

PROCRAFT

512000

AC/DC 200AMP INVERTER PULSE TIG / MMA WELDER

OPERATING INSTRUCTIONS



WARNING!

READ AND UNDERSTAND ALL INSTRUCTIONS

Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.

SAVE THESE INSTRUCTIONS

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

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Made in P.R.C.



N3570

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SAVE THIS MANUAL

Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

IMPORTANT SAFETY INFORMATION

In this manual, on the labeling, and all other information provided with this product:

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: NOTICE is used to address practices not related to personal injury.

SAFETY WARNINGS AND PRECAUTIONS

WARNING: When using tool, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

Read all instructions before using this tool!

WARNING!

READ AND UNDERSTAND ALL INSTRUCTIONS

Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.

Work Area Precautions

1. **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control. Protect others in the work area from debris such as chips and sparks. Provide barriers or shields as needed.

Electrical Safety

1. **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt whether the outlet is properly grounded.** If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
2. **Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.** Double insulation eliminates the need for the three wire grounded power cord and grounded power supply system.
3. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electric shock if your body is grounded.
4. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
5. **Do not abuse the Power Cord. Never use the Power Cord to carry the tool or pull the Plug from an outlet. Keep the Power Cord away from heat, oil, sharp edges, or**

moving parts. Replace damaged Power Cords immediately. Damaged Power Cords increase the risk of electric shock.

6. **When operating a power tool outside, use an outdoor extension cord marked “W-A” or “W”.** These extension cords are rated for outdoor use, and reduce the risk of electric shock.

Personal Safety

1. **Stay alert. Watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
3. **Avoid accidental starting. Be sure the Power Switch is off before plugging in.** Carrying power tools with your finger on the Power Switch, or plugging in power tools with the Power Switch on, invites accidents.
4. **Remove adjusting keys or wrenches before turning the power tool on.** A wrench or a key that is left attached to a rotating part of the power tool may result in personal injury.
5. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the power tool in unexpected situations.
6. **Use safety equipment. Always wear**

eye protection. Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Tool Use and Care

1. **Use clamps (not included) or other practical ways to secure and support the workpiece to a stable platform.** Holding the work piece by hand to against your body is unstable and may lead to loss of control.
2. **Do not force the tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
3. **Do not use the power tool if the Power Switch does not turn it on or off.** Any tool that cannot be controlled with the Power Switch is dangerous and must be replaced.
4. **Disconnect the Power Cord Plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.
5. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
6. **Maintain tools with care. Keep cutting tools maintained and clean.** Properly maintained tools are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools "Do not use" until repaired
7. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may**

affect the tool's operation. If damaged, have the tool serviced before using. Many accidents are caused by poorly maintained tools.

8. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

Service

1. Tool service must be performed only by qualified repair personnel. Service or maintenance performed by unqualified personnel could result in a risk of injury.
2. When servicing a tool, use only identical replacement parts. Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

SPECIFIC SAFETY RULES

1. **Maintain labels and nameplates on the tool.** These carry important information. If unreadable or missing, contact TOOLEX INDUSTRIAL for a replacement.
2. **Always wear the approved safety impact eye goggles and heavy work gloves when using the tool.** Using personal safety devices reduce the risk for injury. Safety impact eye goggles and heavy work gloves are available from Harbor Freight Tools.
3. **Maintain a safe working environment.** Keep the work area well lit. Make sure there is adequate surrounding workspace. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use a power tool in areas near flammable chemicals, dusts, and

- vapors. Do not use this product in a damp or wet location.
4. **Avoid unintentional starting.** Make sure you are prepared to begin work before turning on the tool.
 5. **Never leave the tool unattended when it is plugged into an electrical outlet.** Turn off the tool, and unplug it from its electrical outlet before leaving.
 6. **Always unplug the tool from its electrical outlet before performing and inspection, maintenance, or cleaning procedures.**
 7. **Prevent eye injury and burns.** Wearing and using the approved personal safety clothing and safety devices reduce the risk for injury.
 - a. Wear the approved safety impact eye goggles with a welding helmet featuring at least a number 10 shade lens rating.
 - b. Leather leggings, fire resistant shoes or boots should be worn when using this product. Do not wear pants with cuffs, shirts with open pockets, or any clothing that can catch and hold molten metal or sparks.
 - c. Keep clothing free of grease, oil, solvents, or any flammable substances. Wear dry, insulating gloves and protective clothing.
 - d. Wear an approved head covering to protect the head and neck. Use aprons, cape, sleeves, shoulder covers, and bibs designed and approved for welding and cutting procedures.
 - e. When welding/cutting overhead or in confined spaces, wear flame resistant ear plugs or ear muffs to keep sparks out of ears.
 8. **Prevent accidental fires.** Remove any combustible material from the work area.
 - a. When possible, move the work to a location well away from combustible; protect the combustibles with a cover made of fire resistant material.
 - b. Remove or make safe all combustible materials for a radius of 35 feet (10 meters) around the work area. Use a fire resistant material to cover or block all open doorways, windows, cracks, and other openings.
 - c. Enclose the work area with portable fire resistant screens. Protect combustible walls, ceilings, floors, etc., from sparks and heat with fire resistant covers.
 - d. If working on a metal wall, ceiling, etc., prevent ignition of combustibles on the other side by mobbing the combustibles to a safe location. If relocation of combustibles is not possible, designate someone to serve as a fire watch, equipped with a fire extinguisher, during the welding process and for at least one half hour after the welding is completed.
 - e. Do not weld or cut on materials having a combustible coating or combustible internal structure, as in walls or ceilings, without an approved method for eliminating the hazard.
 - f. Do not dispose of hot slag in containers holding combustible materials. Keep a fire extinguisher nearby and know how to use it.
 - g. After welding or cutting, make a thorough examination for evidence of fire. Be aware that easily visible smoke or flame may not be

- present for some time after the fire has started. Do not weld or cut in
- h. Dangerously reactive or flammable gases, vapors, liquids, and dust.
 - i. Provide adequate ventilation in work areas to prevent accumulation of flammable gases, vapors, and dust. Do not apply heat to a container that has held an unknown substance or a combustible material whose contents, when heated, can produce flammable or explosive vapors. Clean and purge containers before applying heat. Vent closed containers, including castings, before preheating, welding, or cutting.

