



OPERATING INSTRUCTIONS MIG/MAG IMPULSE POWER SOURCE

PANTHER 202 PULS

REHM SCHWEISSTECHNIK



Product identification

Designation MIG/MAG impulse power source

Model PANTHER 202 PULS

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1 General Description

Dear Customer,

You have purchased a REHM MIG/MAG pulsed power source and therefore a branded product made in Germany. Thank you for the trust that you have placed in our quality products.

This device is a power source with INVERTER technology that provides several welding variants: synergetic MIG/MAG pulsed arc welding, conventional MIG/MAG welding (not pulsed), and MIG/MAG welding in manual mode.

The PANTHER 202 PULS is a real powerhouse, weighing in at just 24.5 kg and with appropriately compact dimensions. In conjunction with the robust housing, this makes the PANTHER the ideal companion for the harsh outdoor conditions on the building site. However, the new MIG/MAG pulsed power source also has all of the characteristics that you can expect of a professional device when it is used in the workshop:

- 230 V pulsed power source
- 200 A welding current with activation time of 40%
- 30 programmed synergy characteristics for conventional welding operation
- 28 programmed synergy characteristics for pulsed operation
- 28 programmed synergy characteristics for double pulsed operation with Fe, CrNi, AlMg, AlSi, CuSi3, CuAl8 welding wire
- ADC – electronic pre-programmed welding choke
- Manual correcting facility for ADC
- 200mm wire roll adapter, can be optionally retrofitted for 300mm

The PANTHER 202 PULS is extremely suitable for the low to medium strength steel construction, body construction and repair, ventilation engineering, thin sheet metal processing areas, and the entire mobile deployment area.

The device may only be used for the applications described in this manual.

The device may not be used to thaw out pipes.

2 The following safety instructions must be followed



IMPORTANT: Please read through these operating instructions with care before starting up the device; the operating instructions must be kept in a location that is known to all interested persons for the entire service life of the device.

This device may only be used to carry out welding work.

The accident prevention regulations pertaining to welding, cutting, and related processes (BGR 500 Chap. 2.26) must be taken into consideration when operating this device.

Dry protective clothing must be worn and the eyes and face must be protected with a welding shield.

The device must be operated at earthed sockets and with power cables with properly connected protective conductors.

The device may only be maintained by trained experts. In the event of problems, REHM customer service can be reached by phone at +49 (0) 7161-3007-85.

Arc welding and cutting can be harmful to the health of yourself and others; for this reason, the user must be instructed about the dangers that occur during welding that are briefly explained below.



Electric shock - potentially fatal!

- Install and earth the welding machine in accordance with the relevant regulations.

Under no circumstances must live parts of the electrodes be touched with unprotected hands, wet gloves or items of clothing.

- The user must insulate himself from the earth and the workpiece.
- Ensure that your working location is safe.



Smoke and gas - can be hazardous to health

Do not put your head in the smoke gas.

- Provide adequate ventilation when welding, and use an extractor in the vicinity of the arc so that the working area is kept free of smoke gas.

Arc radiation - can injure the eyes and cause burning to the skin!

- Protect eyes with appropriate eye protection filters and use protective clothing.
- Use suitable protective screens or shelters to protect others.

Risk of fire and burns

- The sparks (spatter) can cause fires and burn the skin. It must therefore be ensured that no flammable materials are in the vicinity. Wear suitable protective clothing.



Heart pacemakers

- The magnetic fields generated by the high currents can affect the operation of pacemakers. Wearers of vital electronic devices (pacemakers) must therefore consult their doctor before working in close proximity to arc welding, cutting, flame chipping or spot welding processes.

Risk of explosion

- Do not carry out any cutting or welding work in close proximity to pressurised containers or in environments containing explosive dust, gas or vapours. Take care when handling the gas cylinders and pressure regulators that are used for the welding/cutting process.

ELECTROMAGNETIC COMPATIBILITY

- This device has been constructed in compliance with the specifications of the harmonised standard EN60974-10 (group 2 class A), and may only be used for commercial purposes and in industrial working environments. In the event of malfunctions an expert must be consulted.

Power supply requirements

- The device complies with IEC61000-3-12.

3 Meaning of markings and symbols

3.1 Control panel

The MIG/MAG impulse power source is operated using the control panel shown in figure 1.

