

OWNER'S MANUAL



PLEASE CAREFUL READ THIS MANUAL BEFORE ASSEMBLY,
USE OR MAINTAINANCE



! WARNING When the DC inverter welder works with AC welder, please don't let the output cable of Two different machine connected together prevented from damage welder

 <p>DANGER</p>	<p>Once you touch the electric parts will result in electric shock</p>
	<ul style="list-style-type: none"> ● Don't touch the electric parts. ● Make sure the welder connect to earth before using. ● Off power supply while assembly and maintainance. ● Don't use the welder while opening the case. ● Please use the good insulating gloves.
 <p>CAUTION</p>	<p>ARC、 Spatter and slag may burn eyes and skin, abnormal noise may hurt hearing</p>
	<ul style="list-style-type: none"> ● Please use the welding mask to protect your face and eye ● Please use the welding clothes to protect your body ● Please use hearing protecting tool when it is noising
 <p>DANGER</p>	<p>Using welder in a narrow place or higher have the potential to cause electric shocks, stinging lead to falls and other accidents.</p>
	<ul style="list-style-type: none"> ● Please use the VRD device or build-in VRD welder in the following location ● 2m or higher location with risk of falling, workers who may be exposed to bars and other places of grounding electrical conductivity. ● Please check the VRD device per the safety rule while operating
 <p>CAUTION</p>	<p>The dust, smoke or gas caused by welding are bad for health</p>
	<ul style="list-style-type: none"> ● Please use local exhaust ventilation equipment and respiratory protective equipment. ● When operating in narrow places, please check and accept monitoring of adequate ventilation, wearing of respiratory protective equipment ● Please don't use the welder in the degreasing, cleaning and spraying area
 <p>CAUTION</p>	<p>It may result in fire, blasting or other accident during welding</p>
	<ul style="list-style-type: none"> ● Please don't place any Combustible and flammable gases in the welding location. ● Please don't weld any airtight container, like oil tank or tube or others ● Please equip with fire apparatus in welding location.
 <p>CAUTION</p>	<p>Lifting Device:</p>
	<p>The standard package for this welder is carton or wooden box without any connector for lifting device, so when the welder arrive, please use the fork lift truck to move the machine and then open it.</p> <ul style="list-style-type: none"> ● When the welder equipped with rings for lifting, you can use the ring to transport the machine, but please notice that don't use roller to move the welder since it may damage the welder ● Please make sure all accessories have been removed when lifting ● When the welder is being lifted, please make sure there is nobody below the welder and there is someone to mention the passengers. ● Please don't use the crane to move the welder quickly. ● Please install the welder in accordance with the assembly direction.

! WARNING Please make the generator's power is at least 2 times than the welder's rated power when using generators as power supply

CONTENTS

1、CONTENTS·····	1
2、MACHINE DESCRIPTION·····	2
3、TECHNICAL PARAMETERS TABLE·····	3
4、PANEL FUNCTION INSTRUCTION·····	5
5、ACCESSORY DRAWING·····	7
6、INSTALLATION INSTRUCTION·····	7
7、OPERATION NOTES·····	8
8、QUESTIONS TO BE RUN INTO DURING WELDING·····	9
9、MAINTENANCE·····	10
10、WELDING ISSUES·····	10
11、TROUBLESHOOTING AND FAULT FINDING·····	11

2、MACHINE DESCRIPTION:

1) INVERTER MMA/ARC WELDER SERIES FEATURES:

