ELDING AND CUTTING TOTAL

Operation Manual

WAVE 315KD

AC/DC INVERTER TIG WELDER

V1.0

Please read this manual carefully before using

GENERAL SAFETY RULES

 **WARNING: Read and understand all instructions.** Failure to follow all instructions listed below may result in serious injury.

 **CAUTION: Do not allow persons to operate or assemble this WAVE 315KD series welder until they have read this manual and have developed a thorough understanding of how the WAVE 315KD SERIES series welder works.**

 **WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur.** It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

1.1 Your Welding Environment

-Keep the environment you will be welding in free from flammable materials.
-Always keep a fire extinguisher accessible to your welding environment.
-Always have a qualified person install and operate this equipment.
-Make sure the area is clean, dry and ventilated. Do not operate the welder in humid, wet or poorly ventilated areas.
-Always have your welder maintained by a qualified technician in accordance with local, state and national codes.
-Always be aware of your work environment. Be sure to keep other people, especially children, away from you while welding.
-Keep harmful arc rays shielded from the view of others.
-Mount the welder on a secure bench or cart that will keep the welder secure and prevent it from tipping over or falling.

1.2 Your Welder's Condition

-Check ground cable, power cord and welding cable to be sure the insulation is not damaged. Always replace or repair damaged components before using the welder.
-Check all components to ensure they are clean and in good operating condition before use.

1.3 Use of Your Welder

⚠ CAUTION

Do not operate the welder if the output cable, electrode, torch is wet. Do not immerse them in water. These components and the welder must be completely dry before attempting to use them.
-Follow the instructions in this manual.
-Keep welder in the off position when not in use.
-Connect ground lead as close to the area being welded as possible to ensure a good ground.
-Do not allow any body part to come in contact with the welding wire if you are in contact with the material being welded, ground or electrode from another welder.
-Do not weld if you are in an awkward position. Always have a secure stance while welding to prevent

accidents. Wear a safety harness if working above ground.
-Do not drape cables over or around your body.
-Wear a full coverage helmet with appropriate shade (see ANSI Z87.1 safety standard) and safety glasses while welding.
-Wear proper gloves and protective clothing to prevent your skin from being exposed to hot metals, UV and IR rays.
-Do not overuse or overheat your welder. Allow proper cooling time between duty cycles.
-Keep hands and fingers away from moving parts.
-Do not point torch at any body part of yourself or anyone else.
-Always use this welder in the rated duty cycle to prevent excessive heat and failure.

1.4 Specific Areas of Danger, Caution or Warning

Electrical Shock

⚠WARNING

Electric arc welders can produce a shock that can cause injury or death. Touching electrically live parts can cause fatal shocks and severe burns. While welding, all metal components connected to the wire are electrically hot. Poor ground connections are a hazard, so secure the ground lead before welding.
-Wear dry protective apparel: coat, shirt, gloves and insulated footwear.
-Insulate yourself from the work piece. Avoid contacting the work piece or ground.
- Do not attempt to repair or maintain the welder while the power is on.
-Inspect all cables and cords for any exposed wire and replace immediately if found.
-Use only recommended replacement cables and cords.
-Always attach ground clamp to the work piece or work table as close to the weld area as possible.
-Do not touch the welding wire and the ground or grounded work piece at the same time.
-Do not use a welder to thaw frozen pipes.

Fumes and Gases

⚠WARNING

-Fumes emitted from the welding process displace clean air and can result in injury or death.
-Do not breathe in fumes emitted by the welding process. Make sure your breathing air is clean and safe.
-Work only in a well-ventilated area or use a ventilation device to remove welding fumes from the environment where you will be working.
-Do not weld on coated materials (galvanized, cadmium plated or containing zinc, mercury or barium). They will emit harmful fumes that are dangerous to breathe. If necessary use a ventilator, respirator with air supply or remove the coating from the material in the weld area.
-The fumes emitted from some metals when heated are extremely toxic. Refer to the material safety data sheet for the manufacturer's instructions.
-Do not weld near materials that will emit toxic fumes when heated. Vapors from cleaners, sprays and degreasers can be highly toxic when heated.

UV and IR Arc Rays

⚠ DANGER

The welding arc produces ultraviolet (UV) and infrared (IR) rays that can cause injury to your eyes and skin. Do not look at the welding arc without proper eye protection.
-Always use a helmet that covers your full face from the neck to top of head and to the back of each ear.
-Use a lens that meets ANSI standards and safety glasses. For welders under 160 Amps output, use a shade 10 lens; for above 160 Amps, use a shade 12. Refer to the ANSI standard Z87.1 for more information.
-Cover all bare skin areas exposed to the arc with protective clothing and shoes. Flame-retardant cloth or leather shirts, coats, pants or coveralls are available for protection.
-Use screens or other barriers to protect other people from the arc rays emitted from your welding.
-Warn people in your welding area when you are going to strike an arc so they can protect themselves.

Fire Hazards

⚠WARNING

Do not weld on containers or pipes that contain or have had flammable, gaseous or liquid combustibles in them. Welding creates sparks and heat that can ignite flammable and explosive materials.
-Do not operate any electric arc welder in areas where flammable or explosive materials are present.
-Remove all flammable materials within 35 feet of the welding arc. If removal is not possible, tightly cover them with fireproof covers.
-Take precautions to ensure that flying sparks do not cause fires or explosions in hidden areas, cracks or areas you cannot see.
-Keep a fire extinguisher close in the case of fire.
-Wear garments that are oil-free with no pockets or cuffs that will collect sparks.
-Do not have on your person any items that are combustible, such as lighters or matches.
-Keep work lead connected as close to the weld area as possible to prevent any unknown, unintended paths of electrical current from causing electrical shock and fire hazards.
-To prevent any unintended arcs, cut wire back to ¼" stick out after welding.

Hot Materials

⚠ CAUTION

Welded materials are hot and can cause severe burns if handled improperly.
-Do not touch welded materials with bare hands.
-Do not touch TIG gun nozzle after welding until it has had time to cool down.

Sparks/Flying Debris

⚠ CAUTION

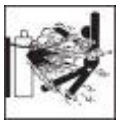
Welding creates hot sparks that can cause injury. Chipping slag off welds creates flying debris.
-Wear protective apparel at all times: ANSI-approved safety glasses or shield, welder's hat and ear plugs to keep sparks out of ears and hair.

Electromagnetic Field

⚠ CAUTION

-Electromagnetic fields can interfere with various electrical and electronic devices such as pacemakers.

