

COMPACTA 30

Through hole plating machine

Instructions for use



Preface

Professional equipment for laboratory prototyping of through-hole plated PCBs up to 210 x 300 mm size. Clean system including built-in rinsing compartment. Maintenance free and made for easy processing and handling. This particular machine type is optimized in terms of space requirements and costs. COMPACTA 30 is suitable for the Dexter 3 D process (known on the market as the ABC chemical system).

Features:

Processing sequence for the ABC panel plating (tenting) technique:

- Cleaner
- Conditioner
- Pre-dip
- Catalyst
- Salt remover
- Copper plate

Equipment:

- 5 treatment tanks, 2 of them with heaters
- 1 galvanic copper bath
- 1 triple-cascade rinse with flow control
- 1 spray rinse tank with magnetic valve, foot switch and flow control
- 1 free tank (i.e. for chemical tinning)

Rectifier:

1 Rectifier for copper plating 6 V / 40 A, separate current and voltage display and setting. Residual ripple < 0.1 % DCU

Bath control:

2 PTFE/PFA coated heaters, controlled by analogue instruments, full digital timers with count-down, auto-reset and beeper. Air injection into the copper plating bath. Board movement by DC gear motor, adjustable speed.

Options:

Digital timers

Additional required equipment:

Chemicals, anodes, anodes holder and board holder

Technical Data

Dimensions		
Treatment Tanks		Galvanic Tank
Length	400 mm	400 mm
Width	100 mm	300 mm
Depth	300 mm	300 mm
Content	ca. 10 l	ca. 30 l
Dimensions	(Width x Depth x Height): 88 cm x 100 cm x 135 cm	
Working Height	95 cm	
Weight	80 kg	
Heating	2 x 400 W	
Rectifier	1 x 6 V, 40 A	
Bath Movement	DC Gear Motor	
Electrical Connection	220 V, 50 Hz, 6.3 A	

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Safety Instructions

1. The machine is designed for through hole plating of PCBs. Only use the apparatus for its described application. For any other application please contact us.
2. Check chemical resistance of the tanks against your chemicals. Chemicals supplied by Bungard are suitable to be used with this machine. Please contact us if you use different kind of chemicals. Mix chemicals outside of machine in a suitable container.
3. 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! Keep this unit out of the rain and away from moisture.
Pay attention to the warning signs on the machine.
4. 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.
5. 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.
6. 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.
7. Do not put the unit anywhere near sources of heat, such as radiators, hot air shafts, oven etc..
8. Connect the unit only to the power source indicated in the operating instructions or on the unit. We assume that your power source is in accordance to the regulations of your country.

9. Follow the manufacturer's recommendations for cleaning the unit.

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

11. 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.

12. 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.

13. 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.

Because of possible exothermic reactions please mix chemicals in a suitable container outside of the machine. We recommend to use sulphuric acid 36% instead of the 98% concentrate.

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

14. Only run the unit with tanks completely filled. Control the liquid level daily.

15. Close the drain valves before refilling the machine.

16. Personal safety regulations:

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

a) Wear goggles and protective gloves for all work.

b) If necessary only work under an extractor hood or at least in well ventilated rooms.

c) Avoid contact with skin, eyes and mucous membranes at all costs.

d) Take off clothing soaked in caustic substances immediately.

e) Rinse splashes on skin immediately with copious amounts of water.

f) In the event of accidents or feeling unwell, always consult a doctor.

