



**EN**

## Wire feed unit

Drive 4 Basic S  
Drive 4X Steel Synergic S  
Drive 4X Steel puls S

099-005593-EW501

Observe additional system documents!

16.07.2018

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## 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](http://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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## 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	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
			Switch
	Incorrect / Invalid		Turn
	Correct / Valid		Numerical value – adjustable
	Input		Signal light lights up in green
	Navigation		Signal light flashes green
	Output		Signal light lights up in red
	Time representation (e.g.: wait 4 s / actuate)		Signal light flashes red
	Interruption in the menu display (other setting options possible)		
	Tool not required/do not use		
	Tool required/use		

## 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.

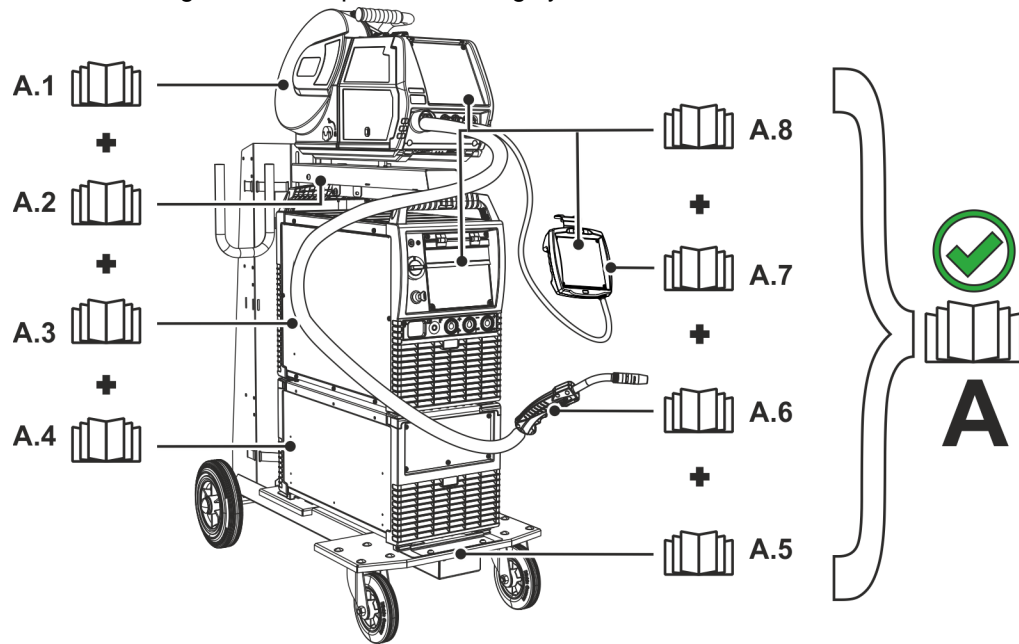


Figure 2-1

Item	Documentation
A.1	Wire feeder
A.2	Conversion instructions
A.3	Power source
A.4	Cooling unit, voltage converter, tool box etc.
A.5	Trolley
A.6	Welding torch
A.7	Remote control
A.8	Control
A	Complete documentation

## 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

MMA welding system for GMAW-pulse and standard welding as a MMA welding secondary process. It may be possible to expand the range of functions by using accessories (see the documentation in the relevant chapter).

### 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 with this machine:

	Drive 4X / D200 Basic S	Drive 4X / D200 Steel Synergic S	Drive 4X / D200 Steel puls S
Taurus xx5 Basic S	✔	✘	✘
Taurus xx5 Steel Synergic S	✘	✔	✘
Taurus xx5 Steel puls S	✘	✘	✔



### 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](http://www.ewm-group.com)!

#### 3.3.2 Declaration of Conformity

**The labelled product 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 product was tested with calibrated measuring equipment according to the applicable standards IEC/EN 60974, ISO/EN 17662, EN 50504 and complies with the permissible tolerances. Recommended calibration interval: 12 months.

