

# Diagnostic Manual

## DishDrawer™

MODELS:  
DD605 DS605



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# 1 DIMENSIONS & SPECIFICATIONS

## 1.1 Product Size (mm)

Height (double)	819.5 – 879.5mm
Height (single)	409mm
Width	595mm
Depth	570mm
Drawer Open (including cabinet)	1090mm

## 1.2 Specifications

Electrical	
NZ/AUS/UK/UE	230-240Volt AC 50Hz 10 amp/5 amp max.
USA	110-120Volt AC 60Hz 10.6 amp/5.3 amp max.
JAP	90-110Volt AC 50/60Hz 11.6 amp/5.3 amp max.
Water Inlet Valves	24Volt DC 65 ± 10 Ohms 2.5 Lt/min (0.65 US gal/min)
Japan only	4 Lt/min
Chassis P.C.B.	
NZ/AUS/UK/UE	230 Volt AC
USA/JAP	120 Volt AC
Temperature Sensor (On Heater Plate)	12000 Ohms @ 20°C (68°F) 8300 Ohms @ 30°C (86°F) 3000 Ohms @ 60°C (140°F)
Drying Fan	2 to 3 Meg Ohms
Motor	80 Volt DC 3 Phase Brushless
Drain	4200 RPM
Wash	2300 – 2850 RPM
Stator	8 ± .5 Ohms per winding
Inlet Hose	1.56m (61 inches) 1000Kpa (145 PSI)

599464

Drain Hose 2.01m (78 inches) from rear of cabinet  
2.5m (98 inches) bottom tub  
2.9m (114 inches) top tub

Detergent Dispenser 24 Volt DC  
65 ± 10 Ohms

Rinse Aid Dispenser 24 Volt DC  
65± 10 Ohms

Heater Plate (NZ/AUS/UK/UE) 230 Volt AC  
Heater Track 50 ± 4 Ohms  
Power Supply Resistor 98 ± 7 Ohms

Heater Plate (USA) 120 Volt AC  
Heater Track 24 ± 3 Ohms  
Power Supply Resistor 24 ± 3 Ohms

Heater Plate (JAP) 100 Volt AC  
Heater Track 20 ± 2 Ohms  
Power Supply Resistor 19 ± 3 Ohms

Diverter Valve Softener Assy 24 Volt DC  
65 ± 10 Ohms

Brine Pump 24 Volt DC  
65 ± 10 Ohms

## 2 OPTION ADJUSTMENT

### 2.1 Changing Setup Options

To enter the option adjustment mode, press **POWER** to turn the LCD on, then hold the **ECO** button and **KEYLOCK** button simultaneously for 5 seconds, ensuring that **ECO** is pressed first. Once the option adjustment mode is entered, a beep is emitted and the LCD displays the letters rA. Pressing the **START/PAUSE** button scrolls through the options and allows changes as follows:-

Rinse Aid Setup (rA).

Water Supply Hardness Setup (hd). (Water softener models only)

Auto Power Option (AP).

End of Cycle Beeps (EC).

Closed Drawer Option (Ld).

Clean/Dirty Dish Symbol (dS).

*Integrated and flat door models:-* On an integrated or flat door DishDrawer™ where there is no display, the option chosen is indicated by the lights showing on the integrated badge as follows:-

Rinse Aid Setup (red light above **START/PAUSE** button).

Water Supply Hardness (green light above **START/PAUSE** button).

Auto Power Option (orange light above **START/PAUSE** button).

End of Cycle Beeps (green light above **START/PAUSE** button and **ECO** light is red).

Closed Drawer Option (red light above **START/PAUSE** and **ECO** light is red).

Clean/Dirty Dish Symbol (not available on Integrated or flat door models).

Dry Enhancement Option (no light above buttons, **ECO** light is red).

Press **POWER** at any time to exit this setup mode.

#### 2.1.1 Rinse Aid Setup (rA)

The current rinse aid setting is shown using the red LED's on the touch switch panel.

The amount of rinse aid dispensed into a rinse cycle can be varied to suit the level of hardness of the local water supply. It is adjusted for 1 - 5 dispensing levels.

(1 = approx 0.5mls (1/10) teaspoon of rinse aid, 5 = approx. 2.5mls (1½) teaspoon of rinse aid).

Press **KEYLOCK** to advance the rinse aid setting. Once the desired setting is achieved, press **POWER** to exit. The rinse aid index is stored in EE memory, so even with the power removed, the rinse aid level is retained.

### 2.1.2 Water Supply Hardness Setup (hd) (Where Fitted)

The current supply hardness setting is shown using the red LED's on the touch switch panel. One of 5 settings should be selected according to the known hardness of the supply water. Each setting is appropriate for the following water supply hardness:

No LED Water Softener turned off, continuous bypass of softener.

1 LED 150-250 ppm water supply hardness.

2 LEDs 250-350 ppm water supply hardness.

3 LEDs 350-450 ppm water supply hardness.

4 LEDs 450-550 ppm water supply hardness.

5 LEDs 550-625 ppm water supply hardness.

Press **KEYLOCK** to advance the Water Softener setting. Once the desired setting has been achieved, press **POWER** to exit.

Selection of a setting affects how the Electronic Controller diverts supply water, how much water is treated, and how much salt is used in regeneration, in a manner that optimises the performance of the Water Softener.

### 2.1.3 Auto Power Option (AP)

The automatic power up sequence that occurs when the tub is opened can be turned on or off using the **KEYLOCK** button. If the scrubbing brush symbol is showing on the LCD, then the auto power up sequence will occur when the tub is opened. If the scrubbing brush symbol is not showing, then the DishDrawer™ will not automatically power up when the tub is opened (the customer will need to press the power button each time they wish to use the DishDrawer™). Press **POWER** to exit when the desired setting has been selected.

### 2.1.4 End of Cycle Beeps (EC)

The six beeps that occur at the end of the cycle can be turned on or off using the **KEYLOCK** button. If the scrubbing brush symbol is showing on the LCD, then the end of cycle beeps are activated. If the scrubbing brush symbol is not showing, then the end of cycle beeps are deactivated. Press **POWER** to exit when the desired setting has been selected.

