

## FAULT AND MAINTENANCE



The following operations require the operator must have sufficient expertise and comprehensive knowledge of electrical safety aspects, the operator should hold a valid qualification certificates to prove their ability and knowledge. Please confirm welder input cable has been disconnected from the grid before opening the cabinet.

### Common failure analysis and troubleshooting:

| Symptom  | Remedy   |
|--|--|
| Power light is off, the fan does not run, no welding output  | <ol style="list-style-type: none"> <li>1. Make sure the power switch is closed.</li> <li>2. Confirm input cable connected to an electric power source.</li> </ol>  |
| Fan run, the output current failure control from the potentiometer or unstable, the current times large and times small. | <ol style="list-style-type: none"> <li>1. The potentiometer broken, change it.</li> <li>2. Various connection is bad, especially the connectors, etc., required to check.</li> </ol>   |
| The green light on, the fan run, no output current   | <ol style="list-style-type: none"> <li>1. Check the various patch cord whether bad connection</li> <li>2. Check output terminal connections for breaks or bad</li> <li>3. Overheating protection lights on                             <ol style="list-style-type: none"> <li>1) Means in the over heat protection state, in this case, you don't need turn off the power, to continue the work of the fan and cooling down the machine. When the protection light off, can start work again;</li> <li>2) Check the thermal switch whether damaged, if so, replace it</li> </ol> </li> </ol> |
| Welding holder hot   | Change a higher power welding holder   |
| MMA big splash   | Output polarity unreasonable, exchange the connector of holder and clamps.   |

This product is constantly being improved, in addition to the function and operation, other parts may be different, Thanks for your understand.

## LIST

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### PROMISE

YONGKANG SONGSHI ELECTRIC APPLIANCE FACTORY PORMISE: THIS PRODUCT IS MANUFACTURED BY THE CHINESE AND INTERNATIONAL STANDARDS. PRODUCTS COMPLY WITH INTERNATIONAL SAFETY STANDARDS IEC 60974-1. THE DESIGN AND MANUAFCTURING TECHNOLOGY USED IN THIS PRODUCT IS PROTECTED BY PATENTS.

PLEASE READ THIS MANUAL CAREFULLY BEFORE WORK.

1. THIS MANUAL IS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.
2. IN SPITE OF THIS MANUAL CAREFULLY CHECKEC, BUT STILL MAY HAVE INACCURACIES. IF FIND ANY, CONTACT WITH US PLEASE







#### YONGKANG SONGSHI ELECTRIC APPLIANCE FACTORY

Address: No.156 Xicheng, Huachuan Rd, Yongkang, Zhejiang, China

Tel: 86-579-87261098

# SAFETY

During the welding process, it might give you and others hurt, make protection during welding. For details, see the operator in line with the manufacturer safety guidelines accident prevention requirements.

|   |  |
|---|--|
|    | <p><b>Required by professionals after training before operating the equipment!</b></p> <ul style="list-style-type: none"> <li>• The use of national security and supervision departments approved welding labor protection supplies!!</li> <li>• The operator must hold a valid "metal welding (gas cutting) job" of special operations personnel operating permit!</li> <li>• When maintenance and repair welding, do not live work.</li> </ul>   |
|    | <p><b>Shock - can cause serious injury or even death!</b></p> <ul style="list-style-type: none"> <li>• In accordance with applicable standards, installed grounding device.</li> <li>• In exposed skin, wearing wet gloves or wet clothes when prohibiting contact with live parts.</li> <li>• Ensure that you and the ground and between the work piece is insulated.</li> <li>• Make sure your station is safe.</li> </ul>   |
|    | <p><b>Smoke - may be harmful to health!</b></p> <ul style="list-style-type: none"> <li>• Keep your head keep out smoke, avoid inhaling exhaust gas welding.</li> <li>• When welding, use ventilation or exhaust system, air circulation to keep the working environment.</li> </ul>  |
|   | <p><b>Arc radiation - can damage your eyes, skin burns!</b></p> <ul style="list-style-type: none"> <li>• Use a suitable welding mask, put on protective clothing to protect your eyes and body.</li> <li>• Use the appropriate mask or curtain to protect bystanders from injury.</li> </ul>   |
|  | <p><b>Improper use operation may cause a fire or explosion</b></p> <ul style="list-style-type: none"> <li>• Welding sparks could cause a fire, make sure no combustible materials near the welding station, and pay attention to fire safety.</li> <li>• ensure fire-fighting equipment in the vicinity, and there is a trainee can skillfully use the fire extinguisher.</li> <li>• Do not weld airtight container.</li> <li>• <b>Prohibit the use of machines for the pipe thawing.</b></li> </ul> |
|  | <p><b>Hot product can cause severe burns</b></p> <ul style="list-style-type: none"> <li>• Do not bare hand contact with hot parts.</li> <li>• have a cooling period during continuous use gun.</li> </ul>  |