WARNING

INHALATION HAZARD: Welding and Plasma Cutting Produce TOXIC FUMES.

Exposure to welding or cutting exhaust fumes can increase the risk of developing certain cancers, such as cancer of the larynx and lung cancer. Also, some diseases that may be linked to exposure to welding or plasma cutting exhaust fumes are:

- a. Early onset of Parkinson's Disease
- b. Heart disease
- c. Ulcers
- d. Damage to the reproductive organs
- e. Inflammation of the small intestine or stomach
- f. Kidney damage
- g. Respiratory diseases such as emphysema, bronchitis, or pneumonia

Use natural or forced air ventilation and wear a respirator approved by NIOSH to protect against the fumes produced to reduce the risk

9. Avoid overexposure to fumes and gases. Always keep your head out of

atmospheres containing

the fumes. Do not breathe the fumes. Use enough ventilation or exhaust, or both, to keep fumes and gases from your breathing zone and general area.

- Where ventilation is questionable, have a qualified technician take an air sampling to determine the need for corrective measures. Use mechanical ventilation to improve air quality. If engineering controls are not feasible, use an approved respirator.
- Work in a confined area only if it is well ventilated, or while wearing an air-supplied respirator.
- Follow OSHA guidelines for Permissible Exposure Limits (PEL's) for various fumes and gases.
- Follow the American Conference of Governmental Industrial Hygienists recommendations for Threshold Limit Values (TLV's) for fumes and gases.
- Have a recognized specialist in Industrial Hygiene or Environmental Services check the operation and air quality and make recommendations for the specific welding or cutting situation.

10. **Always keep hoses away from welding/cutting spot.** Examine all hoses and cables for cuts, burns, or worn areas before each use. If any damaged areas are found, replace the hoses or cables immediately.

11. **Read and understand all instructions and safety precautions as outlined in the manufacturer's**

Manual for the material you will weld or cut.

12. **Proper cylinder care.** Secure cylinders to a cart, wall, or post, to prevent them from falling. All cylinders should be used and stored in an upright position. Never drop or strike a cylinder. Do not use cylinders that have been dented. Cylinder caps should be used when moving or storing cylinders. Empty cylinders should be kept in specified areas and clearly marked "empty."
13. **Never use oil or grease on any inlet connector, outlet connector, or cylinder valves.**
14. **Use only supplied Torch on this Inverter Air Plasma Cutter.** Using components from other systems may cause personal injury and damage components within.
15. People with pacemakers should consult their physician(s) before using this product. Electromagnetic fields in close proximity to a heart pacemaker could cause interference to, or failure of the pacemaker.
16. **USE PROPER EXTENSION CORD.**
Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. We recommend that a 15amp extension cord be used with the 1.5mm² cable. The following Toolex Industrial Extension Leads would be suitable 594530 10 metre, 594531 20 metre & 594532 30 metre.

2. Description of this welder

The welder adopts rectifier designed with advanced inverter technology.

The advent of inverter arc welding machine derives from inverter power theory and devices. The inverter arc welding power uses high-power device IGBT field-effect transistor to turn the working frequency of 50/60Hz to high frequency (such as 100KHz or higher). Then voltage is reduced and current is regulated. A powerful DC power source can be produced by using the pulse width modulation (PWM) technology. The weight and volume of the main transformer of the welder are reduced remarkably, and the efficiency is increased by 30%. The advent of inverter welding machine is regard as a revolution of the welding machine industry.

This product is a dual-purpose machine composed of DC pulse argon arc welder and AC argon arc welder, whose most important feature is a machine with multiple purposes, you can achieve the welding for a various metal by a various ways without having to change machines. DC pulse argon arc welding can achieve high-quality welding for the plate, various metals, different thickness and double-sided forming process. AC argon arc welding adopts double-time inverter techniques and a pure square wave output, making a feature of a good arc stiffness, heat concentration, strong reverse cleaning capability, wide cleaning range and so on, to ensure the welder good welding characteristics, suitable for welding aluminum and aluminum alloy products.

We welcome friends from all walks of life to use the products and present valuable suggestions to us. We'll devote ourselves to providing customers with perfect products and services.



