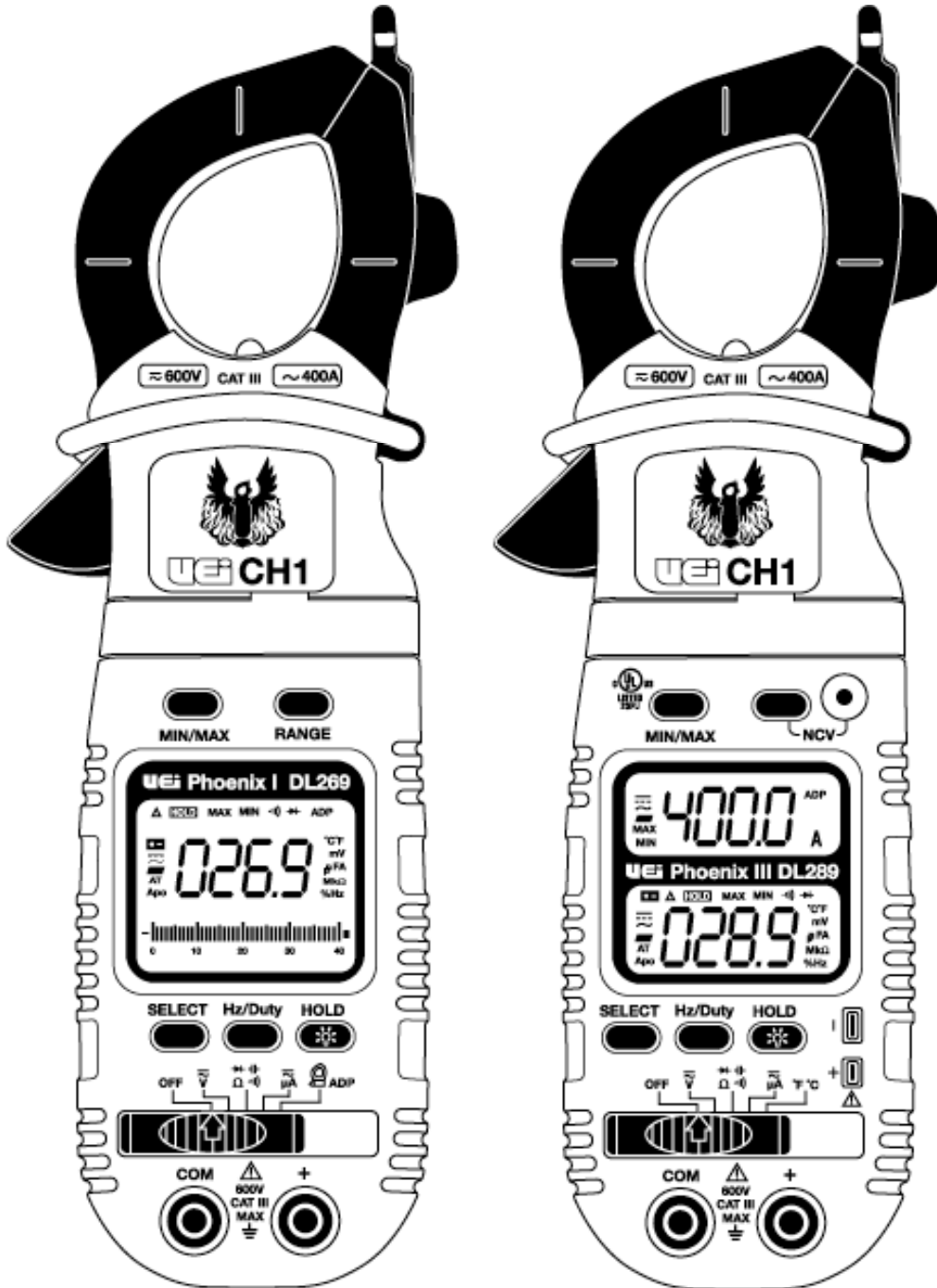


UEi INSTRUCTION MANUAL

PHOENIX

CLAMP METER SERIES



DL269/DL279/DL289

Featuring The New
WORKLIGHT

1-800-547-5740 • Fax: (503) 643-6322
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Introduction

The Phoenix Series is a hand-held, battery powered digital multimeter with clamp-on current measuring capability, back light and work area light.

