HPA

SERIES

Safety, Operation, and Procedure Instructions for the HPA – High Powered AC Hipot

Danger- Lethal Voltages:

Equipment to be used by trained personnel only

This Operator Manual contains instructions for the operation of a High Voltage power source. The operator of this equipment must use good judgement and follow all safety precautions noted in this guide to ensure the protection of himself and others in close proximity to the test area. Failure to follow the instructions could result in injury or death. Proper grounding of the test set must be done prior to connecting this unit to a power source.

Operator Manual

31 County Route 7A
Copake, N.Y. 12516
Phone 518/329-3275 • Fax 518/329-3271
http://www.hvinc.com
E-mail: factory@hvinc.com

Table of Contents

About the Operator Manual

Important

This Operator Manual describes the features and safe operation of a High Voltage Test Set. The instructions are intended to be clear and simple, but the operator must be trained and qualified according to established procedures for the use of this type of equipment.

This Operator Manual is organized to provide information on the HPA Series AC Hipots in steps that familiarize the new operator with the operation of this test set.

Section 1: Specifications and Controls.

Section 2: Setup and Operation.

Section 3: Performing Special Operations.

The Functions, Features, and Specifications of this HPA Series of AC Hipots are also discussed in the HPA Brochure available from High Voltage, Inc.

SECTION

1

General Information

This section familiarizes the operator with the features and specifications of the HPA Series of High Power AC Test Sets manufactured by HIGH VOLTAGE, INC.

Features and Specifications

The HPA-15040 AC high voltage test set provides continuously adjustable output voltage for the testing up to 150kV at 40KVA.

Features of this unit include:

- Continuously adjustable motorized output voltage control.
- Auto/Manual Output Mode selection.
- Switch selectable output Rate of Rise, with fixed speeds of 1.5kV/2.5kV/7.5kV/15kV per second.
- Fixed primary current overload, factory set to 120% of variable transformer rated primary current.
- Adjustable secondary current overload, variable from 10-110% of secondary current rating.
- “Zero Start” and External Interlock provision.
- Secondary connected single range 3.5 digit voltmeter.
- Single range 3.5 digit output current meter.

HPA-15040FC3 MODEL SPECIFICATIONS

	HPA-15040FC3 Part No. PFT-1323S
Input	230V, 50/60 Hz, 175 amps, single phase
Output	0-150kVac, 40KVA resistive load(400mA)
Output Termination	GRADED FEED-THRU BUSHING 3" X 21" Aluminum Toroid
Duty	40kVA - 1 hour ON, 1 hour OFF (50% DUTY) 32kVA – Continuous Duty
Distortion	<5%
Meter Accuracy	1% of full scale
Kilovolt meter	3.5 digit LED display, Scaled 0-150.0kVac (RMS)
Current Meter	3.5 digit LED display, Scaled 0-267 mAac
Dimensions: Controls Tank	 22"w x 30.75"d x 66.5"h 28.5w x 30.5d x 57.5 high
Weight Controls Tank	 488lbs. (222kg) 1315lbs. (596kg)

