

PULSE WELDING MACHINE

aXe 500 IN PULSE

**OPERATING AND MAINTENANCE
INSTRUCTIONS**



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1. INTRODUCTION

Dear consumer,

Company ALFA IN a.s. thank you for buying our product, and we believe you will be satisfied with our machine.

Welding machines 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 this manual carefully.

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.

The **aXe 500 IN PULSE** welding machine is a new generation of multifunctional synergistic welding machines from ALFA IN. The device is designed for **MIG/MAG, MMA** and **AIR** welding.

Note: The TIG method is not a standard feature of the welding machine.

With this machine, you can weld different types of connections (butt, single-sided, double-sided, fillet, lap, etc.) using wire from diameters 0.8 to 1.2, respectively to 1.6 mm of different metals and alloys (carbon and alloy steels, aluminium alloys, etc.). They are designed not only for heavy industrial operations but also for industries demanding precision and speed.

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 form.



2. SAFETY PRECAUTIONS

PERSONAL PROTECTION

1. For safety reasons, protective gloves must be worn during welding. These gloves protect you from electric shock (circuit voltage at no load). It also saves you from heat radiation and splashing drops of hot metal.
2. Wear sturdy, insulated footwear. Open shoes are not suitable as droplets of hot metal can cause burns.
3. Do not look into the welding arc without face and eye protection. Always use a high-quality welding helmet with an intact protective filter.
4. 🖐️ Notice 🖐️
Persons with implanted pacemakers must not work with the machine or move in their immediate vicinity! There is a risk of the stimulator malfunctioning!
5. Persons near the welding site must also be informed of the danger and provided with protective equipment.
6. When welding, especially in small spaces, it is necessary to ensure a sufficient supply of fresh air, as welding produces harmful emissions.
7. Do not perform welding work on gas, oil, fuel, etc. Tanks (even empty ones) as there is a risk of explosion.
8. Special regulations apply in potentially explosive atmospheres.
9. Stop welding immediately if the power cord is damaged. Do not touch this cable. Unplug it.
10. It is important to note that only machines marked with a symbol should be used in areas with a higher risk of electric shock.
11. Welded joints that are subject to high stress must meet special safety requirements. These are mainly rails, pressure vessels, etc. These joints may only be made by qualified, trained welders with the necessary authorisation.

SAFETY REGULATIONS

1. Before beginning any welding work, it is essential to become familiar with the welding machine and the safety regulations for metal welding and arc welding that are currently in effect in your country.
2. The CO₂ bottle of mixed gases must be handled following the regulations for working with pressure vessels.
3. The welder must use protective equipment.
4. Hitch the machine on all crane eyes when handling the machine with a lifting device. Another mounting is not permitted!
5. Disconnect the device from the mains before working on the electrical system, removing or cleaning the cover.

MACHINE PROTECTION

This machine is electronically protected against overload. Do not turn off the main power switch while the machine is loaded.

ACL-10 coolant is designed for ambient temperatures up to -10°C.

Notice

Persons with implanted pacemakers must not work with the machines or move close to them! There is a risk of impaired pacemaker function!

3. OPERATING CONDITIONS

1. aXe 500 IN PULSE welding machine is designed for welding steel, aluminium, and alloys for commercial and industrial applications.
2. Use only the designated transport equipment to transport the welder. Do not use a forklift or single crates for transport.
3. The device may only be operated by trained personnel within the technical regulations. The manufacturer is not liable for damage caused by improper use and operation. Only use original spare parts from ALFA IN for maintenance and repairs.
4. The device complies with IEC 61000-3-12.
5. The welding machine is tested according to the standard for degree of protection IP 23S, which protects against the intrusion of solids with a diameter greater than 12 mm and protection against the intrusion of water falling in a vertical to the oblique direction to a slope of 60°.
6. Operating ambient temperature between -10 to +40 °C.
7. Relative humidity below 90% at +20 °C.
8. Altitudes of up to 3000 meters above sea level.
9. The machine must be located so the cooling air can enter and exit through the cooling vents without restriction. Care must be taken to ensure that no mechanical particles, especially metal particles, are sucked into the machine (e.g. during grinding).
10. The handling handle is intended for travel only and is not designed for lifting machines.
11. All interventions in the el. Equipment and repairs (disassembly of the mains plug, replacement of fuses) may only be carried out by an authorised person.
12. It is essential to conduct a regular inspection on the welding machine every 6 to 12 months, as per the regulations for the revision of electrical equipment in your country and the regulations for welding and safety provisions for metal arc welding. It is recommended that an authorised employee performs the inspection. – See paragraph Maintenance and service tests.
13. From the point of view of interference suppression, the welding machine is designed primarily for industrial premises. Special measures may be required if other premises are used (see EN 60974-10).
14. The machine must be protected against the following:
 - a. Moisture and rain
 - b. Mechanical damage
 - c. Drafts and possible ventilation of neighbouring machines

- d. Excessive overloading – exceeding tech. parameters
- e. Rough treatment

ELECTROMAGNETIC COMPATIBILITY

Concerning interference suppression, the welding equipment is designed primarily for industrial premises. It meets the requirements of EN EN 60974-10 class A and is not intended for use in residential areas where a public low-voltage power supply network supplies electricity. Possible problems with ensuring electromagnetic compatibility in these areas may be caused by line propagation and radiated interference.

The device may be a source of interference during operation.

 Notice 

Due to the installed capacity's size, the distribution plants' approval must be required to connect the equipment to the public distribution network. We warn the user that he is responsible for any interference from welding.

4. TECHNICAL DATA

aXe 500 IN PULSE				
Method		MIG/MAG	MMA	TIG
Mains voltage	V/Hz	3x400/50-60		
Welding current range	A	20/15,0 - 500/39,0	10/20,4 - 500/40,0	10/10,4 - 500/30,0
Open-circuit voltage U ₂₀	V	94,0	103,0	100,0
Mains protection	A	32 @		
Max. effective current I _{1eff}	A	32,0	31,4	27,0
Welding current (DC=100%) I ₂	A	400	400	400
Welding current (DC=60%) I ₂	A	500	450	500
Welding current (DC=x%) I ₂	A	60% = 500	55% = 500	60% = 500
Protection		IP 23S		
Standards		EN IEC 60974-1, EN 60974-10 cl. A		
Dimensions (w x l x h) generator	mm	474 x 846 x 956		
Compact weight	kg	84		
Wire-speed	m/min	1,0 - 20,0	---	---
Spool diameter	mm	300	---	---
Spool weight	kg	18	---	---
Feeder weight	kg	21,5	---	---
Cooling power (Q=1l/min)	kW	0,8	---	0,8

Total liquid content	l	5,0	---	5,0
Max. pressure	Bar	3,5	---	3,5
Max. flow	l/min	9	---	9
Max. input power I_{1max}	A	41,2	42,3	34,6
Reduced Open-circuit voltage U_{2R}	V	16,0		
Insulation class		F		
Max. příkon S_{1max}	kVA	28,6	29,1	24,4
Efficiency	%	89		
Input power in idle mode P_{10}	W	25		

5. MACHINE ACCESSORIES

PART OF DELIVERY

1. Operating manual
2. Grounding cable 3 m 500 A 70 mm² with clamp
3. Pulley (s) for wire diameters 1,0 - 1,2 mm
4. 2x Reducer for wire spool
5. Hose for gas connection (in the separate version, the gas hose is included in the link)

ACCESSORIES TO ORDER

See Catalog

TORCHS TO ORDER

1. Torch ARC M6W 3m DIGIMIG
2. Torch ARC M6W 4m DIGIMIG
3. Torch ARC M6W 5m DIGIMIG
4. Torch ARC M6W 3m DIGIMIG PISTOL
5. Torch ARC M6W 4m DIGIMIG PISTOL
6. Torch ARC M6W 5m DIGIMIG PISTOL
7. Torch ARC M6OSW 3m DIGIMIG
8. Torch ARC M6OSW 4m DIGIMIG

Assembly and maintenance instructions for M6WP/M6OSWP:

