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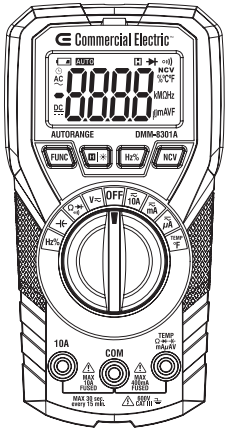
Retain this manual for future use.

Commercial Electric™

Item # 1001 418 348
Model # DMM-8301A

USE AND CARE GUIDE

AUTO-RANGING MULTIMETER



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THANK YOU

We appreciate the trust and confidence you have placed in Commercial Electric through the purchase of this outlet tester. We strive to continually create quality products designed to enhance your home. Visit us online to see our full line of products available for your home improvement needs. Thank you for choosing Commercial Electric!

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Safety Information

Please read this manual carefully and pay attention to related safe working standards before using this meter. Protection provided by the instrument will be impaired if used in a manner not specified by the manufacturer.

SAFETY SYMBOLS

Symbol	Definition
⚠	Indicates important safety information.
⚠	Caution! Indicates a potentially hazardous situation.
⚠	Caution, possibility of electric shock.
⧈	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION.
⏚	Protective conductor terminal.
▭	The fuse must be replaced with the rating specified in this manual.
Intertek 5023835	Conforms to UL STD. 61010-1, 61010-2-033. Certified to CSA STD. C22.2 NO. 61010-1, 61010-2-033.
CAT II	(Measurement Category II) is applicable to test and measuring circuits connected directly to utilization points(socket outlets and similar points) of the low-voltage MAINS installation.
CAT III	(Measurement Category III) is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.

Safety Information (continued)

PRECAUTIONS

⚠ **WARNING:** Measure known voltage with the meter to verify that the meter is working properly. If the meter is working abnormally, stop using it immediately. A protective device may be damaged. If there is any doubt, have the meter inspected by a qualified technician.

⚠ **WARNING:** Do not use the meter or test leads if they look damaged. Check to see if the test wire has insulation damage or bare metal. Check test wire continuity. If the wire is damaged, replace it with a new one before using the meter.

⚠ **WARNING:** When testing voltage that exceeds 30V AC voltage RMS or 42V AC peak, or 60V DC, be particularly careful to avoid electric shock.

⚠ **WARNING:** Before measuring current, check the meter's fuse and turn off power to the circuit before connecting the meter to the circuit.

⚠ **WARNING:** Do not operate the meter with the case (or any part of case) removed or damaged.

⚠ **WARNING:** When the battery low voltage indicator illuminates, replace the battery immediately. A low battery will cause meter reading errors and may result in electric shock or personal injury.

⚠ **WARNING:** Do not operate the meter around explosive gas, vapor, or dust.

⚠ **WARNING:** When measuring, use the correct jack, and select the proper function and measuring range.

⚠ **WARNING:** When making connections, connect the common test lead before connecting the live test lead. When disconnecting, disconnect the live test lead before disconnecting the common test lead.

⚠ **WARNING:** Do not use under direct sunlight or high temperatures.

⚠ **WARNING:** Do not measure voltages exceeding the rated voltage marked on the meter.

⚠ **WARNING:** Disconnect power to the circuits and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.

⚠ **WARNING:** Before changing functions, disconnect the test leads from the circuit under test.

⚠ **WARNING:** For all DC functions, including manual or auto ranging, avoid the risk of shock due to a possible inaccurate reading by verifying the presence of any AC voltages. Firstly, use the AC function and then select DC voltage range equal to or greater than the AC range.

⚠ **CAUTION:** When maintaining the meter, use replacement parts specified by the manufacturer.

Safety Information (continued)

CAUTION: To avoid damage to the meter, do not exceed the maximum limits of the input values shown in the specification tables.

CAUTION: When the range of the value to be measured is unknown, check that the range initially set on the meter is the highest possible setting or, wherever possible, choose the auto-ranging mode.

CAUTION: Pay attention to the battery polarity when changing the battery.

CAUTION: When maintaining the meter, use replacement parts specified by the manufacturer.

