

Translation of the original instructions



## Content

Leaflet.....	2	Setup.....	7
Declaration of Conformity.....	3	Operating.....	8
Intended Use of Machine.....	4	Cleaning and Maintenance.....	8
Technical Data.....	4	Guarantee.....	11
Safety Instructions.....	4	Disclaimer of Warranty.....	11
Composition.....	5	Copyright.....	11

**Leaflet**

The Bungard AquaPur 1000 is a modern and compact system for cleaning the rinsing water in a PCB laboratory, e.g. the rinse water from an etching or a PTH-machine (PTH = Plating through hole) . The system can also be used for the cleaning the rinsing water from steel cliché etching process in the printing industry. After a rough and a fine filter the AquaPur1000 has two columns of mixed bed resin ion exchanger to remove both both metallic cations and anions from the water. This way all your rinsing water regulations are easily met. No further use of chemicals or special expert staff to e.g adjust ph-level is necessary. As part of a closed cycle of recyclable resources, the used ion exchange columns in this device can be recycled and reusable materials are recovered from the waste water.

**Characteristics:**

- removes heavy metals and solids
- reduces the chemical oxygen demand
- integrated dual particle filter (10 microns) on magnetic centrifugal pump
- 2 large-sized ion exchange columns
- integrated conductivity meter
- for treatment of etch and galvanic rinsing water
- closed water cycle possible
- integrated collection tank for 250 litres of waste water

The system operates in direct recycle process with the respective spray zones of the etching or PTH-machine. The pump pressure and the flow rate can be regulated. The rinse water of the etching or PTH machine is conducted via a pipe system by gravity into the storage tank of the plant. A powerful pump presses the water back into the rinsing zone. Via a bypass part of the water is pumped through the regeneration cycle. The amount can be adjusted by a diaphragm valve and read on the flow meter. In the filter unit, the solids are bound and in the ion exchanger the metallic cations and the anions. A conductivity meter displays the load status of the first column. The second ion exchange column is connected in series with the first, so only fully loaded columns must be replaced and at the same time a ion breakthrough is prevented

The loaded column or only the mixed bed resin can be regenerated in service by Bungard Elektronik GmbH & Co. KG.

**On request, we adjust for you to:**

measuring device

tank size

Size of the ion exchange columns

Filtration rating

pump capacity

connections

## Declaration of Conformity



### EG-Konformitätserklärung/Declaration of Conformity

Hersteller / Supplier:	Bungard Elektronik GmbH & Co. KG Rilkestraße 1 51570 Windeck Germany
Bevollmächtigte Person für die Zusammenstellung der technischen Unterlagen: Person in charge	Jürgen Bungard, Geschäftsführer /general director Rilkestraße 1 51570 Windeck Germany
Produkt:	Rinse water treatment machine AquaPur1000

Hiermit erklären wir, dass die oben beschriebenen Maschinen allen einschlägigen Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

Die oben genannte Maschine erfüllt die Anforderungen der nachfolgend genannten Richtlinien und Normen:

We hereby declare that the machines described above complies with all relevant provisions of the Machinery Directive 2006/42/EC.

The above machine meets the requirements of the following guidelines and standards:

- **Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC**
- **EMV-Richtlinie 2014/30/EG / EMC Directive 2014/10830EC**
- **Niederspannungsrichtlinie 2014/35/EG / Low Voltage Directive 2014/35/EC**
- **DIN EN 60204-1** Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen / Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- **DIN EN ISO 14121-1** Sicherheit von Maschinen - Risikobeurteilung - Teil 1: Leitsätze / Safety of machinery - Risk assessment - Part 1: Principles
- **DIN EN ISO 12100-1** Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze, Risikobeurteilung und Risikominderung / Safety of machinery - Basic concepts, risk assessment and risk reduction
- **DIN EN 55014-1 2012-05** Elektromagnetische Verträglichkeit, Anforderungen an Haushaltsgeräte, Elektrowerkzeuge und ähnliche Elektrogeräte, Teil 1: Störaussendung / Electromagnetic compatibility Requirements for household appliances, electric tools and similar electrical appliances Part 1: Emission
- **DIN EN 55014-2-2009-06** Elektromagnetische Verträglichkeit - Anforderungen an Haushaltgeräte, Elektrowerkzeuge und ähnliche Geräte - Teil 2: Störfestigkeit - / Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus - Part 2: Immunity
- **Niederspannungsrichtlinie / Low Voltage Directive 2014/35/EG**
- **Maschinenrichtlinie / Machinery Directive 2006/42/EG/37/EG**