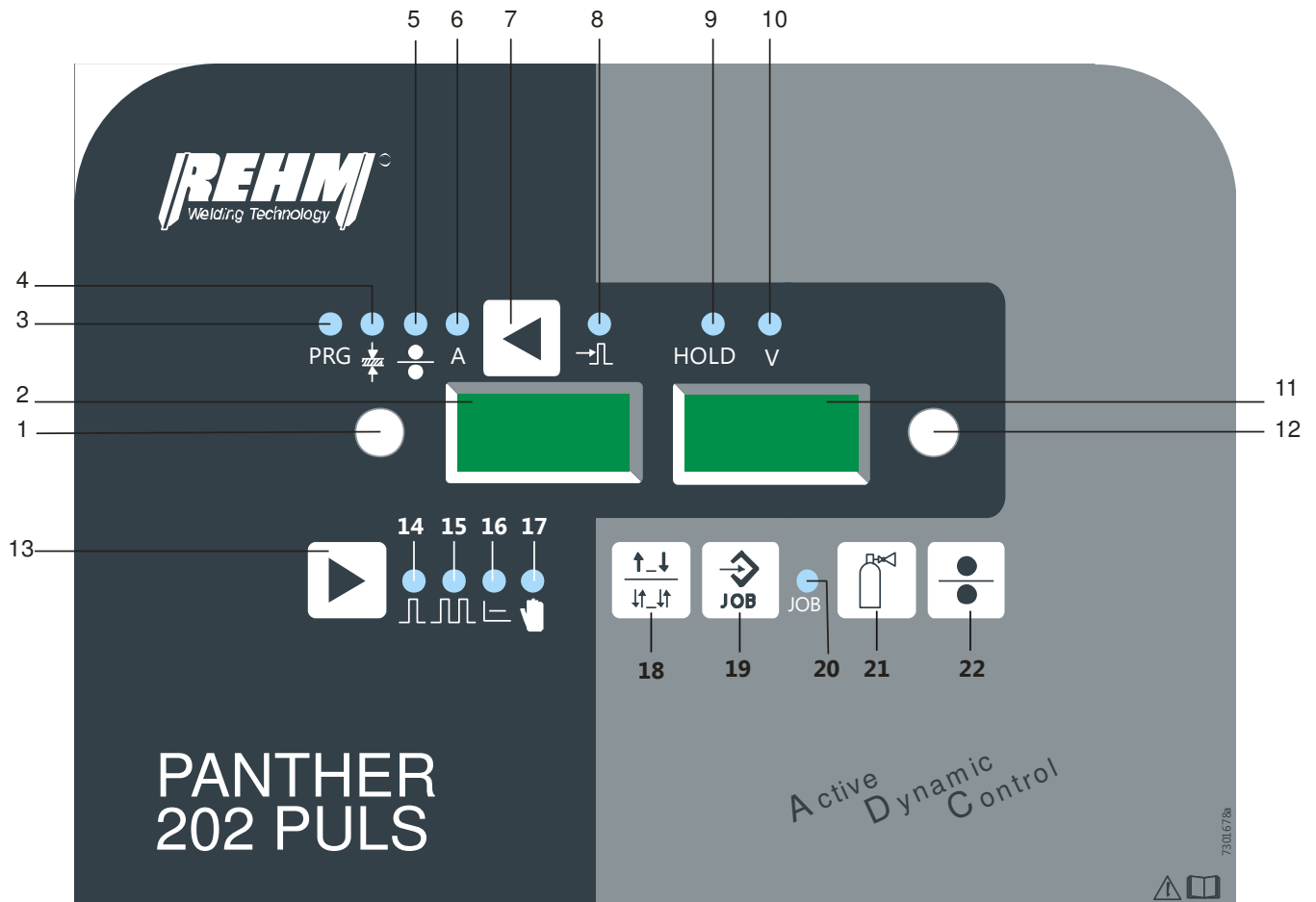


Figure 1: PANTHER 202 PULS control panel

The control panel is divided into the following areas:

- 1 - Energy rotary knob
- 2 - Energy digital display
- 3 - LED program display (PRG)
- 4 - Material thickness display LED
- 5 - Wire feed speed display LED
- 6 - Welding current display LED (A)
- 7 - Energy/programs pushbutton
- 8 - Pulse indicator lamp – pulsed welding recommendation
- 9 - Hold function indicator lamp
- 10 - Welding voltage display LED (V)
- 11 - Digital display of welding voltage and arc length
- 12 - Welding voltage and arc length rotary knob
- 13 - Welding procedure pushbutton
- 14 - Pulse display LED

- 15 - Double pulse display LED
- 16 - Synergetic MSG display LED
- 17 - MSG conventional manual operation display LED
- 18 - 2-step / 4-step pushbutton
- 19 - Job pushbutton
- 20 - Job display LED
- 21 - Gas test pushbutton
- 22 - Wire-threading pushbutton

3.1.2 Switching on

The Panther 202 Puls welding system is started up using the main switch. All LED's illuminate for approx. 3 seconds. Then the machine model appears in the digital displays. Then an acoustic signal is heard, and the ventilator runs for approx. 9 seconds. The welding system is now ready for operation. The previous program number to be selected and all of the associated settings (procedure, material thickness, current strength etc.) are displayed.

3.1.3 Working with welding programs

The PANTHER 202 PULS has a large number of programmed welding programs that make it extremely easy to set up and work. Each welding program has its own program number. The respective welding program is called up by selecting its program number.

The synergetic welding programs automatically set all parameters to the correct values. Individual adjustments can be made based on these settings. Synergetic welding programs are available for the most frequently used combinations of material type, wire diameter and inert gas for both conventional (non-pulsed) and pulsed welding.

If a welding task is pending for which no synergetic welding program is available, other additional welding programs are available for conventional manual operation with which the parameters can be individually adjusted over the entire value range, therefore allowing the PANTHER 202 PULS to be freely adjusted.

An overview of the welding programs can be found on the inside of the side door (see figure 2).

MIG/MAG Synergie-Programme		MIG/MAG synergic programmes		Konv./ conv.	Puls/ Pulse
Material	Ø Draht/Wire	Gas	Progr. Nr.		
Fe (SG2)	0,6	Argon/CO ₂ 18%	01		
Fe (SG2)	0,8	Argon/CO ₂ 18%	02		
Fe (SG2)	0,9	Argon/CO ₂ 18%	03		
Fe (SG2)	1,0	Argon/CO ₂ 18%	04		
Fe (SG2)	0,6	CO ₂ 100%	07		
Fe (SG2)	0,8	CO ₂ 100%	08		
Fe (SG2)	0,9	CO ₂ 100%	09		
CrNi (308L)	0,6	Argon/CO ₂ 2%	21		
CrNi (308L)	0,8	Argon/CO ₂ 2%	22		
CrNi (308L)	0,9	Argon/CO ₂ 2%	23		
CrNi (308L)	1,0	Argon/CO ₂ 2%	24		
CrNi (316L)	0,8	Argon/CO ₂ 2%	32		
CrNi (316L)	1,0	Argon/CO ₂ 2%	33		
CrNi (308L)	0,8	Argon/O ₂ 2%	28		
CrNi (308L)	1,0	Argon/O ₂ 2%	29		
AlMg5	0,8	Argon 100%	52		
AlMg5	0,9	Argon 100%	53		
AlMg5	1,0	Argon 100%	54		
AlMg5	1,2	Argon 100%	55		
AlSi5	1,2	Argon 100%	61		
AlSi12	0,6	Argon 100%	63		
AlSi12	0,8	Argon 100%	64		
AlSi12	0,9	Argon 100%	65		
AlSi12	1,0	Argon 100%	66		
AlSi12	1,2	Argon 100%	67		
Al4,5MnZr	1,0	Argon 100%	69		
CuSi3	0,8	Argon 100%	81		
CuSi3-UHSS	0,8	Argon 100%	82		
CuSi3	0,9	Argon 100%	83		
CuSi3	1,0	Argon 100%	84		
CuSi3	0,8	Argon+He 15%	86		
CuSi3	1,0	Argon+He 15%	89		
CuAl8	0,8	Argon 100%	91		
CuAl8	1,0	Argon 100%	94		
CuAl8-UHSS	0,8	Argon 100%	92		
CuAl8	0,8	Argon+He 15%	96		
CuAl8	1,0	Argon+He 15%	97		

Figure 2: Program list on inside of side door

3.2 Energy/Programs pushbutton [7]

The Energy/Programs pushbutton [7] is used to select programmed programs [3], material thickness [4], wire feed speed [5] and welding current [6], whereby the display LEDs [3-6] indicate the selection by illuminating.

