Small-Size Electroplating Unit
DIGITAL V

INSTRUCTION MANUAL

Thank you for choosing a Jentner brand device.

For 40 years, Jentner stands for quality, perfection & competence in metal finishing.

With our sophisticated electroplating programme, we specifically address goldsmiths, jewellers, watchmakers' workshops, schools, universities, institutes and laboratories, restorers and museums - in short: businesses that want to easily finish even small to medium-sized pieces of jewellery or workpieces.

Jentner – Quality Made in Germany

Contents

1. Advice and Security

1.1 Advice for the operator

The operating instructions are an essential part of the product. The operator is responsible for ensuring that the operating personnel take note of these operating instructions and comply with the specifications contained therein. Ensure that the workspace is well ventilated. It must be ensured that the operating personnel operates the unit with proper protective equipment. Rinsing water and used chemicals must be disposed of properly. Please observe the regulations of the locally responsible water authority. Please observe the instructions in the Material Safety Data Sheets (MSDS). Your chemical supplier will be happy to provide you with this.
Repairs to the unit may only be carried out at the manufacturer's factory!

1.2 Security advice

- If a bath heater is required, make sure that the heater and the temperature sensor are together in the same filled tank. If the level is too low or if the heater is outside the working bath, there is a risk of fire and destruction of the heater and the working bath.
- Always make sure that there is very good contact between the suspension and the cathode rod.
- Do not close the unit lid until all baths have cooled down to room temperature.

1.3 Fuse

The fuse 22 is located on the rear of the device in the mains connection socket in the fuse holder 24

In the event of a fault, e.g. if the anode plate triggers a short circuit by touching the anode and cathode rods simultaneously, the fuse blows. The fuse holder 24 can be taken out to replace the fuse 22 Only fuses with the following data may be used: 4 A slow blow fuse, 115 V-230 V ~, 5* 20 mm.

2. Small electroplating unit Digital V

2.1 Description

The compact, universal Digital V small electroplating unit is ideal for electrolytic degreasing, rhodium plating, gold plating, silver plating and many other electroplating surface coatings.

2.2 Dimensions and weight

Width 820 mm, depth 350 mm, height 260 mm, weight 30 kg

3. Scope of delivery and accessories

3.1 Scope of delivery

- 4 x 2,5 L tanks PPH (100x150x220 mm)
- 4 x 5 L tanks PPH (190x150x220 mm)

- 1 protective contact power cable
- 1 temperature sensor with titanium holder

Check the completeness and integrity of the scope of delivery. Contact your supplier immediately if any parts are missing or defective. **Do NOT use a defective or incomplete unit!**

3.2 Available accessories (not included in the scope of delivery)

- Tank lid PP for 1.5 liter tank
- Jig with 32 hooks for rings
- Jig with 16 hooks for chains
- Titanium immersion heater, 200 Watt
- Titanium holder for immersion heater
- Anodes made of stainless steel, platinised titanium, mixed oxide (MOX) with holder
- Silver, copper and nickel anodes without holder
- Titanium anode holder for silver, copper and nickel anodes
- Copper tie wire
- Electroplating pen for bicolor work