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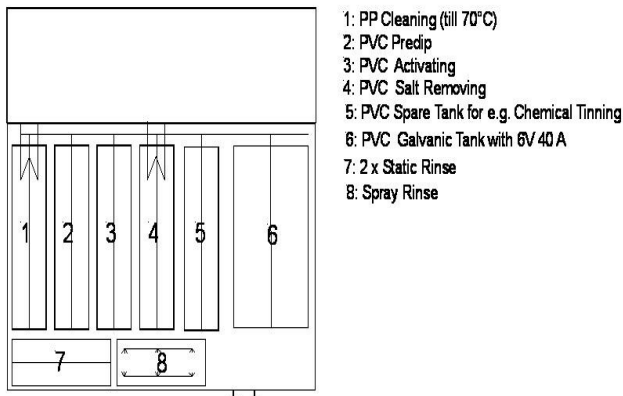
Equipment

The machine is designed for through hole plating of PCBs . It has 6 treatment tanks, a double static rinse and a spray rinse.

Heating

Use the heating elements only when the tanks are filled with solution. Using the heater without liquid will cause irreversible damage!

Control the level daily. If a tank with heating element is not used, fill the tank with water.

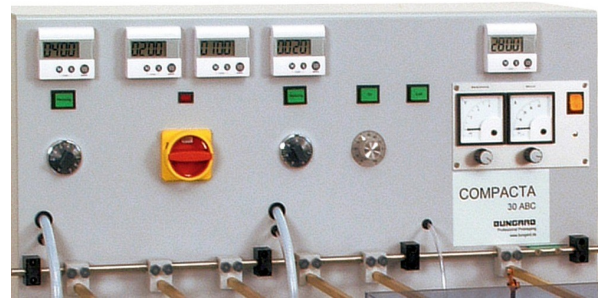


Three tanks are equipped with PTFE coated heating elements, 230 V 400 W controlled by thermostat.

The heating element is not protected against overheating. For protection devices please contact us.

Control panel

- Main switch
- 2 pc. temperature controller with switch
- Conveyer with low voltage D.C.-gear motor, speed adjusting and switch
- Switch for air injection
- Switch and potentiometers for the rectifier
- Fuses



Start the machine by turning on the main switch. Each heating element is equipped with a separate switch. If the adjusted temperature is reached, the green signal of the switch disappears.

Timer

Press MIN and Sec button at the same time to reset timer to zero.

Press MIN button to advance minute digits. Press and hold MIN button for speed setting.

Press SEC button to advance second digits. Press and hold SEC button for speed setting.

After time setting is ready, press START/STOP once and timer will start to count down.

Battery replacement: Follow the arrow direction to open the battery, insert a new 1,5V "AAA" battery as indicated by the polarity symbols marked and close battery cover.

Set Up

Examine the machine on any apparent transport damage and in that case immediately contact us and the freight forwarder.

Please set up machine in a well ventilated area, equipped with the necessary water and power supply.

Use the adjustable feet at the base to level the machine.

In addition to delivery you need for commissioning the following parts:

1 set of anodes with holders and bags

1 or more PCB holder.

1 Chemicals set for initial filling

On site will be fabric-reinforced hose 1 / 2 "required for water supply and 1" PVC tubing and hose clamps for the course.

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Power supply:

The connection must be made to 230V 50 Hz. The nominal current host is max. 8A. We recommend using a residual current circuit breaker.

Water supply:

The water connection is made at the 1/2" Nozzle which is located at the front right. In order to fix the hose take off the side door. Please use a fabric reinforced hose and secure it with a hose clamp.

The COMPACTA is equipped with a solenoid valve to prevent overflow in the inactive state. The valve opens only when the COMPACTA is turned on. You can connect the power supply for the solenoid valve on the switch output at the water treatment plant IONEX A or B. Then the water supply is interrupted when the water level in the IONEX is too high.

The box to connect the cable is located behind the front right side door of the COMPACTA (see picture).



Drain:

The tanks are drained without pressure through a 25 mm port (1"), which is located below the rinsing zones. Observe the regulatory requirements when discharging the drain water.

Test:

To ensure that the facility was not damaged in transit, we recommend that you run them first with water.

Please proceed as follows:

1. Fill each treatment tanks with 10 liters of water, but the galvanic tank with 30 liters of water.

2. Turn on the system with the main switch.
3. Check now the heating of all tanks by using the corresponding function switch. The green lights indicate the heating process. Upon reaching the desired temperature, the light goes off.

