



INVERTER GAS SHIELDED MIG WELDING MACHINE

OPERATION MANUAL

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Safe Item

Please do the best safeguard when operator does the welding work, welding work will be bringing the harm to you and others. Regarding the detailed information regarding the accident when welding, please check the manual carefully.

There is necessary to have a train for the welding work operator, in order to use this machine safely.

- using the necessary and good quality safeguard dressing.
- operator should be the person who has enough welding skill and ability to operate the machine.
- please cut off the power connection when they maintain and repairing being in.

Electric shock ----- it would be issuing the deeply harmful, even die.

- please connect and assemble depending on the application standard.
- please do not touch the electriferous elements when you keep your skin bareness, dressing the wet gloves or wet clothes.
- please make sure that you, ground and working material would be isolated.
- please make sure your working position is in safe situation.

Fume ----- may be harmful for your health

- please keep your head out of the smoke avoid to take in the welding fume.
- while welding working, please keep the ventilation running well, in order to keep the working condition well for surrounding air.

Arc light radiation ----- may be harmful for your eyes and burn your skin

- please use the qualified welding mask, dressing the safeguard clothes, to keep your eyes and body in safe situation.
- please use the suitable mask and curtain to keep the onlookers in healthy situation.

Fire hazard

- welding spark would issue the fire, please make sure there is no combustibles thing nearby welding place, and also there is necessary to do the fire protection.
- to be making sure the fire unit near the place of welding and confirm there is at least one person could use the fire unit.

Noise ----- more noise would be harmful for hearing.

- protection your ears, please wear the necessary unit to protect your ears from harmful noise.
- please warn the onlookers, noise would hurt their hearing.

Product Brief

INMIG IH gas shielded welding machine is the inverter welding machine with the international advanced inverter technology.

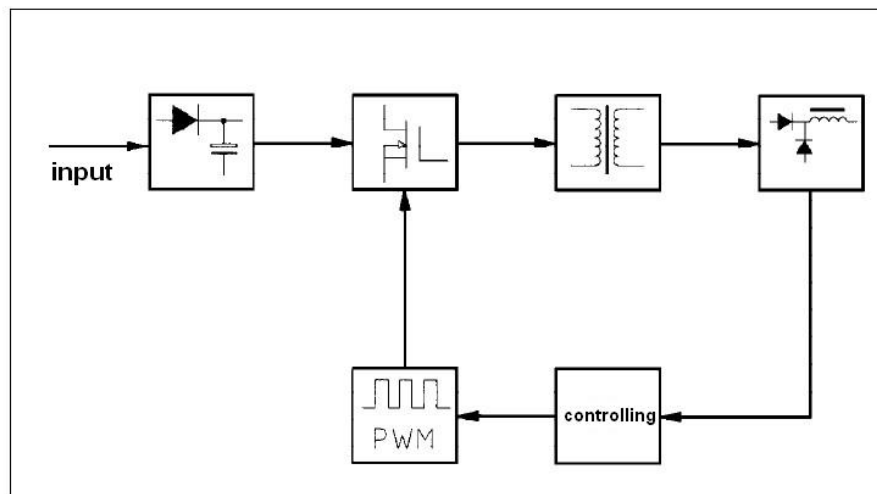
The general principle of it is to make the 50Hz/60Hz AC current into DC current, and make the DC current into high frequency AC current basing on the high power electronic element IGBT, whose frequency could be 20KHZ, reducing voltage and rectification.

Character:

1. IGBT inverter technology, current controlling model, high quality, steady properties.
2. constant voltage output, high adaptability for electricity network ($\pm 15\%$)
3. electronic inductor controlling, less splash, deep weld pool and good forming
4. Hot start with slow wire feeding, welding with globule wiping off, high hot start success rates.
5. suitable for 0.8mm thickness welding material
6. small size, light weight, simple operation

