V1.1 11.10.24

INSTRUCTION MANUAL

INVERTER WELDER DIGIARC 210
SOLID

Sherman® digitec

CE

WARNING!

Before installation and commissioning, please read this manual

1. GENERAL COMMENTS

Commissioning and operation of the unit may only be carried out after thorough reading of these Operating Instructions.

Due to the continuous technical development of the device, certain functions may be modified and their operation may differ in detail from the descriptions in the manual. This is not a fault of the device, but the result of progress and continuous modification work on the device.

Damage to the unit due to improper handling will void the warranty entitlements. Any modification of the charger is prohibited and will void the warranty.

2. SECURITY

Employees operating the equipment should have the necessary qualifications to carry out welding work:

- should be qualified as an electric welder in gas-shielded welding,
- know the health and safety rules for the operation of electrical power equipment such as welding equipment and electrically powered ancillary equipment,
- know the health and safety rules for handling compressed gas (argon) cylinders and installations,
- be familiar with the contents of this manual and operate the appliance in accordance with its intended use.

WARNING

Welding can endanger the safety of the operator and other people in the vicinity. Therefore, special precautions must be taken when welding. Before welding familiarise yourself with the health and safety regulations applicable to the workplace.

The following hazards exist during electric MMA and MIG/MAG welding:

- **ELECTRIC SHOCK**
- **ADVERSE EFFECTS OF THE ARC ON HUMAN EYES AND SKIN**
- **POISONING BY VAPOURS AND GASES**
- **BURNS**
- **EXPLOSION AND FIRE RISKS**
- **NOISE**

Prevention of electric shock:

- connect the equipment to a technically efficient electrical installation with adequate protection and effectiveness of neutralisation (additional anti-shock protection); other equipment in the welder's workplace must also be checked and correctly connected to the mains,
- install the conductors with the unit switched off,
- do not touch non-insulated parts of the electrode holder, electrode and workpiece at the same time, including the housing of the machine,
- do not use handles or current cables with damaged insulation,
- work with a helper who assists the welder and supervises safety, wear clothing and gloves with good insulating properties,
- if you notice any irregularities, contact the competent persons to rectify them,
- It is prohibited to operate the unit with the covers removed.

Preventing negative effects of the electric arc on human eyes and skin:

- Wear protective clothing (gloves, apron, leather shoes),
- Use shields or visors with a properly selected filter,
- Use protective curtains made of non-combustible materials and properly choose colours for walls that absorb harmful radiation.

Prevention of poisoning by vapours and gases emitted during welding from electrode lagging and metal evaporation:

- Use ventilation and extraction equipment installed at sites with limited air exchange,
- Blow with fresh air when working in enclosed spaces (tanks),
- Use masks and respirators.

Burn prevention:

- Wear appropriate protective clothing and footwear to protect against burns from arc radiation and splatter,
- Avoid soiling the garment with grease and oils that can ignite it.

Explosion and fire prevention:

- It is forbidden to operate the device and weld in explosive or fire hazardous areas,
- The welding station should be equipped with fire extinguishing equipment,
- The welding station should be at a safe distance from flammable materials.

Preventing the negative impact of noise:

- Use earplugs or other means of noise protection,
- Warn people in the vicinity of the danger.

 **WARNING**!

Do not use a power source to thaw frozen pipes.

Before starting up the unit:

- Check the condition of the electrical and mechanical connections. It is forbidden to use handles and current cables with damaged insulation. Inadequate insulation of handles and current cables risks electric shock,
- Ensure proper working conditions, i.e. proper temperature, humidity and ventilation in the work area. Outside enclosed spaces, protect from precipitation,
- Place the charger in a location where it can be easily operated.