3.2.1 Program Display LED [3]

The number of the selected program is shown on the digital display [2].

3.2.2 Material thickness display LED [4]

When this function is selected, the digital display [2] shows the recommended material thickness resulting from the welding current and wire feed speed settings. This function is only active with synergetic MSG.

3.2.3 Wire feed speed display LED [5]

The digital display [2] shows the feed speed of the welding wire.

3.2.4 Welding current display LED [6]

The digital display [6] shows the welding current. The current value is always displayed during the welding procedure. When the welding procedure is complete, the last welding value (current/voltage) is displayed (Hold function).

3.3 Energy rotary knob [1]

The energy rotary knob [1] is used to select the program number [3] and set the material thickness [4], wire feed speed [5] and welding current [6]. The settings are displayed on the digital display [2].

The special parameters are selected using the energy/programs pushbutton [7]. The relevant mnemonics for the special parameters (see chapter 3.13) are shown on the digital display [2].

3.4 Digital display [2]

The following values appear on the digital display [2]:

- When the display LED program PRG [3] is selected, the selected program number is displayed.
- The material thickness is displayed in millimetres
- The wire feed speed is displayed in metres per minute
- The welding current is displayed in Amperes

- With the special parameters the relevant mnemonics are displayed, e.g. 3L, Sp, tSP etc. For detailed description see Chapter 3.13.
- If there is an error in the machine, the mnemonic "Err" is displayed.

3.5 Welding voltage and arc length rotary knob [12]

When using the synergetic programs, the arc length is set using the rotary knob [12] and the welding current is set with conventional MSG welding. The settings are displayed on the digital display [11].


If you are in the special parameters menu, the rotary knob [12] is used to set the values of the selected special parameters or to activate (On) or deactivate (Off) special parameters. The values and settings are shown on the digital display [11] (see Chapter 3.13).

3.6 Digital display [11]

The following values appear on the digital display [11]:

- The welding voltage is displayed in Volts
- The arc length is displayed as a number between -9.9 and +9.9.
- Values and functions of the selected special parameters. See Chapter 3.13 for a detailed description of the special parameters.
- If a defect or error is detected during operation, this is displayed by means of an error number (number between 1 and 99). For detailed description see Chapter 5.1.

3.7 Indicator lamps

Symbol	Description
Pulse welding recommendation [8] 	The pulse indicator lamp is only active if the synergetic MSG welding procedure [16] has been selected. If synergetic MIG welding is taking place within a power range in which pulsed welding is advisable, the indicator lamp illuminates.
Hold function [9] Hold	When the welding procedure is complete, the digital display [2] shows the value of the welding current and the display [11] shows the value of the welding voltage that were being used at the end of welding. The Hold function is activated automatically at the end of each welding procedure. During this time (the Hold time), the Hold indicator lamp flashes. The Hold function is cancelled by briefly pressing any button, rotating the rotary knob or pressing the torch button.

3.8 Welding procedure pushbutton

Pushbutton [13] is used to select between pulsed [14], double pulsing [15], synergetic MSG [16] and MSG conventional manual operation [17] welding procedures, whereby the display LEDs [14-17] indicate the selected welding procedure by illuminating.

3.9 Operating mode pushbutton

Pushbutton [18] is used to select between the 2-step and 4-step function operating modes. The selection is shown on the digital display [2].

3.9.1 2-step function

2-step welding is recommended for fast, controlled tacking and manual spot welding. With the 2-step function, the welding procedure starts by pressing the torch button. The welding procedure ends as soon as the torch button is released.

3.9.2 4-step function

4-step welding is recommended for longer weld seams. With the 4-step function, the welding procedure starts by pressing the torch button. When the arc has been ignited, the torch button is released. The welding process continues unchanged. The welding procedure is stopped by pressing the torch button. Releasing the torch button again makes the system available again for the next welding procedure.

3.10 JOB pushbutton

The JOB pushbutton [19] is used to save, retrieve, edit and delete a JOB. Up to 99 programs can be saved.

3.10.1 Saving a JOB

- To save a JOB, press and hold down the pushbutton [19] for approx. 3 seconds.
- The JOB display [20] LED illuminates, the digital display contains the mnemonic "STO" and the number of the first free position flashes on the digital display [11]. Note: Free numbers are indicated by flashing in the digital display [11].
- The rotary knob for welding voltage and arc length [12] can be used to select the desired number under which the JOB is to be saved.
- Press and hold down JOB pushbutton [19] again until the acoustic signal for confirming the save procedure is heard for approx. 1 second and the selected number no longer flashes. The required JOB has been saved.

3.10.2 Retrieve JOB

- To retrieve a JOB, press pushbutton [19].
- Select the required number using the welding voltage and arc length rotary knob [12].

3.10.3 Edit JOB

- To edit a JOB, press and hold down the pushbutton [19] for approx. 3 seconds.
- Select the program number to be edited using the welding voltage and arc length rotary knob [12].
- Select function "rcI" using the Energy rotary knob [1].
- Press and hold down the JOB [19] pushbutton again for approx. 3 seconds. An acoustic signal confirms the procedure.
- The JOB can now be edited. Save JOB again, see Chapter 3.10.1.

3.10.4 Delete JOB

- To delete a JOB, press and hold down the pushbutton [19] for approx. 3 seconds.
- Select the program number to be deleted using the welding voltage and arc length rotary knob [12].
- Select function "dEL" using the Energy rotary knob [1].
- Press and hold down the JOB [19] pushbutton again for approx. 3 seconds. An acoustic signal confirms the procedure.

3.11 Gas test pushbutton

The gas test is carried out by pressing the pushbutton [21] once for the factory set time of 30 seconds. The gas test can be prematurely terminated by pressing the pushbutton [21] again.

During the gas test, the gas valve is opened and inert gas flows out of the welding torch. This allows the required gas flow volume to be adjusted without voltage and without wire feeding.

3.12 Wire-threading pushbutton

As long as the pushbutton [22] is pressed, the welding wire is transported for the first 3 seconds without gas and voltage at a speed of 1m/min. Then it is accelerated to a speed of 9m/min. When the pushbutton [22] is released, the motor stops immediately.