### 2.1.5 Closed Drawer Option (Ld)

The closed drawer option can be turned on or off using the **KEYLOCK** button. If the scrubbing brush symbol is showing on the LCD, then the closed drawer option is selected and it will keep the DishDrawer™ locked at all times by bringing the lid down. When this mode is selected, the customer needs to press the **POWER** button to lift the lid whenever they want to open the drawer. When they close the drawer again, the lid comes down automatically after 30 seconds and locks the tub. If the scrubbing brush symbol is not showing, then the closed drawer option is deactivated. Press **POWER** to exit when the desired setting has been selected.

### 2.1.6 Clean/Dirty Dish Symbol (dS)

*(Not available on integrated or flat door models)*

The clean/dirty dish symbol can be turned on or off using the **KEYLOCK** button. If the scrubbing brush symbol is showing on the LCD, then the clean/dirty dish option is selected. This means that the end of cycle clean dishes symbol will remain in the LCD display until the power button is pressed to clear it. If the scrubbing brush symbol is not showing, then the clean/dirty dish symbol will disappear when the drawer is first opened at the end of a cycle (factory setting). Press **POWER** to exit when the desired setting has been selected.

## 3 DIAGNOSTICS

### 3.1 DishDrawer™ Diagnostics

Dishwasher Diagnostics can **only** be entered in Power Off mode, i.e. when there is no display on the LCD or the badge LED's are off. Diagnostics is entered by holding the **KEYLOCK** and **START/PAUSE** buttons simultaneously for 5 seconds. Ensure that **KEYLOCK** is pressed first.

There are currently four levels of diagnostics. To move to the next level, press **POWER**. To enter a level, press **START/PAUSE**. Once a level has been entered, pressing **POWER** will exit diagnostics completely. If no level is entered, then the display will cycle through the four levels and exit after the last. On entering diagnostic mode, the first level is the Display/Download Mode.

### 3.2 Display/Download Mode

In this mode, all LED's and LCD segments (except keylock) are illuminated.

### 3.3 Optical LED Download/Fault Display

An optical data download is available here to download all EE data to a PC or Palm PC via the lower tub-home sensor light pipe. Hold the reader pen over the lower tub-home sensor light pipe and press **START/PAUSE** to initiate the download. A short beep indicates the start and finish of download.

The last two faults are displayed on the LCD (secondary control panel LEDs for integrated and flat door models) during the optical download. The Current Fault code is displayed first followed by the Previous Fault Code. To read the Fault Code on the secondary display, refer to Section 4.7 on Fault Codes.

### 3.4 Clearing Fault Logs

To clear the current fault code, press the **KEYLOCK** button until a beep is sounded. This action moves the current fault into the previous fault while clearing the current fault. To clear the previous fault code, press **KEYLOCK** once more until the beep is sounded.

**Warning:** Once a fault code has been cleared, it is permanently removed from memory and cannot be recovered.

Press **POWER** to advance to the next level.



### 3.5 Hardware Output Diagnostic Test Mode

This level tests all the hardware outputs and inputs. The LCD display shows "HO".

Press **POWER** to skip hardware diagnostics and advance to the next level.  
Press **START/PAUSE** to enter hardware diagnostics.

Once hardware diagnostics has been entered, the current hardware output being tested is indicated by letters in the LCD display, and for integrated and flat door models the LEDs on the touch switch panel using binary encoding, as shown in the table on the next page.

Different combinations of outputs can be switched on or off together, but the controller will prevent higher current drawing components such as the wash pump and the lid motors being turned on together.

Press **START/PAUSE** to advance to the next hardware output.  
Press **KEYLOCK** to turn the currently displayed output on or off. If the scrubbing brush symbol (green LED above start/pause button on integrated and flat door models) is displayed, then that output has been switched on, and if it is not displayed then that output is off.

Press **POWER** to exit at any time (all outputs will be switched off on exit).

As mentioned on the previous page, the LCD display and touch switch panel LEDs are illuminated to correspond to a particular hardware device. The following table details the display order of the test.

LCD	Norm LED	Fast LED	Deli LED	Rinse LED	Hardware Output
bL	Off	Off	Off	<u>On</u>	Backlight
Er	Off	Off	<u>On</u>	Off	Element Relay
Ld	Off	Off	<u>On</u>	<u>On</u>	Lid Motors (will run for 10 seconds)
dd	Off	<u>On</u>	Off	Off	Detergent Diverter Valve
FU	Off	<u>On</u>	Off	<u>On</u>	Fill Water Valve
P1	Off	<u>On</u>	<u>On</u>	Off	Motor Wash direction (2300-2850 rpm)
P2	Off	<u>On</u>	<u>On</u>	<u>On</u>	Motor Drain direction (4200 rpm)
rd	<u>On</u>	Off	Off	Off	Rinse Aid Dispenser (dispenses current setting)
dF	<u>On</u>	Off	Off	<u>On</u>	Drying fan
LE	<u>On</u>	Off	<u>On</u>	Off	Rinse Aid LED
C1	<u>On</u>	Off	<u>On</u>	<u>On</u>	Water Softener Diverter Valve
C2	<u>On</u>	<u>On</u>	Off	Off	Water Softener Brine Pump
C3	<u>On</u>	<u>On</u>	Off	<u>On</u>	Water Softener Brine Valve
°C	<u>On</u>	<u>On</u>	<u>On</u>	Off	Displays current water temperature.
°E	<u>On</u>	<u>On</u>	<u>On</u>	<u>On</u>	Displays controller rail voltage
(C3 is used in the Factory to empty the Water Softener before the Product is packed.)					

**WARNING:** In diagnostic mode there is no component protection. Therefore take care when running individual components not to overload them. It is advisable to avoid turning the element on without placing some water in the tub first.

**NB :** No fault codes will come up while in diagnostics mode.

Tub Home Sensor Test: At any time during HO test mode, the Keylock symbol on the LCD display (Keylock LED on integrated badge) indicates the tub position. On = Closed, Off = Open.

### 3.6 Fast Test Cycle

**WARNING:** Only run this cycle if the DishDrawer™ is connected to the water supply.

This level runs an 8 minute fast test cycle.

Press **POWER** to skip Fast Test Cycle and advance to the next level.

Press **START/PAUSE** to enter Fast Test cycle.

Once Fast Test Cycle is selected the DishDrawer™ goes into standby mode and 8 minutes will be showing on the display. The test cycle is started by pressing **START/PAUSE**, and the following components are run during the 8 minute cycle that follows:- Lid motors, fill valve, wash motor, element, drain motor, drying fan.

Press **POWER** to exit at any time.

