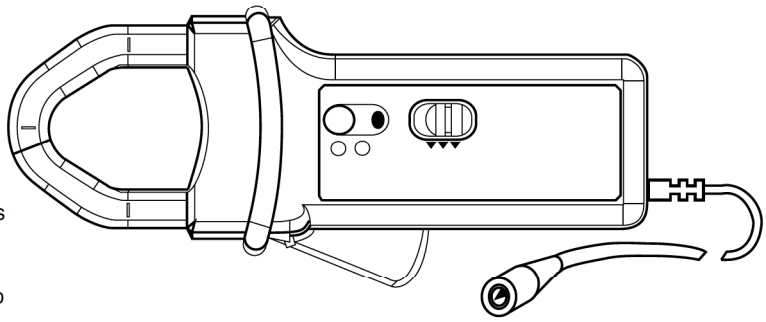
Oscilloscope clamp for AC/DC current
Model PAC12

Current	40 A AC 60 A DC	400 A AC 600 A DC
Output	10 mV/A	1 mV/A



■ Description

The PAC12 model accurately measures AC or DC currents by using the Hall-effect principle.

This clamp with mV output on BNC (direct reading on oscilloscopes, etc.) is equipped with an automatic DC Zero system.

■ Electrical specifications

Current calibres:
0.2 A AC...40 A AC (60 A peak) / 0.4 A DC...60 A DC
0.5 A AC...400 A AC (600 A peak) / 0.5 A DC...600 A DC

Output signal:
10 mV AC+DC / A AC+DC (0.6 V for 60 A)
1 mV AC+DC / A AC+DC (0.6 V for 600 A)

Accuracy and phase shift [1]:

■ 60 A calibre

Primary current	0.5 A…10 A	10 A…20 A	20 A…40 A	40 A…60 A (only DC)
Accuracy in % of output signal	≤ 1.5 % + 5 mV	≤ 1.5 % + 5 mV	≤ 1.5 % + 5 mV	≤ 1.5 %
Phase shift	Not specified	≤ 3°	≤ 2.2°	–

■ 600 A calibre

Primary current	0.5 A…10 A	10 A…100 A	100 A…300 A	300 A…400 A	400 A…600 A (only DC)
% Accuracy of output signal	≤ 1.5 % + 1 mV	≤ 1.5 % + 1 mV	≤ 2 %	≤ 2 %	≤ 2.5 %
Phase shift	Not specified	≤ 2.2°	≤ 2.2°	≤ 1.5°	-

Bandwidth:
DC...10 kHz (-3 dB) (depending on current value)

Rise/fall time from 10 % to 90 %:
29 µs

10 % delay time:
15 µs

Insertion impedance (at 400 Hz / 10 kHz):
< 2.7 mΩ / < 72 mΩ

Maximum currents:
3000 A DC or 1000 A AC continuous for a frequency ≤ 1 kHz (limitation proportional to the inverse of one third of the frequency above that)

DC zero adjustment:
Automatic
■ 60 A calibre:
± 10 A in 25 to 40 mA increments
■ 600 A calibre:
± 10 A in 25 to 40 mA increments

Typical output noise level (peak-peak) from DC to 100 kHz:
■ 60 A calibre:
DC to 1 kHz: ≤ 8 mV or 0.8 A DC
DC to 5 kHz: ≤12 mV or 1.2 A DC
0.1 Hz to 5 kHz: ≤ 2.0 mV rms or 0.2 A rms
■ 600 A calibre:
DC to 1 kHz: ≤ 1 mV or 1 A DC
DC to 5 kHz: ≤ 1.5 mV or 1.5 A DC
1 Hz to 5 kHz: ≤ 500 µV rms or 0.5 A rms

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

Battery life:
50 hours typical

Typical consumption:
10 mA typical / 14 mA max.

Battery level indicator:
Green LED

Overload indicator:
Red LED indicates if measured current is too high for the selected range
Influence of power supply voltage:
≤ 0.1 % of the reading

Influence of temperature:
Measurement: ≤ 300 ppm/K or 0.3 % of output signal per 10 °K
DC zero: 40 mA/10 °K

Influence of relative humidity:
< 0.5 % of output signal

Influence of adjacent conductor at 23 mm:
≤ 10 mA/A at 50 Hz

Influence of external field:
≤ 1.3 A pour 400 A/m

Influence of Ø 20 mm conductor position in jaws:
DC at 440 Hz: ≤ 0.5 % of the reading
DC at 1 kHz: ≤ 1 % of the reading
DC at 2 kHz: ≤ 3 % of the reading
DC at 5 kHz: ≤ 10 % of the reading

