

**WELDING MACHINE**

# **PEGAS 350 AC/DC PULSE**

**OPERATING MANUAL**

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# 1. INTRODUCTION

Dear consumer,

Company ALFA IN a.s. thanks you for buying our product and believe that you will be satisfied with our machine.

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.

PEGAS 350 AC/DC PULSE welds by those methods:

1. TIG DC (Lift arc or High Frequency ignition)
2. TIG AC (Lift arc or High Frequency ignition)
3. MMA DC coated electrodes up to 4,0 mm
4. MMA AC coated electrodes up to 4,0 mm

Welding machine may be operated only by trained persons and only in the technical provisions. Company ALFA IN a.s. accept no responsibility for damage caused by improper use. Before commissioning please read carefully this manual.

The machine complies with the appropriate CE mark.

For maintenance and repairs, use only original spare parts. There is of course a complex of our services.

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 PRECAUTIONS

1. Once the packing has been opened, make sure that the machine is not damaged. If in any doubt, call the service centre.
2. This equipment must only be used by qualified personnel.
3. During installation, any electric work must only be carried out by trained personnel.
4. The machine must be used in a dry place with good ventilation.
5. 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.
6. It is prohibited to connect more than one inverter generator in series or in parallel.
7. When installing the machine, follow the local regulations on safety.
8. The position of the machine must allow easy access by the operator to the controls and connectors.
9. When the welding machine is operating, all its covers and doors must be closed and well fixed.
10. Do not expose the welding machine to direct sunlight or to heavy rain. This equipment conforms to protection rating IP23S.
11. During welding, the welding cables must be located near or at ground level. They should be as short as possible.
12. 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 welding.
13. 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 electrical welding 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.
14. The operator is obliged to warn anyone near the welding area of the risks that welding involves and to arrange to provide adequate protection equipment.
15. It is very important to arrange for sufficient ventilation, especially when welding in enclosed spaces. We suggest using suitable fume extractors to prevent the risk of intoxication by fumes or gas generated by the welding process.
16. The operator must ensure all flammable materials are removed from the work area to avoid any risk of fire.
17. The operator must NEVER weld 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.**
18. The operator must be aware of all the special regulations which he needs to conform to when welding in enclosed spaces with a high risk of explosion.
19. 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 welding 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.

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 welding clamps.

The maximum open-circuit voltage of the welding machines is established by national and international standards (EN 60974-1) depending on the type of weld 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.

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

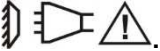
In case 1, the DC welding machines with rectifier must be built in such a way that, in case of a fault developing in the rectifier (for example open circuit, short circuit or lack of power), the permitted values cannot be exceeded.

20. Before opening the machine switch off the machine and disconnect it from the power socket.

21. Only personnel authorised by this company can carry out maintenance on the machine.

**NOTE:**

Device complies with IEC 61000-3-12 with following conditions: Short-circuit power  $S_{sc}$  of network in place at an interface between the user's supply and the public network (PCC) must be least 3581 kW. User is obliged to consult with the electricity supplier if the impedance of the network at this point is that required short-circuit capacity  $Z_{max} = 45 \text{ m}\Omega$  and whether the device can be connected with a public low-voltage network.

On the nameplate are the following symbols: 

Working ambient temperature between -10 and +40 °C.

Relative humidity below 90% at +20 °C.

Up to 3000 m altitude.

## 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.

## 3. TECHNICAL DATA

Method		MMA - AC	MMA - DC	TIG - AC	TIG - DC
Mains voltage	V/Hz	3x400/50-60			
Welding current range	A	30 - 300	5 - 350	30 - 350	5 - 350
Open-circuit voltage $U_{20}$	V	78,0	81,0	78,0	77,0
Mains protection	A	25 @			
Max. effective current $I_{1eff}$	A	21,6		16,9	
Welding current (DC=100%) $I_2$	A	270	270	280	280
Welding current (DC=60%) $I_2$	A	300	330	340	340
Welding current (DC=x%) $I_2$	A	60%=300	45%=350	50%=350	50%=350
Protection		IP23S			
Standards		EN 60 974-1, EN 60 974-10 cl.A			
Dimensions (w x l x h)	mm	492 x 891 x 873			
Weight	kg	88,0			
Cooling power (Q=1l/min)	kW	---		0,74	
Total liquid content	l	---		4,0	
Max. pressure	Bar	---		3,5	
Max. flow	l/min	---		8,0	

 **Caution**  Due to the size of installed power can be for connecting device to public distribution network necessary the agreement from distribution establishment.