Features include

- 3-3/4 digit, 4000 count LCD display
- Auto-ranging measurement with manual ranging (Amps or adapters only) capability
- MIN/MAX (Peak Hold) (all ranges except Frequency)
- Frequency/Duty Cycle/Data Hold
- Auto power off with manual override
- Detachable current probe with optional current hook adapter for tight spaces
- Built-in test lead storage & magnetic mount
- Backlit display & Worklight

DL279 & DL289

- Temperature/Non-Contact Voltage/Dual display
- TRMS Measurement (DL289 only)

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.

- Do not attempt to measure any voltage that exceeds the category based rating of this meter
- Do not attempt to use this meter if either the meter or the test leads have been damaged - Turn instrument in for repair at a qualified repair facility
- Ensure meter leads are fully seated by making a quick continuity check of the leads prior to making voltage measurements
- Keep your fingers away from the test lead's metal probe contacts when making measurements - Always grip the leads behind the finger guards molded into the probes
- Do not open the meter to replace batteries or while the probes are connected



WARNING!

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

- Voltages above 60 volts DC or 25 volts AC may constitute a serious shock hazard
- 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
- 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

- 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



WARNING!

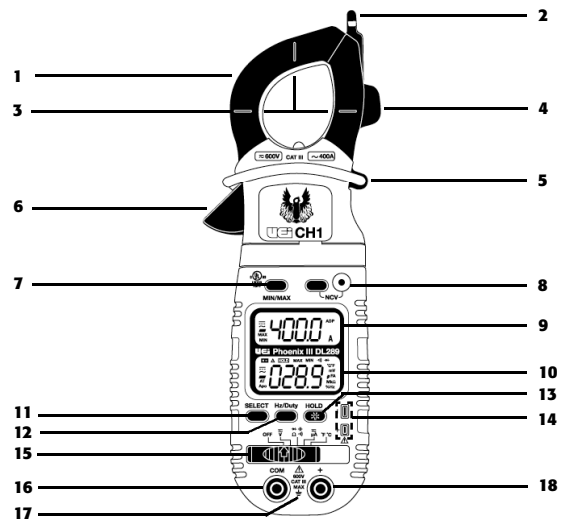
Higher voltages and currents require greater awareness of physical safety hazards. Before connecting the test leads; turn off the power to the circuit under test; set the meter to the desired function and range; connect the test leads to the meter first, then connect to the circuit under test. Reapply power. If an erroneous reading is observed, disconnect power immediately and recheck all settings and connections.

This meter is designed for trade professionals who are familiar with the hazards of their trade. observe all recommended safety procedures that include proper lock-out utilization and the user of personal protective equipment that include safety glasses, gloves and flame resistant clothing.

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:** Measures inductive AC current. Opens to 1.25" (32 mm).
2. **Wire Separation Tab:** Used to separate bundled wires to aid in measuring.

3. **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.
4. **Test Lead Holder:** Used for hands-free use of one of the test probes.
5. **Hand Guard:** Used as a point of reference for the operators safety.



WARNING!

