

User Manual Afon[®] DynaStil 4L **DS4/220V**

Water Distillation Unit | 4 Liters per hour

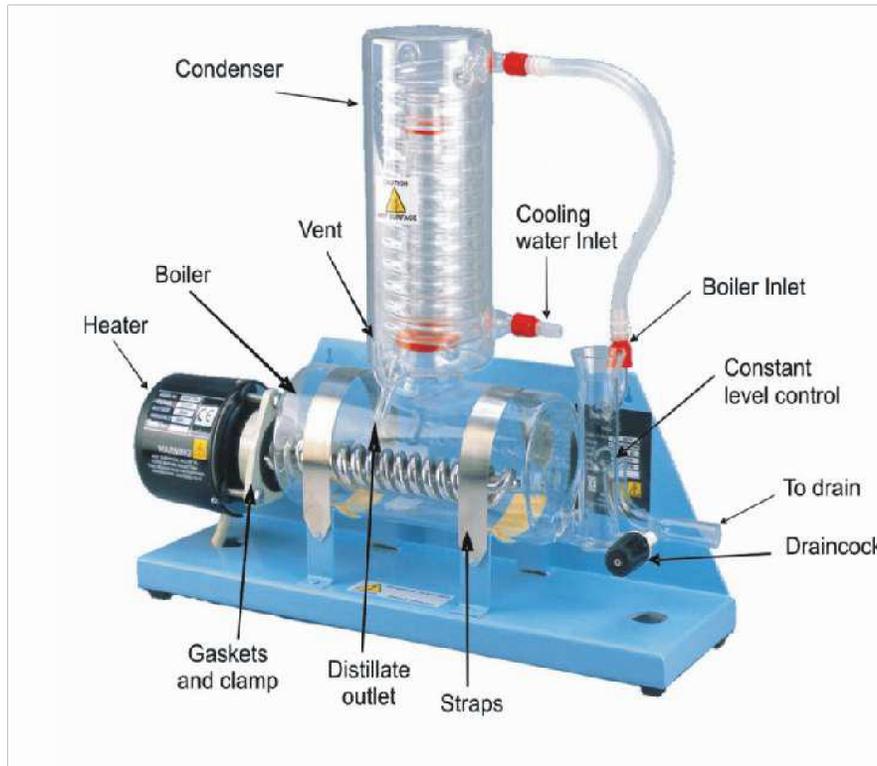


Dynalab Corp. / Dynalon Labware

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MOUNTING & PLACEMENT

This equipment can be either wall or bench mounted.

CHECK FOR THE FOLLOWING SERVICES :

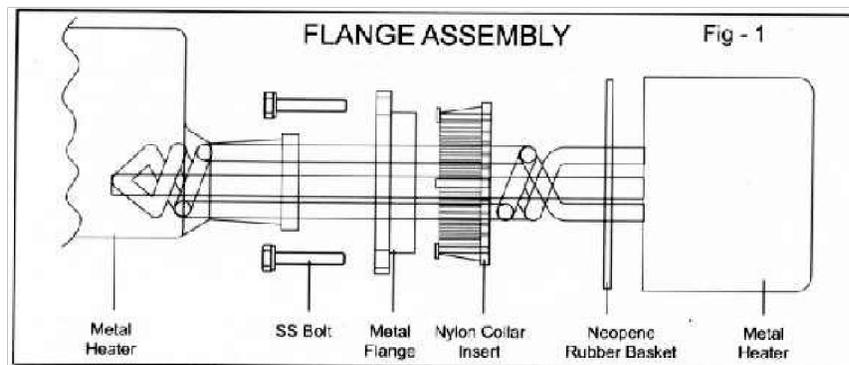
- Single Phase electric supply capable of handling a load of 3 KW, 230V + 10%, 50 – 60 cycles and with a fuse carrier of 15 amps.
- A 15 amps plug and socket, wall mounted, is recommended.
- The equipment must be earthed in all cases. Blue - Live, Brown – Neutral, and Green – Earth.
- Cooling water supply for Glass condenser capable of providing minimum flow rate of 60 liters/hour (1 liter/minute). The flow rate has to be adjusted by the lab technician using a measuring cylinder or using a flow meter.
- A drain located below the level of still so that the PVC drain pipe from the Glass boiler can fall straight without kinks or bends to allow unimpeded flow of water.
- Space for distillate collection reservoir located below the still.

