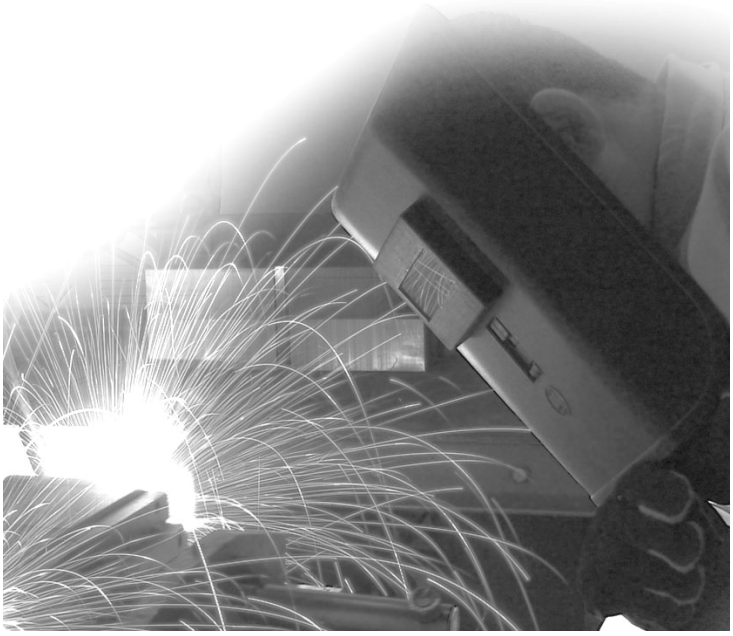
WELDING AND CUTTING TOTAL SOLUTION

OWNER'S MANUAL

INVERCUT 125/160III



⚠ WARNING:

Read carefully and understand all **ASSEMBLY AND OPERATION INSTRUCTIONS** before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Dear Users:

This manual will tell you how to install, test, use and repair our "INVERVUT-W inverter plasma machines", then you can operate correctly, with less wrong operation, you can use our machines in good performance.

Warning! * The welders should be used and maintained by professional person, also repaired by professional people!

* Please do not use and maintain this machine before you read and understand this manual.

Contents

Part one. Security warnings

General safety precautions:

Please obey the attentions in this manual, otherwise an accident may occur.

Please decide input power supply as required, choose installation place as required, and use high pressure gas as required

Unrelated person do not enter cutting area.

Machines should be mounted, tested, maintained and used by professional person.

Do not use this machine except cutting (like charging, heating, pipe thawing, etc.)

Pay attention to prevent the machine from dumping if on the not flat ground.

Prevent electric shock caused by electric shock or burn.

Do not touch gas connector and the bare metal part on the cutting torch when the power connected.

Please use the specified section of the copper wire to connect the welder to the ground by professional person.

Please use the specified section of the copper wire to connect the cutting machine to the power supply, and the insulated sheath cannot be damaged, operated by professional person.

Ensure the insulation between the body and the parent material when working in a damp or restricted area.

Please use safety net when working at high altitude.

Please turn off the input power when you do not use it

Avoid the harm of smoke and gas to the human body

Please use the prescribed air exhausting equipment to avoid accidents

such as gas poisoning and asphyxiation.

When working at the bottom of the container, the harmful gases will be deposited around and cause asphyxiation. Pay attention to ventilation.

Avoid cutting arc, spatter and slag on the human body

Please wear protective glasses with enough shading. The arc can cause inflammation of the eye.

Please use the cutting leather gloves, long sleeved clothes, hats, aprons, corner protection products, so as to avoid arc, spatter and slag burn and scald skin.

Prevent accidents, such as fire, explosion, etc.

Do not put combustibles in cutting places, splash and hot cutting will cause a fire.

The cutting cable and the base material should be connected and fasten, otherwise the fire will lead to a fire.

Do not cut in a combustible gas or cut on a container with a combustible material, or it will cause an explosion.

A fire extinguisher should be prepared in case.

Prevent revolving moving parts to hurt people

Do not put the fingers, hair, clothes, and other rotating parts close to the cooling fan.

Prevent the cutting machine from hurting people during running.

Using a forklift or crane handling cutting machine, cutting machine may not prevent cutting movement below the front is broken down machine.

When lifting rope should be able to withstand enough tension, no fault. The rope and the hook angle should not be greater than 30 degrees.

Part Two Brief introduction for the machine

- INVERCUT-W inverter air plasma cutting machine is a newly designed metal cutting equipment. It adopts insulated gate high power transistor IGBT and pulse width modulation (PWM) technology to design and manufacture. The cutting machine can cut all metal materials, especially suitable for cutting the flame cutting method cannot cut diamond and non-ferrous metal alloy. The series of cutting machines have ideal static external characteristics and good dynamic characteristics, and have high frequency arc induction function. It is widely used in various machinery manufacturing industries. According to the CISPR11 requirements,

the electromagnetic compatibility of the equipment is classified as: a.

