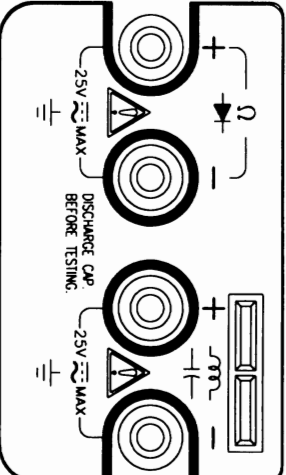
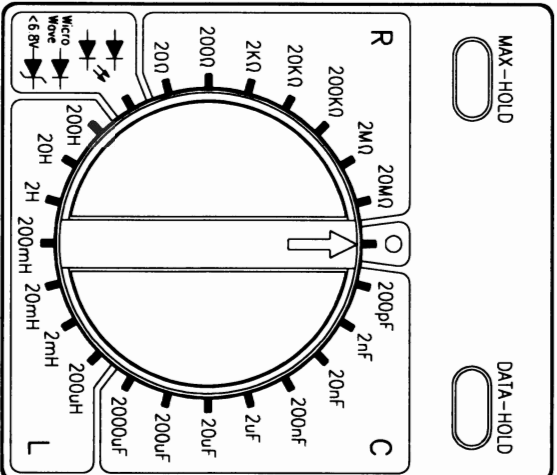
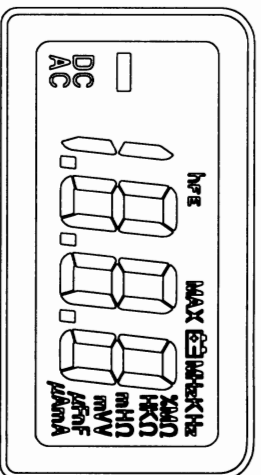


OPERATING INSTRUCTIONS

MODEL 24

DIGITAL LCR METER



SPECIFICATIONS

Display: 3 1/2 digit liquid crystal display (LCD) with a maximum reading of 1999.

Polarity: Automatic; positive implied, negative polarity indication.

Overrange: (OL) or (-OL) is displayed.

Zero: Automatic.

Low battery indication: the " " is displayed when the battery voltage drops below the operating level.

Measurement rate: 2.5 times per second, nominal.

Operating Environment: 0°C to 40°C at < 70% relative humidity.

Storage Temperature: -20°C to 60°C, 0 to 80% R.H. with battery removed from meter.

Accuracy: Stated accuracy at 23°C ± 5°C, < 75% relative humidity.

Power: single standard 9-volt battery, NEDA 1604, JIS 006P, IEC 6F22.

Battery life: 30 hours typical with carbon-zinc.

Dimensions: 200mm (H) x 90mm (W) x 40mm (D).

Weight: Approx. 14 oz. (400g) including battery.

Accessories: One pair test leads, One spare fuse installed, 9V battery (installed) and Operating Instructions.

RESISTANCE

Ranges: 20Ω, 200Ω, 2KΩ, 20KΩ, 200KΩ, 2MΩ, 20MΩ

Resolution: 20Ω range 10mΩ

Accuracy:

- ±1.0% rdg + 10dgs) on 20Ω range
- ±(0.3% rdg + 3dgs) on 200Ω range
- ±(0.3% rdg + 1dgs) on 2KΩ to 2MΩ ranges
- ±(2.0% rdg + 2dgs) on 20MΩ range

Open circuit volts:

- 6.5VDC on 20Ω to 200Ω Ranges
- 1.2VDC on other range

Overload protection: All ranges 25VDC or AC rms

Note: in the range 20Ω, subtract residual offset reading from result.

