

GDB-IV

Transformer Turns Ratio Tester

User's Guide





Caution

- Please read the manual carefully before operating.
- The operator should have used common sense of electric equipment or instrument.
- The instrument can be used indoor or outdoor, but it is necessary to protect it from rain, corrosive gas, dust, high temperature and direct sunlight.
- Before starting test, please check if the wires of test object and the instrument are well connected.
- High voltage and low voltage cable must not be reversely connected.
- Do not maintain or create instrument privately. Otherwise, the instrument is out of the warranty.
- Please make sure the equipment is upright before opening the box. Don't drop equipment heavily to avoid equipment movement damage.
- Panel should be upright during storage. Elevate stored items to protect from moisture.
- Place the equipment in dry, clean, ventilated area free from corrosive gas. Stacking equipment without transit containers is dangerous.
- If long time does not use this instrument, please preheat the instrument before use, to remove moisture.

Warranty

The warranty period for this series is one year from the date of shipment, please refer to your invoice or shipping documents to determine appropriate warranty dates. HV Hipot corporation warrants to the original purchaser that this product will be free from defects in material and workmanship under normal usage. Throughout the warranty period, provide that such defects are not determined by HV Hipot to have been caused by abuse, misuse, alteration, improper installation, neglect, or adverse environmental condition, HV Hipot is limited solely to repair or replacement of this instrument during the warranty period.

Packing List

GDB-IV Tester	1 piece
Carrying Bag	1 piece
Charger	1 piece
HV Test Lead (4-core, red sheath)	1 piece
LV Test Lead (4-core, black sheath)	1 piece
USB disk	1 piece
USB cable	1 piece
Ground cable	1 piece
Print paper	2 rolls
User's guide	1 copy
Factory test report	1 copy

HV Hipot Electric Co., Ltd. has strictly and carefully proofread the manual, but we cannot guarantee that there are no errors and omissions completely in the manual.

HV Hipot Electric Co., Ltd. is committed to making continuous improvement in product functions, and improving service quality, so the company remains the right to change any products and software programs described in this manual as well as the content of this manual without prior notice.

I. General Information

GDB-IV Transformer Turns Ratio Tester is suitable for measuring variable ratio phase of power transformers, phase-shift rectifier transformers, Scott transformers, reverse Scott transformers, etc.

The internal power module in the tester generates the three-phase power or two-phase power, which is output to the high voltage side of the transformer. Then the high voltage and low voltage are sampled at the same time. Finally, the group, ratio, error, and phase difference are calculated.

II. Features

- 7inch touch screen, full menu.
- It generates 3-phase power or 2-phase power, and output to HV side of transformer. LV side and HV side are sampling at the same time, and group, turns ratio, error and phase error are calculated at last.
- The instrument output 2voltages, which enhance the adaptation of different voltage grade transformer.
- For the transformer with tap changer, after rated parameter is set, the position of tap changer, tap changer ratio of current position can be determined automatically when measuring.
- Fast speed, testing time for one group data is 10s.
- Three-phase(120°) or two-phase(90°) power supply with stable amplitude and constant phase.
- With over-current, over-voltage protection function, over-heat function, reverse connection protection function.
- With 2pcs USB port, one for online and it can be controlled and measured by PC, data can be uploaded and saved by EXCEL file, one for inserting USB disk to save data.

III. Specifications

- Voltage ratio test range: 1-10000
- Group test range: 0-11
- Voltage ratio test accuracy
 - 1-500: 0.1% High voltage
 - 500-2000: 0.2% High voltage
 - 2000-10000: 0.5% High voltage
 - 1-100: 0.2% Low voltage
 - 100-500: 0.5% Low voltage
- Voltage ratio resolution: 0.0001
- Angle accuracy: 0.1°
- Angle resolution: 0.01°
- Accuracy of current measurement: 1% FS+2digits
- Power Input: Lithium battery 12V 10Ah
- Dimension: 387*175*379mm
- Weight: 9kg
- Operating temperature: -20°C -40°C
- Relative moisture: ≤85%, no condensation

IV. Panel





Figure 1

V. Wiring

According to the type of the tested transformer, connect the test wire clip correctly.