### 3.7 Continuous Cycle Test Mode

In this level the DishDrawer™ can be run continuously in any wash cycle. Once the cycle has finished, the DishDrawer™ automatically restarts the same wash cycle.

Press **POWER** to skip Continuous Cycle. As this is the last level, doing this will exit diagnostics.

Press **START/PAUSE** to enter Continuous Cycle.

Once selected, the LCD backlight flashes on and off to indicate the DishDrawer™ is in continuous cycle and the cycle starts straight away (for integrated and flat door models the LED above the start/pause button will be orange instead of green to indicate the DishDrawer™ is running in continuous cycle). It will run the last cycle that had been selected prior to going into diagnostics mode.

If it is desired to run a different cycle, exit diagnostics, turn the DishDrawer™ on as normal and select the cycle required. Then turn the DishDrawer™ off again, re-enter diagnostics and restart the Continuous Cycle as above.

Press **POWER** to Exit at any time.

The test sequence in fast cycle mode performs 33 tests. The number of any failed test is displayed on the touch switch panel LEDs. The test sequence continues even if a test fails. If there are multiple failures the LEDs will change during the test.

0 = LED off, X = LED on.

LED Display HNF DRE	Test ID	Test Description / Probable Cause
0 0 0 0 0 X	1	Uncontrolled load on PSU (PSU volts < 30 with PSU on and no devices turned on)
0 0 0 0 X 0	2	Unrealistic zero crossing time, mains frequency non standard
0 0 0 0 X X	3	Uncontrolled load on PSU (volts dropped when PSU turned off and no devices on)
	4	Unused
0 0 0 X 0 X	5	Detergent diverter not connected
0 0 0 X X 0		Fill valve not connected
0 0 0 X X X		Water softener bypass valve not connected
0 0 X 0 0 0		Rinse Aid pump not connected
0 0 X 0 0 X		Water softener brine pump not connected
0 0 X 0 X 0		Fan not connected
0 0 X 0 X X	11	Detergent diverter solenoid low resistance (shorted?)
0 0 X X 0 0		Fill valve solenoid low resistance (shorted?)
0 0 X X 0 X		Water softener bypass valve solenoid low resistance (shorted?)
0 0 X X X 0		Rinse Aid pump solenoid low resistance (shorted?)
0 0 X X X X		Water softener brine pump solenoid low resistance (shorted?)
0 X 0 0 0 0	16	Fan low resistance (shorted?)
0 X 0 0 0 X	17	Lid motor 1 no current (not connected?) in down direction
0 X 0 0 X 0		Lid motor 1 no current (not connected?) in up direction
0 X 0 0 X X		Lid motor 2 no current (not connected?) in down direction
0 X 0 X 0 0		Lid motor 2 no current (not connected?) in up direction
0 X 0 X 0 X	21	Lid motor 1 excessive current in down direction
0 X 0 X X 0		Lid motor 1 excessive current in up direction
0 X 0 X X X		Lid motor 2 excessive current in down direction
0 X X 0 0 0	24	Lid motor 2 excessive current in up direction
	25-29	Unused
0 X X X X 0	30	Motor FET A phase high side "shorted"
0 X X X X X		Motor FET B phase high side "shorted"
X 0 0 0 0 0		Motor FET C phase high side "shorted"
X 0 0 0 0 X		Motor FET A phase low side "shorted"
X 0 0 0 X 0		Motor FET B phase low side "shorted"
X 0 0 0 X X	35	Motor FET C phase low side "shorted"
X 0 0 X 0 0	36	Motor phases AB no current (not connected?)
X 0 0 X 0 X		Motor phases BC no current (not connected?)
X 0 0 X X 0	38	Motor phases CA no current (not connected?)
X 0 0 X X X	39	Motor phases AB current excessive (shorted winding?)
X 0 X 0 0 0		Motor phases BC current excessive (shorted winding?)
X 0 X 0 0 X	41	Motor phases CA current excessive (shorted winding?)

### 3.8 Temperature & Voltage Display Mode

*(Not available on integrated or flat door models)*

During a wash cycle, the current water temperature or the power supply rail voltage of the controller can be displayed on the LCD instead of the time remaining. To enter temperature/voltage display mode, start a wash cycle as normal. Initiate a keylock by pressing and holding the **KEYLOCK** button for 4 seconds.

Once in keylock mode, press and hold **START/PAUSE** for 8 seconds to enter temperature display mode. The display now alternates between a °C symbol and the water temperature. Pressing the **START/PAUSE** again changes the display to alternate between an °E symbol and the power supply rail voltage of the controller.

To cancel temperature/voltage display mode, press the **POWER** button.

### 3.9 Show Off/Showroom Wash Mode

This mode initiates a shop show off display and wash operation demonstration.

With the DishDrawer™ powered up and turned on, the show off mode is entered by pressing and holding the **ECO** and **POWER** buttons simultaneously for 5 seconds. Ensure that **ECO** is pressed first.

The DishDrawer™ is now in the show off mode and cycles through all of the LED & LCD segments.

Pressing the **POWER** button now puts the DishDrawer™ into the showroom wash mode. Before running this, mode the tub should be filled with water until it is just touching the underside of the spray arm. The showroom wash is started by pressing the **START/PAUSE** button whereby the following cycle is run:-

The lid is pulled down.

The wash motor starts and runs for 4 minutes.

The wash motor stops.

The lid is lifted.

The display counts down to zero throughout this cycle.

The DishDrawer™ turns off at the end of this cycle.

The DishDrawer™ is still in the Showroom wash mode however, and it can be re-run by pressing **POWER** and then **START/PAUSE**. Once show off/showroom wash mode has been initiated, the mains power must be removed to exit out.

### 3.10 Playing Tunes

Once in showroom mode, pressing the **START/PAUSE** button for 3 seconds will start a tune playing. Pressing the **START/PAUSE** button again will toggle the tune between Bach and the Star Spangled Banner. This feature is not widely known about, may not be present in all models and may be removed in future products.

## 4 DIAGNOSTICS QUICK REFERENCE CHARTS

### 4.1 Fault Display/Download Mode

Press and hold **KEYLOCK**, then **START/PAUSE** for 5 seconds.

All LEDs & LCD segments except Keylock are illuminated.

Press **START/PAUSE**.

This initiates pen data download via the lower tub-home light pipe. At the same time the current and then the previous fault code will be displayed in the LCD screen and on the secondary control panel LEDs. To read the fault code on the secondary display, refer to Section 4.7 on fault codes.

