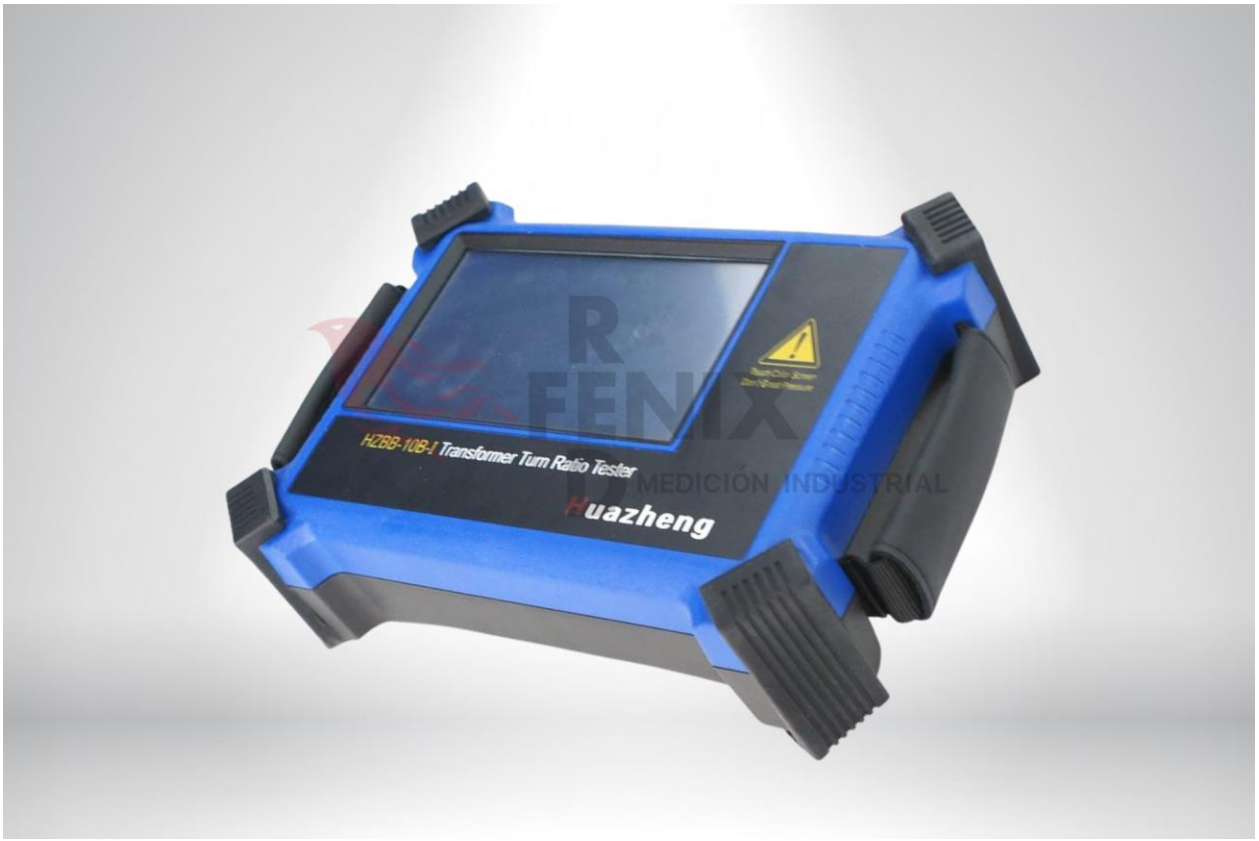
HZBB-10B-I Intelligent Transformer Turn Ratio Tester

USER MANUAL



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Preface

Dear Respected Users,

Thank you for choosingHZBB-10B-I intelligent tester of Transformer Ratio and Connection Groups. This detailed operating manual providesyou with product introduction, usage instruction, performance, safety precautions, and other relevant information for your convenience.

Before using, be sure to read this manual carefully and operate and maintain the tester in accordance with this manual, which will help you to use the product better and extend the life of the tester.

We work in a scientific and rigorous manner while writing this manual and believe that the information provided here is correct and reliable. However, if you find any mistake in the manual, please be sure to inform us and we will correct it as soon as possible.

Our company reserves the right to improve the function of the tester. If inconsistency with the manual exists in course of operation, please take the actual function of the tester as standard. We hope that this tester will make your work easier and enjoyable, so that you can enjoy the relaxed pleasure in automatic operation.

