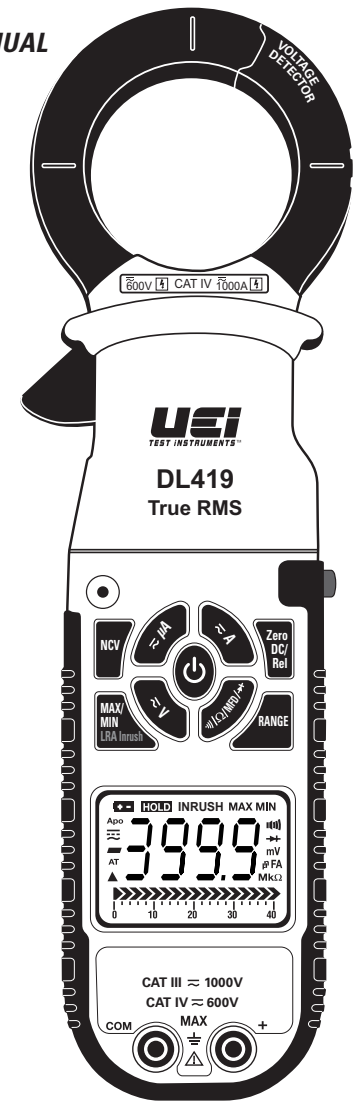
DL419

TEST iNSTRUMENTS™

True RMS Digital Clamp-On Multimeter

INSTRUCTION MANUAL

ENGLISH



Intertek

RoHS Compliant

WARRANTY

The DL419 is warranted to be free from defects in materials and workmanship for a period of two year 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.

BATTERY REPLACEMENT

- When +− indicator is displayed on the LCD, batteries must be replaced.
- Remove the back screw and replace 2 x AAA batteries.

CLEANING

Turn instrument off and disconnect test leads. Clean the instrument by using a damp cloth. Do not use abrasive cleaners or solvents.

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 Specifications section, allow the instrument to return to normal operating conditions before using it.

FUNCTIONS

- **AC/DC Voltage** ≂ V
- **AC/DC Current** ≂ A
- **AC/DC MicroAmps** ≂ µA
- **Audible continuity**
- **Resistance** Ω
- **Diode test**
- **Capacitance**

FEATURES

- **True RMS**
- **LRA Inrush current measurement**
- **Data hold mode HOLD**
- **MIN/MAX (All ranges except Capacitance)** ..... **Min/Max**
- **Rel/DC A Zero mode** ..... **Rel/Zero**
- **Back-lit display.**
- **Non-contact voltage detect** ..... **NCV**
- **Magnetic mount**
- **Autoranging measurements with manual ranging capability**
- **Bar Graph**
  a. The bar graph shows an approximate analog representation of a measurement.
  b. The bar graph responds much faster than the digital display.
  c. The scale of the bar graph is zero to the maximum reading of the selected range.
- **Auto-Power-Off:** After 30 minutes of non-use
- **Low battery:** +− is displayed if battery voltage drops below operating voltage.

GENERAL SPECIFICATIONS

- **Altitude:** Operating - up to 2000m (6,561 ft.)
  Storage - 10,000m (32,808 ft.)
- **Humidity:** 80% max
- **Operating Temperature:** 32°F to 104°F (0°C to 40°C) at < 75% R.H
- **Storage Temperature:** -4°F to 140°F (-20°C to 60°C) at < 80% R.H
- **Relative humidity:** 0% to 80% at 32°F to 95°F (0°C to 35°C),
  0% to 70% at 32°F to 131°F (0°C to 55°C)
- **Temperature Coefficient:** Nominal 0.1 x (Specified accuracy) / °C
  (<18°C or >28°C ; <64°F or >82°F)
- **Pollution degree:** 2
- **Display:** 3-3/4 digits 4000 counts single LCD display with 20 segments bar graph
- **Refresh Rate:** 3 times/sec
- **Overrange:** "OL" is displayed
- **Polarity:** Automatic(no indication for positive polarity) ; Minus(-) sign for negative polarity
- **Dimensions:** 10.6" x2.5" x 1.5"
- **Weight:** 16.8oz.
- **Calibration:** Accurate for one year
- **CAT Rating:** CAT IV 600V, CAT III 1000V
- **Certifications:** ETL & C-ETL Listed IEC61010-2-032
- **Battery type:** 2 x 1.5V AAA or LR03
- **Silicon Test Lead:** IEC61010-2-031
- **Accuracy:** ± (% of reading + # of least significant digits)

