Operating instructions

EN

Wire feed unit

drive 4X IC D EX

099-005598-EW501 | Observe additional system documents! | 26.01.2018

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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1 Contents

2 For your safety

2.1 Notes on the use of 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.

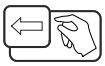
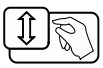
☞ ***Technical aspects which the user must observe to avoid material or equipment damage.***

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
	Indicates technical aspects which the user must observe.
	Switch off machine
	Switch on machine
	Wrong
	Correct
	Input
	Navigation
	Output
	Time representation (e.g.: wait 4 s/activate)
	Interruption in the menu display (other setting options possible)
	Tool not required/do not use
	Tool required/use

Symbol	Description
	Activate and release/tap/tip
	Release
	Press and keep pressed
	Switch
	Turn
	Numerical value – adjustable
	Signal light lights up in green
	Signal light flashes green
	Signal light lights up in red
	Signal light flashes red

2.3 Part of the complete documentation

☞ ***These operating instructions are 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.

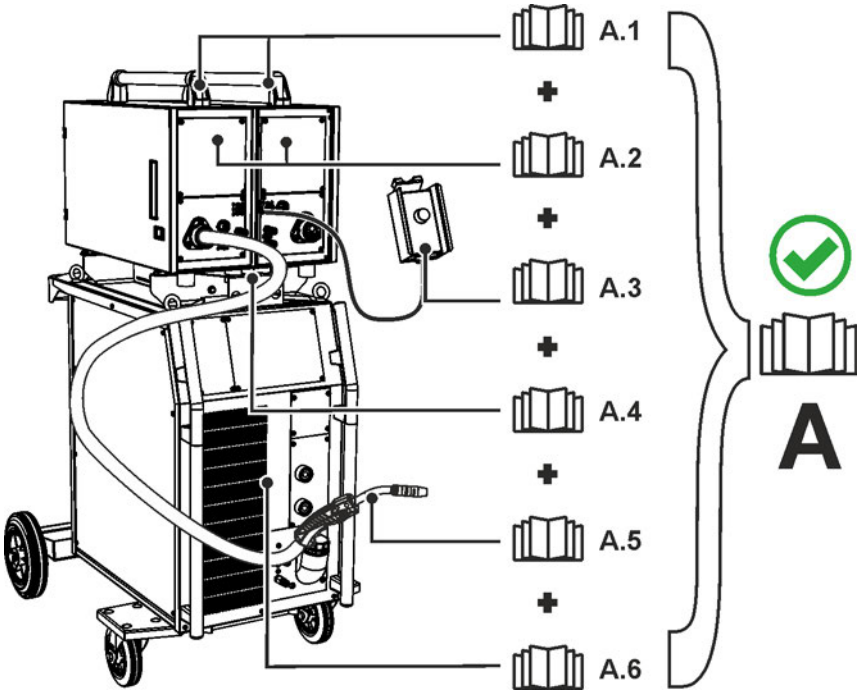


Figure 2-1

The illustration shows a general example of a welding system.

Item	Documentation
A.1	Wire feeder
A.2	Controller
A.3	Remote adjuster
A.4	Options conversion instructions
A.5	Welding torch
A.6	Power source
A	Complete documentation

2.4 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!

⚠ WARNING

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 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.

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!

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 can lead to breathing difficulties and poisoning. In addition, solvent vapour (chlorinated hydrocarbon) may be converted into poisonous phosgene due to the ultraviolet radiation of the arc!

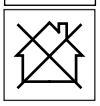
- Ensure that there is sufficient fresh air!
- Keep solvent vapour away from the arc beam field!
- Wear suitable breathing apparatus if appropriate!

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 may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.

- Observe the maintenance instructions > *see 6.2 chapter*!
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).

☞ ***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.

2.5 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.

☞ ***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

Wire feeder to feed wire electrodes for gas-shielded metal-arc welding.

Machine series	Main process							Secondary process		
	Standard MIG/MAG welding				Pulsed MIG/MAG welding					
	forceArc	rootArc	coldArc	pipeSolution	forceArc puls	rootArc puls	coldArc puls	TIG welding (lift arc)	MMA welding	Gouging
alpha Q puls MM	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Phoenix puls MM	☑	☑	☐	☐	☑	☑	☐	☑	☑	☑
Taurus Synergic S MM	☑	☑	☐	☐	☐	☐	☐	☑	☑	☑

☑ possible
☐ not possible

3.2 Use and operation solely with the following machines

☞ ***A suitable power source (system component) is required in order to operate the wire feed unit!***

☞ ***For machine variants with wheel spacers only!***

The following system components can be combined with this machine:

- alpha Q Expert 2.0 puls MM
- alpha Q Progress puls MM
- Phoenix Expert 2.0 puls MM
- Phoenix Progress puls MM
- Taurus Synergic S MM

☞ ***Power sources must have the MM identifier for MULTIMATRIX technology in their model designation.***

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

The labelled machine complies with the following EC directives in terms of its design and construction:

- Low Voltage Directive (LVD)
- Electromagnetic Compatibility Directive (EMC)
- Restriction of Hazardous Substance (RoHS)

In case of unauthorised changes, improper repairs, non-compliance with specified deadlines for "Arc Welding Equipment – Inspection and Testing during Operation," and/or prohibited modifications which have not been explicitly authorised by the manufacturer, this declaration shall be voided. An original document of the specific declaration of conformity is included with every product.

3.3.3 Service documents (spare parts and circuit diagrams)

⚠ WARNING

Do not carry out any unauthorised repairs or modifications!
To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!
The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!

Original copies of the circuit diagrams are enclosed with the unit.

Spare parts can be obtained from the relevant authorised dealer.

3.3.4 Calibration/Validation

We hereby confirm that this machine has been tested using calibrated measuring equipment, as stipulated in IEC/EN 60974, ISO/EN 17662, EN 50504, and complies with the admissible tolerances. Recommended calibration interval: 12 months

4 Machine description – quick overview

4.1 Front view / side view from the right

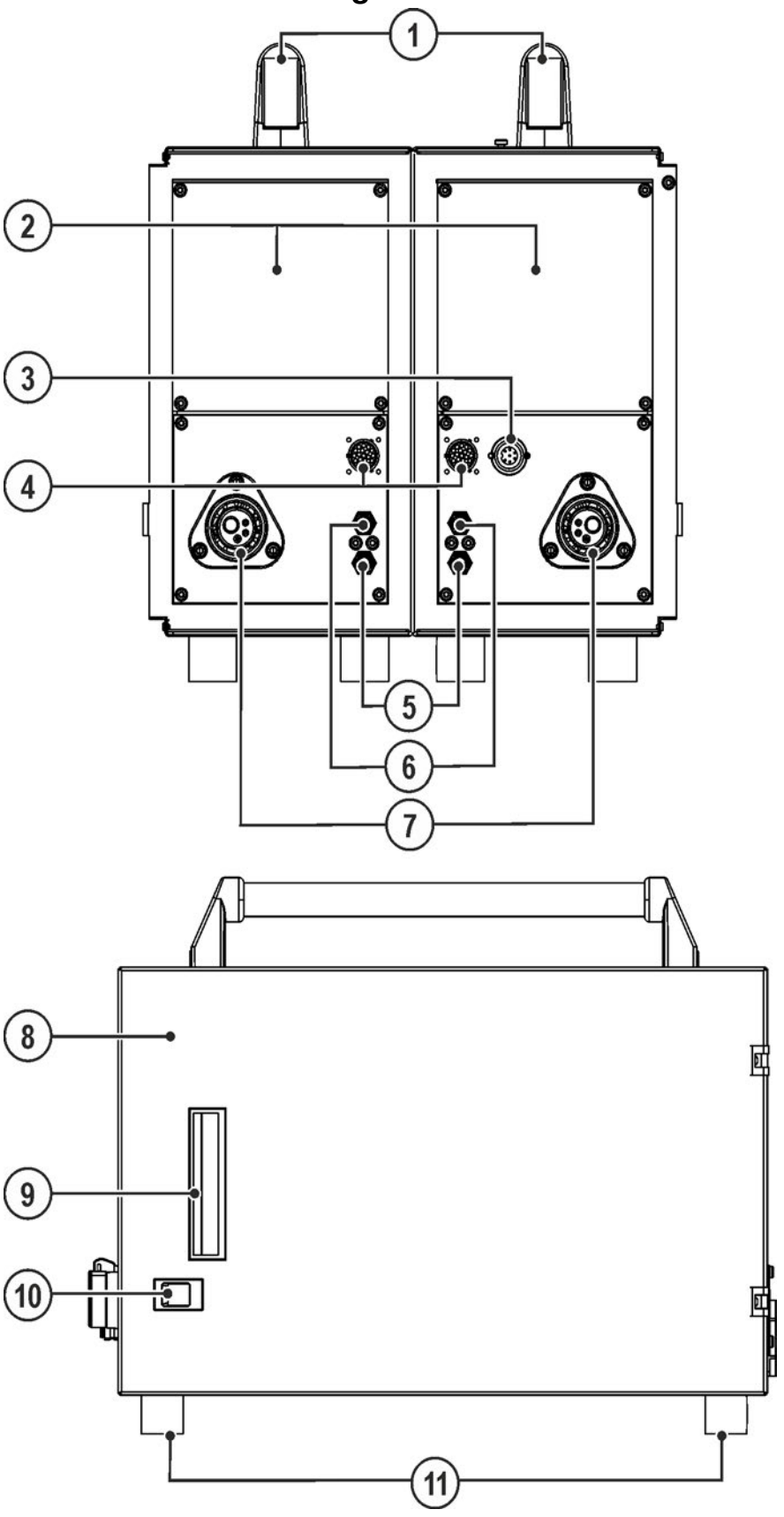


Figure 4-1

Item	Symbol	Description
1		**Carrying handle**
2		**Machine control, see the relevant control operating instructions**
3	digital	**Connection socket, 7-pole** Connection for peripheral devices with digital interface
4		**19-pole connection socket (analogue)** For connecting analogue accessory components (remote control, welding torch control lead, etc.)
5		**Quick connect coupling (red)** Coolant return
6		**Quick connect coupling (blue)** Coolant feed
7		**Welding torch connection (Euro or Dinse torch connector)** Welding current, shielding gas and torch trigger integrated
8		**Protective cap** Cover for the wire feed mechanism and other operating elements. Depending on the machine series, additional stickers with information on the replacement parts and JOB lists will be located on the inside.
9		**Recessed grip for opening the cap**
10		**Slide latch, lock for the protective cap**
11		**Machine feet**