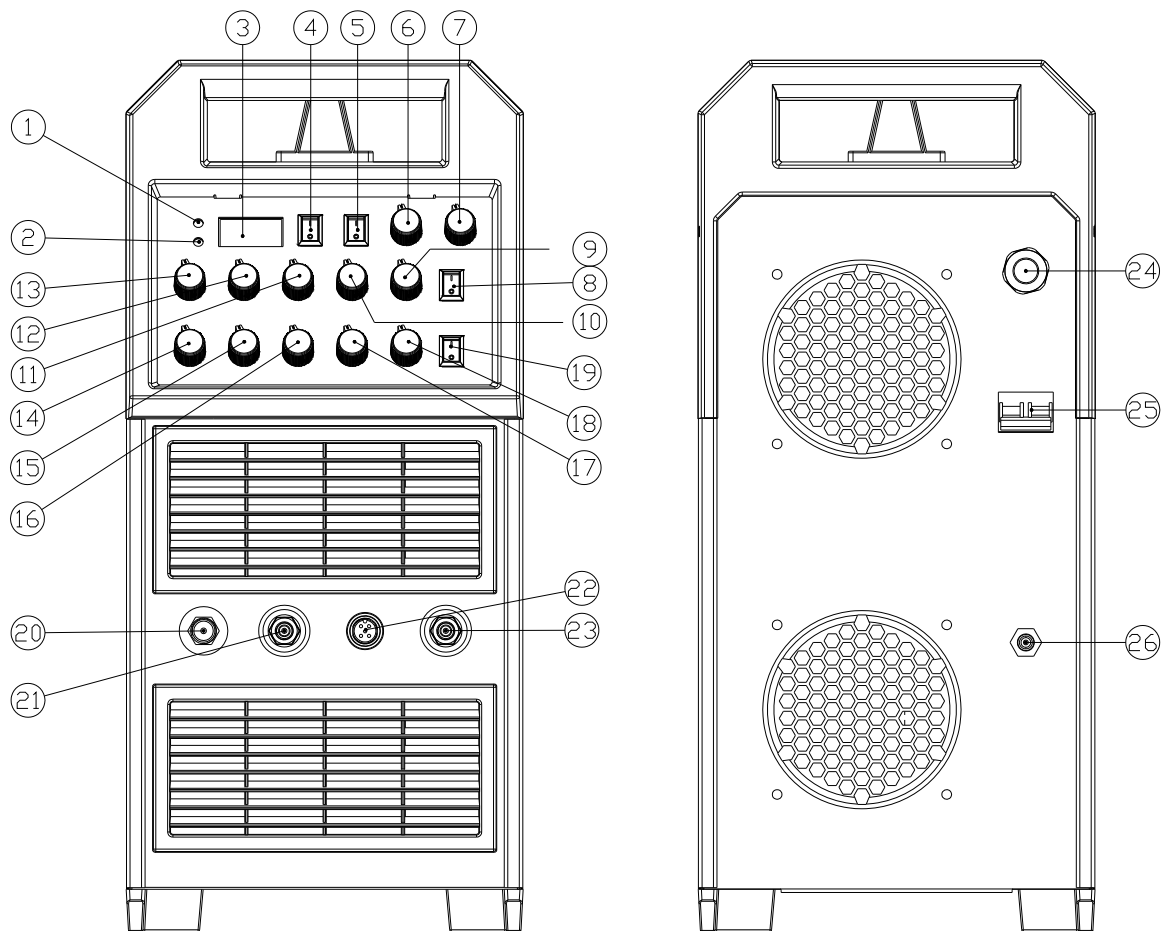
Warning!

This equipment is mainly used in the industrial sector. In an indoor environment it may produce radio jamming and operators should adopt adequate preventive measures.

3. Table of technical Parameters

model parameters	512000
Power voltage (V)	1 PhaseAC240V ± 15%
Frequency (HZ)	50
Rated input current (A)	TIG 25..7
	MMA 34.9
Rated output voltage (V)	TIG 18
	MMA 27.2
Rated output current (A)	TIG 200
	MMA 180
No-load voltage (V)	67
Arcing way	HF
Pre-flow (S)	0.1-1
Current descending time (S)	1-10
Post flow time (S)	1-15
Duty cycle (%)	60
No-load loss (W)	40
Efficiency (%)	80
Power factor	0.73
Insulation grade	F
Housing protection grade	IP21
weight (kg)	25.3
Overall dimension (mm)	548×252×534

4. Description of the panel function



1	Abnormal indicator	14	pre flow knob
2	Remote control indicator	15	base current
3	current display	16	pulse frequency
4	TIG/MMA control switch	17	pulse duty
5	AC/DC control switch	18	post flow
6	AC frequency knob	19	pulse control switch
7	AC balance knob	20	TIG welding torch interface
8	2T/4T control switch	21	STICK welding interface
9	end amps knob	22	TIG welding torch switch/Remote control socket
10	down slope knob	23	ground cable connector
11	welding current	24	Power supply input
12	up slope knob	25	Power switch
13	start current	26	Gas Inlet interface

Start current - current appearing in the circuit after pressing the button in the grip handle. The higher the initial current, the easier it is to ignite the arc. However, when welding thin sheets, too high an initial current can lead to the burning of the sheet. In some welding modes, the current does not increase in order to heat the welded element.

End current - current used in some welding modes, when the arc is not extinguished immediately after the welding current sinking. It allows filling the crater and the end of the weld.

Base current - current responsible for maintaining the welding process, lower value of the current pulse. It makes it easier to control the amount of heat entering the material. The adjustment of the base current is only possible when the switch (19) is in the (central) position.

Pulse frequency - frequency with which the value of the current pulse between the welding current and the base current changes. Pulse frequency adjustment is possible with the knob (16) in two ranges - low 0.5 - 10 Hz with the switch (19) in the (upper) position and high 10 - 200 Hz with the switch (19) in the (central) position. Setting the switch (19) to (lower) will result in welding without a pulse.

