CO2/MAG WELDER

OMEGA 350C/500C

OPERATION MANUAL

SAMSUNG - WEL SAMSUNG wel-tech

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◀ Guarantee Certificate ▶

The warranty of products shall confirm to the specification set forth in the article 2 'Configuration and Specification" for 12 months from the date on Bill of Lading.

The extent of seller's liability under this warranty shall be limited to the repair or replacement as herein provided of any defective parts thereof.

The warranty does not extend to following occasion:

-subjected to mis- use, neglect, accident or abuse
-improperly repaired, installed, transported, altered or modified
-used in violation of instructions furnished by user's manual

Warranty Card.

Model		
Serial No.		
Manufacture Date		
Ship Date		
Seller's Name	SAMJIN WEL-TECH	
Client Name	Company	
	Person	

1.Warranty period is 12 months From the date on Bill of Lading.

2.Except For the express limited warranties set forth in this guarantee certificate, SAMJIN WEL-TECH has no other liability.
Certified by SAMJIN WEL-TECH

* Note:

The 'Guarantee Certificate' shall practically be effected with seller's signature after fill in blank of Warranty Card.

Users has to pay attention to the subjects set forth Article 3 'Installation* when installing the main power units and accessories.

SAMJIN WEL-TECH has no liability of accessories, which are consumable and not to manufactured by SAMJIN.

◀ CONTENTS ▶

Before using welding machine, users have to read the all contents described by manual to have better quality of weld, and to reduce maintenance works.

1. Product Introduction

SAMJIN WEL-TECH, Inverter C02/MAG ARC Welding Machine sustains excellent stability under the changes of input power or surrounding temperature by using I.G.B.T, and covering from thin plate to thick plate through very stable ARC and minute adjustment due to welding parameter, and it is suitable in automatic welding and high-speed welding.

2. Configuration and specification

2-1. Configuration

Item \ Type	350 C	500 C
Input voltage	AC 220V/AC 415V 1/3 Phase	
Input power	16 KVA	26.5 KVA
Frequency	50/60HZ	
Output current	50- 350A	60-500A
Max. no-load voltage	61V	70V
Load voltage	16-36V	16-42V
Use rate	40%	40%
Dimension (WXDXH)	380 x540 x 600	410 x 620 x730
Weight	50kg	62kg

2-2. Standard Specification

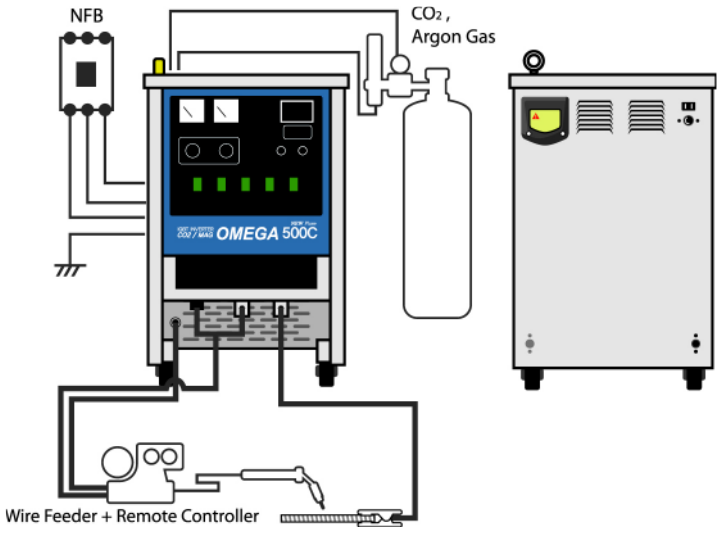
Type \ Name	350 C	500 C	Q'ty
Welding power	DC 350A	DC 500A	1
Wire feeder	Φ (0.9)1.2	Φ (1.2)1.6	1
Torch	350A, 3M	500A, 3M	1
Gas gage	C02, Argon (110V)	C02, Argon (110V)	1
Welding cable	5M	5M	1
Base metal cable	38SQ, 3M	60SQ, 3M	1
Tip	Φ (0.9)1.2	Φ (1.2)1.6	3
Gas diffuser	350A	500A	3
Insulator	350A	500A	3
Nozzle	350A	500A	3

