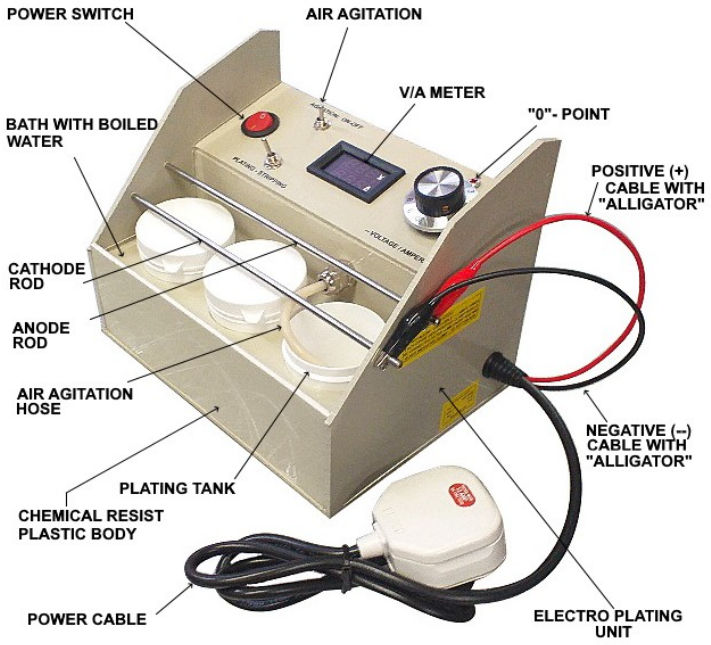
Compact Electro Plating Machine - CEPM-2A: USER MANUAL



Model	**CEPM-2A**
Input (V)	**100V ac – 240V ac**
Output (ADC)	**1-11 Vdc / 0 - 2 Adc continuously**
"Keep Solution Hot" option (water)	**Yes**
Plating-Stripping option	**Yes**
Overload power cut-off system	**Yes**
Air agitation system	**Yes**
Tank's boiled water bath	**Yes**
Set of anodes (3)	Yes
Anode's rod	**Yes, 4 mm**
Cathode's rod	**Yes, 4 mm**
Plating line	**x 1**
Biggest dimensions of plating object	**1.1/2 cube inch (40 cu.mm)**
Tank quantity	**x 3**
Volume of each tank	**50 ml of solution**
Dimensions of each tank (mm) inch	**(50) 2"(Diam) x (60) 2.2/5 (H)**
Body and tank's material	**Polypropylene**
Dimensions of station (mm) inch	**(200)8"(W) x (150)6"(D) x (150)6"(H)**
Weight	**1 Kg**

PRODUCT INTRODUCTION:

This compact electroplating machine is a high performance compact plating unit that is especially designed for coating all conductive objects by most popular metals such as copper, nickel, silver, gold, chrome, zinc, tin, rhodium, platinum etc.

These electroplating processes are widely used in many industries such as medical, electronic, machinery, decorating, crafts, jewellery, arts, etc.

This unit is also able to strip old surfaces (for re-coating) or/and for cleaning conductive objects before electroplating. For best results and for your convenience this unit has three professional industrial options like: plating-stripping, "Keep solution hot" and an air agitation. The low voltage (1-11Vdc) and amperage (0-2Adc) make this machine safe to use at home.

Is fully suitable also too work with many types of Pen electroplaters and with brush electroplaters.

DELIVERY SPECIFICATIONS:

Black and red leads with crocodile clamps; 3x50 ml plastic tanks with lids; anode and cathode steel rods x 2; stainless steel, copper and nickel anodes with protective plastic mesh for cleaning, copper, nickel, gold and silver plating processes. You will get also copper plating salt for 50 ml of solution to test this unit. Downloadable user manual with Video for beginners and other useful information will be sent to you on your email address after purchase .

BRUSHES AND PENS:

The unit has also possibility to work with Brush or/and Pen plating processes as well.

