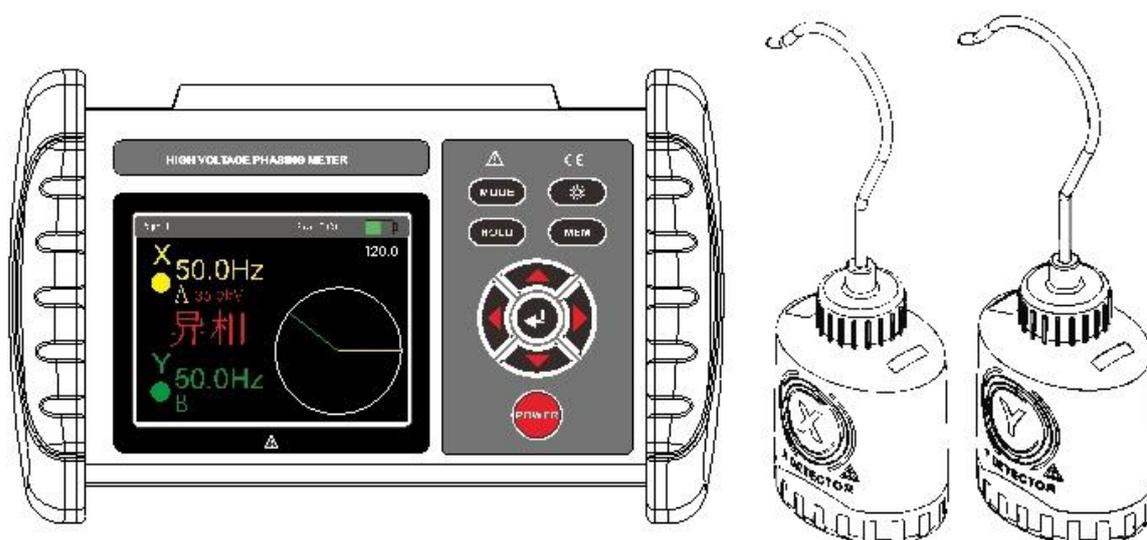


WIRELESS HIGH VOLTAGE PHASING METER



ES2080 USER MANUAL

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Notice

Thank you for purchasing our company's **Wireless High Voltage Phasing Meter**. In order to use this product better, please:

—Read this user manual in detail. The operator must fully understand the instructions in the manual and be able to operate the power supply skillfully before using it.

—Strictly abide by the safety rules and precautions listed in this manual.

- ✧ In any case, the use of this instrument should pay special attention to safety, especially when conducting high-voltage detect phase.
- ✧ Pay attention to the labels and symbols on the panel and back panel of this instrument.
- ✧ If the voltage of the line under test exceeds 400V, it must be connected to an insulating rod, and hold the insulating sheath end of the insulating rod.
- ✧ When the bare wire voltage exceeds 35KV, non-contact detect phase must be used.
- ✧ For the first use, a withstand voltage test should be performed on the insulating rod, and a qualified insulating rod must be used.
- ✧ Since high-voltage lines are very dangerous, operators must be strictly trained and certified for high-voltage operation in the country before using this instrument for on-site testing.
- ✧ Do not place and store the meter for a long time in places with high temperature and humidity, condensation and direct sunlight.
- ✧ It is recommended that the meter be tested for dielectric strength at least once a year.
- ✧ If the detector, insulating rod and other parts are damaged, please do not use it.
- ✧ When replacing the battery, please pay attention to the polarity of the battery. If the instrument is not used for a long time, please remove the battery.
- ✧ The use, disassembly and maintenance of this instrument must be operated by authorized personnel.
- ✧ Due to the reasons of this instrument, if it is dangerous to continue to use it, stop using it immediately, and seal it up immediately and handle it by an authorized organization.
- ✧ Danger signs on the instrument and manual, users must follow the instructions for safe operation.
- ✧ The extremely dangerous signs in the manual, the user must strictly follow the instructions for safe operation.

