Operating instructions

EN

Power source

Sirion 405 puls
Sirion 505 puls

099-005720-EW501 | Observe additional system documents! | 09.04.2024

General instructions

⚠ WARNING

Read the operating instructions!
The operating instructions provide an introduction to the safe use of the products.

- Read and observe the operating instructions for all system components, especially the safety instructions and warning notices!
- Observe the accident prevention regulations and any regional regulations!
- The operating instructions must be kept at the location where the machine is operated.
- Safety and warning labels on the machine indicate any possible risks.
  Keep these labels clean and legible at all times.
- The machine has been constructed to state-of-the-art standards in line with any applicable regulations and industrial standards. Only trained personnel may operate, service and repair the machine.
- Technical changes due to further development in machine technology may lead to a differing welding behaviour.

In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.

A list of authorised sales partners can be found at www.ewm-group.com/en/specialist-dealers.

Liability relating to the operation of this equipment is restricted solely to the function of the equipment. No other form of liability, regardless of type, shall be accepted. This exclusion of liability shall be deemed accepted by the user on commissioning the equipment.
The manufacturer is unable to monitor whether or not these instructions or the conditions and methods are observed during installation, operation, usage and maintenance of the equipment.

An incorrectly performed installation can result in material damage and injure persons as a result. For this reason, we do not accept any responsibility or liability for losses, damages or costs arising from incorrect installation, improper operation or incorrect usage and maintenance or any actions connected to this in any way.

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The content of this document has been prepared and reviewed with all reasonable care. The information provided is subject to change; errors excepted.

Data security

The user is responsible for backing up data of all changes from the factory setting. The user is liable for erased personal settings. The manufacturer does not assume any liability for this.

1 Contents

2 For your safety

2.1 Notes on using these operating instructions

⚠ DANGER

Working or operating procedures which must be closely observed to prevent imminent serious and even fatal injuries.

- Safety notes include the "DANGER" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol on the edge of the page.

⚠ WARNING

Working or operating procedures which must be closely observed to prevent serious and even fatal injuries.

- Safety notes include the "WARNING" keyword in the heading with a general warning symbol.
- The hazard is also highlighted using a symbol in the page margin.

⚠ CAUTION

Working or operating procedures which must be closely observed to prevent possible minor personal injury.

- The safety information includes the "CAUTION" keyword in its heading with a general warning symbol.
- The risk is explained using a symbol on the edge of the page.

☞ ***Technical aspects which the user must observe to avoid material or equipment damage.***

Instructions and lists detailing step-by-step actions for given situations can be recognised via bullet points, e.g.:

- Insert the welding current lead socket into the relevant socket and lock.

2.2 Explanation of icons

Symbol	Description	Symbol	Description
	Indicates technical aspects which the user must observe.		Activate and release / Tap / Tip
	Switch off machine		Release
	Switch on machine		Press and hold
	Incorrect / Invalid		Switch
	Correct / Valid		Turn
	Input		Numerical value – adjustable
	Navigation		Signal light lights up in green
	Output		Signal light flashes green
	Time representation (e.g.: wait 4 s / actuate)		Signal light lights up in red
	Interruption in the menu display (other setting options possible)		Signal light flashes red
	Tool not required/do not use		Signal light lights up in blue
	Tool required/use		Signal light flashes blue

2.3 Safety instructions

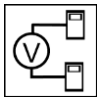
⚠ WARNING

Risk of accidents due to non-compliance with the safety instructions!
Non-compliance with the safety instructions can be fatal!

- Carefully read the safety instructions in this manual!
- Observe the accident prevention regulations and any regional regulations!
- Inform persons in the working area that they must comply with the regulations!

Risk of injury from electrical voltage!
Voltages can cause potentially fatal electric shocks and burns on contact. Even low voltages can cause a shock and lead to accidents.

- Never touch live components such as welding current sockets or stick, tungsten or wire electrodes!
- Always place torches and electrode holders on an insulated surface!
- Wear the full personal protective equipment (depending on the application)!
- The machine may only be opened by qualified personnel!
- The device must not be used to defrost pipes!



Hazard when interconnecting multiple power sources!
If a number of power sources are to be connected in parallel or in series, only a technical specialist may interconnect the sources as per standard IEC 60974-9:2010: Installation and use and German Accident Prevention Regulation BVG D1 (formerly VBG 15) or country-specific regulations.
Before commencing arc welding, a test must verify that the equipment cannot exceed the maximum permitted open circuit voltage.

- Only qualified personnel may connect the machine.
- When taking individual power sources out of operation, all mains and welding current leads must be safely disconnected from the welding system as a whole. (Hazard due to reverse polarity voltage!)
- Do not interconnect welding machines with pole reversing switch (PWS series) or machines for AC welding since a minor error in operation can cause the welding voltages to be combined, which is not permitted.

Risk of injury due to radiation or heat!
Arc radiation can lead to skin and eye injuries.
Contact with hot workpieces and sparks can lead to burns.

- Use hand shield or welding helmet with the appropriate safety level (depends on the application).
- Wear dry protective clothing (e.g. hand shield, gloves, etc.) in accordance with the applicable regulations of your country.
- Persons who are not directly involved should be protected with a welding curtain or suitable safety screen against radiation and the risk of blinding!

⚠ WARNING

Risk of injury due to improper clothing!
During arc welding, radiation, heat and voltage are sources of risk that cannot be avoided. The user has to be equipped with the complete personal protective equipment at all times. The protective equipment has to include:

- Respiratory protection against hazardous substances and mixtures (fumes and vapours); otherwise implement suitable measures such as extraction facilities.
- Welding helmet with proper protection against ionizing radiation (IR and UV radiation) and heat.
- Dry welding clothing (shoes, gloves and body protection) to protect against warm environments with conditions comparable to ambient temperatures of 100 °C or higher and arcing and work on live components.
- Hearing protection against harming noise.

Explosion risk!
Apparently harmless substances in closed containers may generate excessive pressure when heated.

- Move containers with inflammable or explosive liquids away from the working area!
- Never heat explosive liquids, dusts or gases by welding or cutting!

Fire hazard!
Due to the high temperatures, sparks, glowing parts and hot slag that occur during welding, there is a risk of flames.

- Be watchful of potential sources of fire in the working area!
- Do not carry any easily inflammable objects, e.g. matches or lighters.
- Ensure suitable fire extinguishers are available in the working area!
- Thoroughly remove any residue of flammable materials from the workpiece prior to starting to weld.
- Only further process workpieces after they have cooled down. Do not allow them to contact any flammable materials!

⚠ CAUTION

Smoke and gases!
Smoke and gases may lead to shortness of breath and poisoning! The ultraviolet radiation of the arc may also convert solvent vapours (chlorinated hydrocarbon) into poisonous phosgene.

- Ensure sufficient fresh air!
- Keep solvent vapours away from the arc beam field!
- Wear suitable respiratory protection if necessary!
- To prevent the formation of phosgene, residues of chlorinated solvents on workpieces must first be neutralised using appropriate measures.

Noise exposure!
Noise exceeding 70 dBA can cause permanent hearing damage!

- Wear suitable ear protection!
- Persons located within the working area must wear suitable ear protection!

According to IEC 60974-10, welding machines are divided into two classes of electromagnetic compatibility (the EMC class can be found in the Technical data) > *see 8 chapter*:

Class A machines are not intended for use in residential areas where the power supply comes from the low-voltage public mains network. When ensuring the electromagnetic compatibility of class A machines, difficulties can arise in these areas due to interference not only in the supply lines but also in the form of radiated interference.

Class B machines fulfil the EMC requirements in industrial as well as residential areas, including residential areas connected to the low-voltage public mains network.

Setting up and operating

When operating arc welding systems, in some cases, electro-magnetic interference can occur although all of the welding machines comply with the emission limits specified in the standard. The user is responsible for any interference caused by welding.

In order to **evaluate** any possible problems with electromagnetic compatibility in the surrounding area, the user must consider the following: (see also EN 60974-10 Appendix A)

- Mains, control, signal and telecommunication lines
- Radios and televisions
- Computers and other control systems
- Safety equipment
- The health of neighbouring persons, especially if they have a pacemaker or wear a hearing aid
- Calibration and measuring equipment
- The immunity to interference of other equipment in the surrounding area
- The time of day at which the welding work must be carried out

Recommendations for **reducing interference emission**

- Mains connection, e.g. additional mains filter or shielding with a metal tube
- Maintenance of the arc welding system
- Welding leads should be as short as possible and run closely together along the ground
- Potential equalization
- Earthing of the workpiece. In cases where it is not possible to earth the workpiece directly, it should be connected by means of suitable capacitors.
- Shielding from other equipment in the surrounding area or the entire welding system

Electromagnetic fields!
The power source can create electrical or electromagnetic fields that may impair the function of electronic systems such as EDP and CNC devices, telecommunication, power and signal lines as well as pacemakers and defibrillators.

- Follow the maintenance instructions > *see 6.2 chapter*!
- Unwind the welding leads completely!
- Shield radiation-sensitive equipment or facilities appropriately!
- The function of pacemakers may be impaired (seek medical advice if necessary).

⚠ CAUTION

Obligations of the operator!
The respective national directives and laws must be complied with when operating the machine!

- Implementation of national legislation relating to framework directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work and associated individual guidelines.
- In particular, directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work.
- The regulations applicable to occupational safety and accident prevention in the country concerned.
- Setting up and operating the machine as per IEC 60974.-9.
- Brief the user on safety-conscious work practices on a regular basis.
- Regularly inspect the machine as per IEC 60974.-4.

☞ ***The manufacturer's warranty becomes void if non-genuine parts are used!***

- ***Only use system components and options (power sources, welding torches, electrode holders, remote controls, spare parts and replacement parts, etc.) from our range of products!***
- ***Only insert and lock accessory components into the relevant connection socket when the machine is switched off.***

Requirements for connection to the public mains network

High-performance machines can influence the mains quality by taking current from the mains network. For some types of machines, connection restrictions or requirements relating to the maximum possible line impedance or the necessary minimum supply capacity at the interface with the public network (Point of Common Coupling, PCC) can therefore apply. In this respect, attention is also drawn to the machines' technical data. In this case, it is the responsibility of the operator, where necessary in consultation with the mains network operator, to ensure that the machine can be connected.

2.4 Transport and installation

⚠ WARNING

Risk of injury due to improper handling of shielding gas cylinders!
Improper handling and insufficient securing of shielding gas cylinders can cause serious injuries!

- Observe the instructions from the gas manufacturer and any relevant regulations concerning the use of compressed air!
- Do not attach any element to the shielding gas cylinder valve!
- Prevent the shielding gas cylinder from heating up.

⚠ CAUTION

Risk of accidents due to supply lines!
During transport, attached supply lines (mains leads, control cables, etc.) can cause risks, e.g. by causing connected machines to tip over and injure persons!

- Disconnect all supply lines before transport!

Risk of tipping!
There is a risk of the machine tipping over and injuring persons or being damaged itself during movement and set up. Tilt resistance is guaranteed up to an angle of 10° (according to IEC 60974-1).

- Set up and transport the machine on level, solid ground.
- Secure add-on parts using suitable equipment.