Single-phase transformer wiring diagram

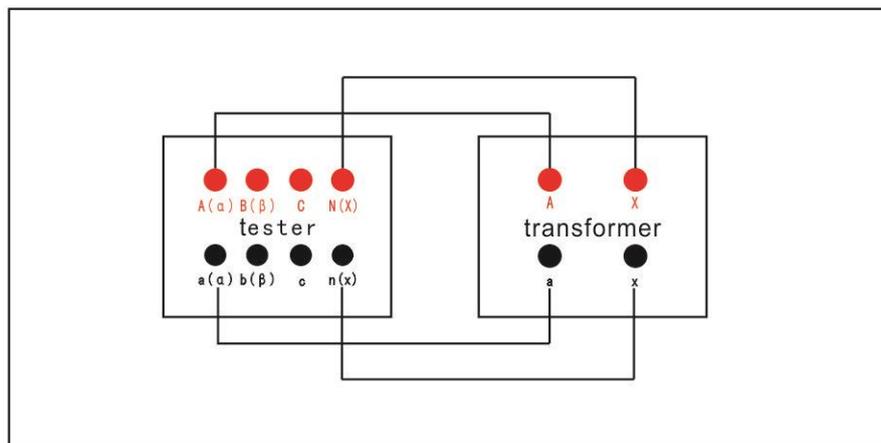


Figure 2

Power transformer wiring diagram

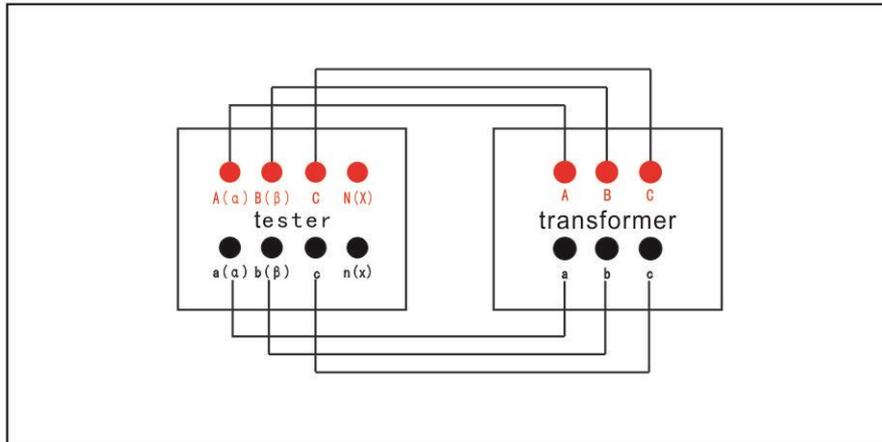


Figure 3

Ily transformer wiring diagram

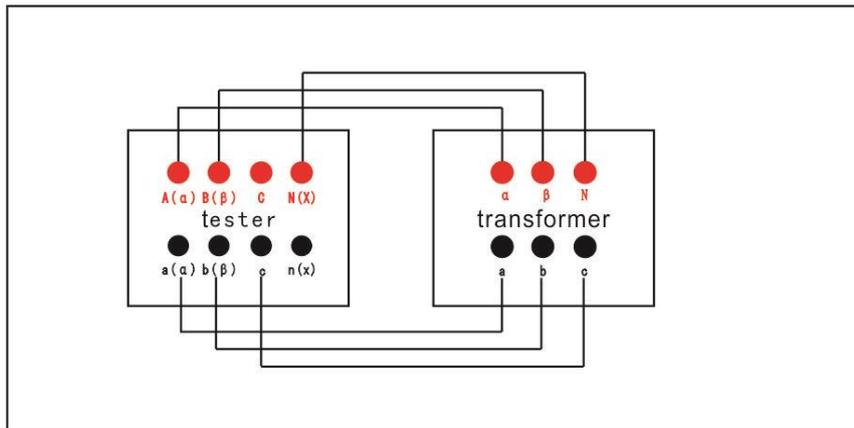


Figure 4

Yii transformer wiring diagram

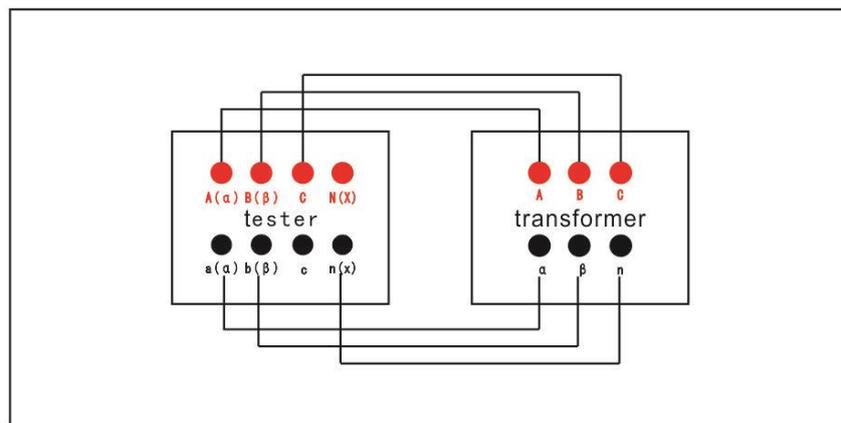


Figure 5

Three phase autotransformer wiring diagram

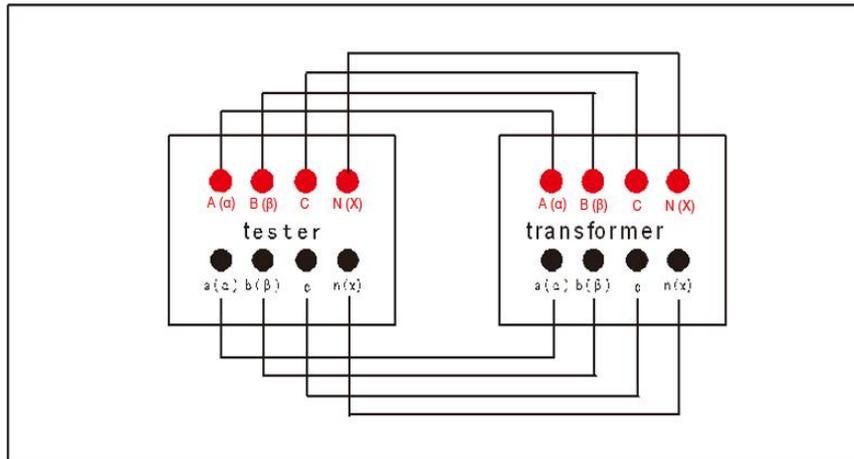


Figure 6

- Single-phase transformer is connected according to Figure 2.
- The three-phase transformer is connected as shown in Fig. 3. The transformer neutral point N(n) is connected to the N(n) of the tester. If there is no neutral point, the N(n) of the tester is left unconnected.
- Two-phase/three-phase transformer is connected according to Figure 4.
- Three-phase/two-phase transformer is connected according to Figure 5.
- Three-phase autotransformer is connected according to Figure 6.

VI. Operation

1. Parameter Setting

After the connection is completed, turn on the power switch and the screen will display the main screen.

