schweißkraft
Schweißtechnik

Operating Instructions

EASY-TIG SERIES

TIG-Inverter

- EASY-TIG 181 DC
- EASY-TIG 201 DC PULSE
- EASY-TIG 201 ACDC PULSE

EASY-TIG 181 DC

Imprint

Product identification	TIG-Inverter	Item number
	EASY-TIG 181 DC	1074018
	EASY-TIG 201 DC PULSE	1074020
	EASY-TIG 201 ACDC PULSE	1074021

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Indications regarding the operating instructions

Original instructions
according to DIN EN ISO 20607:2019

Edition: 14.06.2022
Version: 1.12
Language: English

Author: SN/RL

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1 Introduction

You have made a good choice by purchasing the welding power welding machine.

Carefully read the operating manual before putting the machine into operation.

This is an important part and must be kept near the machine and accessible to every user.

The operating manual informs you about the proper start-up, the intended use as well as the safe and efficient operation and maintenance of the welding machine.

In addition, observe the local accident prevention regulations and general safety regulations for the area of application of the welding device.

1.1 Copyright

The contents of these instructions are protected by copyright and are the sole property of Stürmer Maschinen GmbH. Their use is permitted within the scope of the use of the welding device. Any other use is not permitted without the written consent of the manufacturer.

Passing on as well as duplication of this document, utilization and communication of its contents are prohibited, unless expressly permitted. Violations will result in liability for damages. We register trademark, patent and design rights for the protection of our products, if this is possible in individual cases. We emphatically oppose any infringement of our intellectual property.

1.2 Customer service

If you have any questions about your Device or technical information, please contact your dealer. There you will be happy to help with expert advice and information.

Germany:
Stürmer Maschinen GmbH
Dr.-Robert-Pfleger-Str. 26
D-96103 Hallstadt

Repair-Service:

Fax: 0049 (0) 951 96555-111
Email: service@stuermer-maschinen.de

Spare parts orders:
Fax: 0049 (0) 951 96555-119
Email: ersatzteile@stuermer-maschinen.de

We are always interested in information and experiences that arise from the application and can be valuable for the improvement of our products.

1.3 Limitation of liability

All information and instructions in the operating instructions have been compiled taking into account the applicable standards and regulations, the state of the art as well as our many years of knowledge and experience. In the following cases, the manufacturer assumes no liability for damages:

- Failure to observe the operating instructions,
- Improper use,
- Use of untrained personnel,
- Unauthorized conversions,
- Technical changes,
- Use of unauthorized spare parts.

The actual scope of delivery may differ from the explanations and illustrations described here for special versions, when using additional order options or due to the latest technical changes.

The obligations agreed in the delivery contract, the general terms and conditions as well as the delivery conditions of the manufacturer and the legal regulations valid at the time of the conclusion of the contract apply.

2 Safety

This section provides an overview of all major safety packages for personal protection and safe and trouble-free operation. Further task-related safety instructions are contained in the individual chapters.

2.1 Symbol explanation

Safety instructions

Safety instructions are indicated by symbols in these operating instructions. The safety instructions are initiated by signal words that express the extent of the hazard.

DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation. It leads to death or serious injury if it is not avoided.

WARNING!

This combination of symbol and signal word indicates a potentially dangerous situation. It leads to death or serious injury if it is not avoided.

CAUTION!

This combination of symbol and signal word indicates a potentially dangerous situation. It can cause minor or minor injuries if not avoided.

ATTENTION!

This combination of symbol and signal word indicates a possibly hazardous situation which, if not avoided, may result in damage to property and the environment.

NOTE!

This combination of symbol and signal word indicates a potentially dangerous situation. It can lead to material and environmental damage if it is not avoided.

Tips and recommendations

Tips and recommendations

This symbol indicates useful tips and recommendations as well as information for efficient and trouble-free operation.

To reduce the risk of personal injury and property damage and to avoid dangerous situations, the safety instructions in this manual must be observed.

2.2 Qualification of the staff

The various tasks described in this manual place different demands on the qualifications of the people entrusted with these tasks.

WARNING!

Danger due to insufficient qualification of persons!

Insufficiently qualified persons can not assess the risks involved in handling the machine and expose themselves and others to the risk of serious or fatal injuries.

- All work should only be carried out by qualified persons.
- Keep inadequately qualified persons out of the work area.

Only persons who can be expected to carry out this work reliably are permitted to carry out all work. Persons whose reactivity is influenced, e.g. by drugs, alcohol or medication, are not permitted.

Operator

The operator has been instructed in a briefing by the operator about the tasks assigned to him and possible dangers of improper behavior. The operator may only carry out tasks that go beyond normal operation if this is specified in this operating manual and the operator has expressly entrusted this to him.

Specialist staff

Due to their professional training, knowledge and experi-ence as well as their knowledge of relevant regulations the specialist staff is able to perform the assigned tasks and to recognise and avoid any possible dangers them-selves.

2.3 Personal protective equipment

The personal protective equipment serves to protect per-sons against impairments of safety and health while working. The staff has to wear personal protective equip-ment while performing different works on and with the welding equipment which are indicated in the individual paragraphs of these instructions.

The personal protective equipment is explained in the following paragraph:

Welders face protection shield or helmet with welder's face protection shield

Wear a welding helmet fitted with a proper shade of filler to protect your face and eyes when welding or watching (see Safety Standards).

Protective gloves with pulse protection

The protective gloves with pulse protection protect hands from sharp-edged components as well as from friction, abrasions, minor burns or deeper injuries.

Protective apron

The protective apron mainly protects the front of the body against sparks or radiation during welding.

Safety boots

The safety boots protect the feet against crushes, falling parts and slipping over on slippery under-ground.

Protective clothes

The protective clothes are tight clothes of little ten-sile strength.

2.4 General safety instructions

WARNING!

Danger in case of misuse!

The device may only be operated in a technically perfect condition. Any faults must be rectified immediately. Unauthorized modifications to the TIG inverters or improper use of the TIG inverters as well as disregard of the safety regulations or the operating instructions exclude the manufacturer's liability for any resulting damage to persons or objects and invalidate the warranty claim!

The following must be observed:

- The device must not be modified in its design and must not be used for purposes other than those provided for by the manufacturer.
- Never work under the influence of concentration-disturbing diseases, fatigue, drugs, alcohol or medication.
- Keep children and persons not familiar with the TIG inverters away from their working environment.

2.5 Safety markings on the welding machine

Safety signs and instructions are attached to the device (Fig. 1) which must be observed and followed.

Fig. 1: 1 Mandatory sign I 2 Warning sign

The safety labels and instructions attached to the device must not be removed. Damaged or missing safety markings can lead to malfunctions, personal injury and property damage. They are to be replaced immediately.

If the safety markings and instructions are not immediately recognizable and comprehensible, the device must be taken out of operation until new safety markings have been affixed.

2.6 Safety data sheets

Safety data sheets for hazardous materials can be obtained from your specialist dealer or by phone: +49 (0)951/96555-0. Specialist dealers can find safety data sheets in the download area of the partner portal.

3 Intended Use

The device is exclusively designed for arc welding according to MMA and TIG. Intended use also includes compliance with all information in these instructions. No other use is permitted. Any use beyond the intended use or any other use is considered misuse.

WARNING!

Danger in case of misuse!

Misuse of the device can lead to dangerous situations.

- Only operate the device in the power range specified in the technical data.
- Never bypass or disable the safety devices.
- Only operate the device in a technically perfect condition.
- Keep away from all moving parts.

Stürmer Maschinen GmbH does not assume any liability for constructive and technical changes to the device.

Claims of any kind due to damage due to improper use are excluded.

The TIG inverters welding devices are direct current inverters with high frequency ignition and partly with pulse function. The required welding current can be steplessly adjusted via a knob. The HF ignition enables contactless ignition of the arc. If the permissible temperature of the power components is exceeded, this is indicated by a display on the control panel. The EASY-TIG 201 ACDC PULSE can also be welded with alternating current.

The housing ensures the protection of the components against external influences and against direct contact. Depending on the application, there are different degrees of protection against penetration of solid bodies and water. The degree of protection is indicated by the letters IP, followed by two digits: the first digit indicates the degree of protection against solid bodies and the second the degree of protection against water.

	1. Digit	Description	2. Digit	Description	Aditional field	Description
IP2 1	2	Protect against solid objects over 12 mm e.g. hands, large tools	1	Protected against vertically falling dripping water	S	Tested when moving parts are at a standstill

NOTE!

The Schweißkraft welding equipment may only be operated by persons who have been instructed in the use of welding equipment and are familiar with safety regulations.

- Always wear protective clothing when welding to protect against splashes and sparks.
- Make sure that other persons are not endangered by the UV radiation of the arc.

4 Principle of operation

4.1 Principle of the metal inert gas welding process

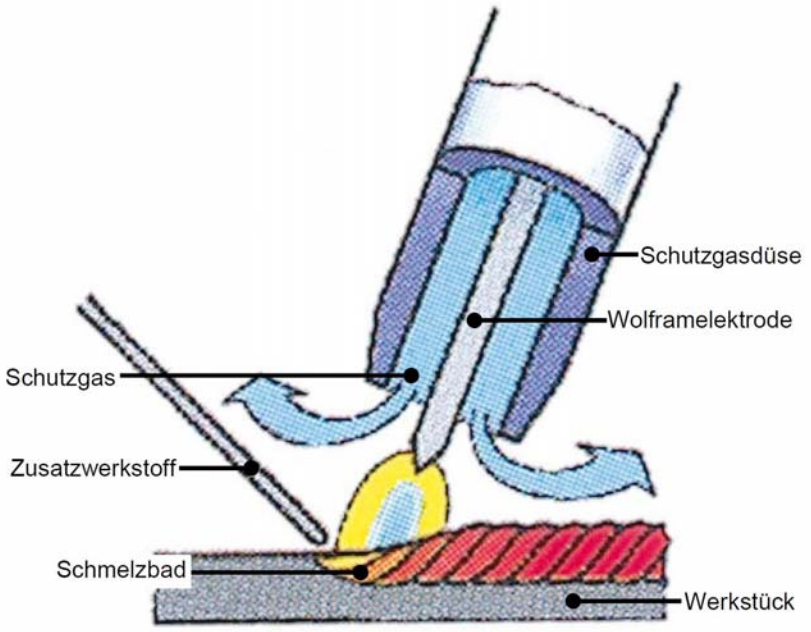


Fig. 2: Metal inert gas welding

In TIG welding (Wolfram Inert* Gas Welding) an arc is drawn between a non-meltable tungsten electrode. Pure argon is usually used as the shielding gas - a noble gas that does not combine with any element and therefore also prevents reactions of the molten metal. The filler wire is supplied without current, either manually (manual welding) or mechanically (automatic welding). However, there are welding operations that do not require filler materials. It depends on the material used whether direct or alternating current is used. The main advantage of TIG welding is the wide range of materials to be welded. Materials from 0.3 mm thickness (automated) such as alloyed steels, high-alloy steels, aluminium (alternating current welding), magnesium, copper and their alloys, unalloyed steels, nickel, gold, silver, titanium and many more can be welded. Can be used for welding all material thicknesses and root layers with thicker cross-sections. The TIG process achieves the best results compared to other welding processes due to pore-free welds with a very high tensile strength.

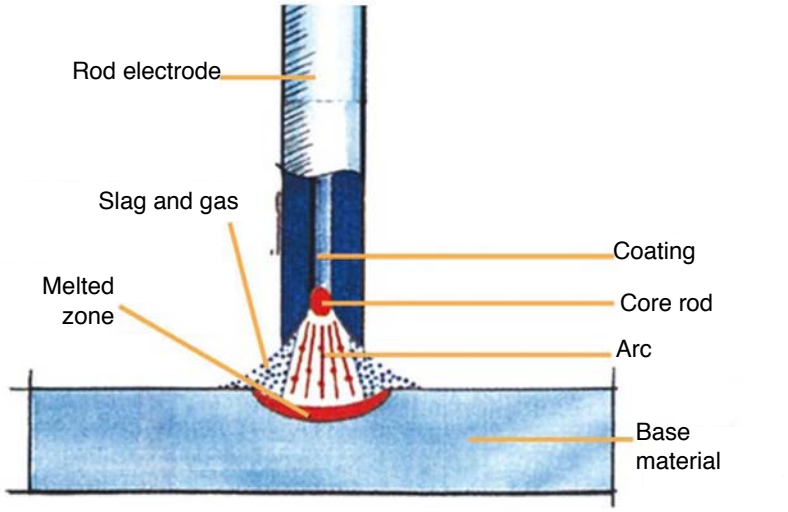
Alternating current welding (AC): For welding of aluminium. A hemispherical tungsten dome forms on the tungsten electrode and the arc changes in high frequency between the minus and plus poles.

Direct current welding (NC): For welding alloyed steels and non-ferrous metals. The tungsten electrode is ground to a point. The arc burns stable.

HF ignition = contactless ignition

Lift-Arc ignition = contact ignition

4.2 Principle of manual arc welding (MMA)



Electrode welding is an uncomplicated welding method with which almost all metals can be welded. This method can also be used outdoors and with special equipment even under water. In electrode welding, the arc length is determined by hand. The distance between the electrodes determines the arc length. Welding is mainly carried out under direct current; e.g. rutile electrodes are easy to weld under minus-pole direct current; basic electrodes under plus-pole direct current.

The electrode is an arc carrier and additional material. It consists of a core wire and a cladding. The cladding protects the molten pool from harmful atmospheric oxygen and stabilizes the arc. In addition, a slag forms which protects and shapes the weld seam. Depending on the thickness and composition of the coating, a distinction is made between rutile and basic electrodes. Rutile electrodes are easier to weld and have a beautiful flat seam. The slag is also easier to remove. It should be noted that many electrodes have to be redried after prolonged storage because moisture accumulates from the air over time. Otherwise, electrode welding is a very common and easy-to-use welding process.

5 Technical Data

Parameter	EASY-TIG 181 DC	EASY-TIG 201 DC PULSE	EASY-TIG 201 ACDC PULSE
Dimensions (LxWxH) [mm]	430x150x280	500x150x280	460x150x280
Net weight [kg]	7,3	9,7	9
Supply voltage [V]	230±10%	230±10%	230±10%
Phase (s)	1	1	1
Type of current	AC	AC	AC
Mains frequency [Hz]	50/60	50/60	50/60
Power input [A]	MMA 42.6 TIG 28.8	110V: TIG 23.9 110V: MMA 38.6 230V: TIG 19.7 230V: MMA 30.1	AC TIG 34/DC TIG 29.1 AC MMA 40.2/DC MMA 42.9
Power draw [kVA]	9,8/ 6,6	110V: TIG 2.6 110V: MMA 4.2 230V: TIG 4.5 230V: MMA 6.9	AC TIG 7.8 DC TIG 6.7 AC MMA 9.2 DC MMA 9.8
Connecting cable length [m]	2,2	2,2	2,2
Norm /EMV-Class	EN 60974-1:2012, EN 60974-10:2014 / A		
Degree of protection	IP21S	IP21S	IP21S
Isolation class	H	H	H
Fuse slow-blow [A]	16A	16A	16A
Required generator power	>9,8 kVA	>6,9 kVA	> 9,8 kVA
Mains plug	16A	16A	16A
Open circuit voltage [V]	MMA 75.5 TIG 92.6	110V: TIG 66.5 110V: MMA 66.7 230V: TIG 66.5 230V: MMA 66.7	AC TIG 73.4 DC TIG 69.8 AC MMA 69.3 DC MMA 69.3
Operating temperature [C°]	-10~40	-10~40	-10~40
Weldable electrode Ø [mm]	1.6~4.0	1.6~4.0	1.6~4.0
Adjustment range TIG DC [A]	10-180	5~200	10~170
Adjustment range electrode [A]	10-180	5~200	10~170
Duty cycle at $I_{max.}$ 40°C TIG DC [%]	40	50	40
Duty cycle at $I_{max.}$ 40°C electrode [%]	40	30	30
Current at 100% 40°C TIG [%]	100	145	110
Current at ED 100% 40°C electrode [%]	100	135	95
Power consumption TIG DC [kVA]	3,9	4,5	4
Power consumption electrode [kVA]	5,9	6,9	5,9
Pulse frequency [Hz]	/	0.5~200	0.5~200
Ignition	High frequency	High frequency	High frequency
Torch cooling	Air	Air	Air
Performance factor [cos Phi]	0,6	0,99	0,6
Sheet thicknesses [mm]	0,5~8,0	0,5~10,0	0,5~10,0

5.1 Type plate

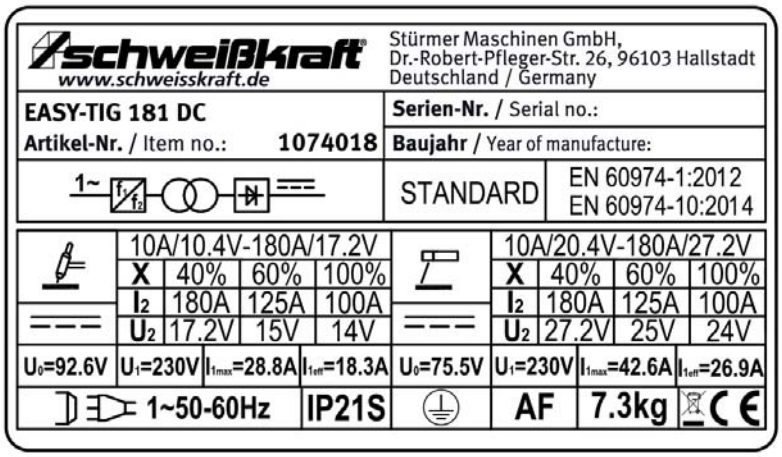


Fig. 3: Type plate EASY-TIG 181 DC

6 Transport, packaging, storage

6.1 Transport

Check the delivery

After delivery, check the device for visible transport damage. If you discover any damage to the device, report it immediately to the transport company or dealer.

6.2 Packaging

All used packaging materials and packaging aids are recyclable and should be taken to a materials recycling depot to be disposed of.

The delivery packaging is made of cardboard, so please dispose carefully by having it chopped up and given to the recycling collection.

The film is made of polyethylene (PE) and the cushioned parts of polystyrene (PS). Deliver these substances to a collection point for recyclable materials or to the waste disposal company which looks after your region.

6.3 Storage

The welding machine must be installed in closed, dry and well-ventilated rooms with room temperatures between 15 and 35 degrees. It must not be exposed to moisture or intense sunshine.

6.4 Installation conditions

The device has been designed for use in roofed rooms and must be set up in a dry environment.:

- Operating range above sea level: below 1000 metres.
- Application temperature range: -10°C to +40°C.
- Relative humidity in the environment must be below 90% (20°C).
- Place the unit at a certain angle to the floor. The angle must not exceed 15°.
- Protect the device from the influence of rain or direct sunlight in hot conditions.

- The content of dust, acid, harmful gases in the ambient air or substances must not exceed the normal standard.
- The ambient air must be free of dust, acids, salts or concentrations of iron or metal powders.
- Ensure that there is sufficient ventilation during welding.
- There must be at least 30 cm between the device and the wall.

Ensure that there is sufficient space in front of the device so that the operating elements can be easily reached and viewed. Position the unit so that the air inlet and outlet are not obstructed. Make sure that no metal parts, dust or other foreign objects can penetrate into the device.

DANGER! ELEKTRICAL CONNECTION

Do not use the device outdoors in the rain!
Ambient conditions must be adequate for IP21 protection!

Moving and positioning

When moving, handle the welding device carefully and do not tip it over. Please use the handle on the top of the welder to move the unit. Make sure that the welder is well positioned after it has been placed in the final working position. When the welder is used, it is necessary to fix it in place to prevent it from slipping. When using a forklift truck, its arm length must be long and wide enough to pick up and lift the welder according to its center of gravity.

The welding movements can lead to a possible danger or material hazard. Therefore, make sure that the machine is in a safe position before using it.

7 Scope of delivery

EASY-TIG 181 DC

- TIG inverter
- 3 m welding cable 16 mm² with electrode holder 300 A
- 3 m ground cable 16 mm² with ground clamp 300 A
- Torch ECR17 4 m
- 4 m gas hose including quick connector
- Operating instructions

EASY-TIG 201 DC PULSE

- TIG inverter
- 3m welding cable 16mm² with electrode holder
- 3m ground cable 16mm² with ground clamp
- Torch TIG 26 4m
- Gas hose 4m incl. quick connector
- Instruction manual

EASY-TIG 201 ACDC PULSE

- TIG inverter
- Gas hose 4m incl. quick connector
- Torch TIG 26 4m
- 3m ground cable 25 mm² with ground clamp
- Operating instructions

8 TIG Inverter characteristics

Current-carrying conductors generate electromagnetic fields (EMF). So far, no negative effect of these magnetic fields on health has been proven. Nevertheless, a hazard cannot be completely excluded.

NOTE!

For your own safety you should observe the following to minimize the electromagnetic field lines:

- Lay the cables as far away from your body as possible.
- Never wrap welding cables around your body.
- Ensure that the welding and and power cord sare as far away from the operator as possible.
- Connect the earth cable as close as possible to the welding point.
- Special care must be taken with pacemakers!