⚠ WARNINGS

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

- 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 the meter during electrical storms, or in wet weather.
- Do not use the meter or test leads if they appear to be damaged.
- Ensure meter leads are fully seated, and keep fingers away from the metal probe contacts when making measurements.
- Do not open the meter to replace batteries while the probes are connected.
- Use caution when working with voltages above 60V DC, or 25V AC RMS. Such voltages pose a shock hazard.
- 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 lock out power before measuring resistance or capacitance.
- Always adhere to local and national safety codes. Use Personal Protective Equipment (PPE) to prevent shock and arc blast injury.

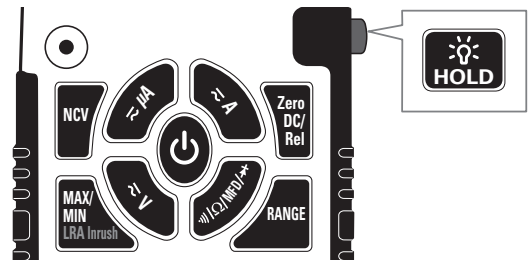
SYMBOLS USED ON LCD

~	AC Measurement	⎓	DC Measurement
▬	Negative DC Value	AT	Auto Range Active
O.L.	Overload: Range Exceeded	Apo	Auto Power-Off Active
+−	Low Battery	HOLD	Hold Active
MIN	Minimum Reading	MAX	Maximum Reading
▲	Relative / Zero Mode	A	Current in Amps
V	Voltage Measurement	⏩	Diode Test
Ω	Resistance in Ohms	k	Kilo (x 10^3)
µA	MicroAmps	M	Mega (x 10^6)
m	Milli (x 10^{-3})	nF/µF	Nanofarad/Microfarad

INTERNATIONAL SYMBOLS

≂	DC/AC Voltage or Current	⧈	Double Insulated Class II
⏚	Ground	⚡	Safe for disconnect from live conductors
~	AC Source		

NAVIGATION



⏻	• Press briefly to turn the meter on • Press and hold "HOLD" while turning on to disable auto power off. • Press and hold to turn the meter off • Default is AC Volts
The new user interface allows direct access from any mode.	
≂ µA	• Press to select DC µA measurement mode. • Press a second time for AC µA.
A	• Press to select AC Amps. • Press a second time for DC Amps.
⏩	• Press to select continuity. • Press a second time for resistance. • Press a third time for capacitance and a fourth time for diode.
V	• Press to select AC Volts. • Press again to select DC Volts.
NCV	• Non-Contact Voltage Detection key is used to detect power with a sensor located at the tip of the clamp head and indicates positive response with an audible alarm and visual LED indicator light just above the "NCV" button. • Do not use non-contact voltage detector to determine if there is current in the wire. Detection operation could be affected by socket design, insulation thickness, type and other factors. • Voltage indicator light may also light when voltage is present on the meter's input jack or from external interference sources such as motors, flashlights etc.
MAX/ MIN	• Press to enter Max / Min mode; the largest and smallest values will be saved while in this mode. • Press repeatedly to alternate between the maximum and minimum readings. • Press for 2 seconds to return to live reading and clear the stored maximum and minimum values. **Note**: *Select range prior to selecting Min/Max to capture large values*
RANGE	• Press repeatedly to cycle through manual ranges. • Press for 2 seconds to return to auto ranging mode. • AT is displayed on LCD only during auto ranging mode. **Note:** *Select range prior to Min/Max for best results.* 0.000 x1 x1
Zero DC/ Rel	• Press to zero any offset in Volts AC/DC, DC µA, Amps AC/DC. ◊ Used to monitor change from the present displayed value • Required during DC Amp measurement to establish a zero level ⚠ **DO NOT use Zero DC/Rel mode at voltages greater than 1000V.**
HOLD	• Press to hold the reading on the display. Press again to return to live reading. • Press and hold "work light" key for 2 seconds to turn on. Press and hold again to turn off.

accessories shall be subject to a separate collection and correct disposal.

