OC6000 Series Current Probes
User Manual

- **OC6053**
- **OC6055**
- **OC6123**

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 OC6000 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 designed for measuring and analyzing conductor currents.

The current probes are available in ranges up to 50A. The frequency bandwidth of the current signals is up to 120MHz. Its features include high bandwidth, high precision, two range options, automatic demagnetization and zero adjustment function, standard BNC output interface, and can be matched with any manufacturer's oscilloscope.

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
- Welding and electroplating power supplies
- 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		OC6053	OC6123	OC6055
Bandwidth (-3dB)		DC-50MHz (Figure 2-1)	DC-120MHz (Figure 2-4)	DC-50MHz (Figure 2-7)
Rise time		≤7ns	≤2.92ns	≤7ns
Maximum measured current		30Arms (Figure 2-2)	30Arms (Figure 2-5)	50Arms (Figure 2-8)
Peak current		50Apk		75Apk
Range		5A: 1X attenuation		7.5A: 1X attenuation
		30A: 10X attenuation		50A: 10X attenuation
Overcurrent alarm value		5A: ≥5A		7.5A: ≥7.5A
		30A: ≥50A		50A: ≥75A
Current transfer ratio		5A: 1V/A		7.5A: 1V/A
		30A: 0.1V/A		50A: 0.1V/A
Resolution		5A: 1mA		7.5A: 1mA
		30A: 10mA		50A: 10mA
Accuracy (DC, 45-66Hz maximum continuous current)		5A: ±1%±10mA		7.5A: ±1%±10mA
		30A: ±1%±100mA		50A: ±1%±100mA
Input impedance		Reference (Figure 2-3)	Reference (Figure 2-6)	Reference (Figure 2-9)
Delay time-lapse	Probe host	14ns		
	BNC(1m)	5ns		
Terminal load requirements		≥100kΩ		
Power supply mode		DC 12V/2A (Standard adapter)		
Maximum voltage to		600V CAT Ⅱ 300V CAT Ⅲ		

ground (Bare conductor)	
Safety meets standards	EN61010-1: 2010+A1:2019 EN 61010-2-032:2019
EMC meets standards	EN61326-1:2013 EN61000-3-2:2014 EN61000-3-3:2013

Note: The maximum duration is 2 seconds, and cooling for more than 20 seconds is required when the maximum peak current is input.

Supplementary Characteristics

Mechanical Specifications			
Model	OC6053	OC6123	OC6055
Jaw diameter	Approximately 5mm		
Cable length	Approximately 1m(Current clamp handle to control box)		
Coaxial output line length	Approximately 1m		
Current clamp handle size (L * W * H)	Approximately 176*39.5*18mm		
Control box size (L * W * H)	Approximately 100*50*27mm		
Weight	Approximately 500g		
Environment Specifications			
Working temperature	0~40℃		
Storing temperature	-10~50℃		
Working humidity	80%RH		
Storing humidity	80%RH		
Working altitude	2000m		
Storing altitude	12000m		