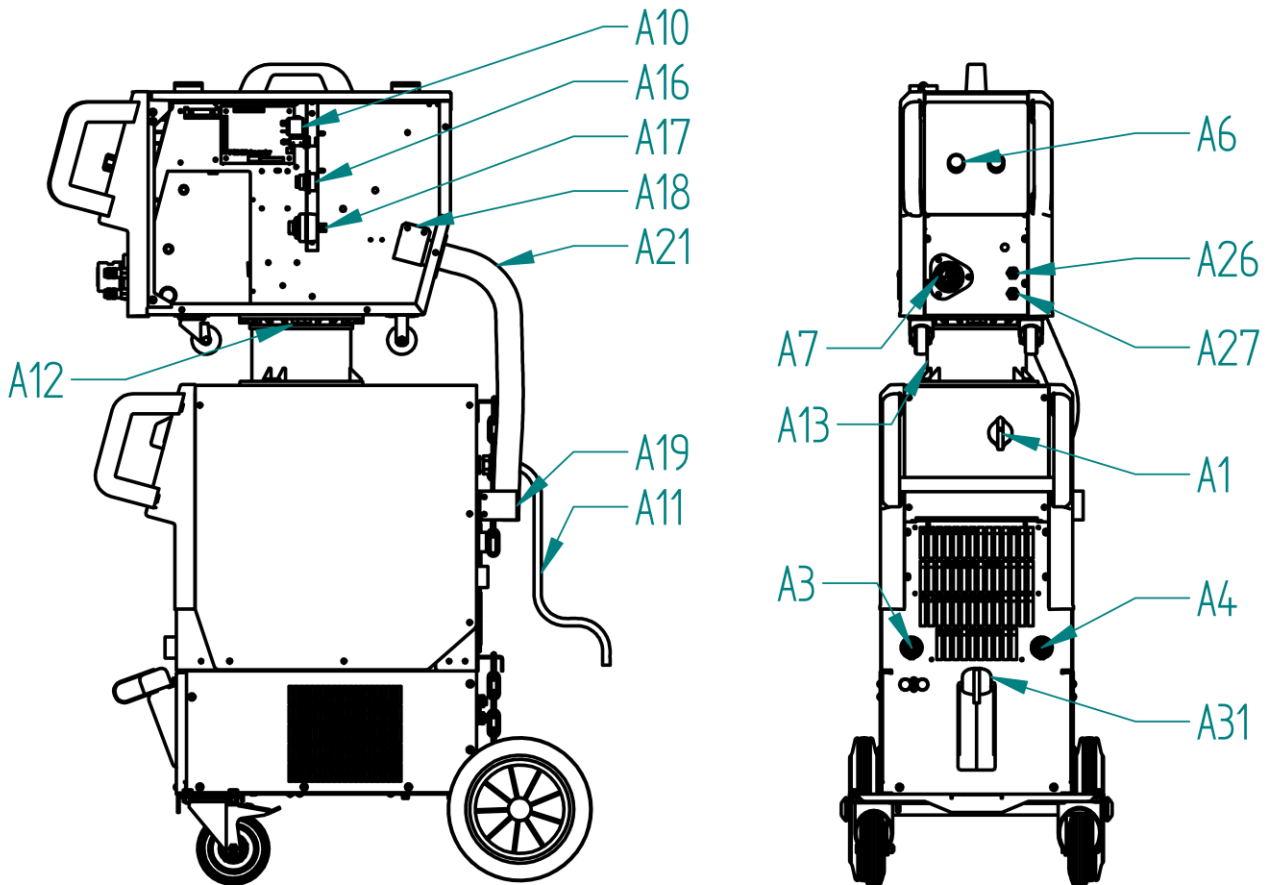


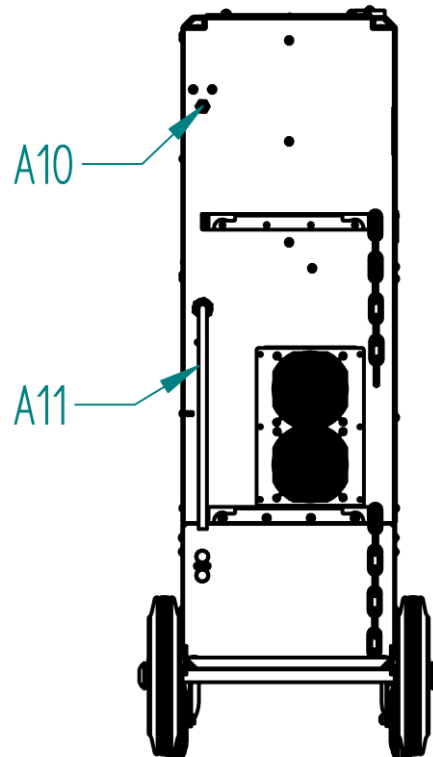
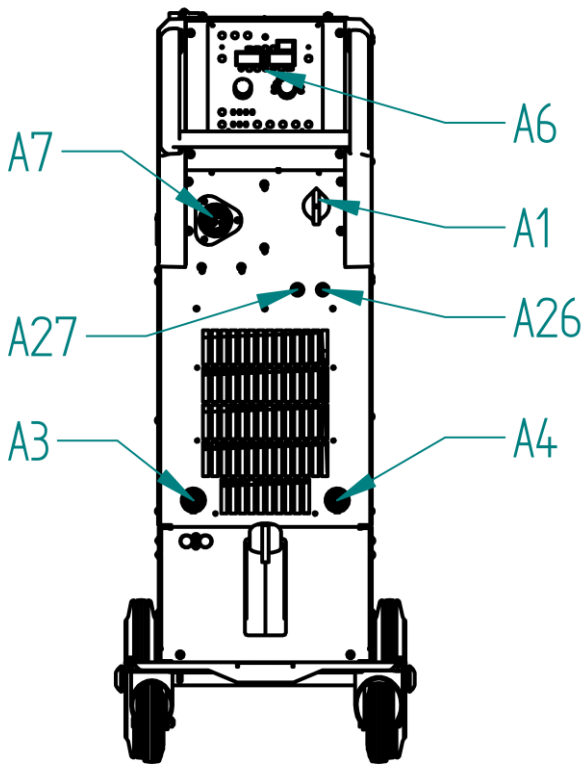
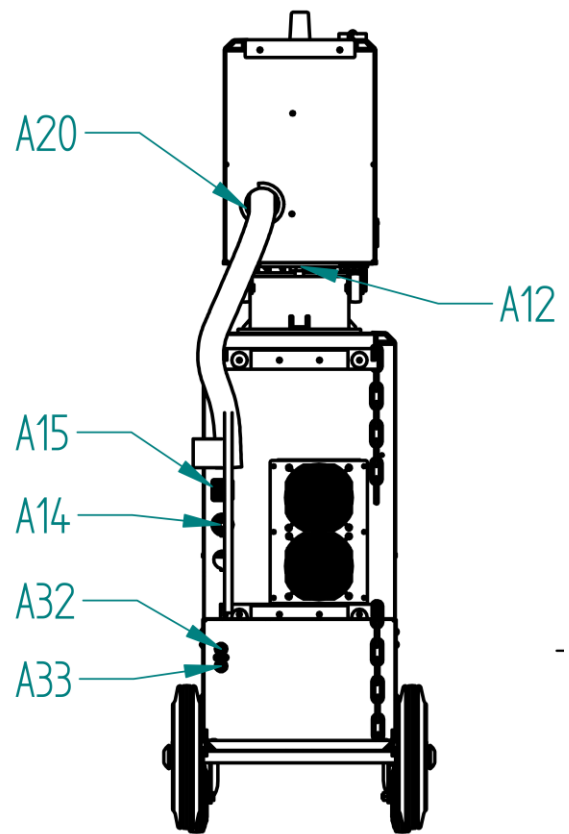
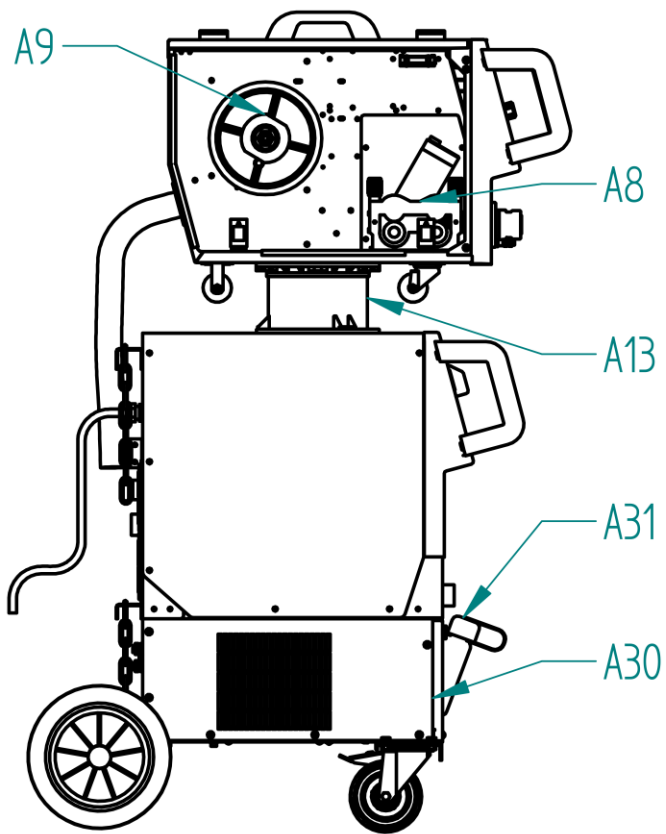
Notice 🙌 If you decide to use a torch other than the one listed above, you