Risk of accidents due to incorrectly installed leads!
Incorrectly installed leads (mains, control and welding leads or intermediate hose packages) can present a tripping hazard.

- Lay the supply lines flat on the floor (avoid loops).
- Avoid laying the leads on passage ways.

Risk of injury from heated coolant and its connections!
The coolant used and its connection or connection points can heat up significantly during operation (water-cooled version). When opening the coolant circuit, escaping coolant may cause scalding.

- Open the coolant circuit only when the power source or cooling unit is switched off!
- Wear proper protective equipment (protective gloves)!
- Seal open connections of the hose leads with suitable plugs.

☞ ***The units are designed for operation in an upright position!***
Operation in non-permissible positions can cause equipment damage.

- ***Only transport and operate in an upright position!***

☞ ***Accessory components and the power source itself can be damaged by incorrect connection!***

- ***Only insert and lock accessory components into the relevant connection socket when the machine is switched off.***
- ***Comprehensive descriptions can be found in the operating instructions for the relevant accessory components.***
- ***Accessory components are detected automatically after the power source is switched on.***

☞ ***Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.***

- ***The protective dust cap must be fitted if there is no accessory component being operated on that connection.***
- ***The cap must be replaced if faulty or if lost!***

3 Intended use

⚠ WARNING

§ **Hazards due to improper usage!**
The machine has been constructed to the state of the art and any regulations and standards applicable for use in industry and trade. It may only be used for the welding procedures indicated at the rating plate. Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!

- The equipment must only be used in line with its designated purpose and by trained or expert personnel!
- Do not improperly modify or convert the equipment!

3.1 Applications

Multi-process welding machine for arc welding covering the following welding procedures:

Main procedures for MIG/MAG welding:

- MIG/MAG standard arc
- forceArc
- rootArc
- MIG/ MAG pulsed arc
- forceArc puls
- rootArc puls

Secondary procedures:

- TIG welding (Liftarc)
- MMA welding
- Gouging

3.2 Use and operation solely with the following machines

A suitable wire feed unit (system component) is required in order to operate the welding machine!
The following system components can be combined:

Power source	Sirion 405 puls Sirion 505 puls
Wire feed unit	Drive 4X S
Welding torch cooling unit	Cool 55 U40
Transport vehicle	Trolly 54-5

3.3 Documents which also apply

3.3.1 Warranty

For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!

3.3.2 Declaration of Conformity

CE This product corresponds in its design and construction to the EU directives listed in the declaration. The product comes with a relevant declaration of conformity in the original.
The manufacturer recommends carrying out the safety inspection according to national and international standards and guidelines every 12 months (from commissioning).

3.3.3 Welding in environments with increased electrical hazards

S Power sources with this marking can be used for welding in an environment with increased electrical hazard (e.g. boilers). For this purpose, appropriate national or international regulations must be followed. The power source must not be placed in the danger zone!

3.3.4 Service documents (spare parts and circuit diagrams)

⚠ WARNING

No improper repairs and modifications!
To prevent injuries and damage to the machine, only competent personnel (authorised service personnel) are allowed to repair or modify the machine.
Unauthorised manipulations will invalidate the warranty!

- Instruct competent personnel (authorised service personnel) to repair the machine.

Original copies of the circuit diagrams are enclosed with the unit.
Spare parts can be obtained from the relevant authorised dealer.

3.3.5 Calibration/Validation

An original certificate is enclosed with the product. The manufacturer recommends calibration / validation at intervals of 12 months (from commissioning).

3.3.6 Part of the complete documentation

This document is part of the complete documentation and valid only in combination with all other parts of these instructions! Read and observe the operating instructions for all system components, especially the safety instructions!

The illustration shows a general example of a welding system.

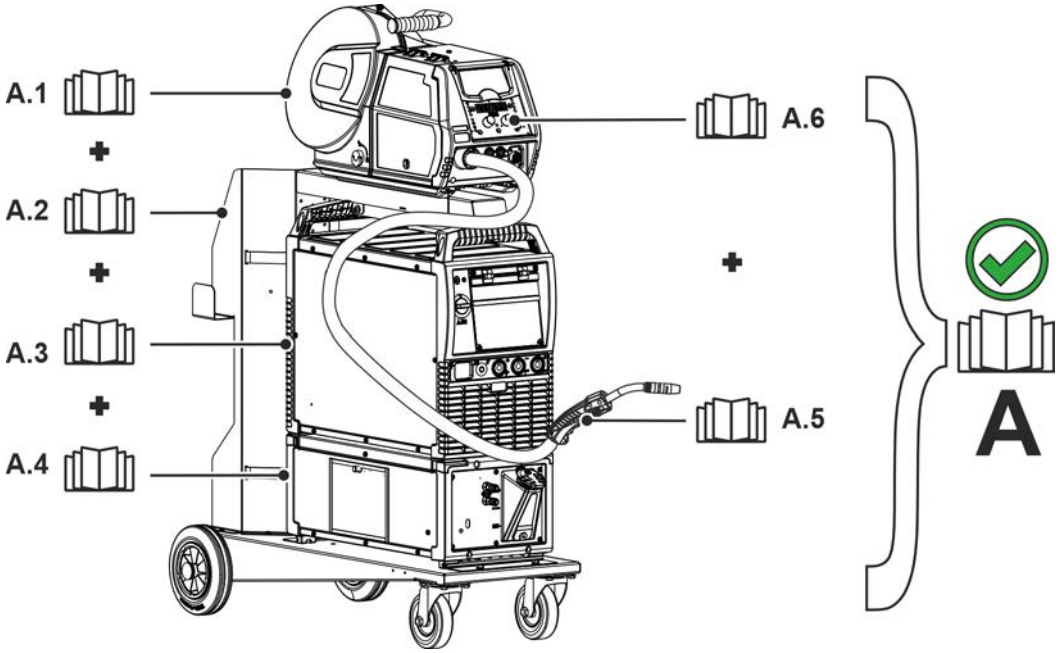


Figure 3-1

Item	Documentation
A.1	Wire feed unit
A.2	Transport vehicle
A.3	Power source
A.4	Cooling unit
A.5	Welding torch
A.6	Control
A	Complete documentation

4 Machine description – quick overview

4.1 Front view / rear view

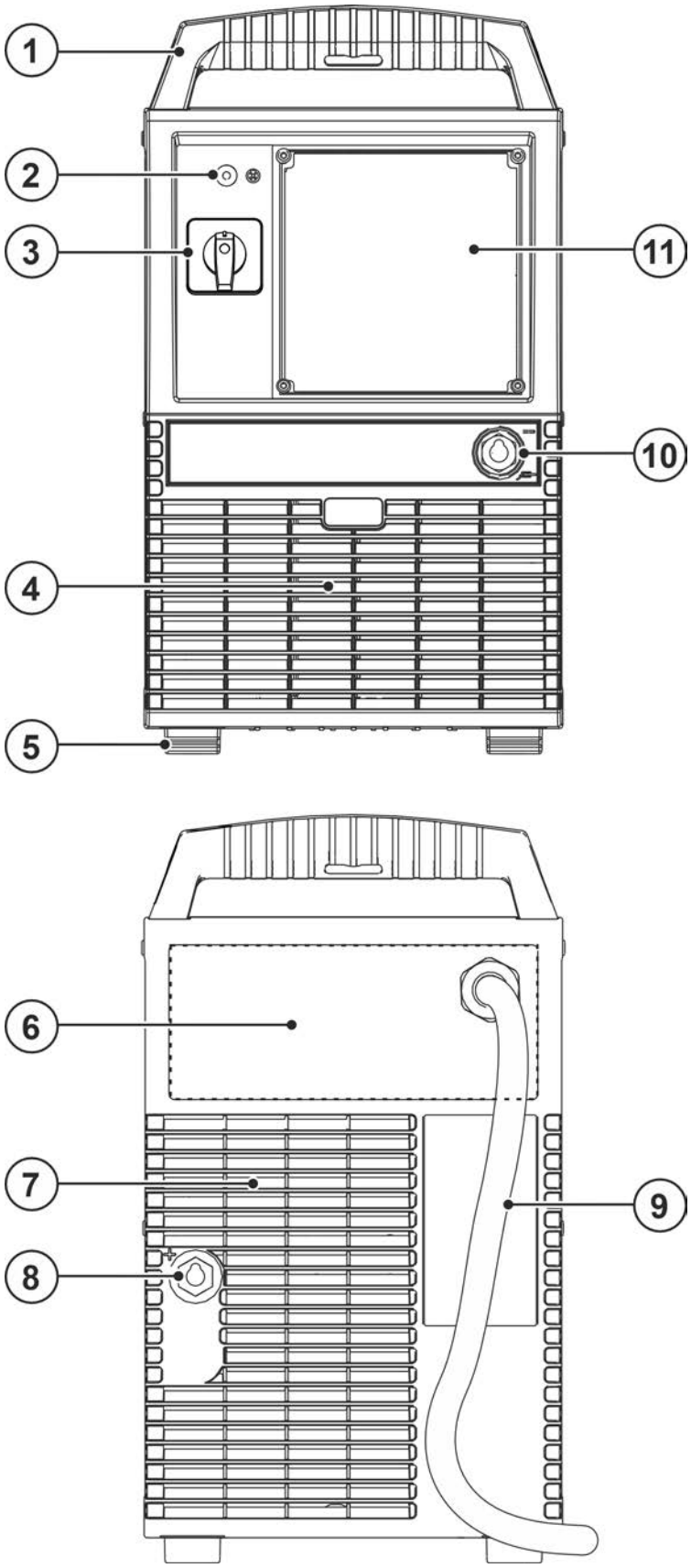


Figure 4-1

Item	Symbol	Description
1		**Carrying handle**
2		**Ready for operation signal light** Signal light on when the machine is switched on and ready for operation
3		**Main Switch** Switching the machine on or off.
4		**Cooling air inlet** Dirt filter optional *> see 9 chapter*
5		**Machine feet**
6		**Connection panel > *see 4.1.1 chapter***
7		**Cooling air outlet**
8		**Connection socket, “+” welding current** How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > *see 5 chapter*.
9		**Mains connection cable > *see 5.1.6 chapter***
10		**Connection socket, “-” welding current** How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > *see 5 chapter*.
11		**Machine control (see the relevant control operating instructions)**

4.1.1 Connection panel

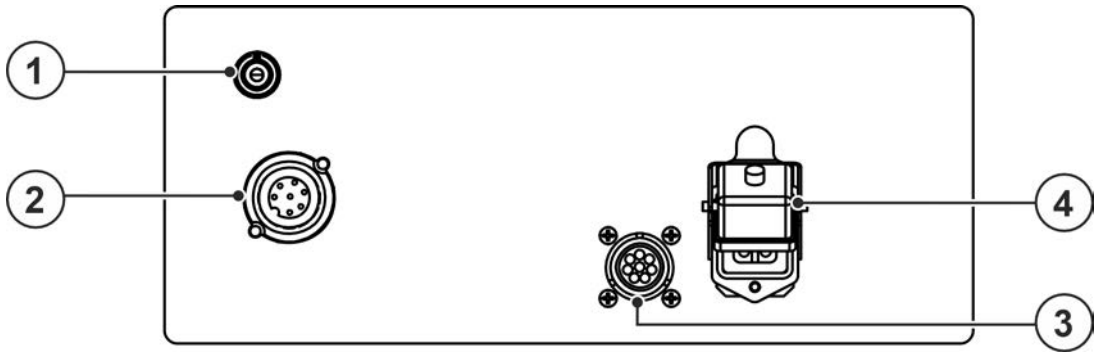


Figure 4-2

Item	Symbol	Description
1		**Key button, Automatic cutout** Wire feed motor supply voltage fuse (press to reset a triggered fuse)
2		**7-pole connection socket (digital)** Wire feed unit connection
3		**8-pole connection socket** Cooling unit control lead
4		**4-pole connection socket** Cooling unit voltage supply

5 Design and function

⚠ WARNING

Risk of injury from electrical voltage!
Contact with live parts, e.g. power connections, can be fatal!

