

User Manual



Compact Digital Multimeters

with NIST-Traceable Calibration

Model 20250-50

(2000 count, manual ranging)

Model 20250-51

(4000 count, autoranging)



THE STANDARD IN PRECISION MEASUREMENT

Introduction

Digi-Sense Compact Digital Multimeters (manual ranging model 20250-50; autoranging model 20250-51) are a must-have on your electrical tool belt. These versatile and simple-to-use DMMs safely measure common ranges of voltage, current, and resistance, and are packaged in a very convenient compact size. Large display provides easy-to-read measurements. The instruments are fully tested and calibrated to NIST-traceable standards. Careful use of the meter will provide years of reliable service.

Safety

These meters have been designed for safe use, but must be operated with caution. The rules listed below must be carefully followed for safe operation.

- **NEVER** apply voltage or current to the meter that exceeds the specified maximum:

Input Limits	
Function	Maximum Input
VAC	600 V DC/AC
V DC or V AC	600 V DC/AC, 200 Vrms on 200 mV range
mA DC	200 mA 250 V fast acting fuse
A DC	10 A 250 V fast acting fuse (30 seconds max every 15 minutes)
Resistance, Continuity	250 Vrms for 15 sec max

- **USE EXTREME CAUTION** when working with high voltages.
- **DO NOT** measure voltage if the voltage on the "COM" input jack exceeds 500 V above earth ground.
- **NEVER** connect the meter leads across a voltage source while the rotary function switch is in the current, resistance, or diode mode. Doing so can damage the meter.
- **ALWAYS** discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
- **ALWAYS** turn off the power and disconnect the test leads before opening the doors to replace the batteries.
- **NEVER** operate the meter unless the back cover and the battery and fuse doors are in place and fastened securely.
- **NEVER** use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly.
- **NEVER** ground yourself when taking electrical measurements. Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material.
- **ALWAYS** use caution when working above 60 V dc or 30 V ac rms. Such voltages pose a shock hazard.
- **ALWAYS** keep your fingers behind the finger guards on the probes.

Safety Symbols



This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the User Manual to avoid personal injury or damage to the meter.

This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result damage to the product.



This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage with respect to earth ground exceeds (in this case) 500 VAC or VDC.



This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.



This symbol indicates that a device is protected throughout by double insulation or reinforced insulation.

Unpacking

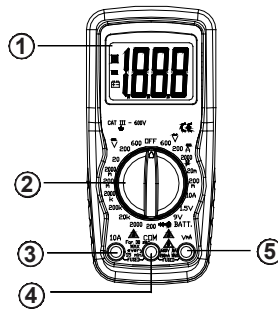
Check individual parts against the list of items below. If anything is missing or damaged, please contact your instrument supplier immediately.

1. Instrument
2. Test leads
3. One type K temperature probe (model 20250-51 only)
4. One 9 V battery
5. Carrying case
6. User manual
7. NIST-traceable calibration report with data

Meter Description (Model 20250-50)

1. 2000-count LCD
2. Rotary function switch
3. 10 A (positive) jack
4. COM (negative) jack
5. Positive input jack

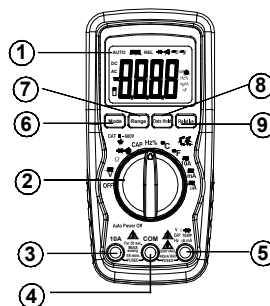
Note: Tilt stand and battery compartment are on rear of unit.



Meter Description (Model 20250-51)

1. 4000-count LCD with symbols
2. Rotary function switch
3. 10 A (positive) jack
4. COM (negative) input jack
5. Positive input jack
6. MODE button
7. Range button
8. Data HOLD button
9. Relative (REL) button

Note: Tilt stand and battery compartment are on rear of unit.



Symbols and Annunciators

•))	Continuity
BAT	Low battery
➔	Diode
AC	Alternating Current or Voltage
DC	Direct Current or Voltage
HOLD	Data HOLD (model 20250-51)
AUTO	Autoranging (model 20250-51)

Setup and Operation

WARNING: Risk of electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.