Table 1 *HPA-15040FC3 Specifications.*

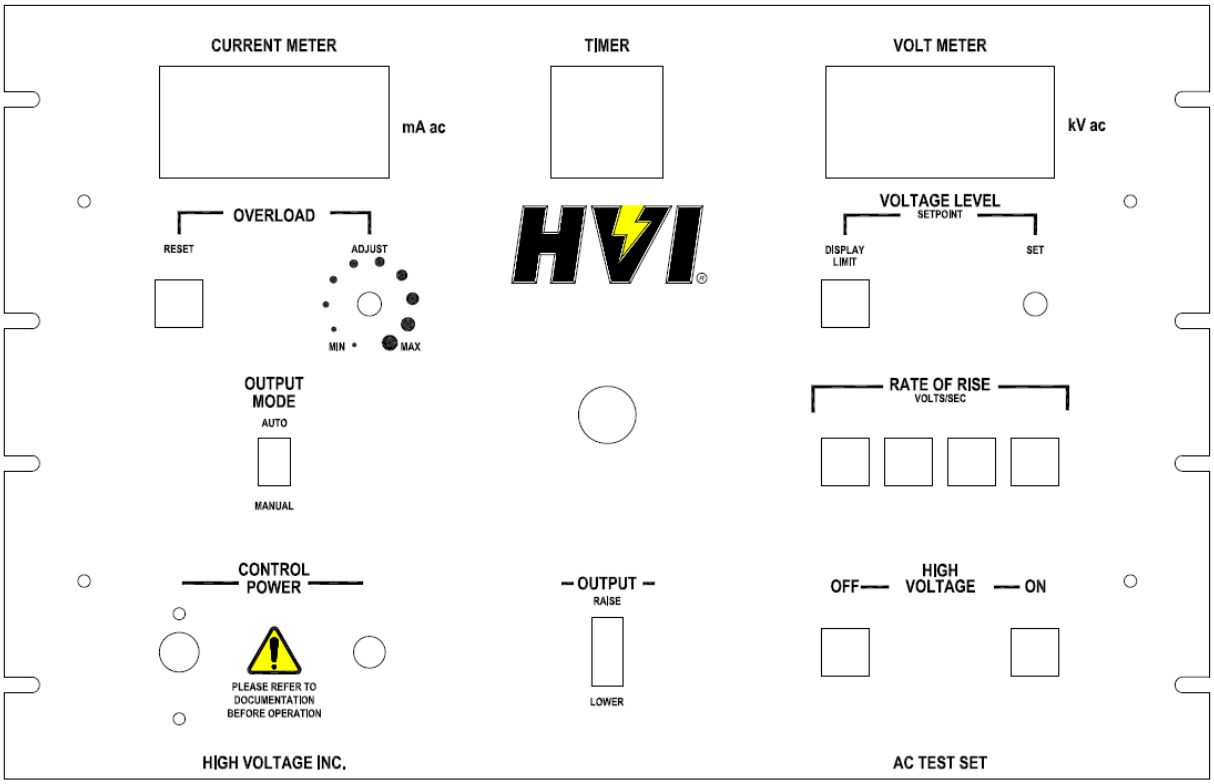


Figure 1 *HPA front panel controls.*

MAIN POWER (ON BREAKER PANEL)

The MAIN POWER circuit breaker provides the power to the entire unit. The neon lamp will light when the power is on and voltage is available through input line cord.

CONTROL POWER

The CONTROL POWER circuit breaker provides protection for the control circuits. The neon lamp will light when both the MAIN POWER and CONTROL POWER breakers are on and voltage is available through input line cord.

HIGH VOLTAGE ON/OFF

The HIGH VOLTAGE ON (OFF) pushbuttons activate (de-activate) the high voltage power circuits. The LED indicators provide long life positive indication of the circuit status. The RED (ON) LED lights when high voltage is energized, the GREEN (OFF) LED lights when the high voltage is de-energized.

OUTPUT MODE

The OUTPUT MODE rocker switch sets the output control to AUTO or MANUAL. The AUTO function is used in conjunction with the VOLTAGE LEVEL SETPOINT and the RATE OF RISE speed selector pushbuttons. The MANUAL function enables the OUTPUT RAISE/LOWER spring-loaded rocker switch. MANUAL MODE also disables the VOLTAGE LEVEL SETPOINT and TIMER.

OUTPUT RAISE/LOWER

The OUTPUT RAISE/LOWER spring-loaded rocker switch controls the motorized output control in the MANUAL MODE. In the AUTO MODE this switch is disabled. Used with the RATE OF RISE speed selector pushbuttons, this control will by default automatically start at ZERO (0) to energize the high voltage circuits. The output control automatically returns to zero at the completion of testing, after de-energizing the output.

RATE OF RISE VOLTS/SEC

The RATE OF RISE pushbutton switches set the motorized output control four preset rates. Whether in AUTO or MANUAL. The four rates available are 1kV/2.5V/5kV/10kV per SEC.

EMERGENCY STOP

The EMERGENCY STOP switch, when depressed, shuts off the high voltage output. To release, rotate the cap clockwise.

OVERLOAD RESET AND ADJUST

The secondary OVERLOAD circuit protects the output from excessive current peaks. The adjustment is 10% - 110% of the output rating. When an overload occurs, the HIGH VOLTAGE will de-energize. Triggering of the OVERLOAD will cause the Voltmeter to retain the breakdown voltage reading. Depressing the RESET pushbutton will release the memory function.

VOLTAGE LEVEL SETPOINT

The VOLTAGE LEVEL SETPOINT stops the motorized output control at the preset voltage in the AUTO OUTPUT MODE. To set the stopping point, depress the DISPLAY LIMIT pushbutton, rotate the SET adjustment clockwise until the VOLTMETER displays the desired test voltage.

CURRENT METER

The DIGITAL CURRENT METER provides secondary current monitoring.

VOLTMETER

The DIGITAL KILOVOLT METER provides accurate output voltage readings. 1-% precision resistors minimize the need for re-calibration due to aging shift. See Voltmeter Re-calibration in Section 3 for details on calibration.

TIMER

The Timer is provided for tests when dwell time is important. The timer can be set from .1 second increments up to 10 hour increments. After the test has started in AUTO MODE, the timer will start. The preset time will count up from zero (or down from pre-set). Upon reaching the pre-set time, the timer will ramp the output voltage to zero and the output will de-energize.

To set the H5CX timer.

1) Press and hold 'mode' button for 3 seconds to enter program mode
2) Set the time range using the 'up/down' push buttons (default 30min 00 sec)*
3) Set the timer mode using the 'up/down' push buttons (default down)*
4) Set the timer output mode using the 'up/down' push buttons (default F)*
5) Set input signal width using the 'up/down' push buttons (default 20mS)*
6) Set key protect level using the 'up/down' push buttons (UP-1)*
7) Press and hold 'mode' button for 3 seconds to exit program mode

*press 'mode' button briefly after adjusting each parameter to move to next step

MAIN POWER CIRCUIT BREAKER

The MAIN POWER circuit breaker provides the power connection to the control and power circuits. A neon lamp will light when the power is on and voltage is available through the input line cord.

