

Inverter Welder

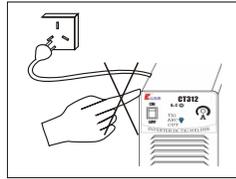
OWNER'S MANUAL

T174/T175DV/T212DV

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 not disconnect the electrode-holder cable with the equipment, after the performance of welding.
- A safety switch is necessary to prevent the equipment from

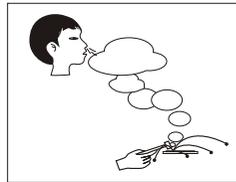


Electric-leakage.

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

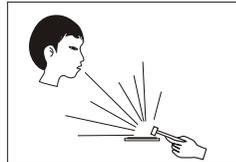
Electric Shock: It may be fatal

- 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.



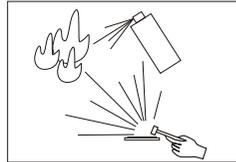
Smoke and Gas generated while welding or cutting: harmful to people's health.

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



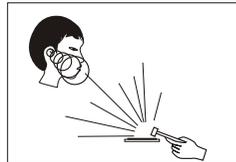
Arc light-emission: harmful to people's eyes and skin

- 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.



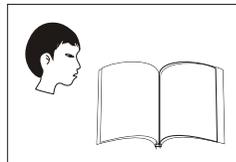
Fire hazard

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

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AN INTRODUCTION TO DC WELDERS

First of all, thank you for using our welders!

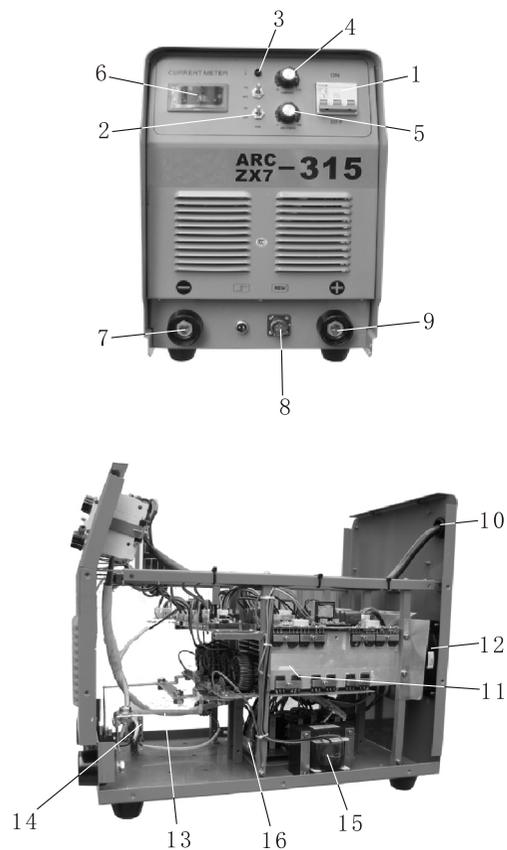
Our welders are made with advanced inverter technology. The inverter power supply is to first rectify the working frequency to 50/60HZ DC, and then invert it to high frequency with high power factor IGBT (as high as 15KHZ) , and rectify again, and then use PWM to output DC power of high power factor, thus greatly reducing the weight and volume of the main transformer and the efficiency is raised by 30%. The arc-leading system employs the principle of HF vibration. The main features are: stable, firm, portable, energy-saving and noiseless. The coming out of the inverter welders is considered as a revolution in the welding industry.

The features of MMA series are: perfect functions and satisfying all kinds of welding need, esp. places requiring welding of high quality, e.g. pipes, boiler, vacuum compressing container, etc.

Welcome friends of all works to use our products and give us your suggestion, we'll contribute all to making our products and service better.

1. Maintenance for main engine is one year, excluding other spare parts.
2. During the maintenance period, all maintenance is for free except intentional damage.
3. Customers are not allowed to unfold and refit or change the parts, or the consequent trouble is on you, and our company bears no duty over it.

