Operator's Manual

ZD5(D) Power source

Save for future reference.

Date Purchased

Code:(ex: ZD5(D)-1000)

Serial:(ex: D1234567)

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THANK YOU FOR SELECTING A QUALITY PRODUCT BY HYWD.

PLEASE EXAMINE CARTON AND EQUIPMENT FOR DAMAGE IMMEDIATELY

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

SAFETY DEPENDS ON YOU

HYWD arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part.
DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.
And, most importantly, think before you act and be careful.

⚠ WARNING

This statement appears where the information must be followed exactly to avoid serious personal injury or loss of life.

⚠ CAUTION

This statement appears where the information must be followed to avoid minor personal injury or damage to this equipment.

KEEP YOUR HEAD OUT OF THE FUMES.

DON'T get too close to the arc. Use corrective lenses if necessary to stay a reasonable distance away from the arc.
READ and obey the Safety Data Sheet (SDS) and the warning label that appears on all containers of welding materials.
USE ENOUGH VENTILATION or exhaust at the arc, or both, to keep the fumes and gases from your breathing zone and the general area.
IN A LARGE ROOM OR OUTDOORS, natural ventilation may be adequate if you keep your head out of the fumes (See below).
USE NATURAL DRAFTS or fans to keep the fumes away from your face.
If you develop unusual symptoms, see your supervisor. Perhaps the welding atmosphere and ventilation system should be checked.

WEAR CORRECT EYE, EAR & BODY PROTECTION

PROTECT your eyes and face with welding helmet properly fitted and with proper grade of filter plate.
PROTECT your body from welding spatter and arc flash with protective clothing including woolen clothing, flame-proof apron and gloves, leather leggings, and high boots.
PROTECT others from splatter, flash, and glare with protective screens or barriers.
IN SOME AREAS, protection from noise may be appropriate.

BE SURE protective equipment is in good condition. Also, wear safety glasses in work area **AT ALL TIMES.**

SPECIAL SITUATIONS
DO NOT WELD OR CUT containers or materials which previously had been in contact with hazardous substances unless they are properly cleaned. This is extremely dangerous.
DO NOT WELD OR CUT painted or plated parts unless special precautions with ventilation have been taken. They can release highly toxic fumes or gases.
Additional precautionary measures
PROTECT compressed gas cylinders from excessive heat, mechanical shocks, and arcs; fasten cylinders so they cannot fall.
BE SURE cylinders are never grounded or part of an electrical circuit.
REMOVE all potential fire hazards from welding area.
ALWAYS HAVE FIRE FIGHTING EQUIPMENT READY FOR IMMEDIATE USE AND KNOW HOW TO USE IT.

SECTION A: WARNINGS

- **Always start and operate the engine in a well-ventilated area.**
- **If in an exposed area, vent the exhaust to the outside.**
- **Do not modify or tamper with the exhaust system.**
- **Do not idle the engine except as necessary.**

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY.
PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.
BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

ELECTRIC AND MAGNETIC FIELDS MAY BE DANGEROUS

Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF).
Welding current creates EMF fields around wel ding cables and welding machines
EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.
Exposure to EMF fields in welding may have other health effects which are now not known.

All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:
Route the electrode and work cables together - Secure them with tape when possible.
Never coil the electrode lead around your body.
Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.
Connect the work cable to the workpiece as close as pos- sible to the area being welded.
Do not work next to welding power source.

ELECTRIC SHOCK CAN KILL

The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.
Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- Semiautomatic DC Constant Voltage (Wire) Welder.
- DC Manual (Stick) Welder.
- AC Welder with Reduced Voltage Control.

In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.
Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.
Ground the work or metal to be welded to a good electrical (earth) ground.
Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.
Never dip the electrode in water for cooling.
Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.
When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

ARC RAYS CAN BURN.

Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding.
Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

Protect other nearby personnel with suitable, non-flammabl e screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES CAN BE DANGEROUS.

Welding may produce fumes and gases hazardous to health.
Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. When welding hardfacing (see instructions on container or SDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and within applicable OSHA PEL and ACGIH TLV limits using local exhaust or mechanical ventilation unless exposure assessments indicate otherwise. In confined spaces or in some circumstances, outdoors, a respirator may also be required.

Additional precautions are also required when welding on galvanized steel.
The operation of welding fume control equipment is affected by various factors including proper use and positioning of the equipment, maintenance of the equipment and the specific welding procedure and application involved. Worker exposure level should be checked upon installation and periodically thereafter to be certain it is within applicable OSHA PEL and ACGIH TLV limits.
Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.
Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.
Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the Safety Data Sheet (SDS) and follow your employer’s safety practices. SDS forms are available from your welding distributor or from the manufacturer.

WELDING AND CUTTING SPARKS CAN CAUSE FIRE OR EXPLOSION

Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines.

CYLINDER MAY EXPLODE IF DAMAGED.

Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

SAFETY

Have a fire extinguisher readily available.

Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to “Safety in Welding and Cutting” and the operating information for the equipment being used.

When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”,

Vent hollow castings or containers before heating, cutting or welding. They may explode.

Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

Do not use a welding power source for pipe thawing.

