DC/AC Current Probes

CP8000 Series

CP8030B 30A/DC～ 50 MHz

CP8030H 30A/DC～100 MHz

CP8150A 150A/DC～12 MHz

CP8300A 300A/DC～ 6 MHz

CP8500A 500A/DC～ 5 MHz

Safety Notices

CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a **CAUTION** notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

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1. Features and Applications

The **CP8000** series current probes are wide bandwidth DC/AC active current probes, featuring flat bandwidth, low noise and low circuit insertion loss. This probe can be used with any oscilloscope having a high-impedance BNC input.

The key **features** include:

- Highly accurate current measurements;
- Wide bandwidth;
- Accurate and easy current measurements;
- DC/AC measuring capabilities;
- Over-current protection with dual indicators (buzzer and LED);
- High and low range selection;
- Low current measurements;
- Degaussing and automatic zero setting.

CP8000 Series

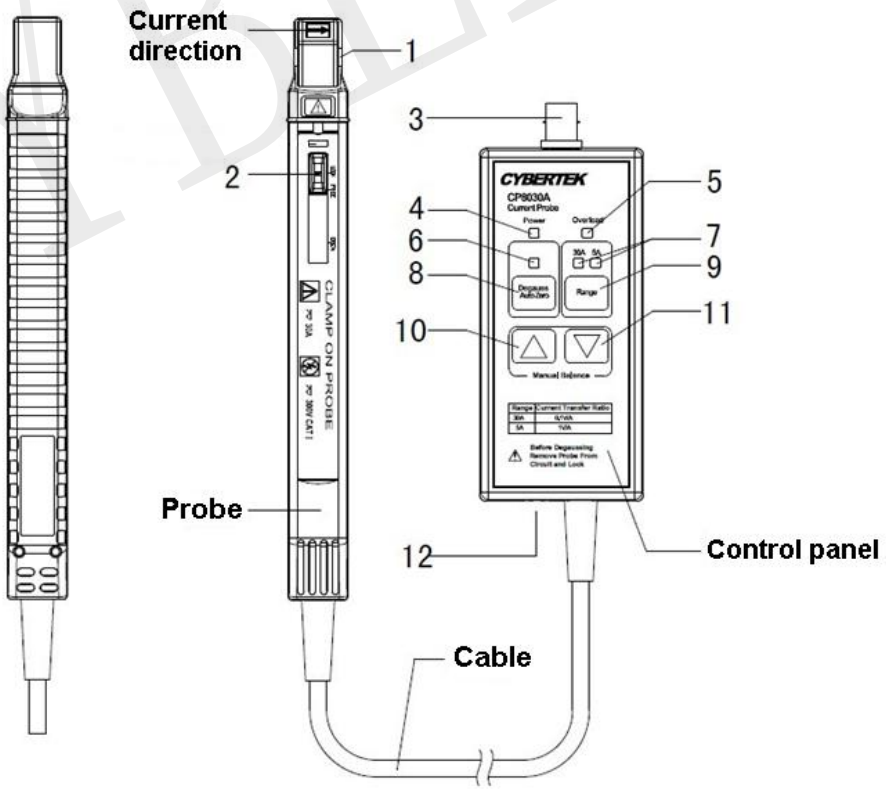
Model	Maximum Continuous Current	Bandwidth	Range	Current Transfer Ratio
CP8030B	30A	50MHz	30A/5A	1V/A(5A) 0.1V/A(30A)
CP8030H	30A	100MHz	30A/5A	1V/A(5A) 0.1V/A(30A)
CP8150A	150A	12MHz	150A/30A	0.1V/A(30A) 0.01V/A(150A)
CP8300A	300A	6MHz	300A/50A	0.1V/A(50A) 0.01V/A(300A)
CP8500A	500A	5MHz	500A/75A	0.1V/A(75A) 0.01V/A(500A)

