ENGLISH

CL120KIT

INSTRUCTION MANUAL

400A AC Auto-Ranging Digital Clamp Meter

- NON-CONTACT VOLTAGE TESTING
- AUTO-RANGING
- DATA HOLD
- RANGE HOLD
- AUDIBLE CONTINUITY

600V ≅
400A ~
20MΩ

2m

CE

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Intertek
5001748

CAT III 600V

KLEIN TOOLS

GENERAL SPECIFICATIONS

Klein Tools CL120 is an automatically ranging digital clamp-meter that measures AC current via the clamp, and AC/DC voltage, resistance and continuity via test-leads.

- **Operating Altitude:** 6562 ft. (2000 m)
- **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:** 8.46" x 3.54" x 1.50" (215 x 90 x 38 mm)
- **Weight:** 11.04 oz. (313 g) including batteries
- **Calibration:** Accurate for one year
- **Auto Power-Off (APO):** After approx. 10 minutes of inactivity
- **Standards:** IEC EN 61010-1, 61010-2-032, 61010-2-033. IEC EN 61326-1, 61326-2-2.

  Conforms to UL STD.61010-1, 61010-2-032,61010-2-033; Certified to CSA STD.C22.2 NO. 61010-1, 61010-2-032,61010-2-033.
- **Pollution degree:** 2
- **Accuracy:** ± (% of reading + # of least significant digits)
- **Drop Protection:** 6.6 ft. (2m)
- **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

OTHER MEASUREMENT APPLICATIONS

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

- **Continuity Check:** Audible signal <10Ω, max current 1.5mA
- **Sampling Frequency:** Approx. 3 samples per second
- **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.

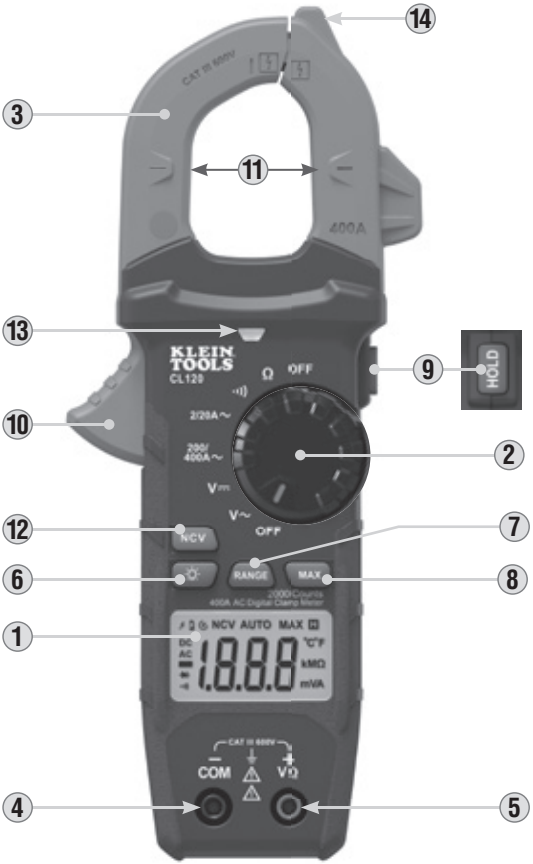
SYMBOLS ON METER

~	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)
COM	Common	NCV	Non-Contact Voltage Tester
-☼-	Backlight	SEL	Select
+	Positive	–	Negative

SYMBOLS ON LCD

AC	AC (Alternating Current)	DC	DC (Direct Current)
–	Negative Reading	H	Data Hold
AUTO	Auto Ranging	MAX	Maximum Value Hold
▭	Low Battery	•))	Audible Continuity
M	Mega (value x 10^6)	k	kilo (value x 10^3)
m	milli (value x 10^{-3})	V	Volts
A	Amps	Ω	Ohms
NCV	Non-Contact Voltage Tester	↻	Auto Power-Off
⚡	Hazardous Voltage Indicator		

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
11. Arrow markings
12. NCV Button
13. NCV Light
14. NCV Sensing Antenna

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. The Auto-Power Off icon will be visible in the display. By default, the meter will automatically power OFF after 10 minutes of inactivity. If the meter automatically powers-OFF while in a measurement setting, press any button to power the meter ON, or rotate Function Selector (2) switch to OFF, then power ON the meter. To deactivate Auto-Power OFF functionality press and hold the "NCV" button (12) before powering ON from the OFF setting. When Auto-Power OFF is deactivated, the Auto-Power Off icon will not be visible in the display.

