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Ⅰ Product Overview

YDQ sf6 testing transformer is the necessary test equipment for power equipment test and preventive test. With the development of power industry, the demand for the voltage level of the test transformer is becoming higher and higher, and the traditional oil immersed testing transformer, both in volume and in weight or in performance, can not meet the requirements of the field work.

With the progress of basic scientific research in China and the application of new materials and technologies, the new medium six sulfur fluoride gas has been applied to the field of power equipment. Because of its excellent insulation and arc extinguishing performance and non combustibility, the six sulfur fluoride gas has been widely used as a new insulating medium.

After years of efforts, our company has studied the SF6 gas inflated testing transformer successfully. Comparing with the traditional oil immersed light test transformer, YDQ series of products weight has been 20% - 60% lighter (depending on the voltage and capacity grade), and no oil pollution. Single set of testing transformer voltage class can reach 300kV. With the adoption of the new production technology, the technical performance of the product has been greatly improved, especially suitable for on-site work or conditions that need frequent handling operation.

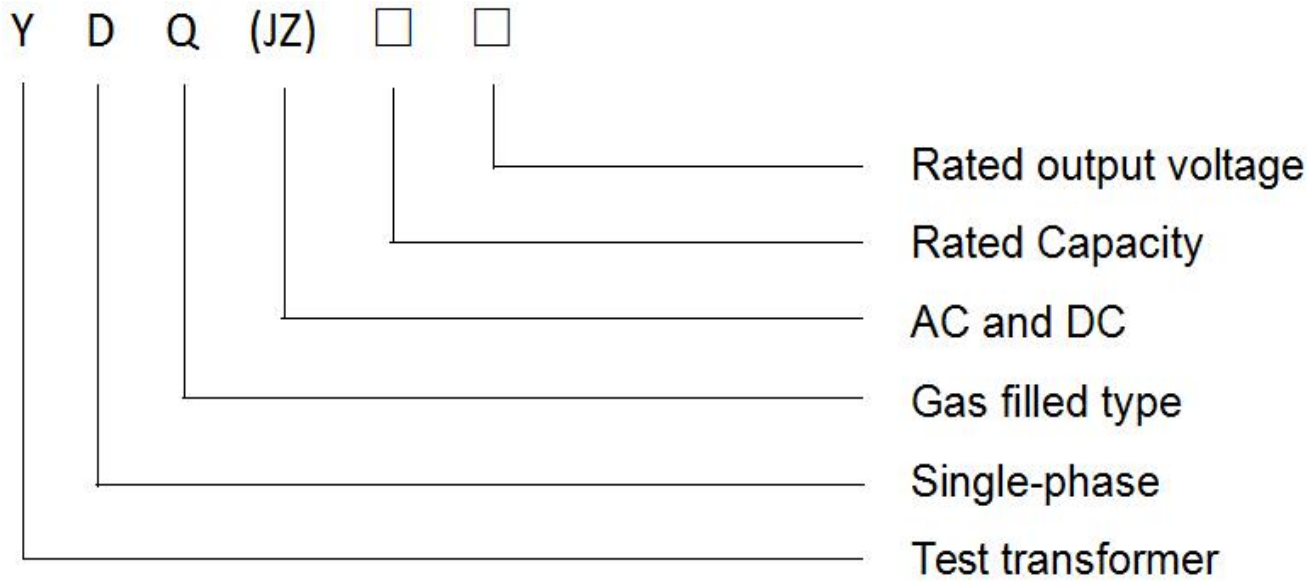
Ⅱ Product Mix

1. New designed conception, material and process flow, small in size, light in

weight and beautiful in shape

2. YDQ (JZ) series of products are made of high quality cold rolled DQ 151 oriented silicon steel sheet into multistage cylindrical frame core, and the high strength insulated barrel is directly coiled by QZ type wire on the special high strength insulation cylinder. The shell is cylindrical, filled with SF6 gas.
3. YDQ (JZ) differs with YSD(J) that the high voltage rectifier silicon reactor is ingeniously installed in the high voltage sleeve, through the insertion and extraction of the short circuit rod, transform YDQ (JZ) can output power frequency high voltage AC output or high voltage DC output.

