WELDING MACHINE

PERUN 200 SDpulse

OPERATING MANUAL

Content:

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 your ALFA IN product's correct use and operation. Your satisfaction with this product and its safe process is our ultimate concern. Therefore, please take the time to read the entire manual, especially the Safety Precautions. They will help you avoid potential hazards 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 SDpulse is a multifunctional welding machine with synergic programs and dual pulse functions. The MIG function allows welding with wires in shielding gas and provides excellent professional welding results. The easy step-less adjustment of tension and wire feed, along with integrated digital gauges, allows easy adjustment of welding parameters. This machine features MIG welding with synergic welding programs for easy use with your chosen gas mixture. It is suitable for use with MEDVED power generators.

The added Lift-Arc DC TIG function ensures perfect arc ignition every time, and the remarkably smooth, stable arc produces high-quality TIG welds.

 The machine can be used for welding in areas with elevated risk of electric shock.

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

2. Safety precautions

2.1 Personal precaution

1. For safety reasons, it is necessary to use welding gloves during welding. These gloves will protect you before the 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 a quality welding helmet with an intact protective filter.
3. Ensure the torch insulation and the earthing cable are in good condition.
4. Persons near the welding must be informed of the danger and equipped with protective equipment.
5. During welding, especially in small spaces, it is necessary to ensure an adequate supply of fresh air because, during welding, harmful fumes arise.
6. In tanks of gas, oil, fuel, etc. (even empty ones), do not make welding because there is a chance of explosion.
7. In areas with a chance of explosion, special provisions are applied.
8. Welding machines 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.

2.2 Safety regulations

1. Before starting work with the welding machine, getting familiar with the CSN 050601 and norm CSN 050630 provisions is necessary.
2. 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 is necessary to disconnect the device from the network before working on the electrical components.

3. Operating conditions

1. Putting the machine into operation can be performed only by trained personnel and 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. The device complies with IEC 61000-3-12.
3. The welding machine is tested according to the degree of protection.
   IP 23S protects against the intrusion of solid bodies with a diameter greater than 12 mm and against water ingress 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. It is not permissible to connect multiple machines in parallel or series.
8. The machine must be positioned so that cooling air can enter and leave through cooling vents with no problem. It is necessary to ensure no mechanical equipment, especially metal particles (e.g. during grinding), is drawn into the machine. Cooling is controlled by electronic temperature control.
9. Welding machines must undergo a periodic inspection every 6/12 months by an authorized officer as per the regulations for the revision of electrical equipment in your country and the rules for welding and safety provisions for metal arc welding – see Maintenance and service tests.
10. All interventions in the electrical equipment, as well as repair (removal of the plug, fuse replacement), should be performed by an authorized person.
11. The manufacturer sets the welding machine to 230V with a tolerance range of 110 - 230 V ± 10%, which allows the device to operate in a ~ 230V and ~ 110V network.
12. With competent mains, voltage and input must match the plug.
    NOTICE: In the event that the welding device is transported from a cold to a warmer location, there is a possibility of moisture condensation developing, particularly within the welder. Should this occur, it could weaken the electrical strength and heighten the likelihood of electrical discharge on parts under stress, resulting in severe harm to the equipment. It is crucial to allow the welder to rest for approximately an hour until it has reached the same temperature as its surroundings, preventing any potential condensation. Once the waiting period is

complete, the device may be connected to the power supply and utilized without concern.

13. 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 neighbouring machines
    e) Excessive overloading – exceeding tech. parameters
    f) Rough treatment

3.1 Elektromagnetic compatibility

The welding device is in terms of interference designed primarily for industrial areas. It meets the requirements of EN 60974-10 class A requirements. It isn't intended for use in residential areas, where a public low-voltage power supply network supplies the electrical energy. There can be potential problems with ensuring electromagnetic compatibility in these areas due to interference caused by power lines and radiated interference. During operation, the device may be the source of interference.

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

4. Technical data

Method		**MIG/MAG**	**MMA**	**TIG**
Mains voltage	V/Hz	1x230/50-60		
Welding current range	A/V	20/15,0 – 200/24,0 - 200	10/20,4 – 200/28,0	10/10,4 - 200/18,0
Open-circuit voltage U_{20}	V	66		
Open-circuit voltage reduced U_{2R}	V	11	---	11
Mains protection	A	16		
Max. effective current I_{1eff}	A	15,6	15,8	12,9
Welding current (DZ=100 %) I_2	A	130	120	130
Welding current (DZ=60 %) I_2	A	165	150	165
Welding current (DZ=x%) I_2	A	30 %=200	25 %=200	40 %=200
Protection		IP 23S		
Standards		EN IEC 60974-1, EN IEC 60974-10 cl. A		
Dimensions (w x d x h) kompakt	mm	230 x 640 x 420		
Weight-compact	kg	18,4		
Wire-speed	m/min	1,5 - 16,5	---	---
Spool diameter	mm	200	---	---
Spool weight	kg	5	---	---

ALFA IN 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 previously sold or shipped equipment 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 1 x 230 V single-phase network.

S The device marked with this symbol can be used for welding in areas with an increased risk of electric shock.

The design of the machine is such that in no case, even in rectifier failure, is the permissible peak value of the no-load voltage exceeded according to EN 60974-1 ed. 3, i.e., 113 V DC or 68 V AC.

NOTICE: Due to the installed capacity's size, the distribution companies' approval may be required to connect the equipment to the public distribution network.

