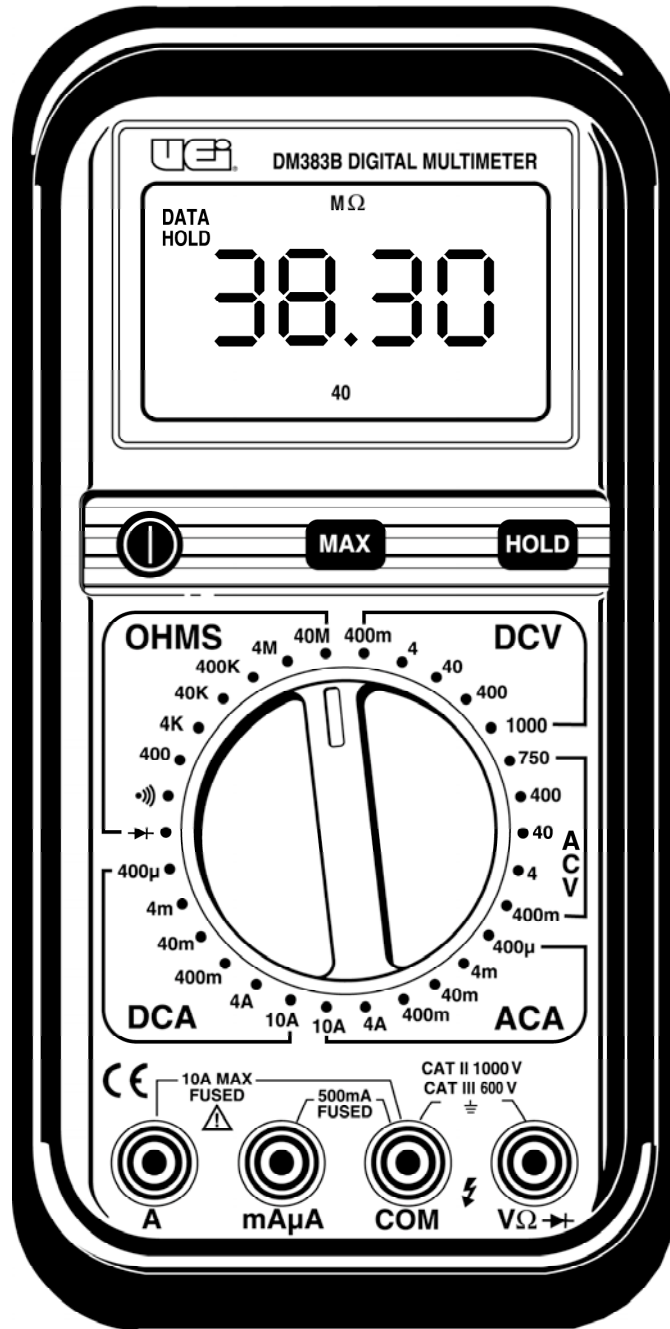




INSTRUCTION MANUAL

DM383B

Digital Multimeter



1-800-547-5740 • Fax: (503) 643-6322
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Introduction

The DM383B is a handheld, battery powered digital multimeter that is designed to meet IEC 1010-1 (EN61010-1), standards, the EMC directive, and other safety standards (see "Specifications"). It will measure up to 1000 volts DC and 750 Volts AC in a CAT II environment and up to 600 volts AC and DC in a CAT III environment.

Features include

- 750 volts AC and 1000 Volts DC
- 10 Amps AC and DC
- Resistance to 40 Megohms
- Diode check function
- Continuity
- 3 3/4" digit, 4000 count display
- Max capture mode
- Data hold
- On-screen range and function indicators
- CE listed CAT III

Safety Notes

Before using this meter, read all safety information carefully. In this manual the word "**WARNING**" is used to indicate conditions or actions that may pose physical hazards to the user. The word "**CAUTION**" is used to indicate conditions or actions that may damage this instrument.

- Do not attempt to measure any voltage that exceeds the category-based rating of this meter
- Do not attempt to use this meter if either the meter or the test leads have been damaged. Turn it in for repair at a qualified repair facility
- Ensure meter leads are fully seated by making a quick continuity check of the leads prior to making voltage measurements
- Keep your fingers away from the test lead's metal probe contacts when making measurements. Always grip the leads behind the finger guards molded into the probes
- Use a current clamp adapter when measuring current that may exceed 10 amps. See the accessories in UEI's full-line catalog
- Do not open the meter to replace batteries or fuses while the probes are connected



WARNING!

