

USER MANUAL



CROS-ARC 201 MF

CONTENTS

1. CONTENTS	1
SAFETY WARNING	3
3. PRODUCT DESCRIPTION	8
TECHNICAL PARAMETERS	9
5. INSTALLATION INSTRUCTION	10
6. PANEL FUNCTION ILLUSTRATION	14
7. OPERATION PARAMETER RECOMMENDATION	20
8. STRUCTURE CHART AND MAJOR PARTS LIST	23
9. CIRCUIT DIAGRAM	25
10. ATTENTIONS & PREVENTIVE MEASURES	26
11. POTENTIAL OPERATING PROBLEMS	27
12. DAILY MAINTENANCE	28
13. TROUBLESHOOTING AND FAULT FINDING	29
14. INITIAL PROBLEMS DIAGNOSE	30
15. DAILY CHECKING	32

SAFETY WARNING


- Please read this manual carefully before using the machine.
- The safety notes listed in this manual are to ensure correct use of the machine and to keep you and other people safe.
- The machine is of a safety-considered design, please refer to the safety warnings listed in the manual when using it in case of bad accidents.
-

Warning sign Description	Meaning
 <p>High-danger</p>	<p>"High-danger" means there is possibility of severe dangerous, and may cause dead if not avoid. This sign is used in extreme</p>
	<p>Wrong use of the machine will cause different extent of hurt as follows, and there will be warning sign and description for remind.</p> <p>case, which is normally related to body dangerous neither than property loss.</p>
<p>Danger</p>	<p>"Danger" means there is possibility of dangerous situation, and may cause badly hurt if not avoid. It can also refer to property loss.</p>
<p>A</p> <p>Notes</p>	<p>This means it may cause body hurt if not avoid. Please refer to the related description when this sign occurred.</p>

⚠️ Danger! Please follow the rules below in case of bad accidents:

1. Do not use the machine in none-welding areas.
2. The machine is safety considered designed, please do read the warning notes carefully in case of dead or other bad accidents.
3. Follow related regulations for the construction of the input drive force, selection of the setup place, usage of the high-pressure gas. storage and configuration, safe-keeping of the workpiece after welding and management of the offal etc.

4. No entry of unrelated person to the welding area.

5. People using heart pacemaker cannot get close to the welding machine and a...ea ,i,"-::-owr. ne s
permit. The magnetism caused when connecting the machine wm c.a_se a7t:'iL.Je11!71Ce nm1 b,
IIHItEffllffllalilal'



Danger! Please use preventive measures to avoid gas and

professional person to install, check and maintain the machine.

- Please correctly understand the contents of this manual to ensure safety, and ask those professional

people with safety knowledge and technique to operate the machine.



Danger! Please follow the rules below in case of electric shock:



*** Any contact of electric parts may cause fatal electric shock or burnt.**

- Don't touch any electric parts.
- 2. Ask professional person to connect the machine and workpiece to the ground.
- 3. Cut off the power box before the installation or checking, and restart after 5 minutes. For the capacitance to discharge, please ensure it has no voltage before restart even if the power source is cut off.
- 4. Do not use cable with worn-out cover or broken conductor.
- 5. Do ensure insulation at the cable joint parts.
- 6. Do not use the machine when the housing is off.
- 7. Do not use broken or wet insulation gloves.
- 8. Use safety net when work at high position.
- 9. Check and maintain regularly, don't use it until the broken parts are fixed well.
- 10. Cut off all the input power when not use.
- 11. Follow the national or local related standard and regulations when using the AC/DC machine at narrow or high position.



*** Gas and fumes are harmful to health.**

*** It may cause choke when operate in narrow space.**

- 1. In case of accidents like gas poisoning or choke, please use suggested exhaust equipment and breathe overpressure facilities.
- 2. In case of accidents by gas and other powder, please use suggested part exhaust equipment and breathe overpressure facilities.
- 3. When operated on trunnions, the CO2 and argon gas will stay in the bottom. Please replace gas sufficiently and use gas escape facilities in case of oxygen shortage.

A Please accept the supervisor's check when operate in narrow space, and ensure enough gas supply and use of the preventive facilities.

5. Do not weld in degrease, washing and spray space.

6. Use breathe preventive facilities as it will cause poisonous dust and gas when weld shielded steel.



Danger! Please follow the below notes to avoid accidents like fire and explode:



* Spark and hot workpiece can cause fire.



* It may cause fire if the cable is not connected well or when the current of the steel or other workpiece are not connected completely.

* Do not weld on the case of tinder stuff, or it may cause explode.

* Do not weld airtight containers such as slot, pipe etc., or may break.

1. Do not put tinder stuff in welding area.

2. Do not weld around tinder gas.

3. Do not put heat workpiece near the tinder stuff.

4. When weld the dooryard, ground and wall, do move away the tinder stuff around.

5. The cable joint place should be insulated.

6. The cable joint of the workpiece should be close enough to the welding place.

7. Do not weld those facilities with gas pipe or airtight slot.

8. Put fire extinguisher around the welding area in case of fire.



Notes! Please wear protective appliance to avoid arc, spark, residue and noise.

Arc ray can cause eye inflammation or skin burnt

***Spark and residue will burn your eyes and skin.**

1. When welding or supervise welding, please use preventive facilities with enough shielding.

2. Please wear preventive glasses.

3. Please wear preventive facilities such as leather gloves, coat, foot-safeguard and apron.

4. Set preventive shield screen around the welding area to protect other people from harmful arc rays.

Notes! Please follow the below notes to avoid gas cylinder toppling over or broken.



***Toppling over of the gas cylinder will cause body hurt.**

* Wrong use of the gas cylinder will lead to high-pressure gas! SC

1111111

cause human hurt.

1. Use the gas cylinder correctly.
2. Use the equipped or recommended gas adjustment.
3. Read the manual of the gas adjustment carefully before using it, and pay attention to the safety notes.
4. Fix the gas cylinder with appropriate holder and other relative parts.
5. Do not put the cylinder under high temperature and sunshine.
6. Do not put your face close to the gas cylinder exit when opening it.
7. Put on the gas shield when not use.
8. Do not put the torch on the gas cylinder or touch the electrode.

A Notes! Any touch of the switch part will cause injury, please pay attention to the below notes:



* Do not put fingers, hair, clothes etc. near to the moving parts such as the fan.

1. Do not use the machine when the housing is off.
2. Ask professional person to install, operate, check and maintain the machine.
3. Do not put fingers, hair, clothes etc. near to the switch parts such as the fan.

A Notes! Follow the below note as the wire end may cause body hurt:

* The wire shoot out from the torch can stab eyes, face and other naked parts.

1. Before feeding the wire, do not look into the electric conduction hole, or the wire shoot out may stab your eyes and face.
2. When feeding the wire manually or press the torch, do not put the torch end near to your eyes, face and other naked parts.

A, Notes! Follow the below notes to ensure better work efficiency and power source:

-r No person under of in front of the machine when swing in case of injury!



1. Precautions against toppling over.
2. Lift the power source on a 1-1:1 sillies, use up-down forklift truck in case of toppling over.
3. When using the crane or other lifting equipment, the angle no more than 15 to the vertical.

direction.

5. If the machine is equipped with gas cylinder and wire feeder, horizontal of the machine.

Do fix the gas cylinder with gallus or chain when moving it in case of body hurt.

6. Ensure fastness and insulation when using the swing ring to lift the wire feeder in welding.

7. If the machine is equipped with gallus or handles, they are only for hands not for crane, fork-lift truck or other swing equipments.

A Notes for electromagnetism disturb:

1. It may need extra preventive measures when the power is used in some partial space.

2. Before the installation, please estimate the potential electromagnetism problems of the environment as follows:

1) Upper and down parts of the welding equipments and other nearby power cable, control cable, signal cable and phone cable.

2) Wireless electric as well as TV radiation and reception equipment.

3) Computer and other control equipments.

4) Safety-recognition equipment etc. Eg: supervise of industrial equipments.

5) Health conditions of the people around. Eg: use of the heart pacemaker and audiphone.

6) Equipments for adjustment and measurement.

7) Anti-disturb capability of other used equipments. Users should ensure these equipments and the environment are compatible, and this may need extra preventive measures.

8) Practical state of the welding and other activities.

3. Users should follow the below notes to decrease radiation disturb:

1) Connect the welding equipments to the power supply lines.

2) Maintain the welding equipments regularly.

