PoWer ARC Series

GeKaMac®

PoWer ARC 205
Manual Instructions

Please Read and Understand This Manual
Before Operating The Welding Machine

www.gedikwelding.com

This machine is for internal use only.

It complies with the WEEE Directive.

This machine has been designed in accordance with the EN 60974-1 and EN 60974-10 standards.

The machine is safe when installation, operation, and maintenance are performed in accordance with the user manual and regulations. The operator and machine owner are responsible for adhering to safety rules.

Gedik Kaynak San. Ve Tic. A.Ş. assumes no responsibility for safety or CE compliance if any modifications are made to the machine or if safety rules are not followed.

This Class A equipment is not suitable for use in homes and similar residential areas where the power supply is provided by the low-voltage public electricity network.

This machine is not household waste and cannot be disposed of in the trash.

When the machine reaches the end of its service life or becomes obsolete, it must be disposed of in accordance with regulations.

COMPLIES WITH THE WEEE DIRECTIVE.

Eco Design Statement

This machine has been designed and manufactured in accordance with the requirements of the 2009/125/EC Eco Design Directive concerning the environmentally friendly design of energy-related products.

Accordingly, machines with an idle mode are as follows.

	Idle Mode
MMA	**X**
MIG	√
TIG	√
Plazma	√
SAW	**Out of Scope**

Efficiency measurements should be conducted only on the power unit. The water cooling system should be disabled. For more information on measurements and machine settings, Gedik Kaynak Sanayi ve Ticaret A.Ş. should be consulted.

Attention!

Our Valued Customer,

We kindly request that you obey the warnings mentioned below:

- Definitely have the “Warranty Document” approved when you get the machine.
- Use the machine in a way that is in accordance with the fundamentals that are mentioned in the user’s guide of the machine.
- Refer to the nearest GEDIK WELDING authorized service or the service center of GEDIK WELDING when a problem comes up.

Thank you for prefering one of GeKaMac® products.

Attention!

Field Evaluation

Before the user installs arc welding equipment, it is necessary to evaluate the working area in terms of the risk of electromagnetic problems. Therefore the following items should be considered.

- Other supply, control, signal and telephone cables above or under the machine and near the welding machine;
- Radio and television transmitters and receivers;
- Computer and other control devices;
- Critical devices, such as the protection of industrial devices, in terms of safety;
- Pacemakers, hearing aids, etc. the health of people that use devices in the vicinity;
- Calibration or measurement devices;
- The associated of all other devices in the area (The user should be careful that other nearby equipment can work together with the arc welding equipment. For this reason additional protection devices may be required);
- The time of day when the welding or other activity was applied.

The area that may be affected, may vary depending on the structure plan of the used machine and the area covered by the other applications and may extend beyond the machine's used construction.

Evaluation of Welding Configuration

In addition to field evaluating, evaluation of the arc weld installation can be used to measure and remove interference conditions. The interference evaluation should include in situ measurements as described at CISPR 11:2009 in paragraph 10. In situ measurements can also be used to verify the efficiency of attenuation measurements.

Thank you for prefering one of GeKaMac® products.

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2. SAFETY RULES

Protect yourself and others against possible serious injury or death risks. Keep children away. People who have pacemakers in their bodies should consult their doctors before operating the welding machine. Be careful when you are doing operations with your hands on the pieces. Use proper equipment that are necessarry to protect yourself from burns that can be caused by excessive heating of the piece during welding and / or cutting operation. Be sure that all set up, maintenance and repair related operations are performed only by qualified people.

2.1. ELECTRICAL SHOCK

Electrode and the piece that is being worked on or ground circuits are active in terms of electricity while the welding machine is on. Don't touch these active parts with bare hands or wet clothing. Wear dry gloves that have no holes to insulate your hands.

2.2. ARC RAYS

Use a protective mask with a proper filter to protect your eyes from the sparks and the rays of the arc while welding or watching such an actitivity. The head mask and the filtered glasses must meet the ANSI Z87.I standards.

2.3. GASES AND FUMES

Fumes and gases that are harmful to health can form during the welding operation.

