

Current clamps for AC current

D_N series



D_N series

The D_N series comprises a range of high-performance clamp-on AC current probes designed for high current measurements.

Their excellent current transformation ratios and low phase shift, combined with a broad frequency response, allows highly accurate current and power measurements.

High quality magnetic cores and windings mean high-precision current measurement up to 3000 A (AC).

The rectangular jaws can be used to clamp large-diameter cables or busbars.

The D_N series clamps provide true RMS measurement values and faithful signal reproduction.

There are two different kinds of model available in the D series: the first acts as a traditional current transformer with a current output (mA) and has a wide range of voltage ratios.

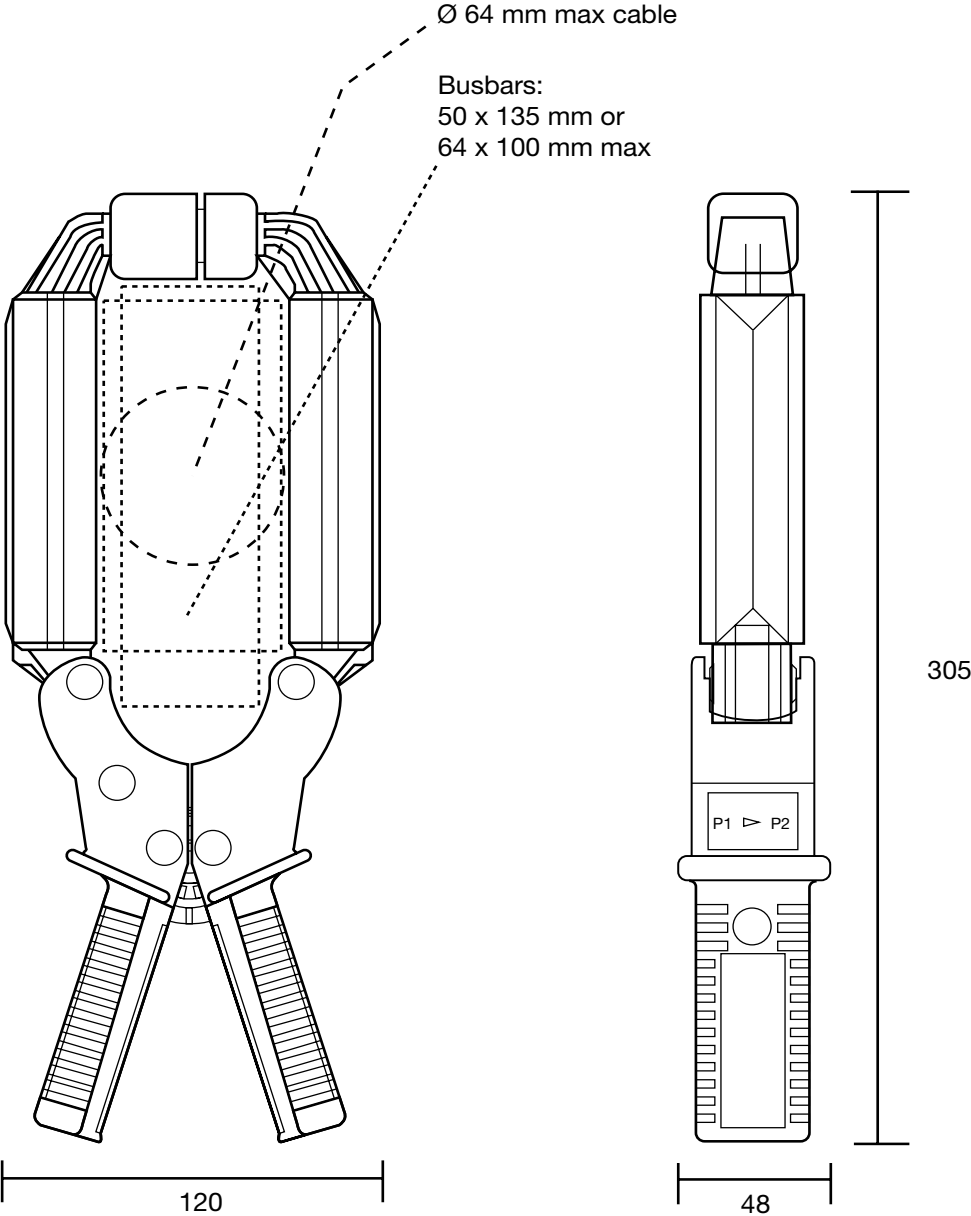
These clamps may also be used with multimeters, harmonic and power measurement equipment, logging apparatus or other instruments allowing AC current input.

