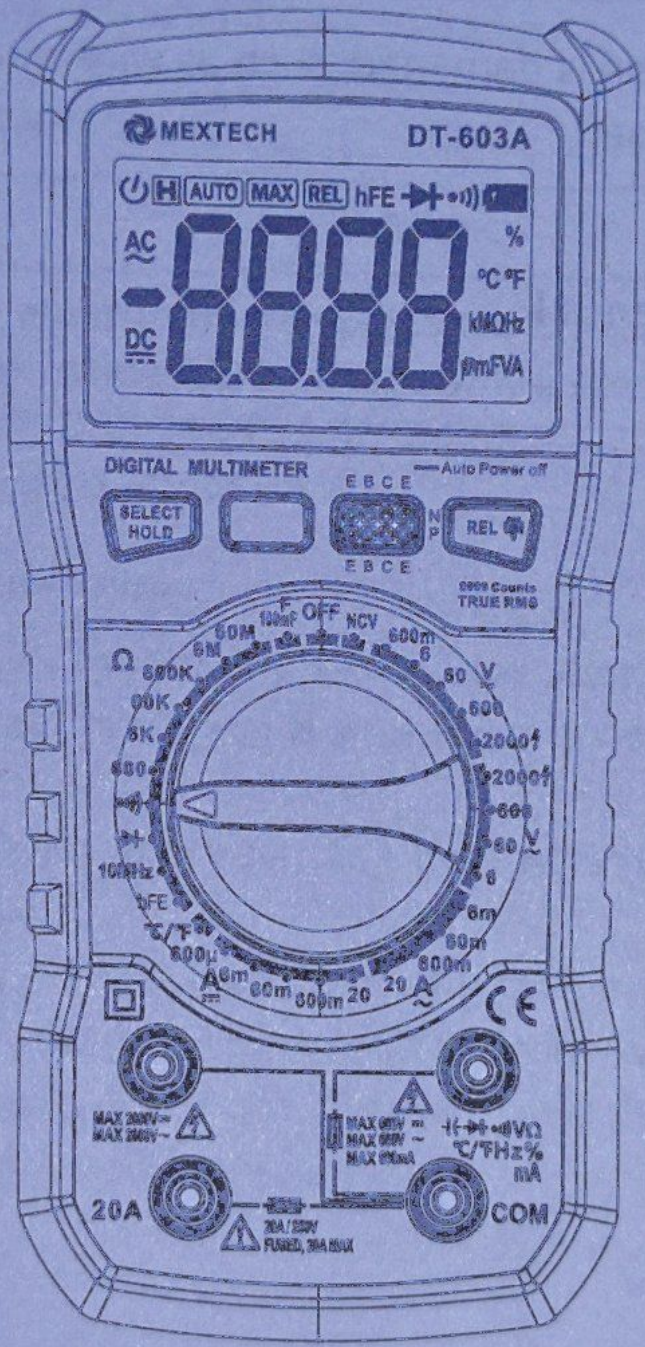
MEXTECH

User Manual Digital Multimeter



Model: DT603A

1.Introduction

This series of instruments is a stable performance, battery-driven high reliability digital multimeter, the instrument uses 34mm word high-definition LCD display, the degree of clarity, more convenient to use.

This series of instruments can be used to measure DC voltage and AC voltage, DC current and AC current, resistors, capacitors, diodes, transistors, on-off test, temperature, frequency, automatic shutdown turn on and off, backlight and other parameters. The whole machine is based on dual integral A / D conversion. It is an excellent tool and instrument, and is an ideal tool for laboratories, factories, radio enthusiasts and families.

⚠ Warning

Take special care when using this instrument. Improper use may cause electric shock or damage to the instrument. In use should follow the usual safety procedures and in full compliance with the safety manuals provided.

To fully utilize the features of the instrument and ensure safe operation, carefully follow the instructions in this section (chapter).

2.Security Information

In order to avoid personal injury caused by electric shock and Instrument damage, users should pay attention to the following safety tips.

- Do not measure any voltage beyond the measurement range specified by this instrument.
- Although there is an internal protection circuit in the resistance measurement range, do not apply a high voltage (above 100V) to the input of the resistance measurement range.
- Check the test leads for damage or exposure of metal parts.
- Try to avoid the instrument in the direct sunlight or very high temperature environment.
- Be aware of the possibility of electric shock when measuring voltages in excess of 30V AC or 50V DC.
- Before measuring the current, turn off the power, disconnect the circuit under test after measuring the power.
- Replace the battery to pay attention to its polarity.

