# BYQ5kVA Hipot Tester

# User Manual

Wuhan Lvnengde Precision Testing Technology Co., Ltd

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# I.Overview

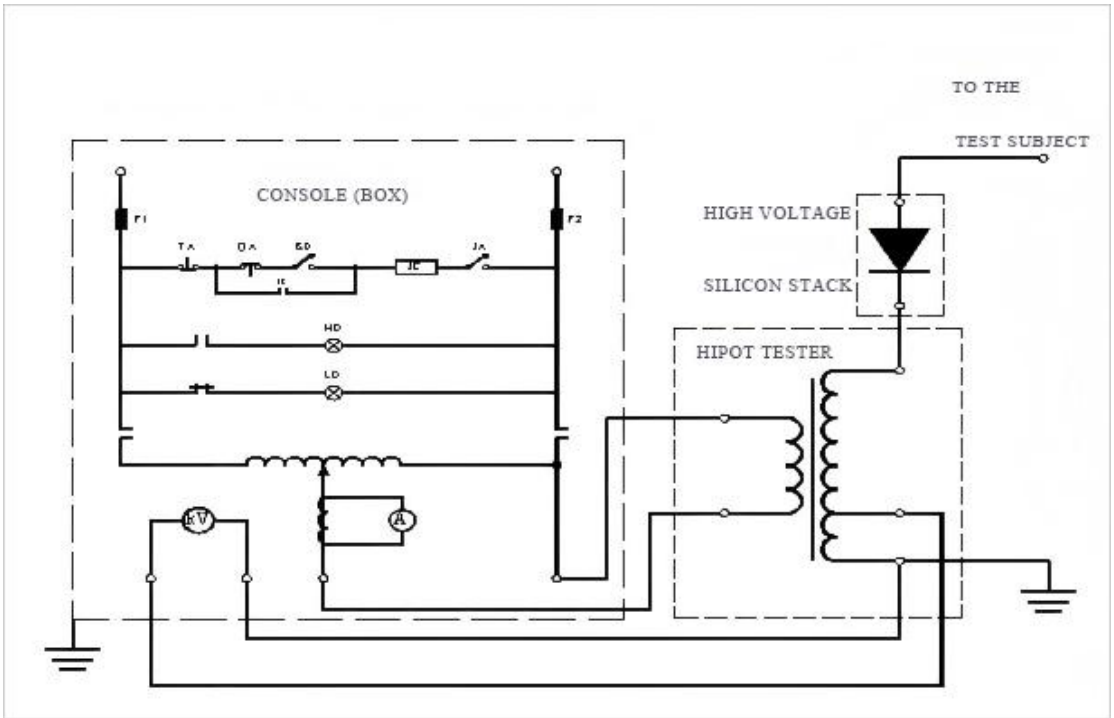
Test transformers, also known as boosters, are essential equipment for testing the electrical strength of power generation and supply equipment, various electrical products, and insulation tool materials.
Our company's dry-type test transformer series has completely changed the outdated situation of old-fashioned test transformers being bulky, large, and heavy. It can also provide DC high-voltage test power after installing high-voltage silicon stacks, equipped with control boxes (platforms), automatic protection microamperes, ball gaps, and other ancillary equipment. It is particularly suitable for on-site testing, making heavy work convenient, fast, easy, and flexible, and greatly improving efficiency. Therefore, it is highly welcomed by high-voltage testing personnel in power systems and large factories and mines.

# II.Structure

This series of products, due to their innovative design concepts, material selection, and manufacturing processes, aim to minimize volume and weight without compromising performance.
This series of products utilizes advanced production equipment, adopts coil winding epoxy vacuum casting, and high-quality cold-rolled silicon steel wound CD type iron core, effectively weakening leakage magnetic field. DC withstand voltage test does not require external silicon stack, only the DC high-voltage silicon stack is rotated on the high-voltage end to obtain DC.

## III. Working principle

The input voltage of this series of products is 200V or 400V, which is connected to the matching control box (platform). The input voltage is adjusted by an autotransformer to the primary winding (low voltage) of the test transformer. Using the principle of electromagnetic induction, the secondary winding (high voltage) can obtain an output high voltage of the same multiple according to its ratio to the number of turns of the primary winding. It can be continuously adjusted from zero volts to the rated maximum value. When conducting DC withstand voltage and leakage current tests, simply rotate the high-voltage silicon stack onto the high-voltage output terminal to obtain DC high voltage, which is 1.414 times the amplitude of the power frequency high voltage value.