You are welcome to recommend the tester to your friends if you are satisfied with our product.Please contact us if you have any comments or suggestions, the company will make every effort to give you a satisfactory answer. Thank you again for your support!

Contents

I. Overview

HZBB-10B-Iintelligent tester of Transformer Ratio and Connection Groups adopts popular ARM processor, 168M frequency, 128M memory available to be extended to 4G memory card. The LCD screen adopts7-inch high-definition color touch screen, combined with emwin display, making the tester interface simple and user-friendly in full touch screen andnon-keyboard operation. The tester supports database and can be exported from the USB drive or through the data cable to the background computer.

Elaborate and compact design, unique thinking, makes the tester superior and powerful with small size and light weight. The tester uses a programmable signal source, can output single-phase, two-phase or three-phase standard Sine signal or high-frequency Sinesignal, with adjustable output phase frequency. It is especially suitable for special transformers such as Z-type transformers, rectifier transformers, Scott or anti-Scott transformers, etc. The tester adopts the new algorithm developed by our company to measure the ratio of three-phase transformer and ensure the measurement accuracy without adjusting the balance of the three-phase power supply. Therefore, the transformer ratio and wiring method can be measured in about 3 seconds.

Wiring and notice: When using the tester, please follow the instructions.

1. The ground terminal or the ground wire in the power cable should be grounded reliably.

2. Please note that the four-color test wiresat the high-voltage side in yellow, green, red and black correspond respectively to the transformer A, B, C, N terminals. The three-color test wires at the low-voltage side in yellow, green and red correspond respectively to the transformer a, b, c, n terminals. Be sure to make correct connections.

3. When testing the Scott transformer, the high voltage side is the same as the above, low-voltage side a, β, n correspond to a, b, c terminal.

For single-phase transformer, high-voltage side A, X correspond to A, C terminals, low-voltage side a, x corresponds to a, c terminals.

4. For general Y / y, Y / d, D / d, D / y, ZN / y, ZN / d normal connection group measurements, connection to the neutral point N terminal is not needed. For single-phase transformer measurements, please use the yellow, green test clips at high-voltage side and the yellow, green test clips at low-voltage side.

5. Please enter correct setting parameters beforetest. The group label and the measured transformer must be consistent.If not sure, choose unknown to be measured by the tester automatically.

6. If you the rated ratio is not put in, results only show the measured ratio value, and do not show the error.

7. To make self-test, please use the built-in output and externally connect standard instrument. Make comparisonsbetweenthe first and second voltage measurements to checkits accuracy.(The accuracy cannot be confirmed in measuring range as the nonlinearity of the Potential Transformer.)

II. Main Functions and Characters

1. The tester makes automatic measurement with no need to set any parameters and automatically completes the three-phase ratio and connection group measurements with easy operation. All you need to do is to press a button.
2. The tester measures three-phase and single-phase transformer ratios automatically, and calculates the ratio error.
3. The tester has built-in three-phase signal source, which can make measurement of Y / y, Y / d, D / y, D / d, ZN / y, ZN / d, rectifier transformer, traction transformer and all kinds of ratios of transformerconnection groups.
4. The tester can measure transformer connection group label and polarity to clearly display the first and second winding connection vector.intuitive and clear, the instrument comes with self calibration function, according to self calibration results to determine the test line or instrument failure

5. The tester can track the transformer on-load tap-changer position automatically, and indicate the current tap point automatically.

6. The tester can display a transformer's first and secondary voltage Oscillograms and phase relationship. It can measure transformer's first and second harmonic voltages, to facilitate the analysis of transformer failure.

7. The tester is with CT, PT ratio, polarity testing function

8. The tester has perfect and reliable automatic protection, to ensure the intactness of the tester under abnormal conditions.

9. The tester has small size and light weight. It makes accurate measurement at fast speed (about 3 seconds to complete the test).

10. The tester is available to store and print all the test results. It has Built-in 128M memory (extendableto 4G memory card), available to export the database by USB, or upload to computer. The database supports excel spreadsheet opening.

11. The tester has7-inch true color touch screen operation, emwinGUI interface andsupport English input, which is easy and convenient. It also has no power-down calendar and clock function. The test time can be stored at any time.

