

MX 350

**Pince multimètre AC
AC Clamp-on meter
AC-Vielfachmesszange
Pinza multimetro AC
Pinza multímetrica CA**

MX 355

**Pince multimètre AC/DC
AC/DC Clamp-on meter
AC/DC- Vielfachmesszange
Pinza multimetro AC/DC
Pinza multímetrica CA/CC**

metrix

User's manual
Chapter II - page 17

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1. GENERAL INSTRUCTIONS

1.1. Precautions and safety measures

1.1.1. Before using

You have just acquired a 4,000-count multimeter clamp. We thank you for your confidence.

This multimeter clamp complies with the IEC 61010 norms concerning electronic measuring instruments. For your own safety and to prevent damage to the instrument, you must follow the instructions given in this manual.

* This instrument can be used for measurements on circuits in installation category II, in an environment with pollution level 2, for voltages no greater than 300 V in relation to the earth.

* Definition of the installation categories
(see IEC 61010-1 publication):

CAT I: CAT I circuits are circuits protected by low level transient over-voltage limiters

Example: protected electronic circuits

CAT II: CAT II circuits are household or similar appliance power circuits, which may carry medium-level transient over-voltage.

Example: household appliance and portable tool power supplies

CAT III: CAT III circuits are high-power appliance power circuits, which may carry high-level transient over-voltage.

Example: industrial machinery or instrument power supplies

CAT IV: CAT IV circuits are circuits which can carry very substantial transient over-voltage.

Example: power feeders

For your own safety, only used leads that comply with the IEC 61010 norm. Before using them, always check that they are in perfect working order.

1.1.2. When using the instrument

- Never exceed the protection limit values indicated in the specifications for each type of measurement.
- When the multimeter clamp is linked to the measurement circuits, do not touch any unused terminals.
- Before changing the function, disconnect the measurement leads from the circuit measured.
- Never measure resistances on a live circuit.

1.1.3. Symbols



Refer to the user's manual



Risk of electric shock



Dual insulation

1.1.4. Instructions

- **Before opening the instrument**, disconnect it from the measuring circuits and make sure that you are not charged with static electricity, which could irreparably damage the instrument's internal elements.
- A "**qualified person**" is someone who is familiar with the installation, the construction, the application and the dangers at hand. This person is authorised to power up and power down the installation and equipment, in compliance with safety regulations.

1.1.5. Cleaning

Clean the instrument with a damp cloth and soap.
Never use abrasive products or solvents.

1.2. Warranty

This equipment is guaranteed against any material or manufacturing defects, in accordance with the general conditions of sale.

During the warranty period (1 year), the instrument can only be repaired by the manufacturer, who reserves the right to repair the instrument or to exchange all or part of it. If the equipment is returned to the manufacturer, the outgoing transport costs are borne by the customer.

The warranty is not applicable in the following cases:

1. improper use of the equipment or use of it in conjunction with incompatible equipment;
2. modifications to the equipment without the explicit authorisation of the manufacturer's technical department;
3. work carried out on the instrument by a person not approved by the manufacturer;
4. adaptation for a specific application, not included in the definition of the equipment or the user's manual;
5. knocks, falls or flooding.

The contents of this manual must not be reproduced in any form without our consent.

1.3. Maintenance

Return your instrument to your distributor for any work to be done within or outside the guarantee.

1.4. Unpacking - Repacking

All the equipment was checked mechanically and electronically before shipment. Every precaution was taken to ensure that you receive the instrument undamaged. It is a good idea to check quickly to detect any damage that may have occurred during transport. If there is any damage, immediately notify the transporter of the customary reservations.

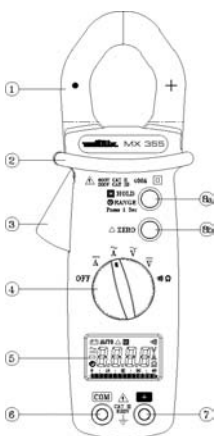
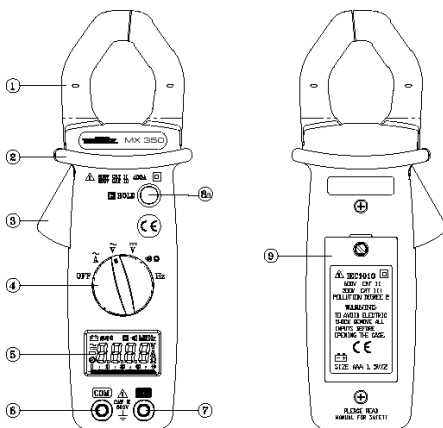
Caution! *If you ship this instrument on elsewhere, use preferably the original packaging and indicate the reasons for reshipment as clearly as possible in a note enclosed with the equipment.*

Our products are patented in FRANCE and ABROAD. Our logos are registered trade marks.

