

KickingHorse®

WELDING INVERTER FOR HOME

OPERATION MANUAL

P40 Plasma Cutting Machine



Serial Number: _____

Where Purchase: _____

Date of purchased: _____

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1. Safety



- ❖ Welding may damage your body or others, so please take protection measure in operation
- ❖ Only ones who are trained professionally can install , debug, operate, maintain and repair the equipment.
- ❖ Do not maintain and repair the machine when the machine is connected with power.



Electric shock can kill

- ❖ Never touch electrical parts.
- ❖ Wear dry, hole-free gloves and clothes to insulate yourself.
- ❖ Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.
- ❖ Ensure to install the equipment correctly and ground the work or metal to be welded to a good electrical (earth) ground according the operation manual.
- ❖ Ensure to operate the equipment in safe position.



Fumes and gasses can be dangerous

- ❖ Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out the fume.
- ❖ Using enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone.



Welding sparks can cause fire or explosion

- ❖ Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and not materials from welding can easily go through small cracks and openings to adjacent areas.



Do not weld enclosed tanks or containers

- ❖ Prohibit to use welder to unfrozen.
- ❖ Have a fire extinguisher readily available.



Hot parts can lead to burn

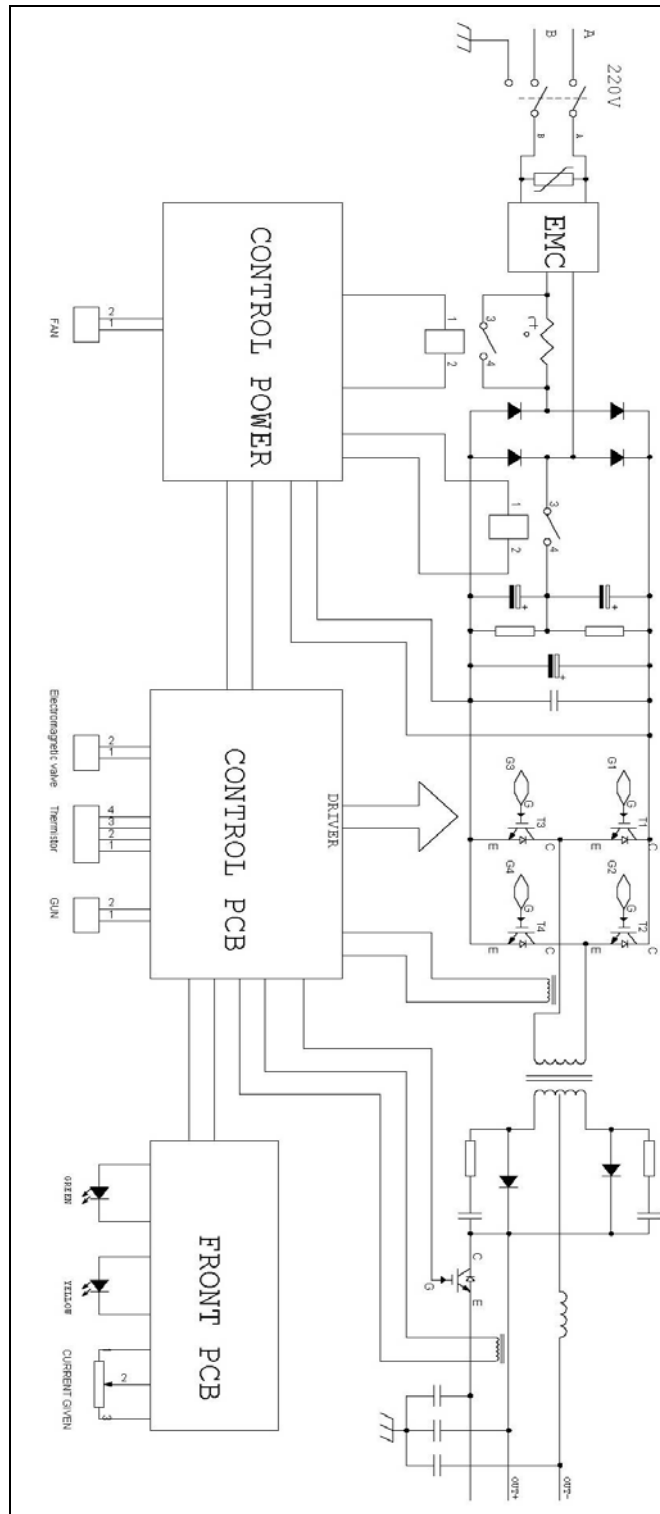
- ❖ Do not touch the hot parts.
- ❖ Please use the torch after cooling or use the welding blow lamp.
- ❖ The people with heart-pacemaker should be away from the welding arc.



