

WELDING INVERTER

**PERUN 200 AC/DC PULSE
PERUN 200 AC/DC**

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.

PERUN 200 AC/DC (PULSE) welds by those methods:

1. TIG (PULSE) DC (Lift arc or High Frequency ignition)
2. TIG (PULSE) AC (Lift arc or High Frequency ignition)
3. MMA DC coated electrodes
4. MMA AC coated electrodes

PERUN 200 AC/DC (PULSE) have these special functions for effective use: Pre gas (only for PULSE model) and Post gas of protective gas, Up slope (only for PULSE model) and Down slope, Starting current and Final current (only for PULSE model), HF ignition, 2T and 4T mode, Aluminum cleaning level, Pulsed mode (only for PULSE model), Bilevel and UP-DOWN control from the torch.

For MMA method are these machines equipped with functions HOT START, ARC FORCE and ANTISTICK.

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

PERSONAL PRECAUTION



1. For safety reasons, it is necessary to use welding gloves during welding. These gloves will protect you before intervention of electric current (open circuit voltage). It protects you against thermal radiation and splashing drops of hot metal too. Wear sturdy isolated shoes. Do not wear open shoes, because drops of hot metal can cause burns.
2. Do not look into the welding arc without eye and face protection. Always use good quality welding helmet with intact protective filter.
3. The persons appearing in the vicinity of the welding must be informed of the danger and must be equipped with protective equipment.
4. During welding, especially in small spaces, it is necessary to ensure an adequate supply of fresh air, because during welding, harmful fumes arise.
5. In tanks of gas, oil, fuel, etc., (even empty ones) do not make welding, because there is a chance of explosion.
6. In areas with chance of explosion special provisions are applied.
7. Welding machines that are subjected to great exertion must comply with specific security requirements. These include the rail pressure of the vessel etc. These connections may only be carried out by competently trained welders with the necessary permissions.

SAFETY REGUALTIONS

1. Before starting work with welding machine, it is necessary to get familiar with the provisions of the CSN 050601 and norm CSN 050630.
2. With a bottle of CO₂ or mixed gases should be handled according to the regulations for working with pressure vessels contained in CSN 07 83 05.
3. The welder must use protective equipment.
4. Before working on the electrical part, removing the cover or cleaning it is necessary to disconnect the device from the network.

3 OPERATING CONTROLS

1. Putting the machine into operation can be performed only by trained personnel and only within the technical provisions. The manufacturer is not liable for damages resulting from improper use or handling. For maintenance and repair, use only original spare parts from ALFA IN.
2. Device complies with IEC 61000-3-12.
3. The welding machine is tested according to the degree of protection IP 23S, which provides protection against the intrusion of solid bodies with a diameter greater than 12 mm and protection against ingress of water, falling on the machine in a vertical direction or max degree of 60°.
4. Working ambient temperature between -10 and +40 °C.
5. Relative humidity below 90% at +20 °C.
6. Up to 3000 m altitude.
7. The machine must be positioned so that cooling air can enter and leave through cooling vents with no problem. It is necessary to ensure that there are no mechanical equipment, especially metal particles (e.g. during grinding) drawn into the machine.
8. It is necessary for welding machine to undergo a periodic inspection every 6/12 months by an authorized officer according to CSN 331500 and CSN 050630 – see Maintenance and service tests.
9. All interventions in the el. equipment as well as repair (removal of the plug, fuse replacement) should be performed by an authorized person.
10. With competent mains voltage and input must match the plug.

 **Caution**  **Extension cables must not have conductors with a smaller cross section than 3x2,5 mm². The machine can be operated on a single-phase electric generator 10 kVA (1x230V/50Hz) and more, which has ensured voltage stabilization $\pm 10\%$. Generators with lower power can damage the machine.**

11. It is necessary to protect the machine against:
 - a. Moisture and rain
 - b. Chemically aggressive environments
 - c. Mechanical damage
 - d. Draft and possibly ventilation of neighboring machines
 - e. Excessive overloading – exceeding tech. parameters
 - f. Rough treatment

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.



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

4 TECHNICAL DATA

Method		MMA - AC	MMA - DC	TIG - AC	TIG - DC
Mains voltage	V/Hz	1x230/50-60			
Welding current range	A	10 - 170	10 - 170	10 - 200	10 - 170
Open-circuit voltage U_{20}	V	---	63,0	---	63,0
Mains protection	A	16 @ (25 @)			
Max. effective current I_{1eff}	A	16,0 (22,7)		16,0 (17,3)	
Welding current (DC=100%) I_2 $t_a=40$ °C	A	80 (110)	80 (110)	120 (120)	120(120)
Welding current (DC=60%) I_2 $t_a=40$ °C	A	100 (140)	100 (140)	140 (140)	140 (140)
Welding current (DC=x%) I_2 $t_a=40$ °C	A	20%=170 (40%=170)	20%=170 (40%=170)	30%=200 (35%=200)	40%=170 (40%=170)
Protection		IP23S			
Standards		EN 60974-1, EN 60974-10 cl. A			
Dimensions (w x l x h)	mm	160 x 530 x 310			
Weight	kg	9,5			

The machine is equipped with a 16 A plug for connection to a single-phase supply 1 x 230 V, the corresponding data for this 16 A plug (Duty Cycle = DC) are in the table above without brackets.

