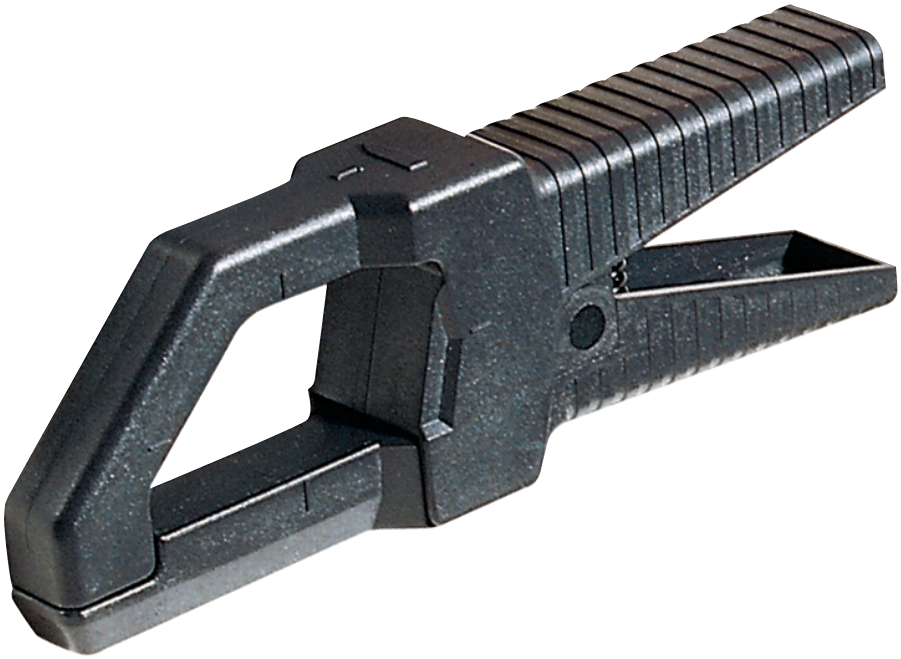
CURRENT CLAMPS FOR AC CURRENT



Y_N series

The Y series clamps are designed to be both rugged and versatile whilst remaining easy to use. The jaws are designed so that the clamps can be hooked onto cables and clamped onto busbars for current measurement up to 600 A AC.

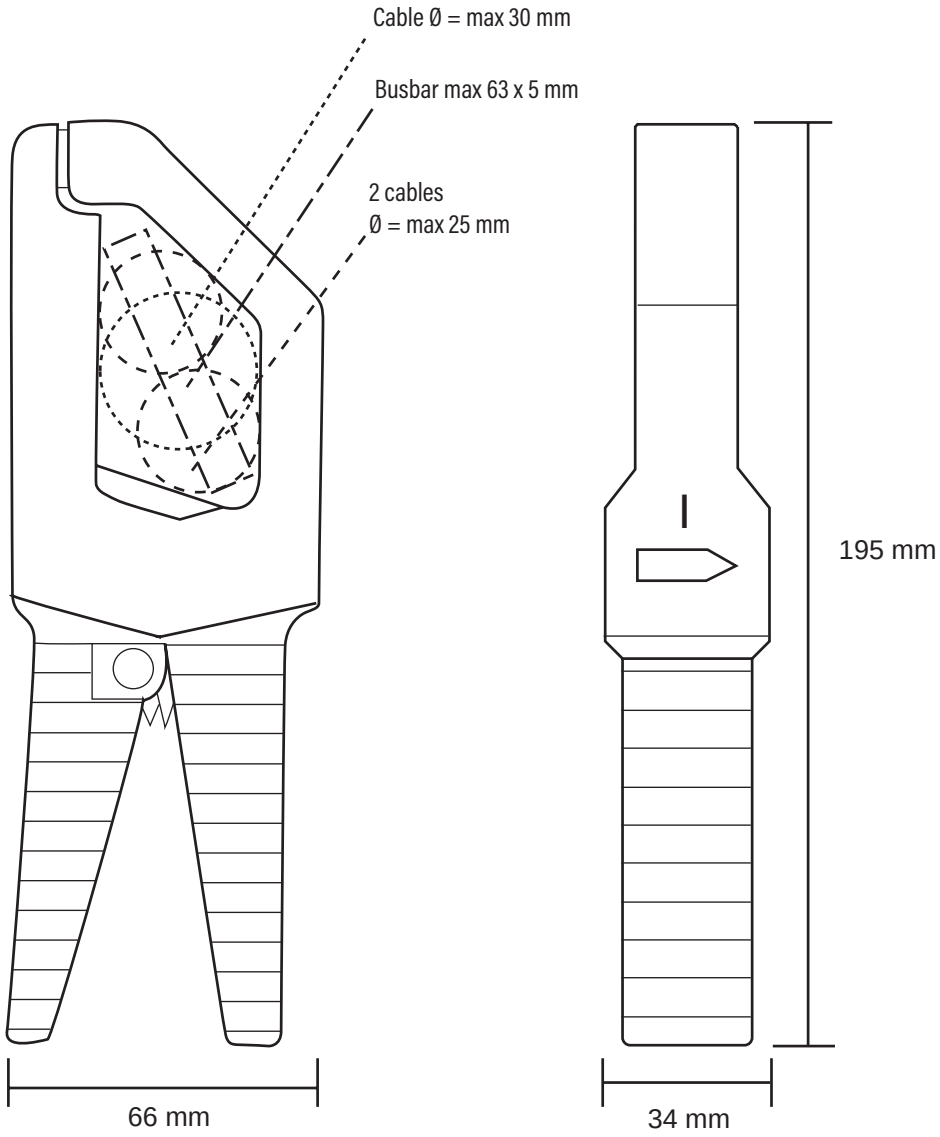
There are two types of Y series clamps available:

The first acts as a current transformer (ratios of 100:1 or 1,000:1), giving an output current that may be read by a multimeter, logger or other suitable devices with appropriate current calibres.

The other kind of Y series clamp has a DC voltage output proportional to the AC current measured, allowing instruments without current calibres to measure, display and record currents on a DC voltage calibre.

There is also a model available specifically for direct use with oscilloscopes.

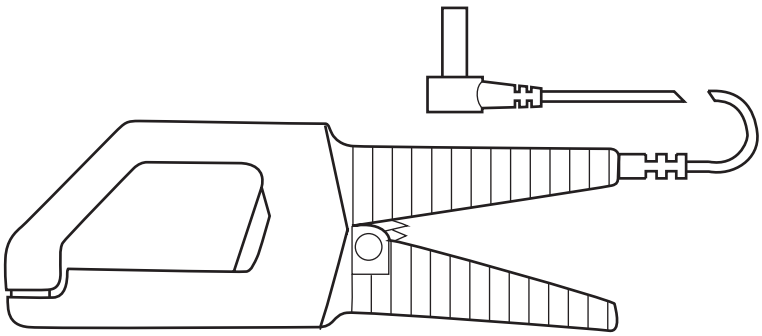
CURRENT CLAMPS FOR AC CURRENT



CURRENT CLAMPS FOR AC CURRENT

Model Y1N

Current	500 A AC
Ratio	1,000/1
Output	1 mA / A



Electrical specifications

- **Current range:**
  4 A AC .. 600 A AC
- **Turns Ratio:**
  1,000:1
- **Output signal:**
  1 mA AC / A AC
- **Accuracy** (1)**:**

Primary current:	4 A	25 A	100 A	250 A	500 A	600 A (2)
Accuracy in % of output signal	4.5 % + 0.5 mA	4.5 %	3.5 %	3 %	3 %	3 %
Phase shift	not specified	4°	2°	2°	2°	2°

  Class 3 at 1.5 VA
- **Bandwidth:**
  48 Hz .. 1,000 Hz
- **Load impedance:**
  5 Ω max
- **Overload:**
  700 A for 10 minutes
- **Maximum output voltage (secondary open):**
  Limited to 10 V peak max.
- **Operating voltage:**
  600 V_{RMS}
- **Common mode voltage:**
  600 V_{RMS}
- **Influence of adjacent and parallel conductors:**
  < 30 mA / A at 50 Hz
- **Influence of conductor position in jaws:**
  ± 1.5 %