- Observe the safety information on the first pages of the operating instructions!
- Commissioning must be carried out by persons who are specifically trained in handling power sources!
- Connect connection or power cables while the machine is switched off!

⚠ CAUTION

Risk from electrical current!
If welding is carried out alternately using different methods and if a welding torch and an electrode holder remain connected to the machine, the open-circuit/welding voltage is applied simultaneously on all cables.

- The torch and the electrode holder should therefore always be placed on an insulated surface before starting work and during breaks.

Read and observe the documentation to all system and accessory components!

5.1 Transport and installation

⚠ WARNING

Risk of accident due to improper transport of machines that must not be lifted!
Do not lift or suspend the machine! The machine can drop and cause injuries! The handles, straps or brackets are suitable for transport by hand only!

- The machine must not be suspended or lifted using a crane.
- Depending on machine type, equipment for lifting by crane or use while suspended is available as a retrofitting option *> see 9 chapter*.

☞ ***Damage to the machine due to improper transport!***
The machine can be damaged by tensile or lateral forces if it is set down or picked up in a non-vertical position!

- ***Do not drag the machine horizontally on the machine feet!***
- ***Always pick up the machine vertically and set it down carefully.***

5.1.1 Ambient conditions

☞ ***The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!***

- ***The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.***
- ***Safe operation of the machine must be guaranteed at all times.***

☞ ***Machine damage due to contamination!***
Unusually high amounts of dust, acid, corrosive gas or substances may damage the machine (note the maintenance intervals > see 6.2 chapter).

- ***Prevent high amounts of smoke, weld spatter, steam, oil vapour, grinding dust and corrosive ambient air from developing!***

In operation

Temperature range of the ambient air:

- -25 °C to +40 °C (-13 °F to 104 °F) [1]

Relative humidity:

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

Transport and storage

Storage in a closed room, temperature range of the ambient air:

- -30 °C to +70 °C (-22 °F to 158 °F) [1]

Relative humidity

- up to 90 % at 20 °C (68 °F)

[1] Ambient temperature dependent on coolant! Observe the coolant temperature range of the torch cooling

5.1.2 Machine cooling

☞ ***Insufficient ventilation results in a reduction in performance and equipment damage.***

- ***Observe the ambient conditions!***
- ***Keep the cooling air inlet and outlet clear!***
- ***Observe the minimum distance of 0.5 m from obstacles!***

5.1.3 Workpiece lead, general

⚠ CAUTION

Risk of burning due to incorrect welding current connection!
If the welding current plugs (machine connections) are not locked or if the workpiece connection is contaminated (paint, corrosion), these connections and leads can heat up and cause burns when touched!

- Check welding current connections on a daily basis and lock by turning to the right when necessary.
- Clean workpiece connection thoroughly and secure properly. Do not use structural parts of the workpiece as welding current return lead!

5.1.4 Welding torch cooling system

5.1.4.1 Cooling unit connection

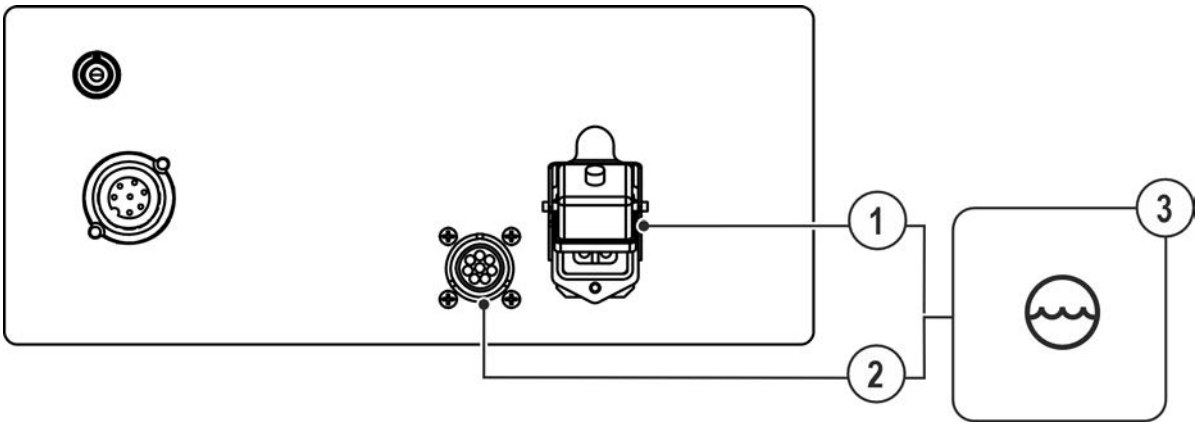


Figure 5-1

Item	Symbol	Description
1		**4-pole connection socket** Cooling unit voltage supply
2		**8-pole connection socket** Cooling unit control lead
3		**Cooling module**

- Insert and lock the 4-pole supply plug on the cooling unit into the 4-pole connection socket on the welding machine.
- Insert and lock the 8-pole control lead plug on the cooling unit into the 8-pole connection socket on the welding machine.

5.1.5 Connecting the intermediate hose package to the power source

Some wire electrodes (e.g. self-shielding cored wire) are welded using negative polarity. In this case, the welding current lead should be connected to the "-" welding current socket, and the workpiece lead should be connected to the "+" welding current socket. Observe the information from the electrode manufacturer!

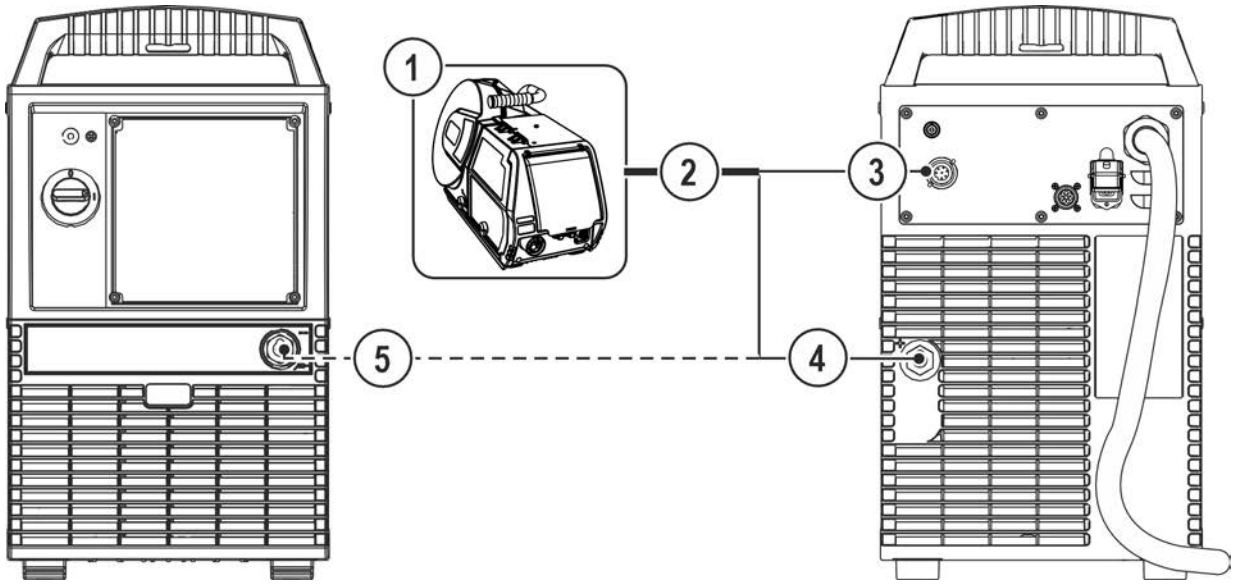


Figure 5-2

Item	Symbol	Description
1		**Wire feed unit**
2		**Intermediate hose package**
3		**Connection socket, 7-pole (analogue)** Connecting the wire feeder
4		**Connection socket, "+" welding current** • Standard MIG/MAG welding (intermediate hose package)
5		**Connection socket, "-" welding current** • MIG/MAG cored wire welding: Welding current to wire feed/torch

- Insert the end of the hose package through the strain relief of the hose package and lock by turning to the right.

The strain relief for fastening the intermediate hose package is provided on the transport cart used (see corresponding documentation).

- Insert the welding current cable plug into the relevant welding current connection socket and lock by turning to the right:
  - MIG/MAG cored wire: Welding current "-" connection socket
  - MIG/MAG standard: Welding current "+" connection socket
- Insert cable plug on the control lead into the 7-pole connection socket and secure with crown nut (the plug can only be inserted into the connection socket in one position).

5.1.6 Mains connection

⚠ DANGER

Hazards caused by improper mains connection!
An improper mains connection can cause injuries or damage property!

- The connection (mains plug or cable), the repair or voltage adjustment of the device must be carried out by a qualified electrician in accordance with the respective local laws or national regulations!
- The mains voltage indicated on the rating plate must match the supply voltage.
- Only operate machine using a socket that has correctly fitted protective earth.
- Mains plug, socket and lead must be checked by a qualified electrician on a regular basis!
- When operating the generator, always ensure it is earthed as stipulated in the operating instructions. The network created must be suitable for operating machines according to protection class I.

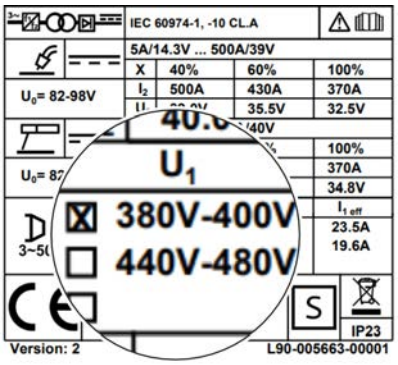
☞ ***The welding power source is equipped with an internal clamp device for multiple mains voltages. The currently set mains voltage of the power source must match the supply voltage! The following steps have to be carried out:***

- ***Visual inspection - comparison between the currently set mains voltage at the power source and the supply voltage > see 5.1.6.1 chapter***
- ***Adaptation and marking of the mains voltage > see 5.1.6.2 chapter***
- ***Carry out a safety check after intervention in the machine > see 5.1.6.3 chapter!***

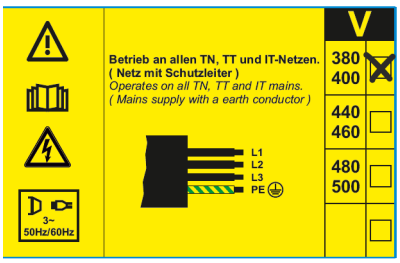
5.1.6.1 Visual inspection of the set mains voltage

The set mains voltage is marked on the rating plate and the label on the mains connection cable by a marking. If the marked mains voltage range coincides with the supply voltage, further commissioning may take place. If the specifications for mains and supply voltage do not match, the mains voltage in the machine must be reconnected to the supply voltage > *see 5.1.6.2 chapter*.