In order to fully use the technical capabilities of the machine, the machine must be connected to the industrial single-phase networks with a blue plug 32 A with the maximum permissible fuse of 25 A. The corresponding data for such a 32 A plug are stated in the table above in brackets.

Another option is to connect the machine to the three-phase mains 3x400 / 230V TN-S (CS). The condition is to use a 5 pin 32 A plugs for the supply cable and connection to the phase voltage. Black (brown) wire connected to one phase (e.g. L1), the blue wire to the neutral wire (N) and green-yellow wire to the grounded conductor "PE". In this case, it is possible to connect the machine to a three-phase socket, which may be protected by fuse max. 25 A.


Attention! Do not connect to the interconnected voltage (delta voltage) (between 2 phases)!

Replacement of the plug may only be performed by ALFA IN authorized service personnel.




ALFA IN continuously strives to produce the best product possible and therefore reserves the right to change, improve or revise the specifications or design of this or any product without prior notice. Such updates or changes do not entitle the buyer of equipment previously sold or shipped to the corresponding changes, updates, improvements or replacement of such items.

5 EQUIPMENT

CONTENT OF DELIVERY

Item No.	Description	Picture
5.0293	PERUN 200 AC/DC Pulse	
5.0294	PERUN 200 AC/DC	

ACCESSORIES TO ORDER

Item No.	Description	Picture
VM0151-1	Hose Gas 3m G1/4-G1/4	
VM0253	Welding Cable Set 2x 3m 35-50 200A	
5.0508	Welders Cart P 80	

T24ST	Torch T2 4m 35-50 arc ST	
T28ST	Torch T2 8m 35-50 arc ST	
T24STUD	Torch T2 4m 35-50 arc ST UD	
T28STUD	Torch T2 8m 35-50 arc ST UD	
6008	Pressure Reducer FIXICONTROL Ar 2 manometers GCE	
7029	Belt PERUN	
S7SUN9B	Welding Helmet S9B Shooting Blue Shark	
S7SUN9BBlack	Welding Helmet S9B Shooting Blue Shark Black	
5.0174ST	Foot Pedal Remote CTRL 3 m incl. Connector ST	

6 OPERATOR CONTROLS

MAIN PARTS

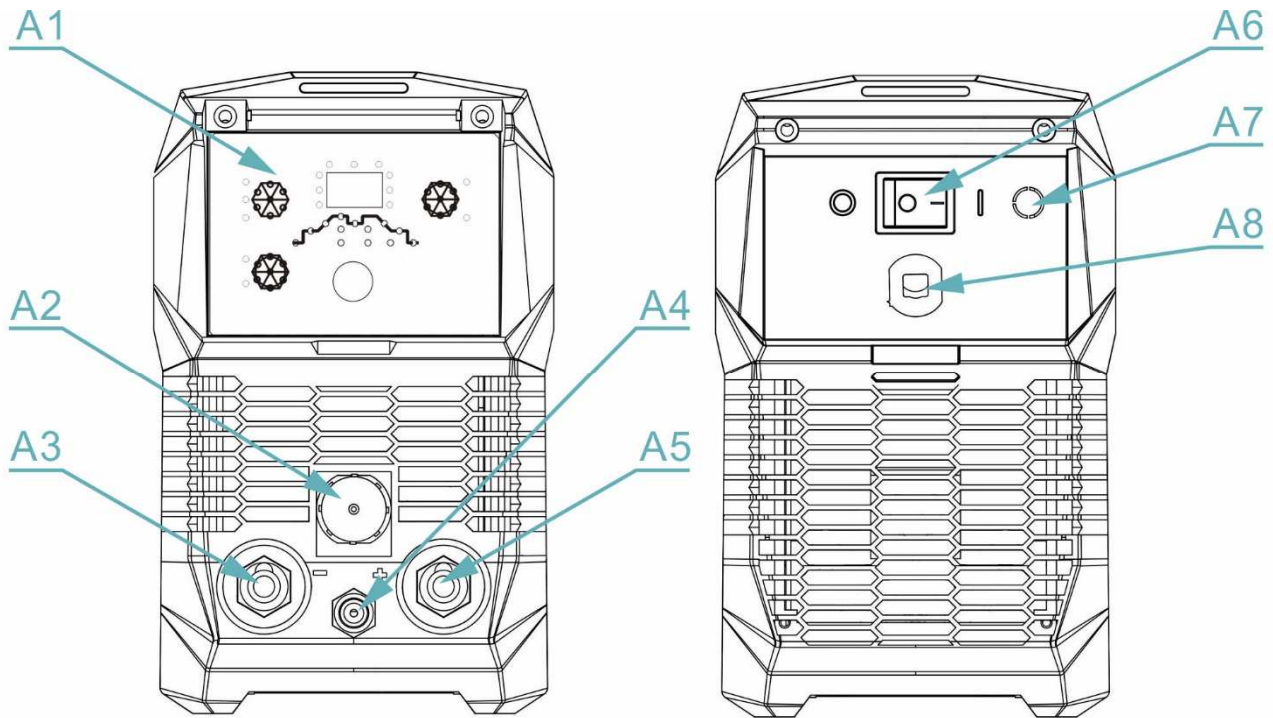


Fig. 1. Main parts

Pos.	Description
A1	Operating panel
A2	Torch control connector
A3	Quick connector (-)
A4	Gas connector of the welding torch
A5	Quick connector (+)
A6	ON/OFF switch
A7	Gas inlet
A8	Mains cable and plug

