

Power Plus+ Series



GeKaMac[®]

**PLUS CUT
40PFC MV
AIR PLASMA
CUTTER**

Users Manual

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedikwelding.com

OPERATORS' MANUAL

PLUS CUT 40PFC MV AIR PLASMA CUTTER

IMPORTANT: Read this Owner's Manual Completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. Contact your distributor if you do not fully understand this manual.

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§1 Safety

Notice: The instructions are for reference only. The manufacturer reserves the right to explain the differences between the description and the product due to product changes and upgrades!

Important Safety Precautions: Operation and maintenance of plasma ARC equipment can be dangerous to your health.

- Plasma arc cutting produces intense electric and magnetic emissions that may interfere with the proper function of cardiac pacemakers, hearing aids, or other electronic health equipment. Persons who work near plasma arc cutting applications should consult their medical health qualified technician and the manufacturer of the health equipment to determine whether a hazard exists.
- To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment.



GASES AND FUMES

Gases and fumes produced during the plasma cutting process can be dangerous and hazardous to your health.

- Keep all fumes and gases from the breathing area. Keep your head out of the cutting fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the plasma arc depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or cutting any metals which may contain one or more of the following:

Antimony	Chromium	Mercury	Beryllium
Arsenic	Cobalt	Nickel	Lead
Barium	Copper	Selenium	Silver
Cadmium	Manganese	Vanadium	

Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are using.

These MSDSs will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.

- Use special equipment, such as water or down draft cutting tables, to capture fumes and gases.
- Do not use the plasma torch in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.



ELECTRIC SHOCK

Electric Shock can injure or kill. The plasma arc process uses and produces high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically “live” or “hot.”
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the cutting circuit.
- Repair or replace all worn or damaged parts.
- Extra care must be taken when the workplace is moist or damp.
- Disconnect power source before performing any service or repairs.
- Read and follow all the instructions in the Operating Manual.



FIRE AND EXPLOSION

Fire and explosion can be caused by hot slag, sparks, or the plasma arc.

- Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapors from the workplace.
- Do not cut or weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.
- Hydrogen gas may be formed and trapped under aluminum workpieces when they

are cut underwater or while using a water table. DO NOT cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.



NOISE

Noise can cause permanent hearing loss. Plasma arc processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs. Protect others in the workplace.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.



PLASMA ARC RAYS

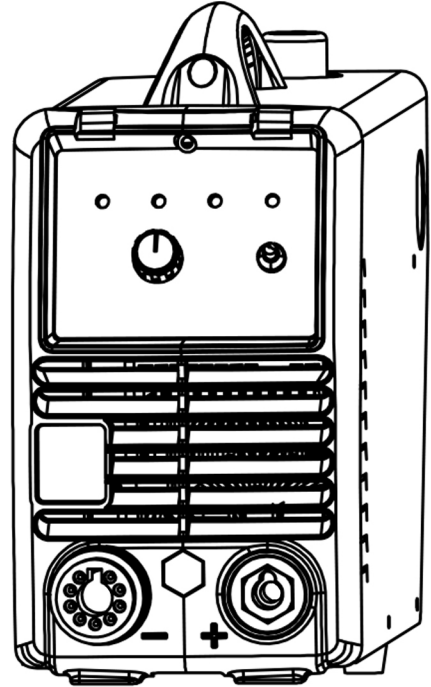
Plasma Arc Rays can injure your eyes and burn your skin. The plasma arc process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a cutting helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.
- Wear cutting gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.