Exceeding the specified limits of this meter is dangerous and can expose the user to serious or possibly fatal injury.

- Voltages above 60 volts DC or 25 volts AC may constitute a serious shock hazard
- Always turn off power to a circuit (or assembly) under test before cutting, unsoldering, or breaking the current path - Even small amounts of current can be dangerous
- Always disconnect the live test lead before disconnecting the common test lead from a circuit
- In the event of electrical shock, ALWAYS bring the victim to the emergency room for evaluation, regardless of the victim's apparent recovery - Electrical shock can cause an unstable heart rhythm that may need medical attention

- Higher voltages and currents require greater awareness of physical safety hazards - Before connecting the test leads; turn off power to the circuit under test; set the meter to the desired function and range; connect the test leads to the meter first, then to the circuit under test. Reapply power
- If any of the following indications occur during testing, turn off the power source to the circuit under test:
 - Arcing
 - Flame
 - Smoke
 - Extreme Heat
 - Smell of Burning Materials
 - Discoloration or Melting of Components



CAUTION!

Do not attempt to remove the meter leads from the circuit under test. The leads, the meter, or the circuit under test may have degraded to the point that they no longer provide protection from the voltage and current applied. If any of these erroneous readings are observed, disconnect power immediately and recheck all settings and connections

International Symbols

Dangerous Voltage	Ground
AC Alternating Current	Warning or Caution
DC Direct Current	Double Insulation (Protection Class II)
Either AC or DC	Fuse
Not Applicable to Identified Model	Battery

Controls and Indicators

1. **Digital Display:** Readings are displayed on a digital, 4000 count display, which includes the appropriate polarity indication, the range and function icons, and shows the decimal point position for the selected range. (See Display Icons).
2. **Power Push-button:** Used to turn the power to the meter on or off.
3. **MAX Push-button:** Causes the meter to record and display the maximum value of any function selected. The word "**MAX**" appears in the upper right of the LCD. This feature resets only when the push-button is pressed a second time, not when the selector is moved.
4. **Hold Push-button:** Freezes the reading presently on the digital display, and displays the words "**DATA HOLD**" on the left side of the LCD. To cancel data hold, press the "**DATA HOLD**" button again. This feature resets only when the push-button is pressed a second time, not when the selector is moved.
5. **Rotary Switch:** Allows you to switch between any of the functions or values indicated by the numbers, icons, and group outlines printed around the rotating dial.

