

# HZ-20A Wireless Zinc Oxide Arrester Tester



Dear user:

Thank you for choosing HZ-20A Wireless Zinc Oxide Arrester Tester.

We hope that this instrument can make your work easier and more enjoyable, so that you can get the feeling of office automation in the test and analysis work.

Before using the instrument, please read this manual, and operate and maintain the instrument according to the manual to prolong its service life. "Just a light press, the test will be completed automatically" is the operating characteristics of this instrument.

If you are satisfied with this instrument, please tell your colleagues; if you are not satisfied with this instrument, please call (0312) 6775656 to tell you to serve you at all times-Baoding Huazheng Electric Manufacturing Co., Ltd., our company will definitely make you satisfied !

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## I. Overview

Wireless Zinc Oxide Arrester Tester is a special instrument for on-site and laboratory detection of lightning arrester's electrical parameters, widely used in on-line monitoring of zinc oxide surge arresters (online test) and laboratory (offline maintenance) test. Meet the People's Republic of China power industry standard "DL474.5-92 field insulation test implementation guidelines - arrester test" to the surgery. The instrument uses microcomputers for sampling, control and other advanced technologies to measure the full current, third harmonic, resistive current, resistive current peak, capacitive current, active power, etc. of zinc oxide surge arresters at power frequency voltages. And display the voltage, current waveform and printout test data. Large-screen liquid crystal display, English menu prompt operation, so that the human-machine exchange function is stronger, while providing on-site waveform display. This instrument has the characteristics of simple wiring, high measurement accuracy, and strong reliability. The instrument is small in size, light in weight, and has an integrated design for easy carrying and field operations.

## II. Main Technical index

### 1. Technical parameters

(1) voltage and current parameters: :

Item	Range	Accuracy
Full current	0-20mA	$\pm(\times 5\%+5\mu A)$
Resistive current	0-20mA	$\pm(\times 5\%+5\mu A)$
Capacitive current	0-20mA	$\pm(\times 5\%+5\mu A)$
Current harmonics	0-20mA	$\pm(\times 10\%+10\mu A)$
Reference voltage	Max400V RMS	$\pm(\times 5\%+0.5V)$
Voltage harmonics	Max400V RMS	$\pm(10\%)$

(2) working temperature:  $-10^{\circ}C \sim 40^{\circ}C$

(3) the environmental humidity :  $\leq 85\%$  no condensation

(4) storage temperature:  $-20^{\circ}C \sim 50^{\circ}C$

(5) Overall dimensions:  $320 \times 260 \times 135(\text{mm})$

(6) the instrument weight: 5kg (does not include the test line and cable box)

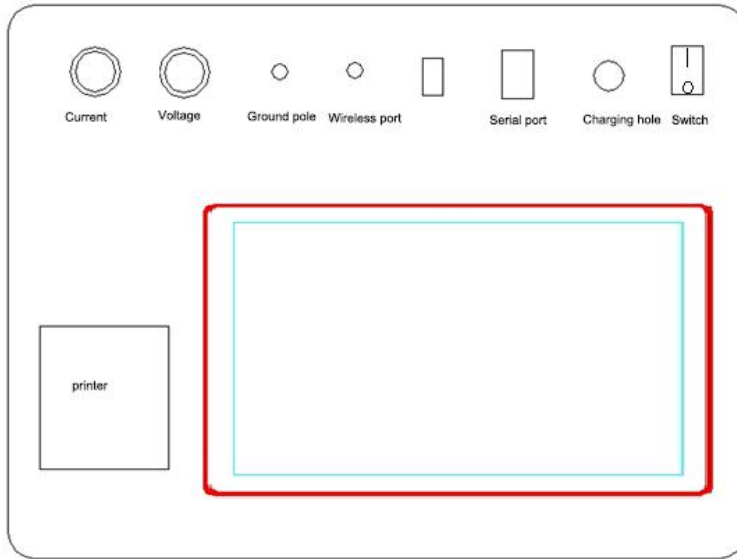
## III. Main functions and features

1、The machine adopts 1024×600 dot matrix 65K color resistance touch screen.