Removed or not clearly identifiable adhesive labels must be replaced!



Example of rating plate



Adhesive label of mains connection cable

Figure 5-3

5.1.6.2 Adjusting the power source to the mains voltage

The mains voltage is adapted by replugging the operating voltage plug on the printed circuit board VB xx0 into the power source.

The machine can be reconnected between two voltage ranges:

1. 380 V to 400 V (factory-set)
2. 440 V to 480 V

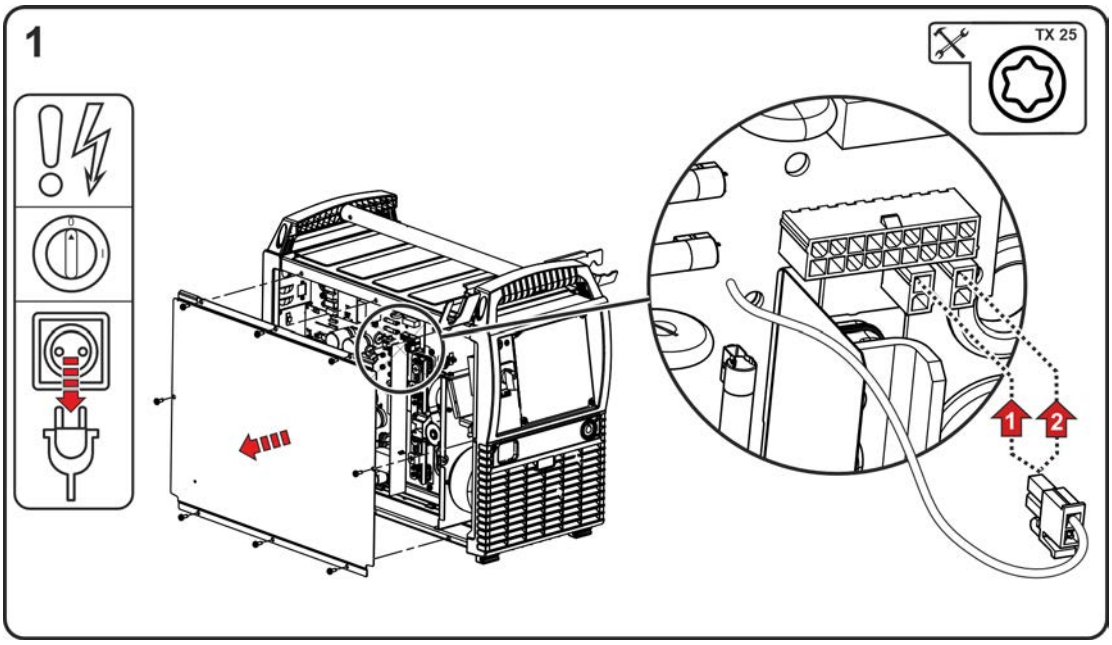


Figure 5-4

- Switch off machine at the main switch.
- Disconnect mains plug.
- Loosen the fastening screws from the housing cover. Open the housing cover at the side and lift it up.
- Reconnect operating voltage plug (printed circuit board VB xx0) to the corresponding voltage range of the supply voltage (380V/400V ex works).
- Screw on the casing cover.
- Install a mains plug which is permissible for the selected mains voltage to the mains cable. Identify the selected mains voltage on the rating plate and on the adhesive label of mains connection cable.

5.1.6.3 Re-commissioning

⚠ WARNING

Dangers resulting from failure to perform test after conversion!
Before reconnection, "Inspection and Testing during Operation" according to IEC/BS EN 60974-4 "Arc welding systems – Inspection and Testing during Operation" has to be performed!

- Perform test to IEC / DIN EN 60974-4!

5.1.6.4 Mains configuration

The machine may be connected to:

- **a three-phase system with four conductors and an earthed neutral conductor**
- **a three-phase system with three conductors of which any one can be earthed,**

e.g. the outer conductor

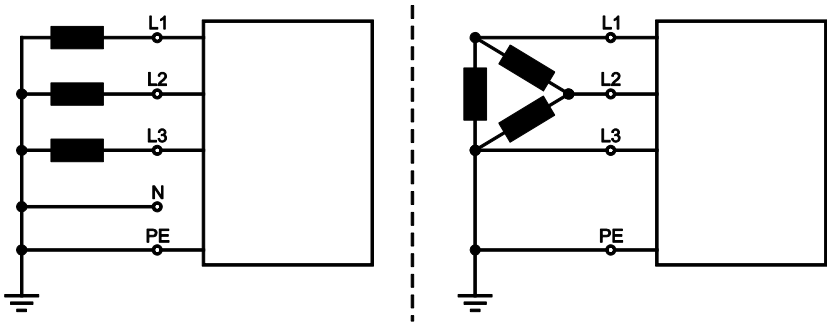


Figure 5-5

Legend

Item	Designation	Colour code
L1	Outer conductor 1	brown
L2	Outer conductor 2	black
L3	Outer conductor 3	grey
N	Neutral conductor	blue
PE	Protective conductor	green-yellow

- Insert mains plug of the switched-off machine into the appropriate socket.

5.1.7 Switching on and system diagnosis

The entire welding system runs data synchronisation and system diagnosis of the individual components every time it is switched on. The duration of the start time (switching on up to welding readiness) depends on the number of connected system components and the information to be exchanged under these devices. This time can take from several seconds to several minutes (e.g. for the system components interconnected for the first time). During this start phase, the system components will display the control type and, if applicable, software information in the welding data display (if available). This start phase is terminated by displaying the nominal values for current, voltage or wire feed speed.

Function of the machine fan

The machine fans in this machine series are temperature and status-controlled. This ensures that subsystems of the welding machine run only when they are needed. The machine fans run at full power for approximately 2 seconds each time the machine is switched on, for example, to blow out dust deposits.

5.1.8 Notes on the installation of welding current leads

- Incorrectly installed welding current leads can cause faults in the arc (flickering).
- Lay the workpiece lead and hose package of power sources without HF igniter (MIG/MAG) for as long and as close as possible in parallel.
- Lay the workpiece lead and hose package of power sources with HF igniter (TIG) for as long as possible in parallel with a distance of 20 cm to avoid HF sparkover.
- Always keep a distance of at least 20 cm to leads of other power sources to avoid interferences
- Always keep leads as short as possible! For optimum welding results max. 30 m (welding lead + intermediate hose package + torch lead).

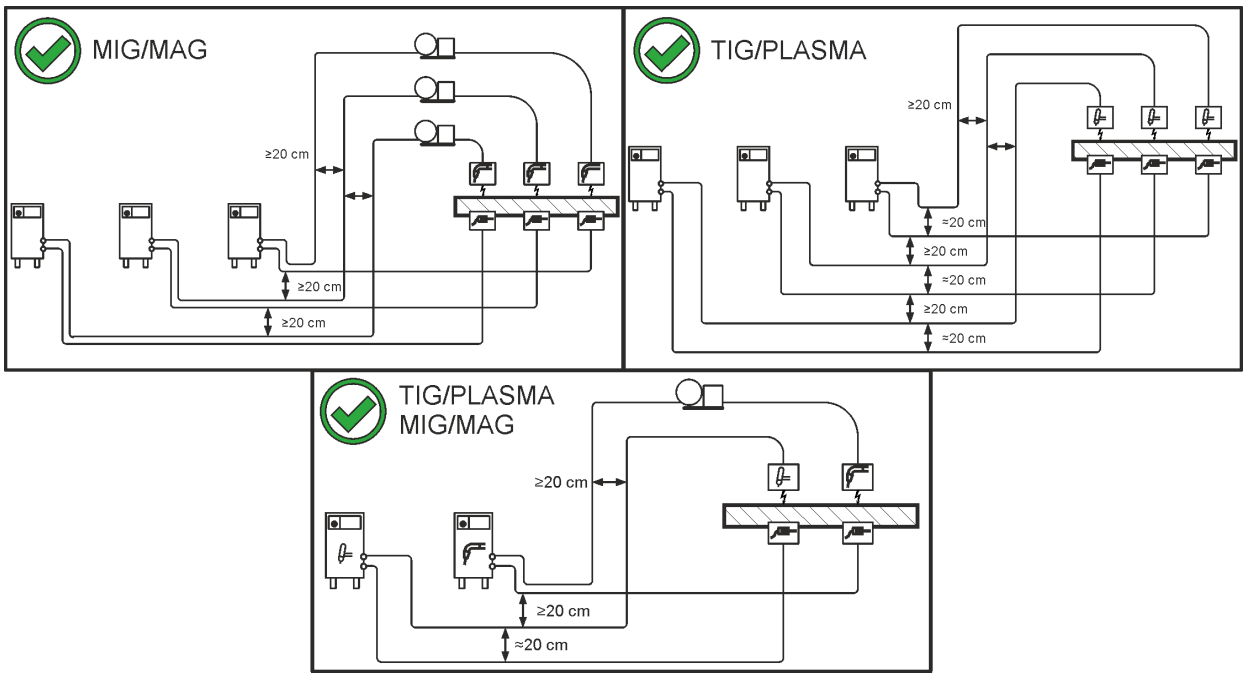


Figure 5-6

- Use an individual welding lead to the workpiece for each welding machine!

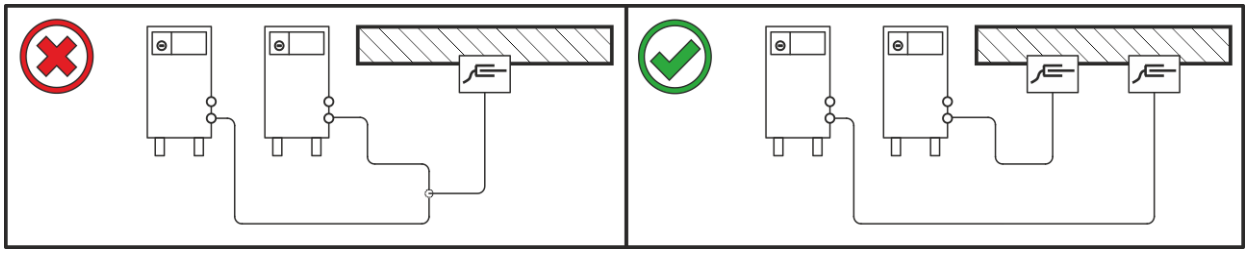


Figure 5-7

- Fully unroll welding current leads, torch hose packages and intermediate hose packages. Avoid loops!
- Always keep leads as short as possible!

Lay any excess cable lengths in meanders.

