ENGLISH

CL210

INSTRUCTION MANUAL

400A AC Auto-Ranging Digital Clamp Meter

65° – 83°F
18° – 28°C

- AUTO-RANGING
- DATA HOLD
- RANGE HOLD
- TEMPERATURE
- AUDIBLE CONTINUITY

600V ≂ ⎓
400A ~
20MΩ

1 m

ESPAÑOL pg. 15

FRANÇAIS pg. 29

KLEIN TOOLS®

For Professionals… Since 1857™

Intertek 5001748

CAT III 600V

GENERAL SPECIFICATIONS

Klein Tools CL210 is an automatically ranging digital clamp-meter that measures AC current via the clamp, AC/DC voltage, resistance and continuity via test-leads, and temperature via a thermocouple probe.

- **Operating Altitude:** 6562 ft. (2000m)
- **Relative Humidity:** <95% non-condensing
- **Operating Temp:** 32° to 122°F (0° to 50°C)
- **Storage Temp:** 14° to 122°F (-10° to 50°C)
- **Accuracy:** Values stated at 65° to 83°F (18° to 28°C)
- **Temp Coefficient:** 0.1 x (Quoted Accuracy) per °C above 28°C or below 18°C, corrections are required when ambient working temp is outside of Accuracy Temp range
- **Dimensions:** 8.66" x 3.03" x 1.61" (220 x 77 x 41 mm)
- **Weight:** 9.88 oz. (280 g) including batteries
- **Calibration:** Accurate for one year
- **Standards:** Conforms to: UL 61010-1, UL 61010-2-032, UL 61010-2-033.

  Certified to: CAN/CSA C22.2 NO. 61010-1, 61010-2-032, 61010-2-033, IEC EN 61010-1, 61010-2-032, 61010-2-033, IEC EN 61326-1
- **Pollution degree:** 2
- **Accuracy:** ± (% of reading + # of least significant digits)
- **Drop Protection:** 3.3 ft. (1m)
- **Safety Rating:** CATIII 600V, Class 2, Double insulation
- **Electromagnetic Environment:** IEC EN 61326-1. This equipment meets requirements for use in basic and controlled electromagnetic environments like residential properties, business premises, and light-industrial locations.

Specifications subject to change.

ELECTRICAL SPECIFICATIONS

Function	Range	Resolution	Accuracy
AC Voltage (V AC)	200.0mV	0.1mV	±(2.5% + 10 digits)
	2.000V	1mV	±(2.0% + 5 digits)
	20.00V	10mV	
	200.0V	100mV	
	600V	1V	
DC Voltage (V DC)	200.0mV	0.1mV	±(1.0% + 8 digits)
	2.000V	1mV	±(1.0% + 3 digits)
	20.00V	10mV	
	200.0V	100mV	
	600V	1V	

Input Impedance: 10MΩ
Frequency Range: 45 to 400Hz
Maximum Input: 600V AC RMS or 600V DC

AC Current (A AC)	2.000A	1mA	±(2.5% + 30 digits)
	20.00A	10mA	±(2.0% + 10 digits)
	200.0A	100mA	
	400A	1A	

Frequency Range: 50 to 60Hz

Resistance	200.0Ω	0.1Ω	±(1.2% + 5 digits)
	2.000KΩ	1Ω	±(1.2% + 3 digits)
	20.00kΩ	10Ω	
	200.0kΩ	100Ω	
	2.000MΩ	1kΩ	
	20.00MΩ	10kΩ	±(2.0% + 5 digits)

Maximum Input: 600V AC RMS or 600V DC

Temperature	-40° to 1832°F	1°F	≤0°F ±(2.8% + 12 digits) >0°F ±(2.8% + 6 digits)
	-40° to 1000°C	1°C	±(2.8% + 6 digits)

