

Operating Instructions

— MIG/MAG Inverter

— EASY-MIG 201i MULTI

— EASY-MIG 211i MULTI



EASY-MIG 201i MULTI



EASY-MIG 211i MULTI

EASY-MIG

Imprint

Product identification

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Indications regarding the operating instructions

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1 Introduction

You have made a good choice by purchasing the SCHWEISSKRAFT MIG/MAG inverter welder.

Read the operating instructions carefully before commissioning.

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 MIG/MAG inverter welder.

In addition, observe the local accident prevention regulations and general safety regulations for the area of application of the MIG/MAG inverter welder.

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 MIG/MAG inverter welder. Any other use is not permitted without the written approval 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 words indicates a possibly dangerous situation which may lead to property and environmental damages if they are not avoided.

**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 highlights 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 Obligations of the operating company

The operating company is the person who operates the welding device for business or commercial reasons by herself, or leaves it to a third party for use or application, and who bears the legal product responsibility for the protection of the user, the staff or for third parties.

Obligations of the operating company

If the welding device is used for commercial purposes, the operating company of the welding device must comply with the legal working safety regulations.

Therefore, the safety notes in this operating manual, as well as the safety, accident prevention and environment protection regulations applying for the area of application of the welding device must be met. The following applies in particular:

- The operating company must be informed about the applying industrial safety regulations and further analyse hazards resulting from the special working conditions at the place of use of the welding device. She must implement these in form of operating manuals for the operation of the welding device.
- During the entire lifetime the welding device, the operating company must verify whether the operating manuals prepared by her correspond to the current status of the regulations, and must adapt these if necessary.
- The operating company must unambiguously regulate and determine the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operating company must ensure that all persons who work with the welding device, have read and understood this manual. Furthermore she must instruct the staff in regular intervals and inform them about the hazards.
- The operator must provide the necessary protective equipment to the staff and order the use of the necessary protective equipment in a binding way.

Furthermore the operating company is responsible to keep the welding device always in a technically flawless state. Thus, the following applies:

- The operator must ensure that the maintenance intervals described in this manual are kept.
- The operator must have all safety devices checked regularly for their good working order and their integrity.

2.3 Requirements to staff

Qualifications

The different tasks described in this manual represent different requirements to the qualification of the persons entrusted with these tasks.



WARNING!

Danger in case of insufficient qualification of the staff!

Insufficiently qualified persons cannot estimate the risks while using the welding device and expose themselves and others to the danger of severe or lethal injuries.

- Have all works only performed by qualified persons.
- Keep insufficiently qualified persons out of the working area.

Only persons reliable working procedures can be expected from, are allowed to perform all works. Persons the responsiveness of which is affected by e. g. drugs, alcohol or medication, are not allowed to work with the machine.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator is instructed by the operating company about the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in the standard mode must only be performed by the operator if it is indicated in these instructions and if the operating company expressly commissioned the operator.

Electrically qualified person

Electrically qualified person is due to their professional training, knowledge and experience as well as knowledge of the relevant standards and regulations, in a position to carry out work on the electrical systems and to independently recognize and avoid possible dangers.

Qualified personnel

Due to their professional training, knowledge and experience 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 themselves.

Manufacturer

Certain works may only be performed by specialist personnel of the manufacturer. Other personnel is not authorized to perform these works. Please contact our customer service for the execution of all arising work.

2.4 Personal protective equipment

The personal protective equipment serves to protect persons against impairments of safety and health while working. The staff member has to wear personal protective equipment while performing different tasks on and with the machine 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

The welding shield, which is wear on the head and in front of the face or is attached to a suitable protective helmet, protects eyes and face, equipped with suitable filters.



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.



Safety boots

Safety boots protect the feet from being crushed, falling parts and slipping over on slippery ground.



Protective clothes

Protective clothes are made of a tightly fitted fabric without the protruding parts of low tear strength.



Protective apron

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

2.5 General safety instructions

Please note the following:

- The operator must be sufficiently trained in the safe use of the welding device. The operator must be informed about the risks involved in arc welding procedures, about the protective precautions and the behaviour in an emergency. (See also standard "EN 60974-9: Arc welding equipment". Part 9: Erection and operation").
- Avoid direct contact with the welding circuit; the open-circuit voltage provided by the welding machine is dangerous under certain conditions.
- The connection of welding cables, tests and repairs may only be carried out when the welding device has been switched off and disconnected from the power supply.
- Switch off the welding unit and disconnect the power plug as soon as you replace operating materials or wearing parts.

- Before replacing wearing parts of the torch, the welding device must be switched off and disconnected from the mains supply.
- The electrical installation must be carried out in accordance with the relevant regulations and accident prevention regulations.
- The welding unit may only be connected to a supply network with earthed neutral conductor.
- Make sure that the current socket is correctly connected to the protective earth.
- The welding device must not be used in a damp or wet environment or in rain.
- Do not use cables with worn insulation or loose connections - If a liquid cooling unit is available, it must only be filled when the welding unit is switched off and disconnected from the mains.
- Do not weld on containers, vessels or pipes that contain or have contained flammable liquids or gases.
- Do not work on materials that have been cleaned with chlorinated solvents. Do not work near these solvents.
- Do not weld on pressurized containers.
- Remove all flammable substances (e.g. wood, paper, scraps of fabric, etc.).
- Ensure that there is sufficient air exchange or suitable aids to dissipate the flue gases released during welding near the arc. It must be systematically examined which limit values apply to the respective composition, concentration and exposure time of the welding exhaust gases.
- The gas cylinder must be protected from heat sources including solar radiation.
- Ensure proper electrical insulation of the electrode, the workpiece and nearby (accessible) earthed metal parts. It is normally sufficient to wear appropriate gloves, footwear, headgear and clothing, as well as footboards and insulating carpets.
- Always protect your eyes with glare glass attached to masks or helmets. Use appropriate fire-retardant protective clothing and avoid exposing the skin to UV and infrared radiation from the arc, and use umbrellas or non-reflecting curtains to protect third parties near the arc.
- Noise: If a daily level of 85 db(A) or more (LEPd) is reached during particularly intensive welding work, appropriate individual protective equipment must be used.
- When the welding current passes, electromagnetic fields (EMF) are generated in the vicinity of the welding current circuit. The electromagnetic fields can impair medical aids (e.g. pacemakers, breathing aids or metal prostheses). Appropriate protective measures must be taken for the wearers of these aids, for example by prohibiting them from entering the operating area of the welding device.

- This welding equipment complies with the technical product standards for exclusive use in commercial and professional environments. Compliance with the basic limits applicable to the exposure of humans to electromagnetic fields in the domestic environment is not ensured.

The operator must take the following steps to reduce the effects of electromechanical fields:

- The two welding cables must be fixed as close as possible to each other.
- The head and body shall be kept as far away from the welding circuit as possible.
- Under no circumstances should the welding cables be wrapped around the body.
- When welding, the body must not be in the middle of the welding circuit. Hold both cables on the same side of the body.
- Connect the power return cable to the workpiece as close to the weld as possible.
- Never weld close to the welding machine, sitting on the welding machine or leaning against the welding machine (minimum distance: 50 cm).
- Do not leave any ferromagnetic objects near the welding circuit. - Minimum distance $d=20\text{cm}$.
- Use the guards and secure them securely. Never work without guards and get them working.
- Always keep the welding machine and its working environment clean. Ensure adequate lighting.
- Always secure your workpiece when working with suitable clamping devices. Ensure a sufficient contact surface.
- The design of the welding machine must not be changed and it must not be used for purposes other than those foreseen 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 welding machine away from their working environment.
- Do not pull the power cord to unplug the plug from the outlet. Protect the cable from heat, oil and sharp edges.
- Immediately remove any malfunctions that may affect safety.
- Protect the welding device from moisture (danger of short circuits).
- Before each use of the welding machine, make sure that no parts are damaged. Damaged parts must be replaced immediately to avoid sources of danger.
- Do not overload the welding machine! You will work better and safer in the specified power range.
- Use only original spare parts and accessories to avoid possible dangers and accident risks.

Additional safety precautions

During welding work

- in environments with increased risk of electric shock;
- in confined spaces;
- in the presence of flammable or explosive substances

1. A "responsible specialist" must weigh the circumstances. This work may only be carried out in the presence of other persons who can intervene in an emergency.
2. The technical protective equipment specified in 7.10; A.8; A.10 of the standard "EN 60974-9: Arc welding equipment. Part 9: Erection and operation".
3. Welding must be prohibited if the welding equipment or the wire feed system is carried by the operator (e.g. on belts).
4. Welding must be prohibited when the operator is working above ground level, unless he is using a safety platform.

Voltage between electrode clamps or torches:

When working with several welding machines on a single workpiece or on several electrically connected workpieces, the open circuit voltages between two different electrode clamps or torches can accumulate dangerously up to twice the permissible limit value.

