



User's Manual for semi-automatic welding machine **FANMIG** **280-4N Minor** **320-4N Minor**



Attention! Before starting work every person using or responsible for maintenance work on this device should familiarize with the entire content of these User's Manual. This will optimize the use of device potential.

Attention! A copy of this User Manual should be stored at a location of device use and always remain available to the operator.



Catalogue no:
280-4N Minor 51 000 22294
320-4N Minor 51 000 22334

User Manual
Version 1.0 of 22.04.2021

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Thank you for purchasing a semi-automatic welding machine FANMIG by MOST.
This manual booklet is common for two types of devices differing in some technical parameters
We do believe that this product will meet your requirements. In order to ensure the correct use,
all the safety and operating manual should be read before operating this device.

1. Health and Safety Manual



Warning! The device is may not be used for the purpose of pipe defrosting!
Information included on icons located on the device.

	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. The national regulations for working with this device and accident prevention should be kept up to date.
	All flammable or combustible materials must be removed from the working area. Do not weld in tanks where flammable liquids (fuel) were stored previously. Place all combustible materials away from welding spatter.
	Do not expose the device to rain or water vapour and do not spray water over it.
	Do not weld without proper eye protection. Pay attention to providing safety for bystanders against welding 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 properly or is not available.

	Stop your work immediately after finding damage to the power cords. Do not touch the damaged cords. Prior to 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.
	Electromagnetic interference. The device may influence other devices sensitive to electromagnetic interference (robots, computers, etc.) Always ensure that the devices within the welding work station are resistant to interference. In order to minimize interference it is recommended to use possibly shortest welding cables arranged in parallel. Always work in a distance at least 100 m from other sensitive devices. Always make sure that the installation is grounded. In case of interference with other devices, shield the cables or use appropriate filters. The device is compliant with the currently applicable standards. In accordance with IEC 60974-10 classified as class A and is intended for use in workshop and industrial conditions. The device application nearby to residential buildings, especially the power supply using a home electrical network, may interfere with the operation of other electrical or telecom devices. The user is responsible for the correct device connection and removal of potential electromagnetic disturbances.

INTRODUCTION

Commissioning and normal operation are possible only after reading the carefully reading following manual. MIG/MAG welding requires meeting the requirements for electric arc welding regulations and complying with fire regulations. Device operator should be equipped with appropriate personal protective equipment. It is necessary to use a set of compatible protective equipment

with the provisions of the European Parliament and the Directive 2016/425/EEC. 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 demonstrate considerable discipline in terms of health and safety requirements that protect against harmful and health hazardous factors resulting from welding technology.

OPERATING CONDITIONS

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

- 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 could get inside the device,
- device has an IP23S protection rating for housing and may be
- do not use the device for welding tanks previously used for flammable substances storing.



ATTENTION GASES AND FUMES

Using MIG / MAG 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 radiation emitted during welding is harmful to eyesight and skin. Therefore a welding mask with protective filters is required. Welding work station should meet certain requirements, including:

- adequate lighting system,
- fixed or movable protection screens, governing bystanders against radiation effects (depending on requirements),
- placed in a room with appropriate wall colour (absorption of UV radiation)

FIRE PROTECTION

Welding work station should be located at a safe distance from flammable materials placed especially on the floor or walls. All flammable materials 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.

2. 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** (a list of authorized service shops is available on the last page of the 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
- keep it clean at all times.

Periodic maintenance (every 3 months at least)

Periodic maintenance frequency can be increased depending on the environment conditions 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: Power supply must be disconnected from the device before any maintenance and service work. After each repair, perform a proper check to ensure safe use.

Mandatory device checks

According to the Labour 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 EN ISO 17662 clause 4.2), and post-repair tests after each repair that restored welding functionality (legal basis: EN 60974-4 clause 4.6).

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

In accordance with Regulation 2019/1784 (EU) Annex II pt. 2. b1,
The RYWAL-RHC company provides information on repairs and maintenance to
PROFESSIONAL TECHNICAL SUPPORT PROVIDERS under the terms of the regulation.

3. Technical description and operating conditions

FANMIG 280-4N / 320-4N Minor is a semi-automatic welding machine designed for MIG/MAG gas shield welding. It is a compact-sized device including electrical power supply and wire feeder located inside a single housing. FANMIG 280-4N Minor and FANMIG 320-4N Minor include a 4-roll wire feed systems.

All devices include the same type of feeding roll see chapter 6.

The device has excellent welding properties and has a wide application range. It may be used for sheet thickness between 0.8 mm and 8 mm. Welded material types cover carbon steel, stainless steel or aluminium (after feeder and holder conversion).

Recommended wire diameters are 0.6 mm to 1.2 mm.

Wire feed speed may be set between 1 and 19 m/min, the welding current has a step setup setting (FANMIG 280-4N - 10 steps, FANMIG 320-4N - 12 steps).

Transformer and the induction coil are made of copper (insulation class F) and are fan cooled.

The device is sensor protected against overheating.

Made in accordance with EN 60974-1 standard.

«Safety requirements for arc welding equipment. Welding energy sources».

Wire feeder may be used for spools between 5 to 15 kg. Basket spools require an additional adapter.

Operating Conditions

Range of air temperatures:

Operating temperature: -10°C to +40°C,

Transport and storage temperature from -25°C to +55°C.

Relative air humidity up to 50% at +40°C and up to 90% at +20°C.

Transport.

Be especially careful when transporting device with a forklift or a lift truck

- risk of damage to the device's chassis.

Use only suitable slings for a vertical transport by crane. Before the device transporting, remove gas cylinder from the rear shelf and disconnect gas and electrical grid. The maximum permissible inclination angle for transport is 10°.



ATTENTION: Danger of falling or overturning the device during transport!

