

# Digital Clamp-on DMMs with uncompromising performance

With this new range of clamp-on meters, Metrix introduces practical and inexpensive instruments with uncompromising performance. Designed to satisfy the demands of the world-wide electrical industry, professionals can use them to face all test conditions and provide extremely reliable results.



## Selector Guide

	MX345	MX640	MX1140	MX1240	MX200	MX1200	MX210	MX215	MX240	MX2040
Max. Current (A max.)	400	600	1000	1200	200	1000	200	200	300	2000
Application	AC	AC	RMS AC, DC	AC	True RMS	True RMS	True RMS	True RMS	True RMS	True RMS
Voltage Ranges (V)	600	600	600	600	750	750	750	750	1000	1000
Application	AC	AC, DC	AC, DC	AC, DC	True RMS	True RMS	True RMS	True RMS	True RMS	True RMS
Power Measurement										
Single-phase					●	●	●	●	●	●
Three -phase					optional	optional	optional	optional	●	●
Energy Measurement									●	●
Frequency Measurement			●		●	●	●	●	●	●
Meas. on frequency converters							1 kHz	5 kHz		
Analog output					●	●	●	●	●	●
Digital output									RS232	RS232
Max. Jaw opening (mm)	30	42	53	53	25	60	25	25	40	65
Safety IEC 1010	Cat. III 300 V	Cat. III 600 V	Cat. III 600 V	Cat. III 600 V	Cat. III 600 V	Cat. III 600 V	Cat. III 600 V	Cat. III 600 V	Cat. IV 600 V	Cat. IV 600 V

# Reliable, simple and safe instruments. Ideally suited for the tight budget.

## Digital AC Clamp-On Meters

Models MX345, MX640 and MX1240 for AC circuits combine, in compact units, three measurement functions : current, voltage (AC and DC) and resistance. The MX345 is particularly light, and can be carried easily in the pocket. The three models are equipped with «HOLD» functions, allowing the technician to record the displayed value and to read it later in the most accurate and safe way. They have a rate of measurement of 4 readings per second, a display of 4,000 points, an automatic range selection and a continuity beeper. They conform fully to IEC1010-1 standards in category III. To sum up, choosing one of these clamp-ons is to choose an instrument which is reliable, simple, safe and ideally suited for the tight budget.

## MX345



Pocket-size MX345 Digital AC Clamp-on Meter measures current up to 400A and features a 30 mm jaw opening.



MX345 digital AC clamp-on meter features easy-to-read LCD. HOLD button freezes measurements for easier, safer reading.

### MX345

### MX640

### MX1140

### MX1240

General Specifications				
Display LCD	3999 points	●	●	●
Measuring Rate	4 / sec.	4 / sec.	2 / sec.	4 / sec.
Overrange Indication	«OL»	«OL»	«OL»	«OL»
Low battery indicator	●	●	●	●
Auto power off	30 min.	30 min.	10 min.	30 min.
Operating temp. (0°C to 45°C)	●	●	●	●
Storage temp. (-20°C to + 60 °C)	●	●	●	●
Relative Humidity < 80%	●	●	●	●
Safety IEC1010-1	Cat III, 300V	Cat III, 600V	Cat III, 600V	Cat III, 600V
Pollution degree : 2	●	●	●	●
Max. conductor size	29 mm	40 mm	51 mm	51 mm
Max. jaw opening	30 mm	42 mm	53 mm	53 mm
power requirement :9V battery	●	●	●	●
Battery life (Alkaline battery)	200 h.	200 h.	40 h.	200 h.
Dlmsions	195 x 77 x 36 mm	245 x 85 x 40 mm	265 x 100 x 42 mm	265 x 105 x 42 mm
Weight (kg), with battery	0.250	0.320	0.420	0.420
Supplied accessories :				
Safety test leads	●	●	●	●
Battery (1 x 9V)	●	●	●	●
Carrying case	●	●	●	●

# MX640      MX1140      MX1240



MX640 digital AC clamp-on meter provides 400A and 600A ranges and a 42 mm jaw size.

