

HTXZ-2500kVA/600kV AC Resonant Test System for GIS Testing(30min)



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I . Scope of test article

HTXZ-2500kVA/600kV AC Resonant Test System for GIS Testing is used for conducting AC withstand voltage test for large GIS, test frequency is 20-300Hz, test voltage is no more than 600kV, and test time is 30min.

Attention: Pls conduct the test in strict conformity with the above situation including the test object, test frequency, test voltage and test time, if any test requirement need to change for on site test, pls firstly consult us before conduct the test !

II . Main components

No.	Name of components	Specification	Unit	Quantity
1	AC Power Source	HTXZ-150kW	Pcs	1
2	Excitation Transformer	HTJL-150kVA/18/36kV/0.4kV	Pcs	1
3	High Voltage Reactor	HTDK-832kVA/200kV	Pcs	3
4	Capacity Divider	HTFY-1000pF/600kV	Set	1
5	Current Limit Impedance	600kV/4.16 A	Set	1

III. Main function

HTXZ series Series Resonant Test System adopts the way of adjusting the electric power frequency, which makes the reactor and the tested capacitor realize resonance, so as to obtain high voltage and high current on the tested object. Because of the small power required, the light weight and small volume of the equipment, it has been widely praised and applied at home and abroad, which is a popular method and trend of high voltage test.

The main functions and technical features of the frequency series resonant test device are as follows:

1.The device has protection functions such as overvoltage protection, overcurrent protection, zero start, system detuning (flashover), what's more,

overvoltage and overcurrent protection values can be set according to user needs, and flashover protection action when the sample flashes to protect the product.

2.The entire unit is lightweight and easy to use on site.

3.The device has three working modes, which is convenient for the user to flexibly select according to the site conditions and improve the test speed. The working modes are: fully automatic mode, manual mode, and automatic tuning manual boost mode.

4.It can store and print data off-site, and the stored data number is a number, which is convenient for users to identify and find.

5.When the device is automatically swept, the starting point of the frequency can be arbitrarily set within the specified range, and the large screen of the liquid crystal displays the scanning curve, which is convenient for the user to intuitively know whether to find the resonance point.

6.The DSP platform technology is adopted, which can conveniently increase or decrease functions and upgrades according to user needs, and also makes the human-machine exchange interface more humanized.

7.The required power capacity is greatly reduced. The series resonant power supply uses the resonant of the resonance reactor and the capacitance of the tested object to generate high voltage and current. In the whole system, the power supply only needs to provide the active power consumption part of the system, so the power required for the test is only $1 / Q$ of the test capacity.

8. The weight and volume of the equipment are greatly reduced. In the series resonance device, on need to use the bulky high-power voltage regulating device and common high-power power frequency test transformer . Moreover, the resonant excitation power supply only needs $1 / Q$ of the test capacity, which greatly reduces the weight and volume of the system, generally $1 / 10-1 / 30$ of the common test device

9. Effectively improve the output voltage waveform. The resonant power supply is a resonant filter circuit, which can improve the waveform distortion of the output voltage, obtain a good sinusoidal waveform, and effectively prevent the false breakdown of the test object by the harmonic peak value

10. Prevent large short circuit current from burning the fault point.under the condition of series resonance , when the insulation weakness of the test object is broken down, the circuit will immediately de resonance, and the circuit

current will rapidly drop to $1/Q$ of the normal test current. While the parallel resonance or the test transformer is used for the withstand voltage test, the breakdown current will immediately rise dozens of times. Compared with the two testing method, the short-circuit current and the breakdown current are hundreds of times different. Series resonance can effectively find the weak point of insulation, and there is no danger of large short-circuit current burning the fault point.

11. There will be no recovery overvoltage. In case of breakdown of the test object, due to the loss of resonance condition, the high voltage disappears immediately, the arc goes out immediately, and the recovery voltage process is very long, so it is easy to disconnect the power supply before reaching the flashover voltage again. The recovery process of this voltage is an intermittent oscillation process of energy accumulation, with a long process and no recovery overvoltage.