OPERATING PANEL

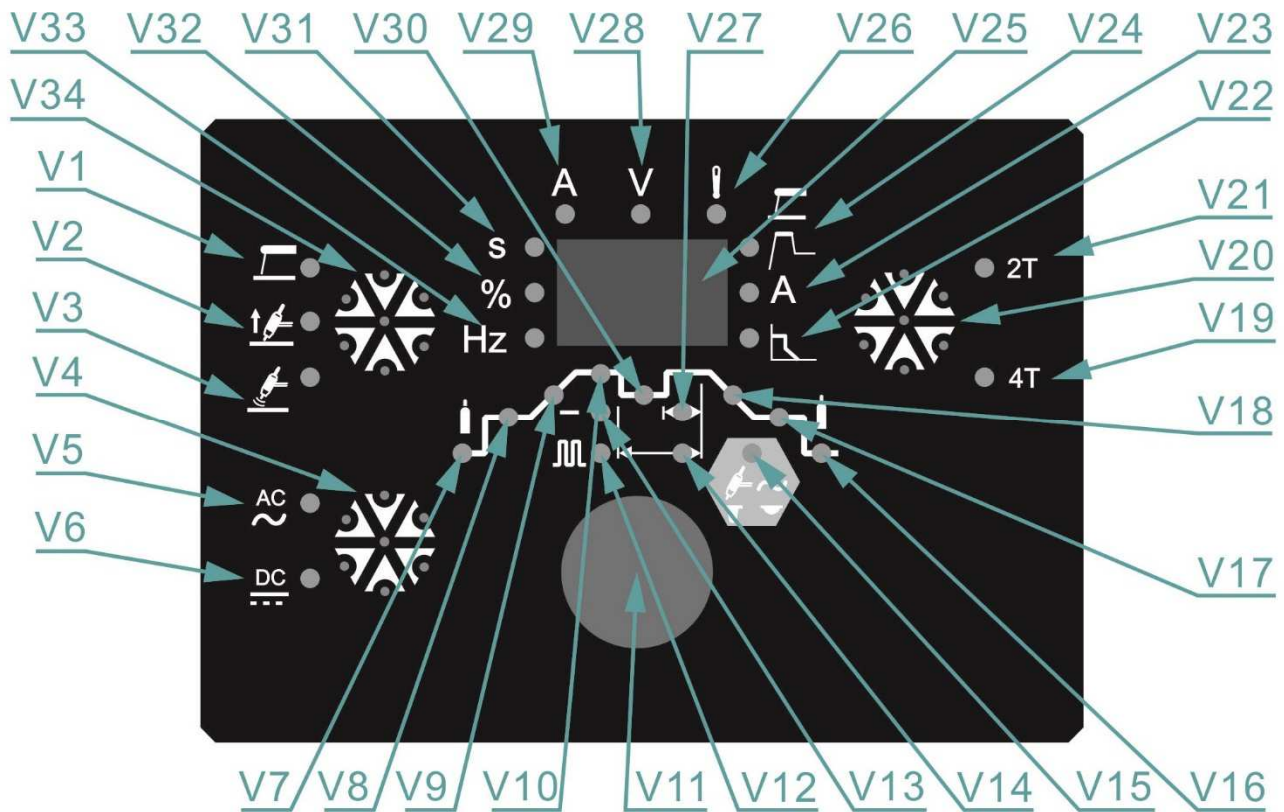


Fig. 2. Operating panel of PERUN 200 AC/DC PULSE

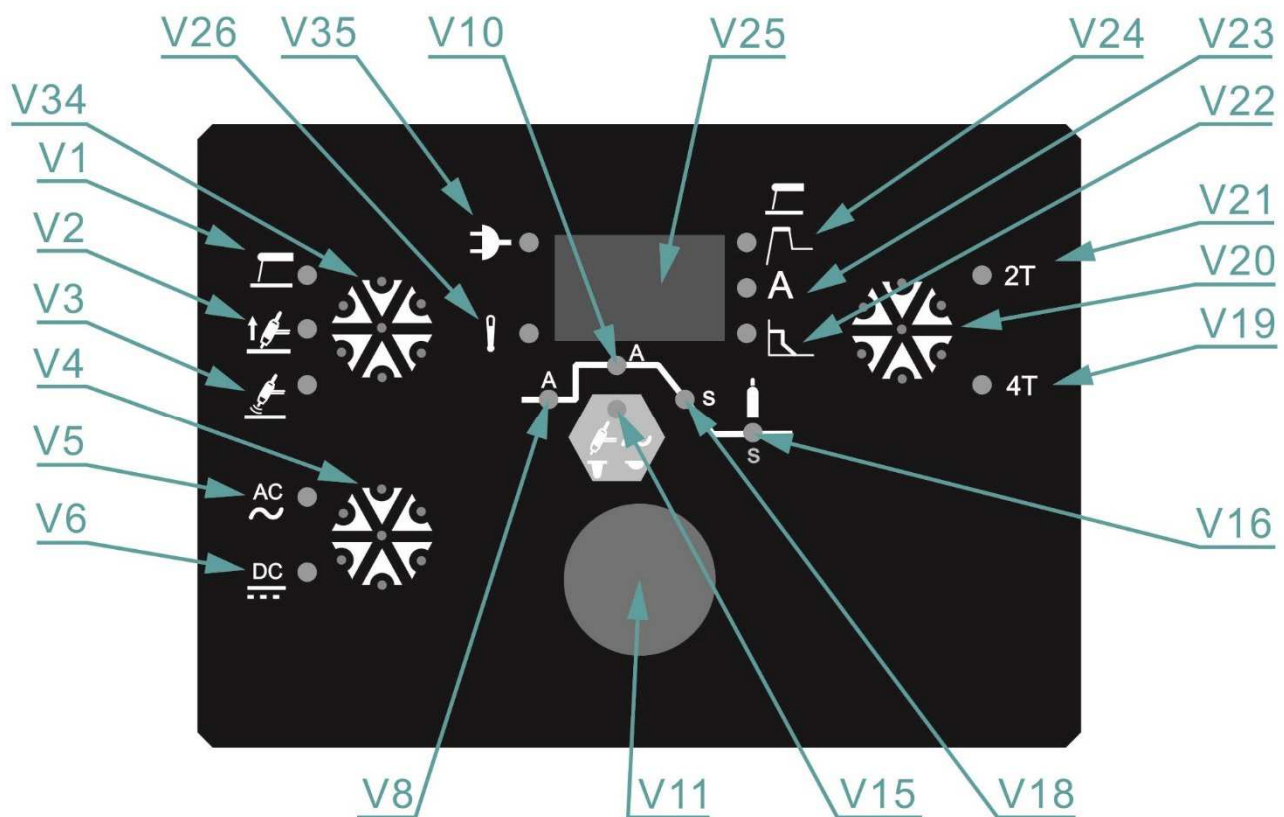


Fig. 3. Operating panel of PERUN 200 AC/DC

Pos.	Description
V1	LED. If illuminated the method MMA was selected.
V2	LED. If illuminated the method TIG LIFT ARC was selected.
V3	LED. If illuminated the method TIG HF was selected.
V4	Switch AC/DC
V5	LED AC
V6	LED DC
V7	LED Pre gas, 0,1 – 2,0 s. (0,3 s)
V8	LED Starting current (only for 4T). 10 – 170 A in DC, 10 – 200 A in AC. (50 A)
V9	LED Up slope, 0 – 25 s. (0 s)
V10	LED Main welding current. 10 - 170 A (TIG-DC) ; 10 - 200 A (TIG-AC) ; 10 – 170 A (MMA-AC/DC) (80 A all methods)
V11	Encoder
V12	LED – Pulsed mode; To change, rotate the encoder V11 and confirm by means of pressing the encoder V11 down. Display V25 shows -P- .
V13	LED – Non pulsed mode; To change, rotate the encoder V11 and confirm by means of pressing the encoder V11 down. Display V25 shows --- .
V14	LED Pulse frequency. 0,5 – 200 Hz. Just for pulsed mode. (100 Hz)
V15	LED Balance (only for TIG AC). It is used for elimination of aluminum oxide. Range from -5 to +5. (0)
V16	LED Post gas, 0 – 20 s. (10 s)
