

## Machine Installation.

We connect the power cable to 3N or 1N power supply socket depending on the machine type.

We press the On/Off Button once, then its led backlit will go on. Now the machine is waiting for an action by the user. This is the default state any time the machine is turned on.

The default temperature settings are:

- Boiler Max: 80 °C, Minimum: 70 °C
- Tank Max: 60 °C, Minimum: 35 °C

Their heating elements are controlled by PT100 temperature probs.

Now pressing the On/Off button and the Start button simultaneously the installer menu will appear. In this menu the following choices will be displayed:

- Peristaltic Pumps Priming
- Maximum boiler temperature adjustment (72 - 80 °C)
- Maximum tank temperature adjustment (50 - 60 °C)
- Peristaltic Pumps flow adjustment (ml/cycle)
- Initial dosage of detergent upon startup (ml)

### Peristaltic Pumps Priming

- The installer through the menu selects Peristaltic Pumps Priming using the arrows and the SET button. Then selects which of the 2 peristaltic pumps wants to prime and then pushes START. The correspondent peristaltic pump starts to spin and the screen will show: PRIMING until the installer interrupts it using START. In any other case the pump will stop after 120 sec.
- Once the tubes for the chemicals are filled with detergent and rinse aid the machine is ready for use.

Once everything is adjusted we press the On/Off and the machine saves the settings and goes Off.

## Machine Function

### First Start (Commissioning):

- We push the On/Off button and its backlit goes on. Then we push the START button which will flash on and off with 1 sec interval and the display will show: FILLING until the following process completes.

- The solenoid valve (which is normally closed) opens and water starts filling the machine until the top water level probe signals that the tank is full. There is also the lower water level probe which is used for other operations described later. The process starts if only the door is closed. If the door opens while running the machine will pause and continue after the door is closed again with a delay of 5 sec.
- Once the above is complete, the machine will show GETTING READY, then simultaneously: The 2 heating elements go ON (one 1N in the Tank and one 3N in the boiler), the peristaltic pump for the detergent begins working for 50ml which is the initial startup dosage setting. (The time that the pump will work depends on the type of it). The whole second step applies even if the door is open.
- Once the temperature probe of the tank signals that it have reached 35 °C and the boiler's 70 °C the machine will show READY and the START's button backlit will light up still. From now on the tank's heating element should keep the tank's temperature above 45 °C.
- The machine display will show the programs' icons which can be selected using the arrows and the SET button. If none is selected and the user pushes START, the machine will select the NORMAL program automatically. In idling the machine show the 2 temperatures and the READY message and the icon of a thermometer will show if the machine's heating elements are working.

## Programs:

### NORMAL 120 sec. Without drain pump

While the door is closed and the machine completed filling operation and the temperatures are correct, the user can select the normal program or it will be selected automatically. Any selected program will remain selected until otherwise.

Pushing START will begin the following:

- The wash (main) pump is working for 90 sec. and the display will now show the seconds counter and the message WASHING.
- After 90 sec. the solenoid valve opens for 30 sec and simultaneously the rinse aid peristaltic pump will work for 5ml. Now the display will show the seconds counter and the message RINSING
- At the end of the program the peristaltic of detergent will work for 12 ml

During the second stage of the program, the boiler's temperature will drop very fast. Upon beginning to drop the boiler's element should start heating again until it reaches maximum set point even if it was between the default range of 70-80 °C. This way the machine will require fewer seconds to reach READY again.

After the 120 sec of the program have passed, if the temperatures are in their corresponding ranges the display will show again READY. The same message will apply at the end of any program if the conditions are met.

### **Intensive 180 sec. Without drain pump.**

Everything is the same as normal with the difference that the main wash pump will work for 150 sec instead of 90.

### **Utensils and Cookware 300 sec. Without drain pump.**

Everything is the same as normal with the difference that the main wash pump will work for 270 sec instead of 90.

### **Sensitive Glassware 200 sec. Without drain pump.**

In this case the tank temperature should only be 60 °C (+-2).

When selected if the tank's temp is not as instructed the machine will run the program however will stall at the beginning until 60 °C (+-2) is reached. The display will show WASHING but the counter will be still and the temperature icon will be blinking.

The sequence here is as following:

- Upon pushing START the machine will start the program but will not do anything for 20 sec in case that the tank is already at 60 °C (+-2). If it is still heating up as mentioned above these 20 sec will be counterbalanced with the time it took to heat up. (For example: 1: If the tank is at 55 °C and took 40 sec to reach 58 then the next operation starts immediately. 2: If the tank is at 57 and took 10sec to reach 58 then the machine will wait only 10 extra sec before proceeding to the next operation).
- Then the wash pump will work for 150 sec and the following is as in any other program above.

