

AC/DC Current Probe

GCP-100

QUICK START GUIDE



ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

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SAFETY INSTRUCTIONS

In this User's manual, failure to follow or carry out instructions preceded by this symbol may result in personal injury or damage to the device and the installations.

Safety Symbols



Warning

Warning: Identifies conditions or practices that could result in injury or loss of life.



Symbol 102 according to IEC-1010-2-032(Application or withdrawal authorized on the drivers under dangerous tension)



Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

Thank you for purchasing GCP-100 AC/DC current probe. To obtain the best possible service from your device:

- Read this User's manual carefully,
- Comply with the precautions for use.

PRECAUTIONS FOR USE

- Do not use the clamp on conductors in which the voltage is more than 600 V rms.
- Keep the jaw faces clean. Clean them if necessary with a lightly oiled soft cloth to prevent rusting.
- Keep the cable or the busbar centred in the clamp which should be perpendicular to the conductor.
- Avoid proximity to other conductors which may create fields of interference.
- The clamp must be totally disconnected in the OFF position when the battery is changed.

- For your safety, ensure that the instruments used with your clamp are also in accordance with IEC 1010.

ELECTRICAL SAFETY

Protection From Electric Shocks

Instrument with double insulation or strengthened insulation in the part that is hand held in normal use, and with single insulation or additional insulation between the primary and the secondary output.

Maximum service voltage in accordance with IEC 1010	
600V in installations of category III and degree of pollution 2	300V in installations of category IV and degree of pollution 2
Dielectric strength test voltage in accordance with IEC 1010	
5550V 50/60Hz between the parts that are hand-held in normal use, on one hand, and the primary with the secondary on the other hand.	3250V 50/60Hz between the primary on one hand, and the secondary on the other hand

Electromagnetic Compatibility

Electrostatic discharge	4kV without disturbance, 8kV without destruction in accordance with IEC 801-2
Radiated field	3V/m in accordance with IEC 801-3
Rapid transients	1kV class 1 without disturbance, 2kV class 2 with minor defects in accordance with IEC 801-4
Electric shocks	1kV - 0.5kA class 2 without disturbance, 2kV - 1kA class 3 with minor defects in accordance with IEC 801-5

FEATURES

- The GCP-100 is a current probe for oscilloscope which uses a Hall effect cell for the measurement of DC or AC current without modification of the installation (without switching off the circuit)
- It can measure currents from 50 mA to 100 A peak. It has 2 ranges and 2 lights indicating:

ON	correct power supply to the clamp
OL	overload of the range in use (saturation or peak)

- In addition a thumbwheel can be used to reset zero for adaptation to the measurement environment.
- This clamp adapts to all measurement instruments which have a BNC input and an impedance of $1M\Omega$, < 100 pF.

DESCRIPTION

1. Switch

The switch has 3 positions:

Off	The clamp is no longer supplied with power
Range 10 mV/A	Measurement of DC or AC peak currents on the basis of 10 mV per ampere.
Range 100 mV/A	Measurement of DC or AC peak currents on the basis of 100 mV per ampere.

2. Battery indicator

This LED is unlit when the switch is OFF.

In normal use, the green LED is lit. When the switch is no longer in the OFF position and the LED is unlit, this warns that the value of the battery voltage is too low or that the cell is no longer supplied with power, thus showing that there is a fault in the clamp.

3. Resetting zero on the probe

The thumbwheel makes it possible to reset the output voltage to zero. It is thus possible to overcome the different errors due to thermal shifts, the Earth's magnetic field, the environment, and residual induction.

4. Indicator of range overload

This indicator symbolized by «OL» shows as a red light when the measurement signal is outside the capabilities of the range. It can also indicate the presence of an impulse outside the capabilities of the range or that the measurement made on the clamp isn't valid.

5. Battery compartment

To change the 9V battery, the clamp should be in the normal position (jaws closed) and disconnected from the oscilloscope, it must not clamp any conductor and the switch must be in the «OFF» position. Unscrew the tool release screw then pull off the cover in the handle extension to access the battery to be changed.