Press **KEYLOCK**.

This will clear current fault code. Note: If Keylock is pressed again, the previous fault code will be cleared. Pressing Keylock also toggles the wash icons on the LCD on and off.

Press **POWER** to exit.

## 4.2 Hardware Output Test Mode

Press and hold **KEYLOCK**, then **START/PAUSE** for 5 seconds.

All LEDs & LCD segments except Keylock are illuminated.

Press **POWER** once.

“HO” will show in the display (integrated and flat door models: Heavy, Normal, Fast, Delicate, Rinse LEDs showing).

Press **START/PAUSE**.

Scroll through the following outputs using Start/Pause. Turn the outputs on & off using Keylock button.

Press **POWER** to exit.

*Note: Scrubbing brush symbol = output on, no scrubbing brush = output off (on integrated and flat door models a green LED above the start/pause button is used in place of the scrubbing brush).*

LCD Display	Norm LED	Fast LED	Deli LED	Rinse LED	Hardware Output
bL	Off	Off	Off	<u>On</u>	Backlight
Er	Off	Off	<u>On</u>	Off	Element Relay
Ld	Off	Off	<u>On</u>	<u>On</u>	Lid Motors (will run for 10 seconds)
dd	Off	<u>On</u>	Off	Off	Detergent Diverter Valve
FU	Off	<u>On</u>	Off	<u>On</u>	Fill Water Valve
P1	Off	<u>On</u>	<u>On</u>	Off	Motor Wash direction (2300-2850 rpm)
P2	Off	<u>On</u>	<u>On</u>	<u>On</u>	Motor Drain direction (4200 rpm)
rd	<u>On</u>	Off	Off	Off	Rinse Aid Dispenser (dispenses current setting)
dF	<u>On</u>	Off	Off	<u>On</u>	Drying fan
LE	<u>On</u>	Off	<u>On</u>	Off	Rinse Aid LED
C1	<u>On</u>	Off	<u>On</u>	<u>On</u>	Water Softener Diverter Valve
C2	<u>On</u>	<u>On</u>	Off	Off	Water Softener Brine Pump
C3	<u>On</u>	<u>On</u>	Off	<u>On</u>	Water Softener Brine Valve
°C	<u>On</u>	<u>On</u>	<u>On</u>	Off	Displays current water temperature.
°E	<u>On</u>	<u>On</u>	<u>On</u>	<u>On</u>	Displays controller rail voltage

**Tub Home Sensor test:-** Keylock symbol on = tub closed, off = tub open

### 4.3 Fast Test Cycle

Press and hold **KEYLOCK**, then **START/PAUSE** for 5 seconds.  
All LEDs & LCD segments except Keylock are illuminated.  
Press **POWER** twice.  
"FC" will show in the display (integrated and flat door models: Heavy, Normal, Delicate, Rinse LEDs showing).  
Press **START/PAUSE** twice.  
The 8 minute fast test cycle will start.  
Press **POWER** to exit.

### 4.4 Continuous Cycle

Press and hold **KEYLOCK**, then **START/PAUSE** for 5 seconds.  
All LEDs & LCD segments except Keylock are illuminated.  
Press **POWER** three times.  
"CC" will show in the display (integrated and flat door models: Heavy, Normal, Rinse LEDs showing).  
Press **START/PAUSE**.  
The last cycle that had been selected prior to going into diagnostics mode will be run continuously.  
Press **POWER** to exit.

### 4.5 Temperature & Voltage Display Mode

(Not available on integrated or flat door models.)  
Start a wash cycle running.  
Press & hold **KEYLOCK** for 4 seconds.  
Keylock will be activated.  
Press & hold **START/PAUSE** for 8 seconds.  
LCD will now alternate between °C symbol and the water temperature.  
Press **START/PAUSE**.  
LCD will now alternate between °E symbol and the controller's rail voltage.  
Press & hold **KEYLOCK** for 4 seconds.  
Keylock is deactivated.  
Press **POWER** to exit.



## 4.6 Fault Codes

There are 10 F (fatal) faults, which are displayed in the LCD along with the symbol of a spanner (not on integrated or flat door models). A fatal fault will usually require the assistance of a qualified service person.

In addition, there are 4 U (user) faults.

U1 indicates the machine had failed to prime within a certain length of time usually because the tap has not been turned on. For this reason, at the same time a U1 comes up in the display we also show the symbol of a tap.

U2 indicates restricted lid travel. The customer can usually rectify a U1 or U2 fault.

A U3 fault is not displayed to the customer, but is recorded in the fault history and displayed in Smart Tool. It is logged if the motor senses prime in less than 20 seconds because water was left in the tub from a previous fill, or because it has filled too quickly. The product will drain and refill up to 5 times before logging the fault and continuing on with the cycle.

On a double drawer model, a U4 fault indicates an F fault with the other tub that has disabled the power supply.

In the Integrated and flat door models, an LCD is not available, and the presence of a fault is indicated by a red centre (start/pause) LED, with the fault number indicated by the red LEDs on the touch switch panel.

Once a fault is repaired, it can be cleared by pressing the **POWER** button. If the fault is still present, then it will not clear.

A fatal or user fault is accompanied by a continuous pulsating beep, which can be turned off by pressing either the **POWER**, **START/PAUSE**, or **KEY LOCK** button. This also stops the drain pump running for an F1 fault.

The last two faults are logged into EE memory.

If a tub is forced open, the product simply pauses as if someone had pressed the start/pause button.

Except for U4, F1, F3, F8 and F9 faults, the other tub can still be used on a double drawer model.

Once the fault has been cleared for an F3, F8 or F9 fault, the power needs to be disconnected and reconnected to reset the isolation relay before the product can be used again.

## 4.7 Fault Code Description Chart

The following chart is a quick reference guide on fault codes. To read a fault code off an integrated or flat door model, refer to the LED Display column on the chart below. The LED that has activated on the secondary display indicates which fault code has occurred.

To make diagnostics easier, a test handle can be made for use on integrated or flat door models using a cut down handle and a DD605 PCB LCD. This will not be able to be used on DD603 products, nor can a DD603 test handle be used on DD605 products.