12. The tester support on-site record print by Bluetooth or serial printer.

III. Main Technical Specifications

1. Ratio measurement range: 0.8-5000(0.8-20000 for Customization)

2. Ratio measurement accuracy:

0.2%（0.8-1000），0.5%（1000-5000）,0.1%（0.8-2000），0.2%（2000-20000）(customized)

3. Working power: AC220V

4. Operating temperature: -10 ℃ -40 ℃

5. Environmental humidity: 10% -85%

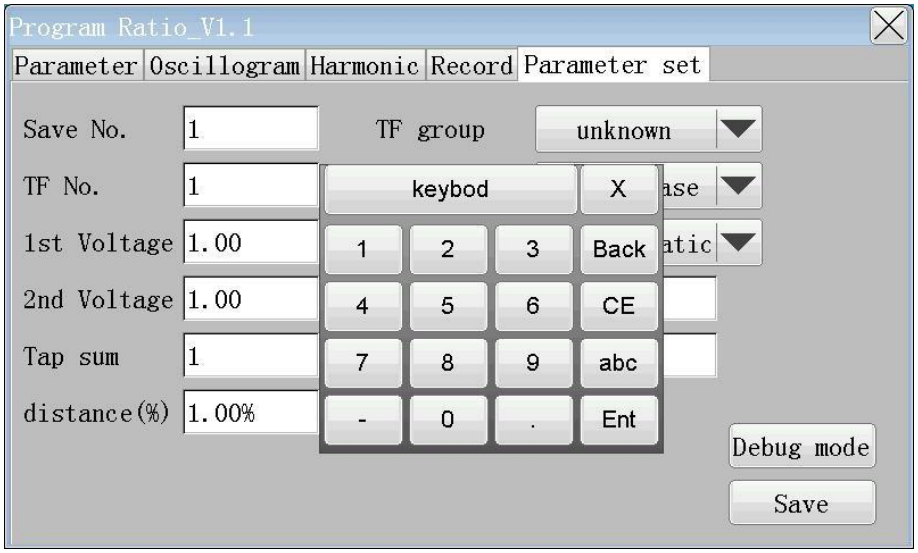
6. Volume: 270 × 190 × 70mm

7. Weight: 2kg (not including test wires)

IV. Key Set

The tester is a full touch screen operation, with 16 keys of the numeric keypad and digital phonetic alphabet (similar to the computer keyboard).

Figure:



Number key “0-9”: Used to enter data in parameter input status. “a-z” key is used to input user name or transformer type, etc.The "abc" key is used to switch from the numeric keyboard to the alphabet keyboard. The “123” is used to switch the alphanumeric keyboard to the numeric keypad. The “C/e” and “c/E” key is used to switch between the Chinese and English input method. The “X” is used to close the soft keyboard. The “keyboard” is used to move the keyboard freely on the screen. Pressand hold the button by hand, you can drag the keyboard to any position on the screen. The “Back” is the backspace key to clear the character before the cursor. The “CE” is to clear all the characters current entered. The “Ent” key is the Enter key.

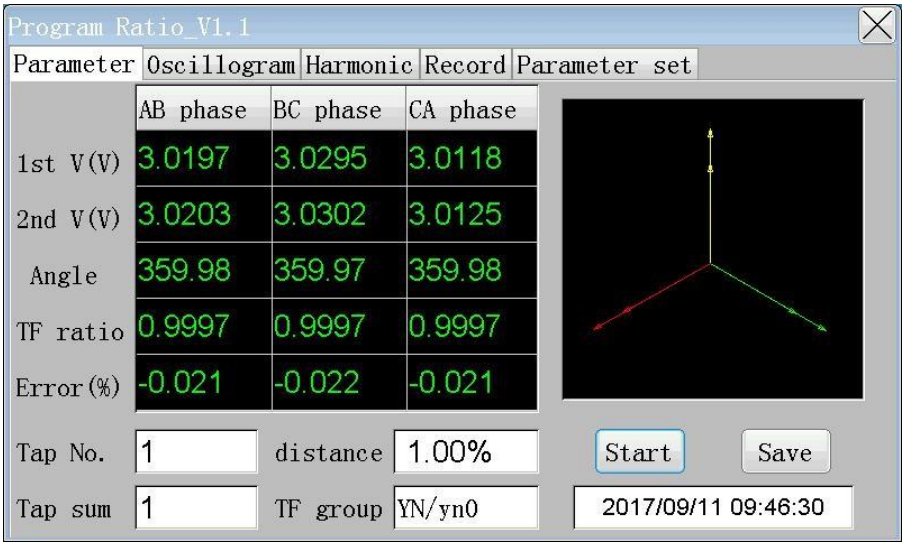
V. Operation Method

Connect the power wire, test wire and ground wire according to the instruction and notice 2,3,4,5 in this manual. Turn on the power and enter the main interface of the computer.