2-3. Electrical apparatus

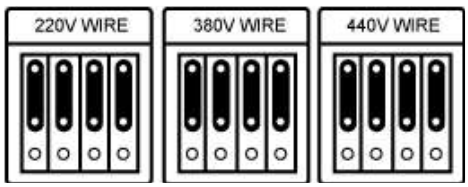
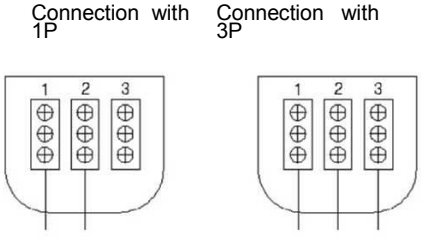
Item \ Type	350 C	500 C
NFB	50A	75 A
1st cable	10SQ or above	16SQ or above
Grounding cable	5.5 SQ or above	

3. Installation

3-1. Installation Diagram



Flg1. Full Installation Diagram

Voltage selection	
Single phase / Triple phase connection	

3-2. Location of installation

1)Keep wall side clearance of more than 30cm in dry room.

2)The area with no direct ray of sun, or no wind and rain.

3)The area where the surrounding temperature is in -10~40°C range.

4)The altitude of the location shall not higher than 1000m above the sea level.

3-3. Cautions in grounding

1)The welder must be grounded, or electrical current of the case causes the unstability of operation and accidents.

2)Connect grounding conductive cable which is 10SQ or more to the grounding terminal which is marked "Grounding". During the grounding work, make sure to off the on/off switch in the switch board, and afterward connect the ground cable.

3)When the base metal is placed on insulator such as wood, the base metal must be grounded.

4)When there swimming pool or pond between the earth of power source switch board and the earth of welder, leakage current may flow to the pond or swimming pool. So in such place, please connect grounding to both grounding points in parallel so that the leakage current flow through the cable.

3- 4. Capacity of power facility

Please use this welding machine at a rated input voltage. Since the welder is installed with a building- out network for input voltage, it will operate normally within a range of ±10% of the input voltage. Any excessive input of voltage beyond the allowance can result in failure.

3-5. Ventilation

CO2 arc-welding resolves shield gas, CO2 in high temperature and produces few carbon monoxide, Therefore, please ventilate properly when welding is carried out in a small space.

3-6. Carbon dioxide

Please use KS No.3 or the one specified for welding.

3-7. Connection of electrical sys (Off the on/off switch in the switchboard)

Even one point of defective connection may cause unsatisfactory welding quality. Please tighten the connection cables firmly with tool.

1)Connection of input power : Please connect referring to the Fig. 1. Install NFB for your safety. When you install the electric leafage breakers, please install the one which can detect more than 30mA.

2)Connection of output : Referring the Fig 1, please connect the torch to (+), base metal to (-).

3)Connection of control cable: Connect the control cable to remote terminal in order to control welding wire feeder and remote control box.

4)Ground: Ground terminal is behind of the inverter welder. The connection cable shall be 10SQ or above.

5)When it is used with engine generator, please use bigger engine generator than the one specified in 2- 2.standard specification. Unstable output power voltage may cause the stop by activating the abnormal voltage detection circuit of welder. And please start the engine generator when the power switch of welder is off mode. An instant applying of excessive voltage may cause malfunction of welder.

3-8. Gas Connection

1)Connect CO2 gas to pressure regulator.

2)Connect outlet hose of gas pressure regulator to the gas inlet behind of in the welder.

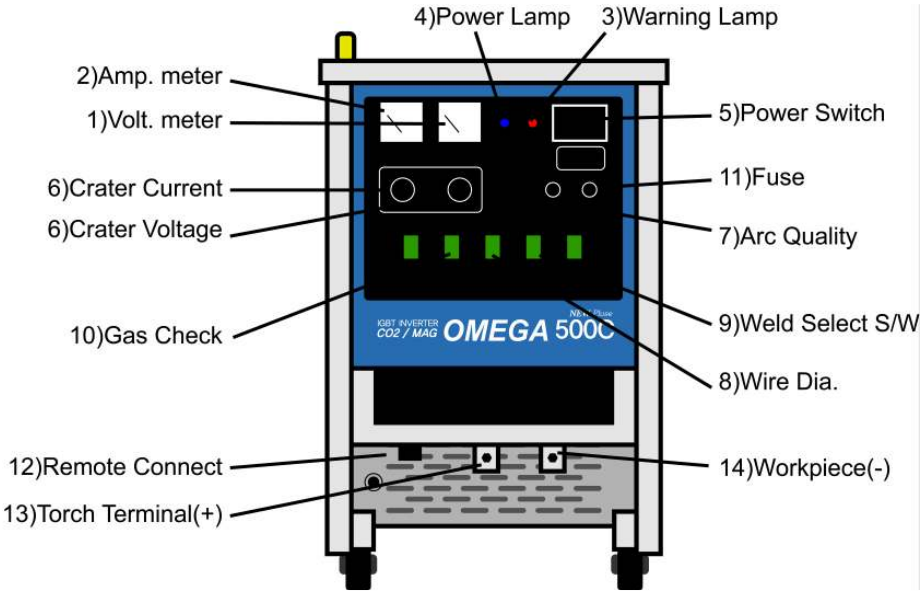
3)Connect the heat plug of gas pressure regulator to the dedicated receptacle behind of the welder. (The receptacle is dedicated to pressure regulator)