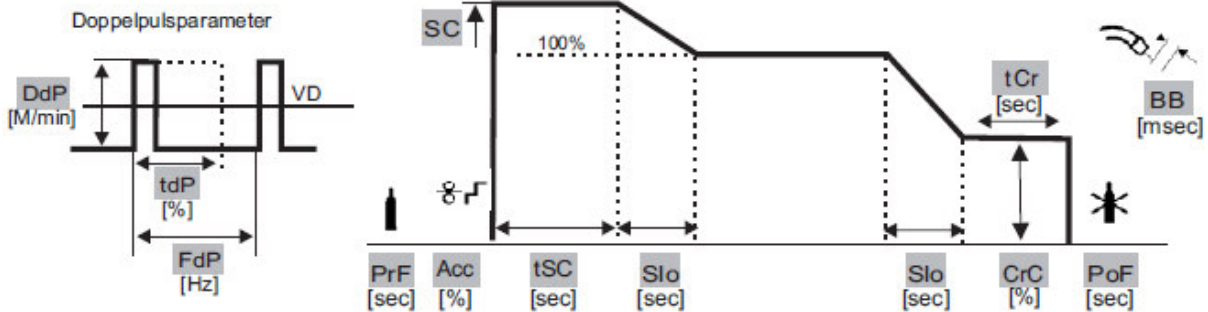
3.13 Special parameters

The mnemonics for these functions are displayed on the digital display [2]. The machine can be adapted in accordance with requirements using the special parameter menu.

- To call up these functions, press and hold down the Energy/Programs pushbutton [7] for 3 seconds.
- The required special parameters are selected by rotating the rotary knob marked Energy [1]. The relevant mnemonic (see fig. 3) is shown on the digital display [2].
- The function or the value of the parameter can be modified using the welding voltage and arc length rotary knob [12]. These values are shown on the digital display [11].
- To exit the special parameters, briefly press the Energy/Programs pushbutton [7].

The device only displays those special parameters that can be used for the respective machine setting (welding procedure, program etc.). All special parameters can be reset to the factory settings by pressing the JOB button [19] for 3 seconds. When you exit the special parameters menu, the changes that have been made are saved.

PANTHER 202 PULS



Sonderparameter / Special parameters

3L	3-Level	3-level = SL + Slo + CrC	ON / OFF
SP	Punktschweißen	Spotwelding	ON / OFF
tSP	Punktschweißzeit	Spot-welding-time	0,3s bis 25s
tIN	Pausenzeit Intervall	Interval time	0,3s bis 5s
HSA	Aut. Hotstart+Absenken (2T)	Aut. Hotstart+Downslope (2Stroke)	ON / OFF
tSC	Hotstartzeit (nur bei HSA ON)	Hotstart-time (only if HSA ON)	0,1s bis 10s
CrA	Endkraterfüller	Craterfiller	ON / OFF
PrF	Gasvorströmzeit	Pregas-time	0,1s bis 10s
PoF	Gasnachströmen	Postgas-time	0s bis 25s
Acc	Einschleichgeschwindigkeit (% von VD)	Creeping speed (% from VD)	1% bis 100%
SC	Hotstartwert	Hotstart level	10% bis 200%
Slo	Downslopezeit	Downslope time	0,1s bis 10s
CrC	Endkraterstrom	Craterfiller-current	10% bis 200%
tCr	Endkraterzeit	Craterfiller-time	0,1s bis 10s
BB	Freibrantzeit	Burn-back-time	AU / 4 bis 250ms
L	Drosseldynamik	Chocke dynamic	-9,9 bis 9,9
FdP	Doppelpuls Frequenz	Double-pulse frequency	0,1 bis 5Hz
ddP	Doppelpuls Amplitude	Double-pulse amplitude	0,1 bis 3m/min
tdP	Doppelpulsverhältnis	Double-pulse proportion	25% bis 75%
Adp	Doppelpuls Lichtbogenlänge	Double-arc-lenght	-9,9 bis 9,9
ito	Drahtlänge bis Zwangsabschaltung	Feeding until Forced switch off	0 bis 50cm
USB	nicht belegt	not used	
Fac	Clear all	Clear all	noP/PrG/All

Figure 3: Overview of special parameters (side door sticker).

3.13.1 Explanation of special parameters

3.13.1.1 3L (3 Level)



Active in the curves for synergetic welding. Particularly recommended for welding aluminium. Attention: If you activate function 3L (3 stages) the HSA (Hot start Automatic) function is automatically disabled.

If the "3L" function is activated, the following mnemonics appear one after the other when the torch button is pressed:

- **SC (Hot start value)**
Adjustment range of 10 - 200% of the welding current. Manufacturer setting: 135 %. The setting is made using the rotary knob [12].
- **Slo (Downslope time)**
Adjustment range: 0.1 - 10 s; manufacturer's setting: 0.5 s. Defines the transition time between the first current (SC) and selected welding current and between the welding current and the third current CrC "Crater Filler".
- **CrC (end crater current)**
Adjustment range of 10 - 200% of the welding current. Manufacturer setting: 60%.

Method of operation:

The welding process takes place in 4-step operation, i.e. the execution times are specified by the welder. Particularly recommended for MIG welding of aluminium.

Three current strengths are available, which can be called up with the torch button when welding. The welding procedure starts when the torch button is pressed, using the current value that has been selected using the SC function (manufacturer setting: 135%). This current value is maintained for as long as the torch button is pressed. When the torch button is released, in the time defined using the **Slo** function (manufacturer setting: 0.5 s) a transition takes place from the first current value to the selected welding current, which is maintained until the torch button is pressed again. The next time the torch button is pressed, the welding current uses the time defined using the Slo function (in this particular case: 0.5 s) to go to the third current selected using the CrC function, the "Crater Filler" current (manufacturer setting: 60%) and is maintained for as long as the torch button is pressed. The welding procedure is stopped if the torch button is pressed.

3.13.1.2 SP (Spot welding)

Spot welding can be activated or deactivated by selecting ON or OFF.

Attention: Spot welding is switched off automatically if the 3L (3 stages) function is activated.

The spot welding time **t_{SP}** can be set to a value of 0.3 – 25 seconds. The interval time **t_{IN}** between one spot weld and the next can be set to a value of 0.3 – 5 seconds.

The welding process runs using the fixed spot time setting, unless the torch button is released prematurely during welding.



