

WELDING INVERTER

PERUN 160 E
PERUN 220 E

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.

Welding inverters PERUN 160 E – 220 E are designed for professional welding in MMA method (coated electrode) and in TIG method with touch ignition (LIFT ARC).

Welding machines are equipped with ecological function FOD – fan on demand. This function ensures that after about 4 minutes of inactivity, the electronics will turn off the fan, then the electronics will turn on the fan automatically, when you start welding again. This leads to less wear, less noise and power saving.

Content of functional equipment is also switchable function VRD to protect the welder against the unpleasant effects of open-circuit voltage, adjustable function HOT START for perfect arc ignition, adjustable function ARC-FORCE which ensures stable arc and function ANTI STICK which prevents the electrode sticking to the weldment.

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 PROTECTION

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 REGULATIONS

1. Before starting work with welding machine it is necessary to get familiar with applicable provisions of standards.
2. The welder must use protective equipment.
3. Before working on the electrical part, removing the cover or cleaning it is necessary to disconnect the device from the network.

3. OPERATING CONDITIONS

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 ROUTINE MAINTENANCE & INSPECTION.
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.
11. Extension cables must not have conductors with a smaller cross section than 3x2,5 mm².
12. The machine can be operated on a single-phase electric generator 10 kVA for PERUN 160 E and 12 kVA for PERUN 220 E (1x230V/50Hz) and more, which has ensured voltage stabilization ± 10%. Generators with lower power can damage the machine.
13. It is necessary to protect the machine against:
 - a. Moisture and rain
 - b. Mechanical damage
 - c. Draft and possibly ventilation of neighboring machines
 - d. Excessive overloading – exceeding tech. parameters
 - e. 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.

 Caution 

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

4. TECHNICAL DATA

PERUN 160 E			
Method		MMA	TIG
Mains voltage	V/Hz	1x230/50-60	
Welding current range	A	10 - 160	10 - 160
Open-circuit voltage U_{20}	V	67	67
Mains protection	A	16 @	
Max. effective current I_{1eff}	A	16,0	13,0
Welding current (DC=100%) I_2	A	80	90
Welding current (DC=60%) I_2	A	100	110
Welding current (DC=x%) I_2	A	15%=160	25%=160
Protection		IP23S	
Standards		EN 60974-1, EN 60974-10 cl. A	
Dimensions (w x l x h)	mm	160 x 370 x 280	
Weight	kg	4,4	

PERUN 220 E			
Method		MMA	TIG
Mains voltage	V/Hz	1x230/50-60	
Welding current range	A	10 - 220	10 - 220
Open-circuit voltage U_{20}	V	64,0	64,0
Mains protection	A	16 @ (25 @)	
Max. effective current I_{1eff}	A	16,0 (23,7)	13,1 (16,9)
Welding current (DC=100%) I_2	A	80 (110)	90 (120)
Welding current (DC=60%) I_2	A	105 (150)	110 (160)

Welding current (DC=x%) I ₂	A	10%=220 (15%=220)	20%=220 (25%=220)
Protection		IP23S	
Standards		EN 60974-1, EN 60974-10 cl. A	
Dimensions (w x l x h)	mm	160 x 370 x 280	
Weight	kg	4,8	

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.

The machine is equipped as standard with a 16 A plug for connection to a single-phase network of 1 x 230 V. For this 16A plug the loaders in front of the brackets apply.

When the machine is operated in higher load areas where the effective current drawn from the mains exceeds 16 A, it is necessary to replace the standard plug with a 32 A industrial plug.

Protection of the mains socket with the same design, to which the machine will be connected, it must be max. 25 A.

For this power supply with 25 A protection the loaders in the brackets apply.

Modification of the connection may only be carried out by a qualified electrician, which at the same time assesses the state of the network at the connection point and decides whether it will be possible to connect the machine in this way.

5. EQUIPMENT

CONTENT OF DELIVERY

Item No.	Description	Picture
5.0309	PERUN 160 E	
5.0317	PERUN 220 E	

ACCESSORIES TO ORDER

WELDING TORCHES

Item No.	Cooling	Picture
SRT 17V	Gas	

Caution

The torch must be selected according to the used current range. ALFA IN a.s. is not responsible for damage to the welding torches due to overload.

