USER'S MANUAL

TIG/MMA dual function
IGBT inverter technology
DC welding power source

TIG 220 DIGITAL PULSE RC

QUICK**SILVER**

INDEX

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Introduction

First of all, thank you for choosing an IWELD welding or cutting machine!

Our mission is to support your work with the most up-to-date and reliable tools both for DIY and industrial application.

We develop and manufacture our tools and machines in this spirit.

All of our welding and cutting machines are based on advanced inverter technology, reducing the weight and dimensions of the main transformer.

Compared to traditional transformer welding machines the efficiency is increased by more than 30%.

As a result of the technology used and the use of quality parts, our welding and cutting machines are characterized by stable operation, impressive performance, energy efficient and environmentally friendly operation.

By activating the microprocessor control and welding support functions, it continuously helps maintain the optimum character of welding or cutting.

Read and use the manual instructions before using the machine please!

The user's manual describes the possible sources of danger during welding, includes technical parameters, functions, and provides support for handling and adjustment but keep in mind it doesn't contain the welding knowledge!

If the user's manual doesn't provide you with sufficient information, contact your distributor for more information!

In the event of any defect or other warranty event, please observe the „General Warranty Terms".

The user manual and related documents are also available on our website at the product data sheet.

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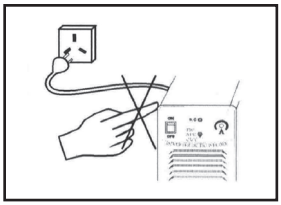
WARNING!

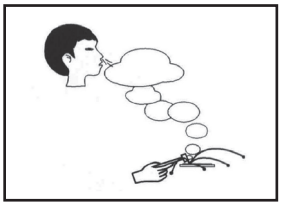
Welding is a dangerous process! The operator and other persons in the working area must follow the safety instructions and are obliged to wear proper Personal Protection Items. Always follow the local safety regulations! Please read and understand this instruction manual carefully before the installation and operation!

- The switching of the machine under operation can damage the equipment.
- After welding always disconnect the electrode holder cable from the equipment.
- Always connect the machine to a protected and safe electric network!
- Welding tools and cables used with must be perfect.
- Operator must be qualified!



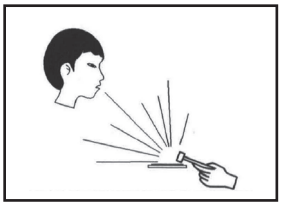
ELECTRIC SHOCK: may be fatal

- Connect the earth cable according to standard regulation.
- Avoid bare hand contact with all live components of the welding circuit, electrodes and wires. It is necessary for the operator to wear dry welding gloves while he performs the welding tasks.
- The operator should keep the working piece insulated from himself/herself.



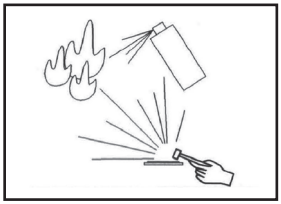
Smoke and gas generated while welding or cutting can be harmful to health.

- Avoid breathing the welding smoke and gases!
- Always keep the working area good ventilated!



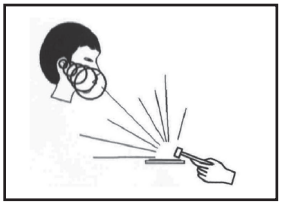
Arc light-emission is harmful to eyes and skin.

- Wear proper welding helmet, anti-radiation glass and work clothes while the welding operation is performed!
- Measures also should be taken to protect others in the working area.



FIRE HAZARD

- The welding spatter may cause fire, thus remove flammable materials from the working area.
- Have a fire extinguisher nearby in your reach!

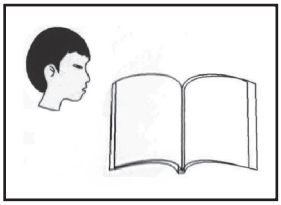


Noise can be harmful for your hearing

- Surface noise generated by welding can be disturbing and harmful. Protect your ears if needed!

Malfunctions

- Check this manual first for FAQs.
- Contact your local dealer or supplier for further advice.



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PRECAUTIONS TO ELECTROMAGNETIC COMPATIBILITY

1 General

Welding may cause electromagnetic interference.

