YAHONG

PLASMA

Manual of Use

Read the instructions before use.

CNC plasma cutting machine

YAHONG TECHNOLOGY CO.,LTD

CNC- Plasma arc cutting Operating Instructing

Dear users:

The product manual will tell you how to install the " inverter air plasma cutting machine".Debugging, use and maintenance.Please read the instructions carefully and you will learn how to use this series of plasma cutting machines， Reduce the error in operation to ensure that the plasma cutting machine achieves the desired cutting effect.

Warning! Plasma cutting machine should be used and maintained by full-time staff and must be maintained by professional staff! The equipment shall not be operated and maintained until the reading and understanding of this manual!

Catalog

ONE BRIEF DESCRIPTION OF CUTTING MACHINE

◎YH series inverter type air plasma cutting machine, Is a new design of metal processing equipment, Insulated gate high power transistor IGBT and pulse width modulation (PWM) soft switching technology are used to design and manufacture. The cutting machine can cut all metal materials, especially suitable for "flame cutting" can not achieve high alloy steel and non-ferrous metals. The seriesof cutting machines have reasonable static and external characteristics, and also have good dynamic characteristics, With high frequency arc starting function .Widely usedin all kinds of machinery manufacturing industry. According to the CISPR11 requirements, the electromagnetic compatibility of the equipment is classified as: class a..

The cutting machine has the following features:

- ○ The arc energy is highly concentrated, with good stability and strong cutting force
- ○ Cutting speed (3-5 times of gas cutting)
- ○ Cutting costs are low
- ○ Incision stenosis. Clean and tidy; close to vertical.
- ○ Small deformation of workpiece
- ○ The cutting current is adjustable continuously
- ○ Easy arc setting
- ○ The operation is very convenient
- ○ Light weight, small size, easy to move
- ○ High efficiency, high power factor, it is a kind of energy saving equipment.
- ○ Low noise and strong adaptability
- ○ Has two functions of self-locking and non self locking, adapt to the length of slot without requirement, can reduce the labor intensity of workers.
- ○ Easy to form cutting equipment

If there is a product update, no notice, our company promptly with the new product manual.

 warning

There is high pressure in the main circuit of the machine，Electric shock should be prevented during maintenance, Please do a good job of safety protection。Non professional personnel are prohibited from opening the case lid to repair.

Power should be cut off before dust removal

Prohibit changing the line or damage components during dust removal

TWO SECURITY WARNING

General safety precautions

* Please comply with the notice stipulated in this manual, You may have an accident.

* Power selection of input power supply, Selection of installation site, The use of high-pressure gas, Please proceed according to the standard。

* Non professionals are prohibited from entering the work area

* The machine must be a professional engineer, installed, maintained, maintained and used.

* Prohibited for use other than cutting

* Pay attention to ground leveling during use and prevent inclining

2. Preventing electric shock from causing electric shock or burns

* In the electric state of the machine, people are forbidden to contact the metal parts exposed to the gas path joint and the cutting gun.

* A professional electrical engineer is invited to connect the machine to the earth with a specified section of copper wire.

* Professional electrical engineers are asked to use a specified section of copper wire to connect the machine to the power supply.

* Please make sure that the personnel and the machine are insulated under the condition of damp or limited activity.

* When the machine is not used, please turn off the power.

3. Avoid the harm of smoke and gas to the human body

* Please use the prescribed air exhausting equipment to avoid gas poisoning and asphyxiation.

4. Avoid cutting arc, spatter and slag on the human body injury

* Please wear a protective mirror with enough light, which can cause inflammation of the eye.

* Please use leather gloves, protective clothing, safety helmet, so as to avoid arc, spatter and slag burn and scald skin.

5. Prevent accidents, such as fire, explosion, etc

* The working environment is not allowed to place combustible materials to prevent the occurrence of fire.

* Please fasten the connection between the power line and the joint to prevent the fire from happening

* Do not cut on combustible gas or combustible material to avoid explosion. Please prepare the fire extinguisher.

6. Prevent revolving moving parts to hurt people

* Prohibit the fingers, hair, clothing, and other rotating parts close to the cooling fan

* Prevent the machine from hurting people at work

* Using a forklift or crane handling equipment, personnel prohibited activities in handling range, to prevent bruising.

* When lifting rope should be able to withstand enough tension. The rope and the hook angle should not be greater than 30 degrees.

THREE INSTALLATION INSTRUCTIONS

1. Installation environment

1.1In the room without direct sunlight, rain proof, small humidity, and little dust, The ambient air temperature range is -10℃+40℃

1.2There should be no wind in the cutting environment. Please do a good job of shielding.

