Visible corona and radio interference performance test device

technical proposal

Jiangsu Jinxiu High Voltage Electrical

Appliance Co., LTD

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

According to the national standard of GB / T 1001.1-2021 nominal voltage above 1000V overhead line insulator part 1: ac system with porcelain or glass insulator components-definition, test method and judgment criteria, for high voltage electrical equipment such as insulator, transformer, casing, lightning arrester under high voltage, uhv ac / dc radio interference, make the system performance decline, and even damage. By detecting the radio interference indexes of all kinds of products at different voltage values, the quality of the products is evaluated.

The equipment for this test is composed of radio interference measurement receiver system, no local power frequency test transformer system, radio interference shielding laboratory and other parts. Each part of these equipment can be used independently for other tests or combined for insulator radio interference measurement tests. Below are the specific parameters and technical indicators of each component.

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

Visible corona and radio interference shielding laboratory

technical proposal

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First, the introduction

Design idea: The planned construction of the full shielded partial discharge laboratory is a steel frame structure. The frame is composed of galvanized rectangular pipe and shield plate welding; the shielding layer is sealed by six side flat frame steel plate with electric welding to meet the shielding attenuation requirements of magnetic field, electric field and plane wave.

Shield outdoor wall with rock wool board or flame retardant fiber board decoration. Interior wall spray paint decoration, the color can be specified by the user.

The whole shielding room is located on the concrete load-bearing foundation. The shielding room adopts polypropylene (PP) insulation layer separated from the concrete, so that it achieves the insulation from the earth. The shielding room uses three grounding rods at most, and the grounding resistance is ≤0.5 Ω.

2. Follow the standards

GB 12190	Method of measurement of the shielding efficiency of the high-performance shielding chamber
GB 50800	Technical specification for acoustic and semi-muffler chambers
GB 3096	Sound environment quality standards
GB 12523	Environmental noise emission standard at the construction site boundary
GB 12349	Standard measurement method of factory boundary noise in industrial enterprises
GB 50222	Code for interior decoration
GBJ 47	Specification for measuring the sound absorption coefficient in the mixing chamber
GB 12348	Noise emission standards of industrial enterprises
GJB 5792	Division and measurement methods of electromagnetic shielding body of military classified information system
GB /T 16	Fire protection code for building design
GB 50052	Design specification for power supply and distribution system
GB 50054	Specification for low voltage distribution
GBJ 52	Code for the design of industrial and civil power supply systems
GBJ 54	Specification for low-voltage power distribution devices and line design
GB 50055	Design specification for general electrical equipment
GBJ 32	Code for construction and acceptance of electrical device safety engineering
GBJ 232	Code for installation works and acceptance of electrical installations

DL -560	Electricity industry safety work regulations
DL /T 417	Guidelines for the field measurement of the local discharge of electric power equipment
GJB 20219	General technical requirements for military shielding room
SJ 31470	Code for the construction and acceptance of the electromagnetic shielding room engineering
GB 50174	Electronic computer room design code
GB 9361	Computer site security requirements
GBGR 2887	Technical requirements for computer site
BMB 3	Technical requirements and measurement methods for handling the electromagnetic shielding of classified information
GB 50116	Design code and special standard of automatic fire alarm system
GB 3096	Environmental noise standards in urban areas
GBJ 118	Code for sound insulation design of civil buildings
GB /T 18883	Indoor air quality standards
GB 50259	Code for construction and acceptance of electrical lighting devices

3. Full shielding bureau is part of the laboratory

3.1 The foundation and ground of the shielding room (the buyer is responsible for the completion);

3.2 Construction of the grounding system (the buyer is responsible for the completion);

3.3 Insulation layer of the hall (the supplier is responsible for the completion);

3.4. Shielding test hall (the supplier is responsible for the completion);

3.5 Shield the gate (the supplier is responsible for the completion);

3.6 Shielded small door (the supplier is responsible for the completion);

3.7 Control room (the supplier is responsible for the completion);

3.8 Other accessories (the supplier is responsible for the completion);

Iv. Comprehensive performance of the full shielding partial discharge laboratory and system equipment:

4.1 Technical requirements:

Insulation floor insulation resistance: the insulation resistance of grounding with the parent building should be> 10KΩ without grounding

It must be measured with an insulation shaking table above 1000V. If there is no parent building in the shielding room, the insulation resistance of the grounding between the shielding room and adjacent buildings should be> 10K Ω, which shall be measured with an insulation shaking table above 1000V.

partial discharge equipment grounding system ≤0.5 Ω

In the shielding room, the background noise is less than 2.0 pc;

Shielding efficiency: the magnetic field in the 14KHz-1.6 MHz frequency band-≧60-70dB;

4.2 Allocation requirements of the shielding room:

A) The inner net size of the shielding room in length, width and height is 6m x3mx 3.5m;