Persons operating the welder should:

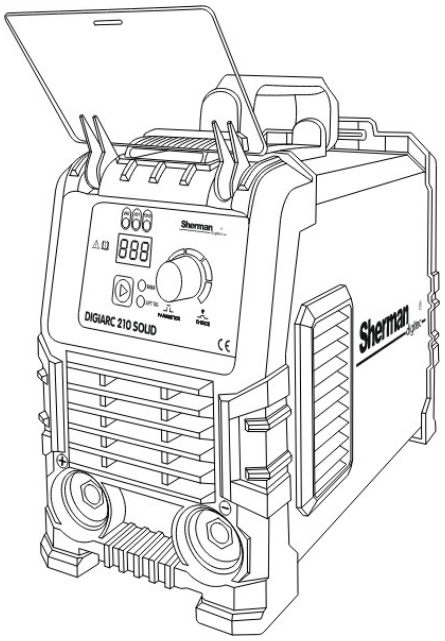
- be qualified in MMA and MIG/MAG electrical welding,
- know and observe the health and safety regulations applicable to welding work,
- use appropriate, specialised protective equipment: gloves, apron, rubber boots, shield or welding visor with appropriately selected filter,
- be familiar with the contents of these operating instructions and operate the welding machine in accordance with its intended use.

Any repairs to the appliance must only be carried out after disconnecting the plug from the power socket.
When the appliance is connected to the mains, it is not permitted to touch any of the components making up the welding current circuit with the bare hand or through damp clothing.
It is forbidden to remove external covers while appliance is switched on.
Any modification of the charger on your own is prohibited and may represent a deterioration in safety conditions.
All maintenance and repair work must only be carried out by authorised persons in compliance with the safety conditions applicable to electrical equipment.
It is forbidden to operate the welding machine in explosion or fire hazard areas! The welding station should be equipped with fire extinguishing equipment.
the unit's power cord when finished working.

The hazards and general OSH rules outlined above are not exhaustive of welder safety, as they do not take into account the specifics of the workplace. Important additions to these are the workplace health and safety instructions and the training and instruction given by supervisory personnel.

3. GENERAL DESCRIPTION

The DIGIARC 210 SOLID welder is used for manual DC welding of structural steels with covered electrodes (MMA method) and non-fusible electrodes in argon shielding with arc ignition by rubbing (TIG Lift method). It is an inverter device, manufactured with the most technologically advanced components made with digitally controlled IGBT technology. The welder is equipped with adjustable HOT START functions for easy ignition and ANTI STICK to prevent damage to the device. The unit also has an optional VRD function to reduce the voltage in no-load condition and minimise the risk of electric shock.
The welder is used indoors or in covered areas not exposed to direct weathering.



4. TECHNICAL SPECIFICATIONS

4.1 Welder

Supply voltage:	AC 230V 50Hz
Maximum power consumption:	6.12 kVA
Rated welding current:/ duty cycle	200A / 60%
Rated no-load voltage	69 V (21 V with VRD)
Maximum current consumption:	MMA: 36.5 A; TIG: 23 A
Network security	20 A
Weight (excluding accessories):	3.6 kg
Dimensions [mm]:	290 x 120 x 245
Degree of protection:	IP21

4.1.1 Parameter adjustment ranges

Welding current:	MMA: 20 - 200 A; TIG:10 - 200 A
ARC FORCE (MMA):	0 - 100
HOT START (MMA)	0 - 50
VRD	on. - off.

Work cycle
The duty cycle is based on a 10-minute period. A duty cycle of 60% means that a 4-minute break is required after the unit has been running for 6 minutes. A duty cycle of 100% means that the unit can run continuously without interruption.
Note: The heating tests were carried out at ambient air temperature. The duty cycle at 40ºC was determined by simulation.

Degree of protection
IP indicates the degree to which the device is resistant to the ingress of solid and water contaminants. IP21 means that the device is suitable for indoor use.

Protection against overheating
The IGBT module is protected from overheating by a protection system which switches off the power supply to the welder. After a few minutes, the unit cools down to a temperature that allows it to switch on again automatically. Do not disconnect the power supply during this time, as the continuously running fan cools the unit's internal heat sinks to lower the temperature faster. After restarting, remember to limit the welding parameters in order to continue continuous operation of the device.

