

Q 1: Display message: Current too low.

This text on the Aqua-Hort display indicates that the unit cannot deliver the amperage asked for. The voltage as arrived at the maximum 24 DC Volt, therefore the text: Current too low. The maximum voltage is 24 for all models below 100 amp in size. The big models with 100 or more ampere have 48 as their maximum voltage.

There are two main reasons for this condition. It might be because the ampere asked for exceeds the capacity of the transformer(s). The requirement for ampere is determined by the formula: Flow (m³/h) x ppm Cu applied x 0,8 = ampere. Example 10 cubic per hour with 2 ppm Cu requires 16 ampere. (10 x 2 x 0,8= 16). The Aqua-Hort must be designed to have enough ampere available for the desired levels.

The other main reason is a drop in conductivity of the nutrition water. Such a drop demands higher voltage to deliver the wanted ampere. Consequently the maximum volt might be achieved. The answer to this problem is a redesign to a machine with more electrode surface. Which mean longer or more electrode rod, or conversion to plate electrodes with a bigger surface of the plates. An increase in conductivity is also an answer to this problem.

The Aqua-Hort will still operate with this message displayed, but the amperage is not sufficient. On the display it can be seen how many amps are delivered. From the formula one can calculate how far off from the right ampere the machine is working.

Q. 2: Display message: Current too high.

This message indicate that the ampere is higher than wanted. It occurs when there is a short circuit in the electrodes. If it happens they should be taken out for examination.

Q. 3: How often shall I replace my electrodes.

The wear on the electrodes depends on the amount of water and the ppm level applied. One cubic meter with 1 ppm Cu consumes one gramme of copper. With 2 ppm two grammes of copper. On the Aqua-Hort display there is a counter for the total cubic meter. This number multiplied with the average ppm applied gives an answer to how copper is used. Example: 16000 cubic meters with 1,5 ppm in average, means 24 kg of copper used.

In a standard Aqua-Hort with four 1,5 m electrodes 20 mm there are 33 kg of copper. With 1 ppm applied this means 33000 cubic meter of water. In glasshouse cultivation is the consumption roughly 1 cubic meter of water per square meter per year.

Q 4: What copper set point shall I apply.

Aqua-Hort got started in Denmark where most growers are potplant producers. Here the set point was often 1,5 ppm. This is cultivation in peat moss, with recirculation of the water. One to two watering per week. With the proliferation of Aqua-Hort to many other types of crops with all types of growing media and climate conditions have the settings become rather diversified. In vegetable production on inactive media and very frequent watering of recirculated water, the setting might be as low as 0,2 ppm, while on pot orchids watered once a week from above the setting might be 3,5 ppm.

Basically it is so that higher disease pressure and temperatures demands higher settings. Please consult Aqua-Hort for advise on set levels in the concrete cases.

Q. 5: How often shall I check my Aqua-Hort machine.

It is recommended that the level of free copper in the nutrition water is checked and recorded once a week. This is done with the test kit delivered with the machine. When an Aqua-Hort is used for the first time, the recordings will be low for some time. This because the biofilm in the in the pipes must be cleaned out before the full capacity of free copper ions can arrive at the plant site.

In case the recording is lower than the setting it might be because there is interference from aggressive water, bad quality iron chelates or organic particles in the water. Within manageable levels this interference might be accepted, and the set point increased accordingly. If this is not possible, some measures must be taken to improve the water quality.

It is recommended that the copper rods are inspected and cleaned every 3 months. The electrodes are basically self cleaning, but some particles might at times accumulate near the spacers, making the wear uneven.

Q 6: Primary and Secondary effect of Aqua-Hort.

The primary effect of the Aqua-Hort stems from the direct killing of zoospores and spores of fungus and bacteria. This takes place in the nutrition water and the root zone of the plant. The secondary effect stems from the consequences of removing the pressures of fungus and bacteria diseases on the plant. More white root hairs will develop. This leads to stronger plants with increased resistance against other threats like Fusarium, Meldeew and Spider Mites.

Q. 7: Why can I not just use Copper Sulphate instead of the Aqua-Hort.

Aqua-Hort was developed because copper sulphate addition to nutrition water did not have effects. This is because the copper ions are complex bound to particles and ions in the water. In such a state they cannot act against zoospores and spores.

Aqua-Hort generated copper ions are supercharged, making them remain free ions for some time in the nutrition water. The electromagnetic treatment enhances the high charge of the ions, making them even more lethal.

Q. 8: How can I know what type of Aqua-Hort machine to order.

You should consult the Aqua-Hort company. Computer models incorporating the relevant information will give the answer to what machine type and size to use.