1.3The distance between the machine and the wall is more than 20cm. The distance between machines and machines is more than 10cm

1.4 The use of water-cooled torch, please pay attention to antifreeze

2. Power supply voltage requirements

2.1 The waveform should be a standard sine wave, The effective value is 380V+10%, and the frequency is 50HZ

2.2 The imbalance of the three-phase voltage ≤5%

3. Power input

Model	Intercepting area of copper core wire (mm^2)	Ground wireSectional area(mm^2)	Fuse(A)	Switching capacity(A)
YH-60IGBT	≥6	≥6	60	63
YH -105IGBT	≥6	≥6	60	63
YH -120IGBT	≥6	≥6	60	64
YH -105AL	≥6	≥6	60	63
YH -120AL	≥6	≥6	60	64
YH -160IGBT	≥10	≥10	80	80
YH -200IGBT	≥16	≥16	125	125
YH -200AH(pro)	≥16	≥16	125	125
YH -300IGBT	≥20	≥20	150	150
YH -400IGBT	≥25	≥25	200	200

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

FOUR THE INSTALLATION OF THE MACHINE

The placement of a machine

*Machines should be placed in places with dry dust, no chemical corrosiveness, flammable, explosive gases, and articles.

*If a machine is placed on an inclined plane, it should be prevented from dumping

*Avoid direct sunlight 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 power supply should be cut off first when replacing the conductive cap or electrode

*The reliable grounding of the wire of the machine casing, using the conductor of the conductive section ≥8mm². The method is connected to the grounding device from the grounding bolt on the back of the machine.

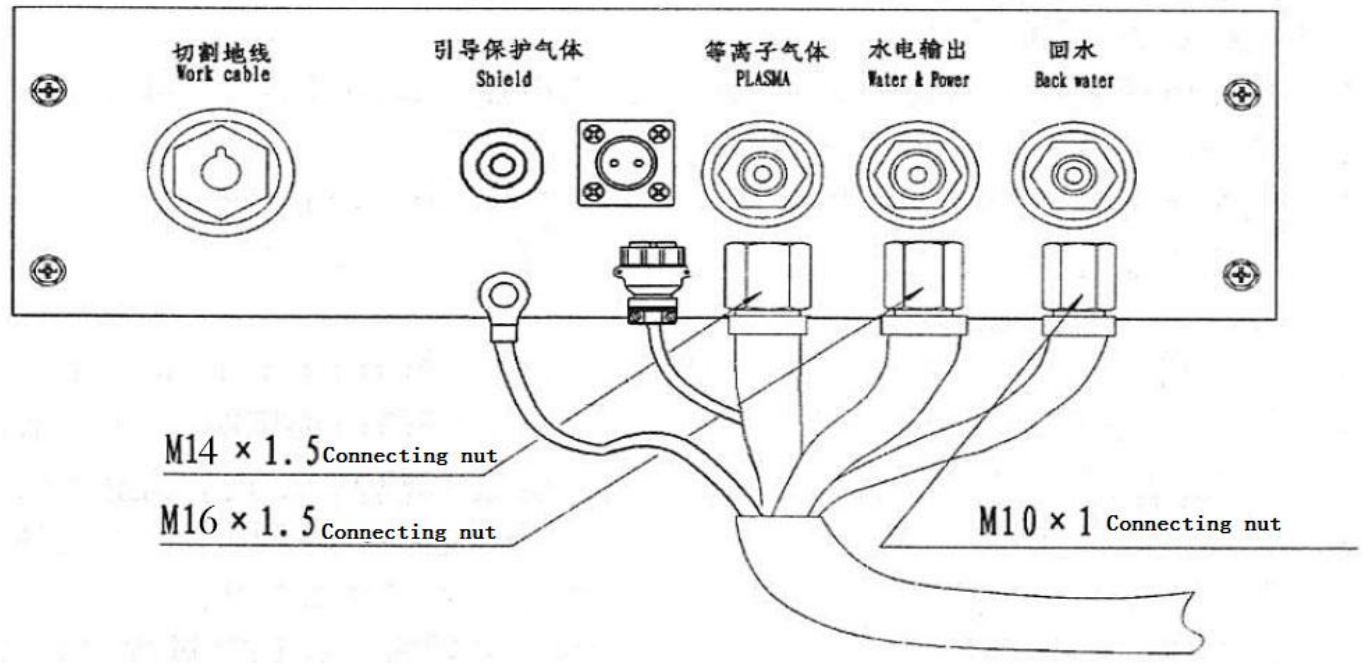
*The gas inlet and the compressed air source are connected to the rear of the machine by the trachea. With the fastening clamps or other methods to prevent leakage. And ensure that the gas source can provide the appropriate pressure, sufficient flow, and dry.