CAUTION: When repairing televisions or carrying out measurements on power-switching circuits, remember that high-amplitude voltage pulse at the test points can damage the meter. Use of a TV filter will attenuate any such pulse.

NOTE: Keep your fingers behind the protection guards while measuring.

FCC COMPLIANCE STATEMENT

WARNING: This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The Home Depot, Inc.
2455 Paces Ferry Road, Atlanta, GA 30339
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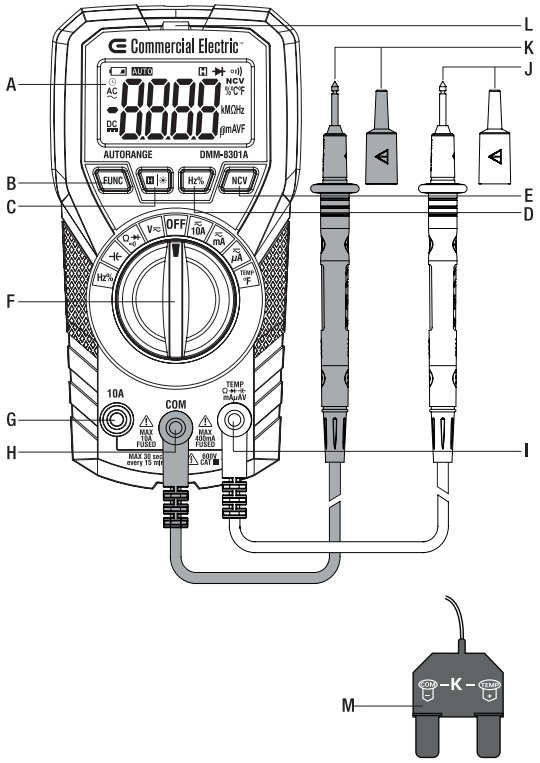
Warranty

WARRANTY: 12 months
For one year from the date of purchase, this product is warranted against any defects in material or workmanship. This warranty is void if this product is ever used while providing commercial services or if rented to another person.

Contact the Customer Service Team at 1-877-527-0313 or visit www.homedepot.com.

Pre-Operation

PRODUCT DESCRIPTION



Pre-Operation (continued)

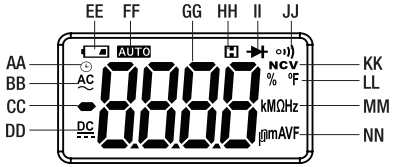
Part	Name	Description
A	LCD display	Displays the measured readings.
B	FUNC (Function) selection button	Press ''FUNC'' button to switch among functions or between AC/DC current and voltage.
C	H (Data hold) & ☀ (Backlight / Flashlight) button	Press to hold the current reading on the display. Press again to release the hold. Press for 2 seconds to turn on the backlight and flashlight. Press for 2 seconds again to turn off the backlight and flashlight.
D	**Hz%** (Frequency/ Duty cycle) button	In AC voltage/current modes, press this button to show the frequency measurement. Press again to switch to duty cycle. Press this button a third time to return to normal display. In Hz/duty cycle mode, press this button to show the duty cycle. Press again to switch to the frequency measurement.
E	NCV button	Press NCV button in any rotary function mode to enter NCV detection mode. Press again or rotate the rotary switch to exit NCV detection mode.
F	Rotary switch	Rotate to select a measurement mode.
G	10A jack	Connect to the red test lead to measure 10A current.
H	COM jack	Connect to the black test lead.
I	Positive input jack	Connect to the red test lead to measure voltage, mA/ µA current, resistance, diode, capacitance, temperature, frequency/duty cycle and continuity.
J	Red test lead with removable cap	Connect to positive input jack or 10A positive input jack.
K	Black test lead with removable cap	Connect to COM jack.
L	Non-contact AC voltage indicator	Alerts you the live voltages to ensure safe operation of this meter.
M	K-type thermocouple	Connect to COM jack and positive input jack for temperature measurement.

