

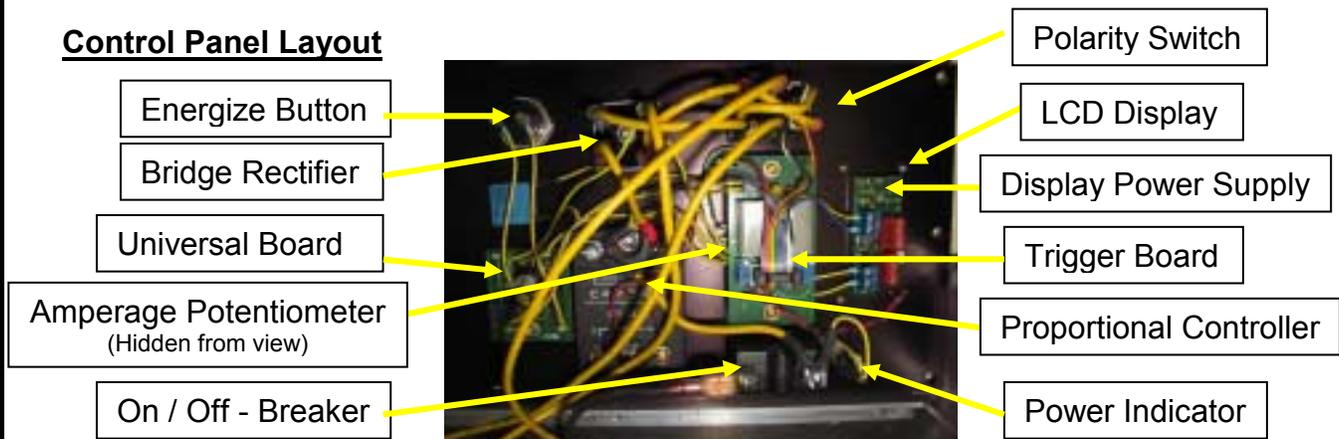
Western Instruments

Established 1965

Calibration of Amp Meter on WD-Series Coils

The following procedure is provided to Customers and their preferred service contractors for the sole purpose of providing Calibration and repair to Western Instruments WD-Series Coils. This document should accompany the wiring diagram for these coils as well. This documentation is not intended for general distribution.

Control Panel Layout



Calibration and Testing

1. Measure the resistance of the encapsulated winding(s) by removing the Control Panel Cover. For most accurate readings, remove the connections to the winding Terminals, but recorded and identify the wires and the appropriate terminals.

When manufactured the original resistance measurement(s) are recorded using European Standard resistor markings. As an example 8R6 is 8.6Ω.

Where Dual Internal Coils are used (multiple Taps) for 115 VAC, the taps are connected in parallel, and the total resistance is recorded. If the internal coils have a resistance of 18.6 and 18.8, the resulting resistance will be 9.35Ω. Often dual coils are connected in series for 230 Volt applications. In this case the resistance will be different and marked as such. For this series example of 18.6 and 18.8, the resulting resistance will be 37.4Ω.

2. To Calibrate the panel meter to indicate the coil current, we are using the indirect method by which we measure the voltage drop across the known load and express it as a current.

2.1 Procedure - Resistance less than 10Ω.

For loads up to 10Ω, simply multiply the resistance value by 10 and adjust the panel meter to read 10 Amps. As an example, 8.6Ω x 10 = 86 Volts.

- Connect a Digital Volt Meter (DVM) across the load (Coil or common terminals of SW1).
- Switch the power ON via the Circuit Breaker CB1.
- Press the Energize Switch.
- Adjust the Current Control Knob so that the DVM reads 86 Volts.
- Adjust the reading to 10 Amps on the Panel meter with the DC Coil Board R5.
- Release the Energize switch.
- Adjust the Panel Meter to read 10 Amps with the DC Coil Board R8.

2.2 Procedure – Resistance greater than 10Ω.

For load resistance values greater than 10Ω, we will have to use Ohm's Law to calculate the current:

$$I = E / R$$

As an example for a 230 VAC Coil, $I = 186V/37.4\Omega$
 $= 3.94$ Amps

- Connect a DVM across the load (Coil or Common Terminals of SW).
 - Switch the power ON via Circuit Breaker CB1.
 - Press the Energize Switch.
 - Set the Current Control knob to about $\frac{3}{4}$ of its maximum rotation f .
 - Read the voltage and calculate the current.
 - Set the Current reading on the panel meter with the DC Coil Board R5.
 - Release the Energize Switch.
 - Match the reading with the DC Coil Board R8.
3. Finally, reinstall the Control Panel in the Control Panel Housing using the Stainless Steel Allen Drive Button Head Screws (10-24 x $\frac{1}{2}$ "). Check for proper operation of the Coil. Switch the Coil OFF and set the Control knob to the minimum setting.

A recommended practice for testing a coil is to magnetize $\frac{3}{8}$ " Allen Key at the maximum current setting. Leave the Key in the coil opening, reduce the Current Control by 20%, reverse the field to the opposite polarity (direction) from the magnetization shot and Energize the Coil. Release the Energize switch and Reverse the field again, reducing the Current Control by 20%, and Energize the Coil. Follow the Reducing and Reversing cycle until the last shot is at the minimum Current Setting. The result should be a fully demagnetized Allen Key.