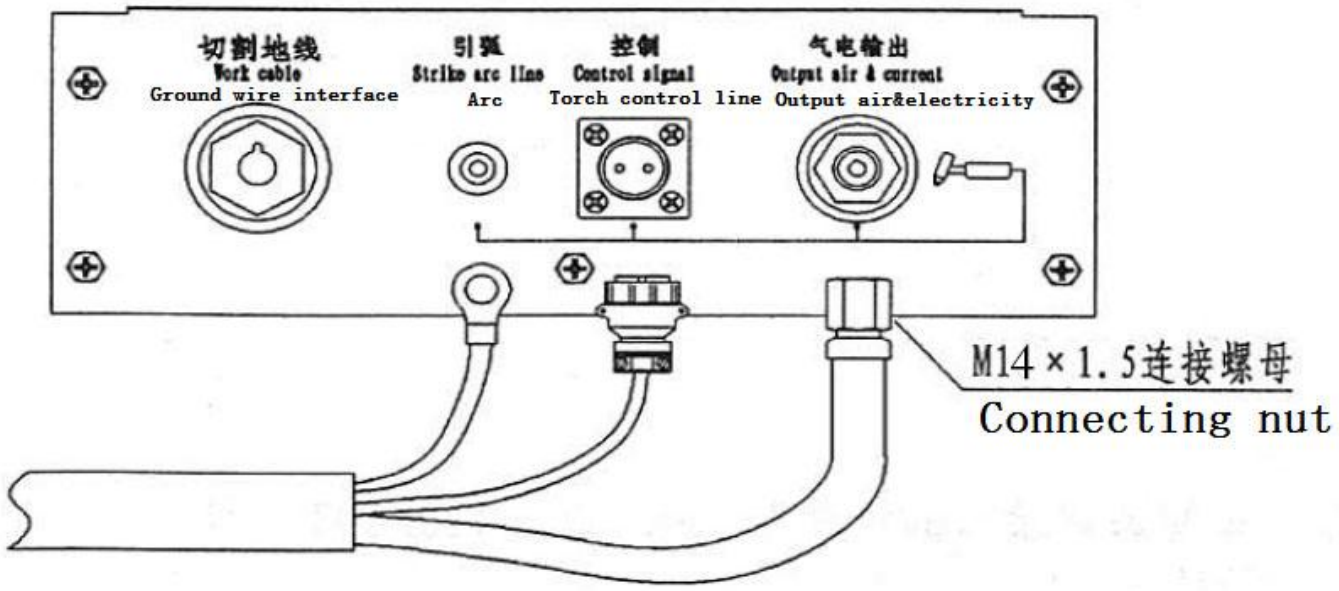
*The tilt angle of the machine is 10°. It should be fixed to prevent its dumping

*Please install the gas and electricity joint of the cutting gun to the joint of the panel of the machine.

The wrench is fastened clockwise and the plug is connected to the interface of the machine panel