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 two seconds (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.

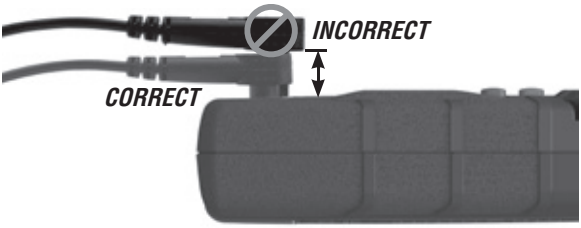
DATA HOLD
Press the Data Hold button (9) to hold the current measurement on the display. Press again to return to live measuring mode.

NCV
Press and hold the "NCV" button (12) to enter Non-contact Voltage Testing (NCV) mode to test for presence of AC voltage. The NCV icon and "**EF**" will be present on the display. Approach the conductor under test leading with the sensing antenna (14). In the presence of AC voltage, the red NCV light (13) will illuminate and audible signals (beeps) will sound. As the NCV sensing antenna (13) approaches the voltage source, the frequency of the audible sound will increase. Release the "NCV" button to exit NCV testing mode.
NOTE: *Only voltages of 40V AC or greater will be detected.*

OPERATING INSTRUCTIONS

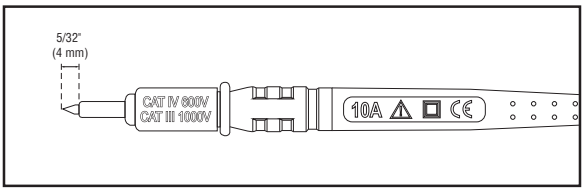
CONNECTING TEST LEADS

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.



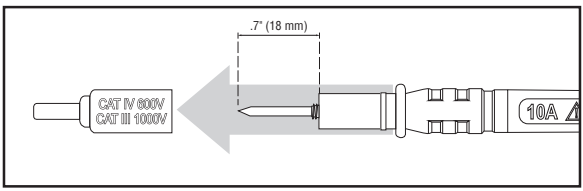
TESTING IN CAT III MEASUREMENT LOCATIONS

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.

Black lead Red lead

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.*

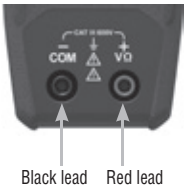
NOTE: *To access mV range for V AC* **V∼** *the "RANGE" button* (7) must be used.

NOTE: *When voltages in excess of 25V AC or 60V DC are measured, the Hazardous Voltage Indicator will appear on the display.*

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.

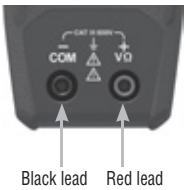


NOTE: *When in a Resistance setting and the test leads are open (not connected across a resistor), or when a failed resistor is under test, the display will indicate O.L. This is normal.*

⚠ ***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.***

MAINTENANCE

BATTERY REPLACEMENT

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

1. Loosen captive screw and remove battery cover.
2. Replace 3 x AAA batteries (note proper polarity).
3. Replace battery cover and fasten screw securely.

⚠ ***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.

RT210

GENERAL SPECIFICATIONS

Relative Humidity: < 85% non-condensing
Operating Temperature: 32° to 140°F (0° to 40°C)
Storage Temperature: 14° to 122°F (-10°C to 50°C)
Weight: 1.3 oz. (37 g)
Nominal Power: 0.3W
Certification: Conforms To UL Std 1436
Certified To CSA Std C22.2 # 160
Drop Protection: 6.6 ft. (2 m)
Nominal Voltage: 110/125V AC at 50/60Hz in 3-wire outlet

⚠ WARNINGS

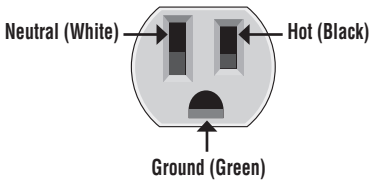
Read, understand, and follow all warnings and instructions before operating testers. Failure to follow instructions could result in death or serious injury. Before each use, verify tester operation by testing on a known live and correctly wired receptacle. Do not use if the tester appears damaged in any way. The tester is intended for indoor use only. Other equipment or devices attached to the circuit being tested could interfere with the tester; clear the circuit before testing. This tester only detects common wiring problems. Always consult a qualified electrician to resolve wiring problems.

