

VOLKSWAGEN

AKTIENGESELLSCHAFT

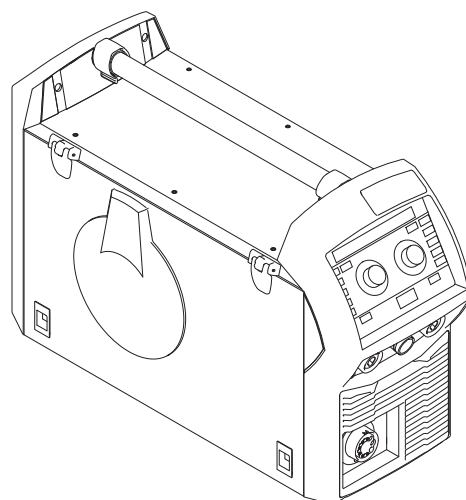


VW AG/VAS 821 001/MIG270i

EN-US

Operating Instructions

MIG/MAG Power source



42,0426,0347,EA 015-18112020

Table of contents

Safety Instructions.....	7
Explanation of Safety Instructions.....	7
General.....	7
Intended Use.....	7
Environmental Conditions.....	8
Obligations of the Operating Company.....	8
Obligations of Personnel.....	8
Grid Connection.....	8
Residual current circuit breaker.....	9
Personal Protection and Protection of Others.....	9
Data regarding Noise Emission Values.....	10
Danger from toxic gases and vapors.....	10
Danger from Flying Sparks.....	10
Risks from grid current and welding current.....	11
Stray welding currents.....	12
EMC Device Classifications.....	12
EMC Measures.....	12
EMF measures.....	13
Particular Hazard Areas.....	13
Requirement for the shielding gas.....	14
Danger from Shielding Gas Cylinders.....	14
Danger Posed by Shielding Gas Leak.....	15
Safety Measures at the Setup Location and During Transport.....	15
Safety Measures in Normal Operation.....	16
Maintenance and repair.....	16
Safety Inspection.....	16
Disposal.....	17
Data backup.....	17
Copyright.....	17
General information.....	19
General.....	21
Device concept.....	21
Functional principle.....	21
Application areas.....	21
Warning notices on the device.....	22
Description of Warning Notices on the Device.....	24
Welding packages, welding characteristics and welding processes.....	26
General.....	26
Welding characteristics.....	26
Summary of MIG/MAG pulse synergic welding.....	28
Summary of MIG/MAG standard synergic welding.....	28
Summary of the PMC process.....	29
Summary of the LSC process.....	29
Summary of SynchroPulse welding.....	29
Summary of the CMT process.....	30
System components.....	31
General.....	31
Overview.....	31
Operating controls, connections and mechanical components.....	33
Control Panel.....	35
General.....	35
Safety.....	35
Control panel.....	35
Displaying plain text for parameters.....	40
F1/F2 special function parameters, Favourites button.....	41
F1 and F2 special function parameters.....	41

The Favourites button.....	42
Connections, Switches, and Mechanical Components.....	45
Connections, switches and mechanical components.....	45
Installation and Startup	47
Minimum equipment for welding operations.....	49
General.....	49
MIG/MAG gas-cooled welding.....	49
Manual CMT welding.....	49
TIG DC welding.....	49
MMA welding.....	49
Before installation and initial operation.....	50
Safety.....	50
Intended Use.....	50
Setup regulations.....	50
Mains connection.....	50
Generator-Powered Operation.....	51
Information on system components.....	51
Connecting the Mains Cable.....	52
Safety.....	52
General.....	52
Stipulated mains cables.....	52
Connecting the mains cable - general.....	52
Commissioning.....	55
Safety.....	55
General.....	55
Connecting the gas cylinder.....	55
Establishing a ground earth connection.....	56
Connecting the welding torch.....	56
Inserting/replacing feed rollers.....	57
Inserting the wirepool.....	58
Inserting the basket-type spool.....	59
Feeding in the wire electrode.....	60
Setting the contact pressure.....	61
Adjusting the brake.....	62
Design of the Brake.....	62
Performing R/L alignment.....	63
Welding Mode	65
MIG/MAG Operating Modes.....	67
General.....	67
Symbols and their explanations.....	67
2-step mode.....	68
4-step mode.....	68
Special 4-step mode.....	68
Special 2-step mode.....	68
MIG/MAG and CMT welding.....	69
Safety.....	69
MIG/MAG and CMT welding – overview.....	69
Switching on the power source.....	69
Setting the welding process and operating mode.....	69
Retrieving the currently set filler metal.....	70
Selecting the filler metal.....	70
Setting the welding parameters.....	72
Setting the shielding gas flow rate.....	72
MIG/MAG or CMT welding.....	73
MIG/MAG and CMT welding parameters.....	74
Welding parameters for MIG/MAG pulse synergic welding, for CMT welding and PMC welding.....	74
Welding parameters for MIG/MAG standard synergic welding and LSC welding.....	75
Welding parameters for MIG/MAG standard manual welding.....	77
Explanation of footnotes.....	78

EasyJob mode.....	79
General.....	79
EasyJob mode.....	79
Spot welding.....	80
Spot welding.....	80
TIG welding.....	82
Safety.....	82
Preparations.....	82
TIG welding.....	82
Igniting the arc.....	84
Finishing welding.....	84
Manual Metal Arc Welding.....	85
Safety.....	85
Preparations.....	85
MMA welding.....	85
Welding parameters for manual metal arc welding.....	87
Setup Settings	89
Setup menu - overview.....	91
Entering/exiting the Setup menu.....	91
Setup menu - overview.....	92
Process parameters.....	93
Process parameters for start of welding/end of welding.....	93
Process parameters for Gas-Setup.....	94
Process parameters for process control.....	95
Penetration stabilizer.....	95
Arc length stabilizer.....	97
Combination of penetration stabilizer and arc length stabilizer.....	99
Process parameters for spot welding.....	100
Process parameters for monitoring and components.....	100
Process parameters for electrode setup.....	101
Process parameters for TIG setup.....	104
Process parameters for SynchroPulse.....	105
Process parameters for Process Mix.....	107
R/L alignment.....	109
Settings.....	111
General.....	111
Overview.....	111
Setting the units.....	111
Setting the standards.....	112
Setting the display brightness.....	112
Displaying replaced characteristics.....	112
Setting F1 and F2 special function parameters via the Setup menu.....	112
Setting the Favourites button via the Setup menu.....	113
Retrieving system data.....	113
Setting the interior lighting.....	114
Restoring the factory settings.....	115
Resetting the password for the power source website.....	115
Retrieving device information.....	115
Setting the special display for JobMaster.....	115
Setting the mode for spot welding.....	116
Setting the language.....	117
Setting the language.....	117
Keylock.....	118
Keylock.....	118
Troubleshooting and Maintenance	119
The Error menu.....	121
The Error menu.....	121
Troubleshooting.....	122
General.....	122

Safety.....	122
Power Source Troubleshooting.....	122
Service, maintenance and disposal.....	126
General.....	126
Safety.....	126
At every start-up	126
If necessary.....	126
Every 2 months.....	126
Every 6 months.....	126
Disposal.....	126
Technical data	127
Average consumption values during welding	129
Average wire electrode consumption during MIG/MAG welding	129
Average shielding gas consumption during MIG/MAG welding.....	129
Average shielding gas consumption during TIG welding.....	129
Technical data.....	130
Explanation of the Term Duty Cycle	130
Special Voltage.....	130
VW AG/VAS 821 001/MIG270i.....	131
VW AG/VAS 821 001/MIG270i MV.....	133
Overview with critical raw materials, year of production of the device.....	134
Appendix	135
VW AG/VAS 821 001/MIG270i.....	136

Safety Instructions

Explanation of Safety Instructions

DANGER!

Indicates an immediate danger.

- ▶ Death or serious injury may result if appropriate precautions are not taken.

WARNING!

Indicates a possibly dangerous situation.

- ▶ Death or serious injury may result if appropriate precautions are not taken.

CAUTION!

Indicates a situation where damage or injury could occur.

- ▶ Minor injury or damage to property may result if appropriate precautions are not taken.

NOTE!

Indicates the possibility of flawed results and damage to the equipment.

General

The device has been manufactured using state-of-the-art technology and according to recognized safety standards. If used incorrectly or misused, however, it can cause

- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company
- Inefficient operation of the equipment

All persons involved in the commissioning, operation, maintenance, and servicing of the device must

- Be suitably qualified
- Have knowledge of welding
- Have completely read and followed these Operating Instructions

The Operating Instructions must always be at hand wherever the device is being used. In addition to the Operating Instructions, all applicable local rules and regulations regarding accident prevention and environmental protection must also be followed.

All safety and danger notices on the device must

- Be kept in a legible state
- Not be damaged/marked
- Not be removed
- Not be covered, pasted, or painted over

For the location of the safety and danger notices on the device, refer to the section headed "General" in the Operating Instructions for the device.

Before switching on the device, remove any faults that could compromise safety.

Your personal safety is at stake!

Intended Use

The device is to be used exclusively for its intended purpose.

The device is intended exclusively for the welding process specified on the rating plate. Utilization for any other purpose, or in any other manner, shall be deemed to be "not in accordance with the intended purpose." The manufacturer is not responsible for any damage resulting from improper use.

Proper use also means

- Completely reading and obeying all instructions in the Operating Instructions
 - Completely reading and obeying all safety instructions and danger notices
 - Carrying out all the specified inspection and servicing work
-

Never use the device for the following applications:

- Thawing pipes
 - Charging batteries
 - Starting motors
-

The device is designed for operation in industry and business. The manufacture shall not be liable for any damage resulting from use in a living area.

The manufacture shall also not be liable for faulty or incorrect work results.

Environmental Conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer accepts no liability for any damage resulting from improper use.

Temperature range of the ambient air:

- During operation: -10°C to +40°C (14°F to 104°F)
 - During transport and storage: -20°C to +55°C (-4°F to 131°F)
-

Relative humidity:

- Up to 50% at 40°C (104°F)
 - Up to 90% at 20°C (68°F)
-

Ambient air: free of dust, acids, corrosive gases or substances, etc.

Altitude above sea level: up to 2000 m (6561 ft. 8.16 in.)

Obligations of the Operating Company

- The operating company must only allow persons to work with the device if they
- Are familiar with the basic occupational safety and accident prevention regulations and are trained in handling the device
 - Have read and understood these Operating Instructions, especially the section "Safety Rules," and have confirmed this with their signature
 - Are trained according to the requirements for the work results
-

The safety-conscious work of the personnel must be checked regularly.

Obligations of Personnel

All persons who are assigned to work with the device must do the following before beginning the work:

- Follow the basic regulations for occupational safety and accident prevention
 - Read these Operating Instructions, especially the section "Safety Rules," and confirm that they have understood and will follow them by signing
-

Before leaving the workplace, ensure that no personal injury or property damage can occur in one's absence.

Grid Connection

Devices with a high output can influence the energy quality of the grid due to their current consumption.

This may affect a number of device types in terms of:

- connection restrictions
- criteria regarding maximum permissible grid impedance *)
- criteria regarding the minimum required short-circuit power *)

*) both at the interface with the public grid

See technical data

In this case, the operator or the person using the device should check whether or not the device is allowed to be connected, where appropriate through discussion with the power supply company.

IMPORTANT! Ensure secure grounding of the grid connection!

Residual current circuit breaker

Local regulations and national guidelines may mean that a residual current circuit breaker is required when connecting a device to the public grid. The residual current circuit breaker recommended for the device by the manufacturer can be found in the technical data.

Personal Protection and Protection of Others

You are exposed to numerous hazards while handling the device, for example:

- Flying sparks and pieces of hot metal
- Arc radiation that poses a risk of injury to the eyes and skin
- Hazardous electromagnetic fields that pose a risk of death for individuals with pacemakers
- Electrical risks from grid current and welding current
- Increased noise exposure
- Harmful welding fumes and gases

Wear suitable protective clothing when dealing with the device. The protective clothing must have the following properties:

- Flame resistant
- Insulating and dry
- Covering the entire body and in good condition with no damage
- Safety helmet
- Cuffless pants

Protective clothing involves the following:

- Protecting the face and eyes from UV radiation, heat and flying sparks with a face guard featuring a regulation-compliant filter
- Wearing regulation-compliant protective goggles with side protection behind the face guard
- Wearing rigid, wet-insulating footwear
- Protecting hands with appropriate gloves (featuring electrical insulation and thermal protection)
- Wearing ear protection to reduce noise exposure and protect against injury

Keep persons, especially children, away during the operation of the devices and during the welding process. If persons are in the vicinity, however:

- Instruct them about all hazards (blinding hazard due to arcs, risk of injury from flying sparks, welding fumes hazardous to health, noise exposure, possible hazard due to grid current or welding current, etc.)
- Provide suitable protective equipment or
- Construct suitable protective walls and curtains.

**Data regarding
Noise Emission
Values**

The device produces a maximum noise level of <80 dB(A) (ref. 1pW) when idling and in the cooling phase following operation in relation to the maximum permitted operating point at standard loading in accordance with EN 60974-1.

A workplace-specific emission value for welding (and cutting) cannot be specified because this value depends on the welding process and the environmental conditions. It is influenced by a wide range of parameters, such as the welding process itself (MIG/MAG, TIG welding), the selected current type (direct current, alternating current), the power range, the type of weld metal, the resonance properties of the workpiece, the workplace environment, and many other factors.

**Danger from
toxic gases and
vapors**

The fumes produced during welding contain toxic gases and vapors.

Welding fumes contain substances that cause cancer, as stated in monograph 118 from the International Agency for Research on Cancer.

Use at-source extraction source and a room extraction system.
If possible, use a welding torch with an integrated extraction device.

Keep your head out of the welding fumes and gases.

Take the following precautionary measures for fumes and harmful gases:

- Do not breathe them in.
- Extract them from the work area using appropriate equipment.

Ensure that there is a sufficient supply of fresh air. Ensure that there is a ventilation flow rate of at least 20 m³ per hour.

Use a welding helmet with air supply if there is insufficient ventilation.

If there is uncertainty as to whether the extraction capacity is sufficient, compare the measured toxic emission values against the permissible limit values.

The following components are factors that determine how toxic the welding fumes are:

- The metals used for the workpiece
- Electrodes
- Coatings
- Cleaning agents, degreasers, and the like
- The welding process used

Consult the corresponding material safety data sheets and manufacturer's instructions for the components listed above.

Recommendations for exposure scenarios, risk management measures and identifying working conditions can be found on the European Welding Association website under Health & Safety (<https://european-welding.org>).

Keep flammable vapors (such as solvent vapors) out of the arc radiation range.

When no welding is taking place, close the valve of the shielding gas cylinder or the main gas supply.

**Danger from Fly-
ing Sparks**

Flying sparks can cause fires and explosions.

Never undertake welding near flammable materials.

Flammable materials must be kept at least 11 meters (36 ft. 1.07 in.) from the arc or protected with a certified cover.

Keep suitable, tested fire extinguishers on hand.

Sparks and pieces of hot metal may also get into surrounding areas through small cracks and openings. Take appropriate measures to ensure that there is no risk of injury or fire.

Do not undertake welding in areas at risk of fire and explosion, or on sealed tanks, drums, or pipes if these have not been prepared in accordance with corresponding national and international standards.

Do not undertake welding on containers in which gases, fuels, mineral oils, and the like are/were stored. Residues pose a risk of explosion.

Risks from grid current and welding current

An electric shock can be fatal.

Do not touch voltage-carrying parts inside or outside the device.

During MIG/MAG welding and TIG welding, the welding wire, the wirespool, the feed rollers, as well as all pieces of metal that are in contact with the welding wire, are live.

Always place the wirefeeder on a sufficiently insulated base or use a suitable insulating wirefeeder holder.

Ensure suitable personal protection with dry temporary backing or cover with sufficient insulation against the ground potential. The temporary backing or cover must completely cover the entire area between the body and the ground potential.

All cables and leads must be secured, undamaged, insulated, and adequately dimensioned. Replace loose connections and scorched, damaged, or inadequately dimensioned cables and leads immediately.

Before every use, check power connections for secure fit by hand.

In the case of power cables with bayonet connectors, turn the power cable by at least 180° around the longitudinal axis and pretension.

Do not wrap cables or leads around your body or parts of the body.

Concerning the electrode (rod electrode, tungsten electrode, welding wire, etc.)

- Never immerse it in liquids to cool it
- Never touch it when the power source is switched on.

The open circuit voltage of a welding system may double, for example, between the electrodes of two welding systems. Touching the potentials of both electrodes at the same time may be life-threatening in some cases.

Have the grid and device supply lead regularly inspected by an electrician to ensure that the ground conductor is functioning properly.

Protection class I devices require a grid with a ground conductor and a connector system with ground conductor contact for proper operation.

Operation of the device on a grid without a ground conductor and on a socket without a ground conductor contact is only permitted if all national regulations for protective separation are observed.

Otherwise, this is considered gross negligence. The manufacturer accepts no liability for any damage resulting from improper use.

Use suitable equipment to ensure that the workpiece is sufficiently grounded if necessary.

Switch off unused devices.

When working at elevated heights, wear a safety harness to prevent falls.

Before working on the device, switch off the device and remove the grid plug.

Secure the device to prevent the grid plug from being connected and switched on again by applying a clearly legible and understandable warning sign.

After opening the device:

- Discharge all electrically charged components
 - Ensure that all components are disconnected from the power supply.
-

If work is needed on voltage-carrying parts, bring in a second person who will switch off the main switch at the correct time.

Stray welding currents

If the following instructions are not observed, stray welding currents may occur, which pose a risk of the following:

- Fire
 - Overheating of components connected to the workpiece
 - Destruction of ground conductors
 - Damage to the device and other electrical equipment
-

Ensure that the workpiece terminal is securely connected to the workpiece.

Secure the workpiece terminal as close to the spot to be welded as possible.

Position the device with sufficient insulation against electrically conductive environments, e.g., insulation against electrically conductive floors or electrically conductive mounts.

Observe the following when using electrical distributors, double-headed retainers, etc.: Even the electrode of the welding torch/electrode holder not in use carries electric potential. Ensure that there is sufficient insulation when the unused welding torch/electrode holder is stored.

In automated MIG/MAG applications, only guide the wire electrode from the welding wire drum, large spool or wirepool to the wirefeeder with insulation.

EMC Device Classifications

Devices in emission class A:

- Are only designed for use in industrial settings
 - Can cause line-bound and radiated interference in other areas
-

Devices in emission class B:

- Satisfy the emissions criteria for residential and industrial areas. This is also true for residential areas in which the energy is supplied from the public low-voltage grid.
-

EMC device classification as per the rating plate or technical data.

EMC Measures

In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g., when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers).

If this is the case, then the operating company is obliged to take appropriate action to rectify the situation.

Test and assess the immunity of equipment in the vicinity of the device in accordance with national and international provisions. Examples of interference-prone equipment that could be affected by the device:

- Safety devices
 - Grid power lines, signal lines and data transfer lines
 - EMC and telecommunications equipment
 - Devices for measuring and calibrating
-

Supporting measures to avoid EMC problems:

1. Grid power supply
 - If electromagnetic interference occurs despite a grid connection that complies with regulations, take additional measures (e.g., use a suitable grid filter).
2. Welding power-leads
 - Keep them as short as possible
 - Route them close together (also to avoid EMF problems)
 - Route them far from other lines
3. Equipotential bonding
4. Workpiece grounding
 - If necessary, establish grounding using suitable capacitors
5. Shield, if necessary
 - Shield other devices in the vicinity
 - Shield the entire welding installation

EMF measures

Electromagnetic fields may cause health problems that are not yet known:

- Effects on the health of persons close by, e.g., those with pacemakers and hearing aids
- Persons with pacemakers must seek advice from their doctor before staying in the immediate vicinity of the device and the welding process
- Keep distances between welding cables and the head/torso of the welder as large as possible for safety reasons
- Do not carry welding cables and hosepacks over one's shoulder or wrap them around one's body or body parts

Particular Hazard Areas

Keep hands, hair, loose clothing, and tools away from moving parts, such as:

- fans
- gears
- rollers
- shafts
- wire spools and welding wires.

Do not reach into rotating gears of the wire drive or into rotating drive parts.

Covers and side parts must only be opened/removed during maintenance and repair work.

During operation:

- Ensure that all covers are closed, and all side parts have been mounted properly.
- Keep all covers and side parts closed.

The protrusion of welding wire from the welding torch represents a high risk of injury (cuts to the hand, facial and eye injuries, etc.)

Therefore always hold the welding torch away from the body (devices with wirefeeder) and use suitable protective goggles.

Do not touch the workpiece during or after welding—burning hazard.

Slag may fly off cooling workpieces. Therefore, also wear regulation-compliant protective equipment when reworking workpieces and ensure that other persons are sufficiently protected.

Leave the welding torch and other parts with a high operating temperature to cool before working on them.

Special regulations apply in areas at risk of fire or explosion
– follow the appropriate national and international regulations.

Power sources for work in areas with increased electrical hazard (e.g. boilers) must be labeled with the symbol (Safety). However, the power source may not be located in such areas.

Risk of scalding due to leaking coolant. Switch off the cooling unit before disconnecting connections for the coolant supply or return.

When handling coolant, observe the information on the coolant safety data sheet. The coolant safety data sheet can be obtained from your service center or via the manufacturer's website.

Only use suitable load-carrying equipment from the manufacturer when transporting devices by crane.

- Attach chains or ropes to all designated attachments of the suitable load-carrying equipment.
 - Chains or ropes must be the smallest angle possible from vertical.
 - Remove gas cylinder and wirefeeder (MIG/MAG and TIG devices).
-

In the event of crane attachment of the wirefeeder during welding, always use a suitable, insulating wirefeeder hoisting attachment (MIG/MAG and TIG devices).

If the device is equipped with a carrier belt or handle, then this is used exclusively for transport by hand. The carrier belt is not suitable for transport by crane, counterbalanced lift truck or other mechanical lifting tools.

All lifting equipment (belts, buckles, chains, etc.), which is used in association with the device or its components, must be checked regularly (e.g. for mechanical damage, corrosion, or changes due to other environmental influences).

The test interval and scope must at least comply with the respective valid national standards and guidelines.

There is a risk of colorless, odorless shielding gas escaping without notice if an adapter is used for the shielding gas connection. Use suitable Teflon tape to seal the thread of the shielding gas connection adapter on the device side before installation.

Requirement for the shielding gas

Especially with ring lines, contaminated shielding gas can cause damage to equipment and reduce welding quality.

Meet the following requirements regarding shielding gas quality:

- Solid particle size < 40 µm
 - Pressure condensation point < -20 °C
 - Max. oil content < 25 mg/m³
-

Use filters if necessary.

Danger from Shielding Gas Cylinders

Shielding gas cylinders contain compressed gas and may explode if damaged. Shielding gas cylinders are an integral part of the welding equipment, so they must be handled very carefully.

Protect shielding gas cylinders with compressed gas from excessive heat, mechanical impact, slag, open flames, sparks, and arcs.

Mount the shielding gas cylinders vertically and secure them in accordance with instructions so they cannot fall over.

Keep shielding gas cylinders away from welding or other electrical circuits.

Never hang a welding torch on a shielding gas cylinder.

Never touch a shielding gas cylinder with an electrode.

Risk of explosion: Never weld on a compressed shielding gas cylinder.

Always use suitable shielding gas cylinders for the application in question and the correct matching accessories (controller, hoses, and fittings, etc.) Only use shielding gas cylinders and accessories that are in good condition.

If a valve on a shielding gas cylinder is open, turn your face away from the outlet.

When no welding is taking place, close the valve of the shielding gas cylinder.

Leave the cap on the valve of the shielding gas cylinder when the cylinder is not connected.

Follow the manufacturer's instructions and applicable national and international provisions for shielding gas cylinders and accessories.

Danger Posed by Shielding Gas Leak

Risk of asphyxiation due to uncontrolled shielding gas leak

Shielding gas is colorless and odorless and may suppress the oxygen in the ambient air in the event of leakage.

- Ensure there is a sufficient supply of fresh air with a ventilation flow rate of at least 20 m³ per hour.
- Please observe the safety and maintenance information for the shielding gas cylinder or the main gas supply.
- When no welding is taking place, close the valve of the shielding gas cylinder or the main gas supply.
- Always check the shielding gas cylinder or main gas supply for uncontrolled gas leakage before each start-up.

Safety Measures at the Setup Location and During Transport

A toppling device can be deadly! Set up the device securely on an even, solid surface

- The maximum permitted tilt angle is 10°.

Special regulations apply in areas at risk of fire or explosion

- Follow the appropriate national and international regulations.

Use instructions and checks within the company to ensure that the vicinity of the workplace is always clean and organized.

Only set up and operate the device in accordance with the protection class shown on the rating plate.

When setting up the device, ensure that there is an all-round clearance of 0.5 m (1 ft. 7.69 in.) to allow cooling air to circulate unhindered.

Take care to ensure that the applicable national and regional guidelines and accident prevention regulations are observed when transporting the device, especially guidelines concerning hazards during transport and shipment.

Do not lift or transport any active devices. Switch off devices before transport or lifting.

Before transporting the device, completely drain the coolant and dismantle the following components:

- wirefeeder
- wirespool
- shielding gas cylinder

It is essential to conduct a visual inspection of the device to check for damage after it has been transported but before commissioning. Have any damage repaired by trained service technicians before commissioning the device.

**Safety Measures
in Normal Operation**

Only operate the device when all safety devices are fully functional. If the safety devices are not fully functional, there is a danger of:

- Injury or death to the operator or a third party
- Damage to the device and other material assets belonging to the operating company
- Inefficient operation of the device

Safety devices that are not fully functional must be repaired before the device is switched on.

Never bypass or disable safety devices.

Before switching on the device, ensure that no one can be put in danger.

The device must be examined at least once a week for externally detectable damage and functionality of the safety devices.

Always secure the shielding gas cylinder well and remove before transporting by crane.

Only the original coolant from the manufacturer is suitable for use in our devices due to its properties (electrical conductivity, anti-freeze, material compatibility, flammability, etc.)

Only use appropriate original coolant from the manufacturer.

Do not mix original coolant from the manufacturer with other coolants.

Only connect system components from the manufacturer to the cooling unit circuit.

If there is damage due to use of other system components or other coolants, the manufacturer accepts no liability for this and all warranty claims are forfeited.

Cooling Liquid FCL 10/20 is not flammable. The ethanol-based coolant is flammable in certain conditions. Only transport the coolant in closed original containers and keep away from sources of ignition.

Properly dispose of used coolant according to national and international regulations. The coolant safety data sheet can be obtained from your service center or via the manufacturer's website.

When the system is cool, always check the coolant level before starting welding.

**Maintenance and
repair**

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made of them, or that they satisfy safety requirements.

- Use only original spare and wearing parts (also applies to standard parts).
- Do not carry out any modifications, alterations, etc. to the device without the manufacturer's consent.
- Components that are not in perfect condition must be replaced immediately.
- When ordering, please give the exact designation and part number as shown in the spare parts list, as well as the serial number of your device.

The housing screws provide the ground conductor connection for earthing the housing parts.

Only use original housing screws in the correct number and tightened to the specified torque.

Safety Inspection

The manufacturer recommends that a safety inspection of the device be performed at least every 12 months.

The manufacturer recommends calibrating power sources within the same 12-month interval.

