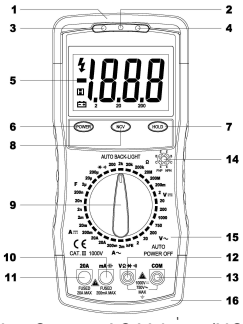
770A
DIGITAL MULTIMETER
OPERATOR'S MANUAL

1. Overview
The multimeter is characterized at slim size, portable, stable performance and anti-dropping capacity. Using 3 1/2 digits LCD monitor with character 28mm high, they offer clear readings. With overall circuitry design centering on large-scale IC A/D converters in conjunction and over-load protection circuit, the meters give excellent performance and exquisite making as a handy utility instrument.
The meters can be used to measure DC & AC voltage, DC & AC current, resistance, capacitor, transistor hFE, Non Contact AC Voltage (NCV) detection, positive diode voltage fall and audible continuity.

2. Panel Layout


① NCV detection area: Non Contact AC Voltage (NCV) detection area.
② **CDS** sensor: The CDS sensor can reaction to the ambient brightness range, then automatically control the LCD backlight to lighten or go out.
③ NCV red light: Non Contact AC Voltage (NCV) detection red light.
④ NCV green light: Non Contact AC Voltage (NCV) detection green light.
⑤ LCD display: 3 1/2 digits LCD display.
⑥ **POWER** key: Press the "**POWER**" key to power on or off the meter.
⑦ **HOLD** key: Press the "**HOLD**" key to lock display value, and the "H" sign will appear on the display, press it again to exit.
⑧ **NCV** Key: Press and hold the "**NCV**" key, the meter enters Non Contact AC Voltage (NCV) detection, the NCV green LED light will light up, free it to exit.
⑨ Rotary Switch: Use this switch to select functions and ranges.
⑩ **mA⊣⊢:** mA and capacitor Input Jack
⑪ **20A:** 20A Input Jack
⑫ **VΩ→•))):** VΩ→•)) Input Jack
⑬ **COM:** COM Input Jack
⑭ Transistor hFE test Input Jack
⑮ Crust of meter
⑯ Protective casing

3. Safety Information
3-1 The meter is designed according to IEC-1010 concerning electronic measuring instruments with an over-voltage category 1000V (CAT Ⅲ) and pollution 2.
3-2 Follow all safety and operating instructions to ensure that the meter is used safely and is kept in good operating condition.
3-3 safety symbols:
⚠ Important safety information, refer to the operating manual.
⚠ Dangerous voltage may be presence.
⧈ Double insulation (protection Class II)

4. Special Cautions for Operation
4-1 The meters can be safe only according to standard procedures when used in conjunctions with the supplied test leads. To replace damaged test leads with only the same model or same electric specifications.
4-2 To avid risk of electric shock, do not use the meters before the cover is in place.
4-3 The range switch should be right position for the testing.
4-4 To avoid electric shock and damaging the instruments, the input signals are forbidden to exceed the specified limits.
4-5 When measuring TV set or switched power, attention should be paid to the possible pulses that may bring destruction to the circuit.
4-6 Range switch position is forbidden to be changed at random during measurement.
4-7 Take caution against shock in the course of measuring voltage higher than DC 60V & AC 30V.
4-8 Protection fuse should be replaced only with same type and same specification.
4-9 After operation is finished, power OFF the meter to save battery power.
4-10 If the meter is without usage for long time, take out battery to avoid damage by battery leakage.

5. GENERAL SPECIFICATIONS
5-1 Max Voltage between input terminal and Earth Ground: CAT Ⅲ 1000V
5-2 Over-range Indication: display "1" or "-1" for the significant digit.
5-3 Automatic display of negative polarity "-" .
5-4 Low Battery Indication: "🪫" displayed.
5-5 Display: 3 1/2 digit LCD with a max. reading of 1999.
5-6 Manual range control
5-7 Auto Power Off: The meter will switch to standby mode when power on after approx. 20 minutes. Press the "**POWER**" key two times to power on the meter again.
5-8 Auto LCD backlight
5-9 Fuse protection: 200mA/500V & 20A/500V Fast Fuse
5-10 Power supply: 9V battery (6F22 or NEDA 1604)
5-11 Operating Temp. : 0℃ to 40℃ (relative humidity <85%)
5-12 Storage Temp. : -10℃ to 50℃ ((relative humidity <85%)
5-13 Guaranteed precision Temp. : 23±5℃ (relative humidity <70%)
5-14 Dimension: 195x88x40mm
5-15 Weight: approx. 350g (including battery)

6. Testing Specifications
Accuracy is specified for a period of year after calibration and at 18℃ to 28℃ (64℉ to 82℉) with relative humidity to 70%.

