Metrix+™ 725A+ AC/DC Clamp Meter Instruction

I. INTRODUCTION

This True RMS digital clamp meter has a 3999-count LCD for measuring AC current, DC and AC voltage, capacitance, resistance, frequency, diode, and continuity with a buzzer sound. It can also measure temperature with a range of -50 – 1,000 °C. Inrush current measurement (80ms RMS) can show the current spike when an appliance is first turned on.

The non-contact voltage tester makes it very convenient to check if a circuit has power or not.

It is an ideal tool for measuring and monitoring electronic appliances, electrical equipment, and household appliances.

II. SAFETY STANDARD

The meter complies with the safety requirements of EN61010-1 CATIII 600V. Please read before use:

1. The testing AC or DC voltage should not be more than the maximum voltage (600V) of the meter.
2. In general, voltage less than 36V is considered safe. If the voltage is more than DC 51V or AC 36V, check the test leads to ensure that they are connected correctly and free from defectives.
3. When changing the functional measuring range, the test lead should be away from test point.
4. The function and the range should be selected before use.
5. Safety symbols:

⚠ Warning!

⚠ Risk of High Voltage and Electric Shock!

III. FEATURES

3.1 General

3.1.1 Measurement method: True RMS

3.1.2 Maximum display count: 3999 or 9999

3.1.3 Maximum clamp conductor diameter: opening diameter 27mm

3.1.4 Auto negative polarity indication: Displays "-"

3.1.5 Low battery power: displays "⊟"

3.1.6 Auto power off

3.1.7 Work environment: 0°C-40°C, 75% RH

3.1.8 Storage environment: -10°C-60°C, 85% RH

3.1.9 Battery: AAA 1.5V×2

3.1.10 External dimensions: 213 (L) × 80 (W) x 35 (H) mm

3.1.11 Weight: About 240g (including battery)

3.2 Technical specifications

Accuracy: ±(% reading + digit); calibration term is one year.

Ambient temperature: 23°C±5°C; Ambient humidity: ≤70%RH

3.2.1 DCV

Range	Accuracy	Resolution	Input Impedance
400mV	±(0.5%+5d)	0.1mV	>100 MΩ
4V		1mV	About 10MΩ
40V		10mV	About 10MΩ
400V		100mV	About 10MΩ
600V		1V	About 10MΩ

3.2.2 ACV

Range	Accuracy	Resolution	Input Impedance
400mV	±(1.2%+5d)	0.1mV	>100 MΩ
4V		1mV	About 10MΩ
40V		10mV	About 10MΩ
400V		100mV	About 10MΩ
600V		1V	About 10MΩ

Frequency: 10Hz-1kHz (Warning: Frequency for square wave accuracy is specified from 10Hz to 400Hz)

Display: True RMS (sinusoidal waveform RMS calibration)

3.2.3 DCA

Range	Accuracy	Resolution
400A	±(2%+10d)	100mA
600A		1A

3.2.4 ACA

Range	Accuracy	Resolution
400A	±(2%+10d)	100mA
600A		1A

AC Conversion Type: True RMS RMS (Sinusoidal Waveform RMS Calibration). Frequency Range:50-60Hz.

3.2.5 Resistance Ω

Range	Accuracy	Resolution
400Ω	±(1%+3d)	0.1Ω
4kΩ		1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40MΩ	±(1.5%+5d)	10kΩ

Overload protection: effective value 220V.

3.2.6 Capacitance

Range	Accuracy	Resolution
10nF	±（3%+20d）	0.001nF
100nF	±（3%+5d）	0.01nF
1uF		0.1nF
10uF		1nF
100uF		10nF
1000uF		100nF
10mF	±（5%+5d）	1uF

Overload protection: effective value 250V.

Note: In the 10nF range, capacitance below 20pF cannot be measured.

3.2.7 Frequency (AC V <30V)

Range	Accuracy	Resolution
100Hz	±（0.5%+3d）	0.01Hz
1kHz		0.1Hz
10kHz		1Hz
100kHz		10Hz
1MHz		100Hz
10MHz		1kHz
40MHz		10kHz

Overload protection: effective value 250V. Input sensitivity RMS: 1V. For AC V >2V, use AC V frequency measurement mode. It can measure 10Hz – 100KHz.

