Low Frequency Flexible Current Probe

CP9000LFA Series

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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 machine, 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.**

1. Summary

CP9000LFA series Low Frequency flexible current probe applies low frequency flexible probe with double ranges design, and was able to realize wide measurable current range, from 60A to 120kA. Guaranteed accuracy in the loop is 1%, and the typical accuracy is 2%, bandwidth up to 600 kHz (700mm loop perimeter). It is a unique oscilloscope probe and digital display integrated in the industry Probe.The outer diameter typical value is 8mm, withstand voltage 10kVpk. CP9000LFA is very good at the testing of low frequency large current and large power.

The advantages of CP9000LFA includes: the loop that are flexible and easy plug-in can reach many places where the hard probe can't and thus connect to subject under test; the insertion loss is almost zero, and thus has little interference on subject under test.

Standard BNC output interface, easy to connect with oscilloscope, data collector and digital voltmeter to observe the current waveform. The industry's original battery and USB dual power supply, very convenient to be used.

CP9000LFA has overload alert system, and the length of the probe loop and connection cable can be customized freely to fulfill testing requirement in different situation.

The display accuracy of the LCD is as high as 4 and a half, and it can display the valid value of 15Hz to 400Hz.

2. Applications

- Observe the current waveform of low frequency sine wave
- Distributed current monitoring
- Current bus monitoring
- Monitoring harmonic wave, power and power quality
- Large motor, pump and draught fan testing

3. Specification

3.1 Electronical Parameter

Testing Condition: 23℃, 60%RH, cable under test pass through the center of probe loop center

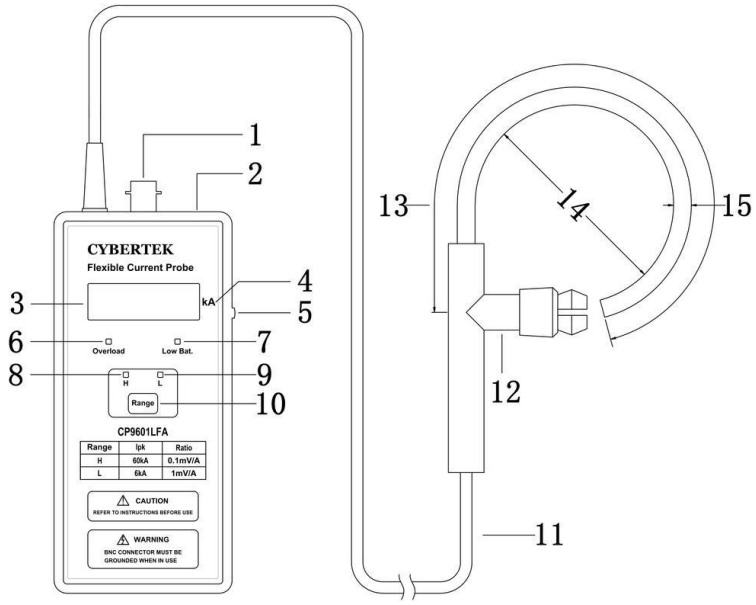
Type	Sensitivity (mV/A)		Peak Current(A)		Max noise (mVrms)		Low frequency bandwidth -3dB(Hz)	Phase shift (50Hz)	Peak di/dt(kA/us)		High Frequency bandwidth -3dB	LCD display value (15Hz-400Hz)
	X10	X1	X10	X1	X10	X1			X10	X1		
CP9060LFA	100	10	60	600	3	1	0.45	<0.85°	0.015	0.25	600kHz	**Arms**
CP9120LFA	50	5	120	1200	3	1	0.23	<0.5°	0.03	0.5		
CP9300LFA	20	2	300	3000	2	1	0.15	<0.35°	0.1	1.2		
CP9600LFA	10	1	600	6000	2	1	0.1	<0.25°	0.2	2.5		
CP9121LFA	5	0.5	1.2k	12k	2	1	0.08	<0.2°	0.4	5		
CP9301LFA	2	0.2	3k	30k	1	0.5	0.07	<0.18°	0.9	6		
CP9601LFA	1	0.1	6k	60k	1	0.5	0.07	<0.18°	1.8	6		
CP9122LFA	0.5	0.05	12k	120k	1	0.5	0.07	<0.18°	3.5	6		

3.2 Other Parameter

Typical accuracy	±1%
Max output voltage	±6Vpk
Probe loop withstand voltage value	10kVpk
Terminal load requirement	≥100kΩ
Typical battery type and life	alkaline dry battery, 4*AA/around 50 hours
Power method	alkaline dry battery, 4*AA or external USB 5 V power supply (standard adaptor)
Low battery indicator function	The battery indicator lights red alarm when the battery voltage is less than 4.3V
Overload indicator function	Lighted red and the buzzer alarms when the current under test surpass the range
Safety compliance	EN61010-1: 2010
EMC compliance	EN61326-1:2013 EN61000-3-2:2014 EN61000-3-3:2013