B)The net size of the width and height of the electric air shield is 2mx 3m;

C) The net size of the width and height of manual shielding is 0.95m x2.05m;

D) The net size of the width and height of the manual unshielded door is 0.95m x2.05m;

E) 3 sets of single-phase 3-eye sockets (10A-2 pcs,16A-1pc) are installed in the shielding room;

F) 2 LED lights are installed indoors;

G) A 3x2x3 (H) control room is configured in the shielding room;

H) 2 lights are installed in the control room;

I) The floor of the control room is an all-steel antistatic floor;

j) one emergency lamp;

4.3 The production indexes of the shielding room are as follows:

There are the following parts composition: (1) Ground foundation excavation part, including:, grounding device, load-bearing foundation ground (including reinforcement mesh

(2) insulation floor; (3) shielding room part; (4) control room part.

4.3.2 Dimensions and requirements of grounding:

In order to minimize the background interference of the local system, the laboratory is required to have its own separate grounding system, not mixing with other grounding devices in the workshop. Design to drive up to 3 galvanized steel pipes with a diameter not less than 70mm into the ground of no less than 30 meters, and the grounding resistance should be less than 0.5 Ω. Theoretically, fewer ground points is better,

If one grounding bar can reach less than 0.5 ohms, only one grounding bar can be used.

4.3.3 Dimensions and requirements of insulating floor:

Because the structure is not excavated, the insulating floor is tiled on the cement floor, the insulating floor adopts 6mm thick PP plate, welded into an integral plate with a size of 6.6mX 3.375m, and then the insulating floor and insulation pipe welding gun are fully welded to ensure no leakage of welding. Isolate the test area from the surrounding earth. Each joint is welded by insulation electrode.

After the completion of the insulation floor resistance of the shielding room: without grounding, the insulation resistance of the mother building shall be> 100M Ω, which shall be measured with an insulation shaking table above 1000V. If there is no mother building in the shielding room, the insulation resistance of the grounding between the shielding room and the adjacent building shall be> 100M Ω, which shall be measured with an insulation shaking table above 1000V.

In order to ensure the single point grounding of the system and reduce the external interference transmitted through the ground, the entire test area is located on the insulated floor in addition to a separate grounding system to ensure that there is no electrical connection with the workshop floor.

4.3.4 Dimensions and requirements of the shielded room:

The whole shielding room is all located in the insulation floor, and ensure a single point of grounding.

The shielding layer material is 1.2mm thick high quality cold rolled galvanized steel plate assembled and welded into wall panels, and then welded 50mmX50mmX2.5mm hollow rectangular tube, and then 6mm iron plate for the bottom plate to form six walls. All joint welding is reliable, no leakage welding, false welding phenomenon. Apply the paint after welding.

Net dimension of shield room: 6mX3mX3m (height)

4.3.5 Ventilation requirements of the shielding room

The shielding room is equipped with 2 waveguide ventilation Windows, one located at the lower part of the side wall panel and the other located at the top, measuring 300x 300 mm to facilitate the air circulation of the shielding hall. The waveguide ventilation window adopts the honeycomb type structure.

4.3.6. Shield the gate structure

Shielded electric gas sliding door, using air-tight shielding, the structure to ensure the electrical reliable contact between the door fan and the door frame. We adopt a no-threshold design scheme and ensure good electrical contact between the door fan and the copper strip. Handle the cracks between the copper strip and the concrete, and ensure the full contact with the door frame when the shielding gate is closed. Around, the door frame is reliably grounded, the gate is equipped with safety control protection, anti-collision and chain device, and the gate has electric control operation. The reed we use adopts the shielding gate of beryllium bronze reed imported from Switzerland as the form of transverse translation. The gate can be manually / automatically controlled (electrical interlocked), and the door is equipped with test warning lights. The gate adopts frequency conversion speed regulation, PLC program control, touch screen operation, smooth and moving without noise, with anti-clip safety function.

Open speed: 9m / min, which can be adjusted freely;

Flat of gate frame: ≤L / 1000 (L is the width of gate);

The flatness of the track top surface is ≤1mm (within the full length range);

The door shall ensure a smooth switch and flexible control.

Gate size: 2 m (height)x 3 m (width)

4.3.7 routing pipeline processing

All cables entering the shielding room should be entered through the corresponding steel pipe, and the pipeline is welded with the shielding plate body through a corresponding pipe diameter wave catheter, so as to prevent interference signals from entering the shielding room through the surface of the cable.

4.3.8 .3.84 shielding room exterior wall decoration treatment

The exterior wall is decorated with high quality color sandwich rock wool board or flame retardant fiber board, and the appearance is smooth, clean and beautiful. When the sandwich board is installed, the whole wall panel has a protective film. After the whole shielding body is completed, tear the protective film with good gloves, so as to ensure that the shielding outside wall is clean as new.