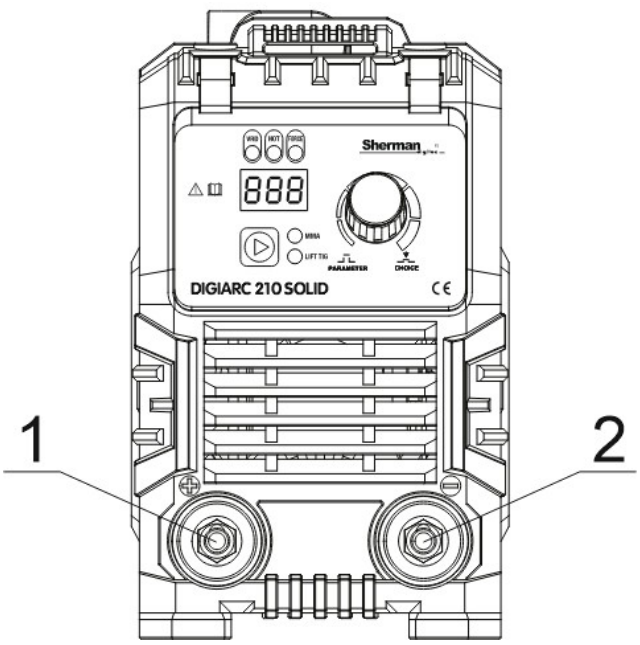
VRD function
The VRD function reduces the voltage in the no-load condition. The correct voltage value is only restored just before the arc is struck. This minimises the risk of electric shock, however, in some cases it can make arc ignition difficult.

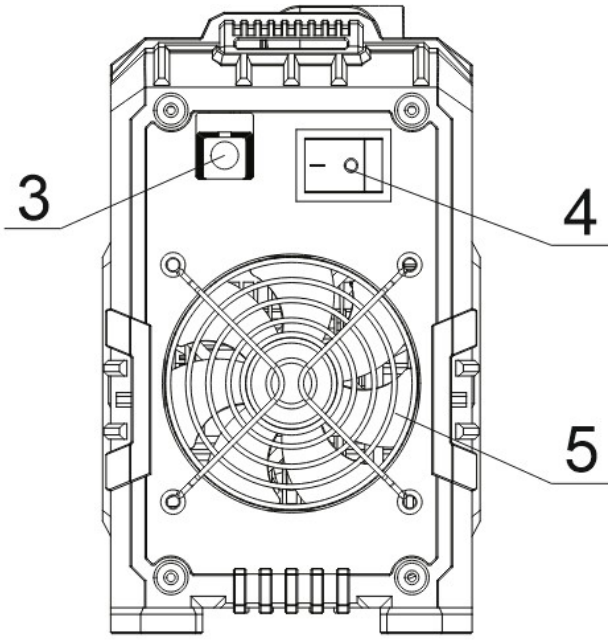
ARC FORCE function
The ARC FORCE function makes it possible to regulate the dynamics of the welding arc. Shortening the arc length is accompanied by an increase in welding current, which stabilises the arc. Decreasing the value produces a soft arc and a shallower depth of fusion, while increasing the value produces a deeper fusion and the possibility of short arc welding. When the ARC FORCE function is set to a high value, it is possible to weld while maintaining a minimum arc length and high electrode melting speed

HOT START function
The HOT START function is commonly referred to as a hot start. It operates at the moment of arc ignition, causing a momentary increase in welding current above the value set by the welder. HOT START is designed to prevent the electrode from sticking to the material and is a great help during ignition. When welding small workpieces, it is advisable to switch this function off, as it can burn the weld material.

5. PREPARING THE MACHINE FOR OPERATION

If the unit is stored or transported in frosty conditions, the unit must be brought to a temperature above freezing before operation.