The characteristics are as following:

- Can be used in manual cutting and automatic cutting.
- The arc energy is highly concentrated, the stability is good, the cutting force is strong.
- High speed.(3-5 times speed of gas cutting)
- Low cutting cost
- The incision was narrow. Clean, neat, close to the vertical.
- Small work piece deformation
- Continuous adjustable cutting current
- Easily arcing, and high arcing height
- Easy operation
- Light, small size, portable
- High efficiency, high power, it is a high duty cycle and energy saving device.
- Low noise and strong adaptability
- Have two functions of self-locking and non self locking, adapt to the different requirements of the length of the slot, can reduce the labor intensity of workers.
- With net cutting function
- Quality cutting thickness 25mm(mainly for manual cutting using and automatic cutting using), maximum cutting thickness 60mm(mainly for manual using)

This specification will be changed at any time without notice if the instructions are omitted or unclear, and the function of the cutting machine is changed.

Warning!

* The main circuit in the machine has high pressure, and the safety measures should be done to prevent accidental electric shock. The untrained personnel are strictly forbidden to open the chassis.

* The power supply should be cut off before dust removal.

* Do not change the connection or bruised components at random when dust removal

Part Three Mounting instructions

1 Mounting environment

1.1 In the room with no direct sunlight, rain proof, small humidity, and little dust, the ambient air temperature range is -10 C +40 C.

1.2 The slope is not more than 15 degrees.

1.3 The cutting station should not have the wind, if it should be shielded.

1.4 The cutting machine is more than 20cm from the wall, and the distance between the cutting machine is 10cm

1.5 When using water cooled cutting gun, we should pay attention to antifreeze.

2 Power Supply quality

2.1 The waveform should be a standard sine wave with an effective value of 380V+15% and a frequency of 50HZ.

2.2 The three-phase voltage unbalance is less than or equal to 5%.

3 Power supply

Model		INVERCUT-125III	INVERCUT-160III
Power supply		3ph AC380V±15% 50HZ	3ph AC380V±15% 50HZ
Maximum power	Electric net	22 KVA	28KVA
	Generator	25KVA	30KVA
Input protection	Breaker	63A	100A
Cable	Input	4mm2	6mm2
	Output	16mm2	20mm2

Note: The capacity of the fuse and the circuit breaker in the above table is for reference only.

Part Four Machine mounting

The placement of a cutting machine

* The equipment should be placed in the area of dry dust, no chemical corrosion, flammable, explosive gas and goods around;

* If the cutting power is placed on the inclined plane, attention should be paid to prevent its dumping;

* Avoid sunshine and rain, keep the ambient temperature in the range of -10~ + 40;

* At least 50cm space should be left around the equipment;

* The ventilation and exhaust device should be installed in the room with bad ventilation

* The replacement of electrode or electrode should first cut off the power supply

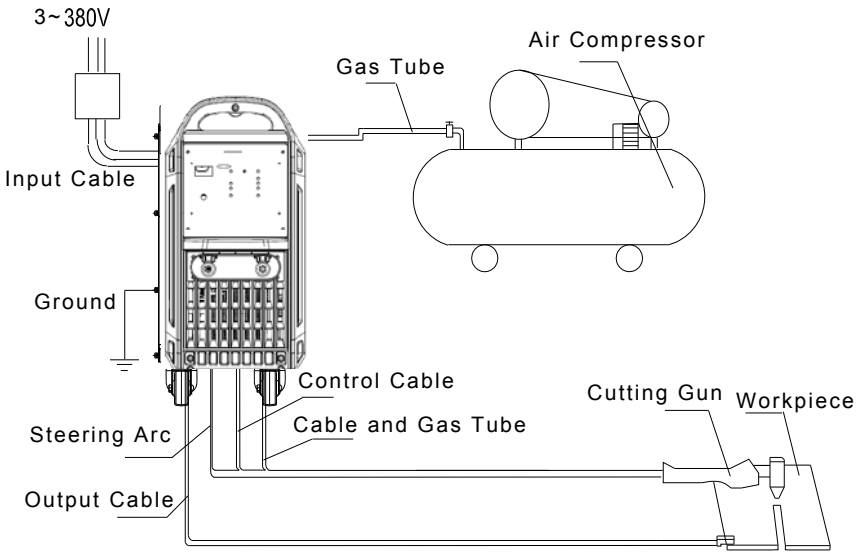
* A conductor with a conductive section less than 4mm2 is used to connect the ground reliably. The method is connected to the grounding device from the grounding bolt on the back of the cutting machine

* With the pipe cutting machine is connected behind the gas entrance and the source of compressed air, with hose clamps or other methods with the interface, so as to avoid leakage. And ensure that the gas source provides suitable pressure, sufficient flow, and dry.