I . Introduction

ES2080 **Wireless High Voltage Phasing Meter** is specially designed and manufactured for the high voltage line detecting phase, breaking through the limitation of the traditional detect phase device voltage level, can be used in extremely low voltage line to check phase, Fully realize automatic check phase measurement from 70V to 550kV (such as 220V, 10kV, 35kV, 66kV, 110kV, 220kV, 550kV) and voltage, no need to purchase multiple sets of phasing meter according to the voltage level, saving cost, reducing carrying, saving time and fast. For the phasing of the high voltage line (voltage over 400V), the metal detector hook can be gradually close to the wire, when the electric field signal can be induced to complete the phasing check, without direct contact with the high voltage wire, safe! **When the bare conductor voltage exceeds 35kV, the non-contact phasing check must be used.** The phasing meter also has the functions of testing phase, frequency, phase sequence, electric test, voltage measurement, transformer group judgment and so on.

The **Wireless High Voltage Phasing Meter** is composed of **host, detector, telescopic insulating rod**, etc. The wireless signal linear transmission distance is about 30 meters. The host adopts 3.5-inch true color LCD screen, which can display phase, frequency, phase sequence and phasing check results on the same screen. Vector diagram indication, phase indication, clear and intuitive; With "X signal normal, Y signal normal, in phase, out of phase" and other voice prompt functions, making the test more simple and easy.

II . Electrical symbols

符号	含意
	Extremely dangerous! The operator must strictly abide by the safety rules, otherwise there is a danger of electric shock, resulting in personal injury, injury or casualty accidents.
	Danger! The operator must strictly abide by the safety rules, otherwise there is a danger of electric shock, resulting in personal injury or death.
	Warning! Safety rules must be strictly followed, otherwise personal injury or equipment damage may be caused.
	Double insulation
	Complies with EU Community Safety Standards
	AC
	DC

	Battery, when displayed it means the battery is low
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III. Model comparison

Model	ES2080	ES2080A
*Voltage measurement function	Have	N/A

IV. Technical Specifications

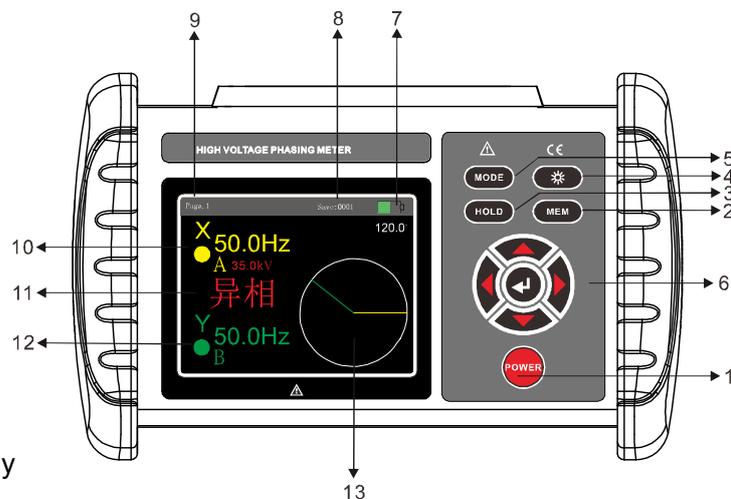
Features	Frequency measurement, phase measurement, phase sequence display, voltage measurement, voltage inspection	
power supply	Host: DC7.5V, 5 AA alkaline batteries Detector: zinc-manganese dry battery 6F22, 9V	
Baseline conditions	23°C±5°C, below 75%rh	
Phasing	Contact phasing: The bare wire below 35kV or the wire with insulating sheath below 550kV can contact the wire core phase non-contact phasing. When the bare line voltage exceeds 35kV, a non-contact test must be used, and the probe is gradually approached to the core phase of the conductor	
Transmission distance	Wireless transmission, straight-line transmission distance of about 30 meters	
Differential characterization	In-phase: -30°~30°	Out-of-phase: 90° ~ 150° and 210° ~ 270°
Phasing voltage	70V~550kV	
Phase range	0.0°~360.0°; Accuracy: ≤±12°; Resolution: 0.1°	
Frequency range	45.0Hz~65.0Hz; Accuracy: ≤±2Hz; Resolution: 0.1Hz	
*Voltage range	70V~110kV; Accuracy: ±15%±5dgt Resolution: 100V	
*Voltage accuracy	High-voltage overhead line ±15%±5dgt (other applications: ±25%±5dgt)	
transmit frequency	433MHz, 315MHz	
display mode	3.5 inch color screen	
LCD display size	72mm×55mm	
Meter size	Host 187×119×48mm Detector 146×100mm	
Phase indication	Simultaneous display of phasor diagram and numbers	
Work instructions	When phase checking, the detector has sound and light indication function, red double flashing light indication and "beep-beep-beep" beep	
data storage	100 groups, flashing "FULL" symbol indicates that the storage is full	
Data access	Data access function: "READ" symbol display	
Power consumption	Detector: 70mA Max Max Host: 150mA Max	

