

USER MANUAL

WELDING INVERTER RECTIFIER
TIG 201 AC/DC

Sherman®
workshop—

CE



ATTENTION!

Before installing and starting the device, please read this manual

1. GENERAL REMARKS

The device may only be started and operated after carefully reading this Operating Instructions.

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

Damage to the device caused by improper operation will void your warranty.

Any modifications to the rectifier are prohibited and will void the warranty.

2. SECURITY

Employees operating the device should have the necessary qualifications entitling them to perform welding work:

- should have qualifications of an electric welder in the field of welding with coated electrodes and gas shields,
- know the health and safety rules when operating electrical power equipment such as welding equipment and auxiliary equipment powered by electricity,
- know the health and safety regulations when handling cylinders and installations with compressed gas (argon),
- be familiar with the contents of this manual and use the device in accordance with its intended purpose.



WARNING



Welding can pose a safety risk to the operator and other people in the vicinity.

Therefore, special precautions must be taken when welding. Before starting to weld, familiarize yourself with the health and safety regulations applicable at the workplace.

The following hazards exist during MMA and TIG electric welding:

- **ELECTRIC SHOCK**
- **NEGATIVE IMPACT OF ARC ON HUMAN EYES AND SKIN**
- **VAPORS AND GAS POISONING**
- **BURNS**
- **EXPLOSION AND FIRE HAZARDS**
- **NOISE**

Preventing electric shock:

- connect the device to a technically efficient electrical installation with proper protection and effective zeroing (additional protection against electric shock); other devices at the welder's workstation should also be checked and correctly connected to the network,
- install power cables when the device is switched off,
- do not touch the non-insulated parts of the electrode holder, the electrode and the object at the same time welded, including the device housing,
- do not use handles and power cables with damaged insulation,
- in conditions of particular risk of electric shock (work in environments with high humidity and closed tanks) work with an assistant supporting the welder's work and ensuring safety, use clothing and gloves with good insulating properties,
- If you notice any irregularities, please contact the competent persons for assistance.
their removal,
- It is prohibited to operate the device with removed covers.

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

- Wear protective clothing (gloves, apron, leather shoes),
- Use protective shields or visors with a properly selected filter,

- Use protective curtains made of non-flammable materials and choose the right wall colors absorbing harmful radiation.

Prevention of poisoning by vapors and gases emitted during welding from electrode coating and metal evaporation:

- Use ventilation devices and exhaust systems installed in places with limited air exchange. air,
- Blow with fresh air when working in a confined space (tanks),
- Use masks and respirators.

Burn prevention:

- Wear appropriate protective clothing and footwear to protect against burns from arc radiation and spatter,
- Avoid staining your clothes with grease and oils that may cause them to catch fire.

Explosion and fire prevention:

- It is prohibited to operate the device and weld in rooms with a risk of explosion or fire.
- The welding station should be equipped with fire extinguishing equipment,
- The welding station should be located at a safe distance from flammable materials.

Preventing the negative impact of noise:

- Use earplugs or other noise protection measures
- Warn people nearby about danger



WARNING!

Do not use an electrical source to thaw frozen pipes.

Before starting the device, you must:

- Check the condition of electrical and mechanical connections. It is forbidden to use handles and power cables with damaged insulation. Incorrect insulation of handles and power cables may cause electric shock
- Ensure proper working conditions, i.e. ensure proper temperature, humidity and ventilation in the workplace. work. Outside closed rooms, protect against atmospheric precipitation,
- Place the charger in a place where it can be easily operated.

People operating a welding machine should:

- have the qualifications for electric welding with coated electrodes and the TIG method,
 - know and comply with the occupational health and safety regulations applicable to welding work,
 - use appropriate, specialist protective equipment: gloves, apron, rubber boots, shield or a welding helmet with an appropriately selected filter.
 - be familiar with the contents of this instruction manual and use the welding machine in accordance with its intended purpose,
- Any repairs to the device may only be performed after disconnecting the plug from the power socket.

When the device is connected to the mains, it is not permitted to touch any elements forming the welding current circuit with bare hands or through wet clothing.

It is prohibited to remove external covers when the device is connected to the mains.

Any modifications to the rectifier on your own are prohibited and may constitute a deterioration of safety conditions.

All maintenance and repair work may only be carried out by authorised persons in compliance with the work safety conditions applicable to electrical devices.

It is prohibited to operate the welding machine in rooms at risk of explosion or fire!

