

User’s Manual

PulseTig-200AC/DC
250AC/DC
315AC/DC

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Product Information

THGACDC is the latest ACDC machine developed by our company. The key function of the machine is that it can not only weld stainless steel, alloy steel, carbon steel, steel and other nonferrous metal with DC function, but also weld aluminum and aluminum alloy product with AC function. For example, the integrated power inversion rate of welding machine exceeds 85% during welding on the aluminum products of scooter and bicycle, which saves energy and electricity. Key models are THG200ACDC, 250AC/DC and 315ADDC.

The application and development of inversion technology on the aspect of welding equipments benefits from the origination and development of high power electronic components. Especially the birth of the third generation high speed field effect transistor with high power enables welding machine to operate stably under 100KHz high frequency, which dramatically lessens the size and weight of key components (transformer and reactor). The application of PWM (Pulse Width Modulation) technology makes welding current centralized and smooth, current adjustment more convenient and accurate. Unique structure design enables welding machine to be easily removed and repaired, and to protect welding machine from electromagnetic interference.

Welding machines of ACDC series, which are of smaller size, lighter weight, higher inversion efficiency, electricity and energy saving comparing with traditional machines; and lower price, stronger adaptive capacity of power system comparing with importing machines, are also manufactured with our unique high frequency inversion technology. Especially the adopted quadratic inversion technology delivers pure square wave, which leads to favorable arc stiffness, centralized heat, strong reverse clearing ability, wide clearing area and arc not easily interrupted of low current, ensuring the favorable welding features of the machines.

Argon welding gun is equipped for the inversion welding machine, with corresponding length of cables, air flux and water-cooled connector. Besides, some accessories applied on gun head with different sizes are supplied, such as ceramic nozzle, connector and long-pipe/shorting handle. The size and number of these accessories can get from random loading list. If more accessories are needed, you can make further purchase order.

Instructions!
This equipment is applied mostly in the field of industry. Operators should carry out adequate preventive measures to avoid possible radio jamming at indoor environment.

I Transfer Switch

1. ACDC transfer switch – when transfer switch places at AC, the AC argon arc welding is functioned to weld aluminum product.
When transfer switch places at DC, the DC argon arc welding is functioned to weld stainless steel product.
2. Manual/foot step transfer switch – when transfer switch places at OFF, current is to be adjusted by panel knob.
When transfer switch places at ON, welding current is to be adjusted by foot step switch.

II Adjusting knob

1. Fore-blow period adjustment – to ensure welding effect, argon rushed prior to current is required. This knob is used to adjust the time interval between argon and current.
2. Current adjusting knob – it is the welding current knob. Only when the manual/foot step transfer switch places at OFF will the knob operate.
3. Dutyfactor adjusting knob – current alternately transfers from forward direction to reverse direction during AC argon arc welding. When current flows from tungsten electrode directly to workpiece, the current flow is forwardly that produces low and controlled heat of tungsten electrode, favored welding process; when current flows from workpiece directly to tungsten electrode, the current flow is reversely that can clear the oxidized surface layer of workpiece, which helps to form a favorable welding effect, but the tungsten electrode will be easy to burn out caused by high heat. The knob is set to adjust the proportion of forward and reverse current period. When knob places at 0, forward and reverse current period possesses 50% respectively; when knob places at +5, the proportion of forward and reverse current period is 80%, while at -5, the proportion of forward and reverse current period is 20%. Forward current period extends and reverse current period shortens while rotates clockwise; rotates counter clockwise shows oppositely.
Note: choose minor dutyfactor when current is strong; choose dutyfactor below 30% while current is above 200A, for instance.

- Choose major dutyfactor when current is weak; choose dutyfactor above 50% while current is below 100A.
4. Attenuation adjusting knob – to complete a welding process, the current should gradually attenuates to end during arc stopping period for a favorable molding. This knob is used to adjust the fallen period of current.
5. Adjusting knob of after blow period –workpiece that is just welded will be oxidized for the intense heat. Therefore, argon is needed to protect it from oxidation by blowing from the welding gun after welding stopped. This knob is used to adjust the after blow period with tail gas, the maximum period can reach 10 seconds.

III Use of Indicators

1. Indicator with over-heat protection –to protect the inner parts of welding machine burned out from high heat caused by operating continuously under a long period and strong current condition, the over-heat protecting function is set. When this indicator is on, work is needed to stop but not as that the machine down. After 2 to 3 minutes around, it can recover automatically.
2. Abnormal indicator –this indicator will be on while abnormal situation occurs during welding machine operation. Please shut the machine down once the abnormal indicator lights on. Then turn on the machine again, it can make further use if the situation returns to normal, otherwise, you need search professionals or factories for repair.

