

Dear Client,

Thank you for Purchasing our SBF Series Triple Frequency Induced Withstand Voltage Test Set. Please read the manual in detail prior to first use, which will help you operate the equipment skillfully.



Our aim is to continually improve and perfect the company's products, so there may be slight differences between your purchase equipment and its instruction manual. You can find the changes in the appendix. Sorry for the inconvenience. If you have further questions, welcome to contact with our service department.



The input/output terminals and the test column may bring voltage, when you plug in/pull out test line or power outlet, they will cause electric spark. PLEASE CAUTION RISK OF ELECTRIC SHOCK! To avoid risk of electric shock, be sure to follow the operating instructions!

◆ **SERIOUS COMMITMENT**

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

◆ **SAFETY REQUIREMENTS**

Please read the following safety precautions carefully to avoid personal injury and to prevent the product or any other attached products being damaged. In order to avoid possible danger, this product can only be used within the scope of the provision.

Only qualified technician can carry out maintenance or repair work.

--To avoid fire hazard or personal injury:

Use Proper Power Cord

Only use the power wire supplied by the product or meet the specifications of this product.

Connect and Disconnect Correctly

When the test wire is connected to the charged terminal, please do not connect or disconnect the test wire at will.

Grounding

The product is grounded through the power cord; besides, the ground pole of the shell must be grounded. To prevent electric

shock, the grounding conductor must be connected to earth ground. Before making connections to the input or output terminals of the product, please do check that the product is properly grounded.

Pay Attention to the Ratings of All Terminals

To prevent the fire hazard or electric shock, please be care of all ratings and labels/marks of this product. Before connecting, please read the instruction manual to acquire information about the ratings.

Do Not Operate without Covers

Do not operate this product when covers or panels removed.

Use Proper Fuse

Only use the fuse with type and rating specified for the product.

Avoid Touching Bare Wire and Charged Conductor

Do not touch the bare connection points and parts of energized equipment.

Do Not Operate with Suspicious Faults

If you encounter operating faults/suspect there is damage to this product, do not continue. Please contact with our maintenance staff.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmospheres.

Ensure Product Surfaces Clean and Dry.

— **Security Terms**

Warning: indicates that death or severe personal injury may result if proper precautions are not taken

Caution: indicates that property damage may result if proper precautions are not taken.

Contents

I. Fundamental	6
II. Product structure	6
III. Application	7
IV. Technique parameters	7
V. Instructions	8
VI. Test precautions	10
VII. Service conditions	12
VIII. Complete set of products	13

I. Fundamental

According to the national standard <GB311-64> and the <preventive test procedure for electrical equipment> issued by the former Ministry of water and electricity, it is designed to meet the requirements of the power system for high-voltage voltage transformer and frequency doubling induction withstand voltage test equipment. It is widely used in the AC withstand voltage test of 35 ~ 220kV potential transformer in the power system to assess the main longitudinal insulation strength of the transformer. At the same time, it can also conduct induction withstand voltage test on the windings of motor and transformer, It can also be used as 150Hz power supply for short-time operation.

The third harmonic power generation device uses the saturation characteristics of the magnetic circuit to take out the third harmonic voltage with the largest component in the harmonic as the power supply of the generator, and conduct frequency and voltage doubling tests between turns, segments and layers for induction coil electrical products; Check the insulation level and withstand voltage of the coil.

II. Product structure

It is composed of three-phase five column transformer (or three single-phase transformers), single-phase voltage regulator, reactor and control part. According to the user's requirements, the shape can be integrate or split type.

III. Application

1. It is widely used for frequency doubling induction withstand voltage test of voltage transformer;
2. Conduct phase splitting frequency doubling induction withstand voltage test for power transformer;
3. Conduct frequency doubling induction voltage withstand test for other induction coil electrical products.

IV. Technique parameters

Input voltage: three-phase 380V 50Hz

Output voltage: single phase 300V, 500V, 800V, 1000V, single phase 150Hz (if higher voltage is required, external step-up transformer is required)

Output capacity: 20% of product capacity

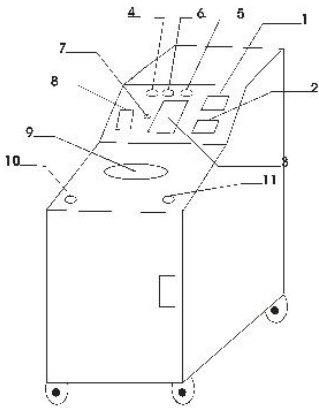
Harmonic distortion: $< 5\% - 8\%$

No load operation time: ≤ 5 minutes

Duration of test object under rated voltage: 40 seconds

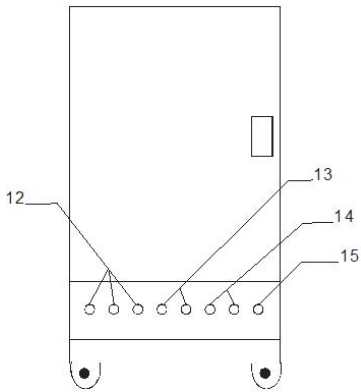
V. Instructions

1. Front side



- 1 Output voltage
- 2 Output current
- 3 Overcurrent protection relay
- 4 Power supply (Green)
- 5 Power transmission (Red)
- 6 Alarm
- 7 Timer
- 8 Timming set
- 9 Voltage regulator
- 10 Start (Green)
- 11 Stop (Red)