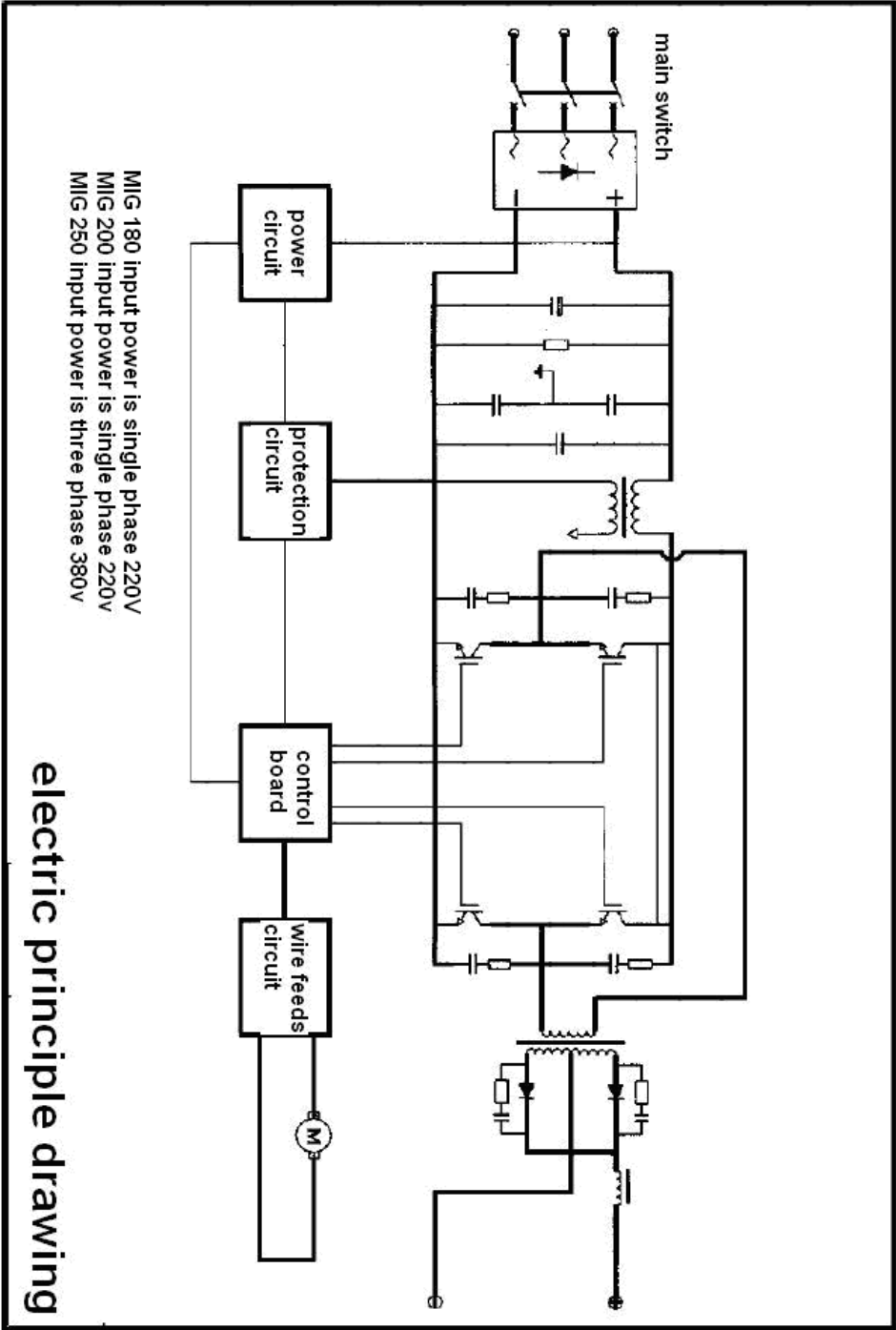
The efficiency of machine would be above 85%, and machine would be with energy conservation function

Drawing



Parameter

Parameter	INMIG 250 IH
Input power	Three phases 380V +/-15% 50/60 HZ
Input current (A)	14
Power capacity (KVA)	9.2
Current adjustment range (A)	50-250
Output voltage (V)	15-29
Duty cycle (%)	60
Power factor	0.85
Efficiency (%)	85
No Load Voltage	55
Wire feeder model	INSIDE
Post blow time (S)	1 +/-0.5
Roller diameter (mm)	270
Welding wire diameter (mm)	
Welding thickness (mm)	> 0.8
Isolation class	F
Protection class	IP21
WEIGHT	18



Assemble

Wire connection

1. input wire connection

There is a power wire for each machine.