Figure:

Please click the "next" button on the screen to enter the test program interface. Then click the "start"button, turn ratio andwiring method will be tested automatically.

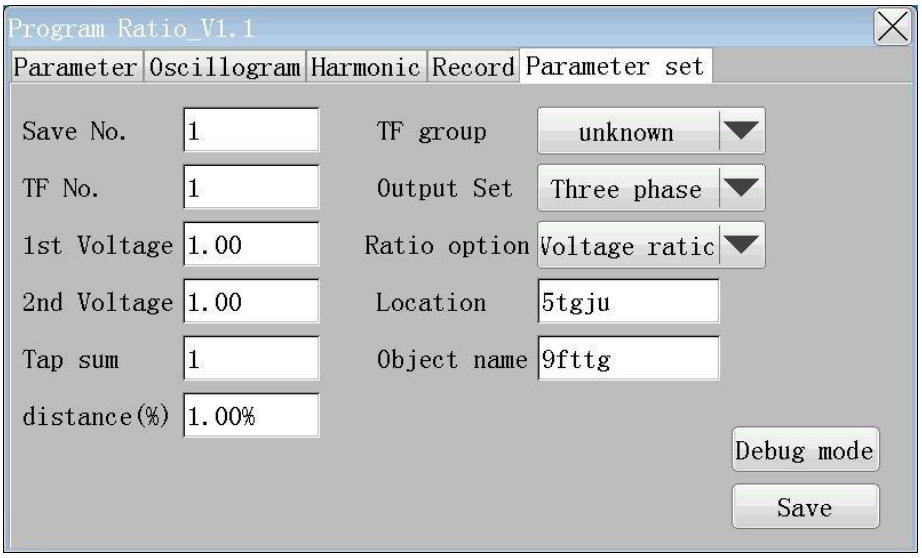
Figure:



5.1 Parameter Setting

Set parameters before the test. Click the “parameter settings” button to enter the parameter settings interface.

Figure:



Click the input box which needs to be set.

Storage No.: To set the record number of the test is to be stored.

Transformer No.: store information of the transformer undertest.

1st Voltage: Transformer rated voltage of high voltage side

2nd Voltage: Transformer rated voltage of low voltage side

Total tap number: The total number of tap points for multi-tap transformer. If it's not a multi-tap transformer, total tap number should be set as 1 (initial value 1).

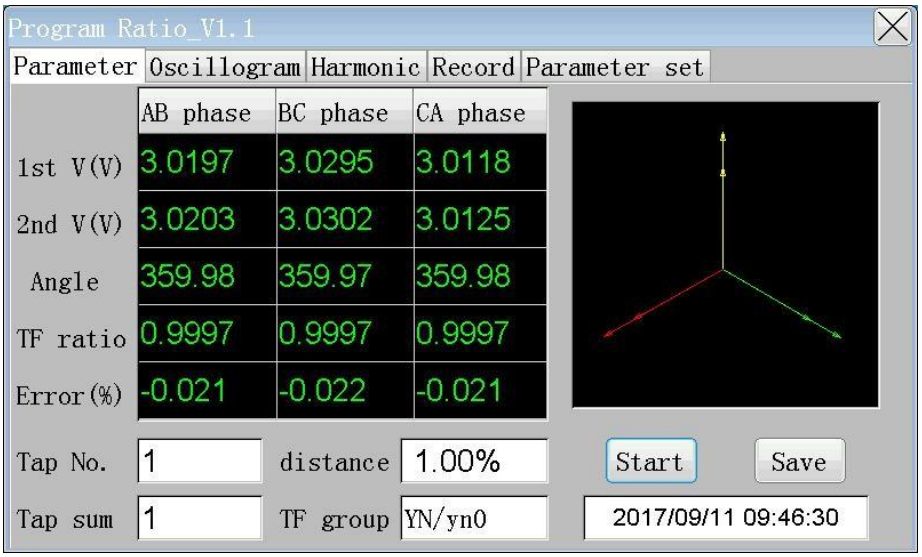
Tap distance:the adjustment percentage of each tap ratio, e.g. 1.25%, then 1.25 should be entered.

Connection group: Select the transformer wiring methods such as: Y / y \ D / y, ZN / y, etc. If you are not sure about the wiring method, please select unknown, then the tester will detect automatically. Click the “Save” button after setting completed to save the information to the database.