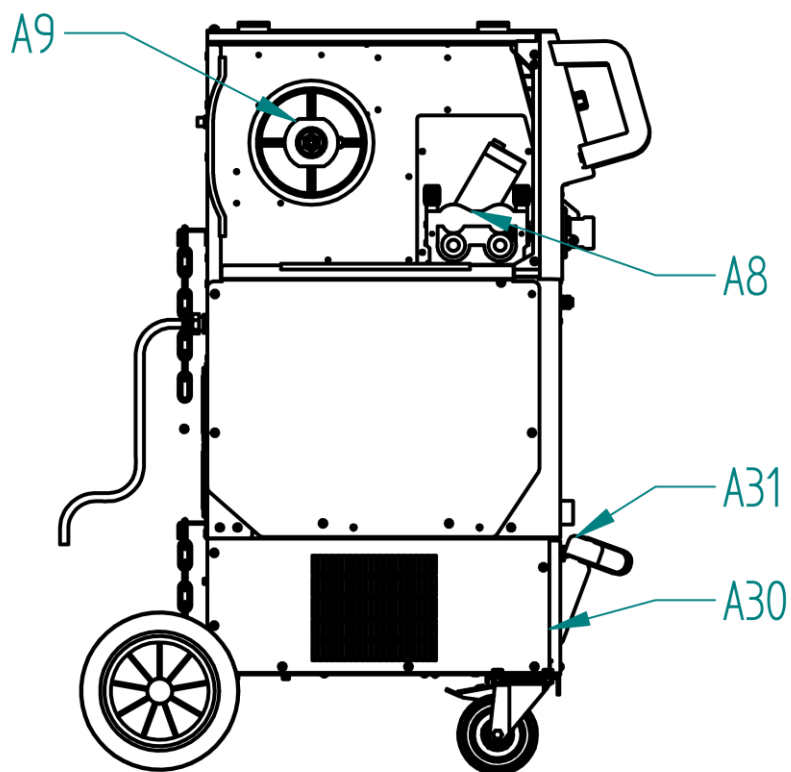
need to choose according to the current range used and the load time of the torch. ALFA IN a.s. is not responsible for damage to welding torches due to overloading.

6. DESCRIPTION OF MACHINE AND FUNCTIONS

MAIN MACHINE PARTS







Poz.	Popis
A1	ON/OFF switch
A3	Quick connector (+)
A4	Quick connector (-)
A6	Control panel
A7	EURO connector
A8	Wire Feeder
A9	Spool holder
A10	Gas valve
A11	Mains cable
A12	Feeder Holder Feeder
A13	Feeder Holder Generator
A14	Quick connector
A15	Connector female
A16	Connector male panel
A17	Quick Connector male
A18	Clamp for the Cable Bundle
A19	Clamp for the Cable Bundle
A20	Cable Bundle Inlet Feeder
A21	Cable Bundle
A26	Quick connector W (red)
A27	Quick connector W (blue)

A30	CU aXe Cooling unit
A31	Cup
A32	Quick connector W (red)

COLLING SYSTEM OF THE WATER TORCH (COOLANT)

1. The cooling unit is located at the bottom of the machine.
2. The pump seal in this ALFA IN welder is specially designed for ACL-10 fluid (pink, order no: 4600, 5 l canister.

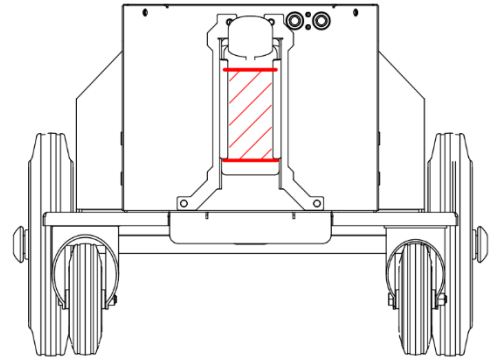
Operating range - ambient temperature -10 °C to +40 °C).

3. Leakage of the cooling circuit may occur if other fluid is used.

A failure of the cooling circuit using a fluid other than ACL-10 cannot be covered under the manufacturer's warranty. The liquid must not be mixed with any other type of fluid.

4. Keep the coolant level in the coolant reservoir within the permitted range (see illustration). The fluid level is visually visible on the front of the reservoir. Use the fluid prescribed by the manufacturer.

5. Turn off the main switch if the error message "ERR 2" illuminates during operation. After switching on the machine, test the cooling unit. If the error recurs, the cause of the fault must be determined.



NOTE: The seal at the red cap must be replaced every time the fluid is changed. The gasket can be ordered as an accessory (4712F).

6. ACL-10 liquid is not poisonous. Please note that the fluid replaced in the pump should be treated as hazardous waste. Do not pollute the environment. In the worst case, please take it to a salvage yard in its original canister. The safety data sheet can be found at

<https://www.alfain.eu/static/dokumenty/1/2/8/8/0/4/Bezpecnostni-list-ACL->

[10.pdf](#).

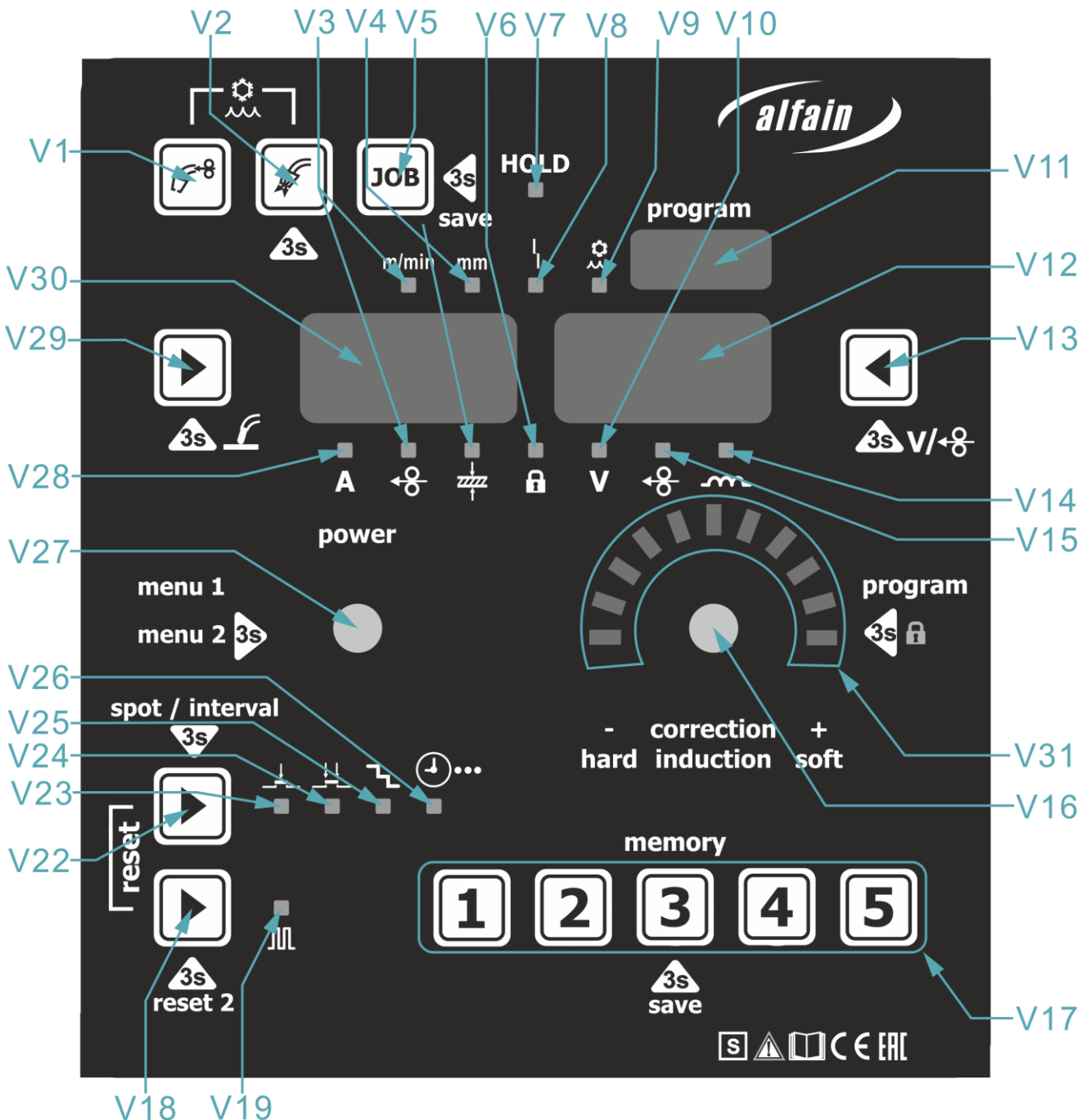


7. Note: When connecting a gas-cooled torch, securing the quick water couplings with the liquid circuit connection hose is necessary! Failure to do so may result in damage to the pump!

