
POWER STICK 200K
INVERTER WELDER

MANUAL

Please read this manual carefully before using



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Operator's Manual

The Respectable User:

The detailed information provided here in below, which contains the installation, trial run, operation and maintenance of "POWER STICK 200K DC Inverter Arc Welder", is intended for your kind perusal to help you minimize the operational problems so that the product can work as smoothly as it is expected.



WARNING! * TO INSTALL, OPERATE, TEST AND MAINTAIN ONLY THE POWER STICK 200K PERSONNEL ARE ALLOWED.

* ANY OPERATION AND MAINTAINENCE BEFORE READING THIS MANUL IS NOT ALLOWED.

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1. Product Description

POWER STICK 200K DC Inverter Arc Welder is designed to be used with the advanced IGBT and rapid recovery diode as its main control and transfer components and assisted with the specially developed control circuit, it has uniformly regulated welding current which enable the welding power source to achieve the adaptability to the excellent welding procedures. It largely enhanced the welder's protection abilities to ensure safety welding operation. It is quite popular in welding the materials like low-carbon steel, stainless steel, high-intension steel, alloy steel and cast iron.

The highlighted characteristics of POWER STICK 200K DC Inverter Arc Welder:

- 1) Featured with small volume and light weight, it widely used in upholstering field, repairing field and fieldwork.
- 2) Excellent arc-piloting feature and melt & drip transition feature.
- 3) By various sound protection performance, it can keep the welding machine from overheating, over voltage, under voltage, over current and so on. When the main supply compensation is not less than $\pm 15\%$, it can increase while the welding current reduces. Because of its anti jamming high performance, the control system can respond to the power source, work piece, electrode and operational changes with less than 1m/s speed in order to keep steady output of the current.
- 4) Speical arc character , suitable to all welding processes
- 5) Easy connection. To conduct external connection, POWER STICK 200K use all the connectors, which can facilitate quick and safe connection with simple but reliable performance. No notification will be given if the manual's content or welder's function change.

2. Safety Operation

Operator's Self Protection

- * Please always follow the rules that conform to safety and hygiene. Wear protective garments to avoid injuries to eyes and skins.
- * Use the welding helmet to cover your head while working with the welding machine. Only by viewing through the filter lens on the welding helmet can you watch your operation.
- * Under no circumstance can you allow any part of your body to touch the welder's output bipolarity (the handle of electrode holder and work piece.).

Attention

- * POWER STICK 200K DC Inverter Arc Welder is electronic products whose spare parts are very tender, do not change or adjust with a rush otherwise the switch will be damaged.
- * Check the connection to see if it is well connected, whether the earth (ground) connection is reliable, etc.
- * Fumes and gases produced when welding are hazardous to health. Make sure to work in places where there are exhaust or ventilation facilities to keep fumes or emissions away from the breathing zone.
- * Please remember to keep arc rays away from the other nearby people when welding. This is only due to the interference from arc rays.
- * Never allow anybody else other than the operator himself to dislocate or modulate the welding machine.
- * Never allow the people with the cardiac pacemaker or any other things which are susceptible to the electromagnetism to get close to the welding machine, which has interference with the pacemaker's normal function.
- * The welder can not be used for pipeline ice-out.
- * Over-load is forbidden. Please noted the rated continuous loading factor

Safety Measures to Be Taken to Assure the Correct Installation and Position

- * Careful precaution must be taken to keep the operator and the machine from the foreign materials falling from up above.
- * The dust, acid and erosible dirt in the air at the job site can not exceed the amount required by the norm (excluding the emission from the welder).
- * The welder must be installed in the place where it can not be exposed to sun and rain. Also it must be stored in less humid place with the temperature range at -10~40.°C
- * There should be 50 cm space about for the welding machine to have good ventilation.
- * Make sure that there is no metal-like foreign body to enter the welding machine.
- * No violent vibration in the welder's surrounding area.
- * Make sure that there is no interference with the surrounding area at the installation site.
- * Make sure whether there is enough power supply to make the welding machine work properly. Any power source required to access the welder must be installed with some protective equipments.
- * The welder should be installed on the horizontal surface and if it over 15°, there should be added some anti-dump set.