EXT INTLK (EXTERNAL INTERLOCK)

The Ext Intlk terminal block, located near the input power terminal block, is provided to allow for a normally open safety interlock switch to control the energizing of the high voltage output.

SECTION

2

SETTING UP THE EQUIPMENT

The setup of this equipment must be in accord with local electrical codes and requirements. Careful consideration of the operator and any support personnel must be taken to minimize the possibility of electrical shock. These instructions provide an outline for the safe installation of this equipment. The need for a restricted access test area and the use of safety interlocks cannot be stressed enough. Always think safety above all else when installing any high voltage test equipment.

1. Position the high voltage section in the testing area. Allow 36 inches (61CM) to grounded objects to avoid arcing or corona when operating.

2. Locate the Control cabinet close to the power source and within 20 feet (6.1M) of the HIGH VOLTAGE tank.

3. Select a location for the control unit that will allow easy viewing of the meters at a safe distance from the test object and high voltage section.

4. Connect input power to the input terminal block using CUSTOMER SUPPLIED power leads. Install the input power in accord with local electrical codes to ensure safe operation. See the Model Specification Table on Page 3 for the input power requirements. Input terminals are inside rear access door of cabinet.

5. Be sure that all the controls are off, in their de-energized or fully counterclockwise position.

6. Secure ground leads to the high voltage section and the input power section. The CUSTOMER SUPPLIED ground leads must be of sufficient rating to accept the line power fault current. A 2AWG lead or larger (diameter) is appropriate. Secure the ground to the building frame or to a secure station ground in the area. A single point ground is recommended. DO NOT RELY ON GROUNDS IN THE POWER LINES AS THESE MAY BE TIED THROUGH CONDUIT COUPLINGS AND MAY NOT BE A SOLID GROUND.

7. Connect the interconnect cables between the control section and the high voltage section. The cables are marked appropriately. (X1 to X1, X2 to X2, VM to VM and CM to CM, GND to ground.)

Setting the Overload

1. Ensure that all the steps listed in **Setting up the Equipment** have been accomplished. Take special note to ground the cart to a solid earth ground.

2. Short the high voltage output toroid to the **GROUND** stud on the high voltage section.

3. Connect the input power to a grounded source.

4. Rotate the **OVERLOAD ADJUST** to the maximum setting.

5. Operate the **MAIN POWER** circuit breaker to energize the power circuits.

6. Operate the **CONTROL POWER** circuit breaker to energize the control circuits.

CAUTION

POTENTIALLY LETHAL VOLTAGES MAY BE PRESENT

7. Select **MANUAL MODE** and depress the **HV ON** pushbutton. The **HV ON** light glows.

8. Increase the output slowly by depressing the **OUTPUT RAISE** control until the desired output (overload) current is reached. Rotate the **OVERLOAD ADJUST** control towards the minimum setting until the **OVERLOAD** trips.

9. Re-energize High Voltage and raise the output once more to verify the desired setting. At the completion of setting the overload proceed to the next section for testing instructions.

Operating the Equipment

This section provides step-by-step instruction on various test methods. Many facilities have their own in-house test procedures that should not be superceded by this manual. The purpose of this section is to explain the capabilities of this test set in real-world applications.

AC Insulation Testing

1. Ensure that all the steps listed in **Setting up the Equipment** have been accomplished. Take special note to ground the cart to a solid earth ground.

2. Prior to connecting the output to the test sample be certain the unit is off and the high voltage termination is grounded.

3. Connect the output to the test sample using a customer supplied test lead or electrode. ***Ensure there is enough clearance to grounded objects for the expected test voltage. The minimum clearance in air is 10 kV ac/inch.***

4. Return the low side of the test specimen to ground.

5. Connect the input power to a grounded source.

6. Operate the **MAIN POWER** circuit breaker **ON** to energize the main power circuits. If line voltage is present, the **MAIN POWER** pilot light illuminates.

CAUTION

POTENTIALLY LETHAL VOLTAGES MAY BE PRESENT

7. Operate the **CONTROL POWER** circuit breaker to the **ON** position. The corresponding indicator illuminates.

8. Select the appropriate **RATE OF RISE** for the test sample. Note: The **RATE OF RISE** must be re-selected after each time the external interlock is opened.

Auto Mode

1. To set the test voltage, depress the DISPLAY/LIMIT pushbutton while rotating the SET knob until the desired voltage level is displayed on the digital VOLTMETER.

2. Select the desired test time on the dwell TIMER.

3. Set the desired OVERLOAD current trip level.

4. Depress the HV ON pushbutton. The HV ON light illuminates.

CAUTION

POTENTIALLY LETHAL VOLTAGES MAY BE PRESENT

5. The output voltage increases at the selected RATE OF RISE until the output voltage matches the pre-set limit (Some overshoot/undershoot may be experienced at different speeds and voltages). The LIMIT light illuminates and the output remains at the test voltage until the elapsed time on the TIMER expires. Afterwards, the output control automatically returns to zero and the high voltage shuts off.