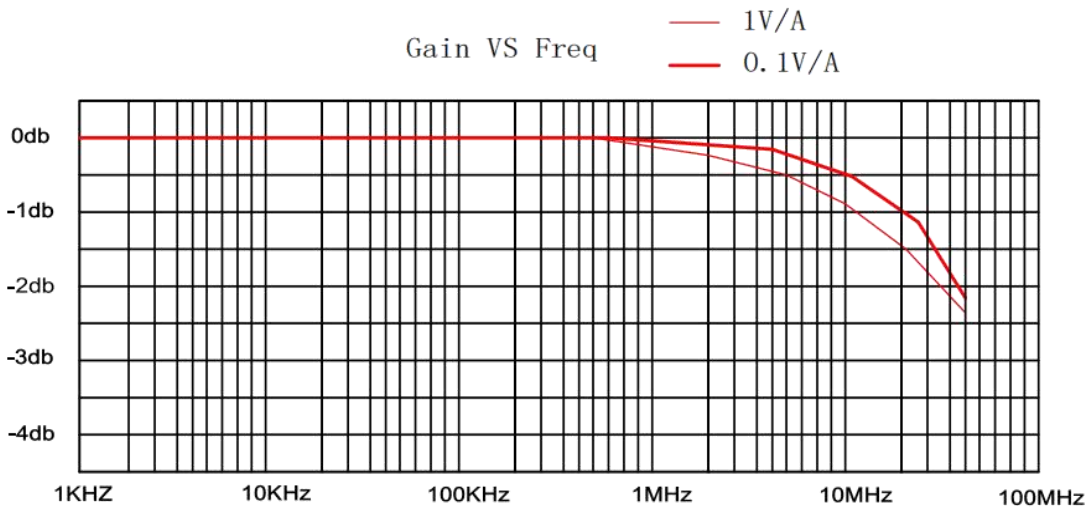
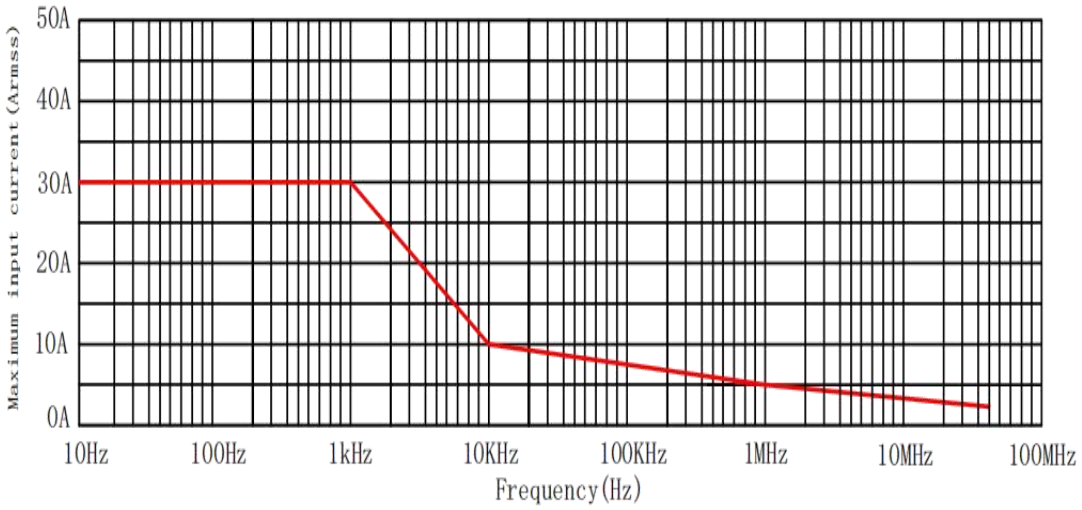


Figure 2-1 OC6053 amplitude frequency curve



Note: (Continuous use beyond the maximum current shown in the curve may cause the probe to burn out)