The interference emission of arc welding equipment can be minimized by adopting proper installation method and correct use method.

The products described in this manual belong to the limit of class A equipment (applies to all occasions except the residential areas powered by public low-voltage power system).

Warning: Class A equipment does not apply to the residential areas powered by public low-voltage power system. Because the electromagnetic compatibility cannot be guaranteed in these areas owing to conducted and radiated disturbances.

2 Environmental assessment suggestions

Before installing the arc welding equipment, user shall assess the potential electromagnetic disturbance problems in the surrounding environment. The following matters shall be considered:

- Whether there are other service cables, control cables, signal and telephone wires, etc. above, under or around the welding equipment;
- Whether there are radio and television transmitting and receiving devices;
- Whether there are computers and other control equipment;
- Whether there are high-security level equipment, such as industrial protective equipment;
- Consider the health of staff at the site, for example, where there are workers wearing hearing aid or pacemaker;
- Whether there are equipment used for calibration or inspection;
- Pay attention to the noise immunity of other equipment around. The user should ensure that the equipment is compatible with the surrounding equipment, which may require extra protective measures;
- Time for welding or other activities;

The range of environment shall be determined according to the building structure and other possible activities, which may exceed the boundary of building.

3 Methods to reduce emission

- Public power supply system

The arc welding equipment shall be connected to the public power supply system according to the method recommended by the manufacturer. If there is interference, additional preventive measures shall be taken, such as access with filter in the public power supply system. For fixed arc welding equipment, the service cables shall be shielded by metal pipe or other equivalent methods. However, the shield shall ensure electrical continuity and shall be connected with the case of welding source to ensure the good electrical contact between them.

- Maintenance of arc welding equipment

The arc welding equipment must be regularly maintained according to the method recommended by the manufacturer. When the welding equipment is running, all entrances, auxiliary doors and cover plates shall be closed and properly tightened. The arc welding equipment shall not be modified in any form, unless the change and adjustment are permitted in the manual. Particularly, the spark gap of arc striker and arc stabilizer shall be adjusted and maintained according to the manufacturer's suggestions.

- Welding cable

The welding cable shall be as short as possible and close to each other and to the ground line.

- Equipotential bonding

Pay attention to the bonding of all metal objects in surrounding environment. The overlapping of metal object and workpiece can increase the risk of work, as operators may suffer from electric shock when touch the metal object and electrode simultaneously. Operators shall be insulated from all these metal objects.

- Grounding of the workpiece

For electrical safety or workpiece location, size and other reasons, the workpiece may not be grounded, such as the hull or structural steelwork. Grounding of workpieces sometimes can reduce the emission, but it is not always the case. So be sure to prevent the increasing risk of electric shock or damage of other electrical equipment caused by grounded workpieces. When necessary, the workpiece should be directly connected with the ground. But direct grounding is forbidden in some countries. In such case, use appropriate capacitor in accordance with regulations of the country.

- Shielding

Selectively shield the surrounding equipment and other cables to reduce the electromagnetic interference. For special applications, the whole welding area can be shielded.

The Main Parameters

QUICK**SILVER**			**TIG 220 DIGITAL PULSE** RC
	Art. Nr.		800TIG220DIPU
FUNCTIONS / GENERAL	Inverter type		IGBT
	Water Cooling Unit		×
	Arc Ignition		HF/LT
	Number of programs		×
	Wireless Remote Control		opcionális
	Remote Control from TIG Torch		✓
	Digital Control Panel		✓
	Analog Control Panel		×
FUNCTIONS / TIG	AC TIG		×
	AC PULSE TIG		×
	DC TIG		✓
	DC PULSE TIG		✓
	2T/4T		✓
	Number of Waveforms		1
FUNCTIONS / MMA	AC MMA		×
	DC MMA		✓
	Arc Force		✓
	Adjustable Arc Force		✓
	Hot Start		✓
PARAMETERS	Accessories TIG Torch		IGrip SR17
	Optional TIG Torch		-
	Phase number		1
	Rated input Voltage		230V AC±10% 50/60Hz
	Max./eff. input Current	MMA	47A/30A
		TIG	32A/25A
	Power Factor (cos φ)		0.68
	Efficiency		≥85%
	Duty Cycle (10 min/40 °C)	MMA	**200A @ 40% 125A @ 100%**
		TIG	**200A @ 60% 155A @ 100%**
	Welding Current Range	MMA	10A - 200A
		TIG	10A - 200A
	Output Voltage	MMA	20.24V - 28V
		TIG	10.4V - 18V
	No-Load Voltage		69V
	Insulation		H
	Protection Class		IP21S
	Weight		6.2 kg
	Dimensions (LxWxH)		400 X 145 X 235 mm