The second type of model gives a voltage output in precise proportion to the measured current (1 mV/A, 10 mV/A or 100 mV/A) so you can display and log currents on instruments without current inputs.

Model D38N has been specifically designed for use with oscilloscopes, or other instruments with a BNC input.

Current clamps for AC current

DN series



Oscilloscope clamp for AC current

Model D38N (insulated AC current probe)

DN series

Current	90 A peak	900 A peak	9000 A peak
Output	10 mV/A	1 mV/A	0.1 mV/A

Description

The D38N offers accurate AC current measurement and a voltage output in mV allowing direct readings on oscilloscopes. A switch with 3 positions on the handle can be used to select the ranges. The wide opening of the jaws means they can be used on cables and small busbars.

Electrical specifications

Current calibres:

1 A AC ... 30 A AC (90 A peak)
 1 A AC ... 300 A AC (900 A peak)
 1 A AC ... 2400 A AC (9000 A peak)
 (3000 A for temperature < 35 °C)

Output signal:

10 mV/A AC (3 V for 30 A)
 1 mV/A AC (3 V for 300 A)
 0.1 mV/A AC (3 V for 3000 A)

Accuracy and phase shift ⁽¹⁾:

■ 30 A calibre

Primary current	1.5 A	6 A	30 A	36 A
% Accuracy of output signal	2 % ± 1 mV			
Phase shift	≤ 20°	≤ 10°	≤ 5°	≤ 5°

■ 300 A calibre

Primary current	15 A	60 A	300 A	360 A
% Accuracy of output signal	2 % ± 0.5 mV			
Phase shift	≤ 3°	≤ 1.5°	≤ 1°	≤ 1°

■ 3000 A calibre

Primary current	150 A	600 A	3000 A	3600 A
% Accuracy of output signal	2 % ± 0.2 mV			
Phase shift	≤ 3°	≤ 1.5°	≤ 1°	≤ 1°

Bandwidth:

10 Hz to 50 kHz (depending on current)

Rise/fall time from 10 % to 90 %:

4 μs

10 % delay time:

0.3 μs

Ampere second product:

- 30 A calibre: 30 A.s
- 300 A calibre: 125 A.s
- 3000 A calibre: 180 A.s

Insertion impedance (at 400 Hz / 10 kHz):

- 30 A calibre: < 0.1 mΩ / < 1 mΩ
- 300 A calibre: < 0.1 mΩ / < 0.5 mΩ
- 3000 A calibre: < 0.1 mΩ / < 0.4 mΩ

Maximum currents:

I < 2400 A permanent
 2400 A ... 2800 A for 10 minutes and then 30 minutes shutdown
 2800 A ... 4000 A for 5 minutes and then 30 minutes shutdown

Output impedance:

- 30 A calibre: ≤ 130 Ω ± 15 %
- 300 A calibre: ≤ 140 Ω ± 15 %
- 3000 A calibre: ≤ 140 Ω ± 15 %

Influence of temperature:

≤ 0.2 % of output signal per 10 °K

Influence of adjacent conductor:

≤ 5 mA/A at 50 Hz

Influence of DC current < 10 % of rated calibre superimposed on the rated current:

0.05 % / A DC

Influence of conductor position in jaws:

≤ 1 % + 0.1 A at 50/60 Hz

Influence of frequency ⁽²⁾:

- 30 A calibre: < 1 dB from 10 Hz...10 kHz
- 300 A calibre: < 1 dB from 10 Hz...10 kHz
- 3000 A calibre: < 1 dB from 10 Hz...10 kHz

Mechanical specifications

Max. jaw opening:

90 mm

Clamping capacity:

Cable: Ø max 64 mm
 Group of busbars:
 5 busbars of 125 x 5 mm
 3 busbars of 100 x 10 mm
 (busbars spaced by their thickness)

Output:

2 m coaxial lead with insulated BNC plug

Dimensions:

310 x 120 x 48 mm

Weight:

1200 g

Operating temperature:

-10 °C to +50 °C

Storage temperature:

-25 °C to +80 °C

Relative humidity for operation:

0 to 85 % RH with a linear decrease above 35 °C

Operating altitude:

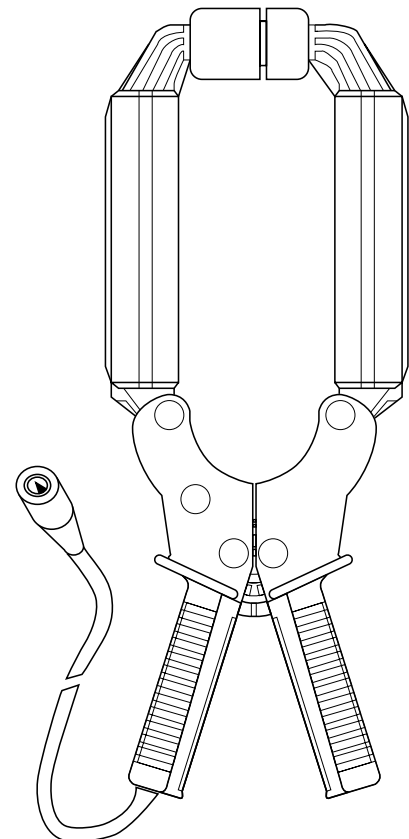
0 to 2,000 m

Casing protection rating:

IP 20 (IEC 529)

Drop test:

0.5 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:

10/55/10 Hz, 0.15 mm (IEC 68-2-6)

Self-extinguishing capability:

Handles: UL94 V0

Jaws: UL94 V2

Colours:

Dark grey handles 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

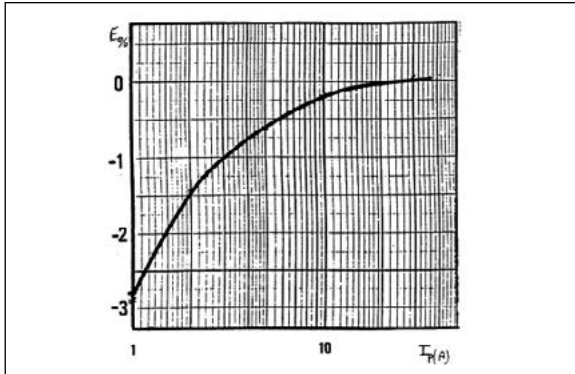
Oscilloscope clamp for AC current Model D38N (insulated AC current probe)