A safety inspection by a certified electrician is recommended:

- After changes
- After alterations
- After repair, care, and maintenance
- At least every 12 months

For the safety inspection, follow the appropriate national and international standards and guidelines.

You can obtain more information about the safety inspection and calibration from your service center. The service center will provide the necessary documents upon request.

Disposal

Do not dispose of this device with normal domestic waste! To comply with the European Directive on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your dealer, or you must locate the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse effects on the environment and your health!

Data backup

The user is responsible for backing up any changes made to the factory settings. The manufacturer accepts no liability for any deleted personal settings.

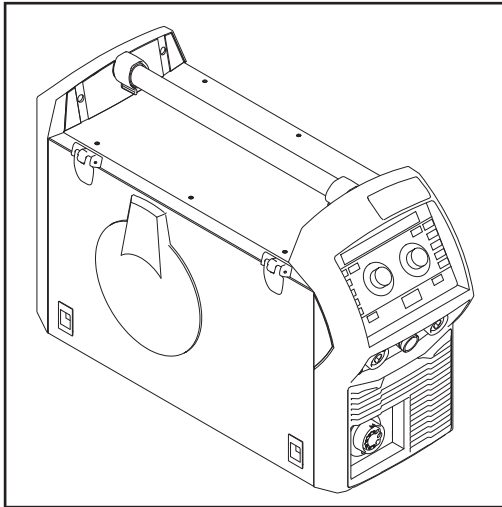
Copyright

Copyright of these Operating Instructions remains with the manufacturer.

Text and illustrations were accurate at the time of printing. Fronius reserves the right to make changes. The contents of the Operating Instructions shall not provide the basis for any claims whatsoever on the part of the purchaser. If you have any suggestions for improvement, or can point out any mistakes that you have found in the Operating Instructions, we will be most grateful for your comments.

General information

Device concept



The MIG/MAG VW AG/VAS 821 001/ MIG270i power source is a completely digitised, microprocessor-controlled inverter power source with integrated 4-roller wire drive.

The modular design and potential for system add-ons ensure a high degree of flexibility.

Its compact design makes the power source particularly suitable for mobile applications.

The power source can be adapted to any specific situation.

Functional principle

The central control and regulation unit of the power sources is coupled with a digital signal processor. The central control and regulation unit and the signal processor control the entire welding process.

During the welding process, the actual data is measured continuously and the device responds immediately to any changes. Control algorithms ensure that the desired target state is maintained.

This results in:

- a precise welding process
- exact reproducibility of all results
- excellent weld properties.









Application areas


The devices are used in trade and industry for manual applications with classical steel, galvanised sheets, chrome/nickel and aluminium.

The integrated 4-roller wire drive, high performance and low weight of the power source makes it the ideal choice for portable applications on building sites or in repair workshops.


Warning notices on the device

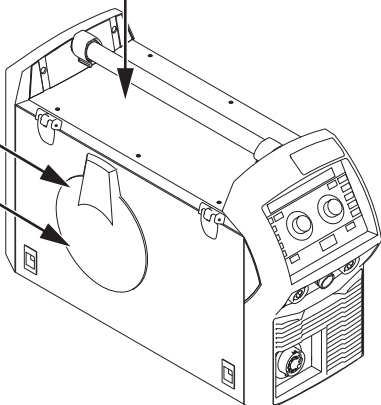
Warning notices and safety symbols are affixed to power sources with the CSA test mark for use in North America (USA and Canada). These warning notices and safety symbols must not be removed or painted over. They warn against incorrect operation, as this may result in serious injury and damage.

⚠ WARNING		 <p>ARC RAYS can burn eyes and skin; NOISE can damage hearing.</p> <ul style="list-style-type: none"> ● Wear welding helmet with correct filter. ● Wear correct eye, ear and body protection. 	Read American National Standard Z49.1, "Safety in Welding and Cutting" From American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126; OSHA Safety and Health Standards, 29 CFR 1910, from U.S. Government Printing Office, Washington, DC 20402. CSA, W117-2, M87 Code for Safety in Welding and Cutting. 42,0409,5074
Do not Remove, Destroy, Or Cover This Label			
 <p>ARC WELDING can be hazardous.</p> <ul style="list-style-type: none"> ● Read and follow all labels and the Owner's Manual carefully ● Only qualified persons are to install, operate, or service this unit according to all applicable codes and safety practices. ● Keep children away. ● Pacemaker wearers keep away. ● Welding wire and drive parts may be at welding voltage. 	 <p>EXPLODING PARTS can injure.</p> <ul style="list-style-type: none"> ● Failed parts can explode or cause other parts to explode when power is applied. ● Always wear a face shield and long sleeves when servicing. 		
 <p>ELECTRIC SHOCK can kill.</p> <ul style="list-style-type: none"> ● Always wear dry insulating gloves. ● Insulate yourself from work and ground. ● Do not touch live electrical parts. ● Disconnect input power before servicing. ● Keep all panels and covers securely in place. 	 <p>ELECTRIC SHOCK can kill; SIGNIFICANT DC VOLTAGE exists after removal of input power</p> <ul style="list-style-type: none"> ● Always wait 60 seconds after power is turned off before working on unit. ● Check input capacitor voltage, and be sure it is near 0 before touching parts. 		
 <p>FUMES AND GASES can be hazardous.</p> <ul style="list-style-type: none"> ● Keep your head out of the fumes. ● Ventilate area, or use breathing device. ● Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for materials used. 	⚠ AVERTISSEMENT		
 <p>WELDING can cause fire or explosion.</p> <ul style="list-style-type: none"> ● Do not weld near flammable material. ● Watch for fire: keep extinguisher nearby. ● Do not locate unit over combustible surfaces. ● Do not weld on closed containers. 	 <p>UN CHOC ELECTRIQUE peut etre mortel.</p> <ul style="list-style-type: none"> ● Installation et raccordement de cette machine doivent etre conformes a tous les pertinents. <p>SOUDAGE A L'ARC peut etre hasardeux.</p> <ul style="list-style-type: none"> ● Lire le manuel d' instructions avant utilisation. ● Ne pas installer sur une surface combustible. ● Les fils de soudage et pieces conductrices peuvent etre a la tension de soudage. 		



*)





*) on the inside of the device



Welding is dangerous. The following basic requirements must be met to ensure the equipment is used properly:

- Anyone performing automated welding must be sufficiently qualified
- Suitable protective equipment must be used
- All persons not involved must be kept at a safe distance from the wirefeeder and the welding process



Do not use the functions described here until you have fully read and understood the following documents:

- These Operating Instructions
- All the Operating Instructions for the system components, especially the safety rules



Do not dispose of used devices with domestic waste. Dispose of them according to the safety rules.



Keep hands, hair, clothing and tools away from moving parts. For example:

- Cogs
- Feed rollers
- Wirespools and welding wires

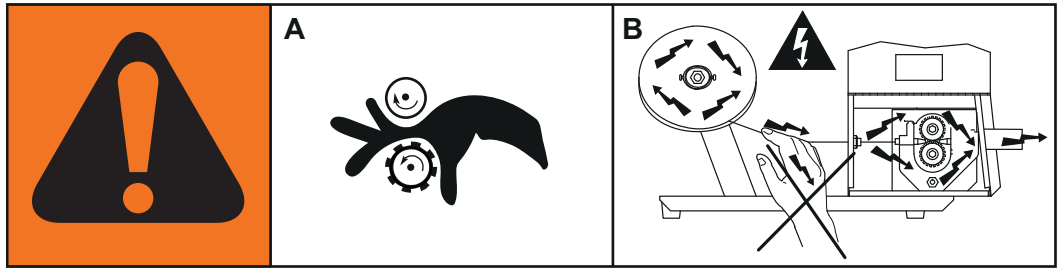
Do not reach into the rotating cogs of the wire drive or into rotating drive components.

Covers and side panels may only be opened / removed while maintenance or repair work is being carried out.

Description of Warning Notices on the Device

On certain device versions, warning notices are attached to the device.

The arrangement of the symbols may vary.

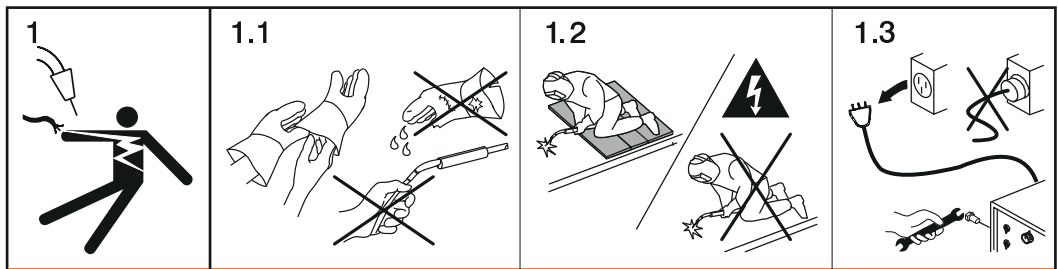


Warning! Watch Out!

There are possible hazards as shown by the symbols.

A Drive rolls can injure fingers.

B Welding wire and drive parts are at welding voltage during operation
Keep hands and metal objects away.

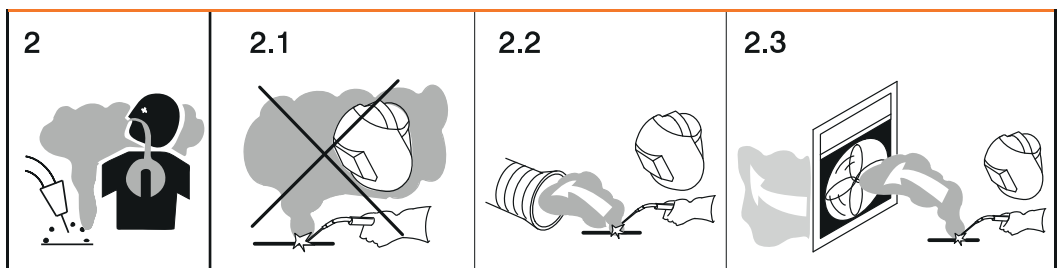


1. Electric shock can kill.

1.1 Wear dry insulating gloves. Do not touch electrode with bare hand. Do not wear wet or damaged gloves.

1.2 Protect yourself from electric shock by insulating yourself from work and ground.

1.3 Disconnect input plug or power before working on machine

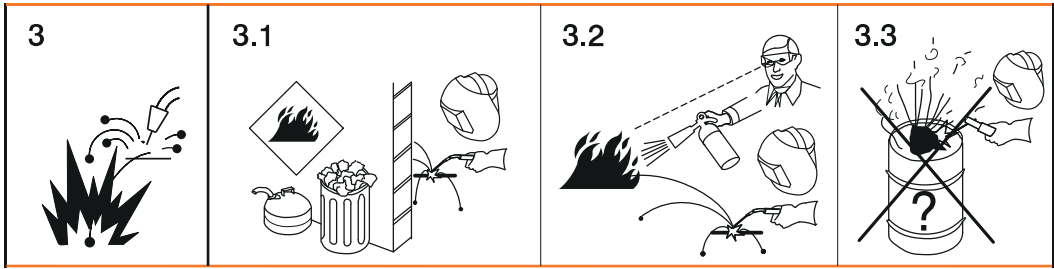


2. Breathing welding fumes can be hazardous to your health.

2.1 Keep your head out of the fumes.

2.2 Use forced ventilation or local exhaust to remove the fumes.

2.3 Use ventilating fan to remove fumes.

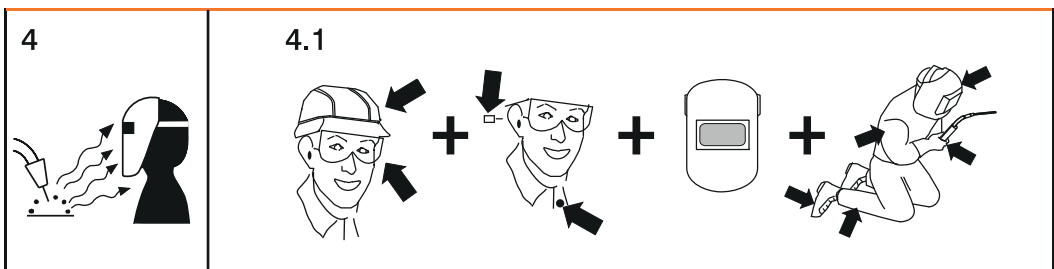


3 Welding sparks can cause explosion or fire.

3.1 Keep flammables away from welding. Don't weld near flammables.

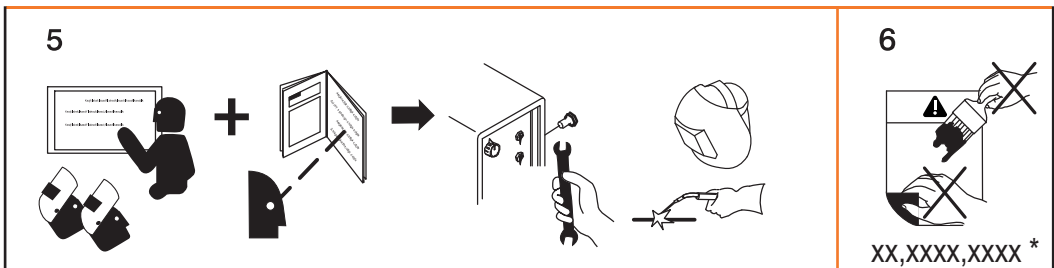
3.2 Welding sparks can cause fires. Have a fire extinguisher nearby and have a watchperson ready to use it.

3.3 Do not weld on drums or any closed containers.



4. Arc rays can burn eyes and injure skin.

4.1 Wear hat and safety glasses. Use ear protection and button shirt collar. Use welding helmet with correct shade of filter. Wear complete body protection.



5. Become trained and read the instructions before working on the machine or welding.

6. Do not remove or paint over (cover) the label.

* identifying number to order label from manufacturer

Welding packages, welding characteristics and welding processes

General

Various welding packages, welding characteristics and welding processes are available with power sources that enable a wide range of materials to be effectively welded.

Welding characteristics

Depending on the welding process and shielding gas mix, various process-optimised welding characteristics are available when selecting the filler metal.

Examples of welding characteristics:

- MIG/MAG 3700 PMC Steel 1,0mm M21 - arc blow *
- MIG/MAG 3450 PMC Steel 1,0mm M21 - dynamic *
- MIG/MAG 3044 Pulse AlMg5 1.2 mm I1 - universal *
- MIG/MAG 2684 Standard Steel 0.9 mm M22 - root *

The additional designation (*) next to the welding process provides information about the special properties and use of the welding characteristic.

The description of the characteristics is set out as follows:

Marking

Welding process

Properties

arc blow

PMC

Characteristic with improved arc break properties by deflecting the external magnetic fields

braze

CMT, LSC, PMC

Characteristics for brazing processes (high brazing speed, reliable wetting and good flow of braze material)

braze+

CMT

Optimised characteristics for brazing processes with special "Braze+" gas nozzle (narrow gas nozzle opening, high shielding gas flow rate)

cladding

CMT, LSC, PMC

Characteristic for cladding with low penetration, low dilution and wide weld seam flow for improved wetting

dynamic

CMT, PMC, Pulse, Standard

Characteristics for high welding speeds with concentrated arc

flanged edge

CMT

Characteristics for flange welds with frequency and energy yield adjustments; the edge is fully covered with the weld seam but not melted down

galvanized

CMT, LSC, PMC, Pulse, Standard

Characteristics for galvanised sheet surfaces (low zinc pore risk, reduced zinc melting loss)

galvannealed

PMC

Characteristics for iron-zinc coated sheet surfaces

gap-bridging

CMT, PMC

Characteristics with very low heat input for optimum gap-bridging ability

hot spot

CMT

Characteristics with hot start sequence, specifically for plug welds and MIG/MAG spot weld joints

mix **

PMC

also required: Pulse and PMC welding packages

Characteristics with process switch between pulsed and dip transfer arc
Specially for welding vertical-up seams with cyclic change between a hot and cold supporting process phase.

mix ** / ***

CMT

also required: CMT drive unit WF 60i Robacta Drive CMT, Pulse, Standard and CMT welding packages

Characteristics with process switch between pulsed and CMT, where the CMT process is initiated by wire movement reversal.

mix drive ***

PMC

also required: PushPull drive unit WF 25i Robacta Drive or WF 60i Robacta Drive CMT, Pulse and PMC welding packages

Characteristics with process switch between pulsed and dip transfer arc, where the dip transfer arc is initiated by wire movement reversal.

multi arc

PMC

Characteristics for components being welded by several arcs each influencing the other

PCS **

PMC

Pulse Controlled Sprayarc - Direct transition from the concentrated pulsed arc to a short spray arc. The advantages of pulsed and standard arcs combined in a single characteristic

pipe

PMC

Characteristic for pipe applications and positional welding on narrow gap applications

retroCMT, Pulse, PMC, Standard
older characteristics**ripple drive *****

PMC

also required:
CMT drive unit WF 60i Robacta Drive CMT

Characteristics that behave like interval mode for clear weld rippling, especially with aluminium

root

CMT, LSC, Standard

Characteristics for root passes with powerful arc

seam track

PMC, Pulse

Characteristics with increased seam tracking signal, especially for use with several welding torches on one component.

TIME

PMC

Characteristics for welding with long stick out and TIME shielding gases (T.I.M.E. = Transferred Ionized Molten Energy)

universal

CMT, PMC, Pulse, Standard

Characteristics for conventional welding tasks

WAAM

CMT

Characteristics with reduced heat input and greater stability at a higher deposition rate for welding bead onto bead in adaptive structures

weld+

CMT

Characteristics for welding with short Stick out and Braze+ gas nozzle (Gas nozzle with small opening and high flow velocity)

** Mixed process characteristics

*** Welding characteristics with special properties provided by additional hardware

**Summary of
MIG/MAG pulse
synergic welding**

MIG/MAG pulse synergic

MIG/MAG pulse synergic welding is a pulsed-arc process with controlled material transfer.

In the base current phase, the energy supply is reduced to such an extent that the arc is only just stable and the surface of the workpiece is preheated. In the pulsing current phase, a precise current pulse ensures the targeted detachment of a droplet of welding material.

This principle guarantees a low-spatter weld and precise working across the entire power range, as unwelcome short circuits with simultaneous droplet explosion and uncontrolled welding spatter are virtually eliminated.

**Summary of
MIG/MAG stand-
ard synergic
welding**

MIG/MAG standard synergic

The MIG/MAG standard synergic welding process is a MIG/MAG welding process across the entire power range of the power source with the following arc types:

Short circuit arc

Droplet transfer takes place during a short circuit in the lower power range.

Intermediate arc

The droplet increases in size on the end of the wire electrode and is transferred in the mid-power range during the short circuit.

Spray arc
A short circuit-free transfer of material in the high power range.

**Summary of the
PMC process**

PMC = Pulse Multi Control

PMC is a pulsed arc welding process with high-speed data processing, precise recording of the process status and improved droplet detachment. Faster welding possible with a stable arc and even fusion penetration.

**Summary of the
LSC process**

LSC = Low Spatter Control

LSC is a new, low-spatter dip transfer arc process. The current is reduced before breaking the short-circuit bridge; re-ignition takes place at significantly lower welding current values.

**Summary of Syn-
chroPulse weld-
ing**

SynchroPulse is available for all processes (standard/pulsed/LSC/PMC). Due to the cyclical change of welding power between two operating points, SynchroPulse achieves a flaking seam appearance and non-continuous heat input.

Summary of the CMT process

CMT = Cold Metal Transfer

A special CMT drive unit is required for the CMT process.

The reversing wire movement in the CMT process results in a droplet detachment with improved dip transfer arc properties.

The advantages of the CMT process are as follows

- Low heat input
- Less spattering
- Reduced emissions
- High process stability

The CMT process is suitable for:

- Joint welding, cladding and brazing – particularly in the case of high requirements in terms of heat input and process stability
- Welding on light-gauge sheet with minimal distortion
- Special connections, such as copper, zinc, and steel/aluminium

NOTE!

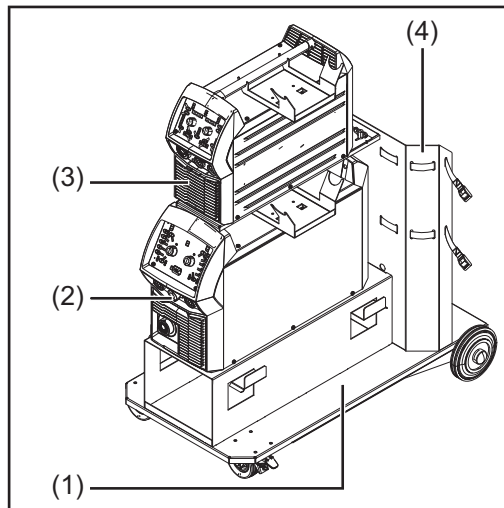
A CMT reference book is available complete with typical applications; see ISBN 978-3-8111-6879-4.

System components

General

The power sources can be operated with various system components and options. This makes it possible to optimise procedures and to simplify machine handling and operation, as necessitated by the particular field of application in which the power source is to be used.

Overview



- (1) Trolley
- (2) Power source VW AG/VAS 821 001/MIG270i
- (3) Power source VW AG/VAS 821 001/MIG220
- (4) Gas cylinder holder

also:

- Welding torch
- Grounding cable and electrode cable

Operating controls, connections and mechanical components

Control Panel

General

Welding parameters can be easily changed and selected using the adjusting dial. The parameters are shown on the display while welding is in progress.

The synergic function ensures that other welding parameters are also adjusted whenever an individual parameter is changed.

NOTE!

As a result of firmware updates, you may find that your device has certain functions that are not described in these operating instructions, or vice versa.

Certain illustrations may also differ slightly from the actual controls on your device, but these controls function in exactly the same way.

Safety

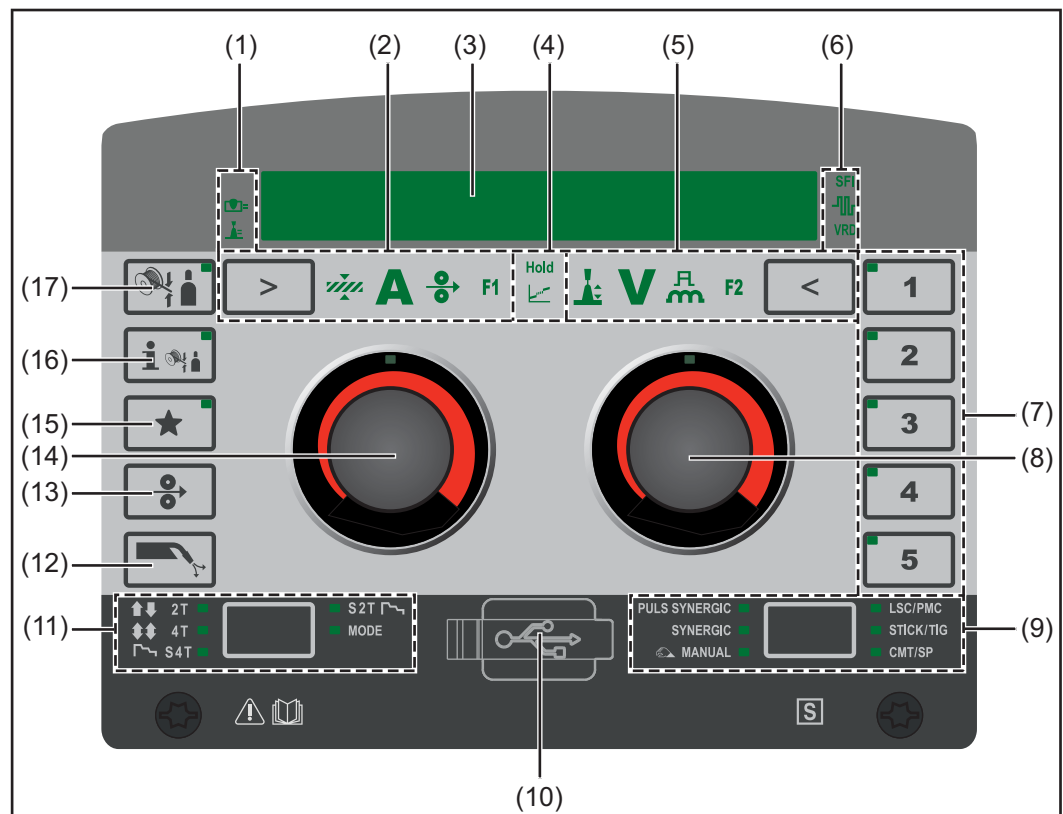
⚠ WARNING!

Danger due to incorrect operation.

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the Operating Instructions.
- ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

Control panel



No.	Function
-----	----------

- (1) **Process control parameter indicator**
For the LSC and PMC welding processes



Penetration stabilizer indicator

Lights up if the penetration stabilizer is active



Arc length stabilizer indicator

Lights up when the arc length stabilizer is active

- (2) **Left parameter selection**



The corresponding indicator lights up when a parameter is selected.
The following parameters can be selected by pressing the button:



Material thickness *

In mm or inches



Welding current *

In A

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.



Wire speed *

In m/min or ipm

F1

Special function

Any parameter can be assigned to this

The function can be selected if a parameter has been saved.



Penetration stabilizer



Arc length stabilizer

The "Penetration stabilizer" and "Arc length stabilizer" process control parameters can only be selected when the LSC/PMC welding process is used.

The currently adjustable parameter is marked with an arrow.

* Synergic parameter When a synergic parameter is changed, the synergic function automatically changes all other synergic parameters to match.

(3) Display

For displaying values

(4) Hold/Intermediate arc indicator

Hold

Hold indicator

The indicator lights up at the end of each welding operation and the actual values for the welding current, welding voltage and wire speed, etc. are automatically shown on the display.



Intermediate arc indicator

The indicator lights up when a spatter-prone intermediate arc occurs between the dip transfer arc and the spray arc.

(5) Right parameter selection



The corresponding indicator lights up when a parameter is selected. The following parameters can be selected by pressing the button:



Arc length correction

For correcting the arc length



Welding voltage *

In V

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.



Pulse/dynamic correction

The function varies according to the welding process being used. A description of the various functions can be found in the Welding chapter under the corresponding welding process.

F2

Special function

Any parameter can be assigned to this

The function can be selected if a parameter has been saved.

* Synergic parameter

When a synergic parameter is changed, the synergic function automatically changes all other synergic parameters to match.

(6) Indicators

SFI

SFI indicator

Lights up when SFI (Spatter Free Ignition) is active



SynchroPulse indicator

Lights up when SynchroPulse is active

VRD

VRD indicator

Lights up when the voltage reduction device (VRD) is active

(7) EasyJob buttons

For saving, retrieving and deleting EasyJobs

The LED on the corresponding button lights up when an EasyJob is selected.

(8) Right adjusting dial with turn/press function

For setting the arc length correction, welding voltage, pulse/dynamic correction and F2 parameters

Turn the adjusting dial to:

change values, select parameters (in the Setup menu and when selecting the filler metal)


Press the adjusting dial to:

confirm a menu selection, apply values

(9) Welding process selection

The corresponding LED lights up when a welding process is selected.