IV. Technical parameters

Rated Capacity	2500kVA
Rated Voltage	600kV
Rated current	4.16A
Accuracy of measurement	Effective value of the system is 1.5
Working frequency	20-300Hz
Device output waveform	Sine wave
The quality factor	Device $Q \geq 30$ ($f=45\text{Hz}$)
Waveform distortion rate	Output voltage waveform distortion rate $\leq 1\%$
The input power	Three phase 380V , frequency: 50Hz
Working time	Continuous 30min is allowed under rated load; Overvoltage 1.1 times 1 min
Temperature rise	Continuous 30min operation under rated load, Temperature rise $\leq 65\text{K}$

Protection function	Over voltage, Over current, Zero start, and system detuning protection function
Accuracy of measurement	Effective value of the system is 1.5
Environment temperature	— 20°C-55°C
Relative humidity	≤90%RH
The altitude	≤3000m

V. Verify device capacity

The capacity of System is 2500KVA, divided into three reactors, each one is 832kVA / 200kv / 4.16A / 130H, can meet your requirements of testing large GIS .

VI. Equipment combination model

MODEL TEST ITEMS	REACTOR (3 PCS 832kVA/200kV)	EXCITATION TRANSFORMER	TESTING VOLTAGE (KV)
Large GIS	3 PCS REACTORS IN SERIES CONNECTION	36KV	≤600KV

VII. System parameters

AC Power Source

HTXZ-150kW

1 pc

Rated output capacity	150kW
Working power supply	380±10%V (three-phase), power frequency
The output voltage	0-400V
Rated input current	375A
Rated output current	375A
Voltage resolution	0.01kV
Accuracy of voltage measurement	1.5%
Frequency range	20-300Hz
Frequency regulation resolution	≤0.1Hz
Frequency stability	0.1%
Rising Temperature	Continuous 60min at rated capacity, ≤65k
Running time	Continuous 60min at rated capacity
Noise level	≤50dB
Dimension	880×640×680mm
Gross Weight	125kg

Excitation Transformer**HTJL-150kVA/18/36kV/0.4kV****1pc**

Rated Capacity	150kVA
The input voltage	0-400V
The output voltage	18/36kV/0.4kV
structure	Oil type
Dimension	930×730×800mm
Gross Weight	585kg

High Voltage Reactor**HTDK-832kVA/200kV****3pc**

Rated Capacity	832kVA
Rated Voltage	200kV
Rated Voltage	4.16A
inductance	130H/single section
The quality factor	$Q \geq 30 (f=45\text{Hz})$
structure	Oil type
Dimension	Diameter 900mm, High 1300mm
Weight	1250kg

Capacity Divider**HTFY-1000pF/600kV****1 PC**

Rated voltage	600kV
High piezoelectric capacity	1000pF
Dielectric loss	$\text{tg}\sigma \leq 0.5\%$
Voltage division ratio	7000: 1
measurement accuracy	Valid value of 1.5
Dimension (Inner Height)	Single stage $\varnothing 200 \times 1750$, 2 stages in total
Weight	42kg

Current Limit Impedance**600kV/4.16A****1pc**

Single phase	
Rated frequency	50Hz
Rated voltage	600kV
Rated current	4.16A
Rising Temperature	Continuous 1.1 times of rated working times, $\leq 110\text{k}$
Dimension	$\varnothing 300 \times 1850\text{mm}$
Weight	$< 24\text{kg}$

VIII. Packing list

No.	Product name	Model	Unit	QTY
1	AC Power Source	HTXZ-150kW	pcs	1
2	Excitation Transformer	HTJL-150kVA/18/36kV/0.4kV	pcs	1
3	High Voltage Reactor	HTDK-832kVA/200kV	pcs	3
4	Capacity Divider	HTFY-1000pF/600kV	pcs	1
5	Current Limit Impedance	600kV/4.16A	pcs	1
6	Test wires		pcs	1
7	Inspection report		pcs	1
8	Instruction manual		pcs	1
9	Certificate		pcs	1
10	Packing list		pcs	1

IX. Testing Standard

DL/T 596-1996	Preventive test procedures for electric equipment
GB50150-2006	Power equipment test and hand over standard in electric power project
GB10229-88	Reactor
GB1094	Power Transformer
GB1094.1-GB1094.6-96	Casing protection of transformer and reactor
GB2900	Electrotechnical terminology
GB/T16927.1~2-1997	Technique of High Voltage Test
DL/T474.4-2006	Guide for field insulation test - AC withstand voltage test
DL/T1015	Guide for the use of voltage measurement systems for field DC /AC withstand voltage tests
GB/T311.1-1997	Insulation and coordination of high voltage transmission and transformation equipment
GB191-2000	Packaging, storage and transportation pictorial mark
JB/T9641-1999	Testing transformer
IEC358(1990)	Coupling capacitors and capacitive dividers
GB4793-1984	Electric measuring device safety requirement
GB/T3859.2-1993	Application guide of semiconductor converter
GB/T2423.8-1995	Power equipment basic environment test regulation