

No. 963763
10/98

OPERATING INSTRUCTIONS
for
AMPROBE



**Digital Clamp-On
Volt/Amp/Ohmmeter**

Models
ACD-10 ULTRA
ACD-10H ULTRA
ACD-10 TRMS (Shown)



AMPROBE.
A United Dominion Company

630 Merrick Road, Lynbrook, NY 11563
Phone: (516) 593-5600
Fax: (516) 593-5682
Tech Support: (800) 477-VOLT (8658)
Web: <http://www.amprobe.com>
Email: info@amprobe.com



AMPROBE.
A United Dominion Company

LIMITED WARRANTY

Congratulations! You are now the owner of an AMPROBE instrument. It has been quality crafted according to quality standards and contains quality components and workmanship. This instrument has been inspected for proper operation of all its functions. It has been tested by qualified factory technicians according to the long-established standards of AMPROBE.

Your AMPROBE instrument has a limited warranty against defective materials and/or workmanship for one year from the date of purchase provided that, in the opinion of the factory, the instrument has not been tampered with or taken apart.

Should your instrument fail due to defective materials, and/or workmanship during the one-year warranty period, return it along with a copy of your dated bill of sale which must identify instrument by model number and manufacturing number.

For your protection, please use the instrument as soon as possible. If damaged, or should the need arise to return your instrument, it must be securely wrapped (to prevent damage in transit) and sent via Air Parcel Post insured or UPS where available to:

Service Division
AMPROBE®
630 Merrick Road (For U.P.S.)
P.O. Box 329 (For Parcel Post)
Lynbrook, NY 11563-0329

Outside the U.S.A. the local Amprobe representative will assist you. Above limited warranty covers repair and replacement of instrument only and no other obligation is stated or implied.

UNPACKING AND INSPECTION OF CONTENTS

Included with the Clamp-On meter should be the following items:

- 1) Two test leads; one black, one red, Model: DTL-12
- 2) Instruction Booklet
- 3) Carrying Case, SV-16
- 4) ACD-10 TRMS & ACD-10H Ultra includes, HT-13Y Holster

PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION

- 1) Read these instructions thoroughly and follow them carefully.
- 2) In many instances you will be working with dangerous levels of voltage and/or current: therefore, it is important that you avoid direct contact with any uninsulated, current-carrying surfaces. Appropriate insulating gloves and clothing should be worn.
- 3) Before connecting or disconnecting the meter to or from the circuit to be tested, turn off all power to the circuit.
- 4) Before applying test leads to circuit under test, make certain that leads are plugged into proper jacks and switches are set to proper range and function.
- 5) Before using any electrical instruments or tester for actual testing, the unit should be checked on a low energy high impedance source. **Do not use power distribution lines or any other high energy sources.**
- 6) If the instrument should indicate that voltage is not present in circuit, do not touch circuit until you have checked to see that all instrument switches are in proper position and instrument has been checked on a known live line.
- 7) Make certain no voltage is present in circuit before connecting ohmmeter to circuit.
- 8) The instrument should only be operated between 0°C-45°C and at less than 80%RH.
- 9) Do not use or store this instrument in a high temperature or high humidity environment and do not store the unit in direct sunlight.
- 10) Do not replace battery with power on condition.
- 11) If the unit is not going to be used for a long period of time, remove the battery.

IMPORTANT: Plug in only one accessory probe or set of test leads at any one time, except as directed.

IMPORTANT: Failure to follow these instructions and/or precautions may result in personal injury and/or damage to the instrument and/or accessories.

REFERENCE DESIGNATION

Refer to Fig. 1 to familiarize yourself with the meter's front panel controls, connectors, annunciators, and warning symbols.