Safety Check

Each item listed below must be carefully checked before operation:

- * Make sure that the welding machine has reliable earth wire connection;
- * Make sure that there is no short circuit connection with welder's both outputs;
- * Make sure that there is always sound output and input wire connection instead of exposing it outside.

Regular check needs to be conducted by the qualified personnel after the welder has been installed over a period of six months, which involves as follows:

- * Routine cleaning needs to be done to make sure that there is no such abnormal condition as loose connection happening in the welding machine.
- * The external parts installed with the welder must guarantee that the welder works properly.
- * Check the welding cable to see if it can continue to be used before it is worn out.
- * Replace the welder's input cable as soon as it is found to be broken or damaged.

Please do not hesitate to contact us for technical assistance whenever you come across the problems you can not work out or you may deem difficult to fix.

3. Technical Specification

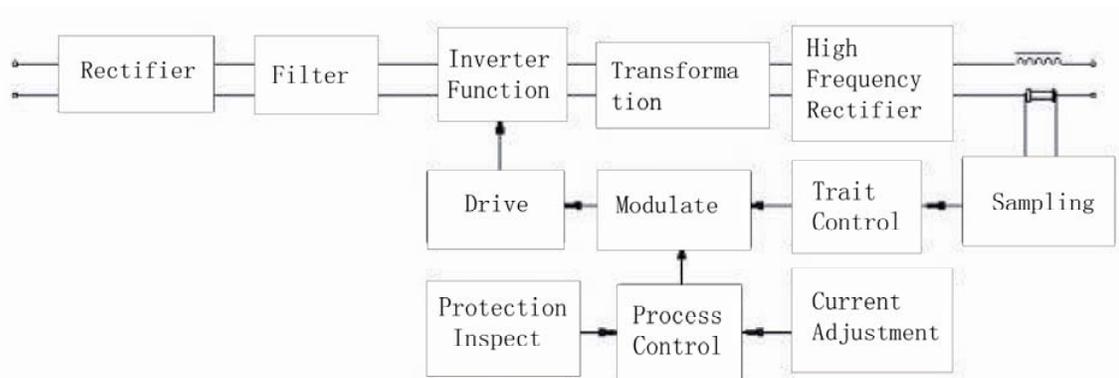
Environment to which the product is subject

- * The surrounding temperature range:
- * When welding: -10~+40°C
- * During transport or in storage: -25~+55°C
- * Relative humidity: when at 40°C: ≤50%, when at 20°C: ≤90%.
- * The dust, acid and erosible materials in the air can not exceed the amount required by the norm (apart from the emissions from the welder). No violent vibration at the job site.
- * Altitude no more than 1,000m.
- * Keep from raining when it is used outdoors.

The Requirement for Main Supply

- * The voltage oscillogram should display actual sine wave, the oscillation of the frequency should not exceed ± 1% of the rated value.
- * The oscillation of the supplied voltage should not exceed ±15% of the rated value.

The Welder's Principle



The welder acquires 220V single phase industrial frequency AC power source through the power switch SW 1 and rectify through single phase rectifier bridge DB1 and then filtered through capacitor C1, C2, C3, to get the DC current. The 31 KHz AC current is got through the IGBT(Q1, Q2, ... Q4) all-bridge inverter. Then this alternating current, transformed by the intermediate frequency transformer and rectified by quick recovery diode (D1, D2, ...,D6), outputs the stable direct current .

The Welder Structures

POWER STICK 200K use the movable carton like structures: The upper part in the front is equipped with a power switch, a welding current regulation knob, power indicator light(green), abnormal indicator light (yellow), working indicator (red) while the lower part is furnished with the current output “+” quick connector and “-” quick connector. The back side is installed with cooling fan, power source lead-in wire. On the top there is a strap for the convenient of easy transport. When you open the cover, there is one primary transformer, one piece of printed circuit board. The bottom part is supplied with output reactor, primary transformer and etc. Installed in the middle part is a radiator with power elements.

