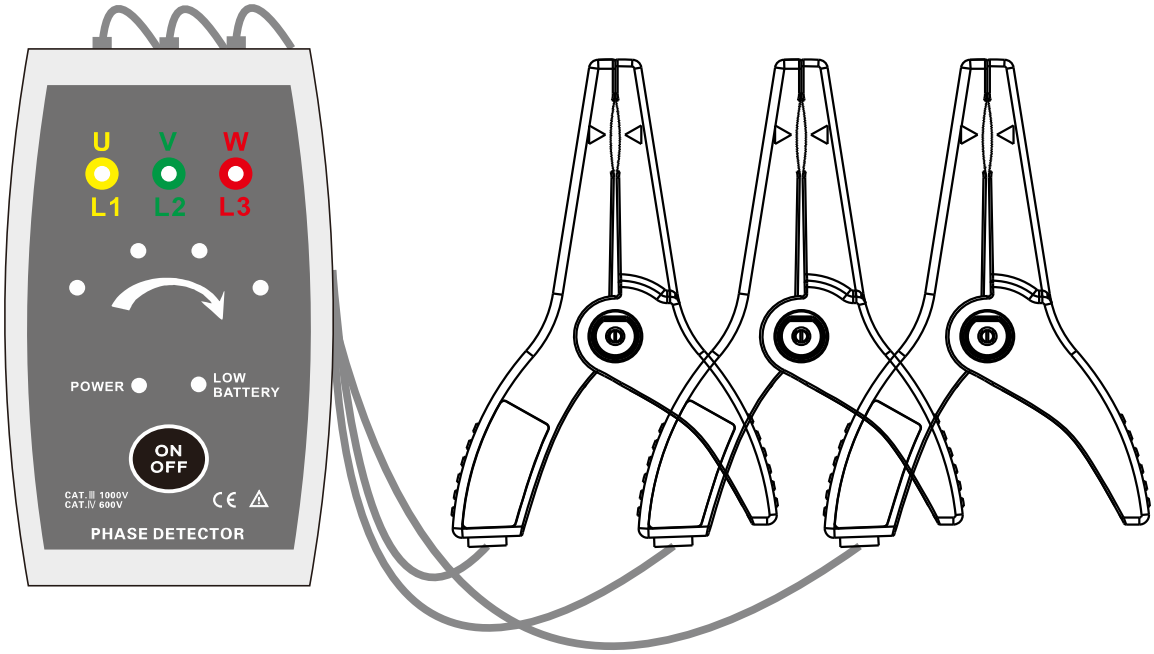
Non-contact Phase Detector



FR2060
USER MANUAL

Guangzhou Zhengneng Electronic Technology Co.,Ltd

CONTENT

⚠ Warning ⚠

Thank you for purchasing our FR2060 non-contact phase detector. In order to use this product better, please be sure to:

—— Read this user manual in detail.

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

- In any case, special care should be taken when using this instrument.
- Pay attention to the label text and symbols of the instrument panel and back panel.
- Before use, make sure that the insulation of the instrument, leads, and clamps is not damaged, exposed, or broken.
- Never touch bare exposed wires during the test。
- Do not place and store the instrument for a long time under high temperature and humidity, in a place with condensation and direct sunlight.
- Not use the instrument for a long time, please remove the battery。
- Replace the battery, please pay attention to the polarity of the battery. It is forbidden to replace the battery when the clamp is not removed from the tested line.
- Use, disassembly, and repair of this instrument must be performed by authorized personnel。
- Due to the reason of this instrument, if it is dangerous to continue using it, it should be stopped immediately and sealed immediately, and handled by an authorized institution.
- "⚠" warning sign on the instrument, the user must strictly follow the instructions for safe operation.
- The "⚠" hazard symbol in the manual must be operated safely by the user in strict accordance with the instructions.

I. Brief Introduction

FR2060 non-contact phase detector is a major breakthrough in traditional phase sequence detection methods.The traditional phase sequence detection must be to open the three-phase wire terminal, the phase sequence table of the three exposed clips or test pins are connected to the exposed three fire lines. It uses clamp-type non-contact inductive measurement. It does not need to open the wire, and does not need to touch the high voltage exposed live wire. It can directly detect the phase sequence by sandwiching the three super induction

high-insulation clamps to clamp the three-phase live wire insulation sheath., It is safe and reliable, and is widely used in electric power, communication, meteorology, railway, oil field, construction, measurement, scientific research and teaching units, industrial and mining enterprises and other fields. At the same time, the acousto-optic indicates the normal or reverse phase state of the phase sequence of the three-phase power supply

Non-contact phase detector also has functions such as live line inspection, easy power inspection, open circuit search, break point location, and line maintenance.。

Non-contact phase detector detects quickly and easily, shows at a glance, greatly improves the safety of field tests, effectively protects the personal safety of operators, and increases productivity! It is a safety instrument for phase sequence, motor detection and line maintenance of three-phase power supply!

