

Inverter Welder

OWNER'S MANUAL

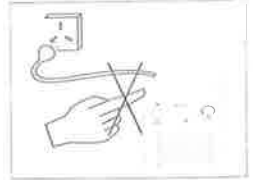
WSE160/200/250/315、WSE(P)200/250/315
(TIG160AC/DC TIG200AC/DC TIG250AC/DC TIG315AC/DC
TIG200PAC/DC TIG250PAC/DC TIG315PAC/DC)



WARNING

Welding and cutting is dangerous to the operator, people in or near the working area, and the surrounding, if the equipment is not correctly operated. Therefore, the performance of welding/cutting must only be under the strict and comprehensive observance of all relevant safety regulations. Please read and understand this instruction manual carefully before the installation and operation.

- The switching of function modes is possibly damaging to the equipment, while the welding operation is performed.
- Do disconnect the electrode-holder cable with the equipment, after the performance of welding.
- A safety switch is necessary to prevent the equipment from



Electric-leakage.

- Welding tools should be of high quality.
- Operators should be qualified.

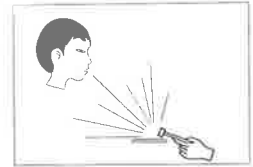
Electric Shock: It may be fatal

- connect the earth cable according to standard regulation.
- Avoid all contact with live components of the welding circuit, electrodes and wires with bare hands. It is necessary for the operator to wear dry welding gloves while he performs the welding task.
- The operator should keep the working piece insulating from himself/herself.



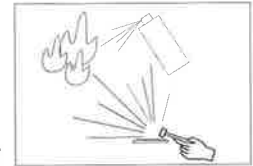
Smoke and Gas generated while welding or cutting: harmful to people's health.

- Avoid of breathing the smoke and gas of welding or cutting.
- Keep the working area in good ventilation.



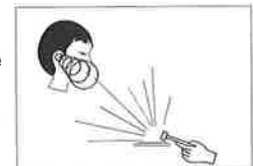
Arc light-emission: harmful to people's eyes and skin

- Wear the welding helmet, anti-radiation glass and work clothes while the welding operation is performed.
- Measures also should be taken to protect people in or near the working area.



Fire hazard

- The welding splash may cause fire, thus remove flammable material away from the working place.
- Have a fire extinguisher nearby, and have a trained fire person ready to use it.

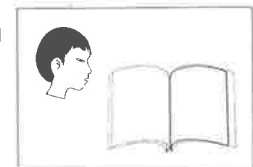


Noise: Possibly harmful to people's hearing.

- Surface noise is generated while welding/cutting, the hearing aids is necessary in some cases.

Machine Fault:

- Consult this instruction manual.
- Contact your local dealer or supplier for further advice.



INDEX

A BRIEF INTRODUCTION TO THE PRODUCTS-----	01
THE MAIN PARAMETER-----	02
INSTALLATION-----	05
OPERATION-----	06
CAUTIONS-----	07
MAINTENANCE-----	08
PRE-CHECKING-----	09
CIRCUIT DIAGRAM -----	09
BLICK DIAGRAM-----	11
DIAGRAM CIRCUIT-----	11
INSTALLATION&OPERATION-----	12

A BRIEF INTRODUCTION TO THE PRODUCTS

TIGAC/DC P serial is our newly-developed AC/DC and pulse products, whose main character is that it can not only weld stainless steel, alloy steel and carbon steel and other nonferrous metals with DC function, but also it can weld aluminum and alloy aluminum with AC function. For instance, for welding skateboard and bicycle made of aluminum. The total power exchange rate of the machines are over 85%, and they are energy-saving. The main types are AC/DC 200P, AC/DC 250P and AC/DC315P.

The use and development of inverter technology in welding benefits from the invention of high power electronic spare parts, esp. IGBT, the employ of which greatly reduces the volume and weight of main parts, e.g. transformer and anti-electricity, thus making our machines able to work under HF 100KHZ. We also employ PWM and CPU-control to make the welding current stable, accurate and easy to adjust; and make the machines convenient to operate, and avoid the disturbance of electric magnetism.