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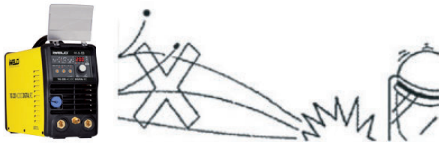
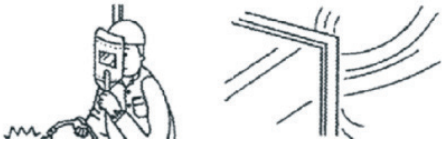
2. Installation

2-1. Installation Place

Place the welding machine in the rainproof room with no direct sunshine, low humidity and little dust! (room temperature 10 °C -40 °C). 	Any conductive foreign object can not enter the welding power supply! 
Keep the welding power supply over 20 cm away from the wall! Two welding machines should be over 30 cm apart when placed in parallel. 	Conduct the welding at the place without wind (use the wind shield, etc.)! 

CAUTION	This product should be used indoor; it's recommended not to use it in the place which may suffer from rain!
In case this product is soaked with rain, raindrops may fall into power supply inside; at this time, a serious accident may occur. therefore, ask professional personnel to related check maintenance.	

2-2. Notices

- The line voltage of the 3 phase power supply should be within 200V-250V!
- The earth cable of the welding machine should be connected correctly and reliably!
- Be sure to check all connection cables regularly. If finding the connector is loose, be sure to screw it tight; otherwise, it may be burnt and cause unstable welding!
- After the welding is over, be sure to power off in time!
- For outdoor use, be sure to cover the machine in rainy or snowy day; but do not obstruct its ventilation!
- Regularly check if the insulated skin of all cables is broken if yes, bind up or replace such cable!
- Regularly check if all electric connections inside the machine are loose. Be sure to taste the loose one!
- Take care of all devices and do not let them suffer artificial damages!

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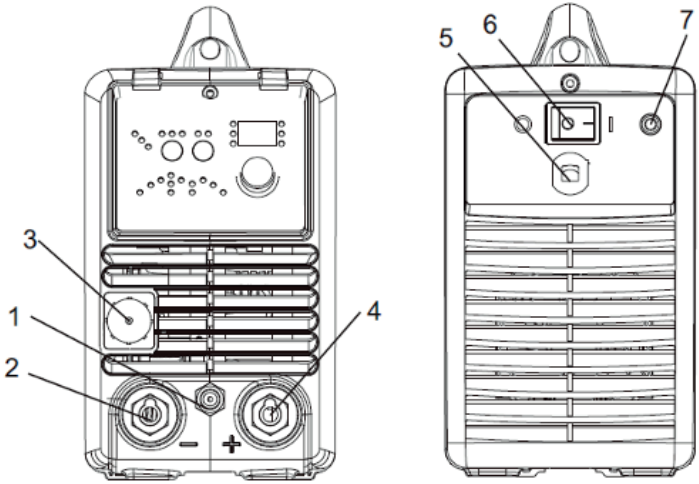
2-3. Front and Rear Panel Structure and Description



1	Shield gas output connector	5	Power source input
2	Negative output terminal	6	Power switch
3	TIG Torch connector	7	Shield gas input joint
4	Positive output terminals - AC and DC		

