

## CATIV Clamp Meter and Voltage Tester

### INSTRUCTION MANUAL

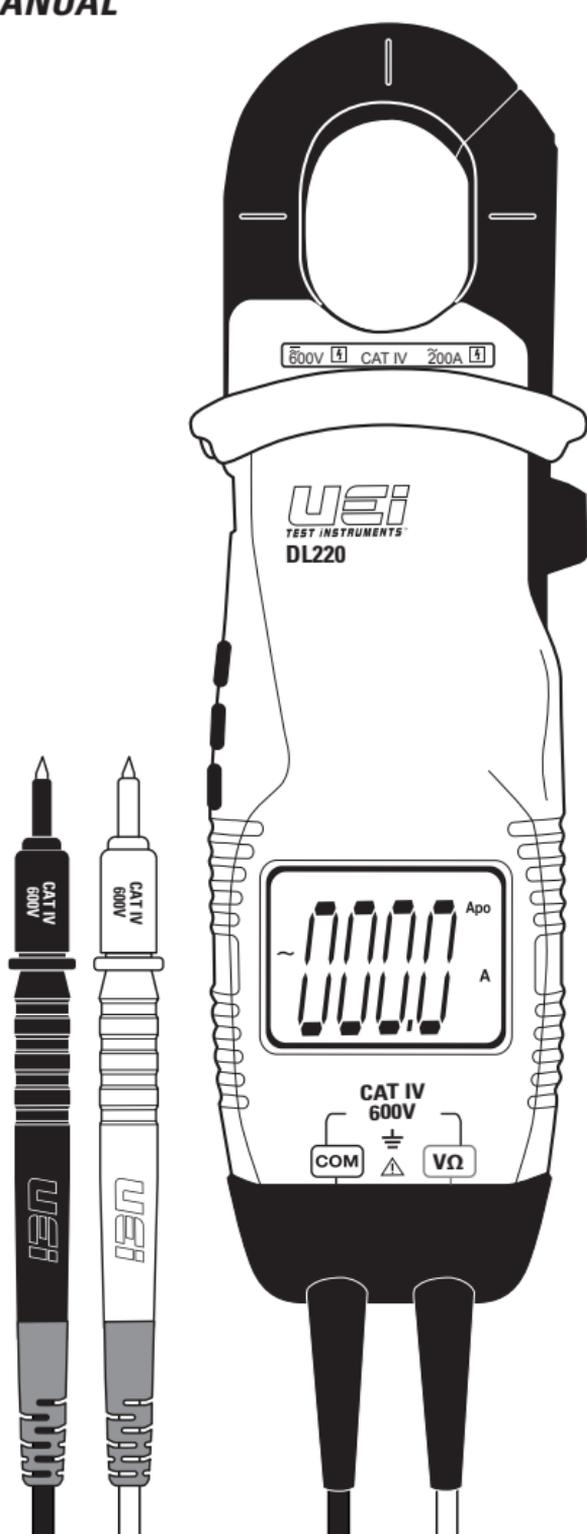
ENGLISH



Intertek



RoHS Compliant



1-800-547-5740

[www.ueitest.com](http://www.ueitest.com) • email: [info@ueitest.com](mailto:info@ueitest.com)

### WARRANTY

The DL220 is warranted to be free from defects in materials and workmanship for a period of two 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.

For more information on warranty and service, contact:

**[www.ueitest.com](http://www.ueitest.com) • Email: [info@ueitest.com](mailto:info@ueitest.com)**  
**1-800-547-5740**

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

### DISPOSAL



**CAUTION:** This symbol indicates that equipment and its accessories shall be subject to separate collection and correct disposal.

### 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.

### STORAGE

Remove the batteries when instrument is not in use for a prolonged period of time. Do not expose to high temperatures or humidity. After a period of storage in extreme conditions exceeding the limits mentioned in the General Specifications section, allow the instrument to return to normal operating conditions before using it.

