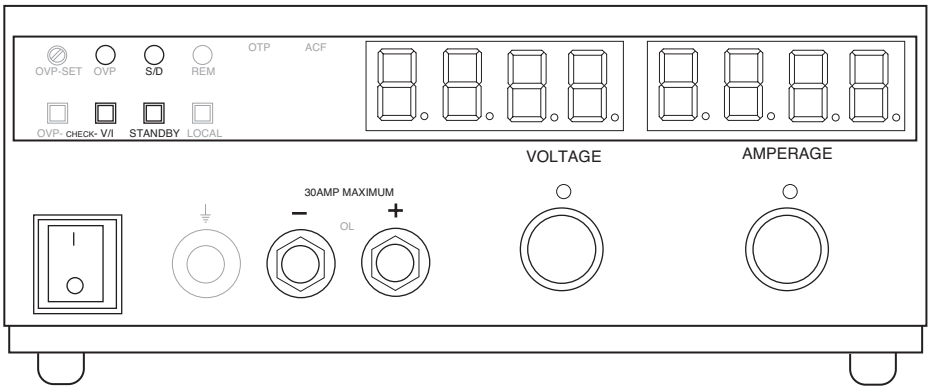
Using Your Solid State Anodizer

0-150Volts dc, 0-4.0, 0-7.0Amp



Reactive Metals Studio Inc

PO Box 890 Clarkdale, AZ 86324
www.reactivemetals.com
928/634-3434 800/876-3434 F928/634-6734

For the purposes of these anodizing instructions only the components that are involved in anodizing are high lighted and discussed. Setup instructions and test procedures are covered in the Xantrex Manual that came with your power supply. It is recommended that you read and follow those instructions.

SAFETY SUMMARY

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Reactive Metals Studio, Inc. and Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

Before Applying Power

Verify that the product is set to match the available line voltage.

Ground The Instrument

This product is a Safety Class I instrument (provided with a protective earth terminal). To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument must be connected to the AC power supply mains through a three-conductor power cable, with the third wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective(grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury. If the instrument is to be energized via an external autotransformer for voltage reduction, be certain that the autotransformer common terminal is connected to the neutral (earthed pole) of the AC power lines (supply mains).

Do Not Operate In An Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified service personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power, discharge circuits and remove external voltage sources before touching components.

SAFETY SYMBOLS

WARNING

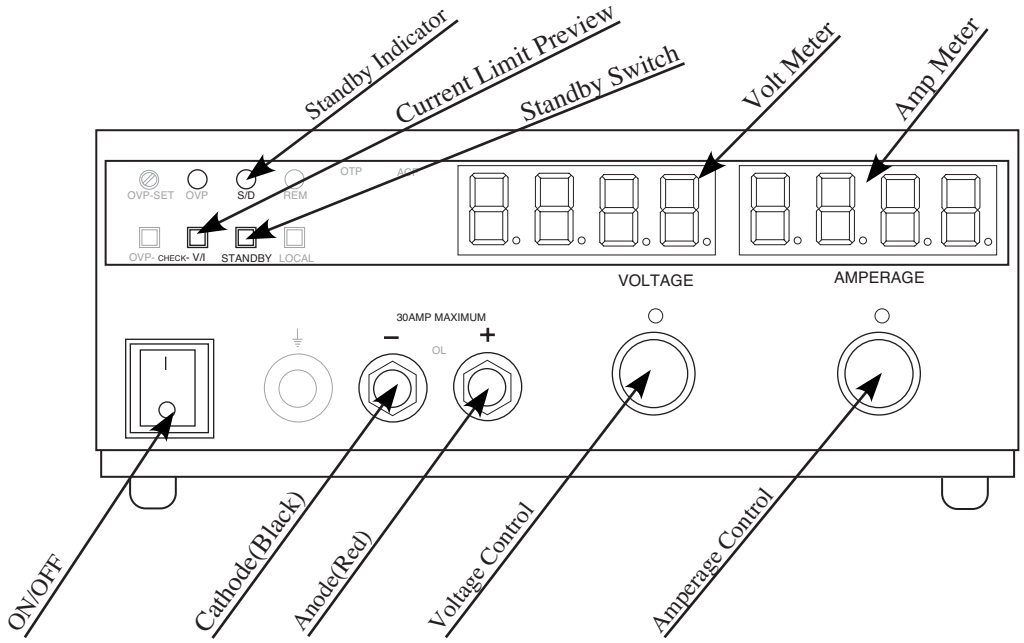
The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.

