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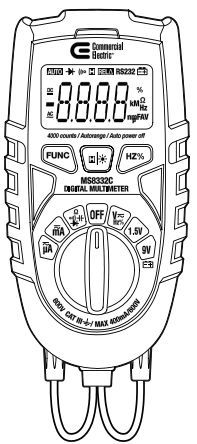
Commercial Electric™

Item # 730 696
Model # MS8332C

USE AND CARE GUIDE

DIGITAL MULTIMETER



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THANK YOU

We appreciate the trust and confidence you have placed in Commercial Electric through the purchase of this digital multimeter. 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!

Table of Contents

Safety Information

WARNING: BE EXTREMELY CAREFUL IN THE USE OF THIS METER. Improper use of this device can result in electric shock or destroy the meter. Follow all safeguards suggested in this manual and the normal safety precautions used in working with electrical circuits. Do not service this device if you are not qualified to do so. To ensure safe operation, and in order to exploit to the full the functionality of the meter, please follow the directions in this section carefully.

This digital multimeter is designed and manufactured according to safety requirements of EN 61010-1:2010, EN 61010-2-030, EN 61010-2-033, EN 61010-031 on electronic measuring instrument and hand-helddigital multipurpose meter. This meter conforms to UL STD.61010-1,61010-2-030,61010-2-033, Certified to CSA STD.C22.2 NO.61010-1, 61010-2-030, IEC STD61010-2-033. The product meets with the requirements of 600V CAT III and pollution degree 2.

The meter can be used for measuring DC voltage, AC voltage, resistance, diode, buzzer, continuity test, DC current, and AC current. The unique non-contact AC voltage detection feature of this multimeter and the full scale AC 220V protection design allows for safe operation.

This series of meters can be widely used for schools, labs, research institutes, enterprises, and factories. 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 Information (continued)

SYMBOLS

Symbol	Definition
	Indicates important safety information
	Equipment protected throughout by double insulation or reinforced insulation.
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.
	Conforms to UL STD. 61010-1, 61010-2-030 and 61010-031
	Fuse
	AC (Alternating Current)
	DC (Direct Current)
	AC or DC (alternating current or direct current)
	Diode
	Continuity buzzer
AUTO	Auto range
	There is not enough battery power for sufficient operation

PRELIMINARY PRECAUTIONS

WARNING: When using the meter, the user must observe all normal safety rules concerning the protection against the dangers of electrical current and protection of the meter against misuse.

WARNING: When the meter is delivered, check that it has not been damaged in transit.

Safety Information (continued)

WARNING: Full compliance with safety standards can be guaranteed only with test leads supplied. If necessary, they must be replaced with the same model or same electric ratings.

WARNING: If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment/probe assembly may be impaired.

WARNING: When poor conditions under harsh preservation or shipping conditions occur, inspect and confirm that there is no damage to this meter immediately.

WARNING: Test lead or test clip must be in good condition. Before using verify that the insulation on the test lead or test clip is not damaged and/or the lead wire is not exposed.

USAGE PRECAUTIONS

WARNING: Before using, you must select the right function and range.

WARNING: Never exceed the protection limit values indicated in specifications for each range of measurement.

WARNING: When the meter is linked to a measurement circuit, do not touch the probe tip of test lead or test clip.

WARNING: Do not apply high voltage (above 100V) at the input end when measuring resistance and diode.

WARNING: Do not measure voltage if the voltage on the terminals exceeds 600V .

WARNING: Always be careful when working with voltages above 46V DC or 36V AC rms.

WARNING: Never connect the meter leads across a voltage source while the transform switch is in the resistance, diode or continuity mode. Doing so can damage the meter.

WARNING: Never perform resistance, diode and continuity measurements on live circuits.

WARNING: Before rotating the transform switch to change the function, disconnect the tip of the meter and the probe of the test lead or test clip from the circuit under test.

WARNING: Before measuring current, turn off the power of the measured equipment and circuit. Electrify to measure after connecting the test leads.