The TIG inverters are TIG welding machines with pulse width modulation and IGBT switching. The TIG series welders are equipped with the newest pulse width modulation (PWM) technology and insulated gate bipolar transistor (IGBT) power modules. Switching frequencies ranging from 20 kHz to 50 kHz are used to replace traditional line frequency transformer welding machines. Therefore, machines are characterized by portability, small size, low weight, low power consumption, low noise, etc. In welding, high frequency and high voltage are required to ignite the arc in order to ensure the success ratio of the arc.

In addition, these inverter power sources are characterized by low weight and excellent welding properties. All required parameters can be set on the operating display (gas pre-currents, start current, current rise, current reduction time, final current, gas post-currents, as well as the pulse parameters).

The TIG DC-series welding machines and the EASY-TIG 201 ACDC PULSE welding machine are suitable for welding in all positions for different sheets of stainless steel, carbon steel, alloy steel, titanium, magnesium, copper, etc. It is also used for welding work on pipes, repairing jobs, in the petrochemical industry, architectural decoration, car repair, in the bicycle industry, in crafts and general manufacturing.

Characteristics:

MMA - manual metal ARC welding

PWM - pulse width modulation

IGBT - Bipolar transistor with isolated gate electrode

TIG - Wolfram inert gas welding

TIG DC Characteristics:

- DC TIG and E-Hand (MMA), IGBT technology and pulse width modulation (PWM).
- High performance MCU, Digital control, Digital display.
- Preset all parameters with hold process.
- HF/Lift TIG, current down slope and up slope, gas post-flow, Pulse Frequency.
- Intelligent protection: over-voltage, under-voltage, over-current, over-heat.

1. E-Hand (MMA): polarity connection can be chosen according to different electrodes.

EASY-TIG 181 DC

ATTENTION!

Overloading

When electrode welding with the EASY-TIG 181 DC welding machine, welding may only be carried out with currents of up to 140 A. Electrode welding with higher currents leads to overloading and to fuse tripping.

2. For DC TIG, DCEP is used normally (workpiece connected to positive polarity, while torch connected to negative polarity). This connection has many characters, such as stable welding arc, low tungsten pole loss, more welding current, narrow and deep weld.

3. DC Pulsed TIG has the following characters:

1) Pulse heating. Metal in Molten pool has short time on high temperature status and freezes quickly, which can reduce the possibility to produce hot crack of the materials with thermal sensitivity.
2) The workpiece gets little heat. Arc energy is focused. Be suitable for thin sheet and super thin sheet welding.
3) Exactly control heat input and the size of the molten pool. The depth of penetration is even. Be suitable for welding by one side and forming by two sides and all position welding for pipe.
4) High frequency arc can make metal for microlite fabric, eliminate blowhole and improve the mechanical performance of the joint.
5) High frequency ARC is suitable for high welding speed to improve the productivity.

EASY-TIG 201 ACDC PULSE Characteristics:

- MCU control system, reacts immediately to any change.
- High frequency and high voltage for arc ignition to ensure the success of optimum arc ignition, reverse polarity ignition provides good ignition performance in TIG-AC welding mode..
- Prevention of arc interruption with the aid of special instruments as soon as the arc is interrupted, the HF keeps the arc stable.
- Pedal control for the welding current.
- TIG/DC application. When the tungsten electrode touches the workpiece, the current drops to the short circuit current to protect the tungsten electrode.
- Automatic protection function: Overvoltage, overcurrent, overheating. If one of the previous cases occurs, the alarm light on the front panel is switched on and the output current is cut off. This protects the unit from damage and increases the life of the unit..
- Two applications: AC inverter TIG/MMA and DC inverter TIG/MMA, outstanding welding performance with aluminium alloys, carbon steel, stainless steel, titanium.

The following welding process types can be selected on the front panel:

- DC MMA
- DC TIG
- DC pulse TIG
- AC MMA
- AC TIG
- AC pulse TIG

1. E-Hand (DC MMA): Selection of the polarity connection depending on the electrode coating.

2. E-Hand (AC MMA): With AC MMA, the magnetic flow can be avoided caused by the constant DC polarity.

3. DC TIG: DCEP is usually used for this purpose (workpiece connected to positive polarity, while torch connected to negative polarity). This connection has many characters, such as stable welding arc, low tungsten pole loss, more welding current, narrow and deep weld.

4. AC TIG: With the rectangular wave, the arc is much more stable than with the AC sine wave TIG. It is possible to obtain both the maximum penetration depth and the minimum tungsten pole loss at the same time and also a better cleaning effect.

5. DC TIG pulse welding has the following characteristics:

   1) Pulse heating. The metal has a short time to high temperature status in the molten bath and solidifies rapidly, reducing the possibility of hot cracking of the material with thermal sensitivity.
   2) The workpiece receives little heat. The arc energy is concentrated. It is suitable for welding thin sheets and very thin sheets.
   3) Precise control of the heat input and the size of the molten pool. The depth of penetration is uniform. It is suitable for welding from one side and forming from two sides and all welding positions when welding pipes.
   4) High frequency ARC can generate metal for microlite structure, eliminate air inclusions and improve the mechanical performance of the joint.
   5) High frequency ARC is suitable for high speed welding to improve productivity.

EASY-TIG 181 DC:

HF Mode:	HF TIG arc system for easy ignition of the arc free of impurities.
Inclined current reduction function/ gas post-flow time:	Adjustable current reduction function and post-flow time for TIG welding.
Additional function:	Automatic arc ignition, hot start and anti-adhesion control for greater control and ease of use when MMA welding.
2T/4T Trigger function:	Programs for the optimal selection of the current increase / current decrease by the torch trigger.
Digital display:	Digital display measuring device for accurate setting and reporting of welding performance.
Safety function:	Equipped with temperature, phase failure protection, voltage and current sensor for high protection..
Weight:	Extremely low weight and high flexibility.
Generator compatible:	Designed to work with diesel generators and to avoid breakdowns due to voltage peaks.

8.1 Function principle

The function principle of the EASY-TIG 181 DC and EASY-TIG 201 DC PULSE is shown as the following figur. Single phases work frequency AC 220V (50 Hz) is rectified into DC, then is converted to medium frequency AC by inverter device (IGBT), after reducing voltage by medium transformer (the main transformer) and rectifying by medium frequency rectifier (fast recovery diode), and is outputted by inductance filtering. The circuit adopts current feedback control technology to insure current output stably. Meanwhile, the welding current parameter can be adjusted continuously and steplessly to meet with the requirements of welding craft.

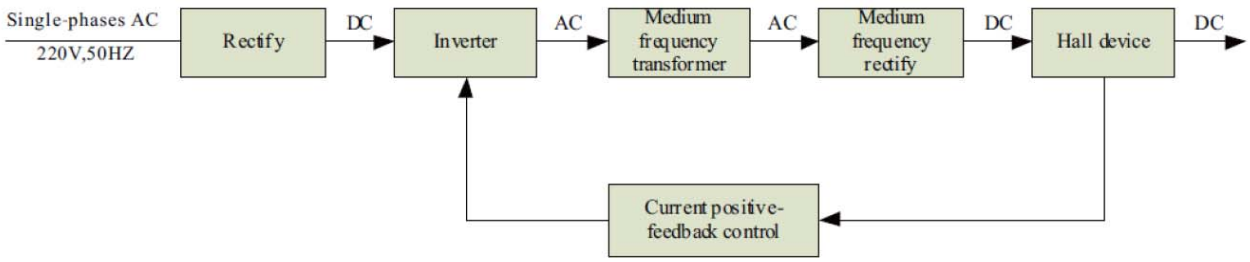


Fig. 4: Function principle of EASY-TIG 181 DC and EASY-TIG 201 DC PULSE

The function principle of the EASY-TIG 201 ACDC PULSE is shown as the following figur. Single-phase 220V work frequency AC is rectified into DC (about 312V), then is converted to medium frequency AC (about 40KHz) by inverter device (IGBT module), after reducing voltage by medium transformer (the main transformer) and rectifying by medium frequency rectifier (fast recovery diodes), then is outputted DC or AC by selecting IGBT module. The circuit adopts current feedback control technology to insure current output stably. Meanwhile, the welding current parameter can be adjusted continuously and steplessly to meet with the requirements of welding craft.

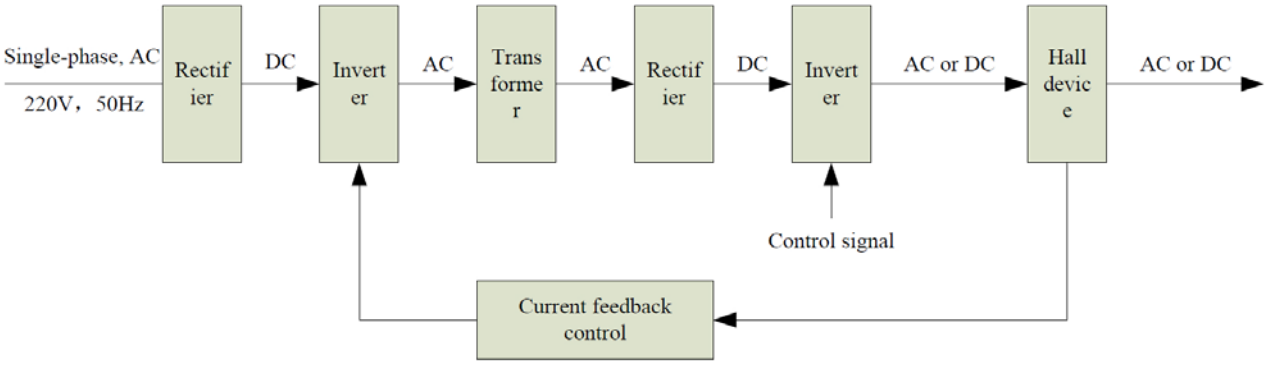


Fig. 5: Function principle of EASY-TIG 201 ACDC PULSE

8.2 Volt-Ampere Characteristic

The TIG-Inverters EASY-TIG 181 DC, EASY-TIG 201 DC PULSE and EASY-TIG 201 ACDC PULSE have an optimized volt-ampere characteristic (see diagram). In TIG mode, the ratio between nominal voltage U_2 and welding current I_2 is as follows:

IF $I_2 \leq 600$ A, $U_2 = 10 + 0{,}04\ I_2$ (V);

IF $I_2 > 600$A, $U_2 = 34$ (V)

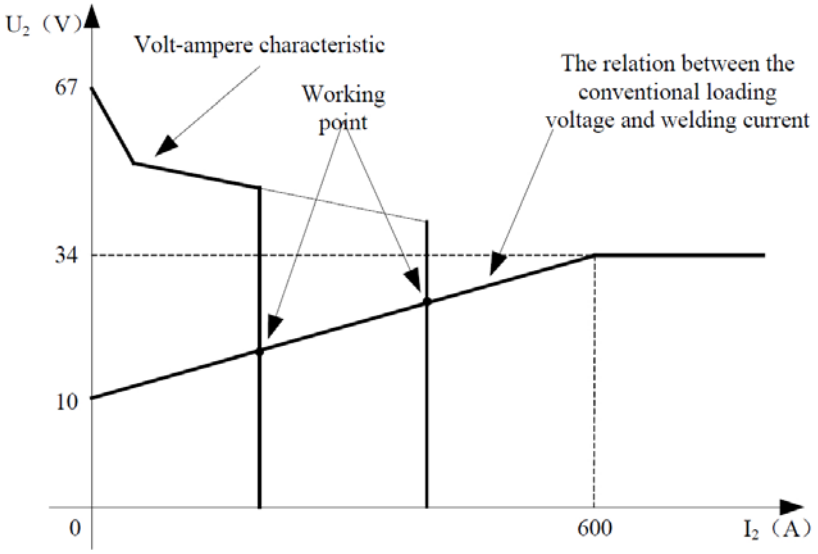


Fig. 6: Volt-Ampere Characteristic

8.3 Duty cycle and thermal protection

The "X"-axis stands for Duty Cycle, which is defined as the portion of the time a welding machine can weld continuously with it's rated output current within a certain time cycle (10 minutes).

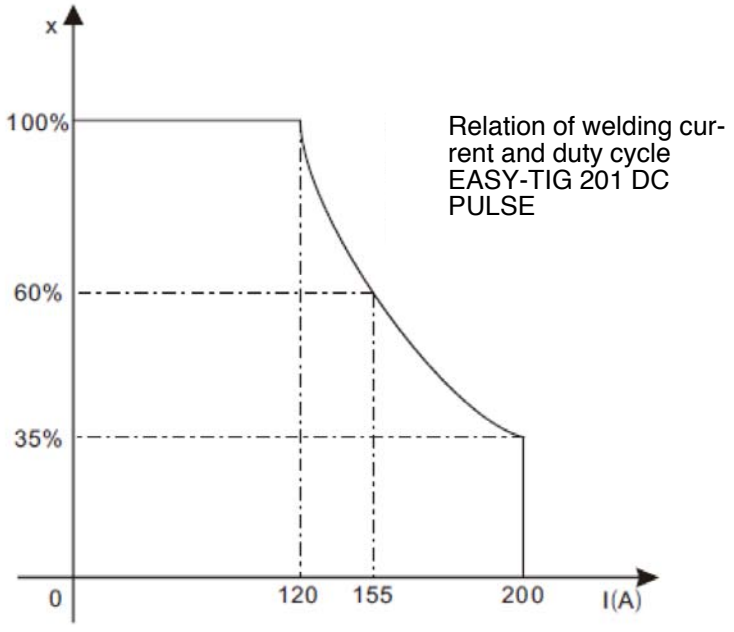


Fig. 7: Relation of welding current and duty cycle

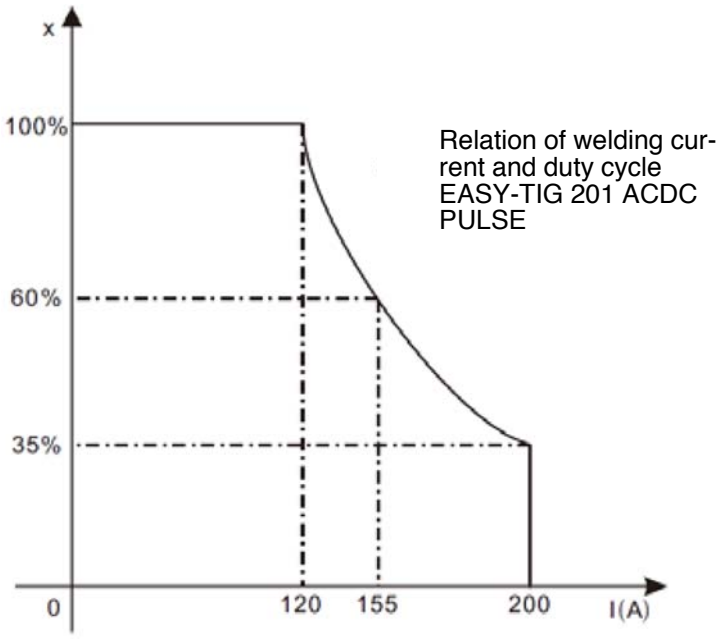


Fig. 8: Relation of welding current and duty cycle

If the welding device overheats, the thermoswitch responds and puts the welding device out of operation

Indication: The LED alarm indicator is licht up red.

In that case, the machine should not be welding for 10-15 minutes to cool down with the fanrunning.
When operating the machine again, the welding output current or the duty cycle should be reduced.

At particularly high ambient temperatures, in combination with difficult operating conditions of the machine, the light indicating overheating of the generator may light up on the display.

At the end of the cooling cycle, the display automatically returns to the original display.

8.4 Assembly of equipment (TIG)

DC POSITIVE CONNECTION

The workpiece is connected to the positive electrode of the welding machine and the welding torch is connected to the negative electrode. In general, the DC POSITIVE CONNECTION is operated in TIG welding mode.

DC NEGATIVE CONNECTION

The workpiece is connected to the negative electrode of the welding machine and the welding torch is connected to the positive electrode.

Equipment

Components:

- Welding torch control cable consisting of two wires.
- Pedal control consisting of 3 wires.
- Flight socket (has 14 cables for EASY-TIG 201 DC PULSE, EASY-TIG 201 ACDC PULSE).
- Wear parts for the TIG welding torch, e.g. tungsten electrode, tip, gas nozzle, electrode shield (short/long).

When using welding equipment with the HF ignition method, the ignition spark may cause interference in the equipment near the welding equipment. Make sure that special safety precautions or shielding measures are taken.

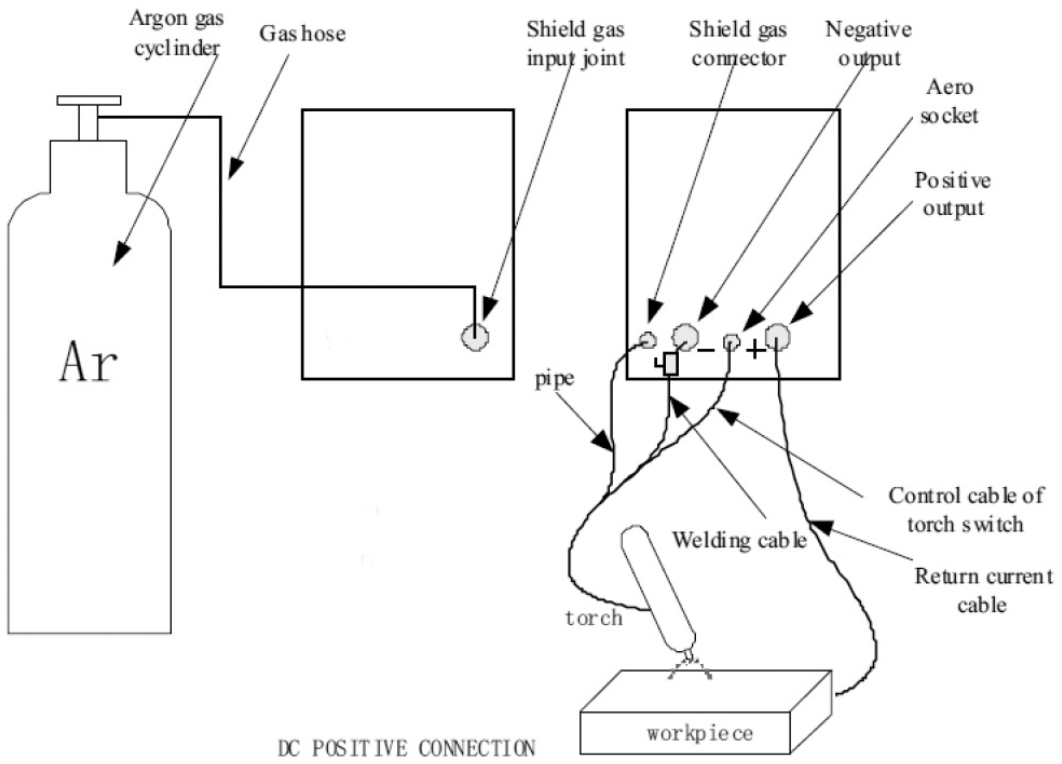


Fig. 9: Connecting the equipment to the EASY-TIG 201 DC PULSE

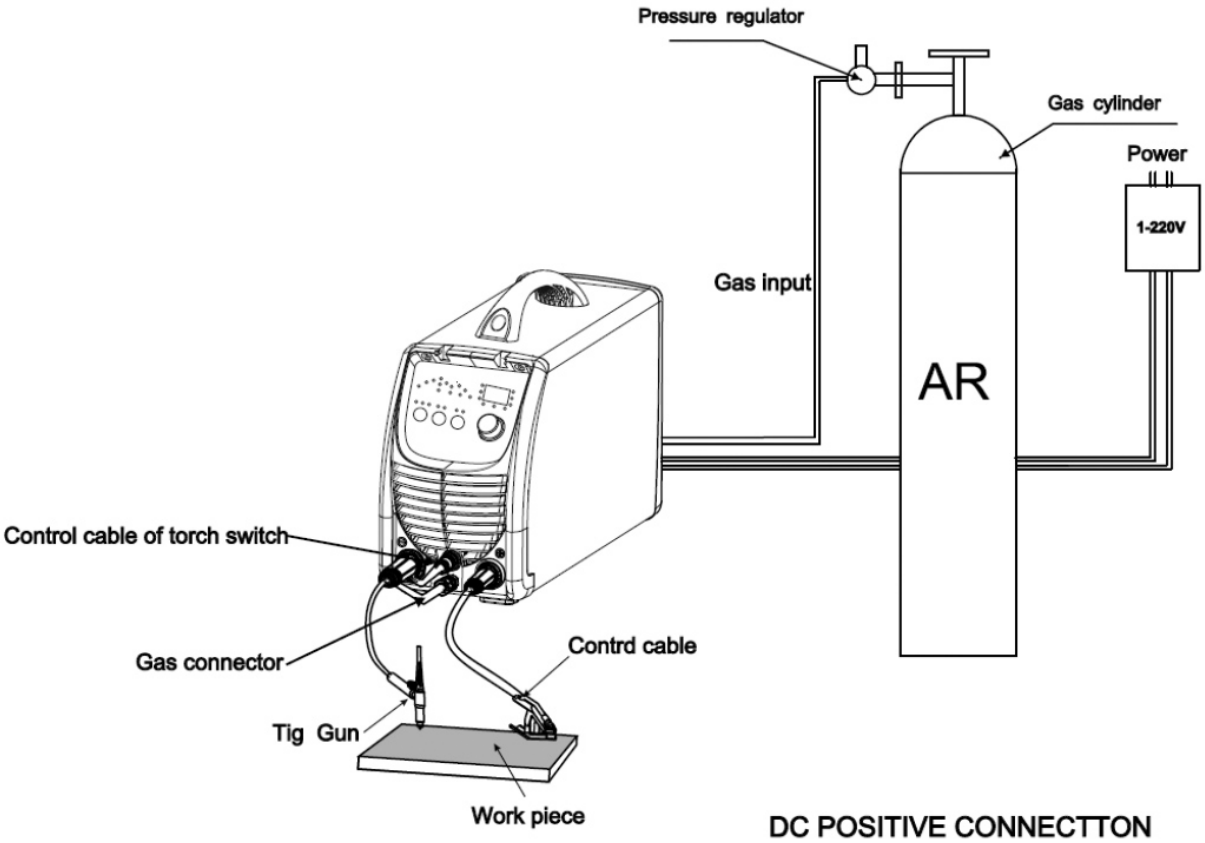


Fig. 10: Connecting the equipment

8.5 Polarity connection (MMA)

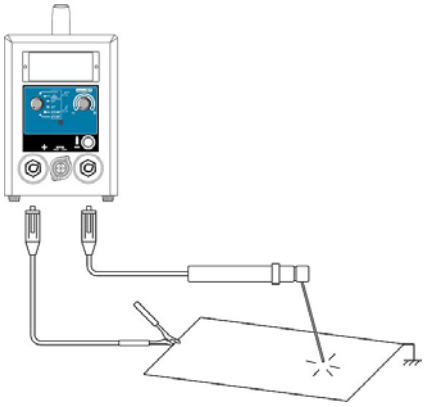


Fig. 11: Polarity connection

MMA (DC): Select the connection type DCEN or DCEP according to the electrode to be used. Refer to the Electrode instructions for information.