4.2 Inside view from the right

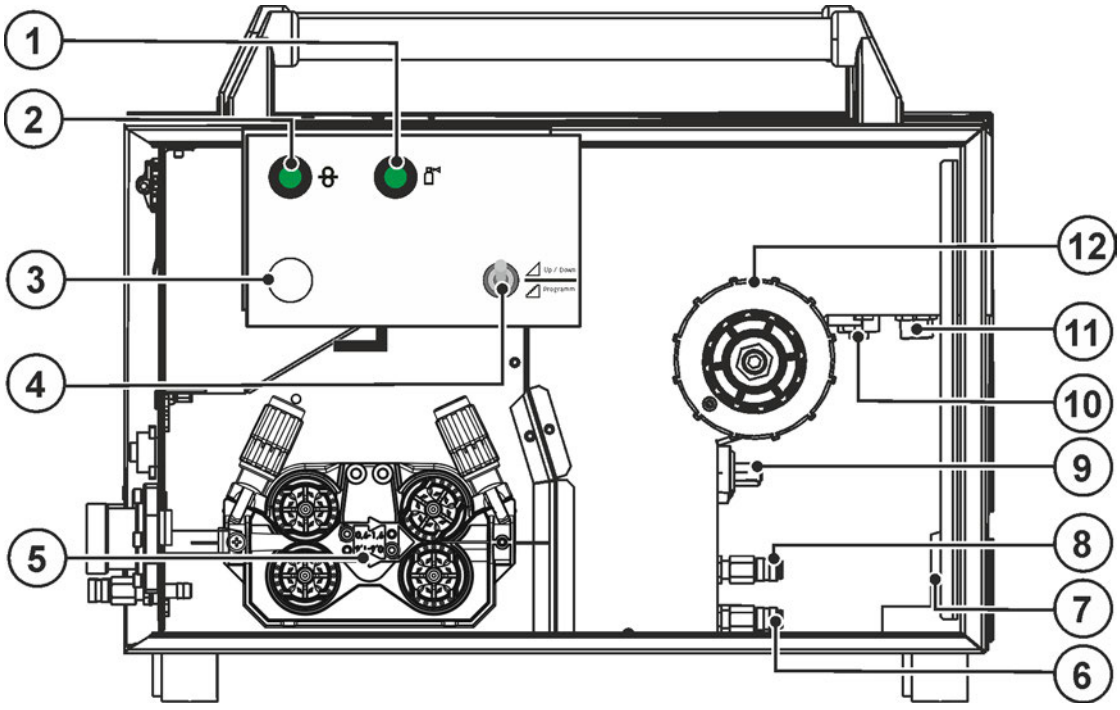


Figure 4-2

Item	Symbol	Description
1		**Push-button gas test / rinse hose package** > ***see 5.1.6 chapter***
2		**Wire inching push-button** For potential- and gas-free inching of the wire electrode through the hose package to the welding torch.
3		**Lighting, inside** In power-saving mode and with MMA or TIG welding, the lighting is switched off.
4		**Welding torch function changeover switch (special welding torch required)** Up / Down ---- Welding power infinitely adjustable Programm --- Change over programs or JOBs
5		**Wire feed unit**
6		**Quick connect coupling (red)** coolant return
7		**Intermediate hose package strain relief** > ***see 5.1.5 chapter***
8		**Quick connect coupling (blue)** coolant supply
9		**Connector plug, welding current "+"** Welding current connection on wire feed unit
10		**7-pole connection socket (digital)** • Control lead for wire feed unit
11		**Connecting nipple G¼, shielding gas connection**
12		**Wire spool holder**

4.3 Inside view from the left

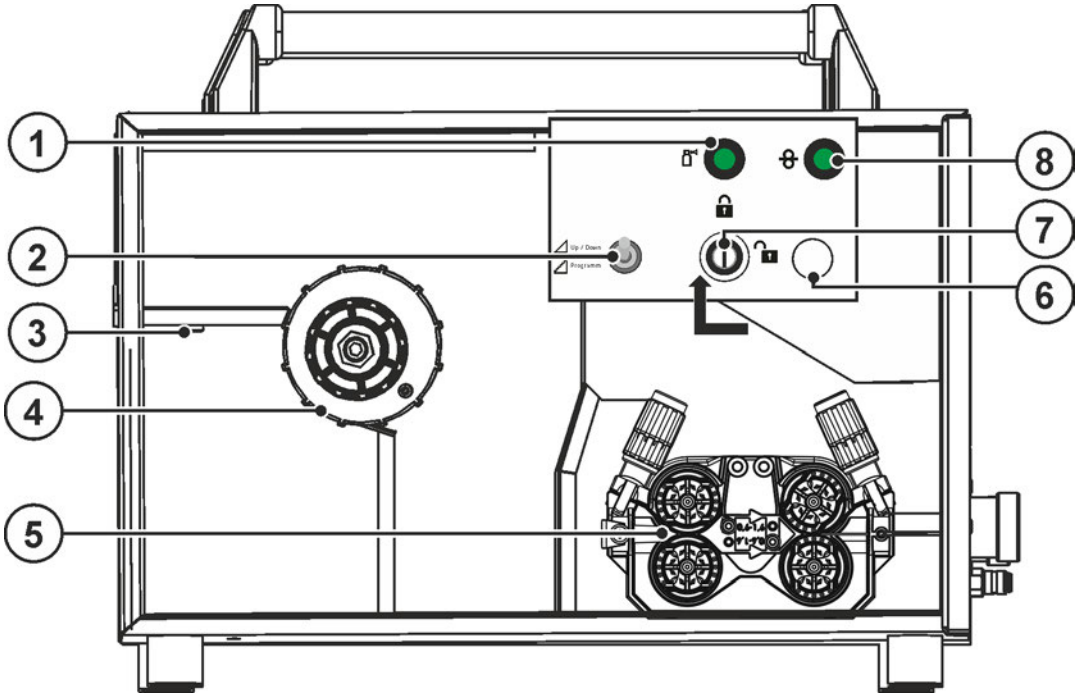


Figure 4-3

Item	Symbol	Description
1		**Push-button gas test / rinse hose package** > ***see 5.1.6 chapter***
2		**Welding torch function changeover switch (special welding torch required)** Up / Down ----- Welding power infinitely adjustable Programm ---- Change over programs or JOBs
3		**Connecting nipple G¼, shielding gas connection**
4		**Wire spool holder**
5		**Wire feed unit**
6		**Lighting, inside** In power-saving mode and with MMA or TIG welding, the lighting is switched off.
7		**Key switch for protection against unauthorised use** > ***see 5.7 chapter*** --------- changes possible,G front drive-4x-EX ---------- changes not possible.
8		**Wire inching push-button** For potential- and gas-free inching of the wire electrode through the hose package to the welding torch.

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!

☞ ***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.

5.1.1 Ambient conditions

☞ ***T he 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.***

☞ ***Equipment damage due to contamination!***
Unusually high amounts of dust, acids, corrosive gases or substances can damage the machine (observe maintenance intervals > see 6.2 chapter).

- ***Avoid large amounts of smoke, steam, oily fumes, grinding dust and corrosive ambient air!***

5.1.1.1 In operation

Temperature range of the ambient air:

- -25 °C to +40 °C (-13 F to 104 F)

Relative humidity:

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

5.1.1.2 Transport and storage

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

- -30 °C to +70 °C (-22 F to 158 F)

Relative humidity

- up to 90 % at 20 °C (68 F)

⚠ 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.

⚠ CAUTION

Risk of accident due to unsuitable power source!
If this wire feeder is operated with an unsuitable power source, it may topple and injure persons. In addition, the performance of the overall system would be restricted.

- For suitable power sources, see the "Intended use" chapter > *see 3 chapter*.

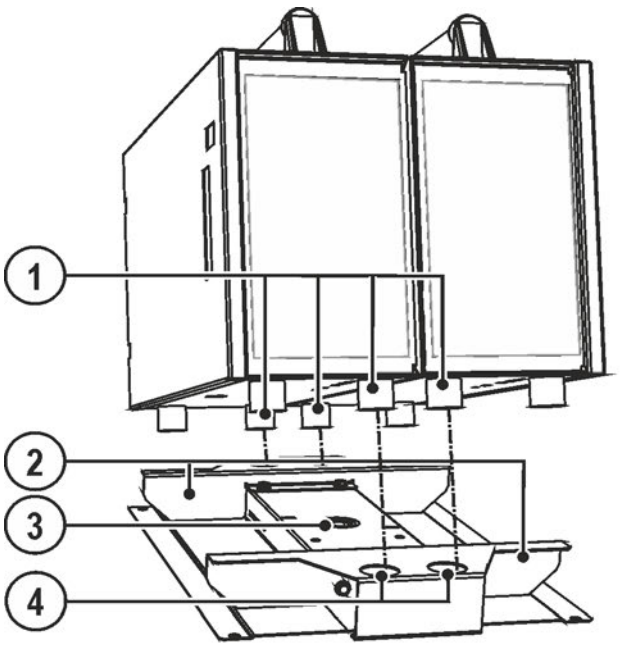
☞ ***T he machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!***

- ***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.***

⚠ CAUTION

Risk of falling!
If the double wire feed unit is not positioned correctly on the holder, it may fall, become damaged and cause injury to persons as a result.

- Always position the inner feet of the wire feed unit in the provided recesses!
- Outer housing frames of the wire feed must lay flat on the holder!
  (See figure, part "b")
- Check that the wire feed is properly secured before any transport and every start-up operation!
- Observe the safety instructions on transport and positioning, as well as on lifting by crane, in the operating instructions for the power source!
- Do not apply tractive force to the torch tube package! If there is any possibility that tractive force may be unavoidable, the wire feed must be removed from the support!
- The press arbor bracket must not be used (even with a single wire feed)!



