

# OPERATION MANUAL

## A6 DIGITAL MULTIMETER

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#### 1. SAFETY

**1.1 Read these operating instructions thoroughly and completely before operating the multimeter. Note all cautions very carefully.**

1.2. Always inspect your MULTIMETER, test leads and accessories for any signs of damage or abnormalities before every use. If any abnormal conditions exist, do not attempt to take any measurements.

1.3. Always start with the multimeter set to the highest range of the function to be measured. Never take a measurement if the value of that function may be greater than the highest range in that function on the MULTIMETER.

1.4. Never ground yourself when taking electrical measurements. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats or any suitable and approved insulating material.

1.5 Never touch exposed wiring, connections or live circuit conductors when attempting to take measurements.

1.6 Never replace the protective fuse inside the MULTIMETER with any other than the approved equal.

1.7. Remember: Think Safety and Act Safely.

#### 2. SPECIFICATIONS

##### 2.1. GENERAL SPECIFICATIONS

**Display:** 3-3/4 digits LCD with 25mm high numerals

**Auto Functions:** Auto-zero, Auto-polarity, Auto-range

**Auto power off:** 30 minutes after stopping the switch or no button push, the meter enters Power off mode. To resume, push any button or turn switch.

**Overrange Indication:** "OL" or "-OL"

**Power Supply:** 9V battery

**Sample Rate:** 3 times/sec

**Safety Standards:** The meter conforms to IEC1010 Double Insulation, Pollution degree 2 Overvoltage Category II

**Operating Environment:** 0°C to 40°C at <75% relative humidity

**Storage Environment:** -20°C to 60°C at <80% relative humidity

**AC Measurement:** Average RMS

**Fuse:** 0.8A/250M fast acting, 10A/250V fast acting

**Dimensions:** 180mm(H) x 90mm(W) x 46mm(D)

**Weight:** 310g (including battery)

##### Accessories:

Operation manual	1 piece
Test leads	1 pair
Battery (6F22) 9V	1 piece
Temperature test probe	1 piece
RS232 Wire	1 piece
RS232 Software Disc	1 piece

##### 2.2. MEASUREMENT SPECIFICATIONS

**Accuracies are ± (% of reading + number of digits), at 23 ° C ± 5° C, less than 75% RH.**

#### DC VOLTAGE

RANGE	ACCURACY	RESOLUTION
400mV	±(0.5%+2)	100µV
4V		1mV
40V		10mV
400V	±(0.8%+2)	100mV
1000V		1V

**Overload Protection:** 1000V DC/750V AC

Input impedance: ≥ 100M Ω on 400mV range  
10M Ω on other ranges

#### AC VOLTAGE

RANGE	ACCURACY	RESOLUTION
400mV	±(3.0%+5)	100µV
4V		1mV
40V		10mV
400V	±(1.0%+3)	100mV
750V		1V

**Overload Protection:** 1000V DC/750V AC

Input impedance: ≥ 100M Ω on 400mV range  
10M Ω on other ranges

Frequency: 400mV, 750V at 50Hz ~100Hz

4V ~ 400V at 50Hz ~ 500Hz.

Display: Average RMS

#### DC Current

RANGE	ACCURACY	RESOLUTION
400 µA	±(1.2%+2)	0.1 µA
4000 µA		1 µA
40mA	±(1.5%+2)	10 µA
400mA		100 µA
4A	±(2.0%+3)	1mA
10A		10mA

**Overload Protection:**

4A & 10A Range: 10A/250V fuse

Other Ranges: 0.8A/250V fuse

#### AC Current

RANGE	ACCURACY	RESOLUTION
400µA	±(1.8%+3)	0.1 µA
4000µA		1µ A
40mA	±(2.0%+3)	10µ A
400mA		100µ A
4A	±(2.5%+3)	1 mA
10A		10mA

**Overload Protection:**

4A & 10A Range: 10A/250V fuse

Other Ranges: 0.8A/250V fuse

Frequency: 400µA - 400mA at 50Hz - 500Hz

4A & 10A at 50Hz - 100Hz

Display: Average RMS

#### RESISTANCE

RANGE	ACCURACY	RESOLUTION
400 Ω	±(1.0%+2)	0.1 Ω
4K Ω		1 Ω
40K Ω		10 Ω
400K Ω		100 Ω
4M Ω		1K Ω
40M Ω	±(2.0%+3)	10K Ω

**Overload protection:** 250V DC/250Vrms AC

#### CAPACITANCE

RANGE	ACCURACY	RESOLUTION
40nF	±(2.5%+10)	10pF
400nF		100pF
4µ F	±(2.5%+5)	1nF
40µ F		10nF
100µ F	±(5.0%+10)	100nF