CAUTION

The **CAUTION** sign denotes a hazard. It calls attention to an operating procedure, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond **CAUTION** sign until the indicated conditions are fully understood and met.

Refer to the Operating and Service Manual for detailed specifications, operation and testing procedures.

Copyright Reactive Metals Studio, Inc. 2003-2014



INPUT: 115 Vac +/- 10%, 47-63Hz, 0.8 A, 600 W
OUTPUT: 0 to 150 Vdc, 0-4A
SIZE: 3.425″H x 8.45″W x 18.59″D, 87.0mmH x 214.6mmW x 472.2mmD
WEIGHT: Approx. 14lbs (6.4 kg)

INSTALLATION

Inspection

When you receive your power supply, inspect it for any obvious damage that may have occurred during shipment. If there is damage, notify the carrier and Reactive Metals Studio, Inc. immediately. Warranty information is printed on a card in the packing container. Save the shipping carton and packing materials in case the supply has to be returned in the future. If you need to return the supply for service call for authorization and instruction. Attach a tag identifying the owner and model number. Also include a brief description of the problem.

The "Turn-On Checkout Procedure" in this manual can be used as an incoming inspection check to verify that the supply is operational. See the factory manual appendix for tests that verify the supply's specifications.

Location And Cooling

The unit is shipped ready for bench operation after connection to an AC power source. The supply is air cooled. Sufficient space should be allotted so that a free flow of cooling air can reach the rear of the instrument when it is in operation. It should be used in an area where the ambient temperature does not exceed 40 degrees C. The current derates 1% per degree C between 40°C-55°C.

WARNING

Do not install on a metal work surface or next to metal pumbing fittings.

Input Power Requirements

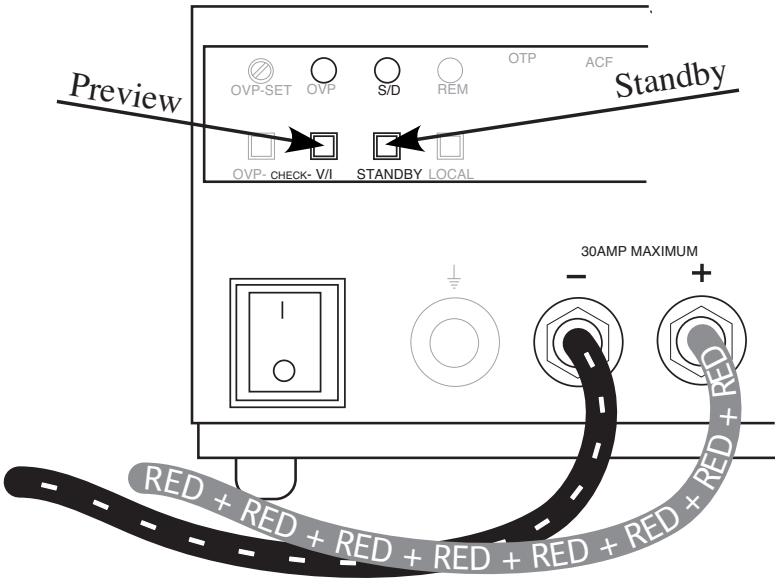
The power supply is ready to be operated from 110Vac, 43-63Hz.

Power Cord

This instrument is equipped with a three conductor power cable. The third conductor is the ground conductor and when the cable is plugged into an appropriate receptacle, the instrument is grounded. The offset pin on the power cable three prong connector is the ground connection. In no event should this instrument be operated without an adequate cabinet ground connection.
The power supply was shipped with a power cord for the type of outlet used in the USA.