Pulse width - duration of the pulse, allows you to adjust the depth of the penetration. The increase in width increases the penetration depth, the reduction reduces the amount of heat entering the material, reducing the risk of burning thinner sheets or smaller elements.

Lower pulse width values should be used for higher currents. For example, a width of 30% should be used for currents greater than 200A. The larger pulse width should be used for small currents, for example, a width greater than 50% should be used for currents below 100A.

Gas pre-flow time - time from pressing a button in the grip handle until the arc is ignited. It should normally be longer than 0.5 s to provide shielding gas to the nozzle tip outlet to cover the welding start point and the tungsten electrode. In the case of a longer gas line from the cylinder, the pre-run time should be longer.

Time of gas post-flow - time from extinction of the arc to closing the gas valve to shield the solidifying weld pool from air and to cool the tungsten electrode. Too short time of outflow may result in oxidation of the weld. When welding in AC TIG mode (AC), this time should be longer

Current rise time - time of welding current rise from the start current to the set welding current value.

Time of current descent - time of welding current dropping from the value set to zero or the value of the crater current.

AC current frequency - a function useful when welding aluminum. The higher the frequency, the better the weld quality, the better the arc focus

AC Current Balance - The ratio of the duration of the positive to negative phase. The reduction of the balance results in the introduction of more heat into the material, resulting in a narrower weld and deeper penetration, and at the same time reduces the heat load of the tungsten electrode. Increasing the balance results in the introduction of less heat into the material, resulting in better cleaning, a broad joint and a shallower penetration, however, it significantly weighs the tungsten electrode.

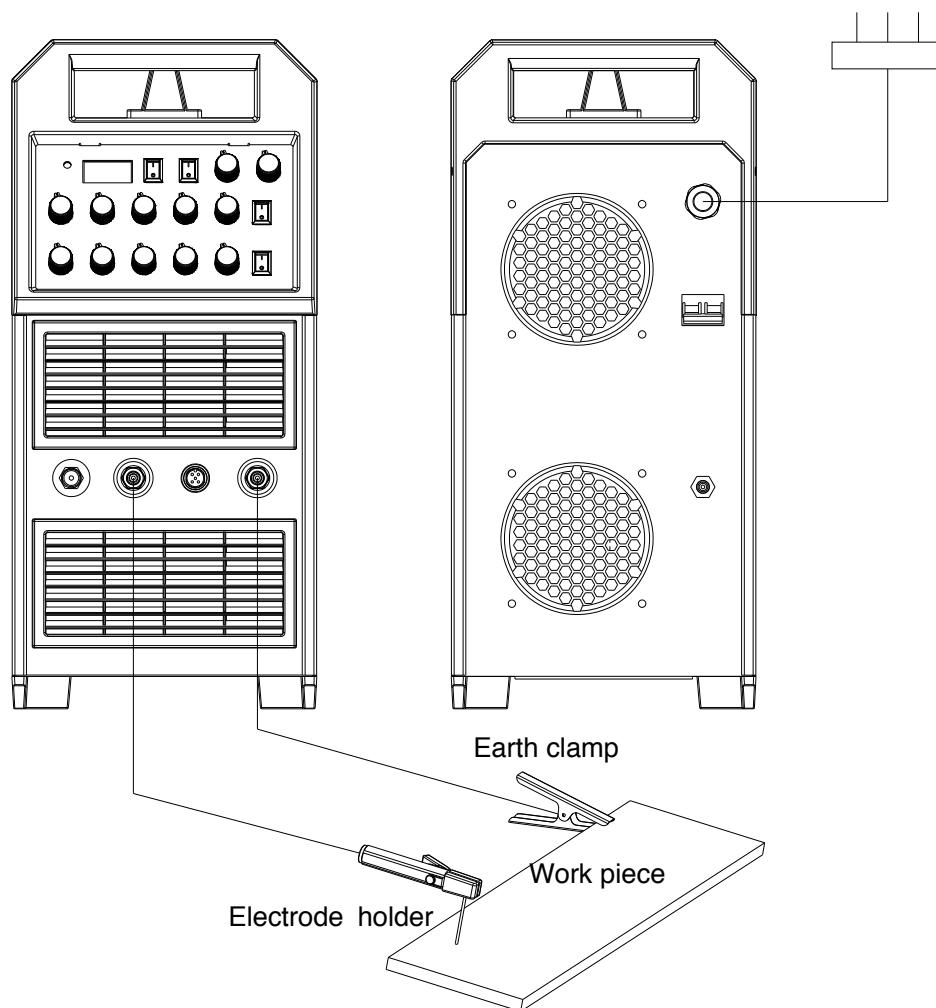
2T / 4T - modes of source operation control. In the 2T time, pressing the TIG torch button starts welding, releasing the welding end button. In the 4T, pressing and releasing the button starts welding, to finish it, press and release the button again. Four-stroke is mainly used when making long welds, as it does not require holding the button on the handle during operation at all times.

5. Protection against overheating

The power source is equipped with a thermal, automatic overload switch. When the temperature of the welding machine is too high, the protection will disconnect the welding current and the diode signaling overheating will light (1). After the temperature has dropped, the breaker will be automatically reset.

6. Welding with elementary electrodes (MMA method)

6.1 Preparation of the device for work



If the device is stored or transported in low temperatures, the device should be brought to the right temperature before starting work !!!

The ends of the welding cables should be connected to the sockets (21) and (23) on the front panel, so that the polarity of the electrode is on the electrode holder. The polarity of the welding cable connection depends on the type of electrode used and is given on the electrode packaging. The clamp of the return pipe should be securely attached to the welded material. Connect the device plug to the 115V/230V 60Hz mains socket. Switch on the device using the switch (25) on the back of the welding machine.