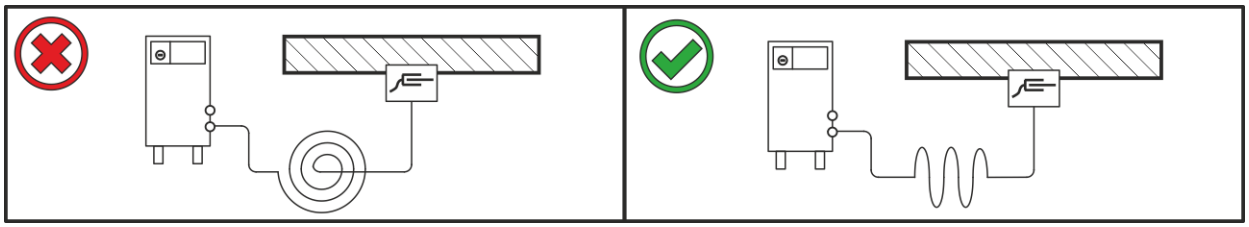


Figure 5-8

5.1.9 Stray welding currents

⚠ WARNING

Risk of injury due to stray welding currents!
Stray welding currents can destroy protective earth conductors, damage machines and electronic devices and cause overheating of components, leading to fire.

- Check that all welding current connections are firmly secured and electrical connections are in perfect condition.
- Set up, attach or suspend all conductive power source components such as casing, transport vehicles and crane frames so they are insulated.
- Do not place any other electronic devices such as drills or angle grinders on the power source, transport vehicle or crane frames unless they are insulated.
- Always put welding torches and electrode holders on an insulated surface when they are not in use.

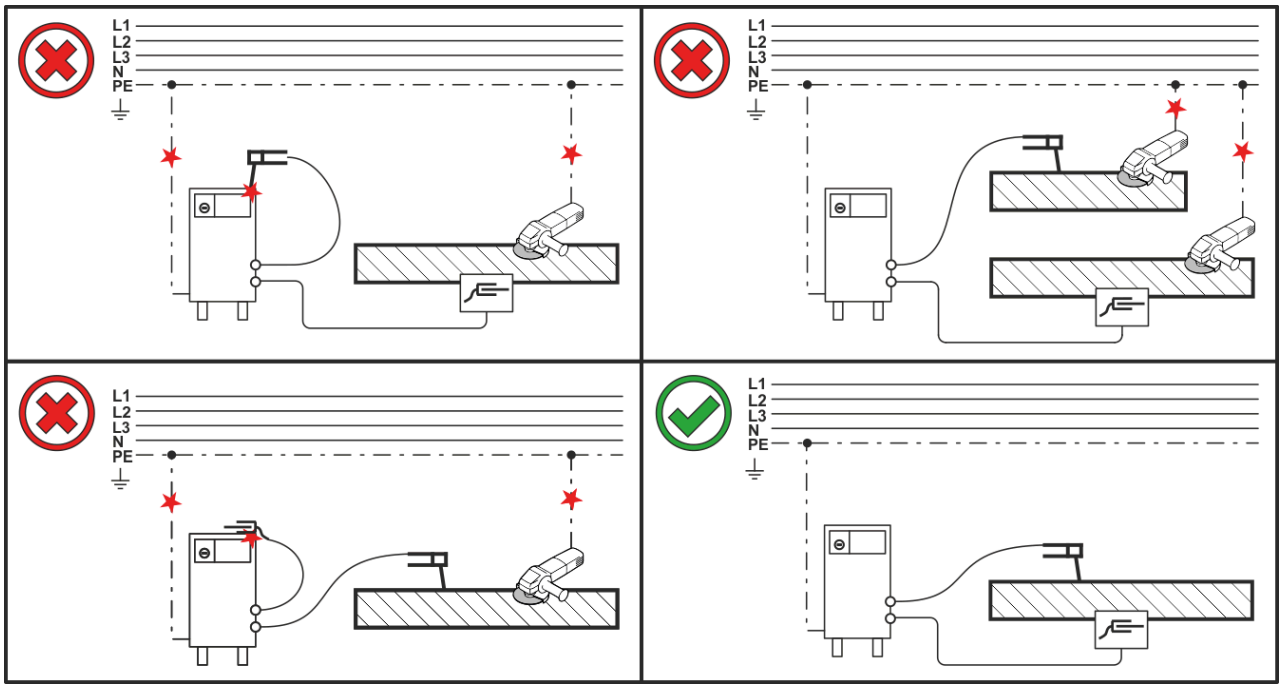


Figure 5-9

5.2 MIG/MAG welding

5.2.1 Connection for workpiece lead

Some wire electrodes (e.g. self-shielding cored wire) are welded using negative polarity. In this case, the welding current lead should be connected to the "-" welding current socket, and the workpiece lead should be connected to the "+" welding current socket. Observe the information from the electrode manufacturer!

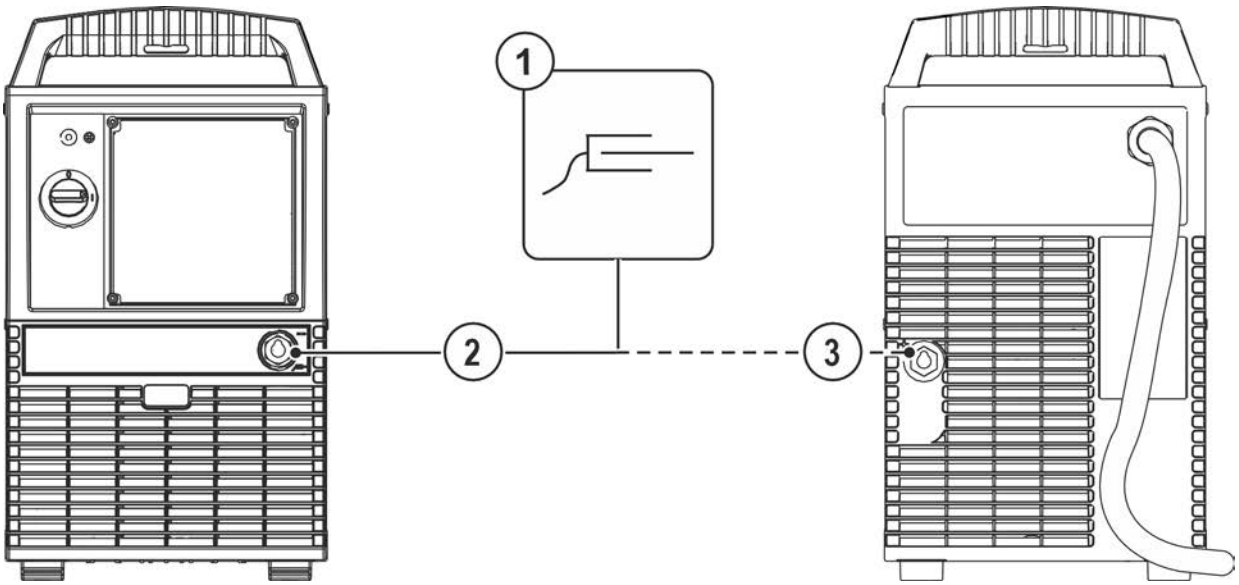


Figure 5-10

Item	Symbol	Description
1		**Workpiece**
2		**"-" welding current connection socket** •---------- MIG/MAG welding: Workpiece connection
3		**Connection socket, "+" welding current** •---------- MIG/MAG cored wire welding: Workpiece connection

- Insert the plug on the workpiece lead into the "-" welding current connection socket and lock.

5.2.2 Welding torch connection

For connection description, see the relevant “Wire feeder” operating instructions.

5.2.3 Welding task selection

For selection of the welding task and for general operation see the relevant Control operating instructions.

5.3 MMA welding or gouging

5.3.1 Connection of electrode holder or gouging torch

⚠ CAUTION

Risk of crushing and burns!
When changing stick electrodes there is a risk of crushing and burns!
- Wear appropriate and dry protective gloves.
- Use an insulated pair of tongs to remove the used stick electrode or to move welded workpieces.

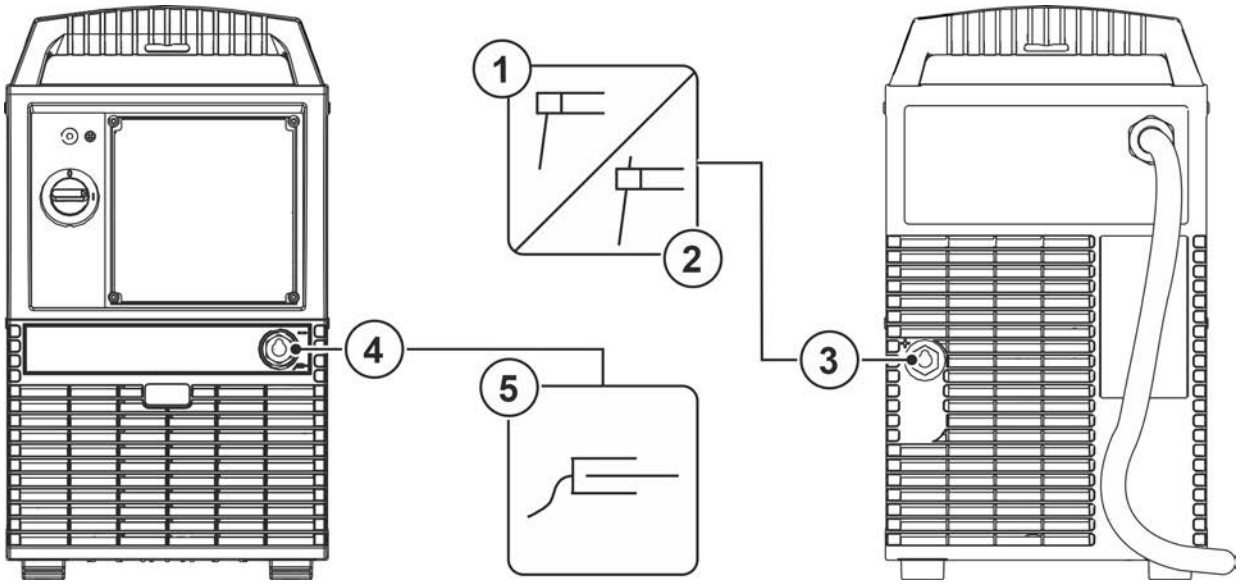


Figure 5-11

Item	Symbol	Description
1		**Electrode holder**
2		**Gouging torch** Note the additional system documents!
3	+	**Connection socket, "+" welding current**
4	–	**Connection socket, welding current "–"**
5		**Workpiece**

- Insert the cable plug of the electrode holder or gouging torch into the connection socket, welding current and lock by turning to the right.
- Insert the electrode holder plug and workpiece lead into the welding current socket depending on application and lock in place by turning to the right. The corresponding polarity will be based on the information of the electrode manufacturer on the electrode packaging.

5.3.2 Welding task selection

For selection of the welding task and for general operation see the relevant Control operating instructions.