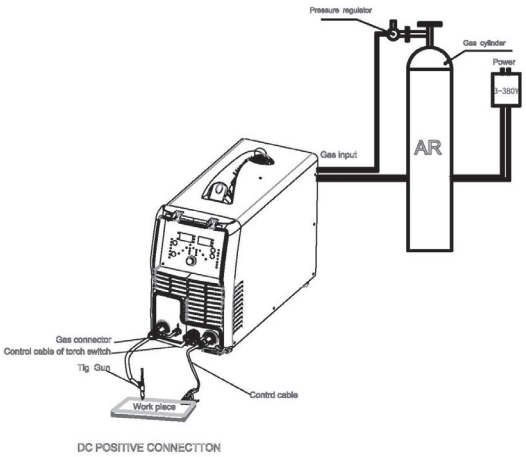
2-4. Installation in TIG mode

Workpiece is connected to the positive electrode of welding machine, and welding torch is connected to the negative electrode, which is called DC POSITIVE CONNECTION; otherwise, that is called DC NEGATIVE CONNECTION. Generally, it is usually operated in DC POSITIVE CONNECTION in TIG welding mode.

The control cable of torch switch consists of 2 wires, pedal control of 3 wires and the aero socket has 14 leads.

Consumable parts for TIG torch, such as tungsten electrode, tip, gas nozzle, electrode shield(short/long) , please enquire us by mail or phone according to the accessory codes.

When TIG 320 400 AC/DC welding machines are operated in HF ignition method, the ignition spark can cause interferences in equipment near the welding machine. Be sure to take specially safety precautions or shielding measures.



DC POSITIVE CONNECTION

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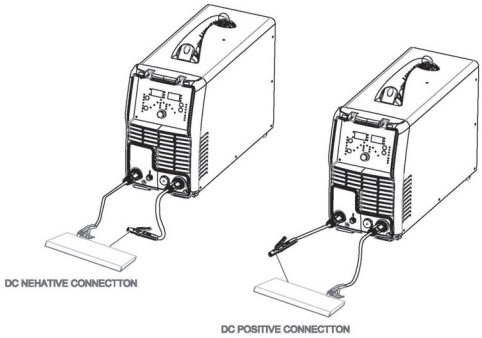
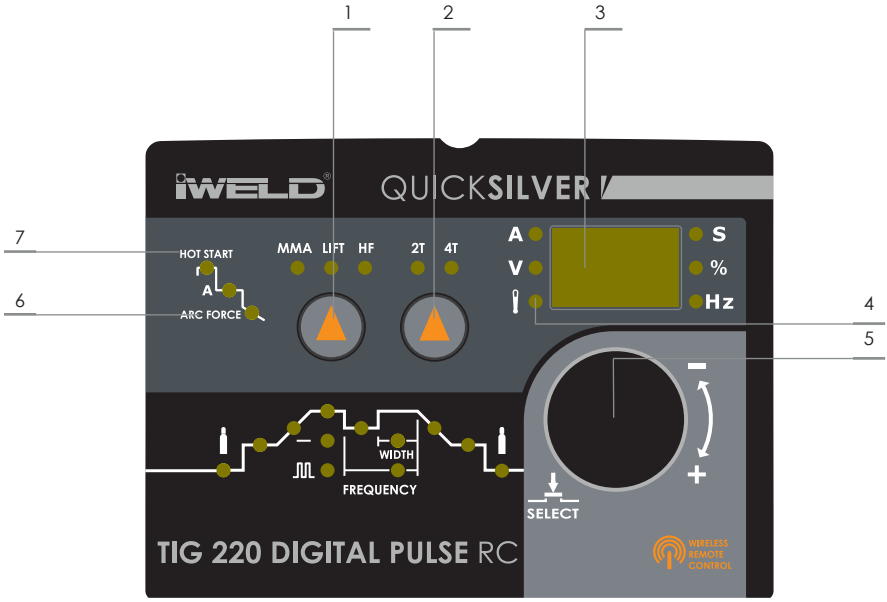
2-5. Installation in MMA mode

MMA: Choosing the connection of DCEN or DCEP according to the different electrodes. Please refer to the electrode manual.



