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Introduction

The DL39 is a hand-held, battery powered digital multimeter with clamp-on current measuring capability. This instrument is ideal for anyone that needs to make quick, accurate measurements of AC inductive amperage, AC voltage and resistance. The low voltage DC function accommodates accessory adapters.

Features include

- AC inductive amps
- AC volts
- DC volts for adapters
- Ohms (resistance)
- Continuity (with audible alert)
- Max capture
- Data hold
- Low battery indicator
- Rugged construction
- Compact size for easy access to tight areas

Safety Notes

Before using this meter, read all safety information carefully. In this manual the word "**WARNING**" is used to indicate conditions or actions that may pose physical hazards to the user. The word "**CAUTION**" is used to indicate conditions or actions that may damage this instrument.



WARNING!

Exceeding the specified limits of this meter is dangerous and can expose the user to serious or possibly fatal injury.

- **DO NOT** attempt to measure any voltage that exceeds 600 volts with this meter - UEi offers numerous alternatives for measuring high voltage and current
- Voltages above 60 volts DC or 25 volts AC may constitute a serious shock hazard
- **DO NOT** attempt to use this meter if either the meter or the test leads have been damaged. Send unit in for repair by a qualified repair facility
- Test leads must be fully inserted prior to taking measurements
- Always turn off power to a circuit (or assembly) under test before cutting, unsoldering or breaking the current path. Even small amounts of current can be dangerous
- Always disconnect the live test lead before disconnecting the common test lead from a circuit
- When measuring high voltage, disconnect the power source before making test lead connections. Connect the test leads to the meter first then to the circuit under test. Reapply power

- If any of the following indications occur during testing, turn off the power source to the circuit under test:
 - Arcing
 - Flame
 - Smoke
 - Extreme Heat
 - Smell of Burning Materials
 - Discoloration or Melting of Components
- Read the safety precautions associated with the equipment being tested and seek assistance or advice when performing unfamiliar tasks.
- Keep your fingers away from the test lead metal probe contacts and bus-bars when making measurements. Always grip the instrument and test-leads behind the hand guards (molded into the probes).
- In the event of electrical shock, ALWAYS bring the victim to the emergency room for evaluation, regardless of the victim's apparent recovery. Electrical shock can cause an unstable heart rhythm that may need medical attention.

International Symbols

 Dangerous Voltage	 Ground
 AC Alternating Current	 Warning or Caution
 DC Direct Current	 Double Insulation (Protection Class II)
 Either AC or DC	 Fuse
 Not Applicable to Identified Model	 Battery

Controls and Indicators

1. **Clamp:** Used to measure inductive AC current. Opens to 1 1/4" (32 mm).



CAUTION!

*The clamp uses a high-tension spring to close the jaw. **DO NOT** allow fingers or objects to become pinched in the base as jaw closes.*

2. **Conductor Alignment Marks:** Used to aid in the visual alignment of a conductor when measuring inductive amperage. Greatest accuracy is achieved when the conductor inside the clamp is centered at the intersection of these marks.
3. **Hand Guard:** Used as a point of reference for the operator's safety.



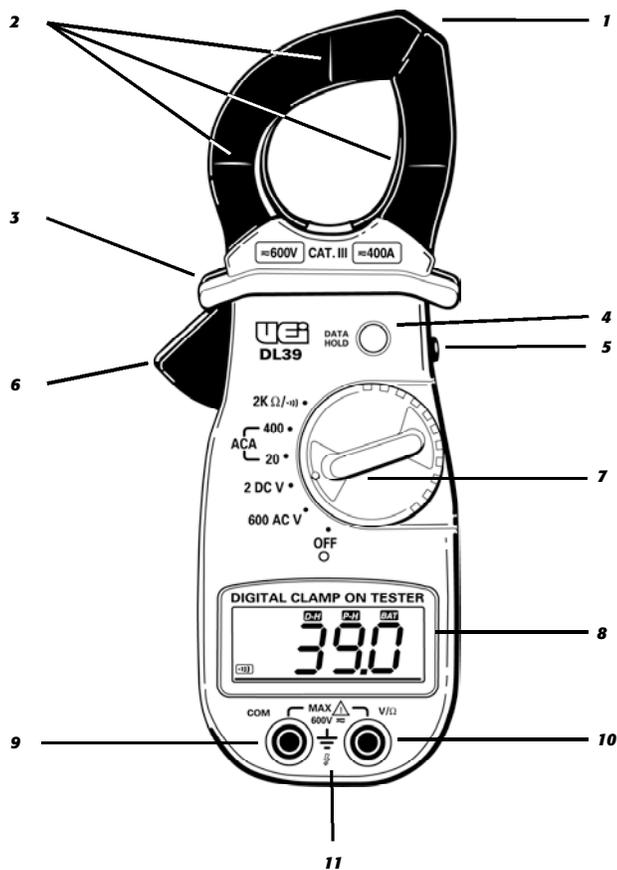
WARNING!

