

HIGH VOLTAGE DIGITAL AMMETER

Operating & Instruction Manual



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GENERAL DESCRIPTION

The High Voltage Digital Ammeter, HVA-2000, measures line current on overhead and underground secondary voltage, distribution voltage and transmission voltage distribution systems up to 500kV.

The HVA-2000 measures current from 1 Amp up to 2000 Amps and current is displayed in the large easy to read four digit display.

The HVA stores the four most recent current readings, typically three individual phase currents and a neutral current for easy review after making measurements.

IMPORTANT SAFETY INFORMATION

- Only trained, professional operating personnel should use the HVA High Voltage Ammeter. The voltages this instrument operates at are dangerous and lethal. Severe injury or death can occur if improperly used.
- Risk of electrocution is inherent in or around high voltage.
- Always use proper high voltage procedures, including personal protective equipment, when working near or around high voltage equipment or conductors.
- Do not exceed the maximum voltage rating.
- The Ammeter must be used with a hot stick of the appropriate length for the voltage of the conductor being measured per your company and OSHA published requirements.
- Do not touch the HVA High Voltage Ammeter during measurements. The housing should be considered to be at the same voltage as the conductor under test.
- Prior to using, inspect the instrument for any physical damage, cleanliness and check for proper working order by pressing and holding the ON button. Do not proceed if the display does not indicate all 8's.
- Never allow another high voltage or grounded conductor to contact the instrument during use. Keep the housing free and clear of all structures at all times. Bridging the housing from line-to-ground or line-to-line may cause a fault and arc.
- The HVA High Voltage Ammeter does not measure current below 1 Amp. A zero current reading **does not** mean the line is dead or grounded.
- The HVA High Voltage Ammeter measures AC current only. It does not measure DC current.

**This important label is affixed to the product.
Read and understand before proceeding.**

HVA-2000 High Voltage Digital AC Ammeter For use on overhead or underground circuits to 500kV. Press ON switch. Place conductor inside U to measure current. View stored readings by *pressing* ON button. Clear stored readings by *holding* ON button. See instructions to select measurement mode. Measures AC current only, 25-500Hz. **CAUTION:** Use only with high voltage insulating hotsticks with length appropriate for voltage. The housing is not an insulator and must not bridge energized conductors or an energized conductor to ground. **WARNING:** Do not touch during measurement. Read and understand all instructions. For use by trained professionals only. Misuse or abuse of this product can lead to severe injury or death. HD Electric Company www.HDElectricCompany.com U.S. Patent 8,212,549 HVA 3/16 **s.n.**



OPERATIONAL IMPAIRMENT

If the HVA High Voltage Ammeter is used in a manner not described in this instruction manual, the protection and effective operation of this equipment may be impaired.

MANUFACTURING LOCATION

HD Electric • Southaven, MS, 38672 USA

HOW TO USE IT

Test the Ammeter battery and display by pressing the ON button. Verify that each digit in turn displays 8. If needed, replace the 9V battery with a lithium or alkaline type.

The Ammeter measures and displays current in two modes:



The initial factory default mode is Peak Hold, which displays the peak RMS current measured while the Ammeter is placed on a conductor. Peak Hold mode allows a user to capture and store the peak current over the period of time the Ammeter is applied to a conductor.

The second available mode is Real Time which displays the current as it normally rises or falls. Real Time mode allows the user to see changes in load current as they occur.

The measurement mode can be viewed or changed after the HVA High Voltage Ammeter is turned on. Simply press the ON button again to display **PH** for Peak Hold, the initial factory default, or **rt** for Real Time, as shown above. The selected measurement mode will be saved when the Ammeter shuts off. To switch between measurement modes, press the ON button again.

The measurement mode can be displayed and changed any time after the Ammeter is turned on but before current measurements are made by pressing the ON button. Press it once to display the measurement mode and press it again to change the mode. If current measurements have already been made, the memory must be cleared before the measurement mode can be changed. To clear the memory, press and hold the ON button until zero is shown on the display. Then proceed to display or change the measurement mode by pressing the ON button.

Always install the HVA High Voltage Ammeter on a hot stick with length appropriate for the voltage to be measured by way of the built-in universal spline or hookstick connection, making certain it is securely attached.

To measure the current in a conductor, place the Ammeter completely over the conductor as shown (upper right) so that the conductor is completely inside the U. When the conductor is properly positioned inside the U, the current reading is displayed.