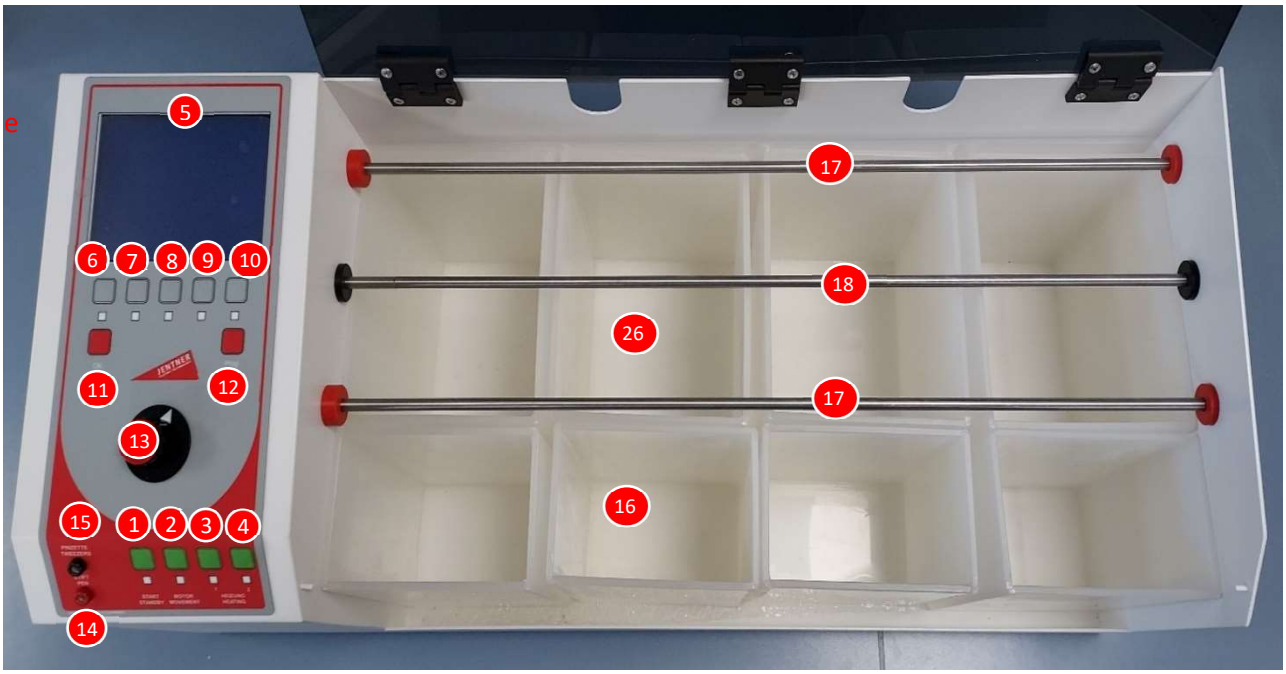
3.3 Chemicals

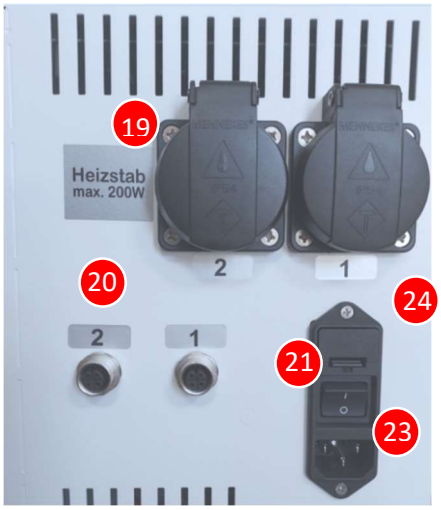
You can obtain the bath chemicals to be used from us or from specialist dealers. Please read and follow the manufacturer's product descriptions carefully. After finishing the work, cover the baths with the transparent plastic lid.

Any accessories and electrolytes can be ordered safely and quickly online in our electroplating store at shop.jentner.de

4. Operating and display elements

4.1 Picture of the Digital V with inscription





1. Button „Start/Standby“
2. Button „Motor/Movement“
3. Button „Heating 1“
4. Button „Heating 2“
5. Display
6. Button “Temp“ – temperature setting
7. Button “SPG“ – tension setting (Temp 1 or minutes in the respective programme)
8. Button “Load“ – charge quantity setting (Temp 2 or minutes in the respective programme)
9. Button “Time“ – Setting the time default
10. Button “Tank“ – Selection of the working tank
11. Button “OK“ – confirmation of the entries made
12. Button “Prog“ – programme selection
13. Rotary knob for setting and selecting diverse parameters and values
14. Connection socket red for electroplating pen (anode)
15. Connection socket black for tweezers/clamp (cathode)
16. 2,5L PPH tank (100x150x220 mm)
17. Anode bar (2 x)
18. Cathode bar
19. Protective contact socket for heater (bath heater)
20. Connection socket for temperature sensor
21. Toggle switch "On-Off" for switching the device on and off
22. 4 A slow blow fuse, 115 V-230 V ~, 5* 20 mm
23. Mains connection socket with fuse holder for socket 230 V ~, 50 Hz
24. Fuse box for removable fuse
25. Temperature sensor
26. 5 L PPH tank (190x150x220mm)

The outer two anode bars 17 can be easily pulled out, the middle cathode bar 18 can be unscrewed by turning it to the right. Anode and cathode bar must always be kept clean and can be cleaned with a scotch sponge.