3) The cable should be short enough to be close to each other and near to the ground.

4) Ensure the safety of all the metal parts and other parts nearby.

5) The workpiece should be well connected to the ground.

6) Shield or protect the other cable and equipments to decrease the influence of

disturb. The equipments can be fully shielded under special conditions.

4. Users are responsible for the disturb problems caused by weld;

PRODUCT DESCRIPTION

The welding machine applies the most advanced inversion technology in the world.

The principle of inversion is to transform the power frequency of 50Hz/60Hz into direct current and invert it into high frequency through high-power device (IGBT), then perform voltage-drop and communication with the output high-power D.C power supply via Pulse Width Modulation (PWM). Since the switch power inversion technology is adopted, the weight and volume decrease greatly while the conversion efficiency increase of more than 30%

Additional to MIG, the machine has the functions of STICK and TIG. It adopts full digital panel display, which can realize synergic adjustment of feeding speed and welding voltage as well to regulate the welding parameters easily. Our CO2 gas shielded welding machine is equipped with unique electronic reactor circuit, which can precisely control the short-circuiting transformer and mixed transformer resulted in better performance than other machines. Compared with silicon controlled welding machine and tapped welding, our products have the following advantages: stable wire feed rate, portable, energy-saving, electromagnetic noise free. Besides, our products spatter less, easier arc starting, deep welding pool, high duty cycle etc.

This equipment is portable with full function of STICK, TIG and MIG having merits of high-efficiency; power-saving etc. It is especially suitable for home garage use and need of different metal or techniques demand.


Thank your for choosing our products. Please feel free to propose your valuable suggestions; we will make efforts to perfect our products and service.

WARNING!



The machine is mainly used for industrial purpose. It will cause radio interference indoor, operators shall fully prevent the measures.

TECHNICAL PARAMETERS

 m	GROS-ARC 201MF
Power voltage (V)	1 phase 230V±15%
Frequency (Hz)	50/60
Rated input current (A)	35.8(MIG)
	26.8(TIG)
No-load voltage(V)	41.7(MM A)
	65
Output current adjustment (A)	40-200(MIG)
	15-200(TIG)
Output voltage (V)	40-200(MM A)
	16-24
Duty cycle (%)	30
Power factor	0.7
	3
Efficiency (%)	80
Type of wire feeder	Internal
Wire feed speed (m/min)	2-13
Post flow time (S)	2
Welding-wire diameter (mm)	
0.6/0.8/1.0 Insulation grade	F
Housing protection grade	IP21

Welding thickness {mm}

More than 0.8

Weight (kg)

12.8

Overall dimension (mm)

450*218*370

INSTALLATION INSTRUCTION

The welding equipment is equipped with power voltage compensation device. It keeps the machine working normally when power voltage fluctuates $\pm 15\%$ of rated voltage.

When using long cable, in order to reduce voltage drop, big section cable is suggested. If the cable is too long, it will affect the performance of arcing and other system function, it is suggested to use the recommend length.

1. Make sure the intake of the machine is not covered or blocked to avoid the malfunction of the cooling system.
2. Use ground cable whose section no less than 6mm^2 to connect the housing and earth. The method is to connect the grounded interface in the back to the earth device, or make sure the earth end of power interface has been reliably and independently grounded. Both ways can be used together for better security.

CROS-ARC 201 MF Installation Procedures:

1, Correct Installation of MIG:

- 1) Connect the gas cylinder with CO2 decompression flow meter tightly to gas inlet on the rear of the machine, using the appropriate gas hose.
- 2) Insert the dinse plug of earth the cable into - socket on the front panel.
- 3) Set the wire wheel with wire on the spool hub, the wheel hole should be matched with the spool hub diameter.
- 4) Choose feed rollers according to wire size.
- 5) Loosen the screw of wire-pressing wheel, put the wire into slot via wire-guide tube, adjust the wire-press wheel to keep wire fix from gliding, but strength should be suitable in case the wire distorts and affects wire sending.
- 6) Feed rollers should turn clockwise rotation to let out wire, to prevent wire from gliding; wire is usually set to the fixed hole on the wheel side. To prevent the bent wire from getting stuck, please cut off this part of the wire.
- 7) Put and tighten the torch on the output socket and put the wire into the torch by hand.

2, Correct Installation of LIFT TIG:

- 1) Connect the shielded-gas source correctly. The gas supplying route shall include gas cylinder, argon decompression flow meter and gas pipe. The connecting parts of the gas pipe should be fastened by hose clamp in order to prevent leakage .
- 2) Connect the plug of TIG torch to "-" of the front panel, and fasten it clockwise.
- 3) Connect the plug of TIG torch to the relative interfaces of panel and fasten the screw.
- 4) Connect one dinse plug of the earth cable to "+" of the front panel, and fasten it clockwise, the clamp should fix to the workpiece.

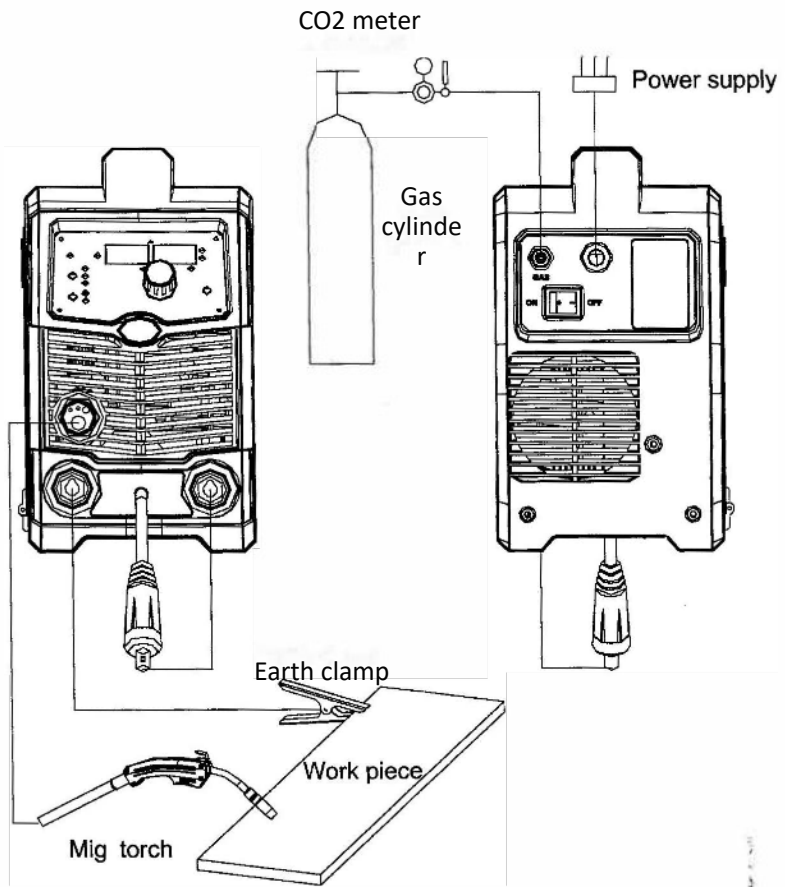
3, Correct Installation of STICK:

- 1) Make sure electrode holder and dinse plug connected well. Connect the dinse plug to the socket "+" of the machine, and fasten it clockwise tightly.
- 2) Connect the dinse plug of the earth cable into the socket "-" of the machine, and fasten it clockwise, the earth clamp connects to the workpiece.
- 3) Please pay attention to the connecting terminal, DC welding machine has two connecting ways: positive connection and negative connection. Positive connection: holder connects with "+" terminal, while work piece with the "-" terminal. Negative connection: work piece with the "+" terminal, holder with the "-" terminal. Choose suitable way according to the working situation. If unsuitable choice is made, it will cause unstable arc, more spatters and contamination. If such problems occur, please change the polarity of the fastened plug. It should adopt negative connection when welding with alkaline electrode, while positive connection when welding with acid electrode.

