Flexible probe for AC current
Model MA200 30-300/3 (insulated AC current probe)

Current	45 A peak	450 A peak
Output	100 mV/A	10 mV/A

Description

The Mini***FLEX*** MA200 is a flexible sensor comprising an active part (Rogowski coil) linked to a casing containing electronics.

Unlike a current clamp with magnetic circuits, the Mini***FLEX*** models are flexible and are not subject to magnetic saturation constraints, so they offer excellent linearity, low phase shift and a large dynamic range for measurement (up to several kA) while remaining easy to use.

The oscilloscope probes in the MA200 series a specially designed for viewing alternating currents in order to assess the transition and propagation times on electrotechnical equipment.

The sensors' flexibility makes it simple to clamp and measure any conductor, whatever its type (cable, busbar, strand, etc. and accessibility.

The click-lock system for opening and closing the coil is specially designed for use with safety gloves.

The casing can be connected to any oscilloscope equipped with an AC voltage input.

Specifications for current measurement (1)

Calibre	**30 A**	**300 A**
Measurement range in use	0.5...30 A AC (45 A peak)	0.5...300 A AC (450 A peak)
Specified measurement range (2)	5...30 A AC (45 A peak)	5...300 A AC (450 A peak)
Output/input ratio	100 mV/A	10 mV/A
Accuracy in % of output signal	≤ 1 % + 0.3 A	
Phase shift at 1 kHz	≤ 1.5°	
Residual current (noise) at I = 0	≤ 0.5 A rms	
Output impedance	1 kΩ	

Frequency measurement specifications (1)

Calibre	**30 A**	**300 A**
Bandwidth at -3 dB	2 Hz…1 MHz	2 Hz…1 MHz
Rise time (3) (10 to 90 %) Fall time (4) (10 to 90 %)	0.3 µs (typical)	0.24 µs (typical)
Propagation time (5) (to 10 %)	0.4 µs (typical)	0.3 µs (typical)
Insertion impedance at 10 kHz	< 0.05 mΩ	

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Electrical specifications (1)

Operating voltage:
600 V rms (Cat. IV)
1000 V rms (Cat. III)

Battery:
9 V alkaline battery (NEDA 1604A, IEC 6LR61)

Battery life:
100 hours typical

Typical consumption:
3.6 mA typical

Battery level indication:
Green LED when > 7.0 V approx.

Influence of battery voltage:
≤ 0.1 % from 9 V to 7 V

Influence of temperature:
≤ 0.2 % / 10 K

Influence of humidity:
≤ 0.5 % from 10 % to 90 % RH without condensation

Influence of conductor position in the sensor (8):
≤ 2.5 %

Influence of sensor deformation (6):
≤ 1 %

Influence of an adjacent conductor with circulating AC current (7):
≤ 1.5 % or 36.5 dB

Common mode rejection:
- between enclosure and secondary: ≤ 75 dB
- between sensor and secondary: ≤ 80 dB

Influence of the measurement instrument's impedance Z:
0.1 % / Z (in MΩ)

Mechanical specifications

Clamping capacity:
Model 170 mm: Ø max 45 mm
Model 250 mm: Ø max 70 mm

Operating temperature:
-10 °C to +55 °C

Storage temperature:
-40 °C to +70 °C

Max. temperature of clamped conductor (measured):
≤ 90 °C

Relative humidity for operation:
0 to 85 % RH with a linear decrease above 35 °C

Operating altitude:
0 to 2,000 m

Storage altitude:
≤ 12,000 m

Casing protection rating (leakproofing):
Casing: IP50
Sensor: IP50
according to EN 60529/A1 Ed.06/2000

Shock resistance:
IK04 according to EN 50102 Ed. 1995

Self-extinguishing capability:
Casing: UL94-V2
Sensor: UL94 V0

Dimensions:
Casing: 140 x 64 x 28 mm
Connector lead: 2 m (connects sensor to casing)
Ø of sensor: 5.5 mm approx.
Connection cable Ø: 3 mm approx.

Colours:
Sensor: red
Sensor closing system: dark grey
Sensor locking tab: yellow
Casing: dark grey

Output:
Depending on model:
Coaxial cable 40 cm long, terminated by an insulated BNC plug

Safety specifications

Electrical safety:
Class II equipment with double or reinforced insulation between the primary and the secondary (winding connected to the connection cable) as per EN 61010-1 and 61010-2-032:
- 1000 V Cat. III, pollution degree 2
- 600 V Cat. IV, pollution degree 2
- Type-B sensor
- 600 V Cat. III between the BNC output and the external enclosure of the casing

Electromagnetic compatibility (EMC):
Complies with the IEC 61326 (Ed. 1997) + A1 (Ed. 1998)
- Adequate immunity to disturbances for industrial environments
- Adequate immunity to disturbances for residential environments

(1) Conditions of reference: 23 °C ± 5 °K, 20 % to 75 % RH
Battery voltage: 9 V ± 0.5 V
Continuous external DC magnetic field (earth field) < 40 A/m
Absence of external AC magnetic field
External electrical field < 1 V/m
Position of conductor measured: centred in the measurement coil
Shape of measurement coil: quasi-circular
Measurement instrument input impedance (oscilloscope) ≥ 1 MΩ
Frequency and form of signal measured: 40 to 400 Hz sinusoidal.

