



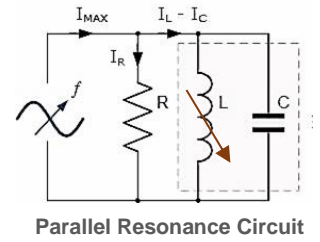
Application: Testing High μF Loads with Resonant Technology

Application Description

Field testing high capacitance loads with AC voltage isn't easy. Try finding 0 - 50 kVac @ 10 amps or 0 - 100 kVac @ 3 amps to test a large motor or generator, a high MVA transformer, long iso-phase bus, many switchgear cabinets at once, GIS, long cable runs, etc. Typically, when AC testing many loads, Partial Discharge and Tan Delta diagnostic measurements are taken, requiring a low PD noise level from the set. **Conventional 50/60 Hz. AC Dielectric Test Sets** at the power levels needed are enormous, expensive, and require very high kVA inputs to test their loads. **Very Low Frequency (VLF) AC 0.10 Hz.** hipots can be used in some cases, saving greatly, but only when testing some cables and motors/generators. DC is not an acceptable alternative. We need power frequency AC but in a more economical and practical method. What is the alternative?

Technology Solution: Series and Parallel Resonance Technology

Don't overlook the use of Resonant Technology AC Dielectric Test Sets. These designs use variable frequency or variable inductance transformers to compensate for the capacitance of the load to minimize the input power required to perform the test. The concept is simple. By connecting a variable reactance transformer in parallel with a fixed capacitance load, we can vary, or "tune", the inductive reactance of the power supply to match the capacitive reactance of the load. Once "Resonance" is achieved, the necessary input power consumed by the test set may be only 5% - 20% of the power delivered and consumed by the load. There are two basic designs for Series & Parallel Resonant Test Sets:



Parallel Resonance Circuit

- Variable Inductance via variable gapped core transformer design.
- Variable Inductance via variable frequency output, typically 20 Hz. – 300 Hz.

HVI Product Solutions

Parallel Resonant systems are designed and produced by HVI, offering several standard models intended for testing short cable runs, substation apparatus of high capacitance, and large motors & generators. The HVI design uses a variable gapped core transformer to tune the **Inductance of the system to match the Capacitance of the load**. When $X_L = X_C$, resonance is achieved. Standard models are available from **8 kVac – 250 kVac @ 50 kVA – 300 kVA load** and suitable for 50 Hz. or 60 Hz. Custom models are also available and common. Refer to the **PAR Series** brochures for more.



Model PAR-25050FC5
0-50 kVac, 5 A, 250

Alternate AC Technology to Consider: Very Low Frequency (VLF)

The **VLF & VLF E Series** are 0.1 Hz. - 0.01 Hz. AC output hipots for testing very high capacitance loads, like MV/HV power cables and large rotating machinery, that would require hundreds of kVA of test power at 50/60 Hz. Models from **30 kVac - 200 kVac and load rated from 0.1 μF – 50 μF** .

Other Applications: HVI also produces many lines of **AC Dielectric Test Sets** to serve the multitude of applications needing AC Withstand or Diagnostic testing, like Partial Discharge and Tan Delta. These lines range from small, portable 1 kVA - 3 kVA hipots to field mobile 15 kVA models to 40kVA models for factory use.



VLF AC 0.1 Hz. Technology
0-34 & 0-65 kVac, < 10 μF