Ⅲ Product Model Series



Ⅳ Working Principle

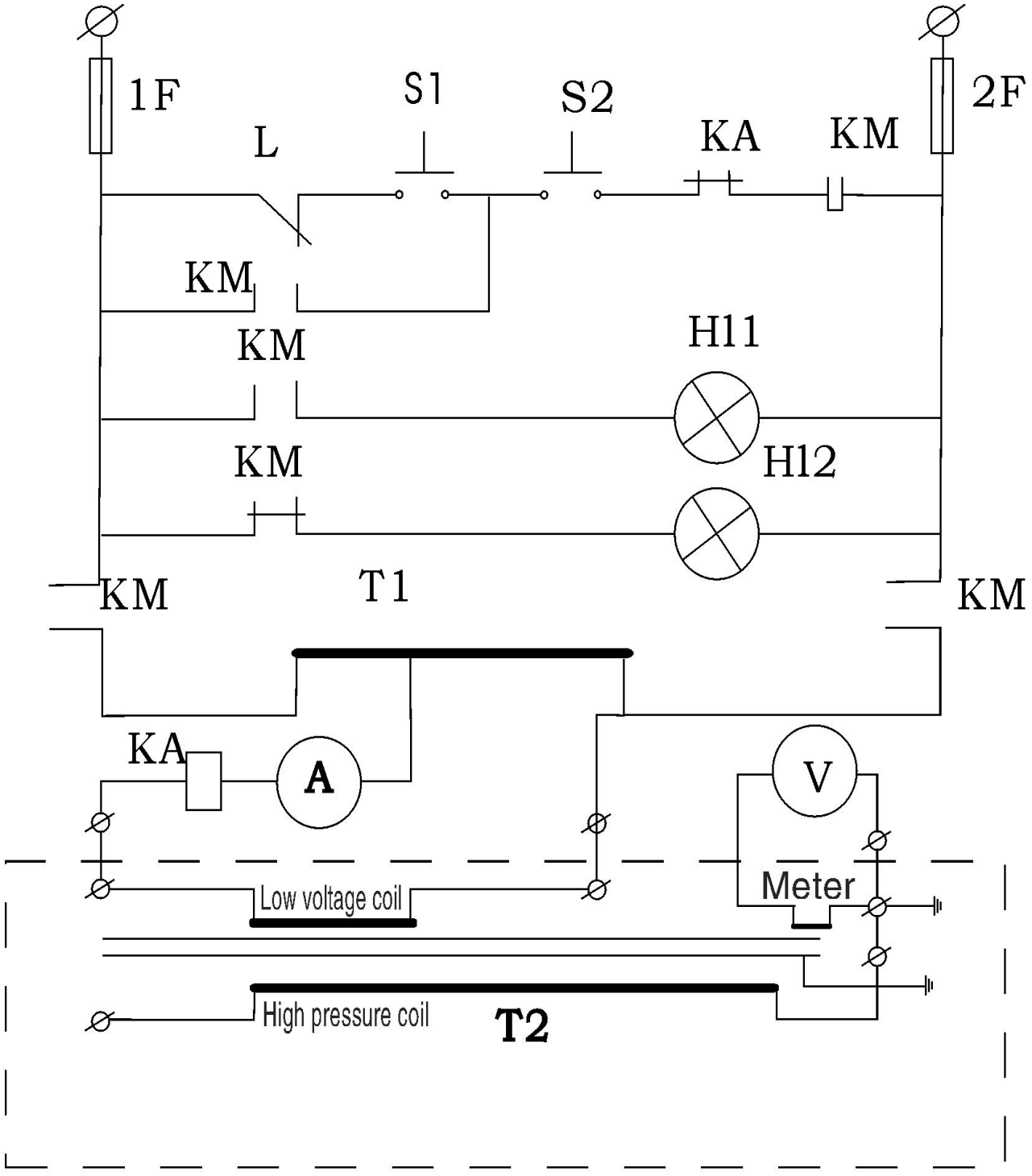
Apply power to into zero position linkage operation table (box) functioned with over current automatic release and prevention of sudden voltage stepping

up. The voltage input YDQ (JZ) is adjusted by the autotransformer into the primary winding of the transformer. According to the principle of electromagnetic induction, the voltage amplitude of the equivalent number (Power frequency high voltage) can be obtained at the ratio of the secondary (HV) winding turns to primary winding turns. This high voltage, after high voltage silicon rectifier and voltage stabilizing capacitor filter, can obtain DC high voltage, and its amplitude is square root of 2 (√2) of the effective value of power frequency high voltage.