The following welding processes can be selected by pressing the button:

- PULS SYNERGIC (MIG/MAG pulse synergic welding)
- SYNERGIC (MIG/MAG standard synergic welding)
-  MANUAL (MIG/MAG standard manual welding)
- LSC/PMC (LSC = Low Spatter Control, PMC = Pulse Multi Control)
Depending on which function package is enabled
- STICK/TIG (MMA welding/TIG welding)
- CMT / SP (CMT welding / special programs)





(10) USB port

For updating the software using a USB Ethernet adapter

(11) Mode selection

The corresponding LED lights up when a mode is selected.

The following modes can be selected by pressing the button:

-  2T (2-step mode)
-  4T (4-step mode)
-  S4T (Special 4-step mode)
- S2T  (Special 2-step mode)
- MODE (Special modes depending on the function package)

(12) Gas-test button

For setting the required gas flow rate on the gas pressure regulator.

After pressing this button, gas flows for 30 seconds. Press the button again to stop the gas flow prematurely.

(13) Wire threading button

To thread the wire electrode into the torch hosepack with no accompanying flow of gas or current

(14) Left adjusting dial with turn/press function

- For setting the sheet thickness, welding current, wire speed, F1, penetration stabilizer and arc length stabilizer parameters
- For displaying help texts

Turn the adjusting dial to:

select parameters, change values, display long help texts

Press the adjusting dial to:

confirm a menu selection, apply values, call up help texts for parameters

(15) Favourites button

Individual parameters or parent folders can be assigned to it

(16) Filler metal info button

For showing the currently set filler metal

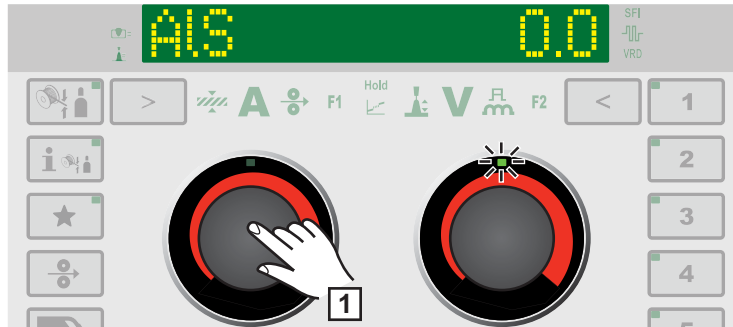
(17) Filler metal selection button

For selecting the filler metal

Displaying plain text for parameters

The left adjusting dial can be used to display the corresponding plain text for each parameter abbreviation shown on the display.

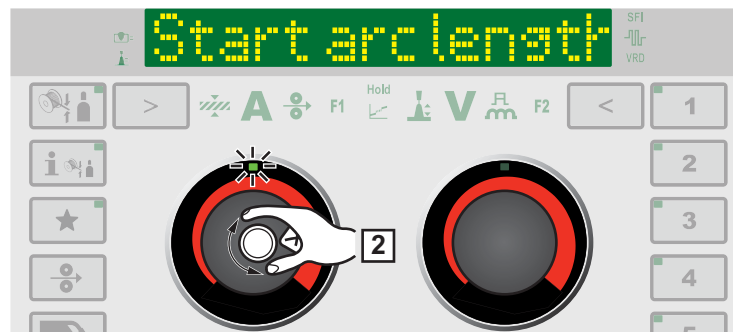
Example:



Parameter or entry from the Setup menu has been selected using the right adjusting dial; the LED on the right adjusting dial lights up.

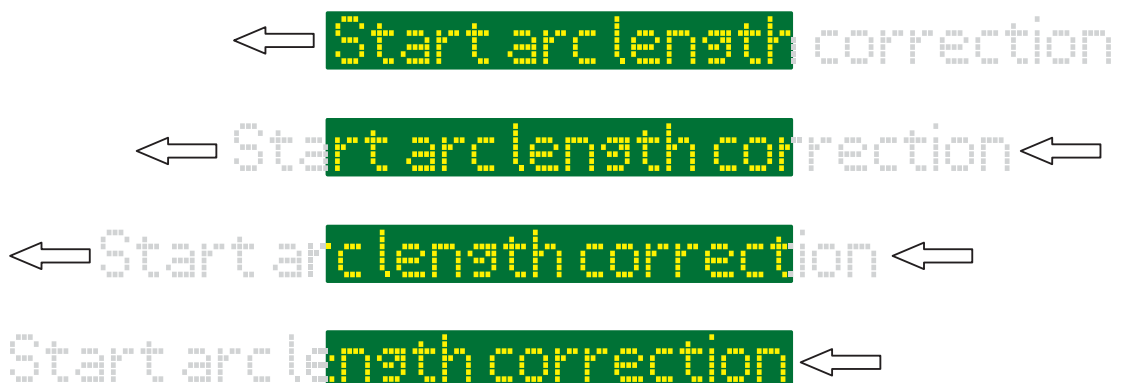
1 Press the left adjusting dial

The plain text for the parameter is displayed; the LED on the left adjusting dial lights up.



2 To display extended plain texts, turn the left adjusting dial

The plain text is moved across the display.

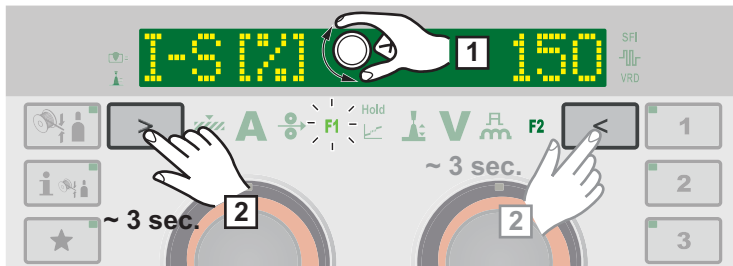


3 To make another selection, turn the right adjusting dial

F1/F2 special function parameters, Favourites button

F1 and F2 special function parameters

Setting F1 and F2 special function parameters



Example: the selected parameter I-S is assigned to F1

- 1 Select the desired parameter in the Setup menu

Further information on the Setup menu can be found from page 89

- 2 To assign the selected parameter to F1 or F2, press the parameter selection button for approx. 3 seconds:
 F1 ... left parameter selection
 F2 ... right parameter selection

F1/F2 flashes while the parameter selection button is pressed.

As soon as the parameter is saved, the indicator for the corresponding special function parameter lights up.

F1 (for example) and a tick is shown next to the parameter:



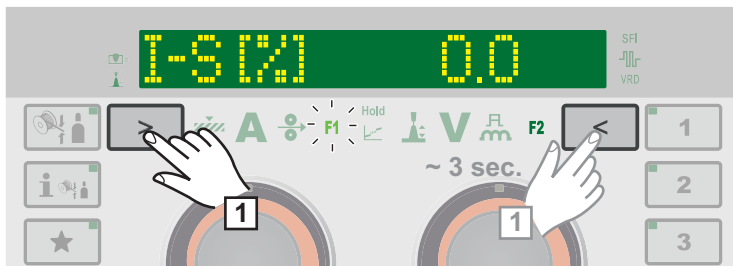
The selected parameter is now stored under F1.

If a parameter cannot be assigned to the F1 or F2 special function parameters, after approx. 5 seconds F1 (for example) and X is displayed:



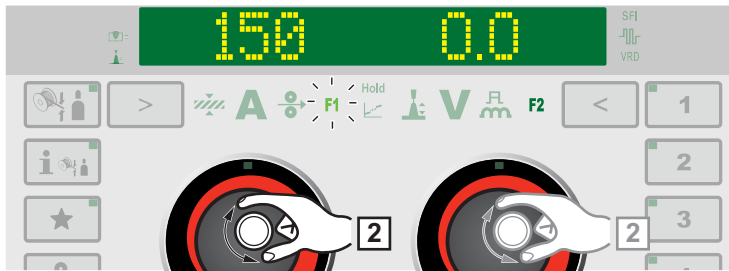
This deletes an existing stored parameter.

Retrieving F1 and F2 special function parameters



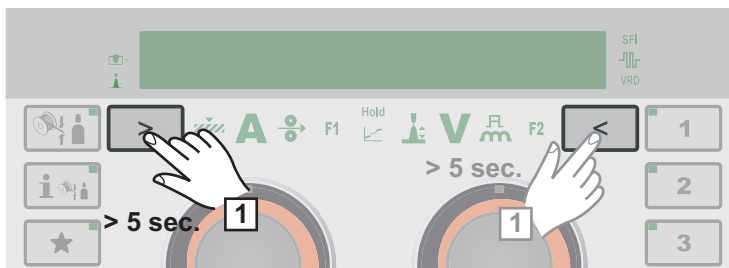
- 1 Press the parameter selection button until F1 or F2 lights up:
 F1 ... left parameter selection
 F2 ... right parameter selection

The stored parameter is shown first, then the currently set value of the parameter.



- 2 Change the value of the parameter by turning the adjusting dial:
 F1 ... left adjusting dial
 F2 ... right adjusting dial

Deleting F1 and F2 special function parameters



- 1 Press the parameter selection button for at least 5 seconds:
 F1 ... left parameter selection
 F2 ... right parameter selection

The stored parameter is deleted, F1 (for example) and X is shown on the display:

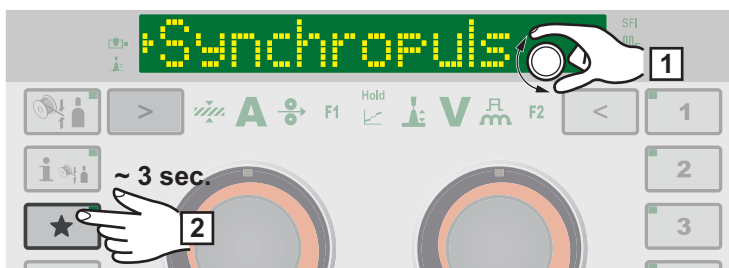


The F1 and F2 special function parameters can also be set in the Setup menu (page [112](#)).

The Favourites button

Assigning the Favourites button

Individual parameters or parent folders from the Setup menu can be assigned to the Favourites button. These parameters or parent folders can then be called up directly using the control panel.



Example: The selected SynchroPulse folder is assigned to the Favourites button

- 1 Select the desired parameter or the desired parent folder in the Setup menu

Further information on the Setup menu can be found from page 89

- 2 To assign the selected parameter or folder to the Favourites button, press the Favourites button for approx. 3 seconds

Next to the parameter or folder ★ and a tick are shown:

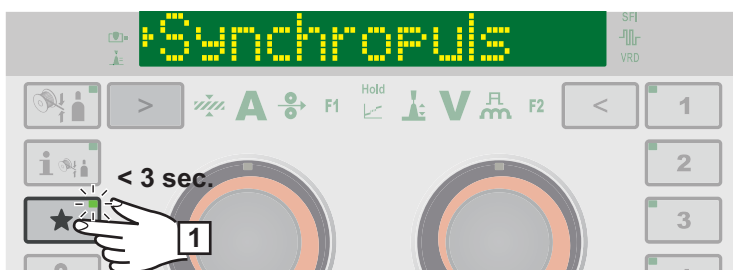


The selected parameter or folder is now assigned to the Favourites button.

Retrieving favourites

Parameters or folders stored under the Favourites button can be retrieved in any setting, except for when the Setup menu is active.

Ongoing selection processes or called up jobs are cancelled when favourites are retrieved.



- 1 Briefly press the "Favourites" button (< 3 seconds)

The LED on the Favourites button lights up and the stored parameter or folder is shown on the display.

- 2 To end retrieval of the favourite, briefly press the Favourites button again (< 3 seconds)

The LED on the Favourites button goes out and the display switches to the welding parameters.

Deleting favourites



- 1 Press the Favourites button for at least 5 seconds:

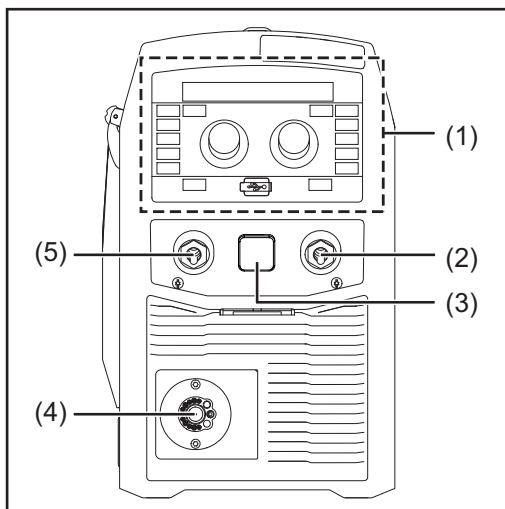
The stored parameter or folder is deleted and ★ and X are shown on the display:



The Favourites button can also be assigned in the Setup menu (page [113](#)).

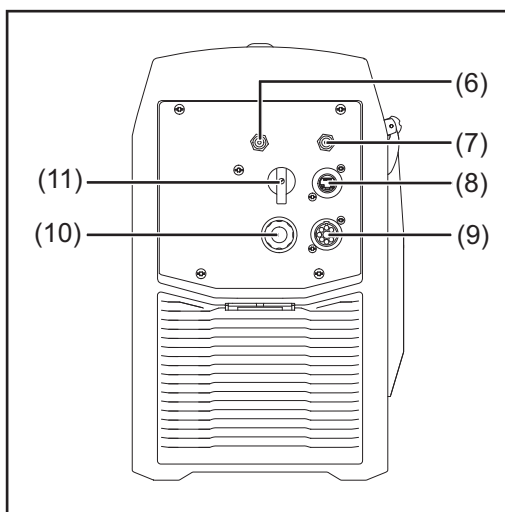
Connections, Switches, and Mechanical Components

Connections, switches and mechanical components



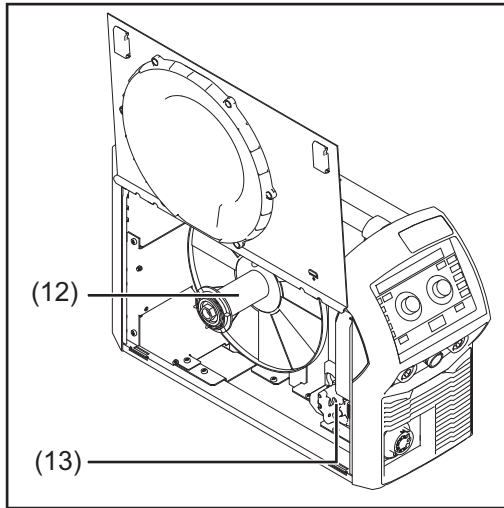
Front

No.	Function
(1)	Control panel with display for operating the power source
(2)	(+) current socket with bayonet latch
(3)	Blanking cover reserved for the TMC connection socket of the TIG option
(4)	Welding torch connection for connecting the welding torch
(5)	(-) current socket with bayonet latch used to connect the grounding cable during MIG/MAG welding



Rear

No.	Function
(6)	MIG/MAG shielding gas connection socket
(7)	Blanking cover/TIG shielding gas connection socket (option)
(8)	Blanking cover/Ethernet connection socket (option)
(9)	Blanking cover/SpeedNet Connector connection socket (option)/external sensor (option)
(10)	Mains cable with strain relief device
(11)	Mains switch for switching the power source on and off



Side view

No.	Function
(12)	Wire spool holder with brake for holding standard wire spools weighing up to 19 kg (41.89 lb.) and with a max. diameter of 300 mm (11.81 in)
(13)	4 roller drive

Installation and Startup

Minimum equipment for welding operations

General

Depending on the welding process, a minimum level of equipment is required to work with the power source.

The following describes the welding processes and the corresponding minimum equipment for welding operations.

MIG/MAG gas-cooled welding

- Power source
 - Grounding (earthing) cable
 - MIG/MAG welding torch, gas-cooled
 - Shielding gas supply
 - Wire electrode
-

Manual CMT welding

- Power source
 - Standard, Pulse and CMT welding packages enabled on the power source
 - Grounding cable
 - PullMig CMT welding torch incl. CMT drive unit and CMT wire buffer
 - OPT/i PushPull
 - CMT interconnecting hosepack
 - Wire electrode
 - Gas connection (shielding gas supply)
-

TIG DC welding

- Power source
 - Grounding (earthing) cable
 - TIG gas-valve torch
 - Gas connection (shielding gas supply)
 - Filler metal (depending on the application)
-

MMA welding

- Power source
- Grounding (earthing) cable
- Electrode holder with welding cable
- Rod electrodes

Before installation and initial operation

Safety



WARNING!

Danger due to incorrect operation.

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the Operating Instructions.
 - ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.
-

Intended Use

The power source is only intended for MIG/MAG, MMA and TIG welding. Any other use is deemed to be "not in accordance with the intended purpose." The manufacturer shall not be liable for any damage resulting from such improper use.

Intended use also means:

- Following all instructions in the Operating Instructions
 - Carrying out all the specified inspection and maintenance work
-

Setup regulations

The device has been tested according to degree of protection IP23. This means:

- Protection against solid foreign bodies larger than \varnothing 12.5 mm (0.49 in.)
- Protection against spraywater at any angle up to 60° from the vertical

The device can be set up and operated outdoors in accordance with protection class IP23. Direct moisture (e.g. from rain) must be avoided.



WARNING!

Toppling or falling devices can be deadly.

- ▶ Set up devices, upright brackets and trolleys so that they are stable on a flat and solid surface.
-

The ventilation channel is a very important safety device. When selecting the setup location, ensure that the cooling air can enter or exit unhindered through the vents on the front and back. Any electrically conductive dust (e.g. from grinding work) must not be allowed to be sucked directly into the system.

Mains connection

- The devices are designed for the mains voltage specified on the rating plate.
- Devices with a nominal voltage of 3 x 575 V must be operated on three-phase systems with earthed star point.
- If your version of the appliance does not come with mains cables and mains plugs ready-fitted, these must be fitted by a qualified person in accordance with national standards.
- The fuse protection for the mains lead is indicated in the technical data.

⚠ CAUTION!

An inadequately dimensioned electrical installation can cause serious damage.

- ▶ The mains lead and its fuse protection must be dimensioned to suit the local power supply.
The technical data shown on the rating plate applies.

Generator-Powered Operation

The power source is generator-compatible.

The maximum apparent power $S_{1\max}$ of the power source must be known in order to select the correct generator output.

The maximum apparent power $S_{1\max}$ of the power source is calculated as follows:

Three-phase devices: $S_{1\max} = I_{1\max} \times U_1 \times \sqrt{3}$

Single-phase devices: $S_{1\max} = I_{1\max} \times U_1$

$I_{1\max}$ and U_1 according to the device rating plate and technical data

The generator apparent power S_{GEN} needed is calculated using the following rule of thumb:

$$S_{\text{GEN}} = S_{1\max} \times 1.35$$

A smaller generator can be used when not welding at full power.

IMPORTANT! The generator apparent power S_{GEN} must not be less than the maximum apparent power $S_{1\max}$ of the power source!

When single phase devices are being operated with a 3-phase generator, note that the stated apparent power of the generator is often just the total that can be present across all three phases of the generator. If necessary, obtain further information about the single-phase power of the generator from the generator manufacturer.

NOTE!

The voltage delivered by the generator must never fall outside of the mains voltage tolerance range.

The mains voltage tolerance is specified in the "Technical Data" section.

Information on system components

The steps and activities described below include references to various system components, including:

- Trolley
- Welding torch
- etc.

For more detailed information about installing and connecting the system components, please refer to the appropriate operating instructions.

Connecting the Mains Cable

Safety



WARNING!

Danger from work that is not carried out properly.

This can result in severe personal injury and damage to property.

- ▶ The work described below may only be performed by trained specialist personnel.
- ▶ Follow national standards and guidelines.



CAUTION!

Danger from improperly prepared mains cable.

Short circuits and damage to property may result.

- ▶ Fit ferrules to all phase conductors and the ground conductor of the stripped mains cable.

General

A mains cable that is suitable for the connection voltage must be connected to the MV power source before commissioning.

A strain-relief device for cables with an outer diameter of 14 - 18.5 mm is fitted to the MV power source.

Strain-relief devices for other cable cross-sections must be designed accordingly.

Stipulated mains cables

Mains voltage	Cable cross-section	
	USA / Canada *	Europe
3 x 200 V 3 x 230 V	AWG 12	4G 2.5 mm ²
3 x 380 V 3 x 400 V 3 x 460 V	AWG 14	4G 2.5 mm ²

* Cable type for USA / Canada: Extra-hard usage

AWG = American wire gauge

Connecting the mains cable - general



CAUTION!

Risk of injury and damage from short circuits.

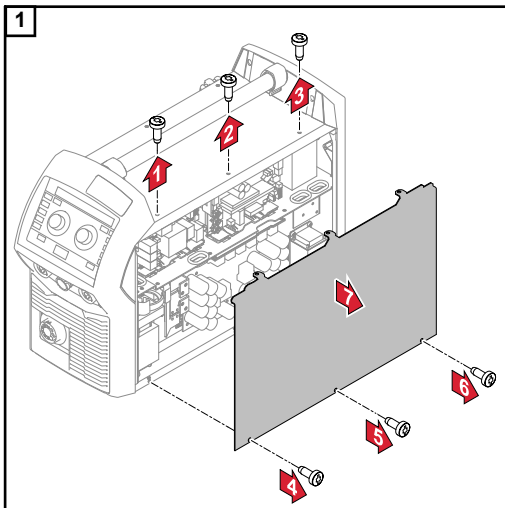
Short circuits can occur between the phase conductors or between the phase conductors and the ground conductor unless ferrules are used.

- ▶ Strip the insulation of the mains cable and fit ferrules to all phase conductors, as well as the ground conductor.

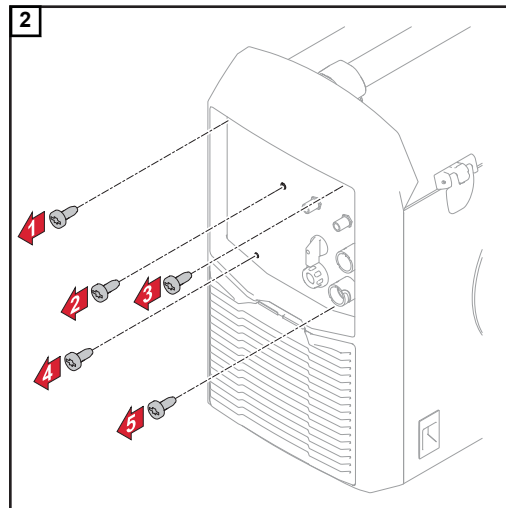
NOTE!

Mains cables must be connected to devices in compliance with national standards and guidelines and the work must be carried out by suitably qualified personnel!

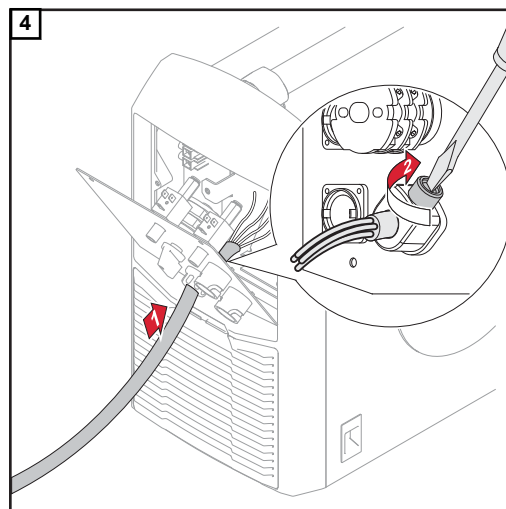
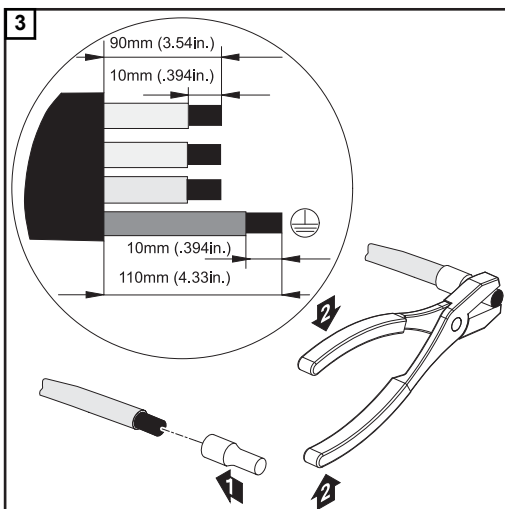
IMPORTANT! The ground conductor should be approx. 20 - 25 mm (0.8 - 1 in.) longer than the phase conductors.



6 x TX25



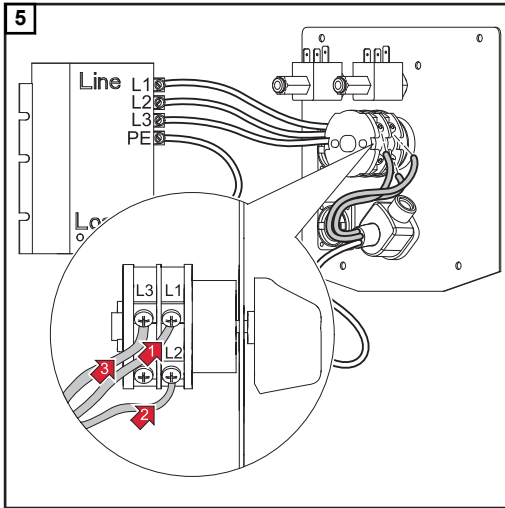
5 x TX25



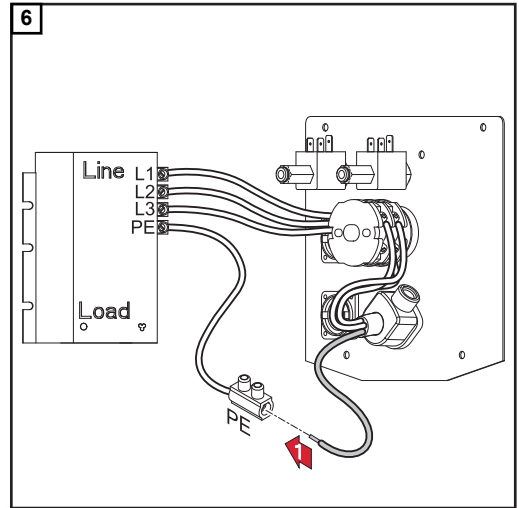
Tightening torque = 1.2 Nm

IMPORTANT! When connecting the cable to the switch, ensure:

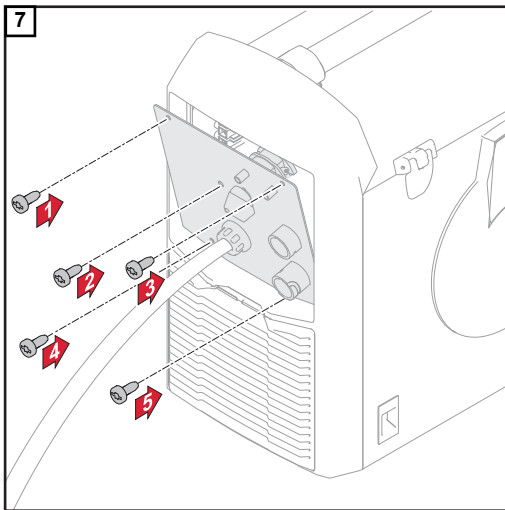
- To route the conductors near to the switch
- Not to make the conductors unnecessarily long
- To fit the protective hose supplied over the cable and insert the covered cable into the strain-relief device if cable diameters are small



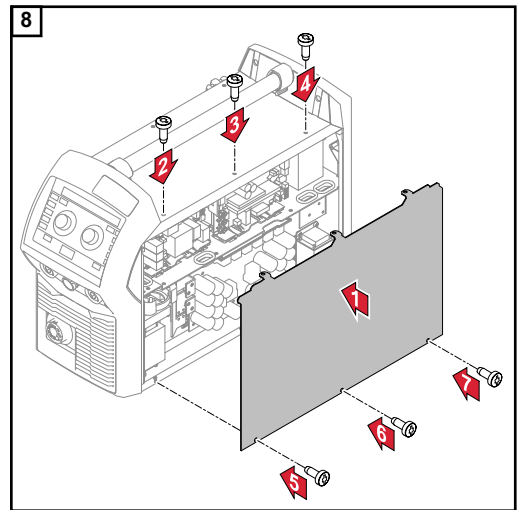
Tightening torque = 1.2 Nm



Tightening torque = 1.2 Nm



5 x TX25, tightening torque = 3 Nm



6 x TX25, tightening torque = 3 Nm

Commissioning

Safety

WARNING!