Applications

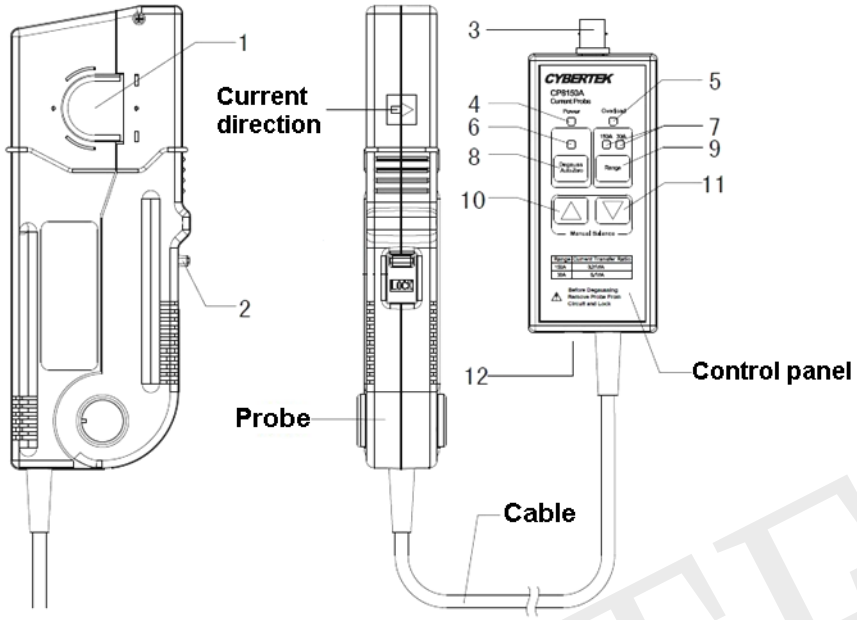
- ✧ Switching and linear power design
- ✧ LED lighting design
- ✧ New Energy Resources
- ✧ Frequency Conversion Household Appliances
- ✧ Experiment of Electronic Engineering
- ✧ Semiconductor Devices design
- ✧ Inverters/ transformer design
- ✧ Electronic ballast design
- ✧ Industrial Control/Consumer Electronic Design
- ✧ Engine driven design
- ✧ Power Electronic and Electrical Drive Experiment
- ✧ Electric vehicle transportation design

2. Description of products

1） CP8030B CP8030H



2） CP8150A、CP8300A、CP8500A



❖ Sensor Head

This clamps the conductor being measured, and carries out the actual current measurement. It is a precision assembly including a molded component, a ferrite core, and a Hall effect element. It may be damaged if subjected to sudden changes in ambient temperature, or mechanical strain or shock. Care should be exercised when handing the sensor head.

❖ Opening lever

Operating lever for opening the sensor head. Always use this lever to open the sensor head
.

❖ BNC Output Connector

The BNC port allows quick connect/disconnect the probe to any brand of oscilloscope by a BNC Cable (CK-310)

❖ Power indicator LED

A green LED indicate the power adapter is plugged in.

❖ Overload Indicator LED

If/when the current under measured exceeds the limit current, the red LED will light up and the buzzer will sound an alarm.

❖ Degaussing and Zero Setting Indicator

This green LED indicates the probe is degaussing and auto Zero Setting, and measurement is unavailable.

❖ Range Indicator LED

The green LED indicates the selected range.

❖ Degaussing and Zero Setting

When the key is pressed, the probe will demagnetizes the core and set the output to zero voltage .If degaussing and Zero Setting succeeds, the buzzer will make two short beeps. If degaussing and Zero Setting failed, the buzzer will make a single sound, for one second.

❖ Range selected Key

Model	Range	Transfer ratio
CP8030B/H	30A	0.1V/A
	5A	1V/A
CP8150A	150A	0.01V/A
	30A	0.1V/A
CP8300A	300A	0.01V/A
	50A	0.1V/A
CP8500A	500A	0.01V/A
	75A	0.1V/A

❖ Manual Offset (Up) adjusting

Increase the offset voltage of the output by press this button

❖ Manual Offset (Down) adjusting

Decrease the offset voltage of the output by press this button

❖ Power Supply socket

Use Power Adapter (12V/1.2A) (CK-612) and Equivalent

3. Making Measurements

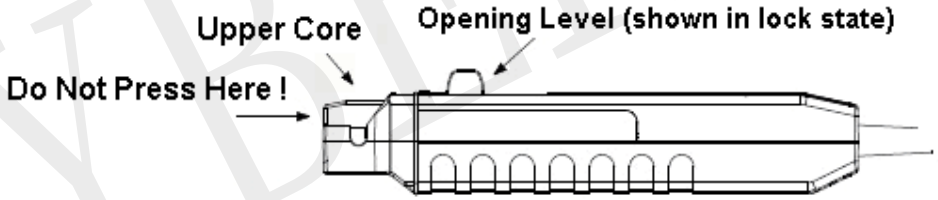
Before using the probe, check that the system is safe and that the preparations described in Safe Probing

- Have a visual inspection of the current probe of high frequency CP8000 Series probes, power supply, cable and oscilloscope.