AUTOMATIC POWER OFF FUNCTION

If the meter remains idle for 15 minutes, the meter automatically enters a sleep state. Press any button or rotate the rotary switch to any working position to enter the working mode. To disable the auto power off function, rotate the rotary switch to OFF position, hold the FUNC button, and rotate the rotary switch to any working position. The beeper will sound and the auto power off icon "⏲" will disappear, indicating that the auto power off function is successfully turned off.

Pre-Operation (continued)

LCD DISPLAY DEFINITIONS



Part	Symbol	Description
AA		Active auto power off indicator
BB	AC	Alternating current/voltage indicator
CC		Numerical value polarity indicator (negative sign)
DD	DC	Direct current/voltage indicator
EE		Low battery indicator
FF	AUTO	Automatic measuring range indicator
GG	8888	Measurement display value
HH		Data hold indicator
II		Diode measurement function indicator
JJ		Continuity measurement indicator
KK	NCV	Active NCV indicator
LL	%	Duty cycle
LL	°F	Degree Fahrenheit
MM	k	Kilo (value x 10^3)
MM	M	Mega (value x 10^6)
MM	Ω	Ohms (Resistance)
MM	Hz	Hertz (Frequency)
NN	μ	Micro (value x 10^{-6})
NN	n	Nano (value x 10^{-9})
NN	m	Mili (value x 10^{-3})
NN	A	Amps (Current)
NN	V	Volts (Voltage)
NN	F	Farads

Pre-Operation (continued)

PRODUCT SPECIFICATIONS

Component	Specification
LCD display	4000 counts
Fuse protection	F: 10A/ 600V, 6 X 32 mm (Rated breaking capacity: 10kA) F: 400mA/ 600V, 6 X 32 mm (Rated breaking capacity: 10kA)
Battery	2 X AAA 1.5V batteries
Accuracy	Accuracy is specified for a period of one year after calibration and at 18°C to 28°C (64°F to 82°F) with relative humidity up to 80%. Accuracy specifications take the form of: ±(% of reading + number of least significant digits).
AC response	True RMS
Low battery indication	on the display
Over-range indication	LCD displays "OL"
Polarity indication	"" displayed for negative polarity.
Operating altitude	< 6560 ft. (2000 m)
Operating environment	32°F to 104°F (0°C to 40°C), < 70% relative humidity, indoor use only.
Storage environment	14°F to 122°F (-10°C to 50°C), < 80% relative humidity, battery removed.
Pollute degree	2
Safety rating	CAT III 600V, Class 2, Double insulation.
Size	6.08 X 3.15 X 1.98 in (154.3 X 79.9 X 50.3 mm)
Weight	Approx. 12.13 oz (343.7 g), battery included.

DC VOLTAGE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400.0mV	0.1mV	±(0.5% of rdg + 5 digits)
4.000V	0.001V	
40.00V	0.01V	
400.0V	0.1 V	
600V	1V	±(0.8% of rdg + 3 digits)

- ☐ Input Impedance: 10MΩ
- ☐ Frequency: 50 to 60Hz
- ☐ Maximum Input Voltage: 600V DC

Pre-Operation (continued)

AC VOLTAGE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
4.000V	0.001V	±(0.8% of rdg + 5 digits)
40.00V	0.01V	
400.0V	0.1V	
600V	1V	±(1.0% of rdg + 5 digits)

☐ Input Impedance: 10MΩ

☐ Frequency Range: 40 - 400Hz (sine), 50/ 60Hz (all wave). All AC voltage ranges are specified from 5% of range to 100% of range.

☐ Maximum Input Voltage: 600V AC RMS

DC CURRENT SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400.0µA	0.1µA	±(1.0% of rdg + 5 digits)
4000µA	1µA	
40.00mA	0.01mA	
400.0mA	0.1mA	
4.000A	0.001A	±(2.0% of rdg + 10 digits)
10.00A	0.01A	

☐ Overload Protection: F: 10A/ 600V, F: 400mA/ 600V.

☐ Maximum Input: µA/mA setting: 400mA DC
10A setting: 10A DC (30 sec. max with reduced accuracy)

☐ When measured current is greater than 2A, the continuous measurement time cannot be more than 2 minutes. Disconnect the current and wait 10 minutes before you take another measurement.