## 4 Machine description – quick overview

### 4.1 Front view / side view from the right

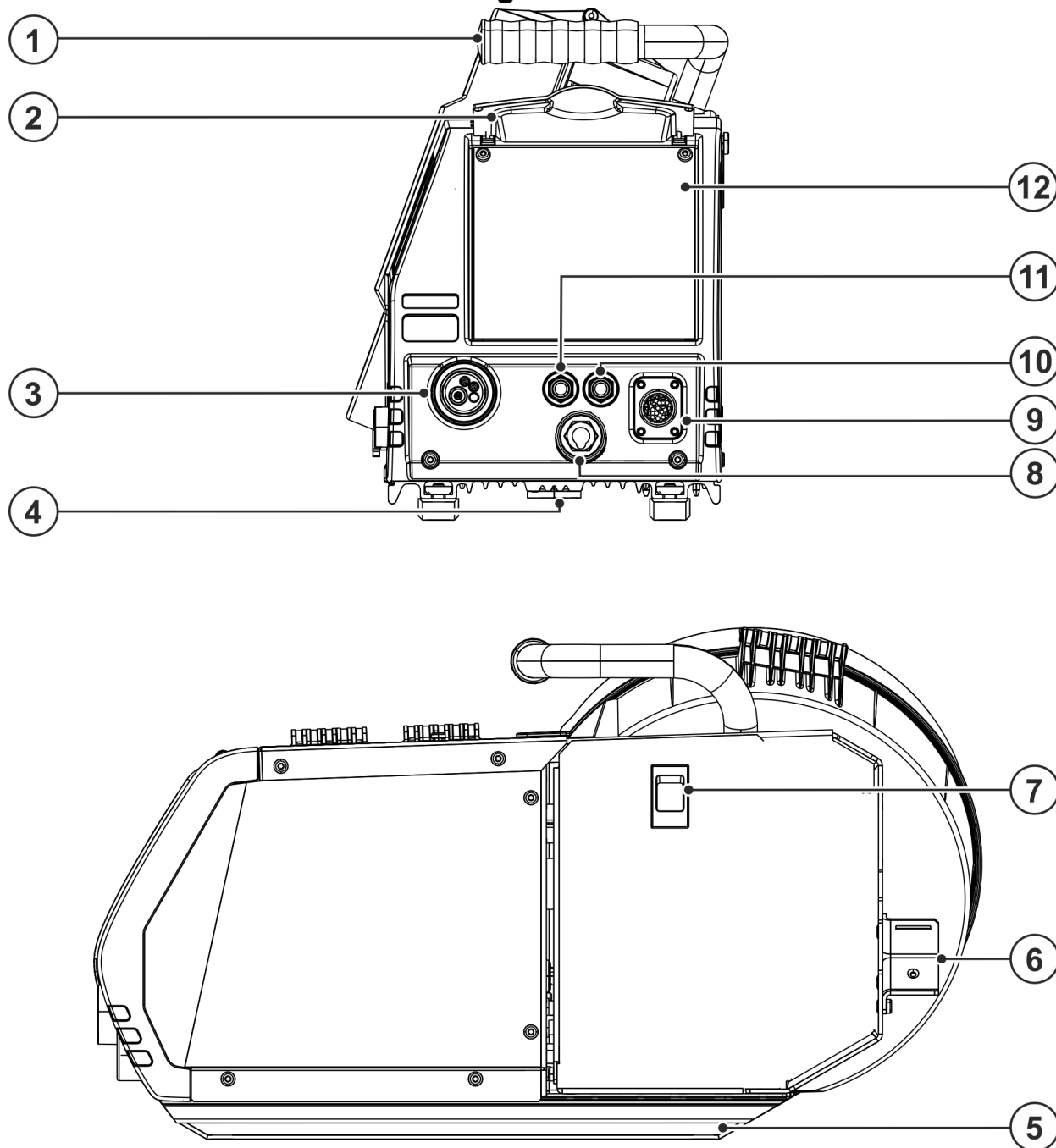





Figure 4-1

Item	Symbol	Description
1		<b>Carrying handle</b>
2		<b>Protective cap, welding machine control &gt; see 5.2.3 chapter</b>
3		<b>Welding torch connection (Euro or Dinse torch connector)</b> Welding current, shielding gas and torch trigger integrated
4		<b>Turning mandrel support</b> The wire feeder is placed onto the power source turning mandrel using this support to enable horizontal pivoting of the machine.
5		<b>Sliding rails</b>
6		<b>Intermediate hose package strain relief &gt; see 5.2 chapter</b>
7		<b>Slide latch, lock for the protective cap</b>
8		<b>Welding current connection socket (depending on variant)</b> Welding current potential of the torch connector for MMA welding or gouging
9		<b>19-pole connection socket (analogue)</b> For connecting analogue accessory components (remote control, welding torch control lead, etc.)
10		<b>Quick connect coupling (red)</b> Coolant return from welding torch
11		<b>Quick connect coupling (blue)</b> Coolant forward flow to the welding torch
12		<b>Machine control, see the relevant control operating instructions</b>