The provided cables are for the connection of the welding material with the device. The welding material must be clean at the connection with the ground clamp to achieve good contact. The ground clamp must always be connected directly to the workpiece and to ¨+¨ or ¨-¨ Connection on the device side - according to the instructions of the electrode manufacturer.

EASY-TIG 201 DC PULSE:

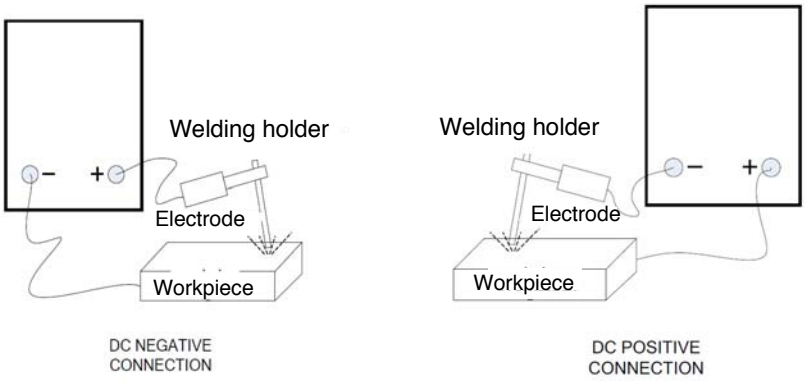


Fig. 12: DC connection options

EASY-TIG 201 ACDC PULSE:

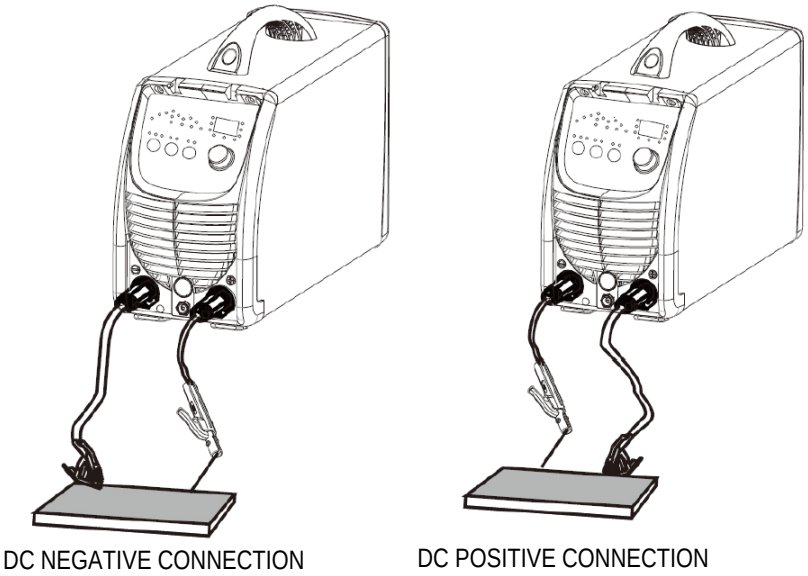


Fig. 13: DC connection options

EASY-TIG 181 DC:

Two sockets are available for connecting the output cables to this welding machine. In E-Hand welding, the electrode holder is connected to the positive

socket, while the ground wire (workpiece) is connected to the negative socket, called DCEP.

Depending on the electrode, however, a different polarity is required for optimum results and therefore polarity should be taken into account. Information on correct polarity can be found in the information provided by the electrode manufacturers.

DCEP: Electrode is connected to the "+" pole socket.

DCEN: Electrode is connected to the "-" pole socket.

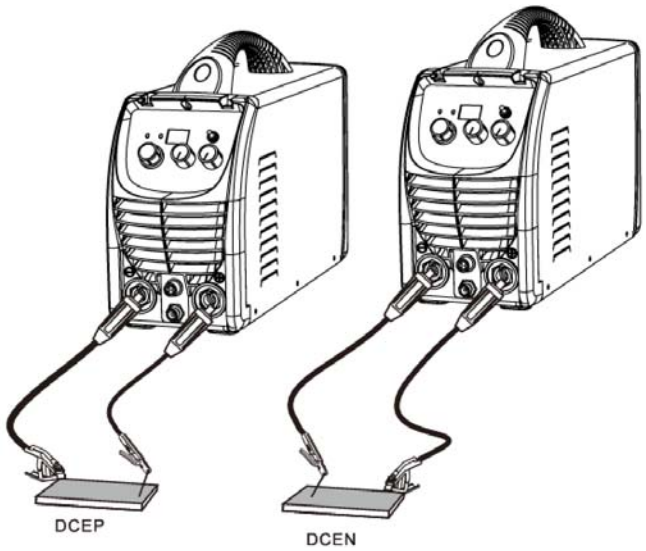


Fig. 14: DC connection options

Step 1: Connect the ground cable to the "-" pole, fastening it clockwise.

Step 2: Connect the ground clamp to the workpiece. The contact with the workpiece must be a solid contact with clean, bare metal, without corrosion, paint or scale at the contact point.

Step 3: Connect the electrode leads to the "+", turn it clockwise to tighten.

Step 4: Each unit is equipped with a power cord. This should be connected to the input voltage of the welding power cable at the appropriate position. Be sure to select the correct voltage.

Step 5: Ensure good contact with the appropriate input of the power supply connector or socket to prevent oxidation.

Step 6: Measure with a multimeter whether the input voltage is in the fluctuation range.

Step 7: The power supply ground must be well grounded.

9 Description of the operating and connection elements

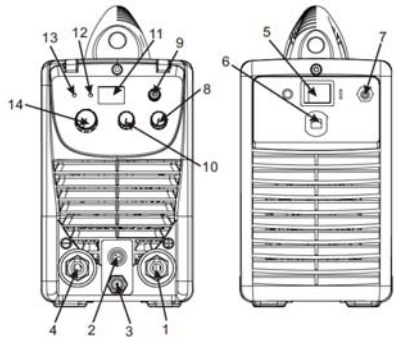


Fig. 15: Operating and connection elements

EASY-TIG 181 DC:

1. „+“ Connection: Positive output of the welding machine with reference to polarity.
2. TIG welding torches Remote control Connection socket.
3. Inert gas connection: Is connected to the gas inlet of the welding torch.
4. „-“ Connection: Negative output of the welding machine with reference to polarity.
5. Power supply switch: In "ON" position, the welding machine is switched on. In "OFF" position, the welder is switched off.
6. Power Source Inlet: Connects the power source.
7. Quick connection for the shield gas: For connecting one coupling of the gas hose. The other end of the gas hose is connected to the argon cylinder.
8. TIG adjustment knob for the gas post-flow.
9. Selector switch for welding output mode: TIG 2T, TIG 4T or MMA mode.
10. Control knob for the power-down mode
11. Digital power display counter
12. Warning light
13. Power indicator light: Lights up when the input voltage is connected and the machine is switched on.
14. Knob to control the welding current

Detailed description of the operating elements:

Knob to control the after-flow time:

Controls the period in which the shielding gas continues to flow after the arc has stopped. This protects the weld area and tungsten from contamination while it is still hot enough to react with atmospheric gases after the weld is completed. Set the run-on time (0 - 7 s) by turning the knob during TIG welding.

Knob for setting the reduction of the welding current:

When the trigger is released, the current decreases gradually over the time set to 0. This allows the operator to complete the weld without leaving a crater at the end of the weld pool. Set the run-on time (0-10 s) by turning the knob during TIG welding.

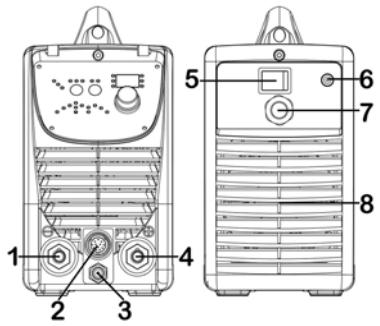


Fig. 16: Operating and connection elements

EASY-TIG 201 DC PULSE:

1 Connection : Negative output of the welder with respect to polarity..

2 Socket: Is connected to the welding torch control switch cable..

3 Protective gas connection for connecting the torch.

4 " + " connection: positive output of the welder with respect to polarity.

5 Toggle switch of the power supply: In the "I" position, the welder is switched on. In the "O" position, the welder is switched off.

6 Quick connector for the shielding gas: For connecting one coupling of the gas hose. The other end of the gas hose is connected to the argon gas cylinder.

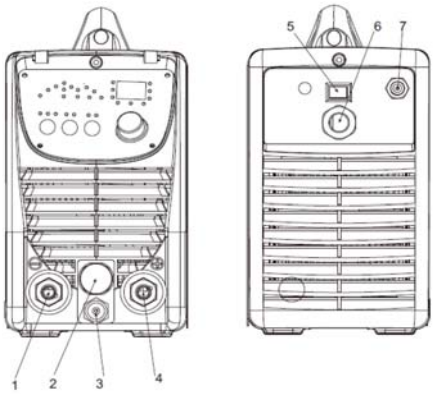


Fig. 17: Operating and connection elements

7 Mains cable connection

8 Fan for cooling the unit

EASY-TIG 201 ACDC PULSE:

1. „-“ Connection: Negative output of the welding machine with reference to polarity.
2. Aero socket: Is connected to the torch control switch cable (equipped with14 wires and line 8 - line 9 are connected to the torch switch control cable).
3. Inert gas connection: Is connected to the gas inlet of the welding torch.
4. „+“ Connection: Positive output of the welding machine with reference to polarity.
5. Power source switch: Switch to “ON”, the welder is turned on, while switch to “OFF”, the welder is turned off.
6. Power source input: To connect power source.
7. Shield gas input joint: To connect one head of the gas hose while the other head of which is connected to argon gas cylinder

Control panel

Overview:

Main features of the control panel are the logical way in which the control is arranged. All the main parameters needed in daily use can be easily set:

- Can be selected using the keys.
- Modified with the setting dial.
- shown on the display during welding.

The figure below shows an overview of the main settings needed for daily use. In the following section you will find a detailed description of these settings.

EASY-TIG 181 DC:

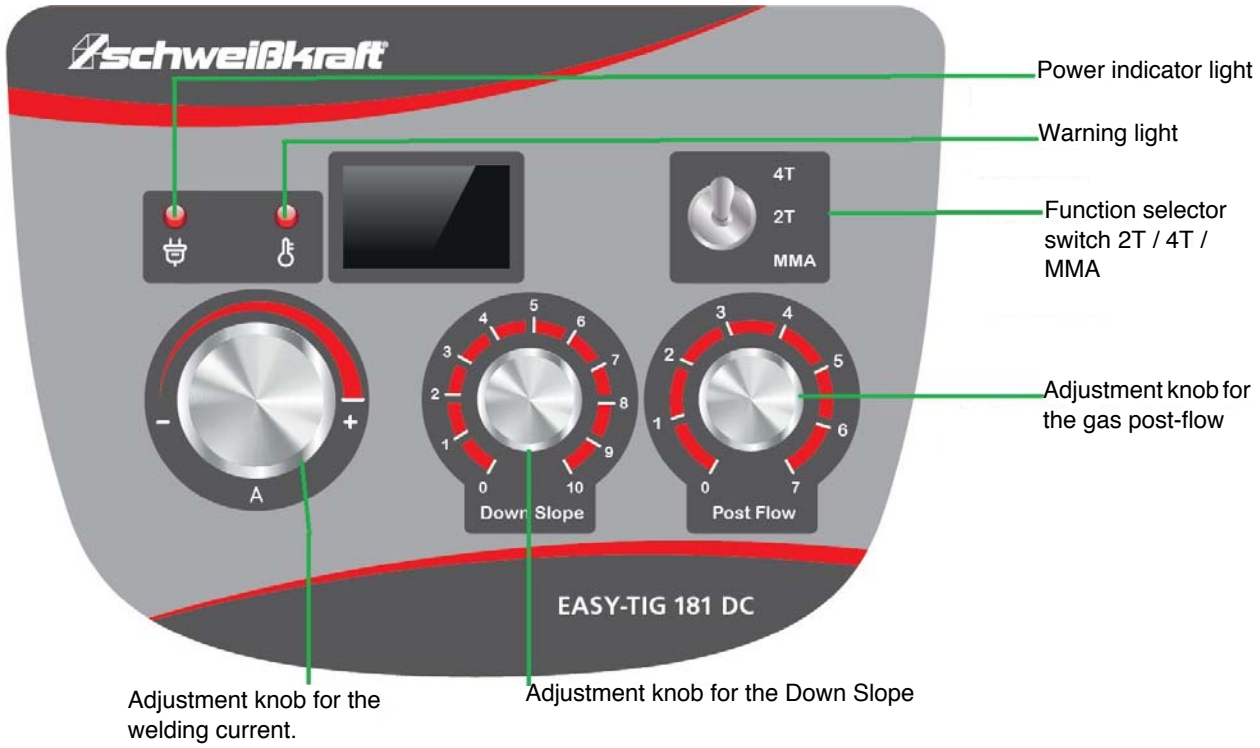
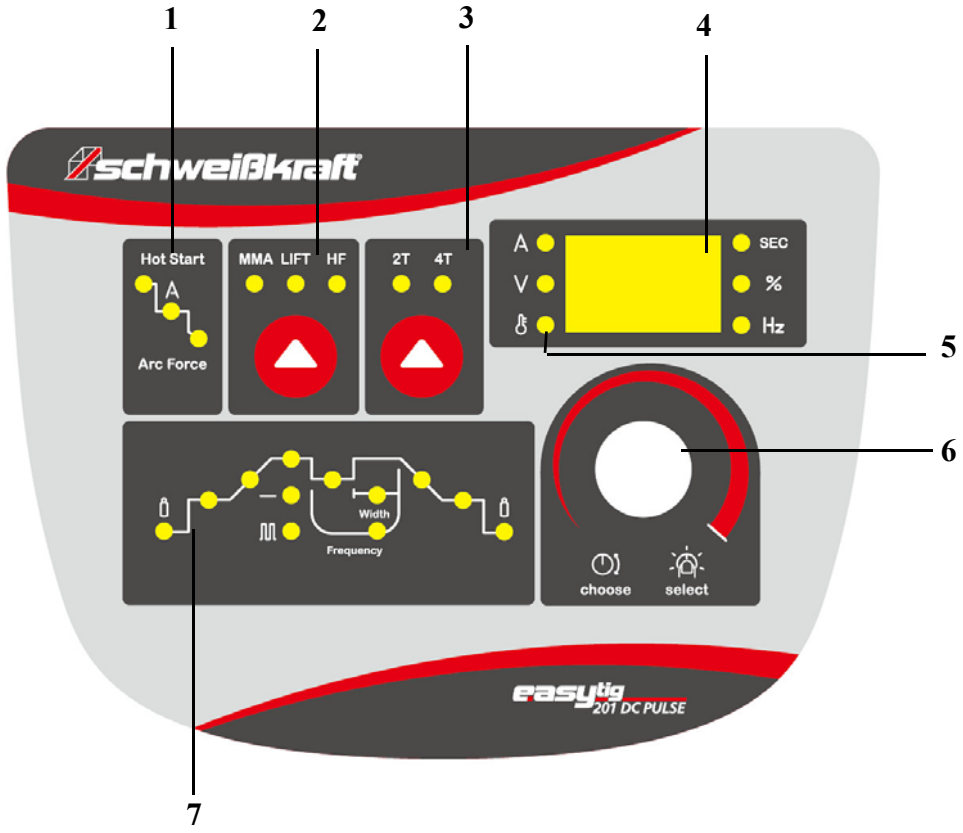


Fig. 18: Control panel EASY-TIG 181 DC

EASY-TIG 201 DC PULSE:



1 MMA parameters set

2 Function selection key

3 Selection 2/4T Mode

4 Parameter display

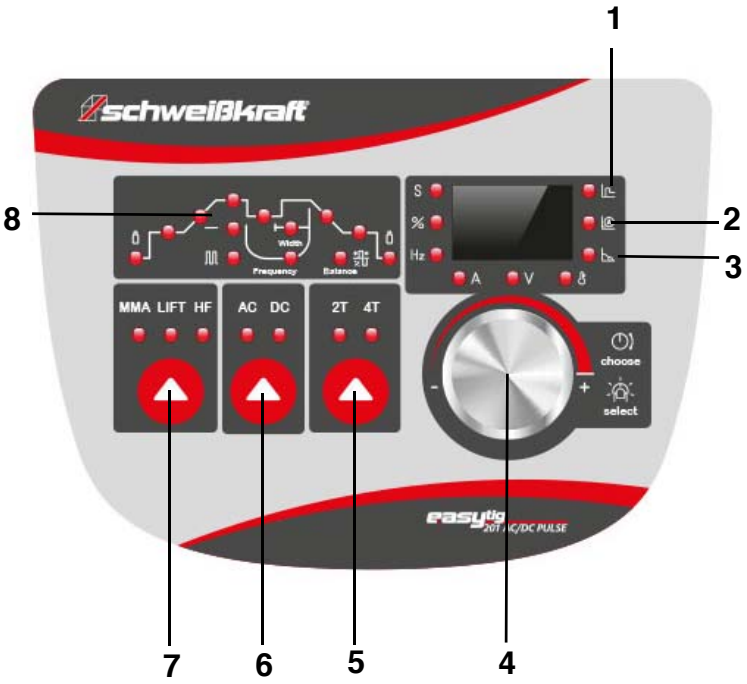
5 Alarm indicator

6 Key for selecting and setting the parameters

7 TIG parameters

Fig. 19: Contrl panel EASY-TIG 201 DC PULSE

EASY-TIG 201 ACDC PULSE:



1 Hot start

2 Welding current

3 Electric arc force

4 Parameter selection and setting button

5 TIG 2T/4T-Mode selection button

6 AC/DC selection button

7 MMA/LIFT/HF TIG selection button

Fig. 20: Control panel EASY-TIG 201 ACDC PULSE

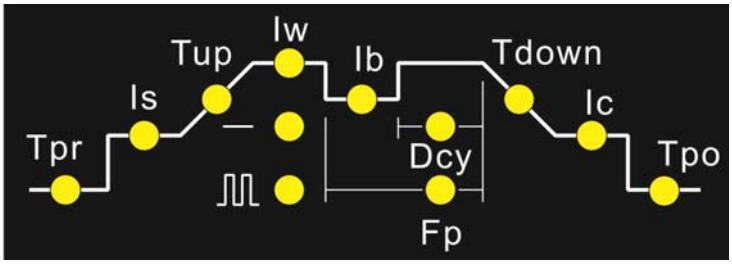
TIG mode selection key of the models:

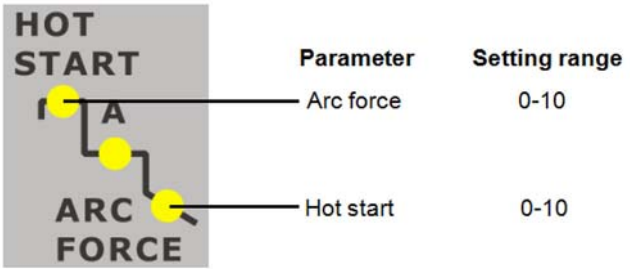
- EASY-TIG 181 DC (Fig. 19 top right)
- EASY-TIG 201 DC PULSE (Fig. 19 top right)
- EASY-TIG 201 ACDC PULSE (Fig. 20)

Select and set parameters for the models:

Press the encoder to select the parameter, if the parameter indicator lights up, the selected parameter can be changed via the setting dial.