Main Technical Data**POWER STICK 200K**

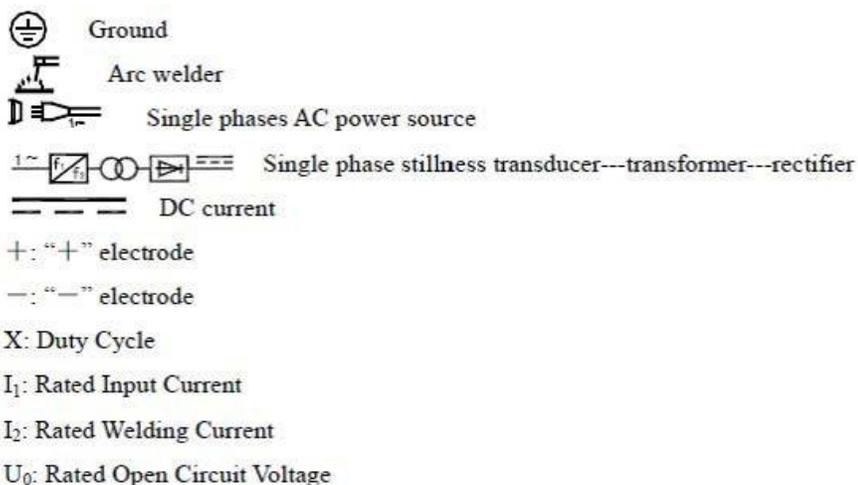
ITEM UINT

Lift ARC

| | | |
|-------------------------------|------------------|--------------|
| Rated Input Voltage | V | 220(220~240) |
| Electrical Source Frequency | Hz | 50/60 |
| Rated Input Current | A | 39 |
| Rated Input Capacity | KVA | 8.5 |
| Open circuit Voltage | V | 78 |
| Rated Working Voltage(MMA) | V | 28 |
| Rated Working Voltage(TIG) | V | 18 |
| Current Regulation Range(MMA) | A | 20~200 |
| Current Regulation Range(TIG) | A | 20~200 |
| Rated Duty Cycle % | % | 40 |
| Welding Current 10min/40% | A | 200 |
| 10min/60% | A | 163 |
| 10min/100% | A | 126 |
| Efficiency | η | 80% |
| Power Factor | $\text{Cos}\phi$ | 0.7 |
| Insulation Grade | | H |
| Case Protection Grade | | IP21S |
| Cooling Type | | Fan cooling |
| Case Size (L×W×H) | mm | 400*150*290 |
| Weight | Kg | 5.2 |

Standards of the machine

Portable POWER STICK 200K DC Inverter Arc Welder conforms with the following standard to perform
EN 60974-1



U1: Rated Input Voltage

U2 : Rated Load V

~50/60 Hz: AC, Rated frequency 50 Hz, workable frequency 60 Hz.

...V: Voltage (V)

...A: Current (A)

...%: Duty cycle

...A/...V~...A/...V: Output range. Rated minimum and rated maximum welding current and related load voltage.

