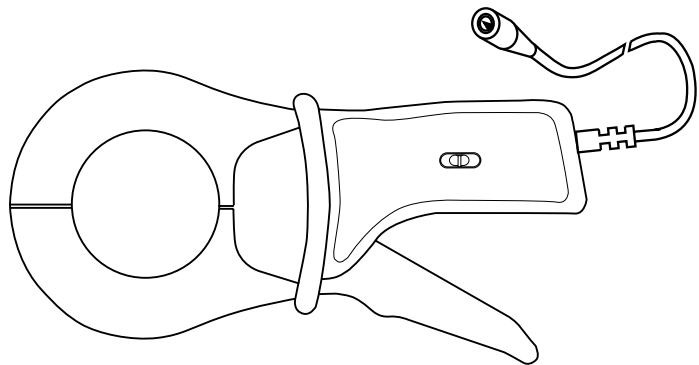


Model C160 (insulated AC current probe)

Current	30 A peak	300 A peak	2000 A peak
Output	100 mV/A	10 mV/A	1 mV/A



Description

This 1,000 A AC clamp can be used for easy display and measurement of current curves. Equipped with a coaxial cable terminated by a BNC connector, it is ideal for use with any oscilloscope. It outputs a signal in mV directly proportional to the current. It offers 3 different sensitivities.

Electrical specifications

Current calibres:

- 0.1 A AC...10 A AC (30 A peak)
- 1 A AC...100 A AC (300 A peak)
- 1 A AC...1000 A AC (2000 A peak)

Output signal:

- 100 mVAC/AAC (1 V for 10 A)
- 10 mVAC/AAC (1 V for 100 A)
- 1 mAAC/AAC (1 V for 1000 A)

Accuracy and phase shift ⁽¹⁾:

10 A calibre

Primary current	0.1 A...0.5 A	0.5 A...2 A	2 A...10 A	10 A...12 A
% Accuracy of output signal	≤ 3 % + 10 mV	≤ 3 % + 10 mV	≤ 3 % + 10 mV	≤ 3 % + 10 mV
Phase shift	not specified	not specified	≤ 15°	≤ 15°

100 A calibre

Primary current	0.1 A...5 A	5 A...20 A	20 A...100 A	100 A...120 A
% Accuracy of output signal	≤ 2 % + 5 mV	≤ 2 % + 5 mV	≤ 2 % + 5 mV	≤ 2 % + 5 mV
Phase shift	not specified	≤ 15°	≤ 10°	≤ 5°

1000 A calibre

Primary current	1 A...50 A	50 A...200 A	200 A...1000 A	1000 A...1200 A
% Accuracy of output signal	≤ 1 % + 1 mV	≤ 1 % + 1 mV	≤ 1 % + 1 mV	≤ 1 % + 1 mV
Phase shift	not specified	≤ 3°	≤ 2°	≤ 1°

Bandwidth:

10 Hz...100 kHz (-3 dB) (depending on current value)

Rise/fall time from 10 % to 90 %:

3.5 μs

10 % delay time:

0.5 μs

Ampere second product:

- 10 A calibre: 3.2 A.s
- 100 A calibre: 26 A.s
- 1000 A calibre: 64 A.s

Maximum currents:

1000 A permanent
1200 A for 40 minutes max. / > 20 minutes shutdown for a frequency ≤ 1 kHz (limitation proportional to the inverse of one third of the frequency beyond that)

Insertion impedance (at 400 Hz / 10 kHz)

- 10 A calibre: < 0.3 mΩ / < 6.6 mΩ
- 100 A calibre: < 0.3 mΩ / < 2 mΩ
- 1000 A calibre: < 0.3 mΩ / < 1.6 mΩ

Output impedance at 1 kHz:

- 10 A calibre: ≤ 515 Ω ± 10 %
- 100 A calibre: ≤ 515 Ω ± 10 %
- 1000 A calibre: ≤ 515 Ω ± 10 %

Influence of temperature:

≤ 150 ppm / K or 0.15 % of output signal per 10 °K

Influence of relative humidity:

< 0.1 % of output signal

Influence of adjacent conductor:

≤ 1 mA/A at 50 Hz

Influence of DC current superimposed on rated current:

< 1 % of output signal for a current ≤ 30 A DC

Influence of conductor position in jaws:

≤ 0.1 % of output signal for frequencies ≤ 400 Hz

Influence of frequency ⁽²⁾:

10 A calibre:

- < 10 % of output signal from 10 Hz to 1 kHz
- < 5 % of output signal from 1 kHz to 10 kHz
- < 20 % of output signal from 10 kHz to 50 kHz
- 3 dB of output signal from 50 kHz to 100 kHz

100 A calibre:

- < 5 % of output signal from 10 Hz to 1 kHz
- < 3 % of output signal from 1 kHz to 10 kHz
- < 20 % of output signal from 10 kHz to 50 kHz
- 3 dB of output signal from 50 kHz to 100 kHz

1000 A calibre:

- < 1 % of output signal from 10 Hz to 1 kHz
- < 2 % of output signal from 1 kHz to 10 kHz
- < 10 % of output signal from 10 kHz to 50 kHz
- 3 dB of output signal from 50 kHz to 100 kHz

Influence of crest factor:

< 1 % of output signal for crest factor ≤ 6 with current

- 10 A calibre: ≤ 30 A peak
- 100 A calibre: ≤ 300 A peak
- 1000 A calibre: ≤ 3000 A peak

Oscilloscope clamp for AC current

Model C160 (insulated AC current probe)

C100 series

■ Mechanical specifications

Max. jaw opening:
53 mm

Clamping capacity:

Cable: \varnothing max 52 mm

Busbar: 1 busbar of 50 x 5 mm / 4 busbars of 30 x 5 mm

Operating temperature:

-10 °C to +55 °C

Storage temperature:

-40 °C to +70 °C

Relative humidity for operation:

0 to 85 % RH decreasing linearly above 35 °C

Operating altitude:

0 to 2,000 m

Casing protection rating:

IP30 with clamp open (IEC 529)

IP40 with clamp closed (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:

Casing and jaws: UL94 V0

Dimensions:

216 x 111 x 45 mm

Weight:

550 g

Colours:

Dark grey case with red jaws

Output:

2 m coaxial lead with insulated BNC plug

■ 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

without disturbance: 4 kV class 2

non-destructive: 15 kV class 4

- Radiated field: IEC 1000-4-3

without disturbance: 10 V/m performance criterion A

- Fast transients: IEC 1000-4-4

without disturbance: 1 kV class 2

non-destructive: 2 kV class 3

- Magnetic field at 50/60Hz: IEC 1000-4-8

field of 400 A/m at 50 Hz: < 1 A

(1) Conditions of reference: 23 °C \pm 3 °K, 20 % to 75 % RH, sine signal, frequency of 48 Hz to 1000 Hz, distortion factor < 1 % with no DC component, external magnetic field < 40 A/m, no DC components, no external conductor with circulating current, conductor centred for measurement, load impedance: \geq 1 M Ω and < 100 pF

(2) Out of reference domain

To order	Reference
AC current clamp model C160 with operating manual	P01120308

Oscilloscope clamp for AC current

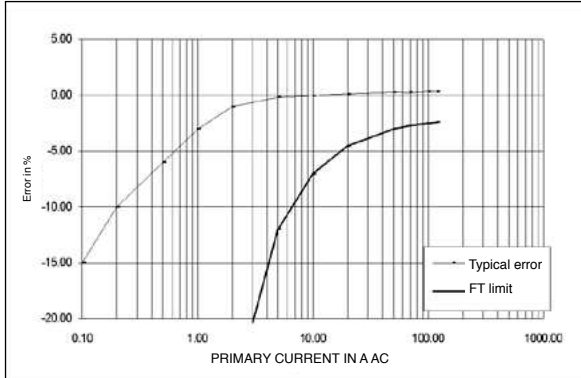
Model C160 (insulated AC current probe)