4. Product and Accessories

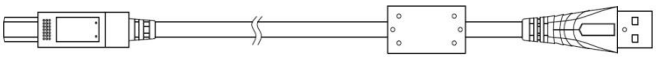
4.1 Product



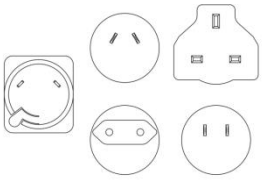
1. **Signal Output Interface:** BNC standard interface, can connect to the oscilloscope of any brand through standard BNC connecting cable.
2. **USB 5V power supply connector:** Standard USB (Type B) connector with standard USB power supply cable.
3. **LCD display:**Display current valid value.
4. **Current unit:**If the unit on the film is kA, the readings on the LCD display are ka as the unit; the unit on the film is The readings on A, LCD display are based on A.
5. **Power Switch:** Controlling the on and off of the power supply.
6. **Overload indicator:** Lighted red and the buzzer alarms when the current overload.
7. **Low power alert indicator LED:** The red LED will be lighted if battery voltage goes low, reminding users to exchange battery.
8. **H gear indicator:** Large Current Gear indicator LED.
9. **L gear indicator:** Small Current Gear indicator LED.
10. **Range Selection button:** Switch between H and L range.
11. **Connection cable:** Connecting the probe and control box; length is customizable.
12. **Current direction label:** indicating the current direction, output is positive if the current direction complies, otherwise the output is negative.
13. **Flexible probe perimeter:** Typical value 700mm; length is customizable
14. 14:**Rogowski Coil loop diameter (minimum):**150mm
15. **Probe loop diameter:** Typical value 8mm

4.2 Accessories

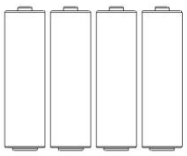
Coaxial Output Cable (CK-310: 1m)



USB cable (CK-315B AM-BM, 1.5m)



Power supply adaptor
(USB output: DC5V/1000mA)



AA cells
(alkaline dry battery, 1.5V*4）

5. Specification

Type	CP9000LFA
Flexible probe perimeter Typical value(Customizable)	700mm
Loop diameter Typical value	8mm
Loop connection cable length	4m(Customizable)
BNC connection cable length	1m or 2m, 1m is standard version
Front probe size	About 150*70*26mm
Probe weight	500g(Non -battery)

6. Environmental Characteristics

Operating temperature	Probe loop	-20℃～70℃
	Main system	-10℃～55℃
Storage temperature	-30℃～70℃	
Operating humidity	≤85%RH	
Storage humidity	≤90%RH	

7. Operating Method

- When the probe is connecting to oscilloscope or other testing device, the reference ground is needed and the input impedance should be 1MΩ (or ≥100kΩ) for these devices; Proper gear should be chosen according to the current under test;

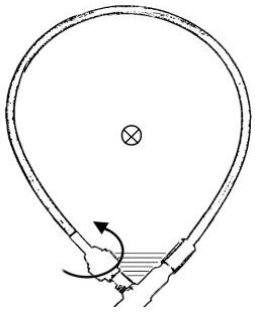
- Powering up by battery or external DC 5V power supply, switch on and the green power indicator ,mobilize the switch to the open position.
- Insert the cable of current under test, make sure the probe loop is inserted to the bottom, and lock the probe with the rotary knob when necessary. Please make sure the cable under test pass through the center of probe loop, or the measurement accuracy will be influenced.
- Power up the circuit under test
- The LCD shows the valid value of the 15Hz ~ 400Hz measurement current.For example: LCD shows "20.3". If the unit on the film is A, it means that the actual value of the measured current is 20.3A; if the unit on the film is kA, it means that the measured current validity value is 20.3kA.
- After the testing, turn off the circuit first, and take down the probe loop then.
- Disconnect the probe power supply and save the probe

8. Tips

Note

- To guarantee the testing accuracy, the cable under test should pass through the center of the loop during measurement.
- The cross section of the probe loop shown in the shadowed area of the picture below is not quite accurate, has the largest testing error, it's not a good idea to put the cable under test through this area.
- Please make sure the probe loop is inserted well (until its bottom), or the testing accuracy will be influenced.
- During the measurement of the signal under test, please be as far away from strong magnetic field interference source (like the magnetic emission source made of multiple loops), or there will be errors.
- During the measurement of the signal under test, please be as far away from fast alternating high voltage interference source (like signal over 100V/us) or those which have frequency over MHz, or there will be errors.
- To determine if there's strong interference source nearby, you could put the probe loop close to the cable under test to determine the strength of interference signal around.
- The Arrow direction below shows the rotate direction of the rotary button. Rotate to lock the probe and reverse to unlock.

PS: The shadow area shown below has maximum error. Cable under test should avoid this area.



9. Maintenance

- Keep the probe dry and clean
- Please use soft and dry cloth to clean the device if necessary. Do not use chemical potion.
- Please put the probe back to the package when not using it and place it in somewhere clean, dry and shady.
- Please put the probe into our shockproof package during transportation.
- Do not drag or pull the cable to avoid distortion, twisting and tie off.

10. Guarantee

Please reference to Guarantee Instruction

11. Packing List

Packing List	
Current probe	1
USB 5V/1A adapter (CK-605A)	1
Alkali batteries(AA 1.5V)	4
USB cable（AM-BM， 1.5m）	1
BNC output cable(CK-310)	1
Instruction book	1
Warranty card	1
Calibration Report	1

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