scheppach PLC40 Plasma Cutting Machine Instruction Manual

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PLC40 Plasma Cutting Machine
Instruction Manual

https://www.scheppach.com/be/servive

Translation of original instruction manual

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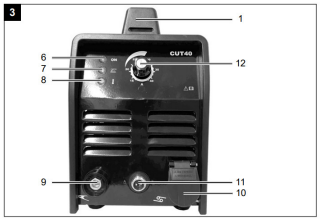

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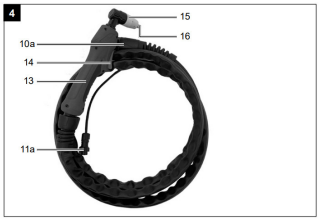

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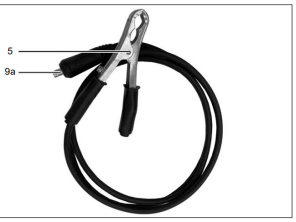

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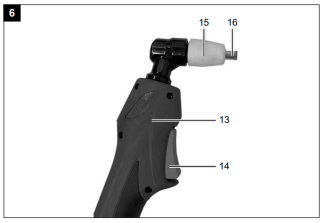

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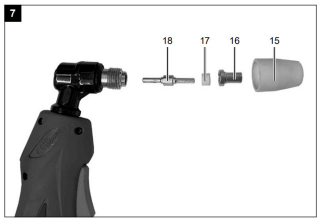

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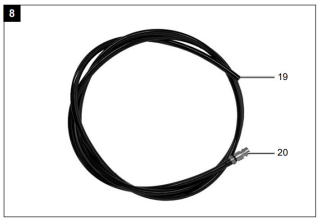

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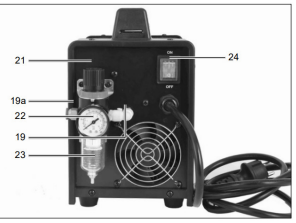

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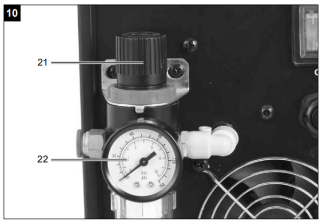

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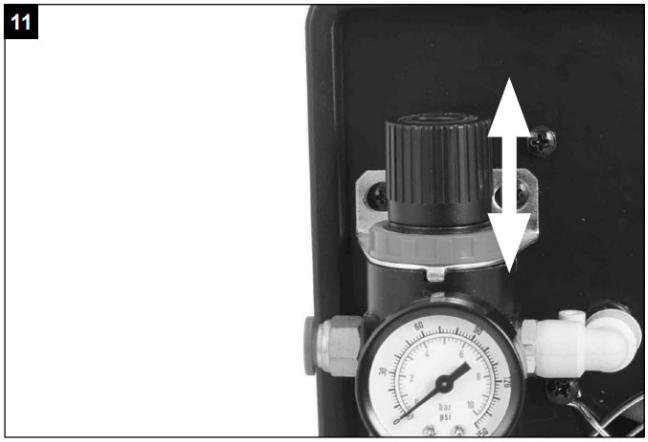

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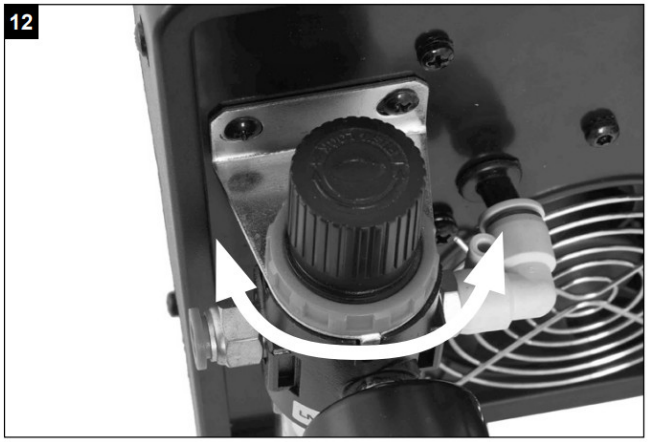
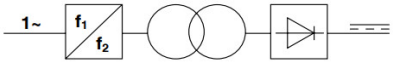
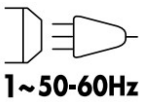
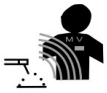


Explanation of the symbols on the device

Symbols are used in this manual to draw your attention to potential hazards. The safety symbols and the accompanying explanations must be fully understood. The warnings themselves will not rectify a hazard and cannot replace proper accident prevention measures.

	Caution – Read the operating instructions to reduce the risk of inquiry.
EN 60974-1	European standard for welding sets for manual arc welding with limited time.
	Single-phase static frequency converter transformer rectifier
	Direct current
	Power input; phase number, as well as Alternating current symbol and rated value of the frequency
U_0	Rated idling voltage
U_1	Mains voltage
I_2	Cutting current
U_2	Operating voltage [V]
Imax	Rated maximum mains current
Ieff	The effective value of the highest line current [A]
IP21S	Protection type
H	Insulation class
	Caution! Risk of electric shock!
	Electric shock from the welding electrode can be fatal.
	Inhaling welding smoke can be hazardous to your health.
	Electromagnetic fields can interfere with the functionality of pacemakers.
	Welding sparks can cause an explosion or fire.
	Arc rays can damage the eyes and injure the skin.
	Do not use the device outdoors and never in rain!