5. Equipment

5.1 Models

Item No	Description	Picture
5.0335	PERUN 200 SDPULSE	

5.2 Accessories to order

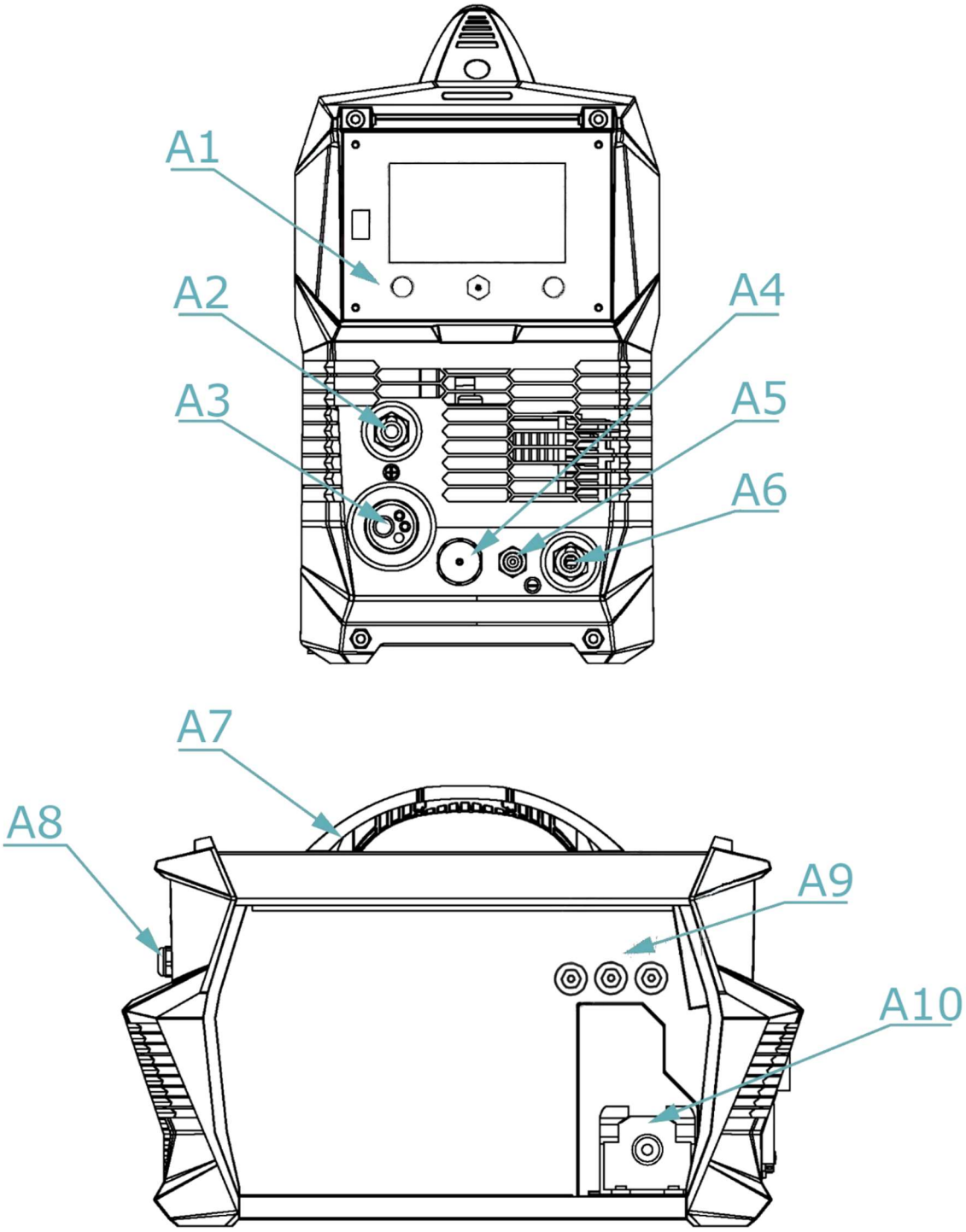
Item No.	Description	Picture
M1-3M	Torch ARC M1 3m 180/150A *	
M1-4M	Torch ARC M1 4m 180/150A *	
M1-5M	Torch ARC M1 5m 180/150A *	
M22-3M	Torch ARC M22 3m 250/220/145A *	
M22-4M	Torch ARC M22 4m 250/220/145A *	
M22-5M	Torch ARC M22 5m 250/220/145A *	
T24ST	Torch T2 4m 35-50 arc ST	
T28ST	Torch T2 8m 35-50 arc ST	

5847	Set Connectors ST 12 PIN	
VM0151-1	Hose Gas 3m G1/4-G1/4	
VM0253	Welding Cable Set 2x 3m 35-50 200A	
5.0174ST	Foot Pedal Remote CTRL 3 m PERUN, PEGAS incl. Connector ST	
5.0139ST	DOV PERUN remote control 10 m ST	
	Rolls – see section WIRE FEEDER	
S777C	Welding Helmet Barracuda S777C Black	
S7SUN9B	Welding Helmet S9B Shooting Blue Shark	
S7SUN9BSIL	Welding Helmet S9B Shooting Shark SILVER true color	
4488	Wire 0.8 Coreshield 15 A D200 Self Shielding 4,5kg spool	

SGL2	Small Gas Lens Body Starter Kit 1.6mm-1/16"	
SGL4	Small Gas Lens Body Starter Kit 2.4mm-3/32"	
SGL5	Small Gas Lens Body Starter Kit 3.2mm-1/8"	
700.0306.10	Electrode wolf.1.6x175-Violet	
700.0308.10	Electrode wolf.2.4x175-Violet	
700.0310.10	Electrode wolfram E3 3.2x175 - violet	

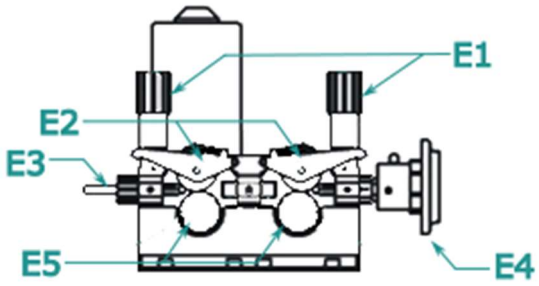
NOTE: Valid for duty cycle 60 % and the first entry in A is for gas CO_2 and second entry valid for Ar/CO_2

