AMPROBE®

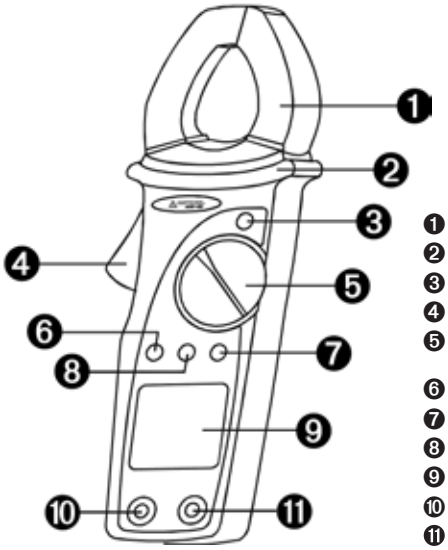
ACDC-400

Digital AC/DC Clamp-on Multimeter

Users Manual

English

ACDC400_Rev001



1. Inductive clamp jaw
2. Safety guard
3. Data HOLD key
4. Jaw trigger
5. Rotary selector functions
6. ZERO key
7. RANGE R-H and key
8. MAX/MIN key
9. LCD display
10. COM jack
11. V/Ω jack

CONTENTS

SYMBOLS

	Battery		Refer to the manual
	Double insulated		Dangerous Voltage
⎓	Direct Current	⏚	Earth Ground
~	Alternating Current		Audible tone
	Conforms to relevant Australian standards.	CE	Complies with EU directives
	Do not dispose of this product as unsorted municipal waste.	c UL us	Underwriters Laboratories. [Note: Canadian and US.]
	Application around and removal from hazardous live conductors is permitted		

SAFETY INFORMATION

- The ACDC-400 Series Digital Clampmeters conform to EN61010-1:2001; EN61010-2-032:2002; CAT III 600 V, class 2 and pollution deg.2
- This instrument is EN61010-1 certified for Installation Category III (600V). It is recommended for use in distribution level and fixed installations, as well as lesser installations, and not for primary supply lines, overhead lines and cable systems.
- Do not exceed the maximum overload limits per function (see specifications) nor the limits marked on the instrument itself. Never apply more than 600 Vdc/600 V ac rms between the test lead and earth ground.

⚠ **Warnings and Precautions**

- Before and after hazardous voltage measurements, test the voltage function on a known source such as line voltage to determine proper meter functioning.
- Disconnect the test leads from the test points before changing meter functions.
- **Disconnected from the meter's test leads before measuring current.**
- Inspect the Clampmeter, test leads and accessories before every use. Do not use any damaged part.

- Never ground yourself when taking measurements. Do not touch exposed circuit elements or test probe tips.
- Do not operate the instrument in an explosive atmosphere.
- To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.
- The meter is intended only for indoor use. To avoid electrical shock hazard, observe the proper safety precautions when working with voltages above 60 VDC or 30 VAC rms. These voltage levels pose a potential shock hazard to the user.
- Before and after hazardous voltage measurements, test the voltage function on a known source such as line voltage to determine proper meter functioning.
- Keep your hands/fingers behind the hand/finger barriers (of the meter and the test leads) that indicate the limits of safe access of the hand-held part during measurement.
- Inspect test leads, connectors, and probes for damaged insulation or exposed metal before using the instrument. If any defects are found, replace them immediately.
- This Clamp-on meter is designed to apply around or remove from uninsulated hazardous live conductors. Individual protective equipment must be used if hazardous live parts of the installation could be accessible.
- Exercise extreme caution when: measuring voltage >20 V // current >10 mA // AC power line with inductive loads // AC power line during electrical storms // current, when the fuse blows in a circuit with open circuit voltage >1000 V // servicing CRT equipment.
- Remove test leads before opening the case to change the battery.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance,continuity, diodes, or capacitance.
- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator (+▬) appears.

UNPACKING AND CONTENTS

Your shipping carton should include

1 ACDC-400

1 Test lead set

2 AAA - 1.5V Batteries

1 Users Manual

1 Carrying Case

If any of the items are damaged or missing, immediately return the complete package to the place of purchase for an exchange.