Mechanical specifications

- **Operating temperature:**
  -15°C to +50°C
- **Storage temperature:**
  -40°C to +85°C
- **Influence of temperature:**
  < 0.1 % per 10 °K
- **Relative humidity for operation:**
  0 to 85 % RH with a linear decrease above 35 °C
- **Operating altitude:**
  0 to 2,000 m
- **Max. jaw opening:**
  33 mm
- **Clamping capacity:**
  Cable: Ø max 20 mm
  Busbar: 63 x 5 mm
- **Casing protection rating:**
  IP20 in accordance with IEC 529
- **Drop test:**
  1.5 m (IEC 68-2-32)
- **Shock resistance:**
  100 g, in accordance with IEC 68-2-27
- **Vibration resistance:**
  10 / 55/10 Hz, 0.15 mm test in accordance with IEC 68-2-6
- **Self-extinguishing capability:**
  UL94 V0
- **Dimensions:**
  66 x 195 x 34 mm
- **Weight:**
  420 g
- **Colour:**
  Dark grey
- **Output:**
  Two-wire cable with reinforced insulation or double insulation, length 1.5 m, terminated by 2 insulated elbowed male banana plugs (4 mm)

Safety specifications

- **Electrical safety:**
  Double or reinforced insulation between the primary and secondary circuits and the outer casing in accordance with 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
  - Radiated field: IEC 1000-4-3
  - Fast transients: IEC 1000-4-4
  - Magnetic field at 50/60Hz: IEC 1000-4-8

(1) Conditions of reference: 23 °C ± 5 °K, 20 % to 75 % RH, 48Hz to 65Hz, external magnetic field < 40 A/m, no current-carrying conductor nearby, centred test sample, load impedance 5 Ω.

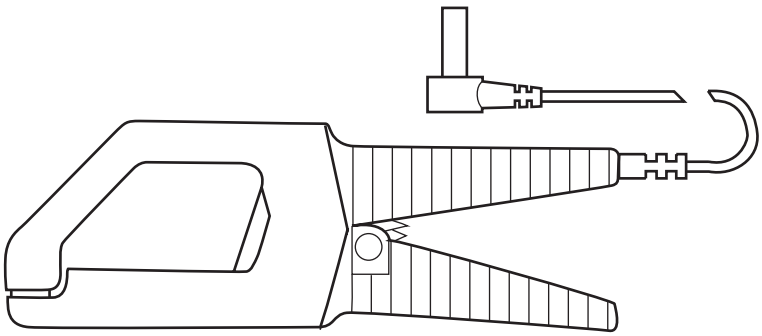
(2) 700 A for 10 minutes max.

To order	Reference
AC current clamp model **Y1N** with operating manual	P01120001A

CURRENT CLAMPS FOR AC CURRENT

Model Y2N

Current	500 A AC
Ratio	1,000/1
Output	1 mA / A



Electrical specifications

- **Current range:**
  4 A AC .. 600 A AC
- **Turns Ratio:**
  1,000:1
- **Output signal:**
  1 mA AC / A AC
- **Accuracy** (1)**:**

Primary current:	4 A	25 A	100 A	250 A	500 A	600 A (2)
Accuracy in % of output signal	3 % + 0.5 mA	3 %	1.5 %	1 %	1 %	1 %
Phase shift	not specified	3°	1.5°	1°	1°	1°

  Class 1 at 1.25 VA
- **Bandwidth:**
  48 Hz .. 1,000 Hz
- **Load impedance:**
  5 Ω max
- **Overload:**
  700 A for 10 minutes
- **Maximum output voltage (secondary open):**
  Limited to 10 V peak max.
- **Operating voltage:**
  600 V_{RMS}
- **Common mode voltage:**
  600 V_{RMS}
- **Influence of adjacent and parallel conductors:**
  < 30 mA / A at 50 Hz
- **Influence of conductor position in jaws:**
  < 1%