4)Install the gas container in the place where is no direct ray of sun. And it is recommended to fix it to a supporter for safety.

5)For the good welding quality, please use high purity gas.

4. Handling and operation

4-1. Front panel and name



4-2. Function and explanation

1)Voltmeter (Voltage): It will work at the time of no-load or when the welding machine is put in operation.
2)Amperemeter (Current): It will operate only at the time of welding (not work at the time of no-load)
3)Warning lamp (Error)
①Abnormal power: In case input voltage drops below 20% of the standard voltage, lamp will be turned on (stop)
②Overload: It will be turned on (stop) when welding current rises sharply
③Abnormal temperature: The temperature inside the machine reaches above 85℃, it will be turned on; in case the warning lamp is turned off after a certain period of time, the machine will be operative for use.

4)Power lamp (power): It shows that power is supplied to the welding machine.

5)Power switch (power): The switch turns on and off the welder and it will shut off in case of overload.

6)Crater voltage, current: When Weld Select Switch is set to Crater, it will be adjustable. Please refer to Welding Chart (chapter 8) for welding conditions.

7)Arc quality: Depth of weld penetration in base metal, height and width of weld bead can be adjusted depending on length of arc, current, and voltage.

Scale	Amount of Weld penetration of welding rod	Height of weld bead	Width of weld bead
0~ 6	Getting larger	Getting lower	Getting wider
0~ −6	Getting smaller	Getting higher	Getting narrower

8)Wire diameter select switch

Welding current (A)		100	150	200	250	300	400	500
Diameter of wire (Φ. mm)	0.8- 1.0	----------						
	1.2		----------	----------	----------			
	1.6				----------	----------	----------	----------

9)Weld select switch
A)When there is no crater - It is operative only when torch switch is set to ON.
B)When there is a crater - Welding current start to flow when torch switch is turned on, and the welding current keeps running even if the current is off; once the switch is turned on again, the crater current begins to run, and when the switch is off, the welding is terminated.

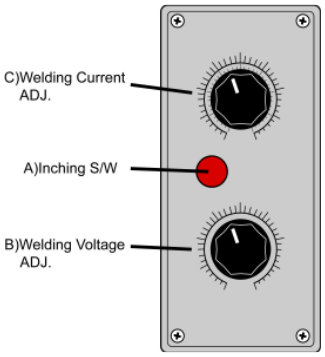
10)Gas check : Gas check/welding

11)Fuse: It protects PCB (3A) and Motor (10A). Please use a fuse that meets standard requirements.

12) Remote connector: It is to be connected with remote control box.

13) Torch terminal (+): It is to be linked to the torch terminal of wire feeder.

14)Earth terminal (-): It should be connected to base metal



Remote control box

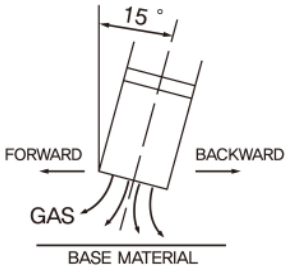
A) Inching: Switch that feeds wire up to the tip of torch at the time of replacing welding rod

B) Welding voltage: Welding voltage can be adjusted.

C) Welding current: Welding current can be adjusted.

4-3.Cautions in handling

1) Torch angle by welding direction Incline the torch 10-15° toward the welding direction, and afterward you can weld by 'forward method", or 'Backward method" In general, "Forward method' is used considering with the friction of arc and protection of welded surface by gas.