Instrument quality	Detector: about 250g (including hook and battery)
	Host: about 450g (including battery)
battery voltage	The battery voltage is insufficient, and the low battery symbol "  " is displayed
Automatic shut-down	The meter shuts down after 15 minutes of inactivity
Insulation rod length	Maximum diameter $\Phi 38\text{mm}$; Length: 800mm in contracted state; 3015mm in extended state
Insulation test	Both ends of the insulating rod after stretching: AC 220kV/rms; host and detector: AC3700V/rms (between exposed metal and plastic casing)
Suitable for safety regulations	GB13398-92, GB311.1-311.6-8, 3DL408-91 standards and the newly promulgated national electric power industry standard "General Specifications DL/T971-2005 for 1kV ~ 35kV Portable Phase checking Apparatus for Live Work"
	Comply with IEC61481-A2; 2004; IEC 61243-1

V. Instrument Structure

Host

1. Power button
2. Look up key
3. Hold key
4. Backlight keys
5. Mode key
6. Navigation keys
7. Battery level display
8. Total number of stored data
9. Page notation
10. X detector status display
11. Phase detection result display
12. Y detector status display
13. Phase Vectors



Detector

1. Power switch
2. Power indicator
3. Working status indicator
4. battery compartment cover

V. Operation

1. Power on the host

Press the **POWER** button to turn it on, the LCD will display the measurement page, and then press the **POWER** button to turn it off. If the LCD keeps flashing after booting, the battery voltage may be insufficient, please replace the battery. The meter will automatically shut down after 15 minutes of no operation after it is turned on to reduce battery consumption.

2. Detector switch

Press the **POWER** button to turn it on, the power indicator and the working indicator light on, the buzzer beeps for a long time, the detector enters the test mode, and then press the **POWER** button to shut down, if the power indicator flashes after booting, the battery voltage may be insufficient, please replace the battery. After the detector is turned on for 15 minutes, the working indicator light is always on and the buzzer is beeping for a long time, indicating that the detector will automatically shut down to reduce battery consumption.

3. Mode switch

Press the MODE key to switch between phase measurement mode and voltage measurement mode. The voltage display refresh rate in phase measurement mode is 4s once. In the voltage measurement mode, the voltage display refresh rate is once every 2s

4. Data retention

In the phase measurement mode, press the **HOLD** key to keep the LCD display, and the "HOLD" symbol indicates. Press the **HOLD** key again to release the data lock, return to the measurement mode, and the "HOLD" symbol disappears.

5. Data storage

In the phase measurement mode, when pressing the **HOLD** key to hold the data, the meter will automatically number and store the currently held data. The instrument can store 100 sets of data. If the storage is full, it will display "FULL" and no longer store data. The memory must be cleared before it can be stored again.

6. Data query

In the test mode, press the **MEM** key to enter the data review mode, the "READ" symbol indicates, and the stored data of the 0001st group is automatically displayed. Press the "◀" and "▶" keys to read. Press the **MEM** key again to switch to the voltage display mode. In this mode, only the voltage value is displayed, and the phase and other data are not displayed. Press the "◀" and "▶" keys to switch the voltage type display. Press the **MODE** key to exit the viewing mode and return to the phase measurement mode.

7. Data deletion

In the data review mode, press and hold the **HOLD** button for more than 5 seconds to enter the data deletion mode, and select "YES" or "NO" with "◀" and "▶" keys to delete the data. After the system operation is completed, it will automatically return to the measurement mode.

8. Backlight brightness

Press the **Back Light** key to enter the backlight adjustment mode, press "◀" and "▶" keys to change the brightness of the LCD backlight, press the Enter key to save the setting, and return to the test mode, the meter will automatically restore the stored brightness value when it is powered on.

9. Self-check

Please do self-calibration before on-site phase verification to confirm that the instrument can work normally. Connect the two clips of the self-calibration line to the probes of the two detectors respectively, and then insert the plug of the self-calibration line into the AC 220V power socket, self-calibrate on the same live wire, the host indicates the same phase, if there is no power, it may be plugged. If the zero line is connected, plug the self-calibration line plug in reverse.

