Pro-Tech TOOLS

Plasma cutter



Instructions for use

Translation of the original instructions

SAFETY WARNING !



Injury can occur when welding or cutting. Take care during operation Protection. For more detailed information, please refer to the 's Safety Manual, which complies with the manufacturer's precautionary requirements.

Electric shock - can lead to death !!!

- Set the earthing fitting according to the applicable standard.
- It is forbidden to touch electrical parts and electrodes when the skin is bare in wet gloves or clothes.
- Make you are isolated from the ground and the workshop.
- Make sure you are in a safe position.

Gas - can be harmful to health!

- Keep your head out of the gas.
- When arc welding, an air extractor should be used to prevent gas inhalation.

Arctic radiation - harmful to the eyes and burns the skin.

- Wear a suitable helmet and light filter, wear protective clothing to protect eyes and body.
- Use a suitable helmet or light filter to protect the observer.

Fire

- Welding sparks can cause fire, make there are no flammable substances around the welding area.

Noise - extreme noise damages hearing.

- Wear protection other means of hearing protection.
- Use appropriate protection or other means of protection to protect the observer.

Malfunction - when a problem occurs, contact the experts.

- If are encountered during installation and operation, follow these instructions.
- If you do not fully understand the operating instructions, or if you are unable to solve the problem using the instructions, you should contact our service centre for professional assistance.



ATTENTION !

When using the machine, a protective switch against stray current should be installed!!!

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ABOUT THE MACHINE

Welding machines are rectifiers using state-of-the-art inverter technology that can be used in a plasma cutting system using pressurized air.

The development of inverter welding equipment in shielding gas benefits from the development of inverter power supply theory and components. The inverter power first commutates the 50/60 Hz working voltage to DC. (DC). Then the inverter welding current source in the shielding gas uses a high-power IGBT component to transfer the 50/60 Hz frequency, then reduces the voltage and commutates and exports the high-power voltage through PWM technology, resulting in a large reduction in the weight and volume of the main transformer and an increase in efficiency of 30%. The arc initiation system uses high-frequency surge theory. It is simple to initiate the arc and has the function of timely air supply and air shut-off, and its features are arc stable, reliable, portable, energy-saving and no electromagnetic noise, high cutting speed, smooth cutting.

Plasma cutting machines can produce a stronger, more concentrated and stable arc. The arc is rapidly compressed by fast flowing air and the temperature can be up to 10,000 - 15,000 degrees Celsius. This creates an electrolyte mixture and then a powerful plasma arc. It has the functions of arc initiation current, arc stop current, welding current, current, current rise time, current descent time, gas delay time, continuous adjustment. In addition, pulse frequency and pulse intensity can also be independently adjusted. It has the features of automatic control of arc initiation, arc stop and stable arc, which achieves the best result for the shape and internal quality of the welded surface. Its exclusive design is especially suitable for the cycling industry.

Compared with other cutting machines, these series of cutting machines use advanced electron circuit for fast power supply and control. In addition, they have superior cutting operations and extremely high transmission efficiency.

The welding machine series can be easily designed for different cutting power, and the output current is constant and adjustable, as well as excellent operating performance. In normal situation, its transmission efficiency is more than 85%.

The machine is widely used; it is easier to design the welding machine with different dynamic characteristics. It can weld stainless steel, carbon steel, copper and other non-ferrous metals, and can also be used for traditional electric welding.

ATTENTION !

The machine is mainly used in industry. It will produce radio waves, so the worker should fully prepare for protection.

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PARAMETERS

Parameters \ Model	CUT 45
Supply voltage (V)	Single phase voltage 220V ±15%
Rated input power (KVA)	4,8
No-load voltage (V)	230
Rated input current (A)	22
Current range (A)	10-40
Rated output voltage (V)	96
Working cycle	60%
Efficiency (%)	85
Performer	0.93
Model of the pilot arc	HF oscillation
Burner diameter (mm)	1.0
Degree of protection of the housing	IP21
Arc method	Untouched
Air compressor pressure (kg)	4-5
Thickness (mm)	1-14
Weight (kg)	9
Dimensions (mm)	371×153×232

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INSTALLATION

The plasma cutter is equipped with a power supply voltage compensation device. When the supply voltage fluctuates within ±15% of the rated voltage, it can still work normally.

