

LOTUS[®]
Performance, Delivered.[™]



60A Plasma Cutter

LT60CXT Pro

Made in China/Fabriqué en Chine
Lotus Tool Group (Philippines)
www.lotustoolworks.com



Precautions!



Importance:

- Don't switch the function shift to avoid damage of machine in welding.
- Take out the quick connected with electric welding clamp before welding to confirm the breakage between the clamp and main engine without electric shock.
- The machine must be used with leakage current protection switch!
- The welding labour protective equipment certified by the state safety supervision department!
- The operator must be the special operation personnel with metal welding (including gas welding) operation certificate.

ELECTRIC SHOCK MAY CAUSE CASUALTY!

- Earthing is a must according to application standards.
- It is prohibited to touch live parts or electric welding rod with naked skin or when wearing wel gloves or clothes
- Insulation shall be guaranteed for ground and storage room.
- Safe working position is a must.

FUME MAY DO HARM TO YOUR HEALTH

- Have your head slay out of the enclosure of fume.
- Ventilator or air extraction device must be equipped for arc welding

ARC RAYS MAY HURT YOUR EYES AND BURN YOUR SKIN!

- Mask & ray filter goggles, protective clothing must be put on to protect your eyes and body
- The onlooker must put on proper mask or screen protection.

FIRE

- Welding flame may cause fire. please ensure there are no flammable materials around the welding area.

EXCESSIVE NOISE MAY DO HARM TO YOUR HEARING!

- Protective ear plug or other similar devices must be put on to protect your ear.
- The onlooker must know well that the noise may have potential harm on his hearing.

IN CASE OF FAULTS, PLEASE COME TO PROFESSIONAL FOR HELP!

- In case that you have difficulty in installation and operation, please refer to the relative content in this manual for troubleshooting.
- In case that you have difficulty in understanding the manual or this manual fail to solve the problems, please contact your supplier or our service center for professional help.



INTRODUCTION OF PLASMA CUTTING MACHINE

Thank you for your selection plasma cutting machine!

Plasma cutting machine was made with advanced inversion technique with the application of MOSFET from high power devices, the machine inverts 60Hz industrial frequency like over 100KHz and carries out step-down rectification. With the large power voltage source output from PWM technique the weight and size of the main transformer can be decreased greatly and the efficiency is 30% higher. With the arc starting system applying high frequency oscillation, it is easy for arc starting, earlier for air feeding and later for air stopping. The machine features in stable and reliable wire feeder speed, Handiness, energy saving, less noise, quicker cutting, speed and clean cutting mouth without polishing.

The machine can be widely used for cutting on stainless steel, alloy steel, low carbon steel, copper and other nonferrous metal materials. Its whole transform frequency is over 85%.

Your esteemed suggestion on our products and application will assist us in improving our technique and service.

1. The repairing guarantee period of main engine is one year but excluding the other related accessories.
2. Any damage caused by non-human factors can be repaired for free in the repairing guarantee period.
3. Don't remove, change or replace the electronic parts by clients, otherwise it will cause more serious effect. Any responsibility from the effect is not covered by our company.

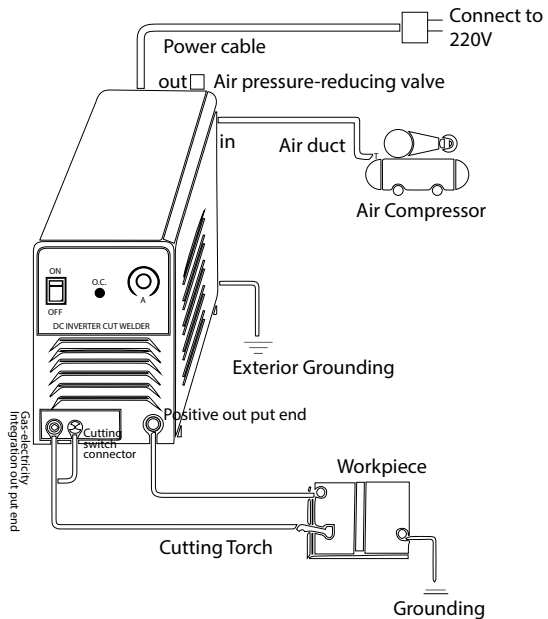
I. Technical Parameter

MODEL	LT60CXT Pro
Input Voltage (V)	AC220V±15%
Input Power Capacity (KVA)	7.5
No Load Voltage (V)	250
Current Range (A)	20-60A
Rated Output Voltage (V)	103
Load Sustaining Rate (%)	60
Efficiency	85
Power Factor Cos Ø	0.93
Insulation Class	B
Shell Protection Grade	IP21
Arc Starting Type	Touch
Suggested Air Pressure (KG)	5
Suggested Discharge of Air Compressor (m ³ /min)	0.25
Weight (Kg)	20.3
Dimension (mm) (LxWxH)	180×205×355