Ⅴ Control Circuit Diagram

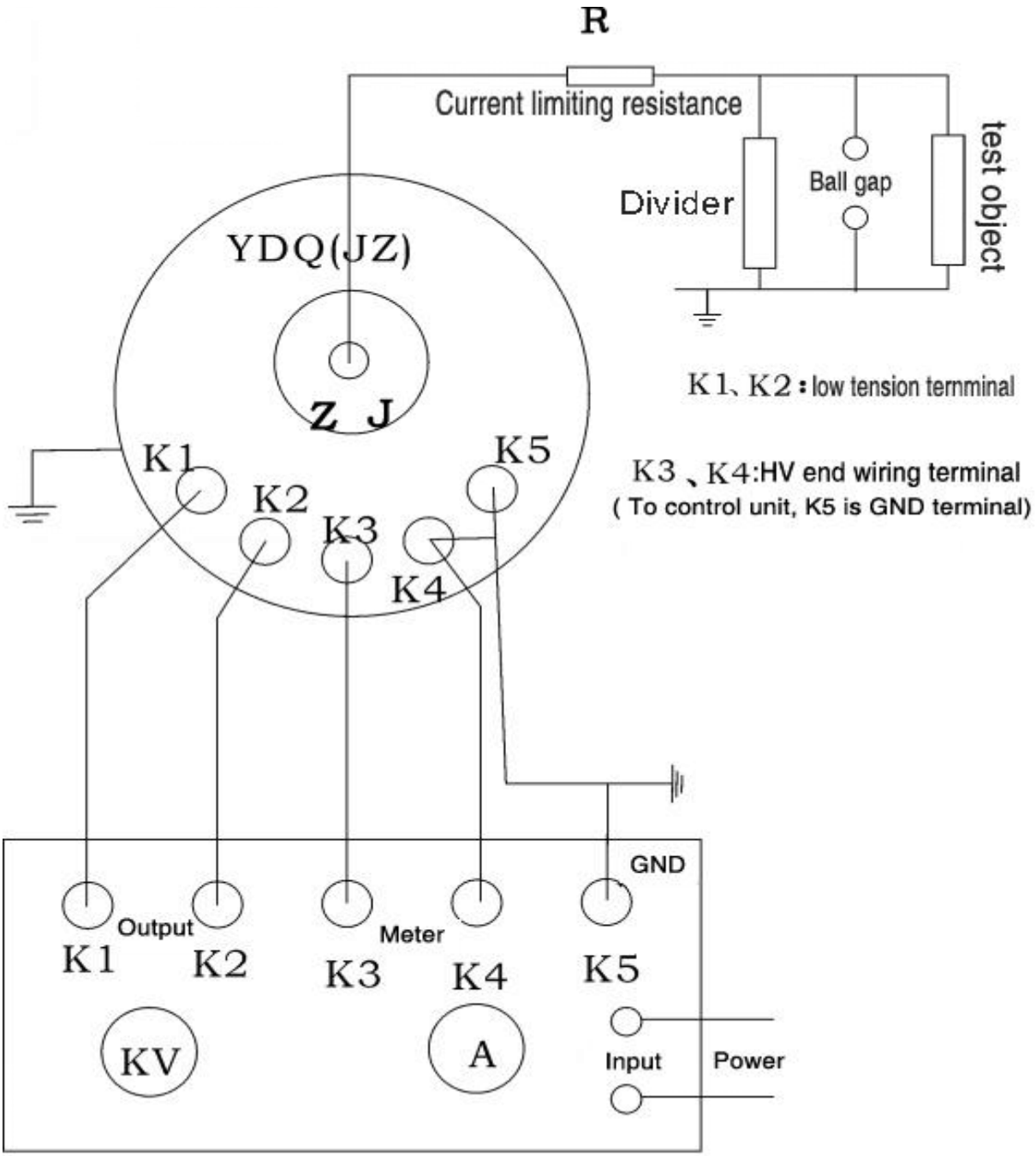
The general operation console (box) circuit diagram is as follows:

1F-2F: Fuse	KM: AC contactor	KA: Overcurrent breaker	L: Zero switch
H11:Closing indicator	A: Ammeter	S1: Closing button	H12: Power indicator
V: Kilovoltmeter	S2: Opening switch	T1: Voltage regulator	T2: Test transformer



