OWNER'S MANUAL IGBT SERIES MIG/MAG-YN



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This welding machine for industrial and professional use is in conformity with **IEC974 International Safety Standard.**

Hereby we state that we provide one year of guarantee for this welding machine since the date of purchase.

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

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

1.SAFETY

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

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

ELECTRIC SHOCK: IT COULD BE FATAL!

•Connect the earth cable according to standard regulation. •Avoid all contact with live electrical parts of the welding circuit, electrodes and wires with bare hands. It is necessary for the operator to wear dry welding gloves while he performs the welding task.

•The operator should keep the working piece insulating from himself/herself.

SMOKE AND GAS GENERATED WHILE WELDING OR CUTTING: HARMFUL TO PEOPLE'S HEALTH.

Avoid breathing the smoke and gas generated while welding or cutting.

·Keep the working area well ventilated.

ARC RAYS: HARMFUL TO PEOPLE'S EYES AND SKIN.

•Wear welding helmet, anti-radiation glass and work clothes while the welding operation is performed.

•Measures also should be taken to protect people in or near the working area.

FIRE HAZARD

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













2.GENERAL DESCRIPTION

This welding machine is composed of the inverter MIG welder power supply with invariable voltage output external characteristics manufactured with advanced IGBT inverter technology designed by our company. With high-power component IGBT, the inverter converts the DC voltage, which is rectified from input 50Hz/60Hz AC voltage, to high frequency 20KHz AC voltage; as a consequence, the voltage is transformed and rectified. The features of this machine are as follows:

- IGBT inverter technology, current control, high quality, stable performance;
- Closed feedback circuit, invariable voltage output, great ability of balance voltage up to ±15%;
- Electron reactor control, stable welding, little splash, deep molten pool, excellent welding bead shaping;
- Fit for welding the thin plate which over 0.8mm
- Slow wire feeding during arc starting, remove the melting ball after welding, reliable arc starting;
- •Small volume, light weight, simple operation, economical and practical.

Block Diagram



3. MAIN PARAMETER

Model	(MIG 250A) (MIG 300A)			
Power supply voltage (V)	3-phase 220V±15%			
Input current (A) Imax	17	20		
Power supply capacity (KVA)	8.3	12		
Current adjustment range (A)	60-250	60-300		
Output voltage (V)	15-26.5	15-29		
Rated duty cycle (%)	52-56	52-56		
Current adjustment range (A)	60			
Power factor	0.93			
Efficiency (%)	85			
Wire feeder type	integrated			
Water-cooled		NO		
Post-flow time (s)	-	1-2S		
Welding wire diameter (mm)	0.8\1.0\1.2	0.8\1.0\1.2\1.6		
Insulation class	F			
Protection class	IP21			
Workpiece thickness (mm)	≥0.8			
Machine dimension(mm)	875*420*807			
Package dimension(mm)	990*	650*1010		

4. INSTALLATION AND STRUCTURE

4.1. Input wire connection

Each welder is equipped with connection box, connect the power line with the power source 220V.

4.2. Output wire connection

Connect the gas bottle (equipped with the CO2 flow gauge) and the gas inlet with gas tube.

4.2.1 Connect the terminal of the earth clamp with the negative output, another side is clamped on the workpiece

4.2.2 Connect the MIG torch with the output terminal on the wire feeding machine, insert the welding wire through the MIG torch manually.

4.2.3 Connect the wire feeding machine input cable with the positive terminal of power source. The control cable of wire feeding machine should be connected with the control connector of power source.

4.3. Welding wire reel installation

4.3.1 Install the wire reel on the holder of wire feeding machine, the hole of wire reel should align with fixed pin on the holder.

4.3.2 Choose different wire feeding groove according to the wire dimension. (Note: aluminum welding chooses U-shape groove, other welding wire choose the V-shape groove

4.3.3 Loose the nut of wire pressing roller, thread the welding wire from the spool through the input guide tube, through the roller groove and into the outlet guide tube. Note: adjust the wire pressing roller and impact the wire, to make sure the wire will not slide. Avoid the wire deformation due to the oversize pressure

4.3.4 release the wire by rotating the wire reel anticlockwise. In order to avoid wire loose, the new wire reel will fix the top of wire on the edge of wire reel. Please cut off this top of wire.

4.3.5 choose different wire feeding groove position according to the wire diameter.