- The output of the current probe is terminated internally. Use a high impedance input to the measuring instrument. Accurate measurements are not possible when the input impedance of the oscilloscope is set to 50Ω. Be sure to set the input impedance to 1 MΩ before making measurements. Set the oscilloscope's input coupling to DC. With the oscilloscope input at ground, adjust the trace to the zero position. Connect the probe's output connector to the oscilloscope's input connector

- Connect the power supply to probe and the power indicator will light. Select suitable Range you want via the Range Key.

- Ensure that the probe sensor is NOT clamped around any conductors. Slide the probe's Opening Lever into the LOCKED position as shown in Figure. Confirm that the sensor head is properly closed.



- **Degaussing and Zero Setting**

When the key is pressed, the probe will demagnetizes the core and set the output to zero voltage if it has been magnetized by switching the power on and off, or by an excessive input. Always carry out demagnetizing and Zero Setting before measurement and without current in the clamp. The demagnetizing and Zero Setting process takes about 5 second. During demagnetizing and Zero Setting, a demagnetizing waveform is output.
If degaussing and Zero Setting succeeds, the buzzer will make two short beeps. If degaussing and Zero Setting failed, the buzzer will make a single sound, for one second.

Do not demagnetize while the conductor being measured is clamped.
This could damage the components of the circuit being measured. Also, check that the conductor being measured is not clamped when supplying power to the current probe for the same reason. Demagnetized waveforms are generated when switching on the supply.

- **Measurement**
  - Press the opening lever to open the sensor head.
  - Align the sensor so that the probe's current direction indication corresponds to the direction of current flow through the conductor to be measured. Also, align the clamp so that the conductor is in the center of the sensor aperture.
  - Press the opening lever on the sensor head until the UNLOCK indication disappears. Check that the opening lever is firmly locked and the sensor head securely closed.

4. Safe Probing

This device is designed to comply with Safety Standards, and has been thoroughly tested for safety prior to shipment. However, mishandling during use could result in injury or death, as well as damage to the device. Be certain that you understand the instructions and precautions in the manual before use. We disclaim any responsibility for accidents or injuries not resulting directly from device defects.

To avoid short circuits and potentially life-threatening hazards, follow these warnings and precautions:

WARNING

- Never attach the clamp to a circuit that operates at more than the maximum rated voltage to earth.
- For safety's sake, avoid clamping around bare conductors, while clamping or measuring.
- While clamping and measuring, do not touch the clamp in front of the barrier or the conductor being measured.
- Be careful to avoid damaging the insulation surface while taking measurements.
- Make sure that the waveform measuring equipment connected to this device's output terminal (BNC) is equipped with a protective earthling with double-insulation construction.
- Do not allow the device to get wet, and do not take measurements with wet hands. This may cause an electric shock.
- If the waveform measuring instrument being connected to the output terminal (BNC) on this device is equipped with any other measurement terminals, take the following precautions to ensure that the other instrument does not form a bridge between the probe and any hazardous live part of a part.
  Isolate the terminal to which the probe is connected from other terminals on the measuring instrument using basic insulation conforming to the measurement category, working voltage, and pollution degree requirements of the circuit being tested.
  If basic insulation requirements cannot be met between the terminal to which this device is connected and other terminals of the measuring instrument, make sure that the voltage input to the measurement terminal does not exceed the Separated Extra-Low Voltage Earthed .
  Read and observe all warnings and precautions relating to electrical safety for the measuring instrument being connected to the probe.

CAUTION

- To avoid damage to the device, protect it from vibration or shock during transport and handling, and be especially careful to avoid dropping.
- Do not store or use the device where it could be exposed to direct sunlight, high temperature, humidity, or condensation. Under such conditions, the device may be damaged and insulation may deteriorate so that it no longer meets specifications.
- Before using the device the first time, verify that it operates normally to ensure that the no damage occurred during storage or shipping. If you find any damage, contact your dealer or CYBERTEK representative.
- This device is not designed to be entirely water- or dust- proof. To avoid damage, do not use it in a wet or dusty environment.
- The sensor head is a precision assembly including a molded component, a ferrite core, and a Hall effect element. It may be damaged if subjected to sudden changes in ambient temperature, or mechanical strain or shock, and therefore great care should be exercised in handling it.
- The matching surfaces of the sensor head are precision ground, and should be treated with care. If these surfaces are scratched, performance may be impaired.
- Foreign substances such as dust on the contact surfaces of the sensor head can cause acoustic resonance and degrade measurement, so it should be cleaned by gently wiping with a soft cloth.
- To avoid damaging the sensor cable and power supply cable, do not bend or pull the cables.
- When the power is on, keep closed, except when clamping them onto the conductor to be measured. The facing surface of the core section can be scratched while it is open.
- Do not place any un-clamped conductor with an electric current of a frequency of 10 kHz or more near the sensor head. Current flowing in the conductor nearby may heat up the sensor head and cause its temperature to rise, leading to damage to the sensor. For example, when one side of a go-and-return conductor is clamped and the other side is also placed near the sensor head , even if the electric current is lower than the consecutive maximum current, electric currents in both sides will heat up the wires and raise the temperature, thereby causing damage to the sensor.
- The maximum continuous input range is based on heat that is internally generated during measurement. Never input current in excess of this level. Exceeding the rated level may result in damage to the probe.
- The maximum continuous input range varies according to the frequency of the current being measured.
- If excess current is input, generated heat activates a built -in safety function that blocks normal output. If this happens, remove the input immediately (remove the sensor from the conductor being measured or reduce the input current to zero). Wait until the sensor has had sufficient time to cool before resuming operation.