Influence of frequency [2]:
< 1 % of output signal from 65 Hz...440 Hz
< 3.5 % of output signal from 440 Hz...2 kHz
3 dB % of output signal from 2 kHz...10 kHz

Common mode rejection:
> 65 dB A/V at 50 Hz

Remanence:
0 to 50 A DC: 0.8 A typical
0 to 100 A DC: 1.3 A typical
0 to 200 A A DC: 2.1 A typical
0 to 400 A A DC: 3.3 A typical
0 to 600 A A DC: 4.0 A typical

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Mechanical specifications

Max. jaw opening:
31 mm

Clamping capacity:
Cables: Ø 30 mm
Ø 24 mm x 2
Bars: 1 busbar 50 x 10 mm
2 busbars 31.5 x 10 mm
3 busbars 25 x 8 mm
4 busbars 25 x 5 mm

Output:
Coaxial cable 2 m long, terminated by an insulated BNC connector

Dimensions:
224 x 97 x 44 mm

Weight:
440 g with battery

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

Storage temperature:
-40 °C to +80 °C

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

Operating altitude:
0 to 2,000 m

Casing protection rating:
IP40 (IEC 529)

Drop test:
1 m (IEC 68-2-32)

Shock resistance:
100 g / 6 ms / half-period (IEC 68-2-27)

Protection against impacts:
IK04 0.5 J (EN 50102)

Vibration resistance:
5-15 Hz: 1.5 mm peak
15-25 Hz: 1 mm peak
25-55 Hz: 0.25 mm peak
(IEC 68-2-6)

Self-extinguishing capability:
UL94 V2

Colours:
Dark grey casing with red jaws

Safety specifications

Electrical safety:
Instrument with double insulation or reinforced insulation between the primary, the secondary and the grippable part located under the guard as per IEC 1010-1 & IEC 1010-2-032
- 600 V category III, pollution degree 2
- 300 V category IV, pollution degree 2

Electromagnetic compatibility (EMC):
EN 50081-1: class B
EN 50082-2:
- Electrostatic discharge IEC 1000-4-2:
  4 kV in contact, performance criterion B
  8 kV in the air, performance criterion B
- Radiated field IEC 1000-4-3:
  3 V/m level 2: influence < 5 % of measurement range
- Fast transients IEC 1000-4-4:
  1 kV performance criterion B
- Magnetic field at the network frequency IEC 1000-4-8:
  field of 30 A/m at 50 Hz level 4
  performance criterion A
- Conducted disturbances (IEC 1000-4-6):
  3 V performance criterion A

(1) Conditions of reference: 23 °C ± 5 °K, 20 % at 75 % RH, power supply voltage 9 V ± 0.1 V DC sinusoidal signal with frequency of DC to 65 Hz, external magnetic field < 40 A/m, no DC components, no external conductor with circulating current, conductor centred for measurement, load impedance > 1 MΩ / < 100 pF.

(2) Out of reference domain.

To order	Reference
AC/DC current clamp model **PAC12** for oscilloscope with battery and user's manual	P01120072

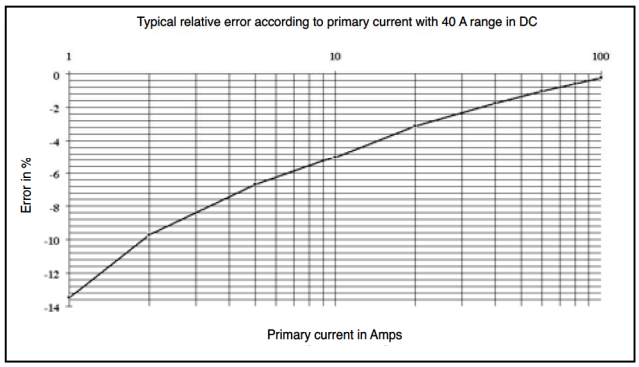
Oscilloscope clamp for AC/DC current
Model PAC12