4. Technical data and device completion

Parameter	Unit	FANMIG 280-4N	FANMIG 320-4N
Electrical power supply	V/Hz	3x400/ 50/60	3x400/ 50/60
Network protection [slow-blow]	A	16	25
Power factor	cos	0,9	0,9
Power S1max	kVA	11,1	14,3
Welding current range	A	40 - 290	40 - 340
Idle mode power consumption	W	63	63
Power source efficiency	%	79	80
Welding current [A] at: 25% work cycle 30% work cycle 60% work cycle 100% work cycle	A/V	- 290 A / 28,5 V 210 A / 24,5 V 170 A / 22,5 V	340 A / 31 V - 230 A / 25,5 V 200 A / 24 V
Welding current set point number		10	12
Wire feeder		4-roll (-2N/4N)	4-roll
Wire feeding speed	mm	1-19	1-19
Welding torch cooling		Air	Air
Welding Torch (gas)		M 24 lub M25 MOST	M 24 lub M25 MOST
Protection class		IP 23S	IP 23S
Insulation class		H	H
Noise emission	dB(A)	<70	<70
EMC noise level according to PN60974-10		Class A	Class A
Weight	kg	88	99
Dimensions (length x width x height)	mm	868x500x806	868x500x806

Table 1: FANMIG 280-4N / 320-4N Minor technical data

Completion

3 m long ground cables.

3 m long power cable.

Gas hose included. On request the devices are supplied with different cable lengths or welding torches.

5. FANMIG 280-4N / 320-4N Minor control panel

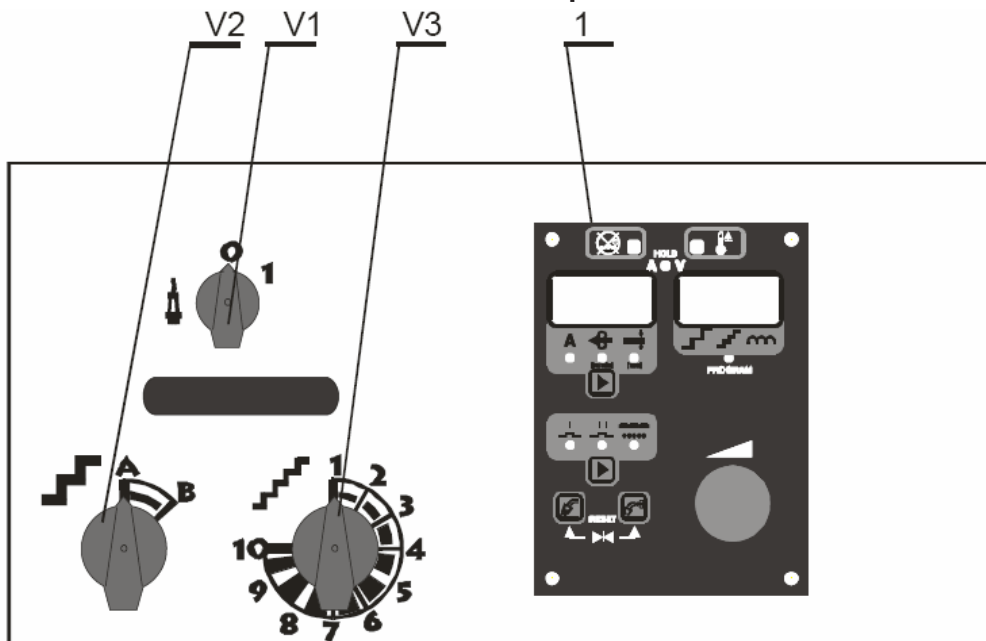


Figure 1: Device front panel

V1 - main switch

V3 - welding current accurate switch

P1 - Minor version control panel (see Fig. 2)