	Cutting with the plasma cutter.
	Connection – Ground terminal plug
	Connection – plasma burner – Power plug
	Connection – plasma burner
⚠**Attention!**	In this operating manual, we have used this sign to mark all sections that co ncern your safety.

Contents

Introduction

Manufacturer: scheppach
Fabrikation von Holzbearbeitungsmaschinen GmbH
Günzburger Straße 69
D-89335 Ichenhausen
Dear customer,
We hope your new tool brings you much enjoyment and success.
Note:
According to the applicable product liability laws, the manufacturer of the device does not assume liability for damages to the product or damages caused by the product that occurs due to:

- Improper handling,
- Non-compliance with the operating instructions,
- Repairs by third parties, not by authorized service technicians,
- Installation and replacement of non-original spare parts,
- Application other than specified,
- A breakdown of the electrical system that occurs due to non-compliance with the electric regulations and VDE

regulations 0100, DIN 57113 / VDE0113.

We recommend:
Read through the complete text in the operating instructions before installing and commissioning the device. The operating instructions are intended to help the user to become familiar with the machine and take advantage of its application possibilities in accordance with the recommendations. The operating instructions contain important information on how to operate the machine safely, professionally, and economically, how to avoid danger, and costly repairs, reduce downtimes, and how to increase the reliability and service life of the machine. In addition to the safety regulations in the operating instructions, you have to meet the applicable regulations that apply to the operation of the machine in your country. Keep the operating instructions package with the machine at all times and store it in a plastic cover to protect it from dirt and moisture. Read the instruction manual each time before operating the machine and carefully follow its information. The machine can only be operated by persons who were instructed concerning the operation of the machine and who are informed about the associated dangers.
The minimum age requirement must be complied with. In addition to the safety notices contained in this operating manual and the particular instructions for your country, the generally recognized technical regulations for the operation of identical devices must be complied with. We accept no liability for damage or accidents which arise due to non-observance of these instructions and the safety information..

Layout

1. Handle
2. Plasma cutter
3. Mains plug
4. Plasma hose package
5. Ground terminal
6. Mains indicator lamp
7. Work light
8. Overheat protection indicator lamp
9. Ground terminal connection socket
   9a. Ground terminal plug
10. Plasma burner connection socket
    10a. Plasma burner plug
11. Plasma burner power socket
    11a. Plasma burner power plug
12. Current controller
13. Plasma burner
14. Plasma burner button
15. Ceramic cap
16. Nozzle
17. Diffuser
18. Electrode
19. Compressed air hose
20. Quick connector compressed air hose
21. Rotary knob to regulate the pressure
22. Manometer
23. Condensation water tank
24. On/off – switch

Scope of delivery

A. Plasma cutter(1x)
B. Compressed air hose (1x)
C. Ground cable with a terminal (1x)
D. Plasma hose package (1x)
E. Hose clamp (1x)
F. Nozzle (3x) (1x pre-assembled)
G. Electrodes (3x) (1x pre-assembled)
H. Operating instruction (1x)
I. Diffuser (1x pre-assembled)
J. Ceramic cap (1x pre-assembled)

Proper use

The device is intended for compressed-air plasma cutting of all electrically conductive metals. An element of the intended use is also the observance of the safety instructions, as well as the assembly instructions and operating information in the operating manual. It is imperative to adhere to the applicable accident prevention regulations.
The device must not be used:

- in insufficiently ventilated rooms,
- in moist or wet environments,
- in explosive environments,
- to defrost pipes
- in close proximity to people with cardiac pacemakers and
- in close proximity to easily flammable materials.

The device may only be used in an intended manner. Any use beyond this is improper. The user/operator, not the manufacturer, is responsible for damages or injuries of any type resulting from this. An element of the intended use is also the observance of the safety instructions, as well as the assembly instructions and operating information in the operating manual.
Persons who operate and maintain the machine must be familiar with it and must be informed about potential dangers.
Other general occupational health and safety-related rules and regulations must be observed. The liability of the manufacturer and resulting damages are excluded in the event of modifications to the machine.
Please note that our equipment has not been designed for use in commercial, trade, or industrial applications. Our warranty will be voided if the machine is used in commercial, trade, or industrial businesses or for equivalent purposes.
The device may only be operated by qualified or instructed personnel. This includes persons who, due to their technical training, experience, and knowledge of the relevant facilities, are able to assess the work assigned to them and recognize possible dangers or persons who are responsible for the assigned work and have been instructed about possible dangers due to careless behavior.
Please observe that our equipment was not designed with the intention of being used for commercial or industrial purposes. We assume no guarantee if the equipment is used in commercial or industrial applications, or for equivalent work.

Safety information

⚠Warning!
Please read through the operating instructions carefully before use. Familiarise yourself with the device, its proper use, and the safety notes based on these operating instructions. These form part of the product and must be available at all times!

⚠**Warning!**
RISK OF SERIOUS INJURY OR DEATH FOR INFANTS AND CHILDREN!
Never leave children unsupervised near packaging material. There is a risk of suffocation!