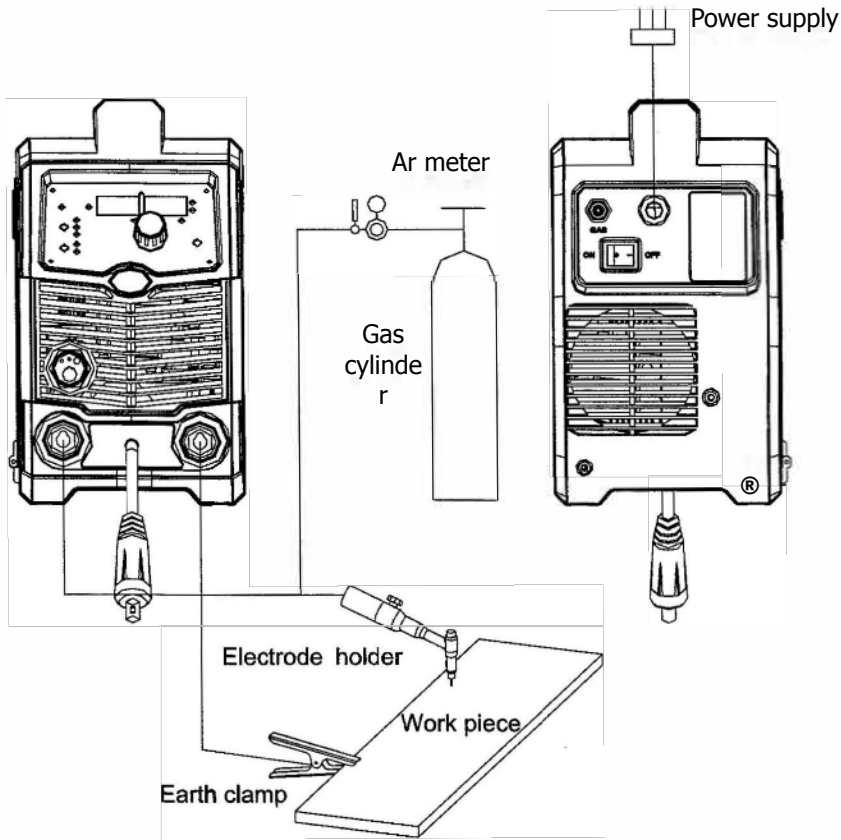
This procedure shall be operated by electrician!

Connect proper power cable to the distribution box with corresponding capacity according to the input voltage and current (See technical parameter table). Do not connect to the inappropriate voltage and make sure that the difference of power supply is within permitted range.

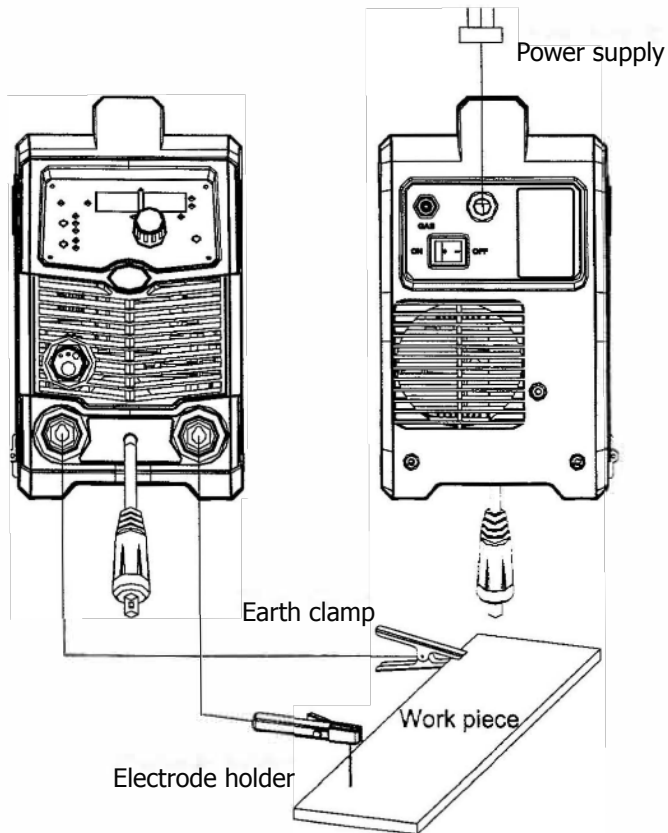
Explanatory drawing for Installation of CROS-ARC 201MF{MIG):



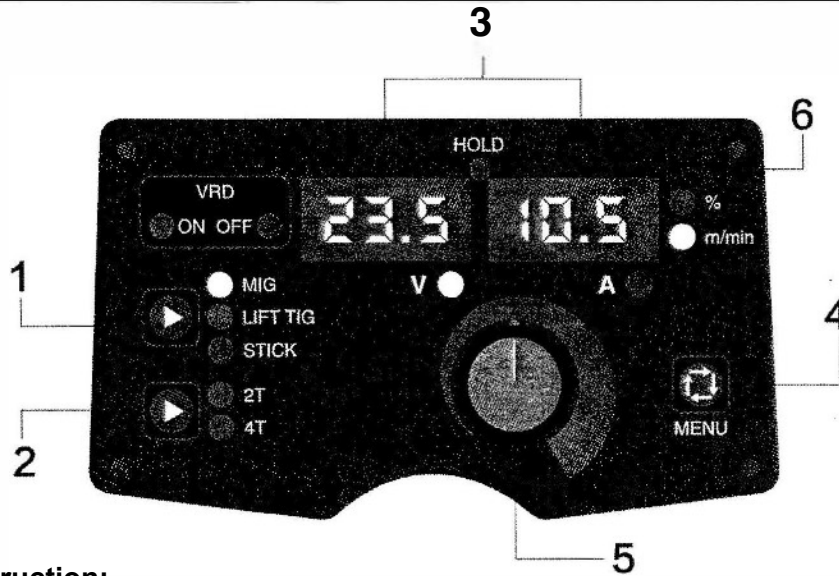
Explanatory drawing for Installation of CROS-ARC 201MF (LIFT TIG):



Explanatory drawing for Installation of CROS-ARC 201MF (STICK):



PANEL FUNCTION ILLUSTRATION



Front panel instruction:

1. STICK/LIFT TIG/MIG switch key
2. 2T/4T switch key
3. Multifunctional data display
4. MENU selection key (Working under MIG and STICK mode)
5. Multifunctional data adjusting knob (coarse adjustment by pressing the knob and turning it: big regulating rate and high speed; fine adjustment only by turning the knob: small regulating rate and low speed)
6. Panel data lock indicator light (When stop weld this light shine, the multifunctional data display shows the last time welding data)

Polarity conversion joint

This machine has the polarity conversion; There are positive output terminal and negative output terminal between wire feeder and wire spool; When use solid wire with gas protection, torch socket should be connected to the positive output terminal, ground cable should be connected to the negative output terminal; When use flux-cored wire, the two connected cable should be switched.

Operation Instruction:

1) The starting up display

1. [multifunctional data display] flashing for 5 seconds, the machine into welding mode

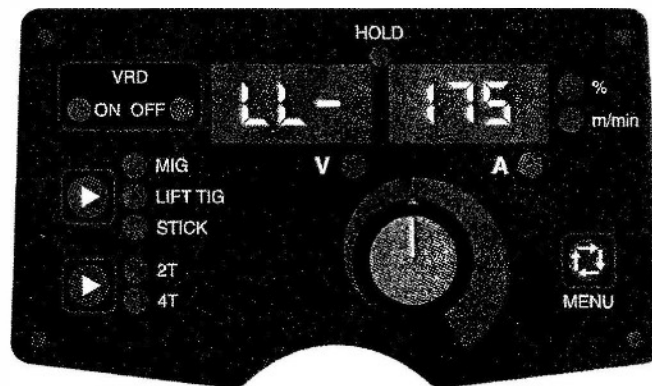


Chart 1: the starting-up display interface

2) Operation instruction under STICK mode.

(D When welding stops, Press the (STICK/LIFTTIG/MIG switch key) , the STICK indicator lights up, and it turns into STICK mode.

- Ⓜ Under STICK mode, the way to start and turn off VRD function: Set the current to 108A, hold down [2T/4T switch) to start and turn off the VRD function; Chart2 shows VRD enabled, Chart3 shows VRD disabled.