AIR BLEEDING TORCH COOLING SYSTEM

1. After filling the empty cooling system of the torch or replenishing the fluid after a substantial leak and aeration, it is necessary to perform a complete air bleeding of the circuit.
2. Remove the coolant reservoir cap and connect the quick water couplers with the fluid circuit jumper hose.
3. Run the cooling test for about 30 seconds.
4. Connect the torch and start the cooling test for about 30 seconds.
5. The procedure must be repeated if the error message "ERR 2" - low water pressure lights up after pressing the torch button.

DESCRIPTION OF THE CONTROL PANEL



Poz.	Popis
V1	Button: Wire Feeding
V2	Button: Gas Test
V3	LED: feed rate (m/min)
V4	LED: material thickness (mm)
V5	Button: JOB
V6	LED: lights up when the control panel is locked
V7	LED: Hold
V8	LED: Error
V9	LED: Cooling unit error
V10	LED: voltage or voltage correction
V11	Display for selecting methods
V12	Display for voltage, choke and feed rate correction.
V13	Button: correction selection
V14	LED: choke or choke correction
V15	LED: feed rate correction
V16	Encoder for voltage setting/voltage correction/chokes/short press - enter the method setting menu
V17	Button: 1-5 - Quick JOB selection
V18	Button: Synergy, Pulse
V19	LED: lights up when pulse mode is selected
V22	Button: mode selection
V23	LED: Two-stroke 2T
V24	LED: Four-stroke 4T
V25	LED: Steps
V26	LED lit: interval welding LED flashing: spot welding
V27	Encoder for setting current and feed rate / short press - access to MENU 1 (menu of secondary parameters)
V28	LED: lights up when the left display shows the current - the expected value the welder wants.
V29	Button: Select synergy display
V30	Display: shows the current, feed rate and material thickness
V31	LEDs: for displaying choke values

MENU STRUCTURE

METHOS SETTINGS MENU

Press the **V16** encoder briefly to enter the method selection.

Set the **AIR/ELE/TIG/MAN/SYN** method with encoder **V16**. In synergic welding mode, select the synergic program number - the selection is shown on display **V11** (displays **V30** and **V12** are off). Confirm the selection by pressing encoder **V16** or **V27**. Press another button to exit the menu.

You can switch between the synergy and pulse synergy programs using the **V18** button. The selected method or synergy program number is displayed on the **V11** display.

MENU 1 (MENU OF SECONDARY PARAMETERS)

Press the **V27** encoder briefly to enter the secondary parameters menu.

The secondary parameter menu varies depending on the selected method selected.

Use encoder **V27** to select the parameter and encoder **V16** to set the desired value. Press any button to exit the menu.

Display **V30** shows "parametr ", display **V12** shows the set value and display **V11** shows the default value.

MENU 1 STRUCTURE ELE

Parameter tag	Parameter	Range	Default settings
VRD	Voltage reduce device	(on/off)	[on]
ASt	Antistick	(on/off)	[on]
HS	HotStart	(100-250%)	[150]
AF	ArcForce	(100-250%)	[130]
PdC	Second (lower) current	(1-99%)	[60]
dut	Duty cycle	(1-99%)	[50]
FrE	Frequency	(0,5-250Hz)	[1,0]

MENU 1 STRUCTURE TIG - (if the machine is equipped with the TIG method)

Parameter tag	Parameter	Range	Default settings
LA	LiftArc	(on/off)	[on]
PoG	Post Gas	(0-20s)	[3,0]
tuP	Time Up	(0-20s)	[0]
Tdo	Time Down	(0-20s)	[0,5]
SCu	Start current	(10-100%)	[100]
bCu	Second (BiLevel) Current	(10-100%)	[100]
ECu	End Current	(10-100%)	[10]
PdC	Second Current	(1-99%)	[40]
dut	Duty cycle	(1-99%)	[50]
FrE	Frequency	(0,5-250Hz)	[1,0]

MENU 1 STRUCTURE MAN

Parameter tag	Parameter	Range	Default settings
ISP	Initial Speed	(10-100%)	[30]
PrG	Pre Gas	(0-20s)	[0,1]
PoG	Post Gas	(0-20s)	[0,5]
Brn	Burnback	(0-150ms)	[60]
SPo	Spot	(0,5-20s)	[2,0]
Int	Interval	(0,5-20s)	[2,0]

DP PARAMETERS

- **FdP** – frequency of alternating main vs. lower current
- **dut** – Main vs. secondary current duration ratio
- **bAL** – the percentage of how much will be the secondary current compared to the main current (smaller number = more significant difference between main and secondary current)
- **dPC** – side current correction
 - LEDs below the right display show the currently selected correction

MENU 2 (CALIBRATION MENU)

Long press encoder **V27** to enter the calibration menu.

Cu1 - Cooling unit

- oFF - Cooling unit permanently switched off
- on - Cooling unit permanently switched on
- Aut - Automatic start-up of the cooling unit

Cu2 – Flow sensor

- 0 - without sensor
- 1 - pressure switch/flow sensor
- 2 - flow meter (Hall-Effect)

Cor - Resetting of correction (1 - resetting of correction and choke when changing the power value).

LoC - Machine lock menu (control panel lock level)

- Cannot enter MENU 3 (calibration menu)
- Cannot save JOBS
- Cannot calibrate the torch
- Cannot switch methods (only by loading JOB)
- Cannot use the reset
 - 1 - Cannot switch JOBS
 - Cannot enter the secondary parameters menu
 - Cannot change set parameters, only correction in synergy
 - 2 – The machine can only be operated from the remote control

u-I - Voltage and current calibration menu (password protected)

toC – Menu for entering a token

tIM – Menu of counters for machine start-up time, total welding time and working time in individual modes

By long pressing button **1 (V17)** in this mode, the **PAS** menu is called up, where after entering the password (123), the counter can be reset.

Long press button **2 (V17)** to display the software version of each board:

- (V30)** – Control PCB (7130)
- (V12)** – Motor PCB (7131)
- (V11)** – Display PCB (7132)

Press button 3 (V17) to display the machine's serial number.

Long press button 4 (V17) to display the current machine configuration

(V30) – Machine power

(V12) – Current configuration

Long press button 5 (V17) to test the display.

TOKEN

The token is a unique combination of characters for each machine and is generated by the manufacturer based on the required features or a purchased configuration extension. The token can unlock features and configure the machine without reloading the software. In case of a change request (purchase of functions), the supplier sends a new token and the procedure for using the token.

GAS TEST

Press the V2 button to turn on the gas valve. If the button is pressed for less than 3 seconds, the gas valve switches off when the button is released. If the button press time is longer than 3 s, the gas valve switches off after approx—20 seconds or after pressing any button.

WIRE FEEDING

Press the V1 button to start the feed motor. Releasing the button stops the feed motor.

The V30 display shows the wire feed speed. The wire feed speed is set with encoder V27. INS is displayed on display V11, and display V12 is off. Press button A36 (wire feeding) inside the feed to start the feed motor. Releasing the button stops the feed motor.

WIRE LOAD (optional)

Press the V1 and V29 buttons simultaneously to start the feed motor. Releasing the V1 button stops the feed motor.

The V30 display shows the wire feed speed. V27. Na displeji V11 je zobrazeno RET, displej V12 je zhasnutý.

COOLING UNIT TEST

Start the cooling unit by pressing the V1 and V2 buttons simultaneously (for more than 3 seconds). To end the test, press any button. The display V11 shows CU. Display V30 shows the number of half-pumps from the flow sensor, and V12 shows the flow rate in l/min.

If the flow rate is insufficient, the V9 indicator lights up, and the ERR message appears on the V30 display.

FAST LOCK

Long press encoder **V16** to lock/unlock the machine.

The lock is not under the password and is signalled by the **V6** light.