Figure 2-2 OC6053 maximum measured current vs. frequency curve

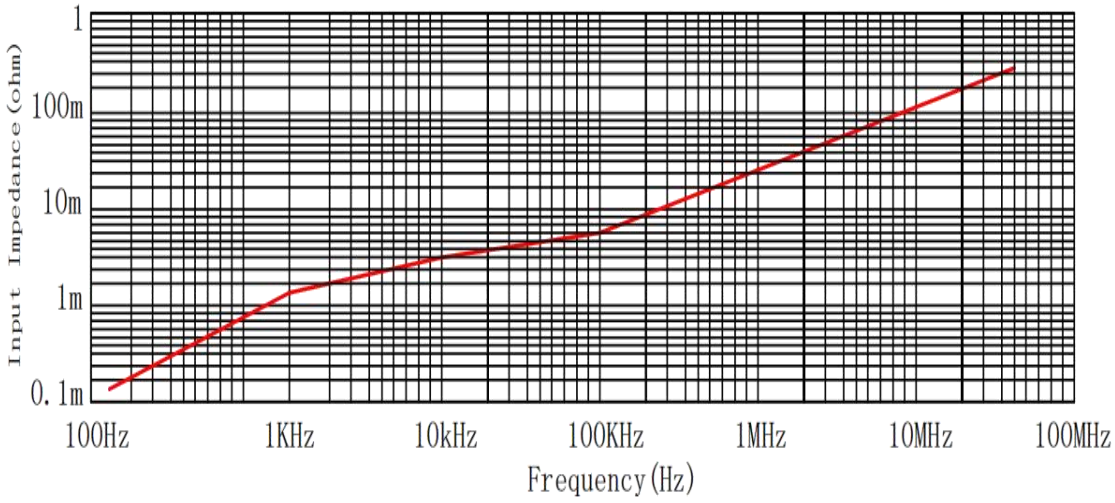


Figure 2-3 OC6053 input impedance vs. frequency curve

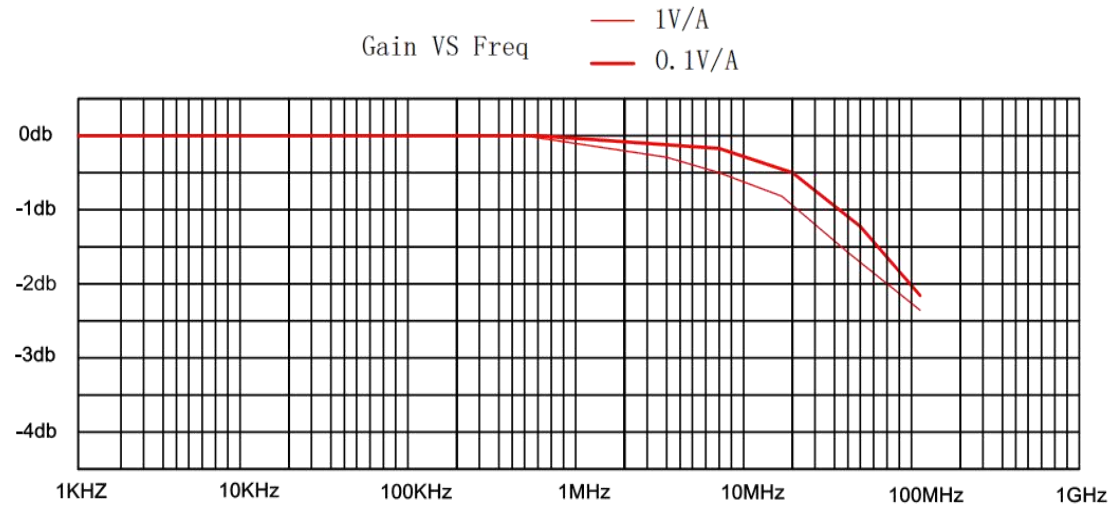
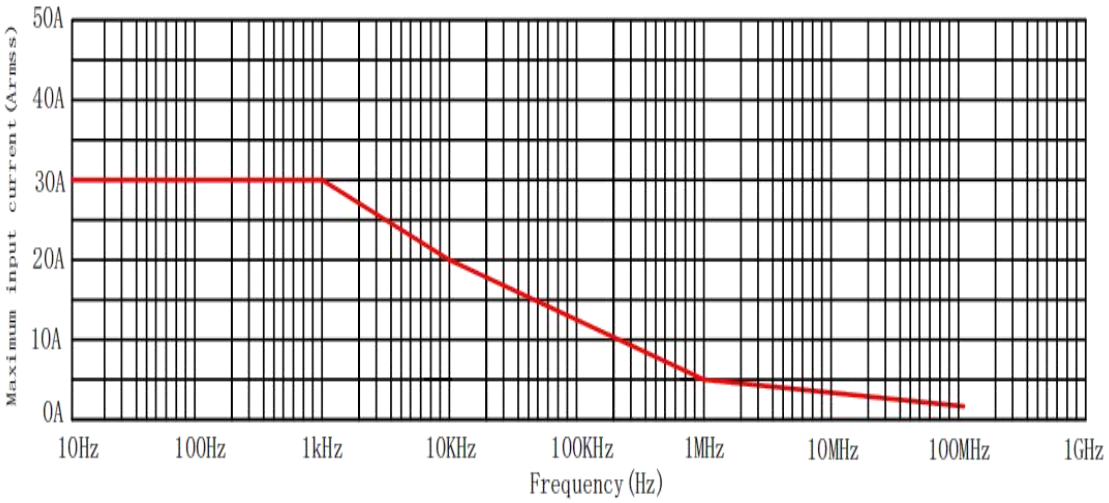


Figure 2-4 OC6123 amplitude frequency curve



Note: (Continuous use beyond the maximum current shown in the curve may cause the probe to burn out)