PLEASE RECYCLE

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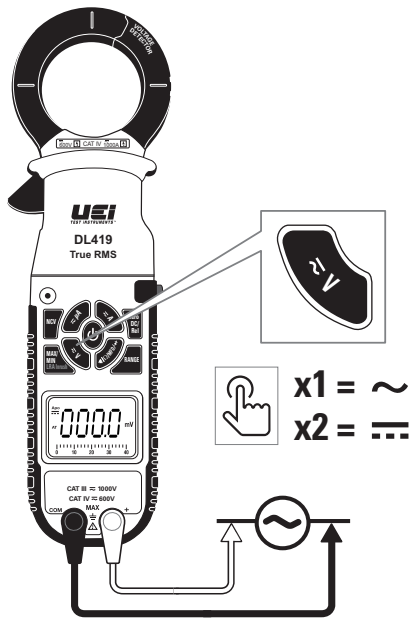
AC / DC Voltage: < 1000V



⚠ **Use CAT III rated leads or higher.**
Do not attempt to measure more than 1000V.

⚠ **Keep hands below line when measuring high current levels.**

- Select AC or DC voltage source.

Features: NCV, Rel, MAX/MIN, RANGE, HOLD

DC Voltage Measurement

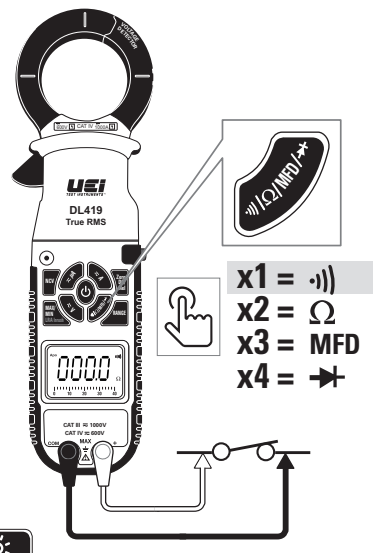
Range	Resolution	Accuracy	Overload Protection
400mV	0.1mV	± (0.5% + 4 digits)	1000V
4V	1mV		
40V	10mV		
400V	100mV		
1000V	1V	± (0.8% + 10 digits)	

AC Voltage Measurement

Range	Resolution	Accuracy	Overload Protection
400mV	0.1mV	± (2.0% + 5 digits)	1000V RMS
4V	1mV		
40V	10mV		
400V	100mV		
1000V	1V		

True RMS: 45Hz to 400Hz

Continuity



- Display shows resistance.
- Buzzer sounds if less than 40Ω.

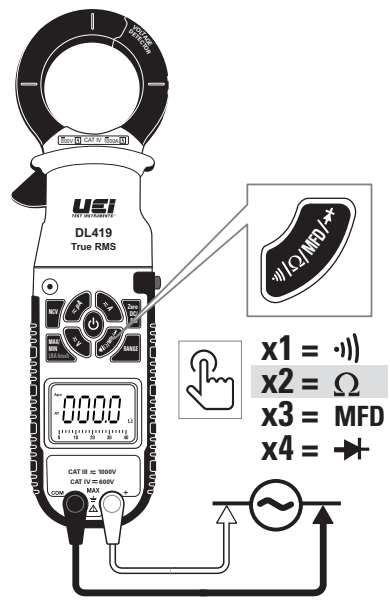
Features: NCV, MAX/MIN, HOLD

Audible Continuity

Overload Protection	Open Circuit Voltage
600V RMS	< 0.44V

Threshold Approx : < 40Ω

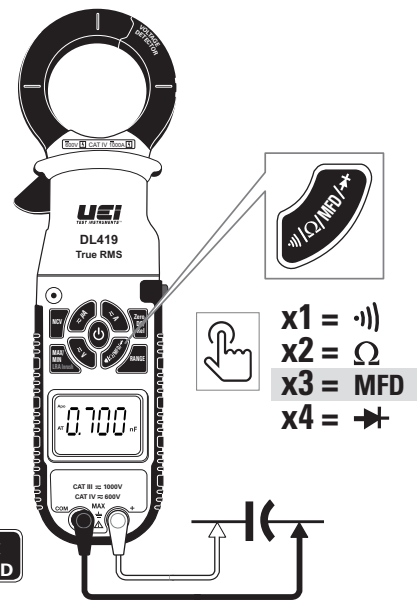
Resistance: < 40MΩ



- ⚠ **Do not** measure resistance on a live circuit.