This structure drawing is suitable for ARC315 (ARC400) welding machine.



PART ONE.

The front-panel indication:

- 1 .Air switch
- 2 .Remote exchange
- 3 .Protecting indication
- 4 .Current adjust knob
- 5 .Drive adjust knob
- 6 .Current meter
- 7 ."-output connector
- 8 .Remote connector
- 9 ."+output connector

PART TWO.

Inner elements:

- 10 .Power cable
- 11 .Inverter
- 12 .Fan
- 13 .Connector
- 14 .MMA switch
- 15 .Transformer

PART THREE.

Control module:
16 .Bottom board

THE MAIN PARAMETER

1-1、Parameter

PARAMETER	T175DV	T174	T212DV	ARC200B (H)	ARC250 (H)	ARC300 (H)	
Input power voltage (V、Hz)	Single phase AC110V 230V±15% 50Hz		Single phase AC230V±15% 50Hz				
Rated input current (A)	110V 27.6	230V 19.7	20	32	32	43	55
Rated output voltage (V)	24	25.6	25.6	28	28	30	32
Output current adjustment (A)	20~100	20~140	20~140	20~200	20~200	20~250	20~300
Arc force adjustment range (A)				0~50	0~100	0~100	
Duty cycle %	60	60	40	60	60	60	60
No-load voltage (V)	70	70	62/76	62	62	62	62
No-load consumption (W)	40	40	40	40	60	60	60
Efficiency %	85	85	85	85	85	85	85
Power factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Insulation class	F	F	F	F	F	F	F
Protection class	IP23	IP23	IP23	IP23	IP23	IP23	IP23
Weight (kg)	6	6	8	10	15	21	
Size (mm)	400*180*295	400*180*295	400*180*295	425*205*355	480*210*310	555*220*355	

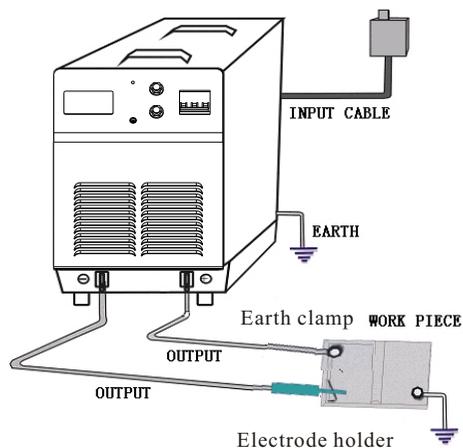
PARAMETER	TYPE	ARC315	ARC250(H)	ARC300(H)	ARC315	ARC400	ARC400B	ARC500
Input power voltage (V、Hz)		Single phase AC220V±15% 50/60Hz		Three phase AC380±10% 50/60Hz				
Rated input current (A)		59	15	18.5	20	28	28	38
Rated output voltage (V)		33	30	32	33	36	36	40
Output current adjustment (A)		20~315	20~250	20-300	20~315	20~400	20~400	20~500
Arc force adjustment range (A)		0~100	0~60	0-100	0~100	0~100	0~100	0~100
Duty cycle %		60	60	60	60	40	60	60
No-load voltage (V)		62	68	61	69	67	67	67
No-load consumption (W)		80	60	60	80	100	100	100
Efficiency %		85	85	85	85	85	85	85

Power factor	ARC315	ARC250(H)	ARC300(H)	ARC315	ARC400	ARC400B	ARC500
Insulation class	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Protection class	F	F	F	F	F	F	F
Weight (kg)	IP23						
Size (mm)	18	15	21	18	28	35	35
	450*300*290	480*210*310	555*220*355	450*300*290	565*305*495	540*365*370	540*365*370