6. Main parts of the machine



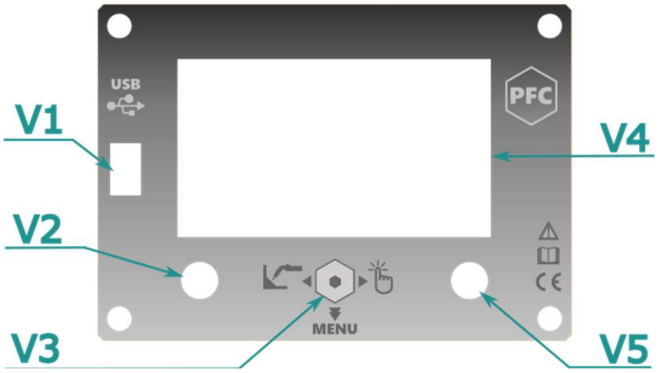
Pos.	Description
A1	Control panel
A2	Quick connector (+) of welding cables
A3	Central MIG/MAG torch connector
A4	TIG torch control connector
A5	Gas connector for TIG torch
A6	Quick connector (-) of welding cables or TIG torch connector
A7	Handle
A8	Mains cable
A9	Terminals of change polarity MIG/MAG torch
A10	Wire feeder

6.1 Wire feeder



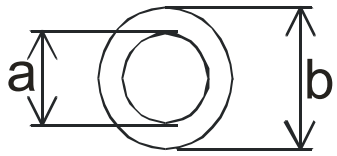
Pos.	Description
E1	The nut of a pressure arm
E2	Pressure arm
E3	Inlet liner
E4	EURO connector
E5	Roll

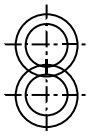
6.2 Control panel



Pos.	Description
V1	USB Connector
V2	Left encoder
V3	Button
V4	LCD
V5	Right encoder

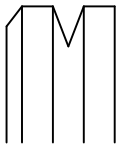
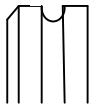
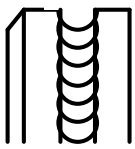
6.3 Overview of rolls for wire feed





a = 22 mm

b = 30 mm

Groove type	Wire diameter	Item No
Steel 	0,6-0,8	2187
	0,8-1,0	2188
Aluminium 	0,8-1,0	2270
Flux core 	0,8-1,0	2318
	1,0-1,2	2319

7. Main menu

When the machine is switched on, the main welding screen is displayed. These are described below for each method. The V3 button must be held down to go to the main menu. Return to the main screen by briefly pressing the MENU button.

The left encoder V2 is used to move around the main menu. The selected item will be highlighted in orange and you press the left encoder V2 to select the item (only valid for selecting the method.

If "wire feed" is selected, the wire is fed while the left encoder V2 is held down. If "gas test" is selected, confirm with the left encoder V2 when the valve is opened, and a second press closes the valve.

7.1 Method selection

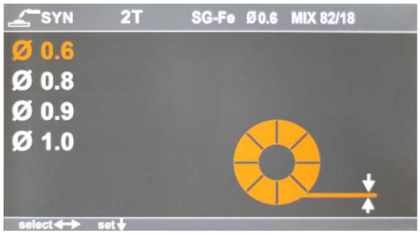
Pressing the button next to the selected item "method" opens the submenu for selecting the method.

In this submenu, the left encoder V2 is again used for navigation. To select a method, press the left encoder V2.

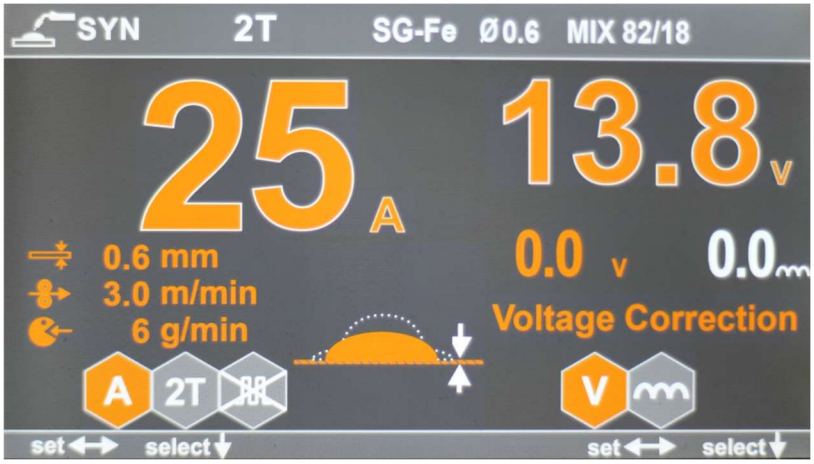
7.1.1 MIG MAG SYN

1. Synergy parameters selection

If the MIG MAG SYN method is selected, further submenus are opened, the first of which is the material selection, followed by the gas selection and wire diameter. The selection is made using the left encoder and is confirmed by pressing the left encoder.



2. MIG MAG SYN Screen



On the main screen in the bottom left corner, press the left encoder V2 and then turning to the right to select parameters according to the user's needs. In the lower right corner, pressing the right encoder V5 and then turning right or left changes the voltage correction or choke.

3. Setting secondary welding parameters MIG MAG SYN

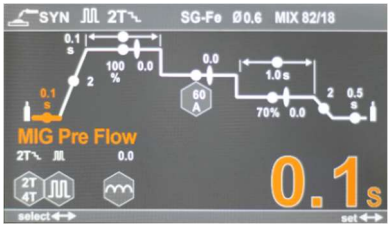
Parameter selection is done with the left encoder V2 and parameter value change with the right encoder V5. The setting of the secondary welding parameters is the same for all methods.

This screen changed appearance according to the selected parameters:

