



# **INVERTER DC TIG WELDING MACHINE**

## **OPERATION MANUAL INTIG 200 IDS**

### **WARPP ENGINEERS PVT. LTD.**

**B-1005, Western Edge II, Near Metro Mall, Off. Western Express Highway,  
Borivali (E), Mumbai-400 066.**

**Tel: 91-22-28542272 /73/74. Fax: 91-22- 28542275.**

**E-mail: [sales@warpp.co.in](mailto:sales@warpp.co.in) Web Site: [www.warpp.co.in](http://www.warpp.co.in)**

## Safety precautions

- Please read this instruction carefully for correct use.
- The objective of the precautions listed in this instruction is to ensure the safe use of machine and prevent you and others from being harmed or injured.
- Safety consideration for the welding machine in design and manufacture. Work to the precautions in this instruction, otherwise it will cause major accident.
- If used incorrectly, the harm and damage will occur in three different ways. So the caution symbol and warning labels are listed in this instruction.

Caution symbols	Warning labels	Content
	High danger	If used incorrectly, potential major harm will result in death or serious injury and major danger accident once it occurs.
	Danger	If used incorrectly, potential scourge harm will result in death or serious injury and danger accident once it occurs.
	Caution	If the welding machine is used incorrectly, the harm with mild degree, slight wound and other dangerous accidents and the damage of articles will be caused.

\*The symbol above is applicable to the general occasion.

The serious injury mentioned above refers to eyesight damage, trauma, harm, electric shock, fracture and poisoning and so on which will leave sequel and is in need of making treatment in need of making treatment in hospital of going to hospital for long period, slight wound refers to burn and electric shock and so on which is not in need of being in hospital but treatment for long period. The damage of articles refers to the loss of property and damage of machine.

On the usage of machine, the symbols shown as following indicate [must do] and [forbid doing].

	Compulsion	Must do For example [ grounding]
	Forbidden	Forbid doing

\*The symbols above are used in the general occasions



Danger Work to the following items in case of the major personal

## Accident

1. Safety consideration for the welding machine in design and manufacture.  
Work to the precautions in this instruction, otherwise it will cause death, serious injury and other major personal accident.
2. For the construction power source of input, the choice of equipment location, the application keeping and configure of high pressure gas, the keeping of workpiece after welding and the treatment of rejection and so on, please observe the relative regulations and the standards inside your company.
3. The unconcerned personnel never go in the welding working location.
4. The person using heart pacemaker do not be close to the welding machine in operation and the surrounding of welding operation location without permission of doctor. The produced magnetic field when the welding machine is electrified will produce the bad effect on the action of pacemaker.
5. Invite the professional or expert person to install, examine and repair and maintain the welding machine.
6. To ensure safety, please correctly understand the content in this instruction and invite the personnel with safety usage knowledge and skill to operate this machine.
7. Do not use machine in the work except the welding.



Danger Work to the following items in case of electric shock



\*Once contact the position with electricity, the fatal electric shock or heat injury will be caused.

1. Never contact electrified position.
2. Invite electric personnel to earth welding machine and parent metal according to regulations.
3. In installation and examination and repair, must turn off the power of electric switch box first, then the operation was made after 5 minutes.
4. Never use the cable which lacks of capacity of where conductor exposes for the damage of insulation jacket.
5. For cable connection part, please ensure insulation.
6. Never use welding machine on the condition of dismounting machine shell.
7. Please use dry insulation glove.
8. Please use safety net at high place operation.
9. Make maintenance and examination and repair, only the damaged part can be used until it is repaired well.
10. Please shut off all input powers when the machine is unused.
11. When use AC arc welding machine in the confined place or high place, please use electric shock-proof device.



- \*Arc light will cause the inflammation of eye or heat injury of skin and other personal damages.
- \*Splashing and weld slag will burn eye or skin
- \*Noise will be harmful to hearing

1. When make welding or supervise welding, please use the safety appliance with enough shading degree.
2. Please emphasize particularly on wearing protective glasses.
3. Please wear protective glove, long sleeve clothes, welding spats, apron and other safety appliances in welding, which are made of leather.
4. Protective barrier are set around the welding location to prevent arc light from end angering others.
5. When noise is great, please use sound insulation apparatus.



Caution To avoid weald dust and gas endanger you and others, please use safety appliance



- \*Weld dust and gas endanger health
- \*In operation in the confined location, lack of oxygen will result in

1. To prevent gas poisoning and suffocation and other accidents, please use regulated exhaustion facilities, and breath protection appliance is coordinated for use.
2. In operation in the confined location, please accept the examination by supervision personnel and fully change gas and coordinate in using breath protection appliance.
3. Never make weld within degrease, cleaning and atomization working area.
4. When weld the steel plate with electroplate or coating, the harmful dust and gas will produce, please use protection appliance for breath.