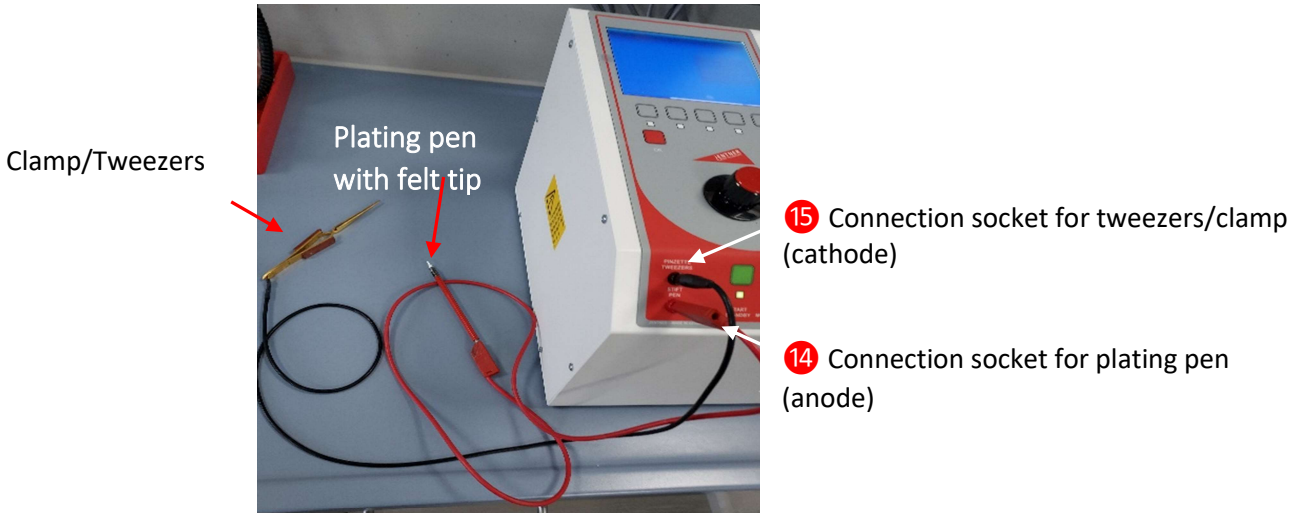
4. 2 Goods movement (cathode bar movement)

The goods are moved by an integrated drive motor, which is controlled by means of the key 2 eingeschaltet werden kann. The low-current cathode bar 18 is then moved horizontally with the aid of a geared motor. The good movement enables uniform metal deposition on the goods. Whether goods movement is required depends on the respective electrolyte. Please observe the instructions in the product descriptions of the chemical supplier.

4.3 Electroplating pen (Available accessories)

You also have the possibility of selective/partial plating with our device. For this purpose, the plating pen and tweezers/clamp are connected to the provided sockets 14 and 15 plugged into the control panel on the front of the unit. The required tension (volts) is controlled by the selected working program. The special chemicals for pen plating (rhodium, gold and silver baths) and all accessories are available from us or from specialist dealers.

Example für electroplating pen



4.4. Cover

The cover protects the sensitive and valuable electroplating baths from dust and dirt. When working with heated baths, the cover must be open. When the cover is closed, the heat accumulation can deform the cover.

5. Working with the Digital V

5.1 Preparation

Carefully remove the Digital V from the box and place it on a stable surface.
The operator is recommended to wear protective glasses, protective gloves and protective clothing.