OTHER ACCESSORIES

Item No.	Description	Picture
VM0253	Welding Cable Set 2x 3m 35-50 160A	
7029	Belt PERUN	
6008	Pressure Reducer FIXICONTROL Ar 2 manometers GCE	
6124	Pressure Reducer BASECONTROL Ar 2 manometers	
6125	Pressure Reducer BASECONTROL CO2 2 manometers	
S777c.	Welding Helmet Barracuda S777C Black	
5.0139ST	Remote CTRL 10 m PERUN incl. ST	

6. OPERATOR CONTROLS

MAIN PARTS

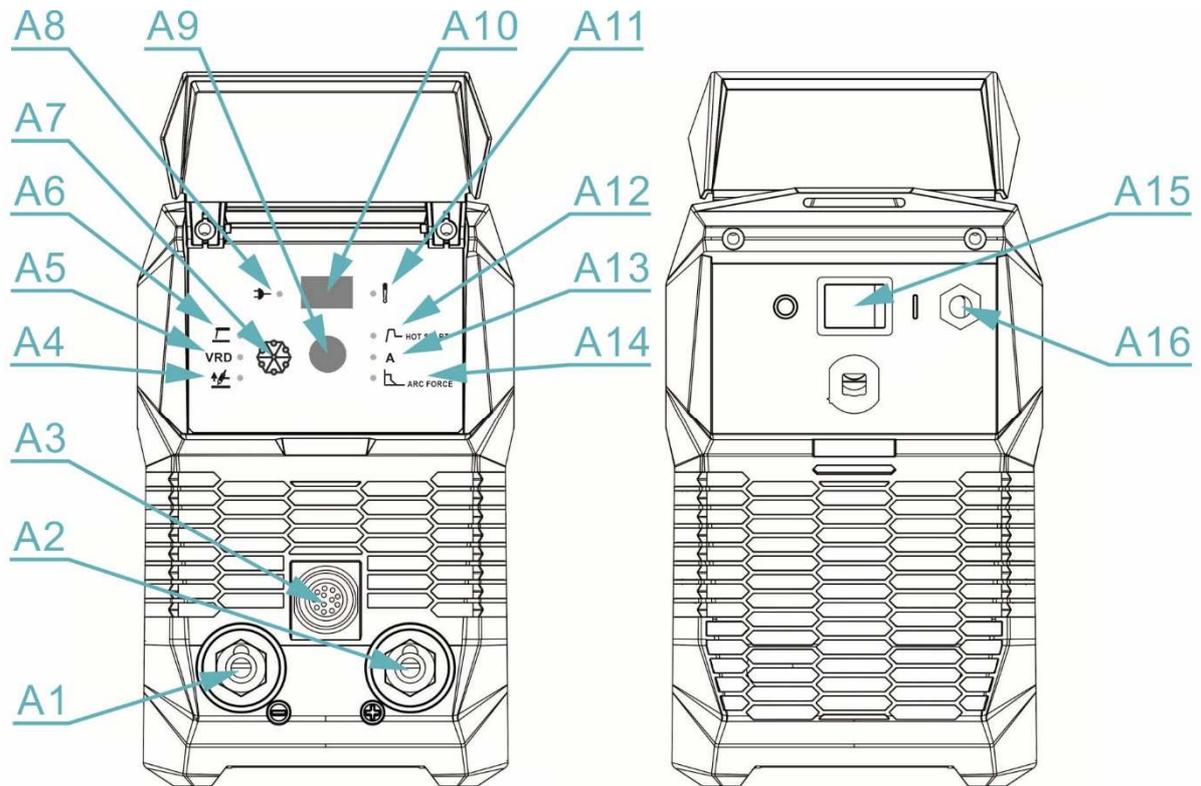


Fig. 1. Main parts

Pos.	Description
A1	Quick connector (-)
A2	Quick connector (+)
A3	Connector
A4	LED – TIG method is selected
A5	LED – MMA VRD method is selected
A6	LED – MMA method is selected
A7	Welding method switch  MMA electrode VRD MMA VRD  TIG
A8	LED of turning on the machine

A9	Encoder
A10	Display
A11	LED overheating (When illuminated leave the machine turned on and wait until the machine cools down.)
A12	LED of selected functions – HOT START / A / ARC FORCE
A13	
A14	
A15	Main switch
A16	Mains cable

Overheating of the machine – LED ALARM lights up and the machine switches to the mode, when is effectively cooled to the operating temperature. Don't use the machine for about 15 minutes. Until the machine reaches the operating temperature, it remains in „cooling mode“ and the machine will only be able to supply reduced welding current.

HOT START – range 1 – 10, default 5, Function HOT START is designed for easier arc ignition.

ARC FORCE – range 1 – 10, default 3, Function ARC FORCE is the prevention against the unwanted sticking of the electrode to the weldment and against the unwanted arc extinguishing.