AC/DC welders are made with inverter technology, and they are lighter, smarter and more efficient compared with traditional ones; while compared with imported ones, they are cheaper, and has stronger electric net. The most characteristic one is the use of twice inverter technology and output of pure square wave, which makes the arc more straight, heat more concentrating, anti-clearance stronger and wider clearance wider etc to make sure the high quality of the machines.

AC/DC P serials are equipped with foot switch, thus liberating the workers' hands, and they can adjust the current with their foot freely. As a result, at the very beginning or wire-adding, we can speed up the current; while at the end slow down the current in order to form a good welding seam. In a word, the use of foot switch helps raise the welding efficiency and reduces the welding difficulty as well as make sure of the welding quality. If you need pulse welding, we have foot-control switch with the function of pulse welding.

Inverter welders are also equipped with TIG torch, and cable of suitable length, hose and water-cooling connector. Besides, there are also other spare parts for torch, such as ceramic nozzle, collet body, short cap and long cap. The size and quantity of them can see in the enclosed packing list. If you need more spare parts, you can order separately

**CAUTIONS!**

This equipment is used mainly in technology. Under room temperature, this equipment may have wireless emission, please pay attention to it when working.



This product is suitable only for TIG series (TIG).

THE MAIN PARAMETER

The following models don't have the function of pulse

TYPE	TIG160 AC/DC	TIG200 AC/DC	TIG250 AC/DC	TIG315 AC/DC	TIG250 AC/DC	TIG315 AC/DC
Power voltage	AC220V \pm 10%/50/60Hz		AC220V \pm 10%/50/60Hz		AC380V \pm 10%/50/60Hz	
Rated input current	15A	17.8A	28.8A	40.9A	7.9A	13.3A
Power capacitance	3.3KVA	3.9 KVA	6.3KVA	8.7KVA	5.2KVA	8.7KVA
Rated output current(DC)	160A	185A	220A	305A	220A	305A
Rated output current(AC)	160A	148A	176A	244A	176A	244A
Range of output current	20-160A	20-200A	20-250A	20-315A	20-250A	20-315A
Arc force (A)	—	—	0-75	0-75	0-75	0-75
No-load voltage(DC)	56V	62V	40V	45V	40V	45V
No-load voltage(AC)	50V	56V	32V	36V	32V	36V
Working voltage	16.4V	17.4V	18.8V	22.2V	18.8V	22.2V
Pre-flow (S)	0-1	0-1	0-1	0-1	0-1	0-1
AC output frequency (Hz)	60	60	60	60	60	60
Clean width (%)	20-80	20-80	20-80	20-80	20-80	20-80
Slope-down time (S)	0-10	0-10	0-10	0-10	0-10	0-10
Tail-gas time (S)	1-10	1-10	1-10	1-10	1-10	1-10
Remote control	No	No	Yes	Yes	Yes	Yes
Arc-leading	HF vibration	HF vibration	HF vibration	HF vibration	HF vibration	HF vibration
Efficiency (%)	85	85	85	85	85	85
Rated duty cycle (%)	40	40	40	40	40	40
Power factor	0.93	0.93	0.93	0.93	0.93	0.93
Insulation class	F	F	F	F	F	F
Protection class	IP21S	IP21S	IP21S	IP21S	IP21S	IP21S
Weight (kg)	19	20	30	37	30	37
Size (mm)	480×240×330	493×330×320	510×33×360	700×460×415	510×33×360	700×460×415
Max welding thickness (mm)	10	10	12	15	12	15

