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Schweißtechnik

Operating Instructions

Multifunctional Inverter

Easy-MIG 181 Multi

Easy-MIG 181 Multi

MULTI-SERIES

Imprint

Product identification

Multifunctional Inverter	Item number
Easy-MIG 181 Multi	1071181

Manufacturer

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Information about the operating instructions

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according DIN EN ISO 20607:2019

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Indications regarding the copyright

Content

1 Introduction

You have made a good choice by purchasing the SCHWEISSKRAFT multifunction inverter.

Read the operating instructions carefully before commissioning.

These are an important part and must be kept near the machine and accessible to every user.

The operating instructions inform you about the proper commissioning, the intended use as well as the safe and efficient operation and maintenance of the multifunction inverter.

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

1.1 Copyright

1.2 Customer service

Please contact your dealer if you have questions concerning your Multifunctional Inverter or if you need technical advice. They will help you with specialist information and expert advice.

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

Repair service:
Fax: 0951 96555-111
E-Mail: service@stuermer-maschinen.de
Internet: www.schweißkraft.de

Spare part orders:
Fax: 0951 96555-119
E-Mail: ersatzteile@stuermer-maschinen.de

We are always interested in valuable experience and knowledge gained from using the application-which then could be shared and be valuable to develop our products even further.

1.3 Limitation of liability

All information and notes in these operating instructions were summarised taking the applicable standards and rules, the state-of-the-art and our long-term knowledge and experiences into consideration.

In the following cases the manufacturer is not liable for damages:

- Non- observance of the operating instructions,
- Inappropriate use,
- Use of inexperienced staff,
- Unauthorised modifications,
- Technical changes,
- Use of not allowed spare parts.

The actual scope of delivery may deviate from the explanations and presentations described here in case of special models, when using additional ordering options or due to latest technical modifications.

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 at the time of the conclusion of the contract are applicable.

2 Safety

This paragraph will give you an overview of all important safety packages for the protection of persons as as well as for the safe and undisturbed operation. Other task-based safety notes are included in the individual chap-ters.

2.1 Symbol explanation

Safety instructions

The safety notes in these operating instructions are highlighted by symbols. The safety notes are introduced by signal words which express the concern of the risk.

DANGER!

This combination of symbol and signal word indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNiNG!

This combination of symbol and signal word indicates a potentially dangerous situation that will result in death or serious injury if not avoided.

CAUTION!

This combination of symbol and signal word indicates a potentially hazardous situation which, if not avoided, may result in minor or slight injury.

ATTENTION!

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

NOTE!

This combination of symbol and signal words indicate a possibly dangerous situation which may lead to property and environmental damages if they are 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.

It is necessary to observe the safety notes quoted in these operating instructions in order to reduce the risks for personal injuries and damages to property.

2.2 Personal protective equipment

The personal protective equipment serves to protect persons against impairments of safety and health while working. The staff has to wear personal protective equipment while performing different works 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:

Welder face shield or helmet with welder face shield

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

Suitable 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

The safety boots protect the feet against crushes, falling parts and slipping on slippery underground.

Hearing protection

Hearing protection protects ears from hearing damage caused by noise.

Protective clothes

The protective clothes are tight clothes of little tensile strength.

Protective apron

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

2.3 General safety informations

- Before commissioning, check the devices for externally visible damage and defects.
- Repair defects and damage immediately.
- Before switching on the device, check the correct position and fixation of the workpiece!
- When carrying out maintenance work with the device, never bring your hands near rotating parts!
- Never work without protective device. Securely fixate, check and maintain the protective devices before using the device.
- Always keep the device and its working environment clean. Ensure adequate lighting.
- Secure the workpiece for machining with suitable clamping devices. Ensure sufficient contact surface.
- Never change the design of the device and use it for purposes other than those specified by the manufacturer.
- Never work under the influence of concentration-disturbing illnesses, fatigue, drugs, alcohol or medicines.
- Remove the tool key and other loose parts after installation or repair.
- The device may only be used, equipped and maintained by persons who have been trained and are familiar with it. They must have been informed about the dangers.
- Do not disconnect the power plug from the socket by the plug. Protect the power cord from heat, oil and sharp edges.
- Make sure that the main switch is in the "OFF" position when the device is connected to the mains to prevent unintentional switching on / starting.
- Disruptions that affect safety have to be eliminated immediately.
- Never leave the welder in operation unattended and remain there until the device stops. Then pull out the power plug.
- Never use the welding machine near flammable liquids and gases (danger of explosion!).
- Do not overload the device! Only work in the specified power range. Use the wire and gas recommended for the device!
- Only use original spare parts and original accessories to avoid possible danger and accident risks.
- Do not use the device in damp wet conditions, rain, etc. Protect the device against moisture (danger of short circuit!).
- After switching off the unit, please check and maintain the equipment according to the instructions in this manual because of the DC voltage applied to the electrolytic capacitors.

2.4 Safety markings on the device

The following safety labels are attached to the multifunction inverter (Fig. 1) and must be observed and followed.

Fig. 1: Safety labels

Electric shock

An electric shock can be fatal. Touching live parts can cause serious shocks or burns. Ensure that all parts are connected correctly and that the earth connection is correct. Ensure that there is always insulation between your body and the workpiece and avoid any contact of live parts with bare hands. Wear dry, insulating protective clothing during welding and never operate the machine with the housing open.

Electric arcs

Arcs pose a particular danger to the eyes and skin. Always wear a welding helmet with a suitable welding filter and appropriate protective clothing such as welding gloves during welding.

Vapours and gases

Welding produces fumes and gases that are hazardous to health. Try to keep your head as far away from the fumes as possible during welding. Provide adequate ventilation, exhaust or a breathing air supply to keep them out of the air you breathe.

Welding spatter

Welding spatter can cause fire and explosions. Do not weld near flammable materials or on containers containing flammable material.

The safety labels attached to the multifunction inverter must not be removed. Damaged or missing safety labels can lead to incorrect actions, personal injury and damage to property. They must be replaced immediately.

If the safety labels are not recognisable and comprehensible at first glance, the multifunction inverter must be taken out of operation until new safety labels have been applied.

2.5 Special safety instructions

- Wear dry insulating protective clothing and protective shoes.
- Protect eyes and face with a welding shield or welding helmet.
- Operate the unit with power cords with the protective conductor properly connected and connect them to earthed sockets.
- When operating this device, the accident prevention regulations "Welding, cutting and related processes" (VGB 15) must be taken into account. The main risks are:
  - Fire and explosion hazard,
  - Pollutants (gases, vapors, smoke / dusts),
  - Optical radiation,
  - Electrical hazard / electric shock,
  - Handling errors.

DANGER!

Electrical voltage!

Electric shock can be deadly!

- Keep the electrode holder, the workpiece clamp, the welding cable and the welding machine in a good and safe operating condition. Replace the damaged insulation.
- At the same time, do not electrically touch "hot" parts of electrode holders connected to two welders since the voltage between them can be the sum of the open circuit voltage of both welders.

DANGER!

Radiation and resulting heat!

The arch generates radiations that can damage the eyes and cause skin burns. The welding arc is to be classified as dangerous up to a distance of 15 m. Use appropriate protective devices.

Use a shield with the correct filter and cover plates to protect your eyes from sparks and electric arc when welding or observing open arc welding.

Use appropriate clothing made of durable, fire-resistant material to protect your and your assistant's skin from the light rays.

Protect other nearby people with suitable non-combustible shields and / or warn them against observing the arc and exposing themselves to arc jets or hot splatter or metal.

DANGER!

Electrical voltage!

Electric shock can be deadly!

- Insulate yourself with dry insulation from the work area and the floor. Make sure the insulation is large enough to cover the entire area of physical contact with the work area and floor.
- Be careful when using the device in a tight place where it may fall and get wet.
- Make sure that the device is correctly installed and ground the workpiece or metal to be welded with a good ground in accordance with the operating instructions.
- The electrode and working circuits (or grounding circuits) are electrically "hot" when the welder is switched on. Do not touch these "hot" parts with bare skin or wet clothing. Wear dry and non-puncture gloves to insulate hands.
- In semi-automatic or automatic wire welding, the electrode, electrode coil, welding head, nozzle or semi-automatic welding gun are also electrically "hot".

DANGER!

Electrical voltage!

Electric shock can be deadly!

- Do not touch any parts that are live.
- Always disconnect the generator from the power supply before intervening.
- Insulate yourself from the workpiece to be welded and from the floor, and wear insulating gloves, shoes and clothing.
- Never immerse the electrode in water for cooling.
- When working over the ground, use a safety belt to protect yourself from falling if you get an electric shock.
- Do not work with damaged, poorly connected cables or loose pliers cables.
- Work clothes and keep the body dry.
- Do not work in damp or wet environments.
- Do not lean the body against the workpiece to be welded.
- Protect the supply system with a suitable thermomagnetic switch, if possible close to the welder.
- Do not use the device if components or guards have been removed.
- Ensure that the supply system is properly grounded.

DANGER!

Electrical voltage!

Electric shock can be deadly!

- Keep the electrode holder, the workpiece clamp, the welding cable and the welding machine in a good and safe operating condition. Replace the damaged insulation.
- Always make sure that the working cable has a good electrical connection with the metal to be welded. The connection should be as close as possible to the area to be welded.

2.6 Safety data sheets

You can obtain safety data sheets for dangerous goods 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.

3 Intended Use

The Easy-MIG 181 Multi multifunction inverter is intended exclusively for electrode welding, MIG welding and TIG welding.

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

3.1 Reasonably foreseeable misuse

Any use beyond the intended use or any other use is considered misuse.

Possible misuses can be:

- Use of the multifunction inverter with materials other than metal (e.g. processing of wood).
- Operating the multifunction inverter without the functioning protective devices provided.
- Installation of spare parts and use of accessories not approved by the manufacturer.
- Service work by untrained or unauthorised personnel.
- Maintenance work on an unsecured machine.
- Use for heating objects or liquids.
- Use of the plasma cutter in areas with hazardous substances, explosion or fire hazards.

Misuse of the multifunction inverter can lead to dangerous situations.

Stürmer Maschinen GmbH accepts no liability for design and technical modifications to the unit.

3.2 Residual risks

- Even if all safety instructions are observed and the appliance is used according to the instructions, 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 vapours
- Electric shock if electrical insulation is defective or due to moisture
- Burns to the upper limbs if unsuitable gloves are used

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

4 Technical Data

4.1 Table

Technical data	EASY-MIG 181
Length (Product) approx.	525 mm
Width/depth (Product) approx.	220 mm
Height (Product) approx.	410 mm
Weight approx.	14,5 kg
Supply voltage	230 V
Mains frequency	50/60 HZ
Protection class	IP21S
Isolation class / EMC-class	H/ A
Fuse (slow blowing)	16 A
Open circuit voltage	67.5 - 69 V
Wire feed speed	2.0 -13.5 m/min
Power factor [cos phi]	0,6
Efficiency [cos phi]	0,835
Setting range MIG/MAG	40-180 A
Setting range Electrode	10-160 A
Setting range TIG DC	10-180 A
Duty cycle at max. electricity 40°C MIG/MAG Electrode TIG DC	 20% 20% 20%
Switch-on duration current at ED 100% 40 ° C MIG / MAG TIG DC Electrode	 80 A 80 A 70 A
Power consumption MIG/MAG	8,41 kVA
Power consumption TIG DC	6,67 kVA
Power consumption Electrode	8,4 kVA
Cooling type / Torch cooling	AF / Gas

Technical data	EASY-MIG 181
Weldable wires [Steel]	0.6, 0.8, 0.9 mm
Weldable wires [Stainless steel]	0.8, 0.9 mm
Weldable electrodes	E6013 / E7018 φ1.6/2.5/3.2/ 4.0

NOTE!

The device must be secured with an inert fuse!

4.2 Type plate

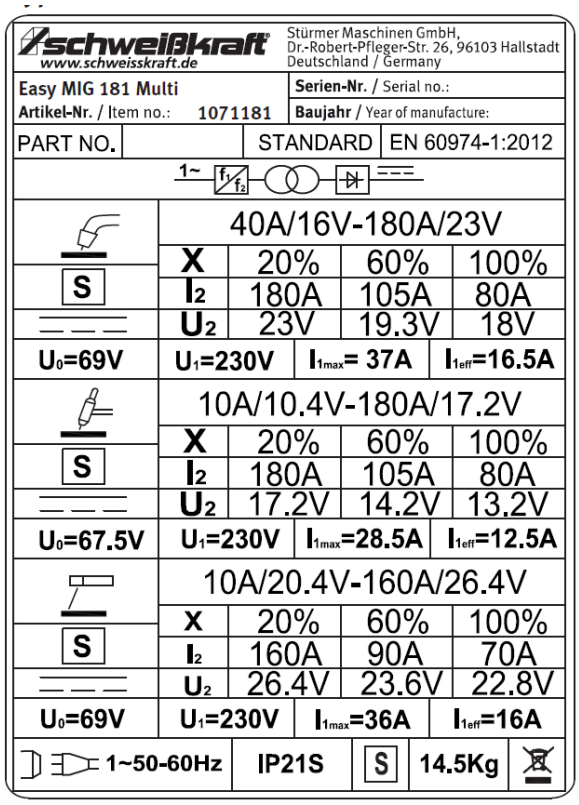


Fig. 2: Type plate Easy-MIG 181 Multi

5 Transportation, Packaging, Storage

5.1 Delivery and Transport

Check if there are any visible transportation damages after delivery of the multifunctional inverter. If the multifunctional inverter shows any damages, immediately inform the carrier or the distributor.

5.2 Packaging

All used packaging materials and packaging aids the Multifunctional Inverter are recyclable and generally need to be transported to the material recycling.

Crush the packaging material made of cardboard and supply it to the waste paper collection.

The films are made of polyethylene (PE) and the upholstery parts are made of polystyrene (PS). These materials have to be delivered to a recycling station of the responsible dumping company.

5.3 Storage

The welder must be stored 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 Installation Conditions

Do not place the welder in places where the circulation of air to the valve and the ventilation fins is obstructed (do not cover the unit).

Make sure (environmental conditions):

- that the space in which the welding machine operates has a temperature below + 40 ° C and that there is no moist air containing dust, acids, salts or concentrations of iron or metal powder.
- an operating temperature range of -10 ° C ~ + 40 ° C.
- The content of dust, acid, corrosive gases in the surrounding air or substance shall not exceed the normal standard value.
- that the voltage value of the mains current matches that of the welding device.
- that the available power of the power grid is adequate to the power requirement of the welding machine (see technical data).
- that the environmental conditions are appropriate to the degree of protection IP 21 S.
- that the height above sea level ≤ 1000 m.
- that the relative humidity is below 90% (20 ° C).
- Preferably place the unit at an angle above the floor. The maximum angle must not exceed 15 °.
- Protect the device from heavy rain and direct sunlight.
- When welding, adequate ventilation measures must be taken. There must be a distance of at least 30 cm between the unit and the wall.