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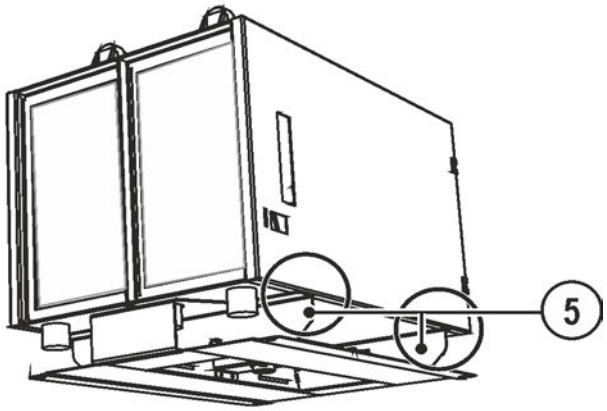


b

Figure 5-1

Item	Symbol	Description
1		Internal unit feet
2		Holder for wire feed unit
3		Press arbor bracket
4		Recesses for unit feet
5		External casing frame

- Set the double wire feed on the holder in such a way that the unit's inner feet are held securely in the recesses provided for them.

5.1.2 Welding torch cooling system

☞ ***Insufficient frost protection in the welding torch coolant!***
Depending on the ambient conditions, different liquids are used for cooling the welding torch > see 5.1.2.1 chapter.
Coolants with frost protection (KF 37E or KF 23E) must be checked regularly to ensure that the frost protection is adequate to prevent damage to the machine or the accessory components.

- ***The coolant must be checked for adequate frost protection with the TYP 1 frost protection tester .***
- ***Replace coolant as necessary if frost protection is inadequate!***

☞ ***Coolant mixtures!***
Mixtures with other liquids or the use of unsuitable coolants result in material damage and renders the manufacturer's warranty void!

- ***Only use the coolant described in this manual (overview of coolants).***
- ***Do not mix different coolants.***
- ***When changing the coolant, the entire volume of liquid must be changed.***

☞ ***Dispose of the coolant in accordance with local regulations and the material safety data sheets.***

5.1.2.1 Approved coolants overview

Coolant	Temperature range
KF 23E (Standard)	-10 °C to +40 °C
KF 37E	-20 °C to +30 °C

5.1.2.2 Maximal hose package length

	Pump 3.5 bar	Pump 4.5 bar
Machines with or without separate wire feeder	30 m	60 m
Compact machines with additional intermediate drive (example. miniDrive)	20 m	30 m
Machines with separate wire feeder and additional intermediate drive (example: miniDrive)	20 m	60 m

Data as a rule refer to the entire hose package length including welding torch. The pump output is shown on the type plate (parameter: Pmax).

Pump 3.5 bar: Pmax = 0.35 MPa (3.5 bar)

Pump 4.5 bar: Pmax = 0.45 MPa (4.5 bar)

5.1.3 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).

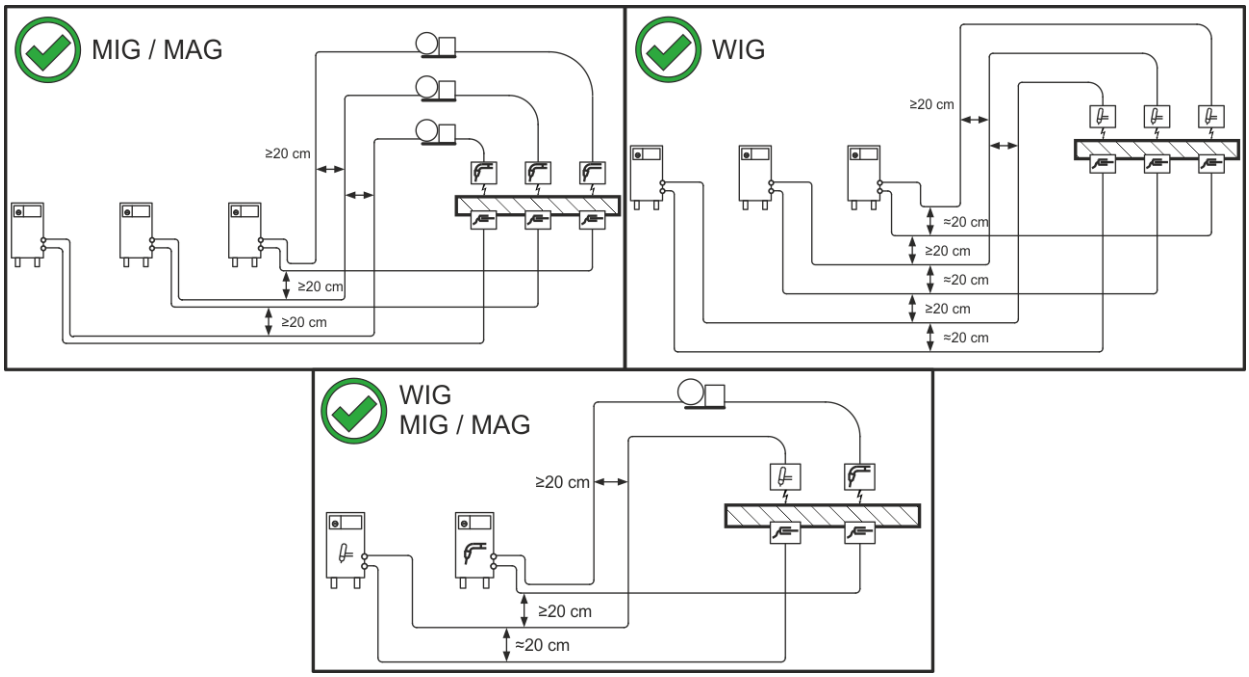


Figure 5-2

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

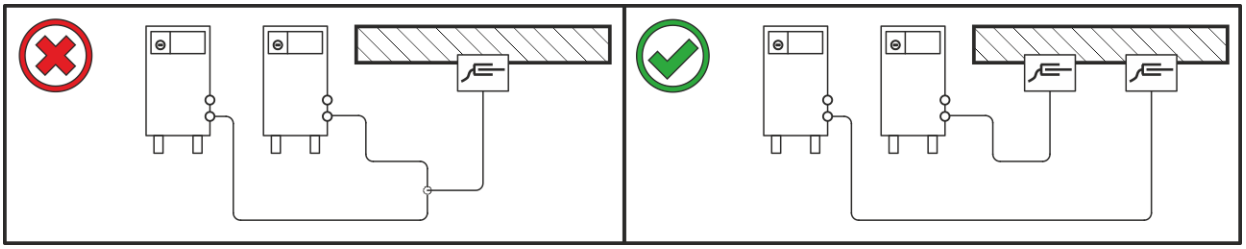


Figure 5-3

☞ ***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.***

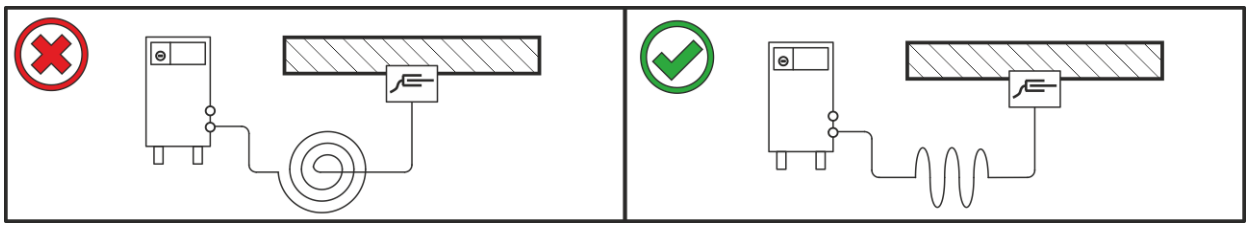


Figure 5-4

5.1.4 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.

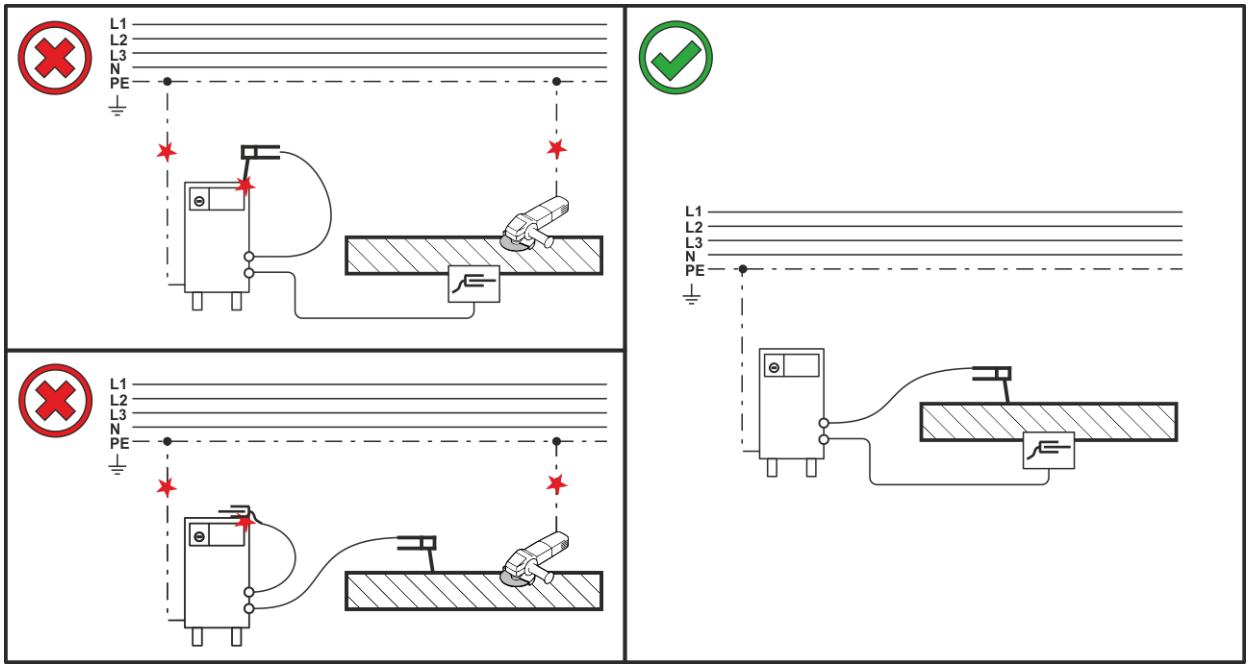


Figure 5-5

5.1.5 Intermediate hose package connection

⚠ 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.