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

6. **Clamp Lever:** Opens and closes current clamp jaw.
NOTE: 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.
7. **MIN/MAX Button:** Activates MIN/MAX capture function, cycles through minimum value, maximum value. Press longer than two seconds to return to current reading.
8. **NCV/Range Button:** Activates non-contact voltage function when meter is off. Used to select "Range" for the upper display when meter is on. (NCV only available on DL279/DL289)
9. **Upper Display (DL279/DL289 only):** Used to display current when used with UEi clamp or hook adapter. Displays output from other accessories when connected to the UEi meter.
10. **Lower Display:** Used to display input to test lead jacks. Includes AC/DC Volts, Frequency, Resistance, Diode, Capacitance and AC/DC microamps (μA).
11. **Select Button:** Used to choose measurement mode from selections with multiple options such as AC or DC volts, AC or DC μA , Resistance, Diode, Capacitance or Continuity, Temperature in $^{\circ}F$ or $^{\circ}C$.
NOTE: Press and hold when turning the meter on to disable auto power off.
12. **Hz/Duty Button:** Used to scroll through Frequency or Duty Cycle when in the AC Voltage measurement mode.
13. **HOLD/Backlight Button:** Freezes display or activates display backlight and work area light.
14. **Temperature Input Jack:** Input jack for k-type thermocouple probe (DL279/DL289 only).
15. **Power/Function Selector:** Turns meter on and is used to select the range or function.
16. **Common Terminal:** The black test lead is plugged into this terminal to supply the ground or "low" reference for all measurements.
17. **Category Max Indicator:** Indicates maximum voltage for the rated working category.



WARNING!

Do not exceed 1000 volts DC or AC - RMS at either the common or multifunction input ports as measured from earth ground.

18. **Multifunction Input Port:** Used for measuring AC/DC Volts, Frequency or Duty Cycle, Resistance, Diode, Continuity and Capacitance.

Displays and Indicators



DL269



DL279/DL289

~	AC indicator
=	DC indicator
-	Indicates a negative value (DC Negative Voltage)
Max	Maximum value displayed
Min	Minimum value displayed
A (top display)	Display is in Amps from UEi Clamp or Hook adapter
ADP (top display)	Maximum value displayed
+	Low battery symbol
HOLD	Hold function activated
→	Diode function
~))	Continuity function
nF / μF	Capacitance (nanofarads or microfarads)
μA	Microamps (1 μA is 0.000001 Amp)
Hz	Frequency measurement
%	Duty Cycle measurement
mV	Millivolts (1 mV is 0.001 Volt)
APO	Auto power off mode active
AT	Auto range function active
O.L	Displayed if the input value exceeds selected range

Operating Instructions

Auto power off

After powering off, the meter will turn back on if you perform one of the following; Change the range, move the position of the selector or any other button is pressed.

To disable this function; press and hold the "SELECT" button while turning the meter on. The "APO" indicator will now be off, indicating that the auto power off function is not active.

Back-light / work area light

Press the "HOLD" button longer than two seconds to activate the backlight/work area light. The lights automatically turn off after 10 seconds to extend battery life.

NOTE: After activating worklight, press briefly to activate hold.

Auto / Manual Range

In auto range the meter will select the best range for the measured value, and "AT" is displayed in the lower left of the display. Press the "RANGE" button to cycle through available ranges for the upper display. "AT" will not be on the display when locked in a specific range.

MIN/MAX mode

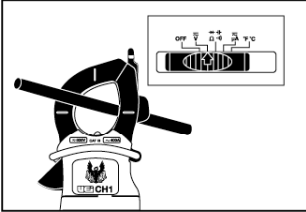
When using the MIN/MAX capture mode for Amps, it is recommended that you first select the range of the expected maximum value. If this is not done it will lock in the lowest range possible for the initial measurement. If the maximum value exceeds this range the meter will capture "O.L" as the maximum value.

Manual ranging will also provide a faster response current input.

Data Hold

Press the "HOLD" button to activate. This will freeze the reading and range in the display for your review.

Measuring AC Amps

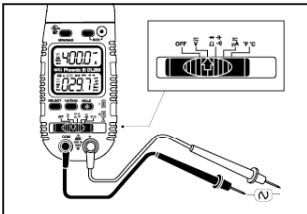


Press "NCV/RANGE" to select range prior to MIN/MAX.

- DL269
Select "ADP" to measure AC Amps with the clamp head or hook
- DL279/DL289
Select any range to power the upper display

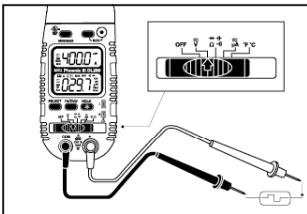
Press "Min/Max" to activate Max capture, Min capture, or normal display.

