Electroplating Unit
DIGITAL II
version 2.0



Operating instructions



Thank you for choosing a device from the Jentner brand.

In the last 40 years, Jentner has stood for quality, perfection and expertise in metal finishing.

With our sophisticated electroplating product range, we specifically cater to goldsmiths, jewellers, watchmaking workshops, schools, universities, institutes and laboratories, restorers and museums – in short: to businesses that wish to independently and conveniently finish small to medium-sized jewellery pieces or workpieces.

Jentner – Quality made in Germany

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1. Notes and Safety

1.1 Information for the operator

The operating instructions are an important part of this product. The operator must ensure that all users read and follow these instructions. Make sure the work area is well ventilated and all users wear suitable protective equipment. Wastewater and used chemicals must be disposed of properly. Please follow the regulations of your local water authority and refer to the Safety Data Sheets (SDS) provided by your chemical supplier. Repairs to the device may only be carried out by the manufacturer.

1.2 Safety instructions

If bath heating is required, make sure that the heater and the temperature sensor are placed together in the same filled tank. If the liquid level is too low or the heater is located outside the working tank, there is a risk of fire and damage to the heater and the tank. Always ensure that there is a very good electrical contact between the suspension rack and the cathode bar. Close the device lid only after 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 power inlet inside the fuse holder 24.

In the event of a fault, for example if the anode plate causes a short circuit by simultaneously touching the anode and cathode bars, the cartridge fuse will blow. The fuse holder 24 can be removed to replace the cartridge fuse.22
Only cartridge fuses with the following specifications may be used:
4a time-delay cartridge fuse, 115 V-230 V ~, 5* 20 mm.

2. Electroplating Unit DIGITAL II version 2.0

2.1 Description

The compact, universal Digital II Version 2.0 small-scale electroplating unit is ideally suited for electrolytic degreasing, rhodium plating, gold plating, silver plating, and many other electroplating surface coating applications.

2.2 Dimensions and weight

Width: 700 mm, depth: 320 mm, height: 320 mm, weight: 18 kg

3. Scope of delivery and accessories

3.1 Scope of delivery

- 8 x 1,5 L plastic tanks made of PP (150x100x150 mm)
- 1 protective contact power cable
- 1 Temperature sensor with titanium mount

Please make sure that the delivery is complete and that all items are free from damage. Please contact your supplier immediately if any parts are missing or defective. DO NOT use a defective or incomplete device!

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

- Plastic tank lid for 1,5 Litres tank
- Jig with 12 hooks for rings
- Jig with 12 hooks for chains
- Immersion titan heater 200 W (the heater must only be used for its intended purpose)
- Titan fixation for heater
- Stainless steel, platinized titanium and MMO anodes with holder
- Silver, copper and nickel anodes without holder
- Titanium-fixation for silver, copper and nickel anodes
- Copper wire
- Electroplating pen for bicolor applications

3.3 Chemicals

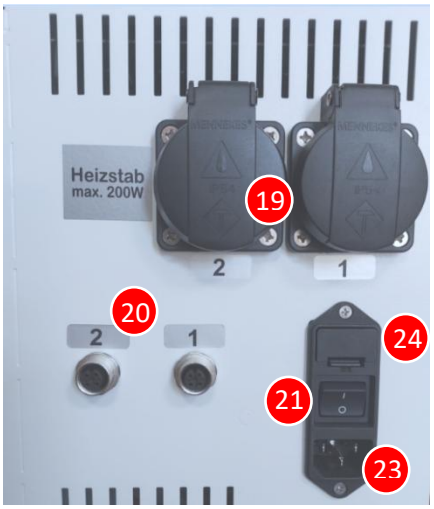
The required bath chemicals are available from us or from specialist suppliers. Read and follow the manufacturer's product instructions carefully. After use, the baths should be covered with the transparent unit cover.

Any accessories as suitable electrolytes can be ordered quick and safe from our electroplating shop Jentner Galvanik Shop.