D_N series

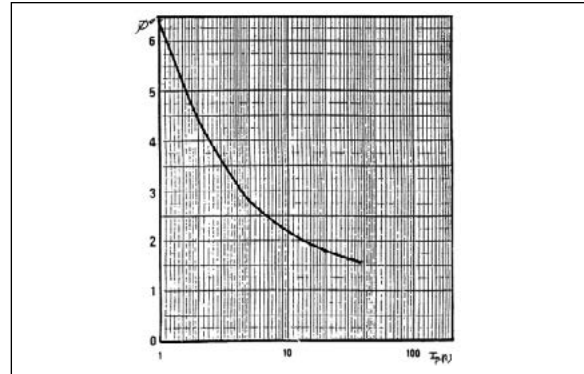
■ Curves at 50 Hz

30 A calibre

Error on measurement

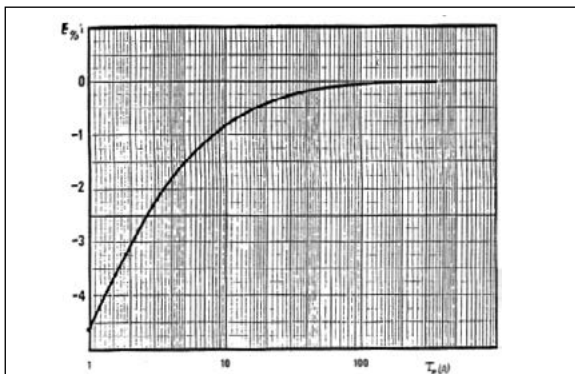


Phase shift

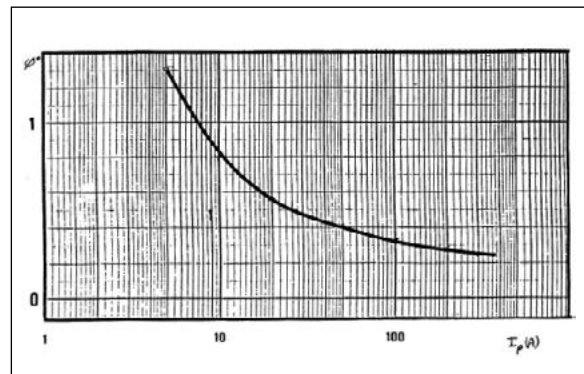


300 A calibre

Error on measurement

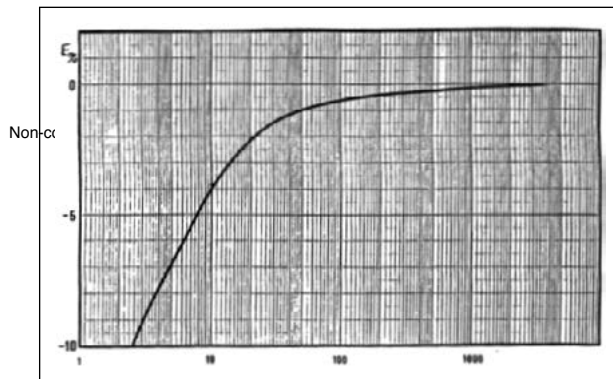


Phase shift

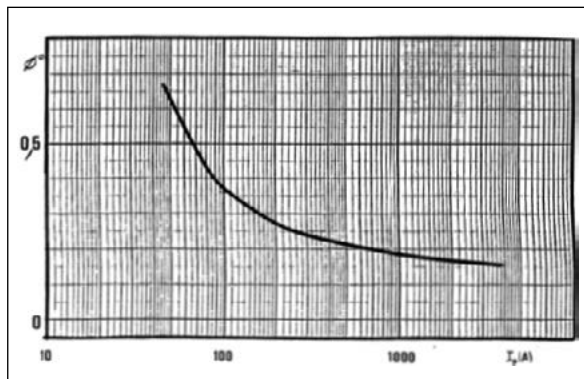


3000 A calibre

Error on measurement



Phase shift



Oscilloscope clamp for AC current

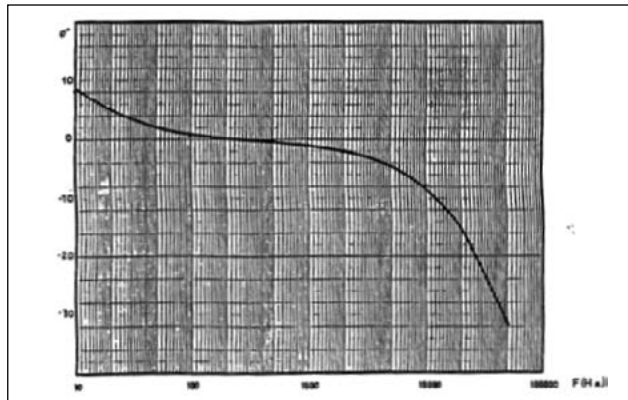
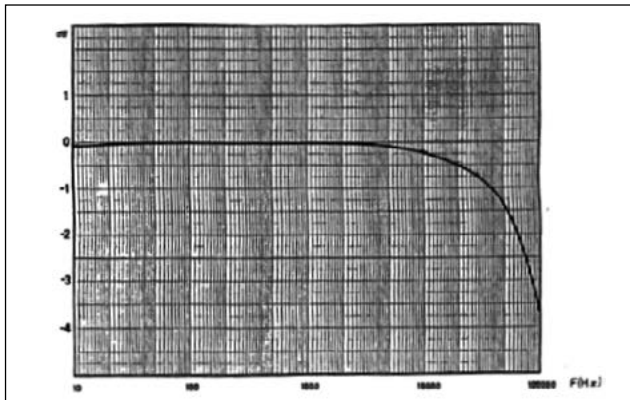
Model D38N (insulated AC current probe)

