? is the drink price for the tariff in force. Because alternative prices are not necessarily displayed on the price decals, the above sequence is a useful method for the customer to check the price of a particular drink.

8. The alternative method of leaving standby mode is to insert credit into the coin or card system. When a coin (eg. 50p) is accepted, the display will show the message:

DRINK
CREDIT 0.50

The sequence for selecting a drink is exactly the same as before, however the machine will not return to standby mode until the credit has been cancelled. This is achieved either by returning the credit, or vending a drink.

Note: If a change-giver is connected, the controller will wait for up to twenty-five seconds to allow the change-giver to dispense change. It is important to ensure that if a coin mechanism is not connected, the management sub-program is set to free vend, otherwise the controller may wait for twenty-five seconds after each drink, attempting to communicate with a change-giver.

3.5 Jug Selection

To make and vend a jug selection, proceed as follows:

1. The jug key is inserted and turned clockwise. The LCD will display the message:-

PLEASE SELECT DRINK **JUG SELECTION ONLY**

2. It is now only possible to make jug selections from the machine.

3. Place a Jug into the dispense area. Enter the correct two-digit jug selection code and the jug vend will be dispensed.

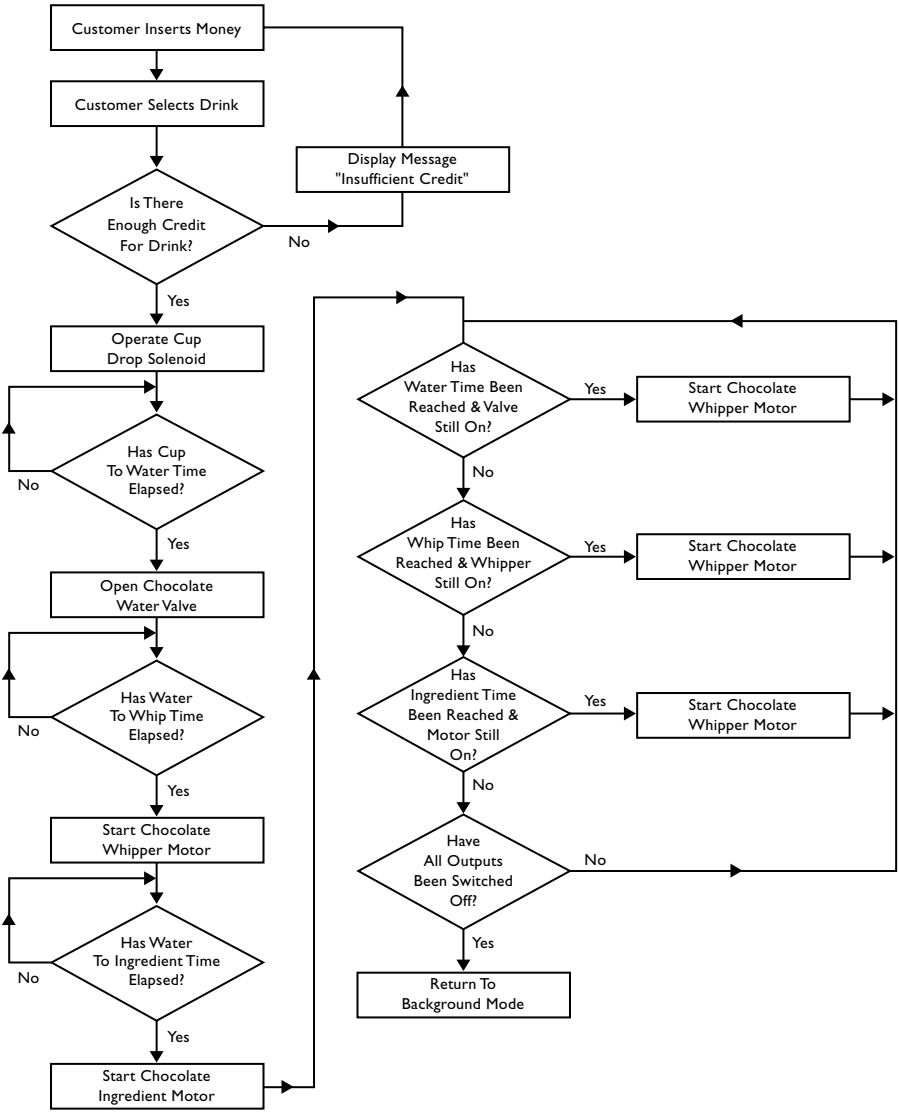
3.6 Example Vend

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

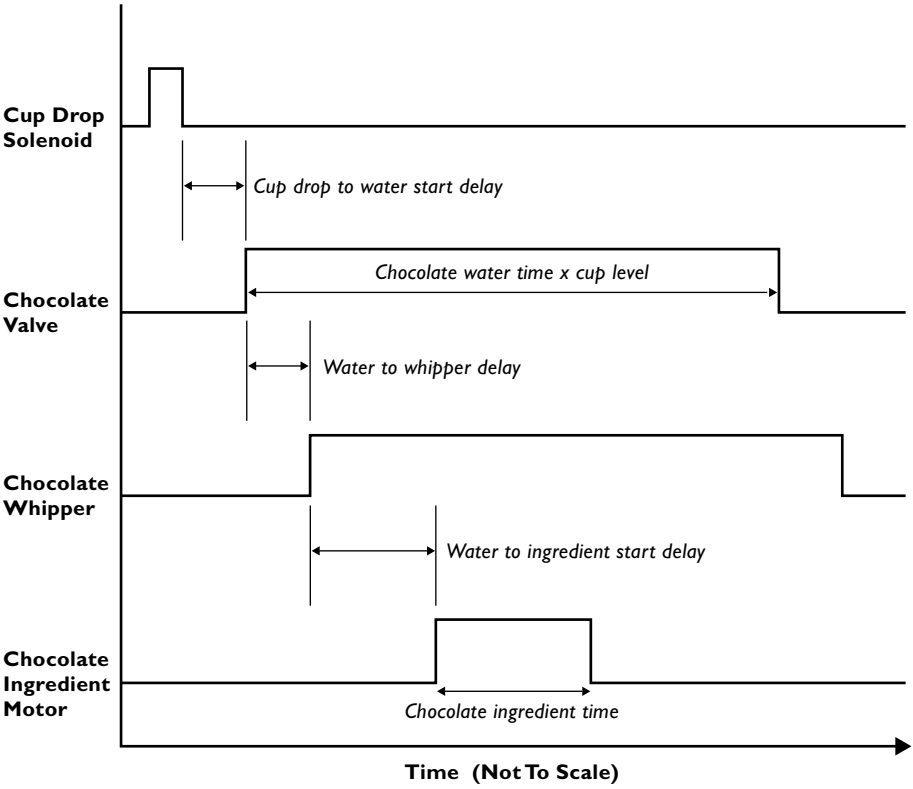
1. Vending machine is in standby mode.
2. Customer inserts sufficient credit for a chocolate drink.
3. Customer keys in code 40, followed by a strength button.
4. The controller checks that the credit is at least as much as the price of drink 40 for the current tariff in force.
5. The cup-drop solenoid is operated.
6. The controller waits for the time specified in the cup-drop delay.
7. The dispense head moves to the dispense position.
8. The chocolate water valve is opened.
9. The chocolate whipper motor is started.
10. The controller waits for the time specified in the water to ingredient start delay.
11. The chocolate ingredient motor is started.
12. The cup level percentage is used to calculate the chocolate water time.
13. The chocolate ingredient time is read from the drink settings.
14. The controller waits until each time period has elapsed to turn off the motor and valve.
15. The controller waits for the time specified in the water to whipper stop delay after the valve has closed.
16. The whipper is switched off.
17. The dispense head returns to the parked position.
18. The machine returns to standby mode.

The **flow chart** (below), viewed in conjunction with the **timing diagram** on the following page is a graphic representation of the example vend.

Flow Chart



Timing Diagram



Section 4 - Technical Information

4.1 Water Services

The mains water supply provides water for the boiler and a separate cold supply for the chiller unit. Water enters at the rear of the machine through a solenoid operated inlet/splitter valve which opens or closes the water supply as required.

Bean to cup machines: On bean to cup machines water is diverted via a tee piece connector fitted between the bulk head connection and the splitter/inlet valve to supply the B2C module. This water line contains a manual shut off valve to aid service or maintenance.

4.2 Hot Water System

Instant and Freshbrew machines:

1. Water is heated in the boiler to the required temperature by a heating element rated at 2.4 Kilowatts. The mains voltage required for the element is switched by a solid state relay, controlled by the vending machine controller via an analogue signal transmitted by the thermistor probe.

2. The water level inside the boiler is controlled 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.

3. 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.

Bean to cup machines:

1. Bean-to-cup vending machines utilise two heating systems. The first is the standard heater tank using a 2.4 Kilowatt element as described above. Water from this system is used for all instant and freshbrew drink selections.

2. The second system, used for bean-to-cup selections, utilises two 1.2 Kilowatt heater blocks contained within the B2C module. Water will not be pumped through the heater blocks until they have reached the correct temperature.

3. The vending machine controller always ensures that only one of the heating systems fitted to bean to cup machines can operate at any one time thus preventing current over load.

4.3 Cold Water System

1. A cold water supply is required for the chiller unit. The chiller unit utilises a post mix system in which chilled water (carbonated or still) is mixed with the drink syrup in the cup, thus giving a high level of hygiene within the machine. The temperature of the chiller unit is regulated independently of the vending machine controller.

2. Carbonated water is produced by chilling the water to a temperature of approximately 4° centigrade then infusing carbon-dioxide gas at a pressure of 35 PSI.

3. Separate control valves deliver still or sparkling water from the carbonator to the dispense head. Both valves are controlled by the vending machine controller.

4. The cold water pump will run for a maximum of 1 minute and then switch off for 10 minutes to protect the pump motor.

4.4 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 keypad will be disabled, all outputs from the controller board (including the heater element) will be switched off and the display will show the message:

SORRY NOT IN USE LOW WATER

3. **Bean to cup machines:** If the water supply to the B2C module is interrupted in any way and a vend is attempted, the display will show:

WATER SHORTAGE CONTACT SERVICE

   The vending machine controller assumes a failure in the water supply and disables the machine.

4.5 Ingredient Dispense

1. The ingredients required for making up a drink, either instant or freshbrew, 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 timing constants set in the engineers program - refer to Section 5 of this manual, 'Programming the Machine' for further details.

3. The required ingredients for each vend are delivered to a mixing bowl, where they are blended with hot water by a high speed whipper prior to discharge at the dispense head.

4. To ensure a free flow of ingredient powder and granules, it is essential that they are kept completely dry. This is achieved by extracting steam from the mixing system using an extract fan. The electrical supply for the extract fan is 110 Volts AC.

Note! The fan runs continuously whilst the cabinet door switch is in the ***on*** position.

5. **Bean to cup machines:** Coffee beans are contained in the fresh bean canister and are dispensed by means of the bean grinder and espresso brewer contained within the B2C module.

   The amount of beans dispensed from the canister is controlled by the vending machine controller and may be adjusted via timing constants set in the engineers program - refer to Section 2 of this manual, 'Programming the Machine' for further details.

4.6 Cup Dispense Unit

Cups for receiving dispensed vends are stored in tubes within the cup dispense unit. The machine can be fitted with a 'reverse peeler' cup drop unit. This unit is intended for use with paper cups* but can also dispense plastic HIPS vending cups. These units can be easily identified by two blue stickers placed on either side of the unit.

* Crane Merchandising Systems recommend Huhtamaki paper cups.

1. The cups are separated and 'dropped' by a cup ring. The cup ring comprises five separator cams operated by a solenoid, which is controlled by the vending machine controller.

2. Located above the separator is the cup ring micro-switch which senses if the cup ring contains less than three cups. If this is the case, the controller will index the cup tubes until a full stack is located. A turret location micro-switch ensures that the cup tubes stop centrally over the cup ring. Both of these micro-switches switch logic levels directly to the vending machine controller.

3. The cup stack index motor is protected by a time-out feature. The cup stack will rotate for a maximum period of 90 seconds. If all of the cup tubes are empty at the

end of this period, the machine will be rendered inoperative and the display will show the message:

SORRY NOT IN USE
NO CUPS

4.7 Brewer Unit - (Freshbrew Models)

1. The brewer unit provides a freshly brewed vend of either tea or coffee. The ingredient (either prepared tea or coffee grounds), is dispensed into the brewer unit via the canister.

2. A 110 Volt motor, controlled by an index cam fitted to the drive shaft, operates the brewer unit. The cam operates a switch which sends a logic signal to the controller when the brewer is in the correct position.

4.8 Coin and Card/Key Systems

The machines may be equipped with coin or card/key validation systems using Mars protocol 'A'. The coin or card/key system informs the vending machine controller of the amount of credit which has been deposited into the vending machine.

4.9 Change Giver

1. The Change Giver communicates with the vending machine controller through a serial communication interface. It will validate a coin and if accepted, send a signal to the vending machine controller indicating the total amount of money which has been tendered since the last vend.

2. Once sufficient credit has been accumulated a vend will be permitted. The vending machine controller will communicate to the change giver the actual price of the drink dispensed. The change giver will return any change due to the customer, provided the change tubes contain coinage above a pre-set level.

4.10 Card/Key System

1. The card system fitted to the machine communicates with the vending machine controller using the same principle as the change giver.

2. The card system informs the vending machine controller of the amount of credit on the customer's card. If there is sufficient credit for the selected drink, the vending machine controller permits a vend and informs the card system of the amount of credit to be taken from the card. The new balance will then be re-written onto the customer's card.

4.11 Coin Acceptor

1. The coin acceptor is an electronic coin system which can validate up to six different coin or token denominations and gives an appropriate pulsed output if a coin has been recognised.

2. The outputs are one line per coin from open collector NPN transistors referenced to 0 Volts. Each output is normally off and is switched on for between 80 and 200 milliseconds on acceptance of a corresponding coin.

3. The vending machine controller has separate inputs for each coin line. When sufficient money has been deposited, the vending machine controller will permit a vend.

4. The acceptor will not dispense change.

4.12 Coin Blocker

Both coin systems have a coin blocking facility. On machines fitted with a coin acceptor, a logic "low" level on the input disables any coin acceptance. For machines fitted with a change-giver, the appropriate command from the vending machine controller will have the same effect.

Note! For full information and programming instructions for all of these systems, please refer to the user manual supplied with the validation system.

Section 5 - B2C (Bean to Cup) Module

5.1 Description

The bean-to-cup module is a self contained espresso system capable of producing high quality espresso based drinks either independently (Espresso, Americano) or in conjunction with the soluble product from the vending machine (Cappuccino, Caffe Mocha etc.).