If the machine is used with long cables, to avoid voltage drop, it is recommended to use a cable with a larger cross section. If the cable is too long, it may affect the performance of the power system. Therefore, it is recommended to use cables with configured length.

1. Make sure that the air supply to the machine is not blocked or covered to prevent system malfunctions.
2. Use a cable (at least 6 in cross-section) to connect the enclosure and the earth. The method is from the connection screw at the of the power supply or make sure the ground is solid.

For absolute safety, both methods can be used.

3. Use a heavy-duty air pipe to connect the air supply and the compressed air source against pressure and use a hoop or other method to tighten the joint. The air source should supply suitable pressure, flow and be dry. If your air source does not meet the above requirements, you should consider using another compressor with the correct capacity and an air decompression filter to supply the appropriate pressure and remove impurities and moisture in the air.
4. Install the air electrical system plug into the socket in the panel and fix it clockwise. Connect the cutting torch air plug and arc maintenance cable (for CUT80/100/160) to the appropriate socket and secure the screw.
5. Insert the cable plug with loop into the fixing socket and tighten , the next clamp holds the workpiece.
6. According to the input voltage class, connect the power cord to the power box of the corresponding voltage class. Make sure there is no mistake and check if the voltage is different between the permit range.
7. You can start cutting.

Connecting the input cable

1. Each machine has a power that must be connected to a coordinated voltage class in accordance with the input voltage of the cutting machine. If a cutting machine whose supply voltage is 220 V is incorrectly connected to AC 380 V, this will cause components between the machines to burn.
2. Make sure the power cord is securely connected to the power switch and prevents oxidation. Ensure that the supply voltage is within the selected range.

Output cable connection

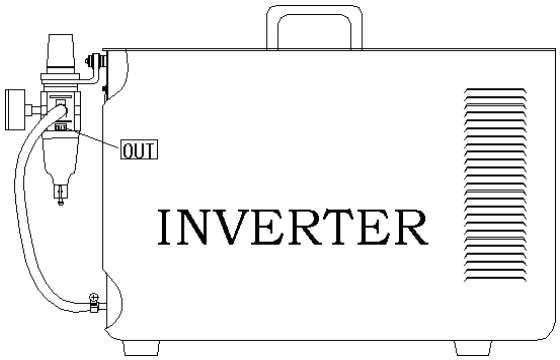
1. Make sure that the compressed air hose is firmly connected to the copper connector with the high pressure rubber hose.
2. Make sure the copper screw of the other end of the burner is connected to the integration clamp, and then tighten them clockwise (prevent gas leakage). The movable plug of the other end of the ground cable is connected to the positive terminal of the front panel, and then tighten them.
3. Make sure the air plug of the torch is connected to the switch connector on the panel (if it is an arc cutter, the arc cable of the torch is connected to the terminal of the arc cutter.)

Installation and operation of the air regulator

1. Tighten and seal the copper air hole on the IN and OUT terminal firmly with a high pressure rubber tube.
2. Tighten and seal the meter with the rubber tube on the face of the meter.
3. Fix the connecting shelf with the screw as the position of the controller.
4. Remove the plastic screw and fix the controller on the shelf.
5. Turn on the air valve, turn the knob to adjust the pressure, turn the pressure to the rated volume (the gauge inside shows kg), and then put the knob down. (+ means increasing pressure, - means decreasing pressure.)

Installing the controller .