The welding station should be equipped with fire extinguishing equipment,

After finishing work, the device's power cord must be disconnected from the mains.

The above-mentioned hazards and general health and safety rules do not exhaust the issue of welder's work safety, because they do not take into account the specifics of the workplace. An important supplement to them are workplace health and safety instructions and training and instruction provided by supervisory employees.

3. GENERAL DESCRIPTION

The TIG 201 AC/DC welder is used for manual welding of structural steel with direct current using coated electrodes (MMA method), a non-consumable electrode in an inert gas shield using direct current for steel, copper and its alloys (TIG DC method) and alternating current for aluminum and its alloys (TIG AC method). It is an inverter device manufactured from the most technologically advanced components.

made in MOSFET technology.

The use of inverter technology has resulted in a significant reduction in the dimensions and weight of the devices, which enables their operation in particularly difficult-to-access places.

The device is recommended for service and craft establishments for workshop work and light, occasional production work.

4. TECHNICAL PARAMETERS

4.1 Welding machine

Supply voltage	AC 230V 50Hz
Maximum power consumption	6.4kVA
Rated welding current/duty cycle	200A / 60%
Welding current adjustment range	30-200A
Method of regulating the welding current	Liquid
Nominal no-load voltage	56V
Maximum current consumption	28 A
Mass	20kg
Dimensions	475x225x510mm
Degree of protection	IP21
Application class	S

4.1.1 Parameter adjustment ranges

Gas pre-flow	0.1 - 1 sec
Gas leak	2 – 8 sec
Current drop	1 - 10 sec
Welding current	TIG: 10-200A MMA: 10-195A
AC Balance	-5 - 5%

4.2 TIG torch

Handle type	T-26
Maximum current carrying capacity	200A
Air flow	10-20 l/min
Arc striking	Contactless (HF)
Length	4m

Work cycle

The duty cycle is based on a 10-minute period. A duty cycle of 60% means that after 6 minutes of operation, a 4-minute break is required. A duty cycle of 100% means that the device can operate continuously without interruption.

Note! Heating tests were conducted at ambient air temperature. Duty cycle at 40°C was determined by simulation.

Degree of protection

IP determines the degree to which the device is resistant to the ingress of solid and water contaminants. IP21 means that the device is designed for use in closed rooms and is not suitable for use in rain and snow.

Application class

The application class means that the device is suitable for use in places with an increased risk of electric shock.