OTHER MEASUREMENT APPLICATIONS

Maximum Input: *600V AC RMS or 600V DC*

- **Continuity Check:** Audible signal <10Ω, max current 1.5mA
- **Sampling Frequency:** 3 samples per second
- **Auto Power off:** After ~15 minutes of inactivity
- **Overload:** "OL" indicated on display
- **Polarity:** "-" on display indicates negative polarity
- **Display:** 3 ½ digit, 2000 Count LCD

⚠ WARNINGS

To ensure safe operation and service of the meter, 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.
- Use only with CAT III or CAT IV rated test leads.
- 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 25V AC RMS or 60V DC. Such voltages pose a shock hazard.
- To avoid false readings that can lead to electrical shock, replace batteries when a low battery indicator appears.
- Do not attempt to measure resistance or continuity on a live circuit.
- Always adhere to local and national safety codes. Use personal protective equipment to prevent shock and arc blast injury where hazardous live conductors are exposed.

SYMBOLS ON METER

~	AC (Alternating Current)	⎓	DC (Direct Current)
Ω	Resistance (in Ohms)	•)))	Audible Continuity
⧈	Double Insulated Class II	⏚	Ground
⚠	Warning or Caution	⚡	Risk of Electrical Shock
V	Voltage (Volts)	A	Amperage (Amps)
°F/°C	Temperature (Fahrenheit / Celsius)		

SYMBOLS ON LCD

AC	AC (Alternating Current)	DC	DC (Direct Current)
−	Negative Reading	HOLD	Data Hold
AUTO	Auto Ranging	MAX	Maximum Value Hold
▭	Low Battery	•)))	Audible Continuity
°F	Degrees (Fahrenheit)	°C	Degrees (Celsius)
M	Mega (value x 10^6)	k	kilo (value x 10^3)
m	milli (value x 10^{-3})	V	Volts
A	Amps	Ω	Ohms

FEATURE DETAILS

NOTE: There are no user-serviceable parts inside meter.

1. 2000 count LCD display
2. Function selector switch
3. Clamp
4. "COM" jack
5. "VΩ" jack
6. Backlight button
7. "RANGE" button
8. "MAX" (Maximum) button
9. Data Hold button
10. Clamp trigger (press to open clamp)
11. Arrow markings
12. "SELECT" button

FUNCTION BUTTONS

ON/OFF

To power ON the meter, rotate the Function Selector switch (2) from the OFF setting to any measurement setting. To power OFF the meter, rotate the Function Selector switch (2) to the OFF setting. By default, the meter will automatically power OFF after 15 minutes of inactivity. If the meter automatically powers OFF while in a measurement setting, rotate Function Selector (2) switch to any other setting (excluding the OFF setting) to power ON the meter.

"SELECT" BUTTON (FOR SECONDARY FUNCTIONS)

The "SELECT" button (12) activates the secondary function for the temperature setting, switching between °F and °C. The default setting (°F) is printed on the meter in white; the secondary setting (°C) is printed on the meter in orange.

BACKLIGHT

Press Backlight button symbol (6) to turn ON or OFF the backlight. The backlight does not automatically power OFF.

RANGE

The meter defaults to auto-ranging mode AUTO. This mode automatically determines the most appropriate measurement range for the testing that is being conducted. To manually force the meter to measure in a different range, use the "RANGE" button (7).

1. Press the "RANGE" button (7) to manually select measurement range (AUTO is deactivated on the LCD). Repeatedly press the "RANGE" button (7) to cycle through the available ranges, stopping once the desired range is reached.
2. To return to auto-ranging mode, press and hold the "RANGE" button (7) for more than one second (AUTO is reactivated).

MAX

When the "MAX" button (8) is pressed, the meter keeps track of the Maximum value as the meter continues to take samples.

1. When measuring, press "MAX" button (8) to display the maximum value. If a new maximum occurs, the display updates with that new value.
2. Press "MAX" button (8) again to return to normal measuring mode.