3.13.1.3 HSA (Hot start and automatic lowering)

Only active for programs for synergetic welding. **ATTENTION: When the HSA function is activated, the 3L function (3 stages) is switched off automatically.** If the function is activated, the following mnemonics are displayed in sequence when the torch button is pressed:

- **SC (Hot start - start current)**
Adjustment range of 10 - 200% of the welding current.
Manufacturer setting: 135%
- **tSC (duration)**
Duration of the previously displayed start current in seconds.
Adjustment range: 0.1 - 10 s; manufacturer's setting: 0.5 s.
The tSC (hot start duration) is independent of step 1 during 4-step operation.
- **Slo (Downslope time)**
Adjustment range: 0.1 - 10 s; manufacturer's setting: 0.5 sec.
Defines the transition time between the initial current (SC) and the welding current set in the welding programs.
Note:
The welding process takes place in 2 and 4 step mode. We recommend this function for spot welding aluminium plates.

3.13.1.4 CrA (End crater filler)

This function is also selected for 2-step and 4-step welding and (on request) also in combination with the hot start function. Once the special parameter has been activated, the following parameters are selected one after the other using the "Energy" rotary button and the relevant values set using the welding voltage and arc length rotary button [12].

- **Slo (Downslope time)**
Transition time between the welding current and the crater filling current. Adjustment range: 0.1 - 10 s, manufacturer's setting: 0.5 s
- **CrC (end crater current)**
Adjustment range of 10 - 200 % of the welding current.
Manufacturer setting: 60 %.
- **TCr (end crater time)**
Duration of end crater current. Adjustment range: 0.1 - 10 s; manufacturer's setting: 0.5 s.

3.13.1.5 PrF (gas pre-flow time)

Active in all welding programs.

Adjustment range: 0 - 10 s. Manufacturer's setting: 0.1 s

3.13.1.6 PoF (gas after-flow time)

Active in all welding programs.

Adjustment range: 0 - 25 s. Manufacturer's setting: 3 s

3.13.1.7 Acc (Automatic creep speed)

Only active for programs for synergetic welding. Adjustment range: 0 –100%

This is the wire feed speed as a percentage of the speed selected for welding before the wire touches the workpiece.

NOTE: This setting is extremely important for providing the best possible start.

Factory setting: "**Au**" Automatic (depending on characteristics).

3.13.1.8 bb (Burn-back time)

Active in all welding programs.

Adjustment range: 4 – 250 ms. Factory setting: "**Au**" Automatic.

For regulating the length of the wire coming out of the gas nozzle at the end of the welding procedure. The higher the number, the greater the amount of wire burn-back.

3.13.1.9 L (Choke dynamics)

Adjustment range: -9.9 - +9.9. Factory setting: 0

A negative number reduces the choke effect (arc becomes harder) and a positive number increases the choke effect (arc becomes softer).

3.13.1.10 dP Double pulse

Current strength varies between two values. Only active for programs for synergetic welding. Before entry, a short seam must be welded in order to determine the most suitable welding speed for the task to be performed. The reference speed is determined as follows:

- To activate the function, select Double pulse using the pushbutton [13] and open the special parameter menu using the "Energy/Programs" pushbutton [17].
- Rotate energy rotary knob [1] until the **FdP** mnemonic (double pulse frequency) appears in the digital display [2]. Adjust work frequency using the welding voltage and arc length button [12], adjusting range: 0.1 – 5 Hz (e.g.: 5 Hz setting = switch between high current and low current 5 times per second). The setting is displayed on the digital display [11].
- Rotate energy rotary knob [1] until the "**ddP**" (double pulse amplitude) mnemonic appears on the digital display [2]
- Rotate the welding voltage and arc length rotary knob [12] to select the adjusting range (0.1 – 3 m/min) which is added to or subtracted from the reference speed. Manufacturer setting: 1 m/min
- Rotate energy rotary knob [1] until the "**tdP**" (double pulse ratio) mnemonic appears on the digital display [2]. This is the duration for which the maximum current is maintained. This is expressed as a percentage of the time derived from the frequency "**Fdp**".

- Select the percentage using the welding voltage and arc length rotary knob [12]. Adjustment range: 25 – 75 %. Factory setting: 50 %.
- Rotate energy rotary knob [1] until the "**AdP**" (double pulse arc length) mnemonic appears on the digital display [2]. Adjustment range: -9.9 - +9.9. Manufacturer setting: 0. When welding, ensure that the arc length for both currents is the same. If necessary, correct it using the welding voltage and arc length rotary knob [12].

Note: It is possible to weld within the double pulse function. To terminate the special parameters, briefly press the Energy/Programs push button [7].

The arc length of the lowest current (slowest speed) is regulated using the reference speed arc length. If the reference speed is changed, the settings that were previously made must also be repeated for the new speed.

3.13.1.11 Ito (Wire length until forced shut-off)

The welding machine is blocked if the wire comes out of the torch without current flowing after starting up. Adjustment range: 1 – 50 cm. This function can be switched on and off. Factory setting: Forced shut-off at 15cm.

3.13.1.12 FAc (Clear all)

Resets all parameters to the factory settings. After the special parameter has been selected, the following options appear in the digital display [11]:

- noP: Restores the factory settings of the welding machine without deleting the saved programs.
- Prg: Deletes all saved programs.
- ALL: Restores the factory settings of the welding machine, and all existing programs are deleted.

To confirm the required option, the Job pushbutton [19] must be pressed for 3 seconds. The mnemonic that appears on the digital display [11] flashes and an acoustic signal confirms execution after a few seconds.

3.14 Controls on rear of machine

On the rear of the PANTHER 202 PULS there is the gas connection for the inert gas, the main switch for switching the machine on and off and the power cable for disconnecting the device from the mains. In the upper area there are also the two attachment points for the Panther adapter kit for 300 mm wire roll (order no. 1180255).

