HIGH VOLTAGE DIGITAL AMMETER

Operating & Instruction Manual

HVA-2000

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Making the Invisible Visible™

HD ELECTRIC COMPANY
A Textron Company

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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 hotstick 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

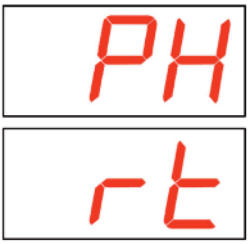
HD Electric Company • Waukegan, IL. 60085, USA

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 hotstick 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 such as Energizer® type LA522 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.

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 & 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.

SERVICE - Return to HD Electric Company for service.

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 29cm)

WEIGHT: 1.8 lbs. (0.8 kg)

LED HEIGHT: 1.5" (3.8 cm)

ACCURACY: 50-60Hz

RANGE	ACCURACY
1-10A	1%±2 counts
11-100A	1%±3 counts
101-500	1%±6 counts
501-2000	1%±8 counts

25-49Hz and 61-500Hz

RANGE	ACCURACY
1-10A	2%±3 counts
11-100A	2%±4 counts
101-500	2%±6 counts
501-2000	2%±8 counts

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

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This warranty applies to all products sold by HD Electric Company (the "Products"); provided, however, that the term Products does not include any third party products purchased through HD Electric Company, for which no warranties are made (the "Third Party Products"). Third Party Products may be subject to a separate manufacturer's warranty; [should you have any question regarding whether a separate warranty applies, please contact HD Electric Company].

NOTICE: READ THIS LIMITATION OF WARRANTY AND LIABILITY BEFORE BUYING OR USING THE PRODUCTS CONTAINED HEREIN.

It is impossible to eliminate all risks associated with the use of the Products. Risks of serious injury or death, including risks associated with electrocution, arcing and thermal burns, are inherent in work in and around energized electrical systems. Such risks arise from the wide variety of electrical systems and equipment to which Products 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 HD Electric Company.

HD Electric Company 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.

HD Electric Company warrants to the original purchaser that the Products (excluding any third party products purchased through HD Electric Company, for which no warranties are made) will be free from defects in material and workmanship, under normal use and regular service, and preventative maintenance for a period of one (1) year (ten (10) years for HDE Capacitor Controls) from the date of shipment (the "Warranty Period"). Should any failure to conform with this warranty be found during the Warranty Period, you must notify HD Electric Company of your claim within thirty (30) days of discovery, and within the Warranty Period. Your failure to give notice of claims of breach of warranty within the Warranty Period shall be deemed an absolute and unconditional waiver of claims for such defects. HD Electric Company will have no responsibility to honor claims received after the date the applicable Warranty Period expires.

Upon notice of your claim, HD Electric Company will provide a return authorization number, and further instructions on how to return the product for service. You must follow HD Electric Company's instruction. You are responsible for all Product removal, handling, re-installation, and shipping (both to and from HD Electric Company). Products returned for repair, as well as repaired or replacement Products shall be sent postage / freight prepaid. After receipt of a product which HD Electric Company determines is defective, HD Electric will, at its option, either (1) repair (or authorize the repair of) the Product or (2) replace the Product, subject to the following: The Products are made using parts sourced from a variety of manufacturers. Due to the rapidly changing technology environment, parts may become obsolete / unavailable over time (end of life). In the event that a Product cannot be repaired or replaced due to unavailability of parts, HD Electric Company will use commercially reasonable efforts to obtain substitute parts or conduct work around design, but cannot guarantee its ability to do so.

Items not found defective will be returned at your expense, or failing receipt of instruction from you on return of such items within five (5) business days of our notice to you that the product is not defective, HD Electric may dispose of the product at its discretion and with no liability to you. HD Electric Company's determination of defects is final. Products repaired or replaced during the Warranty Period shall be covered by the foregoing warranties for the remainder of the original Warranty Period or ninety (90) days from the date of delivery of the repaired or replaced Products, whichever is longer.

LIMITATIONS:
This warranty is void in the event of misuse, alteration, faulty installation, or misapplication of the product.

This warranty does not cover failure of product or components due to any ACT OF NATURE; lightning, floods, hurricanes, tornadoes or any other such catastrophic events.

HD Electric Company does not warrant any third party products or associated hardware or their performance or suitability for use and application. Such items are provided "as-is".

All repairs must be authorized by HD Electric Company. Unauthorized repairs will not be reimbursed under any circumstances.

HD Electric Company is not required to make replacement or loaner equipment available while Products are being repaired or replaced, or to compensate you for any in/out labor charges or expenses associated with removal, handling or re-installation of the Products.

TO THE MAXIMUM EXTENT PERMITTED BY LAW, THIS WARRANTY AND THE REMEDIES SET FORTH ABOVE ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, REMEDIES AND CONDITIONS, WHETHER ORAL OR WRITTEN, EXPRESS OR IMPLIED. HD ELECTRIC EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY AND NON-INFRINGEMENT.

IN NO EVENT SHALL HD ELECTRIC COMPANY BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THESE PRODUCTS. THIS SHALL INCLUDE BUT, NOT LIMITED TO, LOST PROFITS OR REVENUE, LOSS OF USE OF THE PRODUCTS, COST OF SUBSTITUTE PRODUCTS, FACILITIES OR SERVICES, OR DOWNTIME.

IN NO EVENT SHALL HD ELECTRIC COMPANY HAVE ANY LIABILITY FOR ANY THIRD PARTY PRODUCTS OR ASSOCIATED HARDWARE, OR CUSTOMER-OWNED SYSTEMS, EQUIPMENT OR SOFTWARE.

HD Electric Company must have prompt notice of any claim so that an immediate product inspection and investigation can be made. Buyer and all users shall promptly notify HD Electric Company of any claims, whether based on contract, negligence, strict liability, or other tort or otherwise be barred from any remedy.

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.
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US Patent 8,212,549