

# **XZB-360kVA/360kV**

**Adjustable Inductance Series Resonant  
Withstand Voltage Device for CVT**

# **SOLUTION**

**WUHAN HUATIAN ELECTRIC POWER  
AUTOMATION CO.,LTD**

**XZB-360kVA/360kV**  
**Adjustable Inductance Series Resonant Withstand Voltage**  
**Device for CVT**

**I. Scope of test article and requirement:**

**XZB-360kVA/360kV Adjustable Inductance Series Resonant Withstand Voltage Device can be used for :**

(1) 500kV Electromagnetic Transformer, CVT , capacitance:0.004-0.008uF, test frequency is 50hz, test voltage is no more than 360kv.

(2) 220kV Electromagnetic Transformer, CVT , capacitance:0.006-0.01uF, test frequency is 50hz, test voltage is no more than 160kv.

(3) 110kV Electromagnetic Transformer, CVT , capacitance:0.016-0.024uF, test frequency is 50hz, test voltage is no more than 80kv.

**II. Working Environment**

1.Ambient temperature: - 15 °C ~ + 55 °C

2 Relative humidity: ≤ 60% (25 °C)

3 Working Frequency: 50Hz±0.5Hz

4. Relative humidity: ≤ 60% RH;

5. Altitude: ≤ 1000m;

### **III. Main technical parameters and functions of the device**

1. Rated capacity: 360KVA;
2. Input power supply: 380V, frequency is 50 Hz;
3. Rated voltage: 360kV;
4. Rated current: 1A;
5. Working frequency: 50 Hz;
6. Waveform distortion rate: output voltage waveform distortion rate  $\leq 1\%$ ;
7. Working time: 5 min continuous under rated load; 1.1 times over voltage for 1 min;
8. Temperature rise: temperature rise  $\leq 65K$  after continuous operation for 5min under rated load;
9. Quality factor: the device itself  $Q \geq 10$  ( $F = 50$  Hz);
10. Measurement accuracy: System RMS 1.5 level;

### **IV. Testing Standard**

GB10229-88 《reactor》

GB1094 《power transformer》

GB50150-91 《standard for handover test of electrical equipment in electrical installation engineering》

DL/T 596-1996 《code for preventive test of power equipment》

GB1094.1-GB1094.6-96 《protection class of shell》

GB2900 《terminology for electrical engineering》

GB/T16927.1-2-1997 《High voltage test technology 》

JB3570-1991

## V. System parameters

### 1. Excitation Transformer

JLB-20kVA5/10/20kV/0.4kV

1 pc

Rated capacity	20kVA
Working power supply	380±10%V (three-phase)
The output voltage	5kV, 10kV, 20kV
Structure	Dry Type
Gross Weight	75kg

**2. AC Variable Frequency Control Console    XZB-20KVA/380V    1pc**

The output capacity	20kVA
Working power supply	380±10%V (three-phase), power frequency
The output voltage	0-400V
Rated input current	50A
Rated output current	50A
Working time	Continuous 5min at rated capacity
Temperature rise	Continuous 5min at rated capacity, ≤ 65k
Noise level	≤50dB
Weight	18kg

**3. Adjustable High Voltage Reactor    DK-45kVA/45kV    8pcs**

Rated Capacity	45kVA
Rated Voltage	45kV
Rated Voltage	1A
inductance	140-300H/single section
The quality factor	Q≥10(f=50Hz)

structure	Dry type
Weight	About 55kg

#### 4. Capacity Divider

**HTFY-500pF/400kV**

**1pcs**

Rated voltage	400kV
High piezoelectric capacity	500pF
Dielectric loss	$\text{tg}\sigma \leq 0.5\%$
Voltage division ratio	4000: 1
measurement accuracy	Valid value of 1.5
Dimension (Inner Height)	Single stage $\varnothing 140 \times 1210$ , 2 stages in total
Weight	70 kg

## VI.Packing list

### (一) Packing list

No.	Item Name	Model	Unit	QTY	Remark
1	Excitation Transformer	JLB-20kVA/5/10/20kV /0.4kV	pc	1	
2	AC Variable Frequency Control Console	XZB-20KVA/0.38kV	pc	1	
3	Adjustable High Voltage Reactor	DK-45kVA/45kV	pc	8	
4	Capacity Divider	FY-500pF/400kV	pc	1	2 stage

### (二) Accessory list

No.	Item name	Unit	QTY	Remark
1	Inspection report	pc	1	
2	Instruction manual	pc	1	
3	Certificate	pc	1	

## VII. Main Function & Features

7.1.1 the output voltage waveform is good, the circuit is in the power frequency resonance state, showing low reactance to the power frequency fundamental current and high reactance to other harmonic currents, so it has excellent filtering performance.

7.1.2 small power supply capacity is required. Q-factor is 20 times of the required capacity of the power supply.

7.1.3 when the sample breaks down and the circuit is detuned, the reactor will immediately limit the short-circuit current. The loop current is only  $1 / Q$  of the normal working current, which will not aggravate the damage to the tested object.

7.1.4 the device is a dry-type combined series resonant device, which is composed of a dry-type test transformer (excitation transformer) and a dry-type reactor.

7.1.5 the whole set of equipment of the device shall be of combined type and suitable for field use.

7.1.6 the voltage regulating control box has over-current protection function, and the over-current protection adopts dial setting.

7.1.7 the reactor used in the device shall adopt the mode of continuously adjustable air gap to conveniently adjust its inductance value in a wide range,

## **7.2 Series Resonant Boost Equipment Reactor and Excitation**

### **Transformer:**

7.2.1 the difference between inductance value of reactor and rated inductance value shall not exceed - 5% ~ + 3% of rated inductance value.

7.2.2 the insulation level of the reactor can withstand 1.2 times of the rated voltage, and the voltage will not flashover or breakdown under the voltage for 1min.

7.2.3 the winding temperature rise of reactor shall not be greater than 45k under corresponding load and time when resonance device works.

9.2.4 when the reactor is under rated voltage, two high-end short-circuit discharges to ground are conducted within 5min, and the whole device will not be damaged.

7.2.5 partial discharge test of reactor shall be conducted under the system of the device itself, and shall not be greater than 10pc under rated voltage.

7.2.6 the operation performance of the adjustable inductance reactor is stable, sensitive, free of jamming, and can be continuously adjustable. The air gap



position indication is corresponding to the inductance value, and the indication position should be correct and reliable.

7.2.7 the connection of reactor operating system is soft connection with certain regulation range.

7.2.8 the ratio of reactor no-load loss after withstand voltage to that before withstand voltage shall not be greater than 1.02 times.

7.2.9 the DC resistance, transformation ratio, insulation resistance and dielectric loss of excitation transformer shall meet the performance requirements of gb1094.1, gb1094.2 and gb1094.5.

7.2.10 the temperature rise performance of dry-type excitation transformer shall meet the requirements of rated capacity, and the winding temperature rise shall not be greater than 45k, and the insulation shall not crack.

7.2.11 the insulation level of excitation transformer shall withstand 1.2 times of rated output voltage at working frequency for 5min without flashover and breakdown.

### Equipment combination mode

TEST ITEMS	MODEL	REACTOR	Excitation Transformer Output Terminal	TEST VOLTAGE (kV)
110kV CVT		2 pcs reactors series connected	5kV	≤80kV
220kV CVT		5 pcs reactors series connected	10kV	≤160kV
330kV CVT		8 pcs reactors series connected	20kV	≤360kV