## 4. EQUIPMENT

### CONTENT OF DELIVERY

Item No.	Description	Quantity
5.0277	PEGAS 350 AC/DC PULSE	1
5.0189	Set of Connectors for PEGAS AC/DC AERO	1

### ACCESSORIES TO ORDER

Item No.	Description
VM0184-1	Hose Gas ATA PULSE PEGAS 3m G1/4, D 9.5 HD
VM0025	Earthing cable 3 m 500 A 50-70
VM0185	Cable with E holder 3 m 400 A 35-70
18SCSL4A	Torch PARKER SGT 18SC 4m 35-50 AERO
18SCSL8A	Torch PARKER SGT 18SC 8m 35-50 AERO
18SCSL4AUD	Torch PARKER SGT 18SC 4m 35-50 AERO UD
18SCSL8AUD	Torch PARKER SGT 18SC 8m 35-50 AERO UD
6008	Pressure Reducer FIXICONTROL Ar 2 manometers GCE
6124	Pressure Reducer BASECONTROL Ar 2 manometers
6125	Pressure Reducer BASECONTROL CO2 2 manometers
5.0174A	Foot Pedal Remote CTRL 3 m PEGAS incl. Connector AERO
S777	Welding Helmet ALFA IN S777
S7S	Welding Helmet ALFA IN S7S, S7SU

## 5. OPERATOR CONTROLS

### MAIN PARTS



Fig. 1 – Main parts

Pos.	Description
A1	ON/OFF switch
A2	On/Off Switch - cooling
A3	Control panel
A4	Quick connector (+)
A5	Quick connector (-)
A6	Connector - remote control
A7	Gas connector - exit
A8	Solenoid Valve
A9	Mains cable
A11	CU PEGAS 350 cooling unit
A12	Cup
A13	Quick connector W (red)
A14	Quick connector W (blue)