Rotating parts may be dangerous

- ❖ Far away from rotating parts. (like fan)
- ❖ Keep the parts of machine in the safe position.

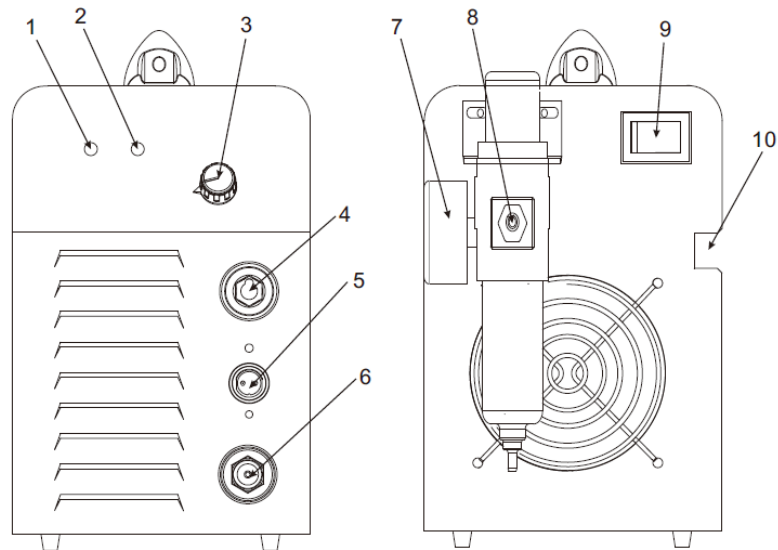
2. Electrical principle drawing



3. Specifications

Parameters	Models	P40
Input power		1+220/230/240±10% 50/60Hz
Rated input current (A)		33
Rated input power (KW)		4.9
Cutting current adjustment range A)		20~40
Max no-load voltage (V)		450
Duty cycle (40C,10 minutes) %		40% 40A 60% 36A 100% 30A
Severance cut for Carbon Steel (MM)		≤18
Capacity (MM)	Carbon Steel	≤14
	Stainless Steel	≤14
	Aluminum	≤12
	Copper	≤6
Compress air Pressure(Psi)		29-58(0.2-0.4Mpa), recommend 43.5(0.3MPa)
Protection class		IP23
Insulation class		H
Net weight (kg)		7
Dimensions (MM)		420*136*210

4. Operation control and connectors



1. **Power pilot lamp:** turn on power, the lamp on.
2. **Over-current, over-heat alarm:** when over-heat, over-current, the lamp would be on.
3. **Cutting current regulator** it is used to regulate the current when cutting.
4. **Positive output cable:** connected to the workpiece.
5. **Aviation socket:** cutting gun control connector.
6. **Negative output cable:** connected to the cutting gun.
7. **Air filter:** Ensure there are no impurity and moisture in the compressed air.
8. **Air pressure regulator:** It is used to regulate the air pressure of the compressed air.
9. **Power switch:** Turn on or off the power source
10. **Power cable:** connected to the appreciate power supply.

5. Installation & Operation

Electrical connection operation must be shut after power distribution box power switch!

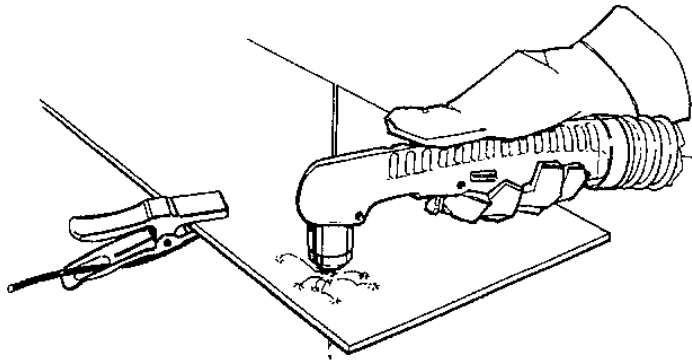
The equipment protection level is IP23. Do not use in the rain!