DIODE TEST

Including: , microwave , zener (< 6.8V)

Test current: 3mA (approx)

Open voltage: 8VDC typical

Accuracy: ±(10% rdg + 10dgs)

Display: forward junction voltage

Overload protection: 25 VDC or AC rms

CAPACITANCE

Ranges: 200pF, 2nF, 20nF, 200nF, 2μF, 20μF, 200μF, 2000μF

Accuracy:

- ±(1.0% rdg + 3dgs) on 200pF to 200nF ranges
- ±(2.0% rdg + 3dgs) on 2μF to 200μF ranges
- ±(3.0% rdg + 3dgs) on 2000μF range; ≤1000μF
- ±(5.0% rdg + 5dgs) >1000μF

Test frequency:

- 1000Hz on 200pF to 2μF range
- 100Hz on 20μF to 200μF range
- 10Hz on 2000μF range

Temperature Coefficient:

- ≤0.5μF: 0.1%/°C
- >0.5μF: 0.2%/°C

Overload protection: 0.1A/250V fast blow fuse

Note: in lower range 200pF, 2nF subtract residual offset reading from result with test leads opening.

INDUCTANCE

Ranges: 200μH, 2mH, 20mH, 200mH, 2H, 20H, 200H

Accuracy:

- ±(5.0% rdg + 3dgs) on 200μH range
- ±(3.0% rdg + 3dgs) on 2mH to 200mH ranges
- ±(5.0% rdg + 4dgs) on 2H to 200H ranges

Test frequency:

- 1000Hz on 200μH to 2H ranges
- 100Hz on 20H to 200H ranges

Temperature Coefficient:

- ≤0.5H: 0.2%/°C
- >0.5H: 0.5%/°C

Overload protection: 0.1A/250V fast blow fuse

Note: in lower range 200μH, 2mH subtract residual offset reading from result with test leads being shorted.

OPERATION

However, electrical noise or intense electromagnetic fields in the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

Capacitance

1. Discharge capacitors before trying to measure it.
 2. Set the Range to the desired C range.
 3. Insert the leads directly into **←** socket or test leads sockets.
 4. Never apply an external voltage to **←** sockets damage to the meter may result.
 5. Read the capacitance directly from the display.
- Note: in lower range 200pF, 2nF subtract residual offset reading from result with test leads opening*

Inductance

1. Set the Ranges to the desired L range.
2. never apply an external voltage to the sockets damage to the meter may result.
3. Insert the inductor leads directly into **↘** sockets or test leads sockets.
4. Read the inductance directly from the display.

Note: in lower range 200µH, 2mH subtract residual offset reading from result with test leads being shorted.

Resistance

1. Set the Function/Range switch to the desired resistance range.
2. Remove power from the equipment under test.
3. Connect the red test lead to the "Ω" jack and the black test lead to the "COM" jack.
4. Touch the probes to the test points. In ohms, the value indicated in the display is the measured value of resistance.

WARNING

The accuracy of the functions might be slightly affected, when exposed to a radiated electromagnetic field environment, eg, radio, telephone or similar.

Note: in the range 20Ω, subtract residual offset reading from result.

Diode Tests and Continuity Measurements


1. Connect the red test lead to the "+" jack and the black test lead to the "-" jack.
2. Set the Function/Range switch to the **→**, **→²**, microwave **→**, zener **→**, position.
3. Turn off power to the circuit under test.
4. Touch probes to diodes. A forward-voltage drop on diode, microwave diode about 0.6 VDC typical. LED about 2 VDC typical. zener diode about its shown voltage.
5. Reverse probes, if the diode is good, diode, microwave diode, LED about open voltage 8 VDC typical. zener diode about 0.7V typical.
6. If the junction is measured in a circuit and a low reading is obtained with both lead connections, the junction may be shunted by a resistance of less than 1kΩ. In this case the diode must be disconnected from the circuit for accurate testing.

MAINTENANCE

WARNING

Remove test leads before changing battery or fuse or performing any servicing.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. (NEDA 1604 IEC 6F22). The "  " appears on the LCD display when replacement is needed. To replace the battery, remove the two screws from the back of the meter and lift off the battery case. Remove the battery from battery contacts.

Fuse Replacement

If no capacitance and inductance measurements are possible, check for a blown overload protection fuse. For access to fuses, remove the two screws from the back of the meter and lift off the battery case. Replace F1 only with the original type 0.1A/250V, fast acting fuse.

Cleaning

Periodically wipe the case with a damp cloth and detergent, do not use abrasives or solvents.