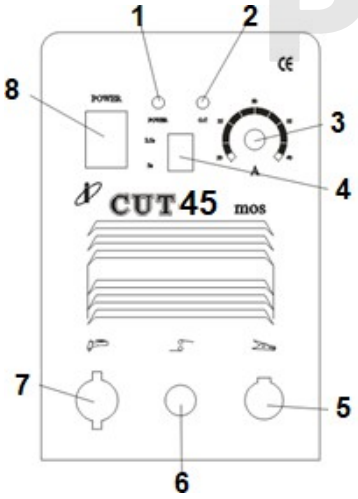
6. If there is too much water in the gas filter bottle, turn on the water valve to let the water flow out.



OPERATION

1. Open the main switch on the front panel; make sure the main switch is in the "on" position. At this point, the main switch indicator is lit. The screen will display the current volume.
2. Adjust the gas pressure so that it is sufficient to use the machine, open the compressed air valve..
3. Press the burner control knob, the solenoid valve will start, the sound of a high frequency arc will be heard and gas should flow out of the burner burner (the burner of the arc support cutter should be shooting fire).
4. There is a distance of 1 mm between the copper tip and the workpiece (larger if it is an arc-assisted cutting machine). Press the torch knob and light the arc. The sparks from the ignition of the high frequency arc are immediately reduced. The welding machine can start cutting.

CUT 45 Control panel:



1. Power indicator
2. Abnormal indicator
3. Cutting current adjustment
4. Flow switch
5. Positive output
6. Burner switch socket
7. Output of the gas-electric system
8. Power switch.

NOTICE:

In order for the plasma cutting machine to achieve the best possible capacity and result, the air flow and pressure must be well matched. Therefore, the pressure and flow rate must be adjusted appropriately when setting the current. If the air flow is too high and the cooling effect is too strong, it will cause the

arc, and if the air flow is too small, the nozzle and electrodes will get too hot and burn.

PREVENTIVE MEASURES

1、Environment

1）The product can be used in the environment where the dry conditions and humidity are max. . 2
）The ambient temperature is from -10 to 40 degrees Celsius.

3）Avoid welding in the sun or during rain.

4）Do not use the machine in an environment where there is polluted conductive dust in the air, or corrosive gas in the
air.

5）Avoid gas welding in environments with strong air flow.

2、Safety standards

The cutting machine has a protection circuit installed against overvoltage, overcurrent and overheating. When the voltage, output current and temperature of the machine exceed the standard, the welding machine will stop working automatically. Because will damage the welder, the user must pay attention to the following warning.

1）**The working area is sufficiently ventilated !**
The cutting machine is a powerful machine, high currents and natural wind are generated during its operation
will not satisfy the cooling requirements of the machine. Therefore, there is a fan in the intermediate room to cool the machine. Make sure that the inlet is not covered. The user should ensure that the work area is sufficiently ventilated. This is important for the performance and life of the machine.

2）Don't overload !
The operator should remember to monitor the maximum working current (response to the selected working cycle).
The welding current must not exceed the maximum current of the working
cycle. Current overload will cause damage and burn the machine.

3）**No overvoltage !**
The supply voltage can be found in the diagram of the main technical data. Automatic compensation the voltage circuit will ensure that the welding current is maintained in the permissible arrangement. If the supply voltage exceeds the permissible limitation, it will damage the machine components. The operator should understand the situation and take precautions.

4）Behind the welder, there is a grounding screw on which there is a grounding mark. The sheath must be reliably grounded by a cable whose cross-section is greater than 6 millimeters square in order to prevent the generation of static electricity.

5）If the cutting time limited by the duty cycle is exceeded, the plasma cutter stops working for protection. If the machine is overheated, the temperature control switch is in the "ON" position and the indicator light is on
in red. In this situation, do not pull the plug to allow the fan to cool the machine. When the light goes out and the temperature drops to the standard range, you can turn off the machine.

ISSUES YOU MAY ENCOUNTER DURING CUTTING

Forging, cutting materials, factor, power forces have influence on cutting. The user must try to improve the level of the cutting environment.