Mechanical specifications

- **Operating temperature:**
  -15 °C .. +50 °C
- **Storage temperature:**
  -40 °C .. +85 °C
- **Influence of temperature:**
  < 0.1 % per 10 °K
- **Operating altitude:**
  0 to 2,000 m
- **Max. jaw opening:**
  33 mm
- **Clamping capacity:**
  Cable: Ø max 30 mm
  Busbar: 63 x 5 mm
- **Casing protection rating:**
  IP20 in accordance with IEC 529
- **Drop test:**
  1.5 m (IEC 68-2-32)
- **Shock resistance:**
  100 g, in accordance with IEC 68-2-27
- **Vibration resistance:**
  10 / 55/10 Hz, 0.15 mm test in accordance with IEC 68-2-6
- **Self-extinguishing capability:**
  UL94 V0
- **Dimensions:**
  66 x 195 x 34 mm
- **Mass:**
  420 g
- **Colour:**
  Dark grey
- **Output:**
  1.5 m two-wire lead with double or reinforced insulation terminated by 2 elbowed male safety plugs (4 mm)

Safety specifications

- **Electrical safety:**
  Double or reinforced insulation between the primary and secondary circuits and the outer casing in accordance with IEC 1010-2-032.2-032
  - 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
  - Radiated field: IEC 1000-4-3
  - Fast transients: IEC 1000-4-4
  - Magnetic field at 50/60Hz: IEC 1000-4-8

(1) Conditions of reference: 23 °C ± 5 °K, 20 % to 75 % RH, 48Hz to 65Hz, external magnetic field < 40 A/m, no current-carrying conductor nearby, centred test sample, load impedance 5 Ω.

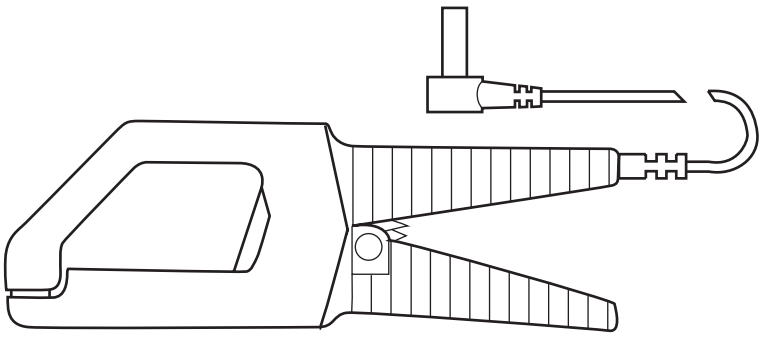
(2) 700 A for 10 minutes max.

To order	Reference
AC current clamp model **Y2N** with operating manual	P01120028A

CURRENT CLAMPS FOR AC CURRENT

Model Y3N

Current	500 A AC
Ratio	100/1
Output	10 mA/A



Electrical specifications

- **Current range:**
  4 A AC .. 600 A AC
- **Turns Ratio:**
  100:1
- **Output signal:**
  10 mA AC / A AC
- **Accuracy** (1)**:**

Primary current:	4 A	25 A	100 A	250 A	500 A	600 A (2)
Accuracy in % of output signal	5 % + 5 mA	5 %	3 %	3 %	3 %	3 %
Phase shift	not specified	6°	5°	3°	3°	3°

  Class 3 at 2.5 VA
- **Bandwidth:**
  48 Hz .. 1,000 Hz
- **Load impedance:**
  0.1 Ω max
- **Overload:**
  700 A for 10 minutes
- **Maximum output voltage (secondary open):**
  Limited to 10 V peak max.
- **Operating voltage:**
  600 VRMS
- **Common mode voltage:**
  30 VRMS
- **Influence of adjacent and parallel conductors:**
  < 30 mA / A at 50 Hz
- **Influence of conductor position in jaws:**
  ± 1 %