A technical coordinator shall carry out an instrument measurement to determine whether there is a risk and whether the appropriate protective measures have been taken in accordance with point 7.9 of the standard "EN 60974-9: Arc welding equipment". Part 9: Erection and operation" can be applied.

2.6 Safety labels

Safety labels and instructions are attached to the welding machine which must be observed and followed.



Fig. 1: Safety labels

If safety labels on the machine are damaged or missing, this can cause errors, personal injury and material damage. The safety symbols attached to the machine must not be removed. Damaged safety symbols must be replaced immediately. As soon as the signs are not clearly visible and comprehensible at first glance, the machine must be stopped until new signs have been attached.

2.7 Safety data sheets

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

2.8 Safety devices



WARNING!

Danger to life through non-functioning safety devices!

If the safety devices do not function or are rendered ineffective, there is a risk of extremely serious injuries or even death.

- Before starting work, check that all safety devices are functional and correctly installed.
- Never bypass or disable the safety devices.
- Ensure that all safety devices are always accessible.



WARNING!

Danger from uncontrolled restart!

Uncontrolled restarting of the welding machine may result in serious injury.

- Before switching on the welding machine again, make sure that the cause of the switch-off has been eliminated and that all safety devices have been installed and are in working order.
- Do not switch on the welding unit until there is no more danger.

3 Intended use

EASY-MIG 201i / 211i MIG/MAG MULTI welders are designed for arc welding after MIG (metal inert gas) welding and MAG (metal active gas) welding of carbon steels or low alloy steels with the shielding gas CO₂ or with argon/CO₂ mixtures.



WARNING!

This Class A welding equipment is not intended for use in residential facilities where power is supplied by a public low-voltage power system. It may be difficult, due to both conducted and radiated interference, to ensure electromagnetic compatibility in these areas.

Intended use also includes compliance with all the information in these instructions.

3.1 Reasonably foreseeable misapplication

Any use beyond or different from the intended use is considered misuse.

Possible misuses can be:

- Use in areas with hazardous substances,
- Risk of explosion or fire.
- Use for heating objects or liquids.
- Use of other accessories such as welding torches that are not approved by the manufacturer.
- Use for machining non-metallic products.
- Use for igniting fuels.

Misuse of the welding device can lead to dangerous situations.

Stürmer Maschinen GmbH accepts no liability in the event of design and technical modifications to the welding device.

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

3.2 Residual risks

Even if all safety regulations are observed and the welding equipment is used as prescribed, there are still residual risks, which are listed below:

- Eye damage when using defective or unsuitable eye protection.
- Damage to the respiratory tract when inhaling vapors.
- Damage to the workpiece if the user is not sufficiently qualified or experienced.
- Upper limb burns if improper gloves are used.
- Electric shock if electrical insulation is defective or due to moisture.

4 Technical Data

Parameter	EASY-MIG 201i EASY-MIG 211i
Electrical connection	230 V
Fuses slow-blow	16 A
Open circuit voltage	33 V
Continuously variable setting range	20 - 200 A
Setting range - TIG DC	10 - 200 A
Setting range - electrode	20 - 180 A
Duty cycle at I_{max} 40°C	35 %
Welding current at DC = 100% and 40 °C	110 A
Wire feed speed	1,0 - 14 m/min.
Wire Ø steel	0,6 - 0,8 mm
Wire Ø stainless steel	0,6 - 0,8 mm
Wire Ø aluminium	1,0 mm
Ø gasless filler wire	0,9 mm
Wire feed rolls/driven	2/1
Cos phi power factor	0,96
Required generator output	12 kVA
Positive mains voltage tolerance	10%
Degree of protection	IP 21
Dimensions EASY-MIG 201i MULTI (LxWxH) [mm]	525 x 260 x 340 mm
Weight EASY-MIG 201i MULTI	16,0 kg
Dimensions EASY-MIG 211i MULTI (LxWxH) [mm]	795 x 540 x 700 mm
Weight EASY-MIG 211i MULTI	25,0 kg

The housing protects the components against external influences and direct contact. Depending on the use, there are different degrees of protection against penetration by 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 digit the degree of protection against water.

	1. digit	Description	2. digit	Description
IP21	2	Protected against solid bodies larger than 12 mm (for example the fingers of one hand)	1	Protected against vertical dropping of water drops

4.1 Type plate

The most important information on the operation and performance of the welding unit are summarized on the type plate:

Stürmer Maschinen GmbH Dr. Robert-Pfleger Strasse 26 D-96103 Hallstadt (Bamberg)		CE	
Schutzgasschweißgerät		Art. Nr.: 1089020	
EASY-MIG 201i MULTI		Serien Nr.:	
		EN 60974-1 EN 60974-10: Klasse A	
	20 A / 15,0 V - 200 A / 24,0 V		
		x	35 % 60 % 100 %
	U_0 V 42	I_2	200 A 160 A 110 A u_2 24,0 V 22,0 V 19,5 V
	10 A / 10,4 V - 200 A / 18,0 V		
		x	40 % 60 % 100 %
	U_0 V 5	I_2	200 A 160 A 110 A u_2 18,0 V 16,4 V 14,4 V
	20 A / 20,8 V - 185 A / 27,4 V		
		x	25 % 60 % 100 %
	U_0 V 80	I_2	185 A 140 A 100 A u_2 27,4 V 25,6 V 24,0 V

6.1 Principle of the metal inert gas welding process

The principle of MIG / MAG welding is that a metal wire is passed through the welding gun and melted in an arc. The welding wire has to fulfill two tasks, on the one hand it is the current-carrying electrode and on the other hand at the same time the weld metal to be introduced. The electric current is supplied via a welding power source to the contact tube in the welding gun.

A protective gas flowing through the gas nozzle protects the arc and the melt. The inert gas is either inert (MIG) or active (MAG). Inert gases do not react with the melt. Examples of gases in this category are argon and helium. Active gases are involved in the processes between the arc and the melt. Argon with a small amount of carbon dioxide or oxygen is an example of an active gas. The active component affects e.g. the penetration and / or the sweat bath temperature.

Due to the high welding speed, the low distortion and the minimal reworking, MIG/MAG welding is today the most frequently used welding process. The high weld seam strength, the excellent thin sheet properties and the simple, safe handling of steel, aluminium and stainless steel make this welding process universal.

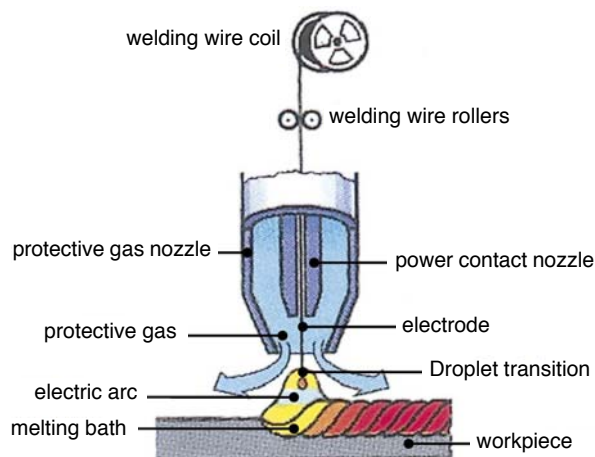


Fig. 4: Functional principle metal inert gas welding

The arc is formed between the workpiece to be welded and the emerging metal wire. The metal wire serves as both an electrode and as a deposition material; It is wound on a spool and is constantly inserted into the burner by wire guide rollers. The welding current passes through the wire guide tip of the burner to the electrode.

The inert gas exiting through the nozzle protects the electrode, the arc and the molten bath against the surrounding air.

6.2 Functional principle of wire feeding

The wire conveyor unrolls the weldment wound on a basket or mandrel spool and conveys it through the hose package to the torch. When using basket coils, a basket coil adapter must be used. Mandrel coils can be used without adapters. The wire feed roller is provided with a groove for the wire guide and must be replaced accordingly when using a thicker or thinner wire. The contact pressure of the pressure roller is adjusted via the pressure control and should be selected so that the wire spool can still be stopped by hand while the drive is running. For aluminum, the pressure should be as low as possible, but still allow a safe transport of the wire.

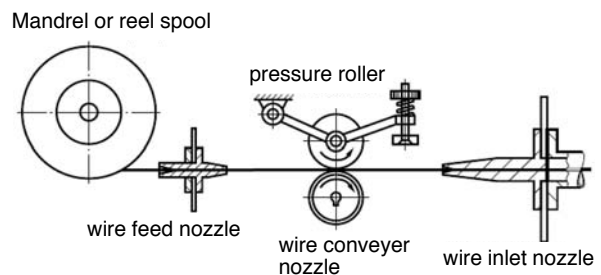


Fig. 5: Functional principle of wire conveying

6.3 Torch equipment



DANGER!

Before carrying out any adjustments / maintenance work on the torch, switch off the welding unit and disconnect the power plug. Allow the nozzles to cool down.