## FEATURES

- 600V AC/DC
- 200A AC
- Resistance 2000Ω
- Audible continuity
- LRA Inrush
- Sliding clamp
- Auto hold
- Auto ranging
- Backlight
- Low battery indicator
- Auto power off
- Permanent test leads
- Latches for battery compartment
- Storage for test leads
- Auto-on

## GENERAL SPECIFICATIONS

- Operating Temperature: 32° to 104°F (0° to 40°C)
- Storage Temperature 14° to 122°F (-10° to 50°C)
- Operating Humidity: <75%
- Operating Altitude: 6,562ft (2,000m)
- Pollution Degree: 2
- Display: 3 1/2" 2000 count
- Backlight: Yes
- Refresh Rate: 3/sec
- Over-range: "OL" is displayed
- Dimensions: 8.66" X 2.72" X 1.56"
- Item Weight: 12 oz
- Calibration: Recommended annually
- CAT Rating: CATIV 600V
- Certifications: cETLus 3rd Edition, CATIV 600V, CE Conformity, IP41, RoHS Compliant, 6' Drop Protection, IEC 61010-1 3rd Edition
- Battery Type: 1.5V (AAA) X 2
- Accuracy: ± (% of reading + # of least significant digits)

## IMPORTANT SAFETY WARNINGS

### WARNING

Read entire Safety Notes section regarding potential hazard and proper instructions before using this meter. 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

To ensure safe operation and service of the tester, follow these instructions. Failure to observe these warnings can result in severe injury or death.

### WARNING

- Before each use, verify meter operation by measuring a known voltage or current.
- Never use the meter on a circuit with voltages that exceed the category based rating of this meter.
- Do not use this meter during electrical storms or in wet weather.
- Do not use the meter or test leads if they appear damaged.
- Keep fingers away from the metal probe contact when making measurements. Always grip the leads behind the finger guards molded into the probe.
- Use caution when working with voltages above 60V DC or 25V AC RMS. Such voltages pose shock hazards.
- To avoid false readings that can lead to electrical shock, replace batteries if a low battery indicator appears.
- Unless measuring voltage or current, shut off and lockout power before measuring resistance or capacitance.
- Always adhere to national and local safety codes. Use proper personal protective equipment (PPE) to prevent shock and arc blast injury where hazardous live conductors are exposed.
- 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 the circuit.
- In the event of electrical shock, ALWAYS bring the victim to the emergency room for evaluation, regardless of victim's apparent recovery. Electrical shock can cause unstable heart rhythms that may need medical attention.
- If any of the following occur during testing, turn off the power source to the circuit being tested: arcing, flame, smoke, extreme heat, smell of burning materials or discoloration/melting of components.

### WARNING

Higher voltages and currents require greater awareness of physical safety hazards. Set meter to desired function prior to applying test leads to a live circuit. If an erroneous reading is observed: disconnect test leads immediately, recheck all settings and connections before testing again.

### WARNING

Do not change function on the meter while test leads are connected to a live circuit.

### WARNING

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 use of personal protective equipment that includes safety glasses, gloves and flame resistant clothing.