The following models are WSE-P series with the function of pulse

TYPE	TIG200P AC/DC	TIG250P AC/DC	TIG250P AC/DC	TIG315P AC/DC	TIG315P AC/DC
Power voltage	AC220V±10% 50/60Hz	AC220V±10% 50/60Hz	AC380V±10% 50/60Hz	AC220V±10% 50/60Hz	AC380V±10% 50/60Hz
Rated input current	17.8A	28.8A	7.9A	40.9A	13.3A
Power capacity	3.9 KVA	6.3KVA	5.2KVA	8.7KVA	8.7KVA
Rated output current(DC)	185A	220A	220A	305A	305A
Rated output current(AC)	148A	176A	176A	244A	244A
Range of output current	10~200A	10-250A	10-250A	10-315A	10-315A
Arc force (A)	0-75	0-75	0-75	0-75	0-75
No-load voltage(DC)	62V	40V	40V	45V	45V
No-load voltage(AC)	56V	32V	32V	36V	36V
Working voltage	17.4V	18.8V	18.8V	22.2V	22.2V
Pre-flow (S)	0-1	0-1	0-1	0-1	0-1
AC output frequency (Hz)	60	60	60	60	60
Clean width (%)	20-80	20-80	20-80	20-80	20-80
Slope-down time (S)	0-10	0-10	0-10	0-10	0-10
post-gas time (S)	1-10	1-10	1-10	1-10	1-10
Base current (%)	10-90	10-90	10-90	10-90	10-90
Pulse frequency (Hz)	0.5-300	0.5-300	0.5-300	0.5-300	0.5-300
Air-occupy proportion (%)	10-90	10-90	10-90	10-90	10-90
Remote control	Yes	Yes	Yes	Yes	Yes
Arc-leading	HF vibration	HF vibration	HF vibration	HF vibration	HF vibration
Efficiency (%)	85	85	85	85	85
Rated duty cycle (%)	40	40	40	40	40
Power factor	0.93	0.93	0.93	0.93	0.93
Insulation class	F	F	F	F	F
Protection class	IP23S	IP23S	IP23S	IP23S	IP23S
Weight (kg)	20	30	30	37	37
Size (mm)	493×330×320	510×330×360	510×330×360	700×460×415	700×460×415
Max welding thickness (mm) DC	10	12	12	15	15

Panel board functions & instructions

一、Exchange switch:

- 1、 **ARC/TIG exchange switch:** Place the switch on "ARC", it's for MMA welding; Place the switch on "TIG", it's for AC or DC tig welding .
- 2、 **AC/DC Exchange switch:** Place the switch on "AC", it's AC, for aluminum. Place the switch on "DC", it's DC, for stainless steel.
- 3、 **2T/4T switch:** Place the switch on "2T", it's short welding. that's, when you press the button, there is current output, when loosen your hand, it stops, as for "4T", when you first press it, there is current out, when loosen your hand, it never stops, there is still current out; press the second time, the current output stops. So it's called long welding.
- 4、 **DC/PULSE:** (It is only suitable for Tig p model) When the switch is at , the AC with pulse or DC current would be out, and when the switch is at , there is no pulse at all.

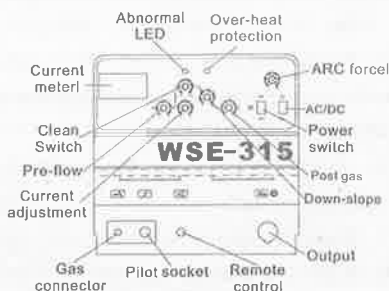
二、Adjustment switch

- 1、 **Pre-flow time switch:** To guarantee the welding efficiency, gas should be reach before current, this switch is to adjust the time between gas and current.
- 2、 **Current time switch:** It's for current adjustment, and change the volume of the current:
- 3、 **Clear width switch:**

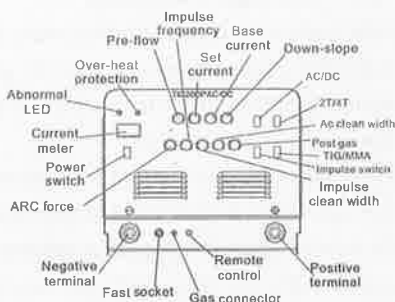
TIG200 AC/DC Panel



TIG250 AC/DC (315 AC/DC) Panel



TIG200P AC/DC Panel



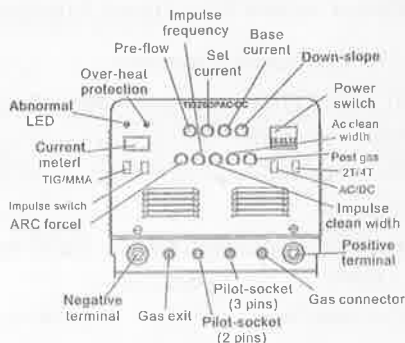
In ACTIG welding, the current exchanges between positive and negative directions, when Current is from tungsten to work piece, it's positive direction and tungsten heats little, convenient for welding; while if current is from work piece to tungsten, it's negative and good for removing the oxidization coating on the surface of the work piece, but the tungsten may be easily damaged because of overheating. This switch is for adjusting the

current time between positive and negative. When it's at the middle, the proportion is 50% ; at the maximum is 80%; at the minimum, 20%. If in clockwise direction, the positive current time turns longer and negative one shorter; and vice versa.

