

**Thank you for choosing a GHE hydroponic system. They are dependable, high-quality tools. Don't hesitate to contact us for information or technical support : +33 (0)5 62 06 08 30 or tech@eurohydro.com**

## UNPACKING AND SETTING

Check the packing list and familiarize yourself with the parts.

Abundant light, proper temperature and humidity, and adequate ventilation, are crucial to fast growth, healthy plants, and higher yields. Place the system in a warm, well-lit, well-ventilated location, such as an outdoor garden, sunlit window, patio or greenhouse. And of course, keep your system away from areas where the inevitable dripping that occurs during filling, draining and pH adjustment might cause damage.

## THE NUTRITIVE SOLUTION

You can mix your solution directly in the reservoir or in any other container. You can prepare a solution in a large container and keep it (covered) to top-off the system when needed. For your cuttings and in small units, you can use 30% tap water and 70% rain or demineralised water.

Our two nutrient systems, Flora-series and One Part, are adapted to your growing unit. They are exhaustive, user-friendly, and regularly updated formulas. You will find detailed application charts on your bottles. Other GHE products are available to help you optimise your crops : Diamond Nectar, Ripen, Mineral Magic, the BioBoosters, and the pH regulators. (See p. 26)

Flora-series was specially formulated to allow you to closely monitor your plant's growth at each stage of its development. The following formula for fast flowering annuals is very easy to use and gives amazing results on crop quantity and quality.

	FloraGro	FloraMicro	FloraBloom
<b>Cuttings</b>	1	1	1
<b>Vegetative stage</b>	3	2	1
<b>Fruiting and flowering</b>	1	2	3

*EC range for your hydroponic mixes :*

*Cuttings : 0.4 to 0.8 EC      Vegetative stage : 1.2 to 1.8 EC      Fruiting and flowering stage : 1.8 to 2.0 EC*

Last days before harvesting add only water with adjusted pH, or use Ripen.

To benefit from the best salt dilution, adjust your water to a pH between 5.5 and 6.5, before mixing. Check after and readjust if needed. Use our pH Down regulators (liquid or powder – see labels). These high-end formulas contain special pH buffers, which help stabilize your pH level. In addition they are quite convenient as you use the same formula during all your plant's life, from vegetative growth to flowering, and/or fruiting.

For practical measuring, use the cap of 1 or 1/2 litre bottles : 1 cap = 10 ml.

Example : For 20 Litres of pure water : 1 cap FGro + 2 caps FMicro + 3 caps FBloom = +/- 1.00 to 1.50 EC,

depending on the quality of your water

Important notice : Shake your bottles before using.

Our nutrients are extremely concentrated. Very little is needed for your crop. To avoid any precipitation while mixing your solution, make sure to rinse your measure after pouring each component, and never mix the components together.

## BIOPONICS ! (ORGANIC HYDROPONICS)

**Bioponics is a revolutionary cultivating method which allows you to finally go organic with your hydroponic system.**

In bioponics with a humid substrate like rockwool, coconut fibre or perlite, use BioSevia with BM. In bioponics with a draining substrate like clay pellets or lava rocks, or with bare roots, add the BioFiltre.

Detailed instructions come with your bottle. Please read them carefully. As bioponics is a new concept, don't hesitate to contact us : we guarantee fast and complete technical advice and follow up.

## GROROX (THE CLAY PEBBLES)

There are different qualities of rocks, the best ones are neutral (which don't influence your solution's pH). For "hydro" systems, GHE offers a special Grorox mix. Inquire with your supplier.

Before use :

- It is important to wash your rocks correctly to get rid of the dust and other particles and residues.
- Check the rock's pH : Put some pebbles in a glass of distilled water. Stir well and let it rest. Measure the pH. If it is high (pH>8.0), soak overnight in an acidic solution (pH<4.0). Then rinse thoroughly.

After the crop :

- If needed, especially if you had a disease or an insect infestation, it is recommended to disinfect thoroughly : soak in pH Down (pH<4.0) overnight and rinse thoroughly.

## COCOTEK (100% BIODEGRADABLE AND NATURAL COCONUT FIBER AND LATEX).

The CocoTek pots exist in Ø 5 & 7,5 cm. You can use them with your choice of substrate (clay pebbles, lava rocks, perlite, vermiculite, coconut fibre, etc.) or with your own mix of substrates. You can choose not to use substrate at all, but cover the pot with a CocoTek disk.

After the harvest clean thoroughly. After removing the pots from your system, get rid of as many roots as possible, rinse well, let them dry, and shake the debris off.

The CocoTek line is adapted to aero-hydroponics, drip irrigation and soil. Pots can be used to germinate seeds and grow seedlings and young plants. They can be replanted directly, without removing the substrate and stressing the plant.