WARNING: If any defects or abnormalities are observed, immediately stop using this meter.

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

WARNING: Please do not store or use the meter in areas exposed to direct sunlight, high temperature, humidity or condensation.

Safety Information (continued)

WARNING: Using this appliance in an environment with a strong radiated radio-frequency electromagnetic field (approx. 3V/m), may influence its measuring accuracy. The measuring result could be strongly deviating from the actual value.

MAINTENANCE PRECAUTIONS

WARNING: Please do not attempt to adjust or repair the meter by removing the rear case while voltage is being applied. Only a technician who fully understands the danger involved should carry out such actions.

WARNING: Before opening the battery cover or case of the meter, always disconnect the tip of the meter and the probe of the test lead or test clip from all tested circuits.

WARNING: To avoid incorrect readings that could cause electric shock, you must change the battery when the battery symbol appears on the LCD display.

WARNING: Do not use abrasives or solvents on the meter. Use a damp cloth and mild detergent only.

WARNING: Always set the transform switch to the OFF position when themeter is not in use.

WARNING: If the meter is to be stored for a long period of time, remove the batteries to prevent damage to the unit.

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 ENERGYAND, 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 THEINTERFERENCE 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.

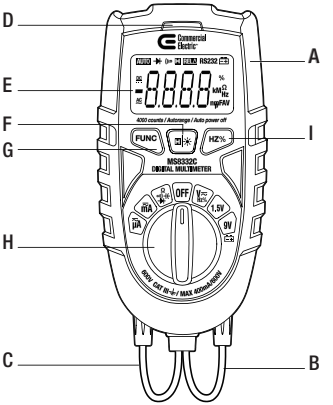
Warranty

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

PACKAGE CONTENTS



Part	Name	Quantity
A	Multimeter	1
B	Black test lead	1
C	Red test lead	1

PRODUCT DESCRIPTION

Part	Name	Description
D	Non-contact AC Voltage Indicator Light	Alerts you to live voltages to ensure safe operation of this meter.
E	LCD Display	Displays the measurement result.
F	Hold/Backlight Key	Press the key to hold the data , press the key 2 seconds to open the backlight .

Pre-Operation (continued)

G	Function Selection Key 	The voltage current range is used for switching AC/DC mode, the resistance range is used for switching ⊣◀ ◦)) Ω CAP mode.
H	Select Switch	Used to select functions and desired ranges.
I	Hz% Switching Key 	Switching key between frequency and duty cycle, it is used for switching Hz and % at voltage range and current range.

PRODUCT SPECIFICATIONS

Component	Specification
Automatic Measuring Range	DMM, full range is 3999 counting
Overload Protection	Full range protection
Altitude	Up to 2000 meters
Battery	2x1.5V AAA batteries
Auto power-off time	Approx. 30 minutes
Data	Hold function
Safety Class	EN61010-1, CAT III 600V
Over range indication	LCD displays "OL"
Ambient Temperature	23±5°C Relative Humidity: <75%
Operating environment	0°C - 40°C (32°F - 104°F), <80% relative humidity and 10°C non-condensing
Storage temperature	-10°C - 50°C (14°F - 122°F), <70% relative humidity, battery removed
Size	116 x 61 x 38.5 mm
Weight	Approx. 190 g

DC VOLTAGE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400mV	0.1mV	±(0.5% of rdg + 3 digits)
4V	1mV	
40V	10mV	
400V	100mV	
600V	1V	±(0.8% of rdg + 5 digits)

Additional specifications:

Pre-Operation (continued)

☐ Input Impedance: 10MΩ

☐ Maximum Input Voltage: 600V DC

AC VOLTAGE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
4V	1mV	±(0.8% of rdg + 3 digits)
40V	10mV	
400V	100mV	
600V	1V	±(1.0% of rdg + 5 digits)

Additional specifications:

☐ Input Impedance: 10MΩ

☐ Frequency Range: 40 - 400Hz

☐ Response: Average response (calibrated in rms of sine wave)