Pre-Operation (continued)

AC CURRENT SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400.0µA	0.1µA	±(1.2% of rdg + 5 digits)
4000µA	1µA	
40.00mA	0.01mA	
400.0mA	0.1mA	
4.000A	0.001A	±(2.5% of rdg + 10 digits)
10.00A	0.01A	

☐ Overload Protection: F: 10A / 600V, F: 400mA / 600V

☐ Frequency Range: 40 - 400Hz (sine), 50/ 60Hz (all wave). All AC current ranges are specified from 5% of range to 100% of range.

☐ Maximum Input: µA/mA setting: 400mA AC RMS
10A setting: 10A AC RMS (30 sec max with reduced accuracy)

☐ For measurements greater than 2A, the continuous measurement time cannot be more than 2 minutes. Disconnect the current and wait 10 minutes before making another measurement.

RESISTANCE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400.0Ω	0.1Ω	±(0.8% of rdg + 5 digits)
4.000kΩ	0.001kΩ	
40.00kΩ	0.01kΩ	
400.0kΩ	0.1kΩ	
4.000MΩ	0.001MΩ	
40.00MΩ	0.01MΩ	

☐ Overload Protection: 250V AC RMS or 250V DC

AUDIBLE CONTINUITY SPECIFICATIONS

Measuring Range	Function
	When the on-resistance is smaller than (50±30)Ω, the built-in buzzer sounds. The open circuit voltage is approximately 1V.

☐ Overload Protection: 250V AC RMS or 250V DC

DIODE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
3.2V	0.001V	Display forward voltage drop of diode

☐ Overload Protection: 250V AC RMS or 250V DC

CAPACITANCE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
50.00nF	0.01nF	±(5.0% of rdg + 20 digits)
500.0nF	0.1nF	±(3.0% of rdg + 5 digits)
5.000µF	0.001µF	
50.00µF	0.01µF	
500.0µF	0.1µF	
5.000mF	0.001mF	

☐ Overload Protection: 250V AC RMS or 250V DC

FREQUENCY SPECIFICATIONS - THROUGH GRADE HZ/DUTY CYCLE

Measuring Range	Resolution	Accuracy
9.999Hz	0.001Hz	±(1.0% of rdg + 5 digits)
99.99Hz	0.01Hz	
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
99.99kHz	0.01kHz	
999.9kHz	0.1kHz	
9.999MHz	0.001MHz	
10.00MHz	0.01MHz	

☐ Overload Protection: 250V AC RMS or 250V DC

☐ Input Voltage Range: ≥3V AC RMS (Input voltage increases when the frequency to be measured increases)

FREQUENCY SPECIFICATIONS - THROUGH GRADE V OR A

Measuring Range	Resolution	Accuracy
99.99Hz	0.01Hz	±(1.5% of rdg + 5 digits)
999.9Hz	0.1Hz	
9.999kHz	0.001kHz	
10.00kHz	0.01kHz	

☐ Measuring Scope: 40Hz - 10kHz

☐ ACA Range (≥6% Range), 4000µA/ 400.0mA Range (≥6% Range), 400.0µA/ 40.00mA/ 4.000A/ 10.00A Range (≥60% Range).

☐ Input Impedance: 10MΩ

☐ Maximum Input Voltage: 600V AC RMS.

DUTY CYCLE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
0.1% - 99.9%	0.1%	±3.0%

THROUGH GRADE HZ/DUTY:

☐ Frequency Response: 1 - 100.0kHz

☐ Input Voltage Range: ≥ 3V AC RMS (Input voltage increases when the frequency to be measured increases)

☐ Maximum Input Voltage: 250V AC RMS

THROUGH GRADE V OR A:

☐ Frequency Response: 40 - 10kHz

☐ ACA Range (≥6% Range), 4000µA/ 400.0mA Range (≥6% Range), 400.0µA/ 40.00mA/ 4.000A/ 10.00A Range (≥60% Range).