5.1 Minor version control panel

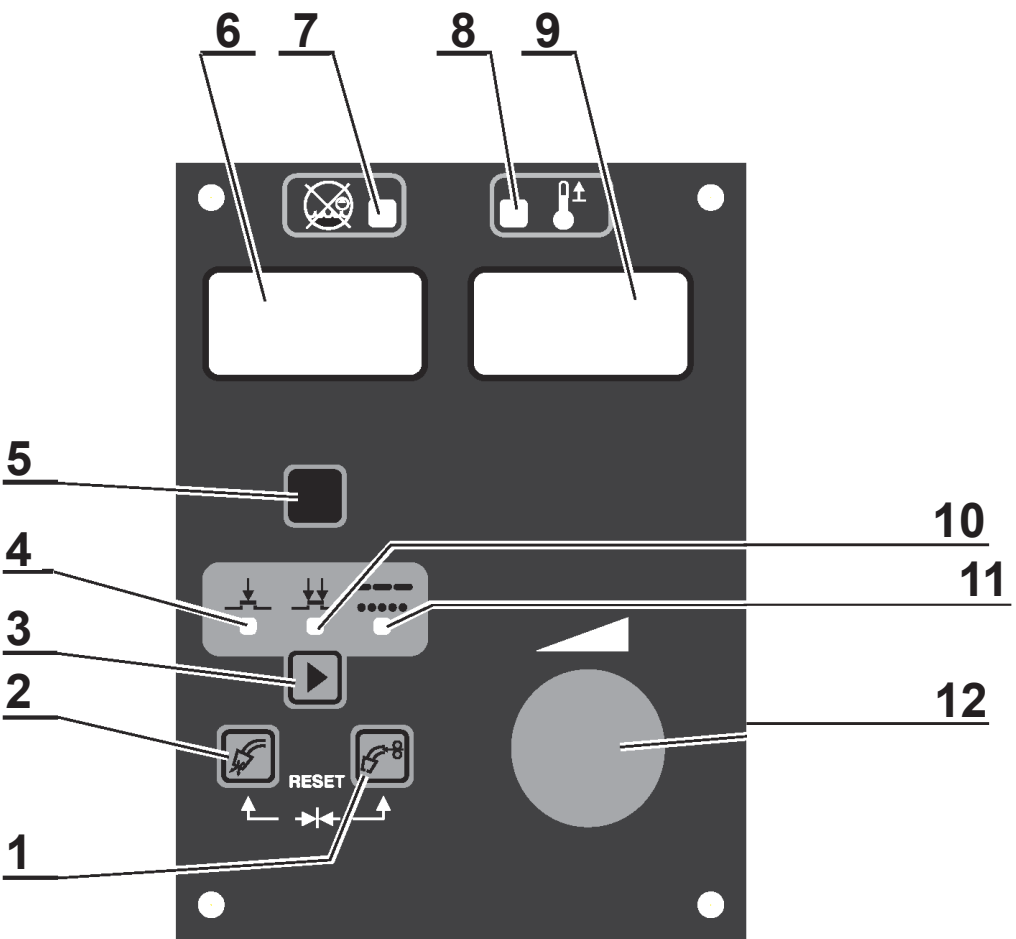


Figure 2: Control panel (P1 as on Fig.1) on Minor version

1	Button  - Wire installation (of a new spool) - Deleting/Resetting parameters (simultaneously press button 2)
2	Button  - Gas test - Deleting/Resetting parameters (simultaneously press button 1)
3	Button  - Switch between 2-step and 4-step - Pressing longer than for 2 s switches on spot welding (led 11 lights up) or intermittent (led 11 blinks) - Entering secondary parameters - see table 3 (press simultaneously with the button 5)
4	LED  2-step
5	Button  Entering secondary parameters - see button description 6 (press simultaneously with the button 3)
6	Display  shows secondary parameters - Wire feeding speed (adjustable) - PrG – gas pre-flow [s] - PoG – gas post-flow [s] - brn – wire burn time [s] - SPO – spot-welding time [s] (active spot-welding only) - Int - break time at intermittent welding [s] (active spot-welding only)
7	LED  cooling system fault (optional)
8	LED  overheat Let the device to cool down using a fan
9	Display  shows secondary parameters
10	LED  4-cycle
11	LED  - Switches on – spot welding - Blinks – intermittent welding
12	Knob  - Sete the feed speed - Selects secondary parameters

Table 2: Minor control panel function markings



Attention! Displays 6 and 8 do not show A/V current value when welding.

5.2 Return to factory settings (RESET)



+



Press 1 and 2 simultaneously, so all function values return to factory settings.

5.3 Setting range of the individual welding functions:

Symbol on Display 6	Parameter	MIN	MAX	Unit
SPo	Welding time for spot weld. and interm. welding	0,5	20	s
Int	Pause time at intermittent welding	0,5	20	s
brn	Wire burn time	0	0,75	s
PrG	Gas pre-flow	0	20	s
PoG	Gas post-flow	0	20	s

Table 3: Welding functions and ranges

6. Wire feeding system

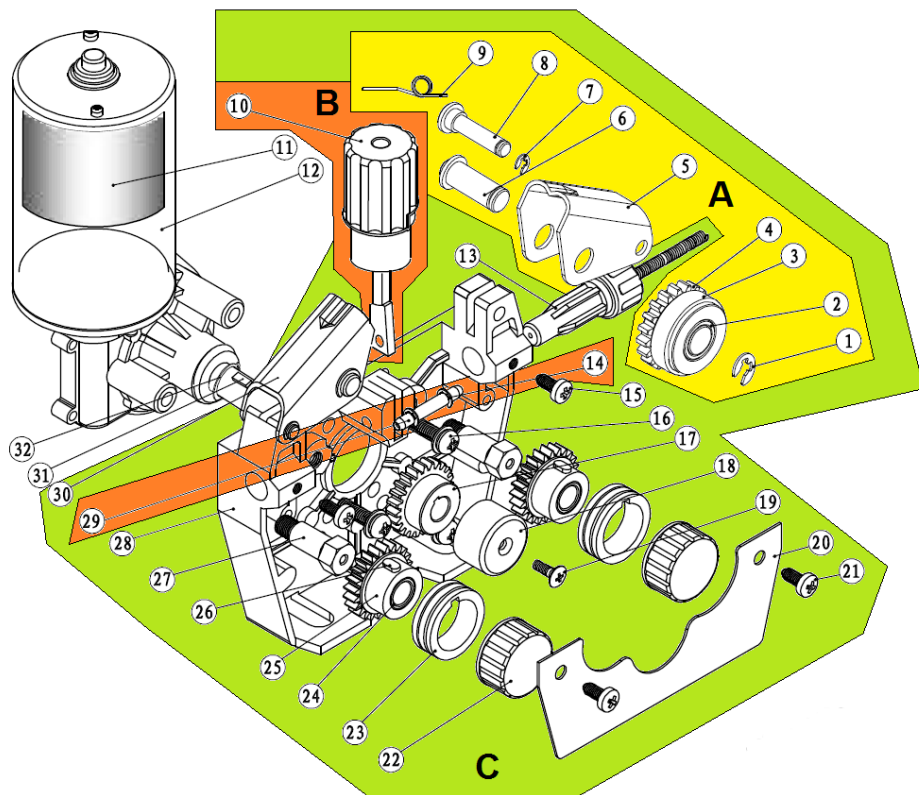


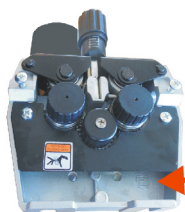
Figure 3: FANMIG 280-4N / 320-4N feeding system

Pos.	Catalogue no.	Nazwa	Name
1	5630	Podkładka mocująca	Retaining washer
2,3,4	5633	Rolka zębata komplet TR 402/404	Gear Wheel TR 402/404 set
5	5634	Ramię dociskowe prawe TR 404	Arm TR 404
6	5635	Tuleja 10	Shaft 10
7	5630	Podkładka mocująca RA 5	Retaining ring for shaft RA5
8	5636	Tuleja 6	Shaft 6
9	5637	Sprężyna górna TR 404	Spring TR 404
10	5638	Korpus dociskowy TR 404	Fixing arm compl. TR 404
12	5468	Silnik	Motor
13	5639	Dysza wejściowa 2R/4R mała	Liner for Feeder 2roll,4roll Small
14	5630	Podkładka mocująca	Retaining washer
15	5640	Śruba M5x10	Screw M5x10