Overview of parameters for EASY-TIG 201 DC PULSE:

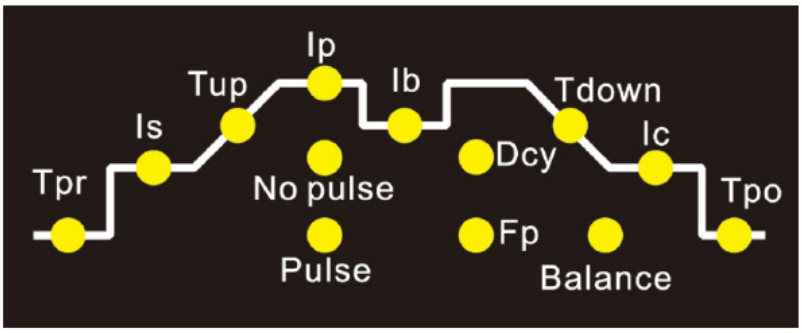




Adjustable parameters after selection of 2T or 4T mode		
Tpr	**Gas pre-flow time**	
Unit	S	
Setting range	0 - 2	
Factory setting		
Is	**Starting current (only with 4T)**	
Unit	A	
Setting range	5 -100% of main current Iw	
Factory setting		
Tup	**Upslope time**	
Unit	s	
Setting range	0 - 10	
Factory setting		
Iw	**Welding current**	
Unit	A	

Adjustable parameters after selection of 2T or 4T mode		
EASY-TIG 201 DC PULSE	DC PULSE 5-200	
Ib	**Base current**	
Unit	A	
EASY-TIG 201 DC PULSE	DC PULSE 5 - 200	
Important! Only selectable when "pulse key" has been pressed.		
Dcy	**Ratio of pulse duration to base current duration**	
Unit	%	
Setting range	5 - 95	
Factory setting		
Important! Only selectable when "pulse key" has been pressed.		
Fp	**Pulse frequency**	
Unit	Hz	
Setting range	0,5 - 200	
Factory setting		
Important! Only selectable when "pulse key" has been pressed.		
Tdown	**Downslope time**	
Unit	S	
Setting range	0 - 10	
Factory setting		
Ic	**Crater arc current (only with 4T)**	
Unit	A	
Setting range	5 -100% of main current Iw	
Factory setting		
Tpo	**Gaspost-flow time**	
Unit	S	
Setting range	1 - 10	
Factory setting		

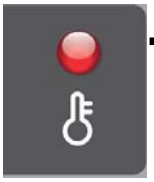
Overview of parameters for EASY-TIG 201 ACDC PULSE:



Adjustable parameters after selection of 2T or 4T mode		
Tpr	**Gas pre-flow time**	
Unit	S	
Setting range	0 - 2	
Factory setting		
Is	**Starting current (only with 4T)**	
Unit	A	
Setting range	10 -170 (DC); 10 - 200 (AC)	
Tup	**Upslope time**	
Unit	s	
Setting range	0 - 10	
Ip	**Welding current**	
Unit	A	
EASY-TIG 201 ACDC PULSE	10 - 170 (TIG -DC); 10 - 200 (TIG-AC)	
Ib	**Base current**	
Unit	A	
EASY-TIG 201 ACDC PULSE	10 - 170 (TIG -DC); 10 - 200 (TIG-AC)	
Dcy	**Ratio of pulse duration to base current duration**	
Unit	%	
Setting range	5 - 95	
Factory setting		
Fp	**Pulse frequency**	
Unit	Hz	
Setting range	0,5 - 200	
Tdown	**Downslope time**	

Adjustable parameters after selection of 2T or 4T mode		
Unit	S	
Setting range	0 - 10	
Ic	**Crater arc current (only with 4T)**	
Unit	A	
Setting range	10-170 (DC); 10-200 (AC)	
Tpo	**Gaspost-flow time**	
Unit	S	
Setting range	0 -10	
Zykluslänge (nur bei TIG-AC)		
Unit	S	
Setting range	-5 - +5	
The cycle length setting is mainly used to set the setting for elimination of metal oxides (such as aluminum, magnesium and its alloys) during AC output.		

Warning light (EASY-TIG 181 DC, EASY-TIG 201 DC PULSE und EASY-TIG 201 ACDC PULSE):



Light up if the welding machine overheat

Fig. 21: Display of overheating protection

Welding current and other parameter display by EASY-TIG 201 DC PULSE:

Before start of welding Indicate the open-circuit voltage when you push the enconder for 3s and the display shows the pre-set value of Tpr ,Is ,Tup,Iw,Dcy,Iw,Fp,Ib,Tdown,Ic,Tpo . After the start of welding, display shows the present actual value of the welding current.

The control panel indicates which position has been reached in the welding process by brightening the light.

NOTE: Only the Iw of TIG or the welding current of MMA can be adjust when welding!

Control via pedal switch on model EASY-TIG 201 ACDC PULSE

After plugging in the foot pedal connector (fourteen pins), the welding torch will identify the foot pedal switch. The welding power button on the front panel will become unusable and only the 2T mode can be selected.

The maximum welding current can be set on the side of the pedal by using the adjustment knob.

The eighth and ninth of the fourteen pins of the connector switches the welding gun. The first and the second of the fourteen pins of the plug are short-circuited. The third, fourth and fifth of the fourteen pins is for the adjustable pedal resistance.

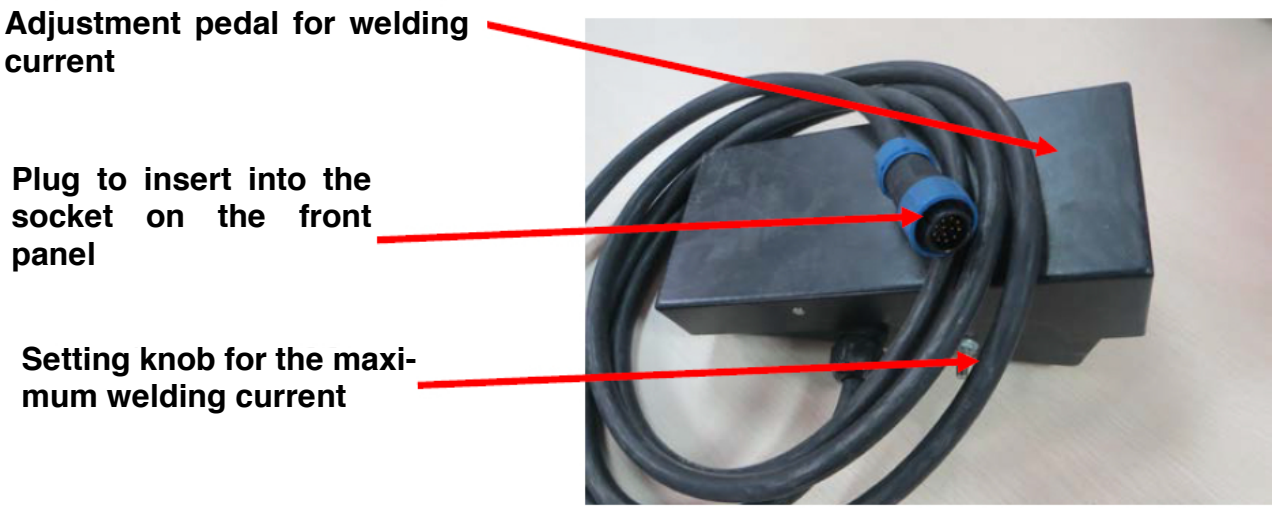


Fig. 22: Pedal control for the welding current

Replacement of welding pistol and adjustment of the control current for the model EASY-TIG 201 ACDC PULSE

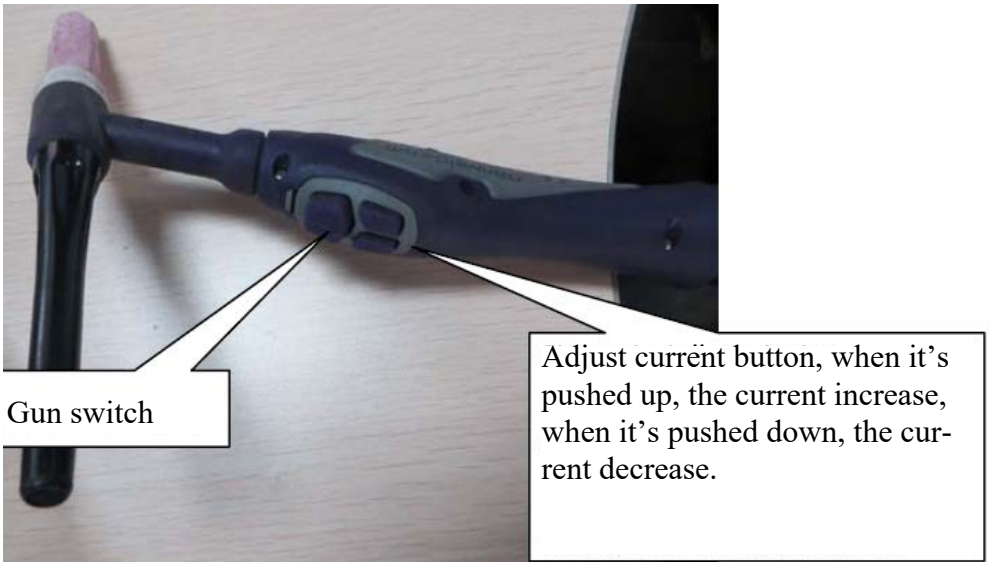


Fig. 23: Replacement of welding pistol torch

Replacement of welding gun and adjustment of the control current for the model EASY-TIG 181 DC

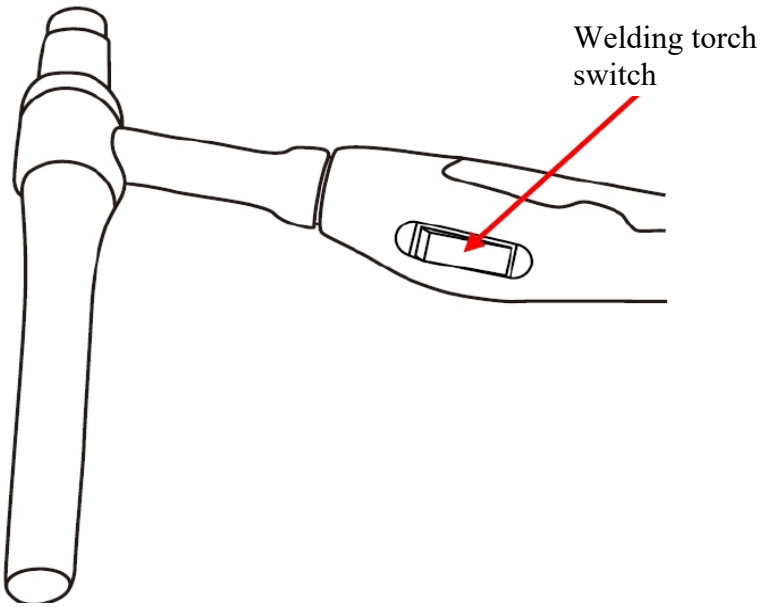


Fig. 24: Welding torch switch

10 EMC measures

Fig. 25: EMC

In the special situation, The specified area may be affected, the standard of radiation limit value has been complied with (eg: The device, which is easy effected by electromagnetism, is used at the installation location, or there is radio or TV near the installation location). In this condition, the operator should adopt some appropriate measures to remove interference.

Accoring to the domestic and international standards, the ambient devices' electromagnetism situation and anti-interference ability must be checked:

- Safety device
- Power line, Signal transmission line and Date transmission line
- Date processing equipment and telecommunication equipment
- Inspection and calibration device

The effective measures avoid the problem of EMC:

a) Power source:

Even though the power source connection meet rules, we still need to take additional measure to remove the electromagnetic interference (eg: Use the right power filter).

b) The welding line:

- Try to shorten the length of cable
- Put the cable together
- Be Far away from other cable

c) Equipotential connection

d) Ground connection of work-piece:

- When necessary, use appropriate capacitance to connect the ground.

e) Shielding, when necessary:

- Shield the ambient devices
- Shield the whole welding machine

Radiation Class B device:

It can meet the radiation requirements of residential area and industrial area. It also can be used in residential area which power is supplied by public low voltage circuit.

Hi-zone welding machines belong to Class A.

11 Welding

With the EASY-TIG welding machine, most materials can be welded using the TIG method.

Welding with rod electrodes is also possible. The Easy-TIG machines have the function "Arc Force".

Display overheating:

If the device is overheated, it is displayed on the panel. Overheating can occur after long welding with high current. After the unit has cooled down, the previous display appears again.

WARNING!

Danger in case of insufficient qualification of the staff!

Insufficiently qualified persons cannot assess the risks when handling the machine and expose to the danger of serious or fatal injuries themselves and others.

- All work must only be carried out by qualified personnel.
- Keep insufficiently qualified persons away from the work area.
- Keep unneeded personnel away from the work area and the surrounding area.

DANGER OF EXPLOSION!

- Do not weld in rooms where there is a risk of fire or explosion. Special regulations apply here!
- No welding work may be carried out on containers in which gases, fuel, oils, dyes or the like have been stored, even if they have been emptied for a long time. There is a risk of explosion due to residues.
- Do not carry out welding work near pressurised containers.
- Do not weld in environments where dust, gas or explosive vapours are present.
- Do not use damaged or leaking gas cylinders.
- Never touch the gas cylinders with the electrode or other live parts!

DANGER! ELECTRICAL VOLTAGE!

- Open-circuit voltage is present when the device is switched on. Never touch the electrode with any part of your body!
- Do not use the unit outdoors in the rain!
- Do not connect welding equipment together. The open circuit voltage could lead to fatal injuries!
- The wire, the drive roller, the wire feed housing and all metal parts touching the welding wire are live!
- Never touch simultaneously live heated parts of electrode holders which are connected to two welding devices. The voltage between the parts can be the total of the open circuit voltage!

WARNING!

DANGER FROM DUST AND GASES!

During welding hazardous gases are produced:

- Avoid inhalation of harmful substances.
- During the welding process, keep your head as far away as possible.
- Ensure sufficient ventilation, suction or, if necessary, supply of breathing air.
- Take special care when welding stainless steel electrodes, hardfacing electrodes and over-welding coatings!
- Never weld near chlorinated hydrocarbons. Together with the arc they form a lethal poison gas mixture.
- Protective gases can displace the breathing air and lead to suffocation. Therefore, always ensure adequate ventilation. Many gases used in welding are invisible and odourless.
- Use approved breathing apparatus.
- Read and understand the operating instructions of the filler material manufacturers and carefully read the safety data sheets.
- When opening the gas valve, never face the valve and open the valve slowly.
- Switch off the protective gas supply when not in use

WARNING!

- Protect your body and eyes from electric arc radiation.
- Ensure adequate ventilation of the machine.
- Switch off the machine if welding is not taking place. (Energy consumption)
- If the device switches to safety mode, check the error before switching the device off and on again.

NOTE!

The welding equipment may only be operated by persons who have been instructed in the use of welding machines and are familiar with safety regulations.

Always wear protective clothing when welding and ensure that other persons are not exposed to the UV radiation of the arc.

NOTE!

The welding equipment may only be operated by persons who have been instructed in the use of welding machines and are familiar with safety regulations.

Always wear protective clothing when welding and ensure that other persons are not exposed to the UV radiation of the arc.

NOTE!

Always make sure that the ground connection is correctly attached to the component.

Attach the earth connection as close as possible to the spot to be welded. Frame constructions, chains, cables or the like can lead the earth incorrectly and cause fires.

Make sure that the welding device, the workpiece clamps, the electrode holder and the earth cable are in good condition. Replace damaged cables immediately.

Never cool the electrodes with water!

RISK OF FIRE!

- Avoid the dispersion of open fire, which can be caused by sparks, slag and glowing material.
- Fire protection devices must be in the vicinity of the workplace.
- Remove flammable materials and fuels from the work area.
- Never weld next to flammable materials.
- Have suitable extinguishing agents ready.

RISK OF FIRE!

- Special safety regulations apply to compressed gases.
- Never weld on tanks or containers until you know exactly what was inside and whether the appropriate protective measures should be taken.
- Make sure that no part of the electrical circuit comes into contact with the workplace or the floor if you do not weld

WARNING!

Danger due to burns!

Moving parts or thermal parts can damage your body or other people.

- Workpieces become very hot during welding, wear suitable protective clothing.
- Make sure that the wire, the electrode, the electrode coil, the welding head, the nozzle and the semi-automatic welding gun are heated by the current and become very hot!

ATTENTION!

Welded connections which are subject to special stresses and must meet high safety requirements may only be carried out by specially trained and tested welders.

ATTENTION! MAGNETIC FIELD!

Magnetic fields from power circuits can influence the function of pacemakers. Persons wearing vital electronic devices of this type must consult their physician before being in areas where such welding equipment is present.

Interference may occur in the following areas/devices. Appropriate countermeasures must be taken:

- Data transmission systems,
- Communication systems,
- Control,
- Security devices,
- Calibration and measuring equipment.

DANGER! ELECTRICAL VOLTAGE!

- Never touch any live parts!
- There is a danger of an electric shock!
- Always wear dry and closed gloves and flame-retardant clothing with insulating properties.

WARNING!

Risk of hearing damage due to noises!

You must protect your ears from loud noise to avoid permanent hearing loss or damage.

- To protect your hearing from loud noises, wear ear plugs and/or ear plugs. Protect others in the workplace.
- The noise level should be measured to ensure that the decibel number (sound) does not exceed the safe level for the hearing.

WARNING!

Danger from sparks and welding spatter!

- The arc throws the spatter and sparks. Always wear oil-free protective clothing! Cover your hair with a cap.
- Wear ear plugs when welding in a constrained position or in small spaces.
- Always wear safety glasses with side shields when you are in a welding zone.

APPLICATION INSTRUCTIONS

- Connect the protective conductor directly to the machine.
- Switch off the motor when the welding machine is not used to save energy.
- If the mains switch switches off in a protective manner due to a fault. Do not restart until the problem is solved. Otherwise the problem area will be extended.

WARNING!

Danger due to incorrect storage and incorrect use of inert gas cylinders!

- Only use inert gases in cylinders designed for this purpose.
- Ensure that all gas lines and hoses are intact.
- Ensure that inert gas cylinders are properly secured. Always keep the cylinders in an upright position, e.g. securely chained, on a chassis or fixed support.
- When storing the bottles, make sure that they are properly secured and that there are no mechanical or thermal hazards.
- Store the gas cylinder at a safe distance from the arc and hot parts.
- If the gas cylinder is not in use, close it with the protective cap.
- Always keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Use only compressed gas cylinders that contain the correct inert gas for the process and properly functioning regulators. The components must be designed for the gas and pressure used.
- All hoses, clamps, etc. must be suitable for the application, maintained and in good condition.
- Never allow the electrode, electrode holder or any other "hot" part to touch a gas cylinder.
- Protect gas cylinders from excessive heat, mechanical shock, physical damage, slag, open flames, sparks and electric arcs.
- Never let the welding electrode or ground clamp touch the gas cylinder, do not lay any cables over the cylinder.

WARNING!

Danger from the arc!

- Ensure that persons standing nearby have sufficient protection against the arc and wear protective goggles.
- Prevent uninvolved persons from looking into the arc.

WARNING!

Danger from rotating parts!

- Moving or rotating parts can damage their bodies or other people. Never touch moving parts with your limbs!
- Keep all guards, covers and equipment in place and in good condition.
- Keep hands, hair, clothing and tools away from V-belts, gears, fans and other moving parts when starting, operating or repairing equipment.

DANGER! ELECTRICAL VOLTAGE!

- Make sure that the insulation of the workplace is such that no person can be physically damaged by contact with the workplace.
- Always make sure there is insulation between your body and the component.
- Special care and precautions should be taken when using the welder and equipment in confined spaces.
- Take care not to use the welding device in a humid environment.
- Make sure that the welder is always standing securely so that it cannot fall down. Use a safety catch for the unit when working at great heights.
- When working at higher altitudes above the ground, wear a safety harness to avoid a dangerous fall if you are exposed to an electric shock.
- Do not switch on the machine until all cables have been connected correctly.
- Ensure that all accessories are correctly connected and that the ground connection is always correct.

11.1 Welding methods

The selector switch can be used to switch between TIG and electrode welding.

11.2 Welding current

The desired welding current intensity can be set steplessly from the minimum value to the maximum value with the rotary knob. The set value can be read on the display.