Up to four current measurements are stored, sufficient to measure three phase conductors and a neutral.

To display the stored readings, press the ON button for each reading. Each of the four readings will be displayed in rotation. The last reading will be displayed first. For example, pressing the ON button four times will show the most recent four readings:

The Ammeter will shut off automatically four minutes after the last reading. All stored readings are cleared when the unit shuts off.

All stored readings can also be cleared by pressing and holding the ON button until zero is shown on the display.

All readings are in Amps. Currents below 1 Amp may indicate zero. A zero current reading does not mean the line is dead or grounded. Voltage in excess of 500kV may damage the unit.

BATTERY REPLACEMENT INSTRUCTIONS

If the Ammeter does not turn on or if it shuts off during use, replace the battery with a standard 9V lithium or alkaline type. For temperatures below -20°F (-7°C) a lithium battery is recommended.

To replace the battery, open and remove the compartment on the bottom of the housing. Remove and dispose of the old battery, replacing it with a fresh, new 9-volt lithium or alkaline battery. Note battery polarity on the battery compartment. This compartment cannot be reinserted if the battery polarity is reversed.

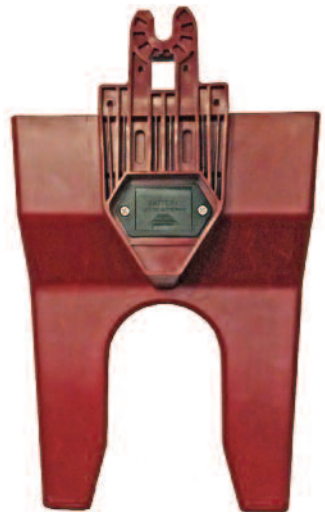


208

183

227

21



MEASURING CURRENT ON UG CABLES & IN PADMOUNT ENCLOSURES

Secondary voltage cables are generally unshielded and current can be easily measured by placing the Ammeter completely over the secondary cable or cable bundle so that all cables are completely inside the U on the HVA High Voltage Ammeter.



Primary voltage cables are generally shielded and the Ammeter cannot measure current on a shielded cable except in areas where the shield has been removed. Current can be measured where primary voltage cables are terminated, generally in a vault or padmount enclosure, as long as the Ammeter is placed on the cable just above the termination where the shield wires have been terminated. The Ammeter can be placed over small drain wires but the cable shield wires should not go inside the U of the HVA High Voltage Ammeter.

CARE AND MAINTENANCE

STORAGE - It is recommended for protection of the HVA High Voltage Ammeter that it is stored in the carrying case provided.

CLEANLINESS - The molded housing is very rugged, but it should be kept clean and free of dirt, grease and any other foreign materials. If the housing surface integrity has been compromised in any way, remove from service and return to factory for repair or replacement.

CLEANING INSTRUCTIONS - To clean, wipe with a damp cloth with water. Do not use harsh chemicals or solvents.

DAMAGE - If you suspect any mechanical or electrical damage, do not use and arrange for repair by returning to the factory.

CALIBRATION & TESTING - Calibration service is available at the HD Electric factory.

TECHNICAL SPECIFICATIONS

MODEL NUMBER: HVA-2000

OPERATING VOLTAGE RANGE: Up to 500kV line to ground

OPERATING FREQUENCY: 25-500Hz

ENVIRONMENTAL CONDITIONS:

CONDITIONS: Indoor and outdoor use

ALTITUDE: Up to 6,566 ft. (2000M)

OPERATING TEMPERATURE: -20°F to +140°F (-29°C to +60°C)

HUMIDITY: 95% to +60°C (non-condensing)

POLLUTION DEGREE: PD4

OVERVOLTAGE CATEGORY IV

DIMENSIONS: 4"H x 6.6"W x 11.5"L

(10 cm x 17 cm x 29 cm)

WEIGHT: 1.8 lbs. (0.8 kg)

LED HEIGHT: 1.5" (3.8 cm)

ACCURACY: 50-60Hz

RANGE	ACCURACY
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1-10A	1%±2 counts
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11-100A	1%±3 counts
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101-500	1%±6 counts
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501-2000	1%±8 counts
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25-49Hz and 61-500Hz

RANGE	ACCURACY
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1-10A	2%±3 counts
-------	-------------

11-100A	2%±4 counts
---------	-------------

101-500	2%±6 counts
---------	-------------

501-2000	2%±8 counts
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RESOLUTION: 1 Amp in all ranges