A locked machine cannot be operated from the control panel; a remote control can be used.

SMALL RESET

Simultaneously, briefly press the **V18** and **V22** buttons to reset the selected method to factory settings. The JOBs will not be deleted – the values in the calibration menu will remain.


BIG RESET

Long press buttons **V18** and **V22** simultaneously to set the machine to factory settings. All JOBs will be deleted. The values in the calibration menu will remain.

7. JOBS

JOB means the saved welding machine settings (programs) for a specific welding job. JOBs work only for the MIG method (manual, synergic, pulse)

SAVING JOBS

Long press the **V5**  button to enter the menu to save the JOB.

The **V30** display shows **SAV**, the **V12** display shows the JOB number and the **V11** display shows **Job**.

Symboly před číslem znamenají:

E. - empty JOB.

n. - inactive JOB (cannot be switched by remote control).

A. - Active JOB (can be switched by remote control).

Use encoder **V16** to set the JOBs number.

Press encoder **V27** or **V16** to store the desired JOB.

Press another button to exit the menu to load the job.

LOADING JOBU (JOB LOA)

Short press the **V5** buttons to enter the JOB load menu.

The **V30** display will be shown **LoA**, the **V12** display will indicate the JOB number and the **V11** display will offer **Job**.

The symbol in front of the number means:

E. - empty JOB.

n. - inactive JOB (cannot be switched by remote control).

A. - Active JOB (can be switched by remote control).

Use encoder **V16** to set the JOBs number.

Use encoder **V27** to set the JOB as active inactive or delete the selected JOB.

Press encoder **V27** or **V16** to load the desired JOB.

Press another button to exit the menu to load the job.

QUICK JOB SELECTION - MEMORY

JOBs work only for the MIG method (manual, synergic, pulse). Values, including secondary Parameters, are stored. JOBs are stored as active (can be switched by remote control on the torch).

Long press buttons **1-5 (position V17)** to save the set parameters to memory. Short press buttons **1-5 (position V17)** to retrieve the stored parameters from memory.

If no JOB is stored at the desired position, an error (**ERR 6**) appears on the display.

8. MACHINE PREPARATION FOR GROOVING (AIR)

CONNECTION OF THE GROOVING TORCH

Connect the groove torch quick coupler to the plus quick coupler **A3** on the generator, carefully forcefully secure by turning clockwise.

CONNECT THE EARTH CABLE

Connect the earth cable quick coupler to the minus quick coupler **A4** on the generator, and secure carefully by forcefully turning clockwise. Attach the earth clamp to the weldment.

AIR CONNECTION TO THE GROOVE TORCH

Connect the torch to a compressed air source and ensure the pressure is minimally 5 Bar.

9. GROOVING (AIR)

1. In the PROGRAM menu, select the **AIR method** (See page 14).
2. **AIR** is shown on display **V11**. The current setpoint is shown on the left display **V30**. Display **V12** is off.
3. Use encoder **V27** to set the current spline value.
4. During welding, the measured value of the welding current is displayed on display **V30**. The measured voltage value is displayed on display **V12**.
5. After the welding is finished, the measured value **HOLD** remains on display. The illumination of **V7** indicates the **HOLD** value.
6. If a torch with a remote control is connected, the display shows: ---.
7. **If the MIG/MAG torch remains connected, the welding voltage will be displayed on the**

10. MACHINE PREPARATION FOR ELECTRODE WELDING (ELE)

CONNECTION OF ELECTRODE HOLDER AND EARTH CABLE

Connect the electrode holder and ground cable to the **A3** and **A4** quick connectors following the polarity required by the electrode manufacturer on the electrode packaging. Carefully forcefully secure by turning clockwise.

When using basal electrodes, connect the electrode clamp to the + pole.
When using rutile electrodes, connect the electrode pliers to the - pole.

11. ELECTRODE WELDING (ELE)

1. In the PROGRAM menu, select the **ELE method** (see page 14).
2. Display **V11** shows **ELE**, the left **V30** shows the set current value, and the right **V12** is off.
3. Use encoder **V27** to set the welding current value.
4. The pulse mode can be switched on using the button **V18** - **the function may not be available**, depending on the machine programming. The setting is displayed on **V19**.
5. During welding, the measured welding current value is displayed on **V30**. The measured voltage value is shown on display **V12**.
6. After the welding is finished, the measured value **HOLD** remains on display. The **HOLD** value is signalled by the **V7** lighting up.
7. If the torch with remote control is connected, its display shows ---.
8. **If the MIG/MAG torch remains connected, the welding voltage will be on it!**

12. MACHINE PREPARATION FOR TIG WELDING

Valid if the welding machine is equipped with the TIG method.

TORCH CONNECTION

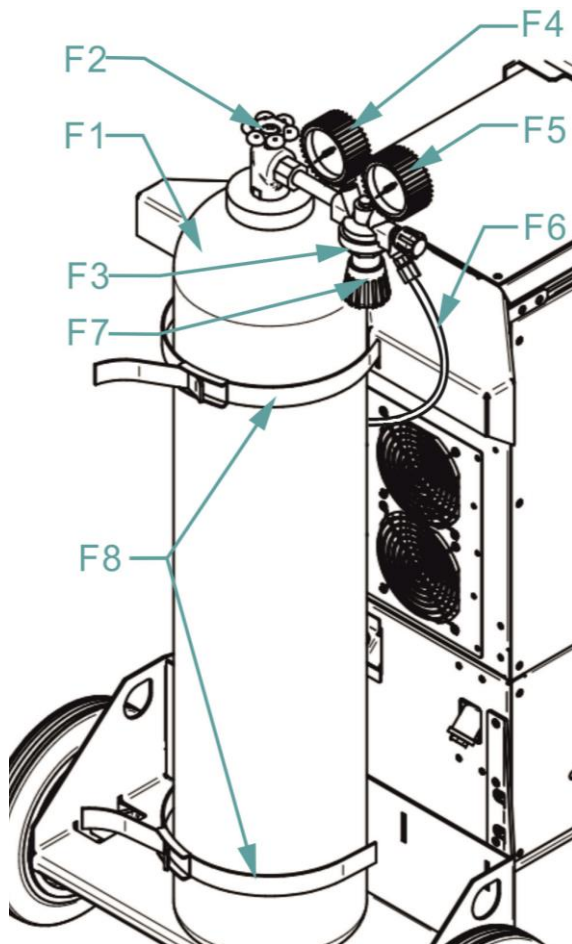
Connect the torch connector to the EURO connector **A7** on the feed unit. Then, connect the torch liquid quick connectors according to the colour to the liquid quick connectors **A26** and **A27** on the machine.

CONNECTING THE GROUNDING CABLE

Connect the ground cable quick coupler to the minus quick coupler **A4** on the generator, carefully secure by turning clockwise. Attach the grounding clamp to the weldment.

ATTACHING THE GAS INLET

1. Place the **F1** gas bottle on the chassis at the rear of the machine and secure it with strap **F8**.
2. Open valve **F2** several times to clear the connection point of any debris.
3. Connect the pressure-reducing valve **F3** to bottle **F1**.
4. Connect the hose connector **F6** to the pressure-reducing valve **F3**.
5. Open the valve on bottle **F2** and adjust the gas flow through valve **F7** while running gas test **V2**. The flow rate is indicated on the flow meter **F5**. This value should be approximately the diameter of the wire times 10l/min. Pressure gauge **F4** shows the contents of the cylinder.



13. TIG WELDING (TIG)

If the welding machine is equipped with the TIG method.

1. In the menu PROGRAM, select the **TIG** method (see page 14). The TIG mode can only be used if the machine has a reversing connector.
2. Display **V11** shows **TIG**, the left display shows the set current value and display **V12** is off.
3. Use encoder **V27** to set the welding current value.
4. Press the **V22** button to switch the mode - **2T/4T**.
5. Press button **V18** to switch on pulse mode (Pulse mode is only active in main and bi-level current) - The function may not be available, depending on machine programming.
6. During welding, the measured welding current is displayed on the **V30** display. The measured voltage value is displayed on the **V12** display.
7. After the welding process, the measured value **HOLD** remains on display. The illumination of **V7** indicates the **HOLD** value.
8. To cancel the **HOLD** value, press any button or turn the encoder.
9. A **TIG** torch can be used in the EURO connector. When using the button connected to the EURO connector, the gas valve is switched in the feed and the generator. Only the gas valve is switched if the torch button is connected to the **A3** connector.