C100 series

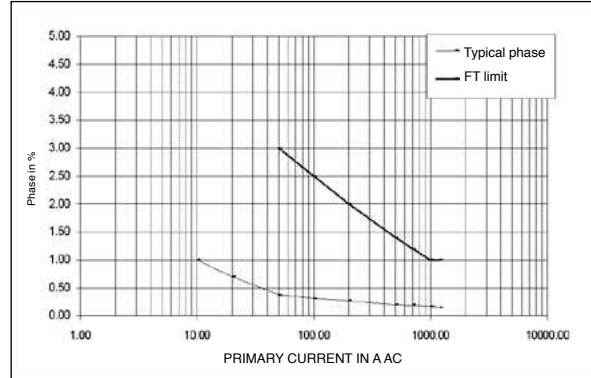
■ Curves at 50 Hz

1000 A calibre

Error on measurement

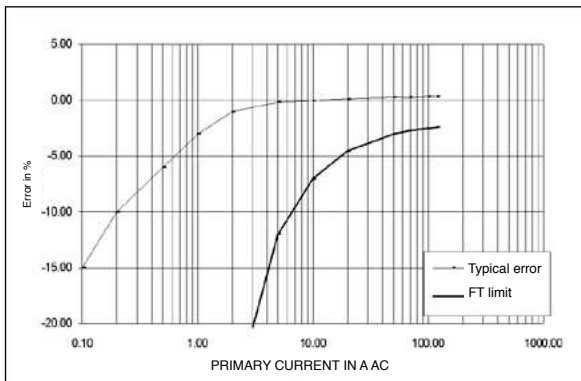


Phase shift

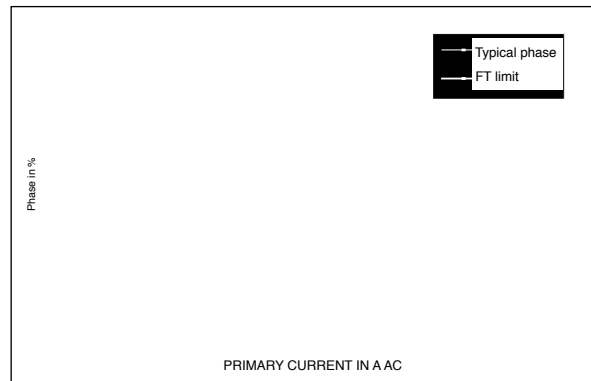


100 A calibre

Error on measurement

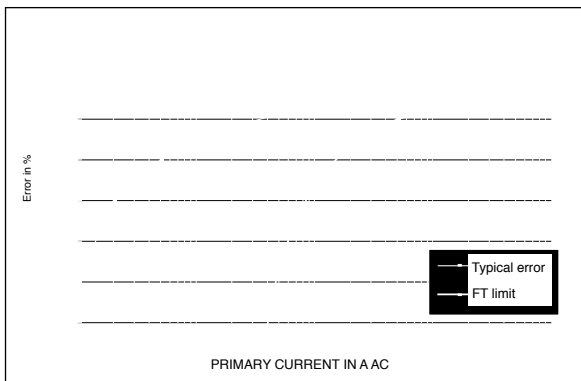


Phase shift

