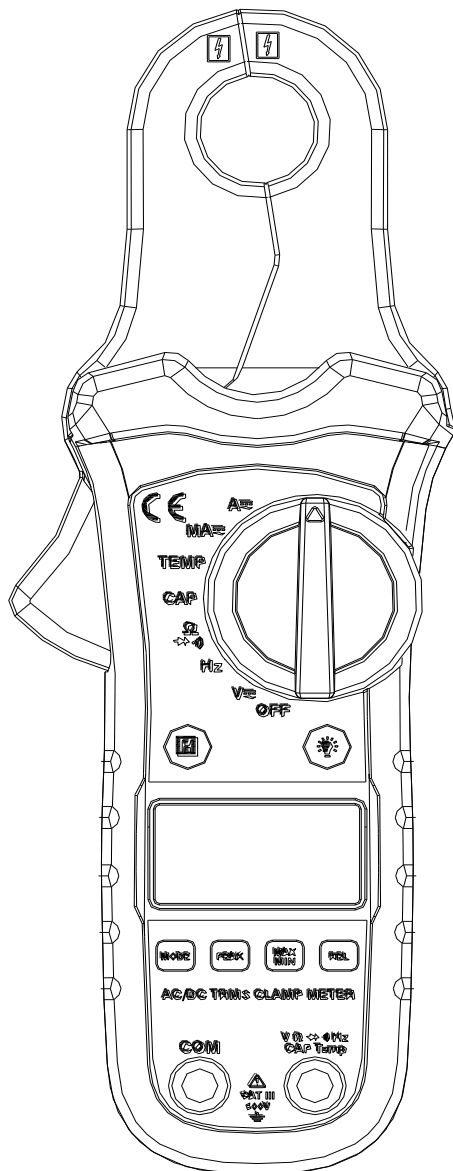







#688 PREMIUM True RMS Low Current Clamp Meter



Safety

International Safety Symbols

-  This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.
-  This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present
-  Double insulation

SAFETY NOTES

- Do not exceed the maximum allowable input range of any function
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.

WARNINGS

- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current/resistance modes.
- When changing ranges using the selector switch always disconnect the test leads from the circuit under test.
- Do not exceed the maximum rated input limits.

CAUTIONS

Improper use of this meter can cause damage, shock, injury or death. Read and understand this user manual before operating the meter. Always remove the test leads before replacing the battery. Inspect the condition of the test leads and the meter itself for any damage before operating the meter. Repair or replace any damage before use. Use great care when making measurements if the voltages are greater than 25VAC rms or 35VDC. These voltages are considered a shock hazard. Remove the battery if the meter is to be stored for long periods.

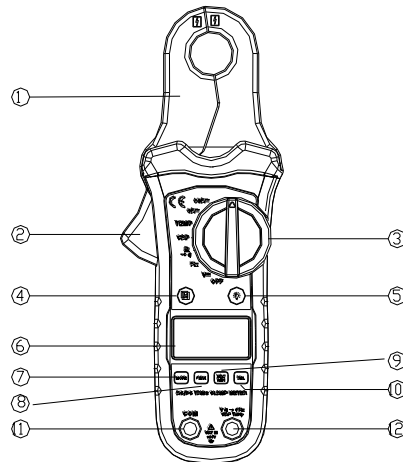
Always discharge capacitors and remove power from the device under test before performing Diode, Resistance or Continuity tests.

- Voltage checks on electrical outlets can be difficult and misleading because of the uncertainty of connection to the recessed electrical contacts. Other means should be used to ensure that the terminals are not "live".
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

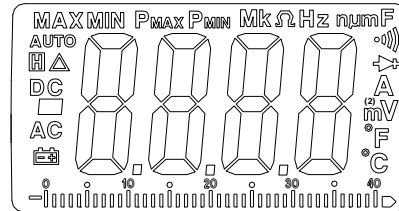
Input Limits	
Function	Maximum Input
A	80A DC/AC
V DC, V AC	600V DC/AC
Frequency, Resistance, Diode, Continuity , Capacitance Test	250V DC/AC
Temperature (°C/°F)	250V DC/ AC

Meter Description

1. Current clamp
2. Clamp trigger
3. Rotary Function swith
4. Data Hold button
5. Back Light button
6. LCD display
7. MODE select button
8. PEAK button
9. MAX/MIN button
10. Relative button
11. COM input jack
12. V Ω CAP TEMP Hz jack