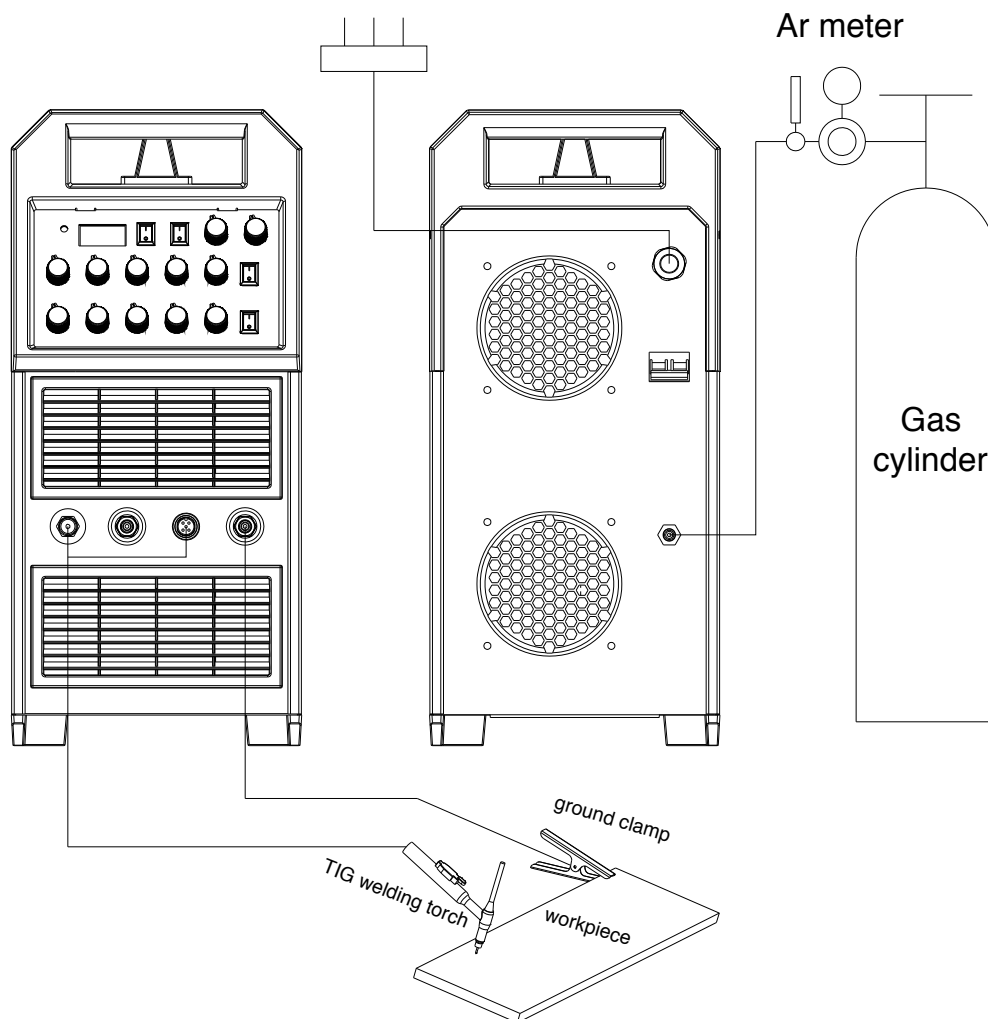
6.2 Setting of welding parameters

The welding method switch (4) must be set to the MMA position. Turn the knob (11) to set the desired welding current.

6.3 Arc initiation

Arc initiation during welding with the coated electrode consists in touching the electrode to the welded material, short rubbing and detachment. In the case of arc initiation with electrodes, the lagging of which forms a nonconductive slag after setting, it is necessary to pre-clean the top of the electrode by repeated impact against a hard surface until metallic contact with the welded material.

7. Welding with a non-combustible electrode in an inert gas shield (TIG methode)



7.1. Connection of shielding gas

Secure the cylinder against tipping over. Unscrew the cylinder valve for a moment to remove any contamination. Install the regulator on the cylinder. Connect the reducer hose to the welder by fitting one end of the hose to the reducer connector and the other at the inlet connector (26) on the back of the welding machine. Tighten the hose with the hose clamp. Open the cylinder and regulator valve.

7.2. Preparation of the device for work

If the device is stored or transported in low temperatures, the device should be brought to the right temperature before starting work !!!

The TIG torch gas connector should be connected to the socket (20) and dinse plug should be connected to the socket (21), the control plug of the torch should be carefully screwed to the control socket (22), The gas pipe from the reducer should be led and secured to the gas connector (26) on the back of the device. Connect the positive pole of the source with the material being welded using a cable with a clamp. Connect the device plug to the 115/230V 60Hz mains socket. Switch on the device using the switch (25) on the back of the welding machine.

7.3. Setting of welding parameters

7.3.1 Selecting the type of welding current

Set the welding current type with the switch (5). If you are going to use DC power, the switch should be in the DC position and the AC should be AC.

7.3.2 Setting the welding current

The welding method switch (4) must be set to the TIG position. Turn the knob (13) to set the desired start current value, turn the knob (12), the current rise time, the knob (11) the welding current value, the knob (10) time of current descent, and the knob (9) the end current. In the case of alternating current (AC) welding, the arc ignition is possible at a current of at least 20A.

