Operator's Manual

ZX7 Inverted DC Power source

Save for future reference.

Date Purchased

Code:(ex: ZX7-500)

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 operations 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.

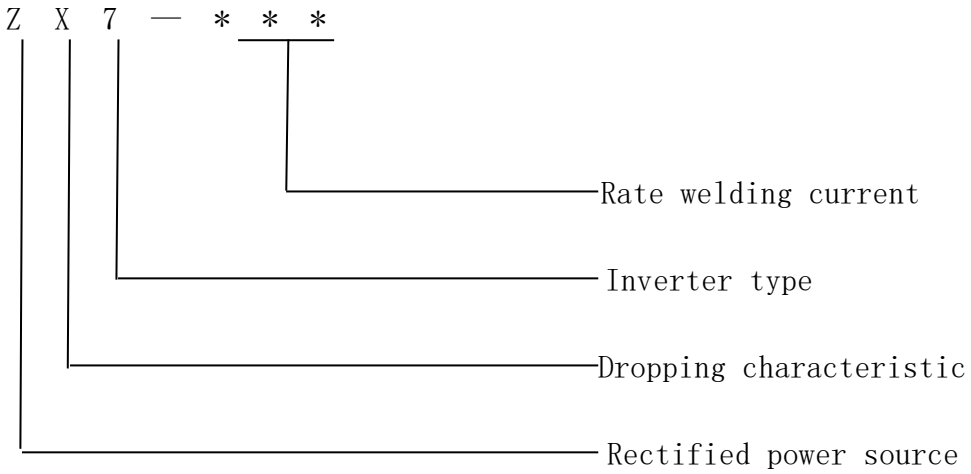
Ground the equipment in accordance with the National Electrical Code and the manufacturer’s recommendations.

Contents

1. Introduction

The ZX7 series inverter DC power source adopts advanced inverter principles and electronic circuit control methods. It is a new, efficient, and energy-saving electromechanical integrated welding equipment developed, designed, and manufactured by our company by digesting and absorbing advanced technology from similar international equipment and combining our strong technical strength. This equipment has extremely high comprehensive technical indicators and excellent welding process performance, making it an ideal replacement product for traditional high-energy welding equipment. It has the advantages of minimal volume, easy operation, high reliability/weldability, and light weight. Widely used in industries such as petroleum, chemical, power construction, boilers, containers, machinery, shipbuilding, military, aviation, etc. This welder is not only suitable for manual coating arc welding, but also suitable for cellulose electrode downward welding.