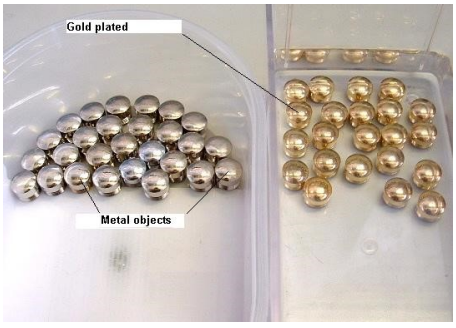
In order to do this connect the pen (brush) to the positive "+" (red "alligator" clamp) lead and connect the negative power source "-" (black "alligator" clamp) lead to a plating object .

For a brush (Pen) stripping process please use "Stripping" option.

IMPORTANT!

If the received unit looks a little different from the model that you expected, please do not worry: changes that have been made are solely made with the purpose of improving the quality and appearance of the plating unit to improve your convenience.

SAMPLES OF WORKS:

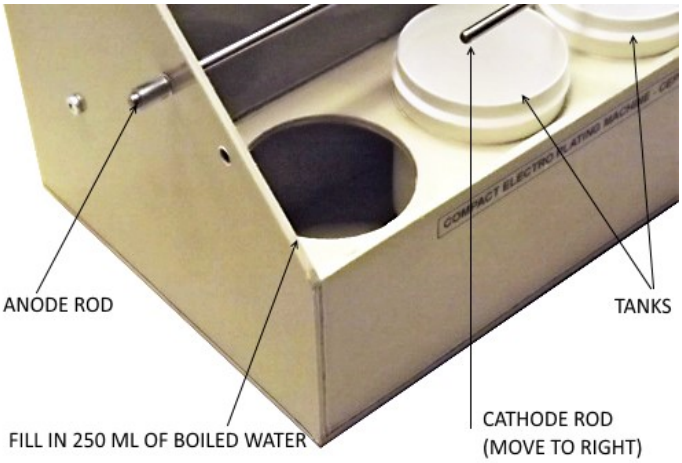


INSTALLATION AND OPERATION:

Installation and operation of this unit does not require deep professional knowledge or specific training:

- First of all please fill the "Keep solution hot" reservoir with 250 ml of hot-tap or boiled water (95 C – 98 C / 203 F - 208 F) for heating up solutions in all three tanks. For this, move bottom or both metal rods to the left side of the unit and lift any one tank up to fill the opened reservoir with the boiled water - please see picture below:

PIC 2:



INFO: This will allow you to heat up all solutions in tanks to about 50C(122 F) - 70C(158 F) that may be important for getting high quality of coated surface in some processes and for long life of used chemicals.

- When the reservoir was filled up insert this tank back into his hole (to keep the water in the reservoir hot in about 30 minutes that is fully enough for any type of electroplating process that usually takes just about one-two minute) and fix the anode and cathode rod/s back in their holes.

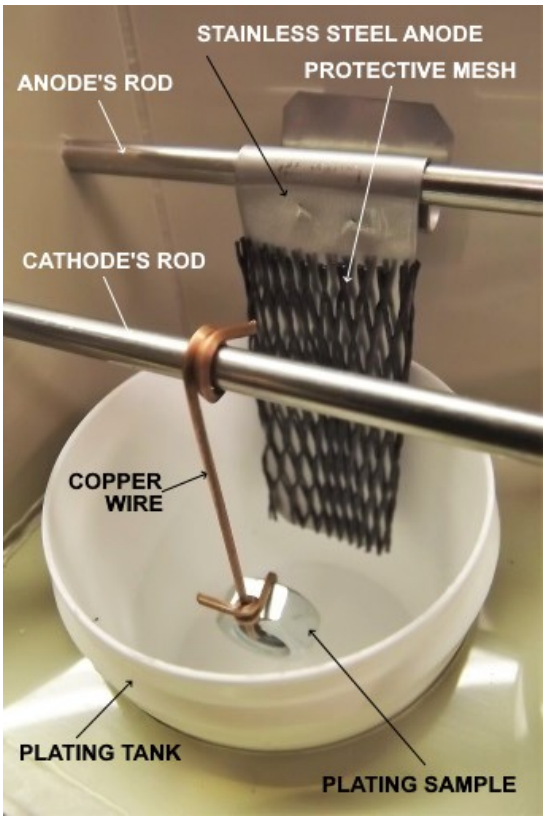
PIC 3:

INFO: After finishing your works or when the water in the reservoir was already cooled down and you need now to change it please drain out this cooled water out from the reservoir by small hole on the front right corner of the unit (Pic 3) and, if you need, just repeat instructions above to fill in new boiled water again.