5.2 Parameter measurement

Click the “parameter measurement” button to carry out the turn ratio test.

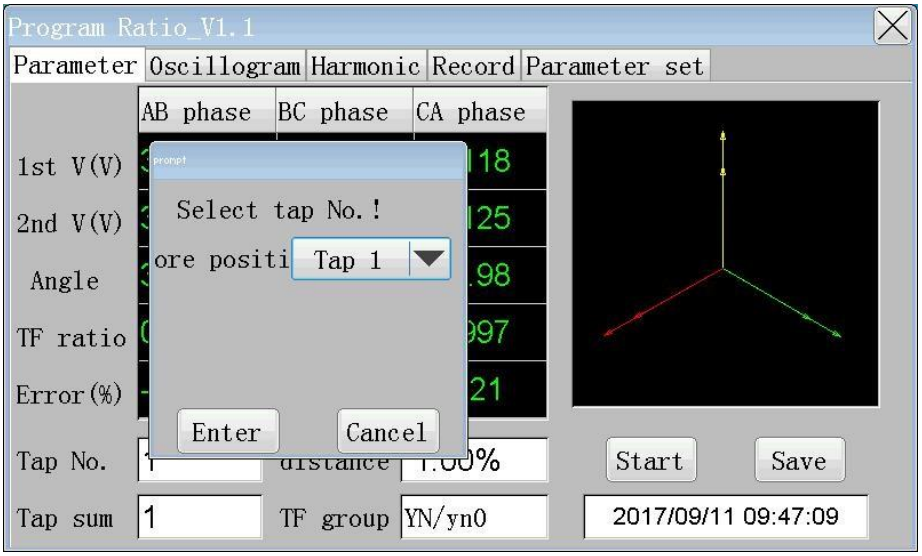
Figure:



Click the “start” button to start the test, andit takes about 3 seconds to complete the test and then display the testing results. “First” and “Second” is the first and second voltage of the tested transformer. “Angle” is the difference between the first and the second voltage angle(clock time).“Ratio” is the measured turn ratio. “Error” is the error with the standard ratio. “Tap position” is the present tap measured by the instrument. “Wiring method”is also actual measured wiring method.

When click “save”, the system will promptwhich tap records it is to be stored. Select the correct tap to store the current test results into the database.

Figure:

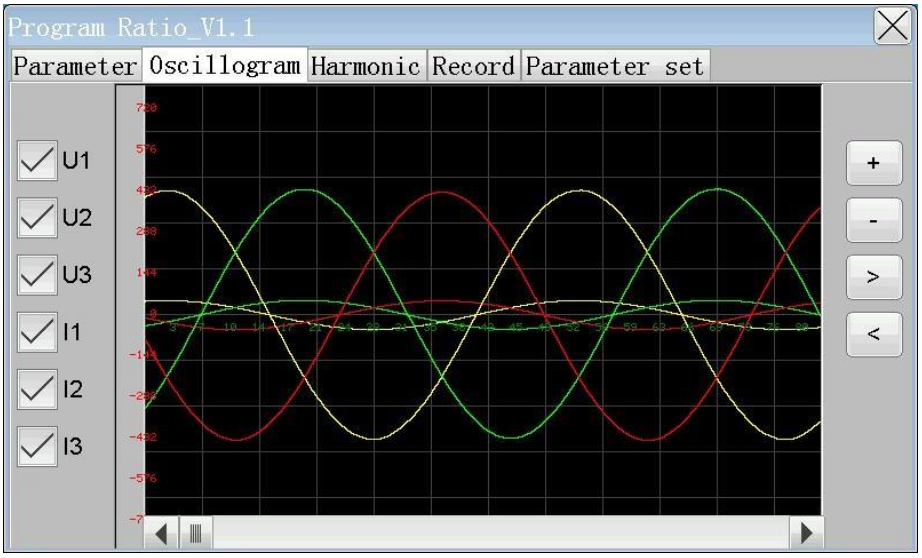


The Scott and Anti-Scott transformers are two phase ratios, shown in BC and CA phase.

5.3 Oscillogram

After the test is started and before the test is complete, click the “Oscillogram” button to display the voltage waveforms of the first and second voltage applied to transformer.

