V1.0 08/08/25

USER MANUAL

CUTTER 42 LED INVERTER PLASMA CUTTER

Sherman®

CE

WARNING!
Read this manual before installing and starting the device

1. GENERAL NOTES

The device may only be started up and operated after thoroughly reviewing this User Manual.

Due to the continuous technical development of the device, its external appearance and certain functions may be subject to modification, and their operation may differ in detail from the descriptions in the manual and on the box. This is not a device malfunction, but a result of progress and ongoing modifications to the device. The standard equipment of the device may also be subject to change.

Damage to the device caused by improper use voids the warranty. Any modifications to the cutter are prohibited and will void the warranty.

2. SAFETY

Operators of the device must possess the necessary qualifications to perform plasma cutting:
- be familiar with health and safety rules for operating electrical power equipment, such as plasma cutting machines and electrically powered auxiliary equipment,
- be familiar with health and safety rules for operating air compressors,
- be familiar with the contents of this manual and operate the device in accordance with its intended use.

WARNING

Plasma cutting may endanger the safety of the operator and other people in the vicinity. Therefore, special precautions must be taken during cutting. Before starting to cut, familiarize yourself with the health and safety regulations applicable at the workplace. The following hazards exist during plasma cutting:
- **ELECTRIC SHOCK – MAY BE FATAL**
- **HARMFUL EFFECTS OF THE ARC ON THE EYES AND SKIN**
- **POISONING FROM SMOKE AND GASES**
- **BURNS**
- **EXPLOSION AND FIRE HAZARDS**
- **NOISE**

Prevention of electric shock:
- Connect the device to a technically sound electrical installation with proper protection and effective grounding (additional protection against electric shock); also check and properly connect other devices at the workstation to the power supply,
- Install power cables with the device turned off.
- do not touch the uninsulated parts of the plasma torch, the workpiece, and the device housing simultaneously,
- Do not use torches or power cables with damaged insulation.
- in conditions of particular risk of electric shock (working in high-humidity environments and enclosed tanks), work with an assistant who supports the work and monitors safety, and wear clothing and gloves with good insulating properties,
- if you notice any irregularities, contact qualified personnel to have them corrected,
- It is prohibited to operate the device with the covers removed.

Preventing the harmful effects of an electric arc on the eyes and skin:
- Wear protective clothing (gloves, apron, leather boots),
- Use protective shields or face shields with an appropriately selected filter,
- Use protective screens made of non-flammable materials and select appropriate colors for walls that absorb harmful radiation,

- Protect people in the vicinity using screens and protective materials.

Preventing poisoning from fumes and gases emitted during cutting:

- Keep your head out of the smoke zone,
- Use ventilation equipment and exhaust systems installed at workstations with limited air exchange,
- Supply fresh air when working in enclosed spaces (tanks),
- Use masks and respirators.

Prevention of burns:

- Wear appropriate protective clothing and footwear to protect against burns from arc radiation and sparks,
- Avoid getting clothing contaminated with greases and oils that could cause it to ignite

Prevention of explosions and fires:

- It is prohibited to operate the equipment or perform cutting in areas at risk of explosion or fire.
- The cutting station should be equipped with fire extinguishing equipment,
- The cutting station should be located at a safe distance from flammable materials.

Preventing the adverse effects of noise:

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

 **WARNING**!

Do not use the power source to thaw frozen pipes.

Before starting the device, you must:

- Check the condition of electrical and mechanical connections. Do not use handles or power cords with damaged insulation. Improper insulation of handles and power cords poses a risk of electric shock
- Ensure proper working conditions, i.e., maintain appropriate temperature, humidity, and ventilation at the work site. When used outdoors, protect the unit from precipitation
- Place the cutter in a location that allows for easy operation. Persons

operating the cutter should:

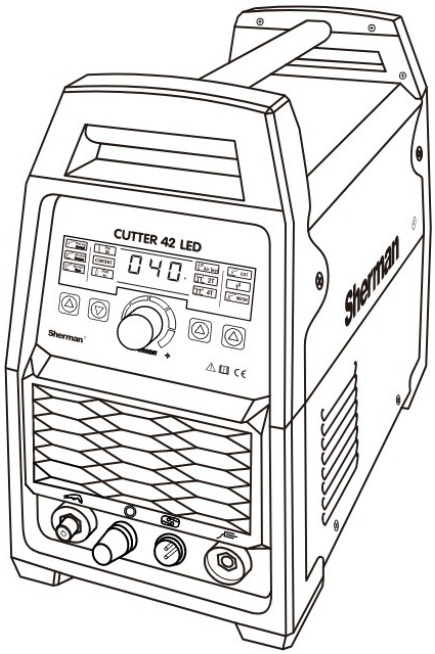
- be familiar with and comply with the health and safety regulations applicable to plasma cutting,
- use appropriate, specialized protective equipment: gloves, an apron, rubber boots, and a welding shield or helmet with a properly selected filter
- be familiar with the contents of this operating manual and use the cutter in accordance with its intended

purpose. Any repairs to the device may only be performed after unplugging the power cord from the outlet.
When the device is connected to the power supply, it is prohibited to touch any components forming part of the cutting circuit with bare hands or through damp clothing.
It is prohibited to remove the external guards while the device is connected to the power supply.
Any unauthorized modifications to the cutter are prohibited and may compromise safety.
All maintenance and repair work may be performed only by authorized personnel in compliance with the safety regulations applicable to electrical equipment.
It is prohibited to operate the cutter in areas at risk of explosion or fire! The cutting station must be equipped with fire extinguishing equipment
After finishing work, disconnect the power cord from the power source.