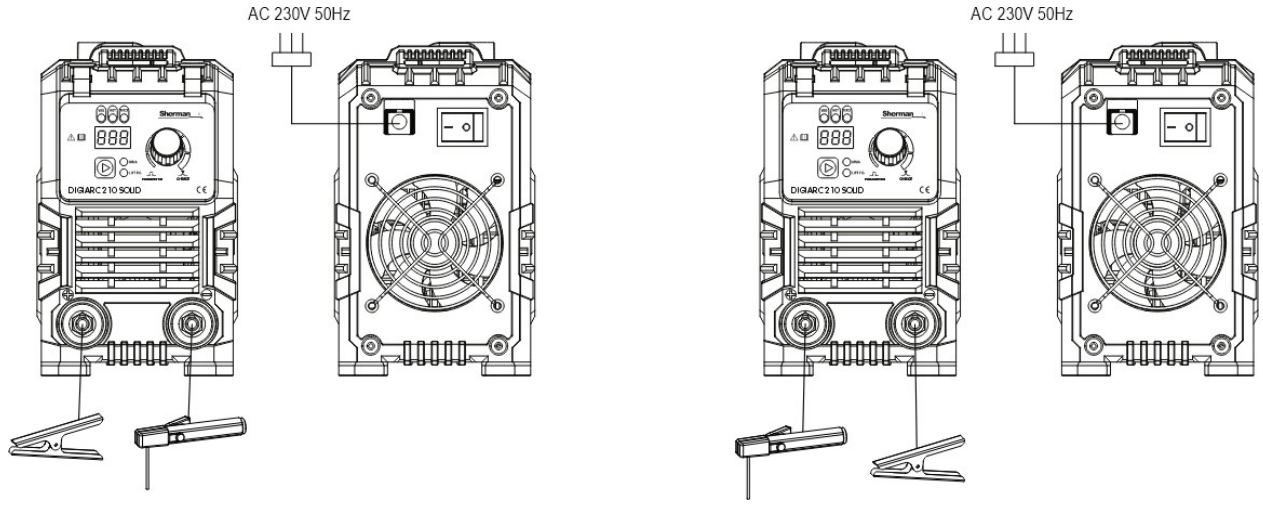


1. Socket "+"
2. Socket "-"
3. Power cable
4. Power switch
5. Fan

5.1 Connection of cables

5.1.1 MMA method

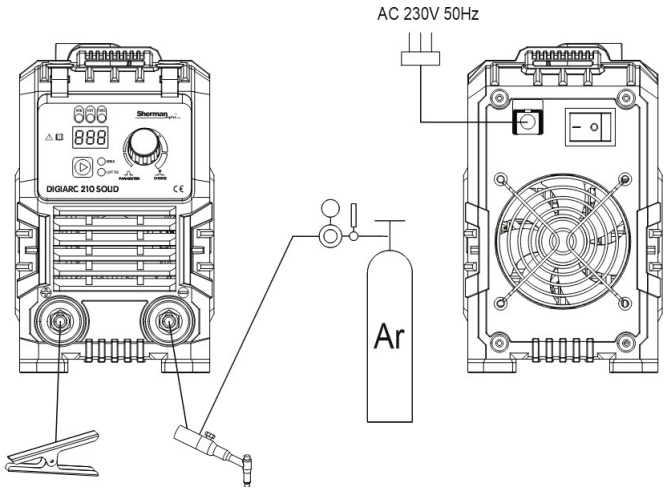
The ends of the welding cables must be connected to the sockets (1) and (2) on the front panel so that the correct polarity for the electrode is present on the electrode holder. The polarity of the welding cable connection depends on the type of electrode used and is indicated on the electrode packaging (negative polarity DCEN or positive polarity DCEP). The terminal of the return cable must be carefully fixed on the weld material. Connect the device plug to a 230V 50Hz mains socket.



DCEN DCEP

5.1.2 TIG method

An additional TIG handle is required to weld using this method. A gas-cooled handle with a current capacity of 200A and equipped with a shielding gas control valve is required.
Connect the handle current terminal to the negative polarity socket (2) and the gas line to the regulator on the gas cylinder. Connect the positive polarity of the source (1) to the material to be welded with a tick terminal cable. Connect the appliance plug to a 230V 50Hz mains socket.