D_N series

■ Frequency response

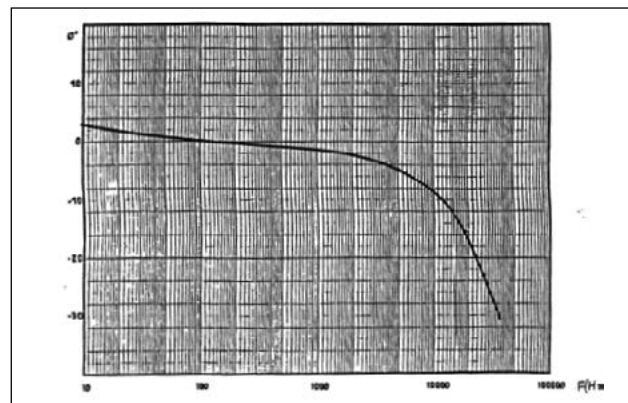
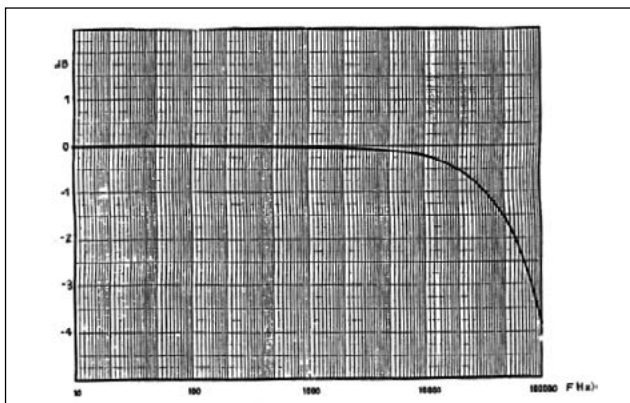
30 A calibre

I = 10 A



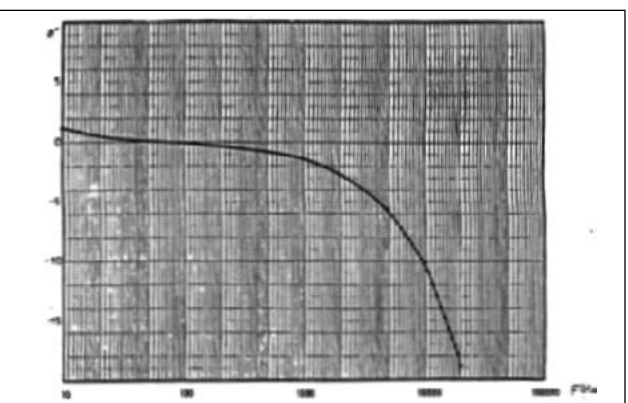
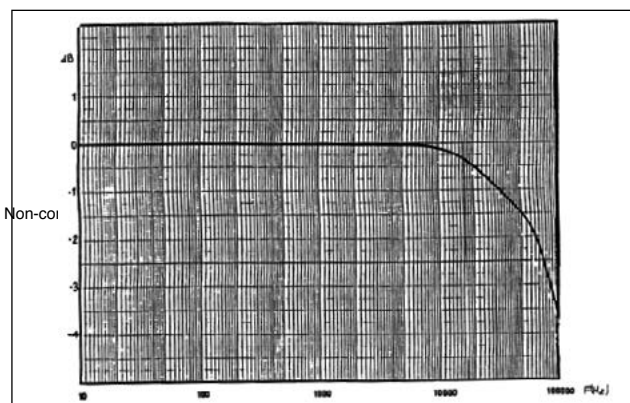
300 A calibre