4. Operating and display Elements

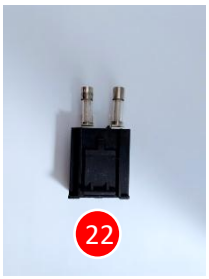
4.1 Image of the Digital II Version 2.0 with labels











1. Button „Start/Standby“
2. Button „Motor/Movement“
3. Button „ Heating 1“
4. Button „ Heating 2“
5. Display
6. Button “Temp“– setting temperature
7. Button “VLT“– voltage setting (Temp 1 or minutes in the selected program)
8. Button “Charge“– charge quantity setting (Temp 2 or seconds in the selected program)
9. Button “time“ – time setting
10. Button “Tank“ – working tank selection
11. Button “OK“ – confirmation of entered settings
12. Button “Prog“ – program selection
13. Rotary knob for setting and selecting various parameters and values
14. Red connector socket for the electroplating pen (anode)
15. Black connector socket for workpiece tweezers/workpiece clamp (cathode)
16. 1,5L plastic tank made of PP (150x100x150mm)
17. Anode rod (2 x)
18. Cathode rod
19. Protective contact socket for heater (bath heater)
20. Connector socket for temperature sensor
21. „On/Off“ toggle switch for switching the device on and off
22. 4 A slow-blow fuse, 115-230 V ~, 50 x 20 mm
23. Power inlet socket with fuse holder for 230 V / 50 Hz (120 V / 60 Hz) mains connection
24. Fuse compartment for removable fuse
25. Temperature sensor

The two outer anode rods 17 can be easily removed, the center cathode rod 18 can be unscrewed by turning it to the right.
The anode and cathode rods must always be kept clean and can be cleaned with scotch sponge.

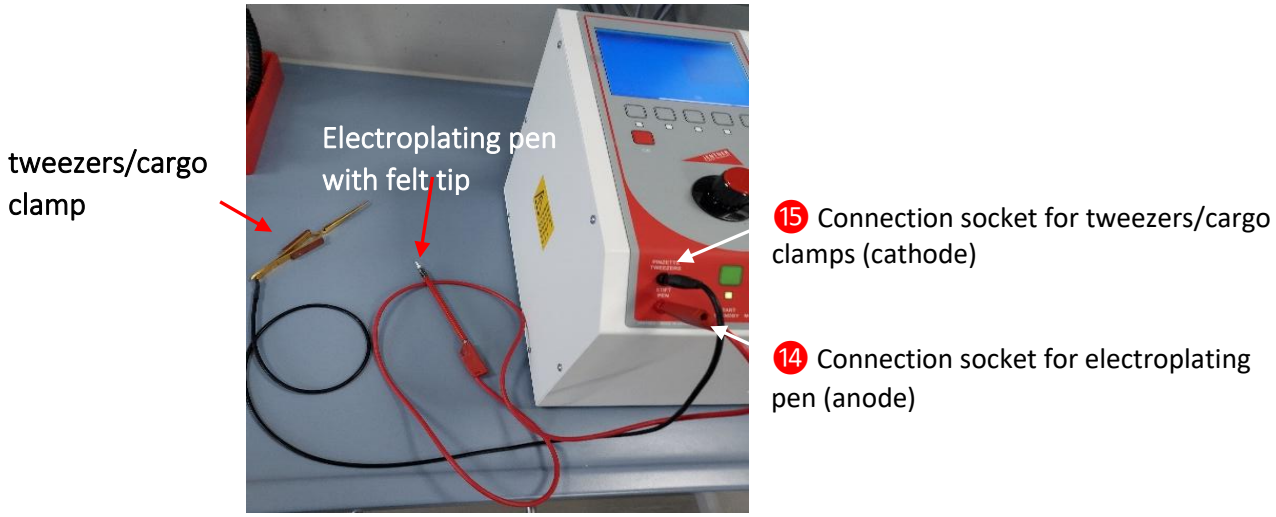
4. 2 Workpiece movement

The workpiece movement is provided by an integrated drive motor, which can be activated using button 2. The low-current rod 18 is then moved horizontally by a geared motor. The workpiece movement ensures an even metal depostion on the workpiece. Whether workpiece is required depends on the electrolyte being used. Please follow the instructions in the product descriptions provided by the chemical supplier.

4.3 Pen Plating

Our equipment also enables selective/partial electroplating. To do this, connect the electroplating pen and the tweezers/cargo clamp to the corresponding sockets 14 and 15 on the front panel of the device. The required voltage is controlled via the selected work program. The special chemicals required for pen plating (rhodium, gold and silver plating solutions) as well as all necessary accessories, are available directly from us or through specialized retailers.