An electric shock can be fatal.

If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

- ▶ Only carry out work on the device when the power source's power switch is in the - O - position.
- ▶ Only carry out work on the device when the power source has been disconnected from the grid.

WARNING!

Danger of electrical current due to electrically conductive dust in the device.

This can result in severe personal injury and damage to property.

- ▶ Only operate the device if an air filter is fitted. The air filter is a very important safety device for achieving IP 23 protection.

General

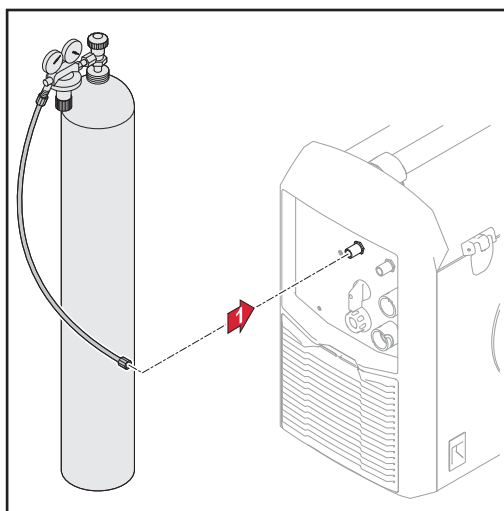
Commissioning the power source is described with reference to a manual gas-cooled MIG/MAG application.

Connecting the gas cylinder

WARNING!

There is a high risk of very serious injury and damage if a gas cylinder falls over.

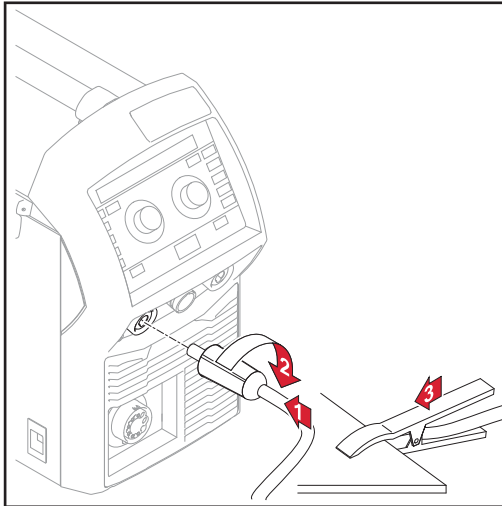
- ▶ Place them on a solid, level surface in such a way that they remain stable
- ▶ Secure the gas cylinders to prevent them from falling over
- ▶ Observe the safety rules of the gas cylinder manufacturer



Connecting the gas hose

- 1 Place the gas cylinder on a solid, level surface in such a way that it remains stable
- 2 Secure the gas cylinder to prevent it from toppling over (but not around the neck of the cylinder)
- 3 Take the protective cap off the gas cylinder
- 4 Briefly open the gas cylinder valve to remove any dust or dirt
- 5 Inspect the seal on the gas pressure regulator
- 6 Screw the pressure regulator onto the gas cylinder and tighten it
- 7 Connect the pressure regulator to the shielding gas connection on the power source using the gas hose

Establishing a ground earth connection



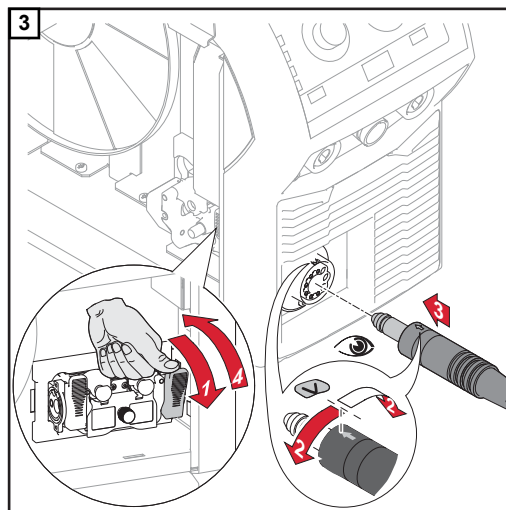
Connecting the grounding cable

- 1 Plug the grounding cable into the (-) current socket
- 2 Lock the grounding cable in place
- 3 Use the other end of the grounding cable to establish a connection to the workpiece

Connecting the welding torch

- 1 Before connecting the welding torch, check that all cables, lines and hosepacks are undamaged and properly insulated.

- 2 Open the wire-feed unit cover



Inserting/replacing feed rollers

In order to achieve optimum wire electrode feed, the feed rollers must be suitable for the diameter and alloy of the wire being welded.

NOTE!

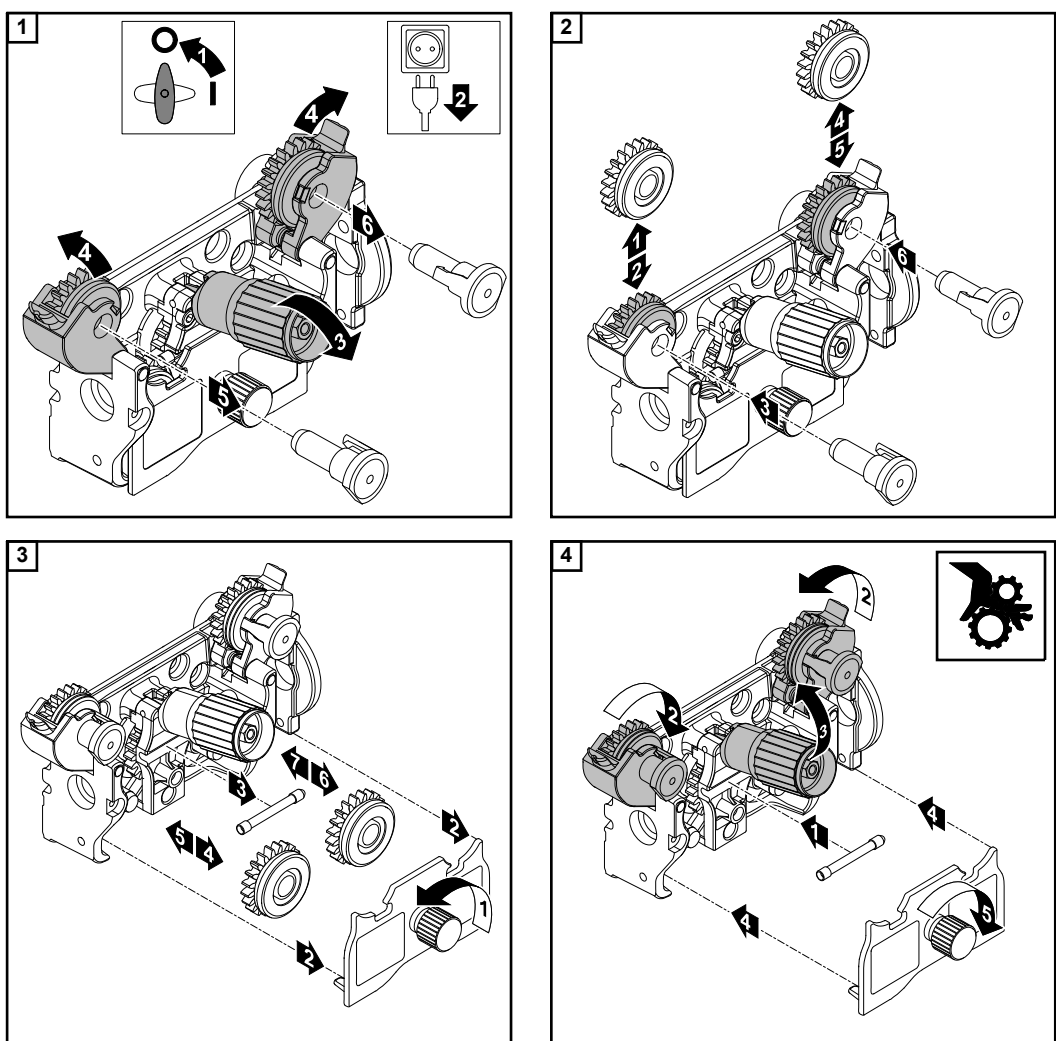
Only use feed rollers that are suitable for the wire electrode.

An overview of the feed rollers available and their possible areas of use can be found in the spare parts lists.

⚠ CAUTION!

Risk of injury if the feed roller holders fly upwards.

- ▶ When unlocking the lever, keep fingers away from the area to the left and right of the lever.



Inserting the wirespool

CAUTION!

Risk of injury due to springiness of spooled wire electrode.

- ▶ While inserting the wirespool, hold the end of the wire electrode firmly to avoid injuries caused by the wire springing back.

CAUTION!

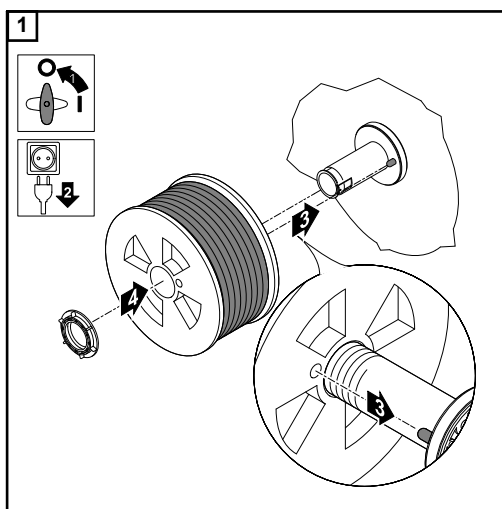
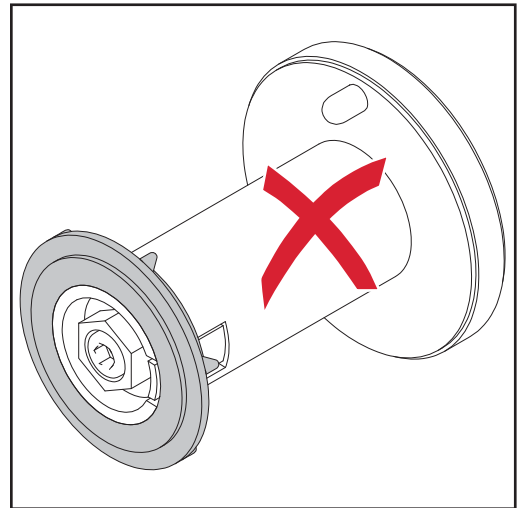
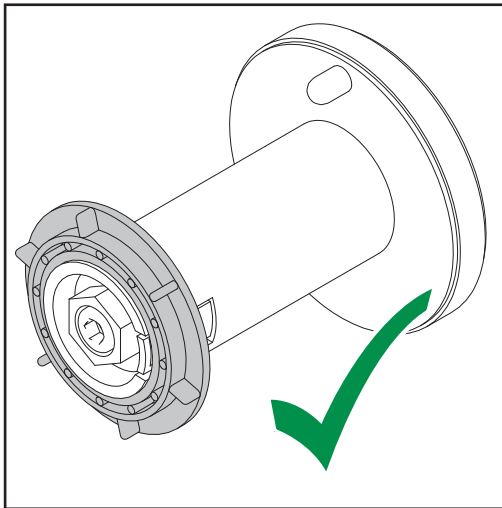
Risk of injury from falling wirespool.

- ▶ Make sure that the wirespool is fitted securely to the wirespool holder.

CAUTION!

Risk of injury and impaired performance if the wirespool topples over because the locking ring has been placed the wrong way round.

- ▶ Always position the locking ring as shown in the diagram on the left.



Inserting the basket-type spool

CAUTION!

Risk of injury due to springiness of spooled wire electrode.

- ▶ While inserting the basket-type spool, hold the end of the wire electrode firmly to avoid injuries caused by the wire springing back.

CAUTION!

Risk of injury from falling basket-type spool.

- ▶ Make sure that the basket-type spool and basket-type spool adapter are fitted securely to the wirepool holder.

NOTE!

When working with basket-type spools, only use the basket-type spool adapter included in the scope of supply.

CAUTION!

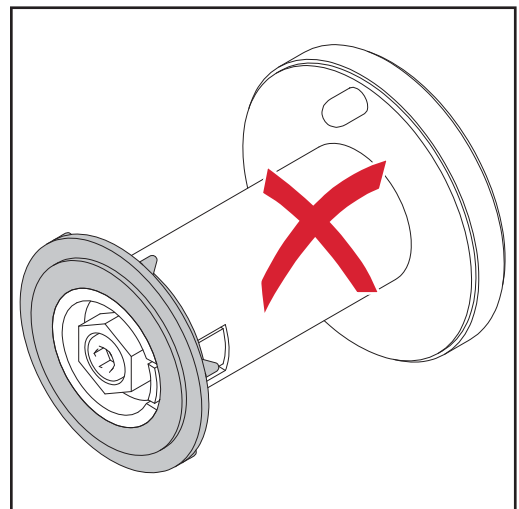
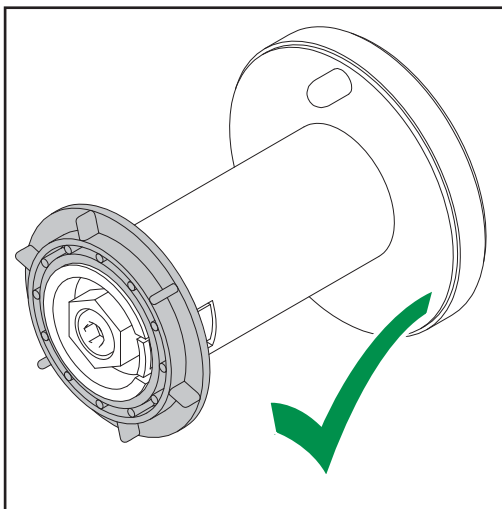
Risk of injury from falling basket-type spool.

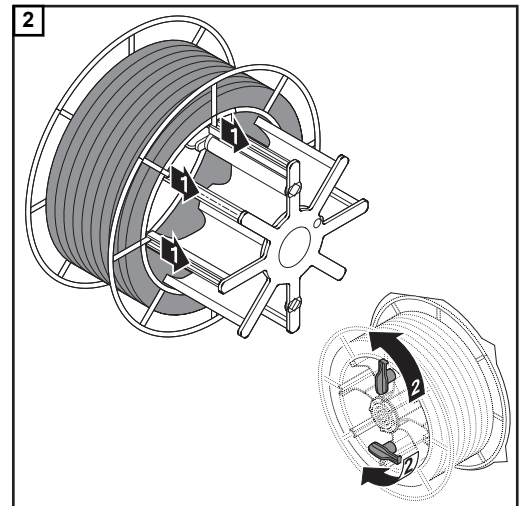
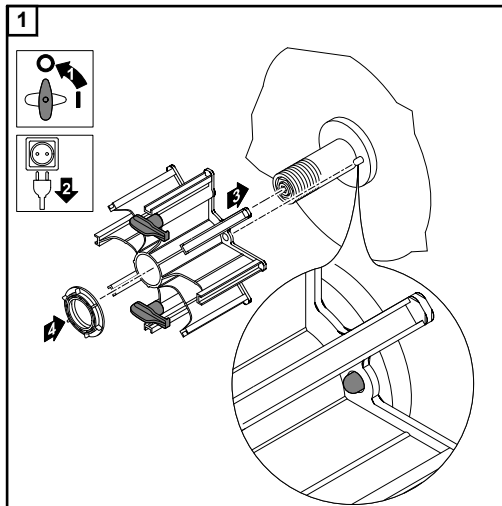
- ▶ Place the basket-type spool on the adapter provided in such a way that the bars on the spool are inside the adapter guideways.

CAUTION!

Risk of injury and impaired performance if the basket-type spool topples over because the locking ring has been placed the wrong way round.

- ▶ Always position the locking ring as shown in the diagram on the left.





Feeding in the wire electrode

⚠ CAUTION!

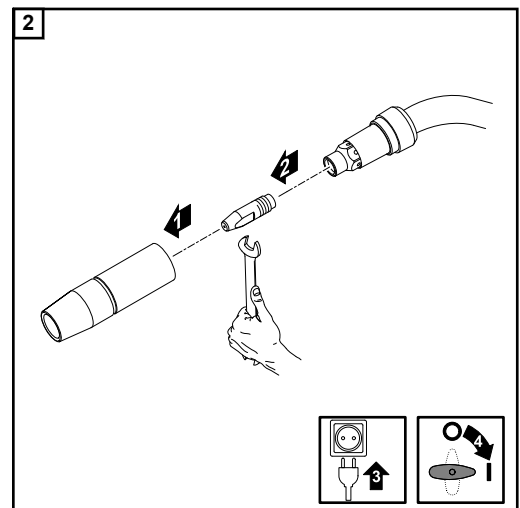
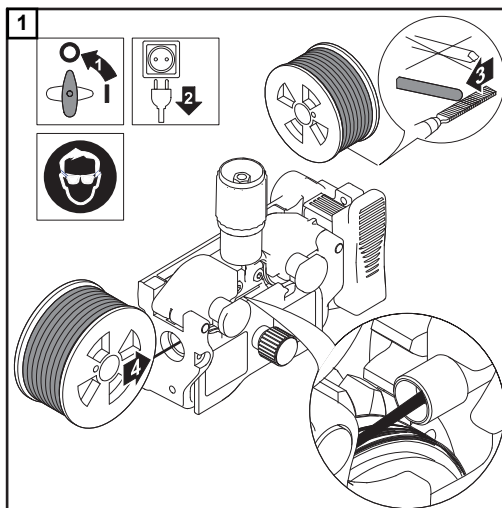
Risk of injury from springiness of spooled wire electrode.

- ▶ When inserting the wire electrode into the 4-roller drive, hold the end of the wire electrode firmly to avoid injuries caused by the wire springing back.

⚠ CAUTION!

Risk of damage to the welding torch from sharp end of wire electrode.

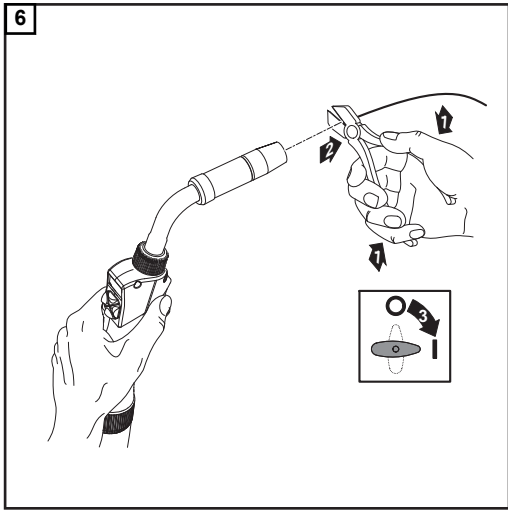
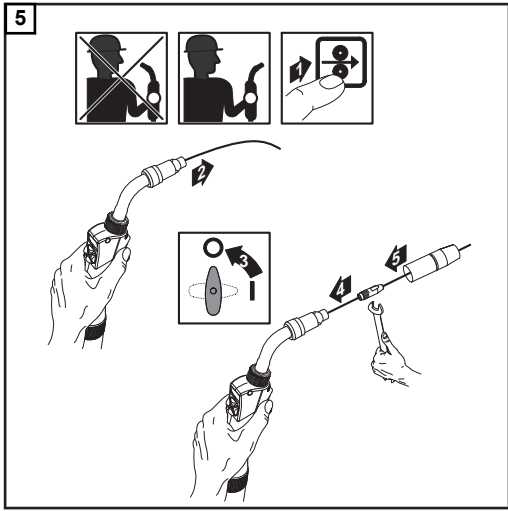
- ▶ Deburr the end of the wire electrode well before feeding in.
Arrange the welding torch hosepack in as straight a line as possible.



⚠ CAUTION!

Risk of injury and damage from electric shock and from the wire electrode emerging from the torch.

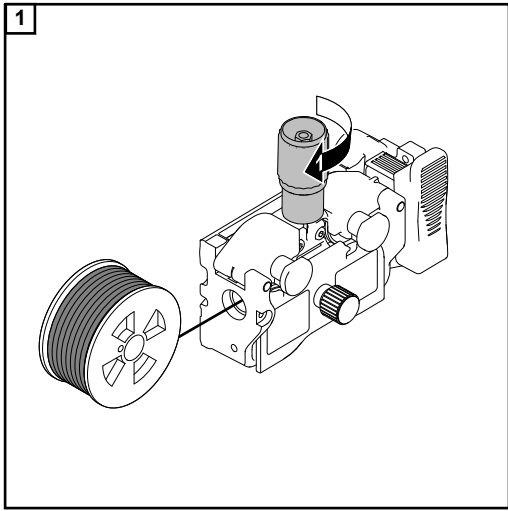
- ▶ Keep the welding torch away from the face and body when pressing the torch trigger or feeder inching button.
- ▶ Do not point the welding torch at people
- ▶ Make sure that the wire electrode does not touch any conductive or earthed (grounded) parts (e.g. the housing, etc.) when pressing the torch trigger



Setting the contact pressure

NOTE!

Set the contact pressure in such a way that the wire electrode is not deformed but nevertheless ensures proper wirefeed.



Contact pressure standard values for U-slot rollers

Steel:
4 - 5

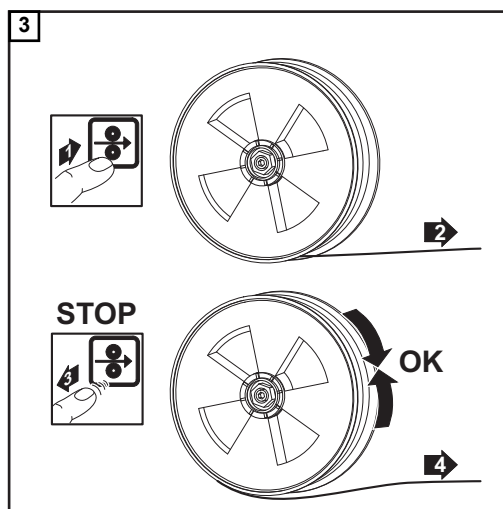
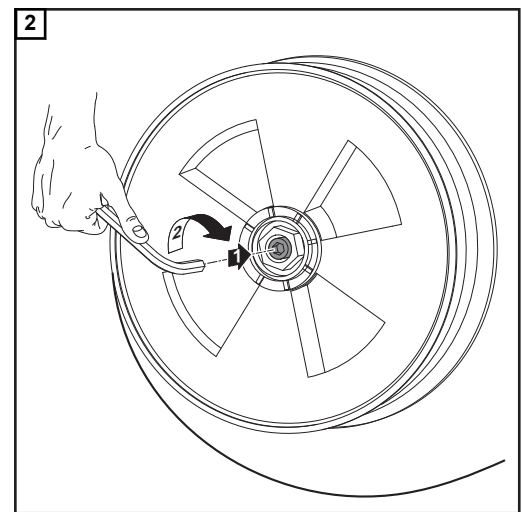
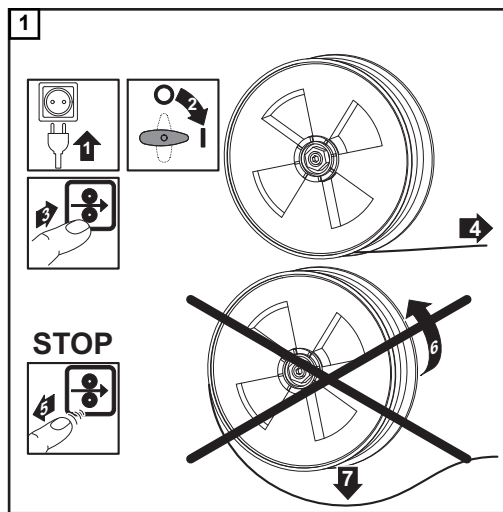
CrNi
4 - 5

Tubular cored electrodes
2 - 3

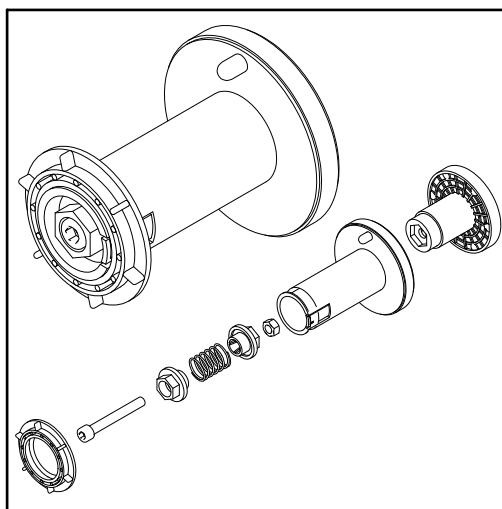
Adjusting the brake

NOTE!

After releasing the torch trigger the wirespool should stop unreeling. Adjust brake if necessary.



Design of the Brake



⚠ WARNING!

Danger from incorrect installation. Serious personal injury and damage to property may result.

- ▶ Do not dismantle the brake.
- ▶ Maintenance and servicing of brakes is to be carried out by trained, qualified personnel only.

The brake is only available as a complete unit. This illustration is for information purposes only.

Performing R/L alignment

IMPORTANT! For optimum welding results, the manufacturer recommends performing an R/L alignment when starting the device for the first time and when any changes are made to the welding system.

Welding Mode

MIG/MAG Operating Modes

General

 **WARNING!**

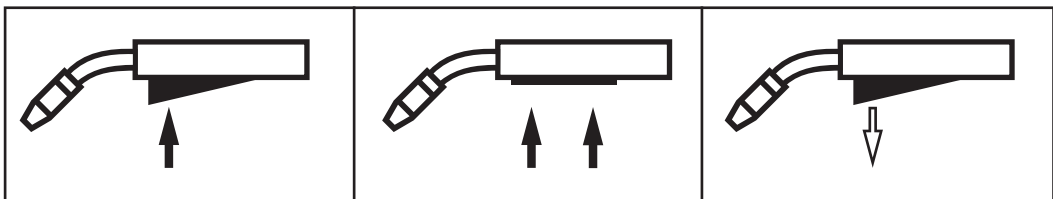
Danger from incorrect operation.

Possible serious injury and damage to property.

- ▶ Do not use the functions described here until you have read and completely understood these Operating Instructions.
- ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions for the system components, in particular the safety rules!

See the Setup menu for information on settings, setting range and units of measurement for the available parameters.