I = 10 A



3000 A calibre

I = 100 A



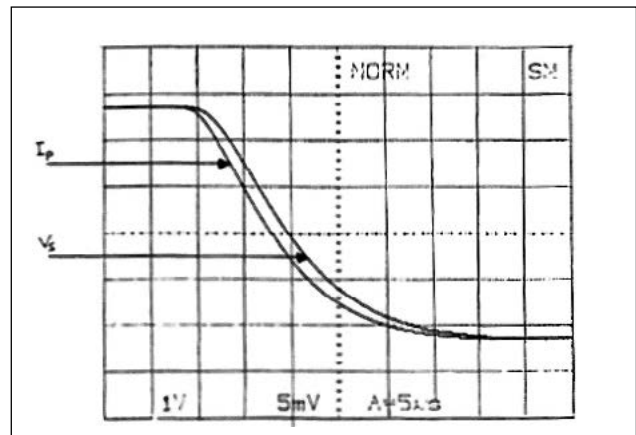
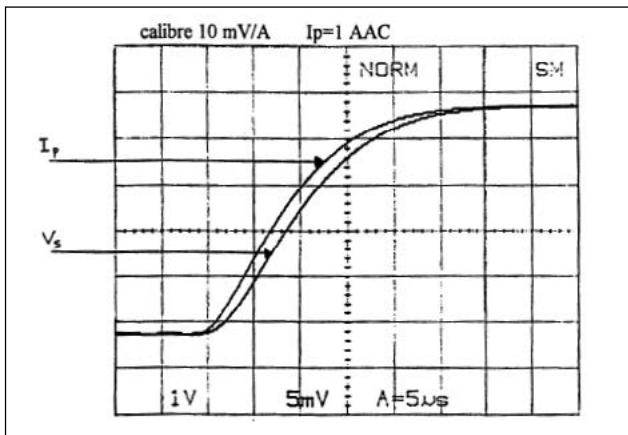
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Oscilloscope clamp for AC current Model D38N (insulated AC current probe)

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■ Response to a step ($I_p = 1\text{ A}$)

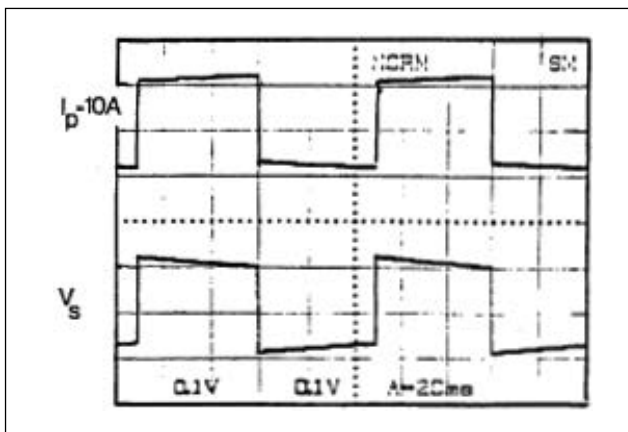
30 A calibre



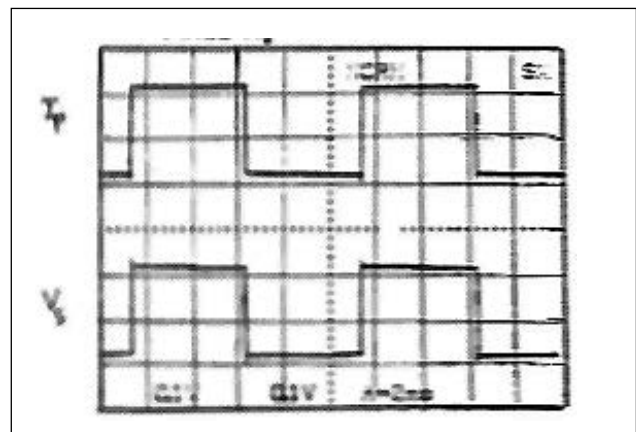
■ Response to a square signal ($I_p = 10\text{ A}$)