TEMPERATURE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
-4°F - 1832°F	1°F	±(3.0% of rdg + 9 digits)

☐ Overload Protection: 250V DC or 250 V AC RMS

Pre-Operation (continued)

PREPARATION - BEFORE MEASUREMENT

CAUTION: If the current under measurement is higher than the selected value for a long period, overheating may take place compromising the safety and operation of the inner circuits.

CAUTION: Do not measure currents on high-voltage conductors (>600V) in order to avoid the risk of discharge and/or incorrect readings.

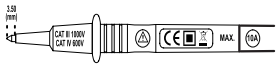
CAUTION: Check the batteries before use. Replace the batteries if the low battery symbol appears on the LCD display.

CAUTION: Before you take a measurement, turn the rotary switch to the desired range.

CAUTION: Warm up the meter for at least 30 seconds.

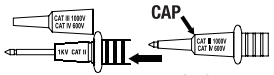
1 Testing in CAT III / CAT IV measurement locations.

Ensure the test leads shield is pressed firmly in place. Failure to use the CAT III / CAT IV shield increase arc-flash risk.



2 Testing in CAT II measurement locations

CAT III/ CAT IV shields may be removed for CAT II locations. This will allow testing on recessed conductors such as standard wall outlets. Take care not to lose the shields.



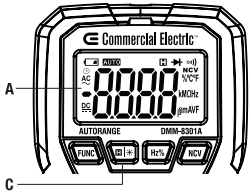
use for CAT II test use for CAT III test

Operation

1 Using Data Hold and Backlight/ Flashlight

Data Hold mode causes the meter to stop updating the data on the LCD display (A). To enter and exit Data Hold mode:

- ☐ Press Data Hold button (C) to freeze the current measurement on the LCD display (A) and the "H" icon appears.
- ☐ Press again to release the display and return to current measurement and the "H" icon disappears.

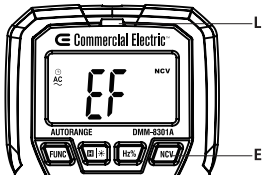


Backlight and Flashlight function selection:

- ☐ Press the backlight and flashlight button (C) for 2 seconds to turn on the backlight and flashlight at the same time.
- ☐ Press the backlight and flashlight button (C) for 2 seconds again to turn off the backlight and flashlight at the same time.

2 Non-contact AC Voltage Detection

- ☐ Hold down the NCV button (E) and move the top of the meter towards the conductor under testing.
- ☐ When the live voltage is greater than 110V (RMS), the NCV indicator (L) flashes and the buzzer sounds.



NOTE: Even without LED indication, voltage may still exist. Do not rely on non-contact voltage detection to determine the presence of voltage wire. Detection operation may be subject to socket design, insulation thickness, and other factors.

NOTE: Keep the meter away from electrical noise sources during the tests, such as fluorescent lights, dimmable lights, motors and so forth. These sources can trigger the non-contact AC voltage detection function and invalidate the test.

3 Completing an AC or DC Voltage Measurement

CAUTION: To avoid electrical shock and/or damage to the meter, do not attempt to take any voltage measurement that might exceed 600V DC or AC rms.

☐ The meter defaults to AC measurement. Press the FUNC button (B) to select AC or DC modes. The AC or DC icon on the LCD display (A) indicates which mode is selected.

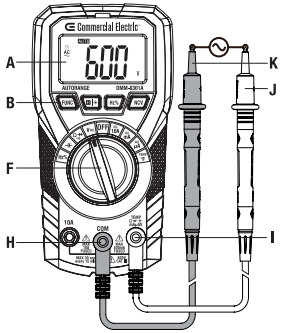
☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to the V AC/DC (V≂) setting.

☐ Apply test leads to the circuit to be tested to measure voltage. The meter will auto-range to display the measurement in the most appropriate range.

☐ Read the data on the LCD display (A).

NOTE: If "⬬" appears on the LCD display, the test leads are being applied to the circuit in reverse polarity. Swap the position of the leads to correct one.

NOTE: When in a voltage setting and the test leads are open, readings of order mV may appear on the display. This is noise and is normal. By touching the test leads together to close the circuit, the meter will measure zero volt.



