

**PLASMA CUTTING MACHINE**

**PEGAS 101 PLASMA**

**OPERATING MANUAL**

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## 1. INTRODUCTION

Congratulations on your new ALFA IN product. We are proud to have you as our customer and will strive to provide you with the best service and reliability in the industry.

This Operating Manual has been designed to instruct you on the correct use and operation of your ALFA IN product. Your satisfaction with this product and its safe operation is our ultimate concern. Therefore please take the time to read the entire manual, especially the Safety Precautions. They will help you to avoid potential hazards that may exist when working with this product.

Read and understand this entire Manual and your employer's safety practices before installing, operating, or servicing the equipment. While the information contained in this Manual represents the Manufacturer's best judgement, the Manufacturer assumes no liability for its use.

Machine PEGAS 101 PLASMA is designed for cutting metal on the basis of modern technology cutting material through a thin beam plasma gas.

PEGAS 101 PLASMA is designed for high-quality cutting of materials up to 40 mm thick carbon steel (for more information, see instructions below). Productive cutting of carbon steel can be to a thickness of 25 mm. At lower demands on the quality of the cut can be cut through (separate) the material thickness to 50 mm.

We reserve the law of adjustments and changes in case of printing errors, change of technical paramaters, accessories etc. without previous notice. These changes may not be reflected in the manuals for use in paper or electronic form.



## **2. SAFETY INSTRUCTIONS AND WARNINGS**

1. OPERATION AND MAINTENANCE OF PLASMA ARC EQUIPMENT CAN BE DANGEROUS AND HAZARDOUS TO YOUR HEALTH.
2. Plasma arc cutting produces intense electric and magnetic emissions that may interfere with the proper function of cardiac pacemakers, hearing aids, or other electronic health equipment. Persons who work near plasma arc cutting applications should consult their medical health professional and the manufacturer of the health equipment to determine whether a hazard exists.
3. Once the packing has been opened, make sure that the machine is not damaged. If in any doubt, call the service centre.
4. This equipment must only be used by qualified personnel.
5. During installation, any electric work must only be carried out by trained personnel.
6. The machine must be used in a dry place with good ventilation.
7. Make sure that no metal dust can be drawn in by the fan inside the machine, as this could cause damage to the electronic circuits.
8. It is prohibited to connect more than one INVERTER generator in series or in parallel.
9. When installing the machine, follow the local regulations on safety.
10. The position of the machine must allow easy access by the operator to the controls and connectors.
11. When the cutting machine is operating, all its covers and doors must be closed and well fixed.
12. Do not expose the cutting machine to direct sunlight or to heavy rain. This equipment conforms to protection rating IP 23 S.
13. The operator must wear gloves, clothes, shoes, and a helmet or a welder's helmet, which protect and are fire-resistant in order to protect him against electric shock, flashes and sparks from cutting.
14. The operator must protect his eyes with safety visor or mask designed for welding, fitted with standard safety filters. He should also be aware that during plasma cutting ULTRAVIOLET RADIATION is emitted. Therefore it is vital that his face is also protected from radiation. Ultraviolet rays produce the same harmful effect as sun burning on unprotected skin.
15. The operator is obliged to warn anyone near the cutting area of the risks that cutting involves and to arrange to provide adequate protection equipment.
16. Keep all fumes and gases from the breathing area.
17. Keep your head out of the fume plume.
18. Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
19. The kinds of fumes and gases from the plasma arc depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain

one or more of the following:

Antimony	Chromium	Mercury
Nickel	Cobalt	Arsenic
Barium	Copper	Selenium
Beryllium	Lead	Silver
Cadmium	Manganese	Vanadium

20. Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are using. These MSDSs will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.
21. It is very important to arrange for sufficient ventilation, especially when cutting in enclosed spaces. We suggest using suitable fume extractors to prevent the risk of intoxication by fumes or gas generated by the cutting process.
22. Noise can cause permanent hearing loss. Plasma arc processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.
23. To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs. Protect others in the workplace.
24. Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.
25. The operator must ensure all flammable materials are removed from the work area to avoid any risk of fire.
26. The operator must NEVER cut containers that have previously contained petrol, lubricants, gas or similar flammable materials, even if the container has been empty for a considerable time. THERE IS A VERY HIGH RISK OF EXPLOSION.
27. The operator must be aware of all the special regulations which he needs to conform to when cutting in enclosed spaces with a high risk of explosion.
28. To prevent electric shock, we strongly suggest the following rules:
  - a) Do not work in a damp or humid environment.
  - b) Do not use the machine if its cables are damaged in any way.
  - c) Make sure that the earthing system of the electric equipment is correctly connected and operational.
  - d) The operator must be insulated from the metal components connected to the return wire.
  - e) The earthing of the piece being worked could increase the risk of injury to the operator.
29. EN 60974-1 Standard: Open-circuit voltage. During the operation of the machine, the highest voltage, with which it is possible to come into contact, is the open-circuit voltage between the clamps. In our generator this voltage is 380V.
30. The maximum open-circuit voltage of the plasma machines is established by national and international standards (EN 60974-1) depending on the type

of current to be used, on its waveform and on the hazards arising from the work place. These values are not applicable to the strike currents and those for stabilisation of the arc that could be above it.

