

Root Interference

The Marix root control mat should prevent, for most plants, roots from growing out of the bottom of the pot. However, if the roots still grow through the pot, you can cut off the roots only when necessary. Root pruning will not cause any harm to the plants.

The Marix root control mats also keep the tray free of particles such as perlite entering the tray.

Trouble Shooting

Very little can go wrong with the new Smart-valve Mk2. It has undergone years of testing before we finally arrived at this design – which is a new invention in its own right.

If the valve does not allow nutrient to flow, the most likely problem is a blockage in the valve. To clear blockages, remove the valve from the Hydro-tray. Take the bottom float out and clear off all debris that have accumulated over time.

Clear the orifice with a small piece of wire and hose the dirt off, preferably under some pressure.

FLUSHING THE POTS

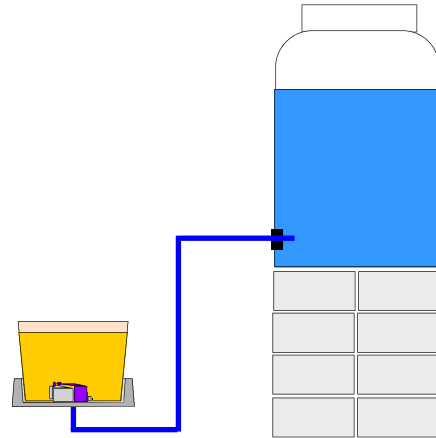
Auto-Pot Systems is different from others when flushing is concerned. It is better not to flush within a crop cycle. There will be salt built up in the growing medium but this is only confined to the top 20mm. This zone is too dry for the roots to survive and as such salt built up here has no effect on the plant.

Should you decide to flush, it must be done regularly (with 2 litres of water per plant) at fortnightly intervals. Or else, flushing say after two months of growth will cause severe root damage to the plant. This is because salt from the top 20mm of the growing medium had been washed into the root zone. Replace growing medium after each crop.

TAKING A LONG VACATION

A week away is no problem but if you are planning an extended vacation you may wish to take special precautions.

Use a large tank. Say a 200 litre (50 gallons) tank would be ideal.



WATER CONSUMPTION GUIDE

Water consumption of a plant varies from day to day influenced by the weather conditions. A full grown tomato plant, in a normal Summer day, consumes around 1.5 litres of solution a day. This can increase to 4 litres on a day when it is very windy with air temperature in the 40's. If you have two mature tomato plants growing in a Hydropak kit, be prepared to expect that a full reservoir tank of 30 litres of solution may last only 4 days!

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HYDROPAK

Operation Instruction

Hypakin4/ Updated Friday, August 18, 2006

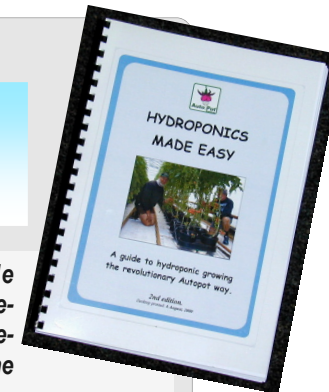
BOOK AVAILABLE

"Hydroponics Made Easy" was written in response to the many requests from users of the Autopot Systems.

Some wanted a good understanding of why Autopot Systems is so different to conventional hydroponics.

Others wanted to know how we managed to avoid many of the trials and tedious procedures that are basic to conventional hydroponic systems such as flushing.

The rest, simply wanted to know how to get the best out of their Autopot Systems and only a couple of existing books explain it.



CHECK THE CONTENT OF YOUR HYDROPAK KIT

The Hydropak Kit consists of the following items:-

- 1 Hydrotray ie 2 cavity tray with Lid
- 1 Smart-valve Mk2
- 2 units of 250 mm squat pots
- 2 pieces of Marix root control mats
- 2 bags of 5 litre perlite
- 1 pair of 500 ml x 2 A & B nutrients
- 2 M 4mm tubing
- 2 pieces of 4mm taps
- 1 rectangular in-line filter
- 1 Hydrotank 30L with Lid and a grommet
- 1 instruction booklet.