Caution To prevent fire, explosion, cracking and other accidents from taking place, please be sure to observe the following regulations.



- \*Splashing or heat parent metal just welded will cause fire.
- \*When current loop produce non full contact on the bad connection of cable and steel bar and other parent metals, the heat after electrifying will be caused.
- \*Never weld on the container filling combustibility substance, otherwise explosion will be caused.
- \*Never weld seal container, for example groove (b o x), pipe, otherwise

1. Never place combustible in the weld location.
2. Never weld near combustible gas.
3. Never close to the combustible when the heat parent metal is just welded.
4. When weld dooryard, ground and wall, please eliminate the combustible on the back.
5. The connection of cable shall surely be insulation.
6. The connection of cable of parent metal side shall approach welding position as possible.
7. Never weld the gas pipe and seal groove and so on which stores gas.
8. The fire extinguisher shall be placed near weld work location to protect against accident.



Caution To prevent gas bottle from dumping, gas adjustor from Cracking and other accidents, please sure to observe the follow regulations.



\*The dumping of gas bottle will result in personal accident.  
 \*If gas bottle stores high pressure gas, incorrect use will cause the ejection, thus causing personal accident.

1. Please use gas bottle correctly according to regulations.
2. Please use he gas adjustor equipped or recommended by our company.
3. Please read the operation instruction for gas adjustor before use, observe precautions.
4. Please use the special gas bottle support structure to fix gas bottle.
5. Never put gas bottle in the place where temperature is high or sunlight shines directly.
6. Make sure you face keep away from the outlet of gas when the valve of gas bottle is opened.
7. Please install the gas bottle protecting jacket when the gas bottle is unused.
8. Never put welding torch on the gas bottle, electrode can not contact gas bottle.

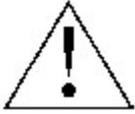


Caution Contact of rotation position will cause injury, please observe the following regulations



\*Never ringer, hair, clothes, etc approach cooling fan and the electrode wheel of electrode feeding machine and other rotation positions.

1. Never use welding machine on the condition of dismounting machine shell.
2. Invite the professional or expert person to install, examine and repair and maintain the welding machine.
3. Never finger, hair, clothes, etc approach cooling fan and the electrode wheel of electrode feeding machine and other rotation positions.



Caution The end of welding wire will cause injury, please be sure to observe the following regulations

\*If the welding wire emits from welding torch, the eye, face and other exposure parts of the body will be stabbed.

1. In affirming whether the welding wire is fed, do not peek into the small hole of current contact nozzle. Otherwise welding wire will prick eye and face.
2. When welding wire is fed by hand or welding torch is opened, please do not put the end of welding torch dose to eye, face and other exposure parts of the body.



Caution Plasma weld will result in burn, please be sure to observe the following regulations

\*Never put such any part of body as finger close to plasma work, otherwise burn will cause.

1. In cutting work, the finger shall leave the nozzle and electrode on the end of cutting torch.
2. Never make cutting work near place where parent metal is held by hand.
3. When change nozzle and electrode, please first turn off power.



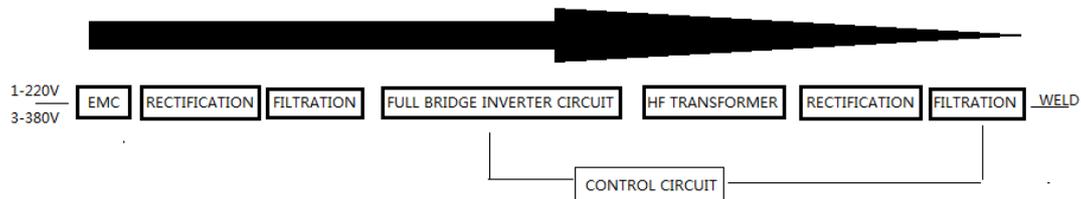
Caution To prevent fire caused by the deterioration of insulation of welding power, please be sure to observe the following regulations.