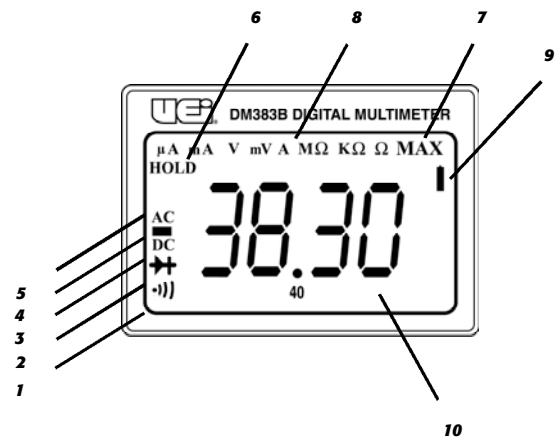
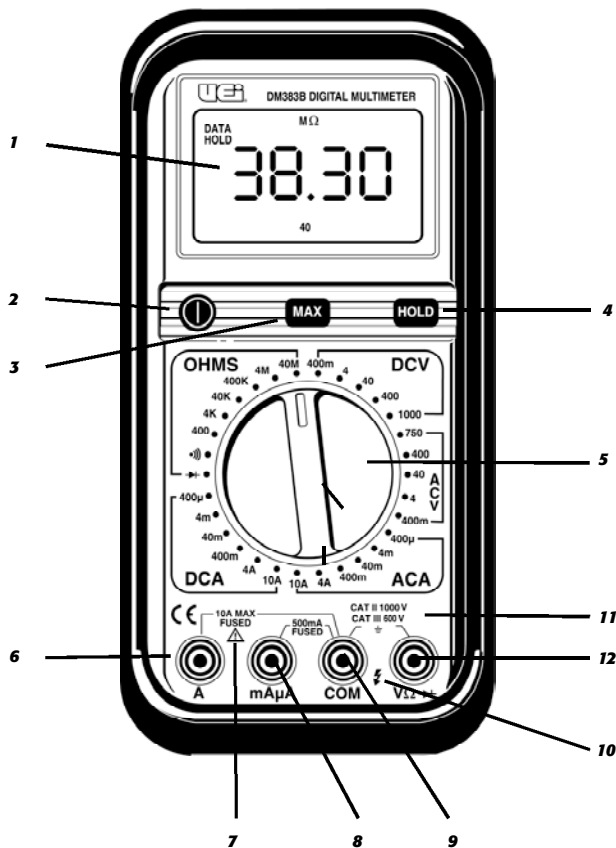
6. **10 Amp, Fused, Meter Lead Terminal:** Use this input terminal (port) when measuring amps greater than 400 mA, but less than 10 Amps AC or DC. Use caution when selecting amperage measurements on the rotary dial. Remember amperage measurements are made in series with your circuit.
7. **This Symbol Reminds the User to Follow Provided Instructions:** See "Caution" in the international symbol section of this manual.
8. **Microamp/Milliamp Input Terminal:** The red test lead is plugged into this terminal when measuring current (AC or DC) in the 400 mA and below range.
9. **Common Terminal:** The black test lead is plugged into this terminal, and supplies the ground or "low" reference for all measurements.
10. **"Flash" Symbol:** Warns operators that potentially dangerous voltages may be present. Use caution when making high-voltage measurements.
11. **Multifunctional Terminal Information:** Indicates the maximum input values and category ratings established by IEC 1010-1.
12. **Multifunctional (Volts, Ohms, and Diode Test) Input Terminal:** Use the red test lead in this terminal for any of these test functions.

1. Indicates that the audible continuity mode has been selected.
2. Indicates that diode testing has been selected.
3. Indicates the meter is reading DC voltage or current.
4. Indicates a negative polarity measurement. (Applicable to DC functions).
5. Indicates the meter is reading AC voltage or current.
6. Indicates that HOLD has been selected and the display is no longer updating numerical data.
7. Indicates MAX push-button is pressed and the meter is displaying the maximum numerical value recorded in any mode from the time the button was pressed.
8. The following symbols represent the type and value of measurement being made.

Symbol	Function or Value
V	Volts
A	Amps
	Ohms (Resistance Value)
M	1 Meg = 1,000,000
K	1 Kilo = 1,000
m	1 Milli = 0.001
μ	1 Micro = 0.000001

9. Indicates the battery is low and must be changed immediately
10. Indicates measured numerical values

NOTE: When OL is displayed on the LCD, it indicates the value measured exceeds the limits of the selected range, or exceeds the over-all limits of the meter.



Operating Instructions

Functional Description

The DM383B is designed to make basic electrical measurements quickly and easily. The LCD provides range and function information while the extra large numerical data display can be monitored from a distance.

This is a 4000 count, manual-ranging digital multimeter that employs high input impedance to ensure accurate readings and circuit isolation for digital and analog devices.

The input ports use standard four-millimeter insulated-plug test leads (provided). Maximum measurement values are 1000 Volts DC, and 750 Volts AC (CAT II) or 600 V AC/DC (CAT III) and 10 amps AC or DC.

Meter Power

The DM383B is powered on and off using the push-button on the far left, which is marked with the international on/off symbol (Ⓜ). This instrument will remain on until manually turned off to allow constant monitoring or maximum value recording.

Selecting the Proper Test Lead Ports

The test leads must be plugged into the proper ports to make electrical measurements. Press the test lead plugs firmly into the meter ports to ensure they are fully seated.

The black test lead will be plugged into:

- COM: For all measurements

The red test lead will be plugged into:

- $V\Omega \rightarrow$: For testing volts AC or DC, ohms, continuity, and diodes
- $\mu A mA$: For testing amps AC or DC with values below 400 milliamps
- A: For testing amps AC or DC with values up to (not exceeding) 10 amps

MAX Recording

After selecting your desired mode and range, you can enable the MAX recording function. This function allows the meter to display the highest numerical value obtained in the selected mode. This numerical data is not reset when the rotary switch is moved from one function to another, yet it will display higher values if they are provided by the newly selected function. For best results, set the range and function you intend to record prior to pressing the MAX push-button then leave the function selector in that position.