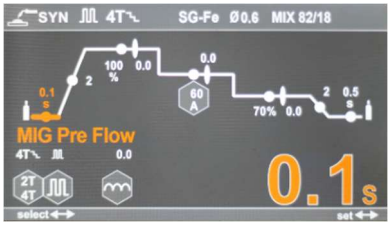
2T/4T

Pulse 2T

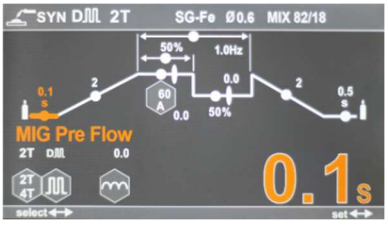
Pulse 4T



Pulse 2T sequence

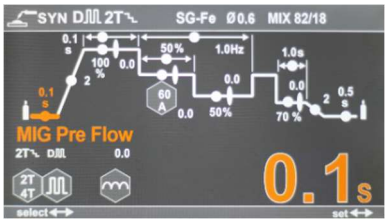


Pulse 4T sequence

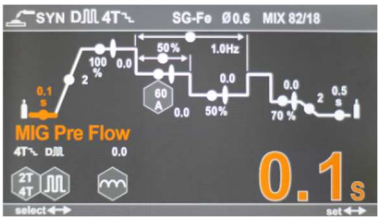


DPulse 2T

DPulse 4T



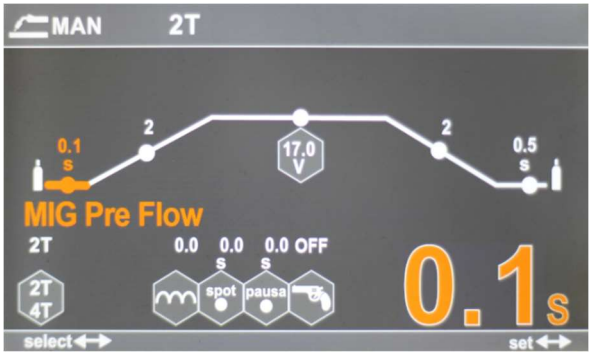
DPulse 2T sequence



DPulse 4T sequence

7.1.2 MIG MAG MAN

MIG MAG MAN Screen



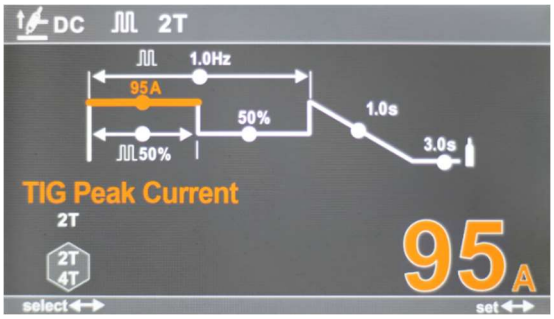
Secondary parameters screen

On the left side of the screen, press the left rotary pushbutton V2 and then move sideways to change the parameters. On the right side, press the right encoder V5 and rotate to change parameters.

7.1.3 TIG LIFT ARC

TIG LIFT ARC Screen

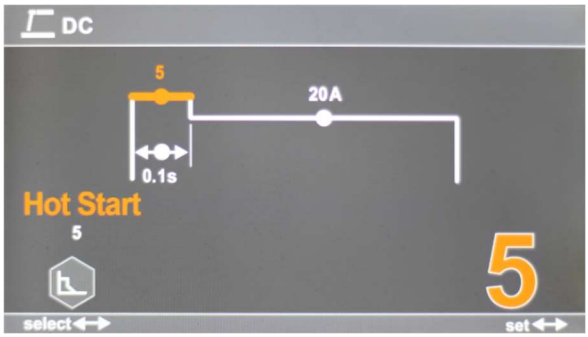
2T/4T

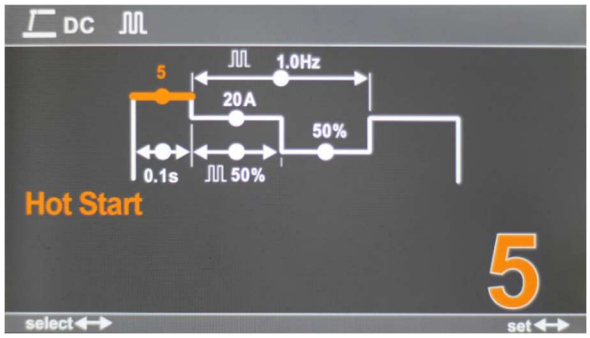


Pulse 2T/4T

7.1.4 MMA DC

MMA DC Screen





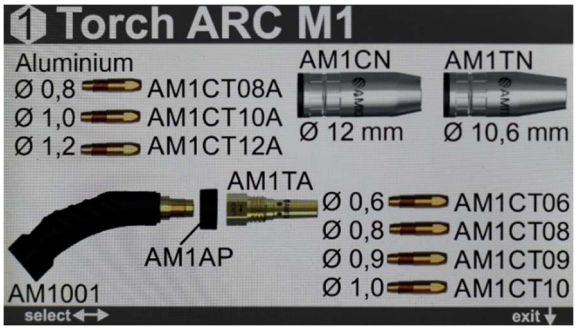
Pulse

Secondary welding parameters	MIG/MAG welding parameters (Default)	TIG welding parameters (Default)	MMA welding parameters (Default)
Two/four Stroke	2T/4T/S2T/S4T (2T)	2T / 4T (2T)	-
Burn Back	0 - 10 (2)	-	-
Initial Speed	1 - 10 (2)	-	-
Pre Flow	0 - 2 s (0,1 s)	-	-
Post Flow	0 - 5 (0,5 s)	0 - 20 (3 s)	-
Inductance	-10 - 10 (0)	-	-
Downslope	-	0 - 20 s (1 s)	
Hot Start	-	-	0-10 (5)
Hot Start Time	-	-	0,1 – 0,5s (0,1 s)
Peak Current	10 – 200 A (25 A)	10 – 200 A (80 A)	10 – 200 A (20 A)
Base Current	-	20 – 80 % (50 %)	20 – 80 % (50 %)
Crumb	20 – 80 % (50 %)	5 – 95 % (50 %)	5 – 95 % (50 %)
Frequency	0,5 – 5 Hz (1Hz)	0,5 – 999 Hz (1Hz)	0,5 – 100 Hz (1Hz)
Arc Force	-	-	0-10 5)

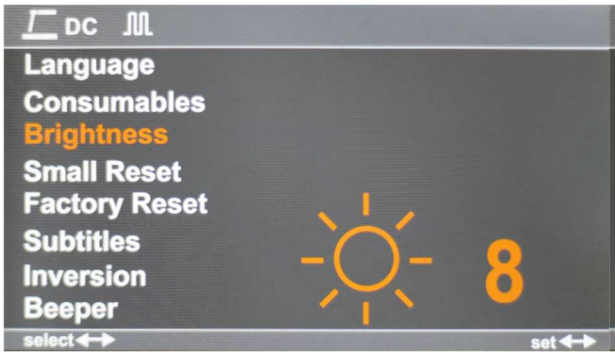
7.2 System settings

Use the left encoder V2 to navigate the menu and the right encoder V5 to change settings. To enter consumables, select "Consumables" and press the to enter.