The hazards and general health and safety guidelines outlined above do not cover all aspects of workplace safety during cutting operations, as they do not take into account the specific conditions of the workplace. They are effectively supplemented by workplace-specific health and safety instructions, as well as training and guidance provided by supervisors.

3. GENERAL DESCRIPTION

The CUTTER 42 LED is a modern, digitally controlled device used for air plasma cutting of sheet metal and components made of carbon and stainless steel, aluminum, and copper. It is recommended for manufacturing companies with moderate cutting process requirements and for service work in craft workshops.
The device is equipped with a 2T/4T control mode switch and an air purge function for the cutting torch, which extends the service life of consumable parts. It also features pilot arc current adjustment, allowing for the selection of the optimal value without damaging the material. In addition, the device is equipped with Pilot Arc and Hot Start functions that facilitate piercing the material, initiating the plasma arc, and cutting materials contaminated with paint residues, a layer of corrosion, or oxides. There is also the option to use Mesh mode, in which the cutter automatically activates the pilot arc in the event of a loss of cutting continuity,thus minimizing the need for time-consuming, energy-intensive, and consumable-wearing arc ignition for each mesh line when cutting materials with holes over which the cutting arc does not operate, such as mesh.
The cutter is equipped with a 4-meter plasma torch with HF ignition and an air preparation unit with a regulator for adjusting and controlling air pressure.



4. TECHNICAL SPECIFICATIONS

4.1 Cutter

	CUTTER 42 LED
Power supply	AC 230V 50Hz
Rated cutting current / duty cycle	40 A / 60%
Maximum cutting thickness	20 mm
Cutting current adjustment range	15–40 A
Pre-flow air	0.1 – 1 s
Post-flow time	4 – 60 s
Pilot Arc	16 – 20 A
Hot Start function (current)	15–45 A
Hot Start function (time)	0.1 – 1 s
Maximum current draw	30.8 A
Mains protection	16 A
Operating air pressure	3.5–4.5 bar (0.35–0.45 MPa)
Weight (without accessories)	5.7 kg
Dimensions	330 x 163 x 306 mm
Electrical safety rating	IP21S

4.2 Plasma torch

Torch type	AG60
Maximum current rating	60 A
Duty cycle	60%
Air pressure	3.5–4.5 bar (0.35–0.45 MPa)
Air flow	120 l/min
Arc ignition	HF
Length	4 m

Maximum cutting thickness
The maximum cutting thickness value was determined under optimal cutting conditions for standard-grade carbon steel. To select the appropriate equipment, it is recommended to perform technical tests under actual operating conditions and on a sample of the material.

Duty cycle
The duty cycle is based on a 10-minute period. A 60% duty cycle means that after 6 minutes of operation, a 4-minute break is required. A 100% duty cycle means that the device can operate continuously, without breaks.
Note! Heating tests were conducted at ambient air temperature. The duty cycle at 40°C was determined by simulation.

Degree of protection
IP specifies the degree to which the device is resistant to the ingress of solid and liquid contaminants. IP21S means that the device is designed for indoor use and is not suitable for use in rain or snow.

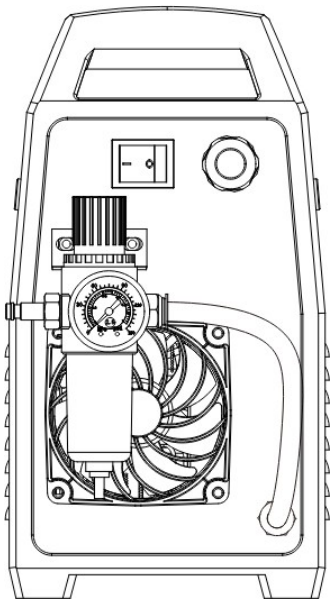
5. CONSTRUCTION AND OPERATION

The basis of the power conversion system in the cutter consists of electronic circuits manufactured using IGBT technology, enabling operation at frequencies above 200 kHz.