10. Check phase, phase, electroscope, frequency, phase sequence test

	Caution: Electricity! It must be operated by trained and authorized personnel, and the operator must strictly abide by the safety rules, otherwise there is a danger of electric shock, causing personal injury or equipment damage.
	It cannot be used to test lines with a voltage exceeding 550kV, otherwise there is a danger of electric shock, causing personal injury or equipment damage.
	For high voltage test, the insulating rod must be connected, fully stretched, and

	used by holding the sheath end of the insulating rod.
	The safety withstand voltage level of this insulating rod is 220kV at maximum. When the voltage exceeds 35kV, non-contact detect phase must be used. It is strictly forbidden to directly contact the bare wires above 35kV, otherwise there is a danger of electric shock, causing personal injury or equipment damage.

Connect the insulating rod and start the machine. If the communication between the host and the detector is normal, the corresponding indicator light will be on. If the communication is not normal, the indicator light will not light up.

When the detector senses the voltage, the detector will send out a "beep-beep-beep" tone and the indicator light will continue to flash, and the host will voice prompt "X signal is normal", "Y signal is normal".

When checking the phase, first place the X detector close to or contact any phase line, and then move the Y detector close to or contact the other phase lines to be nucleated. When the high-voltage phasing check is used, the detector does not need to directly contact the high-voltage wire, and the detector hook is gradually approached to the wire. When the electric field is sensed, the detector will emit a "beep-beep-beep" sound and the indicator light will continue to flash, and the inspection is completed. electrical function. For low-voltage phase verification (400V and below), especially for the low-voltage phase verification of the distribution box, please replace the metal probe with a metal probe.

In the case of non-contact phase checking, if the phase wires are relatively close to each other, the test should be carried out at a position far away from other wires.

The phase checking is based on the X detector, and the A phase is fixedly displayed. If the phase angle difference between the two detectors is within the range of $-30^{\circ}\sim 30^{\circ}$ ($330^{\circ}\sim 360^{\circ}$ is $-30^{\circ}\sim 0^{\circ}$), the Y detector The detection result is A phase, which is qualitatively in-phase; if the phase angle difference between the two detectors is within the range of $90^{\circ}\sim 150^{\circ}$ or $210^{\circ}\sim 270^{\circ}$, it is qualitatively out of phase. At the same time, the host voice prompts "in-phase" or "out-of-phase".

When the phase angle difference is between $90^{\circ}\sim 150^{\circ}$, the detection result of the Y detector is B phase, that is, the sequential phase sequence; when the phase angle difference is $210^{\circ}\sim 270^{\circ}$, the detection result of the Y detector is the C phase, that is, the reverse phase sequence.