II. Installation

2.1 Connection of Input wires (The Installation figure as attach)

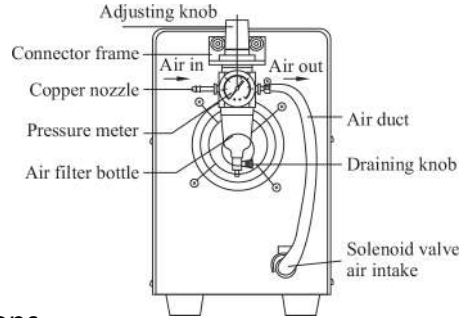
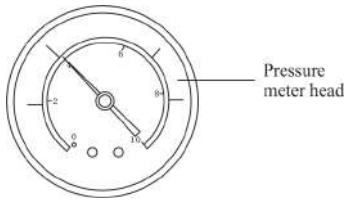
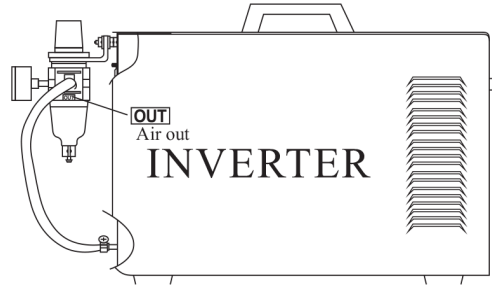
1. The power cable provided with each cutting machine shall be connected to the end of corresponding voltage grade according to the input voltage of cutting machine. Don't misconnect to the end of improper voltage grade. Some users misconnect the 220V power cable to AV 380V end to burn the parts in the machine.
2. Keep good contact between power cable and switch or wiring terminal to avoid oxidation. If applicable, check whether the power voltage is within waving range in the cutting status by the instrument.



3. Installation and operation of air pressure-reducing valve

- Tight the copper nozzle with seal tape through IN and OUT ends.
- Tight the meter head with seal tape on its installed position.
- Fix the connector frame on the valve installed position on the back of machine with the nut shown as the figure.
- Remove the plastic nut and fix the valve on the connector frame shown as the figure.
- Ventilation, raise the adjusting knob, adjust the air pressure in KG in the meter to the required one by turning it toward the "+" to increase the pressure or the "-" to decrease the pressure. Then press down the knob.
- The scale of meter appears four KG pressure shown as the figure.
- When the water is too much in the air filter bottle, the water shall be released by opening the drain valve.

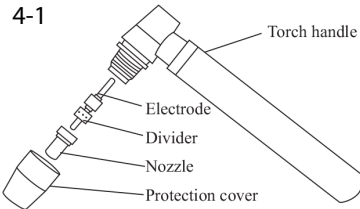
The installation of pressure-reducing valve shown as the figure



4. Cutting torch installation instructions

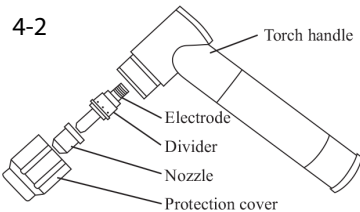
4-1 Torch head installation method shown as the figure.

- Insert one end of electrode into the torch head.
- Pack the divider to the other end of the electrode
- Separately connect the nozzle to the electrode and driver.
- Connect the protection cover to the nozzle, turn the cover into the torch head and tight it up.



4-2 Torch head installation method shown as the figure.

- Turn the threaded end of electrode into the torch head and tight it up.
- Pack the divider to the other end of the electrode shown as the figure.
- Separately connect the nozzle to the electrode and divider.
- Connect the protection cover to the nozzle, turn the cover into the torch head and tight it up.