☐ Maximum Input Voltage: 600V rms AC

DC CURRENT SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400uA	0.1uA	±(1.8% of rdg + 5 digits)
4000uA	1uA	
40mA	10uA	
400mA	100uA	

Additional Specifications:

☐ Max. Current: 400mA

☐ Overload Protection: mA measuring range: FF400mA/600V fuse

AC CURRENT SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400uA	0.1uA	±(2.0% of rdg + 8 digits)
4000uA	1uA	
40mA	10uA	
400mA	100uA	

Pre-Operation (continued)

Additional Specifications:

☐ Max. Current: 400mA

☐ Overload Protection: mA measuring range: FF400mA/600V fuse

☐ Frequency Range: 40Hz – 400Hz

☐ Response: Average, calibrated in rms of sine wave

RESISTANCE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
400 Ω	0.1 Ω	±(1.0% of rdg + 3 digits)
4k Ω	1 Ω	
40k Ω	10 Ω	
400k Ω	100 Ω	
4M Ω	1K Ω	
40M Ω	10K Ω	±(1.2% of rdg + 15 digits)

Additional Specifications:

☐ Maximum Open Circuit Voltage: 0.25V

☐ Overload Protection: 250V DC or rms AC

DIODE AND CONTINUITY SPECIFICATIONS

Measuring Range	Function
	Display shows approximate forward voltage of diode.
	Built-in buzzer sounds if resistance is lower than 50±20Ω.

Additional Specifications:

☐ Open Circuit Voltage: Diode is approximately 1.5V, buzzer is approximately 0.5V

☐ Overload Protection: 250V DC or rms AC

Pre-Operation (continued)

CAPACITANCE SPECIFICATIONS

Measuring Range	Resolution	Accuracy
4nF	0.001nF	±(5.0% of rdg + 0.6 digits)
40nF	0.01nF	±(5.0% of rdg + 30 digits)
400nF	0.1nF	±(5.0% of rdg + 15 digits)
4uF	1nF	±(5.0% of rdg + 25 digits)
40uF	10nF	
100uF	100nF	

Additional Specifications

☐ Overload Protection: 250V DC or rms AC

FREQUENCY SPECIFICATIONS

Measuring Range	Accuracy
1Hz – 5MHz	±(1.5% of rdg + 15 digits)

DUTY CYCLE

Measuring Range	Accuracy
0.5-99.9%	±(2.0% of rdg + 5 digits)

BATTERY TEST

Measuring Range	Accuracy
1.5V	±(2.0% of rdg + 20 digits)
9V	

Operation

BEFORE YOU TAKE A MEASUREMENT

Operation (continued)

☐ Set the transform switch to the right range. At the manual range, when the value scale to be measured is unknown beforehand, select the highest range.

☐ Before measuring, first connect to the public (COM) testing line, then connect the probe tip of the meter to the circuit under test.

☐ If the battery voltage is less than 2.4V, the display will show a battery icon. Change the battery in the meter immediately.

1 Measuring AC and DC voltage

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.

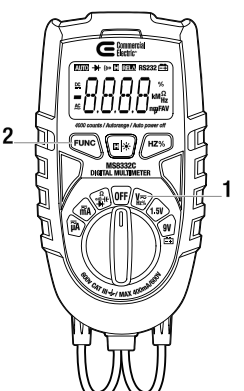
CAUTION: Do not measure AC/DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

The voltage ranges of the meter are:
DC Voltage: 400.0mV, 4.000V, 40.00V, 400.0V, 600V;
AC Voltage: 4.000V, 40.00V, 400.0V, 600V.

☐ Turn the rotary switch to the V≂Hz% position (1).

☐ Press the FUNC key (2) and select AC or DC for your measurement. Apply the two ends of the test leads to measure the voltage value of the circuit under test.

☐ The polarity of the tested terminal appears in the LCD display. When measuring DC voltage, the display shows the voltage polarity connected with the red test lead at the same time.

