SBW Compensation AC Voltage Stabilizer

Installation and Operation Instruction

Before installing and using the product, please read the instruction carefully and well keep it for future reference.

Product Certificate

This product has passed the inspection and meets the requirements of JB/T7620, and therefore is allowed to leave the factory.

Inspector: 

Date of inspection: See the product or packaging.

Huanyu Group Co., Ltd.

Contents

Overview

The SBW or DBW Series Compensation AC Power Voltage Stabilizer (hereinafter referred to as “Voltage Stabilizer”) is designed by our factory to stabilize AC voltage by introducing and absorbing advanced technologies from home and abroad, combined with China's national conditions. The voltage stabilizer automatically keeps the output voltage stable when the power grid fluctuation is caused by the external power supply network voltage fluctuation or load change.

Compared with other types of voltage stabilizers, this series of voltage regulators is characterized by large capacity, high efficiency, no waveform distortion, stable voltage regulation, and applicable wide load. This series of products is also able to withstand instantaneous overload, and support long-term continuous work, and optional manual and automatic switching. Meanwhile, this series is equipped with the automatic protection device for the overvoltage, undervoltage, overcurrent, phase sequence and mechanical failure, as well as has the advantages of small size, light weight, convenient use and installation, and reliable operation. It can be widely used in large electromechanical equipment, metal processing equipment, elevator and medical equipment, computer control equipment in the computer room, embroidery and textile equipment, air conditioning, radios and televisions, and household appliances and lighting equipment in the fields of industry, agriculture, transportation, post and telecommunications, military, railway, scientific research and culture.

Working Conditions

SBW and DBW Series Voltage Stabilizers shall be used indoors, with the normal use conditions below:

1. Ambient temperature: -15°C~+45°C.
2. The altitude shall not exceed 1,000 m.
3. Relative humidity: ≤90%.
4. The installation site shall be free of gas, steam, chemical deposits, dust, dirt or other explosive and corrosive media that seriously affect the insulation of the voltage stabilizer.
5. The installation site shall be free from severe vibration or turbulence.
6. Any special use conditions that do not meet the above requirements shall be determined through the consultation between the user and our company.

Structure

The voltage stabilizer consists of a three-phase compensation transformer, a three-phase contact voltage regulator, a transmission mechanism, a brush contact system, a box and an electric control system. The column winding of three-phase contact voltage regulator has the outer surface polished by lathe and the conductor with smooth insulation layer removed, so as to facilitate the smooth contact of brushes. The transmission mechanism consists of a motor, a worm gear, a worm, a sprocket and a chain. The brush system structure is reasonable and reliable to ensure the brush pressure. The enclosed cabinet is adopted, with small size, good heat dissipation, obvious position of detection instrument, and accurate indication.

1. Model

The model representation of this series of voltage stabilizers is shown in Figure (I):

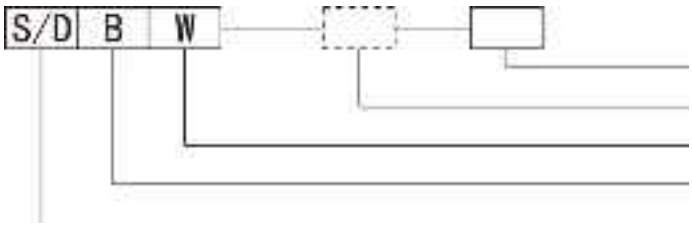


Figure I

Drawings of the Machine and Main Components

Overall appearance of the machine

Servo motor control circuit and protection circuit

Operation panel

Machine structure

Contact voltage regulator

Compensation transformer

Size and Weight

2. Main technical indicators and specifications

Model	Rated capacity (kVA)	Output current (A)	Input voltage (V)	Output voltage (V)	Number of phases	Withstand voltage	Insulation resistance (MΩ)	Efficiency	Waveform distortion	Working frequency (Hz)	Voltage stabilization accuracy	Voltage stabilization time
			304~456	380 ±5% Adjustable	Three-phase	2,000 No breakdown within 1 minute	≥2	≥98%	≤1%	50–60	±(1-5)% Adjustable	The stabilization time is less than 1.5 s when the input voltage jumps by 10% relative to the rated value.
SBW-30	30	46										
SBW-50	50	76										
SBW-60	60	91										
SBW-80	80	122										
SBW-100	100	152										
SBW-120	120	182										
SBW-150	150	228										
SBW-180	180	273										
SBW-200	200	304										
SBW-225	225	342										
SBW-250	250	380										
SBW-300	300	456										
SBW-320	320	486										
SBW-350	350	532										
SBW-400	400	608										
SBW-500	500	760										
SBW-600	600	912										
SBW-800	800	1,216										
SBW-1000	1,000	1,520										
SBW-1200	1,200	1,823										
SBW-1400	1,400	2,127										
SBW-1600	1,600	2434										
SBW-2100	2,100	3,191										
SBW-3200	3,200	4,862										
DBW-10	10	46	176 ~ 264	220 ±5% Adjustable	Single-phase	1,500 No breakdown within 1 minute						
DBW-20	20	91										
DBW-30	30	137										
DBW-50	50	228										
DBW-100	100	455										
DBW-180	180	818										
DBW-225	225	1013										
DBW-300	300	1,364										

★ **Special specifications and requirements can be customized by contacting our company.**

Dimensions and Weight

The dimensions and weight of the voltage stabilizer are as follows:

Model	Rated capacity (kVA)	Number of phases	W × D × H (mm)	Number of cabinets	Net weight (kg)
		Three-phase		Single cabinet	
SBW-30	30		800 × 540 × 1,230		230
SBW-50	50		800 × 540 × 1,230		250
SBW-60	60		800 × 540 × 1,230		265
SBW-80	80		800 × 620 × 1,390		280
SBW-100	100		800 × 620 × 1,390		350
SBW-120	120		1,000 × 700 × 1,600		370
SBW-150	150		1,000 × 700 × 1,600		400
SBW-180	180		1,000 × 700 × 1,600		560
SBW-200	200		1,000 × 700 × 1,600		600
SBW-225	225		1,100 × 800 × 1,900		700
SBW-250	250		1,100 × 800 × 1,900		730
SBW-300	300		1,100 × 800 × 1,900		780
SBW-320	320		1,100 × 800 × 1,900		860
SBW-350	350		1,100 × 800 × 1,900		910
SBW-400	400		1,000 × 800 × 2,000	Double cabinets	1,080
SBW-500	500		1,000 × 800 × 2,000		1,470
SBW-600	600		1,000 × 800 × 2,000		2,170
SBW-800	800		850 × 1,100 × 2,000	Three cabinets	2,750
SBW-1000	1,000		850 × 1,100 × 2,000		3,450
SBW-1200	1,200		850 × 1,100 × 2,000		4,050
SBW-1400	1,400		1,300 × 1,350 × 2,000	Four cabinets	5,500
SBW-1600	1,600		1,300 × 1,350 × 2,000		7,050
SBW-2100	2,100		1,800 × 1,500 × 2,200 1,350 × 1,500 × 2,200		10,300
SBW-3200	3,200		2,400 × 1,500 × 2,200 1,500 × 1,500 × 2,200		12,600
DBW-10	10	Single-phase	650 × 560 × 1,350	Single cabinet	150
DBW-20	20		650 × 560 × 1,350		180
DBW-30	30		650 × 560 × 1,350		200
DBW-50	50		650 × 560 × 1,350		220
DBW-100	100		900 × 700 × 1,700		260
DBW-180	180		1,000 × 800 × 1,900		310
DBW-225	225		1,000 × 800 × 1,900		340
DBW-300	300		1,000 × 800 × 1,900		380

★ **Special specifications and requirements can be customized by contacting our company.**

Principle of Operation

The voltage stabilizer consists of a compensation circuit, a contact voltage regulator, a voltage detection circuit, a servo motor control circuit, a deceleration transmission structure, a main circuit switch operation circuit, a voltage and current measurement and protection circuit. The single-phase electrical principle is shown in Figure (II), and the three-phase electrical principle is shown in Figure (III).

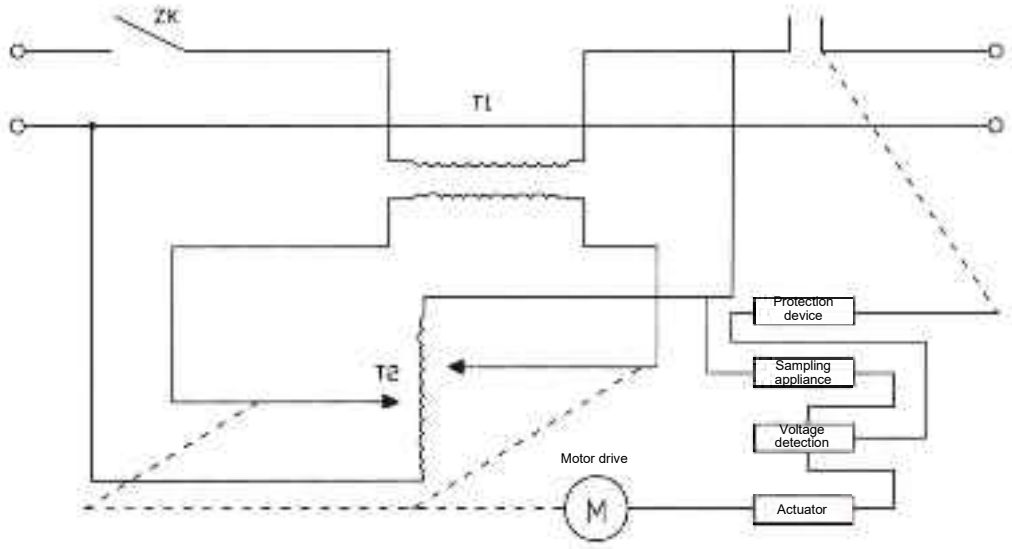


Figure II. Single-phase electrical schematic diagram

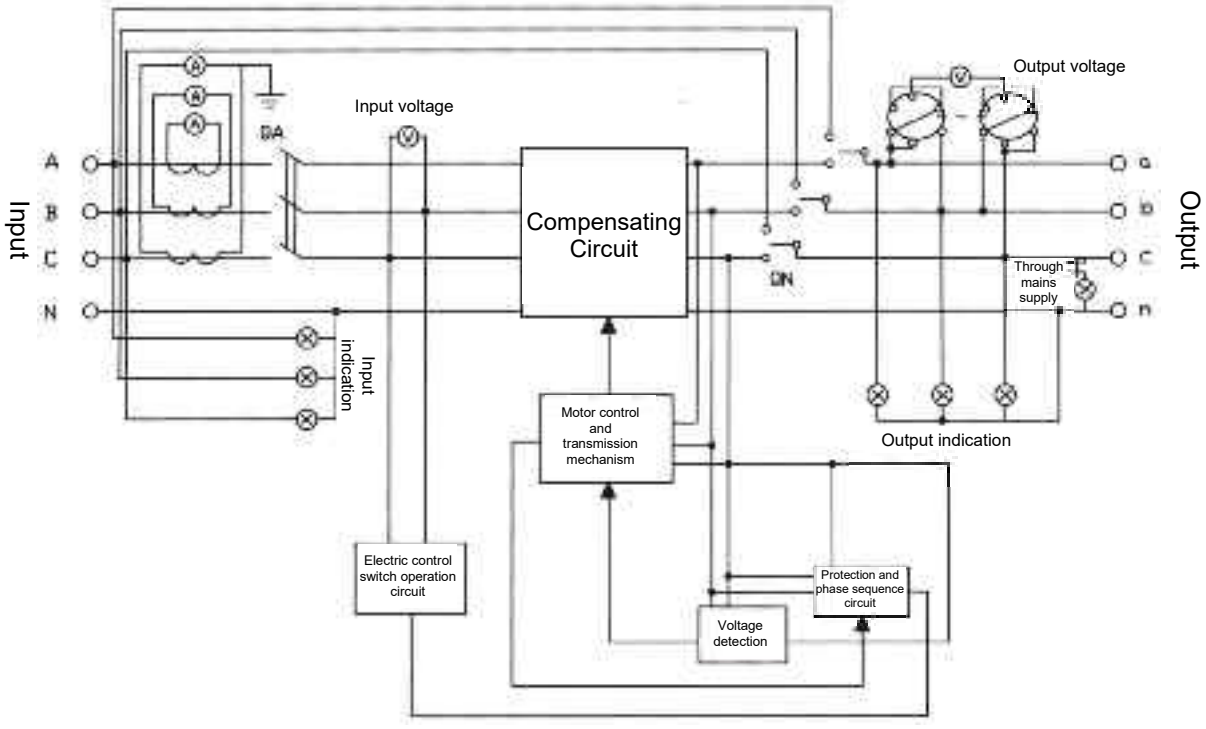


Figure III. Three-phase electrical schematic diagram

Main Components and Circuits

1. Compensation transformer

The Compensation Transformer TB is a compensation power transformer that can make the secondary coil connected in series with the load circuit produce variable amplitude and polarity when the magnitude and polarity of the voltage applied to the primary coil change.