**Overload protection:** 250V DC/250Vrms AC Note: Only AUTO range function

#### FREQUENCY

RANGE	ACCURACY	RESOLUTION	SENSITIVITY
40Hz	±(0.5%+4)	0.01 Hz	FRE. RANGE: 0.6Vrms Hz/Duty Key Control: 0.1Vrms
400Hz		0.1Hz	
4000Hz		1 Hz	
40KHz		10Hz	
400KHz		100Hz	
4MHz		1KHz	
10MHz		10KHz	

**Overload protection:** 250V DC/250Vrms AC DUTY

CYCLE Range: 0.1% - 99.9%

FREQUENCY Range, Duty test Min Pulse width: 100nS

Hz/Duty Key Control, Duty test Min Pulse Width: 1uS

Note: Only AUTO range function.

#### TEMPERATURE (NiCr - NiSi SENSOR)

RANGE	SCALE	ACCURACY
Temp °C	-20° C - 150 ° C	±(3° C + 1)
	150° C - 800 ° C	±(3%+1)

**Overload protection:** 250V DC/250Vrms AC

#### DIODE TEST & CONTINUITY TEST

RANGE	DESCRIPTION	TEST VOLTAGE
➔	Test Forward Voltage of Diode	1.5V
⦿))	≤ 50 Ω Buzzer Sounds	0.5V

**Overload protection:** 250V DC/250Vrms AC

### 3. FUNCTIONS

#### 3.1. SELECT Key

Push key to the choose function while Function rotary switch is at the same position. Push the key and power on, Auto power off disable.

#### 3.2. RANGE Key

Push the key to select manual mode, push it again to change the ranges. Press and hold down for two seconds to exit manual mode. Note: Hz/Duty and Capacitance has no manual mode.

#### 3.3. REL Key

Push the REL key and the present display value will be stored in memory; new display value is the difference between input value and stored data. Note: Hz/Duty does not offer this option.

#### 3.4. HOLD Key

Push the HOLD key to lock display value, and the DH symbol will appear, push it again to exit.

#### 3.5. Hz/Duty Key

Push the Hz/Duty key to change function to Frequency Test and Push it again to Duty test at DCV, ACV, DCA, ACA, Hz. Frequency RANGE, Push it to Duty test, Push it again to Frequency test.


#### 3.6. RS232 Key

Push the RS232 key to enable RS232 output. Measurements will then be sent to other equipment via the supplied RS232 cable. The enclosed software must be installed on the host computer.

#### 3.7. LIGHT Key

Push the LIGHT key to turn on the backlight. Light will automatically stop after approx. 5 seconds.

### 4. OPERATION

4.1. If the battery is weak, a  symbol will appear on the display. The battery should be replaced immediately.

4.2. **Warning:** The symbols next to the test lead jacks indicate the maximum input voltage or current. Do not exceed these values. This is to prevent damage to internal circuitry.

4.3. The Function rotary switch and SELECT key should be set to the test range before operation.

#### 4.4. DC Voltage Measurement

4.4.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to the "VΩHz" jack.

4.4.2 Set the Function rotary switch to the "V" position. The symbols "AUTO" and "mV" will be displayed.

4.4.3 Connect the test leads across the source or load and the reading will appear on the display.

#### 4.5. AC Voltage Measurement

4.5.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to the "VΩHz" jack.

4.5.2 Set the Function rotary switch to "V~" position. Push the SELECT key. The "AUTO", "AC", and "V" will be displayed.

4.5.3 Connect the test leads across the source or load, and the measurement value appears on the display. If AC voltage is under 400mV, Push RANGE key until "AC", "mV" will appear on the display.

#### 4.6. DC Current Measurement

4.6.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to "mA/Temp" jack for a maximum of 400mA, for a maximum of 10A, move the RED test lead to the "10A" jack.

4.6.2 Set the Function rotary switch to "mA~" position for a maximum of 400mA. For a maximum of 4000μA, rotate the FUNCTION rotary switch to "μA~" position. For a maximum of 10A, rotate the Function rotary switch to "10A~" position.

4.6.3 Connect the test leads across the source or load. The reading will be displayed.

#### 4.7. AC Current Measurement

4.7.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to "mA/Temp" jack for a maximum of 400mA, for a maximum of 10A, move the RED test lead to "10A" jack.