5.2 Start-up

The supplied grounding power cord is plugged into the mains connection socket 23 on the back of the device and connected to an earthed socket 230 V/ 50 Hz (120 V / 60 Hz). The unit is switched on with the toggle switch 21 Do not switch on the unit until all the steps for preparing for electroplating

have been completed (see 5.3). The power of the rectifier is 300 watts with an output current of 20 A. The max. working voltage is 15 volts.
After switching on, the device is under direct current!

5.3 Working steps (preparation for electroplating))

5.3.1 Bath heating (If necessary see bath description))

Connecting the rod heater and temperature sensor
The bath is heated by a titanium immersion heater, which is available as an accessory. This is suspended in the corresponding galvanic bath with the aid of a special holder (not included in the scope of delivery), also made of titanium. The immersion heater is plugged into the socket 19 on the rear wall of the housing for operation (1 or 2). The heater must be connected only to the device and is inserted through the hole on the wall of the device. Then attached to the edge of the filled pool by means of the titanium holder (→ see the example picture for the use of the bath heater). The immersion heater must always be in the filled tank that is about to be heated. The temperature is controlled continuously by a special temperature sensor. A temperature sensor with titanium holder is included in the delivery.

The temperature sensor 25 gets plugged into the connection socket 20 (1 or 2)
(Attention: Always plug the heating rod and the temperature sensor into the socket with the same number 1 or 2). The temperature sensor must always be in the filled bath that is to be heated. The immersion heater heats the bath to the set temperature. When this is reached, the heater switches off automatically. If the temperature drops by 2° C, the heater switches on again automatically. The temperature should be checked with the help of a thermometer. By gently stirring the electrolyte, you can achieve an even temperature distribution. If an even distribution of the temperature is not given, the temperature can rise locally above the set value and the warning message "Overtemperature" (see 5.3.1.3) appears in the display. This warning message is confirmed with the "OK" button 11
The heating switches off and can be restarted after cooling down with the buttons 3 and/or 4

The heater should only be switched on when the work tank is filled with sufficient liquid. The holders of the immersion heater and temperature sensor must be attached to the side of the plastic tank and not to the anode rod.

Example pictures for the use of the bath heater

Bath temperature setting
Please refer to the corresponding product descriptions of your chemical supplier for the bath temperature required by the respective baths. A maximum of two heaters with the corresponding sensors can be connected to the device. These can be used in any tank. The tank in which the heater

and sensor hang is heated, regardless of the program. The heater is switched on separately at the front of the device. A symbol appears in the display (top right) as soon as a heater is active.

- Operate toggle switch 21 in order to switch on the device.
- Press button 6 → Programme „TEMPERATURE SETTING“ opens.
- With the buttons 7 and 8 set the temperature for the respective connected heater by turning the rotary knob 13
- Confirm with button 11 .
- Switch on heater when heater and temperature sensor 25 are suspended together in the filled tank. Press button 3 or 4 for the respective heater.

Attention! If the filling level is too low or if the immersion heater is outside the working tank, there is a risk of fire and destruction of the working tank and immersion heater.

Dry heat protection/level control
The heating is controlled automatically by the temperature sensor. The sensor is equipped with level monitoring, thus overheating is avoided in the event of a drop in volume. If the level of a heated tank drops, the sensor switches off the heating and the warning message "Level too low" appears in the display. The warning is reset with the "OK" button 11 This prevents overheating of the heater or tank. When the volume of the bath is refilled to target, the respective buttons 3 or 4 can be used to restart the bath heating.