Electrical symbols:

ϟ	Dangerous voltage	⏚	Ground
~	AC (alternating current)	⚠	Warning, to see the tips in the instructions.
⎓	DC (direct current)	⧈	Double insulated
≂	AC or DC	⏤	Fuse

3.2.Function button

SELECT/ HOLD

In the frequency range, press the "SELECT / HOLD" button to switch between frequency and duty cycle.

In the temperature range, press the "SELECT / HOLD" button, switch between degrees Celsius and Fahrenheit, in the AC2000Vrange, press the "SELECT / HOLD" button, you can switch to the frequency test, in addition to temperature and frequency, AC2000V gear, press Under the "SELECT / HOLD" button, the LCD will display "H", the instrument will keep displaying the measurement result, then click the HOLD button again, the instrument will exit the keep measurement mode and display the current measurement result randomly.

REL/

Press the "REL / " button for 2 seconds to illuminate the backlight, press the button again for 2 seconds, and the backlight turns off. (The backlight will turn off automatically after turning on the backlight for about 30 seconds.) In addition to the diode, transistor, on-off test, the other gear has relative value measurement function (OL, REL is inactive) REL key is relative measurement key, Action, press this button to exit the relative value mode.

4.Technical indicators

4.1.General characteristics

- Manual range digital multimeter, full scale is 5999 count;
- Display: 3 5 / 6 digit LCD display;
- Overload protection: In the resistance, the use of PTC protection circuit;
- battery low voltage display;
- Fuse protection: uA, mA file: ceramic fuse F1 600mA / 250V 20Afile: ceramic fuse F2 20A / 250V
- Automatic shutdown: about 15 minutes without turning the function knob switch or use any key operation, the display will blanking the display, then the instrument into the micro-power hibernation. To awaken the meter to work again, just turn the rang knob or press any button;
- Power: 9V battery NEDA1604 / 6F22 or 006P;
- Working temperature and humidity: 0 ~ 40 ℃ / 32 ~ 104 ° F, 45% -80% RH;
- Storage temperature and humidity: -20 ~ 60 ℃ / -4 ~ 140 ° F, 45% -80% RH;
- Security level: IEC61010-1, CAT Ⅲ 600V
- Size and weight: 195 (L) x92 (W) x55 (H) mm. About 380g (with battery)

4.2.Electrical Specifications

Accuracy: ± (a% of reading + number of words), one year warranty (ambient temperature: 23 ± 5 ℃ relative humidity: <75%)

4.2.1 DC voltage

Range	Resolution	Accuracy
600mV	0.1mV	± (0.5% of reading + 2 words)
6V	0.001V	
60V	0.01V	
600V	0.1V	
2000V	1V	± (2% of reading + 5 words)

Input impedance: 10MΩ

Maximum input voltage: 600mV Range of 250V DC or AC peak, 6V/60V/600V Range of 1000V DC ,2000V Range of 2000V DC(RMS)

4.2.2 AC voltage true RMS (50Hz-1000Hz)

Range	Resolution	Accuracy
6V	0.001V	± (1% of reading +3 words)
60V	0.01V	
600V	0.1V	
2000V	1V	± (3 % of reading +5 words)

* Input impedance: 10MΩ
* Response: True RMS
* Maximum input voltage:
  6V/60V/600V Range of 1000V AC ,2000V Range of 2000V AC(RMS)
* Frequency response: 40Hz ~ 1KHz (for standard sine wave and triangle wave)
* Display: True RMS (other waveform size 200Hz for reference only)
* In AC2000V file, press the SELECT button, you can test AC380V, 220V mains frequency.

4.2.3 Resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	± (0.8% of reading +3 words)
6KΩ	0.001KΩ	
60KΩ	0.01KΩ	
600KΩ	0.1KΩ	
6MΩ	0.001MΩ	
60MΩ	0.01MΩ	± (2% of reading +5 words)

* Open circuit voltage: about 0.8V
* Overload protection: 250V DC and AC RMS
* Warning: Input voltage is forbidden in the resistance range for safety

4.2.4 DC Current

Range	Resolution	Accuracy
600μA	0.1μA	± (0.8% of reading +10 words)
6mA	1μA	
60mA	10μA	± (1.0% of reading +10 words)
600mA	100μA	
20A	10mA	± (2.0% of reading +5 words)