2. Back side



- 12 380V Input (A,B,C)
- 13 Test object
- 14 Compensation reactor
- 15 Grounding

3. Operation procedure

1. No load test

Connect the three-phase 380V power supply directly to the "A, B and C" input terminals on the back of the device. Press the "Start" button, turn the Voltage regulator counterclockwise to zero, and the power indicator (green light) is on; Press the green button, the contactor is closed, and the working indicator light (red light) is on;

Rotate the handle of the voltage regulator clockwise evenly, and pay close attention to the output voltmeter. When it rises to the required voltage value, turn on the timing switch (the time relay is set to 40 seconds according to the test requirements) and start timing.

When the test time reaches 40 seconds, the timer will give an alarm. At this time, immediately rotate the voltage regulator handle counterclockwise to zero; Press the red stop button, the contactor is powered off, the working indicator light is off, the green signal light is on, turn off the main power switch (Stop button)on the right, and the no-load test is completed.

2. Load test

Connect the three-phase 380V power supply directly to the input terminals (A, B, C) on the backside of the device, and connect both ends of the tested object with the output terminals (a, x) respectively; And connect the grounding wire;

Turn on the power supply, return the voltage regulator handle to the zero position, and the power indicator light (green light) is on; Press the green button, the contactor is closed, and the working indicator light (red light) is on;

Rotate the handle of the voltage regulator clockwise evenly, and pay close attention to the output voltmeter and output ammeter. When it rises to the required voltage value, turn on the timing switch (the time relay is set to 40 seconds according to the test requirements) and start the withstand voltage timing.

When 40 seconds are reached, the alarm light will lighting, and the voltage regulator handle will be rotated in reverse to zero position at the same time; Press the red stop button, the contactor is powered off, the working indicator light is off, the green signal light is on, cut off the main switch on the right, and the load test is completed.

VI. Test precautions

1. The device is equipped with overcurrent protection, which is set according to 80% of the rated output current when leaving the factory. When it is used for small load, it should be reset according to the actual situation of the load; When overcurrent or breakdown occurs in the process of boosting, the overcurrent protection action can protect the tested object from expanding the accident of the tested object. At this time, the input three-phase power supply should also be cut off immediately to avoid damage to the device.

2. During the test, if the capacitance of the tested object is small, the compensation reactor generally does not need to be connected. If the capacitance current of the tested object is too large, both ends of the compensation reactor shall be connected in parallel with both ends of the tested object (or another winding) for current compensation, so as to improve the power factor of the whole test circuit and reduce the output current.

3. The triple frequency generator works under supersaturation, so the time for connecting to the three-phase line should be as short as possible, generally no more than five minutes. When testing the test object, the test time shall not exceed 40 seconds when the test frequency is 150Hz;

4. The distribution reactance of the triple frequency generator is only allowed to be used when testing the voltage transformer. When the voltage of the tested object exceeds a certain range, another distribution reactance shall be selected (which can be explained when ordering).

Note appended:

1. If the device is used for induction test of power transformer (35kV / 400V, 10kV / 400V), step-up transformer must be added.

2. For different voltage levels, the pressurization values of Pt (voltage transformer) are as follows:

Example: 110kV voltage transformer

$$\frac{200KV}{110/\sqrt{3}} \times 100/\sqrt{3} = 181.7V$$

35kV Potential transformer

$$\frac{85KV}{35/\sqrt{3}} \times 100/\sqrt{3} = 243V$$

10KV Potential transformer (jdz-10)

$$\frac{42KV}{10/\sqrt{3}} \times 100/\sqrt{3} = 420V$$

3. This manual is a brief description of the universal Triple frequency tripler, which can be designed and manufactured according to the user's requirements when necessary. The manual shall be subject to the manual accompanying the equipment!

4. This product complies with the China's power industry standard < DL / T848. 4-2004 general technical conditions for high voltage test device: triple frequency test transformer device >.

VII. Service conditions

1. Altitude: $\leq 1000\text{m}$;
2. Ambient temperature: $- 10\text{ }^{\circ}\text{C} - + 40\text{ }^{\circ}\text{C}$;
3. Relative humidity: $< 95\%$;
4. Place of use: no steam, corrosive gas and flammable and explosive medium.

VIII. Complete set of products

1. Triple frequency power generator	1PC
2. Supporting connecting wire	1PC
3. Delivery test report	1PC
4. Product manual	1PC
5. Product certificate / warranty card	1PC