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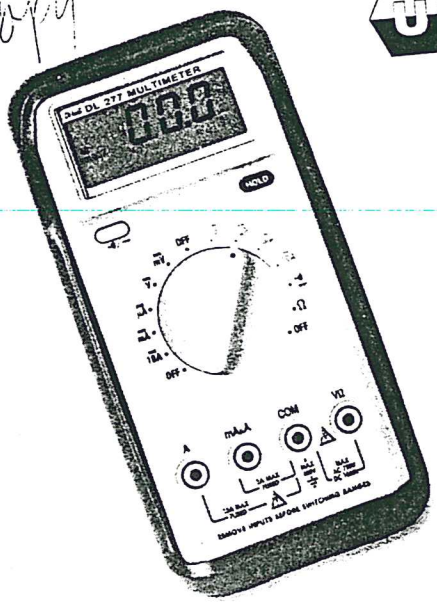

DL277

DIGITAL MULTIMETER

USER'S MANUAL

Congratulations!

You have just purchased a state-of-the-art tool to help you do your job better and more efficiently. Please take time to read this manual to familiarize yourself with its capabilities before using the instrument.

Contents

Features of the DL277

- Designed to meet or exceed IEC348 and UL1244
- 3 3/4 digit, 3260 count LCD with 34 segment analog bar graph
- Auto Range
- Data Hold
- Diode Test
- Rubber Boot
- 600V fuse protection on all current ranges
- Continuity Buzzer
- Auto Polarity
- 5 Year Limited Warranty

Safety Considerations

Observe all safety precautions when measuring higher voltages and/or currents. Turn off power to the circuit under test, set the meter to the desired function and range, and connect the test leads to the meter and then to the circuit under test. Reapply power. If an erroneous reading is observed, disconnect power immediately and recheck all settings and connections.

International Symbols:


Dangerous Voltage (risk of electric shock)


Alternating Current (AC)


Direct Current (DC)


Either AC or DC


Ground


Caution (see manual)


Double Insulation (Protection Class II)


Fuse

Safety Tips

Exceeding the specified limits of this meter is dangerous and can expose the user to serious and possibly fatal injury. To ensure safe and appropriate use, please follow the safety guidelines below:

- Do not try to measure any voltage that exceeds 1000DCV or 750ACV RMS.
- Voltages above the 25V DC or AC may constitute a serious shock hazard.
- Do not attempt to use this meter if either the meter or the test leads have been damaged.
- Turn off power, disconnect the battery and discharge all capacitors before using the Ω or diode functions.
- Use a current clamp if measuring any current above 10 amps.
- When measuring current, turn the power off on the unit under test before connecting the meter in the circuit.
- Do not exceed the limits shown on each function page.

Input Jacks and Push Buttons

"A" Input Jack	The red test lead is plugged into this jack for measuring current on the 2 and 10AC or DC amp functions.
"mAμA" Input Jack	The red test lead is plugged into this jack for measuring mA or μA on either AC or DC current functions
"COM" Input Jack	The black test lead is plugged into this jack for all measurements.
"VΩ" Input Jack	The red test lead is plugged into this jack for all ACV, DCV, Ohm, Continuity Buzzer, and Diode test functions.
"RANGE" Push Button	Selects manual ranging and toggels between diode test and audible continuity buzzer.
"HOLD" Push Button	Freezes the reading on the LCD for all functions and ranges.

General Specifications

Operating Temperature	32° to 104°F (0° to 40°C)
Storage Temperature	-4° to 140°F (-20° to 60°C)
Relative Humidity	0 to 80% RH
Battery Type	9V, NEDA 1604, 6F22 or 006P
Battery Life	200 hours, alkaline battery
Size (with boot)	1.85" x 3.94" x 7.99"
Weight (with boot)	21.5 oz.
Safety	Meets or exceeds IEC348, CSA C22.2 No. 31, ISA-DS82, and UL1244

Measuring DC Volts

WARNING!

To avoid the risk of electrical shock, instrument damage and/or equipment damage, input voltages must not exceed 1000V DC. Do not attempt to take any unknown voltage measurements that may be in excess of 1000V DC.