§2 Overview

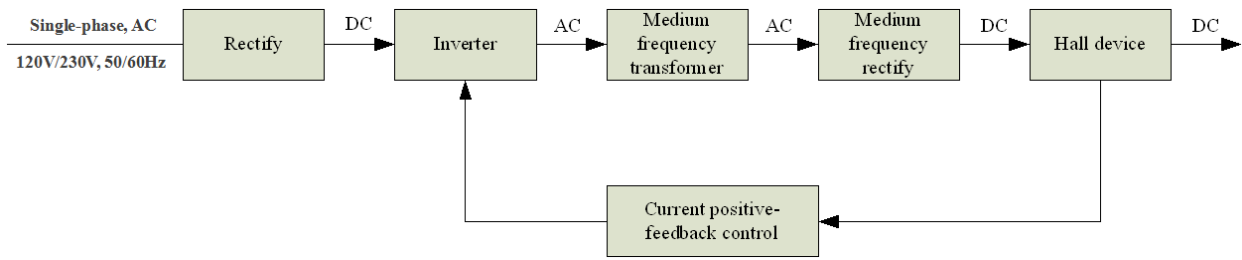
§2.1 Features

1. Multiple advantages such as energy saving and welder input voltage, works with 120V/230V.
2. IGBT parallel balanced current technology and digital control technology.
3. EMI filter restrains the EMI transmission of the power.
4. Starts without high-frequency so it will not interfere with controls or computers.
5. Pilot Arc Controller increases cutting capabilities and speeds, and improves tip life. So it can be applied to cut netlike workpiece.
6. Various protective and alarm functions for pressure, tip, over-temperature and over-current allow faster troubleshooting, eliminating unnecessary downtime.
7. Back striking tip and electrode ensure the velocity of striking and the quality of arc, and extend the life of them.



§2.2 Working Principle

The working principle of CUT Air Plasma Cutting Machine is shown as the following figure. Single-phase 120V/230V work frequency AC is rectified into DC (about 530V), then it is converted to medium frequency AC (about 20 KHz) by inverter device (discrete IGBT), after reducing voltage by medium transformer (the main transformer) and rectified by medium frequency rectifier (fast recovery diode), and is outputted by inductance filtering. The circuit adopts current feedback control technology to insure current output stably. Meanwhile, the cutting current parameter can be adjusted continuously and steplessly to meet with the requirements of cutting craft.



§2.3 Technical Data

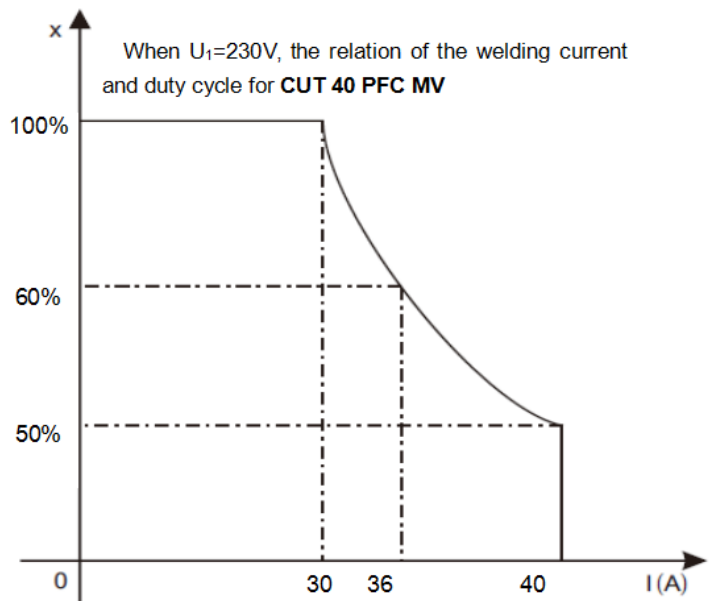
Models	CUT 40 PFC MV	
Parameters		
Rated input voltage (V)	1~110±10%	1~230±10%
Frequency (HZ)	50/60	
Rated input current (A)	34.5	22.6
Rated input power (KW)	3.8	4.9
Cutting current (A)	20~30	20~40
No-load voltage (V)	210	
Duty cycle (40°C 10minutes)	35% 30A 60% 22A 100% 20A	50% 40A 60% 36A 100% 30A
Severance Cut for Carbon Steel (mm)	≤ 20	≤ 25
Carbon steel	≤ 15	≤ 20
Stainless steel	≤ 15	≤ 20
Aluminum	≤ 12	≤ 16
Cuprum	≤ 8	≤ 12
Dimensions (mm)	510*146*278	
Protection class	IP21S	
Circuit breaker	JD03-A1 30A	
Net weight (kg)	8	
Cooling method	AF	

Note: The above parameters are subject to change with the improvement of machines.

§2.4 Duty Cycle and Over-heat

The letter “X” stands for Duty Cycle, which is defined as the portion of the time a welding machine can weld at maximum rated output current within a 10-minute cycle.