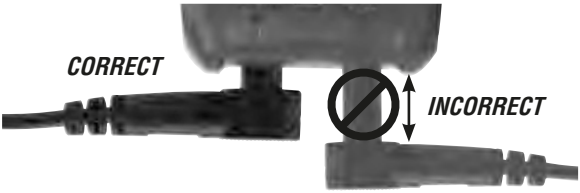
DATA HOLD

Press the Data Hold button (9) to hold the current measurement on the display. Press again to return to live measuring mode.

OPERATING INSTRUCTIONS

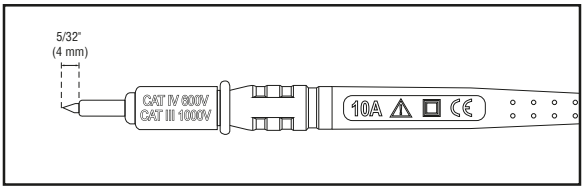
CONNECTING TEST LEADS

Do not test if leads are improperly seated. Results could cause intermittent display readings. To ensure proper connection, firmly press leads into the input jack completely.



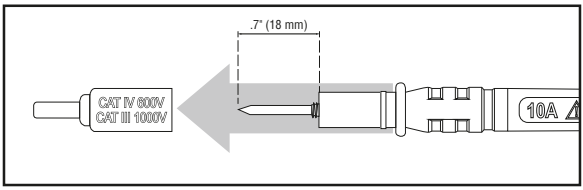
TESTING IN CAT III / CAT IV MEASUREMENT LOCATIONS

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



TESTING IN CAT II MEASUREMENT LOCATIONS

CAT III / CAT IV shields may be removed for CAT II locations. This will allow testing on recessed conductors such as standard wall outlets. Take care not to lose the shields.



OPERATING INSTRUCTIONS

AC CURRENT (LESS THAN 400A)

AC Current is measured by pressing the clamp trigger (10) to open the clamp and placing it around a current-carrying wire. When measuring, care should be taken to ensure that the clamp is completely closed with trigger (10) fully released, and that the wire passes perpendicularly through the center of the clamp in line with the arrow markings (11).

To measure current:

1. Rotate the Function Selector switch (2) to the 200/400 A setting.

2. Place clamp around wire. The current measurement will be shown in the display.

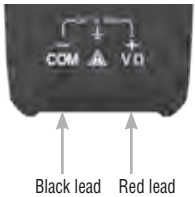
NOTE: *If the measurement is less than 20A, rotate the Function Selector switch (2) to the 2/20 A setting for improved resolution.*

⚠ ***Disconnect test leads when measuring with the clamp.***

OPERATING INSTRUCTIONS

AC/DC VOLTAGE (LESS THAN 600V)

1. Insert RED test lead into VΩ jack (5), and BLACK test lead into COM jack (4), and rotate function selector switch (2) to the DC Voltage **V⎓** or AC Voltage **V∼** setting. Note "**DC**" or "**AC**" on the display.



OR

2. Apply test leads to the circuit to be tested to measure voltage. The meter will auto-range to display the measurement in the most appropriate range.

NOTE: *If "–" appears on the LCD, the test leads are being applied to the circuit in reverse. Swap the position of the leads to correct this.*

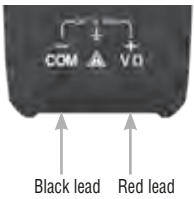
NOTE: *When in a voltage setting and the test leads are open, readings of order mV may appear on the display. This is noise and is normal. By touching the test leads together to close the circuit the meter will measure zero volts.*

NOTE: *To access mV range for V AC* **V∼** *the "RANGE" button* (7) must be used.

OPERATING INSTRUCTIONS

RESISTANCE MEASUREMENTS

1. Insert RED test lead into VΩ jack (5), and BLACK test lead into COM jack (4), and rotate function selector switch (2) to the Resistance **Ω** setting. The resistance symbol **Ω** will appear on the display.
2. Remove power from circuit.
3. Measure resistance by connecting test leads to circuit. The meter will auto-range to display the measurement in the most appropriate range.

