

**ZX5050 High Precise Three
Phase Programmable Testing Source**



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I Product overview

ZX5050 Three Phase testing Source adopts with integrated structure of meter and source, all-digital closed-loop standard power source technology, advanced embedded system, large screen TFT color liquid crystal display, CPLD chip and high-precision A/D, D/A, small in size and light in weight. It can be widely used in electric metering industry, electrical laboratory and other relevant area, and is easy to carry to the field.

II Product features

1. Touch panel screen, massive information to display, simple and convenient to use.
2. Embedded high class standard power watt-hour meter and digital closed-loop feedback. The parameters like voltage, current, frequency, phase, active power, reactive power, apparent power and power factor can be used as standard.
3. A variety of protection functions: current limiting protection, power amplifier protection, voltage short circuit protection, current open circuit protection, power amplifier heat protection, etc
4. Independent control of Three-phase voltage and current loops, output of each phase voltage and current can be adjusted separately.
5. Users can freely set the rated voltage and current, the test points and adjust step, as long as it is within the allowable output range.
6. Abundant test points of voltage, current and phase

7. RS232 serial port, easy for computer control and software upgrade.

III. Technical Indicators

1. Power output:

1) AC Phase Voltage Output

- A. Adjustment fineness: 0.01% RG
- B. Resolution: 4-bit significant digits
- C. Accuracy: better than ($\pm 0.5\%$ RG)
- D. Stability: better than ($\pm 0.01\%$ RG/1 min)
- E. Distortion: better than 0.2% (non-capacitive load)
- F. Output power: rated at 25VA per phase
- G. Output range: 10V-460V
- H. Gear settings: 60V, 100V, 220V, 380V, internal automatic gear switching.

2) AC current output

- A. Adjustment fineness: 0.01% RG
- B. Accuracy: $\pm 0.5\%$ RG
- C. Resolution: 4-bit significant digits
- D. Stability: 0.01% RG/1 min
- E. Distortion: better than 0.2%
- F. Output power: 20A and below rated at 20VA per phase, 50A rated at 40VA.
- G. Output range: 1mA~60A

H. Gear Settings: 0.2A, 1A, 5A, 10A, 20A, 50A Automatic Gear Switching

3) Power Output

A. Accuracy: 0.5% RG

B. Stability: 0.02%/1 min (PF=1 at rated power)

C. Resolution: 4-bit significant digital (active power, reactive power, apparent power)

4) Power factor

A. Adjustment range: - 1~ 0 ~+1;

B. Resolution: 0.001;

C. Accuracy: 0.005.

5) phase

A. Adjustment range: 0-359.99 degrees

B. Resolution: 0.001 degrees

C. Accuracy: ± 0.5 degrees

6) frequency

Adjustment range: 45Hz-65Hz

B. Resolution: 0.01Hz

C. Accuracy: ± 0.02 Hz

2. Common Output Regulation Functions

1) Voltage test points: 10%, 20%, 50%, 80%, 100%, 110%, 120%.

2) Current test points: 5%, 10%, 20%, 50%, 70%, 100%, 120%.

3) Phase test points: 0.5L, 0.8L, 1.0, 0.8C, 0.5C.

4) The magnitude of three-phase U & I regulation: 10%, 1%, 0.1% and

0.01%, max 120%.

5) The phase phase and power factor regulation steps: 10° , 1° , 0.1° and 0.01°

6) The phase of UB, UC to UA can be adjusted by 10° , 1° , 0.1° and 0.01°

7) Three phase Frequency regulation steps: 5 Hz, 1 Hz, 0.1 Hz and 0.01 Hz

3. Power supply: single-phase AC 100-264V, 50/60Hz.

4. External dimensions: 495*600*170mm

5. Net Weight: 26Kg.

IV. Appearance

Front panel shown in Fig 1.



Fig.1

Back panel shown in Fig 2.

