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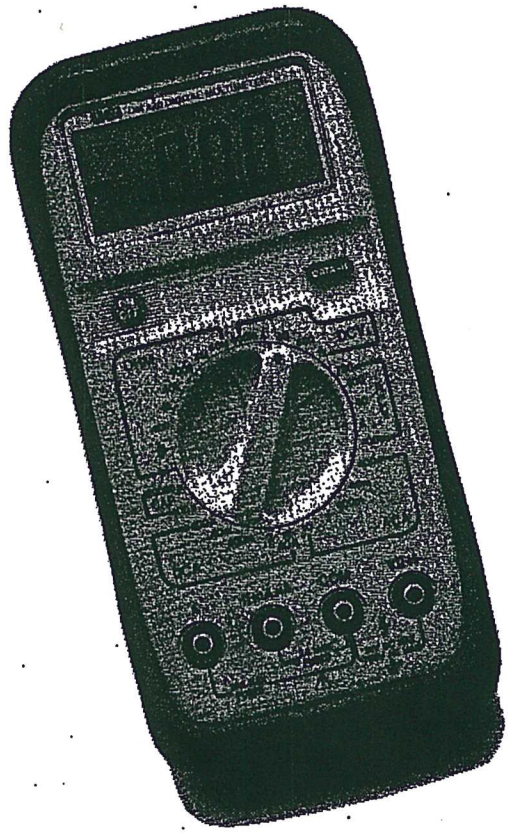
UEi **DM420**
Digital Multitester



OPERATING INSTRUCTIONS

UNIVERSAL ENTERPRISES, INC.
8030 SW Nimbus
Beaverton, OR 97008

Congratulations!

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

Features of the DM420

- Designed to meet or exceed IEC348 and UL1244
- 3 3/4 digit LCD display with 0.91" tall numerals
- Data Hold
- Diode Test
- Rubber Boot
- 600 Volt fuse protection on all current ranges
- Continuity Buzzer
- Auto Polarity
- Capacitance up to 20,000µF
- 5 Year Limited Warranty

Safety Considerations

Warning!
Observe all safety precautions when measuring higher voltages and/or currents. Turn off power to the circuit under test, set the DM420 to the desired function and range, connect the test leads to the DM420 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		GROUND
~	AC-ALTERNATING CURRENT		SEE EXPLANATION
⎓	DC-DIRECT CURRENT		DOUBLE INSULATION (Protection Class II)
≂	EITHER DC OR AC		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 peak.
- Voltages above 25V AC or DC 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 and diode functions.
- Use a current clamp if measuring any current above 10 amps.
- When measuring current, turn off the power of 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 10 AC 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.
"ON/OFF" Push Button	Turns the DM420 on and off.
"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 or 6F22 or 006P
Size (with Boot)	2.25" x 3.875" x 7.35"
Weight (with Boot)	1lb, 3oz.
Safety	Meets or excees IEC348, CAS C22.2, No. 231, ISADS82 and UL1244

Measuring DC Volts

Warning!

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

1. Set function and range 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 "V/Ω" input jack and the black lead into the "COM" input jack of the instrument.
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 of the instrument.
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 of the display.
7. Disconnect power to the circuit before removing the test leads from the circuit.

Function	Range	Resolution	Accuracy
DCV	400mV	100μV	±0.5% of reading, ±1 digit
	4V	1mV	
	40V	10mV	
	400V	0.1V	
	1000V	1V	

Maximum Input Voltage - 1000V
Input Impedance - 20MΩ

Measuring AC Volts

Warning!

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

1. Set function and range 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 "V/Ω" input jack and the black lead into the "COM" input jack of the instrument.
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 the power to the circuit before removing the test leads from the circuit.

Function	Range	Resolution	Accuracy
ACV	400mV	100µV	±1.0% of reading, ±4 digits
	4V	1mV	
	40V	10mV	
	400V	0.1V	
	750V	1V	

Maximum Input Voltage - 750 Peak ACV
Frequency Response - 50Hz to 400Hz
Input Impedance - 20MΩ

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 DM420 must be connected in SERIES with the circuit or circuit element under test. Never connect the test lead across a voltage source (in parallel). This can cause damage to the circuit under test or the DM420.