The housings ensure the protection of the electrical component against external influences as well as against direct contact. Depending on the situations in which they can be used, they have different degrees of protection against the ingress 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.

Protection class: IP 21 S		Description
1.Digit	2	Protection against ingress of foreign bodies > 12 mm
2.Digit	1	Protection against vertically falling dripping water
Additional field	S	Device not in operation.

DANGER!

Electrical voltage!

Do not use the device outdoors in the rain!

ATTENTION!

Moveable parts!

- Keep all flaps and protective covers closed.
- Do not approach the moving parts (blower, motor, wire feed for MIG devices) with your hands, hair and clothing.

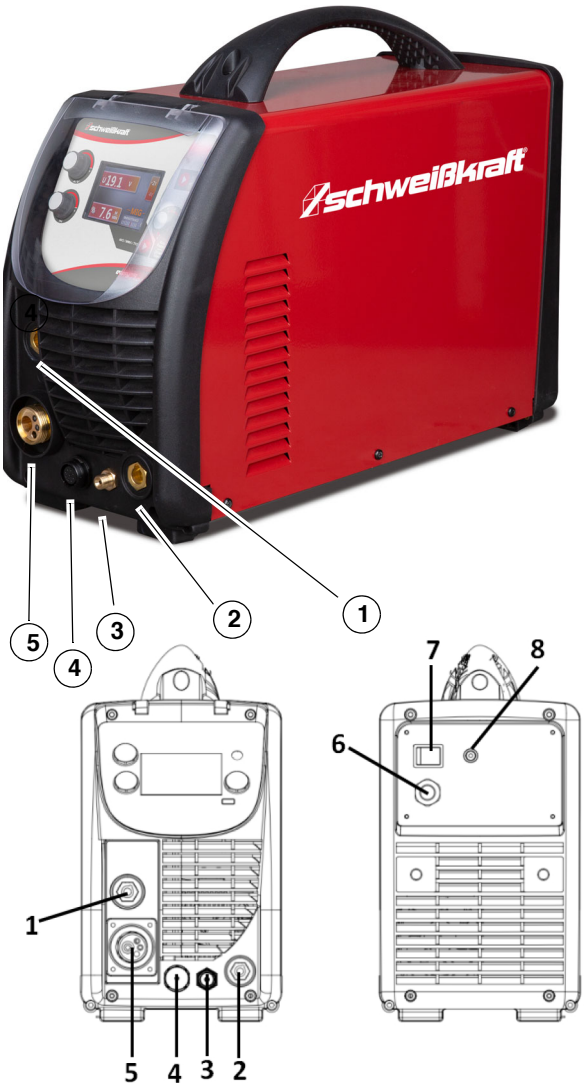


Fig. 3: Device view Easy-MIG 181 Multi

1. Connection socket for the positive (+) connection
2. Connection socket for the negative (-) connection
3. Gas outlet: connection for the inlet of the TIG-gun
4. TIG pistol control connection
5. MIG welding torch connection
6. Power cable
7. Power switch
8. Gas inlet: Connection for the gas duct

Wire feed of the welding machine

7 Description of the Device

7.1 Representation

Device view Easy-MIG 181 Multi

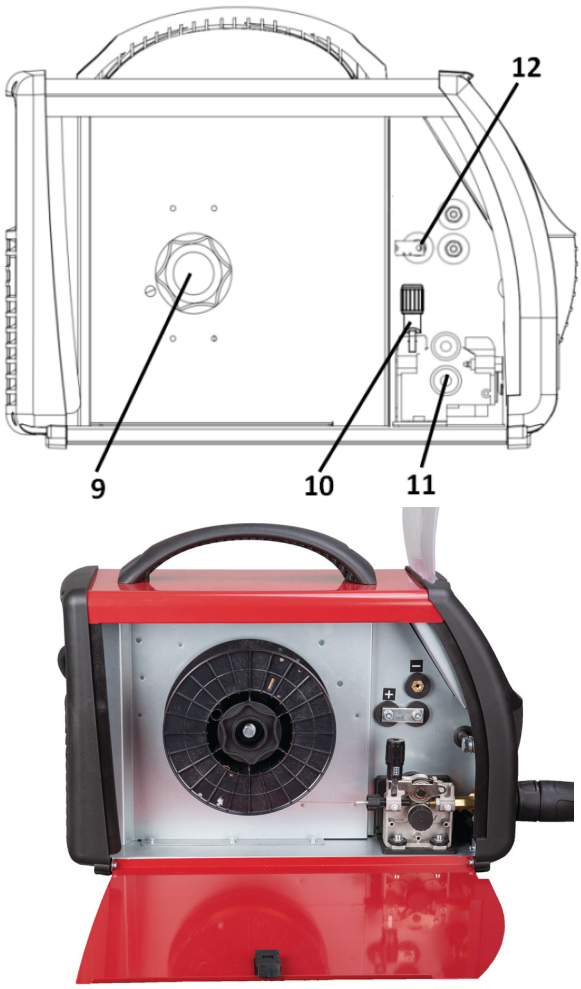


Fig. 4: Wire feed of the welding machine

9. Coil holder
10. Setting the wire feed tension
11. Drive roller bracket
12. Switching terminal for the polarity

7.2 Scope of delivery

- Multi functional inverter
- 3 mtr. welding cable 16 mm² with 300A electrode holder
- 3 mtr. earth cable16 mm² with 300A earth terminal
- 3 mtr. torch MB 15
- 4 mtr. Gas hose incl. Quick connector
- Pressure reducer
- Operating instructions

8 Duty Cycle and Thermal Protection

The X-axis defines the duty cycle, which is calculated from a total welding time of 10 min. The duty cycle thus describes the relationship between welding current and the resulting maximum welding time.

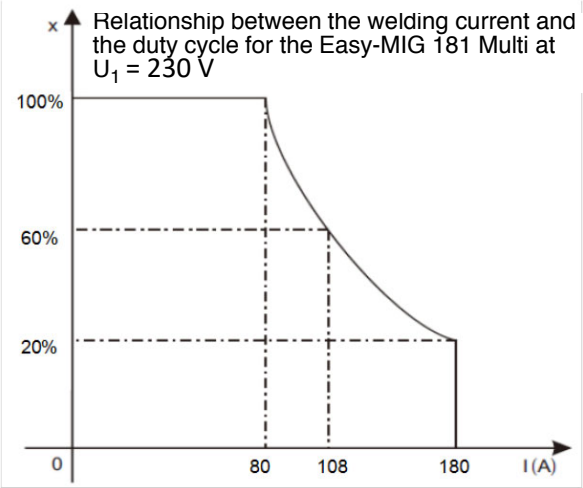


Fig. 5: Relationship between welding current and duty cycle

If the welding machine overheats, the thermal switch will respond and shut down the welding machine.

Display: red LED overheating. If the thermal protection is activated, the device should remain switched on for about 15 minutes to be cooled by the fan.

When the unit is operated again, the power output or duty cycle should be reduced.

8.1 Volt-Ampere characteristic

The Multifunctional Inverter Easy-MIG 181 Multi has an optimized volt-ampere characteristic (see graphic). The relationship between nominal voltage U_2 and welding current I_2 is as follows:

$U_2 = 14 + 0{,}05\ I_2$ (V)

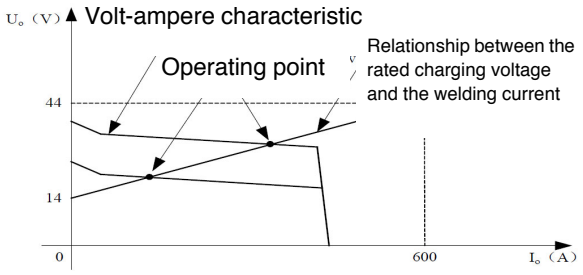


Fig. 6: Volt-Ampere characteristic

9 Commissioning of the Device

The installation of the device must be carried out by qualified personnel. All connections and adjustments must be made in accordance with applicable standards and accident prevention regulations.

NOTE!

Please observe the following before operating the device.

- The mains voltage must correspond to the voltage specifications on the rating plate.
- The on / off switch must be set to OFF.
- The safety devices as well as the protective covers must be functional.

The power outlet must be properly grounded. Use an overvoltage protection device.

10 Electromagnetic Fields

Current passed through conductors generate electromagnetic fields (EMF). So far, no negative impact of these magnetic fields on health has been demonstrated. Nevertheless, a hazard can not be completely ruled out.

NOTE!

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

- Lay the electrode and working cables together - tape them where possible.
- Lay the cables as far away from your body as possible.
- Never wrap welding cables around your body.
- Make sure the welder and power cord are as far away from the operator as possible.
- Connect earth cable as close to the weld as possible.
- Take special care with pacemakers! People with pacemakers should stay away from the welding area.

11 Operation

Wear welder face shield or helmet with welder face shield.

Wear suitable protective gloves with pulse protection

Wear safety shoes

Wear protective clothing

Wear protective apron

NOTE!

Please observe the following before operating the device.

- The mains voltage must correspond to the voltage specifications on the rating plate.
- The on / off switch must be set to OFF.
- The safety devices as well as the protective covers must be functional.

FIRE HAZARD!

- Avoid spreading open fire, which can be triggered by sparks, slag and glowing material.
- Fire protection devices must be present near the workplace.
- Remove flammable materials and fuels from the work area.
- Remove the risk of fire from the welding area. If this is not possible, cover it to prevent the welding sparks from causing a fire. Keep in mind that welding sparks and hot materials can easily pass through small cracks and openings in adjacent areas during welding. Avoid welding near hydraulic lines. Have a fire extinguisher ready.

DANGER!

Electric voltage!

Do not use the device outdoors in the rain!

FIRE HAZARD!

DO NOT fill the fuel with an open flame or with the engine running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from evaporating on contact with hot engine parts and ignition. Do not spill fuel when filling the tank. If fuel is spilled, wipe it up and do not start the engine until the exhaust gases have been removed.

ATTENTION MAGNETIC 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.

ATTENTION!

Danger from smoke and fumes!

Welding produces smoke and harmful vapors:

- Use a suction system to protect the airways when working in confined spaces.
- Clean materials to be welded if they contain solvents or other substances that could lead to the formation of toxic gases.
- Do not weld materials containing or containing any lead, cadmium, graphite, zinc, chromium or mercury coating. In these cases it is essential to use a respiratory protection device.

Important: Do not use oxygen for ventilation!

ATTENTION!

Welded joints which are subject to special stresses and which have to meet high safety requirements may only be designed by specially trained and certified welders.

ATTENTION!

Danger from noise!

The noise emission level of the welding arc complies with the applicable regulations (80db are not exceeded). When working overhead or in confined spaces, ear protection must be worn.

FIRE HAZARD!

- If compressed gas is to be used on site, special precautions should be taken to avoid dangerous situations.
- If you do not weld, make sure that no part of the electrode circuit touches the workpiece or mass. Inadvertent contact can cause overheating and fire hazard.
- Do not heat, cut, or weld tanks, drums, or containers until the correct steps have been taken to ensure that such procedures do not cause combustible or toxic fumes from substances inside. They can cause an explosion even though they have been "cleaned".
- Vent hollow parts or containers before heating, cutting or welding. They can explode.
- Sparks and spatters are thrown from the welding arc. Wear oil-free protective clothing such as leather gloves, a heavy shirt, trousers without cuffs, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in tight spots. Always wear protective goggles with side protection in the welding area.
- Connect the working cable as close as possible to the welding area. Work cables connected to the building frame or other locations outside the welding area increase the possibility of welding current flowing through lifting chains, crane cables or other alternative circuits. This can cause a fire hazard and overheat hoist chains or cables until they fail.

NOTE!

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

When welding, always wear protective clothing and take care that other persons are not endangered by the UV radiation of the arc.

ATTENTION!

Danger caused by smoke and fumes!

- Welding can produce harmful vapors and gases. Avoid inhaling these vapors and gases. Keep your head away from the smoke when welding. Provide adequate ventilation and / or suction on the arc to keep vapors and gases out of the breathing zone. Keep the exposure when welding with electrodes that require special ventilation, such as. For example, when welding stainless steel, armor welding, welding of lead or cadmium coated steel, other metals or coatings that produce highly toxic vapors, as low as possible and below the limits using local exhaust ventilation or mechanical ventilation.
- In confined spaces or under certain circumstances outdoors, a respirator may be required. Additional precautions are also required when welding galvanized steel.
- Do not weld near chlorinated hydrocarbon vapors resulting from degreasing, cleaning or spraying. The heat and the rays of the arc can react with solvent fumes and form phosgene, a highly toxic gas and other irritating products.
- Shielding gases used in arc welding can displace the air and cause injury or death. Always ensure adequate ventilation, especially in confined areas, to ensure the safety of breathing air.
- Read and understand the manufacturer's instructions for this equipment and consumables, including the Material Safety Data Sheet, and follow your employer's safety practices.

RISK OF EXPLOSION!

- It is not allowed to weld in fire - and explosion - hazardous areas. 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.
- Do not use gas cylinders where the gas contained is not indicated.
- Do not expose the gas cylinders to high heat.
- Never mix the gas in the gas cylinders.
- Never refill the gas bottles yourself. The gas cylinders should only be refilled by specialized companies.
- Avoid accidental contact of the gas cylinder with the electrode or other live parts.
- Replace gas lines that could be damaged.
- Keep the pressure reducers functional.
- Do not use gas pressure reducers for purposes for which they are not manufactured.

WARNING!

DANGERS DUE TO INCORRECT STORAGE AND INCORRECT USE OF PROTECTIVE GAS CYLINDERS!

- Protect gas cylinders from excessive heat, mechanical impact, physical damage, slag, open flames, sparks and arcing.
- Never let the welding electrode or the grounding clamp touch the gas cylinder, do not put any cables over the gas cylinder.

WARNING

DANGERS DUE TO INCORRECT STORAGE AND INCORRECT USE OF PROTECTIVE GAS CYLINDERS!