Figure 2-5 OC6123 maximum measured current vs. frequency curve

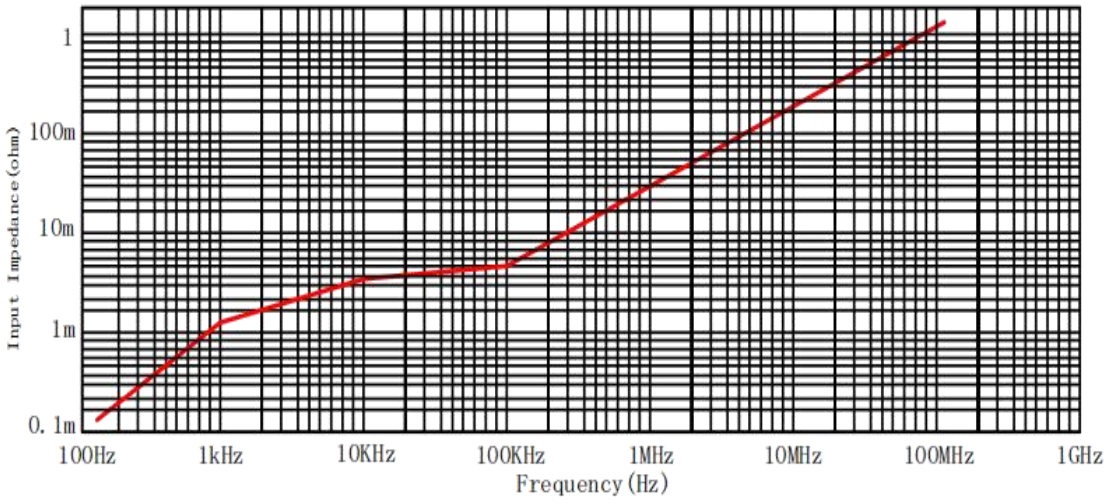


Figure 2-6 OC6123 input impedance vs. frequency curve

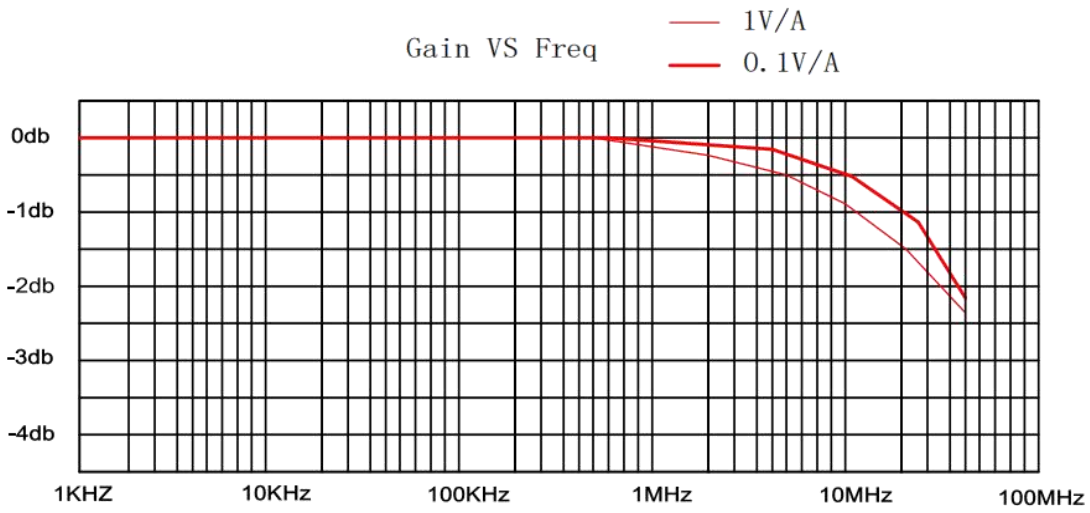
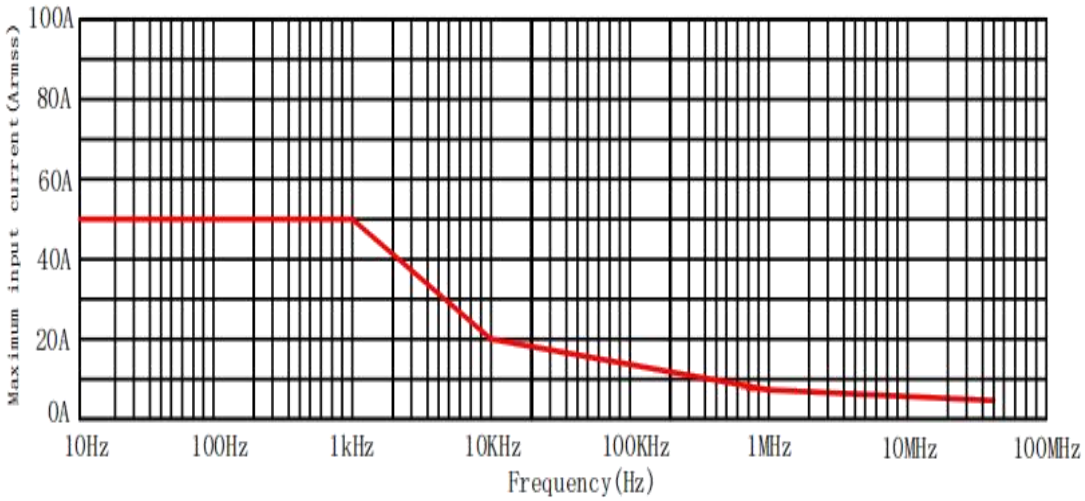


