AIR PLASMA CUTTER

INSTRUCTION MANUAL

TYPE: CUT30/CUT40(B)/CUT60

CUT70/CUT100/CUT120

Z05003-A0

CONTENTS

EC DECLARATION OF CONFORMITY

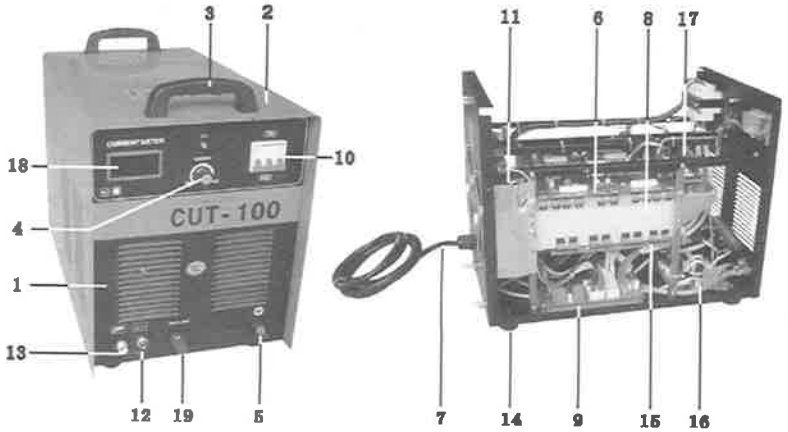
Hereby we declare that our machines for industrial and professional use as stated below
Type: CUT30/CUT40, CUT30 II /CUT40 II
Conform the EMC Directives: 73/23/EEC and 89/336/EEC
European Standard: EN/IEC60974

Please read and understand this instruction manual carefully before the installation and operation of this equipment.

The contents of this manual may be revised without prior notice.

This instruction manual is issued on Apr. 20th 2005.

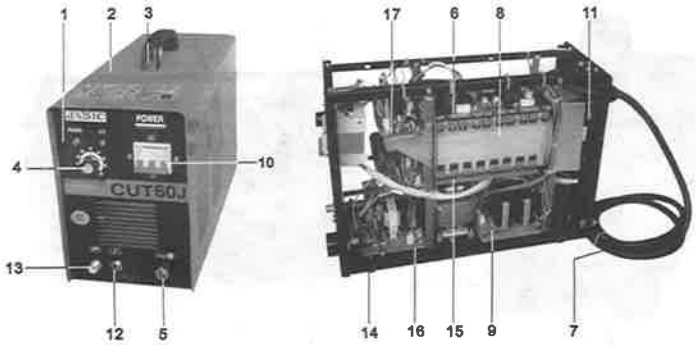
SPARE PARTS LIST



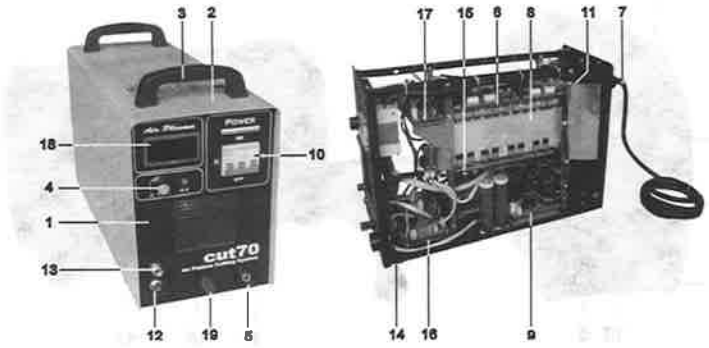
The structure of CUT120 is same as above photo, but some critical part is different.

