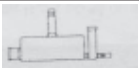
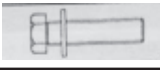
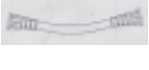
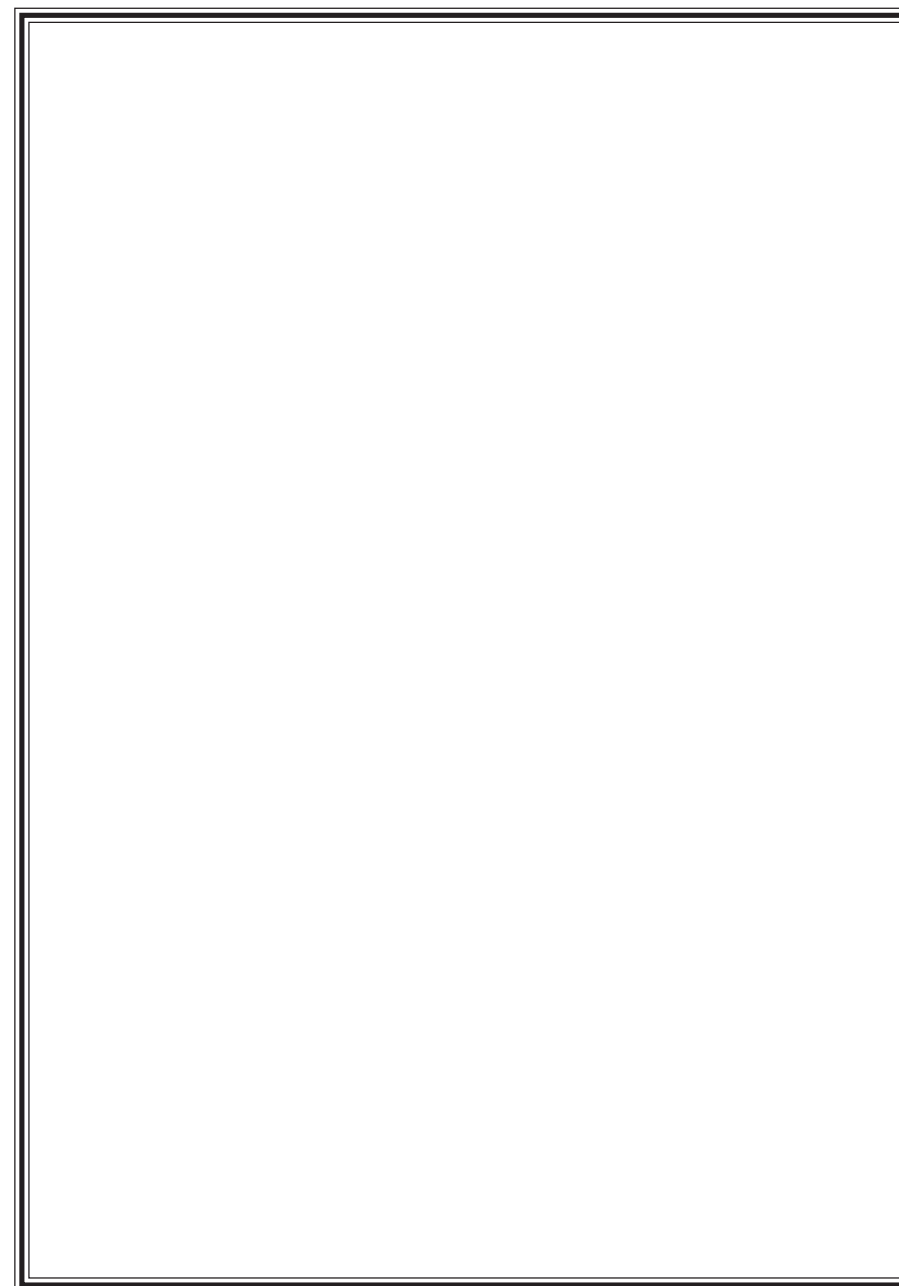


Operating Manual
for

W A T E R
D I S T I L L E R



Part no.	Item Description	Diagram
1	Powder Coated Stand	
2	Glass Boiler	
3	Glass Condenser	
4	Metal Heater	
5	P.V.C Ring	
6	Metal Flange	
7	Stainless Steel Bolts	
8	HDPE Collar Insert	
9	Stainless Steel Boiler Straps With springs	
10	PVC drain pipe	
11	PVC tubing with threaded plastic connector	
12	PVC tubing with plastic connector	
13	Silicone tubing for distilled Water	



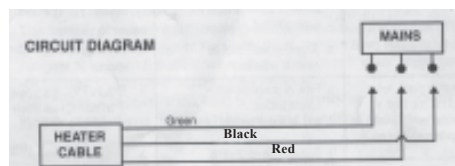


Warning : Please ensure that all electrical connections are disconnected before opening the heater cup.