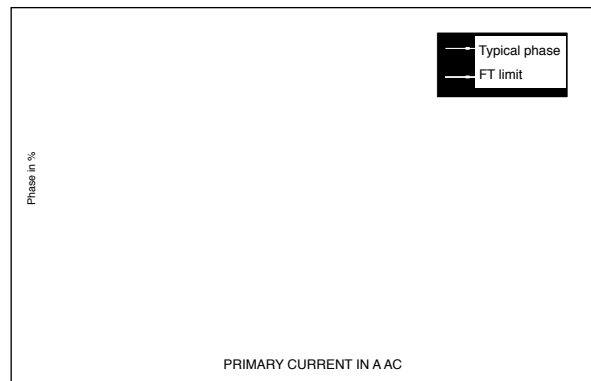


10 A calibre

Error on measurement



Phase shift



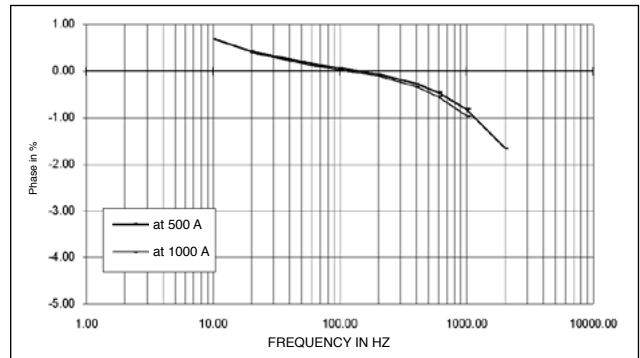
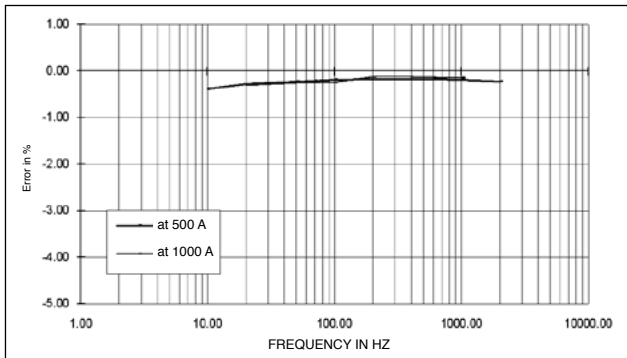
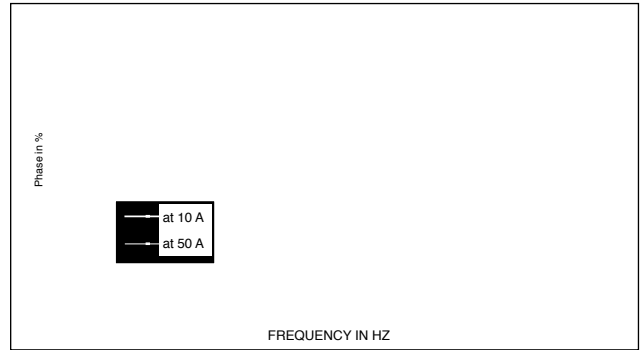
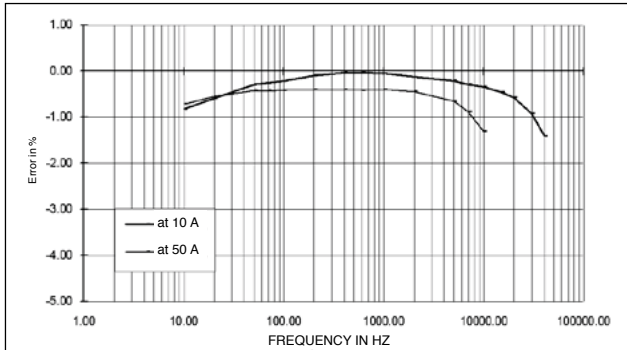
Oscilloscope clamp for AC current

Model C160 (insulated AC current probe)