## OPERATING PANEL

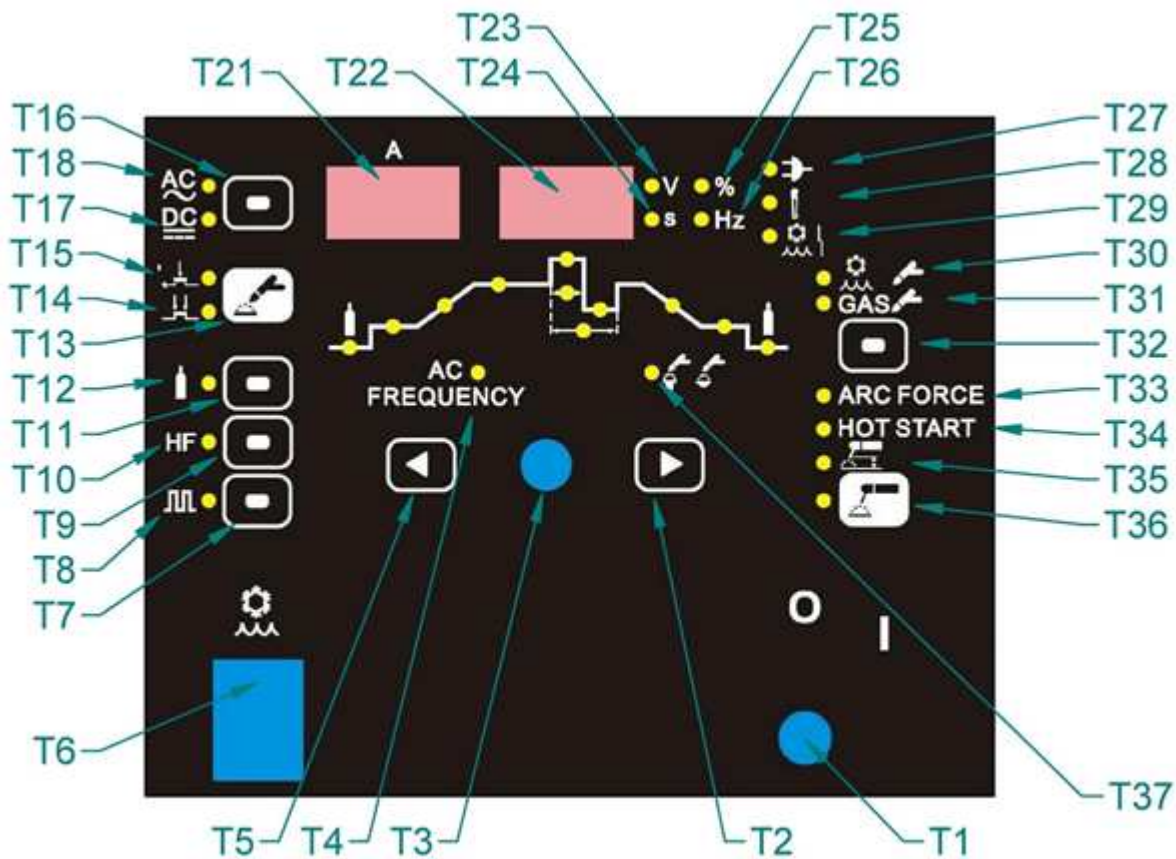









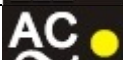












Fig. 2 Operating panel

Pos.	Designation	Description
T1		ON/OFF switch
T2		Button for moving to the right on parameters curve.
T3		Encoder
T4		LED AC frequency (just TIG AC). The higher current, the more the maximal frequency decreases. 50-250 Hz
T5		Button for moving to the left on parameters curve.
T6		Switch - cooling unit pump ON/OFF. If the switch illuminated, pump was turned on.
T7		Button switches pulsed/no pulsed mode.
T8		LED PULSE. If illuminated the PULSE mode was set.
T9		Switch button HF/LIFT ARC
T10		LED HF. If illuminated the HF ignition was set.

T11		Gas test
T12		LED Gas test. If illuminated the mode of setting the gas flow was selected (by means of the gas valve on the gas cylinder). To turn it off press the button 11 again or it will go off this mode after 15 s.
T13		Button TIG 2T or 4T
T14		LED Four stroke (4T)
T15		LED Two stroke (2T)
T16		Button switch AC/DC mode.
T17		LED DC
T18		LED AC
T21		Current display
T22		Display voltage, %, time and Hz.
T23		LED Voltage (V). If illuminated there are values in V on the display T22.
T24		LED Time (s). If illuminated there are values in s on the display T22.
T25		LED %. If illuminated there are values in % on the display T22.
T26		LED Hz. If illuminated there are values in Hz on the display T22.
T27		LED ON
T28		LED ALARM. If illuminated there is under or over voltage in the mains or the machine is overheated. At the same time the displays show Err 001.
T29		LED watercooled torch unit fault. If the flow of cooling liquid is insufficient, machine activity lights and is blocked. Active just in watercooled torch mode. (T30 lights).
T30		LED watercooled torch. If illuminated, by T32 button was set type of water torch.
T31		LED gascooled torch. If illuminated, by T32 button was set type of gas torch.
T32		Switch button of cooling type according to selected torch.
T33		LED ARC FORCE for MMA

		0 – 10.
T34		LED HOT START 0 – 10.
T35		LED Arc Length 0 – 10.
T36		LED MMA. If illuminated the MMA mode was set.
T37		LED Balance (just TIG AC). Used for elimination of the aluminium oxides. Range 15 – 50 %, default 15% (more in the text below).