CYLINDER MAY EXPLODE IF DAMAGED.

Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operat ions and any other source of heat, sparks, or flame.

Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a cylinder.

Keep your head and face away from the cylinder valve Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l.

FOR ELECTRICALLY POWERED EQUIPMENT.

Turn off input power using the disconnect switch at the fuse box before working on the equipment.

Install equipment in accordance with the National Electrical Code, all local codes and the manufacturer’s recommendations.

Ground the equipment in accordance with the National Electrical Code and the manufacturer’s recommendations.

Contents

1. Introduction

ZD5(D) series power source includes ZD5(D) - 1000 and ZD5(D) -: 1250, which are mainly applicable to submerged arc welding and electroslag welding and can also be used for carbon arc gas generation, cast steel insulation, etc., meeting the requirements of GB15579.1-2013. The ZD5(D) series power source adopts the soft start mode. The main AC contactor is controlled by the panel button switch SB1. At this moment, the main transformer and thyristor have withstood the working voltage. The control signal and trigger pulse are controlled by the welding control box. In this way, the main AC contactor can be switched without current, which can greatly improve the service life and reduce the impact on the power grid. It has the characteristics of convenient operation, simple maintenance, and high reliability.

2. Working Environment and Conditions

2.1. Environmental temperature: -10℃—40℃

2.2. Height above sea level: ≤1000M

2.3. Up to 90% relative humidity and the minimum temperature 25℃ on average in every month.

2.4. No gas, steam, chemical deposition, dust and mildew and other combustible materials which will influence the welding equipment are around the equipment.

2.5. The equipment should be put in Dry and Ventilated Place, preventing it from irradiation and rain.

3. **Technical** Parameters

Model	ZD5 (D)-1000	ZD5 (D)-1250
Input power (3 Phase)	220/60Hz 380V/50/60Hz 415V/50/60Hz 440V/60Hz	220/60Hz 380V/50/60Hz 415V/50/60Hz 440V/60Hz
Rated duty cycle	100%	60%
Open circuit Voltage (V)	58	58
Rated welding Voltage(V)	44	44
Rated welding Current (A)	1000	1250
Current range (A)	200-1000	250-1250
Rated input capacity (KVA)	55	68
Rated input current (A/V)	102/380	124/380
Air breaker capacity (A/V)	160/380	160/380
Dimension (mm)	780×660×1400	780×660×1400
Weight (kg)	440	440

Note:

1. Cooling system adopts exhaust fan cooling mode.
2. No electric unit except control transformer and fans.
3. Insulated class: F

4. Structure and Functions

4.1. Structure and feature

ZD5 (D) series power source mainly consists of main transformer, rectifier, reactor, control board, machine frame, control panel, input and output ends (Sketch 1).

4.1.1. **Main transformer**: 3 phase dry wind cooling unit, can drop voltage and segregate.

4.1.2. **Rectifier**: 3 phase half-control bridge mode rectifying, consists of 3 SCR, 12 diodes, 3 extending current diodes and control the output power of arc-welding rectifier

4.1.3. **Reactor**: Dry wind cooling unit, can limit current and filtrate wave.

4.1.4. **Control board**: Supplying control power and realizing closed loop control of welding criterion.

4.1.5. **Panel**: For operation and parameters display (Sketch 2).

PV (Voltage meter): Displaying actual welding voltage, V.

PA (Current meter): Displaying actual welding current, A.

SA1 (Selective switch): Switch of welding modes. Can realize Submerged-arc welding, Carbon arc air gouging and electroslag welding.

RP5 (Potentiometer): Adjusting current criterion when carbon arc air gouging.

SB1 (Start-up button): Can switch on the main loop, if the green lamp is on, the main loop is switch on, otherwise the main loop is switch off.

SB2 (Stop button): Can switch off the main loop, if the red lamp is on, it electrifies the power source.

HL1: (abnormal lamp):the lamp is alight when equipment is abnormal and the output is cut off. The lamp is off when there is no error in equipment.

4.1.6. **Input end**: Connect with the 3 phase 380V electric net(Or customize the voltage), the earth bolt behind the rectifier must be earthed reliably, and the cross section of the earth cable should ≥16mm^2.

4.1.7. **Output end (+) (-)**: Connect with positive and negative welding cable.

4.1.8. **Others**:

Fan: It is used for cooling the rectifier.

Temperature relay: When the rectifier is overheated, it will automatically break the electricity for protection.

AC contactor: Can control the 3-phase switch on/off of the main power source.

Control transformer: Supporting control power source, realizing electrical seclusion between the strong and weak electricity.

4.2. Working principle

Rectifier consists of main circuit and control circuit (Sketch 3).

Main circuit is 3 phase half-control bridge SCR rectifier. The anode of diode has been connected, it is called “share anode group”, the cathode of SCR VT33-VT35 has been connected together, it is called “share cathode group”, can adjust output DC voltage through adjusting SCR open angle.