31. The open-circuit voltage, for as many adjustments as possible, must never exceed the values relating to the various cases shown in the following table:

Case	Working conditions	Open-circuit voltage	
1	Places with increased risk of electric shock	DC current: 113V peak value	AC current: 68V peak value and 48V effective
2	Places without increased risk of electric shock	DC current: 113V peak value	AC current: 113V peak value and 80V effective
3	Torches held mechanically with increased protection for the operator	DC current: 141V peak value	AC current: 141V peak value and 100V effective
4	Plasma cutting	DC current: 500V peak value	

32. In case 1, the dc machines with rectifier must be built in such a way that, in case of a fault developing in the rectifier (for example open circuit, short circuit or lack of power), the permitted values cannot be exceeded. The

plasma cutting machines of this type can be marked with the symbol: 

33. Before opening the machine switch off the machine and disconnect it from the power socket.
34. Only personnel authorised by this company can carry out maintenance on the machine.

## PROTECTIVE UTILITIES

1. Welding helmet with filter shade at least 10
2. Welding gloves
3. Welding apron and cloth
4. Welding boots

## RISK OVERVIEW

1. Risk of electric shock
2. Ultraviolet light and light radiation
3. Risk of inhaling gas fumes and dust particles
4. Burns
5. Noise

 **NOTE** 

**The Machine Torches (AUT) must not be used with PEGAS 101 PLASMA. It may only be used together with PEGAS 101 PLASMA CNC.**

 **NOTE** 

1. It is forbidden to operate a machine with damaged insulation of the cutting torch or supply cable.
2. Never operate the machine taken down or damaged covers.
3. It is forbidden to operate the machine in wet environments and outdoors in rain or snow.
4. Ensure proper grounding clamping pliers, which also reduces the risk of electric shock.
5. Use prescribed protective utilities, keep them dry.
6. Plasma arc cutting produces intense electric and magnetic emissions that may interfere with the proper function of cardiac pacemakers, hearing aids, or other electronic health equipment. Persons who work near plasma arc cutting applications should consult their medical health professional and the manufacturer of the health equipment to determine whether a hazard exists.
7. Never aim the torch against the eyes, body or other person.

### **3. CONDITIONS OF USE**

1. This equipment must only be used by qualified personnel.
2. During installation, any electric work must only be carried out by trained personnel.
3. Device complies with IEC 61000-3-12.
4. Do not expose the plasma machine to direct sunlight or to rain or snow. This equipment conforms to protection rating IP 23 S.
5. Place the machine the way that the cooling air can enter the vents without restriction to. It is necessary to ensure that no impurities, especially metal particles, are not drawn into the machine.
6. Cutting machine in terms of interference suppression is intended primarily for industrial premises. In the case of use of other areas may be need for special measures (see EN 60974-10).
7. The machine must be protected against:
  - a. Moisture and rain and snow
  - b. Mechanical damage
  - c. Draft and any ventilation of neighbouring machine
  - d. Excessive overloading - crossing technical parameters
  - e. Rough handling

## ELECTROMAGNETIC COMPATIBILITY

The welding device is in terms of interference designed primarily for industrial areas. It meets the requirements of EN 60974-10 class A and it isn't designed for using in residential areas, where the electrical energy is supplied by public low-voltage power supply network. It can be here potential problems with ensuring of electromagnetic compatibility in this areas, due to interference caused by power lines as well as the radiated interference.

During operation, the device may be the source of interference.



Caution

We warn users, that they are responsible for possible interference from welding.