INTRODUCTION

The ACDC-400 Clamp-On meter is an average responding autoranging 400 Amp / 600 V clamp meter. The features include AC / DC voltage, AC / DC current, Resistance, and Continuity tests.

This Instrument's display also contains an analog bar graph.

OPERATION

Alignment marks (see Fig. 2)

Place conductor within the jaws at the intersection of the indicated marks as close as possible to maximize the accuracy of the reading.

Auto Power Off function

In order to save battery life, your clampmeter powers down automatically after approximately 30 minutes of inactivity. You can turn it back on by turning the function selector switch to OFF and back to a measuring function. The instrument does not power down while in MAX MIN mode. You can disable Auto Power Off by pressing and holding the ZERO button while turning the meter ON.

R-H Range selection

Press R-H button < 1 second, to enable/disable manual range selection.

Backlight function (☼)

Press Backlight button more than 1 second, enable/disable Backlight. To use the backlight in the 'Autoranging' mode, press and hold the R-H button for more than 2 seconds.

D-H function (DATA HOLD)

Freezes the reading present on the LCD at the moment the button is pressed. To use this button feature, set up the meter for the type of measurement and range desired. Connect the test leads or clamp jaws to the circuit/component to be measured, then press Hold. The LCD reading will freeze and display "H." You may now remove the test leads and the reading will not change until you press D-H again.

ZERO button: Relative display function

The ZERO mode displays the difference between the actual reading and a reference value. It may be used with any function or range; however, the range must be set manually. To make a relative measurement first establish a reference value by measuring a value and then pressing the ZERO button after the reading has stabilized. This stores the measured value as the reference and sets the display to zero. The meter subtracts the reference value from subsequent measurements and displays this difference as the relative value. Measurement values greater than the reference value will be positive and values less than the reference value will be negative. To exit the Zero Mode, Press and hold the Zero button for 2 seconds.

Select the proper Range using the R-H button before enabling the Zero feature. This function will not autorange.

MAX / MIN button

The MAX MIN feature reads and updates the display to store and show the maximum or minimum value measured after you press the MAX MIN button. Pressing the MAX MIN button for less than 1 second will put the meter into a mode of displaying the maximum, minimum, or actual readings. Each time the button is pressed, the meter will cycle to the next display mode as shown in the table below. Press the MAX MIN button for more than 2 seconds to disable this feature.

Select the proper Range using the RANGE button before enabling the MAX MIN feature. This function will not autorange.

Button Display -- Value Displayed

MAX value after feature activated

< 1 second MIN - Minimum value after feature activated

< 1 second - Actual reading, min max being recorded.

> 2 seconds - Exit MAX MIN and return to normal measurement.

Analog bargraph

The analog bargraph provides a visual indication of measurement like a traditional analog meter's needle.

AC Voltage measurement (See Fig. 3)

1. Select the '~V' position with the rotary selector switch.
2. Insert the test leads into the jack, the red lead into V/Ω jack, and the black lead into the COM jack.
3. Connect the test leads to the circuit,
4. The voltage measured will be displayed.

DC Voltage measurement (See Fig. 4)

1. Select the '⎓V' position of selector functions.
2. Insert the test leads into the jack, the red lead into V/Ω jack, and the black lead into the COM jack.
3. Connect the test leads to the circuit,
4. The voltage measured will be displayed.

AC Current measurement (See Fig. 5)

The instrument will not work correctly for non-sinusodial waveforms.

1. Select '**~A'** position.
2. Position the test conductor is in the center of the clamp jaw.

3. The current measured will be displayed.

DC Current measurement (See Fig. 6)

1. Select '⎓**A**' position.
2. If the display doesn't read zero, press the ZERO button.
3. If the current flow is over 40A, press R-H button to select 400A range before zeroing operation.
4. Position the test conductor is in the center of the clamp jaw.
5. The current measured will be displayed.

Resistance measurement (See Fig. 7)

1. Select the ' Ω ' function .
2. Insert the test leads into the jacks. The red lead into V/Ω jack, and black lead into COM jack.
3. Remove power from the circuit being tested and discharge all the capacitors.
4. Connect the test leads to the circuit, the resistance measured will be displayed.
5. If OL appears on the highest range, the resistance is too large to be measured.