Hold

The HOLD push-button freezes the numerical data displayed on the LCD at the moment it is pressed. To engage data hold, press the HOLD push-button, located on the right side on the face of the instrument. When this function is active, the word "**HOLD**" appears on the left side of the digital display. To cancel data hold, press the HOLD button again. The numerical value will remain displayed even if the rotary dial is moved from its original position.

Rotary Function Switch

The rotary function select switch is used to select the measurement function and range. The operator has complete control over the function and resolution of the measurement.



CAUTION!
While this meter is manufactured with a number of built in fail-safe, the potential to damage the meter or blow a fuse due to improper use does exist. Set the rotary function select switch to the appropriate setting before connecting test leads, or applying power to circuits under test.

Measure Voltage



WARNING!
*To avoid the risk of electrical shock and instrument damage, input voltages must not exceed specified limits. **DO NOT** attempt to take any unknown voltage measurements that may be in excess of these values.*

NOTE: When taking voltage measurements your meter must be connected in parallel to the circuit, or circuit element, under test.

To measure DC or AC volts plug in the test leads as instructed, then:

1. Turn on the multimeter.
2. Set the rotary function switch to one of the DC volt (DCV) or AC volt (ACV) positions, as appropriate. If you do not know the maximum value of the voltage to be measured, start at the highest range and reduce the setting as required to obtain satisfactory resolution.
3. Disconnect the power from the circuit to be tested (if practical).
4. Connect the test leads to the circuit to be tested.
5. Reapply power to the circuit (when applicable).
6. Read the measured voltage on the display.

NOTE: When measuring DC voltage, if the voltage on the red test lead is lower (more negative) than that on the black test lead, the negative polarity sign (a minus symbol) will appear on the left of the display.

7. Disconnect power to the circuit under test before removing the test leads (if practical).

Measuring Resistance

Resistance is the measure of a component or circuit's tendency to oppose current flow. Because of the many factors that affect resistance, the most accurate measurements are made when components under test are isolated from other components or circuits. It is critical to the accuracy of the measurement that you remove all power to the circuit under test when making resistance measurements. If the component or circuit under test cannot be isolated, turn off all power sources and discharge all capacitors affecting the circuit to be tested before attempting the in-circuit measurement. This meter may be damaged if more than 600 volts are present.

Note: When measuring critically low ohm values, touch the tips of the test leads together and record the reading. Subtract this value from the total circuit resistance of the unit under test to obtain the actual resistance value.

For resistance measurements above one Megohm the display might take a few seconds to stabilize. This is normal for high resistance readings.

Use caution when measuring resistance in extremely sensitive electronic devices. Typically, the voltages present at the test leads when making resistance measurements range from 3 Volts at 1.5 mA (in the lowest range) to .5 Volts at <1 mA (in the highest range).

To measure resistance, plug in the test leads as instructed then:


1. Turn off power to the circuit under test. Voltage across the circuit, from any source, will cause an erroneous reading.
2. Set the rotary switch to the appropriate scale in the OHM ranges.
3. Touch the test probes to the test points and read the display. Be sure you have good contact between the test leads and the circuit. Dirt, oil, solder-flux, or other foreign matter alters the reading value.

Note: During continuity or resistance measurements, red and black test lead polarity does not matter.


Measuring Continuity

Continuity is the measure of a circuit or component's ability to conduct electricity. Use this mode to make quick for continuity in electrical circuits, such as wiring, speaker cables, connections, switches, or relays. In the continuity mode an audible tone sounds when the value measured is approximately 50 or less. The resistance of the circuit (up to 400 ohms) is displayed regardless of the continuity tone.


To measure continuity plug in the test leads as instructed, then:

1. Turn on the meter.
2. Set the rotary switch to the continuity  function.
3. Place one probe to each side of the circuit to be tested. If the circuit measures approximately 50Ω or less, the meter will sound a continuous tone.



Testing Diodes

The diode test function () allows you to check diodes, transistors, and other semi-conductor devices for opens, shorts, and normal operation. diodes allow current to flow easily in one direction and prevent current to flow easily in one direction and prevent current flow in the other direction. When a diode is forward biased, it allows current to flow. When it's reverse biased it prevents current flow.

