OC5000 Series Current Probes
User Manual

- **OC5010A**
- **OC5110**
- **OC5310**
- **OC5510**

For product support, visit:www.owon.com.hk/download

※：The illustrations, interface, icons and characters in the user manual may be slightly different from the actual product. Please refer to the actual product.

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General Warranty

We warrant that the product will be free from defects in materials and workmanship for a period of 1 years from the date of purchase of the product by the original purchaser from our company. This warranty only applies to the original purchaser and is not transferable to a third party.

If the product proves defective during the warranty period, we will either repair the defective product without charge for parts and labour, or will provide a replacement in exchange for the defective product. Parts, modules, and replacement products used by our company for warranty work may be new or reconditioned like new. All replaced parts, modules and products become the property of our company.

In order to obtain service under this warranty, the customer must notify our company of the defect before the expiration of the warranty period. Customer shall be responsible for packaging and shipping the defective product to the designated service centre, a copy of the customers proof of purchase is also required.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care.

We shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than our company representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of not our supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

Please contact the nearest Sales and Service Offices for services.

Excepting the after-sales services provided in this summary or the applicable warranty statements, we will not offer any guarantee for maintenance declared or hinted, including but not limited to the implied guarantee for marketability and special-purpose acceptability. We should not take any responsibilities for any indirect, special, or consequent damages.

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1.Product Introduction

The OC5000 series current probe utilizes an advanced magneto electric inductor to precisely measure current signals by detecting the magnetic field signals generated by the current. It is primarily used for measuring and analyzing conductor currents.The current probes are available in ranges up to 100A.

The frequency bandwidth of the current signals is up to 5MHz.

This series of current probes can be used in conjunction with the OD6000 series differential probes produced by our company to perform complete voltage, current, and power analysis on the circuit.

This series of current probes boasts an exquisite appearance and a sturdy structure, while also offering high stability and precision.

Usually, it may be used at the following locations:

- Non-contact current measurement
- Power analysis measurement
- New energy application design
- LED power supply design
- Switching power supply design
- Power convert design, etc
- Inverter power supply, UPS power supply
- Variable frequency drive, variable frequency household appliance
- Motor detection and maintenance
- Low voltage electrical testing
- Electrical and electronic experiment
- Electricity and power transmission experiments, etc

2. Technical Specifications

Main Technical Specifications

Electrical Performance				
Model	OC5010A	OC5110	OC5310	OC5510
Bandwidth (-3dB)	500kHz	1MHz	3MHz	5MHz
Rise time	≤700ns	≤350ns	≤116ns	≤70ns
Maximum working current	See the table of rated voltage and current values			
Maximum working voltage	See the table of rated voltage and current values			
Maximum floating voltage	See the table of rated voltage and current values			
Gear level	L		H	
Current ranges	50mA~10A peak		1A~100A peak	
Range sensitivity	0.1V/A		0.01V/A	
DC accuracy,typical	3%±50mA		500mA~40A peak: 4%±50mA; 40A~100A peak: ±15% max	
Phase shif	DC～65Hz: <1.5°		DC～65Hz: <1°	
Working voltage RMS	CAT Ⅰ 600V	CAT Ⅱ 600V	CAT Ⅲ 300V	
Common mode voltage RMS	CAT Ⅰ 600V	CAT Ⅱ 600V	CAT Ⅲ 300V	
Power adapters	Input: AC100V~240V 50-60Hz, output: DC12V/1A			
Battery type and life, typical	9V alkaline laminated battery / 15 hours			
Low battery indicator function	When the battery voltage <6.5V, the battery indicator is red.			
Overload indication function	Measured current exceeds range, buzzer sounds			

Supplementary Characteristics

Parameter	Maximum working current (A)		Maximum working voltage (V)	Maximum floating voltage (V)
	H(0.01V/A)	L(0.1V/A)		
DC	100	10	600	600
DC+AC peak	100	10	600	600
AC peak	100	10	600	600
AC peak	200	20	1200	-
RMS CAT III	70.7	7.07	300	300
RMS CAT II	70.7	7.07	600	600
RMS CAT I	70.7	7.07	600	600

Machine Specifications	
Current clamp size (L*W*H)	Approximately 230*33*70mm
Maximum size of the measured conductor	Calibre approximate 12mm
Length of current clamp output coaxial cable	Approximately 1.5m
Weights	Approximately 300g(Battery not included)
Environmental Specifications	
Operating temperature	0℃ to +50℃
Storing temperature	-20℃ to +80℃
Operating altitude	0 to 2000m
Operating relative humidity	0℃ to +40℃，humidity level 95%RH； +40℃ to +50℃，humidity level 45%RH
Pollution degree	Level 2