5.3.2 Filling of the PPH tanks

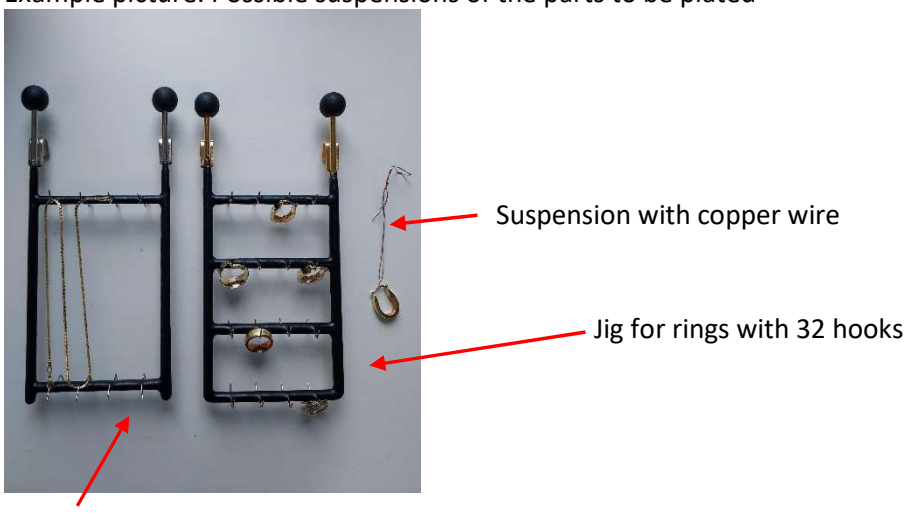
The plastic tanks are filled with 5 L electrolyte and pushed under the cathode/anode rods. A maximum of 4 tanks can be filled with electrolyte and placed next to each other.
Fill the 2,5 L tanks with rinsing water (demineralized water) and place them in front of the electrolyte tanks.

5.3.3 Anode selection

The anode material required depends on the electrolyte used. Please observe the instructions in the product descriptions of the chemical supplier. Stainless steel, platinized titanium, mixed oxide (MOX), silver, nickel and copper anodes are available as accessories. The anodes are mounted on the outer anode rods 17 or inserted in such a way that good contact is ensured.

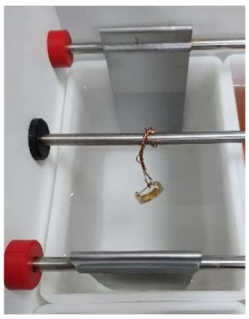
5.3.4 Contacting of the parts to be plated

Example picture: Possible suspensions of the parts to be plated



Suspension with a jig
The part to be plated is fixed or hung on the jig (accessory), make sure that there is a good contact. The jig is attached to the cathode bar 18

Suspension with a copper wire
The part to be plated is attached with a copper wire. Contact between the wire and the part must be ensured. The part to be electroplated must be completely immersed in the electrolyte. **At high voltage, a thin copper wire can become hot !**



5.4 Programme and parameter setting

5.4.1 Programme selection

The device is equipped with 15 programmes that can be customized. The first 9 programmes are pre-labeled and have preset parameters (temperature, voltage, time, etc.), these parameters can be changed and re-saved in the respective programme.
Programmes: „EF“ degreasing, „Au“ Gold, „Ag“ Silver, „Rh“ Rhodium, „Ru“ Ruthenium, „Pd“ Palladium, „Pt“ Platin, „Ni“ Nickel, „Cu“ Copper und Nr.1,2,3,4,5,6.
Up to three programmes can be saved per tank.

- Operate toggle switch 21 in order to start up the machine.
- Press 12 „LOAD PROGRAMM“ opens.
- By turning the rotary knob 13 the desired programme can be selected.
- Confirm with „OK“ 11

5.4.2 Parameter setting

For the parameter settings for the respective electrolyte, please refer to the corresponding product descriptions of your chemical supplier.

Exposure time setting (deposition time)

- Press 12 , the "SET TIMER" programme opens.
- Press 7 and turn the knob 13 → set minutes
- Press 8 and turn the knob 13 → set seconds
- Confirm with „OK“ 11
- Save time in the respective programme → Press 12 and hold for about 5 seconds, „ SAVE“ appears on the display above the button 10 , press 10 then „SAVED“ appears on the display
- By pressing „OK“ 11 you get back to the overview of the respective programme.

If no time is preselected, the device operates in permanent mode.

Tension setting

- Press 7 , the programme „TENSION SETTING“ opens.
- Turn the knob 13 to set the tension (voltage) (continuously variable and lossless toroidal controller).
- Confirm with „OK“ 11
- Save the voltage in the respective programme → Press 12 and hold for about 5 seconds, „ SAVE“ appears on the display above the button 10 , press 10 then „SAVED“ appears on the display.
- By pressing „OK“ 11 you get back to the overview of the respective programme.

