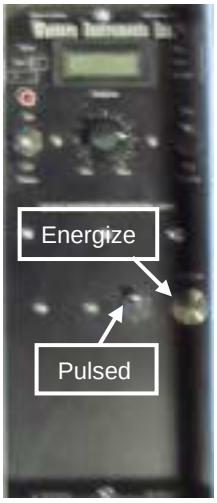
WD-Series Coils - Pulsed DC Option



The Pulsed DC Power Supply Option is a recent addition to the WD-Series Coils (Spring 2010). A switch is installed, on the Control Panel, immediately next to the Energize Button. When activated, the Coil automatically begins to Pulse at a rate of 40 t0 80 times per minute (size dependent). The duty cycle, when in Pulsed Mode, is extended to 100% as the Coil is energized less that 30% of the time. Thus, while in Pulsed Mode, the unit can be left on for extended periods of time. While in Pulsed Mode, all other functions continue to operate (Variable Amperage, and Reversible Polarity), but are typically not required during testing.

Most high performance inspection specifications for Down Hole Tools, such as T.H. Hill's *DS-1 or Fearnley Procter's NS-2,* requires an Active Field Inspection. An active field inspection means the field generator (Coil, Yoke, or Power Pack) must be on (activated and placed over the workpiece) when the particles are applied. If an *End Area Coil* (Multi-Turn Low Amperage Coil) is used, more often than not, the *Field* generated is virtually *Full Wave*, which means there is no particle mobility. Chances are the inspector knows this and simply uses a residual field in any case.

Like the Coil that induced the residual field in the first place, there is no particle mobility when using anything other than an AC or Rectified DC field. As most inspectors know, AC is of little use on end areas (especially box ends). Any type of Coil (End Area or Coil Wrap) can't produce a truly Rectified DC Field (a pulse every $1/60^{th}$ or $1/50^{th}$ of a second. The only real alternative, for an effective, Active Field Inspection is a Pulsed or Pulsing Field that mimics a Rectified DC field. A Rectified DC field is similar to that produced by the controls of an AC/DC Yoke.

A DC Field is used for down hole tools because of its ability to detect subsurface defects and its ability to penetrate the ID Threads on Box ends. AC fields are not used, as defects must be surface breaking to be detected, and an AC field will not reach into the Box End Threads.

During Pulse mode, the Amp Meter does not display the Amperage. If the operator needs to accurately set the amperage for pulse mode, he first must adjust the amperage while the coil is energized (not in Pulse Mode). When the Coil is switched to Pulse, the amperage setting will remain the same.

The Pulsed Option truly gives the operator the ability to perform an Active Field Inspection. The Pulses occur about every ¾ of a second, with a very short duration. This way, the particles are 'jarred' every pulse, to give the particles that encouragement they need to congregate around cracks. Performing an Active Field Inspection with Pulsed DC will not just satisfy an auditor looking over the inspector's shoulder, but will actually help to produce faster and crisper indications.