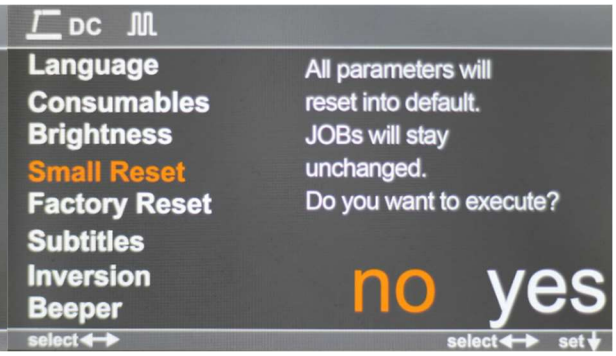
Changing the language of the user interface



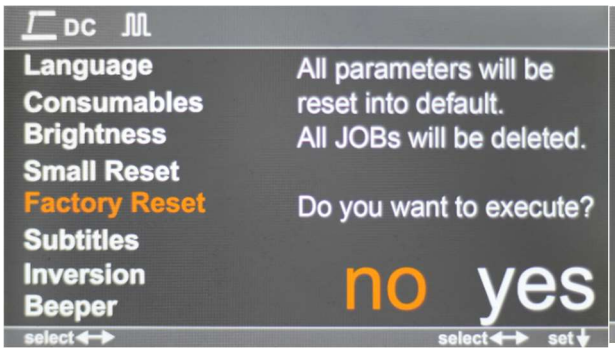
Recommended accessories



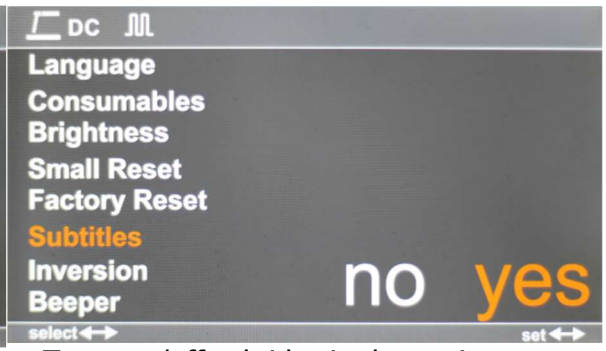
Display brightness



Small reset (all parameters set to default values, but saved JOBs remain)



Factory reset (sets all parameters to default values and deletes all saved JOBs)



Turns on/off subtitles in the environment

Choice of environmental colour scheme

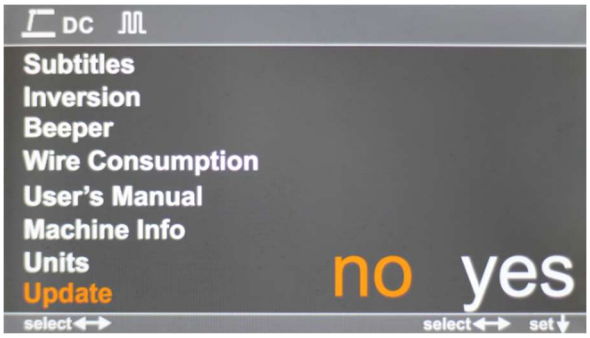
Turns on/off beeping when navigating through the menu

Turns on/off the display of wire consumption on the screen

Link to the user manual

Information about the machine

Selection of units



Perform firmware update from USB disk

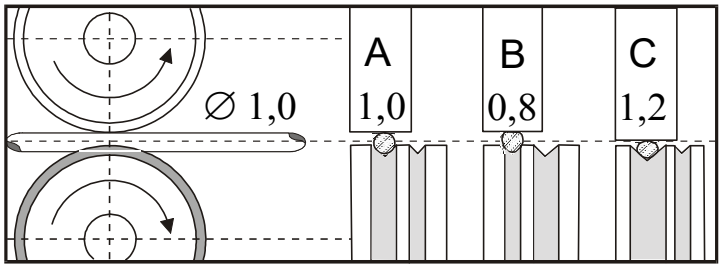
8. Getting started MIG/MAG

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

8.1 Choosing the feeding roll

All machines (ALFA IN MIG / MAG) have rolls with two grooves are used. These grooves are intended for wire diameters (e.g. 0,8 and 1,0 mm).

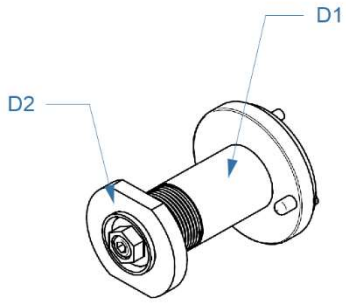
Rolls for wire feed must comply with the diameter and material of the welding wire. Only this way a smooth wire feed can be achieved. Irregularities of the wire feed lead to poor welding quality and deformation of the wire.



