THANKS FOR PURCHASING OUR PRODUCT

TIG - 130 P
TIG - 160 P

INVERTER
DC TIG/PULSE TIG
WELDING MACHINE

Operation Manual

(Read the manual carefully before installation ,operation and maintenance)

Safety Depends on You

WEICO arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

SAFETY PRECAUTIONS

Follow these precautions carefully. Improper use of any welder can result in injury or death.

1. ONLY CONNECT WELDER TO A POWER SOURCE FOR WHICH IT WAS DESIGEND. The specification plate on the welder lists this information. When welding outdoors only use an extension cord intended for such use.
2. ONLY OPERATE WELDER IN DRY LOCATIONS and on cement or masonry floor. Keep area clean and uncluttered.
3. KEEP ALL COMBUSTIBLES AWAY FROM WORK SITE.
4. DO NOT WEAR CLOTHING THAT HAS BEEN CONTAMINATED with grease or oil.
5. KEEP CABLES DRY AND FREE FROM OIL AND GREASE and never coil around shoulders.
6. SECURE WORK WITH CLAMPS or other means; don't over reach when working.
7. NEVER STRIKE AN ARC ON A COMPRESSED GAS CYLINDER
8. DON'T ALLOW THE INSULATED PORTION OF THE ELECTRODE HOLDER TO TOUCH THE WELDING GROUND WHILE CURRENT IS FLOWING.
9. SHUT OFF POWER AND UNPLUG MACHINE WHEN REPAIRING OR ADJUSTING. Inspect before every use. Only use identical replacement parl.
10. FOLLOW ALL MANUFACTURER'S RULES on operating switches and making adjustments.
11. ALWAYS WEAR PROTECTIVE CLOTHING when welding . This includes: long sleeved shirt(leather sleeves), protective apron without pockets, long protective pants and boots. When handing hot materials, wear asbestos gloves.
12. ALWAYS WEAR A WELDER'S HELMET WITH PROTECTIVE EYE PIECE when welding. Arcs may cause blindness. Wear a protective cap underneath the helmet.
13. WHEN WELDING OVERHEAD, BEWARE OF HOT METAL DROPPINGS. Always protect the head, hand, feet and body.
14. KEEP A FIRE EXTINGUISHER CLOSE BY AT ALL TIMES.
15. DO NOT EXCEED THE DUTY CYCLE OF THE MACHINE. The rated cycle of a welding machine is the percentage of a ten minute period that the machine can operate safely at a given output setting.
16. KEEP ALL CHILDREN AWAY FROM WORK AREA. When storing equipment, make sure it is out of reach of children.
17. GUARD AGAINST ELECTRIC SHOCK. DO not work when tired. Do not let body come In'contact with grounded surfaces.

1. MAIN USAGE AND THE RANGE OF USAGE(APPLICATIONS):

TIG130P,TIG160P inverse argon arc welder with international advanced technology is a new variety of welding machine using MOSFET. It has performance and high efficiency that the traditional welder can not be compared with. TIG130P,TIG160P welder is triple functional machine used as MMA/DC TIG,PULSE TIG welder. The welding current and pulse frequency is all infinitely and independently adjustable. All ferrous metal, copper and stainless steel material can be omnibearing welding in all position.The welding current is stable. The welding seam is nice.few spatters and low noise occurs during welding.It has high frequency arc striking. The welder has outstanding feature of minimum current. The minimum current can be up to 5A.Protection measures of the welder are perfect. The welder is reliable,light in weight and easy to use. It is particularly suitable for enterprise of plant and mine, build, decoration and maintenance sectors.

2. OPERATING CONDITION AND WORK SURROUNDING

1. Operating condition:

Voltage of power source: single phase, AC 220/230V

Frequency: 50/60Hz

Reliable grounding protection

2. Work surrounding

(1) relative humidity: ≤90%(average monthly temperature≤20℃)

(2) ambient temperature: -10℃ - 40℃

(3) The welding site should have no harmful gas, chemicals, molds and inflammable matter, explosive and corrosive medium, no big vibration and bump to the welder.