2) Welding torch

If the welding torch is bent excessively, smooth wire feeding is not available, and welding condition is damaged due to reduced current. Please do not bend cable forcefully.

3)Standard use rate

Use rate	350C	500 C
60%	350A	500A
70%	320A	440A
80%	280A	380A
90%	240A	340A
100%	200A	300A

5. Safety instruction

1)Power source device : Install one on/off switch for one welder.

2)Terminal connection : Fasten the connection part for smooth current carrying in welding. Loose fastening may cause cable damage or wasting power.

3)Ground : Apply class 3 grounding

4)Surrounding environment : Please avoid the location where moisture and dust is too much, and surrounding temperature is too high. Select place where air is ventilated well. Especially, ventilation relates to the use rate.

6. Maintenance and inspection

Input power switch must be OFF when internal and external terminal are checked. The condenser of welder internal circuit is charged, so please wait 5 minutes after completing welding work, and afterward open the case and check.

6-1. Check items by time

Before welding	1)Does the switch work well ? 2)Does the cooling fan works well according to the On and Off mode, and is the air well ventilated to forward? 3)Is there any abnormal vibration, noise or smell? 4)Any thing wrong in weld cable and connecting area? 5)Is there any defective insulation on cable?
3-6 month	1)Remove dust : Remove dusts by blowing out dry compressed air. Especially, transformer, reactor and semiconductors shall be cleaned carefully. 2)Check of electrical contact area : Fasten bolts tightly and remove foreign material such as rust with file or sand paper so that sufficient contact is available between metals. 3)Check if ground is done well.
Annual total maintenance	1)Based on maintenance schedule, replace expendable supplies, repair case and reinforce worn cables. 2)Insulation resistance shall be 1 mega ohm or above, or maintenance and repair are required.

7. Trouble shootings

Step	Phenomenon	Reason	Remedy
1	Power lamp id not tuned on when power switch is ON.	Poor lamp	Replace lamp
		Poor contact of the 1st *put part	Contact test
		Poor fuse	Replace fuse
		Poor NFB	Replace NFB
2	Only FAN works	Poor torch switch	Replace torch switch
	Power lamp is on. but fan does not work.	Poor fan motor	Replace fan motor
3	Gas do not come out	No gas or no connection	Check and replace
		Poor solenoid valve	Replace valve
		Defect in control PCB	Request A/S
		Poor torch switch	Replace torch switch
4	Gas comes out continuously	Gas comes out even if power is off.	Remove foreign material from valve
		Poor solenoid valve	Replace valve
		Defect in control PCB	Request A/S
		Poor torch switch	Replace torch switch
5	Weld wire is not fed even though inching switch is pressed	Poor motor fuse	Replace fuse
		Poor motor	Replace motor
		Poor PCB relay	Replace relay
	Wire is not fed when torch switch is ON	Poor torch switch	Replace torch switch
		Poor PCB	Request A/S
6	Voltage and current are not adjustable	Poor remote contact	Check and replace
		Poor control volume	Replace
		Poor PCB	Request A'S
7	Under no- load condition, voltage meter does* not work and no arc	Poor torch switch	Replace torch switch
		Poor PCB	Request A/S
	Under no- load condition, voltage meter works but no arc	Broken torch cable	Replace torch cable
		Poor contact of earth able	Check
8	Crater is not controllable	Poor control volume	Replace
		Poor PCB	Request A/S

8. Weld condition

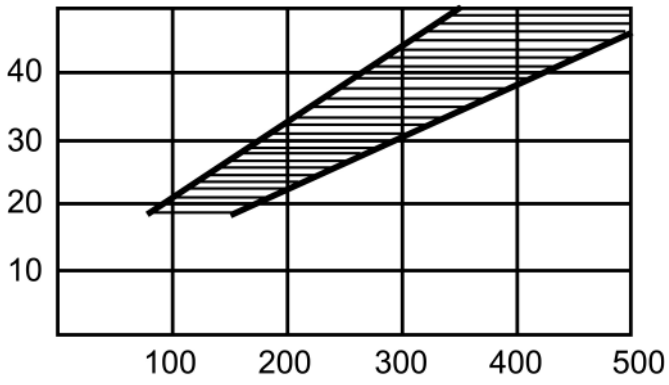
8-1. In case of improper welding conditions

Reason	Remedy
Arc length is growing. Particle of spatter becomes bigger. Bead width is widening. The length and height of weld penetration become smaller.	Arc voltage is too high.
Wire sticks to the base metal and too many spatters. Bead width becomes narrow. The depth and height of weld penetration becomes bigger.	Arc voltage is too low.
Particle of spatter becomes smaller. Bead width is widening. The depth of weld penetration becomes bigger.	Welding current is too high.
Bead width becomes narrow. The length and height of weld penetration become smaller.	Welding speed is fast.
Particle of spatter becomes smaller the number of spatter decreases. The depth and height of weld penetration becomes bigger.	Current density of wire is high.