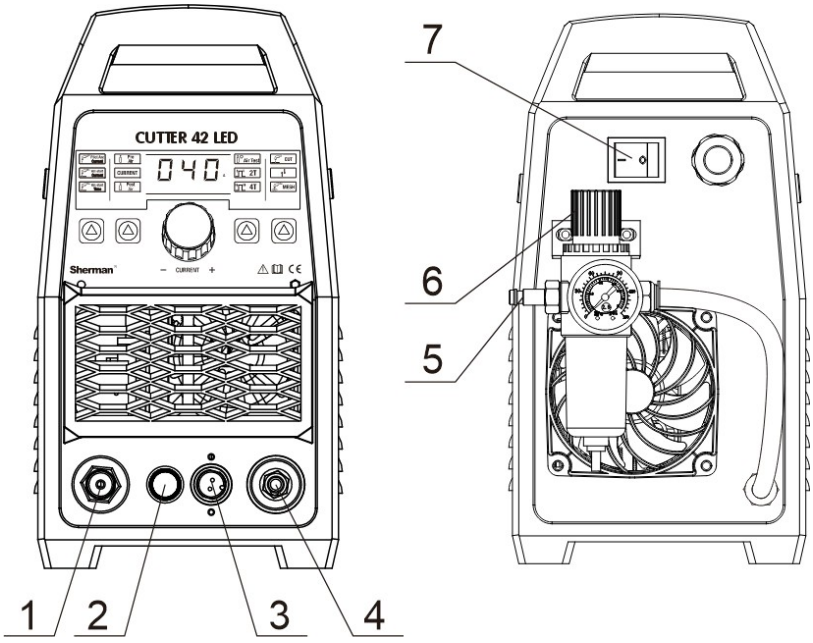
The operating principle involves rectifying the single-phase mains voltage to DC, converting the resulting DC voltage into a high-frequency square wave, transforming the voltage to the range required by the cutting process, and rectifying the resulting voltage back to DC.

6. INSTALLATION OF THE DEVICE

Before starting the cutter for the first time, install the pressure reducer with a desiccant on the rear panel as shown in the figure:

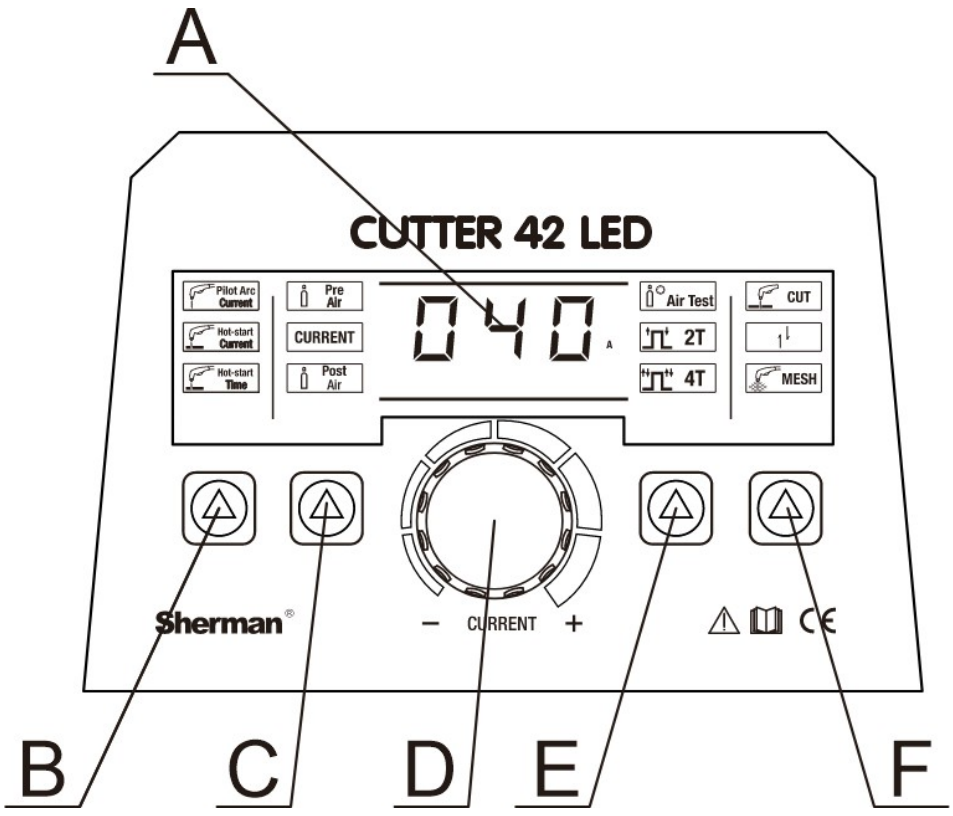


7. FRONT AND REAR PANELS



1. Current and air connection for the plasma torch
2. Ionizer terminal
3. Plasma torch control socket
4. Ground cable connector
5. Air connection
6. Air pressure adjustment knob
7. Main power switch

8. CONTROL PANEL



A – Cutting current display

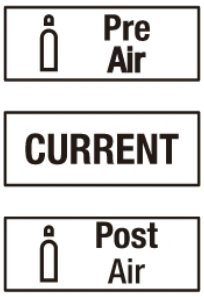
The display shows the cutting current, parameter values and functions during adjustment, or error codes. A list of error codes can be found in section 12 of the manual

B – Pilot Arc and Hot Start function button

This button is used to adjust the parameters of the Pilot Arc and Hot Start functions. These functions facilitate piercing the material and igniting the plasma arc, and ensure arc stability from the start of cutting. This is particularly useful when cutting materials contaminated with a layer of corrosion, oxides, or paint residue.
To activate the Hot Start function, set its duration to a value greater than 0.