If the changed parameters are not saved, you can plate once with the newly set parameters, then the settings jump back to the parameters set before.

5.5 Starting the process

5.5.1 Prepare electroplating unit for electroplating

1. Fill the plastic tanks → 5.3.b
2. Heat electrolytes to be warmed up → 5.3.a
3. Fix anodes to anode rods → 5.3.c
4. Programme selection → 5.4.a
5. Set exposition time and voltage → 5.4.b

5.5.2 Working steps

1. Programme selection→ 5.4.a
2. Fix the parts to be plated on jigs or with copper wire. → 5.3.d
3. Attach or hang suspensions on the cathode rod in the respective electrolyte
4. Make sure there is good contact between the suspension and the cathode rod
5. Good movement, press 2 , switch on if necessary → 4.2
6. To start the process → press „Start“ 1
7. A warning signal sounds at the end of the exposure time → process is finished
8. The plated part is removed from the cathode bar and rinsed in the corresponding rinsing tank. Make sure that the rinsing water is changed regularly.
9. Dry the parts

The working steps are repeated for each plating/degreasing.

The first step in your small electroplating unit should always be electrolytic degreasing. All further steps depend on your needs. Between all electroplating baths, rinse thoroughly in demineralized water. Please be sure to request the product information from your chemical supplier. All important process parameters (such as exposure time, voltage and temperature) are listed there.

It is essential to switch off the device and the heating at the end of work!

When the device is not in use, it automatically goes into standby mode and can be reset by pressing „START“ 1 . The electroplating unit can also be switched to standby mode by holding down the "START" key for 3 sec.

6. Additional information

6.1 Language selection

The device display can be set in 4 different languages.

- Press 11 and hold for about 3 sec., the programme „LANGUAGE“ opens
- Select the desired language with the buttons 6 - 9
  - Button 6 → 1 German
  - Button 7 → 2 Spanish
  - Button 8 → 3 English
  - Button 9 → 4 French

- Press the button 11 in order to save the language.

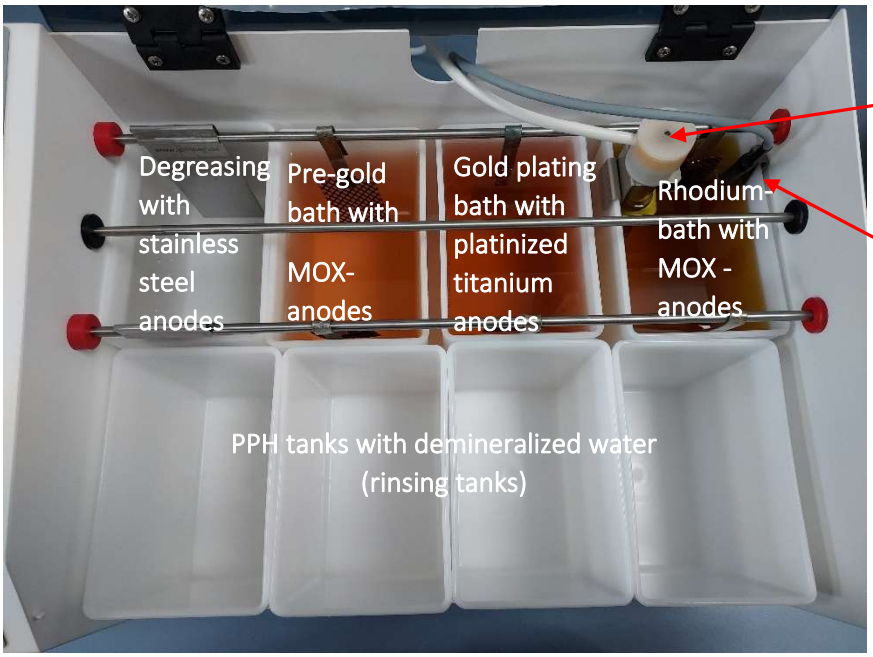
6.2 Ampere-minutes setting

- Press 8, the programme „AMPERE-MINUTES SETTING“ opens.
- Turn the knob 13 to set the ampere-minutes (continuously variable and lossless toroidal controller).
- Confirm with 11.
- Save the ampere-minutes in the respective programme → Press and hold 12 for about 5 sec., „ SAVE“ appears on the display above the button 10, press 10 then „SAVED“ appears on the display.
- By pressing „OK“ 11 you get back to the overview of the respective programme.