Figure 2-7 OC6055 amplitude frequency curve



Note: (Continuous use beyond the maximum current shown in the curve may cause the probe to burn out)

Figure 2-8 OC6055 maximum measured current vs. frequency curve

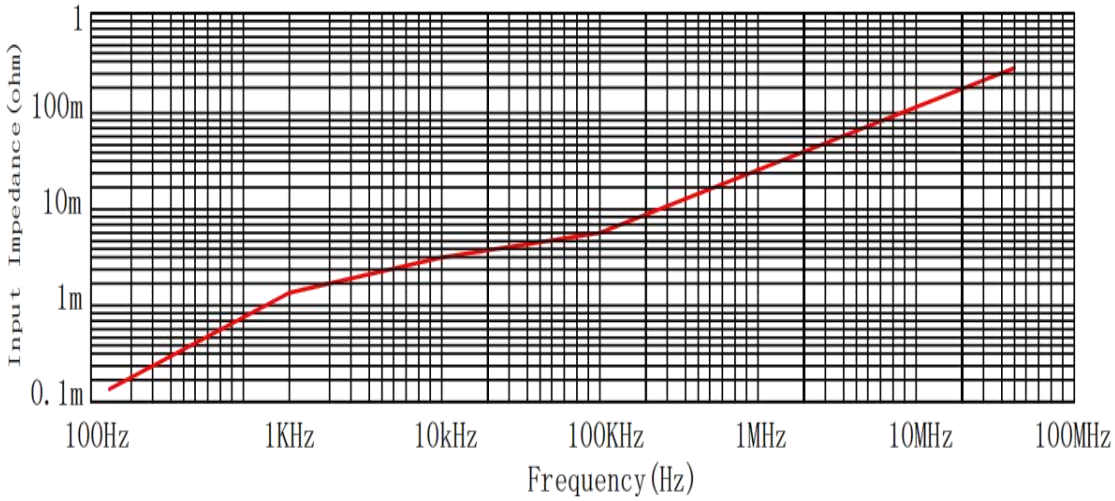


Figure 2-9 OC6055 input impedance vs. frequency curve

3. Quick Start

This chapter will briefly introduce the appearance of the OC6000 series current probe, allowing you to quickly understand the OC6000 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