BATTERY LIFE: About 100 readings with 9V alkaline or lithium

BATTERY: 9V alkaline ANSI 1604A, IEC 6LR61 or 9V lithium, ANSI-1604LC

ENCLOSURE MATERIAL: Supertough nylon UL94-HB

PRINTED CIRCUIT BOARDS: FR-4 UL94V-0

TERMS AND CONDITIONS OF SALE

HD Electric Company is herein referred to either as "HDE" or "Seller" and the customer or person or entity purchasing goods or services (hereinafter collectively referred to as "Goods") is referred to as the "Buyer". These Terms and Conditions, any price list or schedule, quotation, acknowledgment or invoice from HDE relevant to the sale of the Goods and all documents incorporated by specific reference therein, constitute the complete and exclusive statement of the terms of the agreement governing the sale of Goods by HDE to Buyer. Buyer's acceptance of the Goods will manifest Buyer's assent to these terms and conditions with variation or addition. Any different or additional terms in the Buyer's purchase order or other Buyer documents are hereby objected to. HDE reserves the right in its sole discretion to refuse orders.

1. PRICES AND TAXES: Unless a fixed price is quoted, the price at which the order is accepted is subject to adjustment to HDE's price in effect at the time of order. Any current or future tax or governmental charge (or increase in same) affecting Seller's costs or production, sale or delivery at which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods (but excluding any tax on Seller's net income or profit) shall be for Buyer's account and shall be added to the price.

2. TERMS OF PAYMENT: Terms are stated on HDE's invoice in U.S. currency. HDE shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with the Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly, or HDE otherwise deems itself insecure. Buyer shall be liable for all expenses, including attorney's fees, relating to the collection of past due amounts. Should Buyer's financial responsibility to HDE, cash payments or security satisfactory to HDE may be required by HDE for future deliveries and for the goods thereafter delivered. If such cash payment or security is not provided, in addition to HDE's other rights and remedies, HDE may discontinue deliveries. HDE may apply a finance charge for payments made by credit card.

3. SHIPMENT AND DELIVERY: Unless otherwise expressly provided, shipments are made F.O.B. HDE's shipping point. Risk of loss or damage and responsibility shall pass from HDE to Buyer upon delivery to and receipt by common carrier. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by the Buyer directly to the carrier. Shortages or damages must be acknowledged and signed for at the time of delivery. While HDE will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by HDE, all shipping dates are approximate and not guaranteed. HDE reserves the right to make partial shipments. HDE, at its option, shall be bound to tender delivery of Goods to the Buyer, but does not provide shipping instructions. If the shipment of Goods is postponed or delayed by the Buyer for any reason, Buyer agrees to reimburse HDE for any and all handling and storage costs and other additional expenses resulting therefrom. All claims for shipping errors, lost shipments or any other discrepancies must be made within ninety (90) days or they will be disallowed and deemed waived.

4. HDE LIMITED WARRANTY: HDE covers its products with a manufacturer's warranty against defects in material or workmanship for a period of ten years in the case of Capacitor Controls and in all other circumstances for a period of one year, unless otherwise stated by HDE in writing. To take advantage of this warranty, the complete product must be delivered prepaid to HDE or an HDE Authorized Service Center. This warranty shall not apply to any Goods including but not limited to products which: (a) Have been repaired or altered outside HDE's factory (or Authorized Service Center) or in any manner so as, in HDE's judgment, to affect its serviceability or proper operation; (b) have been subjected by persons other than HDE (or Authorized Service Center) to improper handling, operation, maintenance, repair or alteration; and, (c) have been subjected to normal wear and tear and misuse, neglect, or improper use. HDE's limited warranty does not cover consequential damages. HDE's limited warranty shall be limited to the cost of repair or replacement of any allegedly defective Goods or issuance of credit. HDE requires the return of any allegedly defective Goods, transportation prepaid, before honoring any claim. All returned Goods must be inspected, and if examination does not disclose any defect covered by this warranty, replacement of such Goods or issuance of credit for same will not be approved. THE FOREGOING CONSTITUTES HDE'S SOLE WARRANTY RESPONSIBILITY AND BUYER'S EXCLUSIVE REMEDY WHETHER SOUNDING IN TORT, CONTRACT, STRICT LIABILITY OR OTHERWISE, EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS AGREEMENT. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. No employee, agent, dealer, or other person is authorized to give any warranty on behalf of HDE. This warranty extends only to persons or organizations who purchase the Goods from HDE for resale.

