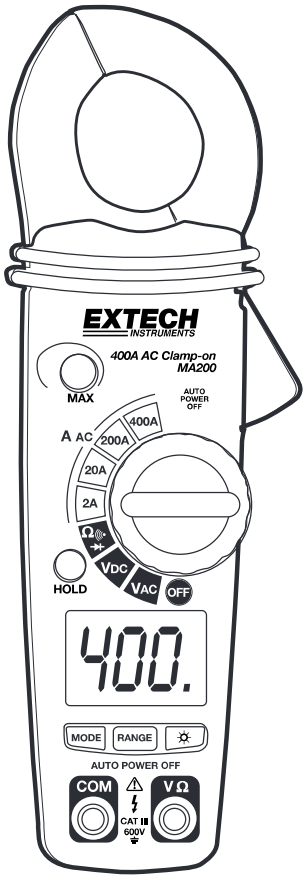
EXTECH INSTRUMENTS

User's Guide

# 400A AC Clamp Meter

## Model MA200




CE

## *Introduction*

Thank you for selecting the Extech MA200 AC Clamp Meter. This professional meter, with proper care, will provide years of safe reliable service.

## *Safety*

## *International Safety Symbols*

This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.

This symbol, adjacent to a terminal, indicates that, under normal use, hazardous voltages may be present

Double insulation

**SAFETY NOTES**

- Do not exceed the maximum allowable input range of any function
- Do not apply voltage to meter when resistance function is selected.
- Set the function switch OFF when the meter is not in use.
- Remove the battery if meter is to be stored for longer than 60 days.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- This device is not a toy and must not reach children's hands. It contains hazardous objects as well as small parts that the children could swallow. In case a child swallows any of them, please contact a physician immediately
- Do not leave batteries and packing material lying around unattended; they can be dangerous for children if they use them as toys
- In case the device is going to be unused for an extended period of time, remove the batteries to prevent them from training
- Expired or damaged batteries can cause cauterization on contact with the skin. Always, therefore, use suitable hand gloves in such cases
- See that the batteries are not short-circuited. Do not throw batteries into the fire.

**WARNINGS**

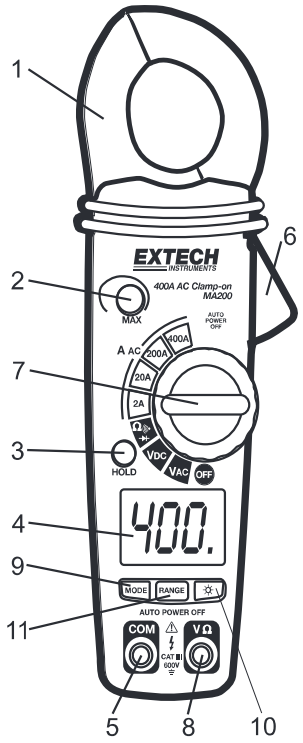
- Set function switch to the appropriate position before measuring.
- When measuring volts do not switch to current/resistance modes.
- Do not measure current on a circuit whose voltage exceeds 240V.
- When changing ranges using the selector switch always disconnect the test leads from the circuit under test.
- Do not exceed the maximum rated input limits.

**OVERVOLTAGE CATEGORY III 600V**

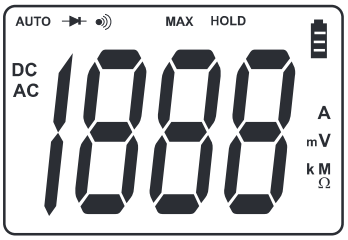
This meter meets the IEC 610-1-95 standard for OVERVOLTAGE CATEGORY III 600V. Cat III 600V meters are protected against overvoltage transients in fixed installation at the distribution level. Examples include switches in the fixed installation and some equipment for industrial use with permanent connection to the fixed installation.