☞ ***The connection is carried out in the interior of the wire feed unit. The connections must be fed through the opening on the rear and the hose package end must be fastened using the strain relief.***

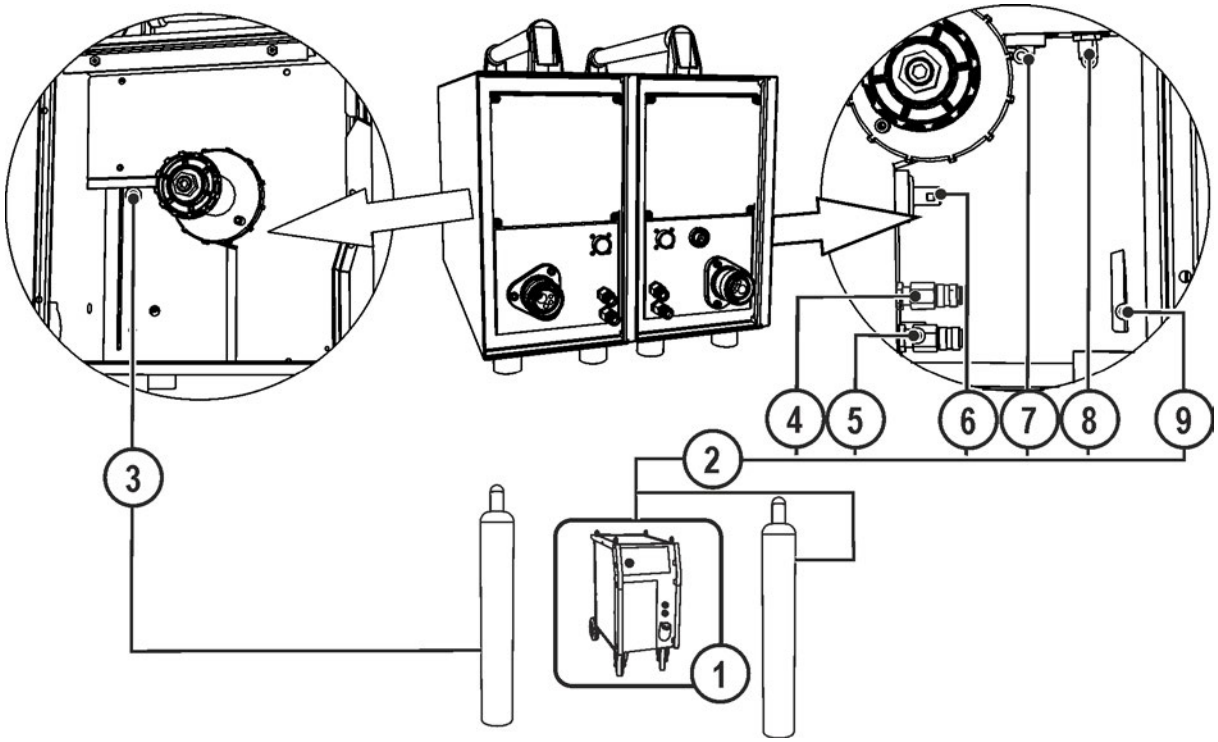


Figure 5-6

Item	Symbol	Description
1		**Power source**
2		**Intermediate hose package**
3		**G¼" connecting nipple, shielding gas connection** Shielding gas supply to the central connection of the second welding torch
4		**Quick connect coupling (blue)** coolant supply
5		**Quick connect coupling (red)** coolant return
6		**Connector plug, welding current "+"** Welding current connection on wire feed unit
7		**7-pole connection socket (digital)** • Control lead for wire feed unit
8		**G¼" connecting nipple, shielding gas connection** Shielding gas supply to the central connection of the first welding torch
9		**Strain relief**

- Insert the end of the hose package through the strain relief of the hose package and lock by turning to the right.
- Push the welding current cable socket onto the “welding current connecting plug” and lock by turning to the right.
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).
- 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).
- Connect crown nut of the shielding gas line to the G¼“ connecting nipple.

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

5.1.6.1 Shielding gas volume settings

If the shielding gas setting is too low or too high, this can introduce air to the weld pool and may cause pores to form. Adjust the shielding gas quantity to suit the welding task!

- Slowly open the gas cylinder valve.
- Open the pressure regulator.
- Switch on the power source at the main switch.
- Trigger gas test > *see 5.1.6.2 chapter* function (welding voltage and wire feed motor remain switched off – no accidental arc ignition).
- Set the relevant gas quantity for the application on the pressure regulator.

Setting instructions

Welding process	Recommended shielding gas quantity
MAG welding	Wire diameter x 11.5 = l/min
MIG brazing	Wire diameter x 11.5 = l/min
MIG welding (aluminium)	Wire diameter x 13.5 = l/min (100 % argon)
TIG	Gas nozzle diameter in mm corresponds to l/min gas throughput

Helium-rich gas mixtures require a higher gas volume!

The table below can be used to correct the gas volume calculated where necessary:

Shielding gas	Factor
75% Ar/25% He	1.14
50% Ar/50% He	1.35
25% Ar/75% He	1.75
100% He	3.16

5.1.6.2 Gas test

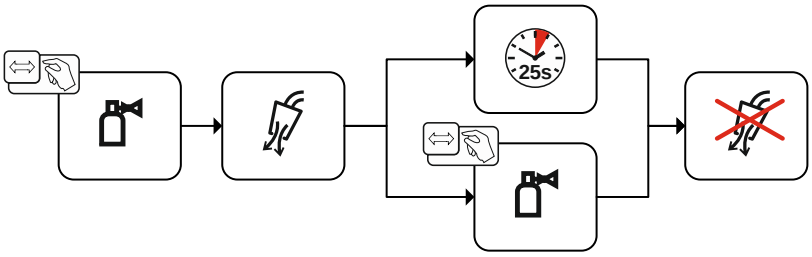


Figure 5-7

5.1.6.3 Purge hose package

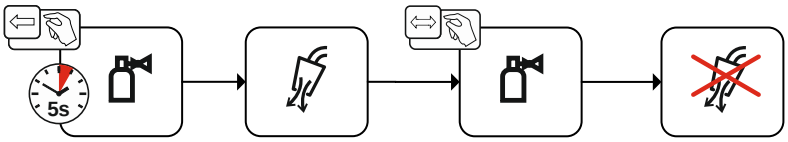


Figure 5-8

5.2 MIG/MAG welding

5.2.1 Welding torch connection

☞ ***Equipment damage due to improperly connected coolant pipes!***
If the coolant pipes are not properly connected or a gas-cooled welding torch is used, the coolant circuit is interrupted and equipment damage can occur.

- ***Connect all coolant pipes correctly!***
- ***Completely unroll the hose package and the torch hose package!***
- ***Observe maximal hose package length > see 5.1.2.2 chapter.***
- ***When using a gas-cooled welding torch, use a hose bridge to establish the coolant circuit > see 9 chapter.***

☞ ***On delivery, the Euro torch connector is fitted with a capillary tube for welding torches with a steel liner. Conversion is necessary if a welding torch with a liner is used!***

- ***Operate welding torches with a liner > with a guide tube.***
- ***Operate welding torches with a steel liner > with a capillary tube.***

Depending on the wire electrode diameter or type, either a steel liner or liner with the correct inner diameter must be inserted in the torch!

Recommendation:

- Use a steel liner when welding hard, unalloyed wire electrodes (steel).
- Use a chrome nickel liner when welding hard, high-alloy wire electrodes (CrNi).
- Use a plastic or teflon liner when welding or brazing soft wire electrodes, high-alloy wire electrodes or aluminium materials.

Preparation for connecting welding torches with a liner:

- Push forward the capillary tube on the wire feed side in the direction of the Euro torch connector and remove it there.
- Insert the liner guide tube from the Euro torch connector side.
- Carefully insert the welding torch connector with as yet too long a liner into the Euro torch connector and secure with a crown nut.
- Cut off the liner with a liner cutter > *see 9 chapter* just before the wire feed roller.
- Loosen the welding torch connector and remove.
- Carefully chamfer the cut off end of the liner with a liner sharpener > *see 9 chapter* and sharpen.

Preparation for connecting welding torches with a spiral guide:

- Check that the capillary tube is correctly positioned in relation to the central connector!

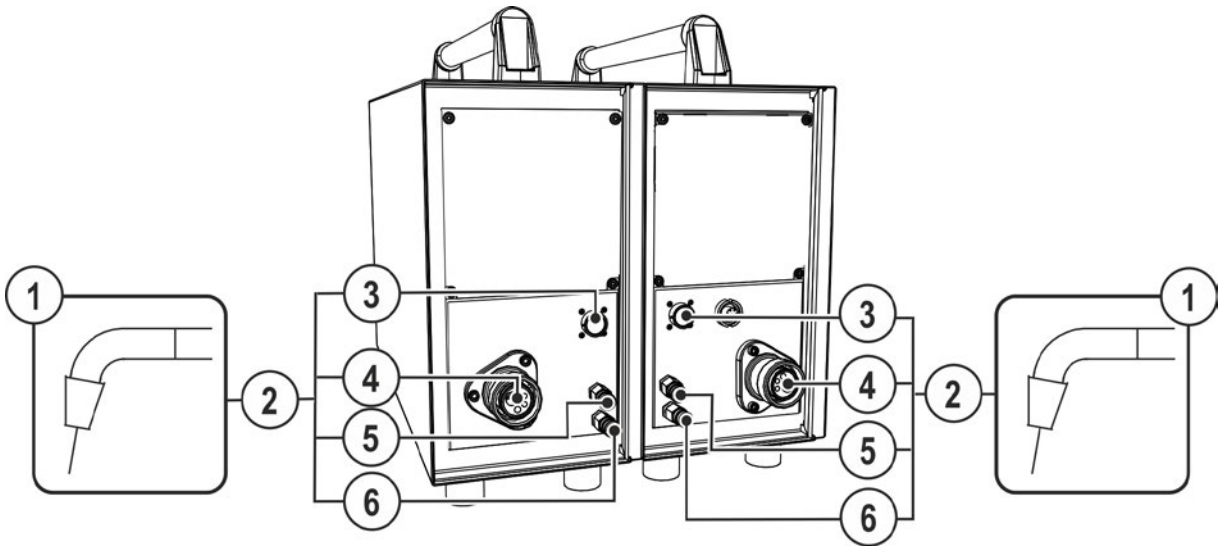


Figure 5-9

Item	Symbol	Description
1		**Welding torch**
2		**Welding torch hose package**
3		**19-pole connection socket (analogue)** For connecting analogue accessory components (remote control, welding torch control lead, etc.)
4		**Welding torch connection (Euro or Dinse torch connector)** Welding current, shielding gas and torch trigger integrated
5		**Quick connect coupling (blue)** Coolant feed
6		**Quick connect coupling (red)** Coolant return

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings:
  Return line red to quick connect coupling, red (coolant return) and
  supply line blue to quick connect coupling, blue (coolant supply).