(4) Avoiding rain water. Operating in rain is not allowed.

3. MAIN TECHNICAL SPECIFICATIONS

Model	TIG130P	TIG160P
Power Supply Voltage	AC 220/230V (Single phase) 50Hz	
No-load Voltage	60-80V	
Rated Output Current	130A	160A
Rated Duty Cycle	35%	
Welding Cur. Adjusting Range	5-130A	5-160A
base Current	5A	
Initial current	15A	
crater-fill current	15A	
Pulse Width Ratio	0.5	
Pulse Frequency	0.5 - 25Hz	
Arc starting mode	high frequency arc striking	
Up-slope,Down-slope time	0-5 Sec	
After Flow Time	1 - 10 Sec	
Mass	9.8kg	9.8kg
Protection Class of enclosure	I P21S	
outline Dimensions (mm^3)	305×165×290	

4. DESCRIPTION OF THE ERECTION

a. Before welding , the operator should read the operation instructions and uses the welder correctly according to the process specification.

b. Checking the welder appearance for deformation and damage.

c. For the safety of the equipment and the persons, the customer must correctly make grounding or protecting according to the power supply system: using 4 mm^2 lead to connect the protection grounding of the welder.

d. Welding operation should be carried out in dry and good ventilating area. The surrounding objects should be not less than 0.5m away from the welder.

e. Checking the welder output connector for tightness.

f. The welder can not be moved or the cover can not be opened during the power is on and welding operation is carried out.

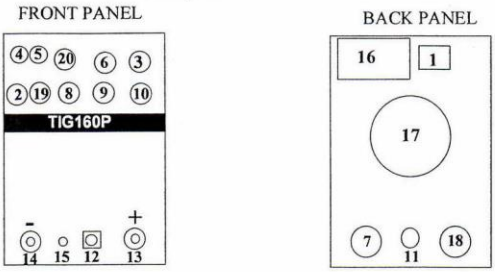
g. The welder should be cared,used and managed by specialized person.

h. Confirming that the power source is single phase and 220/230V.

It can not be connected with 380V power absolutely.

5. SKETCH OF THE PANEL FUNCTION

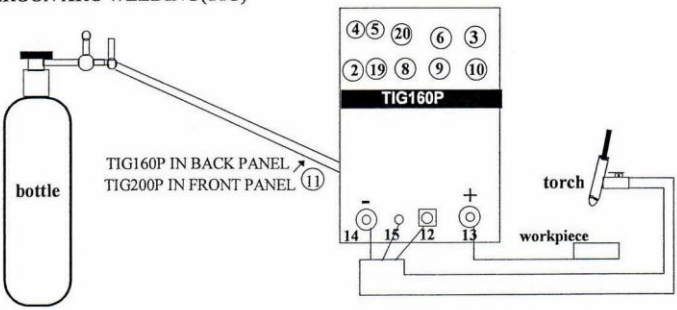
TIG130P,160P



1. power switch 2. 2steps/4steps switch .3. current regulator 4. indicating light of power
5. warning indicating light 6. (Gas)post flow 7. safety earthing column 8. pulse Freq. regulator
9. Up-slope regulator 10.Down slope regulator 11. gas inlet 12. torch control
13. output"+"14.output"-" 15. gas outlet 16. data plate
17. fan 18.incoming line of the power 19.Pulse ON/OFF switch 20.MMA/TIG switch

6.METHOD OF THE OPERATION

6.1.ARGON ARC WELDING(TIG)



6.1.1 CLEARING BEFORE WELDING

Tungsten argon arc welding is very sensitive to surface contamination of filled metal. Therefore before welding is carried out,grease, paint and coating on the surface,lubricant for machining and oxidized film should be removed.

6.1.2 DC argon arc welding(DC TIG)

Put switch"20" (MMA/TIG switch) onto the position "TIG"

(1) Connecting the gas inlet pipe to gas inlet"11" of the welder.