	Pilot arc current. Adjusting this value allows you to set the current intensity of the pilot arc, which initiates the cutting process and enables the transition to the cutting arc. The optimal value should be set high enough to ignite the pilot arc, but low enough to prevent damage to the material, and should be selected individually depending on the material; for example, it will be higher for sheets covered with a layer of corrosion. Adjustment range: 16 – 20 A
	Hot Start current. Adjusting this value allows you to set a temporary increase in current immediately after the arc is struck. Adjustment range: 15 – 45 A
	Penetration time. Adjusting this value allows you to set the duration of the Hot Start function. A longer Hot Start pulse provides more energy at the start, which facilitates penetration of thicker sheets or coated surfaces (paint, rust, oxides), but may result in a wider cut gap and increased electrode wear. Adjustment range: 0 – 3 s

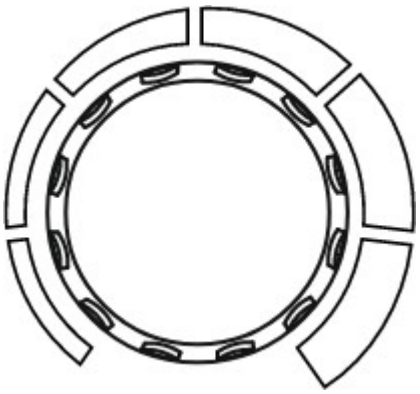
C – Air flow and cutting current button



The button is used to select the adjustable parameter:

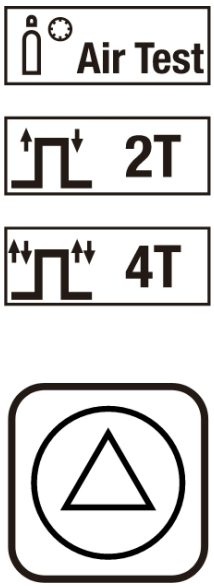
Pre Air	The duration of the air purge immediately before the plasma arc is ignited. The pre-purge removes contaminants, such as dust or loose metal filings, from the area where the arc is to be ignited. This ensures a clean start and a stable plasma arc. Adjustment range: 0.1 – 1 s; factory setting 0.1 s
CURRENT	Cutting current.
Post Air	The duration of the air purge after cutting is complete. The post-purge is intended to cool the torch, the holder, and consumables, and should be increased as the current and cutting intensity increase. Adjustment range: 4 – 60 s; factory setting 10 s

D – Cutting current adjustment knob



The knob is used to adjust the cutting current as well as parameter and function values.

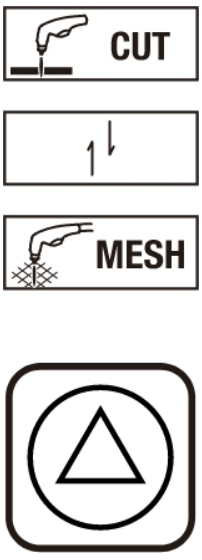
E – Cutter control mode selection button



This button is used to select the cutter control mode:

Air Test	This mode is used to check the proper operation of the air system and to clean it. When starting the machine after an overnight shutdown, blow through the plasma torch for about 30 seconds to remove condensation from the circuit. This process will extend the service life of consumable parts and facilitate the startup of the cutter.
2T	Two-stroke mode. In this mode, press the button on the plasma torch handle, strike the arc, and continue cutting while holding the button down. To stop cutting, release the button on the handle.
4T	Four-stroke mode. In this mode, press the button on the plasma torch handle, strike the arc, release the button, and continue cutting with the button released. To end the cut, press the button again.

E – Cutting mode button



This button is used to select the cutting mode:

	Sheet metal cutting mode. This mode allows for continuous cutting of sheet metal. In this mode, the torch generates a pilot arc for approximately 3 seconds. This limits the duration of the pilot arc and helps conserve consumables. Use this mode when making long, continuous cuts. If the arc goes out, press press the button on the handle to resume cutting.
	Mesh cutting mode, continuous cutting of metal mesh materials. In this mode, the pilot arc turns on automatically if the cut is interrupted. Once continuity is restored, the cutting arc will turn on again and the pilot arc will turn off. This cycle will repeat continuously as long as necessary. This mode can be used for cutting corroded components. It results in faster wear consumables.