There are only three connections to the module - (1) 230V ac via a 10A switch, (2) RS232 communication with the vending machine controller and (3) the water supply.

5.2 Example Vend

When a bean-to-cup drink is selected the following occurs: -

1. The customer selects a bean to cup drink. A controlled amount of fresh beans are delivered into the grinder and the grinder is operated for a pre-determined time. Ground coffee is deposited into the brewer.

2. The brewer moves to the vend position, forming the ground coffee into a compressed pellet as it does so.

3. When the two heaters reach the required temperature the inlet valve and the steam relief valve both open. At the same time the pump will start pumping water through the system.

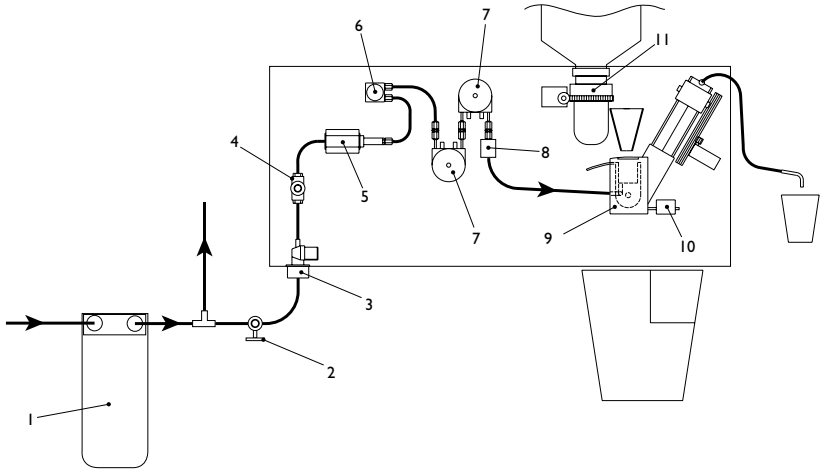
4. Whilst water is passing through the system a water flow meter will send pulses back to the main controller in the B2C module. Each pulse indicates xx.xxml.

5. Once the required amount of water has been pumped through the system, the heaters are turned off, the drain release valve opens, the steam relief valve closes and the brewer compresses the used coffee pellet. At this point approximately 9mls of water will exit the brewer via the drain release valve port.

6. The brewer moves back to the stand-by position, ejecting the used coffee pellet into the dry waste container in the process. The drain valve is closed completing the process.

5.3 System Overview

The B2C module contains eight main component parts with two essential external parts. The following section contains an overview of each these components along with a diagram.



1. Water Filter

The machine must be operated in conjunction with a water filter of food grade quality, capable of removing temporary hardness (scale), heavy metals (lead, copper, iron, cadmium), chlorine and any organic pollutants/discolouration. Crane Merchandising Systems recommend the Brita AquaQuell compact water filter for use in its bean-to-cup vending machines.

2. Shut-off Valve

The water supply to the B2C module is diverted via a tee piece located between the bulk head adaptor and the splitter/inlet valve. The supply line incorporates a manual shut-off valve that can be operated with a flat blade screwdriver or similar. This enables an engineer to work on the B2C module without having to turn off the main water supply to the machine.

3. Water Inlet Valve

A 230V ac single solenoid water inlet valve. When a bean to cup drink is selected the inlet valve is opened. At the same time the pumps are operated, pumping water through the system.

4. Pressure Regulator

An inline pressure regulator that maintains water pressure to the B2C module at 1.5 bar.

5. Vibration Pump - 230V ac

When a bean-to-cup drink is requested the pump will switch on at the appropriate moment until the required amount of water has been pumped through the system.

6. Flow Meter

As water flows through the system, the flow meter sends pulses back to the B2C control board.

7. Heater Blocks

Two 1.2 kW heating blocks are utilised in the system, each controlled by the main B2C controller via NTC thermisters. Each heating block is protected by a single shot 192°C thermal fuse.

8. Steam Relief Valve

The steam relief valve is a 24V dc solenoid operated valve. During the vend cycle this valve is open. At the end of the vend the valve closes thus preventing steam generated by the two heating blocks escaping through the brewer. However, should excessive pressure build up within the system whilst the machine is in standby mode, the valve opens to release this pressure out through the brewer, protecting the system.

9. Brewer (Plus Motor and Encoder)

The brewer unit is capable of receiving between 7 and 16 grams of ground coffee. Once the coffee has been ground and dispensed into the brewer unit, the 24V dc brewer motor drives the brewer to the vend position using the encoder pulses as control. Once the coffee has been slightly compressed into a round 'cake', water is pumped through the brewer. When the required amount water has passed through the brewer, the now wet coffee 'cake' is squeezed, removing most of the water from the 'cake', preventing the brewer becoming unnecessarily dirty. After the 'cake' has been squeezed the brewer will deposit the cake into the dry waste container and return to the stand-by position.

10. Drain Release Valve - 24V dc, Solenoid Operated

This valve opens when the system needs to evacuate water from the brewer, i.e. after the coffee 'cake' has been squeezed at the end of a vend.

11. Grinder (Plus Grinder Adjust Motor)

The grind mechanism consists of a 230V ac conical grinder with a 24V dc grinder adjust motor. When a bean-to-cup drink is selected the grinder will run for the required time, grinding beans and feeding the brewer at the same time. Should the B2C controller detect an incorrect water flow for three consecutive vends, it assumes that the grinder is set either too coarse or too fine. At this point the controller automatically adjusts the grinder settings, thus ensuring consistent drink quality.

12. Switch Mode Power Supply

A general purpose 60W switch mode power supply.

V in	=	220 - 240V ac
V1 out	=	24V dc @ 2.5A
V2 out	=	5V dc @ 0.5A

Safety: UL1950D3
CSA 22.2 No.234
VDE EN60 950

13. Module Control Board

All processing and output switching is controlled from the Module Control Board.

Section 6 - Electrical/Electronic Information

The machines utilise a 220 - 240 Volt, 13 Amp single phase electricity supply. This is fed via a 16 Amp line filter, door switch, 25 Amp solid state relay contact and high temperature cut-out to the 2.4 kW element located in the heater tank.

Bean to cup machines: The mains electrical supply is routed to the bean to cup module, after the 16A filter and door switch. Please see "Power Circuit" diagram, Section 7 - Figures and Diagrams.

6.1 16 Amp Filter

The 16 Amp filter prevents spurious voltages reaching the power supply on the I/O and controller boards and other sensitive components within the machine.

6.2 Door Switch

When the door is opened, the door switch automatically cuts off the mains electricity feed to the transformer. To aid cleaning and servicing of the machine, a door switch safety key may be inserted when the door is open, restoring the mains voltage to the transformer.

Safety First! The door switch safety key does not isolate the cold unit which remains live. The cold unit can be isolated using the switch located on the power supply. (See **6.6 - Chiller Unit** on page 54).

6.3 25 Amp Relay

The 25 Amp relay switches 240 Volts to the 2.4 Kilowatt heater element when required as detailed under **4.1 - Water Services** on page 43.

6.4 High Temperature Cut-Out

A high temperature cut-out, located in the heater tank overflow, senses the temperature of any water in the overflow 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 cause the cut-out to operate, switching off the electrical supply to the heater element.

2. With the electrical supply disconnected and the control fault rectified, the cut-out can be reset by a small push button located on its' top side.

6.5 Transformer

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

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

1. 24 Volt Output

The 24 Volt supply is used to power the coin mechanism or card/key system fitted to the machine and also provides power for graphic display panel lighting (via a two pole switch) on Riocca, Eclipse and Calico machines.

2. 12 - 0 - 12 Volt Outputs

1. These outputs are connected to the I/O board where they are rectified to produce an unregulated DC supply.

2. The I/O board regulates the DC supply to produce two separate 5 volt supplies for the logic circuits and the triac drivers.

3. The unregulated DC supply is also connected to the controller board where it is regulated to 5 and 12 Volts to power the logic circuits and level probe respectively.

3. 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, solenoid's and motors in the machine.

2. The extractor fans are connected across the 110 Volt supply and operate continuously.

3. The earthed 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. Each triac is operated by an encoded signal sent along the serial communication link from the controller board.

5. 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'***.

6. Each triac may be individually tested using the 'Engineers Output Test Program'.

Safety First! Care must be taken when servicing the machine as 110 Volts is always present at the triacs when the mains is switched on.

6.6 Chiller Unit

The chiller unit (carbonated or still) is fed with a 240 Volt supply via a 6 Amp line filter, single pole switch and (T) rated 12A fuse. The line filter prevents electrical noise from the carbonator reaching the main 240 Volt feed.

Note: If the machine is switched on at the mains, the carbonator will be live regardless of the position of the door switch. The carbonator ***ON/OFF*** switch is located on the fuse panel beside the transformer.

6.7 Serial Communications Link

Communication between the controller and I/O boards is accomplished by a two wire serial data bus using the I^2C protocol.

Bean to cup machines: Communications between the B2C module and controller is accomplished by an RS232 link.

A screened cable is used to reduce any radiated electrical interference and thus prevent any data transfer failures.

3.11 System Memory

Three types of memory are used on the machines controller board as follows:

1. EPROM Memory - holds the controller operating program.

2. Data Memory - used by the controller during operation.

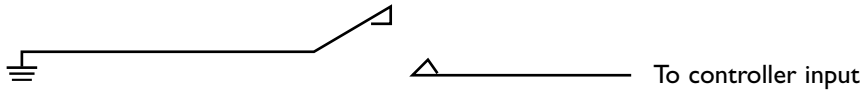
3. Battery Backed Memory - stores all parameters set by the operator or engineer when the mains power is switched off.

Note: The battery is intended to keep the parameter data intact for a minimum period of ten years.

Bean to cup machines: Bean to cup machines utilise a forth memory type. The B2C module uses flash memory to store the operating program, drink parameters etc.

3.12 Input Monitoring

The vending machine controller monitors inputs from a number of switching devices. The normally open contact of a switching device is connected directly to an input line of the controller, with the common contact connected to ground. This is configured as follows:



When the contact is closed, the controller input will be taken to 0 Volts. The level control circuit, cold fill and thermostat are monitored continually when the machine is switched on. All other inputs are monitored when required, depending on their function within the machine.

3.13 Individual Input Functions

Note: Diagrams illustrating how the inputs are connected from the loom to the controller board are included in the "Figures and Diagrams" section at the rear of this manual. The switching units are represented diagrammatically as normally open switches with their commons connected to ground. The operation of each input is as follows:

1. Paper Sold Out (Plug 1, Pins 1 and 7) - Riocca and Eclipse Machines

Note: This option is not fitted as a standard feature. If fitted, the switch detects when the brewer filter paper roll is about to "run out" and disables all freshbrew selections.

2. Cold Fill (Plug 1, Pin 2)

The cold fill input is controlled directly from the chiller unit. When the chiller activates the cold fill input, the inlet valve and cold fill valve are switched on by the controller until the chiller unit switches off the cold fill input. To prevent the cold fill pump in the chiller unit from overheating, there is a ten minute duty cycle time-out in operation. If the cold fill input is on for one minute, it is switched off and not reactivated for a further ten minutes. Should a cold drink be selected during the nine minute rest period the display will show the message:

SELECTION NOT AVAILABLE

3. Cup Empty and Carousel Micro-switches (Plug 1, Pins 3 & 4)

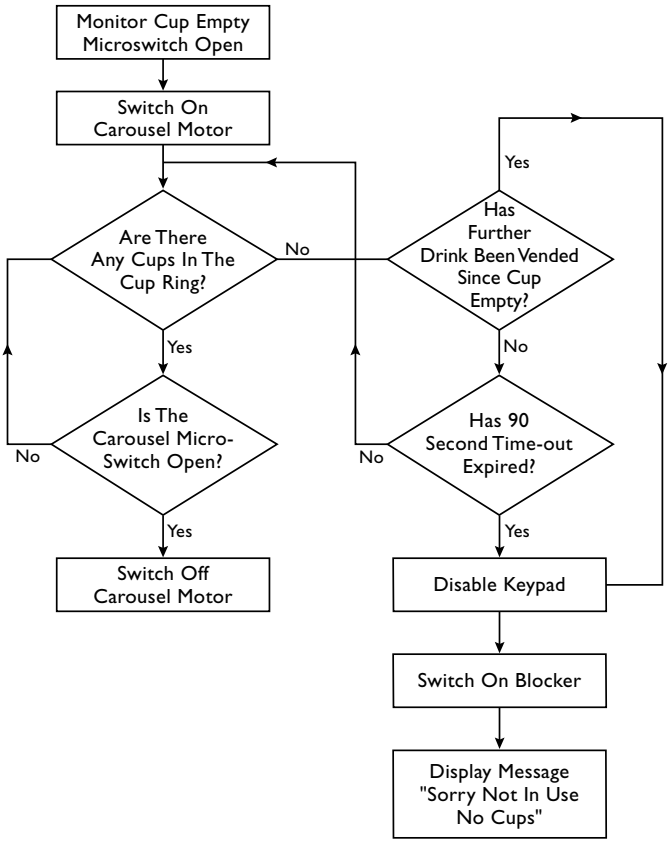
The cup empty micro-switch is located beside the cup ring and is activated when less than three cups remain in the cup ring. When this state is detected, the cup carousel motor is operated and rotates the cup turret until the next full stack of cups drops

into the ring. In order to ensure that the turret stops with the cup stack positioned centrally over the ring, the carousel micro-switch is activated by a series of levers on the turret. By ensuring that both the cup empty and carousel micro-switches are off, the controller always stops the turret in the correct position.

Two features of the controller program assist in the operation of the cup mechanism:

1. To prevent the customer having to wait for the cup stack to rotate into position after the cup empty micro-switch activates, one further vend can be made before the "out of cups" message is displayed, allowing the next cup stack to move into position.
2. Should the cup turret jam or be empty, the cup indexing motor would continue to run and eventually burn out. To eliminate this, a ninety second time-out has been incorporated after which time the machine will be set into the disabled state and display the "out of cups" message.

The flow chart below shows the general operation of the cup mechanism.



4. Brewer Index Micro-switch (Plug 1, Pin 5) - Freshbrew machines only

The brewer index micro-switch is fitted to the brewer unit and is operated by a cam on the brewer motor. The micro-switch closes when the brewer motor starts to operate and opens again when the brewer returns to it's closed position. This ensures that the starting position of the brewer is always correct.

If the micro-switch is closed during power up, the machine will wait until the brewer motor returns to the correct position and the micro-switch opens. During this time, the LCD will display the message:

PLEASE WAIT
BREWER REPOSITIONING

If at any time the brewer index micro-switch is closed for more than sixty seconds, the brewer will be switched off. The message "Selection Unavailable" will be displayed if a freshbrew drink is selected.