Do not inhale these gases or fumes. Keep your head out of the fumes while welding. Provide sufficient ventilation in the arc and / or use fume suction machines to keep fumes and gases out of the breathing area.

2.4. WELDING SPARKS

Put away elements that are fire hazards from the welding area. If this is not possible, cover these hazards to prevent welding sparks from starting a fire. Do not forget that welding sparks and hot materials coming from welding can go on to neighboring areas easily through small cracks and openings. Don't do welding near hydrolic lines. Always keep a fire extinguisher on hand.

2.5. ELECTRIC AND MAGNETISM

Electric flow that passes through a conductor causes Electric and Magnetic Fields (EMF) to be formed. Welding current creates EMF around welding cables and welding machines.

— EMF can ruin the operation of some pacemakers. For this reason, welders who have pacamakers in their bodies should consult their doctors before welding.

— Being exposed to EMF during welding, can cause other unknown health problems.

— Getting exposed to EMF will be minimized by paying attention to the following instructions:

- Guide electrode and chassis cables together.
- Never wrap electrode and chassis cables around your body.
- Do not place your body between the electrode and chassis cables.
- Connect the chassis cable as close to the piece that is being worked on as possible.
- Stay as far away as you can from the power units.

2.6. ACCIDENTS ORIGINATED FROM THE MOVING PARTS

- Stay away from moving objects.
- Be careful while working next to moving parts.
- Choose metal-nosed shoes against the falling.
- Keep the machine covers closed.

3. ELECTROMAGNETIC COMPATIBILITY (EMC)

This machine has been designed in accordance with all related regulations and norms. Additionally, it can still generate electromagnetic forces that affect other systems such as communications (telephone, radio, television). These affects can cause security problems in the exposed systems. Read carefully and understand this section in order to reduce or get rid of the affects that can be created by this machine.

This machine has been designed to be operated in the industry area. If it is operated in private places (house etc.), it will become necessary to take special precautionary measures in order to prevent possible electromagnetic affects. It is necessary for the user to set up and operate these machines just like the way it is described in the handbook. If an electromagnetic affect is perceived due to the operation of these machines, the user should take corrective measures in order to get rid of these affects. If necessary, the user should contact GEDIK WELDING IND. COM. LTD. CO. No changes should be made in the machine without getting written approval from GEDIK WELDING IND. COM. LTD. CO.

The control of the work area should be made in terms of tools that can work improperly due to the electromagnetic affects before the machine is assembled.

- Inlet and outlet cables, telephone cables and control cables that are found in the work area of the machine.
- Radio and/or television transmitters and receivers,
- Computer or computer controlled tools,
- Safety and control equipment for industrial operations,
- Calibration and measurement appliances,
- Medical appliances such as heart rhtyme appliance and hearing aids,

Control the electromagnetic immunity of the equipments that operate near the work area. The user should be certain that all the equipments that are in the work place are compatible. Otherwise, it can necessitate additional protective measures.

Ideal dimensions of the work place are determined by the construction of the area and other factors that are found there. Take the warnings below into consideration in order to decrease the affects of the electromagnetic waves that the machine generates:

* Make the connection of the machine with the network electricity in the way it is stated in the user's guide. If an electromagnetic interaction comes into being, such preventive measures as filtring the main electrical inlet may need to be taken.

* Outlet cables should be as short as possible and should be kept together.

4. GENERAL INFORMATION AND WARNINGS

Do not set up, operate or repair before reading the user's guide and the security measures that are found in it. Hide this user's guide and always have it on hand.

- Cut off the electrical connection between the welding machine and the network when the work is finished or when you are going to take a long break.
- Do not make any changes in the welding machine. This operation can cause the machine to lose its properties and a change in technical data.
- It is forbidden to do adaptation on the welding machine. Doing adaptation does not only cause the loss of warranty rights, but also can jeopardize the operational safety of the machine and can create the risk of electrocution for the users.
- A damage in the welding machine due to a mistake of the user will cause the loss of warranty rights.
- Acceptable environmental temperature range during work is between -10 °C and +40 °C.
- Acceptable relative humidity rate is 95% at 20 °C.