Current contact nozzle

The current nozzle transmits the electric current to the wire electrode. Power nozzles are wearing parts and must be replaced from time to time. Current nozzles are available for various materials and wire diameters. For aluminum special current nozzles are used.

Shield Cup

The protective gas nozzle has the task of directing the protective gas emerging at the gas flow distributor to the welding point. The protective gas nozzle must always be kept clean and free of beads of sweat to guarantee protection of the welding bath from the ambient air. While the conical gas nozzle concentrates the shielding gas on the weld, the cylindrical gas nozzle covers a larger area.

Guide spiral

The wire guide spiral is pulled through the hose assembly of the burner, in her the welding wire is passed to the burner.

The selection of the correct wire guide spirals depends on the material type and the wire diameter. Souls are made of different materials and are available for a wide variety of welding tasks.

For aluminum, for example, a special Teflon core must be used.

7 Operation



Wear the welders face protection shield or helmet with welder's face protection shield!



Wear protective gloves with pulse protection!



Use safety boots!



Wear protective clothes!



Wear protective apron!



DANGER! ELECTRICAL VOLTAGE!

Do not use the device outdoors in the rain!



DANGER OF EXPLOSION!

- In Fire - and explosion - prone rooms must not be welded. Here are special rules!
- Welding operations shall not be carried out on vessels storing gases, fuel, oils, dyes or the like, even if they have been emptied for a long time. There is a danger of explosion due to residues.
- Do not weld near pressurized containers.
- Do not weld in environments where dust, gas or explosive vapors are present.
- Do not use damaged or leaking gas cylinders.



DANGER OF FIRE!

- Avoid spreading open fire, which can be triggered by sparks, slag and glowing material.
- Fire protection devices must be near the workplace.
- Remove flammable materials and fuels from the work area.



ATTENTION!

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



ATTENTION! MAGNET FIELD!

Magnetic fields of power circuits can affect the function of pacemakers. Persons wearing vital electronic devices of this type must consult with the physician before traveling to areas where such welding equipment is available.

Interference may occur in the following areas / devices. For this, appropriate countermeasures must be taken:

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

7.1 Description of device

7.1.1 Wire feed

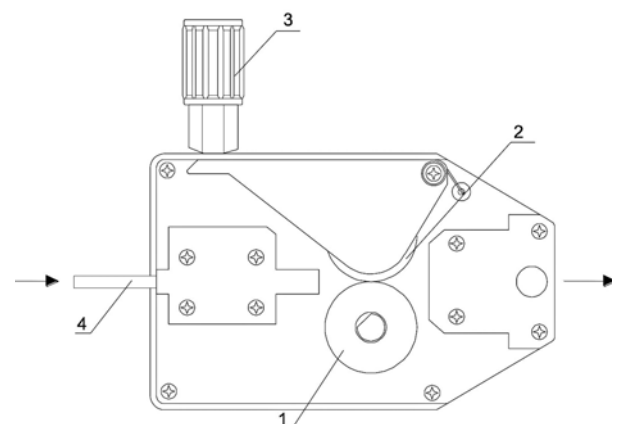


Fig. 6: Wire feed

- 1 Feed rollers
- 2 Pressure rollers
- 3 Pressure setting
- 4 Wire inlet nozzle

Wire feed: 10 L (EASY-MIG 201i MULTI)
SSJ-29 (EASY-MIG 211i MULTI)

Feed roller: 30 mm

7.1.2 Device view EASY-MIG 201i MULTI

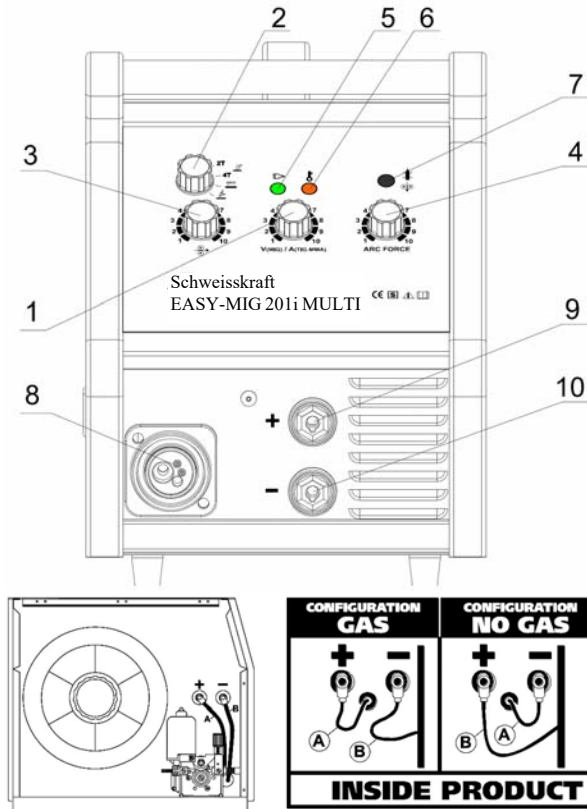


Fig. 7: Device view EASY-MIG 201i MULTI

Main switch (ON/OFF) on the rear of the device

- 1 Welding voltage adjustment (Welding current for electrode welding)
- 2 Selection button: (2T-4T) MIG – TIG - MMA
- 3 Wire feed control
- 4 Arc force current setting
- 5 LED, green - Power control indicator
- 6 LED, orange - Overload Indicator
- 7 Threading key
- 8 Central connector
- 9 Ground connection for MMA and TIG
- 10 Ground connection for MIG, MMA; torch connection for TIG

7.1.3 Device view EASY-MIG 211i MULTI

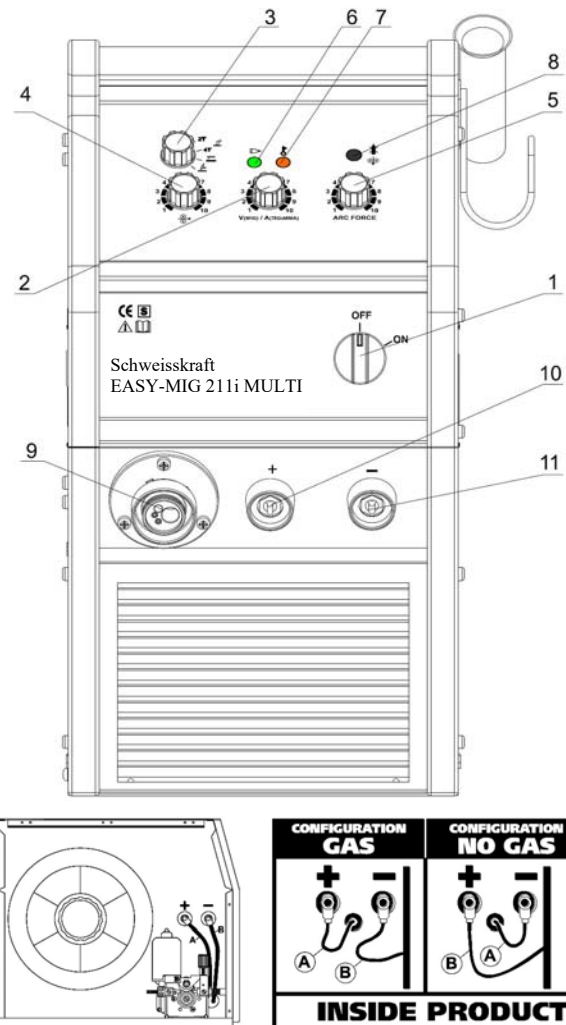


Fig. 8: Device view EASY-MIG 211i MULTI

- 1 Main switch (ON/OFF)
- 2 Welding voltage adjustment (Welding current for electrode welding)
- 3 Selection button: (2T-4T) MIG – TIG - MMA
- 4 Wire feed control
- 5 Arc force current setting
- 6 LED, green - Power control indicator
- 7 LED, orange - Overload Indicator
- 8 Threading key
- 9 Central connector
- 10 Ground connection for MMA and TIG
- 11 Ground connection for MIG, MMA; torch connection for TIG

Please observe - change of polarity:

Some flux-cored wires require reverse polarity for welding. Figure 10 below shows the internal connections. Flux-cored wire can also be used for welding without gas.

7.2 Scope of delivery

- Torch SMB 15, 3m
- Ground cable 3m, 16 mm²
- Feed roller 0,8/1,2 mm
- Pressure reducer small

7.3 Installation conditions

The device has been designed for use in roofed rooms and outdoors and must be installed in a dry environment.



DANGER! ELECTRICAL VOLTAGE!

Do not use the device outdoors in the rain!



ATTENTION!

The welding machine must be placed on a flat surface with sufficient bearing capacity to prevent it from slipping or tipping over.

Select the installation location of the welding unit so that the inlet and outlet of the cooling air is not obstructed (forced circulation with fan, if present); at the same time ensure that no conductive dust, corrosive vapours, moisture, etc. are sucked in.

There must be at least 250 mm of free space around the welding unit.