2. Contact voltage regulator

The Contact Voltage Regulator TUV is a special contact voltage regulator that changes the magnitude and polarity of the output voltage by changing the contact position of the brush.

3. Motor control circuit

The servo motor control has two modes: "Manual" and "Automatic", which are selected by the switch QT1. In manual mode: Press the SB3 button to close the KC1 switch contact during the "Voltage Rise" and the SB4 button to close the CK2 switch contact during the "Voltage Drop". In automatic mode: The voltage rise and voltage drop are detected and automatically controlled by the voltage detection unit, thus realizing the "Automatic" voltage stabilization. JK is the voltage drop limit switch, while SK is the voltage rise limit switch. There are three-phase and single-phase servo motors. The working principle of the single-phase motor is shown in Figure (IV). The working principle of the three-phase motor is shown in Figure (V).

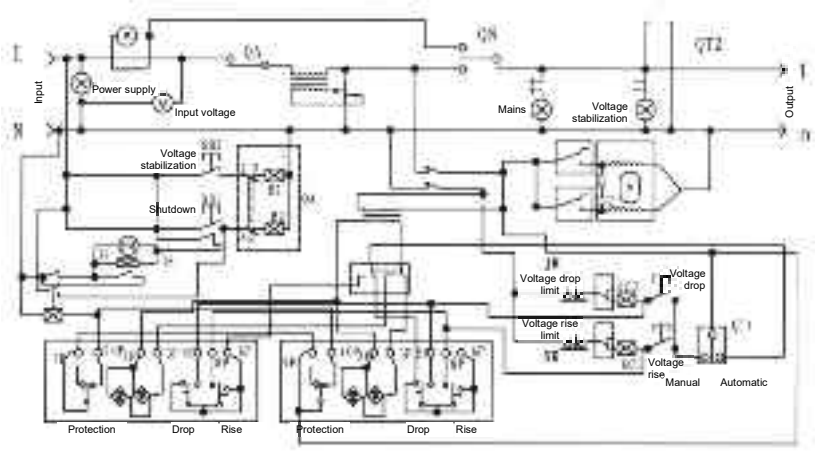


Figure IV. Electrical schematic diagram of DBW

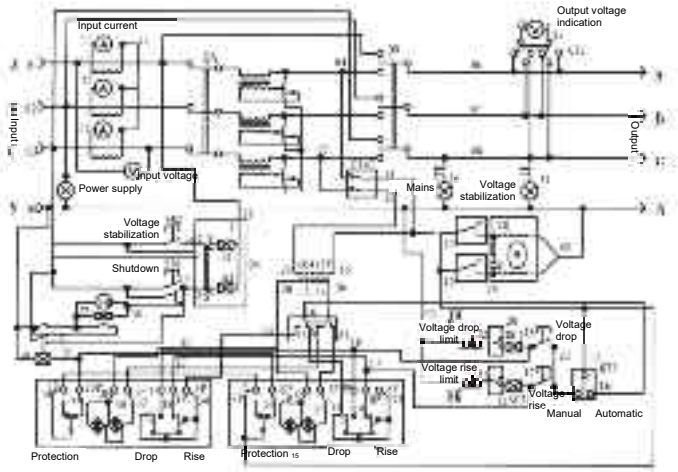


Figure V. Electrical schematic diagram of SBW

Main Components and Circuits

4. Switch device of three-phase main circuit and operation circuit

1. The main circuit of the voltage stabilizer is provided with an electric control switch QA and a knife switch ON to make the automatic voltage compensation system easy to throw in and out. When the switch is put into operation, just put the knife switch ON in the "Voltage Stabilization" state and press the "Start" button, and the electric control switch QA can be automatically closed. If the voltage stabilizer itself fails or needs to be used in the through state of the mains, just put the knife switch handle in the "Mains" position and press the "Stop" button to make the mains indicator light on.
2. The overvoltage and undervoltage protection device, namely Relay KC3, is connected in series in the closing circuit of the electric control switch. During the voltage stabilization operation, as long as the voltage of the output terminal is abnormal, the electric control switch will automatically turn off when the overvoltage or undervoltage occurs, and the buzzer will give an alarm sound. At this time, press the "Stop" button to reset and then activate the standby circuit board.
3. The voltage stabilizer above 400 kVA adopts the DW15 Series Universal Air Circuit Breaker. The compensation system automatically stops running when the output terminal voltage is abnormal, or there is overvoltage or undervoltage.

5. Voltage detection and regulation unit of the three-phase voltage stabilizer

The Sampling Transformer TC takes out the sampling voltage and control voltage from the output terminal of the voltage stabilizer. After the voltage transformation, rectification, filtering and voltage stabilization, the control voltage is divided by RP1 and RP3 to obtain the signal voltage varying with the output voltage, which is output to the voltage amplifier for voltage comparison. When the signal voltage is between the upper limit and the lower limit reference voltage, the contacts of control relays KC1 and KC2 are in the off state. When the signal voltage exceeds the upper limit or lower limit reference voltage value (accuracy range), the contacts of KC1 (KC2) and contactor KA1 (KA2) act.