MX1140 measures AC and DC current up to 1000 Arms. Jaw opening 53 mm (max. conductor size 51mm)

MX1240 provides three AC current ranges 40, 400 and 1000A. Same jaw size as MX1140

## A clamp-on for AC and DC circuits

The MX1140 clamp-on meter allows, for both AC and DC circuits, measurement of current (up to 1000Arms), voltages, resistance, continuity and frequencies. The use of Hall effect sensors guarantees the accuracy and precision of all measurements. Its large jaws will test conductors up to 51 mm thick. The «AUTO ZERO» function allows the user to reset the meter to zero quickly and easily. An audible test for continuity, automatic range selection, conformity with IEC1010 Cat.III standard and its price make the instrument ideal for industrial maintenance applications.

### MX345

### MX640

### MX1140

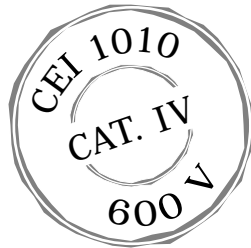
### MX1240

#### Technical Specifications - (Accuracy specified as +/- (%Reading (R) + D) all at 23°C +/-5°C, <75% R.H.)

AC Voltage	Ranges 400 V - 600 V	●	●	●	●
	Resolution 0.1 V - 1 V	●	●	●	●
	Accuracy +/- (1.2 %R + 5D)	●	●	●	●
	Input impedance	11 MΩ // < 100 pF	11 MΩ // < 100 pF	10 MΩ // < 100 pF	11 MΩ // < 100 pF
	Protection	600 Vrms	600 Vrms	850 Vrms	600 Vrms
DC Voltage	Ranges 400 V - 1000 V	●	●	●	●
	Resolution 0.1 V - 1 V	●	●	●	●
	Accuracy ±(1.2 %R + 5D)	●	●	●	●
	Input impedance		11 MΩ // < 100 pF	10 MΩ	11 MΩ // < 100 pF
AC Current	Ranges	400 A	400 A - 600A	RMS 400 A - 1000 A	400 A, 1200 A
	Resolution	0.1 A	0.1 A - 1A	0.1 A - 1 A	0.1 A - 1 A
	Accuracy	±(1.9 % R + 5D)	±(1.9 % R + 5D) / 400 A ±(2.9 % R + 5D) / 600 A	±(1.9 % R + 8D) / 40 A ±(1.9 % R + 7D) / 400 A ±(2.9 % R + 7D) / 1000 A 2000 AAC (1 min.)	±(1.9 % R + 8UR) / 40 A ±(1.9 % R + 5UR) / 400 A ±(2.9 % R + 5UR) / 1200 A 1500 AAC (1 min.)
	Protection	420 Arms	800 A		
DC Current	Ranges			400 A - 1000 A	
	Resolution			0.1 A - 1 A	
	Accuracy			±(1.9 % R + 9D) / 400 A ±(2.9 % R + 5D) / 1000 A	
Frequency	Ranges 20 Hz - 10 kHz			●	
	Resolution 1 Hz			●	
	Accuracy ±(0.5%R + 3D)			●	
	Protection 2000 AAC (1 min.)			●	
Resistance	Ranges	4 kΩ - 40 kΩ	4 kΩ - 40 kΩ	4 kΩ - 40 kΩ	4 kΩ - 40 kΩ
	Resolution	1 Ω - 10Ω	1 Ω - 10Ω	1 Ω - 10Ω	1 Ω - 10Ω
	Accuracy	±(1.9 % R + 8D)	±(2.0 % R + 9D)	±(1.9 % R + 9D)	±(2.0 % R + 9UR)
	Protection	600 Vrms		550 VAC rms	
Continuity	Threshold	< 100 Ω	< 100 Ω	< 100 Ω	< 100 Ω
	Indicator	tone buzzer	tone buzzer	tone buzzer	tone buzzer

