

IGBT Inverter Welder

USER'S MANUAL

Model: MMA160-180-200 (220v)

1. SAFETY

Welding is dangerous, and may cause damage to you and others, so take good protection when welding. For details, please refer to the operator safety guidelines in conformity with the accident prevention requirements of the manufacturer.

Professional training is needed before operating the machine.

- Use labor protection welding supplies authorized by national security supervision department.
- The operator must be qualified personnel with a valid "metal welding (OFC) operations" operation certificate.
- Cut off power before maintenance or repair.



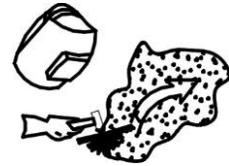
Electric shock—may lead to serious injury or even death.

- Install earth device according to the application criteria.
- Never touch the live parts when skin bare or wearing wet gloves/clothes.
- Make sure that you are insulated from the ground and work piece.
- Make sure that your working position is safe.



Smoke & gas—may be harmful to health.

- Keep the head away from smoke and gas to avoid inhalation of exhaust gas from welding.
- Keep the working environment in good ventilation with exhaust or ventilation equipment when welding.



Arc radiation—may damage eyes or burn skin.

- Wear suitable welding masks and protective clothing to protect your eyes and body.
- Use suitable masks or screens to protect spectators from harm.



Improper operation may cause fire or explosion.

- Welding sparks may result in a fire, so please make sure no combustible materials nearby and pay attention to fire hazard.
- Have a fire extinguisher nearby, and have a trained person to use it.
- Airtight container welding is forbidden
- **Must not use the machines for other purposes except welding, such as pipe thawing, battery charging, heating.**



Hot work piece may cause severe scalding.

- Do not contact hot work piece with bare hands.
- Cooling is needed during continuous use of the welding torch.



Magnetic fields affect cardiac pacemaker.

- Pacemaker users should be away from the welding spot before medical consultation.



Moving parts may lead to personal injury.

- Keep yourself away from moving parts such as fan.
- All doors, panels, covers and other protective devices should be closed during operation.



Please seek professional help when encountering machine failure.

- Consult the relevant contents of this manual if you encounter any difficulties in installation and operation.
- Contact the service center of your supplier to seek professional help if you still cannot fully understand after reading the manual or still cannot solve the problem according to the manual.



2. GENERAL DESCRIPTION

This LCD type MMA welder is IGBT DC ARC welder. It has LCD display, which is for choosing welding technics and set parameters on it directly. It has functions of choosing hot starting, arc force, electrodes selection, VRD, lift TIG etc. Users could choose according to their own welding habits, to realize the final best welding results.

➤ **Advanced IGBT inverter technology**

- ◆ High inverter frequency greatly reduces the volume and weight of the welder.
- ◆ Great reduction in magnetic and resistance loss obviously enhances the welding efficiency and energy saving effect.
- ◆ Switching frequency is beyond audio range, which almost eliminates noise pollution.

➤ **Leading control mode**

- ◆ Advanced control technology meets various welding applications and greatly improves the welding performance.
- ◆ It can be widely used in acid and basic electrode welding.
- ◆ Easy arc starting, less spatter, stable current and good shaping.

➤ **Features of MMA series**

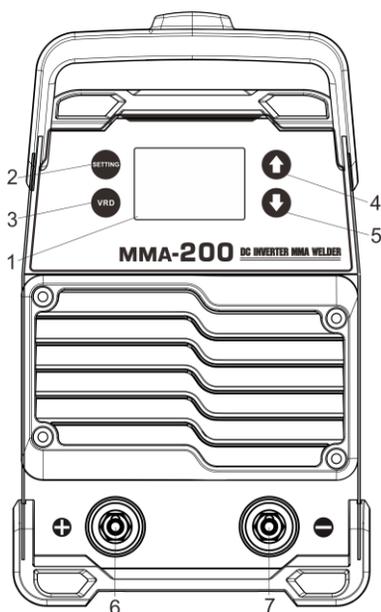
- ◆ Efficiency, energy saving, portable, stable arc, high no-load voltage, and with good compensation of arc force, are able to meet various welding requirements in field work.