INSTALLATION

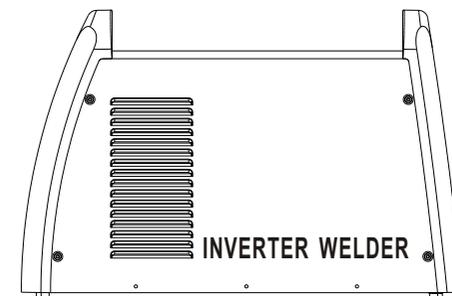
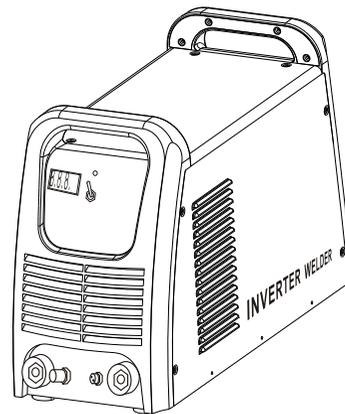
2-1 Connection of the power wires

- 1) Each machine is equipped with primary power wire, according to the input voltage, please connect the primary wire to the suitable voltage class.
- 2) The primary wire should be connected to the corresponding socket to avoid oxidization.
- 3) Use multimeter to see whether the voltage value varies in the given range



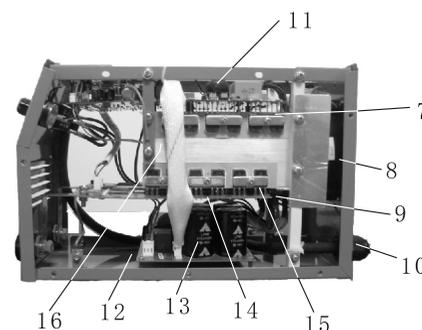
2-2 Connection of output wires

- 1) Each welder has two air sockets, connect the plug to the socket on the panel board, and tighten it and make sure that it's well-connected, or it may cause the damage of both the plug and socket.
- 2) The electrode holder wire is connected to the negative terminal, while the work piece is connected to the positive terminal; connect one terminal of the earth clamp to the red air plug, and tighten it with hexagon spanner to make the secondary wire well-connected to the air plug, or the air plug may get burned.
- 3) Pay attention to the electrode of the wire. Generally, there are two ways of the DC



INSTALLATION&OPERATION

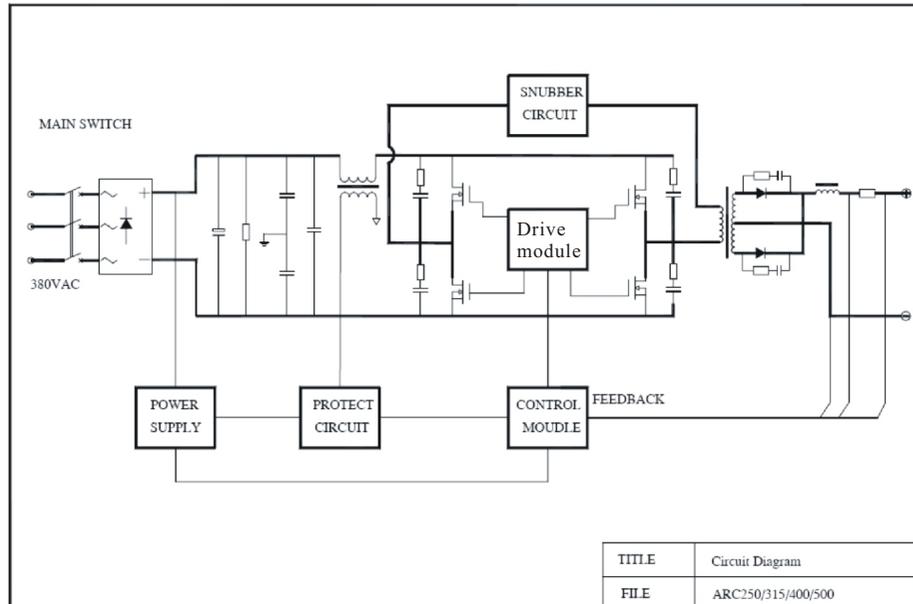
This structure drawing is suitable for ARC200 welding machine.