11.3 2-T Operation

If the machine is set to 2-T operation, the welding process is started when the torch button is pressed. If the torch button is released, the current is reduced to a fixed value and the arc extinguishes.

11.4 4-T Operation

If the system is set to 4-T operation, the welding process starts with 50% of the set welding current when the torch button is pressed. When the torch button is released, the welding current rises to the set value. When the torch button is pressed again, the welding current drops to a pre-set value. Releasing the button results in the extinction of the arc.

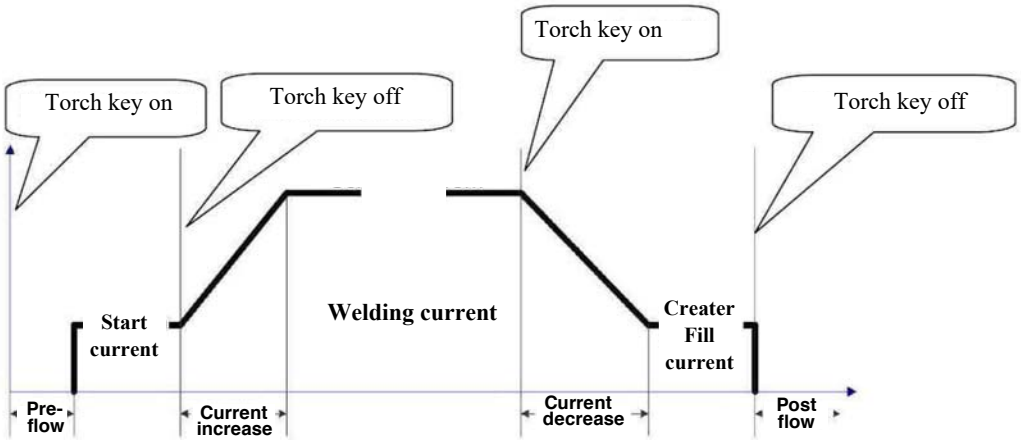


Fig. 26: 4-T operation

Pre-flow and post-flow are important when welding sensitive materials. The weld seam is well covered with shielding gas before and after welding. The duration of the pre-flow and post-flow regulates how long the gas flows before and after the arc.

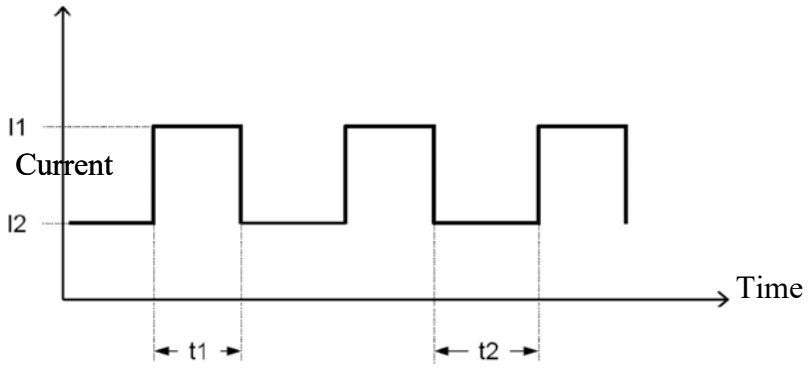
Starting current and final current can only be set for 4T welding. The starting current is used for heating welding material. The final current is used for "Crater Fill".

The welding current is set to this position for all welding processes. After setting other parameters, the machine always returns to this position.

In the TIG-DC Pulse the pulse current is set to the welding current phase.

11.5 Pulse function

In a pulse welding process, the current intensity alternates between a stronger pulse current and a lower background current according to a preset frequency.



Quick pulse:

With this pulse in the range of approx. 50-300 Hz, for example, a high penetration can be achieved with less heat input. You can recognize the fast pulse by the high sound level due to the high frequency.

Long pulse:

The alternation of the two welding currents is easily visible here. The frequency is very low and lies between 1 and 2 Hz. The additional material can be added very nicely drop by drop during the long pulse, resulting in a uniform and beautiful seam pattern.

EASY-TIG 181 DC:

Lights up when overvoltage, overcurrent or electrical overheating (due to exceeding the duty cycle) is detected and protection is activated. If the protection is activated, the welding power is deactivated until the overload of the safety system is sufficiently reduced and the indicator lamp goes out. Can also be triggered if an internal circuit fault occurs.

11.6 Starting with welding

1 Switch on the device with the switch on the back.

2 Use the selector switch to select the method you want.

11.7 TIG welding

EASY-TIG 181 DC:

Assembly and installation for TIG welding

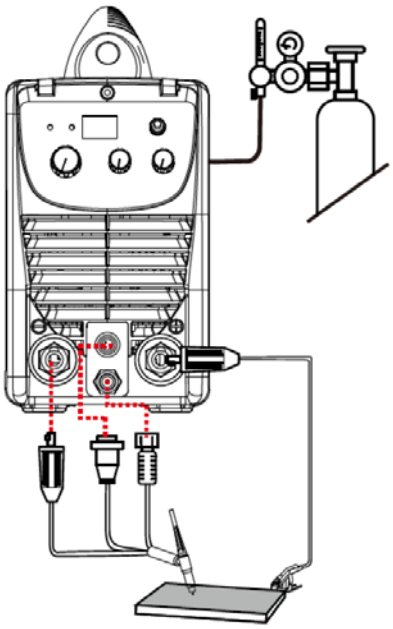


Fig. 27: Connection EASY-TIG 181 DC

Step 1: Set the ON/OFF switch (located on the back of the unit) to OFF.

Step 2: Connect the ground cable to the "+" terminal, and secure it by turning it clockwise.

Step 3: Connect the ground clamp to the workpiece. The contact with the workpiece must be a solid contact with clean, bare metal, without corrosion, paint or scale at the contact point.

Step 4: Connect the welding torch to the "+" pole, tighten clockwise.

Step 5: Connect the TIG torch gas connection to the TIG gas outlet and the TIG torch remote plug to the remote socket. Make sure all connections are tight and secure.

Step 6: Connect the gas regulator to the gas cylinder and connect the gas line to the gas regulator.

Step 7: Connect the gas line to the gas connection on the back of the machine using the quick-release fastener. Check that there are no leaks.

Step 8: Open the gas cylinder valve and adjust the regulator. The flow rate should be between 5 -10 l/min depending on the application.

Step 9: Each machine is equipped with a power cord. The cable should be connected to the input voltage side of the welding power cable at the appropriate position.

Step 10: Check the flow pressure of the regulator again when the torch valve is open, as the static gas flow setting may drop after the gas flow.

Step 11: Using a multimeter, measure whether the input voltage is within the fluctuation range.

Step 12: The power supply ground must be well grounded.

TIG welding application EASY-TIG 181 DC:

Step 1: Connect the equipment as described in the previous section.

Step 2: Turn the power switch to the "ON" position, the power indicator should start to light. The fan will begin to rotate. The unit is working properly.

Step 3: Select the 2T/4T application with the 4T/2T/MMA selector switch.

Step 4: Set the welding current (Pos. 14, Fig. 15), current drop (Pos. 10, Fig. 15), and gas post-flow time as required.

Step 5: The tungsten must be ground to a blunt tip for optimum welding results. It is important to grind the tungsten electrode in the direction in which the grinding wheel rotates.

Step 6: Install the tungsten electrode about 3mm to 7mm protruding from the gas cup to ensure that you have a clamping sleeve of the correct size.

Step 7: Attach the rear cap.

Step 8: Start welding. If necessary, readjust the welding current regulator to obtain the required welding conditions.

Step 9: After completion of the welding process, the power source should remain switched on for 2 to 3 minutes. This will allow the fan to still run and cool the internal components.

Step 10: Turn the ON/OFF switch to OFF.

11.8 PULS Function

This function can be set for TIG welding.

The PULS function is activated or deactivated by holding down the rotary knob when the cursor is in the corresponding position, or it is activated automatically when the value of the pulse rate is changed.

The activation/deactivation of the pulsed arc is indicated by the icon next to the selected current value. The setting range of the pulse frequency is from 1 to 300 Hz.

11.9 Anti-glue protection

If the electrode sticks for a few seconds during the STICK or STICK + ARC FORCE welding process, the output current is reduced to Imin. to prevent overheating of the electrode.

11.10 Argon ARC welding application

TIG welding (4T operation)

The starting current and the melting current can be preset. This function can compensate for the possible crater at the beginning and end of the welding process. This makes 4T suitable for welding medium thick sheets.

Impulse TIG Long-term welding (4T) with the models EASY-TIG 201 DC PULSE:

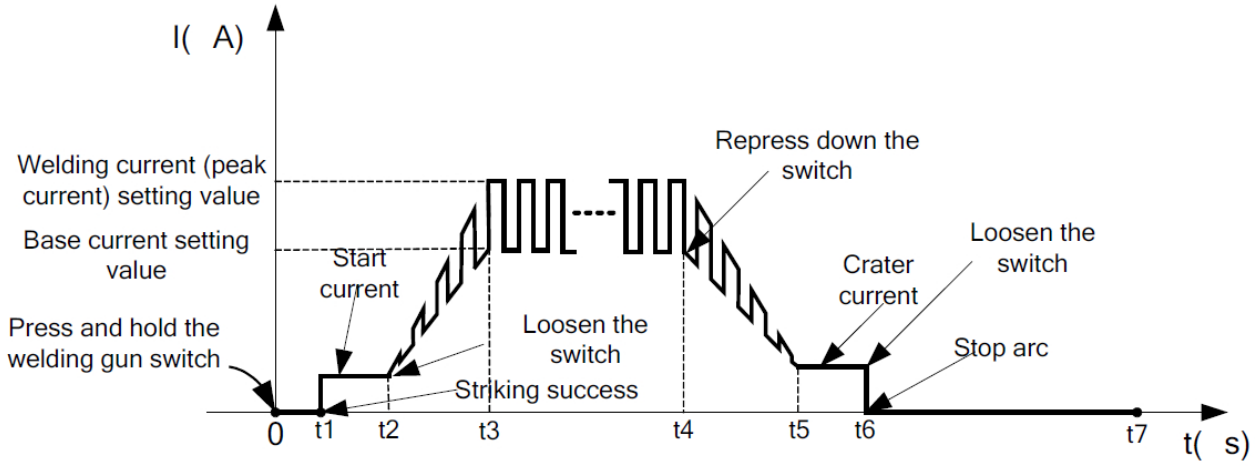


Fig. 28: 4-T operation

Instruction:

0: Press and hold the gun switch, Electromagnetic gas valve is turned on. The shielding gas starts to flow;

0 to t1: Pre flow time, adjustment range of pre flow time: 0 to 2s;

t1: Striking success, adjustment range of start current:

- 5 to 200 A in model EASY-TIG 201 DC PULSE.

t2: Release the gun switch. The output current increases to the welding current within the set time.

t2 to t3: The current increases to the welding current within the set time.

t3 to t4: The welding process is running. During this period the gun switch is released.

Note: When the pulse output function is switched on, the output current is pulsed. If the output current function is switched off, the output current is equal to the welding current Iw.

t4: Press the welding torch switch once more, the output current drops to the crater current; if the pulse output function is switched on, the sloping current is pulsed.

t4 to t5: Post flow time, adjustment range of post flow time: 0 ~10s;

t5 to t6: The crater current time; Adjustment range of the crater current:

- 5 to 200 A in model EASY-TIG 201 DC PULSE.

t6: Loosen the gun switch, stop arc and keep on argon flowing.

t6 to t7: Post-gas time can be set by the post-gas time adjustment knob on the front panel 0 ~10s;

t7: Electromagnetic valve is closed and stop argon flowing. Welding is finished.

Impulse TIG Long-term welding (4T) for the models EASY-TIG 181 DC:

4T is known as „Interlock Mode“. The trigger is pulled and released once to activate the welding circuit, pulled and released again to stop the welding circuit. This function is useful for longer welds as there is no need to keep the trigger pressed all the time.

Impulse TIG long-term welding (4T) at the EASY-TIG 201 ACDC PULSE:

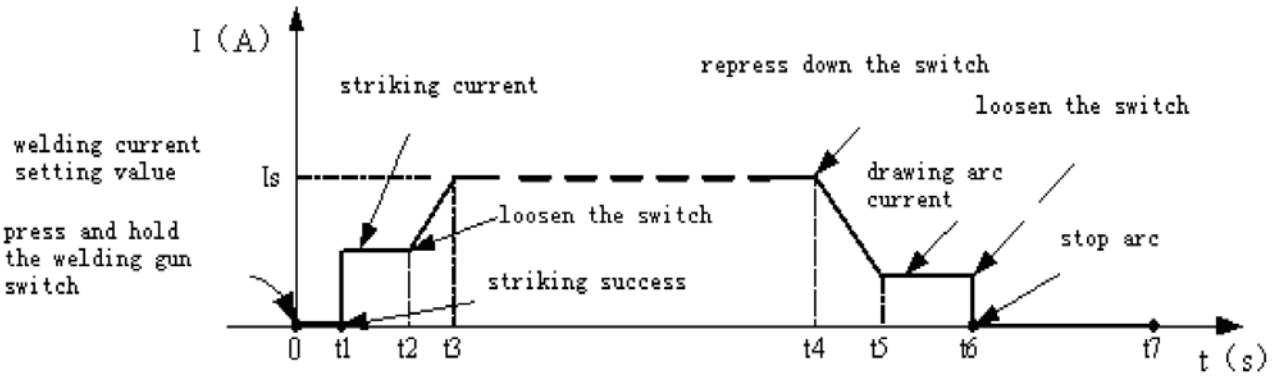


Fig. 29: 4-T operation

Instruction:

0: Press the gun switch and hold it. Electromagnetic gas valve is turned on. The shielding gas stars to flow.

0 to t1: Pre flow time, adjustment range of pre flow time: 0 to 2s;

t1 to t2: Ignition of the arc at time t1 with output of the set starting current value.

t2: Release the gun switch. The output current increases within the set time to the welding current Iw.

t2 to t3: The output current increases within the set time to the welding current (Iw or Ib).

t3 to t4: The welding process is running. During this period the gun switch is released.

Note: Select the pulsating output function, the base current and the welding current are output alternately; on the other hand, the set value of the welding current is output.

t4: Press the welding torch switch once more, the output current decreases according to the set value of the drop time.

t4 to t5: The output current decreases inclined to the crater current. The current decrease time can be adjusted.

t5 to t6: Crater current time.

t6: Releasing the welding torch switch, stops the arc, and keeps the argon supply running.

t6 to t7: The post-flow time can be set via the post-flow time knob. Setting range of the post-flow time: 0 to 10s.

t7: Electromagnetic valve closes and stops argon flow. The welding process is finished.

TIG welding (2T operation)

Impulse TIG Short time welding (2T) for the models EASY-TIG 201 DC PULSE:

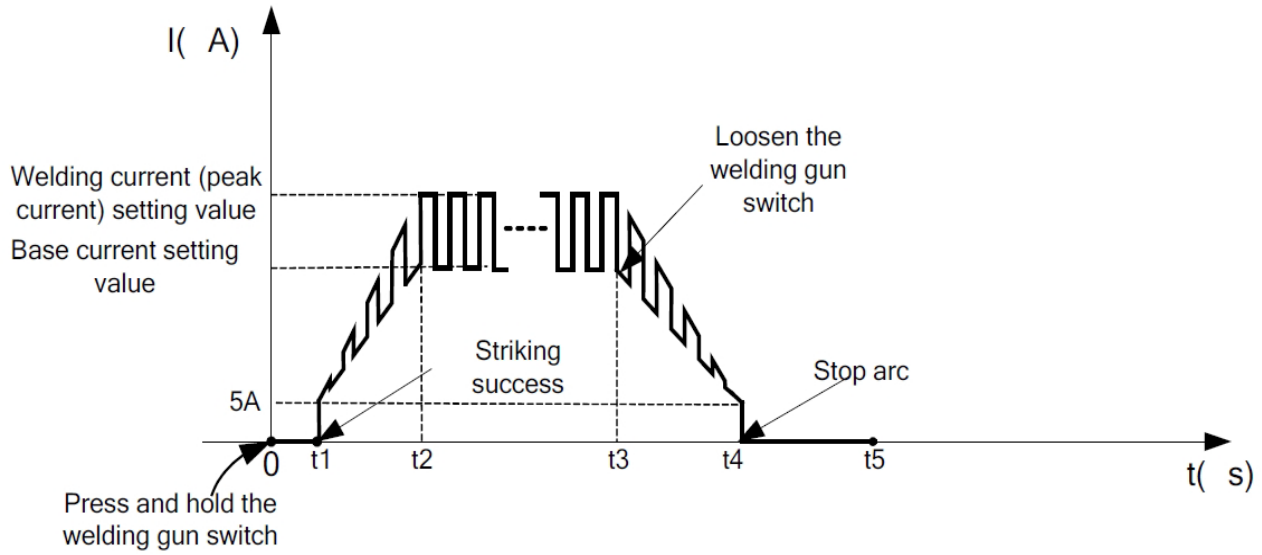


Fig. 30: 2-T operation

Instruction:

0: Press the gun switch and hold it. Electromagnetic gas valve is turned on. The shielding gas stars to flow.

0 to t1: Pre flow time, adjustment range of pre flow time: 0 to 2s.

t1 to t2: Arc ignition, the output current increases obliquely from the minimum current (5A). When the output pulse function is switched on, the diagonally rising current is pulsed.

t2 to t3: The welding torch switch is kept pressed during the entire welding process.

Note: When the output pulse function is switched on, the output current is pulsed. When the output pulse function is off, the output current is DC current.

t3: Release the welding torch switch, the output current drops obliquely; when the output pulse function is switched on, the obliquely falling current is pulsed.

t3 to t4: The output current decrease obliquely to the minimum current (5A), stops ARC; setting range of the current decrease time: 0 to 10s.

t4 to t5: Post flow time, adjustment range of post flow time: 0 ~10s;

t5: Electromagnetic valve closes and stops argon flow. The welding process is finished.

Impulse TIG Short time welding (2T) on the model EASY-TIG 201 ACDC PULSE:

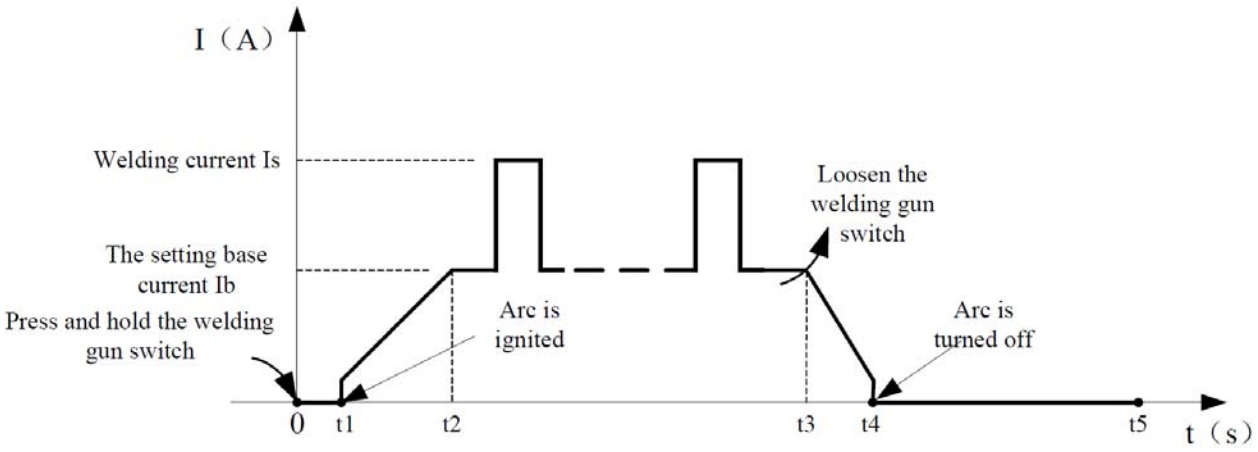


Fig. 31: 2-T operation

Instruction

0: Press the gun switch and hold it. Electromagnetic gas valve is turned on. The shielding gas stars to flow.

0 to t1: Pre flow time, adjustment range of pre flow time: 0 to 2s.

t1 to t2: Arc ignition, the output current increases to the set value (Iw or Ib) of the minimum welding current.

t2 to t3: The welding torch switch is kept pressed during the entire welding process.

Note: If you select the pulsating output function, the basic current and the welding current are output alternately. On the other hand, the set value of the welding current is output.

t3: Release the welding torch switch, the output current drops depending on the selected drop-out time.

t3 to t4: The output current decrease obliquely to the minimum welding current. The arc stops. setting range of the current decrease time of the oblique curve: 0 to 10s.

t4 to t5: After-flow time after the arc has ended. The after-flow time can be set using the rotary knob on the front panel. Setting range of the post-flow time: 0 - 10s.

t5: Electromagnetic valve closes and stops argon flow. The welding process is finished.

Impulse TIG Short time welding (2T) on the model EASY-TIG 181 DC:

In 2T mode, the trigger is pulled and held to activate the weld circuit. When the trigger is triggered, the welding circuit stops.