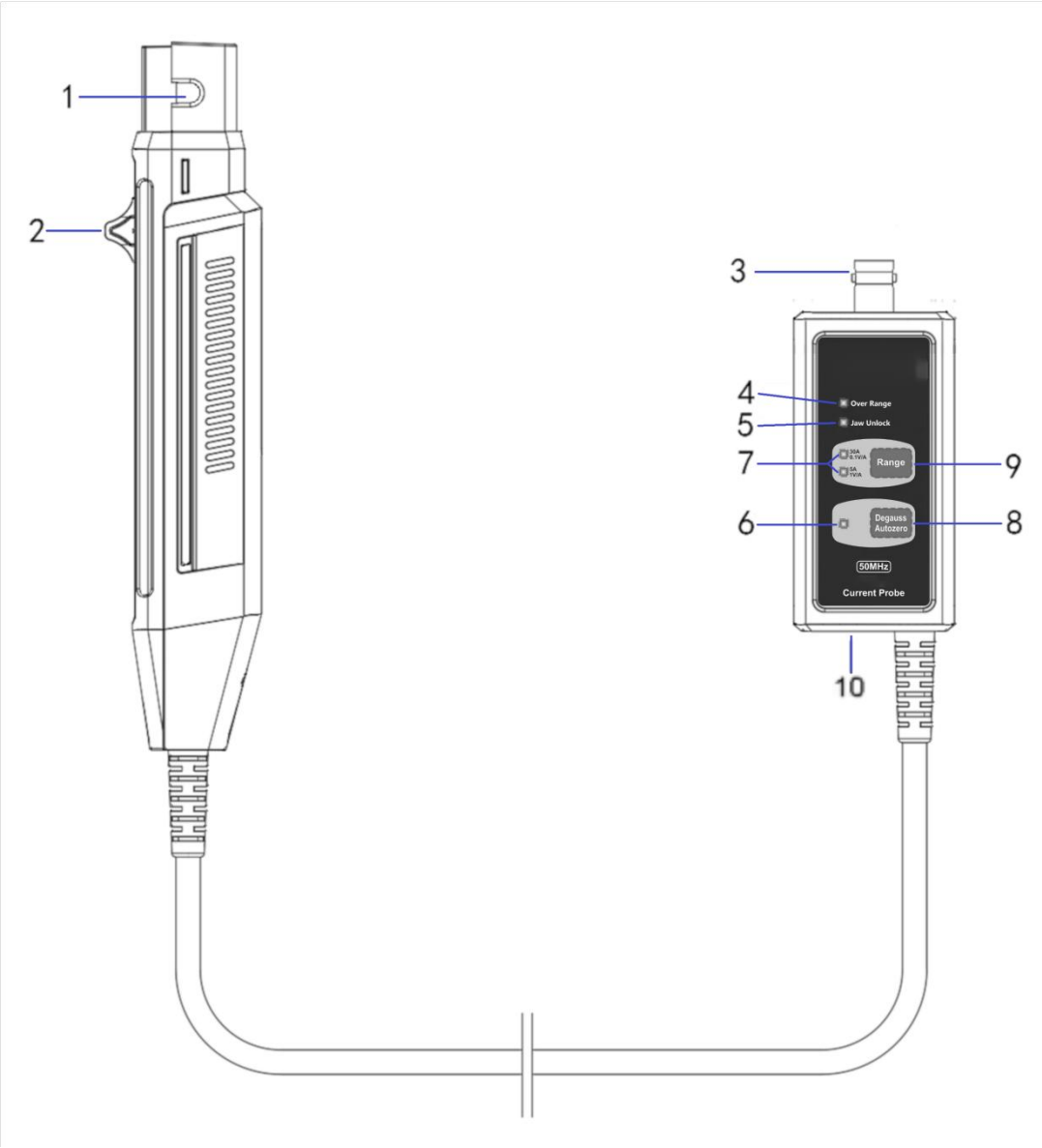


Figure 3-1 OC6000 Series Current Probe

1. Sensor head

The core component for detecting conductor current. The component is composed of a precise semiconductor, and rapid changes in ambient temperature, external pressure shocks, etc. may cause damage to it. Therefore, great attention must be paid during operation.

2. Switch control lever

The joystick that controls the opening and closing of the sensor head. When measuring current, first pull the joystick to open the sensor and place the wire under test. Then push the joystick to place the probe in the LOCK state.

3. Output interface

The standard BNC output interface can be connected to any manufacturer's oscilloscope through the standard BNC coaxial cable.

4. Overload indicator light

After the measured current exceeds the range, the indicator light will turn red and there will be an alarm sound, prompting to switch the range.

5. Jaw open indicator light

The light on indicates that the push rod is in the UNLOCK state. When measuring, make sure that the jaws are in the LOCK state.

6. Demagnetization and zero adjustment indicator light

After pressing the demagnetization zero adjustment button, the indicator light will turn green, and it will turn off after demagnetization is completed.

7. Range indicator light

Indicate the current range status.

8. Degauss AutoZero button

After frequent use, the probe sensor of the machine will have residual magnetic field. Demagnetizing and zeroing before measurement can improve measurement accuracy. Press the demagnetization auto zero button, and the machine will demagnetize and automatically zero for approximately 5 seconds.

9. Range selection button

Used to select the current measurement range.