- Only use protective gases in bottles provided for this purpose.
- Pay attention to the integrity of all gas pipes and hoses.
- Make sure that protective gas cylinders are properly secured. Always keep the bottles in an upright position, e.g. secured chained, on a chassis or solid support.
- When storing the bottles, make sure that they are properly secured and that there are no mechanical or thermal hazards.
- Store gas cylinder at a safe distance from the arc and hot parts.
- If the gas cylinder is not in use, it must be closed with the protective cap.
- Valve caps should always be fitted and hand-tight unless the gas bottle is used or connected for use.
- Always keep your head and face away from the cylinder valve outlet when opening the cylinder valve.
- Use only compressed gas cylinders containing the correct inert gas for the process and properly operating regulators. The components must be designed for the gas and the pressure used.
- All hoses, clamps, etc. must be suitable for the application, serviced and in good condition.
- Never allow the electrode, electrode holder or any other "hot" part to touch a gas cylinder.

Instructions for use

- Connect the grounding cable directly to the device.
- Make sure the input is single-phase: 50/60 Hz, 230 V ± 10%.
- Do not watch the arc with unprotected eyes.
- Ensure good ventilation conditions to improve the duty cycle.
- Turn off the engine when it is finished to reduce energy consumption.
- If the power switch shuts off due to a fault. Do not restart the device until the problem is resolved. Otherwise, the extent of the fault may be widened.
- In case of faults, contact your dealer if no authorized maintenance personnel are available!

The MULTI-SERIES arc welder uses the latest PWM (Pulse Width Modulation) technology and an Insulated Gate Bipolar Transistor (IGBT) power module that can be used to change the operating frequency to mid-frequency to replace the traditional solid-state frequency transformer with the medium-frequency transformer. Thus, it is characterized by portable, small size, low weight and low consumption.

The arc welding machine of the MULTI-SERIES uses mixed gas as protective gas for the realization of inert gas welding, active gas as protective gas for the realization of MAG welding and inert gas (Ar) as protective gas for the realization of the MIG welding process.

The MULTI-SERIES arc welder has automatic protection features with intelligent overvoltage, overcurrent and overheat functions. If any of the above problems occur, the alarm lamp on the front panel lights up and the output power automatically shuts off to protect the unit itself and extend the life of the unit.

Characteristics of the MULTI series:

Digital control system, real time Display of welding parameters.

High performance multifunction power source (MIG / MAG).

Wavy control, stick welding.

IGBT technology with low power loss.

The MULTI arc welding machines are suitable for welding in all positions for various stainless steel plates, carbon steel, alloy steel, etc., also for piping, mold making, petrochemical, architectural decoration, car repair, bicycle industry, handicraft and the like general production can be used.

MAG - metal active gas welding

TIG - tungsten inert gas welding

MIG - metal inert gas welding

11.1 Control panel of the welding device

Fig. 7: Control panel

1. Rotary knob for adjusting welding voltage or current.
2. Parameter knob: Sets the wire feed speed.
3. Push-button for setting 2 or 4-cycle operation.
4. Rotary knob for ARC-Force and Down-Slope.
5. Push-button for setting MIG / MAG-W or E-manual operation.
6. Display of welding voltage, current and other set parameters.

Selection switch of the pulse welding mode (3)

2T pulsed-arc welding

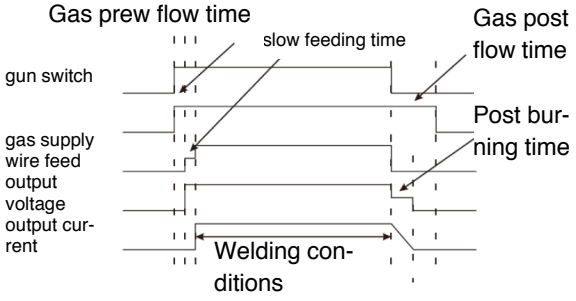


Fig. 8: 2 T- pulsed-arc welding

4T pulsed-arc welding

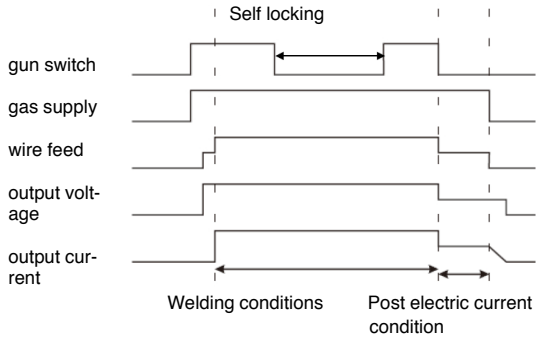


Fig. 9: 4 T pulsed-arc welding

Description of the MIG function front panel

1. Selection key for the welding process: Press to select the MIG welding process.
2. Rotary knob for adjusting the voltage.
3. Voltage display: Here you can see the set voltage value. Range: 10.0 to 24.0 V.
4. Rotary knob: Sets the wire feed speed.
5. Display of the wire feed speed: Here you can see the set wire feed speed or the welding current. Range: 0.1-1.8 m / min.
6. Selection switch for the pulse welding mode. Choice between 2T and 4T mode.
7. Pulse Welding Mode Display: Here is the selected mode of operation.
8. Rotary knob for controlling the shaft: Setting the inductance.
9. Display of the inductance value: Here you can see the set inductance value.

   Range: 0 - 10.

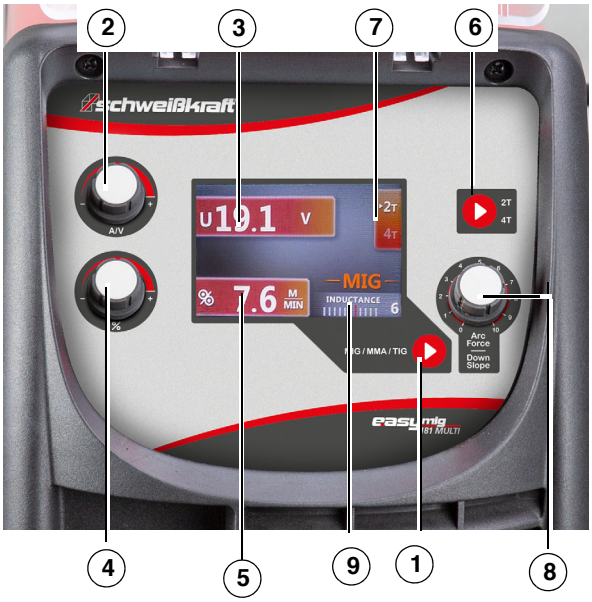


Fig. 10: Keys of the MIG welding process

Description of the MMA function - Front panel

1. Selection key for the welding process: Pressing selects the MMA welding process.
2. Rotary knob for adjusting the welding current.
3. Current display: Here you can see the set current value. Range: 10.0 to 180.0 A.
4. Arc rotary knob: Sets the arc strength.
5. Display of the arc strength: Here you can see the set arc value. Range: 0 to 10.

Fig. 11: Keys of the MMA - welding process

Description of the TIG function - Front panel

1. Selection key for the welding process: Pressing selects the MMA welding process.
2. Rotary knob for adjusting the welding current.
3. Current display: Here you can see the set current value. Range: 10.0 to 180.0 A.
4. Rotary knob for power drop: Adjustment for the power drop time.
5. Display of the Power drop time: Here you can see the set current drop time. Range: 0.0-10.0 s.
6. Selection switch for arc-pulsed mode: option between 2T- and 4T- mode.
7. Display of the pulse welding mode: Here you can see the selected operating mode.

Fig. 12: Keys of the TIG welding process

Welding with almost all common rod electrodes is possible with the welding machine. The welding machine has the automatic functions:

Hot-Start-Function: Starting aid for the ignition of the arc of a stick electrode during electrode welding. By an automatic, short-term increase in the welding current, the arc ignites immediately stable.

Arc-Force-control: The welding power is kept as constant as possible during electrode welding at the set value. The arc burns stably (even with difficult electrodes or positions). Advantage: The welding result is more uniform.

Anti-Stick-Function: In the case of sticking the electrode on the workpiece, the welding current is switched off. The electrode does not glow and is easily detached from the workpiece.

Lift-Arc-ignition: Ignition during TIG welding with a minimum current. Only after the ignition of the arc, the set welding current is released. The Advantages are a slight ignition without sticking the tungsten needle on the workpiece and thus a stable ARC.

11.2 Connection to the mains

Check the conformity of the voltage indicated on the rating plate with the rated voltage of your power supply. The required power consumption must be available and the power outlet must be properly grounded. The protection of the supply lines to the mains socket must comply with the regulations.

For some applications, extension cords must be used to reach the workstation. To ensure the full performance of the device, the required cross sections of the conductors must be taken into account, depending on the cable length. For this purpose a qualified electrician must provide the suitable conditions for the electrical installation to ensure perfect operation of the welding machine.

DANGER!

Danger to life caused by current!

Work on the electrical connection may only be carried out by qualified electricians.

NOTE!

The device must be protected with a time-lag fuse!

12 Connection and Operation

12.1 Set up the MMA-welding mode

Step 1: Connect the connection cables.

Two sockets are available for connecting the output cables to this welding device. For manual welding, the electrode holder is connected to the positive socket while the earth cable (workpiece) is connected to the negative socket. This is called DCEP. Different electrodes, however, require different polarity for best results. Observe the polarity information. The correct polarity can be found in the information provided by the electrode manufacturer.

DCEP: Connecting the electrode to the output socket "+".

DCEN: Connecting the electrode to the output socket "-".

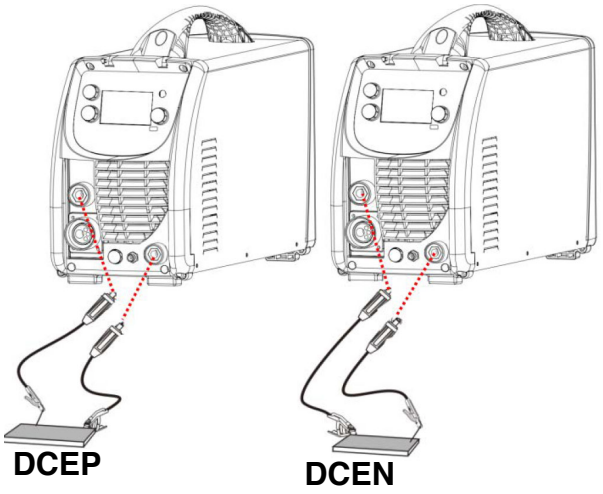


Fig. 13: Connecting of the connection cable

Fig. 14: Operation of the MMA welding process

Step 2: Turn on the power source and press the welding mode select button (1) to select the MMA mode.

Step 3: Turn the button (2) to set the welding current that is relevant to the type of electrode and size used as recommended by the electrode manufacturer.

Step 4: Adjust the arc thickness as needed by turning the Arc Force knob (3).

Step 5: Place the electrode in the electrode holder and pinch it.

Step 6: Strike the electrode over the workpiece to create an arc and hold the electrode steady to sustain the arc.

12.1.1 MMA-Welding

One of the most common types of arc welding is manual metal arc welding (MMA) or bar welding. An electric current is used to create an arc between the base material and a rod electrode. The rod electrode is made of a material compatible with the base material to be welded and covered with a flux. The flux releases gaseous vapors, which serve as inert gas and form a slag layer. Both protect the welding area from atmospheric contamination. The electrode core itself acts as a filler. The residue from the flux, which covers the weld metal with slag, must be knocked off after welding.

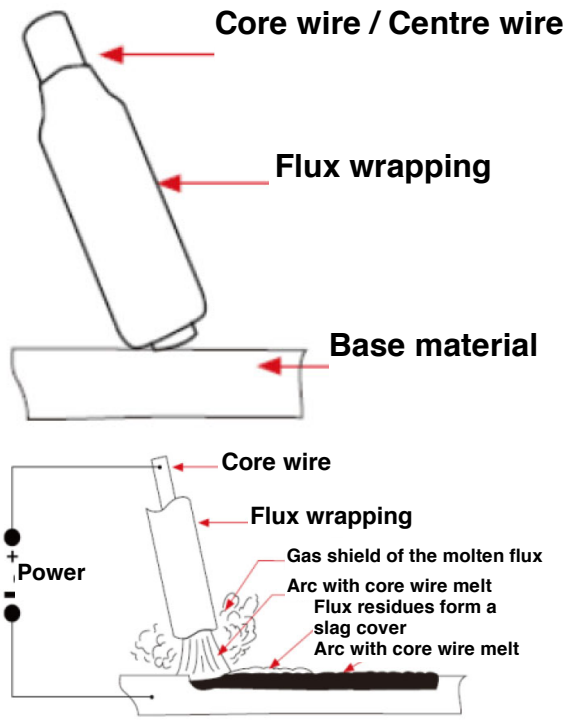


Fig. 15: MMA-welding process

The arc is ignited by briefly touching the base material through the electrode.

The heat of the arc melts the surface of the base material and forms a molten pool at the end of the rod electrode.

The molten electrode metal is transferred into the melt via the arc and becomes a deposited weld metal.

The deposit is covered and protected by a slag derived from the electrode coating.

The arc and the immediate environment are surrounded by a protective gas atmosphere. (Stick electrodes have a solid metal wire core and a flux coating).

The metal wire core conducts the current that sustains the arc. The core wire melts and deposits in the weld pool.

The coating of a shielded metal arc welding electrode is referred to as a flux. The flux on the electrode performs many different functions.

These include:

- Generating inert gas in the welding area.
- Provision of fluxes and deoxidizers.
- As the weld cools, a protective layer of slag is formed.
- Determination of the arc properties.
- Add alloying elements.

Enveloped electrodes have many purposes, among other things to bring filler metal in the molten bath.

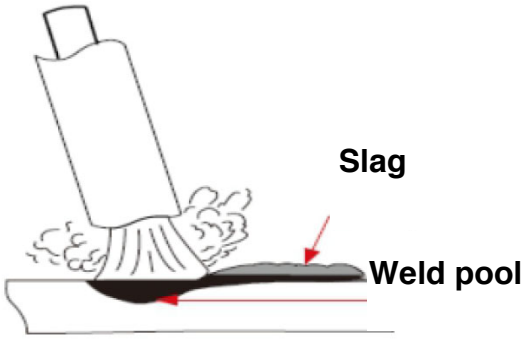


Fig. 16: Weld pool

12.1.2Basics of MMA welding

Selection of the electrode

In general, the selection of an electrode is simple, since only one electrode with a similar composition as the parent metal must be selected. However, for some metals, there are several electrodes to choose from, each of which has certain properties to suit particular classes.

Electrode size

Average material thickness	Maximum recommended electrode diameter
1.0 - 2.0 mm	2.5 mm
2.0 - 5.0 mm	3.2 mm
5.0 - 8.0 mm	4.0 mm
> 8.0 mm	5.0 mm

The size of the electrode generally depends on the thickness of the area to be welded. The stronger the area, the larger the required electrode must be. The table indicates the maximum size of the electrodes that can be used for multiple thicknesses. The values are based on general uses of a Type 6013 electrode.