A	Correct
B	Wrong
C	Wrong

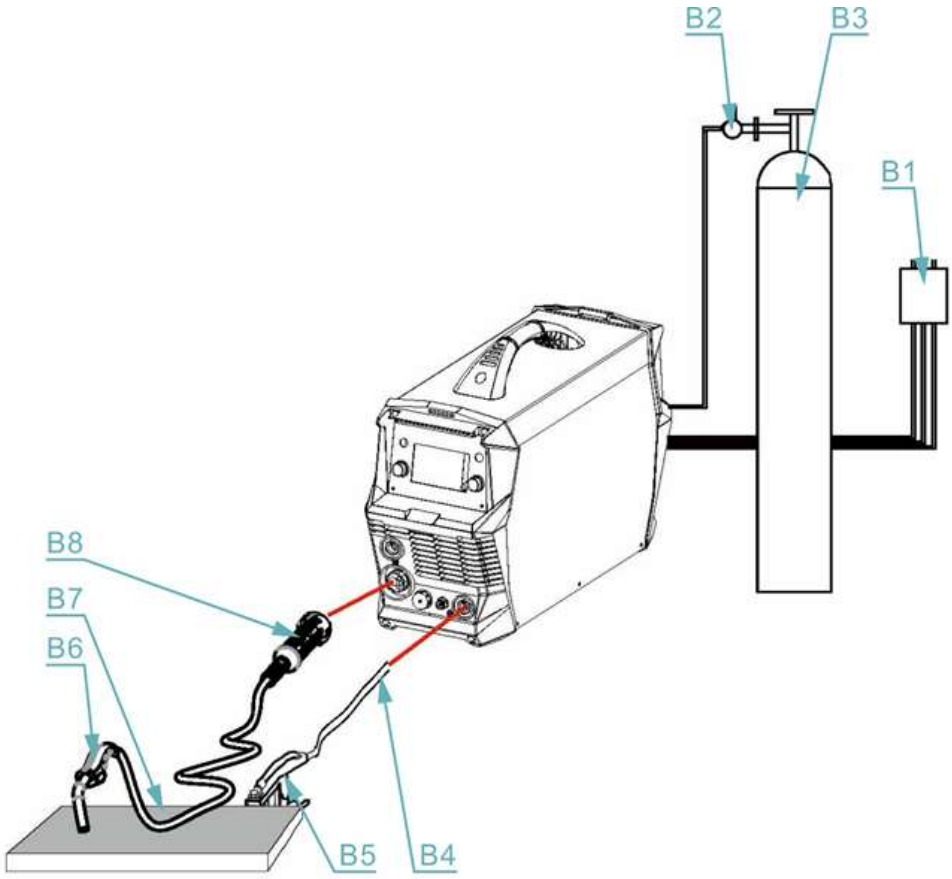
8.2 Inserting the wire

1. Open the side cover of the wire feeder space.
2. Put the wire spool on the wire spool holder D1 and fix it with the fixing nut D2.
3. Cut off the curved or damaged end of the welding wire, lead it through the inlet liner E3, and roll it into the liner inside the EURO torch connector (about 5 cm). Make sure that you use a suitable groove.
4. Put the pressure arm E2 down so that the teeth or the gear fit and fix it by setting the lever E1 vertically.
5. Adjust the pressure nut so that it provides constant movement of wire but does not deform wire. The adjusting screw is located under the plastic screw E1.
6. The manufacturer sets the spool brake. If necessary, the brake can be adjusted by a screw D1 so that while stopping the feed, the spool will be stopped on time (it will avoid excessive release of wire). However, a too-tight brake needlessly strains the feeding mechanism, and thus, slippage may occur in the wire rolls.



Pos.	Description
D1	Spool Holder
D2	Nut Spool Holder

8.3 Inserting the wire to the torch and connection of ground cable



1. Connect the torch B6 to connector A3 on the machine while the machine is turned off.
2. Connect the ground cable B4 to the quick connector (-) A6 welding cables.
3. Connect the ground clamps B5 to the weldment B7 or the welding table.
4. **NOTICE:** When inserting the wire, do not point with the torch to the eyes!
5. Remove the gas nozzle from the torch.
6. Unscrew the current nozzle.
7. Connect the machine to the power supply.
8. Turn the main switch on the rear panel to ON.

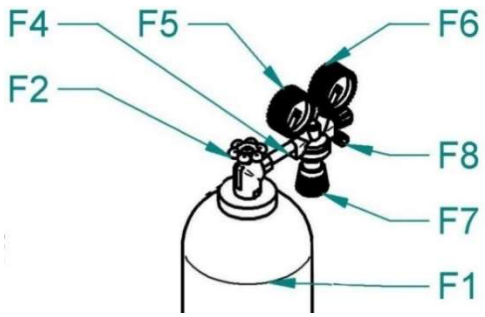
9. Enter the main menu by holding the V3 button for 2 sec.
10. Select the "wire feed" function by V2 encoder and hold V2 encoder to feed the wire to the torch.

8.4 Adjustment of gas flow

The electric arc and the weld must be perfectly shielded by gas. Too small an amount of gas does not perform the protective atmosphere; on the other hand, too big an amount of the gas brings air into the electric arc.

NOTICE: The gas bottle must be well secured against fall. This manual does not solve the safe securing of gas bottles. Information can be obtained from a supplier of industrial gases.

1. Connect the gas hose to gas outlet F8 on the valve and the gas inlet to the gas connector.
2. Use menu to select wire feeding.
3. In the main MENU, press the left encoder V2 to test the gas, the valve will open. A second press will stop the valve.
4. Turn the adjusting screw F7 at the bottom side pressure-reducing valve until the meter F6 shows the required flow, then release the button. The optimum flow is 10-15l/min.
5. After long-term shutdown of the machine or torch replacement, it is suitable to blow the pipes with protective gas before welding.
6. Close the cylinder valve when welding is finished.



Pos.	Description
F1	Gas bottle
F2	Cylinder Valve
F4	Pressure Reducer
F5	High-Pressure Manometer
F6	Low-Pressure Manometer
F7	Adjusting Screw
F8	Gas outlet

8.5 Adjusting welding parameters for MIG SYN

1. Select a suitable welding program by choosing a suitable MIG mode (PA, PB), welding wire material, shielding gas and welding wire diameter.
2. Select the trigger mode (2T/4T/S2T/S4T), eventually PULSE/DPULSE mode on the main welding screen.
3. Recommendation – For perfect manual tack welding (for example, car bodywork repairs), use the machine in the MIG Manual mode.

8.6 Adjusting welding parameters for MIG MAN

1. The approximate setting for the MIG / MAG welding current and voltage corresponds to the empirical relationship $U_2 = 14 + 0.05\ I_2$. According to this relationship, we can determine the required voltage. When setting the voltage, we expect a decline in voltage during load. The voltage drop is approximately 4,8V at 100 A.
2. Select voltage.
3. Then, select the appropriate wire speed.
4. Tune the arc by changing the levels of the choke.