Windeck, 10.1.2018

\_\_\_\_\_  
Jürgen Bungard Geschäftsführer

### *Intended Use of Machine*

The AquaPur 1000 is used for treatment of rinsing water from the etching process of printed circuit boards and the galvanic PTH (plating-through-hole). As an etchant, we recommend ferric chloride. All other applications require our written consent or happen on full risk of the user.

The Bungard GmbH & Co. KG accepts no liability for damages incurred in non-authorized use or application of the machine.

### *Safety Instructions*

#### **General**

Please read the following instructions carefully and pay particular attention to information on operating safety and set up.

Keep these instructions at a safe place. It contains information which also refer for later maintenance and cleaning.

The machines are intended for chemical-physical treatment of printed circuit boards.

The machines are not designed to be embedded or interconnected with other machines or systems. They may only be used in specially equipped rooms and be operated only by qualified staff. Children and pets are to be kept away!

#### **Transport**

Only use suitable lifting and transport equipment such as forklifts or pallet lifts. Secure the machine against sliding / tilting.

#### **Place of installation**

The machine must be standing level and around the machine there has to be sufficient space for operation and maintenance work (approx. 1m on all sides).

#### **Electricity**

The machine is made from certified parts according to standard practice for electrical safety. This does not relieve the user of his duty of care when handling electrically powered devices.

Connect the device only to the designated power supply as indicated in this manual or on the machine plate.

The main switch disconnects the machine from the power supply. We presuppose that the safety fuses of the circuit and the residual current circuit are provided by the building's power supply.

After completion of work, the main switch should always be turned off.

Before all maintenance work on the machine (filling, emptying, cleaning, etc.) turn off machine and pull the plug.

#### **Water supply**

The AquaPur 1000 is usually operated in a closed loop system and does not require a water connection. CAUTION: The system may be switched on only with sufficiently filled storage tank.

#### **Working safety**

##### **Personal protective equipment**

When dealing with aggressive chemicals wear protective clothing, gloves and face protection. The safety data sheets of the manufacturer or the supplier must be observed.

##### **Environmental protection**

Dispose used resin in accordance with local regulations or return it to us for regeneration.

##### **Rinsing water**

If the rinsing water can no longer be used in the circuit operation or for other applications, please dispose it according to your local regulations.

### Technical Data

<b>Electrical connection:</b>	220 V~, 50 Hz, ca. 300 W
<b>Dimension:</b>	LxWxH 1100 x 800 x 1500 mm
<b>Space requirement:</b>	Approx. 1200 x 1500mm
<b>Weight:</b>	110 kg
<b>Materials:</b>	PVC, PP, Titan
<b>Tank:</b>	250l
<b>Columns</b>	2 St. a. 14 L.
<b>Pump pressure</b>	Approx. 1.4 bar
<b>Flow rate</b>	ca. 80l/min gross, ca. 3000l/h net
<b>Flow rate Ion exchanger</b>	ca. 250 l/h
<b>Water connection:</b>	Spout D20mm

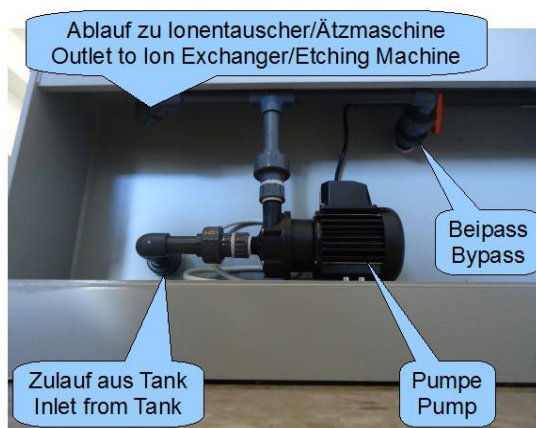
### Cleaning power (thumb rule, all values approximate!):

The usable capacity of a column filling (15 ltr resin) is with tap water of 15 ° dH:

1 µS/cm - 930 l	5 µS/cm - 1080 l	10 µS/cm - 1140 l	20 µS/cm - 1240 l	50 µS/cm - 1325 l
-----------------	------------------	-------------------	-------------------	-------------------

### Composition





## Setup

### Take over from the transport agent

After receiving and unpacking, check the machine for possible transport damages. In case of transport damage, please inform your insurance, the transport company and the manufacturer / supplier.