Manufacturing company reserves the right to change the technical properties without prior notice.

5. ADVANTAGES AND GENERAL PROPERTIES OF POWER ARC 205

Since the 1980s, the size of the welding machines has been reduced and their productivity has increased thanks to the inverter welding machines located in the international market.

This machine is designed to operate with 1-phase, 230V (AC) $\pm$ %10 and 50-60 Hz supply voltage and based on the insulation spacing according to the phase-neutral voltage values. It should be used only in systems with 1 phase, 3 wire and earth line.

Without a healthy protective earth connection approved by an authorized electrician, this grid connection must not be made and the machine must not be started. Electric leakage is a fatal danger to human health.

The machine should not be connected to 3 phase grid. If a 3-phase grid supply is to be made, the machine must be connected to the phase neutral with an insulated plug connection suitable for the supply plug and grounding and this operation must be done by a qualified electrician. Incorrect connection can cause to damage the machine and be risky of life safety. Damage caused by such connections is not covered by the warranty.

The advantages of PoWer ARC 205 welding machine:

- High quality welding and steady arc with constant DC current
- Easy ignition possibility of the electrode
- Light weight and easy portability, simple installation and operation

- Easy control of welding bath which in molten state
- Shortening of output current in case of sticking of electrodes

6. WORKİNG PRİNCİPLE OF POWER ARC 205

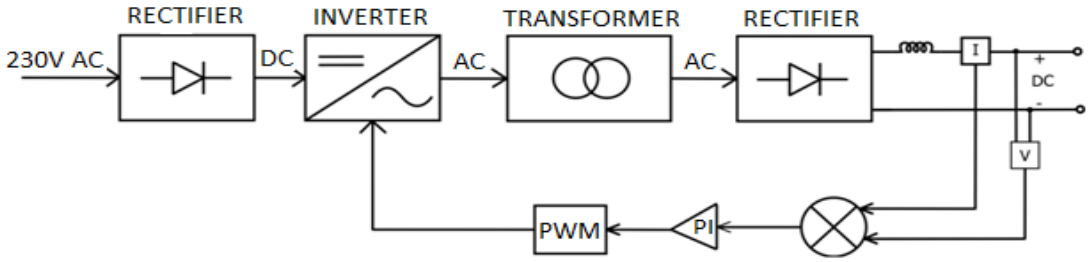


Figure-1

The working principle of the PoWer ARC 205 welding machine is shown in Figure-1.

- The AC single-phase line voltage rectifier is used to convert DC voltage.
- The DC voltage is converted to an AC voltage which it is adjusted high frequency and effective value with the inverter circuit.
- High frequency AC voltage is isolated from the grid by transformer and reduced.
- The high frequency and isolated AC voltage is rectified by the rectifier and transferred to the output.
- Feedback is taken from the output current and voltage to ensure that the welding current is constant.

Volt-Ampere graph and nominal load voltage and source current relationship are given in Figure-2.