Symbols and their explanations



Press the torch trigger | Hold the torch trigger | Release the torch trigger

GPr

Gas pre-flow

I-S

Starting-current phase: the base material is heated up rapidly, despite the high thermal dissipation that occurs at the start of welding

t-S

Starting current time



Start arc length correction

SL1

Slope 1: the starting current is steadily lowered until it reaches the welding current

I

Welding-current phase: uniform thermal input into the base material, whose temperature is raised by the advancing heat

I-E

Final current phase: to prevent any local overheating of the base material due to heat build-up towards the end of welding. This eliminates any risk of weld seam drop-through.

t-E

Final current time



End arc length correction

SL2

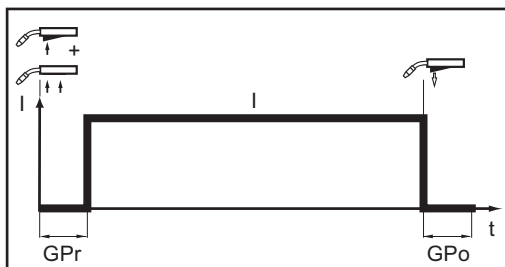
Slope 2: the welding current is steadily lowered until it reaches the final current

GPo

Gas post-flow

A detailed explanation of the parameters can be found in the section headed "Process parameters"

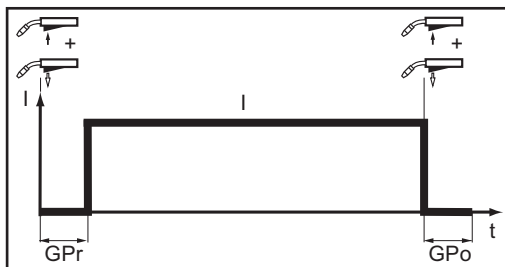
2-step mode



"2-step mode" is suitable for

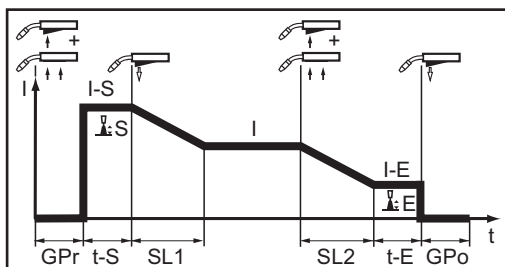
- Tacking work
- Short weld seams
- Automated and robot welding

4-step mode



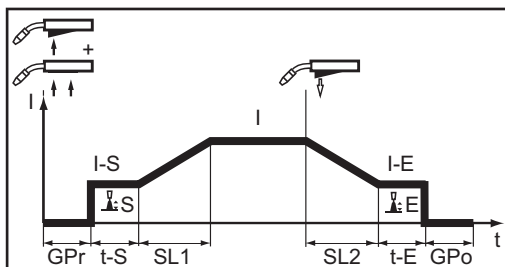
"4-step mode" is suitable for longer weld seams.

Special 4-step mode



"Special 4-step mode" is particularly suitable for welding aluminium materials. The special slope of the welding current curve takes account of the high thermal conductivity of aluminium.

Special 2-step mode



"Special 2-step mode" is ideal for welding in the higher power range. In special 2-step mode, the arc starts at a low power, which makes it easier to stabilise.

MIG/MAG and CMT welding

Safety

⚠ WARNING!

Danger due to incorrect operation.

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the Operating Instructions.
- ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

⚠ WARNING!

An electric shock can be fatal.

If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

- ▶ Only carry out work on the device when the power source's power switch is in the - O - position.
- ▶ Only carry out work on the device when the power source has been disconnected from the grid.

MIG/MAG and CMT welding – overview

The "MIG/MAG and CMT welding" section comprises the following steps:

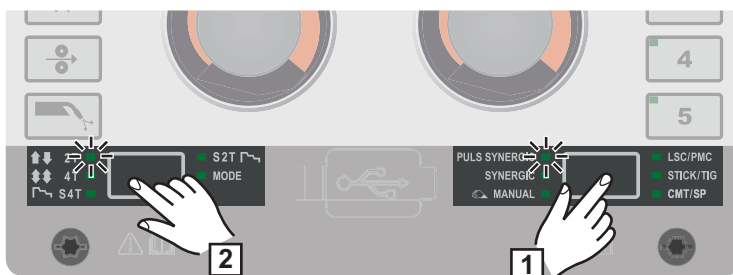
- Switching on the power source
- Selecting the welding process and operating mode
- Retrieving the currently set filler metal
- Selecting the filler metal
- Setting the welding parameters
- Setting the shielding gas flow rate
- MIG/MAG or CMT welding

Switching on the power source

- 1 Connect the mains cable
- 2 Move the mains switch to the "I" position

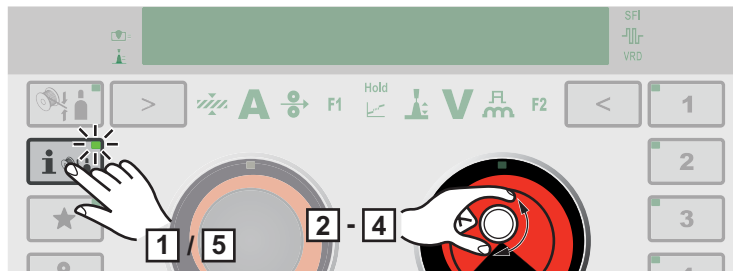
IMPORTANT! For optimum welding results, the manufacturer recommends performing an R/L alignment when starting the device for the first time and when any changes are made to the welding system.

Setting the welding process and operating mode



- 1 Press the "Welding process" button until the LED for the desired welding process lights up
- 2 Press the "Mode" button until the LED for the desired operating mode lights up

Retrieving the currently set filler metal



- 1 Press the "Filler metal info" button

The LED on the button lights up and the currently set filler metal is shown on the display:

CrNi188/188

- 2 Turn the right adjusting dial

The currently set wire diameter is shown on the display:

1.2 mm

- 3 Turn the right adjusting dial

The currently set shielding gas is shown on the display:

M12 Ar+2.5% CO

- 4 Turn the right adjusting dial

The currently set characteristic is shown on the display:

2310

- 5 Press the "Filler metal info" button

The currently set welding parameter values are shown on the display.

Selecting the filler metal



- 1 Press the "Filler metal selection" button

The LED on the button lights up and "filler metal?" is shown on the display:

filler metal?

- 2 Press the right adjusting dial

The first available filler metal is displayed:

Al99.5

- 3 Select the desired filler metal by turning the right adjusting dial

- 4 Press the right adjusting dial

"diameter?" is shown on the display: *

diameter?

- 5 Press the right adjusting dial

The first available wire diameter is displayed:

1.2 mm

- 6 Select the desired wire diameter by turning the right adjusting dial

- 7 Press the right adjusting dial

"gas?" is shown on the display: *

gas?

- 8 Press the right adjusting dial

The first available shielding gas is displayed:

IL 100% Ar

- 9 Select the desired shielding gas by turning the right adjusting dial

- 10 Press the right adjusting dial

If available, the first available characteristic is displayed: *

Std. root 2B91

- 11 Select the desired characteristic by turning the right adjusting dial

- 12 Press the right adjusting dial

A prompt to apply the new filler metal is displayed: *

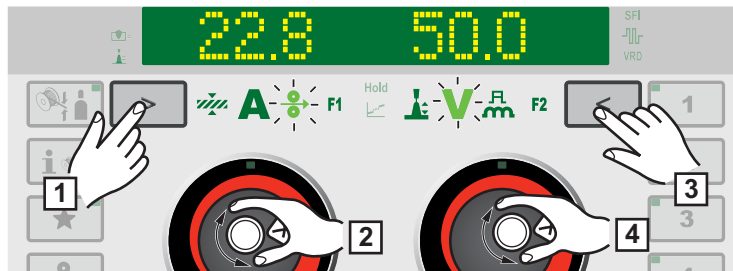
store?

- 13 Press the right adjusting dial

The set filler metal is saved.

* The previous item can be called up by turning the right adjusting wheel and selecting "back".

Setting the welding parameters



- 1 Press the button until the desired welding parameter lights up



Material thickness



Welding current



Wire speed

F1

Special function

- 2 Turn the left adjusting dial to change the value of the welding parameter



- 4 Turn the right adjusting dial to change the value of the welding parameter

The amended parameter values are applied immediately.

If one of the wire speed, material thickness, welding current or welding voltage parameters are changed during synergic welding, the remaining parameters are immediately altered accordingly.

Setting the shielding gas flow rate

- 1 Open the gas cylinder valve

- 2 Press the gas test button

Shielding gas flows out

- 3 Turn the adjusting screw on the underside of the pressure regulator until the pressure gauge shows the required shielding gas flow rate

- 4 Press the gas test button

The flow of gas stops.

**MIG/MAG or CMT
welding**** CAUTION!**

Risk of injury and damage from electric shock and from the wire electrode emerging from the torch.

When pressing the torch trigger:

- ▶ keep the torch away from your face and body
 - ▶ do not point the welding torch at people
 - ▶ make sure that the wire electrode does not touch any electrically conducting or earthed (grounded) parts, such as the housing, etc.
-

1 Press the torch trigger and start welding

Whenever welding ends, the actual values for the welding current, welding voltage and wire speed are stored, and HOLD appears on the display.

NOTE!

It is not always possible to change parameters that have been set on a system component control panel (e.g. remote control) on the power source control panel.

MIG/MAG and CMT welding parameters

Welding parameters for MIG/MAG pulse synergic welding, for CMT welding and PMC welding

The following welding parameters can be set and displayed for MIG/MAG pulse synergic welding, CMT welding and PMC welding:

using the left adjusting dial:



Material thickness¹⁾

Setting range: 0.1 - 30.0 mm ²⁾ / 0.004 - 1.18 in. ²⁾



Welding current¹⁾

in A

Setting range: depends on the welding process and welding program selected

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.



Wire speed¹⁾

Setting range: 0.5 - 25 m/min ²⁾ / 20 - 980 ipm. ²⁾

F1

Special function

any parameter can be assigned to this (see page [41](#))

The function can be selected if a parameter has been saved.



Penetration stabilizer⁴⁾ (see page [95](#))

Setting range: 0 - 10 m/min / 0 - 393.7 ipm

Factory setting: 0



Arc length stabilizer⁴⁾ (see page [97](#))

Setting range: 0 - 5

Factory setting: 0

using the right adjusting dial:



Arc length correction

for correcting the arc length;

Setting range: -10 - +10

Factory setting: 0

- ... shorter arc length

0 ... neutral arc length

+ ... longer arc length



Welding voltage¹⁾

in V

Setting range: depends on the welding process and welding program selected

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.



Pulse/dynamic correction

for correcting the pulsing energy of a pulsed arc

Setting range: -10 - +10

Factory setting: 0

- ... lower droplet detachment force

0 ... neutral droplet detachment force

+ ... increased droplet detachment force

F2

Special function

any parameter can be assigned to this (see page [41](#))

The function can be selected if a parameter has been saved.

Welding parameters for MIG/MAG standard synergic welding and LSC welding

The following welding parameters can be set and displayed for MIG/MAG standard synergic welding and LSC welding:

using the left adjusting dial:



Material thickness¹⁾

Setting range: 0.1 - 30.0 mm ²⁾ / 0.004 - 1.18 in. ²⁾

A

Welding current¹⁾

in A

Setting range: depends on the welding process and welding program selected

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.



Wire speed¹⁾

for setting a harder, more stable arc

Setting range: 0.5 - 25 m/min ²⁾ / 20 - 980 ipm. ²⁾

F1

Special function

any parameter can be assigned to this (see page [41](#))

The function can be selected if a parameter has been saved.



Penetration stabilizer⁴⁾ (see page [95](#))

Setting range: 0 - 10 m/min / 0 - 393.7 ipm

Factory setting: 0

using the right adjusting dial:



Arc length stabilizer⁴⁾ (see page [97](#))

Setting range: 0 - 2

Factory setting: 0



Arc length correction

for correcting the arc length, which is pre-set by the characteristic or the synergic program

Setting range: -10 - +10

Factory setting: 0

- ... shorter arc length
- 0 ... neutral arc length
- + ... longer arc length

V

Welding voltage¹⁾

in V

Setting range: depends on the welding process and welding program selected

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.

F

Pulse/dynamic correction

for influencing the short-circuiting dynamic at the instant of droplet transfer

Setting range: -10 - +10

Factory setting: 0

- ... harder and more stable arc
- 0 ... neutral arc
- + ... soft and low-spatter arc

F2

Special function

any parameter can be assigned to this (see page 41)

The function can be selected if a parameter has been saved.

Welding parameters for MIG/MAG standard manual welding

The following welding parameters can be set and displayed for MIG/MAG standard manual welding:

using the left adjusting dial:



Wire speed¹⁾

for setting a harder, more stable arc

Setting range: 0.5 - 25 m/min ²⁾ / 20 - 980 ipm. ²⁾

F1

Special function

any parameter can be assigned to this (see page 41)

The function can be selected if a parameter has been saved.

using the right adjusting dial:

V

Welding voltage¹⁾

in V

Setting range: depends on the welding process and welding program selected

F
m

Pulse/dynamic correction

for influencing the short-circuiting dynamic at the instant of droplet transfer

Setting range: 0 - 10

Factory setting: 0

0 ... harder and more stable arc

10 ... soft and low-spatter arc

F2

Special function

any parameter can be assigned to this (see page [41](#))

The function can be selected if a parameter has been saved.

Explanation of footnotes

- 1) Synergic parameter
When a synergic parameter is changed, the synergic function automatically changes all other synergic parameters to match.

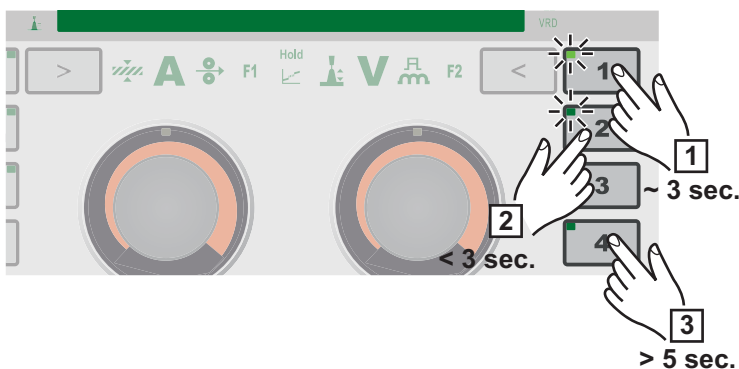
The actual setting range depends on the power source and wirefeeder used and on the welding program selected.

- 2) The actual setting range depends on the welding program selected.
3) The maximum value depends on the wirefeeder used.
4) Only in the LSC and PMC welding processes

EasyJob mode

General The 5 EasyJob buttons enable up to 5 operating points to be saved quickly. The current welding settings are saved.

EasyJob mode



Storing EasyJob operating points

- 1 To store the current welding settings, press one of the EasyJob buttons for approx. 3 seconds.

"Job", the button number and a tick are shown on the display and the EasyJob button LED lights up, e.g.: Job1✓
 The settings have now been stored.

IMPORTANT! If an operating point has already been saved under an EasyJob button it will be overwritten without any prior warning.

Retrieving EasyJob operating points

- 2 To retrieve a saved EasyJob operating point, press the corresponding EasyJob button briefly (< 3 seconds).

The EasyJob button LED lights up and the saved values are shown on the display.

17.5 62.0

If no values are displayed after pressing an EasyJob button, an operating point is not stored under this EasyJob button.

Deleting EasyJob operating points

- 3 To delete an EasyJob operating point, press the relevant EasyJob button for approx. 5 seconds.

After approx. 3 seconds the saved operating point will be overwritten with the current settings and "Job", the button number and a tick are shown on the display.

After a total of approx. 5 seconds the EasyJob button LED goes out and "Job", the button number and an X are shown on the display, e.g.: Job1✗

The EasyJob operating point has been deleted.

Spot welding

Spot welding

Spot welding can be carried out in the following welding processes:
PULSE SYNERGIC | SYNERGIC | MANUAL | LSC/PMC | SP (CMT)

- 1 Select the desired welding process by pressing the "Welding process" button
- 2 Select the MODE by pressing the "Mode" button

"Spot" appears briefly on the display.

- 3 Setup menu / Process parameters / Spot welding
- 4 Press the right adjusting dial

The SPt (spot welding time) parameter is shown.

- 5 Enter the desired value for the spot welding time: press and turn the right adjusting dial

Setting range: 0.1 - 10.0 s
Factory setting: 1.0 s

- 6 Confirm the value by pressing the right adjusting dial

NOTE!

4-step mode is assigned as standard for spot welding.

Press the torch trigger - Spot welding process runs until the end of the spot welding time
- Press again to stop the spot welding time prematurely

- ▶ The spot welding setting can be changed to 2-step in the Setup menu under Settings / System / SPm
(more information on 2-step and 4-step mode for spot welding starts on page [116](#))

- 7 Select the filler metal, wire diameter and shielding gas
- 8 Open the gas cylinder valve
- 9 Set the shielding gas flow rate

⚠ CAUTION!

Risk of injury and damage from electric shock and from the wire electrode emerging from the torch.

When pressing the torch trigger:

- ▶ Keep the welding torch away from your face and body
- ▶ Wear suitable protective goggles
- ▶ Do not point the welding torch at people
- ▶ Make sure that the wire electrode does not touch any conductive or earthed parts (e.g. housing, etc.)

- 10 Spot welding

Procedure for producing a welding spot:

- 1 Hold the welding torch vertical
- 2 Press and release the torch trigger
- 3 Keep the torch in the same position

- 4 Wait for the gas post-flow time
- 5 Lift the torch off the workpiece

NOTE!

Pre-set start of welding and end of welding parameters are also active for spot welding.

- ▶ A start of welding / end of welding action for spot welding can be stored in the Setup menu under Process parameters / Start/End.
 - ▶ If the final current time is active, the end of welding is not after the pre-set spot welding time, but only once the pre-set slope and final current times have ended.
-

TIG welding

Safety

WARNING!

Danger due to incorrect operation.

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the Operating Instructions.
 - ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.
-

WARNING!

An electric shock can be fatal.

If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

- ▶ Only carry out work on the device when the power source's power switch is in the - O - position.
 - ▶ Only carry out work on the device when the power source has been disconnected from the grid.
-

Preparations

- 1 Move the mains switch to the "O" position
 - 2 Disconnect the mains plug
 - 3 Remove the MIG/MAG welding torch
 - 4 Disconnect the grounding (earthing) cable from the (-) current socket
 - 5 Plug the grounding (earthing) cable into the 2nd (+) current socket and twist to fasten it
 - 6 Use the other end of the grounding (earthing) cable to establish a connection to the workpiece
 - 7 Plug the bayonet current plug on the TIG gas-valve torch into the (-) current socket and twist it clockwise to fasten it
 - 8 Screw the pressure regulator onto the (argon) gas cylinder and tighten it
 - 9 Connect the gas hose of the TIG gas-valve torch to the pressure regulator
 - 10 Plug in the mains plug
-

TIG welding

CAUTION!

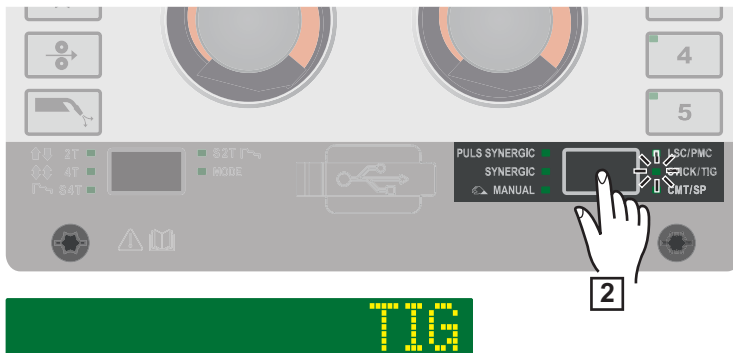
Risk of injury and damage from electric shock.

As soon as the mains switch is in the "I" position, the tungsten electrode of the welding torch is live.

- ▶ Make sure that the tungsten electrode does not touch any persons or electrically conductive or earthed parts (e.g. housing, etc.)
-

- 1 Move the mains switch to the "I" position

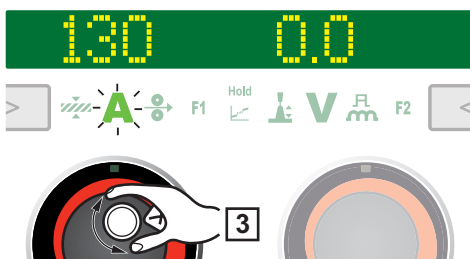
IMPORTANT! For optimum welding results, the manufacturer recommends performing an R/L alignment when starting the device for the first time and when any changes are made to the welding system.



2 Press the "Welding process" button until the LED for the STICK/TIG welding process lights up and "TIG" is shown on the display.

After a short time, the currently set welding current is shown on the display. The welding current indicator lights up.

The welding voltage is applied to the welding socket with a three second time lag.



NOTE!

Parameters that have been set on a system component control panel (e.g. wire feed unit or remote control) might not be able to be changed on the power source control panel.

3 To change the welding current, turn the left adjusting dial

The altered welding current is applied immediately.

4 Adjust the process parameters accordingly to make user- or application-specific settings on the welding system

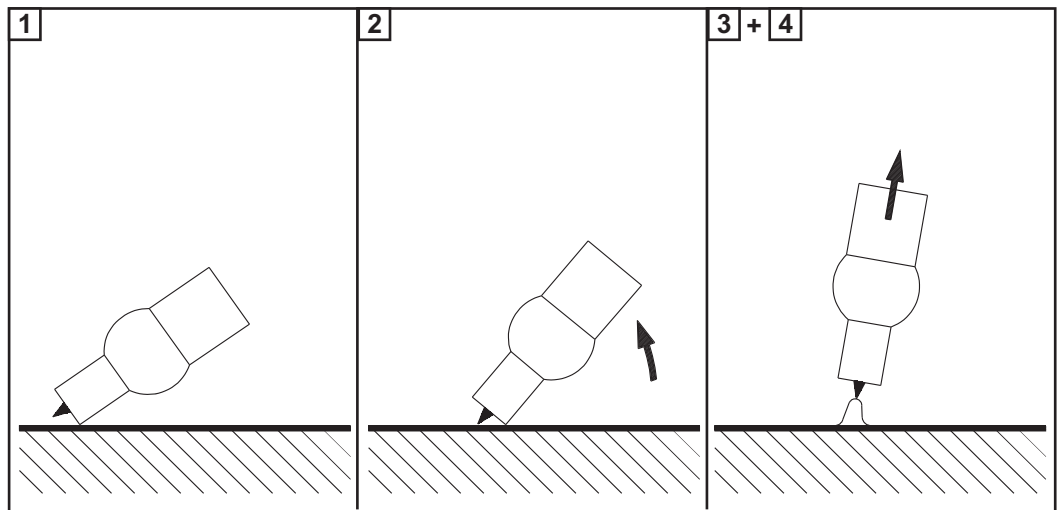
5 Open the gas stop valve on the TIG gas-valve torch

6 Set the desired shielding gas flow rate on the pressure regulator

7 Start welding (ignite the arc)

Igniting the arc

The welding arc is ignited by touching the workpiece with the tungsten electrode.



- 1 Place the gas nozzle on the ignition location so that there is a gap of 2-3 mm (0.08 - 0.12 in.) between the tip of the tungsten electrode and the workpiece
- 2 Gradually tilt the welding torch up until the tungsten electrode touches the workpiece
- 3 Raise the torch and tilt it into the normal position - the arc now ignites
- 4 Carry out welding

Finishing welding

- 1 Lift the TIG gas-valve torch away from the workpiece until the arc goes out.

IMPORTANT! To protect the tungsten electrode, ensure that the shielding gas at the end of welding flows for long enough to allow the tungsten electrode to cool sufficiently.

- 2 Close the gas stop valve on the TIG gas-valve torch

Manual Metal Arc Welding

Safety

WARNING!

Danger due to incorrect operation.

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the Operating Instructions.
- ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions of the system components, especially the safety rules.

WARNING!

An electric shock can be fatal.

If the power source is connected to the grid during installation, there is a danger of serious personal injury and property damage.

- ▶ Only carry out work on the device when the power source's power switch is in the - O - position.
- ▶ Only carry out work on the device when the power source has been disconnected from the grid.

Preparations

- 1 Move the mains switch to the "O" position
- 2 Disconnect the mains plug
- 3 Remove the MIG/MAG welding torch

NOTE!

Check the rod electrode packaging or labelling to determine whether the rod electrodes are for positive pole or negative pole welding.

- 4 Plug the grounding (earthing) cable into either the (-) or the (+) current socket depending on the type of electrode, and twist to fasten it
- 5 Use the other end of the grounding (earthing) cable to establish a connection to the workpiece
- 6 Plug the bayonet current plug of the electrode holder cable into the free current socket with the opposite polarity, according to the type of electrode, and twist it clockwise to latch it in place
- 7 Plug in the mains plug

MMA welding

CAUTION!

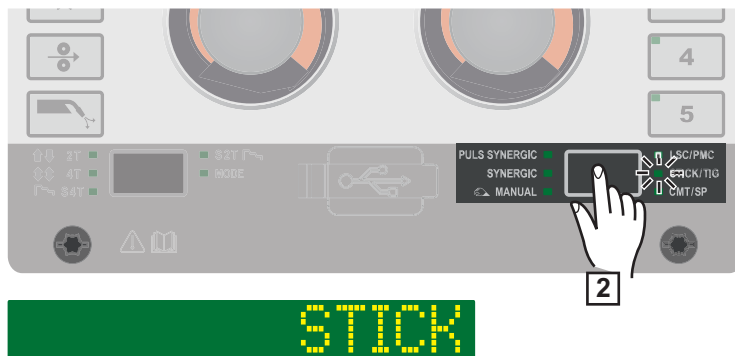
Risk of injury and damage from electric shock.

As soon as the mains switch is in the "I" position, the rod electrode in the electrode holder is live.

- ▶ Make sure that the rod electrode does not touch any persons or electrically conductive or earthed parts (e.g. housing, etc.)

- 1 Move the mains switch to the "I" position

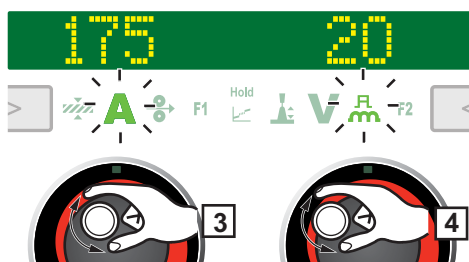
IMPORTANT! For optimum welding results, the manufacturer recommends performing an R/L alignment when starting the device for the first time and when any changes are made to the welding system.



- 2 Press the "Welding process" button until the LED for the STICK/TIG welding process lights up and "STICK" is shown on the display.

After a short time, the currently set welding current and the currently set dynamic are shown on the display. The welding current and dynamic indicators light up.

The welding voltage is applied to the welding socket with a three second time lag.



NOTE!

Parameters that have been set on a system component control panel (e.g. wire feed unit or remote control) might not be able to be changed on the power source control panel.

- 3 To change the welding current, turn the left adjusting dial
- 4 If required, turn the right adjusting dial to change the dynamic

The amended values are applied immediately.

