



INSTRUCTION MANUAL

MT770^{II}

AC TRMS CLAMP METER



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1. Safety

1.1. 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.

1.2. 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.

1.3. 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.

1.4. 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 if damaged 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.

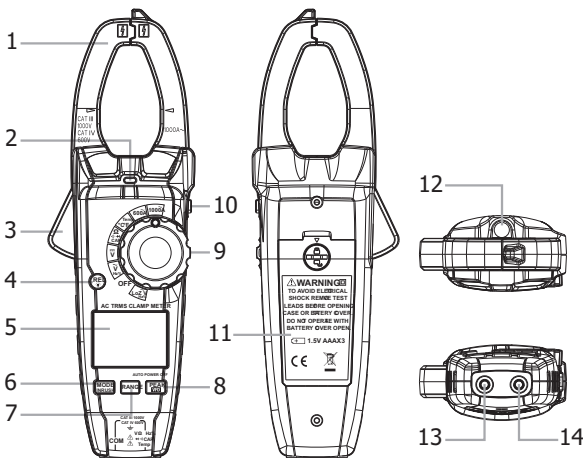
2. Input Limits

Function	Maximum Input
A AC	1000A
V AC/DC	1000V DC/AC
Frequency, Resistance, Diode, Continuity,	1000V DC/AC
Capacitance Test Temperature	1000V DC/ AC

2. Description

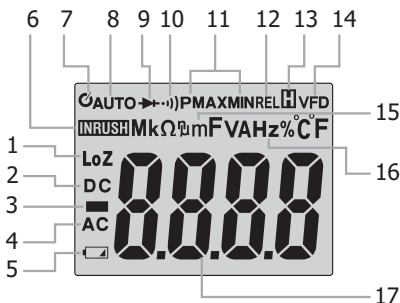
2.1. Meter Description

- | | |
|---|-----------------------------------|
| 1. Current Clamp | 7. RANGE Button |
| 2. Non-Contact AC Voltage Indicator Light | 8. PEAK / VFD Button |
| 3. Clamp Trigger | 9. Rotary Function Switch |
| 4. Relative / Backlight Button | 10. Data Hold / Flashlight Button |
| 5. LCD Display | 11. Battery Cover |
| 6. MODE / INRUSH Select Button | 12. Flashlight |
| | 13. COM Input Jack |
| | 14. VΩHz% CAP TEMP Jack |



2.2. Symbols Used on LCD Display

1. Low Impedance Input Mode
2. DC (Direct Current)
3. Minus Sign
4. AC (Alternating Current)
5. Low Battery
6. Inrush Current Mode
7. Auto Power Off
8. Auto Range Mode
9. Diode Test Mode
10. Audible Continuity
11. Peak Voltage Value
12. Relative Mode
13. Data Hold Mode
14. Variable Frequency Drive Voltage Value
15. Units of Measure List
16. Frequency/Duty Cycle Test Mode
17. 6000 Count Measurement Reading



3. Specifications

3.1. Specifications

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
AC Current (50/60Hz)	600.0A	\pm (2.5% + 8 digits)
	1000A	\pm (2.8% + 8 digits)

Over range protection: Maximum input 1000A.

Accuracy specified from 5% to 100% of the measuring range.

Frequency Response: 50Hz to 60Hz True RMS.

Inrush current Maximum Input: 1000A.

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
AC Voltage (50-400Hz)	6.000V	\pm (1.5% + 5 digits)
	60.00V	
	600.0V	
	1000V	

Variable frequency Drive TEST AC voltage range: 100V - 600V.

AC voltage bandwidth: 50 to 400Hz (Sine); 50/60 (All wave).

Accuracy specified from 5% to 100% of the measuring range.

Maximum Input: 1000V AC RMS.

VFD, PEAK Maximum Input: 1000V.