- 2、 High-precision sampling and processing circuit, advanced Fourier harmonic analysis technology, more reliable data.
- 3、 With the function of measuring harmonic content, it can measure single phase or three phase simultaneously.
- 4、 With resistive current base wave peak output function.
- 5、 The instrument has built-in large storage capacity. Can store test data, waveform, harmonics and other large amount of recording information. It can save 200 groups of measurement records in the cycle update mode.
- 6、 The instrument is equipped with a U disk interface, which can store any group of test records (the capacity is limited by the size of U disk).
- 7、 The voltage test line of the instrument is equipped with insurance to prevent misconnection. The voltage and current plug of the instrument has the function of misconnection prevention.
- 8、 The instrument is equipped with a wireless module for wireless voltage acquisition and wireless measurement with the host.
- 9、 The instrument has a high precision real-time clock, which can be calibrated by date and time.
- 10、 The instrument is equipped with a high-speed miniature thermal printer, which can print measurement data (optional).
- 11、 The instrument has a large capacity lithium battery, which can work continuously for 6 hours.
- 12、 It can be connected to Bluetooth for remote control

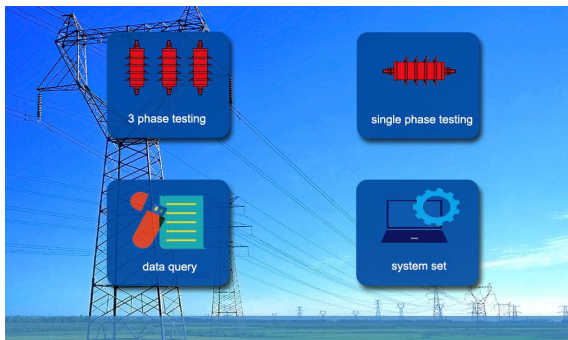
## **IV.Method of operation**

### **(A) Instrument panel structure and description**



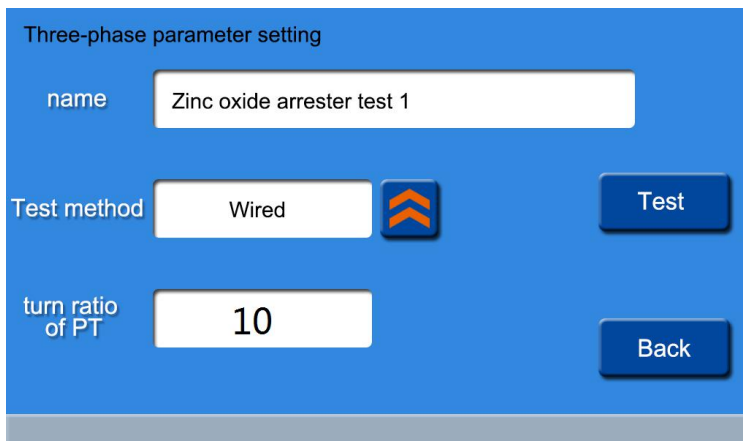
**(B) Zinc oxide test and menu operation method**

1、After connecting the test line and turning on the power of the instrument, the display interface is shown below:



**2、 Three-phase test setting interface**

Press the three-phase test to enter the three-phase parameter setting interface;