Sample image for pen plating



4.4. Device lid

The device lid protects the sensitive and valuable electroplating solutions from dust and dirt. Keep the device lid open while working with heated plating solutions. With the device lid closed, the heat buildup can warp the cover.

5. Working with the Digital II Version 2.0

5.1 Preparation

Carefully remove the digital II from the carton and place it on a stable surface.
The operator is advised to wear safety goggles, protective gloves, and protective clothing.

5.2 Commissioning

The supplied protective contact power cable is plugged into the power socket 21 on the back of the device and connected to a 230 V/ 50 Hz (120 V / 60 Hz) protective contact outlet. The device is switched on using the toggle switch 23 . Switch on the device only after all preparation steps for the electroplating process have been completed **(see 5.3)**. The rectifier has a power rating of 300 watts with a current output of 20 A. The maximum operating voltage is 15 volts.

After the device has been switched on, it is energized with direct current!

5.3 Preparation steps for electroplating

5.3.1 Bath heating (if necessary, see bath description)

Connecting the immersion heater and temperature sensor

Bath heating is provided by a titanium immersion heater, available as an accessory. The heater is installed in the respective electroplating bath using a special titanium holder (not included in the scope of delivery). For operation, the immersion heater must be connected to socket on the back of the device 19 (1 or 2). The heater may only be connected to the device and is threaded through the hole in the device wall. Then attach it to the edge of the filled tank using the titanium holder (see example image for the use of the bath heater). The temperature sensor must always be located in the filled tank that is to be heated. The temperature control is continuously regulated by a special temperature sensor. A temperature sensor with a titanium holder is included in the scope of delivery.

The temperature sensor is connected to socket 20 (1 or 2). (**Warning:** Always plug the heating rod and temperature se 25 r into the same intended socket, either 1 or 2). The temperature sensor must always be placed in the filled tank being heated. The immersion heater raises the bath temperature to the set value. Once the set temperature is reached, the heater switches off automatically. If the temperature drops by 2°C, the heater automatically switches on again. The temperature should be checked using a thermometer. By gently stirring the electrolyte, you achieve an even temperature distribution. If the temperature is not evenly distributed, the actual temperature may exceed the set value, causing the warning message “Overtemperature” (see Section 5.3.1.3) to appear on the display. Press the “OK” button 11 to confirm the warning message. The heater switches off and can be restarted after it has cooled down by pressing the buttons 3 and/or 4 .

The heater and temperature sensor **must always be installed** in the same tank.
The heater may only be switched on when the process tank is filled with a sufficient amount of liquid.
The immersion heater and temperature sensor holders may only be mounted on the side of the plastic tank and not on the anode bar.

Example images for using the bath heater





Setting the bath temperature

The required temperature for each bath can be found in the relevant product documentation from your chemical supplier. A maximum of two heaters, together with their corresponding sensors, can be connected to the gadget. These can be used in any tank. The tank in which the heater and temperature sensor are immersed will be heated, regardless of the selected program. The heater is switched on separately using the controls on the front of the unit. A symbol appears in the upper right corner of the display whenever a heater is active.

- Use the toggle switch 21 to turn on the gadget.
- Press the 6 button → the "SET TEMPERATURE" menu opens.
- Use the 7 and the 8 buttons to select the connected heater, then set the temperature by rotating the rotary knob 13.
- Confirm with the button 11.
- Switch on the heater (Attention: Only when the heater and temperature sensor 12 are both in the filled tank) → press butto 3 (4 for the respective heater.

Attention! If the liquid level is too low or if the immersion heater is located outside the process tank, there is a risk of fire and damage to the process tank and immersion heater.

Dry-Run Protection / Level Controller

The heating system is controlled automatically by the temperature sensor. The sensor is equipped with a level monitoring system, so overheating is avoided when the volume drops.
When the liquid level of a heated tank drops, the heater is switched off by the sensor and the warning message "Liquid Level Too Low" appears on the display. Confirm the warning by pressing the "OK" button 11 . This prevents overheating of the heater or the tank. Once the bath has been refilled to the required level, the bath heater can be restarted by pressing the corresponding button 3 or 4.