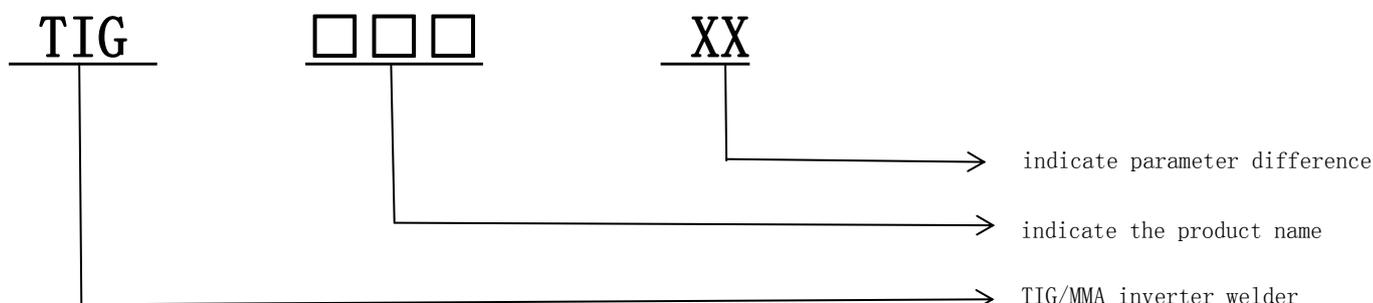
TIG 200MAX、TIG250MAX、TIG315MAX inverter welding machine series are TIG inverter welding machines which were designed and developed by our company ,they have the following advantages:

- ① Strong ability against the power fluctuation, it can work normally under the fluctuation of $\pm 15\%$;
- ② Fashionable appearance, small size, light weight and easy to move;
- ③ Using the three-proofed structure against the dust,moisture and corrosion, very considerable protectionfor all the electronic components
- ④ This series of manual arc welding machine using current-mode PWM pulse width adjustment technology IGBT inverter technology, high-power fast recovery diode application technology, product reliability, stability, higher.
- ⑤ With undervoltage, overheating, overcurrent, lack of protection, to ensure product reliability.
- ⑥ Stable output performance, real-time monitoring of the welding output power, the effective management of the output current to ensure welding welding reliability.
- ⑦ Has a good dynamic characteristics, easy arc, arc stability, easy to control the pool.
- ⑧ With precise preset welding current to make sure good welding result and energy saving,more Easy to operate and suitable for different thickness work-piece, thin plate in small current and thick plat in large current.

2) APPLICATION:

Suitable for welding of carbon steel, alloy steel, non-ferrous metals, suitable for boiler pressure-melt industrial power plants, aerospace manufacturing, industrial, automotive and vehicle manufacturing, construction and other related metals welding industry.

3) MODEL EXPLANATION:



4) LABEL EXPLANATIONS:

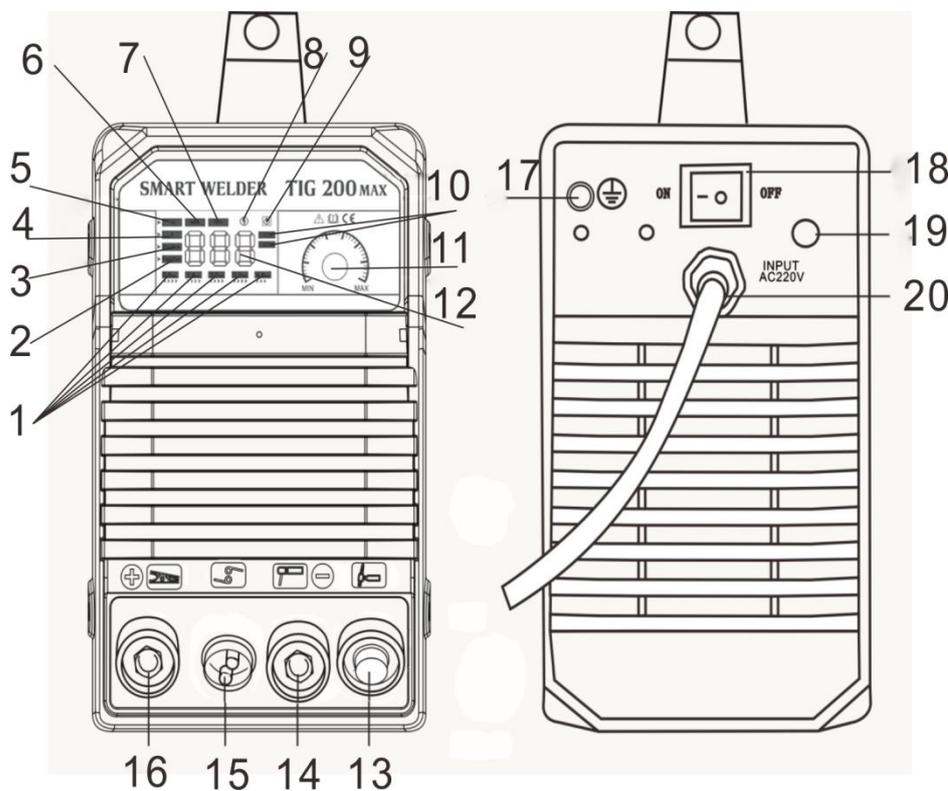
	Read all saftrty regulations and instructions		Earthing loop
	Disconnnet the machine from the mains before instal-lation or adjustment		Attention.Warning of possi-ble user health damage
	Wear a welding mask		Movement direction
	Wear a dust mask		Unlocked
	Rotation direction		Locked