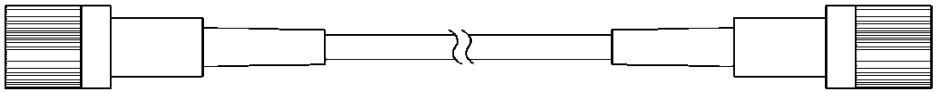
- Even if the input current does not exceed the rated continuous maximum, continuous input for an extended period of time may result in activation of the safety circuit to prevent damage resulting from heating of the sensor.
- At high ambient temperatures, the built-in safety circuit may activate at current input levels below the rated continuous maximum.
- Continuous input of current exceeding the rated maximum or repeated activation of the safety function may result in damage to the unit.
- The probe is rated for maximum input under two conditions in addition to the input maximums shown in the Specifications . These are (1) 30 A peak for noncontinuous input and (2) 50 A peak for pulse widths 10 μs. (1) indicates an upper waveform response limit of 30 Apeak. Use the sensor at RMS current input levels that are within the rated continuous maximums. (2) indicates the upper response limit for a single input pulse.
- When opening the sensor head of the probe, be sure to operate with the opening lever. If an upper core is forced to open when the sensor head is locked, the open-close mechanism can be damaged.

NOTE

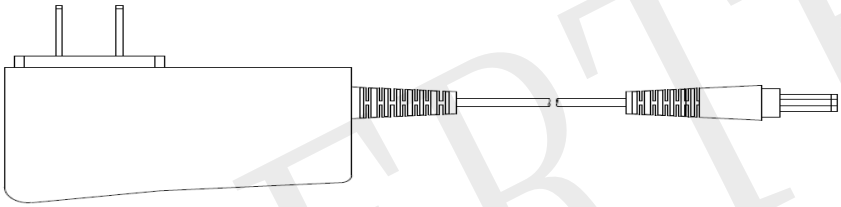
- The output of this unit is terminated internally. Use an oscilloscope with an input impedance of at least 1 MΩ .
- Immediately after powering on the probe, the probe may be subject to an appreciable offset drift due to the effect of self-heating. To counteract this, allow the probe to warm up for about 30 minutes before carrying out measurement.
- When performing continuous measurements, it is necessary to be aware that the offset voltage drifts, depending on factors such as the ambient temperature.
- Under certain circumstances, oscillation may occur if the probe is connected to the power supply while the power supply is on. This does not indicate a malfunction. Oscillation can be stopped and operation restored to normal by opening and closing the sensor head.
- Depending on the measured current frequency, some sound maybe produced by resonance, but has no effect on measurements.
- The reading may be affected by the position within the clamp aperture of the conductor being measured. The conductor should be in the center of the clamp aperture.
- When carrying out a measurement, press the opening lever until the **UNLOCK** indication disappears and check that the sensor head is properly closed. If the sensor head is not properly closed, an accurate measurement is not possible.

- Accurate measurement may be impossible in locations subject to strong external magnetic fields, such as transformers and high-current conductors, or in locations subject to strong external electric fields, such as radio transmission equipment.
- At high frequencies, common mode noise may affect measurements taken on the high voltage side of circuits. If this occurs, reduce the frequency range of the waveform measuring instrument or clamp onto the low-voltage side of the circuit.