- 5 Adjust the process parameters accordingly to make user- or application-specific settings on the welding system
- 6 Start welding

Welding parameters for manual metal arc welding

The following welding parameters can be set and displayed for manual metal arc welding:

using the left adjusting dial:

A**Main current¹⁾**

in A

Setting range: depends on the power source available

Before the start of welding, the machine automatically displays a standard value based on the programmed parameters. The actual value is displayed during welding.

using the right adjusting dial:

**Arc-force dynamic**

to influence the short-circuiting dynamic at the instant of droplet transfer

Setting range: 0 - 100

Factory setting: 20

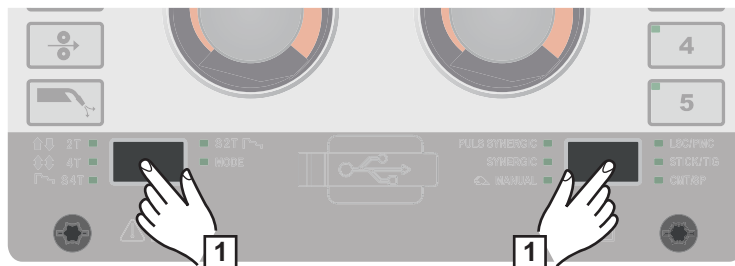
0 ... soft and low-spatter arc

100 ... harder and more stable arc

Setup Settings

Setup menu - overview

Entering/exiting the Setup menu

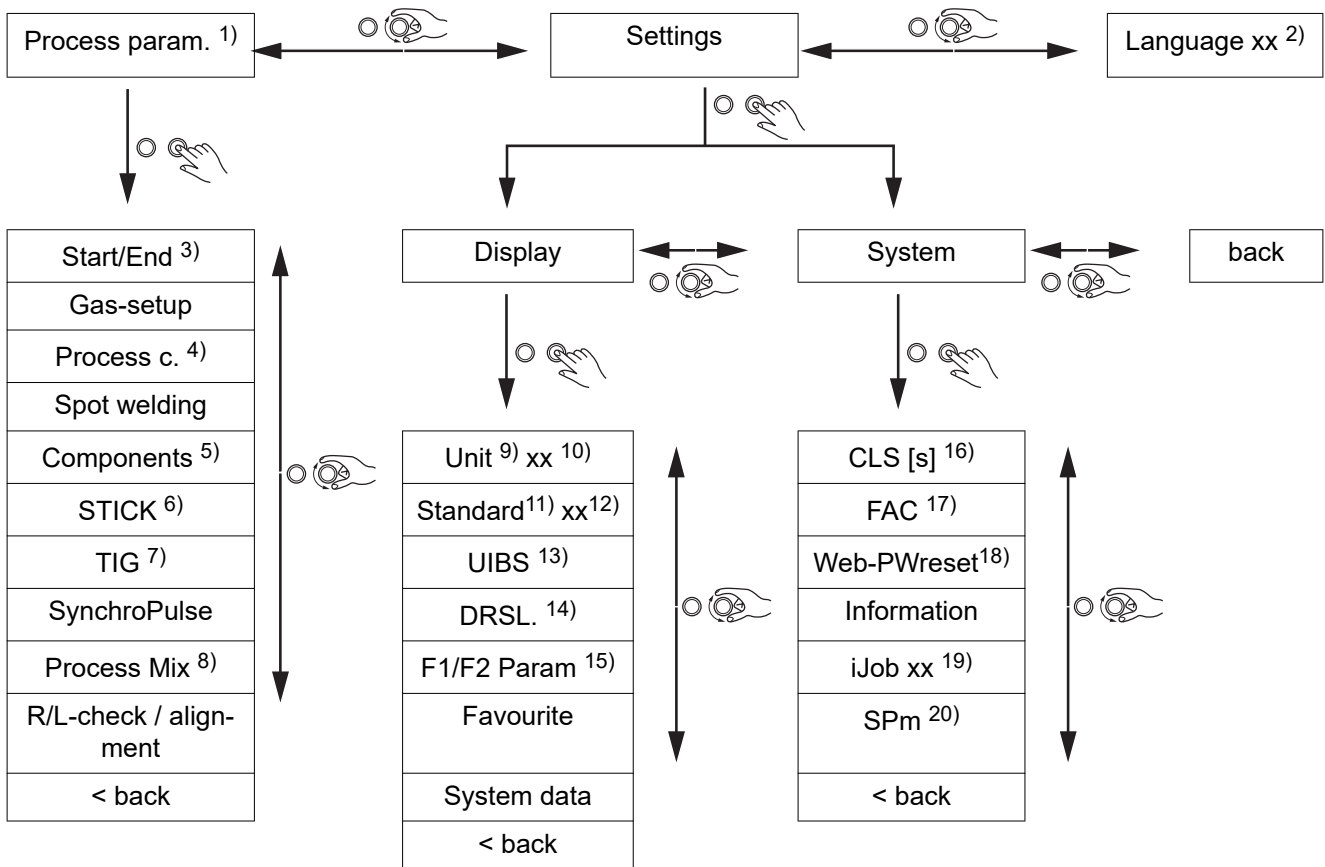


- 1** To enter the Setup menu, press the "Welding process" and "Mode" buttons at the same time

"Process parameters" is shown on the display.

- 2** To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Setup menu - overview



... Turn the right adjusting dial



... Press the right adjusting dial



... Press the left adjusting dial:
The parameter is shown in plain text



... Turn the left adjusting dial:
To read long plain texts for parameters; the plain text for the parameter is moved to the left on the display

- 1) Process parameters
- 2) Language abbreviation
- 3) Start/end of welding
- 4) Process control
- 5) Component monitoring
- 6) Electrode setup
- 7) TIG setup
- 8) Process Mix

- 9) Units
- 10) metric/imperial
- 11) Standards
- 12) CEN/AWS
- 13) Display brightness
- 14) Display replaced characteristics
- 15) Activate F1/F2 parameter

- 16) Duration of interior lighting
- 17) Restore factory settings
- 18) Reset password for the website
- 19) Mode Setup – Special display for JobMaster
- 20) 2-step/4-step spot welding

Process parameters

Process parameters for start of welding/end of welding

The following process parameters can be set and displayed for the start and end of welding:

I-S

Starting current

For setting the starting current for MIG/MAG welding (e.g. aluminium welding start-up)

Setting range: 0 - 200% (of welding current)

Factory setting: 135%

AIS

Start arc length correction

For correcting the arc length at the start of welding

Setting range: -10 - +10% (of welding voltage)

Factory setting: 0

- shorter arc length

0 ... neutral arc length

+ ... longer arc length

t-S

Starting current time

For setting the length of time the starting current is to be active

Setting range: off / 0.1 - 10.0 s

Factory setting: off

SL1

Slope 1

For setting the time during which the starting current is decreased or increased to the welding current

Setting range: 0 - 9.9 s

Factory setting: 1 s

SL2

Slope 2

For setting the time during which the welding current is decreased or increased to the final current.

Setting range: 0 - 9.9 s

Factory setting: 1 s

I-E

Final current

For setting the final current so that

- heat build-up towards the end of welding is prevented and
- the end-crater can be filled when welding aluminium

Setting range: 0 - 200% (of welding current)

Factory setting: 50

AIE

End arc length correction

For correcting the arc length at the end of welding

Setting range: -10 - +10% (of welding voltage)

Factory setting: 0

- shorter arc length

0 ... neutral arc length

+ ... longer arc length

t-E

Final current time

For setting the length of time for which the final current is to be active

Setting range: off / 0.1 - 10.0 s

Factory setting: off

SFI

to activate/deactivate the SFI function (Spatter Free Ignition of the arc)

Setting range: off / on

Factory setting: off

SFI-HS

SFI HotStart

For setting a HotStart time in conjunction with SFI ignition

During SFI ignition, a spray arc phase occurs within the set HotStart time. This increases the heat input irrespective of the mode, thus ensuring deeper penetration right from the very start of welding.

Setting range: off / 0.01 - 2.00 s

Factory setting: off

W-r

Wire retract

For setting the wire withdrawal value (= composite value based on backward movement of wire and a time).

The wire withdrawal depends on the features of the welding torch.

Setting range: 0.0 - 10.0

Factory setting: 0.0

IgC

Ignition current (manual mode)

For setting the ignition current for MIG/MAG standard manual welding

Setting range: 100 - 450 A

Factory setting: 450

W-r (man.)

Wire retract (manual mode)

For setting the wire withdrawal value (= composite value based on backward movement of wire and a time) for MIG/MAG standard manual welding.

The wire withdrawal depends on the features of the welding torch.

Setting range: 0.0 - 10.0

Factory setting: 0.0

Process parameters for Gas-Setup

The following process parameters can be set and displayed for Gas-Setup:

GPr**Gas pre-flow**

For setting the gas flow time before the arc is ignited

Setting range: 0 - 9.9 s

Factory setting: 0.1 s

GPo**Gas post-flow**

For setting the gas flow time after the arc has gone out

Setting range: 0 - 9.9 s

Factory setting: 0.5 s

GCV**Gas set value**

For specifying the gas set value in l/min

GCF**Gas factor**

For setting the gas correction factor

Setting range: aut, 0.90 - 20.0

Factory setting: aut

Process parameters for process control

The following process parameters can be set and displayed for the process control:

- PSt - penetration stabilizer
- ASt - arc length stabilizer

Penetration stabilizer and arc length stabilizer can also be set in combination with one another.

Penetration stabilizer

The penetration stabilizer is used to set the max. permitted change in the wire speed to ensure that the welding current and hence the penetration is kept stable or constant with variable stick out.

The penetration stabilizer parameter is only available when the WP PMC (Welding Process Pulse Multi Control) or WP LSC (Welding Process Low Spatter Control) option has been enabled on the power source.

0 - 10.0 m/min (ipm)

Factory setting: 0 m/min

0

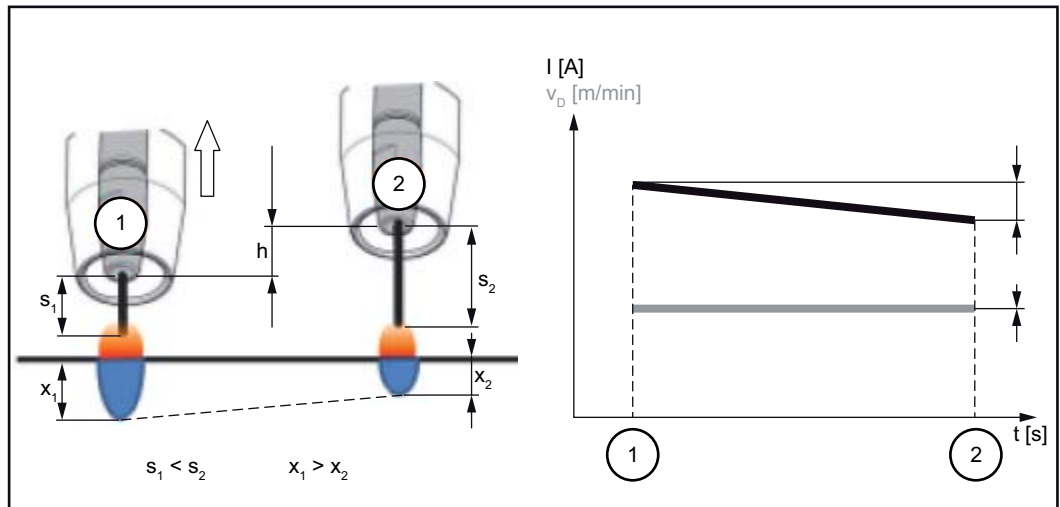
The penetration stabilizer is not activated.
The wire speed remains constant.

0.1 - 10.0

The penetration stabilizer is activated.
The welding current remains constant.

Application examples

Penetration stabilizer = 0 m/min (not activated)

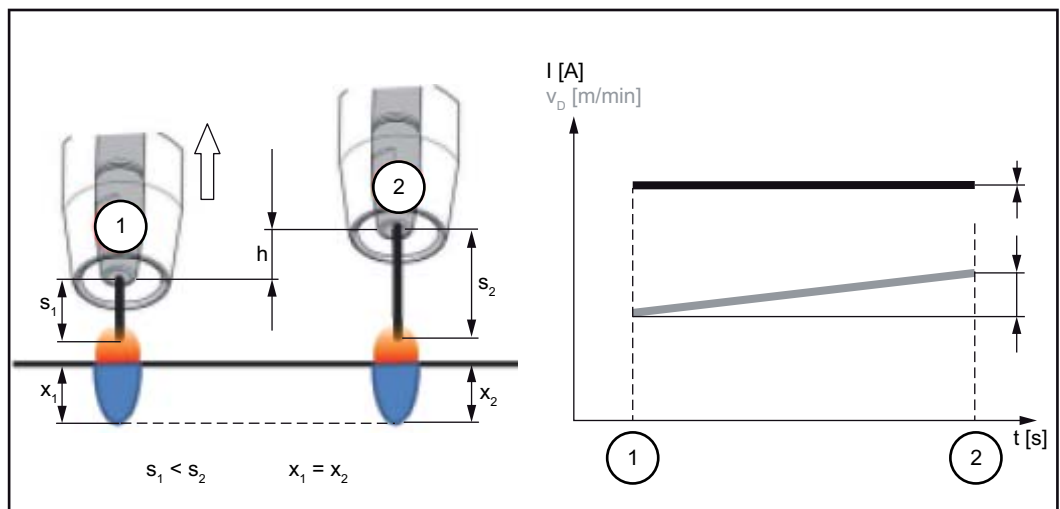


Penetration stabilizer = 0 m/min (not activated)

Changing the contact tube distance (h) alters the resistance in the welding circuit due to the longer stick out (s_2).

The constant voltage control for constant arc length causes a reduction in the mean current value and hence a smaller penetration (x_2).

Penetration stabilizer = n m/min (activated)

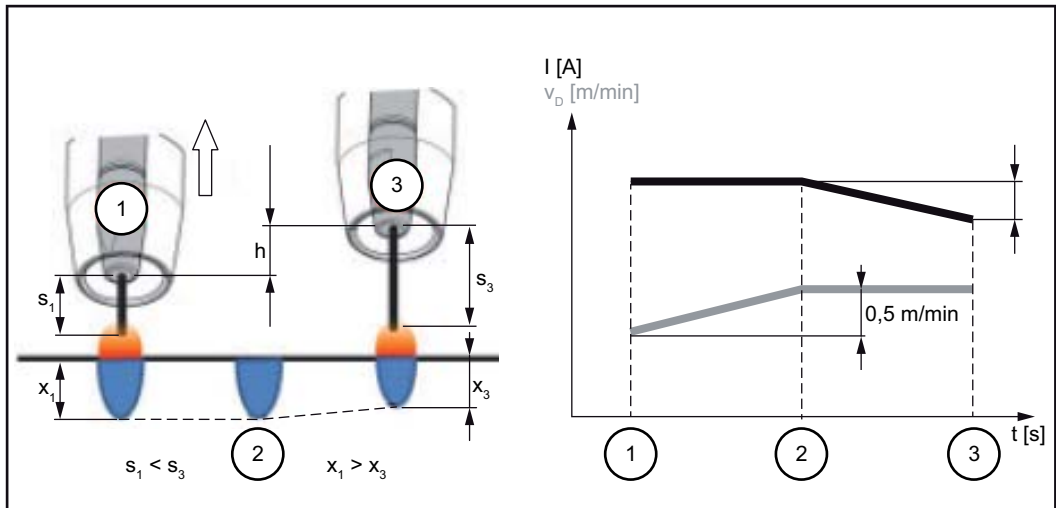


Penetration stabilizer = n m/min (activated)

Specifying a value for the penetration stabilizer ensures a constant arc length without large current variations if the stick out is changed ($s_1 \implies s_2$).

The penetration (x_1, x_2) remains virtually unchanged and stable.

Penetration stabilizer = 0.5 m/min (activated)



Penetration stabilizer = 0.5 m/min (activated)

To minimise the change in welding current if the stick out is changed ($s_1 \implies s_3$), the wire speed is increased or reduced by 0.5 m/min. In the example shown, the stabilising effect is obtained without a change in current up to the set value of 0.5 m/min (Position 2).

I ... Welding current v_D ... Wire speed

Arc length stabilizer

Arc length stabilizer

The arc length stabilizer forces short arcs, advantageous for welding, via a short-circuit current control and keeps them stable even with a variable stick out or external interference.

The arc length stabilizer welding parameter is only available if the WP PMC (Welding Process Pulse Multi Control) option has been enabled on the power source.

0.0 - 5.0 (effect of stabilizer)

Factory setting: 0.0

0.0

The arc length stabilizer is deactivated.

0.1 - 5.0

The arc length stabilizer is activated.

The arc length is decreased until short circuits start to occur.

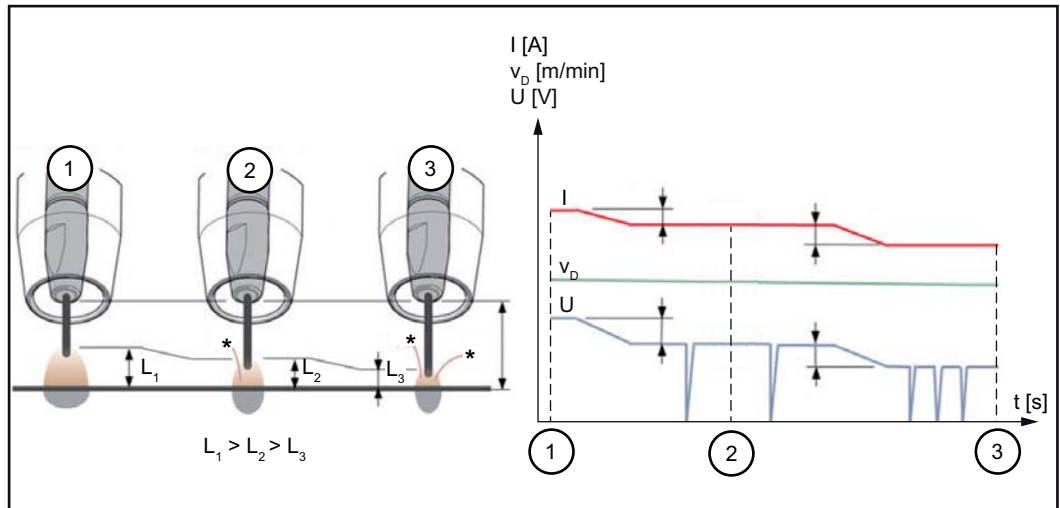
Application examples

Arc length stabilizer = 0 / 0.5 / 2.0

① Arc length stabilizer = 0

② Arc length stabilizer = 0.5

③ Arc length stabilizer = 2

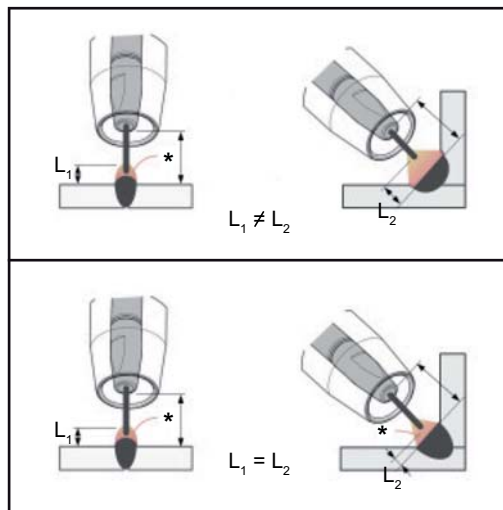


Arc length stabilizer = 0 / 0.5 / 2.0

Activating the arc length stabilizer reduces the arc length until short circuits start to occur. The frequency of the short circuits is controlled and kept stable.

Increasing the arc length stabilizer causes a further shortening of the arc length ($L_1 \implies L_2 \implies L_3$). The advantages of a short, stable and controlled arc can be used more effectively.

Arc length stabilizer with change of weld seam profile and position



Arc length stabilizer not activated

A change of weld seam profile or welding position can negatively affect the welding result

Arc length stabilizer activated

Since the number and duration of the short circuits is controlled, the properties of the arc stay the same if the weld seam profile or welding position is changed.

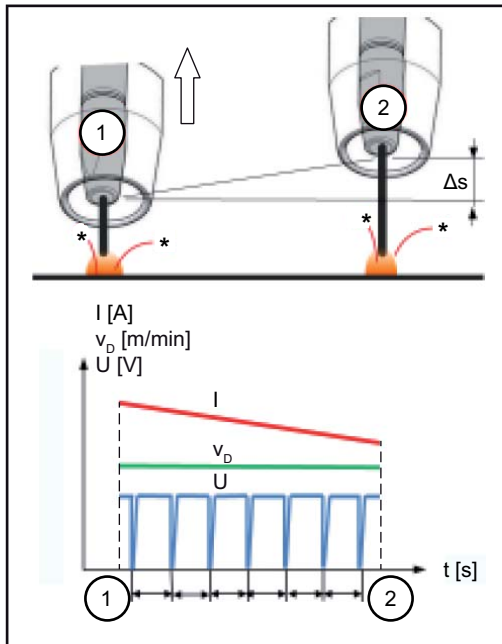
I ... Welding current v_D ... Wire speed U ... Welding voltage

* ... Number of short circuits

Combination of penetration stabilizer and arc length stabilizer

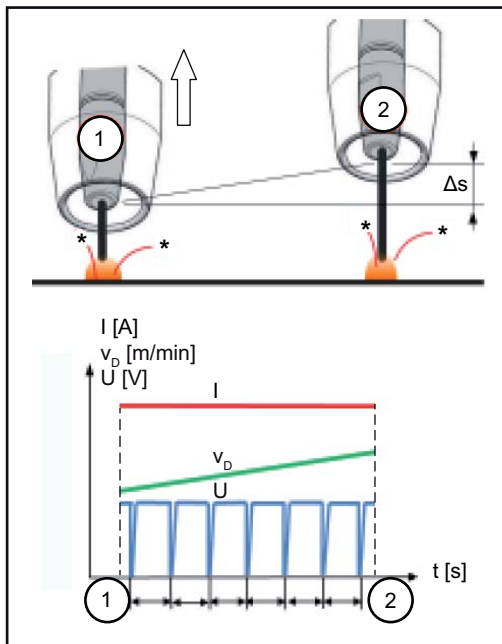
Example: Stick out change

Arc length stabilizer without penetration stabilizer



The advantages of a short arc are maintained even if the stick out is changed, since the short-circuit properties stay the same.

Arc length stabiliser with penetration stabilizer



If the stick out is changed with the penetration stabilizer activated, the penetration also stays the same. The short circuit behaviour is controlled by the arc length stabilizer.

I ... Welding current v_D ... Wire speed U ... Welding voltage
 * ... Number of short circuits Δs ... Stick out change

Process parameters for spot welding

SPt
Spot welding time

0.1 - 10.0 s
Factory setting: 1.0 s

Process parameters for monitoring and components

The following process parameters can be set and displayed for the system components of a welding system:

C-C
Cooling unit mode

To determine whether a cooling unit is to be switched on or off, or operated automatically

Setting range: eco / auto / on / off (depending on the cooling unit)
Factory setting: auto

C-t
Delay time flow sensor

For setting the time from when the flow sensor responds until a warning message is output

Setting range: 5 - 25 s
Factory setting: 10 s

CFU
Cooler flow warning limit

Setting range: off / 0.75 - 0.95 l/min
Factory setting: off

Fdi
Feeder inching speed

in m/min (ipm)

For setting the wire speed at which the wire electrode is threaded into the torch hosepack

Setting range:
min. - max. (depending on the wire speed)
Factory setting: 10.0 m/min

ito
Ignition time-out

Length of wire that is fed before the safety cut-out trips

Setting range: off / 5 - 100 mm (0.2 - 3.94 in.)
Factory setting: off

The ignition time-out process parameter is a safety function. The length of wire that is fed before the safety cut-out trips may differ from the pre-set wire length, particularly when the wire is being fed at fast wire speeds.

How it works:

Once the torch trigger is pressed, gas pre-flow begins immediately. Wirefeeding then begins, followed by ignition. If no current starts flowing before the specified length of wire has been fed, the power source cuts out automatically.

To try again, press the torch trigger again.

GSL**Lower gas flow rate limit**

Setting range: 0.5 - 30.0 l/min

Factory setting: 7.0 l/min

GS_t**Maximum duration of gas flow deviation**

Setting range: off; 0.1 - 10.0 s

Factory setting: 2.0 s

GSF**Gas factor sensor**

dependent on the shielding gas used

(only in conjunction with the OPT/i gas controller option)

Setting range: auto, 0.90 - 20.0

Factory setting: auto

(the correction factor is automatically set for standard gases from the Fronius welding database)

Process parameters for electrode setup

The following process parameters can be set and displayed for manual metal arc welding (STICK):

I-S**Starting current**

For setting the starting current

Setting range: 0 - 200%

Factory setting: 150%

H_{ti}**Starting current time**

For setting the length of time for which the starting current is to be active

Setting range: 0.0 - 2.0 s

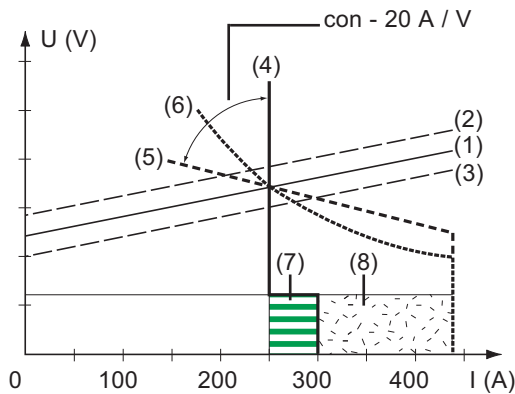
Factory setting: 0.5 s

E_{ln}**Characteristic**

For selecting the electrode characteristic

Setting range: I-constant / 0.1 - 20.0 A/V / P-constant

Factory setting: I-constant



- (1) Load line for rod electrode
- (2) Load line for rod electrode where arc length is increased
- (3) Load line for rod electrode where arc length is reduced
- (4) Characteristic where "I-constant" parameter is selected (constant welding current)
- (5) Characteristic where "0.1 - 20" parameter is selected (drooping characteristic with adjustable slope)
- (6) Characteristic where "P-constant" parameter is selected (constant welding power)

- (7) Example of pre-set arc-force dynamic where characteristic (4) is selected
- (8) Example of pre-set arc-force dynamic where characteristic (5) or (6) is selected

I-constant (constant welding current)

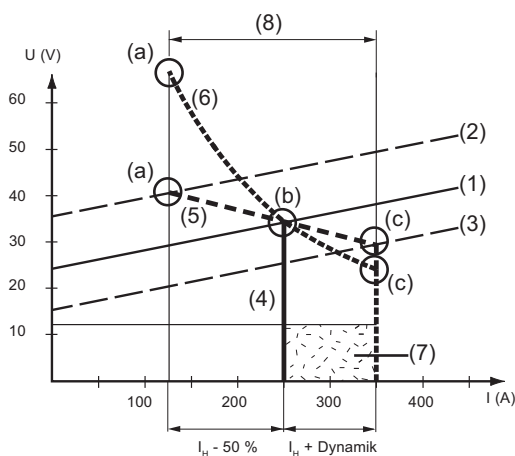
- If the "I-constant" parameter is set, the welding current will be kept constant, irrespective of the welding voltage. This results in a vertical characteristic (4).
- The "I-constant" parameter is particularly suitable for rutile electrodes and basic electrodes.

0.1 - 20.0 A/V (drooping characteristic with adjustable slope)

- Parameter "0.1 - 20" is used to set a drooping characteristic (5). The setting range extends from 0.1 A / V (very steep) to 20 A / V (very flat).
- Setting a flat characteristic (5) is only advisable for cellulose electrodes.