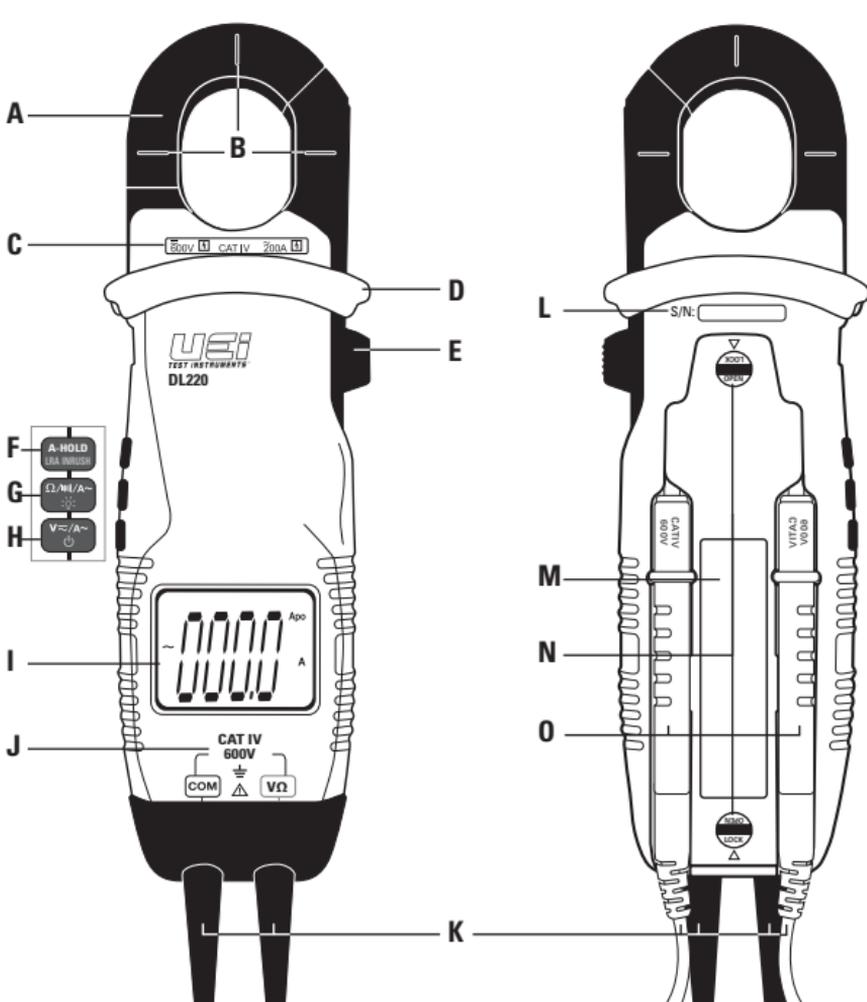
## SYMBOLS

~	AC (Alternating current)	≡	DC (Direct current)
—	Negative DC	⎓	AC/DC
OL	Overload: Range Exceeded	A-HOLD	Auto-Hold/Capture Value
+	Low Battery	V	Voltage
A	Amperage	Ω	Ohms/Resistance
( )	Continuity	⚡	High Voltage Indication
⚠	Warning or Caution	⏏	Ground
⚠	Dangerous Levels	□	Double Insulation (Protection to Class II)
⚠	Safe for disconnect from live conductors		

## CATEGORY DEFINITIONS

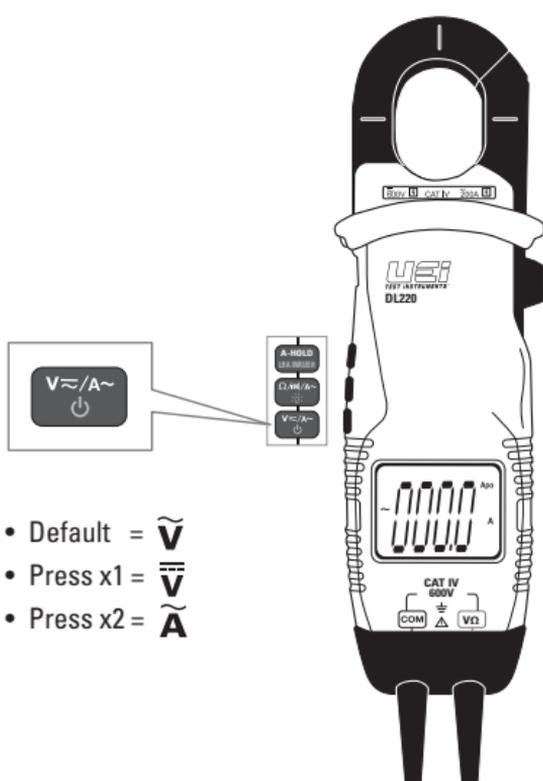
Measurement Category	Short-Circuit (typical) kA <sup>a</sup>	Location in the building installation
II	< 10	Circuits connected to mains socket outlets and similar points in the MAINS installation
III	< 50	Mains distributions parts of the building
IV	> 50	Source of the mains installation in the building