5.3.2 Filling the plastic tanks

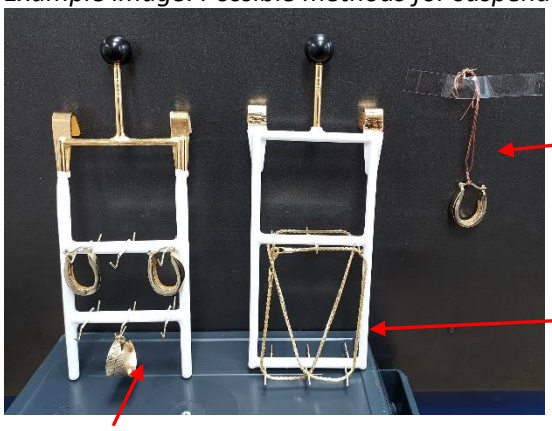
Fill the plastic tanks with 1.5 L of electrolyte and place them beneath the cathode/anode bars.
A maximum of four tanks can be filled with electrolyte and placed side by side.
Fill the plastic tanks with rinse water (demineralized water) and place them in front of the electrolyte tanks.

5.3.3 Selecting the anodes

The required anode material depends on the electrolyte being used. Please follow the instructions, given in the product documentation, provided by your chemical supplier. Anodes made of stainless steel, platinized titanium, mixed metal oxide (MMO), silver, nickel, and copper are available as accessories. The anodes are attached to the outer anode rods 17 or plugged in so that a good contact is ensured.

5.3.4 Parts to be electroplated

Example image: Possible methods for suspending the parts to be electroplated



Hanging with a copper wire

Electroplating rack for chains with 12 hooks

Electroplating rack for rings with 12 hooks

Hanging with a workpiece rack.

Attach or hang the workpiece to be electroplated on the plating rack (accessory), ensuring that good contact is maintained. Attach the plating rack to the cathode bar 18.

Hanging with a copper wire

The part to be electroplated is attached to a copper wire. Good electrical contact between the wire and the part must be ensured. The part to be electroplated must be completely immersed in the electrolyte.



The copper wire may heat up when a high voltage is applied.

5.4 Program settings

5.4.1 Program selection

The device is equipped with 15 programs that can be customized individually.
The first 9 programs are predefined and already contain preset parameters (temperature, voltage, time, etc.). These parameters can be modified within the respective program and then saved again.
Programs: “EF” (Degreasing), “Au” (Gold), “Ag” (Silver), “Rh” (Rhodium), “Ru” (Ruthenium), “Pd” (Palladium), “Pt” (Platinum), “Ni” (Nickel), “Cu” (Copper), and programs No. 1, 2, 3, 4, 5, and 6.
Up to three programs can be assigned to each tank.

- Activate the toggle switch 21 to turn on the device.
- Press the button 12 to open the "LOAD PROGRAM" menu.
- Turn the rotary knob 13 to select the desired program.
- Press the “OK” button 11 to confirm the selection.

5.4.2 Parameter setting

Please refer to the corresponding product data sheets provided by your chemical supplier for the parameter settings applicable to the respective electrolyte.

Exposure time setting

- Press the button 12 to open the "SET TIMER" menu.
- Press the button 7 and turn the rotary knob 13 → set the minutes.
- Press the button 8 and turn the rotary knob 13 → set the seconds.
- Press the “OK” button 11 to confirm.
- Save the time in the respective program by pressing and holding the button 12 for approximately 5 seconds. The display will show “SAVE” above the button 10 . Press the button 10 and the display will show “SAVED”. By pressing the “OK” button 11 , you will return to the overview of the respective program.

If no operating time is set, the device will run continuously.

Voltage setting

- Press the button 7 to access the "SET VOLTAGE" menu.
- Turn the rotary knob 13 to adjust the voltage (via a continuously variable, low-loss toroidal transformer control system).
- Press the “OK” button 11 to confirm.
- To save the voltage in the respective program, press and hold the button 12 for approximately 5 seconds. The display will show "SAVE" above the button 10 . Press the button 10 , then the display will show "SAVED". Press the "OK" button 11 to return to the overview of the respective program.