Fault Code	LED Display	Fault	Possible Causes
F1	Rinse LED.	The bottom controller flood sensor detector has been activated for more than six seconds.	<ul style="list-style-type: none"> <li>● Lid not closing.</li> <li>● Overfilling.</li> <li>● Foaming.</li> <li>● Not draining.</li> <li>● Lid seal damaged.</li> <li>● Dispenser or water softener or their seals leaking.</li> <li>● Damaged water inlet or drain hoses.</li> <li>● Leaking heater plate or motor seals, or drain o-ring seals.</li> <li>● Yoke jammed or broken.</li> <li>● Inlet hose to inlet valve connection loose.</li> <li>● Inlet valve body leak.</li> <li>● Heater plate damage (chipped enamel).</li> <li>● Dry F1 – PCB mains filter, harness or connectors, electronic controller.</li> </ul>

Fault Code	LED Display	Fault	Possible Causes
F2	Delicate LED.	The controller has not sensed the motor rotating.	<ul style="list-style-type: none"> <li>• Foreign object has jammed the rotor.</li> <li>• The rotor has failed.</li> <li>• Hall sensor connector or wiring fault at hall sensor or controller.</li> <li>• The hall sensor has failed.</li> <li>• Motor stator winding or connection open circuit.</li> <li>• The electronic controller has failed.</li> <li>• PCB mains filter has failed.</li> </ul>
F3	Delicate and Rinse LEDs.	The water temperature has been sensed as greater than 85°C (185°F).	<ul style="list-style-type: none"> <li>• The incoming water is greater than 85°C (185°F).</li> <li>• The element has failed closed circuit.</li> <li>• The temperature sensor on the heater plate has failed.</li> <li>• The electronic controller has failed.</li> </ul>
F4	Fast LED.	No temperature increase has been sensed for about 4 hours while the element is on.	<ul style="list-style-type: none"> <li>• The element is not connected.</li> <li>• The element has failed open circuit.</li> <li>• The temperature sensor has failed.</li> <li>• The electronic controller has failed.</li> </ul>
F5	Fast and Rinse LEDs.	Lid motor current too high during start.	<ul style="list-style-type: none"> <li>• Lid jammed up or down.</li> <li>• The electronic controller has failed.</li> </ul>
F6	Fast and Delicate LEDs.	Lid motors ran but did not reach stall current.	<ul style="list-style-type: none"> <li>• Lid actuator off yoke or slide.</li> <li>• Yoke off lid.</li> <li>• Faulty lid actuator.</li> </ul>

Fault Code	LED Display	Fault	Possible Causes
F7	Fast, Delicate and Rinse LEDs.	No lid motor current detected.	<ul style="list-style-type: none"> <li>● Lid actuator not connected.</li> <li>● PCB mains filter and controller connectors.</li> <li>● Faulty PCB mains filter.</li> <li>● Faulty electronic controller.</li> </ul>
F8	Normal LED.	Earth leakage fault.	<ul style="list-style-type: none"> <li>● Test for earth leakage.</li> <li>● Connectors and earth connections fitted correctly.</li> <li>● Damaged harnesses.</li> <li>● Water damaged harness, connector, or controller.</li> </ul>
F9	Normal and Rinse LED.	Power supply / controller fault.	<ul style="list-style-type: none"> <li>● Caused by F3, F8 or F9 faults.</li> <li>● Check coils and motor windings.</li> <li>● Check lid actuators.</li> <li>● Check controller for signs of damage.</li> <li>● Check PCB mains filter and controller connectors.</li> <li>● Check heater plate harness and connectors.</li> <li>● Replace electronic controller.</li> <li>● Replace PCB mains filter.</li> </ul>
FF	Normal, Fast, Delicate and Rinse LEDs.	Top tub not responding.	<ul style="list-style-type: none"> <li>● Chassis harness or connectors.</li> <li>● Faulty top controller.</li> <li>● Faulty PCB mains filter.</li> </ul>

Fault Code	LED Display	Fault	Possible Causes
U1	Heavy and Rinse LED.	Machine has failed to prime with water within approx. 3 minutes.	<ul style="list-style-type: none"> <li>• The water supply is not turned on.</li> <li>• Low water pressure.</li> <li>• Blocked water softener if fitted.</li> <li>• The inlet valve has failed.</li> <li>• The machine is siphoning.</li> <li>• The spray arm is not in place, or the flapper is jammed.</li> <li>• Excessive foaming - using tablets (not EU/GB), liquid detergent or spilled rinse aid.</li> <li>• The motor has failed.</li> <li>• Rotor not fitted correctly or faulty.</li> <li>• The electronic controller has failed.</li> </ul>
U2	Heavy and Dry LEDs.	Restricted lid travel, the lid has reached stall current too soon.	<ul style="list-style-type: none"> <li>• Dishes or cups / glasses prevent the lid from closing.</li> <li>• Lid, lid actuators or yokes jammed.</li> </ul>
U3	Not displayed to customer.	Water filled too quickly, or tub failed to drain.	<ul style="list-style-type: none"> <li>• Not draining completely from previous fill.</li> <li>• Excess water pressure.</li> <li>• Faulty fill valve.</li> </ul>
U4	Heavy and Fast LEDs.	Advisory only – the other tub has a fault and has disabled the power supply.	<ul style="list-style-type: none"> <li>• Diagnose and repair the fault in the other tub.</li> </ul>

## 4.8 Fault Code Problem Solving Charts

The following charts can be used as a guide to help locate faults in a DishDrawer™.

### F1 Flood Detected

The bottom controller flood detector circuit has been activated.

The product will abort the wash program, log the fault, start the drain pump, and report to the user.

Neither tub can be used until the fault is cleared.

#### PRIMARY ACTION

- Determine if a flood actually occurred? Is there water in the base of the machine?

#### SECONDARY ACTION

If water in base.

- Determine where the water has come from, check the following:  
Check for the lid not closing (lid actuators), overfilling (spray arm correctly fitted and flapper shutting off, rotor correctly fitted) or foaming (rinse aid spill or wrong detergent (liquid or tablets) used, not draining (rotor or motor housing damaged, drain hose blocked / crushed), lid seal damaged, dispenser or water softener seals leaking, damaged fill or drain hoses, tub leaking around heater plate or motor seals, drain hose o-ring at connection to motor, yoke pegs broken or yoke jammed at front or rear, oversize dishes, inlet hose connection to water inlet valve leak (washer not fitted, connection not tight) water inlet valve not shutting off.
- Mop up water in the chassis base before attempting to restart.