## *Meter Description*

1. Transformer jaws
2. MAX Hold button
3. Hold button
4. LCD Display
5. COM Input Terminal
6. Jaw opening trigger
7. Function select switch
8. Voltage, Resistance Input Terminal
9. Mode Select Button
10. Backlight Button
11. Range Select Button




**AC** Alternating current
**DC** Direct currrent)
**AUTO** AutoRange mode
**MAX** MAX Hold mode
Diode test mode
Audible Continuity
**HOLD** Data Hold mode
Low Battery icon

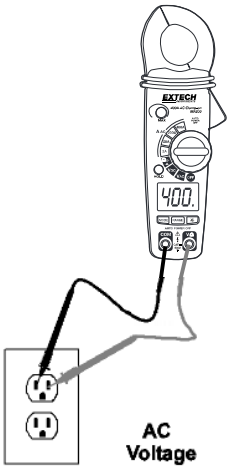


## *Operation*

**NOTICES**: Read and understand all **warning** and **precaution** statements listed in the safety section of this operation manual prior to using this meter. Set the function select switch to the OFF position when the meter is not in use.

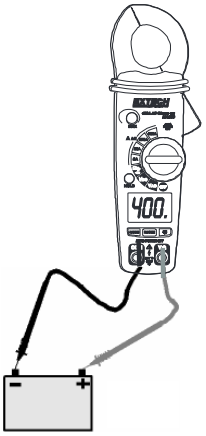
**AC Voltage Measurements**

1. Set the rotary function switch to the **VAC** position.
2. 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
3. Touch the test probe tips to the circuit under test
4. Read the voltage in the display. The display will indicate the proper decimal point and value



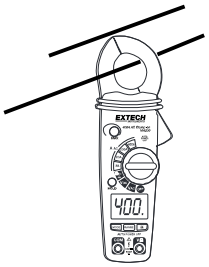

**DC Voltage Measurements**

1. Set the rotary function switch to the VDC position.
2. 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
3. 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)
4. 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



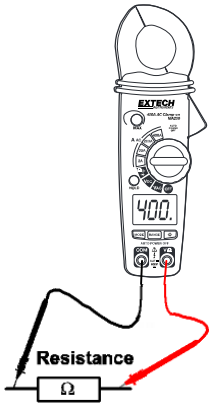
**AC Current Measurements**

**WARNING:** Ensure that the test leads are disconnected from the meter before making current clamp measurements.



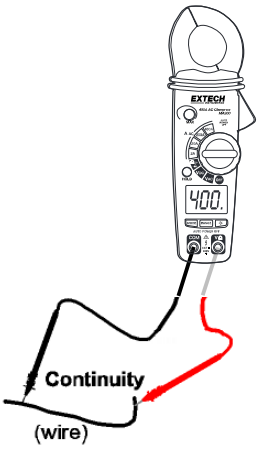
1. Set the Function switch to the **400 or 200A** range. If the range of the measured is not known, select the higher range first then move to the lower range if necessary.
2. Press the trigger to open jaw. Fully enclose one conductor to be measured.
3. The clamp meter LCD will display the reading.

**Resistance Measurements**




1. Set the function switch to the Ω ⊣◀ •))) position.
2. Insert the black test lead banana plug into the negative (COM) jack Insert the red test lead banana plug into the positive (VΩ) jack.
3. 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.
4. Read the resistance in the display. The display will indicate the proper decimal point and value.

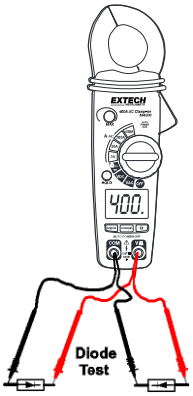
**Continuity Check**




1. Set the function switch to the Ω ⊣◀ •))) position.
2. Push the mode button to indicate •))) on the display.
3. Insert the black lead banana plug into the negative (COM) jack Insert the red test lead banana plug into the positive (VΩ) jack.
4. Touch the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately 30Ω, the audible signal will sound. If the circuit is open, the display will indicate “OL.”.

**Diode Test**

1. Turn the rotary switch to the Ω →| •))) position.
2. Insert the black test lead banana plug into the negative (COM**)** jack and the red test lead banana plug into the positive (VΩ) jack.
3. Push the mode button to indicate →| on the display.
4. Touch the test probes to the diode under test. Forward voltage will indicate 400 to 700mV. Reverse voltage will indicate “OL”. Shorted devices will indicate near 0mV. Shorted devices will indicate near 0mV and an open device will indicate “OL” in both polarities.