5. Secondary Brewer Index Micro-switch (Plug 1, Pin 6) - Freshbrew machines only

A secondary brewer index micro-switch is fitted to the additional brewer fitted to Eclipse machines. The switch operates in exactly the same way as the primary brewer index switch.

6. Service Switch (Plug 1, Pin 8)

The service switch comprises a single pole, normally open, biased switch. Pressing the service switch mounted in the switch panel enables the operator to make one free test vend using the keypad to ensure that the machine is operating correctly.

7. Cup Test Switch (Plug 1, Pin 9)

The cup test switch allows the operator to test the cup mechanism after refilling the cup carousel. It comprises a single pole, normally open, biased switch, which when activated will pulse the cup drop solenoid and operate the cup mechanism.

8. Flush Switch (Plug 1, Pin 10)

This is a single pole, normally open, biased switch, which when operated flushes either the hot water system, cold water system or both, depending on what type of flush has been selected in the management sub-program. Each valve is operated in sequence for a specified time (set in the 'Miscellaneous Settings Program') and 'rattled' to remove any build up of limescale. The corresponding whipper is also operated. The brewer is also operated for 4 (four) complete cycles.

Bean to cup machines: The brewer module fitted to bean to cup machines is also rinsed automatically during the flush sequence. When all hot and cold water valves have been flushed the B2C module will initiate a brewer flush sequence. Water is pumped through the system with the brewer moving to three different positions as it does so. This is to ensure that all internal parts of the brewer are rinsed.

9. Counter Switch (Plug 1, Pin 11)

The counter switch comprises a single pole, normally open, biased switch. When operated the operator is able view the vend counters by means of the arrow keys on the keypad. To exit from this sequence press the cancel (C) or 'blank' key. A 'time-out' feature ensures that the controller automatically reverts to standby mode if a key is not pressed after a period of thirty seconds.

10. Syrup Prime Switches (Plug 1, Pins 12, 13 and 32)

The syrup prime switches are single pole, single throw, biased switches. These switches, mounted in the switch panel and numbered 8, 10 and 12, allow the operator to prime the syrup selections. After replacing a syrup container, press the relevant syrup prime switch to operate the syrup pump for that station, enabling it to be primed ready for use.

11. Counter Reset (Plug 1, Pin 14)

The counter reset switch comprises a single pole, normally open, biased switch, which when operated allows the operator to reset the vend counters.

12. Program Entry Switch (Plug 1, Pin 15)

The program entry switch input comprises a single pole, normally open, biased switch. When operated the LCD will display a '>' cursor. The correct operator/engineer code must be entered within five seconds of the cursor appearing, allowing access to the program. The factory pre-set for the operator code is '17' whilst the engineers code is set to '21'. The program entry will terminate when no button on the keypad has been pressed for a period of thirty seconds or the 'blank' or 'cancel' button is pressed.

13. Park Head Switch (Plug 1, Pin 16)

The park head switch comprises a single pole, normally open, biased switch. When this switch is pressed, the dispense head moves to its fully extended (dispensing) position. Press the switch again to return the dispense head to its correct parked position.

14. Jug Key Switch (Plug 1, Pin 17)

This is a two position key switch located on the front of the machine which allows the machine to dispense jug quantity vends of coffee, tea or decaffeinated coffee.

15. Free Vend Input (Plug, 1 Pin 18)

16. Coin Lines (Plug 1, Pins 19 - 25)

Seven separate input lines (one for each denomination of coin which can be accepted) are provided from the coin acceptor unit. Each input is normally high and will be pulsed low for between 80 and 200 milliseconds on acceptance of the corresponding coin.

17. Waste Bucket Sensor (Plug 1, Pin 26)

Not Used.

18. Paper Feed Switch (Plug 1, Pin 27) - Freshbrew machines only

The paper feed input enables the operator to load a new roll of filter paper. The switch is pressed and released to allow the brewer to start its cycle. Once it has reached its open position (brewer chamber raised) it will stop and the filter paper can be fed safely through the unit. Pressing and releasing the switch again will cause the filter paper to index automatically and the brewer chamber will return to its closed position.

Note: For extra safety the mains may be switched off using the door switch when the brewer unit reaches the top of its cycle. When the mains supply is restored, the brewer will reposition.

19. Brewer Flush Switch (Plug 1, Pin 28) - Freshbrew and B2C Machines

The brewer flush switch allows the brewer to be flushed independently. In order to guarantee the highest standards of cleanliness, the boiler fill valve is disabled, ensuring that the water used is delivered at the optimum temperature to kill any micro-organisms.

Freshbrew machines: The brewer unit is filled with hot water and then operated through four complete brew cycles.

Bean to cup machines: The cleaning sequence lasts for approximately 10 - 15 minutes, during which time the machine will rinse the brewer three times. During the sequence the LCD will display the message:

PLEASE INSERT TABLET
AND PRESS NORMAL KEY

Insert one cleaning tablet into the cleaning tube located on the top of the module. Press the **Normal** key on the keypad to restart the cleaning cycle. The display reverts to the "B2C module self cleaning" message.

Once the flush cycle is complete, the boiler refills and when the water is at the correct temperature, the machine returns to standby mode, ready to vend.

20. Dispense Head Motor Index Switch (Plug 1, Pin 29)

This micro-switch is fitted to the dispense head assembly and is operated via a cam. When the dispense head operates, the index switch closes until the dispense head returns to its "parked" position.

If the index switch is closed on power-up of the machine, the dispense head motor will operate and return the dispense head to its "parked" position, causing the following message to be displayed:

PLEASE WAIT
HEAD REPOSITIONING

21. '0' Volts (Plug 1, Pins 33 and 34)

This plug is the '0' volts (ground) referred to in the paragraph headed "Input Monitoring".

22. Thermistor Probe Input (Plug 1, Pin 35)

The Thermistor probe measures the temperature of the water in the boiler and converts this into an analogue signal. This signal is used by the controller board to determine whether or not to switch on the heater element.

If the temperature in the boiler is below the maximum boiler temperature (set in the "engineer temperature sub-program"), the heater element will be switched on. When the boiler temperature reaches the maximum boiler temperature, the heater element is switched off. When the machine is initially powered up, it will display the message:

SORRY NOT IN USE
WATER HEATING

This message will be displayed until the minimum vend temperature is reached, as defined in the temperature sub-program in the Engineers program.

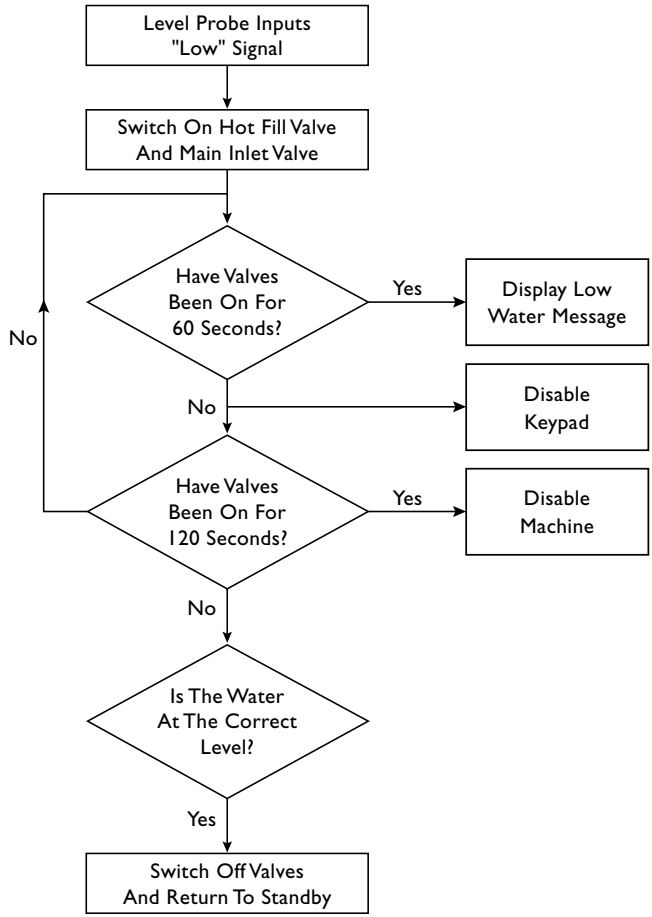
23. Heater Tank Level Control (Plug 1, Pin 36)

This input does not operate on the same logic switching principle as those outlined previously. 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.

If the level circuit indicates low water, the controller switches on the inlet valve and the hot fill 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.

Note: There is a two minute time-out feature on the boiler filling sequence to prevent the possibility of leakage or overflow from the tank. This also prevents the heater element from running dry should the incoming water supply fail.

After sixty seconds of filling, the keypad is disabled and the "Low Water" message displayed to prevent any further water being taken. Should the boiler still be filling after a further sixty seconds, the machine will be completely disabled as illustrated by the Level Control Flow Diagram below.



If the water level in the boiler is low when the machine is switched on, the "Low Water" message will be displayed. The boiler will fill as described previously 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.

24. Electronic Waste Probe (Plug 1, Pins 37 and 38)

A level control circuit on the controller board is connected between two probes located in the waste bucket. A signal is sent to the micro-processor depending on the level of the water in respect to the level probe. If the level circuit indicates a high waste water level, the LCD will show the message:-

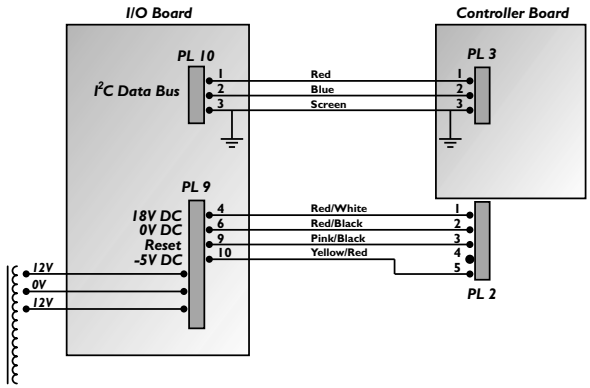
SORRY NOT IN USE
WASTE BUCKET FULL

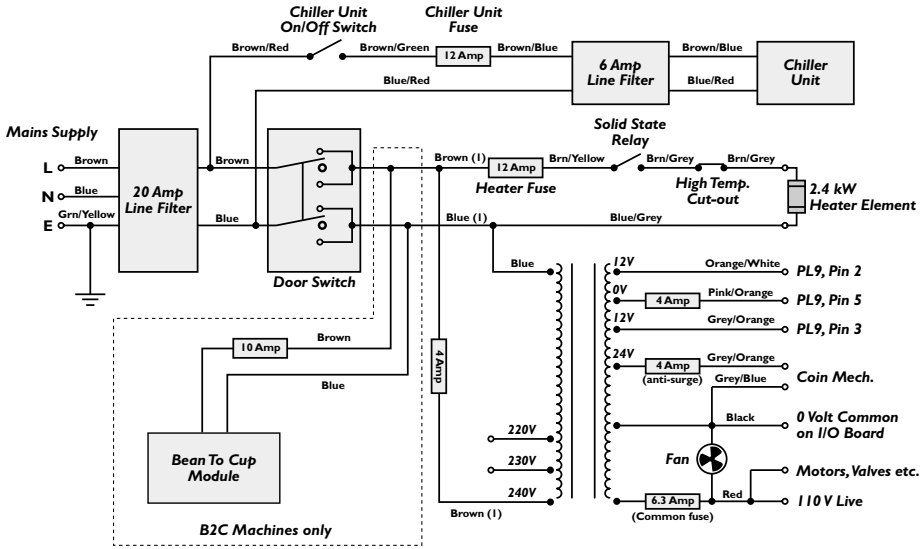
The machine will remain in this state until the waste bucket has been emptied.

Section 7 - Figures and Diagrams

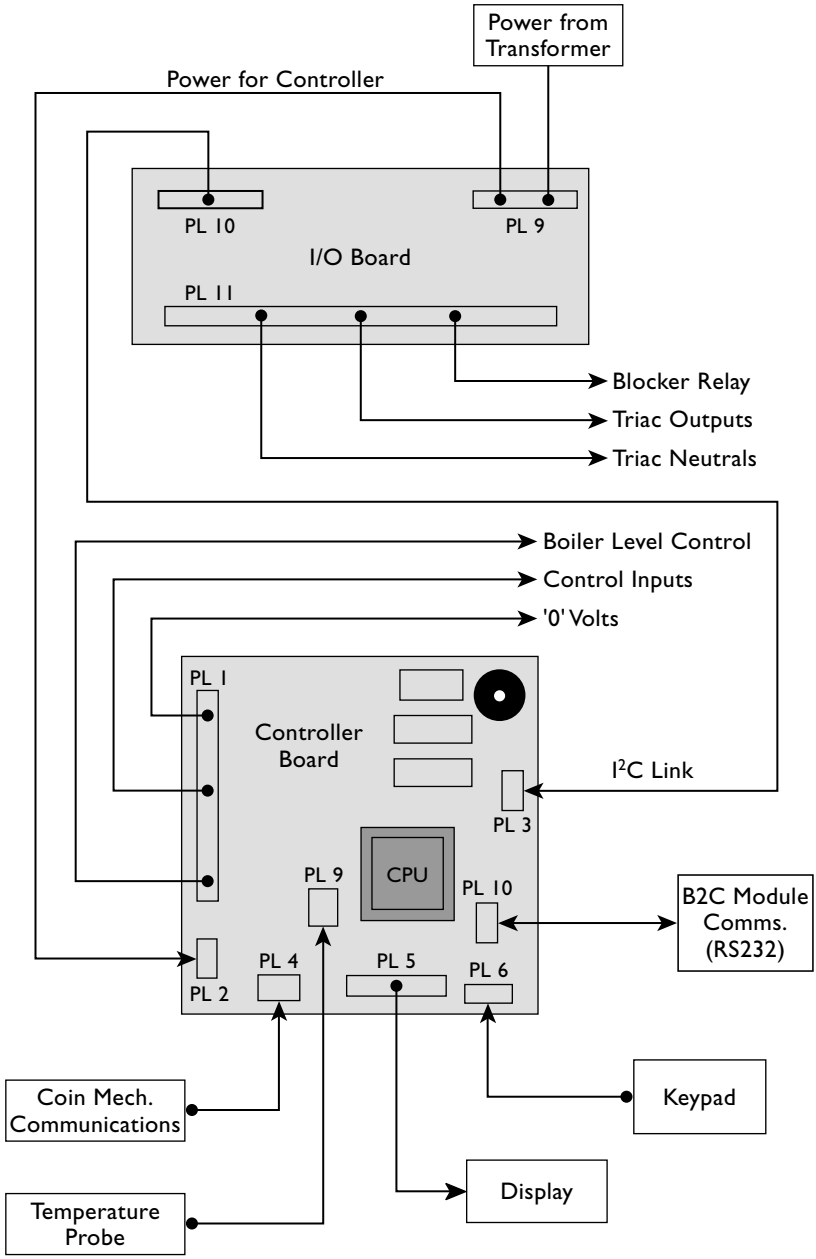
The diagrams shown on the following pages illustrate the power circuit, routing circuit, input and output circuits, chiller circuit and water flow diagrams for Fusion, Ventura, Optima, Riocca, Eclipse and Calico machines.