5. Accessories Description



BNC Cable: 100cm, MALE X MALE (CK-310)



Power Adapter (12V/1.2A) (CK-612)

Model	CP8030B/H	CP8150A	CP8300A	CP8500A
Line of coaxial cable(CK-310)	BNC coaxial line：100cm			
Adapter dimensions (CK-612)	DC12V/1.2A			

6. Specification

Electrical characteristics

Model		CP8030B / CP8030H		CP8150A		CP8300A		CP8500A	
Bandwidth(-3dB)		CP8030B	DC-50MHz (Fig.1.a)	DC-12MHz (Fig.4)		DC-6MHz (Fig.7)		DC-5MHz (Fig.10)	
		CP8030H	DC-100MHz (Fig. 1.b)						
Rise time		CP8030B	≤7ns	≤29ns		≤58ns		≤70ns	
		CP8030H	≤3.5ns						
Continuous maximum input range		CP8030B	30Arms Fig. 2.a	150Arms Fig. 5		300Arms Fig. 8		500Arms Fig. 11	
		CP8030H	30Arms Fig.2.b						
Max peak current value		50Apk		300Apk		500Apk		750Apk	
Range		5A	1X	30A	10X	50A	10X	75A	10X
		30A	10X	150A	100X	300A	100X	500A	100X
Overload		5A	≥5A	30A	≥30A	50A	≥50A	75A	≥50A
		30A	≥50A	150A	≥300A	300A	≥500A	500A	≥500A
Current transfer ratio		5A	1V/A	30A	0.1V/A	50A	0.1V/A	75A	0.1V/A
		30A	0.1V/A	150A	0.01V/A	300A	0.01V/A	500A	0.01V/A
Lowest measurable current		5A	1mA	30A	5mA	50A	5mA	75A	5mA
		30A	10mA	150A	50mA	300A	50mA	500A	50mA
Amplitude accuracy (DC,45-66Hz)		5A	±1%±1mA	30A	±1%±10mA	50A	±1%±10mA	75A	±1%±10mA
		30A	±1%±10mA	150A	±1%±100mA	300A	±1%±100mA	500A	±1%±100mA
Input impedance		CP8030B	Reference Fig. 3.a	Reference Fig. 6		Reference Fig. 9		Reference Fig.12	
		CP8030H	Reference Fig. 3.b						
Delay Time	Probe	About 14ns		About 36ns		About 41ns		About 42ns	
	BNC(1m)	About 5ns							
Terminal Load		≥100kΩ							
Power Supply		Standard Adaptor(DC 12V/1.2A)							
Voltage of Insulated Wire		300V CAT I		600V CATII 300V CATIII					
Safety Compliance		EN61010-1: 2010							
EMC Standard		EN61326-1:2013 EN61000-3-2:2014 EN61000-3-3:2013							

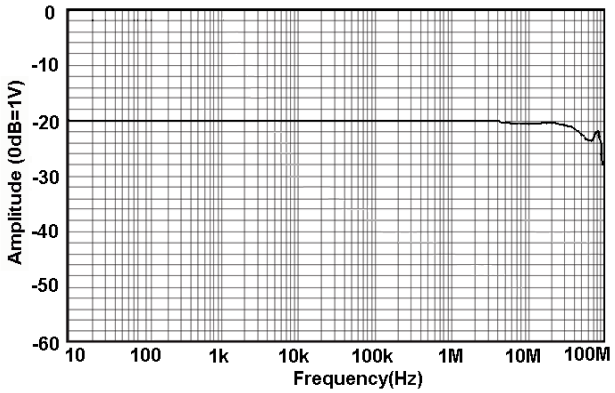


Fig. **1 .a CP8030B**
Amplitude-frequency Curve

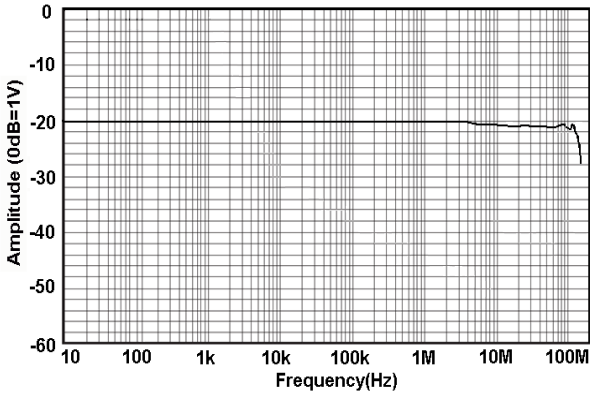


Fig. **1.b CP8030H**
Amplitude-frequency Curve

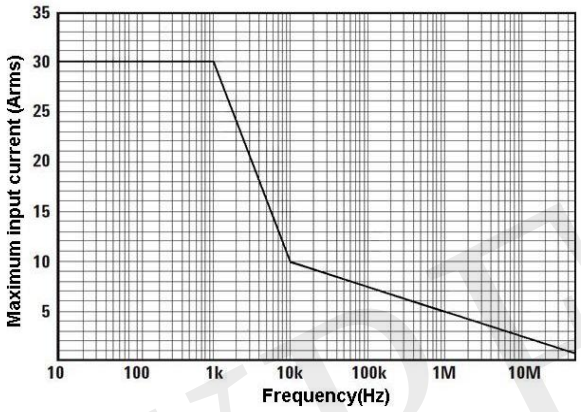


Fig 2.a CP8030B
Continuous maximum input measurement
(Frequency derating)