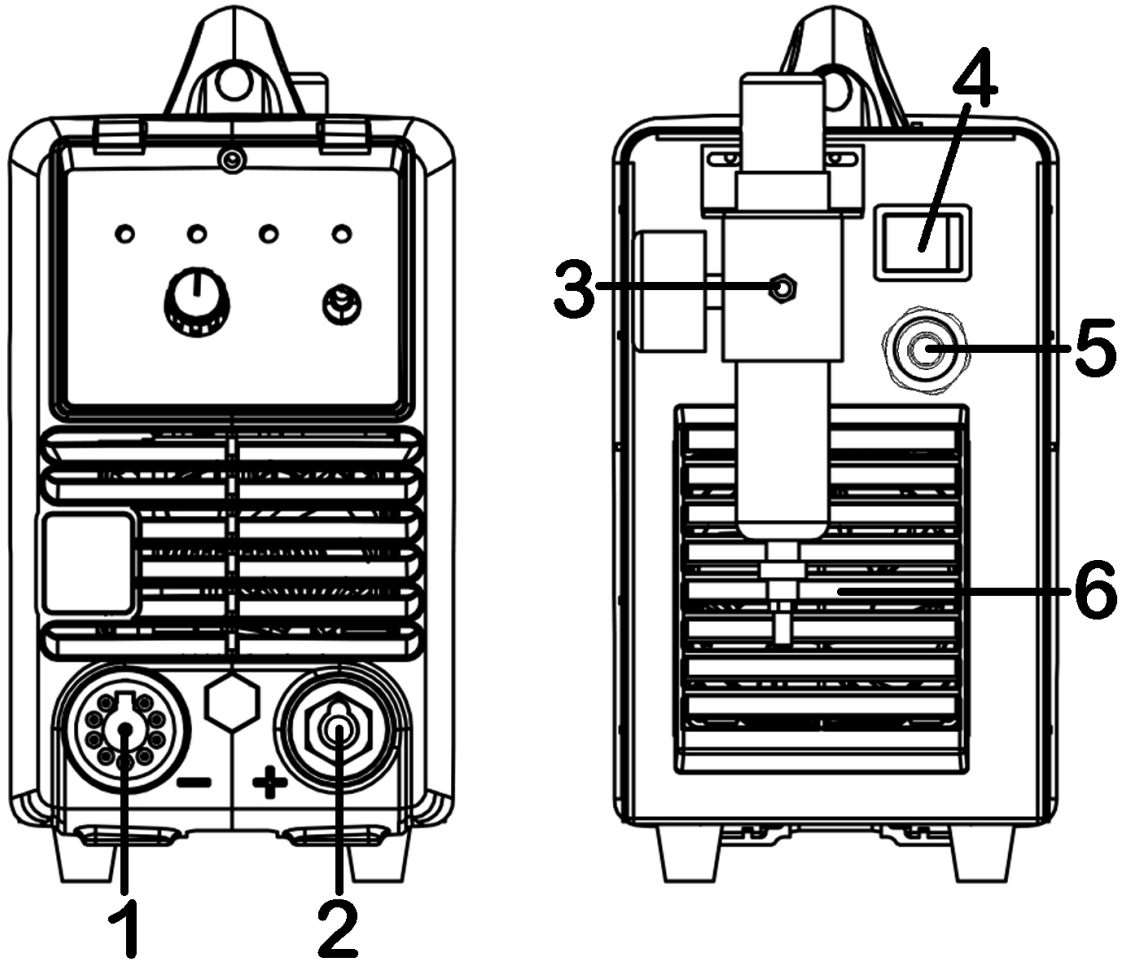
If the welding machine is operated beyond the rated duty-cycle, the IGBT heat sensor will send a signal to the welding machine control unit to switch the output welding current



OFF and light the over-heat. The machine should not be operated for 10-15 minutes to allow cool down. When operating the machine again, the welding output current should be reduced to match the duty cycle.