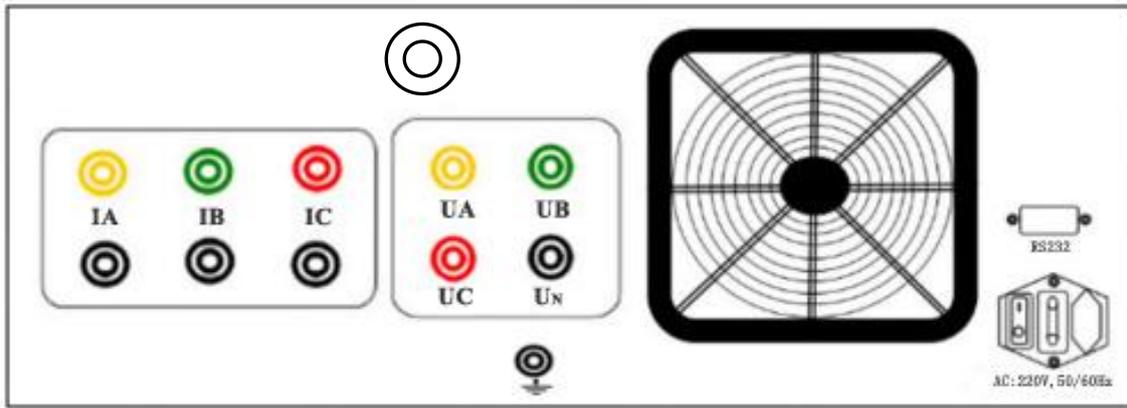


Fig.2

V. Operation method

When using the machine, please do mind the strength and don't break the screen.

Here is the introduction of the panel buttons: The buttons on the keyboard can perform different functions. The instrument can go to the following interfaces:

- 【】: Setting the rated value of three-phase voltage and current output of power supply, and the status of quadrant, direction, active or reactive power and other parameters of the watt-hour meter that being inspected.
- 【】: Adjust any or all of the output amplitude, phase, power factor, frequency, phase between U1, U2 and U3 of three-phase voltage and current.
- 【】: Calibrating the kilowatt-hour meter according to the scheme.
- 【 + 】: Calibration button on the touchable screen.
- 【 UI 】: The master switch of 3 phase voltage current output, which makes output rise or turn off.
- 【 U 】: The master switch of 3 phase voltage output makes three-phase voltage

rise or turn off.

【I】 : The master switch of 3 phase current output makes the three-phase current rise or turn off.

【U1】 : Switch of phase A voltage output.

【U2】 : Switch of phase B voltage output.

【U3】 : Switch of phase C voltage output.

【I1】 : Switch of phase A current output.

【I2】 : Switch of phase B current output.

【I3】 : Switch of phase C current output.

【0.....9】 : Digital input button.

【.】 : decimal input button.

【←】 : Delete unnecessary data or selected harmonic setting.

【Enter】 : Confirm the input data or save.

Make sure the external wiring is correct (voltage output can not be short-circuited, current output can not be open-circuited), then turn on the power switch. The instrument enters the loading interface (Fig. 3). About two or three seconds later, when the instrument system is loaded, the buzzer sounds and enters the **【Test Point】** interface, as shown in Figure 4.