Welding current (amperage)

Electrode size Ø mm	Current range (A)
2.5 mm	60-95
3.2 mm	100-130
4.0 mm	130-165
5.0 mm	165-260

The operating current for a particular job may be considered to be the maximum that can be used without producing burn through of the workpiece, overheating the electrode or creating a rough, sprayed surface. The table shows current ranges that are generally recommended for a general-purpose type 6013 electrode.

12.2 Connection and operation for TIG welding

12.2.1 Setting up the TIG welding process

ATTENTION!

Move the gas cylinder to a safe place and make sure it is securely fastened.

Step 1:Insert the plug of the ground wire (ground lead) into the positive socket of the inner connector output (+) on the front of the unit and tighten it.

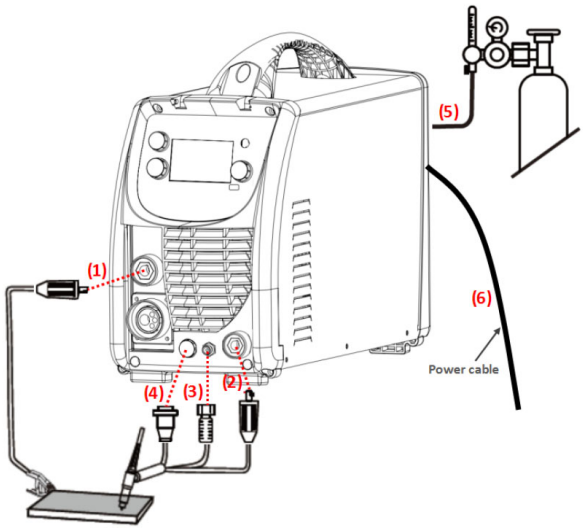


Fig. 17: Installing of the connections

Step 2: Insert the torch connection into the socket of the inner connection output (-) on the front side and tighten it.

Step 3: Connect the TIG torch gas connection to the TIG gas outlet.

Step 4: Connect the plug of the TIG torch remote control to the remote control socket and make sure all connections are firmly connected.

Step 5: Connect the gas line to the gas connection of the unit via the quick release on the back. Check for leaks! Follow the manufacturer's instructions included with the pressure reducer.

Step 6: Connect the power cable of the welding machine to the existing output switch in the control box.

Step 7: Carefully open the valve on the gas cylinder and set the required gas flow.

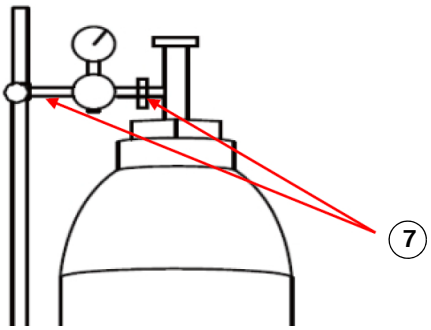


Fig. 18: Connecting elements on the gas cylinder.

Fig. 19: Keys of the TIG welding process

Step 8: Select the TIG welding process by using the welding procedure selection key (1).

Step 9: Depending on the requirement of the welding task, select 2T or 4T pulse welding by pressing the pulse welding mode button (6).

Fig. 20: Key for choosing the mode of the TIG welding process

Step 10: Ignite the welding arc by placing the tip of the electrode on the workpiece to be welded. Slowly lift the electrode to a distance of 3 mm - 4 mm. To stop the sheet after welding is complete, remove the electrode from the workpiece to be welded. Allow the gas to escape for a few seconds (at least 6 seconds) to avoid oxidizing the electrode and then close the gas valve when the electrode is cooled down.

DANGER!

We strongly recommend to check the device and the connected components for gas leaks before starting the application. We recommend that you close the gas cylinder valve when it is not in use.

12.2.2 DC TIG welding

In the DC circuit there is an electrical principle that should always be considered when using a DC circuit. In a DC circuit, 70% of the energy (heat) is always on the positive side. This must be understood as it determines which socket the TIG torch is connected to.

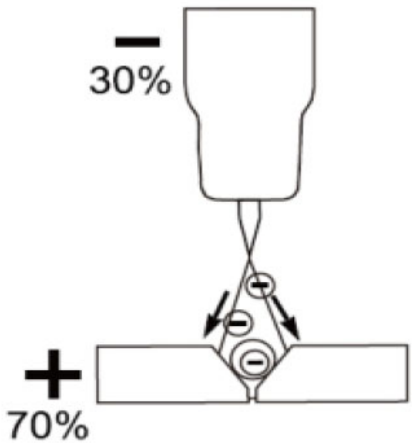


Fig. 21: Heat distribution

DC TIG welding is a process in which an arc is initiated between a TUNGSTEN electrode and the metal workpiece. The weld area is protected by an inert gas stream to prevent contamination of the tungsten, molten bath and weld area. Upon ignition of the TIG arc, the inert gas is ionized and overheated, changing its molecular structure and converting it into a plasma stream. This plasma stream flows between the tungsten and the workpiece. It is a very pure and concentrated arc that allows the controlled melting of most metals into a weld pool. DC TIG welding produces the cleanest weld without sparks or spatter.

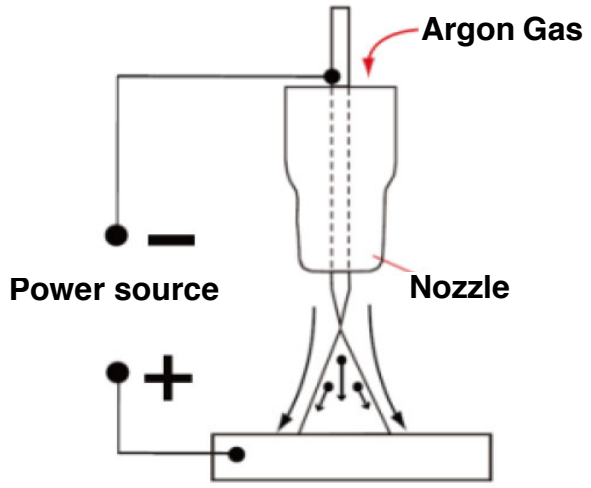


Fig. 22: TIG welding with direct current

The intensity of the arc is proportional to the current flowing from the tungsten. The welder regulates the welding current to adjust the power of the arc. Typically, thin material requires a less intense arc with less heat to melt the material, requiring less amperage. Thicker material requires a stronger arc with more heat, so more current (ampere) is required to melt the material.

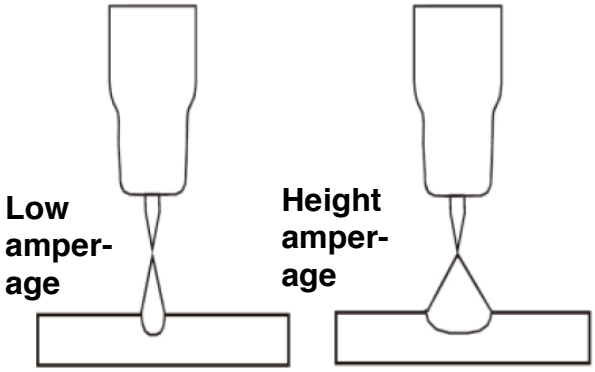


Fig. 23: Effects of the current

Arc lift ignition in the TIG welding process

Lift Ignition is a form of arc ignition in which the device has a low voltage on the electrode of just a few volts with a current limit of one or two amps (well below the limit that causes the transfer of metal and contamination of the weld or electrode). When the device detects that the tungsten has left the surface and a spark is present, it immediately increases (within microseconds) the power and converts the spark into a full arc. It is a simple, safe, inexpensive alternative arc ignition process to HF (high frequency) welding and a superior arc starting process for spark ignition.

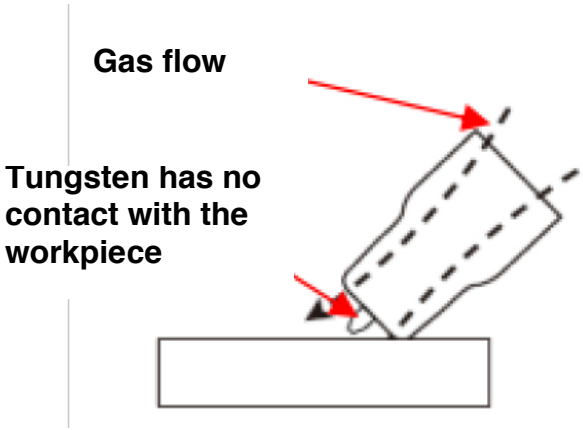


Fig. 24: Arc ignition by drawn arc lift ignition

Place the nozzle on the workpiece without the tungsten touching the workpiece.

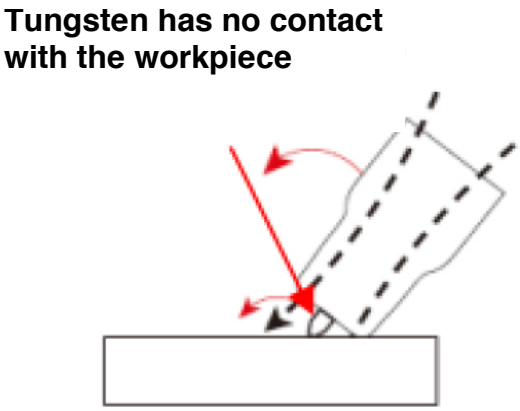


Fig. 25: Arc ignition by drawn arc lift ignition

Tilt the torch aside so that the tungsten touches the workpiece and hold the position for a moment.

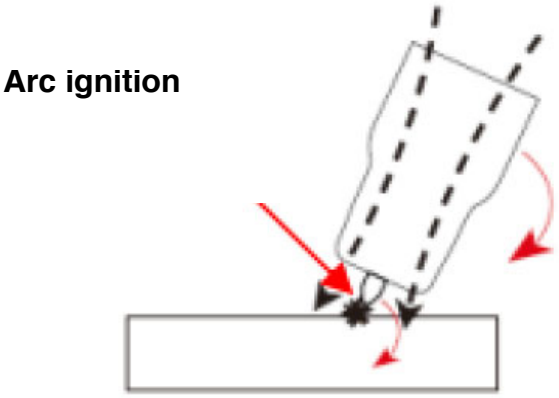


Fig. 26: Ignition of the arc

Tilt the torch back in the opposite direction. As soon as the tungsten electrode is lifted off the workpiece, the arc ignites.

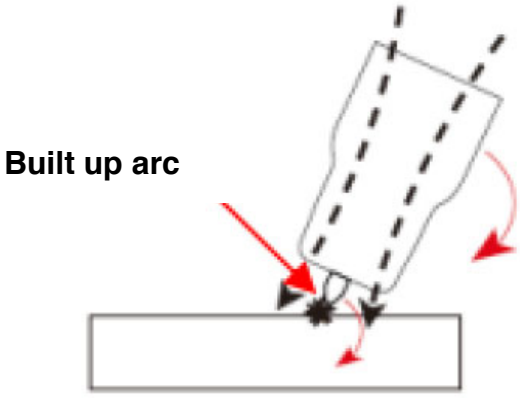


Fig. 27: Formed arc

Lift the torch to maintain the arc upright.

12.2.3 TIG welding process with additional wire technology

In many situations, TIG welding requires adding filler wire to the weld pool, building up a weld reinforcement to create a strong weld. Once the arc is started, the torch's tungsten is held in place until a weld pool is created. A circular movement of tungsten helps to create a weld pool of the desired size. Once the weld is made, tilt the torch at an angle of about 75 ° and move it and evenly along the joint. The welding filler is introduced at the front edge of the welding pool. The filler wire is normally held at an angle of about 15 ° and inserted into the leading edge of the molten bath. The arc melts the filler wire into the weld pool as the torch is moved forward. A dabbing technique may also be used to control the amount of added wire added. The wire is inserted into the molten bath and withdrawn in a repetitive sequence while the torch is slowly and smoothly advanced. During welding, it is important to leave the molten end of the filler wire inside the gas shield, as this protects the end of the wire from oxidation and contamination of the weld pool.

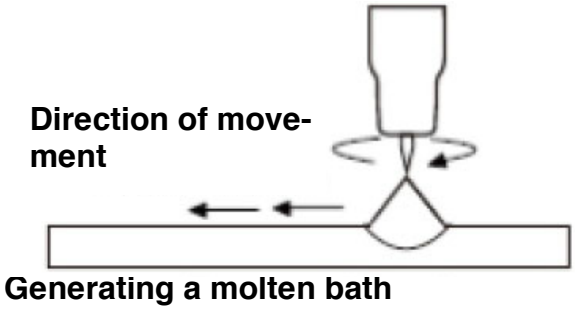


Fig. 28: Generating a molten bath

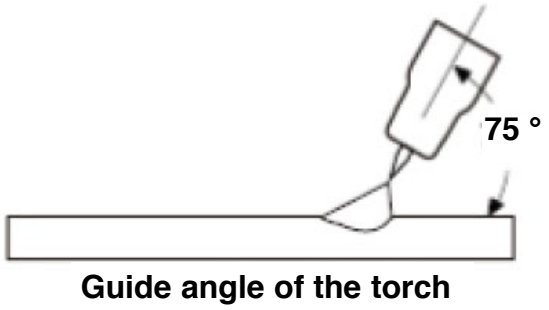


Fig. 29: Guide angle of the torch

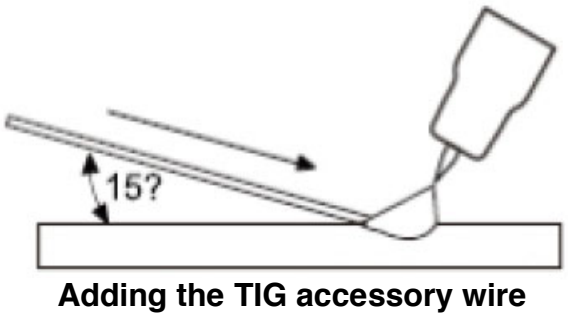


Fig. 30: TIG filler wire

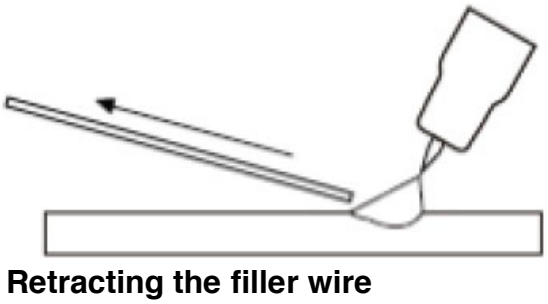


Fig. 31: Retracting the filler wire

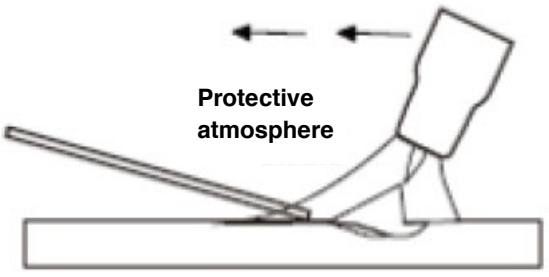
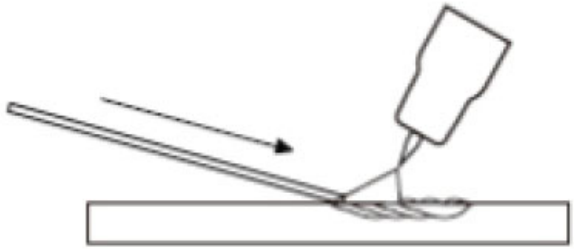


Fig. 32: Movement of the torch



Repeat the process continuously.