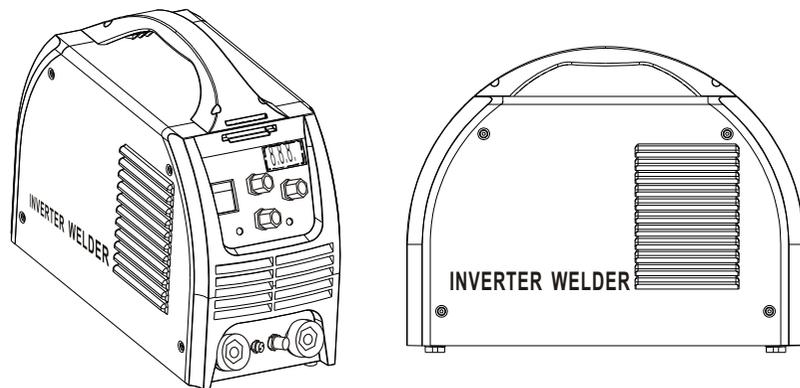
Inner elements:

- 1 .Protecting indication
- 2 .Power indication
- 3 .Power switch
- 4 .Variable resistor
- 5 . "-" output connector
- 6 . "+" output connector
- 7 .Inverting diode
- 8 .Fan
- 9 .Silicon bridge
- 10 .Power cable
- 11 .Electric reactor
- 12 .Bottom board (Power board)
- 13 .Capacitor
- 14 .Eddy plate (Center board)
- 15 .Rectifying tube
- 16 .Main transformer

CIRCUIT DIAGRAM



STRUCTURE



welder connection: positive connection and negative connection. Positive: electrode holder to “-” ,while work piece to “+” ; Negative: work piece to “-” , while electrode holder to “+” ; Choose the way according to the practical requirements, and wrong choose may cause unstable arc and big splash, etc. Under this circumstance, renew the air plug rapidly in order to change the poles.

4) If the work piece is too far away from the machine (50-100m) , and the secondary wire is too long, the section of the cable should be bigger to reduce the lower of the cable voltage.

2-3 Checking

- 1) Whether the machine is connected to standard to earth.
- 2) Whether all the connections are well-connected. (esp. that between the earth clamp and the work piece)
- 3) Whether the output of the electrode holder and earth cable is short-circuited.
- 4) Whether the pole of the output is correct.
- 5) If you choose the circuit protector, the leaking electricity should be less than 30mA.
- 6) The welding splash may cause fire, so make sure there is no flammable materials nearby.

OPERATION

3-1 Operation instructions (enclosed panel board sketch)

- 1) Turn on the power switch, and the meter indicates the set current value, and the fan begins to spin.
- 2) According to practical need, adjust the “welding current knob” and “the arc-leading pulse knob” to the welding requirement.
- 3) Generally, the welding current of each wire is :

$\Phi 2.5$: 70-100A; $\Phi 3.2$: 110-160A;

$\Phi 4.0$: 170-220A; $\Phi 5.0$: 230-280A.

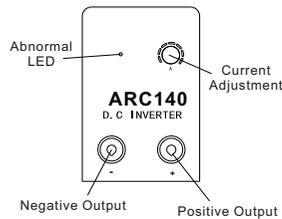
- 4) “arc-leading pulse knob” is to adjust the welding function, esp. match “current knob” in little current range, can take convenience to adjust the current of arc-starting, and is out of control of the “welding current knob” .

5) if the machine has remote control .