II. Electrical Symbol

	Extremely dangerous! The operator must strictly abide by the safety rules, otherwise there is a danger of electric shock, resulting in personal injury or casualty accident.
	Warning! The operator must strictly abide by the safety rules, otherwise it will cause personal injury or equipment damage.
	Double insulation
	AC
	DC

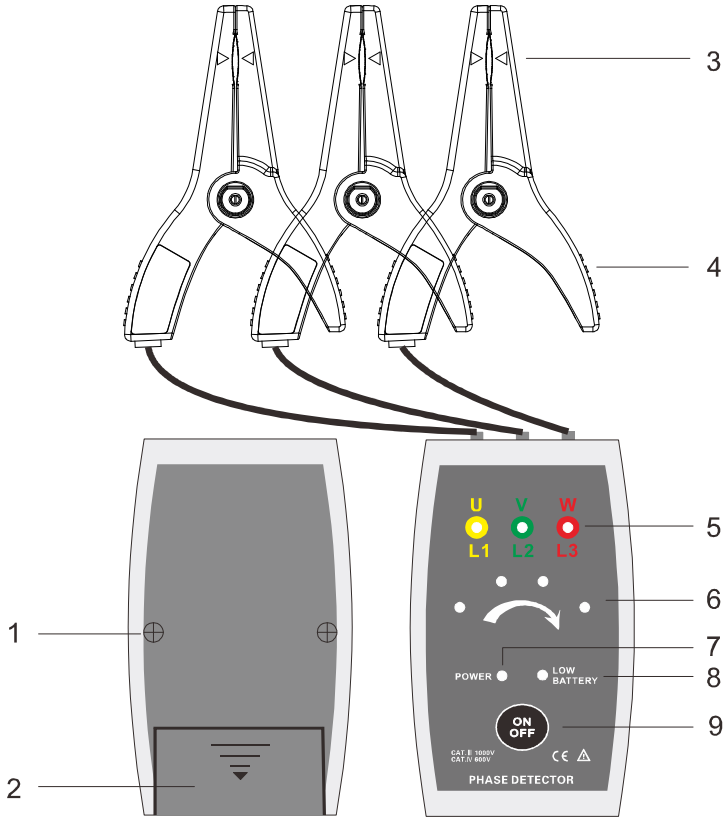
III .Technical Specifications

Function	Phase detection (normal phase, reverse phase), live line inspection, simple electricity inspection, phase loss judgment, circuit breaker search, breakpoint location, and line maintenance.
Power	9V battery, continuous use time is about 70 hours.
Measure mode	Non-contact clipping method
Wire position	The measured wire is in the center of the jaw
Frequency	50Hz/60Hz Automatic Identification
Live electricity range	AC70～1000V，45/65Hz（Sine wave continuous input），Conducted electrostatic detection
Measuring the highest voltage	AC1000V
Clamp wire size	Outside diameter ø1.5mm～ø48mm
Display	【Positive phase】4 phase detector lights are turned on in a clockwise direction;
	【Reverse phase】4 4 phase detection lights are turned on counterclockwise;
	【Live electricity】L1, L2, L3 lights in the voltage setting range;
	【Lack of phase】L1 or L2 or L3 lights are not lit;
	【Open circuit】L1 or L2 or L3 lights are not lit
Beep	【Positive phase】The instrument emits intermittent short beep;

	【Reverse phase】The instrument emits a continuous long beep。
Battery check	After the power is turned on, the power indicator is on; the battery is low; the LOW BATTERY lamp is on。
Clamp lead length	0.6m
Instrument size	L 117.6mm×W 81mm×T 25mm
Automatic shut-down	After about 6 minutes of power on, the meter automatically shuts down to reduce battery consumption.
Battery voltage	When the battery voltage drops to about 5.2V, the battery voltage is low symbol to remind to replace the battery
Instrument weight	Instrument：260g(including battery)
Maximum rated power	300mVA
Working temperature and humidity	-10℃～55℃；below 80%rh
Storage temperature and humidity	-20℃～60℃；below 90%rh
Insulation strength	3.7kVrms
Suitable for Safety Regulations	EN61010-1：2001、EN61010-031：2002、pollution grade 2、CAT Ⅲ(600V)、Instant overvoltage 6000V。

IV. Structure

1. Upper and lower cover screws
2. Battery cover
3. Clamp wire indication
4. Clamp handle
5. Power inspection indicator light
6. Phase sequence indicator light (4)
7. Power indication
8. Low battery voltage indication
9. Switch button