A、The cutting surface is rough, poor cutting result

The machine may not be operated correctly. You can check as follows:

1. Make that the compressed air supply has sufficient pressure which is not less than 0.3 MPa（ 3kg/cm$^{2)}$and its range is ±0.05 MPa.
2. The electrode and nozzle are not adapted to the current. Check as follows:

Current	10-30A	30-40A	60-100A	100-120A
Jet	φ1.0 mm	φ1.2 mm	φ1.3 mm	φ1.4 mm

B、Arc strikes are difficult and often pause:

1. The cutting current is too small and the air flow too large. And if the cooling effect is too strong, it leads to the arc stopping.
2. The mains supply voltage is low and the input cable is too long.

C、Output current does not reach the rated value:

When the supply voltage deviates from the rated value, it will cause the output current not to match the rated value; when the voltage is lower than the rated value, the maximum output may also be lower than the rated value.

D、The current is not stabilized when the machine is in operation:

This is related to the following factors:

1. The mains voltage of the power lines has been changed.
2. Harmful interference from the mains or other devices.

E、The electrode or nozzle is often burned:

1. The flow is too large or the nozzle is too small.
2. The air pressure is low, the cooling effect is weak and the nozzle is too hot.

F、The arc fails to fully cut into the steel plate, or too much is released from it splashes.

1. Maybe the capacity of the machine can not meet the demand of this thickness, use a larger machine.
2. The electrode or nozzle is burnt, replace it.

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In normal work, you should cut from the edge of the workpiece.
In this way you can protect the burner from damage due to splashing.

MAINTENANCE

ATTENTION:
The power must be switched off before maintenance and inspection, and the opening the cover, make sure the power plug is pulled out.

1、Regularly remove dust with dry and clean compressed air, if the plasma cutter is working in the environment that is polluted by smoke and polluted air, the machine needs daily removal.

2、The pressure of compressed air must be within a reasonable arrangement to avoid damage

small components between machines.

3、 Regularly check the intermediate circuit of the plasma cutter, and make sure that the cable circuit is properly connected and the connectors are firmly connected (especially the insertion connector and components). If found
corrosion and loosening, polish them well and then rejoin them tightly.

4、 Prevent water and steam from entering the intermediate machine, if they get into the machine, dry the intermediate machine, and then check the insulation of the machine.

5、If the plasma cutter will not be used for a long time, it must be put into a packing box and stored in dry environment.

DEFECT CHECK

Notes: to operate the machine according to the following instructions, the user must be a worker in the specific field of electricity and safety and have the appropriate certificate to prove his/her skills and knowledge.

CUT 45/50/60 (220 V)

Disorders	Solvable methods
1. Switch indicator is on, fan is not working and the control knob is inoperative.	1. Surge protection works. Close the device and reopen it after a few minutes.
2. The switch indicator is lit and the fan is running. When the burner control knob is pressed, no sound of HF arc is heard and the solenoid valve is not working.	1. Check that the burner is open. 2. Check that the burner control knob is not damaged. 3. Part of the top board auxiliary power supply is damaged and the 24 V DC output is not available.
3. The switch indicator is lit and the fan is running. When the burner control knob is pressed, no sound of HF arc is heard and lit red diode.	1. Check if the MOS K2837 of the top board is not damaged (the driver mold is damaged). 2. The rising transformer of the bottom plate is damaged. 3. The control form is damaged.
4. The switch indicator is lit and the fan and solenoid valve are working. However, the HF sound is not heard arc and the red LED does not light up.	There are some problems in the arc strokes section, such as: 1. It is too far between the drain tip, or there is adhesion in the drain tip. 2. The primary coil of the arc transformer is damaged or has poor contact. 3. Check that the diode of the quadruple voltage rectifier is not affected. 4. Check for leakage of HF 102/10KV electrical capacity. The relay is damaged.