Power Circuit

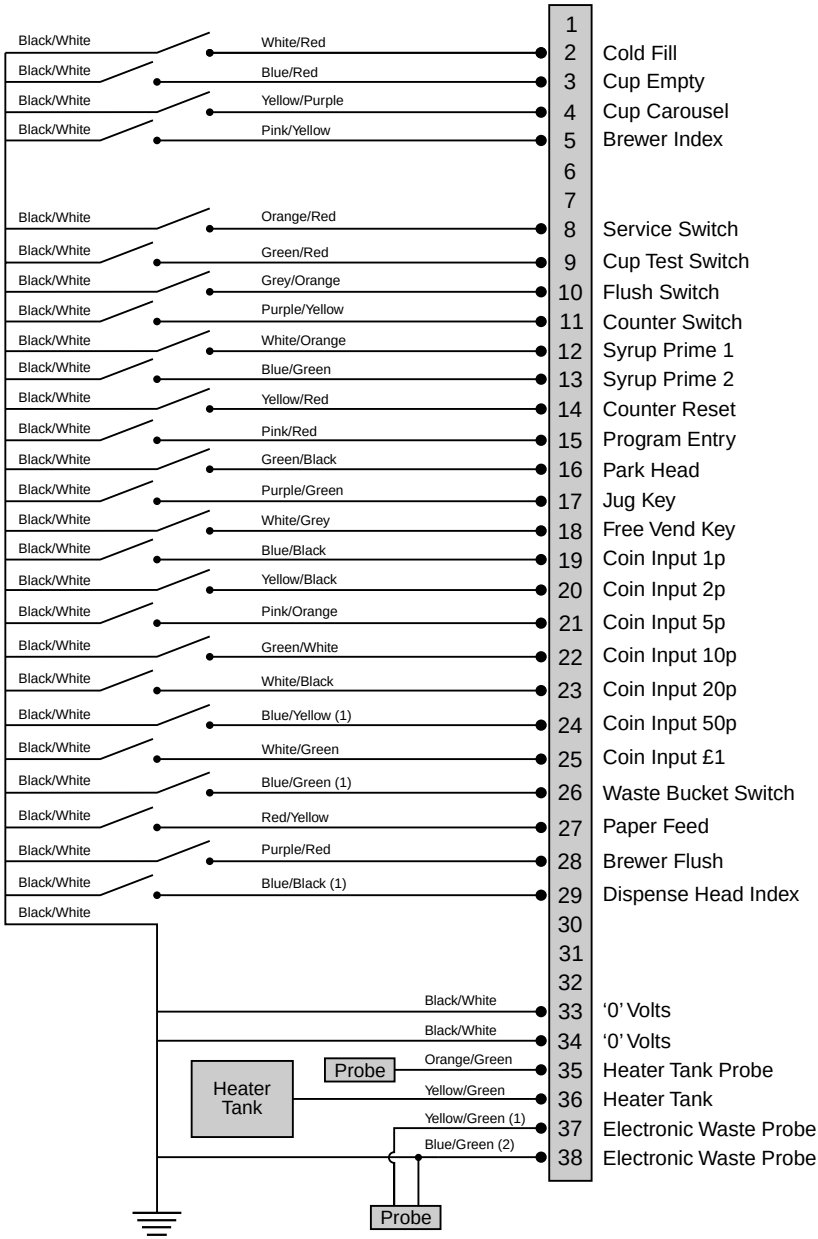




Route Diagram

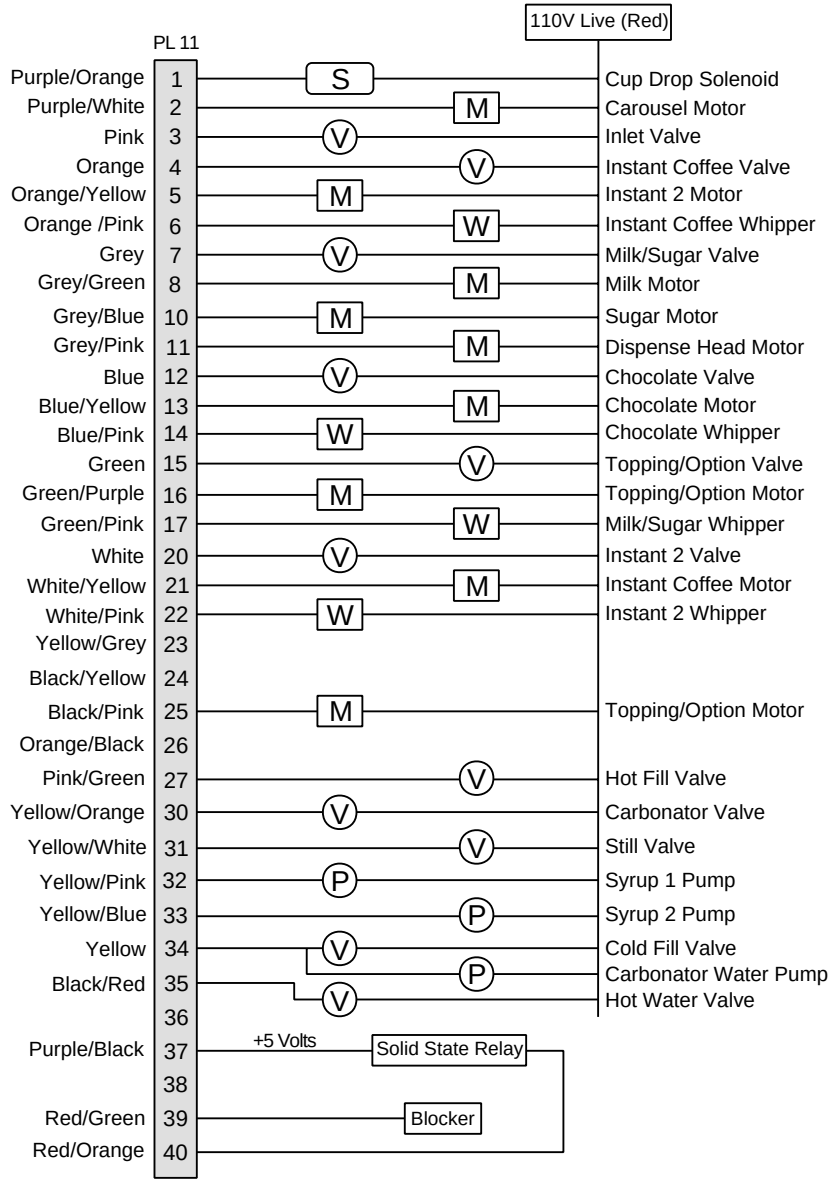


Input Circuit
Fusion, Ventura, Optima and Calico



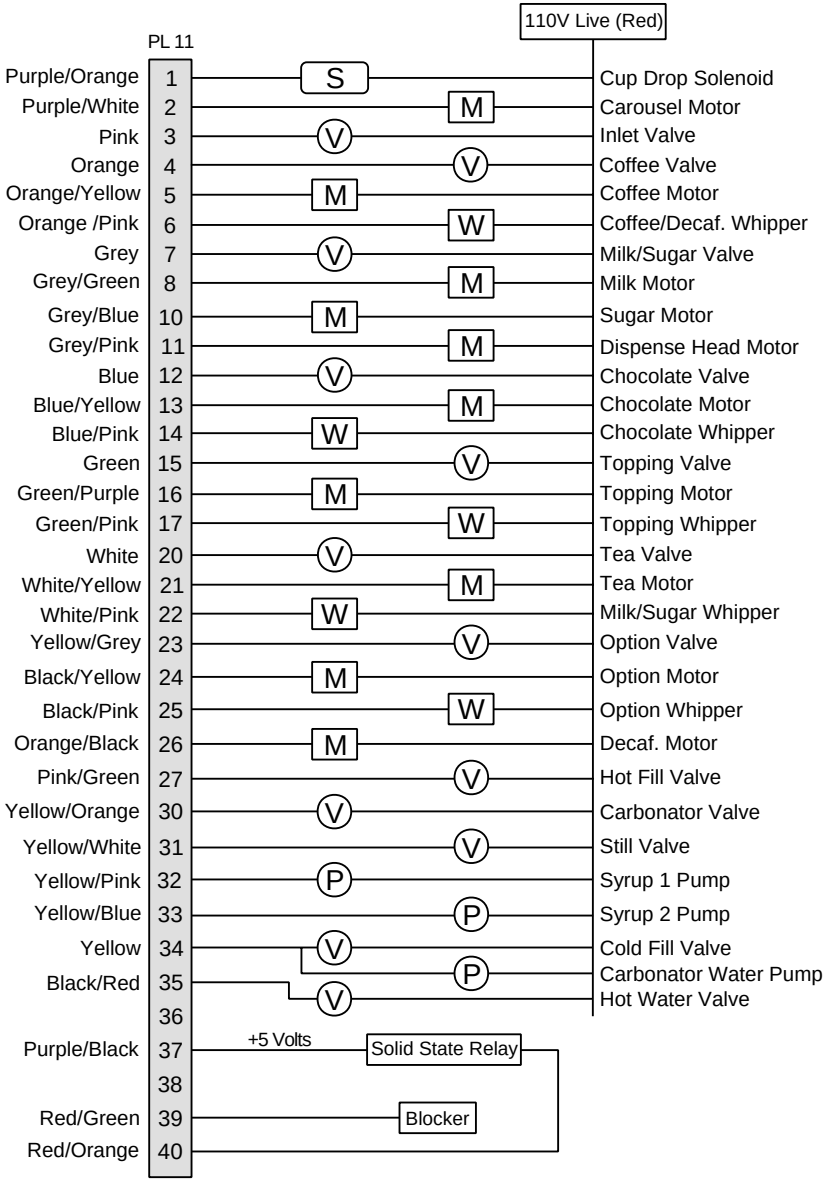
Output Circuit
Fusion - 6 Canister Instant

Software - FIA



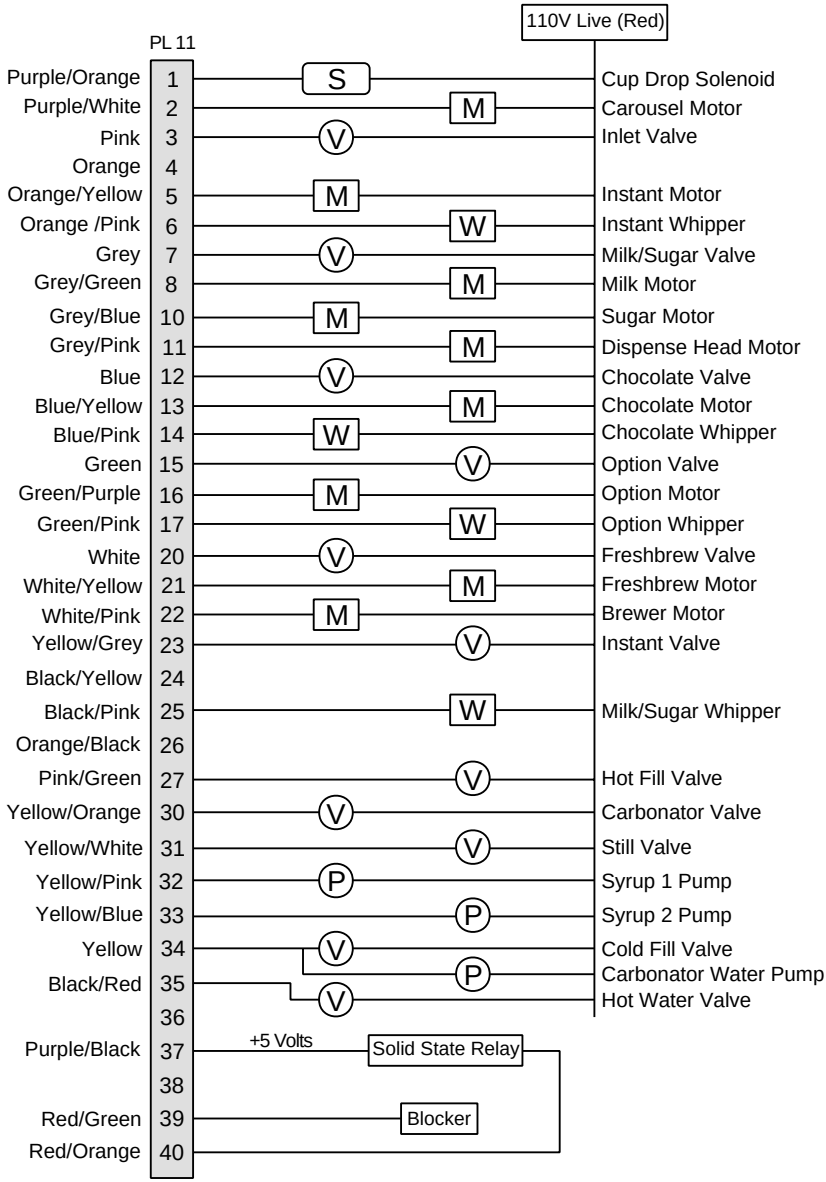
Output Circuit
Fusion - 8 Canister Instant