## 4. TECHNICAL DATA

PEGAS 101 PLASMA			
Method			Plasma cutting
Mains voltage		V/Hz	3 x 400/50-60
Cutting current range		A	20 - 100
Open-circuit voltage $U_{20}$		V	380
Mains protection		A	32 @
Max. effective current $I_{1eff}$		A	27,8
Cutting current (DC=100%) $I_2$		A	100
Cutting current (DC=60%) $I_2$		A	100
Cutting current (DC=x%) $I_2$		A	100%=100
Max. productive cut. thickness - carbon steel		mm	25
Max. cutting thickness - carbon steel (separate mat.)		mm	50
Quality cutting thickness	Carbon steel	mm	40
	Stainless steel	mm	30
	Aluminium	mm	20
	Copper	mm	15
Max. Input pressure (torch SCP 120)		bar	8,5
Working pressure (torch SCP 120)		bar	5,0
Air consumption (torch SCP 120)		l/min	200
Arc ignition			pneu-mechanic
Current regulation			continuous
Protection			IP 23 S
Standards			EN 60974-1, EN 60974-10 cl. A
Dimensions (w x l x h)		mm	240 x 440 x 675

Weight	kg	32,4	
<b>PEGAS 101 PLASMA CNC</b>			
Method		Plasma cutting	
Mains voltage	V/Hz	3 x 400/50-60	
Cutting current range	A	20 - 100	
Open-circuit voltage $U_{20}$	V	380	
Mains protection	A	32 @	
Max. effective current $I_{1eff}$	A	27,8	
Cutting current (DC=100%) $I_2$	A	100	
Cutting current (DC=60%) $I_2$	A	100	
Cutting current (DC=x%) $I_2$	A	100%=100	
Mild steel	Production pierce/cut ( $I_{2max}$ )	mm	12
	Production pierce/cut ( $I_2@DC=100%$ )	mm	12
	Maximum pierce/cut ( $I_{2max}$ )	mm	15
	Edge start/cut ( $I_{2max}$ )	mm	30
Max. Input pressure	bar	8,5	
Working pressure (torch TM 125/6m)	bar	5,5	
Air consumption (torch TM 125/6m)	l/min	295	
Arc ignition		pneu-mechanic	
Current regulation		continuous	
Protection		IP 23 S	
Standards		EN 60974-1, EN 60974-10 cl. A	
Dimensions (w x l x h)	mm	240 x 440 x 675	
Weight	kg	32,4	

## EXPLANATION OF TERMS (VALID ONLY WHILE USING ALFA IN ALFATEC CNC SYSTEM)

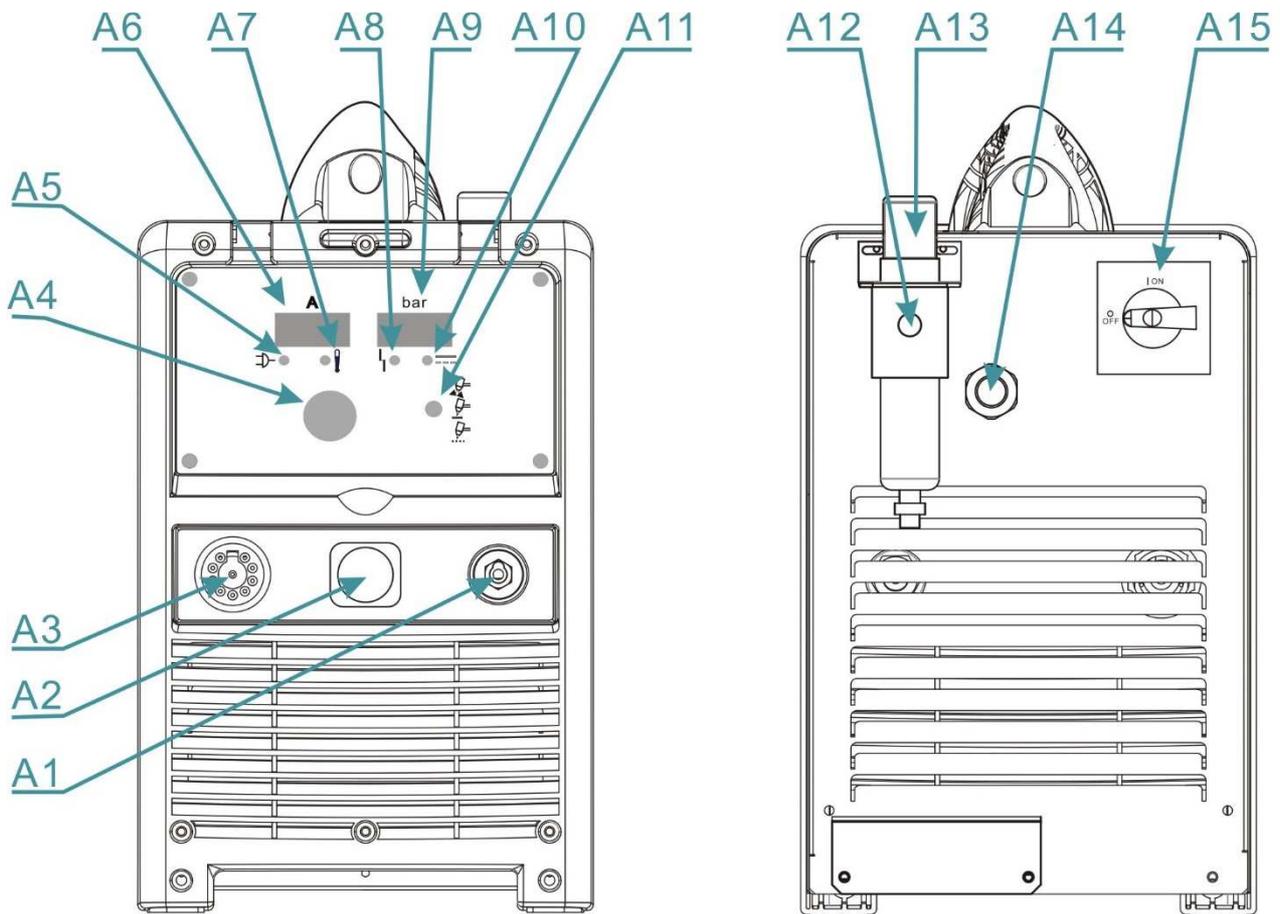
Productive Pierce / cutting ( $I_2$  max) means a cutting process whereby the plasma is set to the maximum cutting current and a good cut quality is achieved.

