INSTRUCTION MANUAL

MT720"

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.

Application around and removal from uninsulated hazardous live conductors is permitted.

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.
- Remove the battery if meter is to be stored for longer than 60 days.

1.3. WARNINGS

- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current resistance modes.
- Do not measure current on a circuit whose voltage exceeds 600V.
- When changing ranges always disconnect the test leads from the circuit under test.

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 or fuses.
- 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.
- 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

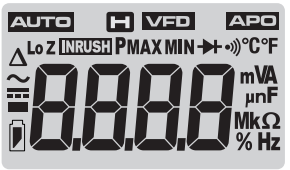
Function	Maximum Input
A AC	400A
V AC/DC	1000V DC/AC
Resistance, Capacitance, Frequency, Diode Test, Temperature	300V DC/AC

3. Meter Description

1. NCV Test
2. Current clamp
3. Non-contact AC voltage indicator light
4. Clamp trigger
5. REL button
6. LCD display
7. RANGE button
8. COM input jack
9. Data Hold and Backlight button
10. Rotary Function switch
11. MODE select and Flashlight button
12. INRUSH and PEAK button
13. V Ω Diode Continuity CAP TEMP Hz% jack
14. Battery Cover

4. Symbols Used on LCD Display

HOLD	Data Hold
Minus sign	Negative reading display
0 to 3999	Measurement display digits
REL	REL/DCA Zero
MAX/MIN	Maximum/Minimum
	Auto Power Off
AUTO	Auto Range mode
⎓	Direct/ Voltage
~	Alternating Current Voltage
	Low battery
mV or V	Milli-volts or Volts (Voltage)
Ohms	(Resistance)
A	Amperes (Current)
F	Farad (Capacitance)
Hz/%	Hertz (Frequency)/Percent (duty ratio)
°F and °C	Fahrenheit and Celsius units (Temperature)
n, μ, m, M, k	Unit of measure prefixes: nano, milli, micro, mega, and kilo
•))	Continuity test
→+	Diode test



5. Specifications

Function	Range	Resolution	Accuracy ±(% of reading+digits)
AC True RMS Current	40.00A	10mA	±(2.0% + 8 digits)
	400.0A	100mA	±(2.5% + 8 digits)

Over range protection: Maximum input 400A.
Accuracy specified from 5% to 100% of the measuring range.
Frequency Response: 50Hz to 60Hz True RMS.
Inrush current Maximum Input: 400A Inrush current Sensitivity: >2A.

Function	Range	Resolution	Accuracy ±(% of reading+digits)
DC Voltage	4.000V	1mV	±(1.0% + 3 digits)
	40.00V	10mV	±(1.0% + 3 digits)
	400.0V	100mV	±(1.0% + 3 digits)
	1000V	1V	±(1.2% + 3 digits)

Maximum input: 1000V DC

Function	Range	Resolution	Accuracy ±(% of reading+digits)
AC True RMS Voltage (with VFD)	4.000V	1mV	±(1.2% + 5 digits)
	40.00V	10mV	±(1.2% + 5 digits)
	400.0V	100mV	±(1.2% + 5 digits)
	1000V	1V	±(1.5% + 5 digits)

Variable frequency Drive TEST AC voltage range: 100V---600V.
AC voltage bandwidth: 50 to 1000Hz (sine) 50/60 (all wave)
Accuracy specified from 5% to 100% of the measuring range
Maximum Input: 1000V AC RMS.
PEAK Maximum Input: 1000V

Function	Range	Resolution	Accuracy ±(% of reading+digits)
Resistance	400.0Ω	0.1Ω	±(1% + 4 digits)
	4.000kΩ	1Ω	±(1.5% + 2 digits)
	40.00kΩ	10Ω	±(1.5% + 2 digits)
	400.0kΩ	100Ω	±(1.5% + 2 digits)
	4.000MΩ	1kΩ	±(2.0% + 5 digits)
	40.00MΩ	10kΩ	±(3.0% + 8 digits)

Input Protection: 300V DC or 300V AC RMS

Function	Range	Resolution	Accuracy ±(% of reading+digits)
Capacitance (Auto-ranging)	99.99nF*	0.01nF	±(4.5% + 20 digits)
	999.9nF	0.1nF	±(3.0% + 5 digits)
	9.999µF	0.001µF	
	99.99µF	0.01µF	
	999.9µF	0.1µF	
	9.999mF	0.001mF	±(5% + 5 digits)
	99.99mF	0.01mF	