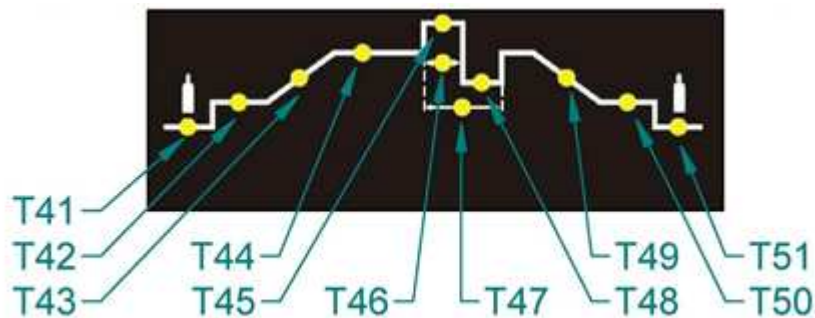


Fig. 3 Parameters curve

Pos.	Description	
T41	LED Pregas	0,1 – 10 s
T42	LED Start current	5 – 350A in DC, 30 – 350A in AC
T43	LED Up slope	0 – 10 s
T44	LED Main welding current	5 – 350 A TIG DC, 30 – 350 TIG AC 5 – 350 MMA DC, 30 – 350 MMA AC
T45	LED Main welding current in pulse mode	5 – 350 A DC, 10 – 200 TIG AC
T46	LED Ratio of the pulse current and the base current Just for the pulse mode.	5 – 100 %
T47	LED Pulse frequency Just in the pulse mode.	0,5 – 200 Hz
T48	LED Pulse base current	5 – 350 A DC, 30 -350 A AC.
T49	LED Down slope	0 – 10 s
T50	LED End current Just in 4T.	5 – 350A in DC, 30 – 350A in AC
T51	LED Post gas	0,1 – 10 s

## 6. GETTING STARTED

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

### GETTING STARTED MMA – COATED ELECTRODE

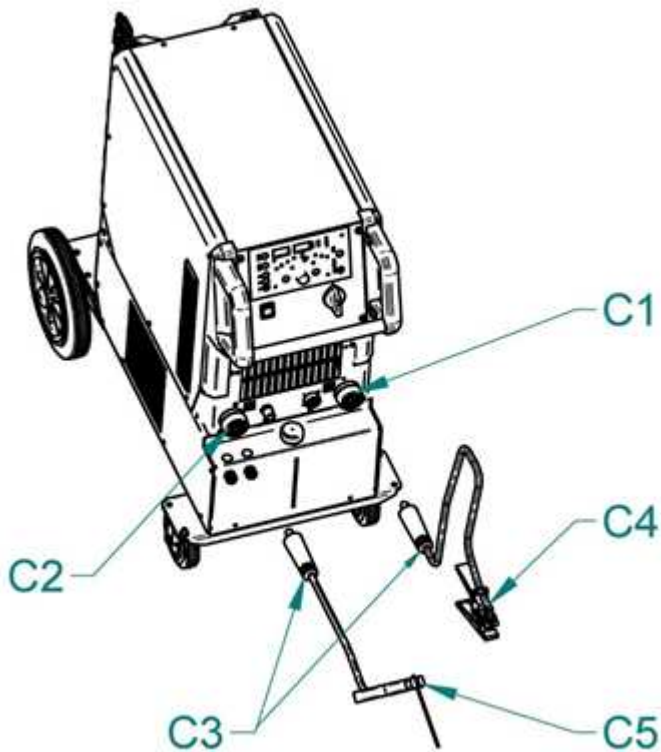


Fig. 4 Getting started MMA

C1	Quick Connector (+)
C2	Quick Connector (-)
C3	Quick Connector male
C4	Earthing Clamp
C5	Clamp – Electrode Holder

1. Insert the mains plug into a suitable 3x400 V mains socket, 50-60 Hz. The supply fuses or circuit breaker should correspond to the technical data stated in this manual.
2. Connect the welding cables to the panel quick connectors (+) **C1** and (-) **C2** according the instruction on the electrodes packing.
3. Switch the machine on by the ON/OFF switch **A1**.
4. Set the welding current by means of encoder **T3**. The values will be showed on the display **T21**.
5. It is possible to change the settings of the **HOT START** (increase of current during arc ignition time), **ARC FORCE** (an automatic increase of the welding current in case the electrode touches the welding piece) and **Arc Length** by means of the button **T36** and the encoder **T3**.
6. Then switch to the MMA mode by means of the button **T36**. LEDs **T26**,

**T27** a **T28** may not illuminate.

7. Connect the earthing clamp to the weldment.
8. Insert into the electrode holder the appropriate electrode and you can start welding.