Pos.	Catalogue no.	Nazwa	Name
16	5641	Śruba M6x16	Screw M6x16
17	5642	Koło zębate napędowe TR 404	Gear Wheel center TR 404
18	5643	Ośłona plastikowa TR 404	Fixing Cup TR 404
19	5644	Śruba M4x12	Screw M4x12
20	5645	Ośłona TR 404	Metal cover TR 404
21	5640	Śruba M6x16	Screw M6x16
22	5646	Nakrętka rolki mała	Bolt Small
23	5113007783	Rolka 0.6-0.8 22/30	Roll 0.6-0.8 22/30
	5113007826	Rolka 0.8-1.0 22/30	Roll 0.8-1.0 22/30
	5113007862	Rolka 1.0-1.2 22/30	Roll 1.0-1.2 22/30
	5113007956	Rolka 1.2-1.6 22/30	Roll 1.2-1.6 22/30
	5113997828	Rolka 0.8-1.0 22/30 AL	Roll 0.8-1.0 22/30 AL
	5113007863	Rolka 1.0-1.2 22/30 AL	Roll 1.0-1.2 22/30 AL
	5113007960	Rolka 1.2-1.6 22/30 AL	Roll 1.2-1.6 22/30 AL
	5113007895	Rolka 1.0-1.2 22/30 TD	Roll 1.0-1.2 22/30 TD tube wire
	5113007899	Rolka 1.2-1.4 22/30 TD	Roll 1.2-1.4 22/30 TD tube wire
24,25, 26	5647	Koło zębate dolne komplet TR 404	Gear wheel upper TR 404 set
27	5649	Tuleja TR 404	Shaft TR 404
28	5650	Korpus zespołu podającego TR 404	W. Feeder Body TR 404 Set
29	5651	Rurka pośrednia TR 404	Tube for W. Feeder pro TR 404
30	5652	Ramię dociskowe lewe TR 404	Arm left TR 404
31	5653	Klin	Key
32	5654	Podkładka	Washer
A	5976	Ramię lewe TR 404	Arm left TR 404
	5977	Ramię prawe TR 404	Arm right TR 404
B	5978	Korpus dociskowy TR 404	Fixing arm compl. TR 404 set
C	5618	Zespół napędowy kompletny TR 404 0.8-1.0 bez silnika	WF body TR 404 0.8-1.0 complet without Motor

Attention: The sets A and B are included in set C

Table 4: Feeding system spare parts for FANMIG 280-4N / 320-4N Minor.



TR404



The drawing and a table for feeding system parts of TR404 (marked with a stylized letter „H” on the aluminium housing). In the case of parts for older versions of FANMIG devices, please contact RYWAL-RHC technical support.

7. Device commissioning

7.1 Power connections

The device is powered from a three-phase 400V/50Hz. The required protection is a slow-blow fuse 16 A (FANMIG 280-4N) or 25 A (FANMIG 320-4N) with grounding. Plug type CEE FANMIG 280-4N 16 A 5-pin, FANMIG 320-4N 32 A 5-pin.

7.2 Welding torch connection

The welding torch should be connected with euro socket and screwed with a nut. The torch insert and contact tip must refer to welded wire diameter – see torch catalogue.

7.3 Feed rolls in wire feeder (see table 4).

Each roll includes two notches - marking is stamped on roll side.

The notch must reflect the wire type and diameter. When changing the wire, make sure that the correct roll is applied.

7.4 Mounting the spool on a feeder and wire feeding in the welding torch - button 1 as on Fig.2.

The wire spool should be installed on the feeder so the wire unwinds from the bottom of the spool and goes straight to feed rolls. If the spool is based on a metal basket, use a basket spool adapter. It is necessary to secure the spool so the basket does not touch the device metal casing

The spool's braking force is controlled by a bolt inside the spool's sleeve.

Unroll a short wire section from spool. Align the wire ending (cutting it off with off-cuts) and guide it onto feeding roll with upper press mechanism is lifted! Then guide the wire through euro-socket and welding torch. Press the pressure arm after inserting the initial 20 cm wire section into the welding torch and continue feeding wire automatically by pressing torch button. It is recommended to demount the gas nozzle and the tip contact when inserting the wire into the torch. It is not allowed to use excessive pressure on the rolls, as it may lead to wire deformation and feeding issues.

7.5 Gas hose and shielding gas flow.

Shielding gas hose connects the device to gas bottle. Gas reducer located on the cylinder used for gas mixtures and argon. Cylinder should be located on the rear shelf of the device and secured with a chain to prevent tipping over. Having the cylinder placed and gas hose connected to the back of welding device, unscrew the cylinder valve and set pressure level with the reducer. Gas flows out after pressing the button 2. Recommended gas flow rate is 10 x the wire diameter and equals the gas flow in litres per minute

7.6 Aluminium welding

For aluminium welding use rolls with U-shaped notch (see table 4). Recommended wire type: AlMg3 or AlMg5 and 1.0 mm diameter. Welding torch (suggested m length) should be accordingly adjusted and have its insert replaced to a Teflon one and tip fitting the wire diameter. Having the above operations completed and connection checked, the device is ready for operation.

8. Welding

For an approximate setting of the correct welding current, use the following empirical formula = $14 + 0,05 \times I_2$.

After turning the device on with main switch **V1** (see Fig. 1) and setting the gas shield flow (see 6.5) and wire (see 6.4) you can proceed with setting the welding current. Welding voltage (current) is set with **V2** and **V3** switches.

Use the knob **12** to set the wire feed speed (see Fig. 2). Welding arc should be stable and produce minimal amount of spatter. Use button **3** to set following available welding modes:

Button 4 - 2-cycle continuous welding

Button 10 - 4-cycle continuous welding

Buttons 4 and 11 (LED is on) - 2-cycle spot welding

Buttons 4 and 11 (LED blinks) - 2-cycle intermittent welding

Buttons 10 and 11 (LED is on) - 4-cycle spot welding

Buttons 10 and 11 (LED blinks) - 4-cycle spot welding

In order to set the spot or intermittent welding, press and hold button **3** for longer than 2 seconds. A choice between 2- and 4-cycle when constant welding is made by pressing button **3**.

Wire diameter [mm]	Wire feeding speed [m/min]	Max. feeding speed [m/min]	Weight of 1 m of wire [g]	Wire consumption per minute for maximum feed speed [g/min]	Wire consumption per hour for the maximum feed speed [g/h]
Solid 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

Wire diameter [mm]	Recommended gas flow [l/min]	Gas consumption per hour of welding [l/h] (recommended gas flow * 60 minutes)
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

Table 5: Approximate wire and gas consumption for MIG / MAG welding.