Note: The electrode shall be turned into the torch head by using hex key wrench in the installation of torch head and tight it up. Otherwise it will burn the inner thread of electrode.

2-2 Input wire connection

1. Connect the air duct from the output end of compressor to the input end of pressure-reducing valve (IN). Closely connect the high pressure leather belt from output end of pressure-reducing valve (OUT) to the copper tube on the back of machine.
 2. Connect the copper nut on the torch with the gas-electricity integration output end on the front of machine and tight it up clockwise to prevent leakage. Connect the quick plug on the grounding clip with the positive output end on the front plate of the machine and tight it up.
 3. Connect the switch plug on the torch with the torch switch connector on the panel. (For the cutting machine with pilot arc, The pilot arc wire on the torch shall be connected with the pilot arc wiring terminal on th panel).
 4. Turn the electrode into cutting torch in order, tight it closely after it is turned into the end. Then properly install the nozzle and protection cover in order. (Refer to the cutting torch installation instructions)
- Note: Whenever replace or examine the nozzle and electrode, the machine must be off)

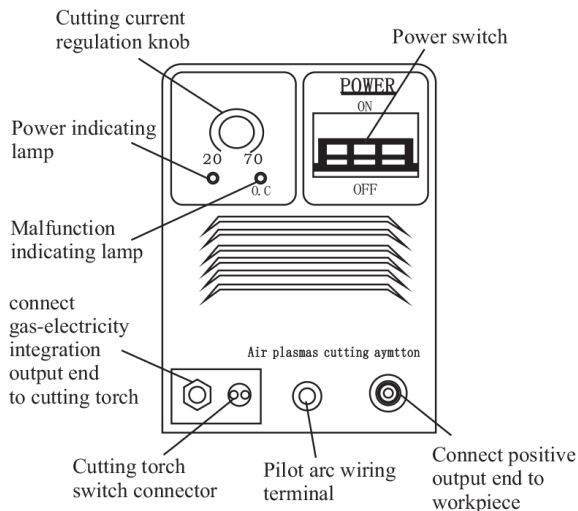
Examination


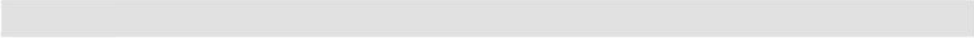
1. Check for the cutting machine grounded as required
2. Check for good contact of all connecting points
3. Check for proper voltage connected with the power cable
4. Check for no abrasion, breakage or bending of connecting cable or air duct.

III. Operation

1. Turn the power switch on the front plate to the "ON" position, after that the power switch indicating lamp will be on and the screen of the meter display the set current value.

LT60CXT Control Panel description Figure



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2. Adjust the pressure to the required one with the adjusting knob of the pressure-reducing valve and open the air compressing valve. (Refer to the installation and operation of air pressure-reducing valve). Proper air pressure can reduce the abrasion of nozzle and electrode and improve the cutting capacity.
 3. Press the control knob on the cutting torch and start the solenoid valve, High frequency arc discharge sound will be heard from the machine and the gas will be blown out from the nozzle. (For the cutting machine with pilot arc, plasma arc will be sprayed out from the nozzle).
 4. Set the corresponding cutting current according to the thickness of cutting workpiece.
 5. Contact the copper nozzle of cutting torch with the workpiece (The copper nozzle with pilot arc is about 2mm from the workpiece. Press the knob on the cutting torch to ignite and starts arc, then properly raise the cutting torch and get it about 1mm away from the workpiece, the cutting can be start.

IV. Matters need attention

IV-1 Ambient Environment


1. Welding operation shall be carried out under dry ambient environment with humidity $\geq 80\%$
2. The ambient temperature shall be maintained between -10°C and 40°C
3. Do not carry out welding under sunshine or in rain. Keep the welder out of water or rain.
4. Do not carry out welding in dusty area or under the environment full of corrosive gas.