Productive Pierce / cutting (DC=100%) means a cutting process whereby the plasma is set to the current equal to 100% of duty cycle and a good cut quality is achieved.

Maximum Pierce / cutting ( $I_2$  max) means a cutting process whereby the plasma is set to the maximum cutting current and an acceptable cut quality is achieved.

Edge Start / cutting ( $I_2$  max) means a cutting process whereby the plasma is set to the maximum cutting current and an acceptable cut quality is achieved starting the cut from the edge of the material.

## 5. MAIN PARTS OF THE MACHINE FRONT AND REAR PANELS



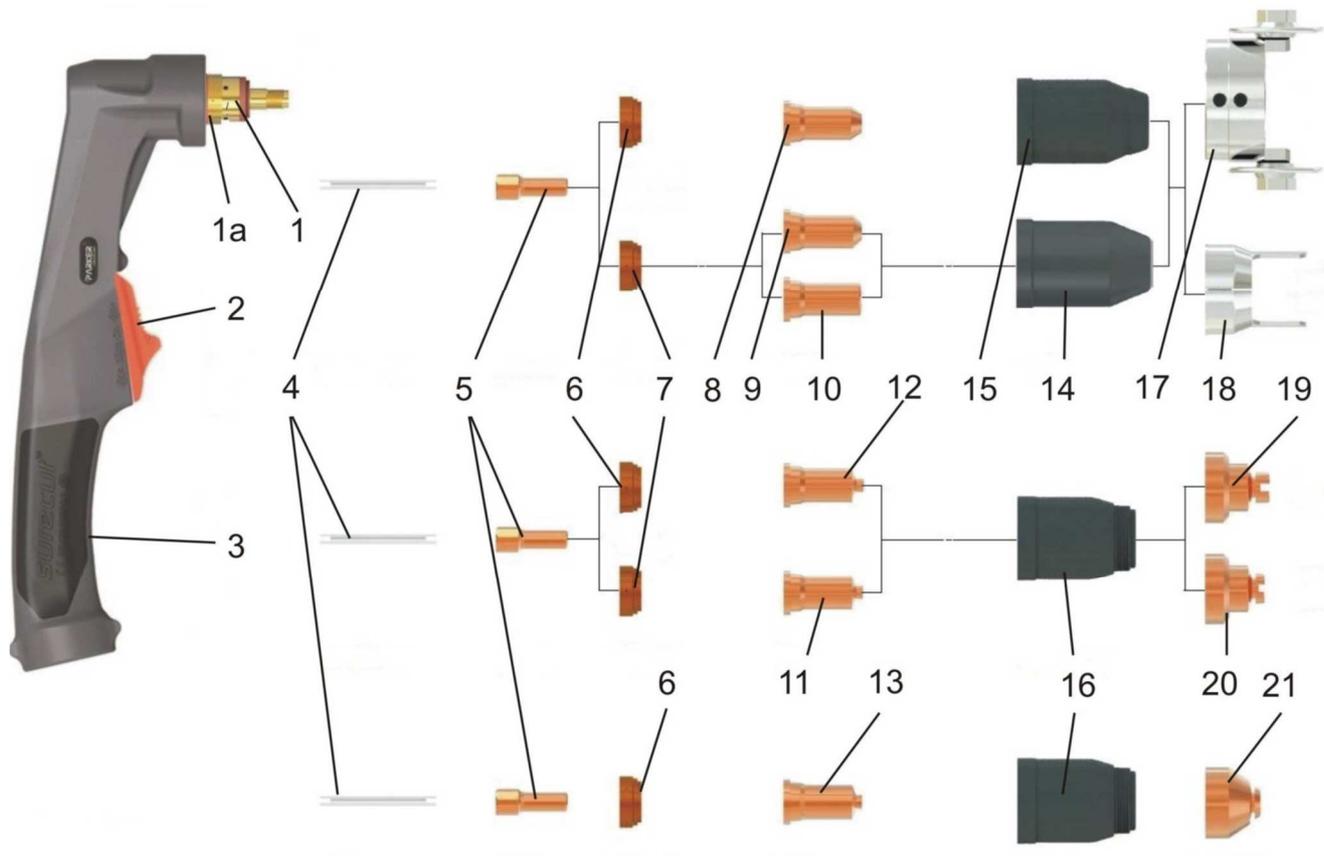
Picture 1 – The main parts

Pos.	Description
A1	Quick connector - earthing cable
A2	Connector - remote control – in standard doesn't work – only on request
A3	Connector - torch
A4	Potentiometer-set cut current
A5	 LED indicator – when illuminated, the machine is ON
A6	Value of a cutting current
A7	 LED indicator-overheating when illuminated, please leave the machine turned on and wait on cooling the machine down.

A8	 <p>1. LED indicator flashes – the Retaining Cup isn't on or is fitted badly 2. LED indicator shines – low gas pressure</p>
A9	Manometer
A10	 LED indicator – arc burning – after you press the torch button, it shines, on the torch is a voltage
A11	<p>Switch</p>  Setting of gas flow  Continuous cutting  Cutting material with gaps – Caution! Higher wear of nozzles and electrodes
A12	Gas fitting
A13	Controller
A14	Mains cable
A15	Switch ON/OFF

## 6. ACCESSORIES PART OF DELIVERY

Pos.	Code	Description
	V9030038	Earthing cable with clamp 3m 10-25 150A



Picture 2 – Torch SCP 120 6 m PEGAS – spare parts

### ON REQUEST

Pos.	Code	Description	
	SCP120-6-60	Torch Plasma SCP 120 6m PEGAS 60/101	
	5926-1	Torch TH-125 6 m Coax PEGAS 101/121	
	SCP1250	Circle Cutting Attachment 120	
	5302	Air Filter AT 1000	
	5304	Adapter for AT 1000 PEGAS PLASMA	