Decreased ARC FORCE – it is used at medium and higher welding currents.

Maximal ARC FORCE - it is used if you weld with low currents (vertically up, over the head, etc.).

Increased ARC FORCE – it is used for easier arc ignition and arc maintaining, for good penetration.

When welding thin sheets, ARC FORCE increases the risk of burning.

MMA VRD – Voltage Reduction Device. If this mode is active and when the welding process is finished, the VRD immediately reduces the open-circuit voltage to 14 V. Inverters PERUN 160 E – 220 E generate the open-circuit voltage 70 V (MMA) and 70 V (TIG), which is safe and is in compliance with the standard EN 60974-1. However, in a certain environment the welder can feel very unpleasant tingling – electrical shocks. If the MMA VRD mode is active, it will not exposure the welders to those unpleasant states. If the VRD function is not turned on, the control will reduce the open-circuit voltage to 14 V after 90 s.

7. GETTING STARTED

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

GETTING STARTED MMA – COATED ELECTRODE

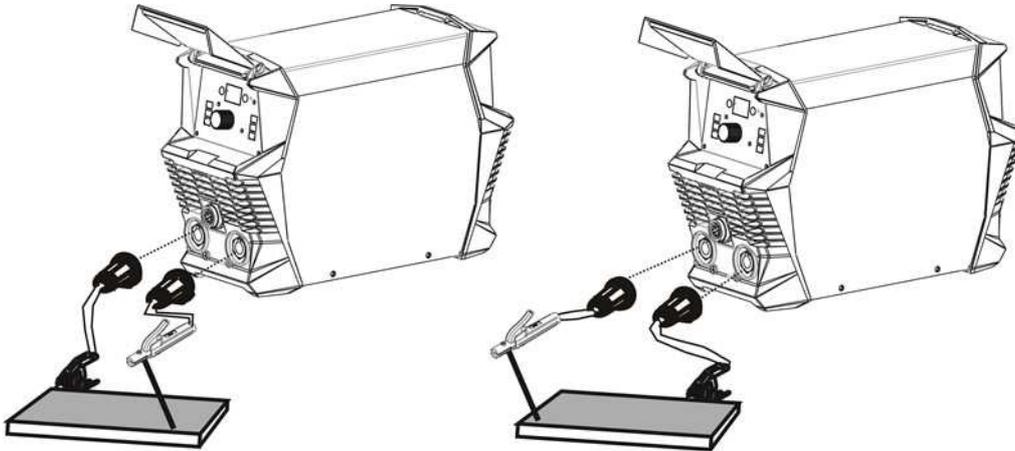


Fig. 2. Getting started MMA

1. Insert the mains plug into a suitable 1x230 V \pm 10% mains socket, 50/60 Hz. The supply fuses or circuit breaker should correspond to the technical data stated in this manual.
2. Switch the main switch **A15** to the position “I”.
3. Connect the electrode holder to the quick connector (+) **A2** and the earthing cable to the quick connector (-) **A1** according the instruction on the electrodes packing.
4. By means of the welding method switch **A7** switch to the position MMA

 or MMA **VRD**.

5. By means of the encoder **A9** set the welding current.
6. Press and then rotate the encoder **A9** to adjust the level of HOT START (increase of the current when arc is ignited; range 1 – 10, default 5) and ARC FORCE (automatic increase of the welding current at the contact of the electrode and the weldment during welding; range 1 – 10, default 3).
7. Connect the earthing clamps of the ground cable to the welding piece.
8. Insert the appropriate coated electrode into the electrode holder and you may start welding.

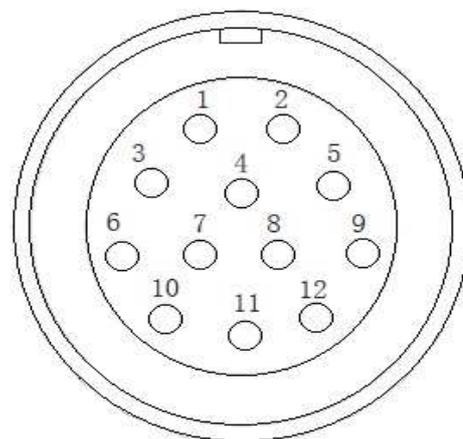
 **NOTE**  Prevent touching the electrode any metal material for in this mode the quick connectors **A2** and **A1** are under current.