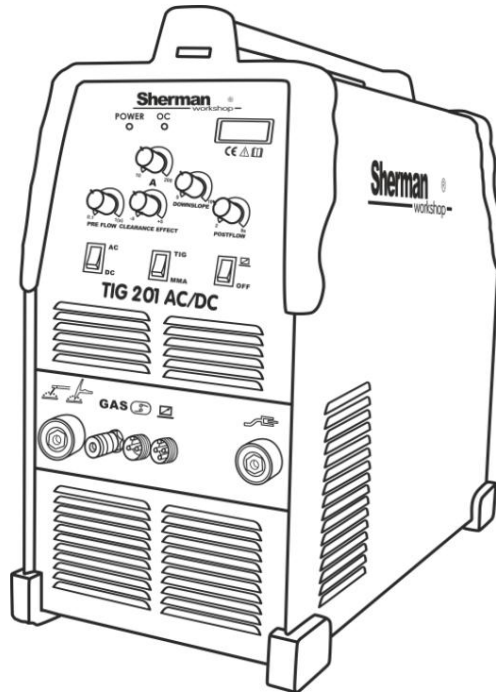


Fig. 1. General view of the device

5. CONSTRUCTION AND OPERATION

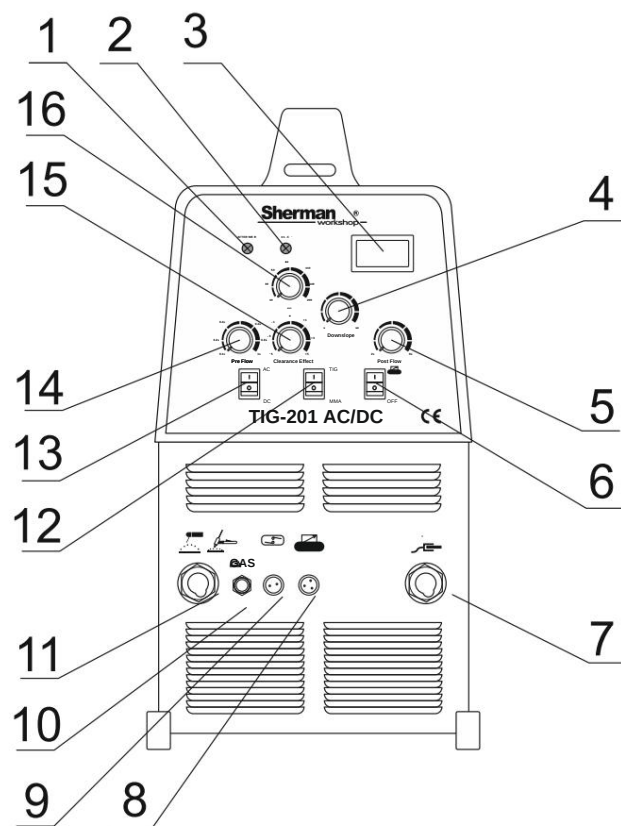
The basis for the construction of the welding machine's electrical energy conversion system are electronic systems made in MOSFET technology enabling operation in the frequency range above 100 kHz.

The operating principle is to rectify the voltage of a single-phase supply network to a direct voltage, convert the obtained direct voltage to a high-frequency square waveform, transform the voltage into the range required by the welding process and rectify the obtained voltage to a direct voltage.

6. CONNECTION TO THE POWER SUPPLY

1. The device should only be used in a single-phase power supply system, three-wire, with grounded neutral point.
2. TIG 201 AC/DC inverter rectifiers are designed to work with a 230V 50 Hz network. protected by 25 A delayed fuses. The power supply should be stable, without voltage drops.
3. The device is equipped with a power cord and plug. Before connecting the power supply, make sure the power switch is in the OFF position.

7. DESCRIPTION OF SWITCH AND KNOB FUNCTIONS



1. Signaling that the device is connected to the network
2. Overheating/device failure indication
3. Welding current display
4. Current drop adjustment knob
5. Gas flow delay adjustment knob
6. Remote control switch
7. Ground cable socket (+)
8. Remote control socket
9. TIG torch control socket
10. Protective gas quick connector socket
11. Handle socket (-)
12. Welding method switch
13. Welding current type switch
14. Gas flow acceleration knob
15. AC Balance Knob
16. Welding current knob

Fig. 2. View of the front panel

Gas pre-flow time - the time from pressing the button on the handle until the arc is struck.

It should usually be longer than 0.5 s to deliver shielding gas to the torch nozzle outlet. to shield the weld start and tungsten electrode. In case of longer gas supply line from the cylinder, the pre-flow time should be longer.

Gas post-flow time - the time from arc extinction to gas valve closing. in order to shield the solidifying weld pool from air and to cool the tungsten electrode. Too short a post-flow time can result in weld oxidation. When welding in TIG AC mode (alternating current), this time should be longer

Current slope down time - the time it takes for the welding current to fall from the set value to zero or the crater current value.

AC Current Balance – The ratio of the duration of the positive current phase to the negative current phase. Reducing the balance introduces more heat into the material, achieving a narrower weld and deeper penetration, while also reducing the thermal load on the tungsten electrode. Increasing the balance introduces less heat into the material, achieving better cleaning, a wider weld and shallower penetration, but significantly loads the tungsten electrode.

When ready for operation, the device is turned on using the switch located on the rear wall.

If the device is stored or transported at low temperatures, bring the device to the correct temperature before starting work!!!

The switch (12) is used to select the welding method.

The switch (13) sets the welding current type (DC-constant, AC-alternating)

The welding current is set using the knob (16).

On the front panel of the device there is also a diode (1) signaling that the device is connected to the mains and a diode (2) indicating overheating or incorrect operation of the welding machine.

Only for TIG method:

Knobs (14) and (5) are used to adjust the gas flow acceleration before welding starts and the gas flow delay after welding ends.

The knob (15) is used to adjust the AC current balance (electrode cleaning)

The knob (4) is used to adjust the current drop at the end of welding.

8. OVERHEATING PROTECTION

The power source is equipped with a thermal, automatic overload switch. When the temperature of the welding machine is too high, the protection will disconnect the welding current and the overheating diode (2) will light up. After the temperature drops, the switch will automatically reset.

9. WELDING WITH COATED ELECTRODES (MMA METHOD)

9.1. Preparing the device for work

The welding cable plugs should be connected to the sockets (7) and (11) located on the front panel so that the correct pole for the given electrode is on the electrode holder. The polarity of the welding cable connection depends on the type of electrode used and is given on the electrode packaging. The ground cable clamp should be carefully secured to the welded material. Connect the device plug to a 230V 50Hz mains socket.