4.3.9.Control room

The control room is placed in the shielding room, and the wall is made of high-quality color sandwich rock wool board for partition, and the floor of the control room is made of all-steel antistatic floor.

Control room to the shielding hall of a small hinge door, the size of 0.95 M X 2.05M (width x height).

The control room has a small shielding door leading to the shielding outdoor. The size of the shielding door is: 2.05M(H)X 0.95M (W).

There is a piece of observation glass installed on the wall between the control room and the screen hall, and the glass is a wire screen glass, size: 1.5 m (length)X 0.8 m (height). Easy to observe the test situation

The control room reserves the air conditioning wave guide and the air conditioning installation position. Air conditioning can be fixed frequency air conditioning 1.5 p (the user buys himself).

4.3.10 Other requirements of the shielding room and the control room:

A) Lighting and socket

The shield room has two 100W LED lights, all the way through control, illumination ≥200 LUX; the control room has two 40W LED lights, all power supply through the power filter and through the galvanized steel pipe.

The shielding room has an emergency safety light.

Install 5 single-phase sockets (hall 10A: 2pcs,control rooms 10A: 2pcs and one 16A air conditioning outlet). The power supply all passes through the power supply filter and enters through the galvanized steel pipe.

The shielding room is equipped with a distribution box, and the total power supply, socket and all light switches are all installed in the distribution box.

B) Safety circuit, warning light

Install a finite bit switch at the screen door as a safety monitoring system (safety loop). Connect to the high voltage test equipment to ensure the safety of the high voltage test.

There is a alarm light (red light) installed outside the test hall and connected to the voltage regulator. The red light indicates that high pressure has been added.

4.3.11 Shielding effect of the shielding room:

A) The shield attenuation effect

The completed high-pressure shielding chamber can achieve the following shielding effects:

Shield efficiency: 0.15 ~ 2 MHz> 60dB

The attenuation of shielding effect should be according to GB / T 30842-2014.

All power supply and signal cables between external and shielded rooms shall be filtered for external electromagnetic noise through low voltage high frequency power filter, control filter and high frequency signal filter.

B) Background interference value of the shielding laboratory system

The background interference value can reach 2 pC.

Iv. Technical data:

The supplier shall provide on-site equipment operation technology training to ensure the performance of the equipment normal operation, use and maintenance.

Free to provide two sets of operating procedures and instructions for use.

The supplier is responsible for training the operators and maintenance personnel free of charge.

V List of tools and materials to be provided by the demander:

1. The buyer shall be responsible for the independent power supply of the local discharge shielding room, and the supplier shall provide the technical requirements and relevant parameters.

2. In the process of site construction, installation and debugging of the demander, the demander shall provide electricity, water, gas and other tools.

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

Full shielding bureau to put the laboratory configuration list

order number	device name	specifications and models	quantity	Price (yuan)	remarks
1	High-voltage shielding laboratory	6 m (L)X 3 m(W) X3 m (H) internal net size	A set		
2	console cabinet	3m x2m x 3m (high)			
3	Insulation floor	6.6m x 3.375 m	A set		
4	Electric shield shift door	2m (W) X 3m (H)	A fan		
5	Manual screen of small doors	0.95 m (W) X 2.05 m (H)	A fan		
6	Indoor small door	0.95 m (W) X 2.05 m (H)	A fan		
7	Lighting and socket		A set		
8	Waveguide ventilation window		2 pcs		
Total RMB figures: Yuan Capital: Yuan Yuan					
Terms of payment: 30% in advance under the contract, 30% before delivery, 30% after installation and debugging, and 10% quality guarantee shall be paid within one year					
Warranty period: five years					
The above quotation includes tax, freight and spare parts, on-site installation and debugging and training expenses, excluding third-party testing costs					

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

Type ZN 3950C-EMI radio interference measurement and receiving system

technical proposal

Jiangsu Jinxiu High Voltage Electrical Appliance Co., LTD

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

First, overview

High voltage radio interference test system of electrical equipment is suitable for radio interference test of high voltage electrical equipment, high voltage electrical equipment such as AC high voltage switches, AC high voltage transformers, current transformers, coupling capacitors, lightning arresters, insulators and fittings.