Re: Big current, low clear width; e.g. > 200A, the clear width < 30%.

Little current, high clear width; e.g. < 100A, the clear width > 50%.

TIG250P AC/DC (315P AC/DC) Panel



4、Slope-down switch: After finishing welding, at the crater time, the current is required to reduce gradually until it stops, and this switch is to adjust the reducing time of current.

Re: If use "foot switch", this switch is adjusted to "0" in counterclockwise direction.

5、Post-flow time switch: The work piece may be oxidized because of heat, so it needs to be cooled with the welding gas for sometime as long as 10 seconds, this switch is for adjusting the post-flow time.

6、Arc force adjustment: if you adjust this switch at MMA, then it can change the welding characteristic of the little current.

7、Base current: at DCTIG pulse, this button can adjust the volume of the valley current.

8、Pulse frequency switch: at DCTIG, and place the DC/PULSE at PULSE, this switch can adjust the pulse frequency (0.5-300HZ).

9、Air-occupying proportion: change the air-occupying proportion at DCTIG pulse.

≡、Pilot light function

Pilot light for over-heat protection: If the machine works continuously for long time under big current, its inner parts may get burned as a result of over-heat. To avoid this, we set the pilot light, when it's on, please stop working, but do not turn off the machine, and it can recover after 2 or 3 min.

Pilot light for abnormal phenomenon: If the machine has abnormal phenomenon, the light will be on, and you should turn off the power supply and restart the machine to see if it's normal again; if not, please ask professionals or the manufacturer for help.

INSTALLATION

1、TIG welders are equipped with power voltage complement, and when the power voltage ranges between 15%, it can still work.

When using long output cable, to reduce voltage-decreasing, we suggest you choose cables with wider section; but if the cable is too long, it may cause abnormal in the

working system, so we recommend you use the given length.

Make sure the ventilating mouth is not blocked or covered lest the cooling system invalid.

2. Connect well the CO₂ source. The gas supply includes gas bottle, gas hose and gas regulator, the connection of the hose should be connected with hose clamp or other things lest gas leaking or air-in.
3. Connect the case to earth with cables whose section is no less than 6mm², from the back of the welding machine to earth screw to earth-connecting equipment.
4. Plug the air-plug of the back circuit cable to the air-socket "+", and whirl the switch in clockwise direction tightly, the other terminal of the earth clamp is tied to the work piece.
5. Tie the power plug to the concerned socket, and make sure that the power supply is AC 380V with a tolerance of the given range.

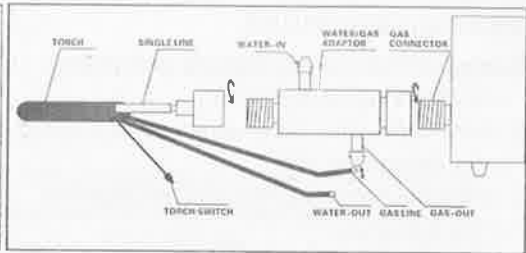
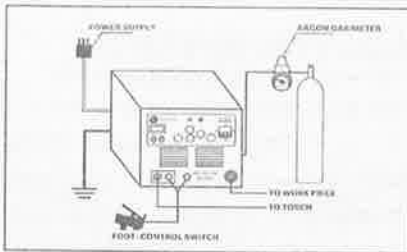
Set up the water-cooling torch according to the given map, tie the copper screw at one end of the torch to the one-knob on the panel board, and tighten it in clockwise direction.

7. Connect the two-cored air plug of the foot switch respectively to the two-pins and three-pins sockets on the panel board.

After finishing all the work above, you can start welding.