-Consult your doctor before using any electric arc welder or cutting device
-Keep people with pacemakers away from your welding area when welding.
-Do not wrap cable around your body while welding.
-Wrap TIG gun and ground cable together whenever possible.
-Keep TIG gun and ground cables on the same side of your body.



Shielding Gas Cylinders Can Explode

⚠WARNING

High pressure cylinders can explode if damaged, so treat them carefully.
-Never expose cylinders to high heat, sparks, open flames, mechanical shocks or arcs.
-Do not touch cylinder with TIG gun.
-Do not weld on the cylinder
-Always secure cylinder upright to a cart or stationary object.
-Keep cylinders away from welding or electrical circuits.
-Use the proper regulators, gas hose and fittings for the specific application.
-Do not look into the valve when opening it.
-Use protective cylinder cap whenever possible

1.5 Proper Care, Maintenance and Repair

⚠ DANGER

-Always have power disconnected when working on internal components.
- Do not touch or handle PC board without being properly grounded with a wrist strap. Put PC board in static proof bag to move or ship.

-Do not put hands or fingers near moving parts such as drive rolls of fan

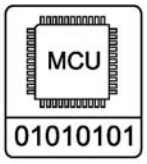
WAVE 315KD SERIES USE AND CARE

- **Do not modify the WAVE 315KD SERIES in any way.** Unauthorized modification may impair the function and/or safety and could affect the life of the equipment. There are specific applications for which the **WAVE 315KD SERIES** was designed.
- **Always check of damaged or worn out parts before using the WAVE 315KD SERIES.** Broken parts will affect the **WAVE 315KD** operation. Replace or repair damaged or worn parts immediately.
- **Store idle WAVE 315KD.** When **WAVE 315KD SERIES** is not in use, store it in a secure place out of the reach of children. Inspect it for good working condition prior to storage and before re-use.

Notice: * If the welder continues to work too long time, the Heat Protection Indicator on the panel would be on, indicating that the inner temperature rise inside the welder had exceed the designed permitted temperature. At this time, stop the welding work, wait until the welder cooled inside and the Heat Protection Indicator turned off, then continue to work again;
* Cut off the power switch and Argon valve, before leaving the welding place temporarily or after the welding worked finished;
* Welders should wear canvas work clothes and welding face shield to prevent arc light and heat radiation;
* Put light-proof screen around the work area to prevent others influenced by the arc lights.
* Flammable, explosive items could not be put near the welding area;
* Every outlet of the welder should be connected and earthed correctly.

Notice: The cover protection degree of the **WAVE 315KD SERIES** series inverter TIG welder is IP21S.When the welder is operated, do not insert finger or round stick diameter less than 12.5mm (especially metal stick) into the welder; Do not allow to press heavily onto the welder.

1. Description



WAVE 315KD is inverter MMA, AC\DC TIG welder. It use MCU core processor to monitor and adjust the welder real time to get reliable and stable welding effect.

WAVE 315KD During the ac square wave welding process，MCU control each wave real time，Reduce the AC TIG welding and AC arc reversing sharp arc noise, protect the welder hearing and reduce the tungsten electrode loss.

WAVE 315KD use HF arc ignition, improve the ignition success rate. Alost 100% arc ignition success rate whether the tungsten electrode thermal state or cold state

WAVE 315KD Use IGBT inverter technology, reduce main transformer and reactance volume. It reduce the cooper and core loss, then improve the efficiency of the power and power factor

- DC flux-coated electrode (DC-MMA)
- AC flux-coated electrode (AC-MMA)

- DC-TIG
- AC-TIG

- DC-PTIG
- AC-PTIG

2.Technical Characteristic

2.1 Machine parameter

Model	WAVE 315KD
Rated input power	3 phase AC ，380V±15%，50/60Hz
Rated input current	21A
Rated input capacitance	13.8kVA
No-load voltage	65 V
Rated duty cycle	35% (@40℃)
Power factor	≥0.80
Efficiency	80%
Insulation class	F
Enclosure protection	IP21S
Cooling type	Fan cooled
Dimension L×W×H	1100*540*1240
Weight	82 kg

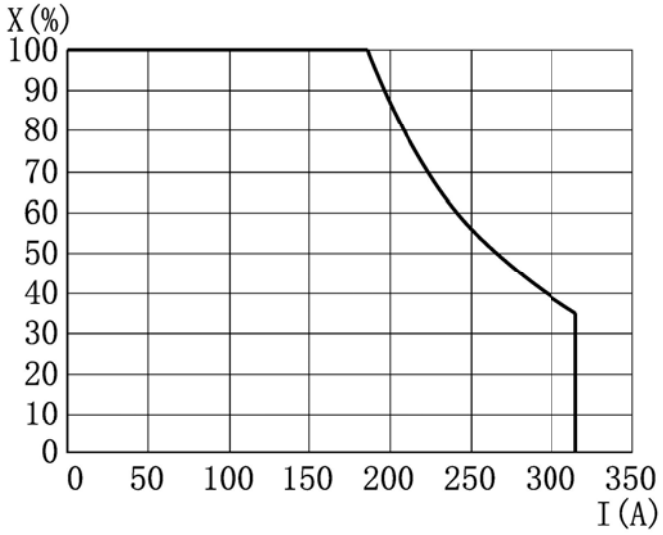
Model	WAVE 315KD
Rated input power	3 phase AC ，400V±15%，50/60Hz
Rated input current	21A
Rated input capacitance	13.8kVA
No-load voltage	70 V
Rated duty cycle	35% (@40℃)
Power factor	≥0.80
Efficiency	80%
Insulation class	F
Enclosure protection	IP21S
Cooling type	Fan cooled
Dimension L×W×H	1100*540*1240
Weight	82 kg

2.2 Welding parameter

Model	WAVE 315KD
MMA	
Rated output current	20A～250A
AC Frequency	50Hz
AC duty ratio	50%
TIG	
Slope up time	0s～10.0s
Slope down time	0s～25.0s
Gas pre flow time	0s～10.0s
Gas post flow time	0.2s～20.0s
Ignition way	HF
	DC TIG
Rated current	10A～315A
	DC PULSE TIG
Peak current	10A～315A
Base current	10A～315A
Pulse Frequency	0.1Hz～250Hz
Duty ratio	10%～90%
	AC TIG
Rated current	20A～315A
AC Frequency	30%～100%
Pulse width adjustment	20%～60%
	AC PULSE TIG
Peak current	20A～315A
Base current	20A～315A
AC Frequency	30%～100%
Pulse width adjustment	20%～60%
Pulse Frequency	0.1Hz～20Hz
Pulse ratio	10%～90%

2.3 Duty cycle

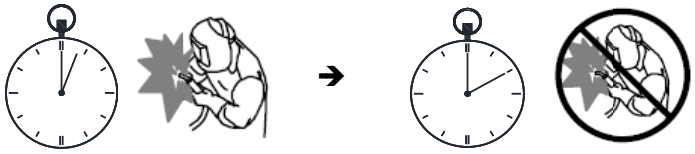
overload work will damage the machine！



2-1 Current duty cycle curve table

Please use the machine under rated duty cycle range. This machine rated duty cycle range is 35%.

