



User manual for MIG/MAG semi-automatic welding machine **Fanmig 322 mobil Pulse**



Catalogue no:
Fanmig 322 mobil Pulse - 51 00 023930

**Attention! A copy of this manual should be located in the
place of device use and should always remain available to the operator.**

Original manual



Operation Manual
rev. 1.1 of 30.01.2019EN

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1. Introduction

Thank you for purchasing Fanmig 322 mobil Pulse a semi-automatic inverter machine by MOST.

We do believe that this product will meet your requirements. Before starting the work please familiarize yourself with this User Manual

Recycling

In accordance with Directive 2012/19/EU WEEE II (WEEE - Waste Electrical and Electronic Equipment), after decommissioning, the device must be recycled by a specialized company.

Do not dispose of worn-out welding equipment with domestic waste!












2. Health and Safety Manual



Attention: The following user manual should be read prior installing and starting the device. OSH manual should be known to every welder and employee responsible for equipment maintenance.

Attention: The device is may not be used for the purpose of pipe defrosting!

	Use and maintenance of welding equipment may be dangerous. The user must observe health and safety rules and regulations. Welding and cutting machines may be used only by qualified personnel. Follow your local rules and regulations on working with that type of devices and prevention of accidents.
	Prior to starting your work remove all flammables from the welding area. Welding inside tanks previously used as flammable liquids storage is forbidden. Place any flammables in a safe location away from welding spatter.
	Do not expose the device to rain, water vapour and do not spray water over it.
	Do not start welding without proper eye protection equipment. Also protect other people against generated radiation.
	Use ventilation and filters in order to remove welding fumes from the work site. Use individual filters if the filtering/ventilation system does not operate correctly or is not available.
	Stop your work immediately after finding damage to the power cords. Do not touch the damaged cords. Prior a repair or maintenance disconnect the device from power source. Never use the device with damaged power cords.
	Keep a fire extinguisher close to the welding location. After finishing welding check work station against fire hazard.
	Never try to fix a damaged gas reducer on your own. In case of malfunction replace the reducer to a fully functional one.
	<p>Electromagnetic interference</p> <p>The device may influence other devices sensitive to electro-magnetic interference (robots, computers, etc.)</p> <p>Always ensure that the devices within the welding work station are resistant to interference.</p> <p>For the purpose of limiting interference, it is recommended to use as short welding cables as possible and arranged in parallel.</p> <p>Always work in a distance at least 100 m from other sensitive devices.</p> <p>Always make sure that the installation is grounded.</p> <p>If there still are interference with other devices, properly shield the cables or use appropriate filters.</p>

INTRODUCTION

Commissioning and normal operation are possible only after reading the carefully reading following manual. The MIG/MAG, and MMA welding requires meeting the conditions corresponding to electric arc welding and fire regulations. Device operator should be equipped with appropriate personal

health and safety equipment. It is necessary to use a set of personal protective equipment in accordance with the provisions of Directive of the Council Directive No. 89/686/EC. Personal protective equipment includes: welding mask, welding gloves, protective apron, leather shoes, non-flammable welding clothing.

Despite the high technical standard of the device, the personnel should represent considerable discipline in approach to health and safety requirements to protect against harmful and health hazardous factors developed from welding technology.

OPERATING CONDITIONS

In order to ensure adequate service life and trouble-free operation it is recommended to:

- do not place or use this device on an inclined surface (of more than 15°),
 - do not use the device for pipe defrosting,
 - the device needs to be located in a place with free clean air circulation (to and from the fan without obstacles). When connected to electrical network the device must not be covered (with, for example, paper or cloth),
 - minimize the amount of dirt and dust that can get into the device,
- The device has an IP23S protection rating for housing and may be exposed to atmospheric fallout and is capable of operating outdoors.
- do not use the device for welding tanks previously used for flammable substances storing.



GASES AND FUMES

Using MIG / MAG, TIG and MMA techniques produces harmful gases and fumes containing ozone and hydrogen as well as oxides or metal particles. Therefore, the welding work station should be fitted with very good ventilation (dust and smoke extraction or airy location). Metal surfaces intended for welding should be free from chemical contamination, especially degreasers (solvents) that decompose during welding process and produce toxic gases. Welding of galvanized, cadmium-coated or chromium-plated parts is permitted only when a suction and filtering device is fitted, and with introduction of fresh air to the welding work station.

RADIATION

Ultraviolet emission radiated when welding is harmful to eyesight and skin. Therefore a welding mask with protective filters is required. Welding work station should meet certain requirements and include:

- adequate lighting system,
- fixed or movable protection screens, governing bystanders against radiation effects (depending on requirements),
- location with wall colour providing appropriate for radiation absorption.

FIRE PROTECTION

Welding work station should be located at a safe distance from flammables placed especially on the floor or walls. All flammables need fire protection against hot metal drops. It is recommended to fit the work station with fire blankets and fire extinguishers.

PROTECTION AGAINST ELECTRIC SHOCK

It is unacceptable to connect the device to an improper installation or to an installation with unverified zeroing efficiency. It is prohibited to use of device with shields removed or remove the external shields while the device is connected to electric network. It is not allowed to work on a suspended device (e.g. using a crane or a gantry). Only authorized persons should perform maintenance and repair works keeping it in compliance with the safety conditions applicable to renovation equipment.

3. Maintenance (power supply and wire feeder)

ATTENTION: In order to carry out any repair or maintenance activity, it is recommended to contact your nearest technical support of **RYWAL-RHC** (for list of company locations providing technical support - see last page of this manual).

In the event of noticing any damage, the welder should stop working, disconnect the device from power supply and report it to direct supervisor or appropriate service - **RYWAL-RHC** technical support.

General maintenance (daily)

- check the condition of cables and connections, replace if necessary,
- remove spatter from the gas nozzle of the welding torch, spatter may transfer with the shielding gas to the welding arc, tend to disrupt the shielding gas flow and can effect in a short circuit,
- check condition of welding torch, replace if necessary,
- check condition and operation of the cooling fan; keep the cooling air inlet and outlet openings clean,
- keep the device clean.

Periodic maintenance (every 3 months at least)

Periodic maintenance frequency can be increased depending on the environment in which the device is operating. Maintenance scope:

- using a stream of dry air (at low pressure) remove the dust from the outer parts of the casing and from inside of the welding device,
- check and tighten all the screws,
- check the state of all electrical contacts and correct if necessary.



ATTENTION: Electrical network must be disconnected from the device before any maintenance and service work. After each repair, perform respective check to ensure safe use.

Mandatory device checks

According to the Labor Code provisions: „All responsibility for the safe use of machinery and equipment shall be borne by the owner.” This results in the obligation to perform periodic and post-repair checks and inspections of equipment. Periodic tests are carried out at least once a year (legal basis PN-EN ISO 17662 clause 4.2), and post-repair tests after each repair that restored welding functionality (legal basis: PN-EN 60974-4 clause 4.6).