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

* < 99.99nF (no specification)

Frequency with test leads (AC Voltage)

Function	Range	Accuracy ±(% of reading+digits)
Frequency (Auto-ranging)	10Hz to 100kHz	±(1.0% + 5 digits)

Input Protection: 1000V AC RMS

Sensitivity: > 15V AC RMS

Frequency (AC Current)

Function	Range	Accuracy ±(% of reading+digits)
Frequency (Auto-ranging)	45Hz to 1kHz	±(1.0% + 5 digits)

Sensitivity: > 20A

Function	Range	Resolution	Accuracy ±(% of reading+digits)
Duty Cycle	20.0% to 80.0%	0.1	±(1.2% + 10 digits)

Function	Range	Resolution	Accuracy ±(% of reading+digits)
Temperature (Type-K)	-20.0 to 1000°C	0.1/1°C	±(3% + 3°C)
	-4.0 to 1832°F	0.1/1°F	±(3% + 5°F)

Sensor: Type K Thermocouple

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

Function	Testing Condition	Reading
Diode	Forward DCA is approx .1mA, open circuit voltage MAX 3V	Forward voltage drop of Diode
Continuity	Test current MAX 1.5mA	Buzzer makes a long sound, While resistance is less than (50Ω)

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

6. General Specifications

Clamp jaw opening	30mm approx.
Display	3-3/4 digits (4000 counts) backlit LCD
Low Battery indication	' ▭ ' is displayed
Over-range indication	'OL' display
Measurement rate	3 readings per second, nominal
Temperature sensor	Type K thermocouple
Input Impedance	10M (VDC and VAC)
AC response	True RMS (AAC and VAC)
ACV Bandwidth	2KHZ
Operating Temperature	5°C to 40°C (41°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F 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.
Battery	Three (3) x 1.5V AAA Battery
Battery life	~30h (backlight ON), ~100h (backlight OFF)
Auto power OFF	After approx. 15 minutes
Dimensions	220 x 80 x 39mm
Weight	305g
Safety	For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (2001): EN61010-2-030 EN61010-2-032 EN61010-2-033 Overvoltage Category lll 600V, Pollution Degree 2.

7. Operation

NOTES: Read and understand all Warning and Caution statements in this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.

7.1. 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 **400A** range. If the approx. range of the measurement is not known, select the highest range then move to the lower ranges if necessary.
2. Press the **REL** button to zero the meter display.
3. Use Rotary Function switch to select AC 40A 400A range.
4. Select AC current Test, press the INRUSH key to tum Inrush current test, the LCD will display "----".
5. Press the trigger to open jaw. Fully enclose only one conductor. For optimum results, center the conductor in the jaw.
6. The clamp meter LCD will display the reading.

INCORRECT

CORRECT

7.2. AC Voltage Measurement

1.Insert the black test lead into the negative **COM** terminal and the red test lead into the positive **V⏥CAP·TEMP·Hz%Ω** terminal.
2. Set the function switch to the **V~** position.
3. Press the MODE/FD key for 1 second to turn on the VFD test.
4. Press the PEAK key to tum on Peak test.
5. Connect the test leads in parallel to the circuit under test.
6. Read the voltage measurement on the LCD display.

7.3. DC Voltage Measurement

1. Insert the black test lead into the negative **COM** terminal and the red test lead into the positive **V⏥ CAP·TEMP·Hz%Ω** terminal.
2. Set the function switch to the **V~** position.
3. Connect the test leads in parallel to the circuit under test.
4. Read the voltage measurement on the LCD display.

7.4. Resistance

1. Insert the black test lead into the negative COM terminal and the red test lead into the **V⏥ CAP TEMP Hz%** positive terminal.
2. Set the function switch to the **Ω⏥•))** position.
3. Touch the test probe tips across the circuit or component under test.
4. Read the resistance on the LCD display.

7.5. Capacitance Measurements

WARNING: To avoid electric shock, discharge the capacitor under test before measuring.

1. Set the function switch to the **CAP** position.
2. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the **V⏥CAP TEMP Hz%Ω** positive jack.
3. Touch the test probe tips across the part under test. If "**OL**" appears in the display, remove and discharge the component.
4. Read the capacitance value in the display.
5. The display will indicate the proper decimal point and value.

Note: For very large values of capacitance measurement it can take several minutes before the final reading stabilizes.