3.2.8 Duty

Range	Accuracy	Resolution
1%~99%	±（0.5%+3d）	0.1%

Overload protection: effective value 250V. Input sensitivity RMS: 1V

3.2.9 Temperature

Range	Resolution	Accuracy
-50 – 300 ℃	1 ℃	±(1%+5)
301 – 1000 ℃	1 ℃	±(1.9%+15)
-58 – 600 °F	1 °F	±(1.2%+6)
601 – 1832 °F	1 °F	±(1.9%+25)

Temperature sensor: K WRNM- 010 bare contact thermojunction

Overload protection: effective value 250V.

3.2.10 Diode Test ⊣◀

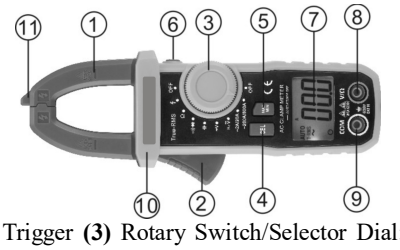
Displays approximate forward voltage drop of the diode. Measuring condition: forward direct current is 1.5mA; Open DC voltage is ~3V.

3.2.11 Continuity Test •))

If the resistance between two tested points is less than 90Ω±30Ω, the buzzer will sound. Test condition: Open-circuit voltage is ~0.5V.

IV. OPERATIONS

4.1 Control Panel



(1) Jaws. **(2)** Trigger **(3)** Rotary Switch/Selector Dial: This switch is used to select the following functions: current, voltage, capacitance, resistance, forward voltage drop of diode, continuity and turns ON/OFF the meter. **(4)** "SEL" Button: Used to select functions. **(5)** "RAN" Button: This Range button is used to manually select the measurement range of a test function. **(6)** The DH/LIGHT button: Data Hold and back light control button Press this button once to lock the current reading on the LCD. The "DH" symbol will be displayed. Press this button again to cancel the hold function, and the "DH" symbol will disappear. Long press "DH" for 2 seconds to turn on or off the backlight. The backlight will turn off after 10 seconds of inactivity. **(7)** LCD Display. **(8)** "V/Ω" Jack: This is the positive input terminal for voltage, resistance, capacity, and diode measurements. **(9)** "COM" Jack:

This is the negative (ground) input terminal. **(10)** Safety Barrier. **(11)** NCV Sensor Head

4.2 AC/DC Voltage Measurement

Turn the rotary switch to "≈V/Hz". For DC V measurement, press SEL button to select DC mode. "⎓" logo will appear on the LCD. For AC V measurement, press SEL button to select AC mode. "∼" logo will appear on the LCD.

Plug the black lead into the "COM" socket and plug red lead into the "V/Ω" socket. Connect the test lead with the two ends of the circuit and read the display on the LCD.

If the voltage measured is less than 400mV, use the "mV/⊣⊢" mode for a higher resolution measurement.

To measure AC frequency of greater than 2V, press the "SEL" to enter the "Hz" mode. It can measure 10Hz to 100KHz.

⚠ NOTE: Do NOT measure voltage that is more than 600V, otherwise it may damage the tester. If the screen displays OL, it means that the tested voltage is higher than 660V.

4.3 AC/DC Current Measurement

(1) For AC current, set the rotary switch to "~A" position. For DC current, set the rotaty switch to "⎓A" position.

(2) Press the trigger to open the clamp type current sensor (CT) jaw and clamp only one conductor ensuring the jaw is firmly closed around the conductor. Read the current value on LCD.

⚠ For safety reasons, please disconnect the test leads from the tester before measuring the current.

⚠ If two or more conductors are clamped at the same time, the tester will not be able to measure the current.

⚠ The most accurate reading is when the conductor is situated at the center of the jaw marked with the "---" line.

4.4 AC Inrush Current Measurement

Prepare the tester like how it would be for AC current measurement. Press "SEL" and "INR" logo will appear on the LCD. Start the device to be tested. The peak current of a measurement window of 80ms will be displayed.

4.5 Resistance Measurement, Diode and Continuity Test

⚠ WARNING! When in this mode, make sure that there is no voltage in the circuit or components that will be measured.

(1) Turn the Rotary switch to the range of Ω/•))) /⊣▶⊢. "Ω" logo will be displayed on the LCD. The tester will be in resistance measurement mode.

(2) Plug red lead in "V/Ω" socket and plug black lead in "COM" socket.

(3) Connect the test probes to the components to be tested. Resistance value will be displayed on the LCD.

(4) For continuity test, push the SEL key to change the mode to •))). When the resistance measured is less than about 90Ω±30Ω, the buzzer will sound.