1. ALWAYS turn the rotary function switch to the OFF position when the meter is not in use. This meter has Auto Power-Off that automatically shuts the meter OFF if 15 minutes elapse between uses.
2. If "OL" appears in the display during a measurement, the value exceeds the range you have selected. Change to a higher range.

NOTE: On some low AC and DC voltage ranges, with the test leads not connected to a device, the display may show a random, changing reading. This is normal and is caused by the high-input sensitivity. The reading will stabilize and give a proper measurement when connected to a circuit.

AC/DC Voltage Measurements

CAUTION: Do not measure AC/ DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

Model 20250-50: AC Voltage Measurement

WARNING: Risk of Electrocution. The probe tips may not be long enough to contact the live parts inside some 240 V outlets for appliances because the contacts are recessed deep in the outlets. As a result, the reading may show 0 volts when the outlet actually has voltage on it. Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.

CAUTION: Do not measure AC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1. Set the rotary function switch to the highest **V AC** position.
2. Insert the black test lead banana plug into the negative COM jack and insert red test lead banana plug into the positive V jack.
3. Touch the black test probe tip to the negative side of the circuit and touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display. Reset the rotary function switch to successively lower **V AC** positions to obtain a higher resolution reading. The display will indicate the proper decimal point and value.

Model 20250-50: DC Voltage Measurement

1. Set the rotary function switch to the highest **V DC** position.
2. Insert the black test lead banana plug into the negative COM jack and insert the red test lead banana plug into the positive V jack.
3. Touch the black test probe tip to the negative side of the circuit and touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display. Reset the function switch to successively lower **V DC** positions to obtain a higher resolution reading. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (–) minus before the value.

Model 20250-51: AC Voltage Measurement

1. Set the rotary function switch to the **V AC** position.
2. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
3. Touch the test probe tips to the circuit under test.
4. Read the voltage on the display. The display will indicate the proper decimal point, value, and symbol (AC, V, etc.).

Model 20250-51: DC Voltage Measurement

1. Set the rotary function switch to the **V DC** position ("mV" will appear in the display).
2. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
3. Touch the test probe tips to the circuit under test. Be sure to observe the correct polarity (red lead to positive, black lead to negative).
4. Read the voltage in the display. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (–) minus before the value.

AC/DC Current Measurements

Model 20250-50: DC Current Measurement

CAUTION: Do not make current measurements on the 10A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to meter and test leads.

1. Insert the black test lead banana plug into the negative COM jack.
2. For current measurements up to 200 mA DC, set the rotary function switch to the highest **DC mA** position and insert the red test lead banana plug into the (mA) jack.
3. For current measurements up to 10 A DC, set the rotary function switch to the **10 A** range and insert the red test lead banana plug into the (10 A) jack.
4. Remove power from the circuit under test, then open up circuit at the point where you wish to measure current.

5. Touch the black test probe tip to the negative side of the circuit and then touch the red test probe tip to the positive side of the circuit.
6. Apply power to the circuit.
7. Read the current in the display. For mA DC measurements, reset the rotary function switch to successively lower **mA DC** positions to obtain a higher resolution reading. The display will indicate the proper decimal point and value.

Model 20250-51: DC Current Measurement

1. Insert the black test lead banana plug into the negative COM jack.
2. For current measurements up to 4000 μ A DC, set the rotary function switch to the **μ A** position and insert the red test lead banana plug into the (μ A) jack.
3. For current measurements up to 400 mA DC, set the rotary function switch to the **mA** range and insert the red test lead banana plug into the (mA) jack.
4. For current measurements up to 10 A DC, set the rotary function switch to the **10A** position and insert the red test lead banana plug into the 10 A jack.
5. Press the **MODE** button until "DC" appears in the display.
6. Remove power from the circuit under test, then open the circuit at the point where you wish to measure current.
7. Touch the black test probe tip to the negative side of the circuit; touch red test probe tip to the positive side.
8. Apply power to the circuit.
9. Read the current in the display. The display will indicate the proper decimal point, value, and symbol.