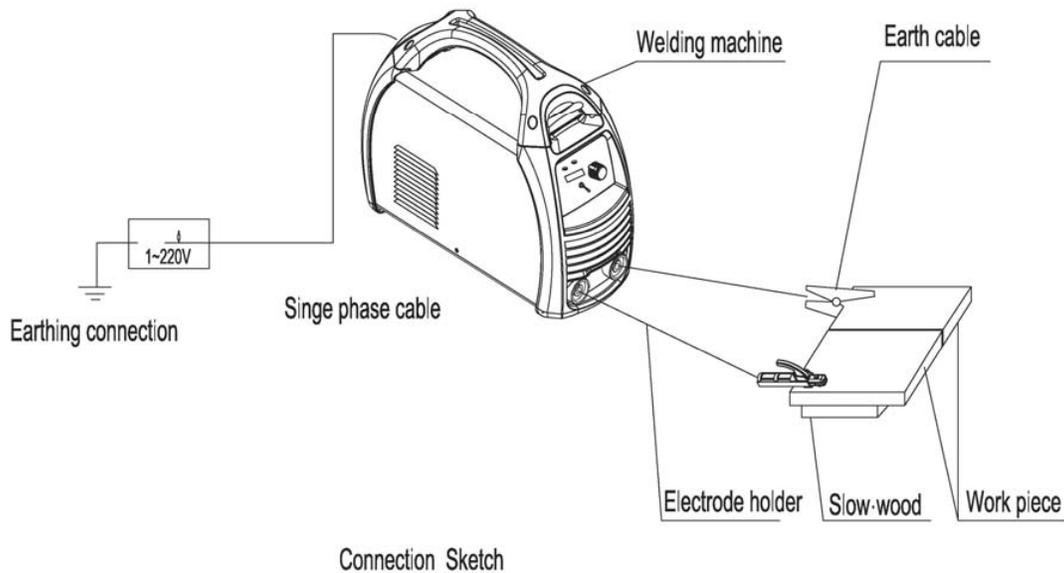
IP21S: Case protection class. IP is the code of International Protection. 2 mean preventing user's finger from the dangerous parts; preventing the solid material with the diameter no less than 12.5 mm into the box. 1 means preventing water dropping vertically which is harmless. S means water proof test is conducting while the movable parts are standstill.

H: H insulation grade.

4. Installation

Welder's Placement

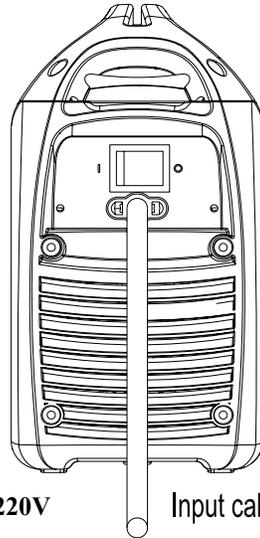
- * The dust, acid and erosible dirt in the air at the job site can not exceed the amount required by the norm.
- * The welder must be installed in the place where it can not be exposed to sun and rain. Also it must be stored in less humid place with the temperature range at -10~40°C.
- * There should be 50 cm space about for the welding machine to have good ventilation.
- * Apparatus to exclude wind and smoke should be equipped if the inside aeration is not sound.



Connection between Welder and Power Source (See the Input Connection Sketch)

Connect the power source cable at the back board of the welder into the single phase 220 voltage power network with breaker; 380 voltage power sources is strictly prohibited to the welder which will severely damage the welder, otherwise the user should take the consequences for it.

Notice: Power network earth connection is not power network connection zero.



Sing phase 220V

Input cable connection

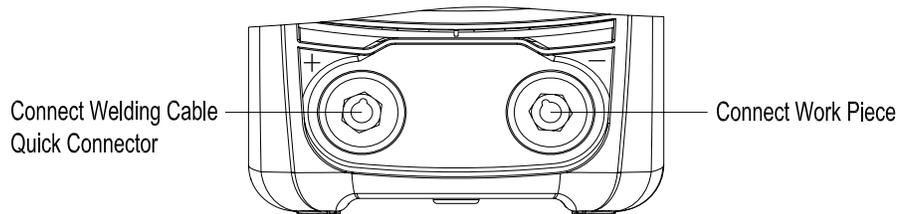
Singal phase220V Power supply configure of a welder:

| ITEM | POWER STICK 200K |
|--------------------------------------|------------------|
| Air switch (A) | ≥ 40 |
| Fuse (Rated current) A | 40 |
| Knife switch (A) | ≥60 |
| Cablespecificati (mm ²) | ≥6 |

Notice: The melting current of the fuse is two times of its rated current.

Connection between Welder and Electrode Holder (See Output Connection Sketch)

Insert the quick connector of the welding cable on the electrode holder into current output “+”electrode adaptor on the second half of the front panel and then screw down clockwise.



Connect Welding Cable Quick Connector

Connect Work Piece

Output Connection Sketch

Connection between Welder and Work Piece (See Output Connection Sketch)

Insert the quick connector of earth cable with earth clamp into current output ‘-’ electrode adaptor on the second half of the front panel and then screw down clockwise. The earth clamp is connected with work piece.

