MODEL ACDC-610
DIGITAL AC/DC CLAMP-ON

Measures Current up to 600A AC and DC

FEATURES

- 3% Digit LCD display, (4000 count)
- Measures ACV/ACA, DCV/DCA, ohms/continuity
- Frequency counter
- Peak hold to measure motor start or surge currents
- Data hold freezes display reading
- Auto power OFF
- Over-range indicator, low battery indicator
- Full annunciated display
- 9V battery, carrying case, test leads and instruction manual included

The Model ACDC-610 is an average sensing instrument, calibrated to give an RMS readout of a sine wave.

SPECIFICATIONS

Type of Display: 3% digits - LCD
Size of Digits: 0.5"
Auto Power Off: 30 minutes after turn on
Over-range indication: "OL"
Ohmmeter Test Voltage: 1.70 VDC
Low Battery Indication: 
Case Voltage Breakdown: 3000V AC/DC
Measurement Rate: 4 times per second minimum
Peak Response Time: 0.08 seconds
Peak Decay Rate: 2 digits max.
Frequency Response: 40-400 Hz
Response Time: Not more than 3.5 seconds
Polarity: Automatic (+, -) negative indication, + implied
Continuity with Buzzer: 0-150Ω + 10%
Frequency Counter: Coupling –AC
Minimum Input Frequency: 20Hz
Minimum Signal Level: 200mV RMS
Maximum Signal Level: 5V RMS
Input Impedance: 10 Megohms
Power Supply: 9 Volt Alkaline
Battery Life: More than 180 hours
Maximum Jaw Opening: 1.65" (4.1 cm)
Maximum Jaw Size: 1.77" (4.5 cm) x 1.57" (4 cm)
Maximum Operating Temperature/Humidity:
32°F (0°C) to 120°F (49°C) 75% RH
Temperature Coefficient: 0.15 x (Spec. Accy)/°C, <18°C or >28°C
Maximum Storage Temperature/Humidity:
20°F (-6°C) to 140°F (60°C) 80% RH
Functions: DCV, ACV, ACA, DCA,
OHM/CONTINUITY, FREQUENCY,
COUNTER, PEAK HOLD, DATA HOLD
Circuit Protection: The frequency and OHMS/Continuity functions are protected to a maximum of 550 volts for not longer than one minute.

ACCESSORIES AND REPLACEMENTS

Description
ACDC-610 Carrying Case
Test Leads
Battery (9V)
Alligator Clips
Energizer (increases sensitivity by 10 times AC or DC)

Model #
SVPC
DTL-10
MN-1604
VRC-320
A-47L

P.O. BOX 329, 630 MERRICK ROAD, LYNBROOK, NY 11563 • (516) 593-5600 • FAX: (516) 593-5682

AAD-110
OPERATING INSTRUCTIONS
for
AMPROBE®
AC/DC Digital Clamp-On
Model ACDC-610

FIG. 1

DATA
HOLD
SWITCH

FUNCTION
SELECT
SWITCH

TRIGGER

LCD
DISPLAY

REVERSE
Polarity

LOW BATTERY
INDICATOR

DROP-PROOF
WRIST STRAP

INPUT
TERMINALS

See "PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION" on Page 3

See "LIMITED WARRANTY" on Page 2

AMPROBE INSTRUMENT®
DIVISION OF CORTE INDUSTRIES INC., LYME, NEW YORK 11683

Printed in Taiwan
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 of its functions. It has been tested by qualified factory technicians according to the long-established standards of AMPROBE INSTRUMENT.

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 serial 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 prepaid via Air Parcel Post insured or UPS where available to:

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

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

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, clothing and eye protection should be worn.
3) To avoid electrical shock to the user and/or damage to the instrument, do not apply more than 1000 V between any terminal and ground.
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) Do not attempt to measure a voltage unless you are already certain that the voltage is below 750 VAC or 1000 VDC. Do not use the 200 mV range unless you are already certain that the voltage is below 500 V (AC or DC).
7) 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.
8) Make certain no voltage is present in circuit before connecting ohmmeter to circuit.