	S777a	Welding Helmet ALFA IN S777a Black	
5753 Set START to the torch SCP 120 (Recommended START set for the torch – Pic. 2)			Quantity
7	SCP1207	Swirl Ring 4 Holes 30-70A	1
10	SCP1222-09	Cutting Tip 0,9 Contact 30-40A	2
9	SCP1220-10	Cutting Tip 1,0 40-50A	2
9	SCP1220-11	Cutting Tip 1,1 50-60A	2
9	SCP1220-12	Cutting Tip 1,2 60-70A	2

8	SCP1221-14	Cutting Tip 1,4 80-90A	2
8	SCP1221-15	Cutting Tip 1,5 100-110A	2
5	SCP1204	Electrode SCP 120	10
14	SCP1230	Retaining Cup 30-70 A	1
11	SCP1226-10	Cutting Tip 1,0 Contact 40-50A	1
11	SCP1226-11	Cutting Tip 1,1 Contact 50-60A	1
16	SCP1232	Shield Cup Body	1
19	SCP8041	Shield Cup Contact 30-80 A	1
Parts of the torch (Pic. 2)			
<b>1</b>	<b>SCP1201</b>	<b>Torch Head SCP 120</b>	
<b>1a</b>	<b>5008</b>	<b>O-Ring</b>	
<b>2</b>	<b>SCP2516</b>	<b>Button SCP 120 PARKER</b>	
<b>3</b>	<b>SCP8014</b>	<b>Handle SCP 120</b>	
<b>4</b>	<b>SCP1202</b>	<b>Cooling Tube SCP 120</b>	
<b>5</b>	<b>SCP1204</b>	<b>Electrode SCP 120</b>	
<b>6</b>	<b>SCP1206</b>	<b>Swirl Ring 6 Holes 80-120A</b>	
7	SCP1207	Swirl Ring 4 Holes 30-70A	
8	SCP1221-14	Dýza 1,4 80-90A	
<b>8</b>	<b>SCP1221-15</b>	<b>Dýza 1,5 100-110A</b>	
9	SCP1220-10	Cutting Tip 1,0 40-50A	
9	SCP1220-11	Cutting Tip 1,1 50-60A	
9	SCP1220-12	Cutting Tip 1,2 60-70A	
10	SCP1222-09	Cutting Tip 0,9 Contact 30-40A	
11	SCP1226-10	Cutting Tip 1,0 Contact 40-50A	
11	SCP1226-11	Cutting Tip 1,1 Contact 50-60A	
11	SCP1226-12	Cutting Tip 1,2 Contact 60-70A	
12	SCP1227-14	Cutting Tip 1,4 Contact 80-90A	
12	SCP1227-15	Cutting Tip 1,5 Contact 100-110A	
13	SCP1228-22	Cutting Tip	
14	SCP1230	Retaining Cup 30-70A	
<b>15</b>	<b>SCP1231</b>	<b>Retaining Cup 80-120A</b>	
16	SCP1232	Shield Cup Body	
17	SCP1251	Cutting Buggy SCP 120	
<b>18</b>	<b>SCP1240</b>	<b>Double Pointed Spacer SCP 120</b>	
19	SCP8041	Shield Cup Contact 30-80A	
20	SCP1241	Shield Cup Contact 80-120A	
21	SCP8043	Shield Cup Gouging	