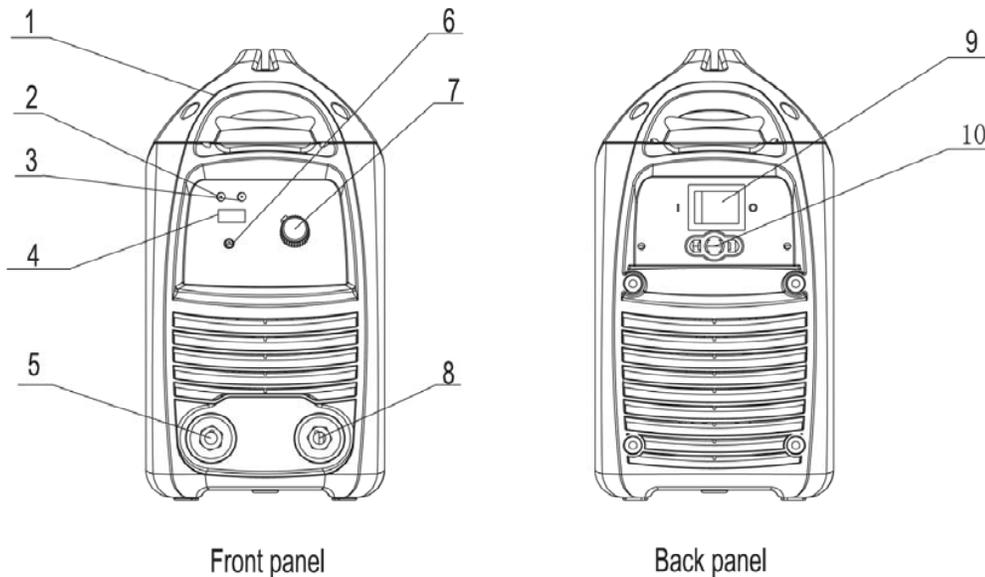


Notice: Do not use steel plate or the materials alike which are ill conductor to connect between welder and work piece.

5. Operation (See the front panel)



ATTENTION: The protection class of POWER STICK 200K DC Inverter Arc Welder is IP21S. It is forbidden to put in a finger or insert a round bar less than 12.5 mm (metal bar in particular) into the welder. No heavy force can be employed on the welder'



| | | | |
|--|-----------------------|---------------------------------------|--|
| 1. welder's handle | 2. Power Indicator | 3. Alarm Indicator | 4. digital current indicator |
| 5. Current Output "+" Electrode Quick Connector Socket | 6. Potentiometer wire | 7. Welding Current Adjustment Knob | 8. Current Output "-" Electrode Quick Connector Socket |
| 9. On-off Switch | 10. Power Input Wire | | |



Attention:

- * The 'protection indicator light' will be on after a long time operation, it shows that the inner temperature is over the permitted data, then the machine should be stopped using for some time to let it cool down. It can continue using after the 'protection indicator light' is off.
- * The power source should be switched off after the operation or while temporarily leaving job site.
- * Welders should dress canvas work cloth and wear welding mask to prevent the hurt from arc and thermal radiation.
- * Light separating screen should be put in the job site to prevent the arc will hurt other people.
- * Inflammable or explosive materials are prohibited to access the job site.
- * Each connection of the welder should be connected correctly and creditably

Basic Welding Procedure

- a) Connecting the power source switch, **【Power Indicator Light】** bright;
- b) Regulate the welding current potentiometer to reach the value for welding;
- c) Take-up the torch hand, aim at the welding seam, use the stick contact with the work piece and then the electric arc was ignited, i.e. you can effect the arc welding at the same time the **【Welding Indicator Light】** bright.

Replacement of Electrode

Only when the electrode burns up to 1~2 cm away from the electrode holder does it become necessary to replace it with a new one in order to proceed with welding.



REMARKS: * Electrode burns at high temperature. Please do not use hand to replace it.

The replaced electrode end should be placed in a metal container.

* Do not use the electrode holder to clamp the electrode coating.