V17	LED Final current. 10 – 170 A in DC, 10 – 200 A in AC, just in 4T. (10 A)
V18	LED Down slope, 0 – 25 s. (0)
V19	LED 4T (four stroke)
V20	Switch 2T/4T
V21	LED 2T (two stroke)
V22	LED ARC FORCE, only for MMA, 0 – 100. (30) LED lights up after pressing the encoder V11 .
V23	LED Welding current for MMA, 10 – 170 A (only for MMA) (80) LED lights up after pressing the encoder V11 .
V24	LED HOT START, only for MMA, 0 – 100. (50)

	LED lights up after pressing the encoder V11 .
V25	Display
V26	LED ALARM. If illuminated there is under or over voltage in the mains or the machine is overheated.
V27	LED Ratio of the pulse current and the base current. 5 – 95 %. (50 %) Just for the pulsed mode.
V28	LED Voltage. If illuminated there are values in V on the display V25 .
V29	LED Current. If illuminated there are values in A on the display V25 .
V30	LED Lower current. 10 – 170 A (TIG-DC) ; 10 – 200 A (TIG-AC) ; 10 – 170 A (MMA-AC/DC)
V31	LED s. If illuminated there are values in s on the display V25 .
V32	LED %. If illuminated there are values in % on the display V25 .
V33	LED Hz. If illuminated there are values in Hz on the display V25 .
V34	Welding method switch – MMA / TIG LIFT ARC / TIG HF.
V35	LED ON