We reserve the right to modify the characteristics and prices should technological advances make it necessary.

2. DESCRIPTION OF THE INSTRUMENT

2.1. Description of front and rear



- ① Jaws
- ② Protective guard
- ③ Trigger
- ④ Switch
- ⑤ Display
- ⑥ COM input terminals
- ⑦ + input terminals
- ⑧_a HOLD function
- ⑧_b Zero button
- ⑨ Battery compartment

2.2. Description of the display



MX 350	MX 355		
•	•		Batteries flat
•	•	AUTO	Automatic range
•	•		Manual range
•	•		Hold
•	•		Continuity measurement
•	•	V	Voltage measurement
•	•	A	Current measurement
•	•	Ω	Resistance measurement
•	•		Alternating current
	•		Direct current
•	•		Negative value
•	•		Bargraph
•		MKHz	Frequency measurement
	•		DC zero/"delta" function

3. GENERAL DESCRIPTION


3.1. Preparation for use

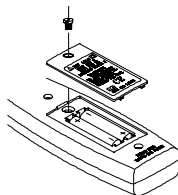
3.1.1. Power supply

Battery: AAA or LR03 1.5 V x 2

Charge life: 100 hours (with alkaline batteries).

3.1.2. Battery installation and replacement

1.  is displayed when the voltage supplied by the batteries is lower than the operating voltage.
2. Before changing the batteries, set the switch to "OFF", disconnect the measuring leads and remove the clamp from the circuit measured.
3. Loosen the screws and open the flap of the battery compartment using a screwdriver.
4. Replace the flat batteries with 2 new 1.5 V LR03 batteries.
5. Put the battery flap back in place and tighten the fixing screws.



3.2. Zero mode / "Delta" function

(MX 355) Press the "zero" button to select the "zero" mode. The " Δ " symbol is displayed. The last value measured becomes the reference value which will be subtracted from any subsequent measurements.


Press the button again: the " Δ " symbol flashes and the display indicates the reference value subtracted from the measurements.

To quit the "zero" mode, press the zero button for 2 seconds.

In "zero" mode, the auto-range function is deactivated. This function can also be used to perform RCD measurements (in A, V or Ω) by recording a "calibration value" subtracted from the measurements.

3.3. Memorization, automatic range

It is possible to freeze the value displayed by pressing on the "HOLD" button. To deactivate this function, press the "HOLD" button a second time.

(MX 355) In A and V, it is possible to change the range by keeping the **RANGE** button pressed. The  "manual range" symbol appears. The user can choose the position of the decimal point. To quit the manual range, you must keep the **RANGE** button pressed for at least 2 seconds; the clamp then returns to **AUTO** mode (Autorange).

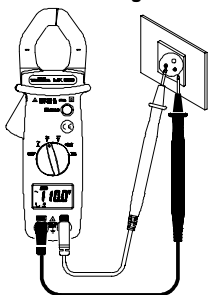
3.4. Auto cut-off

The clamp shuts down automatically after 30 minutes if no operations are performed.

To deactivate this function (MX 355 only), press the "Zero" button and keep it pressed down. Then power up the clamp.

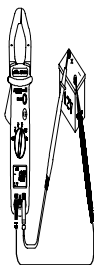
4. FUNCTIONAL DESCRIPTION

4.1. Measuring AC voltage



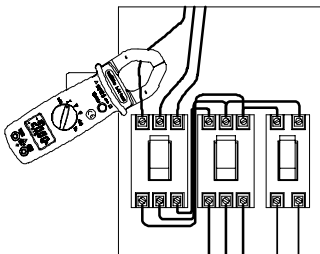
Set the switch to $V\sim$. Connect the red test lead to the "+" input terminal and the black test lead to the "COM" input terminal. Then place the touch prods in contact with the points where the AC voltage is to be measured. Then read the result on the display.

4.2. DC voltage measurement



Set the switch to $V\text{---}$. Connect the red test lead to the "+" input terminal and the black test lead to the "COM" input terminal. Then place the touch prods in contact with the points where the DC voltage is to be measured. Then read the result on the display.