180/200's power wire should be connecting to AC 220V; 250's power wire should be connecting to AC 220V, there is no phase order for three wires.

2. output wire connection

Please connect the gas cylinder which is with the gas gauge to the CO2 enter door at the rear of machine through gas tube.

Please connect the quick connector of grounding wire to the corresponding quick joint of the machine; other end of grounding wire should be connecting to the working piece.

Please connect torch to the joint of wire feeder and fasten it, and put the welding wire into torch.

3. roller assemble

Please put the roller which is with welding wire on the axle of wire feeder; please make sure the roller is put right and stable.

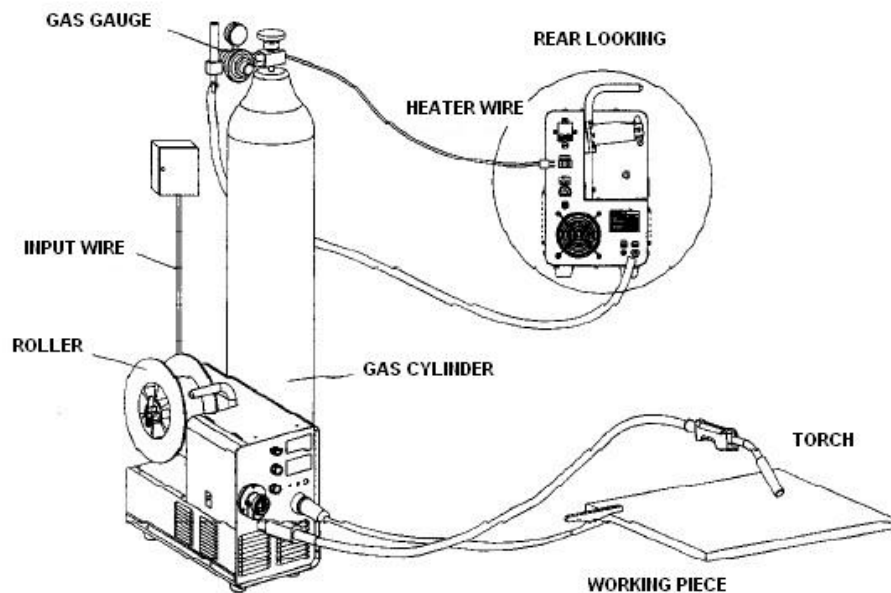
Please choose the right roll for the welding wire.

Release the the roll pinch, put the wire in groove, adjust the roll pinch to press the wire, in order to keep the wire stable in groove, but the pressure could not be big for wire feeding.

Roll should be running with clockwise to release the wire.

Please choose the dimension of roll basing on the dimension of wire for welding

Please touch the button to feed the wire out of torch



Gas cylinder assemble

Please connect the gas cylinder which is with the gas gauge to the CO2 enter door at the rear of machine through gas tube , and fasten it by gas tube lock.

Please pay attention:

1. Please keep the gas cylinder far from high temperature area, and all possible high temperature places, in order to avoid increasing the gas pressure for accident.
2. Please fasten the joint of gas cylinder, keep the gas not go out of cylinder.
3. Please do not kick gas cylinder and lie down the gas cylinder.
4. Please turn off the gas cylinder when there is no any person in front of the gas gauge.
5. Please connect the heater power stock to the machine rear – 36vac connector.
6. Gas gauge should be assembled in upright situation; otherwise it cannot show the parameter correctly.
7. Please choose the right gas gauge
8. Please keep the gas cylinder connector clean to protection the gas gauge goes well.

Please dressing the mask when you do the welding work.