7 GETTING STARTED

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

GETTING STARTED MMA – COATED ELECTRODE

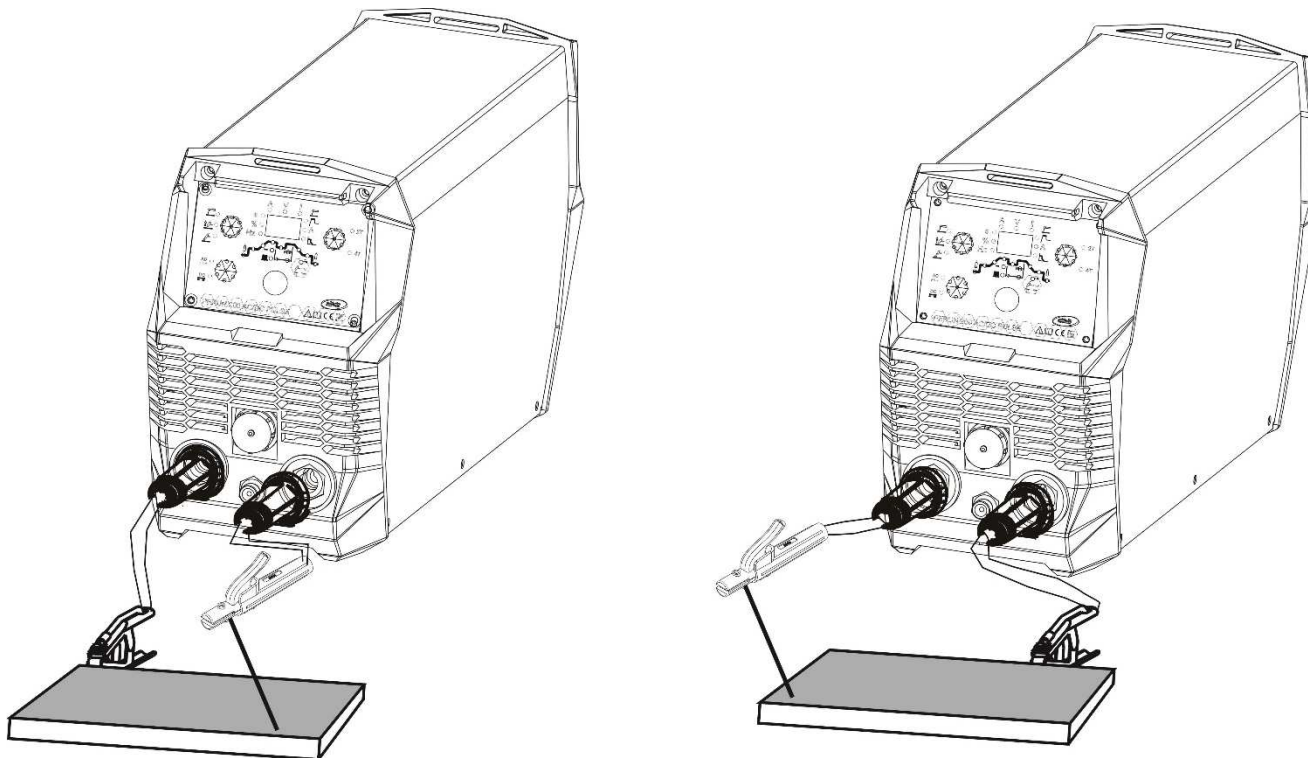


Fig. 4. Ways of connecting the welding cables. Follow the instructions on the packing of the welding electrodes.

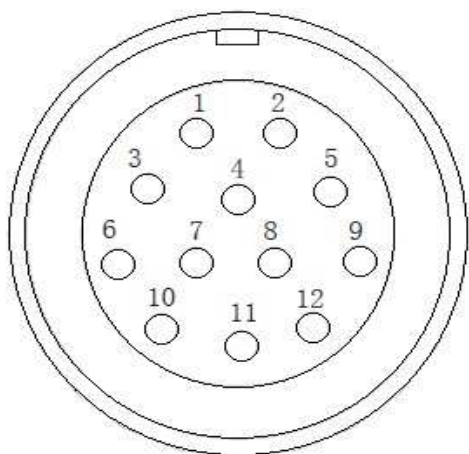
1. Insert the mains plug **A8** into a suitable 1x230 V mains socket.
2. Connect the welding cables to the panel quick connectors (+) **A5** and (-) **A3** according the instruction on the electrodes packing.
3. Switch the machine on by the ON/OFF switch **A6**.
4. By means of the welding method switch **V34** select MMA method. The corresponding LED **V1** will light up.
5. By means of the encoder **V11** set the welding current. The values will be showed on the display **V25**.
6. By means of the button **V4** select AC or DC welding current. The corresponding LED **V5** or **V6** will light up.
7. 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) by means of the encoder **V11**.

NOTE Prevent touching the electrode any metal material for in this mode the quick connectors **A5** and **A3** are under current.

8. 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**TORCH CONNECTION SCHEMA**

5737 CONNECTOR ST 12 PIN MALE			
PIN NO.	FOOT PEDAL	TORCH WITH POTENTIOMETER	UP-DOWN TORCH
1	SHORT CIRCUIT	/	/
2		/	/
3	POTENTIOMETER (+)	POTENTIOMETER (+)	/
4	POTENTIOMETER CENTER TAP	POTENTIOMETER CENTER TAP	/
5	POTENTIOMETER (-)	POTENTIOMETER (-)	/
6	/	/	UP
7	/	/	DOWN
8	START/STOP	START/STOP	START/STOP
9	START/STOP	START/STOP	START/STOP (GND)
10	/	SHORT CIRCUIT	/
11	/		/
12	/	/	/