If the modified parameters are not saved, the newly adjusted settings will remain effective for one electroplating process only. Upon completion, the device will automatically return to the previously saved parameter settings.

5.5 Starting the electroplating process

5.5.1 Preparing the electroplating unit for electroplating

1. Fill the plastic tanks. → 5.3.b
2. Heat the electrolytes that require heating. → 5.3.a
3. Secure the anodes to the anode bars. → 5.3.c
4. Select the program. → 5.4.a
5. Set the plating time and voltage.→ 5.4.b

5.5.2 Arbeitsschritte

1. Select the program. → 5.4.a
2. Attach the parts to be electroplated to racks or secure them using copper wire.→ 5.3.d
3. Suspend the workpiece racks from the cathode bar in the respective electrolyte bath.
4. Ensure good electrical contact between the suspension holder and the cathode bar.
5. Workpiece movement (agitation): Press the button 2 to activate the function as required. → 4.2
6. Start the process → Press button 1
7. A warning signal sounds when the exposure time has ended -> the process is complete
8. Remove the workpiece from the cathode bar and rinse it in the designated rinse tank. Care must be taken to change the rinse water at regular intervals.
9. Dry the work pieces.

The same work steps are repeated for every electroplating and degreasing operation.

The first process step in your small electroplating unit should always be electrolytic degreasing. All subsequent process steps depend on your specific requirements.
Between the electroplating baths, the workpieces must be thoroughly rinsed in distilled water.
Please ensure that you request the product information from your chemical supplier. It contains all important process parameters, such as exposure time, voltage, and temperature.

Always switch off the device and the heater after completing work.

If the unit is not used for a certain period of time, it automatically enters standby mode. The unit can be switched on again by pressing the “START” button 1 .
Alternatively, the small electroplating unit can be placed in standby mode by pressing and holding the “START” button 1 for 3 seconds.

6. Additional information

6.1 Language selection

The device display supports four selectable languages.

- Press and hold button 11 for 3 seconds to open the "LANGUAGE" menu.
- Use buttons 6 - 9 to select one of the following languages:
  - Button 6 → 1 German
  - Button 7 → 2 Spanish
  - Button 8 → 3 English
  - Button 9 → 4 French

- Press button 11 to save the selected language.

6.2 Ampere-Minute Setting

- Press button 8 to open the "SET AMPERE-MINUTES" menu.
- Turn the rotary knob 13 to adjust the ampere-minute value (using a continuously variable, low-loss toroidal transformer control system).
- Press button 11 to confirm the setting. 10
- Save the ampere-minute setting in the respective program.→ Press and hold button 12 for approx. 5 seconds until "SAVE" appears on the display. Press the button 10 to save the setting. The display will indicate "SAVED". Press the "OK" button 11 to return to the program overview.

