

STAHLWERK®

STAHLWERK Schweißgeräte Deutschland
Auf dem Schurwessel 31 / D-53347 Alfter / Germany

OPERATION MANUAL

PLASMA CUTTER CUT 70 S PILOT

Modell 2017



Please read the operating instructions before use!
There is a risk of non-reading!



The devices are marked with the CE marking.

© 2017

Stand 05/2017 – Subject to change

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DISCLAIMER

All efforts have been made to ensure the correctness and completeness of the information in this manual. We reserve the right to change specifications at any time.

IMPORTANT INSTRUCTIONS

NOTE

During welding or cutting you will be confronted with possible hazards. For this reason, please read these operating instructions carefully before using the appliance. Understand these instructions, familiarize yourself with the device and its operation. Observe the general safety instructions for your own safety. Always pass this manual with the appliance if you hand it over to other persons.

ATTENTION

There are many situations where you may be injured during welding or cutting. For this reason, you should consider protecting yourself appropriately. For more details please refer to the application safety guidelines, which correspond to the manufacturers preventive requirements.

Functional Disorder – If problems occur, rely on professionals!

If you have any problems with the repair or use of the appliance, please contact a specialist. Please follow the instructions for the control examination.

If you do not fully understand the operating instructions or if you cannot correct the error by means of operating instructions, you should contact your dealer for professional help.

DANGER

Electrical shock can lead to death!

A welding machine works with high voltages. These can lead to life-threatening burns or even to fatal electric shock.

Also when touching low voltages you can be frightened and in the event of an accident.

- Open the appliance only by qualified personnel!
- Do not touch any live power source on the unit!
- Connection and connection cables must be defect-free!
- Place the welding torch and electrode holder in isolation!
- Wear only dry protective clothing!

Gases and vapors can harm your health, or even lead to death! If necessary, wear a respirator and provide sufficient fresh air.

Risk of fire!

Welding sparks, slag and hot parts can ignite or other objects. Have funds available for counter-measures.

Electromagnetic fields!

Electrical or electromagnetic fields can be generated by the current source, which can be electronic devices such as CNC devices, telecommunication lines, computer systems and for example heart pacemaker in their function.

No improper repairs and modifications!

In order to avoid injuries and damage to the device, the device may only be repaired or modified by competent, qualified persons! Warranty is void if unauthorized!

- In the event of a repair, hire qualified persons (competent service personnel)!

WARNING

Hazards due to improper use! The device is manufactured according to the state of the art and the rules and standards. If the device is not used in accordance with its intended use, the device may pose a risk to persons, animals and property. No liability is accepted for any resulting damage!

- Only use the appliance in accordance with its intended use and by trained, competent personnel!
- Do not modify or change the appliance improperly!

WARNING

Risk of injury from radiation or heat!

Arc radiation can harm your eye and cause contact with hot workpieces to burn.

Use a suitable helmet and light filter, wear protective clothing to protect your body as well. Use a suitable helmet or darkening to allow good visibility.

Extreme volume can cause hearing damage!

Use ear protectors or other aids to protect the ear. Noise above 70 dB can cause hearing damage.

Risk of explosion! Apparently harmless substances in closed containers can build up overpressure by heating!

- Remove containers with flammable or explosive liquids from the working area!
- Do not heat explosive liquids, dusts or gases by welding or cutting!

ATTENTION

Obligations of the operator! In the European Economic Area (EWR), the respective national implementation of the framework guidelines must be complied with and observed!

- National implementation of the Framework Directive (89/391/EEG) and the related individual directives.
- In particular, Directive (89/655/EEG) on the minimum health and safety requirements for the use of work equipment by workers at work.
- The accident prevention regulations of the respective country (for example in Germany the BGV D 1)
- Check the safety-conscious work of the user at regular intervals! Damage caused by foreign components! The manufacturing guarantee expires in case of equipment damage caused by external components!
- Only use system components and options (current sources, welding torches, electrode holders, remote control, spare and war parts, etc.) from our product range!
- Connect the accessory component to the connection socket only when the power source is switched off and lock it! Electromagnetic interference! According to IEC 60974-10 the devices are intended for use in industrial areas. If, for example, used in residential areas, difficulties can arise if electromagnetic compatibility is to be endured.
- Check the influence of other devices!