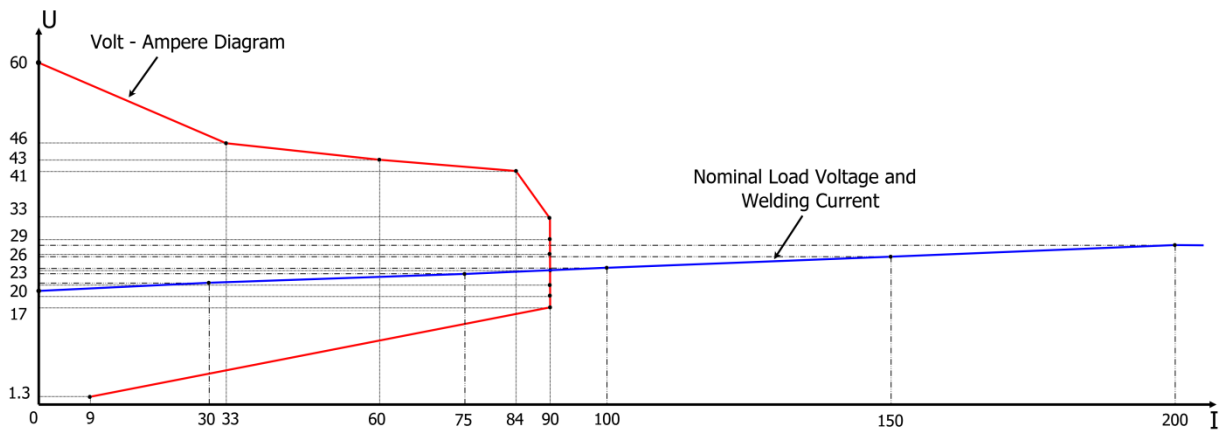


Figure-2: Volt-Ampere Characteristic

The following equation applies between the nominal load voltage and the welding current:

U = 20+0.04 I (V)

U = Nominal Load Voltage

I = Welding Curren

7. TECHNICAL İNFORMATION

Parameters	Unit	PoWer ARC 205
Input Voltage	V	Single Phase 230V, 50/60 Hz
Input Power	kVA	8,16
Welding Type		MMA
Rated Input Current	A	35,5 (%20)
Rated Input Power	kW	6,2
Power Factor		0,76
Welding Current Range	A	30 ～ 200
No-Load Voltage	V	65
Duyt Cycle		200A 20%, 105A 100%
Protection Class		IP21
Insulation Class		H
Dimensions of Machine (LxWxH)	mm	365x150x240
Weight	kg	7,5

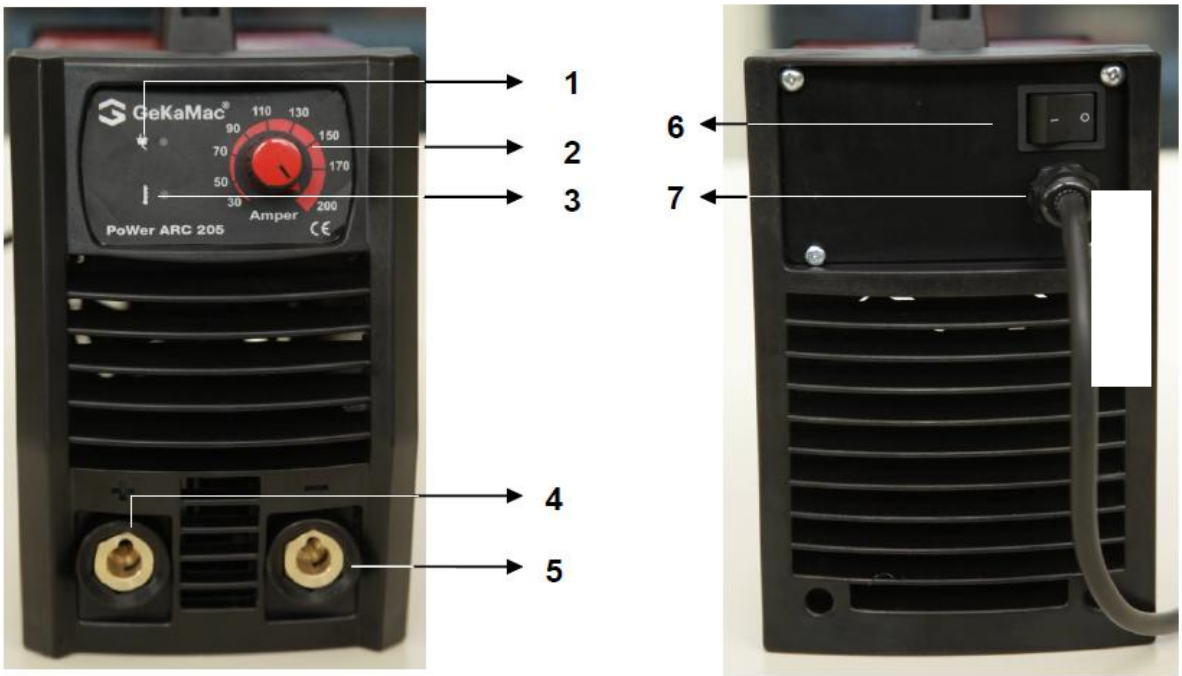
8. DUTY CYCLE & OVER HEAT

No-Load Ratio: It is called the working rate of the machine for 10 minutes without stopping under welding.