Operation

1. Please turn on the the gas switch of welding machine, open the valve of the gas cylinder, and adjust the gas gauge to the ideal parameter.
2. Please choose the torch tip basing on the welding wire.
3. please adjust voltage and current basing on the work piece
4. Inductance adjustment could be helpful for electric arc' strength, soft or hard.
5. push the button of torch to begin the welding work

Welding current adjustment

Welding current and electric arc voltage would be very important for the welding stability, welding quality and production efficiency. In order to make sure the welding quality, please adjust the parameter of welding current and electric arc inductance well, usually, it would be chosen basing on the welding wire diameter and production efficiency.

Please check the common parameter list below for the welding current and electric arc:

Welding method	Thin wire co2 welding	Thick wire co2 welding	Thick wire big current co2 welding
CO2 flow parameter (L / min)	5-15	15-25	25-50

CO2 welding current and voltage scope

Welding wire diameter (mm)	Short cut transition		submarine-launched transition	
	Current (A)	Voltage (V)	Current (A)	Voltage (V)
0.6	40-70	17-19	160-400	25-28
0.8	60-100	18-19	200-500	26-40
1.0	80-120	18-21	200-600	27-40
1.2	100-150	19-23	300-700	28-42
1.6	140-200	20-24	500-800	32-44

Welding speed choice

This should be adjusted for the welding quality and production efficiency. If the welding speed was faster, protection effect would not be good, cooling speed should be bigger, the result is the welding crack's forming would not be good and it would not be well for welding forming. If the welding speed was slower, it would be very easy to burn through the work piece and to make welding crack structure bigger and more rough. In real situation, welding speed would not be faster than 30m/hour.

Welding wire extension length

Welding wire extension length's increasing would be helpful for welding wire fusion quicken and increase the production efficiency. If the extension would be bigger, welding wire would be very easy to welding break, bigger splash, and make the welding process not steady. Usually, the length of welding wire should be the ten times longer that the diameter of welding wire.

CO2 gas flow parameter choice

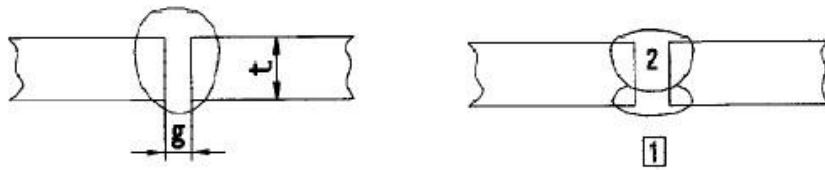
Mainly considering the effect of protection. And, inside corner protection would be better than the outside's.

Welding parameter list

Welding current and arc voltage will be the key point for the welding stability, welding quality and production efficiency. To keep the good welding quality, it should be a good collocation between welding current and arc voltage. It should be choosing basing on the diameter of welding stick and production efficiency.

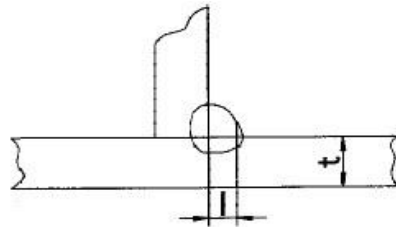
The checking the list for the welding current and arc voltage for regular using

1.1 butt welding



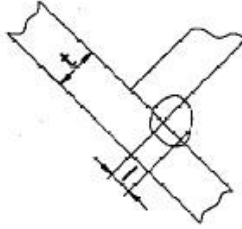
thickness t (mm)	gap g(mm)	welding stick diameter φ (mm)	welding current (A)	welding voltage (V)	welding speed (cm/min)	gas flow (L/min)
0.8	0	0.8~0.9	60~70	16~16.5	50~60	10
1.0	0	0.8~0.9	75~85	17~17.5	50~60	10~15
1.2	0	1.0	70~80	17~18	45~55	10
1.6	0	1.0	80~100	18~19	45~55	10~15
2.0	0~0.5	1.0	100~110	19~20	40~55	10~15
2.3	0.5~1.0	1.0or1.2	110~130	19~20	50~55	10~15
3.2	1.0~1.2	1.0or1.2	130~150	19~21	40~50	10~15
4.5	1.2~1.5	1.2	150~170	21~23	40~50	10~15

2.