*Connect the corresponding cable according to the diagram

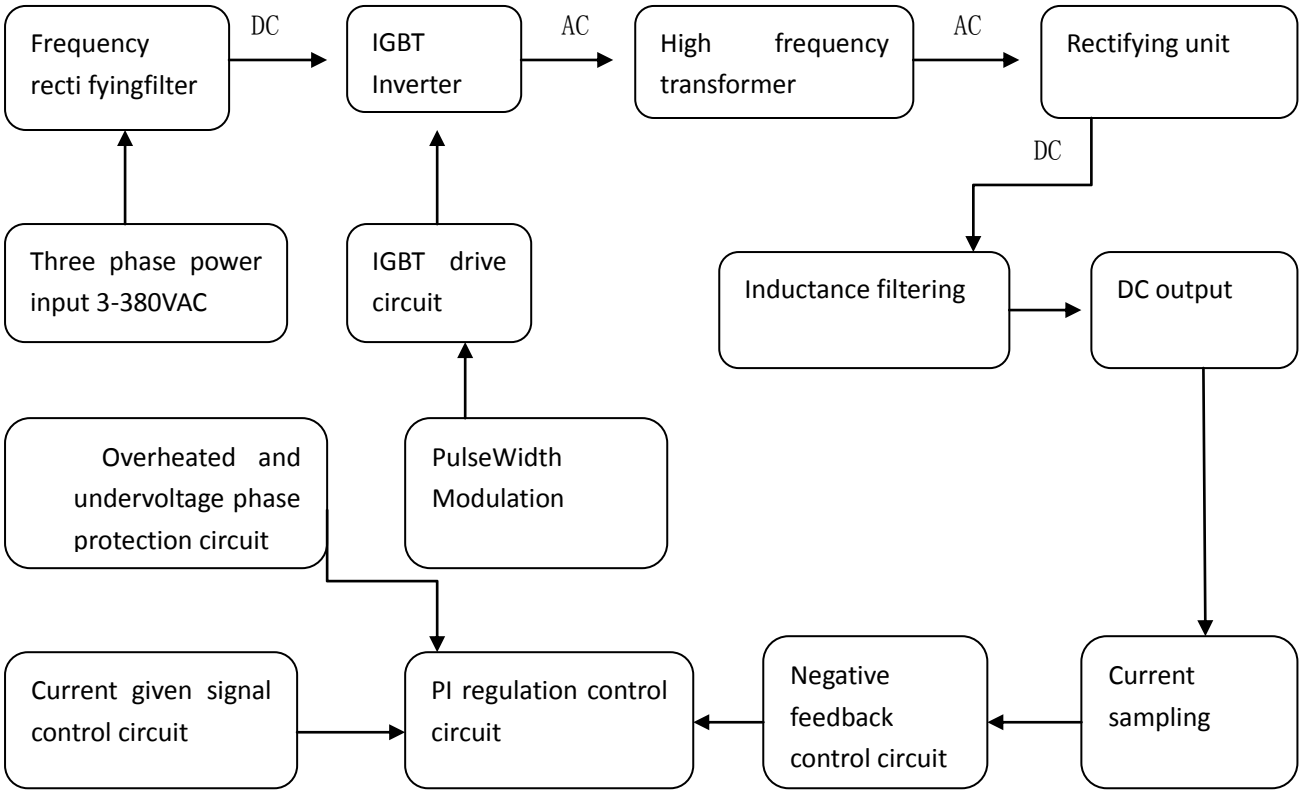




YH-XXX schematic diagram of the external electrical connection of a series of machines

Note: the highest pressure of the selected air compressor should be 0.8Mpa, The minimum is not less than 0.45Mpa, Gas flow ≥250L/min. The compressed air source is connected to the air filter intake nozzle, Opening the air compressor to the pressure to reach the pressure required. Open the air switch on the rear panel of the machine

FIVE PRINCIPLE INTRODUCTION



YH Introduction of cutting machine products

This series of machines use IGBT intermediate frequency inverter technology. Power frequency three-phase 380V power input, After direct rectification, 380V is sent to inverters composed of IGBT and other devices, and then converted to intermediate frequency communication. After the intermediate frequency transformer isolation, the output of a medium frequency rectifier is suitable for cutting the DC voltage of the steel. Through this whole process, the dynamic response ability of the cutting machine is improved. The volume and weight of the transformer and reactor are reduced, and the efficiency of the use of electricity for the whole machine is also improved.

The control circuit design realizes the closed loop control of the whole machine. The cutting plasma has the external characteristics of vertical and steep drop and good ability to resist the power grid fluctuation. Given a given signal in a given circuit, used to adjust the output current: The feedback circuit sampling and amplifying the output current to get the feedback signal that meets the requirements. The pulse width modulation (PWM) circuit compares the given signal with the feedback signal to determine the output pulse width. The drive circuit drives the control pulse to drive the power amplifier to drive IGBT. Protection circuits are protected under extreme conditions such as overcurrent, undervoltage, overheating and so on. Ensure the reliable work of IGBT. The cutting machine is controlled in a reasonable logical sequence. It can carry out the process of transporting gas ahead of time, high frequency arc ignition, cutting and closing the gas source in time lag.

YH Model marking method for cutting machine

*The model of the product is made up of English letters and numbers

*Model number schematic of product

SIX MAIN TECHNICAL PARAMETERS

Model / parameter	YH-60IGBT	YH -105IGBT/ YH -105AL	YH -120IGBT/ YH -125AL	YH -160IGBT	YH -200IGBT / YH -200AH	YH -300IGBT	YH -400IGBT
Rated input voltage	3~380V/50HZ						
Rated input capacity	15.6KVA	17.8KVA	22.4KVA	32.2KVA	46.5KVA	65.4KVA	92KVA
Rated Output current	70A	105A	120A	160A	200A	300A	400A
Rated output voltage	100V	120V	128V	144V	160V	170V	190V
Rated load sustainability	100%	100%	100%	100%	100%	100%	100%
No-load voltage	300VDC	300VDC	300VDC	315VDC	315VDC	380VDC	380VDC
Regulating rangeof current	30~70A	30~105A	30~120A	30~160A	30~200A	30~300A	30~400A
High quality cuttingthickness	0.3-12mm	0.3-16mm	0.3-20mm	0.3-25mm	1-30mm	1-40mm	1-45mm
Maximum cuttingthickness	15mm	18mm	20mm	25mm	30mm	40mm	45mm
Use of plasma gas	compressed air	ompressed air	ompressed air	ompressed air	ompressed air	ompressed air	ompressed air
Working gas pressure	0.4~0.6MPa	0.4~0.6MPa	0.4~0.6MPa	0.4~0.6MPa	0.4~0.6MPa	0.4~0.6MPa	0.4~0.6MPa
The cooling method of cutting torch	air-cooled	air-cooled	air-cooled	air-cooled/ water-cooling	air-cooled water-cooling	air-cooled water-cooling	air-cooled water-cooling
Arc ignition mode	Non contact mode						
Insulation grade	F						