Range	Resolution	Accuracy	Overload Protection
400Ω	0.1Ω	± (1.0% + 4 digits)	600V RMS
4kΩ	1Ω		
40kΩ	10Ω		
400kΩ	100Ω		
4MΩ	1kΩ		
40MΩ	10kΩ	± (2.0% + 4 digits)	

Capacitance (MFD)

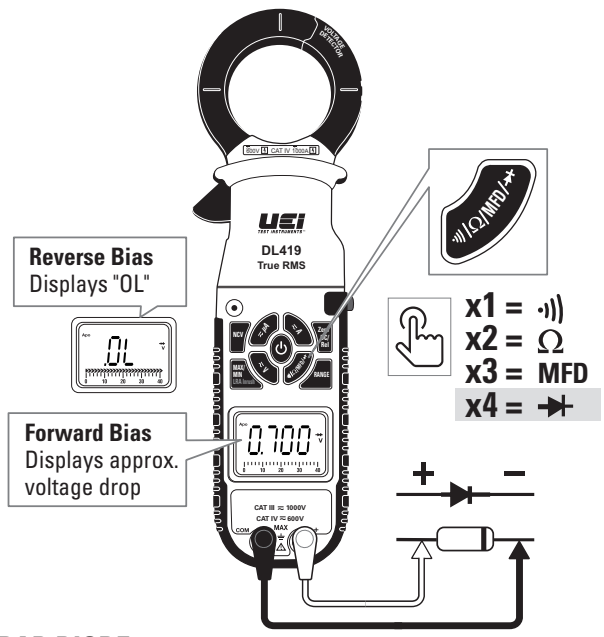


Features: NCV, HOLD

Range	Resolution	Accuracy	Overload Protection
40.00nF	0.01nF	± (3.5% + 6 digits)	600V RMS
400.0nF	0.1nF		
4.000uF	0.001µF		
40.00uF	0.01µF		
400.0uF	0.1µF		
2000uF	1µF		

Diode

GOOD DIODE



BAD DIODE

Open Diode
Displays "OL"
Both directions

or

'0' Both directions

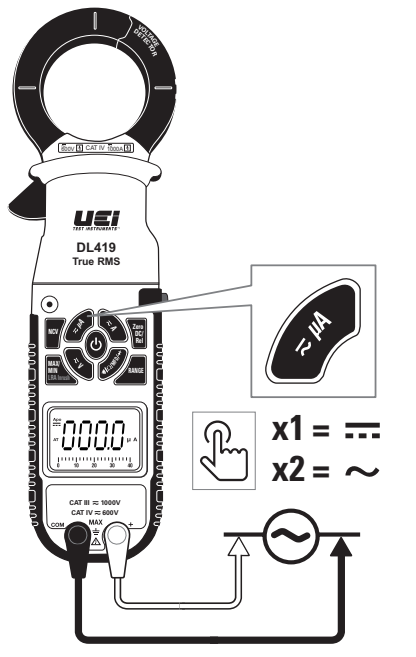
- Forward voltage drop if forward biased.
- "O.L." if reverse biased.

Features: NCV, MAX/MIN, HOLD

Diode Test

Range	Open Circuit Voltage	Test Current (Typical)	Overload Protection
2.0V	< 1.6V DC	0.25mA	600V RMS