Voltage and Current rating table

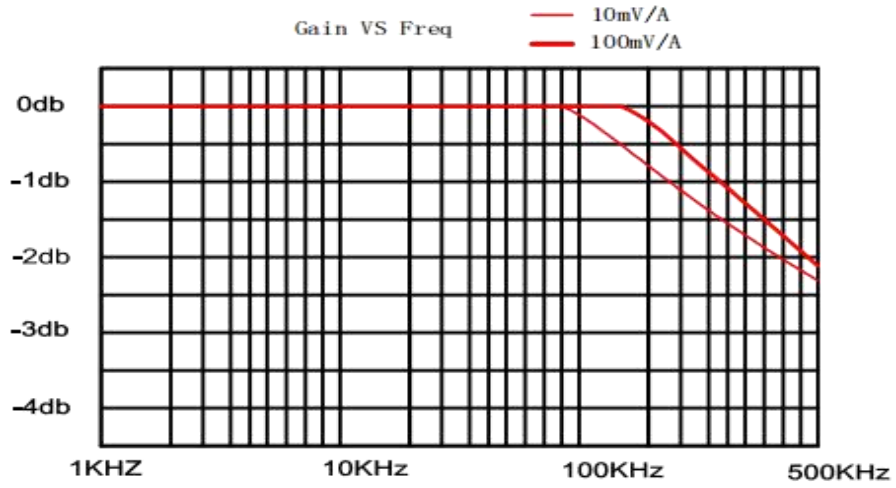


Figure 2-1 OC5010A Typical gain-frequency relationship curve

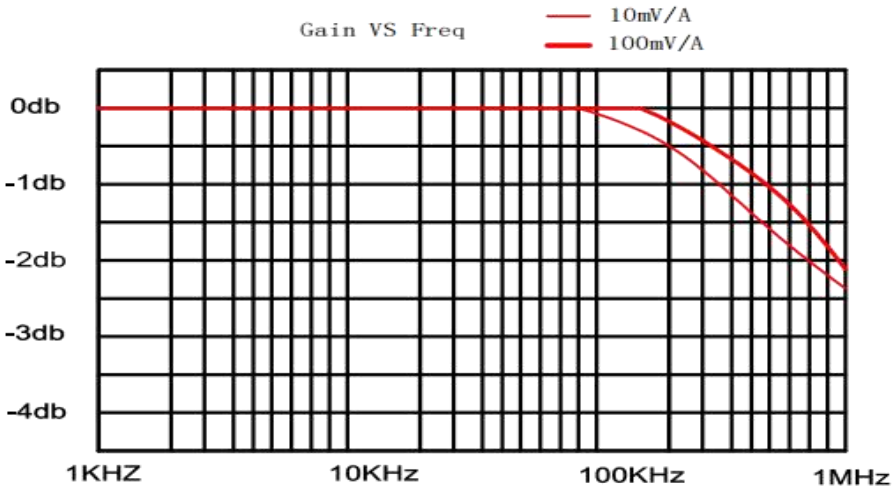


Figure 2-2 OC5110 Typical gain-frequency relationship curve

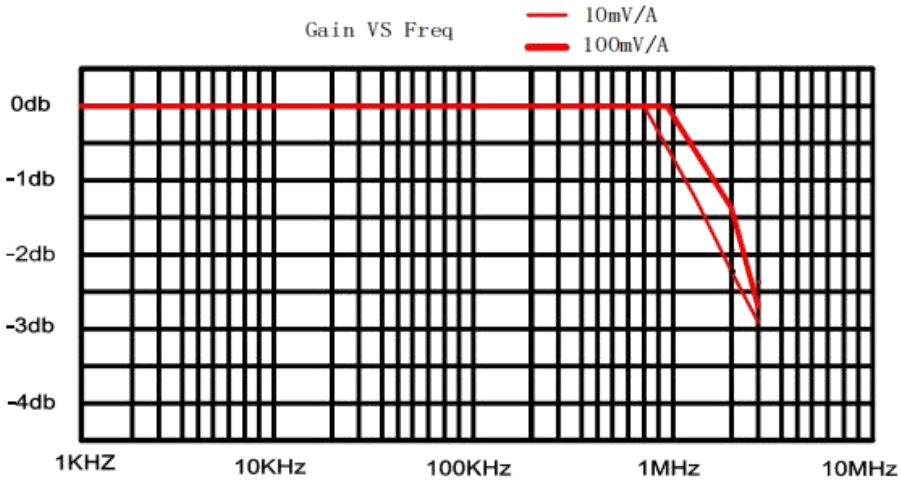


Figure 2-3 OC5310 Typical gain-frequency relationship curve

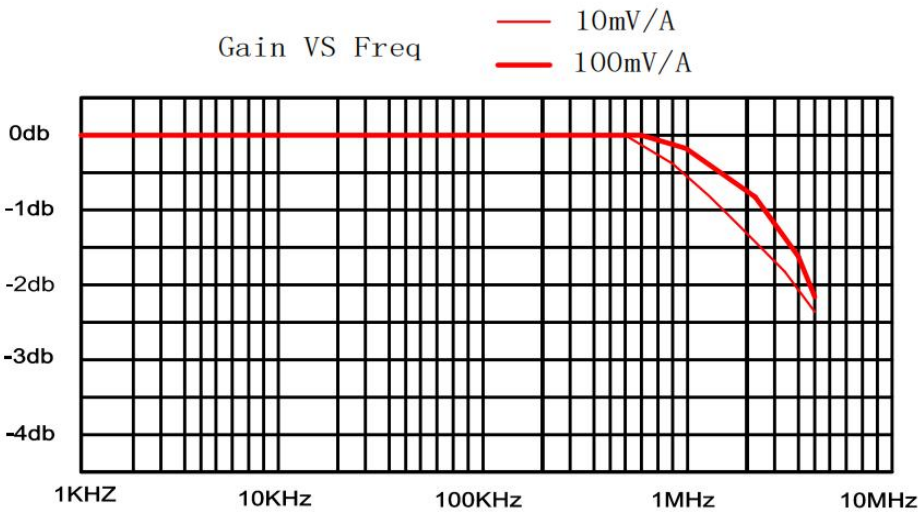


Figure 2-4 OC5510 Typical gain-frequency relationship curve

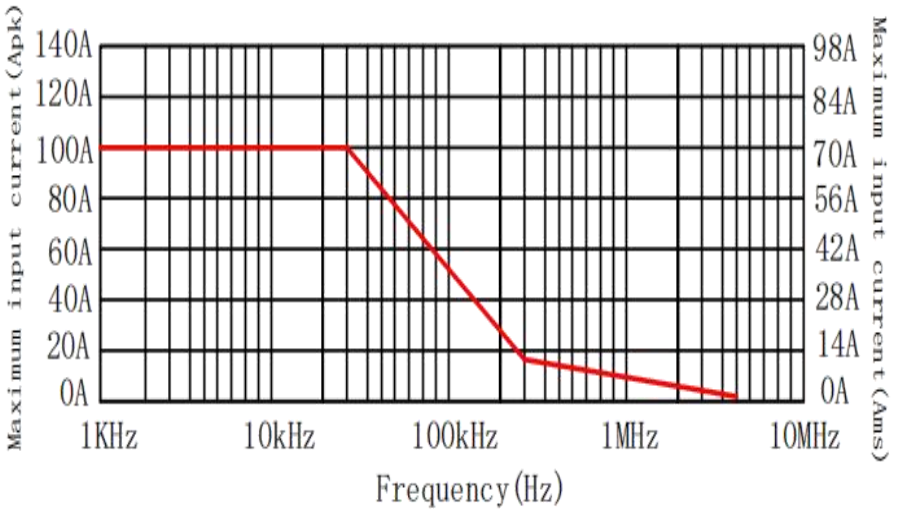


Figure 2-5 Maximum current VS frequency characteristic curve

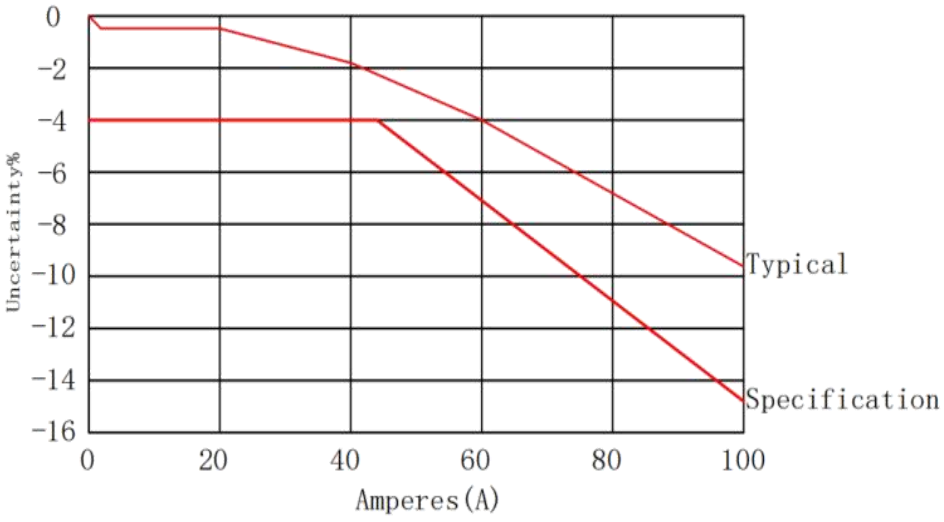


Figure 2-6 Typical DC linearity (0.01V/A setting)

3. Quick Start

