DIGITAL MULTIMETER

AX-585N



OPERATION MANUAL

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1. Summery

The instrument is a steady performance, battery-driven 4 ½ digiatal multimeter. It uses the LCD with 32mm-high figure to make the reading clear. The function of 5 sec. backlight displaying and overload protection make operation more convenient.

The instrument has the function of measuring DCV, ACV, DCA, ACA, resistance, capacitance, temperature,

Frequency, diode and continuity performance test. It adopts double integral A/D converter as its core. It is an excellent tool for labs, factories and radio-technology.

2. Safety notes:

The instrument is designed according to IEC1010 standard (safety standard issued by International Electrician Committee). Please read the manual before operation.

2-1. Do not input a over range value when measuring.

2-2. Voltage less than 36V is a safety voltage. When measuring voltage higher than DC 36V, AC 25V, check the connection and insulation of test leads to avoid electric shock.

2-3. Be sure to keep the test leads off the testing points when switching function or range.

2-4. Select correct function and range to avoid fault operation. You may still be careful to ensure the safety even the meter has all range protection functions.

2-5. Please do not measuring before battery isn't installed and back cap isn't firm.

2-6. Please don't input voltage value when measuring resistance.

2-7. Please move the test leads away from test points and turn off the power before replacing battery or fuse.

2-8. Introduction for safety symbol:



Exists high voltage



GND



Dual insulation



must refer to manual



Low battery

3. Specification

3-1. General features

3-1-1. Displaying: LCD

3-1-2. Max display: 1999 (4 ½) digits automatic polarity display.

3-1-3. Measurement method: double integral A/D conversion.

3-1-4. Sampling rate: approx. 3 times/sec.

3-1-5. Over-range display: “1” displayed in the highest dogit.

3-1-6. Low battery display: “”.

3-1-7. Working environment: (0~40)°C, relative humidity: 80%

3-1-8. Power supply: one 9V battery (NEDA 1604/6F22 or equivalent model)

3-1-9. Dimension: 189mm x 97mm x 35mm (length x width x height)

3-1-10. Weight: approx. 400g (including 9V battery)

3-1-11. Accessories: test leads, user manual, temperature probe, holster, gift box.

3-2. Technical features

3-2-1. Accuracy: ±(a% x reading data + digits), environment temperature at (23+5)°C, relative humidity <75%, One year guarantee since production data.

3-2-2. Performance: Measuring DCV, ACV, DCA, ACA, resistance Ω, capacitance C, frequency f, temperature T, diode/continuity performance testing, with auto power off, backlight, and data hold function.

3-2-3. Technical parameter:

3-2-3-1. DCV

Range	Accuracy	Resolution
200 mV	± (0,1 % + 5)	10 µV
2 V		100 µV
20 V		1 mV
200 V		10 mV
1000 V	± (0,2 % + 5)	100 mV

Input impedance: All range is 10MΩ

Over load protection: 250V DC or AC peak value for range 200mV; 1000V DC or AC peak value for other ranges.

3-2-3-2. ACV

Range	Accuracy	Resolution
2 V	± (0,8 % + 25)	100 µV
20 V		1 mV
200 V		10 mV
750 V	± (1,0 % + 25)	100 mV

Input impedance: All range is 10MΩ

Overload protection: 1000V DC or AC peak value

Frequency response: 40~400Hz range under 200V

40~200Hz for range 750V

Display: Sine wave RMS (Average value response).

3-2-3-3. DCA

Range	Accuracy	Resolution
200 µA	± (0,5 % + 4)	0,01 µA
2 mA		0,1 µA
20 mA		1 µA
200 mA	± (0,8 % + 6)	10 µA
20 A	± (2,0 % + 15)	1 mA

MAX measurement voltage drop: 200mV

Max input current: 20A (within 10 seconds)

Over load protection: 0.2A/250V self-resume fuse, 12A quick-break fuse for range 20A.

3-2-3-4. ACA

Range	Accuracy	Resolution
20 mA	± (1,5 % + 25)	1 µA
200 mA		10 µA
20 A	± (2,5 % + 35)	1 mA

MAX measurement voltage drop: 200mV

Max. input current: 20A (within 10 seconds)

Over load protection: 0.2A/250V self-resume fuse

12A quick-break fuse for range 20A

Frequency response: 40~200Hz

Display: Sine RMS (Average value response)

3-2-3-5. Resistance (Ω)

Range	Accuracy	Resolution
200 Ω	± (0,4 % + 10)	0,01 Ω
2 kΩ	± (0,4 % + 5)	0,1 Ω
20 kΩ		1 Ω
200 kΩ		10 Ω
2 MΩ		100 Ω
200 MΩ	± [5,0 %(odczyt -1000) +10]	10 kΩ

Open circuit voltage: less than 3V

Over load protection: 250V DC or AC peak value

Note:

a) At range 200Ω, short-circuit the test leads to measure the wire resistance, then subratact it from the real measurement.

b) At range 200MΩ, when the test leads short circuit, LCD displays 1.0MΩ. It's normal and doesn't affect the accuracy. Please deduct the value from the real measurement.

