



PFT-301CM

SERIES

Safety, Operation, and Procedure Instructions for the PFT -301CM AC Hipot



Please Refer to
Documentation
Before Operation

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



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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 PFT-301CM 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 the PFT-301CM of AC Hipot is also discussed in the PFT Brochure available from High Voltage, Inc.

General Information

This section familiarizes the operator with the features and specifications of the

PFT-301CM Power Frequency AC Test Set manufactured by **HIGH VOLTAGE, INC.**

Features and Specifications

The PFT-301CM AC hipot test set provides continuously adjustable output voltage for the GO/NO-GO testing of high voltage vacuum bottles up to 30 kVac.

Standard features of the PFT Series of AC Hipots

- Continuously adjustable output voltage
- Fixed overload, factory set to 120% of variable transformer rated output current
- "Zero Start" and External Interlock provision
- Primary connected single-range voltmeter
- Shielded output cable precludes unnecessary insulated support of the cable
- One piece portable design (50 lbs.)
- Transit protected meters prevent meter damage between test sites
- Rugged transit case

PFT-301CM MODEL SPECIFICATIONS

	PFT-301CM Part No. PFT-1139S (PFT-301CM) Part No. PFT-1141S (PFT-301CMF)
Input	120 V, 50/60 Hz, 10 amps, single phase 230 V, 50/60 Hz, 5 amps, single phase
Output	0-30kVac, 1KVA resistive load
Output Termination	8 ft. long shielded cable
Duty	1 KVA:1 hour ON, 1 hour OFF 700VA: continuous
Distortion	<5%
Meter Accuracy	2%
Kilovoltmeter	3.5 inch Scaled 0-30 kVac (RMS)
Current Meter(CM unit)	3.5 inch Scaled 0-40 mAac
Case Size	17W x 11.5d x 15.5 high
H.V. TANK	High Voltage Tank Included
Weight	50 lbs. (23kg)

Table 1 PFT-301CM Specifications.