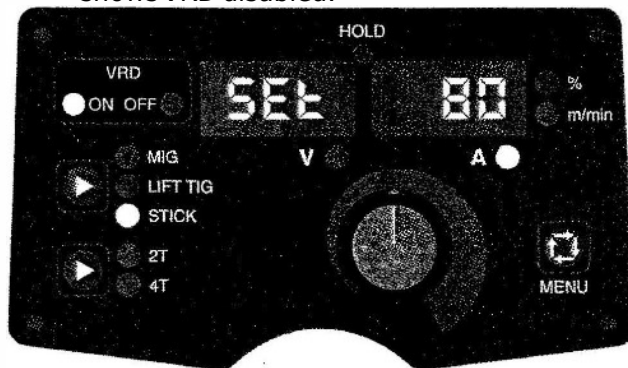


Chart 2

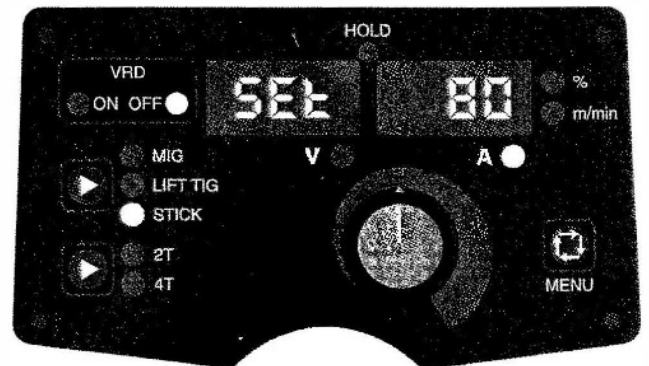


Chart 3

Chart 2: preset current display with VRD enabled Chart 3: preset current display VRD disabled

- Ⓜ [multifunctional data display] shows the preset current "80", its unit is ampere(A).

Ⓜ Adjusting the [Multifunctional data adjusting knob) can change the welding current during welding process, and displayed in [multifunctional data display I .

Ⓜ 3 seconds later after setting the welding parameters, the [multifunctional data display] would flash for one

time, which means the data has been saved. Moreover, the panel would display these data when restart the machine next time if the parameters keep unchanged.

Ⓜ Arcforce current adjustment: press the (MENU selection key) into the arc force current adjustment mode, turn the [Multifunctional data adjusting knob] to set the arc force data, adjustment range is 20%~100%(Chart 4)

CD Chart 5 shows the data and figure in welding mode.

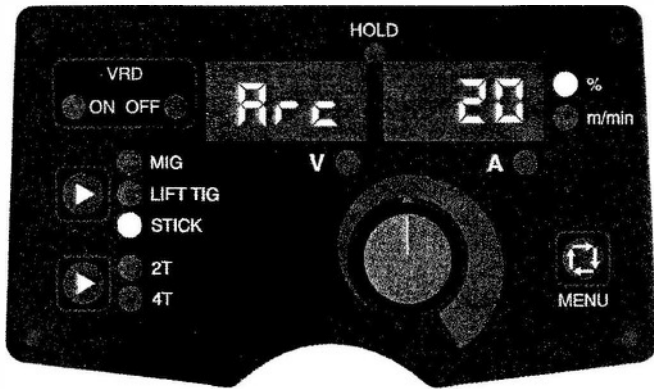
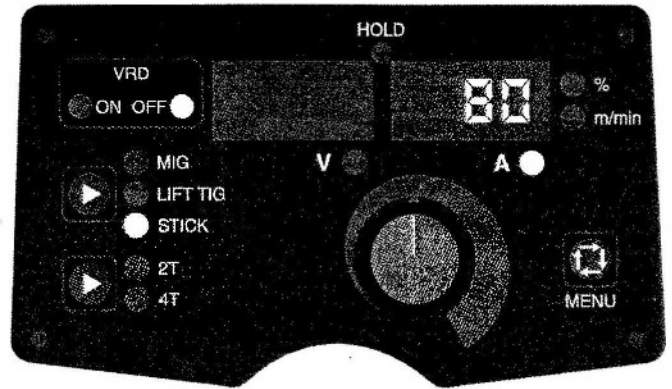


Chart4



Charts

3) Operation instruction under LIFT TIG mode.

CD When welding stops, press the [STICK/LIFT TIG/MIG switch key], the LIFT TIG indicator lights up, and it turns into LIFT TIG mode. LIFT TIG means the tungsten contacts the workpiece first, then lift up the arc

Ⓜ Under LIFT TIG mode (Chart 6)

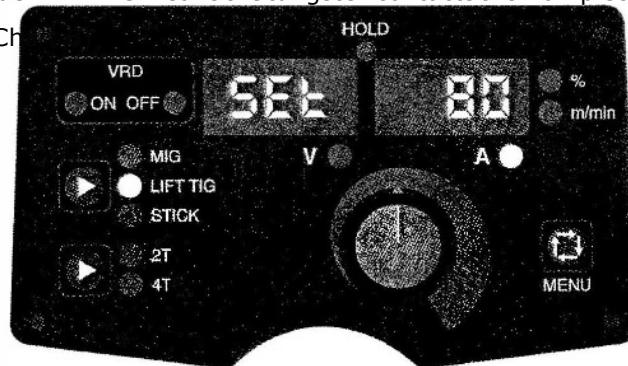


Chart6: The preset current under LIFT TIG mode

- Ⓜ [multifunctional data display] shows the preset current "80", its unit is ampere (A).
- Ⓜ Adjusting the [Multifunctional data adjusting knob] can change the welding current during welding process, and display in [multifunctional data display]
- Ⓜ 3 seconds later after setting the welding parameters, the [multifunctional data display] would flash for one time, which means the data has been saved. Moreover, the panel would display these data when restart the machine next time if the parameters keep unchanged.
- Ⓜ The panel displays as Chart 7, its unit is 80A.

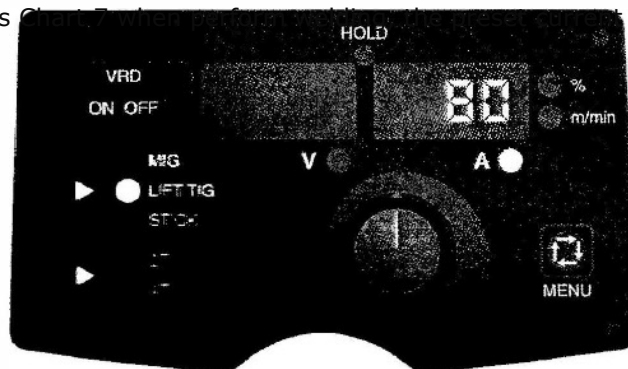


Chart 7: Display state after setting the current in LIFT TIG mode

4) Operation instruction under MIG mode.

CD When welding stops, press [STICK/LIFT TIG/MIG switch key], MIG indicator lights up, and the machine enters into MIG mode.(Chart 8)

@ Wire check function: Press the MIG torch switch for 5 seconds into fast wire feeding mode, after 15 seconds if you still pressing the MIG torch switch, it would stop automatically.

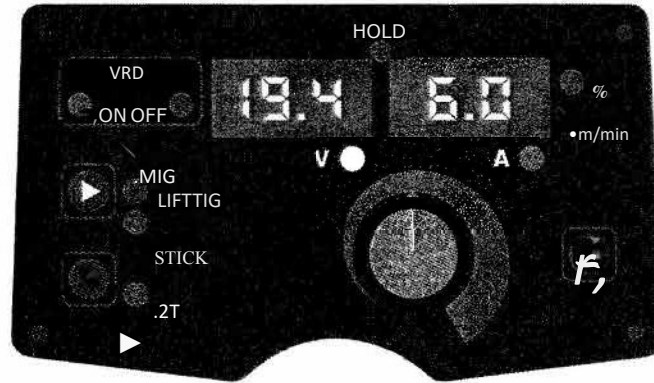


Chart 8: Preset voltage display under MIG mode

- Ⓜ [multifunctional data display] shows the preset voltage "19.4V", its unit is volt(V). while "6.0m/min means the preset wire feeding speed, its unit is m/min"
- Ⓜ Under MIG mode, operate [VRD/2T/4T switch key] to choose the welding mode. 2T NORMAL lighting up means 2 step control way: press the torch switch, feed the gas in advance, and perform welding normally; release the torch switch, burn back and get rid of the ball on the end of wire, then stop feeding gas 3 seconds later. While, 4T (LATCH) lighting up means 4 step control way: press the torch switch for the first time, feed the gas in advance, and ignite the arc to perform welding; then release the torch switch and perform welding normally. Press the torch switch for the second time, the welding current decreases to the crater value and keep on, then release the torch switch again, burn back and get rid of the ball on the end of wire, then stop feeding gas 3 seconds later.
- @ Adjust [Multifunctional data adjusting knob] during welding can realize the synergic manipulation of welding voltage and feeding speed, which displays in [multifunctional data display]
- @ Welding arc voltage slightly adjustment: Under welding data set mode or welding mode can slightly adjust the arc voltage, the adjustment range is -10%~+10%;press the [MENU selection key] into voltage adjustment mode, turn the data adjusting knob to adjust the arc voltage, see Chart 9,finish the setting after 3 seconds.will back to the main menu(Chart 8)
Induction adjustment:Under welding data set mode or welding mode can slightly adjust the induction,the adjustment range is -10%~+10%;press [MENU selection key] into induction adjustment mode.turn the data adjusting knob to adjust the induction
See Chart 10,finish setting for 3 seconds,it would back to the main manu(Chart 8)