5.4 TIG welding

5.4.1 Connection

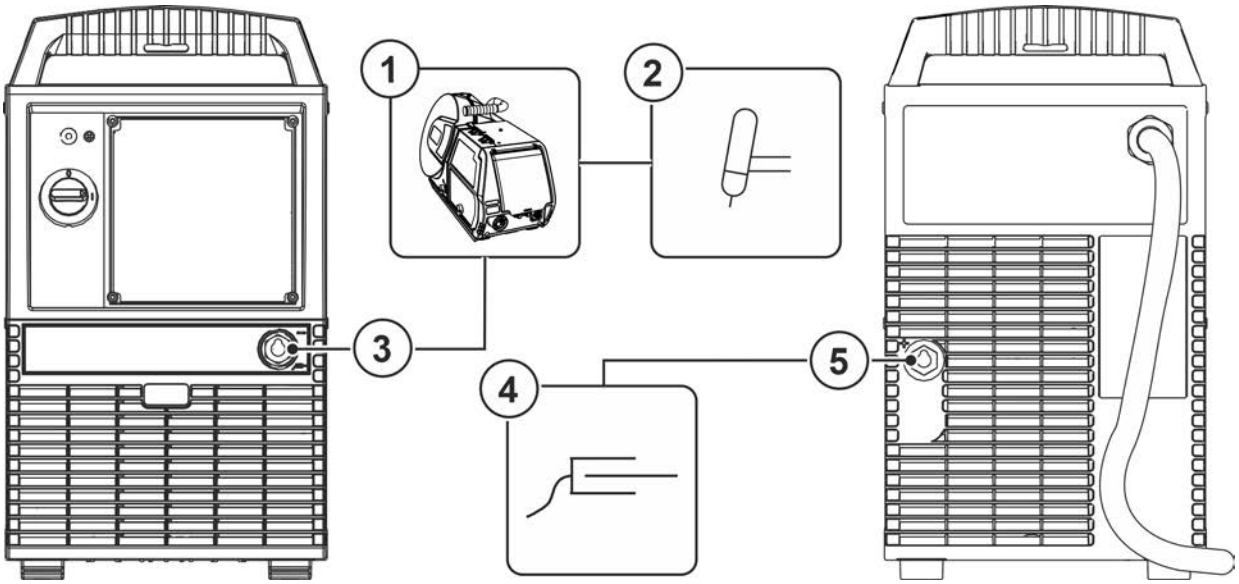


Figure 5-12

Item	Symbol	Description
1		**Wire feeder** Note the additional system documents!
2		**Welding torch** Observe additional system documents!
3		**Connection socket, welding current “–”**
4		**Workpiece**
5		**Connection socket, “+” welding current**

- Insert the cable plug of the welding current lead (intermediate hose package) into the connection socket, welding current "-" and lock by turning to the right.
- Insert the cable plug on the work piece lead into the "+" welding current connection socket and lock by turning to the right.

5.4.2 Welding task selection

For selection of the welding task and for general operation see the relevant Control operating instructions.

6 Maintenance, care and disposal

6.1 General

⚠ DANGER

Risk of injury due to electrical voltage after switching off!
Working on an open machine can lead to fatal injuries!
Capacitors are loaded with electrical voltage during operation. Voltage remains present for up to four minutes after the mains plug is removed.

1. Switch off machine.
2. Remove the mains plug.
3. Wait for at last 4 minutes until the capacitors have discharged!

⚠ WARNING

Improper maintenance, testing and repairs!
Maintenance, testing and repair of the machine may only be carried out by skilled and qualified personnel (authorised service personnel). A competent person is someone who, based on training, knowledge and experience, can recognize the hazards and possible consequential damage that may occur when testing power sources and can take the necessary safety precautions.

- Follow the maintenance instructions *> see 6.2 chapter*.
- If any of the test requirements below are not met, the unit must not be put back into operation until it has been repaired and tested again.

Repair and maintenance work may only be performed by qualified authorised personnel; otherwise the right to claim under warranty is void. In all service matters, always consult the dealer who supplied the machine. Return deliveries of defective equipment subject to warranty may only be made through your dealer. When replacing parts, use only original spare parts. When ordering spare parts, please quote the machine type, serial number and item number of the machine, as well as the type designation and item number of the spare part.

Under the specified ambient conditions and normal working conditions this machine is essentially maintenance-free and requires just a minimum of care.

Contamination of the machine may impair service life and duty cycle. The cleaning intervals depend on the ambient conditions and the resulting contamination of the machine. The minimum interval is every six months.

6.1.1 Cleaning

- Clean the outer surfaces with a moist cloth (no aggressive cleaning agents).
- Purge the machine venting channel and cooling fins (if present) with oil- and water-free compressed air. Compressed air may overspeed and destroy the machine fans. Never direct the compressed air directly at the machine fans. Mechanically block the fans, if required.
- Check the coolant for contaminants and replace, if necessary.

6.1.2 Dirt filter

When using a dirt filter, the cooling air throughput is reduced and the duty cycle of the machine is reduced as a result. The duty cycle decreases with the increasing contamination of the filter. The dirt filter must be remove at regular intervals and cleaned by blowing out with compressed air (depending on the level of soiling).

6.2 Maintenance work, intervals

6.2.1 Daily maintenance tasks

Visual inspection

- Mains supply lead and its strain relief
- Gas cylinder securing elements
- Check hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!
- Gas tubes and their switching equipment (solenoid valve)
- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- Check correct mounting of the wire spool.
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)
- Other, general condition

Functional test

- Operating, message, safety and adjustment devices (Functional test)
- Welding current cables (check that they are fitted correctly and secured)
- Gas tubes and their switching equipment (solenoid valve)
- Gas cylinder securing elements
- Check correct mounting of the wire spool.
- Check that all screw and plug connections and replaceable parts are secured correctly, tighten if necessary.
- Remove any spatter.
- Clean the wire feed rollers on a regular basis (depending on the degree of soiling).

6.2.2 Monthly maintenance tasks

Visual inspection

- Casing damage (front, rear and side walls)
- Wheels and their securing elements
- Transport elements (strap, lifting lugs, handle)
- Check coolant tubes and their connections for impurities

Functional test

- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps
- Check wire guide elements (wire feed roll holder, wire feed nipple, wire guide tube) for tight fit. Recommendation for replacing the wire feed roll holder (eFeed) after 2000 hours of operation, see replacement parts).
- Check coolant tubes and their connections for impurities
- Check and clean the welding torch. Deposits in the torch can cause short circuits and have a negative impact on the welding result, ultimately causing damage to the torch.

6.2.3 Annual test (inspection and testing during operation)

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed.
For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at www.ewm-group.com!

6.3 Disposing of equipment

Proper disposal!
The machine contains valuable raw materials, which should be recycled, and electronic components, which must be disposed of.

- **Do not dispose of in household waste!**
- **Observe the local regulations regarding disposal!**

In addition to the national or international regulations mentioned below, it is mandatory to follow the respective national laws and regulations on disposal.

- According to European provisions (Directive 2012/19/EU on Waste of Electrical and Electronic Equipment), used electric and electronic equipment may no longer be placed in unsorted municipal waste. It must be collected separately. The symbol depicting a waste container on wheels indicates that the equipment must be collected separately.
  This machine has to be disposed of, or recycled, in accordance with the waste separation systems in use.

According to German law (law governing the distribution, taking back and environmentally correct disposal of electrical and electronic equipment (ElektroG)), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.

The deletion of personal data is the responsibility of the end user.

Lamps, batteries or accumulators must be removed and disposed of separately before disposing of the device. The type of battery or accumulator and its composition is marked on the top (type CR2032 or SR44). The following EWM products may contain batteries or accumulators:

- Welding helmets
  Batteries or accumulators are easy to remove from the LED cassette.
- Device controls
  Batteries or accumulators are located on the back of these in corresponding sockets on the circuit board and are easy to remove. The controls can be removed using standard tools.

Information on returning used equipment or collections can be obtained from the respective municipal administration office. Devices can also be returned to EWM sales partners across Europe.

Further information on the topic of the disposal of electrical and electronic equipment can be found on our website at: https://www.ewm-group.com/de/nachhaltigkeit.html.

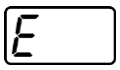
7 Rectifying faults

All products are subject to rigorous production checks and final checks. If, despite this, something fails to work at any time, please check the product using the following flowchart. If none of the fault rectification procedures described leads to the correct functioning of the product, please inform your authorised dealer.

7.1 Error messages (power source)

The possible error numbers displayed depend on the machine series and version!

Depending on the options of the machine display, a fault is shown as follows:

Display type - machine control	Display
Graphic display	
two 7-segment displays	
one 7-segment display	

The possible cause of the fault is signalled by a corresponding fault number (see table). In the case of an error, the power unit shuts down.

- Document machine errors and inform service staff as necessary.
- If multiple errors occur, these are displayed in succession.

Reset error (category legend)

[A] The error message disappears when the error is eliminated.

[B] The error message can be reset by pressing a push-button ◀.

All other error messages can only be reset by switching the machine off and on again.

Error 3: Tacho error

Categories A, B

- Fault in the wire feeder.
  - Check the electrical connections (connectors, lines).
- Permanent overload of the wire drive.
  - Do not lay the liner in tight radii.
  - Check the wire in the liner for ease of movement.

Error 4: Excess temperature

Category A

- The power source is overheating.
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.

Error 5: Mains overvoltage

Category A [1]

- Mains voltage is too high.
  - Check the mains voltages and compare them with the connection voltages of the power source.

Error 6: Mains undervoltage

Category A [1]

- Mains voltage is too low.
  - Check the mains voltages and compare them with the connection voltages of the power source.

Error 7: Low coolant level

Category B

- Low flow rate.
  - Fill with coolant.
  - Check coolant flow - remove kinks in the hose package.
  - Adjust the flow threshold [2].
  - Clean the cooler.
- The pump does not turn.
  - Turn the pump shaft.
- Air in the coolant circuit.
  - Vent the coolant circuit.
- The hose package is not filled with coolant.
  - Switch the machine off and on > pump running > filling process.
- Operation with a gas-cooled welding torch.
  - Deactivate the torch cooling.
  - Connect the coolant feed and return with a hose bridge.

Error 8: Shielding gas error

Categories A, B

- No gas.
  - Check the gas supply.
- The pre-pressure is too low.
  - Remove kinks in the hose package (nominal value: 4-6 bar pre-pressure).

Error 9: Secondary overvoltage

- Overvoltage at the output: Inverter error.
  - Request service.

Error 10: Earth fault (PE error)

- Connection between welding wire and machine casing.
  - Remove the electrical connection.
- Connection between welding circuit and machine casing.
  - Check the connection and routing of the earth wire / welding torch.

Error 11: Fast shut-down

Categories A, B

- Remove the logical signal "Robot ready" during the process.
  - Eliminate errors in the higher-level control.

Error 16: Pilot arc power source - collective error

Category A

- The external emergency stop circuit has been interrupted.
  - Check the emergency stop circuit and eliminate the cause of the error.
- The emergency stop circuit of the power source has been activated (internally configurable).
  - Deactivate the emergency stop circuit.
- The power source is overheating.
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.
- Short circuit on welding torch.
  - Check the welding torch.
  - Request service.

Error 17: Cold wire error

Category B

- Fault in the wire feeder.
  - Check the electrical connections (connectors, lines).
- Permanent overload of the wire drive.
  - Do not lay the liner in tight radii.
  - Check the liner for ease of movement.

Error 18: Plasma gas error

Category B

- No gas.
  - Check the gas supply.
- The pre-pressure is too low.
  - Remove kinks in the hose package (nominal value: 4-6 bar pre-pressure).