Set the temperature of the tanks at the thermostats as follows:

Bath 1 Cleaner / Conditioner 65 ° C

Bad 4 Salt Remove 45 ° C

The remaining tanks operate at room temperature.

4. Let the the machine now run for 2-3 hours with heating switched on and then turn it off at the main switch.

The next day, check the tanks for possible leaks. If everything is okay, you can drain the water now through the respective drain cocks. Please remove residual water inside the containers with a clean, lint-free cloth. Do not forget to close the drain valves again

Operation

Important Information

We count the tanks from left to right starting with 1st Bath. The fifth tank of the plant serves as a reserve tank. It has no heating, but can be used e.g. for the chemical tinning. Wait before using your equipment please, until all the tanks are heated to proper temperature. Before removing or inserting a board, always turn off the bath movement. When rinsing, it is important that all parts of the PCB holder which came into contact with chemicals, are cleaned thoroughly, so that no chemicals pollute the next bath.

We generally recommend to mix chemicals outside of machine.

Close the cover of the tanks directly after each use.

After each emptying of the bath, please make sure that the drain cocks are closed again.

If the fill level at the activator (= Catalyst) lowers, fill it up with ready-made solution. All other baths are filled with distilled water.

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From time to time it may be necessary to check the attachment of the anodes to the holding rod to ensure good contact.

Make sure that the temperature in your work and storage space never falls below 0 ° C.

Chemicals Set-up:

We supply Plating System chemicals pre-mixed and ready for use. All bathes should be filled up to about 20 mm below the top of the tank. If that level lowers (e.g. due to evaporation) you can fill the Activator bath with ready made catalyst solution -never with water - but all other bathes with deionised water. Refer to the Plating System Step documentation for details.

The sequence of bathes is:

Bath 1: Cleaner Conditioner

Bath 2: Pre-Dip First use the pre-dip solution for cleaning of tank 3. Fill in the pre-dip solution into tank 3 overnight and after that re-use it to fill tank 2:

Bath 3: Catalyst

To stir the bath, always use a very clean glass or plastic rod that you rinse in bath 2 - never in water.

Bath 4: Intensifier

Bath 5: spare bath

This spare bath can be used e.g. for our electroless tin plating (SUR-Tin) at room temperature. If not in use, please fill the tank with plain water to avoid deformation of the PVC walls.

Bath 6: Copper plating

Fix both anodes to the anode holders, use anode bags to cover anodes and use the strings to form a knot so that the bags are kept in place.

Make up the copper bath as per the append-ing Bath Set up instructions. The chemicals for bath 6 must be mixed outside of machine, because of possible exothermic reactions. We recommend to use sulphuric acid 36% instead of the 98% concentrate.

Anode preparation:

For proper copper plating results it is necessary to run the anodes under working conditions but with reduced current of 1 A / dm². For that reason fix a clean and well brushed PCB of 200 x 300 mm in a board holder. Then mount the holder onto the agitation rod and screw it carefully. Start air agitation. Start mechanical bath agitation.

Adjust agitation speed to about value 4 on the scale. Activate rectifier and adjust a current of:

$$1 \text{ A / dm}^2 : 2 \text{ sides} \times 6 \text{ dm}^2 \times 1 \text{ A / dm}^2 = 12 \text{ A.}$$

Run the bath according to items 8 to 12 of the Plating System Step 5 instructions. Anodes + copper bath solution are then ready for use.

Rinse section:

The COMPACTA ABC unit is equipped with a water saving triple cascade rinse section: two cascading rinsing tanks with overflow followed by one fresh water spray rinse tank.

Pre-rinse always in the bath with the highest water level followed by the one with the lower level. Last rinsing step is fresh water spray rinse (activated by foot switch). It is highly important to clean not only the PCB but also the board holder with every rinsing step in order to avoid contamination of the following treatment bathes.