   If the HIGH VOLTAGE OFF pushbutton is depressed while testing, the output control automatically returns to zero.

   Note: If a fault occurs while testing, the voltmeter retains the voltage level and the OVERLOAD RESET light illuminates. Testing may be resumed after depressing the OVERLOAD RESET pushbutton.

6. At the conclusion of testing, turn off the CONTROL POWER breaker and the MAIN POWER breaker.

7. Thoroughly ground the test sample ***and*** the high voltage bushing before disconnecting the output from the load.

Manual Mode

1. Set the desired OVERLOAD current trip level.

2. Depress the HV ON pushbutton. The HV ON light illuminates.

CAUTION

POTENTIALLY LETHAL VOLTAGES MAY BE PRESENT

3. Adjust the output voltage to the desired level by depressing the OUTPUT RAISE/LOWER rocker switch.

4. If the HIGH VOLTAGE OFF pushbutton is depressed while testing, the output control automatically returns to zero.

5. Note: If a fault occurs while testing, the voltmeter retains the voltage level and the OVERLOAD RESET light illuminates. Testing may be resumed after depressing the OVERLOAD RESET pushbutton.

6. At the conclusion of testing, return the output voltage to zero before depressing HIGH VOLTAGE OFF. Turn off the CONTROL POWER breaker and the MAIN POWER breaker.

7. Thoroughly ground the test sample ***and*** the high voltage bushing before disconnecting the output from the load.

THIS PAGE LEFT BLANK FOR APPLICATION NOTES

SECTION

3

PERFORMING SPECIAL OPERATIONS

The following section contains information on the care and upkeep of your new HPA SERIES High Power AC Test Set. There are some notes on troubleshooting and service, which will save much time and money over the life of the unit.

Meter Re-calibration

The HPA SERIES of hipots use precision metal film resistors for measurement and calibration of the voltmeter. The use of these resistors in both the high voltage tank and the metering circuits has minimized circuit drift due to aging and temperature. If recalibration is necessary, potentiometers are provided to compensate any discrepancies.

The certification of meters on a yearly basis is recommended to ensure accurate test results.

Voltmeter Calibration

1. Locate the unit in a position that will allow easy reading of the meters.

2. Remove the panel screws that retain the rack mounted control into the cabinet and pull the panel forward. Place the rack assembly on a stand in front of the cabinet to gain access to the Set point/Limit Metering board (PCB-028) mounted directly behind the digital voltmeter.

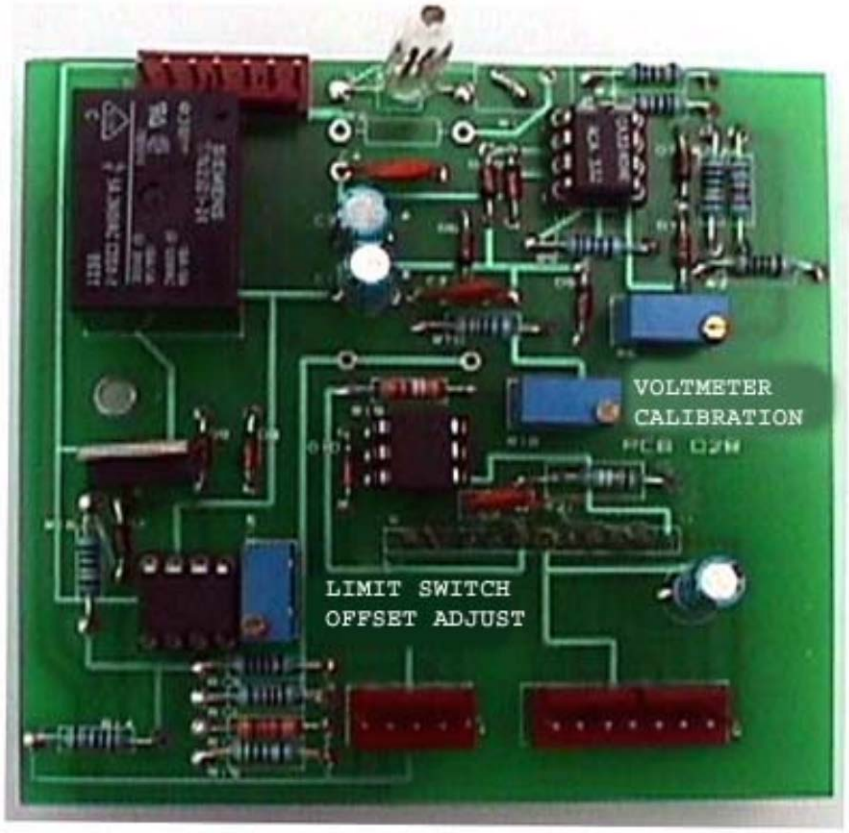
3. Perform the steps in Setting up the Equipment at the start of SECTION 2. Be sure to ground the power and high voltage sections to a solid earth ground using a ground lead as mentioned in Setting up the Equipment prior to connecting the unit to input power.