2. Composition of the test system

1. ZN 3950C EMI Test receiver
2. ZN 1060A Standard signal generator
3. ZN 30900C active ring antenna
4. ZN 28200 Interference measurement (impedance) Mater
5. ZN 28300 blocking impedance
6. 15 m cable (2 pcs)

3. operative norm

JB / T 3567-1999 Test method for high-voltage insulator radio interference

GB 11604-2015 Test method and test system for high voltage electrical equipment

GB / T 24623-2009 high-voltage insulator radio interference test

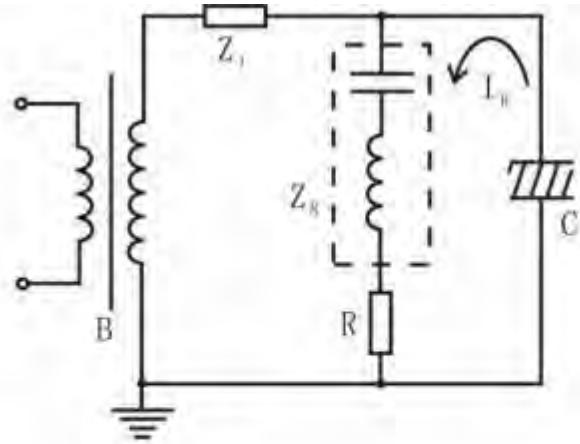
4. environment measurement

Equipment: ZN 3950C electromagnetic interference measurement test receiver, ZN 30900C, active ring antenna for environmental field strength test of 0.5 M ~ 2 MHz frequency range, select minimum field intensity frequency point, prepare for the next test, to ensure the background radio interference level (radio interference caused by external electric field and high voltage transformer) at least 6dB lower than the specified radio interference level (preferably 10dB).

V. Test methods:

(I) Test principle:

1. The test principle is shown in Figure Figure 1 / 2



图一/二 测试原理图

B—高压试验变压器；C_x—试品；Z_1—阻塞阻抗；Z_8—测试耦合阻抗；
R—检测阻抗；I_R—试品所产生的无线电干扰电流

The radio interference current IR generated by test sample CX forms a loop through Z8 and R. blocking impedance

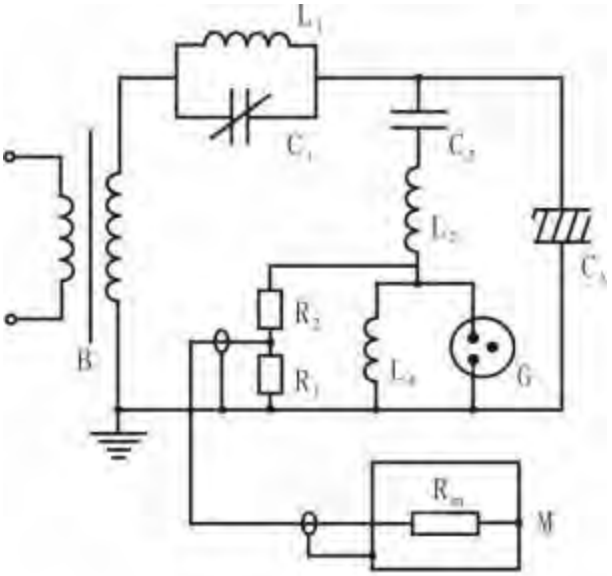
2. Z1 is used to block the RF current flow between the test voltage supply end and the test CX.

Under ideal conditions, Z1 has infinite impedance at the test frequency, and Z2 has zero impedance. The detection impedance R is equal to the load impedance of the radio interference when the test article CX is operating, that is, the wave impedance of the overhead transmission line. R is specified as 300Ω.

(2) Test loop

1. According to the test schematic diagram, the standard test loop adopts the wiring mode shown in Figure 2 / 2. Also allowed to pick

With the corrected and slightly altered other equivalent circuits.



图二/二　标准测试回路

2. Sign description and corresponding technical requirements in the test circuit

(1) The AC test voltage provided by high-voltage test transformer B shall meet the requirements of GB311.3.

(2) Block impedance L_1、C_1, Presa high impedance at the test frequency.

A 300 Ω load will provide at least 35d B of decay.

The test loop should be arranged so that the blocking impedances L1 and C1 are as close as possible to the high-frequency part of the test loop. By tuning the blocking impedances L1 and C1, the high-frequency signal generator can be connected in parallel between the high-voltage end of the test transformer B and the ground, and the variable capacitance of the blocking impedance can be adjusted when the high-frequency signal generator sends out the test frequency signal. C1, to obtain the lowest reading on the interference measuring instrument. The attenuation value of the blocking impedance can be obtained by connecting and short-circuiting the blocking impedance (keeping the signal strength sent by the high-frequency signal generator unchanged). Two readings are obtained on the measuring instrument, and the difference is the attenuation value of the blocking impedance. When using the reference measurement frequency, the inductance value of L1 is about 200μH, the capacitance of C1 is variable, and the maximum capacitance value is 600pF.

(3) The coupled series resonant circuits L2 and C2 and the capacitor C2 should be able to withstand the maximum AC test voltage of the test product and should not produce radio interference themselves. Coupling capacitor C3 can also be used instead of coupling series resonant circuits L2 and C2.