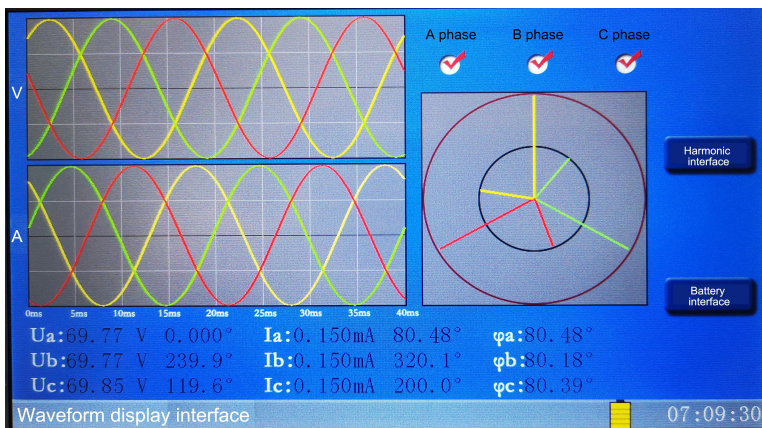


After setting the parameters, press "Test" button to enter the test interface;

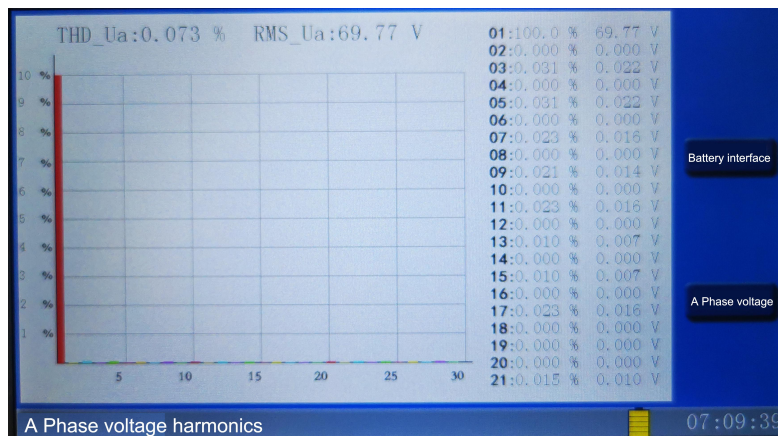
Test method:

Primary voltage	0.698kV	0.698kV	0.699kV
Secondary voltage	69.77 V	69.77 V	69.85 V
Full current Ix	0.150mA	0.150mA	0.150mA
Resistive current fundamental wave peak I1p	0.035mA	0.036mA	0.035mA
Resistive current fundamental wave peak I1p	0.035mA	0.036mA	0.035mA
Peak value of third resistive current fundamental wave I3p	0.000mA	0.000mA	0.000mA
Peak value of fundamental wave of fifth resistive current I5p	0.000mA	0.000mA	0.000mA
Seven-order resistive current fundamental wave peak I7p	0.000mA	0.000mA	0.000mA
Capacitive current fundamental wave peak value Icp	0.209mA	0.209mA	0.209mA
Voltage and current angle	80.48°	80.18°	80.39°
Fundamental loss P1	1.729mW	1.786mW	1.749mW
Frequency	50.00Hz	50.00Hz	50.00Hz

According to the waveform display, display waveform;



Display by harmonics, display harmonics:



For single-phase test, the file display mode is the same as that for three-phase test.

(3) Parameter description:

a) Name: For storage or printing, it is recommended to set before measurement.

b) Measurement method: .

i. Wired measurement method: the voltage input is clipped to the PT secondary end by

the crocodile through the voltage test line, and the other end is connected to the instrument 6-core air seat (voltage input end). Or access through a voltage extension cord.

- ii. Wireless measurement method: the voltage input is connected to the PT secondary terminal through the alligator clip of the voltage test line, and the other end is connected to the wireless module 6-pin aviation seat (voltage input terminal) .
- iii. No PT measurement method: No voltage signal is connected, only current signal is connected.

Regardless of the measurement method, the current wiring method is the same. The alligator clips of the ABC three-phase current wiring are connected in series with the zinc oxide to be measured.

c) PT transformation ratio: PT quadratic method can set a voltage transformation ratio  $K_u$ , which is "multiplied" by the reference voltage amplitude input by the instrument, and affects the voltage-related data. Set appropriate PT ratio in wired or wireless mode, which can directly display the bus voltage.