4. Connect the output toroid to a calibrated reference meter with ability to read to the full output voltage of the unit. Be sure to ground the low side of the meter.

5. Raise the output to one half scale on the unit meter. Adjust R18 on PCB-028 as required. This control is located near the center of the board.

6. Check calibration at half and full scale. If the customer facility calibration certification requires more points of reference, follow those procedures instead of these.

7. Repeat steps 5 and 6.
8. To compensate for limit switch offset, adjust R17.
9. Replace the auxiliary metering panel.



Current meter Calibration

1. Locate the unit in a position that will allow easy reading of the meters.

2. Remove the panel screws that retain the rack mounted control into the cabinet and pull the panel forward. Place the rack assembly on a stand in front of the cabinet to gain access to the calibration pot behind the current meter.

3. Perform the steps in Setting up the Equipment at the start of SECTION 2. Be sure to ground the power and high voltage sections to a solid earth ground using a ground lead as mentioned in Setting up the Equipment prior to connecting the unit to input power.

4. Connect the output bushing to a calibrated reference meter with ability to read to the full output current of the unit. Be sure to ground the low side of the meter. ***Also be cautious to raise the output slowly as the short circuit of the meter on the output will cause the current to jump quickly.***

5. Raise the output current to one half scale on the unit meter. Adjust the calibration pot as required.

6. Check calibration at half and full scale. If the customer facility calibration certification requires more points of reference, follow those procedures instead of these.

1. Miscellaneous

Oil Insulated High Voltage Tanks

The oil-filled tanks in all the PFT SERIES of hipots are field serviceable. The only requirement is that the tank must be oil filled under vacuum at re-assembly if the transformer is left out of the oil for longer than 3 hours. The parts to service the tank are available from HIGH VOLTAGE, INC. at the address noted on the inside front cover of this manual.

The oil level in the tank should be 1.50 inch from the top header when the oil temperature is 20°C.

RETURNED MATERIAL

If for any reason it becomes necessary to return any equipment or materials to High Voltage, Inc., the Service Department of High Voltage, Inc. must be notified, and authorization received, prior to the shipment of the equipment. When notified, the following information must be provided:

MODEL:
SERIAL NO:
PART NO:
REASON FOR RETURN:
SUSPECTED DEFECT:
CAUSE OF DEFECT:

With the above information provided, High Voltage, Inc. will determine if the return of the equipment is appropriate. If deemed appropriate, a Return Authorization Number will be issued. At that time, the Purchaser will be instructed how to mark and return the equipment.

The above procedure must be adhered to in order to ensure prompt service. No equipment should be returned without the prior knowledge and authorization of High Voltage, Inc.

REPLACEMENT PARTS ORDERING

To order replacement parts, first refer to the Parts List for the product in question. Every part is issued a part number. It is necessary this part number, the product model and serial number are provided. When calling High Voltage, Inc. request the Service Department.

TERMS AND CONDITIONS AND LIMITED WARRANTY Rev. 102113

High Voltage, Inc., 31 County Route 7A, Copake, NY USA 12516
Phone: (518) 329-3275 Fax (518) 329-3271 E-mail: factory@hvinc.com

THESE TERMS AND CONDITIONS OF SALE AND LIMITED WARRANTY OF HIGH VOLTAGE, INC. ("High Voltage") SHALL BE GOVERNED BY AND CONSTRUED ACCORDING TO THE INTERNAL LAWS OF THE STATE OF NEW YORK, USA, WITHOUT GIVING EFFECT TO ITS CONFLICT OF LAWS PROVISIONS. THE RIGHTS AND OBLIGATIONS OF ALL PARTIES AND ALL PERSONS OR ENTITIES CLAIMING HEREUNDER SHALL NOT BE GOVERNED BY THE PROVISIONS OF THE 1980 U.N. CONVENTION ON CONTRACTS FOR THE INTERNATIONAL SALE OF GOODS.

1. **ACCEPTANCE.** All orders become effective only when accepted by High Voltage's written order acknowledgment at Copake, New York, USA. Unless modified in writing by an authorized representative of High Voltage, or modified in High Voltage's Quotation or order Acknowledgment, these Terms and Conditions and Limited Warranty shall solely control Purchaser's order. High Voltage expressly rejects any additional or different provisions, terms or conditions proposed by Purchaser at any time.

2. **SCHEDULING.** High Voltage's shipping date specified in High Voltage's quotation or purchase order acknowledgment is approximate and High Voltage shall use reasonable commercial efforts to effect timely shipment. Furthermore, High Voltage shall not be liable for any delay in the performance of orders or contracts or in the delivery or shipment of goods or for any damages suffered by Purchaser by reason of such delay when such delay is, directly or indirectly, caused by, or in any manner arising from Purchaser's fault, fires, floods, accidents, riots, acts of God, war, governmental interference or, embargoes, strikes, labor difficulties, shortage of labor, fuel, power, materials or supplies, transportation delays, or any other cause or causes (whether or not similar in nature to any of these hereinbefore specified) beyond the control of High Voltage.