(2) Connecting gas inlet pipe of the welding torch to argon outlet "15" of the welder.

(3) Connecting connecter (DKJ-16)of the welding torch to output of negative pole(-)"14", connecting the workpiece to be welded to output (+)"13" of the welder.

(4) Putting the aerial plug of the welding torch in the argon arc control socket"12".

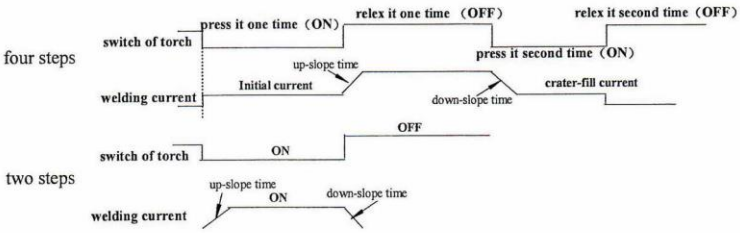
(5) Testing gas: get the power of the welder ready and switch on the power "1", open the argon bottle switch and switch on the flow meter, press the torch switch, select suitable argon flow , release the torch switch and automatically shutting off the gas in about 1 - 5 seconds.

(6) Put the"19.Pulse ON/OFF switch"on "OFF"; Regulating current knob "3". Selecting suitable welding current according to thickness of the workpiece to be welded.Selecting suitable current down slope time,current up slope time and after flow time according to the current.

(7) When high frequency arc striking is used, Tungsten electrode end is 2-3 mm away from the welding workpiece . Press the torch switch,arc striking will occur.

Notice: During welding, when the" 2. 2steps/4steps switch"on "2 steps", switch of the torch must be pressed and can not be released.otherwise the arc will be broken.

★ 2/4 steps change



(8) Releasing the switch of the torch, welding current will reduce gradually (time is adjustive by regulating down-"10". Selecting suitable down-time) and arc extinguishes.The welding torch can not be removed as soon as the arc extinguishing. Let the protection gas cooling down for the welding seam not to be oxidized.

(9) When the welding operation is finished, turn off argon bottle switch and cut off input power of the welder. Don't pull off the power plug when the switch "1" is on.

6.1.3 PULSE ARGON ARC WELDING(PULSE TIG)

Put switch"20" (MMA/TIG switch) onto the position "TIG"

(1) Put the"19.Pulse ON/OFF switch"on "ON"; Regulating current knob "3". Selecting suitable welding current according to thickness of the workpiece to be welded.

(2) Pulse frequency regulating:When the knob "8" is regulated clockwise,the frequency is high and pulse speed is high, conversely the speed is slow. The frequency changes between 0.5 - 25Hz.

(3) Base current is 5A(fixed);pulse width ratio is 0.5(fixed).Current of arc and current for arc draw back is 15A(fixed).

(4) Gas connecting and testing, arc generating and arc blowing off etc. are all the same as DC TIG welding.

6.2.Hand welding with electrode

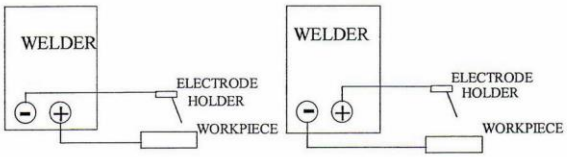
①.Put switch"20" (MMA/TIG switch) onto the position "MMA".

②.Regulating Current Knob"3" to select right welding current

select empiric formula:I=40d, d is dia. of the electrode.

③.Notice positive and negative connection during welding.

A. POSITIVE CONNECTION B . NEGATIVE CONNECTION



④ .Connecting input power for the welder, then switch on the power and current indicating light "4" is on .

⑤.Pay attention to rated welding current and rated duty cycle of the welder. Overload is not allowed.

⑥.After the welding operation is finished, let the welder be ventilated for a few minutes and then cut off the power switch.