- This device may be used by children aged 16 years and older, and by persons with reduced physical, sensory or mental capacities, or a lack of experience and knowledge if they are supervised or have been instructed in how to use the device safely and understand the dangers that may arise when using it. Do not allow children to play with the device. Cleaning and day-to-day maintenance must not be performed by children without supervision.
- Repairs or/and maintenance work must only be carried out by qualified electricians.
- Only use the cutting cable provided in the scope of delivery.
- During operation, the device should not be positioned directly on the wall, covered, or jammed between other devices so that sufficient air can be absorbed through the ventilation slats. Makes sure that the device is correctly connected to the supply voltage. Avoid any form of tensile stress on the power cable. Disconnect the plug from the socket prior to setting up the device in another location.
- If the device is not in operation, always switch it off by pressing the ON/OFF switch. Place the electrode holder on an insulated surface and only remove it from the holder after allowing it to cool down for 15 minutes.
- Hot metal and sparks are blown off from the cutting arch. Flying sparks, hot metal as well as hot objects, and hot device equipment can cause fires or burns. Check the working environment and make sure the workplace is suitable prior to using the device.
- Remove all flammable material within 10 m of the plasma cutter. If this is not possible, cover the objects meticulously using suitable covers. • Do not make cuts in places where flying sparks could come into contact with flammable material.
- Protect yourself and others from flying sparks and hot metal.
- Please be careful because sparks and hot materials can easily fall through small gaps and openings while cutting and land on adjacent areas.
- Please be aware that cutting on a ceiling, floor or partition can cause a fire on the opposite side that is not visible.
- Connect the power cable using the shortest route with a socket situated close to the workplace to prevent the power cable from being spread across the whole room and located on a surface that could cause an electric shock, sparks, or fire outbreak.
- Do not use the plasma cutter to defrost frozen tubes.

Risk of electric shock
Electric shock from the cutting electrode can be fatal.

- Do not use the plasma cutter when it is raining or snowing.
- Wear dry insulating gloves.
- Do not touch the electrodes with bare hands.
- Do not wear wet or damaged gloves.
- Protect yourself from electric shock with insulation against the workpiece.
- Do not open the device housing.
- Additional protection against a shock from the mains power in the event a fault can be provided by using a fault-circuit interrupter, which is operated with a leakage current of no more than 30 mA and covers all mains-

powered devices in close proximity. The fault-circuit interrupter must be suitable for all types of current.
- There must be means of rapid electrical isolation of the cutting power source or the cutting circuit (e.g. emergency stop device) which are easily accessible.

Danger from smoke emission when plasma cutting:

- Inhalation of fumes that result from plasma cutting can endanger health.
- Do not keep your head in the fumes.
- Use the device in open areas.
- Only use the device in well-ventilated spaces.

Danger from flying sparks when plasma cutting:

- Cutting sparks can cause an explosion or fire.
- Keep flammable substances away from the cutting location.
- Do not use the plasma cutter near flammable substances.
- Cutting sparks can cause fires.
- Keep a fire extinguisher close by and an observer should be present to be able to use it immediately.
- Do not carry out plasma cutting on drums or any other closed containers. Danger from arc beams:
- Arc beams can damage your eyes and injure your skin.
- Wear a hat and safety goggles.
- Wear hearing protection and high, closed shirt collars.
- Use a welding safety helmet and make sure that the filter setting is correct.
- Wear complete body protection. Danger from electromagnetic fields:
- Cutting current generates electromagnetic fields.
- Do not use it if you have a medical implant.
- Never wrap the cutting cable around your body.
- Guide cutting cables together. Welding shield-specific safety instructions
- With the help of a bright light source (e.g. lighter) examine the proper functioning of the welding shield prior to starting with any cutting work.
- Cut spatters can damage the protective screen. Immediately replace damaged or scratched protective screens.
- Immediately replace damaged or highly contaminated or splattered components.
- The device must only be operated by people over the age of 16.
- Please familiarise yourself with the cutting safety instructions. To that end, you must also observe the safety instructions of your plasma cutter.
- Always wear a welding helmet while welding and plasma cutting. If it is not used, you could sustain severe lesions to the retina.
- Always wear protective clothing during welding and plasma cutting operations.
- Never use the welding shield without the protective screen because this could damage the optical unit. There is a risk of damage to the eyes!
- Regularly replace the protective screen to ensure good visibility and fatigue-proof work.

An environment with increased electrical hazard

Environments with increased electrical hazards may be encountered, for example:

- In workplaces where the space for movement is restricted, such that the operator is working in a forced posture (e.g.: kneeling, sitting, lying) and is touching electrically conductive parts;
- In workplaces that are restricted completely or in part in terms of electrical conductivity and where there is a high risk through avoidable or accidental touching by the operator;
- In wet, humid, or hot workplaces where the air humidity or weld significantly reduces the resistance of human skin and the insulating properties or effect of protective equipment.
- Even a metal conductor or scaffolding can create an environment with increased electrical hazards.
- When using plasma cutters under electrically dangerous conditions, the output voltage of the plasma cutter must be greater than 48 volts when idling (effective value).
- The plasma cutter may not be used in these cases due to the output voltage.

Plasma cutting in tight spaces

- When welding and plasma cutting in tight spaces this may pose a hazard through toxic gases (risk of suffocation). In tight spaces, the device may only be operated if there are trained individuals in the immediate vicinity who can intervene if necessary. In this case, before starting to use the plasma cutter, an expert must carry out an assessment in order to determine what steps are necessary, in order to guarantee safety at work and which precautionary measures should be taken during the actual cutting procedure.

Total of open circuit voltages

- When more than one plasma power source is operated at the same time, their open circuit voltages may add up and lead to an increased electrical hazard. The plasma power sources must be clearly marked with their individual control units and connections, in order to be able to identify which device belongs to which circuit.

Using shoulder straps

- The plasma cutter must not be used if the device is being carried e.g. with a shoulder strap.

