Waste Water Treatment Unit Operating Instructions



Preface

The name IONEX stands for IONEXchanger, which is the very heart of this modern waste water treatment system. In total it consists of a two-stage filtration, one cationexchange and two anion exchange units. IONEX is ideally suited for all waste water cleaning processes in modern PCB prototype laboratories. The drain water quality from this system is in accordance to German directives, which are of the highest standards world wide! The units exist in four variants with different sump capacities and ion exchange capacities.

Features

- Removal of solids and all heavy metals
- Decrease of chemical oxygen demand
- · Easy handling and operation
- Regeneration of ion exchange resins by supplier or by user at little costl
- IONEX K types offer additional Anion capture for full rinse water recycling
- IONEX K series designed for closed loop rinse water circulation
- Built-in hose pump
- Active coal filter candle, 10 µm
- Lower and upper sump level control switch
- Storage sump for 110 (IONEX KA) or 220
 litres (IONEX KB) of waste water

	IONEX KA (KB)
Dimensions	1400 x 425 x 600 mm
(H x W x D):	(1400 x 850 x 600 mm)
Weight:	30 kg (60 kg)
Tank Capacity:	max. 110 l(220l)
Cleaning Capa- city:	10 l/h (20l/h)
Power Supply:	230 V~, 50 Hz, 50 W
Filter:	10" filtercartridge filled with acitive carbon
lon exchanger:	1 x cation 3I (6I), 2 x anion 3I (6I)
Water in- and outlet:	20 mm
Capacity:	approx.100(200)Eurocardsor1000(2000)pre-rinsedEurocards

Technical Data





Waste Water Treatment Unit Operating Instructions

Safety

The following safety precautions should always be observed when handling chemicals (etching agent, acids, lies, etc.):

- Wear goggles and protective gloves for all work.
- If necessary only work under an extractor hood or at least in well ventilated rooms.
- Avoid contact with the skin, eyes and mucous membranes at all costs.
- Take off clothing soaked in caustic substances immediately.
- Rinse splashes on skin immediately with copious amounts of water.
- In the event of accidents or feeling unwell, always consult a doctor.

Only use the apparatus for its described application – that is treating diluted rinsing water. The unit is not suitable to treat concentrated solutions.

To avoid the risk of electric shock, do not remove the casing or open the back. There are no user serviceable parts inside. Leave servicing to the experts!

To prevent fire or the risk of electric shock, keep this unit out of the rain and away from moisture.

The lightning symbol with the arrow head inside an equilateral triangle means that there are live, uninsulated parts inside this unit that may give you a dangerous electric shock if touched.

The symbol with goggles and gloves indicate to all user that sufficient protection clothing and equipment is unalterable whilst working with chemicals. 1. Instructions:

Read all the safety instructions and all the operating instructions thoroughly before using the unit for the first time.

Keep these safety instructions and operating instructions somewhere safe in case you need to refer to them again in the future.

2. Safety warnings:

In your own interest pay heed to all the safety warnings on the unit and in the operating instructions. Follow the instructions on operation and use of the unit in every respect.

3. Ventilation:

Wherever you put the unit, always ensure there is sufficient ventilation.

For the etching and plating units in some circumstances an exhaust system is necessary. This mainly depends on the chemicals used.

4. Effect of heat:

Do not put the unit anywhere near sources of heat, such as radiators, hot air shafts. oven etc..

5. Power source:

Connect the unit only to the power source indicated in the operating instructions or on the unit.

6. Protecting the flex:

Run the flex so that no one can step on it and nothing can rest on or against it. The flex is particularly at risk in the area of the plug, the socket and where it comes out of the unit.

7. Cleaning:

Follow the manufacturer's recommendations for cleaning the unit.

8. Unit not in use:

If you are not going to use the unit for some time, remove the plug from the socket.

9. Foreign bodies:

Take great care to ensure that no liquids or other foreign bodies can find their way inside the unit through the openings in the casing.