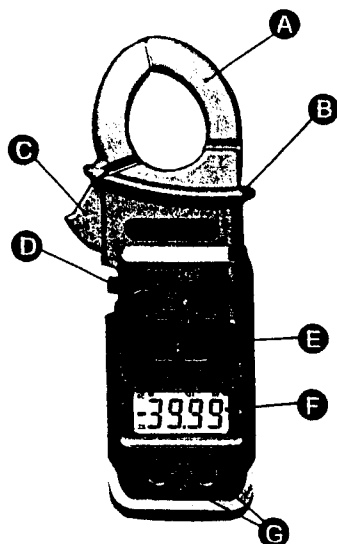






Fig. 1 - ACD-10 TRMS

- A. **Transformer Jaws** - Designed to pick up the AC current flowing through the conductor.
- B. **Hand Guard** - Designed to protect user for safety.
- C. **Trigger** - Press the lever to open the transformer jaws. When the pressure on the lever is released, the jaws will close again.
- D. **Data Hold Switch** - Hold display reading for all functions and ranges.
- E. **Function Switch** - Slide switch is used to select \tilde{V} , \tilde{A} , or Ω function.
- F. **Digital Display** - The digital display has a 3-3/4 digit LCD readout (maximum reading 3999) plus decimal point, \square , AC \sim , and unit annunciators.
- G. **Input Terminal** - The black test lead is always connected to the "COM" input jack and the red test lead is always connected to the "V- Ω " input jack when measuring ACV and OHMS.
- H. **Drop Proof Wrist Strap** - Prevents the instrument from slipping off the hand while in use (not shown).

REFERENCE DESIGNATION cont.

-  DOUBLE INSULATION - Protection Class II
-  CAUTION - Indicates where cautionary or other information is found in the manual.
-  CAUTION - Risk of electric shock.
-  BATTERY

DESCRIPTION

Model ACD-10 Ultra, ACD-10H Ultra, and ACD-10 TRMS will directly measure AC current, AC voltage and resistance. The ACD-10 Ultra and ACD-10H Ultra are average sensing calibrated to the RMS value of a sine wave. The ACD-10 TRMS measures and displays the True RMS of a waveform. When the HOLD button is activated, the reading in the display is held indefinitely. The instrument is auto ranging with a 3-3/4 digit display.

CIRCUIT PROTECTION

The OHM/CONTINUITY function is protected to a maximum 550 volts by utilizing a positive temperature coefficient resistor (PTC). All resistance ranges are protected against misapplication of voltage for not longer than one minute.

LCD ANNUNCIATORS

AC Voltage Mode

\tilde{A} , \tilde{RMS} , and V will appear when slide switch is in AC Voltage Mode, \tilde{V} (Fig. 2).



Fig. 2 - AC Voltage Mode

AC Current Mode

\tilde{A} , \tilde{RMS} , and A will appear when slide switch is in AC Current Mode, \tilde{A} (Fig. 3).



Fig. 3 - AC Current Mode

*Note: Model ACD-10 TRMS Only.

OHMS / Continuity Mode

K Ω will appear when slide switch is in Ω \rightarrow) and measured resistance is >999 Ω . If measured resistance is >9.99 K Ω , "O.L." will appear in the display (Fig. 4).



Fig. 4 - OHMS Continuity Mode

Data Hold Push Button

An \square will appear when the yellow Data Hold Push Button is depressed (Fig. 5).

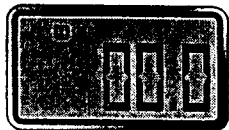


Fig. 5 - Data Hold Push Button

Low Battery Indication

Replace the battery when the low battery indication appears in the lower left hand side of the display (Fig. 6). Use a MN1604 9V Alkaline battery.

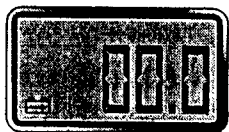


Fig. 6 - Low Battery Indication

BATTERY INSTALLATION OR REPLACEMENT

The meter is Powered by a single 9V battery. It is recommended that an Alkaline battery be used for longer performance.

1. Disconnect the test leads from the front terminals and turn the meter off. If equipped, slide the protective holster off the meter.
2. Remove the case bottom from the instrument by removing the screw and then lifting the cover off.
3. Lift the battery from the case top, and carefully disconnect the battery connector leads.
4. Snap the battery connector leads to the terminals of a new battery and reinsert the battery into the case top. Make sure that the battery leads and drop proof wrist strap do not become pinched between the case bottom and case top.
5. Replace the case bottom and reinstall the screw.