Shell protection grade	IP21S

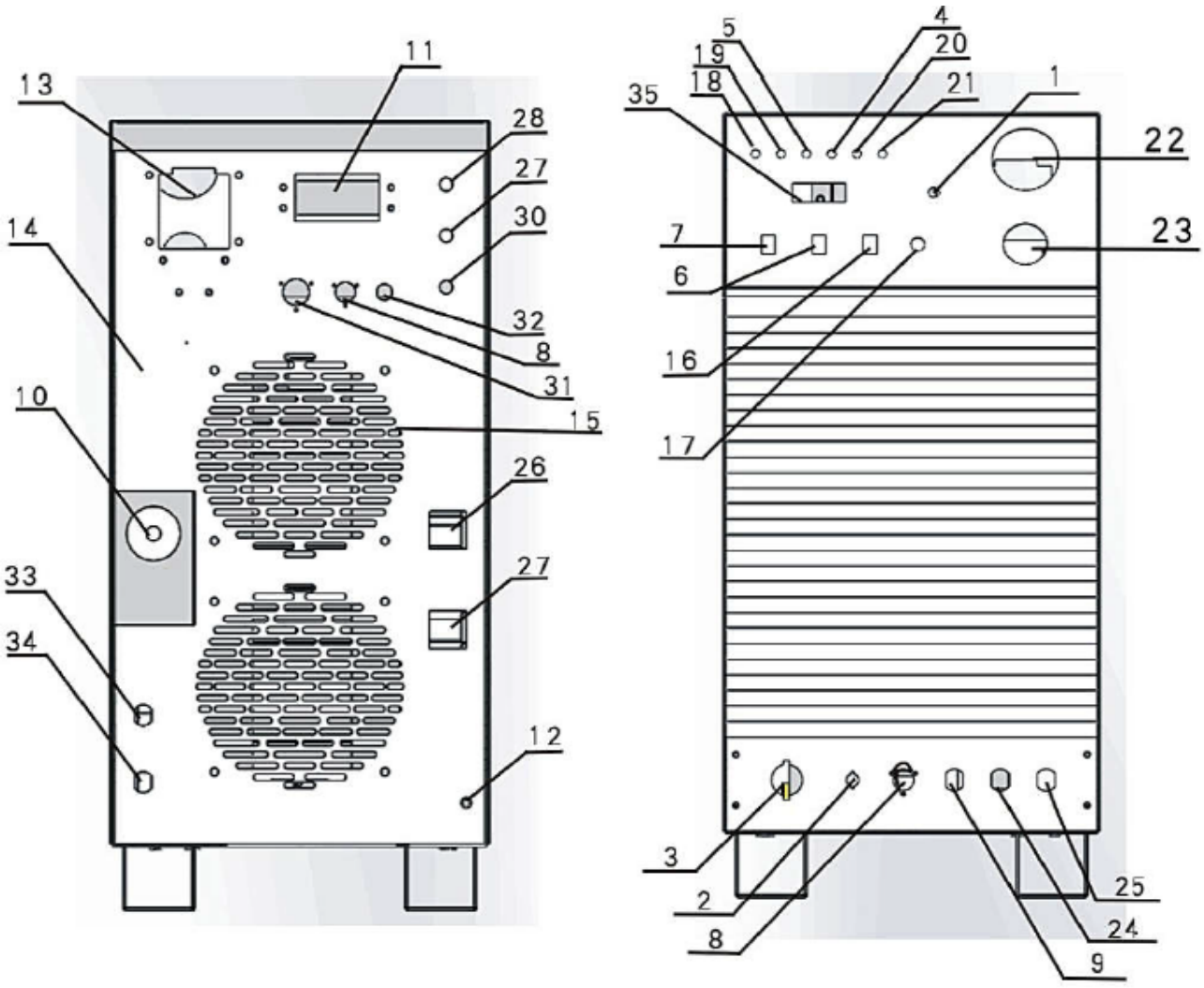
Note: the above cutting thickness standard is used (steel material)

Standards used for cutting machines

*GB 15579.1	Arc welding equipment Part 1: welding power supply

SEVEN FUNCTIONAL1 INTRODUCTION

7.1 Function description of cutting machine



1. Current adjusting knob

   Note: used to adjust the size of the cutting current

2. Transfer arc junction column

   Note: the transfer arc lead interface of a non-contact cutting gun

3. Output cable socket (+)

   Note:Connect the cut workpiece through the output cable

4. Overheat indicator bulb

Note: When the machine is overheated (generally judged to be a cooling fan fault) this indicator is often lighted.