All above services re performed by the technical support of **RYWAL-RHC**.

4. Technical description and operating conditions

Fanmig 322 mobil Pulse is a cutting edge semi-automatic welding inverter machine designed for MIG/MAG welding and MMA coated electrode welding (Stick). It is a compact-sized device including electrical power supply and wire feeder located inside a single housing. Fanmig enables users to weld with MIG/MAG pulsating current. Fanmig has a 4-roll wire feed system embedded. The device has excellent welding properties and has a wide application range. It may be used for welding:

a/ MIG/MAG welding technique

Welded materials include ordinary steel, stainless steel or aluminium.

Recommended wire diameters are 0.8 mm to 1.2 mm steel wire and 1.0 mm for aluminium wire.

Wire feed speed may be set between 1 and 16 m/min, the welding current has smooth adjustment. Wire feeder may be used for spools between 15kg/18 kg or 5kg. B300 basket spools require an additional adapter eg. 50 00 001103.

b/ MMA electrode welding

Recommended electrodes from 2.0 to 5.0 mm in diameter, with a rutile or alkaline casing, for steel or stainless steel.

The device is protected against overheating by a thermal sensor. Made in accordance with EN 60974-1 standard.

ENVIRONMENTAL CONDITIONS

Range of

air temperatures at operation from

-10°C to +40°C

storage and transportation from

-25°C to +55°C

relative air humidity:

up to 50% at + 40 ° C; up to 90% at + 20 ° C.

4. Technical parameters

Parameter	Fanmig 322 mobil Pulse	
Welding method	MIG/MAG	MMA
Electrical power supply [V]	3x400/ 50/60Hz	
Network protection [A]	16 delayed	
Max. current drawn from the network I [A]	23,9	22,9
Effective current I [A]	13,3	12,8
Welding current range [A/V]	20A / 15,0V - 315A / 29,8A	10A / 20,4A - 300A / 32,0V
Idle voltage U [V]	63	
Welding current [A] at:	210 A / 24,5V 250 A / 26,5V 25%/315 A / 29,8V	190 A / 27,6V 230 A / 29,2V 20%/300 A / 32,0V
100% work cycle		
60% work cycle		
Work cycle for max. current		
Welding current set point	Smooth	
Wire feeder	4-roller	
Wire feeding speed [m/min]	1 – 16	x
Welding torch cooling	Air	
Welding Torch (gas)	M24, M36, M38 SGRIP MOST or Digimig 355	
Weight [kg]	26.6	
Housing protection class	IP23S	
Insulation class	H	
Dimensions [mm] height x length x width	438 x 650 x 240	

Table 1: Technical parameters

The device is marked with the S sign which means the possibility of working in an environment with an increased risk of electric shock.

Device assembly:

Mass cable with a cross-section of 35 mm², 3 m long. Power cord, 3 m long, with 16 A CEE plug, 5-pin. Gas hose 3 m long with connections.

The feeder is equipped with rollers for steel wire 0.8 - 1.0 mm. Other rollers - see section 5.1.

Devices available on request supplied with different cable lengths or welding torches.

MIG/MAG welding torches (optional):

Welding torch M24 SGRIP 3 m 55 08 302430

Welding torch M24 SGRIP 4 m 55 08 302440

Welding torch M24 SGRIP 5 m 55 08 302450

Welding torch M38 SGRIP 3 m 55 08 303830

Welding torch M38 SGRIP 4 m 55 08 303840

Welding torch M38 SGRIP 5 m 55 08 303850

Welding torch Digimig 355 3 m 55 08 308003

Welding torch Digimig 355 4 m 55 08 308004

Welding torch Digimig 355 5 m 55 08 308005

Note: while welding with pulsating current welding torch heating increases (by approx. 30%). Please apply welding work cycles provided by manufacturer welding torch devices. Solution to this issue is an application of cooling for welding torch liquid e.g. by connecting Fancool 601-WA as additional cooling unit (cat. no. 50 03 003805).

Accessories for aluminium welding and brazing (recommended wire diameter 1.0 mm) - optional: Roll 1.0AL-1.2AL 51 13 007894

Teflon inserts for welding torch: 55 13 013010 (3 m); 55 13 013020 (4 m); 55 13 013030 (5 m)

Brass tube for EURO connection: 51 13 008011.

6. Device construction

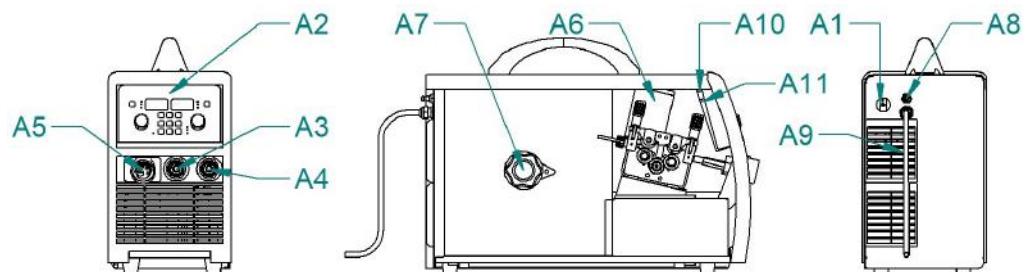


Figure 1: Device construction

A1	Main switch ON/OFF
A2	Control panel PCB
A3	Current socket (+)
A4	Current socket (+)
A5	Euro socket
A6	Wire feeder
A7	Spool mounting
A8	Gas connection
A9	Power cable
A10	Lighting diode for inside of feeder
A11	Immediate wire feeding button

Table 2: The main parts of the device.

Wire feeder construction

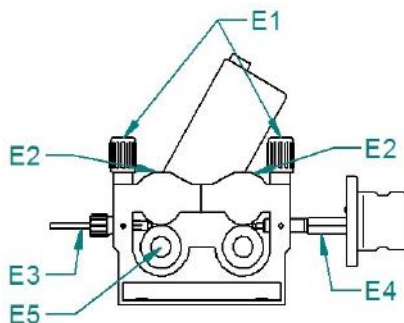


Figure 2: 4-roller wire feeder

E1	Pressure arm nut
E2	Pressure arm
E3	Entry sleeve
E4	Euro socket
E5	Roll (see table 4)

Table 3: Wire feeder parts list

6.1 Selection of the wire feeder

In all Fanmig devices, two-groove rollers are used. Grooves are used for feeding wire with two different diameters (e.g., 0.8 and 1.0 mm).

In order to change the diameter of the roller, pressure knob **E1** must be released first (according to Fig. 2), so the pressure arm **E2** will lift up. Then tighten the fastening bolt **E5** and turn it 180 degrees. Alternatively replace it with the right wire for the given diameter. Rolls intended for wire feeding must correspond to the diameter and workpiece of the wire to be welded. Only such compatibility ensures equal wire feeding. Disturbances in wire feeding lead to poor welding quality and wire deformation (see figure 3).