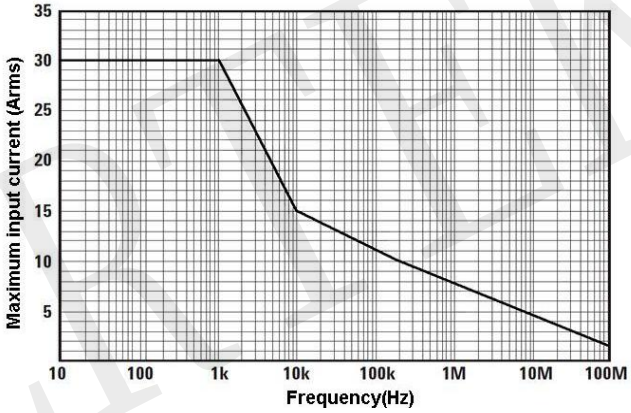


Fig 2.b CP8030H
Continuous maximum input measurement
(Frequency derating)

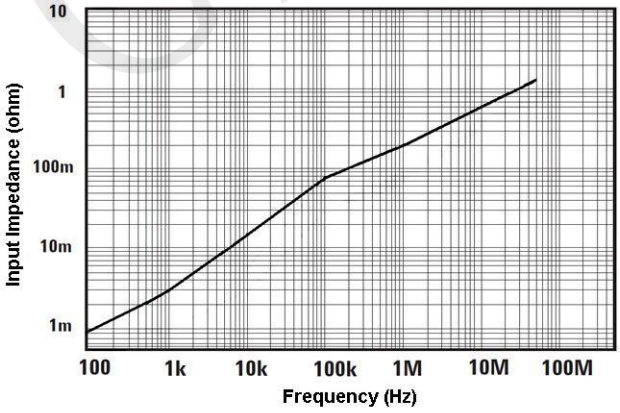


Fig. **3.a CP8030B**
Input impedance VS Frequency

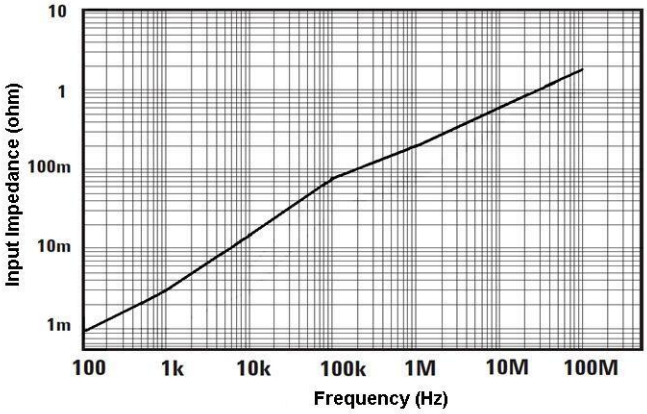


Fig. **3.b CP8030H**
Input impedance VS Frequency

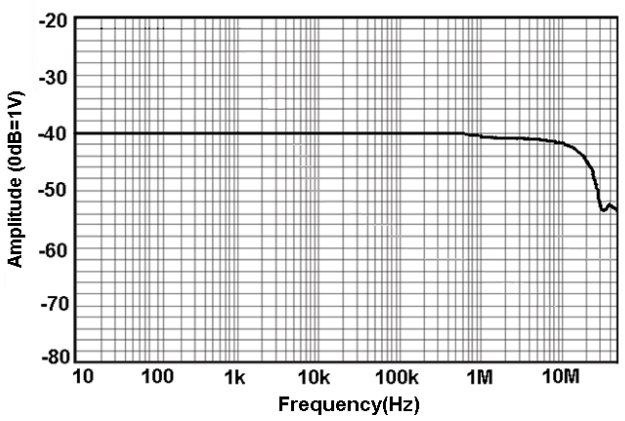


Fig. **4** **CP8150A**
Amplitude - frequency Curve

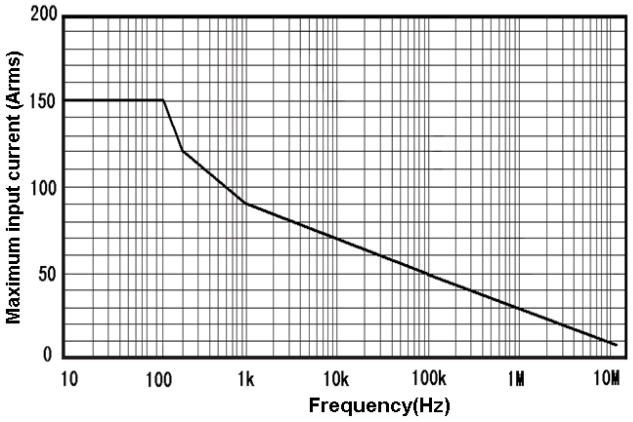


Fig. **5** **CP8150A**
Continuous maximum input rating
(Frequency derating)

