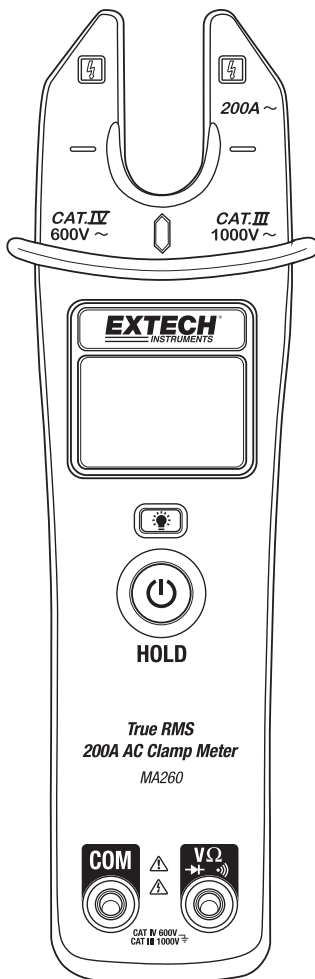


200A True RMS Open Jaw Clamp Meter with Auto Sensing Technology

Model MA260



Introduction

Thank you for selecting the Extech MA260 200A True RMS Open Jaw Clamp Meter. The MA260 incorporates Auto Sensing where the measurement type is automatically sensed and configured, no need to turn a dial to select the measurement type or range. For AC Voltage, the Auto-sense feature also evaluates input signals and adjusts the Input Impedance to eliminate effects of ghost voltages.

The MA260 measures AC current, AC/DC Voltage, Resistance, Continuity, and Diode and offers extra-large display digits, data hold, and a display backlight function. The non-contact Volt-Detection feature senses electrical sources safely.

This device is shipped fully tested and calibrated and, with proper use, will provide years of reliable service. Please visit our website (www.extech.com) to check for the latest version of this User Guide, Product Updates, Product Registration, and Customer Support.

Safety Information

To ensure the safe operation and service of the meter, follow these instructions closely. Failure to observe warnings can result in severe injury.



WARNINGS

WARNINGS identify hazardous conditions and actions that could cause BODILY HARM or DEATH.

- The time delay that results from the meter's automatic sensing circuit (1 to 2 seconds) may cause GFCI circuits to reset and breakers to trip.
- It is not recommended to use calibration equipment to test the MA260. Calibrators can be damaged if used to test the MA260.
- Individual protective equipment should be used if HAZARDOUS LIVE parts in the installation where measurements are to be carried out could be accessible.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Always use proper terminals.
- To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.
- Verify the meter operation by measuring a known current. If in doubt, have the meter serviced.
- Do not apply more than the rated voltage/current as marked on the meter.
- To avoid false readings that can lead to electric shock and injury, replace battery as soon as the low battery indicator appears.
- Do not use the meter in or around explosive gas or vapor.
- When using test leads or probes, please keep fingers behind the finger guards.
- Remove test leads from the meter before opening the battery compartment or the meter case.
- Use caution with voltages above 30VACrms, 42VAC peak, or 60VDC. These voltages pose a shock hazard.
- Probe assemblies to be used for MAINS measurements must be rated as appropriate for measurement Category III or IV according to IEC 61010-031 and must have a voltage rating of at least the voltage of the circuit to be measured.
- Do not expose meter to extremes in temperature or high humidity.
- De-energize the installation under test or wear suitable protective clothing when placing or removing the flexible current probe from a test setup.
- Do not apply/remove the flexible current probe to/from UNINSULATED HAZARDOUS LIVE conductors which may cause electric shock, electric burn, or arc flash.

CAUTIONS

CAUTIONS identify conditions and actions that could cause DAMAGE to the meter or equipment under test. Do not expose the meter to extremes in temperature or high humidity.

Safety Symbols that are typically marked on meters and instructions

	This symbol, adjacent to another symbol, indicates the user must refer to the manual for further information.
	Do not apply or remove clamp from HAZARDOUS LIVE conductors
	Equipment protected by double or reinforced insulation
	Battery symbol
	Conforms to EU directives
	Do not discard this product in household trash.
	AC measurement
	DC measurement
	Earth ground

PER IEC1010 OVERVOLTAGE INSTALLATION CATEGORY

OVERVOLTAGE CATEGORY I

Equipment of OVERVOLTAGE CATEGORY I is equipment for connection to circuits in which measures are taken to limit the transient over-voltages to an appropriate low level.