# MAINTENANCE



**The following operations require the operator must have sufficient expertise and comprehensive knowledge of electrical safety aspects, the operator should hold a valid qualification certificates to prove their ability and knowledge. Please confirm welder input cable has been disconnected from the grid before opening the cabinet**

- (1) Regularly check welder internal circuit connections, make sure the line is connected correctly, the connection head firmly (especially into connectors or components), if found to have rust and loose Use sand paper polished off the rust layer or an oxide film, reconnect, and tighten.
- (2) When the machine is powered on, do not let the hand, hair, and tools near live inside the devices, such as: fan, so as not to cause injury or damage to the machine
- (3) Regularly use clean dry Air compressors to remove dust, if used in welding smoke and severe air pollution bad environment, should clean welding dust every day. Compressed air pressure should be at a reasonable level so as not to damage the small components within the welder.
- (4) Avoid water or moisture into the welding machine inside, if there is such a situation, to deal with the internal welder drying process. Subsequently, Use the megger test the insulation of the welder (including connections between nodes and the junction with the chassis). Only confirmed that no unusual circumstances, then can continue the welding work.
- (5) Regularly check all cables welder insulation is not damaged, wrap or replace the cable if any.
- (6) If a long time without welder, welder should be back in the original packaging and store in a dry environment.

## PRECAUTIONS

### 7.1 Use of the environment





- (1) Welding operation should be under a relatively dry environment, air humidity should generally not exceed 90%.
- (2) The ambient temperature should be between -10 ° C to 40 ° C.
- (3) Avoid welding sunlight or rain, do not let water or rain water infiltrated within the welder.
- (4) Avoid welding work in a dusty area or corrosive atmospheres.
- (5) Eliminating gas welding operation in a strong air flow environment

### 7.2 Safety Tips

Within welding over current and thermal protection circuit has been installed, when output current and internal temperature exceeds the set standard, the welder will automatically stop working; however excessive use (such as voltage too high) will continue to cause damage to the welder , so you still need to pay attention to the following matters:

- (1) To ensure adequate ventilation! When the welder in operation, a large operating current through, natural ventilation can not meet the cooling requirements of the welder, it built fans to effectively cool the welder to make it work smoothly. User should confirm ventilated place uncovered or blocked from the welder and the surrounding objects shall not be less than 0.3 meters, the user should always pay attention to maintaining good ventilation, because it better for welding work and ensure a longer life is very important.
- (2) Prohibits the voltage is too high! Power supply voltage listed in the " MAIN TECHNICAL PARAMETER " table, under normal circumstances, automatic voltage compensation circuit welder welding current within the guarantee to maintain the allowable range. If the supply voltage exceeds the allowable value(not higher than 260V), it will damage the welding machine, the using staff should be fully aware of this situation and take appropriate preventive measures.
- (3) If the welding working over load, welder may suddenly stop into the protected status, which means that the welder beyond the standard duty cycle, excessive heat triggers a thermostat switch that allows the welder to stop working, while the yellow LED on the front panel lights up. In this case, you do not have cut the power in order to the cooling fan continue work, cooling the welder When the yellow light is off, the temperature dropped to the standard range, can be re-start welding.