note:Be sure to identify the product model on the nameplate, the same product model may have different parameters.

3、 TECHNICAL PARAMETERS TABLE:

Mode Parameters	TIG 200 MAX	TIG 250 MAX		TIG 315 MAX
Power voltage (V)	AC220V±15%	AC220V±15%	AC380V±15%	AC380V±15%
Frequency (Hz)	50/60	50/60		50/60
Rated input current (A)	26	26	15	22
No-load voltage (V)	70	68		60
Output current (A)	8-200	8-200A	8-250A	8-315
Rated output voltage (V)	18	18	20	22.6
Force adjusting range(A)	—	—		—
Duty cycle (%)	60	40		40
No-load loss (W)	40	40		40
ARC start high	frequency arc start	frequency arc start		frequency arc start
Efficiency (%)	≥ 80	≥ 80		≥ 85
Power factor	≥ 0.7	≥ 0.7		≥ 0.90
Insulation grade	F	F		F
Housing protection grade	IP21	IP21		IP21
Weight (kg)	6.15	6.25		6.25
Dimensions (mm)	400*159*300	400*159*300		400*159*300

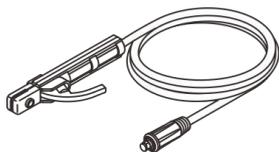
4、PANEL FUNCTION INSTRUCTION:



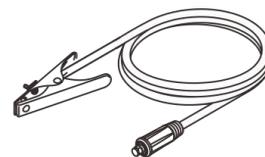
Function description	
1	Plate thickness indicator
2	Post Flow
3	Pre Flow
4	Welding current adjustment indicator light
5	TIG welding light
6	Manual welding indicator light
7	Spot
8	protection lamp
9	Power lamp
10	Input voltage indicator light
11	①current adjustment knob ②Press to switch functions
12	Digital ammeter
13	Argon welding torch interface
14	Negative output terminal
15	The welder controls the socket
16	Positive output terminal
17	Earth connecting screw
18	Power switch
19	Air intake
20	Input power line

Picture 3-1 TIG 200MAX、250MAX、315MAX

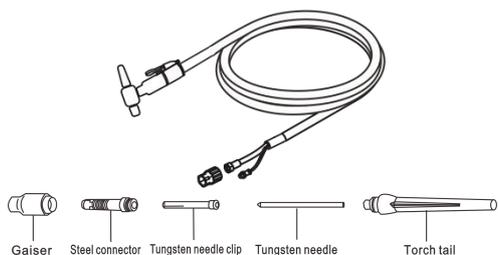
5、ACCESSORY DRAWING:



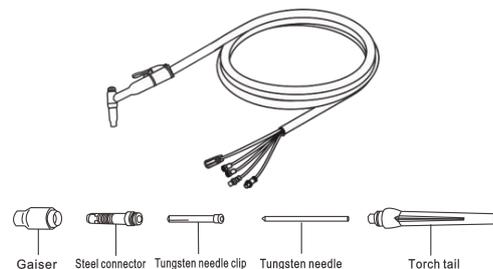
Picture 4-1 Electrode holder with cable



Picture 4-2 Earth clamp with cable



Picture 4-3 Compact torch



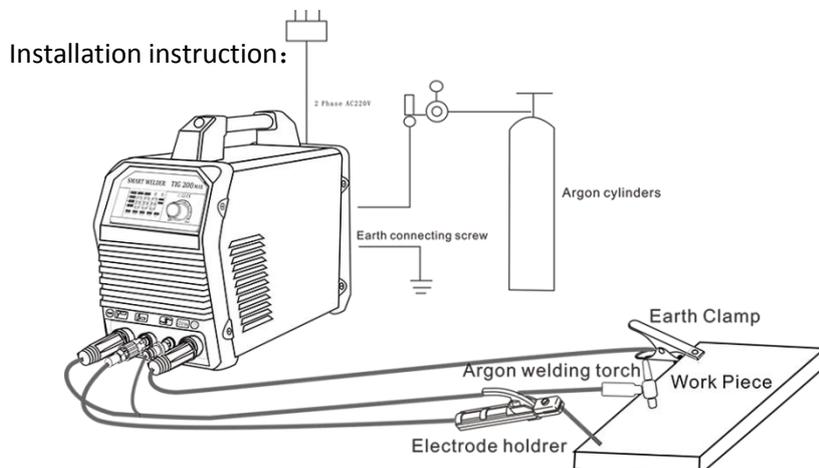
Picture 4-4 Separated torch

6、INSTALLATION INSTRUCTION:

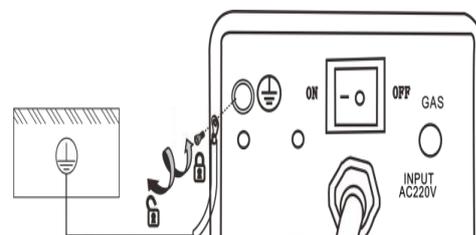
Long connecting cable can affect the ARC start character and stability of welding performance, so please use the recommended cable length, and in order to reducing the voltage down, please use the large cable face:

1. Please use at least 6mm² cable to connect the welder to the earth.
2. Please make sure the power supply is right match for the welder and install the torch, earth clamp according to the right instruction;
 - 1) Using the MMA function, please connect the earth clamp and electrode holder according to the nature of electrode, and tighten the connector.
 - 2) Using the TIG function, please following the installation instruction to install the the torch and tighten it.
3. For the earth clamp, please let the connector connect to "+", and the other side connect to the workpiece.
4. Before using the welder, please check the cable is right connected as the following picture and tighten them.
5. Please pay attention to polarity, since there are two connecting method for MMA process. ① positive pole connecting method, earth clamp connect to "-" and electrode holder connect to "+"; ② negative pole connecting method, earth clamp connect of "+" and electrode holder connect to "-".

Please noted that which connecting way would be used is up to the workpiece processing requirement, if using the wrong connecting way, it will occur some phenomenon.



Picture 5-1 Installation of Instruction, using TIG200MAX as a installing example



Earth connecting

7、 OPERATION NOTES:

The use of manual welding function:

1. Turn the power switch to "ON",the power indicator lit up,cooling fan within the machine start to work immediately
2. According to the thickness of the welding,the diameter of the electrode, station and technology needs, ensuring the suitable welding current and thrust current.
3. Clip electrode to the electrode holder,the machine is in the manual welding mode and standby state.