Note – the bold items are equipped on the torch

## 7. GETTING STARTED

Getting started must be consistent with technical data and conditions of use.

### FIRST STEPS



**NOTE** This equipment must only be used by qualified personnel.

1. Before beginning work is necessary to connect the machine to the mains.
2. Check completeness of the mounted cutting torch.
3. Connect the torch to the connector. By means of the thorn (part of the delivery) press the safety pin. Turn the nut of the connector clock wise and tight it properly.
4. Connect the mains cable **A14** to the on the network according 4 TECHNICAL DATA.
5. Connect the compressed air on connector **A12** on the rear wall of the machine.
6. Set the air pressure by means of regulator **A13** to 5.
7. Connect the mains plug to the mains socket.
8. After turning on the ON/OFF switch **A15** the display **A5** will illuminate.
9. Connect the work lead cable to the material being cut and to the connector **A1**.
10. Check up the input air pressure (min 5,0 bar, max 8,5 bar) and make a regulation if necessary.
11. Set potentiometer **A4** to the cutting power you need.
12. Fit the torch with appropriate type of cutting tip electrode and shield cup according to the selected cutting current.
13. Press the trigger on the cutting torch, the pre gas will flow for 1 s.
14. The pilot arc will start.
15. Shift the torch with the pilot arc close to the material, the pilot arc will change to cutting arc automatically. If you do not start cutting within 2 s, the arc will snuff off. If the torch delays during the cutting from the material, the arc will snuff off. In case that the machine is in mode Cutting material with gaps – switch **A11** position  , cutting arc will change to pilot arc and if you do not start cutting within 2 s, this arc will snuff off.
16. To finish the cutting process, release the torch trigger.

### REQUIREMENTS FOR SOURCE OF COMPRESSED AIR

1. Delivered air pressure must be max. 8,5 bar and min. 5,0 bar.
2. Air consumption minimal 220 l/min.
3. Compressed air for the plasma must be clean and dry.
4. Pressure dew point +3 °C.
5. Maximum oil content 0.1 mg/m<sup>3</sup>.

6. Maximal size of solid particles 15 microns.
7. The minimal size of an air tank is 50 l.
8. No additional oiling if the pressure air is permitted. That could damage the plasma machine and the cutting torch.

## OPTIONAL AIR FILTERS

To achieve high quality cutting and to avoid serious disturbances to the torch it is highly advised to include the air filter.

Pos.	Item No	Description
24	5302	Air filter AT 1000
25	5304	Set for filter AT 1000 to PEGAS Plasma

**NOTE** Max. allowable pressure of filter AT 1000 is 8,5 bar.



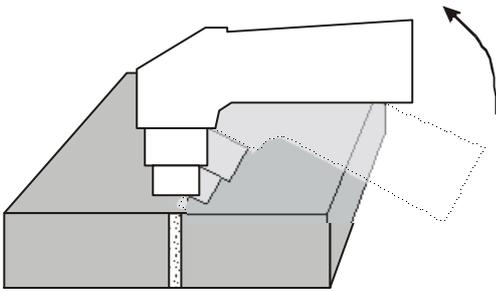
Picture 3 – Air filter

## 8. CUTTING

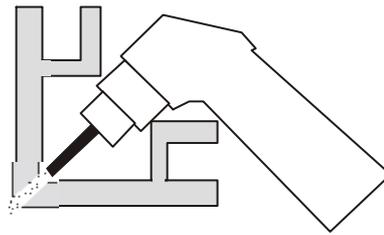
The table below show just referential values. The real values may change according the material qualities. The darker colour highlights heat area where the consumables are more worn off.