Fig. 33: Performing the weld

12.3 Pistol switch for TIG-Welding

When the single pushbutton is pressed and the work-piece is simultaneously touched with the tungsten electrode, the arc can be ignited and drawn up (so-called contact or lift-arc ignition). The arc extinguishes again when the single pushbutton is released.

1: Single Push button

Fig. 34: Control of the TIG welding process

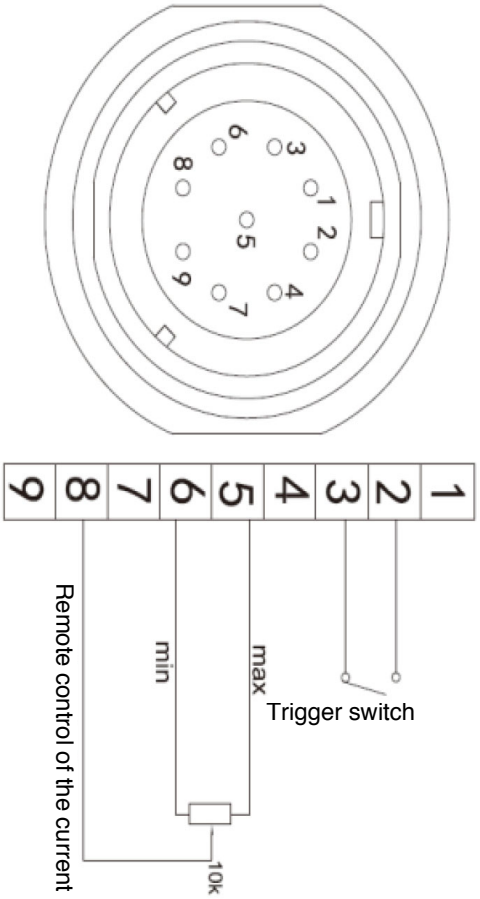


Fig. 35: PIN-Assignment of the plug of the torch

Remote Control

Sockets-PIN	Function
1	not used
2	Input of the release switch
3	Input of the release switch
4	not used
5	10 k Ohm (Maximum) connection to 10k Ohm remote controll potentiometer
6	0 Ohm (Maximum) connection to 10k Ohm remote controll potentiometer
7	not used
8	Grinding arm connection to 10k Ohm potentiometer of the remote control
9	not used

12.4 Connection and operation for MIG welding

12.4.1 Setting up the MIG welding process

Step 1: Insert the torch connection into the MIG torch connection socket (1) and tighten it.

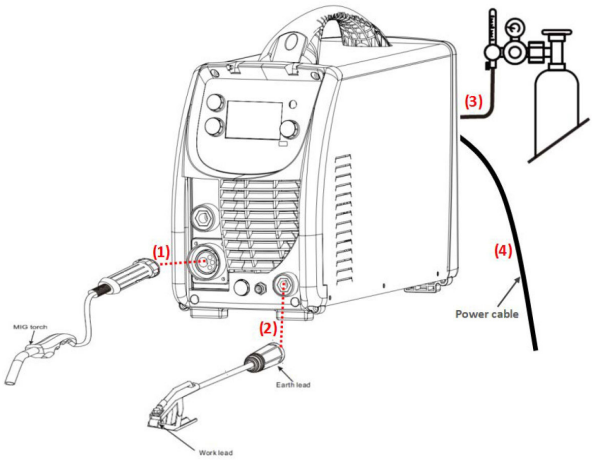


Fig. 36: Installation of the connection

Step 2: Insert the plug of the grounding cable into the negative socket (2) on the front of the device and tighten it.

Step 3: Connect the gas regulator to the gas bottle (3) and the gas line (3) to the MIG gas regulator. Connect the gas line to the gas connection on the back.

Step 4: Connect the power cable (4) of the welding machine on site to the output switch in the control box.

Fig. 37: Keys of the MIG welding process

Step 5: Select the MIG welding process by pressing the welding selection switch (5).

Step 6: Select 2-stroke or 4-stroke pulse by pressing the selection button for the required operating mode (6).

Step 7: Turn the wire feed speed knob (7) to set it.

Step 8: Turn the voltage adjustment switch (8) to adjust the voltage.

Step 9: Turn the Waveform Control Knob (9) to control the properties of the arc (determines the ratio at which the current increases when a short circuit occurs).

Step 10: Place the wire on the bobbin holder - (The bobbin holding nut has a left hand thread) The wire feeding through the inlet of the guide tube onto the drive roller.

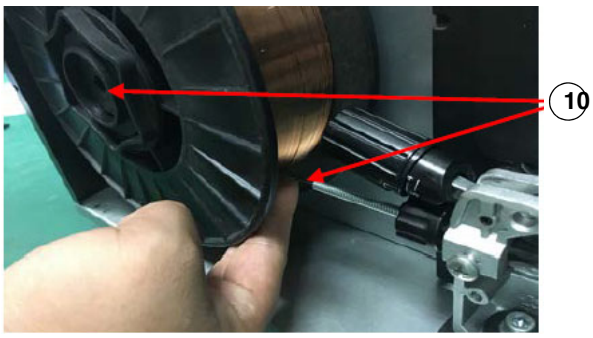


Fig. 38: Inserting of the wire for the MIG welding process

Step 11: Pass the wire over the drive roller into the outlet of the wire guide tube (10 and 11) and push the wire through about 150 mm.

Fig. 39: Insert the wire into the feeder

Step 12: Close the upper roller retainer and fixate the pressure arm (12) with medium pressure.

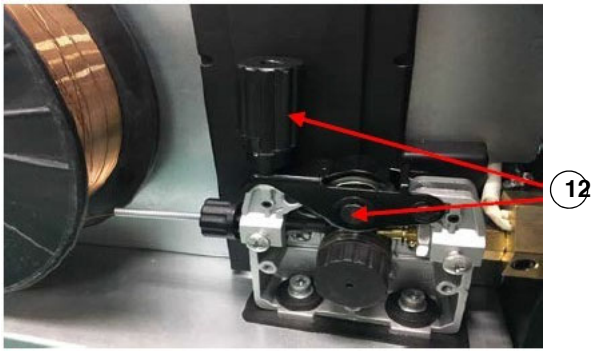


Fig. 40: Pressing of the wire through the upper pressure roller

Step 13: Carefully open the valve of the gas cylinder and set the required gas flow rate.

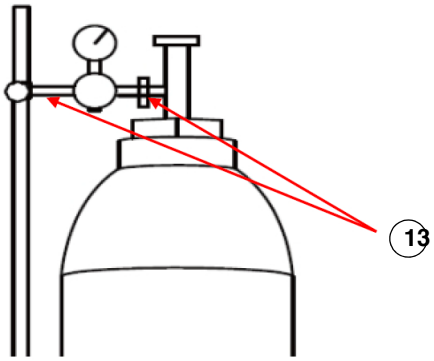


Fig. 41: Adjustment of gas flow rate

12.4.2Selection of the wire feed roller

Feed rollers or drive rollers serve the suppose for mechanical advancement of the wire along the longitudinal direction by the welding gun. Feed rollers are designed for particular types of welding wire and have various types of grooves incorporated into them to accommodate the various types of wire. The wire is held in the groove by the upper roller (pressure roller) of the wire drive unit. The pressure is applied by a clamp arm that can be pressure adjusted as needed to increase or decrease the pressure as needed. The type of wire determines how much pressure can be applied and what type of drive roller is best suited for optimum wire feed.

Solid hard wire - like steel or stainless steel requires a drive roller with a V-shaped groove for optimum grip and drive capability. With solid wires, more pressure can be applied to the wire from the upper pinch roller that holds the wire in the groove. The V-shaped groove is better suited for this. Solid wires are more forgiving, stiffer, and less bendable due to their higher cross-sectional strength.

Soft wire - as aluminum requires a U-shaped groove. Aluminum wire has a much lower column strength, can bend easily and is therefore harder to feed. Soft wires easily buckle on the wire feeder when the wire is fed into the torch's inlet guide tube. The U-shaped roller provides more grip and traction on the surface to promote the softer wire. Softer wires also require less pressure from the upper pinch roller to avoid deformation of the wire form. Too much tension pushes the wire out of the mold and causes it to hang in the contact tip.

Flux core / gasless wire - These wires consist of a thin metal sheath on which flux and metal compounds are stacked and then rolled into a cylinder to form the finished wire. The wire can not absorb too much pressure from the upper roll because it can be crushed and deformed by too much pressure. A knurled drive roller has been developed which has small serrations in the groove. The tines grab the wire and help propel it without too much pressure from the top roll. The underside of the knurled wire feed roller on cored wires is designed to slowly peel off, bit by bit, on the surface of the welding wire over time, eventually passing these small pieces into the liner. This leads to a clogging of the liner and additional friction, which leads to problems in advancing the welding wire. A U-groove wire can also be used for flux core wire without wire particles getting off the wire surface. However, it is believed that the knurling roll gives a better feed of the flux core wire without any deformation of the wire form.

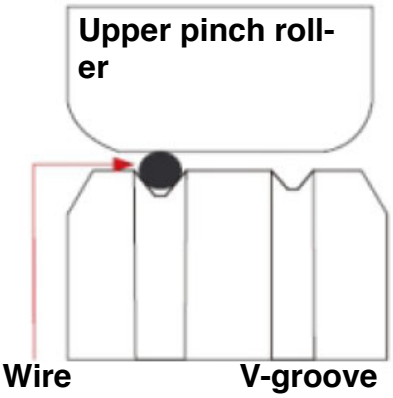


Fig. 42: Drive roller with V-groove

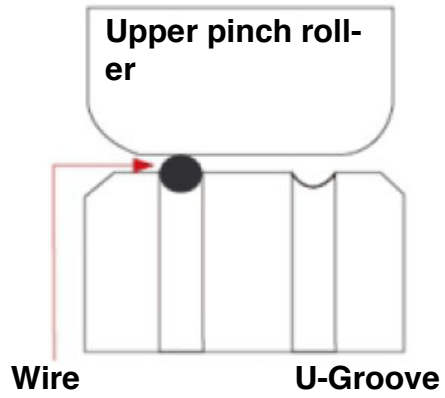


Fig. 43: Drive roller with U-groove

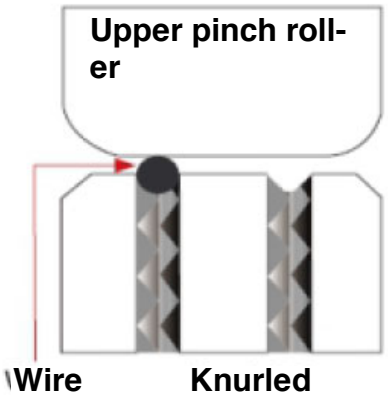


Fig. 44: Drive roller with knurled groove

12.4.3 Wire installation and setting up the guide

A uniform wire feed during MIG welding is very important. Proper installation of the wire spool and wire in the wire feed unit is critical for a smooth and even wire feed. A high percentage of MIG welding errors are due to poor wire feed wire insertion. The instructions below will help you to set up your wire feeder correctly.

Step 1: Remove the nut holding the coil back.

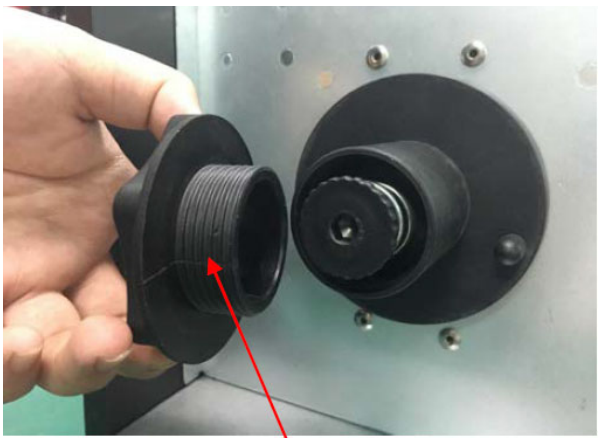


Fig. 45: Retaining nut of the tension spring

Step 2: Note the tension spring of the adjuster and the spool locating pin.

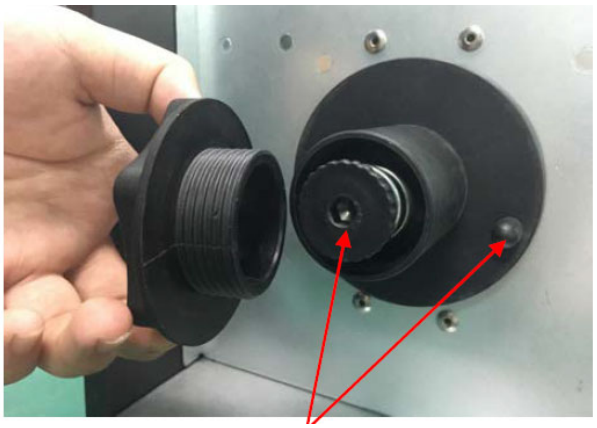


Fig. 46: Tension spring of the adjuster and coil fixing spring

Step 3: Place the wire spool on the spool holder so that the fixing pin goes into the fixing hole of the spool. Reinstall the coil retaining nut.

Fig. 47: Fixing hole

Step 4: Carefully cut off the wire, making sure that the wire is held to prevent unwinding of the spool. Carefully insert the wire into the inlet of the guide tube of the wire feed unit.