In the above two cases, it should be ensured that after L2, C2 (or C3) and 300Ω are connected in series, the resultant impedance value at the test frequency is 300±40Ω, and the phase angle displacement is not greater than 20°.

(4)Matching resistor R1. In order to eliminate the radio frequency signal reflection in the measurement loop, the resistance of R1 should be equal to the resistance of the measurement cable.

Wave impedance and input impedance Rm of the measuring instrument.

(5) The series resistor R2 should meet the requirement that the radio interference load impedance of the test sample CX is 300Ω, R2=300-0.5R1.

(6) Inductor L3 provides a low impedance path for power frequency current. To reduce measurement errors, the inductance value of L3 should not be less than 1mH at the test frequency.

(7) Overvoltage protection discharge tube G. Due to safety reasons, the power frequency discharge voltage of G should not be higher than 500V, and usually the inflatable overvoltage protection discharge pipe can be selected.

(8) Measuring instrument M is a heterodyne radio interference voltage measuring instrument, which should meet the requirements of GB6113 "Electromagnetic interference
Interference measuring instrument" requirements.

3. Measurement results

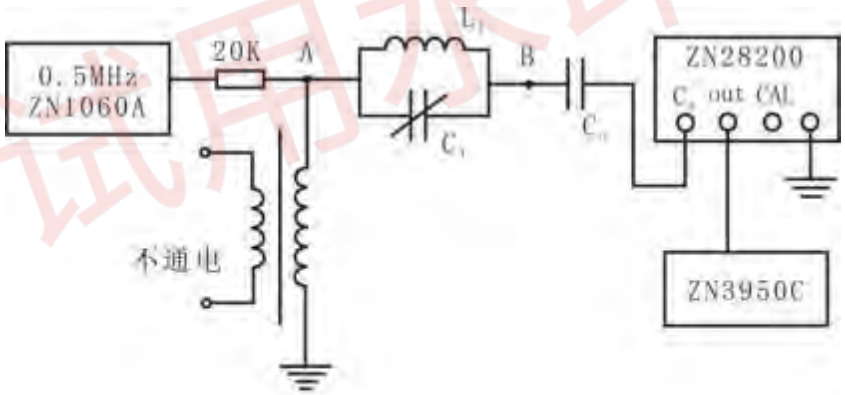
The radio interference level B (dB) of the test product is the sum of the reading Bm of the measuring instrument, the loop attenuation coefficient BC and the resistor network attenuation coefficient BR.

approach:B=Bm+BC+BR

4. Test steps:

1. Connect as shown in Figure one / three

Send the 0.5MHz, 1V signal in series with a 20KΩ resistor to point A, adjust C1 to minimize the ZN3950C reading, and record the ratio B1



图一/三

2. Connect a 0.5MHz, 1V signal source and a 20KΩ resistor to terminal B, and measure a number B2. B3=B2-B1 should be greater than 35dB.

3. Connect the signal source 0.5MHz, 1V signal in series with a 20KΩ resistor to CAL, and the reading is B4, as shown in Figure 2/3, BC=B2-B4

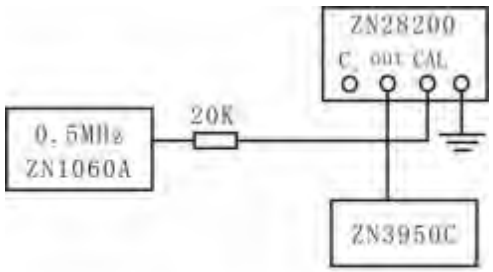


图 三

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

List of the radio measurement system configuration

order number	device name	specifications and models	quantity	Price (yuan)	remarks
1	Radio interference measurement receiver	ZN 3950C	1		
2	Impedance Matcher	ZN 28200	1		
3	Blocking impedance	ZN 28300	1		
4	calibrated signal generator	ZN 1062	1		
5	active antenna	ZN 30900C	1		
6	System test cable		2		
Total RMB figures: Yuan Capital: Yuan Yuan					
Terms of payment: 30% in advance under the contract, 30% before delivery, 30% after installation and debugging, and 10% quality guarantee shall be paid within one year					
Warranty period: five years					
The above quotation includes taxes, freight and spare parts, site installation and debugging and training costs, etc					

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

YDTW -10/100

Power frequency without partial discharge test transformer complete set of test device

technical proposal

Jiangsu Jinxiu High Voltage Electrical Appliance Co., LTD

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

YDTW -10/100

Technical scheme of complete test device without partial discharge at power frequency

I. Scope of application of the equipment

This set of equipment is mainly used for transformer, power transformer, high voltage circuit breaker, insulator, coupling capacitor, capacitor casing, switch and other test products for power frequency voltage resistance, partial discharge, radio interference test and other scientific test research.

