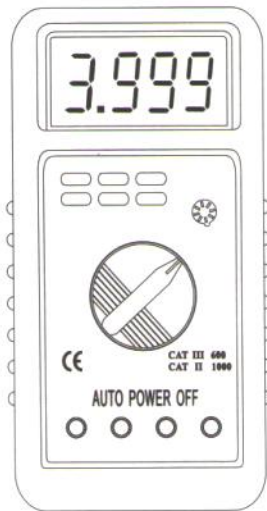


OPERATION MANUAL

AUTO-RANGING DMM



QM1536















THANK YOU FOR PURCHASING OUR PRODUCT, PLEASE READ THIS MANUAL CAREFULLY BEFORE USING THIS INSTRUMENT.

WARNING






- To avoid damage to the instrument, do not exceed the maximum limit of the input value shown in the technical specifications tables.
- Do not use the meter or test leads if look damaged. Use extreme caution when working near uninsulated Conductors.
- Accidental contact with the conductors could result in electric shock.
- Use the instrument only as specified in this manual, otherwise, the protection provided by the instrument may be impaired.
- Caution when working with voltages above 60VDC or 30VACRMS, because such voltages may cause shock hazard.
- Before taking resistance measurements or testing continuity, disconnect circuit from power supply and all loads from circuit.
- Replace the fuse inside the instrument with same rating fuse.

International Electrical Symbols

| | | | |
|---|--|---|---|
|  | AC (Alternating Current) |  | Resistance Test |
|  | DC (Direct Current) |  | Continuity Test |
|  | AC or DC Current |  | Diode |
|  | Grounding |  | Capacitance Test |
|  | Double Insulated |  | Fuse |
|  | Warning. Refer to the Operating Manual |  | Conforms to Standards of European Union |

Rotary Switch

The table below indicates for information about the rotary switch positions and functions.

| Rotary Switch Position | Function |
|---|--|
| V— | DC voltage measurement range from 400mV to 1000V. |
| V~ | AC voltage measurement range from 4V to 750V. |
|  |  Continuity test. |
| |  Diode test. |
| |  Resistance measurement range from 400 Ω to 40M Ω . |
|  | Capacitance test range from 40nF to 100uF. |
| °C | Model RE91/RE92: Temperature in celsius from -40°C ~ 1000°C. |
| °F | Model RE93: Temperature in fahrenheit from -40°F ~ 1832°F. |
| Hz | Frequency measurement range from 10Hz to 10MHz. |
| mH | Model RE95: Inductance measurement range from 4mH to 4H. |
| μ A \approx | AC or DC current measurement range from 400uA to 4000uA. |
| mA \approx | AC or DC current measurement range from 40mA to 400mA. |
| A \approx | AC or DC current measurement range from 4A to 10A. |
| EF | Model RE94 electric field measurement. |

SPECIFICATIONS

Display: 4000 count 3 3/4 digit LCD.

Auto ranging function

Auto power off (approx. 15minutes)

Sampling Rate: 2~3 times per second

Low Battery Indication: "BAT" displayed on the left of LCD

Operating Temperature: 0°C ~ 50°C, less than 80% RH

Dimensions: 189×91×32mm

Weight: Approx. 310 grams (Including batteries & test leads)

Battery: RE90, RE91, RE93: 1.5V×2pcs (size:AAA)

RE92, RE94, RE95: 9V (6F22.NEDA1604).

DC VOLTAGE: ---Auto ranging

| Range | Resolution | Accuracy | Overload protection |
|-------|------------|------------|-------------------------|
| 400mV | 0.1mV | ± (0.8%+3) | 1000V DC 750V AC RMS |
| 4V | 1mV | | |
| 40V | 10mV | ± (0.8%+1) | |
| 400V | 100mV | | |
| 1000V | 1V | ± (1.0%+3) | Continuous |

Remarks: Input impedance \geq 10M Ω

AC VOLTAGE: ---Auto ranging

| Range | Resolution | Accuracy | Overload protection |
|-------|------------|------------|-------------------------|
| 4V | 1mV | ± (1.0%+5) | 1000V DC 750V AC RMS |
| 40V | 10mV | | |
| 400V | 100mV | | |
| 750V | 1V | ± (1.2%+5) | |

Remarks: Input impedance $\geq 10M\Omega$.
 Frequency range: 40~500Hz.
 Response: displays effective value of sine wave.
 ※ Model RE92: Displays true RMS value.