Software - FIB



Output Circuit
Fusion - Freshbrew

Software - FFA



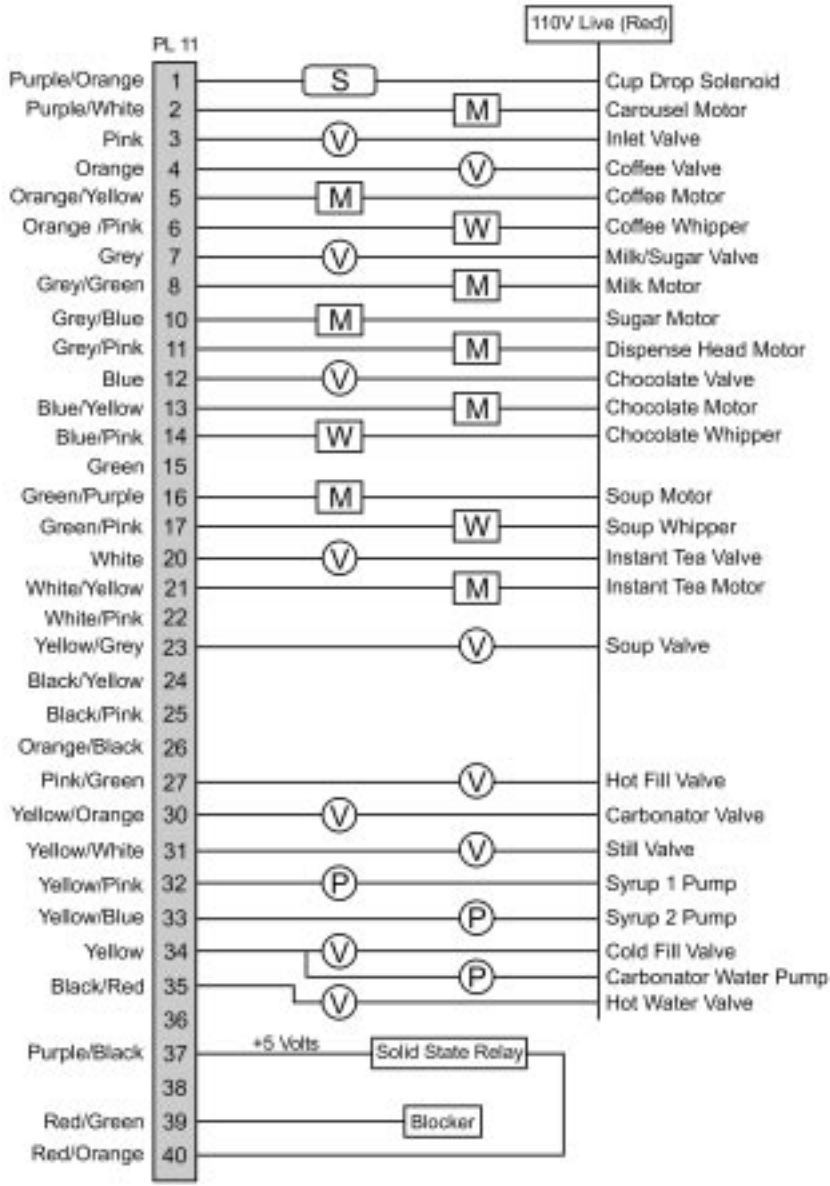
Output Circuit
Ventura, Optima and Calico - Instant

Software - WBA

Output Circuit

Ventura, Optima and Calico - Instant (Option 1)

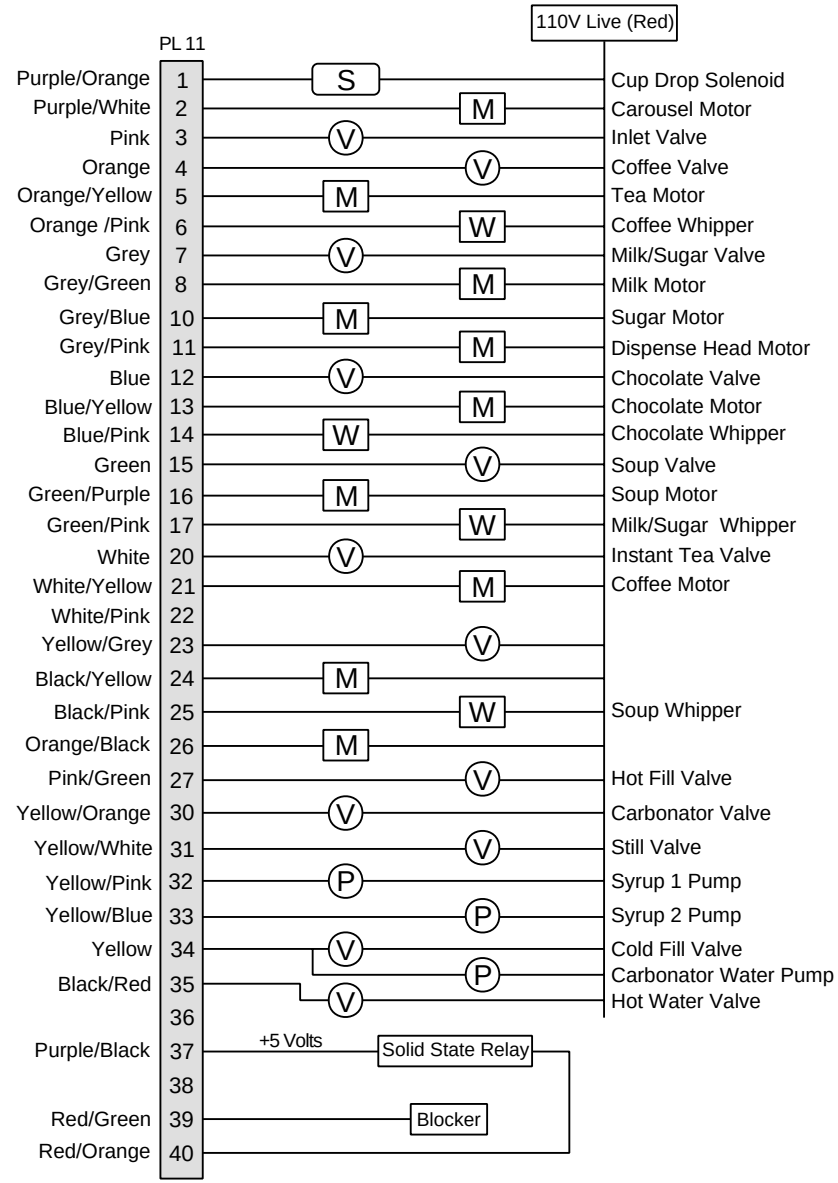
Software - WCA



Output Circuit

Ventura, Optima and Calico - Instant (Option 2)

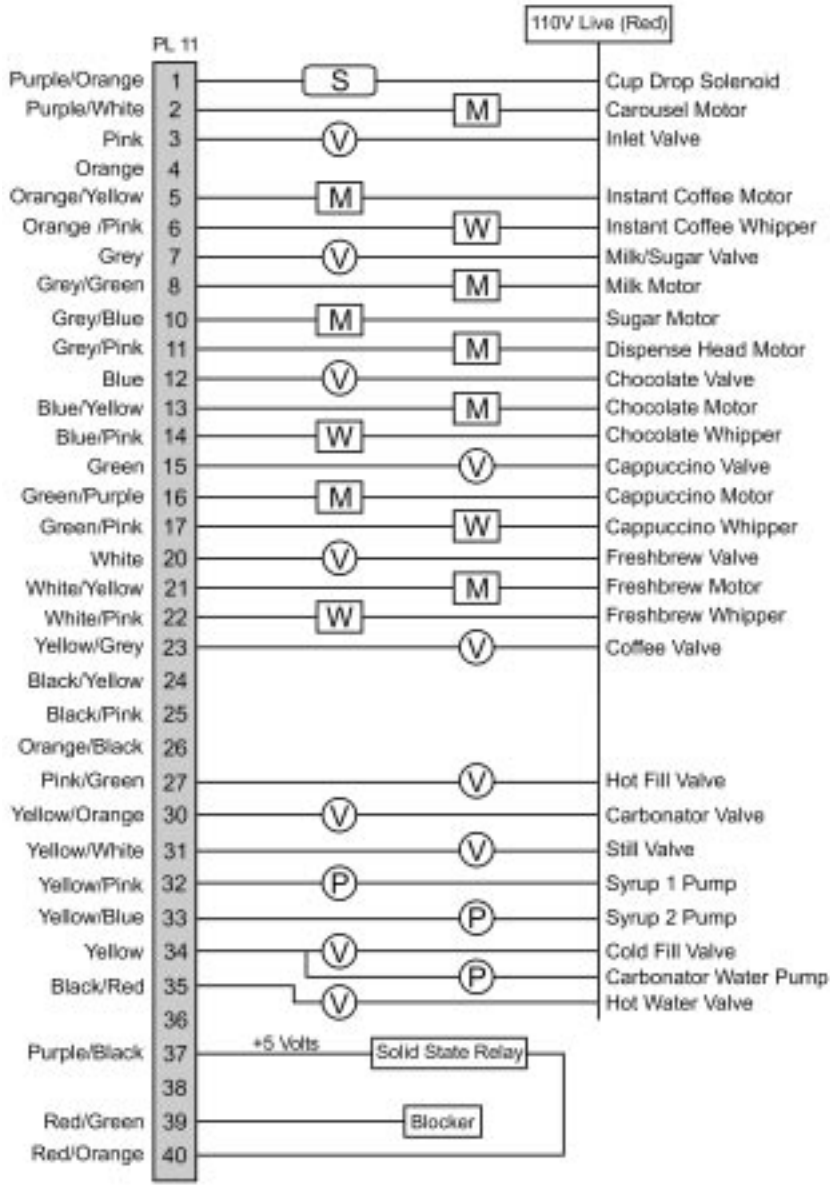
Software - WBC



Output Circuit

Ventura, Optima and Calico - Freshbrew (Option 1)

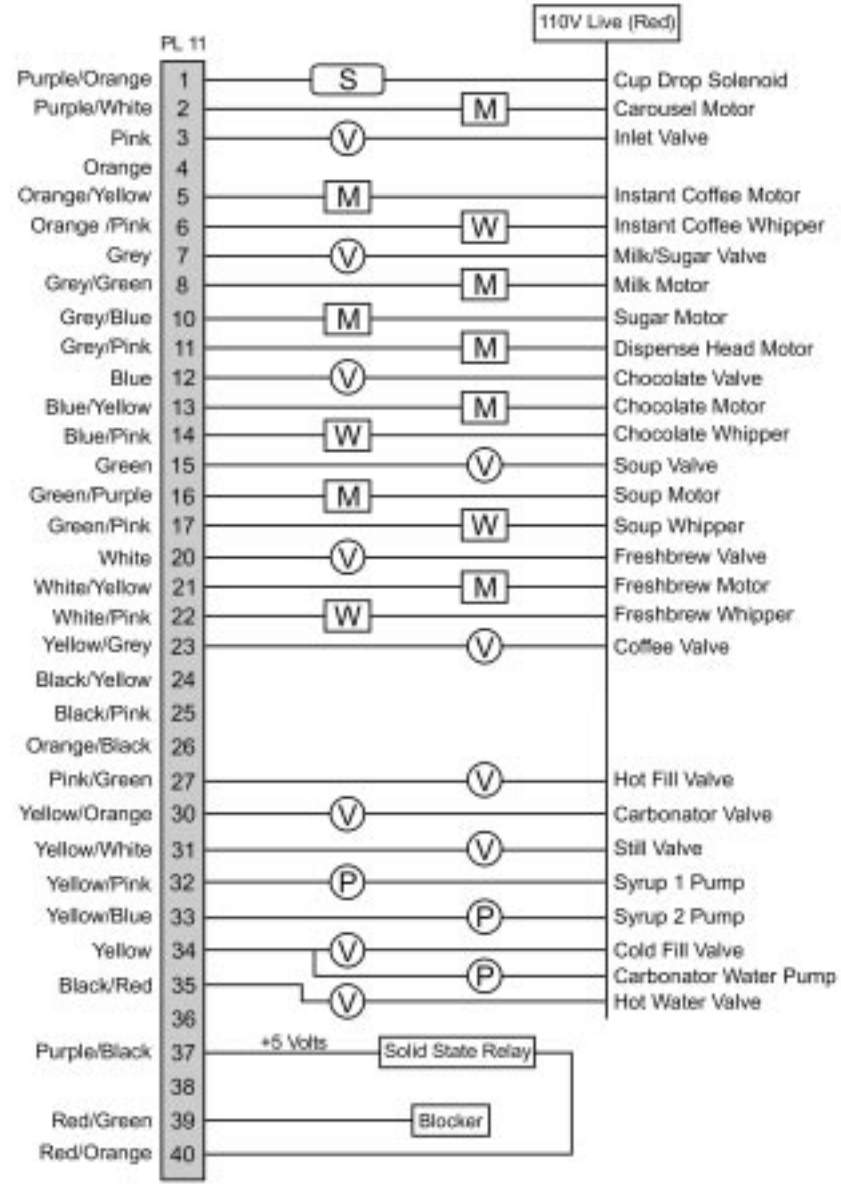
Software - WAA



Output Circuit

Ventura, Optima and Calico - Freshbrew (Option 2)