6.3 Example pictures

6.3.1 Warning messages

6.3.2 Filling the plastic tanks (example picture small electroplating unit Digital II)



Titanium immersion heater, 200 Watt, with holder (not included in delivery)

Temperature sensor 25 with holder

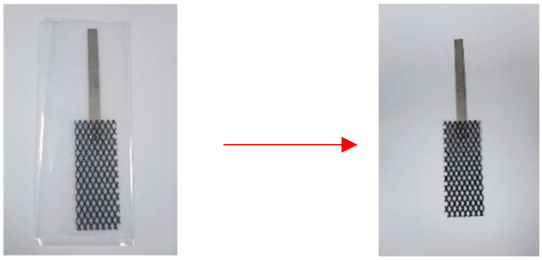
6.4 Symbols on the display

Symbole der Displayanzeige

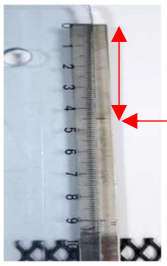
	Amin
	Gesamtladungsmenge überschritten
	Gesamtladungsmenge in Ordnung
	Heizung in Betrieb
	Bewegungsmotor an
	Gerät in Betrieb
	Permanentbetrieb

6.5 Professional bending of the anode lugs

Unpack the anode from the original packaging

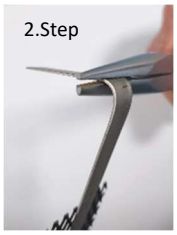


1. Mark anodes for bending

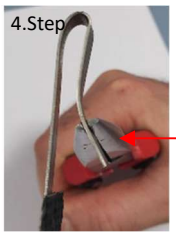


Mark anode at 4.5cm

2. Bending the anode lugs with flat nose pliers



Attention! When bending, make sure that the eyelet does not exceed 6mm to ensure good contact with the anode rod.



At the end of the anode holder, another bend is bent so that the anode can be better inserted onto the anode rod.

6.6 Example rhodium bath

Each galvanic bath works with a theoretical deposition value, e.g. approx. 6 mg/Amin are deposited in a rhodium bath (value can be taken from the respective product description). It is now possible to select whether a deposition time is to be preselected or a charge is to be defined. By defining the charge, the metal weight to be deposited is determined. If 10 amins are entered for the rhodium process, this would mathematically mean a deposition of 60 mg (10 amins x 6 mg/Amin = 60 mg). Please note that these are purely theoretical values which may differ from the actual values.

6.7 Total charge quantity

A total charge quantity can be specified per tank, and a warning is displayed if this is exceeded. The warning symbol  appears in the display. By entering the total charge quantity, a metal quantity can be specified, when it is reached, the bath must be regenerated. To enter the total charge quantity, press and hold the "Tank" key for three seconds. Select a tank and enter the desired target value. Once a preset is entered, a countdown occurs. The symbol  appears on the display. If the total charge quantity of the selected tank is now assigned to a program (e.g. Rh), monitoring takes place for this process. It means one sets the total charge quantity for a specific tank, then selects the desired programme, assigns the respective tank to it and then saves it. In this way, the functions "total charge quantity" and "programme" are virtually coupled. If you select the tank "0", there is no monitoring of the total charge quantity, which means that you can work manually.

If you need assistance with the start-up of the device, please feel free to contact us. You can reach us by phone from 8:30 a.m. to 4:30 p.m. at +49 7231-418094-0, or send us an email at sales@jentner.de with your request and you will get support as soon as possible.

For further information on the equipment, bath chemicals or the respective electroplating processes, please contact:

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