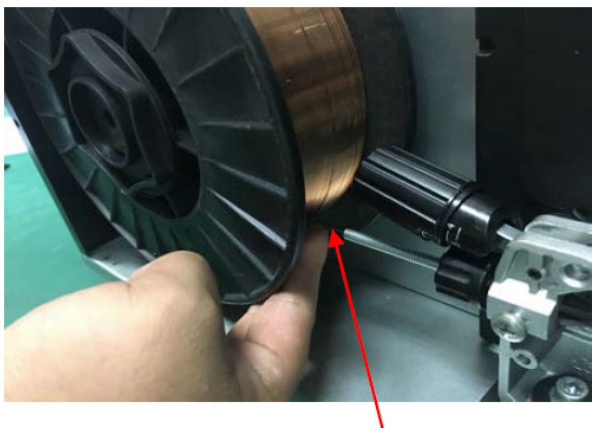


Fig. 48: Inlet of the guide tube

Step 5: Insert the wire through the drive roller and into the outlet of the guide tube of the wire feed.

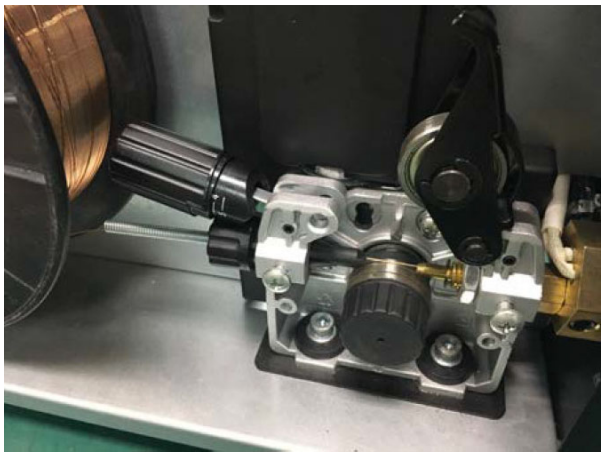


Fig. 49: Outlet of the guide tube

Step 6: Set the upper pressure roller down and apply an average amount of pressure using the adjusting knob.

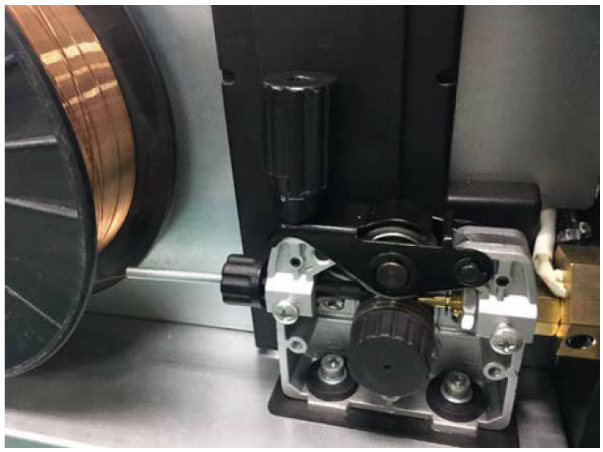


Fig. 50: Tension spring of the adjuster and coil fixing pin

Step 7: Check that the wire passes through the center of the output guide tube without touching the sides. Loosen the locking screw and then loosen the retaining nut of the exhaust guide tube to adjust if necessary. Carefully retighten the locking nut and screw to hold the new position.

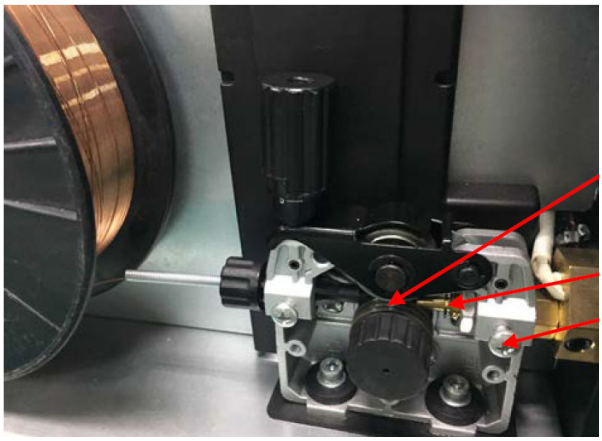


Fig. 51: Fixation hole

Step 8: A simple test to check for the correct tension is to hold the end of the wire 100 mm away from the hand and then let it run into the hand. It should then wind up in his hand without stopping and without sliding off the drive roller. When sliding, you must increase the voltage.

Fig. 52: Checking the wire tension

Step 9: The weight and speed at which the wire spool rotates creates an inertia that can cause the spool to continue to run and cause the wire to overflow and tangle.

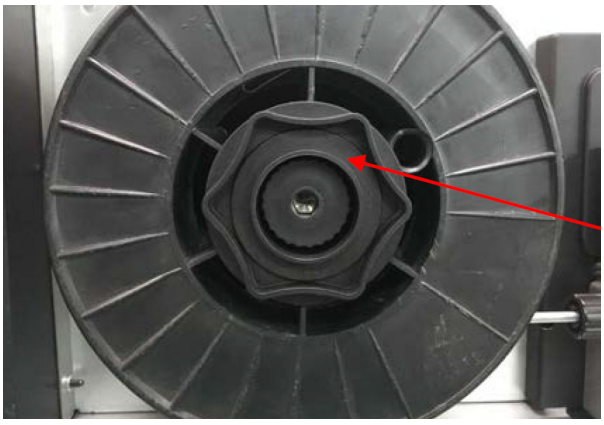


Fig. 53: Coil

12.4.4 Selection of the gas for the MIG welding process

The purpose of the gas in the MIG process is to protect the wire, the arc and the molten weld metal from the atmosphere. Most metals react with the air in the atmosphere when heated to a molten state, without the protection of the shielding gas the weld produced would contain defects such as porosity, bonding defects and slag inclusions. In addition, part of the gas is ionised (electrically charged) and supports the smooth flow of current.

Proper gas flow is also very important to protect the weld zone from the atmosphere. Too low a flow results in insufficient coverage and welding errors and unstable arc conditions. Excessive flow may cause air to be drawn into the gas column and contaminate the weld zone.

Use the correct shielding gas. CO_2 is good for steel and offers good penetration properties, the welding profile is narrower and slightly higher than the welding profile obtained from argon-CO_2 mixed gas. Argon CO_2 mixed gas offers better weldability for thin metals and a wider range of adjustment for the device. Argon 80% CO_2 20% is a good all-rounder that is suitable for most applications.

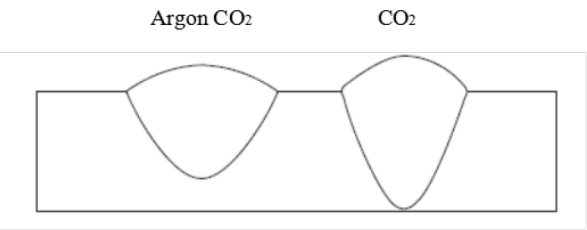


Fig. 54: Selection of the gas

12.5 Flux-cored wire welding without gas

In order to weld without gas with the Easy-MIG 181 Multi unit, a filled wire must be used instead of a conventional solid wire.

The welding process is the same as for MIG welding. However, here the flux-cored wire replaces the gas from the cylinder. The shielding gas is generated by burning off the powder inside the wire.

Due to the larger diameter of the welding wire, not every machine is automatically suitable for flux-cored wire welding.

When using flux-cored wire without shielding gas, the following procedure must be observed:

1. Set the polarity of the torch from "+" to "-"

To do this, move the metal bridge above the feed unit from the vertical position ("+") to the horizontal position ("-").

Abb. 55: Set the polarity

2. the torch should be equipped with a combination Teflon core, because the wire is very soft.

NOTE!

Consult your authorized dealer if necessary.

3. The earth cable must be connected to the welding socket "+", above the torch connection.

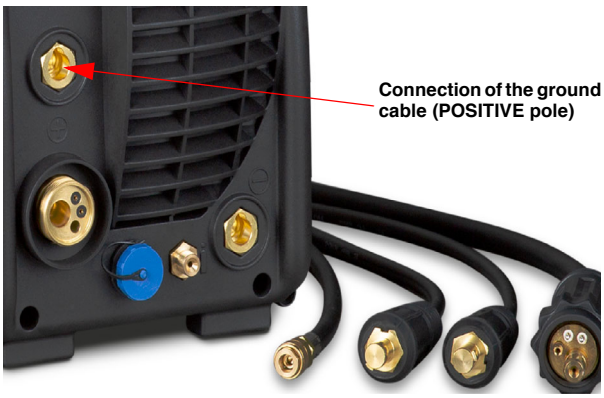


Abb. 56: Grounding Cable Connection

13 Troubleshooting

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	
Communication	E40	Connection problems between the wire feed and the power source	
	E41	Connection error	
	E42	Connection error robot	
	E43	Connection error WIFI	

MIG welding troubleshooting

Troubleshooting-Table of the Model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
1	Excessive spatters	The wire feed speed is set too high.	Select a slower wire feed speed.
		Voltage too high.	Select a lower voltage setting.
		Wrong polarity setting.	Select the correct polarity for the wire used.
		Protrusion too big.	Move the welding torch closer to the workpiece.
		Contaminated base material.	Remove impurities such as paint, grease, oil and dirt from the base material.
		Dirty MIG wire.	Use clean, dry and stainless wire. Do not lubricate the wire with oil, grease etc.
		Unsuitable gas flow or too much gas.	Check that the protective gas is connected, check that the hoses, the gas valve and the welding torch are not restricted. Set the gas flow between 6 to 12 l / min. Check the hoses and couplings for holes and leaks. Protect the welding zone from wind and turbulence.
2	Porosity - small voids or holes resulting from gas inclusions in the weld metal.	Wrong gas.	Make sure the right gas is used.
		Unsuitable gas flow or too much gas.	Check that the gas is connected, check that the hoses are in the correct position and that the gas valve and the welding torch are not blocked. Set the gas flow between 10 to 15 l / min. Check the hoses and couplings for holes and leakage. Protect the welding area against wind and airflows.
		Moist basic material.	Remove any moisture from the base material before welding.
		Contaminated base material.	Remove contaminants and material such as paint, grease, oil and dirt from the base material.
		Contaminated cored wire.	Remove all grease, oil and dirt as well as chips from the base material.
		Gas nozzle clogged or worn out.	Clean or replace the gas nozzle.
		Missing or damaged gas diffuser.	Replace the gas diffuser.
		MIG welding torch: euro-specific O-ring is missing or damaged.	Replace the O-ring.

Troubleshooting-Table of the Model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
3	The wire is pressed out during welding.	The welding torch is kept too far away.	Move the welding torch closer to the workpiece and feed out the tips 5 -10 mm.
		Welding voltage is set too low.	Increase the voltage.
		Wire feed speed is too high.	Reduce the wire feed speed.
4	Binding error - Defects in the weld metal when merging with the base material or a progressive weld bead.	Contaminated base material.	Remove materials such as paint, grease, oil, and dirt, including mill scale from the base material.
		Insufficient heat import.	Select a higher voltage range and / or set a suitable wire feed speed.
		Insufficient operating welding skills.	Hold the arc at the front edge of the weld pool. The working angle of the gun should be between 5 and 15 °. Aim the arc at the weld. Adjust the working angle or widen the groove to gain access to the ground during welding. When using the weaving technique, hold the arc temporarily on the side walls.
5	Excessive penetration - burn-through.	Excessive heat input.	Select a lower voltage range and / or set a suitable wire feed speed.
6	No penetration - flat fusion of weld metal and base material.	Badly prepared weld.	Material too thick. The preparation and construction of the joint must allow access to the bottom of the groove while maintaining proper weld wire extension and arc characteristics. Hold the arc at the front edge of the weld pool and the angle of the gun at 5 and 15 ° and keep the bar out between 5 and 10 mm.
		Insufficient heat import.	Select a higher voltage range and / or set a suitable wire feed speed.
		Contaminated base material.	Remove materials such as paint, grease, oil, and dirt, including mill scale from the base material.

Troubleshooting wire feed in the MIG welding process:

Troubleshooting table for the model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
1	No wire feed	Wrong operating mode selected.	Set the TIG / MMA / MIG switch to the MIG position.
		Selector switch set incorrectly for the welding torch.	Make sure that the wire feed / coil gun selector switch for MIG welding and spool gun is in the wire feed position when using the spool gun.
2	Unstable or disruptive wire feeding.	Wrong setting of the scale values.	Make sure you have set the wire feed and voltage scale for MIG welding. The current scale is intended for MMA and TIG welding.
		Wrong polarity selected.	Select the correct polarity for the wire used - see the device setup guide.
		Incorrect setting of wire feed speed.	Set the wire feed speed.
		Wrong setting of the voltage.	Set the voltage correctly.
		MIG welding torch guide too long.	Small diameter wires and soft wires, e.g. Made of aluminum can be forward by long welding torch guides - replace the torch with a less long torch.
		MIG torch guide kinked or held at an acute angle.	Remove the kink, reduce the angle or arc.
		Contact tip is close, wrong size, wrong type.	Replace the tip with the correct size or type.
		Running sleeve worn or clogged (the most common causes of poor feeding).	Try to clean the liner by temporarily blowing it out with compressed air. It is recommended to replace the bushing.
		Wrong bushing size.	Install the correct bushing size.
		Clogged or sealed inlet guide tube.	Clean or replace the inlet guide tube.
		Wire misaligned in the drive roller groove.	Position the wire in the groove of the drive roller.
		Wrong drive roller size.	Insert the correct drive roller size: e.g. For a 0.8 mm wire, use the required 0.8 mm drive roller.
		Wrong type of drive roller selected.	Insert the correct type of roller. (e.g., knurling rolls for flux cored wires).
		Worn out drive rollers.	Replace the drive rollers.
		Drive roller pressure too high.	It can flatten the wire electrode and cause it to stick in the contact tip - reduce the pressure on the drive roller.
		Too much pressure on the spool turntable.	Reduce the brake pressure on the coil turntable.
		The wire crosses on the spool or swells out.	Remove the coil, untangle the wire or replace the wire.
		Dirty MIG wire.	Use clean, dry and stainless wire. Do not lubricate the wire with oil, lubricant etc.