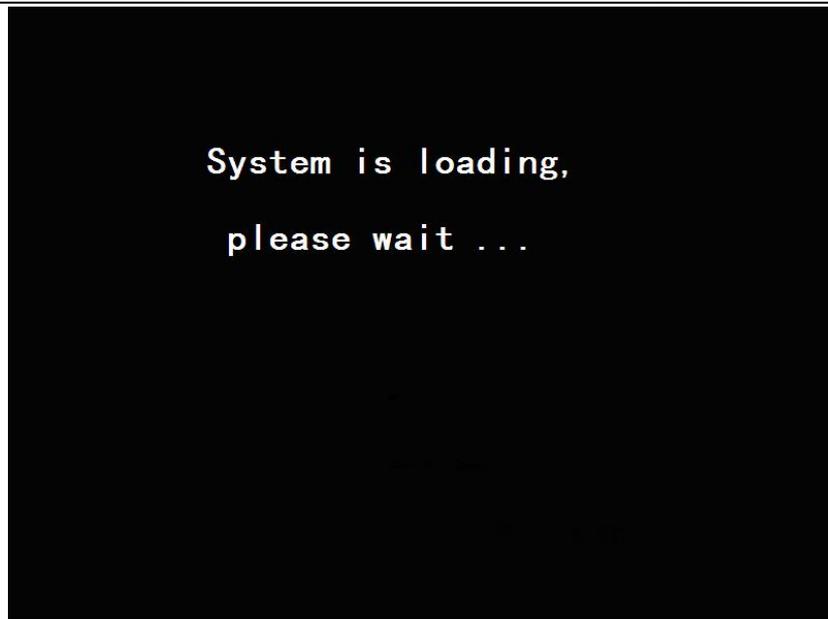


Fig.3

1. The Test Point Interface



Fig.4

This interface is mainly consist of three areas.

The top area is the output display area and below is output setting area. Users can choose the test points of voltage, current and power factor.

The bottom is the status display area of the instrument, which shows the output status of each phase voltage and current and the name of the interface.

Fig. 5 shows the output status of the power supply under three-phase

four-wire, voltage 220v, current 5A and power factor 1.0.



Fig. 5

1) Output display area

L1, L2, L3 means phase L1, phase L2 and phase L3 respectively.

Phase L2 is not displayed in three-phase three-wire and phase L1 is only displayed in single-phase.

U (V): The voltage output value of phase-neutral point of each phase is displayed in three-phase and four-wire, and the voltage of U12 and U32 are only displayed in three-phase and three-wire.

I (A): Output current of each phase;

Φ(°): Phase value of each phase current to each phase voltage;

P (W): Active power value of each phase and total active power values;

Q (var): Reactive power value of each phase and total active power values;

S (VA): The apparent power values of each phase and the total apparent power values;

PF: power factor of each phase and total power factors;

F (Hz): Output frequency of power supply.

The upper value of the vector diagram is the phase value between each phases, and there are only phase value between U1 and U3 in 3P3W state.

In 3P4W state Press [Enter] key, The position where displays the phase between each voltages on the vector diagram shows the values of line voltages U12, U23 and U32. As shown in



Fig. 6

2) Output Setting Area

The touchable area of the LCD screen is available only in the output setting area.

Each interfaces in this equipment, means single selection, means multiple selection, means items are already chosen; The percentage test point of voltage and current is relative to the rated value of three-phase voltage and current set by user under Set Parameter [I] interface. Different U PF I testing percentage points can be selected on touchable screen.

3) Status Display Area

The status area is in the bottom of the screen. There are six circles in the status area, which means the output state of three-phase voltage and current respectively. White means that the output is not allowed, colored ones means that it is in the output state. Yellow, green and red circle respectively means the output switch of L1, L2 and L3 are turned on. The rightmost side shows the name of present interface.

2. Parameter Setting

Press to enter the interface of **【Set Parameter [I]】**, as shown in Fig. 7.

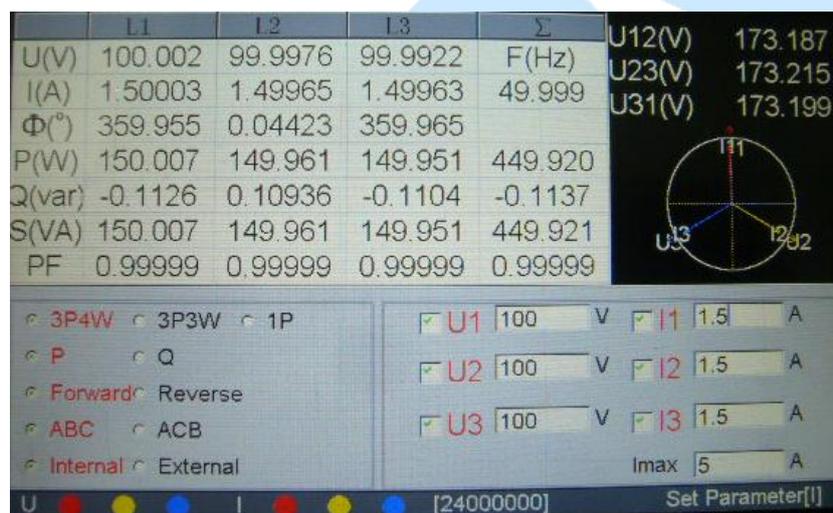


Fig. 7

The **【Set Parameter [I]】** interface shows how to determine the output electricity mainly based

on the information of the checked meter. It is divided into left and right parts in the setting area.