CONTROL PANEL DESCRIPTION



*Picture may differ

1. Display
2. The cutting current is infinitely variable between 20 and 70 Ampere.
3. Overheat protection (CURRENT" and/or „OC“ luminaire. Starts as soon as the device is overloaded (depending on the model – URRENT). A yellow (if applicable, green is the case of a POWER) indicator light turns on and goes out as soon as the unit has cooled down again.
4. ON-OFF switch










CONNECTION PANEL DESCRIPTION



*Picture may differ

1. Connection for the torch
2. Power supply for the torch
3. Pilot ARC – Connection terminal for torch
4. Connection for ground cable

FUNCTIONS / CAPABILITY CHARACTERISTICS

PLASMA 	With the integrated Plasma Cutter CUT 70 S Pilot can be cut without problems all conductive metals. For example: aluminum, steel, copper, brass, titanium and so on.
 CUT to 25mm	Cutting power up to 25 mm Material thickness (depending on material).
PILOT ARC 	CUT PILOT - Plasmatic sinus with pilot arc. - Non-contact pilot ignition.
Automatic Gas post-flow 	Gas post-flow protects the tungsten electrode from excessive wear and protects the weld seam for oxidation. Automatically controlled air afterflow time for the cooling system.
TOSHIBA MOSFET 	With all our devices, we trust in MOSFET technology from Toshiba , whose innovative solutions set new standards in welding technology.
SMART COOLING 	Smart Cooling Fast cooling fan allows maximum power consumption and increases the operating time (ED) of the unit.
OVERHEATING CONTROL 	Overheating -Control (O.C. - Overheating Control). Overheat protection starts as soon as the unit is overloaded. A yellow indicator light turns on and goes out as soon as the unit has cooled down again.
	The welding machine is connected directly to the three-phase alternating current (AC) 400 V (+ -15%), 50/60 Hz operation. The three-phase alternating current is to be protected in the household with a 16 A fuse.
STAHLWERK S-GUARD HOUSING 	S-Guard-Housing is ergonomic, robust and operationally reliable: - Sturdy sheet steel housing, - Shock-proof, - Hard plastic formwork, - Control panel conveniently accessible and easier to operate, - Intelligent fan guide.

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS

NOTE

Values are only valid for correct operation and use of STAHLWERK original parts.

Operating

Temperature range -5 °C to +40 °C

Transport and Storage

Storage in closed room, Temperature range -15 °C to +55 °C

Data Sheet

Output current CUT	20-70 A
Duty cycle CUT 60%	70 A
Duty cycle CUT 100%	40 A
Cutting strength (depending on the material)	25 mm
ARC	PILOT-ARC
Open circuit voltage	230 V
Protection class	IP21
Insulation class	F
Mains voltage	400 V AC (+/-15%) / 3 ~
Mains frequency	50/60 Hz
Mains fuse	3 x 16 A
Maximum connected power	7,8 kVA
Required compressor power	> 8 kVA / 3 ~
Weight	19,0 kg
Dimension L x B x H (mm)	550 x 220 x 430
Mains plug type	CEE 16 A 3L 6h
Norm	IEC 60 974-1 ; CE

Technical requirements CUT compressor:

Required gas / air - flow	120 L/Min
Required air pressure	Up to 6,5 Bar

CONSTRUCTION PLASMA-BURNER



*Picture may differ

1. Ceramic cap
2. Plasma nozzle
3. Plasma electrode
4. Plasma head

To assemble:

- No. 3 in 4 screw in
- No. 2 over 3 in 4 screw in
- No. 1 on 4 screw in

Assemble CUT:

Connect the ground cable to the socket labeled + (plus) and CUT .

Depending on the type of cable-hose assembly, the connection is made to the marked, the gas thread connection and the two – (minus) pole switch box.