Note – Examples include protected electronic circuits.

OVERVOLTAGE CATEGORY II

Equipment of OVERVOLTAGE CATEGORY II is energy-consuming equipment to be supplied from the fixed installation.

Note – Examples include household, office, and laboratory appliances.

OVERVOLTAGE CATEGORY III

Equipment of OVERVOLTAGE CATEGORY III is equipment in fixed installations.

Note – Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

OVERVOLTAGE CATEGORY IV

Equipment of OVERVOLTAGE CATEGORY IV is for use at the origin of the installation.

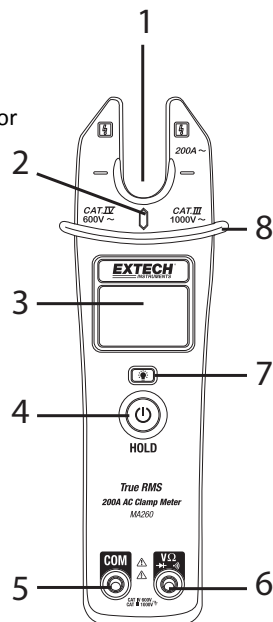
Note – Examples include electricity meters and primary over-current protection equipment

Description

Meter Description

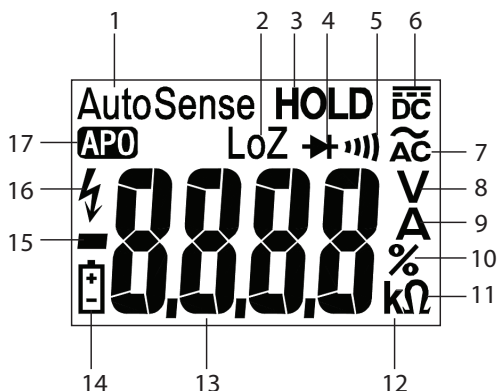
1. Transformer current measurement jaw
2. Non-contact Volt-Detection and AC/DC contact voltage indicator
3. Backlit Multi-function Display
4. Power/Hold button
5. COM (-) Terminal
6. Voltage, Resistance (+) Input Terminal
7. Backlight button
8. Finger-Hand Guard

Note that the battery compartment is located on back of meter



Display Description

1. Automatic measurement detect
2. Low impedance mode is always active
3. Data Hold
4. Diode test
5. Continuity alert
6. DC measurement
7. AC measurement
8. Voltage
9. Amperes
10. Battery Status in Percent
11. Resistance/Continuity ohms
12. Kilo prefix
13. Main display digits
14. Battery status
15. Minus sign
16. DANGER. Live voltage detected
17. Auto Power OFF



Operation



CAUTIONS

Read and understand all **WARNING** and **CAUTION** statements listed in the safety section of this manual prior to use. Note that the meter Powers up in the Resistance/Continuity mode.

Powering the Meter

1. Press the Power-Hold button to power the meter. Check batteries if unit fails to power up.
2. Press and hold the Power-Hold button until OFF appears on the display, release the power button to power off the meter.
3. The meter has an Auto Power OFF feature (APO) where the meter is switched OFF after 20 minutes of inactivity. To disable this feature see the following section.

Note: The meter displays the battery capacity when powering up. Please replace the battery when the display shows <10% battery power.

Disable Auto Power OFF

Note: The meter will auto power OFF after 20 minutes of inactivity. To defeat this feature, follow the steps below.

1. With the meter OFF, press and hold the power button until **APO** flashes three (3) times.
2. The Auto Power OFF function will now be disabled until the next cycle of power. Note that the **APO** display icon is always showing when the APO feature is active.

Self-Test and Related Cautions

The meter performs a Self-Test routine while it is powering up. A battery status percentage value appears on the screen, if it reads 10% or lower, replace the batteries.



CAUTION: Do not take a measurement while powering up the meter. Doing so will cause a Self-Test failure and **FAIL** will display.



CAUTION: Do not use the meter if **FAIL** is displayed on the LCD. Power down the meter and start again. Do not attempt measurements until the meter is fully powered up.



CAUTION: If the meter is used in the vicinity of equipment that is generating electromagnetic interference, the display may become unstable or the measurement displayed may be widely inaccurate.

Display Backlight

With the meter powered ON, press the backlight button to switch the backlight ON or OFF. Note that excessive use of the backlight will shorten the battery life.

Voltage Measurements



WARNING: Do not apply > 1000VAC/DC between the meter's terminals and earth ground



CAUTION: When connecting the test leads to the circuit or device under test, connect the black lead before the red; when removing the test leads, remove the red before the black lead.