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 observe the above precautions may result in personal injury and/or damage to the instrument and/or accessories.
SAFETY

This instruction manual has warnings and safety precautions which must be followed in order to ensure safe operating conditions.

CAUTION

To avoid damage to the meter:
1. Disconnect the test leads from circuit under test before changing functions.
2. Never connect instrument to a voltage source with the rotary switch in the Ohms position.
3. Before taking any reading, be sure that the DATA HOLD and PEAK HOLD switches are in the deactivated or "up" position. Also, check display to verify that these functions are not activated.

Unpacking and Inspection of Contents

Included with the Clamp-On meter should be the following items:
1. Two test leads; one black and one red
2. Instruction Booklet
3. Carrying Case

GENERAL

The model ACDC-610 will directly measure ACV, DCV, ACA, DCA, OHMS and FREQUENCY and provide a digital readout of the value. It is average sensing but calibrated to give an RMS readout of the variable being measured.

Helpful Hints For Getting Top Performance From Your Digital Clamp-On

1. Make certain Data Hold is off during the measuring process.
2. When measuring Peak AC Amps, be sure to zero adjust instrument on DC Amps first.
3. When measuring currents 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 jaws, open and close the jaws a few times between measurements.
4. When using the Peak mode to take and lock in a low current measurement that is to be read away from the conductor, open the jaws slowly and then slowly remove them from the conductor.
CIRCUIT PROTECTION

The Frequency and Ohms/Continuity functions are protected to a maximum of 550 Volts for not longer than one minute.

LOW BATTERY INDICATION

Replace the battery when the low battery indication appears in the display. Use an MN1604 9V alkaline battery.

BATTERY INSTALLATION

Remove a single screw from the battery compartment cover and slide cover off by pushing it away from the instrument. Carefully snap a new battery into the connector. Align compartment cover and slide into place. Insert screw and tighten. See Fig. 2.

OVER-RANGE INDICATION

When the input exceeds the range capability, the display will show “OL”. Move rotary switch to the next higher range.

When used as an Ohmmeter, resistances higher than 3999Ω will result in an “OL” condition.

DATA HOLD

When Data Hold is activated, an “H” appears in the display. The reading in the display register is locked in and never changes. This is especially helpful when taking a reading in hard-to-reach or poorly lit areas. Just press the button and remove the instrument to an area where it can be easily read. The reading is held indefinitely. Press again to deactivate.

SPECIFICATIONS FOR ACDC-610

Type of Display: 3 1/4 digits - LCD
Size of Digits: 0.5*
Auto Power Off: 30 minutes after turn on

Over-range Indication: “OL”
Ohmmeter Test Voltage: 1.70 VDC
Low Battery Indication: ●
Case Voltage Breakdown: 3000V AC/DC
Measurement Rate: 2 times per second minimum

Peak Response Time: 0.08 seconds
Peak Decay Rate: 2 digits max.
Frequency Response: 40-400Hz
Response Time: Not more than 3.5 seconds
Functions: DCV, ACV, ACA, DCA,

