

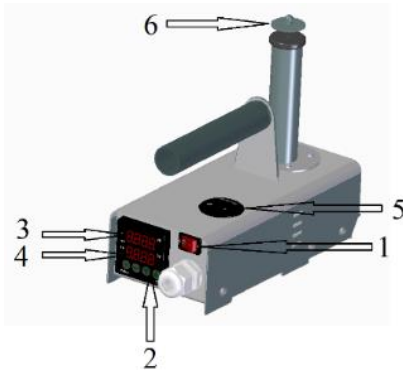
Crystalline oxalic acid sublimator / vaporizer instructions for use

A device for the treatment of Varroa mites, for the application of oxalic acid di-hydrate into a hive by vaporization (or sometimes it is called sublimation).

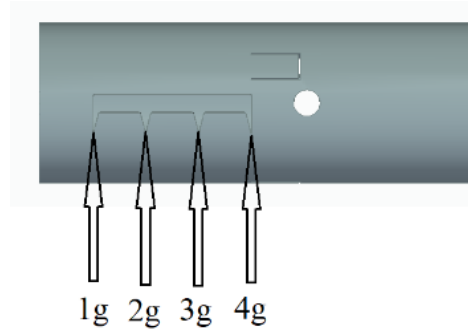
InstantVap 12: DC 12V 240W 20A

InstantVap 18: DC 18V 240W 13A (powered by Li-Ion small machine batteries)

The sublimation device should only be used in closed clothing with appropriate protection, gloves (chemical resistant gloves) and a protective mask (the appropriate respiratory protection should be a full face mask with A2B2E2K2-P3 combined filter inserts)! Inhalation or contact with eyes of sublimated oxalic acid, even in small quantities, will cause serious damage to health! The parts around the furnace and the outlet tube of the device, which will heat up, should only be used with gloves on! When sublimating, special attention must be paid to the fact that the oxalic acid vapour may be blown by the wind towards other persons not wearing protective equipment, and this must be avoided at all costs!



1. Figure: Vaporizer parts



2. Figure Oxalic acid dispenser quantities

1. Before connecting (and removing) the battery, switch off the heating (load) with switch marked **1**.
2. Red = positive, Black = negative. IMPORTANT: incorrect polarity will damage the machine and this failure will not be covered by the warranty!
3. Set the desired temperature (between 200-230°C, lower temperature results in slower sublimation, recommended: 210-230°C) with the up/down arrows (**drawing 2**).
4. Pull out the oxalic acid dispenser (**6**) and set the desired gram quantity as shown on **Figure 2**. The setting can be adjusted by turning the serrated washer at the end of the dispenser. The outward facing plane of the washer rotating inside the dispenser and the position of the lines indicate the set gram quantity. (For average to medium strength hives, a setting of 2g is recommended, for especially large colonies: 2,5-3g.) Return the dispenser and push it into place.
5. Turn on the heating of the machine with the switch (**1**). Wait for the machine to warm up to the set temperature. IMPORTANT: position the machine so that the hot parts do not burn or melt anything! Leave the dispenser (**6**) in the machine when warming up, it will heat up faster. It takes 3-5 minutes to heat up.
- 6 Put on a full face mask, gloves and closed clothing before the oxalic acid treatment.

7. Place the copper tube located on the front of the machine into the hive, lightly pressing the front of the machine plate against the outer wall of the hive. (Either through the 7mm hole drilled in the back of the hive or through the entrance). Release the machine to hold it by itself, but never lean on it! The brass outlet tube is strong enough to support the self-weight of the vaporizer.
8. Pull the dispenser out of the device and press 2-3 times confidently into the oxalic acid to fill it up. The serrated pressure plate should not be pressed at this time, but kept free.
9. Place the dispenser back in the machine and with one firm movement, push down on the moving end of the spring-loaded dispenser to empty the oxalic acid into the bowl.
10. Wait until the thermostat is a few degrees near the set temperature, i.e. until the oxalic acid has vaporized and the bowl is heated back. (~20-25 sec /2g for 230°C bowl)
11. Remove the outlet tube from the hive and proceed to the next beehive and continue with the process 7-10.
12. Monitor the battery display on the voltage indicator (5) and do not allow the battery to over discharge! For 12V battery at 8V, for 18-20V Li-ion battery at 14.7-15V, switch off the device (**1**) and replace the battery!
13. After handling the last hive, switch off the tool (**1**) and remove the battery. (The battery should be charged as soon as possible!)
14. Wait till the device cools down below 80 degrees, then pour ~1/3 dl of water into the dispenser entry tube, put back the dispenser and shake gently. Remove the dispenser and carefully pour out the water. Repeat 2-3 times.
15. You can wash the dispenser separately, agitate it in water and then allow the bowl and dispenser to dry.
16. If necessary, clean the outside of the appliance with a slightly damp cloth.
17. Put the appliance away only when it is cool, so as not to cause fire or burns.

Although it is possible to treat bees through the entrance, it is better to drill a hole in a place less accessible to the bees and let the sublimated oxalic acid in through that hole. Such a place could be at the bottom of the cleaning slats, on top of the escape area, or a few centimetres below the frames. It is advisable to make the oxalic acid inlet hole as far away from the exit as possible, even diagonally across, to maximise the passage of the oxalic acid through the hive. It is advisable to drill the hole at the back of the hive, so that access is easier and the bees' movements are not disturbed. The outer diameter of the outlet tube is 6mm, so a 7mm hole should be drilled. The sublimator can stand firmly in a hole of this size, but it will not get stuck. The hole should be plugged with something to prevent bees from getting propolis or wax on it. You can even use a golf tee as plug, etc. for this purpose. **The device is to be used only outdoor, never indoors!**

When moving from hive to hive, do not wait for the furnace to heat back completely before adding oxalic acid. It is advisable to use oxalic acid 2-hydrate of analytical purity (min 99,8%), as this will reduce the amount of fouling in the bowl.

If you have any comments, suggestions or questions, please contact: instantvap@gmail.com

Yours sincerely, János Fenyősy (+36 30 357 3509)