Flexible Current Probe

CP9000（S/L）

Shenzhen Zhiyong Electronic Co., Ltd

Standard ring size and schematic diagram:

Large Loop
Circumference: 600mm

Middle Loop
Circumference: 200mm

Small Loop
Circumference: 80mm

Note: ring size can be customized, please contact us if necessary.

Preface

First of all, thank you for purchasing our products, this instruction manual is the description about the function, usage, operation attention points, etc. Before use, please read the instructions carefully and use correctly.

Manual annotation will use the following symbols to distinguish.

This symbol means it is harmful to the machine and human body; you must strictly follow the instruction manual to operate.

Warning **In the case of wrong operation, the user risk injury. The content under this mark records the relevant matters needing attention to avoid such dangers.**

Notice **The user may suffer minor injuries and material damage with the wrong operation. To avoid such situation, the matters under this mark need attention.**

Note **This symbolizes important note about how to use the machine.**

To the safely use the device, you must abide by the following safety precautions strictly. The violation against the manual is likely to damage the protective function of the machine. In addition, the company is not responsible for any safety problem caused by the violation of matters needing attention in operation.

- **Make sure the BNC terminal is well grounded when BNC output cables connect to oscilloscope or other devices**
- **Make sure the circuit under test is turned off before it is accessed by the probe.**
- **Please check the probe skin before use. If there is any breakage, stop using it right away**
- The sharp edge of the circuit could damage the probe loop, please check carefully before access it.
- The operating voltage requirement has been marked on the loop; please make sure the probe is operating within safety range.
- **Select the standard adapter power supply of our product.**

Menu

1. Summary

CP9000(S/L) series AC flexible current probes are designed with characteristics of high bandwidth and high precision (typically 2%). CP9000 series are able to realize wide range current measurement, with frequency ranging from several Hz to tens of MHz and current ranging from mA level to kA level.

The main features include:

- A handy flexible coil that can reach most corners bothering the hard probe; Minimized insertion loss of about a few pH that will cause little interference to the conductor under test.
- Standard BNC output connector that can adapt any oscilloscope, data collector or DVM to observe current waveform;
- USB power supply connector that provide flexibility and convenience;
- Sound and LED alarm function, the design is more humanized;
- Can be customized according to customer requirements, meet the test requirements of special applications.

CP9000S Series: Has an extremely thin, clip-around Rogowski coil of typical wire diameter 2.5mm*1.3mm, and withstanding voltage of up to 1kVpk. It is very suitable for measurement including MOSFET, IGBT device pin current (TO-220, to-47 package), capacitance ripple current and other small package device current.

CP9000 Series probe: With the coil typical outer diameter of 3.8mm, withstanding voltage of up to 2kVpk, its coil can reach any circuit in narrow space and measure large current conveniently.

CP900L Series probe: With the coil typical outer diameter of 8mm, withstanding voltage of up to 10kVpk, it is designed for measuring large current with large power.

2. Application

- Measuring the harmonic composition of current
- Measuring waveform of high-frequency sinusoidal current
- Measuring small current of 50 / 60Hz
- Measuring the small phase shift in the sine wave
- Monitoring current of semiconductor switch
- Capacitance discharge test and ripple measurement
- Measuring harmonic current components
- Distributed current monitoring
- Power bus monitoring
- Monitor harmonics, power and power quality
- Large motor, pump and fan test
- Switching current waveforms in MOSFET or IGBT devices as small as TO-220 or TO-47

3. Electrical Specifications

Measuring conditions：23℃；60%RH；Conductor is central in the loop.