Mechanical specifications

- **Operating temperature:**
  -15°C to +50°C
- **Storage temperature:**
  -40°C to +85°C
- **Influence of temperature:**
  < 0.1 % per 10 °K
- **Relative humidity for operation:**
  0 to 85 % RH with a linear decrease above 35 °C
- **Operating altitude:**
  0 to 2,000 m
- **Max. jaw opening:**
  33 mm
- **Clamping capacity:**
  Cable: Ø max 30 mm
  Busbar: 63 x 5 mm
- **Casing protection rating:**
  IP20 in accordance with IEC 529
- **Drop test:**
  1.5 m (IEC 68-2-32)
- **Shock resistance:**
  100 g, in accordance with IEC 68-2-27
- **Vibration resistance:**
  10 / 55/10 Hz, 0.15 mm test in accordance with IEC 68-2-6
- **Self-extinguishing capability:**
  UL94 V0
- **Dimensions:**
  66 x 195 x 34 mm
- **Weight:**
  420 g
- **Colour:**
  Dark grey
- **Output:**
  Two-wire cable with reinforced insulation or double insulation, length 1.5 m, terminated by 2 insulated elbowed male banana plugs (4 mm)

Safety specifications

- **Electrical safety:**
  Double or reinforced insulation between the primary and secondary circuits and the outer casing in accordance with 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
  - Radiated field: IEC 1000-4-3
  - Fast transients: IEC 1000-4-4
  - Magnetic field at 50/60Hz: IEC 1000-4-8

(1) Conditions of reference: 23 °C ± 5 °K, 20 % to 75 % RH, 48Hz to 65Hz, external magnetic field < 40 A/m, no current-carrying conductor nearby, centred test sample, load impedance 0.1 Ω.

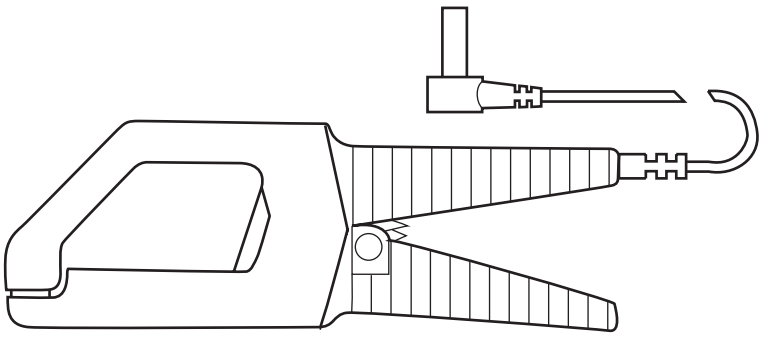
(2) 700 A for 10 minutes max.

To order	Reference
AC current clamp model **Y3N** with operating manual	P01120029A

CURRENT CLAMPS FOR AC CURRENT

Model Y4N

Current	500 A AC
Output	1 mV DC / A AC



Electrical specifications

- **Current range:**
  4 A AC .. 600 A AC
- **Output signal:**
  1 mV DC / A AC
- **Accuracy** (1)**:**

Primary current:	2 A	25 A	100 A	250 A	500 A	600 A (2)
Accuracy in % of output signal	5 % + 0.5 mV DC	5 %	2 %	1 %	1 %	2 %

- **Bandwidth:**
  48 Hz .. 1,000 Hz (error: add 2 % to reference)
- **Load impedance:**
  > 100 kΩ
- **Overload:**
  700 A for 10 minutes
- **Operating voltage:**
  600 VRMS
- **Common mode voltage:**
  600 VRMS
- **Influence of adjacent and parallel conductors:**
  < 30 mA / A at 50 Hz
- **Influence of conductor position in jaws:**
  +/-1 %

Mechanical specifications

- **Operating temperature:**
  -15 °C .. +50 °C
- **Storage temperature:**
  -40 °C .. +85 °C
- **Influence of temperature:**
  < 0.1 % per 10 °K
- **Operating altitude:**
  0 to 2,000 m
- **Max. jaw opening:**
  33 mm
- **Clamping capacity:**
  Cable: Ø max 30 mm
  Busbar: 63 x 5 mm
- **Casing protection rating:**
  IP20 in accordance with IEC 529
- **Drop test:**
  1.5 m (IEC 68-2-32)
- **Shock resistance:**
  100 g, in accordance with IEC 68-2-27
- **Vibration resistance:**
  10 / 55/10 Hz, 0.15 mm test in accordance with IEC 68-2-6
- **Self-extinguishing capability:**
  UL94 V0
- **Dimensions:**
  66 x 195 x 34 mm
- **Mass:**
  420 g
- **Colour:**
  Dark grey
- **Output:**
  1.5 m two-wire lead with double or reinforced insulation terminated by 2 elbowed male safety plugs (4 mm)