#### TERTIARY ACTION

If no water in base

- Check the chassis harness connection to the PCB mains filter.
- Check for corrosion/dirt around the flood sensor on the side of the mains filter housing.
- Replace the PCB mains filter.

## F2 Motor Not Rotating

The controller has not sensed the motor rotating.

The product will pause the wash program, log the fault, and report to the user.

### PRIMARY ACTION

- Check the rotor is free to turn.
- Check that power is available at controller (e.g. do the lid actuators run in diagnostics).

### SECONDARY ACTION

- Check whether the rotor is not moving or is vibrating in diagnostics.
- If vibrating, check the hall sensor is properly fitted, check that the motor stator connections are OK.
- If not moving, check the connections at the controller and the motor.
- Check the resistance of the motor windings.

### TERTIARY ACTION

- Check if a replacement hall sensor solves problem.
- Check if a replacement controller solves problem.
- Check if a replacement PCB mains filter solves problem.

### F3 Water Temperature Measurement Exceeds 85 Degrees Celsius

The water temperature is sensed at greater than 85 degrees C / 185 degrees F.

The product will abort the wash program, log the fault, report to the user, and disable the power supply.

Note: The isolation relay will be disabled. Power to the product will need to be disconnected then reconnected for it to become fully functional again.

#### PRIMARY ACTION

- Check the incoming water temperature is not too hot.
- Check the temperature reading in diagnostics, and if 199, ensure the power connector is properly fitted to the controller and the connector on the heater plate is correctly fitted.

#### SECONDARY ACTION

- Check the resistance between pins 1 and 2 of the controller power connector is about 10K at approx. 25°C / 77°F ambient room temperature.
- If not (provided the harnesses are ok and the connectors are correctly fitted), replace the heater plate (bad temperature sensor).

#### TERTIARY ACTION

- Check that the temperature reading in diagnostics is the same as the temperature of the water in the tub. If the tub water temperature is obviously below 85°C / 185°F, replace the controller.



#### **F4 Element Has Been On Too Long (About 4 Hours) And Water Has Not Reached Required Temperature**

The element has been on too long (about 3 hours) and the water has not reached the required temperature.

The product will abort the wash program, log the fault and report to the user.

##### **PRIMARY ACTION**

- Check that the controller power connector and the heater plate connectors are properly fitted and the harness is not damaged.
- Check the resistance between pins 1 and 3 of heater plate PCB, and if open circuit, replace the heater plate.

##### **SECONDARY ACTION**

- Check the resistance between pins 1 and 2 of the controller power connector is about 10K at approx. 25°C / 77°C ambient room temperature.
- If not (provided the harnesses are OK and the connectors are correctly fitted), replace the heater plate (bad temperature sensor).

##### **TERTIARY ACTION**

- Replace the controller.

#### **F5 Lid Motor Current(s) Too High During Start**

Lid actuator is jammed up or down.

The product will abort the wash program, log the fault and report to the user.

##### **PRIMARY ACTION**

- Check for dishes, cutlery or cups and glasses preventing lid from closing.
- Check the lid actuators in diagnostics.
- Check the yokes are moving freely and are not jammed at the front or the rear (physical inspection).

##### **SECONDARY ACTION**

- Replace the lid actuators.

##### **TERTIARY ACTION**

- Replace the controller.

**F6 Lid Motors Ran But Did Not Reach Stall Current**

Lid actuators ran but did not reach stall current.

The product will pause the wash program, log the fault and report to the user.

**PRIMARY ACTION**

- Check that the lid actuators are properly connected to the yokes and the slide mounting bracket.
- Check that the yokes are clipped into the lid.
- Run the lid actuators in diagnostics.

**SECONDARY ACTION**

- Replace the lid actuators.
- Replace the controller.

**F7 No Lid Motor Current Detected**

No lid actuator current detected.

The product will abort the wash program, log the fault and report to the user.

**PRIMARY ACTION**

- Check that the lid actuator connectors are properly fitted.

**SECONDARY ACTION**

- Check that the controller is receiving power (use diagnostics to run the wash or drain pump).
- If not, check the harnesses.

**TERTIARY ACTION**

- Replace the PCB mains filter.
- Replace the controller.

## F8 Earth Leakage Fault

Earth leakage fault.

The product will disable the power supply, log the fault, lock out the user and report to the user.

Note: The isolation relay will be disabled. Power to the product will need to be disconnected then reconnected for it to become fully functional again.

### PRIMARY ACTION

- Test for earth leakage (using a Megger).

### SECONDARY ACTION

- Check that the connectors are properly fitted and earthing connectors are fitted.

### TERTIARY ACTION

- Check for physically damaged harnesses.
- Check for water damage to the harnesses, connectors, PCB mains filter and controllers.
- Check the heater plate tracks for water, damage.

## F9 Power Supply/Controller Fault

Power supply/controller fault.

The product will disable power supply, log the fault, lock out the user and report to the user.

Note: The isolation relay will be disabled. Power to the product will need to be disconnected then reconnected for it to become fully functional again.

### PRIMARY ACTION

- Check the previous fault, and if it was F3, F8 or F9, then this F9 is a consequential fault - fix the previous fault.
- If the fault occurred immediately after power on, check the solenoid coils and motor stator windings for damage, overheating and correct resistances.
- Check the lid actuators are properly connected.
- Check the controller for damage, signs of overheating or fluid leaking.

### IMPORTANT

Check the solenoid coils and motor winding resistances are OK before replacing a controller.

### SECONDARY ACTION

- If the fault is on the top controller and the bottom controller works, check the top controller chassis and power harnesses are properly connected, are not damaged and no wires are loose (controller may not be receiving power from bottom tub).
- If OK, replace the top controller.
- If the fault is on the top controller and the bottom controller does not work, check the chassis connector on the bottom controller is properly fitted and the harness is not damaged. Check the connectors on PCB mains filter is properly fitted.
- Check the heater plate harnesses are properly connected/undamaged.
- If still not OK, replace the bottom controller.

### TERTIARY ACTION

- If a single product, and harnesses and resistances are OK, replace the controller. If replacing the controller does not fix the fault, replace the PCB mains filter.

**FF Top Tub Not Responding**

Top tub not responding.

**PRIMARY ACTION**

- Check the top controller works when swapped with the bottom controller and vice versa. Replace the top controller if it does not work in the bottom tub.