## 4.2 Rear view / side view from left

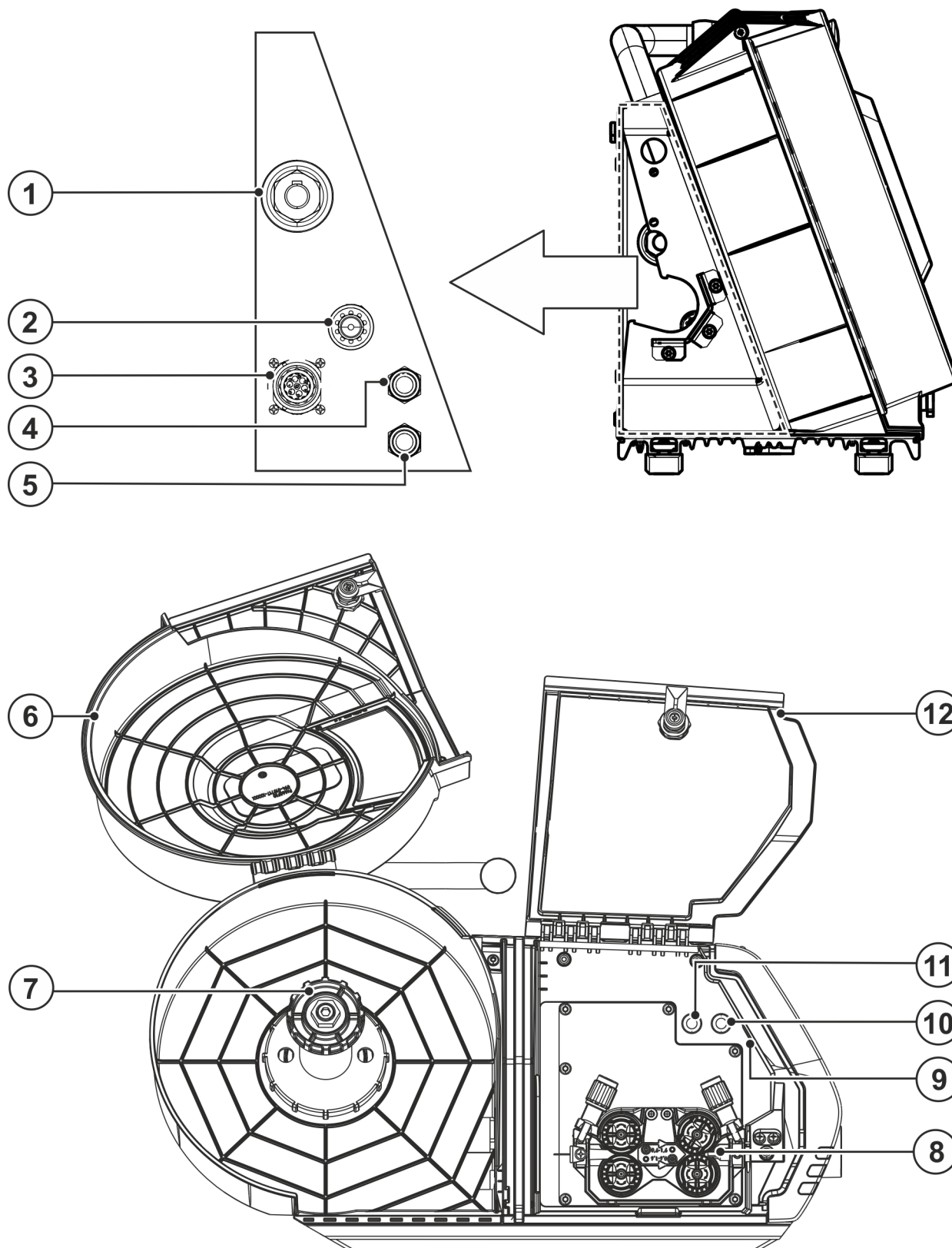









Figure 4-2

Item	Symbol	Description
1		<b>Power source welding current connector plug</b> Welding current connection between power source and wire feeder
2		<b>G1/4" connecting nipple, shielding gas connection</b>
3		<b>7-pole connection socket (digital)</b> • Control lead for wire feed unit
4		<b>Quick connect coupling (red)</b> Coolant return
5		<b>Quick connect coupling (blue)</b> Coolant feed
6		<b>Wire spool protective cap</b>
7		<b>Wire spool holder</b>
8		<b>Wire feed unit</b>
9		<b>Lighting, inside</b> In power-saving mode and with MMA or TIG welding, the lighting is switched off.
10		<b>Push-button gas test / rinse hose package &gt; see 5.2.1 chapter</b>
11		<b>Wire inching push-button</b> For potential- and gas-free inching of the wire electrode through the hose package to the welding torch.
12		<b>Protective cap, wire feed mechanism</b> On the inside of the protective cap the welding task lists (JOB-List) for the relevant welding machine series can be found.

## 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.

### 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.



**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)

## 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

All information relates to the total hose package length of the complete welding system and presents exemplary configurations (of components of the EWM product portfolio with standard lengths). A straight kink-free installation is to be ensured, taking into account the max. delivery height.

**Pump: Pmax = 3,5 bar (0.35 MPa)**

Power source	Hose package	Wire feeder	miniDrive	Welding torch	Max.
Compact			 (25 m / 82 ft.)	 (5 m / 16 ft.)	30 m 98 ft.
	 (20 m / 65 ft.)			  (5 m / 16 ft.)	
Decompact	 (25 m / 82 ft.)			 (5 m / 16 ft.)	
	 (15 m / 49 ft.)		 (10 m / 32 ft.)	 (5 m / 16 ft.)	

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

Power source	Hose package	Wire feeder	miniDrive	Welding torch	Max.
Compact			 (25 m / 82 ft.)	 (5 m / 16 ft.)	30 m 98 ft.
	 (30 m / 98 ft.)			  (5 m / 16 ft.)	40 m 131 ft.
Decompact	 (40 m / 131 ft.)			 (5 m / 16 ft.)	45 m 147 ft.
	 (40 m / 131 ft.)		 (25 m / 82 ft.)	 (5 m / 16 ft.)	70 m 229 ft.