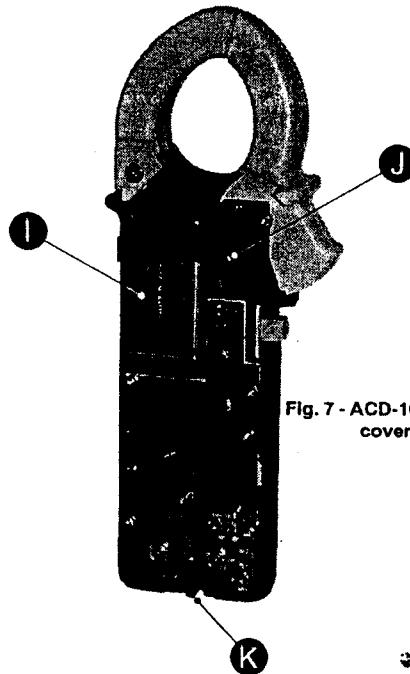


Fig. 7 - ACD-10 TRMS with back cover removed

- I. **Battery** - 9V Alkaline Battery
- J. **Screw Hole** - Removing the screw that goes in this slot will allow you to remove the back cover.
- K. **Drop Proof Strap Holder** - Place Drop Proof Strap here when closing instrument.



HOW TO MEASURE AC VOLTAGE

1. Connect voltage test leads to instrument (Red to V and Black to COM).
2. Turn instrument on and move function select switch to volts position.
3. Be sure that the "DATA HOLD" switch is not depressed.
4. Apply test probes to points of circuit to be measured.
5. If voltage to be measured is higher than 400 Volts, instrument will automatically shift to higher voltage range.

IMPORTANT

Read "PRECAUTIONS FOR PERSONAL & INSTRUMENT PROTECTION" before using instrument.

HOW TO MEASURE AC CURRENT

1. Disconnect voltage test leads if connected to the instrument.
2. Turn instrument on by moving function select switch to Amps position.
3. Be sure that the "DATA HOLD" switch button is not depressed.
4. Encircle single conductor with jaws of instrument.
5. Release finger pressure on trigger and allow jaws to close around conductor.
6. If current to be measured is greater than 400 Amps, instrument will automatically shift to higher range (accuracy is valid to 400 Amps only).

IMPORTANT

Read "PRECAUTIONS FOR PERSONAL & INSTRUMENT PROTECTION" before using instrument.

HOW TO MEASURE RESISTANCE

- 1) Connect test leads to instrument (Red to V and Black to COM).
- 2) Turn instrument on by moving slide switch to " Ω \rightarrow)" position.
- 3) Remove at least one leg of the component to be tested from the circuit.
- 4) Apply the test leads, one to each side of the component.
- 5) If the resistance is less than approximately 230 Ω , the continuity buzzer will sound.
- 6) Read the display.

AUTO-POWER OFF FUNCTION

Once the Clamp-On meter is powered on, a timer is activated which will turn the unit off after approximately 20 minutes. If you wish to continue making measurements after the unit automatically powers off, you must switch the function selector to "OFF" and then back to the desired function.

SPECIFICATIONS

Type of Display: 3-3/4 digits LCD, 4000 count

Size of Digits: 0.5"

Over-range Indication: "O.L"

Low Battery Indication: In Display, 

Functions: AC Amps, AC Volts, Ohms, Continuity, Hold

Function Select: Slide Switch (4 Positions)

Ranging: Auto

Ranging Point: 390 \pm 5 counts

AC Conversion Type:

Ultra: Average Sensing rms indication.

TRMS: AC, Volt, and Amp Conversions are ac-coupled, true rms responding, calibrated to the rms value of a sine wave input, the basic accuracy is for sine wave at full scale, for non-sine wave accuracy refer to *

***Crest Factor:** 1.4 to 2.0, add 1.0% to Accuracy.
2.0 to 2.5, add 2.5% to Accuracy.

AC Volts: 0-400, 400-600 (40-500Hz)

Resolution: 0.1V for 0-400V, 1V for 400-600V

Overload Protection: 600 Vrms

Input Impedance: 10 Megohms // less than 100 pF

Accuracy: 1.2% of rdg. \pm 5 LSD

AC Current: 0-400Amps (40-500Hz).