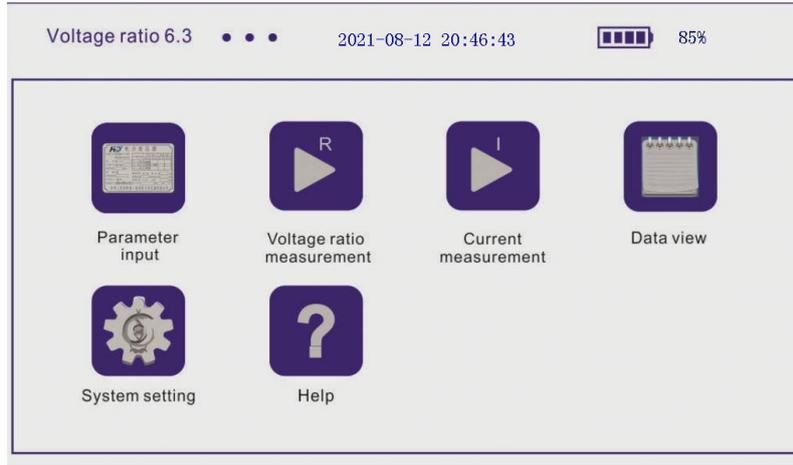


Figure 7

Click the "Parameter input" and enter the transformer parameters setting screen.

Set the transformer parameters

Product No.:	123	
Connection method:	Dy	
High voltage:	14.385	kv
Low voltage:	1.0000	kv
Total tapping number:	5	
Voltage regulation ratio:	5.00	%

Figure 8

Setting Product No.

In Figure 8, click on the number "123" to pop up the numbering screen, enter the number "456" or anything you need to set and click "Enter" to return.

Set the transformer parameters

Product No.: _____ 123

Connection method: _____ Dy

High voltage: _____ 14.3

Low voltage: _____ 1.00

Total tapping number: _____ 5

Voltage regulation ratio: _____ 5.00 %

Figure 9

Setting connection method

In Figure 8, click on "Dy" to pop up the connection setting screen.

Set the transformer parameters

Product : _____ 001

Connection method: _____

High voltage: _____

Low voltage: _____

Total tapping number: _____

Voltage regulation ratio: _____ 5.00 %

Figure 10

According to the actual connection of the transformer to choose, here click "Dy", and automatically return.

Notes

- For the single-phase transformer, select Ii.
- For the three-phase transformer, the method is selected according to the actual connection method.
- Three-phase/two-phase transformer, select "Yii (Scott).
- Two-phase/three-phase transformer, select "Ily (reverse Scott).
- For three-phase transformers, the connection method has no effect on the measurement, it is only used for saving and printing.

- For three-phase autotransformers, select “YNa”.

Setting the high voltage

In Figure 8, click on "14.385" to pop up the voltage setting screen.

Set the transformer parameters

Product No.:	123
Connection method:	Dy
High voltage:	14.385
Low voltage:	1.000
Total tapping number:	5
Voltage regulation ratio:	5.00

Figure 11

Enter the high voltage value of the transformer and click "Enter" to return.

Setting the low voltage

The same as the method for setting high voltage

Set the total tapping number

The same as the method for setting high voltage

Setting the voltage regulation ratio

The same as the method for setting high voltage

If the rated voltage ratio of the transformer is known, the high voltage can be set to the rated voltage ratio, and the low voltage can be set to 1.

After all data is set, click “Confirm” to return to the main screen.

2. Voltage ratio measurement

In the main screen, click "Voltage ratio measurement", and display



Figure 12

After measurement is completed, the test result is displayed as shown in Figure 13.