(5) When the test lead is under open-circuit or input-overload status, the LCD will display "OL".

(6) For diode test, push the SEL key to change the mode to ⊣▶⊢

(7) Connect the test probes to the diode to be tested. If the diode not damaged and connected in the correct direction, the forward voltage drop will be displayed.

This function can also be used to test LEDs that have less than 3V operating voltage.

(8) If the diode is connected in reverse or open-circuit status, the LCD will display "OL".

⚠ NOTE: a) When the resistance measured is above 1MΩ, the tester takes several seconds for the reading to stabilize. This is normal for the measurement of high resistance.

b) To avoid interference while measuring high resistance, insert the resistor pins directly into the V/Ω and COM jack.

c) When measuring resistance in a circuit, make sure the power to the circuit is off and all capacitors are discharged.

4.6 Capacitance Measurement

⚠WARNING! When measuring capacitor, make sure the capacitor is completely discharged before testing.

Turn the rotary switch to the "⊣⊢" mode. Plug the red lead into the "V/Ω" socket, and the black lead into the "COM" socket. Connect the test probes to the capacitor to be tested. Read the result on the LCD.

⚠ The measurement range cannot be set manually. When the capacitor is large capacitance, the measurement time may take longer.

⚠ Do not take an external voltage or a charged capacitor (especially a large capacitor) and connect it to the test terminal. If the large capacitor has a significant leakage or breakdown, the measurement value will be unstable.

4.7 Frequency and Duty Ratio Measurement

(1). To measure frequency, turn the Rotary switch to "Hz." For duty ratio measurement, press SEL button to change. (2) Plug red test lead in "V/Ω" terminal and plug black lead in "COM" terminal. (3) Connect the probes to the circuit and the value will be displayed on the LCD.

⚠NOTE: If the voltage of the frequency being measured is above 30V, please first drop the voltage to below 30V to prevent damage to the tester. Or, use the frequency measurement mode inside AC V function.

4.8 Measurement of temperature

Turn the Rotary switch to "°C/°F." Plug the red connector of the temp. probe into the V/Ω socket and the black into the COM socket. Place the sensor tip in the environment to be measured. The measured temp. value will be displayed on the LCD. To change between °C and °F, press the SEL button.

⚠Caution: If a temp. probe is not inserted, the tester might display the approximate environmental temp. The K WRNM- 010 bare contact thermojunction has a maximum measurement temp. of 250°C (300°C for short time). A different sensor needs to be used if higher temperature measurement is required.

4.9 Non-Contact Voltage Tester and Line/Neutral Detector

Turn the Rotary switch to the "ϟNCV" position. The LCD will show "EF". There are two measurement methods:

(1) To use NCV sensor head, move the head close to or in contact with the object to be measured. It can be electrical conductors, switches, or sockets.

(2) To use the red test lead for contact measurement, put the tip of the red (V/Ω) test probe on the conductor.

If no voltage is detected, the meter will show "EF". If voltage is detected,"-" is displayed. The higher the detected voltage, the more "--" will be displayed and the stronger the buzzer will sound.

To detect Line or Neutral electrical line, test the two lines individually. The one with stronger voltage will be Line and the weaker one will be Neutral.

⚠ Caution:

1. Even if there is no indication, voltage may still exist. Do not absolutely assume that there is no voltage in the wire. The testing may be affected by many factors such as the socket design, the insulation thickness, and types etc.
2. Interference source of external environment, such as flash, motor and etc, may falsely trigger the non-contact voltage tester.

4.10 Auto Power Off

When the instrument is in "ON" mode, it will automatically enter sleep mode after 15 minutes of inactivity. While in sleep mode, pressing the "SEL" key will turn the tester back on. To turn off the automatic sleep mode feature, hold down the "DH" key while turning on the tester, and the symbol "⏻" will not display on the LCD.

V. MAINTENANCE OF TESTER

⚠WARNING! Before changing the battery or opening the cover, please switch off the power, remove the test leads, and remove any of input signals to prevent electric shock.

5.1 When the meter displays the symbol of "−+", the battery should be changed. Open the battery cover, and then change the used battery with new battery to ensure the normal operation of the meter.

5.2 The meter should be protected against damage, vibration, and impact. It should not be placed where high temperature or intense magnetic field exists.

5.4 Calibrating of the meter is done on a yearly basis.

VI. ACCESSORIES

Test lead: 1 set; user manual: 1 piece; temperature probe: 1 set