### Transport to the place of installation

Only use suitable lifting and transport equipment such as forklifts or pallet lifts. Secure the machine against sliding / tilting.

### Place of installation

The machine must be standing level and around the machine there has to be sufficient space for operation and maintenance work (approx 1m on all sides). When setting up the machine all safety regulations and other local regulations are to be observed.

### Connections

Connect the outlet of the fresh water rinse of your etching or PTH-machine to the inlet of the AquaPur (PVC-tubes D50mm). Then make a connection to the fresh water inlet of your etching or PTH-machine to the Aqua-Pur-outlet (spout 20mm; fiber reinforced tube with inner diameter 19 - 20mm))

Install mixed bed resin column 1 and 2 and connect to pipe screw. Mount conductivity meter and fasten with tube fitting.

Fill storage tank with water to max. 80 -100 mm below the rim of the tank

Finally connect the machine to the mains (220V / 50Hz). A house-sided protection (16A) is a must.





## Operating

**CAUTION:** The system may be switched on only with sufficiently filled storage tank.

If the system is turned on, the pump pushes the water into the bypass first through the filter unit, in which the solids are filtered out and after that through the ion exchange columns 1 and 2, where both metals (cations) and e.g. halogens (anions) are bound.

Via the manual diaphragm valve, the flow rate to the active carbon filters and ion exchange columns is set.

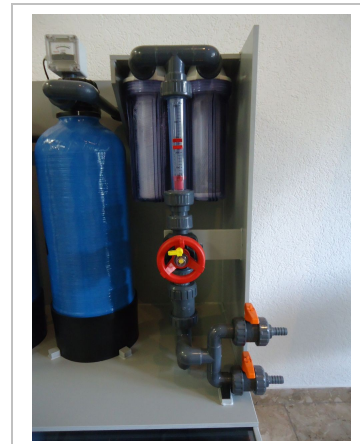
The lower the flow rate the more thoroughly the ions are removed.

If the flow rate is too high there is the risk that the ions "penetrate" through the resin. As a guideline set flow rate to approx. 250l / h (= 42 l / min) (mark on the flow meter).

The excess water passes either through the pump bypass back into the reservoir or via the ball valves to the rinsing zone of the etching or PTH machine. From there it returns by gravity back into the reservoir.

In etching machines with closed loop pre-rinse commonly used for larger production quantities (Sprint series) 90% of the pollutants are washed off in the pre-rinse.

The rinse water from the pre rinse can be used for new batch of fresh etching medium. In the fresh water rinse only the residual pollutant is cleaned by the ion exchange columns. In etching machines with only one rinsing zone for smaller production quantities (small Sprint 3000 FS) the total amount of pollutants must be cleaned by the ion exchange columns. With these machines faster loading of the resin will take place.



## Cleaning and Maintenance

The mixed bed ion exchanger resin has a limited capacity of ions.

Thumb rule (all values approximate):

The usable capacity of a column filling (15 ltr resin) is with tap water of 15 ° dH:

1 µS/cm - 930 l	5 µS/cm - 1080 l	10 µS/cm - 1140 l	20 µS/cm - 1240 l	50 µS/cm - 1325 l
-----------------	------------------	-------------------	-------------------	-------------------

the filter cartridge in the filter unit should be replaced periodically depending on throughput

(at least after every third change of the mixed bed resin).

Behind the first ion exchange column is the conductivity meter that monitors the load status of the column.

If the full load of the first column is displayed (meter in the red zone), it must be replaced and column 2 moves in its place.

The second column is replaced by a fresh unloaded column.