IV-2 Safety Outline

1. Ensure fine ventilation.
It is a small and compact type machine. A strong working current passes through upon welding operation so the natural draught fails to cool the welder. A fan has been internally installed for forced cooling. The user shall ensure the uncovered or unplugged ventilation and the distance between the machine and particles around shall not less than 0.3m. Users shall maintain sound ventilation to guarantee the better operation of the machine and longer service life.
2. Guard against overloading.
Overloading is prohibited, otherwise the operation will be suddenly stopped in cutting. That is an activity of inner thermal sensitive component under overloading. It allows the fan rotating to improve the speed of temperature decreasing in the machine without cutting power. After the temperature decrease to the allowable range, the operation will be recovered.
3. Guard against over voltage
The power voltage of the machine is specified in the table of technical parameters. Generally, the automatic voltage compensation circuit of the machine will remain the welding current in the allowable range. Over voltage will damage the components. The users shall note it.
4. Each welder is installed with a grounding screw marked with grounding indication. Prior to operation, The operator shall use a cable having the cross section of 10mm^2 to have secure grounding and to release electrostatic charge to avoid any accident resulted from power leakage.
5. Don't touch the output end to avoid electric shock in operation.

IV-3 Notice for Cutting

1. Before cutting hold the torch (If it is a non-contact arc starting type, The torch is not contact with the workpiece), press the switch plasma arc will be sprayed from the nozzle to improve that the devices like electrode nozzle was properly installed. If no or little plasma arc was sprayed from the nozzle, the electrode or nozzle was installed improperly. It shall be reinstalled after the machine is off.

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2. When it start cutting, point the outer edge of nozzle to that of the workpiece, press the switch and it will start arc. If the arc can not be ignited, release the switch, press the switch again and move the torch at stable speed for normal cutting after succeed in arc starting. (Beause the move speed will be changed from different thickness of workpiece, the upturning of spark means the move speed is too high, the workpiece is not cut to the end, it must slow the speed to be proper.) If the splash is flow out vertically, it means the move speed is too high, the hanging slag may be increased. Please properly improve the cutting speed.
 3. When the workpiece would be cut off at the end of cutting, the cutting speed shall be slower. The cutting can be finished after release the torch switch.
 4. The spalah attached on the surface of nozzle will affect the cooling of nozzle. It shall be removed in time. The dust and splash on the torch head shall be removed usually to keep good heat elimination.
 5. The torch wheel frame can keep the end surface of nozzle away from the workpiece. Don't remove the frame i cutting. Otherwise the nozzle cannot be kept away from the workpiece to touch the workpiece to burn the torch.
 6. Change of electrode and nozzle.
Change the electrode and nozzle if it appears as follows:
 - a. The consumption depth of electrode hafnium filament is over 1.5mm
 - b. The diameter of nozzle is deformed irregularly.
 - c. The sutting speed is obviously slower and the arc appears green flare.
 - d. It is difficult to start arcing.
 - e. The cutting mouth is declined or wider,
The electrode and nozzle shall be changed in time, otherwise it will cause strong arc in the nozzle to strike through the electrode and nozzle even burn the torch. The nozzle shall be changed properly according to the model.
 7. The cable shall be kept as flat and straight as possible in cutting. If there is no enough space, don't bend it or press the cable to avoid the block of air flow. If the flow is too little the torch will be burnt. Don't touch the cable with the edge tool to avoid damage or abnormal use.
 8. Remove nozzle cover, nozzle, electrode and pilot arc wire (If not remove the pilot arc wire, it will burn the torch), press the torch switch after the machine is on, some air will be sprayed from the air tube mouth of to clean the dirt in the tube. It shall be cleaned in 15 seconds daily after use.
 9. Don't use the torch head for knocking.