Short-circuit protection function on the models EASY-TIG 201 DC PULSE and EASY-TIG 201 ACDC PULSE:

1. TIG/LIFT: If the tungesten electrode touches the workpiece when welding, the current will drop to 20A, which can reduce the tungsten spoilage farthestly, prolong the using life of the tungsten electrode and prevent tungsten clipping.

2. TIG/HF/DC: If the tungesten electrode touches the workpiece when welding, the current will drop to 0 within 1s, which can reduce the tungsten spoilage farthestly prolong the using life of the tungsten electrode?and prevent tungsten clipping..

3. MMA operation: if the electrode touches workpiece over two seconds, the welding current will drop to the 0 automatically to protect the electrode.

Prevent the arc from breaking:

With the TIG application, a break of the arc with special means is avoided. When an arc is interrupted, the HF function keeps the arc stable.

Instructions to be observed before starting the welding process:

- Check the condition of welding and connection units firstly, otherwise there will be malfunction such as ignition spark gas leakage out of control and so on.
- Check that whether there is enough Argon gas in the shield gas cylinder, you can test the electromagnetic gas valve through the switch on the front panel.
- Do not let the torch aim at your hand or else of your body. When you press the torch switch, the arc is ignited with a high-frequency, high-voltage spark, and the ignition spark can cause interferences in equipment.
- The flow rate is set according to the welding power used in the job. Turn the regulation screw to adjust the gas flow which is shown on the gas hose pressure meter or the gas bottle pressure meter.
- The spark ignition works better if you keep the 3 mm distance from the workpiece to the tungsten electrode during the ignition.

Note: When select AC output (by the model EASY-TIG 201 ACDC PULSE) the current and the wave form are as same as the above, but output polarity changes alternately.

11.11 MMA welding application

EASY-TIG 181 DC:

ATTENTION!

Overload

When electrode welding with the EASY-TIG 181 DC welding machine, welding may only be carried out with currents of up to 140 A. Electrode welding with higher currents leads to overloading and to fuse tripping.

Step 1: Connect the polarity in the given form.

Step 2: Turn the power switch so that the power switch is in the "ON" position. The power indicator will then light, the fan will light, and the unit will function properly.

Step 3: Select the MMA function with the 4T/2T/MMA selector switch.

Step 4: Set the required output current by turning the current control knob.

Step 5: Place the electrode in the electrode holder and clamp it in place.

Step 6: Strip the electrode over the workpiece to create an arc and hold the electrode evenly to maintain the arc.

Step 7: Start welding. If necessary, adjust the welding current via the control knob to obtain the required welding conditions.

Step 8: After completion of the welding process, the power source should remain switched on for 2 to 3 minutes. This allows the fan to cool the internal components.

Step 9: Set the ON/OFF switch (located on the back panel of the housing) to the OFF position.

12 Electrical connection

Check that the voltage indicated on the type plate corresponds to the nominal voltage of your voltage source. The device may only be used on sockets and extension cables with earthing plugs that have been installed by an authorized electrician. The fusing of the supply lines to the mains sockets must comply with the regulations. The mains socket must be properly earthed.

The EASY-TIG 181 DC welding machine of the TIG series is designed for operation with a 220 V AC power supply. If the power supply voltage is higher than the safe working voltage, there is voltage and undervoltage protection inside the welder, the alarm will illuminate and the current output will be interrupted at the same time.

The EASY-TIG 201 DC PULSE welding machine connect to 230 V.

The EASY-TIG 201 ACDC PULSE welding machines connect to 230 V.

If the power supply voltage is above the safe working voltage, the built-in overvoltage and undervoltage protection reacts. The alarm light goes on and at the same time the current output is cut off.

If the supply voltage is continuously below the safe working voltage range, it will shorten the life of the welding machine.

The following measures may be applied to remedy the situation:

- Change the mains supply of the power supply input. e.g. connect the welding unit to a stable supply voltage of the distributor.
- Induce the machines to use the power supply at the same time.
- Adjust the voltage stabilizer on the front of the power cable inlet.

13 Notes to the welding technology

13.1 Jooint forms in TIG/MMA

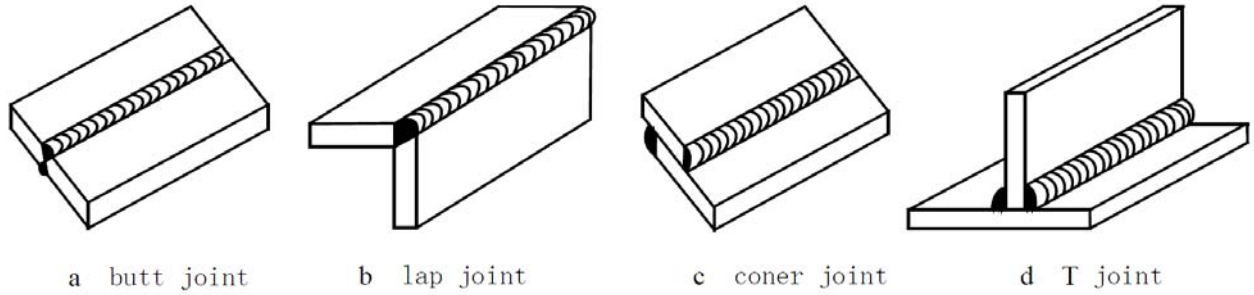


Fig. 32: Possible joint forms

13.2 The explanation of welding quality

The relation of welding area color & protect effect of stainless steel					
Welding area color	**Argent / Golden**	**blue**	**red-grey**	**grey**	**black**
Protect effect	best	better	good	bad	worst

The relation of welding area color & protect effect of Ti-alloy					
Welding area color	**Bright argent**	**Orange - yellow**	**blue-purple**	**caesious**	**White powder of titanium oxid**
Protect effect	best	better	good	bad	worst

13.3 TIG Parameters matching

Parameters of the models EASY-TIG 201 DC PULSE and EASY-TIG 201 ACDC PULSE:

The corresponding relationship between gas nozzle diameter and electrode diameter	
Gas nozzle diameter [mm]	**Electrode diameter [mm]**
6.4	0.5
8	1.0
9.5	1.6 or 2.4
11.1	3.2
Notice: the above parameters originate from Welding Dictionary P.142, Volume 1 of Edition 2.	

Welding current range [A]	DC positive connection	
	Gas nozzle diameter [mm]	Gas flow rate [l/min]
10 ~ 100	4 ~ 9,5	4 ~ 5
101 ~ 150	4 ~ 9,5	4 ~ 7
151 ~ 200	6 ~ 13	6 ~ 8
201 ~ 300	8 ~ 13	8 ~ 9

Tungsten electrode diameter[mm]	Sharpened of the electrode diameter [mm]	Angle of cone [°]	Background current [A]
1.0	0.125	12	2 ~ 15
1.0	0.25	20	5 ~ 30
1.6	0.5	25	8 ~ 50
1.6	0.8	30	10 ~ 70
2.4	0.8	35	12 ~ 90
2.4	1.1	45	15 ~ 150
3.2	1.1	60	20 ~ 200

TIG of stainless steel (single run welding)						
Workpiece thickness [mm]	Joint form	Tungsten electrode diameter[mm]	Welding wire diameter [mm]	Argon gas flowrate [L/min]	Welding current [DCEP]	Welding speed [cm /min]
0,8	Butt joint	1,0	1,6	5	20 ~ 50	66
1,0	Butt joint	1,6	1,6	5	50 ~ 80	56
1,5	Butt joint	1,6	1,6	7	65 ~ 105	30
1,5	Corner joint	1,6	1,6	7	75 ~ 125	25
2,4	Butt joint	1,6	2,4	7	85 ~ 125	30
2,4	Corner joint	1,6	2,4	7	95 ~ 135	25
3,2	Butt joint	1,6	2,4	7	100 ~ 135	30
3,2	Corner joint	1,6	2,4	7	115 ~ 145	25
4,8	Butt joint	2,4	3,2	8	150 ~ 225	25
4,8	Corner joint	3,2	3,2	9	175 ~ 250	20
Notice: the above parameters originate from Welding Dictionary P150, Volume 1 of Edition 2.						

Parameters of piping back sealing welding for mild steel							
Piping diameter [mm]	**Tungsten electrode diameter [mm]**	**Gas nozzle diameter [mm]**	**Welding wire diameter [mm]**	**Welding current [A]**	**Arc voltage [V]**	**Argon gas flowrate [L/min]**	**Welding speed [cm /min]**
38	2,0	8	2	75 ~ 90	11 ~ 13	6 ~ 8	4 ~ 5
42	2,0	8	2	75 ~ 95	11 ~ 13	6 ~ 8	4 ~ 5
60	2,0	8	2	75 ~ 100	11 ~ 13	7 ~ 9	4 ~ 5
76	2,5	8 ~ 10	2,5	80 ~ 105	14 ~ 16	8 ~ 10	4 ~ 5
108	2,5	8 ~ 10	2,5	90 ~ 110	14 ~ 16	9 ~ 11	5 ~ 6
133	2,5	8 ~ 10	2,5	90 ~ 115	14 ~ 16	10 ~ 12	5 ~ 6
159	2,5	8 ~ 10	2,5	95 ~ 120	14 ~ 16	11 ~ 13	5 ~ 6
219	2,5	8 ~ 10	2,5	100 ~ 120	14 ~ 16	12 ~ 14	5 ~ 6
273	2,5	8 ~ 10	2,5	110 ~ 125	14 ~ 16	12 ~ 14	5 ~ 6
325	2,5	8 ~ 10	2,5	120 ~ 140	14 ~ 16	12 ~ 14	5 ~ 6
Notice: the above parameters originate from Welding Dictionary P167, Volume 1 of Edition 2.							

Parameters for the model EASY-TIG 201 ACDC PULSE:

Welding current range [A]	AC	
	Gas nozzle diameter [mm]	Gas flow rate [l/min]
10 ~ 100	8 ~ 9,5	6 ~ 8
101 ~ 150	9,5 ~ 11	7 ~ 10
151 ~ 200	11 ~ 13	7 ~ 10
201 ~ 300	13 ~ 16	8 ~ 15

Parameters of piping back sealing welding for mild steel							
Sheet thickness [mm]	Welding wire diameter [mm]	Tungsten electrode diameter [mm]	Preheating temperature [°]	Welding current [A]	Argon gas flowrate [L/min]	Gas nozzle diameter [mm]	Notes
1	1,6	2	-	45 ~ 60	7 ~ 9	8	Flange welding
1.5	1,6 ~ 2,0	2	-	50 ~ 80	7 ~ 9	8	Flange welding or butt welding
2	2 ~ 2,5	2 ~ 3	-	90 ~ 120	8 ~ 12	8 ~ 12	Butt welding
3	2 ~ 3	3	-	150 ~ 180	8 ~ 12	8 ~ 12	V-seam butt welding
4	3	4	-	180 ~ 200	10 ~ 15	8 ~ 12	
5	3 ~ 4	4	-	180 ~ 240	10 ~ 15	10 ~ 12	
6	4	5	-	240 ~ 280	16 ~ 20	14 ~ 16	
8	4 ~ 5	5	100	260 ~ 320	16 ~ 20	14 ~ 16	
10	4 ~ 5	5	100 ~ 150	280 ~ 340	16 ~ 20	14 ~ 16	
12	4 ~ 5	5 ~ 6	150 ~ 200	300 ~ 360	18 ~ 22	16 ~ 20	
14	5 ~ 6	5 ~ 6	180 ~ 200	340 ~ 380	20 ~ 24	16 ~ 20	
16	5 ~ 6	6	200 ~ 220	340 ~ 380	20 ~ 24	16 ~ 20	
18	5 ~ 6	6	200 ~ 240	360 ~ 400	25 ~ 30	16 ~ 20	
20	5 ~ 6	6	200 ~ 260	360 ~ 400	25 ~ 30	20 ~ 22	
16 ~ 20	5 ~ 6	6	200 ~ 260	300 ~ 380	25 ~ 30	16 ~ 20	X-seam butt welding
22 ~ 25	5 ~ 6	6 ~ 7	200 ~ 260	360 ~ 400	30 ~ 35	20 ~ 22	
Note: The above parameters are taken from the Welding Dictionary P538, Volume 2 of Edition 2.							

14 Care and maintenance

Tips and recommendations

To ensure that the device is always in a good operating condition, regular care and maintenance work must be carried out.

NOTE!

The maintenance instructions must be read carefully before care and maintenance of the TIG Inverter. The TIG Inverter may only be used by persons who are familiar with the TIG Inverter.

WARNING!

Danger in case of insufficient qualification of the staff!!

Insufficiently qualified persons cannot assess the risks associated with maintenance work on the machine and expose themselves and others to the risk of serious injury.

- Have all maintenance work carried out by qualified personnel only.

WARNING!

- Before carrying out any maintenance work, the machine must be switched off and waited at least 5 minutes until the capacity potential has been reduced to 36 V.
- After maintenance, repair and cleaning work, check whether all fairings and protective devices have been properly mounted on the TIG Inverter again and whether there are no tools left inside or in the working area of the TIG Inverter.

Intervall	Maintenance task	
Daily	Observe that whether panel knob and switch in the front and at the back of arc welding machine are flexible and put correctly in place.	If the knob has not been put correctly in place, please correct; If you can't correct or fix the knob, please replace immediately.
	After switching on the power, make sure that the ARC welding unit does not vibrate, make whistling noises or emit strange odours.	If any of the problems mentioned above occur, try to find the cause and fix it. If you cannot do this, contact Service.
	Observe that whether the display value of LED is intact.	Replace if necessary.
	Check whether the min/max value of the LED display matches the set value.	If there are deviations which have an effect on the normal arc strength, please adjust this value.
	Check if the fan is damaged or does not rotate normally.	If the fan is damaged, replace it immediately. If the fan does not rotate after the ARC welding process, the unit is overheated. Check if there is something blocking the rotor blade. If it is blocked, remove the cause. If the fan does not rotate after the above problems have been resolved, nudge the fan in the direction of rotation. If the fan rotates normally, the starting capacity should be replaced. If not, replace the fan.
	Check if the quick connector is loose or overheated.	If the ARC welding machine is experiencing the problems indicated above, the quick connectors should be fastened or replaced.
	Check if the power output cable is damaged.	If it is damaged, it should be isolated or replaced.
Monthly	Cleanliness condition Check the stud in the ARC welding unit for tightness.	Use the dry compressed air to clean the inside of the ARC welder. Mainly to remove the dust on the cooler, the main voltage transformer, the inductive resistor, the IGBT module, the fast charging diode and the PCB. If it is loose, screw it tight. If it can be overtightened, replace it. If it is rusted, remove the rust on the bolt to make sure it is working properly.
Quarterly	Check whether the current corresponds to the value shown in the display.	If the values do not match, the welder should be adjusted. The current value can be measured with the ammeter set.
Yearly	Measure the insulation impedance along the main circuit, PCB and enclosure.	If it is at 1MΩ, the insulation is damaged and must be replaced or reinforced.

15 Troubleshooting

- The ARC welding machines are tested and correctly calibrated before being shipped from the factory.
- Do not make any unauthorized changes to the unit.
- Maintenance, care and servicing must be carried out carefully and conscientiously. If any wire is loose or incorrectly positioned, this may pose a hazard to the user.
- Only qualified personnel authorised by us may service and repair the machine!
- Always switch off the machine before connecting accessories.

Type of error	Error code	Description	Lamp display
Thermal relay	E01	Overheating (thermal relay 1)	yellow light (thermal protection) permanently on
	E02	Overheating (thermal relay 2)	yellow light (thermal protection) permanently on
	E03	Overheating (thermal relay 3)	yellow light (thermal protection) permanently on
	E04	Overheating (thermal relay 4)	yellow light (thermal protection) permanently on
	E09	Overheating (program run error)	yellow light (thermal protection) permanently on
Welding equipment	E10	Loss of phase	yellow light (thermal protection) permanently on
	E11	no water	yellow light (water leak) permanently on
	E12	no gas	red light permanently on
	E13	Undervoltage	yellow light (thermal protection) permanently on
	E14	Overvoltage	yellow light (thermal protection) permanently on
	E15	Overcurrent	yellow light (thermal protection) permanently on
	E16	Overload of the wire feeder	
	E17	Overload wire feed slide	
	E18	Wire feeder cover opened	
	E19	Input voltage error	
Switch	E20	Key error on the operating panel after the machine was switched on.	yellow light (thermal protection) permanently on
	E21	Other error on the control panel when the machine was switched on.	yellow light (thermal protection) permanently on
	E22	Welding torch error after the machine has been switched on.	yellow light (thermal protection) permanently on
	E23	Torch failure during the normal welding process.	yellow light (thermal protection) permanently on
Accessories	E30	Cutting torch switch-off	red light flashes
	E31	Water cooling shutdown	yellow light (water leak) permanently on
	E32	Charge protection signal of the battery	
	E33	Error fan / ventilation wheel	
	E34	Short circuit of the water circulation	

Type of error	Error code	Description	Lamp display
Communi-cation	E40	Connection problems between the wire feed and the power source	
	E41	Connection error	
	E42	Connection error robot	
	E43	Connection error WIFI	

Troubleshooting table of the model EASY-TIG 181 DC:			
S/N	**Malfunction**	**Cause**	**Solution**
1	No arc	Incomplete welding circuit.	Check the ground wire. Check all connecting cables.
		No power supply.	Check that the device is switched on and that there is a power supply.
		Incorrect mode selected.	Check that the MMA selector switch is selected.
2	Porosity - small holes or cavities resulting from gas inclusions in the weld metal.	The arc length is too long.	Shorten the arc length.
		The workpiece is dirty, contaminated or wetted with moisture.	Remove dirt and materials such as paint, lubricant, oil, and dirt, including the mill scale of the base material.
		Wet electrode.	Only use dry electrodes.
3	Excessive splashes	Current too high.	Reduce the current or select a larger electrode.
		The arc length is too long.	Shorten the arc length.
4	Weld seam is at the very top, too little connectivity.	Insufficient heat supply.	Increase the current or select a larger electrode.
		The workpiece is dirty or damp.	Remove impurities and materials such as paint, lubricant, oil, and dirt including the mill scale of the base material.
		Poor welding technology.	Use the correct welding technique or contact support from a specialist.
5	Insufficient penetration depth	Insufficient heat supply.	Increase the current or select a larger electrode.
		Poor welding technology.	Use the correct welding technique or contact support from a specialist.
		Poor weld preparation.	Check the seam form and make sure that the material is not too thick. If necessary, contact a specialist for support.
6	Excessive penetration depth - burn-through	Excessive heat input.	Reduce the current or select a larger electrode.
		Incorrect infeed speed.	Increase the welding speed.
7	Uneven welding results	Shaking or restless hand.	Use two hands for assist when possible.

Troubleshooting table of the model EASY-TIG 181 DC:			
S/N	**Malfunction**	**Cause**	**Solution**
8	Deformation - movement of the base material during welding	Excessive heat input.	Reduce the current or use a smaller electrode.
		Poor welding technology.	Use the correct welding technique or contact support from a specialist.
		Poor seam preparationor wrong seam shape.	Check the seam form and make sure that the material is not too thick. If necessary, seek assistance from a specialist.
9	The electrode welds with different or unexpected arc properties.	Incorrect polarity connection.	Change the polarity, check the electrode manufacturer's specifications for correct polarity.

Troubleshooting table of the model EASY-TIG 181 DC and EASY-TIG 201 DC PULSE:			
S/N	**Malfunction**	**Cause**	**Solution**
1	If the power supply is switched on and the current light is on, no fan function.	A foreign object in the fan.	Remove the foreign object.
		The starting capacitor of the fan is defective.	Replace the capacitor.
		The fan motor is defective.	Replace the fan.
2	The number display on the display is not in sync.	The LED of the display is deffekt.	Replace the LED.
3	The max. and min. displayed value does not match the set value.	The maximum value does not match.	Set the potentiometer I_{max} on the control board.
		The minimum value does not match.	Adjust the potentiometer I_{min} on the measuring blade.
4	No open circuit voltage at output (MMA)	The device is defective	Check the main circuit and the Pr4.
5	The arc cannot be ignited (TIG): There is a spark on the HF ignition board.	The welding cable is not connected to the two outputs of the welding device.	Connect the welding cable to the output of the welding machine.
		The earthing cable is not connected stable enough.	Repair or replace it.
		The earthing cable is not connected stable enough.	Check thr ground cable.
		The welding cable is too lon	Use a suitable grounding cable.
		There is oil or dust on the workpiece.	Check it and remove the oil or dust.
		The distance between the tungsten electrode and the workpiece is too long.	Reduce the distance (about 3m).
	There is a spark on the HF ignition board.	The HF ignition board does not work.	Repair or replace Pr8.
		The distance between the dischargers is too short.	Adjust the distance (approx. 0.7 mm).
		A malfunction of the welding gun switch.	Check the welding gun switch, the control cable and the socket.