As soon as the motor gets the signal voltage, it will operate and make the voltage compensation to stabilize the output voltage of the voltage stabilizer. In short, when the output voltage changes beyond the allowable range of rated voltage accuracy, the voltage detection will issue an instruction to regulate the output voltage until the output voltage returns to the allowable range of rated voltage accuracy. The precision of voltage regulation of the voltage stabilizer is adjusted by setting the potentiometer RP3 between ±(1-5)%, and the center position of the rated output voltage is adjusted by regulating the potentiometer RP1.

Main Components and Circuits

6. Three-phase protection circuit

1. The electric control switch QA protects the main circuit from the overload or short circuit. SK and JK limit travel switches constitute a limit protection circuit. When the brush slides to the upper and lower limit switches, the servo motor stops regulating to achieve the limit protection.
2. Undervoltage and overvoltage protection circuits control the normally-closed contact of KC3 to be closed in normal operation. When the signal voltage is higher or lower than the rated protection voltage value, the protection relay KC3 is normally open and closed, and the electric control switch QA is turned off and the automatic compensation system exits the working state. Under normal circumstances, when the machine leaves the factory, the overvoltage setting is 430 V±5 V and the undervoltage setting is 340 V±5 V, the voltage stabilizer will give an alarm signal simultaneously. (Conventional products are not undervoltage protected when leaving the factory. Please explain when ordering.)
3. The open-phase and reverse-phase protection circuit means that when the power incoming line of the power grid is open-phase or inconsistent with the phase sequence of the voltage stabilizer itself. When the indicator light of the phase sequence protection device turns on, the machine is in standby state, and the indicator light of the protection device goes out under normal phase sequence. (Conventional products do not have this function. Please explain when ordering.)
4. This machine is provided with two control circuit boards: A and B. If there is a problem with the control system of Board A during use, you can pull the switch of the standby board to Board B, and the two circuit boards can be directly used interchangeably.

7. Voltage detection and regulation unit of the voltage stabilizer

The working principle of voltage detection and regulation unit of the single-phase voltage stabilizer is exactly the same as that of the three-phase voltage stabilizer. The schematic diagram of the control circuit board, electrical schematic diagrams of the single-phase voltage stabilizer, three-phase voltage stabilizer of 30 K~400 K and 400 K above are shown in Figure (VI), Figure (VII), Figure (VIII) and Figure (IX).