Ⅵ On Site Layout

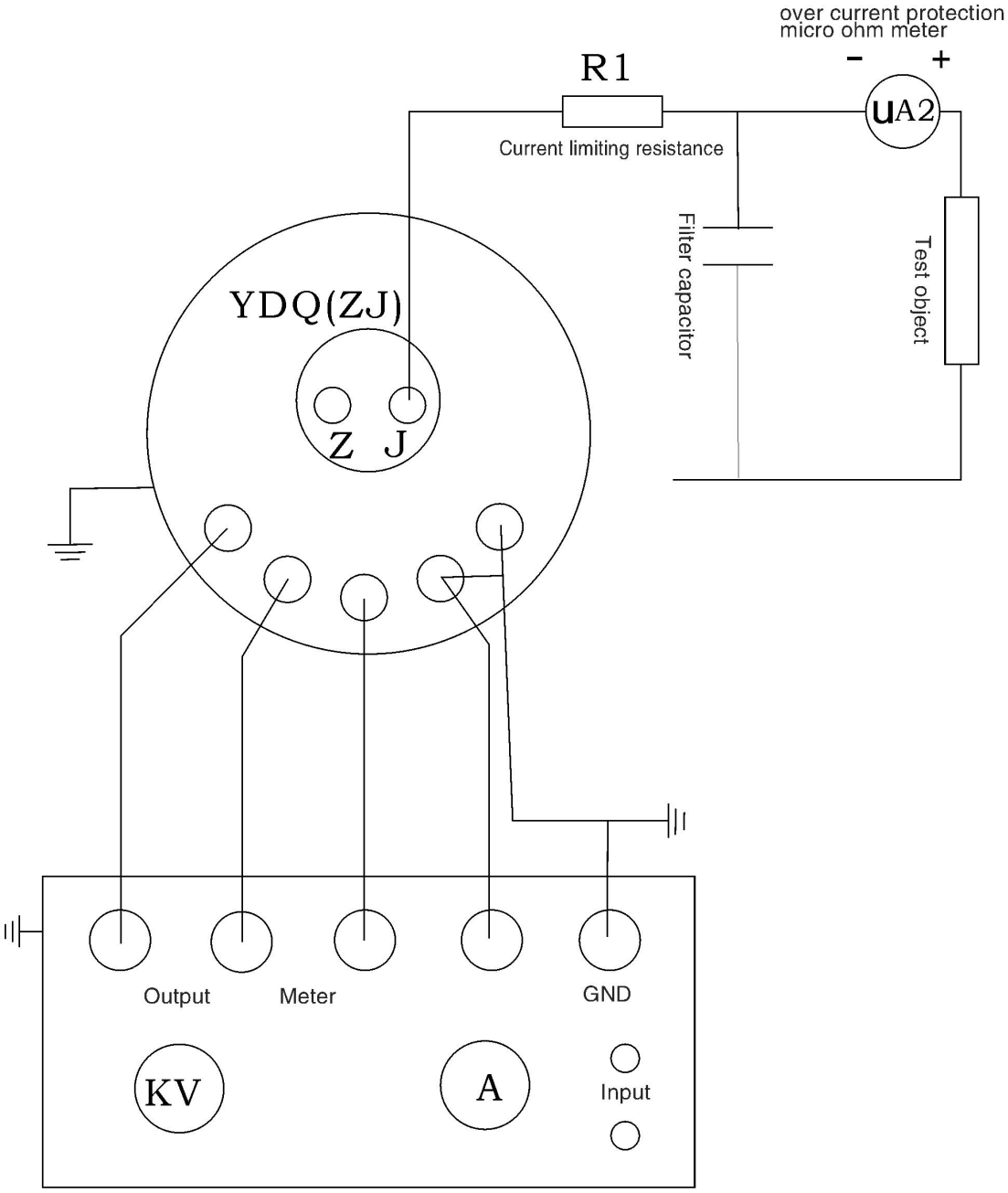
1. AC withstand voltage test wiring diagram



Remarks:

- ✧ The transformers and control boxes supplied, others like current limiting resistors, voltage dividers, ball gaps are separately supplied if requiried.
- ✧ The transformer body, control box body, HV end terminals, meter ends should be well grounded, otherwise the equipment will be damaged and life safety will be endangered.

2. DC leakage test Wiring diagram



Remark:

✧ The transformer body, control box body, trolley, transformer HV end terminal and meter end should be well grounded, otherwise the equipment will be damaged and life safety will be endangered.

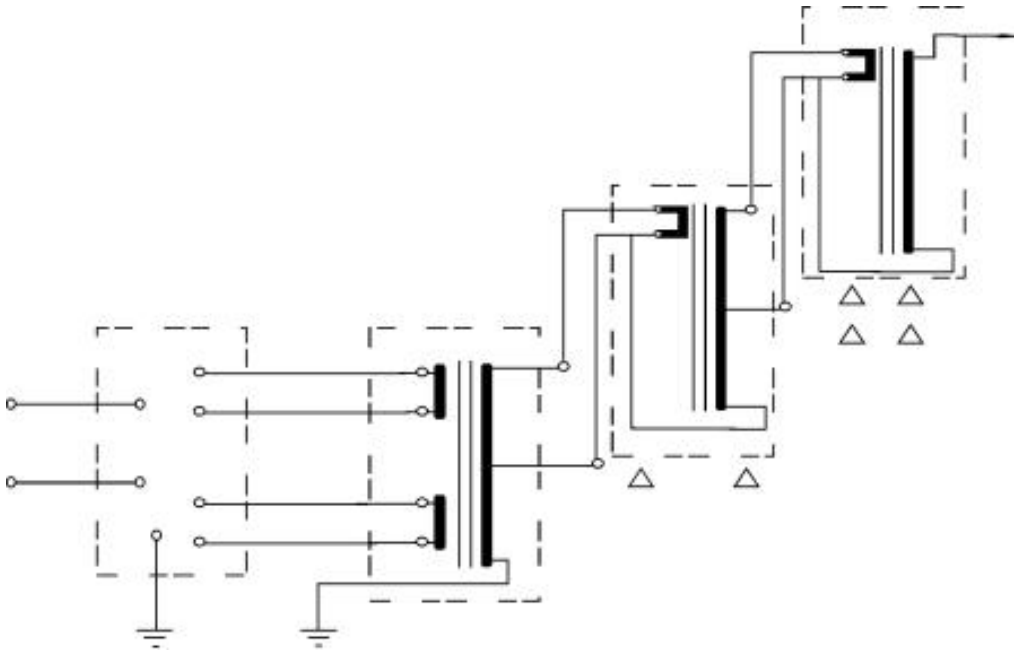
✧ Pay attention to the positive and negative connection of microammeter.