9. Spare parts

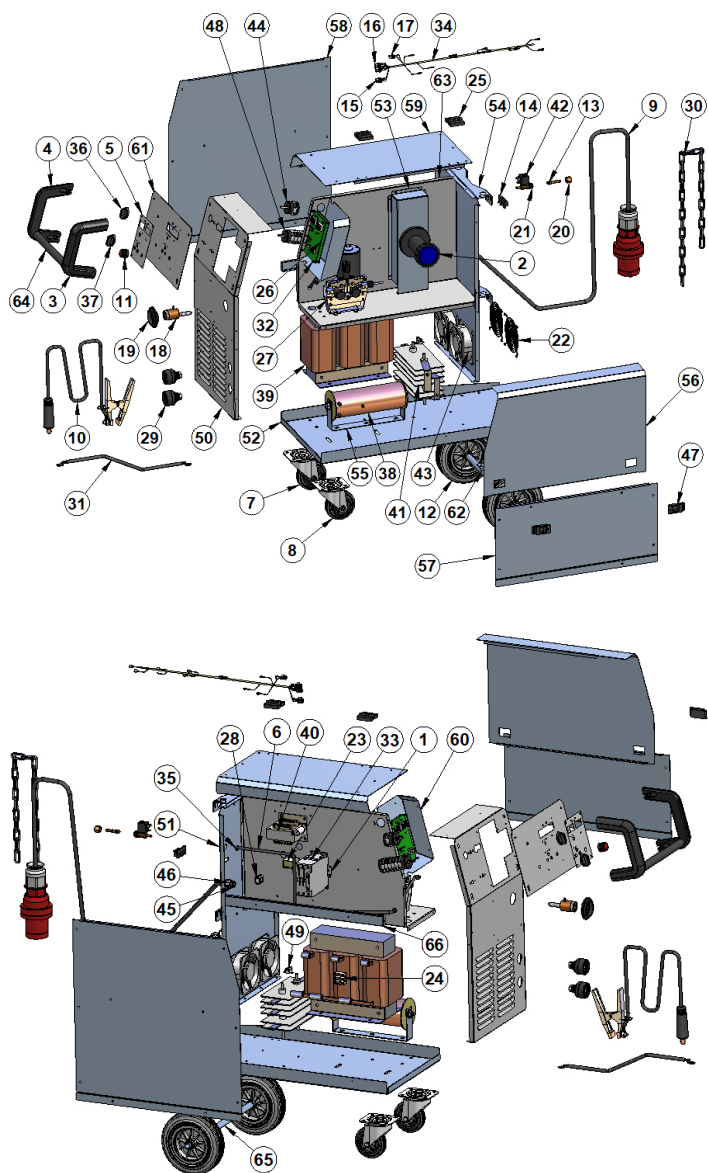


Figure 4: FANMIG 280-4N Minor spare parts

No.	Indeks	Nazwa	Description	szt/pc
1	V0016-2	Cokół DIN 40mm	DIN plinth 40mm	1
2	2532	Tuleja mocująca szpulę czarna	Spool Holder Black	1
3	3598	Uchwyt lewy INDUSTRY	Handle - Holder L INDUSTRY	1
4	3599	Uchwyt prawy INDUSTRY	Handle - Holder R INDUSTRY	1
5	4212	Folia MINOR new HS4615	Film MINOR new HS4615	1
6	302P010000	Wąż gazowy 30 4,9x1,5	Hose 30 Gas 4,9x1,5	0,8 m
7	3253-1	Kolo przednie 3370 PRO 100 P62 LW46 kl.	Front Front Wheel 3370 for 100	1
8	4094	Kolo przednie z hamulcem 3377 PRO 100 P62 LW46	Front Front Wheel 3377 for 100 with brake	1
9	VM0049	Kabel zasilający 16A CGSG4x1,5	Mains Cable 16A CGSG4x1,5	1
10	VM0023	Kabel masowy 3 m 300 A 35-50	Earthing Cable 3 m 300 A 35-50	1
11	2164	Pokrętko, czerwony kapsel, podkładka 28N6	Knob 28N6+Red cover, washer	1
12	2446	Kolo tylne PVO 200x50x20	Rear wheel 200x50x20	2
13	2603	Przylącze 1/4 6mm (kod 8685)	Connector G1/4 6mm	1
14	1812	Konektor 2pol. DK 021	Gas heater connector	1
15	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	3
16	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	6
17	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	2
18	BG-90625	Gniazdo EURO ALFA IN VS040312-1	Connector EURO ALFA IN VS040312-1	1
19	3440	Oslona gniazda EURO	Cover Connector EURO	1
20	2602	Nakrętka G1/4" (kod 8690)	Nut G1/4"	1
21	R 0141	Nakrętka i uszczelnienie zaworu G1/4 2557	Nut G1/4 + insulation for valve 2557	1
22	3461	Kratka wentylatora FG-12 Sunon	Grating FG-12 Fan Sunon	2
23	4236	Filtr FC61113 + R (3x150N+027N-Z01/08)	Filter FC 61113 + R (3x150N+027N-Z01/08)	1
24	3252	Filtr FZ 730 43	Filter FZ 730 43	3
25	4121	Zawias O430-30 M5	Hinge O430-30 M5	2
26	3979.d	Płytką PCB MAJOR/MINOR/SYNERGY.d	PCB MAJOR/MINOR/SYNERGY.d	1
27	4321-2	Zespół podający TR404 1.0-1.2	W. Feeder TR404 1.0-1.2	1
28	V9040040	Mocowanie kabla S12	Cable clamp S12	1
29	AO-20610	Szybkozłączka żeńska 35-70 panel	Quick Connector 35-70 Panel Socket	2
30	VS040258	Łańcuch na butlę 70 cm	Chain 70 cm	2
31	VM0203-1	Przewód Ekonom 280 (szybkozłączka. 12mm)	Cables 280 (Quick Connector 12mm)	1
32	R 0078	Słupek dystansowy KOV DA5M3X10	Distance Post KOV DA5M3X10	4
33	276834	Stycznik MOELLER DILM 12-10 (24V/50Hz)	Contacter MOELLER DILM 12-10 (24V/50Hz)	1
34	VM0114.YQ	Wiązka ALF 349.Y SYNERGY	Bundle ALF 349.Y SYNERGY	1
35	AO-42620	Zacisk D9.5	Clamp D9.5	2
36	2015	Pokrętko strzałkowe OM-C/5 czarne	Knob arrow OM-C/5 Black	1
37	1343	Pokrętko strzałkowe OM-R/5 czerwone	Knob arrow OM-R/5 Red	1
38	2523-1	Dławik ALF 280 (Al)	Choke ALF 280 (Al)	1
39	T28.P	Transformator 280 ALF + przylacza	Transformer 280 ALF + Switch	1
40*	3270-4Z	Transformator JSC E96.32/T01.1 (JSC E3232-0451) z filtrem	Transformer JSC E96.32/T01.1 with filter	1
41	1195-1	Prostownik PTS 240 z 2 x 10nF	Rectifier PTS 240	1
42	2557	Elektrozawór 24V 50Hz AC typ 5541	Solenoid Valve 24V 50Hz AC type 5541	1
43	4172	Wentylator SUNON A2123 HBL (7).GN	Fan A2123-HBL (7).GN	2
44	1005	Włącznik ON/OFF VS 16 1102 A8	Switch ON/OFF	1
45	2285-1	Wyjście OBO 13.5 szare 13.5x12 – nakrętka	Outlet 13.5 Gray 13.5x12 - NUT	1
46	2285	Wyjście OBO 13.5 szare 13.5x12 – korpus	Outlet 13.5 Gray 13.5x12 - BODY	1
47	2681	Zamek A3-40-625-12	Lock A3-40-625-12	2
48	1096	Włącznik VS16 11510001A1	Switch VS16 11510001A1	1
49	1835-1	Termostat SCOMES 115oC	Thermostat 115 C	1
50	V0002	Panel przedni Alf 400	Panel front Alf 400	1
51	V0003	Panel tylni Alf 400	Panel back Alf 400	1
52	V0001	Podstawa Alf 400	Ground Alf 400	1
53	V0017	Mocowanie tulei Alf 400	Support of spool Alf 400	1
54	V0011	Mocowanie butli Alf 400	Holder gas bottle Alf 400	2
55	V0013	Mocowanie dławika Alf 400	Support of choke Alf 400	1
56	V0008	Oslona boczna lewa górna Alf 400	Case left spool Alf 400	1
57	V0009	Oslona boczna lewa dolna Alf 400	Case left lower Alf 400	1
58	V0007	Oslona boczna prawa Alf 400	Case right Alf 400	1