* Overload protection: μA / mA Range: F600mA fuse (fast blow),
20A Range: F20A fuse (fast blow)
* Maximum input current: μA / mA jack: 600mA, 20A jack: 20A

4.2.5 AC Current (50Hz-1000Hz)

Range	Resolution	Accuracy
6mA	1μA	± (1.0% of reading +10 words)
60mA	10μA	± (1.5% of reading +10 words)
600mA	100μA	
20A	10mA	± (3.0% of reading +5 words)

* Overload protection: mA Range: F600mA (fast blow),
20A Range: F20A fuse (fast blow)
* Maximum input current: mA jack: 600mA, 20A jack: 20A
* Frequency response: 50Hz ~ 1KHz (for standard sine wave and triangle wave)

4.2.6 Capacitance measurement

Range	Resolution	Accuracy
9.999nF	0.001nF	Press REL key to clear ± (4.0% of reading + 20 words)
99.99nF	0.01nF	± (3.0% of reading + 5 words)
999.9nF	0.1nF	
9.999μF	0.001μF	
99.99μF	0.01μF	
999.9μF	0.1μF	
9.999mF	0.001mF	± (5.0% of reading + 10 words)
99.99mF	0.01mF	

* Overload protection: 36V DC and AC RMS

4.2.7 Frequency

Range	Resolution	Accuracy
9.999Hz	0.001Hz	± (2.0% of reading + 5 words)
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99kHz	0.01kHz	
999.9kHz	0.1kHz	
9.999MHz	1kHz	

* Overload protection: 250V DC or AC (rms) - Measuring signal: Vpp 30mV AC signal.

Note: As the measurement frequency increases, the VPP input signal also increases

4.2.8 Duty cycle

Range	Resolution	Accuracy
1%~99%	1%	for reference only

4.2.9 Temperature

Range	Resolution	Accuracy
-20℃~1000℃	1℃/2℉	<400 ℃ ± (1.0% of reading + 4 words)
		≥400 ℃ ± (1.5% of reading +5 words)
-4℉~1832℉		<752 ℉ ± (1.0% of reading + 6 words)
		≥752 ℉ ± (1.5% of reading +10 words)

* Temperature specifications do not include thermocouple error.

4.2.10 Transistor

Range	Resolution	Accuracy
hFE	The display reads the approximate value of hFE, (0 -1000)	Base current is about 10μA Vce is about 2.8V

4.2.11 Diode

Range	Resolution	Accuracy
→|	0.001V	Display diode forward voltage approximation

* Forward DC current: about 1mA
* Reverse DC voltage: about 3.8V

4.2.12 On-off measurement

Range	Accuracy
•))	If the measured line resistance is less than 100Ω, the buzzer inside the instrument will sound.

* Open circuit voltage is about 2.1V.

4.3 Automatic shut-down

1. If there is no operation for any 15 minutes after power on, the meter will go to sleep state and shut down automatically to save power.
2. Automatic shutdown, press any key, the instrument resume working condition.
3. If the "SELECT" button is pressed during power-on, the buzzer will give out 5 beeps. The auto power-off function will be canceled, the auto power off symbol will disappear and the auto power off function will resume after power off.

4.4 NCV (non-contact voltage detection)

1. Switch the instrument rotary switch to the NCV position and close the top of the instrument to the conductor. When the detected voltage is greater than 90Vac (RMS), when the instrument is close to the conductor, there will be a dripping alarm sound from the instrument induced voltage buzzer. The LED indicator will be adjusted according to Light from different colors of LED lights, about 2-5cm, green light, about 1-2cm bright yellow light, 0-1cm bright red light and flashing.

Warning :

1. Even if there is no indication, voltage may still exist. Do not rely on non-contact voltage detectors to determine if there is voltage on the wire. Detection operations may be affected by socket design, insulation thickness and type of different factors.
2. When the input voltage of the instrument input terminal or external environment interference sources (such as flash, motor, etc.), due to the induced voltage may trigger false non-contact voltage detection, the instrument will alarm and blink.

4.5 DC voltage measurement

1. Turn the rotary switch to the V⎓ gear, connect the black test pen and the red test pen to the COM input socket and the V input socket respectively, and measure the voltage of the circuit to be tested with the other two ends of the test pen. (In parallel with the circuit under test), measured by the liquid crystal display voltage reading. When measuring DC voltage, the display will also show the voltage polarity connected to the orange test lead.