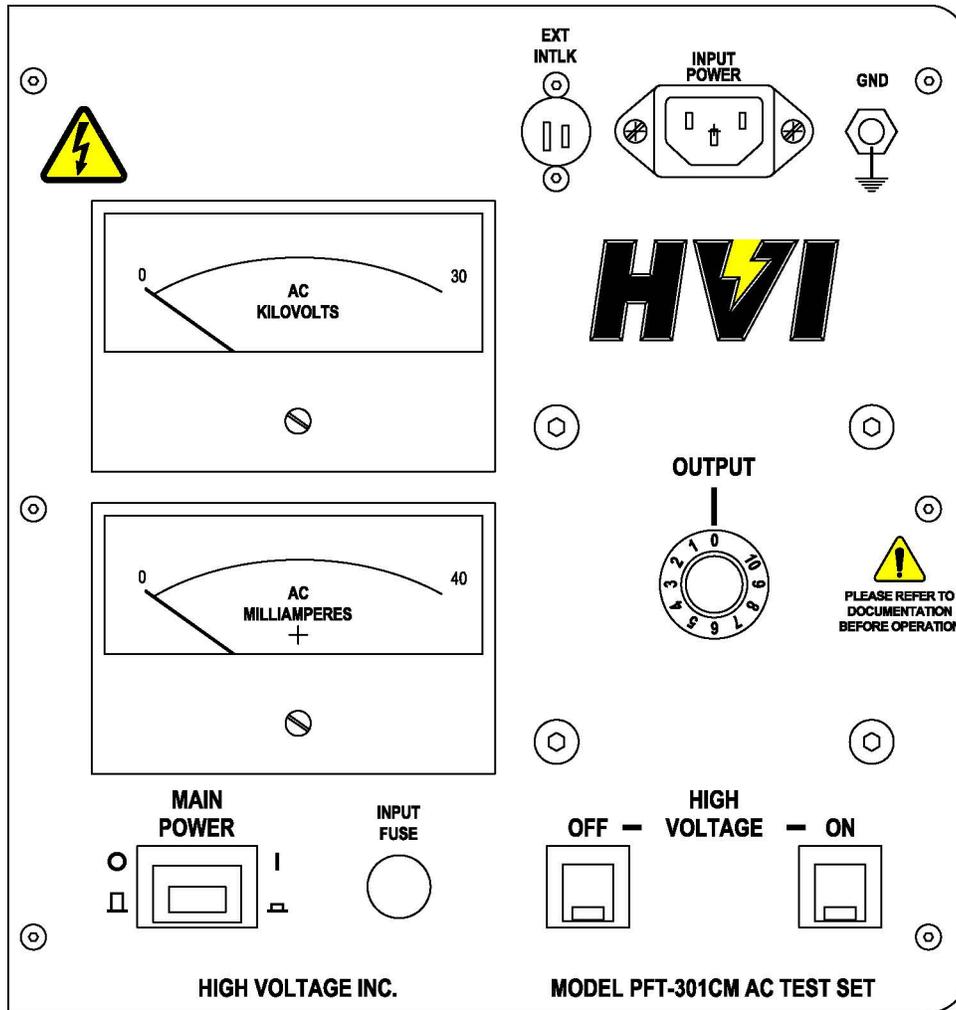


Figure 1 *PFT-301CM front panel controls.*

INPUT POWER

The **INPUT POWER** connector accepts most standard electronic line/extension cords. The power supplied to the input connector must be from a *grounded* source rated to match the input power specifications noted in **Table 1**.

MAIN POWER

The **MAIN POWER** rocker switch provides the power to the control and power circuits. The neon lamp will light when the power is on and voltage is available through the input line cord. The **INPUT FUSE** located electrically before the **MAIN POWER** switch provides line fault protection for the unit.

EXT.INTLK (EXTERNAL INTERLOCK)

The **Ext. Intlk.** connector is provided to allow for a normally open safety interlock switch to control the energizing of the high voltage output.

HIGH VOLTAGE ON/OFF

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

OUTPUT CONTROL

The **OUTPUT** control variable transformer adjusts the output voltage. The 0-10 markings on the knob indicate the low to high setting. The control must be at ZERO (0) to energize the high voltage circuits. **The output control must always be returned to zero at the completion of testing, prior to de-energizing the output**

KILOVOLT METER AND CURRENT METER

The metering devices on the PFT-301CM are 100uA dc movements. The movements are less prone to breakage than those offered by our competitors. The Voltmeter is a primary connected single scale 0-30 kVac meter. The Current meter is a secondary connected single scale 0-40 mAac meter.



List of included components

- Black test leads with black booted clip for ground and return connections.
- Ext. Intlk. jumper plug (provided installed in panel)
- Attached 20 ft. X-Ray shielded output cable
- 6 ft. input line cord
- Alligator and hook connections for working end of output cable.

SETTING UP THE EQUIPMENT

The setup of this equipment has been minimized by careful consideration of the operator during design. The PFT-301CM one-piece construction allows for convenient portability.

1. **Select a location** for the unit that will allow easy viewing of the kilovolt and milliamperemeter meters at a safe distance from the test object.
2. **Be sure that all the controls are off**, in their de-energized or fully counterclockwise position.
3. **Secure both ground test leads to the panel.** The **Ground** post on the front panel should be used for that purpose. One black test lead with black boot has been provided for the safety ground connection, the second test lead is for the test sample return ground.
4. **Insert the EXT INTLK plug into the socket on the panel.** The plug may also be wired to a normally open contact of a safety switch for added protection.
5. **Select the desired output connector.** The alligator and/or the hook termination supplied screws directly into the end of the output cable.

Operating the Equipment

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

AC Vacuum Bottle Testing

1. Ensure that all the steps listed in **Setting up the Equipment** have been accomplished. Take special note to ground the control panel to a solid earth ground using the supplied black test lead.
2. Prior to connecting the output cable to the test sample, be sure that the test sample is de-energized.
3. Connect the output lead to the high voltage side of the test sample. *Be sure that there is enough clearance to grounded objects for the expected test voltage. The minimum clearance in air is 10 kV ac/inch.* Connect a ground lead to the low side of the test sample.

NOTE: The shield of the output cable is grounded and the cable must be routed to avoid arcing to the shield and damage to the outer vinyl sheath.