Continuity Test (See Fig. 8)

1. Select the '))) ' function.
2. Insert the test leads into the jacks, the red lead into V/Ω jack, and black lead into COM jack.
3. Remove power from the circuit being tested and discharge all the capacitors.
4. Connect the test leads to the circuit,
5. The resistance will be displayed and the buzzer sounds when the resistance value is < 40 Ω.

MAINTENANCE AND REPAIR

If there appears to be a malfunction during the operation of the meter, the following steps should be performed in order to isolate the cause of the problem:

1. Check the battery.
2. Review the operating instructions for possible mistakes in operating procedure.
3. Inspect and test the test leads for a broken or intermittent connection.

Except for the replacement of the battery or test probes, repair of the multimeter should be performed only by a Factory Authorized Service Center or by other qualified instrument service personnel. The front panel and case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow to dry completely before using. Do not use aromatic hydrocarbons or chlorinated solvents for cleaning.

Battery Replacement (see Fig. 9)

⚠ **Warning**

To prevent electrical shock or meter damage, disconnect the meter's test leads from any circuit and the meter, then turn the meter off before removing the battery cover. Battery replacement should be performed in a clean environment and with appropriate care taken to avoid contaminating the meter's interior components.

1. Remove the screw and lift the battery cover.
2. Replace the batteries with the same type (1.5V AAA). Note polarity guide below the battery.
3. Replace the battery cover and screw.

SPECIFICATIONS

General Specifications

Display:	3-3/4 digits 4000 counts LCD display
Update Rate:	2 per second nominal
Polarity:	Automatic
Power Supply:	2 standard 1.5V AAA Size (NEDA 24G or IEC R03) battery
Battery Life:	typical 25 hours
APO Timing:	idle for 30 minutes
Low battery:	⊟ on LCD; approx. 2.4V
Environment:	Indoor operation, below 2000 m
Temperature / Humidity:	
Operating:	5°C to 40°C (41°F to 104 °F); < 80% RH
Storage:	-10°C to 60°C (14°F to 122 °F); < 80% RH
Jaw opening:	27mm max
Dimension :	202 x 70 x 40mm (7.9 x 2.7 x 1.6 in.)
Weight :	254 gm (0.6 lb)

Safety LVD: Meets EN60101-1:2001; EN61010-2-032(2002), Category II- 600 Volts ac & dc; pollution degree : 2; class 2

CE EMC: This product complies with requirements of the following European Community Directives: 89/336/EEC (Electromagnetic Compatibility) and 73/23/EEC (Low Voltage) as amended by 93/68/EEC (CE Marking). However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted

signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Electrical (23 °C ± 5 °C) < 75%RH

DC Voltage

RANGE	ACCURACY
400.0 mV 4.000V, 40.00V, 400.0V	± (0.8% rdg + 2 dgts)
600V	± (1.0% rdg + 2 dgts)

Input impedance : 10MΩ, 30pf nominal (100 MΩ for 400.0mV range)

Max input: 600 VDC

AC Voltage (sinusoidal only)

RANGE	FREQUENCY	ACCURACY
400.0mV	40Hz to 60Hz	± (1.0% rdg + 50 dgts)
4.000V, 40.00V, 400.0V	50Hz to 500Hz	± (1.0% rdg + 3 dgts)
600V	50Hz to 500Hz	± (1.2% rdg + 3 dgts)

Input impedance: 10MΩ, 30pf nominal (100 MΩ for 400.0mV range)

Max input: 600 VAC rms

DC Current (Clamp-On)

RANGE	ACCURACY
0.00A to 40.00A	± (2.0% rdg + 10 dgts)
40.0A to 400.0A	± (2.0% rdg + 10 dgts)

Max current: 400A rms continuous; 600 A rms (60 seconds)

ACA Current (Clamp-On) (sinusoidal only)

RANGE	FREQUENCY	ACCURACY
0.00A to 40.00A	50Hz to 60Hz	± (2.0% rdg + 10 dgts)
40.0A to 400.0A	50Hz to 60Hz	± (2.0% rdg + 10 dgts)