2. Model preparation instructions

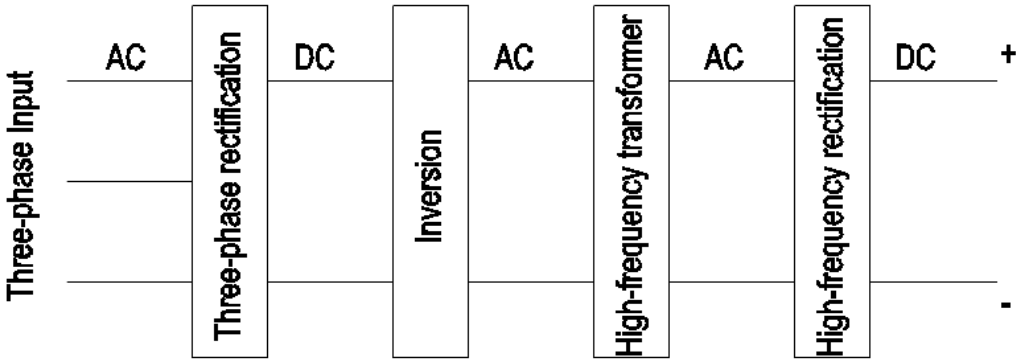


3. Technical Parameters and Working principle

Technical Parameters

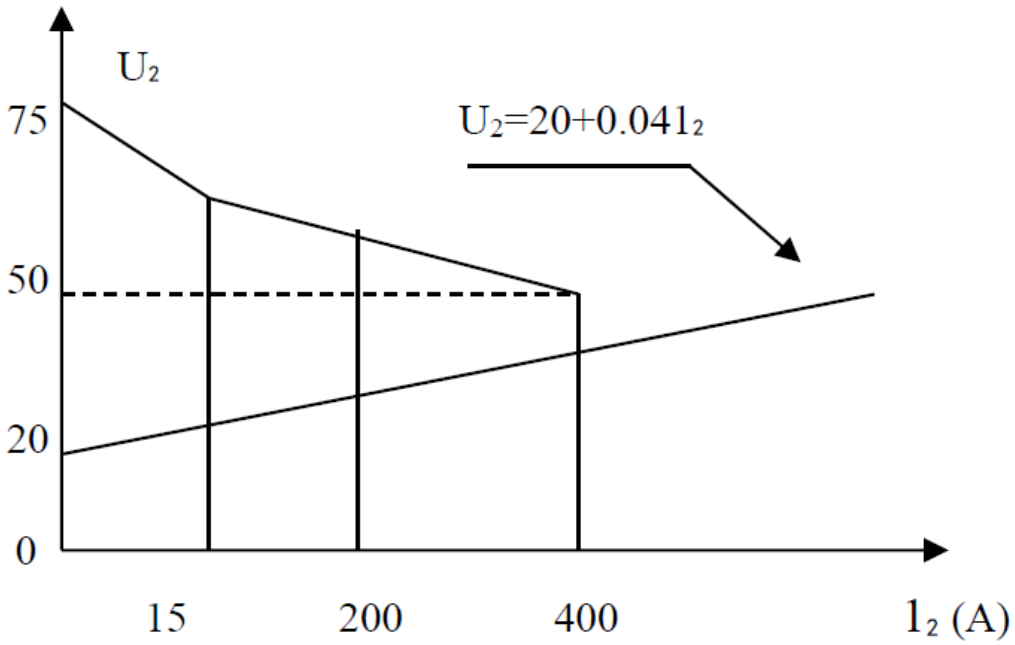
Model	ZX7-315	ZX7-400	ZX7-500	ZX7-630	ZX7-800
Input Voltage	3P 380V±10% 50HZ / 60HZ				
Rated Input Capacity	13.6KVA	19.2KVA	27.2KVA	37KVA	45KVA
Rated output current	315A	400A	500A	630A	800
Current range	30-315A	30-400A	40-500A	60-630A	80-800
Rated Duty Cycle	60%				
no-load voltage	70-80V				
Cooling method	Fan				
protection grade	IP21				
Weight	31kg	32kg	35kg	39kg	79kg
Dimensions (mm)	620×300×510	620×300×510	620×300×510	620×300×510	750×410×720
Executive standards	GB15579.1-2004				

Working principle



The input three-phase power frequency AC power is rectified and supplied to the IGBT inverter to become high-frequency AC power. Then, it is reduced by a high-frequency transformer, rectified, filtered, and output DC. Through such frequency conversion processing, the volume and weight of the transformer are greatly reduced, and energy consumption is reduced; Through current feedback, closed-loop control of the entire machine is achieved to achieve excellent welding performance.

The output characteristics of the ZX7 series inverter power source:

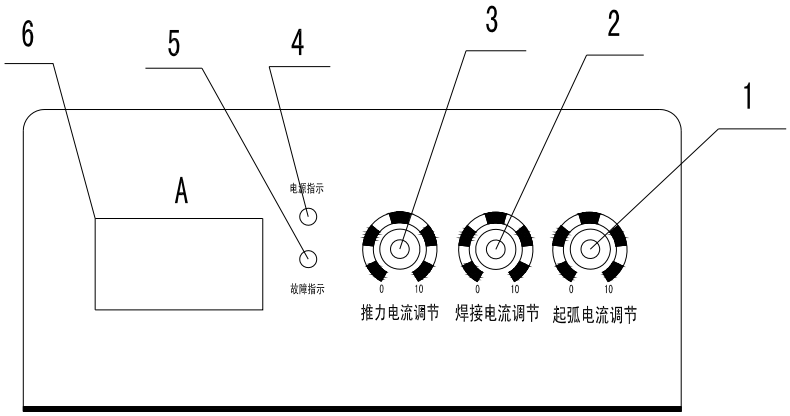


4. Main components

Material name	Specification				
	ZX7-315	ZX7-400	ZX7-500	ZX7-630	ZX7-800
Air Switch	DZ47-C63A	DZ47-C63A	DZ47-C63A	DZ47-C63A	DZ47-C100A
Fan	200FZY2-D	200FZY2-D	200FZY2-D	200FZY2-D	250FZY2-D
Temperature relay	JUC75℃±3℃	JUC75℃±3℃	JU75℃±3℃	JUC75℃±3℃	JUC75℃±3℃
IGBT	LUH50G1201Z	LUH50G1201Z	LUH75G1201Z	LUH100G1201Z	LUH200G1201Z
CORE	UF94	UF94	UF94	UF94	UF94
Rectifier module	MDS75/1200	MDS75/1200	MDS100/1200	MDS100/1200	MDS150/1200
Rectifier diode	MUR20040CT	MUR20060CT	MUR20060CT	MUR30060CT	MUR30060CT

5. Function Introduction

5.1. Introduction to Analog Front Panel Functions



1) Arc starting adjustment knob: Add an arc starting current at the moment of arc starting to improve the arc starting effect.

2) Welding current adjustment knob: Adjusting this knob can change the welding current.

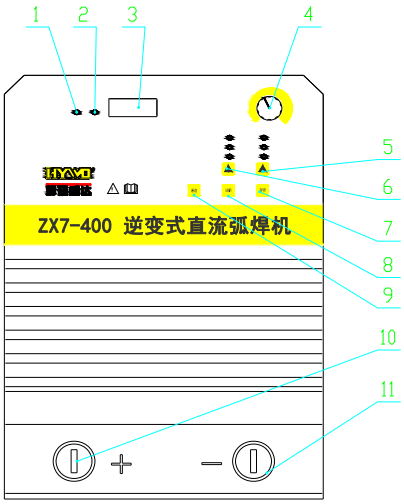
3) force adjustment knob: Adjusting this knob can increase the short-circuit current.