4.3.6 Press "wire check" button to lead out the wire.





NO	Name	NO	Name
1	Machine case	21	Tray
2	Side plate	22	directional wheel
3	Wire spool(optional)	23	Side cover plate II
4	stiffening plate	24	heating plate
5	Side cover plate I	25	rectifier tube
6	Control board	26	EMC board
7	Front metal plate(up)	27	Control board
8	Wire feeding motor	28	Rectifier radiator
9	Front plastic plate(up)	29	IGBT
10	Front plastic plate(down)	30	IGBTradiator
11	Conversion connector	31	clapboard
12	Quick socket	32	Fan
13	Output adapting piece	33	Rear metal plate
14	Power source board	34	Gas bottle tray
15	Output reactor	35	Column fixed
16	Universal wheel	36	Gas bottle hearting socket
17	Rectifier bridge	37	Power switch
18	Main transformer	38	Buckle
19	Column	39	Gas bottle location plate
20	Base plate		





MODE SELECTION INTERFACE ROTATE THE KNOB TO SELECT THE MODE, THEN PRESS THE KNOB TO CONFIRM.



- MIG Mode
- Inductance adjustment
- Wire diameter
- 2T/4T
- Post-flow time
- Slow wire-feeding
- Welding current
- Welding voltage



- MMA Mode
- Welding current adjustment
- Hot start
- ARC force
- VRD



- LIFT TIG Mode
- Welding current adjustment



Alerts: OVER TEMPERATURE!

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4.5. Gas bottle installation

Connection of Shield Gas

Connect the CO_2 hose, which come from the wire feeder to the copper nozzle of gas bottle. The gas supply system includes the gas bottle, the air regulator and the gas hose, the heater cable should be inserted into the socket of machine's back, and use the hose clamp to tighten it to prevent leaking or air-in, so that the welding spot is protected.

Please note:

- Avoid the sunshine on the gas cylinder to eliminate the possible explosion of gas cylinder due to the increasing pressure of gas resulted from the heat.
- 2) Fixed connector avoid leakage of shielding gas affects the performance of arc welding.
- 3) It is extremely forbidden to knock at gas cylinder or lay the cylinder horizontally.
- 4) Ensure no person is up against the regulator, before the gas release or shut the gas output.
- 5) The gas output volume meter should be installed vertically to ensure the precisely measuring.
- 6) Before the installation of gas regulator, release and shut the gas for several time in order to remove the possible dust on

The welding material, process and gas selection are listed below:

Material	Process	Gas
Carbon steel	Constant voltage	100% CO2
Carbon steel	Pulse	80/20 mixed gas
Stainless steel	el Pulse 98/2 mixed gas	
Aluminum silicon	Pulse	100% pure argon
Aluminum magnesium	Pulse	100% pure argon
Aluminum alloy	Cool pulse	100% pure argon

Note: Since the arc of MIG welding is much strong than that of MMA welding, please wear welding helmet and protective clothing.







5.OPERATION

5.1 operation

5.1.1 Open the power switch of machine. Open the valve of the gas bottle and adjust the gas flow

5.1.2 According to the wire diameter, select related diameter of MIG torch contact tip, then select corresponding welding parameter by pressing the "8" button on the control panel, by pressing the "6" button to select welding mode at the meantime.

5.1.3 According to thickness and process of workpiece, adjust the voltage and the current. Select the "synergy" or "separate" function by pressing the "8" button on the control panel.

5.1.4 "Inductance adjustment" (1) can change the ARC

5.1.5 Begin to weld by pressing the switch on the MIG torch

5.2 setting the welding current

The selection of welding current, voltage and ARC will influence the stability, welding quality and the productivity during the welding process. In order to keep a good welding quality, the welding current should match the voltage and the ARC well. Select the wire diameter according to the globular transfer and the production requirement.

Refer to the below list, choose the common welding current, ARC and voltage.

	······································					
Wiro(n(mm)	Short circui	Short circuit transition Granular		transition		
νιιεφ(ππ)	Current (A)	Voltage (V)	Current (A)	Voltage (V)		
0.6	40~70	17~19	160~400	25~38		
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		

Range of welding current and voltage in CO₂ welding

5.3-The option of the welding speed

The welding quality and productivity should be taken into consideration for the option of welding speed. In case that the welding speed increases, it weakens the protection efficiency and speeds up the cooling process. As a consequence, it is not optimal for the seaming. If the speed is too slow, the work piece will be easily damaged, and the seaming is not ideal. In practical operation, the welding speed should not exceed 30m/hour.

5.4 he length of wire stretching out

The increase of the length of the solder length, the melting depth, the melting of the wire and the increase of the productivity; But the dry elongation passes large, the welding wire is easy to fuse, the splash is serious, make the welding process unsteady. Generally, take the diameter of the wire 10-15 times long.