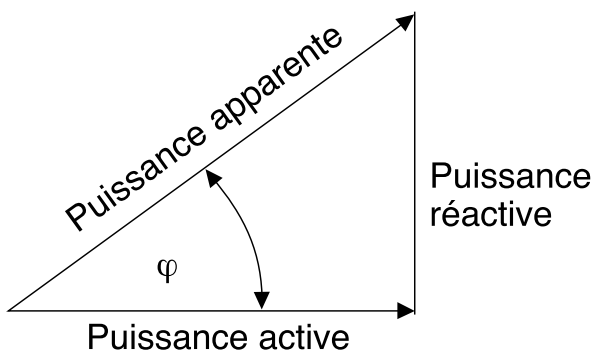


# Key Power Parameters At Your Fingertips



Built to meet the world's most demanding electrical challenges, Metrix MX240 and MX2040 Clamp-ons provide current, voltage, resistance, continuity and frequency measurements in the fields of repair and in the control of electrical systems. As ultimate monitoring and diagnostic tools, MX240 and MX2040 detect excessive power consumption, calculate the power factor automatically and also the value of the necessary compensation capacitor. They perform measurement of three-phase systems.

Conforming to the IEC1010 standard, they are the first clamp-on meters to meet the demands of the installation category level IV 600V.



## Measures Power Factor

The clamp-on meter calculates the power factor automatically, by determining the phase-angle between voltage and current. Dual display shows at the same time power factor with values of active, reactive or apparent power.

It also calculates the value of the necessary compensation capacitor. Conversely, the meter can calculate the effect on the power factor of a particular capacitor value. Ideally the power factor should tend towards 1.

**MX240**



**MX2040**



*Easy-to-use controls allow convenient and safe one-hand operation.*

## True RMS for accurate measurements

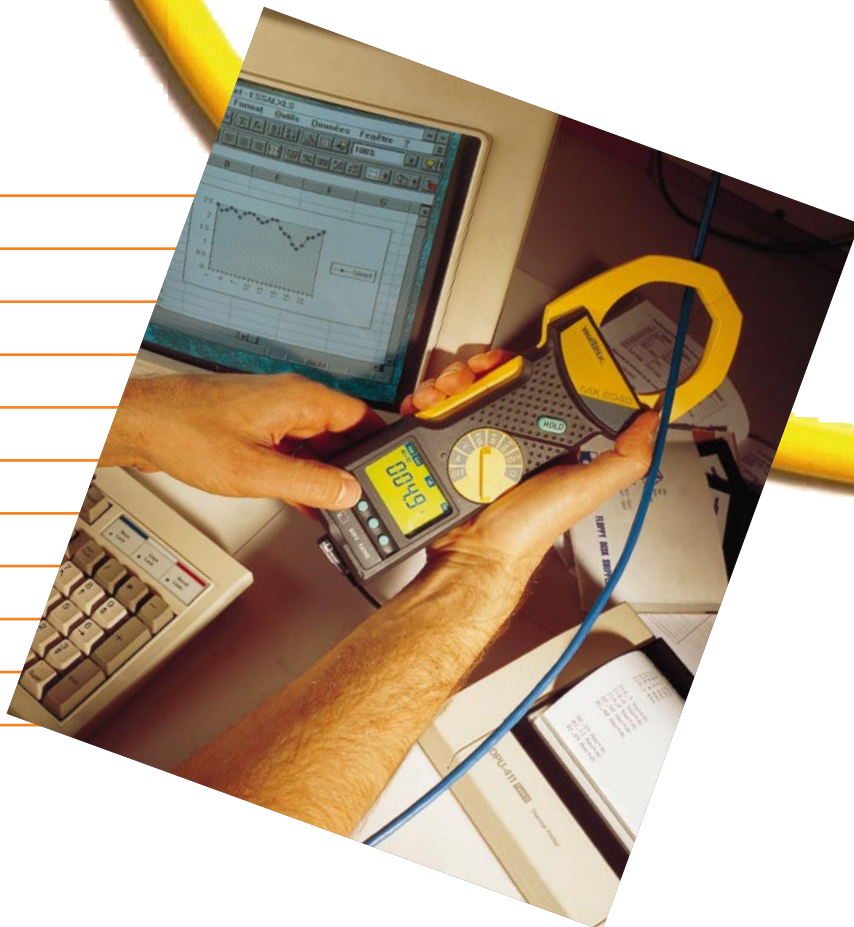
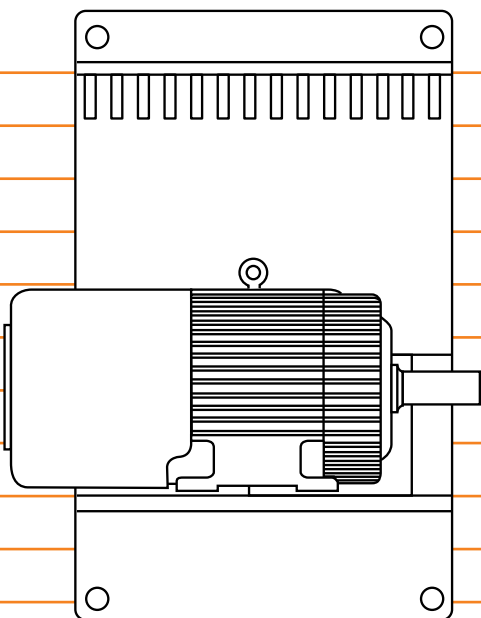
For the most accurate measurements, the clamp-on meter measures DC, RMS and True RMS values for all currents and voltages, even for non-sinusoidal signals.