	DESCRIPTION	CUT100 PART No.	CUT120 PART No.
1	Front panel	J02079	J02079
2	Cover	J03313	J03313
3	Handle	J24005	J24005
4	Button	C14003	C14003
5	Coupling socket	C01015	C01015
6	Top PCB	B01013	B01012
7	Input cable	C08602	C08602
8	Heat sink	J20007、J20008	J20007、J20008
9	Bottom PCB	B03017	B03017
10	Main switch	C15001	C15001
11	Fan	D28004	D28004
12	Pilot-socket (2 pins)	C04001	C04001
13	Knob socket	J21003	J21003
14	Rubber foot	J24010	J24010
15	Center PCB	B02005	B02005
16	HF PCB	B06006	B06006
17	Control PCB	B04010	B04010
18	Digital Meter	D02007	D02007
19	Connector	C07003	C07003

SPARE PARTS LIST

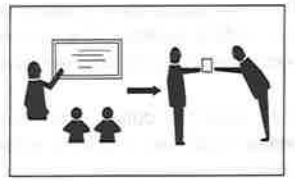


	DESCRIPTION	CUT60J PART No.	CUT70 PART No.
1	Front panel	J02029	J02026
2	Cover	J03004	J03231
3	Handle	J24005	J24005
4	Button	C14003	C14003
5	Coupling socket	C02014	C02014
6	Top PCB	B01008	B01012
7	Input cable	C08602	C08602
8	Heat sink	J20005、J20006	J20005、J20006
9	Bottom PCB	B03001	B03001
10	Main switch	C15001	C15001
11	Fan	D28008	D28005
12	Pilot-socket (2 pins)	C04001	C04001
13	Knob socket	J21003	J21003
14	Rubber foot	J24010	J24010
15	Center PCB	B02030	B02004
16	HF PCB	B06009	B06006
17	Control PCB	B04010	B04010
18	Digital Meter	No	B15001
19	Connector	No	C07003



SAFETY

Welding and cutting is dangerous to the operator, people in or near the working area, and the surrounding, if the equipment is not correctly operated. Therefore, the performance of welding/cutting must only be under the strict and comprehensive observance of all relevant safety regulations. Please read and understand this instruction manual carefully before the installation and operation.

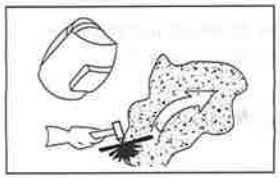


- The switching of function modes is possibly damaging to the machine while the welding operation is performed.
- Do disconnect the electrode-holder cable with the machine before the performance of welding.
- A safety switch is necessary to prevent the equipment from electric leakage.
- Welding tools should be of high quality.
- Operators should be qualified.

Electric shock: It can kill.

- Connect the earth cable according to standard regulation.
- Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. It is necessary for the operator to wear dry welding gloves while he/she performs the welding task.
- The operator should keep the work piece insulating from himself/herself.

Smoke and gas generated while welding or cutting: harmful to people's health.

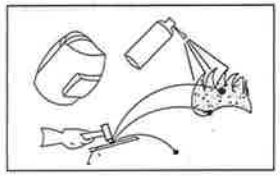


- Avoid breathing the smoke and gas generated while welding or cutting.
- Keep the working area in good ventilation.

Arc rays: harmful to people's eyes and skin.

- Wear welding helmet, anti-radiation glasses and work clothes while the welding operation is performed.
- Measures also should be taken to protect people in or near the working area.

Fire hazard



- The welding splash may cause fire, thus remove flammable material away from the working place.
- Have a fire extinguisher nearby, and have a trained person ready to use it.

Noise: possibly harmful to people's hearing.

- Noise is generated while welding/cutting, wear approved ear protection if noise level is high.

Machine fault:

- Consult this instruction manual.
- Contact your local dealer or supplier for further advice.

GENERAL DESCRIPTION

This cutting machine is manufactured with advanced inverter technology. With high-quality component MOSFET and PWM technology, the inverter converts DC voltage, which is rectified from input AC voltage, to high 100KHz frequency AC voltage; as a consequence, the voltage is transformed and rectified. Therefore, it results the much more small-sized of the main transformer and lighter in weight of the inverter welder, which rates the performance of welding by 30%.
The high frequency oscillation, which enables the output of high frequency DC, is employed in the arc-starting system. The features of this product are as following: stable of current, reliable, completely portable, efficient and low noise generated while welding operation is performed.