Nr	Indeks	Nazwa	Description	szt/pc
59	V0006	Oslona g6rna Alf 400	Cover upper Alf 400	1
60	V0010	Oslona panelu sterowania Alf 400	Case regulator Alf 400	1
61	V0029	Panel przedni ALF 280-320 compact Synergy neutral	Front panel Alf 280-320 compact Synergy neutral	1
62	V0005	Podwozie Alf 400	Carriage unit Alf 400	1
63	V0004	Podp6rka Alf 400	Support Alf 400	1
64	V0015	Rurka przednia Alf 400	Tube of handle Alf 400	1
65	V0012	Rurka podwozia Alf 400	Tube of carriage unit Alf 400	1
66	V0018	Rozpora Alf 400	Strut Alf 400	1

Table 6: FANMIG 280-4N Minor spare parts

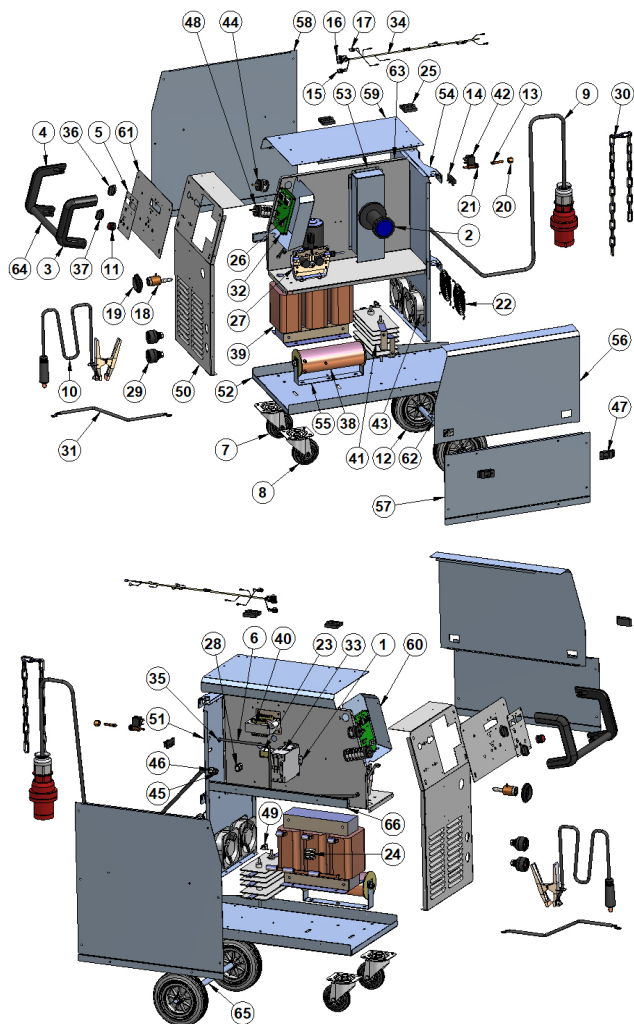


Figure 5: FANMIG 320-4N Minor spare parts

No.	Indeks	Nazwa	Description	szt/pc
1	V0016-2	Cokół DIN 40mm	DIN plinth 40mm	1
2	2532	Tuleja mocująca szpulę czarna	Spool Holder Black	1
3	3598	Uchwyt lewy INDUSTRY	Handle - Holder L INDUSTRY	1
4	3599	Uchwyt prawy INDUSTRY	Handle - Holder R INDUSTRY	1
5	4212	Folia MINOR new HS4615	Film MINOR new HS4615	1
6	302P010000	Wąż gazowy 30 4,9x1,5	Hose 30 Gas 4,9x1,5	0,8 m
7	3253-1	Koło przednie 3370 PRO 100 P62 LW46 kl.	Front Front Wheel 3370 for 100	1
8	4094	Koło przednie z hamulcem 3377 PRO 100 P62 LW46	Front Front Wheel 3377 for 100 with brake	1
9	VM0049	Kabel zasilający 16A CGSG4x1,5	Mains Cable 16A CGSG4x1,5	1
10	VM0023	Kabel masowy 3 m 300 A 35-50	Earthing Cable 3 m 300 A 35-50	1
11	2164	Pokrętło, czerwony kapsel, podkładka 28N6	Knob 28N6+Red cover, washer	1
12	2446	Koło tylne PVO 200x50x20	Rear wheel 200x50x20	2
13	2603	Przylączce 1/4 6mm (kod 8685)	Connector G1/4 6mm	1
14	1812	Konektor 2pol. DK 021	Gas heater connector	1
15	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	3
16	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	6
17	2389	Konektor CUF 5/36 (szary)	Connector CUF 5/36 gray	2
18	BG-90625	Gniazdo EURO ALFA IN VS040312-1	Connector EURO ALFA IN VS040312-1	1
19	3440	Oslona gniazda EURO	Cover Connector EURO	1
20	2602	Nakrętka G1/4" (kod 8690)	Nut G1/4"	1
21	R 0141	Nakrętka i uszczelnienie zaworu G1/4 2557	Nut G1/4 + insulation for valve 2557	1
22	3461	Kratka wentylatora FG-12 Sunon	Grating FG-12 Fan Sunon	1
23	4236	Filtr FC61113 + R (3x150N+027N-Z01/08)	Filter FC 61113 + R (3x150N+027N-Z01/08)	2
24	3252	Filtr FZ 730 43	Filter FZ 730 43	3
25	4121	Zawias O430-30 M5	Hinge O430-30 M5	2
26	3979.d	Płytką PCB MAJOR/MINOR/SYNERGY.d	PCB MAJOR/MINOR/SYNERGY.d	1
27	4321-2	Zespół podający TR404 1.0-1.2	W. Feeder TR404 1.0-1.2	1
28	V9040040	Mocowanie kabla S12	Cable clamp S12	1
29	AO-20610	Szybkoszłączka żeńska 35-70 panel	Quick Connector 35-70 Panel Socket	2
30	VS040258	Łańcuch na butlę 70 cm	Chain 70 cm	2
31	VM0203-1	Przewód Ekonom 280 (szybkoszłączka. 12mm)	Cables 280 (Quick Connector 12mm)	1
32	R 0078	Słupek dystansowy KOV DA5M3X10	Distance Post KOV DA5M3X10	4
33	276834	Stycznik MOELLER DILM 12-10 (24V/50Hz)	Contactore MOELLER DILM 12-10 (24V/50Hz)	1