3-2-3-6. Capacitance (C)

Range	Accuracy	Resolution
20 nF	± (3,5 % + 10)	1 pF
2 µF		100 pF
200 µF	± (3,8 % + 20)	10 nF

Testing frequency: 400Hz

Overload protection: 36V DC or AC peak value

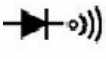
3-2-3-8. Frequency (f)

Range	Accuracy	Reolluton
20 kHz	± (3,0 % + 150)	1 Hz
200 kHz		10 Hz

Input sensitivity: 1VRMS

Over load protection: 250V DC or AC peak value (within 10 seconds)

3-2-3-8. Diode and continuity performance test

Range	Value displayed	Testing condition
	Forward voltage drop of diode	Forwrd DCA is approx. 1mA, the backward voltage is approx 3V
	Buzzer makes a long sound Chile resistance is less than (70 ± 20) Ω	Napięcie ok. 3V

Over load protection: 250V DC or AC peak value

CAUTION: do not input voltage at this range!

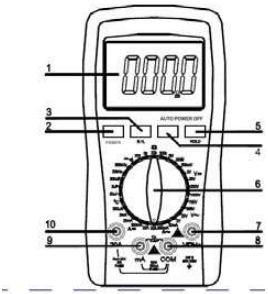
3-2-3-9. Temperature (°C)

Accuracy Range	Accuracy	Resolution
(-20 ÷ 1000) ˚C	< 400 ˚C ± (0,8 % +40) ≥ 400 ˚C ± (1,5 % +150)	0,1 ˚C

Sensor: K type thermocouple (nickel chromium-nisiloy) banana type plug.

4. Operation

4-1. Panel description



1. LCD: display the measuring value.

2. POWER: turn on/off the power

3. B/L: turn on/off the back light

4. Continuity testing indicator.

5. HOLD key: press it, thepresently measured value is held on LCD and “H” symbol displays. Press it again, “H” symbol disappears, and the meter is exited the holding mode.

6. knob: to select measuring function and range.

7. Voltage, resistance and frequency anode COM

8. GND, the anode COM of test accessory

9. COM for the cathode of capacitance, temperature and current lower than 200mA.

10. COM for measuring current 20A

4-2. DCV measurement

4-2-1. Insert the black test lead to “COM” terminal and the test red one to “V/Ω/Hz” terminal.

4-2-2. Select the knob to a proper DCV range, and connect the test leads crossly to the electric circuit under test, LCD displays polarity and voltage under test connected by the red test lead.

Note:

1. Firstly users should select the knob to the highest range, if users had no idea about the range of voltage under test, and then select the proper range based on displaying value. If LCD displays “1” it means meter is over the max. Value of this range, thus should select the knob to a higher range.

2. Do not input a voltage over DC 1000V.

3. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.

4-3. ACV measurement

4-3-1. Insert the black test lead to “COM” terminal and the red one to “V/Ω/Hz” terminal.

4-3-2. Select the knob to a proper ACV range, and then connect the test leads crossly to the electric circuit under test.

Note:

1. Firstly users should select the knob to the highest range, if users had no idea about the range of voltage under test, and then select the proper range based on displaying value. If LCD displays “1” it means meter is over the max. Value of this range, thus should select the knob to a higher range.

2. It’s normal that there is remained value on LCD before measuring and it doesn’t affect the measurement accuracy.

3. Don’t on put a voltage over 750Vrms.

4. Be carefully while measuring a high voltage. DO NOT touch the high voltage circuit.

4-4.DCA measurement

4-4-1. Insert the black test lead to “COM” terminal and the red one to “mA” terminal (the Max. 200mA) or to “20A” (the Max. 20A)

4-4-2. Select the knob to a proper DCA range, and connect the test leads crossly to the electric circuit under test; LCD displays polarity and current under test connected by red test lead.

Note:

1. Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value. If the LCD displays "1", it means the current is over range. Thus should select the knob to the higher rang.

2. Max. input current is 200mA or 20A (subject to where the red test lead insert to), too large current will damage the fuse.

4-5.ACA measurement

4-5-1. Insert the black test lead to "COM" terminal and the red one to "mA" terminal (the Max. 200mA) or to "20A" (the Max. 20A)

4-5-2. Select the knob to a proper ACA range, and connect the test leads crossly to the electric circuit under test.

Note:

1. Firstly users should select the knob to the highest range, if users had no idea about the range of current under test, and then select the proper range based on displaying value. If the LCD displays 1, ir means the current is over range. Thus should select knob to the higher range.