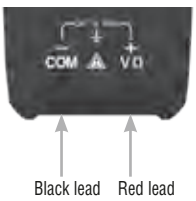


NOTE: *When in a Resistance setting and the test leads are open (not connected across a resistor), or when a failed resistor is under test, the display will indicate O.L. This is normal.*

⚠ ***DO NOT attempt to measure resistance on a live circuit.***

CONTINUITY

1. Insert RED test lead into VΩ jack (5) and BLACK test lead into COM jack (4), and rotate function selector switch (2) to the Continuity •)) setting.
2. Remove power from circuit.
3. Test for continuity by connecting conductor or circuit with test leads. If resistance is measured less than 10Ω, an audible signal will sound and display will show a resistance value indicating continuity. If circuit is open, display will show "**OL**".



⚠ ***DO NOT attempt to measure continuity on a live circuit.***

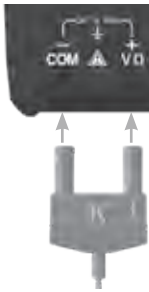
OPERATING INSTRUCTIONS

TEMPERATURE

1. Insert K-type thermocouple into the VΩ (5) and COM (4) jacks (observe polarity markings on thermocouple and meter), and rotate function selector switch (2) to the Temperature °F°C setting.

NOTE: *The meter defaults to Fahrenheit scale in this mode. To enter Celsius scale, press the "SELECT" button (12) once. Ensure that the appropriate icon (either* **°F** *or* **°C***) appears on the display.*

2. To measure temperature, make contact between the thermocouple tip and the object being measured. When thermocouple tip and object are in thermal equilibrium, the measurement on the display will stabilize. The meter will auto-range to display the measurement in the most appropriate range.



⚠ ***Remove thermocouple before switching meter to other measurement functions.***

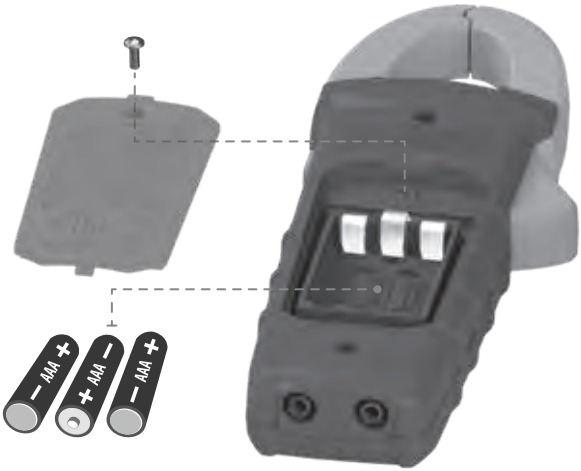
⚠ ***The thermocouple included with the original purchase is suitable for temperatures below 446°F / 230°C only. To measure higher temperatures, a K-type thermocouple with the appropriate measurement range should be used.***

MAINTENANCE

BATTERY REPLACEMENT

When indicator is displayed on LCD, batteries must be replaced.

1. Remove screw from battery door.
2. Replace 3 x AAA batteries (note proper polarity).
3. Replace battery door and fasten securely with screw.



⚠ ***To avoid risk of electric shock, disconnect leads from any voltage source before removing battery door.***

⚠ ***To avoid risk of electric shock, do not operate meter while battery door is removed.***

CLEANING

Be sure meter is turned off and wipe with a clean, dry lint-free cloth. ***Do not use abrasive cleaners or solvents.***

STORAGE

Remove the batteries when meter 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 meter to return to normal operating conditions before using.

WARRANTY

www.kleintools.com/warranty

DISPOSAL / RECYCLE

Do not place equipment and its accessories in the trash. Items must be properly disposed of in accordance with local regulations. Please see **www.epa.gov** or **www.erecycle.org** for additional information.

NOTES