After the data is stable, press the lock screen button and the test ends.

**Parameter Description :** Here, a single-phase full data screen is used to illustrate the meaning of the data.

**Primary voltage:** According to the bus PT transformation ratio, it is the bus voltage.

**Secondary voltage:** The actual measured voltage value.

**I<sub>x</sub>:** Full current effective value

**I<sub>rp</sub>:** Resistive current peak,

**I<sub>r1p</sub>:** The fundamental peak value of the resistive current.  $I_{r1p} = I_{x1p} \sin\Phi$

**I<sub>c1p</sub>:** The peak value of the capacitive current fundamental wave.  $I_{c1p} = I_{x1p} \cos\Phi$

**P<sub>1</sub>:** Fundamental power consumption. P<sub>1</sub> is equal to the product of the effective value of the fundamental wave of resistive current and the effective value of the fundamental wave of voltage.

**I<sub>r3p</sub>、I<sub>r5p</sub>、I<sub>r7p</sub>:** 3rd, 5th, 7th harmonic peak value of resistive current.

**Φ:** The current leads the voltage angle, which already contains the compensation angle

Φ0. The instrument gives the conclusion in the table below:

result	inferior	Low	Middle	Good	Best	interference
Φ	0~74.99°	75~76.99°	77~79.99°	80~82.99°	83~87.99°	≥88°

**Note 1:** The waveform displayed by the instrument is the collected gear signal, so do not use the waveform amplitude to determine the size of the data.

**Note 2:** No PT measurement, fixed UI angle = 83.5 degrees, easy to calculate resistive current.

**(C)Measurement wiring**

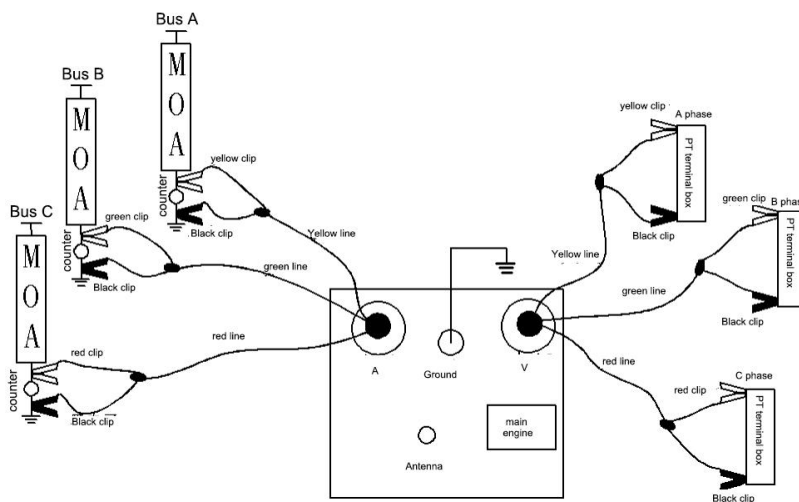
**1、 wiring points**

1.1 Take full current: Single-phase MOA is connected to A (yellow) channel, and the three phases are connected to A (yellow) B (green) C (red).

1.2 There is a fuse on the wire connecting the PT voltage. Do not replace it with fuses or wires of other specifications.

1.3 The instrument can only be used for low voltage and low current tests. All leads must be kept away from high voltage.

**2、 wired transmission wiring diagram (see Figure8)**



**Figure 8** Three-phase measurement wiring transmission wiring diagram

**Three-phase measurement:** Three-phase cable voltage, plus extension cable connection is to connect the opposite connector of the extension cable between “host” and “voltage PT connector”.

**Single-phase measurement:** (main wiring and three-phase measurement wiring are the same, the wiring of the test product is the phase of which phase is connected, which is not measured.) The detailed wiring of each phase is as follows:

2.1 Phase A measurement, the current and voltage lines on the green, red wire clip on the wire hanging, only the corresponding phase A yellow clip.