## OVERVIEW



- A. Clamp:** Measure inductive AC current. Opens to 0.76" (19.10mm).
- B. Conductor Alignment Marks:** Used to aid 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.
- C. Category Max Indicator:** Maximum CAT Rating for Clamp.
- D. Hand Guide:** Used as a point of reference for the operator's safety.
- E. Clamp Lever:** Opens and closes current clamp. Do not allow fingers or objects to become pinched in the clamp as it closes.
- ⚠ CAUTION: When sliding the clamp lever, be careful not to inadvertently press any button when gripping the meter. That will place the meter in a mode that was not desired.
- F. A-Hold/LRA Inrush Button:**
- Auto-Hold: Press to enable Auto-Hold. Press again to return to live readings.
  - Captures present value displayed. When a new stable value is detected, with more than 5% difference than displayed value, the meter displays the new value.
  - Press and hold the **A-Hold** button when meter is in Auto-Hold mode to disable Auto power off mode. Press and hold again to enable Auto power off mode.
  - When the meter is in Auto-Hold mode, there will be an audible beep while the meter captures a new, stable value.
  - LRA Inrush: Press and hold to enable LRA Inrush mode. Press and hold to return to live readings.
  - Used for measuring compressor motor start current.
  - When powering on the meter using this button, the meter will default to last mode used when meter was powered off.
- G. Ohms/Continuity/Backlight Button:**
- Ohms: Press to enter Ohms measurement mode.
  - Continuity: Press again to enter Continuity measurement mode.
  - AC Amps: Press again to enter AC Amps measurement mode.
  - Backlight: Press and hold to turn on backlight. Press and hold again to turn off backlight.
  - Backlight duration is 1 minute.
- H. AC/DC Volts/Power Button:**
- AC Volts: Press to enter AC Volts measurement mode.
  - DC Volts: Press again to enter DC Volts measurement mode.
  - AC Amps: Press again to enter AC Amps measurement mode.
  - Press and hold to power off meter.
- I. Display:** High contrast backlit display.
- J. Category Max Indicator:** Maximum CAT Rating for test lead connections to meter.
- NOTE:** Please see Test Lead Notes section of this manual for specific CAT Rating of the test leads.
- K. Test Leads:** Permanent test leads.
- Multifunction test lead used for measuring: AC or DC volts, resistance and continuity.
- L. Serial Number**
- M. Battery Cover:** Easy access for replacing batteries.
- N. Battery Cover Latches:** Convenient, quick opening.
- O. Test Lead Holders:** For storing test leads when not in use.

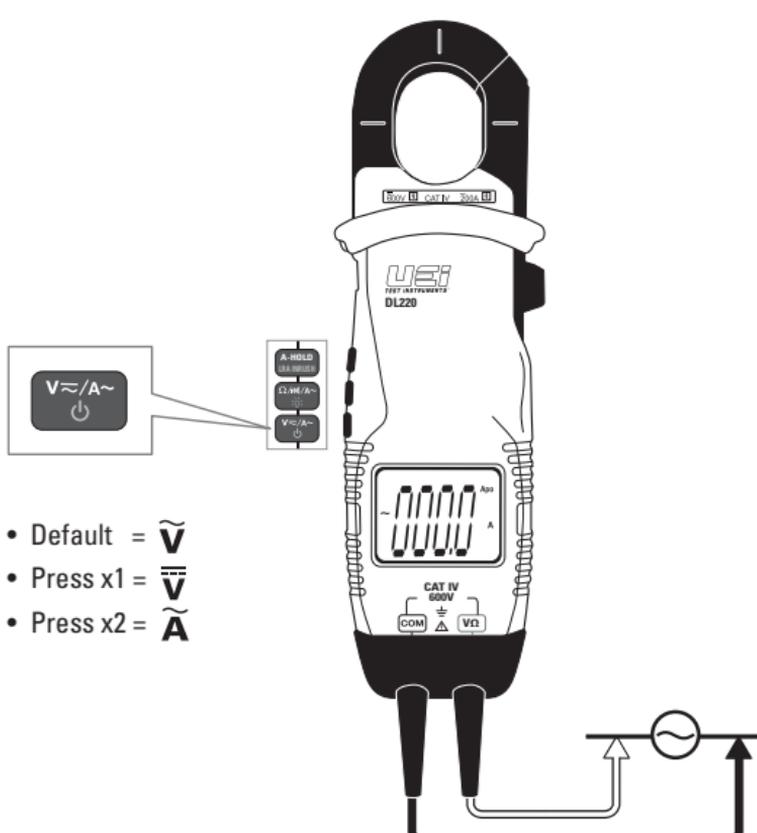
## Auto On/Auto power off (APO)



- Default =  $\tilde{V}$
- Press x1 =  $\bar{\tilde{V}}$
- Press x2 =  $\tilde{A}$

- Press any button to power on meter.
- Press and hold **AC/DC Volts/Power** button to power off meter.
- Auto power off (Apo) after 10 minutes of inactivity. (5 minutes in resistance mode)
- Press and hold the AHold button when meter is in Hold mode to disable Auto power off mode. Press and hold again to enable Auto power off mode.