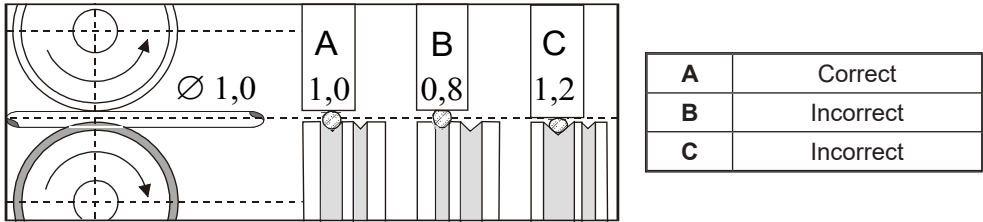


Figure 3: The influence of the roller groove on welding wire.



Catalogue no.	Wire diameter
51 13 007843	0,8-1,0 mm
51 13 007844	0,8-1,0 mm Al
51 13 007893	1,0-1,2 mm
51 13 007894	1,0-1,2 mm Al

Table 4: Wire feeding rollers

6.2 Device adjustment for aluminium welding

When feeding with aluminium wire, it is necessary to use a U-profile roller (e.g. 51 13 007885). To avoid problems with wire feeding, use 1.0 mm AlMg or AlSi wire. Al99 alloy wires are too soft, so their use can be problematic.

For aluminium welding, an additional Teflon insert of welding torch and a special current tip should be applied. It is not recommend to use a welding torch longer than 3 m. Pay high attention to roller pressure adjustments. Pressure should not be too high, as it can cause wire deformation. Always use argon as shielding gas.

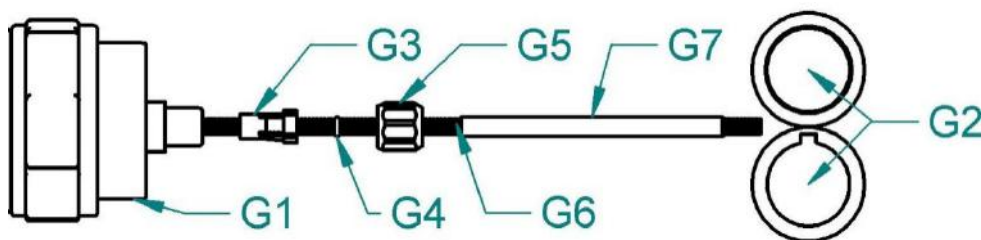


Figure 4: Adaptation of the aluminium wire feeder.

G1	Euro socket
G2	Rollers (upper pressure and lower U-type)
G3	Collet (included with guide insert)
G4	O-ring 3.5 x 1.5mm prevents gas escaping (included with the guide insert)
G5	Nut
G6	Teflon insert (see chapter 4: Equipment)
G7	Brass tube stiffening Teflon insert (51 13 008011)

Table 5: Feeding units' preparation for aluminium welding

6.3 Installation of the wire spool (according to figures 1, 2 and 5)

1. Open the side cover of the wire feeder housing.
2. Place the wire spool on the spool clamping reel **D1** (according to figure 5) and secure it with the mounting nut **D2**. When using a B 300 spool type (15 or 18 kg) use a suitable adapter **D3**, e.g. 50 00 001099). The hole in the back of the adapter must match the pin on the wire spool clamping sleeve!
3. Cut off the end of the wire and pull the wire through the input sleeve **E3**, the roller and then through the bushing in welding torch socket (~5 cm). Check if the applied groove is correct.

4. Lower the pressure arm **E2** to match the teeth, gears and lock the arm by positioning the **E1** lever vertically.
5. Adjust the pressing force with clamping nut to ensure constant wire travel and prevent causing deformation. The adjustment screw is located under the **E1** plastic screw.
6. The spool brake is set by the manufacturer. If necessary, the brake can be adjusted by means of a **D1** sleeve, so when stopping the wire feed, the wire also stops at the same time (thus avoiding excessive wire development). Remember that a too-tight brake causes excessive resistance at unwinding and this can lead to wire rollers slippage.

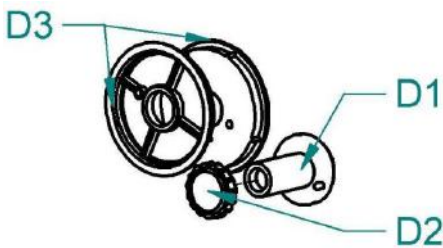


Figure 5: Spool fixing sleeve

D1	Spool fixing sleeve
D2	Nut for spool fixing sleeve
D3	Adapter

Table 6: Parts of spool fixing sleeve

6.4 Adjustment of wire feeding rollers pressure

It is very important to properly adjust the rollers pressure to ensure reliable operation of the wire feed mechanism.

The pressure depends on the type of wire. In case of aluminium or powder wire, less pressure is required.

Application of excessive pressure force leads to greater wear of the mechanical bearings and may damage the device. Before mounting the rollers, clean them with preservative oil.

6.5 Inserting the wire into welding torch and connecting the ground cable (according to fig. 1)

1. Connect the ground clamp to the welding machine and the workpiece to be welded.



Attention! Do not point the welding torch towards the face when inserting the wire!

2. Screw the welding torch connector **B2** to socket **B1** on the machine.
The device must be switched on
3. Remove the gas nozzle from the welding torch.
4. Unscrew the current tip.
5. Connect power to the device
6. Start the device with the **A1** switch.
7. Press button **A11** (according to figure 1). The welding wire is fed to the welding torch.
Tighten the current tip and the gas nozzle after the wire exits the torch.
8. Spray an anti-stick agent into the gas nozzle before welding to prevent damaged from splinters.

6.6 Gas flow adjustment

The welding arc and a cooling down weld must be in the inert gas shield.
Too little gas does not provide a protective atmosphere.



Attention:

The gas cylinder must be adequately protected against falling. This manual does not cover the protection of gas cylinders. Information on cylinder protection can be obtained from the technical gas supplier.

1. Attach the gas hose to port **A8** on the rear panel of the machine.
2. Press the **V1** button on the main panel (according to Figure 7). If the button is held down for less than 3 seconds, the gas valve switches off when the button is released. If the button is held down for more than 3 seconds, the gas valve switches off after approx. 20 seconds or after pressing any button.
3. Turn the adjusting screw **F7** located at the lower part of reduction valve until the F6 meter shows the required flow. Then release the button. The optimal flow rate is 10-15l / min.
4. The pipes should be purged with shielding gas before starting welding after a prolonged period of device being out of service or after replacing the welding torch.