4 Accessories

The standard scope of delivery of the PANTHER 202 PULS consists of:

Designation	Order no.
PANTHER 202 PULS Earth cable 25mm ² /4m ADAPTER 32A -> 16A earth cable	1305502

There are three accessory sets for the PANTHER 202 PULS:

Designation	Order no.
Panther set 1 Torch MB24/3m Pressure reducer	1184212

Designation	Order no.
Panther set 2 Torch MB24/3m Pressure reducer	1184214

Designation	Order no.
Panther set 3 Torch MB26/3m Pressure reducer	1184215

The following accessories are available for the PANTHER 202 PULS:

Cart	8081009
Adapter kit for 300 mm wire roll PANTHER 202 Puls	1180254
Torch 3m MB 24	7602455
Torch 4m MB 24	7602454
Torch 3m MB 25	7602543
Torch 4m MB 25	7602544
Torch 3m MB 26	7682603
Torch 4m MB 26	7682604
Torch 3m MB 24 Up/Down	7602453
Torch 4m MB 24 Up/Down	7602458
Torch 3m MB 25 Up/Down	7603617
Torch 4m MB 25 Up/Down	7603618
Torch 3m MB 26 Up/Down	7603611
Torch 4m MB 26 Up/Down	7603612
Support tube	7710077
Earth cable 25mm ² /4m	7510019
Pressure reducer	7830100
Feed rollers 0.6mm/0.8mm	7503000
Feed rollers 0.8mm/1.0mm	7503001
Feed rollers 1.0mm/1.2mm	7503002
Feed rollers 0.6mm/0.8mm ALU for PANTHER	7503003
Feed rollers 0.8mm/1.0mm ALU for PANTHER	7503004
Feed rollers 1.0mm/1.2mm ALU for PANTHER	7503005
ADAPTER 32A -> 16A earthed plug	3600003

4.1 Remote control socket

4.1.1 Configuration of the remote control socket

REHM torch MM 12-pin Pin no.	Pin configuration
1	
2	
3	
4	UP button
5	DOWN button
6	24V
7	
8	
9	
10	
11	
12	

5 Safety equipment

5.1 Safety lock

In the event of an error, a flashing number may appear on the digital display [11], which has the following meaning:

Code	Fault description
2	EEPROM error
6	Communication error between mainboard and control board
9	Communication error between control board and mainboard
10	UI calibration error
14	Processor supply voltage defective
16	Intermediate circuit voltage too low
22	Hardware code - read error
25	EPLD defective
26	Battery fault
27	Error writing to memory or mainboard
30	LEM converter offset error at mainboard
42	Encoder error
54	No short-circuit recognition when switching on
56	Short-circuit timeout
57	Motor current too high
58	Defect in firmware version detection
61	Mains voltage too low
62	Mains voltage too high
73	Rectifier overtemperature

5.2 Thermal protection

The device is protected by a temperature sensor which stops the machine from operating if the permissible temperature is exceeded. In this condition, the fan remains on and the flashing mnemonic "OPn" appears on the digital energy display (2).

6 Assembly

When the devices are assembled, it must be ensured that the ventilation slots are not covered, and that the environment complies with protection class IP23. The machine must be installed by experts. All connections must be made properly and strictly in compliance with the accident prevention regulations.

7 Welding options

7.1 Start-up

Connect the PANTHER 202 PULS to the power supply strictly in accordance with the applicable VDE regulations, and also observe the regulations from the relevant employer's liability insurance associations.

When connecting the device, please pay attention to the information concerning the supply voltage and the main fuses. Automatic circuit breakers and safety fuses must always be designed for the specified current. The necessary information can be found in → **Chap. 13, Technical Data.**

Always switch the device off if it is not being used.

Before starting up, please ensure that the wire diameter corresponds to the one that is specified on the wire transportation roller, and that the program that is selected is compatible with the material and the type of gas. Use wire transportation rollers with a U-shaped groove for aluminium wire, and the rollers with a V-shaped groove for other types of wire.

7.1.1 Gas hose connection

The gas cylinder must have a pressure reducer and a flow meter. When the cylinder is put onto the cylinder holder of the wire feed unit, it must be secured with the chain provided. Do not attach the gas hose coming out of the rear of the machine to the pressure regulator until the gas cylinder has been positioned. The gas flow must be set to 8-10 litres per minute.

7.2 The welding current source is ready for welding

Connect earth terminal to workpiece.

Move main switch to switch position 1.

Select program to be used from list, see sticker on side door (Fig. 2).

Use the energy rotary knob [1] to select the appropriate number and special parameter for the program, and select the relevant settings and values using the welding voltage and arc length rotary knob [12].

Remove the gas nozzle.

Unscrew the flow nozzle.

Insert wire into wire guide of torch and ensure that it runs in the groove of the roller, which must be correctly positioned. Then close the door.

Press and hold down the wire-threading pushbutton [22] until the wire comes out of the neck of the torch.



ATTENTION: Keep neck of torch away from your face when the wire is coming out.

Screw in the flow nozzle and ensure that the diameter of the hole corresponds to that of the wire being used.

Fit the gas nozzle.

Open the cylinder.

7.3 Welding non-alloyed steels

When these materials are being welded, please pay attention to the following:

Use a two-gas mixture such as ARGON + CO₂ with an argon proportion of 75% or more. This mixture will give you properly joined, neat weld seams. The use of pure CO₂ as inert gas will produce narrower seams with greater penetration depth, but will generate considerably more spatter.

Use additional welding wire of the same quality as the steel that is being welded. It is advisable to always use good quality welding wire. Do not use rusty wire, since this can adversely affect the quality of the welding.

Do not weld workpieces that are rusty or stained with oil or grease.

7.4 Welding stainless steels

In order to weld stainless steels in group 300, an inert gas with a large proportion of argon and a small quantity of oxygen O₂ or carbon dioxide CO₂ (about 2%) must be used. Do not handle the wire. It is important to keep the welding zone clean at all times in order to avoid contaminating the joint that is being welded.