During welding with the electrode, the machine finds a cooling opportunity during electrode replacement and PoWer ARC 205 welding machine provides welding long time with electrodes in diameters of 4mm.

When the welding machine overheats, the IGBT over-heat protection enters and the output welding current is cut off, the overheating lamp on the front panel is on. In this case, welding can not be done until the overheating lamp on the front panel turns off. After the overheating lamp is turned off, welding can be continued.

9. LAYOUT FOR FRONT & REAR PANEL



1. Power Indicator Lamp: This lamp is activated when the machine is turned on.

2. Welding Current Control Button: Set welding current (30 ～200A).

3. Thermic Lamp: In situations such as high temperatures, machine protection is engaged and the lamp is activated.

4. Positive (+) Welding Cable Connection: Positive output connection for welding current.

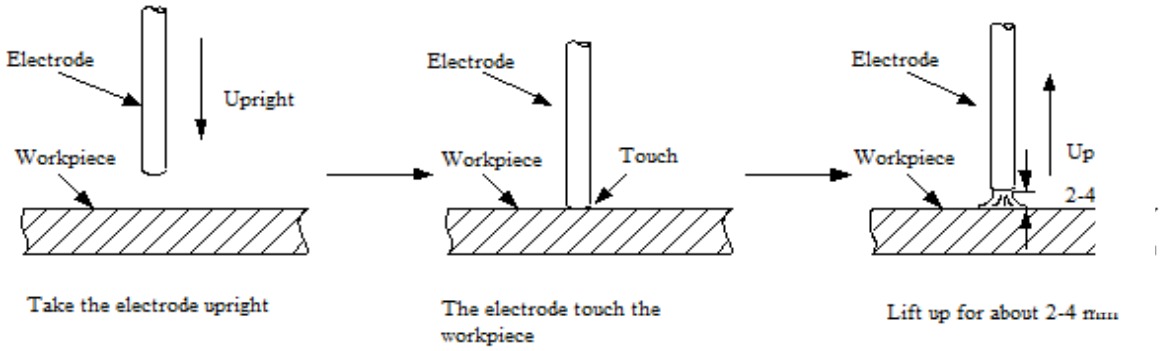
5. Negative (-) Welding Cable Connection: Negative output connection for welding current.

6. Power Switch: Choose “ON”, power through; Choose “OFF”, power cut off.

7. Cable Clamp: Fastened the mains cable.

10. WELDING OPERATION

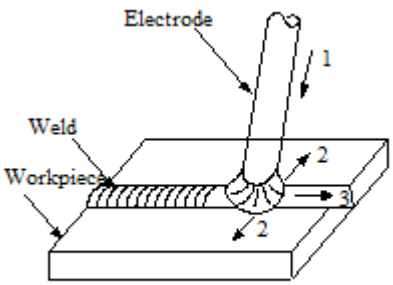
Knocking Arc: Take the electrode upright to touch the workpiece, after forming short circuit, quickly lift up about 2~4 mm, and arc will be ignited. This method is difficult to master. But in the welding for the brittle or hard steel, it is better to use knocking way.



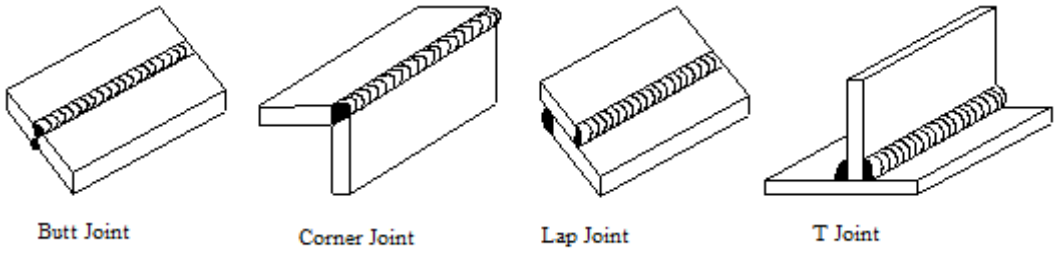
Lifting Arc: take the electrode to scrape the workpiece for striking arc. But it may cause the arc scratch, so must to lift arc in the groove.