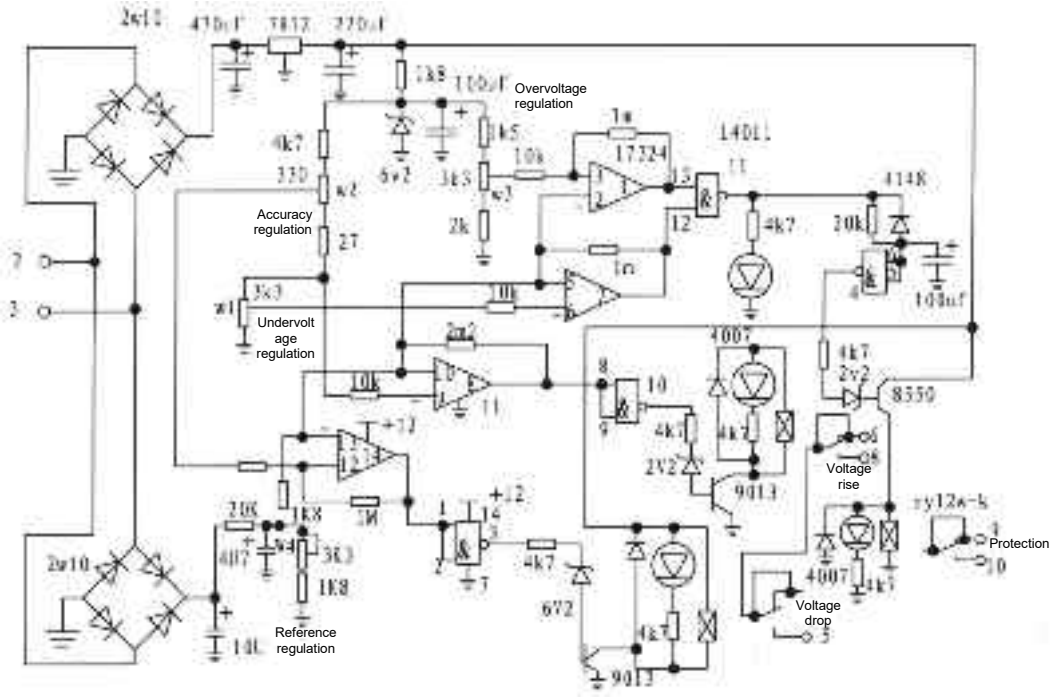


Figure VI. Electrical schematic diagram of the control circuit board

Main Components and Circuits

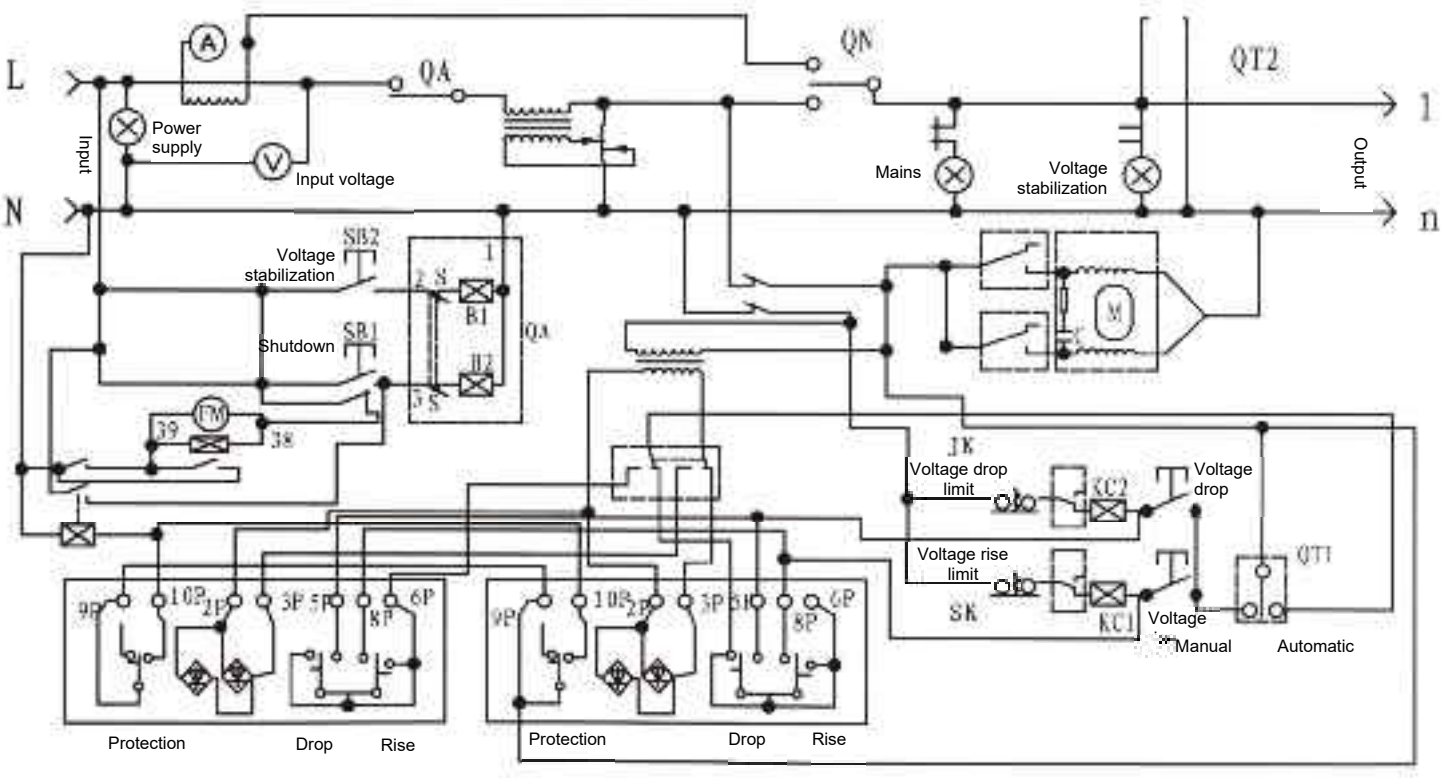


Figure VII. Electrical schematic diagram of the DBW Single-phase Automatic Compensation Power Stabilizer

Main Components and Circuits

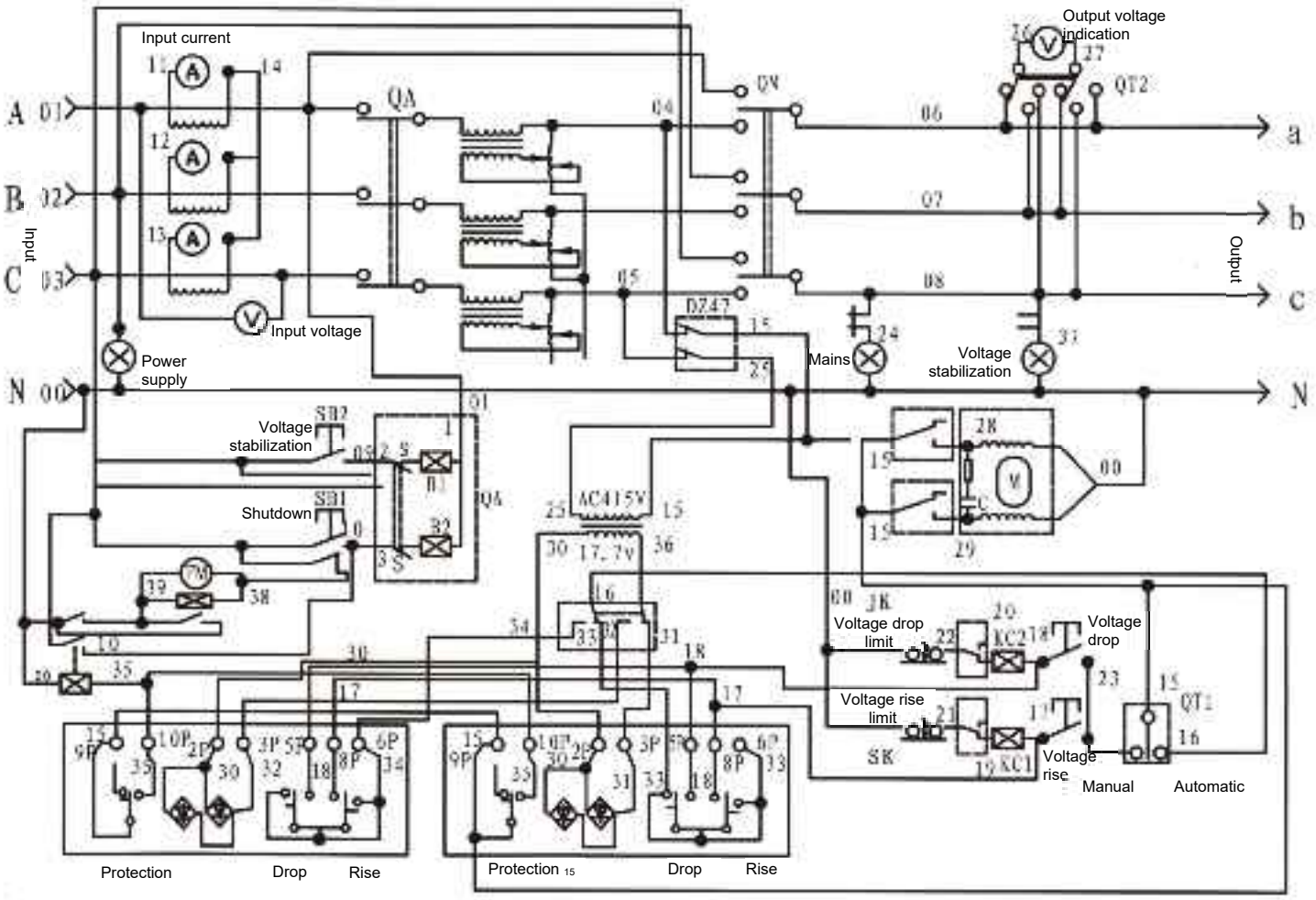


Figure VIII. Electrical schematic diagram of the Three-phase Automatic Compensation Power Stabilizer of SBW-30kVA~400kVA