Error 19: Shielding gas error

Category B

- No gas.
  - Check the gas supply.
- The pre-pressure is too low.
  - Remove kinks in the hose package (nominal value: 4-6 bar pre-pressure).

Error 20: Low coolant level

Category B

- Low flow rate.
  - Fill with coolant.
  - Check coolant flow - remove kinks in the hose package.
  - Adjust the flow threshold [2].
  - Clean the cooler.
- The pump does not turn.
  - Turn the pump shaft.
- Air in the coolant circuit.
  - Vent the coolant circuit.
- The hose package is not filled with coolant.
  - Switch the machine off and on > pump running > filling process.
- Operation with a gas-cooled welding torch.
  - Deactivate the torch cooling.
  - Connect the coolant feed and return with a hose bridge.

Error 22: Excess coolant temperature

Category B

- Coolant is overheating [2].
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.

Error 23: Excess temperature

Category A

- External component (e.g. HF ignition units) overheated.
- The power source is overheating.
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.

Error 24: Pilot arc ignition error

Category B

- The pilot arc cannot ignite.
  - Check the welding torch equipment.

Error 25: Forming gas error

Category B

- No gas.
  - Check the gas supply.
- The pre-pressure is too low.
  - Remove kinks in the hose package (nominal value: 4-6 bar pre-pressure).

Error 26: Excess pilot arc module temperature

Category A

- The power source is overheating.
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.

Error 32: Error I>0

- The current detection is incorrect.
  - Request service.

Error 33: Error UIST

- Voltage recording is faulty.
  - Eliminate the short circuit in the welding circuit.
  - Remove the external sensor voltage.
  - Request service.

Error 34: Electronics error

- A/D channel error
  - Switch the machine off and on.
  - Request service.

Error 35: Electronics error

- Slope error
  - Switch the machine off and on.
  - Request service.

Error 36: [S] fault

- [S] conditions violated.
  - Switch the machine off and on.
  - Request service.

Error 37: Excess temperature / electronics error

- The power source is overheating.
  - Allow the switched-on machine to cool.
- Fan is blocked, dirty or faulty.
  - Check the fan and clean or replace it.
- Air inlet or outlet is blocked.
  - Check the air inlet and outlet.

Error 38: Error IIST

- Short circuit in the welding circuit before welding.
  - Eliminate the short circuit in the welding circuit.
  - Request service.

Error 39: Electronics error

- Secondary overvoltage
  - Switch the machine off and on.
  - Request service.

Error 40: Electronics error

- Error I>0
  - Request service.

Error 47: Radio link (BT)

Category B

- Connection error between the welding machine and peripheral unit.
  - Note the documentation for the data interface with radio transmission.

Error 48: Ignition error

Category B

- No ignition at process start (automated machines).
  - Check the wire feeding
  - Check the load cable connections in the welding circuit.
  - Clean corroded surfaces on the workpiece before welding if necessary.

Error 49: Arc interruption

Category B

- An arc interruption occurred during welding with an automated system.
  - Check the wire feeding.
  - Adjust the welding speed.

Error 50: Program number

Category B

- Internal error.
  - Request service.

Error 51: Emergency stop

Category A

- The external emergency stop circuit has been interrupted.
  - Check the emergency stop circuit and eliminate the cause of the error.
- The emergency stop circuit of the power source has been activated (internally configurable).
  - Deactivate the emergency stop circuit.

Error 52: No wire feeder

- After switching on the automated system, no wire feeder (DV) was detected.
  - Check or connect the control cables of the wire feeders.
  - Check the identification number of the automated wire feeder (for 1DV: number 1, for 2DV: each a wire feeder with number 1 and a wire feeder with number 2).

Error 53: No wire feeder 2

Category B

- Wire feeder 2 was not detected.
  - Check the control cable connections.

Error 54: VRD fault

- Error in the voltage reduction device.
  - If necessary, disconnect the external machine from the welding circuit.
  - Request service.

Error 55: Excess wire feeder current

Category B

- Excess current detected in the wire feed mechanism.
  - Do not lay the liner in tight radii.
  - Check the liner for ease of movement.

Error 56: Mains phase failure

- One phase of the mains voltage has failed.
  - Check the mains connection, mains plug and mains fuses.

Error 57: Slave tacho error

Category B

- Fault in the wire feeder (slave drive).
  - Check the connections (connectors, lines).
- Permanent overload of the wire drive (slave drive).
  - Do not lay the liner in tight radii.
  - Check the liner for ease of movement.

Error 58: Short circuit

Category B

- Short circuit in the welding circuit.
  - Eliminate the short circuit in the welding circuit.
  - Place the welding torch on an insulated surface.

Error 59: Incompatible machine

- A machine connected to the system is not compatible.
  - Disconnect the incompatible machine from the system.

Error 60: Incompatible software

- The software of a machine is not compatible.
  - Disconnect the incompatible machine from the system
  - Request service.

Error 61: Welding monitoring

- The actual value of a welding parameter is outside the specified tolerance range.
  - Maintain the tolerance ranges.
  - Adjust the welding parameters.

Error 62: System component

- The system component was not found.
  - Request service.

Error 63: Mains voltage error

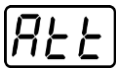
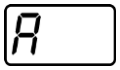
- Operating and mains voltage are incompatible.
  - Check or adjust the operating and mains voltage.

[1] only Picotig 220 pulse

[2] See technical data for values and other switching thresholds > *see 8 chapter*.

7.2 Warnings

Depending on the display options of the machine display, a warning message is displayed as follows:

Display type - machine control	Display
Graphic display	
two 7-segment displays	
one 7-segment display	

The cause of the warning is indicated by a corresponding warning number (see table).

- In case of multiple warnings, these are displayed in sequence.
- Document machine warning and inform service personnel, if required.

Warning		Potential cause / remedy
1	Excess temperature	A shutdown is imminent due to excess temperature.
2	Half-wave failures	Check process parameters.
3	Welding torch cooling warning	Check the coolant level and top up if necessary.
4	Shielding gas	Check the shielding gas supply.
5	Coolant flow	Check min. flow rate. [2]
6	Wire reserve	Only a small amount of wire is left on the spool.
7	CAN bus failure	The wire feeder is not connected; the automatic circuit-breaker of the wire feed motor (reset the tripped automatic circuit breaker by actuating).
8	Welding circuit	The inductance of the welding circuit is too high for the selected welding task.
9	WF configuration	Check WF configuration.
10	Partial inverter	One of several partial inverters is not supplying welding current.
11	Excess temperature of the coolant [1]	Check temperature and switching thresholds. [2]
12	Welding monitoring	The actual value of a welding parameter is outside the specified tolerance range.
13	Contact error	The resistance in the welding circuit is too high. Check the earth connection.
14	Alignment error	Switch the machine off and on. If the error persists, notify Service.
15	Mains fuse	The power limit of the mains fuse is reached and the welding power is reduced. Check the fuse setting.
16	Shielding gas warning	Check the gas supply.
17	Plasma gas warning	Check the gas supply.
18	Forming gas warning	Check the gas supply.
19	Gas warning 4	reserved
20	Coolant temperature warning	Check the coolant level and top up if necessary.
21	Excess temperature 2	reserved
22	Excess temperature 3	reserved
23	Excess temperature 4	reserved

Warning		Potential cause / remedy
24	Coolant flow warning	Check the coolant supply. Check the coolant level and top up if necessary. Check flow and switching thresholds. [2]
25	Flow 2	reserved
26	Flow 3	reserved
27	Flow 4	reserved
28	Wire stock warning	Check the wire feeding.
29	Low wire 2	reserved
30	Low wire 3	reserved
31	Low wire 4	reserved
32	Tacho error	Fault of the wire feeder - permanent overload of the wire drive.
33	Wire feed motor excess current	Excess current detected on wire feed motor.
34	JOB unknown	JOB selection was not carried out because the JOB number is unknown.
35	Wire feed motor slave excess current	Excess current detected on wire feed motor slave (push/push system or intermediate drive).
36	Slave tacho error	Fault of the wire feeder - permanent overload of the wire drive (push/push system or intermediate drive).
37	FAST bus failure	The wire feeder is not connected (reset by actuating the automatic circuit breaker of the wire feed motor).
38	Incomplete component information	Check the Xnet component management.
39	Halfwave failure	Check supply voltage.
40	Weak power grid	Check supply voltage.
41	Cooling unit not recognised	A liquid-cooled welding torch was connected but no cooling unit has been detected. • Check the connection of the cooling unit • Use a gas-cooled welding torch
47	Battery (remote control, type BT)	Battery level is low (replace battery)

[1] only for the XQ machine series

[2] See technical data for values and other switching thresholds > *see 8 chapter*.

7.3 Checklist for rectifying faults

The correct machine equipment for the material and process gas in use is a fundamental requirement for perfect operation!

Legend	Symbol	Description
	↯	Fault/Cause
	🛠	Remedy

Functional errors

- ↯ Mains fuse triggers - unsuitable mains fuse
  - 🛠 Set up recommended mains fuse > *see 8 chapter*.
- ↯ Machine does not start up after switching on (device fan and possibly coolant pump have no function).
  - 🛠 Connect the control cable of the wire feeder.
- ↯ All machine control signal lights are illuminated after switching on
- ↯ No machine control signal light is illuminated after switching on
- ↯ No welding power
  - 🛠 Phase failure > check mains connection (fuses)
- ↯ Machine restarts continuously
- ↯ Wire feeder without function
- ↯ System does not start up
  - 🛠 Make control lead connections and check that they are fitted correctly.
- ↯ Loose welding current connections
  - 🛠 Tighten power connections on the torch and/or on the workpiece
  - 🛠 Properly fasten the contact tip and contact tip holder.

Coolant error/no coolant flowing

- ↯ Insufficient coolant flow
  - 🛠 Check coolant level and refill if necessary
- ↯ Air in the coolant circuit
  - 🛠 Vent coolant circuit > *see 7.4 chapter*

Wire feed problems

- ↯ Contact tip blocked
  - 🛠 Clean and, if necessary, replace.
- ↯ Setting the spool brake
  - 🛠 Check settings and correct if necessary
- ↯ Setting pressure units
  - 🛠 Check settings and correct if necessary
- ↯ Worn wire rolls
  - 🛠 Check and replace if necessary
- ↯ Wire feed motor without supply voltage (automatic cutout triggered by overloading)
  - 🛠 Reset triggered fuse (rear of the power source) by pressing the key button
- ↯ Kinked hose packages
  - 🛠 Extend and lay out the torch hose package
- ↯ Wire guide core or spiral is dirty or worn
  - 🛠 Clean core or spiral; replace kinked or worn cores

7.4 Vent coolant circuit

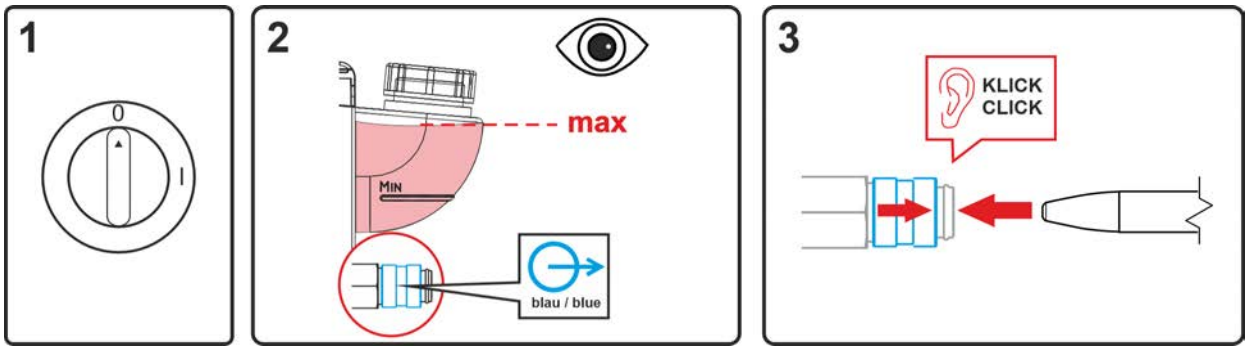


Figure 7-1

- Switch off the machine and fill the coolant tank to the maximum level.
- Unlock the quick-connect coupling with a suitable tool (connection open).