5.5 The setting of the CO₂ flow volume

The protection efficiency is the primary consideration. Besides, inner-angle welding has better protection efficiency than external-angel welding. For the main parameter, refer to the following figure.

Option of CO ₂ flow volume						
Welding mode	Thin wire CO ₂ welding	Thick wire C0 ₂	Thick wire, big			
weiding mode	Thin whe Co ₂ weiding	welding	current C0 ₂ welding			
CO_2 (L/min)	5~15	15~25	25~50			

6.WELDING PARAMETERS TABLE

The option of the welding current and welding voltage directly influences the welding stability, welding quality and productivity. In order to obtain the good welding quality, the welding current and welding voltage should be set optimally. Generally, the setting of weld condition should be according to the welding diameter and the melting form as well as the production requirement.

The following parameter is available for reference.

6.1 Parameter for butt-welding (Please refer to the following figure)





Plate thickness T(mm)	Gap g(mm)	Wire φ(mm)	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	Gas volume (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	1.0 or 1.2	110~130	19~20	50~55	10~15
3.2	1.0~1.2	1.0 or 1.2	130~150	19~21	40~50	10~15
4.5	1.2~1.5	1.2	150~170	21~23	40~50	10~15

6.2 Parameter for flat fillet welding (Please refer to the following figure.)



Plate	Corn size	Wire	Welding	Welding	Welding	Gas volume
thickness	I (mm)	φ(mm)	current (A)	voltage (V)	speed	(L/min)
t (mm)					(cm/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	70~100	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	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

6.3 Parameter for fillet welding in the vertical position (Please refer to the following figure.)



Plate thickness t (mm)	Corn size I (mm)	Wire φ(mm)	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	Gas volume (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

6.4 Parameter for Lap Welding (Please refer to the following figure.)







Plate thickness t (mm)	Corn size I (mm)	Wire φ(mm)	Welding current (A)	Welding voltage (V)	Welding speed (cm/min)	Gas volume (L/min)
0.8	A	0.8~0.9	60~70	16~17	40~45	10~15
1.2	А	1.0	80~100	18~19	45~55	10~15
1.6	А	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	15~20
2.3	В	1.0 ~ 1.2	120~140	19~21	45~50	15~20
3.2	В	1.0 ~ 1.2	130~160	19~22	45~50	15~20
4.5	В	1.2	150~200	21~24	40~45	15~20

7.CAUTION

7.1. Working environment

- 1) Welding should be carried out in a relatively dry environment with its humidity of 90% or less.
- 2) The temperature of the working environment should be within -10°C to 40°C.
- 3) Avoid welding in the open air unless sheltered from sunlight and rain, and never let rain or water infiltrate the machine.
- 4) Avoid welding in dusty area or environment with corrosive chemical gas.
- 5) Avoid gas shielded arc welding in environment with strong airflow.

7.2. Safety tips

Over-current/overheating protection circuit is installed in this welding machine. If the output current is too high or overheating generated inside this welding machine, this welding machine will stop automatically. However, inappropriate use will still lead to machine damage, so please note:

7.2.1. Ventilation:

High current passes when welding is carried out, thus natural ventilation cannot satisfy the welding machine's cooling requirement. Maintain good ventilation of the louvers of this welding machine. The minimum distance between this welding machine and any other objects in or near the working area should be 30cm. Good ventilation is of critical importance for the normal performance and service life of this welding machine.

7.2.2. No over-current:

Remember to observe the max load current at any moment (refer to the optioned duty cycle). Make sure that the welding current should not exceed the max load current.

If welding is carried out under a current which is higher than the max current, over-current protection will occur; the output voltage of the welding machine will be not stable; arc interruption will occur. In this case, please lower the current.

7.2.3. No over-load:

Over-load current could obviously shorten the welding equipment's life, or even damage the machine. A sudden halt may occur while the welding operation is carried out while this welding machine is of over-load status. Under this circumstance, it is unnecessary to restart this welding machine. Keep the built-in fan working to bring down the temperature inside the welding machine.

7.2.4. Avoid electric shock:

An earth terminal is available for this welding equipment. Connect it with the earth cable to avoid the static and electric shock.

8.MAINTENANCE

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

- 4. Keep hands, hair, loose clothing, and tools away from electrical parts such as fans, wires when the machine is switched on.
- 5. Clear the dust at regular intervals with clean and dry compressed air; if the working condition is with heavy smoke and air pollution, the welding machine should be cleaned daily.
- 6. The compressed air should be reduced to the required pressure lest the little parts in the welding machine be damaged.