7.ARGON TUNGSTEN DC ARC WELDING PROCESS (only for reference)

7.1 Current carrying capacity of tungsten electrode(A)

dia. of tungsten electroder (mm)	DC positive connecting			DC negative connecting
	pure tungsten	thorium tungsten	cerium tungsten	pure tungsten
1.0	20 - 60	15 - 80	20 - 80	
1.6	40 - 100	70 - 150	50 - 160	10 - 30
2.0	60 - 150	100 - 200	100 - 200	10 - 30

7.2 Relation between end form of tungsten electrode and arc stability

form	variety	current	application range	electrical arc
	cerium or thorium tungsten electrode	DC positive	narrow gap welding and sheet welding	stable
	tungsten cerium or thorium electrode	DC positive	dia. <1mm tungsten electrode continuous welding	good

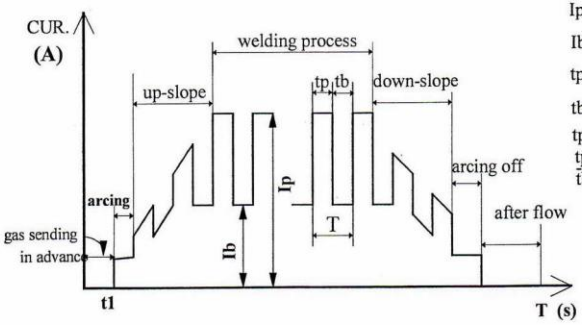
7.3 hand argon tungsten electrode welding specification for stainless steel

power polarity	thickness of sheet (mm)	curling butt connection		butt connection and filling welding wire		dia. of welding wire (mm)
		welding current(A)	Argon flow (L/min)	welding current	argon flow (L/min)	
DC positive connection	0.5	10 - 30	4	15 - 35	4	1.0
	0.8	15 - 40	4	35 - 40	4	1.0
	1.0	35 - 60	4	40 - 70	4	1.6
	1.5	45 - 80	4 - 5	50 - 85	4 - 5	1.6
	2.0	75 -120	5 - 6	80 -130	5 - 6	2.0
	3.0	110-140	6 - 7	120-150	6 - 7	2.0

8.PULSE ARGON TUNGSTEN WELDING PROCESS(only for reference)

(1) Features and application scope of the process

The pulse type argon tungsten arc welding is different from the continuous(DC) argon arc welding. The welding current is pulsed. The wave form of the current is shown in the following sketch.



Ip--pulse current

Ib--base current

tp--width time of pulse current

tb--width time of base current

tp+tb=T

$\frac{tp}{tb}$ = D pulse width

Ip and Ib and their continuous time tp and tb can be regulated according to requirements of the process. The amplitude value of electric current changes periodically with certain frequency in case of the pulse current , molten bath will be formed in the workpiece and the molten bath will be solidified in case of base current. The welding seam is formed by reciprocal overlaps . Welding heat input can be controlled by regulating pulse frequency, pulse current amplitude, size of base current, continuous time of pulse current and base current and therefore the welding seam, size and quality of the zone influenced from heat can be controlled.

(2) Advantages and application scope of pulse argon gas tungsten arc welding

a. Precisely control the size of the bath inputting heat to workpiece to increase penetration resistance of molten seam and preservation of bath. It is easy to obtain even fusing deepness. This process is specially applicable to omni - bearing welding of sheet and formation to be done with both sides through one side welding.

b. Heating and cooling of each welding point is very fast . Therefore, the process is applicable for the workpiece with great difference of heat conductivity and thickness.