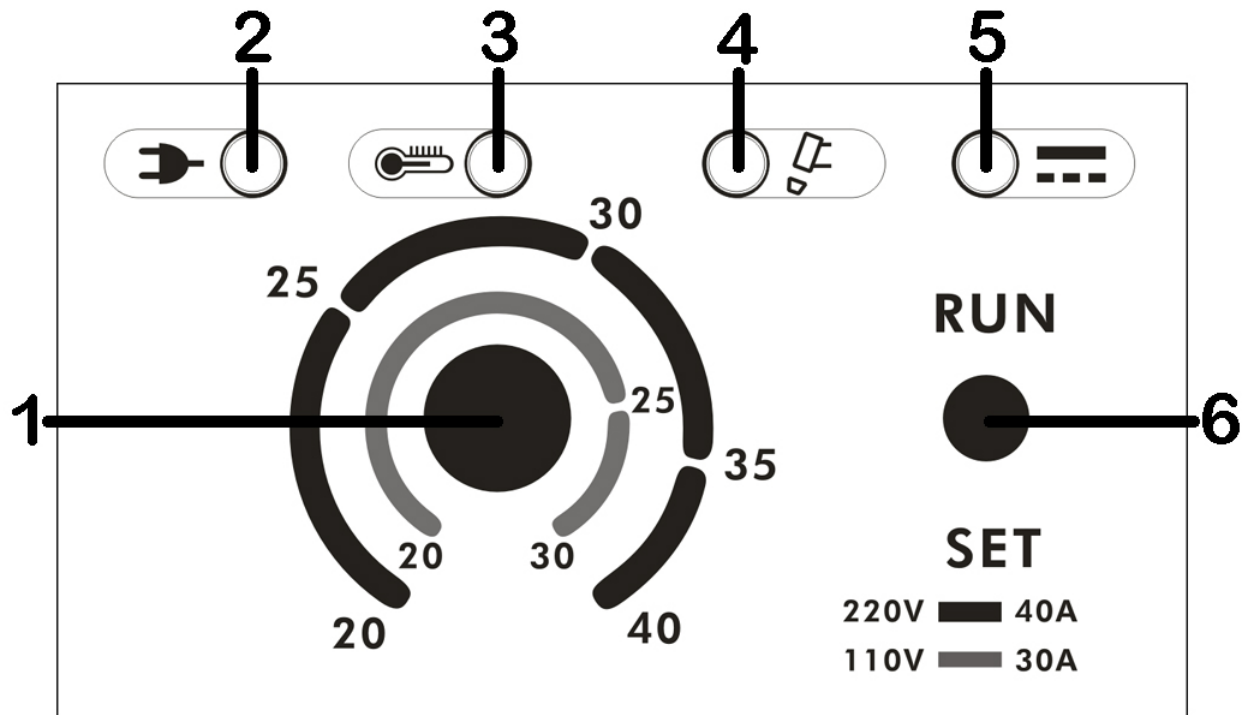
§3 Panel Functions & Descriptions

§3.1 Front and rear panel layout of welding machine



1. **Cutting gun connector:** Connected to the cutting machine.
2. **Positive output cable:** Connected to the workpiece.
3. **Barometer:** Ensure there are no impurity and moisture in the compressed air.
4. **Power switch:** Turn on or off the power source.
5. **Power cable:** Connected to the appreciate power supply.
6. **Fan:** Take away heat and prevent machine overheating.

§3.2 Control panel of welding machine



1. **Cutting current knob:** It is used to adjust current.*
2. **Power indicator:** When the machine is connected to the power supply, the indicator lights on.
3. **Alarm indicator:** When over-heat or over-current, the indicator lights on.*
4. **Gun Alarm indicator.***
5. **DC Indicator:** When DC output circuit is active, the indicator lights on.
6. **RUN/SET switch.***

*Denotes more detailed explanation of function to follow.

Further Controls Explained

Cutting current knob (1)

It is used to adjust the cutting current: counterclockwise rotation reduces the current and clockwise rotates to increase the current. When the input voltage is 120V, the adjustment ranges from 20 amps to 60 amperes. When the input voltage is 230V, the adjustment ranges from 20 amps to 40 amperes.

Alarm indicator (3)

When the machine is over-current or over-heat and cannot work properly, the light will be turned on and the output will be cut off at the same time to avoid damage to the machine.

Gun Alarm indicator (4)

Gun Alarm

- When a short circuit occurs between the electrode and the nozzle of the cutting gun due to abnormal reasons, the lamp lights up and the gas is intermittently sent out.
- When the cutting gun is not equipped with electrodes and nozzles, the lamp lights up and the gas is sent off and off intermittently.
- When the shielding cup is not installed, the next light flickers.

RUN/SET switch (6)

Set

- Before cutting operation, it is necessary to check gas. When checking gas operation, it is necessary to pull the switch down to the "SET" gear.

Run

- If you want to carry out the cutting operation, please pull the switch up to the "RUN" gear.

§4 Installation

§4.1 Unpacking

Use the packing lists to identify and account for each item.

1. Inspect each item for possible shipping damage. If damage is evident, contact your distributor and/or shipping company before proceeding with the installation.
2. When using forklift, its arm length must be long enough to reach the outside so as to ensure lifting safely.
3. The movement may bring the potential danger or substantive hazard, so please make sure that the machine is on the safe position before using.