   If the measured voltage is between 600V and 2000V ,the red test lead connected to the 2000V input socket

4.6 AC voltage measurement

1. Turn the rotary switch to the V~ gear, connect the black test pen and the red test pen to the COM input socket and the V input socket respectively, and measure the voltage value of the circuit to be tested with the other two ends of the test pen. (In parallel with the circuit under test), the crystal display reads the measured voltage value.

4.7 Resistance measurement

1. Turn the switch to Ω gear, respectively, the black test pen and red test pen connected to the COM input socket and V input socket, the other end of the test pen measured resistance of the circuit under test, the LCD reads the measured resistance value.

4.8 On-off continuity measurement

1. Turn the rotary switch to gear, on-off test, respectively, the black test pen and red test pen connected to the COM input jack and input jack, the other end of the test pen measured resistance of the circuit under test, When the resistance of the circuit under test is less than about 50Ω, the buzzer may make continuous sound.

4.9 Diode measurement

1. Turn the rotary switch to gear, diode test, respectively, the black test pen and red test pen connected to the COM input jack and input socket the other end of the test pen measures the diode under test, the instrument shows the positive diode To the pressure drop value.

4.10 Capacitance measurement

1. Turn the rotary switch to "F", connect the black test pen and the red test pen to the COM input socket and the input socket, measure the capacitance of the capacitor to be measured at the other two ends of the test pen, and read the measured value from the LCD .

4.11 Frequency and duty cycle measurement

1. Turn the rotary switch to Hz, connect the black and red test leads to the COM input jack and the Hz input jack. Measure the frequency under test with the other end of the test pen and read the measurement from the LCD.

4.12 AC、DC current measurement

1. Cut the circuit under test. Discharge all high-voltage capacitors on the circuit under test, turn the rotary switch to the proper gear (uA, mA or A position) and connect the black test lead to the COM input socket. If the measured current is less than 600mA, connect the red test pen to the mA input socket; if the measured current is between 600mA and 20A , connect the red test pen to the 20A input socket.
2. Disconnect the circuit under test. Connect the black test lead to one end of the disconnected circuit (which has a lower voltage), connect the red test lead to one end of the disconnected circuit (which has a higher voltage), connect to the power supply of the circuit under test, and then read If the display shows only "OL", this means that the input exceeds the selected range and the rotary switch should be placed in a higher range.

4.13 Temperature measurement

1. Turn the function selection rotary switch to the temperature ℃ / ℉ measuring range.
2. The negative and positive ends of the K-type thermocouple connect to the COM input jacks and the ℃ / ℉ input jacks.
3. Place the K-type thermocouple in the object under test or in the environment.
4. The LCD reads the measurement results.
5. Switch the ℃ / ℉ unit with the SELECT key.

5. Maintain

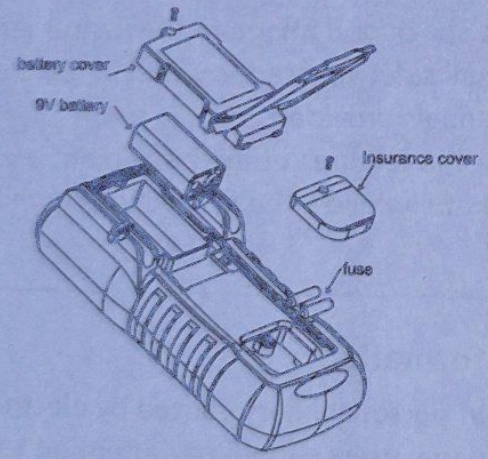
5.1 Replacement battery

> **⚠ Warning**
>
> Before opening the meter's battery cover, remove the test leads from the measurement circuit to avoid the risk of electric shock.

1.If the "⊟" symbol appears, it indicates that the battery should be replaced.
2.Unscrew the cover battery cover screw and remove it.
3.Replace the old battery and replace the battery cover with the original one

Warning :

The polarity of the battery can not be installed.



5.2 Change the pen

> **⚠ Warning**
>
> When changing the test leads, the same or equivalent test lead must be replaced. The pen must be in good condition, the level of the pen: 1000V 20A .

If the pen insulation is damaged, such as wire wire exposed, you must replace the pen.

6. Annex

1. Instruction manual .....1 pc
2. Warranty card ..... 1 pc
3. Test lead .....1 set