Rated duty cycle range 35%



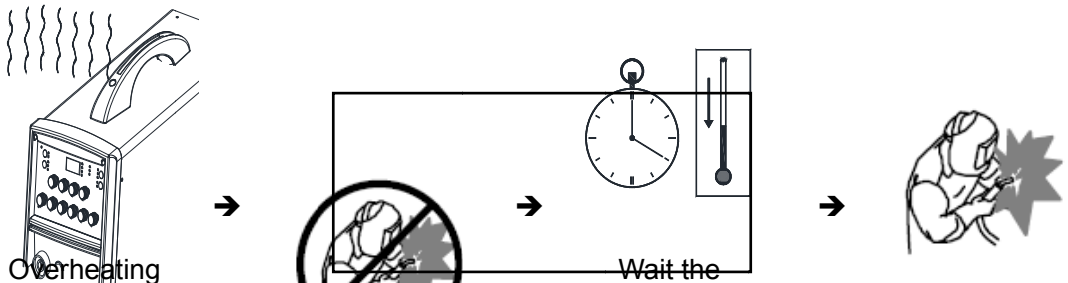
Work 3min30sec Rest 6min30sec

Duty cycle means welding machine can continue welding time in percentage of 10 minutes.

Rated duty cycle means under rated output current, if reduce the output current, the duty cycle will increase.

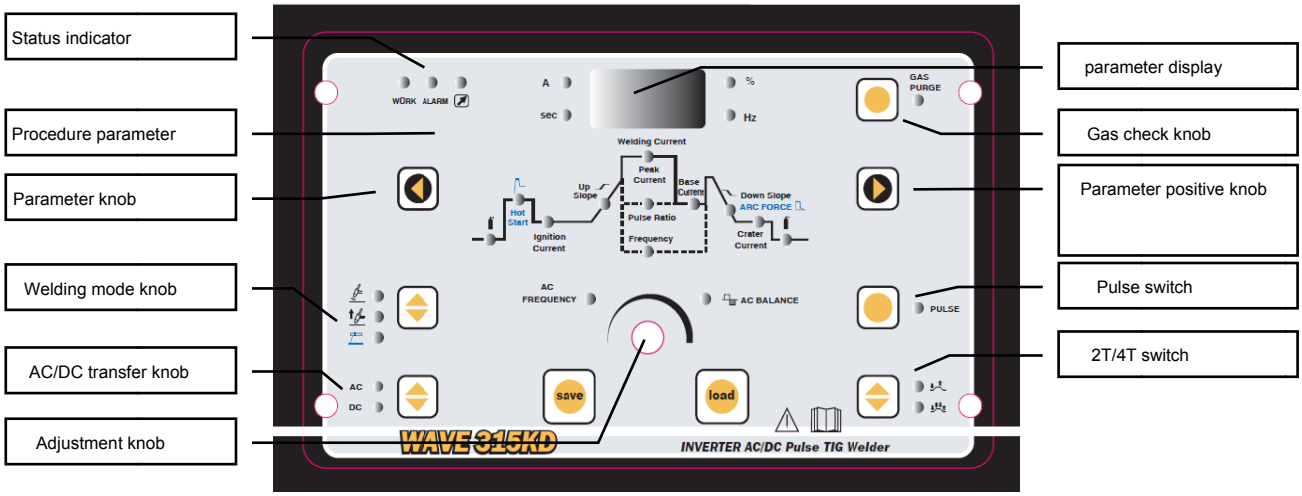
If the welding machine continues to overload work long time. It maybe occur overheating alarm. The digital display will show "**E01**", The ALARM indicator will light at

the same time, machine stop work.



3.Front panel structure description

3.1 Front panel control board



3.1.1. Status indicator

Turn on the welding machine, all indictor on front panel light. Become standard display status after 2S, work indictor light, the machine can work now.

When the machine is abnormal，front panel ALARM indictor will light, digital display show abnormal code.

	Overheating alarm（E01） welding machine continues to overload work , main power device will overheating, the machine will stop and show overheating alarm.
	Low-voltage protection（E03） When input voltage under setting low-voltage point, welding machine will protection and low-voltage alarm indicator will light. When the input voltage reach the setting low-voltage point, the machine can work now.

If the machine connect current adjustment torch or foot pedal, remote indicator will light, Front panel peak current potentiometer knob lose efficacy, the potentiometer knob on current adjustment torch or foot pedal instead of it. The other are same.

3.1.2. Procedure parameter

This part is to show the procedure, when the indicator lights, the corresponding parameter can be adjusted with the adjustment knob.

3.1.3. Parameter knob and positive knob

Use this knob to choose the different procedure. When selected a procedure, the corresponding indicator light, then use adjustment knob to adjust the parameter.

3.1.4. Welding mode knob

Use this knob to choose the welding mode, can be used MMA、HF TIG and contact-type TIG.

3.1.5. AC/DC transfer knob

Use this knob to choose the AC or DC, when AC indicator light, means the machine is under AC mode. When DC indicator light, means the machine is under DC mode.

3.1.6. Adjustment knob

Use this knob to adjust the parameter, and the parameter can be showed on the display.

3.1.6. Parameter display

Turn on the welding machine, digital display show welding current. Use parameter switching key, digital display will show corresponding parameter, and the corresponding indictor will light at the same time.

After all adjustment, the digital display will show the welding current in 5s if you do not adjust other parameter.

3.1.7. Current display

To show the preset current when setting and the welding current when working.

3.1.8. Gas check knob

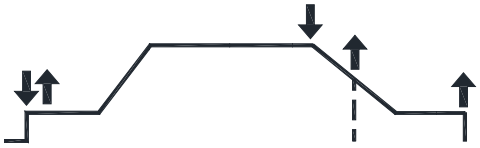
This machine has the gas check function, use knob to check the gas. Press this knob, the gas check indicator light, air valve works, that means the gas circuit is well working. Press this knob again, the indicator extinguish, gas check function does not work.