6-1 DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	±(0.5% of rdg + 2 digits)
2V	1mV	
20V	10mV	
200V	100mV	
1000V	1V	±(0.8% of rdg + 2 digits)

-- Impedance: 10MΩ
-- Overload protection: 1000V DC or 750V AC rms

6-2 AC Voltage

Range	Resolution	Accuracy
2V	1mV	±(1.0% of rdg + 2 digits)
20V	10mV	
200V	100mV	
750V	1V	±(1.2% of rdg + 3 digits)

-- Impedance: 10MΩ (2V range is 1MΩ)
-- Overload protection: 1000V DC or 750 AC rms
-- Frequency Range: 40 to 400Hz
-- Response: average, calibrated in rms of sine wave

6-3 DC Current

Range	Resolution	Accuracy
2mA	1μA	±(1.2% of rdg + 2 digits)
20mA	10μA	
200mA	100μA	
20A	10mA	±(2.0% of rdg + 3 digits)

-- Overload protection: 200mA/500V & 20A/500V Fast Fuse
Note: 20A up to 10 seconds

6-4 AC Current

Range	Resolution	Accuracy
2mA	1μA	±(1.5% of rdg + 3 digits)
200mA	100μA	
20A	10mA	±(2.5% of rdg + 5 digits)

-- Overload protection: 200mA/500V & 20A/500V Fast Fuse
Note: 20A up to 10 seconds
-- Frequency Range: 40 to 400Hz
-- Response: average, calibrated in rms of sine wave

6-5 Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±(1.0% of rdg + 3 digits)
2kΩ	1Ω	±(1.0% of rdg + 2 digits)
20kΩ	10Ω	
200kΩ	100Ω	
20MΩ	10kΩ	±(1.5% of rdg + 3 digits)
200MΩ	100kΩ	±(5.0% of rdg + 10 digits)

-- Overload protection: 500V DC or AC rms

6-6 Capacitance

Range	Accuracy	Resolution
2nF	±(2.5% of rdg + 5 digits)	1pF
20nF		10pF
200nF		100pF
2μF		1nF
20μF		10nF
200μF	±(5.0% of rdg + 10 digits)	100nF

-- Overload protection: 200mA/500V Fast Fuse

6-7 Diode and Audible continuity test

Range	Description	Test Condition
→|	Display read approximately forward voltage of diode	Forward DC current approx. 1mA Reversed DC voltage approx. 3V
•))	Built-in buzzer sounds if resistance is less than 50Ω	Open circuit voltage approx. 3V

Overload protection: 500V DC or AC rms

6-8 Transistor hFE test
Test range: 0-1000
Ib=10μA, Vce=3.0V Approx.

6-9 Non Contact AC Voltage (NCV) detection
Test voltage range: 90V～1000V AC rms
The NCV red LED light and green LED light will light up alternately together with sound.

7. OPERATING INSTRUCTIONS

7-1 Attention before operation

7-1-1 Check battery. When the battery voltage drop below proper operation range, the "🔋" symbol will appear on the LCD display and the battery need to changed.
7-1-2 Pay attention to the "⚠" besides the input jack which shows that the input voltage or current should be within the specified value.
7-1-3 The range switch should be positioned to desired range for measurement before operation.

7-2 Measuring DC Voltage

7-2-1 Set the rotary switch at the desired "**V⎓**" range position.
7-2-2 Connect the black test lead to **COM** jack and the red to **VΩ⊣◀•))** jack.
7-2-3 Connect test leads across the source or load under measurement.
7-2-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC voltage value.
NOTE:
1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only the figure "1" or "-1" is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means you can't input the voltage more than 1000V, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.
4. Be cautious against shock when measuring high Voltage.

7-3 Measuring AC Voltage

7-3-1 Set the rotary switch at the desired "**V~**" range position.
7-3-2 Connect the black test lead to **COM** jack and the red to **VΩ⊣◀•))** jack.
7-3-3 Connect test leads across the source or load under measurement.
7-3-4 You can get reading from LCD.
NOTE:
1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only the figure "1" or "-1" is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means you can't input the voltage more than 750V, it's possible to show higher voltage, but it may destroy the inner circuit or pose a shock.
4. Be cautious against shock when measuring high Voltage.

7-4 Measuring DC Current

7-4-1 Set the rotary switch at the desired "**A⎓**" range position.
7-4-2 Connect the black test lead to **COM** jack and the red to the **mA⊣⊢** jack for a maximum 200mA current , for a 200mA to 20A current, move the red lead to the **20A** jack.
7-4-3 Connect test leads in series with the load under measurement.
7-4-4 You can get reading from LCD. The polarity of the red lead connection will be indicated along with the DC current value.
NOTE:
1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only the figure "1" or "-1" is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means the socket mA's maximum current is 200mA and 20A's maximum current is 20A, over 200mA or 20A current can be protected by the fast fuse.
4. On the 20A range, the measuring time should be less than 10 seconds to prevent precision from affecting by circuit heating.

7-5 Measuring AC Current

7-5-1 Set the rotary switch at the desired "**A~**" range position.
7-5-2 Connect the black test lead to **COM** jack and the red to the **mA⊣⊢** jack for a maximum 200mA current , for a 200mA to 20A current, move the red lead to the **20A** jack.
7-5-3 Connect test leads in series with the load under measurement.
7-5-4 You can get reading from LCD.
NOTE:
1. When the value scale to be measured is unknown beforehand, set the range selector at the highest position.
2. When only the figure "1" or "-1" is displayed, it indicates over-range situation and the higher range has to be selected.
3. "⚠" means the socket mA's maximum current is 200mA and 20A's maximum current is 20A, over 200mA or 20A current can be protected by the fast fuse.
4. On the 20A range, the measuring time should be less than 10 seconds to prevent precision from affecting by circuit heating.