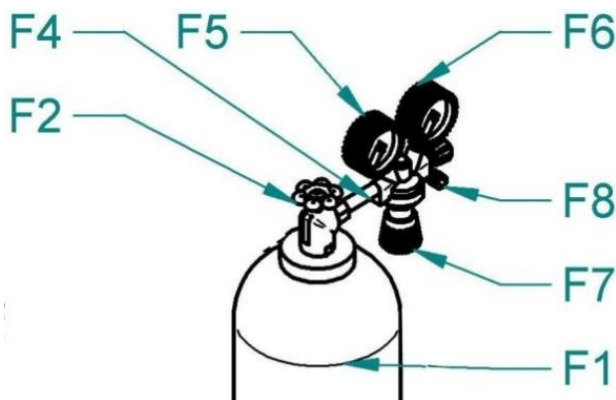


Figure 6: Shielding gas flow settings.

F1	Gas cylinder
F2	Cylinder valve
F4	Pressure reducer
F5	High pressure manometer
F6	Low pressure manometer
F7	Adjustment knob
F8	Gas outlet

Table 7: Gas connection components

7. Welding parameter settings

7.1 Control panel

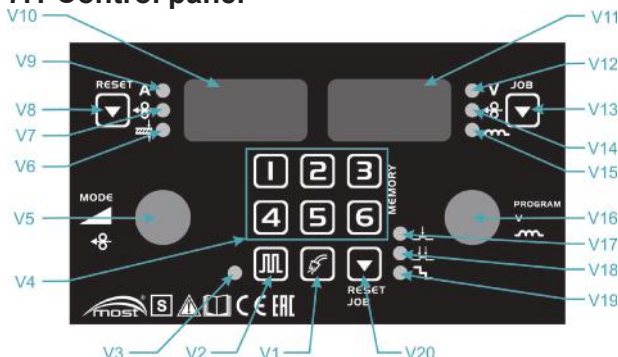


Figure 7: Control panel

Pos.	Presentation
V1	Button: Gas test
V2	Button: Pulse mode MIG
V3	LED: lights up when the MIG pulse mode is active
V4	JOB program memory buttons 1-6
V5	The current knob, welding method or wire feed speed
V6	LED Material thickness [mm]
V7	LED Wire feeding speed [m/min]
V8	Button for selecting the parameter to be set (also RESET)
V9	LED Welding current [A]
V10	The left display shows: 1. Welding current [A] 2. Wire feeding speed [m/min] 3. Material thickness [mm] 4. Symbol of the additional parameter
V11	The right display shows: 1. Voltage [V] 2. Welding current for the MMA method 3. Gland setting
V12	LED Voltage or voltage correction

V13	Button for selecting the parameter to be set or the JOB memory program
V14	LED Correction of wire feeding speed
V15	LED Gland or correction of the gland
V16	Voltage knob or voltage adjustment, programme or throttle value selection
V17	LED diode: 2-tack operation mode for welding torch
V18	LED diode: 4-tack operation mode for welding torch
V19	LED: stepped mode
V20	Selection button 2-cycle / 4-step, step-by-step mode, RESET

Table 8: Components of the control panel.

7.2 Choice of welding method

1. The menu opens after a longer press of the **V5** button.
2. Turn the **V5** knob to select the ELE (MMA coated electrode) method; MAN (manual MIG / MAG settings) or SYN (MIG / MAG synergy).
Confirm the selection by pressing the **V5** knob.

7.3 Quick parameter selection - memory

The memory works for all three welding methods.

1. Press (4s) one of the **V4** buttons (1,2,3,4,5,6) to store the parameters in the memory.
2. A short press on one of the **V4** buttons (1,2,3,4,5,6) allows you to recall parameters from the memory.

7.4 Welding mode 2-stroke 2T, 4-stroke 4T, step and BILEVEL

MIG 2T welding mode (2-stroke) 


Works in the manual and synergy welding mode.

Press the **V20** button to switch between 2T, 4T and stepwise modes. Emergency mode 2T is confirmed by **V17** diode being on. The first pressing of the button activates welding, the second one ends the process.

MIG 4T (4-tact) welding mode 


Works in the manual and synergy welding mode.


Press the **V20** button to switch between 2T, 4T and stepwise modes. Emergency mode 4T is confirmed by the **V18** diode being on. The first pressing and release of the button activates welding, the second pressing and release ends the process.

MIG 2T stepwise welding mode (filling in the crater) 

Works in the manual and synergy welding mode.

Press the **V20** button to switch between 2T, 4T and stepwise modes. Emergency mode 2T stepwise is confirmed by **V19** and **V19** diodes being on. The first time the button is pressed and holding activates SCu start current welding during START tS. Then, after the UPPROFILE UP time, the device will reach the welding current (100%). Releasing the button causes starting the current sinking during DOWN tdo to the final EC END current during END tE (filling the crater). After this time, welding stops.

MIG 4T step welding mode (crater filling). **4T**  Works in manual and synergic welding mode. Press the **V20** button to switch between the 2I, 4T and step modes. Active 4T stepwise mode is confirmed by **V18** and **V19** diodes being on. The first pressing and holding activates starting current (SCu) welding. Release of the button activates rising time UP tuP, at which the device will reach the welding current (100%) The second pressing of the button causes the activation of the current drop at DOWN tdo to time to the end current END ECu which is maintained so long as the button is pressed (filling in the crater). The next release of the button ends welding.

BILEVEL mode (BCU parameter $\neq 100$), only for 4-stroke mode. **4T**  **B-LEVEL**

The difference between the BILEVEL mode and the stepped mode appears the next time the button is pressed. When the BILEVEL mode is on, another short press of the button switches to the second set bCu current.

