

# Flexible Current Probe

## CP9000 ( S/L )



Shenzhen Zhiyong Electronic Co., Ltd

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## 1. Summary

CP9000 ( S/L ) Series are AC Flexible Current Probe .It has the advantages of high bandwidth, high precision (typically 1%) characteristics. The frequency can be from several Hz to tens of MHz, current ranges from mA level to kA level, which solves the problem of current test.

The main features include:

- ✧ easy to measure with thin ,flexible ,clip-around coil; Non-intrusive-loading the circuit under test by only a few pH;
- ✧ BNC Output: easy to plug directly in scope, data acquisition equipment, DVM or power recorders;
- ✧ USB interface Power Supply , ease and flexibility to use;
- ✧ 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 typically 1.6mm cross-section. Such a thin coil enables currents to be measured in the most difficult to reach parts of a power Electronic converter with negligible disruption to the circuit under test. It can be used in MOSFET or IGBT devices as small as TO-220 or TO-47. Cross section only 4mm for 2kV isolation. Accuracy is  $\pm 2\%$  of reading.

**CP9000 Series probe:** Cross section only 3.8mm typically, Safe Coil Voltage Isolation 2kVpk, Accuracy of  $\pm 2\%$  of reading. It is ideal for monitoring currents in even the most difficult to reach parts of a circuit.

**CP900L Series probe:** Cross section only 8mm typically, Safe Coil Voltage Isolation 10kVpk, Accuracy of  $\pm 1\%$  of reading. It is ideal for power electronics development work because it combines an easy to use thin, flexible, clip-around coil with an ability to accurately replicate fast switching current waveforms be they sinusoidal, quasi-sinusoidal or pulsed.

## 2. Application

- ✧ Measuring AC currents superimposed on large DC currents
- ✧ Measuring capacitor ripple current
- ✧ Monitoring current waveforms for semiconductor switches
- ✧ Development and servicing of power electronic equipment
- ✧ Monitoring currents in restricted places
- ✧ Measuring fault currents or circuit breaker interruption currents
- ✧ Measuring harmonic current components
- ✧ Monitoring high frequency sinusoidal , pulsed or transient currents
- ✧ Measuring signal or earth leakage currents in 3-phase supply systems
- ✧ Switching current waveforms in MOSFET or IGBT devices as small as TO-220 or TO-47

### 3. Electrical Specifications

Measuring conditions: 23°C; 60%RH; with conductor 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	0.8	3	70	80	12	2%	2kV
CP9030	20	0.3	2.0	5	40	50	12		
CP9060	10	0.6	4.0	8	3	3.5	12		
CP9120	5	1.2	8.0	14	0.9	1.0	12		
CP9300	2	3.0	20	7	0.7	0.8	12		
CP9600	1	6.0	25	5	0.5	0.6	12		
CP9121	0.5	12	25	3.5	0.35	0.4	12		
CP9301	0.2	30	25	3	0.2	0.2	12		
CP9601	0.1	60	25	3	0.1	0.1	12		
CP9122	0.05	120	25	3	0.06	0.05	12		

#### 3.3 CP9000L Series

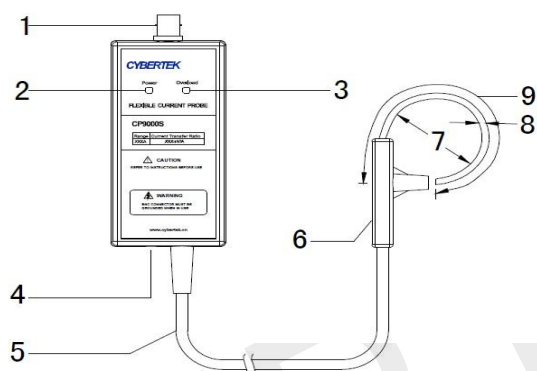
Model	Sensitivity (mV/A)	Peak		Noise max (mV Vpp)	Droop typ. (%/ms)	LF bandwidth -3dB (Hz)	HF bandwidth -3dB (MHz)	Accuracy typ.	Insulation voltage
		Current (kA)	di/dt (kA/μS)						
CP9012L	50	0.12	0.8	3	70	80	10	1%	10kV
CP9030L	20	0.3	2.0	2.5	40	50	10		
CP9060L	10	0.6	4.0	8	3	3.5	10		
CP9120L	5	1.2	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	$\pm 6V_{pk}$
Terminal load	$\geq 100k\Omega$
Power supply	USB 5V
Safety standard	EN61010-1:2010
EMC standard	EN61326-1:2013;EN61000-3-2:2014;EN61000-3-3:2013