4. Connect the input power cord to a grounded source (See the specification table for unit input requirements). If the distance to a power source is greater than the cord provided, a standard **grounded** extension cord can be used.
5. Operate the **MAIN POWER** switch to energize the control circuits.

* * * CAUTION * * *

POTENTIALLY LETHAL VOLTAGES
MAY BE PRESENT

6. With the **OUTPUT** control at zero (zero start interlock engaged), depress the **HV ON** pushbutton. The **HV ON** light will glow.

7. Increase the output by rotating the **OUTPUT** control slowly clockwise until the desired output voltage is reached.
8. Maintain the output voltage for the test time specified in your standard procedures.
9. After the test is complete, rotate the OUTPUT control to zero, prior to depressing the **HV OFF** pushbutton.
10. If the test sample fails during the test, the internal overload relay will de-energize the high voltage. **This relay is in the primary circuit and is sensitive to primary current overloads.** The overload is set to 120% of the rated current of the variable transformer.
11. Prior to removing the output cable from the load, assure that the load has no voltage, a safety ground stick or resistive discharge stick should be used.

PERFORMING SPECIAL OPERATIONS

The following section contains information on the care and upkeep of your new PFT SERIES Power Frequency 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 PFT-301CM hipot uses precision metal film resistors for measurement and calibration of the voltmeter. The use of these resistors has minimized circuit drift due to aging and temperature. But, a potentiometer (R4) on the voltmeter PCB can be used to correct for movement changes from the aging of the meter.

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

Voltmeter Re-calibration

1. Locate the unit in a position that will allow easy reading of the meters.
2. Remove the panel screws and support the panel horizontally to gain access to the calibration pot on the back of the voltmeter.
3. Zero the meter movement using the zero adjustment below the scale window (on the back of the meter on edgewise models).
4. Perform the steps in **Setting up the Equipment** at the start of **SECTION 2**. Be sure to ground the front panel to a solid earth ground using the supplied black ground test lead prior to connecting the unit to input power.
5. Connect the output cable 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.
6. Raise the output to one half scale on the unit meter. Adjust R4 as required.

7. Check calibration at full scale. If the customer facility calibration certification requires more points of reference, follow those procedures instead of these.
8. Calibration must then be verified with the panel in the operating position to check for any meter balance affect on the calibration.

Current Meter Re-calibration

1. Perform steps 1 thru 4 as noted in the Voltmeter Re-calibration Instructions.
2. Connect the output cable 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.
3. Raise the output to one half scale on the unit meter. Adjust R5 (100K pot) as required.
4. Check calibration at full scale. If the customer facility calibration certification requires more points of reference, follow those procedures instead of these.
5. Calibration must then be verified with the panel in the operating position to check for any meter balance affect on the calibration.

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 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 .5 inches from the lid 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 for this part number and the product model and serial number to be provided. When calling High Voltage, Inc. request the Service Department.

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 subject 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

80 kVdc 10 mA

100 kVdc 10 mA

Bucket Truck Tester

**Top DC

AC Hipots - Field Portable

30 kVac @ 1 kVA

50 kVac @ 3 kVA Cable Output** Only 1 piece

100 kVac @ 3 kVA

Built for Field Use

Portable

Affordable

Rugged & Reliable

Easily Serviceable

Aerial Lift Test Sets - AC

0 - 60/120 kVac

7 kVA capacitive*

4 kVA resistive

Long duty cycle

300 kVac 7 kVA

Bucket Truck Tester

** Top AC

Great for other AC applications

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

VLF - TD Pair*

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

TB-60 0 - 60 kVac

TD-34E 0-34 kV

TD/PC Meas. 40 - 200 kV

Capacitor Discharge Systems - Thumpers

Three Full Joule Outputs - VLF/Thumper Combo

Models for URD & Network Systems

0-9/18/36 kV 3200/18/400mA

** VLF - Thumper

TDR/Radar

* Van Package*

Parts List PFT-301CM (120V)