3.1.9. Pulse switch

Use this knob to choose whether you need the pulse, when the indicator light, means it is under pulse mode.

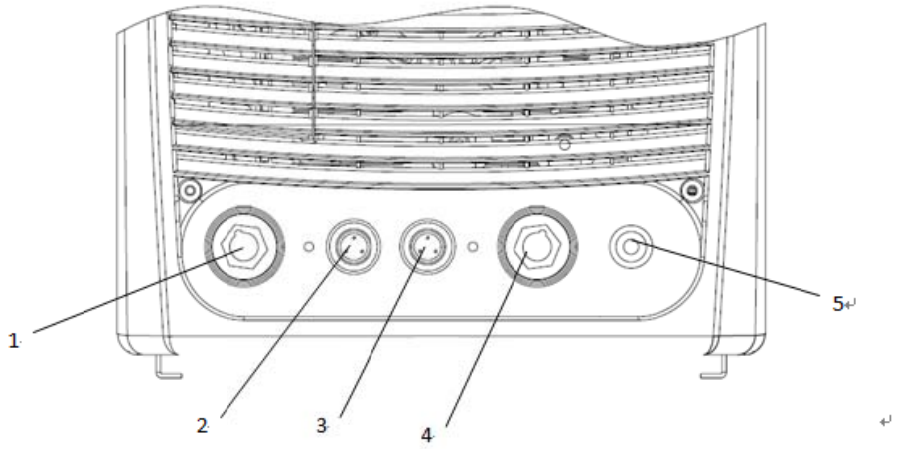
3.1.10.2T/4T switch

	2-T Most common function. Press torch switch gas pre flow -arc ignition-slope up- welding; Loosen torch switch slope down- ending arc- gas down flow. Notice： It will slope up- welding again if you press the torch before arc stop. **（slope up：current increase slowly；slope down：current reduce slowly）**

	 means loose torch switch
	4-T Used for automatic welding and continue weld long weld joint. Press torch switch gas pre flow-arc ignition-slope up- welding; After arc ignition you can loosen torch switch. Press torch switch again, slope down- ending arc- gas down flow. Arc will stop if loosen the torch switch during this process. 

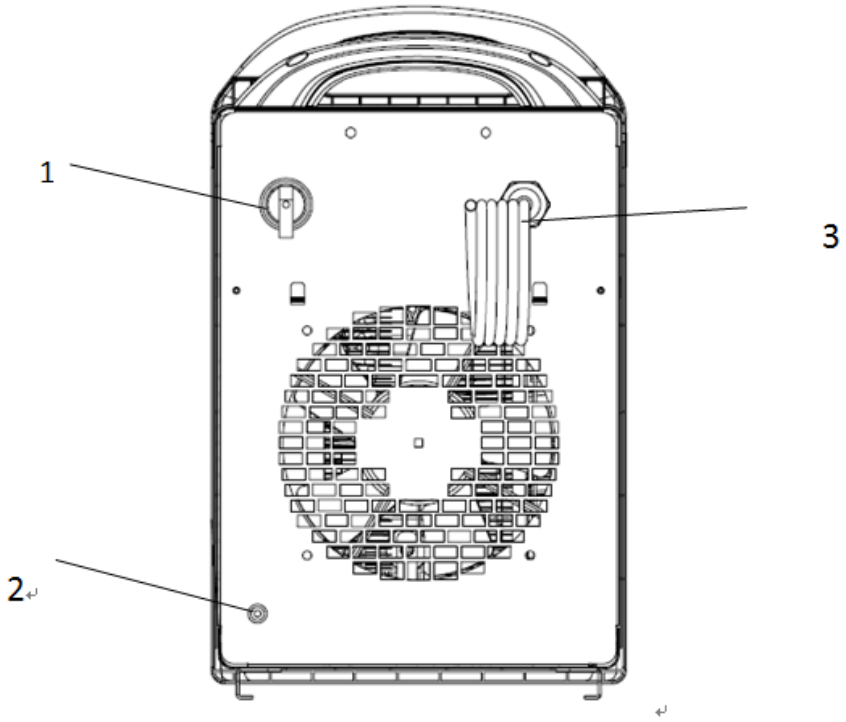
: Press front panel knob then loosen, it will be effective operation, if press more than0.5s. it will deemed as ineffective.

3.2 output panel



1—MMA “+” /TIG earth cable connector	2—Remote aviation socket
3—Torch aviation socket	4—MMA “-” /TIG torch conector
5—Gas connector	

3.3 Back panel

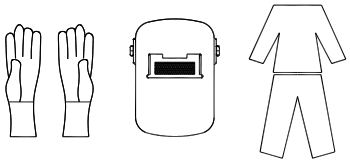


1—Universal change-over switch	2—Protect the gas input connector
3—Output cable	

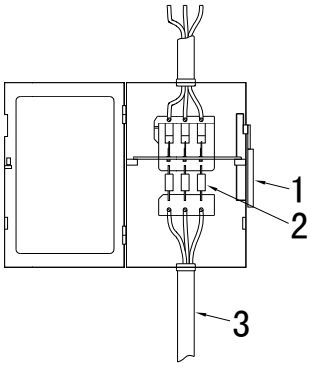
4. Operating instructions

4.1 security warning

Notcie:	● Must shut down the machine and distribution box power Electrical connection operation		
	**Danger！** **Electric shocks can be hurtful and deadly** ● Shut down the machine and distribution box power before connect wire！ ● Do not touch the bare electric connection parts in the machine.		**Welding may cause fire or explosion！** ● Welding spatter may ignite around inflammable. Keep inflammable 10 m away from the welding area. Pay attention your clothes and body not contact the welding spatter.

	**Welding smoke is bad for your health.** ● Do not smoke welding inhalation. ● Clean the oil contamination on work piece. ● Keep welding area air circulation. ● Welding post need smoke extractor**.**		**Arc injury your eyes and skin!** ● Strong arc can damage your eyes。 ● The welding arc produces ultraviolet (UV) and infrared (IR) rays that can cause injury to your eyes and skin. Use a helmet and cover all bare skin areas exposed to the arc with protective clothing and shoes.
	**Welded materials are hot and can cause severe burns if handled improperly** ● Do not touch welded materials with bare hands。 ● Do not touch TIG gun nozzle after welding until it has had time to cool down.		**High-speed moving device maybe cause injuries.** ● Don't put your hands or thin things into the fan. ● Cover the fan case when operation
	**To protect your eyes and skin, Please observe the labor safety and sanitary regulations, wear necessary protective gear.** ● Operation should be performed in accordance with relevant labor safety operation procedures !		