7.3.3 Setting pulse parameters

Use the switch (19) to select the pulse rate range or non-pulse operation. In the case of pulse welding with a knob (15) set the desired value of the base current, the knob (16) the pulse frequency, and the knob (17) the duration of the current pulse

7.3.4 Setting of AC parameters

Turn the knob (7) to adjust the current balance. Turn the knob (6) to set the desired current frequency.

7.3.5 Setting gas flow parameters

Set the pre-flow time with the knob (14). Set the gas post-flow time using the knob (18).

7.3.6. Selecting the source control mode

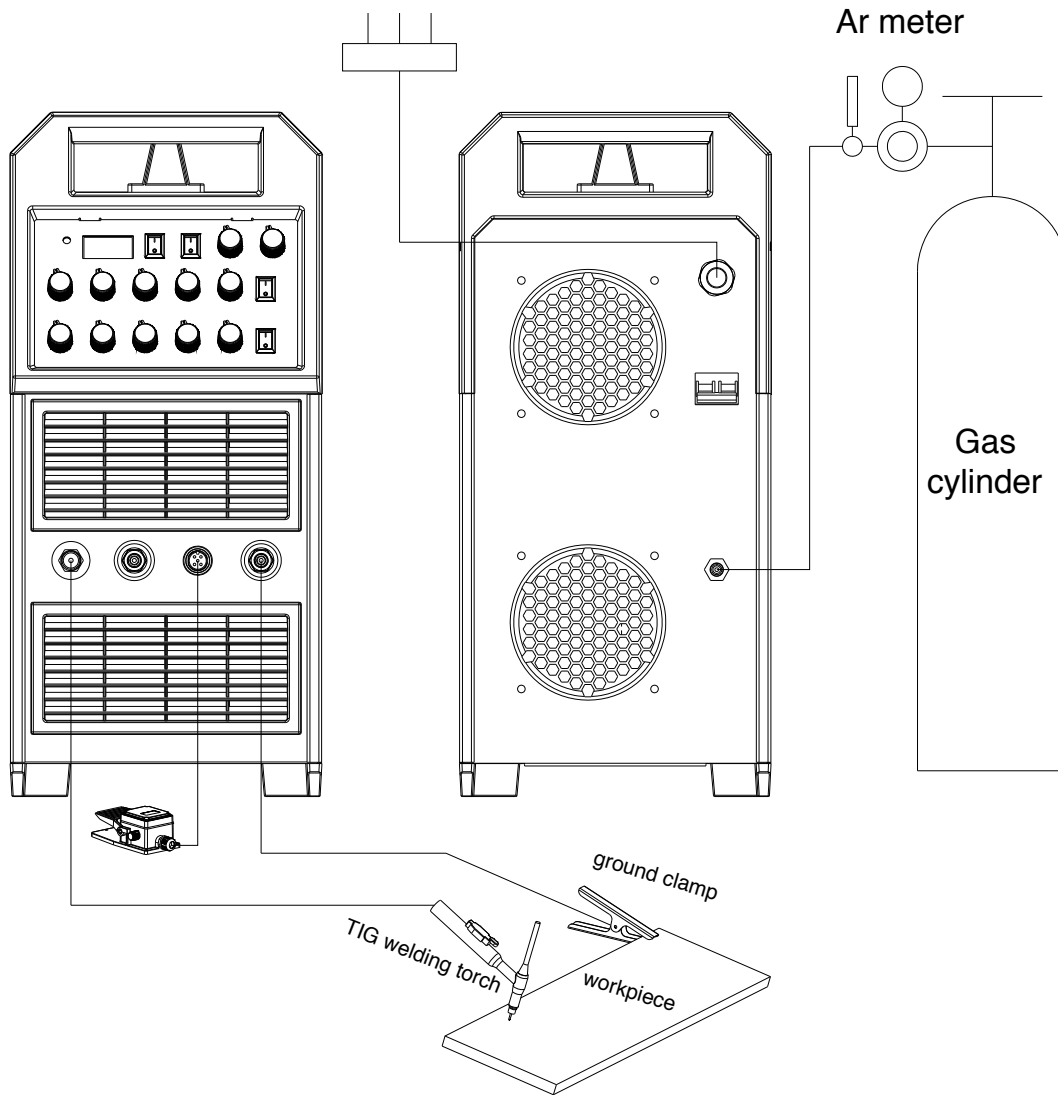
Source control can be done in two-stroke or four-stroke mode. Select the source control mode using the switch (8)

7.4. Arc initiation and welding process

The TIG 225 AC / DC pulse devices are equipped with an ionizer that allows contactless arc ignition. To ignite the arc in the two-stroke mode, the electrode should be brought closer to the welded material for a distance of 2 millimeters and press the button in the torch holder to activate the ionizer. After correct arc initiation, carry out the welding with the button pressed. Releasing the button on the handle causes the start of the current dropping phase and the end of the welding process.

In order to ignite the arc in the four-stroke mode, the electrode should be brought closer to the material for 2 millimeters and press the button on the torch handle to activate the ionizer. After correct arc ignition, the button can be released and the welding can be carried out with the button released. To stop welding, press and release the button on the handle again.

8. Welding with remote control



When the pedal switch is used to control, connect the 7-core aviation plug with the 7 socket. The remote control green indicator(2) will be on, it is automatically recognized when you plug in, adjust the knob(11) "Welding current", it can set the maximum current when you press the foot pedal to the maximum, the current display(3) will show the setting current. The digital display shows the actual welding current when using foot pedal to control the welding.