**Data Hold**

To freeze the LCD meter reading, press the data hold button. The data hold button is located on the left side of the meter (bottom button). While data hold is active, the **HOLD** display icon appears on the LCD. Press the data hold button again to return to normal operation.

**MAX Hold**

To hold the highest reading on the LCD, press the **MAX** button. The max hold button is located on the left side of the meter (top button). While data hold is active, the **MAX** display icon appears on the LCD. The meter reading will not change as readings change, rather it will only display the highest reading encountered since the max hold button was pressed. Press the max hold button again to return to normal operation.

## *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 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 periods of longer than 60 days, remove the batteries and store them separately.

**Battery Replacement**

1. Remove the two rear Phillips head screws
2. Open the battery compartment
3. Replace the two 1.5V AAA batteries.
4. Re-assemble the meter

You, as the end user, are legally bound (**EU Battery ordinance**) to return all used batteries, **disposal in the household garbage is prohibited!** You can hand over your used batteries / accumulators at collection points in your community or wherever batteries / accumulators are sold!

**Disposal:** Follow the valid legal stipulations in respect of the disposal of the device at the end of its lifecycle

## *Specifications*

| Function | Range | Accuracy (of reading) |
|---|---|---|
| AC Current | 2.000 ACA | ± (2.5% + 10 digits) |
| | 20.00 ACA | ± (2.5% + 4 digits) |
| | 200.0 ACA | ± (2.5% + 4 digits) |
| | 400 ACA | ± (3.0% + 5 digits) |
| AC Voltage | 200.0mV, | ± (1.5% + 30 digits) |
| | 2.000V | ± (1.5% + 3 digits) |
| | 20.00V | |
| | 200.0V | |
| | 600V | ± (2.0% + 4 digits) |
| DC Voltage | 200.0mV | ± (0.5% + 5 digits) |
| | 2.000V | ± (1.2% + 3 digits) |
| | 20.00V | |
| | 200.0V | |
| | 600V | ± (1.5% + 3 digits) |
| Resistance Ω | 200.0 | ± (1.0% + 4 digits) |
| | 2.000k | ± (1.5% + 2 digits) |
| | 20.00k | |
| | 200.0k | |
| | 2.000M | ± (2.0% + 3 digits) |
| | 20.00M | ± (3.0% + 5 digits) |

| | |
|---|---|
| **Jaw size** | 23mm (0.9") approx. |
| **Display** | 3-1/2 digits (2000 counts) LCD |
| **Continuity** | Audible tone < 120Ω approx. |
| **Diode Test** | Open circuit voltage < 1.5VDC;<br>Test current 0.3mA (typical) |
| **AC V bandwidth** | 50Hz to 400Hz |
| **AC A bandwidth** | 50/60Hz |
| **Low battery indication** | is displayed |
| **Overrange indication** | "OL" is displayed |
| **Auto Power OFF** | After 15 minutes |
| **Measurement rate** | 2 per second, nominal |
| **Input Impedance** | 7.8MΩ (V DC and V AC) |
| **Operating Temperature** | 5ºC to 40ºC (41ºF to 104ºF) |
| **Storage Temperature** | -20°C to 60°C (-4°F to 140°F) |
| **Operating Humidity** | Max 80% up to 31ºC (87ºF) decreasing linearly to 50% at 40ºC (104ºF) |
| **Storage Humidity** | <80% |
| **Operating Altitude** | 3000m (9800ft) |
| **Batteries** | (2) 1.5V AAA batteries |
| **Weight** | 200g (0.44lb) |
| **Size** | 200 x 50 x 35mm (7.87" x 1.97" x 1.38") |
| **Safety Approval** | CE |
| **Safety information** | For indoor use and in accordance with the requirements for double insulation to IEC1010-1 (1995): EN61010-1 (1995) Overvoltage Category III 600V, Pollution Degree 2. |



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