## AC/DC Voltage: <600V AC/DC



- Default =  $\tilde{V}$
- Press x1 =  $\bar{\tilde{V}}$
- Press x2 =  $\tilde{A}$

### ⚠ WARNING

- Do not attempt to measure more than 600V AC/DC.
- Keep hands below line when measuring high current levels.
- Do not exceed 600V DC or AC-RMS on either the common or multifunction test leads as measured from earth ground.

Select AC or DC Voltage.

Features:



AC Volts

Ranges	Resolution	Accuracy	Overload Protection
1V to 199.9V	0.1V	±(1.5% + 5 dgts)	600V
200V to 600V	1V		

DC Volts

Ranges	Resolution	Accuracy	Overload Protection
1V to 19.9V	0.01V	±(1.5% + 3 dgts)	600V
20V to 199.9V	0.1V		
200V to 600V	1V		

Minimum measurement AC mV: 500mV/DC mV:40mV

Response time (input; AC 100V): 1 sec

Max displayed value: 660V AC/DC

High warning symbol input voltage > AC30V/ > DC30V

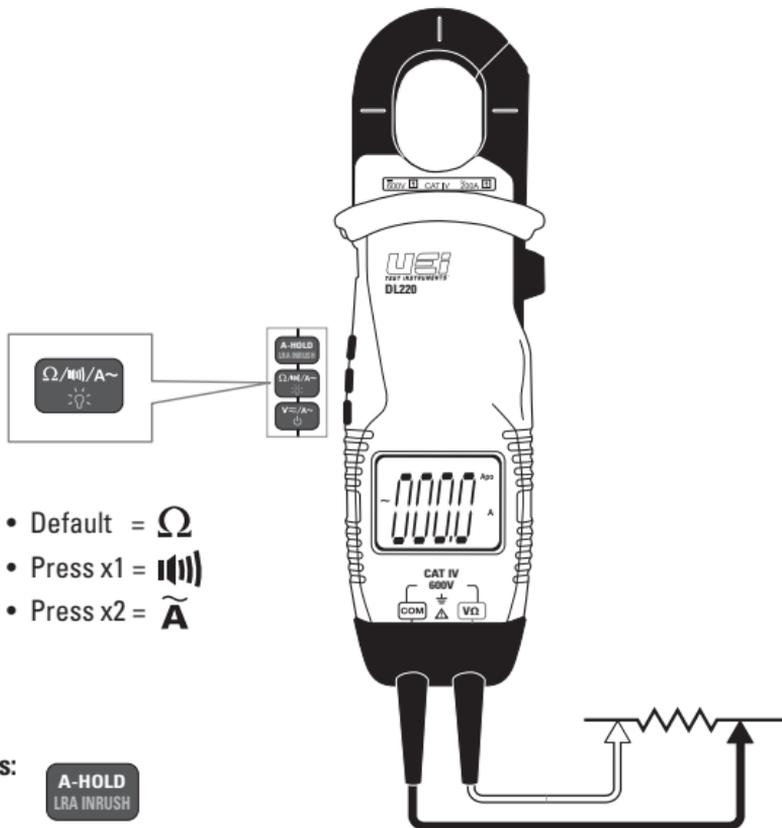
Meter beeps input voltage > AC 601V/ > DC 601V

Input impedance: 10MΩ

Frequency Range: sine wave: 45Hz to 400Hz

Overload protection: 600V AC RMS or 600V DC

## Resistance: <2000Ω



- Default =  $\Omega$
- Press x1 =  $\infty$
- Press x2 =  $\tilde{A}$

Features:



### ⚠ WARNING

- Do not measure resistance on a live circuit.