9.2. Setting welding parameters

The welding method switch (12) should be set to the MMA position (lower position). Set the desired welding current value with the knob (16).

9.3. Arc Initiation

Arc initiation in welding with a coated electrode consists of touching the electrode to the welded material, briefly rubbing it and tearing it off. In the case of arc initiation with electrodes whose coating, after solidification, creates a non-conductive slag, the tip of the electrode should be pre-cleaned by striking it several times against a hard surface until metallic contact with the welded material is achieved.

10. WELDING WITH A NON-CONSUMABLE ELECTRODE IN AN INERT GAS SHIELD (TIG METHOD)

10.1. Preparing the device for work

The current terminal of the handle should be connected to the socket (11), the control plug of the handle should be carefully screwed into the socket (9), and the gas connection to the quick connector socket (10). The gas hose from the reducer should be led and attached to the gas connector located on the rear wall of the housing. The positive pole of the source should be connected to the welded material using a cable with a clamp. Connect the device plug to a 230V 50Hz mains socket.

10.2. Setting welding parameters

The welding method switch (12) should be set to the TIG position (upper position). The type of welding current (constant/alternating) is set with the switch (13). The required welding current value is set with the knob (16). The gas flow acceleration time before welding starts is set with the knob (5) and the gas flow delay time after welding ends is set with the knob (14).

Use the knob (4) to set the desired current drop time at the end of the welding process.

10.3. Arc initiation and welding process

The TIG 201 AC/DC device is equipped with an ionizer enabling contactless arc ignition.

To strike the arc, bring the electrode a few millimeters away from the welded material and press the button on the torch handle. After the arc has been correctly initiated, continue welding with the button pressed.

Releasing the button on the handle starts the current decline phase and ends the welding process.

NOTE! Do not activate the button at a distance greater than 2 mm from the welded material. If the arc does not ignite within 2 seconds, release the button. Activating the ionizer for longer than 2 seconds may damage the ionizer!

CAUTION! Do not touch the electrode while the button on the handle is pressed. The high voltage of the ionizer and the no-load voltage at the electrode may cause electric shock.

NOTE! - During welding with alternating current (AC) at low current values, oxides are deposited on the surface of the tungsten electrode. This can cause problems with arc ignition. In such a case, the electrode should be rubbed against the welded material or the electrode tip should be mechanically cleaned of the oxide layer in another way.

11. BEFORE YOU CALL FOR SERVICE

If the device does not function properly, before sending the welding machine to the service center, check the list of basic faults and try to fix them yourself.

Any repairs to the device may only be performed after disconnecting the plug from the power socket.

Note! The device is not sealed and the user can remove the welding machine housing to eliminate minor faults.

Symptoms	Ways to remove
Power light does not light up, fan does not work, no output voltage	1. Remove the cover and check the connection of all plugs electrical inside the device 2. Make sure the switch is in the ON position 3. Check the fuse and voltage in the network
Power light is on, fan not working, no output voltage.	1. Check that the device is not connected to the network higher voltage. If so, connect to 230V mains and switch on again 2. The supply voltage is unstable and causes the power to turn on. overvoltage protection. Turn the device off for 2-3 minutes and turn it on again 3. Turning the switch on and off for a short time caused the overvoltage protection to be activated. Turn the device off for 2-3 minutes and turn it on again
Power light on, fan running, arc striking problems	1. Check the TIG torch, replace the consumable parts if necessary. are worn out
Power light is on, fan is running, welder does not strike the arc	1. Check terminals and proper electrical conductivity electrode and ground wire 2. Check the connection of the TIG torch to the device, pay attention to whether the pins in the socket are not broken or jammed. 3. Unscrew the TIG torch handle and check if the switch in the handle is functional.
Power light is on, fan is running, overheat light is on	1. The device has overheated. Wait a few minutes until the diode turns off and continue welding.
It is not possible to control the welding current using the knob in the handle	1. Turn the REM switch to the OFF position and disconnect plug from the socket (20) (3-pin). Check whether the welding current can be controlled using the current setting knob on the device. If the welding current can be controlled on the device, the control system in the handle is damaged. Repair or replace the handle.
Unsatisfactory weld quality when welding using the MMA method, the electrode sticks to the welded material	1. Check the polarity of the wire connections welding 2. Check if the electrode is wet. Replace the electrode. 3. The welding machine is powered by a generator or via a long extension cord with too small a cable cross-section. Connect the device directly to the mains