2.2 B-phase measurement, the wiring clips on the yellow and red wires of the current and voltage lines are left open, and only the corresponding clips of the green phase B phase are connected.

2.3 Phase C measurement: The wiring clips on the yellow and green conductors of the current and voltage lines are left unconnected, and only the corresponding clips of the red phase of phase C are connected.

**3、 wireless transmission wiring diagram**

The three-phase wireless measurement wiring is shown in the figure below (see Figure 9):

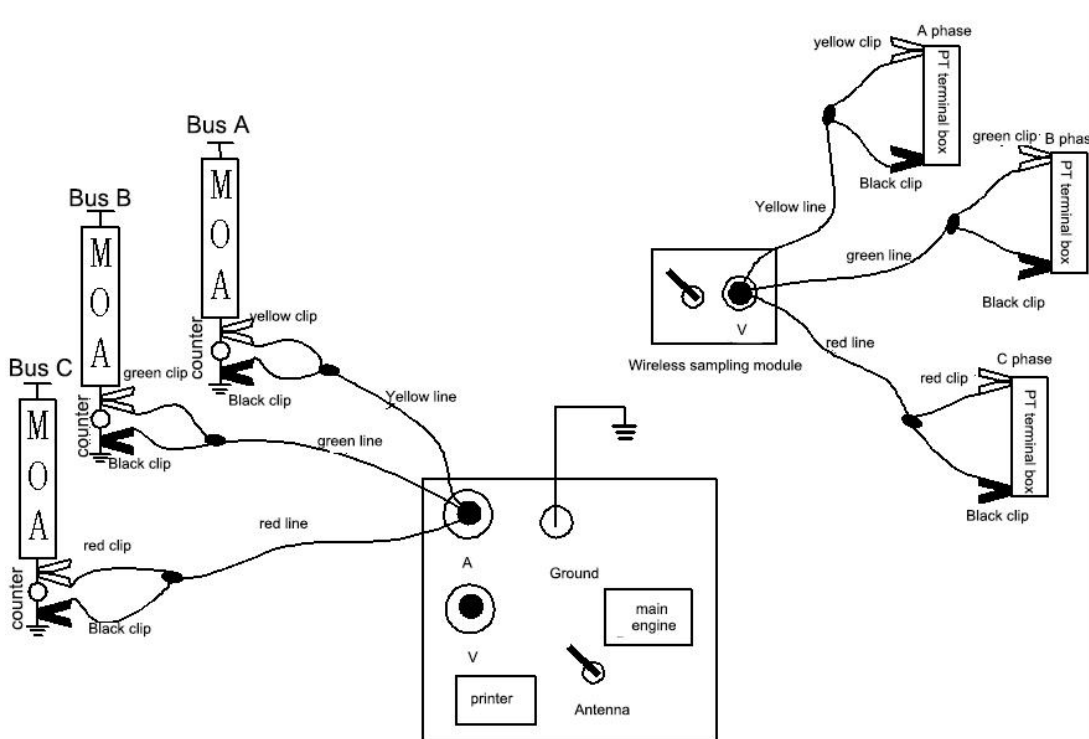
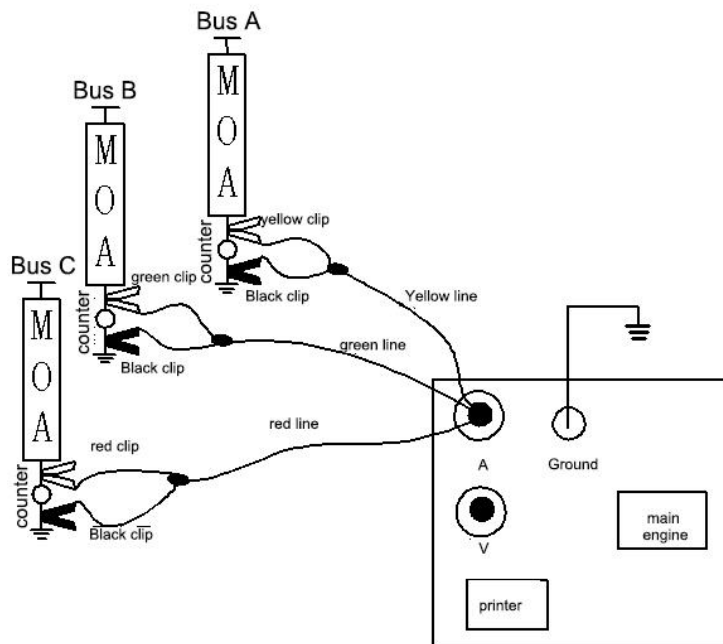