2. Description of scheme preparation

The test object of this set of equipment is mainly the tolerance test article, and the resistance and sensibility test article are also considered. The equipment scheme is to use the power frequency test transformer to generate the power frequency high voltage.

3. Conditions of use

Altitude level: ≤1000m

Ambient temperature: -5℃ ~ + 40℃Maximum daily

temperature difference: ≤25℃

Relative air humidity: ≤90% (20℃)

Earthquake resistance: ≤Level 8

The ground level acceleration is 3.0m / s^2, The vertical ground acceleration is 1.5m / s^2

The waveform of the supply voltage is the actual sine wave, and the waveform distortion rate is <3%

There is a reliable ground site with a ground resistance <0.5 Ω

Installation location: indoor

Background Bureau volume: ≤1pC

4. Follow the technical standards

JB / T 9641- -1999 test transformer

GB	1094.1—2013	Power transformers- -Part 1. General Provisions
GB	1094.2—2013	Power transformers-Part 2 The temperature rise of liquid-immersed transformers
GB	1094.3—2003	Power transformer-Part 3 Insulation level, insulation test and external insulation
air interstice		
GB	1094.5—2008	Power transformer Part 5 ability to withstand short circuit

GB /T 1094.6-2011	Power transformer-Part 6 Reactor
GB /T 1094.10-2003	Power transformers- -Part 10: Sound level determination
GB /T 1094.101-2008	Power transformers-Part 10.1: Sound level determination, application guidelines
GB /T 311.1-2012	Insulation and coordination of high-voltage power transmission and transformation equipment
GB /T 16927.1-2011	High voltage test technology Part I General test requirements
GB /T 16927.2-2013	High Voltage Test Technology Part II Measurement system
GB 2536-2011	General technical conditions for unused mineral insulated oil high voltage test
DL / T 848.2-2004 device	devices for electrical fluid transformers and switches- -Part 2: Power frequency high voltage test
The DL / T 848.3-2004 compressor	General technical conditions of high pressure test device - -Part 3: No local discharge test change
GB /T 7354—2003 GB /T 6113-1995 GB /T 15707-2017	measurement of partial discharge
GB /T 11604-2015 GB /T 6587-2012 GB /T 24623-2009	Specification for radio interference and immunity measurement equipment
GB /T 1001.1-2021	Radio interference value of the high-voltage AC overhead transmission line
	Test method for radio interference of high-voltage electrical equipment
	General specification for electronic measuring instruments
	High-voltage insulator radio interference measurement test
	Overhead line insulators with nominal voltage higher than 1000V-Part 1: cross

Porcelain or glass insulator element for flow system-definition, test method and determination criteria

GB /T 775.2-2003	Insulator test methods- -Part 2: Electrical test methods
DL /T 563-1993	Order technical conditions for coupling capacitors and capacitor voltage dividers
GB /T 19749.1-2016	Coupling capacitors and capacitance voltage dividers- -Part 1: General Provisions
GB /T 19749.4-2016	Coupling capacitors and capacitance dividers- -Part 4: connected between lines and ground AC or DC capacitor voltage divider and RC voltage divider
DL /T 848.1-2004	General technical conditions of the high pressure test device- -Part 1: DC high pressure occurrence

implement

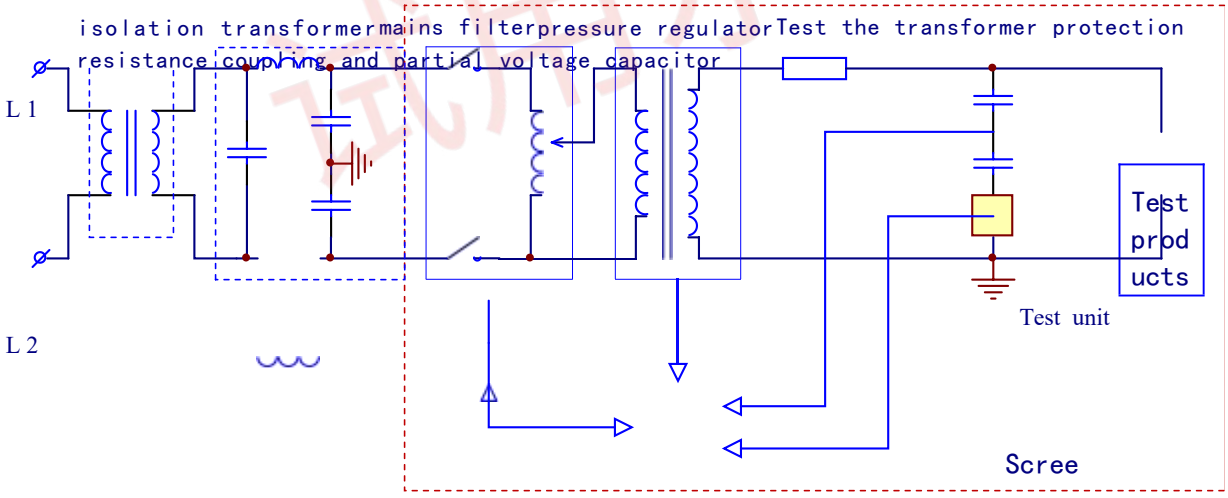
JB /T 8749.1-2007	Regulators- -Part 1: General requirements and tests