1. **AC DC** AC (alternating current) and DC (direct current)
2. **—** Minus sign
3. **8.8.8.8** 5000 count (0 to 4999) measurement reading with 51 segments Analog Bargraph
4. **AUTO** AutoRange mode
5. **△** Relative mode
6. **→|** Diode test mode
7. **•)))** Audible Continuity
8. **H** Data Hold mode
9. **°C, °F, μ, m, V, A, K, M, Ω**, Units of measure list
10. **Hz %** Frequency/duty cycle test mode
11. **MAX MIN** MAX/MIN Hold mode
12. **Pmax Pmin** Pmax Pmin Hold mode




Specifications

Function	Range & Resolution	Accuracy (% of reading)
DC Current	5000mA DC	± (2.8% + 20 digits)
	80.0 A DC	± (3% + 8 digits)
	DC Current ranges specified from 5% to 100% of range	
AC Current (50/60Hz)	5000mA AC	± (3.0% + 20 digits)
	80.0A AC	± (3.0% + 8 digits)
	AC Current ranges specified from 5% to 100% of range	
DC Voltage	500.0 mVDC	± (0.8% + 5 digits)
	5.000 VDC	± (1.5% + 2 digits)
	50.00 VDC	
	500.0 VDC	
	600 VDC	± (2 % + 2 digits)
AC Voltage (50/60Hz)	500.0 mVAC	± (1% + 10 digits)
	5.000 VAC	± (1.5% + 5 digits)
	50.00 VAC	
	500.0 VAC	
	600VAC	± (2.0% + 5 digits)
	AC Voltage ranges specified from 5% to 100% of range	
Resistance	500.0 Ω	± (1.0% + 4 digits)
	5.000K Ω	± (1.5% + 2 digits)
	50.00K Ω	
	500.0K Ω	
	5.000M Ω	± (2.5% + 3 digits)
	50.00M Ω	± (3.5% + 5 digits)
Capacitance	50.00nF	±(5.0% reading + 20 digits)
	500.0nF	±(3% reading + 5 digits)
	5.000 μ F	
	50.00 μ F	
	500.0 μ F	±(4.0% reading + 10 digits)
	5mF	±(5.0% reading + 10 digits)
Frequency	10Hz-100kHz	±(1.5% reading + 2 digits)
	Sensitivity: 100V(<50Hz); 50V(50 to 400Hz); 15V(401Hz to 100kHz)	
Temp (type-K) (probe accuracy not included)	-20 to 760°C	± (3%rdg+5°C)
	-4 to 1400°F	± (3%rdg+9°F)

NOTE:

Accuracy is stated at 65°F to 83°F (18°C to 28°C) and less than 75% RH.

Clamp size	Opening 0.75" (19mm) approx
Diode Test	Test current of 0.3mA typical; Open circuit voltage <3.3V DC typical.
Continuity Check	Threshold <50Ω; Test current < 0.6mA
Low Battery Indication	"  " is displayed
Overrange Indication	"OL" is displayed
Measurements Rate	2 per second, nominal
Input Impedance	10MΩ (VDC and VAC)
Display	5000 counts LCD
AC Current	50-60Hz (TRMS AAC)
AC Voltage bandwidth	50-60Hz (TRMS VAC)
Operating Temperature	41 to 104°F (5 to 40°C)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Operating Humidity	Max 80%
Storage Humidity	<80%
Operating Altitude	7000ft. (2000meters) maximum.
Over voltage	Category III 600V
Battery	One 9V Battery
Auto OFF	approx. 30 minutes
Dimensions/Weight	206x74x42mm/183g
Safety	For indoor use and in accordance with EN-61010-1 2 nd edition. It has been evaluated and complies with overvoltage CAT III. Pollution degrees 2.

BUTTON DESCRIPTIONS

MODE BUTTON

To select DC/ACV,OHM/ Diode/Continuity/CAP, °C/ °F.

REL BUTTON

For DCA and Capacitance Zero & Offset adjustment.

Data Hold Button

To freeze the LCD meter reading, press the data hold button. The data hold button is located on the left side of the meter (top button). While data hold is active, the **H** display icon appears on the LCD. Press the data hold button again to return to normal operation

MAX/MIN

The meter displays the maximum or minimum value of the input in MAX/MIN mode. When MAX/MIN is pressed for the first time, the meter displays the maximum value. When MAX/MIN is pressed again, the meter displays the minimum value. When MAX/MIN is pressed for the third time, MAX/MIN blinks and the meter displays the current input value. To return to normal operation, press and hold MAX/MIN.

PEAK HOLD

The Peak Hold function captures the peak AC voltage or current. The meter can capture negative or positive peaks as fast as 1 millisecond in duration.