4.2 Welding machine power distribution connection



4-1 Distribution box wire connection

1. Distribution box power switch
2. 40A fuse
3. Not less than 2.5mm^2 three-phase cable.

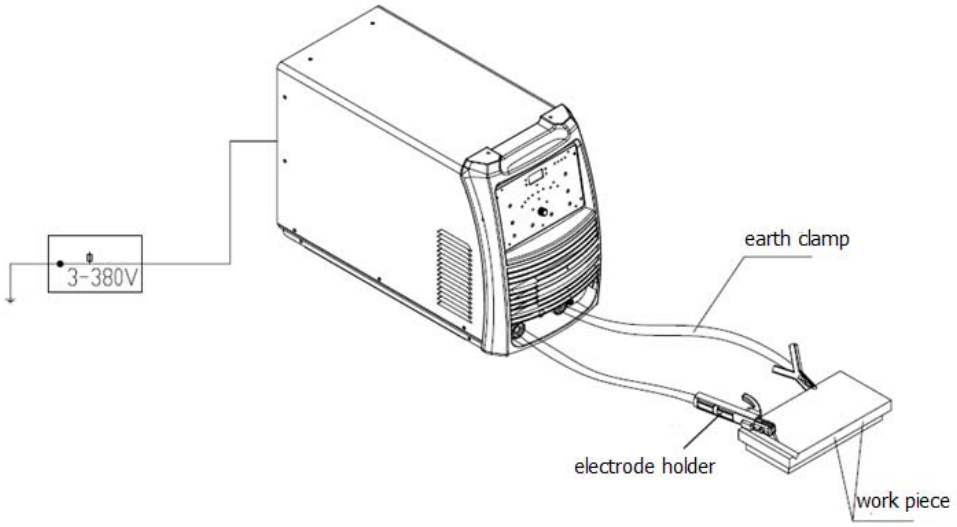
Please according to the explanatory Chart or right way connect the wire. Cut off the main power before you connect the wire. If distribution box has ground connector, please connect the welding machine ground cable to ground connector.

Do not operation with charged. If necessary, User equip the leakage protector.

- Professional electrician connect the wire.
- Do not put two welding machine contact on one fuse-box or l eakage protector.

4.3 MMA flux-coated electrode

4.3.1 Assemble wire connection



4.3.2 Process reference

- MMA flux-coated electrode reference

4-1 Only for reference

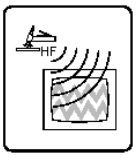
Electrode diameter (mm)	Recommend welding current（A）	Electrode diameter (mm)	Recommend welding current（A）
1.0	20～60	3.2	108～148
1.6	44～84	4.0	140～180
2.0	60～100	4.8	180～220
2.4	80～120	6.0	220～260

☞ This table only use for mild steel welding.

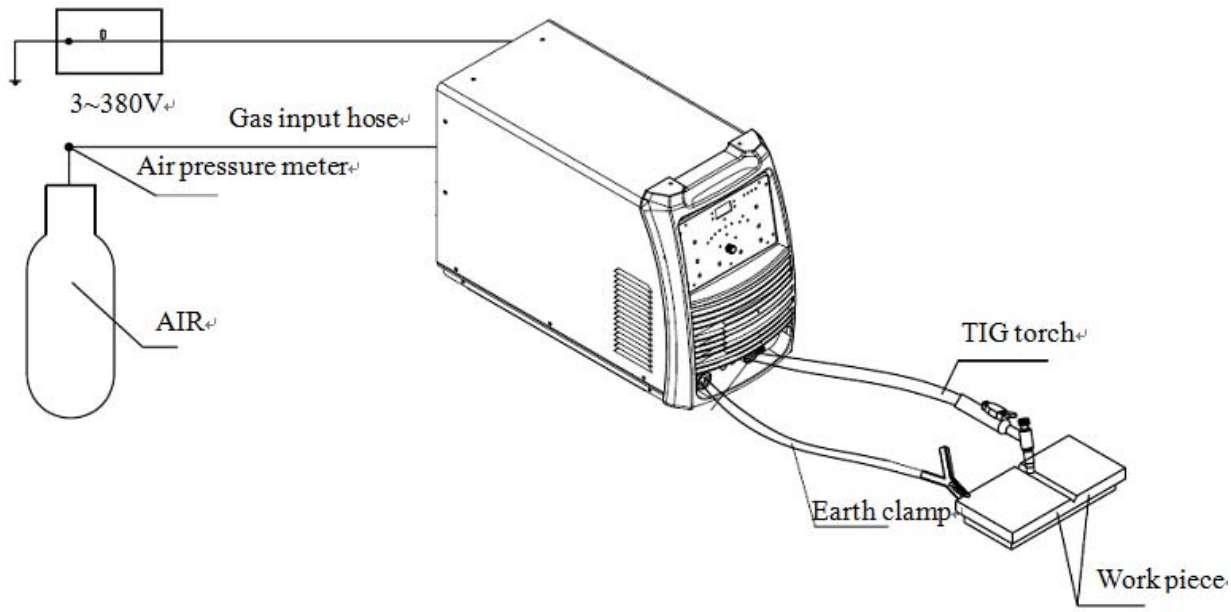
4.4 TIG

4.4.1 security warning

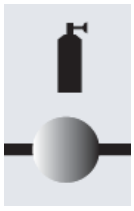
	**Inert gases harmful to body** ● Inert gases harmful to body even make the person suffocate, so please welding in a well-ventilated environment ● If you don't use, please close the cylinder valve.		**Electrical Shock** ● Do not check gas toward anyone. ● Inspect all cables and cords for any exposed wire and replace immediately if found.

	**Shielding Gas Cylinders Can plode** ● Never expose cylinders to high heat ● Keep cylinders away from welding or electrical circuits and fixed good.		● Keep people with pacemakers away from your welding area when welding. Consult your doctor before using any electric arc welder or cutting device ● It maybe interfere with radio, computers, communications equipment and other electronic equipment

4.4.2 Install wiring



4.4.3Parameter adjustment

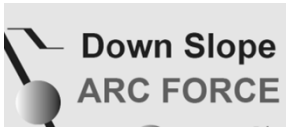


When you asjust, the digital display show time , unit is (s) .

Adjust gas pre flow time

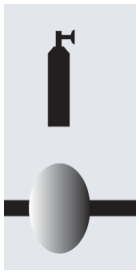
Gas pre flow is to release the air in the gun before welding, it can ensure gas purity. Gas pre flow time according to the gas hose length, normally less than 1s.