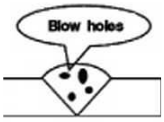
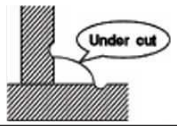
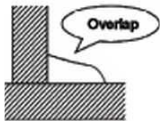
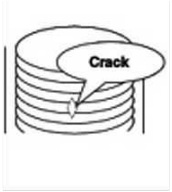
8-2. Clearance between base metal and tip

Wire diameter (mm)	Clearance (mm)
0.9- 1.0	10 -15
1.2	15- 20
1.6	25- 30

8-3. Relation between weld current and voltage



8- 4. Reasons and remedy for defects of CO2 welding

type	Main reason	Remedy
1. Blow holes 	1)No feed gas comes out 2)Air mixed in feed gas 3)Insufficient coating effect due to strong wind 4)Carbon dioxide soaked in 5)Foreign material in welding part 6)Nozzle diameter is too small Arc Is too long	1)Check the gas cylinder, valve and pressure regulator 2)Check the connection part of gas tube 3)Make measure for wind m wind speed 2m/s or more Remove spatter from the nozzle 4)Use gas of welding purpose 5)Clean the welding area Remove feed oil from roller and wire 6)Select proper nozzle diameter 7)Lower voltage
2. Under cut 	1)Wrong grounding location 2)Welding speed is too fast 3)Arc length is long 4)Welding current Is too much	1)Ground onto the first location 2)Slower the welding speed 3)Keep arc length short 4)Select proper welding current
3. Over lap 	1)Too low arc voltage comparing to welding current 2)Welding speed is low	1)Raise arc voltage 2)speed up the welding speed
3. Curve bead 	1)wire pressurizing lever does not work 2)Distance between tip and the base metal is too far. 3)Tip mounting is not proper 4)Wire bent 5)Tip is worn out	1)Adjust control screw of pressurizing lever 2)More than 10-15 times of wire diameter 3)Adjust mounting angle in order to go into the wire guide directly 4)Straighten wire 5)Replace contact tip angle
3. Crack 	1)Improper welding conditions (high current, high speed) 2)Wire approaching angle is too small 3)Too much containing of carbon and other metals in the base metal 4)Too much moisture in gas 5)Quick electrical break of arc in crater	1)Set proper condition (Raise voltage, slow speed) 2)Increase wire approaching angle 3) Preheating and after- heating Treatment 4)Use gas of welding purpose 5} Treat with crater (add up enough deposition metal)

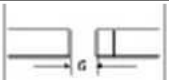
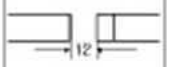
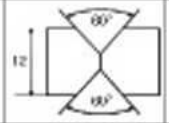
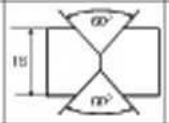
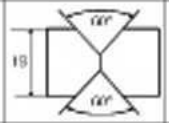
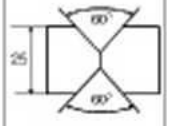
8-5. CO_2 (semi)auto weld condition

1)form butt weld

a) Short ARC weld

Thickness (mm)	Gap (mm)	Wire dia.(mm)	CT (A)	Volt (V)	Weld speed (cm/min.)
1.6	0	0.8~1.0	90	18	45
2.0	0.5	0.8~1.0	100	18	50
2.3	1.0	0.8~1.2	120	19	55
3.2	1.2	0.8~1.2	140	19	50
4.5	1.5	1.2	160	23	50
6.0	1.5	1.2	260	26	50
8.0	1.5	1.2	320	32	50

b) Hi- Current weld

Thickness (mm)	Improved	Pieces	Wire dia. (mm)	Weld condition		
				CT(A)	Volt (V)	SP (cm/min)
6		2	1.2 1.2	190 210	19 20	25
9		2	1.6	340 360	33.5 34	50
12		2	1.6	430 450	36 37	50
12		2	1.2	310 330	32 33	55
16		2	1.6	410 430	34.5 36	45
19		2	1.6	470 490	37 38	43
25		2	1.6	480 500	38 39	40