3. **CANCELLATIONS.** Prior to shipment, Purchaser may request cancellation or delayed delivery of an order or part thereof, but such shall be conditioned upon written consent of High Voltage and upon payment to High Voltage of cancellation or delayed delivery charges to be determined by High Voltage.

4. **SALE AND DELIVERY.** Unless otherwise agreed in writing, sale and delivery of the goods hereunder shall be made EXW or FCA (Incoterms® 2010) at High Voltage's option, High Voltage's dock at Copake, New York, USA, at which time all risk of loss or damage shall pass to Purchaser. All shipments and packaging shall be made in the manner determined by High Voltage, unless otherwise requested by Purchaser, in which case any resultant additional changes and expenses shall be paid by Purchaser.

5. **TAXES.** Any and all sales, use, excise and similar taxes, and duty and all other charges levied or imposed by governmental authority, foreign and domestic, upon any goods sold or contracted to be sold shall be paid by Purchaser and added to the purchase price unless appropriate tax exemption certificates are supplied to High Voltage in form satisfactory to High Voltage.

6. **PAYMENTS.**

a. All payments shall be in US Dollars without discount unless otherwise specified in High Voltage's order acknowledgment. Credit card payments are accepted only if specified in High Voltage's order acknowledgment.

b. Terms of payment are net thirty (30) days from date of invoice, unless otherwise agreed by High Voltage in its order acknowledgment. Delinquent payments are subject to a service charge on the unpaid balance from invoice date equal to the lower of 1-1/2% per month or the maximum rate permitted by law until all amounts are paid in full. If the financial responsibility of Purchaser becomes unsatisfactory to High Voltage for any reason, or if Purchaser has been in default to High Voltage under any order, High Voltage may require full payment in cash before shipment of goods.

c. If Purchaser so requests and makes arrangements prior to shipment which meet High Voltage's full satisfaction, High Voltage in its discretion may accept irrevocable letters of credit in its favor issued by a United States bank which is satisfactory to High Voltage.

7. **INFRINGEMENT, ETC.** On goods manufactured to Purchaser's specifications, Purchaser shall and does indemnify and hold High Voltage harmless against any claims, damages, liabilities, costs and expenses (including attorneys' fees) arising out of or resulting from actual or alleged infringement of patent, copyright, trademark or other proprietary rights, or claim of unfair trade or unfair competition arising from or occasioned by the use, possession, sale or delivery of any such goods sold by High Voltage.

8. **REPRODUCTION RIGHTS.** Drawings, specifications, reports, photographs and other data relating to all orders and all proprietary rights and interests therein and the subject matter thereof shall be and remain the property of High Voltage. Purchaser agrees that it shall not use High Voltage's drawings, specifications or other materials covered by this order, or any similar article from any other source, or reproduce the same or otherwise appropriate them, without the prior written authorization of High Voltage.

9. **LIMITED WARRANTY.**

a. High Voltage warrants to the original Purchaser of any new goods that the goods are free from defects in material and workmanship under normal use and service for a period of one (1) year from the date of shipment by High Voltage. The obligation of High Voltage under this Limited Warranty is limited, in High Voltage's exclusive option, to repair, replace with new or reconditioned parts or issue credit for goods, parts or materials which prove to be defective. Costs incurred by Purchaser for labor or other expenses to repair or replace such goods, parts and/or materials shall be the sole responsibility of Purchaser. High Voltage shall not be responsible for any damage or lack of performance resulting from: (i) defects due to accident, negligence, alteration, modification, faulty installation, abuse or misuse, whether by Purchaser, Purchaser's agents or employees, or by others than High Voltage (ii) attempted or actual dismantling, disassembly, service or repair by any person, firm or corporation not specifically authorized in writing by High Voltage, or (iii) defects caused by or due to handling by carrier, or incurred during shipment, transshipment or other move.

b. High Voltage expressly disclaims any warranty whatsoever of (i) consumables, and of (ii) parts, components, software (including but not limited to object code and source code and software user instructions), accessories, and materials not prepared, compiled or manufactured by High Voltage, and Purchaser must deal directly with such other supplier. High Voltage may elect to assist Purchaser in settling such claim against such other supplier, but any such assistance shall not prejudice High Voltage's position as to its own liability.

c. Compliance with the following Limited Warranty Claim Procedure is a condition precedent to the obligation of High Voltage under this Limited Warranty:

i. Purchaser must notify High Voltage in writing as soon as is reasonably possible, but within the applicable warranty period, of any alleged defect in material, workmanship, or operation of any goods covered under this Limited Warranty. Such notice must describe in detail the defect, any and all defective parts, and the alleged cause of the defect. No goods may be returned to High Voltage without High Voltage's prior written permission, which permission may be withheld by High Voltage in its sole discretion.