Schematic # PFT-1139S

<u>REF.</u>	<u>QUAN</u>	<u>HVI#</u>	<u>DESCRIPTION</u>
CAB	1		CABINET, PORTABLE ENCLOSURE, CHARCOAL GRAY, HVI # CSE-0057D
D1	1	04-030	DIODE, 1N5408A
D2,3	2	04-025	DIODE, 1N4007A
F1	1	06-038	FUSE, 10A, 250V, AGC-10
	1	06-015	FUSE HOLDER, LITTELFUSE # 342004A
J1	1	07-480	CONNECTOR, INPUT, MOUSER # 161-0707-1-250
J2	1	07-440	CONNECTOR, BULKHEAD, 2 SOCKET, CINCH #S302AB
K1,2	2	11-152	CONTACTOR, DPDT , 15A, 120 Vac COIL, MIDTEX # 258-62T200
M1	1	13-106	METER, ANALOG, 100 μ A MOVEMENT, SCALED 0-30 AC KILOVOLTS
M2	1	13-107	METER, ANALOG, 100 μ A MOVEMENT, SCALED 0-40 AC MILLIAMPERES
MOV1	1	06-207	METAL OXIDE VARISTOR, # V130LA10A
MOV2	1	06-210	METAL OXIDE VARISTOR, # V250LA20A
P1	1	22-503	LINE CORD, INPUT POWER, 125V, 10A , 18-3, SJT , MOUSER # 173-33101
P2	1	07-442	CONNECTOR, CABLE, 2 CIRCUIT, CINCH# P302CCT
PCB-001- PFT301	1		PRINTED CIRCUIT BOARD, VOLT METER
PCB-034	1		PRINTED CIRCUIT BOARD, AC OVERLOAD/CURRENT METER
S1	1	10-214	SWITCH, PB, MAINT'D, 250 Vac, 15A, DPST, NO , NEON LAMP, MICROSWITCH #AML32FBB4AD
	1	10-250	SWITCH, PB COVER, BLACK, MICROSWITCH # AML52-N10K
S2	1	10-222	SWITCH, PB, MOM., 125 Vac, 15A, SPDT, GRN LED, MICROSWITCH # AML22CBS2AA
S3	1	10-218	SWITCH, PB, MOM., 125 Vac, 15A, SPDT, RED LED, MICROSWITCH # AML22CBC2AA
	2	10-252	SWITCH, PB COVER, BLACK, MICROSWITCH # AML52-C10K
S4	1	10-106	SWITCH, SNAP ACTION, SHORT ARM, OMRON #A-20GV22-B7-K
T1	1	25-104	TRANSFORMER, VARIABLE, SUPERIOR TYPE 21
HV TNK	1		TANK, HIGH VOLTAGE 50 kVac , HV # PFT-1015S REV B
PCB-001- PFT301			VOLT METER PCB
C1	1	03-060	CAPACITOR, ELECTROLYTIC, RADIAL LEADS, 100 μ F, 50 Vdc, MOUSER # 140-XRL50V100
D1	1	04-025	DIODE, 1N4007A
D2	1	04-415	DIODE, FULL WAVE BRIDGE, 1.5A, 1kVdc, MOUSER # 583-RB157
J1	1	07-136	CONNECTOR, HEADER, 8 PIN, .1" SPACING, MOLEX # 22-23-2081
P1	1	07-120	CONNECTOR, CABLE, 8 PIN, .1" SPACING, MOLEX # 22-01-2087
	8	07-104	CONNECTOR PINS, .1" SPACING, MOLEX # 08-50-0114
PCB	1	14-001	PRINTED CIRCUIT BOARD, HVI # PCB- 001
R2	1	01-166	RESISTOR, METAL FILM, 0.25W, 665K, 1%
R3	1	01-076	RESISTOR, METAL FILM, 0.25W, 2K, 1%
R4	1	02-016	RESISTOR, POTENTIOMETER, 0.25W, 5K, MOUSER # 569-25PR-5K
R5,6	2	01-310	RESISTOR, CARBON FILM, 1W, 1K, 5%
RY1	1	11-110	RELAY, PCB MOUNT, SPDT, 24 Vdc COIL, P&B # T70L5D131-24
PCB-034			AC OVERLOAD/CURRENT METER
C1	1	03-060	CAPACITOR, ELECTROLYTIC, RADIAL LEADS, 100 μ F, 50 Vdc, MOUSER # 140-XRL50V100
D1,2	2	04-415	DIODE, FULL WAVE BRIDGE, 1.5A, 1kVdc, MOUSER # 583-RB157