Record No.:1/99		Product No.:123		Date:17-06-08	
Connection method:Dy 11			AB:240.29v	0.00°	
Tapping position:3			BC:240.28v	-120.00°	
Tap voltage ratio:14.385			CA:240.28v	-240.00°	
AB/ab:14.388	0.02%	330.07°	ab:16.701v	-330.07°	
BC/bc:14.385	0.00%	330.08°	bc:16.703v	-90.08°	
CA/ca:14.387	0.01%	330.08°	ca:16.702v	-210.08°	

Navigation buttons: Save, Print, ALL, one, Measure, Home

Figure 13

Notes

- The phase difference refers to the phase difference of the corresponding line voltage, such as the phase difference between VAB and Vab.
- If it is a two-phase/three-phase transformer, the phase difference refers to the phase difference between the high-voltage single-phase and low-voltage line voltages. Three-phase/two-phase is just the opposite.
- The displayed phase is based on the line voltage VAB.
- The tester itself can save 99 data. After 99, the first data overflows, that is, first-in, first-out.
- Insert the U disk first, and then click "Save".
- The U disk may have compatibility issues. It is better to use the original U disk of the machine.

Button description

At the bottom, 6 function buttons from left to right are as follows in order:

- Save data to U disk.
- Print the current data.
- Delete all data.
- Delete the current data.
- Re-measure.
- Return to home screen.

At the bottom, 4 function buttons from top to bottom are as follows in order:

- The previous 10 data.
- The previous 1 datum.
- The back 1 datum.
- The back 10 data.

3. Measurement of excitation current

In the main screen, click "Current measurement". After the measurement is completed, the measurement data will be displayed, as shown in figure 14.

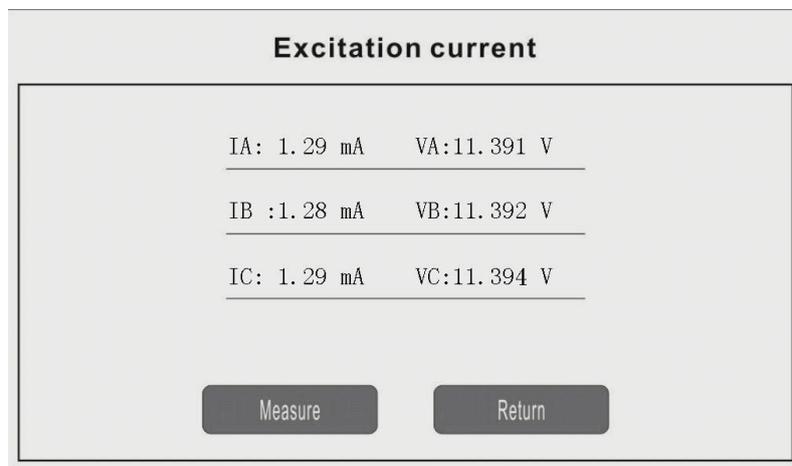


Figure 14

4. View historical data

In the main screen, click "Data view". If there is data, the display is shown in figure 13. In figure 13, a variety of operations can be done.

If there is no data, there is no response on the screen after clicking on.

If the data needs to be download, insert the USB disk, and click "Save" mark. The data is saved by txt file and each data is separated by ",".

5. System setting

In the main screen of Figure 7, click on "System Setting" to display the system settings screen.