This chapter will briefly introduce the appearance of the OC5000 series current probe, allowing you to quickly understand the OC5000 series current probe. At the same time, we will inform you of the basic checks that need to be done after receiving this product to ensure its normal operation.

Schematic diagram of current probe

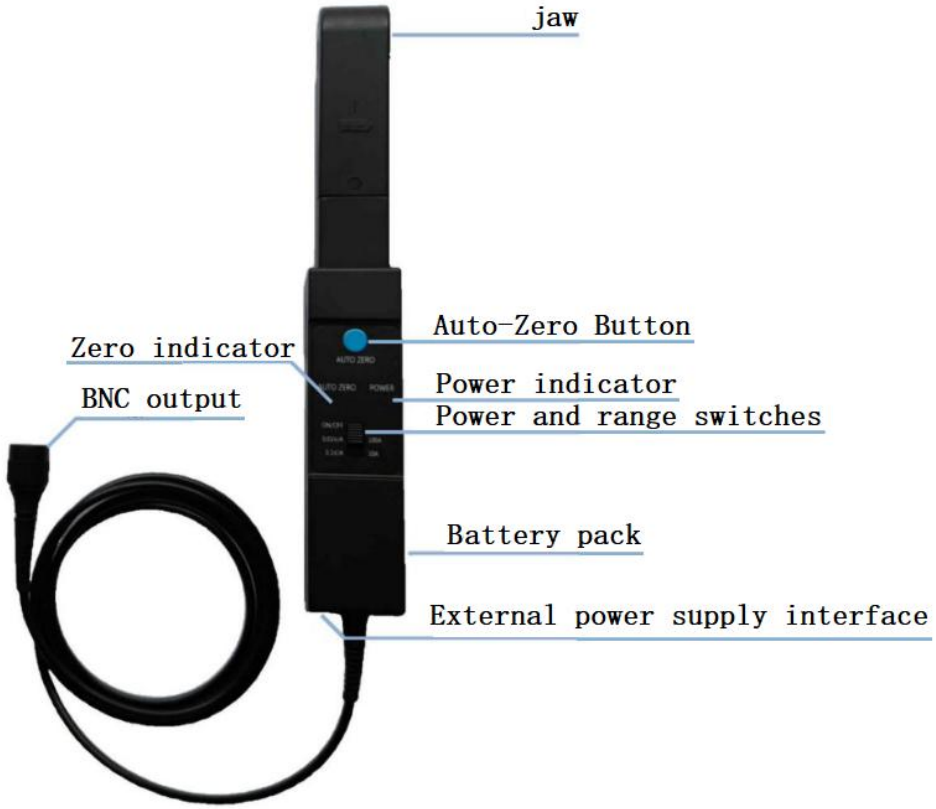


Figure 3-1 OC5000 Series Current Probe

1. **Power and range switch:** OFF probe is off, no power from battery or external power supply; 0.01V/A range is 100A; 0.1V/A range is 10A.
2. **Power indicator:** When the power supply and range switch is switched to 0.01V/A or 0.1V/A, the power indicator lights up green; when the battery voltage is lower than 6.5V,the power indicator lights up red, prompting the replacement of the battery.

3. **Auto zero button:** To ensure measure accurately, zero calibration is required before use to eliminate interference from the earth's magnetic field, temperature drift, and other environmental factors.
4. **Zeroing indicator:** lights up green when zeroing and goes out when zeroing is complete.
5. **Jaw:** Measuring current jaws, max. wire diameter 12mm.
6. **External power supply socket:** For external DC power supply.
7. **Battery pack:** The battery uses a conventional 9V alkaline battery and requires that the current probe is not connected to the conductor under test and the oscilloscope, and that the switch is in the OFF position when replacing the battery.