OHMS/CONTINUITY, FREQUENCY COUNTER, PEAK HOLD, DATA HOLD

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>RANGE</th>
<th>RESOLUTION</th>
<th>ACCURACY</th>
<th>OL PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACV</td>
<td>0-400</td>
<td>0.1</td>
<td>±1.25% ± 4LSD</td>
<td>850VRMS</td>
</tr>
<tr>
<td>40-400Hz</td>
<td>0-750</td>
<td>1.0</td>
<td>±1% ± 4LSD</td>
<td>850VRMS</td>
</tr>
<tr>
<td>DCV</td>
<td>0-400</td>
<td>0.1</td>
<td>±0.7% ± 2LSD</td>
<td>1100V</td>
</tr>
<tr>
<td></td>
<td>0-1000</td>
<td>1.0</td>
<td>±0.7% ± 2LSD</td>
<td>1100V</td>
</tr>
<tr>
<td>ACA</td>
<td>40-400Hz</td>
<td>0.1</td>
<td>±2.0% ± 4LSD</td>
<td>750Amps for not more than 1 min.</td>
</tr>
<tr>
<td></td>
<td>400-600</td>
<td>1.0</td>
<td>±2.0% ± 4LSD</td>
<td>750Amps for not more than 1 min.</td>
</tr>
<tr>
<td>DCA</td>
<td>0-400</td>
<td>0.1</td>
<td>±2.0% ± 2LSD</td>
<td>700Amps</td>
</tr>
<tr>
<td></td>
<td>400-600</td>
<td>1.0</td>
<td>±2.0% ± 2LSD</td>
<td>700Amps</td>
</tr>
<tr>
<td>PEAK HOLD</td>
<td>LO</td>
<td>0.1</td>
<td>±1.5% ± 6LSD</td>
<td>1100VOLTS</td>
</tr>
<tr>
<td></td>
<td>HI</td>
<td>1.0</td>
<td>±1.5% ± 6LSD</td>
<td>700Amps</td>
</tr>
<tr>
<td>OHMS</td>
<td>0-4K</td>
<td>1.0</td>
<td>±1% ± 2LSD</td>
<td>550V AC/DC for 1 min.</td>
</tr>
<tr>
<td>FREQUENCY COUNTER</td>
<td>20Hz-4kHz</td>
<td>1Hz</td>
<td>±0.7% ± 3LSD</td>
<td>550V AC/DC for 1 min.</td>
</tr>
</tbody>
</table>

Polarity: Automatic “-“ negative indication
Continuity with Buzzer: 0-150Ω ±10%
Frequency Counter: Coupling-AC
Min. Input Frequency: 20Hz
Minimum signal level: 200mV RMS
Maximum signal level: 5V RMS

Input Impedance: 10 Megohms
Power Supply: 9 Volt Alkaline
Battery Life: More than 180 hours
Maximum Jaw Opening: 1.65" (4.1cm)
Maximum Jaw Size: 1.77" (4.5cm) x 1.57" (4cm)
Maximum Operating Temperature / Humidity:
32°F (0°C) to 120°F (50°C) 75%RH
Maximum Storage Temperature / Humidity:
20°F (-6°C) to 140°F (60°C) 80%RH
Temperature Coefficient:
0.15 x (Spec.Acc'y) / °C, <18°C or > 28°C
HOW TO MEASURE AC OR DC VOLTAGE

WARNING! DO NOT exceed 1100 VDC or 850 VRMS on any Voltage range

IMPORTANT
See “PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION”

1. Be sure the Data and Peak Hold switches are in the “UP” or deactivated position.
2. Insert voltage test leads, black to “COM” and red to “VΩ Hz” jacks.
3. Move rotary switch to appropriate function and range.
4. Apply test leads to points of circuit to be measured.
5. If an “OL” indication should appear in the display, move the rotary switch to a higher range.
6. For DC voltage; if a “−” minus sign appears in the left side of the display, reverse the test leads.
7. The Data Hold function can now be activated if so desired.

Note: Periodic check on safety leads can be made by shorting lead and checking continuity.

HOW TO MEASURE RESISTANCE

WARNING! DO NOT apply any voltage between these terminals when function switch is set to measure resistance.

IMPORTANT
See “PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION”

1. Be sure the Data and Peak Hold switches are in the “UP” or deactivated position.
2. Insert test leads, black to “COM” and red to “VΩ Hz” jacks.
3. Move rotary switch to 4KΩ resistance range.
4. Apply test leads to resistance to be measured.
5. For resistance from 0-150Ω ± 10%, sound will be heard from the continuity buzzer.

Note: Resistance range is overload protected for up to 550V for not longer than one minute.