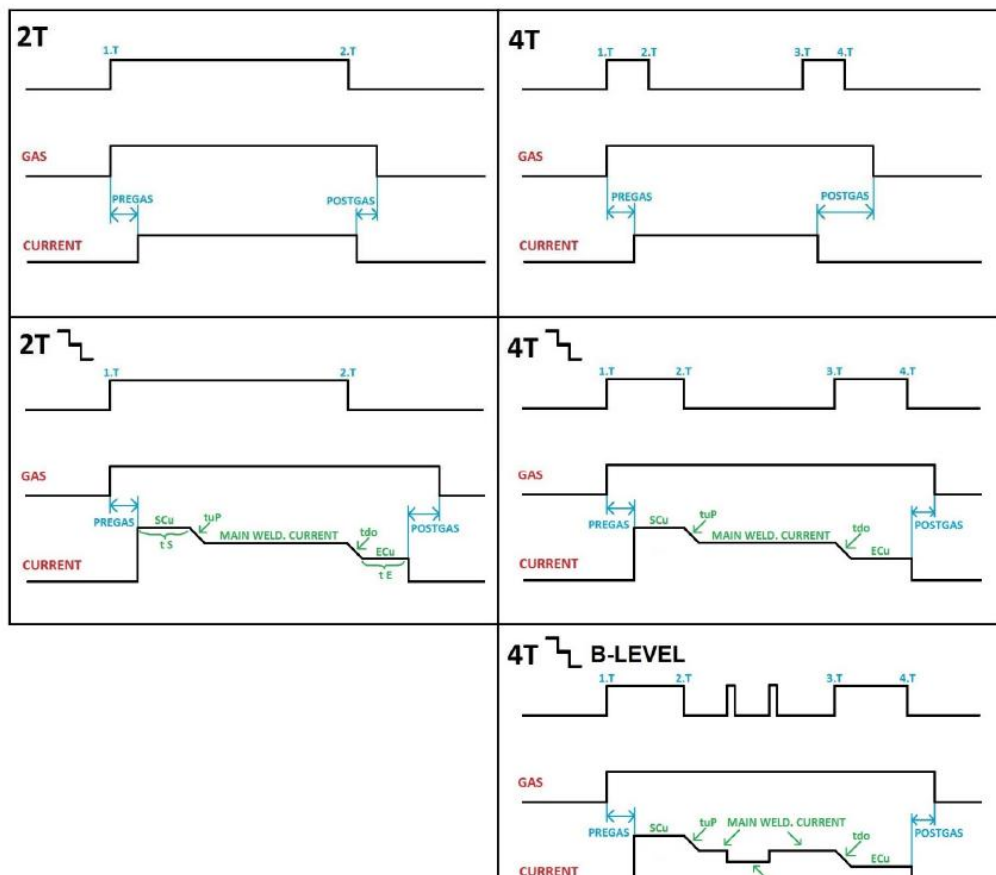


Figure 8: MIG / MAG welding modes

7.5 Additional parameters menu.

After starting the device has factory settings (default).

For most works, the additional parameters should not be changed. The additional parameters for manual welding and MIG / MAG synergies are identical.

1. Pressing V19 and **V5** simultaneously opens the additional parameter menu.
2. The V5 knob is used to select the parameter (ISP, PRG, PoG, brn) and the **V16** knob to set the required value.
3. Press the **V5** knob to confirm the change.
4. Press any button to exit the menu without saving changes.

Symbol	Meaning	Range (default)
ISP (Initial speed)	The speed of the initial Wire feeding	10 - 100 % (30 %).
PrG (Gas pre-flow time)	Gas flow	0 - 20 s (0,1 sek.)
PoG (Gas post-flow time)	Gas post-flow	0 - 20 s (0,5 sek.)
brn (wire burning)	Wire burning	0 - 75 ms (50 ms)
CAL (Calibration menu)	Calibration menu (see also chapter 8)	x.xx (version with motor PCBs)
SCu (Starting current)	Starting current (2-stroke; 4-stroke)	10-200% (130%)
bCu (Bilevel current)	Secondary current (2-stroke; 4-stroke)	10-200% (100% = excluded)
EC (final current)	End current (2-tact; 4-tact)	10-200% (70%)
tuP (UP time)	Rise time (2-bar, 4-bar)	0,1-10,0s (0,1s)
tDo (falling time DOWN)	Falling time (2-bar; 4-bar)	0,1-10,0s (0,1s)
tS (start time)	Start-up time (only 2-bar)	0,1-10,0s (0,1s)
tE (end time)	End current time (only 2-bar)	0,1-10,0s (0,1s)

Table 9: Additional parameters and their values.

The CAL message opens the calibration submenu (see table 10).

Parameters marked as „2-clock“ in Table 9 are only available in this mode.

Pressing the **V4** (1) button for a longer time introduces the panel operation test, all LEDs and digits on the displays should light up.

Pressing the **V4** (2) button for longer shows the device variant and the roll type.

Work time counter.

After selecting the calibration mode, a longer press of the **V4** button (1) shows the arc time counter in the hh.mm format

Pos.	Presentation
u-I	Voltage and amperage calibration (available upon the introduction of the authorization code)
Cu	Cooling system operation: oFF (off) / on (permanently on) / Aut (automatic)
Cor	Deleting corrections (YES = resetting all adjustments for synergistic programs)
CrE	Calibration of the welding circuit - see chapter 8

Table 10: Submenu of CAL calibration.

7.6 Remote control from the welding torch

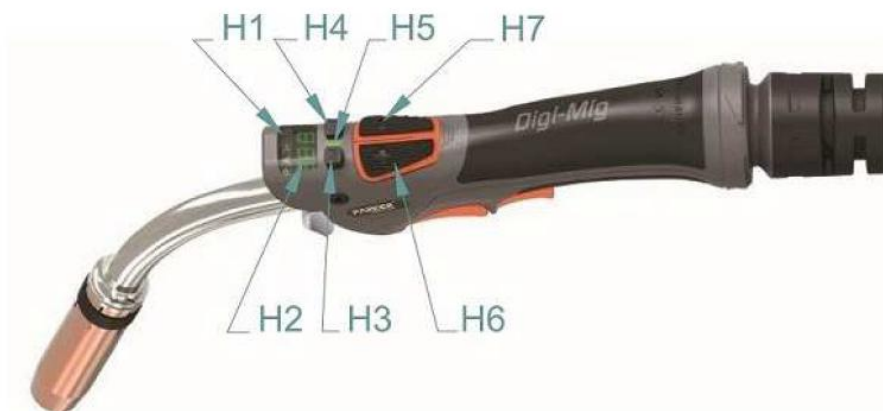


Figure 9: Remote control torch with DIGIMIG.

Pos.	Presentation
H1	Upper display
H2	Value display
H3	M button to change the function MIG manual: wire speed, voltage / inductor, JOB MIG synergistic: current, correction / inductor, JOB
H4	LOCK button to block the M and UP / DOWN buttons. The M and UP / DOWN buttons are automatically locked when the button on the
H5	LED: lights up when the UP / DOWN and M buttons are active
H6	UP button (increasing parameter value)
H7	DOWN button (decreasing parameter value)

Table 11: Functions set on the DIGIMIG torch' bracket.

Switching functions on the handle and working with JOB programs.

1. A long press of the **V13** and **V20** buttons activates the option of switching JOB programs. The display shows JOB on.
2. After pressing the **H3** button, you can switch between the JOB programs.
3. By pressing the **H6** (UP) or **H7** (DOWN) buttons, you can select JOB programs from memory.
4. A short simultaneous pressing of the **V13** and **V20** buttons deactivates the switching function of the JOB programs from the DIGIMIG holder. The display shows JOB off.





Pos.	Presentation
	The synergistic program is active
	Setting the current in amperes (Synergy)
	Setting the wire feed speed
No symbol	Material thickness setting (synergy) Voltage setting (manual)
	Correction (Synergy)

Table 12: Symbols on the H1 display




Pos.	Presentation
	JOB programs (.xx - program number)
	Gland setting (Synergistic / manual)
	Device in electrode mode (torch does not work!)