REPLACEMENT OF FAULTY PARTS/COMPONENTS

Metal Heater (Part no.4) Replacement:

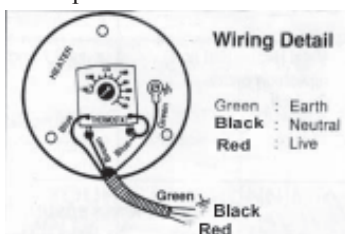
- 1 The metal heater (Part no.4) is turned off and the still is located from the mains electric supply.
- 2 The glass boiler (Part no.2) is cleaned if heavy scaling is present by the following the Cleaning procedures detailed in this manual.
3. It is easier to replace the heater by working with the glass boiler (Part no.2) on the bench.
 - ◆ Remove the glass condenser (Part no.3)
 - ◆ Drain the glass boiler (Part no.2) via drain cock
 - ◆ Remove the glass boiler (Part no. 2) complete with metal heater (Part no.4) for the powder coated stand (Part no.1).
 - ◆ Unscrew the three stainless steel bolts (Part no 8) securing the metal heater (Part no. 4) to the glass boiler (Part no.2) .
 - ◆ Separate the metal heater(Part no.4) from the glass boiler (Part no.2)
4. The new metal heater is fitted to the glass boiler (Part no.2) by following the installation instructions -3
5. The still is reassembled by following the installation instructions 4-12



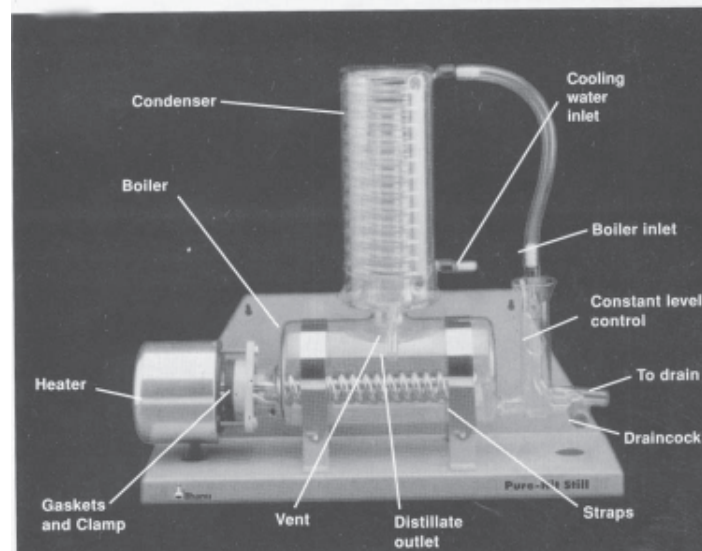
THERMOSTAT REPLACEMENT :

The thermostat is located within the metal heater (part No.) and may easily be replaced by following these instructions:

1. The metal heater (Part No.4) is turned off and the still is isolated from the mains electric supply.
2. The three small retaining screws holding the aluminium cup in place is removed (Not the three bolts securing the heater to the boiler.)
3. Referring to the wiring diagram, the thermostat are disconnected.
4. The thermostat is removed from the heater pocket.
5. The new thermostat is placed in position and the electrical connection are made.
6. Check whether the thermostat is set at 120°C.
7. Replace the metal cover of the heater.



Pure-Hit Still



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., 230 V $\pm$ 10%. 50-60 cycles and with a fuse carrier of 15 amps .
- ◆ A conventional 15 amps plug and socket, wall mounted, is recommended
- ◆ The equipment must be earthed in all cases. Red - Live, Black - Neutral & Green- Earth.
- ◆ Cooling water supply for glass condenser(part no.3) capable of providing minimum flow rate of 60 ltrs/ hr. 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 the still so that the PVC drain pipe (part no. 11) from the glass boiler (part no.2) can fall straight without kinks or bends to allow unimpeded flow of water.
- ◆ Space for distillate collection reservoir to be located below the still