TABLE OF ELECTRODE CONSUMPTION DURING WELDING

Electrode diameter [mm]	Range of welding current [A]	Total electrode length [mm]	Weight of boiled electrode without slag [g]	Boiled electrode time [s]	Weight of boiled electrode without slag per 1 second [g/s]
1,6	30 - 55	300	4	35	0,11
2,5	70 - 110	350	11	49	0,22
3,2	90 - 140	350	19	60	0,32
4,0	120 - 190	450	39	88	0,44

GETTING STARTED TIG**TIG TORCH CONNECTION SCHEMA**

5737 CONNECTOR ST 12 PIN MALE	
PIN NO.	TORCH WITH POTENTIOMETER
1	/
2	/
3	POTENTIOMETER (+)
4	POTENTIOMETER (CENTER TAP)
5	POTENTIOMETER (-)
6	/
7	/
8	/
9	/
10	/
11	/
12	/



1. Insert the mains plug into a suitable 1x230 V \pm 10% mains socket, 50/60 Hz. The supply fuses or circuit breaker should correspond to the technical data stated in this manual.
2. Switch the main switch **A15** to the position "I".
3. Connect the TIG torch to the quick connector (-) **A1**.
4. Connect the earthing cable to the quick connector (+) **A2**.
5. By means of the welding method switch **A7** switch to the position TIG 
6. Connect the gas hose to the gas cylinder connector on the gas bottle.
7. By means of the encoder **A9** set the welding current.

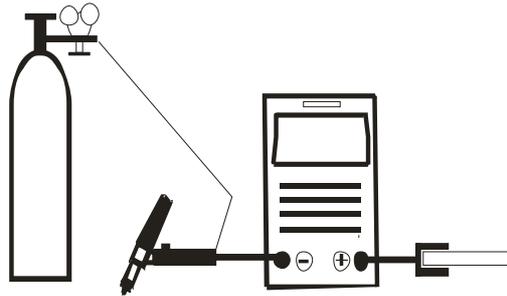


Fig. 3. Getting started TIG

TABLE OF CONSUMPTION DURING TIG WELDING

Wolfram electrode diameter [mm]	Argon flow [l/min]
	Steel / stainless steel
0,5	3 – 4
1,0	3 – 5
1,6	4 – 6
2,4	5 – 7
3,2	5 – 9

8. JOBS

JOBs are available in both methods – MMA and TIG.
The welding machine has a choice from 9 JOBs.

HOW TO SAVE PARAMETERS TO THE JOB

1. Parameters, which you want to save to the JOB, set by means of the encoder **A9**. (By short pressing the encoder **A9** 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 **A9** get into the JOBs menu. The display **A10** will show **-S-**. In the JOBs menu are two positions: **-S-** (Save) and **-L-** (Load).
3. By short pressing the encoder **A9** confirm the message **-S-** on the display **A10** to save your choice of parameters or functions. The display **A10** will show numbers from 2 to 10 for particular JOBs. Rotate the encoder **A9** to

select the desired JOB number, into which you want to save your selected parameters, then confirm your choice by short pressing the encoder **A9**.

HOW TO LOAD THE SAVED JOB

1. By long pressing the encoder **A9** get into the JOBS menu. The display **A10** will show **-S-**.
2. Rotate the encoder **A9** to move to the position **-L-**. By short pressing the encoder **A9** confirm the position **-L-**.
3. The display **A10** will show numbers from 2 to 10 for particular JOBS. Rotate the encoder **A9** to select the desired JOB number, from which you want to load your selected parameters, then confirm your choice by short pressing the encoder **A9**.

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.

9. RESET

The factory reset is performed as follows:

1. By long pressing the encoder **A9** get into the JOBS menu. The display **A10** will show **-S-**.
2. Rotate the encoder **A9** to move to the position **-L-**. By short pressing the encoder **A9** confirm the position **-L-**.
3. Rotate the encoder **A9** and select the number **1**, which is designed for **factory reset**, then confirm your choice by short pressing the encoder **A9**.

10. 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

2. Disconnect the PERUN from the mains supply voltage before disassembling.
3. Special maintenance is not necessary for the control unit parts in the Welder. If these parts are damaged for any reason, replacement is recommended.
4. CAUTION
5. 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.

6. 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.
7. Troubleshooting and repairing of PERUN welding equipment should only be carried out only by suitably qualified or competent person.
8. 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.
9. The person carrying out the servicing needs and repairs must know what to look at, what to look for and what to do.

11. 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.
7. 🖐️ NOTE 🖐️
8. 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.
9. 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.

12. 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.

13. 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:	