* The tilting angle of the machine should not exceed 10 degrees at work, otherwise it should be fixed to prevent its dumping;

* The gas and electricity integrated connector of the cutting gun is installed on the corresponding interface of the cutting machine panel, and is tightened with the wrench clockwise, and the aviation plug is connected to the corresponding interface of the cutting machine panel.

* The corresponding cable is connected according to the diagram, and the next operation can be carried out.

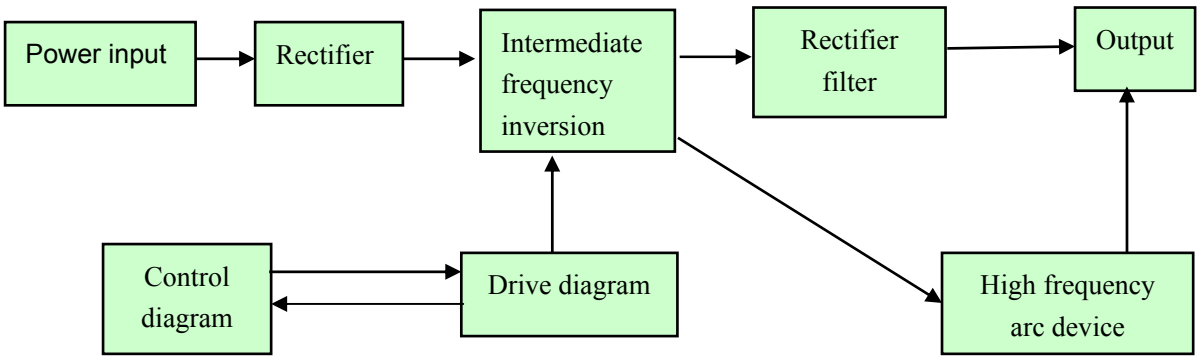


INVERCUT-W series cutting machines out connecting method photo

Note: The maximum working pressure of air compressor selection should be 0.85MPa, a minimum of not less than 0.45MPa, the gas flow is greater than or equal to 250L/min. The compressed air source is connected to the air inlet nozzle of the air filter, and the air compressor is opened to the pressure to reach the required pressure, and the air switch on the rear panel is closed.

Part Five A brief description of the principle

INVERCUT-W Block diagram:



INVERCUT-W product description

This machine uses IGBT middle frequency inverter technology, 3ph 380V power input, after rectifier and the inverter consist of IGBT and other components will change the power to middle frequency AC power, then the output of a DC power suitable for cutting will come out after the intermediate

frequency transformer isolation and the rectification filtering of the intermediate frequency rectifier. Through this process, the dynamic response ability of the cutting machine is improved, the volume and weight of the transformer and reactor are reduced, and the power efficiency of the whole machine is also improved.

The drive circuit design realizes the closed loop control of the whole machine, so that the cutting power has the external characteristics of vertical steepness and good ability to resist the power grid fluctuation. The control circuit outputs a given signal to the drive circuit for adjusting the output current of the feedback circuit; the output current sampling amplification, which could meet the requirements of the feedback signal; pulse width modulation (PWM) circuit compares the given signal and feedback signal to determine the output pulse width; drive circuit will control the pulse power amplifier driver IGBT. Protection circuit is protected under extreme conditions such as overcurrent, undervoltage and overheating, so as to ensure the reliable work of IGBT. Cutting machine adopts logic sequential control to achieve a reasonable, advance aspirated, high frequency arc, cutting, post flow process.

Part Six Main technical parameters

380V

Model name	INVERCUT-125III	INVERCUT -160III
Power input(V)	3ph 380±10% / 50HZ	3ph 380±10% / 50HZ
Rated input power(KVA)	20.4	26.9
Rated input current (A)	31	41
Output current adjust range(A)	20-125	20-160
No-load voltage (V)	325	325
Rated load voltage(V)	130	144
Rated duty cycle(%)	60	60
Cutting torch air pressure (MPa)	0.45～0.85	0.45～0.85
Maximum cutting carbon thickness (mm)	50	60
Quality cutting carbon thickness(mm)	1-30	1-30
Dimension (mm)	719*308*633	719*308*633
Weight (kg)	56	58

400V

Model name	INVERCUT-125III	INVERCUT -160III
Power input(V)	3ph 400±10% / 50HZ	3ph 400±10% / 50HZ
Rated input power(KVA)	20.4	26.9
Rated input current (A)	30	40
Output current adjust range(A)	20-125	20-160
No-load voltage (V)	340	340
Rated load voltage(V)	130	144
Rated duty cycle(%)	60	60
Cutting torch air pressure (MPa)	0.45～0.85	0.45～0.85
Maximum cutting carbon thickness (mm)	50	60
Quality cutting carbon thickness(mm)	1-30	1-30
Dimension (mm)	719*308*633	719*308*633
Weight (kg)	56	58