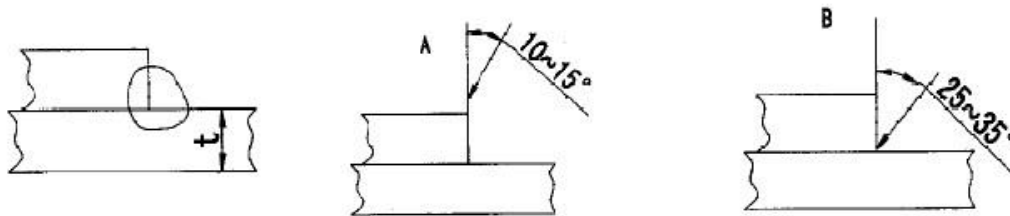
thickness t (mm)	fillet weld size g(mm)	welding stick diameter φ (mm)	welding current (A)	welding voltage (V)	welding speed (cm/min)	gas flow (L/min)
1.0	2.5~3.0	0.8~0.9	70~80	17~18	50~60	10~15
1.2	2.5~3.0	1.0	70~80	18~19	50~60	10~15
1.6	2.5~3.0	1.0~1.2	90~120	18~20	50~60	10~15
2.0	3.0~3.5	1.0~1.2	100~130	19~20	50~60	10~20
2.3	2.5~3.0	1.0~1.2	120~140	19~21	50~60	10~20
3.2	3.0~4.0	1.0~1.2	130~170	19~21	45~55	10~20
4.5	4.0~4.5	1.2	190~230	22~24	45~55	10~20

3.



thickness t (mm)	fillet weld size g (mm)	welding stick diameter φ (mm)	welding current (A)	welding voltage (V)	welding speed (cm/min)	gas flow (L/min)
1.2	2.5~3.0	1.0	70~100	18~19	50~60	10~15
1.6	2.5~3.0	1.0~1.2	90~120	18~20	50~60	10~15
2.0	3.0~3.5	1.0~1.2	100~130	19~20	50~60	10~20
2.3	3.0~3.5	1.0~1.2	120~140	19~21	50~60	10~20
3.2	3.0~4.0	1.0~1.2	130~170	22~22	45~55	10~20
4.5	4.0~4.5	1.2	200~250	23~26	45~55	10~20

4.



thickness t (mm)	welding position	welding stick diameter φ (mm)	welding current (A)	welding voltage (V)	welding speed (cm/min)	gas flow (L/min)
0.8	A	0.8~0.9	60~70	16~17	40~45	10~15
1.2	A	1.0	80~100	18~19	45~55	10~15
1.6	A	1.0~1.2	100~120	18~20	45~55	10~15
2.0	A or B	1.0~1.2	100~130	18~20	45~55	10~20
2.3	B	1.0~1.2	120~140	19~21	45~50	10~20
3.2	B	1.0~1.2	130~160	19~22	45~50	10~20
4.5	B	1.2	150~200	21~24	40~45	10~20

1. Environment

- (1) The welding operation shall be operated in a relatively dry environment, and the air humidity should not exceed 90 percent.
- (2) The ambient temperature should be between -10 and 40 .
- (3) Do not weld under the sunlight or in the rain, and do not let water or rain go into welding machine.
- (4) Do not weld in dust or under the environment containing corrosive gases.
- (5) Do not weld at the vibrant and easy-collision places.

2. Security key points

The welding machine has been installed protection circuit against over current and overheat, which will automatically stop working when the temperature is higher than the standard and welding machine will enter the state of protection when the flow is excessive. But excessive use (such as welding current excessive) would have still caused damage to the welding machine, so you need to pay attention to the followings:

- (1) To keep good ventilation!

Since the size of the welding machine is small, natural ventilation can not meet the need of cooling it when strong current goes through it, we use a cooling fan to make it work smoothly.

User should confirm the ventilation is not covered or blocked. The distance between the machine and the surrounding objects must be kept no less than 0.3 meters. The user should always keep it good ventilation, which is very important to work efficiency and service life of the machine.

- (2) To prohibit electric current from overloading!

User Should observe the strongest load current (relatively to the selected load sustained rate) at any time,so as to ensure the welding current against exceeding the allowed maximum.