👏NOTE👏 Prevent touching the electrode any metal material for in this mode the terminals **C1** and **C2** are under current.

Insert the coated electrode into the electrode holder, connect the clamps of the ground cable to the welding piece and you may start welding.

## GETTING STARTED TIG

### TIG MODE WITH WATERCOOLED TORCH

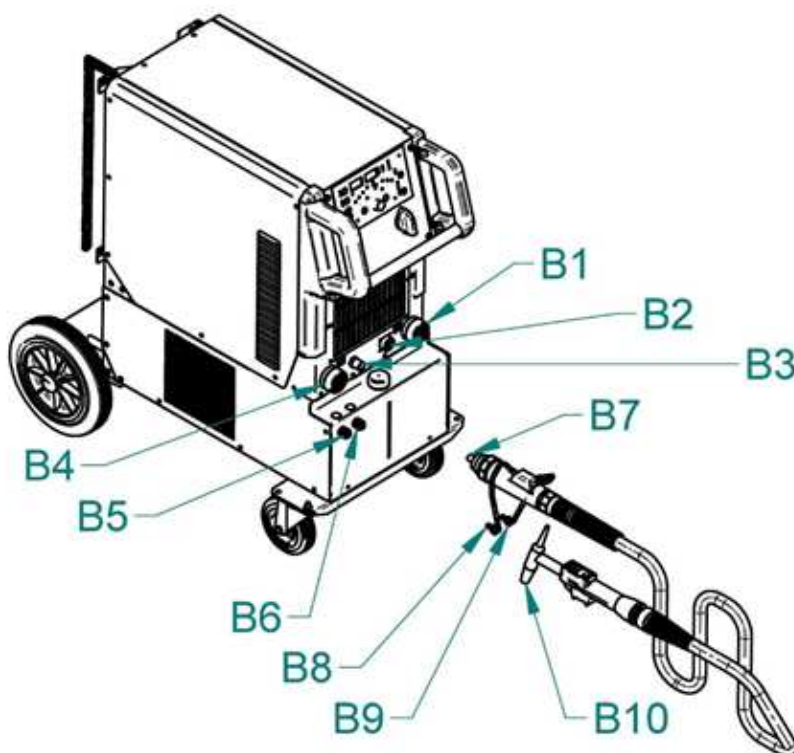


Fig. 5 Connection of the watercooled torch

B1	Quick Connector (+)
B2	Connector – Remote Control
B3	Gas Connector
B4	Quick Connector (-)
B5	Quick Connector W (red)
B6	Quick Connector W (blue)
B7	Quick Connector male
B8	Quick Connector Torch W (red)
B9	Quick Connector Torch W (blue)

B10	Torch TIG
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1. Insert the mains plug into a suitable 3x400 V mains socket, 50-60 Hz.
2. Connect the watercooled torch to the front panel, see fig. above.
3. Connect the earthing clamp to the quick connector (+).
4. Connect the gas hose to the gas cylinder connector on the gas bottle and to the connector **A8** on the rear panel.
5. Switch the machine on by the ON/OFF switch **A1**.
6. Switch the cooling unit on by the switch **T6**.
7. Select with button **T32** the water cooling of the torch. LED **T30** will shine.
8. Activate with button **T11** gas test and set the required flow of the protective gas. LED **T12** will shine.
9. Select with button **T13** TIG 2T or 4T. The appropriate LED **T14**, **T15** will shine.
10. Select with button **T16** AC or DC method. Method must have the appropriate tungsten electrode and grinding method. The appropriate LED **T18**, **T19** will shine.
11. Set with encoder **T3** the required welding current.
12. The others parameters is possible modify with appropriate buttons and encoder **T3**. The appropriate LED will shine. The required parameter is automatically saved, when you go over to the next parameter or after 3 s of the encoder inactivity. For more information see OPERATING PANEL.
13. You can start welding.