\* If splashing produced in welding and iron powder produced in snagging work go in the power, the deterioration of insulation will be produced, thus causing fire

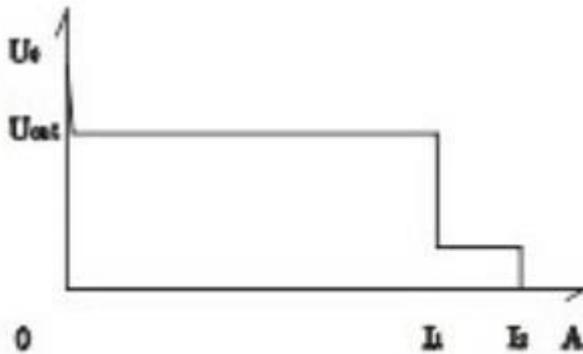
1. To prevent splashing and iron powder and so on from going in the power, please separate weld power from weld work and snagging work.
2. To prevent insulation deterioration caused by powder accumulation, please be sure to maintain and examine and repair regularly.
3. If splashing, iron powder, etc go in the power, please be sure to turn off power switch of welding machine and switch of distributor case, then blow off with air.

## MACHINE WORKING PRINCIPLE

Three phase input power go into the welding machine via EMC, and go through the three phase rectifier bridge work of full bridge rectification, and also pass the filter going into the inverter, to be lower for the voltage with HF transformer, finally, fast rectification and filtration by FRD, give the output as welding work.



## OUTTER FEATURE



## MAINTAIN

please pay more attention for the machine maintain with machine use and machine working situation.

It is the most important things if the machine could be used with a careful use and cycle maintain work.

please check the power supply, whether it is ok for connection.

please take care and change the new power cable if the power supply cable of machine is broken.

## Placement of welding machine

In placement, please pay attention to the following items:

- (a) Lay in the place as possible where the ground is flat and vibration is little and which is more than 20m far from wall.
- (b) Please put it in the clean and dry place where iron powder, dust, paint are little.
- (c) Please put the machine in the place where rain pouring can be avoided and which is not subject to the erosion of sea water.

## Connection

### Grounding

(a) The grounding terminal is set on the bottom of side plate of back of machine shell, please earth with copper wire with above 6mm<sup>2</sup> area.

Please entrust full-time staff (electrician) to earth.

### Connection of power

One welding machine is equipped with one distribution box including switch, fuse and other current protectors, whose output end is connected with input end of welding machine. The capacity of distribution box refers to the following table. Especially for fuse and other current protectors, for the sake of safety, please use the protector with proper capacity rather than the protector with the too great capacity

### Connection of welding end

One end connects with the cable of welding tongs, another end connects with welded object by connection cable. To ensure safety, in operation the welded object must be earthed.

## TECHNOLOGY FEATURE

A new generation TIG welding machine adopts the advanced soft switching inverter based on the core fitting of imported IGBT and microcrystal magnetic cores with the 20KHZ inverter frequency. The product owns high load duty cycle with arc igniting current and current thrust control function. It owns the advantages of automatic compensation function for voltage fluctuation, stable arc, even weld crater, little splash and good weld formation. And on the other hand, it first applies the digital circuit control technique for the purpose of quality of welding, which not only reduces the weight and volume much and improves the portability but simplifies the operation of facility, getting good arc ignition and welding performance to improve the precision of welding.

Due to adopting the digital circuit control, the pre-welding set value can be displayed by the number. The actual value is displayed during the welding, and the value is locked automatically after welding, which makes convenience for presetting and control of welding criterion.

The way of arc striking is the HF arc striking. It adopts one kind of new electric HF arc igniter with strong HF discharge. The unique property improves the adaptability of welding machine, and even connecting long cable, it can keep good arcing performance. Its top inverting frequency of 20KHZ reduces the current fluctuation's influence for arc much, which makes arcing and arc static current very low (20A). The arc burns steadily and quietly with dense arc and small heat affected zone, especially suitable for welding thin metal plates. Considering all aspects of factors' influence for the welding machine in designing, the advanced design is adopted in some minutiae. The shell adopts the engineering plastic, and the die is shaped by single-pressing with prominent edge for protection; the inner bare line adopts the insulating varnish with high insulating strength for protection that can cope with rugged environment. In addition, fully considering the economy of welding machine use in the design, the power consumption efficiency of all digital TIG welding machine reaches 90%, and the power factor reaches 0.89

Regarding TIG welding

Tungsten electrode working current range (DC positive connection)

Electrode Diameter mm	Current (A)		Electrode Diameter mm	Current (A)	
	Pure tungsten	thoriated tungsten		Pure tungsten	thoriated tungsten
0.5	2-20	2-20	3.2	160-310	225-330
1.0	10-75	10-75	4.0	275-450	350-480
1.6	40-130	60-150	5.0	400-625	500-675
2.0	75-180	100-200	6.3	550-675	650-950
2.5	130-230	160-250			

TIG parameter recommend value

tungsten electrode diameter mm	Metal thickness mm	Weld current A	MAX argon flow L/min
1-2	1-3	< 50	4
		50-80	6
2-4	3-6	81-120	7
		121-160	8
		161-200	9
		201-300	10
4-6	6-9	301-400	12
		>400	14

note:

power output, voltage is  $U_2=10+0.04 I_2$

$U_2$  is load voltage

$I_2$  is weld current

## MACHINE PROTECTION FUNCTION

### protection

when the machine is in the situation of over load, welding machine will stop the weld work, machine will be in the over load situation of stop work. In this situation, welding machine protection (overload light) light will power off. And, after the machine become cooling automatically, machine will come back for the normal working situation for weld, and the over load light power on.