3.1 CP9000S Series

Model	Sensitivity (mV/A)	Peak		Noise max (mV Vpp)	Droop typ. (%/ms)	LF bandwidth -3dB(Hz)	HF bandwidth -3dB(MHz)	Accuracy typ.	Insulation voltage
		Current (kA)	di/dt (kA/μS)						
CP9003S	200	0.03	2	20	80	116	30	2%	1kV
CP9006S	100	0.06	4	20	65	67	30		
CP9012S	50	0.12	8	15	35	34	30		
CP9030S	20	0.3	20	15	9	9.2	30		
CP9060S	10	0.6	40	10	6	6.2	30		
CP9120S	5	1.2	70	10	3	3.2	30		
CP9300S	2	3.0	70	5	2	2	30		
CP9600S	1	6.0	70	5	2	2	30		

3.2 CP9000 Series

Model	Sensitivity (mV/A)	Peak		Noise max (mV Vpp)	Droop typ. (%/ms)	LF bandwidth -3dB(Hz)	HF bandwidth -3dB(MHz)	Accuracy typ.	Insulation voltage
		Current (kA)	di/dt (kA/μS)						
CP9012	50	0.12	1	12	9.5	10	15	2%	2kV
CP9030	20	0.3	2.5	12	4.5	4.8	15		
CP9060	10	0.6	5.0	10	2.0	2.3	15		
CP9120	5	1.2	10	10	0.8	0.9	15		
CP9300	2	3.0	25	8	0.4	0.5	15		
CP9600	1	6.0	40	7	0.25	0.3	15		
CP9121	0.5	12	40	5	0.2	0.2	15		
CP9301	0.2	30	40	5	0.1	0.1	15		
CP9601	0.1	60	40	5	0.06	0.06	15		
CP9122	0.05	120	40	5	0.035	0.03	15		

3.3 CP9000L Series

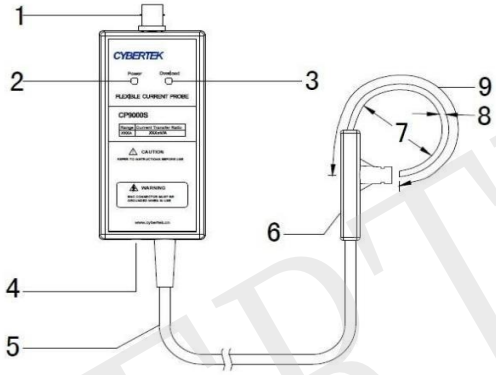
Model	Sensitivity (mV/A)	Peak		Noise max (mV Vpp)	Droop typ. (%/ms)	LF bandwidth -3dB(Hz)	HF bandwidth -3dB(MHz)	Accuracy typ.	Insulation voltage
		Current (kA)	di/dt (kA/μS)						
CP9012L	50	0.12	0.8	3	70	80	10	1%	10kV
CP9030L	20	0.3	2.0	2.5	40	50	10		
CP9060L	10	0.6	4.0	8	3	3.5	10		
CP9120L	5	1.2	8.0	14	0.9	1.0	10		
CP9300L	2	3.0	20	7	0.7	0.8	10		
CP9600L	1	6.0	40	5	0.5	0.6	10		
CP9121L	0.5	12	40	3.5	0.35	0.4	10		
CP9301L	0.2	30	40	3	0.2	0.2	10		
CP9601L	0.1	60	40	3	0.1	0.1	10		
CP9122L	0.05	120	40	3	0.06	0.05	10		

3.4 CP9000(S/L) Series

Max. output voltage	±6Vpk
Terminal load	≥100kΩ
Power supply	USB 5V/1A
Safety standard	EN61010-1:2010
EMC standard	EN61326-1:2013;EN61000-3-2:2014;EN61000-3-3:2013