CUT serials of cutting equipment which is portable, efficient; energy saving and stable, can be widely employed in cutting carbon steel, stainless steel, alloy steel, copper and other nonferrous metals.

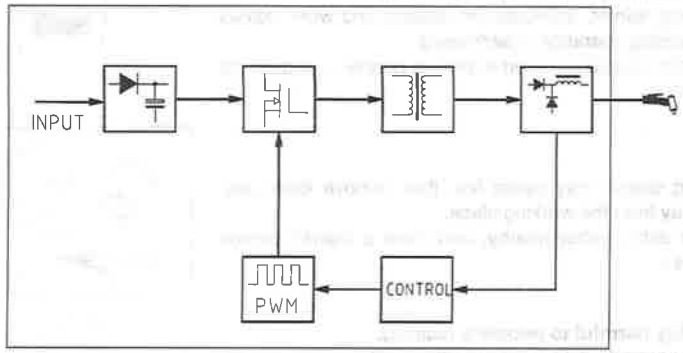
CUT30 II & CUT40 II are two models of new plastic products, the cover of which are made of anti-combustible ABS material. It possesses more advantages in comparision with machines of iron case, such as beautiful design, excellent insulation, and waterproof.

Guarantee of maintenance for main engine is one year, excluding other spare parts.

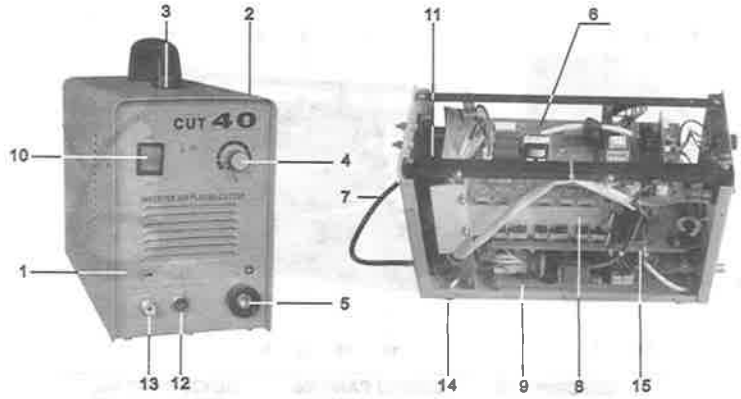
During the guarantee maintenance period, all maintenance is free of charge, not including the deliberated damage to this cutting machine.

Only qualified technician are authorized to carry out the repair task of this cutting equipment in case of machine fault.

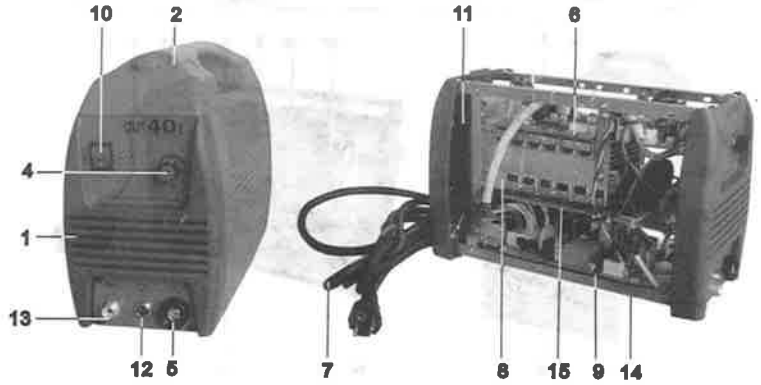
Block Diagram



SPARE PARTS LIST



	DESCRIPTION	CUT30 PART No.	CUT40 PART No.	CUT30 II PART No.	CUT40 II PART No.
1	Front panel	J02042	J02042	J02148	J02148
2	Cover	J03235	J03235	J03148	J03148
3	Handle	J24005	J24005	No	No
4	Button	C16001	C16001	C16001	C16001
5	Coupling socket	C02015	C02015	C02015	C02015
6	Top PCB	B01004	B01005	B01004	B01005
7	Input cable	C08608	C08608	C08608	C08608
8	Heat sink	J20003、J20004	J20003、J20004	J20003、J20004	J20003、J20004
9	Bottom PCB	B03011	B03012	B03011	B03012
10	Main switch	C16001	C16001	C16001	C16001
11	Fan	B15002	B15002	B15002	B15002
12	Pilot-socket (2 pins)	C04001	C04001	C04001	C04001
13	Knob socket	B01010	B01010	B01010	B01010
14	Rubber foot	J24009	J24009	J24009	J24009
15	Center PCB	B02001	B02002	B02001	B02002