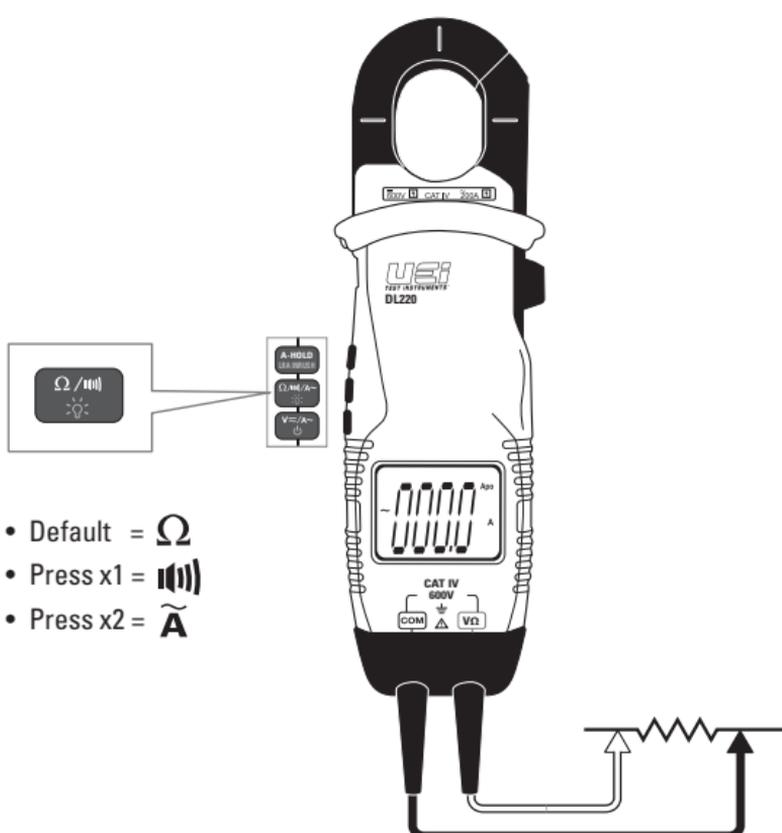
Resistance

Ranges	Resolution	Accuracy	Overload Protection
200Ω to 2000Ω	0.1Ω to 1Ω	±(0.8% + 4 dgts)	600V

Max displayed value: 2200Ω

Overload protection: 600V AC RMS or 600V DC

## Continuity



- Default =  $\Omega$
- Press x1 =  $\text{|||}$
- Press x2 =  $\tilde{\text{A}}$

- Buzzer sounds at less than  $40\Omega$ .

### ⚠ WARNING

- Do not measure resistance on a live circuit.

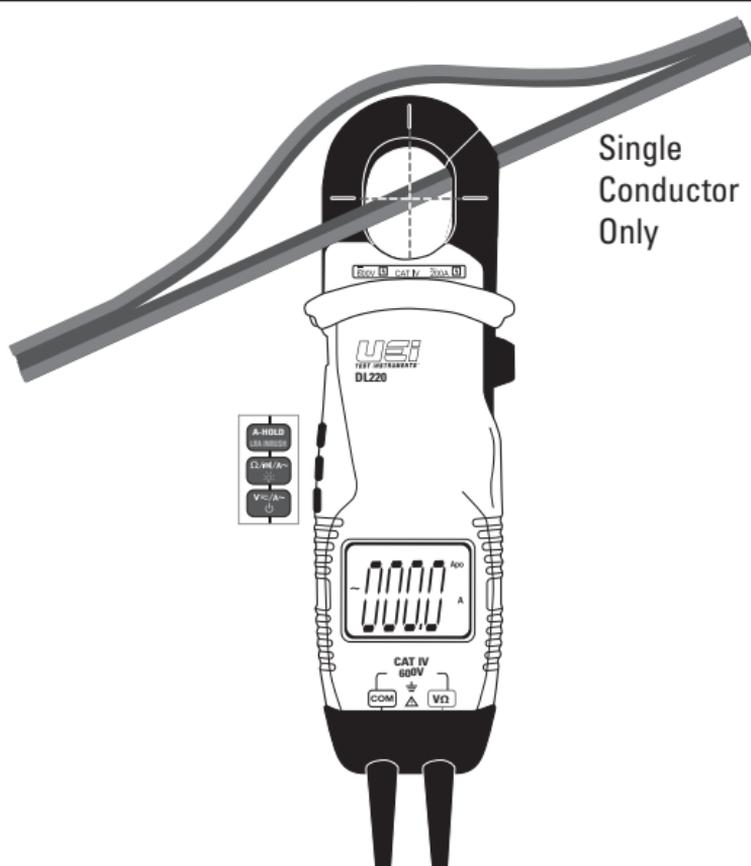
### Features:

**A-HOLD**  
LRA INRUSH

### Continuity

Audible threshold	Response time	Overload Protection
Approx : $< 40\Omega$	50ms	600V

## AC Amps: $<200\text{A}$



Single  
Conductor  
Only

- Center wire in conductor alignment marks for best accuracy.
- Opposing currents cancel (*use line-splitter when necessary*).

### ⚠ WARNING

- Keep hands below guard when measuring high current levels.
- Do not attempt to measure more than  $200\text{A AC}$ .

### Features:

**A-HOLD**  
LRA INRUSH

### AC Amps

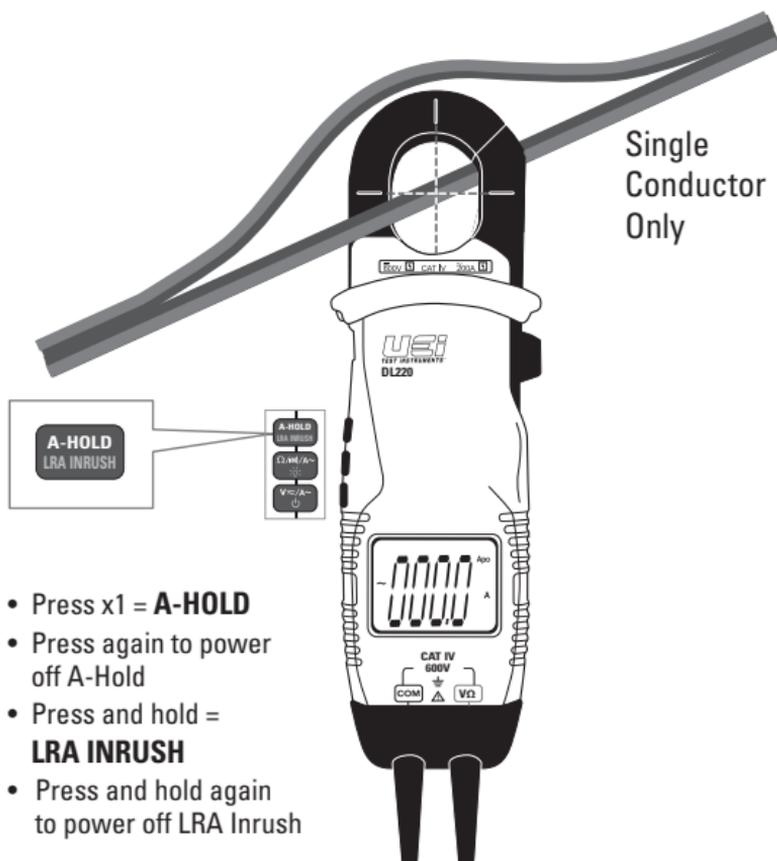
Ranges	Resolution	Accuracy	Overload Protection
1A to 200A	0.1A	$\pm(2.0\% + 5 \text{ dgts})$	600V

Frequency Range: sine wave: 45Hz to 400Hz

Maximum Displayed value: AC220A

Minimum Displayed value: AC 500mA

## LRA Inrush



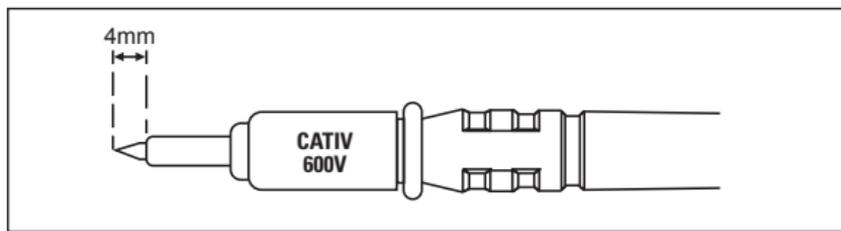
Single  
Conductor  
Only

- Press x1 = **A-HOLD**
- Press again to power off A-Hold
- Press and hold = **LRA INRUSH**
- Press and hold again to power off LRA Inrush

