Operator's Manual

Inverter DC Welder

(ZX7-160/ ZX7-200/ ZX7-250)

(TIG160A/TIG-200A/TIG-250A)

(WS-160/WS-200/WS-315)

(CUT-40/CUT-50/CUT-60/CUT-100)

(CT312/CT520D)

(MIG-200/MIG-250/MIG-350)

IMPORTANT: This operational manual kindly show you how to install, debug, operate and maintain the welder. Read this instructions carefully and you will understand how to use it to reduce the risk of error operation.

 **Warning!**

This machine should be operated and maintained by full-time staffs or professionals.

You are not allowed to operate and repair it unless read this manual in advance!

CONTENT

1 Brief Introduction

welder uses imported IGBT and fast recovery diodes as main electric components. It is supplemented by a specially developed main PCB board. In addition, the uniform regulation of welding current has been designed to guarantee the arc reach good welding process adaptability. What's more, its perfect dynamic protection features ensure that it is safe and reliable when use. It is ideal for using low carbon steel, stainless steel, alloy steel etc.

INARC Features:

- 60% high duty cycle.
- Lower cost operation, more portable, more compact, superior output.
- Excellent arc properties and solution droplet transfer.
- With the protections of over-heating, over-voltage, over-current.
- Digital display function when use (only for plastic shell).
- Plastic handle makes it easy to carry.
- Convenient quick connection for the output makes it quick, safe, simple and stable.

NOTES: The above description may be modified without prior notice such as omissions, unclear statements about this welder.

2 Safety

2.1 Self-Protection

* The user must comply with occupational safety and health rules and wear appropriate labor protective equipment. Try to avoid injury on eye and skin.

* It is safe to cover your head with face mask while welding, only do the observation on the arc through the window of the mask.

* Don’t expose any part of the body at the same time to the welding positive and negative output terminals without insulated protection.

2.2 Cautions

* INARC Inverter DC Arc welder is a kind of electronic product which makes its components more easily damaged. While replacing or modulating, the strength should not be too much in order to avoid causing damage to the device.

* Check the connection to see if it is correct or reliable each time before working. Besides, ensure the grounding outlet device correct.

* While using, as smoke is harmful to human’s health, the operation must be carried out in the ventilation and exhaust facilities.

* Prohibit non-professionals to change or replace the welder.

* Since the welder owns strong electromagnetic and radio frequencies, the people with cardiac pacemakers affected by the interference electromagnetic, electrical frequency are not allowed to stay nearby.

* When it works, please pay attention to its rated duty cycle. Do not overload.

2.3 Safety Precaution for Installation and Location

* In some areas, where something may fall from the sky, personal safety precaution should be taken.

* In some areas around construction site, something like the dust, acid, corrosive gases or other substance in the air can nor exceed the standard value except those

generated while welding.

* It is should be equipped in the open air where there is no direct sunlight, anti-rain, temperature range from -10℃ to +40℃ and low humidity place.

* 50cm space is needed to ensure good ventilation.

* No metal impurities are tolerant inside the welder.

* In some areas, there is no severe vibration.

* Make sure no interference will be caused to the surrounding in the welding area.

* Whether the power supply capacity is sufficient to allow the welder to work normally or not. And a safety protection device should be equipped in the input power.

* Prevent it from dumping if the welder is put in the place of over 10° incline.

2.4 Security Check

The following items must be checked up by the operator each time before access to the power source.

* Make sure the power socket is reliably grounded.

* Make sure the output terminals are well connected without short circuit.

* Make sure output and input cables are perfect with no exposure.

The welding machine must be inspected by professionals at regular time (not exceed 6 months). The contents as follow:

* Whether the electronic components are loosed or not and dust removal must be conducted.

* Whether the panel mounted on the device should be able to guarantee the normal implementation of the machine.

* Whether the input cables are damaged or not. If yes, safe handling must done.

Warning!

Disconnect the power source before servicing it. Contact with the manufacturer or agent immediately to acquire the service and support skills when users do not have the ability to repair it.

3 Technical Description

3.1 Environment

* Working temperature: -10℃~40℃.

* Transportation and storage: -25℃~55℃.