WARNING !!



- During the welding of alternating current (AC) with low current values, the formation of oxides on the surface of the tungsten electrode occurs. This can cause problems with arc ignition. In this case, the electrode should be rubbed against the material being welded or otherwise mechanically cleaned of the tip of the electrode from the oxide layer.

- Do not operate the button more than 2 mm from the welded material.

- Do not touch the electrode while holding the button on the handle. The high voltage of the ionizer and the unloaded voltage then occurring at the electrode can cause electric shock

9、 Routine maintenance



Warning:

All the maintenance and repair jobs must be carried out when the power is cut-off completely. Make sure the power plug is disconnected before opening the shell.

- 1 Dust should be removed with dry and clean compressed air regularly. If the welder is used in a heavily polluted environment with dense smoke and polluted air, dust must be removed from the welder each month.
- 2 The pressure of compressed air should be reasonable so that damage is not done to small elements in the welder.
- 3 Regularly check the connection of electric circuit in the welder and make sure circuit be connected properly and joint is secured (especially inserted joint or element). If the cases of rusting or loosening are found, the rust layer or oxidized film should be removed with abrasive paper and then the joint should be connected again and tightened firmly.
- 4 Entry of water or steam into the interior of the welder should be avoided. If this condition occurs, the welder should undergo drying treatment. Then the welder is measured for insulation by a megohm-meter (including the area between connecting points and the areas between the connecting points and shell). Welding can go on only when evidence shows no abnormality.
- 5 If the welder is not to be used for a long time, it should be replaced in the original package and kept in a dry environment.

10、 Precautions before repairs



Warning

A haphazard experiment and imprudent repair may lead to expansion of fault area, making formal repair more difficult. The exposed part of the welder in energization carries high voltage that may lead to hazards and any direct or indirect touch with it will result in electric shock accident. In serious case death may occur



If in the warranty period the user carries out an erroneous examination and repair of any fault in the welding and cutting power without permission, the free maintenance warranty offered by the supplier will be invalidated.

11、 Precautions or preventive measures



1、 Environment

- 1) Welding operation should be carried out in a relatively dry environment with air humidity usually less than 90%.
- 2) Ambient temperature should be kept between -10°C ~ 40°C .
- 3) Welding in the sun or rain should be avoided and water or rainwater should never be seeped into the welder interior.
- 4) Welding in the dusty area or under a corrosive gas environment should be avoided.
- 5) Gas protection welding operation in an environment with strong air flow should be avoided.

2、 Essentials for safety

In this welder over-voltage, over-current and overheat protection circuits have been installed beforehand. When the grid voltage, output current and machine temperature surpass the set standards, the machine will stop automatically. But excessive use (for example, when the voltage is too high) can still lead to the breakdown of the welder. So you have to pay attention to the following items:

1) Good ventilation !

This machine is a small type welder. In operation a high working current flows in and natural ventilation is unable to meet the welder's requirement for cooling. So a fan is fitted to effectively cool the welder to keep it work smoothly.

Operators should make sure that the vent is not covered or plugged, the distance of the welder from its surrounding objects is not less than 0.3 m and good ventilation is kept all the time. All

these are very important for better operation of the welder and longer service life of the welder.

2) **No overload!**

Operators should bear in mind that maximum permissible load current (relative to the selected load duration factor) be observed at any time and welding current should never surpass the maximum permissible load current.

Over-current will shorten the service life of the welder remarkably and even burn it down.

3) **No over-voltage!**

Power voltage is shown in the main performance parameter table. In general, the voltage auto-compensation circuit in the welder will ensure the welding current remain within the permissible range. If power voltage surpasses the permissible value, the welder will be broken down. Operators should fully know this and adopt corresponding preventive measures.

4) Behind each welder there is a grounding screw with the grounding mark. Before operation the shell of the welder should be grounded reliably by a cable wire with a sectional area bigger than 6mm^2 so as to release static electricity or prevent any accident due to leakage.

5) If the welding machine exceeds the standard load duration factor in operation, it may probably go into a protective state suddenly and stop work, which indicates it has exceeded the standard load duration factor. Excessive heating triggers the temperature control switch and makes the welding machine stop operation. Under such circumstances you needn't turn off the power so that the cooling fan may work continuously for cooling. When the temperature drops to the standard range, welding may be restarted.

12、 Troubles may be encountered in welding

Phenomena enumerated here may have something to do with the parts, gas, environmental factors and power supply you use and efforts should be made in improving the environment to avoid occurrence of such cases.

A、 **Black welding spot**

——This shows the welding spot is oxidized without being protected effectively and you can make the following inspection :

1. Make sure that the valve of argon cylinder has been opened with sufficient pressure. As a rule, if the pressure within the cylinder is lower than 0.5MPa , then it is necessary to refill the cylinder.
2. Check if the argon flow-meter is turned on with sufficient flow. You can select different flow rates in light of varying welding current, but too small flow may lead to inadequate gas stiffness and thus failure to cover all the welded spots. We suggest argon flow should never be lower than 3l/min no matter how weak the current will be.
3. The easiest way to check gas delivery is to touch the nozzle of welding torch to see whether the

gas passage of the welding torch is blocked.

4. Poor sealing of gas passage or lower gas purity will also give rise to welding quality trouble.
5. Strong air flow in the environment may also lead to deterioration of welding quality.