Your meter is designed to apply enough voltage, in the forward biased direction, to allow current flow in most diodes. All diodes use up or "drop" a small amount of the supplied voltage when they are forward biased. When they are reverse biased they drop nearly all

of the supplied voltage, preventing the voltage from reaching other devices in the circuit. Although the voltage drop varies widely from one type of diode to another, the forward bias voltage drop is normally around 0.4 V for germanium diodes and 0.6 V for silicon diodes. When the diode is reverse biased, or the test leads are not connected to a circuit, the meter should indicate the over-range symbol ()

To measure the voltage drop on diodes, plug in the test leads as instructed, then:

1. Turn on the multimeter.
2. Select the diode test function on the rotary function switch.
3. Connect the red test lead to the anode side of the diode, and the black to the other. There is normally a printed black band around the cathode of a diode.
4. Note the displayed value.
5. Reverse the red and black test leads. Again, note the displayed value.
6. If the digital reading in the first (forward biased) direction indicates some measurable value and the reading in the reverse biased direction shows an over-range () the diode is probably good.
7. If the displayed value is low, or all zeros, in both directions, the diode is probably shorted.
8. If the display indicated an overload () in both directions, the diode is probably open.

Note: Some diodes, such as those used in microwave ovens, require a higher biasing voltage than this meter supplies. See UEI's catalog for an economical high-power diode test lead adapter set if necessary.

Measuring Amps

Current flow is measured in amperes or "amps", which indicates the volume of electrons that pass through a given point. When taking current measurements, this meter must be connected in SERIES with the circuit (or circuit element) under test. Never connect the test leads across (in parallel with) a voltage source when attempting to measure current. This can cause damage to the circuit under test or this meter.

Note: To measure current, you must create a break in the circuit under test and make the meter part of the circuit. Two connection points are created when a circuit is broken. On one side is the power source and the other is the load.

To measure AC or DC current flow, (in amps), insert the test leads into the meter as previously instructed (selecting the proper test lead ports), then follow these steps.

1. Ensure power is off to the circuit to be tested.
2. Turn the meter on.
3. Set the rotary switch to the appropriate AC or DC amp position.
4. Break the circuit as described earlier and connect the meter leads to the points created by the break.

Note: When performing flame safeguard testing (a low DC amperage test) on some gas furnace models, an adapter (sold by UEi) can be placed in-line with the flame sensor to make testing fast and easy.

5. Apply power to the circuit.
6. Note your measurement value.
7. When measuring DC current, a minus sign will be displayed if the current is flowing opposite to the connection polarity.
8. Disconnect power to the circuit. Do not remove either test lead from the circuit until power is disconnected.

Maintenance

Periodic Service



WARNING!

Repair and service of this instrument is to be performed by qualified personnel only. Improper repair or service could result in physical degradation of the meter. This could alter the protection from electrical shock and personal injury this meter provides to the operator. Perform only those maintenance tasks that you are qualified to do.

These guidelines will help you attain long and reliable service from your meter:

- Calibrate your meter annually to ensure it meets original performance specifications
- Keep your meter dry. If it gets wet, wipe dry immediately. Liquids can degrade electronic circuits
- Whenever practical, keep the meter away from dust and dirt that can cause premature wear
- Although your meter is built to withstand the rigors of daily use, it can be damaged by severe impacts. Use reasonable caution when using and storing the meter

Cleaning

Periodically clean your meter's case using a damp cloth. **DO NOT** use abrasive, flammable liquids, cleaning solvents, or strong detergents as they may damage the finish, impair safety, or affect the reliability of the structural components.

Battery Replacement

Always use a fresh replacement battery of the specified size and type. Immediately remove the old or weak battery from the meter and dispose of it in accordance with your local disposal regulations. Batteries can leak chemicals that corrode electronic circuits. If your meter is not going to be used for a month or more, remove and store the battery in a place that will not allow leakage to damage other materials.



WARNING!

Disconnect the test leads from the circuit under test and from the meter prior to removing or installing batteries.