* While ignite the electric arc, you should scrap lightly, or it may adhere to the stick.

Removal of Slag

When the welding job is finished, please use the special slag hammer to knock off the slag on the surface of welding rail.



REMARKS: * Only until the slag cools off and becomes hardened can the removal work starts.

* To avoid the slag injuring people, never point at the nearby people when you remove slag.

Maintenance and Service

Unlike the traditional welder, the reversible welder belongs to the scientifically sophisticated product which uses the modern electronic component parts combined with state-of-the art technology. Therefore the trained personnel are required for its maintenance. However, due to the fact that there are very few components to be easily worn out, it doesn't need regular service apart from usual cleaning work. Only the qualified people are allowed to be in charge of the repair job. It is strongly recommended that customers contact our company for the technical back-up or service when they feel unable to work out the technical hitch or problems.

The Maintenance includes:

* Dust Removal

The POWER STICK 200K man must regularly clean up the dust from the welder by the dry compressed air (air compressor or the similar device). Meanwhile examination can also be performed to make sure there are no loose parts and components inside the machine. Immediate cleaning is needed if there is an accumulation of dust. Under normal circumstance cleaning is only required once a year unless there is too much dust inside the welder. If so, cleaning needs to be done every quarter of the year.

* Keep the Welder Cable Plug in good condition

The Welder Cable Plug needs to be checked from time to time. In its regular usage, at least it has to be inspected each month. However, it is necessary to check it every time when it is in the mobile circumstance.



WARNING: * If the main loop voltage happens to be a bit higher, safety precaution should be taken before repair to avoid accidental shock. The untrained people are forbidden to open the case !

* Power source needs to be cut off before dust removal;

* Never tamper with wire or damage the component parts when cleaning.