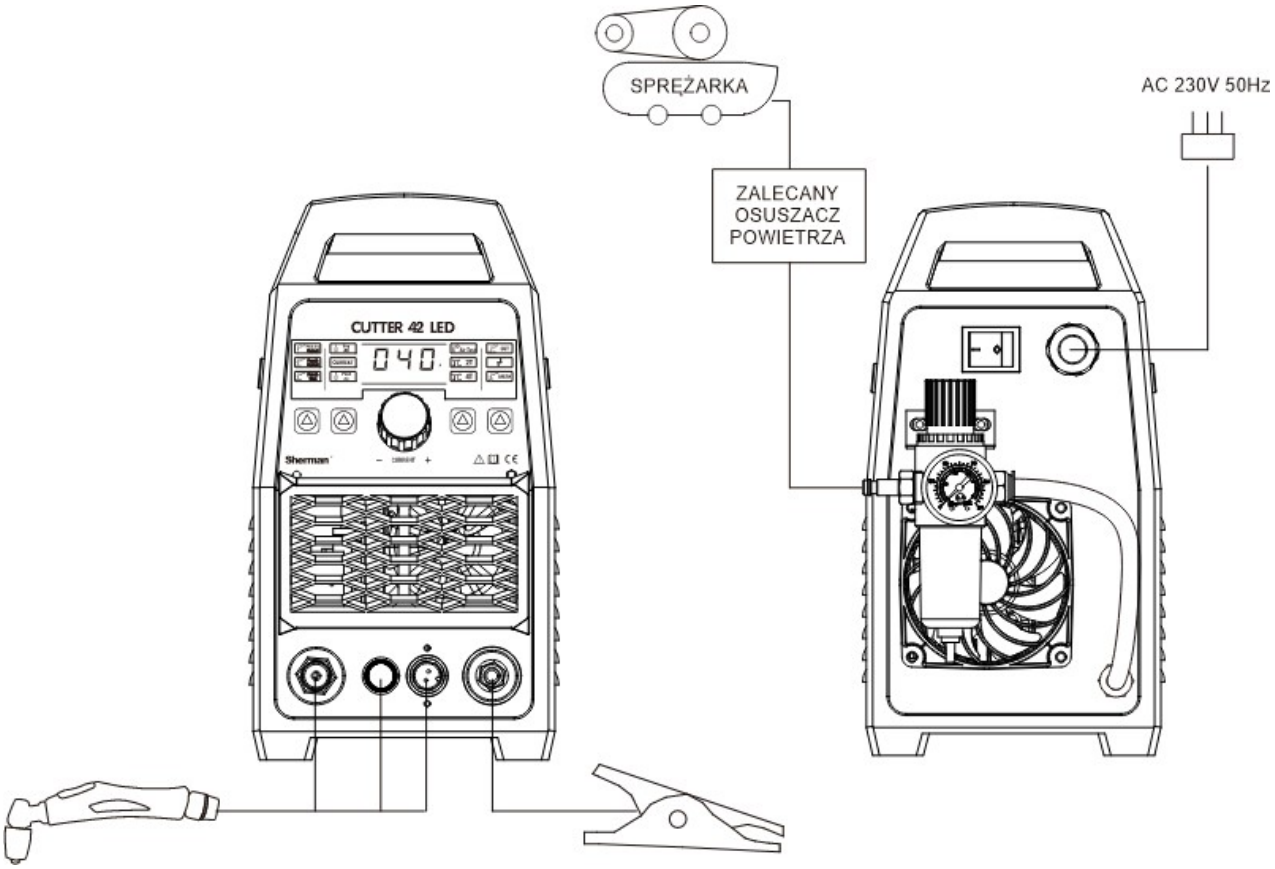
9. CONNECTION TO THE POWER SUPPLY

1. The devices should be used exclusively in a single-phase, three-wire power supply system with a grounded neutral point.
2. CUTTER 42 LED plasma cutters are designed for use with a 230V 50 Hz power supply protected by 16 A slow-blow fuses.
3. Before connecting the power supply, make sure the power switch is in the OFF position.

10. AIR SYSTEM

The device is equipped with an air preparation unit featuring a filter-dryer. The filter-dryer has an automatic drain valve, the outlet of which is located at the bottom of the dryer. The filter-dryer drains automatically after being disconnected from the pneumatic system or if the pressure drops to “0”. It is possible to manually drain the filter-dryer by pressing the valve. The device should be placed on the floor in such a way as to allow the liquid to flow out freely. **The appearance of liquid flowing out of the dryer is a normal occurrence and indicates that the drain valve is functioning properly.** The filter-dryer requires no additional user intervention; it only needs to be inspected periodically.

11. AIR PLASMA CUTTING



11.1. Preparing the device for operation

Plug the device into a 230V 50Hz power outlet. Connect the device to a compressed air source. The air must be dry and oil-free. (If the air from the compressor contains oil or water, the air system must be equipped with an additional air dryer and filter).
Connect the power and air plug of the plasma torch to socket (1), clamp the ionizer's eye terminal onto terminal (2), and connect the control plug to socket (3). Securely attach the ground cable clamp to the material being cut. Connect the cable plug to socket (4).