- Now place the correct anode/s on the top (back) 4-mm steel anode's rod like shown on PIC 4 below. Than connect top (back) steel rod with anode/s to a power supply using RED (positive, +) "alligator" clip and connect bottom (front) steel rod to BLACK (negative, -) "alligator" clip as shown on picture 1 on front page.
- Now connect the plating object/s to the bottom CATHODE rod (See PIC 1 on front page) using copper or aluminium wires (hooks) - please see PIC 6 on next page for a sample and ensure that "Stripping-Plating" switch on top panel of your unit is on "Plating" position (Pic 5).

PIC 4

PIC: 5



INFO: Please ensure that each anode for the electroplating unit is in a protective plastic mesh to avoid short-cut contact with an object to be plated/cleaned in tank/s because it can cause damages on the internal power supply that is NOT under warranty.

INFO: Each anode should be same or bigger in size then area of your plating object and depending on the plating process (nickel, rhodium, gold, copper, nickel) the anode material will vary.

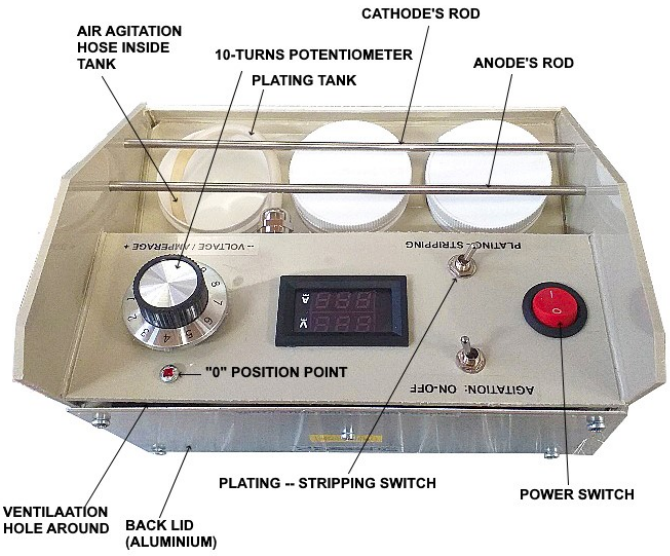
INFO: It is very important to keep temperature of your plating solutions under control because if the temperature reaches more than 80 C (167 F) it may destroy your solutions in few seconds.

INFO: If you are a beginner and never worked with electroplating processes before it may be very useful to find first more information and watch some videos about required electroplating processes on YouTube or on Google. It may save your time, equipment, money and help with your work without disappointments.

Now properly dissolve plating chemicals you have in the correct amount (50 ml) of warm (40C-65C) DISTILLED or DEIONIZED water, pour ready solutions into their 50-ml tanks and wait about 10-15 minutes for heating up these solutions by the boiled water before start an electroplating. To speed up the heating process use lids supplied with these tanks. For example: fill the left tank with cleaning solution, the middle tank with tap (rinsing) water and the right tank with a Rhodium plating solution. Each tank can be also used in different way, for example, for plating solutions in all three tanks (Copper—Nickel—Gold plating processes).

- Now connect your unit to a socket (100 Vac - 250 Vac).
- Switch the unit “On” by power switch and turn the 10-turns potentiometer (metallic knob with 0-9 digits) clockwise to a correct position for your work to supply correct voltage/amperage to the cathode/anode rods. On top line of the digital A/V gauge you will see V (Voltage) and on bottom line (A) amperage (Current). Please see picture 6 below:

PIC 6:



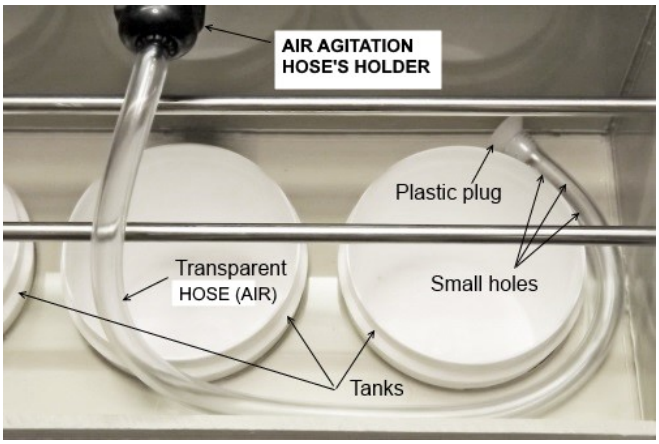
INFO: The current will be shown on the bottom line of digital A/V gauge (in the middle of top panel – see pic.1) only when both, ANODE and plating object are in the solution. If your gauge shows voltage but doesn’t shows amperage (0) its mean that somewhere is a problem with contacts between red/black cable and metal rods or between anode/s and the metal rods, or/and between the metal rods and plating object/s. Please check all contacts and ensure that the top line of the gauge (V) shows minimum 5 volts. Please note that all most popular electroplating processes require just about 1A per 1 sq. inch of plating area. If you see that the ampere gauge starts to show higher amperage then required: turn potentiometer anti-clockwise reducing voltage or , if this is possible, increase distance between an anode and the plating object/s in the tank/s.

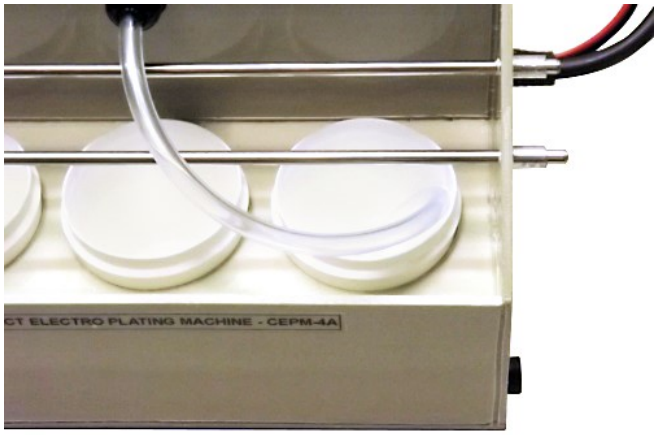
STRIPPING OPTION:

This process is widely used for removing old unwanted layer from a previously plated objects. On this machine it can be done easy without changing the object's and anode's position manually by shifting "Plating-Stripping" switch (Pic 6) on the left part of top panel to the "Stripping" position. There is no need reverse the POLARITY of the cables manually because the unit does this automatically for you - just make sure that the stripping object and an anode are FULLY immersed in the solution and have a good contact with their 4 mm metal rods.

AGITATION OPTION:

Air agitation option is widely used to agitate plating solutions for better finishing result, speed up plating process and for last longer your chemicals. This option will be activated as soon as you will switch the air agitation switch On (PIC 1) and will work until you will switch it off. You can keep the air hose (please see pictures) with small holes and plastic plug on the end inside a tank or out of tank, but to get an agitation result you MUST place the end of the hose inside plating tank with an anode and a plating object and hold it in the tank as long as the plating process will be life. Throughout the entire process you should see in a tank with the transparent air pipe many small air bubbles (milky effect) that will mix your solution during all electroplating processes. Pic 7 & 8:





INFO: To prepare the items for high quality electroplating finishing it is very important to ensure that all oil, grease, paint, old layers and so on are removed properly prior electroplating. The most common cause of poor quality plating result is insufficient preparation of plating object/s. The usage of an electromagnetic or ultrasonic cleaners is excellent for the purpose of removal of some grease, however, vigorous brushing with soapy water is sufficient. You can also electro-clean these objects in a tank. This electro-cleaning process takes just 1-2 minutes and this is a very short period of time compared to the time you may waste trying to plate an object which was not sufficiently cleaned. In order to perform the cleaning process the object to be plated should be hung on the cathode (negative -) rod using a hook made from copper or aluminium wire. Please make sure that the cleaning item is fully immersed in the cleaning solution and have good contact with the cathode rod. Connect this rod to a negative power supply using the BLACK crocodile clamp. Now connect a Stainless Steel anode on the Anode's rod and connect this rod using the RED crocodile clamp. Then make sure that the "Plating – Stripping" switch is on the "Plating" position. Now switch this unit "On" and turn the potentiometer (knob with 0-9 digits) to the required voltage (usually about 7-10 Volts) and commence the process. You can repeat this procedure as many times as you want.