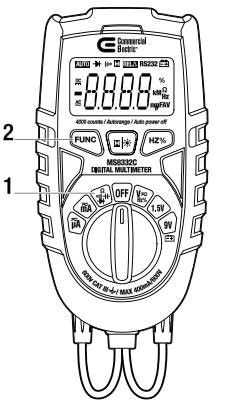


NOTE: At DC 400mV and AC 4V ranges and under non-input, the meter displays several readings because of outside interference, but its normal usage and measuring accuracy will not be affected.

Operation (continued)

2 Measuring resistance

CAUTION: In order to avoid the meter or measured equipment from being damaged, cut off all power supply of measured circuits and discharge all high voltage capacitors before measuring resistance.



The resistance ranges of the meter are 400.0 Ω, 4.000k Ω, 40.00 k Ω, 400.0 k Ω, 4.000M Ω, and 40.00 M Ω.

☐ Turn the rotary switch to the Ω •))) → ⊣ position (1).

☐ Press the FUNC key (2) and select the Ω measuring range.

☐ Apply the two ends of the test leads to measure the resistance value of the circuit.

☐ The reading appears on the LCD display.

NOTE: The no-line measured resistance value is different from the rated resistance value because other elements on circuit are connected with the measured resistance, which is equivalent to parallel connection of two or more resistances.

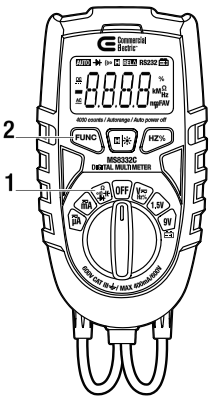
NOTE: When measuring low resistance, for the measurement accuracy, make the two test leads short circuit, read the displayed resistance value, and subtract this displayed value from the correct measured resistance value.

NOTE: When measuring at a high resistance range, the reading can be confirmed after several seconds.

NOTE: Under open circuit, if the meter displays "OL", it will show that the measured value exceeds the range.

3 Measuring diode

CAUTION: To avoid the meter or measured equipment from being damaged, cut off all power supply of measured circuits and discharge all high voltage capacitors before measuring diode.



☐ Turn the rotary switch to the Ω ⊶)) position (1).

☐ Press the FUNC key (2) and select the → measuring range.

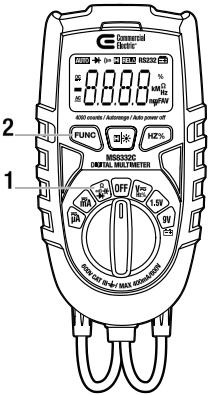
☐ Separately connect the black and read test leads to the negative pole and positive pole of the measured diode.

☐ The meter displays the forward bias value of the measured diode. If the poles of the test leads are connected inversely, the meter will display "OL".

For on-line measuring diode, the meter displays the forward voltage drop at forward measurement; the reverse measurement depends on the values of other elements connected in parallel at both ends of diode.

4 Measuring continuity

CAUTION: To avoid the meter or measured equipment from being damaged, cut off all power supply of measured circuits and discharge all high voltage capacitors before continuity measurement.



☐ Turn the rotary switch to the Ω ⊶)) position (1).

☐ Press the FUNC key (2) and select the ⊶)) measuring range.

☐ Separately connect the two ends of the test leads to the end ends of the measured part and circuit.

☐ The meter displays the approximate resistance value between measured points. Here if the resistance value between measured points is less than 50±20 Ω, the buzzer will make a sound.

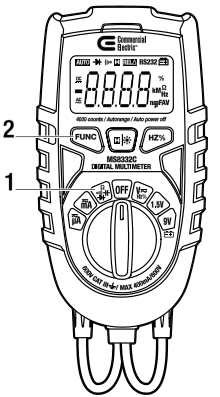
5 Measuring capacitance

CAUTION: To avoid the meter or measured equipment from being damaged, cut off all power supply of measured circuits and discharge all high voltage capacitors before on/off measurement.