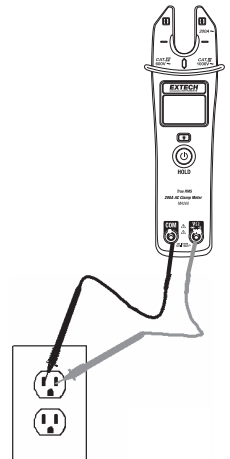
AC Voltage Measurements



WARNINGS:

- The time delay that results from the meter's automatic sensing circuit (1 to 2 seconds) may cause GFCI circuits to reset and breakers to trip.
- It is not recommended to use calibration equipment to test the MA260. Calibrators can be damaged if used to test the MA260.

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (V/ Ω) jack.
2. Touch the test probe tips to the circuit under test.
3. Note that because of the Auto-Sense function the meter starts in the continuity (resistance) mode and, after several seconds, enters the Voltage mode. This time delay may preclude the meter's use on some applications, please use caution.
4. Read the voltage in the display. The display will indicate the proper decimal point and value.
5. Note that the voltage detect LED may light when ACV voltage is measured. The meter is capable of measuring voltage from 1.3VAC to 1000VAC. Signals below 1VAC will trigger the meter's alert beeper.



Input Impedance

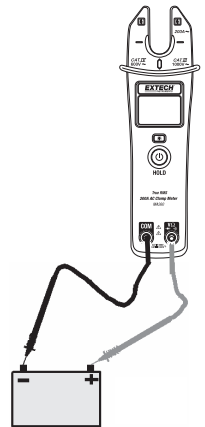
The input impedance is greater than or equal to 6K ohms for input voltages up to 30V.

The input impedance increases with input voltage to approximately 420K ohms at 1000VAC.

For AC Voltage, the Auto-sense feature evaluates input signals and adjusts the Input Impedance to eliminate effects of ghost voltages.

DC Voltage Measurements

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (V/ Ω) jack.
2. Touch the test probe tips to the circuit under test. Be sure to observe the correct polarity (red lead to positive, black lead to negative).
3. Read the voltage in the display. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (-) minus before the value.
4. The meter is capable of detecting DC voltages from + 2.1V to +1000V and from -0.7V to -1000V.
5. The meter's alert beeper will sound a short tone for positive DC voltage measurements and a long tone for negative measurements.



AC Current Measurements

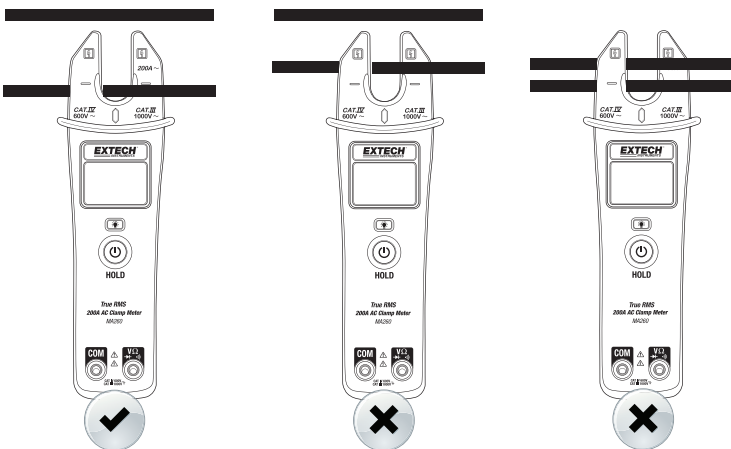


WARNING: Do not handle the meter above the finger and hand guard barrier.



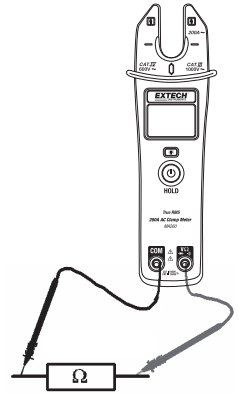
CAUTION: Observe CAT IV 600V with respect to Earth Ground for the Jaw.

1. Position the clamp around one conductor with the conductor positioned as far into the clamp jaw as possible. See accompanying diagrams for correct and incorrect use.
2. Read the current in the display. The display will indicate the proper decimal point and value.