INFO: Step-by-step electroplating process sample: dissolve all required plating chemicals (like copper powder) with 50 ml of warm distilled water and stir them properly - pour received solution into plating tank - insert in the tank a copper anode (for copper plating powder) connected to the top Anode's rod - insert in the tank a plating object connected to a bottom Cathode's rod by a copper wire - connect both metal rods (left side) to power supply by "alligator" clips - insert in the tank Air agitation pipe - ensure that there is NO contact between anode and plating object - switch the unit On and Air agitation switch - get required voltage/amperage on A/V digital gauge. Wait 20-60 seconds (depend of required thickness of layer) - switch power off and take the plated object out. Rinse it in cold water, dry and use.

HEALTH AND SAFETY:

All electro chemical processes (include electroplating) are subjects of two main hazardous effects: electrical injuries and poisoning by solutions and their gases. This compact electroplating machine is very safety for work because has 12Vdc power supply and a plastic body, but in any case for safety and healthy work each user must:

- Keep this unit and all chemicals out of reach of children.
- Never touch any exposed leads (contacts, rods) with unprotected hands. Always use rubber gloves that will also protect your hands from the harmful effects of some chemical solutions.
- Some chemicals which you may use for some types of electroplating may be hazardous. Some of them may have deadly poisons and their combinations often produce corrosive and poisonous gases. Therefore, all general safety precautions should be undertaken when working with them including keeping all chemicals inaccessible to children, wearing eye protection, avoiding skin contacts, wearing latex gloves and avoiding inhalation. Using, during all electroplating process, a proper mask will be great idea as well.
- Keep all solutions in good sealed plastic or glass containers in a cold (but DO NOT freeze), DARK place out of reach of children.
- Proper ventilation of the work-area is required.
- Appropriate rules of working with chemicals are provided by the suppliers of each chemical or on internet. For example, to find useful information about Gold plating salt type on Google: "Gold plating salt MSDS" (Material Safety Data Sheet) and get all required information on the screen or take a look how people work with the Gold salt on YouTube. When possible always use plating solutions friendly to the Environment and waste them in a correct way.

TROUBLESHOOTING:

With correct use this unit will work for you many years because it has an internal power supply cut-off system that will disconnect the power supply from Anode (red) and Cathode Black) cables automatically if a short-cut will be detected. That is why the power supply on the unit is not under warranty.

If, for some reason, the A/V gauge will instantly stop to show Voltage AND Amperage (but you will see 0000 on both lines) and you have reason to think that there was a short-cut between an anode and plating object in a tank or between "crocodile" clips, or Anode and Cathode metal rods - just switch this unit OFF and after 20 seconds ON again to re-start the power supply.

If there is NO power at all (the digital A/V gauge shows nothing) please check if the unit is connected to a working socket, check fuse in the plug (UK, AU, IRL versions) and if you switch this unit On properly turning the potentiometer clockwise. If "yes" please disconnect power supply from the unit on 30 second and switch it ON again for restarting an overload cut-off system on your machine.

If the information on A/V gauge changing without any reason first of all check all contacts:

- Between fixing wire and a plating object (Pic 5).
- Between the fixing wire and Cathode rod (Pic 5).
- Between an anode in tank and Anode rod (Pic 5).
- Between an anode and a plating object in the tank (Pic 5).
- All "alligator" clamps to anode and cathode rods (Pic 1).

If you can't get a plating result using a correct solution, voltage/amperage, anode and plating object's material then check again all contacts or "Stripping-Plating" switch on the top panel (Pic 6) to ensure that it is in "Plating" position.

If your object is going to be black - play with amperage/voltage or with a distance between anode and plating object in the tank.

If you are beginner in electroplating - before you start your work please find research, using Google, YouTube etc., as much information about plating process/s as you can for easier use. start electroplating without damage the equipment and expensive chemicals.

MADE IN UK