TROUBLESHOOTING

CAUTIONS: Only the qualified technicians are authorized to undertake the repair task of this cutting equipment in case of machine fault.

-CUT30/CUT40

Fault Symptoms	Rectification
The indicator of power supply is on; the built-in fan & button of cutting torch unavailable.	It may be of over-voltage protection; Turn off the machine for a while, and restart it until the input recovery from abnormal supply.
The indicator of power supply is on, and built-in fan available. When press button of cutting torch, electromagnetic valve works, however HF electricity releasing is unavailable and the red indicator of diode is on.	1. Top PCB MOSFET is damaged. Replace it. 2. Transformer of bottom PCB is damaged. Replace it. 3. Control module is damaged. Replace it.
The indicator of power supply is on, and the built-in fan available. When press the button of cutting torch, electromagnetic valve works, however HF electricity releasing is unavailable and the red indicator of diode is on.	Fault possible with the arc-starting: 1. Incorrect connection electricity releasing switch. Reconnect. 2. Possible short circuit or invalid connection of primary coil of arc-leading transformer. Reconnect. 3. Rectifier diode is possibly damaged. Replace it. 4. Possibly electricity leaking of HF capacitor. Replace one of 102/10KV. 5. Relay is possibly damaged. Replace it.
Arc-starting unavailable.	1. Low input voltage. 2. Air compressor pressure not available.

