

# durable

## AC DIELECTRIC TEST SETS

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.



HPA-505FC1  
0-50 kV @ 5 kVA

3 kV – 300 kV

5 kVA – 40 kVA



HPA-20020FC3  
0-200 kV @ 20 kVA

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.

Multiple Controller Options

# economical

ISO 9001 : 2008  
**HIGH VOLTAGE**<sup>®</sup>  
VLF HIPOT INSTRUMENTS INC.

[www.hvinc.com](http://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 kVA rating at full voltage. Any increase in the output voltage rating for the same kVA 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:

$$A = 2\pi fCV$$

A = Test current required in Amps (A)

f = Test frequency in Hertz (Hz)

C = Load capacitance in Farads (F)

V = 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 hipotting 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

VOLT. (kV)	MODEL	CURRENT (mA)	CONTROL SECTION					HV SECTION					TYPE
			W in mm	D in mm	H in mm	FIG.	WT LBS KG	W in mm	D in mm	H in mm	WT LBS KG		
10	HPA-105FC*	500	21 533	25 635	30.5 775	C1,2,3	200 91	none - one piece design					NA
30	HPA-305FC*	167	21 533	16 406	15 381	C1,2,3	75 34	13 330	13 330	21 533	95 43	steel	
50	HPA-505FC*	100	21 533	16 533	15 381	C1,2,3	75 34	13 330	13 330	21 533	95 43	steel	
75	HPA-755FC*	67	21 533	16 406	15 381	C1,2,3	75 34	13 356	13 356	21 635	95 43	steel	
100	HPA-1005FC	50	21 533	25 635	30.5 775	C1,2,3	145 66	18.5 470	18.5 470	34 864	300 136	steel	

**10kVA**

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

VOLT. (kV)	MODEL	CURRENT (mA)	CONTROL SECTION					HV SECTION					TYPE
			W in mm	D in mm	H in mm	FIG.	WT LBS KG	W in mm	D in mm	H in mm	WT LBS KG		
10	HPA-1010FC*	1000	21 539	25.5 648	47.3 1200	C2,3	390 177	none - one piece design					NA
30	HPA-3010FC*	333	21 533	25 635	30.5 775	C2,3	200 91	13 330	13 330	25 635	215 97	steel	
50	HPA-5010FC*	200	21 533	25 635	30.5 775	C2,3	200 91	13 330	13 330	25 635	215 97	steel	
75	HPA-7510FC*	133	21 533	25 635	30.5 775	C2,3	200 91	17 432	17 432	32 813	275 125	steel	
100	HPA-10010FC*	100	21 533	25 635	30.5 775	C2,3	200 91	18 457	18 457	37.5 953	325 147	steel	
150	HPA-15010FC*	67	21 533	25 635	30.5 775	C2,3	200 91	28 711	28 711	56.5 1435	825 374	fiberglass	

\*Insert a 1, 2, or 3 to the model number in place of the \* to specify which controller, described on page 4, will be needed.

**20kVA**

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

VOLT. (kV)	MODEL	CURRENT (mA)	CONTROL SECTION					HV SECTION					TYPE
			W in mm	D in mm	H in mm	FIG.	WT LBS KG	W in mm	D in mm	H in mm	WT LBS KG		
10	HPA-1020FC3	2000	22 559	25.5 648	47.3 1200	C3	530 241	none - one piece design					NA
30	HPA-3020FC3	600	22 559	25.5 648	47.3 1200	C3	300 136	17 432	17 432	25 635	300 136	steel	
50	HPA-5020FC3	400	22 559	25.5 648	47.3 1200	C3	300 136	17 432	17 432	25 635	300 136	steel	
75	HPA-7520FC3	267	22 559	25.5 648	47.3 1200	C3	300 136	17 432	17 432	32 813	325 147	steel	
100	HPA-10020FC3	200	22 559	25.5 648	47.3 1200	C3	300 136	18.5 470	18.5 470	37.5 953	375 170	steel	
150	HPA-15020FC3	133	22 559	25.5 648	47.3 1200	C3	300 136	35.5 902	35.5 902	56.5 1435	850 386	fiberglass	
200	HPA-20020FC3	100	22 559	25.5 648	47.3 1200	C3	300 136	35.5 902	35.5 902	56.5 1435	850 386	fiberglass	
300	HPA-30020FC3	67	22 559	25.5 648	47.3 1200	C3	300 136	35.5 902	35.5 902	82 2083	1150 522	fiberglass	