**SECONDARY ACTION**

- Check the chassis harnesses and connectors if the top controller works in the bottom tub and the bottom controller does not work in the top tub.

**TERTIARY ACTION**

- Replace PCB mains filter.

**U1 (“No Tap” Symbol) Wash Pump Has Not Primed.**

The fill valve has been open for more than 180 seconds and the wash pump has not primed.

The product will pause the wash program, log the fault, report to the user, and restart when the start/pause button is pressed.

**PRIMARY ACTION**

No water in the tub:

- Check that the tap is turned on.
- Check for kinked inlet hose, blocked inlet hose filter.
- Check harness connections to water inlet valve.
- Check for a blocked pipe interrupter in the water softener (if fitted).

Not enough water in the tub:

- Is the water pressure sufficient (above 30kPa or 4.3psi)?

Too much water in the tub:

- Is the spray arm correctly fitted? Is the spray arm flapper shutting off?
- Is the rotor correctly fitted?
- Check for foaming - spilled rinse aid or wrong detergent (liquid detergent, or tablets).

**SECONDARY ACTION**

- Check the rotor wash (top) impellor is not loose on the shaft.
- Check the fill valve operation (using diagnostics).
- Check the motor operation (using diagnostics).

**U2 Restricted Lid Travel**

Restricted lid travel. The lid has reached its stall current too soon. The product will retry the lid 3 times, log the fault if the retries fail, then report to the user.

**PRIMARY ACTION**

- Check dishes, cutlery or cups are not projecting above the top of the tub.

**SECONDARY ACTION**

- Check the lid actuator connections and operation in diagnostics.
- Check the yokes for jamming at the front and rear.

**U3 Filled Too Quickly Or Failed To Drain**

This fault is not displayed to the customer, but it is recorded in the fault history and can be seen by Smart Tool.

If the motor senses prime too soon (in less than 20 seconds), it will drain and refill up to 5 times, then continue the wash program regardless, and log the fault.

**PRIMARY ACTION**

Not draining completely from previous fill, test in diagnostics.

Check for:

- A blocked drain or kinked drain hoses.
- Blocked drain sump inlet / outlet pipes.
- Blocked drain filter.
- Faulty rotor.
- Faulty connection to the motor.
- Faulty hall sensor.

**SECONDARY ACTION**

Filling too quickly. Check for:

- Excess water pressure.
- Faulty water inlet valve.

**U4 This Fault is Advisory Only. The Other Tub has a Fault and has Disabled the Power Supply.**

This fault is advisory only. The other tub has disabled the power supply.

**PRIMARY ACTION**

- Diagnose and repair the fault displayed on the other tub.

### 4.8.1 Poor Dry Performance

Poor Dry Performance			
	Question	Yes	No
1	Is the customer complaining of plastic items not drying?	Advise customer that due to plastics having a low thermal mass these items give inherently bad drying performance.	Go to Question 2.
2	Is the customer using rinse aid?	Go to Question 3.	Advise customer that the use of rinse aid will improve dry performance.
3	Is the customer using Fast or Eco cycles.	Advise customer that due to lower final rinse temperatures dry performance is comprised when using Fast and Eco cycles (there is less residual heat for drying at the end of cycle).	Go to Question 4.
4	Is the rinse aid setting high enough for the water hardness in the area?	Go to Question 5.	Turn the rinse aid up to a higher setting.
5	Using diagnostics, test the dispenser. Is it dispensing the correct amount of rinse aid?		Replace dispenser.



#### 4.8.2 Poor Wash Performance

<b>Customers Complaint Food Particles left on Dishes</b>	
<b>Cause of problem (1)</b>	Spray arm has stopped rotating.
How to resolve the problem.	a) One of the dishes / cutlery / utensils has fallen through the basket and jammed the spray arm. Remove the obstruction. b) The filter plate, drain filter, or drain filter access panel is not installed correctly and is causing the spray arm to jam.
<b>Cause of problem (2).</b>	The product is being over loaded or incorrectly loaded with dishes.
How to resolve the problem.	Advise customer of correct loading.
<b>Cause of problem (3).</b>	Customer is selecting the wrong wash cycle for the soil level on the dishes.
How to resolve the problem.	Advise customer about reduced water temperatures (up to 20°C / 70°F lower) and wash times when using Fast and Eco cycles.

<b>Customers Complaint Coffee/Tea Stains left in Cups</b>	
<b>Cause of problem (1).</b>	Not enough detergent being used. To remove these stains requires a stronger concentration of detergent in the water. More detergent is also required in hard water areas as minerals in the hard water reduce the effectiveness of the detergent.
How to resolve the problem.	Fill the main-wash detergent cup to the top & for best results also fill the pre-wash detergent cup. Run on normal or heavy cycles not Eco.
<b>Cause of problem (2).</b>	The product is being over loaded, which is preventing water reaching the cups on the upper cup racks.
How to resolve the problem.	Advise customer of correct loading.

Customers Complaint Dishes have blotchy marks on them that look like water stain marks not food	
Cause of problem.	Not enough rinse aid being used. The water is not soft enough during the final rinse and therefore hard water droplets containing impurities are drying on the dishes instead of running off during the dry cycle.
How to resolve the problem.	<p>Confirm that the customer is using rinse aid.</p> <p>The rinse aid may need to be turned up to a higher setting (4 or 5 lights) and for optimum dry performance run the DishDrawer™ on normal or heavy cycles, not Eco.</p> <p>Check that the rinse aid dispenser is dispensing correctly in diagnostics.</p>

Customers Complaint Glasses & Cutlery have a Cloudy White film on them and/or Plates have a White Chalky film on them	
Cause of problem.	Hard water and not enough detergent being used. Minerals from the water are building up on the dishes or the water softener is not set to the correct water hardness level, or is faulty.
How to resolve the problem.	<p>Once this film forms on the dishes it cannot be removed by normal running in the dishwasher. The dishes will need to be cleaned by soaking them in an acidic solution (such as white vinegar and water).</p> <p><b><i>Where a water softener is not fitted;</i></b> To prevent the build up re-occurring the customer will need to fill both the main-wash &amp; pre-wash detergent cups to the top with a power detergent and we would recommend running on normal cycles.</p> <p>In problem areas with very hard water, the customer may need to use a detergent additive designed for use in hard water areas, or fit a water softener to the incoming water supply.</p>