## SAFETY

|   |  |
|---|--|
|  | <p><b>Noise - excessive noise harmful to human hearing</b></p> <ul style="list-style-type: none"> <li>• Protect your ears, use other ear shields or wear hearing protectors.</li> <li>• Warning spectator, noise can cause potential harm to their hearing.</li> </ul>   |
|  | <p><b>Magnetic fields pacemakers</b></p> <ul style="list-style-type: none"> <li>• Before consulting a doctor, pacemaker users should stay away from the scene welder.</li> </ul>   |
|  | <p><b>Moving parts can cause injury</b></p> <ul style="list-style-type: none"> <li>• should avoid moving parts (such as fans).</li> <li>• all kinds of doors, panels, covers and bumpers and other protective devices shall be closed and in place.</li> </ul>   |
|  | <p><b>Fault - encountered difficulties, seek professional help.</b></p> <ul style="list-style-type: none"> <li>• If you experience difficulty in installation and operation, according to the relevant contents of this manual investigation.</li> <li>• If after you read the still not fully understood, or according to the manual guidance does not resolve the problem, you should immediately get in touch with your supplier or three Poor's service center, seek professional help.</li> </ul> |

## PRODUCT DESCRIPTION

### 2. PRODUCT DESCRIPTION

This series is developed on the basis of the mature technology and good performance market, single argon and "manual / argon arc" dual-use welder. It has the following characteristics:

- ★ Inverter technology advanced, mature
    - ◇ Main circuit uses sophisticated single-tube IGBT inverter technology.
  - ★ Leading control mode
    - ◇ Control circuitry using the latest primary current + peak current feedback control technology, more reliable and stable.
    - ◇ Built thrust and thermal arc make the arc initiation easy and welding performance better.
    - ◇ TIG-band attenuation to adjust, arc crater more perfect.
  - ★ Fully functional
    - ◇ Hand welding with electric shock devices, more secure.
    - ◇ 2T / 4T, digital display and other functional modules.
  - ★ Attractive appearance and structural design
    - ◇ Overall shape more beautiful. High strength carbon steel, effectively ensure the machine is working efficiently under high shock and drop and other harsh conditions.
    - ◇ Excellent insulation properties.
    - ◇ Good "three" design, anti-static, good corrosion resistance.
  - ★ Extensive use
    - ◇ It can be widely used in various acid, alkaline electrode welding.
    - ◇ It can be used for high-altitude operations, field operations, indoor and outdoor decoration.
- Advanced IGBT inverter technology  
Inverter frequency is 50KHz, significantly reduces the size and weight of the welder.  
A significant reduction in the copper and iron losses, significantly improving the overall efficiency of the welder, energy saving effect is remarkable.  
Switching frequencies other than audio, virtually eliminates noise pollution.  
Leading control mode  
Advanced control scheme significantly improved welding performance, greater extent to meet the requirements of the welding process.  
Having easy arc, little spatter, current stability, good molding characteristics.  
Improve the functional design  
Adaptive plus thrust current mode, significantly improved welding performance when an extension cord of welding, remote welding can be realized.

## WELDING PROBLEMS YOU MAY ENCOUNTER

### 6. 4 WELDING PROBLEMS YOU MAY ENCOUNTER

Phenomenon cited herein may be fitting that you are using, gas, environmental factors, the power supply situation, please try to improve the environment, to avoid such occurrences

#### 6. 4. 1 Black pads

Such information note pads have not been effectively protected and is oxidized, you can perform the following checks:

- 1) Make sure the argon cylinder valve is open, and there is sufficient pressure, generally bottle pressure is less than 0.5MPa, it is necessary to refill the cylinders.
- 2) Check the argon flow is turned on, and have enough flow. To save gas, you can choose a different flow depending on the welding current conditions, but too small to protect gas flow may result in insufficient and can not cover all joints. We recommend that you do not make no matter how small current argon gas flow of less than 5L / min.
- 3) The easiest way to check whether there is gas fed is to feel if there is a gas torch nozzle flow by hand, check the torch gas path is not blocked.
- 4) The gas path seal bad, or gas purity is not high, it can also cause weld quality.
- 5) If the environment has a strong air flow, it may cause weld quality lower.