INSTALLATION:

1. OPEN THE BOX CAREFULLY & IDENTIFY THE FOLLOWING COMPONENTS:

COMPONENTS	QTY		COMPONENTS	QTY
Powder Coated Stand with two S.S. boiler straps with springs	1		Metal Heater	1
Glass Boiler	1		Hose Kit	1
Glass Condenser	1		Gasket	1

2. Place the powder coated stand at a suitable location, bench top or wall mounted using the two key holes provided (size of screw required 1/8th x 5 mm brass screw).
3. Take the glass boiler ensuring that the two Silicon Rubber "O rings" on the vapour tube are in place. The smaller silicon "O ring" is to be seated on the top groove of the vapour tube of the glass boiler; the larger silicon rubber "O ring" is to be adjusted to a distance of approx. 35mm from the top surface of the glass boiler or such that when the glass condenser is placed over the vapour tube it does not shake. Take the metal heater, the metal flange, the neoprene rubber gasket and the HDPE collar insert and assemble as shown in figure 1.
 - A. Place the metal flange (flat side facing the boiler) over the tapered glass neck of the glass boiler.
 - B. The HDPE black collar insert is bent around the tapered glass neck and into the metal flange. The metal Flange is pulled and inserted towards the end of the glass boiler neck so that when the metal flange is pulled the HDPE collar insert seals on to the neck.
 - C. Place the neoprene rubber gasket over the metal heater and insert the metal heater through the tapered glass neck and into the glass boiler.



4. Secure the metal heater with the three SS bolts provided. Care should be taken not to overtighten the bolts. The heater axis should be parallel to the boiler axis.
5. Place the glass boiler and heater assembly in the cradle of the powder coated stand. An electrical plug is included and can be attached to the bare wires of the heater element. But you most likely will require a plug that is compatible with your existing 220V electrical outlet.
6. Cleaning the Condenser: For maximum protection during shipment the condenser has been pre-inspected thoroughly and filled with dry detergent and saw dust. The inner coil has not been filled. Prior to use take care to remove the saw dust slowly. Do not tap the condenser hard which could result in breakage of the inner coil. Finally, rinse the condenser thoroughly which will allow desired conductivity to be attained.
7. Mount the glass condenser on the vapor tube of the glass boiler. The distillate outlet tube or vent should face the front.
8. Take the silicon tube with screw thread connectors at either end. Screw one end of the silicon tubing on to the upper outlet of the glass condenser and the other end to the glass thread on the glass boiler.
9. Take the other PVC drain pipe tubing and connect to the drain of the glass boiler.

10. The free end of the PVC drain Pipe should be placed in the drain. Ensure that there are no kinks or bends in the tube so that water flow is not impeded.
11. Ensure that the fluoropolymer drain cock on the glass boiler is closed.
12. Connect the cooling water inlet of the glass condenser to the cold water feed supply through the tubing provided. For easy attachment to the glass condenser a plastic screw thread is attached to this tubing at the other end.
13. Use the PVC tubing to connect the distillate outlet on the glass condenser to a suitable collection reservoir.
14. Connect the main of the metal heater to a fused 15amp electric supply capable of providing a load of 3KW at 230V+10%, 50/60 cycles single phase.

IMPORTANT: THE EQUIPMENT MUST BE EARTHED

STARTING THE WATER STILL

1. Turn on the cold-water supply and adjust the flow rate to approximately 60 liters/hour (1 liter/minute). Allow the water to flow via the glass condenser into the glass boiler. When the water level reaches the correct operation level and excess water flows to the drain, turn on the heater.
2. When the boiling commences and the distillate emerges from the glass condenser, start collecting the distillate in the reservoir.

CLEANING

Over a period of operation scale deposits will build up inside the boiler. To obtain optimum performance from the still, the scale should be removed on a regular basis.

The time span between cleaning depends greatly on the hardness of the water supply and the amount of use.

Frequently used stills in hard water areas may need descaling once a week whereas in a soft water area several weeks may elapse before descaling is necessary.

N.B. Heavy scaling will reduce distilled water quality and can shorten the life of the heating element. It is possible to descale the water still without dismantling the glassware by following these instructions in conjunction with Control of Substances Hazardous to Health regulations (COSHH) 1988.

1. Switch off the electricity supply to the still and allow it to cool completely.
2. Turn off the cooling water supply.
3. Open the stopcock on the constant level control and allow the boiler to drain completely, Close stopcock.

4. Turn on the cooling water supply and allow the boiler to fill to approximately half way to its normal operating level. Turn off the water supply.
5. Into the open funnel of the constant level control carefully add about 1 litre of 10% formic acid solution or kettle descaler. Do not use strong acids such as hydrochloric, this can cause severe corrosion of the metal heating element.

WARNING!

ALWAYS HANDLE ACIDS WITH GREAT CARE. PROTECTIVE CLOTHING, GLOVES AND FACEMASKS SHOULD BE WORN DURING THE DESCALING OPERATION. REMOVE ANY ACID SPILLS IMMEDIATELY.