V. Operation Method

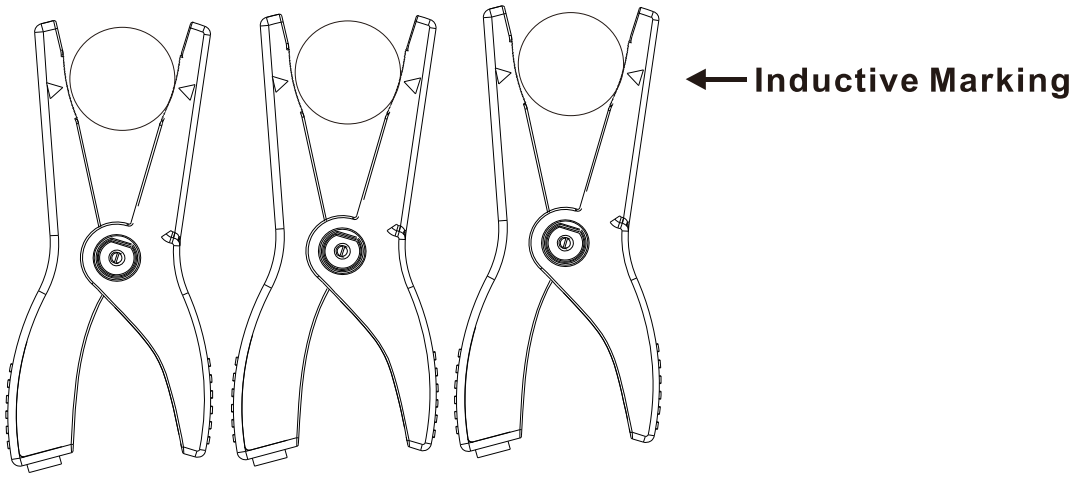
1. Phase sequence detection

⚠	Danger! There is high pressure! Please pay special attention to safety!

(1). Detect connection

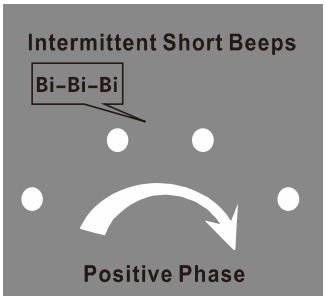
Hold the pre-tested three-phase line with three clamps (see picture)。

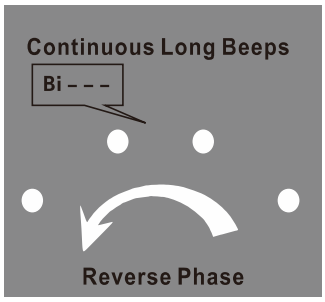
(2). The wire to be inspected is at the “▼” mark of the clamp.



(3). Press the black "**ON OFF**" to turn it on, and the power indicator above it is on. If the power-on indicator is off, the battery may be out of power or the instrument may be checked. Please follow the instructions in the manual to replace the battery.

(4). After the power is turned on, if the four phase sequence indicators are turned on in a clockwise direction and the instrument emits intermittent short beeps, the clamp phase line is positive phase sequence **L1-L2-L3** (ie **UVW**) (left picture); If the four phase sequence indicators are turned on in the counterclockwise direction and the instrument emits a continuous long beep, the clamp phase line is reverse phase sequence **L3-L2-L1** (ie **WVU**) (right picture).





(5) . Press the black "ON OFF" button to shut down. The instrument will automatically shut down after about 5 minutes of power on to reduce battery consumption..

2.Live line detection, simple power detection

⚠	Danger! There is high pressure! Please pay special attention to safety!

(1). Use any clamp to clamp the wire to be tested. If the wire is energized (AC70~1000V within the live line voltage setting range), the L1/U, L2/V or L3/W lamp will be on, and it can be detected whether the wire is live.

(2). Clamp and light correspondence table

Clamp identification	Corresponding lighting symbol
L1/U（yellow）	L1/U lighting
L2/V（green）	L2/V lighting
L3/W（red）	L3/W lighting

3.Phase loss judgment, open circuit search, breakpoint positioning

⚠	Danger! There is high voltage! Please pay special attention to safety!

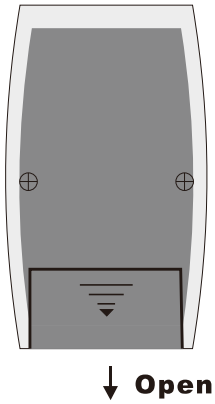
(1). Use three clamps to clamp the three-phase line separately. If there is no phase, the L1, L2 or L3 lights will not light.。

(2). Use any clamp to clamp the wire along the line being repaired. If the clamp point L1, L2 or L3 is not lit, the line is at the line break. Shorten the position of the clamp point, and accurately find the line break position (breakpoint position), which is very convenient and safe for line inspection.。

Note: This function is very suitable for the open circuit fault in the maintenance line, safe and fast.!

VI. Battery Replacement

⚠	**Please pay attention to battery polarity!**



1. Before replacing the battery, the clamp must be removed from the wire to be inspected. Do not replace the battery during the test.
2. Press the "ON OFF" button to shut down.
3. Loosen the instrument battery back cover.
4. Replace with a new qualified battery, please pay attention to the battery polarity and specifications (9V 6F22 model).
5. Close the battery back cover.
6. Press the "ON OFF" button to check if the instrument can be turned on normally. If it cannot be turned on, please check if the battery level is enough or follow step 3 to re-operate.

VII.Accessories

Instrument	1PC
Instrument bag	1PC
Detector battery	9V Alkaline battery 1PC
Manual, certificate	1SET

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