

NeedleFlame

HHO Gas Generator

Operator's Manual

Contents:

Pg.2 – Positioning.

Mixing the Potassium.

Pg.3 – Filling The Bubbler

Pg.4 – Starting Her Up

Normal Operation and identifying Leaks

Pg.5 – Day To Day Use

Pg.6 – Overpressure, Failure and Maintenance

Introduction

HHO (Oxy-hydrogen) has been used for years in workshops due to its excellent properties. Extracting gases from water makes HHO cheap to produce, easy to use, easy to maintain and with its supply-on-demand capabilities, eliminates any need for gas bottle storage.

The NeedleFlame has been designed to fit in any of today's workshops. With its sleek and more compact design, added safety features, and upgraded internals the NeedleFlame can produce more punch with its power.

As the method for extracting gasses from water remains the same, more has been done to give the user a solid and reliable flame. Not drifting too far from its predecessors the NeedleFlame will feel very familiar in its day-to-day use and maintenance.

Inside the box

1. 625gram bag of potassium hydroxide flake
2. 2m Power cable
3. 2m (long) black neoprene hose
4. Operator's hand torch
5. Set of stainless-steel torch nozzles
6. 60ml measuring syringe
7. Bubbler Flask
8. The NeedleFlame unit
9. Operation manual
10. COSHH sheet
11. Certificate of compliance

Note: It's a good idea to keep the box and packaging for any future machine repair and service requirements.

Due to its components, the NeedleFlame units are very heavy; care must be taken when lifting these units.

Step 1: Positioning

- Position is very important. As the unit is heavy and contains chemicals keeping your unit in a safe fixed position is key. Lift the unit with a hand under each side and comply with H&S manual handling guidelines.
- Positioning can be on a desk/worktop, suitable shelf, or a solid floor.
- Allow a suitable air gap (minimum 15cm) around your unit as the onboard fan will suck air in and out of its vents for cooling purposes.
- Avoid placing near a heater or radiator as overheating issues will arise.
- Allow enough room to have access to the top hatch for filling purposes.
- Have mains socket close by.

Step 2: Mixing and adding the Potassium Hydroxide

CAUTION: Ensure correct PPE is worn. As a minimum, wear gloves and eye protection!

- Pour 500ml of De-ionised water into a 1litre glass or chemical-resistant beaker. Then slowly add the whole bag of Potassium Hydroxide flake (KOH) being careful not to splash.
- Use a stirring rod to mix the KOH mixture until completely dissolved. The solution will turn grey and become very hot. This is a normal chemical reaction. At this point there will be fumes so please do this in a well-ventilated area.

You must let the solution cool for at least 30 minutes. It is very important that you do not add the solution to the unit whilst it is still hot. The heat can cause internal pipes to soften and lead to leakage.

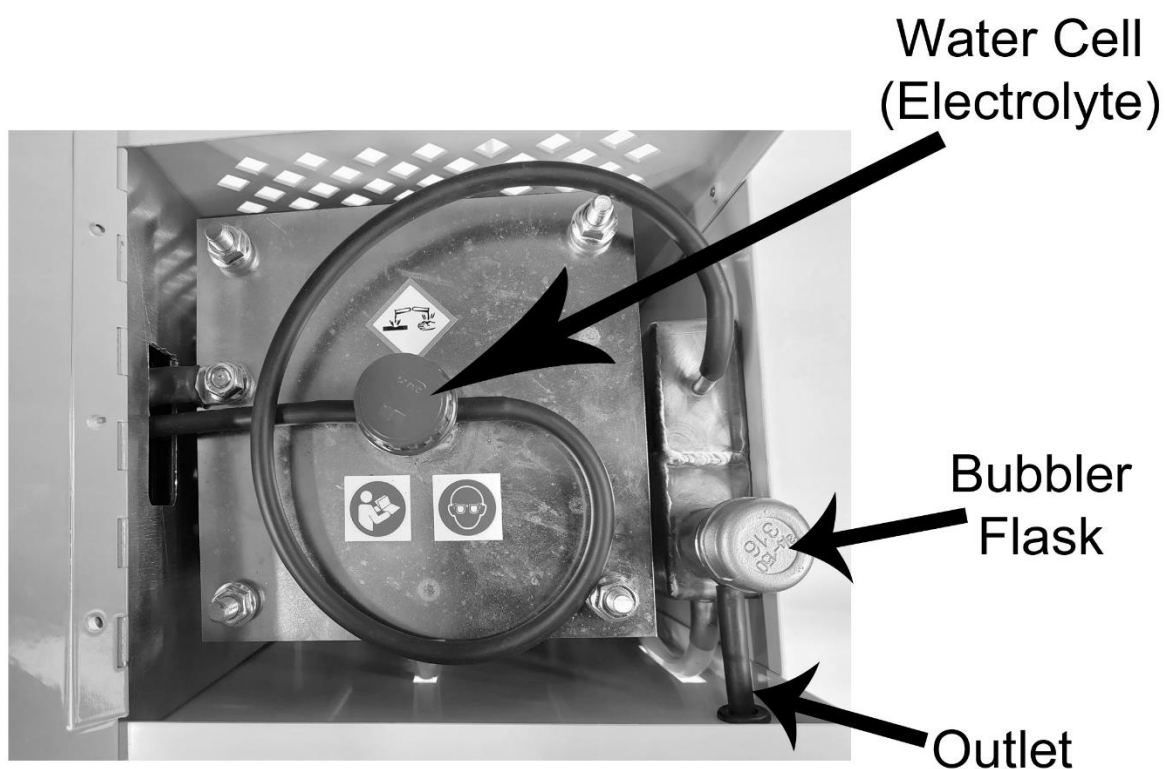
- After 30 minutes the solution will have cleared in colour and cooled enough to then pour in to the main tank (cell) of your Needle-Flame. **Use a funnel to avoid spillage.** Spillages can cause damage and void the warranty.
If you get any KOH drops on your skin wash off with plenty of warm water.