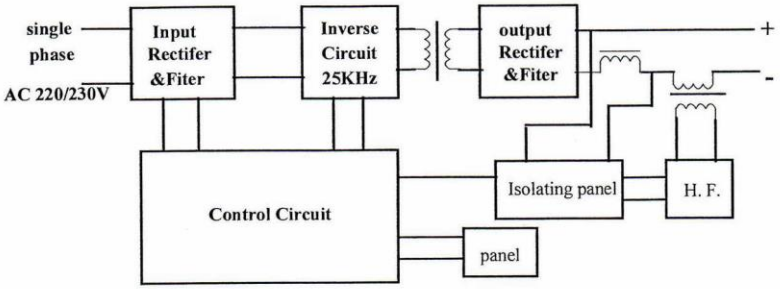
c. Pulse arc can obtain greater fusing deepness with lower heat input. Therefore, under the same condition, the zone influenced from welding heat and deformation from welding can be reduced. This is very important for sheet and ultra -thin sheet welding.

d. Fast cooling of the bath metal and short duration time of high temperature during welding can reduce cracks caused to the thermo-sensitive materials during welding.

(3) Selection of welding parameters

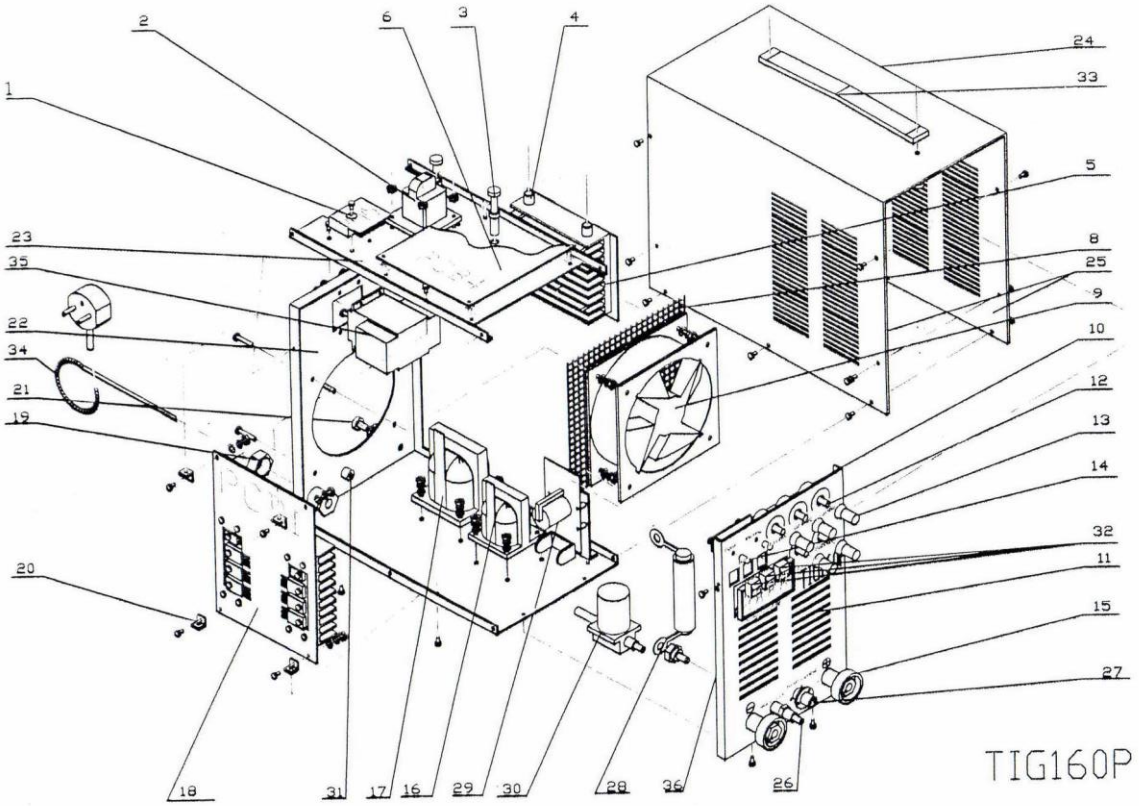
Except for pulse current and the width time(width ratio) as well as pulse frequency,welding parameters of pulse argon gas tungsten arc welding are same as general tungsten DC argon arc welding. Pulse current increasing means electric arc can obtain greater penetration ability. But too much current can cause local melting of tungsten electrode. Generally, welding current required for DC tungsten argon arc welding or greater current is used. Arc holding current(ie base current) influences cooling and crystallizing of the metal in the bath. The range is determined by performance of the welding materials.When sheet is welding, smaller arc holding current (base current) is usually used in order to reduce welding through and deformation. When pulse width ratio (holding time of pulse current and base current) is selected, both the heat input and features of pulse welding should be considered. Usually, it can be selected between 30 -60%. Selection of pulse frequency(periodical change time of pulse current) mainly depends on thickness of sheet and welding speed and operation custom of the operator should be also considered.