Always keep your hands and fingers behind the hand guards when measuring current on exposed conductors. Contact may result in serious safety.

4. **Data Hold Push-button:** Freezes the value displayed on the digital read-out.
5. **Max Capture Button:** Used to capture and display the highest measured value.
6. **Clamp Lever:** Opens and closes current clamp jaw.
7. **Rotary Function Switch:** Used to power the meter on and off, or to select one of the available measurement functions.

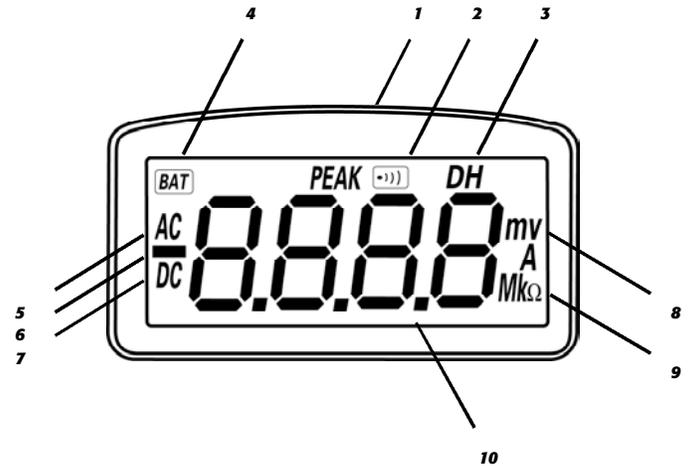
NOTE: Measure inductive AC current using the clamp. Measure volts AC and DC at the test lead inputs, resistance and continuity at the test lead inputs.

8. **Display:** Communicates function, range, and value information to the user.
9. **Common Terminal:** The black test lead is plugged into this terminal to supply the ground or "low" reference for all measurements.
10. **Volt/Ohm (V/ Ω) Terminal:** The red lead is plugged into this terminal. It is used for AC/DC volts, ohms, and continuity measurements.
11. **Maximum Input Statements:** MAX 600V indicates that a maximum of 600 Volts can be applied between the two terminals of between earth ground and any terminal.



LCD Display Functional Description

1. **Numerical Value:** Displays the total value of the units displayed.
2. **Low Battery Indicator:** This symbol appears when the battery needs replacement.
NOTE: A low battery will adversely affect accuracy.
3. **P-H:** Indicates the meter is displaying the maximum value measured.
4. **Data Hold:** Indicates the value displayed is held on screen (the data hold button is pressed).
5. **Minus:** Indicates the value measured has a negative polarity.
6. **Continuity:** Indicates the meter is in the continuity measurement mode and will sound a tone when measuring resistance below approximately 50 ohms.



Operating Instructions

Auto-Power Off

This instrument is turned on and off using the rotary switch. When the meter is moved out of the OFF position, into any of the measurement positions, it will begin to display a measured value.

This instrument will remain on as long as it is in a measurement position to allow long-term monitoring. Always store your meter in the off position.

Max Capture

Use the "MAX CAPTURE" button on the right side of the instrument to capture the highest measured value in any selected function or scale. When Max Capture is selected, the symbol "P-H" appears at the top of the screen and the highest measured value remains on the LCD display.

NOTE: This numerical data is not reset when the rotary switch is moved from one function to another. For best results, set the range and function you intend to record prior to pressing the Max Capture button, then leave the rotary switch in that position.

Press the Max Capture button again to return the instrument to the real-time measurement mode.

Data Hold

The **"DATA HOLD"** button freezes the numerical data displayed on the screen at the moment it is pressed. This function is engaged by pressing the **"DATA HOLD"** button, located on the face of the instrument, above the rotary switch. When Data Hold is active, the letters **"D-H"** appear at the top of the digital display. To cancel Data Hold, press the button again.

NOTE: The numerical value will remain displayed even if the rotary dial is moved from its original position.