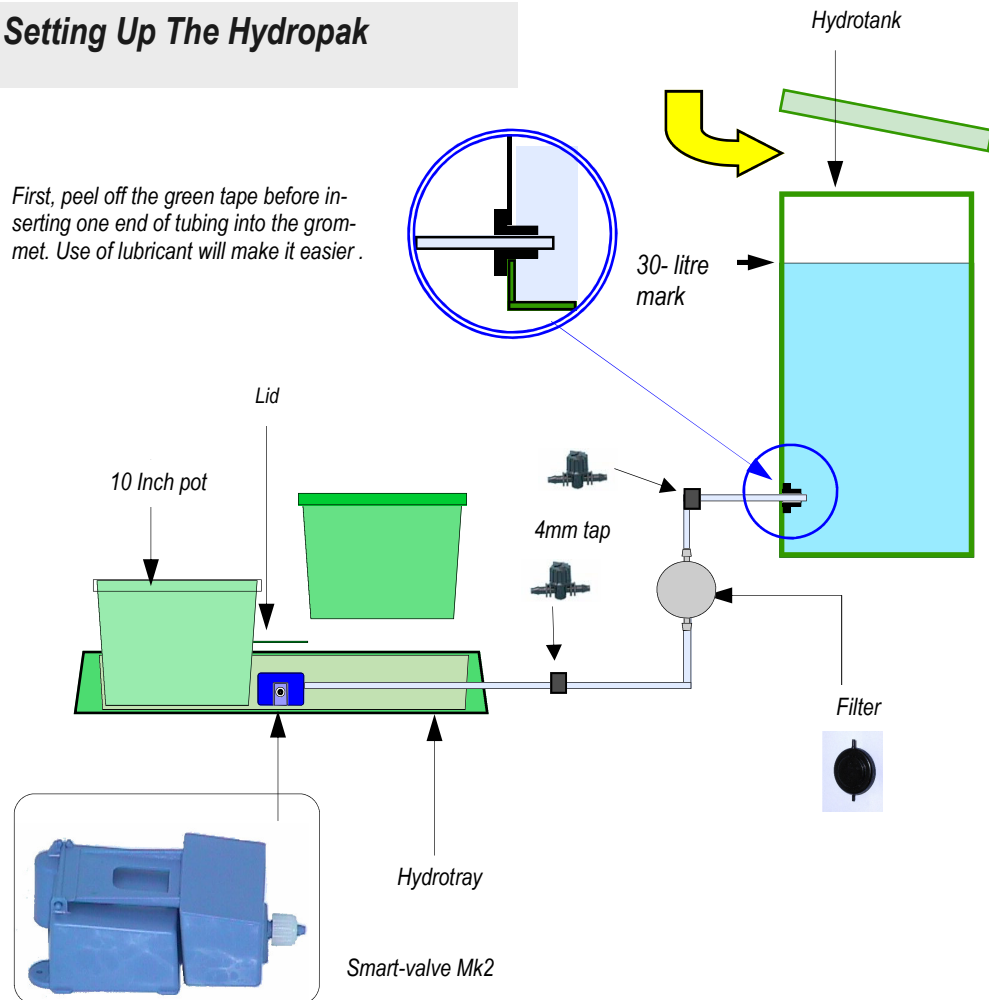
Connect up the system as shown in the diagram below. Place the tank half a meter or higher than the growing module. The higher the better.



Mix in nutrients into the reservoir tank as stated on the labels.

Setting Up The Hydropak

First, peel off the green tape before inserting one end of tubing into the grommet. Use of lubricant will make it easier.



STEP BY STEP CARE GUIDE

REFILLING THE TANK

Keep a check on the consumption of the nutrient water. It is best to clean it out when it is nearly empty to reduce wastage. If you are going away, top up to the maximum – 30L mark.

When plants are growing vigorously, fruiting or flowering, you can increase the strength of nutrient by 20 %.

Avoid dissolving powdered nutrients directly into the tank. Most do not dissolve completely thereby leaving some residuals which can cause blockages.

CLEANING THE TANK

Drain the tank and wash out with a hose. Fill with water, add a common laundry bleach (eg. White King) and leave it for 10 minutes. Drain and rinse well. Refill with nutrients as described earlier.

Repeat this after each crop. More often if you do not have good quality water.

FILTER SERVICING

It is recommended that the filter to be back-washed every 2-4 weeks. More often if water quality is poor.