Waste Water Treatment Unit Operating Instructions

10. Repair in the event of damage:

The unit should only be repaired by qualified personnel. Never try to do more in the way of maintenance to your unit than the operating instructions allow. Beyond that, always consult an expert for repair work.

11. Setting up

Set up apparatus only in a suitable room.

Apparatus filled with chemicals must be placed on chemical resistant floors.

In the case of overflow or leakage see safety data sheets. No chemicals are allowed untreated in the sewerage. In some case absorber tanks are necessary.

The use of the apparatus is not allowed in the residential area; keep away from children.

Description of the process

The lonex serves to treat rinsing waters from etching-, developing or pth-machines. We recommend to use ferric-III-chloride as etching agent.

The plant is made up of a storage tank, a peristaltic pump with a fluid level monitor and three treatment stages:

- Filter element
- One ion exchanger column type cation
- Two ion exchanger column type anion
 - The rinsing water from the etching, pth- or developing process flows into the storage tank of the waste water treatment plant. The

waste water is pumped by the peristaltic pump into the filter and then through the three ion exchanger columns.

There are two solenoid switches in the storage tank. The lower solenoid switch automatically switches off the pump when the tank is empty.

To prevent the tank from overflowing the upper solenoid switch interrupts the power supply for the plug on the left side of the lonex.

This socket is designated to connect the lonex to a pressure unit (max. 2 A) for a closed loop rinsing system. With no power in the socket the pressure unit will stop pumping rinsing water into the etching or pth-machine.

The filter is used to retain suspended matter, which may be made up, for example, of photographic lacquer. Depending on how dirty the fluid is, the filter may have to be replaced or cleaned.

The waste water passes through the ion exchangers from top to bottom. All columns containing the ion exchanger resin are connected in series.



1.: Storage tank 100 (200) I 2.: Tubing pump 10 (20) l/h 3.: 10" mechanical and carbon filter

4.: Cation exchanger 5.: Anion exchanger

6.: Anion exchanger



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Waste Water Treatment Unit Operating Instructions

If we calculate that one board (100 x 160 mm Euro card) diverts 2ml of etching agent into the rinse water and uses 1 litre of rinsing water, then one column of the Ionex has a capacity of approx. 100 boards (Ionex KB 200 boards). If you use a static pre rinse leaving most ions in this rinse, the capacity of one column increases approx. by factor 10 (1000 boards IONEX KA /2000 Boards IONEX KB)

The cleaned water can be reused to rinse the boards.

To run the machine in a complete closed cycle a connection to an external pressure unit is necessary. We offer a perfect fitting rinse water tank with pressure unit as an option.

Installation and commissioning

Install the unit horizontally to achieve an optimum flow through the plant. A spirit level may be used to check its position.

Connect the water inlet of the IONEX to the rinse water outlet of your pcb machines. Use appropriate tubes and fittings (fiber reinforced PVC tubes and hose clamps e.g.). Connect the water outlet of the second anion column to the tank of your pressure unit.

The plant is switched on by pressing the "On" light button. At the same time the fluid level system is activated. Pressing the "Pump" switch activates the peristaltic pumps.

Fill the storage tank with rinsing water.

The etching agent iron (III) chloride contains the metals iron and copper in ionogenic form. If the pH value is not adjusted to approximately 2, part of the metals will be precipitated in the form of hydroxide and will be retained in the filter. To reduce the hydroxide sump, you can lower the ph-value to 1.5-3 by adding approx. 0.5 to 1 litre of hydrochloric acid (approx. 10%) for 100 litres. The chemical is to be added whilst stirring the solution. If the pH value falls below 1.0, it may be corrected with diluted caustic soda (approx. 5%). The pH value may be measured with indicator paper or a pH meter. The chemicals will be totally mixed into the solution within thirty minutes. Open the ventilation screw on the head of the ion exchanger columns.

Turn on the main switch.