11.2. Setting cutting parameters

Set the cutting current and air pressure values according to the thickness of the material being cut. Optimal cutting current and pressure values may vary depending on the type of material being cut.
Set the air purge time after welding is complete. This time should be selected so that the plasma torch and its consumables can cool down.

11.3. Arc Initiation

When starting the machine after an overnight shutdown, blow through the plasma torch of the cutter for about 30 seconds in Air Test mode to remove condensation from the circuit. This process will extend the service life of consumables and facilitate the startup of the cutter.
Bring the torch close to the workpiece and, depending on the thickness of the material being cut, either lightly touch it or keep it at a distance of approximately 2 mm, then press the button on the torch. An arc will ignite between the electrode and the torch nozzle, while the air valve opens, causing the pilot arc to be blown out of the nozzle. If the nozzle is in contact with or at the correct distance from the workpiece, the main arc will ignite, thereby starting the cutting process, which will continue until the button on the torch is released.
CAUTION! Do not press the button when the nozzle is more than 2 mm away from the material being cut. If the arc does not ignite within 2 seconds, release the button. Activating the ionizer for longer than 2 seconds may damage the ionizer!

11.4. Guiding the cut.

To avoid interruptions in the arc during cutting, move the torch evenly across the material, and keep the torch nozzle perpendicular to the workpiece at a constant distance from it. If the arc goes out during cutting, release and then press the button on the torch—the pilot arc will reignite.
The correct cutting speed is determined by assessing the angle at which the cut material is ejected from the lower edge of the workpiece, as well as by observing the material flow and the cut surface. The best cutting results are achieved by using the maximum permissible speeds.
If the cutting speed is too high, the jet is unable to sufficiently melt the metal and eject it from the cut workpiece, which may cause some of the molten metal to be directed toward the nozzle, potentially leading to a serious malfunction.
When cutting thin sheets and aluminum, the cut should start slowly to properly penetrate the material. The cutting speed can be increased once the arc has penetrated the lower edge of the material being cut.
During normal operation, the distance between the torch and the material should be between 0 and 2 mm.
It is not recommended to activate the pilot arc without the intention of cutting, as this causes unnecessary wear on the electrode and nozzle.
In the event of arc flashes, or if the arc flame is green or the arc emits any abnormal noise, immediately turn off the device and check the condition of the consumable parts.
Cutting can be interrupted by releasing the button on the torch (2T mode), pressing the button again (4T mode), or by abruptly pulling the torch away from the material.
After the arc goes out, a few seconds of compressed air will continue to flow. The delay in stopping the compressed air flow is intended to cool the heated parts of the torch.

12. BEFORE CALLING SERVICE

If the device malfunctions, check the list of common faults and try to resolve them yourself before sending the cutter to service.
Any repairs to the device may only be performed after unplugging the power cord from the outlet.
Warning! The device is not sealed, and the user may remove the cutter's housing to resolve minor malfunctions.

Symptoms	Cause	Action
No power, error signal, or malfunction	No connection or loose plug inside the device	Check and secure all internal connections
The power indicator LED does not light up when the power is turned on	No power supply	Check the fuses at the power connection Check if there is power in the mains
After connecting the power supply, the power indicator LED does not light up	The power switch is in the OFF position	Set the power switch to the ON position
The power indicator LED is lit, the fan is not running, and there is no output voltage.	The supply voltage is unstable and triggers the overvoltage protection	Turn off the device for 2–3 minutes and turn it back on
	Briefly turning the switch on and off triggered the overvoltage protection	Turn off the device for 2–3 minutes and turn it back on
The arc does not ignite	Poor contact at the ground terminal	Improve the ground terminal contact
	Damaged switch in the plasma torch	Replace the switch
	Plasma torch is not properly connected to the machine	Check the condition of the torch's electrical connections; check that the pins in the socket are not broken or jammed
The display shows E03	The machine has overheated.	Do not turn off the device. Wait a few minutes until the LED goes out and continue cutting.
The fan is not running	The fan has been blocked by a bent guard	Straighten the fan guard
Unsatisfactory cut quality	Poor quality of materials and consumables used,	Replace consumables
	Air is flowing out at an insufficient rate .	Check the air supply hose, ensure the hose is properly connected to the fittings, and inspect the condition of the quick-connect fittings Check the air compressor

List of error codes:

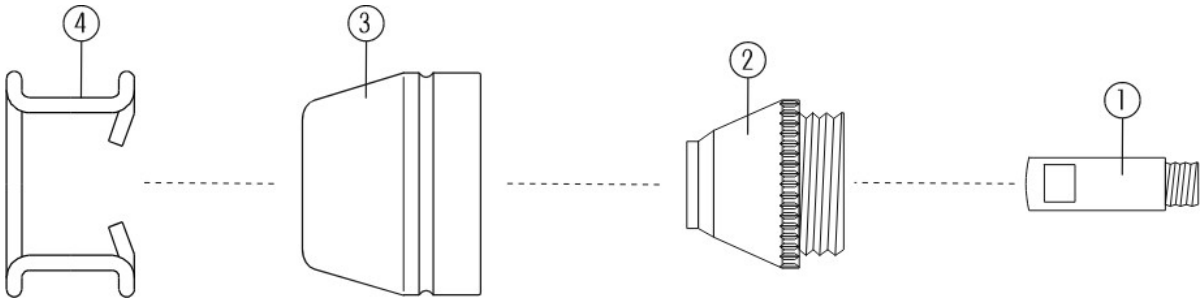
E02	Faulty thermostat
E03	Thermal protection. The device is equipped with an automatic thermal cut-off that cuts off the welding current when the device reaches an excessively high temperature. In such case, do not turn off the cutter or disconnect its power supply. Once the correct temperature is reached, the switch will reset automatically.
E05	Overload protection activated. Make sure the cutting current is not too high, then turn the device off and on again.

13. OPERATING INSTRUCTIONS AND LIST OF CONSUMABLE PARTS

The CUTTER 42 LED should be operated in an environment free of corrosive substances and heavy dust. Do not place the device in dusty areas or near operating grinders, etc. Dust and contamination from metal filings on the control boards, wires, and connections inside the device can lead to an electrical short circuit and, consequently, damage to the cutter.
Avoid operating the machine in high-humidity environments, and especially when dew is present on metal components.
If dew forms on metal parts, e.g., after bringing a cool device into a warm room, wait until the dew has disappeared. When operating the cutter outdoors, it is recommended to place it under a roof to protect it from adverse weather conditions.
The CUTTER 42 LED should be operated under the following conditions:

- fluctuations in the effective value of the supply voltage not exceeding 10%
- ambient temperature from –10°C to +40°C
- atmospheric pressure from 860 to 1060 hPa
- relative humidity of the ambient air not exceeding 80%
- altitude up to 1000 m above sea level List of

consumable parts for the AG60 plasma torch:



No.	Name	TECWELD catalog number	Reference number
1	Electrode	7812910	PR0031
2	Nozzle 0.9	7812906	PD0130-09
	Nozzle 1.0	7812907	PD0130-10
3	Protective sleeve	7812912	PC0021-1
4	Spring-loaded slide	7812911	W0300184

A complete list of consumables and spare parts is available on the website www.tecweld.pl and from TECWELD. These parts can be purchased directly.

14. MAINTENANCE INSTRUCTIONS

As part of daily maintenance, keep the cutter clean and check the condition of external connections. Regularly drain water from the air regulator filter bowl by pressing the valve on the bottom of the cutter.
Replace consumable parts regularly.

Periodically (depending on operating conditions), clean the interior of the unit by blowing compressed air through it to remove dust and metal filings from the control boards, as well as from electrical wires and connections.
At least once every six months, perform a general inspection and check the condition of the electrical connections, in particular:

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

Damage resulting from operating the saw under improper conditions and failure to follow maintenance recommendations is not covered by warranty repairs.