10. When using a **TIG** torch to an EURO connector, reverse the polarity on the **A19** and **A20** quick connectors.
11. If a torch with a remote control is connected, its display shows: ---
12. **If the MIG/MAG torch remains connected, the welding voltage will be on it!**

14. MACHINE PREPARATION FOR MIG/MAG WELDING

CONNECTION OF THE CONNECTING CABLE

Connect the supplied jumper cable **A21** to the generator connectors **A14** and **A15**, feed connectors A10, A16, and A1, and quick feed connectors. The power cable connector will determine the right side. Replacement is not possible. Secure all connectors thoroughly with adequate force.

CONNECTING TORCH

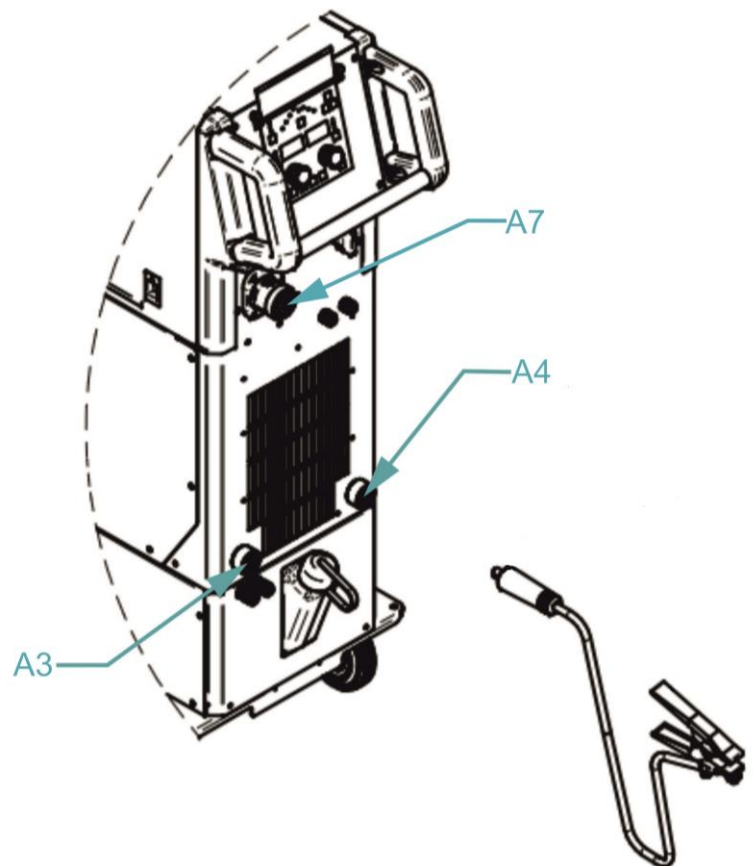
Connect the torch connector to the EURO connector **A7** on the feed unit. Then, connect torch liquid quick connectors according to the colour of the quick liquid connectors **A3** and **A4** on the machine.

CONNECTING THE GROUNDING CABLE

Connect the grounding cable quick connector to the minus quick connector **A4** on the generator, carefully forcefully secure by turning clockwise. Attach the grounding clamp to the weldment.

CONNECTING THE EARTH CLAMP

1. Fix the earth clamp close to the welding point. Care must be taken to ensure the clamp's connection to the weldment is as firm as possible.
2. Do not place the clamp on the welding machine or the welding bottle!
3. Fix the earth clamp close to the welding point. Care must be taken to ensure that the connection of the clamps to the welding rod is as firm as possible.



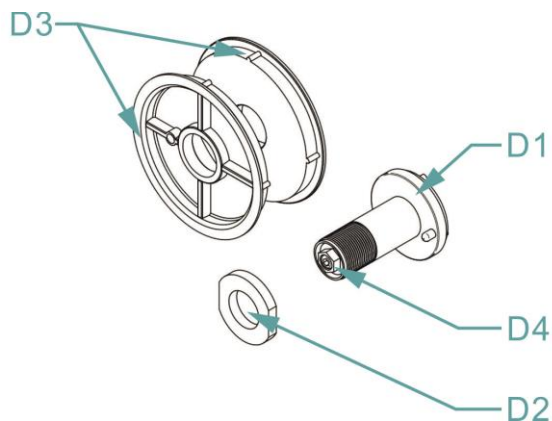
CONNECTING TO THE MAINS

1. Insert the mains plug into the appropriate mains socket. The circuit breakers must correspond to the technical data of the machine.



2. Switch the machine by turning the main switch **A1** to the "I" position.

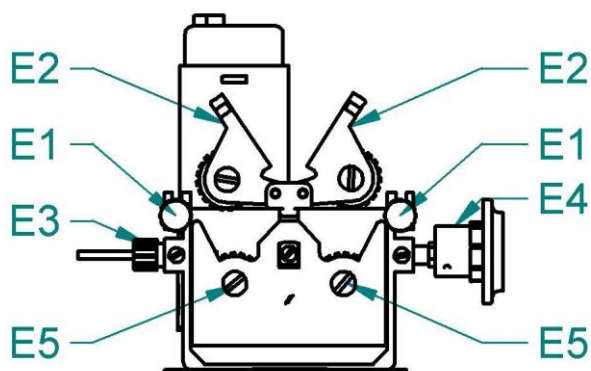
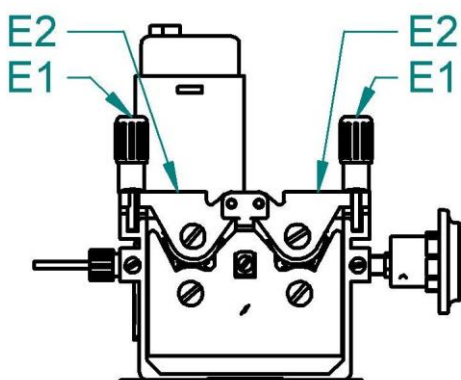
ATTACHING THE WIRE SPOOL

1. Open the wire spool cover and release the safety catch **D2** on the wire spool holder **D1**. Insert the wire spool reducer **D3** and the wire spool on top, secure with safety catch **D2**. Before doing so, ensure the mandrel is inserted into the appropriate hole in the wire spool reducer.
2. If necessary, the braking force can be adjusted with screw **D4** so the wire does not unwind from the wire spool after the wire feed has stopped.

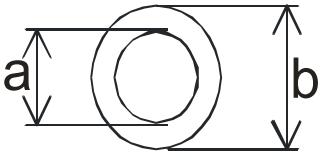
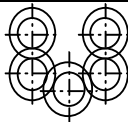










GUIDING THE WIRE INTO THE FEED

1. Unscrew the nozzle and the current feedthrough on the torch. Open the wire feed door. The wire diameter must correspond to the size of the groove on the feed pulley. The size of the groove on the pulley can be read on the pulley. Fold the levers **E1** towards you and push the wire electrode through the capillary **E3** and EURO connector **E4**.
2. Press the pressure pulleys **E2** and secure them with the levers **E1**.
3. Switch on the machine with the main switch **A1**, pull the welding torch cable and press the button (wire guidance) **V1**  on the control panel.
4. Adjust the pressure force by rotating the plastic piece on levers **E1** so that the wire is not deformed, but at the same time, the wire is moved regularly.
5. Please press the button (wire guidance) **V1**  again and hold it until the wire appears at the end of the torch.



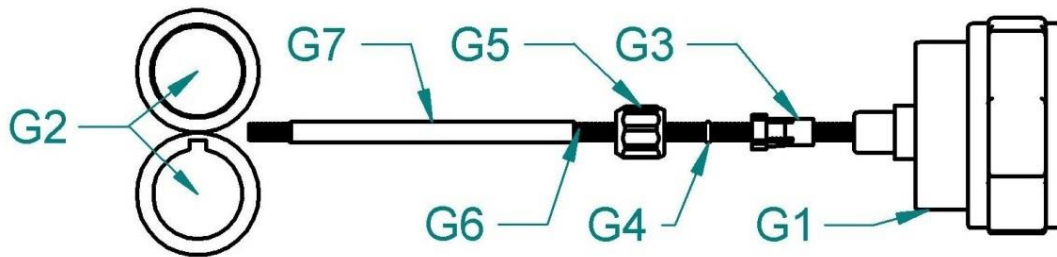
OVERVIEW OF WIRE FEED PULLEYS

		4pulleys	
			
		a = 19 mm	
		b = 37 mm	
Type of pulley groove	Wire diameter	Ordering numbers of pulleys	
Steel wire 	0,6 – 0,8	4299	
	0,8 – 1,0	4300	
	1,0 – 1,2	4301	
	1,2 – 1,6	4302	
Aluminium wire 	1,0 – 1,2	4306	
	1,2 – 1,6	4307	
	1,6 – 2,0	4308	
	2,4 – 3,2	4309	
Trubičkový drát 	1,0 – 1,2	4303	
	1,2 – 1,6	4304	
	2,4 – 3,2	4305	