Manipulation of Electrode

In MMA welding, there are three motions to being matched in the end of electrode: the electrode moving to the molten pool along axes; the electrode swing right and left; the electrode moving along welding way.
The operator can choose the manipulation of electrode based on welding joint shape, welding position, electrode spec, welding current and operation skill, etc.



11. WELDING PARAMETERS



12. MACHINE MAINTENANCE

In order to guarantee that arc welding machine works high-efficiently and in safety, it must be maintained regularly. Let customers understand the maintenance methods and means of arc welding machine more , enable customers to carry on simple examination and safeguarding by oneself, try one's best to reduce the fault rate and repair times of arc welding machine, so as to lengthen service life of arc welding machine .Maintenance items in detail are in the following table.

● **Warning: For safety while maintaining the machine, please shut off the supply power and wait for 3 minutes, until capacity voltage already drops to safe voltage 36V.**

Date	Maintenance items
Daily examination	• Observe that whether panel knob and switch in the front and at the back of arc welding machine are flexible and put correctly in place. If the knob has not been put correctly in place, please correct; If you can't correct or fix the knob , please replace immediately; • If the switch is not flexible or it can't be put correctly in place, please replace immediately; Please get in touch with our company maintenance service department if there are no accessories. • After turn-on power, watch/listen to that whether the arc welding machine has shaking, whistle calling or peculiar smell. If there is one of the above problems, find out the reason to get rid of; if you can't find out the reason, Please contact local this area our company agent or the branch company. • Observe that whether the display value of LED is intact. If the display number is not intact, please replace the damaged LED. If it still doesn't work, please maintain or replace the display PCB. • Observe that whether the min/max value on LED accords with the set value. If there is any difference and it has affected the normal welding craft, please adjust it. • Check up that Whether fan is damaged and is normal to rotate or control. If the fan is damaged, please change immediately. If the fan does not rotate after the arc welding machine is overheated, observe that whether there is something blocked in the blade, if it is blocked, please get rid of ; If the fan does not rotate after getting rid of the above problems, you can poke the blade by the rotation direction of fan. If the fan rotates normally, the start capacity should be replaced; If not, change the fan.

	• Observe that whether the fast connector is loose or overheated. if the arc welding machine has the above problems, it should be fastened or changed. • Observe that Whether the current output cable is damaged. If it is damaged, it should be wrapped up, insulated or changed.
Monthly examination	• Using the dry compressed air to clear the inside of arc welding machine. Especially for clearing up the dusts on radiator, main voltage transformer, inductance, IGBT module, the fast recover diode and PCB, etc. • Check up the bolt in arc welding machine, if it is loose, please screw down it. If it is skid, please replace. If it is rusty, please erase rust on bolt to ensure it works well.
Quarter-yearly examination	• Whether the actual current accords with the displaying value. If they does not accord, they should be regulated. The actual current value can be measured by the adjusted plier-type ampere meter.
Yearly examination	• Measure the insulating impedance among the main circuit, PCB and case, if it below 1MΩ, insulation is thought to be damaged and need to change, and need to change or strengthen insulation.