D3	1	04-025	DIODE, 1N4007A
J1	1	07-136	CONNECTOR, HEADER, 8 PIN, .1" SPACING, MOLEX # 22-23-2081
J2	1	07-130	CONNECTOR, HEADER, 5 PIN, .1"SPACING, MOLEX # 22-23-2051
P1	1	07-120	CONNECTOR, CABLE, 8 PIN, .1"SPACING, MOLEX # 22-01-2087
P2	1	07-114	CONNECTOR, CABLE, 5 PIN, .1"SPACING, MOLEX # 22-01-2057
	12	07-104	CONNECTOR, CRIMP PIN, .1"SPACING, MOLEX # 08-05-114
PCB	1	14-034	PRINTED CIRCUIT BOARD, HVI # PCB-034
R1			NOT USED
R2	1	01-092	RESISTOR, METAL FILM, 0.25W, 5.9K, 1%
R3			NOT USED
R4,7	2	02-018	RESISTOR, POTENTIOMETER, 0.25W, 10K, MOUSER # 569-25PR-10K
R5	2	01-034	RESISTOR, METAL FILM, 0.25W, 348Ω, 1%
R6	1	01-138	RESISTOR, METAL FILM, 0.25W, 49.9K, 1%
R8,9	2	01-312	RESISTOR, CARBON FILM, 1W, 1.6K OHM, 5%
RY1,2	2	11-110	RELAY, PCB MOUNT, SPDT, 24 Vdc COIL, P&B # T70L5D131-24
SG1,2	2	06-213	SPARK GAP, 230V, CP CLARE# CG230L

MISC.

	1	23-109	KNOB, SKIRTED, DIAL, MOUSER # 45KN021
	1	34-315	BRACKET, ZERO START, TYPE 21 PWST, HVI # BKT-1001D
	1		GROUND LEAD, GROUND, BLACK, 20 FT. WITH CLIP AND BOOT
	1		SCHEMATIC, WIRING, HVI # PFT-1139S REV C
	1		PANEL, CONTROL, HVI # PFT-1147D REV0.
	1		CHASSIS, U-WRAP, ALUMINUM, HVI # PFT-1148D REV 0

HV TANK

	1		PFT-301 HIGH VOLTAGE TANK, SCHEMATIC # PFT-1015S
X1-3	3	09-100	TERMINAL, BULKHEAD FEEDTHROUGH, LUNDEY #250-S-T15
T1	1	T-088	TRANSFORMER, HIGH VOLTAGE, HVI # 088
	1		TANK AND HEADER ASSEMBLY, HV # TNK-0009D
	10 ft		CABLE, SHIELDED SILICONE, X-RAY WITH FITTINGS

SPECIFICATIONS

	PFT-301CM Part No. PFT-1139S
Input	120 V, 60 Hz, 10 amps, 50/60Hz, single phase
HV Output	0-30kVac, 1.0KVA
Output Termination	20 ft. long shielded cable
Duty	1 KVA:1 hour ON, 1 hour OFF 700VA: continuous
Distortion	<5%
Meter Accuracy	2%
Kilovoltmeter	3.5 inch Scaled 0-30ac KILOVOLTS (RMS), 2% FS Accuracy
Current Meter	3.5 inch Scaled 0-40 ac MILLIAMPERES , 2% FS Accuracy
Case Size	17w x 11.5d x 14high
H.V. TANK	High Voltage Tank Included
Weight	45 lbs. (20kg)