The female connector and the gas-threaded connector marked with – (minus) are both current-carrying. The connection of a cable-hose assembly with gas and current supply in one is thus easily possible. The clamp of the ground cable is connected to the workpiece to be cut.

OPERATION MANUAL CUT 70 S PILOT

The compressed air must be connected to the rear of the unit.
The water separator with manometer is required for this. The output of the water separator is connected to the input of the cutting unit. The compressed air is then connected to the inlet of the water separator.

The compressor must have the necessary working pressure.

The arc is ignited by the pilot function without contact to the workpiece and guided along the desired cut. Simultaneously with the igniting arc, the compressed air is blown from the gas nozzle at the front.

In the arc, the material is liquefied and blown out of the solid material with the compressed air. This creates a sharp dividing line in the material. The current intensity is selected as a function of the material thickness.

It is important that the compressor delivers really constant pressure, otherwise it results in a dirty cutting pattern. A compressor that is too small is therefore not suitable for this cutting performance.

It is possible to separate steel and stainless steel in this way, but also aluminum and non-ferrous metals such as copper.

BEFORE IMPLEMENTING

NOTE

Machine cooling

In order to achieve an optimum duty cycle of the power parts, please pay attention to the following conditions:

- Ensure adequate ventilation in the workplace
- Air inlet and outlet openings of the appliance
- Metal parts, dust or other foreign objects must not penetrate the device

Ensure that the air supply to the machine is not covered or blocked, otherwise the cooling system may fail.

ATTENTION

Damage caused by foreign components!

The manufacturing guarantee expires in case of equipment damage caused by external components!

- Only use systems components and options (current sources, welding torches, electrode holders, remote control, spare and wear parts, etc.) from our product range!
- Connect the accessory component to the connection socket only when the power source is switched off and lock it!

ATTENTION

Damage to equipment by operation in non-upright position!

The devices are designed for operation in an upright position. Operation in other positions can damage or override the device and safety devices of the device!

Risk of death!

The device may only be installed and operated on a suitable, load-bearing and level surface (also outdoors in accordance with IP 21)!

- Provide for non-slip, level ground and adequate workplace lighting.
- Safe operation of the device must be ensured at all times.

ATTENTION

Damage to equipment due to pollution!

Excessively high quantity of dust or other substances can damage the device.

IMPLEMENTING

DANGER

Risk of injury from electrical voltage!

Contact of live parts, for example welding current sockets, can be hazardous to life!

- Commissioning only by persons with appropriate knowledge of the use of arc welding devices!
- Connect the connecting or welding lines (for example electrode holder, welding torch, workpiece cable, interfaces) with the device switched off!

Risk of injury from electrical voltage after switching off! Working on the open device can lead to injuries with a death row! During operation, capacitors are charged with electrical voltage in the device. This voltage is still up to 5 minutes after the power cord is unplugged.

1. Turn the unit off.
2. Disconnect the appliance reliably from the mains: pull the mains plug!
3. Wait at least 5 minutes until the capacitors are discharged!

DANGER

Danger due to improper mains connection!

Incorrect mains connection can lead to persons or property damage!

- The power cord must be properly connected to the ground.
- Only operate the appliance at a socket with a protective grounding conductor.
- If a new mains plug has to be connected, this installation must only be carried out by a qualified electrician according to the respective national laws or national regulations (any phase sequence for three-phase current generators)!
- Mains plug, plug and socket must be checked at regular intervals by an electrician!

DANGER

Incorrect handling of the protective gas bottle can lead to serious injuries and death!

ATTENTION

Risk of burning at the welding current connection! By means of non-locking welding current connections, connections and lines can be heated and lead to burns on contact!

- Check welding connections daily and, if necessary, lock them by turning clockwise.

WARNING

Risk of burning due to improper connection of the ground terminal!

Color, rust or other contamination at the connection point impede the current flow and can lead to the heating of components!

WARNING

When working with this unit, please consider proper protective clothing.