## IV. Performance indicators

1. Impedance voltage: ≤ 12 %
2. Output voltage waveform: sine wave
3. Surface temperature rise: ＜ 55 ℃
4. No load current: ＜ 4 %
5. Allow continuous running time: 1 hour

# V. Main parameters

| Specification and model | Capacity | Input voltage | Output voltage | Output current | Output DC high voltage | Weight |
|---|---|---|---|---|---|---|
| | ( kVA ) | ( V ) | ( kV ) | ( mA ) | ( kV ) | ( kg ) |
| 1.5/50 | 1.5 | 200 or 400 | 50 | 30 | 70 | 15 |
| 3/50 | 3 | | | 60 | | 20 |
| 5/50 | 5 | | | 100 | | 30 |
| 10/50 | 10 | | | 200 | | 40 |
| 15/50 | 15 | | | 300 | | 50 |
| 20/50 | 20 | | | 400 | | 55 |
| 25/50 | 25 | | | 500 | | 60 |
| 30/50 | 30 | | | 600 | | 65 |
| 5/100 | 5 | 200 or 400 | 100 | 50 | 140 | 60 |
| 10/100 | 10 | | | 100 | | 65 |
| 15/100 | 15 | | | 150 | | 70 |
| 20/100 | 20 | | | 200 | | 75 |
| 25/100 | 25 | | | 250 | | 80 |
| 15/120 | 15 | | 120 | 125 | | 85 |
| 20/120 | 20 | | | 160 | | 90 |
| 25/120 | 25 | | | 200 | | 95 |
| 30/120 | 30 | | | 250 | | 100 |

# VI. Method of use

## 1. Single use

1.1 Before the test, the high-voltage tail "⊥" end of the test transformer should be reliably grounded,otherwise, it will endanger the safety of personnel and equipment.

1.2 Before operation, it is necessary to be familiar with the electrical principles and usage methods of the test transformer and power control box.

1.3 Connect the wires according to the wiring diagram.

1.4 Preparation work and safety measures are ready, and the equipment is tested once in the air.

1.5 Connect the test sample.

1.6 Turn on the power, and the power indicator light on the control box (console) will turn on.

1.7 Press the closing button, and the closing indicator light will turn on.

1.8 Apply pressure evenly clockwise and observe the voltage amplitude and the condition of the test sample at the stage reached by the voltmeter until the rated test voltage is reached.

1.9 Continuously regulate the withstand voltage time and monitor the ammeter and the test sample.

1.10 When the withstand voltage time is up, pay attention to the kV meter and quickly reset the voltage regulator to zero

1.11 Use a discharge rod to discharge through a resistor, and then discharge directly to the ground.

1.12 The high-voltage part may be discharged one by one by the charging parts, and the high-voltage line leads may be changed or removed, at which point the (phase) test is terminated.

## 2.1 Overview

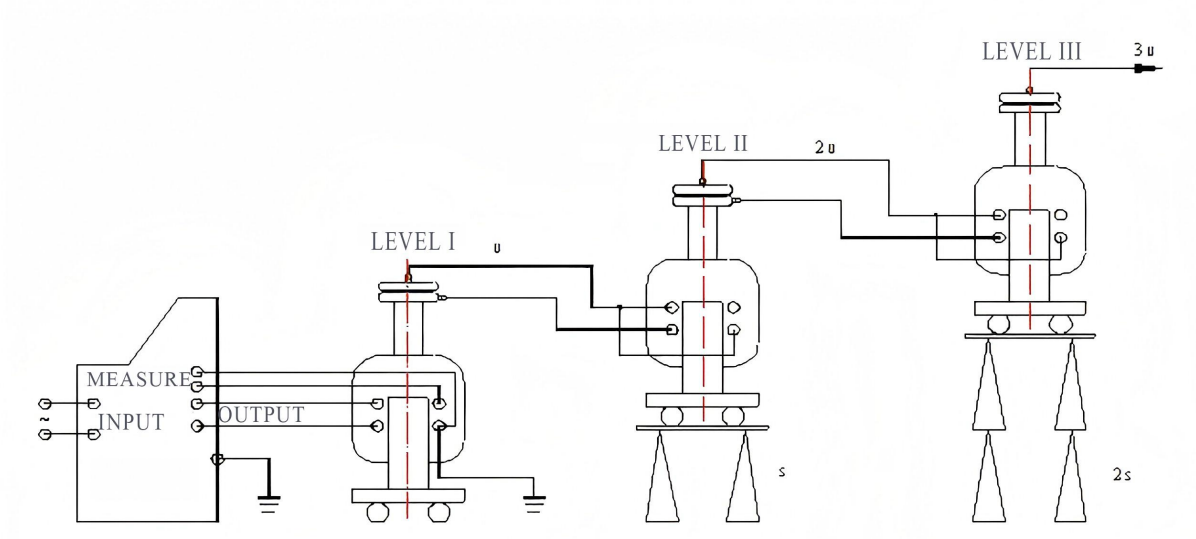
Our company designs and produces a series of test devices using multiple dry-type test transformers in series excitation combination. Due to the ease of use of dispersed combinations, they can meet various on-site needs. A single component is lightweight and easy to transport and move, allowing departments with higher voltage levels to smoothly obtain higher test power sources on site.