This is intended to prevent:

- The risk of losing your balance if the lines or hoses which are connected are pulled.
- The increased risk of an electric shock as the operator comes into contact with the earth if he/she is using a Class I plasma cutter, the housing of which is earthed through its conductor.

Protective clothing

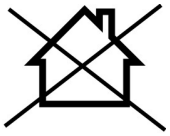
- At work, the operator must protect his/her whole body by using appropriate clothing and face protection against radiation and burns. The following steps must be observed:
- Wear protective clothing prior to cutting work.
- Wear gloves.
- Open windows to guarantee air supply.

- Wear protective goggles.
- Gauntlet gloves made of a suitable material (leather) must be worn on both hands. They must be in perfect condition.
- A suitable apron must be worn to protect clothing from flying sparks and burns. When specific work, e.g. overhead cutting, is required, a protective suit must be worn and, if necessary, even head protection.

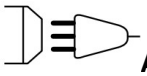
Protection against rays and burns

- Warn the danger to the eyes by hanging up a sign saying “Caution! Do not look into flames!”. The workplaces must be shielded so that the persons in the vicinity are protected. Unauthorized persons must be kept away from cutting work.
- The walls in the immediate vicinity of fixed workplaces should neither be brightly colored nor shiny. Windows up to head height must be protected to prevent rays from being transmitted or reflecting through them, e.g. by using suitable paint.

EMC Device Classification



ATTENTION! This class A device is not intended for use in residential environments in which the power supply comes from a public low-voltage supply system. It can be difficult to ensure electromagnetic compatibility in these areas, both due to conducted and radiated high-frequency interferences.



ATTENTION! This device does not comply with the IEC 61000-3-12 standard. It is intended to be connected to private low-voltage networks that are connected to public electricity networks of medium and high voltage. When operating the device on a public low-voltage network, the operator of the device must consult the local electric power company whether the device is suitable for operation.
If you want to use the device in residential sites in which the power supply comes from a public low-voltage supply system, it may be necessary to use an electromagnetic filter that reduces electromagnetic interference so that radio and television reception is not disturbed.
As a user, you must ensure that the connection point at which you want to operate the device meets the stated requirement. It may be necessary to consult your local electric power company. The operator of the device is responsible for malfunctions caused by welding or cutting.
The device can be used in industrial areas or other areas in which the power supply is not provided by a public low-voltage supply system.

Electromagnetic fields and interferences

The electric currents flowing through a conductor cause electrical and magnetic fields (EMF).
Electromagnetic interference can occur when operating arc welding systems.
Exposure to electromagnetic fields while welding may have other health effects which are not yet known. People with cardiac pacemakers or hearing aids are advised to consult their doctor before using this device. For example, access restrictions for passers-by or an individual risk evaluation for the welders. All welders should take the following precautions in order to minimize exposure to the electromagnetic fields (EMF) generated by the welding circuit:
keep your head and torso as far as possible from the welding circuit;

- bundle the electrode holder and earth cable, and if possible secure them with tape;
- make sure that the cables, cutting torch, or earth clamp do not get wrapped around your body;
- never position your body between the welding cables. Hold both welding cables on the same side of your body;
- connect the earth clamp as close as possible to the area being welded;
- do not work too close to the welding machine;

People with cardiac pacemakers or hearing aids are advised to consult their doctor before using this device. Exposure to electromagnetic fields while welding may have other health effects which are not yet known.
Even if the plasma cutter complies with the emission level as per the standard, the plasma cutter can still result in electromagnetic disturbances in sensitive systems and devices. The operator is responsible for malfunctions that occur through the arc while plasma cutting and must take suitable protective measures. In doing so, the operator must consider the following:

- Power cables, control, signal, and telecommunication lines
- Computer and other microprocessor-controlled devices.
- Television, radio, and other playback devices
- Electronic and electrical safety equipment
- Persons with cardiac pacemakers or hearing aids
- Measurement and calibration devices
- Noise immunity of other devices in the vicinity
- The time of day at which the cutting work is performed.

The following is recommended to reduce possible interference radiation:

- Set up and operate the plasma cutter properly in order to minimize possible disruptive emissions.
- The plasma cutter must be regularly maintained and kept in a good condition
- Cutting cables should be completely unwound and installed parallel on the floor if possible
- Devices and systems at risk of interference radiation must be removed from the cutting area if possible, or shielded.
- Usage of an electromagnetic filter that reduces electromagnetic interference.

General plasma explanations

- Plasma cutters are operated by pushing pressurized gas, e.g. air, through a small pipe. In the center of the pipe, there is a negatively charged electrode that is directly above the nozzle. The vortex ring causes the plasma to rotate quickly. If you supply the negative electrode with current and make the tip of the nozzle touch the metal, this connection creates a closed, electrical circuit.

A powerful spark occurs between the electrode and the metal. While the gas flows into the pipe, the spark heats up the gas until it has reached the plasma condition. This reaction causes a current from the controlled plasma with a temperature of 17.000 ºC or more that moves at speed of 6.096 m/sec and the metal transforms into steam and molten discharge. The plasma itself conducts electrical current.
The working circuit that allows the arc to occur remains as long as the current is supplied to the electrode and the plasma remains in contact with the metal to be processed. The cutting nozzle has a range of further channels. These channels generate a constant flow of protective gas around the cutting area. The pressure of the gas flow controls the radius of the plasma jet.
Please note!
This machine is only designed to use compressed air as “gas”.
Installation environment
Make sure that the working area is sufficiently ventilated. If the device is used without sufficient cooling, the power-on time reduces and it can result in overheating. Additional protection can be required for this purpose:

- The device must be free-standing with a distance of at least 0.5 m all around.
- Ventilation slots must not be blocked or covered.
- The device must not be used as a storage place and tools or other items must not be placed on the device. It

must be operated in a dry and well-ventilated working environment.