JB / T 8749.3-2013 voltage regulators- -Part 3: Contact voltage regulators

V. Equipment composition

1. GLB-15/0.38/0.22 isolation transformer
2. TEDGZ-10/0.22/0~0.25 contact pressure regulator
3. LBQ-10 / 0.22 Power supply noise filter for the main circuit
4. YDTW-10 / 100 power frequency has no local discharge test transformer
5. TAWF-1000 / 100 capacitive voltage divider and coupling capacitor
6. GR 100-0.1/10 protection resistance
7. JX-2010, manual control system
8. Attachment

Vi. Schematic diagram of the complete set of test device system:



VII. Overall technical requirements

Rated output capacity: 10 kVA (no local discharge test)

Rated output voltage: 100kV (no local discharge test)

Rated output current: 0.1A (no local discharge test)

Rated input voltage: 0.22kV

Short-circuit impedance: <6%

Partial discharge level of complete device: ≤3pC at 100% rated voltage, ≤1pC at 80% rated voltage

Running time: Under 100% UH and 100% IH, it is allowed to run for 30 minutes starting from the ambient temperature. The temperature rise of the transformer winding is ≤65K and the temperature rise of the oil surface is ≤55K.

Waveform distortion rate of the complete set of equipment: When the input voltage waveform distortion rate of the voltage regulator is <3%, the output voltage waveform distortion rate of the complete set of equipment is ≤3%.

7.1 GLB-15/0.38/0.22 isolation transformer

Phase number: single phase

Rated capacity: 15 kVA

Frequency: set at 50Hz

Rated voltage of the original side winding: 0.38kV

Original side winding current: 39.5A

Rated voltage of secondary side winding: 0.22kV

Secondary side winding current: 68.2A

Local discharge: local discharge at 100% Un

≤3pC;

Noise level: ≤60dB

Cooling mode: oil immersion, self-cooling

Operating time: continuous operation at the rated voltage and rated capacity

Insulation level: 3kV / 1min

Impedance voltage: ≤6%

Wavelveform distortion rate: ≤3%

Dielectric loss factor: tan δ≤ 0.3%

Temperature rise: under normal use and operation conditions, the winding temperature rise is ≤65K

7.2 TEDGZ-10/0.22/0~0.25 Contact pressure regulator (installed in the console)

Model number: TEDGZ-10/0.22/0~0.25

Phase number: single phase

Frequency: set at 50Hz

Rated capacity: 10 kVA

Rated input voltage: 0.22kV

Rated input current: 45.5A

Rated output voltage: 0~0.22kV

Wavelveform distortion rate: ≤3%

Starting voltage: ≤2%

Short-circuit impedance: ≤8%

Structure form: contact type, dry type

Pressure regulation mode: electric voltage regulation, driven by the DC motor

Running time: the same as the transformer

7.3 LBQ-10 / 0.22 Main circuit power supply noise filter

This device adopts L-C filter loop, and the filter capacitance compensation harmonic elimination device is installed inside.

Model number: LBQ-10 / 0.22

Rated capacity: 10 kVA

Rated voltage: 0.22kV

Rated current: 45.5A

Basal wave frequency: 50Hz

Attenuation characteristics: 40 kHz ~ 100 kHz ≥40dB

100kHz ~2MHz ≥60dB

Running time: the same as the transformer

Note: The filter is dedicated to the equipment room and is installed in the wall of the shielding room

7.4 YDTW-10 kVA / 100kV power frequency without partial discharge test transformer

Model number: YDTW-10 kVA / 100kV

Structural type: insulation shell oil immersion natural cold, single composition

Phase number: single phase

Frequency: set at 50Hz

Rated input voltage: 0.22kV

Rated input current: 45.5A

Rated output voltage: 100kV

Rated output current: 0.1A

Rated output capacity: 10 kVA

Measure the winding voltage ratio: 1000:1

Wavelveform distortion rate: ≤3%

Dielectric loss factor: tan δ≤ 0.3% (90℃)

Partial discharge amount: 100% at the rated voltage 3 pC, ≤1pC at 80% rated voltage

Insulation level: 110% rated self-induction withstand voltage 1 point bell

Overcurrent capacity: under the condition of 110%In rated current duration of 1min, the overcurrent should not cause thermal damage and winding deformation to the test transformer.