7.4 Electrical connection



DANGER!

Risk of fatal electric shock!

Contact with live components may result in fatal injury. Switched-on electrical components can make uncontrolled movements and lead to serious injuries. Connection to the mains and maintenance must be carried out in accordance with VDE regulations! Defective or damaged parts on the burner or hose package must be replaced immediately!



ATTENTION!


Work on the electrical installation and on the electrical equipment may only be carried out by qualified electricians!

Before starting any work on the installation and connection to the power supply, the welding device must be switched off and disconnected from the power supply.

Before making the electrical connections, check that the data on the type plate of the welding unit corresponds to the mains voltage and frequency at the installation site.

The welding unit may only be used with a power connection with earthing plugs installed by an authorised specialist. An earthed neutral conductor must be present.

Circuit-breakers of the following type must be used to protect against indirect contact:

- Typ A () for single-phase devices
- In order to meet the requirements of EN 61000-3-11 (Flicker), it is recommended to connect the welding device to the interfaces of the supply network, which have an impedance of below $Z_{max} = 0.25 \text{ Ohm}$.
- The requirements of the IEC/EN 61000-3-12 standard do not apply to the welding device.
- If it is connected to a public supply network, the installer or the operator must check whether the welding device is really connected. (if necessary, drag the the operator of the distribution network).

Plug and socket

The plug of the supply cable must be connected to a mains socket equipped with fuses or circuit breakers. The earth connection must be connected to the protective conductor (yellow-green) of the supply line.

Before plugging in the mains plug, the mains voltage selector switch must be set to zero.

7.5 Welding circuit connections



CAUTION!

Always make sure that the welding machine is switched off and disconnected from the power supply before making the following connections.

Connection to the gas cylinder (if one is used)



ATTENTION!

When handling gas cylinders, the relevant safety regulations must be observed. In particular, because of the dangerously high internal pressure (up to 200 bar), gas bottles are to be protected against mechanical damage, falling over and falling down, from warming (max 50 °C), from prolonged exposure to the sun and from severe frost.



NOTE!

Interventions and repairs to pressure reducers are not permitted due to the associated hazards. Defective pressure reducers are to be sent to the service workshop.

- Provide and secure gas cylinder. If necessary, it can be loaded onto the storage surface of a trolley; weight max 30 kg.
- After removing the protective cap, briefly open the cylinder valve in the direction away from the body in order to remove any impurities.

- Screw the pressure reducer onto the valve of the gas cylinder. If argon gas or a mixture of argon and CO₂ is used, insert a special reducer, available as an accessory, between the two.

The pressure reducer is equipped with two pressure gauges. The first has a scale of 0 - 300 bar and indicates the filling pressure of the gas cylinder after opening the cylinder valve. The second manometer shows the gas flow rate in litres/minute. The gas flow rate can be adjusted on the pressure reducer directly below the pressure gauges using the toggle screw marked "Plus, Minus". To be able to read the correct flow rate, the burner button must be pressed with the machine switched on. To avoid unnecessary wire consumption, open the wire feeder.

- Connect the gas supply hose to the pressure reducer and tighten the supplied hose clamp.
- Loosen the adjusting nut of the pressure reducer before opening the cylinder valve.

Connection of the welding current return cable

In order to obtain the closed circuit required for welding, the welding device must be connected to the workpiece via an earth clamp. The workpiece clamp of the earth connection cable should be clamped in the immediate vicinity of the welding point in order to achieve the highest possible degree of efficiency.



WARNING!

Ensure that the welding current cannot flow through chains of hoists, crane ropes or other electrically conductive parts. Ensure that the earth cable is connected to the workpiece as close as possible to the welding location. Ground connections made at remote points reduce efficiency and increase the risk of electric shock and „vagrant“ currents.

Torch connection

Connect the central plug of the torch to the marked junction box of the welding unit and screw it to the connection nut.

Recommendations

- The welding cables must be kept as short as possible.
- Avoid using metal structures that are not part of the workpiece instead of the welding current return cable. This can endanger safety and lead to unsatisfactory welding results.

7.6 Inserting the welding rod reel and wire guide

Mandrel or reel spool

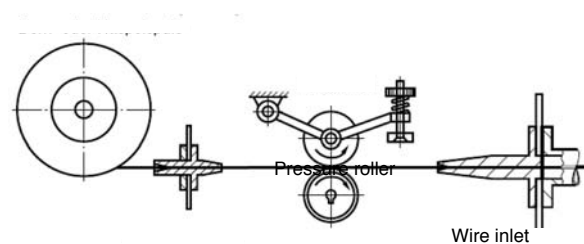


Fig. 9: Inserting the welding rod reel and wire guide



CAUTION!

Before starting to feed the wire, make sure that the welding machine is switched off and disconnected from the mains.

Open the flap of the welder and unscrew the nut from the wire reel mandrel. Mandrel coils can be fitted directly. When using basket spools, basket spool adapters must be used. Attach the reel so that the wire end is "bottom left". Fold the lever for the pressure adjustment in your direction to unlock the pressure roller, the two pressure arms automatically fold upwards. Insert the wire through the wire inlet via the wire feed roller into the wire inlet nozzle. Check that the wire is correctly seated in the groove of the wire feed roller. Fold down the pressure arms and lock them. Set the pressure correctly with the pressure setup.



NOTE!

It should still be possible to stop the wire spool manually while the drive is running. With aluminium, the pressure should be as low as possible, but still allow safe transport of the wire.

Insert the plug into the mains socket, switch on the welding unit, press the torch button and wait until the wire end has passed through the entire wire guide core and protrudes 10-15 cm from the front part of the torch. Now release the button.






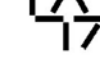
CAUTION!

During these processes, the electrode wire is live and subject to mechanical forces. Failure to take the appropriate precautions may result in electric shock, personal injury, and undesired ignition of electric arcs.













- Do not point the burner at body parts.
- Do not approach the burner to the bottle.
- The contact tube and the nozzle must be reattached to the burner.
- Check that the wire is fed evenly; set the roller pressure and the absorption brake to the minimum values and check whether the wire slips in the groove and whether the wire coils loosen when the feed stops due to the inertia forces of the coil.
- Cut the wire end protruding from the nozzle to 10-15 mm.
- Close the housing compartment again.

7.7 Weld preparation

The weld joint describes the weld and the special position of the welded parts to each other. A particular joint type requires a corresponding seam type, which is also determined by the sheet thickness, the seam preparation (joint shape), the material and the welding process.

Shock mode	Location of the	Description
Butt		The parts lie in one plane and lie dull next to each other.
Lap		The parts lie parallel to each other and overlap.
T-joint		The parts abut each other at right angles (T-shaped).
Corner		Two parts collide at any angle. (Corner)


Groove shapes

Designation	Jointless form	Execution	Sheet thickness s [mm]	Gap b [mm]
I-seam one-sided			From 1,5 to 1,5	0 to 2
I-seam on both sides			2 to 4	to 2
V-seam			3 to 6	to 1
Fillet seam			from 0,6	-
Double fillet weld			0,6 to 1,5	-
Corner joint			from 1	-

The workpieces to be welded should be free of paint, metallic coatings, dirt, rust, grease and moisture in the seam area. The weld seam preparation must be carried out in compliance with the welding regulations.

Seam planning

Guide values for MAG welding

								
Seam planning			Setting values			Performance data		
Seam thickness a [mm]	Wire diameter [mm]	Number of layers	Tension [V]	Electricity [A]	Wire feed speed [m/min]	Protective gas [l/min]	Filler [g/m]	Main usage time [min/m]
2	0.8	1	20	105	7	10	45	1.5
3	1.0	1	22.5	215	11	10	90	1.4
4	1.0	1	23	220	11	10	140	2.1
5	1.0	1	30	300	10	15	215	2.6
6	1.2	1	30	300	10	15	300	3.5
7	1.2	3	30	300	10	15	390	4.6
8	1.2	3	30	300	10	15	545	6.4
10	1.2	4	30	300	10	15	805	9.5

Material: unalloyed structural steel
Welding position: PB (h)
Welding filler: Wire electrode DIN 8559 - SG2, protective gas DIN 32526 - M21

Guide values for MIG welding

Seam planning				Setting values				Performance data	
Weld shape	Seam thickness a [mm]	Wire diameter [mm]	Number of layers	Voltage [V]	Electricity [A]	Wire feed speed [m/min]	Protective gas [l/min]	Filler [g/m]	Main usage [min/m]
Shape 1	4	1,2	1	23	180	3	12	30	2,9
Shape 1	5	1,6	1	25	200	4	18	77	3,3
Shape 1	6	1,6	1	26	230	7	18	147	3,9
Shape 2	5	1,6	1	22	160	6	18	126	4,2
Shape 2	6	1,6	2	22	170	6	18	147	4,6
Shape 2	8	1,6	2	26	220	7	18	183	5,0
Shape 3	10	1,6	1	26	220	6	20	190	5,4
Shape 3	10	1,6	2	24	200	6	20	190	5,4
Shape 3	10	1,6	10 ¹⁾	26	230	7	20	190	5,4
Shape 3	12	2,4	1	27	260	4	25	345	7,6
Shape 3	12	2,4	2	27	280	4	25	345	7,6

¹⁾ G Against plant
Material: aluminum, aluminum alloys
Welding position: PA (w)
Welding filler: DIN 1732 - 5 AlMg5, protective gas DIN 32526 - I1

7.8 Welding




CAUTION!