Preliminary inspection

1. Inspection of goods

Each of our products has undergone strict inspection before leaving the factory. When you receive the product, please first check if the packaging box is intact. If the packaging box is damaged, you must immediately open it for inspection to prevent the product from being damaged or accessories from being lost during transportation. If any product damage or missing accessories are found, please contact the carrier and distributor immediately.

Packing list:

- One manual
- One current probe
- One power adapter

2. Pre use inspection

Before plugging the power adapter into the power outlet, please confirm that the power voltage used is normal. The power supply voltage should be as shown in the table below. If it is not normal, it may cause damage to this product.

Adapter input voltage range	Frequency range

AC100V~240V	50~60Hz

Warning: To prevent damage, please use the original power adapter of this product!

4. Operating Instructions

The use of the OC5000 series current probe is very simple, but users who are not familiar with this product should read this manual completely before starting to operate it.

Operating Steps

1. Before use, ensure that the input power voltage of the power adapter is normal. When the voltage switch is set to 0.01V/A or 0.1V/A, the power indicator light will turn green.
2. In order to obtain accurate measurement results under different testing scenarios, the oscilloscope and probe should be preheated for about 20 minutes before testing. Depending on the magnitude of the test current, select the appropriate range through the range switch.
3. Set the coupling mode of the oscilloscope to DC and the input impedance to 1MΩ. Set the corresponding attenuation multiples. For example, select the probe at the 0.01V/A setting, set the oscilloscope to 100X, select the probe at the 0.1V/A setting, and set the oscilloscope to 10X. Connect the probe's BNC output interface to the input terminal of the oscilloscope.
4. Open the current probe test jaw, insert the test conductor into the test jaw, and close the test jaw. During this process, the test conductor should remain unpowered.
5. Press the auto-zero button to achieve automatic zero adjustment for the probe. Note that external magnetic fields may have a slight impact on the DC zero position of this probe. Please do not move it after zero adjustment is complete.
6. Energize the conductor, adjust the oscilloscope settings as needed, and read the measurement result. A positive measurement result indicates that the current flowing through the conductor is consistent with the direction of the arrow marked on the upper cover of the test clamp.
7. After the test is completed, disconnect the power supply of the conductor first, and then remove the conductor from the slot.

Examples of usage techniques

1. When measuring the differential current waveform of two conductors, they can be simultaneously inserted into the test card slot in opposite directions of current for measurement. When measuring the superimposed current waveform of two conductors, the two conductors

can be inserted in parallel into the test card slot in the same direction of current for measurement.

2. When the test current is small and the test sensitivity needs to be improved, the wire can be wound a few turns through the slot. The desired result can be obtained by dividing the measurement reading by the number of wires passing through the card slot.

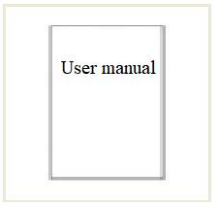
Simple fault phenomena and troubleshooting methods

The power LED does not remain lit	Check that the AC adapter is plugged in and functional.
The measured waveform can't be displayed right and stability	Check that the probe jaw and keep it closed completely. Check the probe connection to the oscilloscope. The oscilloscope is set to DC coupling.
Low amplitude across the band	Adjust the input resistance of other testers such as oscilloscopes to 1MΩ

5. Appendix

Appendix A: Accessories

(The accessories subject to final delivery.)
Standard Accessories:



User Manual



Power Adapter

Appendix B: Safety Operating Specifications

- Use the correct power adapter: Only use the original power adapter provided with this product to avoid damaging the probe.
- Master and adopt the correct connection and disconnection methods: Before connecting or disconnecting the test object, it must be ensured that the test object is in a non-charged state.
- Master and adopt the correct connection and disconnection methods: When connecting, first connect the probe output end to the test instrument and then connect the probe input; when disconnecting, first disconnect the test input and then disconnect the probe output end.
- Grounding: This product is connected to the earth ground of the oscilloscope through the BNC output terminal. During use, it is essential to ensure reliable grounding.
- Please note that this product is only allowed to measure objects with a live voltage range below 600VAC. Do not use it beyond its designated range. It is prohibited to measure bare conductors.
- Please do not use this product with its casing opened. Non-professionals are advised not to open the casing of this product.

- Please do not use this product in flammable or explosive environments.
- Please do not use this product in an excessively humid environment. Keep this product dry and clean. Electric shock accidents may occur if the machine is wet or measured with wet hands.