HOW TO MEASURE AC OR DC CURRENT

IMPORTANT
See “PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION”

1. Be sure the Data and Peak Hold switches are in the “UP” or deactivated position.
2. Disconnect voltage test leads if connected to the instrument.
3. Turn instrument on by moving rotary switch to the desired range and function.
4. If DC Amps is selected, be sure to zero adjust first. With jaws closed and away from conductor, continue to press DCA AUTO ZERO Button until instrument reads all zeroes or very close to it.
5. Encircle conductor with jaws of instrument.
6. Release finger pressure on trigger and allow jaws to close around the conductor.
7. If an “OL” indication appears in the display, move rotary switch to the next higher range.
8. The Data Hold function can now be activated if so desired.

Note: If more than one DC Amp measurement is to be made, the instrument should be zeroed away from the conductor before each subsequent measurement. See (4) above for zeroing procedure. “−” Will appear in the display if direction of current is not as in Fig. 2.

HOW TO MEASURE PEAK (SURGE) CURRENT

IMPORTANT
See “PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION”

1. Be sure the Data and Peak Hold switches are in the “UP” or deactivated position.
2. Disconnect voltage test leads if connected to the instrument.
3. Turn instrument on by moving to either of the two DC Amp ranges, depending on resolution desired.
4. With jaws closed and away from conductor, continue to press DC AUTO ZERO Button until instrument reads all zeroes or very close to it.
5. Move rotary knob to the appropriate AC Amp range.
6. Press the Peak Hold button. “P” will now be visible in the display.
7. Encircle the conductor with jaws of the instrument.
8. Release finger pressure on trigger and allow the jaws to gently close around the conductor.

Note: 1. If an “OL” appears in the display, the range capability was exceeded.
2. Peak or Surge must last for at least .06 seconds.
3. For Peak measurement, instrument must be zeroed on DC first, then switched to AC Amps.

HOW TO MEASURE FREQUENCY

IMPORTANT
See “PRECAUTIONS FOR PERSONAL AND INSTRUMENT PROTECTION”

Caution: DO NOT apply voltage to input terminals while instrument is in the Frequency measuring mode.

1. Be sure the Data and Peak Hold switches are in the “UP” or deactivated position.
2. Insert test leads, black to “COM” and red to “VΩHz” jacks.
3. Move rotary switch to 4M-Hz position.
4. Connect test leads to signal source to be measured.

Note: Amplitude level of signal source has to be a minimum of 100mV for sine waves and 30mV peak for square waves.
Recalibrate your meter:

It is recommended that the multimeter be calibrated once each year.

Use the following procedure to calibrate the multimeter:

1. Perform calibration at an ambient temperature of 23°C ± 2°C and a relative humidity of 75% or less.
   Allow instrument to sit at this temperature for at least thirty minutes.

2. Disconnect the test leads and turn the meter off. Remove the test leads from the front terminals.

3. Position the meter face down. Remove the three screws from the case bottom.

4. Lift the end of the case bottom until it gently unsnaps from the case top at the end nearest the LCD.

5. Lift the circuit board from the case top. Do not remove the screws from the circuit board.

(A) DCV Calibration (Adjust VR9)

6. Set the "." on the rotary selector to the "DC 400V" position on the PCB.

7. Set the output of DCV calibrator for 390.0V ± 0.02% and connect to V-Ω and COM input terminals on instrument.

8. Using a small flat-tipped screwdriver adjust the potentiometer VR9 until the display reads 390.0 or 390.1.

9. Disconnect the DCV calibrator from the instrument.

(B) ACV Calibration (Adjust VR8)

10. Set the "." on the rotary selector to the "AC 400V" position on the PCB.

11. Set the output of ACV calibrator for 390.0V ± 0.02% 500Hz and connect to V-Ω and COM input terminals on instrument.

12. Using a small flat-tipped screwdriver adjust the potentiometer VR8 until the display reads 390.0 or 390.1.

13. Disconnect the ACV calibrator from the instrument.

(C) Peak Hold Zero Calibration (Adjust VR10, VR7)

14. Set the "." on the rotary selector to the "DC 400V" position on the PCB.
Using a small flat-tipped screwdriver adjust VR10 to the lowest side.