Measuring AC or DC Volts



Press "SELECT" to change the reading from AC to DC.

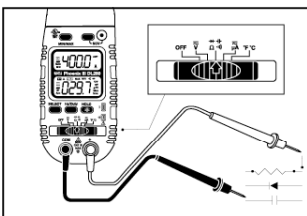
Measuring Frequency or Duty Cycle



Meter must be in AC Volts mode first then press "Hz/Duty" to change function to Frequency or Duty Cycle.

NOTE: Frequency greater than 100Khz will display "0.000 Hz"

Measuring Resistance, Continuity, Diode and Capacitance



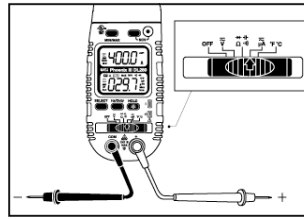
Press "SELECT" to move from Resistance mode to Continuity, diode or continuity mode.

NOTE: Capacitance - leave the meter connected to the capacitor for 10 seconds or more for the reading to stabilize.

Diode - "OL" in reverse mode and approximate forward voltage drop when connected in forward mode.

Continuity - sounds the tone at approximately 50Ω or less.

Measuring AC, DC or μA



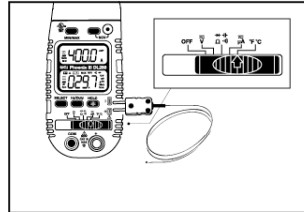
NOTE: Meter must be in series for μA measurements. Press "SELECT" to change AC or DC source.



WARNING!

Do not exceed 2000μA AC or DC current or damage to the meter may occur.

Measuring Temperature (DL279/DL289 only)



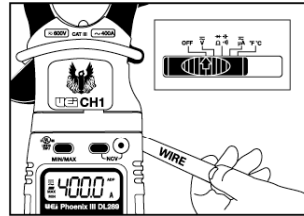
Press "SELECT" to change scale from °F to °C.



WARNING!

Disconnect test leads from any voltage source and the meter before plugging in thermocouple.

Measuring NCV

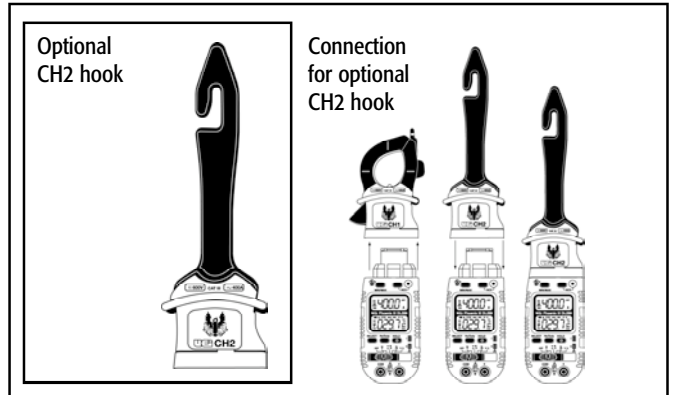


Non-Contact Voltage

(DL279/DL289 only)

Non-contact voltage with the power switch in the off position, press and hold the "NCV" button and move the meter near this voltage source.

Optional Extended Clamp Head (CH2) (Sold separately)



NOTE: Remove the hook adapter when not in use to extend battery life. The hook will consume a small amount of battery power when connected to the meter even when the meter display is off. The meter will automatically display "A" for amps with the CH2 or "ADP" for other adapters.

Maintenance

Periodic 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.

Cleaning

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

Battery Replacement

Remove screws from battery compartment cover on back of meter and remove cover. Replace batteries with fresh batteries paying attention to polarity position. Replace cover and screws.