5.2 Shielding gas connection (TIG method only)

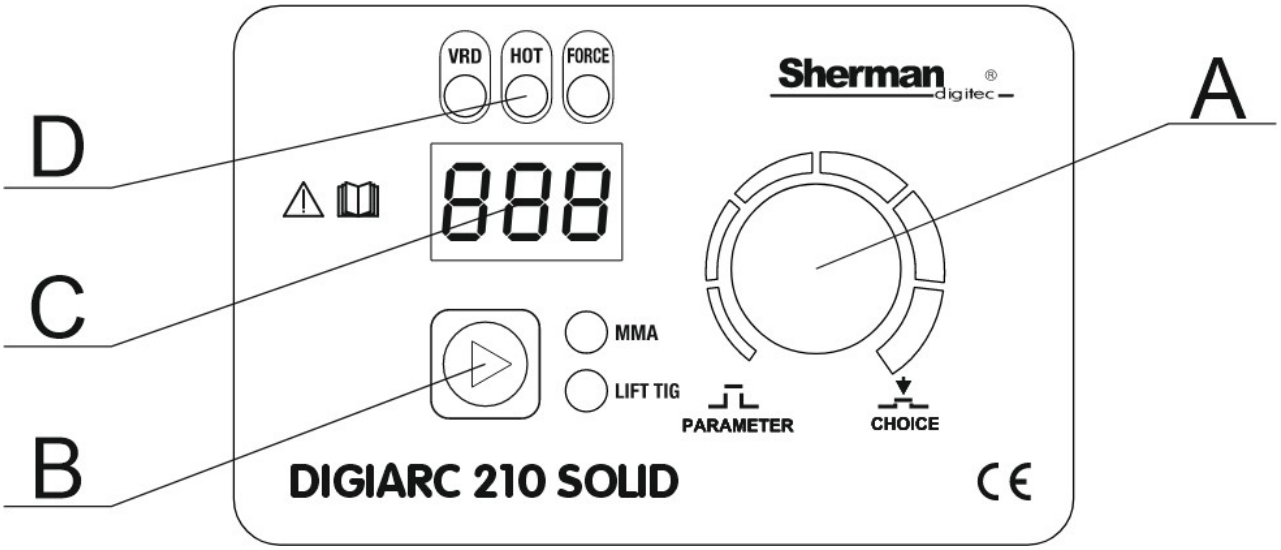
1. Fix the cylinder and secure it against tipping over.
2. Unscrew the cylinder valve momentarily to remove any contamination.
3. Fit the regulator to the cylinder.
4. Connect the regulator to the TIG handle shielding gas line with a hose.
5. Unscrew the cylinder and regulator valve.

5.3 Connection to mains

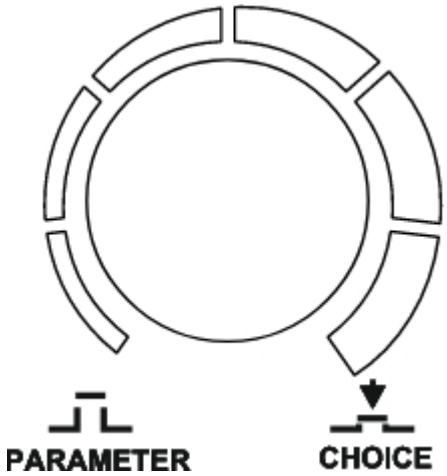
1. The unit should only be operated in a single-phase, three-wire power supply system with the neutral point earthed.
2. The DIGIARC 210 SOLID inverter rectifier is designed for operation on a 230V50 Hz network protected by 20 A delayed-action fuses. The power supply should be stable, without voltage drops.
3. Before connecting the power supply, ensure that the power switch (4) is in the OFF position.

6. SERVICE

6.1 Front panel

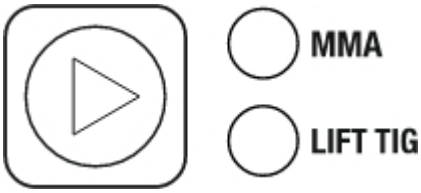


A - Control knob



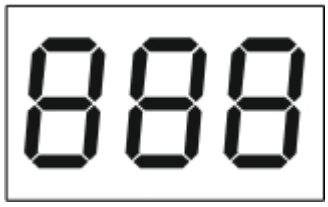
Turning the knob changes the value of the parameter. Pressing the knob will store the set value and move on to adjust the next parameter.