TIG welding Troubleshooting DC application (DC):

Troubleshooting table for the model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
1	The tungsten electrode burns away quickly.	Wrong gas or no gas.	Use pure argon. Check that the gas bottle is filled with gas, connected, switched on and the torch valve is open.
		Inadequate gas flow.	Check if the gas is connected. Check that hoses, gas valve and torch are not affected.
		Torch cap not inserted properly.	Make sure the torch cap is mounted so that the O-ring is in the torch body.
		Welding torch connected with DC +.	Connect the torch to the DC connection.
		Wrong tungsten electrode is used.	Check and change the tungsten electrode type if necessary.
		Tungsten electrode was oxidized after the weld is over.	Maintain the inert gas flow 10-15 seconds after the arc stops. 1 second for every 10 amperes of welding current.
2	Contaminated tungsten electrode.	The tungsten electrode 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 filler wire touched the electrode.	Avoid contact between the filler wire and the tungsten electrode during the welding process. Insert the filler wire into the projection of the molten bath in front of the electrode.
3	Porosity - poor weld and color.	Incorrect gas / low gas flow / gas leak.	Use pure argon. The protective gas is connected, check that the hoses, the gas valve and the welding torch are not restricted. Set the gas flow between 6 to 12 l / min. Check the hoses and couplings for holes and leaks.
		Contaminated base material.	Remove impurities and material such as paint, grease, oil and dirt from the base material.
		Contaminated filler wire.	Remove all grease, oil and dirt from the base material.
		Wrong filler wire.	Check the filler wire used and change it if necessary.
4	Yellow residue / smoke on the aluminum nozzle and discoloration on the tungsten electrode.	Wrong gas.	Use pure argon.
		Inadequate gas flow.	Set the gas flow between 10 and 15 l / min flow rate.
		Aluminum gas nozzle is too small.	Increase the diameter of the aluminum gas nozzle.

Troubleshooting table for the model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
5	Unstable arc during welding.	Welding torch connected with DC +.	Connect the welding torch to the DC output terminal.
		Contaminated base material.	Remove materials such as paint, grease, oil, and dirt, including mill scale from the base material.
		The tungsten electrode is contaminated.	Remove 10 mm from the contaminated tungsten electrode.
		The arc is too long.	Hold the welding torch slightly lower than the distance of 2 to 5 mm above the workpiece.
6	The arc migrates during welding.	Too low gas flow.	Check and set the gas flow to a flow rate between 10 to 15 l / min.
		Wrong arc length.	Hold the welding torch slightly lower than the distance of 2 to 5 mm above the workpiece.
		Wrong tungsten 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.	Abrasive marks should run longitudinally along the tungsten electrode, not circular. Use suitable abrasives such as a grinder with a grinding wheel.
		Contaminated base material or wire electrode.	Remove materials such as paint, grease, oil, and dirt, including mill scale from the base material. Remove all lubricant, oil, or contaminants from the filler.
7	The arc is difficult to ignite. The arc does not start to weld.	Wrong device setting.	Check if the device setting is correct.
		No gas, wrong gas flow rate.	Check that the gas is connected and the 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 and 15 l / min.
		Wrong 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 grind the tungsten electrode.
		Loose connection.	Check all connections and tighten them.
		The ground terminal is not connected to the work table.	Connect the ground terminal directly to the workpiece if possible.

Troubleshooting by MMA welding process:

Troubleshooting table of the model Easy-MIG 181 Multi			
Nr.	**Malfunction**	**Cause**	**Remedy**
1	No arc.	Incomplete welding circle.	Check the ground line. Check all connection cables.
		No power supply.	Check if the device is switched on and there is a power supply.
		Wrong mode selected.	Check if the MMA selector switch is selected.
2	Porosity - small voids or holes 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 impurities and materials such as paint, grease, oil, and dirt, including the mill scale of the base material.
		Moisture on the electrode.	Use only dry electrodes.
3	Excessive splashes.	Current too high.	Reduce the current or select a larger electrode..
		Arc is too long.	Shorten the arc length.
4	Weld is at the top, too little cross linking.	Insufficient heat.	Increase the current or choose a larger electrode.
		The workpiece is dirty, contaminated or damp.	Remove impurities and materials such as paint, grease, oil, and dirt, including the mill scale of the base material.
		Poor welding technique.	Apply the correct welding technique or seek support from a specialist.
5	Lack of penetration.	Insufficient heat.	Increase the current or choose a larger electrode.
		Poor welding technique.	Apply the correct welding technique or seek support from a specialist.
		Poor seam preparation.	Check the seam shape and make sure the material is not too thick. Seek assistance from a specialist if necessary.
6	Excessive penetration - burn-through.	Excessive heat input.	Reduce the current or select a larger electrode.
		Wrong infeed rate	Try to increase the welding speed.
7	Uneven weld result.	Restless hand, wavering hand.	Use two hands for support, if possible.
8	Distortion - movement of the base material during welding.	Excessive heat input.	Reduce the current or use a smaller electrode.
		Bad welding technology.	Apply the correct welding technique or seek assistance from a specialist
		Poor seam preparation or wrong seam shape.	Check the seam shape and make sure the material is not too thick. Seek assistance from a specialist if necessary.
9	The electrode welds with different or unusual arc characteristics.	Wrong connection of the polarity.	Change the polarity and check the notes of the electrode manufacturer for correct polarity.

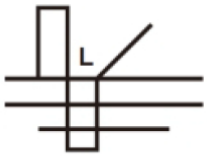
14 Welding Parameters

Welding current (A)	Welding volt (V)	Wave control	Wire speed		
			φ0.8	φ1.0	φ1.2
60A	16～17V	0-2	3--4		
80A	17～18V	0-2	4--5	3--4	
100A	17～19V	2-3	5--6	3--5	2--3
120A	17～19V	2-3	6--7	4--5	3--4
150A	18～20V	3-5	7--9	4--6	4--5
180A	20～23V	3-6	8-10	6--8	5--6
220A	21～24V	4-6		7--10	6--8
250A	22～26V	6-8			7-9

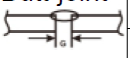
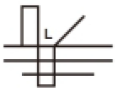
Process reference for CO2 butt welding of low carbon steel solid welding wire

	Material thickness (MM)	Root gap G (MM)	Wire diameter (MM)	Welding current (A)	Welding voltage (V)	Welding speed (CM/MIN)	Gas-flow rate (L/MIN)
Butt-joint 	0.8	0	0.8	60-70	16-16.5	50-60	10
	1.0	0	0.8	75-85	17-17.5	50-60	10-15
	1.2	0	0.8	80-90	17-18	50-60	10-15
	2.0	0-0.5	1.0/1.2	110-120	19-19.5	45-50	10-15
	3.2	0-1.5	1.2	130-150	20-23	30-40	10-20
	4.5	0-1.5	1.2	150-180	21-23	30-35	10-20
	6	0	1.2	270-300	27-30	60-70	10-20
	6	1.2-1.5	1.2	230-260	24-26	40-50	15-20
	8	0-1.2	1.2	300-350	30-35	30-40	15-20
	8	0-0.8	1.6	380-420	37-38	40-50	15-20
	12	0-1.2	1.6	420-480	38-41	50-60	15-20

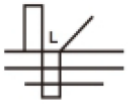
Process reference for CO2 corner welding of low carbon steel solid welding wire

	Material thickness (MM)	Wire diameter (MM)	Welding current (A)	Welding voltage (V)	Welding speed (CM/MIN)	Gas-flow rate (L/MIN)
Corner joint 	1.0	0.8	70-80	17-18	50-60	10-15
	1.2	1.0	85-90	18-19	50-60	10-15
	1.6	1.0/1.2	100-110	18-19.5	50-60	10-15
	1.6	1.2	120-130	19-20	40-50	10-20
	2.0	1.0/1.2	115-125	19.5-20	50-60	10-15
	3.2	1.0/1.2	150-170	21-22	45-50	15-20
	3.2	1.2	200-250	24-26	45-60	10-20
	4.5	1.0/1.2	180-200	23-24	40-45	15-20
	4.5	1.2	200-250	24-26	40-50	15-20
	6	1.2	220-250	25-27	35-45	15-20
	6	1.2	270-300	28-31	60-70	15-20
	8	1.2	270-300	28-31	60-70	15-20
	8	1.2	260-300	26-32	25-35	15-20
	8	1.6	300-330	25-26	30-35	15-20
	12	1.2	260-300	26-32	25-35	15-20
	12	1.6	300-330	25-26	30-35	15-20
	16	1.6	340-350	27-28	35-40	15-20
	19	1.6	360-370	27-28	30-35	15-20

Low carbon steel, stainless steel pulse MAG welding process reference

Welding position	Material thickness (MM)	Wire diameter (MM)	Welding current (A)	Welding voltage (V)	Welding speed (CM/MIN)	Nozzle and workpiece spacing (MM)	Gas-flow rate (L/MIN)
Butt-joint 	1.6	1.0	80-100	19-21	40-50	12-15	10-15
	2.0	1.0	90-100	19-21	40-50	13-16	13-15
	3.2	1.2	150-170	22-25	40-50	14-17	15-17
	4.5	1.2	150-180	24-26	30-40	14-17	15-17
	6.0	1.2	270-300	28-31	60-70	17-22	18-22
	8.0	1.6	300-350	39-34	35-45	20-24	18-22
	10.0	1.6	330-380	30-36	35-45	20-24	18-22
Corner joint 	1.6	1.0	90-130	21-25	40-50	13-16	10-15
	2.0	1.0	100-150	22-26	35-45	13-16	13-15
	3.2	1.2	160-200	23-26	40-50	13-17	13-15
	4.5	1.2	200-240	24-28	45-55	15-20	15-17
	6.0	1.2	270-300	28-31	60-70	18-22	18-22
	8.0	1.6	280-320	27-31	45-60	18-22	18-22
	10.0	1.6	330-380	30-36	40-55	20-24	18-22

Welding process of aluminum alloy pulse MIG

Welding position	Material thickness (MM)	Wire diameter (MM)	Welding current (A)	Welding voltage (V)	Welding speed (CM/MIN)	Nozzle and workpiece spacing(MM)	Gas-flow rate (L/MIN)
Butt-joint 	1.5	1.0	60-80	16-18	60-80	12-15	15-20
	2.0	1.0	70-80	17-18	40-50	15	15-20
	3.0	1.2	80-100	17-20	40-50	14-17	15-20
	4.0	1.2	90-120	18-21	40-50	14-17	15-20
	6.0	1.2	150-180	20-23	40-50	17-22	18-22
	4.0	1.2	160-210	22-25	60-90	15-20	19-20
	4.0	1.6	170-200	20-21	60-90	15-20	19-20
	6.0	1.2	200-230	24-27	40-50	17-22	20-24
	6.0	1.6	200-240	21-23	40-50	17-22	20-24
	8.0	1.6	240-270	24-27	45-55	17-22	20-24
	12.0	1.6	270-330	27-35	55-60	17-22	20-24
	16.0	1.6	330-400	27-35	55-60	17-22	20-24
Corner joint 	1.5	1.0	60-80	16-18	60-80	13-16	15-20
	2.0	1.0	100-150	22-26	35-45	13-16	15-20
	3.0	1.2	100-120	19-21	40-60	13-17	15-20
	4.0	1.2	120-150	20-22	50-70	15-20	15-20
	6.0	1.2	150-180	20-23	50-70	18-22	18-22
	4.0	1.2	180-210	21-24	35-50	18-22	16-18
	4.0	1.6	180-210	18-20	35-45	18-22	18-22
	6.0	1.2	220-250	24-25	50-60	18-22	16-24
	6.0	1.6	220-240	20-24	37-50	18-22	16-24
	8.0	1.6	250-300	25-26	60-65	18-22	16-24
	12.0	1.6	300-400	26-28	65-75	18-22	16-24

15 Disposal, Recycling of used Devices

For environmental benefits it is necessary to ensure that all components of the machine are only disposed of by the provided and allowed means.

15.1 Decommissioning

Immediately decommission used machines in order to avoid later misuse and endangering of the environment or of persons.

- Dispose of all environmentally hazardous operating materials of the used device.
- If required, disassemble the machine into easy-to-handle and usable components and parts.
- Supply the machine components and operating materials to the provided disposal routes.

15.2 Disposal of electrical equipment

Electrical equipment contains a variety of recyclable materials and environmentally harmful components.

These components must be separated and properly disposed of. If in doubt, contact municipal waste man-agement.

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

15.3 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.

16 Maintenance and Repair

NOTES!

Before servicing and maintaining the Multifunctional Inverter, the maintenance instructions must be read carefully. Handling the Multifunctional Inverter is only permitted to persons who are familiar with the Multi-functional Inverter.

WARNING!

- Repair and maintenance work may only be performed by persons trained by welding. Contact your welding specialist dealer. When replacing parts, use only genuine replacement welding parts.
- Disconnect the power plug before repair, maintenance or after use.
- If maintenance or repair work on this device is carried out by persons who are not trained by SCHWEISSKRAFT and are not authorized to carry out this work, the guarantee and liability claim against welding force expires.
- Before starting the cleaning work, the welding machine must be switched off and disconnected from the mains!
- Before maintenance work, the welding system must be switched off and disconnected from the mains and secured against unintentional restart.
- Supply lines must be shut off and depressurised. These are the ones in the chapter. "Safety" listed warnings.
- The welding system and its components are to be maintained according to the maintenance chart.
- Inadequate or improper maintenance or service may cause malfunction. Regular maintenance of the system is therefore essential. No structural changes or additions may be made to the system.

WARNING!

If maintenance or repair work on this device is carried out by persons who are not trained by SCHWEISSKRAFT and are not authorized to carry out this work, the warranty claim against welding force expires.

WARNING!

Before carrying out any maintenance, the unit must be switched off and maintained for at least 5 minutes until the capacity potential has dropped to 36 V!

Tips and recommendations

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

DANGER!

Danger due to insufficient qualification of persons!

Insufficiently qualified persons can not assess the risks involved in maintenance work on the device and expose themselves and others to the risk of serious injury.

- All maintenance work should only be carried out by qualified persons.
- In case of problems, the welding specialist is at your disposal.

After maintenance, repair and cleaning work, check that all panels and guards are correctly installed on the Multifunctional Inverter and that there are no tools inside or in the working area of the Multifunctional Inverter.

Further maintenance tasks:

Measure	Interval
Cleaning the inside of the device.*	at least 2 x per year *
Function test of the safety devices by operating personnel.	daily
Visual inspection of the system, especially the torch hoses.	daily
Connection lines and torch hoses have to be checked by qualified personnel; Record the test in the appropriate test book. **Also carry out examinations more frequently, depending on state law.**	half-yearly
Have the entire welding system checked by qualified personnel; Record the test in the appropriate test book. **Also carry out examinations more frequently, depending on state law.**	yearly

* If the welding machine is used in a dusty environment, the inside of the device must be cleaned at regular intervals by blowing out or sucking it out. The frequency of this cleaning depends on the respective conditions of use, but it should be carried out at least twice a year. Use only clean, dry air to blow out the device or use a vacuum cleaner.