- Never point the torch at body parts.
- Never approach the torch to the bottle.

The welding unit is set up and connected, torch and earth cables are plugged into the unit. The gas cylinder is installed and connected.

Step 1: Switch on the welding unit at the ON/OFF switch.
The green LED lights up.

MIG welding

Step 2: Select MIG welding process with selector switch 2T or 4T .

2T - Operation: Press the burner button: wire feed takes place. Release torch button, wire feed stops. There is no current on the wire.

4T - Operation:

Press the burner button: wire feed takes place.

Release torch button, wire feed continues.

Press the torch button again: Wire feed continues.

Release the torch button: Wire feed stops. There is no current on the wire. Gas flow exists to protect the warm weld seam.



NOTE!

The 4T operation is used for long welds. The welder does not have to press the torch button all the time.

Step 3: **Gas flow setting:**

Set the wire feed speed to minimum (counter-clockwise).

Press the torch button and regulate the gas flow with the gas flow regulator on the pressure reducer.

Step 4: **Welding current / welding voltage adjustment:**

Set the welding voltage to „1“

Set further voltage levels by turning the voltage regulator.

Step 5: **Adjust the wire feed speed:**

The optimum wire feed speed is influenced by the following factors:

Material thickness,

Type of material (steel, Al, stainless steel);

Wire thickness (wire diameter);

Inert gas (CO₂, mixed gas, argon);

welding voltage;

Optimal settings are achieved with experience and experimentation.

Change polarity:

Some cored wires require reverse polarity for welding. The figure shows the inner connections. Flux-cored wire allows welding without gas, but the process and results are unprofessional.

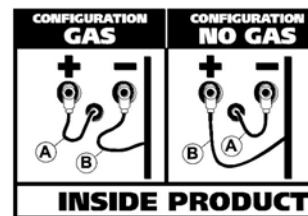
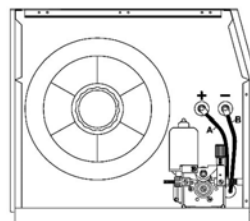



Fig. 10: Connections

Overload

In case of overload, the orange LED lights up and the device switches itself off. In this case, do not switch off the welding unit so that the fan continues to run and the unit cools down. Overloading can occur if high welding currents are used for a longer period of time.

TIG welding

Step 2: Select the TIG welding process with the selector switch .



NOTE!

In TIG welding, the welding voltage is always applied to the welding connections. The arc is ignited when the welding material is touched.

Step 3: **Gas flow setting:**


In the TIG process, the solenoid valve for the gas flow at the welding device is always open. The gas flow is opened or closed with the valve on the TIG torch and is also adjusted additionally.

Step 4: **Welding current / welding voltage adjustment:**

Set the welding voltage to „1“

Set further voltage levels by turning the voltage regulator.

Electrode welding

Step 2: Select the MMA welding process with the selector switch .



NOTE!

In MMA welding, the welding voltage is always applied to the welding connections.

Step 3: **Welding current / welding voltage adjustment:**

Set the welding voltage to „1“ Set further voltage levels by turning the voltage regulator.

Step 4: Arc Force current adjustment:

Set the desired value with the rotary knob for the Arc Force current setting. If the welding voltage is low or the welder lowers the electrode in the weld pool considerably, the welding current is increased so that the electrode burns off and the arc does not extinguish.

Carry out welding process

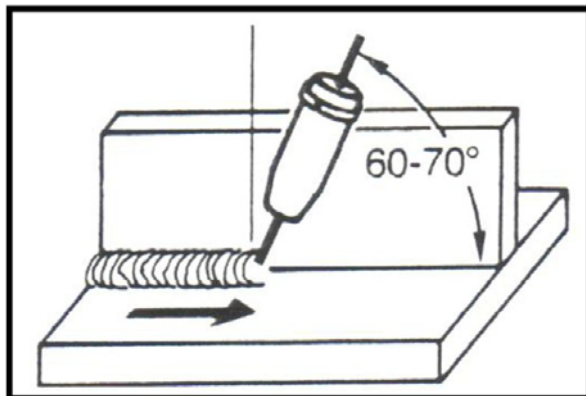
Step 1: Attach the ground clamp to the workpiece and open the gas supply to the pressure reducer.

Step 2: To start welding, move the torch towards the workpiece and press the torch button. The wire feed unit is activated and feeds the current-carrying wire electrode out of the nozzle. The gas begins to flow out of the torch. If the wire touches the workpiece, a short circuit occurs and the arc is created.

Torch guiding

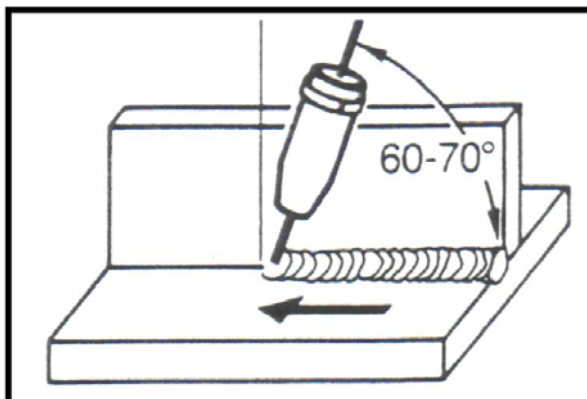
The inclination of the torch to the weld seam should not exceed approx. 70°. The distance between the torch and the workpiece should be approx. 10 - 12 x wire diameter [mm]. It can be welded piercing or dragging.

Towing welding:



The burner is pulled. Deep penetration, narrow seam. The power of the bow prevents slag from entering the molten bath.

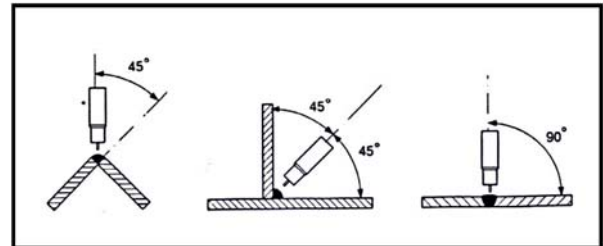
Stepping welding:



The burner is pushed. Flat penetration, wide seam pattern. Good suitability for welding thin sheets, low distortion due to lower heat input.

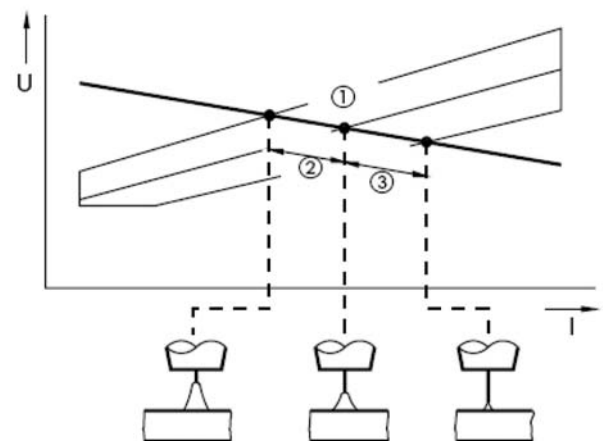
Torch inclination

The angle between burner and workpiece affects the shape of the weld and the penetration depth. The following pictures show how the inclination of the burner should be kept on the seam.



Influence of wire feed change on operating point and arc length

The arc length is set via the ratio of welding voltage to welding current.



Constant parameters	Variable parameters	Electric arc
Wire feed	higher voltage	longer arc
	lower voltage	shorter arc
Voltage	more wire	shorter arc (higher electricity)
	less wire	longer arc (lower electricity)

7.9 Description and use of different arc types

The short arc (KLB) is used for thin sheets, forced and root welds in the low power range. The material transfer takes place with little spatter formation in the short circuit.

The transitional arc (ÜLB) is preferred for medium power in MAG welding of medium plate thicknesses under argon mixed gases. The material transfer is coarse droplet, partly in short circuit - but with less spatter than in LLB (long arc) under carbon dioxide.

The spray arc (SLB) allows high melting rates and higher welding speeds with larger wall thicknesses under argon mixed gases. The material transfer is fine droplet without short circuits and is very low spatter.

In long arc (LLB), high wall thicknesses are MAG-welded under high-performance carbon dioxide. The material transfer is coarse droplets and splashy. That is why this type of arc is only used in a few cases.