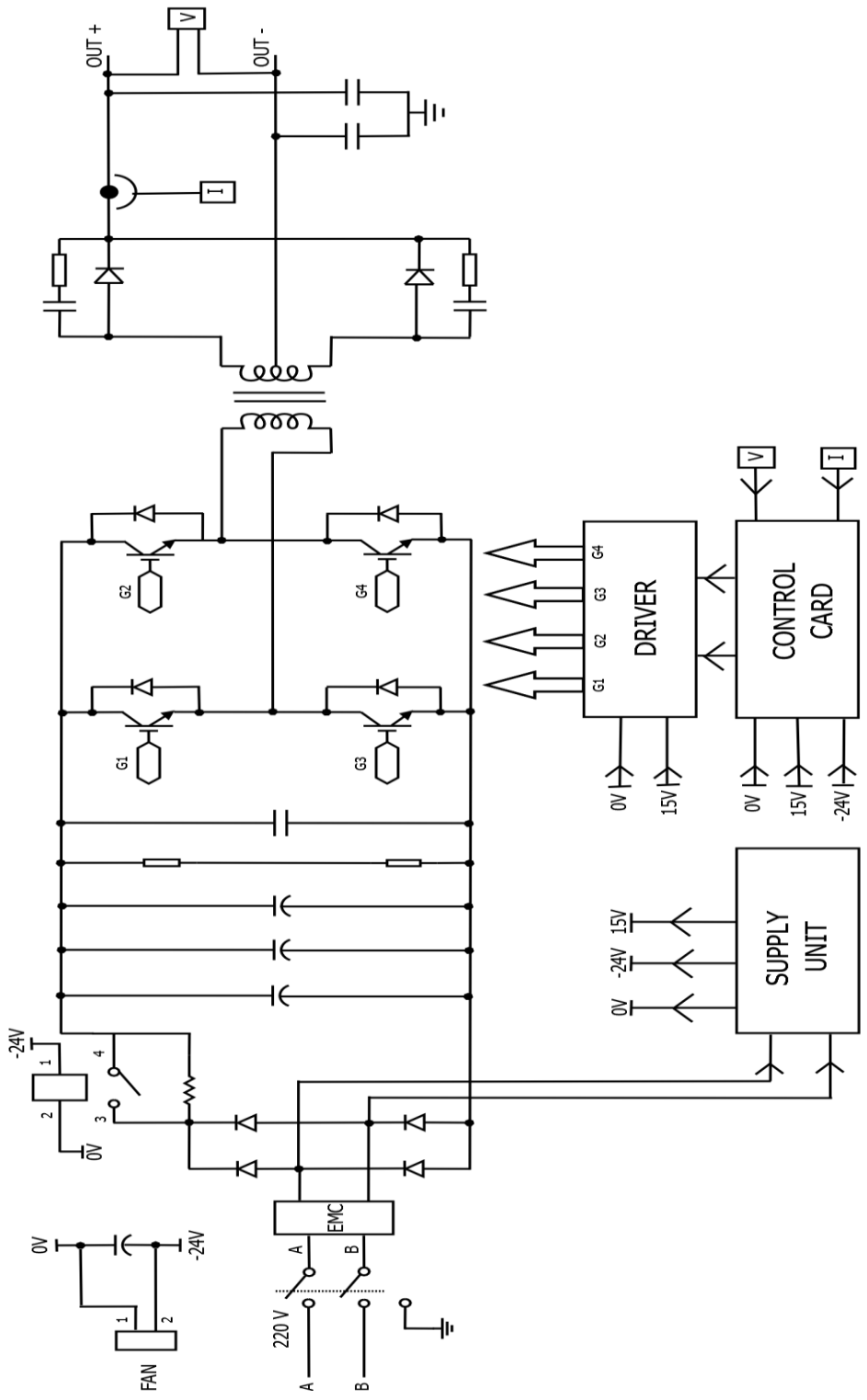
13. TROUBLESHOOTING

- Before arc welding machines are dispatched from the factory, they have already been debugged accurately. So forbid anyone who is not authorized by our company to do any change to the equipment!
- Maintenance course must be operated carefully. If any wire becomes flexible or is misplaced, it maybe potential danger to user!
- Only professional maintenance personal who is authorized by our company could overhaul the machine!
- Guarantee to shut off the arc welding machine's power before turn on the outline of the equipment!
- If there is any problem and has no the authorized professional maintenance personal of our company, please contact local our company agent or the branch company!