5.1. Installation

- (1) Welding machine should be installed in a stable position and with good ventilation. Avoid direct sun outdoors or rain. Place at a distance of 12” (300mm) or more from walls or similar that could restrict natural air flow for cooling. Avoid transport in invert or side position.
- (2) Tightly connect the power cable to electrical socket outlet (refer to “technology parameters” for the input voltage)

- (3) connect the compress air hose to the air supply equipment and the earth cable to the workpiece.
- (4) Switch the ON/OFF Switch (located on the rear panel) to OFF.
- (5) Connect SG55 plasma torch to positive connection and earth cable to negative connection. Connect the control plug to the control receptacle at machine.
- (6) Connect the gas line to the inlet port of the gas filter on the rear panel.
Check Air Quality: To test the quality of air, press the torch trigger, check if there is any oil or moisture in the air.
- (7) Check the connection of work piece, earth cable, welding torch, gas cylinder, regulator and hose, make sure they are firm and reliable. Attach earth clamp as close as possible to the cutting portion. Do not attach earth cable to the portion that will fall away.

5.2.Operation



- (1) Verify that the input gas supply pressure is set to 5kg /cm2 (5 Bar).
- (2) Pull the regulator cap out, gradually turn regulator cap to adjust gas pressure to 2.5-3.5 kg/cm2 (2.5-3.5 Bar) and push the regulator cap back in.
- (3) Switch on the power source. The power light (red) should illuminate. Adjust the cutting current and choose desired post gas flow time with the toggle switch.
- (4) Place the tip of the torch at the edge of the work piece, makes sure the tip is vertical to the work piece. When piercing, the tip should have an angle away from operator. After arc starts, slowly rotate the torch to upright position. This is to blow the melted metal away and is particularly important when cutting thicker material. Make sure that the torch is pointed away from you and the people near you to avoid any danger from sparks and hot metal.

CAUTION P40 CUTTING MACHINES ARE CONTACT-START, THE PLASMA ARC IGNITED IMMEDIATELY AFTER START SWITCH CLOSED. ALWAYS HOLD THE HAND TORCH AWAY FROM YOUR BODY AS A PRECAUTION AGAINST ACCIDENTAL TORCH FIRING. BE AWARE OF THIS HAZARD. FAILURE TO DO SO

CAN RESULT IN SERIOUS BODILY INJURY.

- (5) After arc starts, hold the torch nozzle at vertical position and watch the arc as it cut along the line. By lightly dragging the shield on the workpiece, you can maintain a steady cut. For straight-line cutting, use any straight edge as a guide.
- (6) Evenly move the torch in the desired direction, at a speed which will ensure good cut quality. Pulling the torch through the cut is easier than push it.
- (7) When cutting, make sure that the sparks are coming out of the bottom of the metal. If they are spraying on top of the workpiece, you are moving the torch too fast, or you do not have sufficient power to fully penetrate the workpiece.
- (8) When the cut is finished, release the torch switch to extinguish the arc.
- (9) After finish operation, turn off the gas valve. In the end, turn off welding power source and wall switch.

6. Safety precaution

6.1. Installation

- (1) Welding environmental temperature should be between -10°C to 40°C.
- (2) The air humidity of not more than 90%.
- (3) Avoid environment containing dust or corrosive gas.
- (4) Avoid sunlight or rain, do not let water into the welding machine.
- (5) Avoid the strong wind environment.

6.2. Safety

Refer to the American National Standard Z49.1 entitled: SAFETY IN WELDING AND CUTTING. **ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK MUST BE PERFORMED BY QUALIFIED PERSONAL.**

- (1) Welders must be equipped with welding mask, gloves and tie the sleeves and collar properly. Use Table 6.4 to choose proper glass shade, also can reference to ANSI Z49.1 listed in Safety Standards. There should be an arc shield around welding field to protect others from arc shock.
- (2) Do not weld near flammable, explosive materials or gases.
- (3) Keep finger, hair and clothing away from the rotating fan.
- (4) The power source must be grounded when welding.
- (5) When yellow protection light is enlightened during welding, it is indicating that the welder is over current or over heat, and automatic protection will be triggered. Stop welding immediately and wait until welder cool down.
- (6) Welding machine should not work in a flammable and toxic environment, avoid moisture, rain, and do not directly expose to sun.