Switch on the pump - while the first column is being filled, waste water will escape through the ventilation line and is fed back into the storage tank. The ventilation screw can now be closed to ensure that the column is completely filled. The second and third ion exchanger column is to be filled in the same way. If in the beginning air is collecting at the top of the column, you can evacuate this air by carefully opening the ventilation screw. The ventilation screw must not be completely removed to prevent the fluid spraying out.



Ionex KA / KB Waste Water Treatment Unit Operating Instructions

Maintenance

Before any maintenance work the unit must be switched off.

Put on protective gloves, clothing and goggles.

If you do not use the machine for a longer period, turn off the switch and pull the plug.

Further intervention is only required to a) check the column load, b) check the pH or conductivity of the clean water or c) occasionally check the pH in the storage tank so that no formation of residues can take place that would block the filter unintentionally.

The iron content or copper content in the out feed water may be tested using test rods. Indicator paper or a pH meter is to be used to measure the pH value. The pH value of the water must be between 6.5 and 9 whilst the copper concentration must be < 0.5 mg per litre and the iron content < 3 mg per litre.

The first ion exchanger column must be replaced before the resin has been completely discoloured from beige to dark brown or blue.

The second and third column does not change the colour during loading with anionic substances. You check its load by measuring the the conductivity of the cleaned water. If the conductivity increases to 50-100 μ S/cm, you have to exchange the columns. Conductivity meters are available in electronic supply stores. On request we can send you instructions for regenerating the columns yourself.

Apart from that we complete the regeneration of the resin as a service.

To replace the ion exchanger column:

Open the ventilation screws on all columns.

To empty and replace the columns - first of all undo the sealing cap at the end of the column so that the fluid can drain out of the column. The column can now be lifted and sealed with the appropriate sealing caps. Now pack the column in the prefabricated box and sent it to us.

To replace the filter:

As the filter becomes more and more blocked with dirt the volume flow will fall. Before removing the filter the ventilation screw on the filter and on the ion exchanger columns must be opened. Undo the screw union and insert a new or cleaned filter. The sealing ring must be free of faults and clean.

To replace the pump hose:

The hose has been selected to meet the chemical resistance requirements. Its service life is 1,100 hours according to the manufacturer. This value may vary considerably from the manufacturer's figure depending on the speed of the pump, the age of the hose, etc. If you need to exchange the pumpe hose, please ask for our short instruction.

Cleaning

The waste water treatment plant is made of PVC. Tap water can be used to rinse out the plant. Bad areas of dirt (for example, baked on dirt>) can be cleaned off using diluted acid (e.g. hydrochloric acid or sulphuric acid).



Waste Water Treatment Unit Operating Instructions

Guarantee

All machines are submitted before distribution to examination on function and continuous operation firmness. On the machine we grant a work warranty of 12 months to our customers starting from purchase date on accuracy in material and processing. We warrant at our choice by exchange of incorrect parts or by repair of the machine in our house. Old parts change into our possession.

Disclaimer of Warranty

All parts subjected to wear are excluded from this warranty. Non-observance of this manual shall void all warranty claims.

We cannot accept subsequent claims from damage or destruction of workpieces worked on in the machine, because we have no knowledge or control over the operating conditions at your site. This is valid in a general manner also for requirements from damage to articles, buildings and persons as well as the environment.

We do not warrant that the function of the machine will meet the customer's requirements or that the operation of the machine will to this regard be error free.

In no event will we be liable to the customer for any incidental, consequential, or indirect damages of any kind, including loss of profit and prosecution for environmental pollution, even if we could have been aware of the possibility of such damages.

All information was arranged with great care. We reserve ourselves however mistake and technical changes without previous announcement.

Running the machine in corroding, humid, dusty, extremely hot or explosive atmosphere happens at the operator's own risk and responsibility.

We explicitly exclude any warranty for damages resulting from running the machine in in corroding, humid, dusty, extremely hot or explosive atmosphere.

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