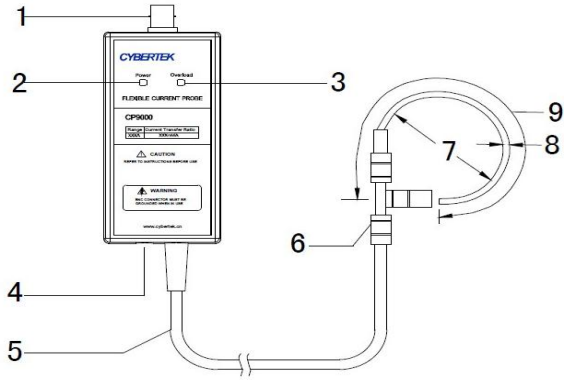
4. Products and Accessories

4.1.1 CP9000S Products



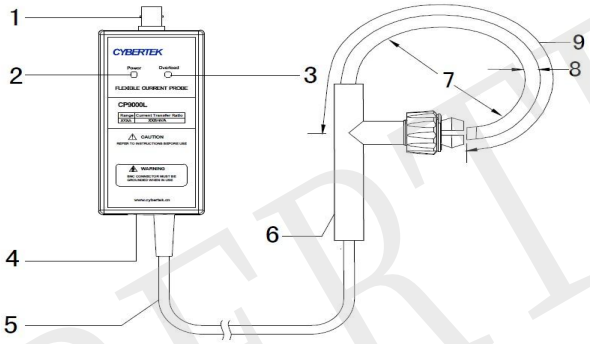
- ✧ Output connector: standard BNC connector, able to connect with oscilloscope of any brand with the BNC Cable.
- ✧ Power indicator LED: When the power adapter is plugged, the green LED lights.
- ✧ Overload indicator LED: When the current measured exceed the range, the red LED lights and the buzzer alarms.
- ✧ USB 5V power supply connector: Standard USB (B) connector.
- ✧ Cable : Standard 1m，Customized according to user needs.
- ✧ Current probe direction: indicating the current direction, output is positive if the current direction complies, otherwise the output is negative.
- ✧ Coil Diameter (min): 25mm typically.
- ✧ Coil Cross-sectional wire diameter: 2.5mm*1.3mm typically.
- ✧ Coil Circumference：80mm typically

4.1.2 CP9000 Products



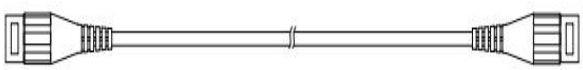
- Output Connector: standard BNC connector, able to connect with oscilloscope of any brand with the BNC Cable.
- Power indicator LED: When the power adapter is plugged, the green LED lights.
- Overload indicator LED: When the current measured exceed the range, the red LED lights and the buzzer alarms.
- USB 5V power supply connector: Standard USB (B) connector.
- Cable : Standard 2m，Customized according to user needs.
- Current probe direction: indicating the current direction, output is positive if the current direction complies, otherwise the output is negative.
- Coil Diameter: 55mm typically.
- Coil Cross Section: 3.8mm typically.
- Coil Circumference：200mm typically.

4.1.3 CP9000L Products

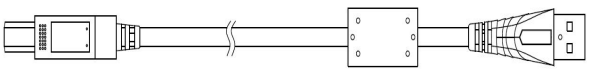


- Output Connector: standard BNC connector, able to connect with oscilloscope of any brand with the BNC Cable.
- Power indicator LED: When the power adapter is plugged, the green LED lights.
- Overload indicator LED: When the current measured exceed the range, the red LED lights and the buzzer alarms.
- USB 5V power supply connector: Standard USB (B) connector.
- Cable : Standard 4m，Customized according to user needs.
- Current probe direction: indicating the current direction, output is positive if the current direction complies, otherwise the output is negative.
- Coil Diameter: 150mm typically.
- Coil Cross Section: 8mm typically.
- Coil Circumference：600mm typically

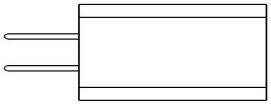
4.2 Accessories



BNC Cable (CK-310：1m)



USB Power Cable（AM-BM，1.5m）



Standard Accessory：USB Adaptor(USB Output：DC5V/1000mA)

5. Typical Mechanical Specifications

Type	CP9000S	CP9000	CP9000L
Coil circumference	80mm	200mm	600mm
Cross-sectional wire diameter	2.5mm*1.3mm	D3.8mm	D8mm
Coil diameter	25mm	55mm	150mm
Cable length	1m	2m	4m
BNC cable	1m(standard accessory) ,2m(optional accessory)		
Integrator box dimension	119*49*28mm		
USB power cable（AM-BM）	1.5m		
USB adaptor	59mm*30mm*20mm		
Probe weight	153g	195g	377g