FEED ROLLER'S MARKING / OZNAČOVÁNÍ KLADEK SM099							
Type							EXAMPLES PŘÍKLADY
Ø mm	Order Nr. Obj. č.	Color Barva	Order Nr. Obj. č.	Color Barva	Order Nr. Obj. č.	Color Barva	
0.6	4299		-	-	-	-	Wire Drát 1.0 shape V drážka V  Mild steel / Běžná ocel Stainless steel / Nerez
0.8							
0.8	4300		-	-	-	-	
1.0							
1.0	4301		4306		4303		
1.2							
1.2	4302		4307		4304		
1.6							
1.4	4392		-	-	4393		 VIDEO Svařování hliníku Aluminium Welding
1.6							

MACHINE MODIFICATION FOR ALUMINIUM WELDING

1. Replace the **G2** pulleys with the correct pulleys **G2** that have a U profile groove for AL welding.
2. Loosen the nut **G5** on the torch.
3. Replace the torch used for steel with an aluminium torch, or at least replace the torch boss with a Teflon boss.
4. Remove the capillary from the EURO connector.
5. Cut off the end of the Teflon bowden so that it is close to the **G2** feed pulley. Thread clamp **G3**, o-ring **G4**, and nut **G5** onto the back of Teflon bowden brass tube **G7** for stabilisation. Tighten nut **G5**.
6. Place the torch on the EURO connector and insert the wire into it.



The M6OSW torch is designed for welding aluminium. Modifying the M-series ARC torch with a special kit and jig is possible. See. Instructions **TORCHES TO ORDER**.

15. MIG/MAG MANUAL WELDING (MAN)

1. In the PROGRAM menu, select the **MAN** method (see page 14).
Note: Pulse mode cannot be used in the MAN method
2. The **V11** display shows MAN.
3. The wire feed speed is displayed on **V30**, and the voltage or choke value is displayed on **V12**. The choke value is also shown on **V31**.
4. Use encoder **V27** to set the wire feed speed (1.0 - 20 m/min [7.0]).
5. Adjust the voltage or inductor using the **V16** encoder.
6. Press the **V13** button briefly to select the setting and display the voltage or choke.
7. Press the **V22** button briefly to switch between **2T/4T** modes.
8. Long press button **V22** to switch between spot, interval and normal welding.
9. During welding, the measured welding current is displayed on the **V30** display. The measured voltage value is displayed on the **V12** display.
10. After welding, the measured values remain **HOLD** on the displays.
11. To cancel the **HOLD** value, press any button or turn the encoder.
12. If a remote control torch is connected, its display shows the voltage and wire feed rate. Use the **UP** and **DOWN** buttons to adjust the displayed value and the **MODE** button to switch between functions. If the JOB selection is activated by remote control, you can switch between JOBS.

16. MIG/MAG SYNERGY WELDING (Programs 0-34)

1. In the PROGRAM menu, select one of the synergy programs (according to the table inside the feed) - no pulse version of the machine, only synergy 0-18.

SYNERGY PROGRAMS		ø 0.8 mm	ø 1.0 mm	ø 1.2 mm
SG/Fe	Ar 82 % CO ₂ 18 %	0	1	2
SG/Fe	Ar 90 % CO ₂ 10 %	3	4	5
SG/Fe	CO ₂ 100 %	6	7	8
Cr/Ni 308	Ar 97,5 % CO ₂ 2,5 %	9	10	11
Cr/Ni 316	Ar 97,5 % CO ₂ 2,5 %	12	13	14
AlSi	Ar 100 %	-	15	16
AlMg	Ar 100 %	-	17	18
SYNERGY PROGRAMS PULSE		ø 0.8 mm	ø 1.0 mm	ø 1.2 mm
SG/Fe	Ar 82 % CO ₂ 18 %	19	20	21
SG/Fe	Ar 90 % CO ₂ 10 %	22	23	24
Cr/Ni 308	Ar 97,5 % CO ₂ 2,5 %	25	26	27
Cr/Ni 316	Ar 97,5 % CO ₂ 2,5 %	28	29	30
AlSi	Ar 100 %	-	31	32
AlMg	Ar 100 %	-	33	34

2. Perform **TORCH CALIBRATION:**

The welding characteristics of the synergistic curve depend on many factors, such as the length of the welding torch, the length of the grounding cable, the quality of the grounding, the distance of the weldment from the grounding point, etc. It is, therefore, advisable to calibrate the welding circuit for the actual welding conditions.

- Unscrew the gas nozzle of the welding torch.
 - Cut the welding wire just at the welding nozzle.
 - Pull a piece of welding wire (approx. 50 mm) into the wire feed. There must now be no welding wire in the jet nozzle.
 - In the MIG welding method, long press the **V29** button to enter the torch calibration menu.
 - The display **V30** shows "reS".
 - Apply slight pressure to the welding torch with the jet nozzle on the cleaned area on the workpiece, press the torch button and hold it down for approx. 3 seconds. The machine performs three current pulses (the 1st one is used to create the conductive path, and the remaining two are measured), and with their help, the new resistance of the lead is determined and displayed. The value is shown on the **V12** display (0 mΩ to 60 mΩ).
 - The right display (V12) shows 8.8.8 if the value is out of range. The measurement must be repeated.
 - The factory setting value reS = 10 mΩ is shown in the display (**V11**).
3. The left display **V30** shows the machine power (current, wire feed speed, material thickness), and the right display **V12** shows the voltage value, correction value (voltage, wire feed speed) or choke value.
 4. Press the **V29** button to switch the settings and display the machine

- performance (current, wire feed speed, material thickness).
5. Use encoder V27 to set the machine power (current, wire feed speed, material thickness).
 6. In the calibration menu, it is possible to switch off the resetting of the correction and change the choke when the machine power value changes.
 7. Long press button **V13** to switch between voltage and wire feed speed correction. The choke value is shown on **V31**.
 8. Use encoder **V16** to adjust voltage correction, chokes, and wire feed speed (as needed).
 9. Press the **V22** button to switch between the modes: **2T/4T/2T-sequence/4T-sequence**.
 10. During welding, the measured welding current is displayed on the **V30** display. The measured voltage value is displayed on the **V12** display.
 11. After welding, the measured values remain **HOLD** on display. The **V7** light indicates the **HOLD** value. Cancel the **HOLD** value by pressing any button, turning the encoder, or pressing the torch button (without igniting the arc).
 12. If a torch with a remote control is connected, its display shows the machine's power (current, wire feed speed, material thickness) and corrections (voltage, wire feed speed). Use the **UP** and **DOWN** buttons to adjust the displayed value and the **MODE** button to switch between functions. If JOB selection is activated by remote control, you can switch between JOBs.

17. PULSE MODE (Function may not be available depending on machine software)

1. Select the pulse mode by selecting the pulse synergy curve or pressing the **V18** button.
2. The setting is shown in **V19**.
3. The left display **V30** shows the machine power (current, wire feed speed, material thickness), and the right display **V12** shows the voltage value. The correction value (voltage, wire feed rate) is shown on the **V12** display only during setup. Display **V13** indicates the number of the selected synergy program.
4. Press the **V29** button to switch the settings and display the machine performance (current, wire feed speed, material thickness)
5. Set the machine output (current, wire feed speed, material thickness) using encoder **V27**.
6. In the calibration menu, set the option to disable the resetting of the correction when the machine power value changes.
7. Long press the **V13** button to switch the wire tension and feed rate correction. **V31** displays the current correction setting.
8. Use encoder **V12** to adjust the voltage or wire feed rate correction (as required).
9. Press the **V22** button to switch between **2T/4T/2T-sequence/4T-**

sequence.

10. After welding, the measured values remain **HOLD** on display.
11. To cancel the **HOLD** value, press any button, turn the encoder, or press the torch button (without igniting the arc).
12. If a torch with remote control is connected, its display shows machine power (current, wire feed rate, material thickness), correction (voltage, wire feed rate), or choke value. Use the **UP** and **DOWN** buttons to adjust the displayed value and the **MODE** button to switch between functions. If JOB selection is activated by remote control, you can switch between JOBS.