Table 13: Symbols on the H2 display

7.7 Restoring factory settings (RESET)

1. Pressing the **V8 + V19** buttons simultaneously for more than 3 seconds restores the default parameters.
2. At the same time, saved JOB PROGRAMS are deleted!

8. MIG / MAG welding synergia, MIG / MAG pulse, MIG / MAG manual and MMA electrode

8.1 MIG / MAG welding synergistic settings

1. Select the SYN method (see chapter 6.2).
2. The left display **V10** shows the message SYN and the right display **V11** shows the program number.
3. Select the synergy curve (program number) using the **V16** knob according to table 14.
Press the **V5** knob to confirm the program number.

Fanmig 322 mobil Pulse		diameter 0,8	diameter 1,0	diameter 1,2
SG/Fe	Ar 82% CO ₂ 18%	0*	1*	2*
SG/Fe	Ar 92% CO ₂ 8%	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*
AlMg	Ar 100%	x	15**	16**
AlSi	Ar 100%	x	17**	18**

Table 14: Table of synergy curves (synergic programs)

Synergic curves (programs) are created for welding in the PB (fillet) position. For welding in other positions, factory programs may require adjustments.

* program in short-arc or pulsating arc mode (after pressing **V2**)

** programs available only in pulse mode

8.2 Welding in MIG mode pulse.

1. Press **V2** to start the pulse current for a given synergy program (see table 14)
 2. When the MIG mode is active, the **V3** diode lights up.
 3. The left **V10** display shows the welding current, the wire feed speed or the thickness of the material being welded, the right **V11** display shows the voltage value. The value of the voltage correction is shown on the **V11** display only during its setting (range from minus 9.9 to plus 9.9).
 4. By pressing the **V8** button, we change the parameter set: welding current, wire feed speed or material thickness. 15)
 5. Set the value of the selected parameter with the **V5** knob.
 6. In the calibration menu, you can disable the possibility of adjusting the welding parameters (Cor parameter).
 7. By pressing the **V13** button a long time, you can switch between voltage correction or wire feed speed.
 8. Setting of the voltage adjustment value or wire feed speed is done with a knob.
- V16.**
9. Press the **V20** button to switch between the 2-step / 4-step or stepped wire modes (filling the crater).
 10. If a torch is connected with a DIGIMIG remote control, the values of the set parameters are shown on its display. Using the buttons on the **H6** (UP) or **H7** (DOWN) handle, set the parameter values, the **M (H3)** button is used to switch between the parameters. After activating the function, you can also change the JOB programs on the display.

8.3 MIG / MAG welding manual settings

1. Select the **MAN** method (see chapter 6.2).
2. The **MAN** message is displayed on the left display **V10**.
3. **The left V10 display shows the wire feed speed and the right V11 display voltage or inductance.**
4. Wire feed speed is set using the **V5** dial.
5. The **V16** knob is used to adjust the voltage or inductance.
6. The voltage and inductance values can be displayed and set by pressing the V13 button for a longer time.
7. During welding, the measured welding current values are shown on the **V10** display, while the **V11** display shows the measured voltage values.
8. After welding is finished the measured value (**HOLD**) stays visible on the display for a 6 seconds after welding.
9. The welding voltage is set using the potentiometer **V16**, see figure 8.

The value of the welding current („amps”) depends on the wire feed speed and voltage. Curve characteristics („hardness / softness”) can be controlled by adjusting the inductance.

Approximate current and voltage settings for MIG/MAG welding correspond to empirical ratio $U_2 = 14 + 0.05 \cdot I_2$. The required voltage can be determined in accordance with this pattern. Set the welding current by first setting the welding voltage and then configuring the wire feed speed until the arc glow is stable and there are the least spatters.

It should be remembered that the actual arc settings may differ slightly depending on the welding material setting and voltage fluctuations. In order to obtain a good weld quality and an optimal welding current setting, it should be ensured that the distance between the current tip and the material is approx. 10x the diameter of the wire (Figure 10).

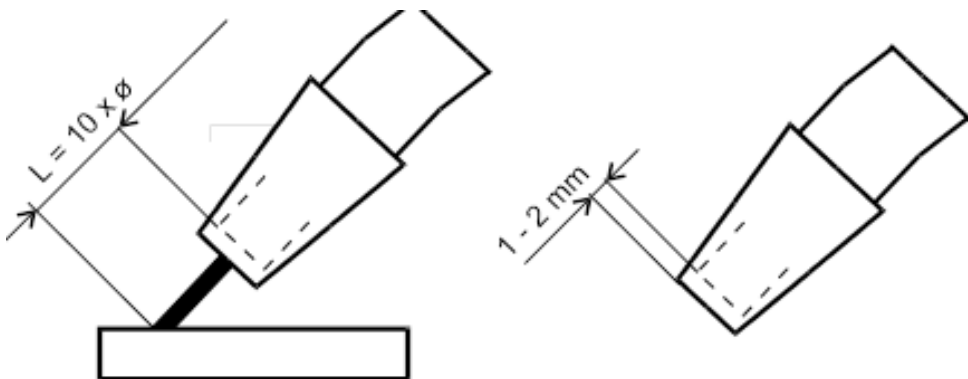


Figure 10: The distance between the tip and the material.

8.4 MMA welding (coated electrode - ELE)

1. Select the ELE method (see chapter 6.2).
2. The left display **V10** shows the welding current value, while the right **V11** display shows the message ELE.
3. Welding current is set using the **V5 dial**.
4. During welding, the display shows the measured values of the welding current.
5. The measured value stays visible on the display for 6 seconds after welding (HOLD).
6. In the event of an accidental connection of the MIG / MAG welding torch with a remote control, the ELE message appears on its display. The remote control function is inactive. Be careful - there is a welding voltage on the welding torch.

9. Welding circuit calibration

Programme welding properties depend on many aspects e.g. the length of the welding torch, the length of the ground cable, the quality of the ground clamp connection, distance between the welding spot and the ground clamp. Therefore, it is recommended to carry out the calibration procedure in order to adapt the programme to actual welding conditions.

1. Press the **V20** button and the **V5** knob simultaneously to enter the additional
2. Select parameter CAL with the **V5** knob and press to confirm.
3. Select CrE with the **V5** knob and press to confirm.
4. Remove the gas nozzle from the hook.
5. Cut the end of the wire.
6. Turning the wire spool manually (with the pressure rollers released), move back approx. 50 cm of wire into the handle to isolate it from the potential.
7. Touch the welded spot with the torch current tip (contact point must be clean), press slightly and press the welding torch button for ca. 2 seconds. The short circuit current will define and remember the current resistance value. (The value may change from 0mΩ to 60mΩ, factory setting amounts to 10mΩ). Resistance value may also be introduced with the **V16** knob.
8. If the right **V11** display shows Err error, the calibration must be repeated.
9. Replace the gas nozzle and insert the wire to start welding.