* Relative air humidity: 40℃≤50%; 20℃≤90%.

* The dust, acids, corrosive gases and substance in the ambient air must be lower normal level except those from welding process.

* Altitude must be less than 1km.

* Keep good ventilation at a distance of 50cm around.

* Put it in somewhere the speed of wind not less than 1m/s.

3.2 Input Power

* Power supply waveform should be sine wave and frequency fluctuations with less than +-1% of its rating.

* The fluctuations of input voltage must be lower than +-10% of the rated value.

3.3 Equipment Principle

NOTES: This is inverter technology. The main part as follow:

Rectifier ⟶ Filter ⟶ IGBT/MOSFET ⟶ Transformer ⟶ Rectifier ⟶ Choke

3.4 Equipment Structure

The INARC Inverter DC MMA Welder uses portable cabinet structure: the upper part of front panel has been equipped with welding current adjustment knob, power indicator (green), abnormal indicator (yellow). The output terminal is fitted with quick connector both “+” and “-”. The back panel owns power switch, motor fan, input power cable. The inside body of the machine includes PCB main board, electronic components, radiator etc.

3.5 Parameter

ZX7/MMA Series

Model	ZX7/MMA-160	ZX7/MMA-200	ZX7/MMA-250
Input Voltage(V)	230	230	230/400
Frequency(Hz)	50/60	50/60	50/60
Power Capacity(KVA)	5.3	6.8	9.4
No-load Voltage(V)	60	60	60
Output Current(A)	20-160	20-200	20-250
Duty Cycle(%)	160A@60%	180A@60%	210A@60%
Efficiency	85	85	85
Diameter of Rod(MM)	1.6-4	1.6-5	1.6-5
Insulation Class	F	F	F
Protection Class	IP21	IP21	IP21
Gross Weight(KG)	6.5	7.5	12
Overall Dimension	39*17*28	39*17*28	58*31.5*41.5

WS/TIG-A seires

Model	TIG160	TIG200
Input Voltage(V)	230	230
Frequency(Hz)	50/60	50/60
Power Capacity(KVA)	3.3	4.5
No-load Voltage(V)	42	54
Output Current(A)	10-160	10-200
Duty Cycle(%)	60	60
Efficiency	85	85
Insulation Class	F	F
ARC Starting	HF	HF
Gross Weight(KG)	8	9
OvOverall Dimension(CM)	37.1*15.3*23.2	37.1*15.3*23.2
Quantity(20ft)	2120 pieces	2120 pieces

CUT-A seires

Spec. \ Model	CUT-40	CUT-50	CUT60	CUT100
Power supply voltage	AC 110/220v±15%		AC220V / AC380V±15%	AC220V / AC380V±15%
Power frequency	50~60 Hz	50~60 Hz	50~60 Hz	50~60 Hz
Power supply capacity	4.8 kVA	5.2 kVA	6.0 kVA	14KVA
Rated input current	20 A	24 A	28 A	35A
No-load voltage	230 V	230 V	230 V	230V
Output current range	10-40 A	10-50 A	10-60 A	20-100
Output voltage	96 V	102 V	108 V	120V
Duty cycle	60%	60%	60%	60%
Efficiency	85%	85%	85%	85%
Arc striking model	Touch	Touch	Touch	Touch
Cosφ (η)	0.93	0.93	0.93	0.93
Air pressure	0.4 MPa	0.4 MPa	0.4 MPa	0.4MPA
Insulation grade	F	F	F	F
Protection grade	IP 21S	IP 21 S	IP 21 S	IP21S
Net Weight	10kg	11 kg	15 kg	30kg

CT-A seires

Spec. \ Model	CT312	CT520D
Power supply voltage	AC 110/220v±15%	
Power frequency	50~60 Hz	50~60 Hz
Power supply capacity	4.8 kVA	5.6kVA
Rated input current	20 A	24 A
No-load voltage	230 V	230 V
Output current range	10-30 A/20-120A/20-120A	10-50 A/20-200A/20-200A
Duty cycle	60%	60%
Efficiency	85%	85%
Arc striking model	Touch	Touch
Cosφ (η)	0.93	0.93
Air pressure	0.4 MPa	0.4 MPa
Insulation grade	F	F
Protection grade	IP 21S	IP 21 S
Net Weight	12kg	15 kg