AC/DC Low Amps: < 2000µA



Features: NCV, Rel, MAX/MIN, RANGE, HOLD

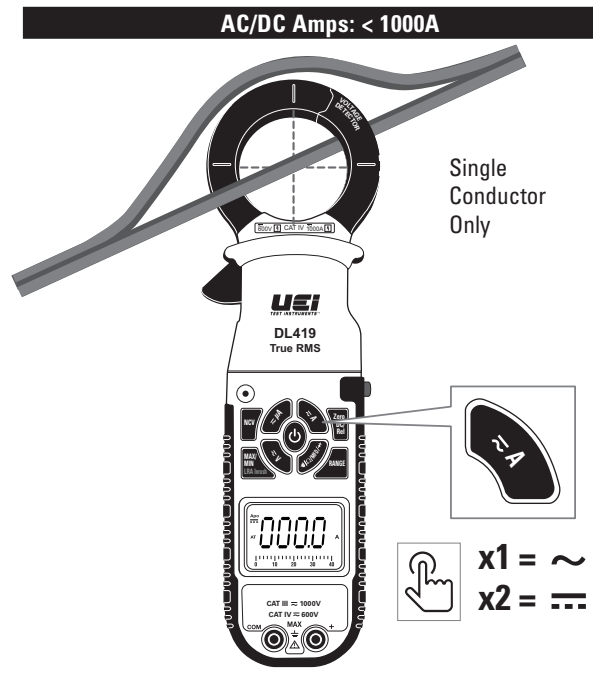
Range	Resolution	Accuracy	Overload Protection
400µA	0.1µA	± (1.2% + 3 digits)	2000µA / 600V RMS
2000µA	1µA		

AC Low Amps Measurement -Test lead input

Range	Resolution	Accuracy	Overload Protection
400µA	0.1µA	± (2.0% + 5 digits)	2000µA / 600V RMS
2000µA	1µA	± (1.5% + 5 digits)	

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

AC/DC Amps: < 1000A



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

Features: NCV, Zero DC/Rel, MAX/MIN LRA Inrush, RANGE, HOLD

DC Amps Measurement

Range	Resolution	Accuracy	Overload Protection
40A	0.01A	± (2.5% + 15 digits)	1000V RMS
400A	0.1A	± (1.5% + 8 digits)	
1000A	1A	± (1.5% + 8 digits)	

AC Amps Measurement

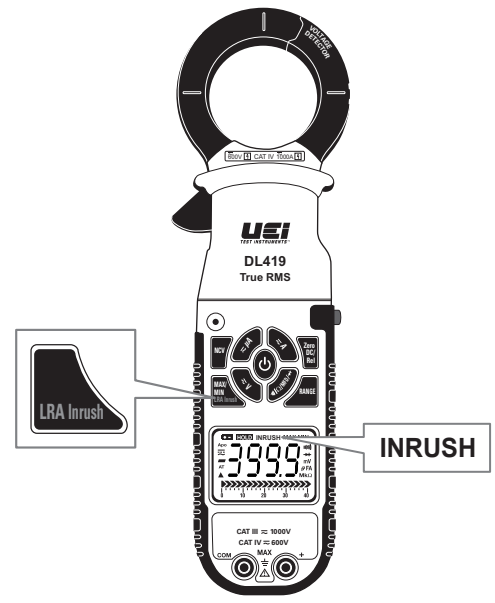
Range	Resolution	Accuracy	Overload Protection
40A	0.01A	± (2.9% + 15 digits)	1000V RMS
400A	0.1A	± (1.9% + 8 digits)	
1000A	1A	± (1.9% + 8 digits)	

True RMS: 45Hz to 400Hz

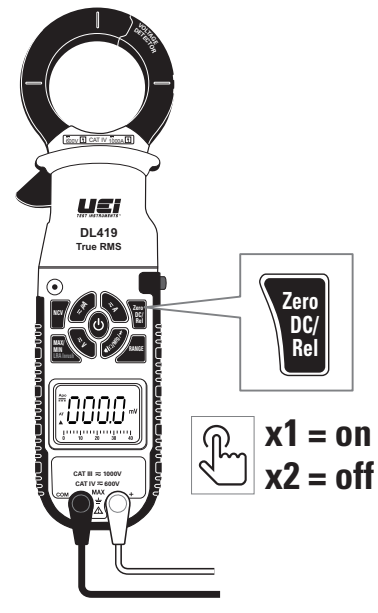
LRA Inrush

The UEi LRA Inrush is programmed to properly capture the starting current for compressor motors.

- Select AC Amps
- Select the range capable of capturing the maximum value
- Press and hold LRA Inrush for two seconds – INRUSH will now be shown on the screen
- Activate compressor and read value on the display
- Press and hold LRA Inrush for two seconds to exit



Zero DC Amps / Rel



- Press to zero any offset in Volts AC/DC, DC µA, Amps AC/DC.

Features: MAX/MIN LRA Inrush, HOLD