Turn on the water supply and fill the boiler to the normal operating level. The water will flush the acid into the boiler. The water supply should be turned off when the level in the boiler is slightly below the overflow.

6. Leave the acid in the boiler to dissolve the scale. This may take some time depending on the severity of the build-up.
7. Open the stopcock and allow the boiler to drain. Note: If the acid in the boiler has not been completely neutralized the liquid flowing to drain may be highly acidic. All necessary safety precautions should be observed around the drain and any effluent control procedures followed.
8. Close the stopcock, turn on the water and allow the boiler to fill with cold water. Turn off the water, reopen the stopcock and allow the boiler to drain. Repeat this procedure three times.
9. The water still may now be restarted by referring to the instructions given under "Operation" in this manual.

Note: The stand and outer surfaces of the glassware should be cleaned using a damp cloth and a mild detergent solution.

SAFETY CUT OUT

A thermostat is provided with the metal heater to protect the still from accidental failure of the water supply. When the glass boiler runs dry the thermostat automatically shuts off the metal heater. The thermostat resets when the metal heater cools.

NOTE ON SETTINGS OF THERMOSTAT:

The thermostat has been FACTORY SET. Do not adjust unless required. Please consult a qualified electrician to do any setting if required.

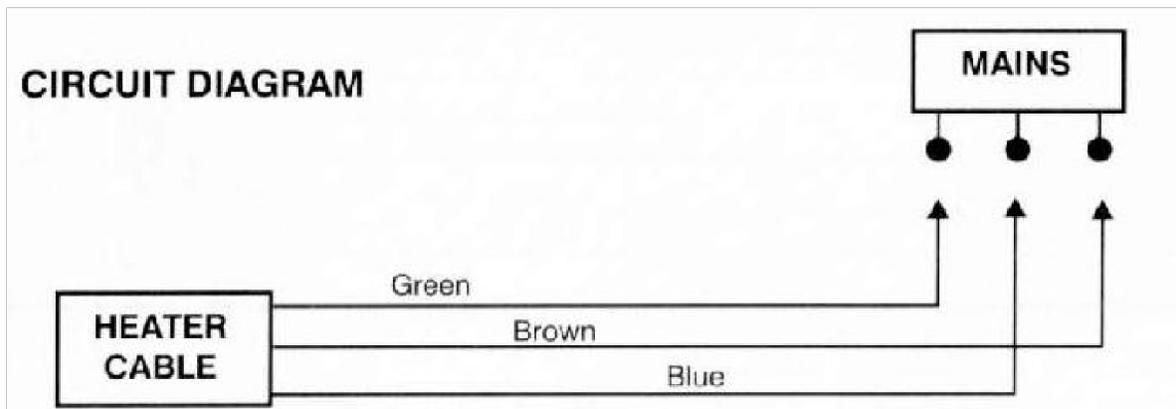
SETTING THE THERMOSTAT:

FIRST THE MAIN WATER SUPPLY IS TURNED OFF. IF THE THERMOSTAT DOES NOT OPERATE.

REPLACEMENT OF FAULTY PARTS

1. METAL HEATER REPLACEMENT:

- A. The metal heater is turned off and the still is detached from the main electric supply.
- B. The glass boiler is cleaned, if heavy scaling is present, by the cleaning procedure detailed in this manual.
- C. It is easier to replace the heater by working with the glass boiler on the bench.
 - Remove the glass condenser
 - Drain the glass boiler via the drain cock
 - Remove the glass boiler complete with metal heater from the powder coated stand
 - Unscrew the three SS bolts securing the metal heater to the glass boiler.
 - Separate the metal heater from the glass boiler
- D. The new metal heater is fitted to the glass boiler by following the installation instruction.
- E. The still is reassembled by following the instructions.

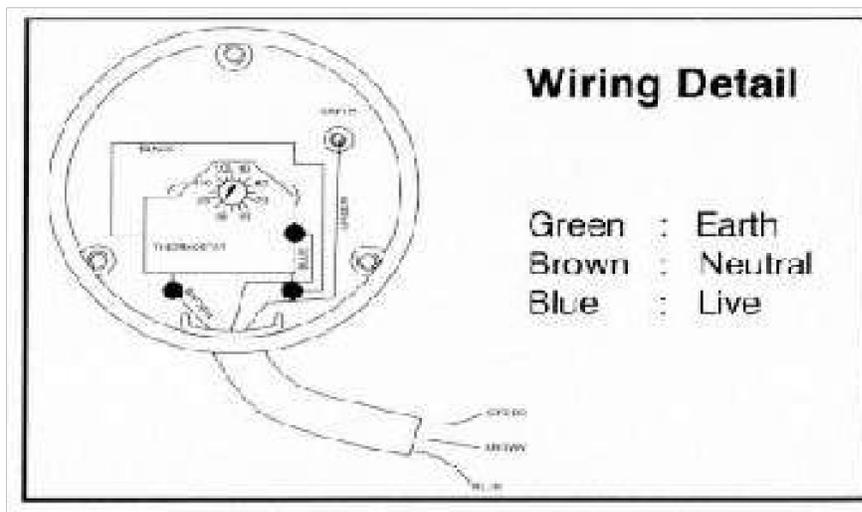


2. THERMOSTAT HEATER REPLACEMENT:

The thermostat is located within the metal heater and may easily be replaced by following this procedure.