Selecting A Function and Scale

The rotary switch is used to turn the meter on, off, and to select the measurement function and scale. The operator has control over the function and resolution of the measurement. While this meter is manufactured with a number of built in fail-safes, the potential to damage the meter due to improper use does exist. Set the rotary switch to the appropriate setting before touching the test leads to the circuit under test.

Measuring Inductive Current

To measure current, clamp-on ammeters rely on the electromagnetic field that occurs when electricity flows through a conductor. Prepare to make your measurement by separating a single live conductor from any other phase, neutral or ground conductor. Squeeze the clamp lever, and place the open jaws around the isolated conductor. To attain the most accurate reading, ensure the conductor is centered in the jaws of the clamp, and the jaws are closed tight. The conductor must be able to fit inside the 1 1/4" (32 mm) fully open jaws.

To measure inductive AC current:

1. Place the function select switch in the AC amp position (ACA - 400 or 20).
2. Place the clamp jaw around a live conductor (as described above).
3. Allow meter to stabilize - Observe reading.

The maximum limit for this function is 400 amps AC. Too much current will saturate the ferrous material in the clamp, and adversely affect accuracy.

WARNING!

DO NOT attempt to take any unknown voltage or current measurements that may be in excess of this meter's maximum limits. To avoid the risk of electrical shock and instrument discharge, open circuit voltage for the circuit under test must not exceed 600 volts (RMS).

NOTE: For all measurements requiring the use of the meter leads, insert the red lead into the V/ Ω port and the black lead into the COM port.

Measuring AC Voltage

WARNING!

Input voltages must not exceed 600 volts AC (RMS). When working with high voltage or current a greater awareness of the physical safety hazards is required. Connect the test leads to the meter, set the meter to the desired function and range, and then connect to the circuit under test. If an erroneous reading is observed, disconnect power immediately and recheck all settings and connections.

When taking voltage measurements your meter must be connected in parallel to the circuit, or circuit element, under test.

To measure DC or AC volts;

1. Insert the meter leads in jacks as instructed.
2. Set the rotary switch to the 600 AC V position.
3. Touch the test leads to the circuit under test.
4. Allow the meter to stabilize - Observe reading.

Using Adapters (2 DC V Position)

This meter includes a 2 Volt DC measurement function that offers 1 mV (one millivolt) resolution. Many adapters (temperature, RPM, etc.) provide a millivolt output to represent the measured value.

The spacing between terminals is an industry standard 3/4" inch (19 mm) on center, which will accommodate most plug-in adapters manufactured for multimeter use.

The output from a temperature adapter measuring 75 degrees Fahrenheit would be displayed as ".075". If 1,200 degrees Fahrenheit were measured, it would be displayed as "1.200". It is capable of displaying up to 1999 units (degrees, RPM, etc.) positive or negative.

Measuring Resistance and Continuity

CAUTION!

Turn off power and discharge all capacitors in the circuit to be tested before attempting "in circuit" resistance measurements. Failure to do so may result in equipment or instrument damage. It is critical to both the welfare of the meter, and the accuracy of the measurement, that you remove all power to the circuit under test when making resistance measurements. If any voltage is present in the test circuit, whether from a conventional power supply, or energy stored in a capacitor, an erroneous reading will result. This meter may be damaged if more than 600 volts are present.

NOTE: Test lead polarity is of no consequence when making continuity or resistance measurements.

Resistance or continuity can be measured while in the resistance position. The continuity tone is used to make quick checks for connections of electrical circuits, such as wiring splices, switch contacts, relays and cables. The audible continuity tone sounds when the value measured is approximately 30Ω or less. To measure resistance, or test for continuity, follow these steps.

1. Set the rotary switch to the resistance function. ($2K\Omega/\ast$)
2. Turn off power to the circuit under test and ensure there is no residual voltage present from any source.
3. Touch the probes to the test points and read the display.
4. If the reading is below 30Ω , the continuity tone will sound.

NOTE: Be sure you have good contact between the test leads and the circuit. Dirt, oil, solder-flux or other foreign matter alters the reading value.

Maintenance

Service



WARNING!

Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the meter. This could alter the protection from electrical shock and personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

These guidelines will help you attain long and reliable service from your meter:

1. Calibrate your meter annually to ensure it meets original performance specifications.
2. Keep your meter dry. If it gets wet, wipe it dry immediately.
3. Whenever practical, keep the meter away from dust and dirt, which can cause premature wear and collect on internal components.
4. Although your meter is built to withstand the rigors of daily use, it can be damaged by severe impacts. Use reasonable caution when using and storing the meter.