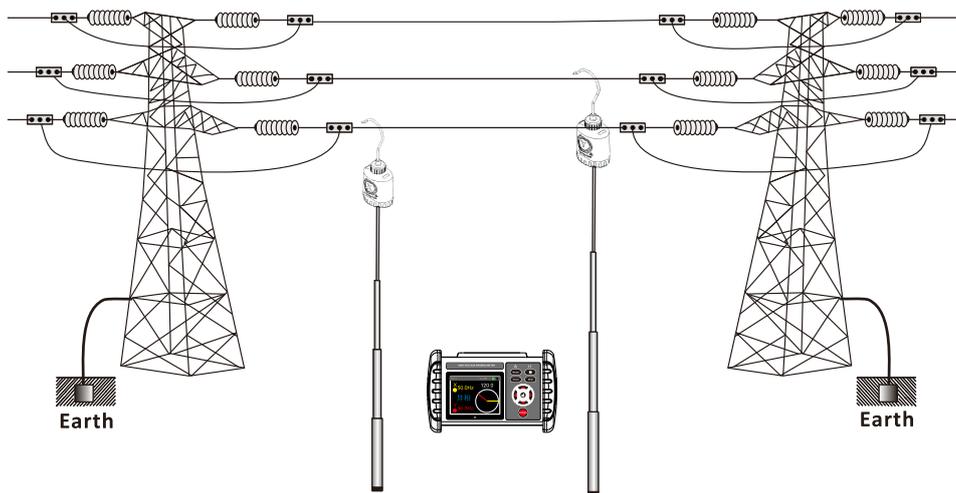
11. Voltage measurement

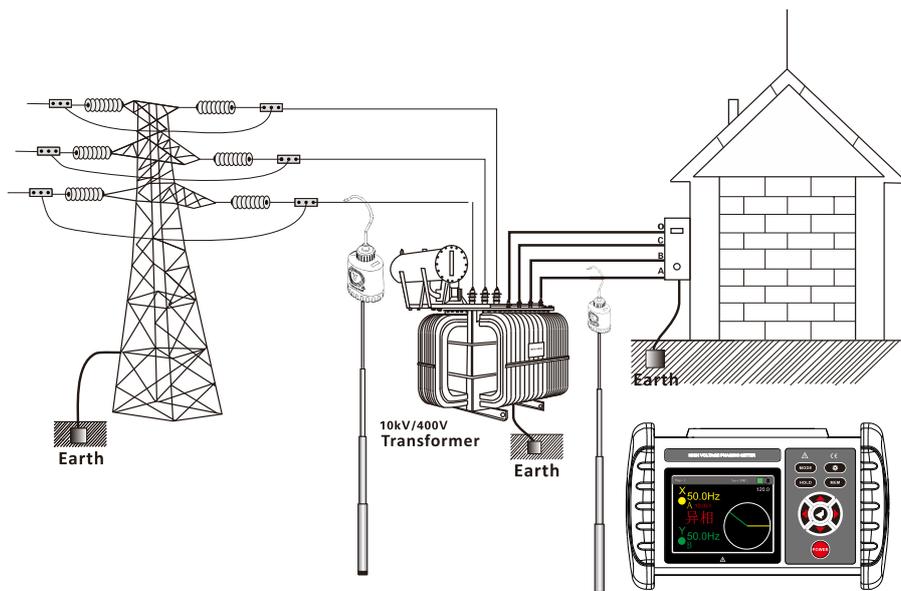
The detector must be connected to the insulating rod. To ensure the accuracy of voltage measurement, please ensure that there is no electric field interference near the detector.

The host is turned on, and the detector is turned on after the insulating rod is connected. When the detector senses a voltage, the detector will emit a "beep-beep-beep" sound and the indicator light will continue to flash. When measuring voltage, touch the probe to the lead first. When the voltage is sensed, the detector will send out a "beep-beep-beep" tone and the indicator light will continue to flash to complete the power inspection function. The host displays the voltage of the conductor under test. For low voltage measurement (400V and below), especially when measuring the low voltage of the distribution box, please replace the metal probe with a metal probe.

12. Voltage type switching

Press the “ ◀ ” and “ ▶ ” keys in the test interface to switch the voltage display type. The phase voltage is the voltage measured with the ground as a reference, the line voltage is the voltage between two phase lines, and the phase voltage is $\sqrt{3}$ times the line voltage.





VII . Battery Replacement

	<p>Pay attention to the battery polarity, otherwise the watch will be damaged.</p>
	<p>The battery is low, please replace the battery in time.</p>
	<p>New and old batteries cannot be used.</p>

1. When the battery voltage of the host computer drops to $6.0V \pm 0.1V$, the host computer displays a low battery voltage symbol, and when it is $5.8V$, the host computer automatically shuts down; when the battery voltage of the detector drops to $7.0V \pm 0.1V$, the power indicator flashes to remind the battery power is low , when the battery voltage of the detector drops to $6.5V \pm 0.1V$, the light will be on for 1s and the buzzer will beep for 1s, indicating that the battery is low and it will automatically shut down, please replace the battery.

2. Press the **POWER** button to shut down, confirm that the meter is in the off state, open the battery cover, and replace with a new qualified battery, pay special attention to the battery specification and polarity, cover the battery cover, and then turn on the power to confirm whether the replacement is completed.

VIII . Packing list

Host	1PC
Detector	2PC

Hook, probe	2 Each
Self-calibration line	1PC
Instrument box	1PC
Alkaline dry battery (AAA 1.5V)	5PC
6F22 9V battery	2PC
Telescopic insulating rod	2PC
User Manual, Warranty Card, Qualification Certificate	1SET

The contents of this user manual cannot be used as a reason to use the product for special purposes.

The company is not responsible for other losses caused by the use.

The company reserves the right to modify the contents of the user manual. Subject to change without notice.