Read This First

It is highly appreciated that you choose our welding machine. To protect the safety of you and others, please read this manual seriously and understand it before installation and operation.

Guarantee

Here we give our unserved guarantee that the inverter welding series comply with IEC60974 international safety standard. Maintenance for one year since the date of purchase.

Safety Alarm!

Please carry out safety preventing measures to protect you and others from possible injury during welding. Refer to safety protection guide of operator, which is in accordance with the accidents prevention requirements of producer for details.

Important Notes

- Safety protection switch needs to be installed for electricity leakage prevention if this equipment is put into use!
- Apply the labor protection articles of welding that are approved by the safety supervision department of state.
- Operators must be special operation personnel who possess the valid Metal Welding (Gas Cutting) Operation Certificate!

Electric Shock – possibly leads to severe injury!

- Install grounding system as per the application standard.
- Touching charged parts is forbidden while skin is bare, wet gloves or clothes are put on.
- Ensure that it is in isolation state among you, ground and workpieces.
- Make sure that your station is safe.

Smoke – possibly be harmful to your health!

- Keep your head out of smoky area.
- Operate the ventilation or extraction device to avoid the gas suctioned during welding.

Arc Light Radiation – possibly leads to your eyes or skin injury!

- Wear a suitable welding mask and encapulated suit to protect your eyes and body.
- Protect the stand-by with suitable mask or curtain to avoid injury.

Fire Hazard

- The sparks during welding will possibly leads to fire. Please make sure that there are no inflammable text to the welding station and pay attention to fire prevention.

Noise – excessive noise is harmful to people’s hearing!

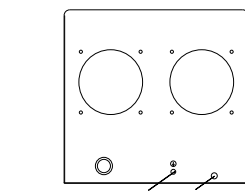
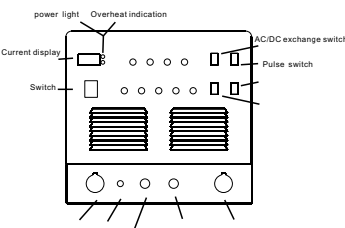
- Please wear the ear defender or other hearing protector to get your ear under protection.
- Warn the stand-by that noise will potentially do harm to their hearing.

Fault –search for help from professionals when you confront with difficulties.

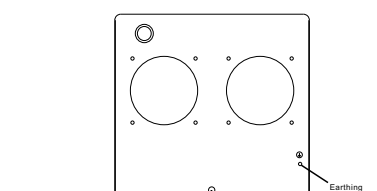
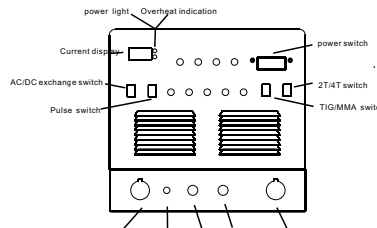
- Carry out elimination as per this manual if difficulty exists during installation and operation.
- You need to get contact with your supplier or service center of our company immediately if you cannot understand complexity or problems cannot be solved, searching for the help of professionals.

Panel Function and Description

PulseTig-200AC/DC:



PulseTig-250AC/DC:
PulseTig-315AC/DC:



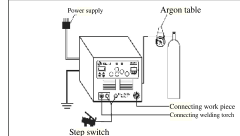
Installation

Welding machine is equipped with compensation device for supply voltage. It can work on if the supply voltage varies within ±15% rated voltage.

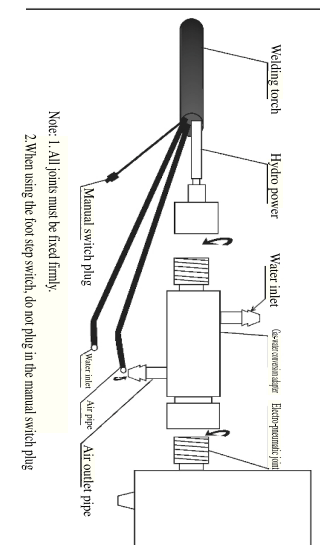
Cable of much larger section is suggested to damp the fallen down of voltage in a longer output cable is adopted. Provided that the cable of welding gun is excessively long, it might be of great effect to the arc striking performance and even other performance of systems such as the abnormal operation of system or the attenuation of high frequency arc striking performance. Therefore, the designated length of cable is highly recommended.