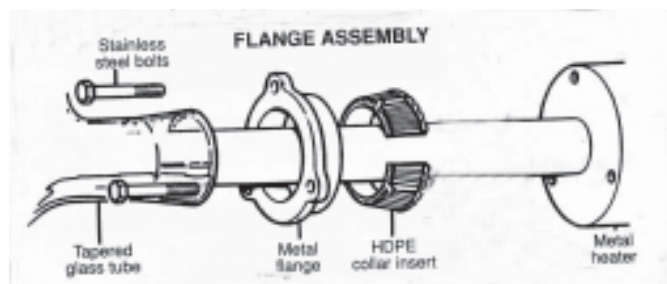
INSTALLATION

1. Open the box carefully & identify following components:-

Component	Quantity
Powder coated stand with 2 stainless boiler straps with spring (Part No.1 & 10)	01
Glass boiler (Part No. 2)	01
Glass Condenser (Part No. 3)	01
Metal Heater (Part No. 4)	01
Hose kit (Part No. 11, 12, 13)	01
Gasket kit (Part No. 7, 8, 9)	01

2. Place the powder coated stand (Part No. 1) at a suitable location, bench top or wall mounted using the two keys holes provided.

3. Take the glass boiler (Part No. 2) ensuring that big P.V.C 'O' ring (Part No. 5) on the vapour tube are in place. The P.V.C 'O' ring (Part No. 5) to be seated on the top groove of the vapour tube of the glass boiler (Part No. 2). The bigger P.V.C 'O' ring (Part No. 5) is to be adjusted such that when the glass condenser (Part No. 3) is placed over the vapour tube it does not shake. Take the metal heater (Part No. 4) the metal flange (Part No. 7) & the HDPE collar insert (Part No. 9) & assemble as shown in figure No. 1.



- Place the metal flange (Part No. 7) (flat side facing the boiler) over the tapered glass neck of the glass boiler (Part No. 2).
- The HDPE Collar insert (Part No. 9) is bent around the tapered glass neck & into the metal flange (Part No. 7). The metal flange (Part No. 7) is pulled & inserted towards the end of the glass boiler (Part No. 2) neck so that when the metal flange (Part No. 7) is pulled the HDPE collar insert (Part No.

TROUBLE SHOOTING

Incase of any operating difficulties with the following tips may help

SYMPTOM	CAUSE	REMDY
1 Distillate rate less than 4ltr/hr.	Mains electric supply below 230V $\pm$ 10%	Ensure sufficient power Supply.
2 Distillate temperature high	Flow of cooling water in glass condenser (Part no.3) not adequate.	Increase flow rate of water to approx. 60 ltr/hr.
3 Distillate quality poor.	Glass Boiler (part no.2) heavily scale.	Clean Glass Boiler (Part no.2)
4 Water in glass boiler (Part no.2) is pumped out of glass boiler to drain	a. Vent on glass condenser (part no.3) distillate outlet is blocked. b. PVC Tubing with plastic connector (Part no.13) formg glass condenser (Part no.3) distillate outlet to reservoir is constricted. c. Supply of feed/ cooling water is insufficient.	a. Remove blockage. b. Ensure that PVC tubing with plastic connector (part no.13) falls freely without any kinks or bends. c. Increase flow rate to approx. 60 ltr/hr
5 Water level in glass boiler (part no.2) is too high e.g., boiling water surging into glass condenser (part no.3)	a Flow of drainage water is constricted. any kinks or bends. b. Supply of feed/ cooling water is excessive	a Ensure PVC drain pipe (part no.11) falls freely without any kinks or binds b. Reduce flow rate of water approx.60 ltr/hr.
6. Water level in glass boiler (part no.2) is too low e.g., metal heater (part no.4) exposed.	a Drain cock on glass boiler (part no.2) inadvertently left open b. Supply of feed/cooling water is insufficient	a. Close drain cock in the glass boiler(partno.2) b. Increase flow rate of water approx.60 ltr/hr.
7 Metal Heater (part no.4) not working	a. Burnt out metal heater (part no.4) b. Mains electric fuse blown c. Faulty thermostat	a. Replace metal heater (part no 4) b. Replace fuse. c. Replace thermostat.
8. Metal Heater(Part no.4) repeatedly cycles On & off.	a. Faulty thermostat b. Thermostat set at incorrect temperature	a. Replace thermostat. b. Set thermostat at 120°C.

- 6 The drain cock in the glass boiler(Part no.2) is closed and the glass boiler(Part no.2) is filled with cold water and allowed to drain out . This procedure is repeated two or three times.
- 7 The still can be restarted when the glass boiler (Part no.2) is filled with water. The still should be allowed to run for around 10 minutes before collecting the distillate .