16. Short the V-O and COM of the instrument.

17. Short the points marked a "PK" symbol between them.

18. Using a small flat-tipped screwdriver adjust VR7 until the display shows 00.0.

(D) Peak Hold Calibration (Adjust VR10)

19. Set the "" on the rotary selector to "AC 400V" position on the PCB.

20. Using a small flat-tipped screwdriver adjust VR10 to its upper side.

21. Set the output of ACV calibration for 200.0V±0.02% 500Hz and connect to the V-O and COM on the instrument.

22. Press the peak hold key and wait until the "P" symbol appeared.

23. Using a small flat-tipped screwdriver adjust VR10 until the display shows 200.0 or + 3 digits.

24. Disconnect the ACV calibrator from the instrument.

(E) Position Error calibration (Adjust VR1)

25. Set the "" on the rotary selector to the "AC 400A" position on the PCB.

26. Flow the current of AC 380A/120Hz around the suitable wire or conductor.

27. Open spring-loaded clamp by pressing trigger on the left side of instrument.

28. Position clamp around wire or conductor and release trigger to make sure the clamp is entirely closed.

29. Using a small flat-tipped screwdriver adjust the VR1 until the error is limited under 1% while position the carry current wire up to clamp and down to the clamp.

30. Disposition the clamp from the wire or conductor.

(F) DCA Zero Calibration (Adjust VR2, VR11)

31. Set the "" on the rotary selector to the "DC 400A" position.

32. Short the points marked "A" and "B" on the bottom PCB (750-2 □).

33. Using a small flat-tipped screwdriver adjust VR2 until the display shows 00.0±5 digits.
34. Disconnect the points marked "A" and "B".
35. Using a small flat-tipped screwdriver adjust VR11 until the display shows 00.0 after pressing the DCA AUTO ZERO key.

(G) AC 400A Range Calibration (Adjust VR6)
36. Set the "AC" on the rotary selector to the "AC 400A" position on the PCB.
37. Flow the current of AC 200.0A±0.02% 120Hz around the suitable wire or conductor.
38. Position clamp around the wire or conductor, release clamp trigger to make sure the clamp is entirely closed.
39. Reposition the clamp to make the wire or conductor is in the center of the clamp.
40. Using a small flat-tipped screwdriver adjust VR6 until display shows 200.0.

41. Disposition the clamp from the wire or conductor.

(H) AC 600A Range calibration (Adjust VR5)
42. Set the "AC" on the rotary selector to the "AC 600A" position on the PCB.
43. Flow the current of AC 300A±0.02% 120Hz around the suitable wire or conductor.
44. Position clamp around the wire or conductor, release clamp trigger to make sure the clamp is entirely closed.
45. Reposition the clamp to make the wire or conductor is in the center of the clamp.

(J) Using a small flat-tipped screwdriver adjust VR5 until the display shows 300.
46. Disposition the clamp from the wire or conductor.

(I) DC 400A Range Calibration (Adjust VR4)
47. Set the "DC" on the rotary selector to the "DC 400A" position on the PCB.
48. Flow the current of DC 200.0A±0.02% around the suitable wire or conductor.
49. Position clamp around the wire or conductor, release clamp trigger to make sure the clamp is entirely closed.
51. Fully compensate the extra magnetic effect of DC 200A current by pressing the DCA AUTO ZERO key.

52. Reposition the clamp to make the wire or conductor is in the center of the clamp.

53. Using a small flat-tipped screwdriver adjust VR4 until the display shows 200.0.

54. Disposition the clamp from the wire or conductor.

(J) DC 600A Range Calibration (Adjust VR3)

55. Set the "DC" on the rotary selector to the "DC 600A" position on the PCB.

56. Flow the current of DC 300.0A±0.02% around the suitable wire or conductor.

57. Position clamp around the wire or conductor, release clamp trigger to make sure the clamp is entirely closed.

58. Fully compensate the extra magnetic effect of DC 300A current by pressing the DCA AUTO ZERO key.

59. Reposition the clamp to make the wire or conductor is in the center of the clamp.

60. Using a small flat-tipped screwdriver, adjust VR3 until the display shows 300.