The core of control circuit is control board (Sketch 3), the current signal from the diffluence unit or the voltage signal from the output end, after having been amplified and synthetically compared with the appointed signal and then output the spring pulse which can be adjusted by spring angle, open angle of SCR control can maintain the invariableness of current and voltage, so arc-welding rectifier has the stable output characteristic (Sketch 4: rectifier wiring)

5. Location

5.1. Winging rings are equipped on the welding tractor whish can realize swinging.

5.2. Welding tractor is packed by wooden case which realizes forklift conveying.

5.3. Shelter and the dry ventilated place is necessary, the temperature should be:-25℃~+55℃.

6. Installation and commissioning

Please firstly read this operator's manual carefully and check if all the accessories are complete.

6.1. Install and connect the arc-welding rectifier as per Sketch 7, the distance between the vent and the wall≥800mm, the distance between the power source and the wall≥100mm.

6.2. Earth the cover of the arc-welding rectifier (on the earthed mark, the cross section of the earth cable should ≥16mm^2)

6.3. 3 phase power source incoming lines enter into the rectifier through the air switch, the technical parameters of the air switch capacity is as per the arc-welding rectifier's requirement (Connect with the 3 phase 380V electric net, the earth bolt behind the rectifier must be earthed reliably, otherwise it can not run well and cause some part overheated)

6.4. Use a welding cable to connect the "+"output end of the arc-welding rectifier with the welding torch or welding clamp, as per the actual requirement, when connect with the positive welding cable, you can select 2 positive output: 500A or 1000A/1250A, use another welding cable to connect the "-" output end with the welding work piece (Note: All the bolts must be fixed, be sure the work piece and the cable are all connected together well).

Attention:

- The machine frame must be earthed reliably.
- Positive output end should be used correctly.
- All the connection parts must be screwed well.
- SA1 selective switch should be used correctly.
- High voltage inside, the maintenance should be handed by qualified personnel.
- Lack of phase is prohibitive.
- The arc-welding rectifier is prohibitive to start up under direct output end short.
- If the fan doesn't work after start-up, operation is prohibitive.
- 3 phase electrical net wave is over ±10%, operation is prohibitive.
- Cable bending and binding by wire should be avoided.

7. Use and operation.

Before the operation of the power source, please carefully check if the installation and connection is correct.
Switch on the air switch, the red lamp of the “stop” button SB2 on the rectifier panel is on.
As per your welding mode requirement, set the selective switch SA1 to the relevant position, if you want to realize Carbon arc air gouging, please set SA1 to “Carbon arc air gouging”, adjust the potentiometer RP on the arc-welding rectifier, this can realize rectifier output adjustment. Press “Start-up” SB1 (SB1 green lamp is on, meanwhile SB2 red lamp is off, fan starts working, open voltage is displayed on the voltage meter), the arc-welding rectifier can work normally.

If you want to realize other welding mode, set SA1 to the relevant position (Note: If choose “submerged-arc welding” or “electroslag welding”, the potentiometer in the rectifier is invalid, you can only adjust by the welding process controller), start up arc-welding rectifier, but there is no voltage display on the voltage meter, until you press “Weld” or “Start-up” on the welding process controller.

If the operation above is not correct, please carefully read Troubleshooting and repair.

8. Maintenance

8.1. Clean the dust termly.

8.2. Check the insulate state: use megohm meter (500V) to survey.

a. The main transformer side versus output end resistance ≥ 5 M Ω.

b. The main transformer side versus ground resistance ≥ 2.5 M Ω.

c. The output end versus ground ≥ 2.5 M Ω.

8.3. Take apart the AC contactor, check if the touch point is broken, if yes, please make the replacement.

8.4. Check diode and SCR:

Use a multimeter to survey out the resistance between output ends, it should be around 100 Ω.

Take apart left and right-side plate, use a multimeter to survey out the resistance value between the cathode and anode of the SCR and diode. Sketch 3: Main loop of arc-welding rectifier. When you survey SCR, if “+” is on the common negative point, the display of multimeter is around 400Ω when “-” is at 104, 105 or 106. If “-” is on the common negative point, the display of multimeter is infinite when “+” is at 104, 105 or 106, this means SCR is perfect. Whereas, if the resistance of “+”, “-” is 0, SCR is broken. When you survey diode, if “+” is on the common positive point, the display of multimeter is around 300Ω when “-” is at 104, 105 or 106, if “-” is on the common positive point, the display of multimeter is infinite when “+” is at 104, 105 or 106, this means the diode is perfect, whereas the diode is broken. Extending current diode consists of VD36, VD37 and VD38 through parallel connection, you should take apart it for survey to see if it is broken.

9. Troubleshooting

Trouble	Cause	What to do
After start-up, the fan doesn't working, the lamp can not be on.	3 phase electricity is lack of phase.	Check power supply system and eliminate.
	Fuse is burned-out.	Replace it.
	Fan is broken.	Replace it.
	Lamp is broken.	Replace it.
Can not start up.	Start-up button or relevant connection has problem.	Check SB1 button and the connection with KA1.
	Contactor or relay KA1 is broken.	Replace it.
No welding voltage.	KA2 loop doesn't work.	Check KA2 loop and eliminate
	PC board is broken.	Repair or replace it.
Welding voltage is too low.	PC board is broken.	Repair or replace it.
	3 phase electricity is lack of phase.	Check power supply system and eliminate.
Output voltage can not be adjusted or is not equality.	Adjusting potentiometer touch point contact is invalid.	Replace potentiometer.
	PC board is broken.	Repair or replace it.
Output voltage is abnormal	Main SCR or diode is broken.	Replace it.
	PC board is broken.	Repair or replace it.