30 A calibre

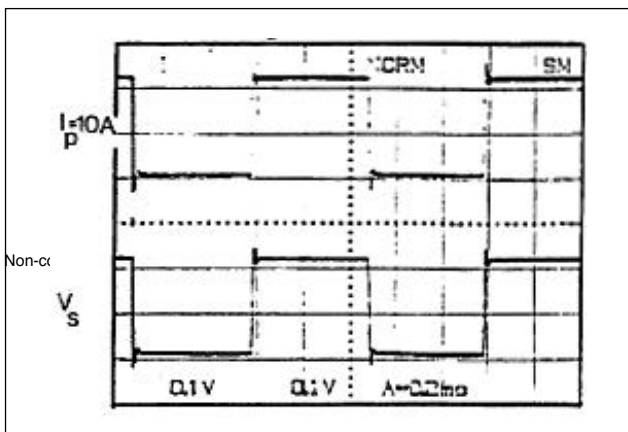
10 Hz



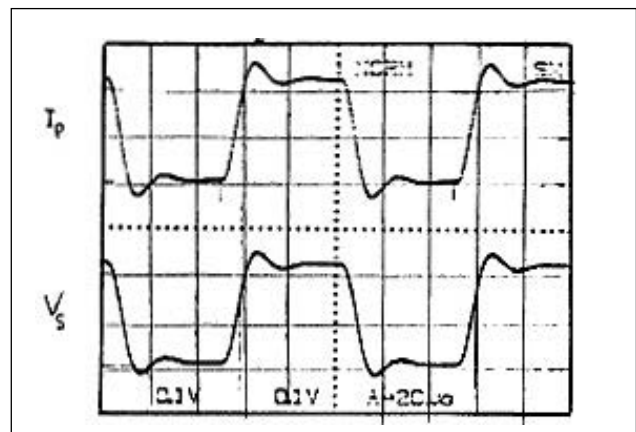
100 Hz



1 kHz



10 kHz

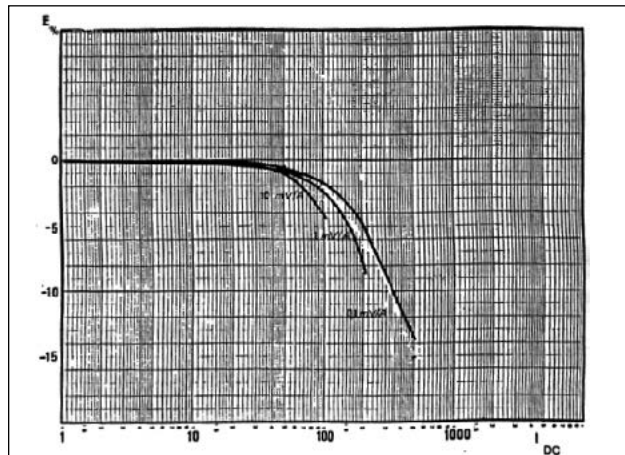


Oscilloscope clamp for AC current

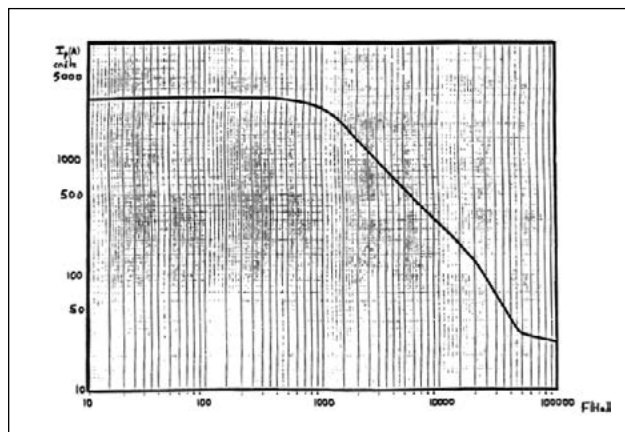
Model D38N (insulated AC current probe)

D_N series

■ Influence of a DC current superimposed on the signal



■ Maximum current according to the frequency



Non-contractual document

- (1) Conditions of reference: 23 °C ± 3 °K, 20 % to 75 % RH, sinusoidal signal with frequency of 48 Hz at 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 / < 47 pF.
 (2) Out of reference domain.

To order	Reference
AC current clamp model D38N for oscilloscope, with operating manual	P01120057A

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