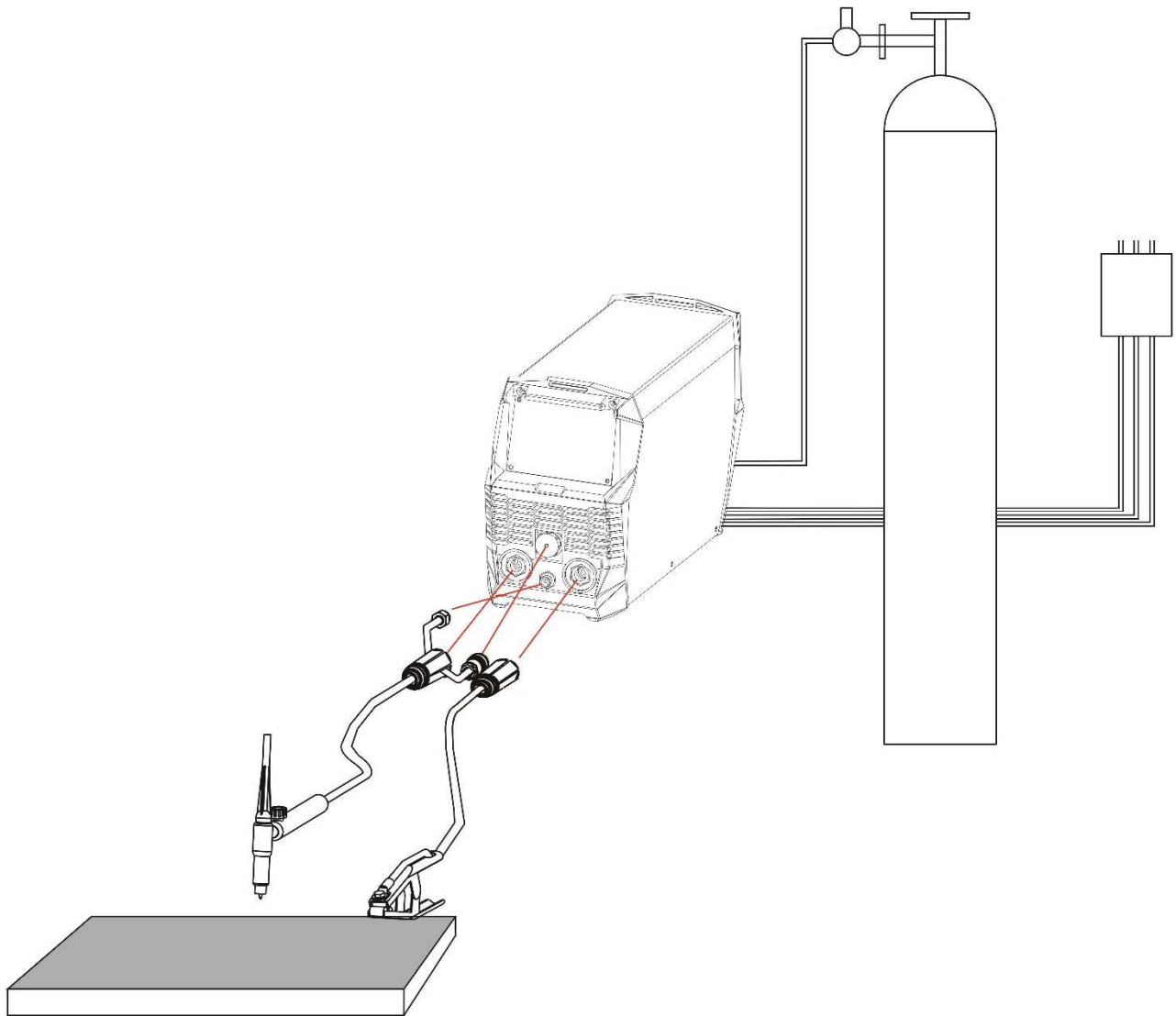
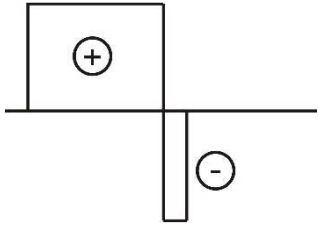
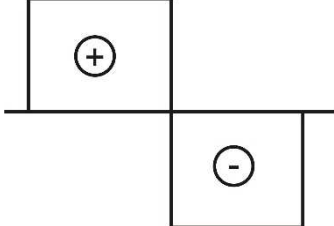


Fig. 5. TIG welding set up

1. Insert the mains plug **A8** into a suitable 1x230 V mains socket.
2. Fit the TIG torch to the panel quick connector (-) **A3**.
3. Connect the torch control connector onto the matching connector **A2**.
4. Connect the gas hose of the TIG torch onto gas outlet connector **A4**.
5. Connect the work lead to panel quick connector (+) **A5**.
6. Connect the gas hose to the reduction valve on the gas cylinder and on the Gas inlet connector **A7** on the rear panel.
7. Switch the machine on by the ON/OFF switch **A6**.
8. Press the torch trigger, the solenoid valve will open; set the desired gas flow (pure argon).
9. By means of the welding method switch **V34** select TIG LA or HF method. The corresponding LED **V2** or **V3** will light up.
10. By means of the switch **V20** select 2T (two stroke) or 4T (four stroke) mode. The corresponding LED **V21** or **V19** will light up.
11. By means of the button **V4** select AC or DC welding current. In the welding torch must be installed a corresponding tungsten electrode (for AC

green or golden). The electrode should be sharpened also corresponding to the AC or DC mode. The corresponding LED **V5** or **V6** will light up.

12. By means of the encoder **V11** set the welding current.
13. Other parameters may be set by means of the encoder **V11**. Illuminate the appropriate LED by means of pressing the encoder **V11**, by means of turning the encoder **V11** set the parameter and save it by means of pressing the encoder **V11**. After that a next LED will illuminate and you may set that parameter the same way. The set parameter will be automatically memorised when you move to another parameter of after 3 s. At every turning of the encoder 11 the last selected parameter will be offered to be changed.
14. Connect the work clamp to the work piece or at the welding table and you can start welding.
15. The following table describes the influence setting the clearance effect.