FIG. 1

RED YELLOW **Indicator Illuminated**

Indicator Not Illuminated

INDICATOR	FAULT	EXPLANATION
☐ ▒ ☐	Open Ground	Ground contact is not connected
☐ ☐ ▒	Open Neutral	Neutral contact is not connected
☐ ☐ ☐	Open Hot	Hot contact is not connected
■ ☐ ▒	Hot/Ground Reversed	Hot and ground connections are reversed
■ ▒ ☐	Hot/Neutral Reversed	Hot and neutral connections are reversed
☐ ▒ ▒	Correct	Receptacle is wired correctly



WIRING CONFIGURATION TESTING

Conditions indicated: wiring correct, open ground, reverse polarity, open hot, open neutral and hot/ground reversed.

Conditions NOT indicated: quality of ground, multiple hot wires, combinations of defects, reversal of grounded and grounding conductors.

All appliances or equipment on the circuit being tested should be unplugged to help reduce the possibility of erroneous readings.

STANDARD RECEPTACLES

1. Verify tester operation by testing on a known live and correctly wired receptacle.
2. Plug tester into receptacle.
3. Compare the illuminated lights on the tester to the key code printed on the tester.
4. If the tester indicates that the receptacle is not wired correctly, consult a qualified electrician.

GFCI RECEPTACLES

1. Check the GFCI receptacle user manual for information on how the specific receptacle operates prior to using this tester.
2. Insert the tester into the receptacle under test to check for correct wiring (See **FIG. 1**). Lights on the tester should illuminate.
3. Press the "TEST" button on the GFCI receptacle. ***Did the GFCI trip and the lights on the tester go dark?***

   YES: Reset the GFCI by pressing the reset button. Proceed to step 4.

   NO: The GFCI is not operating properly or the receptacle is miswired. Consult a qualified electrician.

4. Press and hold the test button on the tester for 7 seconds. ***Did the GFCI trip and the lights on the tester go dark?***

   YES: Reset the GFCI by pressing the reset button. The GFCI appears to be operating properly.

   NO: The GFCI is not operating properly or the receptacle is miswired. Consult a qualified electrician.

CLEANING

Wipe with a clean, dry lint-free cloth. ***Do not use abrasive cleaners or solvents.***

69409

DESCRIPTION

The Line Splitter 10x assists in measuring the current draw of a connected load such as an electrical device or appliance up to 15A without splitting the device or appliances power cord. It has been designed for use with Klein Tools clamp meters, but will also function with many other manufacturers' clamp meters.

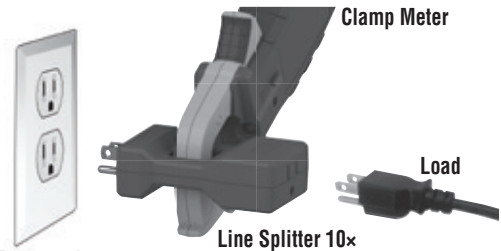
GENERAL SPECIFICATIONS

Relative Humidity: < 85% non-condensing
Operating Temperature: 32° to 122°F (0°C to 50°C)
Storage Temperature: -4° to 140°F (-20°C to 60°C)
Dimensions: 4.67" x 2.28" x 1.22" (119 x 58 x 31 mm)
Nominal Voltage: 110/125V AC at 50/60Hz in 3-wire outlet
Weight: 3.2 oz. (90.7 g)
Drop Protection: 3.3 ft. (1 m)
Maximum Load Current: 15A
Measurement Correction: Clamp Meter will display 10x actual current, eg. Actual current of 1.5A will be displayed as 15A on clamp meter when using Line Splitter 10x.

⚠WARNINGS

- Read, understand, and follow all warnings and instructions before operating this device. Failure to follow instructions could result in death or serious injury.
- Do NOT use with current loads greater than 15A (which would be displayed as greater than 150A on a clamp meter using the Line Splitter 10x).
- Risk of electric shock and burn. Contact with live circuits could result in death or serious injury.
- Do not use if Line Splitter 10x appears damaged in any way, if in doubt, replace Line Splitter 10x.
- Always wear approved eye protection.
- Do NOT use Line Splitter 10x if wet.
- Intended for indoor use only.
- Always consult a qualified electrician to resolve wiring problems.

FIG. 2



USING THE LINE SPLITTER (FIG. 2)

1. Plug Line Splitter 10x into receptacle.
2. Plug the load (appliance or device) into the line splitter.
3. Measure current by clamping the clamp meter around the Line Splitter 10x.
4. The current measured by the clamp meter is 10x the actual current present in the circuit.

CLEANING

Wipe with a clean, dry lint-free cloth. ***Do not use abrasive cleaners or solvents.***