- A. The metal heater is turned off and the still is isolated from the mains electric supply.
- B. The three small retaining screws holding the plastic cover in place are removed (not the three bolts securing the heater to the boiler)
- C. Referring to the wiring diagram, the two wires to the thermostat are disconnected.
- D. The thermostat is removed from the heater pocket.

- E. The new thermostat is placed in position and the electric connections are made.
- F. Check whether the thermostat is set at 120 degrees Celsius.
- G. Replace the heater cover.



TROUBLE SHOOTING

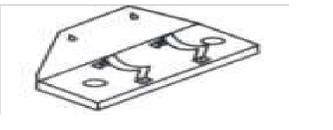
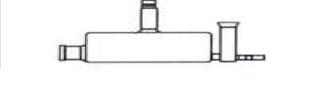
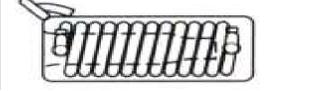
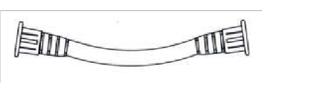
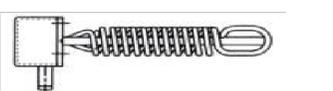
If there is any trouble with the operation of the water still, review and consider the following actions.

SYMPTOM	CAUSE	REMEDY
1. Distillate rate less than 4 liters per hour	Main electric supply below 230V, 10%	Ensure sufficient power supply.
2. Distillate temperature is high	Flow of cooling water in glass condenser not adequate.	Increase flow rate of water to approximately 60 liters per hour.
3. Distillate quality poor	Glass boiler heavily scaled.	Clean glass boiler
4. Water in glass boiler is pumped out of glass boiler to drain	<ul style="list-style-type: none"> a. Vent on the glass condenser distillate outlet is blocked b. PVC tubing with plastic connector from glass condenser distillate outlet to reservoir is constricted. c. Supply of feed/cooling water is insufficient. 	<ul style="list-style-type: none"> a. Remove blockage b. Ensure that PVC tubing with connector falls freely without any kinks or bends. c. Increase flow rate to approximately 60 liters per hour.

<p>5. Water level in glass boiler is too high e.g. boiling water surging in to glass condenser</p>	<p>a. Flow of drainage water is constricted by any kinks or bends. b. Supply of feed/cooling water is excessive</p>	<p>a. Ensure PVC drain pipe falls freely b. Reduce flow rate to approximately 60 liters per hour.</p>
<p>6. Water level in glass boiler is too low e.g metal heater exposed</p>	<p>a. Drain cock on glass boiler inadvertently left open b. Supply of feed/cooling water is sufficient.</p>	<p>a. Close drain cock in the glass boiler b. Increase flow rate to approximately 60 liters per hour.</p>
<p>7. Metal heater not working</p>	<p>a. Burnt out metal heater Mains electric fuse b. down Faulty thermostat c.</p>	<p>a. Replace metal heater b. Replace fuse c. Replace thermostat</p>
<p>8. Metal Heater repeatedly cycles on & off</p>	<p>a. Faulty thermostat b. Thermostat set at incorrect temp.</p>	<p>a. Replace thermostat b. Set thermostat at 120 degrees Celsius</p>

WARNING: PLEASE ENSURE THAT ALL ELECTRICAL CONNECTIONS ARE DISCONNECTED BEFORE OPENING THE HEATER COVER.

PACKING LIST OF WATER DISTILLATION UNIT

	Item Description	Picture
1	Powder coated stand	
2	S.S. Boiler straps with spring	
3	Glass boiler	
4	Glass condenser	
5	Silicon "O" rings small & big	
6	PVC Drain Pipe	
7	Silicon tubing with threaded plastic connector	
8	PVC tubing with plastic connector	
9	Metal Heater	
10	Neoprene rubber gasket	
11	Metal flange	
12	Stainless steel bolts	
13	HDPE collar insert	

WARRANTY:

On Heating Element – 1 year including Parts and Labor.

On Glassware – on damage upon receipt.

Dynalab Corp./Dynalon Labware must be notified immediately on any glassware damage.



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