3. Operation Instruction

3-1. Control Panel



1 MMA/LIFT TIG/ HF TIG SELECT
2 2T/4T selection key
3 Welding current and other parameter display
4 Over-current/over heat indicator
5 Welding current and other parameter display
6 ARC FORCE (0-10)
7 HOT START (0-10)

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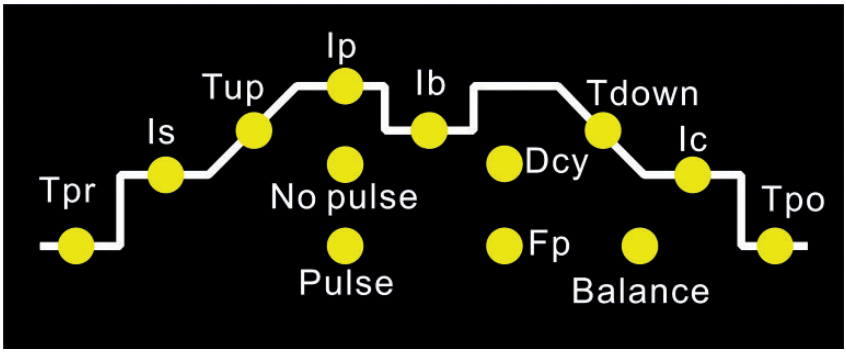
3-2. Available parameters where 2T and 4T mode have been selected



Tpr	Gas pre-flow time	sec.	0.0 - 2.0
Is	Starting current (only with 4T)	A	5 →
Tup	Up-slope time	sec.	0.0 - 10
Ip	Welding current	A	5—200
Ib	Base current	A	5—200
Dcy	Ratio of pulse duration to base current duration	%	5 - 95
Fp	Pulse frequency	Hz	0.5 - 200
Tdown	Down-slope time	sec.	0.0 - 10
Ic	Crater arc current	A	5-200
Tpo	Gas post-flow time	sec.	0.0 - 10
Balance (only with TIG-AC) Balance adjustment is mainly used to set the adjustment of eliminating metal-oxide (such as Aluminium, Magnesium and its alloy) while AC output.			-5 - +5

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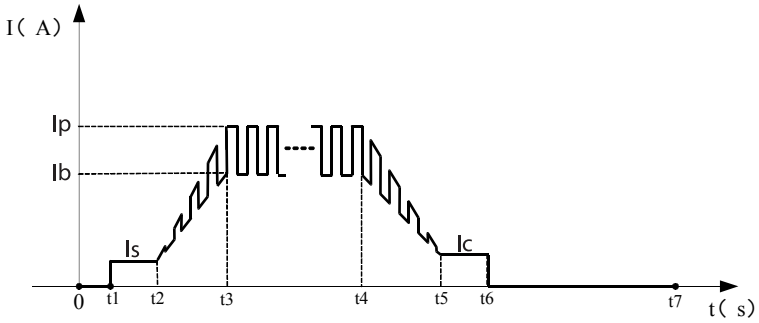
3.3 Pedal switch control

- When plug the fourteen-lead aero-socket of pedal switch in it. Welder will identify the pedal switch, the welding current knob on the front panel will can't use and only 2T can be selected.
- When use the adjustment knob of max-welding current beside the pedal, can set the max-current you want.

3-4 . Operation steps of TIG mode.

4T operation:

The start current and crater current can be pre-setting. This function can compensate the possible crater that appears at the beginning and end of the welding. Thus, 4T is suitable for the welding of medium thickness plates.



- 0: Press and hold the gun switch, Electromagnetic gas valve is turned on. The shielding gas stars to flow;
- 0~t1: Gas Pre-flow time (0.0~2 sec);
- t1~t2: Arc is ignited at t1 and then output the setting value of start current; (5-200A)
- t2: Loosen the gun switch, the output current slopes up from the start current; (0.0-10 sec)
- t2~t3: The output current rises to the setting value (Iw or Ib), the up-slope time can be adjusted; (5-200A)
- t3~t4: Welding process. During this period, the gun switch is loosen;

  Note: Select the pulsed output, the base current and welding current will be outputted alternately; otherwise, output the setting value of welding current;
- t4: Press the torch switch again, the welding current will drop in accordance with the selected down-slope time. (0.0-10 sec)
- t4~t5: The output current slopes down to the crater current. (5-200A) The down-slope time can be adjusted;
- t5~t6: The crater current time;
- t6: Loosen the gun switch, stop arc and keep on argon flowing;
- t6~t7: Gas Post-flow time can be set by the post-gas time adjustment knob on the front panel (0.0-10 sec);
- t7: Electromagnetic valve is closed and stop argon flowing. Welding is finished.

