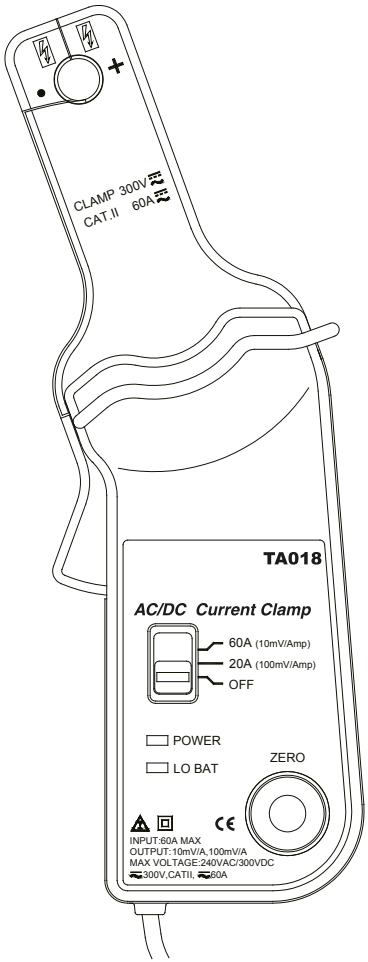
TA018 60 A Current Clamp

User's Guide



Introduction

The TA018 60 A AC/DC Current Clamp is a transducer that you can use with your oscilloscope to measure low electrical currents up to 60 A AC/DC with a frequency response up to 20 kHz. You can perform current measurements without having to break a circuit or disturb the insulation. With the extended measurement jaws you can access narrow spaces. The clamp has a simple zero adjustment button you can use when measuring DC current. The clamp is suitable for leakage detection and monitoring.

Application procedures

Connect the BNC plug to the input of any oscilloscope (or other voltage measuring instrument) with an input impedance of at least 10 kΩ.

Set the power switch from **OFF** to the desired range: **20A (100mV/Amp)** or **60A (10mV/Amp)**. The green **POWER** LED will light to indicate that the clamp is switched on.

Before measuring DC current, always press the **ZERO** button on the clamp until the oscilloscope reads zero.

For measuring currents below 20 A, set the unit to the **20A (100mV/Amp)** range.
For measuring currents above 20 A, set the unit to the **60A (10mV/Amp)** range.

Clamp the jaws around the current-carrying conductor, note the arrow on the jaw which should point in the same direction as the current flow. If you clamp it on the other way, the signal will be inverted on the screen.

DC measurements

The output is positive when the current flows from the front to the back of the clamp.

A hysteresis effect can occur, meaning that the clamp cannot be zeroed in the usual way. To eliminate this effect, open and close the jaws several times and push the **ZERO** button.

Accuracy

For example: If the measured conductor carries a 100 mA current, set the current clamp to the **20A (100 mV/Amp)** range to get an output signal of 10 mV. Suppose the accuracy of the unit is 2.0%, then the tolerance limits should be 9.80 mV to 10.20 mV.

When the unit is connected to an oscilloscope whose accuracy is stated as 0.5% on its **±200 mV** range, the reading displayed on the oscilloscope will be between:

10.20 mV × (1 + 0.5%) = 10.25 mV max. and 9.80 mV × (1 – 0.5%) = 9.75 mV min.

Battery

The unit is powered by a 9 V 6LR61 battery. The current clamp has a battery life indicator, a red warning lamp, labelled **LO BAT**, which illuminates when the device is on and the battery is running low and needs to be replaced.

If the battery is without charge, neither the green power indicator lamp, labelled **POWER**, or the battery life indicator, labelled **LO BAT**, will illuminate when the device is turned on.

Changing the battery:

1. Ensure the clamp is disconnected from the measurement node, and oscilloscope before changing the battery.
2. Remove the screw holding the battery compartment cover to the rear of the unit.
3. Slide open the battery compartment cover and remove it from the unit.
4. Remove the battery from its compartment and unclip it from the connector.
5. Clip the new battery to the connector and place it in the battery compartment.
6. Slide the battery compartment cover into place and replace the screw.