Installation

Installation of water-cooling torch:



OPERATION

SUITABLE TO TIGAC/DC250p, TIGAC/DC315p:

INSTRUCTIONS TO AC TIG:

1. Place "AC/DC to "AC" .
2. Turn on the power switch, the fan begins to work.
3. Turn on the gas switch, adjust the gas to rated standard. (See parameter) .
4. According to the oxidization degree of the work piece, adjust the switch for clean width to change the positive and negative current rate.
5. Turn on the switch on the welding torch, and the electromagnetic valve works, you will hear the sound of HF electricity-releasing, meanwhile, there is gas coming out of the torch mouth. Attention: If it's the first time to weld, please hold the switch for seconds before welding, don't begin welding until all the air in the gas road is yush out. After you finish welding, there will be still begas out for seconds. This is designed for protecting the

Welding point, so please stay in the welding place for seconds before removing the torch.

6、According to practical use , choose the foot switch.

If the foot switch is in use, please turn the current to the minimum, and the current volume is under the control of the foot switch.

7、According to practical use, adjust the time of “pre-flow” 、 “post-flow” and “slope-down”.

8、Keep the distance between the tungsten and work piece between 2mm to 4mm, push the torch switch, then HF electricity-releasing will come out between the welding tungsten and work piece; after the arc-leading, the splash may disappear at once, then you can start work.

INSTRUCTIONS TO DC TIG :

PULSE/DC switch .if you put it at PULSE, you can adjust the buttons for Base current adjustment、 pulse adjustment or clear width adjustment to achieve the welding efficiency that you need.

Turn on the power switch, the fan inside the machine begin to work.

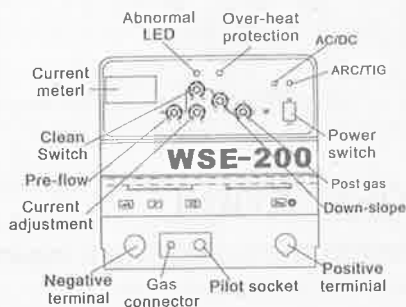
Turn on the gas switch, adjust the gas to rated standard. (See parameter) .

MMA INSTRUCTIONS:

- 1) turn on the power switch on the panel board, and the fan begins to work.
- 2) Place the function button on the panel board to the down place ARC.
- 3) Adjust the current according to the thickness of the workpiece.
- 4) Adjust the arc force switch according to practical use (for TIG250、 TIG400) ,and it is for adjusting the welding performance, esp. when the current is small, and it cooperates with the current adjustment switch to control the current of arc-starting out of the control of the current adjustment button.

Under this circumstance, you can get high arc force at small current, thus imitating the efficiency of DC inverter machine.

Remark: this machine has MMA function



CAUTIONS!

Any plug-in or plug-out of cable or connection during the welding is forbidden, because such operation may cause harm to either body safety or the equipment.

CAUTIONS & PRE-CAUTIONS

Environment

1) The operation should be in a comparative dry environment, the air humidity no more than 90%.

2) The around temperature should be between -10°C and 40°C.

3) Avoid working under the sun or in the rain, do not let in water or rain.

4) Avoid working under the circumstance of dust or air with corrosive gas.

5) Avoid doing CO₂ working under the condition of strong air flow.

1. Safety tips TIG welders are equipped with over-voltage and over-current and over-thermal protection circuit, when the output voltage, output current and inner temperature is over the rated ones, the machine will stop working automatically. But over-use (e.g. over-voltage) may damage the welding machine, so pay attention to the following tips:

1) Make sure of good ventilation TIG welders are large technical welding machines, and has huge current through it when working, and natural air flow cannot satisfy its cooling need, so we put two embodied fans to cool it and make it work normally. The operator should make sure the fan not blocked or covered, and the distance between the welder and surroundings shouldn't be less than 0.3m.

The users should always pay attention to the flowing condition of the machine, because it is very important for the working quality and working year of the machine.

2) No over-load!

The users should pay second attention to the allowed max loading current (comparative load cycle), and make sure the welding current not surpass the allowed max. Over-current may obviously shorten the working year of the machine, and even may fire the machine to pieces.

3) No over-voltage!

The power voltage is listed in the "Main Parameter" table, generally, the automatic compensating circuit may make sure the current is in rated range. If the voltage surpasses the allowed value, the machine may be damaged. The operator should be familiar with it and take certain actions to prevent it.

4) Every welder has an earth screw, and earth connecting mark. Before operation, please choose a cable whose section is more than 6mm², make the case firm earth connecting to avoid accidents which may be caused by electricity-leaking.