1. Make sure that the ventilation opening of welding machine is unobstructed or unobstructed to avoid the installation of cooling system.
2. Make sure that the source of protection gas is connected well. The air supply passage contains cylinder, argon decompressing flowmeter and air duct. The joint of air duct should be lightened with hose clamp or other articles to protect from the argon leakage and incoming air.
3. Ground the shell of welding machine with a cable of at least 6mm² section area of electricity conduction reliably. The way is to connect the ground screw on the rear of welding machine with grounding system.
4. Plug the quick mount plug of circuit cable into the quick mount socket with electrode + of the panel of welding machine, wind up clockwise and clip workpiece with the ground wire clamp over the other end.
5. Plug the power plug into corresponding socket and make sure that supply voltage is 380V AC with a allowable difference.
6. Install water cooling gun correctly as per the illustration. Connect the integrated gas and electrical interface on the front panel of this machine with copper nut on the other end of water cooling gun and wind up clockwise.
7. Connect the 2-pole aerial plug of foot step device with the 2-pole and 3-pole aerial socket of machine panel respectively. After all the above operations are completed, the installation of welding machine is over and the machine can be used to weld.

Installation Illustration



Installation Illustration of Water Cooling Gun



Operation

It applies to the series of W5EACDC250, W5EACDC315.

Take the AC Function Description of Argon Arc Welding as References.

1. Place the ACDC transfer switch at AC.
2. Turn on the power switch, the blower in machine begins to rotate.
3. Turn on the argon switch and adjust the gas flow to the rated standard (refer to the flow table).
4. Adjust the proportion of forward and reverse current period according to the oxidation degree on the surface of workpiece to be welded.
5. As soon as the switch on welding torch is pressed and solenoid valve starts, you can hear the sound of high frequency sparking in welding machine. Meanwhile, there is argon flowing out of the welding torch nozzle. Notice: you need to press switch for several seconds before welding until all the air is vented out of the air duct, provided that it is the first time to weld. After welding is stopped, there's still argon flowing out for several seconds. This is particularly designed to protect welding point before cooling down. Therefore, you should reverse welding gun by keeping welding position for a period of time after the welding arc extinction.
6. Set manual/foot step switch as per the practical need.
 1. When transfer switch places at OFF, current is to be adjusted by panel knob.
 2. When transfer switch places at ON, welding current is to be adjusted by remote control switch. Here, the current adjusting knob on panel is invalid.
7. Adjust the fore-blow, after blow and attenuation period as per the practical need.
8. Keep distance between tungsten electrode and welded workpiece for 2 to 4MM, press the control switch of welding torch, high frequency sparking will occur between the electrode of welding gun and workpiece; the high frequency spark in welding machine will disappear right after striking the arc. Here we can get into work.

Take the DC Function Description of Argon Arc Welding as References.

1. Place the ACDC transfer switch at DC.
2. Turn on the power switch, the blower in machine begins to rotate.
3. Turn on the argon switch and adjust the gas flow to the rated standard (refer to the flow table).
4. Refer to the same article 5, 6, 7 and 8 in AC argon arc welding description.

Attention
Any cable or connector on operation plugging loose during welding is strictly forbidden. Otherwise, it will lead to serious harm to the human body and severe destroy of equipment.

Notice or Preventive Measures

1. Environment

- 1) Welding should be operated under a relative dry condition with no more than 90% air humidity.
- 2) Ambient temperature should be within the range of -10℃ - 40℃.
- 3) Exclude water or rain from entering into welding machine and avoid welding under sunlight or rain.
- 4) Avoid welding under the condition of dust area or containing corrosive gas.
- 5) Avoid welding under gun protection in the environment of strong air flow.

2. Key Points of Safety Protection

The welding machine is equipped with protection circuit for voltage, current and heat exceeding. When output current and temperature inside exceeds the standard, welding machine will stop automatically. However, the overuse of welding machine (such as the voltage is over large) will still lead to damage. Therefore, you still have to note the items below.

- 1) **Ensure favorable ventilation!**
Welding machine is of large-scale industrial equipment. Strong working current flows during operation, which makes the natural ventilation insufficient for the heat of cooling of welding machine. Thus, two fans are installed in the welding machine to effectively cool down to make smooth operation.
Operators shall check that the vent is not covered or blocked. Keep the distance between welding machine and peripheral articles above 0.5m. Users must pay attention to keep favorable ventilation constantly, because it is important for a better performance and longer service life of welding machine.
- 2) **Overloading is forbidden!**
Operators shall keep observation on the maximum loading current (continuous loading rate that can be selected comparatively) and ensure the welding current do not exceed the maximum loading current.
Overloading current will lead to markedly reduce the service life of welding machine even burning out.
- 3) **Voltage over large is forbidden!**
Supply voltage is listed on the Key Performance Specification Table. Generally speaking, the compensated circuit of voltage in welding machine ensures welding current stay within the allowable range. Welding machine will be destroyed if supply voltage exceeds the allowable value. Operators shall fully understand this situation and take corresponding preventive measures.
- 4) A ground screw is attached on all the welding machines, marked with grounding tag. Ground the shell of welding machine with a cable of at least 6mm² section area reliably to discharge electrostatic or to protect accident from occurring of electricity leaking.