Top Tip! If you wet a tissue with vinegar, you can easily wipe and neutralize the area of skin before it becomes irritated. If irritation occurs and worsens take the provided COSHH sheet and seek medical attention.

- Once all the KOH solution is safely poured into your NeedleFlame cell you should then slowly top up with De-ionised water. Top up slowly until you reach just a little under the **‘TOP’** line on the front of the unit. **2.6 litres total.** During operation, the level may rise slightly as gas is produced.
- Fasten the top cap on to your cell making sure it is nice and hand tight to prevent gas leakage.

Step 3: Filling the Bubbler Flask

- Attach the long neoprene hose to the 'outlet' on the flask, which leads out through the hole on the front of the unit.
- Remove the bubbler flask top cap, and with the syringe, or a funnel, you can start slowly adding 100ml of water (this can be tap water). This will bring the level to the **bottom line** displayed on the front of the unit.
- With the syringe, add only 50ml of M.E.K to the flask. This will bring it to its maximum **top line** displayed on the front of the unit. Spillage of M.E.K can result in cosmetic damage and void the warranty.
- Fasten the Bubbler top cap on, hand tight.
- Attach the Operators hand torch to the end of the long neoprene hose. Make sure the torch valve is closed.
- Close down the hatch on top of the NeedleFlame unit.



Step 4: Starting her up

- Attach your nozzle of choice to the end of the hand torch. Each nozzle has a gauge size stamped on it. The lower the number, the bigger the nozzle jet will be. This model of NeedleFlame can run a no.17 as its biggest jet for a short period of time.
- The nozzle is attached with a quarter of a turn in a clock-wise twist. Using a pair of pliers makes short work for this.

Be careful not to tighten too far as this can cause damage to your torch and will require a replacement.

- After fastening the mains cable to the back of the unit you can now plug it into the mains socket on the wall.
- Turn on the NeedleFlame by the large green switch on the front of the unit.
- You will hear the fan start up and continue to run. The green 'Gas Production' light will illuminate briefly. If the green light flickers intermittently see page 4 for '**Leaks**'.
- After topping up solutions you need to run the unit for a few minutes with the hand torch valve open. This will allow any bad air trapped to be pushed out of the unit as HHO gas is produced. Do not attempt to light your torch at this stage as the flame will not light.

You do not need to do this every time you start your unit. Only after topping up.

- After a few minutes of running the unit with the valve open you will notice a smell of M.E.K. This is only while it is not lit.
- You can now light your torch tip and begin using your NeedleFlame.
- When finished, extinguish the flame by closing the valve on the torch handle.

Step 5: Normal operation and identifying leaks

- The NeedleFlame works with its built-in pressure sensors. When the torch is opened, pressure inside the unit drops. The green light will now illuminate indicating gas production. The green light will now pulse on and off during the use of the flame. The pulse of the green light can indicate many symptoms of the unit. A regular intermittent pulse is a happy one.
- The pulse rate is affected by the size of the nozzle on your torch, and how recently your cell KOH solution was replaced. With every size nozzle you are still able to regulate the flame by adjusting the valve on the torch.
- Closing your torch valve will extinguish the flame. The gas production light should now go out and stay out.