ii. At the exclusive option of High Voltage, Purchaser may be directed in writing to dismantle the goods at the Purchaser's cost and expense and ship the goods prepaid to High Voltage (refer to "Returns" Section 10 for provisions regarding the return of any goods to High Voltage). If High Voltage elects to inspect the goods at Purchaser's site, and to repair, replace,

[Section 9.c.ii. continued on page 2]

or ship the defective goods to High Voltage's factory, Purchaser, at its own cost and expense, shall provide the facilities for such work as needed to inspect and evaluate and possibly repair/replace the goods. If inspection discloses that the defect is not one for which High Voltage is liable, then Purchaser shall promptly reimburse High Voltage for all expenses incurred.

iii. Upon receipt of the defective goods, or following access to the same, High Voltage shall inspect and evaluate the goods and determine the validity of Purchaser's claim.

iv. The validity of any warranty claim, Purchaser's compliance with the Limited Warranty and Limited Warranty Claim Procedure, and the obligation to replace, repair, or issue credit for any goods are solely and exclusively to be determined by High Voltage and any determination shall be final and binding.

d. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, STATUTORY OR EXPRESSED OR IMPLIED ON THE PART OF HIGH VOLTAGE, INCLUDING THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NON-INFRINGEMENT; FURTHERMORE, HIGH VOLTAGE MAKES NO WARRANTY REGARDING NON-INTERRUPTION OF USE OR SOFTWARE FREEDOM FROM BUGS. HIGH VOLTAGE NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON, FIRM, OR CORPORATION TO ASSUME ANY LIABILITY OR OBLIGATION IN CONNECTION WITH THIS SALE OR LIMITED WARRANTY ON HIGH VOLTAGE'S BEHALF AND PURCHASER ACKNOWLEDGES THAT NO REPRESENTATION EXCEPT THOSE MADE HEREIN HAS BEEN MADE TO PURCHASER.

10. **RETURNS.** No goods may be returned to High Voltage without High Voltage's prior written permission, which permission may be withheld by High Voltage in its sole discretion. Any request for return authorization must be in writing and include, as applicable, model number, serial number, part number, reason for return, alleged defect, and apparent cause of alleged defect. Except as specifically provided in Section 9 Limited Warranty, if High Voltage consents to return of goods: (a) all return shipments are to be via prepaid freight and with all other charges prepaid, (b) if goods are returned to High Voltage within sixty (60) days from the date of original shipment for reasons other than an error by High Voltage in filling the Purchaser's order, Purchaser shall only be entitled to receive a credit in an amount equal to the payment received by High Voltage for the goods minus (i) handling charges, and (ii) a restocking fee determined solely by High Voltage which shall not exceed twenty five percent (25%) of the invoiced amount, and (c) if goods are returned to High Voltage after sixty (60) days from the date of original shipment for reasons other than an error by High Voltage in filling the Purchaser's order, Purchaser shall only be entitled to receive a credit in the amount equal to the payment received by High Voltage for the goods minus (x) a handling fee, and (y) a restocking fee in excess of twenty five percent (25%) which shall be determined by High Voltage.

11. **SECURITY INTEREST.** In order to induce High Voltage to ship goods without full payment, Purchaser grants a security interest to High Voltage in any and all of Purchaser's right, title and interest in the goods, and Purchaser agrees to comply with any reasonable request of High Voltage to perfect such security interest. Purchaser hereby further authorizes High Voltage to perfect High Voltage's security interest in said goods and consents to filing one or more financing statements without the signature of Purchaser.

12. **ARBITRATION.** Any controversy arising out of or relating to this document, or any breach thereof, including, without limitation, any claim that this document is voidable or void, shall be submitted to final and binding arbitration before, and in accordance with, the Commercial Rules of the American Arbitration Association then in effect, and judgment upon the award may be entered in any court have jurisdiction thereof; provided, however, that this clause shall not be construed to limit any rights which High Voltage may have to apply to any court of competent jurisdiction for equitable, injunctive or provisional relief. This arbitration provision shall be deemed self-executing, and in the event that either party fails to appear at any properly noticed arbitration proceeding, an award may be entered against such party notwithstanding said failure to appear. Such arbitration shall be conducted before a single arbitrator under the aegis of the American Arbitration Association in Columbia County, State of New York. The arbitrator shall have the authority to award expenses to the successful party.

13. **LIMITATION OF LIABILITY.** TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW, AND NOTWITHSTANDING ANYTHING ELSE IN THIS DOCUMENT OR OTHERWISE, INCLUDING THAT HIGH VOLTAGE WAS WARNED THAT DAMAGES WOULD OCCUR OR WERE LIKELY TO OCCUR, HIGH VOLTAGE SHALL NOT BE LIABLE WITH RESPECT TO ANY SUBJECT MATTER OF THIS DOCUMENT UNDER ANY CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER LEGAL OR EQUITABLE THEORY FOR (i) ANY AMOUNTS IN EXCESS IN THE AMOUNT PAID TO HIGH VOLTAGE FOR THE PARTICULAR GOODS OR PART THEREOF WHICH GAVE RISE TO THE APPLICABLE CAUSE OF ACTION OR CLAIM, OR (ii) ANY INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOST PROFITS OR LOST OR CORRUPTED DATA, OR (iii) COST OF PROCUREMENT OF SUBSTITUTE GOODS, SOFTWARE, TECHNOLOGY OR SERVICES. HIGH VOLTAGE SHALL HAVE NO LIABILITY FOR ANY FAILURE OR DELAY DUE TO MATTERS BEYOND ITS REASONABLE CONTROL.