RESISTANCE: ---Auto ranging

| Range | Resolution | Accuracy | Overload protection |
|---------------|--------------|-----------------|---------------------|
| 400 Ω | 0.1 Ω | $\pm (1.2\%+2)$ | 1000Vp |
| 4k Ω | 1 Ω | $\pm (1.0\%+2)$ | |
| 40k Ω | 10 Ω | | |
| 400k Ω | 100 Ω | | |
| 4M Ω | 1K Ω | $\pm (1.2\%+2)$ | |
| 40M Ω | 10K Ω | $\pm (1.5\%+2)$ | |

Open voltage: approx. 0.45V

Continuity

| Range | Resolution | accuracy | Overload Protection |
|----------------|--------------|--------------------------|---------------------|
| 400.0 Ω | 0.1 Ω | Approximate <70 Ω | 1000Vp |

Remarks:

- Buzzer beeps continuously.
- Open circuit voltage approximate 0.45V.

Diode

| Range | Resolution | Overload Protection |
|-------|------------|---------------------|
| Diode | 1mV | 1000Vp |

Remarks:

- Open circuit voltage approximate 1.48V.
- Displays approximate forward voltage drop reading 0.5V~0.8V.

TEMPERATURE:

| Range | Resolution | Accuracy |
|----------------------|---------------|------------------|
| -20~0 $^{\circ}C$ | 1 $^{\circ}C$ | $\pm (3.0\%+3)$ |
| 0~300 $^{\circ}C$ | | $\pm (1.0\%+3)$ |
| 300~1000 $^{\circ}C$ | | $\pm (2.0\%+5)$ |
| -40~32 $^{\circ}F$ | 1 $^{\circ}F$ | $\pm (3.0\%+3)$ |
| 32~1832 $^{\circ}F$ | | $\pm (2.0\%+15)$ |

Overload Protection: ceramic fuse 0.5A/250V, fast type, $\phi 5 \times 20mm$

Battery Test

| Range | Test Current | Accuracy | Overload protection |
|-------|--------------|-----------------|---------------------|
| 1.5V | 100mA | $\pm (1.0\%+3)$ | 1000Vp |
| 9V | 6mA | $\pm (1.0\%+3)$ | |

DC CURRENT: ---Auto ranging

| Range | Resolution | Accuracy |
|--------|------------|-----------------|
| 400uA | 0.1uA | $\pm (1.0\%+2)$ |
| 4000uA | 1uA | |
| 40mA | 10uA | $\pm (1.2\%+3)$ |
| 400mA | 100uA | |
| 4A | 1mA | $\pm (1.5\%+3)$ |
| 10A | 10mA | |

Overload protection: 0.5A/250V in uA and mA range,
 10A/250V in 10A range.

Remarks:

• 0.4A & 10A Range:

For continuous measurement ≤ 10 seconds
 with interval not less than 15 minutes.

AC CURRENT: ---Auto ranging

| Range | Resolution | Accuracy |
|--------|------------|----------------|
| 400uA | 0.1uA | $\pm(1.5\%+5)$ |
| 4000uA | 1uA | |
| 40mA | 10uA | $\pm(2.0\%+5)$ |
| 400mA | 100uA | |
| 4A | 1mA | $\pm(2.5\%+5)$ |
| 10A | 10mA | |

Overload protection: 0.5A/250V in mA and mA range,
10A/250V in 10A range.

Frequency range: 40Hz~500Hz.

Response: displays effective value of sine wave.

※ Model RE92: Displays true RMS value.

Remarks:

• 0.4A & 10A Range:

For continuous measurement \leq 10 seconds
with interval not less than 15 minutes.