Note: The terms Current, Amp and Amperage are used interchangably and have the same meaning.

See the Xantrex operating manual for complete setup and testing. This anodizing manual only covers anodizing setup and procedures.



OPERATION

Turn-On Checkout Procedure

The following checkout procedure describes the use of the front panel controls and indicators and ensures that the supply is operational:

a. Rock the **ON/OFF** button to ***ON***.

b. Turn **VOLTAGE** control fully counter clockwise to ensure that output decreases to 0 Vdc than fully clockwise to ensure that output voltage increases to the maximum output voltage.

c. To check and/or preset the current output:

1) Turn the **VOLTAGE** up a couple of turns so that a few volts show on the meter.

2) Push in and hold the **PREVIEW** button.

3)Turn the **CURRENT** control fully counter clockwise and then fully clockwise to ensure that the current limit value can be set from zero to the maximum rated value.

ON/OFF & STANDBY: It is very important to turn the unit ***OFF*** and the voltage down when not in use. This procedure will help prevent electrical shock.

The **STANDBY** button provides a means to preset the amperage without applying power to the output. This is a safety issue. You may leave the voltage and amperage turned up when in **STANDBY** mode. There will be no power to the leads.

To preset the output push in and hold the **PREVIEW** button. The **AMPERAGE** can then be set to the desired level. The meter will indicate the maximum set. The voltage can also be set but it is not as accurate as when the circuit is in operating mode

OUTPUT: Plug the red lead into the **+** or **ANODE OUTPUT**. This is the lead that will attach to your work.

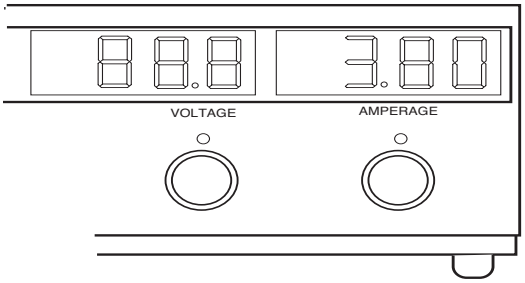
Plug the black lead into the **-** or **CATHODE OUTPUT**. This will attach to the metal cathode strip in your anodizing bath. It will also connect to the cathode in applicators like brushes and sponges.

(The third output which is ground is not accessed for anodizing.)

CAUTION

Operation Beyond Rated Output

The output controls can adjust the voltage or current to values above (up to 5%) the rated output as indicated on the front panel display. Although the supply can be operated in the 5% overrange region without being damaged, it can not be guaranteed to meet all of its performance specifications in this region.



The **METER** array shows both volts and the amperage that is available. The voltage is set and can be changed by turning the ten turn **VOLTAGE** knob. Voltage can be set very accurately and will be indicated on the left. The voltage above is 88.8Vdc. The voltmeter indicates the voltage available prior to applying a load and can be adjusted at anytime. When the anodizing load is applied the voltage will drop and then rise as the process continues to the preset value.

The current/amperage is set with the ten turn **CURRENT** knob and is shown on the right of the meter. The number shown above is 3.80 amps. The maximum output is 4.00 amps. This control may be changed at any time. If the anodizing is progressing too fast or heat and steam are being generated, turn the amperage output down and vise versa if it is too slow. When the anodizing load is applied the meter will show the full amperage you set being drawn. As the process nears the color/voltage desired the meter reading will decrease to near zero.

ANODIZING QUICK START

WARNING

Electrical shock hazard!
Wear rubber gloves at all times.
This is a dangerous process! Maintain all safety procedures at all times. This power supply is capable of dangereous electrical shocks if misused. If you are unsure of the safety of your setup check with an electrical specialist.