§4.2 Input Power Connections

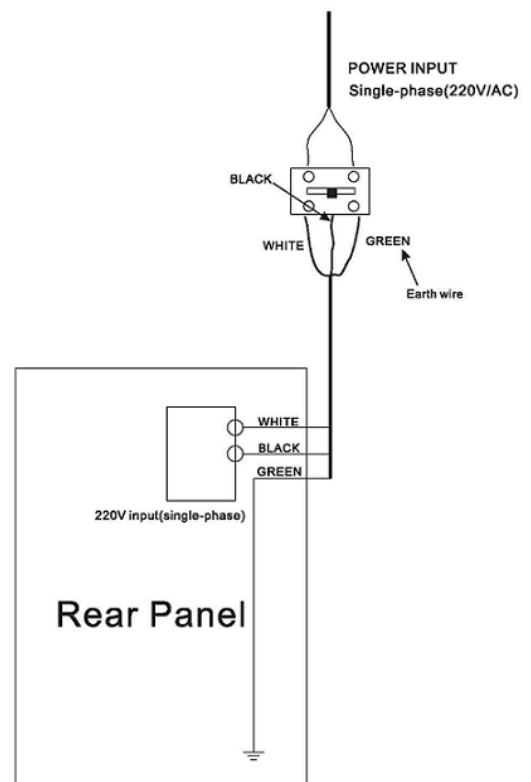
Supply input connection of CUT 40 PFC MV power is shown as the Figure:

1. Check your power source for correct voltage before plugging in or connecting the unit
2. Power Cord and Plug

This power supply includes an input power cord and plug suitable for 110V/230V AC, 1-phase input power.

3. If the power supply voltage continually goes beyond the range of safe work voltage range, it will shorten the welder life-span. The following measures can be used:

- Change the power supply input. Such as, connect the welder with the stable power supply voltage of distributor;
- Reduce the machines using power supply in the same time;
- Set the voltage stabilization device in the front of power cable input.



§4.3 Gas Connections

1. Connecting Gas Supply to Unit

Connect the gas line to the inlet port of the gas filter on the rear panel.

2. Check Air Quality

To test the quality of air, put the Function button in the Gas Check (Down) position, check if there are any oil or moisture in the air.