To vent the cooling system always use the blue coolant connection, which is located as deep as possible inside the system (close to the coolant tank)!

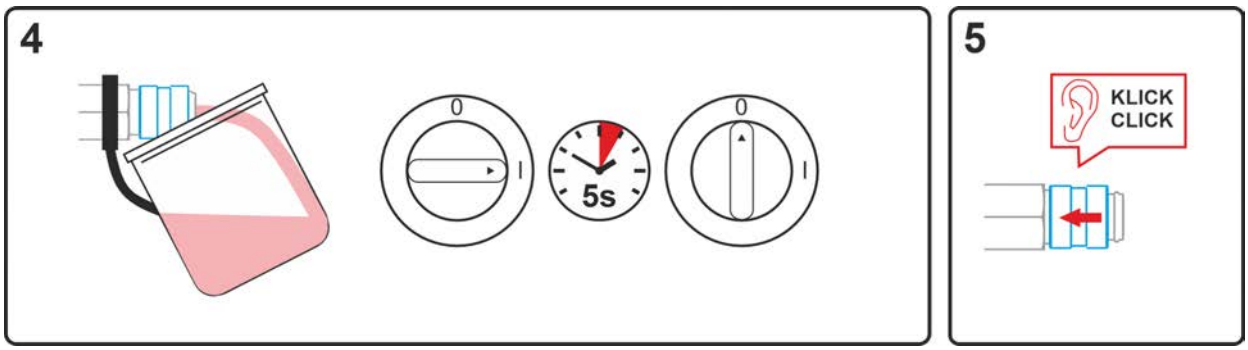


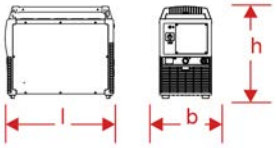
Figure 7-2

- Position a suitable collection container for collecting the escaping coolant at the quick-connect coupling and switch on the machine for approx. 5s.
- Lock the quick-connect coupling by pushing back the locking ring.

8 Technical data

Performance specifications and guarantee only in connection with original spare and replacement parts!

8.1 Dimensions and weighte

	Sirion 405	Sirion 505
		
Dimensions (l x b x h)	625 x 298 x 531 mm 24.6 x 11.7 x 20.9 inch	
Weight	39,4 kg 86.9 lb	42,7 kg 94.1 lb

8.2 Performance data

8.2.1 Sirion 405 puls

	MIG/MAG	MMA	TIG
Welding current (I_2)	5 A to 400 A		
Welding voltage according to standard (U_2)	14,3 V to 34 V	20,2 V to 36,0 V	10,2 V to 26,0 V
Duty cycle DC at 40° C [1]	400 A (60 %) 350 A (100 %)		
Mains voltage [2] / Tolerance / mains fuse [3]	3 x 380 to 400 V / -25 % to +20 % / 3 x 25 A 3 x 440 to 480 V / -25 % to +15 % / 3 x 20 A		
Frequency	50/60 Hz		
Open circuit voltage (U_0)	82 V (380 to 400 V) 98 V (440 to 480 V)		
max. Connected load (S_1)	17,2 kVA	18,2 kVA	13,2 kVA
Generator rating (Rec.)	23,2 kVA	24,6 kVA	17,8 kVA
Power consumption P_i [4]	23 W		
Maximum mains impedance (@PCC)	96 mOhm		
Cos φ / efficiency	0,99 / 89 %		
Protection class / Overvoltage category	I / III		
Contamination level	3		
Insulation class / protection classification	H / IP 23		
Residual current circuit breaker	Type B (recommended)		
Noise level [5]	<70 dB(A)		
Ambient temperature [6]	-25 °C to +40 °C		
Machine cooling / Torch cooling	Fan (AF) / gas or water		
Mains connection cable	H07RN-F4G4		
Workpiece lead (min.) / EMC class	70 mm^2 / A		
Test mark	S / CE / UKCA		
Standards used	See declaration of conformity (appliance documents)		

[1] Load cycle: 10 min. (60 % DC ≙ 6 min. welding, 4 min. pause)

[2] Multi-voltage device - Adjusting the power source to the mains voltage

[3] Safety fuses are recommended DIAZED xxA gG. When using automatic cutouts, the "C" trigger characteristic must be used.

[4] Power in idle state without external or internal peripherals.

[5] Noise level during idle mode and operation under standard load according to IEC 60974- 1 at the maximum operating point.

[6] Ambient temperature dependent on coolant! Observe coolant temperature range!

8.2.2 Sirion 505 puls

	MIG/MAG	MMA	TIG
Welding current (I_2)	5 A to 500 A		
Welding voltage according to standard (U_2)	14,3 V to 39 V	20,2 V to 40 V	10,2 V to 30 V
Duty cycle DC at 40° C [1]	500 A (40%) 430 A (60%) 370 A (100%)		
Mains voltage [2] / Tolerance / mains fuse [3]	3 x 380 to 400 V / -25 % to +20 % / 3 x 25 A 3 x 440 to 480 V / -25 % to +15 % / 3 x 20 A		
Frequency	50/60 Hz		
Open circuit voltage (U_0)	82 V (380 to 400 V) 98 V (440 to 480 V)		
max. Connected load (S_1)	24,6 kVA	25,3 kVA	19,0 kVA
Generator rating (Rec.)	33,2 kVA	34,2 kVA	25,7 kVA
Power consumption P_i [4]	23 W		
Maximum mains impedance (@PCC)	96 mOhm		
Cos φ / efficiency	0,99 / 89 %		
Protection class / Overvoltage category	I / III		
Contamination level	3		
Insulation class / protection classification	H / IP 23		
Residual current circuit breaker	Type B (recommended)		
Noise level [5]	<70 dB(A)		
Ambient temperature [6]	-25 °C to +40 °C		
Machine cooling / Torch cooling	Fan (AF) / gas or water		
Mains connection cable	H07RN-F4G4		
Workpiece lead (min.) / EMC class	70 mm^2 / A		
Test mark	S / CE / UKCA		
Standards used	See declaration of conformity (appliance documents)		

[1] Load cycle: 10 min. (60 % DC ≙ 6 min. welding, 4 min. pause)

[2] Multi-voltage device - Adjusting the power source to the mains voltage

[3] Safety fuses are recommended DIAZED xxA gG. When using automatic cutouts, the "C" trigger characteristic must be used.

[4] Power in idle state without external or internal peripherals.

[5] Noise level during idle mode and operation under standard load according to IEC 60974- 1 at the maximum operating point.

[6] Ambient temperature dependent on coolant! Observe coolant temperature range!

9 Accessories

Performance-dependent accessories like torches, workpiece leads, electrode holders or intermediate hose packages are available from your authorised dealer.

9.1 System components

9.1.1 Wire feed unit

Type	Designation	Item no.
Drive 4X S	Wire feeder drive	090-005719-00502

9.1.2 Welding torch cooling system

Type	Designation	Item no.
Cool 55 U40	Cooling unit	090-008863-00502

9.1.3 Transport system

Type	Designation	Item no.
Trolly 54-5	Transport cart	090-008640-00000
Trolly 35-6	Transport cart	090-008827-00000
Trolly XQ 55-5	Transport cart, assembled	090-008636-00000
Trolly 55-6	Transport cart, assembled	090-008825-00000

9.2 Option for retrofitting

Type	Designation	Item no.
ON TH TG.03/TG.04/TG.11 R	Torch holder, right	092-002699-00000
ON TG	Carrying strap	092-004310-00000
ON Filter TG.04/K.02	Contamination filter for air inlet	092-002698-00000
ON CS TG.0004	Crane console, transport/ram protection	092-007895-00032
ON WAK TG.03/TG.04/TG.09/K.02	Wheel assembly kit	092-001356-00000

9.3 Shielding gas supply (shielding gas cylinder for welding machine)

Type	Designation	Item no.
Proreg Ar/CO2 230bar 15l D	Pressure regulator with manometer	394-008488-10015
Proreg Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-008488-10030
DM 842 Ar/CO2 230bar 15l D	Pressure regulator with manometer	394-002910-00015
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
GH 2X1/4" 2M	Gas hose	094-000010-00001
GH 2x1/4" 3m	Gas hose	094-000010-00003
GH 2X1/4" 5m	Gas hose	094-000010-00005
GH 2X1/4" 10 m	Gas hose	094-000010-00011
GH 2X1/4" 15m	Gas hose	094-000010-00015

9.4 General accessories

Type	Designation	Item no.
32A 5POLE/CEE	Machine plug	094-000207-00000

9.5 Computer communication

Type	Designation	Item no.
Splitter 2x 7POL	Distribution box to expand the existing 7-pole interfaces on the welding machine	090-008302-00000
Xnet LAN Gateway	LAN gateway in external casing	090-008833-00502
Xnet WiFi Gateway	WiFi gateway in external casing	090-008834-00502

10 Appendix

10.1 Average wire electrode usage

5 m/min – 197 ipm								
	mm				inch			
	1.0	1.2	1.6		.040	.045	.060	
Steel	1.8	2.7	4.7	kg/h	3.9	5.9	10.3	lb/h
Stainless steel	1.9	2.8	4.8		4.1	6.1	10.5	
Aluminium	0.6	0.9	1.6		1.3	1.9	3.5	
10 m/min – 394 ipm								
Steel	3.7	5.3	9.5	kg/h	8.1	11.6	20.9	lb/h
Stainless steel	3.8	5.4	9.6		8.3	11.9	21.1	
Aluminium	1.3	1.8	3.2		2.8	3.9	7.0	

10.2 Average shielding gas usage

10.2.1 MIG/MAG welding

mm	1.0	1.2	1.6	2.0
inch	.040	.045	.060	.080
l/min	10	12	16	20
gal/min	2.64	3.17	4.22	5.28

10.2.2 TIG welding

Gas nozzle number	4	5	6	7	8	10
Ø mm	6.5	8.0	9.5	11	12.5	16
Ø inch	0.26	0.31	0.37	0.43	0.5	0.63
l/min	6	8	10	12		15
gal/min	1.58	2.11	2.64	3.17		3.96

10.3 Searching for a dealer

Sales & service partners
www.ewm-group.com/en/specialist-dealers

"More than 400 EWM sales partners worldwide"