5. Start indicator lamp

Note: When the light is always on, the machine begins to work and the steel is being cut.

6. Gas detection / normal cutting

Note: (the function used when the water cooled cutting gun is replaced by the electrode)

7. Self locking / non self locking switch

Note: When you are in a non lock position, the opening switch can start cutting, and the closing switch can stop cutting. In the self locking position, when the switch is opened, the opening arc is successful, the release switch will not stop cutting, and the cutting will stop when the switch is moved again.

8. Control socket

Note:Connect (torch) control plug

9. Air and electricity joint of cutting machine (1)

Note:The connection (the torch) (gas and electricity) joint

10. Air filter

Note:Filter out the moisture in the air. The accumulated water should not touch the filter core. The lower water valve should be released in time to release the water. If overaccumulated water enters (the torch), it will affect the introduction of arc and cutting quality.

11. Air switch

Note:Automatic power off when the cutting machine is overloaded or failure to protect the machine. In general, the switch is pulled upwards to the position of the connection. When you start and stop the machine, please use the power switch on the machine.

12. Grounding bolt

Note: In order to ensure the safety of the human body and the normal use of the cutting machine, be sure to use the wire to reliably connect the bolt to the ground, or to connect the grounding wire in the input cable to the ground reliably.

13. Power input cable

Note:Three wire connected three-phase 380V/50HZ power supply

14. Nameplate

15. Fan

Note: Cooling heating element

16. Selection switch of gas cooling / water cooling

Note:Maximum use current 120A

17. Test button

Note:Press this button to start the whole machine work

18. Power indicator lamp

19. Pressure indicator lamp

Note: Compressed air pressure detection indicator, The light begins to light up when the pressure is higher than the 0.2Mpa pressure The light begins to go out when the pressure is below 0.15Mpa

20. Power supply abnormal indicator

Note: When the power supply is short of phase or lower than 330VAC, the indicator light is lit

21. Water pressure indicator lamp

Note:Connect water cooling water torch, Flow more than 0.15L/min indicator light

22. Digital pressure gauge
    Note:Buttons can choose pressure units
23. Air pressure regulating valve
    Note:Regulating air pressure (0.4Mpa-0.6Mpa)
24. Water / electric output interface
    Note:The output current and the outlet interface interface, for connecting (torch) water-cooled cable joint
25. (cutting torch) backwater interface

    Note:Connect (torch) return (water) pipe
26. AC220V water tank power supply
27. AC380V water tank power supply
28. Main power supply insurance
29. Arc pressure output insurance
30. Water tank insurance
31. Arc pressure output
    Note:The standard output 1:1 arc pressure, the voltage plate output has 4 kinds of signals: 1:1, 1:2, 1:50, 1:100. please be connected according to the needs.
32. Arc ignition successful signal
33. Inlet (water) interface
    Note:The outlet of the water tank
34. Back (water) interface
    Note:Backwater pipe for connecting water tank
35. Digital display (current)
    Note: When there is no cutting work, it is shown that the cutting current is set up in advance and the cutting current shows the real cutting current.

7.2 Operation method

7.2.1 After the inspection is correct, the power supply is opened and the work light begins to light up.

7.2.2 Open the switch  gas

The "air valve" in the machine is opened and pre - ventilated for 1 minutes to remove the condensate vapor in the (cutting torch). Air pressure valve, make the pressure gauge indicate 0.4-0.6MPa. Then dial to "cutting" position.

7.2.3 When the non - contact (cutting torch) is used for cutting, the (cutting torch) nozzle should be distance to the workpiece 3-5mm, and the cutting nozzle can not contact the workpiece.

7.2.4 In general, it should be cut at the edge of the workpiece and can be cut at any point of the workpiece.

7.2.5 During the cutting process, (cutting torch) should keep moving at a constant speed

7.2.6 When the cutting is stopped, when the plasma arc is put out, (cutting torch) can remove the workpiece to prevent the workpiece from being damaged.

7.3 Use attention

7.3.1 Slotted abnormality, broken arc, arc failure and other problems found in the process of cutting.

Easy damage parts such as nozzle and electrode should be checked. Please change it in time

7.3.2 When assembling electrodes, swirl rings, nozzles and nozzle covers, the coaxial assembly should be paid attention to, and the nozzle cover must be pressed tightly.