Notices:

• Check the condition of welding and connection units firstly, otherwise there will be malfunction such as ignition spark, gas leakage, out of control and so on.

• Check that whether there is enough Argon gas in the shield gas cylinder, you can test the electromagnetic gas valve through the switch on the front panel.

• Do not let the torch aim at your hand or else of your body. When you press the torch switch, the arc is ignited with a high-frequency, high-voltage spark, and the ignition spark can cause interferences in equipment.

• The flow rate is set according to the welding power used in the job. Turn the regulation screw to adjust the gas flow which is shown on the gas hose pressure meter or the gas bottle pressure meter.

• The spark ignition works better if you keep the 3mm distance from the workpiece to the tungsten electrode during the ignition.

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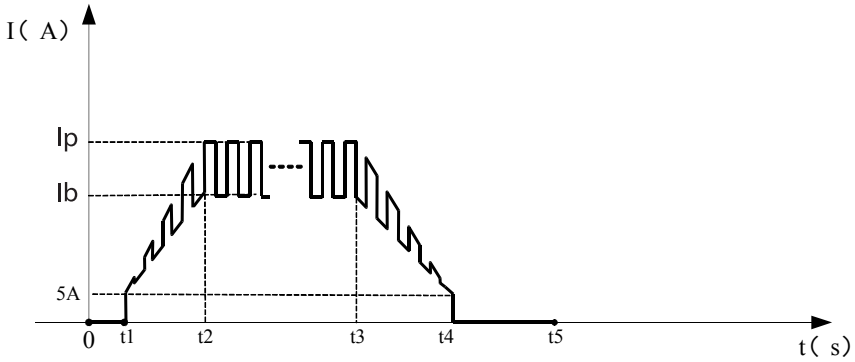
2T operation:

This function without the adjustment of start current and crater current is suitable for the Re-tack-welding, transient welding, thin plate welding and so on.



- 0: Press the gun switch and hold it. Electromagnetic gas valve is turned on. The shielding gas stars to flow.
- 0~t1: Gas Pre-flow time (0.0-2 sec)
- t1~t2: Arc is ignited (t1) and the output current rises (t2) to the setting welding current (Iw or Ib) from the min. welding current. (0.0-10 sec)
- t2~t3: During the whole welding process, the gun switch is pressed and held without releasing.
  Note: Select the pulsed output, the base current and welding current will be outputted alternately; otherwise, output the setting value of welding current;
- t3: Release the gun switch, the welding current will drop in accordance with the selected down-slope time.
- t3~t4: The current drops to the minimum welding current from the setting current (Iw or Ib), and then arc is turned off. (0.0-10 sec)
- t4~t5: Gas Post-flow time, after the arc is turned off. You can adjust it through turning the knob on the front panel. (0.0-10 sec)
- t5: electromagnetic gas valve turned off, the shield gas stops to flow, and welding is finished.

3-5. Short circuit protect function:

TIG /DC/LIFT: If the tungsten electrode sticking to the the workpiece during welding, the current will drop to 20A, which can reduce the tungsten spoilage farthest, prolong the using life of the tungsten electrode and prevent tungsten clipping.

TIG /DC/HF: If the tungsten electrode sticking to the the workpiece during welding, the current will drop to 0 within 1s, which can reduce the tungsten spoilage farthest, prolong the using life of

MMA operation: if the welding electrode sticking to the workpiece over two seconds, the welding current will drop to the 0 automatically to protect the electrode.

Prevent arc-break function: TIG operation, Avoid arc-break with special means, even if arc-break occurs the HF will keep the arc stable

4T TIG: If the TIG torch is pressed quickly, the welding current will drop a half, then if the TIG torch is pressed quickly again, the welding current will get back.