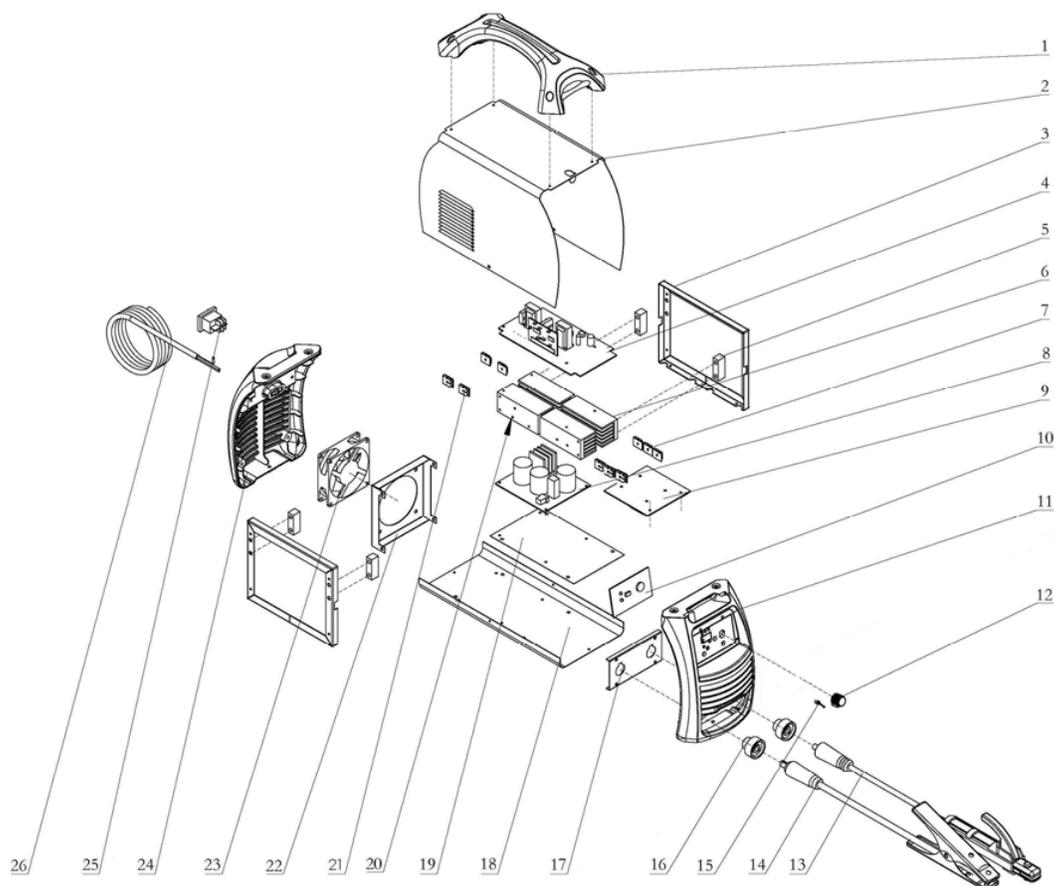
6. Trouble shooting

| No. | Breakdown | Analysis | Solutions |
|-----|--|--|---|
| 1 | Yellow Indicator is on | Bad power ventilation lead to over-heat protection | Improve the ventilation condition. |
| | | Circumstance temperature is too high | It will automatically recover when the temperature low down. |
| | | Using over the rated duty-cycle | It will automatically recover when the temperature low down. |
| 2 | The adjustment knob on the front panel didn't work | Potentiometer broken (current regulation) | Replace the potentiometer. |
| 3 | Cooling Fan not working or turning very slowly | Scarcity of phase | Recover the phase |
| | | Switch broken | Replace the switch |
| | | Fan broken | Replace or repair the fan |
| | | Wire broken or falling off | Check the connection |
| 4 | No no-load voltage | Welder getting overheated | See No. 1 |
| | | Switch broken | Replace the switch |
| 5 | Electrode Holder and Cable getting hot; “+” “-” polar sockets becoming hot | Electrode Holder's capacity is too small; | Replace it with a bigger capacity one |
| | | Cable is of small size | Replace it with another one in conformity with the requirement |
| | | Replace it with another one in conformity with the requirement | Remove the oxide skin and tighten it |
| | | Bigger resistance between the electrode holder and the cable | |
| 6 | Power source tripping | Resume power over a long period of time (more than two days) | Not failure. Trip caused by the main power filter's capacity charging. Switch on the main power source. |
| | | In the process of welding | Contact us |
| 7 | Others | | Contact us |



Power Protection: Continually turn on/off in short time forbidden. It will lock the power source automatic if the forbidden operation has been detected.

7. List of Component Parts



| No | ERP CODE | DESCRIPTION | SPECIFICATION | UNIT | Qty |
|----|--------------------|--------------------------|------------------|------|-----|
| 1 | 2. 05. 05. 134 | Handle | POWERARC200-1 | PC | 1 |
| 11 | 2. 05. 05. 132 | Front/back plastic panel | POWERARC200. 1-3 | PC | 1 |
| 12 | 2. 07. 11. 016 | Potentiometer Knob | KDJII23-16-6J | PC | 1 |
| 16 | 2. 07. 57. 967 | Quick connector | DJK10-25 | PC | 2 |
| 23 | 1. 2. 07. 02. 3747 | Fan | PSTICK200K. 3. 1 | PC | 1 |
| 25 | 2. 07. 80. 830 | Switch | | PC | 1 |

8. Complete Set Specification

| | |
|---|-------|
| * POWER STICK 200K welding power | 1 pcs |
| * Warranty Card | 1 pcs |
| * Operator's Manual | 1 pcs |
| Accessories | |
| * Welding Cable (fixed with Electrode Holder) | 1 pcs |
| * Earth cable (with clamps and adaptor) | 1 pcs |

Remark: a) quick connector is consumables, not including in the warranty service
b) Is sales contract has other requirement, please refer to sales contract.

9. Transport & Storage

The welder comes under the category of indoor equipment. The tolerable temperature for both transport and storage ranges from -25 to +55, and the storage environment should be dry. To keep the machine from the humidity, it is recommended to free it from moisture and dust before it is kept in the plastic bag.

Users are suggested to keep carton and shock-proof stuff for the future possible transport. In line-haul, please prepare another wood carton which is labeled "Keep it from rain", "Handle with care", and "Precision Instrument etc."