ATTENTION: rinsing water has to be treated with an antipollution unit such as our IONEX system. You must follow your local waste water standards.

Do not leave the PCBs longer than necessary in the rinse.

We recommend to hit the PCB 2.3 times against the walls of the rinse. This helps to remove water out of the holes and ensures better contact of the chemicals inside of the holes.

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Rectifier:

The rectifier has a separate on / off switch. Current and voltage are preset manually by potentiometer and read out by analog current and voltage displays.

The rectifier offers constant current and constant voltage supply.

For use with ABC chemistry we only need constant current supply.

For that reason adjust the voltage (unloaded) to approx. 2 V.

Then adjust current according to PCB surface in use. Standard working current setting is 3 A/dm².

Through Hole Plating process sequence:

Cut your PCB to size with our board cutter NE-CUT ensuring that the blank size is about 20 mm larger than the required PCB size.

Drill your blank board to the required hole pattern by using our BUNGARD CCD or similar. Note: allow + 0,05 to + 0,1mm extra diameter for the drill bits because copper plating in the holes will reduce the effective diameter.

After that use one of our brushing machines (RBM series) for scrub cleaning, washing and drying (if no brushing machine available, brush and clean manually).

Fix the cleaned and deburred board in the COMPACTA 3-finger board-holder and fix it on the leftmost conveyor arm (bath1). Turn on the switch for the conveyor. Process the board in the bathes 1 to 4 and 6 from the left to the right, in the sequence and with the timings from the enclosed Process Flow Table.

A step indication of "R" in this Flow Table means a rinse step, consisting of a static rinse in each of the two cascade rinse tanks and a subsequent spray rinse.

The aim of bath 2, the Pre-Dip, is to protect the expensive catalyst in bath 3 from intrusion of both other chemicals and rinse water.

That is why you must not rinse after Pre-Dip but you have to go directly to the following bath 3!

With the oscillating frame still moving and the rectifier switched on and preset and the air agitation switched on you now fix the board over the galvanic plating bath.

Adjust correct current immediately (without current you risk to etch off all catalyst applied). Standard working current setting is 3 A / dm².

Example:

Board size 200 x 300mm = 6 dm², 3 A / dm² x 2 sides at 6 dm² = 3 x 2 x 6 = 36 A.

Every minute in the copper plating bath will apply **0,7µm** copper.

Example:

18µm copper will be applied in 26 minutes of copper plating.

Adjust timer accordingly and leave board in the plating bath as long as necessary.

After that rinse carefully and dry the board immediately to avoid oxidation.

Cleaning and maintenance

Cleaning

The unit is made of PVC. Do not use organic solvents to clean the machine. A cloth is under normal conditions sufficient for cleaning.

For very resistant dirt (for example baked on residues) use sulphuric acid for tanks 1,4 and 6 or diluted hydrochloric acid for tanks 2 and 3. After cleaning the inner of tank 3 remove all cloth fuzzles and rinse the tank walls and ground with demineralized water.

Replenishment

Once your baths have been initially made up, they can be easily replenished by simply adding the appropriate product. See the instructions on the following Plating System Step descriptions. Missing replenishment will spoil the bath.

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Bath maintenance

The Analysis procedures in the Plating System Step descriptions are for expert use only. This is to say the baths maintain stable and working also without analyses, only by replenishment. The Analysis procedures are given for reference of expert users - who have access to the appropriate measuring devices.

For further information or help please give us your fax or e-mail message including your machine serial number and detailed problem description. We will help immediately. Spare parts are supplied with the understanding that only qualified person will repair the unit.

Heating

The heaters may be operated only when completely filled tanks.

Overheating of the radiator) leads to a destruction of the PTFE coating and thermal destruction (fire hazard). Therefore, please check the level daily. The liquid level should not be lower than approx. 60 mm from the top.

