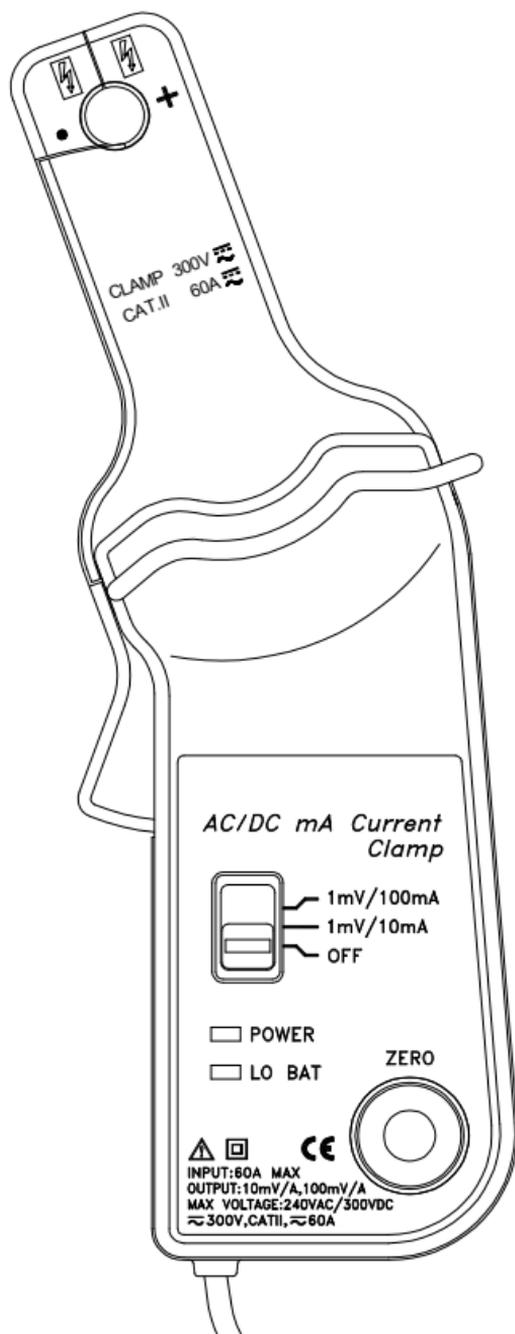# pico®

Technology

TA018
AC/DC mA CURRENT CLAMP
USER'S GUIDE

INTRODUCTION

The AC/DC mA Current Clamp is a transducer which will allow your multimeter to measure low electrical or/and electronic current up to 60 amperes AC/DC, with a frequency response up to 20kHz. When measuring current with this clamp, there is no need to break a circuit or to disturb the insulation.

The extended measurement jaws allow performing measurements in a narrow space. When measuring DC current, a simple operating push button is designed for zero adjustment. The clamp adaptor is applicable to leakage detection or monitoring.

APPLICATION PROCEDURES

1. Connect the BNC plug to the input of any oscilloscope or other measuring instrument with an input impedance of at least 10 kΩ.
2. Set the power switch from "OFF" to the desired range, 1mV/10mA or 1mV/100mA position. The green LED will light to indicate that the clamp is switched on.
3. For current measurement below 2A, set the unit to 1mV/10mA range and set the oscilloscope to 200mV AC range for AC current measurements, or 200mV DC range for DC current measurements. If the measured current exceeds 2A, set the unit to 1mV/100mA range.
4. When perform DC current measurement, always push the zero adjustment button on the clamp until the oscilloscope reads zero.
5. Clamp the jaws around the current-carrying conductor and interpret the reading according to Step 3 above.
6. When 1mV/10mA range of clamp unit is selected, multiply the reading displayed on the oscilloscope by "10" to interpret the measured current value in mA. For example, if the oscilloscope reads 10mV, the measured current is 10x10=100mA.
   When 1mV/100mA range is selected, multiply the reading displayed on the oscilloscope by "100" to interpret the measured current value in mA. For example, if the oscilloscope reads 5mV, the measured current is 5x100=500mA.