1. Set function and range switch to the desired DCA range. If you do not know the value of the current 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 2 or 10 ranges is being used, plug the red lead into the "A" input jack) and the black lead into the "COM" input jack of the instrument.
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads in series to the circuit to be tested
5. Reapply power to the circuit. The measured current will appear on the display of the instrument.
6. Disconnect the power to the circuit before removing the test leads from the circuit.

Function	Range	Resolution	Accuracy
DCA	40µ	0.01µA	±2.0% of reading, ±1 digit
	400µ	0.1µA	±0.5% of reading, ±1 digit
	40m	10µA	
	400m	100µA	±1.2% of reading, ±1 digit
	2A	1mA	
	10A	10mA	±2.0% of reading, ±5 digits

Note: "µA" and "mA" ranges are protected by a 5 amp, 600 volt fuse.

"A" range is protected by a 10 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 volts DC or peak AC must not be measured.

NOTE: When taking current measurements, the DM420 must be connected in SERIES with the circuit or circuit element under test. Never connect the test lead across a voltage source (in parallel). This can cause damage to the circuit under test or the DM420.

1. Set function and range switch to the desired ACA range. If you do not know the value of the current 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 2 or 10 ranges is being used, plug the red lead into the "A" input jack) and the black lead into the "COM" input jack of the instrument.
3. Disconnect the power from the circuit to be tested.
4. Connect the test leads in series to the circuit to be tested.
5. Reapply power to the circuit. The measured current will appear on the display of the instrument.
6. Disconnect the power to the circuit before removing the test leads from the circuit.

Function	Range	Resolution	Accuracy
ACA	400µ	0.1µA	±1.0% of reading, ±3 digits
	40m	10µA	
	400m	100µA	±1.8% of reading, ±3 digits
	2A	1mA	
	10A	10mA	±3.0% of reading, ±7 digits

Note: "µA" and "mA" ranges are protected by a 5 amp, 600 volt fuse.

"A" range is protected by a 10 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 and 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 DM420 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 "V/Ω" 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	400	0.1Ω	±0.7% of reading, ±1 digit
	4K	1Ω	
	40K	10Ω	
	400K	0.1KΩ	
	4M	1KΩ	±1.0% of reading, ±5 digits
	40M	10KΩ	

Overload Protection - RMS 600V AC/DC for 1 minute.

Measuring Capacitance

Caution!

The capitance ranges are protected by fuse of 600 volt rating. To avoid instrument and/or equipment damage, remove the capacitor from the circuit and fully discharge.

1. Set the function switch to the desired "CAP" position.
2. Insert the black test lead into the "COM" input jack and the red test lead into the "mAμA" input jack.
3. Connect the test leads across the capacitor to be measured. (NOTE: Observe proper polarity of electrolitic capacitors).
4. The measured capacitance will appear on the display.

Function	Range	Resolution	Accuracy
⊣⊢	400μF	0.1μF	±2.0% of reading, ±3 digits
	20,000μF	10μF	±3.0% of reading, ±5 digits

Input Protection - 0.3 amp, 600 volt fuse

Audible Continuity Buzzer

1. Set the function switch to the •)) position.
2. Insert the black test lead into the "COM" input jack and the red test lead into the "V/Ω" input jack.
3. Connect the test leads to the circuit to be measured.
4. The DM420 will emit a continuous tone for resistances of less than 90 ohms.

Diode Test

1. Set the function switch to the —|◄— position.
2. Insert the black test lead into the "COM" input jack and the red test lead into the "V/Ω" input jack.
3. Touch the red test lead to the Anode (+ side, non-banded end) and the black test lead to the Cathode (- side, banded end).
4. If the diode is good, the reading should indicate 0.3 to 0.8 on the LCD.

Note: A defective diode will read 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 and 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 battery and/or fuses with the same type and size as the one removed.
4. Snap the front and rear housing back together and reinstall the screws.
5. Reattach the rubber boot.

Accessories

AB9	Battery , 9 Volt
AF120	Fuse: 5A, 600V Ceramic
AF125	Fuse: 10A, 600V Ceramic
ATL50	Test Lead Set
AH190	Rubber Boot
AAC	Alligator Clip Adaptors
ATL60	Microwave Diode Booster Leads
ATLFSG	Flame Safeguard Relay Test Kit
CA2	AC/DC Clamp-on Adaptor
CA310	AC Clamp-on Adaptor
DPM2K	Phototach Adaptor
HM1K	Humidity Adaptor
TA1K	Temperature Adaptor

Warranty

Your DM420 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

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