### COOLING system OF THE WATER-COOLED TORCH

1. Cooling unit **A11** is located at the bottom of the machine.
2. In this ALFA IN machine is the pump seal specially designed for the cooling liquid ACL-10 (pink colour, ordering number: 4600, 5 l canister. Working area – ambient temperature -10 °C to +40 °C).
3. When using other liquid, it may cause the leakage of the cooling circuit. The manufacturer's warranty is not applicable to defects in the cooling circuit when using liquids other than ACL-10.
4. We recommend replacing the liquid completely in one to three years. The liquid must not be mixed with any other kind of liquid. The process of replacing the liquid can be found on the internet address <https://www.alfain.eu/static/dokumenty/1/2/9/7/1/1/Vymena-chladici-kapaliny1-navod-CZ.pdf>
5. Liquid level in the tank must be between maximum and minimum. If an error message “**E11**” – **Lack of liquid** lights up during operation, turn off the main switch and check the liquid level on the watermark. After turning on the machine perform the cooling unit test. If the error recurs, the cause of the fault must be determined.

6. Liquid ACL-10 is not poisonous. However, due to its operation in the pump, the replaced liquid dispose of as hazardous waste. Do not burden the environment. In the worst case, take it to a collection yard in the original canister. You can find the safety data sheet on the link <https://www.alfain.eu/static/dokumenty/1/3/0/5/4/7/Safety-data-sheet-ACL-10.pdf>



7. Note: When connecting a gas-cooled torch, it is necessary to interconnect the quick connectors with water hose of the hydraulic circuit. If this condition is not met, it may result in damage to the pump.

### **VENTING THE COOLING SYSTEM OF THE TORCH**

After filling the empty cooling system of the torch (even in case of extensive leakage and venting) it is necessary to deaerate a complete circuit.

1. Remove the cover from the coolant reservoir and interconnect the quick connectors with water hose of the hydraulic circuit.
2. Run cooling test for about 30 seconds.
3. Plug the torch and run the cooling test for about 30 seconds.
4. If the “E11” – **Lack of liquid** shows after you press the torch button, it is necessary to repeat the procedure.