18. CONSUMPTION TABLES

TABLE OF WIRE CONSUMPTION DURING MIG/MAG WELDING

Wire diameter [mm]	Wire feed speed range [m/min]	Maximum wire feed speed [m/min]	Weight 1 m of wire [g]	Wire consumption per 1 minute of welding [g/min]	Wire consumption per 1 hour of welding [g/hr]
Steel wire					
0,6	2 - 5	5	2,3	11,5	690
0,8	3 - 6	6	4	24	1440
1,0	3 - 12	12	6	72	4320
1,2	4 - 18	18	9	162	9720
Stainless steel wire					
0,6	2 - 5	5	2,3	11,5	690
0,8	3 - 6	6	4	24	1440
1,0	3 - 12	12	6	72	4320
1,2	4 - 18	18	9	162	9720
Aluminium wire					
0,6	2 - 5	5	0,8	4	240
0,8	3 - 6	6	1,3	7,8	468
1,0	3 - 12	12	2	24	1440
1,2	4 - 18	18	3	54	3240

TABLE OF GAS CONSUMPTION DURING MIG/MAG WELDING

Wire diameter [mm]	Gas flow [l/min]	Gas consumption per 1 hour of welding [l/hour]
0,6	6	$6 * 60 = 360$
0,8	8	$8 * 60 = 480$
1,0	10	$10 * 60 = 600$
1,2	12	$12 * 60 = 720$
1,6	16	$16 * 60 = 960$
2,0	20	$20 * 60 = 1200$

CONSUMPTION TABLE DURING TIG WELDING



Tungsten electrode diameter [mm]	Argon flow rate [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

TABLE OF ELECTRODE CONSUMPTION DURING WELDING

Electrode diameter [mm]	Welding current range [A]	Electrode length [mm]	Weight of welded electrode without slag [g]	Electrode welding time [s]	Weight of welded electrode without slag in 1 s [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

19. MAINTENANCE AND SERVICE TESTS

1. When the wire is fed, the copper coating flakes and small filings fall off, which are transferred to the bowden or contaminate the inner space of the feeder and cause unwanted currents.
Remove the deposited debris from the feeder area regularly, preferably by blowing with compressed air.
2. Maintain the welding torch regularly and replace worn parts in time. The stress on the torch is significantly higher when welding in pulse mode.
3. The most stressed parts are the wire feed, the gas nozzle, the wire guide bellows, the connecting cable and the torch button.
4. The wire feed transfers the welding current to the wire and also directs the wire to the welding point. It has a lifetime of 3 to 20 welding hours (according to the manufacturer's data), which depends mainly on the quality of the material (Cu, Cr) and the quality and surface treatment of the wire. Replacement of the wire feed is recommended after the hole has worn down to 1.5 times the wire diameter.
5. For each installation and replacement, we recommend spraying the wire feed and its thread with a separating spray designed for this purpose.
6. The gas hose feeds gas used to protect the arc and welding bath. Metal splash clogs the nozzle, so clean it regularly to ensure a good and even flow of shielding gas and to prevent short-circuiting between the feed and nozzle. The clogging rate of the nozzle depends mainly on the correct adjustment of the welding process. Metal spatter is more easily removed after spraying the gas nozzle with a separating spray. After these measures, the spatter partially falls off, but it should still be removed from the space between the nozzle and the nozzle with a non-metallic rod every 10 to 20 minutes by tapping it gently. Depending on the flow's size and the work's intensity, the gas nozzle should be removed 2 to 5 times during the shift and thoroughly cleaned, including the gas supply channels between the nozzles. The gas nozzle must not be tapped hard as the insulating material may be damaged.
7. The spacer is also subjected to the effects of spray and thermal stress. Its service life is 30-120 welding hours (according to the manufacturer's data).

8. Bowden change intervals depend on wire cleanliness, maintenance of the feeder's mechanism, and the pulleys' adjustment. Consistent use of wire cleaner significantly reduces bowden contamination. Clean them once a week with trichloroethylene and purge them with pressurised air. In case of heavy wear or blockage, the bowden should be replaced.
9. Blow out the power supply cabinet, especially the power element heat sinks and the water cooler with compressed air, periodically according to the level of environmental dustiness.
10. Regularly check the fluid level in the reservoir and the fluid lines, including the torch, for leaks. Avoid contaminating the coolant with mechanical dirt, grease or other substances, especially flammable ones. The vent hole in the reservoir cap must be kept clear.
11.  Notice  Beware of the risk of damage to electronic components from direct contact with compressed air from a short distance when cleaning the machine.
12. All PCBs should be blown from a distance of at least 20mm.
13. Do not touch the components on the PCBs. There is a risk of electrostatic charge damage.

CHECKING THE OPERATIONAL SAFETY OF THE POWER SUPPLY ACCORDING TO EN 60 974-1

The prescribed test operations, procedures and required documentation are specified in EN 60974-4.

ERROR MESSAGES

The **V30** display shows **Err**, and the **V12** display shows the error number/label. Error is indicated by **V8** lighting up, and cooling unit error is indicated by **V9** lighting up.

Err 1	Fan fault
Err 2	Low water pressure. Check the amount of fluid in the reservoir or clean the water circuit. If the cooling unit test cannot be started, check the fuses.
Err 3	Overheating the machine (let the machine cool down; DO NOT SWITCH OFF THE MACHINE!). OT1-IGBT
Err 4	Overheating the machine (let the machine cool down; DO NOT OVERHEAT THE MACHINE!). OT2-MUR
Err 5	Feed motor overload.
Err 6	JOB is not saved.
Err 7	CAN-Bus communication error

Err 7 may be displayed when there is a communication failure/error or when one of the phases fails. Check the power supply (circuit breaker, plug).

PROVISION OF WARRANTY

1. The warranty includes the responsibility for the fact that the delivered machine has the characteristics specified in the binding technical conditions and standards at the time of delivery and during the warranty period.
2. Liability for defects that occur in the machine after its sale within the warranty period consists of the obligation to remedy the defect free of charge by the manufacturer or a service organisation authorised by the manufacturer.
3. The legal warranty period is six months from the sale of the machine to the buyer. The warranty period starts on the machine's handover date to the buyer or the possible delivery date. The manufacturer extends this period to 24 months. The warranty period only includes when a legitimate claim is made once the machine is repaired.
4. It is a condition of the warranty that the welding machine is used in the manner and for its intended purposes. Damage and extraordinary wear and tear caused by lack of care or neglect of even seemingly insignificant defects, failure to fulfil the owner's obligations, his inexperience or reduced abilities, failure to comply with the regulations specified in the operating and maintenance instructions, use of the machine for purposes for which it is not intended, overloading of the device, even if temporary. Only the original manufacturer's parts must be used when maintaining the machine.
5. During the warranty period, no modifications or changes to the machine that may affect the functionality of individual machine components are permitted.
6. Warranty claims must be made immediately after discovering a manufacturing or material defect and filed with the manufacturer or dealer.
7. If a defective part is replaced during warranty repair, ownership of the defective part passes to the manufacturer.
8. The proof of purchase (invoice) with the serial number of the product on it or the warranty card on the last page of this manual is used as a warranty card.
9. A defect in the cooling circuit when using a fluid other than ACL-10 cannot be covered under the manufacturer's warranty.

WARRANTY AND POST-WARRANTY REPAIRS

1. Warranty repairs are carried out by the manufacturer or its authorised service organisations.
2. A similar procedure is followed in the case of post-warranty repairs.
3. Please report your complaint by e-mail at servis@alfain.eu or by phone at +420 563 034 626. The service hours are from 7:00 a.m. to 3:30 p.m. every working day.

20. ECODESIGN OF WELDING MACHINE

The equipment complies with EU Commission Regulation 2019/1784 requirements of 1 October 2019, laying down ecodesign requirements for welding equipment.

The power source efficiency values and the power consumption at rest are given in Ch. 4. The material consumption is given in Ch. 13

21. DISPOSAL OF ELECTRICAL WASTE

INFORMATION FOR USERS ON THE DISPOSAL OF ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE CZECH REPUBLIC

ALFA IN a.s., as a manufacturer, places electrical equipment on the market and is therefore obliged to ensure the take-back, processing, recovery and disposal of electrical waste.

The company ALFA IN a.s. is registered in the LIST of the collective system EKOLAMP s.r.o. (under the producer registration number 06453/19-ECZ).



This symbol on products or accompanying documents means that used electrical and electronic products must not be added to regular municipal waste.



The equipment must be disposed of at the company's separate collection and take-back points. EKOLAMP s.r.o. The list of locations can be found at <http://www.ekolamp.cz/cz/mapa-sbernych-mist>.

For users in European Union countries:

Ask your dealer or supplier for the necessary information to dispose of electrical and electronic equipment.

22. WARRANTY

The warranty certificate is the proof of purchase (invoice) with the product's serial number or the warranty certificate below filled in by the authorised dealer.

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