4.3. Measuring AC current



Set the switch to A~.

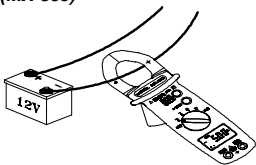
Open the clamp by pressing the trigger.

Place the clamp around the conductor to be measured and release the trigger; check that the clamp is closed properly. Read the result of the measurement on the display.

Note: For safety reasons, disconnect the measuring leads before performing this operation. The clamp must be positioned around a single conductor in a circuit, with the risk of rendering the measurement incorrect. The best measurement is obtained with the conductor centred in the middle of the jaws.

4.4. Measuring DC current

(MX 355)



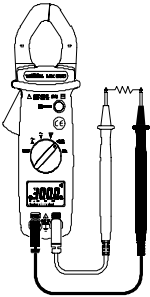
Before measuring currents higher than 40 A, set the scale to 400 A by pressing the **RANGE** button.

Then reset to zero (see § 3.2)

Open the jaws of the clamp by pressing the trigger and insert the cable to be measured between them. Close the clamp and read the result of the measurement on the display.

Note: For safety reasons, disconnect the measuring leads before performing this operation. If reading is difficult, press the **HOLD** button and read the result afterwards.

4.5. Measuring resistance



Set the switch to Ω .

Connect the red test lead to the "+" input terminal and the black test lead to the "COM" input terminal.

Place the touch prods in contact with the points to be measured and read the result on the display.

Note: When performing a measurement on a circuit, make sure that it is not live and that the capacitors have been discharged.

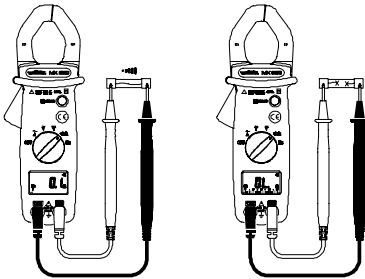
4.6. Continuity test with buzzer

Set the switch to Ω with a buzzer icon.

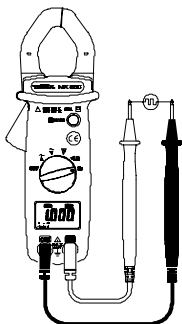
Connect the red test lead to the "+" terminal and the black test lead to the "COM" terminal.

Place the touch prods in contact with the circuit to be tested.

If the resistance is lower than 35Ω , the buzzer sounds continuously.



4.7. Measurement of the voltage frequency (MX 350)



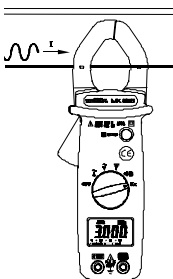
Set the switch to "Hz".

Connect the red test lead to the "+" terminal and the black test lead to the "COM" terminal.

Place the touch prods in contact with the points whose frequency is to be measured.

Read the result on the display.

4.8. Measurement of the current frequency (MX 350)



Set the switch to "Hz".

Open the clamp by pressing the trigger and insert the cable to be measured.

Close the clamp and read the result on the display.

Note: For frequency measurements, you can use either the input terminals (voltage) or the jaws of the clamp (current). If you use both sources, the result of the measurement is false.

5. TECHNICAL SPECIFICATIONS

5.1. General

Only the values assigned tolerances or the limits declared constitute guaranteed values. The values without any tolerance are given as indications.

5.2. Characteristics

The accuracy is \pm [% of the reading (R) + number of representation units (digits or D)] in the reference conditions (see appendix).

5.2.1. DC voltage (Autorange)

Range	Measurement range	Resolution	Accuracy
400 V	0.2 V to 399.9 V	0.1 V	1% R +2 D
600 V	400 V to 600 V	1 V	1% R +2 D

Protection against overloads: 660 Vrms

5.2.2. AC voltage (Autorange)

Range	Meas. range	Frequency	Resol.	Accuracy
400 V	0.5 V to 399.9V	50 .. 500 Hz	0.1 V	1.5%R +5 D
600 V	400 V to 600 V	50 .. 500 Hz	1 V	1.5%R +5 D

MX 350: Input impedance: 1 M Ω

MX 355: Input impedance: 10 M Ω

Protection against overloads: 660 Vrms

5.2.3. DC current (Autorange)

(MX 355)