NOTE: When servicing the meter, use only the replacement parts specified.

Battery: 9V, NEDA 1604 or IEC 6LR 61
Test lead set: ATL55

Cleaning and Decontamination

Periodically clean your meter's case using a damp cloth. **DO NOT** use abrasives, cleaning solvents or strong detergents, as they may damage the finish or affect the reliability of the structural components.

Battery Replacement

Always use a fresh replacement battery of the specified size and type. Immediately remove the old or weak battery from the meter and dispose of it in accordance with your local disposal regulations. Old or defective batteries can leak chemicals that corrode electronic circuits.



WARNING!

To avoid electric shock, be sure to turn off the meter's power and disconnect both test leads from any equipment before you remove or install batteries.

To install a new battery, follow these procedures:

1. Remove the screw from the battery compartment cover on the back (lower half) of the meter and lift the cover (Fig 1).
2. Remove and discard the old battery. Always dispose of old batteries promptly in a manner consistent with local disposal regulations.



WARNING!

Under **NO** circumstance should you expose batteries to extreme heat or fire as they may explode and cause injury.

3. Place a fresh 9V battery in the compartment.

NOTE: If you do not plan to use the meter for a month or more, remove the battery and store it in an area that won't be damaged by a leaking battery.

4. Reattach the battery compartment cover to the meter and reinstall the screw.



(Fig 1)

Specifications

Measurement limits

AC Amperage	400 Amps
AC Voltage	600 Volts
DC Voltage	2 Volts
Ohms	2000 Ohms
Continuity	<30 ohms

General specifications

Size (H x W x L)	7.68" x 3.06" x 1.79" (195 x 77 x 46 mm)
Operating temperature	32° to 113°F (0° to 45°C)
Storage temperature	-4 to 140°F (-20 to 60°C)
Relative humidity	0% to 80% RH
Weight	13 oz. (370g)
Clamp capacity	1 1/4" (32mm)
Calibration period	Annual
Open circuit voltage in ohms/continuity function	Approximately 3 Volts
IEC compliance	1010-1 (CAT III 600 Volts)
Battery	9 Volt Alkaline (NEDA, 1604 or 6F22 or 006P)
Battery life	62 hours continuous use w/typical alkaline battery

Electrical specifications

Function	Range	Resolution	Accuracy
Ohms (Ω)	2 k Ω	1 Ω	$\pm(1.0\% + 5 \text{ digits})$
Volts AC	600 V	1V	$\pm(1.5\% + 5 \text{ digits})$
Volts DC	2 V	1 mV	$\pm(0.8\% + 3 \text{ digits})$
Amps AC (50-60 Hz)	20 A	0.01 A	$\pm(2\% + 10 \text{ digits})$
	400 A	0.1 A	$\pm(1.5\% + 5 \text{ digits})$

Standard & Optional Accessories

Standard

Soft carrying caseAC259
Test leadsATL55

Optional

Soft carrying caseAC319
Large Soft carrying caseAC519
Hard carrying case (service kits)AC506
Plug-in line splitterALS1
Temperature adapterTA2K
Dual input temperature adapterTA2
Flame safeguard test adapterDLMAT

Troubleshooting

If I See This Malfunction	I Should Check For	Then Take This Corrective Action
Instrument does not turn on	Battery Voltage	Replace low battery
	Battery clip	Ensure clip grips battery posts tightly
Data does not update	Date or MAX capture	Turn off Data/MAX Capture
Known VOLTAGE/ RESISTANCE does not appear on screen	Test leads	Fully insert test leads for voltage and resistance measurements - Check for continuity by shorting leads in resistance mode
	Dirt, corrosion or debris on test point	Clean test point or find another point to measure the same signal
	Data or MAX capture	Turn off Data/MAX Capture
Known CURRENT does not appear on screen	Measured conductor	Ensure ONLY ONE WIRE is in the clamp jaw at a time
Hunting/Seeking data	Switch position	Ensure switch is not set between functions
"OL" appears during measurement	High input value	Change scale or reduce input value NOTE: "OL" is the normal indication when no input is applied in ohms



Digital Clamp-On Multimeter

Limited Warranty

The DL39 is warranted to be free from defects in materials and workmanship for a period of three years from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UeI's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UeI shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

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This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