Attention:

The calibration procedure is particularly important in the case of welding with pulsating current or in the case of a large change in welding conditions.

10. Spare parts and device construction

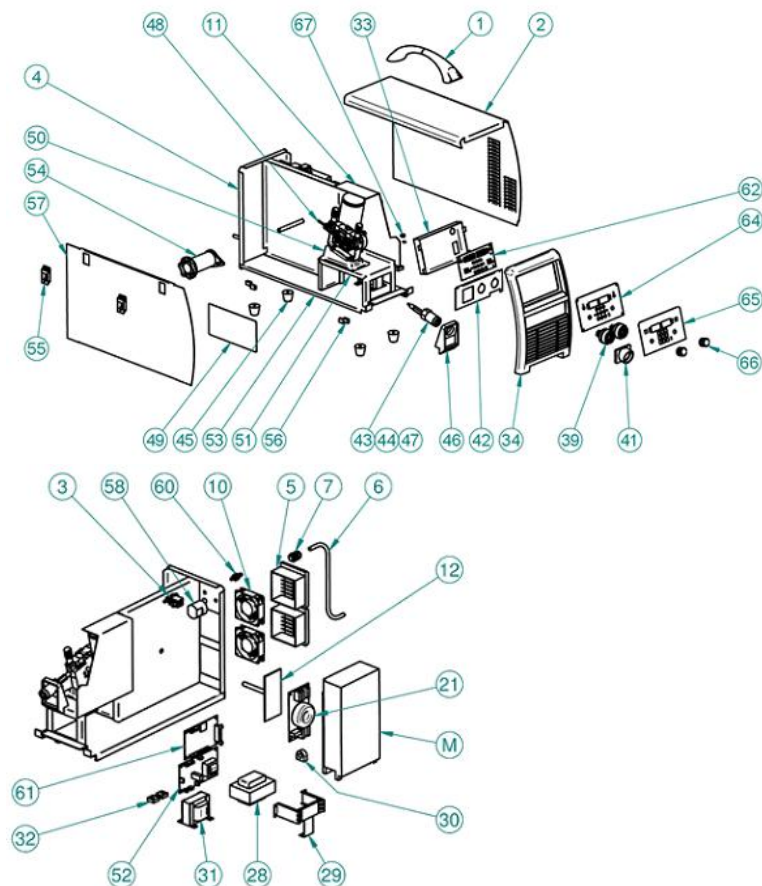


Figure 11: Fanmig 322 mobil Pulse spare part list

No.	Catalogue no.	Name	pcs
1	8.253.035	P200 OVO torch	1
2	8.051RM.204	Pegas 250-2 MIG shield	1
3	7.253.014	P250/320 SYN solenoid valve	1
4	8.068RM.204	P250/320 SYN rear panel	1
5	8.304RM.004	PEGAS 250 MIG fan shield	1
6	7.555.609-B	P 250/320 SYN power supply cable	1
7	7.155.020	P 250/320 SYN cable fastening	1
10	7.720.240	PEGAS 130E fan	1
11	8.124RM.204	P250/320 SYN middle panel	1
12	8.122RM.203	P250/320 MIG sleeve fastening to the spool	1
M	5.0261modul-1	PEGAS module power unit 320 MIG SYN	1

No.	Catalogue no.	Name	pcs
21	6.271.800	EMC Inductor with 5.496.908-B	1
	5.496.908-B	PCB EMC P250 plate	1
28	6.185RM.208	P320 MIG main transformer	1
29	8.123RM.051	P250/320 MIG transformer support	1
30	7.321.130	P250/320 MIG Hall probe	1
31	6.271RM.203	P250/320 MIG throttle	1
32	7.305.132	P250/320 MIG shunt	1
33	8.123RM.052	PCB P250/320 MIG plate shield	1
34	8.069.004	P200 OVO plastic front panel	1
39	AO-20610	Quick connector 35-70 oanel socket	2
41	7.510RM.203	P250/320 MIG EURO socket shield	1
42	8.123RM.054	P250/320 SYN socket panel shield	1
43	8.178RM.203	P250/320 SYN guiding tube	1
44	7.667RM.203	P250/320 MIG EURO socket	1
45	8.046.001	P250/320 SYN foot	4
46	8.123RM.905	P250/320 MIG EURO socket fastening	1
47	8.177RM.203	P250/320 SYN EURO socket fastening bolt	1
48	6083	P250-320 MIG MAN/SYN feeding set, with no motor	1
	5825	TR 24V 50W 210 L motor + encoder	1
49	8.123RM.048	P250/320 SYN feeding set shield	1
50	8.081RM.203	P250/320SYN plastic feeding set torch	1
51	8.123RM.047	P250/320 SYN metal feeding set torch	1
52	5.496RM.110-A	MIG MAN 250/320 PCB power plate	1
53	8.055RM.204	P250/320 SYN bottom wall	1
54	7.803.202	P250/320 MIG spool fastening	1
55	7.686.300	P160MIG lock	2
56	7.686.048	Pegas 250 MIG hinge	2
57	8.050RM.204	Pegas 250-4 MIG left shield	1
58	7.232.404	P250/320 MIG main switch	1
60	8.462.116	P40 gas connection	1
61	5605-1	PCB 250/320 IN control plate	1
62	5604-1	PCB 250/320 IN V004 display plate	1
64	V60548-4A	Pegas 250-300 IN RAL mat 9005 front panel	1
65	6056-1fT	Fanmig 322 Mobil Pulse foil 0.25mm	1
66	4476	25.0 2004-2 knob with no arrow and line	2
67	VM0493	aXe 320 PULSE mobil package	1
	624-296	LED 5mm RTF-5010 fastening	1

Table 15: FANMIG 322 mobil Pulse spare pars as per fig. 11

11. Device operation defects



Attention:

The device may only be repaired by authorized personnel!

11.1 MIG/MAG welding technique

Fault	Potential cause	Recommendations
Arc unstable	Welding current set incorrect	Set the correct welding current
	Wire speed too high / too low	Set the right speed
	Poor contact of the mass clamp with the welded workpiece	Check the clamp and secure it again
	Incorrect current tip	Replace the tip with the correct one
	Incorrect gas flow	Set the correct flow
	Clogged wire guide	Clean with compressed air or replace
	Wire feeding incorrect	Check wire feed unit rolls and pressure force
	Power source failure	Contact technical support
Too much spatter during welding	Too high wire feeding speed	Lower the speed
	Too high welding current	Lower welding current
	Welded workpiece dirty Enable pulse mode (V2 button) for the given welding program	Clean the welded workpiece
Wire feed motor does not work	No power supply	Check the electrical connection
	Poor operation of the welding torch button	Check button
	Damage to the control board	Contact technical support
	Motor damage	Contact technical support
The wire feed motor operates but without wire feed or with unstable wire delivery	Pressure arm tightened to loose	Adjust the pressure with the appropriate nut
	Incorrect feed roll	Turn or change the feed roll
	The wire is blocked in the current terminal	Exchange the current tip.
The device switches off automatically, the V10 display shows the Err message, the right V11 display shows 1.	Work cycle exceeded	Allow the device to cool down and follow the instructions for use
	Fan does not work	Contact technical support
	Electric power source failure	Contact technical support

Table 16: Errors occurring during MIG / MAG welding.