4.7.2 Set the Function rotary switch to "mA~" position for a maximum of 400mA. For a maximum of 4000μA, rotate the Function rotary switch to "μA" position. For a maximum of 10A; rotate the Function rotary switch to "10A~". Then push the SELECT key. The "AC" symbol will be displayed.

4.7.3 Connect the test leads across the source or load. The measurement will appear on the display.

#### 4.8. Resistance Measurement

4.8.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to the "VΩHz" jack.

4.8.2 Set the Function rotary switch to "Ω". The symbols "MΩ" and "AUTO" will be displayed on the screen.

4.8.3 Connect the test leads across the resistance to be measured and the value will be displayed.

#### 4.9. Capacitance measurement

4.9.1 Connect the BLACK socket to the "COM" jack and the RED socket to the "VΩHz" jack.

4.9.2 Set the Function rotary switch to "→|—" . The "nF" and "AUTO" symbols will be displayed.

4.9.3 Connect the capacitor to the input sockets noting the polarity connections when required, and the measurement value will appear on the display.

##### Notes:

- 1) When testing 100uF capacitance, there will be an approx. 15 Sec time lag.
- 2) Do not connect an external voltage or a charged capacitor to the measuring terminal.
- 3) Please use the "REL" key for a precision capacitance measurement.

#### 4.10. Frequency Measurement

4.10.1 Connect the BLACK test lead to "COM" jack and the RED test lead to the "VΩHz" jack.

4.10.2 Set the Function rotary switch to "Hz", the "Hz" symbol will appear on display.

4.10.3 Connect the test leads to the point under measurement. The measurement value will be displayed.

#### 4.11. Duty Measurement

4.11.1 Connect the BLACK test lead to "COM" jack and the RED test lead to "VΩHz" jack.

4.11.2 Set the Function rotary switch to "Hz", and then push the "Hz/duty" key. The "%" symbol will appear on screen.

4.11.3 Connect the test leads to the point under measurement, and the measurement value appear on display.

#### 4.12. Continuity Measurement

4.12.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to "VΩHz" jack.

4.12.2 Set the Function rotary switch to the "Ω", position; then push the SELECT key two times. The symbol "⦿" will be displayed.

4.12.3 Connect the test leads across the circuit to be tested.

**\*\*\* Caution: Ensure that the circuit to be tested is "dead".**

4.12.4 The beeper sounds when the continuity point is below 50Ω.

#### 4.13. Diode Measurement

4.13.1 Connect the BLACK test lead to the "COM" jack and the RED test lead to "VΩHz" jack.

4.13.2 Set the Function rotary switch to "Ω", position, and then push the SELECT key. The "⦿" symbol will be displayed.

4.13.3 Connect the test lead across the diode under measurement.

4.13.4 The meter displays forward voltage drop.

#### 4.14. Temperature Measurement

4.14.1 Connect the RED pin of the temperature probe to "VΩHz" jack and the BLACK pin to "mA/Temp" jack.

4.14.2 Set the Function rotary switch to "Temp °C" position. The "°C" symbol will be displayed.

4.14.3 Place test head of the probe in the temperature field of the subject to be tested. The temperature will appear on the display.

### 5. MAINTENANCE

1) Keep the multimeter dry and dust free. If it gets wet, wipe it dry immediately.

Liquids can contain minerals that can corrode electronic circuits.

2) Use and store the multimeter only in normal temperature environments.

Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic parts.

3) Handle the multimeter gently and carefully. Dropping it can damage the circuit boards and cause the multimeter to work improperly.

4) Keep the multimeter away from dust and dirt, which can cause premature wear of parts.

5) Wipe the multimeter with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the multimeter.

6) Always remove old or weak batteries. They can leak chemicals that destroy electronic circuits.

### 6. BATTERY & FUSE REPLACEMENT

#### 9-Volt battery replacement

1. Ensure the multimeter is not connected to any external circuit. Set the selector switch to OFF position.
2. Remove the screws on the battery cover and lift the battery cover.
3. Remove the spent battery and replace with battery of the same type.
4. Close the battery cover and fasten the screw.

#### Fuse replacement

1. Ensure the multimeter is not connected to any external circuit.
2. Set the selector switch to OFF position.
3. Remove the screws on the bottom case and lift the bottom case.
4. Replace the fuse with same type and rating: 0.8A/250V fast fuse & 10A/250V fast fuse
5. Close the bottom case and fasten the screw.