## Measures irregular wave shapes

Because of digital processing, the clamp-on meter detects and measures peaks as short as 1msec, plus Min. Max and AVG values. In addition, the meter calculates a waveform's crest factor and warns of input overload and saturation.

## Measures kW-Hours

An internal timer, coupled with the ability to measure power, enables the meter to accumulate measurements and calculate the energy in kWh over a duration chosen by the user.

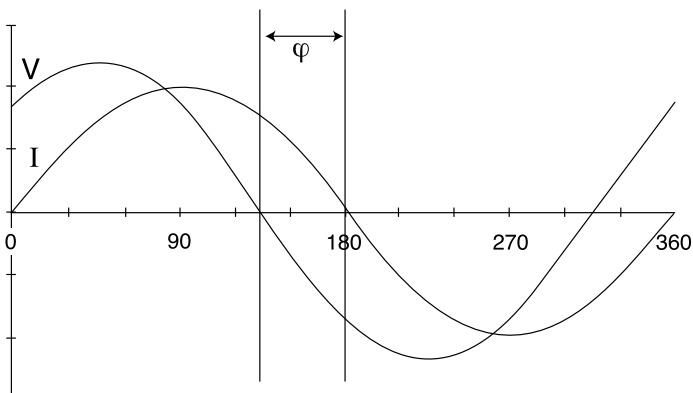


### Three-phase measurements

MX240 and MX2040 perform measurements on three-phase systems and indicate the direction of rotation, facilitating the connection of three phase motors. The sensitivity is 30V on each phase.

### Data Logger and Data Talker Modes

In Data Logger mode, the clamp-on meter can record 512 events at a programmable rate (0.5 sec. to 5 min) and output them either to a PC or to a printer, through the optional interface RS232 (option: HA1261). Also using the RS232 interface, the meter can send measurement results in Data Talker mode at a programmable rate either to a PC or to a printer.



*The power factor is the cosine of the phase angle  $\phi$  between current and voltage, improving it enables you to use energy more efficiently and cut power costs.*

### RS232 Interface

The RS232 interface allows readings to be sent to a printer or a PC. It can also be used to remotely control the clamp-on meter, and for the user to configure and process the results from a PC.

Specific applications can be developed using LabView\* and LabWindows CVI\* compatible drivers. Finally, the meter recalibration is controlled by software through the interface, without needing any mechanical adjustment to the clamp meter.

### Analog Output Port

With optional HA1268 interface, you can output a dynamic analog signal representing the current.

With optional HA1260 interface, you can output analog signals either in dynamic mode (voltage, current,...), or at the display rate (power factor, energy measurements)

### Built to tough European standards

Metrix MX240 and MX2040 clamp-on meters meet IEC1010, Cat. IV 600V, Cat.III 1000V, degree of pollution 2. Each meter is supplied with a Declaration of Conformity.