- The meter must be in AC Amps mode first to be placed into LRA measurement mode.
- The UEi LRA Inrush is programmed to properly capture the starting current for compressor motors.
- Press and hold **A-Hold/LRA Inrush** button – INRUSH will now be shown on the display.
- Activate compressor and read value on display.
- Press and hold **A-Hold/LRA Inrush** button to return to live readings.

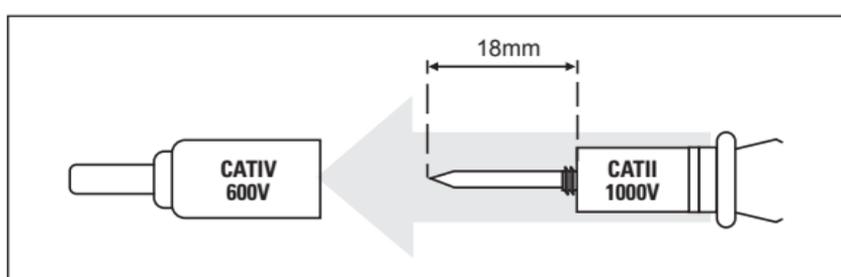
## Test Lead Notes

### CatIV 600V Measurement Locations



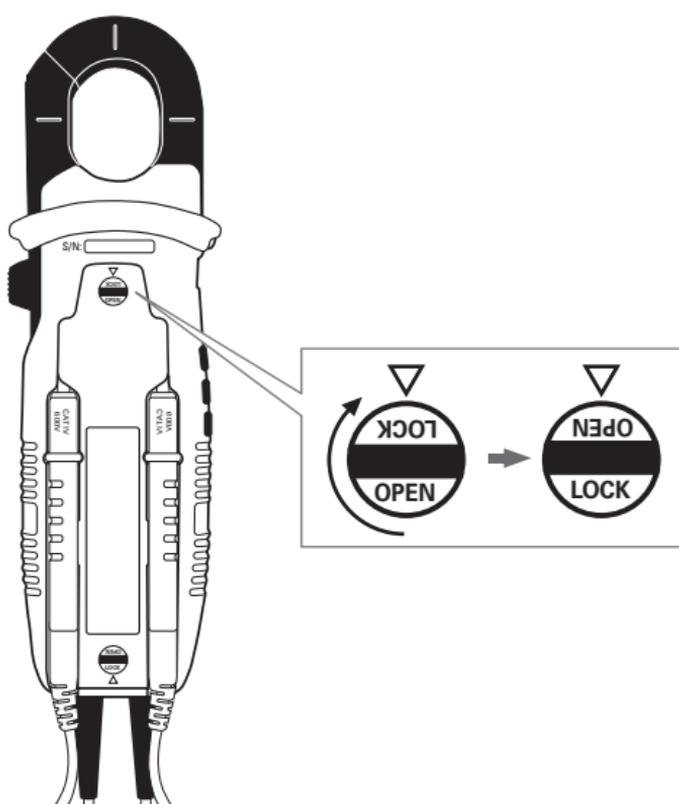
- Ensure the test lead shield is pressed firmly in place. Failure to use the CATIV shield increases arc-flash risk.

### CATII 1000V Measurement Locations



- CATIV shields may be removed for CATII locations. This will allow testing on recessed conductors such as standard wall outlets. Take care not to lose the shields

## Battery Replacement



- **+** **-** When the batteries are too low for safe operation, the Low Battery indicator will display.
- Rotate latches until Unlock symbols are aligned with arrows. Remove battery cover.
- Replace the old batteries with 2 new (AAA) batteries.
- Replace the battery cover
- Rotate latches until the lock symbols are aligned with arrows.