Table 1 ***PFT-301CM Specifications.***

Parts List PFT-301CMF (230V)
Schematic # PFT-1141S

<u>REF.</u>	<u>QUAN</u>	<u>HVI#</u>	<u>DESCRIPTION</u>
CAB	1		CABINET, PORTABLE TRANSIT ENCLOSURE, HVI # CSE-0057D
D1	1	04-030	DIODE, 1N5408A
D2,3	2	04-025	DIODE, 1N4007A
F1	1	06-031	FUSE, 5A, 250V, AGC-5
	1	06-015	FUSE HOLDER, LITTELFUSE # 342004A
J1	1	07-480	CONNECTOR, INPUT, MOUSER # 161-0707-1-250
J2	1	07-440	CONNECTOR, BULKHEAD, 2 SOCKET, CINCH #S302AB
K1,2	2	11-152	CONTACTOR, DPDT , 15A, 120 Vac COIL, MIDTEX # 258-62T200
M1	1	13-106	METER, ANALOG, 100 μ A MOVEMENT, SCALED 0-30 AC KILOVOLTS
M2	1	13-107	METER, ANALOG, 100 μ A MOVEMENT, SCALED 0-40 AC MILLIAMPERES
MOV1	1	06-207	METAL OXIDE VARISTOR, # V130LA10A
MOV2	1	06-210	METAL OXIDE VARISTOR, # V250LA20A
P1	1	22-499	LINE CORD, INPUT POWER, 230V, 10A , 18-3, SJT , VOLEX #21
P2	1	07-442	CONNECTOR, CABLE, 2 CIRCUIT, CINCH# P302CCT
PCB-001- PFT301	1		PRINTED CIRCUIT BOARD, VOLT METER
PCB-034	1		PRINTED CIRCUIT BOARD, AC OVERLOAD/CURRENT METER
S1	1	10-214	SWITCH, PB, MAINT'D, 250 Vac, 15A, DPST, NO , NEON LAMP, MICROSWITCH #AML32FBB4AD
	1	10-250	SWITCH, PB COVER, BLACK, MICROSWITCH # AML52-N10K
S2	1	10-222	SWITCH, PB, MOM., 125 Vac, 15A, SPDT, GRN LED, MICROSWITCH # AML22CBS2AA
S3	1	10-218	SWITCH, PB, MOM., 125 Vac, 15A, SPDT, RED LED, MICROSWITCH # AML22CBC2AA
	2	10-252	SWITCH, PB COVER, BLACK, MICROSWITCH # AML52-C10K
S4	1	10-106	SWITCH, SNAP ACTION, SHORT ARM, OMRON #A-20GV22-B7-K
T1	1	25-104	TRANSFORMER, VARIABLE, SUPERIOR TYPE 21
T2	1	T145	TRANSFORMER, AUTO STEP-DOWN, 230/115, 50/60 Hz, HVI #T-145
HV TNK	1		TANK, HIGH VOLTAGE 30 kVac , HV # PFT-1015S REV B
PCB-001- PFT301			VOLT METER PCB
C1	1	03-060	CAPACITOR, ELECTROLYTIC, RADIAL LEADS, 100 μ F, 50 Vdc, MOUSER # 140-XRL50V100
D1	1	04-025	DIODE, 1N4007A
D2	1	04-415	DIODE, FULL WAVE BRIDGE, 1.5A, 1kVdc, MOUSER # 583-RB157
J1	1	07-136	CONNECTOR, HEADER, 8 PIN, .1" SPACING, MOLEX # 22-23-2081
P1	1	07-120	CONNECTOR, CABLE, 8 PIN, .1" SPACING, MOLEX # 22-01-2087
	8	07-104	CONNECTOR PINS, .1" SPACING, MOLEX # 08-50-0114
PCB	1	14-001	PRINTED CIRCUIT BOARD, HVI # PCB- 001
R2	1	01-166	RESISTOR, METAL FILM, 0.25W, 665K, 1%
R3	1	01-076	RESISTOR, METAL FILM, 0.25W, 2K, 1%
R4	1	02-016	RESISTOR, POTENTIOMETER, 0.25W, 5K, MOUSER # 569-25PR-5K
R5,6	2	01-310	RESISTOR, CARBON FILM, 1W, 1K, 5%
RY1	1	11-110	RELAY, PCB MOUNT, SPDT, 24 Vdc COIL, P&B # T70L5D131-24
PCB-034			AC OVERLOAD/CURRENT METER
C1	1	03-060	CAPACITOR, ELECTROLYTIC, RADIAL LEADS, 100 μ F, 50 Vdc, MOUSER # 140-XRL50V100