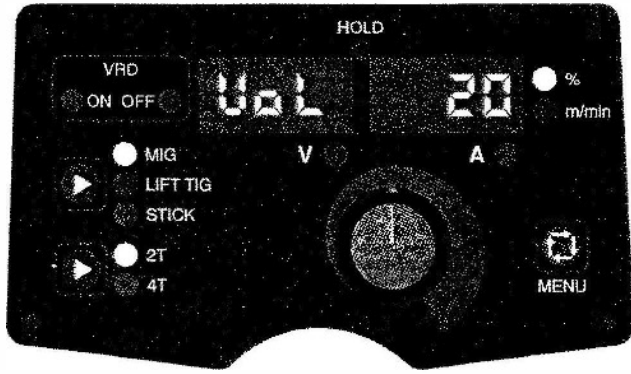


Chart 9_1

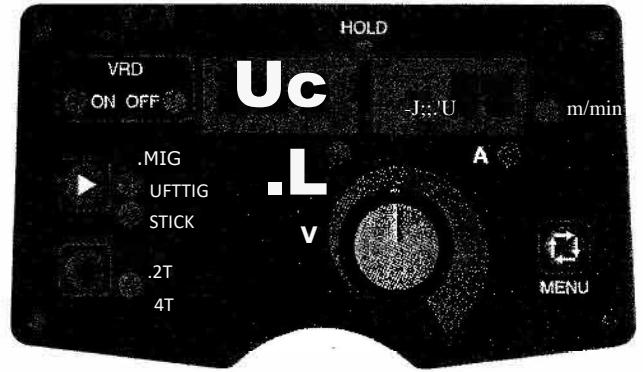


Chart 9_2

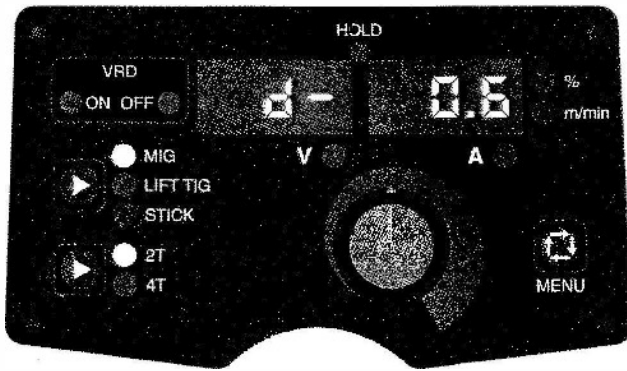
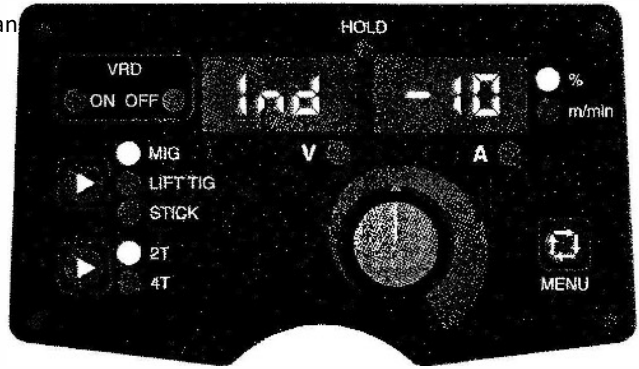
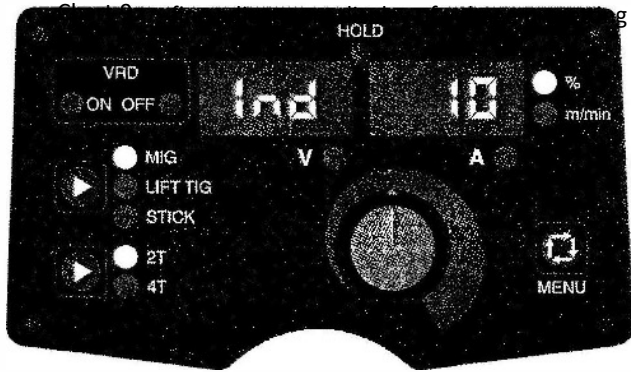


Chart 10_2

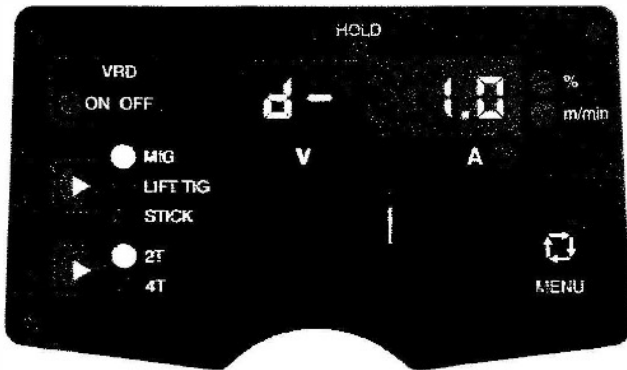
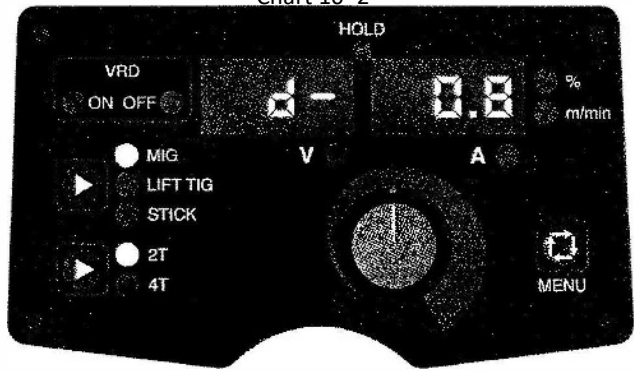


Chart 10_4

Chart 10_5

Chart 10: Fine adjustment display of l11Cu, ::::ance?an;ie ..n:::lell" YIG!"! "IIODE

- CT) 3 seconds later after setting the welding parameters, the [multifunctional data display] would flashes for one time, which means the data has been saved. Moreover, the panel would display these data when restart the machine next time if the parameters keep unchanged.
- @ The panel displays as Chart 11 when perform welding, which means the welding voltage is 19.4V, and the current is 110A.
 - ® From welding to welding stop state, [multifunctional data display] will lock screen to display the practical welding current and voltage, after 2 seconds the lock screen will automatically changed to (Chart 8) welding voltage and wire feed speed setting status.
 - @) MIG welding torch and spool gun switch(Chart 12),Press the [REM] button when the light shine means it's in spool gun mode,if it's not shine means under MIG welding torch mode



Chart 11: display status when perform welding under MIG mode Chart 12: display the spool gun mode

Malfunction display: (Chart 12)

1) Wire feeder fault code

Panel display Err -03 and multifunctional data display keep flashing, it will automatically exit the panel after troubleshooting, the panel will display the reference of the settings before the fault occurs

2) Over output current fault code

Panel display Err-01 and multifunctional data display keep flashing. machine doesn't work. restart the machine, the panel will display the reference of the settings before the fault occurs

3) Over heat fault code

Panel display Err-02 and multifunctional data display keep flashing, machine doesn't work, this is over heat protection, when the machine cool down, the panel will display the reference of the settings before the fault occurs

Panel display Err-04 and multifunctional data display keep flashing, machine doesn't work, this is the Temperature sensor damage, when this fault solved will automatically exit the panel, and the panel will display the reference of the



Chart 12, Fault code display

OPERATION PARAMETER RECOMMENDATION

1: Generally, welding current is adequate to welding electrode according with as following:

electrode specification		cp3. 2	35-45 cp4. 0	cp5. 0
welding current	70-100A	110-140A	170-220A	230-280A

2: **Welding variables when use TIG.**

TIG welding specifications of stainless steel as follows:				
Thickness diameter (mm)	Wire (mm)	Type of butt joint	Welding current (A)	Gas flow (Umin)
0.5	1.0	plain butt	35-40	4-6
0.8	1.0	wire filling joint		4-6
1.0	1.6	1.6	40-70	5-8
1.5	1.6	1.6	50-85	6-8
2.0	2.0-2.5	2.0	80-130	8-10
3.0	2.5-3.0	2.2	120-150	10-12

Tungsten diameter

:C.