Unsatisfactory weld quality when welding with the TIG method	1. Replace consumable parts, replace the shielding gas with a higher quality one 2. Check if the shielding gas is flowing at the appropriate intensity 3. Check the gas supply hose, improve the connection of the hose with the connectors and the condition of the quick connectors. 4. Check the cylinder reducer.
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12. OPERATING INSTRUCTIONS

The TIG 201 AC/DC device should be operated in an atmosphere free from corrosive components and high dust levels. The device should not be placed in dusty places, near working grinders, etc. Dust and contamination with metal filings of control boards, cables and connections inside the device may lead to an electrical short circuit and, consequently, to damage to the welder.

Avoid operation in high humidity environments, especially where dew occurs on metal parts.

If dew appears on metal parts, e.g. after bringing a cold device into a warm room, wait until it dries completely and the device warms up to the ambient temperature. Starting a cold welder in these conditions can damage it. It is recommended that the welder be placed under a roof to protect it from adverse weather conditions if used outdoors.

The TIG 201 AC/DC device should be operated under the following conditions: - changes in the effective value of the supply voltage not greater than 10%
 - ambient temperature from -10°C to +40°C
 - atmospheric pressure 860 to 1060 hPa
 - relative humidity of atmospheric air not exceeding 80%
 - altitude above sea level up to 1000m

List of consumable parts for the TIG T-26 torch:

No.	Name
1	Tungsten electrode
2	T-26 clamping sleeve
3	T-26 current connector
4	T-26 Gas Nozzle

A full list of consumables and spare parts is available on the website www.tecweld.pl and at TECWELD. It is possible to purchase these parts directly.

13. MAINTENANCE INSTRUCTIONS

As part of daily maintenance, keep the welding machine clean and check the condition of external connections.

Replace consumable parts regularly.

Periodically clean the inside of the unit by blowing compressed air through it to remove dust and metal filings from the control boards and electrical wires and connections.

At least once every six months, a general inspection and condition of electrical connections should be carried out, in particular:

- condition of electric shock protection -
- condition of insulation
- status of the security system
- correct operation of the cooling system

Damage resulting from operating the cutter in improper conditions or failure to follow maintenance recommendations is not covered by warranty repairs.

