

# Aqua-Hort for Nursery Production

## Explanation:

- 1 - Electrode 1
- 2 - Electrode 2
- 3 - Electrode 3
- 4 - Electrode 4
- 5 - Electromagnet
- 6 - Control Box
- 7 - Flow meter
- 8 - Water in
- 9 - Water out



Aqua-Hort® is a unit for adding copper nutrition by means of electrolysis. Free Cu ions are released in the water, something which is not possible by adding normal Cu chemicals. An enormous advantage is that the zoospores from **Pythium** and **Phytophthora** are killed by the free Cu ions, due to their thin cell walls. This prevents problems with water borne fungus diseases in the crop. Through usage of Aqua-Hort® the plants get whiter and stronger roots thus yielding a better plant. In some crops it has been observed that the uptake of calcium and manganese is increased by the use of Aqua-Hort®.

**With Aqua-Hort® in your nursery production you can:**

**Stabilize the copper supply**

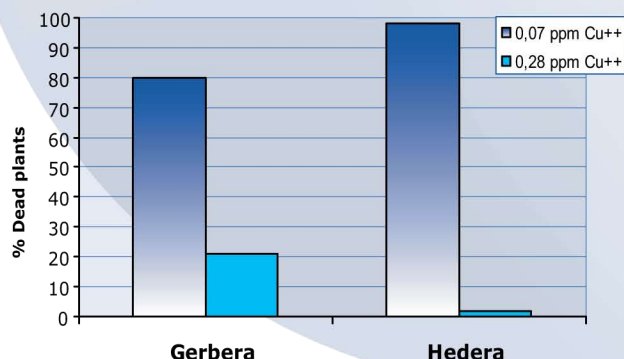
**Prevent fungus attack**

**Produce better plants**

**Achieve better roots**

Aqua-Hort® is supplied in different sizes, ranging from 5 to 240 cubic meters per hour. The standard unit has a maximum capacity of 30 cubic meters per hour. For dosing of chemicals Aqua-Hort® can be fitted with a number of electronic doser pumps. They are controlled from the Aqua-Hort® display.

Aqua-Hort® is equipped with an electronic control box. A microprocessor keeps the copper level at desired level when flow and conductivity varies. The controls can yield 25 amp, sufficient for most mixers. It can be fitted with controls yielding much higher levels if needed. The extended version is used when large water amounts are applied as in Dutch floor watering systems.



## Research

Research of the "Aarslev State Research Station" shows that by using 0,07 ppm free copper-ions by all the infected plants all the plants die and by increasing copper ion concentration till 0,28 ppm the zoospores are killed; most plants grow and survive.

Over 180 nurseries are using Aqua-Hort®. Many nurseries have several units. With Aqua-Hort® chemicals for water borne fungus can be avoided. The plants get stronger and better roots making them more healthy. These advantages improve the nursery economically. The environment benefits. A very countable issue in the environmental programs.

## Why Aqua-Hort®?

Aqua-Hort® implements a controlled supply of copper and an electromagnetic water treatment to the water with liquid fertilizers. Work carried out by the Research Station Aarslev has contributed to the basic ideas behind the construction.

It has been known for a long time that a controlled level of copper ions in the water can contribute considerably to the prevention of fungus attacks. Especially from Pythium and Phytophthora. Both of these can be very destructive when they attack. These two fungi form zoospores which are spread in watery environments. Laboratory tests show that the zoospores are killed when exposed to Aqua-Hort® treated water.

A controlled supply of copper ions was difficult in the past, because copper binds easily before coming into action. With Aqua-Hort® a regulated supply of copper ions is achieved at the moment of watering. The amount released ( 0.0 to 5.0 ppm) is within normal fertilizer standards.

The ions in the water are charged particles with hydrate layers around them. Due to the electromagnetic treatment with dynamic electro magnetic pulses the hydrate layers are removed, and the ions will, therefore, obtain an easier passage in the plants.