7.3.3 It is not possible to move quickly (cutting torch) to avoid cutting the workpiece to cause the arc reflux and burning the nozzle. It is also necessary to avoid cutting speed too slow to affect the quality of the cut

7.3.4 In the process of cutting, if the pressure is lower than 0.4-0.6Mpa. (cutting torch) will cause overheating and damage: if the pressure is higher than 0.8Mpa. will cause the solenoid valve does not open. The water in the air filter should be released in time

7.3.5 There is no undervoltage protection for this machine. When the voltage of the power grid is too low, the machine stops working.

7.3.6 This machine is not overheated. When the temperature is too high, the machine stops working, the protection panel indicator lights.

7.3.7 Pay attention not to (cutting torch) on the human body, so as not to burn,

When changing the vulnerable parts, all power supply must be cut off

EIGHT COMMON FAULT AND ELIMINATION METHOD

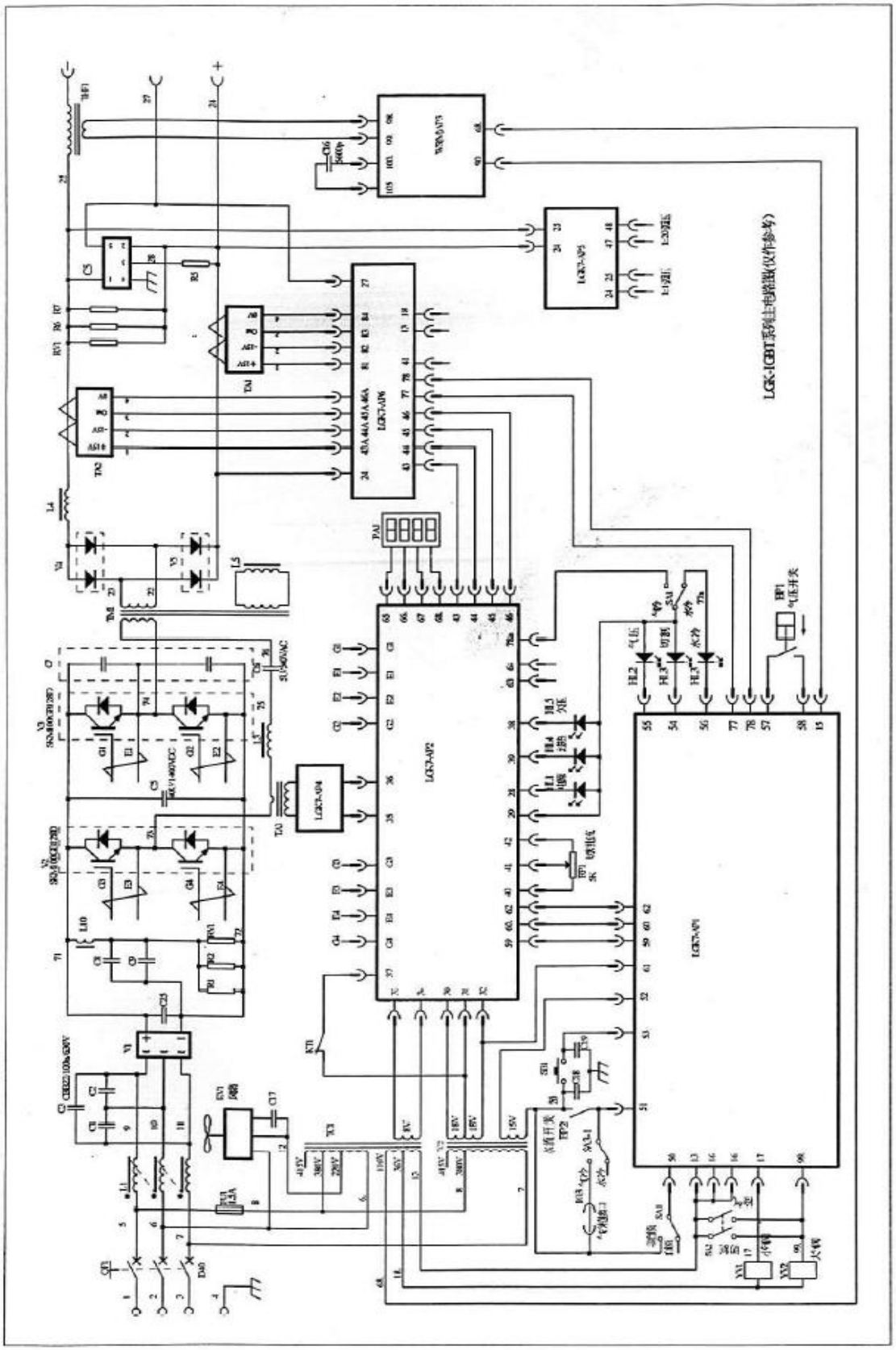
NO	phenomenon	Reason	Measures
1	When the machine is opened, the working light is not bright and the machine does not work.	1. Power supply missing phase 2. Power switch tripping 3. Break	1. Check the power supply 2. Check whether the fan, power transformer, main control board is in good condition 3. Check the wiring
2	Light on Protection	1. High temperature in the machine 2.Damageof temperature relay	1. Wait for the machine to use after cooling 2. Change temperature sensor
3	Gas inspection, gas free flow	1. Damage of solenoid valve 2. Gas clogging 3. K1 switch damage 4. The output pressure of the filter is too high	1. Check and replace 2. Check gas path 3. replace 4. Adjust the pressure regulating knob to reduce the pressure and re tighten the discharge valve
4	Cutting gun control switch malfunction	1.Switch damage (cutting torch) 2. Switch broken line (cutting torch) 3.Control panel damage	1. replace 2. connection 3. replace
5	Over width of incision	1. The cutting speed is too slow 2. Nozzle burning loss	1. Speed up 2. replace
6	Large angle of incision	1.Nozzle damage (cutting torch) 2. Nozzles and electrodes are not concentric	1. replace 2. Adjust the concentricity 3. Adjustment of verticality
7		1.	