*A big advantage to using Grorox and CocoTek is that, unlike rockwool, they are totally harmless and ecological. They can be used several times, crop after crop. They are 100% recyclable and can be added in the ground to help lighten or enrich the soil.*

## OPERATING THE SYSTEMS

**WATERFARMS, AQUAFARMS, AEROFARMS, ECOGROWERS, DPS "HYDRO", DPS "AERO", AEROFLOS**

### 1 - Filling and emptying the systems.

1. For AquaFarms, WaterFarms and AeroFarms, simply fill the reservoir and turn the pump on. Empty in a container using the blue level tubing.
2. For Dutch Pots "Hydro" and "Aero" first fill the reservoir then the pots. Once the system is full, top off the reservoir. To empty, start with the reservoir, then empty the pots and drain the system completely.

**When using AeroFlos :** the AeroFlos secure sufficient water supply to your plants, with a relatively small tank to reduce weight. This is why it is important to fill it and empty it taking a few precautions :

- 1 - Fill your reservoir first then start the pump to fill the chambers.
- 2 - When the chambers are full continue filling 2/3 of the reservoir, not more : if there was a power failure or if you use a timer, the reservoirs will need to collect the water surplus without overflowing.
- 3 - **To empty :** first empty the reservoir. Then, after pulling out the level tubes, empty the chambers one by one in the reservoir. Keep draining until all is gone.

## 2 - Solution maintenance, levels and cycles :

Use mild to normal strength nutrient solution and avoid strong or aggressive formulas. Monitor your nutritive solution by regularly checking your water, EC, and pH levels. Adjust following needs. Plants can absorb :

- 1 - as much water as nutrients : top with a balanced nutritive formula
- 2 - more water than nutrients : top with pure water with adjusted pH, or with a mild nutritive solution
- 3 - more nutrients than water : top with a concentrated nutritive solution.

### Important :

- 1 - As long as your crop is developing well, you don't need to replace your solution completely. Every few weeks, depending on the quality of your water and/or the health of your plants, let the level of solution decrease as much as possible in the reservoir (don't let the pump draw in air!), then fill it up again with fresh water and nutrients.
- 2 - There are a few cases where it is good to replace the solution regularly and completely : when the quality of your water is bad or unreliable, like it may happen in some cities, and/or when your plants are not growing well. Don't just throw it. Use it added to water with adjusted pH to irrigate your house plants, they will look great.
- 3 - No matter which growing system you use, always make sure that your roots are properly watered at all times. Never let them dry. If you work with an AeroFlo, wait for the roots to hang in the solution, then push the level tubes down to lower the level of the solution, leaving the upper part of the roots to hang in air.
- 4 - If you use another substrate than Grorox, adapt your watering cycles : some media, like coconut coir or rockwool will retain humidity, and may become a disease factor for your plants. They need less water. In these cases watering must be intermittent. Don't hesitate to contact us for more info.
- 5 - Keep your reservoir full as much as possible, your nutritive solution will stay more stable. Never let the pump run without water, it would seriously damage it.
- 6 - Cover all empty plant sites with pots and Grorox, or CocoTek covers, to protect the solution from light and debris.

## 3 - The Controller, or central water storage : (see p. 1)

For systems like AquaFarms, WaterFarms and AeroFarms, you can use the Controllers. They act as water storage for 4 to 8 pots, linked in line or in circle. They include a valve which refills the levels as they go down. Fill your controller with your usual formula, like with any other system.

## CLEANING THE SYSTEMS

To avoid disease and to get the best out of your system, keep your growing area clean at all times. Between crops, clean well and you will avoid clogs and infestations.

Choose a day when your nutritive solution is very low in the system. Stop the pump. Empty your system, take it apart and wash each part thoroughly. Shake the rocks away from the roots and place them in a container to wash and use them again. Undo the pump, rinse it well and clean the filter when there is one.

If needed (in case of disease or pest infestation), fill your system with an acidic solution (pH<4.0) and let it run for an hour to disinfect. Then rinse all parts thoroughly. If you use Chlorine, rinse thoroughly to remove all traces of bleach and let it rest overnight to let the Chlorine evaporate completely before you start a new crop

**When using AeroFlos :** if needed, it is easy to unplug the caps at the end of your chambers . They are fixed with plumbing silicone and are easy to remove. To fix them again use the same product (found in all drugstores).

## TO START CUTTINGS

### CUTTINGBOARDS ET RAINFORESTS

GHE offers 2 systems for cuttings : the CuttingBoard and the RainForest. The CuttingBoard is a small and simple unit mostly for beginners, and the RainForest is a high-end module, allowing total success most of the time.

Always use fresh and healthy cuttings that are free from disease and/or soil contamination. Soft green stems work best; woody stems are slower. Don't forget to adjust your environment to the different plants you are growing (climate, temperature, humidity, spacing, etc.) as their needs differ from plant to plant.

If you start several cuttings in one cup, plan to separate them soon after roots have formed and before they become tangled.