If fitted:

- Insert the 19-pole torch control lead plug into the 19-pole connection socket (analogue) and lock.

5.2.2 Wire feed

⚠ CAUTION

Risk of injury due to moving parts!
The wire feeders are equipped with moving parts, which can trap hands, hair, clothing or tools and thus injure persons!

- Do not reach into rotating or moving parts or drive components!
- Keep casing covers or protective caps closed during operation!

Risk of injury due to welding wire escaping in an unpredictable manner!
Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!

- Before mains connection, set up the complete wire guide system from the wire spool to the welding torch!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!

5.2.2.1 Open the protective flap of the wire feeder

☞ ***To perform the following steps, the protective flap of the wire feeder needs to be opened. Make sure to close the protective flap again before starting to work.***

- Unlock and open protective flap.

5.2.2.2 Inserting the wire spool

⚠ CAUTION

Risk of injury due to incorrectly secured wire spool.
If the wire spool is not secured properly, it may come loose from the wire spool support and fall to the ground, causing damage to the machine and injuries.

- Make sure to correctly fasten the wire spool to the wire spool support.
- Before you start working, always check the wire spool is securely fastened.

☞ ***Standard D300 wire spool holder can be used. Adapters are required when using standardised basket coils (DIN 8559) > see 9 chapter.***

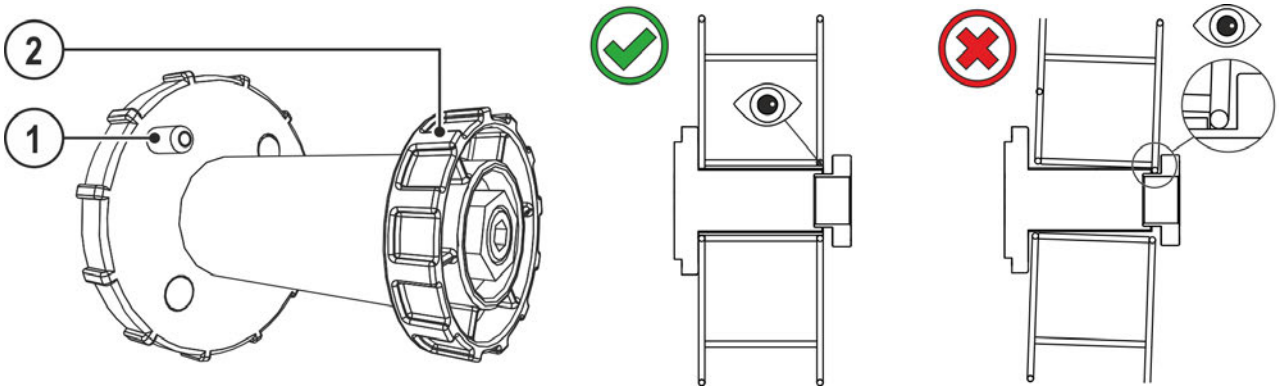


Figure 5-10

Item	Symbol	Description
1		**Carrier pin** For fixing the wire spool
2		**Knurled nut** For fixing the wire spool

- Loosen knurled nut from spool holder.
- Fix welding wire reel onto the spool holder so that the carrier pin locks into the spool bore.
- Fasten wire spool using knurled nut.

5.2.2.3 Changing the wire feed rollers

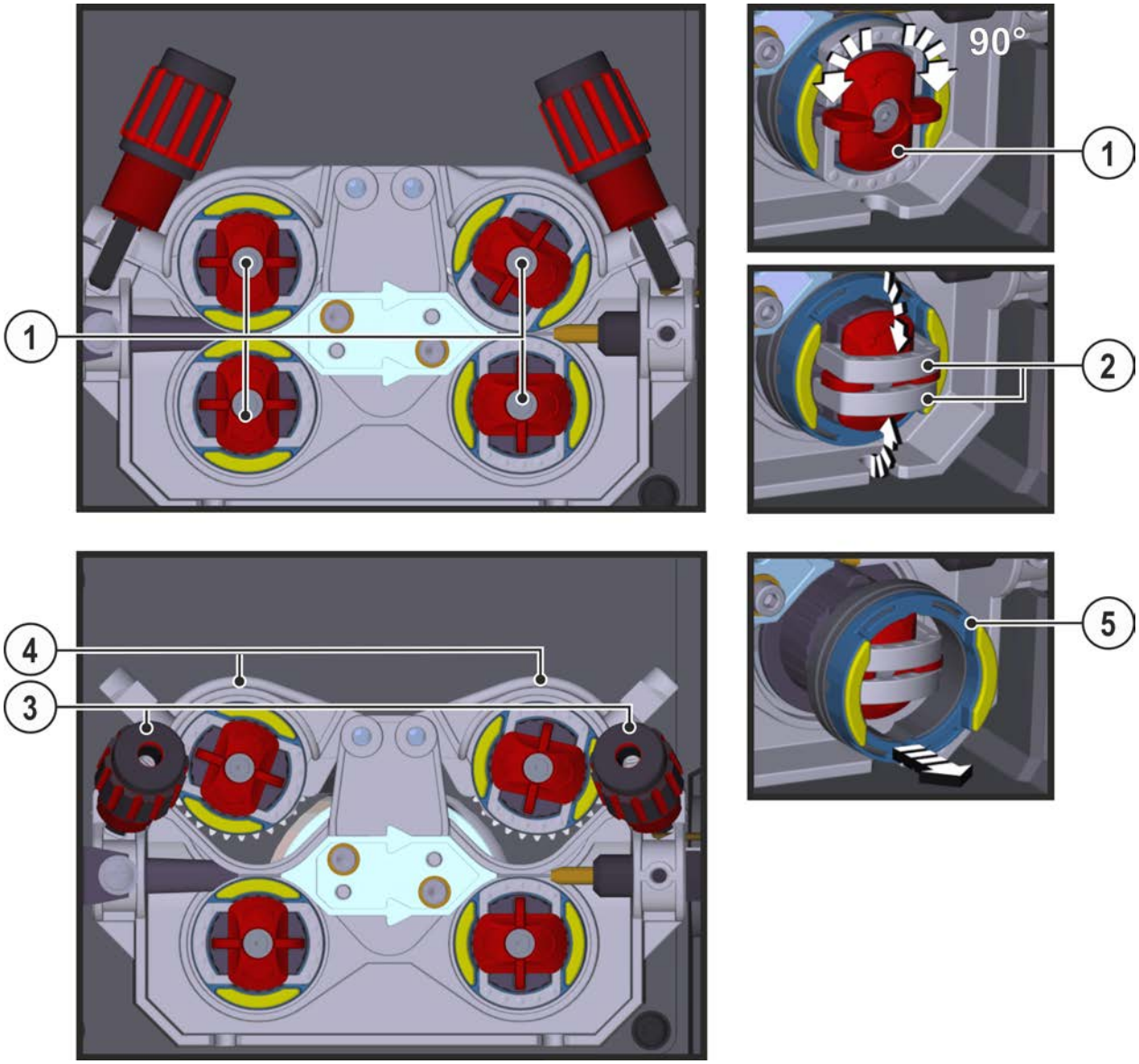


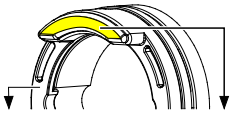
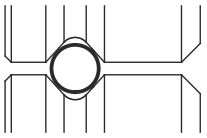
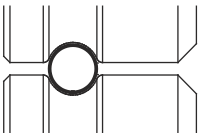
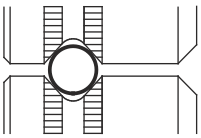
Figure 5-11

Item	Symbol	Description
1		**Tommy** The tommy is used to secure the closure brackets of the wire feed rollers.
2		**Closure bracket** The closure brackets are used to secure the wire feed rollers.
3		**Feed roll tensioner** Fixing the clamping unit and setting the pressure.
4		**Clamping unit**
5		**Wire feed roller** see the Wire feed roller overview table

- Rotate the tommy by 90° clockwise or anti-clockwise (tommy locks into place).
- Fold the closure brackets outwards by 90°.
- Unfasten pressure units and fold out (clamping units and pressure rollers will automatically flip upwards).
- Remove the wire feed rollers from the roller support.
- Select new wire feed rollers accoridng to the Wire feed roller overview table and reassemble the wire feed mechanism in reverse order.

☞ ***Unsatisfactory welding results due to faulty wire feeding!***
The wire feed rolls must be suitable for the diameter of the wire and the material. The wire feed rolls are colour-coded to facilitate distinction (see the Wire feed roll overview table). When working with a wire diameter of > 1.6 mm the drive has to be converted for the wire feed kit ON WF 2,0-3,2MM EFEED > see 10 chapter.

