HVI offers a full line of AC Dielectric Test Sets up to 300 kV in voltage and 40 kVA in power. Conventional test sets are available as well as specialty models, like several designed specifically for motor winding testing. They are all rugged in design, with either oil filled steel or fiberglass high voltage sections and well designed, attractive controllers with all the features needed. Custom models are also available upon request. If lower power models are sufficient for your application, then consider our standard, portable PFT Series of 1 kVA and 3 kVA AC Hipots, available from 10 kV – 100 kV.

Also available are just the high voltage sections used within the test sets described here, like our 50 kV @ 10 kVA HV tank for testing rubber gloves, aerial lift liners, hot sticks, and other similar loads.

ISO 9001:2008

HIGH VOLTAGE

VLF HIPOT INSTRUMENTS

www.hvinc.com
Selecting an AC Dielectric Test Set

AC high voltage testing requires higher power/current ratings than when DC testing the same load. There are several parameters that must be considered when selecting an AC test set, the most important one being the capacitance of the load, which dictates the power required from the test set. Following are several considerations when specifying a test set:

Voltage Output
Select a test set with perhaps 20 – 25% more voltage than presently needed for possible future increases in testing standards or changes in application. However, the output current of the test set is based on the kV A rating at full voltage. Any increase in the output voltage rating for the same kV A rated test set will proportionately decrease the current rating.

Power/Current Rating
When AC testing, most loads appear capacitive. To apply high voltage AC at 50/60 Hz to capacitive loads requires higher power and current ratings from the test set than typical portable AC hipots can supply. A test set rated for 10 – 20 kVA may be needed depending on the load to be tested. The capacitance of the load must be known in order to calculate the required current at the required voltage. Don’t undersize the set: select a test set with at least 20 - 25% extra power than believed needed. To determine the current needed from the test set, the following formula should be used:

\[ A = 2\pi f CV \]

\[ A = \text{Test current required in Amps (A)} \]
\[ f = \text{Test frequency in Hertz (Hz)} \]
\[ C = \text{Load capacitance in Farads (F)} \]
\[ V = \text{Test voltage in volts (V)} \]

Another way to determine the current needed at the required test voltage is to apply a lower voltage to the load and measure the current. The current required at the actual higher test voltage should be fairly linear. For example: if your load draws 10 mA @ 5 kV it will draw approximately 100 mA @ 50 kV. Remember, an AC test set is a constant current device. The maximum output current is the same at any output voltage.

Duty Cycle
Most AC hipoting is performed for 60 seconds at a time. However, production testing may require consecutive tests over many hours. Most HVI AC test sets are duty rated for 50%, meaning full power can be delivered for one hour on followed by one hour off. The continuous duty rating is approximately 80% of full rating. Consult product specifications for details.

Partial Discharge Requirements
Many HVI AC test sets are rated for <10pc of partial discharge at full voltage, but not all. Generally, steel tank bushing output models are <10pc while models with fiberglass HV sections and/or a cable output are not. Consult factory.

HPA-1010FC3
10 kV @ 10 kVA
one piece design
with optional castors
and warning light

HPA-10010FC3
100 kV @ 10 kVA

HPA-055M
5 kV @ 5 kVA
Motor shop model
(Fig C1 controls)
with Burn Mode
## AC Dielectric Models

### 5kVA

**Input:** 230V, 50/60Hz, 1 Ph, 25A  
**Duty:** 5kVA 1 hr On/1 hr Off  
4 kVA Continuous

### 10kVA

**Input:** 230V, 50/60Hz, 1 Ph, 50A  
**Duty:** 10kVA 1 hr On/1 hr Off, 8 kVA Continuous

### 20kVA

**Input:** 230V, 50/60Hz, 1 Ph, 90A  
**Duty:** 20kVA 1 hr On/1 hr Off, 16 kVA Continuous

### 40kVA

**Input:** 230V, 50/60Hz, 1 Ph, 180A  
**Duty:** 40kVA 1 hr On/1 hr Off, 32 kVA Continuous

### Motor Shop Models

**Input:** 230V, 50/60Hz, 1 Ph, 50A  
**Duty:** 50kVA 1 hr On/1 hr Off, 40 kVA Continuous

### High Voltage Section Configurations

Except for the lowest 5 kVA, 10 kVA, and 20 kVA models that contain the HV section within the control cabinet, all models have a separate HV section. There are two HV section designs, a steel tank with a bushing output and a fiberglass cylinder with a toroid/spinning output. HVI can supply a one piece design on several of the lower voltage models, like the 10 kV model pictured in this brochure. A steel tank with a cable output on models rated up to 50 kVA is possible on a custom basis. No HV output cable is provided on bushing and spinning output models. See the pictures in this brochure for examples of the various layout configurations.
Three Standard Control Packages – Variations Available On a Custom Basis

**Fig. C1**
Simplified Controls w/manual output voltage control – up to 5 kVA
- Voltage meter: two range
- Current meter: three range
- Main Power breaker/indicating light
- HV On/Off
- Output Adjust control knob
- Variable Overload w/reset

**Fig. C2**
Simplified Controls w/motorized output voltage control – up to 10 kVA
- Voltage meter: two range
- Current meter: three range
- Control Power breaker/indicating light
- HV On/Off
- Voltage Raise/Lower control
- Fixed voltage rate-of-rise
- Variable Overload w/reset
- Emergency Off button

**Fig. C3**
Automatic Controls & Digital Metering – any kVA
- Voltage meter: digital 3.5 digits
- Current meter: digital 3.5 digits
- Control Power breaker
- HV On/Off
- Output Mode Manual/Auto
- Output Voltage Raise/Lower control
- Four fixed volts/second rates-of-rise
  - 10 – 100 seconds, consult factory
- Test Dwell timer
- Variable Overload w/reset
- Emergency Off button

**OPTIONS:**
PLC Interface: Includes 0-10Vdc signal outputs for voltage and current monitoring, 0-10Vdc signal inputs for voltage and current set points, and normally open contacts for control of power on/off, remote enabled, overload, voltage raise & lower, and other control features. Consult factory for additional controller packages.