Clearance effect	Value -5 to 0	Value +1 to +5
Shape of the current curve		
Penetration	Deep	Shallow
Level of wear of the tungsten electrode	Smaller	Bigger

REMOTE CONTROL

PERUN 200 AC/DC PULSE supports three kinds of remote controls:

1. TIG torch with UP-DOWN buttons
2. Standard separate remote control for changing the value of the welding current
3. Foot pedal

All three models of remote controls can be connected by means of the front panel connector **A2**.

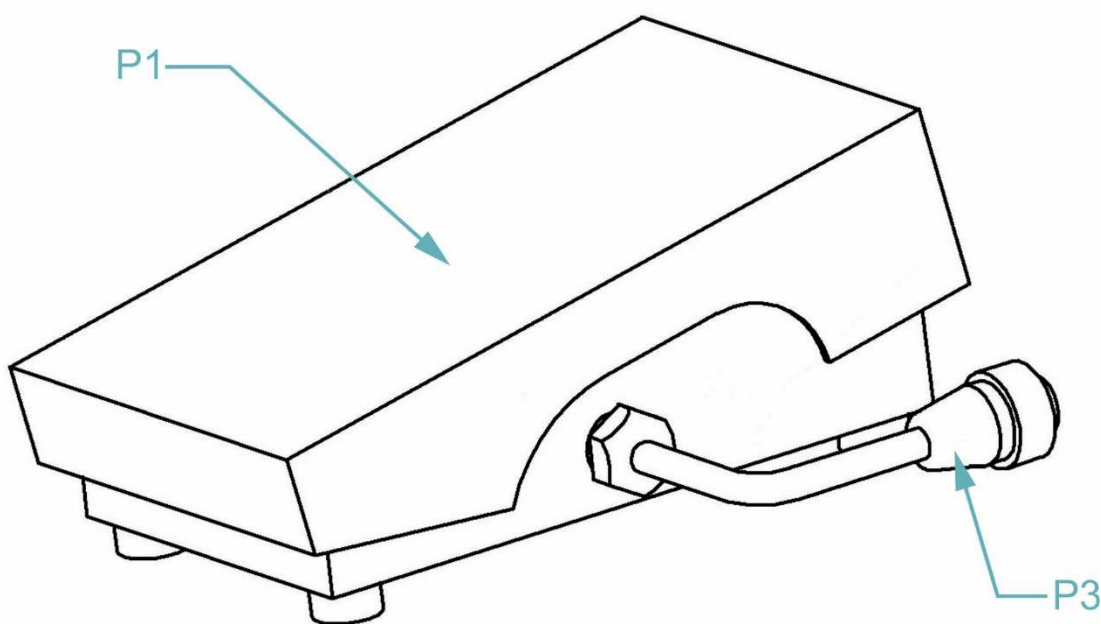


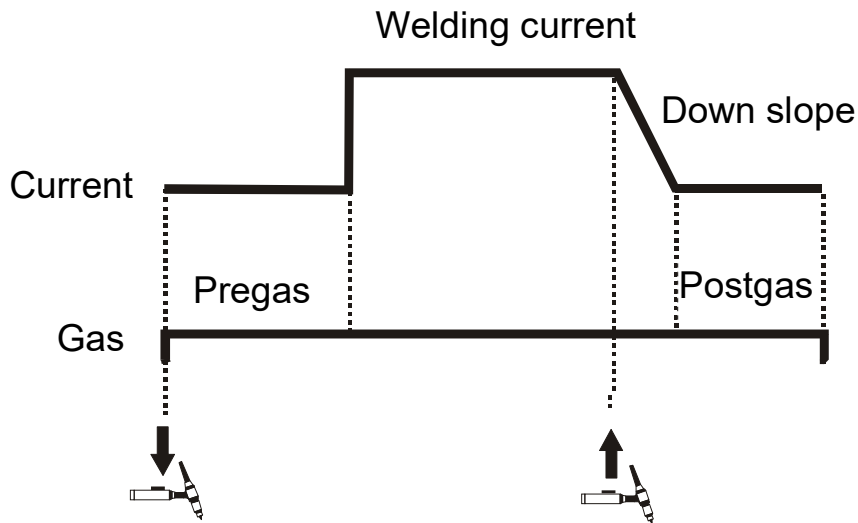
Fig. 6. Foot pedal remote control

Pos.	Description
P1	Stepping surface
P3	Connector (connect to matching connector A2 on the front panel)