This ensures that only fully loaded columns are regenerated and simultaneously a ion penetration is prevented.

With each mixed bed resin change the rough filter insert in the tank should be cleaned.

If the ion exchange column is fully loaded, the complete column can be sent for regeneration. Alternatively, you can fill the loaded resin in a container and sent it to us for regeneration (or dispose according to your local regulations). We recommend to keep 14 L of mixed bed resin in stock.

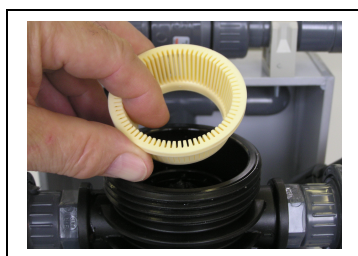
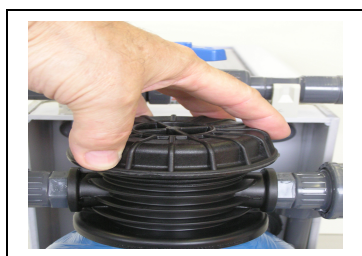


Alternatively you can store a completely filled-exchange column to ensure a continuous operation.

To empty the ion exchange column, the end caps must be removed. After refilling the column with fresh mixed bed resin, the end caps can be closed again. It should be ensured that no resin particles may settle on the sealing O-ring or in the thread (rinse with water).

Do not fill the columns to the brim, but only the prescribed 14 l !! The resin expands when it gets wet.

In the end caps of the column there is an additional top and bottom filter. These filters should be flushed at any mixed bed resin exchange.



**Caution:** After switching off the etching or PTH machine leave the the waste water treatment plant running for about 15 minutes to ensure that only purified water remains in the system..

Always pull the power plug during cleaning or service work.

#### Disposal:

**Ion exchange resin:** the loaded ion exchange resin can either be returned to us for regeneration (charge) or disposed according to your local waste regulations.

**Water:** We recommend the in-house re-use. According to European regulations you can put the water that was cleaned via mixed bed resin into the drains with a permission for a one-time introduction of deionized water (according to Annex 40 of the waste water ordinance and the Statute of its waste water treatment plant).

#### Machine:

The plant was predominantly made from recyclable materials and is to be supplied at a later scrapped a proper and environmentally sound disposal.

### Spare Part List

E A-P 1000 / 1	Magnetic coupled pump 80l/min
E A-P 1000 / 2	conductivity meter 0-50 µS/cm/VS 25
E A-P 1000 / 3	Ion exchange column L14 complete – De.
E A-P 1000 / 4	Head screw for column L14 complete
E A-P 1000 / 5	Head filter for column L14 single
E A-P 1000 / 6	Check valve GF d25
E A-P 1000 / 7	diaphragm valve St.DN 20 m. Screw.
E A-P 1000 / 8	Ball valve GF d 25
E A-P 1000 / 9	Filter 10" So
E A-P 1000 / 10	Tank filter Norm.
E A P 1000 / 11	Mixed bed resin



### 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

Bungard GmbH & Co. KG reserves the right to change or enhance its machines or machine specifications according to its judgement, if necessary. Bungard cannot be held responsible to implement aforesaid changes into machines sold already.

Bungard products and services are liable to the current prices and conditions, which are subject to change.

The instructions and definitions in this document are also subject to change and mark no assurance on the part of Bungard.

This manual contains informations of the Bungard AquaPur1000 and is the translated English version. Please regard the "Sales terms and delivery conditions". These are available after fulfilment of the contract. We don't furnish a guarantee or warranty in cause of damages at material or hurts of people because of

Incorrect use of the machine

Wrong setup, installing and operating of the machine or incapable service

Use of the machine with defective safety equipment

Non-observance of the service manual in regard to transport, stocking, setup, installation and service of the machine

Unlicensed modifications at the machine

Incorrect or incomplete repairs

Destructive force effect at the machine in cause of foreign objects or external use of force

Use of non-original spare parts

normal wear parts.

We cannot accept subsequent claims from damage or destruction of work pieces 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.

### Copyright

© 2018 Bungard Elektronik GmbH & Co. KG