B - Welding method switch



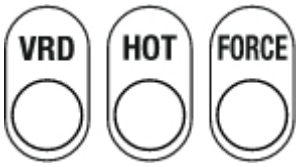
The switch is used to change the welding method
MMA - Metal electrode welding
LIFT TIG - welding with a non-fusible electrode in an argon shield. This method requires an additional welding torch. A handle rated at 200A with a gas flow control valve is required. The arc is struck by rubbing.

C - Display



The display indicates the welding current and the values of the VRD, Hot Start and Arc Force functions as they are adjusted.

D - Indicator lights



The LEDs indicate the operation or adjustment of the VRD, Hot Start and Arc Force functions. A lit diode indicates that the function is active. A flashing diode indicates that the function is in adjustment mode and turning the knob (A) changes its value.

7. PARAMETER SETTINGS

7.1 MMA method

Once the MMA method is selected, it is possible to adjust the welding current, Hot Start and Arc Force functions and to activate the
/ deactivation of the VRD function.

HOT START function
The HOT START function is commonly referred to as a hot start. It operates at the moment of arc ignition, causing a momentary increase in welding current above the value set by the welder. HOT START is designed to prevent the electrode from sticking to the material and is a great help during ignition. When welding small workpieces, it is advisable to switch this function off, as it can burn the weld material.

ARC FORCE function
The ARC FORCE function makes it possible to regulate the dynamics of the welding arc. Shortening the arc length is accompanied by an increase in welding current, which stabilises the arc. Decreasing the value produces a soft arc and a shallower depth of fusion, while increasing the value produces a deeper fusion and the possibility of short arc welding. When the ARC FORCE function is set to a high value, it is possible to weld while maintaining a minimum arc length and high electrode melting speed.

VRD function
The VRD function reduces the voltage in the no-load condition. The correct voltage value is only restored just before the arc is struck. This minimises the risk of electric shock, however, in some cases it can make arc ignition difficult.

7.2 TIG method

Once the TIG method is selected, the welding current can be adjusted.

8. INITIATION OF THE ARC

8.1 MMA method

1. Touch the electrode to the material to be welded, rub briefly and detach.
2. In the case of arc initiation with electrodes whose coating forms a non-conductive slag when solidified, pre-clean the electrode tip by striking it several times against a hard surface until metallic contact with the weld material is achieved.

8.2 TIG method

1. Unscrew the valve on the TIG handle so that the protective gas flow occurs.
2. Lightly touch the electrode to the material to be welded, detach the electrode from the material to be welded by tilting the handle so that the gas nozzle touches the material.
3. Once the arc has been struck, straighten the handle and start welding.

9. BEFORE YOU CALL FOR SERVICE

In the event of a malfunction, check the list of basic malfunctions and try to rectify them yourself before sending the welder for service.
Any repairs to the unit must only be carried out after disconnecting the plug from the power socket. Please note that the unit is not sealed and the user may remove the welder housing to rectify minor faults.
NOTE: The welder is equipped with a Fan Stop function that switches off the fan a few minutes after the welding has finished and the machine has cooled down. The fan restarts under load.

Symptoms	Cause	Proceedings
Power failure, fault signal or malfunction of the unit	No connection or loose plug inside the device	Check and correct the connections of all electrical plugs inside the appliance
Arc does not ignite	Lack of proper ground wire terminal contact	Correct the ground terminal contact
Displays and LEDs do not light up after power-up	No supply voltage	Check the fuses on the mains connection
Fan not running	The fan was blocked by a bent cover	Straighten the fan guard
Unsatisfactory weld quality in MMA welding, electrode sticks to the workpiece	Incorrect polarity of the welding cable connection	Connect the welding cables correctly
	Moist electrode.	Replace the electrode
	The welder is powered from the generator or via a long extension cable with too small a cable cross-section	Connect the device directly to the mains
Unsatisfactory weld quality in TIG welding	Check the quality of the materials and consumables used, especially the electrode tungsten and shielding gas	Replace consumable parts, replace shielding gas with higher quality
	shielding gas does not flow or flows with insufficient intensity	Check cylinder regulator, gas supply hose, improve connection hose with couplings and condition of quick couplings