To install a new battery, follow these procedures:

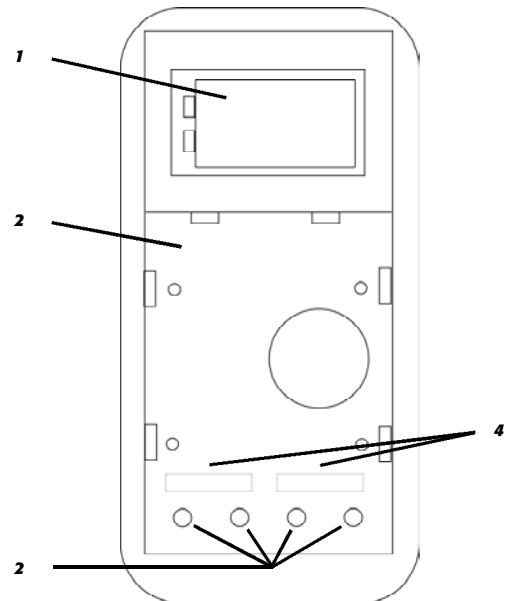
1. Turn off the meter.
2. Remove the rubber boot from the meter, starting at the top.
3. Place meter face down on a clean cloth.
4. Remove the screws from the rear case. Two machined screws fasten the bottom and two self-tapping screws fasten the top.
5. Separate the two halves to expose the battery.
6. Remove and discard the old battery. Always dispose of old batteries promptly in a manner with local disposal regulations.



WARNING!

Under no circumstances should you expose batteries to extreme heat or fire as they may expose and cause injury.

7. Place a fresh 9V battery in the battery clip.
8. Reassemble the meter.



View of meter facedown with back cover off.

- | | |
|--------------------|---------------------|
| 1. Battery | 2. PCB |
| 3. Test lead ports | 4. Fuses, under PCB |

Fuse Replacement



WARNING!

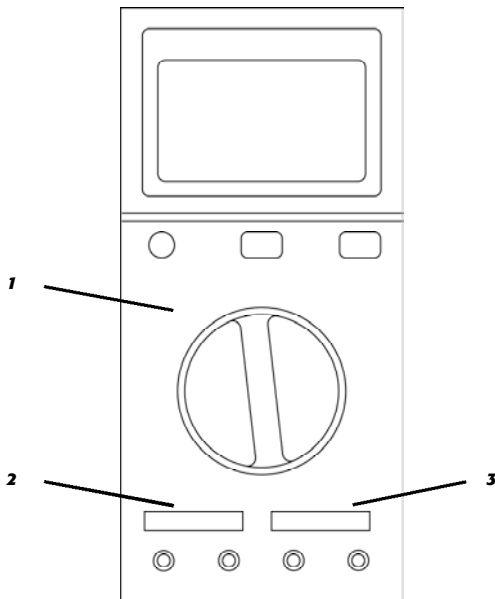
Disconnect the test leads from the circuit under test and from the meter prior to removing or installing fuses! Replace the bottom fuse with the fuse specified for this meter **ONLY!**

To replace a blown fuse, perform the following procedures:

1. Turn off the meter.
2. Remove the rubber boot from the meter, starting at the top.
3. Place meter face down on a clean cloth.
4. Remove the screws from the rear case. Two machined screws fasten the bottom and two self-tapping screws fasten the top.
5. Separate the two halves.
6. Lift the entire printed circuit board (PCB) housing up and away from the front half of the meter. Lift the PCB housing straight up as there are metal cylinders inside the test lead insulators that must slide out with it.
7. Turn the housing over to expose the fuses.
8. Check to ensure the fuse is bad by confirming that there is no continuity between the metal caps.

Note: If the fuse is good, check for corrosion at the fuse clips and ensure clips are tight around the fuse.

9. Insert a new fuse, or reinsert the good one.
10. Reassemble the meter.



View of PCB housing face-up with cover off.