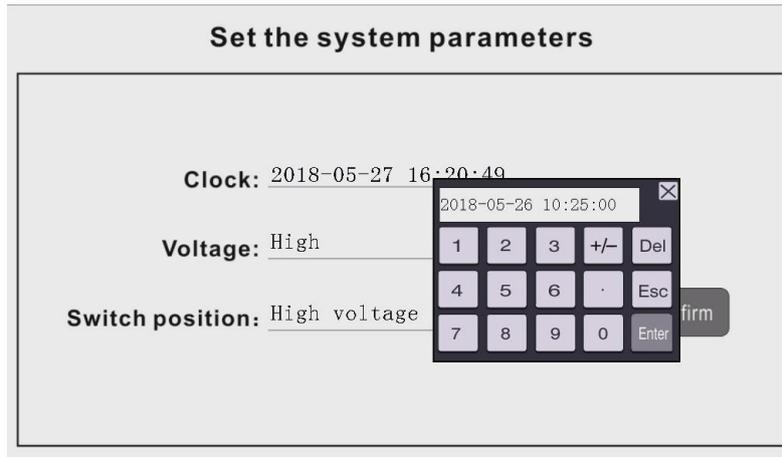


Figure 15

Set system time

In Figure 15, hold "Clock" and pop up the time setting screen, as Figure 16

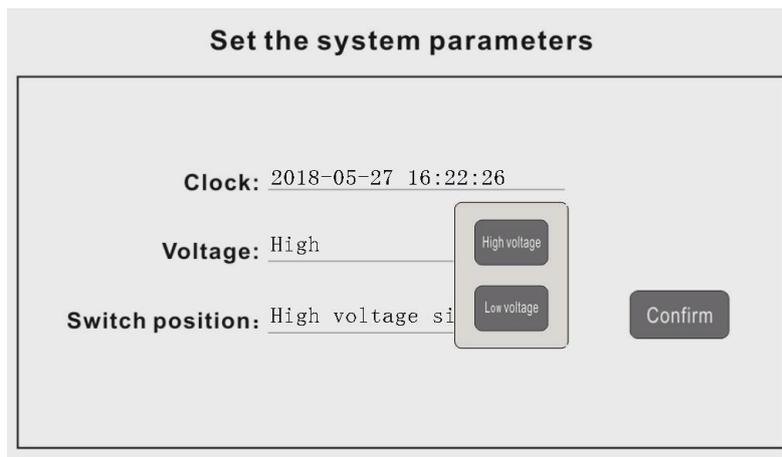


Figure 16

After the input is completed, click "Confirm" to return.

Set the output voltage

In Figure 16, click the "High" word on the right of "Voltage" to display the selection screen of the output voltage.

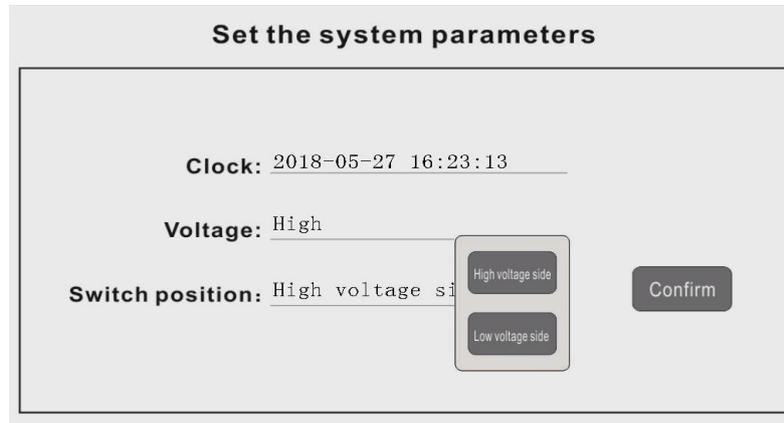


Figure 17

Click "High voltage" or "Low voltage" to return automatically.

Setting the position of the tapping switch

In Figure 15, click on "switch position" to pop up the setting screen of the tap switch position.

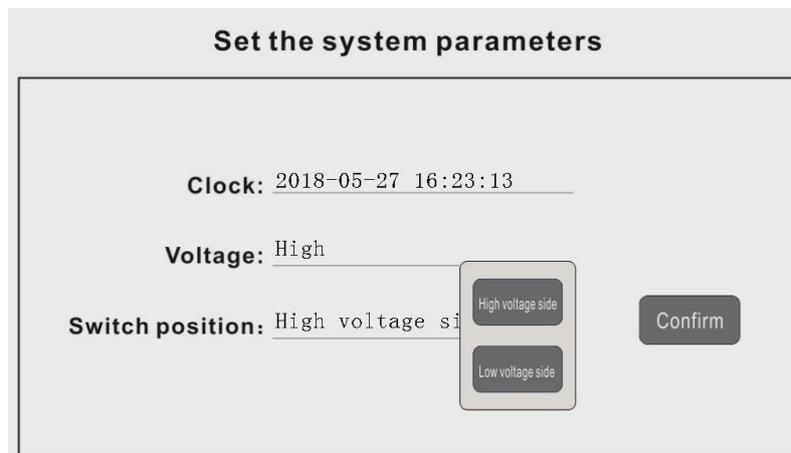


Figure 18

Click "High voltage side" or "Low voltage side" to return automatically.