## TIG MODE WITH GASCOOLED TORCH

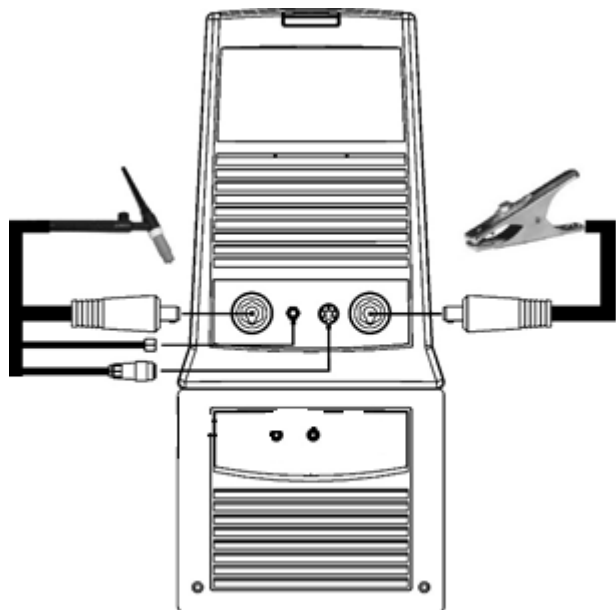


Fig. 6 Connection of the gascooled torch

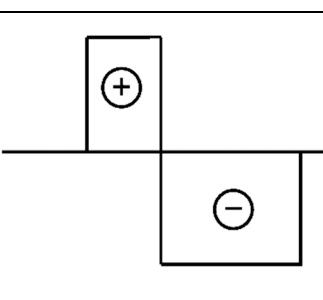
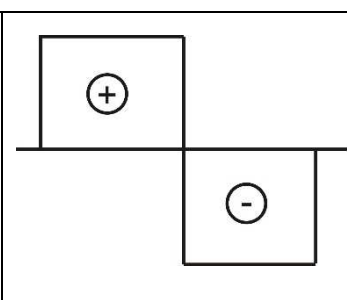
1. Insert the mains plug into a suitable 3x400 V mains socket, 50-60 Hz.
2. Connect the gascooled torch to the front panel, see fig. above.
3. Connect the earthing clamp to the quick connector (+).
4. Connect the gas hose to the gas cylinder connector on the gas bottle and to the connector **A8** on the rear panel.
5. Switch the machine on by the ON/OFF switch **A1**.
6. Select with button **T32** the gas cooling of the torch. LED **T31** will shine.
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12. You can start welding.

⚠ Caution ⚠ Make sure, that in gascooled torch welding method is the cooling unit turned off. At turning of the cooling unit on and at choice of the gascooled torch can happened the pump damage.



## BALANCE FUNCTION IN AC MODE

Function allows to set the ratio between the cleaning effect (plus part of the wave) and the penetration (minus part of the wave).

Shape of the current curve		
BALANCE	Value 15%	Value 50%
Cleaning effect	Smallest	Biggest
Penetration	Deep	Shallow
Level of wear of the tungsten electrode	Smaller	Bigger

## REMOTE CONTROL

PEGAS 350 AC/DC PULSE can work in both of TIG modes with two types of remote control.

1. TIG torch with UP-DOWN buttons for selecting size of welding current.
2. Foot pedal.

Remote controls are connected with connector **A6**.

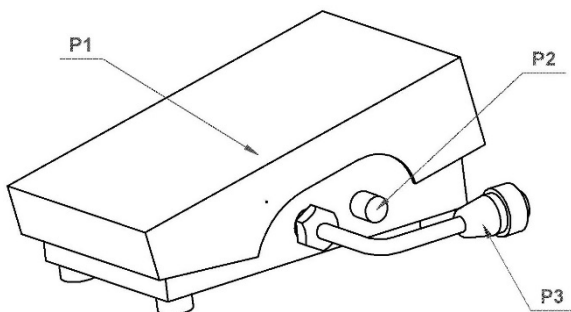


Fig. 7 - Foot pedal remote control

Pos.	Description
P1	Stepping surface
P2	Potentiometer of setting the limit of maximal welding current
P3	Connector (connect to matching connector <b>A6</b> )

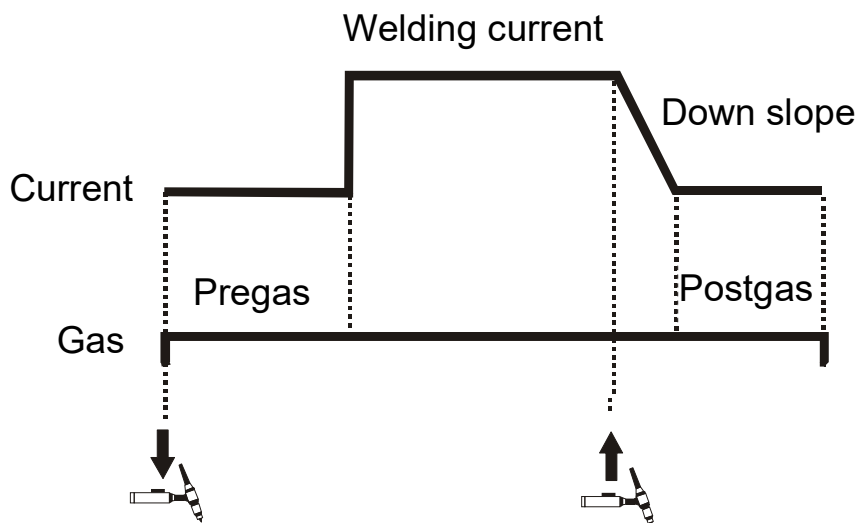
1. When you connect the connector **P3** to matching connector **A6** on the front panel, the function setting the current from the front panel will be blocked, instead of that the max. current is limited by the potentiometer **P2**.
2. With potentiometer **P2** on the foot pedal it is possible to limit the maximal

current.