- 5) Provided that the standard of continuous loading rate is exceeded during the operation of welding machine, it will stop working while suddenly turns to protection mode. This shows the welding machine exceeds the standard of continuous loading rate that the overloading makes temperature control switch be turned on, which stops the welding machine from operating, and the yellow indicator on front panel is on. You need not to plug the power connector out to make the cooling fan keep working for the cooling down of welding machine. Welding can be operated once again after red indicator is off and temperature falls into the standard range.

Maintenance

Warning
All the repair and maintenance shall be carried out after power has been completely cut off. Make sure that the power connector has been plugged out before removing the shell of machine.

- 1) Blow the dust with compressed air of dry and clean regularly; provided that the welding machine is applied under the condition of smoky and severely polluted air condition, dust removal shall be carried out every day.
- 2) The pressure of compressed air shall be within a reasonable range to avoid damage of small components in welding machine.
- 3) Check the connection of inner circuit of welding machine regularly. Make sure that the circuit is connected correctly and connectors are firm especially the plug-in connector or components. Provided that rust and loose occurs, grind the rusted layer or oxidized film with sandpaper, connect once again and tighten.
- 4) Avoid water or steam entering in the welding machine. If it occurs, dry the inner of welding machine, and then measure the insulation performance (include the insulation performance between connectors and between shell and connector) of welding machine with megger. Welding can be carried on only when abnormal situation is proved to be none.
- 5) If the welding machine will not be applied for a long period of time, it should be put into original packing box and stored under dry environment.

Before Repair

Warning
Unsuitable experiment and incautious repair can enlarge the fault area, causing troubles for the formal repair work.
The bare parts of this equipment can cause dangerous high voltage under conductive mode. Any direct or indirect contact may cause electric shock accidents; severe shock can even cause death!

Attention: Any wrong diagnosis and repair on the fault of welding machine and cutting machine by users themselves during the period of guarantee without permission of our company will lead to invalid free service provided by supplier.

Diagnosis and Repair

Attention: The operation below require operators with adequate professional knowledge of electrical aspect and overall safety common sense. Operator shall possess valid certificate to show his ability and qualification to operate. It is suggested that you get contact with our company and reach a consensus before repairing.

Fault Description	Possible Reason	Solving Measure
1. No response when starting up	1. No supply voltage or phase lack. 2. Power cable is in open circuit. 3. Partial damage of auxiliary power supply phase.	1. Check the power supply. 2. Check the voltage of air switch by opening the shell. 3. Search professional personnel for help to repair or contact with dealer.
2. The gauge head indicates with no high frequency sparking sound or abnormal situation indicated.	1. The switch, connector and aerial plug of welding gun is in open circuit or poor contact. 2. Discharging mode is in short circuit or far away. 3. Aerial plug is not installed correctly.	1. Make the two-poles of 2-pole aerial socket be in short circuit with a screwdriver. If sparking sound is heard, this shows problem occurs from short circuit or far away. 2. Adjust the distance of discharging mode. 3. The switch of welding gun should be plugged onto 2-pole socket with corresponding aerial plug.
3. High frequency sparking occurs with no current flowing out.	1. Ground cable contacts poorly. 2. Cable of welding gun is in open circuit.	1. Check if the connection of ground cable is reliable. 2. Check to replace welding gun.
4. Current flows out with adjusting function failure.	1. The knob of regulation resistance damages. 2. Contact cable in the machine is burned.	1. Check with shell removed. 2. Replace the regulation resistance.
5. Abnormal indicator lights on	1. Instant current exceeding protection. 2. Excessive dust causes short circuit in the machine. 3. Part damages in the machine.	1. Start up again after shutting down and indicator being off. 2. Clean up dust with compressed air after opening the shell. 3. Search professional personnel for help to repair or contact with dealer.
6. Oxidized film cannot be broken when attenuation is worked.	1. Welding stage is selected inappropriately. 2. Dutyfactor is adjusted over low. 3. Field effect transistor of quadratic inversion damages.	1. Choose AC function during welding. 2. Enlarge the dutyfactor or clean up the oxidized film on the surface of workpiece. 3. Search professional personnel for help to repair.
7. Current works normally with no argon flowing out.	1. Puffer-sound heard. a. Solenoid valve nozzle is blocked. b. Air duct of welding gun damages. 2. No puffer-sound heard. a. Solenoid valve damages. b. Current circuit of solenoid valve faults.	a. Clean up the seen. b. Repair and replace welding gun. c. Replace solenoid valve. 3. Search professional personnel for help to repair the control board.
8. Severely burning out of tungsten electrode	Dutyfactor is adjusted over high	Adjust the knob of dutyfactor counter clockwise.
9. High heat producing of ground cable	Ground cable contacts poorly	Connecting the both of ground cable onto work bench is suggested.