Aqua-Hort® reduces the usage of fungus chemicals, which means positive economical consequences and also means achieving points in the MPS system.

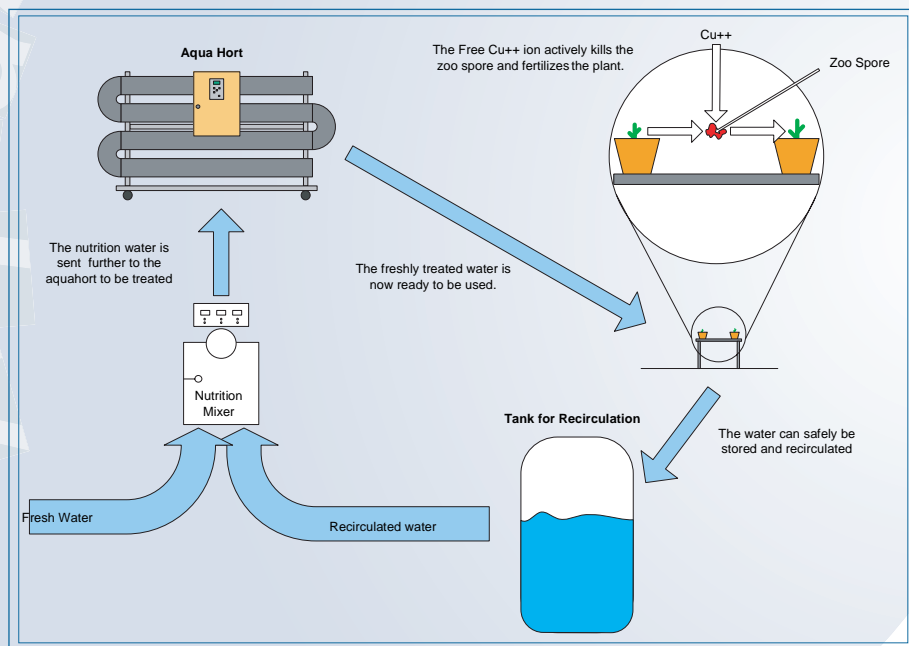
## What is Aqua-Hort® technically speaking?

The Aqua-Hort® system consists of: a Control Box, standard 25 amp, an electromagnetic treatment pipe and 4 set of electrodes, 20 mm thick and 1,5 m long, for release of copper. A flow meter is part of the system to automatically adjust variations in flow. The whole system is built upon a stand of stainless steel. Treatment is made during watering.

Aqua-Hort® is normally installed down-stream the fertilizer mixer. The nutrition water is led through the electrode pipes, then through the electromagnetic pipe and finally to the plants. The control box receives a start signal from the flowmeter. It runs on 1 x 110-230 Volt. 50/60 hz.

The amperes released are a product of the water flow, the Cu set point and a constant factor ( $m^3/h \times ppm \text{ Cu} \times 0,8$ ).