7.5 Welding aluminium

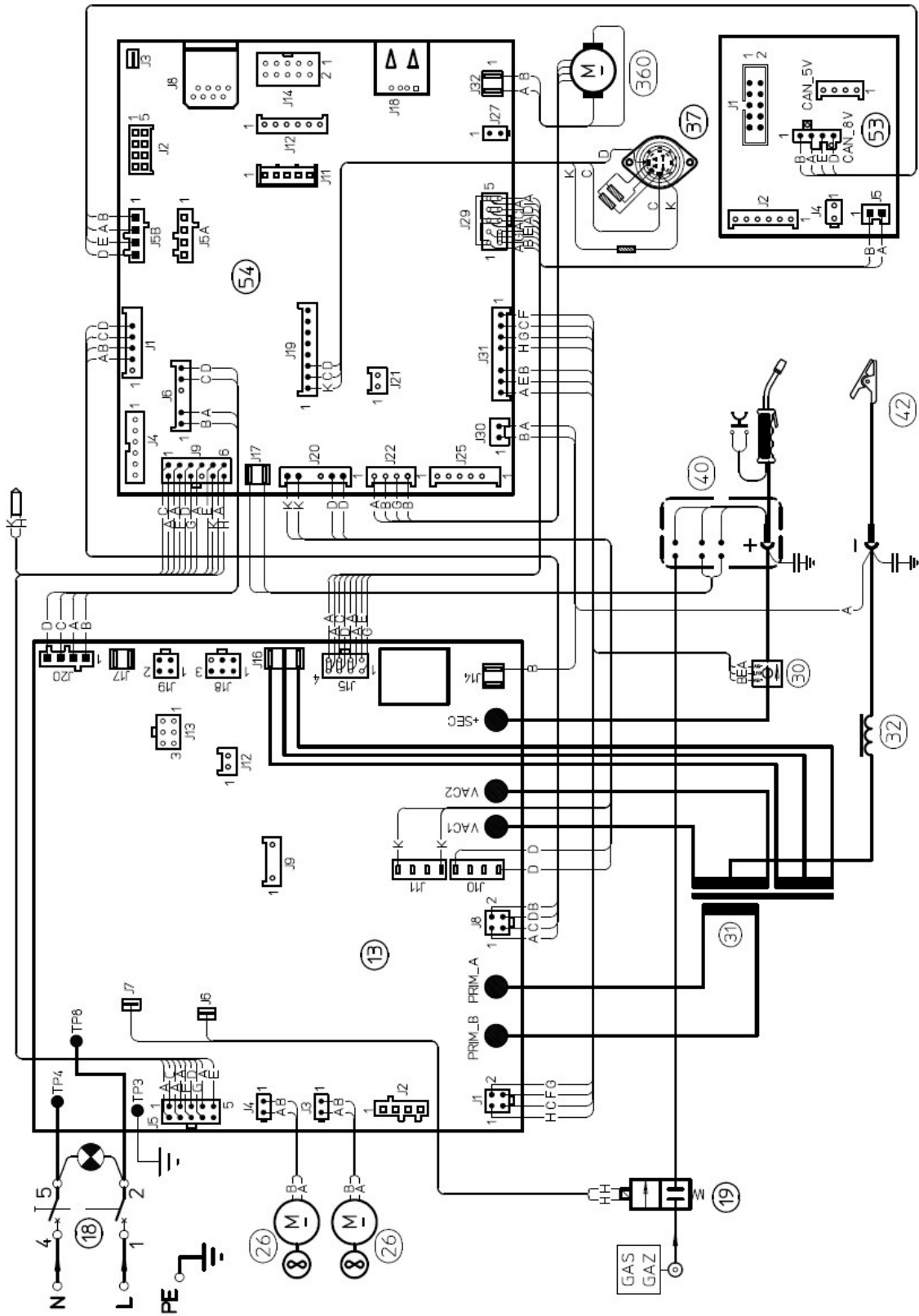
Please pay attention to the following when welding aluminium:

Use pure argon as the inert gas.

Use an additional welding wire with a composition that is suitable for the basic material that is being welded.

Use grinding and brush wheels that are specifically for aluminium; these working materials must never be used for other materials.

8 Circuit diagram



9 Component list with REHM order numbers

Item	Designation	REHM order number
Item 1	Lock	7510001
Item 2	Snap lock	7510002
Item 3	Left side panel, movable	7510063
Item 4	Hinge	7510064
Item 5	Assembly plate	7510065
Item 6	Winding spindle drive	7510007
Item 7	Holder for handle	2500021
Item 8	Handle	2000859
Item 9	Right side panel	7510066
Item 10	Solenoid valve	7510028
Item 11	Main switch	7510024
Item 12	Spacer for power switch	7510025
Item 13	Rear panel	7510073
Item 14	Strain relief	7510026
Item 15	Power cable	7510027
Item 16	Fan cover	7510076
Item 17	Air duct cover	7510077
Item 18	Fan	7510056
Item 19	Fan assembly plate	7510067
Item 20	Upper air deflection plate	7510068
Item 21	Reinforcement plate	7510069
Item 22	Side air deflection plate	7510070
Item 23	Current converter	7510045
Item 24	Secondary side choke	7510041
Item 25	Main transformer	7510042
Item 26	Transformer retaining plate	7510079
Item 27	Housing base	7510043
Item 28	Base	7510078
Item 29	Socket	7510017
Item 30	Front cover for central connection	7510015
Item 31	Central adapter	7510016
Item 32	Front panel	7510072
Item 33	Potentiometer knob	7510071
Item 34	Control board	7510074
Item 35	Control unit	7510075
Item 36	Remote control socket	4300357
Item 37	Motor assembly plate	7510081
Item 38	Insulating plate	7510082
Item 39	Cover for motor	7510083
Item 40	Wire feed unit	7510080
Item 41	Intermediate panel assembly bracket	7510084
Item 42	Insulation film	7510085
Item 43	Intermediate panel	7510086
Item 44	Mainboard	7510087
Item 45	Earth cable	7510019
-----	Gas hose	2200100

Item	Designation	REHM order number
-----	Graphic film	7301678
-----	Adapter cable CEE 32A > safety plug 16A	3600003
-----	roller, 0.6 - 0.8 mm	7503000
-----	Feed rollers, 0.8 - 1.0 mm	7503001
-----	Feed rollers, 1.0 - 1.2 mm	7503002
-----	Feed rollers, 0.6 - 0.8 mm Aluminium	7503003
-----	Feed rollers, 0.8 - 1.0 mm Aluminium	7503004
-----	Feed rollers, 1.0 - 1.2 mm Aluminium	7503005