## 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).

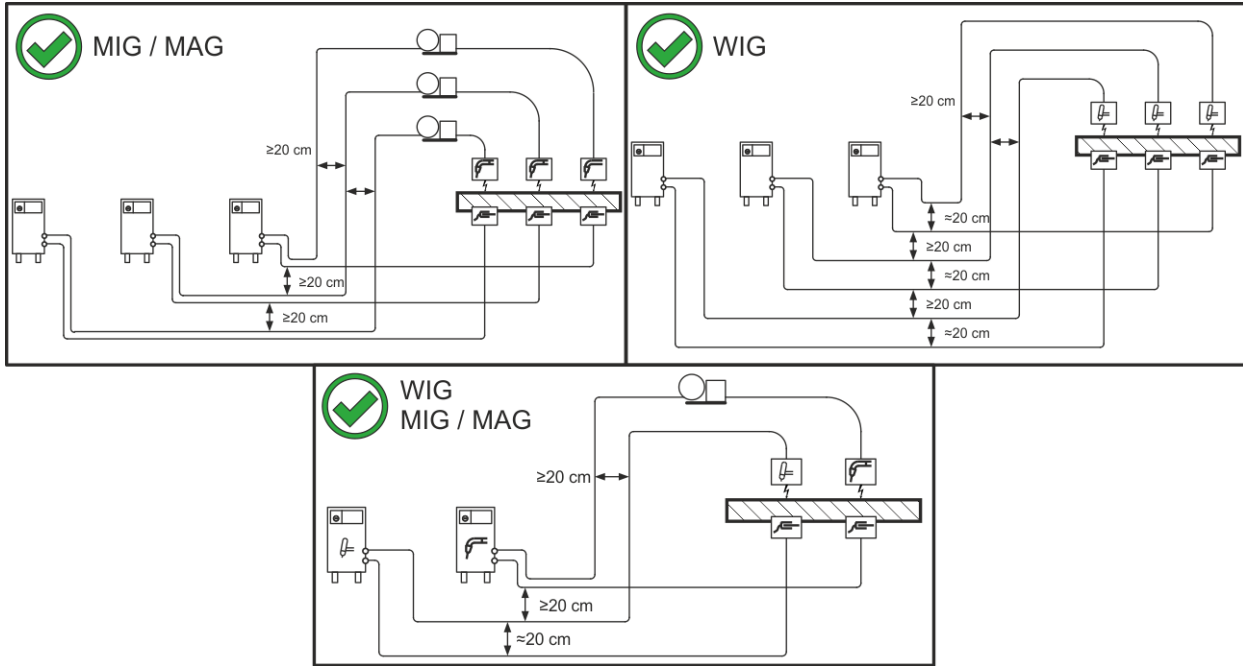


Figure 5-1

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

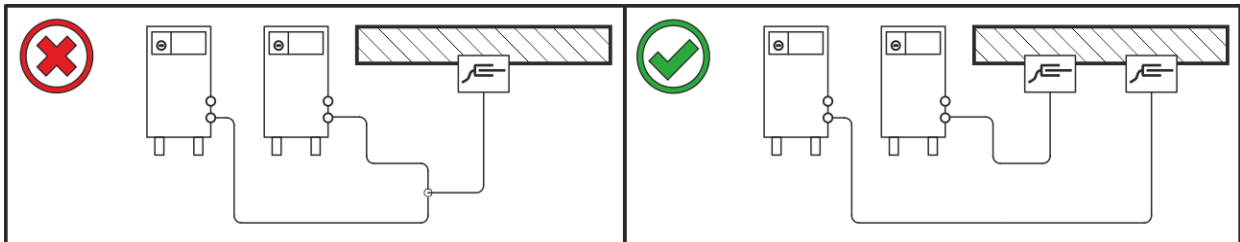


Figure 5-2

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.