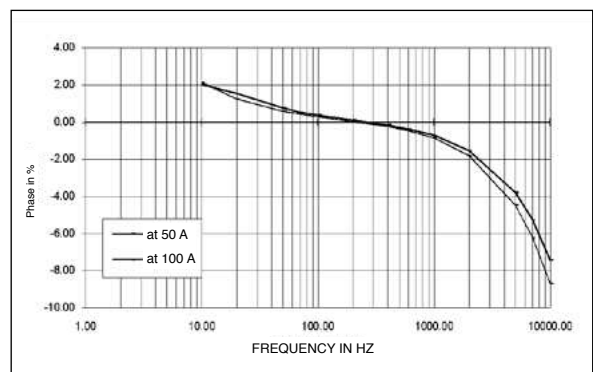
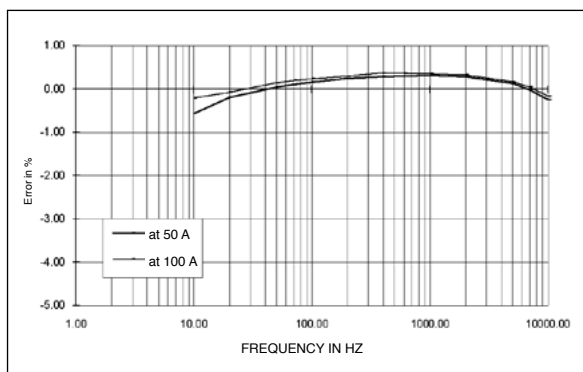
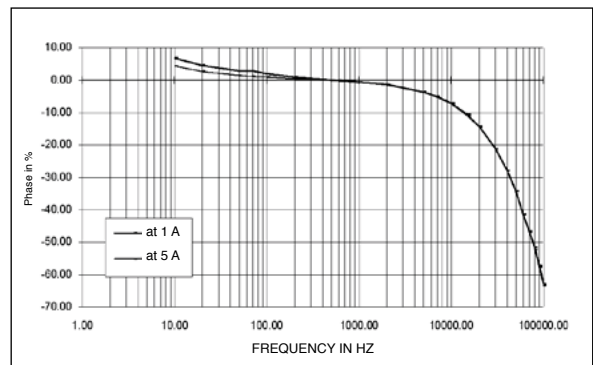
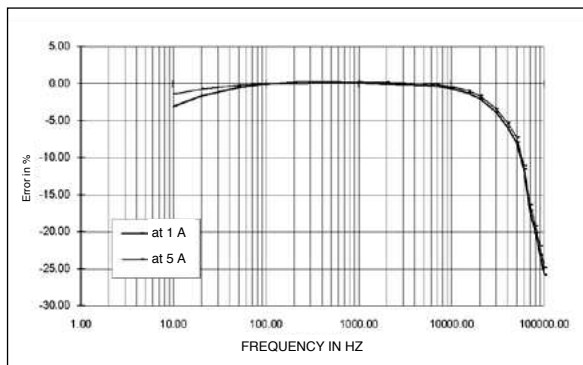
C100 series

■ Frequency response (cont.)