If continue welding, start the next welding before gas valve stop, gas pre flow time will automatically be ignored.



When you asjust, the digital display show time , unit is (s) .。

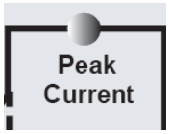
Adjust slope up time\slope downtime slope up time can preheat the work piece, slope down time can fill the ending arc pit.
Normally according the welding process card or setting on 0s.



When you asjust, the digital display show time , unit is (s) .

Adjust gas post flow time
Gas post flow time means the protect gas also protect the hot weld joint after welding , isolate the air then prevent oxidize. It also can prevent hot tungsten electrode to oxidize.
Gas post flow time always according welding current or setting more than 3s.

For standard TIG, you can adjust suitable current to welding now.

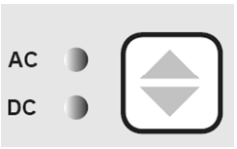


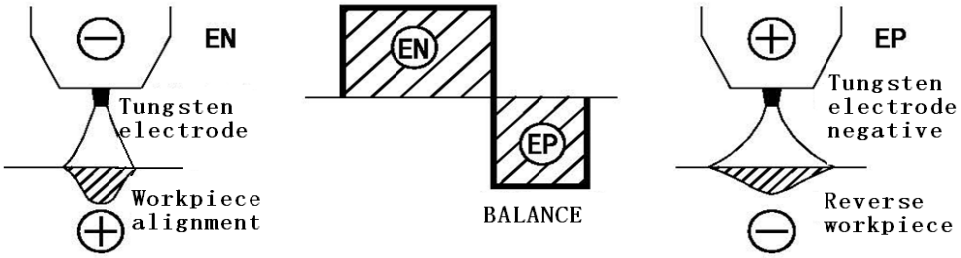
For standard AC or DC TIG secondary knob preset current value.
For pulse AC or DC TIG, secondary knob preset pulse peak current.

When you asjust, the digital display show setting current , unit is A .

☞ The upper parameter, each TIG mode can adjust.

If use AC TIG, need adjust AC frequency and clean area width.





AC TIG, welding current is positive and negative alternating current.
When tungsten electrode is negative, work piece is positive(EN). Now the arc energy is concentrated in the work piece . Arc is more concentrated, weld joint penetration is deep, weld joint is narrow. This is welding stage.
When tungsten electrode is positive negative, work piece is negative(EP). Now it is break oxide film stage. Arc is scattered, weld joint penetration is shallow, tungsten electrode is hot. This stage is clean area width or clean time. Turn up the clean area width suitably can help reduce the weld joint inclusions, welding joint surface murky grey or other defects. But this way is easy to loss of tungsten electrode.

EN+EP is one welding cycle. Cycle length can setting by adjust AC frequency. High frequency and smaller clean area width can improve the arc stiffness, but clean effect will decrease.
We recommended to use cerium tungsten electrode when AC TIG.

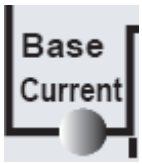
AC FREQUENCY	AC BALANCE
When you asjust, the digital display show AC frequenecy , unit is Hz. According to operation card adjust frequency , normally adjust to 60Hz.	When you asjust, the digital display show clean area width , unit is %. According to operation card adjust clean area width. When frequency high, turn clean area width down, frequency is low, turn clean area width up. normally adjust to 40%, not more than 50%.

☞ The upper two parameter only adjust and show parameter when AC TIG, other situation is useless

If choose pulse TIG, also need to adjust base current , pulse frequency and pulse ratio.

Pluse TIG：

1. Light gauge welding reduce welding input heat and thermal impact zone.
2. Medium plate butt welding, one side welding both sides formation.
3. Special automatic weldingto get uniform fish-scale patterns.



When you asjust, the digital display show base current, unit is A.

Base current

Base current adjust range is: minimum value is min welding current. maximum value is the same to current peak current, if adjust peak current, base current will proportional change.

Please according to the actual situation to adjust base current.

When you asjust, the digital display show pulse frequwncy parameter. Unit is Hz.

Pulse frequency

Pulse frequency range is related to AC or DC.

When DC pulse welding, pulse frequency from 0.3Hz to 200Hz.

When AC pulse welding, pulse frequency from 0.3Hz to 5.0Hz.

When you adjust, the digital display show pulse ratio, unit is %.

Pulse ratio

Pulse ratio means when pulse welding peak current time percentage rates of the whole pulse period.

Pulse ratio related to frequency, When frequency more than 100Hz, pulse ratio fix on 50%, other from 10%-90%.

Open the cylinder valve, adjust the suitable gas flow, welding.

4.4.4 Process reference

- The table 4-2 for TIG process for reference.

4-2 only for reference

	material	design	Work piece thickness (mm)	Wire diagram Φ (mm)	Welding current (A)	Polarity	Argon flow (l/min)	Tungsten sticks diagram Φ (mm)	Taper angle	Flat diagram Φ (mm)
DC	Not AL, MG , al-mg alloy	straight edge docking	1.6~3.0	1.6~2.5	50~90	DC straight polarity	8~12	1.0	12~20°	0.12~0.25
		V groove	＞3.0~6.0		70~120			1.6	25~30°	0.50~0.75
		X groove	＞6.0~12	2.5~3.2	100~150		10~14	2.4	35~45°	0.75~1.10
AC	AL, MG , al-mg alloy	Butt welding	1~2.5	1.6~2.5	45~90		2~6	2~3	90°	1.50
		V groove	3~6	2~4	90~180		10~12	3~4		
		X groove	8~12	4~5	150~220		12~16	4~5		

☞ This table only for reference

4.4.5 Remark

TIG：

A. If the arc ignition success ratio is low, please check the below solution.

1. Check if the tungsten sticks surface is oxidized. If it is oxidized, remove the oxydic coat.
2. Adjust the argon flow augmented suitably.
3. Ask electrician adjust HF ignition board spark gap.

B. This machine has no contact ignition function, do not use tungsten sticks and work piece contact-short-arc ignition , Avoid to loss the tungsten stick .

Maintenance

☞ **WARNING :**	1. Do not open the machine case if you are not professional electrician. 2. Shut down the machine and distribution box power before open the machine case.