#### 6. 4. 2 Arcing initiation difficult, and easily stop:

- 1) Make sure you have good quality tungsten used. Poor quality of tungsten discharge capacity may fail to meet requirements;
- 2) The tungsten has not been sharpened treated also hard arcing initiation and causing an arc of instability.

#### 6. 4. 3 Welder during use, current can not remain stable:

Such conditions may be related to the following factors:

- 1) Changes in grid voltage;
- 2) Serious interference from the power grid or other electrical equipment.
- 3) If this phenomenon at MMA welding state, swap the connection of the electrode holder and earth clamp.

## INSTALLATION COMMISSION

### TIG OPERATION:

- The switch in position TIG;
- Open the argon cylinder valves, regulate to the required flow meter.
- Press the Torch button ,Operate the solenoid valve , starts with an argon gas output.
- Depending on the thickness of the workpiece, select the welding current. Welding parameter reference (Table II, III)
- The torch tungsten work distance 2-4mm, press the torch button, the arc after ignition, the machine high frequency arc discharge sound immediately disappear, current are the set one, then work continue. After releasing the torch switch current starts automatically reduced until the minimum current, the arc is extinguished and then, after the start of aspiration, finally ended.

(Table II) Titanium and its alloys—Select TIG parameters (for reference only)

| Thickness (mm) | Groove form | welding layer | Tungsten diameter (mm) | Wire diameter (mm) | Welding current (A) | Argon gas flow L/min) |       |       | Nozzle diameter (mm) |
|----------------|-------------|---------------|------------------------|--------------------|---------------------|-----------------------|-------|-------|----------------------|
|                |             |               |                        |                    |                     |                       |       |       |                      |
| 0.5            | I           | 1             | 1.5                    | 1.0                | 30~50               | 8~10                  | 6~8   | 14~16 | 10                   |
| 1.0            |             | 1             | 2.0                    | 1.0~2.0            | 40~60               | 8~10                  | 6~8   | 14~16 | 10                   |
| 1.5            |             | 1             | 2.0                    | 1.0~2.0            | 60~80               | 10~12                 | 8~10  | 14~16 | 10~12                |
| 2.0            |             | 1             | 2.0~3.0                | 1.0~2.0            | 80~110              | 12~14                 | 10~12 | 16~20 | 12~14                |
| 2.5            |             | 1             | 2.0~3.0                | 2.0                | 110~120             | 12~14                 | 10~12 | 16~20 | 12~14                |
| 3.0            | Y           | 1~2           | 3.0                    | 2.0~3.0            | 120~140             | 12~14                 | 10~12 | 16~20 | 14~18                |
| 4.0            |             | 2             | 3.0~4.0                | 2.0~3.0            | 130~150             | 14~16                 | 12~14 | 20~25 | 18~20                |
| 5.0            |             | 2~3           | 4.0                    | 3.0                | 130~150             | 14~16                 | 12~14 | 20~25 | 18~20                |
| 6.0            |             | 2~3           | 4.0                    | 3.0~4.0            | 140~180             | 14~16                 | 12~14 | 25~28 | 18~20                |
| 7.0            |             | 2~3           | 4.0                    | 3.0~4.0            | 140~180             | 14~16                 | 12~14 | 25~28 | 20~22                |
| 8.0            | 3~4         | 4.0           | 3.0~4.0                | 140~180            | 14~16               | 12~14                 | 25~28 | 20~22 |                      |
| 10             | Double Y    | 4~6           | 4.0                    | 3.0~4.0            | 160~200             | 14~16                 | 12~14 | 25~28 | 20~22                |
| 20             |             | 12            | 4.0                    | 4.0                | 200~240             | 12~14                 | 10~12 | 20    | 18                   |
| 22             |             | 12            | 4.0                    | 4.0~5.0            | 230~250             | 15~18                 | 18~20 | 18~20 | 20                   |
| 25             |             | 15~16         | 4.0                    | 3.0~4.0            | 200~220             | 16~18                 | 20~26 | 26~30 | 22                   |
| 30             |             | 17~18         | 4.0                    | 3.0~4.0            | 200~220             | 16~18                 | 20~26 | 26~30 | 22                   |