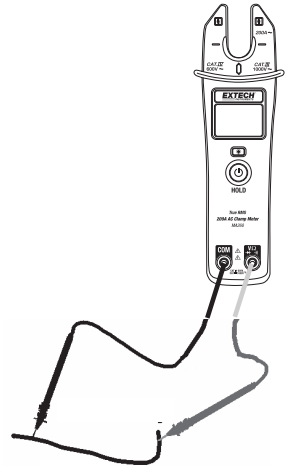
Resistance Measurements

1. Insert the black test lead banana plug into the negative (COM) jack. Insert the red test lead banana plug into the positive (V/ Ω) jack.
2. Touch the test probe tips across the circuit or part under test. It is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
3. Read the resistance in the display. The display will indicate the proper decimal point and value.



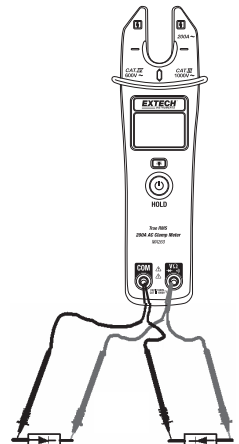
Continuity Check

1. Insert the black lead banana plug into the negative (COM) jack. Insert the red test lead banana plug into the positive (V/ Ω) jack.
2. Touch the test probe tips to the circuit or wire you wish to check.
3. If the resistance is less than approximately 25 Ω , the audible signal will sound. If the circuit is open, the display will indicate "OL".
4. Note that the beeper is off when the resistance is > 400 Ω . However the beeper may sound when the resistance is between 25 Ω and 400 Ω .



Diode Test

1. Insert the black test lead banana plug into the negative (COM) jack and the red test lead banana plug into the positive (V/ Ω) jack.
2. Touch the test probes to the diode under test. Forward voltage will indicate 0.4 to 0.8V Reverse voltage will indicate "OL". Shorted devices will indicate near 0 ohms and beep; an open device will indicate "OL" in both polarities.



Smart Data Hold

To freeze the LCD meter reading, press the hold button. While data hold is active, the **HOLD** display icon appears on the LCD. If no signal is sensed, the meter will flash the **HOLD** icon several times and automatically exit the Data Hold Mode.

From the Data Hold mode, press the data hold button to return to normal operation. The **HOLD** icon will switch OFF.

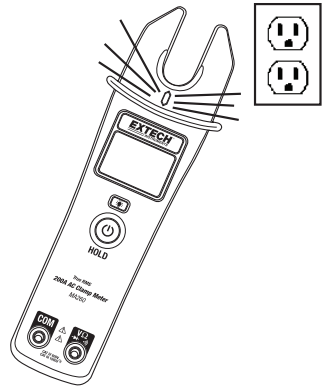
Note: Data hold is not available when no input is detected.

The meter's beeper will sound continuously and the LCD will flash in the following two Data Hold instances:

1. The meter detects a signal different than the held reading.
2. The detected signal is the same unit of measure as the held reading but is 50 counts greater than or less than the held reading.

Non-contact Volt-Detection Feature

The Non-contact Volt-Detection LED illuminates when the meter is placed close to an electric field. If the LED is not lit, there is still a possibility that voltage is present however. Please use caution.



Maintenance



WARNING: To avoid electrical shock, disconnect the meter from any circuit, remove the test leads from the input terminals and turn OFF the meter before opening the case. Do not operate with an open case.

Cleaning and Storage

Periodically wipe the case with a damp cloth and mild detergent; do not use abrasives or solvents. If the meter is not to be used for 60 days or more, remove the batteries and store them separately.

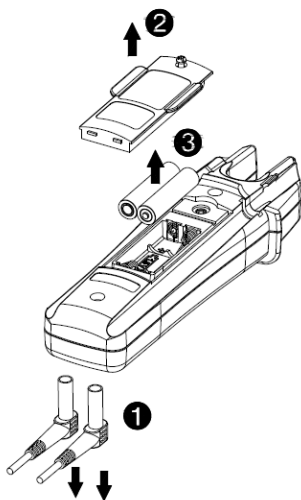
Battery Replacement

1. Remove the small (middle) Phillips head screw at the back of the meter.
2. Open the battery compartment
3. Replace the two 1.5V AAA batteries observing correct polarity.
4. Re-assemble the meter before use
5. Safety: Please dispose of batteries responsibly; never dispose of batteries in a fire, batteries may explode or leak; never mix battery types, install new batteries of the same type.



Never dispose of used batteries or rechargeable batteries in household waste. As consumers, users are legally required to take used batteries to appropriate collection sites, the retail store where the batteries were purchased, or wherever batteries are sold.