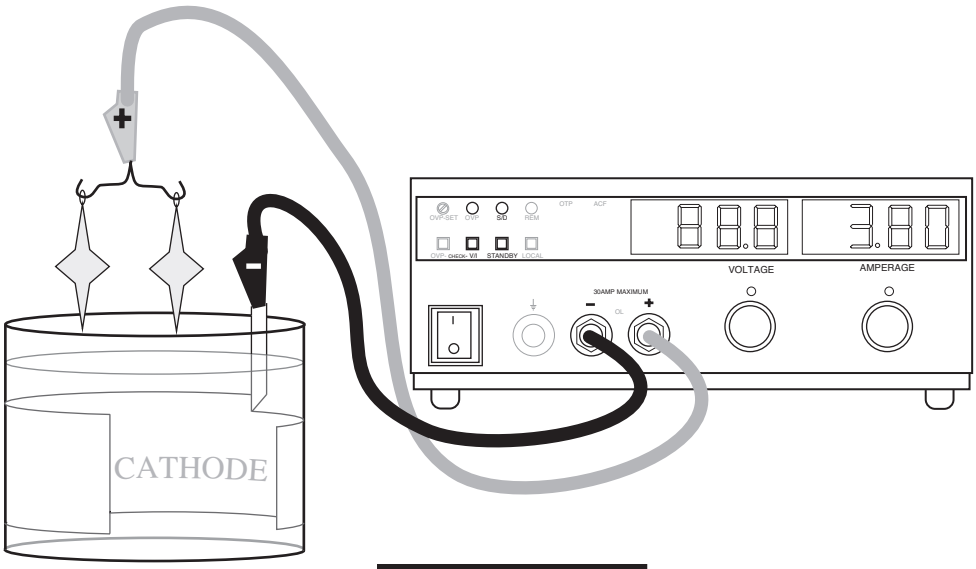
The following is a step by step procedure to quick start you into anodizing. Please read the copy of **Studio Preparation and Coloring of Titanium** that came packed with your anodizer. It contains more detailed information.

Electrolyte
The liquid solution used for this process may be many different things. We recommend TSP(Tri Sodium Phosphate). This is a low sudsing detergent. Products similar to this include automatic dishwasher detergents and may be substituted. The water can be distilled or demineralized bottled water. Do not use tap or well water. A cup of dry TSP per gallon of water is sufficient for most anodizing, although as much as two cups can be used. Mix the dry ingredient into the water and mix well.

A lidded plastic container is best suited for an anodizing tank. The container may be up to 5 gallons(19 liters). It should relate to the size of your work. Mark the container well, so that it will not be confused with other containers or food. Larger baths help dissipate heat during continuous operations.

Cathode
A stainless steel foil strip wrapped around the inside of a container as shown in the illustration is an excellent cathode. Cut a long strip along the top edge and fold it up. This should reach above the tank edge and will be where the BLACK(-) cathode lead attaches. A stainless steel container can also act as the cathode. Restaurant type steam table pans are excellent. *Great care must be taken to protect the operator and equipment from short circuits in and around a metal container. Use plastic mesh and baskets or other insulating materials.*

Anodizing setup



CAUTION

The alligator clips can not be submerged in the electrolyte.

1) The bath is ready, cathode is in place and the **BLACK** lead is connected to the cathode.

2) Put on your rubber gloves.

3) Turn **ON** the anodizer.

4) Push in the **STANDBY** button.

5) Push in and hold the **PREVIEW** button.

6) Set the **VOLTAGE** to **0**.

7) Set the **AMPERAGE** to **1.00**.

8) Attach a strip of titanium or niobium to the **RED(+)** lead.

9) Release the **STANDBY** button.

10) Submerge the metal in the center of the bath.(Not the alligator clip!)

11) Turn the voltage slowly up. As the color begins to appear slowly raise the metal out of the bath. This will produce a rainbow of color. Practice and you will soon be able to produce a full range rainbow.

12) Using the above procedures make a series of metal pieces representing 5 volt increments. Label the voltage on each and save. This will give you a color scale to work from in the future.

To learn more see the enclosed copy of Studio Preparation and Coloring of Titanium.