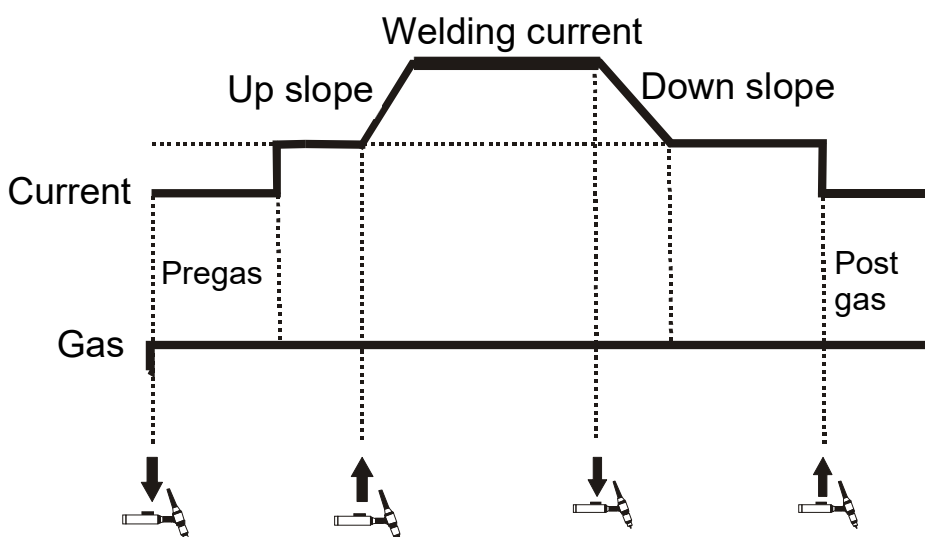
3. By pressing the stepping surface **P1** down, you start the welding process. The value of the welding current depends on the level of pressing the stepping surface. To reach the maximal current limited by potentiometer **P2** requires to gently pressing to the lowest position of the stepping surface **P1**. The set current will be displayed on the current display **T21** see fig. n. 2.
4. The welding process ends after releasing the stepping surface **P1**.

## 7. TWO STROKE AND FOUR STROKE IN TIG MODE

### TWO STROKE – 2T



### FOUR STROKE – 4T





### BILEVEL – SECOND WELDING CURRENT

When the machine is in 4T mode, there is always active the BILEVEL function. The value of the second current is automatically set to 50% of the pre-set value



of the main welding current. To enter the second welding current press the torch button for a short time and release it. To get back to the main welding current press the torch button for a short time and release it.

## 8. ROUTINE MAINTANCE & INSPECTION

1. The only routine maintenance required for the PEGAS range of machines is a thorough cleaning and inspection, with the frequency depending on the usage and the operating environment.

 **WARNING**  Disconnect the PEGAS from the mains supply voltage before disassembling.

2. Special maintenance is not necessary for the control unit parts in the Welder. If these parts are damaged for any reason, replacement is recommended.



 **CAUTION**  Do not blow air into the welder during cleaning. Blowing air into the welder can cause metal particles to interfere with sensitive electronic components and cause damage to the welder.

3. To clean the welder, disconnect it from the mains supply voltage then open the enclosure and use a vacuum cleaner to remove any accumulated dirt and dust. The welder should also be wiped clean. If necessary, solvents that are recommended for cleaning electrical apparatus may be used.
4. Troubleshooting and repairing of PEGAS welding equipment should only be carried out only by suitably qualified or competent person.
5. 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.
6. The person carrying out the servicing needs and repairs must know what to look at, what to look for and what to do.

## 9. 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 welding 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.


 **NOTE**  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.

7. As a warranty list serves proof of purchase (invoice) on which is the serial number of the machine, eventually a warranty list on the last page of this manual.
8. The manufacturer's warranty is not applicable to defects in the cooling circuit when using liquids other than ACL-10.

## 10. 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.

## 11. WARRANTY LIST

As a warranty list serves proof of purchase (invoice) on which is the serial number of the machine, eventually a warranty list below, which is filled in by an authorized dealer.

Serial number:	
Day, month (written in words) and year of sale:	
Stamp and dealer signature:	