Day To Day Use

Every new day it is important to follow the following steps before using your NeedleFlame machine.

1. Before turning on your NeedleFlame look at the water cell level. If it is halfway between the top and bottom line, or lower, top up with deionised water. As close to the top line as possible as this is where gas production is at its optimum. Careful not to spill any solution on top of the machine. Then replace the top cap and tighten by hand. If top up is not necessary jump to step 2.
2. Turn on NeedleFlame and open the torch, **do not light it**.
This will allow gas production to pass through and correct all liquid levels within the machine. Sometimes, an anomaly known as **back-siphonage** can cause the levels, only the MEK flask, to drop. This is completely normal. It happens because of temperature change as the machine cools from previous days use.
3. After a brief moment the flask level will rise to its current level. If the maximum level is in between the top and bottom line, or lower, turn off the machine (torch open) and top up flask with MEK. Replace lid and allow gas to push through for a moment.
4. Close the torch and note the following:
 - The green light should come on briefly and then go out, and stay out. If so, jump to last step.
 - If the green light starts to blink on and off, this means one of the top caps may not be on tight enough. Please check both, the water cell and MEK flask. Also check the torch valve is closed
 - If you are happy the green light has remained out for a moment, open your torch, allow gas to flow then light it. If it does not light, allow a little more time for gas to flow then light it again.

Leaks

If your gas production light starts to pulse whilst you are not using the torch, and you are sure your torch valve is closed correctly then you have a gas leak somewhere on the unit.

1. Be sure your cell top cap and bubbler top cap are tight.
2. Fold and hold tight the black long hose from torch to bubbler for a few moments. If the pulse stops, the leak is near the torch end.
3. Fold and hold tight the black small hose from cell to bubbler for a few moments. If the pulse stops, the leak is near the bubbler.
4. If at this stage the light still pulses, inspect all hose connections and inspect the washers inside each top cap; the one on the cell and bubbler. New parts may be needed to replace any perished gaskets or hoses.

If parts are needed, please contact your NeedleFlame supplier.

Over Pressure warning

The NeedleFlame units are fitted with a safety Over Pressure shut-off. This is in case of any malfunction with the pressure switch or overheating from excessive use.

Pressure Switch Failure

Electrical parts don't last forever but, in this instance, if the pressure switch fails to detect normal working pressure, a relay detecting over pressure mechanically shuts down all power to the unit eliminating any production of HHO gas. The machine will go silent (the fan will stop) and the red 'Over Pressure' light will illuminate. Close your torch valve to extinguish the flame. Once the flame is out, open the torch to release all pressure from the unit. The red light will now go out. Close the torch and turn the unit back on. If over pressure persists, contact your supplier.

If the 'Over Pressure' light comes on due to overheating of the HHO cell, release all pressure as detailed above, when pressure is released close the torch and keep closed, turn the unit on and allow the fan to run for a while helping the machine to cool. Do not use the flame at this point for at least 30 minutes.

Maintenance, Service, Repairs and Spares

Maintenance is very important with the NeedleFlame unit. Lack of maintenance can cause parts to fail or break and the unit can potentially become unsafe. Not the end of the world, as all parts are readily available, just inconvenient.

Service:

Due to the nature of the KOH, as time goes by the cell will need cleaning and pipes will need replacing.

Symptoms of a necessary service are:

1. Smaller flame than usual.
2. Constant green light when torch is in use.
3. Strange burning smell.
4. Unreadable sight levels.
5. Popping noise at torch tip when turning off.

During a service the KOH will also need replacing. Check with your local authorities on how to dispose of the old KOH mix you are replacing.

We recommend your unit is serviced annually by a trained engineer. Where this service is carried out by NeedleFlame, it will be carried out by one of our trained engineers and will be returned with a service warranty of **three** months for the machine and twelve months for any parts that have been replaced.

Contact your supplier for all information on **A Full Service**.

Repairs and Spares:

If parts fail or break contact your supplier with details, any parts can be shipped out when available. Or, similar to the Full Service, the Needle-Flame can be sent in for repair. These repairs, if carried out by NeedleFlame, will be covered under the same warranty details as above.

NeedleFlame

HHO Gas Generator

Designed and built by Team Stone Ltd

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