Safety specifications

- **Electrical safety:**
  Double or reinforced insulation between the primary and secondary circuits and the outer casing in accordance with IEC 1010-2-032.2-032
  - 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
  - Radiated field: IEC 1000-4-3
  - Fast transients: IEC 1000-4-4
  - Magnetic field at 50/60Hz: IEC 1000-4-8

(1) Conditions of reference: 23 °C ± 5 °K, 20 % to 75 % RH, 48Hz to 65Hz, external magnetic field < 40 A/m, no current-carrying conductor nearby, centred test sample, load impedance 10 MΩ.

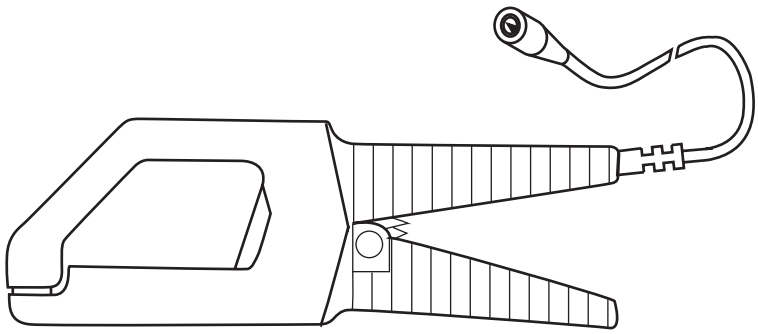
(2) 600 A for 10 minutes max.

To order	Reference
AC current clamp model **Y4N** with operating manual	P01120005A

CURRENT CLAMPS FOR AC CURRENT

Model Y7N (insulated AC current probe)

Current	1,200 A peak
Output	1 mV / A



Description

This 500 A AC clamp enables easy display and measurement of "current" curves.
It fits any oscilloscope since it has a coaxial lead with BNC plug. It produces a mV signal directly proportional to current.

Electrical specifications

- **Current range:**
  1 A AC .. 500 A AC (1,200 A peak)
- **Output signal:**
  1 mV AC / A AC (0.5 V for 500 A)
- **Accuracy and phase shift** (1)**:**

Primary current:	1 A .. 20 A	20 A .. 100 A	100 A .. 500 A
Accuracy in % of output signal	≤ 5 % + 0.3 mV	≤ 5 %	≤ 2 %
Phase shift	not specified	≤ 3°	≤ 1°

- **Bandwidth:**
  5 Hz .. 10 kHz (A -3 dB) (depending on current value)
- **Rise/fall time from 10 % to 90 %:**
  37 µs
- **10 % delay time:**
  1 µs
- **Ampere second product:**
  10 A.s
- **Insertion impedance (at 400 Hz / 10 kHz)**
  < 0.1 mΩ / < 3.1 mΩ
- **dV / dt:**
  0.24 mV / µs (typical)
- **Maximum currents:**
  500 A constant
  700 A: 10 minutes operation / 30 minutes shutdown for frequency 2 kHz (limitation proportional to the inverse of one third of the frequency above that)
- **Internal load impedance:**
  ≤ 100 Ω / 4.7 nF
- **Influence of temperature:**
  ≤ 0.15 % of output signal per 10 °K
- **Influence of adjacent conductor:**
  ≤ 5 µV / A at 50 Hz
- **Influence of conductor position in jaws:**
  ≤ 1.5 % + 0.1 A AC

Mechanical specifications

- **Operating temperature:**
  -25°C to +50°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
- **Max. jaw opening:**
  33 mm
- **Clamping capacity:**
  Cable: Ø max 30 mm
  Busbar: 1 busbar of 63 x 5mm
- **Casing protection rating:**
  IP20 (IEC 529)
- **Drop test:**
  1.5 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:**
  UL94 V0
- **Dimensions:**
  195 x 66 x 34 mm
- **Mass:**
  420 g
- **Colour:**
  Dark grey
- **Output:**
  Coaxial cable 2 m long, terminated by an insulated BNC connector