Wire feed roll overview table:

Material	Diameter		Colour code			Groove form
	∅ mm	∅ inch				
Steel Stainless steel Brazing	0.6	.023	monochrome	light pink	-	 V-groove
	0.8	.030		white		
	0.8 0.9 1.0	.030 .035 .040	bicolour	white	blue	
	1.0 1.2	.040 .045		blue	red	
	1.4	.052	monochrome	green	-	
	1.6	.060		black		
	2.0	.080		grey		
	2.4	.095		brown		
	2.8	.110		light green		
	3.2	.125		purple		
Aluminium	0.8	.030	bicolour	white	yellow	 U-groove
	0.9 1.0	.035 040		blue		
	1.2	.045		red		
	1.6	.060		black		
	2.0	.080		grey		
	2.4	.095		brown		
	2.8	.110		light green		
	3.2	.125		purple		
Flux cored wire	0.8	.030	bicolour	white	orange	 V-groove, knurled
	0.9 1.0	.035 .040		blue		
	1.2	.045		red		
	1.4	.052		green		
	1.6	.060		black		
	2.0	.080		grey		
	2.4	.095		brown		

5.2.2.4 Inching the wire electrode

⚠ CAUTION

Risk of injury due to welding wire escaping from the welding torch!
The welding wire can escape from the welding torch at high speed and cause bodily injury including injuries to the face and eyes!
- Never direct the welding torch towards your own body or towards other persons!

☞ ***Incorrect contact pressure will cause extensive wear of the wire feed rollers!***
- ***With the adjusting nuts of the pressure units set the contact pressure so that the wire electrode is conveyed but will still slip through if the wire spool jams.***
- ***Set the contact pressure of the front rollers (in wire feed direction) to a higher value!***

☞ ***The inching speed is infinitely adjustable by simultaneously pressing the wire inching push-button and turning the wire speed rotary knob. The left display shows the wire feed speed selected, the right display shows the current motor current of the wire feed mechanism.***

☞ ***Depending on the design of the device, the wire feed mechanism may be reversed!***

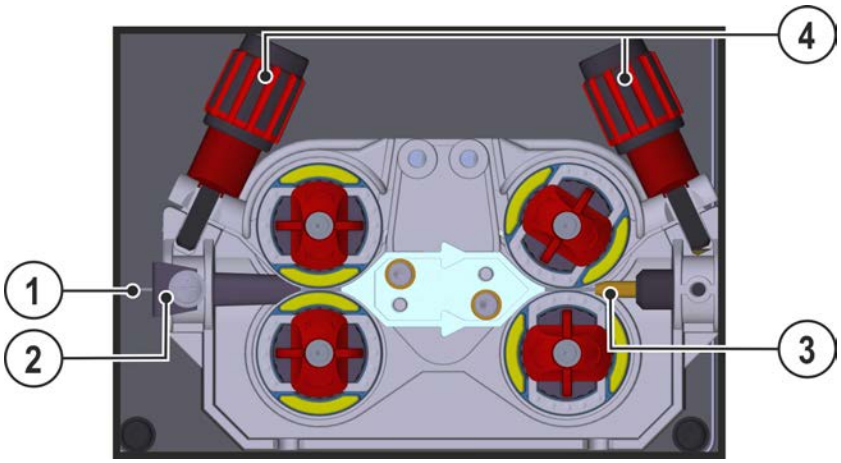


Figure 5-12

Item	Symbol	Description
1		Welding wire
2		Wire feed nipple
3		Guide tube
4		Adjusting nut

- Extend and lay out the torch hose package.
- Carefully unwind the welding wire from the wire spool and insert through the wire feed nipples up to the wire feed rollers.
- Press the inching push-button (the drive catches the welding wire and automatically guides it to the welding torch outlet) > *see 4.2 chapter*.

☞ ***A prerequisite for the automatic inching process is the correct preparation of the wire guide, especially in the capillary and wire guide tube area > see 5.2.1 chapter.***

- The contact pressure has to be adjusted separately for each side (wire inlet/outlet) at the feed roll tensioner setting nuts depending on the welding consumable used. A table with the setting values can be found on a sticker near the wire drive.

Version 1: left hand mounting **Version 2: right hand mounting**

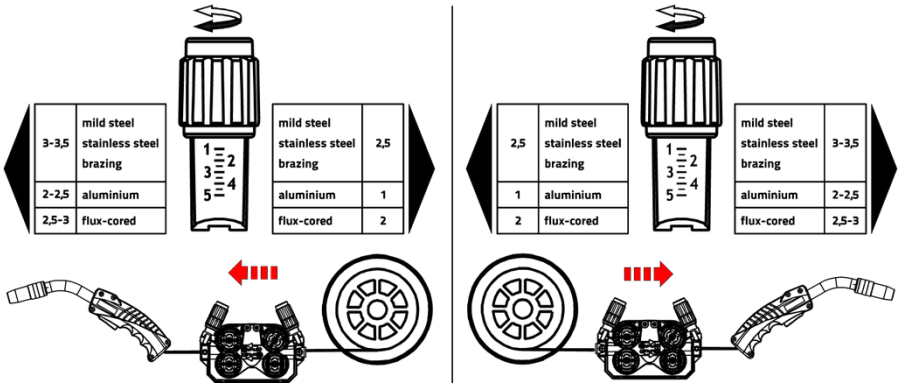


Figure 5-13

Automatic inching stop

Touch the welding torch against the workpiece during inching. Inching of the welding wire will stop as soon it touches the workpiece.

5.2.2.5 Spool brake setting

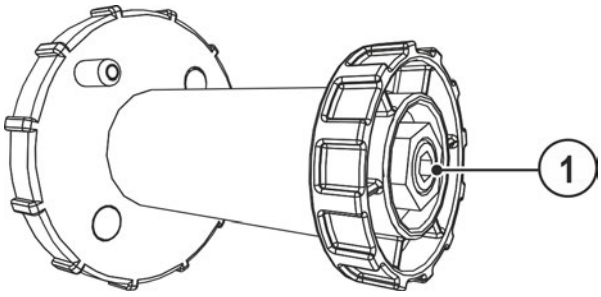


Figure 5-14

Item	Symbol	Description
1		**Allen screw** Securing the wire spool retainer and adjustment of the spool brake

- Tighten the Allen screw (8 mm) in the clockwise direction to increase the braking effect.

☞ ***Tighten the spool brake until the wire spool no longer turns when the wire feed motor stops but without it jamming during operation!***

5.2.2.6 Basic settings for operation with two wire feeders (P10)

☞ ***The wire feeder controls are configured ex works for double wire feeder operation. This setting should be checked and corrected, if necessary, should the controls have been reset to the factory settings or in the event of errors.***

- ***Configure one wire feeder as master, the second as slave.***
- ***Always configure a wire feeder with key switch (optional) as master.***

The special parameter P10 determines the settings for single or dual operation of the machines.

It is located in the menu levels that are not directly accessible on the wire feed or welding machine control.

Assignment of parameter setting and operating mode:

P10	Meaning
0	Single operation
1	Dual operation as master
2	Dual operation as slave

The following settings should be carried out in sequence on both wire feed units (with compact units, on the welding machine and wire feed unit), or checked:

- Open the special parameters menu on the machine control,

set special parameter P10 on a wire feed unit (or welding machine) to "Master" and

set special parameter P10 on the other wire feed unit to "Slave".

The "Master" or "Slave" setting does not mean a difference in function. The unit configured as the master is active after switching on. (Tapping the torch trigger on the inactive unit will change over units.)

☞ ***Please note!***

- ***The system is not designed for simultaneous welding.***
- ***Do not connect any further accessories to the 7-pole connection socket.***

5.2.2.7 Switching between wire feed units

On the welding torch of the inactive wire feed

- Tap torch trigger (press briefly)

Changeover is only carried out if no welding current is flowing!

5.2.2.8 Special points when operating with two wire feed units

Operation with two wire feed units allows you to weld different materials alternately with one welding machine (e.g. welding steel and CrNi).

The machines can be equipped with different filler materials and the corresponding shielding gases.

The corresponding welding task is set at the respective machine control of the wire feed unit (see chapter "Selecting MIG/MAG welding tasks").

☞ ***During the start procedure, the controls of the wire feed unit will show the last active JOB for about three seconds. The unit is then ready to weld.***

The start procedure is carried out

- ***at the control configured as master, after switching on***
- ***at the control configured as slave, after switching over for the first time***

5.2.3 Welding task selection

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

5.3 TIG welding

5.3.1 Welding torch connection

☞ ***TIG welding torches to be connected to a Euro torch connector are available in two versions:***

- ***TIG combi welding torches are connected to the Euro torch connector of the wire feeder and to the (-) welding current plug of the power source.***
- ***TIG welding torches of the EZA version are connected to the Euro torch connector of the wire feeder only. To do so, the welding current lead of the intermediate hose package must be connected to the (-) welding current connection at the rear of the unit!***