CAPACITANCE: ---Auto ranging

| Range | Resolution | Accuracy | Overload protection |
|-------|------------|----------------|---------------------|
| 4nF | 1pF | $\pm(5\%+10)$ | 1000Vp |
| 40nF | 10pF | $\pm(3.5\%+5)$ | |
| 400nF | 0.1nF | | |
| 4uF | 1nF | | |
| 40uF | 10nF | | |
| 100uF | 100nF | $\pm(4\%+1)$ | |

Inductance

| Range | Resolution | Resolution | Overload protection |
|-------|------------|----------------|---------------------|
| 4mH | 1uH | $\pm(3.5\%+5)$ | 1000Vp |
| 40mH | 10uH | | |
| 400mH | 100uH | | |
| 4H | 1mH | | |

FREQUENCY: ---Auto ranging

| Range | Resolution | Accuracy | Overload protection |
|------------|------------|----------------|---------------------|
| 10Hz | 0.001Hz | $\pm(0.1\%+5)$ | 1000Vp |
| 100Hz | 0.01Hz | | |
| 1KHz | 0.1Hz | | |
| 10KHz | 1Hz | | |
| 100KHz | 10Hz | | |
| 1MHz | 100Hz | | |
| 10MHz | 1KHz | | |
| 0.1%~99.9% | 0.01% | | |

Sensitivity: <10KHz---200mV,others---700mV,

(Auto Ranging Mode) Manual Mode Range.

Duty cycle measurement:

range:0.1~99.9%, min pulse width for 100nS Vpp>600mV.

If Hz/Duty key control this function---min pulse width
for 1uS Vpp>100mV.

PANEL DESCRIPTION

- ① LCD display window
- ② Functional key
- ③ Functional rotary switch
- ④ 10A terminal
- ⑤ mA terminal
- ⑥ Transistor test socket
- ⑦ V/ Ω terminal
- ⑧ COM terminal

MEASUREMENT INSTRUCTION

1. KEY FUNCTION

RESET KEY---Push the key to switch function while rotary switch is at the same position.

When pressing the key and power on, auto power off function is disabled.

SELECT KEY---Rotary switch uA $\overline{\text{m}}$, mA $\overline{\text{m}}$, A $\overline{\text{m}}$ or $\overline{\text{m}}$ test position, push the key to select DC or AC and Ω $\overline{\text{m}}$ or $\overline{\text{m}}$ mode.

HOLD KEY---Push the key to lock display value on the LCD, push it again to exit this function.

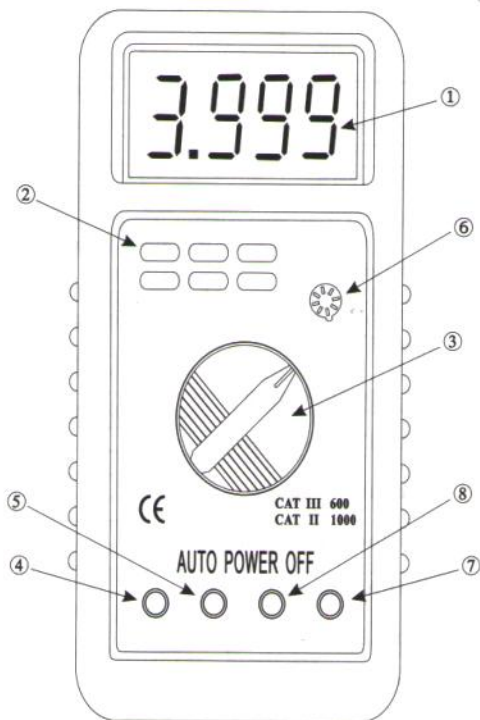
REL KEY---Push the key, then current display value will be store in memory, The new display value is the difference between input value and stored data. this function is not available in Hz/Duty mode.

RANGE KEY---Push the key to select manual mode, push it again to change the range, press and hold down for two seconds to exit manual mode. Manual range is not available On Frequency, Duty cycle and capacitance modes.

Hz/Duty KEY---Push the key to change the current function to Frequency, push it again for Duty Cycle of DC or AC voltage, DC or AC current and Frequency. When using the Frequency /Duty Cycle range, the key changes the mode between Frequency and duty cycle.

2. VDC/VAC MEASUREMENT

1. Connect the black test lead to the "COM" terminal and the red test lead to the "V/ Ω " terminal.



- Set the rotary switch to "V \equiv " or "V \sim " position, the symbol "AUTO", "DC", "AC", "mV" will appear on the display.
- Connect the test leads across the source or load and the measurement value will appear on the display.

3. RESISTANCE MEASUREMENT

- Connect the black test lead to the "COM" terminal and the red test lead to the "V/ Ω " terminal.
- Set the rotary switch to " Ω " position, the symbol " Ω k Ω or M Ω " will appear on the display.
- Connect the test leads across the resistor under measurement and the measurement value will appear on the display.