Troubleshooting table of the model EASY-TIG 181 DC and EASY-TIG 201 DC PULSE:			
S/N	**Malfunction**	**Cause**	**Solution**
6	No gas flow (TIG)	Gas cylinder is close or gas pressure is low	Replace the gas cylinder or open the gas cylinder tap.
		A foreign object in the valve	Remove the foreign object.
		Electromagnetic valve is damaged.	Replace
7	Inert gas flows constantly	The gas test on the front panel is switched on.	Set the gas test on the front panel to OFF.
		A foreign object in the valve	Remove the foreign object.
		Electromagnetic valve is damaged.	Replace
		The gas pre-flow time adjustment knob on the front panel is damaged.	Repair it or replace it.
8	The welding current cannot be adjusted.	The welding current potentiometer on the front panel connector is not good or damaged.	Repair or replace the potentiometer.
9	The displayed welding current does not correspond to the current value.	The min. displayed value does not correspond to the current value.	Set the Imin potentiometer on the power board.
		The maximum value displayed does not correspond to the current value.	Set the potentiometer Imax on the power board.
10	The penetration depth of the melt pool is not sufficient.	The welding current is set too low.	Increase the welding current.
11	The alarm lamp on the front panel is switched on. Overheating protection is active.	Too high welding current	Reduce the welding current output.
		Working time is too long	Reduce the duty cycle. (Work with interruptions)

Troubleshooting table of the model EASY-TIG 201 ACDC PULSE:			
S/N	**Malfunction**	**Cause**	**Solution**
1	When the power supply is switched on, the fan runs but the power supply light does not work.	The power light is damaged or the connection is interrupted.	Check and repair Pr7.
		The current transformer of the power supply is defective.	Repair or replace the current transformer.
		Control PCB faults.	Repair or replace the Pr4 controller.
2	The power supply is on and the power light is on, but the fan is not working.	A foreign object in the fan.	Remove the foreign object.
		The starting capacitor of the fan is defective.	Replace the capacitor.
		The fan is defective	Replace the fan.
3	The power supply is switched on and the power light is on. The fan is not working.	No power supply at the input.	Check whether the mains supply supplies power.
		The fuse is damaged.	Replace the fuse (A3).
4	The number display on the display is not in sync.	The LED of the display is deffekt.	Replace the LED.

Troubleshooting table of the model EASY-TIG 201 ACDC PULSE:			
S/N	**Malfunction**	**Cause**	**Solution**
5	The displayed welding current does not correspond to the current value.	The min. displayed value does not correspond to the current value.	Set the Imin potentiometer on the power board.
		The maximum value displayed does not correspond to the current value.	Set the potentiometer Imax on the power board.
6	No open circuit voltage at output (MMA)	The device is defective.	Check the main circuit and the Pr4.
7	The arc cannot be ignited (TIG): There is a spark on the HF ignition board.	The welding cable is not connected to the two outputs of the welding device.	Connect the welding cable to the output of the welding machine.
		The earthing cable is not connected stable enough.	Repair or replace it.
		The earthing cable is not connected stable enough.	Check thr ground cable.
		The welding cable is too lon	Use a suitable grounding cable.
		There is oil or dust on the workpiece.	Check it and remove the oil or dust.
	_____ There is a spark on the HF ignition board.	The distance between the tungsten electrode and the workpiece is too long.	Reduce the distance (about 3m).
		The HF ignition board does not work.	Repair or replace Pr8.
		The distance between the dischargers is too short.	Adjust the distance (approx. 0.7 mm).
		A malfunction of the welding gun switch.	Check the welding gun switch, the control cable and the socket.
8	No gas flow (TIG)	Gas cylinder is close or gas pressure is low	Replace the gas cylinder or open the gas cylinder tap.
		A foreign object in the valve	Remove the foreign object.
		Electromagnetic valve is damaged.	Replace
9	Inert gas flows constantly	The gas test on the front panel is switched on.	Set the gas test on the front panel to OFF.
		A foreign object in the valve	Remove the foreign object.
		Electromagnetic valve is damaged.	Replace
		The gas pre-flow time setting knob on the front panel is damaged.	Repair it or replace it.
10	The welding current cannot be adjusted.	The welding current potentiometer on the front panel connector is not good or damaged.	Repair or replace the potentiometer.
11	No AC output during "AC".	The Power PCB is in fault mode.	Reparieren oder austauschen.
		The AC driver PCB is damaged.	Replace
		The AC IGBT module is damaged.	Replace

Troubleshooting table of the model EASY-TIG 201 ACDC PULSE:			
S/N	**Malfunction**	**Cause**	**Solution**
12	The penetration depth of the melt pool is not sufficient.	The welding current is set too low.	Increase the welding current..
		The arc is too long in the welding process.	Use the 2T function.
13	The awarning light on the front panel is switched on:	Overheating protection	Reduce the welding current output.
			Reduce the duty cycle. (Work with interruptions)
		Overvoltage protection	Use a stable power supply.
		Low-voltage protection	Use a stable power supply.
			Reduce the total number of machines using the power supply at the same time.
		Overcurrent protection	Check and repair the main circuit and actuator Pr6.

TIG welding

Troubleshooting table of the model EASY-TIG 181 DC for TIG welding:			
S/N	**Malfunction**	**Cause**	**Solution**
1	The tungsten electrode burns away quickly.	Wrong gas or no gas.	Use pure argon. Check that the gas cylinder is filled with gas, connected, switched on and that the burner valve is open.
		Insufficient gas flow.	Check that the gas is connected. Check that hoses, gas valve and burner are not affected.
		Burner cap not inserted correctly.	Make sure that the burner cap is positioned so that the O-ring is in the burner body.
		Welding torch connected to DC+	Connect the burner to the DC- connector.
		Wrong tungsten electrode is used.	Check and change the tungsten electrode type if necessary..
		Tungsten electrode was oxidized after welding is finished.	Maintain inert gas flow 10-15 seconds after arc stop. 1 second for each 10 amp welding current.
		Tungsten electrode melts back into the nozzle during AC welding.	Check that the correct type of tungsten is used. Make sure that the compensation control is not set too high. Reduce the balance if necessary.
2	Dirty tungsten electrode.	The tungsten electrode has touched the weld pool.	Keep the tungsten electrode away from contact with the molten bath. Hold the welding torch so that the tungsten electrode is 2 to 5 mm away from the workpiece.
		The tungsten electrode melts in the molten pool.	Check that the correct type of tungsten electrode is used. Too much welding current for the electrode size, reduce the amperage or switch to a larger electrode.
		The flux cored wire has touched the electrode.	Avoid contact between the flux-cored wire and the tungsten electrode during the welding process, and insert the flux-cored wire into the weld pool protrusion in front of the electrode.

Troubleshooting table of the model EASY-TIG 181 DC for TIG welding:			
S/N	**Malfunction**	**Cause**	**Solution**
3	Porosity - poor weld pattern and colour.	Wrong gas / low gas flow / gas leak.	Use pure argon. The shielding gas is connected, check that the hoses, the gas valve and the welding torch are not restricted. Set the gas flow between 6 and 12 l/min. Check the hoses and couplings for holes and leaks.
		Dirty base material.	Remove dirt and material such as paint, grease, oil and dirt from the base material.
		Dirty cored wire.	Remove all grease, oil and dirt from the workpiece
		Wrong cored wire.	Check the cored wire used and replace if necessary.
4	Yellow debris / smoke at the aluminum nozzle and discoloration at the tungsten electrode.	Wrong gas.	Verwenden Sie pures Argon.
		Low gas flow	Set the gas flow to between 10 -15 l/min flow rate.
		Insufficient gas post-flow.	Increase the gas post-flow time.
		Aluminium gas nozzle is too small.	Increase the diameter of the aluminium gas nozzle.
5	Unstable arc during welding.	Welding torch connected with DC+.	Connect the welding torch to the DC- output terminal.
		Dirty base material.	Remove materials such as paint, lubricant, oil, and dirt, including mill scale, from the base material.
		The tungsten electrode is dirty.	Remove 10 mm from the dirty tungsten electrode.
		The arc is too long.	Keep the welding torch slightly lower in the distance above the workpiece from 2 to 5 mm.
6	HF is active but no welding current	Open welding circuit.	Check that the ground wire is connected.
		No gas	Check that the gas is connected and the gas cylinder valve is open. Check that the hoses, the gas valve and the welding torch are not affected. Set the gas flow to a value between 10 -15 l/min.
		The tungsten electrode melts into the molten bath.	Check that the correct type of tungsten electrode is used. Current too high for tungsten electrode size. Reduce the amperage or change to a larger electrode.
7	The arc moves during welding.	Insufficient gas flow.	Set the gas flow to a value between 10 -15 l/min.
		Incorrect arc length.	Hold the welding torch slightly lower in the distance above the workpiece from 2 to 5 mm..
		Wrong tungsten electrode Electrode is in bad condition.	Check if the correct type of tungsten electrode is used. Remove 10 mm of the welding end of the tungsten electrode and sharpen it again.
		Insufficiently prepared tungsten electrode.	Grinding marks should be along the length of the Wolframe electrode, not circular. Use suitable abrasives such as a grinding machine with a grinding wheel.
		Dirty base material or wire electrode.	Remove materials such as paint, lubricant, oil, and dirt, including mill scale, from the base material. Remove all lubricant, oil, or impurities from the filler material.
		Incorrect wire electrode.	Check the wire electrode and replace if necessary.

Troubleshooting table of the model EASY-TIG 181 DC for TIG welding:			
S/N	**Malfunction**	**Cause**	**Solution**
8	The arc is difficult to ignite. The arc does not begin to weld.	Incorrect device setting.	Check that the device setting is correct.
		No gas, wrong gas flow rate.	Check that the gas is connected and the gas cylinder valve is open. Check that the hoses, the gas valve and the welding torch are not affected. Set the gas flow to a value between 10 -15 l/min.
		Incorrect tungsten electrode size or type.	Check and change the electrode size or electrode type if necessary.
		The tungsten electrode is contaminated.	Remove 10 mm of the contaminated tungsten electrode and regrind the tungsten electrode.
		Loose connection	Check all connections and tighten them.
		The ground clamp is not connected to the worktable.	If possible, connect the ground clamp directly to the workpiece.
		Loss of high frequency	Check the welding torch and cables for faulty insulation or poor connection.

16 Disposal, Recycling of old equipment

In your own interests and in the interest of the environment, please ensure that all components of the machine are disposed of in the proper and approved way.

16.1 Decommission

Disused equipment must be taken out of service immediately in order to avoid later misuse and endangering the environment or people.

Step 1: Remove all environmentally hazardous fluids from the old unit.

Step 2: If necessary, dismantle the machine into manageable and usable assemblies and components.

Step 3: Guide the machine components and operating materials to the appropriate disposal routes.

16.2 Disposal of electrical equipment

Please note that electrical appliances contain a variety of recyclable materials as well as environmentally harmful components.

Make sure that these components are disposed of separately and properly. In case of doubt, please contact your municipal waste disposal.

If necessary, the help of a specialized waste disposal company can be used for the treatment.

16.3 Disposal via municipal collection points

Disposal of used electrical and electronic equipment (Applicable in the countries of the European Union and other European countries with a separate collection system for these appliances).

The symbol on the product or its packaging indicates that this product should not be treated as normal household waste, but must be returned to a collection point for the recycling of electrical and electronic equipment. By helping to properly dispose of this product, you are protecting the environment and the health of others. Environment and health are endangered by improper disposal. Material recycling helps to reduce the consumption of raw materials. For more information about recycling this product, contact your local community, municipal waste management, or the shop where you purchased the product

17 Spare parts

DANGER!

Danger of injury due to use of wrong spare parts!

The use of incorrect or faulty replacement parts may cause danger to the operator and cause damage and malfunction.

- Only use original spare parts from the manufacturer or replacement parts approved by the manufacturer.
- In case of doubt, always contact the manufacturer

17.1 Spare parts order

The spare parts can be obtained from the dealer.

Specify the following key data for inquiries or ordering spare parts:

- device type
- item number
- Position number
- Construction year
- amount
- desired shipping method (post, freight, sea, air, express)
- delivery address

Spare parts orders without above given information can not be considered. If the shipping method is missing, shipping will be at the discretion of the supplier. Information on the device type, article number and year of manufacture can be found on the type plate, which is attached to the device.

Example

The front cover for the TIG-Inverter EASY-TIG 181 DC must be ordered. The front cover is identified in the spare parts drawing 1 with the number 13.

When ordering spare parts, send a copy of spare parts drawing 1 with marked front cover component and marked position number 13 to the authorised dealer or to the spare parts department and provide the following information:

Type of device: EASY-TIG 181 DC

Item number: 1074018

Drawing number: 1

Position number: 13

17.2 Spare parts drawings

In case of service, the following drawings shall help to identify the necessary spare parts. If necessary, send a copy of the parts drawing with the marked components to your authorised dealer.