On the left side of the setting area, touch screen and select one from 3P4W, 3P3W and 1P according to the situation of the calibrated meter. 3P4W

represents three-phase four-wire, 3P3W represents three-phase three-wire and 1P represents single-phase; “P” and “Q” : just choose one, “P” means active power meter, “Q” means reactive power meter; “Forward” and “Reverse” : can only choose one, “Forward” means positive direction and “Reverse” means reverse direction. Noticing that when "P" is selected, [PF] value will show active power factor; when "Q" is selected, [PF] value will show reactive power factor; ABC and ACB represent positive sequence and reverse sequence respectively, and reverse sequence can be selected only in the case of three-phase four-wire; Internal External indicates whether to use this machine as the standard or to use the output pulse of external meter as calibration standard when checking the meter error. General the default is instruments Internal standard.

On the right side of the setting area is the rated voltage and current value of the input meter and the maximum current value of the meter. The digital boxes on the right of U1, U2, U3, I1, I2 and I3 indicate the three-phase rated voltage and current values of the power supply to be set.

Touch the left side near U1, U2, U3, I1, I2 and I3 to select one phase, chose one would turn into ; If all 3 phases are chosen, just input L1 voltage or current, the other phases output value would be same as that of L1 phase. When are not chosen, each phase output value can be different value, that is, the source 3 phases output different voltage or current.

The way to input numbers: Touch the rectangle on the right of U1...I3, so that the cursor appears in the rectangle, and then press the number key on the

panel to input, **【 ← 】** to delete figures input. After inputting figures of three-phase voltage or current, and the cursor stays in any rectangles right of U1, U2, U3, I1, I2, I3, press Enter to confirm.

If the three-phase voltage and current are always in the output state at the time of changing into new values by new inputs, after confirm, the power supply will automatically change the output amplitude according to the latest set parameters

3. Adjust Output

Press **【 📏 】** button, output of the power source can be fine tuning. As shown in Fig. 8.

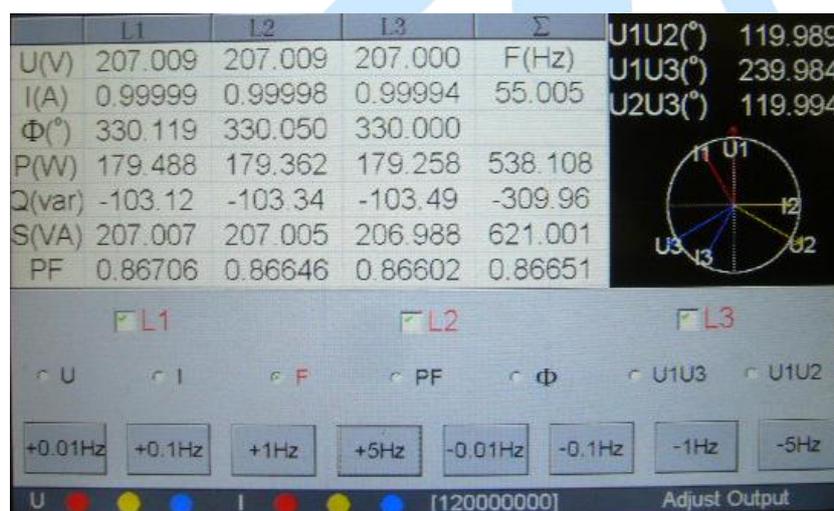


Fig. 8

The first row shows whether the phase L1、L2 and L3 are participating in

adjustment, means they are,, means they are not, status can be changed through touching the rectangles. The second row is the items U, I, F, PF, Φ, U1U3, U1U2 to be adjusted, which respectively represents the voltage amplitude, current amplitude, power factor, phase of voltage to each phase

current, phase between U1U3 and phase between U1U2; the third row represents the adjustment fineness, choose different fineness according to the different items

The adjusting range of voltage and current is the percentage related to the rated value input in "parameter setting". $\pm 10\%$, $\pm 1\%$, $\pm 0.1\%$, $\pm 0.01\%$ can be selected, note that the maximum adjusting limit is 125%.