Time	Maintenance tasks	Maintenance task
Daily	Check that the controls, such as the hand knob and the switches on the front and back of the unit, operate correctly and are seated correctly.	If the knob or switches are not seated correctly, please correct. If the knob and switch can not be corrected in their position, please replace them.
	After turning on the power, check out that the ARC welding device does not vibrate, makes whistling sounds, or exudes peculiar odors.	If any of the above problems occur, try to find the cause and eliminate it. If you can not do this, contact the service.
	Check if the display of the LED display is completely intact.	Replace it if necessary.
	Check whether the min / max value of the LED display matches the set value.	If there are deviations that have an effect on the normal arc strength, please adjust this value.
	Check if the fan is damaged or does not turn normally.	If the fan is damaged, please replace it immediately. If the fan does not rotate after the ARC welding process, the unit overheats. See if there is something blocking the rotor blade. If it is blocked, eliminate 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 turns 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 presents the problems listed above, the quick connectors should be fixed or replaced.
	Check if the power output cable is damaged.	If it is damaged, it should be isolated or replaced.
Monthly inspection	Check cleanliness. Check the bolt in the ARC welding device for firm seat.	Use the dry compressed air to clean the inside of the ARC welder. Especially for removing the dust on the cooler, the main voltage transformer, the inductive resistor, the IGBT module, the fast charging diode and the printed circuit board. If it is loose, screw it tight. If it turns over, replace him. If it is rusted, remove the rust on the bolt to make sure it is working properly.
Quarterly inspection	Check that the current current matches the value shown on the display.	If the values do not match, the welding device should be adjusted. The actual current value can be measured and adjusted with a pincer-specific ammeter.
Annual inspection	Measure the isolation impedance along the main circuit, circuit board and enclosure.	If it is below 1MΩ the insulation is damaged and must be replaced or reinforced.

17 Spare Parts

DANGER!

Risk of injury caused by the use of incorrect spare parts!

The use of incorrect or faulty spare parts may cause risks for operating staff and damage as well as malfunctions.

- Exclusively genuine spare parts made by the manufacturer or spare parts authorised by the manufacturer shall be used.
- Always contact the manufacturer if you are unsure.

NOTE!

The manufacturer warranty shall be rendered void in the event of a use of unauthorised spare parts.

1.1 Spare parts order

Spare parts are available from authorised retailers or directly from the manufacturer.

Contact details:

Fax: 0049 (0) 951 96555-119

email: ersatzteile@stuermer-maschinen.de

Always quote the following key data with your spare parts orders:

- Device type
- Article number
- Position number
- Year of manufacture
- Quantity
- Desired shipping type (post, freight, sea, air, express)
- Shipping address

Spare parts orders without the aforementioned data cannot be taken into account. The supplier shall determine the shipping type if no relevant data was provided.

Information about the device type, article number and year of manufacture can be found on the type plate. The type plate is mounted on the device.

Example

The display cover for the Multifunctional Inverter must be ordered. The display cover has the number 31 in the spare parts drawing 1.

By ordering spare parts, send a copy of the spare parts drawing (1) with the marked part (display cover) and marked position number (31) to the dealer or spare parts department and provide the following information:

Device type:	**Multifunctional Inverter Easy-MIG 181 Multi**
Article number:	**1071181**
Drawing number:	**1**
Position number:	**31**

The article number of your device:

Multifunctional Inverter Easy-MIG 181 Multi: **1071181**

17.1 Spare parts drawing

The following drawing should help in case of service to identify necessary spare parts. To order, send a copy of the parts drawing with the parts marked to your authorized dealer.

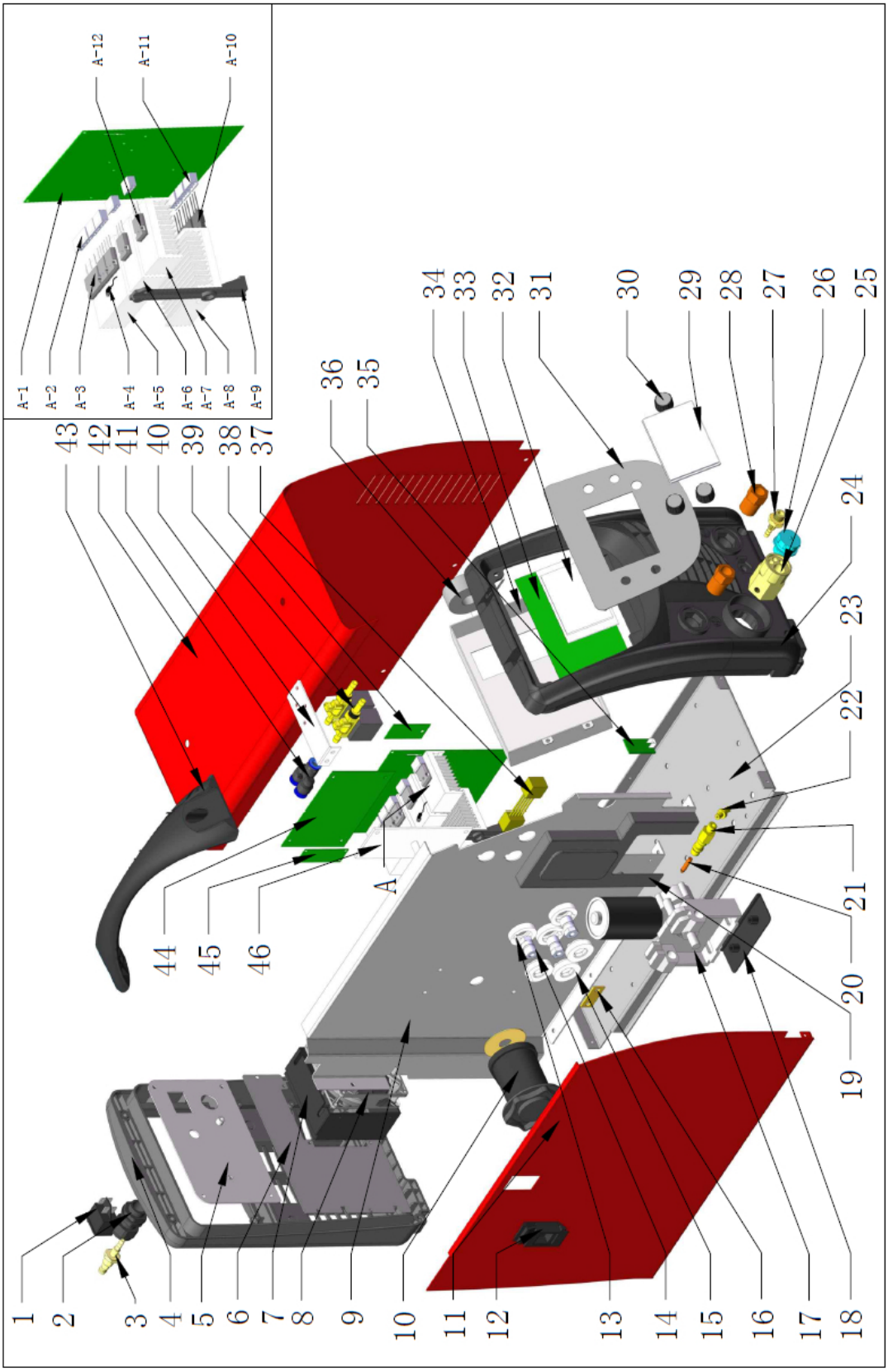


Fig. 57: Spare parts drawing Easy-MIG 181 Multi

Parts list 1

Pos.	Description	Qty	Size
1	Switch	1	
2	Cable clamp	1	
3	Fast connector	1	
4	Rear plastic panel	1	
5	Mounting panel	1	
6	Assembly panel	1	
7	Fan cover	1	
8	Fan	1	
9	Median clapboard	1	
10	spoool core of wire feeder	1	
11	Left side panel	1	
12	Box lock	1	
13	Adapter base	3	
14	adapter	3	
15	adapter base	3	
16	connecting copper	1	
17	Wire feeder device	1	
18	Insulation	1	
19	Protection coverr	1	
20	Giude wire pipe	1	
21	Connecting rod	1	
22	Gas fitting	1	
23	Baseplate	1	
24	Front plastic panel	1	
25	central socket	1	
26	12 pin socket	1	
27	front gas fitting	1	
28	Euro socket	2	
29	LC D transparent cover	1	
30	Knob	3	
31	Face mounting panel	1	
32	3.5 inch screen	1	
33	Control pcb	1	
34	Sealing box	1	

Pos.	Description	Qty	Size
35	Absorbing pcb	1	
36	inductance	1	
37	Diverter	1	
38	Control pcb	1	
39	Solenoid valve	2	
40	Valve mounting plate	1	
41	Y-type joint	1	
42	Right side panel	1	
43	Handle	1	
44	Power pcb	1	
45	Emc pcb	1	
46	Spool mounting assembly	1	
A-1	Main pcb	1	
A-2	Insoluation	1	
A-3	Bridge rectifier	1	
A-4	Thermistor	1	
A-5	IGBT heat sink	1	
A-6	IGBT heat sink	1	
A-7	IGBT heat sink	1	
A-8	MUR hear sink	1	
A-9	Supporting bar	1	
A-10	Fast recovery diode	3	
A-11	Insoluation	7	
A-12	IGBT	4	

18 Electrical Schematic Easy-MIG 181 Multi

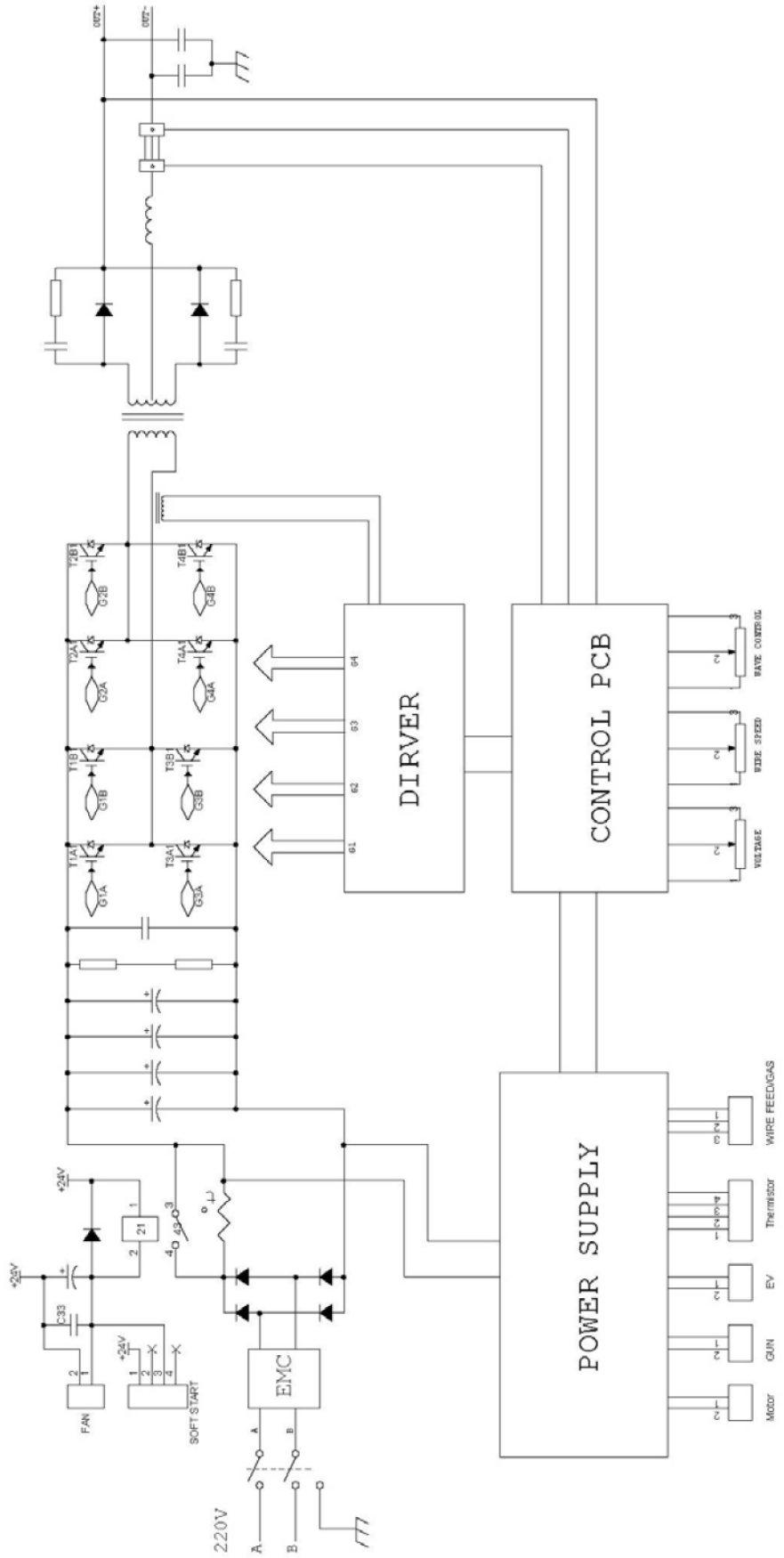


Fig. 58: Electrical schematic Easy-MIG 181 Multi

19 EC-Declaration of Conformity

For the following products,

Manufacturer:	Stürmer Maschinen GmbH Dr.-Robert-Pfleger-Straße 26 D-96103 Hallstadt
Product Group:	Schweißkraft® Schweißtechnik
Type of machine:	Multifunctional Inverter
Description of the machine:	**Item number:**
Easy-MIG 181 Multi	1071181
Serial number*:	_____
Year of manufacture*:	20____

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

is hereby confirmed that they comply with both essential protection requirements of Directive **2014/30/EU** (EMC Directive) of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility and of Directive **2014/35/EU** relating to electrical operating material for use within certain voltage limits, as well as set out in the RoHS Directive **2011/65/EU**.
The above mentioned products comply with the requirements of this Directive and comply with the safety requirements for arc welding equipment in accordance with the following product standards.

The following harmonized standards have been applied:

EN IEC 60 974-1:2018-12	Arc welding equipment - Part 1: Welding power sources (IEC 60974-1:2017)
DIN EN 60974-5:2017-11	Arc welding equipment - Part 5: Wire feeders
EN 55011:2016 + A1:2017	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement (CISPR 11:2015, modified + A1:2017)
EN 60974-10:2014 + A1:2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement (CISPR 11:2015, modified + A1:2017)

According to EC. Directive **2006/42/EC Article 1** drop o.g. Products exclusively within the scope of Directive **2014/35/EC** relating to electrical equipment designed for use within certain voltage limits.

Electromagnetic Compatibility (DIN EN 60974-10)
The device is manufactured in accordance with EN 60974-10 Class A. This Class A cutting device is not intended for use in residential areas where the electrical power is a public low-voltage supply system.

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

Hallstadt, 11. June 2019

Kilian Stürmer
General Manager

CE

20 Notes


stürmer
OPTIMUM