Remaining hazards
The machine has been built using modern technology in accordance with recognized safety rules. Some remaining hazards, however, may still exist.

- Injury through electric current if incorrect electric connection leads are used.
- Even when all safety measures are taken, some remaining hazards which are not yet evident may still be present.
- Remaining hazards can be minimized by following the safety instructions as well as the instructions in the chapter Authorized use and in the entire operating manual.
- Health hazards due to electrical power, with the use of improper electrical connection cables.
- Release the handle button and switch off the machine prior to any operations.
- Avoid accidental starts of the machine: Do not press the start button while inserting the plug into the socket.
- Use the tools recommended in this manual to obtain the best results from your machine.
- Always keep hands away from the work area when the machine is running.
- Eye injuries due to glare,
- Touching hot parts of the device or workpiece (burn injury),
- In case of improper protection risk of accident and fire through sparks and slag particles,
- Harmful emissions from smoke and gases if there is a lack of air or if closed rooms are insufficiently extracted.

Warning!
This electric tool generates an electromagnetic field during operation. This field can impair active or passive medical implants under certain conditions. In order to prevent the risk of serious or deadly injuries, we recommend that persons with medical implants consult with their physician and the manufacturer of the medical implant prior to operating the electric tool.

Technical data

Mains connection	230V — / 50Hz
Output	15 – 40A
On load factor*	35% at 40A (25°C) 20% at 40A (40°C)
Working pressure	4 – 4,5 bar
Insulation class	H
The energy efficiency of the power s ource	83.%
Power consumption when idle	20 W
Cutting capacity	0,1 mm – 12 mm (depending on the material)
Material	Copper: 1 – 4 mm Stainless steel: 1 – 8 mm Aluminum: 1 – 8 mm Iron: 1 – 10 mm Steel: 1 – 12 mm
Dimensions L x W x H	375 x 169 x 250 mm
Weight is Subject to technical chang es!	6 kg

Noise

⚠**WARNING:** Noise can have serious effects on your health. If the machine noise exceeds 85 dB (A), please wear suitable hearing protection.

On-load factor* = is the percentage of the operating time, in which the machine can be used continuously under normal temperature conditions. In relation to a 10-minute time period, this means, for example, that with a duty cycle of 20%, that it can be used for 2 minutes and then there should be a break of 8 minutes. If you exceed the duty cycle values then this will trigger the overheating protection which will bring the device to a stop until it has cooled down to the normal working temperature. Exceeding the duty cycle values continuously can damage the device.

Unpacking

Open the packaging and remove the device carefully. Remove the packaging material as well as the packaging and transport bracing (if available). Check that the delivery is complete. Check the device and accessory parts for transport damage. In case of complaints, the dealer must be informed immediately. Subsequent complaints will not be accepted. If possible, store the packaging until the warranty period has expired. Read the operating manual to make yourself familiar with the device prior to using it. Only use original parts for accessories as well as for wearing and spare parts. Spare parts are available from your specialized dealer. Specify our part numbers as well as the type and year of construction of the device in your orders.

⚠**ATTENTION**

The device and packaging materials are not toys!

Children must not be allowed to play with plastic bags, film, and small parts! There is a risk of swallowing and suffocation!

Attachment / Before starting the equipment

Place of installation

Make sure the work area is adequately ventilated. If the device is operated without sufficient cooling, the operating

time is reduced and overheating can occur. Additional protective measures may be required for this:

- The device must be set up freely, with a distance of at least 0.5 m all around.
- Ventilation slots must not be blocked or covered.
- The device may not be used as a shelf, and no tools or anything else may be placed on the device.
- It must be operated in a dry and well-ventilated work environment.

Connecting the cutting torch

- Insert the plasma burner plug (10a) into the plasma burner connection socket (10) and tighten the union nut hand-tight (see Fig. 1,3 + 4).
- Insert the plasma burner power plug (11a) into the plasma burner power socket (11) and tighten the union nut hand-tight (see Fig. 1,3 + 4).

Connecting the ground cable

- Connect the ground terminal plug (9a) with the ground terminal – connection socket (9). Make sure that the connecting shaft is first connected and then turned. The connecting shaft must face upwards when plugging in the ground cable plug (9a). After plugging in, the connecting shaft must be rotated in a clockwise direction until it reaches the stop, in order to lock it in place (see Fig. 1,3 + 5). This does not require force!

Connect the compressed air hose

- Connect the compressed air hose (19) on the back of the plasma cutter to the compressed air connection (19a). To do so, insert the side of the compressed air hose into the compressed air connection (19a) of the plasma cutter without a quick connector (see Fig. 9).
- The pressure can be set via the knob (21) on the condensate separator (see Fig. 9 – 12). Select a pressure of 4–4.5 bar.
- In order to release the compressed air hose (19), you must press the locking mechanism of the compressed air connection (19a) and pull out the compressed air hose (19) at the same time.

The compressed air source must have a filter and regulator.

⚠**IMPORTANT!** You must fully assemble the appliance before using it for the first time!

⚠**ATTENTION!** The ceramic cap (15) must only be screwed onto the burner (13) once it has been equipped with the electrode (18), the diffuser (17), and the nozzle (16). If these parts are missing, the device may malfunction and it may create a hazard for the operating personnel.