3. PARAMETERS

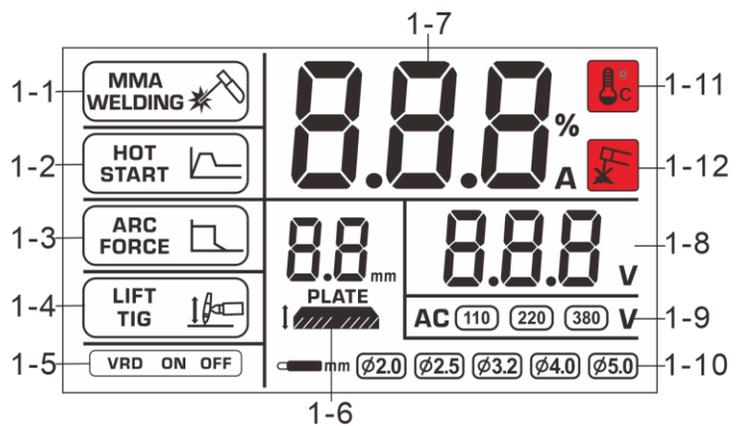
Model	MMA-160	MMA-180	MMA-200
PARAMETERS			
Working voltage (V)	1~ 220V	1~ 220V	1~220V
Frequency (Hz)	50/60	50/60	50/60
Rated input current (A)	35	38	48
Noload voltage (V)	63	63	68
Output current (A)	20-160	20-180	20-200
Rated output voltage (V)	20.8-26.4	20.8-27.2	21-28
Duty cycle (%)	60	60	60
Efficiency (%)	85	85	85
Power factory	0.7	0.7	0.7
Insulation class	F	F	F
Protection class	IP21S	IP21S	IP21S

4. OPERATION CONTROL AND DESCRIPTION

Front panel



LCD DISPLAY



Panel functions and LCD display illustration

1、 LCD display

1-1: MMA WELDING ; 1-2: HOT START ; 1-3: ARC FORCE ; 1-4: LIFT TIG ; 1-5: VRD

1-6: Plates thickness selection: Button 4, 5 to adjust current, and plate's thickness would be changed accordingly

1-7: Display welding current or percentage %

1-8: Display output voltage, such as no load voltage, welding voltage, or VRD voltage

1-9: Display input voltage, if it's 220v input, it's showing 220v, if it's 110v input, it would show 110v.

1-10: Display electrodes dia: The preset electrodes dia are referring to related current range. Choose button 4 and 5, the electrodes diameter would change and different welding current would show related different electrodes diameters.

1-11: Overheat protection

1-12: Anti stick function

2、 SETTING: Choose different modes, MMA WELDING、 HOT START、 ARC FORCE、 LIFT TIG

3、 VRD: Choose VRD ON or OFF.

4、 Current increase button: When it's in MMA WELDING or LIFT TIG mode, select the button, 1-7 shows working current 、 1-6 shows welding plates thickness 、 1-10 shows electrodes diameters. Press once, Output current will increase 1A, Long time pressing, Output current will increase automatically ; If in mode HOT START or ARC FORCE, press this button , hot start or arc force will increase different percentage , 1-7 will show the % change as well.

5、 Current decrease button: When it's in MMA WELDING or LIFT TIG mode, select the button, 1-7 shows working current 、 1-6 shows welding plates thickness 、 1-10 shows electrodes diameters. Press once, Output current will decrease 1A, Long time pressing, Output current will decrease automatically ; If in mode HOT START or ARC FORCE, press this button , hot start or arc force will decrease different percentage 1-7 will show the % change as well.

6、 Positive output connector: Connect earth clamp when using rutile rods, connect electrode holder when using basic rods.

7、 Negative output connector : Connect electrode holder when using rutile rods, connect earth clamp when using basic rods.

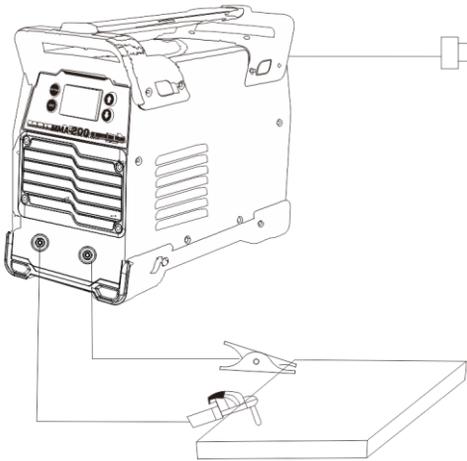
Note: Please install the machine strictly according to the following steps.

Turn off the power supply switch before any electric connection operation.

The protection class of this machine is IP21S, so avoid using it in rain.

5. INSTALLATION AND OPERATION

- (1) A primary power supply cable is available for this welding machine. Connect the power supply cable to the rated input power.
- (2) The primary cable should be tightly connected to the correct socket to avoid oxidization.
- (3) Check whether the voltage value varies in acceptable range with a multi-meter.
- (4) Insert the cable plug with electrode holder into the “+” socket on the front panel of the welding machine, and tighten it clockwise.
- (5) Insert the cable plug with work clamp into the “—” socket on the front panel of the welding machine, and tighten it clockwise.
- (6) Ground connection is needed for safety purpose.



Operation:

1. Put the switch to ON and then LCD would show, now on the display is the preset current, and fan is working and welder is in normal working status.
2. Users could select suitable welding current according to working plate's thickness, electrodes diameters, and etc.
3. Clamp the electrode to electrode holder and scratch the arc to start welding. (Parameters could be read on the LCD display)

Pls note that this parameters is mainly for low carbon steel welding.