The life expectancy of welding machine will be significantly shorten,or even be burned, by overload current.

- (3) To prohibit over voltage!

The power voltage is listed in the main technique parameters such as these in form1, in normal conditions; the voltage auto-compensation circuit in the welder limits the welding current within normal range. If the power voltage exceeds the normal range, the welding machine will be damaged. As a result, the operator should be fully aware of the situation and proper protective measures should be taken.

(4) There is one grounding screw on the back of every welder with the grounding mark.

Before use, selecting one cable with the cross section of more than 4mm^2 , connect the shell of welding machine to ground to discharge electrostatic or avoid possible accidents due to current leakage.

(5) If the welding machine exceeds the standard continuous loading time, the welding machine would enter protective state and stop working. If this situation happens, it indicates that the welding machine exceeds sustained rate of standard load. And excessive heat trigger the temperature detect switch, which make the welder stop working. At the same time, the yellow dictator at the front board goes out.

In this case, do not plug off the power so that the cooling fan starts to cool the welding machine. When the yellow indicator lit up, it indicates the temperature lower down to the normal range and welding work can be continued.

Maintenance

Regular maintenance and inspection are done to ensure the machine to work safely and efficiently. Check whether the power of the welding machine is off before checking the external connectors. Check the internal wiring five minutes after the power of the welding machine is turned off, so that the capacitors of the machine are fully discharged to avoid electric shock accidents and ensure the safety of the staff.

Reference Guide for Maintenance

Line maintenance items	A regular maintenance is done every one or two months
<ol style="list-style-type: none">1. The function of the power switch2. Whether the cooling fan is rotating normally3. Whether the abnormal vibration, noise or smell exists4. Whether the cable connector is overheated5. Whether welded cable is abnormally hot6. Whether the cable is damaged7. Whether a wire connector is loose	<ol style="list-style-type: none">1. Remove dirt: Compressed air is used to remove dirt, in particular the dirt on inductors, transformers, power transistors and printed circuit boards.2. Maintenance of the circuit connectors Check whether the input terminal, the output connector, the external connections are loose or rusty. Tighten the loose places and remove the rust to ensure good contact.3. Check whether the grounding line is well.

The repairing principle of the welding machine should be made by our company and the user can solve the problems met in using it under the direction of our company.

1. Issues to pay attention

- (1) It should rivet the tag of equipment number on the shut of the casing, or the inner elements might be damaged.
- (2) The connection between the welding cable and the connecting terminal of the welding machine should be solid and reliable. Otherwise, the terminal can be burnt out which will result in the unstableness of the welding process.
- (3) To keep the bare copper parts of the welding cable and the connecting terminal of the welding machine from the metals on the ground to avoid the short-circuiting of the welding machine output.
- (4) To avoid the damage or break of the welding cables and the control cables.
- (5) To avoid the deformation of the welding machine caused by being stroked. Do not stack heavy load on the welding machine.
- (6) To keep being ventilated.

2. Regular check and maintenance of the welding machine

- (1) The professional repairing staff should clean the welding power with the condensed air for every 3- 6 months. Meanwhile, check the fastening piece in the welding machine and no loose phenomenon should happen.
- (2) Check often that if the cable has been damaged and if the control knob is loose and if the members on the panel has been damaged.
- (3) Current contact nozzles and the wire feed rolls should be changed timely. The wire feed tube should be cleaned frequently.

3. Faults and solutions of welding machine

3.1 The following check shall be made before maintenance:

- (1) Whether the position of switches on the front panel are right or not.
- (2) Whether the line voltage of three-phase power is within 340V~420V; and open-phase or not.
- (3) Whether the connection of welding machine power input cable is right or not.
- (4) Whether the grounding line of welding machine is right and reliable.
- (5) Whether the connection of welding cable is right or not, and whether the connection is good or not.
- (6) Whether the gas path is good or not, and whether CO₂ gas regulator is normal or not.

Note: The highest voltage in the welding machine reaches 600V. To guarantee safety, it is prohibited to open the shell of welding machine at random.

When maintaining, pay attention to safety and prevent electric shock.