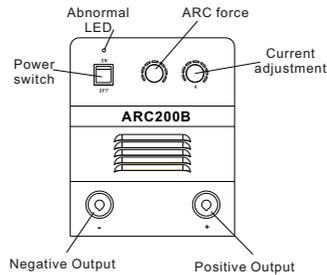
A. make sure of the place of the machine before working , “off” means no remote control, while “on” means using remote control

B. plug the remote plug to the remote socket, whirl it tightly to avoid bad connection.

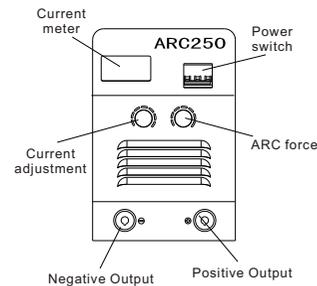
ARC140



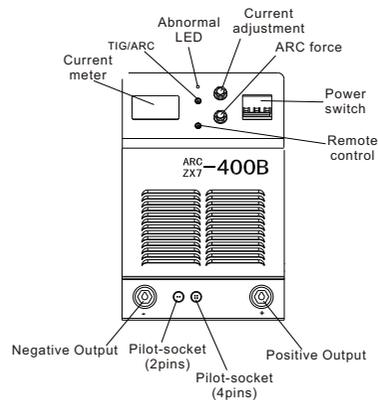
ARC200B



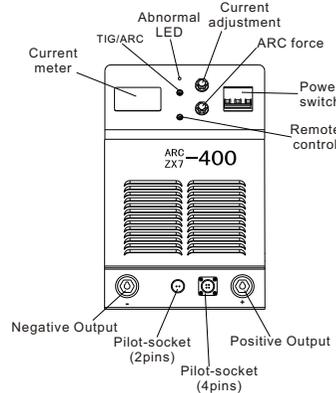
ARC250



ARC400B



ARC400/500

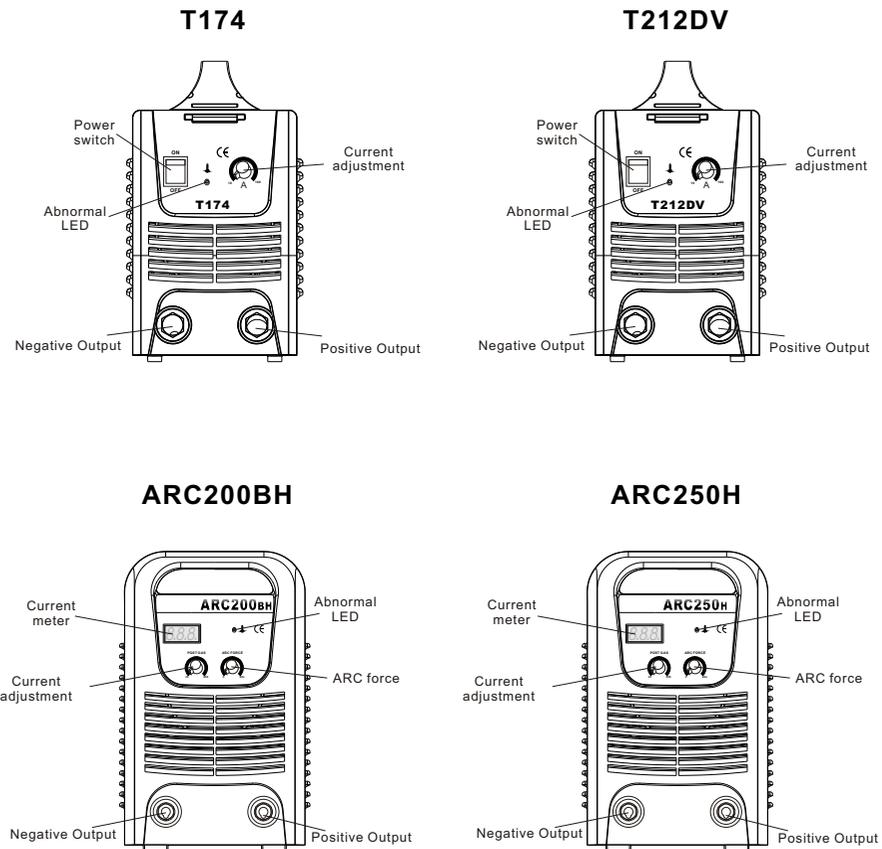


<p>3. The LED monitor shows normal, the fan is working, Run the machine .the red lamp is on.</p>	<p>1.Over current protection. 2.Over temperature protection. 3.It may be wrong with inverter circuit and leading arc board. 1) The red lamp is on, the wrong is in the inverter. (if double inverters, after closing the machine, pull off the socket . (nearby the fan VH-07) Run the machine and press hand-switch ,the red isn' t on ,be sure this inverter is wrong. The red lamp is on, be sure that inverter is wrong. 2) Close the machine and put on the connections of the bad inverter. pull off the connections of middle board transformer (nearby the fan VH-07)Run the machine and press hand-switch ,the red lamp is on , individual MOSFET is damaged. Meanwhile check the components on drive module. 3) If the main transformer are damaged, we can measure them by electricity bridge , the value is too small, replace it 4) Check and Removing the rectification tubes one by one 4.Run the machine, press the hand-switch the red lamp is on 1)the feedback circuit is open circuit the main current circuit loses contact</p>	<p>1. Stop working five minutes. 2. Close five minutes and restart the machine . 3. Check and measure the rectifications tubes one by one and . replace the same type components.</p>
<p>4. The welding splash is very much.</p>	<p>It is wrong that output electrode connections. You may exchange output lines.</p>	
<p>5. The welding current isn' t stability</p>	<p>1. The variable resistance is damaged 2. Put current remote control on remote position. 3. The output cables are too long or slim . 4. The filter capacitance leaks electricity or damaged.</p>	<p>1. Replace . 2. Put on “off” position 3. Thicken the cables 4. Check and replace</p>
<p>5 .Run the machine press the hand-switch the red lamp is on</p>	<p>1. The reverse feedback circuit is open circuit. . 2. The prime current transform circuit is loose contact or broken</p>	<p>Check.</p>