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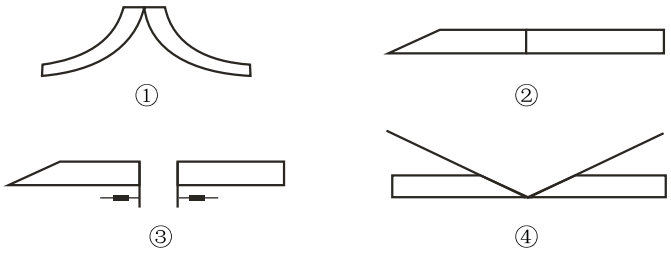
4. Welding Workmanship Parameter Reference Values

4-1. TIG Welding Workmanship Parameters

Workpiece thickness (mm)	Tungsten electrode diameter(mm)	Welding wire diameter (mm)	Welding current(A)	Argon speed (L/min)	Clearance size(mm)	Types of Weld
0.4	1.0-1.6	0-1.0	5-30	4-5	1	①、②
1.0	1.0-1.6	0-1.6	10-30	5-7	1	①、②
1.5	1.0-1.6	0-1.6	50-70	6-9	1	②
2.5	1.6-2.4	1.6-2.4	70-90	6-9	1	②
3.0	1.6-2.4	1.6-2.4	90-120	7-10	1-2	②、③
4.0	2.4	1.6-2.4	120-150	10-15	2-3	④、③
5.0	2.4-3.2	2.4-3.2	120-180	10-15	2-3	④、③
6.0	2.4-3.2	2.4-3.2	150-200	10-15	3-4	④、③
8.0	3.2-4.0	3.2-4.0	160-220	12-18	4-5	④
12.0	3.2-4.0	3.2-4.0	180-300	12-18	6-8	④



4-2. Common MMA Welding Workmanship Parameters

Workpiece thickness (mm)	⩽1	1~2	2~3	4~5	6~12	⩾13
Eleectrode diameter (mm)	1.5	2	3.2	3.2~4	4~5	5~6
Welding current (A)	20~40	40~50	90~120	90~130	160~250	250~400

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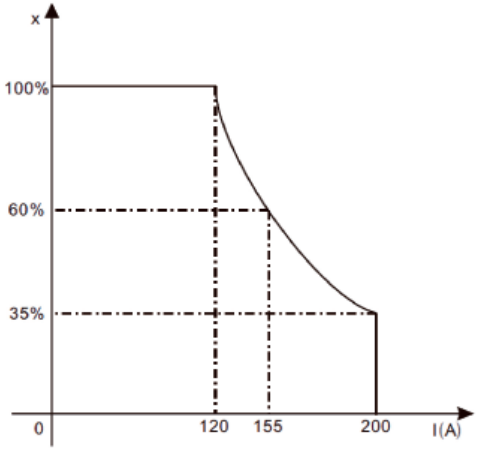
4-3. Duty Cycle Curve

The letter "X" stands for duty cycle, which is defined as the proportion of the time that a machine can work continuously within a certain time (10 minutes). The rated duty cycle means the proportion of the time that a machine can work continuously within 10 minutes when it outputs the rated welding current.
The relation between the duty cycle "X" and the output welding current "I" is shown as the right figure.

If the welder is over-heat, the IGBT over-heat protection unit inside it will output an instruction to cut output welding current, and brighten the over-heat pilot lamp on the front panel. At this time, the machine should be relaxed for 15 minutes to cool the fan. When operating the machine again, the welding output current or the duty cycle should be reduced.

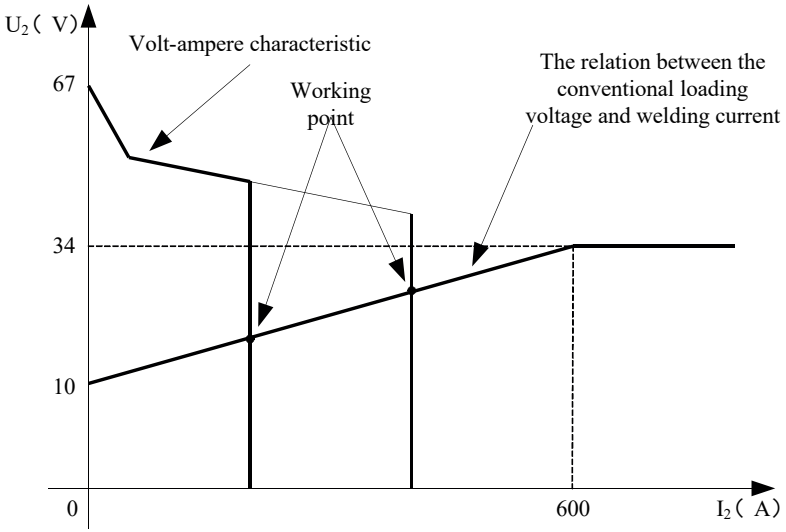


Warning: Work in Overload is Harmful to the Welding Machine

4-4. Volt-Ampere Characteristic

TIG 220 DIGITAL PULSE RC welding machine has an excellent volt-ampere characteristic, whose graph is shown as the following figure.
The relation between the conventional rated loading voltage U_2 and the conventional welding current I_2 is as follows:

When $I_2 \leq 600A \leq U_2 = 10 + 0.04I2(V)$; When $I_2 \geq 600A, U_2 = 34(V)$.



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Precautions

Workspace

1. Welding equipment free of dust, corrosive gas, non-flammable materials, up to 90% humidity for use!
2. Avoid welding outdoors unless protected from direct sunlight, rain, snow, work area temperature must be between -10 °C and +40°C.
3. Wall to position the device at least 30 inches away.
4. Well-ventilated area to perform welding.

Safety requirements

Welding provides protection against overvoltage / overcurrent / overheating. If any of the above events occurs, the machine stops automatically. However, over- stress damage to the machine , keep the following guidelines :

1. Ventilation . When welding a strong current going through the machine , so the machine is not enough natural ventilation for cooling . The need to ensure adequate cooling, so the distance between the plane and any object around it at least 30 cm . Good ventilation is important to normal function and service life of the machine.
2. Continuously , the welding current does not exceed the maximum allowable value. Current overload may shorten its life or damage to the machine .
3. Surge banned ! Observance of tension range follow the main parameter table . Welding machine automatically compensates for voltage , allowing the voltage within permissible limits of law. If input voltages exceed the specified value , damaged parts of the machine .
4. The machine must be grounded! If you are operating in a standard, grounded AC pipeline in the event of grounding is provided automatically . If you have a generator or foreign , unfamiliar , non-grounded power supply using the machine , the machine is required for grounding connection point earth to protect against electric shock .
5. Suddenly stopping may be during welding when an overload occurs or the machine overheats . In this case, do not restart the computer , do not try to work with it right away, but do not turn off the power switch , so you can leave in accordance with the built-in fan to cool the welding machines .

WARNING!

If the welding equipment is used with the welding parameters above 180 amperes, the standard 230V electrical socket and plug for 16 amp circuit breaker is not sufficient for the required current consumption, it is necessary to use the welding equipment with 20A, 25A or even to the 32A industrial fuses! In this case, both the plug and the plug socket fork have to be replaced to 32A single phase fuse socket in compliance with all applicable rules. This work may only be carried out by specialists!

Maintenance

1. Remove power unit before maintenance or repair!
2. Ensure that proper grounding!
3. Make sure that the internal gas and electricity connections are perfect and tighten, adjust if necessary, if there is oxidation, remove it with sandpaper and then reconnect the cable.
4. Hands, hair, loose clothing should be kept away under electric parts, such as wires, fan.
5. Regularly dust from the machine clean, dry compressed air, a lot of smoke and polluted air to clean the machine every day!
6. The gas pressure is correct not to damage components of the machine.
7. If water would be, for example. rain, dry it in the machine and check the insulation properly! Only if everything is all right, go after the welding!

8 When not in use for a long time, in the original packaging in a dry place.

CERTIFICATE OF EUROPEAN STANDARD

Manufacturer:

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2314 Halásztelek
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Item:

TIG 220 DIGITAL PULSE RC
TIG/MMA dual function IGBT inverter technology
AC/DC welding power source

Applied Rules (1):

EN 60204-1:2005
EN 60974-10:2014,
EN 60974-1:2013

(1) References to laws, rules and regulations are to be understood as related to laws, rules and regulations in force at present.
Manufacturer declares that the above specified product is complying with all of the above specified rules and it also complying with the essential requirements as specified by the Directives 2014/35/EU, 2014/30/EU, 2006/42/EU and 2011/65/EU

Serial No.:

CE

Halásztelek (Hungary), 14/09/18

Managing Director:
András Bódi