10. OPERATING INSTRUCTIONS

Operation of the DIGIARC 210 SOLID welding machine should take place in an atmosphere free of corrosive components and high dustiness. Do not place the machine in dusty areas, near grinding machines in operation, etc. Dusting and contamination with metal filings of the control boards, cables and connections inside the machine can lead to an electrical short and consequently to damage of the welding machine.
Operation in high-humidity environments should be avoided, particularly where there is dew on metal components.
In the event of dew on metal parts, e.g. after bringing a cold machine into a warm room, wait until it has dried completely and the machine has warmed up to ambient temperature. Starting the cold welding machine under these conditions may damage it. When operating the welding machine outdoors, it is recommended to place it under a roof to protect it from adverse weather conditions.
The DIGIARC 210 SOLID should be operated under the following conditions:

- variations in the rms value of the supply voltage of no more than 10%
- ambient temperature from -10°C to +40°C
- atmospheric pressure 860 to 1060 hPa
- relative humidity of the atmospheric air not greater than 80%
- altitude up to 1000m

11. MAINTENANCE MANUAL

As part of your daily maintenance, keep the welder clean, check the condition of the external connections and the condition of the electrical wires and cables.
Replace consumable parts regularly.
Periodically (depending on operating conditions), remove the housing and clean the unit internally by blowing with compressed air to remove dust and metallic filings from the control boards and electrical wiring and connections.
No less than once every six months, the general inspection of the appliance and the condition of the electrical connections should be carried out, in particular:

- the state of protection against electric shock
- state of insulation
- the state of the protection system
- the correct functioning of the cooling system

Damage resulting from operation of the welding machine under unsuitable conditions and failure to comply with maintenance instructions is not covered by the warranty repairs.

12. STORAGE AND TRANSPORT INSTRUCTIONS

The equipment should be stored at a temperature of -10°C to +40°C and relative humidity of up to 80% free of corrosive fumes and dust. Packed units should be transported by covered means of transport. During transport, the packaged equipment must be secured to prevent movement and be placed in the correct position.

13. SPECIFICATION OF THE SET

1. Welder	1 pc.
2. Mass cable with clamps	1 pc.
3. Electrode cable	1 pc.
4. Operating instructions	1 pc.
5. Packaging	1 pc.

14. GUARANTEE

The guarantee is given for a period of 12 months for commercial operators, but excluding warranty claims, or 24 months for consumers from the date of sale.
The guarantee will be honoured when the complainant presents the proof of purchase (invoice or receipt) and the guarantee card with the product name, serial number, date of sale and stamped by the point of sale.

To request a warranty repair, please fill in the form at www.tecweld.pl under the SERVICE tab. On the basis of the application, the device will be sent to the service by a courier company. Equipment sent by other means at TECWELD's expense will not be accepted!
The welding machine must be delivered with the welding gun. Claims for the machine without the welding gun will not be processed.
The device sent for complaint must be packed in the original cardboard box protected by the original polystyrene fittings. TECWELD is not responsible for damage to the welding machine caused during transport.

If you intend to dispose of this product, do not dispose of it with your normal household waste. According to the WEEE Directive (Directive 2012/19/EU) in force in the European Union, separate disposal methods must be used for used electrical and electronic equipment.
In Poland, according to the provisions of the Act of 11 September 2015 on Waste Electrical and Electronic Equipment, it is prohibited to place together with other waste used equipment labelled with the crossed-out wheeled bin symbol.

A user who intends to dispose of this product is obliged to hand over waste electrical and electronic equipment to a waste equipment collection point. Collection points are operated, inter alia, by wholesalers and retailers of such equipment and by communal organisational units operating as waste collection operators.
The above-mentioned statutory obligations were introduced in order to limit the amount of waste produced from waste electrical and electronic equipment and to ensure an appropriate level of collection, recovery and recycling of waste equipment. Proper implementation of these obligations is particularly important in the case of waste equipment containing hazardous components, which have a particularly negative impact on the environment and human health.