Range	Measurement range	Resolution	Accuracy
40 A	0.10 A to 39.99 A	0.01 A	2.5% R +10 D
400 A	40.0 A to 400.0 A	0.1 A	2.5% R +10 D

Protection against overloads: 600 Arms

5.2.4. AC current (Autorange)

(MX 350)

Range	Meas. range	Frequency	Resol.	Accuracy
40 A	0.05A to 39.99A	50 .. 60 Hz	0.01 A	1.9%R + 5 D
		60 ... 500 Hz		2.5%R + 5 D
400 A	40.0A to 400.0A	50 .. 60 Hz	0.1 A	1.9%R + 5 D
		60 ... 500 Hz		2.5%R + 5 D

Protection against overloads: 600 Arms

(MX 355)

Range	Meas. range	Frequency	Resol.	Accuracy
40 A	0.05A to 39.99A	50 .. 500 Hz	0.01 A	2%R +10 D
400 A	40.0A to 400.0A	50 .. 500 Hz	0.1 A	2%R +10 D

Protection against overloads: 600 Arms

5.2.5. Resistance (Ω)

Range	Meas. range	Resolution	Accuracy
400 Ω	0.2 Ω to 399.9 Ω	0.1 Ω	1%R +2 D

Max voltage: : 1.5 V DC during measurement.

Protection against overloads: 600 Vrms

Continuity detection threshold: $R < 40 \Omega$

5.2.6. Hz frequency (Autorange) of a current**(MX 350)**

Range	Meas. range	Resol.	Accuracy	Sensitivity
4000 Hz	20 Hz to 3999 Hz	1 Hz	0.1%R + 1 D	2 Arms
10 kHz	4.00 kHz to 10.00 kHz	10 Hz	0.1%R + 1 D	2 Arms

Protection against overloads: 600 Arms

5.2.7. Hz frequency (Autorange) of a voltage**(MX 350)**

Range	Meas. range	Resol.	Accuracy	Sensitivity
4000Hz	2Hz to 3999Hz	1 Hz	0.1%R + 1 D	5 Vrms
40kHz	4.00kHz to 39.99kHz	10 Hz	0.1%R + 1 D	5 Vrms
400kHz	40.0kHz to 399.9kHz	100 Hz	0.1%R + 1 D	5 Vrms
1000kHz	400kHz to 999kHz	1 kHz	0.1%R + 1 D	10 Vrms

Input impedance: 1 M Ω

Protection against overloads: 600 Vrms

5.2.8. Safety

IEC 61010-1 Ed.95 and IEC 61010-2-032 Ed.93:

- Insulation: class II
- Pollution level: 2
- Altitude > 2000 m
- Installation category: CAT II 600V, CAT III 300V


5.2.9. General information**Digital display**

3 $\frac{3}{4}$ digit LCD with max. reading of 3,999 counts

Analogue display

42-segment bargraph


Polarity

When a negative signal is applied, the  signal appears.

Overload

If the range is exceeded, the  symbol is displayed.

Low battery indicator

 is displayed when the voltage supplied by the batteries is lower than the operating voltage.

Sampling

2 measurements/second for the digital display

20 measurements/second for the bargraph

Protection level of the housing

IP30 according to EN 60529 Ed.92

Maximum jaw opening

MX 350: \varnothing 26 mm

MX 355: \varnothing 30 mm

Dimensions

(L x W x H): 193 x 50 x 28 mm

Weight

230 g (with batteries)

5.3. Environmental conditions**5.3.1. Temperature**

Operation: 0°C to 40°C, < 70 % RH

Storage: -10°C to 60°C, < 80 % RH

5.3.2. E.M.C.

Immunity: acc. to EN 61326 + A1 (1998)

Emission: acc. to EN 61326 + A1 (1998)

5.4. Accessories

Instrument delivered with:

1 user's manual

1 set of measuring leads (one black and one red)

2 x 1.5V AAA or LR3 batteries

1 carrying bag

APPENDIX: Reference conditions

Sine signal:

- Frequency from 48 to 65 Hz

- No DC component

Temperature 23°C \pm 5°C

External magnetic field < 40 A/m

No AC magnetic field

Measured conductor centred (in A)

METRIX

Pôle Test et Mesure - CHAUVIN ARNOUX

190, rue championnet

F - 75876 PARIS Cedex 18

Tel. 33 (0)1.44.85.44.85 - Fax 33 (0)1.46.27.73.89

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