4) Power indicator light: When the indicator light is on, it indicates that the welding machine is powered on.

5) Abnormal indicator light: When the indicator light is on, it indicates a malfunction in the welding machine, and it must be stopped for inspection.

6) Welding current indication: Display the current level during the welding process.

5.2. Introduction to Digital Front Panel Functions



1) Abnormal indicator light: When the light is on, it indicates that the welding machine is faulty and has been stopped from use.

2) Overheat indicator light: When the light is on, it indicates that the internal temperature of the welding machine is too high. After a break, it will automatically recover.
3) Ammeter: Display current.
4) Parameter adjustment: Adjust welding parameters and set parameters.
5) Welding material selection button: Press this button to select the welding material that is consistent with the actual welding material.
6) Current selection button: Press this button to display the corresponding current on the ammeter.
7) . Store button: Store parameters.
8) Call button: Call parameters.
9) Call button: Call parameters.
10) Welding machine output positive: welding pliers.
11) Welding machine output negative: connected to the welding workpiece.
Note:
For the convenience of operation and maintenance, each welding machine should be separately equipped with an automatic switch or load switch for power supply. The capacity of automatic switches and fuses, as well as the cross-sectional area of wires used for wiring, should comply with the provisions in the table below.

Description	Specifications				
	ZX7-315	ZX7-400	ZX7-500	ZX7-630	ZX7-800
Switch capacity（A）	50	63	80	100	125
Fuse capacity（A）	30	40	63	80	100
Input wire cross-sectional area mm^2	4	4	6	10	16
Output wire cross-sectional area mm^2	50	70	70	95	120

Reference data for electrode diameter

Electrode diameter(mm)	1.5	2.0	2.5	3.2	3.2	4.0	5.0
Welding current(A)	25-40	40-65	50-80	100-130	160-210	200-270	260-300

- The welding machine casing must be grounded, and the grounding wire should be made of 8-10 mm2 copper wire
- The three-phase incoming line connection of the welding machine must be reliable. If any item is disconnected, the welding machine will not operate normally.

- When installing the incoming cable, it is necessary to use a fuse with the specified current capacity, and do not replace it with copper or aluminum wire.
- The adjustment knob can be turned slightly, and the limit positions at both ends should not be turned again hard to avoid damaging the adjustment potentiometer.
- The positive and negative terminal connectors at the output end must be tightened to avoid burning the connectors.
- The ambient temperature is -10 ℃ -40 ℃.

6. Use and operation.

Connect the input power supply according to the load requirements of the welding machine.
Determine the connection method for output polarity based on the acidity and alkalinity of the selected welding rod and connect the output cable properly. For acidic welding rods, use positive polarity connection, that is, the welding rod is connected to the negative electrode of the output; The alkaline welding rod adopts the reverse polarity connection method, that is, the welding rod is connected to the output positive electrode.
Turn on the power switch of the distribution box and welding machine.
Adjust the required welding current to start welding.
After welding, turn off the power switch.

7. Maintenance

The maintenance of welding machines should be the responsibility of professional personnel. When encountering faults that cannot be eliminated, we should promptly contact our company's after-sales service department and designated repair points.
Daily inspection items
*Does the power supply voltage meet the requirements.
*Check if the input cable of the welding machine power supply is connected correctly and reliably.
*Check if the welding ground wire connection is reliable.
Regular maintenance
Every year, professional maintenance personnel regularly use compressed air to remove dust from the inside of the welding machine, and pay attention to checking whether there are loose fasteners and wiring inside the machine. If there are any, they should be promptly eliminated. In areas with severe sandstorms, dust removal should be carried out every 1-2 months.
be careful:
The maximum voltage inside the machine is 600V. To ensure safety, it is strictly prohibited to

open the machine casing at will. During maintenance, the power supply of the welding machine must be cut off for 10 minutes before proceeding, and safety measures must be taken to prevent electric shock accidents. After disassembly, it is not allowed to randomly damage the internal wiring and components of the machine.

8. Troubleshooting

Trouble	Cause	What to do
After start-up, the fan work, the lamp cannot be on.	Lamp is broken	Replace it
	The power indicator circuit is faulty	Check the power indicator circuit
The power source can work when turned on, but the welding current is small and out of control	Control board damaged	Replace it
	Current potentiometer damaged	Replace it.
	Current sensor damaged	Replace it.
After turning on, the power indicator light is on, and the digital display meter of the power source shows no response or error.	Damaged digital display meter	Replace it.
	Control transformer damaged	Replace it.
	Control board damaged	Replace it.
	Damaged panel button board	Replace it.
After turning on, the air switch automatically trips.	IGBT module damaged	Replace it.
	Damaged three-phase rectifier module	Replace it.
	Individual damage to the filter capacitor	Replace it.
Sudden lack of output current during welding work	temperature protection	Wait for the welding machine to cool down before welding
	Control board damaged	Replace it.
	IGBT module damaged	Replace it.
Continuous arc breakage during welding process	Reactor has inter turn short circuit or poor insulation	Check the reactor
	Output current is too small	Replace it.
	Control board damaged	Replace it.

Sketch 1 ZX7 Series power source wiring