Frequency regulation is for all phases. The fineness of regulation is $\pm 5\text{Hz}$, $\pm 1\text{Hz}$, $\pm 0.1\text{Hz}$, $\pm 0.01\text{Hz}$. Please note the regulation range is 45-65Hz.

The adjustment of power factor includes leading or lagging 0.01, 0.1, etc.

The adjusting fineness of the phase is $\pm 10^\circ$, $\pm 1^\circ$, $\pm 0.1^\circ$, 0.01° , range 0-359.99°.

The regulation of U1U3 and U1U2 is actually regulation of phase between U3 and U2. Whether "L1", "L2", "L3" is selected or not has nothing to do with this regulation. Under 3P3W state, the regulation of U1U2 does not work. The fineness of regulation is $\pm 10^\circ$, $\pm 1^\circ$, $\pm 0.1^\circ$, 0.01° . The range of regulation is 0-359.99°.

4. Calibration of Screen

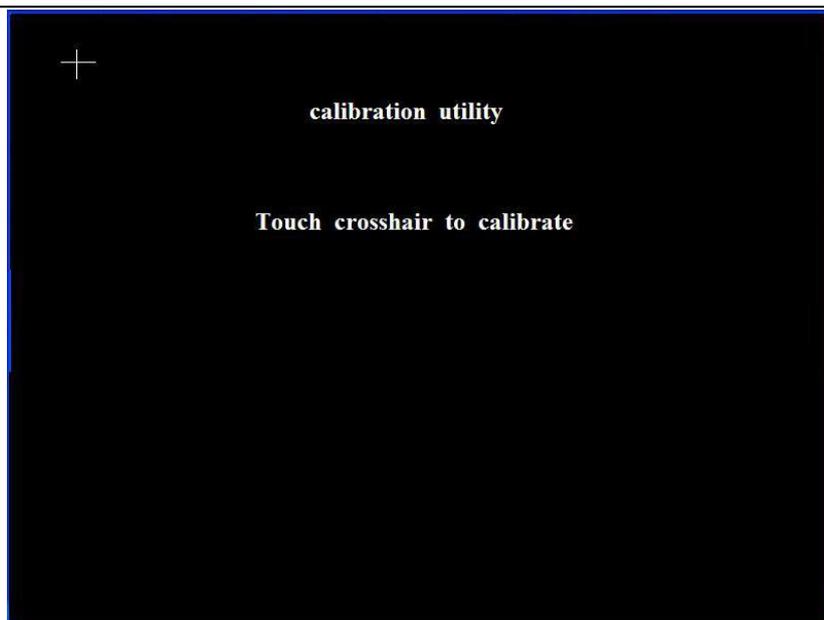


Fig. 9

The touch screen can be calibrated by pressing [+] button twice in succession. Touch the center of the cross graphics displayed on the LCD screen, if the coordinate value generated by this touch is approved by the system, the next cross will automatically appear for calibration; otherwise, the next cross graphics will not appear. When all the five cross graphics are touched through, the operation will be prompted success on the display screen. Please reset or restart the machine, and the new coordinate data will be saved in Flash in the equipment.

VI.Packing List

1). Main Equipment	1 set
2). Voltage test line	1 set
3). Current test line	1 set
4). Power cord	1 pcs
5). Communication line	1 pcs

6). 3A Fuse	3 pcs
7). Aluminum Alloy Box	1 pcs
8). Test report	1 copy
9). Qualification Certificate/Guarantee Card	1 copy
10). Manual	1 copy