2) horizontal fillet weld

Thickness (mm)	Width (mm)	Wire dia. (mm)	Weld current (A)	Weld voltage (V)	Weld speed (cm/min)
1.2	3.0	0.8~1.0	100	19	50
1.6	3.0	0.8~1.2	120	20	50
2.0	3.0	0.8~1.2	130	20	50
2.3	3.5	1.0~1.2	140	20.5	50
3.2	4.0	1.0~1.2	160	21	45
4.5	4.5	1.2	230	23	55
6.0	6.0	1.2	290	28	50
8.0	8.0	1.2	320	32	55

3)Vertical down fillet weld

Thickness (mm)	Weld width (mm)	Wire dia. (mm)	Weld current (A)	Weld voltage (V)	Weld speed (cm/min)
1.6	3.0	0.8~1.0	130	20	50
2.0	3.0	1.0~1.2	130	20	45
2.3	3.0	1.0~1.2	140	20.5	45
3.2	4.0	1.0~1.2	170	21	45
4.5	4.5	1.2	230	23	50
6.0	6.0	1.2	290	28	50
9.0	7.0	1.2	330	33	45
12.0	11.0	1.6	400	38	25

4)Edge weld (thin steel plate)

Plate thick (mm)	Wire dia. (mm)	Current (A)	Voltage (V)	Speed (cm/min)	Tip/Base M (mm)	Gas volume (ℓ /min)
1.6	0.9	65~75	16~17	40~	10	10~15
2.3	0.9	80~100	19~20	40~	10	10~15
3.2	1.2	130~150	20~22	35~	10~15	10~15
4.5	1.2	150~180	21~23	30~	10~15	10~15

5)CO2 ARC for welding wire (solid wire)

Type	Impurities					Uses	Wire dia. (mm)
	C	Si	Mn	P	S		
KC- 25	0.10	0.22	0.62	0.015	0.009	Mild steel hi- tension weld	0.8, 0.9
KC- 26	0.10	0.45	0.98	0.013	0.010		1.0, 1.2
KC- 28	0.11	0.82	1.45	0.014	0.016		1.6

6)horizontal fillet weld(thin steel plate)

Plate thick (mm)	Wire dia. (mm)	Current (A)	Voltage (V)	Speed (cm/min)	Tip- base M (mm)	Gas volume (ℓ /min)
0.8	0.9	60 ~70	16 ~17	40 ~45	10	10~15
1.2	0.9	80 ~ 90	18 ~19	40 ~50	10	10~15
1.6	0.9	90 ~110	19 ~20	45 ~50	10	10~15
2.3	0.9	100 ~130	20 ~21	45 ~50	10	10~15
2.3	1.2	120 ~150	20 ~21	45 ~50	10	10~15
3.2	1.2	150 ~180	20 ~22	45 ~50	10 ~15	10~15
4.5	1.2	200 ~250	24 ~26	40 ~50	10 ~15	10~15

8-6. MAG (semi)auto weld condition

1)Vertical down butt weld

Thickness (mm)	Gap (mm)	Wire dia. (mm)	Current (A)	Voltage (V)	Weld speed (cm/min)
0.4	0	0.4	20	15	40
0.6	0	0.4~0.6	25	15	30
0.8	0	0.6~0.8	30~40	15	40~55
1.2	0	0.8~0.9	60~70	15 ~16	30~50
1.6	0	0.8~0.9	100~110	16~17	25~60
3.2	1.0~1.5	0.8~1.2	120~140	16~17	25~30
4.0	1.5~2.0	1.0~1.2	150~160	17~18	20~30

2)Horizontal fillet weld

Thickness (mm)	Width (mm)	Wire dia. (mm)	Current (A)	Voltage (V)	Weld speed (cm/min)
0.6	2.0	0.4~0.6	30~40	14	40~50
1.0	2.0'2.5	0.6~0.8	40~60	14~15	40
1.6	3.0	0.6~0.8	90~100	15~16	40~55
2.4	3.5	0.8~1.0	110~120	16~17	35~40
3.2	4.0	0.8~1.2	~135	17~18	35~35