5. LIMITATION OF REMEDY AND LIABILITY; THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER SHALL BE LIMITED TO REPAIR, CORRECTION, REPLACEMENT OR CREDIT UNDER SECTION 4. HDE SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE, AND IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL HDE'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS GIVING RISE TO THE CLAIM OR CAUSE OF ACTION, AND BUYER SHALL INDEMNIFY HDE FOR ANY DAMAGES IN EXCESS THEREOF. BUYER AGREES THAT IN NO EVENT SHALL HDE'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS INCLUDE SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES OF ANY CHARACTER IN CONNECTION WITH THE SALE, RESALE OR USE OF THE GOODS, WHICH ARE WAIVED BY BUYER AND AS TO WHICH BUYER SHALL INDEMNIFY HDE. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use of revenue, cost of capital or loss of or damage to property, equipment, or data, or loss of reputation. Further, Buyer shall indemnify and hold HDE harmless from any liability to Buyer, Buyer's employees, workers, contractors or any other persons arising out of Buyer's, and any other persons', use of the Goods. All instructions and warnings supplied by HDE will be passed on to those persons who use the Goods. HDE's Goods are to be used in their recommended applications and all warning labels adhered to the Goods by HDE shall be left intact. It is impossible to eliminate all risks associated with the use of the Goods. Risks of serious injury or death, including risks associated with electrocution, arc flash and thermal burn, are inherent in work in and around energized electrical systems. Such risks arise from the wide variety of electrical systems and equipment to which Goods may be applied, the manner of use or application, weather and environmental conditions or other unknown factors, all of which are beyond the control of HDE. HDE does not agree to be an insurer of these risks, and shall have no liability for any claims arising from such risks. WHEN YOU BUY OR USE THESE PRODUCTS, YOU AGREE TO ACCEPT THESE RISKS.

6. EXCUSE OF PERFORMANCE (FORCE MAJEURE): HDE shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; theft; sabotage; strikes, labor disputes, civil disturbances or riots; governmental restrictions, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or events beyond HDE's reasonable control. Deliveries or other performance may be suspended for an appropriate period or cancelled by HDE upon notice to Buyer in the event of any of the foregoing, but the total of this agreement shall otherwise remain unaffected. If HDE determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth herein, HDE may allocate its available supply of the Goods or such material (without obligation to acquire other supplies of any such Goods or materials) among itself and its purchasers on such basis as HDE determines to be equitable without liability for any failure of performance which may result therefrom.

7. CHANGES: HDE reserves the right to change designs and specifications for standard Goods without prior notice to Buyer, but not with respect to custom Goods being made for Buyer. HDE shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

8. ASSIGNMENT: Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of HDE, and any such assignment, without such consent, shall be void.

9. INSTALLATION: Buyer shall be responsible for receiving, inspecting, testing, storing, installing, starting up and maintaining all Goods.

10. INSPECTION/TESTING: Buyer, at its expense, agrees that it will promptly inspect the Goods upon receipt thereof, and in no event later than thirty (30) days from the date of receipt of the Goods. Buyer shall deliver to HDE within fifteen (15) days of inspection, but in no event later than forty-five (45) days from the date of receipt of the Goods, written notice of all defects, variations from specifications or complaints of any kind with respect to the quantity, quality, condition, shipment, performance, fit, or appearance of the Goods so received by Buyer. In the event no such written notice is received by HDE, Buyer shall be deemed conclusively to have inspected and accepted all such Goods unconditionally and to have waived any and all rights and claims, including without limitation any right to reject the Goods or to claim damages in respect thereof. Buyer may not return goods without first advising HDE of the reasons therefor, obtaining from HDE a material authorization number and observing such instructions as HDE may give in authorizing such return. In the event a return is authorized by HDE, a restocking for any Goods requiring repackaging or maintenance a twenty percent (20%) restocking fee shall be assessed to Buyer in the final credit amount.

11. SERVICES: If this agreement requires HDE to perform or provide any services, HDE (including without limitation its successors, assigns, agents or any person or entity acting as HDE's direction) shall not be responsible for any damages, claims, liabilities or expenses of any nature arising out of such services.

12. U.S. EXPORT CONTROL LAWS: All Goods sold to Buyer by HDE hereunder are subject to U.S. Export Control Laws. Buyer hereby agrees not to re-sell or divert any goods contrary to such laws.