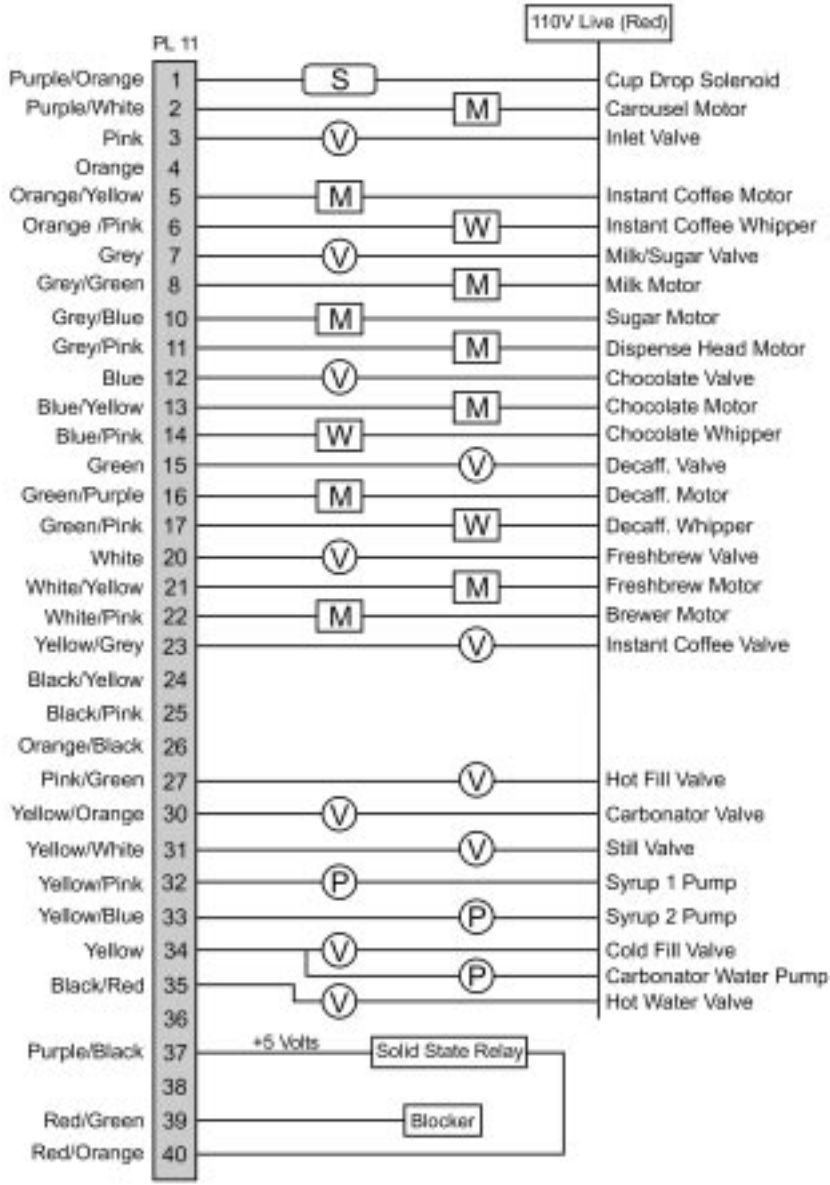
Software - WDA



Output Circuit

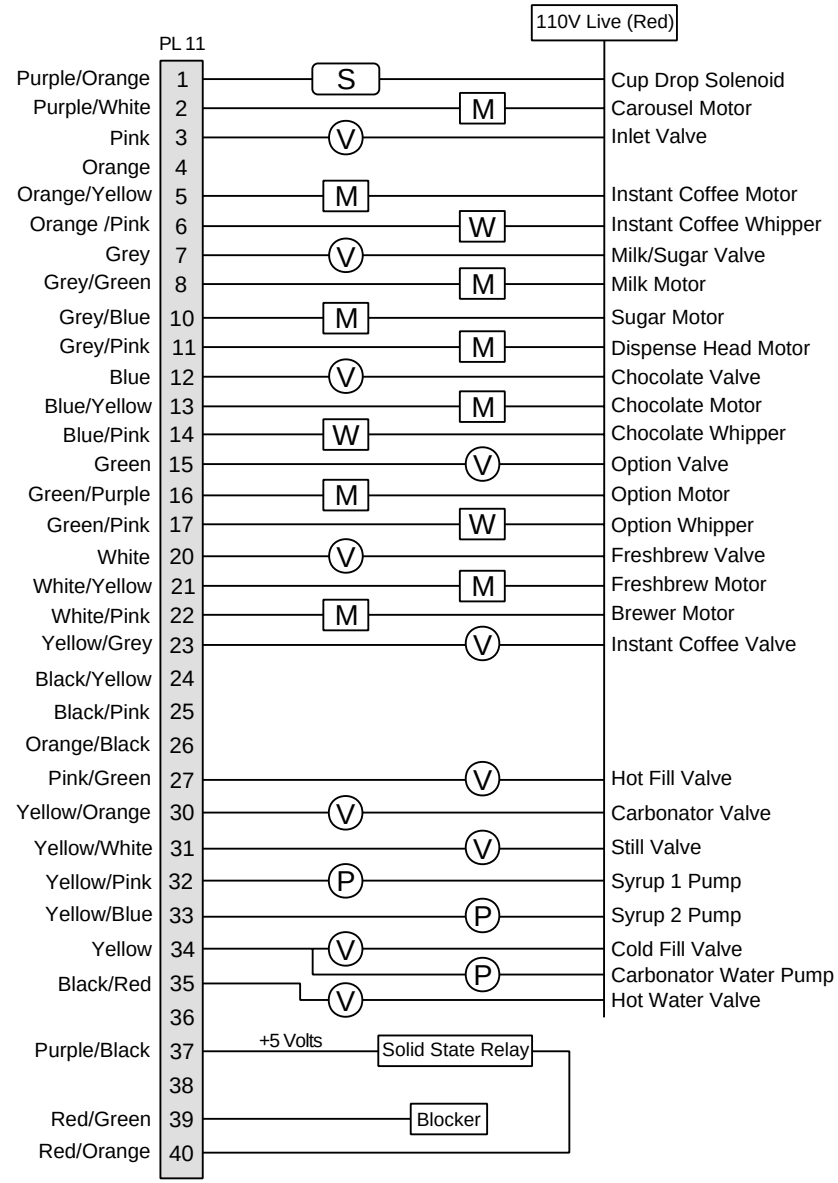
Ventura, Optima and Calico - Freshbrew (Option 3)

Software - CDD

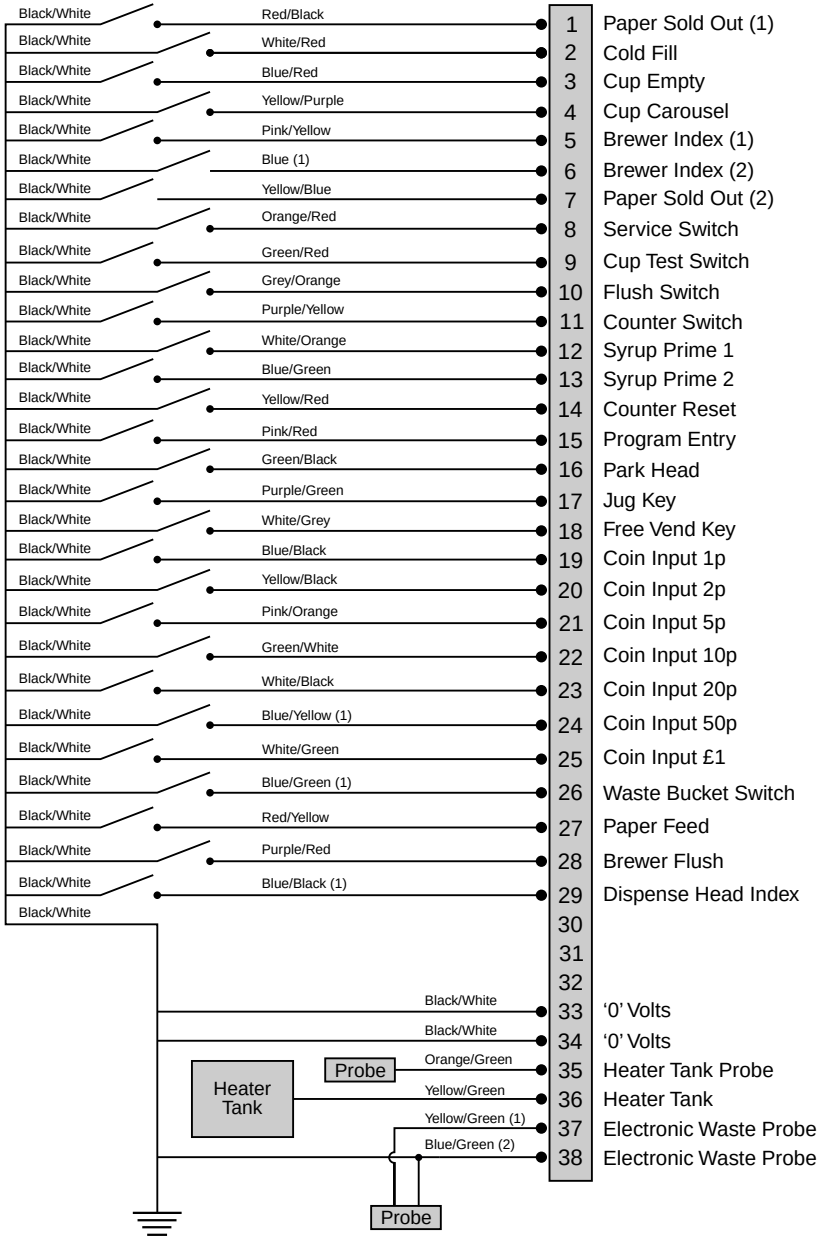


Output Circuit
Ventura and Calico - Freshbrew (Option 4)