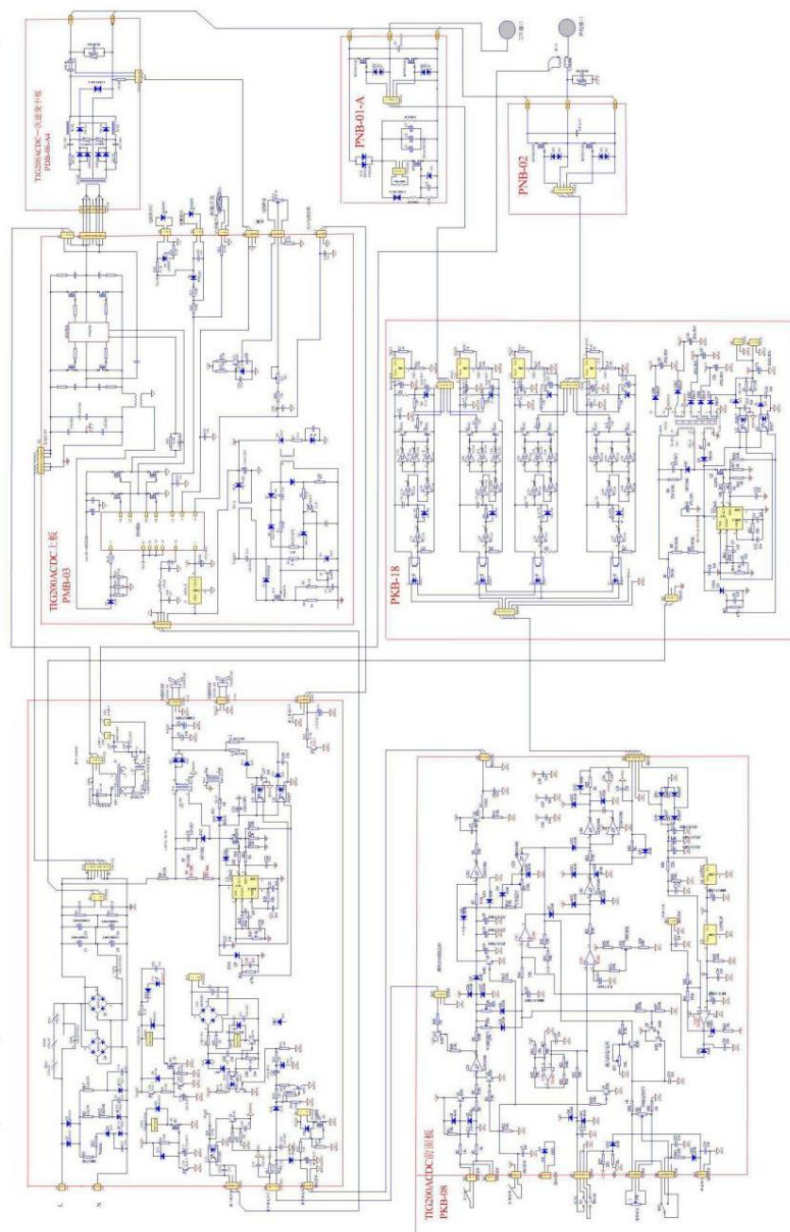
14. STORAGE AND TRANSPORT INSTRUCTIONS

The device should be stored at a temperature of -10°C to $+40^{\circ}\text{C}$ and relative humidity of up to 80%, free from corrosive fumes and dust. The transport of packed devices should be carried out in covered means of transport. During transport, the packed device should be secured against moving and ensured in the correct position.

15. COMPLETE SPECIFICATION

1. TIG 201 AC/DC source 1 pc.
2. TIG welding holder 1 pc.
3. Electrode cable for MMA welding 1 pc.
4. Ground cable with clamp 1 pc.
5. User manual 1 pc.
6. Package: 1 pc.

16. ELECTRICAL DIAGRAM



17. WARRANTY

The warranty is granted for a period of 12 months for business entities, but excluding warranty claims, or 24 months for consumers from the date of sale.

The warranty will be honored upon presentation by the claimant of proof of purchase (invoice or receipt) and a warranty card with the product name, serial number, date of sale and the stamp of the point of sale.

In case of warranty repair, please contact TECWELD, which will arrange for the device to be collected by a courier company. Shipments sent in any other way at TECWELD's expense will not be accepted!

The welding machine must be delivered with a welding torch. Complaints about the machine without a welding torch will not be considered.

The device sent for complaint must be packed in the original carton and secured with original polystyrene shapes. TECWELD is not responsible for any damage to the welder resulting from transport.

The shipment must be accompanied by a completed Damage Report Card, which can be downloaded from the website <http://tecweld.pl/downloads/karta-zgloszenia-uszkodzenia.pdf>



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 collection methods must be used for used electrical and electronic equipment.

In Poland, in accordance with the provisions of the Act of 11 September 2015 on waste electrical and electronic equipment, it is prohibited to place used equipment marked with the crossed-out wheeled bin symbol together with other waste.

The user who intends to dispose of this product is obliged to return used electrical and electronic equipment to a collection point for used equipment. Collection points are run by, among others, wholesalers and retailers of this equipment and by municipal organizational units conducting activities in the field of waste collection.

The above statutory obligations were introduced to limit the amount of waste generated from used electrical and electronic equipment and to ensure an appropriate level of collection, recovery and recycling of used equipment. Proper implementation of these obligations is especially important when the used equipment contains hazardous components that have a particularly negative impact on the environment and human health.

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DECLARATION OF CONFORMITY

02/TIG201AC/DC/2021

Authorized manufacturer representative:

TECWELD Piotr Polak

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ul. Emerald 21/3/6

branch:

41-909 Bytom

1G Krzyżowa Street

POLAND

We declare that the product listed below:

Inverter welder

Trade name: TIG 201 AC/DC

Type: TIG 200 AC/DC

Manufacturer's trademark:

Sherman®
workshop

to which this declaration relates complies with the requirements of the following European Union directives and the national regulations implementing these directives:

Low Voltage Directive LVD 2014/35/EU

EMC Electromagnetic Compatibility Directive 2014/30/EU

RoHS II Directives 2011/65/EU

and complies with the following standards:

PN-EN IEC 60974-1:2018-11/A1:2019-06 Arc welding equipment - Part 1: Welding power sources,

PN-EN 60974-10:2014-12 Arc welding equipment - Part 10: Electromagnetic compatibility (EMC) requirements,

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

Year of CE marking on the device: 2011

Bytom, 01.09.2021

Peter the Pole
(signature of authorized person)