Overvoltage capacity: overvoltage at 1min at 110% UH (110kV) time should not cause any insulation damage to the test transformer, and the waveform distortion rate is ≤5%.

Running time: 30 minutes at 100% UH and IH from ambient temperature, the temperature rise of transformer winding is 65K and oil surface temperature is ≤55K.

Noise level: ≤65 Db

Insulation oil performance: oil withstand pressure≥ 60kV; water content ≤10ppm;

Intermedia loss (90℃) ≤0.4%

The measuring coil of the transformer is equipped with protective fuse; the high voltage current measurement adopts 1:1 and 0.5 current transformers, and the instrument open limit and power conversion device.

7.5 .57 TAWF-1000 / 100 Capacitive voltage divider and coupled capacitor

Model number: TAWF-1000 / 100

Rated voltage: 100kV

Nominal capacity: 1000 pF

Capacitor error: ≤± 2%

Electric average

Dielectric loss: ≤0.15%

Insulation level: 110% 1min at rated voltage

Nominal partial pressure ratio: 1,000:1

Measurement uncertainty: including low voltage arm, measuring cable, digital pressure gauge≤ ± 1%

Partial discharge amount: ≤3 pC at the rated voltage of 100kV

Structural type: Insulated shell oil-paper capacitor Structure: composed of top cover, voltage equalizing ring, capacitor body, movable base, low-voltage arm, etc.

The voltage divider can also be used as a coupling capacitor for partial discharge measurements or for radio interference measurements.

Running time: the same as the transformer

7.6 GR 100-0.1/10 protection resistance

Model number: GR 100-0.1/10

Rated voltage: 100kV

Rated current: 0.1A

Nominal resistance value: 10kΩ

Running time: the same as the transformer

Heat resistance class: Grade F (135℃)

Temperature rise: 100% rated current under continuous operation, resistance surface temperature rise is less than 125℃

Local discharge amount: ≤3 pC at 100% rated voltage, ≤1 pC at 80% rated voltage,

·Structural type:

·The resistance is wrapped in the epoched resistance wire on the epoxy resin plate, and the honeycomb structure is used, so that the heat emitted by the heating wire is fully exchanged, reduce the temperature when the resistance is used, and ensure that the strength of the resistance parent material is not reduced when heating. Both ends are connected to the transformer and voltage

divider.

7.7 The JX-2010 control device

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

Model number: JX-2010

7.7.1 Functions:

7.7.1.1 meter accuracy: level 0.5

(high pressure measurement part)

7.7.1.2 Passing-through pressure protection is provided

7.7.1.3 Pressure withstand timing is provided

7.7.1.4 Synchronous AC motor is used to drive the voltage regulator, and is equipped with upper and lower protection and zero pressure switch protection functions.

7.7.1.5 The console is equipped with the laboratory safety door protection.

7.7.1.6 Instruction that:.

(1) High voltage output AC voltmeter is displayed by digital voltmeter, with an accuracy of level 0.5 levels.

(2) High voltage output DC voltmeter, using digital voltmeter, with accuracy of 0.5.

(3) High voltage output DC current meter, using digital voltmeter display, accuracy of 0.5 level.

(4) Transformer output ammeter, using the pointer type electricity meter display, the precision of 1.5 level

(5) The output voltmeter of voltage regulator is displayed by pointer meter with accuracy of 1.5

(6) The output ammeter of the regulator is displayed by the pointer meter with an accuracy of 1.5

(7) With the power supply closing indication

(8) The voltage regulator has a zero return indication

(9) With a set of control measurement lines (the length is determined by the user, but the longest length shall not exceed 20 meters)

.87 Accessories (measurement and control lines, etc.)

Technical solution of Jiangsu Jinxiu High-voltage Electrical Appliance Co., LTD

No local release transformer configuration list

order number	device name	specifications and models	quantity	Price (yuan)	remarks
1	isolation transformer	GLB -15/0.38/0.22	1 set		
2	contact type voltage regulator	TEDGZ -10/0.228/0-0.25	1 pc		
3	Main circuit power supply noise filter Wave device	LBQ -10/0.22	1 pc		
4	No local discharge test for power frequency Transformer inspection	YDTW -10/100	1 pc		
5	Capacitance divider and coupling capacitor	TAWF -1000/100	1 set		
6	protective resistance	GR 100-0.1/10	1 set		
7	hand control system	JX -2010	1 set		
8	Control measurement line		1 set		
Total RMB figures: Yuan Capital: Yuan Yuan					

Terms of payment: 30% in advance under the contract, 30% before delivery, 30% after installation and debugging, and 10% quality guarantee shall be paid within one year
Warranty period: five years
The above quotation includes tax, freight and spare parts, on-site installation and debugging and training expenses, excluding third-party testing costs