**40kVA**

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

VOLT. (kV)	MODEL	CURRENT (mA)	CONTROL SECTION					HV SECTION					TYPE
			W in mm	D in mm	H in mm	FIG.	WT LBS KG	W in mm	D in mm	H in mm	WT LBS KG		
10	HPA-1040FC3	4000	22 59	31 787	67 1702	C3	600 272	20 508	20 508	27 686	400 204	steel	
30	HPA-3040FC3	1333	22 59	31 787	67 1702	C3	600 272	25 635	25 635	35 890	500 227	steel	
50	HPA-5040FC3	800	22 59	31 787	67 1702	C3	600 272	25 635	25 635	35 890	500 227	steel	
75	HPA-7540FC3	533	22 59	31 787	67 1702	C3	600 272	25 635	25 635	37 940	550 250	steel	
100	HPA-10040FC3	400	22 59	31 787	67 1702	C3	600 272	30 762	30 762	41 1041	650 293	steel	

OPTION: On 5 kVA - 40 kVA models, air and steel tank only configurations, a 50% voltage tap rated full kVA is possible.

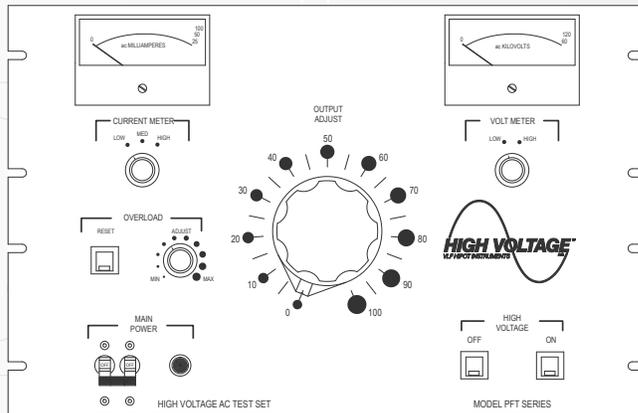
**Motor Shop Models**

VOLT. (kV)	MODEL	CURRENT (mA)	ONE PIECE - SIZE & WEIGHT									
			POWER (kVA)	INPUT Voltage (V)	INPUT Current (A)	FREQ. (Hz)	W in mm	D in mm	H in mm	CONTR. FIG.	LBS	KG
3	HPA-033MF	1000	3	230	13	50/60	14.5 368	21 533	48 1219	C1	140	68
5	HPA-055MF	1000	5	230	22	50/60	26 660	26 660	48 1219	C1	225	109

**High Voltage Section Configurations**

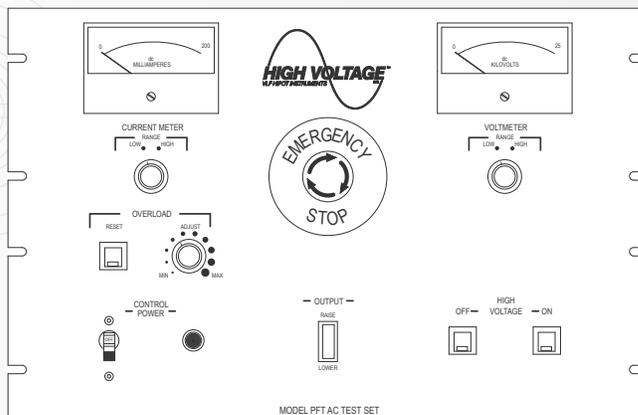
Except for the lowest 5 kVA, 10 kVA, and 20 kVA models that contain the HV section within the control cabinet, all models have a separate HV section. There are two HV section designs, a steel tank with a bushing output and a fiberglass cylinder with a toroid/spinning output. HVI can supply a one piece 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 kV 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



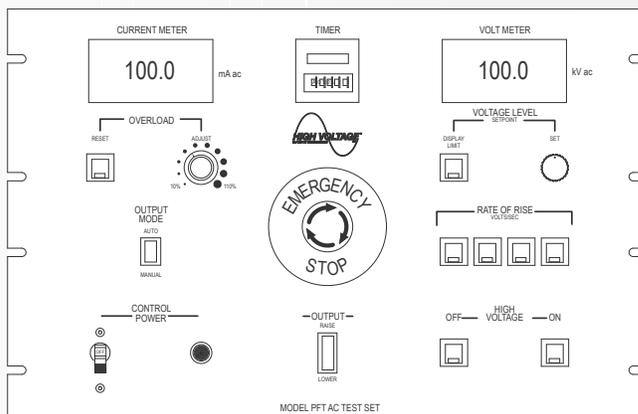
**Fig. C1**  
Simplified Controls w/manual output voltage control – up to 5 kVA

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.