CO2 MIG Machine series

Model	MIG-200	MIG-250	MIG-315
Input Voltage(V)	230/400	400	400
Frequency(Hz)	50/60	50/60	50/60
Power Capacity(KVA)	5.6	7.8	11
Output Current(A)	50-200	50-270	60-315
Duty Cycle(%)	60	60	60
Efficiency	85	85	85
Diameter of Wire	0.6/0.8/1.0	0.6/0.8/1.0/1.2	0.6/0.8/1.0/1.2
Insulation Class	F	F	F
Protection Class	IP21	IP21	IP21
Type of Wire Feeder	inside	inside	inside
Gross Weight(KG)	25	25	25
OvOverall Dimension(CM)	58.8*31*41.5	58.8*31*41.5	58.8*31*41.5
Quantity(20ft)	370 pieces	370 pieces	370 pieces

3.6 Standard

* EN 60974-1: Arc Welding Machine Standards

* JB / T 7824: Technical Conditions of Inverter Arc Welding Rectifier

* GB 4208: Protection Class (IP Code)

3.7 Symbol Chart

Note that only some of these symbols will appear on your model.

	On		Hertz (cycles / sec)
	Off		Frequency
	Dangerous Voltage		Negative
	Increase / Decrease		Positive
	AC Auxiliary Power		Direct Current (DC)
	Fuse		Protective Earth
	Amperage		Line
	Voltage		Single Phase
	Three Phase		Duty Cycle
	SMAW		GMAW
	GTAW		High Temperature
	Wire Feed Function		Welding Gun

4 Installation

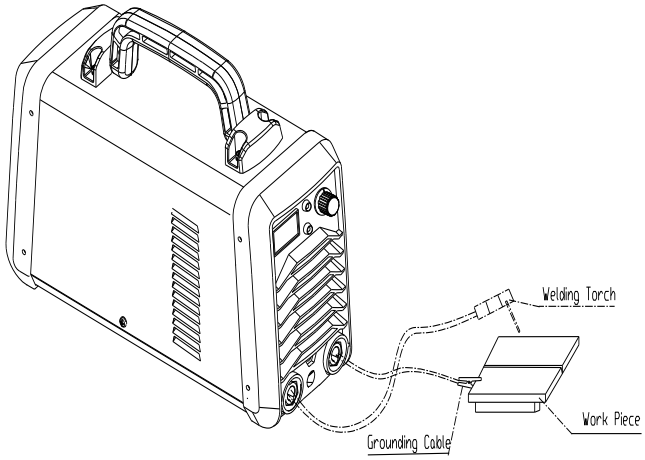
4.1 Connection

* The welder should be placed in dry and dusty surrounding where there is no corrosive chemicals, flammable, explosive gases.

* Avoid direct sunlight and rain. And maintain the ambient temperature ranging from -10℃ to 40℃.

* The space of 50cm should be left around the equipment.

* If indoor ventilation is not good enough, the ventilation exhaust device should be installed.



Installation Diagram

4.2 Power Source Connection

Access the back panel (power source cable) to the power supply which is equipped with circuit breakers and grounding line (grid), and it is strictly prohibited that ground wire is connected to the grid, otherwise bear your own consequences.

4.3 Electrode Polarity (see above picture)

Connect the quick plug with electrode holder to the positive terminal and then tightened them up clockwise.

4.4 Workpiece Connection

Connect the quick plug with earth clamp to the negative terminal on the front panel below. And then tighten them up. Access the earth clamp to the workpiece.

 **Warning!**

It is forbidden to connect the workpiece to the welder with iron or other poor conductors.

5 Operation Instruction

NOTES: The case protection class is IP21S. Finger or round bars especially metal rod must be less than 12.5mm and it can not be inserted into the welder. Also you can not press it heavily.

NOTES: When the welder works for a long time, the high temperature indicator will light. This means the inside temperature has exceeded its standard. And you must turn off the power immediately for a period until it recovers.