Main Components and Circuits

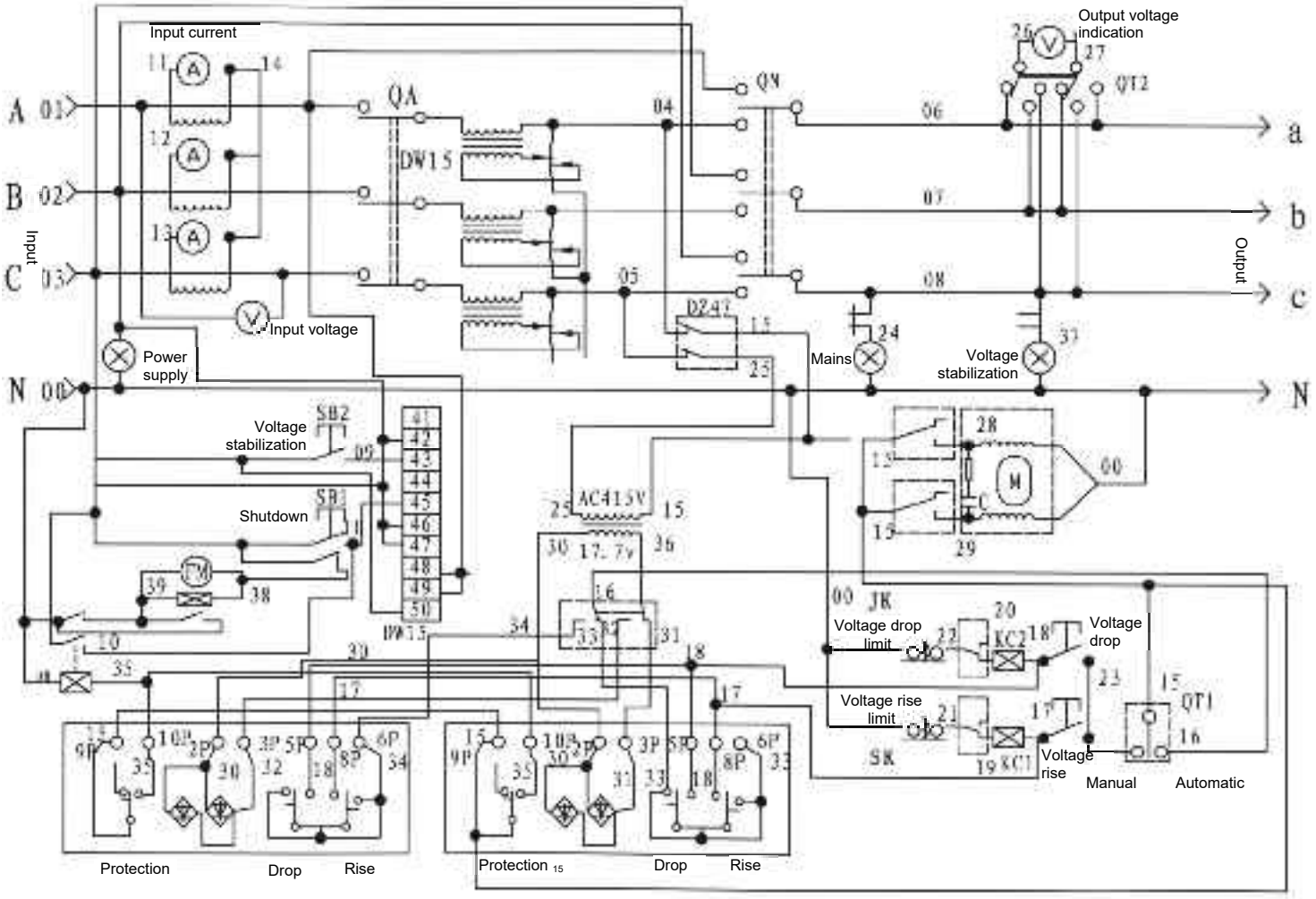


Figure IX. Electrical schematic diagram of the Three-phase Automatic Compensation Power Stabilizer of SBW-400kVA above

Trouble Shooting and Routine Maintenance

1 Trouble shooting

Fault	Possible causes	Solutions
Fail to start	1. The QA electric control switch on the main circuit is broken 2. The neutral wire is not connected	1. Replace the switch 2. Check the neutral wire
Fail to start manual control mode, no voltage adjustment function	1. The limit switch is out of order or the limit switch connecting line is off 2. The Voltage Rise/Drop button is out of order with a poor contact 3. Poor contact of motor power supply 4. Motor failure 5. The brush is stuck 6. The drive chain falls off or breaks	1. Replace the limit switch or check the connecting line 2. Replace the button 3. Connect the power line 4. Replace the motor 5. Repair the brush plate 6. Repair the chain
The regulator has no automatic adjustment function	1. The sampling transformer is damaged 2. The control circuit board is broken 3. The motor is damaged 4. The mechanical system fails 5. Load feedback of high harmonic	1, 2, 3, 4: Repair or replace. 5. The sampling power supply shall be equipped with a filter
Output voltage of the voltage stabilizer deviates from the stabilized value	1. The regulating potentiometer RPI has no response, and RP1 or the circuit board is broken 2. The input voltage exceeds the allowable range of the voltage stabilizer	1. Replace the circuit board or calibrate the potentiometer 2. The input voltage can work within the allowable range
Output voltage oscillation	The output voltage accuracy is too high	Regulate the potentiometer RP3 to slightly widen the gap between the lower limit voltage and the upper limit voltage
No voltage output	1. The QA electric control switch on the main circuit is broken 2. The knife switch on the main circuit is broken	Replace the switch

Constant protection power failure	1. Start the high-power inductive load with large instantaneous current 2. The overvoltage value on the control circuit board is not properly regulated 3. The parameter values of the components on the control circuit board change	1. Reduce the inductive load or increase the overvoltage protection value 2, 3: Re-regulation or maintenance
Reduced voltage stabilizing load capacity	1. Brush damage 2. Poor contact between the brush and voltage regulating coil 3. The load is beyond the allowable range of the voltage stabilizer 4. Looseness of main loop fasteners 5. The load lead is too long and too thin	1. Replace the brush 2. Regulate the spring pressure and position of the brush 3. Lighten the load 4. Tighten the fasteners of the main loop 5. Reduce lead voltage drop, shorten the lead distance and increase the lead cross section

2. Daily service and maintenance

During use, patrol the working state of the voltage stabilizer regularly, check whether the temperature rise of the compensation transformer and the contact voltage regulator is normal, whether the load current exceeds the rated value, whether the input and output voltages are within the specified requirements, whether the voltage regulating system and the rotating structure (including the transmission chain, sprocket and deceleration rotating system) work normally, whether the carbon brush holder is in a plane and whether the contact is good. The series of problems above are the prerequisite to ensure the normal operation of the voltage stabilizer. If similar problems are found, they must be dealt with in time to avoid equipment damage.