3: Welding variables when use MIG welding

The values listed in the following table are the general specification values under standard condition.

thickness (mm)	diameter (Umin) (mm)	(mm)	Current (V)		speed (cm/ min)	extension (m m)	
			(A)				
0.8	0.8,0.9	0	60~70	16~16.5	50~60	10	10
1.0	0.8,0.9	0	75~85	17~17.5	50~60	10	10~15
1.2	0.8,0.9	0	80~90	16~16.5	50~60	10	10~15
1.6	0.8,0.9	0	95~105	17~18	45~50	10	10~15
2.0	1.0,1.2	0~0.5	110~120	18~19	45~50	10	10~15
2.3	1.0,1.2	0.5~1.0	120~130	19~19.5	45~50	10	10~15
3.2	1.0,1.2	1.0~1.2	140~150	20~21	45~50	10~15	10~15
	1.0,1.2	1.0~1.5	160~180	22~23	45~50	15	15
	1.2	1.2~1.6	220~260	24~26	45~50	15	15~20
	1.2	1.2~1.6	220~260	24~26	45~50	15	15~20
	1.2	1.2~1.6	300~340	32~34	45~50	15	15~20
3.2	1.2	1.2~1.6	300~340	32~34	45~50	15	15~20
0.8	0.8,0.9	0	100	17	130	10	15

Plate Wire Interval Voltage Welding Wire Gas flow rate

r
:E
:E
o
C::

Squar utt		C:							
		1.0	0.8,0.9	0	110	17.5	130	10	15
Squar utt	C:	1.2	0.8,0.9	0	120	18.5	130	10	15
		1.6	1.0,1.2	0	180	19.5	130	10	15
		2.0	1.0,1.2	0	200	21	100	15	15
		2.3	1.0,1.2	0	220	23	120	15	20
		3.2	1.2	0	260	26	120	15	20
		Plate	Wire	Current	Voltage	Welding	Wire	Gasflowrate	
		thickness	diameter	CA)	CV)	speed	extension	(Umin)	
		Cmm)	(mm)			(cm/min)	Cmm		
		Squar utt	C:	1.6	0.8,0.9	60~80	16~17	40~50	10
	0.8,0.9			80~100	19~20	40~55	10	10~15	
3.2	1.0,1.2			120~160	20~22	35~45	10~15	10~15	
					21				
Squar utt	C:								

Low welding speed

Plate thickness diameter	Wire diameter (mm)	Welding gun vertical	Current (CA)	Voltage (CV)	Welding speed (cm/min)	Wire extension (mm)	Gas flow rate (CL/min)
-----------------------------	-----------------------	-------------------------	-----------------	-----------------	---------------------------	------------------------	---------------------------

angle(°)

1.0	0.8,0.9		70~80	17~18	50~60		10~15
1.2	0.9,1.0		85~90	18~19	50~60		10~15
1.6	1.0,1.2		100~110	19~20	50~60		10~15
2	1.0,1.2		115~125	19~20	50~60	10	10~15
2.3	1.0,1.2		130~140	20~21	50~60		10~15
3.2	1.0,1.2		150~170	21~22	45~50	15	15~20
4.0	1.0,1.2		140~200	22~24	45~50		15~20
6	1.2		230~260	24~27	45~50		15~20
8.9	1.2,1.6	50°	270~380	29~35	45~50	25	20~25
	1.2,1.6	50°	400	32~36	35~40	25	20~25
1.0	0.8,0.9		140	19~20	160		
1.2	0.8,0.9		130~150	19~20	120	10	15

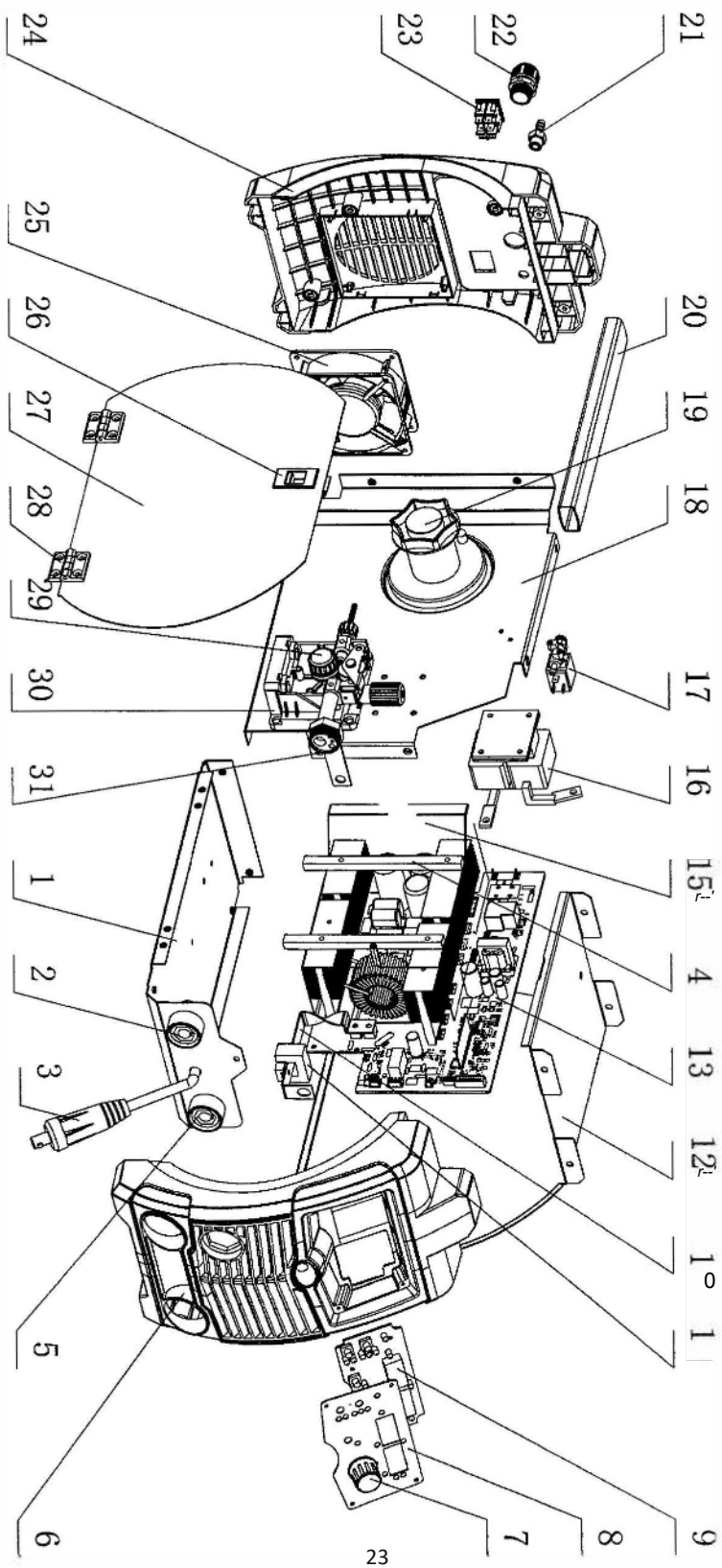
5- 1.0,1.2 180 - 22~23 120 10 15~20 15

tal	1.6							
	2	1.2		210	24	120	10	20
	2.3	1.2		230	25	110	15	25
	3.2	1.2	45°	270		110	20	25
	4.5	1.2	50°	45° 290	30	80		25
	6	1.2	50°	45° 310	33	70	25	25
	0.8	0.8,0.9	45°	60~70	16~17	40~45		10~15
	1.2	0.8,0.9	45°	80~90	18~19	45~50	10	10~15
	1.6	0.8,0.9	45°	90~100	19~20	45~50	10	10~15
	2.3	0.8,0.9	45°	100~130	20~21	45~50		10~15
butt welding T joint	0.8	0.8,0.9	45°	120~150	20~21	45~50		10~15
	1.2	0.8,0.9	45°					
	1.6	0.8,0.9	45°					
	2.3	0.8,0.9	45°					
	3.2	0.8,0.9	45°					
	4.5	0.8,0.9	45°					
	6	0.8,0.9	45°					
	0.8	0.8,0.9	45°		27			
	1.2	0.8,0.9	45°				20	
	1.6	0.8,0.9	45°					
Horizontal fillet welding	0.8	0.8,0.9	10°				10	
	1.2	0.8,0.9	30°					
	1.6	0.8,0.9	30°					
	2.3	0.8,0.9	47°					
	3.2	0.8,0.9	47°					
	4.5	0.8,0.9	47°					
	6	0.8,0.9	47°					
	0.8	0.8,0.9	47°					