## General Specifications

Dual display : both displays up to 3,000 counts  
 Digit Height : 11,5 and 7 mm (with a high contrast display)  
 Range selection : Autoranging or manual ranging  
 Update rate : 2 / sec.  
 Coupling : DC, AC (RMS), AC+DC (TRMS)  
 Fast peak detection : 1 ms  
 Safety: IEC 1010, class 2, 600 V Cat. IV, 1000 V Cat. III. Degree of pollution: 2  
 Overload protection :

	Protective Component	Specification
Voltage steady state	High resistance, diode	1 100 V
Voltage transient	Varistors	9 200 V
Ohms	Resistors	600V

EMC: emission EN 55011, Group 1, class B; EN 50082-1, level 3

Operating temperature : -10 °C to +55 °C, 80% RH at 40 °C

Storage temperature : -20 °C to +75°C (without battery) - Temperature coefficient : 0.1% / °C

Power supply : 9 V, 6LF22 battery

Automatic switch-off : after 3 min.

Battery Life : 40 h. approx. (mains supply option : AA 2742)

Size : MX240 : 270 x 90 mm, MX2040 : 285 x 90 mm. Weight : MX240 : 430 g ; MX2040 : 450 g

Jaw opening : MX240 : 40 mm; MX2040 : 65 mm

Digital calibration

## Technical Specifications (23°C ± 1°C, 50 Hz)

«n %R + n» where R is reading and n is the variance of the least significant digit

### DC, AC (RMS), AC+DC (TRMS) CURRENT

Models	DC Ranges	AC/AC+DC Ranges	Meas. Peak	Resolution	Basic Accuracy
MX240	30 A	20 A	30 Apk	0.01 A	1 % R + 8D
	300 A	200 A	300 Apk	0.1 A	1 % R + 8D
MX2040	300 A	200 A	300 Apk	0.1 A	1 % R + 8D
	2000 A	2000 A	3000 Apk	1 A	1 % R + 8D

Bandwidth : DC and 10 Hz to 3 kHz

Additional error / frequency : 3 % per kHz

### DC, AC (RMS), AC+DC (TRMS) VOLTAGE

Ranges DC AC, AC+DC	Measurable Peak	Resolution	Basic Accuracy
600 VDC	600 Vpk	0.1V	0.5% R +15D
1000 VDC	1000 Vpk	1 V	0.5% R + 8D

Input impedance : 970 kΩ

Bandwidth : DC and 10 Hz to 3 kHz

Additional error / frequency: 1% from 400 Hz to 1 kHz and 3.5% from 1 kHz to 3 kHz

### ENERGY CONSUMPTION

Models	Range	Resolution	Basic Accuracy
MX240	2 kWh	1	1.5%R + 10D
MX240 / MX2040	20 kWh	10	1.5%R + 10D
MX240 / MX2040	200 kWh	100	1.5%R + 10D
MX2040	2 000 kWh	1 k	1.5%R + 10D

Accuracy varies : < 6 % / kHz above 50 Hz

Bandwidth : DC and 10 Hz to 3 kHz

### POWER (Active, Reactive, Apparent)

Models	Range*	Resolution*	Basic Accuracy
MX240	2 k	0.001 k	1.5%R + 10D
MX240/MX2040	20 k	0.01 k	1.5%R + 10D
MX240/MX2040	200 k	0.10 k	1.5%R + 10D
MX240	2000 k	1.0 k	1.5%R + 10D

\* For Active Power : Watts (W)

Reactive Power : Volts-Amps reactive (Var)

Apparent Power : Volts-Amps (VA)

Accuracy varies <6% / kHz above 50 Hz

Bandwidth : DC and 10 Hz to 3 kHz

### CONTINUITY INDICATOR

Threshold : < 30 Ω

Response time : 100 ms

### RESISTANCE

Range	Resolution	Accuracy
200 Ω	0.1 Ω	1.0%R + 5 D
2 000 Ω	1 Ω	1.0%R + 5 D

Test current : 0.5 mA approx.

Max. open circuit voltage : 80 V

### Supplied with :

- 3 Test leads
- 3 Probes
- 3 Alligator clips



### FREQUENCY COUNTER (0.5 Hz to 2 kHz)

Range	Resolution	Accuracy
20 Hz	0.01 Hz	0.3 %R + 1D
200 Hz	0.1 Hz	0.3 %R + 1D
2 000 Hz	1 Hz	0.3 %R + 1D

### POWER FACTOR (cos φ)

Range	Resolution	Accuracy capacitive or inductive
0 to 1	0.01	2° at 50 Hz or 60 Hz 3° at 400 Hz

V > 60V

and I > 3A (MX240)

or I > 30A (MX2040),

from 10 to 400 Hz

Phase shift measured between zero crossings of voltage and current signals.