8.7 Adjusting the machine for another wire diameter

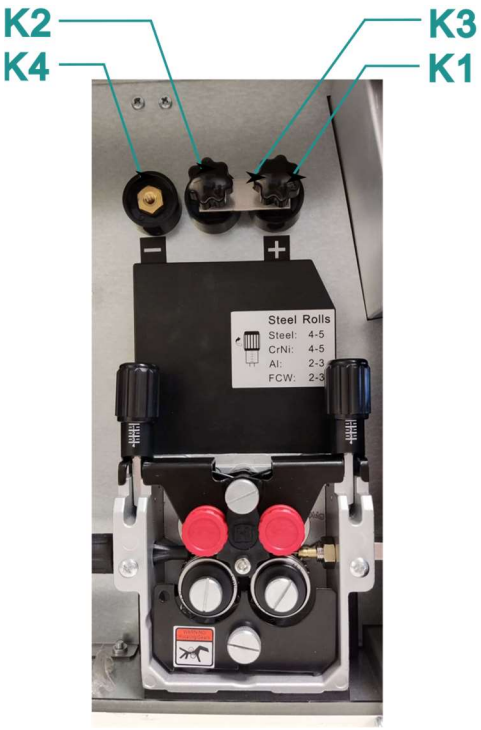
All machines ALFA IN MIG / MAG have used rolls with two grooves. These grooves are intended for two different wire diameters (e.g. 0,8 a 1,0 mm). Grooves can be replaced by removing and rotating the rolls or using different roll grooves with the required dimensions.

See page 13 for the mechanism.

1. Open the nut E1 to the left, and pressure roll E2 will be opened upward.
2. Unscrew the plastic locking element E5 and remove the roll.
3. If there is a suitable groove on the roll, rotate the roll and place it back on the shaft and secure it by screwing the element E5.

8.7.1 Flux core wire – setting the polarity for MIG/MAG torch

1. It is desirable to have positive polarity on the MIG/MAG torch while welding with solid wire in most cases. The welder is supplied from the production with positive polarity on the MIG/MAG torch.
2. Negative polarity on the MIG/MAG torch may be necessary for welding with flux-cored wires.
3. The middle terminal **K2** is connected to the central euro connector of the MIG/MAG torch. We supply the welder with **K2** connected using the bridge **K3** to terminal (+) **K1**.
4. In the case of welding with flux core wire with (-) polarity, connect **K2** using the bridge **K3** with **K4** terminal (-).
5. Make sure you fasten the terminals properly.
6. Connect the ground cable **B4** to the quick connector (+) **A2**.



Pos.	Description
K1	Right terminal (+)
K2	Middle terminal
K3	Bridge
K4	Left terminal (-)

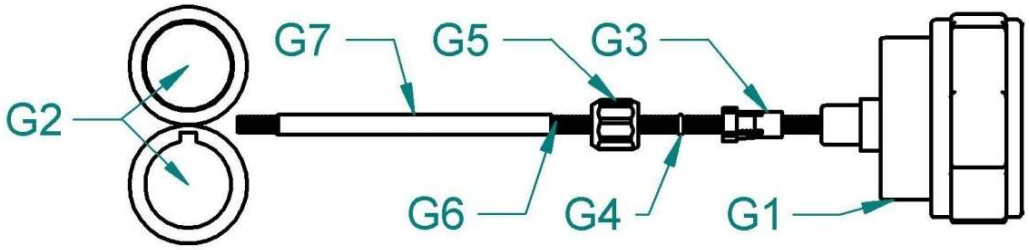
NOTICE: If you want to weld with flux core wire, removing the torch's gas nozzle before starting welding is necessary. Furthermore, you must not touch the weldment with the die during the welding process. There would be a risk of baking the wire.

8.7.2 Adjusting the machine for welding aluminum

For feeding the AL wire, roll with the "U" profile is necessary - see paragraph 6.3 OVERVIEW ROLLS WIRE FEED. To prevent problems with feeding, use wires with diameter. 1.0 mm of $AlMg_3$ or AlMg. Wire of alloy Al99,5 or $AlSi_5$ are too soft and will easily cause movement problems.

For the aluminium welding, it is also necessary to provide the torch Teflon liner and special current nipple. We do not recommend you to use the torch longer than 3 m. Attention must be paid to adjusting the contact power of rolls – it must not be too high. Otherwise, there can be a deformation of the wire.

It is necessary to use argon as a protective atmosphere.



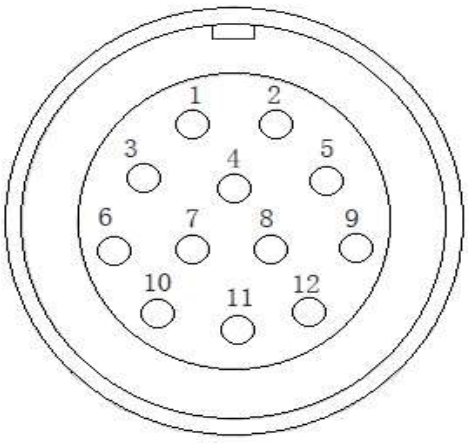
Pos.	Description
G1	EURO connector
G2	Rolls
G3	Liner terminal for 4,0mm, 4,7mm outer diameter
G4	O-ring 3,5 x1, 5mm to prevent escape of gas
G5	Nut
G6	Liner tefl.
G7	Sustain pipe for Teflon and plastic liner.

9. Getting started TIG

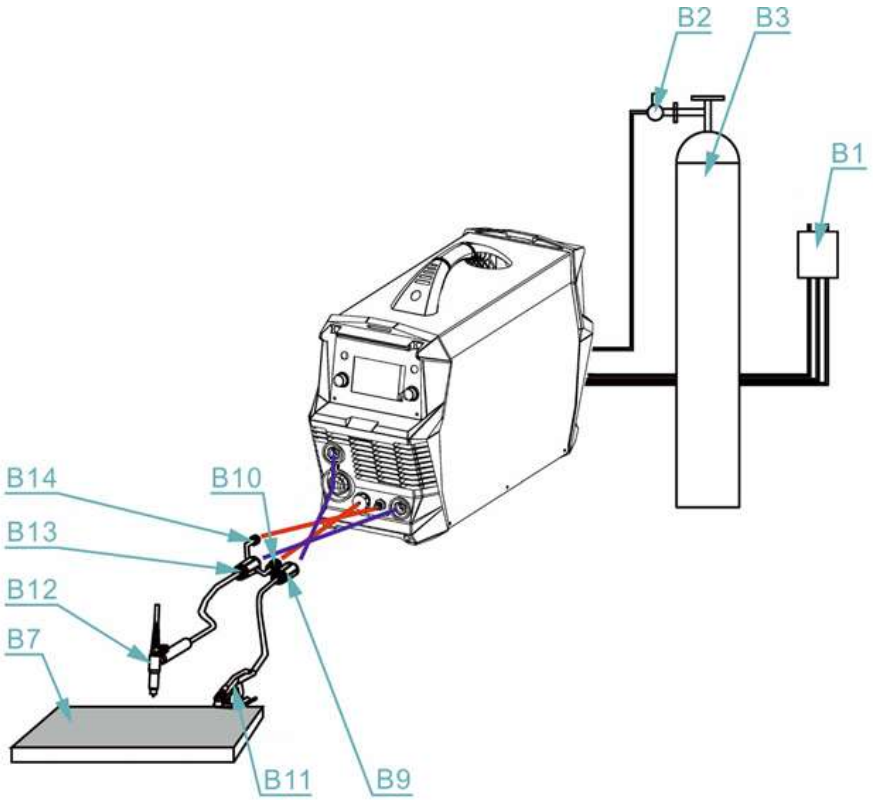
Getting started must be consistent with technical data and conditions of use.