Initial operation

1. Set the plasma cutter up in a dry and well-ventilated area.
2. Position the machine in the vicinity of the workpiece.
3. Press the on/off switch (24).
4. Clamp the ground terminal (5) to the workpiece to be cut and make sure that there is good electrical contact.
5. Set the cutting current on the current controller (12). If the arc beam is interrupted the cutting current must be

set higher if necessary. If the electrode burns through frequently, then the cutting current must be set lower.

6. Position the plasma cutter (13) on the workpiece so that the sleeve (16) is free and that a blowback of the molten metal is not possible. Press the plasma burner button (14). The transmitted cutting arch is ignited on the edge of the sheet in this manner.
7. Start cutting slowly and then increase the speed to achieve the desired cutting quality
8. The speed must be regulated so that a good cutting capacity can be achieved. The plasma beam creates a straight arch (stainless steel, aluminum) or a 5° arch of approach (soft steel).

To cut in the manual cutting mode, pull the overlying burner across the workpiece while maintaining a constant speed. To achieve the perfect cut, it is important for the material thickness to comply with the correct cutting speed. If the cutting speed is too low, the cutting edge will be blunt due to the severe heat input. The optimal cutting speed is achieved once the cutting jet is slightly inclined towards the rear while cutting.
If the plasma burner button (14) is released, the plasma jet goes out and the power source switches off.
The gas continues to flow for approx. 5 seconds in order to cool the burner. The same process is followed when the workpiece is pulled out with a pressed plasma burner button (14). During the gas post-flow time, the plasma cutter must not be switched off to avoid damaging the plasma burner (13) as a result of overheating.
ATTENTION! The device must be left on for approx. 2-3 minutes once the cutting work has been completed. The cooler cools the electronics. Types of plasma cutting

Drag cutting

- Hold the tip of the sleeve (16) low over the workpiece and press the plasma burner button (14).
- Now move the sleeve until (16) there is contact with the workpiece and the cutting arch is fixed.
- Once the cutting arch has been generated, move the plasma burner (8) in the desired direction. Make sure that the burner sleeve is slightly (16) angled and that contact with the workpiece is maintained. This working method is called drag cutting. Avoid quick movements. A sign of quick movements sparked by the fall of the top of the workpiece.
- Move the plasma burner (13) at a speed at which the spark accumulation is concentrated on the bottom side of the workpiece. Ensure the material is completely separated prior to continuing with this process.
- Set the necessary drag speed.

Distance cutting

In some cases, it is beneficial to cut while holding the sleeve (16) at a height of 1.5 mm to 3 mm above the workpiece. This reduces the quantity of material that is blown back into the tip. This makes it possible to penetrate thicker material strengths.
Distance cutting should be used if penetration or furrow work is carried out. Furthermore, the “distance” working technique can be used when you need to cut sheet metal to minimize the risk of material splashing back which could damage the tip.

Perforation

- To drill through place the tip approx. 3.2 mm above the workpiece.
- Hold the plasma burner (13) at a slight angle to guide the sparks away from the sleeve (16) and your body.
- Press the plasma burner button (14) and lower the tip of the plasma burner until there is a main cutting arch and sparks begin to form.
- Test the perforation on a test object that is no longer needed and once there are no problems start drilling through at the previously defined cutting line on your workpiece.
- Check the plasma burner (13) for wear and tear, cracks, or exposed cable pieces. Replace or repair them prior to using the device. A badly worn sleeve (16) contributes to the reduction of speed, voltage, and unclean separation.

- An indication of a badly worn sleeve (16) is an extended or oversized nozzle opening. The external electrode (18) must not be recessed by more than 3.2 mm. Replace it if it is more worn than the specified dimension.
- If the protective cap is difficult to tighten, check the thread.

Electrical connection

The electrical motor installed is connected and ready for operation. The connection complies with the applicable VDE and DIN provisions.
The customer‘s mains connection as well as the extension cable used must also comply with these regulations.
Damaged electrical connection cable
The insulation on electrical connection cables is often damaged. This may have the following causes:

- Passage points, where connection cables are passed through windows or doors.
- Kinks where the connection cable has been improperly fastened or routed.
- Places where the connection cables have been cut due to being driven over.
- Insulation damage due to being ripped out of the wall outlet.
- Cracks due to the insulation aging.

Such damaged electrical connection cables must not be used and are life-threatening due to the insulation damage.
Check the electrical connection cables for damage regularly. Make sure that the connection cable does not hang on the power network during the inspection. Electrical connection cables must comply with the applicable VDE and DIN provisions. Only use connection cables with the same marking.
The printing of the type designation on the connection cable is mandatory.

Cleaning

- Switch off the main power supply and the main switch of the device prior to carrying out maintenance or repair work on the plasma cutter.
- Regularly clean the outside of the plasma cutter and its accessories. Use compressed air, cotton waste, or a brush to remove dirt and dust.
- In case of a defect or a necessary replacement of equipment parts, please contact the appropriately qualified personnel.

Transport

Switch off the device before transporting it.
Lift the plasma cutter using the carrying handle (1).

Storage

Store the device and its accessories in a dark, dry, and frost-proof place that is inaccessible to children. The optimum storage temperature is between 5 and 30˚C.
Cover the electrical tool in order to protect it from dust and moisture. Store the operating manual with the electrical tool.

Maintenance

⚠ **ATTENTION!** Pull out the power plug before carrying out any maintenance work on the equipment.