Model 20250-51: AC Current Measurement

WARNING: To avoid electric shock, do not measure AC current on any circuit whose voltage exceeds 250 VAC.

CAUTION: Do not make current measurements on the 10A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to meter and test leads.

1. Insert the black test lead banana plug into the negative COM jack.
2. For current measurements up to 4000 μA AC, set the rotary function switch to the **μA** position and insert the red test lead banana plug into the (μA) jack.
3. For current measurements up to 400 mA AC, set the rotary function switch to the **mA** range and insert the red test lead banana plug into the (mA) jack.
4. For current measurements up to 10 A AC, set the rotary function switch to the **10A** position and insert the red test lead banana plug into the 10A jack.
5. Press the **MODE** button until "AC" appears in the display.
6. Remove power from the circuit under test, then open the circuit at the point where you wish to measure current.
7. Touch the black test probe tip to the negative side of the circuit and touch the red test probe tip to the positive side of the circuit.
8. Apply power to the circuit.
9. Read the current in the display. The display will indicate the proper decimal point, value, and symbol.

Resistance Measurements

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements. Remove the batteries and unplug the line cords.

Model 20250-50:

1. Set the rotary function switch to the highest Ω position.
2. Insert the black test lead banana plug into the negative COM jack and insert the red test lead banana plug into the positive Ω jack.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display and then set the rotary function switch to the lowest Ω position that is greater than the actual or any anticipated resistance. The display will indicate the proper decimal point and value.

Model 20250-51:

1. Set the rotary function switch to the Ω position.
2. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive Ω jack.
3. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display. The display will indicate the proper decimal point, value, and symbol.

Continuity Check

WARNING: To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

Model 20250-50:

1. Set the rotary function switch to the $\rightarrow \bullet \gg$ position.
2. Insert the black lead banana plug into the negative COM jack and insert the red test lead banana plug into the positive Ω jack.
3. Touch the test probe tips to the circuit or wire you wish to check.
4. If the resistance is less than approximately 30Ω , the audible signal will sound. If the circuit is open, the display will indicate "1".

Model 20250-51:

1. Set the rotary function switch to the $\rightarrow \bullet \gg$ position.
2. Insert the black lead banana plug into the negative COM jack and the red test lead banana plug into the positive Ω jack.
3. Press the **MODE** button until the $\bullet \gg$ symbol appears in the display.
4. Touch the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately 30Ω , the audible signal will sound. The display will also show the actual resistance.

Diode Test

WARNING: To avoid electric shock, do not test any diode that has voltage on it.

Model 20250-50:

1. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive diode jack.
2. Turn the rotary switch to the  position
3. Touch the test probes to the diode under test. Forward voltage will indicate 400 to 700 mV. Reverse voltage will indicate "I". Shorted devices will indicate near 0 mV and an open device will indicate "I" in both polarities.

Model 20250-51:

1. Set the rotary function switch to  position.
2. Press the **MODE** button until the  symbol appears in the display.
3. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive diode jack.
4. Touch the test probe tips to the diode or semiconductor junction you wish to test. Note the meter reading.
5. Reverse the probe polarity by switching probe position. Note this reading.

Diode Test

Model 20250-51 (continued):

6. The diode or junction can be evaluated as follows:
 - A. If one reading shows a value and the other reading shows "OL", the diode is good.
 - B. If both readings show "OL", the device is open.
 - C. If both readings are very small or 0, the device is shorted.

NOTE: The value indicated in the display during the diode check is the forward voltage.

Frequency or % Duty Cycle Measurements (Model 20250-51 only)

1. Set the rotary function switch to the **Hz%** position.
2. Insert the black lead banana plug into the negative COM jack and the red test lead banana plug into the positive Hz jack.
3. Press the **MODE** button to select "Hz" or "%".
4. Touch the test probe tips to the circuit under test.
5. Read the frequency or % of duty cycle on the display.

Capacitance Measurement (Model 20250-51 only)

WARNING: To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any capacitance measurements. Remove the batteries and unplug the line cords.