9. SYSTEMATIC BLOCK DIAGRAM



10. TROUBLES AND PROBLEM SOLVING

trouble	causes	problem solving
power lamp is not lit	1. No electricity at input 2. switch of welder power fails	1. Checking incoming line 2. Replace the switch
Fan not rotating	1. Fan power line is off 2. Enclosure blocks the fan due to deformation 3.The fan fails	1. Reconnect the line 2. reform the enclosure 3. replace
Warning lamp lights No output of welder	1. Overheat protection 2. Short interval of welder switching on and off 3. Welder fails	1. Welding after cools 2. Extending on-off time 3. Maintenance in manufac-turer or service center
Output current decreased	1. Input voltage is low 2. Input line is too thin	1. AC voltage stabilizer (over 5KVA) 2. Power line is thickened
Current can not be regulated	1. Connecting line of the potentiometer is off 2. Potentiometer for current regulation fails	1. Reconnecting the line 2. Replace potentiometer
High frequency arc can not be generated	1. Switch or incoming line of the torch fails 2.Interval of high frequency discharging is too big 3. Distance of the torch and workpiece is too far 4. High frequency arc generator fails	1. Replace torch switch or control incoming line 2. Regulating discharging interval to 0.8-1.0mm 3. Putting torch tungsten electrode close too 4. Replace high frequency arc generator
Arc of argon arc welding is broken or tungsten electrode is burnt	1. Argon flow is not regulated well 2. Tungsten electrode fails 3. Value of current does not match with dia. of tungsten electrode.	1 . Regulate argon flow correctly 2. replace or sharpen 3. Select tungsten tungsten electrode dia.and current correctly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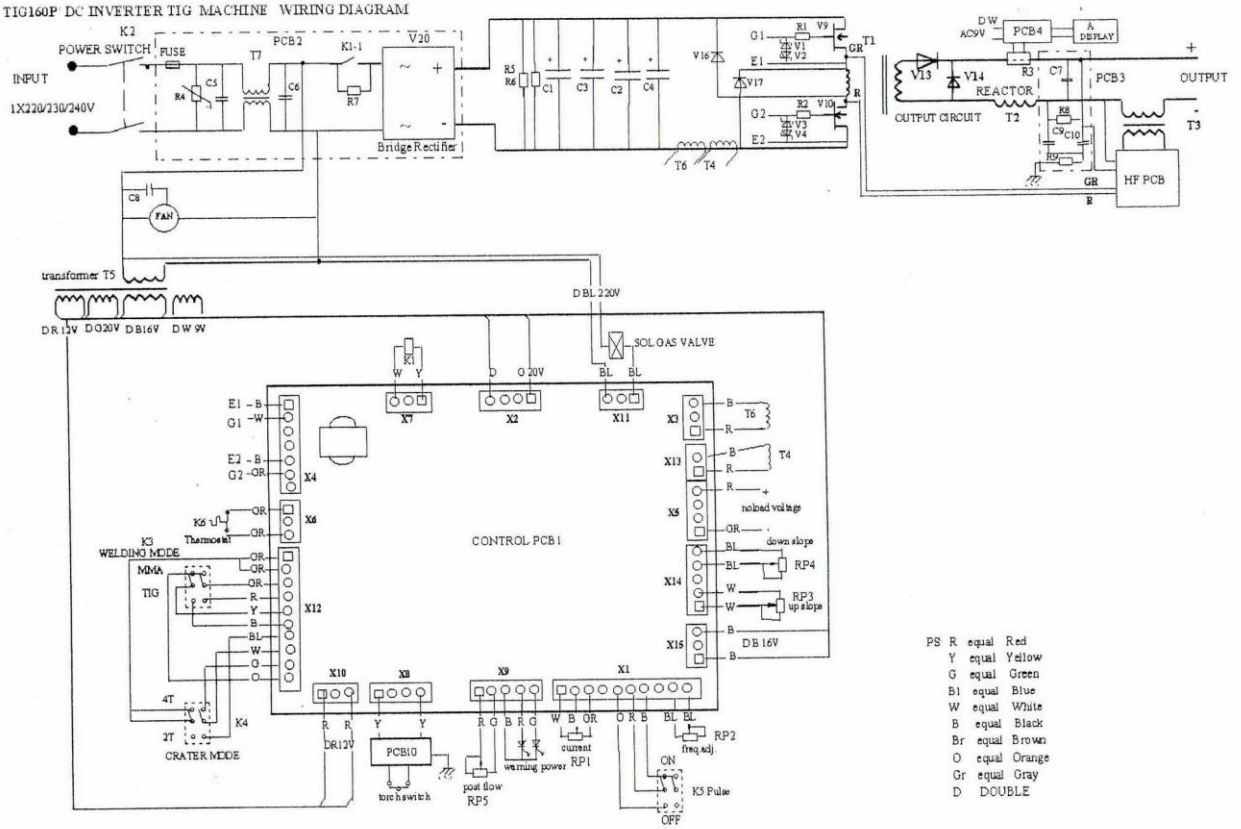
TIG160P