Note:
If you meet the troubles which you cannot eliminate, please contact with our after-sale service department.

Control circuit board maintenance

Please use an oscillograph or multimeter to check if AC 18V is normal, 101-103 and 102-103 is 18V, 101-102 is 36V.

Please use an oscillograph or multimeter to check if ±15V is normal. If there is problem, firstly please check if VD1 or VD2 is broken and N1-N5 is earthed short and eliminate, then check if 7815 or 7915 is normal.

Please check if 3 phase synchronized signal is normal, between 104, 105 and 106 it should be AC 45V.

After start-up if there is no open circuit voltage, firstly please check if R46 (8W/3K) is broken under no power after eliminating outer abnormal. If it is broken, please replace.

Please use an oscillograph to survey if the earthed synchronized signals (sawtooth wave) of C5, C6 and C7 are normal or accordant. If there is no sawtooth wave, the relevant photovoltaic coupling unit is possibly broken, you should replace it. If use a multimeter to survey, these 3 voltage should be accordant, you can use photovoltaic coupling interconvert balance to check if the voltage is normal.

NA output end (VD14 anode) should be -15V in normal, only when current is over limited value, the signal has been changed to +13V around, so you can check if it is normal or N4 is broken.

Set the switch on the panel to “Carbon arc air gouging”, press SB1 to start up arc-welding rectifier, adjust the potentiometer, 138-point earthed voltage can changed from 0-15V, this means the signal is normal. Meanwhile, N5 output should be negative voltage, 14 feet output voltage of N3 should be -0.7V around.

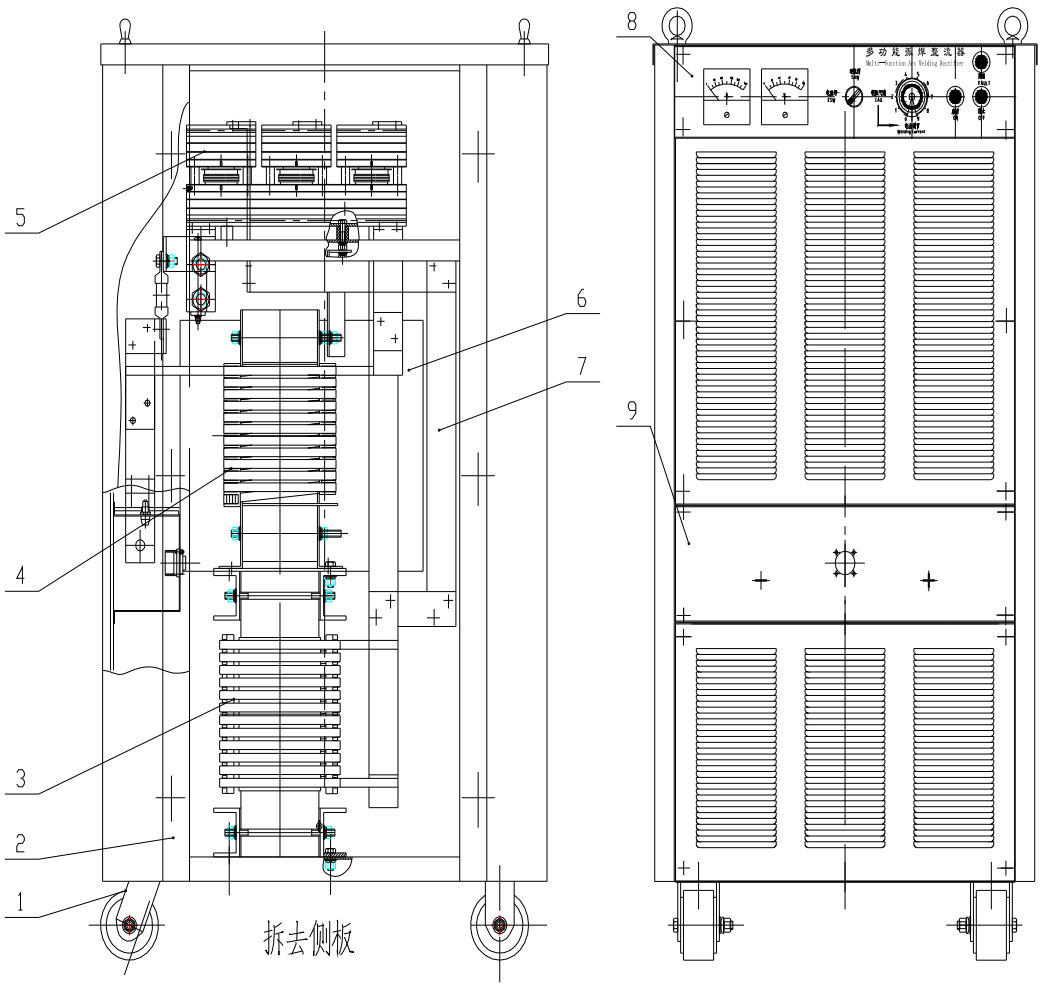
Adjust the middle output end voltage of RP3 to 7.5V-8V, meanwhile the voltage should be a little lower than peak value voltage of C5-C7 sawtooth wave.