Software - WDB

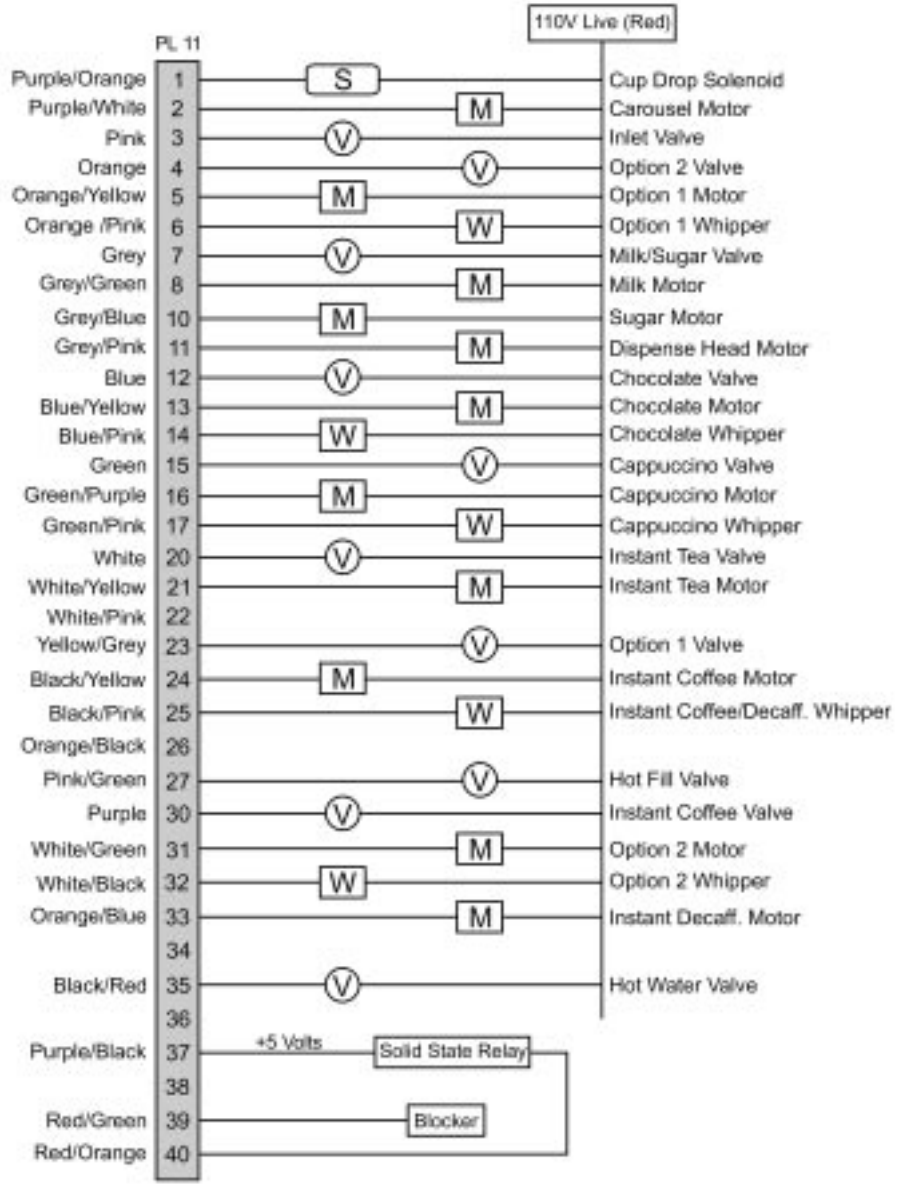


Input Circuit
Riocca and Eclipse



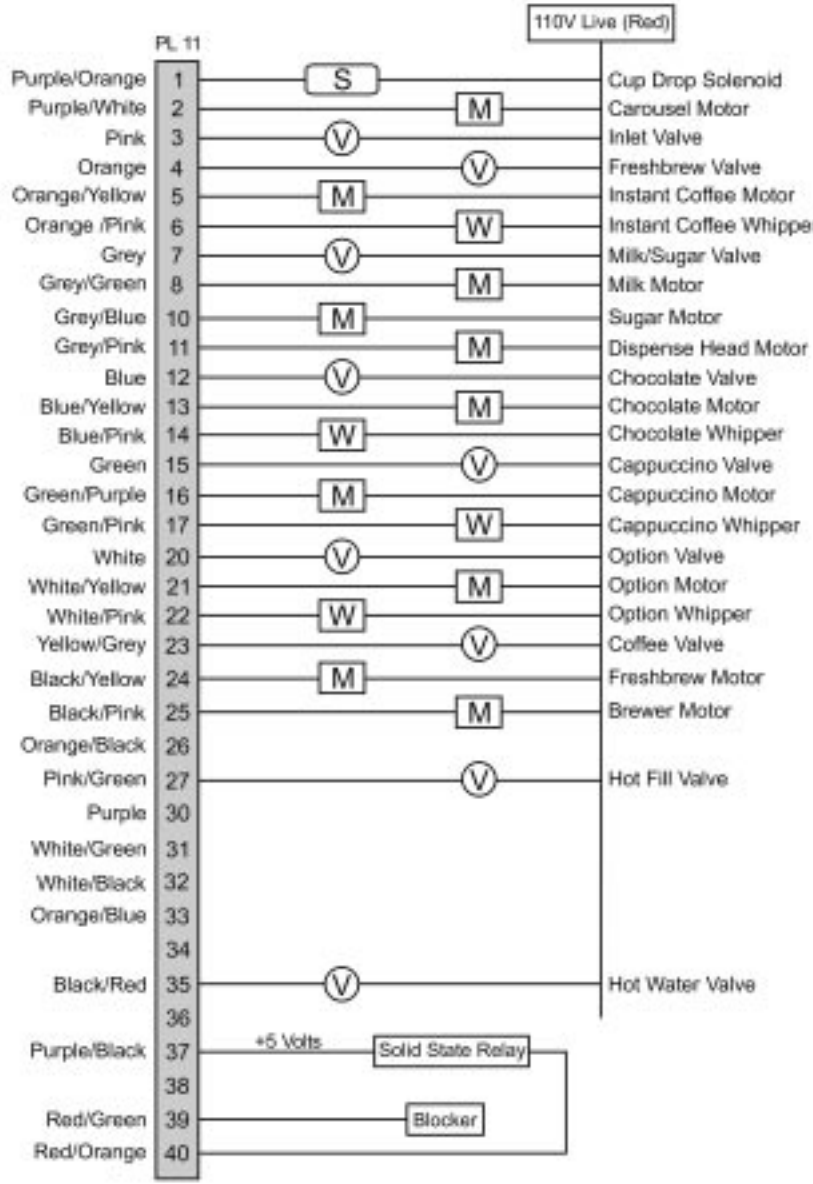
Output Circuit
Riocca - Instant

Software - RBA



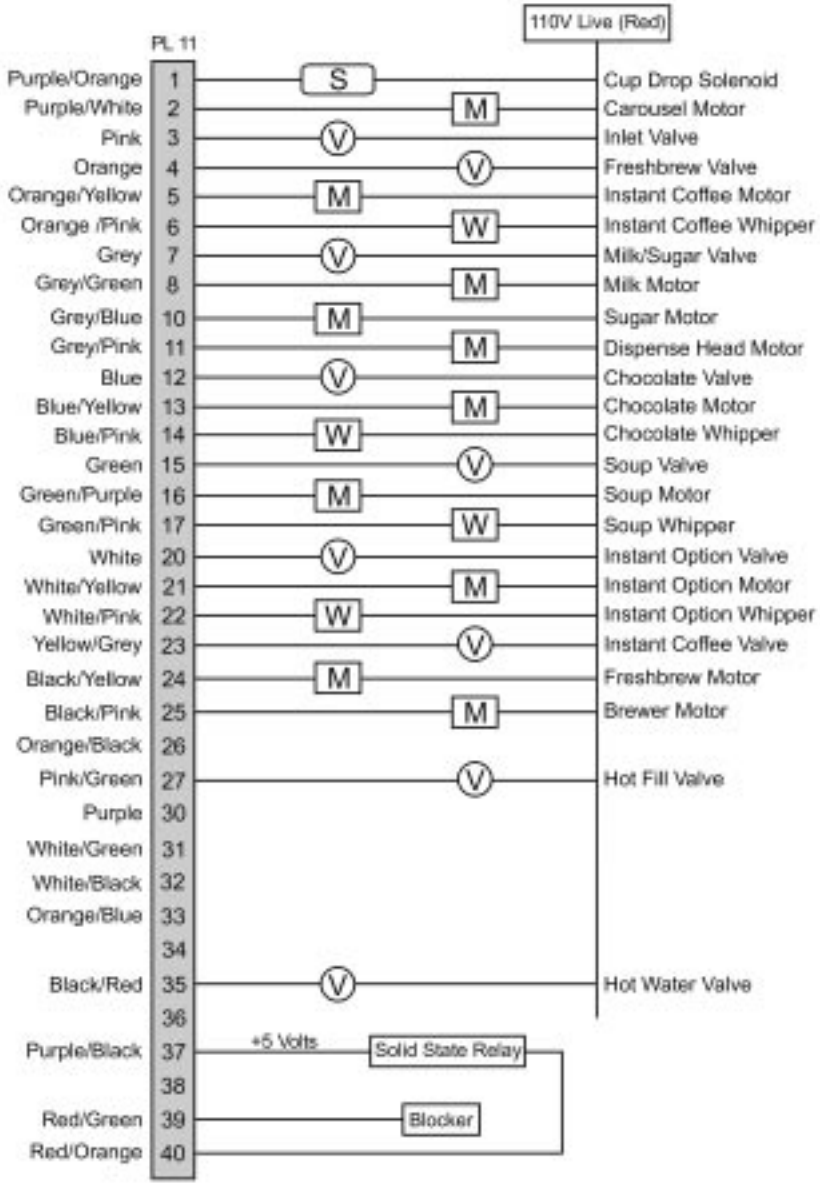
Output Circuit
Riocca - Freshbrew (Option 1)

Software - RBA



Output Circuit
Riocca - Freshbrew (Option 2)

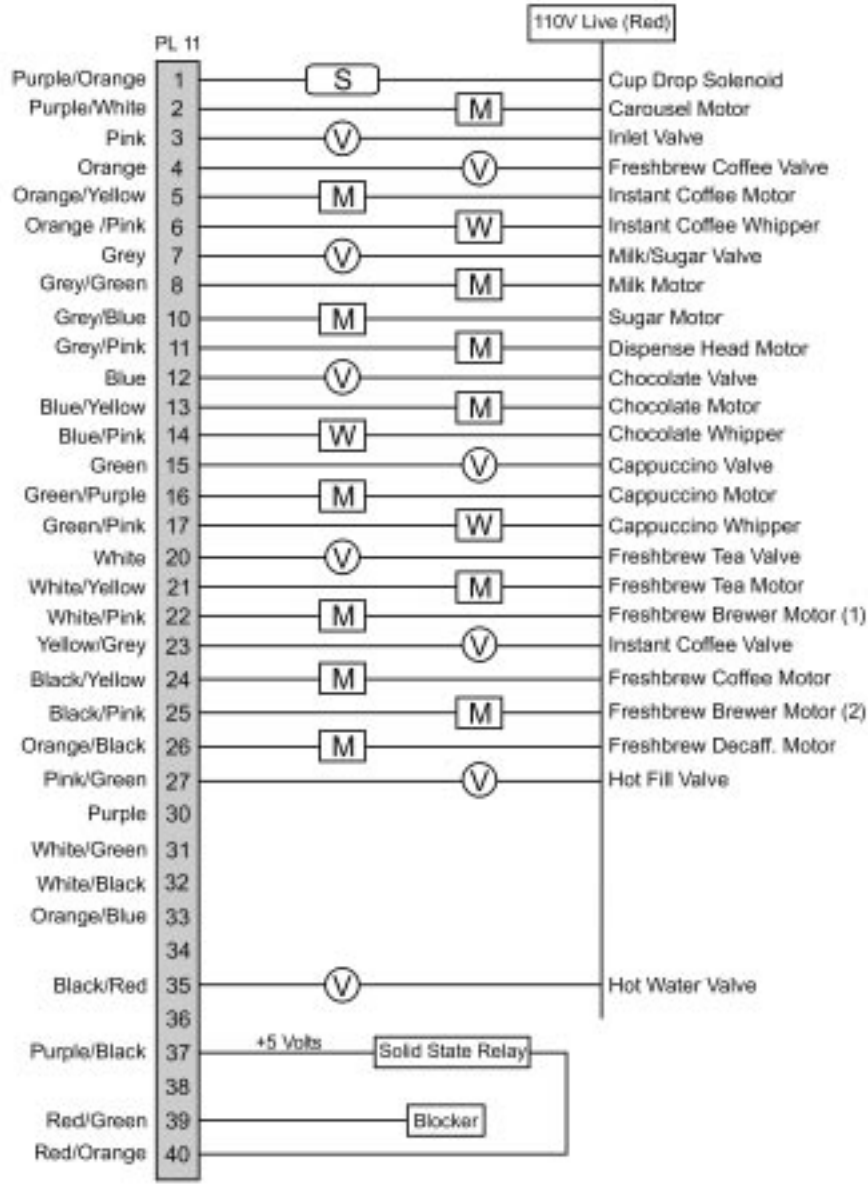
Software - RAC



Output Circuit

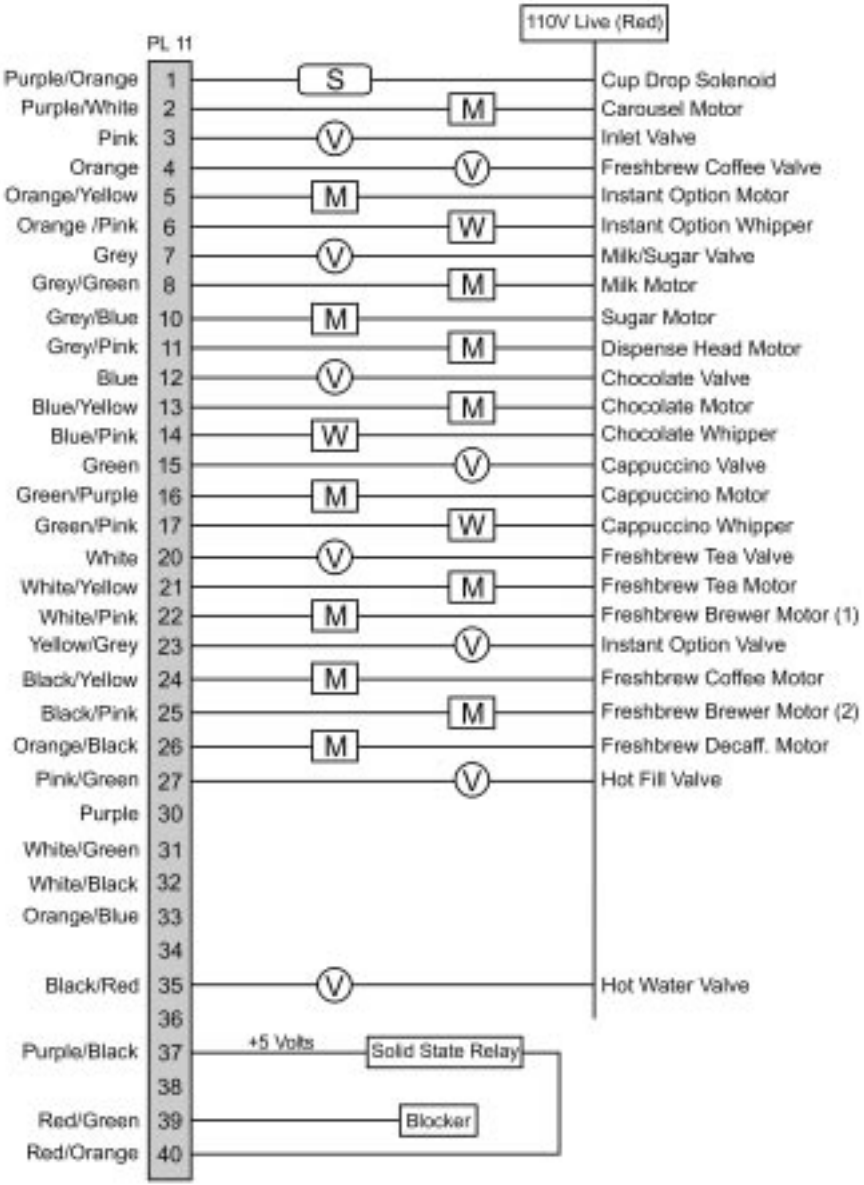
Eclipse - Triple Freshbrew (Option 1)

Software - EAA



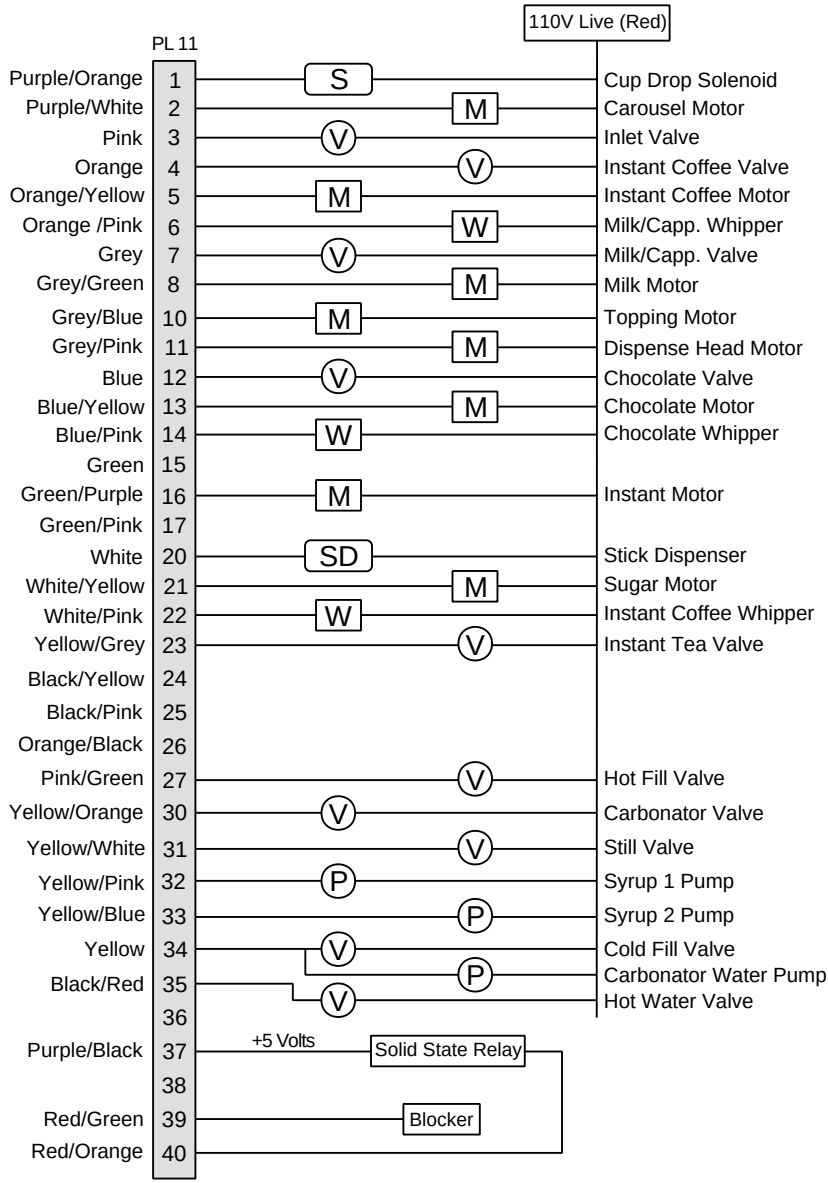
Output Circuit
Eclipse - Triple Freshbrew (Option 2)

Software - EBA



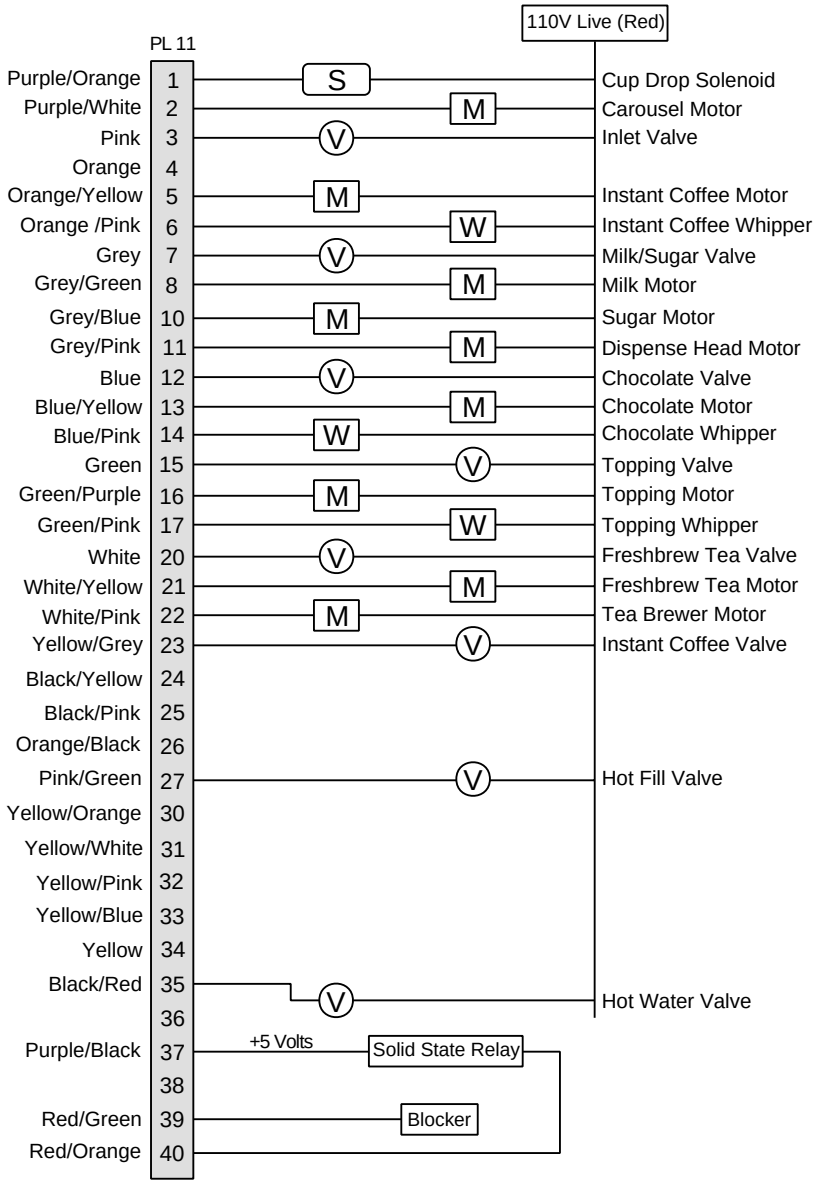
Output Circuit
Fusion/Calico - Bean To Cup (B2C)