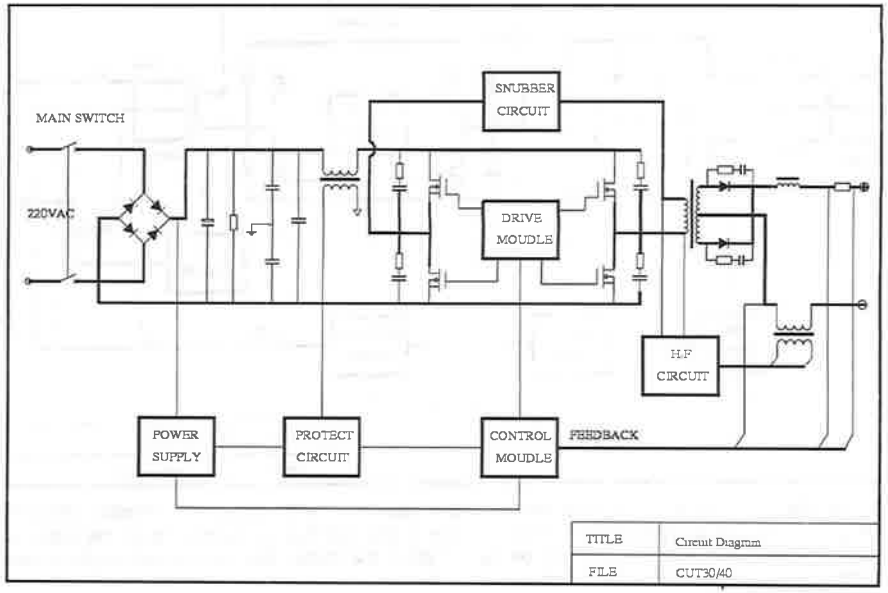
-CUT60J.CUT70.CUT100.CUT120

Fault Symptoms	Rectification
The built-in fan & button of the cutting torch unavailable, no indication of regulator.	1. Secondary transformer of control board is not available. Replace it. 2. Power supply input cable is not well connected. Reconnect it.
The built-in fan & regulator indicator available. Press the button of cutting torch. Electricity releasing unavailable. The red indicator of diode is on.	1. Rectifier diode is possibly damaged. Replace it. 2. Possible electricity leakage of HF capacitor 1KV/102. 3. MOSFET of the top board is possibly damaged. Replace it. 4. Transformer of bottom PCB is possibly damaged. 5. Control module is possibly damaged. Replace it.
Indicator of power supply is on, and the built-in fan available. When press the button of cutting torch, electromagnetic valve works, HF electricity releasing is unavailable and red indicator of diode is on.	Fault possible with the arc-starting: 1. Inappropriate connection of electricity releasing switch. 2. Short circuit or invalid connection of primary coil of arc-leading transformer. Reconnect. 3. Rectifier diode is possibly damaged. Replace it. 4. Possibly electricity leaking of HF capacitor. Replace one of 102/10KV 5. Relay is possibly damaged. Replace it.
Arc maintaining of CUT70, CUT100 & Cut120 unavailable.	1. Clean the electrode with emery cloth. 2. Adjust the distance of electricity-releasing components.

MAIN PARAMETER

TYPE	CUT30	CUT40(B)	CUT30 II	CUT40 II
Input voltage (V)	220V AC ±10%	220V AC ±10%	220V AC ±10%	220V AC ±10%
Input Frequency (Hz)	50/60	50/60	50/60	50/60
Input capacitance (KVA)	4	6	4	6
No-load voltage (V)	230	230	230	230
Current range (A)	15-30	20-40	15-30	20-40
Output voltage (V)	92	96	92	96
Rated duty cycle (%)	60	60	60	60
Efficiency	85	85	85	85
Power factor	0.93	0.93	0.93	0.93
Insulation class	B	B	B	B
Protection class	IP23	IP23	IP23	IP23
Arc Starting	Contact Arc Starting	Contact Arc Starting (pilot arc)	Contact Arc Starting	Contact Arc Starting
Air flow (m^3/min)	0.17	0.17	0.17	0.17
Max. cutting thickness (mm)	8	12	8	12
Weight (Kg)	8	8	8	8
Size (mm) (LxWxH)	371x155x295	371x155x295 (425x205x355)	345x172x310	345x172x310

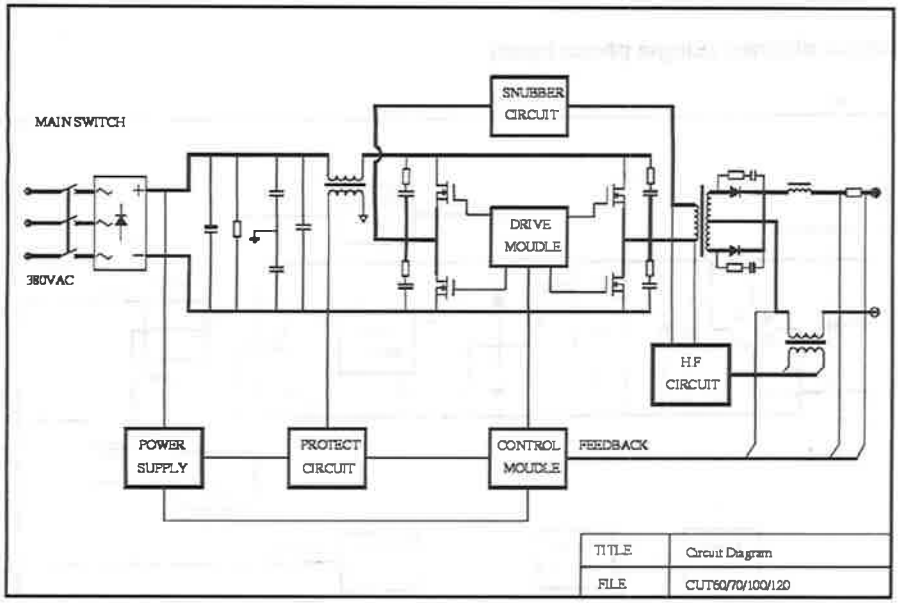
Circuit diagram (Single phase input)



