

HV Testing Application & Product Advice

Application: Vacuum Bottle Withstand Testing

When withstand testing vacuum bottles and similar devices:

- ⚡ Should high voltage AC or DC be used?
- ⚡ If either AC or DC is acceptable, which is the best product choice?



When testing most Substation Apparatus like SG, Breakers, Reclosures, etc., as well as other loads like Cables, Aerial Lifts, Rubber Gloves, etc., the question should be the same: **can the item withstand an AC over voltage test without failing?** Is the item of sound quality or not? There is little in-between considered, why seldom is diagnostic testing performed, like Partial Discharge or Tan Delta. The AC Withstand/Proof Hipot test, performed on a go/no-go basis, is usually the preferred and technically acceptable method of verifying the AC voltage integrity of the load.

In the case of a vacuum bottle, is the vacuum chamber sealed and sound or not? Does it hold

the test voltage or fail? Has there been a breach to the vacuum seal or maybe a breakdown or materials within? There is little in between. If considering DC voltage, there are no leakage currents to measure that are meaningful. Leakage currents reading will change every time the same bottle is tested. DC voltage does not replicate the AC stress under service conditions and is not a reliable indicator of bottle vacuum integrity. Most bottle producers and their suppliers of the solid dielectric materials used within discourage the use of DC. As with many insulating materials, the constant negative polarity output of a DC hipot can polarize the molecular structure and be possibly harmful to the materials. Use AC.

Products Available for VB Testing

AC Voltage output high voltage instruments, or Hipots, are available from many vendors. Popular sizes are those that produce 40 kVac – 50 kVac for testing 15 kV rated gear and those that produce up to 65 kVac for testing 35 kV class apparatus. Voltage is voltage, but the current rating of the instrument is most important. Depending on the capacitance of the load, higher mA ratings may be needed than anticipated. Look for a hipot design with at least **20 mAac** of output current. Also, lightweight and portability are critical to permit carrying the hipot as near to the load connection as possible. Some models offer a shielded cable output, making the load connection very easy.

HVI

Product

Solutions