1. Set the function switch to the **CAP** position. "nF" and a small value will appear in the display.

2. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive CAP jack.
3. Touch the test leads to the capacitor to be tested. The display will indicate the proper decimal point, value, and symbol.

Temperature Measurement (Model 20250-51 only)

WARNING: To avoid electric shock, disconnect both test probes from any source of voltage before making a temperature measurement.

1. If you wish to measure temperature in °F, set the rotary function switch to the **Temp °F** range. If you wish to measure temperature in °C, set the rotary function switch to the **Temp °C** range.
2. Insert the type K thermocouple probe black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive Temp jack.
3. Touch the temperature probe head to the part whose temperature you wish to measure. Keep the probe touching the part under test until the reading stabilizes (about 30 seconds).
4. Read the temperature in the display. The digital reading will indicate the proper decimal point and value.

WARNING: To avoid electric shock, be sure the thermocouple has been removed before changing to another measurement function.

MODE Button (Model 20250-51 only)

To select DC/AC, Diode/Continuity, or Hz/%Duty functions.

RANGE Button (Model 20250-51 only)

When the meter is first turned on, it automatically defaults to Autoranging. This automatically selects the best range for the measurements being made and is generally the optimal mode for most measurements. For measurement situations requiring that a range be manually selected, perform the following:

1. Press the **RANGE** button. The "AUTO" display indicator will turn off.
2. Press the **RANGE** button again to step through the available ranges until you select the range you want.
3. Press and hold the **RANGE** button for 2 seconds to exit the manual ranging mode and return to autoranging.

Data HOLD Button (Model 20250-51 only)

The Data HOLD function allows the meter to "freeze" a measurement for later reference.

1. Press the **HOLD** button to "freeze" the reading on the display. The indicator "HOLD" will be appear in the display.
2. Press the **HOLD** button again to resume normal operation.

REL Button (Model 20250-51 only)

The relative measurement feature allows you to make measurements relative to a stored reference value. A reference voltage, current, etc., can be stored and

measurements made in comparison to that value. The displayed value is the difference between the reference value and the measured value.

1. Perform any measurement as described in the manual.
2. Press the **RELATIVE** button to store the reading in the display and the "REL" indicator will appear on the display.
3. The display will now indicate the difference between the stored value and the measured value.
4. Press the **RELATIVE** button again to resume normal operation.

Battery Test (Model 20250-50 only)

1. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive V jack.
2. Set the rotary function switch to the **1.5 V BATT** or **9 V BATT** position.
3. Connect the red test lead to the positive side of the battery and the black test lead to the negative side of the battery.
4. Read the voltage in the display and use guidelines:

Type	Good	Weak	Bad
9 V battery	>8.2 V	7.2 to 8.2 V	<7.2 V
1.5 V battery	>1.35 V	1.22 to 1.35 V	<1.22 V

Specifications

Accuracy is given at 65 to 83°F (18 to 28°C), less than 70% RH.

DC Voltage (Autoranging for model 20250-51 only)

Range		Resolution		Accuracy	
20250-50	20250-51	20250-50	20250-51	20250-50	20250-51
200 mV	400.0 mV	0.1 mV	0.1 mV	±(0.5% rdg + 2 dgts)	+0.5% rdg + 2 dgts
2000 mV	4.000 V	1 mV	1 mV	±(0.5% rdg + 2 dgts)	+1.2% rdg + 2 dgts
20 V	40.00 V	10 mV	10 mV	±(0.5% rdg + 2 dgts)	
200 V	400.0 V	100 mV	100 mV	±(0.8% rdg + 2 dgts)	
600 V	600 V	1 V	1 V	±(0.8% rdg + 2 dgts)	+1.5% rdg + 2 dgts

Input impedance: 7.8 MΩ

Maximum input: 600 V DC or 600 V AC RMS

AC Voltage

(Autoranging, except 400 mV, for model 20250-51 only)