During all programs the display should always display a reverse time counter so that the user know at all times how long will the program take to complete

## **Notes**

**If** the machine is equipped with drain pump the following will apply to everything mentioned above:

- For the machine to have a drain pump there will be installed a third water level probe sensor. In every program during the phase of rinsing for 30 sec., new water is being added to the machine which the drain pump should dispose controlled by the third level probe. This way the water level in the tank will stay the same. The machine with gravity drain has an overflow pipe in drain outlet so the level is regulated by that.

**Between** every program cycle if the temperatures are not between the correct ranges the machine will start with the push of the button START however it will not begin the operations until the temperatures are right. It will show WASHING however the icon of a thermometer will be blinking. When it reaches the setpoints it will continue according to the program selected.

## Water Exchange Program

- Without drain pump:

The user pushes OFF and the machine will turn off all hardware and display OFF for 5 sec. The user removes the overflow part so that the tank can empty. The lower level probe is out of water so it indicates that the tank is empty. The user puts back the pipe, closes the door and turns the machine on again so that it will follow the Commissioning process.

The same exact process without enabling the machine again takes place for turning Off the machine.

- With drain pump:

The user selects the WATER EXCHANGE program. With the door closed the machine turns off the heating elements (they are underwater elements and should always work in water only). The drain pump will empty the tank until the lower water level probe signals that the tank is empty. Then the message CLEAN FILTERS will appear and the user can open the door for the next 15 sec. to clean the filters. When the door closes again, the machine will start the Commissioning process again. If the 15 sec have passed without the door being opened then the machine will continue to the commissioning process directly.

## Dishwasher Sanitization Program (Decommissioning)

- Without Drain Pump

The user selects the SANITIZE DISHWASHER program and with the door closed pushes START. The washer now disables only the tank heating element and prompts the user to REMOVE OVERFLOW PIPE. Once the user removes it the tank will empty. The user will clean anything that needs to be cleaned and will close the door. Now that the lower level probe indicates that the tank is empty the machine will show the message CLEANING. With a 5 sec delay the solenoid valve will open for 30 sec regardless of the temperature in the boiler or tank. Now the machine will stall for 10 sec. Then If the temperature in the boiler is above 70 °C it will open the solenoid valve again for 20 sec and simultaneously the rinse aid peristaltic pump for 5ml. If the machine needs to heat up the boiler then the temperature icon will be blinking and the display will show CLEANING although it will be waiting to reach 70 °C. In this case the machine does not need to wait 10 sec. Now the machine turns off and displays FINISH for 2 sec and then OFF for 2 sec.

- With Drain Pump

The user selects the SANITIZE DISHWASHER program and with the door closed pushes START. The washer now disables only the tank heating element and begins to drain the tank while displaying the message DRAINING until the lower level probe indicates that the tank is empty. Now the machine displays the message REMOVE AND CLEAN FILTERS. The machine will wait for 15 sec for the user to open and remove the filters to clean anything and will continue when the door is closed again. If 15 sec pass without opening the door then it will continue to next step. With the door closed the machine now will display CLEANING. With a 5 sec delay the solenoid valve will open for 30 sec. Now the machine will stall for 10 sec. Then If the temperature in the boiler is above 70 °C it will open the solenoid valve again for 20 sec and simultaneously the rinse aid peristaltic pump for 5ml. If the machine needs to heat up the boiler, then the temperature icon will be blinking and the display will show CLEANING although it will be waiting to reach 70 °C. In this case the machine does not need to wait 10 sec. During the process of 30 and 20 sec of adding water, the level of the tank should not exceed the top level probe's point. Lastly the drain pump will open again to remove any added water till the lower level probe indicates that the tank emptied. Now the machine turns off and displays FINISH for 2 sec and then OFF for 2 sec.

During all programs the display should always display a reverse time counter so that the user know at all times how long will the program take to complete.

## Notes

During any operation or program running if the door is opened the procedure will be interrupted immediately and will resume if only the door is closed for the next 20 sec. Otherwise the user should run the operation again. Upon resuming the dishwasher will wait 5 sec before continuing. In any case the door is open a symbol on the display will indicate just that.

## Dishwasher Hardware:

Boiler Heating Element 3N 400V 6000W

Boiler Heating Element for 1N version is 230V 3500W

Tank heating Element 1N 230V 2500W

Drain Pump 230V 40W (Optional)

Wash Pump 230V 400W

Peristaltic Pumps (2 units) 230V

Solenoid Valve 230V

Boiler Thermistor 100 °C

Tank Thermistor 100 °C

Magnetic Door Sensor

Water Level Probe Sensor (3 units only with drain pump otherwise only 2)

Temperature probe sensors PT100 (2 units)

## **Water Level Probes are installed as follows:**

- Without drain pump:

One for the tank lower level which indicates that the tank is empty. In any case that this probe is not underwater the tanks heating element should not activate.

One for the top tank level that indicates that the tank is full.

- With drain pump:

As above but with a third water level probe that is in higher point than the top tank level one. This will control how much time the drain pump will work depending on if it is in or out of water.

At any case, the water in the tank should never exceed the point of the third water level probe.