34	VM0114.YQ	Wiązka ALF 349.Y SYNERGY	Bundle ALF 349.Y SYNERGY	1
35	AO-42620	Zacisk D9.5	Clamp D9.5	2
36	2015	Pokrętło strzałkowe OM-C/5 czarne	Knob arrow OM-C/5 Black	1
37	1343	Pokrętło strzałkowe OM-R/5 czerwone	Knob arrow OM-R/5 Red	1
38	2523-1	Dławik ALF 280 (AI)	Choke ALF 280 (AI)	1
39	T28.P	Transformator 280 ALF + przylączca	Transformer 280 ALF + Switch	1
40*	3270-4Z	Transformator JSC E96.32/T01.1 (JSC E3232-0451) z filtrem	Transformer JSC E96.32/T01.1 with filter	1
41	1195-1	Prostownik PTS 240 z 2 x 10nF	Rectifier PTS 240	1
42	2557	Elektrozawór 24V 50Hz AC typ 5541	Solenoid Valve 24V 50Hz AC type 5541	1
43	4172	Wentylator SUNON A2123 HBL (7).GN	Fan A2123-HBL (7).GN	2
44	1005	Włącznik ON/OFF VS 16 1102 A8	Switch ON/OFF	1
45	2285-1	Wyjście OBO 13.5 szare 13.5x12 – nakrętka	Outlet 13.5 Gray 13.5x12 - NUT	1
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56	V0008	Oslona boczna lewa górna Alf 400	Case left spool Alf 400	1
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65	V0012	Rurka podwozia Alf 400	Tube of carriage unit Alf 400	1
66	V0018	Rozpora Alf 400	Strut Alf 400	1

Table 7: FANMIG 320-4N Minor spare parts

10. Device operation defects



ATTENTION!:

The device can be repaired only by authorized personnel!

Fault	Potential Cause	Recommendations
Unstable arc	Incorrect welding current settings	Set the welding current correctly
	Too low wire feed speed	Set the correct speed
	Poor contact of earth terminal with the welded material	Check terminal and secure again
	Incorrect current tip	Replace the end piece to a correct one
	Incorrect gas flow	Correct the flow
	Clogged wire guide component	Clean with compressed air or replace
	Incorrect wire feed	Check the roll and pressure on wire feeder
	Current source failure	Please contact technical service
Too many sparks during the welding	Too high wire feed speed	Reduce speed
	Too high welding current	Reduce the welding current
	Welded material too dirty	Clean the welded material
	CO2 as shielding gas	Changing the shielding gas to mix gas type M21
Wire feed motor does not work	No power supply current.	Check electrical connection
	Malfunction of the welding gun trigger	Check the trigger
	Damage of the control board	Please contact technical service
	Engine damage	Please contact technical service
Wire feed motor works but does not feed wire or feeds unstably.	The clamping arm too loosely tightened	Set the correct pressure with the correct nut
	Incorrect feed roll	Turn or replace roll
	Wire stuck in current tip	Replace the current tip
Device automatically switches off and the V10 display shows Err message while the right side V14 display shows „1“.	Work cycle overrun	Allow your tool to cool down and follow operating instructions
	The fan does not work	Please contact technical service
	Current source failure	Please contact technical service