Range		Resolution		Accuracy	
20250-50	20250-51	20250-50	20250-51	20250-50	20250-51
—	400.0 mV	—	0.1 mV	—	±1.5% rdg ± 15 dgts
—	4.000 V	—	1 mV	—	±1.2% rdg ± 3 dgts
—	40.00 V	—	10 mV	—	±1.5% rdg ± 3 dgts
200.0 V	400.0 V	100 mV	100 mV	±1.2% rdg + 10 dgts	±2.0% rdg ± 4 dgts
600 V	600 V	1 V	1 V		±2.0% rdg ± 4 dgts

Input impedance: 7.8 MΩ

Frequency range: 50 to 60 Hz (20250-50), 50 to 400 Hz (20250-51)

Maximum input: 600 V DC or 600 V AC RMS

DC Current

(Autoranging, μA and mA, for model 20250-51 only)

Range		Resolution		Accuracy	
20250-50	20250-51	20250-50	20250-51	20250-50	20250-51
—	400.0 μA	—	0.1 μA	—	$\pm 1.0\%$ rdg ± 3 dgts
2000 μA	4000 μA	1 μA	1 μA	$\pm 1.0\%$ rdg $+ 2$ dgts	$\pm 1.5\%$ rdg ± 3 dgts
20.00 mA	40.00 mA	10 μA	10 μA		
200.0 mA	400.0 mA	100 μA	100 μA	$\pm 1.2\%$ rdg $+ 2$ dgts	$\pm 2.5\%$ rdg ± 5 dgts
10 A	10 A	10 mA	10 mA	$\pm 2.0\%$ rdg $+ 2$ dgts	

Overload protection (20250-50): 0.2 A / 250 V and 10 A / 250 V fuse

Overload protection (20250-51): 0.5 A / 250 V and 10 A / 250 V fuse

Maximum input (20250-50): 200 mA DC on μA / mA ranges,
10 A DC on 10 A range

Maximum input (20250-51): 400 mA DC or 400 mA AC RMS on
 μA / mA ranges, 10 A DC or AC RMS on 10 A range

AC Current for model 20250-51 only

(Autoranging for μA and mA)

Range	Resolution	Accuracy
400.0 μA	0.1 μA	$\pm 1.5\%$ rdg ± 5 dgts
4000 μA	1 μA	
40.00 mA	10 μA	$\pm 1.8\%$ rdg ± 5 dgts
400.0 mA	100 μA	
10 A	10 mA	$\pm 3.0\%$ rdg ± 7 dgts

Overload protection: 0.5 A / 250 V and 10 A / 250 V fuse

Frequency range: 50 to 400 Hz

Maximum input: 400 mA DC or 400 mA AC RMS on
 μA / mA ranges, 10 A DC or AC RMS on 10 A range

Resistance (Autoranging for model 20250-51 only)

Range		Resolution		Accuracy	
20250-50	20250-51	20250-50	20250-51	20250-50	20250-51
200.0 Ω	400.0 Ω	0.1 Ω	0.1 Ω	$\pm 0.8\%$ rdg + 2 dgts	$\pm 1.2\%$ rdg ± 4 dgts
2.000 k Ω	4.000 k Ω	1 Ω	1 Ω	$\pm 0.8\%$ rdg + 2 dgts	$\pm 1.0\%$ rdg ± 2 dgts
20.00 k Ω	40.00 k Ω	10 Ω	10 Ω	$\pm 0.8\%$ rdg + 2 dgts	$\pm 1.2\%$ rdg ± 2 dgts
200.0 k Ω	400.0 k Ω	100 Ω	100 Ω	$\pm 0.8\%$ rdg + 2 dgts	
2.000 M Ω	4.000 M Ω	1 k Ω	1 k Ω	$\pm 1.0\%$ rdg + 2 dgts	
—	40.00 M Ω	—	10 k Ω	—	$\pm 2.0\%$ rdg ± 3 dgts

Input protection: 250 V DC or 250 V AC RMS

Capacitance for model 20250-51 only (Autoranging)