D1,2	2	04-415	DIODE, FULL WAVE BRIDGE, 1.5A, 1kVdc, MOUSER # 583-RB157
D3	1	04-025	DIODE, 1N4007A
J1	1	07-136	CONNECTOR, HEADER, 8 PIN, .1" SPACING, MOLEX # 22-23-2081
J2	1	07-130	CONNECTOR, HEADER, 5 PIN, .1"SPACING, MOLEX # 22-23-2051
P1	1	07-120	CONNECTOR, CABLE, 8 PIN, .1"SPACING, MOLEX # 22-01-2087
P2	1	07-114	CONNECTOR, CABLE, 5 PIN, .1"SPACING, MOLEX # 22-01-2057
	12	07-104	CONNECTOR, CRIMP PIN, .1"SPACING, MOLEX # 08-05-114
PCB	1	14-034	PRINTED CIRCUIT BOARD, HVI # PCB-034
R1			NOT USED
R2	1	01-092	RESISTOR, METAL FILM, 0.25W, 5.9K, 1%
R3			NOT USED
R4,7	2	02-018	RESISTOR, POTENTIOMETER, 0.25W, 10K, MOUSER # 569-25PR-10K
R5	2	01-034	RESISTOR, METAL FILM, 0.25W, 348Ω, 1%
R6	1	01-138	RESISTOR, METAL FILM, 0.25W, 49.9K, 1%
R8,9	2	01-312	RESISTOR, CARBON FILM, 1W, 1.6K OHM, 5%
RY1,2	2	11-110	RELAY, PCB MOUNT, SPDT, 24 Vdc COIL, P&B # T70L5D131-24
SG1,2	2	06-213	SPARK GAP, 230V, CP CLARE# CG230L

MISC.

	1	23-109	KNOB, SKIRTED, DIAL, MOUSER # 45KN021
	1	34-315	BRACKET, ZERO START, TYPE 21 PWST, HVI # BKT-1001D
	1		GROUND LEAD, GROUND, BLACK, 20 FT. WITH CLIP AND BOOT
	1		SCHEMATIC, WIRING, HVI # PFT-1141S REV C
	1		PANEL, CONTROL, HVI # PFT-1147D REV0.
	1		CHASSIS, U-WRAP, ALUMINUM, HVI # PFT-1148D REV 0