3.2 150~180 20~22 35~45 10~15 20~25
 4.5 200~250 24~26 45~50 10~15 20~25

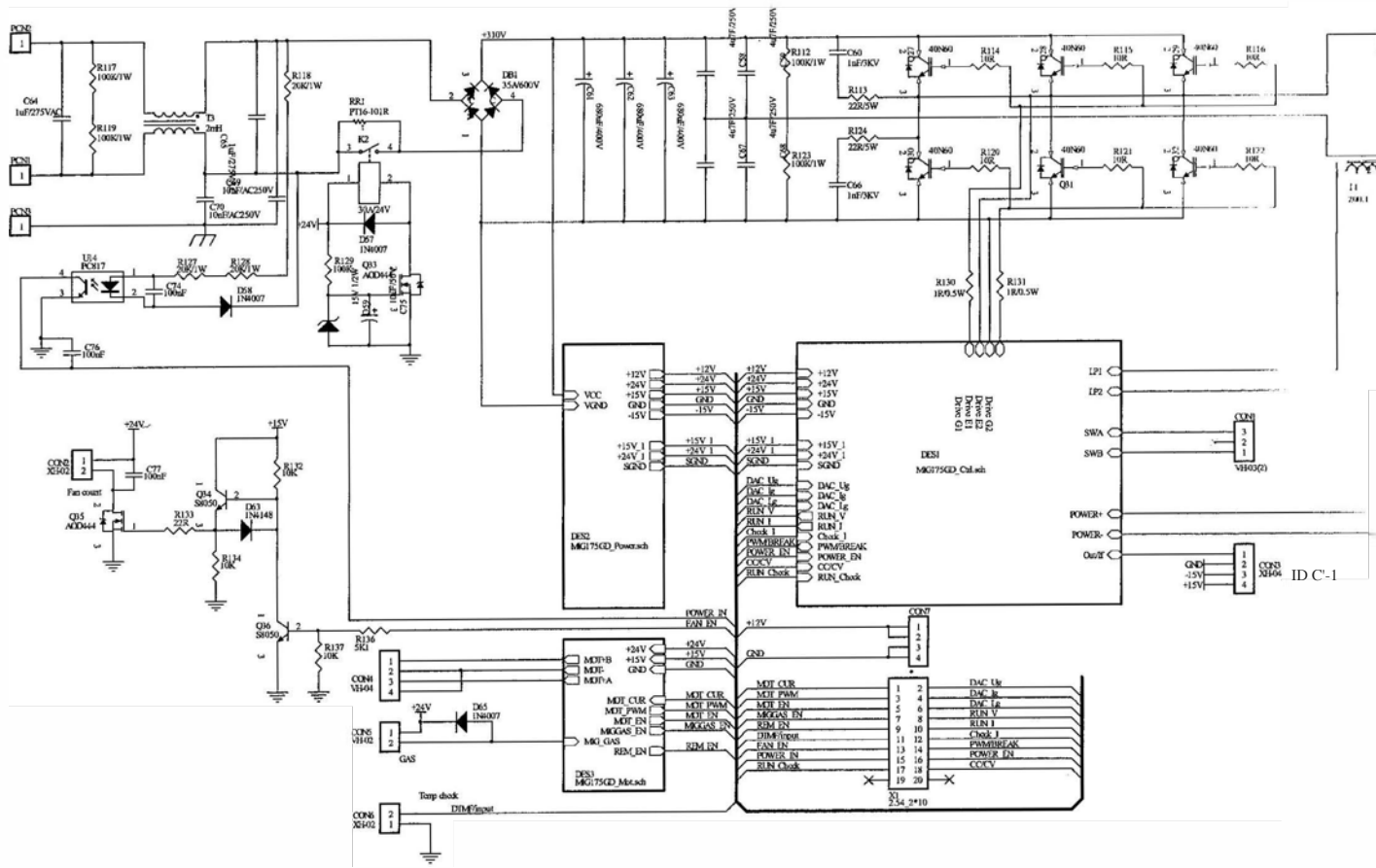
STRUCTURE CHART AND MAJOR PARTS LIST

Structure Chart of CROS-ARC 201 MF



No.	Item	quantit	No	Item	quantit
5	Torch socket(+)	1	25	Crossover coupling	1
5	Torch socket(-)	1	26	Magnetic	1
Major parts list of CROS-ARC 201 MF					
6					
1	Base board			Separator	1
2					1
3					1
4	_____				1
	Plastic front panel	1		Self-locking cable ties	1
7.	Knob		23	Switch	1
8.	Output board				1
9.	Display board	1			1
10.	Holzer current sensor	1			1
11.	Copper connector	1	27	Left movable cover	1
12.	Right cover	1	28	Hinge	2
13.	Main board	1	29	Wire feeder	1
14.	Transom	2	30	wire feeder support	1
15.	Windshield Insulation	1	31	Copper joint	1
	board				
16	Reactor	1			

0 E C U



ID C-1



ATTENTIONS & PREVENTIVE MEASURES

(D)

- 1) The machine works in an environment where air conditions are dry with a dampness level of max 90%.
- 2) Ambient temperature should be between -10 to 40 degrees centigrade.
- 3) Avoid welding in sunshine or raining. Avoid water entering the machine
- 4) Avoid welding in dust area or the environment with corrosive gas.
- 5) Avoid gas welding in the environment with strong airflow.

Our welding machine has a protection circuit of over voltage, over current and over heat. When voltage, output current and temperature of machine are exceeding the rated standard, welding machine will stop working automatically. Excessive operation under over voltage, over current or over heat may damage the machine; operator must pay attention to followings.

1) **The working area is adequately ventilated !**

The welding machine is medium and small model. But the running of the machine will also generate high currents, which natural wind circulation cannot satisfy its cooling demands. Therefore, each machine has an internal fan to ensure its stable performance. Make sure the intake is not blocked or covered, there should be 0.3 meter distance from welding machine to objects of environment. User should make sure the working area is adequately ventilated. It is important for the performance and the longevity of the machine.

2) **Do not over load !**

The operator should keep an eye on max duty current (Compared to the selected duty cycle) to make sure that the machine working current does not exceed max duty cycle current. Over-load current will damage and even burn components within the machine.

If machine exceeds standard duty cycle, it may stop working and switch to protection status. The temperature control switch is activated by over heat released under this circumstance. Meanwhile, the over heat indicator lights up. Under this situation, you do not need to pull out the power plug since the internal fan can work to cool down the machine. When the over heat indicator stops, the temperature has been lowered down to standard range, operator is able to starting working again.

3) **No over voltage!**

Power voltage can be found in diagram of parameters. Automatic compensation circuit of voltage will assure that welding current keeps in allowable range. If power voltage is exceeding allowable range limits, it can damage the components of machine. The operator should understand this situation and take preventive measures.

4) **There is a grounding cable behind welding machine with a mark. Before operation, welding crust must be grounded reliably with cable, in order to prevent static electricity, and accidents for electricity leaking.**

POTENTIAL OPERATING PROBLEMS

The phenomenon listed below may happen due to relevant accessories used, welding material, surroundings and power supply. Please improve surroundings and avoid these problems..

A. Arc starting difficulty. Arc interruption happens easily:

- 1) Examine whether grounding wire clamp contacts with the work pieces well.
- 2) Examine whether each joint has improper contact.

B. The output current fails to reach rated value:

The deviation of power voltage from rated value may cause that the output current does not accord with adjusted value. When the power voltage is lower than rated value, the maximum output current may be lower than rated value.

C. The current can not keep stable during operation:

This situation may relate to the following factors:

- 1) The voltage of electric power network changes;
- 2) Serious interference from electric power network or other electric facilities.

D. Gas vent in welds:

- 1) Examine whether the gas supply circuit has leakage.
- 2) Examine whether there is sundries such as oil, dirt, rust, paint etc. on the surface.