After the system parameters is set, click "Confirm" to return to the main screen.

6. Help

Click "Help" in the main screen, and display the followings

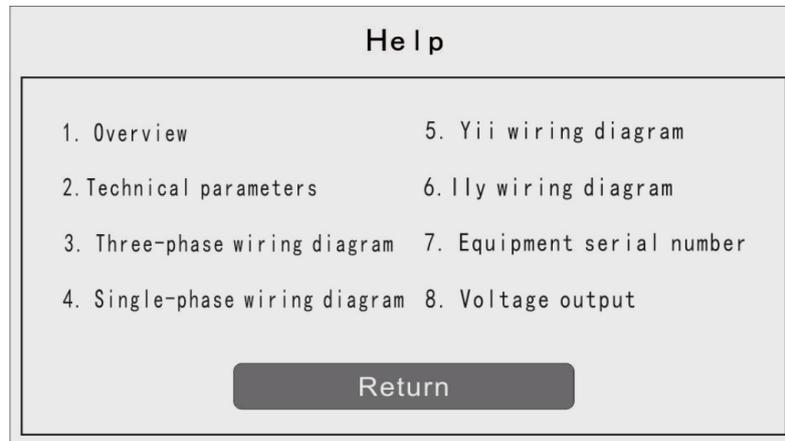


Figure 19

Click on the menu in Figure 19 to view the related descriptions.

In the "Help", click on the "Voltage output" and display the followings:

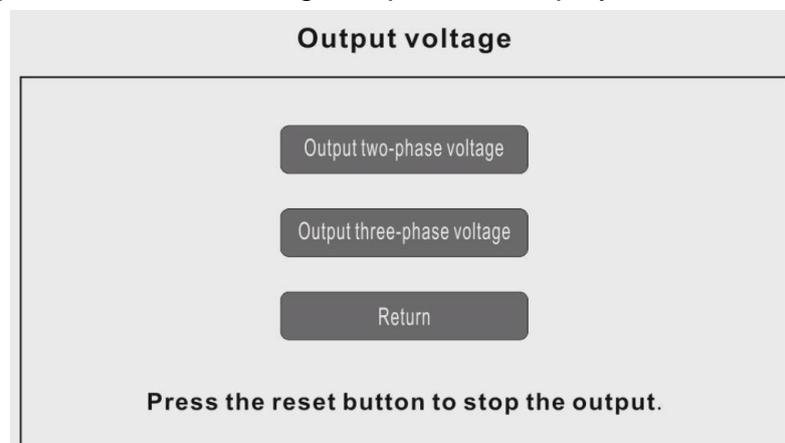


Figure 20

- After the button for output two-phase voltage is clicked, an accurate and stable two-phase voltage is output on the high-voltage output terminal.
- After the button for output three-phase voltage is clicked, an accurate and stable three-phase voltage is output on the high-voltage output terminal.
- The output voltage can be directly applied to the high-voltage winding of the transformer. Measure the amplitude with a voltmeter and display the waveform with an oscilloscope to judge the working status of the tester.
- The output voltage can also be output as a signal source.

- Press the reset button or turn off the power to stop the output.

7. Protection of the tester

- When measurement, the testing voltage is output form 0V. If the voltage at the low voltage terminal exceeds the maximum value, the tester will automatically reset and cut off the output.
- During measurement, if the tester is overloaded or short-circuited, the tester outputs a warning message. Press the reset key or turn off the power to exit.