(Table III) Stainless Steel Sheet—TIG selection parameters (for reference only)

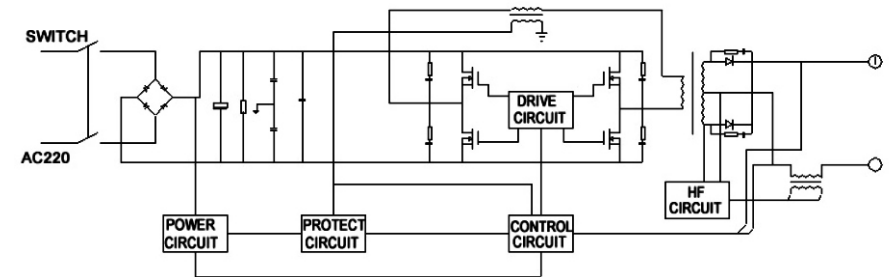
| Thickness (mm) | Connector Type | Tungsten diameter (mm) | Wire diameter (mm) | Current Category                       | Welding current (A) | Argon gas flow (L/min) | Welding speed (cm/min) |
|----------------|----------------|------------------------|--------------------|--|---------------------|------------------------|------------------------|
| 1.0            | Docking        | 2                      | 1.6                | Direct Current<br>Straight<br>Polarity | 7~28                | 3~4                    | 12~47                  |
| 1.2            | Docking        | 2                      | 1.6                | Direct Current<br>Straight<br>Polarity | 15                  | 3~4                    | 25                     |
| 1.5            | Docking        | 2                      | 1.6                | Direct Current<br>Straight<br>Polarity | 5~19                | 3~4                    | 8~32                   |

## MAIN TECHNICAL PARAMETER

### 3. MAIN TECHNICAL PARAMETER

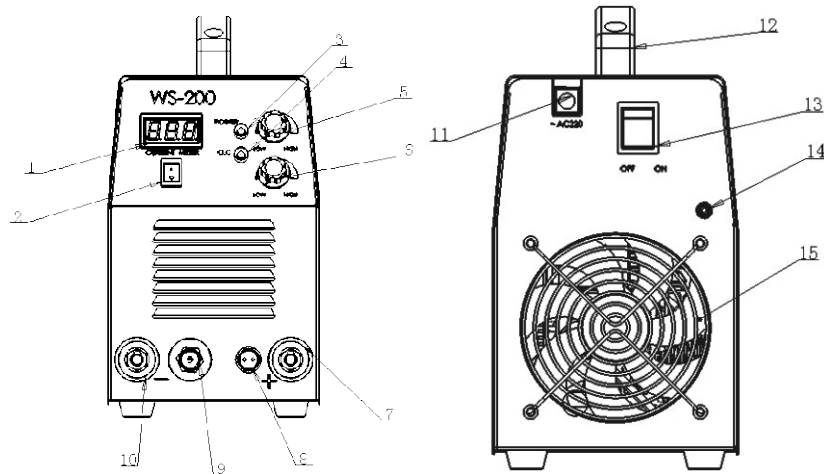
| MODEL                | ZX7-160D           |         | ZX7-200D |         |  |  |  |
|----------------------|--------------------|---------|----------|---------|--|--|--|
|                      | TIG                | MMA     | TIG      | MMA     |  |  |  |
| INPUT VOLTAGE (V)    | AC220V±10% 50/60HZ |         |          |         |  |  |  |
| OUTPUT CURRENT       | 160                | 160     | 200      | 200     |  |  |  |
| INPUT POWER (KW)     | 5.8                |         | 7.5      |         |  |  |  |
| RANGE OUTPUT CURRENT | 15-160A            | 15-160A | 15-200A  | 15-200A |  |  |  |
| NO-LOAD VOLTAGE (V)  | 50±5               |         | 50±5     |         |  |  |  |
| DUTY CYCLE           | 40%                |         | 40%      |         |  |  |  |
| AFTER BLOWING TIME   | 2.5-5S             |         |          |         |  |  |  |
| EFFICIENCY (%)       | 85                 |         |          |         |  |  |  |
| POWER FACTOR         | 0.75               |         |          |         |  |  |  |
| ENCLOSURE            | IP23               |         |          |         |  |  |  |
| INSULATION CLASS     | H                  |         |          |         |  |  |  |
| DIMENSIONS (mm)      | 370×152×211        |         |          |         |  |  |  |
| WEIGHT (Kg)          | 7                  |         | 8        |         |  |  |  |