	<p><b><i>Where a water softener is fitted;</i></b> Set the water softener for the correct local water supply hardness. Check that the water softener is functioning correctly in diagnostics.</p> <p><b>C1 Water Softener Diverter Valve</b> In hardware output diagnostics test mode: FU – turn the fill water valve on. P2 – turn the motor drain on. C1 – water softener diverter valve. On – water bypasses the resin tank. Off – water flows through the resin tank.</p>
	<p><b>C2 Water Softener Brine Pump</b> Turn the Brine Pump on in diagnostics mode. Observe a small quantity of water (approx. 30 ml per min.) flowing out the bottom of the dispenser. (Drop the dispenser door down to observe this.) Observe a change in the water level (approximately 120ml per 4 min.) in the salt reservoir. The reservoir should pump dry of water in this time. Note:- Fill the salt reservoir with salt (and then water if not already) before performing this test.</p> <p><b>Pipe Interrupter (Air Break) Function</b> A critical component in the performance of the water softener is the pipe Interrupter (PI). There is a certain amount of spray leakage from the PI, which is used to provide water to the salt reservoir.</p> <p>If the spray is inadequate, there will be insufficient water in the salt reservoir to make brine.</p> <p>If there is too much spray, then the excess bypasses the water softener and defeats the softening process by pouring untreated water straight into the tub.</p>

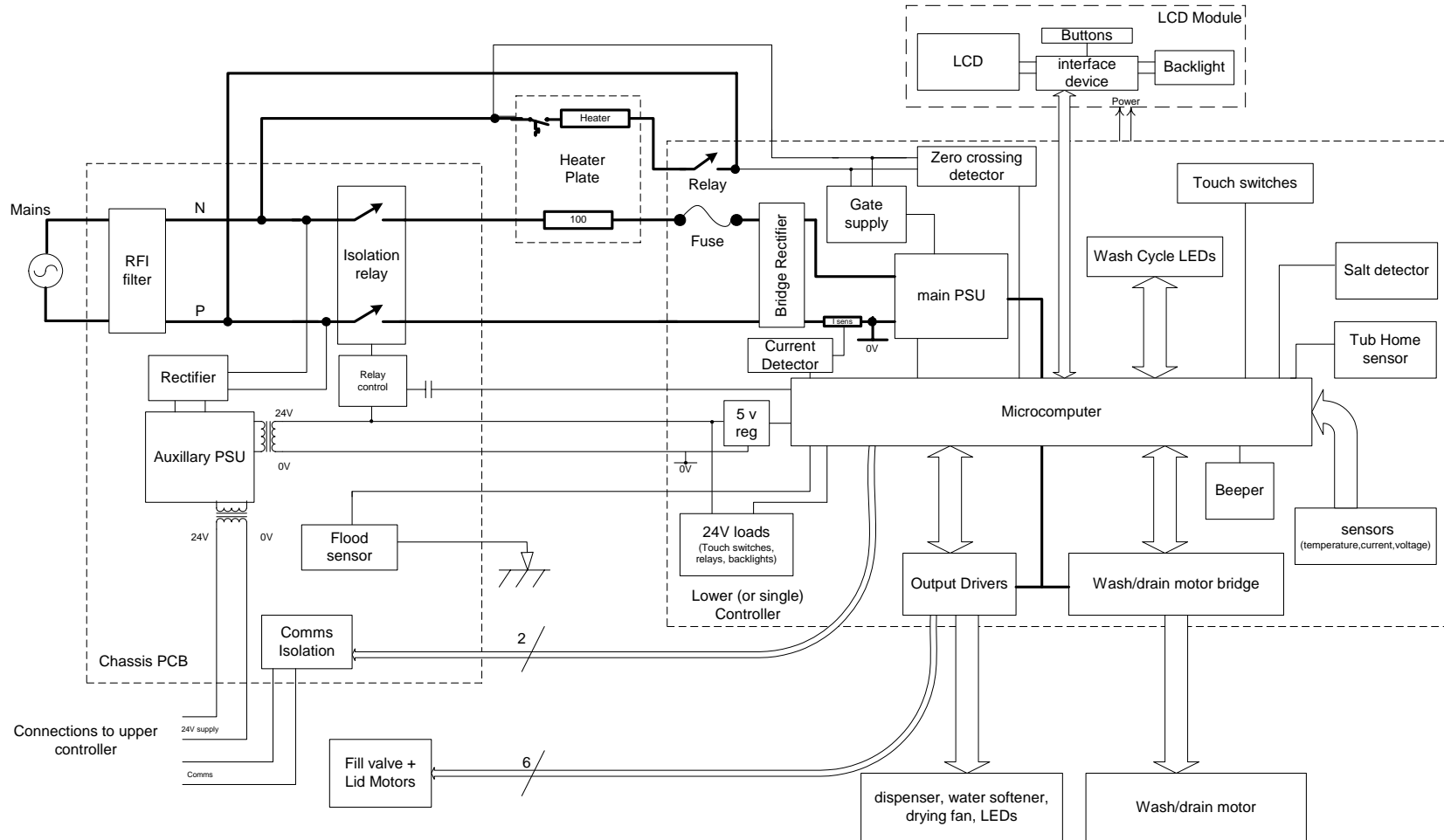
	<p>To check that the amount spray leakage is appropriate:-</p> <p>Fill the salt reservoir with water.</p> <ul style="list-style-type: none"><li>• In diagnostics mode, turn on the fill water valve and the motor drain. Water will flow out of the dispenser into the tub, as well as out of the water softener overflow into the tub.</li><li>• Observe the flow from the water softener overflow (beside the Dispenser). There should be a trickle (25-100 ml per minute). With experience you can guess what is appropriate. If the trickle is outside these rates, replace the softener, as the PI is faulty.</li></ul> <p>To check that there is water in the salt reservoir, remove the drawer front and observe the level of water in the tank. (A quick way to check that there is water in the salt reservoir is to remove the salt bung and test the water level by placing your finger down through the opening.)</p> <p><b>Detergent or Rinse Aid in the Water Softener</b></p> <p>If detergent or rinse aid is poured in to the salt reservoir it will destroy the water softener. This could also happen if the salt bung is left off or falls out. Evidence of this could be white streaks through the resin.</p>
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# 5 WIRING DIAGRAM

## 5.1 Power Distribution Concept

DD605 Power Distribution concept



## 5.2 Wiring Diagram

**Phase 5 Dishdrawer Wiring Diagram (Lower drawer only shown)**