1. PCB
2. 12A, 250V Fuse
3. 0.5A, 660V Fuse

Troubleshooting

If I See This Malfunction	I Should Check For	Then Take This Corrective Action
Instrument does not turn on	Battery voltage	Replace low battery
	On/Off switch position	Ensure button moves freely and is in the on position
Instrument turns on but LCD indicates some unreasonable or unchanging value	MAX button pressed	Look for MAX HOLD icons displayed on the LCD -Turn off one or both buttons
	HOLD button pressed	
A value appears on screen with no input applied	Stray voltage	Short test leads together - If a value near 000 appears, instrument is OK
		Move meter and leads away from devices that create electrical fields
A known value is not displayed on the LCD when measured	MAX and HOLD buttons pressed	Turn off one or both buttons (check for icons on LCD)
	Bad test lead connections	Ensure test leads are fully inserted and free of corrosion or dirt
	Defective test leads	Short test leads together in the 400 ohm scale - Expect less than .5Ω
	Battery voltage	Replace low battery
Meter reading is unstable	Offset rotary selector knob	Ensure knob is firmly placed in switch position
	Bad test lead contacts	Ensure there is no insulating material, dirt or debris at contact points
No audible tone with near zero resistance value	Improper selector position	Tone sounds only in continuity mode. Place selector in (•)) position
Amps readings do not work	Proper switch position	Ensure switch is in proper AC or DC amps position (ACA or DCA)
	Proper test lead port position	Ensure the red test lead is plugged into the appropriate amps port
	Blown fuse	Replace blown fuse

This unit contains no user serviceable parts beyond those listed in the table. In the event your instrument is physically damaged or does not function properly after taking the listed action, please return the instrument to UEi following the warranty and service instructions.

Standard and Optional Accessories

Standard

Test LeadsATL55

Optional

AC/DC Clamp Adapter 400 ampCA30
 AC/DC Clamp Adapter 1000 ampCA40
 Soft carrying caseACC315
 Hard carrying caseAC506
 Flame safeguard test kitATLFSG
 Microwave diode booster test leadATL60
 Temperature probe adapterTA2K

Specifications

Measurement limits

AC Amps (at 50 to 500 hz)	Center left port - 400 milliamps Far left port - 10 Amps
DC Amps	Center left port - 400 milliamps Far left port - 10 Amps
AC Voltage (at 50 to 500 hertz)	750V CAT II (600V CAT III)
DC Voltage	1000V CAT II (600V CAT III)
Resistance	40MΩ
Continuity	Tone sounds at approximately 50Ω or less

Note: When servicing the meter, use only the replaceable parts specified.

9 Volt battery	NEDA 1604 or IEC 6LR 61
Fuse 500 milliamp, 600V	AF 155-660V
Fuse 12A, 250V	AF 160-250V
Test lead set	ATL55
Rubber boot	AH190
Instruction manual	DM383B-MAN

General specifications at 64 to 82°F

Maximum voltage on ground terminal	600V
Digital display	4000 count - updates 4 times per sec
Storage temperature	-4 to 140°F (-20 to 60°C)
Operating temperature	32 to 113°F (0 to 45°C)
Altitude	<6560' (2000 M)
Relative humidity	0% to 80% at 32 to 95°F (0 to 35°C) 0% to 70% at 95 to 113°F (35 to 45°C)
Temperature coefficient	0.1 X (specified accuracy)/°C When ambient temperature is <64°F or >82°F (<18°C or >28°C)
Battery type	9V, NEDA 604 or 6LR 61
Battery life (typical)	80 hours (alkaline)
Size (H x W x L, w/boot)	7 3/4" x 3 7/8" x 2"
Weight (approximate w/boot)	1 lb. 2 oz. (510g)
Drop test	10'
Safety standards	IEC1010-1 (600 Volts overvoltage category III) (1000 Volts overvoltage category II) and the EMC directive



DM383B

Digital Multimeter

Limited Warranty

The DM383B is warranted to be free from defects in materials and workmanship for a period of five years from the date of purchase. If within the warranty period your instrument should become inoperative from such defects, the unit will be repaired or replaced at UEi's option. This warranty covers normal use and does not cover damage which occurs in shipment or failure which results from alteration, tampering, accident, misuse, abuse, neglect or improper maintenance. Batteries and consequential damage resulting from failed batteries are not covered by warranty.

Any implied warranties, including but not limited to implied warranties of merchantability and fitness for a particular purpose, are limited to the express warranty. UEi shall not be liable for loss of use of the instrument or other incidental or consequential damages, expenses, or economic loss, or for any claim or claims for such damage, expenses or economic loss. A purchase receipt or other proof of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired (when repairable) for a service charge. Return the unit postage paid and insured to:

1-800-547-5740 • FAX: (503) 643-6322
www.ueiautomotive.com • Email: info@ueitest.com

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