S 105	Carbon steel – material thickness and recommended cutting tips															
Cutting current	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	Tip
50 A																4546 (1,0)
70 A																4547 (1,2)
100 A																4548 (1,4)

1. Press the torch trigger. The pilot arc will ignite. Then you have to immediately attach the torch to the cut material. At this point begins to burn the main arc between the torch and the material.
2. Move the torch with a constant speed. Cutting speeds vary according to torch output amperage, the type of material being cut, and operator skill.
3. Output current setting or cutting speeds may be reduced to allow slower cutting when following a line, or using a template or cutting guide while still producing cuts of excellent quality
4. To achieve a good cutting quality make sure the distance between the tip and the material is about 3,5 mm. The Stand Off Guide located at the end of the plasma torch guarantees the distance. At a greater distance decreases cutting power and the arc may go off. With too small distance the torch parts will be worn off faster.
5. Plasma cutting may be done in all possible positions (vertically, horizontally, overhead, vertical ascending and descending), but as far as possible choose primarily horizontal cut. In other positions the operator is increasingly threatened by flying drops of molten material.
6. We recommend starting cutting at the edge of the material. If needed to start from the centre of the material, or to cut hole into the material, slightly tilt the torch head and gradually it straighten into a vertical position so the spraying material would not damage the cutting tip (see Pic. 4). This workflow must always be followed, if the thickness of material is above above 3 mm.
7. In case of cutting in the corner or around the corner (see Pic. 5), use the long electrode and cutting tip. The cutting power while using the Long cutting tip is decreased.



Picture 4 - Cutting



Picture 5 - Cutting

## IMPORTANT RULES

1. The pilot arc burning time should be limited only to the time necessary. It lowers the wear of the cutting tips and electrodes.
2. Never turn off the main switch immediately after finishing cutting but always leave time to run cooling cycle to cool down the torch. Immediate turn-off only in case of emergency.
3. Ensure a good el. Contact of the work lead clamps and cutting material.
4. Check and timely exchange cutting tips and the electrodes. Lifetime of these parts is only a few hours of cutting time and is highly dependent on compliance with the principles of good cutting.
5. Disconnect the machine from the mains before replacing the torch consumable parts.
6. Unplug the machine from the mains before any intervention inside the machine.
7. PEGAS 101 PLASMA is adapted for use with torch Plasma SCP 120 PEGAS 60/101. This combination comply with EN 60974-7 Article 10.1.4. Using any other type and design of a torch must be approved by ALFA IN a.s.
8. Imperfect capture of condensate would cause its elimination in the area of the cutting tip and it would prevent ignition of the pilot arc.

## SOURCES OF POOR QUALITY CUTS

### Shallow penetration of the cut

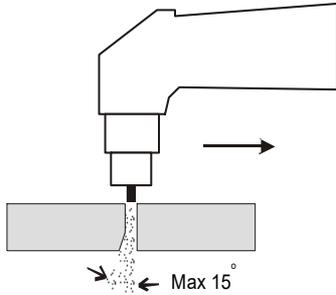
1. The cutting speed is too high. Make sure the slope of the cutting arc does not exceed about 15° (see Pic. 6).
2. High wear of the cutting tip or electrode (see Pic. 7)
3. Too large thickness of material and not adequately chosen value of current and diameter of the cutting tip.
4. Bad contact between the work lead clamps and material.

### Cutting arc is unstable, goes off and "shoots"

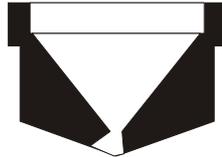
1. Worn out cutting tip or electrode
2. High pressure
3. Impurities in the pressure air
4. Not captured water condensate

## Conical cut

1. If there is a false cut (see Pic. 8) turn off the machine, release the shield cup and rotate the cutting tip about 1/4 and again try to cut.
2. Damaged cutting tip and electrode
3. The position of the torch is not perpendicular to the material
4. Too large distance from the cutting tip to the material.



Picture 6



Picture 7



Picture 8

## 9. MAINTENANCE

1. A great care should be taken to the cutting torch. The molten material sprays while cutting. This sputter contaminates the interior space of the torch. The worn parts (consumables) of a plasma torch should be regularly maintained and timely exchanged. Regularly check the condition of diffuser channels (see diagram of the torch). If contaminated, you must clean it with a pressure air or to replace the diffuser. Poor state of the diffuser has a negative impact on the quality of cutting and causes very strong interference that may cause the collapse of the machine control electronics or influence the surrounding devices. If the cable bundle of the torch is worn out it must be replaced immediately - danger of electrical shock.
2. Disconnect the PEGAS from the mains supply voltage before disassembling.
3. Special maintenance is not necessary for the control unit parts in the plasma cut machine. If these parts are damaged for any reason, replacement is recommended.