7-6 Measuring Resistance

7-6-1 Set the rotary switch at the desired "**Ω**" range position.
7-6-2 Connect the black test lead to **COM** jack and the red to **VΩ⊣◀•))** jack.
7-6-3 Connect test leads across the resistance under measurement.
7-6-4 You can get reading from LCD.
NOTE: Max. input overload: 500V rms＜10sec
1. When only the figure "1" or "-1" is displayed, it indicates over-range situation and the higher range has to be selected.
2. For measuring resistance above 10MΩ , the mete may take a few seconds to get stable reading.
3. When the input is not connected, i.e. at open circuit, the figure "1" or "-1" will be displayed for the over-range condition.
4. When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.

7-7 Measuring Capacitance

7-7-1 Set the rotary switch at the desired "**F**" range position.
7-7-2 Connect the black test lead to **COM** jack and the red to **mA⊣⊢** jack.
7-7-3 Connect test leads across the capacitance under measurement.
7-7-4 You can get reading from LCD.
NOTE: Capacitors should be discharged before being tested.

7-8 Diode & Audible continuity Testing

7-8-1 Set the rotary switch at the "⊣◀•))" range position.
7-8-2 Connect the black test lead to **COM** jack and the red to **VΩ⊣◀•))** jack.
7-8-3 On **diode** range, connect the test leads across the diode under measurement, display shows the approx. forward voltage of this diode.
7-8-4 On **Audible continuity** range, connect the test leads to two point of circuit, if the resistance is lower than approx. 50Ω, the buzzer sounds.
NOTE: Make sure the power is cut off and all capacitors need to be discharged under this measurement.

7-9 Transistor hFE Test

7-9-1 Set the rotary switch at the desired "**hFE**" range position.
7-9-2 Determine whether the transistor is NPN or PNP and locate the Emitter, Base and Collector leads. Insert the leads into the proper holes in the socket on the front panel.
7-9-3 You can get reading of the approximate hFE value from LCD.
NOTE: Don't connect an external voltage to measuring terminals.

7-10 Non Contact AC Voltage detection

7-10-1 Power on the meter, on any range, press and hold the "**NCV**" key, the meter enters Non Contact AC Voltage (NCV) detection, the NCV green LED light will light up.
7-10-2 Hold the Meter so that the mater's top is vertically and horizontally centered and contacting the conductor, when the live voltage ≥90V AC rms, the NCV red LED light and green LED light will light up alternately together with sound.
7-10-3 Free the "**NCV**" key to exit the NCV meter mode.
NOTE:
1. Even without LED indication, the voltage may still exist. Do not rely on non-contact voltage detector to determine the presence of voltage wire. Detection operation may be subject to socket design, insulation thickness and different type and other factors.
2. When the meter input terminals presence voltage, due to the influence of presence voltage, voltage sensing indicator may also be bright.
3. Keep the meter away from electrical noise sources during the tests, i.e., florescent lights, dimmable lights, motors, etc.. These sources can trigger Non-Contact AC Voltage detection function and invalidate the test.

8. Battery replacement

8-1 When the battery voltage drop below proper operation range the "🔋" symbol will appear on the LCD display and the battery need to changed.
8-2 Before changing the battery, power off the meter and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.
8-3 Replace the old battery with the same type battery (9V 6F22 or NEDA 1604).
8-4 Close the cover of the battery cabinet and fasten the screw.

9. Fuse replacement

9-1 This meter is provided with a 200mA/500V fast fuse to protect the capacitance test and the current measuring circuits which measure up to 200mA, with a 20A/500V fuse to protect the 20A range.
9-2 Ensure the meter is not connected to any external circuit, power off the meter and remove the test leads from the terminals. Open the cover of the battery cabinet by a screwdriver.
9-3 Replace the old fuse with the same type and rating: 6×30mm 200mA/500V fast fuse or 6×30mm 20A/500V fast fuse.
9-4 Close the cover of the battery cabinet and fasten the screw.

10. Maintenance

10-1 Before attempting to remove the battery door or open the case, be sure that test leads have been disconnected from measurement circuit top avoid electric shock hazard.
10-2 You must replace the test leads if the lead is exposed, and should adopt the leads with the same specifications as origin.
10-3 Use only moist fabric or small amount of detergent but not chemical solution for cleaning.
10-4 Do not use the meter before the back cover is properly closed and screw secured. Upon any abnormality, stop operation immediately and send the meter for maintenance.
10-5 Please take out the battery when not using for a long time.

11. Accessories

[1] Test Leads: electric rating 1000V 20A
[2] Operator's Manual

Above picture and content just for your reference. Please be subject to the actual products if anything different or updated. Please pardon for not informing in advance.