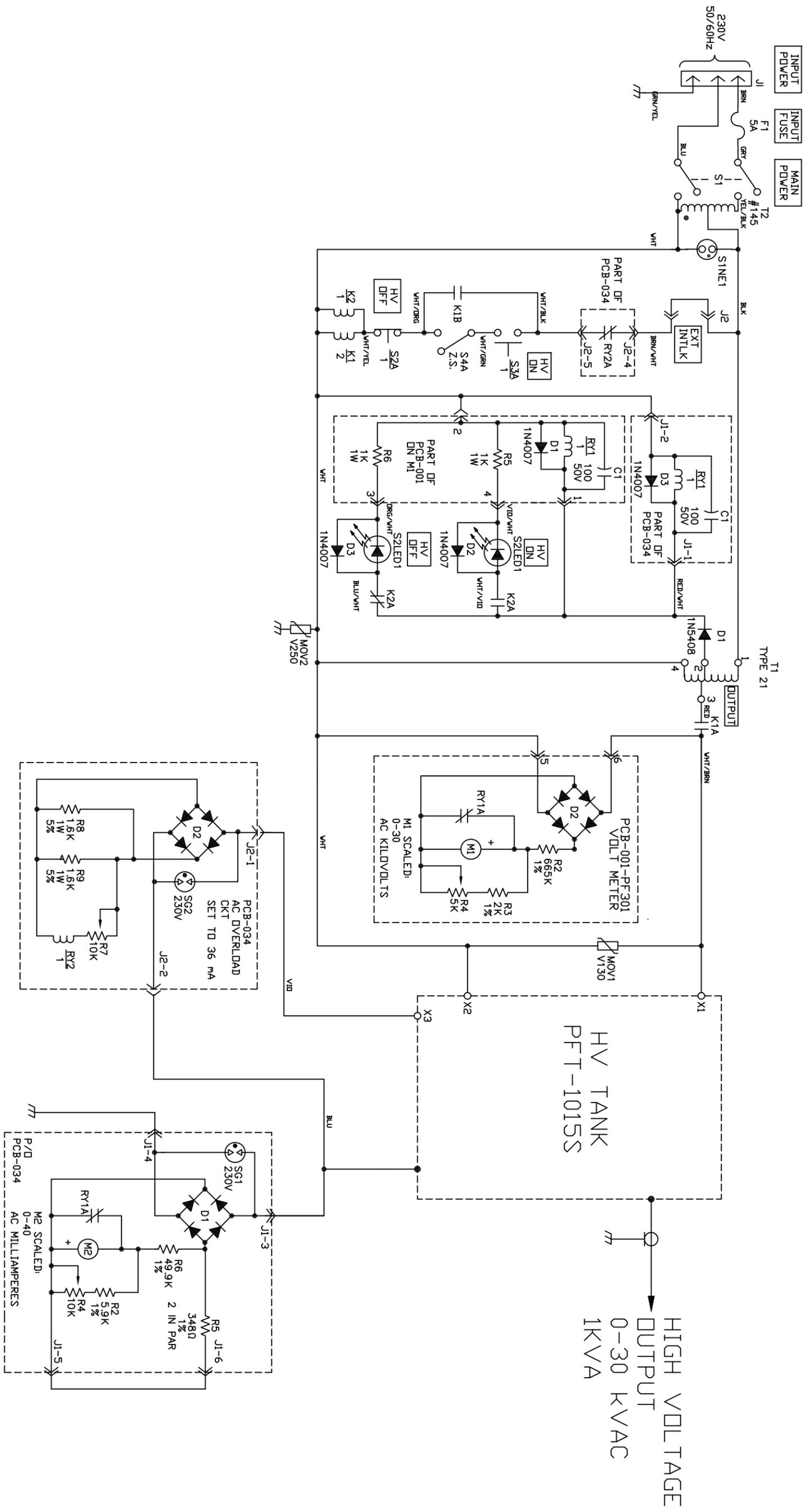
HV TANK

	1		PFT-301 HIGH VOLTAGE TANK, SCHEMATIC # PFT-1015S
X1-3	3	09-100	TERMINAL, BULKHEAD FEEDTHROUGH, LUNDEY #250-S-T15
T1	1	T-088	TRANSFORMER, HIGH VOLTAGE, HVI # 088
	1		TANK AND HEADER ASSEMBLY, HV # TNK-0009D
	10 ft		CABLE, SHIELDED SILICONE, X-RAY WITH FITTINGS

SPECIFICATIONS

	PFT-301CMF Part No. PFT-1141S
Input	230 V, 60 Hz, 5 amps, 50/60Hz, single phase
HV Output	0-30kVac, 1.0KVA
Output Termination	20 ft. long shielded cable
Duty	1 KVA:1 hour ON, 1 hour OFF 700VA: continuous
Distortion	<5%
Meter Accuracy	2%
Kilovoltmeter	3.5 inch Scaled 0-30ac KILOVOLTS (RMS), 2% FS Accuracy
Current Meter	3.5 inch Scaled 0-40 ac MILLIAMPERES , 2% FS Accuracy
Case Size	17w x 11.5d x 14high
H.V. TANK	High Voltage Tank Included
Weight	48 lbs. (22kg)

Table 1 ***PFT-301CMF Specifications.***



QTY	DESCRIPTION	PART NO.	MATL OR NOTE	ITEM
	SCHEMATIC			
	PFT-301CMF			
	TEST SET			
	CONTROLS			

MATL	QTY	DESCRIPTION
-	-	UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES DO NOT SCALE DWG
-	-	FRACTIONS DECIMALS ANGLES
-	-	1/8 30

REV.	DATE	BY	DESCRIPTION
02/04	02/04	JHW	518-329-3275
02/04	02/04	JHW	518-329-3275
02/04	02/04	JHW	518-329-3275