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

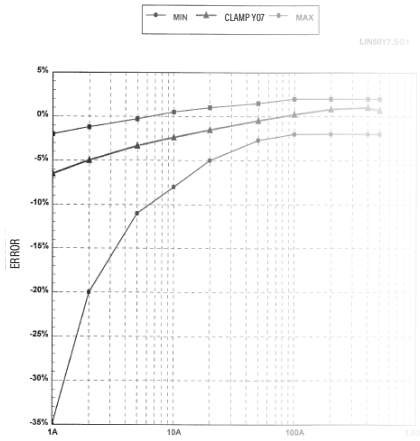
  EN 50082-2:
  - Electrostatic discharge: IEC 1000-4-2
    4 kV level 2 performance criterion B
    8 kV in the air level 3 performance criterion B
  - Radiated field: IEC 1000-4-3
    10 V/m performance criterion A
  - Fast transients: IEC 1000-4-4
    1 kV level 2 performance criterion B
    2 kV level 3 performance criterion B
  - Magnetic field at 50/60Hz:
    IEC 1000-4-8 field of 400 A/m at 50 Hz: < 1 A

CURRENT CLAMPS FOR AC CURRENT

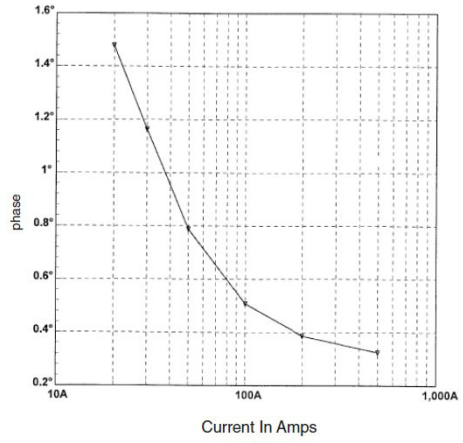
Model Y7N (insulated AC current probe)