Table 8: Device operation defects

11. Electrical scheme

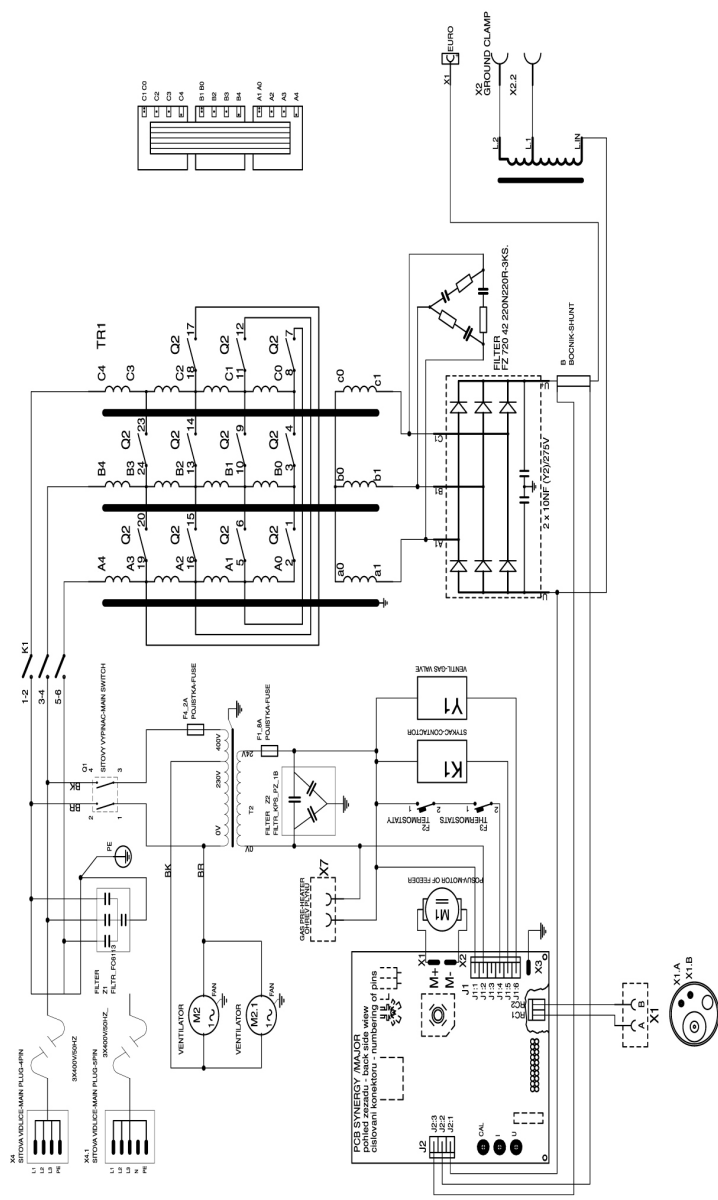


Figure 6: FANMIG 280-4N device electrical diagram

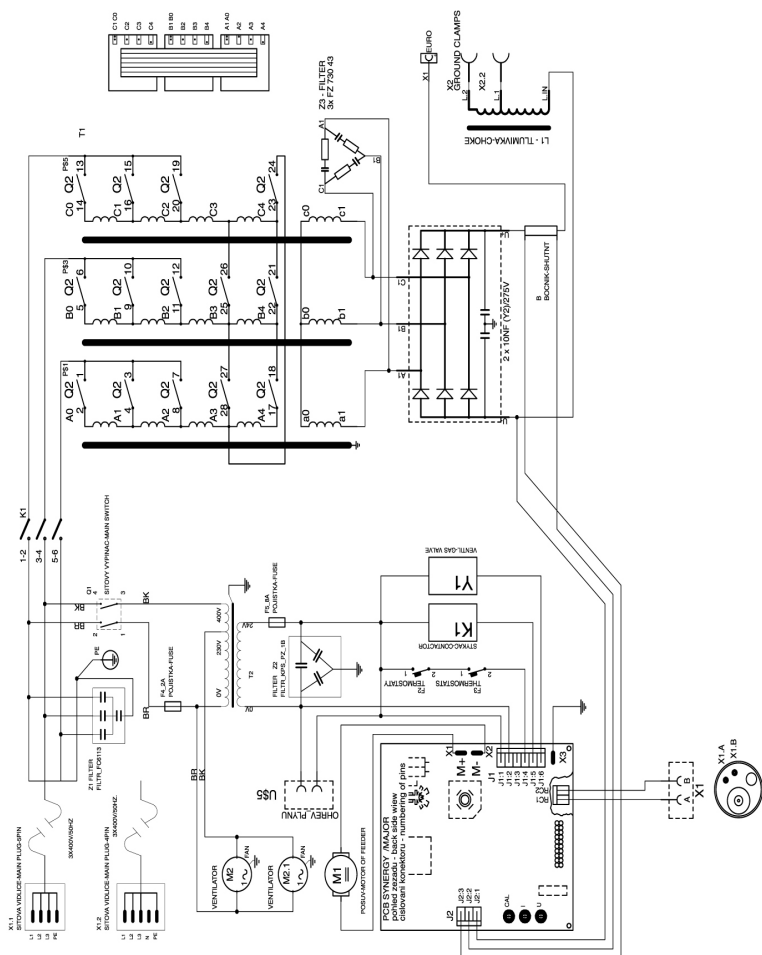


Figure 7: FANMIG 320-4N device electrical diagram

12. 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!

The components used to build the device do not contain critical raw materials in the total amount of more than 1g regarding the requirements of the Ecodesign Directive 2009/125/EC and the Regulation 2019/1784 Annex II, point 3h.

12. EU Declaration Of Conformity

1. Product FANMIG 280-4N Minor and FANMIG 320-4N Minor Semi-Automatic Welding Machine

2. Name and address of the producer:

RYWAL-RHC Sp. z o.o. Warszawa
ul. Chełmżyńska 180
04-464 Warszawa

3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

4. Object of the declaration FANMIG 280-4N Minor and FANMIG 320-4N Minor Semi-Automatic Welding Machine



5. The subject matter of this declaration referred to above is in line with the relevant requirements of EU harmonization legislation:

- Low Voltage Directive LVD 2014/35/EC,
- EMC Directive 2014/30/EC
- The directive on the restriction of the use of certain hazardous substances use in electrical and electronic equipment RoHS 2011/65 / EC
- with the Ecodesign Directive 2009/125/EC and Regulation 2019/1784

6. References to the relevant harmonized standards in relation to which conformity is declared:

EN IEC 60974-1:2012; EN IEC 60974-10:2014.

7. Additional information: None

Toruń, 10.11.2020

Signed on behalf of:

Product Manager
Dyrektor Produktu


mgr inż. Wojciech Wierzba

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This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for letter height. The entire page is otherwise blank, with no margins, text, or other markings.

[illegible]

Manufacturer:

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04-464 Warszawa

Sales and Service network:



www.rywal.eu

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