It is recommended to maintain the voltage stabilizer every three months, and the maintenance contents include:

(1) Operating conditions before the voltage stabilizer is put into operation.

(2) The load current shall not exceed the allowable value.

(3) When the input voltage is within the allowable range and the output voltage is unstable, it shall be checked immediately (to find out the cause of the fault and eliminate it).

(4) The voltage stabilizer is equipped with independent split-phase control and regulation function, and the imbalance of input voltage will occur at the output terminal. If the split-phase regulation is required, please contact our company.

(5) Under normal operating conditions, the voltage stabilizer can run for a long time under the rated load.

(6) No special person is required to supervise the normal operation.

(7) The maintenance cycle differs according to application environments, but the longest cycle shall not exceed half a year. Maintenance shall be carried out under the condition of power off. The maintenance may include:

★ Remove the dust and dirt from all parts of the voltage stabilizer, especially brushes, exposed parts

(slideways) contacting the voltage stabilizer, brush sliding guide rails and variable speed transmission mechanism, which must be scrubbed with (gasoline) or cotton cloth.

★ Replace the worn or damaged brush sheets.

★ The existing faulty or damaged components must be repaired or replaced in time.

★ After using it for a period of time (usually 2–3 months), adjust the tightness of the chain or the clearance degree of the screw of the contact voltage regulator to make it slide freely.

Commissioning Guide

1. Check before the unpacking and energizing.

1). Whether the box is damaged during the transportation.

2). The nameplate on the voltage stabilizer shall be consistent with the model and specifications of the voltage stabilizer ordered by the buyer.

3). Whether the meter head, indicator light, button, transfer switch, compensation transformer, contact voltage stabilizer and other components on the panel are in good condition.

4). Whether the fasteners are loose, and whether the connecting wires of all parts are loose or in poor contact.

5). Whether the devices of the voltage regulating system and transmission mechanism are safe and reliable, and if there is any carbon brush dislocation or incomplete fracture, it shall be corrected and replaced in time.

2. Installation environment

1). The voltage stabilizer shall be installed in a ventilated and dry environment that does not affect the insulation of the voltage stabilizer.

2). There shall be a certain space around the voltage stabilizer to facilitate future commissioning, repair and maintenance.

3). The installation site shall be free from severe vibration or turbulence.

Commissioning Guide

3. Wiring

The specification of the power supply incoming line shall be selected by the user according to the machine capacity. The following table is for reference only.

Model (mm²)	10	16	16	35	35	35	50	70	70	90	90	120	120	Copper busbar or aluminum busbar wiring recommended				
Capacity (kVA)	30	50	60	80	100	120	150	180	200	225	250	300	350	400	500	600	800	1,000

1). The cross section of the input power line of the voltage stabilizer shall meet the current value of the corresponding capacity of the stabilizer.

2). The input power line shall be connected to the input terminal of the voltage stabilizer, and connected to Phase A, Phase B and Phase C respectively according to the color of the busbar: yellow, green and red. The output power line shall be connected to the output terminal of the voltage stabilizer, and connected to Phase A, Phase B and Phase C respectively according to the color of the busbar: yellow, green and red. The neutral wire shall be connected to the "N" terminal. The chassis enclosure shall be connected to the ground, and the ground resistance shall be less than 10 Ω.

3). For the voltage stabilizer with double-cabinet or multi-cabinet structure, busbar and secondary circuit between cabinets must be connected according to the color number.

4. Check the wiring

The first and most important task of the commissioning personnel is to check the wiring, which is the key to ensure the reliable operation of the voltage stabilizer and must be done carefully. Detailed work includes:

1). Check whether the main circuit wiring is firm and reliable, especially whether the contacts of the QA electric control switch, QN knife transfer switch and KM contactor are loose and tighten them if loose.

2). Check whether the contact wires of all electrical components on the panel, such as ammeter, voltmeter indicator light, button and transfer switch, are in virtual connection, and reconnect them if needed.

3). Check whether the control circuit board is in virtual connection, and solder it again if needed.

4). Check whether the control circuit of the electric control switch and the C45 power switch of the motor are closed; if not, please close the control switch of the electric control circuit first.

5. No-load energizing inspection and commissioning

1). After energizing, the input voltmeter has readings, and the power indicator lights up, that is, the input power is energized.

2). Set the "Manual"/"Automatic" selector switch (QT1) on the panel to the "Manual" position.

3). The QN knife switch is in the "Voltage Stabilizing" position, and the voltage stabilizer is in the no-load state. Turn on the power supply and close the electric control switch QA. If the voltage stabilizing indicator on the panel lights up and the output voltmeter has readings, it means that the energizing test of the output power supply is completed.

4). According to the reading of the output voltmeter, press the "Voltage Rise" button SA or "Voltage Drop" button JA, and the pointer of the output voltmeter will also rise or drop. When the brush reaches the bottom, the contacts of the travel switches SK and JK can be opened by themselves, that is, the manual voltage regulation test is completed.

5). Put the "Manual"/"Automatic" switch in the "Manual" position, then press the SA "Voltage Rise" button to make the output voltage reach 410 V, and then transfer the QT1 switch to the "Automatic" position to restore the output voltage of the stabilizer to about 380 V, which is the voltage rise test. The method of the voltage drop test is the same as that of the voltage rise test. The success of these two tests means the automatic voltage regulation test is completed.

6). When the QN knife switch is placed in the "Mains" position, the output voltage is the through voltage of the power grid. When the voltage stabilizing system fails, the QN knife switch can be placed in the "Mains" position to use the power grid voltage in an emergency.