MAIN PARAMETER

TYPE	CUT60J	CUT70	CUT100	CUT120
Input voltage（V）	380V AC ±10%	380V AC ±10%	380V AC ±10%	380V AC ±10%
Input Frequency (Hz)	50/60	50/60	50/60	50/60
Input capacitance（KVA）	9	11	17	20
No-load voltage（V）	230	240	270	270
Current range（A）	20-55	20-60	20-85	20-110
Output voltage（V）	104	108	120	128
Rated duty cycle（%）	60	60	60	60
Efficiency	85	85	85	85
Power factor	0.93	0.93	0.93	0.93
Insulation class	B	B	B	B
Protection class	IP23	IP23	IP23	IP23
Arc Starting	Contact Arc Starting	No-contact arc-starting	No-contact arc-starting	No-contact arc-starting
Air flow（m^3/min）	0.25	0.25	0.36	0.5
Max. cutting thickness（mm）	23	25	30	35
Weight（Kg）	19	25	35	35
Size （mm）（LxWxH）	480x205x357	540x215x360	475x330x370	475x330x370

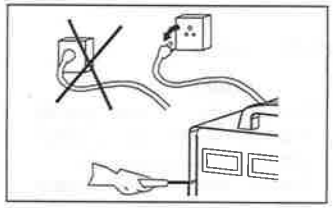
Circuit diagram (Single phase input)



It is important to note that any extension of mains cables or torch cables will possibly affect the cutting performance of this cutting equipment, due to the fact that the resistance of the cable will reduce voltage input, which is decided by the length of the cable. The assembled length of main cables and torch cables is recommended.

MAINTENANCE

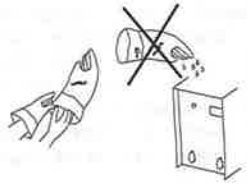
1. Disconnect input plug or power before maintain or repair on machine.
2. Be sure input ground wire is properly connect to a ground terminal.
3. Check whether the inner gas-electricity connection is well（esp. the plugs）, and Tighten the loose connection; If there is oxidization, remove it with sand paper and then re-connect.



4. Keep hands, hair, loose clothing, and tools away from moving parts such as fans, wires.

5. Clear the dust at regular intervals with clean and dry compressed air; if the working condition has heavy smoke and pollution, the welding machine should be cleaned once a month.
6. The compressed air should be reduced to the required pressure lest the little parts in the welding machine be damaged.

7. To avoid water and rain , if there is ,dry it in time, and check the insulation with mega-meter（including that between the connection and that between the case and the connection）.Only when there is no abnormal phenomena can the welding continue.
8. If the machine is not used for long time, put it into the original packing in dry condition.



3. Important Notices for Operation of Cutting

3.1 Before the cutting operation, hold the cutting torch (if it is of no contact arc starting, contact with the work piece is forbid); press the button of the cutting torch. If the output of plasma arc is not available, it is necessary to correctly re-connect the electrode and nozzle.

3.2 Press the button of the cutting torch. Perform the cutting operation at an even speed according to the cut materials.

3.3 Gradually reduce the cutting speed at the end of a cutting operation. Then release the button.

3.4 If there is splash on the nozzle, the cooling efficiency reduces. The removal of splash on the nozzle should be carried out in time.

3.5 The torch rack is to maintain the distance of the nozzle level and the welding piece. The removal of torch rack is forbid during the operation of cutting. It is damaging to the work piece and torch, in case that the torch contacts the work piece.

3.6 Replacement of electrode and nozzle

The electrode and nozzle are to be replaced due to the following factors:

- The minimum thickness electrode cable over 1.5mm.
- Distortion of the nozzle
- The cutting speed declining
- Difficulty in arc starting
- Irregular cutting trace

When the above-listed phenomena occur, the electrode and nozzle should be replaced according to the stipulated specification, in order to avoid serious damage to this cutting equipment and accessories.

3.7 During the cutting operation, folding of the pipe of gas output is possibly damaging to this cutting equipment and its accessories.