To disconnect the filter from the tubing, soften the ends of the tubing with hot water or a lighter to make the job easier. **Caution – Forcibly removing filter from the tubing without heating will cause damage to the filter.**

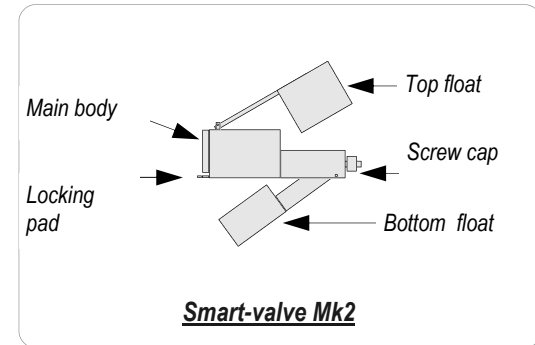
To back flush, use your garden hose to feed water through the filter from either direction. Spares are available from your supplier.

To connect or disconnect tubing from the joiners, always soften the connecting ends of the tubing with hot water or a lighter.

CARING FOR THE SMART-VALVE

About The Smart-valve- Mk2

This is a new version of the Smart-valve Mk1. Both similar in function. But it differs completely in its construction. The Mk2 has been designed to allow the user to take it apart easily for cleaning and putting it back together without difficulty.



The valve is a sensitive mechanical device. With careful and correct usage, it will ensure that it works properly for years.

The valve should not be totally submerged in water. Total immersion might cause the valve to overflow due to the possibility of water entering the top float.

TESTING THE SMART-VALVE Mk 2

Before commencement of the test, make sure that the valve is clean and free from any debris that may obstruct the movement of the floats.

You can test the valve yourself to determine if it is working properly. To test valve, do the following:-

- remove the two pots from the Hydrotray
- turn the tray over to empty content
- now set the hydrotray upright the Smart-valve Mk2 is connected to the tubing to the tank.
- make sure that the tank is sufficient water to fill the tray.
- if the valve allows about 30mm of water to flow into the tray and stops, then it is working properly.

GROWING MEDIUM

Most plants will grow in an amazing variety of media. Of course, not all media will give the best results, but for sake of argument, if you are installing hydroponics on a desert island and you have little chance of importing media, what do you do?

Most desert islands have three possible media. Coral, sand and coconut fiber. You can use them individually or have them mixed in different proportions. We had a commercial grower in Western Samoa using coral sand in Auto-Pot Systems to good effect.

Auto-Pot Systems can use a wide range of media. In its truest hydroponics application inert media are used. But because of its unique action, the system can also use totally organic material as well. In all recirculating hydroponics systems, the idea of mixing inert media with potting mix or allowing organic material like animal manure into the medium goes right against the accepted rules. In an Auto-

Pot Systems there are even cases where this is an advantage. For instance, a tray system that is out in the open will benefit from a surface dressing of organic fertilizer to counteract the diluting effect of rainwater on nutrient. Besides, it is logical to use whatever local material that is available.

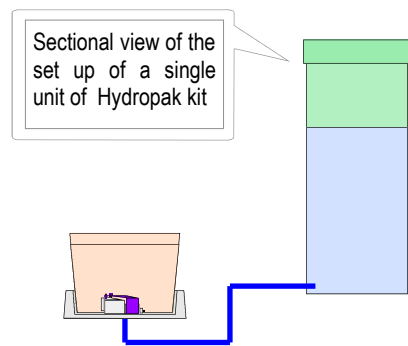
One question we should ask ourselves. Do we really need to go soilless for the academic sake of hydroponics? We do not think so. Use whatever material (preferably available locally) that gives you the best results.



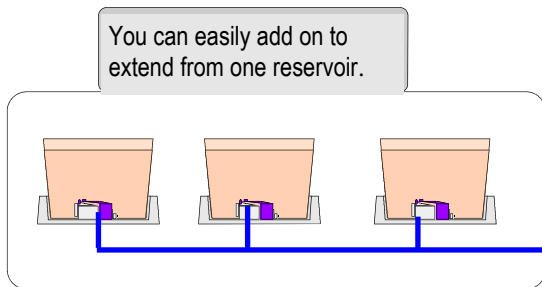
Commercial tomatoes grown in the Autopot Systems. Warmambool Australia

EXTENDING YOUR SYSTEM

You are not restricted in any way by your Auto-Pot Systems. Add more trays. Simple T and straight joiners available from your Auto-Pot supplier meant that you can join in one, two or dozens more trays. Provided you have nutrient flowing with gravity you can run remote trays anywhere you can get the tubing to.