415V

Model name	INVERCUT-125III	INVERCUT -160III
Power input(V)	3ph 415±10% / 50HZ	3ph 415±10% / 50HZ
Rated input power(KVA)	20.4	26.9
Rated input current (A)	29	39
Output current adjust range(A)	20-125	20-160
No-load voltage (V)	345	345
Rated load voltage(V)	130	144
Rated duty cycle(%)	60	60
Cutting torch air pressure (MPa)	0.45～0.85	0.45～0.85
Maximum cutting carbon thickness (mm)	50	60
Quality cutting carbon thickness(mm)	1-30	1-30
Dimension (mm)	719*308*633	719*308*633
Weight (kg)	56	58

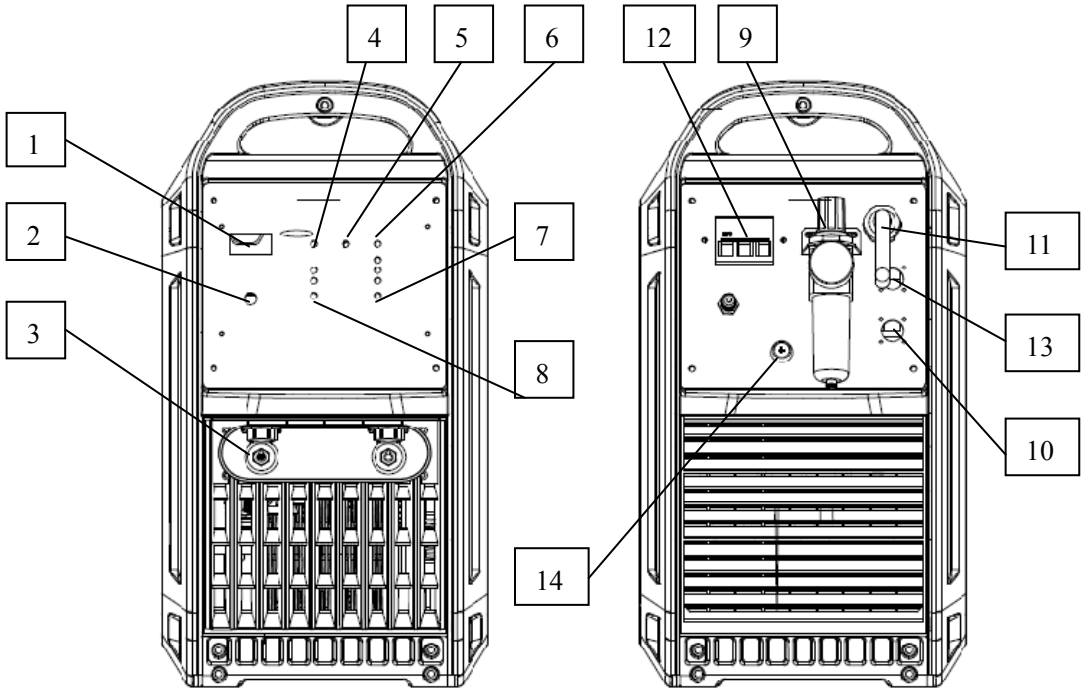
Model name	INVERCUT-125III	INVERCUT -160III
Power input(V)	3ph 440±10% / 50HZ	3ph 440±10% / 50HZ
Rated input power(KVA)	20.4	26.9
Rated input current (A)	31	41
Output current adjust range(A)	20-125	20-160
No-load voltage (V)	345	345
Rated load voltage(V)	130	144
Rated duty cycle(%)	60	60
Cutting torch air pressure (MPa)	0.45～0.85	0.45～0.85
Maximum cutting carbon thickness (mm)	50	60
Quality cutting carbon thickness(mm)	1-30	1-30
Dimension (mm)	719*308*633	719*308*633
Weight (kg)	56	58

Note: the rate of load duration is determined at 40 degrees；

Standards used for welding machines

* GB 15579.1	Arc welding equipment first parts: welding power

Part Seven: Function introduction



Front panel **Back panel**

7.1 Cutting machine function description

1. Digital meter

Used to show the cutting current

2. Current adjustment knob

Used to adjust the cutting current

3. Output cable socket (+)

Connect with working piece through output cable

4. Working indicator

Used to show the working condition, after press torch switch, it will be on, and the machine has output.

5. Protection indicator

To show over/less voltage or over heat inside the machine, if it is on, the machine will stop working, if low air pressure, this light will shine but still work.

6. Power indicator

To show if the machine has connected with the power supply.