9.1 TIG torch / Accessories connector schema

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



9.2 Connection of the main TIG components



1. Connect the torch B12 to the quick connector (-) A6 of welding cables to the gas connector B14 and connector B10.
2. Connect the ground cable B9 to the quick connector (+) A2 of welding cables and the ground clamp B11 to the weldment B7 or the welding table.
3. Connect the machine to the power supply and turn the main switch on the back panel to ON.
4. Connect the gas hose and gas flow adjustment described in **Chyba! Nenalezen zdroj odkazů.**.
5. In the submenu of method selection, select TIG LIFT ARC.
6. Use the knob A2 to adjust the welding current.
7. In the submenu of welding parameters settings, you can change the values of pre and post-gas time.

10. Getting started MMA

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

1. Connect the electrode holder, and the work leads to quick connectors A2 and A6 according to the instructions on the electrode package.

NOTICE: Prevent touching the electrode of any metal material, for in this mode, the quick connectors A2 and A6 are under current.

2. In the submenu of method selection, select MMA DC.
3. Select the current.

11. JOBs

JOBs are available in both MMA and TIG methods. The welding machine has a choice of 10 JOBs.

11.1 Save parametres to JOBs

1. Once you have set all the parameters or functions to suit your needs, a long press on the right V5 encoder will bring up the screen with positions 1-10.
2. Use the left encoder V2 to select the position where you want to save the JOB, press the left encoder V2 to confirm and the JOB will be saved.
3. Press the V3 button to return to the main welding screen.

11.2 Loading saved JOBs

1. If you want to upload a JOB, long press the left encoder V2 to display a screen with the positions of the save JOBs.
2. Rotate the left encoder V2 to move to the desired JOB number and press the left encoder V2 to confirm and the JOB will load.
3. Press the V3 button to return to the main welding screen.

11.3 Transcription of saved JOBs

1. If you change the parameter settings and want to overwrite and saved JOB, a long press of the right encoder V5 will take you to the numeric positions of the JOBs.
2. Select with the left encoder V2 which JOB you want to overwrite and press the left encoder V2.
3. The device will ask you if you really want to overwrite the JOB, confirm with the right encoder V5.

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.
2. **WARNING:** Disconnect the PERUN from the mains supply voltage before disassembling.
   Special maintenance is not necessary for the control unit parts in the welder. If these parts are damaged for any reason, replacement is recommended.
3. **NOTICE:** 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.
4. To clean the welder, disconnect it from the mains supply voltage, 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 recommended for cleaning electrical apparatus may be used.
5. Troubleshooting and repairing of PERUN welding equipment should only be carried out by a suitably qualified or competent person.
6. A 'competent person' must have 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.
7. The person carrying out the servicing needs and repairs must know what to look at, what to look for and what to do.

13. Error messages

Error type	Error code	Description
Temperature	E01	Over Temperature!
	E02	Over Temperature!
	E03	Over Temperature!
	E04	Over Temperature!
	E09	Over Time Of Continuously Welding!
Welding machine	E10	Phase Loss Error!
	E11	Water Shortage!
	E12	Low Air Pressure Error!
	E13	Low Input Power!
	E14	High Input Power!
	E15	Overcurrent Error!
	E16	Wire Feeder Error!
	E17	Fan Error!
Communication	E40	Master And Slave Disconnected Error!
	E41	Communication Data Error!
	E42	Password Error!
	E43	Communication Data Error!
	E50	Read Flash Error!
	E60	Thermistor Unplugged Error!
	E90	Program Upgrade Timeout Error!

14. Statement of warranty

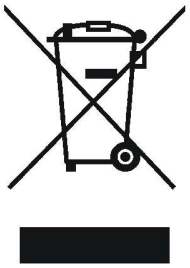
1. Following the warranty periods stated below, ALFA IN guarantees that the proposed product will be free from material or craft defects when operated per the written instructions defined in this operating manual.
2. ALFA IN welding products are manufactured for commercial and industrial users and trained personnel with experience in using and maintaining 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 craft within the warranty period. The warranty period begins on the date of sale to the end user.
4. If a warranty is being sought, don't hesitate to contact your ALFA IN product supplier for the warranty repair procedure.
5. ALFA IN warranty will not apply to:
   a) Equipment modified by anyone other than ALFA IN service personnel or with the prior written consent of the ALFA IN service

department.Equipment that has been used beyond the specifications established in the operating manual.

b) Installation does not follow the installation/operating manual.
c) Any product subject to abuse, misuse, neglect or accident.
d) Failure to clean and maintain (including lack of lubrication, maintenance and protection) the machine as outlined in the operating, installation or service manual.
e) This operating manual details the maintenance necessary to ensure trouble-free operation.

6. **NOTICE:** Warranty repairs must be performed by either an ALFA IN Service Centre, an ALFA IN distributor or an Authorized Service Agent approved by the company ALFA IN.
7. A warranty list serves as proof of purchase (invoice) on which is the machine's serial number, and eventually, a warranty list on the last page of this manual.

15. Disposal



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

Following European Council Directive 2002/96/EC on electrical and electronic equipment waste and its implementation under 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.

16. Warranty list

A warranty list serves as proof of purchase (invoice) on which is the machine's serial number, and eventually, a warranty list below, which an authorized dealer fills in.

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