13. COMPLIANCE: Seller/Contractor shall comply with all applicable federal, state or local laws, rules, regulations, or orders. Seller/Contractor shall comply with Executive Order 11246, as amended by Executive Order 11375, and the applicable provisions of the Office of Federal Contract Compliance Programs (OFCCP), 41 CFR Part 60, which are incorporated herein by this reference. Buyer shall comply with all applicable federal, state or local laws, rules, regulations or orders including but not limited to the Foreign Corrupt Practices Act of 1977, as amended. HDE reserves the right to delay or refuse delivery if requests for reasonable assurances of Buyer's compliance are not tendered as requested.

14. MISCELLANEOUS: These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter hereof. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon HDE unless made in writing and signed on its behalf by its duly authorized representative. No conditions, usage or trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by Seller. No modification shall be effected by HDE's receipt or acceptance of Buyer's purchase orders, shipping instruction forms, or other documentation containing terms at variance with or in addition to those set forth herein, all of which are objected to by HDE. Any such modifications or additional terms are specifically rejected by HDE. No waiver by HDE with respect to any breach or default of any right or remedy and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default of any other right or remedy, unless such waiver be expressed in writing and signed by HDE. All typographical or clerical errors made by HDE in any quotation, acknowledgment or publication are subject to correction. Validity and performance relating to the interpretation and effect of this agreement shall be governed by the laws of the state of Illinois without regard to its conflict of law principles.

15. DISPUTE RESOLUTION: In the event of any dispute INCLUDING, BUT NOT LIMITED TO, BREACH OF CONTRACT, BREACH OF WARRANTY, CLAIMS BASED IN TORT, NEGLIGENCE, PRODUCT LIABILITY, FRAUD, MARKETING, STATE OR FEDERAL REGULATIONS, ANY CLAIMS REGARDING THE ENFORCEABILITY OF THIS LIMITED WARRANTY, AND THE WAIVER OF CLASS ACTION TRIALS between Buyer and Seller, either may choose to resolve the dispute by binding arbitration, as described below, instead of in court. THIS MEANS IF EITHER BUYER OR SELLER CHOOSE BINDING ARBITRATION, NEITHER PARTY SHALL HAVE THE RIGHT TO LITIGATE SUCH CLAIM IN COURT OR HAVE A JURY TRIAL. DISCOVERY AND APPEAL RIGHTS ARE LIMITED IN BINDING ARBITRATION. Buyer and Seller agree that the proper venue of arbitration is not chosen by Buyer or Seller of all actions arising in connection herewith shall be only in the state of Illinois and the parties agree to submit to such jurisdiction. No action, regardless of form, arising out of transactions relating to the agreement, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

16. CLASS ACTION WAIVER: BINDING ARBITRATION MUST BE ON AN INDIVIDUAL BASIS. THIS MEANS NEITHER BUYER NOR SELLER MAY JOIN OR CONSOLIDATE CLAIMS IN ARBITRATION BY OR AGAINST OTHERS, OR LITIGATE IN COURT OR ARBITRATE ANY CLAIMS AS A REPRESENTATIVE OR MEMBER OF A CLASS OR IN A PRIVATE ATTORNEY GENERAL CAPACITY. ADMINISTRATION OF ARBITRATION: The binding arbitration will be administered by the American Arbitration Association ("AAA") in accordance with its Commercial Arbitration Rules and/or Supplementary Procedures for Consumer-Related Disputes (including proceedings to mitigate costs of AAA). This binding arbitration is governed by the Federal Arbitration Act ("FAA") (9 USC §1, et. seq.) and will govern the interpretation and enforcement. The binding arbitration shall be held at a location determined by AAA or at such other location as mutually agreed. In addition to the terms stated above, the following will apply to the binding arbitration: (1) the arbitrator, and not any federal, state, or local court or agency, will have exclusive authority to resolve any dispute relating to the interpretation, applicability, enforceability or formation of this Agreement including any claim that all or any part of this Agreement is void or voidable; (2) the arbitrator shall apply Illinois law consistent with the FAA.

HD Electric Company is committed to ongoing review and improvement of its product lines, and thus reserves the right to modify product design and specifications without notice.

HD Electric Company® products are available through HDE® sales representatives worldwide.

HD Electric products receive final assembly and shipment from HDE's production facility at

Suite 400 - 4320 Executive Drive, Southaven, MS 38672.

HD Electric Company is ISO 9001:2015 certified

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