✧ After the completion of the test, it is necessary to use the discharge rod for

discharge treatment, otherwise it will endanger personal life.

3. Series excitation test wiring

① Cascade connection



YDQ (C) - I II III

△ - insulation bracket

Note:connect according to the direction of the wiring mark, otherwise the polarity is opposite.

② Overview

Each unit is light in weight, easy to transport and move, so that the higher testing voltage can be successfully obtained at the scene.

③ Work principle

The YDQ (C) series high voltage test device, except the last unit, are series wound around the excitation group, each winding is same as a succeeding transformer primary winding.

Control unit provide power supply to grade I test transformer. Class I high

voltage winding tail ends and shell grounded, the head end connected to Grade II transformer HV tail end and shell. Grade I series excitation tap provide excitation power to Grade II LV windings, the output of Grade II Test transformer is total of Grade I and Grade II. In the same way, Grade III can get superimposed voltage.

Ⅶ OPeration Method

1. Operate according to the above wiring, check the pressure gauge indicator whether the internal gas pressure is normal (> 0.3MPA).
2. Insert short circuit rod into hole J for AC voltage withstand test and take it out for DC leakage test
3. Current limiting resistor configuration: power frequency withstand voltage 0.3 to 1 Ohm per volt: DC 5~10 Ohm per volt, unncessary for general tests.
4. Take off the wires of the tested products, removing the dirt from the bushing and the body, adopting shielding measures if necessary.
5. After preparations and safety measures are ready, make a trial test without test objects/load.
6. Connect to test items, apply shielded line for DC test to eliminate stray leakage.
7. Turns on power supply, control unit indicator and zero indicator lights up.
8. press the start button, starting light is up
9. Rotate the regulator handwheel clockwise evenly and slowly. Watch the voltmeter reading. Stop rotating the regulator handwheel when it reaches the rated voltage.

10. watch closely the ammeter indication and withstand time.
11. When the withstand time is up, swiftly counterclockwise the handwheel at a steady speed until the regulator returns to zero.
12. After the test, use discharge rod to discharged by resistor then by ground line directly
13. After discharge, change or remove the high voltage leads.

Ⅷ Precautions

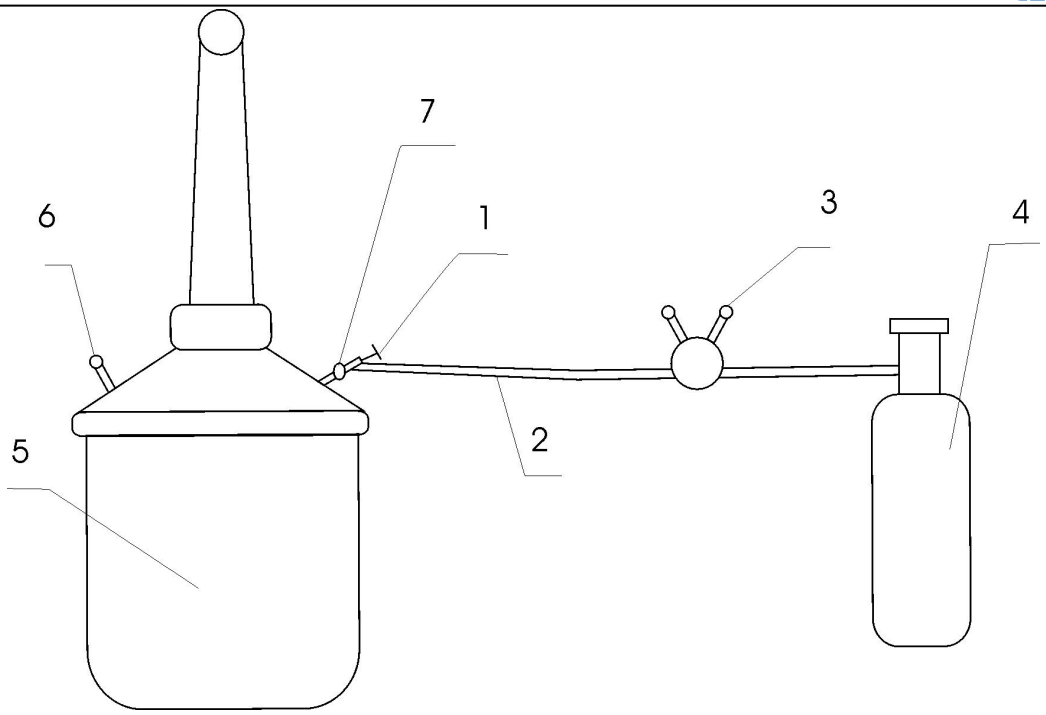
1. Keep enough safety distance of testing site from the persons. Try to avoid placing equipment and high voltage leads round the roads that people may pass by.
2. Install fences and post signs like "stop””HV dangerous" for alarm.
3. There should be something insulating to support/hold/pull the High voltage leads. There must be a safety guard to prevent anyone from coming near and underneath.
4. In addtion to the shielding box, better to have a over current automatic protection device for microameter to prevent sudden breakdown from short circuit or damage from the discharge.
5. Check and calculate enough equipment capacity before Power frequency withstand voltage test, avoid resonance.
6. Working ground wire (high voltage tail, voltage regulated capacitor terminal ground wire) and protective ground wire (operation part shell) should be separately connected, and have good grounding performance.
7. Irregular swing of power supply (such as welding) will inevitably affect the