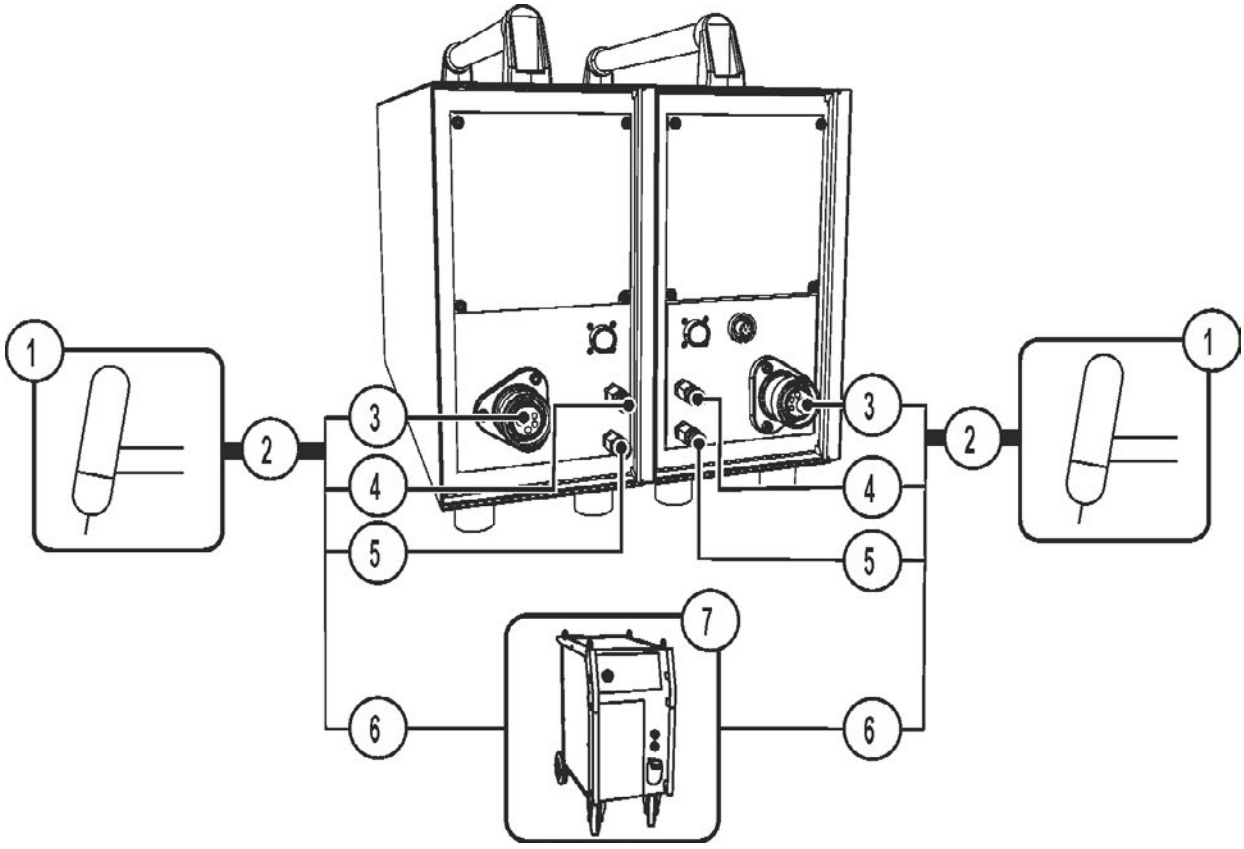
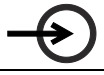
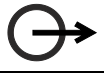


Figure 5-15

Item	Symbol	Description
1		**Welding torch**
2		**Welding torch hose package**
3		**Welding torch connection (Euro or Dinse torch connector)** Welding current, shielding gas and torch trigger integrated
4		**Quick connect coupling (red)** coolant return
5		**Quick connect coupling (blue)** coolant supply
6		**"-" welding current connection socket** • TIG welding: Welding current connection for welding torch
7		**Power source**

- Insert the central plug for the welding torch into the central connector and screw together with crown nut.
- Insert the welding current plug of the combi welding torch into the (-) welding current connection socket and lock into place by turning to the right (only in case of a separate welding current connection).
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).

5.3.2 Welding task selection

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

5.4 MMA welding

5.4.1 Welding task selection

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

5.4.2 Air arc gouging

During gouging, an arc burns between a carbon electrode and the workpiece, heating the workpiece until it is molten. At the same time, the molten metal is blown out with compressed air. Special electrode holders with a compressed-air connection and carbon electrodes are required for gouging.

5.5 Remote control

☞ ***The remote controls are operated via the 19-pole remote control connection socket (analogue) or the 7-pole remote control connection socket (digital), depending on the model.***

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

5.6 Interfaces for automation

⚠ WARNING

Do not carry out any unauthorised repairs or modifications!
To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!
The warranty becomes null and void in the event of unauthorised interference.

- Appoint only skilled persons for repair work (trained service personnel)!

☞ ***Damage to the machine due to improper connection!***
Unsuitable control leads or incorrect connection of input and output signals can cause damage to the machine.

- ***Only use shielded control leads!***
- ***If the machine is to be operated with control voltages connection via suitable isolation amplifiers is required!***
- ***To control the main or secondary current via control voltages, the relevant inputs must be enabled (see specification for activation of control voltage).***

5.6.1 Remote control connection socket, 19-pole

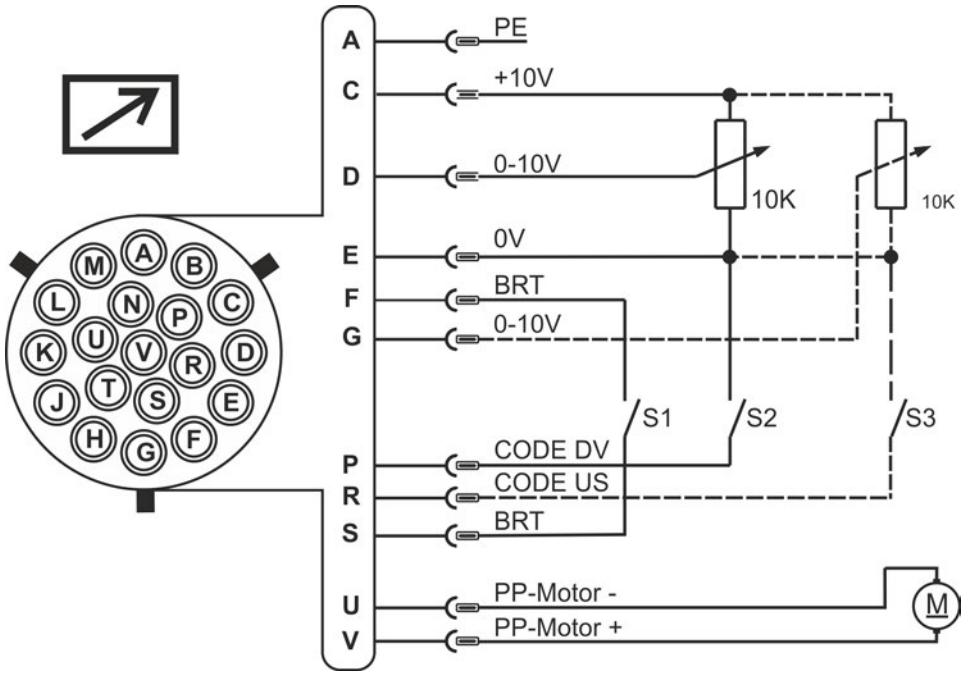


Figure 5-16

Pin	Signal form	Short description
A	Output	Connection for PE cable screen
C	Output	Reference voltage for potentiometer 10 V (max. 10 mA)
D	Input	Control voltage specification (0 V–10 V) – wire feed speed
E	Output	Reference potential (0 V)
F/S	Input	Welding power start/stop (S1)
G	Input	Control voltage specification (0 V–10 V) – arc length correction
P	Input	Activation of control voltage specification for wire feed speed (S2) For activation, put signal to reference potential 0 V (pin E)
R	Input	Activation of control voltage specification for arc length correction (S3) For activation, put signal to reference potential 0 V (pin E)
U/V	Output	Supply voltage push/pull welding torch

5.7 Access control

To protect against unauthorised or unintentional adjustment of the welding parameters on the machine, the control input can be locked with the aid of a key switch.

In key switch position 1 all functions and parameters can be set without restriction.

In key switch position 0 the following functions and parameters cannot be changed:

- No adjustment of the operating point (welding performance) in programs 1–15.
- No change of welding or operating mode in programs 1–15.
- The welding parameters can be displayed but not changed in the control's function sequence.
- No welding task switching (JOB block operation P16 possible).
- No change of special parameters (except P10). Restart required.

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

Incorrect maintenance, testing and repair!
Maintenance, testing and repair of the machine may only be carried out by skilled and qualified personnel. A qualified person is one who, because of his or her training, knowledge and experience, is able to recognise the dangers that can occur while testing welding power sources as well as possible subsequent damage, and who is able to implement the required safety procedures.

Observe the maintenance instructions > *see 6.2 chapter*.

- In the event that the provisions of one of the below-stated tests are not met, the machine must not be operated again until it has been repaired and a new test has been carried out!

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.

6.2 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 that the wire guide elements (inlet nipple, wire guide tube) are fitted securely.
- 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!***

- 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 electric 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.
- Information about returning used equipment or about collections can be obtained from the respective municipal administration office.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

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 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

Coolant error/no coolant flowing

- ↯ Insufficient coolant flow
  - 🛠 Check coolant level and refill if necessary
- ↯ Air in the coolant circuit
  - 🛠 Vent coolant circuit *> see 7.3 chapter*

Wire feed problems

- ↯ Contact tip blocked
  - 🛠 Clean, spray with anti-spatter spray and replace if necessary
- ↯ Setting the spool brake *> see 5.2.2.5 chapter*
  - 🛠 Check settings and correct if necessary
- ↯ Setting pressure units *> see 5.2.2.4 chapter*
  - 🛠 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

Functional errors

- ↯ 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)
- ↯ Several parameters cannot be set (machines with access block)
  - 🛠 Entry level is blocked, disable access lock *> see 5.7 chapter*
- ↯ Connection problems
  - 🛠 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
  - 🛠 Tighten contact tip correctly

7.2 Error messages (power source)

☞ ***A welding machine error will be signalled by an error code (see table) on the control display. In the event of an error, the power unit shuts down.***

☞ ***The display of possible error numbers depends on the machine version (interfaces/functions).***

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

Error (Err)	Category			Possible cause	Remedy
	a)	b)	c)		
1	-	-	x	Mains overvoltage	Check the mains voltages and compare with the welding machine connection voltages
2	-	-	x	Mains undervoltage	
3	x	-	-	Welding machine excess temperature	Allow the machine to cool down (mains switch to "1")
4	x	x	-	Coolant error	Fill coolant Turn on pump shaft (coolant pump) Check air cooling unit overcurrent trip
5	x	-	-	Wire feeder/tachometer error	Check the wire feeder Tachogenerator is not emitting a signal, M3.51 defective > inform Service.
6	x	-	-	Shielding gas error	Check shielding gas supply (for machines with shielding gas monitoring)
7	-	-	x	Secondary overvoltage	Inverter error > inform Service
8	-	-	x	Wire error	Separate the electrical connection between welding wire and casing or an earthed object
9	x	-	-	Quick shut-down	Rectify error on robot (Interface for automated welding)
10	-	x	-	Arc interruption	Check wire feeding (Interface for automated welding)
11	-	x	-	Ignition error (after 5 s)	Check wire feeding (Interface for automated welding)
13	x	-	-	Emergency stop deactivation	Check the emergency stop switch at the interface for automated welding
14	-	x	-	Wire feeder detection	Check cable connections
				ID number allocation error (2DV)	Correct ID numbers > *see 5.2.2.6 chapter*
15	-	x	-	Second wire feeder detection	Check cable connections
16	-	-	x	Open circuit voltage reduction error (VRD)	Inform Service.
17	-	x	x	Overcurrent detection on wire feeder	Check ease of wire feeding
18	-	x	x	Tachogenerator signal error	Check the connection and particularly the tachogenerator of the second wire feeder (slave drive).
56	-	-	x	Mains phase failure	Check mains voltages
59	-	-	x	Machine incompatible	Check machine usage > *see 3.2 chapter*
60	-	-	x	Software update required	Inform Service.