7). When the QA electronic control switch is closed, whether the QN knife switch is in the "Voltage Stabilizing" or "Mains" position, the voltage stabilizing lamp on the panel is on, and the output voltage is determined by the position of the QN knife switch. When the QA electronic control switch is switched off, the QN knife switch is in the voltage stabilizing position, and there is no output voltage. When the QN knife switch is in the “Mains” state and the “Mains” indicator light is on, the voltage stabilizer is in the “Mains Through” state. The commissioning rules of voltage stabilizers above 400 kVA are the same as those described above. The commissioning method of three-phase split-regulated voltage stabilizers are the same as that of three-phase unified-regulated ones, except that three-phase unified-regulated voltage stabilizers adopt unified sampling and share a set of voltage regulation system, while three-phase split-regulated voltage stabilizers adopt three-phase independent sampling, and each phase has its own independent voltage stabilization system. The split-regulated voltage stabilizers are used to achieve the best voltage stabilization effect when the power grid voltage or three-phase load is imbalanced.

6. Load operation

When commissioning, the load must be added step by step. Observe whether the temperature of the brush of the contact voltage stabilizer is abnormal, so as to prevent the overload. The load of the voltage stabilizer shall not exceed 80% of the rated value. The voltage stabilizer has the highest efficiency and reliability at this time. If the load is too high, it is required to gradually increase the load in this application situation, so as to prevent heavy current starting, as the excessive impulse current will damage the voltage stabilizer.

7. Function, arrangement and adjustment of components on the control circuit board

KC3 is an overvoltage/undervoltage protection relay. When the voltage stabilizer fails or the power grid has a too high/low voltage, so that the output voltage exceeds 430 V or is lower than 330 V, the KC3 Relay acts (only lights up for overvoltage and undervoltage) to cut off the power supply of the voltage stabilizer output and give an alarm sound. The Potentiometer RP2 can be set with the undervoltage value and the Potentiometer RP4 can be set with the overvoltage value.

Commisioning Guide

KC1 is a voltage rise relay. When the output voltage of the stabilizer is lower than the rated voltage range, the KC1 Relay acts (the UP indicator light is on). At this time, the servo motor gets a signal, and the motor rotates to drive the brush, so that the output voltage is adjusted to 380 V, KG1 is released, and the automatic voltage regulation process ends.

KC2 is a voltage drop relay. When the output voltage of the stabilizer is higher than the rated voltage range, the KC2 Relay acts (the DW indicator light is on). At this time, the servo motor gets a signal, and the motor rotates to drive the brush, so that the output voltage is adjusted to 380 V, KG2 is released, and the automatic voltage regulation process ends.

RP1 is an output reference voltage setting potentiometer, with the regulation mode below: Make the stabilizer in the no-load operation state. First regulate RP3 to the minimum (clockwise) and then rotate RP1 counterclockwise to increase the output voltage, or rotate it clockwise to decrease the output voltage.

RP3 is a voltage stabilizing accuracy regulating potentiometer: When users rotate RP3 counterclockwise, the voltage stabilizer accuracy tends to 1% direction; when users rotate RP3 clockwise, the voltage stabilizer accuracy tends to 5% direction.

Accessories

1). Instruction (×1)

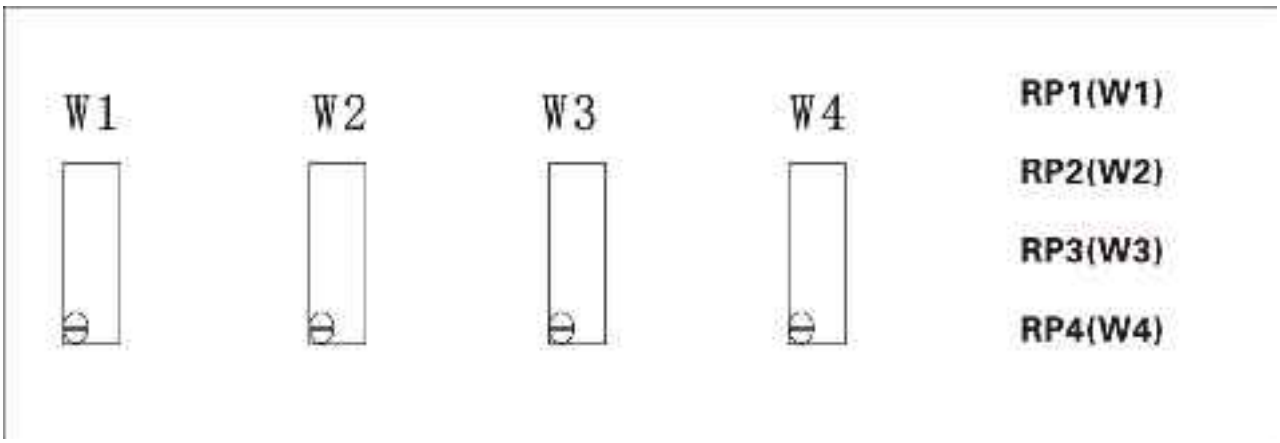
2). Warranty Card (×1) and Certificate (×1)

Ordering Information

1. When ordering, the model, specification, rated output voltage, stable range, voltage stabilization accuracy and routing mode of incoming and outgoing lines shall be stated.
2. If you have special requirements, please contact the technical department of our factory first to get comprehensive professional technical advice. We will serve your company as always.

Circuit Board Regulation Diagram

1. Appendix:



1. W1: Output voltage regulation potentiometer. Rotate it clockwise to decrease the voltage, and rotate it counterclockwise to increase the voltage.
2. W2: Undervoltage protection regulation potentiometer. Rotate it clockwise to increase the protection voltage, and rotate it counterclockwise to decrease the protection voltage. (No undervoltage protection after completely counterclockwise regulation).
3. W3: Accuracy regulation potentiometer. Rotate it clockwise to decrease the accuracy, and rotate it counterclockwise to increase the accuracy.
4. W4: Overvoltage regulation potentiometer. Rotate it clockwise to increase the protection voltage, and rotate it counterclockwise to decrease the protection voltage. (No overvoltage protection after completely clockwise regulation).

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