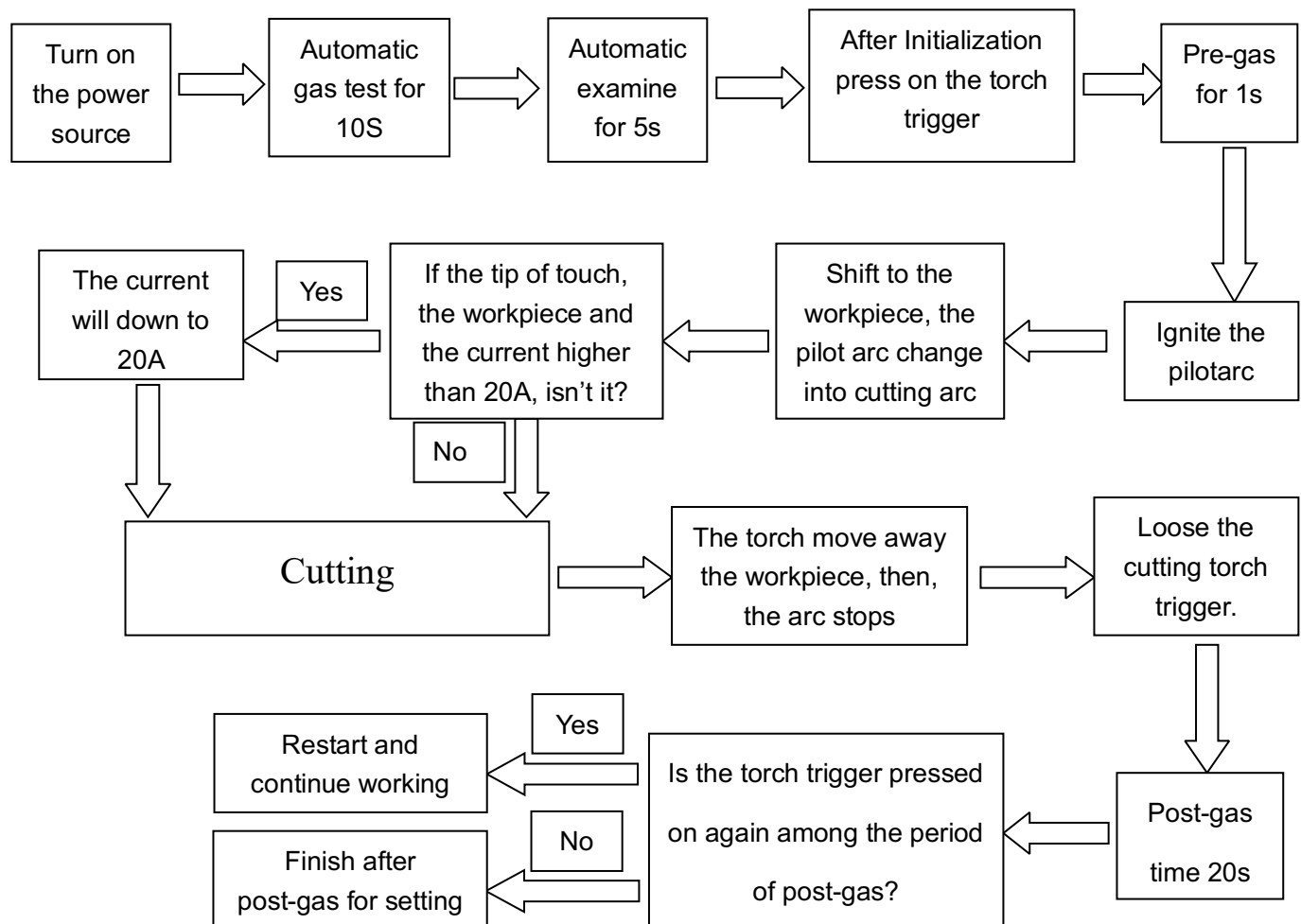
§5 Operation

§5.1 Cutting Preparation

- 1) Tightly connect the power cable to electrical socket outlet (the input voltage, refer to the section 2 technology parameters).
- 2) To connect the gas line to the air supply equipment, the earth cable to the workpiece.
- 3) Turn on the power switch, the power indicator on.
- 4) Turn the Function button in the Gas Check, the air flow, then regulate the air pressure to 3.5-6 bar.
- 5) Turn the Function button in the Normal Cutting or Grid Cutting, regulate the current after the flow stops.
- 6) Now all the preparation done.

§5.2 Cutting Operation

1. Normal Cut



Note:

- 1) If the alarm indicator lights on when cutting, it is needed to loose the switch of the gun until the alarm release, then press on the switch to restart working.
- 2) In the automatic gas test and examine, press on the cutting gun, there will no reflection.
- 3) After a long usage, the surface of the electrode and nozzle will have oxidation reaction. Please replace the electrode and nozzle, For The alarm indicator will on when install the shield cup, and stop working
- 4) It is forbidden to take down the fittings of the cutting indicator when the trigger is pressed.
- 5) Among the period of post gas, if you press the trigger for a long time, the arc restarts; if you press and loosen the trigger quickly, the gas stops, after it you can press the trigger for a long time to restart the machine as well.

2. Account for the alarm indicator:

- 1) When the machine appears over-heat or over-current, the yellow indicator (lamp 2) on the front panel will be on continually.
 - a) Over-heat: The alarm will release after the period of fan cooling. You can restart the machine.
 - b) Over-current: The alarm is beyond retrieve. You must ask the qualified technician to check the machine.
- 2) When any of the torch parts (include Tip, electrode, shield cup and gas distributor) isn't installed, the red indicator (lamp 3) glitters.
- 3) When the air pressure is too lower, the indicator (lamp 3) will on continually.
- 4) When the gas distributor is un-installed only, there is not alarm while operating the machine, and when you press the trigger, there is no arc and no load as well. Open the torch and check it.

§5.3 Operation Environment

- ▲ Height above sea level ≤ 1000 M.
- ▲ Operation temperature range 14 - 104°F (-10~+40°C).
- ▲ Air relative humidity is below 90%.
- ▲ Preferable site the machine some angles above the floor level does not exceed 15°.
- ▲ Protect the machine against high moisture, water and against direct sunshine.
- ▲ Take care that there is sufficient ventilation during welding. There must be at least 1-1/2" (38cm) free distance between the machine and wall.