P-constant (constant welding power)

- If the "P-constant" parameter is set, the welding power is kept constant, irrespective of the welding voltage and welding current. This results in a hyperbolic characteristic (6).
- The "P-constant" parameter is particularly suitable for cellulose electrodes, as well as for arc air gouging.
- For arc air gouging, set the arc-force dynamic to "100".



- (1) Load line for rod electrode
- (2) Load line for rod electrode where arc length is increased
- (3) Load line for rod electrode where arc length is reduced
- (4) Characteristic where "I-constant" parameter is selected (constant welding current)
- (5) Characteristic where "0.1 - 20" parameter is selected (drooping characteristic with adjustable slope)
- (6) Characteristic where "P-constant" parameter is selected (constant welding power)

- (8) Example of pre-set arc-force dynamic where characteristic (5) or (6) is selected
- (9) Possible change in the current where characteristic (5) or (6) is selected, as a function of the welding voltage (arc length)
- (a) Operating point where arc length is long
- (b) Operating point where welding current I_H is set
- (c) Operating point where arc length is short

The characteristics (4), (5) and (6) shown here apply when using a rod electrode whose characteristic corresponds - at a given arc length - to the load line (1).

Depending on what welding current (I) has been set, the point of intersection (operating point) of characteristics (4), (5) and (6) will be displaced along the load line (1). The operating point provides information on the actual welding voltage and the actual welding current.

Where the welding current (I_H) is permanently set, the operating point may migrate along the characteristics (4), (5) and (6) according to the welding voltage at a given moment. The welding voltage U is dependent upon the arc length.

If the arc length changes (e.g. in accordance with the load line (2)) the resulting operating point will be the point where the corresponding characteristic (4), (5) or (6) intersects with the load line (2).

Applies to characteristics (5) and (6): Depending upon the welding voltage (arc length), the welding current (I) will also become either smaller or larger, even though the value set for I_H remains the same.

Ast

Anti-stick

To activate/deactivate the anti-stick function

Setting range: off / on

Factory setting: on

As the arc becomes shorter, the welding voltage may drop so far that the rod electrode will tend to stick. This may also cause the rod electrode to burn out.

The anti-stick function prevents the electrode from burning out. If the rod electrode begins to stick, the power source switches the welding current off after 1.5 seconds. After the rod electrode has been lifted off the workpiece, the welding process can be continued without any problems.

Uco

Break voltage

For setting a voltage, at which the welding process can be ended by slightly lifting the rod electrode.

Setting range: 20.0 - 90.0 V

Factory setting: 90.0 V

The arc length depends on the welding voltage. To end the welding process, it is usually necessary to significantly lift the rod electrode away from the workpiece. With the break-voltage parameter, the welding voltage can be limited to a value that makes it possible to end the welding operation simply by lifting the rod electrode slightly.

IMPORTANT! If, during welding, you often find that the welding operation is ended unintentionally, increase the value of the break voltage.

Process parameters for TIG setup

The following process parameters can be set and displayed for TIG welding:

Uco

Break voltage

For setting a voltage, at which the welding process can be ended by slightly lifting the TIG welding torch.

Setting range: 10.0 - 30.0 V

Factory setting: 14.0 V

CSS

Comfort Stop Sensitivity

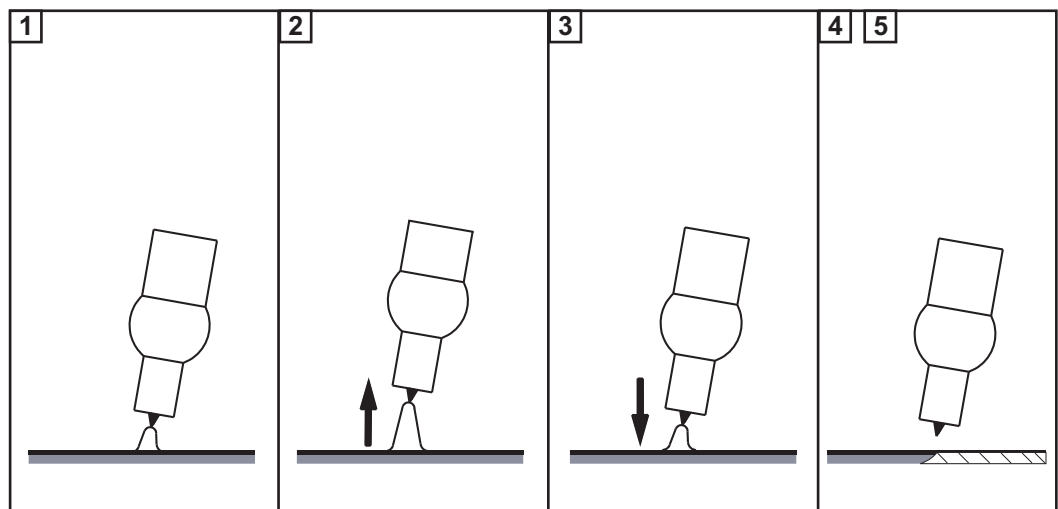
To activate/deactivate the TIG Comfort Stop function

Setting range: off / 0.1 - 2.0 V

Factory setting: 0.8 V

At the end of the welding operation, the welding current is switched off automatically if the arc length increases by more than a defined amount. This prevents the arc being unnecessarily elongated when the TIG gas-valve torch is lifted off the workpiece.

Sequence:



1 Welding

2 At the end of the welding action, briefly raise the welding torch

The arc length is increased significantly.

3 Lower the welding torch

- The arc length is reduced significantly
- The TIG Comfort Stop function is triggered

4 Keep the welding torch at the same height

- The welding current is continuously decreased (downslope).
- The arc goes out.

IMPORTANT! The downslope is pre-set and cannot be adjusted.

5 Raise the welding torch from the workpiece

Process parameters for SynchroPulse

The following process parameters can be set for SynchroPulse welding:

Syn-Puls

SynchroPulse

To activate/deactivate SynchroPulse

Setting range: off / on

Factory setting: off

vd (1)

Wire speed

For setting the average wire speed and therefore the welding power for SynchroPulse

Setting range: 1.0 - 25.0 m/min (40 - 985 ipm)

Factory setting: 5 m/min

dFd (2)

Delta wire feed

For setting the Delta wire feed:

with SynchroPulse, the set wire speed is alternately increased/decreased by the Delta wire feed. The parameters concerned adapt themselves to this wire speed acceleration/delay accordingly.

Setting range: 0.1 - 6.0 m/min (5 - 235 ipm)

Factory setting: 2.0 m/min

F (3)

Frequency

For setting the frequency for SynchroPulse

Setting range: 0.5 - 3.0 Hz

Factory setting: 3.0 Hz

DC (4)

Duty Cycle (high)

For weighting the duration of the higher operating point in a SynchroPulse period

Setting range: 10 - 90%

Factory setting: 50%

AI-h (5)

Arc length correction high

For correcting the arc length for SynchroPulse in the upper operating point (= average wire speed plus Delta wire feed)

Setting range: -10.0 - +10.0

Factory setting: 0

- short arc

0 ... uncorrected arc length

+ ... longer arc

AI-l (6)

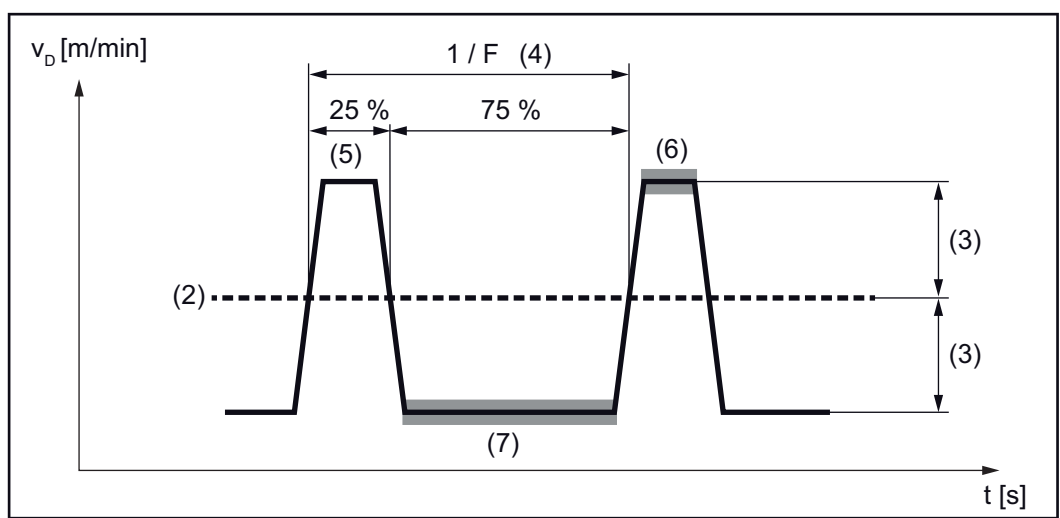
Arc correction low

For correcting the arc length for SynchroPulse in the lower operating point (= average wire speed less Delta wire feed)

Setting range: -10.0 - +10.0

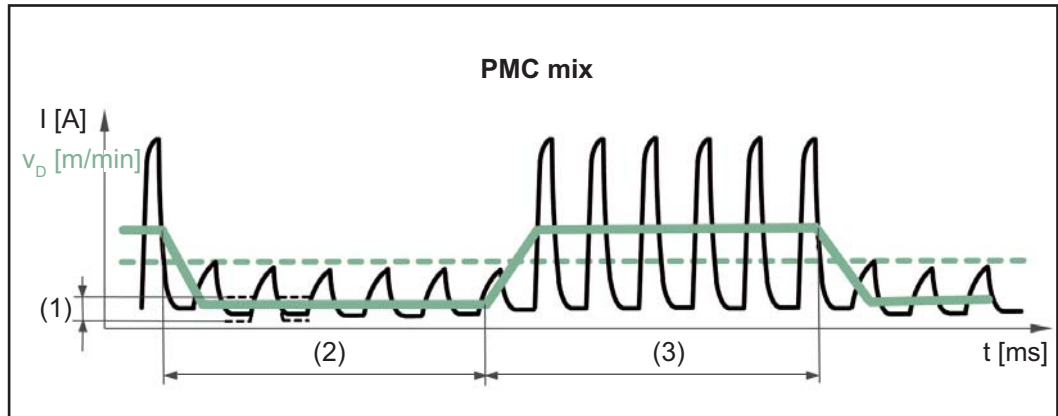
Factory setting: 0

- short arc
- 0 ... uncorrected arc length
- + ... longer arc

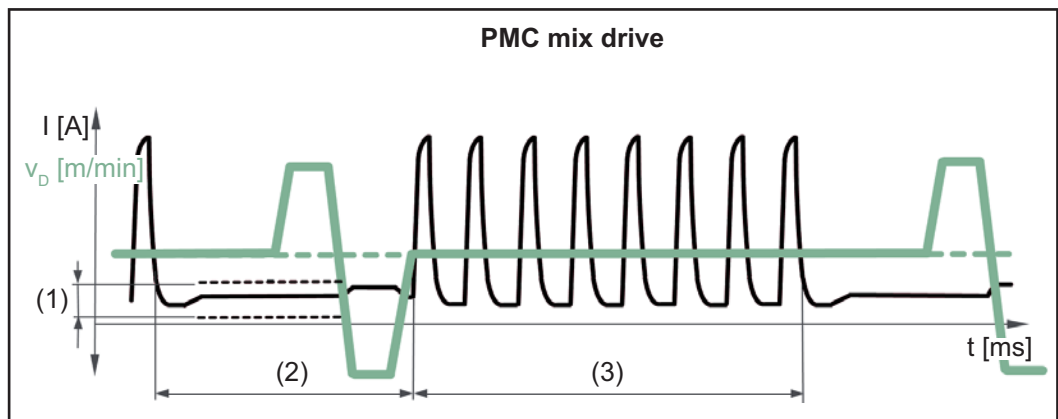


Process parameters for Process Mix

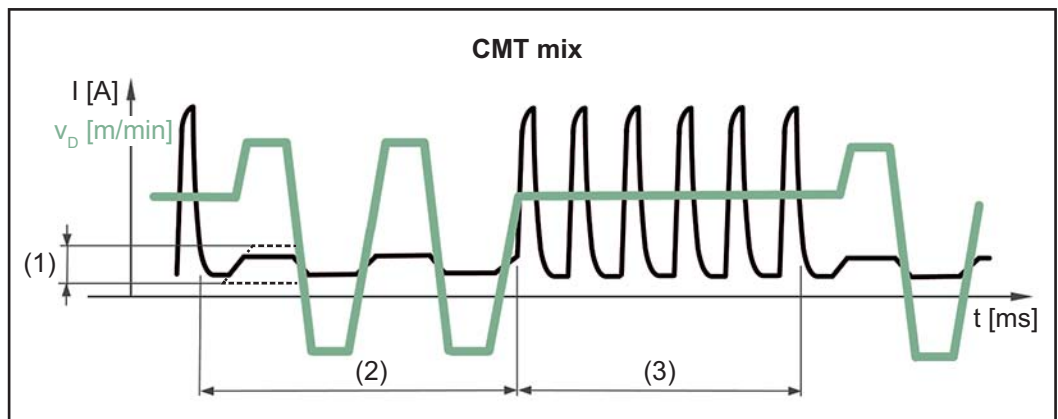
The following process parameters for mixed processes can be set under "Process mix":



Mixed process between PMC and LSC welding process. A cold LSC process phase follows a hot PMC process phase as part of a cycle.



Mixed process between PMC and wire movement reversal using a PushPull drive unit. A cold low power phase with calibration movement follows a hot PMC process phase.



Mixed process between CMT and PMC welding process. Cold CMT process phases follow hot PMC process phases.

- (1) Lpc - Lower power correction
- (2) Lptc - Lower power time correction
- (3) Hptc - Upper power time correction

vd

Wire speed

Is taken from the welding parameters

Setting range: 1.0 - 25.0 m/min (40 - 985 ipm)

The wire speed value can also be specified or changed in the Process mix parameters.

Alc

Arc length correction

Is taken from the welding parameters

Setting range: -10.0 - +10.0

The arc length correction value can also be specified or changed in the Process mix parameters.

For CMT mix:

Positive correction:

increase in the pulsed voltage for the PMC phase

longer reverse movement in the CMT phase (increases arc length)

Negative correction:

reduction in the pulsed voltage for the PMC phase

shorter reverse movement in the CMT phase (reduces arc length)

PDc

Pulse/dynamic correction

Is taken from the welding parameters

Setting range: -10.0 - +10.0

The pulse/dynamic correction value can also be specified or changed in the Process mix parameters.

For CMT mix:

Positive correction:

increase in the pulse energy (pulse current height, pulse current width)

Reduction in the pulse frequency in the PMC phase

Negative correction:

reduction in the pulse energy (pulse current height, pulse current width)

Increase in the pulse frequency in the PMC phase

Hptc (3)

Upper power time correction

To set the duration of the hot process phase in a mixed process

Setting range: -10.0 - +10.0

Factory setting: 0

Lptc (2)

Lower power time correction

To set the duration of the cold process phase in a mixed process

Setting range: -10.0 - +10.0

Factory setting: 0.0

Upper and lower power time correction is used to define the relationship between hot and cold process phases.

If the lower power time correction is increased, the process frequency reduces and the LSC process phase becomes longer.

If the lower power time correction is reduced, the process frequency increases and the LSC process phase becomes shorter.

Lpc (1)**Lower power correction**

To set the energy input in the cold process phase in a mixed process

Setting range: -10.0 - +10.0

Factory setting: 0

If the lower power correction is increased, this results in a higher wire speed and therefore higher energy yield in the cold LSC process phase.

R/L alignment

Align the welding circuit resistance (R) and welding circuit inductivity (L) if one of the following components of the welding system is changed:

- Torch hosepacks
- Return lead cables, welding power-leads
- Welding torches, electrode holders
- Push-pull units

Prerequisites for R/L alignment:

The welding system must be complete: closed welding loop with torch and torch hosepack, wirefeeders, return lead cable, interconnecting hosepacks.

Performing R/L alignment:

1 Select Setup menu / Process param. / R/L-check / alignment

2 Press the right adjusting dial

The current welding circuit inductivity values in μH and welding circuit resistance values in $\text{m}\Omega$ are displayed.

3 Press the right adjusting dial (or press the torch trigger)

"Connect earth" is shown on the display.

4 Establish a safe ground earth connection

IMPORTANT! Contact between the earthing clamp and workpiece must be established on a cleaned area of the workpiece.

5 Press the right adjusting dial (or press the torch trigger)

"Remove nozzle" is shown on the display.

6 Remove the gas nozzle from the welding torch

7 Press the right adjusting dial (or press the torch trigger)

"Contact workp." is shown on the display.

8 Place the contact tip of the welding torch flush against the workpiece surface

9 Press the torch trigger
(or press the right adjusting dial)

After a successful measurement, the current values are displayed.

10 Select "Finish" by turning the right adjusting dial

11 Press the right adjusting dial

- 12 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Settings

General

NOTE!

Because of firmware updates, certain functions may be available for your device but not described in these operating instructions or vice versa.

In addition, individual figures may also differ slightly from the operating elements of your device. However, the function of these operating elements is identical.



WARNING!

Operating the device incorrectly can cause serious injury and damage.

- ▶ Do not use the functions described until you have thoroughly read and understood the following documents:
 - these operating instructions,
 - all operating instructions for system components, especially the safety rules.
-

Overview

The settings contain the following options:

Under "View"

- Units
- Standards
- UIBS (display brightness)
- DRSL (display replaced characteristics)
- Setting F1 and F2 special function parameters
- Setting the parameters for the Favourites button
- System data

Under "System"

- Interior lighting setup
 - Restore factory settings
 - Resetting the password for the power source website
 - Information
 - Special display for JobMaster
 - Spot welding mode
-

Setting the units

1 Select Setup menu / Settings / View / Unit

2 Press the right adjusting dial

The first of the available units is displayed.

3 Select the desired unit by turning the right adjusting dial:

- metric (mm, kg, etc.)
- imperial (in., lbs., etc.)

4 Press the right adjusting dial to apply the units

5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Setting the standards

- 1 Select Setup menu / Settings / View / Standard
- 2 Press the right adjusting dial

The first of the available standards is displayed.

- 3 Select the desired standard by turning the right adjusting dial:
 - CEN
Name of filler metal according to European standards
(e.g. AlMg 5, CuSi3, Steel, etc.)
 - AWS
Name of filler metal according to the American Welding Society Standard
(e.g. ER 5356, ER CuSi-A, ER 70 S-6, etc.)
 - 4 Press the right adjusting dial to set the standard
 - 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time
-

Setting the display brightness

- 1 Select Setup menu / Settings / View / UIBS
UIBS = User interface brightness settings

- 2 Press the right adjusting dial

The value for the display brightness is shown.

- 3 Select the desired display brightness by turning the right adjusting dial (1 - 4)
 - 4 Press the right adjusting dial to apply the value
 - 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time
-

Displaying replaced characteristics

- 1 Select setup menu / Settings / View / DRSL
DRSL = Display replaced synergic lines

- 2 Press the right adjusting dial

- 3 Select "on" by turning the right adjusting dial

- 4 Press the right adjusting dial to activate the function

- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time
-

Setting F1 and F2 special function parameters via the Setup menu

- 1 Select Setup menu / Settings / View / F1/F2 Param.
- 2 Press the right adjusting dial

The parameters currently stored under F1 and F2 are displayed.
If no parameters are stored, the first possible parameter is displayed.

- 3 Select the desired parameter by turning the right adjusting dial
- 4 Press the right adjusting dial

- 5 Turn the right adjusting dial to determine under which special function the parameter should be stored:
 - ... the parameter is not assigned to a special function/a stored parameter is deleted
 - F1 ... parameter is stored under special function F1
 - F2 ... parameter is stored under special function F2
- 6 Press the right adjusting dial to confirm the selection
- 7 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Setting the Favourites button via the Setup menu

- 1 Select Setup menu / Settings / View / Favourite
- 2 Press the right adjusting dial

The list of parent folders and parameters is displayed.
If a parameter or a folder is currently stored under the Favourites button, this is indicated with ★ at the end of the display.

- 3 Select the desired parameter or folder by turning the right adjusting dial
- 4 Press the right adjusting dial
- 5 Turn the right adjusting dial to determine whether the parameter or folder should be stored under the Favourites button:
 - ... parameter or folder is not stored
 - ★ ... parameter or folder is stored
- 6 Press the right adjusting dial to confirm the selection

The stored parameter or folder is indicated with ★ at the end of the display.

- 7 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Retrieving system data

- 1 Select Setup menu / Settings / View / System data
- 2 Press the right adjusting dial

The first available system data value is displayed.

- 3 Select the desired system data value by turning the right adjusting dial
- 4 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

The following system data can be displayed:

IP

Current arc power in kW

The arc power is the product of welding current and welding voltage and is used to calculate the electrical energy input:

$$E = IP / v_s$$

E Electrical energy input in kJ/cm

IP Arc power in kW

v_s Welding speed in cm/s

IE

Current arc energy in kJ

The arc energy is the sum total of the arc power and calculates the heat input of the weld seam most recently produced.

If the weld seam length is known the electrical energy input can be calculated:

$$E = IE / L$$

E Electrical energy input in kJ/cm

IE Arc energy in kJ

L Length of the weld seam in cm

The arc energy is preferably used during manual welding.

I-M1

Current motor current in A, wirefeeder 1
(wirefeeder next to the arc)

I-M2

Current motor current in A, wirefeeder 2
(e.g. the rear wirefeeder in a push-pull system)

I-M3

Current motor current in A, wirefeeder 3
(e.g. an unreeling wirefeeder in a push-pull system with unreeling wirefeeder)

CFI

Current flow rate in l/min on the cooling unit
(with built-in OPT/i CU flow temperature sensor option)

Error output if flow rate < 0.7 l/min

CU-t

Current coolant temperature in °C on the cooling unit
(with built-in OPT/i CU flow temperature sensor option)

Error output if coolant temperature > 70 °C
(measured during coolant return)

I-t

Arc time in h

DC-t

Total power source operating hours in h

Gcon

Total gas consumption in l

Setting the interior lighting

- 1 Select Setup menu / Settings / System / CLS
- 2 Press the right adjusting dial
- 3 Select the desired duration by turning the right adjusting dial:
off ... interior lighting switched off
1 - 60 ... interior lighting is switched on for the duration entered
on ... interior lighting is switched on permanently
- 4 Press the right adjusting dial
- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Restoring the factory settings

- 1 Select Setup menu / Settings / System / FAC
- 2 Press the right adjusting dial
- 3 Turn the right adjusting dial to select "Yes", thereby restoring the power source to the factory settings
- 4 Press the right adjusting dial

The process parameters and machine default values are immediately reset to the factory settings without any further warning.

- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Resetting the password for the power source website

- 1 Select Setup menu / Settings / System / Web-PWreset
- 2 Press the right adjusting dial
- 3 Turn the right adjusting dial to select "Yes", thereby resetting the password for the power source:
User name = admin
Password = admin
- 4 Press the right adjusting dial

The password is immediately reset to the factory settings without any further warning.

- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Retrieving device information

- 1 Select Setup menu / Settings / System / Information
- 2 Press the right adjusting dial

The first item of available information is displayed.

- 3 Select the desired information by turning the right adjusting dial
Serial number
Image version
IP address
MAC address
- 4 Press the right adjusting dial to display the information
- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Setting the special display for JobMaster

- 1 Select Setup menu / Settings / System / iJob
- 2 Press the right adjusting dial
- 3 Activate or deactivate the function by turning the right adjusting dial:
off ... the special display for JobMaster is deactivated
on ... the special display for JobMaster is activated
- 4 Press the right adjusting dial
- 5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

The following can now be set and carried out on the JobMaster welding torch:

- Mode
 - SynchroPulse
 - Gas test
-

Setting the mode for spot welding

1 Select Setup menu / Settings / System / SPm

2 Press the adjusting dial

3 Turn the adjusting dial and select the desired mode for spot welding

2-step = spot welding in 2-step mode:

The spot welding process runs for as long as the torch trigger is kept pressed and ends no later than at the expiry of the spot welding time.

Releasing the torch trigger stops the spot welding process before the spot welding time expires

4-step = spot welding in 4-step mode:

The spot welding process starts once the torch trigger is pressed and ends no later than at the expiry of the spot welding time.

Press the torch trigger again to stop the spot welding process before the spot welding time expires.

4 Press the right adjusting dial

5 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

More information on spot welding:

- Page **80** (spot welding in general)
- Page **100** (spot welding time)

Setting the language

Setting the language

- 1 Access the Setup menu
- 2 Select the language
- 3 Press the right adjusting dial

The language abbreviation of the currently set language is highlighted on the display.

- 4 Select the desired language by turning the right adjusting dial

The following languages can be selected:

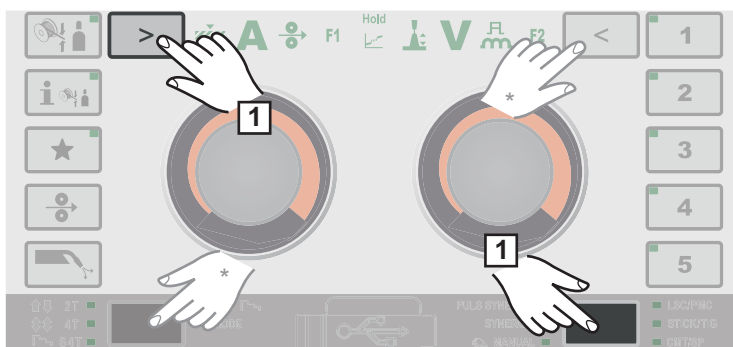
cs	Czech	nl	Dutch
da	Danish	no	Norwegian
de	German	pl	Polish
en	English	pt	Portuguese (Brazil)
es	Spanish	ro	Romanian
et	Estonian	ru	Russian
fr	French	sk	Slovak
hr	Croatian	sl	Slovenian
hu	Hungarian	sr	Serbian
it	Italian	sv	Swedish
lt	Lithuanian	tr	Turkish
lv	Latvian	uk	Ukrainian

- 5 Press the right adjusting dial to apply the language
- 6 To exit the Setup menu, press the "Welding process" and "Mode" buttons at the same time

Keylock

Keylock

To activate the keylock



1 Press the "Welding process" and left parameter selection buttons at the same time

* Alternatively, the "Mode" and right parameter selection buttons can be pressed.

The key symbol and a tick are shown on the display:



The following functions are disabled:

- the adjusting dial functions
- selection of the filler metal
- saving and deleting EasyJobs
- the "Mode" button
- the "Welding process" button
- the Setup menu

The following functions are available:

- the "Filler metal info" button
- retrieving EasyJobs
- the "Wire threading" button
- the "Gas-test" button
- the parameter selection buttons

To unlock keys again

1 Press the "Welding process" and left parameter selection buttons at the same time

* Alternatively, the "Mode" and right parameter selection buttons can be pressed.

The key symbol and a X are shown on the display:



Troubleshooting and Maintenance

The Error menu

The Error menu

Notifications, warnings and errors are shown on the display with the corresponding number.

If an error occurs, the Error menu is always in the foreground.

Pressing the right adjusting dial opens the Error menu on "confirm".

Pressing the right adjusting dial a second time confirms the error; the Error menu closes.