- (7) Do not switch off the welder during welding!
- (8) Periodically maintain the machine and clean the dust inside.

7. Maintenance

Periodic maintenance is necessary for keeping the machine work properly.



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. DISCONNECT POWER INPUT AND SWITCH OFF THE MAIN POWER SWITCH BEFORE START OF MAINTENANCE.

Regular Check and Inspection	6 Month Routine Maintenance
<ul style="list-style-type: none"> • Replace unreadable labels. • TIG-Clean spatter inside the nozzle when continuously use the machine • TIG-Check and change broken parts in the torch to avoid damage to the torch and machine. • Check the function of all switches. • Check if the fan rotates properly and if there is air venting out from back of the machine. • Pay Attention to the abnormal vibration, noise, smell and gas leakage during operation. • Check if the welding cables are over heated. • Check if the cable connections are over heated. • Check if the cable is connected firmly and properly, if it is broken and cause bad insulation. • Check the cover grounded properly. 	<ul style="list-style-type: none"> • Blow out with dry clean pressure air or vacuum inside machine, especially transformer coil and power component. • Check the electric connection of input/output bar to avoid bad contact caused by loose or rusted screw. • Check the contactors and relays in the machine or on the PCB work properly. • Calibrate the current meter. • Check the resistance between machine case and main circuit, if the value is smaller than 1MΩ, sent the machine to an authorized warranty depot to inspect and repair immediately.

8. Troubleshooting & Service

The following operations require the operator has sufficient electrical expertise and comprehensive safety knowledge, the operator can demonstrate its capacity to be held valid qualifications and knowledge Documents.

Common Faults and exclusion method:

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Symptom	Solution
The cutting torch fails to ignite the arc, when press on the torch switch. air feed intermittently	The electrode or nozzle improper installation, turn off the power source, install the electrode or nozzle, and screw shield cup down properly, then turn on the power source
Power lamp and temperature lamp on.	<ol style="list-style-type: none"> 1. Air flow blocked, check for blocked air flow around the unit and correct condition. 2. Fan blocked, check and correct condition. 3. Unit is overheated, let unit cool down for at least 5 minutes. Make sure the unit has not been operated beyond Duty Cycle limit, refer to technology parameters in Section 2. 4. Input voltage over the normal range, choose the proper voltage , refer to technology parameters in the Section 2. 5. Faulty components in unit, return for repair or have qualified technician repair per Service Manual
No cutting output; Torch activated, power source on ; Gas flows; Fan operates	<ol style="list-style-type: none"> 1. Torch not properly connected to power supply, check that torch leads are properly connected 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, dry area of the workpiece. 3. Faulty components in unit, return for repair or have qualified technician repair per Service Manual. 4. Faulty Torch, return for repair or have qualified technician repair.
Low cutting output	<ol style="list-style-type: none"> 1. Incorrect setting of CURRENT (A) control, check and adjust to proper setting. 2. Faulty components in unit, return for repair or have qualified technician repair.
Difficult Starting	Worn torch parts (consumables), shut off input power. Remove and inspect torch shield cup, tip,

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	<p>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.</p>
<p>Arc shuts off during operation; arc will not restart when torch switch is activated.</p>	<ol style="list-style-type: none"> 1. Power Supply is overheated, 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, 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.
<p>No gas flow; the power lamp on; Fan operates</p>	<ol style="list-style-type: none"> 1. Gas not connected or pressure too low, check gas connections. Adjust gas pressure to proper setting. 2. Faulty components in unit, return for repair or have qualified technician repair.
<p>Torch cuts but low quality</p>	<ol style="list-style-type: none"> 1. Current (A) control set too low, increase current setting. 2. Torch is being moved too fast across 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 is required.

9. Plasma torch SG55 consumable order information



NOTES

P40 plasma cutting power source

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