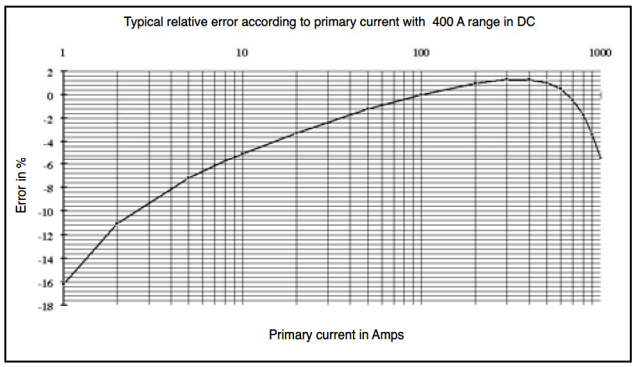
■ Curves

60 A calibre

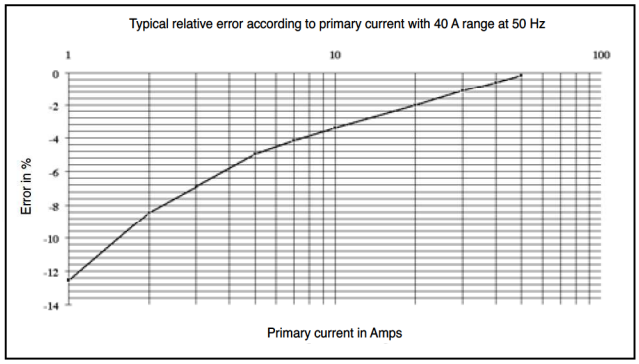
600 A calibre

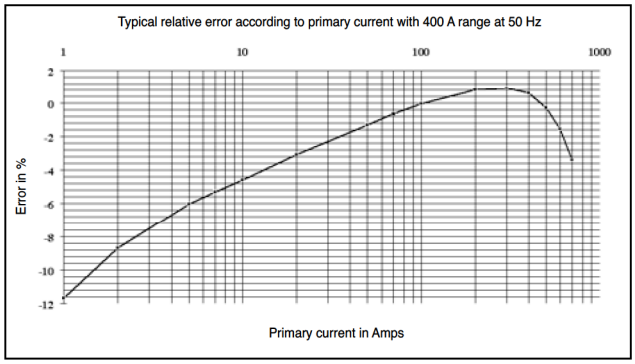
Linearity with DC



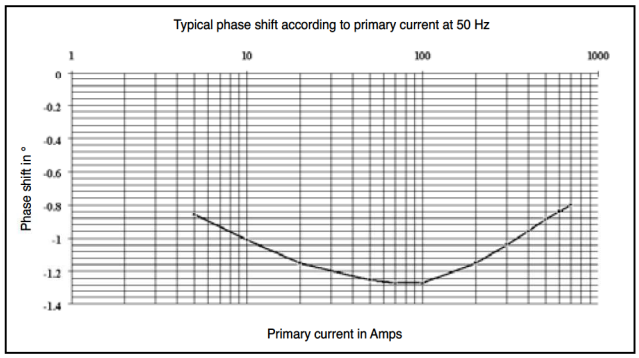


Linearity for AC

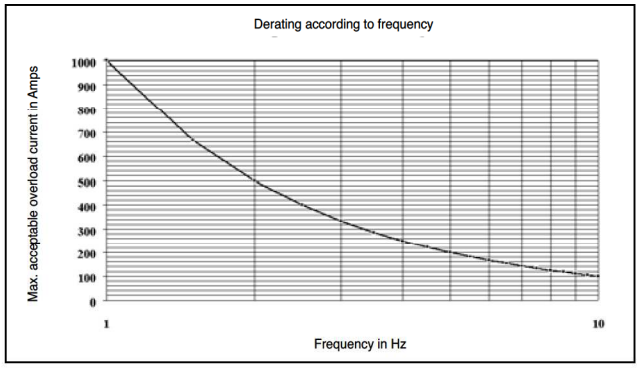




Phase shift



Limitation of measurable current according to the frequency



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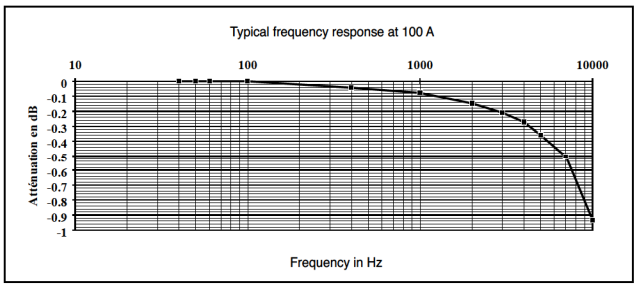
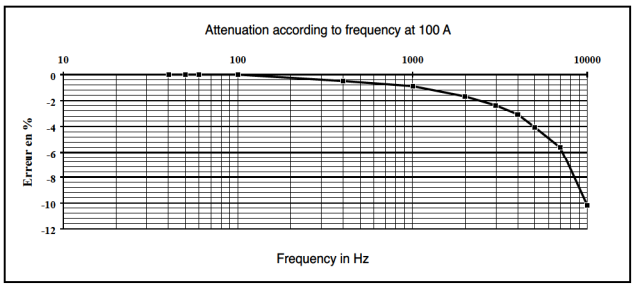
■ Curves

600 A calibre

Frequency response



Attenuation according to the frequency



60 A calibre

600 A calibre

Pulse response