TECWELD Piotr Polak
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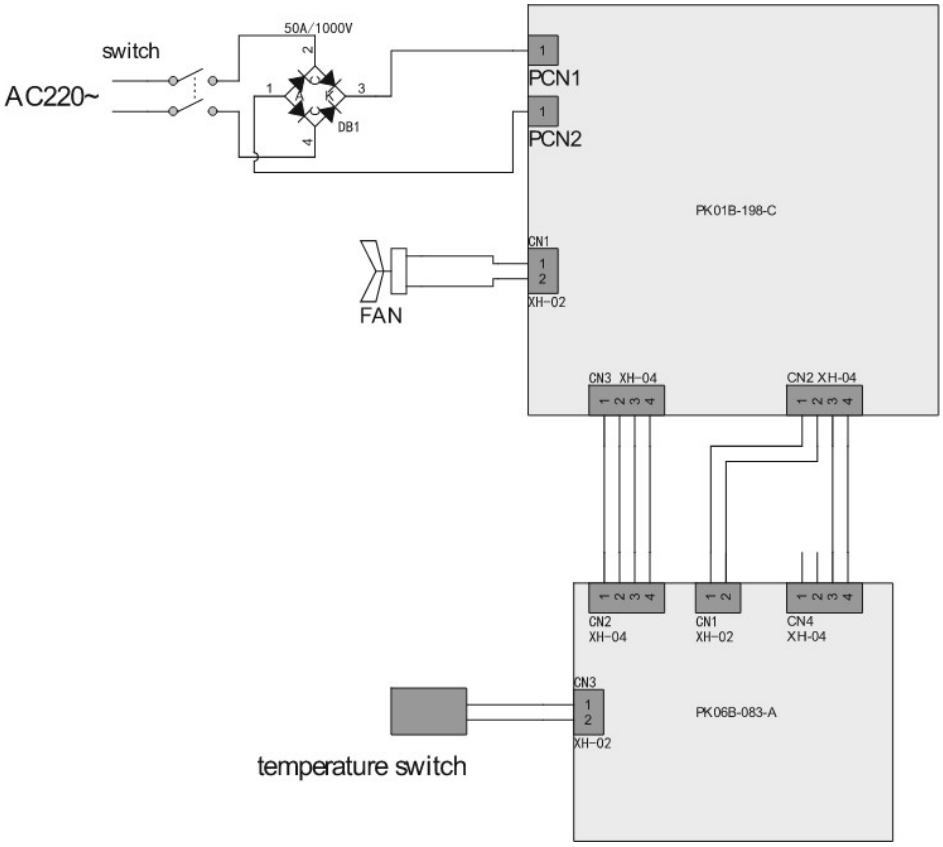
e-mail: info@tecweld.pl, www.tecweld.pl

15. ELECTRICAL DIAGRAM



DECLARATION OF CONFORMITY 01/DIGIARC210SOLID/2024

Authorised representative of the manufacturer:

TECWELD Piotr Polak
41-943 Piekary Śląskie
ul. Szmaragdowa 21/3/6

branch:
41-909 Bytom
ul. Krzyżowa 1G
POLAND

We declare that the following product:

Inverter welder

Type: **MMA-180PRO**

Model: **DIGIARC 210 SOLID**

Manufacturer's trademark: Sherman® digitec

to which this declaration relates complies with the following European Union directives and the national provisions implementing those directives:

Low Voltage Directive LVD 2014/35/EU

Electromagnetic Compatibility Directive EMC 2014/30/EU RoHS II

Directive 2011/65/EU

and complies with the following standards:

PN-EN IEC 60974-1:2023-05+A11:2023-09 Arc welding equipment -- Part 1: Welding energy sources,

PN-EN IEC 60974-10:2022-07 Arc welding equipment -- Part 10: Electromagnetic compatibility (EMC) requirements,

EN IEC 63000:2019-01 Technical documentation for the evaluation of electrical and electronic products with regard to the restriction of hazardous substances.

Year in which the CE mark was affixed to the device:2024

Bytom, dn. 19.08.2024

Piotr Polak
(Signature of authorised person)