7. Gas check/ cutting/ cutting net change key

When you press this key, Check gas / cutting / cutting net indicator lamp sequence conversion, check the gas path is normal when the gas indicator light is on, and cut normally when the cutting lights are on. When cutting the net indicator light, it can cut the mesh profile.

8. Self locking and non self locking

4T self lock the light will be on

2T no self lock the light will be on.

9. Air filter

The function of the air compressor through the pressure relief valve is to decompress and filter the air water. Adjust its knob, can change the filter output air pressure, pressure value reduction pressure gauge. The hydronephrosis should not touch the filter core, and the lower water valve should be released in time to release the water. If excess water is overloaded into the cutting gun, it will affect the quality of the arc and cutting.

10. Arc pressure acquisition joint

Acquisition of arc pressure when use machine。

11. Power input cable

The double color line should be grounded reliably and the other three lines are connected to the three phase 380V/50HZ power supply.

12. Air switch

The function of this switch is to protect the cutting machine as long as it is automatically cut off when the cutting machine is overloaded or malfunction. In general, the switch is pulled upwards to the position of the connection. The power switch on the switchboard (cabinet) should be used as far as possible in the start and stop cutting machine. Do not use this switch as a power switch.

13. Linkage signal

External connection, including the arc success signal and the welding torch switch signal

14. Fuse

Used to protect the power supply

7.2 Operation method

7.2.1 After checking the installation is correct, power up, all the LED lights on the front panel lit for one second, the power indicator lights are on, the two step indicator lights are on, the cutting indicator lights are on, the rest lights are out;

7.2.2 The buttons on the front panel according to "gas detection" position, the machine valve opening, pre ventilation for 1 minute to remove water vapor condensation in the torch, air conditioning filter, the pressure gauge is greater than or equal to 0.6MPa. Then the button is cut to the "cut" position.

7.2.3 The INVERCUT-W series cutting machine uses a cutting gun. When cutting, the cutting gun nozzle should be removed from the work piece 3~5mm to lead the arc, and the nozzle should not be exposed to the work piece when cutting.。

7.2.4 In general should be at the edge of the work piece to start cutting, cutting at any point of the work piece can be cut, but this time the gun should be slightly tilted to one side, to blow off the molten metal, the formation of the initial incision

7.2.5 During the cutting process, the cutting gun should always move at a constant speed.

7.2.6 When the cutting is stopped, the cutting gun can be removed from the work piece until the plasma arc is extinguished. Otherwise, the work piece may be damaged.

7.3 Use attention

7.3.1 Slotted abnormality, broken arc and arc problems found in the process of cutting, should check the nozzle and other consumable electrode. When the loss is too large, it should be replaced in time.

7.3.2 When assembling electrodes, gas screens, nozzles and nozzle covers, the coaxial assembly should be paid attention to. The nozzle must be pressed to press the nozzle.

7.3.3 The cutting gun cannot be moved quickly when cutting, so as not to cut the work piece and cause the arc reflux to burn down the nozzle. The cutting speed should also be avoided to affect the quality of the cut.

7.3.4 In the cutting process, if the pressure is lower than 0.45MPa, the cutting gun is overheated and damaged; if the pressure is higher than 0.85 MPa, the solenoid valve will not be opened. The water in the air filter should be released in time.

7.3.5 The machine is equipped with undervoltage protection. When the voltage of the power grid is too low, the cutting machine does not work。

7.3.6 This machine is equipped with overheating protection. When the temperature is too high, the cutting machine does not work. The protection indicator light on the panel.

7.3.7 Please do not aim the cutting gun at the human body so as not to burn.

Part Eight Common fault and elimination method

NO	Phenomenon	Reason	Method
1	After opening, the working light is not bright and the cutting machine does not work	□ The power is less phase □ Switch trip of power switch □ The cable is not connected	□ Check the power supply □ Check if the fan, power transformer, main control board is broken □ Check the cables
2	The protection indicator is on	□ Overheat inside machine □ Temperature relay is broken	□ Wait till machine not hot and use; □ Replace a temperature relay
3	No gas flow when check the gas	□ The gas valve is broken □ The gas flow is blocked □ K1 switch is broken □ The output pressure of the filter is too high	□ Check and replace □ Check the gas flow □ Replace □ Adjust the pressure regulating knob to reduce the pressure and re tighten the discharge valve
4	Cutting gun control switch malfunction	□ The torch switch is broken □ Torch switch harness is broken □ The main control board is broken	□ Replace □ Replace □ Replace
5	Over width of incision	□ Low cutting speed □ Burnt out of the nozzle	□ Turn up the speed □ replace
6	Biased incision	□ nozzle burnt out □ The nozzles and electrodes are not in pair □ The torch is not vertical	□ Replace □ Adjust □ Adjust