Limit your extension to 4 growing modules from a single tank. With more units you will need to place the tank higher (say 4 feet) to increase water pressure.

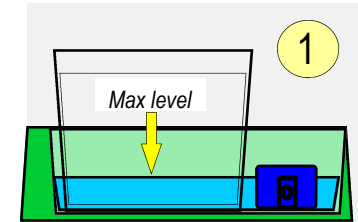


How does the Smart-valve works

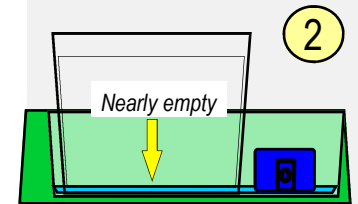
It is important to have an understanding on how the Smart-valve works.

The Smart-valve is the heart of the system. It is small enough to fit on the palm of your hand. Its appearance is simple but its performance is incredible. Being simple enables it to be a low cost item making it practical to have one valve for each individual container and this is the very crux of the system's versatility. It is different from a conventional ball cock float valve because it allows total reduction of the fluid level before it refills. To be able to perform such tasks automatically without any electrical or electronic component is truly amazing

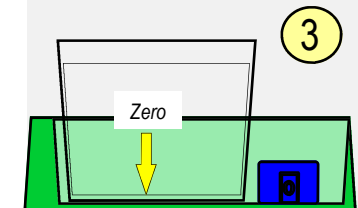
When connected to a water supply (either from a pressure-reduced mains, a gravity tank or a pressure pump) the valve opens to allow water to flow and fill the bottom of the growing container to a pre-determined and pre-set depth (about 30 mm). The valve then closes thereby shutting off the water supply from the tank. The plants intake of the water is absorption by capillary action that naturally occurs in the growing medium. Once the water has been used to the extent that the film of water under the valve has gone, the valve re-opens and allows another supply of water to enter the hydrotray. This concludes one wet and dry out watering cycle controlled by the plants.



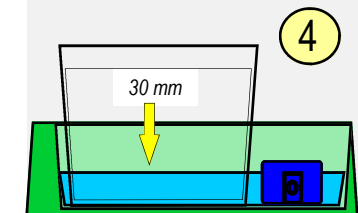
The tray starts empty & the Smart-valve opens to let water into the tray to a pre-set level of about 25 mm.



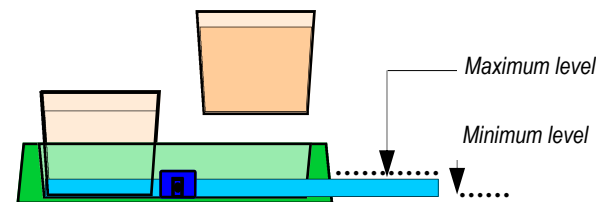
Water level in the tray drops as water is consumed by the plant. It is now nearly empty but the Smart-valve still remains closed.



The tray is now completely empty and will need some time before the Smart-valve re-opens to let in more water.



The Smart-valve will close once the pre-set water level of 30 mm is reached again and this completes one watering cycle.



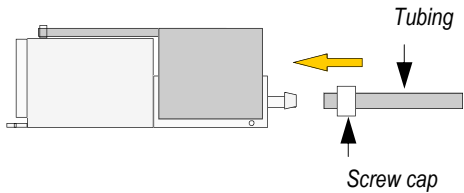
STEP BY STEP INSTALLATION

1. Positioning the tray

Keep the tray level. The system can be located under cover or outdoors. Most plants will prefer full sunlight.

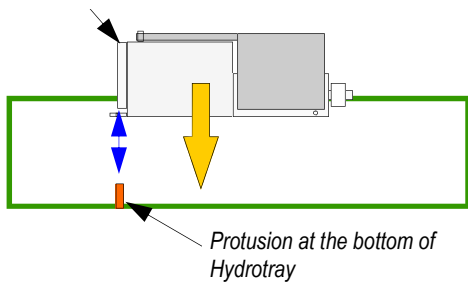
2. Installing the Smart-valve Mk2

(a) Connect the 4mm tubing to the Smart-valve Mk2 with the screw cap.