Specifications

General	
Conductor diameter	9 mm maximum
Low battery indicator	Red LED
Battery type	9 V, 6LR61, NEDA 1604, 6F22, 006P
Weight	250 g typical
Dimensions	195 H x 70 W x 33 D (mm)
Output	Coaxial cable with BNC(m) plug
Electrical (at 23 ±5 °C, 70 %RH maximum)	
Effective measurement range	
20A (100mV/Amp)	10 mA to 20 A DC or AC RMS
60A (10mV/Amp)	100 mA to 60 A DC or AC RMS
Accuracy	
System accuracy	Current clamp accuracy + oscilloscope accuracy
Current clamp accuracy	
DC, **20A (100mV/Amp)** range: 10 mA ~ 20 A	 ±(2.0% ± 5 mA)
DC, **60A (10mV/Amp)** range: 100 mA ~ 40 A 40 A ~ 60 A	 ±(2.0% ± 20 mA) ±(4.0% ± 0.3 A)
AC, **20A (100mV/Amp)** range: 10 mA ~ 10 A (40 Hz – 2 kHz) 10 mA ~ 10 A (2 kHz – 10 kHz) 10 mA ~ 10 A (10 kHz – 20 kHz) 10 A ~ 15 A (40 Hz – 20 kHz)	 ±(2.0% ± 5 mA) ±(4.0% ± 30 mA) ±(6.0% ± 30 mA) ±(8.0% ± 30 mA)
AC, **60A (10mV/Amp)** range: 100 mA ~ 40 A (40 Hz – 1 kHz) 100 mA ~ 40 A (1 kHz – 2 kHz) 100 mA ~ 40 A (3 kHz – 5 kHz) 40 A ~ 60 A (40 Hz – 5 kHz)	 ±(2.0% ± 30 mA) ±(4.0% ± 30 mA) ±(6.0% ± 30 mA) ±(8.0% ± 0.3 A)
Load resistance	10 kΩ typical
Temperature coefficient	0.1 × (specified accuracy) per °C (0 °C to 18 °C, 28 °C to 40 °C)

Safety information

A **WARNING** identifies conditions or practices that could result in injury or death.

A **CAUTION** identifies conditions or practices that could result in damage to the product or equipment to which it is connected.

WARNING
To prevent injury or death, use the product only as instructed. The protection provided by the product may be impaired if used in a manner not specified by the manufacturer.

Safety: Conforms to EN 61010-1 and EN 61010-2-032, CAT II 300 V, Class II, Pollution degree 2 indoor use.

CAT II: is for low-voltage measurements on 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 by double insulation (Class II)
~	Alternating current
⎓	Direct current

WARNING
The TA018 current probe has a tactile barrier provided for user safety. To prevent injury or death, do not hold the current probe beyond the tactile barrier when in use.

WARNING
The TA018 current probe is marked with its maximum voltage rating, which applies when clamped over an uninsulated conductor. To prevent injury or death, do not use the current probe on an uninsulated conductor operating outside the probe's marked voltage protection levels.

WARNING
To prevent injury or death, if the probe has a symbol or is not marked with any symbol, always de-energize any uninsulated conductor before you install or remove the probe. A current probe with the symbol may be safely installed on or removed from an uninsulated conductor while the conductor is energized (live).

⚠ WARNING

When measuring currents in uninsulated circuits connected directly to the utility power supply, always use probes with the appropriate CAT ratings.

To prevent injury or death, always follow the CAT rating of the probe and do not use a non CAT-rated current probe to measure utility power current.

Always use extreme caution when working around bare conductors or bus bars. Contact with the conductor could result in electric shock. Always follow relevant industry-standard safety procedures and use appropriate Personal Protective Equipment (PPE) where applicable. Safety training is essential in these cases and should be separately gained.

⚠ CAUTION

To avoid damage to the probe and inaccurate readings, do not use a current probe on a circuit that exceeds the probe's maximum rated frequency or the maximum rated current at the measurement frequency.
All current probes have a maximum current rating which may be derated depending on the measurement frequency in accordance with the following table:

Probe	Probe maximum current by frequency	Auto power-off	Power supply/ battery	Connection
TA018	60 A pk max, DC to 40 kHz	N/A	Battery	BNC

Environment

This product is for indoor use, in dry locations only.

⚠ WARNING

To prevent injury or death, do not use in wet or damp conditions, or near explosive gas or vapor.

⚠ CAUTION

To prevent damage, always use and store your unit in appropriate environments as below:

Probe	Operating temperature	Storage temperature	Operating humidity	Storage humidity	Pollution degree	Max. altitude
			(non-condensing)			
TA018	0 to 40 °C	−20 to +70 °C	5 to 70 %RH	5 to 80 %RH	2	2000 m

Care of the product

The product contains no user-serviceable parts. Repair, servicing and adjustment require specialized test equipment and must only be performed by Pico Technology or an approved service provider. There may be a charge for these services unless covered by the Pico one year warranty.

Inspect the probe and all connectors and cables before use for signs of damage.

⚠ WARNING
To prevent electric shock do not tamper with or disassemble the probe, case parts, or connectors.

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.

Warranty

Your current clamp is guaranteed for one year from the date of purchase against defective material or workmanship. If the clamp fails during the warranty period, we shall, at our discretion, repair or replace it with a new or reconditioned unit provided we are satisfied that the failure is due to defective material or workmanship. To make a claim under warranty, return the clamp to us, postage prepaid, with a description of the defect. The use of a battery other than that specified invalidates this warranty.

Goods alleged by the buyer to be defective shall not form the subject of any claim for injury, loss, damage, or any expense howsoever incurred, whether arising directly or indirectly from such alleged defects other than death or personal injury resulting from the seller's negligence.

No condition is made or to be implied, nor is any warranty given or to be implied as to the life or wear of goods supplied or that they will be suitable for any particular purpose or for use under specific conditions, notwithstanding that such purpose or conditions may be made known to the seller.

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