5) If the working time of the welder surpasses the standard load cycle, the machine may suddenly enter protection condition and stop working, which shows that the machine has been over the standard load cycle, and over-heating works the thermal control switch, thus making the machine stop working. Meanwhile, the red pilot light on the panel board is on. Under this circumstance, you needn't pull off the plug, so that the fan can continue working, thus cooling the machine. When the red light is off, the temperature decreases to the standard range, then you begin to weld again.

MAINTENANCE



WARNING:

All maintenance and checking work should be carried out under the circumstance of light off. Make sure the power plug is pulled off before you open the case.

- 1) Use clear and dry compressed air to remove the dust in certain period, if the machine is working under heavy-polluted environment, clear it daily.
- 2) The pressure of the compressed air should be in a suitable level lest it damages the little parts in the machine.
- 3) Check the inner circuit connection in the welding machine, and make sure the connections are right and firm (esp. plug-in or parts); if there is rust or loose, use the sand-paper to rub off the rust or oxidized coating and re-connect it firmly.
- 4) Avoid water or water vapour into the inner of the machine, if happens, please first dry it, and then measure the insulation situation with Omen meter. (including the joints and joint vs case).

Do not continue until you make sure there is no abnormal phenomenon.

- 5) If the machine is not used for long time, please put it into the original box and keep it in dry condition.

PRE-CHECKING

WARNING



Blind experiment and uncautious checking may cause trouble for formal repair and make the breakdown area bigger. And the inner bare parts of the machine have voltage that may cause dangers if it has power supply, so any direct or in direct touch may cause accidents of electric shock, and heavy shock may even cause death!



Caution: During the maintenance period, if not authorized, any personal wrong repair to the welders may cause the maintenance invalid.

CHECKING BREAKDOWN



Cautions: The operators are supposed to have enough knowledge of electric electricity and common sense of safety, and concerning certificates are needed. We suggest you contact us before operation and meanwhile get permission.

BREAKDOWN	POSSIBLE CAUSES	SOLUTION
1、No reflection after turn-on	1、No power supply or short of phase 2、Power cable in break circuit 3、Assistant power off in the phase	1、Check the power supply. 2、Open the case to check the voltage 3、Contact the supplier or specialist.

2. The regulator indicates, no sound of releasing electricity, no show of breakdown.	<ol style="list-style-type: none"> 1. Something wrong with the switch 2. Releasing nozzle in short circuit. 3. Air-socket wrongly set up 	<ol style="list-style-type: none"> 1. use screw knife to make the two- pins air socket short circuit. 2. adjust the distance between ele ctri-releasing nozzle. 3. when using torch or foot switch , the concerned plug should be in the two- pins socket.
3. have HF electricity-releasing, but no current output .	<ol style="list-style-type: none"> 1. earth cable not well connected 2. torch cable in short circuit. 	<ol style="list-style-type: none"> 1. check the earth cable . 2. check or renew the torch.
4. have current output, but cannot adjust,	<ol style="list-style-type: none"> 1. hand-control and foot switch in wrong place. 2. potentiometer in the foot switch broken. 	<ol style="list-style-type: none"> 1. when using foot switch , the exchange switch should be in " on " place. 2. renew the potentiometer.
5. hand-control normal, while foot switch abnormal.	<ol style="list-style-type: none"> 1. slight switch in foot switch broken. 2. sliding potentiometer in the foot switch broken. 	<ol style="list-style-type: none"> 1. renew the slight switch. 2. renew 1K sliding potentiometer.
6. abnormal pilot light on	<ol style="list-style-type: none"> 1. spontaneous over-current protection. 2. too much dust causes short circuit 3. some parts in the machine broken . 	<ol style="list-style-type: none"> 1. turn off the machine , and restart after the light on . 2. open the case, use the compressed air to clear the dust. 3. Contact professionals or suppliers.
7. can not remove the oxidized coating in AL-welding	<ol style="list-style-type: none"> 1. choose the wrong welding button 2. clear width too low. 3. Damage the MOSFET in second inverter. 	<ol style="list-style-type: none"> 1. Choose AC button in AL welding. 2. Make clear width high or remove the oxidized coating. 3. Contact professional.
8. Current normal, but no gas out	<ol style="list-style-type: none"> 1. have sound of electromagnetic valve <ol style="list-style-type: none"> a. gas nozzle blocked up b. gas hose broken 2. no sound of electromagnetic valve <ol style="list-style-type: none"> a. valve damaged b. valve-controlled circuit in trouble 	<ol style="list-style-type: none"> a. clear the blockings. b. Repair and change tig torch <ol style="list-style-type: none"> a. Change the valve. b. Ask professional to repair the board.
9. Tungsten terribly damaged	Clear width adjust too much	Adjust the clear width in counterclockwise
10. Earth cable too hot	Earth cable not well connected	Better tie the cable screw to the work table