DAILY MAINTENANCE



WARNING!



The power shall be cutoff completely before all maintenance, repairing works. Make sure to put power plug

before opening the case.

1. Remove dust regularly with dry compressed air. If the welding machine is used in surroundings with heavy smoke and polluted air, it is necessary to remove dust at least once month.
2. The pressure of compressed air shall fall to required level to prevent damage to small components in the machine.
3. Examine inside electric joints and ensure perfect contact (Especially plugs and sockets). Fasten the loosening joints. In case of oxidation, remove oxide film with sand paper and connect again.
4. Prevent water from entering into the machine and prevent the machine from getting moist. If any, blow and dry. Measure the resistance of the insulation to make sure it is qualified to use.
5. If the welding machine is not used for a long time, pack the machine in original package and store in dry surroundings.
6. Every time the wire feeder operates for 300 hours, grind the electrical carbon brush and clear up the armature commutator. Rinse speed reducer, apply 2# Molybdenum Disulfide lubricant to the turbine, whirlpool rod and bearing.

3 TROUBLESHOOTING AND FAULT FINDING

Notes: The following operations must be performed by qualified electricians with valid certifications. Before maintenance, you are suggested to contact local distributor to verify qualification.



Malfunctions and solutions of CROS-ARC 201 MF:

Malfunctions	Solution
The meter show nothing; Fan does not rotate; No welding output	<ol style="list-style-type: none"> 1. Confirm the power switch is on. 2. Power supply available for input cable. Check if the silicon bridge is damaged. 4. There is malfunction occurs in the supplementary power source on control board (contact dealers).
The meter shows; Fan works normally; No welding output	<ol style="list-style-type: none"> 1. Check if all the sockets in the machine are connected well. 2. There is open circuit voltage or poor connect at the joint of output terminal. 3. The control cable on the torch is broken off or the switch is damaged. 4. The control circuit is damaged.(contact to dealers)
the meter shows; Fan works normally; Abnormal indicator lights.	<ol style="list-style-type: none"> 1. It might be over-current protection, please turn off the power switch; restart the machine after the abnormal indicator light blinks. 2. It might be overheating protection, please wait for about 2-3 minutes until the machine renew without turn off the power switch. 3. It might be multifunction of inverter circuit. (contact dealers)

INITIAL PROBLEMS DIAGNOSE

Even the machine comes up with abnormal phenomenon such as welding unable, arc unstable or bad welding effect, it is still early to judge that there is malfunction on the machine.

The above-mentioned abnormal phenomenon may be caused by some reasons. For example: tight parts loosen, forgetting to switch on, wrong set up, cable broken and gas rubber pipe cracked, etc. Therefore, please test and inspect these factors before deliver it back to the factory because a large number of troubles may be easily solved probably.

For this reason, an initial diagnosis list for general welding troubles is shown below. A trouble happened may be found in the column of "Abnormal items" on up-right of the list, please inspect and maintain for the corresponding items which have "O" mark in the column according to the following list respectively.

Initial problems diagnose

Abnormal Items		Z	Z	Z	CO	C	0	0	0	0
Area and Item to be Inspected and Maintained										
Distribution Boxes	1. Turn on power supply or not?									
(Input Protection Devices)	2. Fuse burnt out 3. Connection joint loose	0	0	0	0	0	0			
Input Cable	1. Examine whether the cable is cut off. 2. Connection joint loose 3. Over heat	0			0	0	0			
Welding Power	1. Turn on power supply or not?	0	0	0	0	0	0	0	0	
Operation	2. Phase Lacking 1. Turn on gas supply									
Gas Cylinder and Gas Regulator	2. Residual Amount of Gas in the Cylinder 3. Set value for flow 4. Connection joint loose						0			0

Gas supply hose (the whole line from the high pressure cylinder to the

1. Connection joint loose
2. Gas hose damaged

Initial problems diagnose

Abnormal Items		Z	Z		Cl	C	0	◆	◆	3
Area and Item to be Inspected										3
and Maintained co										
	1. Wire feeding wheel does not match with the diameter of wire in texturing tube									
Wire Feeding Device	2. Crackle on wire feeding wheel, groove blocked up or defect 3. Too tight or loose of the handle 4. Wire powder accumulated on the inlet of SUS pipe			0	0	0	0		0	
Weld Gun and Cable	1. Weld gun cable rolled up or over curved 2. Adaptability of conductive tip, wire feeding pipe and cable diameter Worn, blocked up or deformation, etc.				0	0	0		0	
Body of weld gun	1. Loose connection of conductive tip, nozzle and nozzle contactor 2. Contactor of weld gun body is not plunged in or tightened well									
Power supply cable of	1. Break off (bending fatigue)									
weld gun as well as cable of switch control	2. Damaged by weighted drop	0	0	0		0		0		
Surface Condition of										

Parent material and length that wire stretches out

1. Oil, dirty, rust and paint residues
2. Too long length of wire stretched out

1.

Output Cable	material is not enough	0	0	0	
	3. Bad electric conductivity of parent material				
<hr/>					
Lengthened Cable	1. Cross-section of cable is not enough	0	0	0	
<hr/>					
Work Condition for Welding	Welding current, voltage, angle of weld gun, welding rate and wire length stretched out should	0	0	0	0
Cross-section of cable that connects to parent Loose connection of (+) , (-) output cable					
	2. It is rolled up or folded				


be confirmed once again

DAILY CHECKING

WELDING POWER SUPPLY		
Position	Check points	Remarks
Control panel	1. Switch condition of operation, transfer and installation	
Cooling fan	2. Test the power indicator 1. Check if there is wind and the sound normal or not	If abnormal noise and no wind, please check the inner
Power part	1. When electrified, abnormal smell or 11101 2. When electrified, abnormal vibration a111d buzz or not	
Periphery	3. Color changing and heating or not in appearance 1. Gas pipe broken, loosen or not	

2. Housing and other fixed parts loosen or not



		
Position	Check points	Remarks
Nozzle	If installation fixed, the front distorted	Reason for air hole
		Reason for burning the torch (can use splash-proof material)
Electric hole	If installation fixed	Reason of torch screw thread damage
	Damage of its head and hole blocked or not	Reason of unstable arc and broken arc
	Check the extended size of the pipe	Change when less than 6mm, when the extended part too small, the arc will be unstable
	Wire diameter and the tube inner diameter match or not	Reason of unstable arc, please use the suitable tube
tube		arc, please change
	Block caused by dirt in the tube, and the remains of the wire plating lay	Reason of poor wire sending and unstable arc, (use kerosene to wipe or change new one)
	Wire sending tube broken	Pyrocondensation tube broken, change new tube
Gas bypass	Reason of poor wire sending or the hole blocked or	May lead to vice (splash) because of poor gas shield, torch body get burned (arc in the torch), please handle

Wire sending

Reason of poor wires sending and unstable

Partial bending and extended

WIRE SENDING MACHINE		
Position	Checking keys	Remarks
Pressing arm sending	If put the arm to the suitable indicating level	Lead to unstable arc and wire
Wire lead tube	If powder or residue store up in the mouth of the check the reason tube	Clean the residue and solve it
	Wire diameter and the tube inner diameter match or not	If not match, lead to residue
	If the tube mouth center matches the wire wheel	If unmatched, lead to
	unstable arc and slot center or not. (Eyeballing)	residue 1. Lead to unstable arc and residue, and
Wire wheel	Wire diameter matches the wheel's requirement If the wheel slot blocked	block wire tube 2. Change new one if necessary

Pressure Check the stability of its move, and wearing-out

CABLE		
Position	Checking keys	Remarks
	of pressed wire, the narrowing of its contact wire sending surface	Lead to unstable arc and
Torch cable	1. If torch cable over bended 2. If the metal connecting point of mobile plug loosen	1. Cause poor wire sending 2. Unstable arc if cable over bended
Output cable	1. Wearing-out of the cable insulated material 2. Cable connecting head naked (insulation	For life security and stable welding,
	damage), or loosen (the end of power supply,	adopt suitable method and cable of main material

to connecting point) check according to working place
1. If the connection between the plug and the

Input cable Earth cable
power socket is firm
2. If the power input end cable fixed
3. If the input cable is worn out

and
bares
the
conduct
or

If the
earth
cable
that
connects
the
main
part is
broken
and
connects
tightly

- Simple check daily
- Careful and in-depth check on fixed period