1000 A calibre



100 A calibre



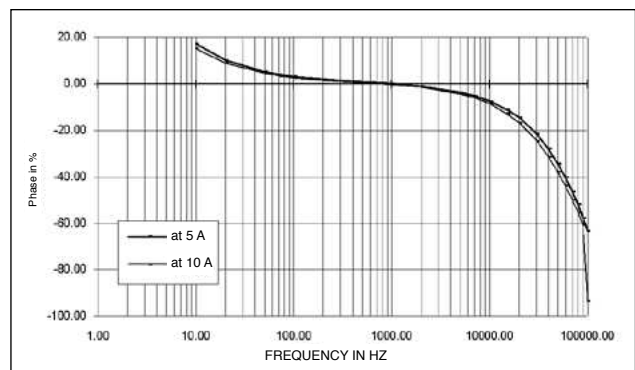
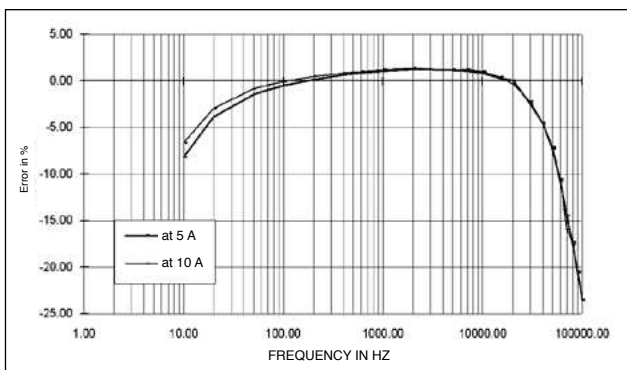
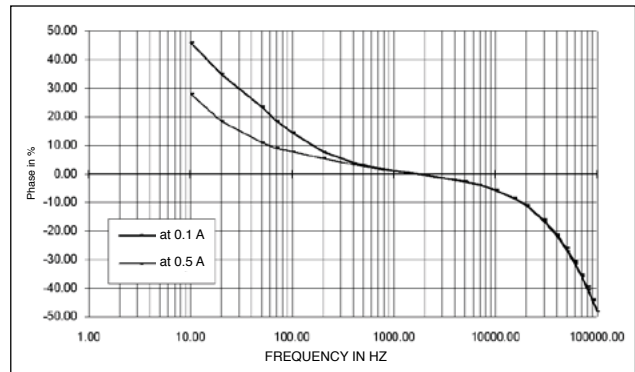
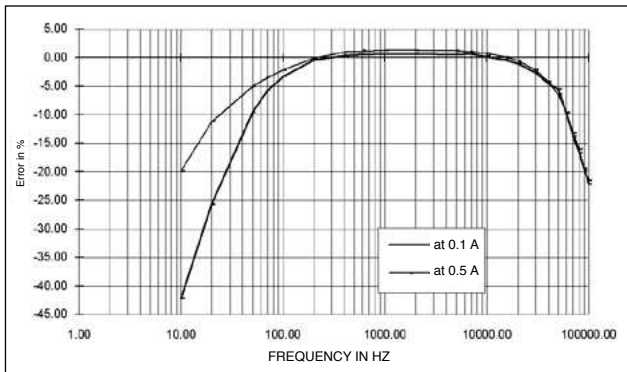
Oscilloscope clamp for AC current

Model C160 (insulated AC current probe)

C100 series

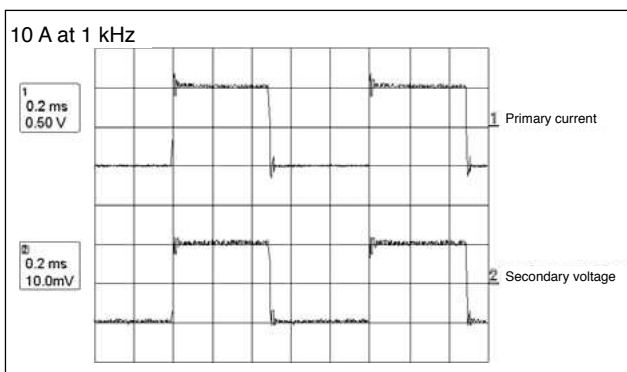
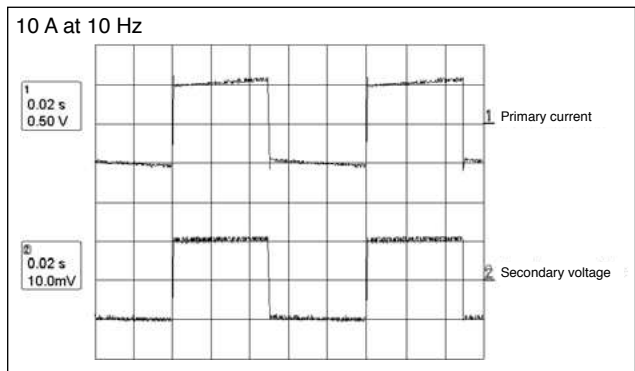
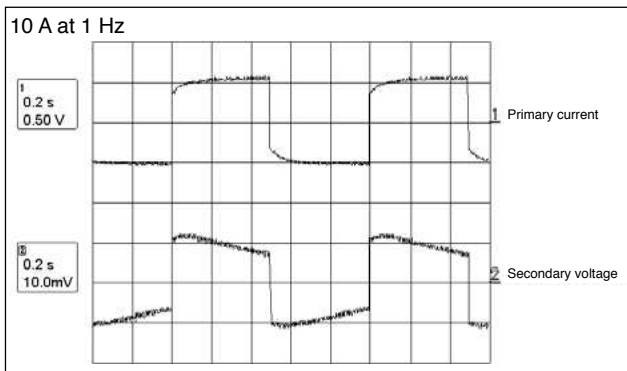
Frequency response (cont.)