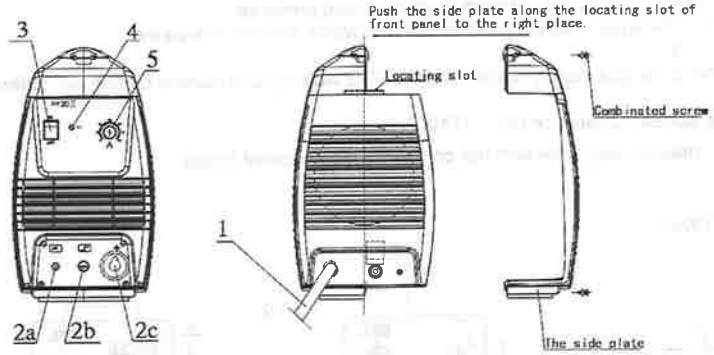
3.8 After the welding operation, remove the nozzle, electrode, and arc-maintaining cable, and press the button of cutting torch to remove the possible dregs inside the gas output pipe. The operation should be carried at least for 15 seconds.

3.9 To knock with the cutting torch is strictly forbid.

INSTALLTION & OPERATION

CUT30 II /40 II

Enclosure installation diagram



1. Connection of Input Cables

（Please refer to installation drawing）

1.1 Each cutter is equipped with a power supply cable; connect to power supply of required voltage input.

1.2 The power supply cable should be well connected with the power switch or the cable connector to avoid possible oxidization. Check with multi-meter whether the voltage of power supply varies in the given range, during the performance of cutting. Please refer to "main parameter".

2. Connection of output cable

Connect the output terminal of the gas hose to the input of the air regulator; connect the output terminal of the air regulator to copper pipe with the HV leather hose.

2a. Install cutting torch

Connect the copper screw on the cutting torch to the output terminal of the one-knob of the front panel, and fasten it toward clockwise direction to avoid gas leaking.

2b. Connect torch switch

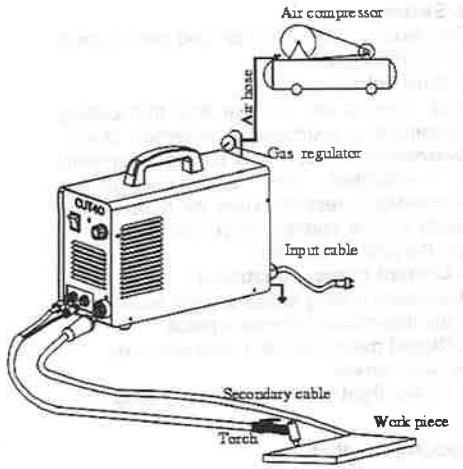
The switch plug of the cutting torch should be connected to the 2-pin socket of the panel.

Spin the electrode to the cutting torch, and install the nozzle and safety cap.

Notice: The operation of examination and installation must be forbid, unless the equipment is turned off.

2c. Connect the earth clamp

Connect the earth clamp to the positive output terminal of the front panel.



INSTALLATION OF THE GAS REGULATOR: Please refer to the above drawing.

The installation and operation of the air regulator

1) Seal the connection of the copper gas hose and the "IN" terminal and "OUT" terminals.
2) Connect the regulator seal to the installation place of the regulator.

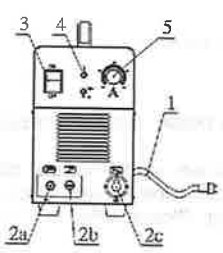
3) Fix the rack with screw to the place of the air regulator at the back of the machine.
4) Remove the rubber nut. Connect the regulator with the track.
5) Release the gas valve, modulate the pressure of gas to stipulated pressure, and press the button.
6) The gas pressure is 4 times of normal atmospheric pressure.
7) In case that the water-filtering bottle is full with water, remove the water.

Please note that:
--Please choose the gas supply respectively for TIG welding and plasma cutting are different.