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
LoZ AC Voltage	6.000V	\pm (3.0% + 40 digits)
	60.00V	
	300.0V	

Maximum Input: 300V AC

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
DC Voltage	600.0mV	\pm (0.5% + 5 digits)
	6.000V	\pm (1.5% + 2 digits)
	60.00V	
	600.0V	
	1000V	

Maximum Input: 1000V DC

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
Resistance	600.0 Ω	\pm (1.0% + 4 digits)
	6.000K Ω	\pm (1.5% + 2 digits)
	60.00K Ω	
	600.0K Ω	
	6.000M Ω	\pm (2.5% + 3 digits)
	60.00M Ω	\pm (3.5% + 5 digits)

Input Protection: 300V DC or 300V AC RMS.

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
Capacitance	60.00nF	\pm (4.0% + 20 digits)
	600.0nF	\pm (3% + 5 digits)
	6.000 μ F	
	60.00 μ F	
	600.0 μ F	
	6.000mF	\pm (5% + 5 digits)
	60.00mF	\pm (5% + 8 digits)
100.0mF	\pm (5% + 15 digits)	

Input Protection: 300V DC or 300V AC RMS.

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
Frequency Sensitivity: =>5VRMS	9.999Hz to 99.99kHz	\pm (1.2% + 5 digits)

Function	Range & Resolution	Accuracy \pm (% of reading+digits)
Duty Cycle Sensitivity: =>5VRMS	10.0% to 90.0%	\pm (1.2% + 2 digits)

Input Protection: 300V DC or 300V AC RMS.


Function	Range & Resolution	Accuracy \pm (% of reading+digits)
Temp (Type-K)	-20.0 to 1000 $^{\circ}$ C	\pm (3% + 5 $^{\circ}$ C)
	-4.0 to 1832 $^{\circ}$ F	\pm (3% + 9 $^{\circ}$ F)

(Probe accuracy not included)

Input Protection: 300V DC or 300V AC RMS.

Note: Accuracy is given as \pm (% of reading + counts of least significant digit) at 23 $^{\circ}$ C \pm 5 $^{\circ}$ C, with relative humidity less than 80%RH. AC voltage and current shall be subject to sine wave.

3.2. General Specifications

Clamp Size	33mm approx
TRMS	The AC voltage and AC current of this instrument are measured by TRMS. True RMS measurement is different from mean measurement. The mean measurement method can only measure the symmetric waveform, such as sine wave. True RMS measurements can reliably measure any irregular waveform and obtain valid values for AC voltage or AC current.
Diode Test	Test current of 0.3mA typical; Open circuit voltage 3.2V DC typical.
Continuity Check	Threshold $\leq 50\Omega$; Test current $< 0.5\text{mA}$
Low Battery Indication	"  " is displayed
Overrange Indication	"OL" is displayed
Measurements Rate	2 per second, nominal
Input Impedance	10M (VDC and VAC)
Display	6000 counts LCD
AC Current	50 - 60Hz (AAC)
AC Voltage Bandwidth	50 - 400Hz (VAC)
Operating Temperature	5 to 40°C (41 to 104°F)
Storage Temperature	-20 to 60°C (-4 to 140°F)
Operating Humidity	Max 80% up to 31°C decreasing linearly to 50% at 40°C
Storage Humidity	$< 80\%$
Operating Altitude	2000 meters maximum.
Over Voltage	Category III 1000V
Battery	Three (3) x 1.5V AAA Battery
Auto Off	Approx. 30 minutes
Dimensions	250 x 70 x 40mm
Weight	350g
Safety	For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (2001): EN61010-1 (2001) Overvoltage Category III 1000V and Category IV 600V, Pollution Degree 2.

4. 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.

4.1. AC 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 **1000A AC, 600A AC** range.
2. If the range to be measured is not known, select the higher range first then move to the lower range if necessary.
3. Press the trigger to open jaw. Fully enclose one conductor to be measured.
4. The clamp meter LCD will display the reading.