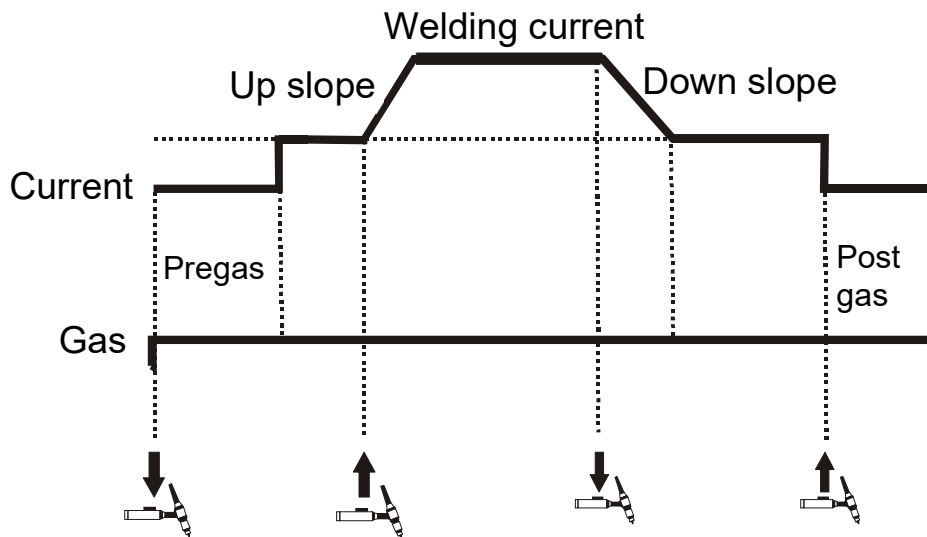
1. When you connect the **P3** connector to matching connector on the front panel **A2** the function setting the current from the front panel will be blocked.
2. Set by the encoder **V11** the maximal required value of the current.
3. Set the machine to the mode **2T**.
4. By pressing the stepping surface **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, set by encoder **V11**, requires to gently pressing to the lowest position of the stepping surface **P1**. The set current will be displayed on the display **V25**.
5. The welding process ends after releasing the stepping surface **P1**.

8 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.

9 JOBS

JOBs are available in both methods – MMA and TIG.

The welding machine has a choice from 10 JOBs.

HOW TO SAVE PARAMETERS TO THE JOB

1. Parameters, which you want to save to the JOB, set by means of the encoder **V11**. (By short pressing the encoder **V11** switch between particular parameters of the curve or functions.)
2. As soon as you will have saved all parameters, then by long pressing the encoder **V11** get into the JOBs menu. The display **V25** will show **-S-**. In the JOBs menu are two positions: **-S-** (Save) and **-L-** (Load).
3. By short pressing the encoder **V11** confirm the message **-S-** on the display **V25** to save your choice of parameters or functions. The display **V25** will show numbers from 2 to 11 for particular JOBs. Rotate the encoder **V11** to select the desired JOB number, into which you want to save your selected parameters, then confirm your choice by short pressing the encoder **V11**.

HOW TO LOAD THE SAVED JOB

1. By long pressing the encoder **V11** get into the JOBs menu. The display **V25** will show **-S-**.
2. Rotate the encoder **V11** to move to the position **-L-**. By short pressing the encoder **V11** confirm the position **-L-**.
3. The display **V25** will show numbers from 2 to 11 for particular JOBs. Rotate the encoder **V11** to select the desired JOB number, from which you want to load your selected parameters, then confirm your choice by short pressing the encoder **V11**.

HOW TO DELETE SAVED PARAMETERS FROM THE JOB

It is not possible to delete parameters from the JOB, they can be only replaced by new parameters. To save new parameters, see the chapter HOW TO SAVE PARAMETERS TO THE JOB above.

10 RESET

The factory reset is performed as follows:

1. By long pressing the encoder **V11** get into the JOBs menu. The display **V25** will show **-S-**.
2. Rotate the encoder **V11** to move to the position **-L-**. By short pressing the encoder **V11** confirm the position **-L-**.
3. Rotate the encoder **V11** and select the number **1**, which is designed for **factory reset**, then confirm your choice by short pressing the encoder **V11**.

11 GENERAL INFORMATION ON THE WELDING MODES

MMA welding

The manufacturers of the electrodes specify the optimum welding current for each type of electrode. The type of electrode to be used depends on the thickness of the material to be welded and on its position.

Insert the chosen electrode into the electrode holder. To strike the electric arc, rub the electrode against the material to be welded connected to the earth (ground) clamp. Once the arc is struck, lift the electrode holder slowly to the normal welding distance.

To strike the arc better, an initial current is supplied which is higher (hot-start) compared to the welding current. The electrode on melting deposits in the form of drops onto the piece to be welded and its outer coating is consumed supplying the shielding gas for the welding. To facilitate the fluidity of the welding arc, while the drops are coming off, which can cause a short circuit between the electrode and the weld pool, a momentary increase in the welding current (arc-force) is given, thus preventing the arc from going out. If the electrode stays stuck to the piece to be welded, there is an anti-stick function that, after a certain short-circuit time, cuts off the power to the generator. Thus you can detach the electrode without damaging it.

When the coating electrodes are used, you need to remove the dross from the welding after every pass.

TIG welding

In TIG (Tungsten Inert Gas) welding the electric arc is struck between a non-consumable electrode (pure tungsten or an alloy) and the workpiece in an atmosphere protected by an inert gas (argon).

The TIG lift-arc process is struck by contact. A low short-circuit welding current is set to limit the tungsten inclusion on the workpiece. This process does not guarantee a weld of high quality at the start of the bead.



To completely prevent the tungsten being included, you must not let the electrode touch the piece to be welded. However you use a start-up with high frequency (HF) discharge, that allows striking of the electric arc at a distance.

12 ROUTINE MAINTENANCE & INSPECTION

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

 **WARNING**  Disconnect the PERUN 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 PERUN 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.

13 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:
6. 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.
7. Equipment that has been used beyond the specifications established in the operating manual.

8. Installation not in accordance with the installation/operating manual.
9. Any product that has been subjected to abuse, misuse, negligence or accident.
10. Failure to clean and maintain (including lack of lubrication, maintenance and protection), the machine as set forth in the operating, installation or service manual.
11. 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.

12. 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.

14 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.

15 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:	