- The parts displayed in Figure 7 are the electrode (18), the diffuser (17), and the nozzle (16). They can be replaced once the ceramic cap (15) has been unscrewed.
- The electrode (18) must be replaced if there is a crater of approximately 1.5 mm depth in the center.
- The nozzle (16) must be placed if the central bore is damaged or if it has expanded in comparison to the drilling of a new nozzle. If the electrode (18) or the nozzle (16) are replaced too late, this can result in an overheating of the parts. This can reduce the life cycle of the diffuser (17).

Attention!

- The ceramic cap (15) must only be screwed onto the burner (13) once it has been equipped with the electrode (18), the diffuser (17), and the nozzle (16).

If these parts are missing, the device may malfunction and it may create a hazard for the operating personnel.
The plasma cutter must be regularly maintained for perfect function and to comply with safety requirements. The improper and wrong operation may cause failures and damage to the device. Have repairs only been conducted by qualified specialists?

Connections and repairs

Connections and repairs of electrical equipment may only be carried out by an electrician.
Please provide the following information in the event of any inquiries:
• Machine data-type plate

Service Information

Please note that the following parts of this product are subject to normal or natural wear and that the following parts are therefore also required for use as consumables.
Wear parts*: electrode, diffuser, nozzle
* Not necessarily included in the scope of delivery!
Spare parts and accessories can be obtained from our Service Centre. Spare parts and accessories can be obtained from our Service Centre.

Disposal and recycling

The equipment is supplied in packaging to prevent it from being damaged in transit. The raw materials in this packaging can be reused or recycled. The equipment and its accessories are made of various types of material, such as metal and plastic. Defective components must be disposed of as special waste. Ask your dealer or your local council.

Old devices must not be disposed of with household waste!

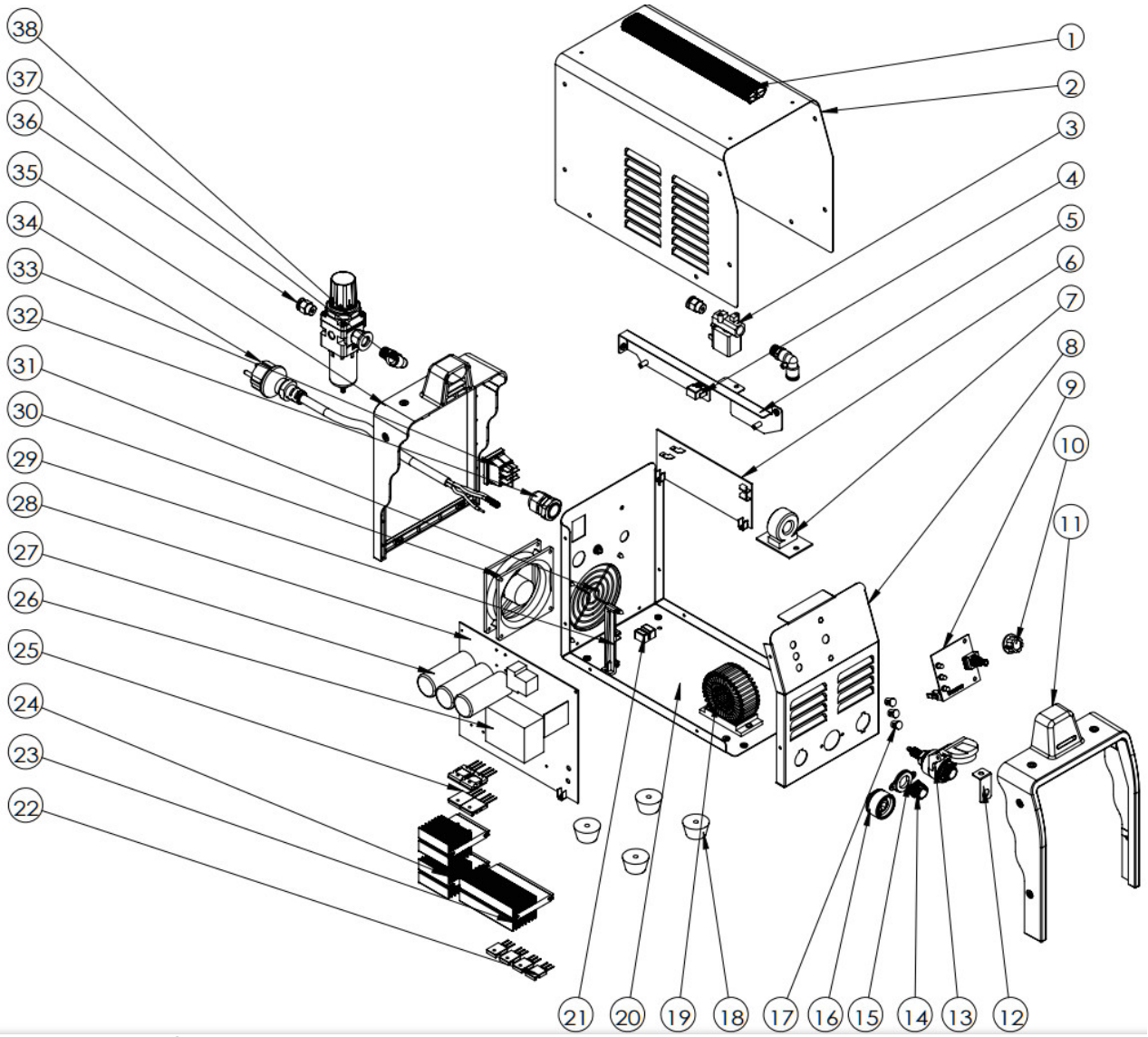
This symbol indicates that this product must not be disposed of together with domestic waste in compliance with the Directive (2012/19/EU) pertaining to waste electrical and electronic equipment (WEEE). This product must be disposed of at a designated collection point. This can occur, for example, by handing it in at an authorized collecting point for the recycling of waste electrical and electronic equipment. Improper handling of waste equipment may have negative consequences for the environment and human health due to potentially hazardous substances that are often contained in electrical and electronic equipment. By properly disposing of this product, you are also contributing to the effective use of natural resources. You can obtain information on collection points for waste equipment from your municipal administration, public waste disposal authority, an authorized body for the disposal of waste electrical and electronic equipment, or your waste disposal company.