Note: if there are other failures in the machine, the professional engineer should be repaired.

NINE KEY NATERIAL1 LIST

NO	Grade	Mame	Model	Number	Remarks
1	QF1	Air switch	DZ47-60D(40A/3P)	1	
2	L1	Input reactance common mode inductor	ZX7-400III.3.5.0	1	
3	C25	Capacitance	MFD-DA01-800VDC-100UF ±5% Capacitance	3	200A 4
4	V1	Three Phase Rectifier Modules	MDS100A-1200A(Small)	1	
5	C	Electrolytic capacitor	1000uf 400v Φ50*80	2	
6	V2~3	IGBT	FF200R12KS4	1	
7	V4	Fast recovery diode module	DWC2F100N060S	1	
8	V5	Fast recovery diode module	DWC2F100N060S	1	
9	L5	Commutation inductor	ZX7-400III.5.2.0	1	
10	AP4	High frequency plate	LGK-XXXGPB	1	
11	THF1	High leakage transformer	LGK-XXX	1	
12	TC1	Power transformer	LGK-XXX	1	
13	EV1	Axial fan	200FZY8-S(220V Single-phase voltage)	1	
14	KT1	Temperature relay	JUC-079F/75℃-1D-A	1	
15	AP2	Drive plate	LGK-XXX QDB	1	
16	AP2	Main control board	LGK-XXXZKB	1	
17	L4	Output inductor	LGK-XXXII.4.1.0	1	
18	YV1	Solenoid valve	DF2-5(0.8MPA)AC36V	1	
19	RP1	potentiometer	WH30PB1K-16/3	1	Current regulation
20	SB1	(cutting torch) switch		1	
21	TA1	hall sensor	TKC100BR	1	
22	TA2	hall sensor	TKC100BR	1	
23	TM1	main transformer	LGK-XXX	1	
24	FU1	Power insurance	5A	1	
25	PA1	Digital display	LGK-XXX	1	
26	AP5	Split voltage control board	LGK-XXX	1	

TEN SCHEMATIC DIAGRAM OF THE MAIN CIRCUIT OF THE PRODUCT



Main circuit schematic diagram of LGK series inverter air plasma cutting machine (reference diagram)

ELEVEN COMPLETE SET OF PRODUCTS AND SELECTION OF ACCESSORIIES LIST

Serial number	Name	Specifications Model	Number
01	YH-XXX	Cutting machine	
02	Cutting torch	(YH-XXX)	
03	Electrode		
04	Injector		
05	Grounding cable		
06	Manual		
07	Product qualification certificate		
08	Warranty card		
09	Clip	Φ16	

Note: a) The above is for reference only

b) The signing of a contract is subject to the contract.

TWELVE TRANSPORT AND STORAGE

This machine belongs to the ordinary indoor use equipment. In the process of transportation and storage, it is necessary to avoid rain and moisture-proof. The warning words on the packing box should be paid attention to during loading and unloading. The storage environment should be kept dry, air circulation, non corrosive gas or dust. The temperature should be at -20℃+55℃, Relative humidity is less than 90%。The machine after unpacking if not used, should be according to the original packaging requirements (re packaging storage should be prepared before the dry cleaning and packaging sealed plastic bags) The user should keep the cartons and protective mats so that they can be properly packed in the long haul. In case of long distance transshipment, wooden cases should be added, and "upward" and "rain proof" should be marked.

THIRTEE QUALITY COMMITMENT

In accordance with the provisions of the product instruction manual, users comply with the rules of installation, storage, use, maintenance and storage of cutting machines, and 12 months from the date of purchase (based on the contract date). The manufacturer will serve the user free of charge when the cutting machine is partially damaged or is not working properly because of the quality of the manufacturing.

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