When welding and cutting, the skin and eyes must be protected from the aggressive radiation.

MMA welding and plasma cutting also involve the risk of inflammation. Again, skin and eyes must be protected.

MAINS SUPPLY

DANGER

Danger due to improper mains connection!

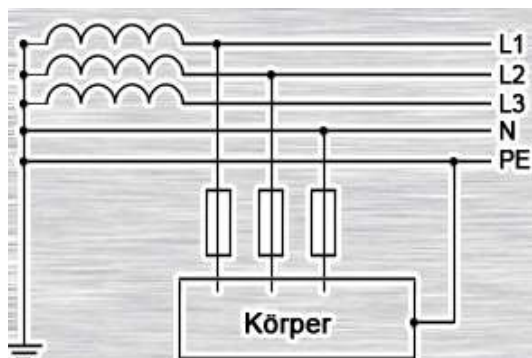
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NETWORK CONFIGURATION

NOTE

The device may only be connected and operated on a single-phase 2-wire system with a grounded neutral conductor.



Pos.	Marking	Id. color
L1	Outer conductor 1	Black
L2	Outer conductor 2	Brown
L3	Outer conductor 3	Gray
N	Neutral conductor	Blue
PE	Protective conductor	Green-Yellow

ATTENTION

Operating voltage – Mains voltage!

The operating voltage must correspond to the mains voltage in order to avoid damage to the device!

- Plug the mains plug of the disconnected device into a suitable socket.

MAINTENANCE

NOTE

Proper, regular maintenance and cleaning of the device is a prerequisite for the maintenance of your warranty claims.

Daily maintenance

- General visual inspection
- Check the mains plug
- Correct connection

Weekly maintenance

- External relief from dust

Monthly maintenance

- The device must be cleaned from the inside, depending on the degree of use

Yearly maintenance

Repeat inspection according to standard IEC 60974-4 „Periodic inspection and testing during operation“. Further information can be found in DIN VDE 0544-4.

CHECK

Procedure

Visual inspection

Electrical test

- *Open-circuit voltage*
- *Insulating resistance*
- *Protective conductor resistance*

Functional Test

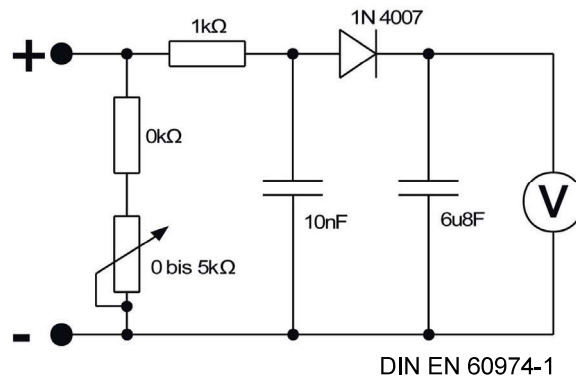
Documentation

NOTE

The testing of the plasma cutting machine is to be carried out only by competent, qualified persons.

The qualified person is who, by virtue of their training, knowledge and experience, can recognize the hazards and possible consequential damage that may occur during the testing of welding current sources and can take the necessary safety measures. If one of the tests below is not fulfilled, the device may only be put into operation again after repair and re-testing!

Measurement of open-circuit voltage



The permissible tolerance of the components of the circuit is $\pm 5\%$.

The voltmeter has an internal resistance of at least 1 M-Ohm and measures voltage values with a measuring accuracy of $\pm 1\%$ of the measuring range. In order to obtain the highest peak value – measured with the load from 0.2 to 5.2 k-ohms – the potentiometer must be adjusted from 0 to 5 k-ohms during the measurement.

Repeat the measurement with the opposite polarity. The higher measured value applies.

Effective value are measured with a load of 5 ± 0.25 k-ohm in the outer welding circuit with a device of the accuracy class 1 for measuring true effective value.

Isulating resistance

Mains circuit against welding circuit and electronics 5 M-ohm.

Welding circuit and electronics against protective conductor circuit (PE) 2.5 M-ohm.