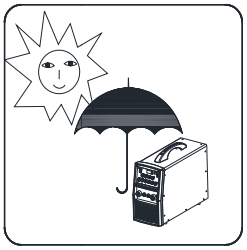
Danger！Electric shocks can be hurtful and deadly

- Do not touch the bare electric connection parts in the machine.
- Shut down the machine and distribution box power before open the machine case.。

Danger！ Rotating fan maybe hurt operator！

- Do not touch the rotating fan blade.
- Assemble the case before open the machine.

1

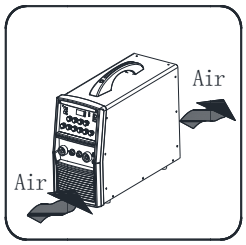


- Don't put the machine exposure to the sun too long time .
- Avoid he machine insolating in the strong sunlight

2

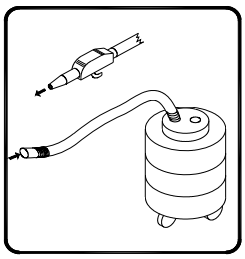
- Don't shower the machine in the rain。
- Don't put or use machine in too wet environment

3



- Ensure the vent is not covered during welding。
- Please use and store the machine in a well-ventilated environment。

4



- Open the machine case at least every six months. use dry compressed air cleaning machine or a vacuum cleaner to clean up the internal dust and metal scrap.

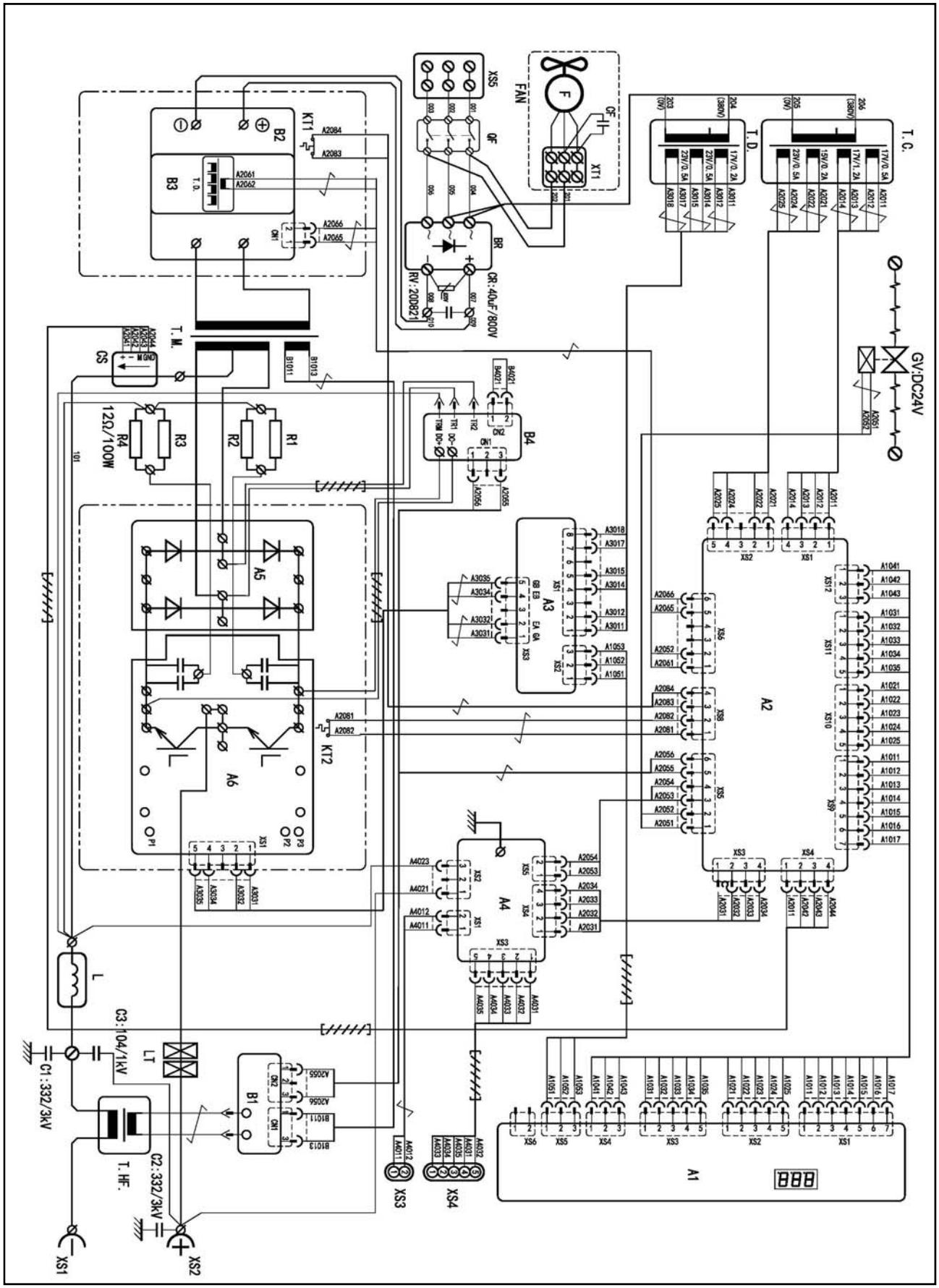
Check all welding cable insulation skin periodically， If there is any breakage, bind up or replace it.

Check all electric connection periodically, fixed all loose part.

Please take good care of all equipment, don't make them by man-made damage.

- **Only professional welder can open machine case.**
- **Remove the 3 ph line from distribution box before welding machine maintenance**