V. Maintenance

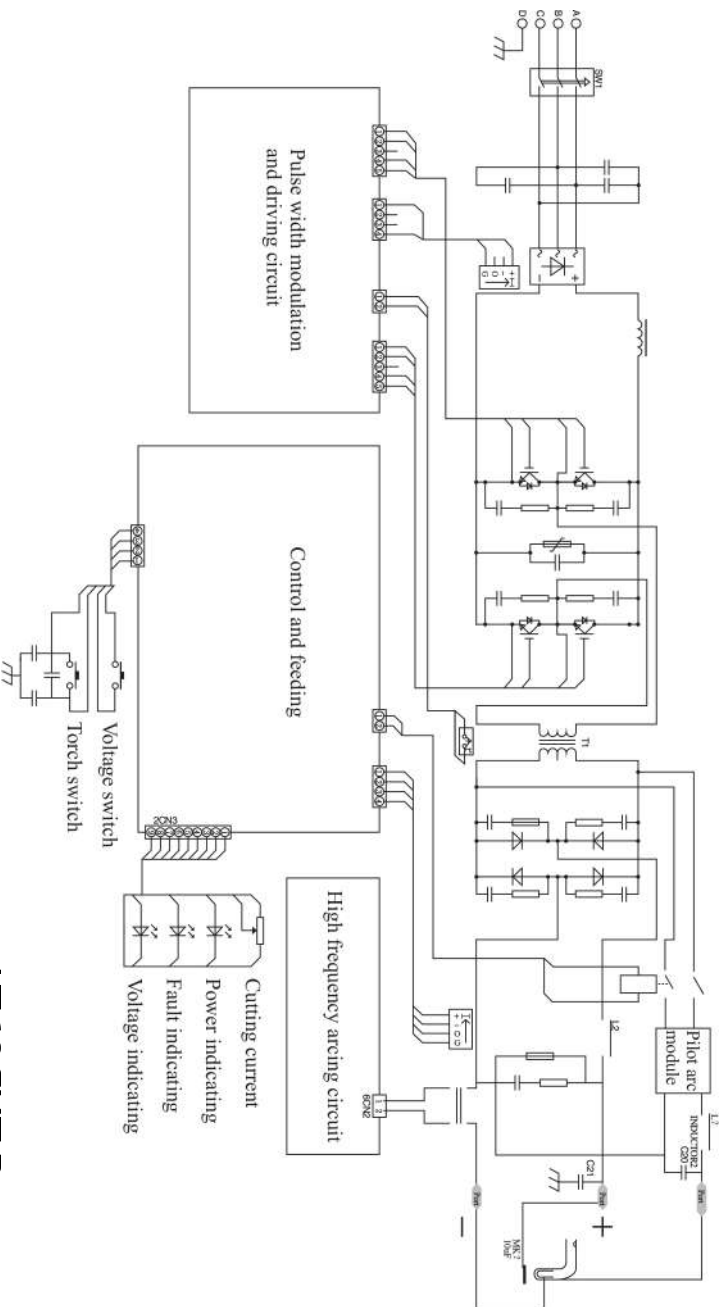
1. De-dust with dry compression air in a regular period. At least twice de-dust operation shall be carried out monthly in case of using the welder in fume or polluted air.
2. Compression air shall have proper pressure (Generally 3-4 air pressure) to avoid damaging the small components inside the machine.
3. Internal electrical points shall be check for proper contact (especially plugs and sockets). The loose point shall be tight up. The improper oxidation film shall be removed with sand paper before reconnected.
4. Water or humidity shall be kept away from the welder. In case that the welder is damped, it must be blown dry in time and a Megohmmeter shall be used to check for the insulation between the connecting points and between the point and the case prior to operation.
5. In case that the welder is kept idle, it shall be packed properly and stored in a dry area.

VI. Faults and Troubleshooting

Note: The following operation require the operator having sufficient knowledge on electricity and relevant safety sense. The operator shall have valid qualification certificates.

1. LT60CXT Faults and Troubleshooting

FAULTS	TROUBLESHOOTING
<ul style="list-style-type: none">• Power indication lamp is on• Fan fails to rotate• Knob is out of control	<p>Overload protection. Turn it on again after stop if for some time.</p>
<ul style="list-style-type: none">• Power indication lamp is on• Fan rotates• Solenoid valve works without high frequency• Arc discharge sound and inner red LED is on when press torch knob	<ul style="list-style-type: none">• The MOSFET on the front plate is broken that is. driving module is broken.• The step-up transformer on the bottom plate is broken• The control module is broken.
<ul style="list-style-type: none">• Power indication lamp is on• Fan rotates• Solenoid valve works without high frequency• Arc discharge sound and inner red LED is on when press torch knob	<p>Some problem appears on arc starting parts as follow:</p> <ul style="list-style-type: none">• Discharge nozzle is too far or edge bonded• Whether primary loop of arc transformer is cut or bad contact• Whether quadruple voltage rectifier diode is striken through• Whether 102/10KV high frequency capacitance is leaked• Whether relay is broken
<ul style="list-style-type: none">• All is normal except arc cannot be start in cutting	<ul style="list-style-type: none">• Input voltage is low• The pressure of air compressor is too large or too little



LT60CXT Pro
Principle Figure