Please use an oscillograph to survey C12, C11 and C10 earthed signal, it should be needle pulse spring signal, if not, the N2 is possibly broken, please replace.

Please use an oscillograph to survey 107, 109 and 110 earthed signal, it should be needle pulse spring signal (You can cancel the survey of this connection part to avoid outer circuit interfering), the average value should be the same.

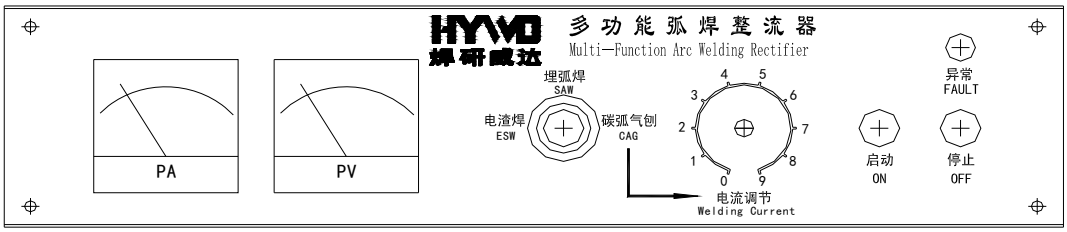
If the current and voltage has raised up at the same time can it can not be adjusted, possibly the performance of C3 and C4 is becoming not good, make parallel connection with 0.47μF/63V and 0.01μF/63V capacitance can solve this problem.