14. **SEVERABILITY.** These Terms and Conditions and Limited Warranty are the entire understanding between Purchaser and High Voltage with respect to the subect matter hereof and supersede all prior agreements, dealings and negotiations. No modification, alteration or amendment shall be effective unless made in writing and signed by a duly authorized representative of High Voltage. No waiver of any breach hereof shall be held to be a waiver of any other or subsequent breach. Nothing contained in this document shall be construed as requiring the commission of any act contrary to law. Whenever there is any conflict between any provision of this document and any present or future statute, ordinance or regulation contrary to which the parties have no legal right to contract, the latter shall prevail, but in such event the provision of this document thus affected shall be curtailed and limited only to the extent necessary to bring it within the requirements of the law. In the event that any part, article, section, paragraph, sentence or clause of this document shall be held to be indefinite, invalid or otherwise unenforceable, the entire document shall not fail on account thereof, and the balance of the document shall continue in full force and effect. If any arbitration tribunal or court of competent jurisdiction deems any provision hereof (other than for the payment of money) unreasonable, said arbitration tribunal or court may declare a reasonable modification thereof, and this document shall be valid and enforceable, and the parties hereto agree to be bound by and perform the same as thus modified.

15. **BASIS OF BARGAIN**. Each party recognizes and agrees that the warranty disclaimers and liability and remedy limitations in this document are material, bargained for bases of their agreement and that they have been taken into account and reflected in determining the respective obligations of the parties.

[End]

THE WORLD'S SOURCE FOR HIGH VOLTAGE TEST EQUIPMENT

ADVANCED TEST EQUIPMENT FOR HIGH VOLTAGE PROOF AND PREVENTIVE MAINTENANCE TESTING OF ELECTRICAL APPARATUS

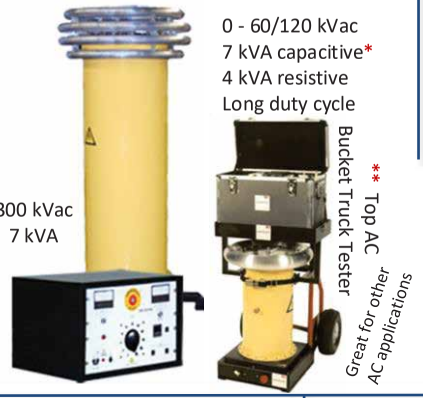
DC Hipot/Megohmmeter Test Sets

Two Testers in One

AC Hipots - Field Portable

Built for Field Use
Portable
Affordable
Rugged & Reliable
Easily Serviceable

Aerial Lift Test Sets - AC



Oil Dielectric Testing

Standard & Micro Controlled

60 kVac & 100 kVac models

60 kVac
.5/2/3 kV/sec
Digital Display

60 kVac
Fully Programmable
Panel Printer

Very Low Frequency AC Technology

Cables & Motors/Generators

0.1 – 0.01 Hz up to 200 kVac

VLF Withstand
VLF TD & VLF PD

200 kVac peak - sine wave
0.1 – 0.02 Hz to 3.75 uF

90 kVac peak - sine wave
0.1 – 0.02 Hz to 2.75 uF

30 kVac
0.4 uF

Many more models avail.

62 kVac peak - sine wave
0.1 – 0.01 Hz to 5.5 uF
Wind Farm Model

** **New Solid State Design**
34 kV peak - sine wave
0.1 – 0.01 Hz to 7 uF

50/60 Hz AC Dielectric Test Equipment: 5 kVA – 50 kVA

AC Testing of High Capacitance Loads – up to 300 kVac

100 kVac
10 kVA
PD <10 pc

5 kVac @ 1 A
Motor Testing

10 kVac @ 10 kVA
Low PD < 10 pc

Concentric Neutral Resistance Tester

Ω-CHECK™

HV Dividers

150 kV AC/DC
300 kV AC/DC

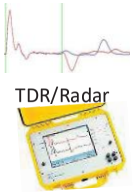
VLF Diagnostic Cable Testing

Tan Delta & Partial Discharge

Capacitor Discharge Systems – Thumpers

Three Full Joule Outputs – VLF/Thumper Combo

Models for URD & Network Systems



HVI Products 10/2015

31 COUNTY RT. 7A, COPAKE, NY 12516 | 518.329.3275 | FAX 518.329.3271 | SALES@HVINC.COM | WWW.HVINC.COM