7.6. Frequency Measurements

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the **V⏚CAP TEMP Hz%Ω** positive jack.
2. Set the function switch to the **V~HZ/%** Position.
3. Press **MODE** button to select the Frequency (Hz) or Duty cycle (%).
4. Touch the test probe tips across the part under test.
5. Read the value on the display.
6. The display will indicate the proper decimal point and value.

7.7. Temperature Measurements

1. Set the function switch to the **TEMP** position.
2. Insert the Temperature Probe into the negative **COM** and the **V⏚CAP TEMP Hz%Ω** positive jacks, observing polarity.
3. Touch the Temperature Probe head to the device under test. Continue to touch the part under test with the probe until the reading stabilizes.
4. Read the temperature on the display. The digital reading will indicate the proper decimal point and value.
5. Use the **MODE** button to select °F or °C.
   WARNING: To avoid electric shock, be sure the thermocouple probe has been removed before changing to another measurement function.

7.8. Diode Test

1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the **V⏚CAP TEMP Hz% Ω** positive jack
2. Turn the function switch to **Ω ⏚·))** position. Use the **MODE** button to select the diode function if necessary (diode symbol will appear on the LCD when in Diode test mode)
3. Touch the test probe tips to the diode or semiconductor junction under test. Note the meter reading
4. Reverse the test lead polarity by reversing the red and black leads. Note this reading
5. The diode or junction can be evaluated as follows:
   - If one reading displays a value (typically 0.400V to 0.900V) and the other reading displays **OL**, the diode is good.
   - If both readings display **OL** the device is open.
   - If both readings are very small or '0', the device is shorted.

7.9. Continuity Measurements

1. Insert the black test lead into the negative COM terminal and the red test lead into the **V CAP TEMP Hz%Ω** positive terminal.
2. Set the function switch to the **Ω** position.
3. Use the MODE button to select continuity "". The display icons will change when the MODE button is pressed.
4. Touch the test probe tips across the circuit or component under test.
5. If the resistance is < 50Ω , a tone will sound.

7.10. 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.

7.11. MODE/VFD (Variable Frequency Drive)

1. Press **MODE/ VFD** key to select the double measurement functions. This key is active in **V CAPΩ** position to select among resistance test, diode test, continuity test, HZ%, and in Temp position to select between °F or °C.
2. Press and hold the **MODE/VFD** key and turn the selector switch to turn the system on, the auto power off function will be cancelled.
3. Press and hold the MODE/VFD key for 2 seconds to switch to VFD.

7.12. HOLD/Flashlight

1. To freeze the LCD reading, press the **Hold/Flashlight** button. While data hold is active,the **HOLD** icon appears on the LCD. Press the button again to return to normal operation.
2. The LCD is equipped with backlighting for easier viewing, especially in dimly lit areas.
3. Press the **Hold/Flashlight** button to turn the Flashlight on. Press again to turn the Flashlight off.

7.13. RANGE

Press the **RANGE** key to activate the manual mode and to disable the Autorange function. The symbol "AUTO" disappears from the upper left part of the display. In manual mode, press the **RANGE** key to change measuring range: the relevant decimal point will change its position. The **RANGE** key is not active in positions →|, •))), **CAP**, **Hz%,Temp °C °F**. In Autorange mode, the instrument selects the most appropriate ratio for carrying out measurement. If a reading is higher than the maximum measurable value, the indication "**0L**" appears on the display. Press and hold the **RANGE** key for more than 1 second to exit the manual mode and restore the Autorange mode.

7.14. PEAK/INRUSH

1. In AC voltage test mode, Press PEAK/INRUSH key, the peak maximum and peak minimum values can be measured.
2. In current test mode, Press **INRUSH** key the inrush current values are measured.

7.15. Relalive/ Backlight

1. Press the **REL** button to zero the display. "**REL**" will appear in the display. The displayed reading is now the actual value less the stored "zero" value.
2. Press the **REL** button to view the stored value. "**REL**" will flash in the display.
3. To exit this mode, press and Hold the REL button until "**REL**" is no longer in the display.
4. Press and hold the **REL/Backlight** button to turn the Backlight on. Press and hold again to turn the Backlight off.

7.16. Automatic Power OFF

1. In order to conserve battery life, the meter will automatically turn off after approximately 15 minutes. To turn the meter on again, turn the function switch to the OFF position and then to the desired function position.
2. Press and hold the **MODE/VFD** key to turn the system on, the auto power off function will be cancelled.

8. 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.

9. 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.

10. 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

11. 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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