INCORRECT



CORRECT

4.2. AC/DC Voltage Measurements

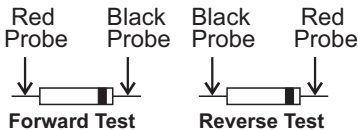
1. Insert the black test lead into the negative **COM** terminal and the red test lead into the positive **V** terminal.
2. Set the function switch to the **ACV** or **DCV** position.
3. Connect the test leads in parallel to the circuit under test.
4. Read the voltage measurement on the LCD display.

4.3. Resistance Measurements

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 \rightarrow **CAP** 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 tests, read the resistance on the LCD display.

4.4. Diode and Continuity 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 \rightarrow **CAP** position.
3. Press the **MODE / INRUSH** button until " \rightarrow " 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.



For Continuity tests, if the resistance is $< 50\Omega$, a tone will sound.

4.5. 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 Ω  **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. Press the **MODE / INRUSH** button to change to capacitance measurements.
4. Touch the test leads to the capacitor to be tested.
5. Read the capacitance value in the display.

4.6. Frequency or % Duty Cycle Measurements

1. Set the rotary function switch to the "VAC/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. Select **Hz** or **%** duty with the **MODE / INRUSH** button.
4. Touch the test probe tips to the circuit under test.
5. Read the frequency on the display.

4.7. 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 part whose temperature you wish 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.

4.8. Non-Contact AC Voltage Measurements

WARNING: Risk of Electrocution. Before use, always test the Voltage Detector on a known live circuit to verify proper operation

1. Touch the probe tip to the live conductor or insert into the live side of the electrical outlet.
2. If AC voltage is present, the detector light will illuminate.

NOTE: The conductors in electrical cord sets are often twisted. For best results, rub the probe tip along a length of the cord to assure placing the tip in close proximity to the live conductor.

NOTE: The detector is designed with high sensitivity. Static electricity or other sources of energy may randomly trip the sensor. This is normal operation.

5. Button

5.1. MODE/INRUSH Button

To select ACV / Hz / %; OHM / Continuity / Diode / CAP; °C / °F.

5.2. RANGE Button

When the meter is first turned on, it automatically goes into Auto Ranging. This automatically selects the best range for the measurements being made and is generally the best mode for most measurements. For measurement situations requiring that a range be manually selected, perform the following:

1. Press the **RANGE** button. The "Auto Range" display indicator will turn off, The "Manual Range" display indicator will turn on.
2. Press the **RANGE** button to step through the available ranges until you select the range you want.
3. Press and hold the RANGE button for 2 seconds to exit the Manual Ranging mode and return to Auto Ranging.

5.3. PEAK/VFD (Variable Frequency Drive) Button

In the AC voltage mode, Press the **PEAK/VFD** key to display "----" first and then enter the PEAK measurement mode. The maximum PEAK and minimum PEAK voltage can be measured circularly.

Hold down the button to enter the VFD function measurement. In the VFD mode, the voltage value of the variable frequency drive device can be measured. The measured values of "PEAK" and "VFD" are for reference only.

5.4. REL/Backlight Button

REL for DCA and Capacitance Zero & Offset adjustment. Hold down this button to turn the backlight ON and OFF.

5.5. Data Hold/Flashlight Button

1. To freeze the LCD meter reading, press the data hold button. The data hold button is located on the right 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.
2. Hold down this button to turn the flashlight ON and OFF.

6. Battery Replacement

1. Remove the one rear head screw.
2. Open the battery compartment.
3. Replace the Requires Three "AAA" 1.5V Battery.
4. Re-assemble the meter.

7. Maintenance

WARNING: To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input terminals, and turn OFF the meter before opening the case. Do not operate the meter with an open case.

8. Cleaning and Storage

1. Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for 60 days or more, remove the battery and store it separately.

9. Battery Replacement

1. Rotate battery door lock 180 degrees to open the battery door
2. Open the battery compartment
3. Replace the 3 x 1.5V AAA battery
4. Secure the battery compartment

10. Temperature Probe Replacement

1. The replacement bead wire probe (with K-Type plug) is part number MT660.
2. The replacement temperature adaptor (with banana plug) is part number MT802.



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