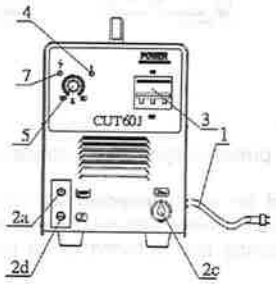
2d. Pilot arc socket (available for CUT100/120)

Connect Arc maintaining cable with the connector on the panel board.

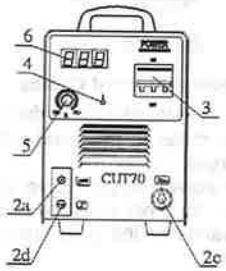
CUT30/40



CUT60J



CUT70



Panel board functions

3. Switch

Two modes " on " and "off" and over-current protection available

4. Pilot light:

Pilot lamp is on, in case that this cutting equipment is overheating protection status. Overheating arises if this cutting equipment is overloaded. This cutting equipment automatically restarts when the temperature inside of this cutting equipment has fallen, and the pilot lamp is off.

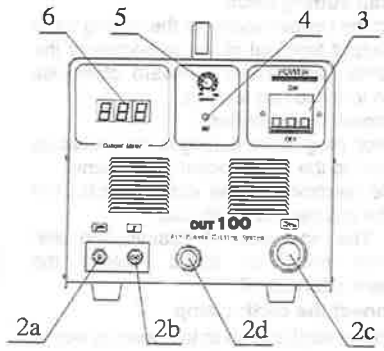
5. Current range adjustment:

Modulating cutting output current according to the thickness of the work piece

6. Digital meter: Digital meter indicates welding current.

7. Power light: Indicate the input is normal

CUT100/120



Checking whether

- This cutting equipment is connected to the earth cable.
- All the connectors is in firm connection
- Power supply cable is connected according to the given voltage range.
- All cables and hoses are of good quality.

Operation

--Turn on the power switch on the front panel board; the pilot light is on, and the meter displays the set current.
--Set the pressure of gas output to required value, and release the gas. The appropriate pressure of output gas is of critical importance to extend the service life of nozzle and electrode and improve the cutting performance of this cutting equipment.

-- Press the button of the cutting torch, and there is gas output from the nozzle.
-- According to the thickness of the work piece, set the cutting current value.
-- Contact the copper nozzle of the torch to the work piece, press the button of the torch until the arc-starting and raise the cutting torch about 1mm above the work piece, and perform the cutting operation.

CAUTIONS

1. Working Environment

1.1 The location in which this welding equipment is installed should be of little dust, corrosive chemical gas, flammable gas or materials etc, and of maximum 80% humidity;
1.2 Avoid the operation of welding in the open air unless the working area sheltered from the sun shining, rain water and snow etc; the temperature of working environment should be maintained within -10°C to +40°C;
1.3 Keep this cutting equipment 30cm distant from the wall;
1.4 Keep the working environment in good ventilation.

2. Safety Tips

2.1 Ventilation
This cutting equipment is small-sized, compact in structure, and of excellent performance in current output. Fans are to abstract heat generated by this cutting equipment while the operation of welding is carried out.
Cautions: Maintain good ventilation of the louvers of this cutting equipment. The minimum distance between this cutting equipment and any other objects in or near the working area should be 30 cm. Good ventilation is of critical importance for the normal performance and service life of this cutting equipment.
2.2 Welding operation is forbid while this cutting equipment is of over-load status.
A sudden halt may occur while the cutting operation is carried out while this cutting machine is of over-load status. Under this circumstance, it is unnecessary to restart this cutting equipment. Keep the built-in fan working to bring down the temperature inside this cutting equipment.
2.3 Over-voltage is forbid.
Regarding the power supply voltage range of the cutting machine, please refer to "Main parameter" table. This cutting equipment is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the voltage of input power supply current exceeds the stipulated value, it is possibly damaging to the components of this cutting equipment.
2.4 An earth terminal available for this cutting equipment. Connect with the earth cable to avoid the static and electric shock.
2.5 It is strongly forbid to contact the output terminal when the welding operation is performed. An electric shock possibly occurs.