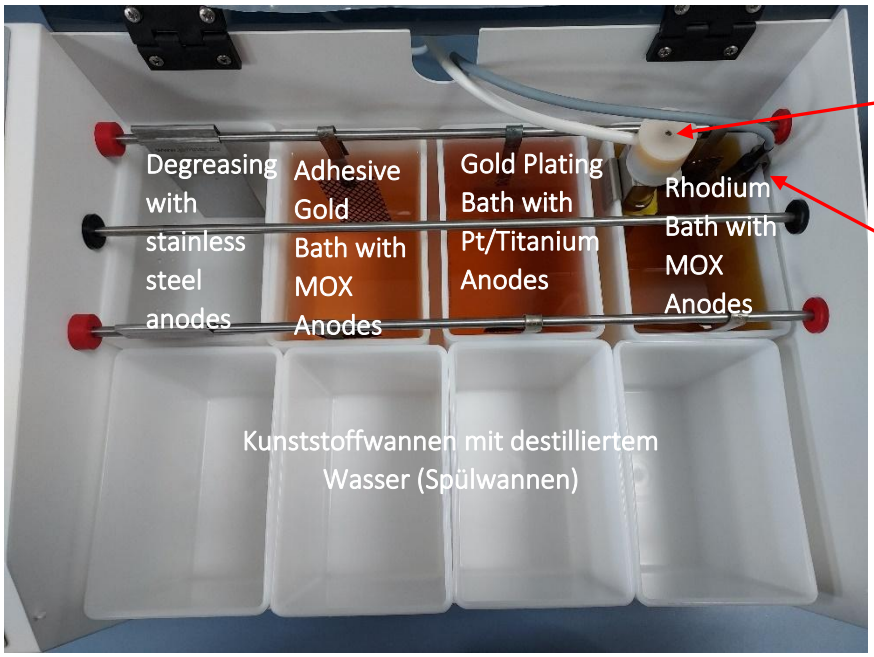
6.3 Example images

6.3.1 Warning messages





6.3.2 Filling the plastic tanks



Titanium immersion heater, 200 W, with mounting bracket (not included in the scope of

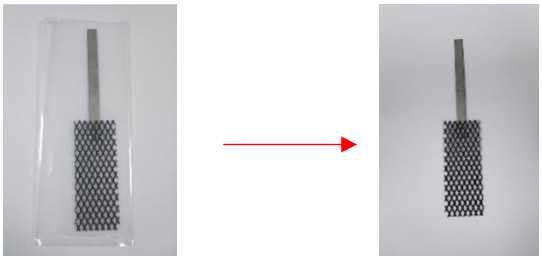
Temperature sensor 25 with mounting bracket

6.4 Display Symbols

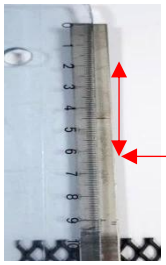
- Amin
- Total charge quantity exceeded
- Total charge quantity within limits
- Heater active
- Agitation motor active
- Device operating
- Continuous operation

6.5 Correct Bending of Anode Tabs

1. **Unpack the anodes form its original packaging**



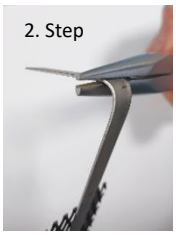
2. **Mark the anode for bending**



Mark the anode at 4.5 cm for bending.

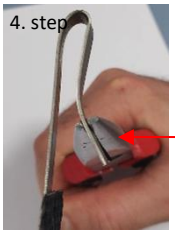
3. **Bend the anode tab using flat-nose pliers.**







Warning! When bending the anode tab, ensure that the eyelet does not exceed 6 mm in diameter to guarantee good contact with the anode bar.



A further bend is made at the end of the anode holder so that the anode can be more easily mounted onto the anode bar.

6.6 Charge Calculation for a Rhodium Bath

Each electroplating bath operates with a theoretical deposition rate. For example, a rhodium bath deposits approximately 6 mg/Amin (this value can be found in the respective product data sheet). You can choose whether to preset a plating time or define a charge value. By specifying a charge value, the amount of metal to be deposited is determined. For example, if 10 Amin are entered for the rhodium process, this would theoretically result in a deposition of 60 mg of rhodium: 10 Amin × 6 mg/Amin = 60 mg. Please note that these are purely theoretical values and may differ from the actual deposition values achieved in practice.

6.7 Total charge amount

A total charge quantity can be specified for each bath. If this value is exceeded, a warning will be displayed and the corresponding warning symbol  will appear on the display. By entering a total charge quantity, a specific amount of deposited metal can be defined. Once this limit is reached, the bath must be regenerated. To enter the total charge quantity, press and hold the **"Bath"** button for **three seconds**. Select the desired bath and enter the required target value. As soon as a value has been entered, a countdown will begin. The corresponding symbol  will be shown on the display.
If the total charge quantity of the selected bath is assigned to a program (e.g., **Rh**), monitoring will be activated for that process. This means that a total charge quantity is first defined for a specific bath, then the desired program is selected, the corresponding bath is assigned to that program, and the settings are saved. In this way, the "Total Charge Quantity" and "Program" functions are linked.
If Bath "0" is selected, no total charge quantity monitoring will be performed, allowing the system to be operated manually.

If you require assistance with commissioning the device, please do not hesitate to contact us. You can reach us by telephone between 8:30 a.m. and 4:30 p.m. at +49 (0)7231 418094-0, or send us an email at sales@jentner.de describing your request. Our team will provide support as quickly as possible.

We look forward to hearing from you!

For further information regarding the device, bath chemicals, or the respective electroplating processes, please contact:

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