Sketch 1 ZD5（D）series power source structure

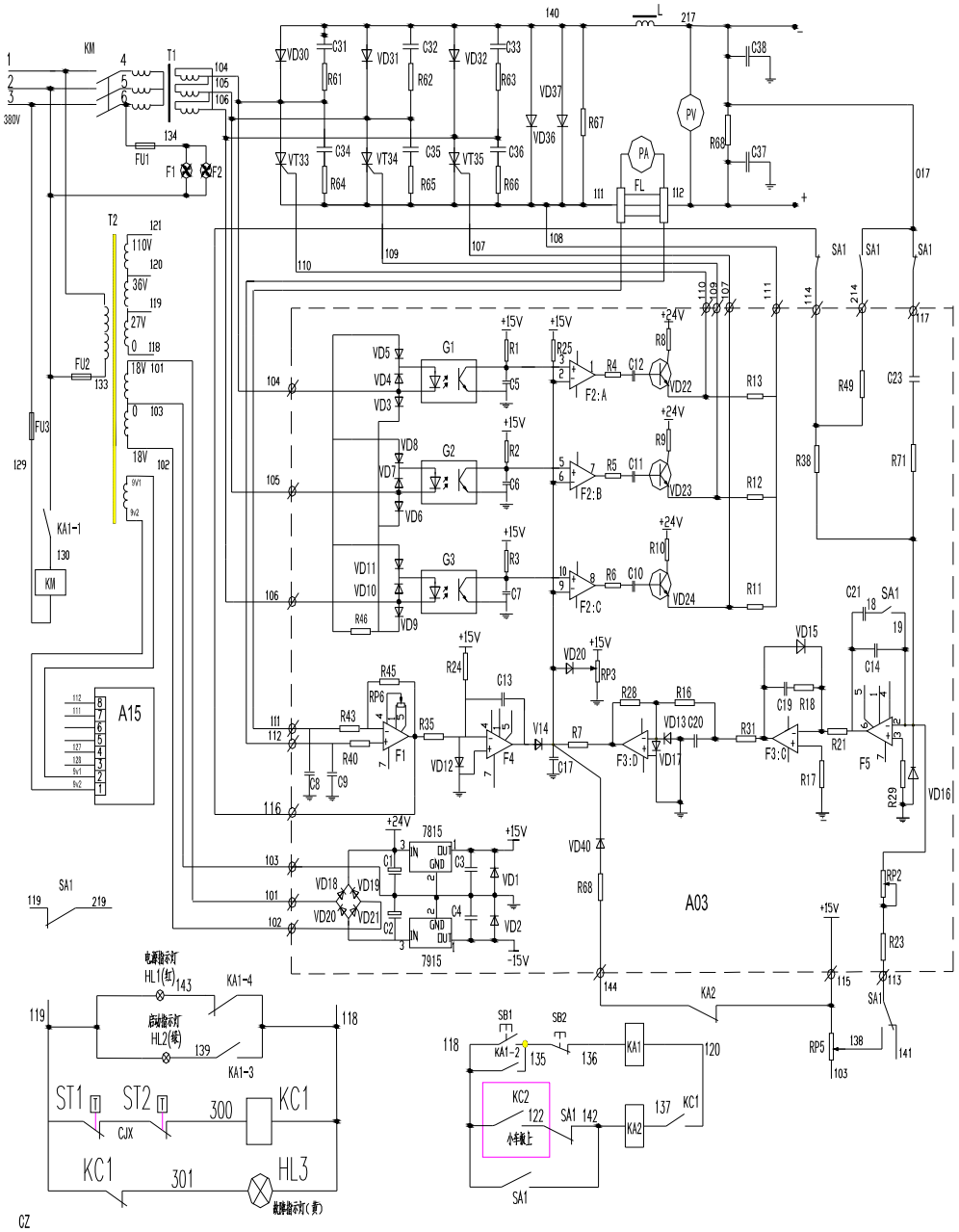


1> 脚轮 2>机架 3>主变 4>电抗器 5>整流器组件 6>控制箱 7>连接母排 8>面板 9>输出端子盒

Sketch 2 ZD5（D）series power source control panel