Software - BTCO

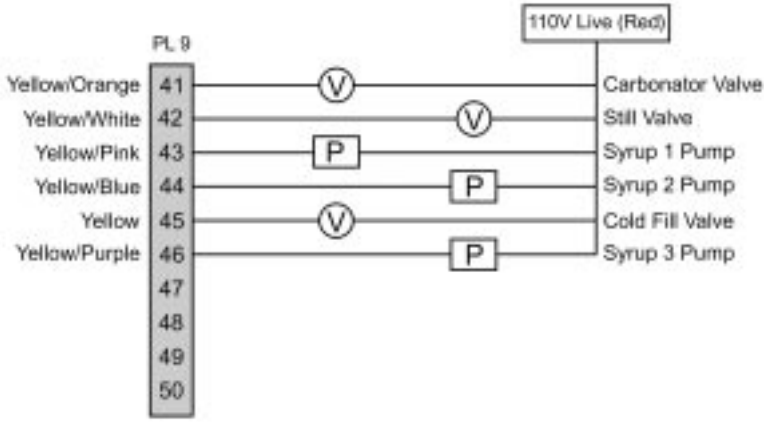


Output Circuit
Eclipse - Bean To Cup (B2C)

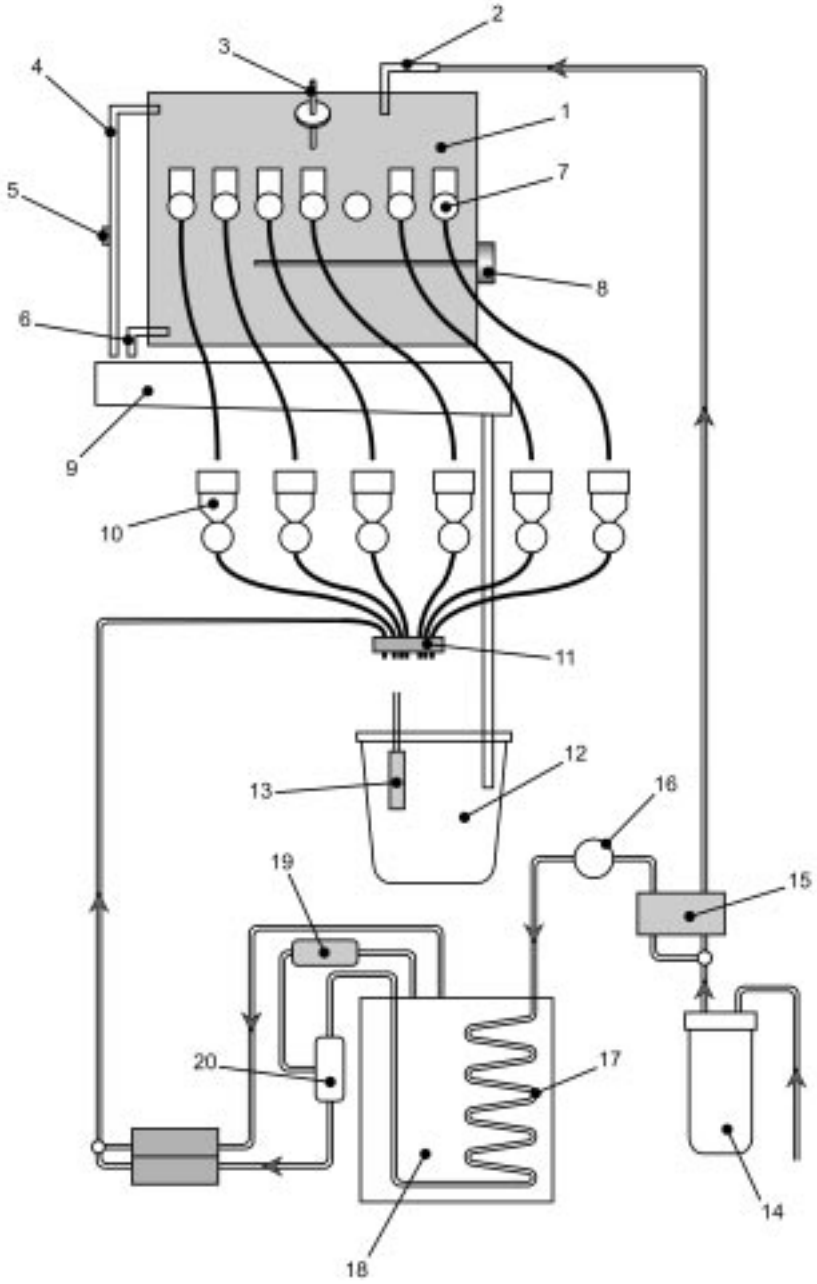
Software - BTCE



Cold Unit Circuit
Riocca and Eclipse - All Models



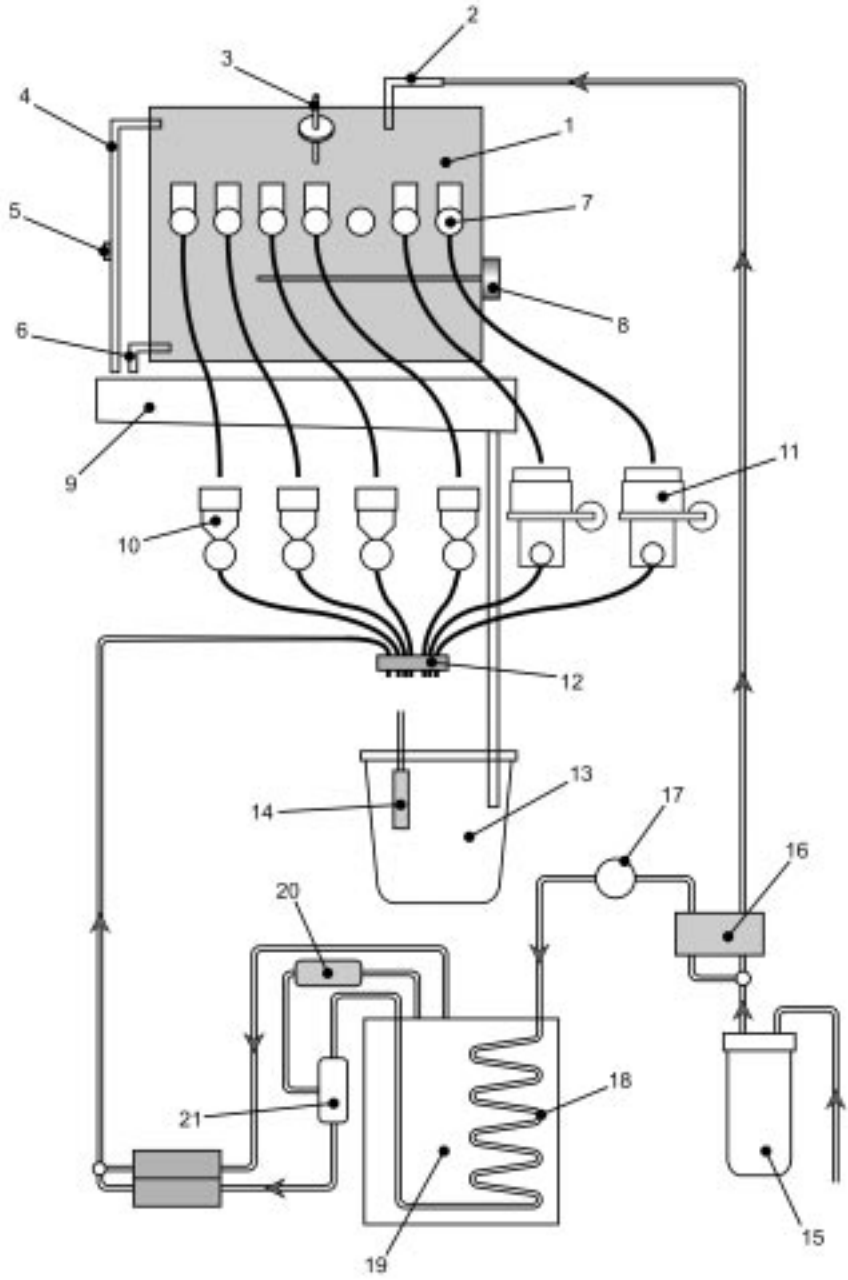
Water Flow Diagram
Instant Models



Water Flow Diagram
Instant Models

1. Boiler
2. Boiler Inlet Pipe
3. Water Level Probe
4. Overflow Pipe
5. High Temperature Cut-Out
6. Boiler Drain Pipe
7. Dispense Valves
8. Thermistor Probe
9. Overflow Tray
10. Ingredient Mixing Stations
11. Dispense Head
12. Waste Bucket
13. Waste Sensor
14. Water Treatment Filter (Where Fitted)
15. Inlet/Splitter Valve
16. Water Pump
17. Water Cooling Coil
18. Chiller Tank
19. Chiller Unit Fill Valve
20. Scale Valve

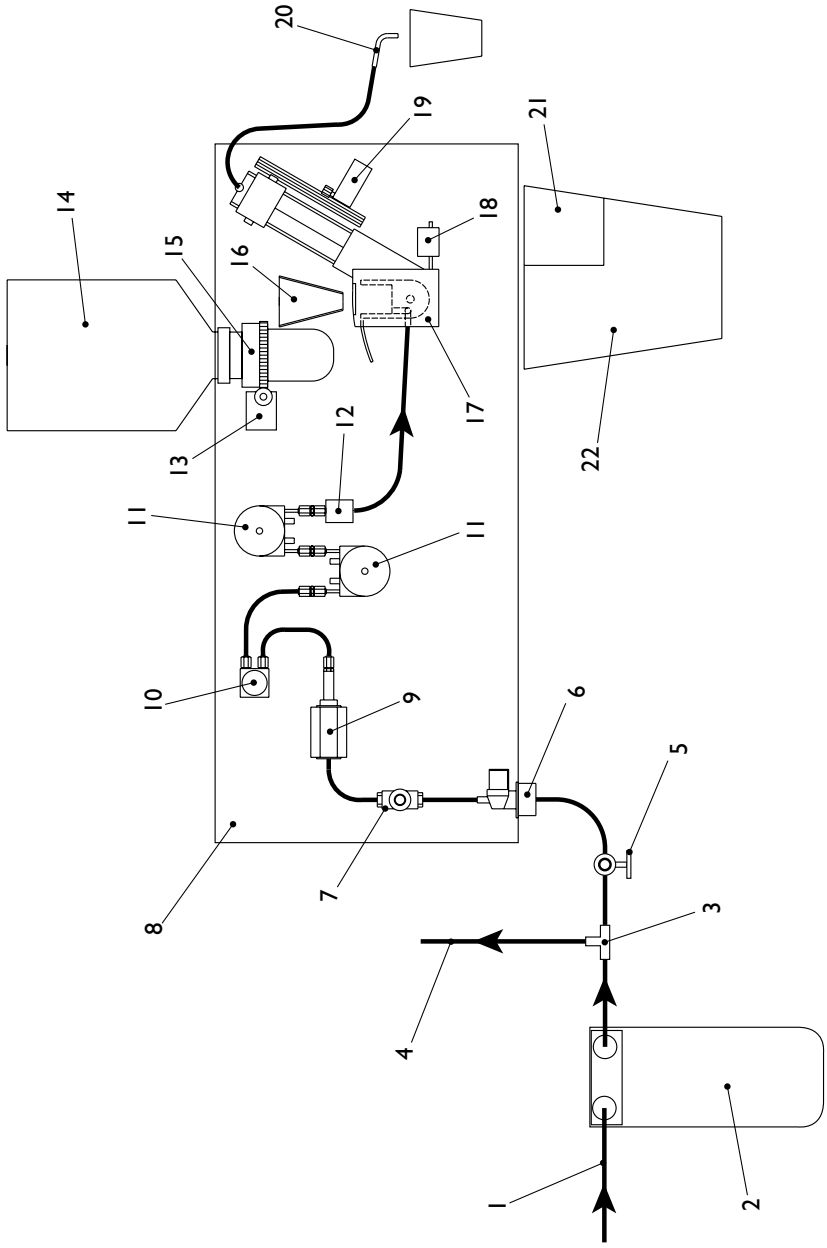
Water Flow Diagram
Freshbrew Models



Water Flow Diagram
Freshbrew Models

1. Boiler
2. Boiler Inlet Pipe
3. Water Level Probe
4. Overflow Pipe
5. High Temperature Cut-Out
6. Boiler Drain Pipe
7. Dispense Valves
8. Thermistor Probe
9. Overflow Tray
10. Ingredient Mixing Stations
11. Brewer Unit(s)
12. Dispense Head
13. Waste Bucket
14. Waste Sensor
15. Water Treatment Filter (Where Fitted)
16. Inlet/Splitter Valve
17. Water Pump
18. Water Cooling Coil
19. Chiller Tank
20. Chiller Unit Fill Valve
21. Scale Valve

Water Flow Diagram
Bean To Cup Module



Water Flow Diagram
Bean To Cup Module

1. Water Inlet
2. Water Filter - Brita AquaQuell
3. Tee Piece
4. Water Supply to Standard Inlet Valve
5. Water Shut off Valve
6. Inlet Valve
7. Regulator
8. B2C Module
9. Water Pump
10. Flow Meter
11. Twin Heater Block Unit
12. Steam Relief Valve
13. Grind Adjust Motor
14. Bean Canister
15. Grinder
16. Chute
17. Brewer Unit
18. Drain Release Solenoid
19. Brewer Motor
20. Dispense Spout
21. Coffee Grounds Waste Container
22. Water Waste Container

Notes

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