Troubleshooting

The table below contains a list of error symptoms and explains what you can do to solve the problem if your tool fails to work properly. If the problem persists after working through the list, please contact your nearest service workshop.

Problem	Possible Cause	Remedy
Indicator lamp not lit up?	No electrical connection.	Check whether the device is connected t o the socket.
	ON/OFF switch set to off.	Switch the current switch to “on”.
The ventilator does not work?	A power line is interrupted.	Check whether the device is connected t o the socket.
	The power line ventilator is faulty.	
	A ventilator is faulty.	
Warning lamp switches on?	Overheating protection is switched on.	Allow the device to cool down.
	Input voltage too high.	Input voltage according to type plate.
No output current?	Machine faulty.	The machine must be repaired.
	Overvoltage protection activated.	Allow the device to cool down.
Output current does not decrease?	Input voltage too low.	Observe input voltage according to the ty pe plate.
	The connection cable cross-section is too low.	
Air current cannot be regulate d?	Compressed air hose damaged or f aulty.	New connection of the hose.
	Valve/manometer fails.	
HF-arc is not created?	The burner switch is faulty.	Renew electrode.
	Soldering point on the burner switch or plug loosened.	
	Valve/manometer fails.	
Bad ignition?	Burner wear parts damaged or wor n.	Change wear parts.
	Check HF spark gap.	Set spark gap.
Plasma burner 8 is not ready for operation?	The current switch is switched off.	Switch the current switch to “on”.
	Air transmission is restricted.	Another indication of this is a green flam e. Check the air supply.
	The workpiece is not connected to t he ground terminal.	Check the connections.
	The burner sleeve does not penetra te the material.	Increase the current.

Sparks fly upwards, instead of down through the material?	The burner sleeve is too far away from the material.	Reduce the distance between the burner sleeve and the material.
	Apparently, the material was not grounded properly.	Check the connection for correct grounding.
	The lifting speed is too quick.	Reduce the speed.
Initial cut but not completely drilled through?	Potential connection problem.	Check all connections.
Slag formation on interfaces?	Tool/material creates heat.	Allow the material to cool down and then continue cutting
	Cutting speed too low or current too high.	Increase the speed and/or reduce the current until the slag has been reduced to a minimum.
	Plasma burner component parts are worn	Check and replace worn parts.
Does the arc stop during cutting?	Cutting speed too low.	Increase the cutting speed until the problem no longer exists.
	The plasma burner is held too high and too far away from the material.	Lower the plasma burner to the recommended height.
	Plasma burner component parts are worn	Check and replace worn parts.
	The workpiece is no longer connected to the grounding cable.	Check the connections.
Insufficient Penetration?	Cutting speed too fast.	Slow down the working speed
	The burner sleeve is not straight	Adjust the inclination.
	Metal is too thick.	Several cycles are necessary.
	Plasma burner component parts are worn	Check and replace worn parts.



CE Declaration of Conformity

CE

hereby declares the following conformity under the EU Directive and standards for the following article
Article name: PLASMA CUTTER – PLC40

	2014/29/EU		2004/22/EC	89/686/EC_96/58/EC
x	2014/35/EU		2014/68/EU	90/396/EC
x	2014/30/EU	x	2011/65/EU*	
2006/42/EC				
	Annex IV Notified Body: Notified Body No.: Certificate No.:			

	2000/14/EC_2005/88/EC
	Annex V
	Annex VI Noise: measured LWA = xx dB(A); guaranteed LWA = xx dB(A) P = xx KW; L/Ø = cm Notified Body: Notified Body No.:
	2010/26/EC
	Emission. No:

Standard references:
EN 60974-10:2014+A1:2015; EN 60974-1:2012
The object of the declaration described above fulfills the regulations of the directive 2011/65/EU of the European Parliament and Council from 8th June 2011, on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
First CE: 2019
Subject to change without notice

Warranty
Apparent defects must be notified within 8 days from the receipt of the goods. Otherwise, the buyerís rights of claim due to such defects are invalidated. We guarantee our machines in case of proper treatment for the time of the statutory warranty period from delivery in such a way that we replace any machine part free of charge which provably becomes unusable due to faulty material or defects of fabrication within such period of time. With respect to parts not manufactured by us, we only warrant insofar as we are entitled to warranty claims against the upstream suppliers. The costs for the installation of the new parts shall be borne by the buyer. The cancellation of the sale or the reduction of the purchase price as well as any other claims for damages shall be excluded.

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Documents / Resources

	scheppach PLC40 Plasma Cutting Machine [pdf] Instruction Manual PLC40, Plasma Cutting Machine, Cutting Machine, Plasma Cutting, PLC40, Plasma Cutter