REGULAR CLEANING WILL KEEP YOUR STILL RUNNING AT OPTIMUM CONDITION.

- 9) seals on to the neck.
- (c) Insert the metal heater (Part No. 4) through the tapered glass neck & into the glass boiler (Part No. 2).
- (d) Secure the metal heater (Part No. 4) with the three stainless steel bolts (Part No. 8) provided. Care should be taken not to over tighten the bolts. The heater axis should be parallel to the boiler axis.
4. Place the glass boiler (Part No. 2) & heater assembly in the cradle of the powder coated stand (Part No. 1). Connect the metal heater (Part No. 4) cables to the pins of the 15 Amps connector as per circuit diagram on Page 6.
5. Mount the glass condenser (Part No. 3) on to the vapour tube of the glass boiler (Part No. 2). The distillate outlet tube or vent should face the front.
6. Take the silicon tubing with screw threaded connectors at either end (Part No. 12). Screw one end of the silicon tubing on to the upper outlet of the glass condenser (Part No. 3) & the other end to the glass boiler (Part No. 2) inlet.
7. Take the other P.V.C drain pipe (Part No. 11) & connect to the drain of the glass boiler (Part No. 2).
8. Lead the free end of the P.V.C drain pipe (Part No. 11) to the drain. Ensure that there are no kinks or bends in the tube so that water flow is not impeded.
9. Ensure that the Teflon drain cock on the glass boiler (Part No. 2) is closed
10. Connect the cooling water inlet of the glass condenser (Part No. 3) to the cold water feed supply through the hose provided. For easy attachment to the glass condenser (Part No. 3) a plastic screw thread is provided along with the hose.
11. Connect the distillate outlet on the glass condenser (Part No.3) to a suitable collection reservoir with the help of a P.V.C tubing with plastic connector (Part No. 13).
12. Connect the mains of the metal heater (Part No. 4) to a 15 amps electric supply capable of providing a load of 3KW at 230V $\pm 10\%$, 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 ltr/ hr.
Allow the water to flow via the glass condenser (Part no.3) into the glass boiler (Part no.2) When the water level reaches the correct operating level and excess water flows to drain, turn on the heater.
- 2 When the boiling commences and the distillate emerges from the glass condenser (Part no.3), start collecting in the reservoir.

SAFETY CUT - OUT

A thermostat is provided with the metal heater (Part no.4) to protect the still from accidental failure of the water supply. When the glass boiler (Part no.2) runs dry the thermostat automatically shuts off the metal heater (Part no.4). 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 settings if required.

SETTING THE THERMOSTAT

First, the mains water supply is turned off . If the thermostat does not operate within two minutes of steam issuing from the distillate outlet tube it is necessary to reduce the thermostat temperature by 5°C. Conversely , if the thermostat operates during normal running conditions the thermostat temperature should be increased by 5°C. Before the thermostat temperature is adjusted the mains electric supply should be TURNED OFF. The thermostat cover

(aluminium cup) which is held in place by three retaining screws is removed . This gives easy access to the thermostat with graduated dial. The cover is replaced after resetting the temperature. After each adjustment the operation of the thermostat should be checked.

CARE AND MAINTENANCE

For prolonged life of the still it is necessary that regular care and maintenance should be taken . Before any maintenance operation, the still must be isolated from the mains electric supply .

CLEANING

Over a period of operation, scale deposits may develop inside the glass boiler (Part no.2). For peak performance from your still it is necessary to clean the glass boiler (Part no.2) regularly. The number of times the still needs to be cleaned during the course of its operation depends on the hardness of the water used. In very hard water areas it might be necessary to clean the still once a week, while in soft water areas several weeks may elapse before cleaning becomes necessary . 10% formic acid (methanoic acid) is used for removing scale deposits.

Proper precautions must be taken during handling of acids.

STEPS ON CLEANING

- 1 The electric supply to the still is switched off and the water in the glass boiler (Part no.2) is allowed to cool .
- 2 The cooling water supply is turned off.
- 3 The teflon drain cock in the glass boiler (Part no.2) is opened and the water in the glass boiler (Part no.2) is completely drained off. The drain cock is then closed.
- 4 Through the funnel of the glass boiler (Part no.2) inlet tube fill dilute 10% formic acid solution till the operating level is reached. Excess acid should be avoided .
- 5 The acid is allowed to react and break down the scale deposits. The time taken depends on the severity of scale build up.
Important: Safety precautions have to be observed since the liquid flowing to the drain may be acidic as it may not be completely neutralized.