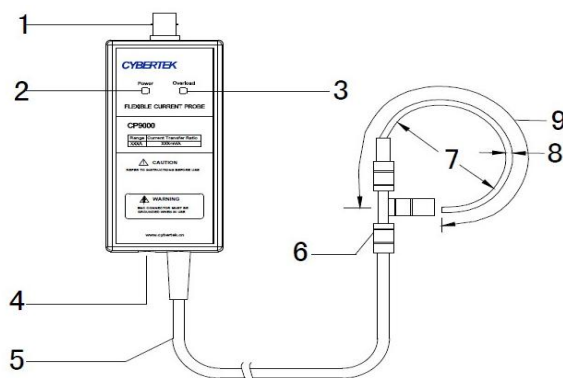
## 4. Products and Accessories

### 4.1.1 CP9000S Products



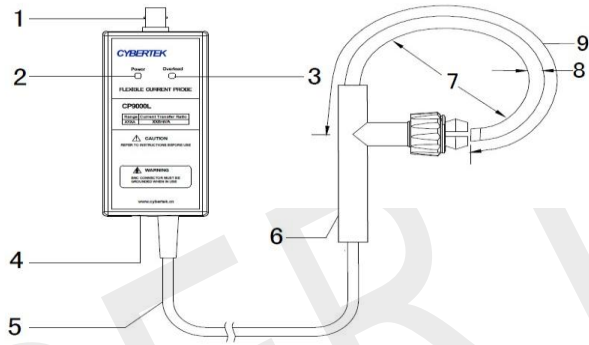
- ✧ Output Interface: standard BNC interface, connect to any manufacturer oscilloscope with the BNC Cable.
- ✧ Power indicator LED: When the power adapter is plugged ,the green LED lights.
- ✧ Overload indicator LED: When the current measured exceed the range,the red LED lights and the buzzer alarms.
- ✧ Power plug: Standard USB (B) interface.
- ✧ Cable : Standard 1m, Customized according to user needs.
- ✧ Current probe direction: the current to the direction shown through, output is positive, otherwise the output is negative.
- ✧ Coil Diameter: 25mm typically.
- ✧ Coil Cross Section: 1.6mm typically.
- ✧ Coil Circumference: 80mm typically

### 4.1.2 CP9000 Products



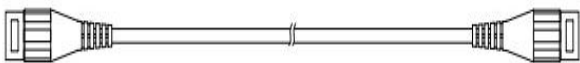
- ✧ Output Interface: standard BNC interface, connect to any manufacturer oscilloscope with the BNC Cable. Power indicator LED: When the power adapter is plugged, the green LED lights.
- ✧ Overload indicator LED: When the current measured exceed the range, the red LED lights and the buzzer alarms.
- ✧ Power plug: Standard USB (B) interface.
- ✧ Cable : Standard 1m, Customized according to user needs.
- ✧ Current probe direction: the current to the direction shown through, output is positive, otherwise the output is negative.
- ✧ Coil Diameter: 55mm typically.
- ✧ Coil Cross Section: 3.8mm typically.
- ✧ Coil Circumference: 200mm typically.

**4.1.3 CP9000L Products**

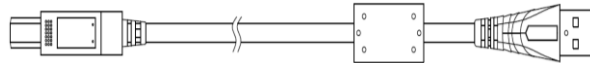


- ✧ Output BNC port : can connect to any brand oscilloscope with the BNC port.
- ✧ Power indicator LED
- ✧ Overload indicator LED: When the current measured exceed the range, the red LED lights and the buzzer alarms.
- ✧ Power plug: Standard USB (B) interface.
- ✧ Cable : Standard 1m, Customized according to user needs.
- ✧ Current probe direction: the current to the direction shown through, output is positive, otherwise the output is negative.
- ✧ Coil Diameter: 150mm typically.
- ✧ Coil Cross Section: 8mm typically.
- ✧ Coil Circumference: 600mm typically

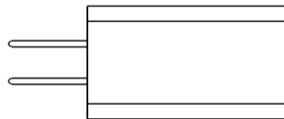
**4.2 Accessories**



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
Coil cross Section	1.6mm	3.8mm	8mm
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

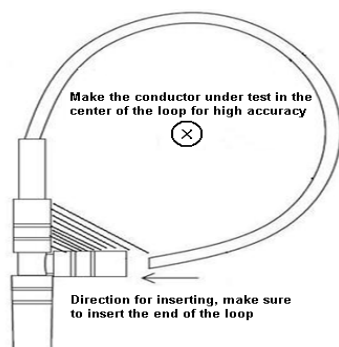
Operating temperature	Coil and cable	-20℃~100℃
	Integrator box	0℃~50℃
Storage temperature	-30℃~70℃	
Operating humidity	≤85%RH	
Storage humidity	≤90%RH	

## 7. Measurement Procedure

- ✧ Have the power supply and oscilloscope ready for waveform measurement ready. The oscilloscope set 1MΩ, and attenuation coefficient. According to the probe type. For example ,CP9012:20X, CP9060:100X, CP9120:200X, CP9600:1000X.
- ✧ Connect the USB Adaptor to the probe, the green power indicator light.
- ✧ Connect the Coil Cross Section. Ensure the Coil Cross Section inserted in the end part, or affect the measuring accuracy.
- ✧ After measurement, disconnect the measured signal and Coil Cross Section.
- ✧ Disconnect the power supply and preserve the probe.

## 8. Attentions

- ✧ To ensure the measurement accurate, the measured wire should be through the center of the probe loop.
- ✧ The measurement has maximum error when the wire has put in the junction shadow area of loop. Please avoid the area.
- ✧ Ensure the Coil Cross tip has been inserted in the end part for high measuring accuracy.



The shadow region has the maximum measurement error

## 9. Care and Maintenance

- ✧ Keep product surfaces clean and dry.
- ✧ 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.
- ✧ Do not use the probe, please put in the packaging, placed in a cool, clean and dry place.
- ✧ Do not pulling the input lines and output lines ,avoid excessive twisting ,bending or knot.

## 10. Service Strategy

According to the warranty card.

## 12. Packing List

List of goods	
Name	Quantity
PROBE	1
USB Adapter( 5V/1A)	1
USB Cable (AM-BM)	1
BNC Cable(CK-310)	1
Tool Bag	1
Instruction Manual	1
Warranty Card	1
Test Report	1
BNC Cable (CK-320)	1 (optional accessory)
USB 5V Mobile Power	1 (optional accessory)

# 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)0755-8662 0008

**Email:** [cybertek@cybertek.cn](mailto:cybertek@cybertek.cn)

**Url:** <http://www.cybertek.cn>

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