Mains circuit against protective conductor circuit (PE) 2.5 M-ohm

Protective conductor resistance

Is between the contact's protective contact and conductive parts, such as housing screws, housing covers, etc. during the measurement, the connection cable must be moved along its entire length.

The resistance must not exceed 0.3 ohm for a mains connection cable up to 5m length. For longer lines, the permissible value is increased by 0.1 ohm 75 m line. However, the maximum permissible value is 1 ohm.

CLEANING

DANGER

Risk of electric shock!

The device must be cleaned only when the device is disconnected from the mains.

1. Turn the unit off.
2. Disconnect the device from the mains: pull the mains plug!
5. Wait at least 5 minutes until the capacitors are discharged.

Use compressed air to blow off or vacuum the current source and electronics, depending on the type of dust.

Frequently asked questions / Problem handling

Machine-dependent

The device you purchased is subject to careful final control and multiple final checks. If a fault occurs, please check whether one of the statements below applies to your case and whether the solutions possible provide a remedy.

Plasma / Problems ignition

If you have problems with ignition, please check the following:

- Earth clamp to plasma
- Required air pressure 4,5 BAR (CUT 50, CUT 55, CUT 55 S)
- Required air pressure 6,5 BAR (CUT 70, 70 S).
- Required air pressure 7,5 BAR (CUT 120, CUT 120 S)
- Replace the nozzles and the electrodes and ensure that the electrodes are firmly. Tighten slightly with a pliers.
- Water in the boiler of the compressor. There must be no water in the boiler
- Water in the water separator. There must be not water in the separator.
- For CUT50, CUT 50 S and CUT 55, make sure that the nozzle touches the workpiece, then press the button on the burner.

All knobs are set to zero, except the welding current

Automatic helmet between fades up or darkens no longer properly

Sensitivity (left) for the sensitivity always set to maximum, otherwise the helmet is deflected by other light sources. Replace button cells with new ones.

DISTURBANCE

In the event of a fault, please contact our customer service. Please send an e-mail to technik@stahlwerk-schweissgeraete.de

GUARANTEE

5 * years warranty on electronic components.

* Three year durability warranty following two year legal warranty.

The warranty period is two years and starts the day on which you received the goods.
The duration of the connection guarantee is three years and begins after expiry of the warranty period, so after two years from receipt of the goods.

The guarantee covers all components in the housing of the device. In particular, it relates to the circuit boards.

It does not extend to the housing and its external components and connecting parts, such as the hose pack or the mass clamp or so. It also does not extend to the supplied accessory, which is not used in the device interior.

The warranty does not cover defects caused by manipulation or misuse.

Should you wish to report a warranty claim, please send an e-mail to technik@stahlwerk-schweissgeraete.de.



STAHLWERK®
Schweissgeräte



EG - Konformitätserklärung
EC – Declaration of Conformity

Hiermit erklären wir, dass das bezeichnete Gerät in seiner Konzeption und Bauart sowie in der von uns in Verkehr gebrachten Ausführung den grundlegenden Sicherheitsanforderungen der unten genannten EG- Richtlinien entspricht. Im Falle von unbefugten Veränderungen verliert diese Erklärung ihre Gültigkeit.

We hereby declare that the machine below conforms to the basic safety requirements of the EC Directives cited both in its design and construction, and in the version released by us. This declaration shall become void in the event of unauthorized modifications.

Hersteller
Manufacture

STAHLWERK WELDING TECHNOLOGY
DEUTSCHLAND

Anschrift des Herstellers
Address of manufacturer

Hansestr. 101
DE - 51149 Köln
Germany

Gerätebezeichnung
Description of the machine

STAHLWERK CUT 70 S PILOT

Zutreffende EG - Richtlinien
Applicable EU - guidelines

EG - Niederspannungsrichtlinie (2006/95/EG)
EC – Low Voltage Directive (2006/95/EC)

Angewandte harmonisierte Normen
Used co-ordinated norms EN 60974

Unterschrift *Signature*
Okan Balaban
Inhaber