Durable carrying case HA1339  
 to organize the clamp-on meter with  
 its test leads, test probes and other accessories.  
 Ideal for testing in the field or at the plant.

### Options :

- HA1260 : analog adapter for all measuring values
- HA1261 : RS232C interface (1200 bauds)
- HA1268 : analog adapter for current only
- AE0224 : soft carrying case
- HA1339 : durable carrying case
- AA2742 : mains power supply



# Multifunction Clamp-on DMMs

Metrix MX210 and MX215 enable you to quickly determine actual operating conditions for AC and DC power distribution systems such as inverters and frequency converters. Ideal for measuring waveforms with a high content of high-order harmonics.



Optional HX-3PL 3-Phase adapter provides current, power, frequency and phase indications in 3-phase systems. Measures and displays  $\cos \varphi$  and phase sequence.

	Current	Voltage	Apparent Power	Active Power	Power Factor	Frequency
<b>MX200 (True RMS)</b>						
Range	20/200 A	200/750 V	2/20 kVA	2/20 kW	1...0.3	200 Hz/1 kHz
Resolution	10/100 mA	0.1/1 V	1/10 VA	1/10 W	0.01	0.1/3 Hz
Bandwidth	DC	DC	DC	DC		
	15 Hz-1 kHz	15 Hz-1 kHz	15 Hz-1 kHz	15 Hz-66 Hz	15 Hz-66 Hz	5 Hz-1 kHz
Sensitivity					4 A/10 V	5V
Current/Voltage						
Accuracy	1 %	0.50 %	1.5 % typ.	0.8 % typ.	2.5 °	0.50 %
Analog Output	50/5 mV/A					
<b>MX1200S (True RMS)</b>						
Range	200/1000 A	200/750 V	20/200 kVA	20/200 kW	1...0.3	200 Hz/1 kHz
Resolution	0.1/1 A	0.1/1 V	10/100 VA	10/100 W	0.01	0.1/3 Hz
Bandwidth	DC	DC	DC	DC		
	15 Hz-1 kHz	15 Hz-1 kHz	15 Hz-1 kHz	15 Hz-66 Hz	15 Hz-66 Hz	5 Hz-1 kHz
Sensitivity					20 A/20 V	20V
Current/Voltage						
Accuracy	1 %	0.50 %	2 % typ.	2 % typ.	1.5 °	0.50 %
Analog output	5/1 mV/A					
<b>MX210 (True RMS) - Min. inverter switching frequency: 1 kHz</b>						
Range	20/200 A	200/750 V	2/20 kVA	2/20 kW		200 Hz/1 kHz
Resolution	10/100 mA	0.1/1 V	1/10 VA	1/10 W		0.1/3 Hz
Bandwidth	DC	DC	DC	DC		
Total	15 Hz-1 kHz	15 Hz-10 kHz	15 Hz-1 kHz			
Fundamental	15 Hz- 100 Hz	15 Hz- 100 Hz		15 Hz- 100 Hz		5 Hz- 100 Hz
Sensitivity						4 A/30 V
Current/Voltage						
Accuracy Total	1 %	0.50 %	1.5 % typ.			
Fundamental	2.50 %	2 %		2% typ.		1.50 %
Analog Output	50/5 mV/A					
<b>MX215 (True RMS) - Min. inverter switching frequency: 5 kHz</b>						
Range	20/200 A	200/750 V	2/20 kVA	2/20 kW		200 Hz/1 kHz
Resolution	10/100 mA	0.1/1 V	1/10 VA	1/10 W		0.1/3 Hz
Bandwidth	DC	DC	DC	DC		
Total	15 Hz-1 kHz	15 Hz-10 kHz	15 Hz-1 kHz			
Fundamental	15 Hz- 500 Hz	15 Hz- 500 Hz		5 Hz- 500 Hz		5 Hz- 500 Hz
Sensitivity						4 A/30 V
Current/Voltage						
Accuracy Total	1 %	0.50 %	1.5 % typ.			
Fundamental	2.50 %	2 %		2% typ.		1.50 %
Sortie analogique	50/5 mV/A					