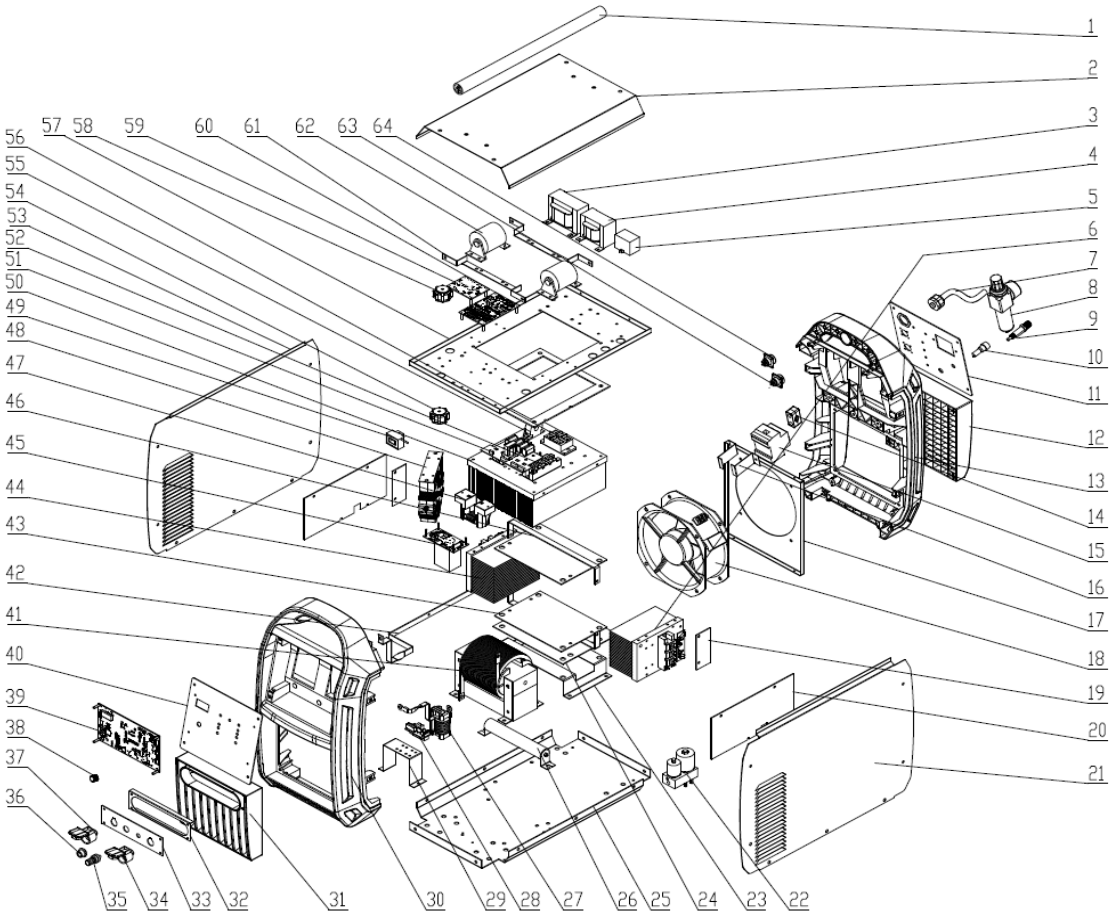
Note: if there are other faults in the cutting machine, the professional personnel should be repaired.