## Functional Diagram Of The Aqua-Hort® System



## Daily running

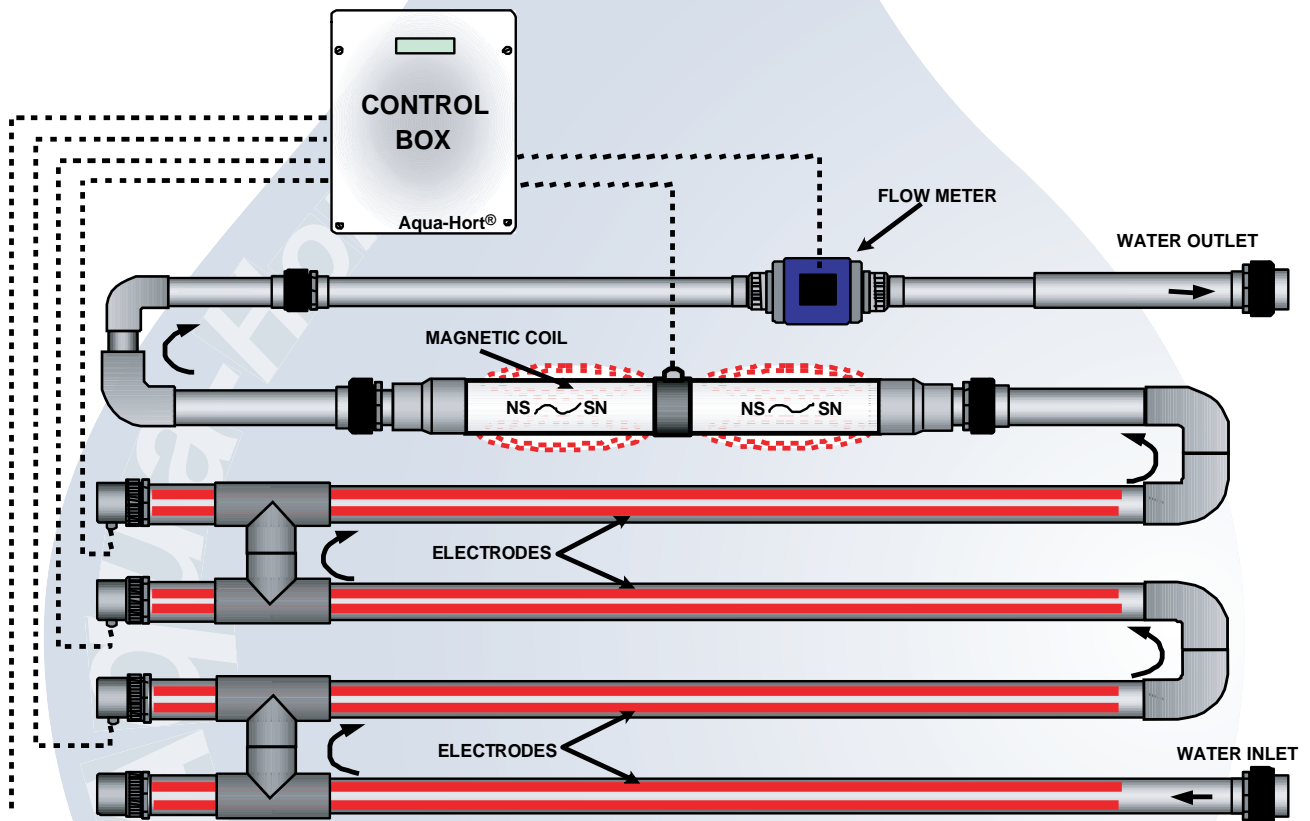
Aqua-Hort® runs automatically during watering. The level of copper is regulated by setting this on the front panel. For the measuring of the free copper levels a test set, produced by Merck (Aquaquant) is used, and is delivered together with the unit.

The electrodes must be replaced when worn out. Lifetime depending on consumption. By 1 ppm Cu the unit consumes 1 Gramme of Cu per cubic meter of water.

# Aqua-Hort® Types

Type	Pipes	Dimension	m <sup>3</sup> /h	Amp.
Aqua-Hort® Mini	63 mm	120*60*60	5	3,5
Aqua-Hort® 75	75 mm	120*110*60	10	25
Aqua-Hort® 90	90 mm	170*140*60	30	25
Aqua-Hort® 110	110 mm	220*170*60	45	25
Aqua-Hort® 125	125 mm	270*200*60	80	25
Aqua-Hort® 140	125 mm	320*200*60	130	25
Aqua-Hort® 250	250 mm	250*150*100	240	separate

## Technical Aspects



### Sales and support:

Hortisystems UK Ltd, West Chilmington Road, Pulborough, West Sussex. RH20 2PR  
 tel: 01798 815815 fax: 815816 email: sales@hortisystems.co.uk

Two years guarantee is granted. Aqua-Hort® is internationally protected by patent.

### Production:

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