1. Set function switch to the desired DCV range. If you do not know the value of the voltage to be measured, always start with the highest range and reduce the setting as required to obtain a satisfactory reading.
2. Plug the red test lead into the "VΩ" input jack and the black lead into the "COM" input jack of the meter.
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads to the circuit to be tested.
5. Reapply power to the circuit. The measured voltage will appear on the display.
6. If the red test lead is connected to the negative (or lower voltage) side of the circuit, a minus sign will appear on the left side of the display.
7. Disconnect power to the circuit before removing test leads from the circuit.

FUNCTION	RANGE	RESOLUTION	ACCURACY
DCV	326.0mV	100µV	±0.5% of reading, ±2 digits
	3.260V	1mV	
	32.60V	10mV	
	326.0V	0.1V	
	1000V	1V	±0.75% of reading, ±3 digits

Maximum Input: 1000DCV

Measuring AC Volts

WARNING!

To avoid the risk of electrical shock, instrument damage and/or equipment damage, input voltages must not exceed 750V AC RMS. Do not attempt to take any unknown voltage measurements that may be in excess of 750V AC RMS.

1. Set function switch to the desired ACV range. If you do not know the value of the voltage to be measured, always start with the highest range and reduce the setting as required to obtain a satisfactory reading.
2. Plug the red test lead into the "VΩ" input jack and the black lead into the "COM" input jack of the meter.
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads to the circuit to be tested.
5. Reapply power to the circuit. The measured voltage will appear on the display.
6. If the red test lead is connected to the negative (or lower voltage) side of the circuit, a minus sign will appear on the left side of the display.
7. Disconnect power to the circuit before removing test leads from the circuit.

FUNCTION	RANGE	RESOLUTION	ACCURACY
ACV	3.260mV	100mV	±0.75% of reading, ±3 digits
	32.60V	10mV	
	326.0V	0.1V	
	750V	1V	±1.0% of reading, ±3 digits

Maximum Input: 750V AC RMS

Measuring DC Current (amps)

CAUTION!

The current functions are protected by a fuse of 600 volt rating. To avoid damage to the instrument, current sources having open circuit voltages greater than 600 volts DC or peak AC must not be measured.

Note: When taking current measurements, the meter must be connected in SERIES with the circuit, or circuit element under test. Never connect the test leads across a voltage source (in parallel). This can cause damage to the circuit under test or to the meter.

1. Set function switch to the desired DCA range. If you do not know the value of the voltage to be measured, always start with the highest range and reduce the setting as required to obtain a satisfactory reading.
2. Plug the red test lead into the "mAμA" input jack (if the 10 range is being used, plug the red lead into the "A" input jack) and the black lead into the "COM" input jack of the meter
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads to the circuit to be tested.
5. Reapply power to the circuit, The measured voltage will appear on the display.
6. Disconnect power to the circuit before removing test leads from the circuit.

FUNCTION	RANGE	RESOLUTION	ACCURACY
μA	326.0μ	0.1μA	±0.5% of reading, ±3 digits
	3260μ	1μA	
mA	32.60m	10μA	
	326.0m	0.1mA	
10A	10A	10mA	±1.0% of reading, ±5 digits

Note: "μA" and "mA" ranges are protected by a 2 amp, 600 volt fuse

"A" range is protected by a 15 amp, 600 volt fuse

Measuring AC Current (amps)

Caution!

The current functions are protected by a fuse of 600 volt rating. To avoid damage to the instrument, current sources having open circuit voltages greater than 600 VDC or peak AC must not be measured.

Note: When taking current measurements, the meter must be connected in Series with the circuit, or circuit element under test. Never connect the test leads across a voltage source (in parallel). This can cause damage to the circuit under test or to the meter.

1. Set function switch to the desired AC range. If you do not know the value of the voltage to be measured, always start with the highest range and reduce the setting as required to obtain a satisfactory reading.
2. Plug the red test lead into the "mAμA" input jack (if the 10 range is being used, plug the red lead into the "A" input jack) and the black lead into the "COM" input jack of the meter.
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads to the circuit to be tested.
5. Reapply power to the circuit, the measured voltage will appear on the display.
6. Disconnect power to the circuit before removing test leads from the circuit.