Part Nine Key components list

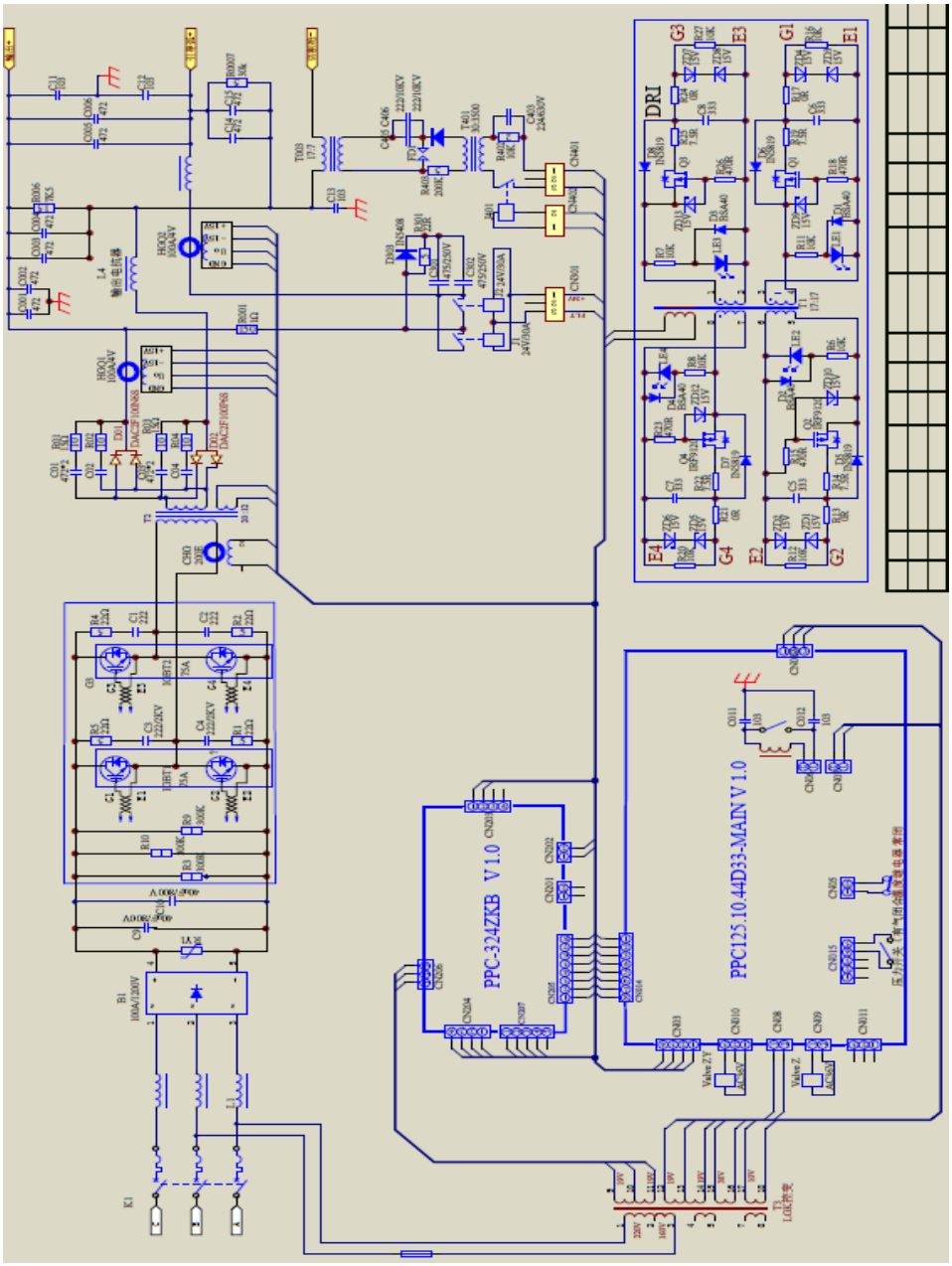
NO.	Part no.	English name	Specificaiton	Unit	QTY
1	20050080118	handle	¢30*473/V1.0	PCS	1
2	11010011795	cover	PROTIG 500W PULSEii	PCS	1
3	20070250027	contorl transformer	415/380V/36/10/19V*4/0.5KVA/ V1.0	PCS	1
4	20070500014	input reactor	ZX7-500WI/PE500.40.24A33.4. 2/70-80uH/1KHZ/0.3V/V2.0	PCS	1
5	20030304142	switch and rectifier bridge	INVERDELTA 500WI/PE500.43.24A33.24/V2.0	PCS	1
6	20070430209	heat sink	ZX7-400WI/PE400.40.24A33.4. 2-4/150*115*90/V1.0	PCS	1
7	20040300009	cable fixed head	EG-21(PG21)	PCS	1
8	20070550015	regulator	QAW3000 0.05-0.85MPa	PCS	1
9	11020020081	water connector	PTP300.20.14A33.2-1	PCS	2
10	20070520004	fuse	BF015 6.3A/250V(BLX-1 15A)	PCS	1
11	11010032541	back panel	INVERCUT-125W/2 20080010372 PANTONG425C	PCS	1
12	20050050650	back panel fan window	INVERMIG 500E/232*205.5*52.1/ABS/V0	PCS	1
13	20050050654	plastic panel	INVERMIG-500E/572*308/PANT ONG130C/ABS/V0	PCS	1
14	20050170019	cable press plate	NB500.5-2/V2.0	PCS	1
15	20070800139	breaker	DZ47	PCS	1
16	11020011828	switch holder	8HG.125.044	PCS	2
17	11020015828	fan fixed plate	INVERMIG 500E	PCS	1
18	20070890166	fan	TG22580HA6BL 0.32A/AC415V/50HZ	PCS	1
19	11020014079	heat sink side wind shield plate	ZX7-400WI	PCS	2
20	11020015794	heat sink up and down connecting bar	LGK-125W	PCS	2
21	11010021178	right panel	INVERMIG-500W	PCS	1
22	12070020002	gas valve	LGK-125W	PCS	1
23	11020013899	heat sink support plate	LGK-125W	PCS	1
24	11020015791	heat sink connecting plate	LGK-125W	PCS	1