Resolution: 0.1 Amp

Overload Protection: 420 Amps rms

Accuracy: 1.9% of rdg. \pm 5 LSD 0-400 Amps (50/60Hz)

Ohms:

0-4K Ω ; Resolution 1 Ω

0-40K Ω ; Resolution 10 Ω

Accuracy: 1.9% of rdg. + 8 LSD

Ohms/Continuity: Circuit Protection 600Vrms for one minute by PTC.

Continuity with Buzzer: 0-230 Ω (approximate)

Hold Function: Separate button on side. No decay in reading.

Power Supply: 9V battery (NEDA 1604, IEC 6F22)

Measurement Rate: 4 times per second minimum

Maximum Jaw Opening: 1.18" (30mm)

Maximum Conductor Size: 1.14" (29mm)

Response Time: Not more than 3.5 seconds with no more than 3 LSD fluctuations.

Temperature Coefficient: 0.2 x (spec. acc'y)/ $^{\circ}$ C, <18 $^{\circ}$ C or >28 $^{\circ}$ C

Drop Proof: 4 feet

Maximum Altitude: 6561 ft. (2000m)

Operating Temp/Humidity: 32 $^{\circ}$ F to 113 $^{\circ}$ F (0 $^{\circ}$ C to 45 $^{\circ}$ C) /80% Max relative humidity for temperatures up to 87.8 $^{\circ}$ F (31 $^{\circ}$ C) decreasing linearly to 50% RH at 104 $^{\circ}$ F (40 $^{\circ}$ C).

Storage Temp: -4 $^{\circ}$ F to 140 $^{\circ}$ F (-20 $^{\circ}$ C to 60 $^{\circ}$ C)

Weight: 9 oz. (250 g.)

Size: 3.03" (W) x 7.67" (L) x 1.42" (H) (77mm x 195mm x 36mm)

Battery Life: Alkaline - 200 Hrs.

Case Breakdown: 3000 Volts AC

Auto-Power Off: Approx. 20 minutes

Safety Standards:

UL3111-1, CAN/CSA-C22.2 No. 1010.1-92, (indoor use).

Insulation

Coordination: Installation Category III 300V, IEC 1010 Category II 600V, Pollution Degree 2

HELPFUL HINTS FOR GETTING TOP PERFORMANCE FROM YOUR DIGITAL CLAMP-ON

1. When measuring Amps, be sure to center the jaws of the Clamp-On around the conductor whose current is being measured.
2. Be sure the jaws are completely closed properly before taking reading.
3. When measuring current of widely varying values, start with the conductor in which you expect to find the lowest current, then the next highest, etc. To reduce the possibility of retained magnetism in the jaw, open and close the jaw a few times between measurements.

CLEANING AND STORAGE INSTRUCTIONS

Instrument should be cleaned with a damp cloth. Do not use abrasives or solvents. Open the clamp jaws and wipe the magnetic pole pieces with a lightly oiled cloth. If instrument will not be used for a long period of time, remove battery. Store it separately.

REPLACEMENT PARTS

Below is a listing of Amprobe replacement parts for use with the ACD-10 Ultra, ACD-10H Ultra, and ACD-10 TRMS Clamp-On:

DTL-12 - Standard Test Leads
(Set of two - Red & Black)

SV-16 - Soft Vinyl Padded Case

MN-1604 - 9 Volt Alkaline Battery

HT-13Y - Holster

SERVICE

Manufacturing number is located on the back of the instrument. For factory service, package instrument and packing slip with sufficient cushioning material in a shipping carton; make certain your name and address also appear on box as well as packing slip; ship prepaid via U.P.S. (where available) or Air Parcel Post to:

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AMPROBE®
630 Merrick Road (Use for U.P.S.)
P.O. Box 329 (Use for Parcel Post)
Lynbrook, NY 11563-0329

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