1. Turn the function switch to the A or V position.
2. Use the **MODE** button to select AC. Allow time for the display to stabilize.
3. Press the **PEAK** button, **Pmax** will display. The display will now update and indicate the highest positive peak.

4. Press the PEAK button again, Pmin will display. The display will now update and indicate the lowest negative peak.
5. Press the PEAK button again, a blinking "MAX MIN" will appear. The meter will display the present reading, but will continue to update and store the max and min reading.
6. Press and hold PEAK to return to normal operation.

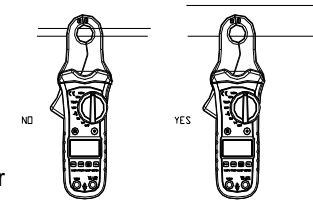
Operation

NOTICES: Read and understand all **warning** and **precaution** statements listed in the safety section of this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.

AC/DC Current Measurements

WARNING: Ensure that the test leads are disconnected from the meter before making current clamp measurements.

1. Set the Function switch to the **A, mA** range.
2. Select AC or DC with the **MODE** button.
3. If the range of the measured is not known, select the higher **A** range first then move to the lower **mA** range if necessary.
4. Press the trigger to open jaw. Fully enclose the clamp over the conductor wire to be measured. Only one wire can be measured each time.
5. In DCA measuring mode, to ensure the reading is correct, please press REL button to clear any residual reading on the LCD before measurement. This should be done before each measurement.






The clamp meter LCD will display the reading.

AC/DC Voltage Measurements

1. Insert the black test lead into the negative **COM** terminal and the red test lead into the positive **V** terminal.
2. Set the function switch to the **V** position.
3. Select AC or DC with the **MODE** button.
4. Connect the test leads in parallel to the circuit under test.
5. Read the voltage measurement on the LCD display.

Resistance Measurements

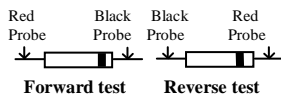
Note: never attempt an Ohm reading on a live circuit. All power to the circuit must be turned off.

1. Insert the black test lead into the negative **COM** terminal and the red test lead into the positive terminal.
2. Set the function switch to the Ω    position.
3. Touch the test probe tips across the circuit or component under Test. It is best to disconnect one side of the device under test so the rest of the circuit will not interfere with the resistance reading.

4. For resistance measurements, read the resistance on the LCD display.
5. For continuity measurements, press the mode button until the **•)))** appears.
6. Follow the same instructions as above - for Continuity tests, if the resistance is $< 50\Omega$, a tone will sound.

Diode Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **DIODE** jack.
2. Turn the rotary switch to the Ω **▶ •)))** position.
3. Press the **MODE** button until **▶** “ appears in the display.
4. Touch the test probes to the diode under test. Forward voltage will indicate 0.4V to 0.7V. Reverse voltage will indicate “**OL**”. Shorted devices will indicate near 0mV and an open device will indicate “**OL**” in both polarities.



Capacitance Measurements

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1. Set the rotary function switch to the **CAP** position.
2. Insert the black test lead banana plug into the negative **COM** jack. Insert the red test lead banana plug into the positive **V** jack.
3. Touch the test leads to the capacitor to be tested.
4. Read the capacitance value in the display

Frequency measurements - AC Only

1. Set the rotary function switch to the “**Hz**” position.
2. Insert the black lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **V** jack.
3. Touch the test probe tips to the circuit under test.
4. Read the frequency on the display.

Temperature Measurements

WARNING: To avoid electric shock, disconnect both test probes from any source of voltage before making a temperature measurement.

1. Set the function switch to **TEMP**.
2. Insert the Temperature Probe into the negative **COM** and the **V** jacks, making sure to observe the correct polarity.
3. Touch the Temperature Probe head to the material surface you intend to measure. Keep the probe touching the part under test until the reading stabilizes (about 30 seconds).
4. Read the temperature in the display. The digital reading will indicate the proper decimal point and value.

WARNING: To avoid electric shock, be sure the thermocouple has been removed before changing to another measurement function

Battery Replacement

1. Remove the one rear Phillips head screw
2. Open the battery compartment
3. Replace the Requires One 9V battery
4. Re-assemble the meter

WARRANTY INFORMATION:

This product is warranted to be free of defects for one year. If this product fails during the first 12 months due to faulty material or workmanship, it will be replaced or repaired free of charge, at the discretion of the manufacturer.

NOTE: this one year warranty does not cover accidental or intentional abuse.

For warranty service and coverage, please return this product to your supplier for processing and evaluation. OR, return it directly to:

Electronic Specialties, Inc.
 139 Elizabeth Ln.
 Genoa City, WI 53128
 262-279-1400
 www.esitest.com