Specifications

AC Amps Measurement - Jaw input (45Hz to 400Hz)

Range	Resolution	Accuracy	Overload Protection
40A	0.01A	±2.9% +15 dgts	600V
400A	0.1A	±1.9% +8 dgts	

*DL269 400A range only

*DL289 45Hz to 400Hz True RMS (Crest factor <3:1)

DC Low Amps Measurement (test lead input)

Range	Resolution	Accuracy	Overload Protection
400µA	0.01µA	±1.2% +3 dgts	2000µA / 600V
2000µA	0.1µA		

AC Low Amps Measurement (test lead input, 45Hz to 400Hz)

Range	Resolution	Accuracy	Overload Protection
400µA	0.01µA	±2.0% +5 dgts	2000µA / 600V
2000µA	0.1µA	±1.5% +5 dgts	

*DL289 45Hz to 400Hz True RMS (Crest factor <3:1)

DC Volts Measurement

Range	Resolution	Accuracy	Overload Protection
400mV	0.1mV	±0.5% +4 dgts	600V
4V	1mV		
40V	10mV		
400V	100mV		
1000V	1V	±0.8% +10 dgts	

AC Volts Measurement (45Hz to 400Hz)

Range	Resolution	Accuracy	Overload Protection
4V	1mV	±2.0% +5 dgts	600V
40V	10mV		
400V	100mV		
750V	1V		

*DL289 45Hz to 1KHz True RMS (Crest factor <3:1)

Ohms Measurement

Range	Resolution	Accuracy	Overload Protection
400Ω	100mΩ	±1.0% +4 dgts	600V
4kΩ	1Ω		
40kΩ	10Ω		
400kΩ	100Ω		
4MΩ	1kΩ	±2.0% +4 dgts	
40MΩ	10kΩ		

Diode Test

Range	Open Circuit Voltage	Test Current (typical)	Overload Protection
2.0V	< 3.0V DC	0.25mA	600V

Capacitance Measurement

Range	Resolution	Accuracy	Overload Protection
40nF	0.01nF	±3.5% +6 dgts	600V
400nF	0.1nF		
4µF	0.001µF		
40µF	0.01µF		
400µF	0.1µF		
4000µF	1µF		

Temperature Measurement (DL279 & DL289 only)

Range	Resolution	Accuracy	Overload Protection
-22° to 14°F (-30° to -10°C)	0.1°F (0.1°C)	±5.4°F (±3.0°C)	30V
15° to 752°F (-9° to 400°C)	0.1°F (0.1°C)	±1.0% +3.6°F (±1.0% +2.0°C)	

Frequency Measurement

Range	Resolution	Accuracy	Overload Protection
9.999Hz	0.001Hz	±0.1% +4 dgts	600V
99.99Hz	0.01Hz		
999.9Hz	0.1Hz		
9.999kHz	1Hz		
99.99kHz	10Hz		

Minimum frequency: 0.5Hz, DC V offset should be zero

Sensitivity: > 1.0V rms

Duty (%) Cycle Measurement

Range	Accuracy	Overload Protection
01. to 99.9%	±(0.2% per kHz +0.1%) +5 count	600V

0.5Hz to 100kHz (pulsewidth > 2µ sec)

Continuity Measurement

Open Circuit voltage <2.7V	Overload Protection
Threshold Approximately <20Ω	600V

Physical Specifications

Operation temperature	32° to 104°F (0° to 40°C)
Storage temperature	-4° to 140°F (-20° to 60°C)
Relative humidity	0% to 80% at 32° to 95°F (0° to 35°C), 0% to 70% at 32° to 131°F (0° to 55°C)
Temperature coefficient	Nominal 0.1 x (Specified accuracy) / °C (<18° or >28°C ; <64° or >82°F)
Altitude	Operating - up to 2000m Storage - 10000m
Pollution degree	2
Installation category	CAT III 600V, CAT II 1000V
Certifications	UL & cUL standard UL 3111-1 Listed



DL269/DL279/DL289

Clamp-On Meter

Limited Warranty

The DL269/DL279/DL289 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:

1-800-547-5740 • FAX: (503) 643-6322
www.ueitest.com • Email: info@ueitest.com

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

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