Flat welding using current and electrode specification list:

Specification	2.5	3.2	4.0	5.0
Current	70-100	100-140	170-220	230-280

Using TIG function :

1. Pushing the power switch to "ON" direction,then the power light and display are on and the cooled fan works.
2. Open the argon gas cylinder valve and adjust the gas flow to the rated criteria
3. After pushing on the torch switch, the electronic value works, you will hear the voice of HF discharge and with gas out.Warning:please hold the torch switch for a few seconds until all the air is clear out when you use the welder first time, and please noted that gas flow is the protection function to make sure the good welding result, so please hold the torch at the welding position for a few minute after you finish your work.
4. According to welding workpiece thickness, set the appropriate welding current and gas time. Keep the tungsten electrode and the workpiece spacing 2-4mm, welding torch switch is pressed, between the electrodes of the welding torch and the workpiece will result in high frequency discharge in arc welding machine high frequency arc starting sparks when ignited disappear immediately,start weld.

Tungsten in different polarity of power supply and the maximum allowable current

Diameter (mm)	DC Current (A)			
	Negative pole		Positive pole	
	Pure Tungsten	Mix Tungsten	Pure Tungsten	Mix tungsten
0.5	2~20	2~20	—	—
1.0	10~75	10~75	—	—
1.6	40~130	60~150	10~20	10~20
2.0	75~180	100~200	15~25	15~25
2.5	130~230	170~250	17~30	17~30
3.2	160~310	225~330	20~35	20~35



WARNING!

Before connecting operation please make sure all the power is turned off. The right order is to connect the welding cable and ground cable to the machine first, and make sure they are firmly connected and then put the power plug to the power source.

8、 QUESTIONS TO BE RUN INTO DURING WELDING:

1. Environment

- 1) The machine should be operated in dry environments with humidity level of max 90%.
- 2) Ambient temperature should be between -10 to 40 degree centigrade.
- 3) Avoid welding in sunshine or drippings. Do not let water infiltrate the machine.
- 4) Avoid welding in dusty area or the environment with corrosive gas.

2. Safety norms

The welding machine is installed with protection circuit of over voltage, over current and over heat. When voltage, output current and temperature of machine exceed the required standard, welding machine will stop working automatically. However, overuse (such as over voltage) will still result in damage to the welding machine. To avoid this, the user must pay attention to the following notes.

1) The working area is adequately ventilated!

The welding machine is powerful machine. When it is being operated, it generated by high current, under this situation, natural wind will not satisfy machine cool demands. So a fan is used into inner-machine to cool down itself. Make sure the intake is not blocked or covered. The objects around the welding machine should be kept away not less than 0.3 meters. Make sure the working area adequately ventilated is specially necessary. It is vitally important for the performance and longevity of the machine.

2) Do not over load!

The operator should remember to watch the max duty current (Response to the selected duty cycle). Keep welding current is not exceed max duty cycle current. Over-load current will damage and burn up machine.

3) No over voltage!

Power voltage can be found in diagram of main technical data. Automatic compensation circuit of voltage will assure the welding current keep in allowable range. If power voltage exceeds the allowable range limited, it will damage to components of machine. The operator should understand this situation and take preventive measures.

4) There is a grounding screw behind welding machine, with a grounding marker on it. Before operation, welding crust must be grounded reliable with cable which section is over 6 square millimeter, in order to prevent from static electricity, and accidents possibly caused by electricity leaking.

5) If welding time exceeds the duty cycle limited, welding machine will stop working for protection. Because machine is overheated, temperature control switch is on "ON" position and the indicator light is yellow (red). In this situation, you needn't pull the plug, in order to let the fan cool the machine. When the indicator light is off, and the temperature goes down to the standard range, it can weld again.

9、 MAINTENANCE:

1. Remove dust by dry and clean compressed air regularly, if welding machine is operating in environment where is polluted with smokes and pollution air, the machine need remove dust every month.
2. Pressure of compressed air must be within the reasonable range in order to prevent damaging to small components of inner-machine.
3. Check internal circuit of welding machine regularly and make sure the circuit connections are connected correctly and tightly (especially plug-in connector and components). If scale and rust are found, please clean it, and connect again tightly.
4. Prevent water and steam from entering into the machine. If that happens, please blow it dry and check insulation of machine.
5. If welding machine will not be used for long time, it must be put into the packing box and stored in dry and clean environment.