17.2.1 Spare parts drawing EASY-TIG 181 DC

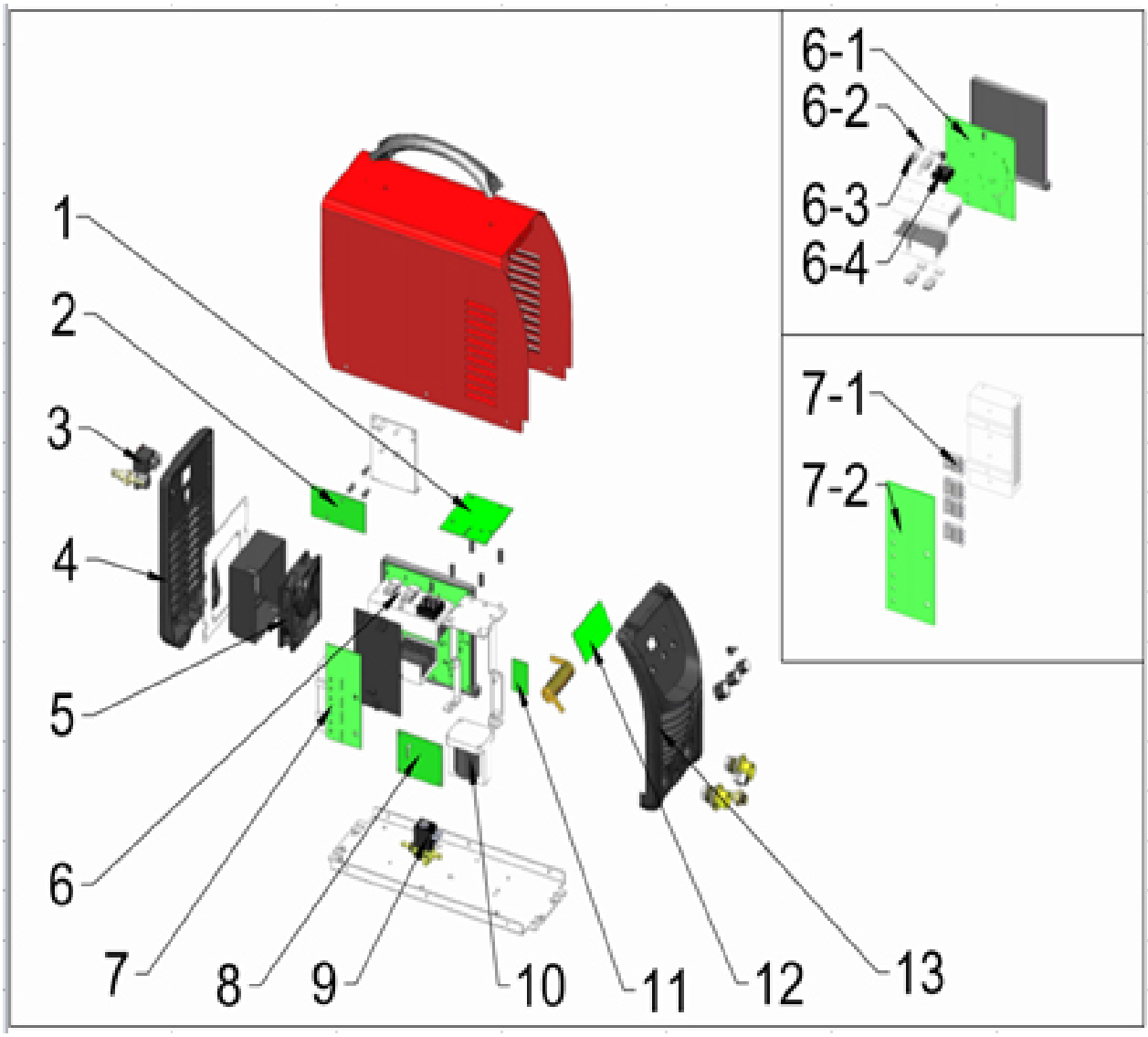


Fig. 33: Spare parts drawing EASY-TIG 181 DC

17.2.2 Spare parts drawing EASY-TIG 201 DC PULSE

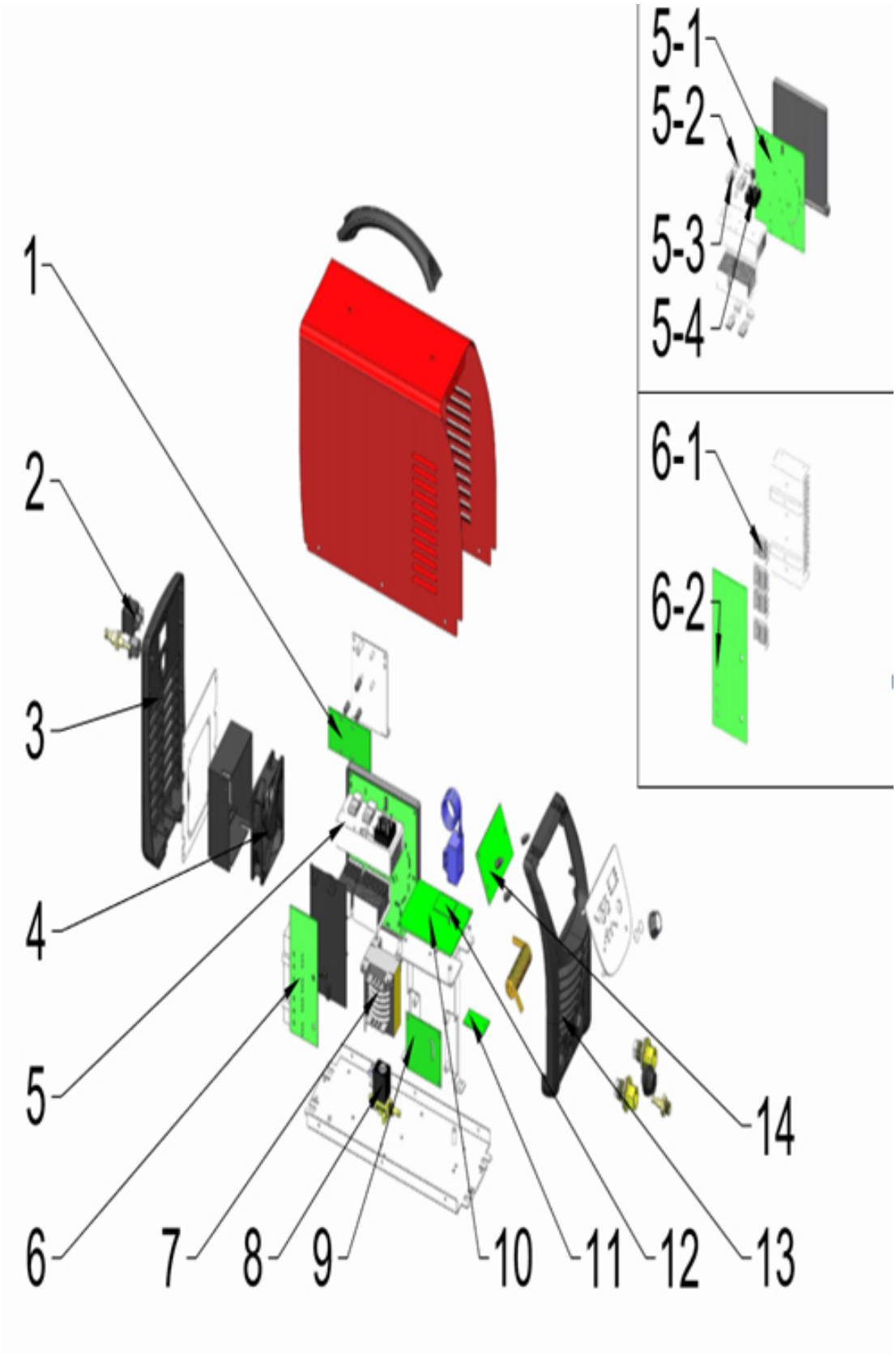


Fig. 34: Spare parts drawing 2 EASY-TIG 201 DC PULSE

17.2.3 Spare parts drawing EASY-TIG 201 ACDC PULSE

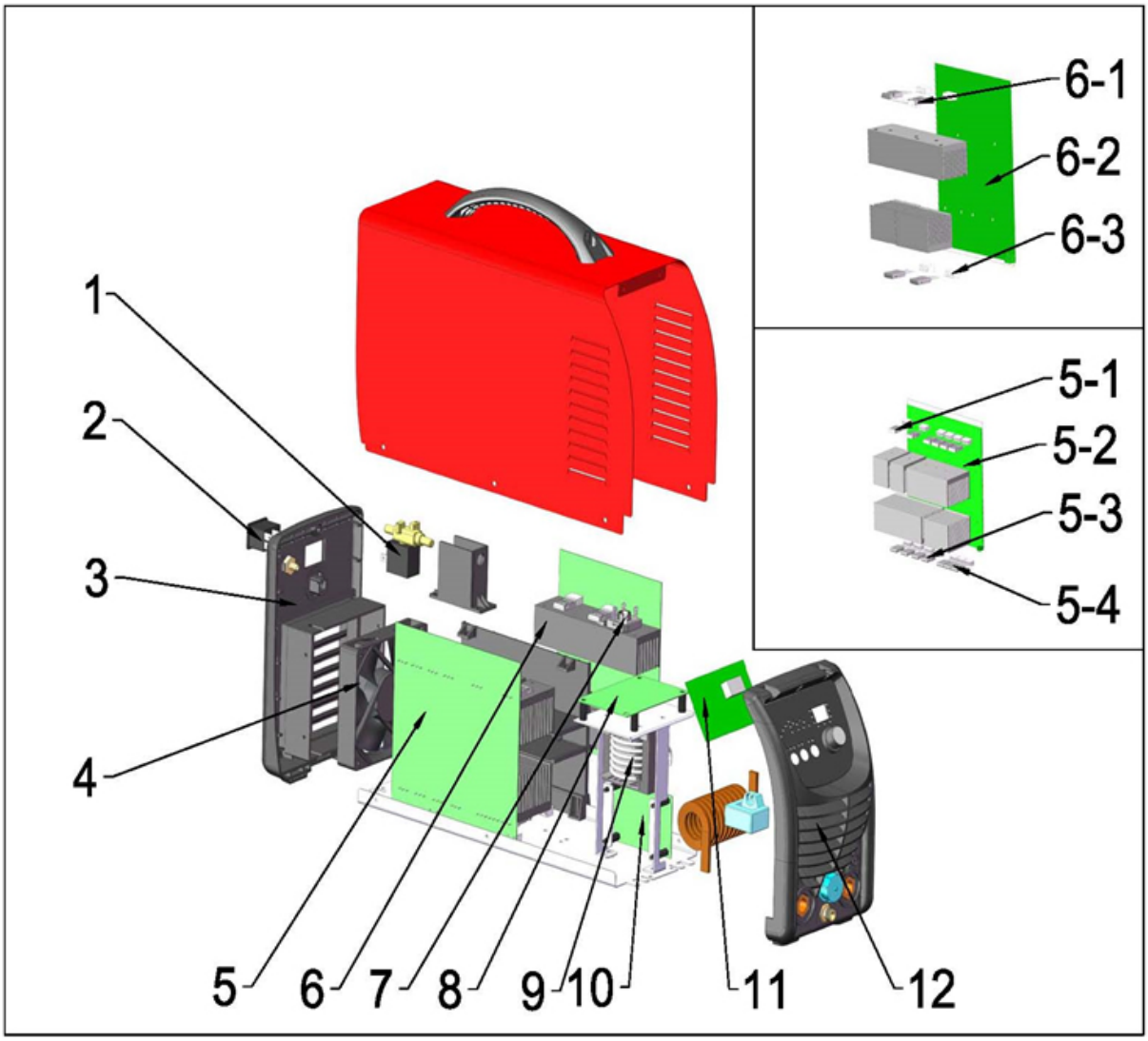


Fig. 35: Spare parts drawing EASY-TIG 201 ACDC PULSE

18 Wiring diagram

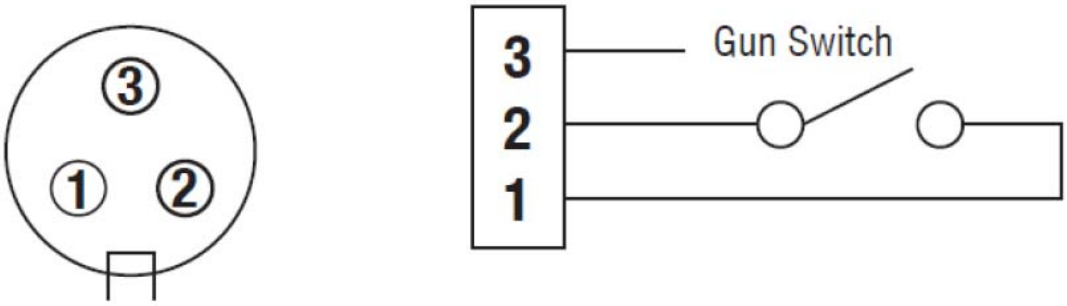


Fig. 36: PIN assignment of the remote control connector of the EASY-TIG 181 DC

12 PIN Wiring Diagram					
Pin	**8 pin Plug for PULSE models**	**Cable foot pedal**	**Normal Torch**	**remote torch**	**UP-DOWN torch**
1	2	short circuit connecting			
2	5（G）				
3	4	potentiometer +	potentiometer +		
4	6	potentiometer medium		potentiometer medium	
5	5（G）	potentiometer -	potentiometer -		
6	7				up
7	8				down
8	3	switch	swtich	swtich	swtich
9	5（G）				
10	1			short circuit connecting	
11	5（G）				
12	No				

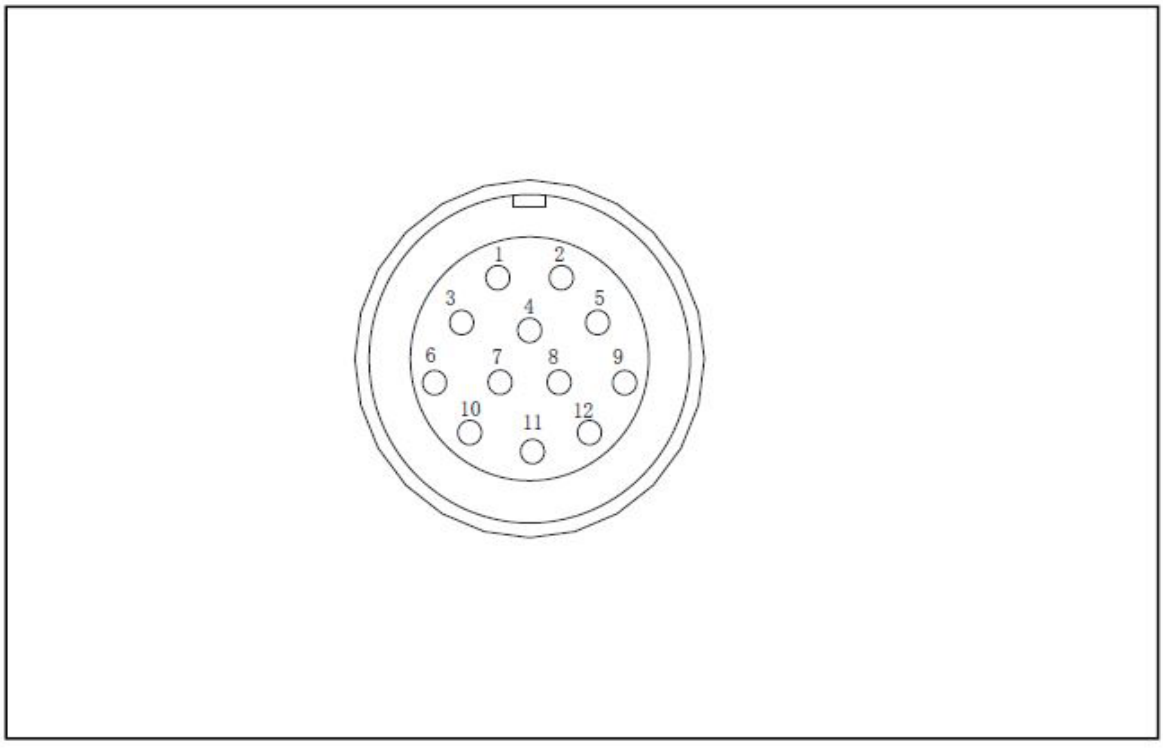


Fig. 37: PIN assignment of the 12-pinl connector of the EASY-TIG 201 ACDC PULSE

19 Electrical circuit diagrams

Electrical circuit diagram EASY-TIG 181 DC

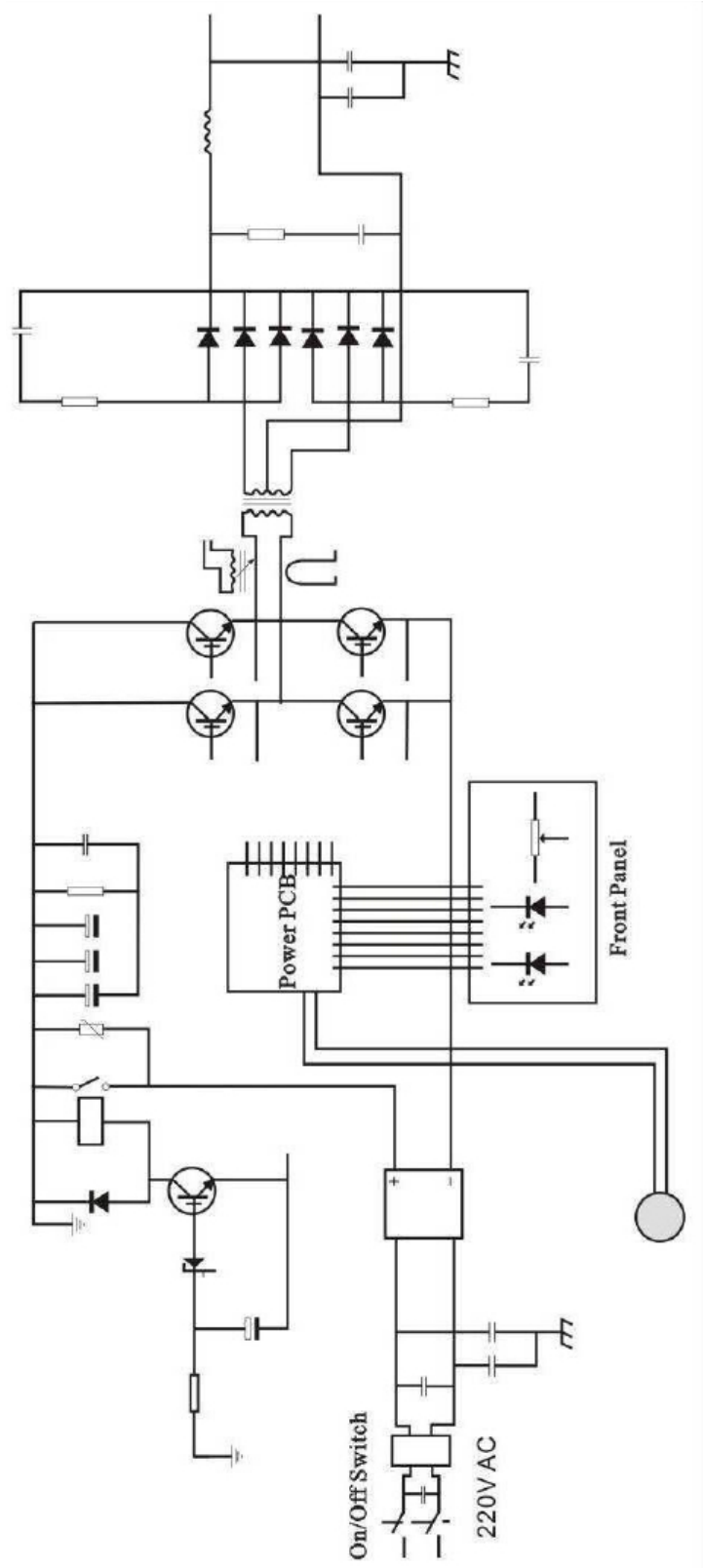


Fig. 38: Circuit diagram EASY-TIG 181 DC

Electrical circuit diagram EASY-TIG 201 DC PULSE

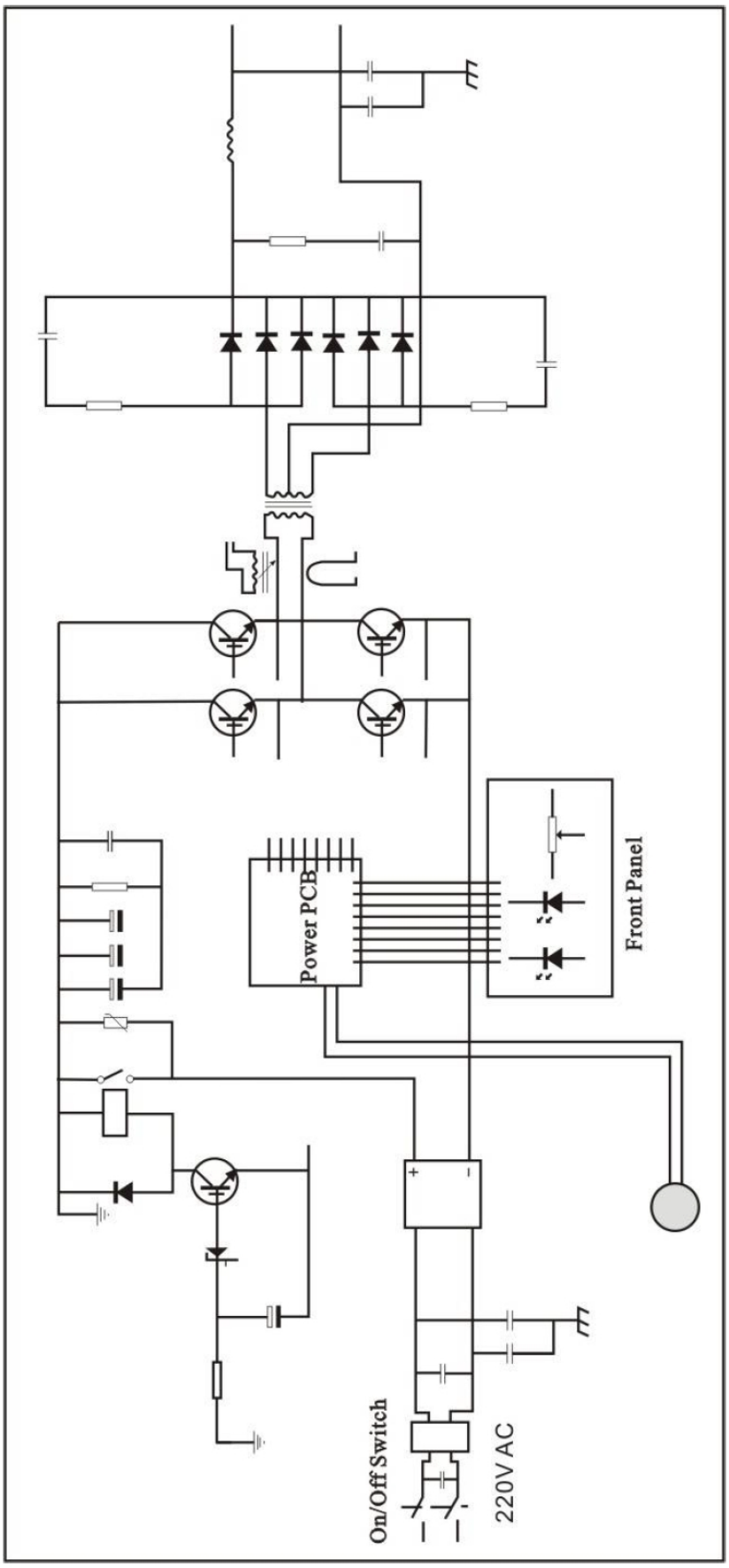


Fig. 39: Electrical circuit diagram EASY-TIG 201 DC PULSE

Electrical circuit diagram EASY-TIG 201 ACDC PULSE

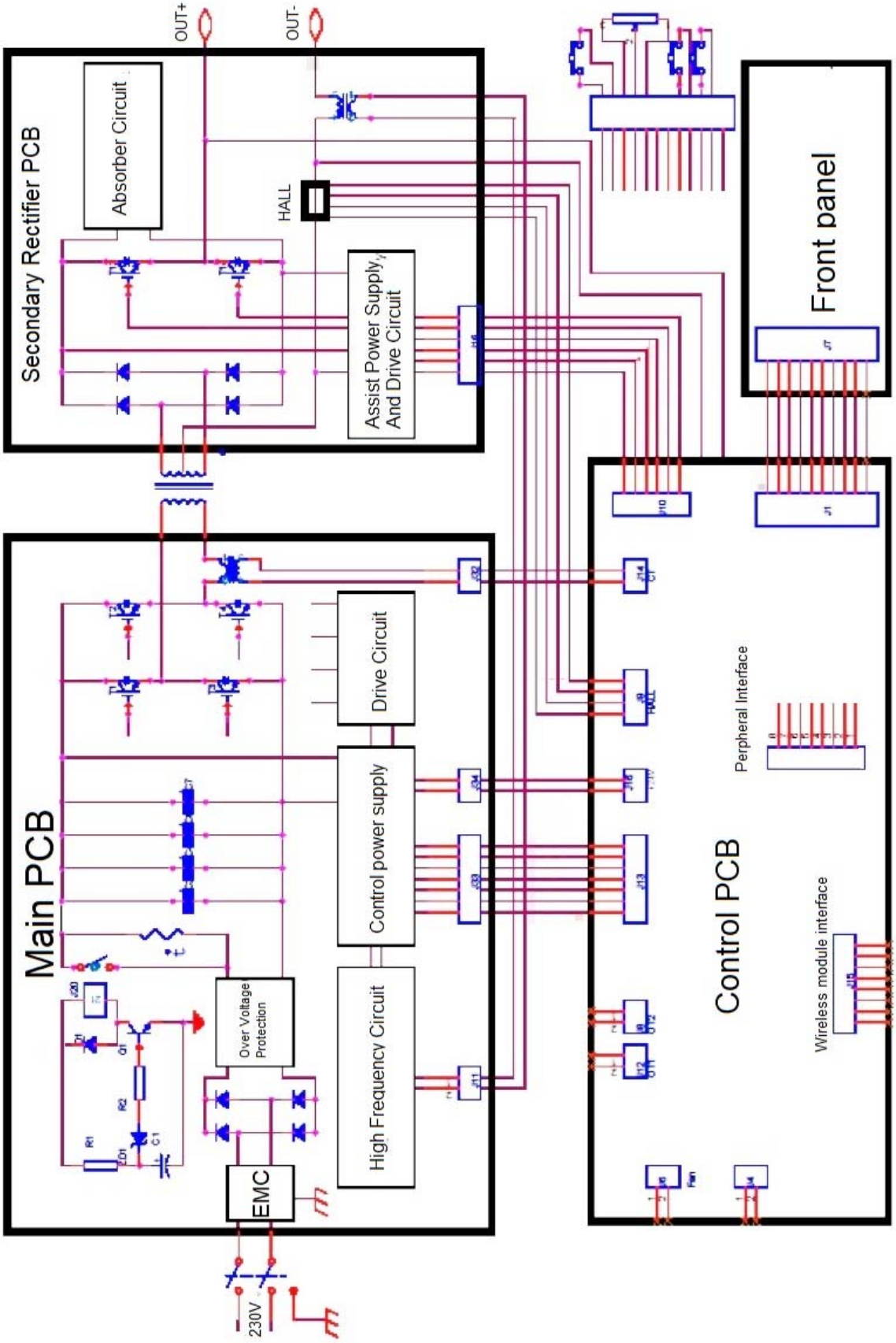


Fig. 40: Electrical circuit diagram EASY-TIG 201 ACDC PULSE

20 EC - Declaration of Conformity

for the following designated product

Manufacturer/distributing company: Stürmer Maschinen GmbH
Dr.-Robert-Pfleger-Straße 26
D-96103 Hallstadt

Product group: Schweißkraft® Schweißtechnik

Designation of machine*:	**Item number:**
☐ EASY-TIG 181 DC	1074018
☐ EASY-TIG 201 DC PULSE	1074020
☐ EASY-TIG 201 ACDC PULSE	1074021

Type of machine: TIG Inverter

Serial number*: _____

Year of manufacturer*: 20____

* fill this fields according to the information on the type plate

is hereby confirmed that it complies with the essential protection requirements laid down in Council Directive 2014/30/EU (EMC Directive) on the approximation of the laws of the Member States relating to the electromagnetic compatibility of electrical equipment designed for use within certain voltage limits.
The above products comply with the provisions of this Directive and the safety requirements for arc welding equipment according to the following product standards

The following harmonized standards were applied:

DIN EN 60974-1:2018-12	Arc welding equipment - Part 1: Welding power sources
DIN EN 60974-10:2016-10	Arc welding equipment - Part10: Requirements for the electromagnetic compatibility (EMC)

According to EC. Directive 2006/42/EC Article 1, the above products fall exclusively within the scope of electrical equipment for use within certain voltage limits.

Responsible for documentation: Kilian Stürmer, Stürmer Maschinen GmbH,
Dr.-Robert-Pfleger-Str. 26, D-96103 Hallstadt

Hallstadt, 21.04.2021

_____
Kilian Stürmer
Managing Director

CE

21 Notes

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OPTIMUM
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