Guide values for arc types and applications depending on wire diameter

Wire \varnothing [mm]	Short arc		Transition arc		Spray arc	
	Electricity [A]	Voltage [V]	Electricity [A]	Voltage [V]	Electricity [A]	Voltage [V]
0,8	50 - 130	14 - 18	110 - 150	18 - 22	140 - 180	23 - 28
1,0	70 - 160	16 - 19	130 - 200	18 - 24	180 - 250	24 - 30
1,2	120 - 200	17 - 20				
Application	Thin sheets in all positions. Middle sheets in predicaments, root welding on sheet metal and tubes even in constrained positions.		Medium sheet thickness range in normal position. Fillet welds also as fill seam.		Medium and thick sheets (fill blankets and fillet welds).	

7.10 Selection of wire electrode and inert gas

With the MIG / MAG process, various materials such as alloyed and unalloyed steels, stainless steels and aluminum welding. The welding system must be retrofitted accordingly and equipped with the right components such as filler material and gas.

Additional material

The filler material is selected based on the base material to be welded and the desired weld seam quality. The wire thickness is chosen according to the thickness of the sheet, the joint shape and the necessary welding current.

Protective gas

The protective gas has the task to shield the molten bath from the atmosphere. It influences the electrical conductivity, the heat conduction and the heat content of the arc. In addition, the shielding gas also influences the chemical composition of the weld metal due to ignition and burnup processes.

The shielding gas also determines the welding process. Steel materials are usually an MAG process (metal-active gas) in which mixed gases are used, which react with the molten bath, ie are active. For welding aluminum, for example, pure argon is used. Argon is an inactive gas and does not react with the molten bath. Therefore, the welding of aluminum is a MIG (Metal Inert * Gas) process.

Combinations of gas, base material and additional material

Parent material		Additional material	Gases
Structural steel	St 37, St 52	G2Si1, G3-Si1	82% Argon 18% CO ₂
Stainless steel	X5Cr-Ni18-10	SG X2 Cr-Ni19 9	97,5% Argon 2,5% CO ₂ oder O ₂
Aluminum	AlMg3, AlMg5	AlMg3, AlMg5	100% Argon

8 Maintenance



ATTENTION!

Before starting maintenance work, make sure that the welding device is switched off and disconnected from the mains.

8.1 Regular maintenance

The regular maintenance activities can be carried out by the welder.

The feed wheel, the pressure roller and the inlet nozzle must be checked regularly for dirt and cleaned if necessary. The complete burner hose package should be cleaned at appropriate intervals because abrasion and dust settle inside. The contact nozzle of the burner is a wearing part.

If its bore has become too large, it must be replaced. Metal splashes are trapped in the inner walls of the plug-in gas cap of the burner. These must be removed if necessary. A separating agent facilitates this work and prevents the splashes from sticking. Damaged lines must be replaced immediately.

Torch

NOTE!

Follow the enclosed torch instructions for all adjustment setup and maintenance work.

- The torch and its cable should not be placed on hot parts because the insulating material would melt and the torch would soon become inoperable;
- Check regularly that the pipes and gas connections are tight;
- Each time the wire coil is changed, blow the wire guide core through with dry compressed air (max. 5 bar) and check its condition;
- Check at least once a day the following torch end pieces for wear and for correct installation: Nozzle, contact tube, gas diffuser.

Wire feed

Check the wire feed rollers more frequently for wear. Metal dust that has accumulated in the drag area must be removed regularly (rollers and wire guide at the inlet and outlet).

8.2 Special maintenance

The activities covered by the special maintenance may only be carried out by specialists in the field of electro-mechanics and in accordance with the IEC/EN 60974-4 technical standard.

- The inside of the welding device must be inspected regularly and at regular intervals, depending on the way it is used and the amount of dust generated at the place of work. The dust deposited on the transformer, reactance and rectifier must be blown off with dry compressed air (max. 10 bar).

- Avoid directing the compressed air jet at the electronic cards. If necessary, clean them with a particularly soft brush or a suitable solvent.
- If possible, check that the electrical connections are tight and that the cable insulation is undamaged.
- When this work is complete, the welding machine covers are reattached and the locking screws are fully tightened.
- Avoid working with the welder open under any circumstances.
- After completion of maintenance or repair, the connections and wiring must be restored to their original condition. Ensure that they do not come into contact with moving parts or parts that can reach high temperatures. Re-bundle all conductors as before, making sure that the high voltage terminals of the primary transformer are kept separate from the low voltage terminals of the secondary transformers.
- Use all original washers and screws to close the housing.

9 Troubleshooting

Mechanical faults usually occur in connection with an irregular wire feed or by blocking the wire feed. Electrical faults cause partial or total failure of the device. Troubleshooting in the electrical part of the unit may only be carried out by an authorised electrician. Further troubleshooting is possible according to the circuit diagram supplied. The troubleshooting should first be carried out in a de-energized state and in the following sequence:

- Check the mains connection and the other connections on the switches, the choke as well as the plug connections and solder connections for tight fit.
- Check the fuse for function and contact.
- Optical check for possible short circuits or overloading of windings (discoloration).

Fault	Possible cause	Solution
Restless or unstable arc	1. Wrong welding voltage 2. Too much / too little wire 3. Workpiece clamp loose or large contact resistance (rust, color) 4. Contact nozzle worn or wrong diameter 5. Wrong amount of gas set 6. Workpiece in the seam area uncleaned amount of gas set 7. Power unit defective 8. Drawer spiral dirty 9. Defective feed	1. Correct on the voltage selector switch. 2. Regulate at the wire feeder 3. Make good contact between workpiece and ground terminal 4. Change 5. Adjust gas volume 6. Remove paint, rust, grease, etc. 7. Bring device to service workshop 8. Clean or replace 9. See below
Many splashes during welding	1. Too much wire 2. Too high welding voltage 3. Workpiece dirty	1. Turn back the wire feed 2. Turn back the voltage selector switch 3. Clean workpiece

Fault	Possible cause	Solution
Feed motor does not run	<ol style="list-style-type: none"> 1. Mains voltage is missing 2. Mains voltage switch is at zero position 3. Burner switch not actuated 4. Fuse defective 5. Motor defective. 	<ol style="list-style-type: none"> 1. Check mains connection 2. Set voltage level 3. Press burner switch 4. Change fuse 5. Repair by customer service.
No wire transport	<ol style="list-style-type: none"> 1. Pressure roller loose 2. Kinked wire at the feed 3. Groove in the feed roll leaked 4. Wire burned to the contact nozzle 	<ol style="list-style-type: none"> 1. Increase pressure on leaf spring with knurled screw 2. Align inlet nozzle 3. Change feed roller 4. Change contact nozzle if wire is deformed, reduce contact pressure
Device switches off, overload indicator lights up	<ol style="list-style-type: none"> 1. Duty cycle (ED) exceeded. 2. Power unit defective 	<ol style="list-style-type: none"> 1. Allow the device to cool down, observe the ED according to the rating plate. 2. Move the device to the service workshop.
Inert gas supply does not switch off	<ol style="list-style-type: none"> 1. Magnet valve obstructed by dirt from closing 	<ol style="list-style-type: none"> 1. Remove burner connection and connecting hose, alternately blow through compressed air at the burner connection and at the connecting hose, while operating the burner switch frequently.
Air bubbles in the weld seam (porosity)	<ol style="list-style-type: none"> 1. Wet electrodes 2. Welding current too high. 3. Surfaces dirty with oil, paint etc. 	<ol style="list-style-type: none"> 1. Dry the electrodes before use. 2. Reduce the welding current. 3. Clean the edges before welding.
Visible cracks in the weld seam immediately after the hardening.	<ol style="list-style-type: none"> 1. Edges too fixed. 2. Weld fillet too small. 3. Cooling too fast. 	<ol style="list-style-type: none"> 1. Avoid tensions due to the edge shape. 2. Reduce the working speed to obtain a more even sedimentation. 3. Preheat the workpiece and cool it slowly.
Cracks due to poor filling of the throat.	<ol style="list-style-type: none"> 1. Welding current too low. 2. Electrode too large for connection. 3. Fillet unsuitable. 4. Wrong welding cycle. 	<ol style="list-style-type: none"> 1. Increase the welding current. 2. Use electrodes with a smaller diameter. 3. Magnify the fillet. 4. Follow the correct welding sequence.
Parts of the workpiece not fused with the sheet metal or the joint.	<ol style="list-style-type: none"> 1. Electrodes too thin for the workpiece to be welded. 2. Welding current too low. 3. Electrode used at the wrong angle. 4. Too fast movement of the electrode. 5. Slag or dirt on the surface of the workpiece. 	<ol style="list-style-type: none"> 1. Use electrodes with a larger diameter and preheat the workpiece. 2. Increase the welding current. 3. Correct the welding angle towards the base plate. 4. Reduce the speed of the electrode. 5. Clean the surfaces before welding.
Non-metallic material in the weld pool (slag inclusions).	<ol style="list-style-type: none"> 1. Particles in the lower layers of the preceding passages. 2. Prepared joint too narrow. 3. An irregular surface promotes slag containment. 4. Poor penetration of slags trapped under the weld pool. 5. Rust or splinters prevent complete melting. 6. Wrong electrode for the intended welding position. 	<ol style="list-style-type: none"> 1. In case of bad welding, remove the slag and replace the base with a small diameter electrode. 2. Provide adequate space for slag cleaning. 3. If necessary, grind off the entire bad or irregular area. 4. Remove all slags from the corners. Use smaller electrodes to allow proper penetration. 5. Clean the edge before welding. 6. Use electrodes appropriate to the position to be welded, otherwise removing the slag will be difficult.