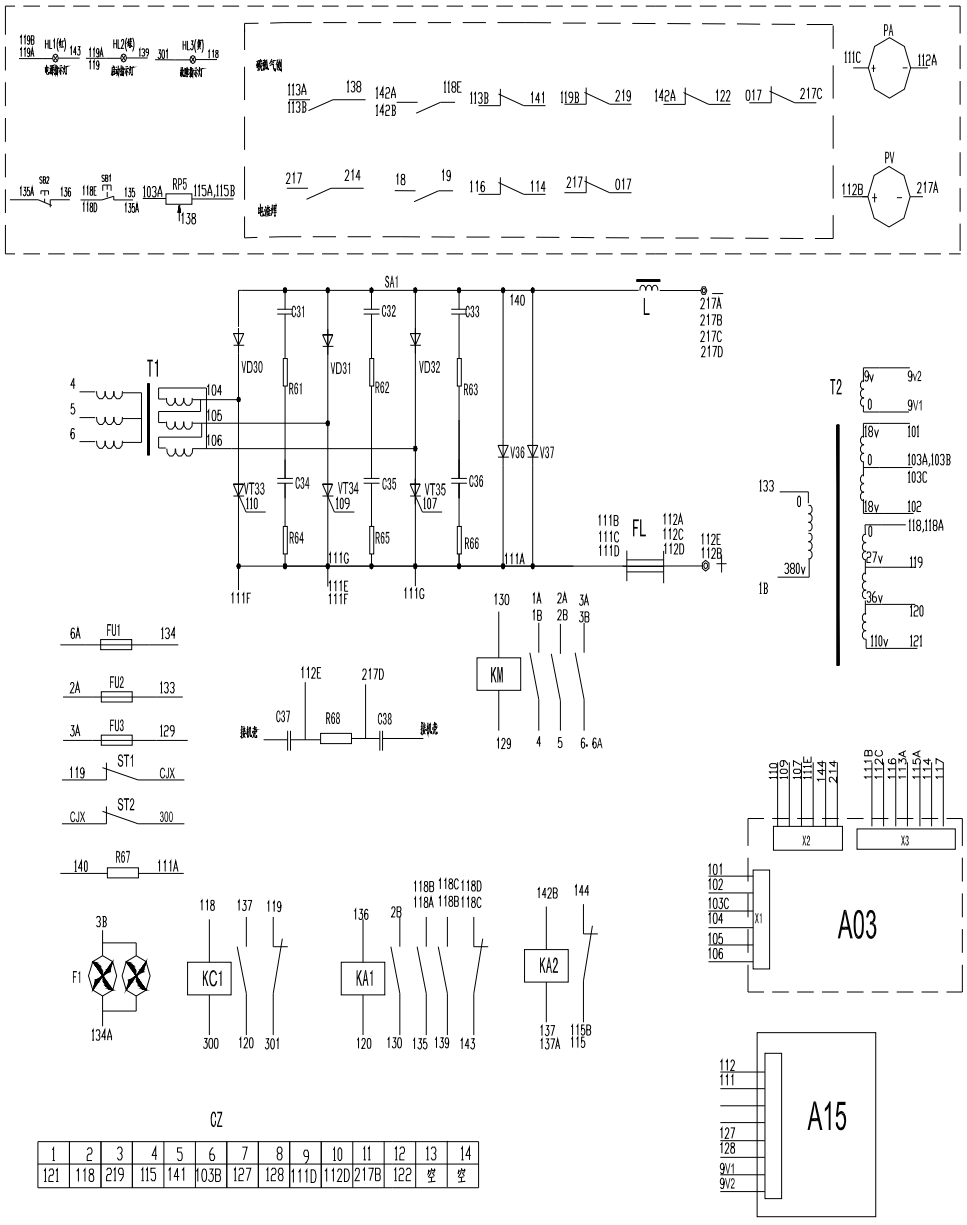


Sketch 3 ZD5（D）Series power source principle

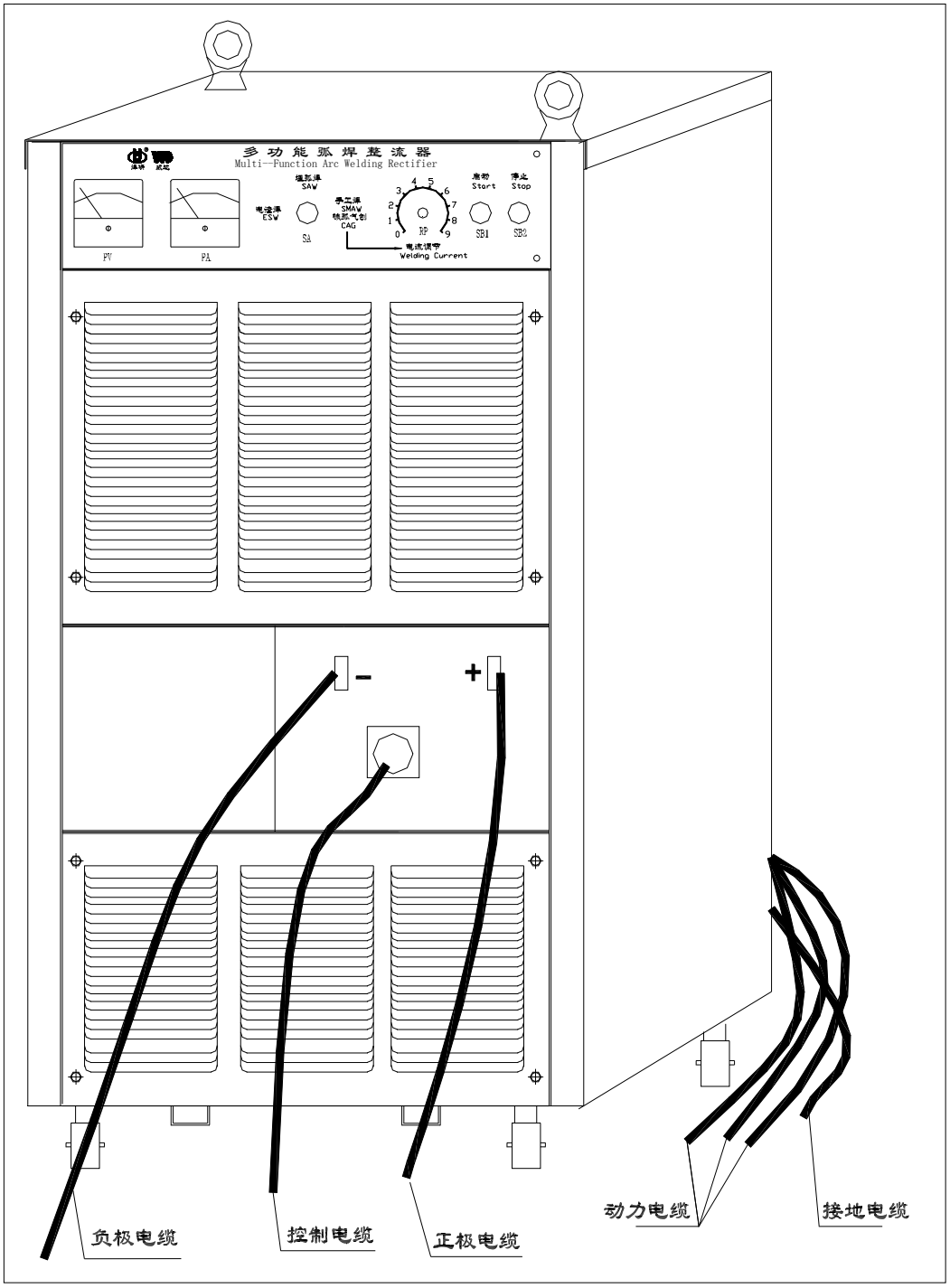


1	2	3	4	5	6	7	8	9	10	11	12	13	14
121	118A	219	115B	141	103B	127	128	111D	112D	217B	122	空	空