stability of high voltage output, at this time, stop the test until the risk factor is eliminated.

8. The requirements for climate (temperature and humidity) shall conform to the requirements of the test procedures and be recorded.
9. The high voltage testing work must strictly abide by the relevant provisions of the safety work regulations issued by the Ministry of energy.

Ⅸ Maintenance

1. Regularly keep the test transformer clean . The nylon sleeve should be wiped clean and covered with plastic cloth before each test.
2. Do not twist the bolts except the wiring props to prevent leakage caused by sealing failure.
3. Slight leakage is a normal phenomenon. It is estimated that the air pressure decreases by 0.05 Mpa every four years, and the air pressure is between 0.3 and 0.4 Mpa when leaving the factory. With the change of the humidity of the environment, the air pressure slightly increases or decreases. When the pressure is reduced to 0.3Mpa, reinflate in time.
4. Please use our company's special air-filling nozzle and small tank of sulfur hexafluoride gas to fill, the air pressure must not be greater than 0.55 Mpa. In general, 0. 3 - 0. 4 Ma is ok.
5. the way of inflating:



1 charging valve 2 oxygen pipe 3 oxygen meter

4 six sulfur fluoride steel cylinder.

5 transformer 6 pressure gauge 7 transformer inflatable nozzle.

① connect the pipe according to the diagram.

② open the valve on the six sulfur fluoride gas cylinder, so that the oxygen meter pressure at 20kg / cm.

③ Screw the top of the oxygen meter and let the air pressure rise slowly. There is gas spillover at this time. The air in the pipe is discharged.

④ immediately turn off the charging valve (clockwise) and hear the air flow into the transformer body.

⑤ Adjust the screw center on the oxygen meter, so that the outlet pressure of the oxygen meter is 5.5Kg/cm2.

⑥ Monitor ransformer pressure gauge, when the pressure reaches 3.0-4Kg/cm2 (i.e.0.3-0.4Mpa), immediately shut off the gas valve (counterclockwise). Absolutely prohibit overpressure in order to avoid danger.

⑦ Switch off the valve on the six fluorinated sulphur cylinder.

⑧ Close the valve on the oxygen meter and end the inflation.

⑨ Remove the pipes and inflatable valves and remain static for 5 minutes, allowing the gas to fully mix then can start work.

Ⅹ Conditions for the use of test transformers

1. The test transformer should meet the following requirements under the rated service condition.

A. ambient temperature: max temperature + 40℃ min -20℃

B. When air temperature is 25℃, relative humidity ≤ 85%.

C. On working site there is no gas, steam, chemical dust, dirt and other explosive media seriously affect the insulation of transformers.

D. When use the test transformer, input voltage should be gradually increased and enough protective resistor should be connected to the output terminal. Do not break and close the equipment under high voltage.

2. The operation time of the transformer

At rated voltage rated voltage, the continuous operation must not exceed half an hour, work time interval should be 5-10 times of working time, in order to ensure the full heat dissipation of the transformer and allow long-term continuous operation under the condition of 2/3 of rated voltage and rated current.

Ⅺ Technical indicators and parameters

For all voltage transformers,

The no-load current is 4 to 9%

and the impedance voltage is 4 to 10%.