Max current: 400A rms continuous; 600 A rms (60 seconds)

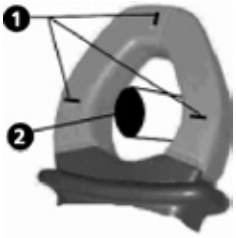
Resistance

RANGE	ACCURACY
400.0Ω	± (1.0% rdg + 5 dgts)
4.000kΩ, 40.00kΩ, 400.0kΩ, 4.000MΩ	± (1.0% rdg + 3 dgts)
40.00MΩ	± (3.0% rdg + 3 dgts)

Open Circuit Voltage : 0.45 Vdc typical; 1.5 Vdc typical for 400.0Ω

Continuity Tester

Open Circuit Voltage: 1.4Vdc typical
Audible threshold: < 40Ω



❶ Alignment marks.
❷ Conductor.

Fig. 2: Alignment marks

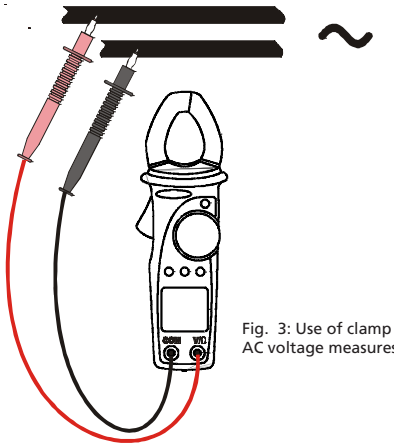


Fig. 3: Use of clamp for AC voltage measures.

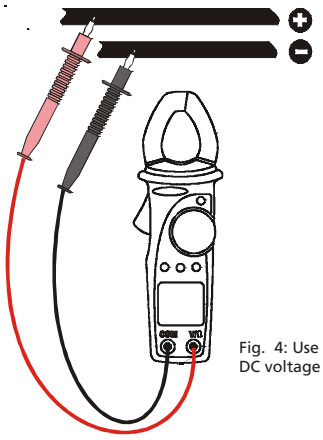


Fig. 4: Use of clamp for DC voltage measures

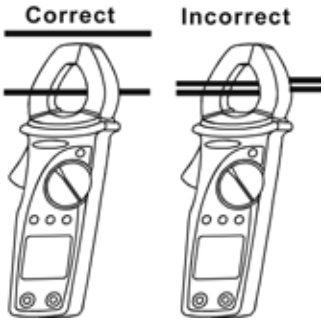


Fig. 5: Use of clamp during AC current measurement

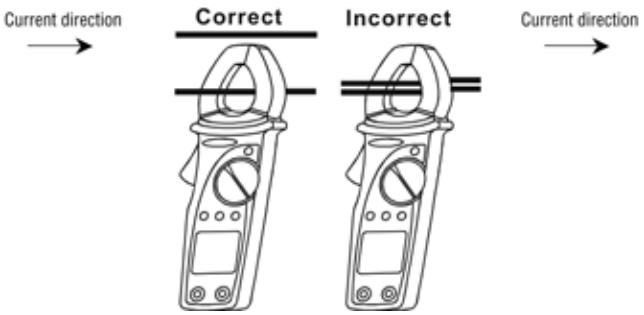


Fig. 6: Use of clamp during DC current measurement.

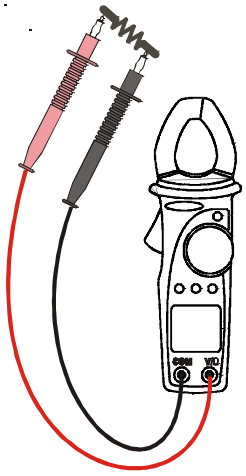


Fig. 7: Use of clamp for resistance measures.

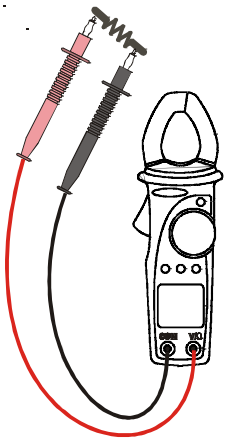


Fig. 8: use of clamp
for continuity measure