10 A calibre



Response to a square signal

1000 A calibre



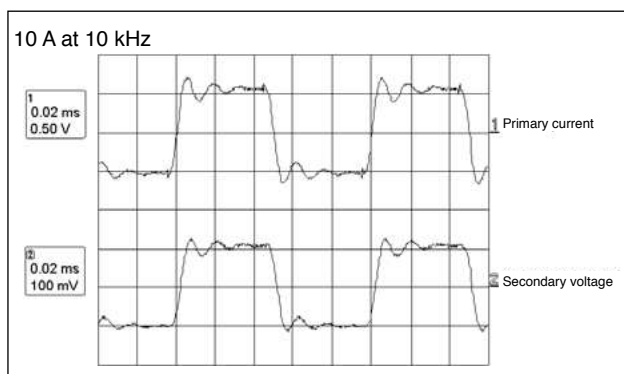
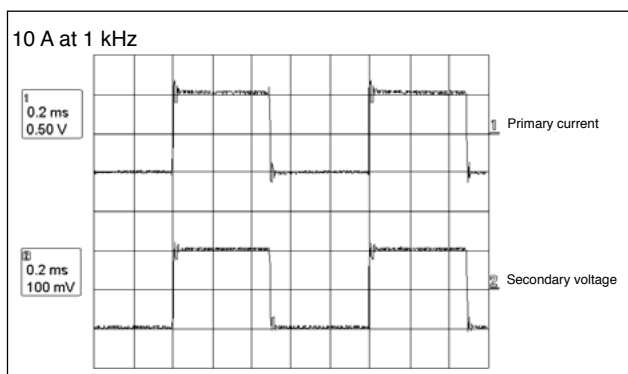
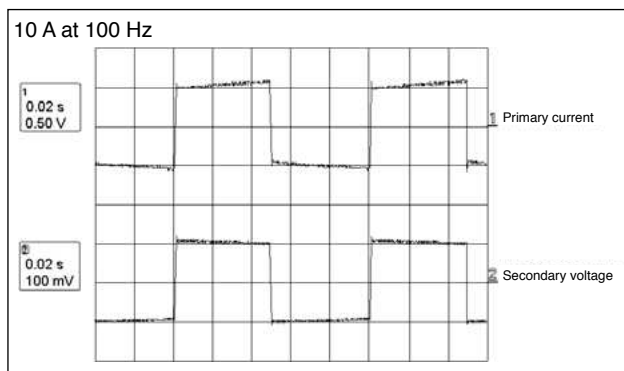
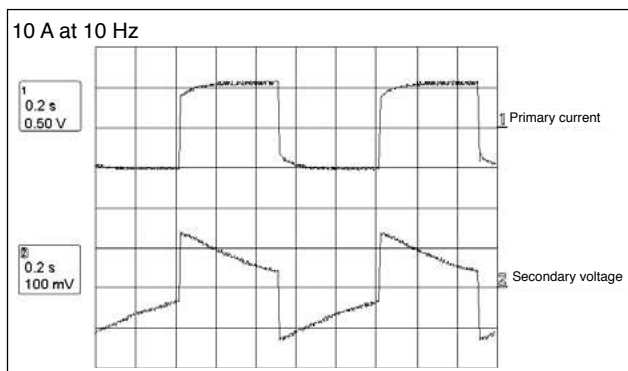
Oscilloscope clamp for AC current

Model C160 (insulated AC current probe)

C100 series

■ Response to a square signal (cont.)

100 A calibre



10 A calibre