10 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.

10.1 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.

10.2 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.

10.3 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.

11 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

11.1 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 fan for the welding machine EASY-MIG 201i must be ordered. The fan is identified in the spare parts drawing with the number 6.

When ordering spare parts, send a copy of spare parts drawing with marked fan component and marked position number 4 to the authorised dealer or to the spare parts department and provide the following information:

Type of device: MIG/MAG Inverter EASY-MIG 201i

Item number: 1089020

Position number: 6

The item number of your device:

MIG/MAG Inverter EASY-MIG 201i: **1089020**

MIG/MAG Inverter EASY-MIG 211i: **1089021**

11.2 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.

Spare parts drawing EASY-MIG 201i MULTI

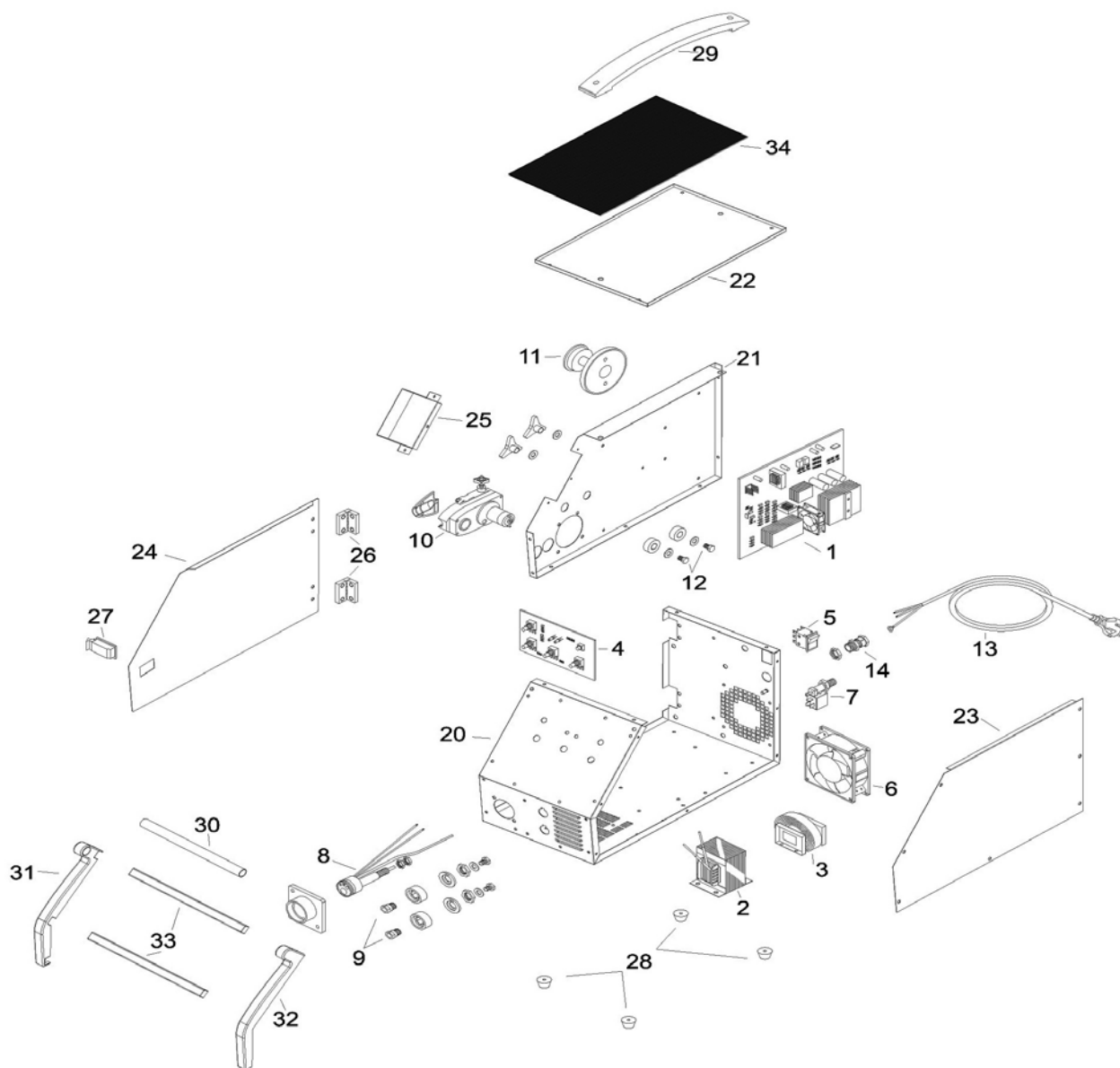


Fig. 11: Spare parts drawing EASY-MIG 201i MULTI

Spare parts list - EASY-MIG 201i MULTI

Pos.	Description	Pos.	Description	Pos.	Description
1	Main board	12	Polarity change insulators	25	Cover of control board
2	Throttle		Polarity change nut	26	Hinges
3	PFC throttle	13	Mains cable 3x1,5 mm ² with plug	27	Spring lock
4	Control board - front panel	15	Fuse T 4A	28	Legs
5	ON/OFF switch, 250V IP32	16	Mains cable mounting	29	Handle
6	Fan 230 V	19	Foil front panel	30	Handle (Ø22 x 248)
7	Magnetic valve 42V AC	20	Housing	31	Plastic mask, top left
8	Central connector	21	Intermediate plate	32	Plastic mask, top right
9	Ground cable connector	22	Cover	33	Plastic strip
10	Wire feed, 10L, 20V –20W	23	Side plate	34	Rubber surface
11	Coil carrier	24	Cover of wire reel		