(2) Measurement range for the specifications indicated in this document

(3) Rise time (t_r)

(4) Fall time (t_f)

(5) Delay time (t_d)

(6) Oblong shape

(7) Adjacent conductor 1 cm from sensor ; ≤ 3 % or 30.5 dB near click-lock system

(8) ≤ 6 % near click-lock system

(9) Typical curve obtained by mathematical modelling

To order		Reference
Mini***FLEX*** **MA200**	**30-300 A / 3 V,** length 170 mm with operating manual and battery	P01120570
Mini***FLEX*** **MA200**	**30-300 A / 3 V,** length 250 mm with operating manual and battery	P01120571

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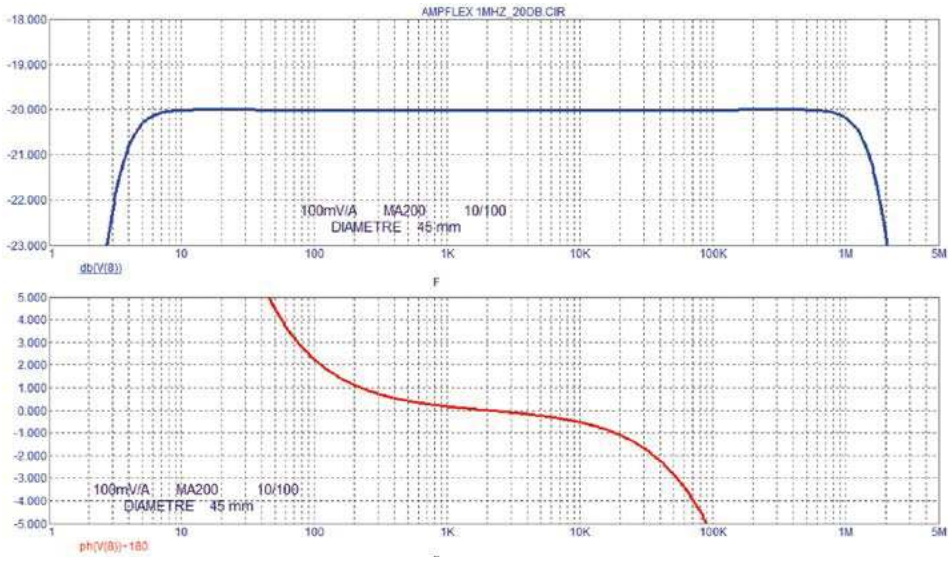
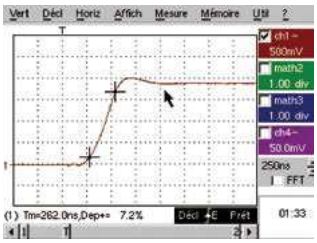
■ 170 mm loop - 30 A calibre

Frequency and phase responses [9]

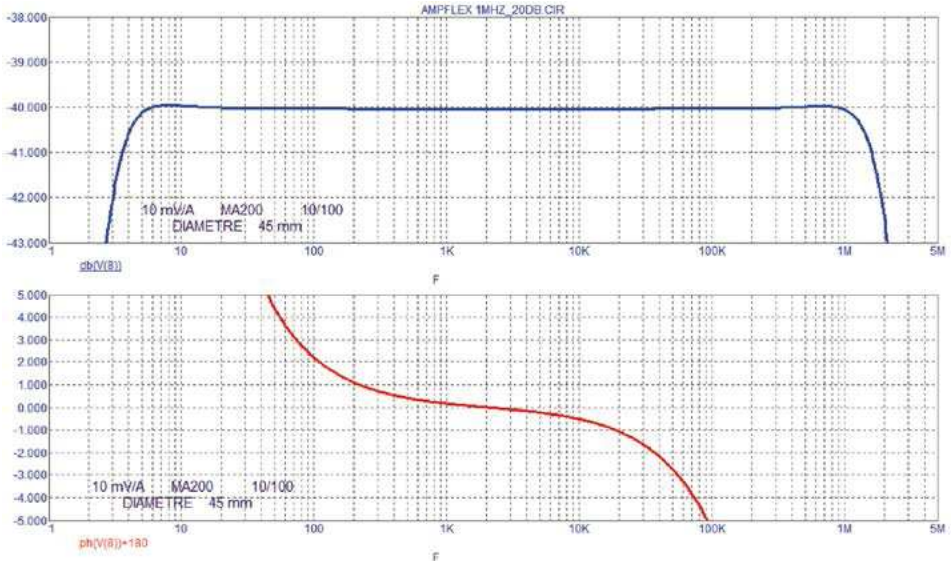


Pulse response



■ 170 mm loop - 300 A calibre

Frequency and phase responses [9]



Pulse response