6.Mian wiring diagram



Wiring diagram parts

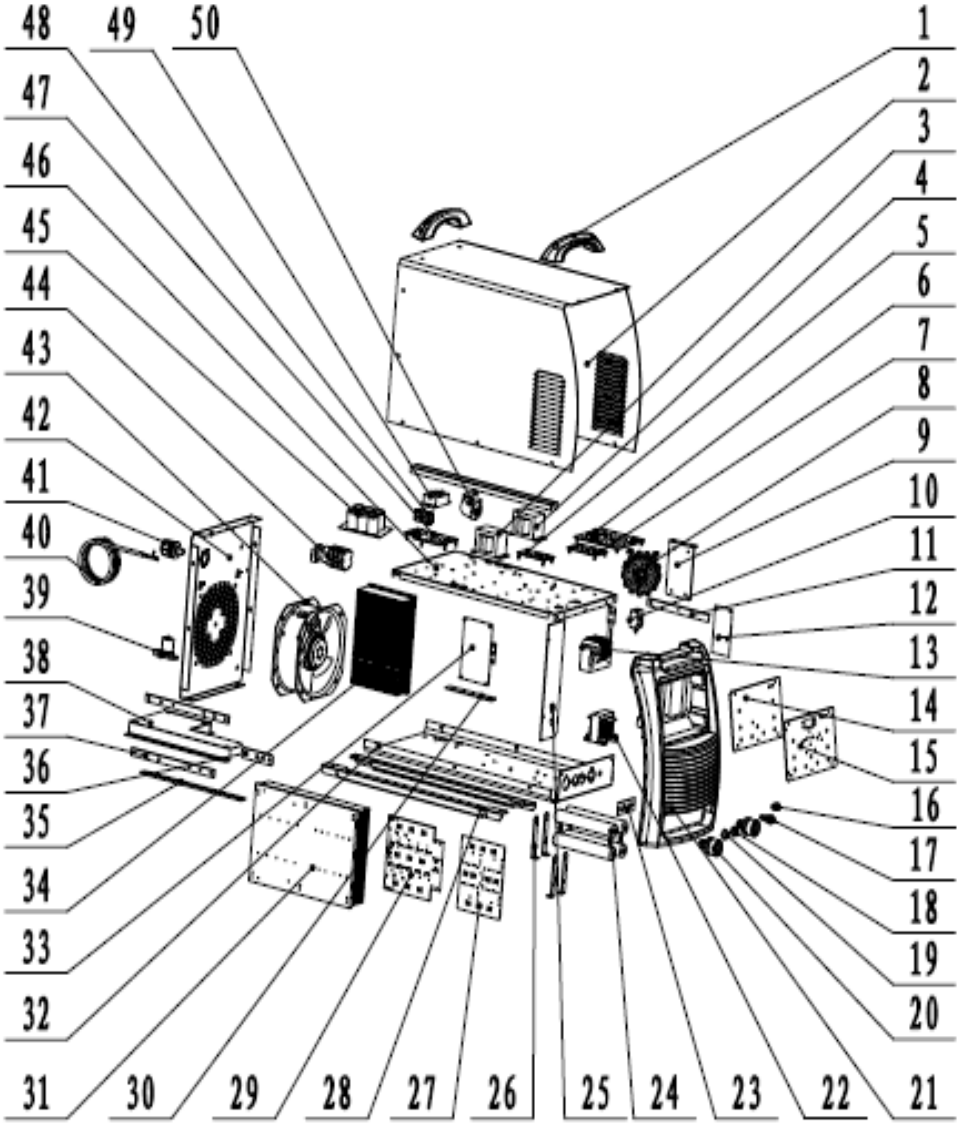
CODE	NAME
A1	Control front panel PanelAnaB
A2	Control board MainCtrlB
A3	Secondary inverter drive board SecDrvB
A4	Filtering absorbing board FeederB
A5	Secondary rectification board SecRecB
A6	Secondary inverter board SecInvB
B1	HF Ignition arc board
B2	Primary inverter noard
B3	Primary drive board
B4	Arc board
FAN	3 ph 380VAC fan
BR	Three phase rectifier bridge
QF	60A Three phase air circuit breaker
GV	DC24V electric gas valve
CS	300A hall current sensor
L	reactance
KT1、KT2	70℃ temperature relay
T.C.	Control power transformer
T.D.	Secondary drive power transformer
T.M.	Medium main transformer
T.HF.	HF coupling transformer
XS1	Quick connector（-）
XS2	Quick connector（+）
XS3	Torch switch aviation socket
XS4	Remote control socket
XS5	3 input connecting box

7. Internal structure and description

7.1 Security warning

<table>
<tr><td>☞
WARNING
:</td><td>3. Do not open the machine case if you are not professional electrician.
4. Shut down the machine and distribution box power before open the machine case.</td></tr>
<tr><td>  </td><td>Danger！Electric shocks can be hurtful and deadly
● Do not touch the bare electric connection parts in the machine.
● Shut down the machine and distribution box power before open the machine case.。</td></tr>
<tr><td>  </td><td>Danger！ Rotating fan maybe hurt operator！
● Do not touch the rotating fan blade.
● Assemble the case before open the machine.</td></tr>
</table>

7.2 Spare parts



7.3 Main components

Item	Code	Name
1	2.05.08.023	Handle
2	1.1.01.01.1188	Case
3	2.07.25.231	Control transformer 1
4	2.07.25.232	Control transformer 2
5	1.1.05.03.0166	Secondary drive board
6	1.1.05.02.0787	Main control board
7	1.1.05.11.0219	Filter wave board
8	2.07.25.315	Mian transformer
9	1.1.02.01.9654	Ignition arc board support
10	1.1.11.34.0065	Hall

11	1.1.02.01.9657	Connect bar
12	1.1.05.10.0051	Ignition arc board
13	2.07.25.710	Output reactance
14	1.1.05.07.0360	Control front panel
15	1.1.02.01.2081	Front panel support
16	2.07.11.022	Potentiometer knob
17	2.07.57.817	Gas connector
18	2.03.30.2407	Torch switch wiring harness
19	2.07.54.115	Aviation connector
20	2.07.57.959	Quick connector
21	2.05.05.277	Plastic front panel
22	1.1.02.04.8665	Coupling transformer
23	1.1.01.05.2354	Switch support
24	2.07.03.415	Wire-wound resistor
25	1.1.02.01.2082	Radiator wind shield
26	1.1.02.01.9653	Resistance support
27	1.2.01.01.9838	Rectification board
28	1.1.02.01.9886	Mian machine connect board
29	1.2.01.01.9837	Secondary inverter board
30	1.1.02.01.1030	Radiator insulation board 1
31	2.07.43.984	Radiator
32	1.1.01.04.1787	Bottom board
33	1.1.05.05.0397	Primary inverter IGBT radiator
34	2.07.43.983	Radiator
35	1.1.02.01.1031	Radiator insulation board 2
36	1.1.03.04.0222	connect bar1
37	1.1.03.04.0223	connect bar2
38	1.1.02.01.1032	Radiator support
39	1.1.11.34.0066	Gas valve
40	1.1.11.34.0071	Power line
41	2.04.30.103	Cable fixed head
42	1.1.01.03.2375	Back panel
43	2.07.89.810	Fan
44	2.07.80.105	Switch
45	1.1.05.11.0312	Capacitor filter board
46	1.1.01.05.3311	Assemble board
47	1.1.05.11.0218	Secondary inverter maintained arc board
48	2.05.17.028	Impacted plate
49	2.07.37.462	Three phase bridge
50	2.07.19.609	HF filtering capacitor

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