Spare parts drawing EASY-MIG 211i MULTI

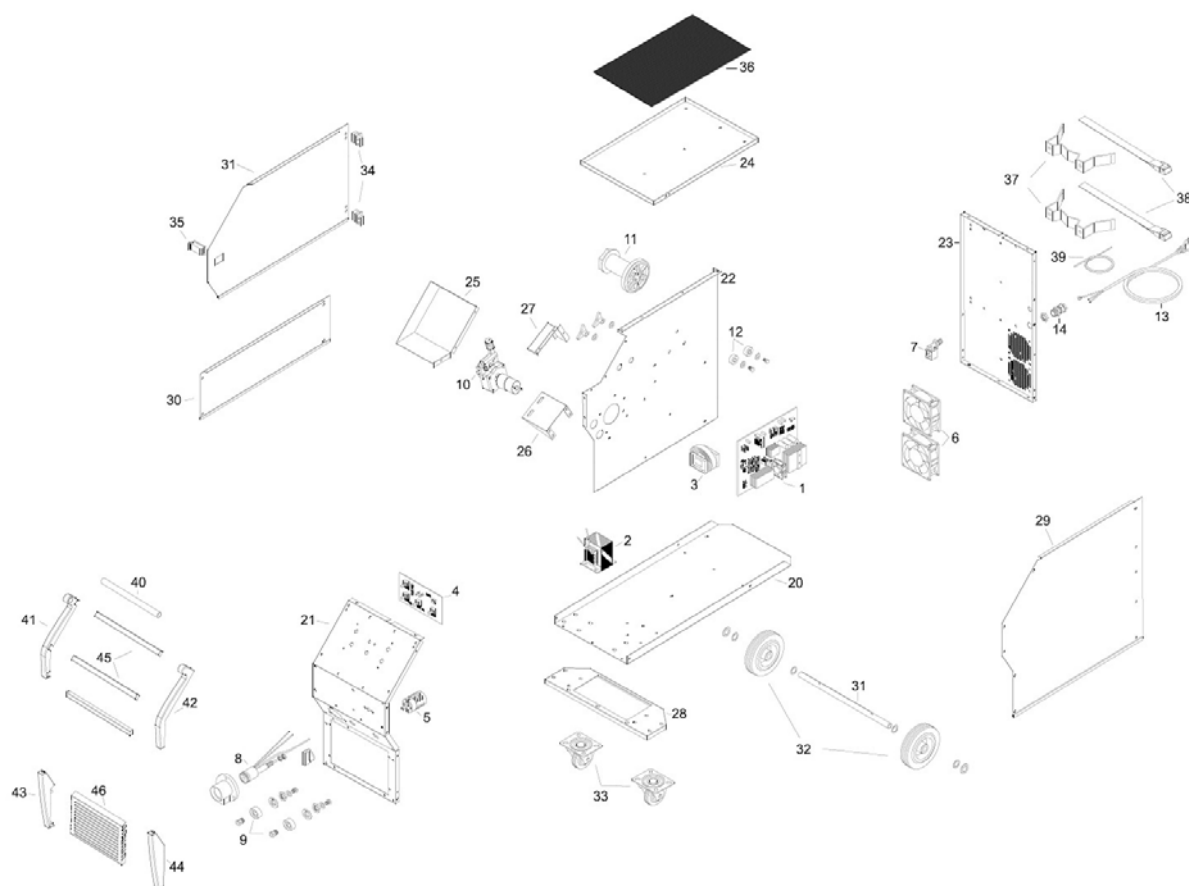


Fig. 12: Spare parts drawing EASY-MIG 211i MULTI

Spare parts list EASY-MIG 211i MULTI

Pos.	Designation	Pos.	Designation	Pos.	Designation
1	Main board	20	Base plate	36	Rubber surface
2	Choke	21	Front panel	37	Gas bottle holder
3	PFC Choke	22	Distance plate	38	Fixing tape
4	Control board - front panel	23	Back plate	39	Gas hose
5	ON/OFF switch	24	Cover	40	Handle (Φ 22 x 290)
6	Fan 24 V DC	25	Control board cover	41	Plastic mask, upper-left
7	Solenoid valve, 230 V AC + relay	26	Wire feeder cover	42	Plastic mask, upper-right
8	Central connection	27	Wire feed holder	43	Plastic mask, lower-left
9	Ground cable connection	29	Side plate, L	44	Plastic mask, lower-right
10	Wire feed 12 V DC	30	Side plate, R	45	Plastic strip
11	Coil carrier	31	Wire coil cover	46	Grid
12	Polarity change insulators	32	Roll	47	Axis
	Polarity change nut	33	Swivel castor		Ground cable 16mm ²
13	Mains cable 3x1.5 mm ² with plug	34	Hinge		Pressure reducer, small,
14	Power cord attachment	35	Snap lock		

12 Electrical circuit diagrams

Electric circuit diagram EASY-MIG 201i MULTI

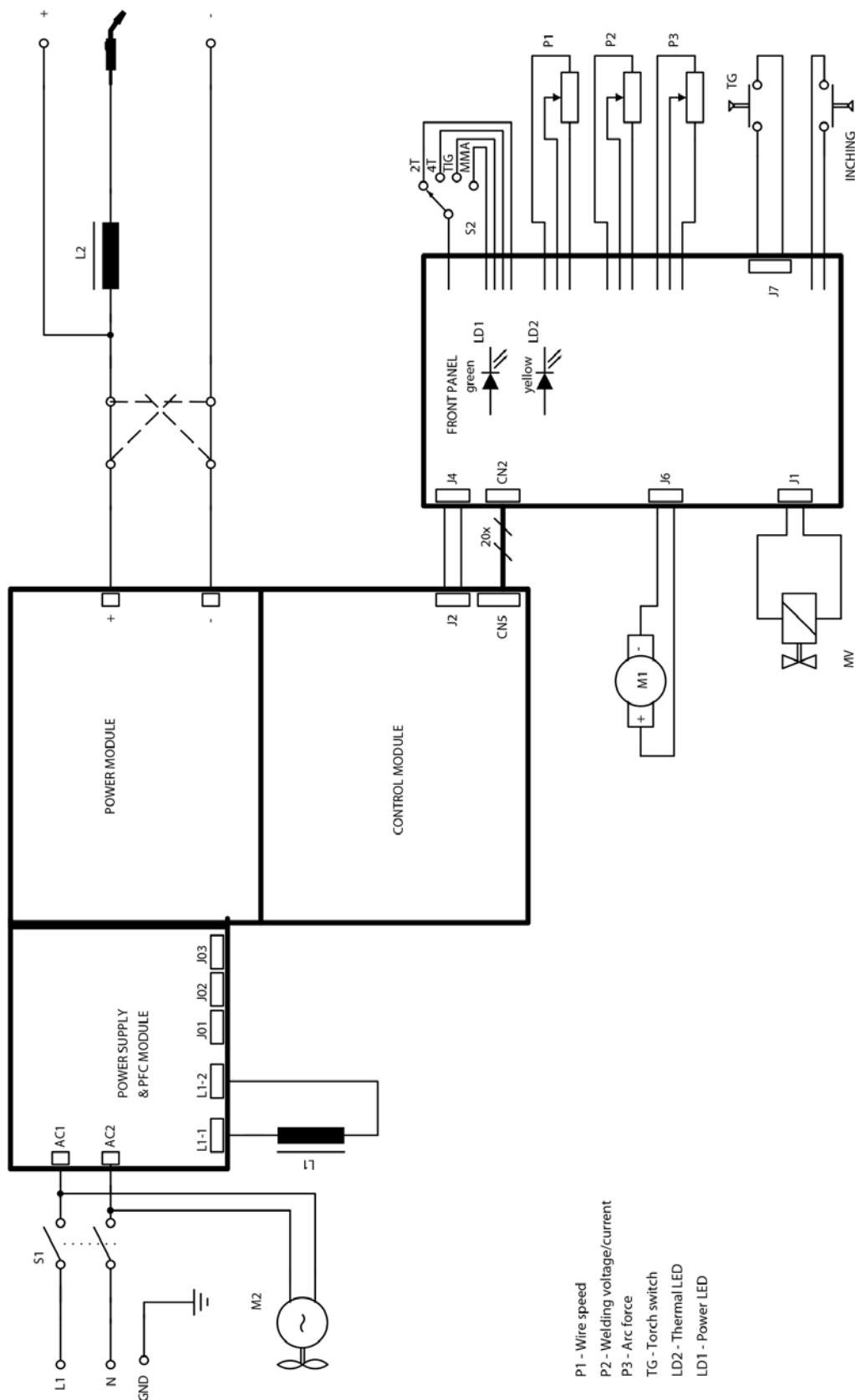


Fig. 13: Electrical circuit diagram EASY-MIG 201i MULTI

The diagram illustrates the electrical connections for a robotic welding system, divided into a Power Module and a Control Module.

Power Module:

- Power Supply & PFC Module:** Features terminals L1-1, L1-2, J01, J02, and J03. It is connected to AC1 and AC2 inputs and a ground connection.
- Wiring:** Shows a 230 V AC source connected to a thermal relay (RL1) and a motor (M1). The motor is connected to the Power Supply & PFC Module via a 20x terminal block.

Control Module:

- Front Panel:** Includes two LEDs, LD1 (green) and LD2 (yellow), and a 20x terminal block.
- Connectors:** The Control Module is connected to the Power Module via J2 and CN5. It also has connections to J4, CN2, J6, and J7.
- Wiring:** Shows a 20x terminal block connected to the Front Panel and the Power Module. The Front Panel is also connected to a 20x terminal block.

Legend:

- P1 - Wire speed
- P2 - Welding voltage/current
- P3 - Arc force
- TG - Torch switch
- LD2 - Thermal LED
- LD1 - Power LED

Fig. 14: Electrical circuit diagram EASY-MIG 201i MULTI

13 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
Type of machine: MIG/MAG Inverter

Designation of welding device *: ☐ EASY-MIG 201i MULTI **Item number *:** ☐ 1089020
☐ EASY-MIG 211i MULTI ☐ 1089021

Serial number*: _____

Year of manufacture*: 20____

*fill in these fields according to the information on the type plate

is hereby confirmed to comply with the essential protection requirements set out in Council Directive 2014/30/EU (EMC Directive) on the approximation of the laws of the Member States relating to electromagnetic compatibility and Directive 2014/35/EU concerning electrical equipment designed for use within certain voltage limits.

Co-applicable EU regulations: EC Regulation 1907/2006 REACH Regulation

The above-mentioned product complies with the provisions of these directives and with the RoHS 2011/65/EU Directive and meets the safety requirements for equipment for arc welding in accordance with the following standards:

The following harmonized standards were applied:

DIN EN IEC 60974-1:2018-12 Arc welding equipment - Part 1: Welding power sources

DIN EN 60974-10:2016-10 Arc welding equipment - Part 10: Requirements for the electromagnetic compatibility (EMC), Requirements (Class A)

According to **EC Directive 2006/42 / EC Article 1** shall apply. Product exclusively within the scope of **Directive 2014/35 / EU** relating to electrical equipment for use within certain voltage limits.

Electromagnetic compatibility EMC (DIN EN 60974-10)

The device is built and tested to Class A standard EN 60974-10. This Class A welding equipment is not intended for use in residential areas where power is supplied by a public low voltage power supply system.

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

Hallstadt, 18.07.2022

A handwritten signature in blue ink, appearing to read 'K. Stürmer', written over a horizontal line.

Kilian Stürmer
Managing Director



14 Notes