B、 Difficulty in arc starting with easy arc breaking:

1. Make sure that the tungsten electrode in use is of good quality as discharge ability of inferior tungsten electrode may fail the requirement;
2. Tungsten electrode without sharpening treatment is also unable to start arc and leads to unstable arc.

C、 Output current can't reach the rated value:

Deviation of power voltage from the rated value will lead to unconformity of output current value with the set value. When power voltage is lower than the rated value, maximum output current of the welder may also be lower than the rated value.

D、 Unstable current in the operation of the welder:

This may be attributed to the following factors:

1. Change in grid voltage;
2. Interference from the power grid or other power equipments.

E、 Severely burn of the tungsten needle

The duty cycle is adjusted too large, causing emission from the workpiece to the tungsten electron for too long, resulting in severe heat of the tungsten needles.

F、 The oxide film can't be torn when welding aluminum:

1. the welding gear is selected wrong.
2. The duty cycle is adjusted too small;
3. The secondary inverter has field pipe damage.

G、 The abnormal pilot lamp is on:

- 1、 The light is on when the welder work abnormally, please turn off the power switch and then reboot the machine, it can continue to use if it return to normal,
- 2、 If the light is on repeatedly, please refer to the professional or the manufacturer for repair.

13. Trouble shooting



Faults	Resolvable Methods
1. Power indicator is not lit ,fan does not work and no welding output	<ol style="list-style-type: none"> 1. Power switch is out of work . 2. Check if electrify wire net (which is connected to input cable)is in work. . 3. Check if input cable is out of circuit .
2. Power indicator is lit ,fan does not work or revolve several circles ,no welding output	<ol style="list-style-type: none"> 1. Maybe connect wrong to 380V power cause machine is in protection circuit ,connect to 220V power and operate machine again . 2. 220V power is not stable,(input cable is too slender)or input cable is connected to electrify wire net cause machine is in protection circuit .Add the section of cable and tighten input connector firmly .Close machine 2-3 minutes then open it again. 3. Cable is loosed from switch to power panel ,tighten them again . 4. Open and close power switch constantly in short time cause machine is in protection circuit Close machine 2-3 minutes then open it again . 5. Main circuit 24V relay of power panel is not close or has damaged .Check 24Vpower source and relay .If relay has damaged replace it with same model.
3. Fan is working , indicator is not lit and sound of HF arc-striking can not be heard ,wiping welding can not strike arc.	<ol style="list-style-type: none"> 1. Positive and negative electrodes of VH-07 insert component voltage should be about DC310V from power panel to IGBT board . (1) If circuit is broken and silicon bridge is poor contact . (2) If some of four high electrolytic(about 470UF/400V) of power panel capacitor is leaking . 2. There is a green indicator in auxiliary power of IGBT board ,if it is not on ,auxiliary power is out of work .Check fault spot and connect with seller . 3. Check if connectors is poor contact . 4. Check control circuit and find out reasons or connect with seller. 5. Check if control cable of torch is broken.
4. Abnormal indicator is not on ,sound of HF arc-striking can be heard ,but there is no welding output .	<ol style="list-style-type: none"> 1. Check if torch cable is broken . 2. Check if grounding cable is broken or not connected to welding piece . 3. Output terminal of positive electrode or torch electrify is loosed from inter-machine .
5. Abnormal indicator is not lit ,sound of HF arc-striking can not be heard ,wiping welding can strike arc .	<ol style="list-style-type: none"> 1. Primary cable of arc-striking transformer is not connected to power panel firmly ,tighten it again. 2. Arc-striking tip is oxidized or too far ,give a good polish to it or change it is about 1 mm between arc-striking tip . 3. Switch(sticking/argon-arc welding) is damaged ,replace it . 4. Some of HF arc-striking circuit components is damage ,find out and replace it .
6. Abnormal indicator is lit but there is no welding output .	<ol style="list-style-type: none"> 1. Maybe it is overheated protection ,please close machine first ,then open the machine again after abnormal indicator is out . 2. Maybe it is overheated protection ,wait for 2-3 minutes (argon-arc welding does not has overheated protection function .) 3. Maybe inverter circuit is in fault ,please pull up the supply power plug of main transformer which is on IGBT board (VH-07 insert which is near the fan)then open the machine again. (1) If abnormal indicator is still lit ,close machine and pull up supply power plug of HF arc-striking power source (which is near the

	<p>VN-07 insert of fan),then open machine :</p> <ol style="list-style-type: none"> a. If abnormal indicator is still lit ,some of fieldistor of IGBT board is damaged ,find out and replace it with same model . b. If abnormal indicator is not lit , rise transformer of HF arc-striking circuit is damaged ,replace it . <p>(2) If abnormal indicator is not lit ,</p> <ol style="list-style-type: none"> a. Maybe transformer of middle board is damage ,measure inductance volume and Q volume of main transformer by inductance bridge(L=0.9-1.6mH Q>35) .If volume is too low ,please replace it . b. Maybe secondary rectifier tube of transformer is damaged ,find out faults and replace rectifier tube with same model . <p>4. Maybe feedback circuit is broken .</p>
7. When welding aluminum, can not break oxidized film	<ol style="list-style-type: none"> 1. Wrong welding value 2. Pulse duty too low 3. Twice inverter IGBT broken
8. Stick is burnt out	Pulse duty is too high, reduce it.

INCLUDED STANDARD ACCESSORIES

512000: AC/DC 200Amp Inverter Pluse TIG / MMA Welder



TIG TORCH



EARTH CLAMP



ELECTRODE HOLDER



FOOT CONTROL



ARGON REGULATOR