ITEM NO	CODE	DESCRIPTION	QTY
1	TIG160P-7	Power start board	1
2	TIG160P-8	Control transformer	1
3	TIG160P-9	Insulating Screw	2
4	TIG160P-10	Insulating Screw	2
5	TIG160P-2	Output rectifier part/Hfboard	1
6	Euro-TIG160P	Control board	1
7	TIG160P-13	Nylon flying part	4
8	TIG160P-14	Net cover of fan	1
9	TIG-160P-5	Cooling fan	1
10	TIG160P-11	Display board	1
11	TIG160P-12	Front panel	1
12	TIG160P-13	VR of current regulator	5
13	TIG160P-14	Regulator knob	5
14	TIG160P-15	Cover of display lamps	2
15	TIG160P-16	Output connectors(kjo50)	2
16	TIG160P-17	Output reator	1
17	TIG160P-18	Invert transformer	1
18	TIG160P-1	Main invert board	1
19	TIG160P-19	Cable clamp	1
20	TIG160P-20	Stand of PCB	4
21	TIG160P-21	Ground connection screw	1
22	TIG160P-22	Back panel	1
23	TIG160P-23	Partition	1
24	TIG160P-24	upper cover	1
25	TIG160P-25	Side cover	2
26	TIG160P-26	Gas outlet conector	1
27	TIG160P-27	TIG control conector	1
28	TIG160P-28	HF transformer (coil)	1
29	TIG160P-29	Gas pipe	1
30	TIG160P-30	Gas valve	1
31	TIG160P-31	Gas outlet conector	1
32	TIG160P-32	function switches	3
33	TIG160P-33	Grip	1
34	TIG160P-34	Input power cable	1
35	TIG160P-35	Power supply switch	1
36	TIG160P-36	Current mater	1

TIG160P DC INVERTER TIG MACHINE WIRING DIAGRAM



PS R equal Red
Y equal Yellow
G equal Green
Bl equal Blue
W equal White
B equal Black
Br equal Brown
O equal Orange
Gr equal Gray
D DOUBLE