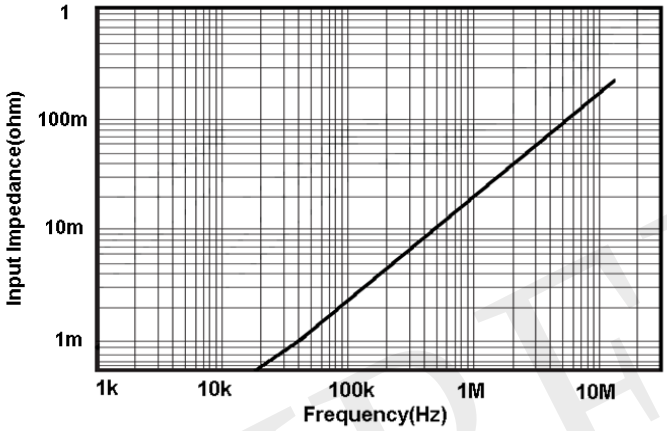


Fig. **6** **CP8150A**
Input impedance VS Frequency

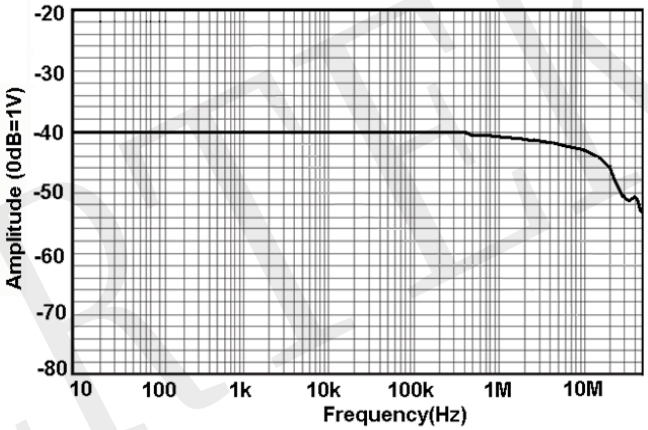


Fig. **7** **CP8300A**
Amplitude-frequency Curve

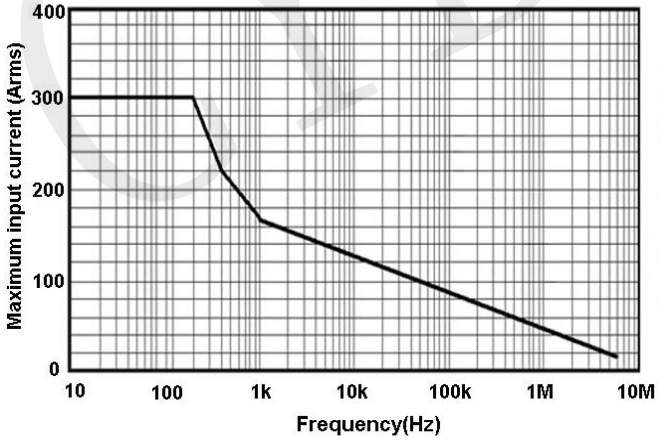


Fig. **8** **CP8300A**
Continuous maximum input rating
(Frequency derating)