10、 WELDING ISSUES:

The phenomena listed out here may be related to your use of accessories, gas, environment, power, and try to improve the environment, to avoid such incidents.

1. ARC starting difficult and fragile arc:

- ① Please use the good quality Tungsten, because the bad quality Tungsten can not match discharge requirements.
- ② Without sharpening of tungsten also result in difficult ARC starting, and ARC instability

2. Welding dot with black mark

——Such issue is caused by without enough protection and being oxidized, you can check the following points:

- ① Make sure the argon cylinder valve has been opened with enough pressure, normally, the cylinder need to be re-filled argon gas when pressure lower than 0.5Mpa。
- ② Check if argon flow table opens, and has plenty of traffic, in order to save gas, you can select different depending on the welding current flows, but the flow is too small could lead to gas very insufficient and cannot cover all the solder, we recommend that you do not make the argon gas flow is lower than 3L/min.
- ③ Make sure the gas supply system works normally and is not blocked.
- ④ Pneumatic sealing problems, and low purity gases can also cause quality problems。
- ⑤ If your environment has a strong air flow, may also result in reduced quality of welding。

3. The output current fail to match rated value:

Power supply rated value of voltage deviation will cause the output current value and set value, when the supply voltage drops below the nominal value, the maximum output current of welding machine may also be lower than the rated value.

4. Without the stable output welding current:

This issue may be caused by the following points:

- ① The power supply fluctuation is too large;
- ② interference from the power supply network or other electrical equipment。

5. Using MMA function with too much spatter :

- ① the welding current not match with the electrode, like big current for small size of electrode;
- ② The polarity connection method for electrode holder is wrong.

11、 TROUBLESHOOTING AND FAULT FINDING:

TIG 200MAX、 TIG250MAX、 TIG315MAX

Fault symptom	Remedy
LED display and power light work normal, but the "OC" light doesn't work, with HF discharge voice, without welding output	<ol style="list-style-type: none"> 1、 The TIG torch cable is broken 2、 The earth clamp is broken or not connect to work piece; 3、 The output cable is broken or has installation issue 4、 Controlled PCB board issue, please contact Punair for details.
LED display is on, power light is on,"OC" light is on and the cooled fan is working,but without welding output	<ol style="list-style-type: none"> 1、 It may caused by over-heat protection function, turn off the power supply until the "OC" light is off, then turn on the power supply again. 2、 Over-heat protection function works, please let the welder cool down for 5-10 minute, then the welder can work normal. 3、 It may be the issue caused by feedback circuit or control circuit, please contact Punair or our distributors for details.
Led display, power light and cooled fan are work normal,and with welding output, but without gas flow	<ol style="list-style-type: none"> 1、 Make sure the gas system without any blocked and has gas input 2、 Make sure the electronic valve is not broken, and its plug is in good condition 3、 If the electronic valve is broken and after changing it, but the welder still can not work normal, please contact Punair or our distributors for details.
The output current is not stable and can not be controlled by potentimeter	<ol style="list-style-type: none"> 1、 Check the connecting cable for potentimeter 2、 Check the potentimeter to see if it is broken
MMA function with large spatter	Please change polarity connecting way
TIG function works normal but not the MMA function	<ol style="list-style-type: none"> 1、 Check the MMA/TIG option switch to see if it is broken, if yes, change it; 2、 Check the connecting cable for MMA/TIG option switch to see if the connecting is not tight; 3、 Contact PUNAIR or our distributors for details.

After the calibration and maintenance still not working, please contact the local distributor or our after-sales service department.



Notes: The above operations must be carried out by qualified electricians with valid certification. Please contact us before repair to obtain professional advice.