The capacitance ranges of the meter are 4.000nF, 40.00nF, 400.0nF, 4.000uF, 40.00uF, 100.0uF.

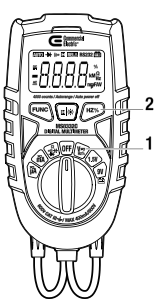
- ☐ Turn the rotary switch to the Ω ◦))) position (1).
- ☐ Press the FUNC key (2) and select the CAP measuring range.
- ☐ Apply the two ends of the test leads to measure the two pins of the capacitance under test and read the measured value on the LCD.

NOTE: The meter will take some time to stabilize the reading when the capacitance is high. A small capacitance with less than 10nF subtracts from the distribution capacitance of the meter and lead (namely displayed base number) when measuring.



6 Measuring frequency and duty cycle

- ☐ Turn the rotary switch to the V≂Hz% position (1).
- ☐ Press the Hz% key (2). For frequency, select the Hz range. For duty cycle, select the % range.
- ☐ Apply the two ends of the test leads to measure the frequency or duty cycle value of the circuit under test.
- ☐ Read the value that displays on the LCD.

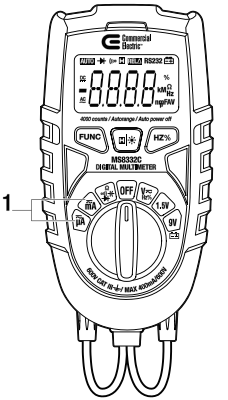


7 Measuring AC and DC current

WARNING: To avoid damage to the meter or injury if the fuse blows, never attempt an in-circuit current measurement where the open-circuit potential to earth (ground) is greater than 250V.

The DC current range is 400uA, 4.000mA, 40.00mA, and 400.0mA .The AC current range is 400uA, 4.000mA, 40.00mA, and 400.0mA.

- ☐ Cut off the power of the measured circuit. Discharge all high voltage capacitance on the measured circuit.
- ☐ Turn the rotary switch to the mA or uA position (1). When the measured current is less than 400uA, select the uA position. When the measured current is 4mA~400mA, select the mA position.
- ☐ Disconnect the circuit under test. Connect the black test lead to the end of dis connected circuit under test (with lower voltage). Connect the red test lead to the other end of the disconnected circuit under test (with higher voltage).
- ☐ Switch on the power of the circuit, and then read the reading displayed on the LCD. If the display only displays "OL", it indicates that the input exceeds the selected range. Move the rotary dial to a higher range.
- ☐ Cut off the power to the measured circuit. Discharge all capacitances, take off the test leads and recover the circuit.



NOTE: Connect the measuring current of the meter in series, not connected in parallel. This prevents damage to the meter or endangering personal safety.

When measuring DC current, if the test leads are reversely connected to the circuit , the display will change into negative, but not affect measuring accuracy.

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

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

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 a high temperature or high humidity environment.

BATTERY REPLACEMENT

WARNING: To prevent electrical hazard or shock, turn off the meter and disconnect the probe tip and test lead (or test clip) and any input signals before removing the battery cover.

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

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

☐ Turn the meter off by turning the rotary switch to the OFF position.

☐ Disconnect the probe tips and/or any connectors from the terminals on the meter.

☐ Use a screwdriver to unscrew and remove the battery cover located on the back of the meter.

☐ Remove the used batteries.

☐ Replace with new 1.5V AAA batteries.

☐ Reattach the battery cover and secure with the screws.

FUSE REPLACEMENT

☐ Turn the meter off by turning the rotary dial to the OFF position.

☐ Disconnect the probe tips and/or any connectors from the terminals on the meter.

☐ Use a screwdriver to unscrew and remove the battery cover and fuse cover located on the back of the meter.

☐ Remove the old fuse and replace with a FF400mA H600V fuse.

☐ Reattach the fuse cover and secure with the screws.

☐ Reattach the battery cover and secure with the screws.

CLEANING

Use a soft cloth to clean the surface of the meter. Do not use harsh abrasives or solvents to clean the meter.