

## DC Current Transducers in Electroplating Operations

**DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm power is off.  
DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION
- Only install this product on insulated conductors.

**Failure to follow these instructions will result in death or serious injury.**

The information provided herein is intended to supplement the knowledge required of an electrician trained in high voltage installations. There is no intent to foresee all possible variables in individual situations, nor to provide all training needed to perform these tasks. The installer is ultimately responsible to assure that a particular installation will be and remain safe and operable under the specific conditions encountered.

In electroplating applications, an anode and a cathode are connected to an external DC power supply, such as a battery or rectifier, and placed into an electrolyte solution. The object to be plated is used as the cathode. When DC power is flowing through the electrodes, the metal cations migrate through the liquid solution toward the cathode. At the cathode surface, these metal ions are reduced to their metallic (zero valence) state and are deposited on the cathode surface. In this manner, a thin film of the desired metal forms across the entire surface of the object.

A DC current sensor allows monitoring of the power supply, in order to quickly identify faults or drops in load. This reduces the downtime associated with repairs. Figure 1 shows a basic diagram of an electroplating apparatus in operation, with a DC current sensor in place to monitor the load from the power supply.

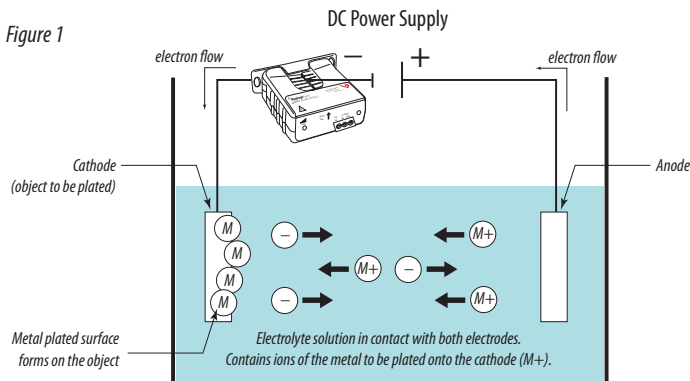


Figure 1

In most electroplating operations, the metallic film that forms on the cathode is not perfectly uniform in thickness. If a smooth surface is needed, the current flowing from the DC power supply can be reversed for a brief time, causing the two electrodes to switch their polarity. The top layer of metal atoms on the object's surface will oxidize back to their ionic state, return to the electrolyte solution, and flow toward the opposite electrode. Figure 2 illustrates this reversal process, called Periodic Reverse Current electroplating.

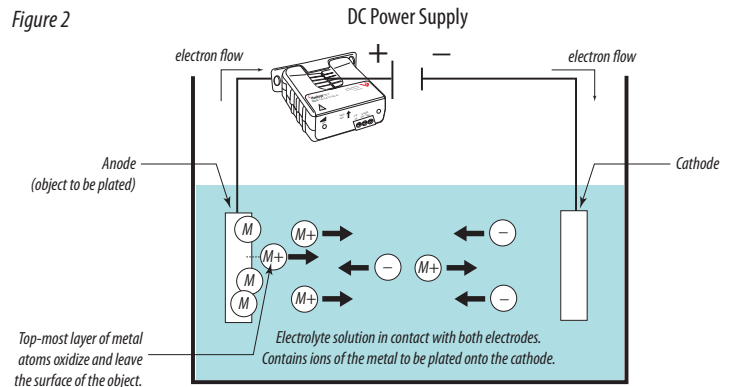


Figure 2

Repeatedly switching the DC current flow direction in this manner will even the plated surface on the object.

A DC current sensor with Pulse Effect Technology™ can improve the accuracy and reliability of DC sensing. These sensors have the added benefit of bidirectional amperage sensing. This allows continuous monitoring for load drops, even when the DC current is travelling in the reverse direction. Faults are detected immediately, at any point in the electroplating operation.