By turning the right adjusting dial you can navigate between "Cause", "Solution" and "Hide".

If you select "Cause" or "Solution", the corresponding description is displayed when the right adjusting dial is pressed.

Turn the left or right adjusting dial to scroll through the displayed text.

Pressing the right adjusting dial takes you back to the Error menu.

If you select "Hide", the Error menu closes, however, the error will not be reset. The top right LED flashes on the display to show that there is a hidden, not reset error. The error can now be called up as the first entry in the Setup menu.

To enter the Setup menu, press the "Welding process" and "Mode" buttons at the same time.

Troubleshooting

General

The power sources are equipped with an intelligent safety system, meaning it has been possible to dispense with nearly all fuses. After a possible malfunction has been remedied, the power source can be used again as normal.

Possible malfunctions, warning notices or status codes are shown on the display as plain text dialogues.

Safety



WARNING!

An electric shock can be fatal.

Before opening the device

- ▶ Turn the mains switch to the "O" position
 - ▶ Unplug the device from the mains
 - ▶ Ensure the device cannot be switched back on
 - ▶ Using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have been discharged
-



WARNING!

An inadequate ground conductor connection can cause serious injury or damage.

The housing screws provide a suitable ground conductor connection for earthing the housing.

- ▶ The housing screws must NOT be replaced by any other screws that do not provide a reliable ground conductor connection.
-

Power Source Troubleshooting

Power source does not function

Mains switch is on, but indicators are not lit up

Cause: There is a break in the mains lead; the mains plug is not plugged in

Remedy: Check the mains lead, ensure that the mains plug is plugged in

Cause: Mains socket or mains plug faulty

Remedy: Replace faulty parts

Cause: Mains fuse protection

Remedy: Change the mains fuse

Cause: Short circuit on the 24 V supply of SpeedNet connection socket or external sensor

Remedy: Unplug connected components

No welding current

Mains switch is on, overtemperature is displayed

Cause: Overload; the duty cycle has been exceeded

Remedy: Check duty cycle

Cause: Thermostatic automatic circuit breaker has been tripped

Remedy: Wait until the power source automatically comes back on after the end of the cooling phase

Cause: Limited supply of cooling air

Remedy: Ensure accessibility to cooling air ducts

Cause: The fan in the power source is faulty

Remedy: Contact After-Sales Service

No welding current

Power source switched on, displays illuminate

Cause: Incorrect ground connection

Remedy: Check ground connection for polarity

Cause: Power cable in welding torch damaged or broken.

Remedy: Replace welding torch

Nothing happens when the torch trigger is pressed

Power source mains switch is ON and indicators are lit up

Cause: Only for welding torches with an external control plug: the control plug is not plugged in

Remedy: Plug in the control plug

Cause: Welding torch or welding torch control line is faulty

Remedy: Replace the welding torch

no shielding gas

all other functions present

Cause: Gas cylinder empty

Remedy: Change gas cylinder

Cause: Gas pressure regulator faulty

Remedy: Replace gas pressure reducer

Cause: Gas hose not attached, or damaged

Remedy: Attach or replace gas hose

Cause: Welding torch faulty

Remedy: Change welding torch

Cause: Gas solenoid valve faulty

Remedy: Inform the service team

Poor-quality weld properties

Cause: Incorrect welding parameters

Remedy: Check settings

Cause: Poor ground earth connection

Remedy: Establish good contact with workpiece

Cause: Too little or no shielding gas

Remedy: Check gas pressure regulator, gas hose, gas solenoid valve, welding torch gas connection, etc.

Cause: Welding torch leaks

Remedy: Change welding torch

Cause: Incorrect or heavily worn contact tip

Remedy: Change contact tip

Cause: Incorrect wire alloy or incorrect wire diameter

Remedy: Check wire electrode in use

Cause: Incorrect wire alloy or incorrect wire diameter

Remedy: Check weldability of the base material

Cause: Shielding gas not suitable for wire alloy

Remedy: Use correct shielding gas

Irregular wire speed

Cause: Braking force has been set too high

Remedy: Loosen the brake

Cause: Contact tip hole too narrow

Remedy: Use suitable contact tip

Cause: Inner liner in the welding torch faulty

Remedy: Check the inner liner for kinks, dirt, etc. and replace if necessary

Cause: Feed rollers not suitable for wire electrode used

Remedy: Use suitable feed rollers

Cause: Feed rollers have the wrong contact pressure

Remedy: Optimize contact pressure

Wirefeed issues

For applications with long hosepacks

Cause: Improper laying of the hosepack

Remedy: Lay hosepack as straight as possible while avoiding tight bending radii

Welding torch gets very hot

Cause: Welding torch is inadequately sized

Remedy: Observe duty cycle and load limits

Cause: For water-cooled systems only: Coolant circulation too low

Remedy: Check coolant level, coolant flow volume, coolant contamination etc. More details can be found in the cooling unit's Operating Instructions

Service, maintenance and disposal

General Under normal operating conditions, the power source requires only a minimum of care and maintenance. However, it is vital to observe some important points to ensure the welding system remains in a usable condition for many years.

Safety



WARNING!

An electric shock can be fatal.

Before opening the device

- ▶ Turn the mains switch to the "O" position
 - ▶ Unplug the device from the mains
 - ▶ Ensure the device cannot be switched back on
 - ▶ Using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have been discharged
-

At every start-up

- Check mains plug, mains cable, welding torch, interconnecting hosepack and grounding (earthing) connection for damage
- Check whether the all-round clearance of 0.5 m (1 ft. 8 in.) is kept to ensure that the cooling air can easily flow and escape.

NOTE!

Air inlets and outlets must never be covered, not even partially.

If necessary

If a lot of dust has accumulated:

- Remove the fin element on the rear of the housing
 - Detach the air filter located behind and clean
-

Every 2 months

- If present: clean air filter
-

Every 6 months



CAUTION!

Risk of damage to electronic parts.

- ▶ Do not bring the air nozzle too close to electronic parts.
-
- Open the device
 - Blow out the inside of the device with dry and reduced compressed air
 - Also clean the cooling air ducts if there is a large accumulation of dust
-

Disposal

Materials should be disposed of according to valid local and national regulations.

Technical data

Average consumption values during welding

Average wire electrode consumption during MIG/MAG welding

Average wire electrode consumption at a wire speed of 5 m/min			
	1.0 mm wire electrode diameter	1.2 mm wire electrode diameter	1.6 mm wire electrode diameter
Steel wire electrode	1.8 kg/h	2.7 kg/h	4.7 kg/h
Aluminum wire electrode	0.6 kg/h	0.9 kg/h	1.6 kg/h
CrNi wire electrode	1.9 kg/h	2.8 kg/h	4.8 kg/h

Average wire electrode consumption at a wire speed of 10 m/min			
	1.0 mm wire electrode diameter	1.2 mm wire electrode diameter	1.6 mm wire electrode diameter
Steel wire electrode	3.7 kg/h	5.3 kg/h	9.5 kg/h
Aluminum wire electrode	1.3 kg/h	1.8 kg/h	3.2 kg/h
CrNi wire electrode	3.8 kg/h	5.4 kg/h	9.6 kg/h

Average shielding gas consumption during MIG/MAG welding

Wire electrode diameter	1.0 mm	1.2 mm	1.6 mm	2.0 mm	2 x 1.2 mm (TWIN)
Average consumption	10 l/min	12 l/min	16 l/min	20 l/min	24 l/min

Average shielding gas consumption during TIG welding

Gas nozzle size	4	5	6	7	8	10
Average consumption	6 l/min	8 l/min	10 l/min	12 l/min	12 l/min	15 l/min

Technical data

Explanation of the Term Duty Cycle

The duty cycle (D.C.) is the period of a ten minute cycle in which the device may be operated at the stated power without overheating.

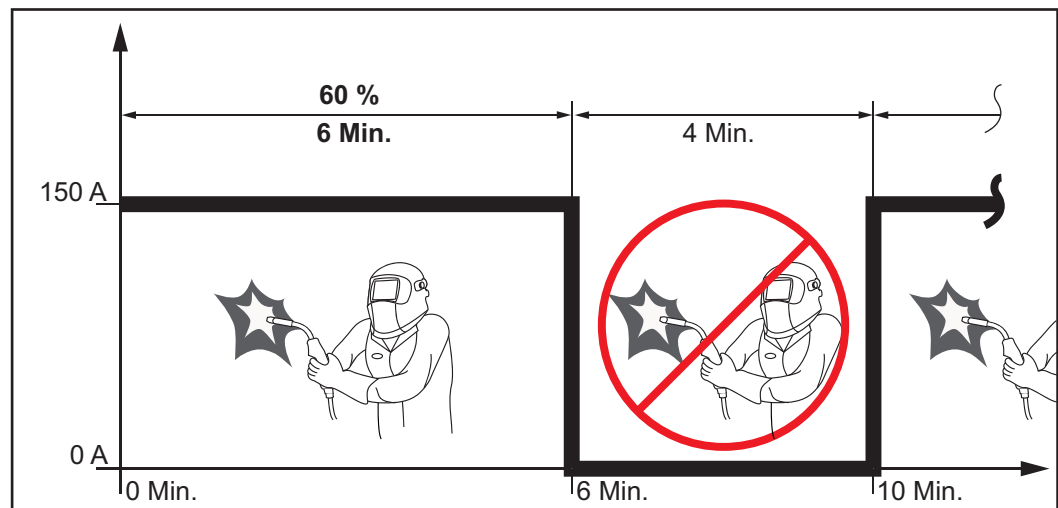
NOTE!

The D.

C. values cited on the rating plate relate to an ambient temperature of 40 °C. If the ambient temperature is higher, the D.C. or power must be lowered accordingly.

Example: Welding with 150 A at 60% D.C.

- Welding phase = 60% of 10 mins = 6 mins
- Cool-down phase = rest time = 4 mins
- Following the cool-down phase, the cycle begins again.



To use the device without interruptions:

- 1 Search for a 100% D.C. value in the technical data, which corresponds to the existing ambient temperature.
- 2 Reduce the power or amperage value correspondingly so that the device can operate without a cool-down phase.

Special Voltage

For devices designed for special voltages, the technical data on the rating plate applies.

The following applies for all devices with a permitted grid voltage of up to 460 V: The standard mains plug allows the user to operate with a grid voltage of up to 400 V. For grid voltages up to 460 V fit a mains plug permitted for such use or install the mains supply directly.

**VW AG/VAS 821
001/MIG270i**

Mains voltage (U_1)	3 x	400 V
Max. effective primary current ($I_{1\text{eff}}$)		9.7 A
Max. primary current ($I_{1\text{max}}$)		15.3 A
Mains fuse protection		16 A slow-blow
Mains voltage tolerance		-15 / +15 %
Grid frequency		50/60 Hz
Cos phi (1)		0.99
Max. permitted mains impedance Z_{max} on PCC ¹⁾		117 mOhm
Recommended earth-leakage circuit breaker		Type B
Welding current range (I_2)		
MIG / MAG		3 - 270 A
TIG		3 - 270 A
Rod electrode		10 - 270 A
Welding current at 10 min/40 °C (104 °F)	40 %	60% 100 %
	270 A	220 A 190 A
Output voltage range according to standard characteristic (U_2)		
MIG / MAG		14.2 - 27.5 V
TIG		14.1 - 20.8 V
Rod electrode		20.4 - 30.8 V
Open circuit voltage (U_0 peak/ U_0 r.m.s)		57 V
Degree of protection		IP 23
Type of cooling		AF
Overvoltage category		III
Pollution degree according to IEC60664		3
EMC device class		A
Safety symbols		S, CE, CSA
Dimensions l x w x h	687 x 276 x 445 mm /	27.0 x 10.9 x 17.5 in.
Weight		33.1 kg / 73.0 lb.
Max. noise emission (LWA)		69 dB (A)
Max. shielding gas pressure		7 bar / 101.5 psi
Wire speed		1 - 25 m/min / 40 - 980 ipm
Wire drive		4-roller drive
Wire diameter		0.8 - 1.6 mm / 0.03 - 0.06 in.
Wirespool diameter		max. 300 mm / max. 11.8 in.
Wirespool weight		max. 19.0 kg / max. 41.9 lb.
Idle state power consumption at 400 V		31 W
Power source efficiency at 270 A / 30,8 V		90 %

The wirefeeder for the VW AG/VAS 821 001/MIG270i is integrated in the power source.

- 1) Interface to a 230/400 V and 50 Hz public grid

**VW AG/VAS 821
001/MIG270i MV**

Mains voltage (U_1)	3 x	200 V	230 V
Max. effective primary current ($I_{1\text{eff}}$)		16.9 A	15.1 A
Max. primary current ($I_{1\text{max}}$)		26.5 A	23.7 A
Mains fuse protection		35 A slow-blow	
Mains voltage (U_1)	3 x	380 V	400 V 460 V
Max. effective primary current ($I_{1\text{eff}}$)		9.5 A	9.7 A 8.5 A
Max. primary current ($I_{1\text{max}}$)		16.0 A	15.3 A 13.4 A
Mains fuse protection		16 A slow-blow	
Mains voltage tolerance		-10 / +15 %	
Grid frequency		50/60 Hz	
Cos phi (1)		0.99	
Max. permitted mains impedance Z_{max} on PCC ¹⁾		117 mOhm	
Recommended earth-leakage circuit breaker		Type B	
Welding current range (I_2)			
MIG / MAG		3 - 270 A	
TIG		3 - 270 A	
Rod electrode		10 - 270 A	
Welding current at 10 min/40 °C (104 °F)		40 %	60% 100 %
		270 A	220 A 190 A
Output voltage range according to standard characteristic (U_2)			
MIG / MAG		14.2 - 27.5 V	
TIG		14.1 - 20.8 V	
Rod electrode		20.4 - 30.8 V	
Open circuit voltage (U_0 peak/ U_0 r.m.s)		66 V	
Degree of protection		IP 23	
Type of cooling		AF	
Overvoltage category		III	
Pollution degree according to IEC60664		3	
EMC device class		A	
Safety symbols		S, CE, CSA	
Dimensions l x w x h		687 x 276 x 445 mm 27.0 x 10.9 x 17.5 in.	
Weight		33.2 kg 73.1 lb.	
Max. noise emission (LWA)		69 dB (A)	
Max. shielding gas pressure		7 bar 101.5 psi	

Wire speed	1 - 25 m/min 40 - 980 ipm
Wire drive	4-roller drive
Wire diameter	0.8 - 1.6 mm 0.03 - 0.06 in.
Wirespool diameter	max. 300 mm max. 11.8 in.
Wirespool weight	max. 19.0 kg max. 41.9 lb.
Idle state power consumption at 400 V	35,9 W
Power source efficiency at 270 A / 30,8 V	90 %

The wirefeeder for the VW AG/VAS 821 001/MIG270i MV is integrated in the power source.

- 1) Interface to a 230/400 V and 50 Hz public grid

Overview with critical raw materials, year of production of the device

Overview with critical raw materials:

An overview of which critical raw materials are contained in this device can be found at the following Internet address.

www.fronius.com/en/about-fronius/sustainability.

To calculate the year of production of the device:

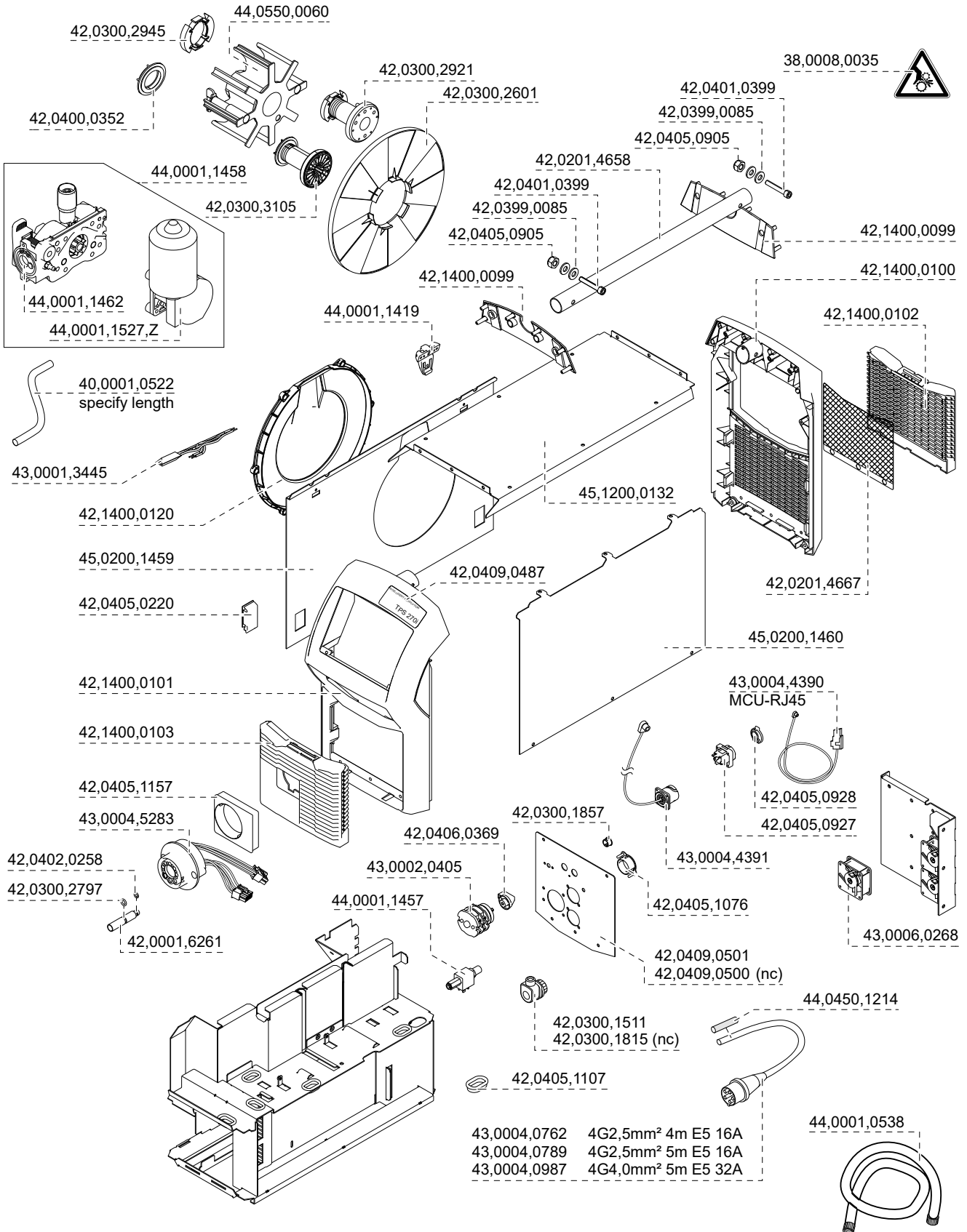
- Each device is provided with a serial number
- The serial number consists of 8 digits - for example 28020099
- The first two digits give the number from which the year of production of the device can be calculated
- This figure minus 11 gives the year of production
 - For example: Serial number = **28**020065, calculation of the year of production = **28** - 11 = 17, year of production = 2017

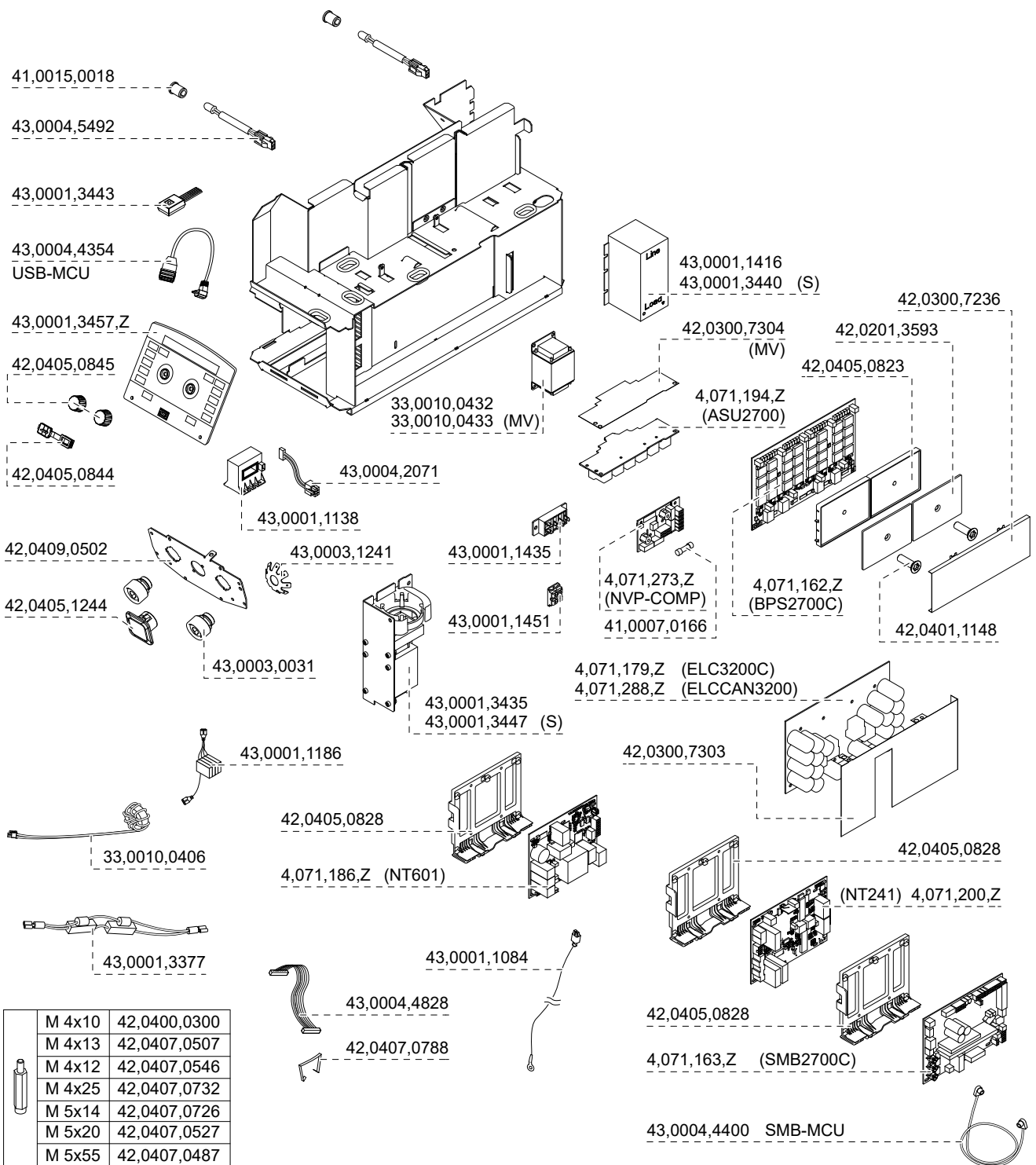
Appendix


Spare parts list: VW AG/VAS 821 001/MIG270i

VW AG/VAS 821 001/MIG270i
 VW AG/VAS 821 001/MIG270i/MV

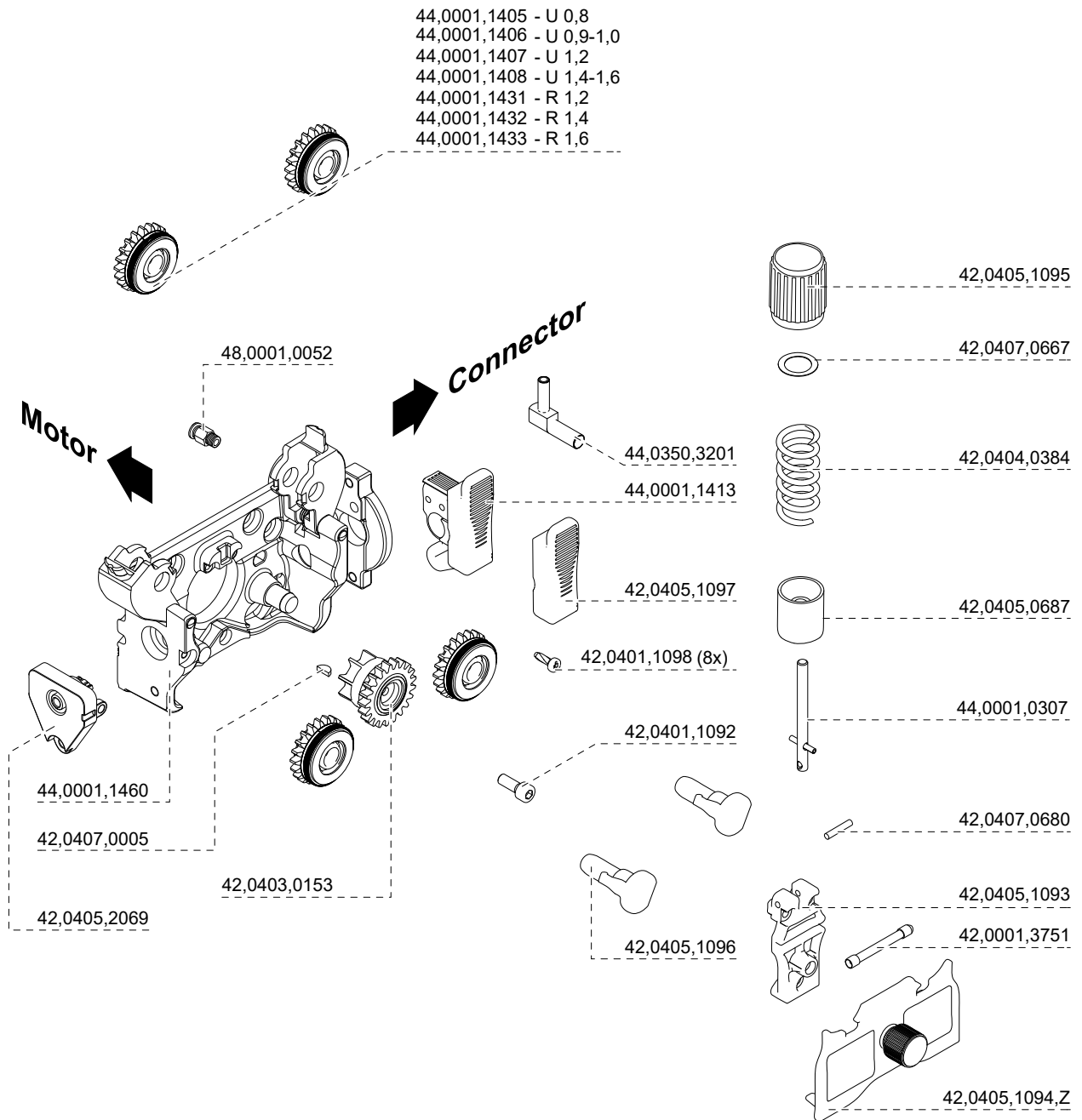
4,075,170,450
 4,075,170,459





	M 4x10	42,0400,0300
	M 4x13	42,0407,0507
	M 4x12	42,0407,0546
	M 4x25	42,0407,0732
	M 5x14	42,0407,0726
	M 5x20	42,0407,0527
	M 5x55	42,0407,0487

motor plate alu 4R s - compact





FAN Austria GmbH
Herderstraße 44
A-4600 Wels

www.fan-austria.com
office@fan-austria.com
deutschland@fan-austria.com
Tel. ++43/7242/44432
Fax. ++43/7242/69438