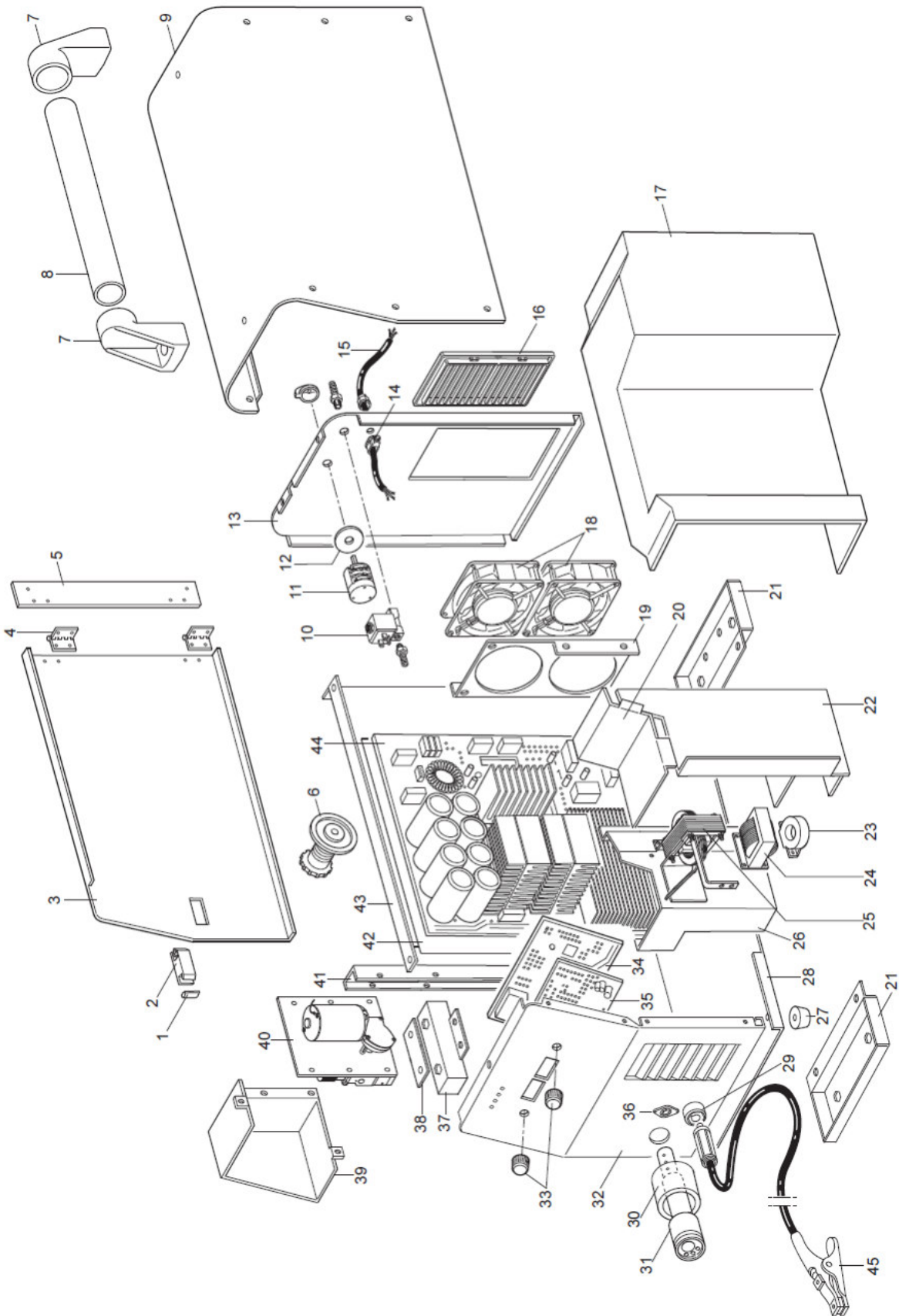


Figure 4: PANTHER 202 PULS exploded drawing

10 Maintenance

The device is maintenance free - however, the condition of the electrical cables must be checked at regular intervals.

Inert gas nozzle

Metal spatter must be removed from this nozzle at regular intervals. If nozzle is deformed or out of round, it must be replaced.

Flow nozzle

A good contact between this nozzle and the wire is the only way to ensure that the arc is stable and current output is optimum; for this reason the following instruction must be followed:

A) The hole in the flow nozzle must be kept free of dirt and oxidation at all times.

B) During long periods of welding, the spatter becomes securely anchored to the nozzle and stops the wire from exiting. The nozzle must therefore be cleaned at frequent intervals and replaced if necessary.

C) The flow nozzle must be securely screwed to the torch body at all times. The thermal cycles of the torch can make it become loose, meaning that the torch body and the nozzle heat up and the wire comes out irregularly.

Wire guide

This is an important component that requires frequent checking because it can become contaminated with copper dust or small chips because of the wire. It must be cleaned at regular intervals together with the gas lines using dry compressed air.

The wire guides are subject to continuous wear, and must therefore be replaced after a certain time.

Gear motor

Rust and metal residue must be removed from the transport roller assembly at regular intervals. Regular checking of the entire wire feeding assembly is required: shaft, wire guide rollers, wire guide and flow nozzle.

11 Technical Data

Type		<i>PANTHER 202 PULS</i>
Setting range	[A]	15 - 200
Duty cycle (DC) at I_{max} at 40°C	[%]	40
Welding current at 40% ED at 40°C	[A]	200
Welding current at 60% ED at 40°C	[A]	180
Welding current at 100% ED at 40°C	[A]	160
Maximum effective mains current $I_{1\text{ eff}}$	[A]	24.7
Effective mains current $I_{1\text{ eff}}$	[A]	18
Mains voltage	[V]	230 (1~)
Mains voltage compensation	[%]	+ 15 / - 20
Fuse up to 200A	[A]	20
Type of cooling		AF
Protection class		IP 23 S
Dimensions L/W/H	[mm]	570 x 252 x 505
Weight	[kg]	24.5

12 Proper disposal

For EU countries only:



Do not dispose of electrical tools along with domestic waste.

According to European directive 2002/96/EC concerning old electrical and electronic equipment and the implementation thereof in national law, used electrical tools must be collected and taken for environmentally friendly recycling.



EC conformity declaration

We hereby confirm that the following products

PANTHER 202 PULS

comply with the main protection requirements that are defined in directive **2004/108/EC** (EMC directive) of the council for the harmonisation of the legal regulations of the member states concerning electromagnetic compatibility and in directive **2006/95/EC** concerning electrical operating materials for use within certain voltage limits.

The above-mentioned products comply with the regulations of this directive and comply with the safety requirements for arc welding equipment as per the following product standards:

EN 60 974-1: 2006-07

Arc welding equipment – part 1: Welding current sources

EN 60 974-5: 2003-02

Arc welding equipment – part 5: Wire feeding devices

EN 60 974-10: 2004-01

Arc welding equipment – part 10: Electromagnetic compatibility (EMC) requirements

As per EC directive **2006/42/EG** article 1, para. 2 the above-mentioned products exclusively come under the application area of directive **2006/95/EC** concerning electrical operating materials for use within certain voltage limits.

This declaration is responsible for manufacturer

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Uhingen 23.07.2012

issued by

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Managing Director

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Development, construction and production – all under one roof – in our factory in Uhingen. Thanks to this central organisation and our forward-thinking policies, new discoveries can be rapidly incorporated into our production. The wishes and requirements of our customers form the basis for our innovative product development. A multitude of patents and awards represent the precision and quality of our products. Customer proximity and competence are the principles which take highest priority in our consultation, training and service.

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