Curves

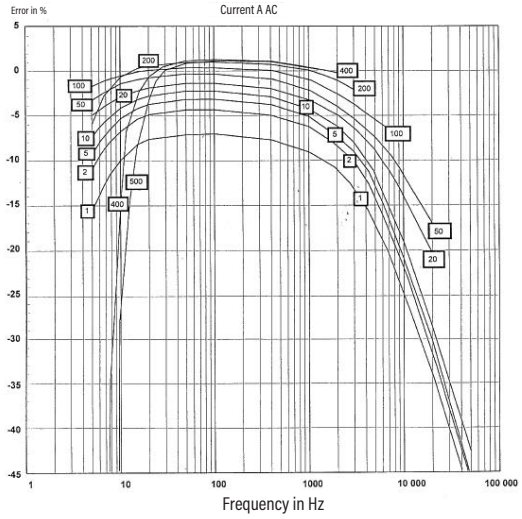
Error on measurement at 50 Hz



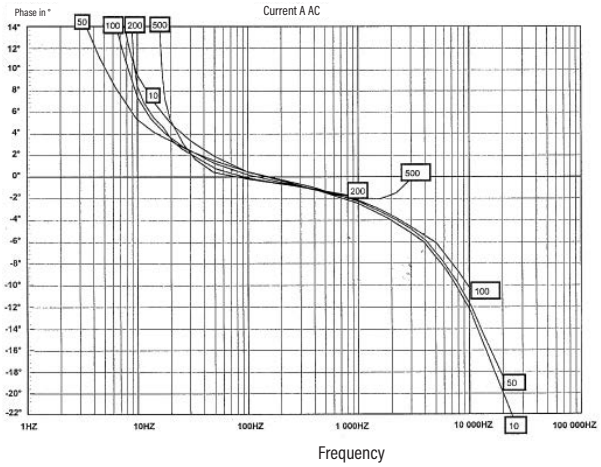
Phase shift at 50 Hz



Frequency response



Phase shift according to frequency

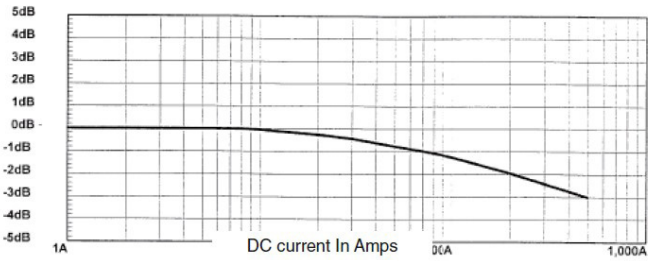


Influence of frequency and derating

Frequency Hz	5 Hz to 10 Hz	10 Hz to 20 Hz	20 Hz to 45 Hz	65 Hz to 3 kHz	3 kHz to 6 kHz	6 kHz to 10 kHz
1 A to 200 A	15 %					
> 200 A	not spec.					
1 A to 300 A		5 %				
300 A to 400 A		15 %				
400 A to 500 A		25 %				
1 A to 500 A			5 %			
1 A to 50 A				5 % + 0.4 A		
50 A to 500 A				5 %		
> 500 A				not spec.		
1 A to 100 A					15 % + 0.4 A	
> 100 A					not spec.	
1 A to 50 A						-3 dB
> 50 A						not spec.

- Error in % of reading; not spec. means not specified
- Do not exceed 500 A for measurement with constant operation, and for the derating, use the formula 500 (A) * 2 / F (kHz) to calculate the maximum current in A AC, in constant use, depending on the frequency in kHz.

Influence of DC current

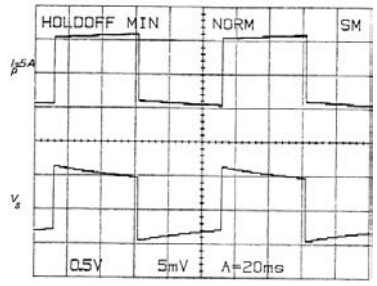


CURRENT CLAMPS FOR AC CURRENT

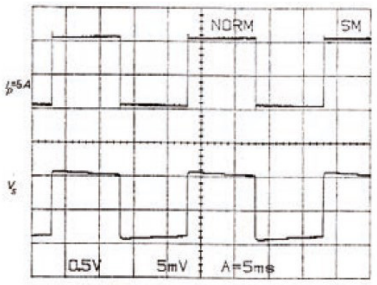
Model Y7N (insulated AC current probe)

Response to a square signal

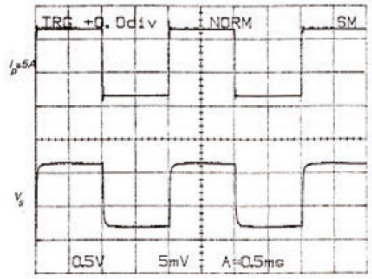
5 A at 10 Hz



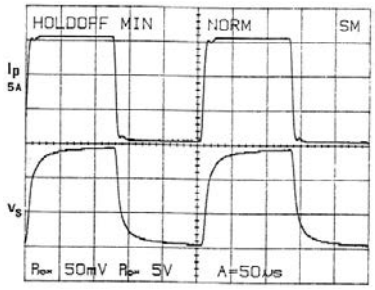
5 A at 50 Hz



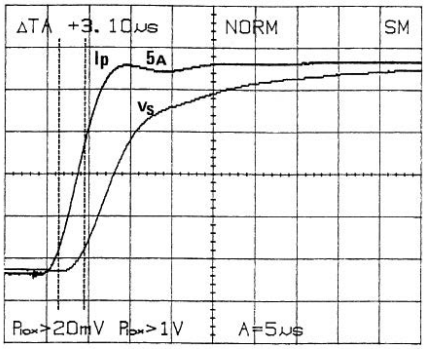
5 A at 500 Hz



5 A at 4 kHz



Response to a step



(1) Conditions of reference: 23 °C ± 3 °K, 20 % to 75 % RH, sinusoidal signal with frequency of 48 Hz at 1 kHz, 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.

To order	Reference
AC current clamp model **Y7N** for oscilloscope with operating manual	P01120075

NOTES