Sketch 4 ZD5（D）Series power source wiring

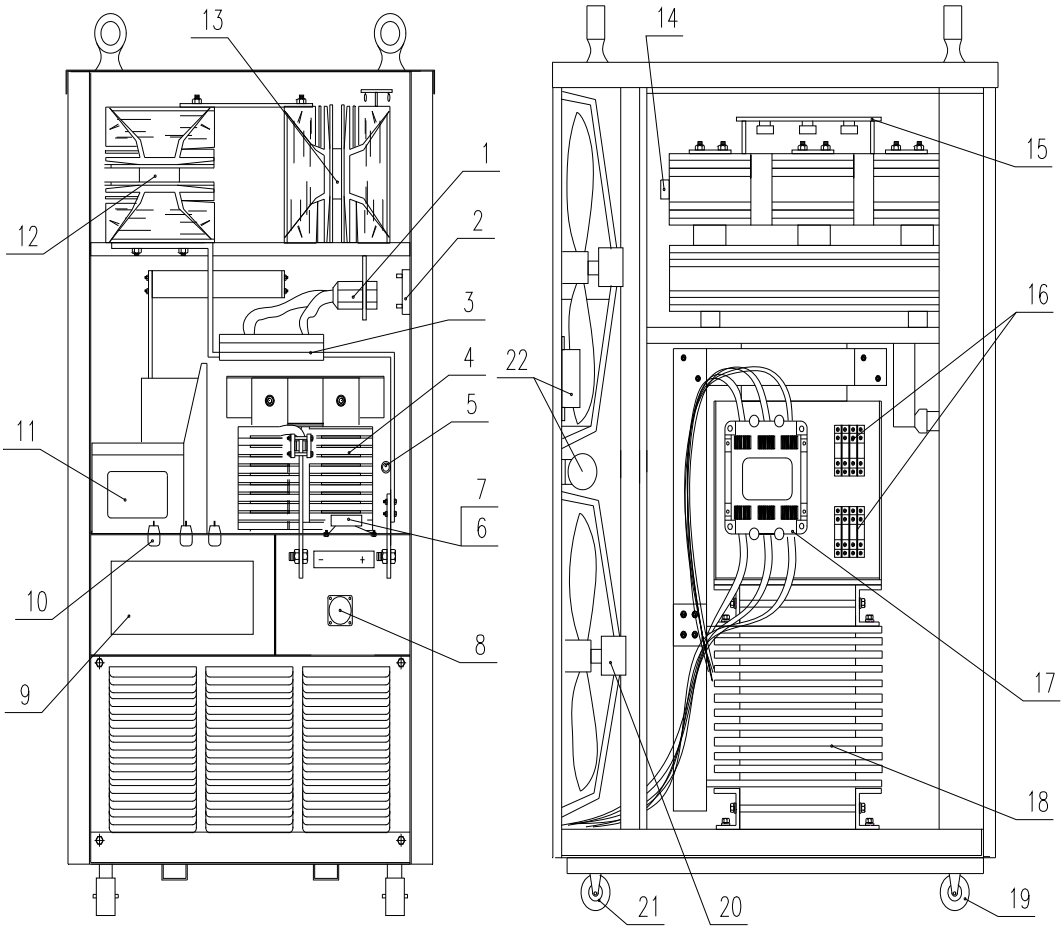


ZD5 (D) Series power source outer wiring



Spare parts list

Item	Specification	Model	Part No	Remark
1	Rectifying and extending current diode	ZP300A/1200V	ZD5（D）001	2 pieces
2	Coil resistance	RX20-50-100Ω	ZD5（D）002	
3	Diffluence unit	FL-1500A/75mV	ZD5（D）003	
4	Reactor		ZD5（D）004	
5	Reed relay	A15	ZD5（D）005	
6	Capacitor	CL-0.47μf/400V	ZD5（D）006	2 pieces
7	Pressing resistance	MYL-3-220	ZD5（D）007	
8	14 cores air plug	P32-K4A	ZD5（D）008	Sleeve base
9	Control circuit board		ZD5（D）009	
10	Burn-out unit base	R3-12	ZD5（D）010	3 pieces
11	Control transformer	BK-400	ZD5（D）011	
12	SCR	KP1000A/600V	ZD5（D）012	3 pieces
13	Temperature relay	JUC-17F-85±5℃	ZD5（D）014	
14	RC protection board		ZD5（D）015	
15	Middle relay	JZ7-44/36V	ZD5（D）016	2 pieces
16	AC contactor	CJ20-100/380V	ZD5（D）017	
17	Main transformer		ZD5（D）018	
18	Universal wheel		ZD5（D）019	
19	Fan	NEF-40Z/380v	ZD5（D）020	2 pieces
20	Directional wheel		ZD5（D）021	
21	Fan capacitor	CBB60-1μf/800V	ZD5（D）022	2 pieces
22	Panel		ZD5（D）023	
23	Button with lamp	XB2-BW34B2C	ZD5（D）024	
24	Button with lamp	XBW-BW33B1C	ZD5（D）025	
25	potentiometer	P20-4.7KΩ/2W	ZD5（D）026	
26	Knob cover	RN-99A	ZD5（D）027	
27	Conversion switch	XB2-ED21	ZD5（D）028	
28	Voltage meter	2094A90-100V	ZD5（D）029	
29	Ampere meter	2094A90-1500A/75mV	ZD5（D）030	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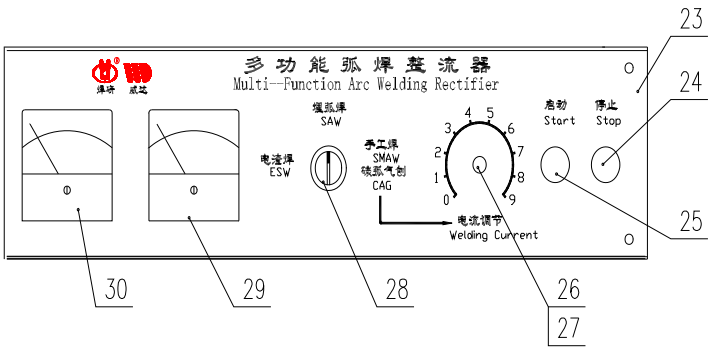
多功能弧焊整流器
Multi—Function Arc Welding Rectifier
埋弧焊
SAW
电渣焊
ESW
手工焊
SMAW
碳弧气刨
CAG
电流调节
Welding Current
启动
Start
停止
Stop
23
24
25
30
29
28
26
27