The convection must not be disturbed by mud or mounting hardware. Remove deposits on the heater surface at sufficient intervals.

Periodically, the function of the thermostats should be checked using a thermometer.

Spray nozzles:

Highly calcareous water can lead to blockage of spray nozzles. The nozzles can be extracted from the PVC pipe. The rigidities are removed with hydrochloric acid. A mechanical cleaning can lead to damage to the nozzle.

Operating panel:

The rectifiers are maintenance free with the exception of the fan. An annual, preventive inspection is advantageous. This includes:

Inspection and cleaning of the fan

Inspection of electrical connections

Clean the contact surfaces of the DC connections

Note: It is forbidden to constructive interference of any kind to carry into the device.

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.

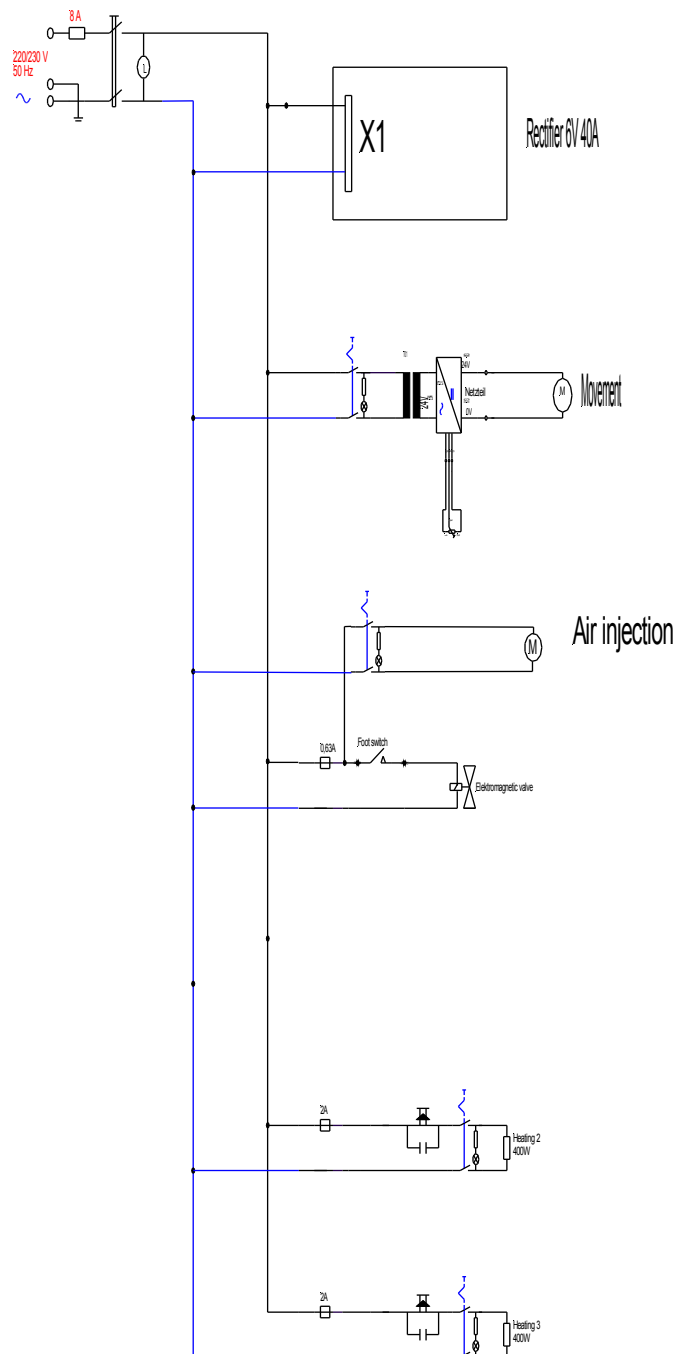
We do not warrant that the function of the machine will meet the customer's requirements or that the operation of the machine will to this regard be error free.

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Electrical Circuit



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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