Note:parameters customizable according torequirements of users

YDQ(JZ) Ratings

Model	Cap	LV		HV		ratio	6min	Impedance	Noload	NW	Size L*W*H
	kVA	V	A	kV	mA		temp ris℃	voltage%	current%	Kg	
1.5/50	1.5	200	7.5	50	30	500	50	10	<4	30	200*275*640
3/50	3	200	15	50	60	500	50	10	<4	35	240*300*690
6/50	6	200	30	50	120	500	50	10	<4	40	250*355*710
10/50	10	200	50	50	200	500	50	10	<4	60	260*375*750
15/50	15	400	37.5	50	300	500	50	8	<4	70	270*420*800
20/50	20	400	50	50	400	500	50	8	<4	85	285*440*820
30/50	30	400	75	50	600	500	50	8	<4	100	295*386*840
50/50	50	400	125	50	1000	500	50	8	<4	120	320*416*910
6/100	6	200	30	100	60	1000	50	9	<4	65	330*330*1200
10/100	10	200	50	100	100	1000	50	10	<4	65	350*475*1300
15/100	15	400	37.5	100	150	1000	50	8	<4	85	510*390*1320

20/100	20	400	50	100	200	1000	50	8	<4	100	540*400*1340
30/100	30	400	75	100	300	1000	50	8	<4	110	560*410*1360
50/100	50	400	125	100	500	1000	50	8	<4	125	600*460*1410
10/150	10	200	50	100	66.7	1500	50	10	<4	90	265*380*1750
15/150	15	400	37.5	150	100	1500	50	8	<4	100	510*390*1800
20/150	30	400	50	150	133.3	1500	50	8	<4	110	540*415*1800
30/150	30	400	75	150	200	1500	50	8	<4	125	560*430*1800
50/150	50	400	125	150	333.3	1500	50	8	<4	140	640*490*1850
20/200	20	400	50	200	100	2000	50	9	<4	140	600*600*1700

X(T)C Transformer Control Unit

Ⅰ Overview

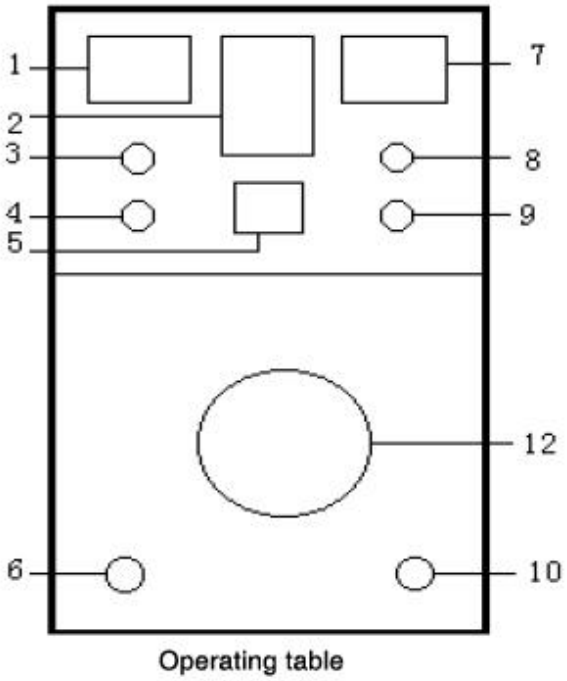
The series is our test transformer supporting equipment, the control box features easy maintenance, superior performance and safe use, beautiful appearance, durable, easy carrying and so on. It is necessary for power maintenance in the power supply enterprises, large factories, metallurgy, power plants, railways and other departments.

Ⅱ Product Series

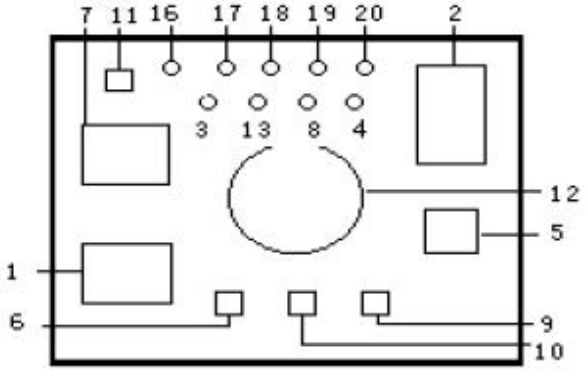
Model	Capacity (kVA)	Power supply			Output		Operating Mode	Estimated Weight	Remarks
		Phase	(V)	(A)	(V)	(A)			
2/220	2	1	220	50	0-220	10	Manual	14	
3/220	3	1	220	50	0-220	15	Manual	16	
5/220	5	1	220	50	0-220	25	Manual	18	
10/220	10	1	220	50	0-220	50	Manual	80	
15/400	15	2	380	50	0-430	37.5	Manual	90	
20/400	20	2	380	50	0-430	50	Manual	100	
25/400	25	2	380	50	0-430	62.5	Manual	120	
30/400	30	2	380	50	0-430	75	Manual	140	
50/400	50	2	380	50	0-430	125	Manual/Auto	160	
100/400	100	2	380	50	0-430	250		50	Separated voltage
150/3000	150	2	380	50	0-430	50		50	