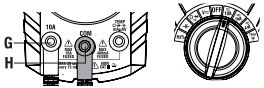
4 Performing an AC or DC Current Measurement

☐ The meter defaults to AC measurement. Press the FUNC button (B) to select AC or DC modes. The AC or DC icon on the LCD display (A)indicates which mode is selected.

1. Insert test leads into the appropriate jacks and rotate rotary switch (F) to the appropriate setting as follows:

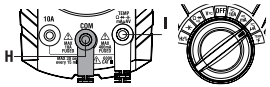
AC/DC currents > 400mA and < 10A:

☐ Insert the RED test lead (J) into 10A jack (G) and BLACK test lead (K) in COM jack (H) , and rotate rotary switch (F) to the 10A setting.



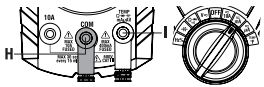
µA AC/DC currents < 400µA:

☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) into the µA setting.



mA AC/DC currents < 400mA:

☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to the mA setting.



CAUTION: To avoid damage to the meter, check the meter's fuse before proceeding. Use the proper terminals, function, and range for your measurement. Never place the test leads in parallel with a circuit or component when the leads are plugged into the current terminals.

WARNING: Do not attempt to measure more than 10A.

WARNING: To avoid damage to the meter or injury if the fuse blows, do not take current measurements if the voltage exceeds 600V.

WARNING: When measuring current greater than 5A, a measurement time of 30 seconds followed by 15 minutes of recovery time is recommended.

2. To measure current: Remove power from circuit, open circuit at measurement point, connect meter in-series in the circuit using the test leads, and apply power to circuit.

3. Measure the current. The meter will auto-range to display the measurement in the most appropriate range.

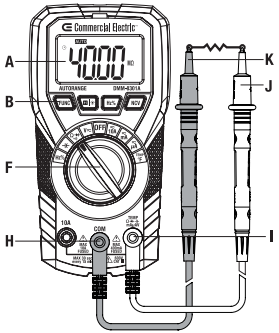
4. Read the data on the LCD display (A).

5 Completing a Resistance Measurement

WARNING: Do not attempt to measure resistance on a live circuit.

CAUTION: To avoid electrical shock and/or damage to the meter, disconnect the circuit power and discharge all high-voltage capacitors before you measure resistance.

- ☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to resistance (Ω)setting.
- ☐ The meter defaults to resistance measurement in this mode. Ensure that the display reads "0.L MΩ" with test leads open. If not, press the FUNC button (B) to select resistance mode. The resistance icon Ω on the LCD display (A) indicates which mode is selected.
- ☐ Remove power from circuit.
- ☐ Measure resistance by connecting test leads to circuit. The meter will auto-range to display the measurement in the most appropriate range.
- ☐ Read the data on the LCD display (A).



Some tips for measuring resistance:

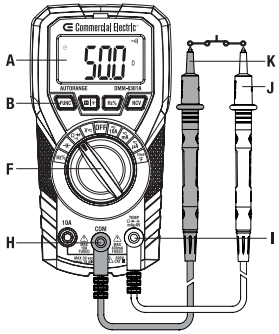
- ☐ The measured value of a resistor in a circuit is often different from the resistor's rated value. This is because the meter's test current flows through all possible paths between the test lead tips.
- ☐ In order to ensure the best accuracy for a low resistance measurement, shorten the test leads before measurement and remember the test probe resistance. This is necessary in order to subtract for the resistance of the test leads.
- ☐ When there is no input (for example, an open circuit), the display shows "OL". This means that the measured value is out of range.

NOTE: When in a Resistance mode and the test leads are open (not connected across a resistor or objects), or when a failed resistor is under test, the display will indicate OL. This is normal.

6 Performing a Continuity Check

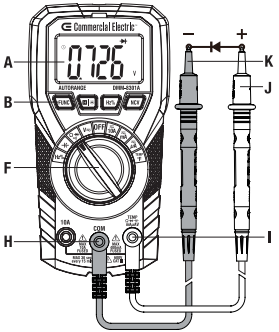
WARNING: Do not attempt to measure continuity with live circuit.

- ☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to continuity (⋯))) setting.
- ☐ The meter defaults to Resitance measurement in this mode. To enter Continuity testing mode, press the FUNC button (B) to select continuity mode. The continuity icon ⋯)) will appear on the LCD display (A).
- ☐ Test for continuity by connecting conductor or circuit with test leads. If resistance is measured less than 50Ω, an audible signal will sound and display will show a resistance value. If circuit is open, display will show “OL”.



7 Performing a Diode Test

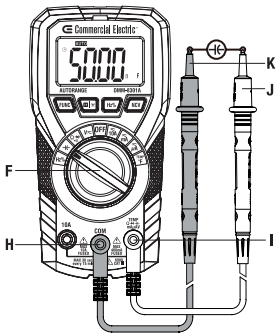
- ☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to diode (⇥) setting.
- ☐ The meter defaults to resitance measurement in this mode. To enter diode testing mode, press the FUNC button (B) to select diode mode. The diode icon ⇥ will appear on the display (A).
- ☐ Connect the BLACK test lead (G) and the RED test lead (H) to the negative pole and positive pole of the measured diode.
- ☐ The LCD display (A) shows the forward bias value of the measured diode. If the poles of the test leads are connected inversely, the meter displays “OL”.



8 Performing a Capacitance Measurement

CAUTION: To avoid electrical shock and/or damage to the meter, disconnect the circuit power and discharge all high-voltage capacitors before measuring capacitance.

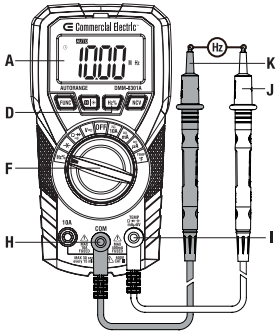
- ☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate rotary switch (F) to capacitance (⊣⊢) setting.
- ☐ Remove power from circuit.
- ☐ Measure capacitance by connecting test leads (J and K) across the capacitor. The meter will auto-range display the measurement in the most appropriate range.
- ☐ Read the data on the LCD display (A).



9 Performing a Frequency/ Duty Cycle Measurement

CAUTION: To prevent electric shock or meter damage, do not input the voltage higher than 60V DC or 30V AC in the frequency/duty ratio measurement position.

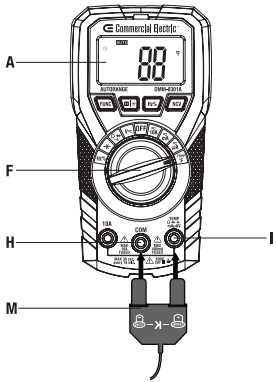
- ☐ Insert the RED test lead (J) into positive input jack (I) and BLACK test lead (K) in COM jack (H), and rotate function rotary switch (F) to frequency / duty cycle (Hz%) setting.
- ☐ The meter defaults to Frequency testing in this mode. To enter Duty-Cycle testing mode, press the Hz% button (D) once. Ensure that the appropriate icon (either Hz or %) appears on the display (A).
- ☐ Apply the test leads (J and K) across the circuit to be measured.



10 Performing a Temperature Measurement

CAUTION: To prevent electric shock or meter damage, do not input the voltage higher than 30V in the temperature measurement position.

- ☐ Insert K-type thermocouple (M) into positive input jack (I) and COM jack (H), and rotate rotary switch (F) to temperature (°C/°F) setting.
- ☐ Place the K-type thermocouple (M) to the object or environment to be measured.
- ☐ Read the data on the LCD display (A).



Maintenance

WARNING: Before you open the meter, always disconnect it from all sources of electrical current and make sure you are not charged with static electricity, which may destroy the internal components.

WARNING: To avoid injury or damage to the meter, do not wet the inner parts of the meter. Before opening the case or battery cover, remove the connecting cable between the test probe and input signal.

WARNING: Any adjustment, maintenance, or repair work carried out on the meter while it is live should be carried out by a qualified electrician.

WARNING: When you open the meter, remember that some internal capacitors can retain a dangerous voltage level even after the instrument is switched off.

WARNING: To prevent electrical hazard or shock, turn off the meter and disconnect the test leads and any input signals before removing the battery cover.