<p>6. Run the machine but trip.</p>	<p>1. The switch lines or the bottom board have shortcut 2. The rectification bridge is short circuit.</p>	<p>Check.</p>
<p>7. Has incline arc phenomenon in weld</p>	<p>1. Check the welding-torch lines or ground line 2. Change the position of ground line and weld</p>	<p>1. Check. 2. Check and adjust .</p>

<p>2. Run the machine, The pilot lamp is on, no output, the fan isn't working or Works a minute and stops.</p>	<ol style="list-style-type: none"> 1.The connections is loose contact from the power supply switch to the bottom board. 2.The input voltage is too high it will cause protection 3.The cables input is slim or long, it will causes protection. 4.The relay of 24/30A in prime circuit closed badly. the removing magnetism resistance or temperature-sensitive resistance's value becomes big. 5.The supplementary power supply on top board is damaged without DC24V. 6.Continuously run and close the machine during the losing wave time, lead to the switch-on resistance too hot. 	<ol style="list-style-type: none"> 1. Check the connections. 2. the voltage input is too high or too low 3.Thicken the input lines 4.Check and replace . 5.Repair and replace . 6.Stop working 3 minutes .
<p>3. Run the machine, the red lamp isn't on, no output, the fan is working .</p>	<ol style="list-style-type: none"> 1. Check all the connections inside 2. Check the control module, drive circuit ,drive module. 3. Check the MOSFET, transformers, rectification and connections . 	<ol style="list-style-type: none"> 1.Check joint. 2.Check and replace . 3.Check and replace .
<p>4. Run the machine, the fan is working, The pilot lamp is working , no output.</p>	<ol style="list-style-type: none"> 1.Over temperature protection 2.Over current protection 3.The inverter parts are wrong 4.Pull off the socket of middle board nearby the fan.VH-07 after closing the machine .restart, the red lamp is on ,be sure that the individual MOSFET is damaged, meanwhile ,check the components on drive module 5.The red lamp isn't on, maybe the main transformer and the rectification tube are damaged L=12~2.0mh Q>40 	<ol style="list-style-type: none"> 1.Stop working five minutes 2.Close the machine five minutes and restart. the machine . Measure the rectification tubes one by one and replace the same type components.