APPLICATION NOTES

1. In the case of DC current, the output is positive when the current flows from the upside to the underside of the clamp.
2. In the case of DC current measurement, a hysteresis effect can occur so that it is impossible to zero the clamp properly. To eliminate this effect, open and close the jaws several times and push zero adjustment button.

OPERATOR SAFETY

1. Do not clamp around conductors with voltages equal to or exceeding 300VDC or 240V rms AC.
2. To avoid physical injury, measurements on bare conductors or conductors with cracked or frayed insulator are forbidden.

SPECIFICATIONS

GENERAL

Captured Conductor Size: 9 mm maximum.
Low Battery Indicator: Red LED lighting.
Operating Temperature: 0°C to 40°C, 70% R.H.
Storage Temperature: -20°C +70°C, 80% R.H.
Battery Type: 9V DC, NEDA 1604, 6F22, 006P.

Weight: 250 gm typical
Dimensions: 195mm (H) x 70mm (W) x 33mm (D).
Output: Cable with BNC plug.

ELECTRICAL (At 23± 5°C, 70% R.H. maximum)

Effective Measurement Range
1mV/10mA: 10mA to 20A DC or rms AC for 200mV range of the oscilloscope.
1mV/100mA: 10mA to 20A DC or rms AC for 200mV range of the oscilloscope.
              20A to 60A DC or rms AC for 2V range of the oscilloscope.

Accuracy
System accuracy: Current clamp accuracy + DMM accuracy.

  For example, if the measured conductor carries a 100mA current, set the current clamp to 1mV/10mA range to get an output signal of 10mV. Suppose the accuracy of the units is 2.0%, the tolerance limit should be between 10.20mV maximum and 9.80mV minimum.

When the unit is connected to a DSO whose accuracy is supposed to be 0.5% in 200mV range,the reading displayed on the DSO will be 10.25mV max. (10.20mV x (1+0.5%)=10.25mV) and 9.75mV min. (9.80mV x (1-0.5%)=9.75mV)

Current Clamp Accuracy

DCA range: 1mV/10mA
    ± (2.0%±5mA) 10mA~20A

DCA range: 1mV/100mA
    ± (2.0%±20mA) 100mA~40A
    ± (4.0%±0.3A) 40A~60A

ACA range: 1mV/10mA
    ±(2.0%±5mA) 10mA~10A (40Hz~2kHz)
    ±(4.0%±30mA) 10mA~10A (2kHz~10kHz)
    ±(6.0%±30mA) 10mA~10A (10kHz~20kHz)
    ±(8.0%±30mA) 10A~15A (40Hz~20kHz)

ACA range: 1mV/100mA
    ±(2.0%±30mA) 100mA~40A (40Hz~1kHz)
    ±(4.0%±30mA) 100mA~40A (1kHz~2kHz)
    ±(6.0%±30mA) 100mA~40A (3kHz~5kHz)
    ±(8.0%±0.3A) 40A~60A (40Hz~5kHz)

Load Resistance: 10 kΩ typical
Temperature Coefficient: 0.1x(specified accuracy) per degree C. (0°C to 18°C, 28°C to 40°C)

SAFETY INFORMATION

Cleaning

Wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings. $C \epsilon$

Safety: Conforms to EN 61010-1, EN 61010-2-032, CAT II 300V, Class II, Pollution degree 2 Indoor use.
CAT II: Is for measurements performed on low-voltage circuits directly connected to the mains.
EMC: Conforms to EN 61326-1.

The symbols used on this instrument are:

⚡ Dangerous voltage.

⚠ Caution, refer to accompanying documents

▣ Equipment protected throughout by Double insulation (Class II)

$\sim$ Alternating current $==$ Direct current

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