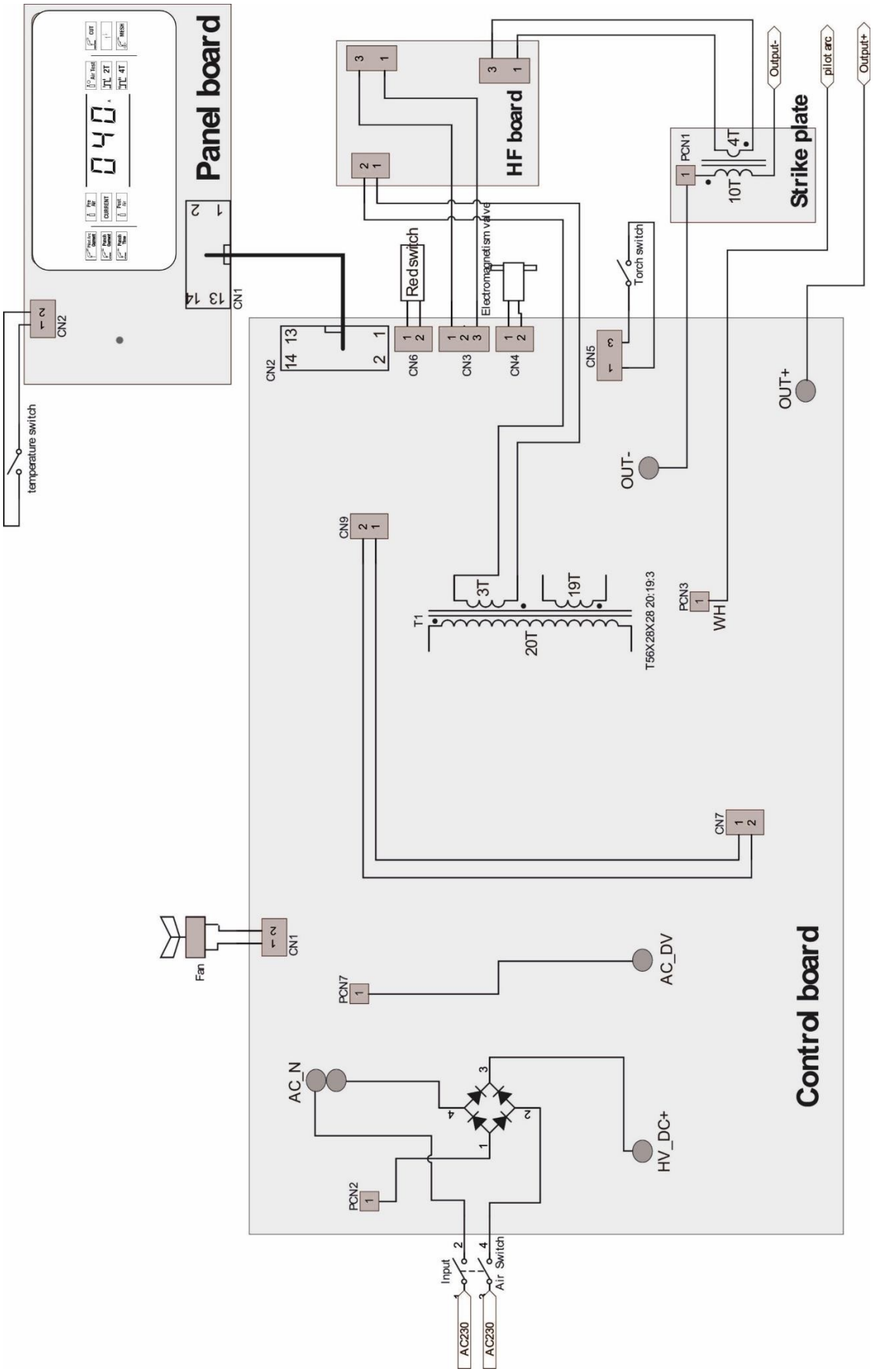
15. STORAGE AND TRANSPORT INSTRUCTIONS

The device should be stored at a temperature of –10°C to +40°C and relative humidity up to 80%, free from corrosive fumes and dust. Transport of packaged devices should be carried out using covered means of transport. During transport, the packaged device must be secured against shifting and positioned correctly.

16. SPECIFICATIONS OF THE SET

1. Cutter	1 pc.
2. AG60 plasma cutting torch	1 pc.
3. Ground cable with clamp	1 pc.
4. Air preparation unit	1 pc.
5. Air hose	1 pc.
6. User manual	1 pc.
7. Packaging	1 pc.

17. ELECTRICAL DIAGRAM



18. WARRANTY

The warranty is valid for 12 months for business entities, excluding claims related to the warranty, 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 bearing the product name, serial number, date of sale, and stamped by the point of sale.
To request a warranty repair, please fill out the form available at www.tecweld.pl **under the SERVICE tab. Based on the request, the device will be shipped to the service center via a courier company. Devices sent by other means at TECWELD's expense will not be accepted!**
The cutter must be delivered together with the plasma torch. Claims for devices without a plasma torch will not be processed.
The device sent for a complaint must be packed in the original box and secured with the original styrofoam inserts. TECWELD is not liable for damage to the welder resulting from transport.

If you intend to dispose of this product, do not throw it away with regular 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, pursuant to the provisions of the Act of September 11, 2015, on Waste Electrical and Electronic Equipment, it is prohibited to dispose of equipment marked with the crossed-out wheelie bin symbol together with other waste.

A user who intends to dispose of this product is required to take the waste electrical and electronic equipment to a collection point for such equipment. Collection points are operated, among others, by wholesalers and retailers of this equipment, as well as by municipal entities engaged in waste collection activities.
These statutory obligations were introduced to reduce the amount of waste generated from waste electrical and electronic equipment and to ensure an adequate level of collection, recovery, and recycling of such equipment. Proper fulfillment of these obligations is particularly important when the waste equipment contains hazardous components that have a particularly negative impact on the environment and human health.

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

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Tel. +48 32 386 94 28
Email:info@tecweld.pl , www.tecweld.pl

DECLARATION OF CONFORMITY
01/CUTTER42LED/2025

Authorized representative of the manufacturer:
TECWELD Piotr Polak
41-943 Piekary Śląskie
21/3/6 Szmaragdowa St.

Branch:
41-909 Bytom,
ul. Krzyżowa
1G, POLAND

We declare that the product listed below:

Plasma cutter

Type: **CUT40H**

Trade name: **CUTTER 42 LED**

Manufacturer's trademark: Sherman®

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

Low Voltage Directive LVD 2014/35/EU

Electromagnetic Compatibility (EMC) Directive 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 power sources,

PN-EN IEC 60974-10:2022-07 Arc welding equipment -- Part 10: Requirements for electromagnetic compatibility (EMC),

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: 2024

Bytom, August 8, 2025

Piotr Polak
(signature of the authorized person)