Figure：

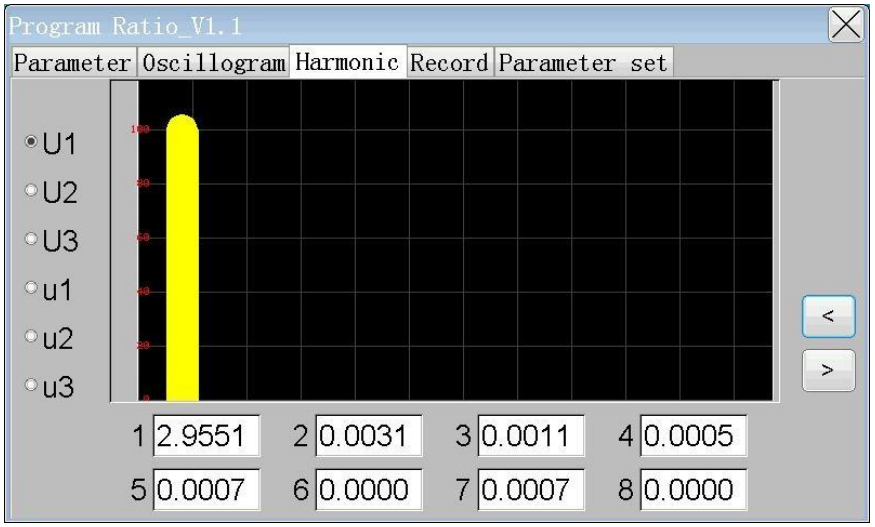


Click corresponding button ofU1, U2, U3, I1, I2and I3 to display or close waveform. Click the button "+" or "-” to enlarge or shrink the wave shape and the "<" or the ">" to stretch the waveform.Also move the bar at the bottom for moving the display.

5.4 Harmonic analysis

After the test is started and before the test is complete, click the “Harmonic Analysis” button to analyze the harmonic content of the first and second phase voltage.

Figure:

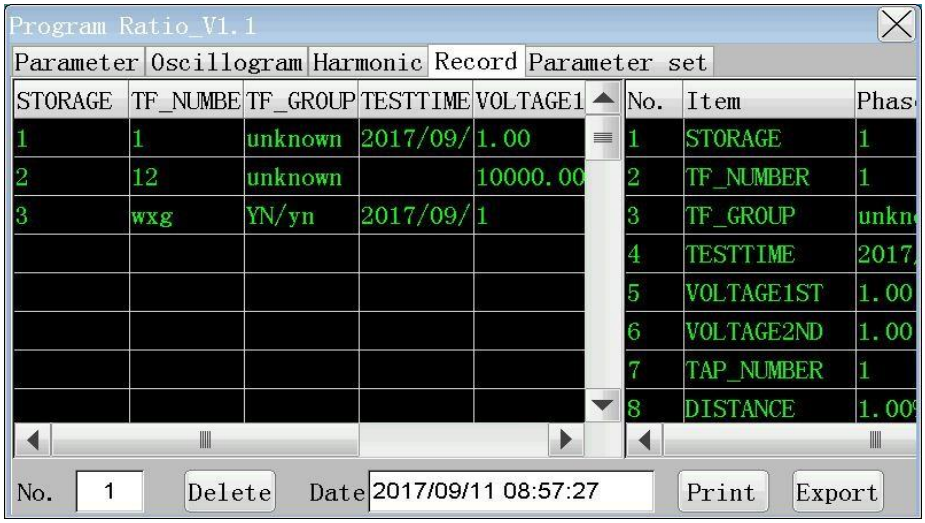


As shown in the image above, select the “U1” to display the harmonic of the U1, and the "<" or ">" to display the harmonic content and the percentage from 1-32.

5.5 Record

After the test is completed, the testing results can be exported to the USB or uploaded to computer.

Figure:



The left side shows the number of records on the database, and the right side displays details of one record. Click the main scroll bar to scroll up and down or left and right to display all the information. Select a record and click the print button to print the test results through serial port or Bluetooth. Insert USB drive and click “export”, the entire database can be exported to USB flash drive (insert the USB and wait two or three seconds, so that the instrument could detect the USB flash drive). USB database adopts Dbase3 format, soit could be open, edit and print through excel spreadsheet. There is no need to install background management software, which makes it more convenient for user management.

VI. After-sales service

The company provides free maintenance for quality problem within one year after purchase and life-long warranty plus technical services. If any abnormal condition or fault about the tester is detected, please contact the company intime so that we can arrange the most convenient scheme for you, and to provide you with the fastest on-site service.

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