4. Do not blow air into the plasma cut during cleaning. Blowing air into the plasma cut can cause metal particles to interfere with sensitive electronic components and cause damage to the welder.
5. To clean the plasma cut, disconnect it from the mains supply voltage then open the enclosure and use a vacuum cleaner to remove any accumulated dirt and dust. The plasma cut should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.

6. Troubleshooting and repairing of PEGAS equipment should only be carried out only by suitably qualified or competent person.
7. A 'competent person' must be a person who has acquired through training, qualification or experience, or a combination of them, the knowledge and skills enabling that person to safely carry out a risk assessment and repairs to the electrical equipment in question.
8. The person carrying out the servicing needs and repairs must know what to look at, what to look for and what to do.

## ERROR MESSAGES

Error type	Error code	Description	LED status
Thermal relay	E01	Over-heating (1. thermal relay)	Yellow LED <b>A5</b> (thermal protection) always on.
	E02	Over-heating (2. thermal relay)	Yellow LED <b>A5</b> (thermal protection) always on.
	E03	Over-heating (3. thermal relay)	Yellow LED <b>A5</b> (thermal protection) always on.
	E04	Over-heating (4. thermal relay)	Yellow LED <b>A5</b> (thermal protection) always on.
	E09	Over-heating (program in default)	Yellow LED <b>A5</b> (thermal protection) always on.
Welding machine	E10	Phase loss	Yellow LED <b>A5</b> (thermal protection) always on.
	E11	No water	Yellow LED <b>A5</b> (lack water) always on.
	E12	No gas	Red LED <b>A8</b> always on.
	E13	Under voltage	Yellow LED <b>A5</b> (thermal protection) always on.
	E14	Over voltage	Yellow LED <b>A5</b> (thermal protection) always on.
	E15	Over current	Yellow LED <b>A5</b> (thermal protection) always on.
	E16	Wire feeder over load	
Switch	E20	Button fault on operating panel when switch on the machine	Yellow LED <b>A5</b> (thermal protection) always on.
	E21	Other faults on operating panel when switch on the machine	Yellow LED <b>A5</b> (thermal protection) always on.

	E22	Torch fault when switch on the machine	Yellow LED <b>A5</b> (thermal protection) always on.
	E23	Torch fault during normal working process	Yellow LED <b>A5</b> (thermal protection) always on.
Accessory	E30	Cutting torch disconnection	Red LED <b>A8</b> blink.
	E31	Water cooler disconnection	Yellow LED <b>A5</b> (lack water) always on.
Communication	E40	Connection problem between wire feeder and power source	
	E41	Communication error	

## 10. STATEMENT OF WARRANTY

1. In accordance with the warranty periods stated below, ALFA IN guarantees the proposed product to be free from defects in material or workmanship when operated in accordance with the written instructions as defined in this operating manual.
2. ALFA IN products are manufactured for use by commercial and industrial users and trained personnel with experience in the use and maintenance of electrical welding and cutting equipment.
3. ALFA IN will repair or replace, at its discretion, any warranted parts or components that fail due to defects in material or workmanship within the warranty period. The warranty period begins on the date of sale to the end user.
4. If warranty is being sought, please contact your ALFA IN product supplier for the warranty repair procedure.
5. ALFA IN warranty will not apply to:
  - a) Equipment that has been modified by any other party other than ALFA IN's own service personnel or with prior written consent obtained from ALFA IN Service Department.
  - b) Equipment that has been used beyond the specifications established in the operating manual.
  - c) Installation not in accordance with the installation/operating manual.
  - d) Any product that has been subjected to abuse, misuse, negligence or accident.
  - e) Failure to clean and maintain (including lack of lubrication, maintenance and protection), the machine as set forth in the operating, installation or service manual.
6. Within this operating manual are details regarding the maintenance

necessary to ensure trouble free operation.

7. Validity condition of warranty is, that the cutting machine must be used only with the torch, which is said in this manual.
8. As a warranty list serves proof of purchase (invoice) on which is the serial number of the machine.



Warranty repairs must be performed by either an ALFA IN Service Centre, an ALFA IN distributor or an Authorised Service Agent approved by the company ALFA IN.

## 11. DISPOSAL



Only for EU countries. Do not dispose of electric tools together with household waste material.

In accordance with European Council Directive 2002/96/EC on electrical and electronic equipment waste and its implementation in accordance with national law, electric tools that have reached the end of their service life must be collected separately and returned to an environmentally compatible

recycling facility.