4. CURRENT MEASUREMENT

- Connect the black test lead to the "COM" terminal and the red test lead to the "mA" terminal. If measured current exceed 0.4A, the red test lead to "10A" terminal.
- Set the rotary switch to "uA" "mA" or "10A" position, the symbol "uA" "mA" "A" will appear on the display.
- Connect the test leads in series with the load in which current is to be measured, and the measured value will appear on the display.
- push the SELECT key to switch AC or DC function.

5. CAPACITANCE MEASUREMENT

- Connect the black test lead to the "COM" terminal and the red test lead to the "V/ Ω " terminal.
- Set the rotary switch to " μ F" position, the symbol "nF" "uF" will appear on the display.
- Connect the test leads across the capacitor under measurement and the measurement value will appear on the display.

6. INDUCTANCE

- Connect the black test lead to the "COM" terminal and the red test lead to the "V/ Ω " terminal.
- Set the rotary switch to "mH" or "H", the symbol "mH" or "H" will appear on the display.
- Connect the test leads across the inductance under measurement and the measurement value will appear on the display.

7. DIODE/CONTINUITY MEASUREMENT

- Connect the black test lead to the "COM" terminal and the red test lead to the "V/ Ω " terminal.
- Set the rotary switch to " Ω \rightarrow " position, push the select key, the symbol " \rightarrow V" will appear on the display.
- Connect the test leads across the circuit or diode under measurement and the measurement value will appear on the display.
- When testing diode, please check the polarity of the diode.
- Push the select key to select " \rightarrow " measurement mode, the symbol " \rightarrow " will appear on the display.
- The buzzer sounds if the resistance of a circuit test is less than around 70 Ω .

8. FREQ/DUTY MEASUREMENT

- Connect the black test lead to the "COM" terminal and the red test lead to the "V/Hz" terminal.
- Set the rotary switch to "Hz" position, the symbol "Hz" or "%" will appear on the display.
- Connect the test leads across the source under measurement and the measurement value will appear on the display.
- Push SELECT key to switch from Hz to Duty or from Duty to Hz mode.

9. TEMPERATURE MEASUREMENT

1. Connect the black terminal of the temperature probe to the T-jack and the red one to T+jack.
2. Set the rotary switch to °C or °F position.
3. Place the probe in the environment or on the object being measured.
4. The measurement value will appear on the display.

10. TRANSISTOR MEASUREMENT

1. Set the rotary switch to hFE position.
2. Insert the transistor into the relevant holes according to the transistors pinout and type.
3. The measurement value will appear on the display.

11. BATTERY

1. Connect the black test lead to the "COM" terminal and the red test lead to the "V/Ω" terminal.
2. Set the rotary switch to " $\frac{V}{\Omega}$ " position, the symbol "V" will appear on the display.
3. Connect the test leads across the battery under measurement and (red to + and black to -) the measurement value will appear on the display.

12. ELECTRICAL FIELD

With this function, power cables can be tested with the measuring instrument for the presence of AC voltages within the range of 50 VAC to 400 VAC max., without contact. In the case of this, the test leads must be kept in the storage compartment (Attention! Do not trap!). For measurement, proceed as follows:

1. Position the rotary switch to E.F
2. The sensor is at the top end on the underside of the case. Hold the meter to the power cable to be checked. From a distance of approx. 10 cm, depending on the voltage (e.g. 230V), an (interrupted) acoustic signal sounds.

MAINTENANCE

1. BATTERY REPLACEMENT

1. When the "BAT" symbol appears on the display, that means batteries should be replaced.
2. Set range switch to OFF position.
3. Use a screwdriver to unscrew the screw of battery cover and remove the cover, then take out the batteries and replace with 2x1.5V batteries (size: AAA), or 9V batteries (6F22, NEDA1604).
4. Place the battery cover and with the screws.

2. FUSE REPLACEMENT

1. When the meter will not work at "uA" or "mA" "10A" position, please check the fuse inside the meter. To replace the fuses if the fuses are defective.
2. Remove the screw from the back cover with a screwdriver and remove the back cover.
3. Replace the defective fuse with same rating and type fuse.
4. Fuses type:

0.5A/250V fast acting fuse 1 pcs

10A/250V fast acting fuse 1 pcs

3. CLEANING

periodically wipe the case with a damp cloth and diluted detergent. Do not use abrasives or solvents.

*** The specifications are subject to change without notice.