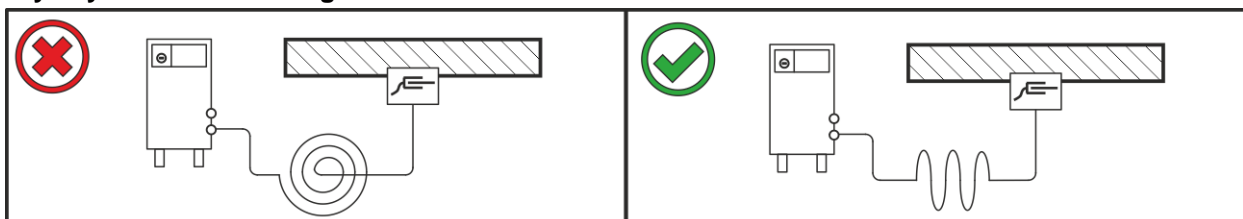


Figure 5-3



## 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.

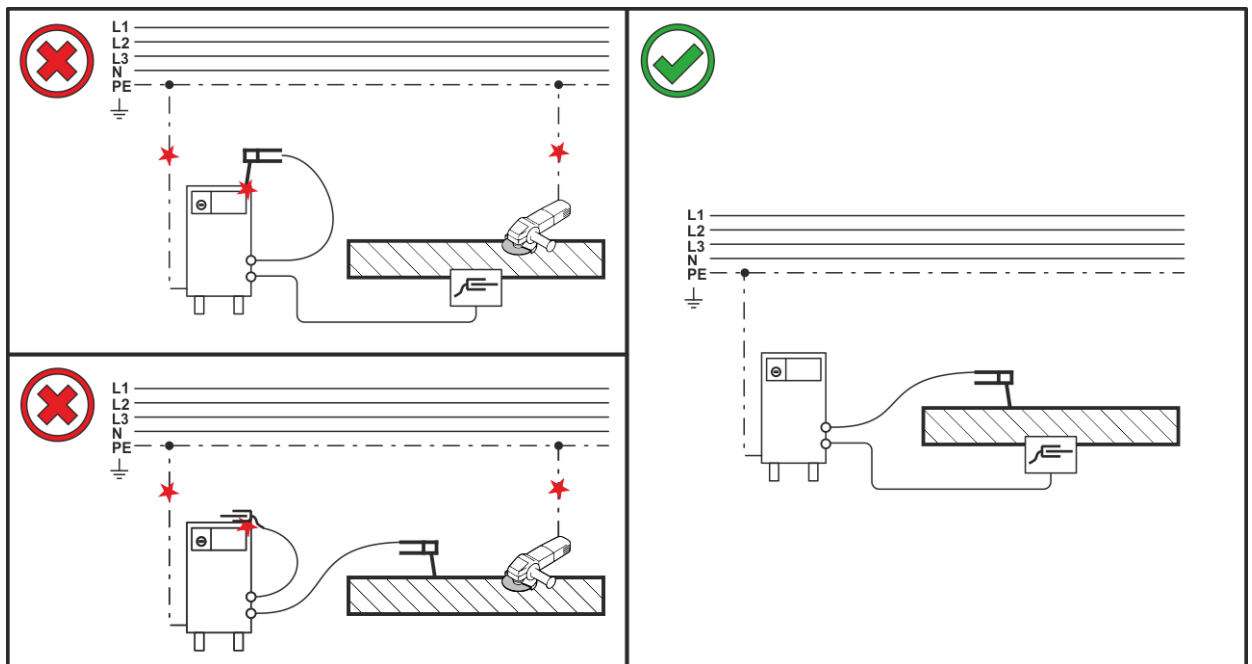



Figure 5-4

## 5.2 Intermediate hose package connection

 **With this machine series, the earth cable