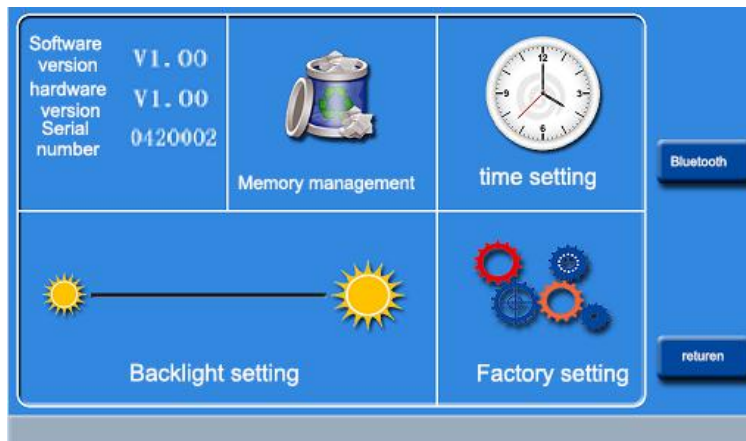
Figure 9 Three-phase measurement wireless transmission wiring diagram.

**4、 no PT wiring schematic (see Figure 10)**



The non-PT measurement method only collects current and only needs to connect the current terminal of the host.

**(D) System setting and menu operation method:**



Can clear memory data;

Adjust the backlight;

Change time;

Press the Bluetooth button to pop up the QR code interface, use the mobile phone software to scan the code, you can connect to the mobile phone for remote control;

## V.Precautions

1. In order to use the instrument safely and correctly, please read the instruction manual carefully. Connect and operate according to this manual.
2. Please enter the correct setting parameters before starting the test.
3. The instrument can only be used for low voltage and small current testing, and all leads must be kept away from high voltage.
5. During the test, it is not allowed to remove the test wire.
6. The memory can store 200 measurement results, the earliest record will be overwritten when more than 200 times, please pay attention to copy or export to U disk in time.
7. The host and wireless collector can work while charging. Please charge once a month to prevent long-term battery shortfall.
8. There is a 100mA fuse on the wires connected to the PT voltage. Do not use other specifications of fuse or wires instead.
9. If the instrument fails, it will not damage the tested product. It is not allowed to start the repair and disassembly without permission by our company. Please contact our after-sales service.

## VI.After-sales service

1. Every purchase of our company's product comes with a product warranty certificate, please inspect it on the spot when ordering the product for delivery
2. Since the date of purchase, the warranty is one year and lifetime maintenance. The battery is a consumable part and is not covered by the warranty. During the warranty period, no maintenance fee will be charged for maintenance; outside the warranty period, maintenance and debugging will be charged an appropriate fee.
3. Warranty will not be provided for one of the following conditions:
  - 1) The user disassembles the instrument by himself or changes the process structure of the instrument artificially.
  - 2) Serious damage to the instrument caused by improper storage or use by the user.

**VII.Packing list**

<b>NO.</b>	<b>Item</b>	<b>Qty</b>
1	Low voltage Dedicated test line	1
2	Black test line	1
3	Wireless module	1
4	High voltage Dedicated test line	1
5	Antenna	2
6	Charger	1
7	Ground cable	1
8	Print paper	1
9	Fuse pipe	4