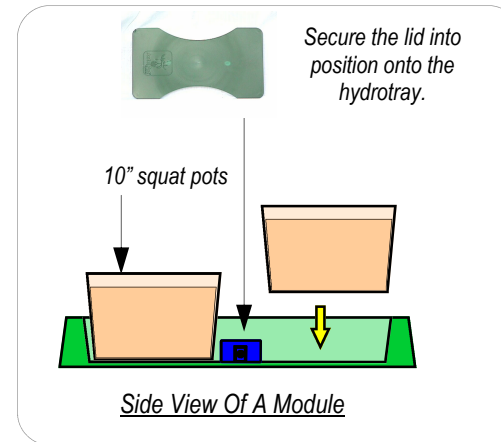
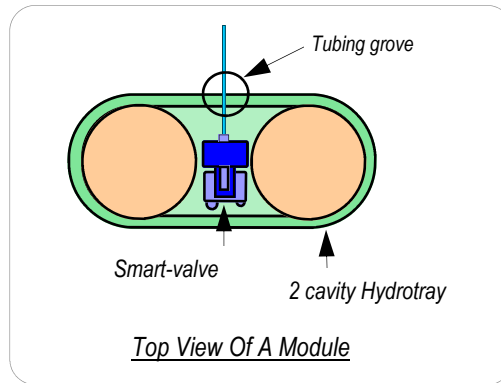


(b) Set the Smart-valve Mk2 onto the valve compartment of the Hydrotray and attach it firmly to the bottom of the tray as shown below.

Semi-circular column at the back of the Smart-valve



Make sure that the opening of the Semi-circular column at the back of the Smart-valve is aligned directly over the protusion of the Hydrotray as shown above. Then push the valve firmly downwards until it is securely locked into position.



3. Positioning the tank

Ideally, the tank should be placed 4 to 5 feet higher than the tray. In practice, it should be at a height convenient for refilling.

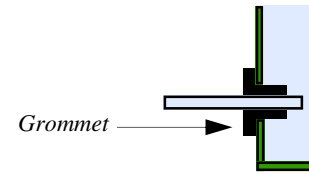
CONNECTING THE TANK TO THE TRAY

1. Connecting the tubing to the Smart-valve

Use one end of the 2 meter 4mm tubing provided to connect to the free end of the Smart-valve. This is the only one connection to be made to the Smart-valve.

2. Connecting to the tank

Push the free end of the tubing through the hole in the grommet attached at the bottom of the Hydro-tank. Use of a lubricant (eg Vaseline) is advisable.



3. Connecting to the filter

Cut the tube at a convenient place between the tank and the tray and push fit the in-line filter. The filter works either way and so it can be connected to either end.

FILLING THE POTS

Pots that come with the kit have narrow slits as drainage holes. First, insert the MARIX root control mat to the bottom of the pot before filling it with the perlite provided. Then place pots in the tray.

The use of other types of pots are not recommended as they tend to have large drainage holes which allow perlite to get through. This can cause problems with the Smart-valve.



Marix root control mat to sit at the bottom of the pot.

PLANTING

First, saturate the growing medium in the pots with 1 litre of nutrient solution drained from the tank.

Make a hole in the perlite and plant as deep as you can. If the seedlings are too small, use half the amount of perlite and then plant. Backfill later as the plant grows larger.

With the Auto-Pot Systems, there is no need to remove potting mix from the roots of the seedlings before planting. They will recover faster as this practice minimizes root damage.

The nutrient solution will not be affected by the presence of potting mix in the growing medium simply because Auto-Pot Systems is a non-recycling system.

After completion of planting, replace the lid on the tray and push fit securely.



Removing the root ball from the pot. Unlike conventional hydroponics systems, you do not need to wash the soil away from the roots of the plant.



Place the rootball into the pot and backfill with perlite to the top. Try to plant as deep as possible.

PREPARING THE NUTRIENT

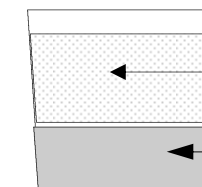
Follow the instructions on the labels of the nutrient bottles. For standard mix - 5ml of part A and 5ml of part B nutrients in one litre of water.

Fill the tank to half way before adding the nutrients to the tank as recommended and mix thoroughly. Top up the tank to the 30-litre mark.



CAUTION - DO NOT MIX THE PART A AND PART B NUTRIENTS UNDILUTED TOGETHER. THIS WILL CAUSE THE CHEMICAL REACTION TO TAKE PLACE AND THEREBY RENDERING THE NUTRIENT USELESS.

For best results, use Autopot nutrients.



Backfill after the plant has grown above the rim of the pot.

For small seedlings, plant to half full with perlite.