BLICK DIAGRAM

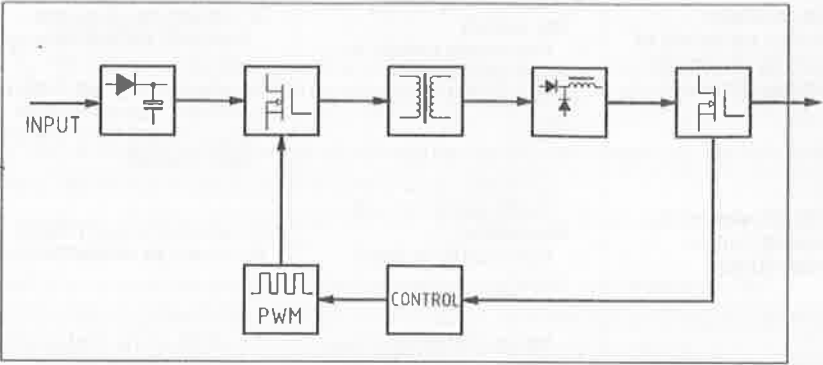
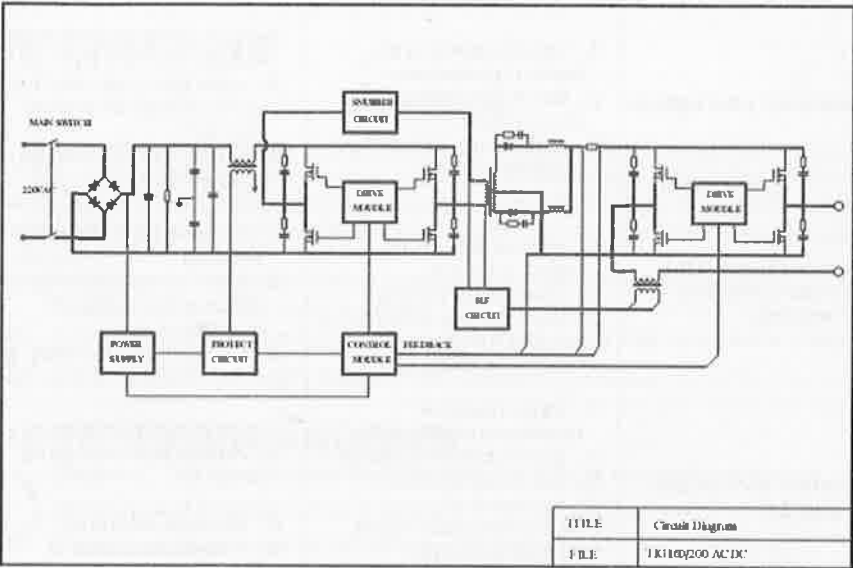


DIAGRAM CIRCUIT



INVERTER WELDER

Purchasing fitting:

The inverter welder sets which you buy contain some free fitting but they may be not enough for long-term usage, we suggest you to buy more according to your needs.

When you send us the purchasing sheet, please write down the item number, serial number, and fittings' name and serial number labelled in the fittings list.

NO:	NAME:
P01004	SR-26 TIG Torch
P07082	SR-26 Torch
P02007	WP-18 Water cooling Torch
P06101	WP-18 Torch
P10040	K-01 Switch
P05009	Collect 3.2
P05008	Collect 2.4
P09008	Earth clamp
P06046	argon regulator(screw thread inside)
P06102	argon regulator(screw thread outside)
P05007	Tungsten 1.6
P05008	Tungsten 2.4
C02036	Gas/electricity exchange connector
P10039	Foot control