PERATING INSTRUMENT

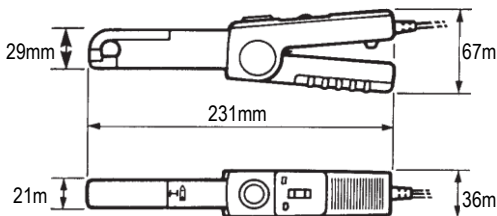
- To make a current measurement, switch on the clamp by selecting the 100 mV/A range.
- Check that the battery indicator (green) is lit and that the «OL» indicator is not lit.
- Connect the clamp to the oscilloscope.
With the clamp closed and without clamping a conductor, select the highest sensitivity (for example 1 mV/cm) on the oscilloscope and 100 mV/A on the clamp, then set zero on the clamp with the thumbwheel in relation to a reference chosen on the oscilloscope. Zero on the oscilloscope makes it possible to adjust this setting.
- Select the measurement sensitivities of the clamp and the oscilloscope.
- Choose the connection method which is the best adapted to measurement on the oscilloscope.

- Note the direction of the primary current by means of the arrow marked on and under the case.
- Insert the conductor carrying the current to be measured in the clamp and take the measurement.
- If necessary, recheck the origin of the graph, with the jaws not clamped around the conductor, and make the measurement again.

SPECIFICATIONS

Mechanical Specifications

Model	GCP-100
Max. cable dimensions	Ø 11.8 mm
Jaw opening	12.5 mm maximum
Dimension	231 x 67 x 36 mm win core lead (coaxial) 2m ended by a BNC plug insulated and moulded
Weight	330g with battery
Protection	<ul style="list-style-type: none"> • Degrees of protection: IP 20 to IEC 529 • Protection from shocks: 100 G, 6 ms, half-cycle, to IEC 68-2-27 • Drop height from all angles: 1 m • Resistance to vibrations: 10/55/10 Hz 0.15 mm, to IEC 68-2-6 • Bumps: 40 G, 6 ms, 4000 bumps, to IEC 68-2-29



Electrical Specifications

Range	Measurement extent	Intrinsic error
Range 100mV/A	50mA to 10A peak	3% R + 50mA
Range 10mV/A	50mA to 40A peak	4% R + 50mA
Range 10mV/A	40A to 100A peak	Graph value below R: reading

Typical noise level at output (peak-peak value)

These specifications are given for an ambient temperature of $23^{\circ} \pm 3^{\circ}\text{C}$, humidity 20 to 75% RH, frequency DC to 1 kHz, load impedance: 1 M Ω /100 pF, conductor centred and parallel to the mark

Frequency band	DC-100kHz
Range 10mV/A	480 μV
Range 100mV/A	3mV
Pass band	DC to 100 kHz The pass band of the oscilloscope used depends on the frequency to be measured. A pass band of more than 4 times the frequency of the signal to be measured is sufficient.
Operating frequency	DC to 20 kHz (not causing an additional error of more than 3% in relation to the reference range)
Breaking frequency	- 3 dB at 100 kHz
Rise or fall time	< 4 μs

General Specifications

Environmental conditions

Battery	9V type 6 LR 61
Consumption	8.6 mA typical, 12 mA max
Service life	55 h typical, 40 h min.
Indicator	Green light goes out for a battery voltage < 6.5 V
Class of protection	Class II according to IEC 348
Dielectric strength	4 kV
Leakage current	< 0.5 mA

DISTORTION MAGNITUDES

- Battery voltage from 6.5 V to 10 V: ± 6 mA/V typical, ± 10 mA/V max.
- Temperature from 0 to 50°C: ± 2000 ppm/°C max
- Position of the conductor in the window (AC signal of frequency 1 kHz): max $\pm 0.5\%$ of the reading.
- Errors of linearity, accuracy, temperature shift and other specifications of the oscilloscope should be taken into account during measurement.
- External magnetic fields generated by an AC or DC current of 1A flowing in a conductor placed in immediate proximity

MAINTENANCE

For maintenance, use only specified spare parts. The manufacturer will not be held responsible for any accident occurring following a repair done other than by its After Sales Service or approved repairers.

- Jaw faces : It is necessary to always keep the jaw faces clean. Clean them and lightly oil them to avoid rust. Do not leave the clamp in very damp places, or directly exposed to water.
- Handles and case : Clean with a cloth or a sponge soaked with soapy water, rinse in the same way without ever getting water on the clamp. Dry with a cloth or in an air flow.
- To maintain the performance of the clamp, it is advisable to carry out a check or recalibration every year.

Calibration

For checking and calibration of your instrument, please contact our accredited laboratories or agent in your country.

Repairs

Repairs under or out of guarantee: please return the product to your distributor.

A PPENDICE

Typical response curves for frequency and phase

Shift measurement current : 1A peak

Measurement current : 1A peak

Different limiting examples of the response of the response of the Clamp