  If there are some simple troubles of PoWer ARC 205 welding machines, you can consult the following overhauling chart:

S/N	Troubles	Reasons	Solutions
1	The machine is warming up.	The fan may be disorder.	Check the fan.
		Input voltage may be low.	Shorten the extension cable.
2	The no-load operating voltage is zero.	One of the electronic cards may have a problem.	Contact the technical service.
3	Not easy to start arc in the welding, or easy to cause sticking.	Welded surface may not be clean.	Clean the welded surface.
4	The welding current can not be adjusted.	The welding current potentiometer in the front panel connection not so good or damaged.	Repair or change the potentiometer.
		The current sensing sensor may be disconnected.	Contact the technical service.
5	The fuse blew while welding is done.	The rated current of fuse which the machine is connected is low.	The machine must be connected to a fuse with a higher rated current.
6	The welding operation is not stable and the arc is not smooth.	The jack connections may be weak or faulty.	Check the jack connections.
		Welding may not be done with the appropriate grid voltage.	Check that the grid voltage is 230V.
		Very long extension cables may have been used.	Do not use extension cable and/or use a extension cable that have large cross section.
7	The machine does not weld.	There may be a problem with the cable connections or power cable.	Check the cable connections.
8	Machine does not work, fan does not run, no output voltage.	There may be no energy in the grid.	Check the phase voltages.
		The power cable may be faulty.	Check the power cable.
		The on/off switch may be faulty.	Change the on/off switch.
		The supply PCB may be faulty.	Contact the technical service.
9	The thermal LED is on.	The machine may have entered thermal protection due to overheating.	Wait until the machine cools down again and the thermal LED is off.

14. ELECTRICAL PRINCİBLE DRAWING



15. WARRANTY CONDITIONS
1. The length of the warranty starts on the date of delivery and it is for 1 year. 2. The whole merchandise including all its parts are covered by the warranty of our company. 3. If the merchandise breaks down within the length of the warranty, the time spent in the repair shop will be added to the length of the warranty. The length of repair of the merchandise is at the maximum 20 working days. This period of time starts on the date that the merchandise was delivered at one of the following locations: A service station or the seller of the merchandise or dealer or agency or representation office or importer or manufacturer, in this order if there are no service stations. 4. If the merchandise breaks down either due to material and workmanship or assembly lines within the length of the Warranty, it will be repaired without demanding any money under the name of expenditure of workmanship, the cost of the changed piece or under any other name. 5. Replacement operation will be done without charge in cases where the merchandise repeats the same fault more than twice or different faults come up more than four times within the length of the warranty, the length of the repair exceeds maximum necessary time and the determination of the unrepairability of the merchandise by a report that is prepared either by a service station or the seller or a dealer or an agency or a representation office or the importer or the manufacturer, in this order, if there are no service stations. 6. Faults that are results of misuse according to the user's guide of the merchandise are not covered by the warranty. 7. Ministry of Science Industry and Technology, The Protection of the Consumer and Competition General Directorate can be refered to whenever a problem concerning the warranty document comes up. 8. Earth clamp and electrode holder kits are not under warranty.

GeKaMac®

Gedik Welding Machines

Warranty Document

MACHINE INFORMATION

Brand : GeKaMac®

Model : ……

Serial Number : ……

CUSTOMER INFORMATION

Company Name : ……

Authorized Person : ……

Telephone : ……

Company Address : ……

City/Country…… ……

E-Mail :…… @……

Signature /Cachet :

SERVICE INFORMATION

Authorized Service : ……

Service Staff : ……

Installation Date : ……/……/……

Warranty Starting Date : ……

Warranty Expiration Date : ……

Signature /Cachet :

GeKaMac®

Gedik Welding Machines

Warranty Document

MACHINE INFORMATION

Brand : GeKaMac®

Model : ……

Serial Number : ……

CUSTOMER INFORMATION

Company Name : ……

Authorized Person : ……

Telephone : ……

Company Address : ……

City/Country…… ……

E-Mail :…… @……

Signature /Cachet :

SERVICE INFORMATION

Authorized Service : ……

Service Staff : ……

Installation Date : ……/……/……

Warranty Starting Date : ……

Warranty Expiration Date : ……

Signature /Cachet :

ARC Series Inverter Welding Machine

GeKaMac®

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