§5.4 Operation Notices

- ▲ Read Section §1 carefully before starting to use this equipment.
- ▲ Ensure that the input is 120V/230V AC, single-phase: 50/60Hz.
- ▲ Before operation, clear the working area. Do not watch the arc in unprotected eyes.
- ▲ Ensure good ventilation of the machine to improve duty cycle and life.
- ▲ Turn off power supply when the operation finished for energy consumption efficiency.
- ▲ When power switch shuts off protectively because of failure. Don't restart it until problem has been resolved. Otherwise, permanent damage could occur.
- ▲ In case of problems, contact your local dealer.

§6 Basic Trouble Shooting

§6.1 Basic Troubleshooting Guide

**WARNING**

There are extremely dangerous voltage and power levels present inside this unit. Do not attempt to diagnose or repair unless you have had training in power electronics measurement and troubleshooting techniques.

§6.1.1 Basic troubles

A. Turn on the machine, the power indicator lights up, but both of the fan and the air control valve is no action.

1. Absent Phases. Please check the input lines, and connect it correctly.
2. The main board in the machine is break. Please ask the qualified technician to change it.

B. Turn on the machine, the GUN indicator lights up.

1. Gas pressure is too low. Adjust the gas pressure to 65psi/4.5bar. The Barometer indicate to 0.45~0.5MPa.

C. Turn on the machine, the GUN indicator glitter.

1. The shield cup is unfitted installation. Turn off the power source, install and screw it properly, then turn on the power source.
2. The Tip or electrode is unfitted installation. Turn off the power source, and install and screw shield cup properly, then turn on the power source.

D. The temperature indicator lights up after the machine working a few of minutes.

1. Air flow blocked, check for blocked air flow around the unit and correct condition.
2. Fan blocked, check and correct condition.
3. The machine is over-heat, let it cool down for at least 5 minutes. Make sure the machine has not been operated beyond the Duty Cycle (refer to technology parameters in Section 2).
4. Input voltage over the normal range, choosing the proper voltage (refer to

technology parameters in the Section).

5. Faulty components in the machine, return for repair or have qualified technician repair per Service Manual.

§6.1.2 Pilot arc troubles

A. Torch failed to ignite the arc when torch is triggered.

1. The system is set in “Gas Check” mode, change it to “Cutting” mode.
2. Faulty in torch parts, inspect torch parts and replace it if necessary.
3. Gas pressure is too high or too low, adjust it to proper state.
4. Faulty components in the machine, return for repair or have qualified technician repair per Service Manual.

B. Difficult igniting

1. The gas distributor is un-installed
2. Worn torch parts (consumables), shut off input power. Remove and inspect torch shield cup, tip, starter cartridge, and electrode. Replace electrode or tip if worn; replace starter cartridge if end piece does not move freely; replace shield cup if excessive spatter adheres to it.
3. The machine is in trouble. Please ask the qualified technician to check it and repair the machine.

C. The torch is triggered, but the pilot arc isn't change to the cutting pilot. The power indicator lights up; Gas flows; Fan operates.

1. It is inaccurate connection between torch and power supply, check the torch leads are properly connect to power supply.
2. Work cable not connected to work piece, or connection is poor, make sure that work cable has a proper connection to a clean and dry area of the workpiece.
3. Faulty components in the machine, return for repair or have qualified technician repair per Service Manual.

4. Faulty Torch, return for repair or have qualified technician repair it.

D. Arc shuts off during operation, and it will not restart when torch is triggered.

1. Power Supply is overheated (OC/OT lamp on), let unit cool down for at least 5

minutes. Make sure the unit has not been operated beyond Duty Cycle limit. Refer to Section 2 for duty cycle specifications.

2. Gas pressure too low (the GUN lamp on when press on torch switch is on), check source for at least 65 psi/4.5 bar; adjust as needed.
3. Torch consumables worn, check torch shield cup, tip, starter element, and electrode; replace as needed.
4. Faulty components in unit, return for repair or have qualified technician repair per Service Manual.

§6.1.3 Cutting troubles

A. No gas flow; the power lamp on; Fan operates

1. Gas pipe not connected or pressure is too low, check gas connections. Adjust gas pressure to proper setting.
2. Faulty components in the unit, return for repair or have qualified technician repair.

B. Low cutting output

1. Incorrect setting of cutting current (A), check and adjust to proper setting.
2. Faulty components in unit, return for repair or have qualified technician repair.