### 4. ELECTRIC BLOCK DIAGRAM



## OPERATION AND INSTRUCTION

### 5.1 Front and back panel instruction



- 1) Digital display.
- 2) MMA/TIG select switch
- 3) Power light
- 4) Protection light
- 5) Current range
- 6) Arc force
- 7) Positive output
- 8) Argon torch switch socket
- 9) Argon torch joint gas and electricity integration
- 10) Negative output
- 11) Power supply cable
- 12) Gas nozzle
- 13) Power switch
- 14) Gas input
- 15) Fan cooling cover

## INSTALLATION COMMISSION

**Note: Please strictly follow the following steps to install electrical connections commissioning.**

**Operations must be shut down after the power distribution box switch!**

**The device protection class IP21, should be avoided in the rain!**

### 6.1 Installation method:

(A) Each machine is equipped with a power cord, a line should be connected to the corresponding voltage level according to the input voltage of the welder, do not pick the wrong voltage levels.

(B) Corresponding to a power supply terminal or socket contact is good, to prevent oxidation.

(C) Measured with a multimeter at the input voltage is within the fluctuation range.

### OUTPUT CONNECTION

#### TIG:

- A. Connect the welding gun correctly in accordance with the drawings. The integration of gas and electricity to the welding torch connector mounting panel corresponding interfaces, clockwise tighten.
- B. The aviation plug on the torch attached to the corresponding interfaces welder panel, clockwise tighten.
- C. The quick plug into the ground welder panel polarity is "+" socket on rapid, clockwise firmly tighten the other end of the ground workpiece clamping pliers
- D. The argon line and on the rear of copper mouth tightly docking. Gas path should include cylinders, argon pressure flow meter and trachea, windpipe connecting portion should be used hose clamps or other items fastened to prevent leakage and air to enter, affect the protective effect of solder joints
- E. The casing with a conductive cross-sectional area of not less than 4mm<sup>2</sup> wire is grounded to prevent static electricity or leakage occurs

#### MMA:

- A. The cable with welding clamp plug into the positive jack on the front panel below the welder, clockwise tighten.
- B. The cable with ground clamp welder plugs into the bottom of the front panel of the negative inner socket clockwise tightening.

The above items is DC reverse method. The operator can also select DCSP method according to the base metal and welding rod cases. In general, alkaline electrode recommend using DC reverse method (ie, connected to the positive electrode), acid electrode no special provision

### 6.2 Method of operation:

(1) After the installation is correct according to the method described above, turn on the power switch, the power switch is in the "ON" position, then the power indicator light, the machine began to turn the fan, welder began to work.

(2) Press the machine panel TIG / MMA switch, select arc welding or TIG perform.

#### MMA OPERATION:

According to the welding specifications models presetting welding current, the welding tune good clip, you can take advantage of a short circuit arc welding, welding parameters refer to 6.3.

### 6.3 Welding process quick reference (this form is only for reference)

| Electrode diameter (mm) | Recommended welding current (A) | Recommended welding voltage (V) |
|-------------------------|---------------------------------|---------------------------------|
| 1.0                     | 20~50                           | 20.8~22                         |
| 1.6                     | 30~60                           | 21.2~22.4                       |
| 2.0                     | 50~90                           | 22~23.6                         |
| 2.5                     | 70~120                          | 22.8~24.8                       |
| 3.2                     | 90~140                          | 23.6~25.6                       |
| 4.0                     | 130~200                         | 25.2~28                         |

**Note: This table applies to low-carbon steel welding, other materials can refer to related materials and technology Manual.**