Disposal: Do not dispose of this instrument in household waste. The user is obligated to take end-of-life devices to a designated collection point for the disposal of electrical and electronic equipment.



Specifications

ELECTRICAL SPECIFICATIONS

Function	Range	Max. Resolution	Accuracy (of reading) and frequency bandwidth
AC Current	1.5~200.0AAC	0.1 A	$\pm (3.0\% + 5 \text{ digits})$ 50 to 60Hz
AC Voltage	1.3V~1000V	0.1 V	$\pm (0.9\% + 3 \text{ digits})$ (50Hz-60Hz) $\pm (1.5\% + 3 \text{ digits})$ (61Hz-500Hz)
DC Voltage	+2.1V ~ 1000V	0.1 V	$\pm (0.3\% + 2 \text{ digits})$
	-0.7V ~ -1000V		$\pm (0.3\% + 2 \text{ digits})$
Resistance	0~10k Ω	1 Ω	$\pm (0.9\% + 2 \text{ digits})$
Diode	0.4V~0.8V	0.1 V	$\pm (1.0\% + 3 \text{ digits})$
Volt-Detection	80V~1000VAC	n/a	50-60Hz

Notes:

- The time delay that results from the meter's automatic sensing circuit (1 to 2 seconds) may cause GFCI circuits to reset and breakers to trip.
- It is not recommended to use calibration equipment to test the MA260. Calibrators can be damaged if used to test the MA260.
- Accuracy is given as $\pm$ (% of reading + least significant digit) at 23C $\pm$ 5C with relative humidity lower than 80%. Accuracy is specified for a period of one year after calibration.
- ACV and ACA specifications are for AC Coupled, True RMS. For non-sinusoidal waveforms, additional accuracy Crest Factor (C.F.) considerations exist as detailed below:
Add 3.0% for C.F. 1.0~2.0
Add 5.0% for C.F. 2.0~2.5
Add 7.0% for C.F. 2.5~3.0
- Overload protection: AC 1000Vrms, DC 1000V for voltage, resistance, continuity, and diode functions.
- Maximum Open Voltage for Resistance/Continuity measurements: 1.6V
- Continuity beeper: Beeper sounds when resistance is < 25 ohms and is off when the resistance is > 400 ohms. Note that between 25 and 400 ohms the beeper may sound.
- Maximum AC/DC operating time: 30 seconds for measurements > 30VAC or DC
- AC Input Impedance: > 6K ohms for input voltage up to 30VAC. Impedance increases to approximately 420k ohms at 1000VAC
- Adjacent Conductor Influence for ACA measurements: <0.08A / A

GENERAL SPECIFICATIONS

Display	4-digit (9999 count) large scale Multi-Function LCD
Over-range indication	"OL" is displayed for resistance and voltage functions
Conversion rate	2 updates per second
Maximum conductor size	16mm (0.6") in diameter
AC V bandwidth	50Hz to 500Hz
AC A bandwidth	50/60Hz
Low battery indication	 is displayed. Meter also displays battery power percentage at startup. Replace batteries when the display shows <10%
Continuity	Beeper sounds when resistance is <25 Ω Beeper is off when resistance > 400 Ω Beeper may sound between 25 Ω and 400 Ω
Auto Power OFF	After 20 minutes (can be disabled)
Operating Temperature and Humidity	0~30°C (32~86°F); 80%RH maximum 30~40°C (86~104°F); 75%RH maximum 40~50°C (104~122°F); 45%RH maximum
Storage Temperature and Humidity	-20°~60°C (-4°~140°F); 80%RH maximum
Temperature Coefficient	0.2 x specified accuracy / °C, < 18°C (64.5°F), > 28°C (82.4°F)
Operating Altitude	2000m (6562ft.)
Battery power	(2) 1.5V 'AAA' batteries
Battery life	300 hours typical using alkaline batteries of the same type
Weight	280g (9.9 oz.)
Dimensions	54 x 193 x 31mm (7.6 x 2.1 x 1.2")
Safety Standards	For indoor use and in accordance with the requirements for double insulation to EN61010-1, EN61010-2-032, EN61010-2-033, EN61326-1; EN61010-1 Over-voltage CAT IV 600V, CAT III 1000V, Pollution Degree 2
Shock and Vibration	Sinusoidal vibration MIL-PRF-28800F (5-55 Hz, 3g max.)
Drop Protection	1.2m (4') drop onto hardwood or concrete flooring

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