CAUTION: If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.

REPLACING THE BATTERY AND FUSE

WARNING: Change the battery when the battery symbol appears on the LCD display in order to avoid incorrect data, which could lead to electric shock or personal injury.

WARNING: Do not use this meter until the rear cover is placed back on the meter and the screws are tightened.

WARNING: Only use the specified batteries and fuses for replacement. See the Product Specifications section of this manual for more information.

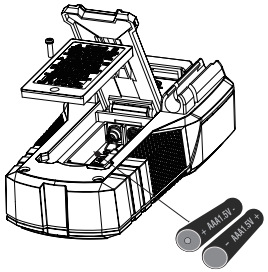
WARNING: Do not mix old and new batteries. Do not mix alkaline, standard (carbon-zinc), or rechargeable (ni-cad, ni-mh, etc.) batteries.

BATTERY REPLACEMENT

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

WARNING: To avoid risk of electric shock, do not operate meter while back housing is removed.

- ☐ When indicator is displayed on the LCD display (A), batteries must be replaced.
- ☐ Turn the meter off by rotating the rotary switch (F) to the OFF position.
- ☐ Disconnect the test leads and any connectors from the terminals on the meter.
- ☐ Remove one screw from battery door.
- ☐ Replace two fresh 1.5V AAA batteries in the battery slot (note proper polarity).
- ☐ Assemble battery cover and fasten securely with screw.



FUSE REPLACEMENT

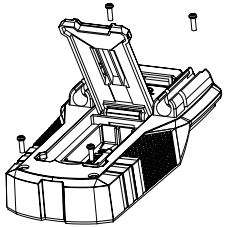
WARNING: To avoid risk of electric shock, disconnect leads from any voltage source before accessing fuses.

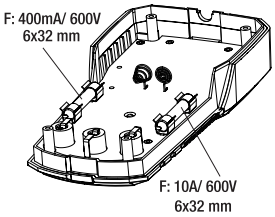
WARNING: To avoid risk of electric shock, do not operate meter while back housing is removed.

- ☐ Fuse may blow if more than 400mA is applied into positive input jack (I) or more than 10A is applied to the 10A jack (G), or voltage has applied to function with current setting. To access fuses:
- ☐ Turn the meter off by rotating the rotary switch (F) to the OFF position.
- ☐ Disconnect the test leads and any connectors from the terminals on the meter.
- ☐ Remove four screws from the back of meter and one screw in battery slot.
- ☐ Remove batteries. Gently remove the back housing. Do not pull on battery clip.
- ☐ Replace blown fuse(s) with:

  VΩ (mA) socket (I): 400mA/ 600V, 6x32 mm

  10A socket (G): 10A/ 600V, 6x32 mm
- ☐ Reassemble the meter, tighten the screws securely on the battery slot and back housing, and install batteries.





Maintenance (continued)

TEST LEAD REPLACEMENT

If the insulation on the leads is damaged, replace the test leads. Replacement test leads must meet the manufacturer's specifications (EN 61010-031 standard, 600V CAT III 10A, or better).

Care and Cleaning

- ☐ Keep the meter dry. If it gets wet, wipe it off.
- ☐ Keep the meter clean. Wipe off dirt with a soft cloth dampened with water. Do not use chemicals, cleaning solvents, or detergents.
- ☐ Use and store the meter in normal temperatures. Temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.
- ☐ Handle the meter gently and carefully. Dropping it can damage the electronic parts or the case.
- ☐ Use only fresh batteries of the recommended size and type. Batteries are to be inserted with the correct polarity. Remove old or weak batteries so they do not leak and damage the unit.
- ☐ Do not mix old and new batteries. Do not mix different types of batteries such as alkaline, carbon-zinc, or rechargeable batteries. Non-rechargeable batteries are not to be recharged.
- ☐ If the meter is to be stored for a long period of time, the batteries should be removed to prevent damage to the unit. Periodically wipe the case with a damp cloth and mild detergent.
- ☐ Do not use abrasives or solvents.
- ☐ Dirt or moisture in the terminals can affect readings.