2. Max. input current is 200mA or 20A (subject to ahere the red test lead insert to), too large current will damage the fuse.

4-6.Resistance measurement

4-6-1. Insert the black test lead to COM terminal and the red one to V/Ω/Hz terminal.

4-6-2. Select the knob to a proper resistance range, and connect the test leads crossly with the resistor under test.

Note:

1. The LCD displays 1 while the resistance is over the selected range. The knob should be adjusted to a higher range. When measuring resistance value is over 1MΩ, the reading will take a few seconds to be stable. It's normal for high resistance measuring.

2. When input terminal is in open circuit, overload displays

3. When measuring in line resistor, be sure that the power is off and all capacitors are released completely.

4. Do not input any voltage at resistance range even the meter has voltage protection functions at this Range!

4-7.Capacitance measurement

4-7-1. Insert the red test lead to “COM” terminal and the black one to “mACx” terminal.

4-7-2. Select the knob to proper capacitance range, and insert the measuring accessories or test leads into “COM” and “mA” terminal. Note: “COM” terminal is for positive pole “+”, mA terminal is “-“/ Connect test leads with the two points of capacitor, be wary of polarity if necessary.

Note:

1. If the capacitance under tested is over the max. Value of selected range, LCD displays “1”, thus should select the knob to a higher range.

2. When measuring at large capacitance range, if capacitor is crept badly or broken, LCD displays a value and it’s unstable.

3. Release the capacitor completely before measuring capacitance.

4. Unit: 1uF=1000nF 1nF=1000pF

4-8.Diode and Continuity performance test:

4-8-1. Insert the black test lead to “COM” terminal and the red one to V/Ω/Hz terminal (the polarity of red lead is “+”)

4-8-2. Select the knob to “ ” range, connect test leads with the diode under tested, the red test connect to diode positive polarity, the reading is the approx. value of diode forward volt drop.

4-8-3. Insert test leads to two points of tested circuits, if the inner buzzer sounds, the resistance is less than (70±20)Ω

Note: Don’t input voltage in position, or it may damage the meter.

4-9. Frequency measurement

4-9-1. Insert test leads or shielded cable into “COM” and “ V/Ω/Hz” terminal.

4-9-2. Select the knob to the frequency range, insert the test leads or shielded cable to the signal source or the load which is tested.

Note:

1. The meter can still work if the input value is higher than 10Vrms, but the accuracy is not guaranteed.

2. In noise environment, you’d better use shiel cable to measure a low signal.

3. When measuring high voltage circuit, any parts of your body should not touch the high voltage circuit.

4. Don’t input voltage higher than 250V DC or AC peak value, or it may damage the meter.

4-10.Temperature measurement

Select the knob to the “C” range, insert the cathode (black pin) of cold end (free end) of thermocouple into “mA” jack, anode (red pin) into “COM” jack, put the working end (temperature measurement port) of thermocouple on the surface or inside the object to be tested. Then you can read temperature from the screen, and the data is in Centigrade.

If using testing accessory, please insert testing accessory into “COM” and “mA”; “com” for anode and “mA” for cathode.

4-11. Data holding

Press the Hold switch, the presently measured value is held on LCD, press it again, the function is cancelled.

4-12. AUTO POWER OFF

The meter will be into sleeping mode when it works for (20±10) minutes. Press “POWER” key twice to restart the power.

4-13. Backlight

Press “B/L” key to turn on the backlight, and it will turn off after 5 sec.

Note:

When turning on backlight, the working current will enlarged, it leads to shorten battery usage and enlarge accuracy of some functions.

5. Meter maintenance

This is a exact instrument, Don’t try modify the electric circuit.

5-1. Keep the meter away from water, dust and shock.

5-2. Do not store and operate the meter under the condition of high humidity, combustible, explosive and strong magnetic place.

5-3. Wipe the case with a damp cloth and detergent, do not use abrasives and alcohol.

5-4. If do not operate for a long time, should take out the batter to avoid leakage.

5-4-1. When  symbol displays, should replace the battery as following the steps.

5-4-1-1. Unlock the button and remove the battery case.

5-4-1-2. Take out the old battery and replace the new one. It's betterto use alkaline battery for longer life.

5-4-1-3. Fit on the battery case and lock the button.

5-4-2. Replace fuse: When replacing fuse, please use another same type and specification fuse.

6. Trouble shooting

If the meter dies not work properly, check the meter as following:

Fault	Solution
No Reading on LCD	• Turn on the power • Set the HOLD key to a correct mode • Replace battery
„" signal appears	• Replace battery
No current or temperature input	• Replace fuse
Big error Value	• Replace battery

The specifications are subject to change without notice.

The content of this manual is regarded as correct error or omits Pls. contact with factory.

We hereby will not be responsible for the accident and damage caused by improper operation.

The function stated for this User Manual cannot be the Reason of special usage.