NO	Mark	Description	Code OR Model				QTY				Remark
			TIG130P	TIG160P	TIG200P	MT-180	TIG130P	TIG160P	TIG200P	MT-180	
1	T1	Invert transformer	TIG160P20		TIG2000P20	TIG160P20	1		1	1	
2	T2	Output reactor	TIG160P24		TIG200P24	TIG160P24	1		1	1	
3	T3	HF transformer (coil)	TIG160P25		TIG200P25	TIG160P25	1		1	1	
4	T4	Mutual inductance	TIG160P261						1		
5	T5	Control transformer	TIG160P21						1		16V (0.5A)+20V(1A)+12V(0.5A)+9V(0.5A)
6	T6	Mutual inductance	TIG160P262						1		
7	T7	Primary inductance	TIG160P27						1		
8	V1,V3	zener Diode	1N4746						1		
9	V2,V4	zener Diode	1N4738						1		
10	V9,V10	MOSFET	IRFP460(80N60UF)				3(2)		4(2)	3(2)	
11	V13-V14	Fast resume Diode	FMS33S				3(4)		5	4	
12	V16-V17	Fast resume Diode	MUR1560						1		
13	V20	Bridge Rectifier	KBPC3510		KBPC3510	KBPC3510	1		1	1	
14	R1,R2	Resistance	15/0.5W				4		4	3	
15	R3	current divider	100A/150mA						1		
16	R4	Resistance	MYG 20K431						1		
17	R5,R6	Resistance	51K/4W						1		
18	R7	Resistance	RX21-8-100						2		
19	R8	Resistance	2W-1K Ω						1		
20	R9	Resistance	2W10Ω						1		
21	C1-C4	Electrolyucal Capacitance	470u/450V		680u/450V	560u/450V	1				
22	C5,C6	Capacitance	X2-MPX1.0uF 280VAC						1		
23	C8	Fan startup Capacitance	FRD1.0UF400VAC						1		
25	C7,C9,C10	Capacitance	472/350VAC Y1,400VAC Y2						5		
26	A	Digital meter display	DISPLAY3				1			1	
27	K1	Soft start Relay	GPF112DMFDC12V				1			2	
28	K2	Power switch	KCD11		DZ47-C40/2P	DZ47-C40/2P	1			1	
29	K3	Welding mode switch	KCD1-202						1		
30	K4	Crater mode switch	KCD1-202						1		
31	K5	PULSE SWITCH	KCD1-202						1		
32	K6	Temperature Relay	JUF6F80℃		JUF6F85℃	JUF6F80℃			1		
33	SOL	gas valve	22XD-2AC220V						1		
34	FAN	Cool Fan	145F2Y6-D-220V						1		
35	FUSE	FUSE	20A				1		2	2	
36	RP1	current reg	WX14-22K						1		
37	RP2	freq reg	--	WH5-100K	--	WH5-100K	--	WH5-100K	--	1	--	1	--	1
43	RP3	Upslope time reg	WH5-100k						1		
44	RP4	Down slope time reg	WH5-100K				--	1	--	1	--	1
45	RP5	post flow time reg	WH5-100K						1		
46	LED1	power(green)	BT203-1						1		
47	LED2	warning(red)	BT203-2						1		
48	PCB1	control pcb	WSM-2X7						1 set		
49	PCB2	INPUT EMS PCB	TIGRQD						1SET		
50	PCB3	OUTPUT EMS PCB	TIGOUT						1SET		
51	PCB4	DISPLAY PCB	7805						1set		
52	PCB10	EMI board	CONTRX						1 set		
53	HF PCB	HF portfire board	1009C						1set		

11.ACCESSORIES:SEE PACKING LIST,PLEASE

PACKING LIST

★★★★★★★★★★★★★★★★★★★★★★★★★

TIG 160P Welding machine	1	
300A Ground pliers+3m 16mm^{2}cable	1	
TIG welding torch	1	
300A Welding clamp+3m 16mm^{2}cable	1	
gas inlet pipe	1	
Operation instructions	1	
Certificate of quality	1	

No.

Name of product: PULSE TIG WELDING

Type of product: TIG 160P

Packing No: _____

Test results of this welder fulfils_____

_____**technical requirements and its release**

from the works is granted.

Inspector_____ **Date**_____