25	11010041329	bottom panel	INVERCUT125W	PCS	1
26	20070070053	winding resistance	RXG20 150W/1Ω±5%(MHZ)	PCS	1
27	11040050092	coupling transformer	LGK125W/LKK	PCS	1
28	11050080073	absorbing board	LGK-125W/LKK	PCS	1
29	11020013899	support holder	LGK-125W	PCS	1
30	20050050654	plastic panel	572*308/PANTONG130C/ABS/V0	PCS	1
31	20050050651	front panel fan window	232*205.5*55/ABS/V0/V1.0	PCS	1
32	11020015830	fixed holder	INVERCUT125W	PCS	1
33	11020015849	output fixed plate	INVERCUT125W	PCS	1
34	20070570013	Euro quick connector	DKJ10-25/2*M14	PCS	1
35	20070660004	argon gas/electric connector	LGK120.1-3	PCS	1
36	20050030013	terminal	SJ333	PCS	1
37	20070570013	Euro quick connector	DKJ10-25/2*M14	PCS	1
38	20070110067	potentiometer knob	KN-28B-6/Pantong 130C	PCS	1
39	11050070514	procedure panel PCB board	LGK-125S	PCS	1
40	11020015826	print support panel	INVERCUT125W	PCS	1
41	11040030315	reator assembly	LGK-125W	PCS	1
42	11030040225	output busbar	LGK-125W/LKK	PCS	1
43	11020015790	heat sink down wind shield	LGK-125W	PCS	1
44	20070430209	heat sink	ZX7-400WI/ 150*115*90/V1.0	PCS	1
45	11050100060	HF arcing PCB board	LGK-125W	PCS	1
46	11020015793	connecting busbar	LGK-125W	PCS	1
47	20070040121	filter inductance	ZX7-400WI/PE400.40.24A33.2.2/UY16/8uH±20%/6/V2.0	PCS	1
48	20070250645	main transformer	ONL120*60*30/20:12:12/24.5KVA	PCS	1
49	12070024134	hall	LGK-125S	PCS	1
50	20070430206	heat sink	ZX7-500WI/240*220*100/IGBT	PCS	1

51	20070330018	IGBT module	GD100HFU120C1S	PCS	2
52	11050030101	drive PCB board	ZX7-500WI	PCS	1
53	11010021179	left panel	INVERMIG-500W	PCS	1
54	20030304527	transfer arc inductance	LGK125W/V2.0	PCS	1
55	20070370028	3ph rectifier bridge	MDS75-14 75A/1400V	PCS	1
56	11020014075	heat sink insulation plate	ZX7-500WI	PCS	1
57	11010050419	mounting plate	INVERCUT125W	PCS	1
58	20030300765	torch switch inductance	LGK125W/V2.0	PCS	2
59	11050110595	transfer arc plate	LGK-125S	PCS	1
60	11050021049	main control board	LGK-125W	PCS	1
61	11030040008	IGBT busbar	ZX7-400WI	PCS	2
62	20070120122	filter capacitor	DMJ-MT 100uF±5%/800V.DC	PCS	2
63	20030304528	linkage signal	LGK125W/V2.0	PCS	1
64	20030304529	voltage signal	LGK125W/V2.0	PCS	1



Part TEN Mian loop schematic diagram



INVERCUT-W series inverter air plasma cutting machine main circuit schematic diagram (reference drawings, if with any changes without notice again)

Part Eleven Complete set of products and list of accessories

NO.	Name/Specification/model	QTY
01	INVERCUT-W	1unit
02	Earth cable 16mm^2*3m	1set
03	Manual	1pcs
04	Product qualification certificate	1pcs
05	Warranty card	1pcs
06	Regulator AW2000-02	1pcs
07	PVC strength gas hose φ8mm	3m
08	Hose clamp φ16	4pcs

Note：a) The above is only for reference, if the change please subject to the object.

b) The contract is otherwise stipulated in the order contract.

Part Twelve Transportationand storage

* This machine belongs to ordinary indoor use equipment. The rain and snow should be avoided during transportation and storage. The warning words on the packing box should be carried out during loading and unloading. Stored warehouses should keep dry, air circulation, and non corrosive gases or dust. The temperature should be - 20 ~ 55 C, relative humidity is not more than 90%
* After unpacking continued after storage, according to the original packaging requirements for re packaging (before storing should be clean and dry and sealed plastic bag packing storage)
* The user should keep the cartons and shock proof blocks in the purchase of the machine so that they can be properly packed when the long-distance transportation is required. In case of long distance transshipment, wooden cases should be added, and "upward" and "rain proof" should be marked.

Part Thirteen Quality commitment

The user in accordance with product instructions, in compliance with the machine installation, storage, use, maintenance, custody rules conditions, from the date of purchase within 12 months (invoice date), welding machine for manufacturing quality problems, resulting in local damage or cannot work normally, the manufacturer will provide users with free service.