FUNCTION	RANGE	RESOLUTION	ACCURACY
μA	326.0μ	0.1μA	±0.75% of reading, ±3 digits
	3260μ	1μA	
mA	32.60m	10μA	
	326.0m	0.1mA	
10A	10A	10mA	±1.0% of reading, ±5 digits

Note: "μA" and "mA" ranges are protected by a 2 amp, 600 volt fuse

"A" range is protected by a 15 amp, 600 volt fuse

Measuring Resistance (ohms, continuity)

CAUTION!

Turn off power and discharge all capacitors on circuit to be tested before attempting in-circuit resistance measurements. Failure to do so may end up in equipment or instrument damage.

The resistance measuring circuit applies a known value of constant current through the unknown resistance and then measures the voltage developed across it. Therefore, remove all power to the circuit under test when making resistance measurements. If any voltage is present in the test circuit, an erroneous reading will result. The meter may be damaged if voltage in excess of 600V AC is present.

Note: when measuring critical low ohm values, touch tips of test leads together and record the reading. Subtract this reading from any additional measurement to obtain the most accurate value.

1. Set the function switch to the desired "Ω" position.
2. Insert the black test lead into the "COM" input jack and the red test lead into the "VΩ" input jack.
3. Connect the test leads to the circuit to be measured.

4. The measured resistance will appear on the display.

FUNCTION	RANGE	RESOLUTION	ACCURACY
Ω	326.0	0.1Ω	±0.5% of reading, ±3 digits
	3.260K	1Ω	
	32.60K	10Ω	
	326.0K	0.1KΩ	
	3.260M	1KΩ	
	32.60M	10KΩ	±1.0% of reading, ±10 digits

Audible Continuity Buzzer

1. Set the function switch to the "•)) ⊣⊢ " position.
2. Press the range button until the "•)) " annunciator appears on the display.
3. Insert the black test lead into the "COM"input jack and the red test lead into the "VΩ" input jack.
4. Connect the test leads to the circuit to be measured.
5. The meter will emit a continuous tone for resistances of less than 200 ohms.

Diode Test

1. Set the function switch to the "•)) ⊣⊢ " position.
2. Press the range button until the " ⊣⊢ " annunciator appears on the LCD.
3. Insert the black test lead into the "COM" input jack and the red test lead into the "VΩ" input jack.
4. Touch the red test lead to the Anode (+ side, non-banded end) and the black test lead to the Cathode (- side, banded end).
5. If the diode is good, the reading should indicate 0.3 to 0.8 on the LCD.
6 Reverse the red and black leads on the diode. If the LCD reads OFL (the overload sign), the diode is good.

Note: A defective diode will read OFL (the overload sign) or 0.00 no matter how the test leads are connected.

Microwave Diodes

Most microwave diodes cannot be tested by a DMM with a diode test function. This is because the DMM does not supply enough power to turn these diodes on. UEI offers an accessory test lead (model ATL60) that boosts the power output so that microwave diodes can be adequately tested. Consult your distributor for more details.

Battery and Fuse Replacement

1. Unplug the test leads and remove the rubber boot from the instrument.
2. Remove the screws in the rear of the instrument and separate the front and rear housing.
3. Replace the batteries and/or fuses with the same type and size as the one removed.
5. Reattach the rubber boot.

Accessories

Battery, 1.5 volt, "AA" requires 2 each	AB1
Fuse (2A, 600V RMS)	AF112
Fuse (15A, 600V RMS)	AF113
Test Lead Set	ATL140
Rubber Boot	AH180

Warranty

Your digital multimeter 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 meter should become inoperative from such defects, the unit will be repaired or replaced at our 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. A purchase receipt or other proof of date of original purchase date will be required before warranty repairs will be rendered. Instruments out of warranty will be repaired for a service charge. Return the unit postage paid and insured to:

UEI Service Department
8030 SW Nimbus
Beaverton, OR 97008
(503) 644-8723

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