### over heat protection

when machine working temperature surpass the normal temperature, welding machine will stop the work, and come into the machine protection situation automatically. At this moment, people should have a check with the machine cooling fan working situation, welding machine is being in the good ventilation or not.

### regarding the MMA function

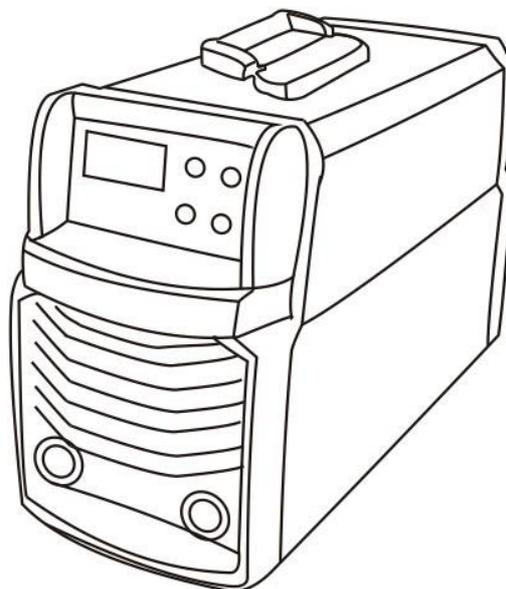
welding machine could use the kinds of MMA weld stick with the rated output power, including the steel welding stick, ALU stick and CrAL weld stick and so on.

### MMA weld stick recommend parameter

Metal thickness	$\leq 4\text{mm}$	4-12mm	$<12\text{mm}$
Weld stick diameter		3.2-4mm	$\geq 4\text{mm}$

### output power pole chosen

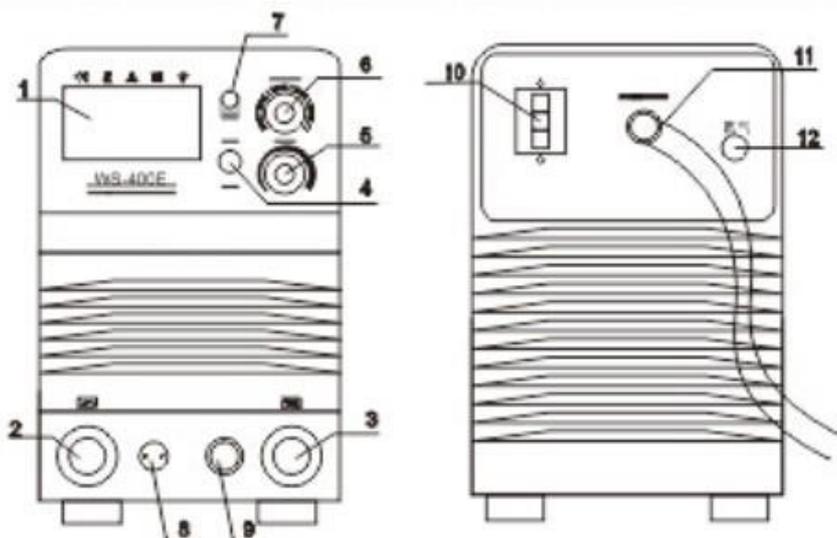
generally, weld black metal, when the weld stick is for the acidity weld, it is chosen the positive connection. but, for alkaline weld, it is chosen the negative connection.



Parameter

model	INTIG 200 IDS
INPUT	1-220V 50/60HZ
NO LOAD	62V
DUTY CYCLE	60%
MAX. OUTPUT	200A/160A
CURRENT RANGE	5-200A
INPUT CABLE	3X2.5MM2
SWITCH FOR POWER	25A
DIMENSION	420X170X260
WEIGHT	10
PROTECTION	IP21

OPERATION



1. display meter
2. positive connector
3. negative connector
4. switch for MMA, TIG
5. welding current adjustment
6. gas post
7. protection light
8. torch control connector
9. torch gas/power connector
10. power switch
11. input cable
12. gas input