200/3000	200	2	380	50	0-430	65		50	regula tor
250/3000	250	2	380	50	0-430	84	Auto	50	
300/3000	300	2	380	50	0-430	100	Auto	50	
Remark:Different type of products can be manufactured according to customer needs									

Ⅲ Panel Outline



Operating table



Operation box

1 Voltmeter（PV）2 Over-current Relay（KA）3 Power indicating light（HG）

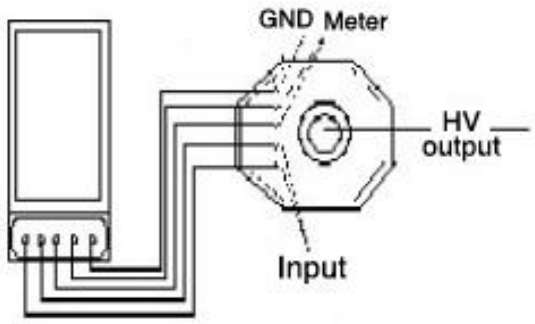
4 Alarm light（HL） 5 Time relay（KT） 6 Start Button（ST）

7 Ammeter（PA）8 Feeding light（HR） 9 Timing button（SB1）

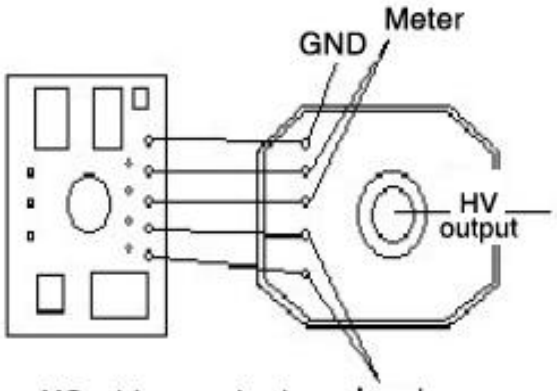
10 Stop button（SP） 11 Ground column 12 Regulator handle

13 Zero Light（HY） 17 18 Wiring terminal 19 20 Output terminal

Ⅳ External Wiring Diagram



TC wiring method



XC wiring method

Ⅴ Operating Procedures

1. Arrange the site according to the relevant procedures, connected the wires, when necessary a person should be arranged for safety guidance.
2. Adjust the current relay (KA) according to the capacity and voltage level of the tested product.
3. Turn on the power switch, press the power feeding button, the regulator power supply lights will be off, power feeding light will be on, then start boosting test
4. Slowly clockwise the regulator handle (if it is the automatic type, press step boosting button) and pay close attention to the voltmeter (3KV per second speed is appropriate), when reach the standard withstanding voltage, press the time button, and watch situation of the test sample.
5. When reach the specified test time, the alarm (bell) will sound, indicating withstanding test qualified. At this time, counter clockwise the regulator handle (for automatic type, press drop down button) to put the regulator to zero position. And press the stop button to turn off the power.

6. In the process of boost or withstand voltage test, if over-voltage occurs, turn the voltage regulator counterclockwise (or press drop button) to return the voltage to the specified value.
7. During the test process, if the current meter indicates that the current exceeds the specified range, please immediately stop the boost to find out the relevant reasons and then test.
8. During the test, if there is short circuit, flash-over, breakdown and other over-current events, the current relay will work to stop so that the regulator automatically power off, which means the tested product failed to pass the test. Return the regulator to zero and reset the timing button to prepare operation next time

Ⅵ Operation Conditions

1. Ambient temperature: 0 ~ 40 ℃
2. Altitude: <2000m
3. Relative humidity: <85%
4. No gas, steam, chemical dust and other explosive and corrosive media which seriously impact the insulation

Ⅶ Attention

1. When unpacking, check the electrical components and contact points if any damage and bad contact.
2. Before use check the electrical contact, especially the regulator carbon brush contact must be good.

3. Strictly follow the relevant operation procedures, don't use personally without security persons on site.

4. The equipment should be stored in a ventilated, dry, non corrosive gas place.

Ⅷ Packing List

1	Operation Unit	1 set
2	Test transformer	1 set
3	Test line	1 set
4	User Manual	1 copy
5	Inspection report	1 copy
6	Warranty card	1 copy