Range	Resolution	Accuracy
4.000 nF	1 pF	$\pm 5.0\%$ rdg ± 50 dgts
40.00 nF	10 pF	$\pm 5.0\%$ rdg ± 7 dgts
400.0 nF	0.1 nF	$\pm 3.0\%$ rdg ± 5 dgts
4.000 μ F	1 nF	
40.00 μ F	10 nF	
200.0 μ F	0.1 μ F	$\pm 5.0\%$ rdg ± 5 dgts

Input protection: 250 V DC or 250 V AC RMS

Frequency for model 20250-51 only (Autoranging)

Range	Resolution	Accuracy
9.999 Hz	0.001 Hz	$\pm 1.5\%$ rdg ± 5 dgts
99.99 Hz	0.01 Hz	
999.9 Hz	0.1 Hz	
9.999 kHz	1 Hz	$\pm 1.2\%$ rdg ± 3 dgts
99.99 kHz	10 Hz	
999.9 kHz	100 Hz	
9.999 MHz	1 kHz	$\pm 1.5\%$ rdg ± 4 dgts

Sensitivity: >0.5 V RMS while ≤ 1 MHz; >3 V RMS while >1 MHz

Overload protection: 250 V DC or AC RMS

Duty Cycle for model 20250-51 only

Range	Resolution	Accuracy
0.1 to 99.9%	0.1%	±1.2% rdg ± 2 dgts

Pulse width: >100 μ s, <100 ms

Frequency width: 5 Hz to 150 kHz

Sensitivity: >0.5 V RMS

Overload protection: 250 V DC or AC RMS

Temperature for model 20250-51 only

Range	Resolution	Accuracy
-4 to +1400°F	1°F	±3% rdg ± 9°F/5°C
-20 to +760°C	1°C	

Sensor: type K thermocouple

Overload protection: 250 V DC or AC RMS

Diode Test for both models 20250-50 and 20250-51

Test current	Resolution	Accuracy
0.3 mA typical	1 mV	±10% rdg ± 5 dgts

Open circuit voltage: 1.5 V DC typical

Overload protection: 250 V DC or AC RMS

Audible Continuity

Audible threshold (20250-50): less than 30; Test current: <1 mA
Audible threshold (20250-51): less than 150; Test current: <0.3 mA
Overload protection: 250 V DC or AC RMS

Compliance: EN61010-1

Insulation: Class 2, Double insulation

Overvoltage category: CAT III 600 V

Display: 2000 count (20250-50), 4000 counts (20250-51) LCD with function indication

Polarity: Automatic, (–) negative polarity indication

Overrange indication: “1” displayed (20250-50),
“OL” displayed (20250-51)

Low-battery indication: “BAT” displayed

Measurement rate: 2 times per second, nominal

Operating environment: 32 to 122°F (0 to 50°C) at <70% RH

Storage temperature: –4 to 140°F (–20 to 60°C) at <80% RH

For inside use, max height: 7000 ft (2000 m)

Power: One 9 V alkaline battery

Auto power-off: Approximately after 15 minutes of inactivity
(model 20250-51 only)

Weight: 9 oz (255 g)

Dimensions: 5⁷/₈" x 2³/₄" x 1⁷/₈" (15 x 7 x 4.8 cm)

Safety: For indoor use and in accordance with Overvoltage Category II, Pollution Degree 2. Category II includes local level, appliance, portable equipment, etc., with transient overvoltages less than Overvoltage Category III.

Maintenance, Recalibration, and Repair

Cleaning and Storage

- The meter should be cleaned with a damp cloth and mild detergent when necessary. Do not use solvents or abrasives.
- Store the meter in an area with moderate temperature and humidity.

Battery Replacement

WARNING: To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery door.

1. When the batteries become exhausted or drop below the operating voltage, "BAT" will appear in the right-hand side of the LCD. The battery should be replaced.
2. Disconnect the test leads from the meter.
3. Open the battery door by loosening the screw using a Phillips head screwdriver.
4. Insert the battery into battery holder, observing the correct polarity.
5. Put the battery door back in place. Secure with the two screws.
6. Dispose of the old battery properly.

WARNING: To avoid electric shock, do not operate your meter until the battery door is in place and fastened securely.