Categories legend (resetting the error)

a) The error message will disappear once the error has been rectified.

b) The error message can be reset by pressing a push-button:

Welding machine control	Push-button
RC1 / RC2	
Expert	
Expert 2.0 / Expert XQ 2.0	
CarExpert / Progress (M3.11)	
alpha Q / Concept / Basic / Basic S / Synergic / Synergic S / Progress (M3.71) / Picomig 355	not possible

c) The error message can only be reset by switching the machine off and on again.

The shielding gas error (Err 6) can be reset by pressing the "Welding parameters" key button.

7.3 Vent coolant circuit

☞ ***Coolant tank and quick connect coupling of coolant supply and return are only fitted in machines with water cooling.***

☞ ***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)!***

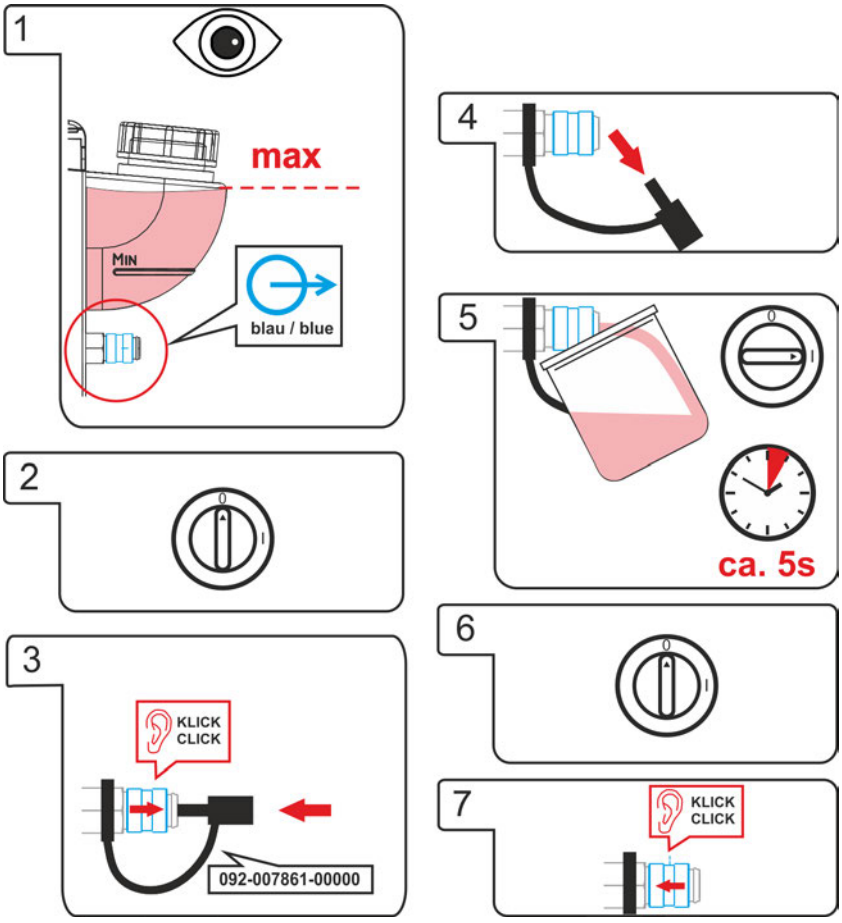


Figure 7-1

8 Technical data

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

8.1 drive 4X IC D EX

Supply voltage	42 VAC
Maximum welding current at 60% DC	550 A
Maximum welding current at 100 % DC	430 A
Wire feed rate	0.5 m/min to 25 m/min
	20 ipm to 985 ipm
Factory-installed roll equipment	1.0 mm + 1.2 mm (for steel wire)
Drive	4 rollers (37 mm)
Wire spool diameter	Standardised wire spools up to 300 mm
Welding torch connection	Euro torch connector
Protection class meter	IP 23
Ambient temperature[1]	-25 °C to +40 °C
EMC class	A
Safety marking	CE / EAC
Applied harmonised standards	See declaration of conformity (appliance documents)
Dimensions L x W x H	633 x 457 x 496 mm
	24.9 x 18.0 x 19.5 inch
Weight	44.0 kg
	97.0 lb

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

9 Accessories

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

9.1 General accessories

Type	Designation	Item no.
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
AK300	Wire spool adapter K300	094-001803-00001
HOSE BRIDGE UNI	Tube bridge	092-007843-00000
SPL	Sharpener for liner	094-010427-00000
HC PL	Hose cutter	094-016585-00000

9.2 Remote control/connecting and extension cable

9.2.1 7-pole connection

Type	Designation	Item no.
R40 7POL	Remote control, 10 programs	090-008088-00000
R50 7POL	Remote control, all welding machine functions can be set directly at the workplace	090-008776-00000
FRV 7POL 0.5 m	Extension/connecting cable	092-000201-00004
FRV 7POL 1 m	Extension/connecting cable	092-000201-00002
FRV 7POL 5 m	Extension/connecting cable	092-000201-00003
FRV 7POL 10 m	Extension/connecting cable	092-000201-00000
FRV 7POL 20 m	Extension/connecting cable	092-000201-00001
FRV 7POL 25M	Extension/connecting cable	092-000201-00007

9.2.2 19-pole connection

Type	Designation	Item no.
R10 19POL	Remote control	090-008087-00000
RG10 19POL 5M	Remote control to set the wire speed and welding voltage correction	090-008108-00000
R20 19POL	Program changeover remote control	090-008263-00000
RA5 19POL 5M	Remote control e.g. connection cable	092-001470-00005
RA10 19POL 10M	Remote control e.g. connection cable	092-001470-00010
RA20 19POL 20M	Remote control e.g. connection cable	092-001470-00020
RV5M19 19POLE 5M	Extension cable	092-000857-00000
RV5M19 19POL 10M	Extension cable	092-000857-00010
RV5M19 19POL 15M	Extension cable	092-000857-00015
RV5M19 19POL 20M	Extension cable	092-000857-00020

10 Replaceable parts

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

10.1 Wire feed rollers

10.1.1 Wire feed rollers for steel wire

Type	Designation	Item no.
FE 4R 0.6 MM/0.023 INCH LIGHT PINK	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00006
FE 4R 0.8-1.0MM / 0.03-0.04 INCH BLUE/WHITE	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00009
FE 4R 1.0-1.2MM / 0.04-0.045 INCH BLUE/RED	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00011
FE 4R 1.4 MM/0.052 INCH GREEN	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00014
FE 4R 1.6 MM/0.06 INCH BLACK	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00016
FE 4R 2.0 MM/0.08 INCH GREY	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00020
FE 4R 2.4 MM/0.095 INCH BROWN	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00024
FE 4R 2.8 MM/0.11 INCH LIGHT GREEN	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00028
FE 4R 3.2 MM/0.12 INCH VIOLET	Drive roll set, 37 mm, 4 rolls, V-groove for steel, stainless steel and brazing	092-002770-00032

10.1.2 Wire feed rollers for aluminium wire

Type	Designation	Item no.
AL 4R 0.8 MM/0.03 INCH WHITE	Drive roll set, 37 mm, for aluminium	092-002771-00008
AL 4R 1.0 MM/0.04 INCH BLUE	Drive roll set, 37 mm, for aluminium	092-002771-00010
AL 4R 1.2 MM/0.045 INCH RED	Drive roll set, 37 mm, for aluminium	092-002771-00012
AL 4R 1.6 MM/0.06 INCH BLACK	Drive roll set, 37 mm, for aluminium	092-002771-00016
AL 4R 2.0 MM/0.08 INCH GREY/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00020
AL 4R 2.4 MM/0.095 INCH BROWN/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00024
AL 4R 2.8 MM/0.110 INCH LIGHT GREEN/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00028
AL 4R 3.2 MM/0.125 INCH VIOLET/YELLOW	Drive roll set, 37 mm, for aluminium	092-002771-00032

10.1.3 Wire feed rollers for cored wire

Type	Designation	Item no.
FUEL 4R 0.8 MM/0.03 INCH WHITE/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00008
FUEL 4R 1.0 MM/0.04 INCH BLUE/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00010
FUEL 4R 1.2 MM/0.045 INCH RED/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00012
FUEL 4R 1.4 MM/0.052 INCH GREEN/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00014
FUEL 4R 1.6 MM/0.06 INCH BLACK/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00016
FUEL 4R 2.0 MM/0.08 INCH GREY/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00020
FUEL 4R 2.4 MM/0.095 INCH BROWN/ORANGE	Drive roll set, 37 mm, 4 rolls, V-groove/knurled for flux cored wire	092-002848-00024

10.1.4 Wire guide

Type	Designation	Item no.
SET DRAHTFUERUNG	Wire guide set	092-002774-00000
ON WF 2,0-3,2MM EFEED	Retrofitting option, wire guide for 2.0–3.2 mm wires, eFeed drive	092-019404-00000
SET IG 4x4 1.6mm BL	Inlet guide set	092-002780-00000
GUIDE TUBE L105	Guide tube	094-006051-00000
CAPTUB L108 D1,6	Capillary tube	094-006634-00000
CAPTUB L105 D2,0/2,4	Capillary tube	094-021470-00000

11 Appendix A

11.1 Searching for a dealer

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

"More than 400 EWM sales partners worldwide"