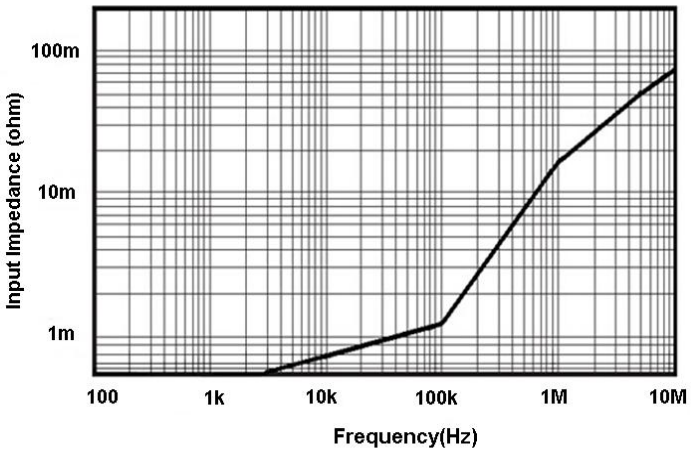


Fig. **9** **CP8300A**
Input impedance VS Frequency

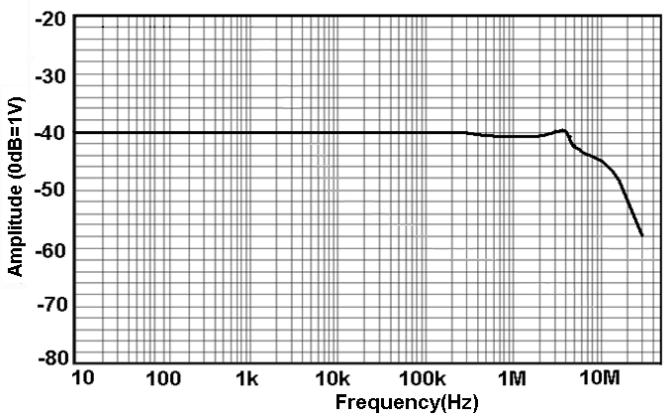


Fig. **10 CP8500A**
Amplitude-frequency Curve

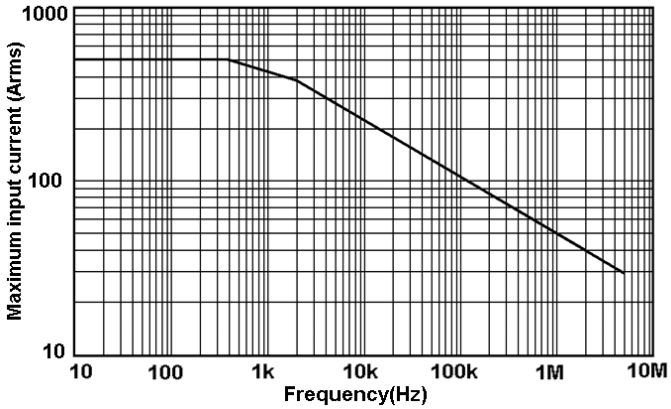


Fig. **11 CP8500A**
Continuous maximum input rating
(Frequency derating)

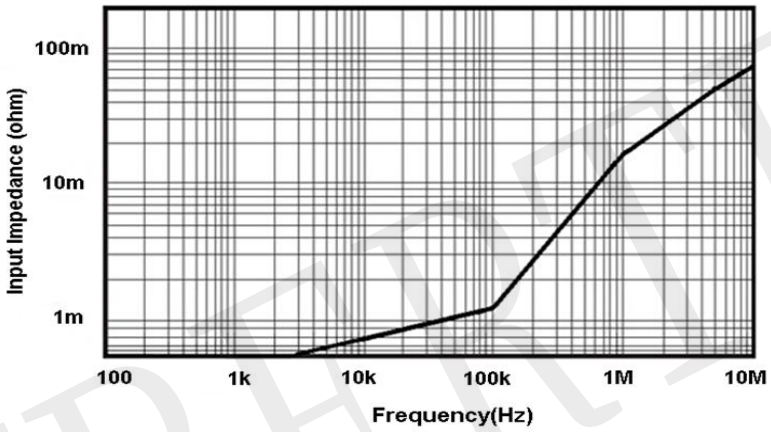


Fig. **12 CP8500A**
Input impedance VS Frequency

Mechanical characteristics

Model	CP8030B/H	CP8150A	CP8300A	CP8500A
Measurement conductor diameter max.	5mm	20mm		
Cable length	1m	1.5m		
Cable length (CK-310)	100cm			
Adapter dimensions(CK-612)	72*62*31mm Wire length: 1.5m			
Clamp dimensions （L*W*H）	75*40*18mm	175*68*29mm		
Termination unit（L*W*H）	119*49*28mm			
Probe Weight	255g	555g	525g	525g

Environmental characteristic

Model	CP8030B/H	CP8150A	CP8300A	CP8500A
Operating temperature and humidity	0-40℃,80% or less			
Storage temperature and humidity	-10-50℃,80% or less			
Operating altitude	2000m			
Storage altitude	12000m			

7. Packing list

Packing list	
ITEM	**Quantity**
Probe	1
DC-12V/1.2A adapter	1
BNC connecting line	1
Tool bag	1
Instruction manual	1
Guarantee 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: +86-755-86620008

Email: cybertek@cybertek.cn

Url: http://www.cybertek.cn

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