C. Torch can cut but the cutting quality is poor

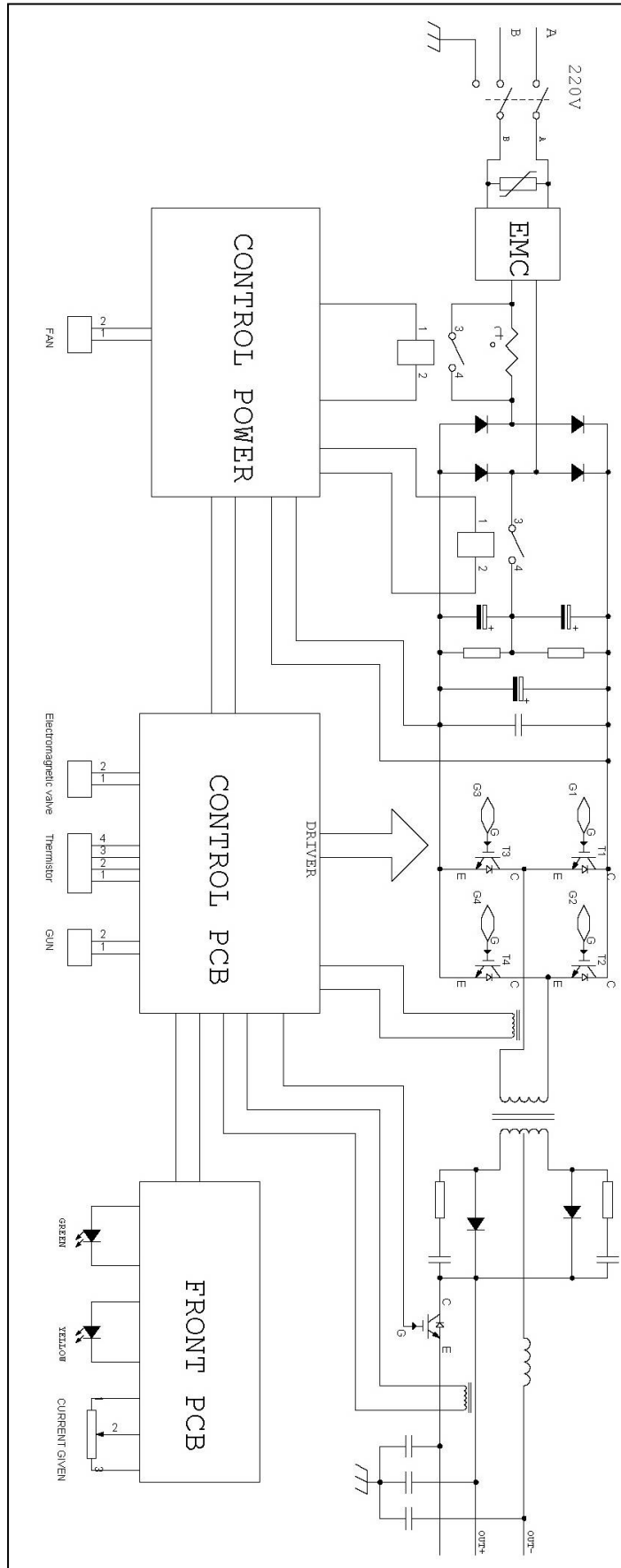
1. Current (A) control set too low, increase current setting.
2. The torch move too fast across the workpiece, reduce cutting speed.
3. Excessive oil or moisture in torch, hold torch 1/8 inch (3 mm) from clean surface while purging and observe oil or moisture buildup (do not activate torch). If there are contaminants in the gas, additional filtering may be needed.
4. Lack of air pressure. Please check the air pressure and air flow, adjust it to the appropriate position.

§6.2 Packing and standard accessories

Chart 5.1 packing list:

NO.	Accessories Name	Specification and Type	Quantity	Accessories Code
1	Host Machine	LG-100I Cut Power	1	3.008.656
2	Torch and Accessories	LT-141 HF Arc Starter Torch	1	7.603.224
		One package of nozzle electrode (including nozzle aperture 1.4,4;1.7,2;three electrodes; three wrenches; one isolating ring)	1	
3	Earth Cable	16mm ² , 4m one quick plug, one 300A earth clamp	1	6.310.322-G
4	Gas Circuit Accessories	Gas tube Φ 12	4	7.501.018
		tube hoop	2	7.514.007
5	Specification	LG-100	1	8.850.660-C

§6.3 Electrical Schematic Drawing



Power Plus+ Series



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