Welding parameters table (for reference only)

Electrode dia. (mm)	Recommended welding current (A)	Recommended welding voltage (V)
1.0	20~60	20.8~22.4
1.6	44~84	21.76~23.36
2.0	60~100	22.4~24.0
2.5	80~120	23.2~24.8
3.2	108~148	23.32~24.92
4.0	140~180	24.6~27.2
5.0	180~220	27.2~28.8
6.0	220~260	28.8~30.4

Note: This table is suitable for common carbon steel welding. For other materials, consult related materials and welding process for reference.

6. CAUTION

1. Working Environment

- (1) Welding should be carried out in dry environment with its humidity of 90% or less.
- (2) The temperature of the working environment should be between -10°C to 40°C.
- (3) Avoid welding in the open air unless sheltered from sunlight and rain. Keep it dry anytime and do not place it on wet ground or in puddles.
- (4) Avoid welding in dusty area or environment with corrosive chemical gas.
- (5) Gas shielded arc welding should be operated in environment without strong airflow.

2. Safety Tips

Over-current/over-voltage/over-heating protection circuit is installed in this machine. If the input voltage or the output current is too high or machine inside temperature over heating inside, the machine will stop automatically. However, excessive use (e.g. too high voltage) of machine may also damage machine, so please note:

2.1 Ventilation

High current passes when welding is carried out, thus natural ventilation cannot satisfy the machine's cooling requirement. Maintain good ventilation through the louvers of the machine. The minimum distance between the 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 lifespan of the machine.

2.2 Welding operation is forbidden while the machine is overload. Remember to observe the max load current at any moment (refer to the corresponding duty cycle). Make sure that the welding current should not exceed the max load current. Overload could obviously shorten the machine's lifespan, or even damage the machine.

2.3 Over-voltage is forbidden.

Regarding the power supply voltage range of the machine, please refer to "Main Parameters" table. This machine is of automatic voltage compensation, which enables the maintaining of the voltage range within the given range. In case that the input voltage exceeds the stipulated value, it would possibly damage the components of the machine.

2.4 A sudden halt may occur while the machine is of overload status. Under this circumstance, it is

unnecessary to restart the machine. Remain the built-in fan working to lower the temperature inside the machine.

7. MAINTENANCE

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity utility before uncovering the welding machine.

- (1) Check periodically whether inner circuit connection is in good condition (esp. plugs). Tighten the loose connection. If there is oxidization, remove it with sandpaper and then reconnect.
- (2) Keep hands, hair and tools away from the moving parts such as the fan to avoid personal injury or machine damage.
- (3) Clean the dust periodically with dry and clean compressed air. If welding environment with heavy smoke and pollution, the machine should be cleaned daily. The pressure of compressed air should be at a proper level in order to avoid the small parts inside the machine to be damaged.
- (4) Avoid rain, water and vapor in filter the machine. If there is, dry it and check the insulation with equipment (including that between the connections and that between the connection and the enclosure). Only when there are no abnormal phenomena anymore, then the machine can be used.
- (5) Check periodically whether the insulation covers of all cables is in good condition. If there is any dilapidation, rewrap it or replace it.
- (6) Put the machine into the original packing in dry location if it is not to be used for a long time.

Correct Disposal of this product	
	This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

8. TROUBLESHOOTING

WARNING



The following operation requires sufficient professional knowledge on electric aspect and comprehensive safety knowledge. Operators should be holders of valid qualification certificates which can prove their skills and knowledge. Make sure the input cable of the machine is cut off from the electricity utility before uncovering the welding machine.

Common Malfunction Analysis and Solution:

Malfunction Phenomena	Cause and Solution
Turn on the welder, the display shows normally, and there's also output current, but fan is not working.	<ol style="list-style-type: none"> 1、 There's any cable inside loose. 2、 Fan supply is normal or not. 3、 Fan is broken or not
Display is normal, fan is working normally, no output current.	<ol style="list-style-type: none"> 1、 Check if inside cable is good 2、 Check if inside connections are good。 3、 Check if OC lamp is on, it's electric circuit problem.
Turn on the machine, fan is not working, there's also no output current	<ol style="list-style-type: none"> 1、 Outside power supply is normal or not. 2、 Power cable is good and connecting well. 3、 Power switch is damaged or not.
Turn on the welder, welding is normal, then suddenly breaker trips.	<ol style="list-style-type: none"> 1. Maybe there's electric leakage in power cable connection, then the input current is too big and trips. 2 .The IGBT or bridge damages.
Turn on the machine normally, but in welding, output current is small.	<ol style="list-style-type: none"> 1、 The potentiometer cable connection is not good. 2、 The potentiometer damages. 3、 Electric circuit has some problem.
Electrode holder is getting hot quickly	Use bigger specs of electrode holder
Lots of spattering in MMA welding	Change the connections of electrode holder cable and earth cable.

We are still constantly improving this welder, therefore, some parts of this welder may be changed in order to achieve the better quality, but the main functions and operations will not be alternated and changed. Your understanding would be greatly appreciated.