7. To avoid water and rain, if there is, dry it in time, and check the insulation with mega-meter (including that between the connection and that between the case and the connection). Only when there is no abnormal phenomenon







9.DAILY CHECKING

To make best use of the machine, daily checking is very important. During the daily checking, please check in the order of torch, wire-feeding vehicle, all kinds of PCB, the gas hole, and so on. Remove the dust or replace some parts if necessary. To maintain the purity of the machine, please use original welding parts.

Cautions: Only the qualified technicians are authorized to undertake the repair and check task of this welding equipment in case of machine fault.

9.1. Power supply

Part	Check	Remarks
Control panel	 Operation, replacement and installation of Switch Switch on the power, and check if the power indicator is on. 	
Fan	1. Check if the fan is functioning and the sound generated is normal.	If the fan doesn't work or the sound is abnormal, do inner check.
Power supply	1. Switch on the power supply, and check if abnormal vibration, heating of the case of this equipment, variation of colors of case or buzz presents.	
Other parts	1. Check if gas connection is available, case and other joints are in good connection.	

9.2. Welding torch

Part	Check	Remarks
Nozzla	1. Check if the nozzle is fixed firmly and distortion of the tip exists.	Possible gas leakage occurs due to the unfixed nozzle.
Nozzie	2. Check if there is spatter sticking on the nozzle.	Spatter possibly leads to the damage of torch. Use anti-spatter to eliminate the spatter.
Contact tin	1. Check if the contact tip is fixed firmly.	Unfixed contract tip possibly leads to unstable arc.
Contact tip	2. Check if the contact tip is physically complete.	The physically incomplete contact tip possibly leads to unstable arc and arc automatically terminating.
	1. Make sure that there is the agreement of wire and wire feed tube.	Disagreement of the diameters of wire and wire feed tube possibly leads to the unstable arc. Replace it/them if necessary.
	2. Make sure that there is no bending or elongation of wire feed tube.	Bending and elongation of wire feed tube possibly leads to the unstable wire feed and arc. Replace it if necessary.
feeding hose	3. Make sure that there is no dust or spatter accumulated inside the wire feed tube, which makes the wire feed tub blocked.	If there is dust or spatter, remove it.
	 Check if the wire feed tube and O-shaped seal ring are physically complete. 	The Physically incomplete wire feed tube or O-shaped seal ring possibly leads to the excessive spatter. Replace the wire feed tube or O-shaped seal ring if necessary.
Diffuser	1. Make sure that the diffuser of required specification is installed and is unblocked.	Defection weld or even the damage of torch occurs due to the non-installation of diffuser or the unqualified diffuser.

9.3. Wire feeder

Part	Check	Remarks
Pressure adjusting handle	1. Check if the pressure-adjusting handle is fixed and adjusted to the desired position.	The unfixed pressure-adjusting handle leads to the unstable welding output.
Wire-feedin g hose	1. Check if there is dust or spatter inside the hose or beside wire-feeding wheel.	Remove the dust.
	2. Check if there is a diameter agreement of wire and wire-feeding hose.	Non-agreement of the diameter of wire and wire-feeding hose possibly leads to the excessive spatter and unstable arc.
	3. Check if rod and wire feeding groove are concentric.	Unstable arc possibly occurs.
Wire-feedin g wheel	1. Check if there is an agreement of wire diameter and wire-feeding wheel.	Non-agreement of wire diameter and wire-feeding wheel possibly leads to the excessive spatter and unstable arc.
	2. Check if the wire groove is blocked.	Replace it if necessary.
Pressure adjusting wheel	1. Check if the pressure adjusting wheel can rotate smoothly, and it's physically complete.	Unstable rotation or physically incompleteness of the wheel possibly leads to unstable wire feeding and arc.

9.4. Cables

Part	Check	Remarks
Torch cable	1. Check if the cable of torch is twisted.	The twisted torch cable leads to unstable wire feeding and arc.
	2. Check if the coupling plug is in loose connection.	
Output cable	1. Check if the cable is physically complete.	Relevant measures should be taken to obtain stable weld and prevent the possible electric shock.
	2. Check if insulation damage or loose connection exists.	
Input cable	1. Check if the cable is physically complete.	
	2. Check if insulation damage or loose connection exists.	
Earth cable	 Check if the earth cables are well fixed and not short-circuited. 	Relevant measures should be taken to
	2. Check if this welding equipment is well grounded.	prevent the possible electric shock.