* You have to wear canvas overalls and face mask to prevent from arc light and heat radiation.

* Vibration screen should be laid out to prevent others from arc light.

* Inflammable and explosive stuffs are not allowed to pile up. All the connections must be right, reliable.

5.1 Procedure

a) Connect to the power switch digital ammeter lights on.

b) To adjust the current potentiometer to the required value of the welding.

c) Pick up electrode holder, and point at the welding edge. Then put the electrode on the workpiece, you can start welding.

5.3 Slag Removal

After finishing work, you should remove the slag with specific knock residue tools in the way of knocking.

 Warning!

The welding slag should not be removed until it is cooled down. Don't point it at the other people while knocking on the slag incase that it will do harm with pop-up slag.

5.4 Maintenance

* The major difference between inverter arc welder and traditional welder is the inverter welder has lots of advanced electronic components. What's more, it is high technology product. And this requires high skill maintenance.

* It is very essential to do daily maintenance. You must be responsible for examination and repair. Once you do not have the ability to check it, kindly contact with manufacturer to acquire the service and support of technology.

The following is the steps for maintaining:

a) Dust removal.

b) Remove dust by professionals with dry and clean compressed air (using a compressor or Paper Tiger) regularly. Meanwhile, check inter circuit of welding machine regularly and make sure the cable is connected correctly and connectors are connected tightly. If scale and loose are found, please give a good polish to them. Then connect them again tightly. Generally, if welding machine is operating in environment where there is no heavy accumulated dust, the machine need remove

dust once a year. If in the environment where is polluted with smokes and polluted air, it is needed to be removed once or even twice of each season.
c) To maintain good contact with cable and plugs.
d) Check up the contact conditions of cable and plug frequently, at least once a month for stationary use.

Warning!

Due to high voltage in the main circuit of the welder, you need to do the safety precaution measure to prevent accidental electric shock. Don't open the shell except for the professionals. Remember to turn off the power before removing dust. And don't meddle with the connections and components when doing this work.

6 Basic Troubleshooting

No.	Description	Possible Cause	Remedy
1	Abnormal indicator	Bad ventilation leads to overheating protection	Improve ventilation conditions
		High environmental temperature	Automatic recovery after decreasing
		Exceed rated duty cycle	Replace potentiometer
2	Current knob broken	Potentiometer damaged	Replace it
3	Motor fan can't work or low rotational speed	Bad power switch	Replace the switch
		Bad fan	Replace the fan
		Led broken	Check the circuit
4	No open circuit voltage	Overheating	See point 1
		Bad power switch	Replace the switch
5	Electrode holder cable is too hot; output terminals are too hot.	Capacity on electrode holder is too small	Replace larger capacity electrode holder
		Cable is too thin	Replace a proper cable
		Socket is loosen	Remove the oxide coat

			and re-tight it
6	Power off	Power capacity is not big enough	Enlarge the capacity
		Welding process	Contact the supplier
7	Other problems		Contact the supplier

Warning!

The machine has the function of prohibit switching power supply in rapid succession within a short period of time for switching on and off. The power will not open then (the indicator light is not on or the fan does not work or there is no-load voltage). Shut down the power switch and resume back to normal after a few minutes.

7 Transportation and Storage

* This machine is an indoor equipment and the attacks of rain and snow should be avoided in the process of transportation and storage. While loading and unloading, more attention should be paid on the package with words of warning. Storage warehouse should be kept dry with good air circulation and no corrosive gas or dust. The temperature should be maintained from -25℃ to 55℃ and relative humidity must be lower than 90%.

* If the products are still needed to continue storing after stripping, repacking should be carried out according to original package's requirement. Remember before storage, don't forget to clean and seal it with plastic bags.

* Users should maintain the cartons and shock blocks in order to be properly packaged in need of long distant transportation. For the long distant transportation, it should be retrofitted with a wooden case and mark the "up" or "rain" symbols.

8 Quality Warranty

If the machine is used in accordance with the regulations on the operation manual, in compliance with the rules on installation, storage, use, maintenance, safeguarding, manufacturers should provide free services for the users under the conditions of within 12 months from the date of purchase (based on the issued invoice date).