ARC250、315、400、400B、500

Breakdown phenomenon	Cause analyzing	Removing ways
<p>1. The LED monitor has no show, Run the machine and has no any reaction..</p>	<ol style="list-style-type: none"> 1.Check the power supply outside 2.Check the AC~380V input and the air-switch 3.Check the DC~24V and the supplementary power supply, and the transformer of DC24V 	<p>Check.</p>
<p>2. The LED monitor shows normal, the fan is working. the red lamp isn't on .no output</p>	<ol style="list-style-type: none"> 1.Check the connections and judge them 2.Check the control model and drive model 3.Check the MOSFET, main transformer, rectification tubes and the connections 	<p>Check.</p>



C、 place the switch on “ OFF ” when not use the remote control, or you can not adjust the current on the panel board.

D、 some users knock over the remote control during the transportation, and mistake it as breakdown of the machine, which should arouse your attention.

3-2 Allowed duty cycle

1) strictly work in conformity with the required duty cycle. (see the technical parameter) if work under over duty cycle, the machine may suddenly stop working .That's the inner thermal parts work because of over-loading. Under this circumstance, you needn't cut off the power supply, leave the fan work to lower the temperature. Generally, it will recover within 5 or 10 mins.

CAUTIONS

4-1. Working environment

under comparative dry environment , the moisture $\leq 80\%$; the environment temperature should be between -10°C and $+40^{\circ}\text{C}$; avoid working in the sun or rain; avoid working in the environment where there is much dust or corrosive gas.

4-2. Safety tips

1) Good Ventilation

This machine is little in volume , tight in structure, and big in current output, so the natural air circulation cannot satisfy its need, and we add special fans in it for cooling.

Re: Cautions: make sure the two terminals and shutter of the cutter are not blocked and covered, and the machine should be placed 0.3m away from the surroundings; please always improve the Ventilation, because it's very important for the normal working of the welding machine.

2) No over-load working

Over-loading is forbidden , or the cutter may stop suddenly during the cutting course. That's, the inner thermal parts work under over-load condition. Under this circumstance, no need to cut off the power switch, leave the fan whirl to speed up the temperature-lowering .If the temperature drops to the given range , the work will recover.

3) No over-voltage

The power voltage range of the machine see the “Main parameter” table, under this circumstance, the inner voltage will complement all by itself, and guarantee the welding current not surpass the allowed value. Please be more careful if the parts are damaged because of over-voltage.

4) Each machine has a screw for earth connecting, the mark is earth signal, please choose a 10mm cable to connect the case of the machine to earth to avoid breakdown caused by static electricity or electricity-leaking.

Do not touch the output terminal when working, or it may cause electric shock.

1). Clear the dust at regular intervals with clean and dry compressed air; if the working condition has heavy smoke and pollution , the welding machine should be cleaned once a month.

2). The compressed air should be reduced to the required pressure lest the little parts in the welding machine be damaged.

3). Check whether the inner gas-electricity connection is well (esp. the plugs) , and tighten the loose connection; if there is oxidization , remove it with sand paper and then re-connect.

4). To avoid water and rain , if there is , dry it in time, and check the insulation with megameter (including that between the connection and that between the case and the connection) . Only when there is no abnormal phenomena can the welding continue.

5). If the machine is not used for long time , put it into the original packing in dry condition.

BREAKDOWN-CHECKING

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

1、 T174、 T175DV、 T212DV、 ARC200B

Breakdown phenomenon	Cause analyzing	Removing ways
1. Run the machine, The pilot lamp isn't on ,no output ,the fan isn't on .	1. The voltage input isn't normal. 2. The power supply lines cut off, the joint is damaged . 3. The machine is damaged .	1. Check 220V/AC 2. Check the joint. 3. Replace.
1. Run the machine, The pilot lamp isn't on ,no output ,the fan isn't on .	4. The voltage input isn't normal. 5. The power supply lines cut off, the joint is damaged . 6. The machine is damaged .	4. Check 220V/AC 5. Check the joint. 6. Replace.

MAINTENANCE