## 2.2 Working principle

The series high voltage test device, except for the first stage test transformer with the highest voltage, has a series wound excitation winding in the high voltage winding, which has the same parameters as the primary winding of the subsequent test transformer.

The primary winding power supply of the Level I test transformer is supplied by the control box (platform). The tail end of the Level I high-voltage winding is grounded to the shell, and the head end is connected to the high-voltage tail end and shell of the Level II test transformer. The excitation power supply for the low-voltage winding of the Level II is supplied by the Level I series excitation tap. At this time, the high voltage of the Level II test transformer is the superposition of the output voltages of the Level I and Level II. Similarly, the Level III can be stacked.

## 2.3 Assembly wiring



## 2.4 Cascade combination method

2.4.1 When two test transformers are connected in series, the ratio of the capacity of the first and second test transformers is 2:1, the total capacity is the capacity of the first transformer, the total voltage is the sum of the highest output voltages of the two individual transformers, and the current is the ratio of the capacity to the total voltage. Example: 5kVA/50kV and 3kVA/50kV. When two units are used in series, the total capacity is 5 kVA, the total output voltage is 100 kV, and the output current is 50mA.

2.4.2 When three test transformers are connected in series, the ratio of their capacities is 3:2:1, and the total capacity is also the capacity of the I-th transformer. The total voltage is the sum of the output voltages of the three transformers.

Note: Regardless of the two-stage or three-stage series, the output current must not exceed the rated current of the last stage.

Explain:
Our company can provide external rectification devices. DC high voltage test power supply can be easily obtained on site.
The high-voltage tail of the test transformer and the tail of the measuring coil are connected internally. When in use, the Level I high-voltage tail together with the shell must be well grounded, and the Level II and Level III together with the shell must have a fixed potential. Therefore, the potential of the Level II and Level III shells is U and 2U, and they must be placed on insulated brackets and kept at a sufficient safe distance from people.
During the series high voltage test, special attention should be paid to checking the correctness of the wiring of Level II and Level III. Reversing the wiring can cause the output voltage to be zero. A voltage divider can be used to directly monitor the high voltage output. It is also necessary to check whether the electrical strength of the insulation bracket meets the voltage requirements.

# VII. Safety precautions

The arrangement of experimental equipment should have sufficient safety distance from personnel and the surrounding area. Try to avoid placing equipment and high-voltage test leads in the personnel aisle as much as possible.
Fences should be installed at the test site, and "**Stop! High Voltage Danger**" signs should be hung.
The high-voltage lead of the test should have supporting or traction insulation materials. Personnel should be assigned to guard every section and the other end of the cable to prevent anyone from approaching or passing underneath.
It is best to keep the microampere meter at high potential for DC high voltage testing. In addition to a shielding box, there should also be an overcurrent automatic protection device to prevent the meter from burning out in case of sudden breakdown, short circuit or discharge.
Power frequency withstand voltage test, please pay attention to checking whether the equipment capacity is sufficient and whether resonance can be avoided.
The working ground wire (high voltage tail, stabilizing capacitor terminal ground wire) and the protective ground wire (control box casing) should be reliably grounded separately,
If there is irregular oscillation of the power supply during the experiment, it must affect the stability of the high-voltage output. At this time, it is necessary to temporarily suspend the impact power supply for welding or other reasons.
The requirements for climate (temperature, humidity) in the experimental work comply with the requirements of the test regulations, and shielding measures must be taken when necessary.
If the pointer of the voltmeter swings greatly, the ammeter reading increases sharply, or there is abnormal noise such as smoking, jumping, or burning smell from the test sample during the experiment, the test should be stopped immediately, the power should be cut off, and the cause should be checked.
The high-voltage testing work must strictly comply with the relevant provisions of the safety work regulations issued by the Ministry of Electric Power.

# VIII. Packing List

| | |
|---|---|
| 1. Test Transformer | 1 set |
| 2. Product manual | 1 set |
| 3. Test report | 1 set |
| 4. Product Qualification Certificate | 1 set |