### To start your cuttings :

1. Fill your reservoir with fresh nutrient solution and plug the pump to start a dynamic, oxygen-rich, nutrient solution for your new plantlets.
2. Cut each cutting beveled just under a node, and delicately scrape one side of the stem to facilitate root growth. Leave 3-4 leaves for photosynthesis above the cover and remove all the rest.
3. Put the cutting in a cup and cover with Grorox or a CocoTek disk. Place in the system.
4. The optimum temperature for most cuttings is 24-25° C and 80 to 95% humidity.
5. Keep the plants in bright, indirect sunlight. You can use color-corrected or sunlight-simulating lamps. Fluorescent lamps are best; if you are using Metal-Halide or High Pressure Sodium, place them well above the cuttings so that they don't get burned.
6. Once the roots have grown - and before they tangle - transfer them to another growing system, or in any substrate you choose. Plants brought up in our systems are extremely healthy and will thrive in their new environment.
7. Cover any unused hole to prevent water loss as well as algae growth.

### Important :

1. In the CuttingBoard : as your plants grow, and as long as they don't bathe in the solution, maintain a high level of nutrient solution in the reservoir. Keep it high until multiple roots have developed.
2. Your RainForest motor is equipped with a thermocouple, which will shut off if it gets too hot. It will work again as soon as temperature gets back to normal. If this keeps happening, you may have a problem with your motor. Don't open it. Just call us. We will either fix it or replace it. Our motors are guaranteed one year from date of purchase. (see stamp p. 1)

### TRANSPLANTING

Plants must be sturdy before being transplanted, especially from substrate to water, where life conditions are drastically different. As much as possible, use young plants (minimum 2 sets of true leaves) : they will recover quickly from transplant shock while older plants may not survive the move.

1. Fill your reservoir with fresh nutrient solution and plug the pump to start a dynamic, oxygen-rich, nutrient solution, where to re-establish your new plants.
2. If germinating in soil or other substrates, and before transplanting your seedlings, gently remove all substrate from the roots and carefully rinse as thoroughly as possible. Or you can avoid these problems by starting plants from cuttings in the RainForest or the CuttingBoard, and simply transferring the pots. In all events, while transplanting, take good care not to damage the root system, including the side rootlets.
3. Once your roots are clean :
  - If working with an "Aero" system : put them in the pots (plastic or CocoTek) and fill with clay pebbles for best support.
  - If working with a "Hydro" system : put them in the middle of the clay pebbles and cover as you would do when planting in soil.

### IMPORTANT NOTICE

- 1 - In summer, when using lights in an enclosed space, and in order to avoid extreme temperatures, you could turn your lights on at night, to take advantage of the cooler air. Stop your operation when the season is hottest, clean and wait for better days.
- 2 - The grow room should be well ventilated. Outside weather allowing, continuous ventilation will eliminate excess humidity and bring in the much needed CO<sub>2</sub>. Circulation fans will homogenate the air, eliminating pockets of hot, humid air.
- 3 - If plants are not growing well and you suspect water quality :
  1. It is important to get a water analysis from your water company.
  2. Inquire about our Hard Water formulas.
  3. Collect rainwater. Try distilled or purified water.
  4. Use a reverse osmosis filter, a costly but often welcome device.
- 4 - If nutrient solution stops flowing from the injectors :
  1. Check to ensure that the pump is plugged in and the reservoir is full.
  2. Make sure the whole irrigation system is clean and clear. Rinse well.
  3. Make sure the distribution tubing and injectors are unclogged. Too much clogging may indicate that you have "hard" water or too strong a nutritive solution.
- 5 - Apply proper prevention, it is more effective :
  1. Always start with healthy plants or good quality seeds.
  2. Now and then check your roots to make sure all is fine : hydroponics offer you the rare opportunity to access and observe your root system, and react long before the disease can establish. Especially when working with bare roots like in the "Aero" versions. But be careful not to damage the root system while removing and replacing the cups, and do not overdo it, you would disrupt your plants.
  3. Use Mineral Magic, BioProtect, or the BioFilter with BioMagix, to protect your plants and strengthen your roots.

**Plants, like all living organisms can be infected with a variety of diseases. The best way to avoid sick plants is to feed them a complete and well balanced diet, maintain clean conditions and correct environmental factors for each given crop. To operate your system successfully :**

- Use the fertilizer best adapted to your water (hard or soft). To do so, get a water analysis from your local water company.
- Always clean your system thoroughly between crops.
- Keep the water temperature under 24° C. Ideally between 18 & 20° C and humidity between 60 & 65%. For your cuttings, keep it between 24 & 25° C with a humidity level between 80 & 95%.
- Sometimes the water temperature can go as high as 35 or 40°C! Don't panic. Make sure your solution has as much oxygen as possible (pump working continuously and perfectly clean and smooth tubing & sprayers) and use BioMagix in the BioFilter for optimal protection.
- Offer each plant the location and environment it needs : adequate space, light, temperature, ventilation, and humidity, as different plants have different needs.

If you have questions, please don't hesitate to contact us. We guarantee free (and fast) technical support and advice to all our customers.

### HAPPY GROWING !

*Notice : with the safety of our environment in mind, and the desire to protect our planet, our units are made to last, with recycled, heavy-duty plastics. They are UV resistant and contain a light barrier to protect roots, and prevent algae from growing in the reservoirs.*