11.2. MMA method

Problem	Potential cause
Excessive splatter	1. Arc too long 2. Too high welding current
Crater	1. Too quick detachment of the electrode from workpiece
Intrusions - slagging	1. Low material purity or densely placed welds 2. Incorrect electrode leading
Lack penetration, no sticking	1. Too high welding speed 2. To low welding current 3. Too small bevel angle 4. Incorrect edge cleaning
Electrode sticking to the workpiece being welded	1. Arc too short 2. To low welding current
Bobbles in weld	1. Moistened electrode coating 2. Arc too long
Cracks	1. Too high welding current 2. Welded workpiece dirty 3. Hydrogen in weld (from electrode coating)

Table 17: Errors occurring during MMA welding.

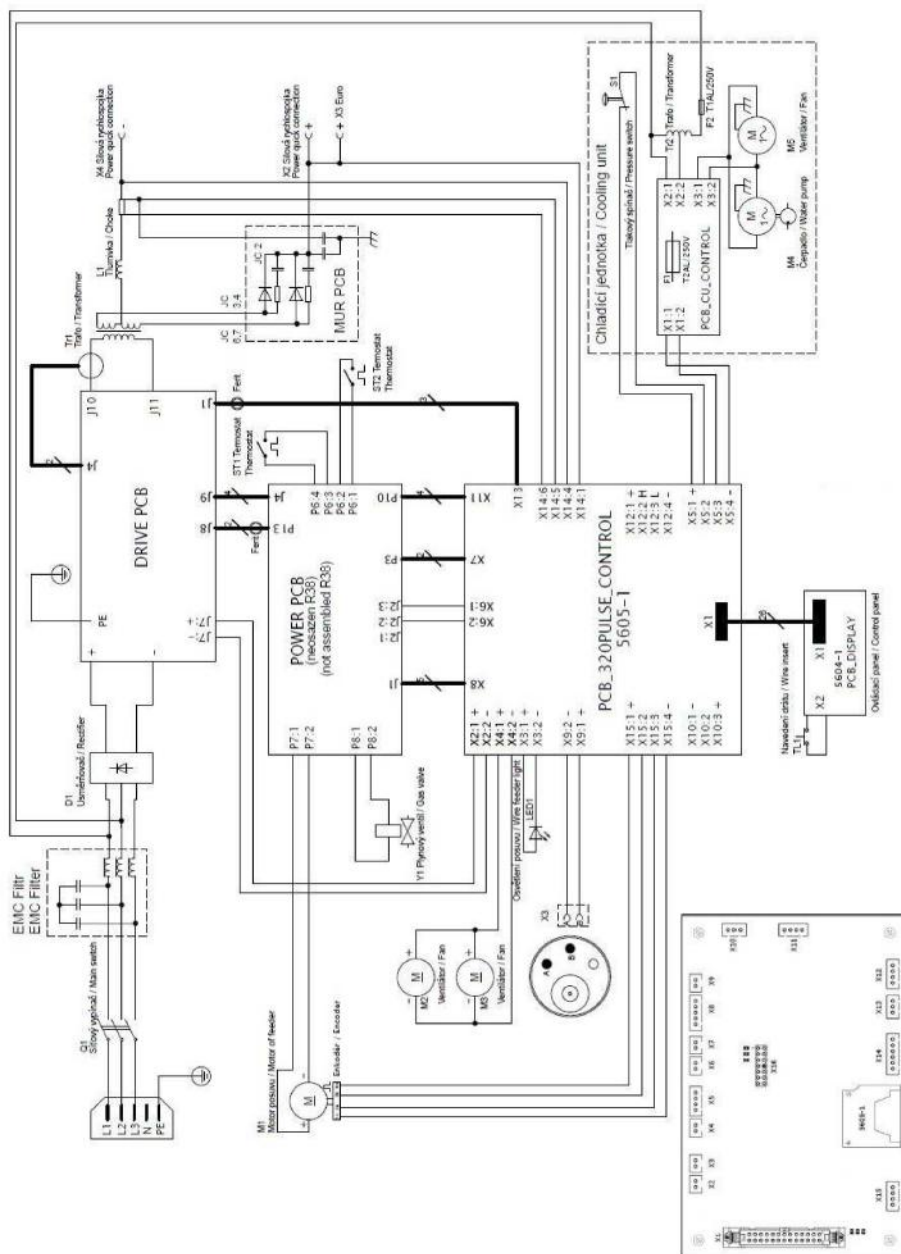
11.3 Error codes shown on the device display

Pos.	Presentation
Err 1	Overheating the device. Do not turn the appliance off until the fan has cooled down.
Err 2	Fanmig 322W Pulse only Coolant has low pressure. Check the liquid level and the liquid hoses. Check the fuse in the cooling unit.
Err noP	MIG mode pulse does not work for a given material-gas combination
Err noS	Program only in pulse MIG mode, can not be welded in a short arc.

Table 18: Error codes shown on the device's display

The Err message will appear on the left display **V10**, on the right **V11** the error number. The device interrupts welding by the time of eliminating the cause of the error.

12. Electrical scheme



13. EU Declaration Of Conformity:

1. **Product** Semi-automatic welding machine Fanmig 322 mobile Pulse MOST
2. **Name and address of the producer:**
RYWAL-RHC Sp. z o.o. Warszawa
Chelmżyńska 180 street
04-464 Warszawa,
3. **This declaration of conformity is issued under the sole responsibility of the manufacturer.**
4. **Object of the declaration:** Fanmig 322 mobile Pulse MOST semi-automatic inverter welding machine



5. **The subject of this declaration mentioned above is consistent with the relevant requirements of EU harmonization legislation:**
 - Low Voltage Directive LVD 2014/35/EC,
 - EMC Directive 2014/30/EC (class A)
 - The directive on the restriction of the use of certain hazardous substances use in electrical and electronic equipment RoHS 2011/65 / EC
6. **References to the relevant harmonized standards in relation to which conformity is declared:** EN 60974-1:2012; EN 60974-10:2014.
7. **Additional information:**

The declaration becomes invalid in the event of any modifications to the device not agreed with the manufacturer.

Toruń, 02.03.2018 Signed on behalf of:

Product Manager
Dyrektor Produktu

mgr inż. Wojciech Wierzbą

The devices are subject to constant changes and improvements.
Subject to change

The End

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[illegible]

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Zintegrowany System Zarządzania



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