6. Environment Specifications

Operating temperature	Coil and cable	-20℃～100℃
	Integrator box	0℃～50℃
Storage temperature	-30℃～70℃	
Operating humidity	≤85%RH	
Storage humidity	≤90%RH	

7. Measurement Procedure

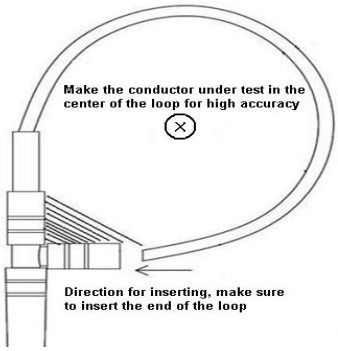
- When the probe is connecting to the oscilloscope or other measuring devices, these devices need to have reference ground and input impedance set up to 1MΩ (or≥100kΩ); Users will need to set up the oscilloscope attenuation ratio according to the probe sensitivity index. For instance, the sensitivity of CP9012 is 50mV/A, thus the oscilloscope need to be 20X; If the sensitivity of CP9600 is 1mV/A, the oscilloscope need to be 1000X.
- Connect the USB adaptor to the probe, and the green power indicator will light up.
- Insert the wire under test into the coil and ensure the plug of current inductive loop is inserted to the bottom. The wire under test need to be central of the coil, or the accuracy cannot be guaranteed. CP9000L series contain an extra rotary knob to lock the probe.
- Power up the circuit.
- After measurement, disconnect the measured signal first and unplug the probe coil later.
- Disconnect the power supply and preserve the probe.

8. Attentions

- To ensure the measurement accuracy, the wire under test should be through the center of the probe loop.
- The measurement error will be maximized if the wire was in the junction shadow area of loop shown below. Please avoid this area.
- Ensure the plug of current inductive loop is inserted to the bottom or the result won't be accurate.
- Avoid any strong magnetic field interference source (e.g. magnetic field radiation

source composed of multiple coils) during measurement, or the result won't be accurate.

- ✧ Avoid any high-voltage signal interference source with high-speed change (such as signals above 100V / us) or interference source with frequency above MHz, or the result won't be accurate.
- ✧ To determine if any strong interference source is around, users can put the coil near the wire under test to determine the interference intensity.



The shadow region has the maximum measurement error

9. Care and Maintenance

- ✧ Keep product surfaces clean and dry.
- ✧ When cleaning the probe, do not use chemical agent. Instead, please clean it with soft and dry cloth.
- ✧ Be careful to avoid damaging the insulation surface while taking measurements.
- ✧ Never attach the clamp to a circuit that operates at more than the maximum rated voltage to earth.
- ✧ Do not use it in a wet or dusty environment.
- ✧ When probe is not needed, please put it in the packaging, placed in a cool, clean and dry place.
- ✧ When transporting the probe, please put it in the shockproof packaging of our company
- ✧ Do not pulling the input lines and output lines, avoid excessive twisting, bending or not.

10. Service Strategy

Please refer to the instruction on warranty card

12. Packing List

List of goods	
Name	**Quantity**
PROBE	1
USB 5V/1A Adapter (CK-605)	1
USB Cable（AM-BM， 1.5m）	1
BNC Cable(CK-310)	1
Instruction Manual	1
Warranty Card	1
Test Report	1

CYBERTEK

SHENZHEN ZHIYONG ELECTRONICS CO., LTD

Addr: Room A1702, Building 4, TianAn Cyber Park, HuangGe North Road, LongGang District, ShenZhen City, China

Tel: +86-400 852 0005 / +86-755-86628000

Q Q: 400 852 0005

Fax: +86-755-8662 0008

Email: cybertek@cybertek.cn

Url: http://www.cybertek.cn

Published in China, May 1st, 2022