- OC6053 is divided into two ranges: 30A and 5A. The 30A range has a probe current transmission ratio of 0.1V/A; The 5A range, probe current transmission ratio 1V/A.
- OC6123 is divided into two ranges: 30A and 5A. The 30A range has a probe current transmission ratio of 0.1V/A; The 5A range, probe current transmission ratio 1V/A.
- OC6055 is divided into two ranges: 50A and 7.5A: The 50A range has a probe current transmission ratio of 0.1V/A; The 7.5A range, probe current transmission ratio 1V/A.

10. Power socket

External power socket, standard with DC 12V/2A adapter.

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
- One BNC connecting cable

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 OC6000 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.

Operation Steps

1） Before use, it is necessary to confirm that the input power voltage of the power adapter is normal.

2） Slide the upper cover of the card slot backwards, open the upper cover of the test card slot, insert the test conductor into the test card slot, and push the sliding switch to close the upper cover of the card slot. During this process, the test conductor should remain unpowered.

3） In order to obtain accurate measurement results in different testing scenarios, demagnetization and DC balance adjustment should be performed before testing. The specific steps are as follows:

- Power on the oscilloscope and allow it to warm up for about 30 minutes. Set the oscilloscope channel used for connecting the probe to the highest sensitivity level and adjust it to zero;
- Connect the BNC output of the current probe to the channel input terminal of the oscilloscope, which has been zeroed;
- The test card slot for the current probe should be empty. Toggle the sliding switch on the slot cover, lock the probe, and the "UNLOCK" sign will disappear, indicating that the probe is locked;
- Press the degaussing and zero adjustment button, and the indicator light will turn green. After the degaussing is complete, the indicator light will turn off.

4） 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 cover of the test card slot.

5） After the test is completed, disconnect the power supply of the conductor first, and then remove the conductor from the card 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.

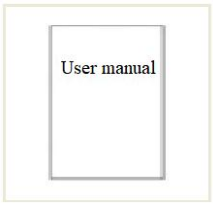
Simple fault phenomena and troubleshooting methods

The power indicator light is not on or flashing.	Check the connection between the power adapter plug and the power socket, or the connection between the output and the probe. Check if the power adapter is working properly.
The measured waveform cannot be displayed stably or has significant errors.	Check if the probe test card slot is tightly closed. Check the connection between the probe output and the oscilloscope. Replace the probe or measuring instrument for troubleshooting.

5. Appendix

Appendix A: Accessories

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



User Manual



Power Adapter



BNC Connection cable

Appendix B: Safety Operating Specifications

- Use the correct power adapter: The original power adapter of this product must be used to avoid damaging the probe.
- Please avoid contact with bare conductors. Please do not touch the measured conductor and sensor head during measurement. Master and adopt the correct connection and disconnection methods: Before connecting or disconnecting the test object, it is necessary to ensure that the test object is in a non electrified state.
- Master and adopt the correct connection and disconnection methods: When connecting, first connect the probe output terminal to the testing instrument and then connect the probe input; When disconnecting, first disconnect the test input and then disconnect the probe output terminal.
- Grounding: This product is connected to the ground of the oscilloscope through the BNC output terminal, and reliable grounding must be ensured during use.
- Please note that this product is allowed to measure the charged voltage range of the object and should not be used beyond the range.

- The upper and lower connection surfaces of the sensor head are produced through precise grinding steps. Please be careful not to damage the connection surface during operation, as any defects may affect its functionality.
- If dust adheres to the upper and lower connection surfaces of the sensor head, it will also affect its performance. Please gently wipe it with a soft, anti-static cloth.
- This machine does not have waterproof or dustproof construction. Please do not use this instrument in environments with high dust and excessive humidity. Keep this product dry and tidy.
- During transportation and operation, avoid vibration and impact. Especially the impact generated after falling.
- Avoid storing and using in environments with direct sunlight, high temperature, humidity, and condensation, as it may cause deformation, insulation deterioration, and fail to meet usage specifications.
- When removing machine contamination, place a small amount of neutral detergent on a soft cloth and gently wipe it. Never use detergents containing petroleum spirit, alcohol, acetone, ether, ketones, thinners, gasoline, etc., as they may cause deformation and discoloration.
- Please do not pull or fold the connecting wire to prevent it from breaking and causing malfunctions.
- Please do not use this product with the product casing open. Non-professionals are advised not to open the casing of this product.