on the intermediate hose package must not be connected to the welding machine or wire feeder! Remove the earth cable or push back into the hose package!**

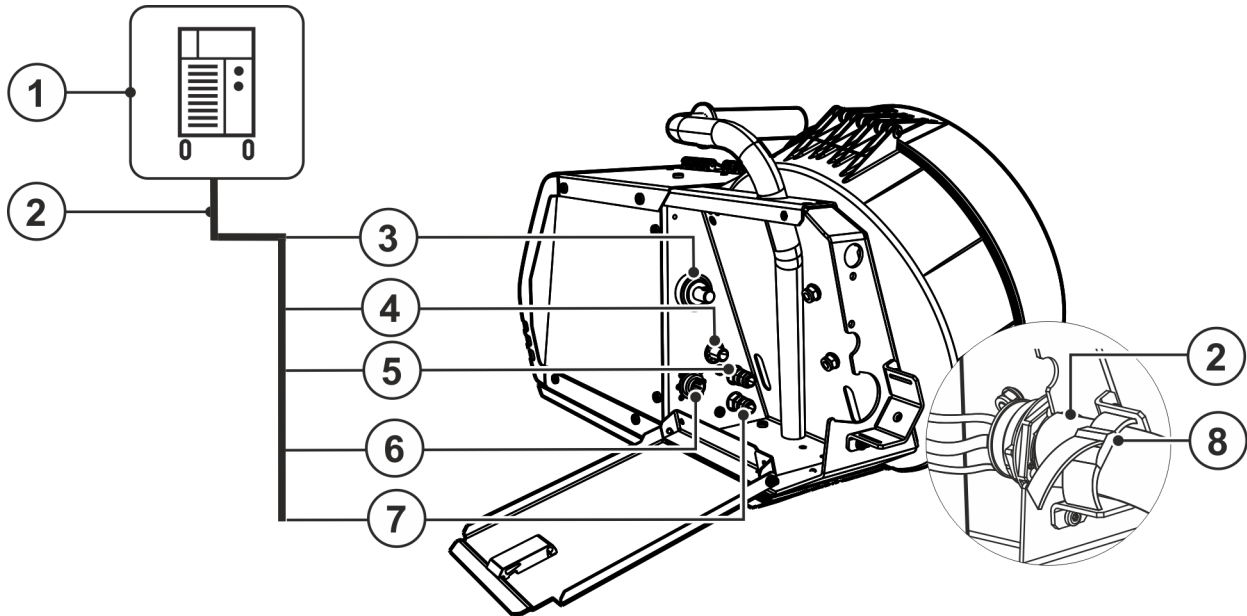









Figure 5-5

Item	Symbol	Description
1		<b>Power source</b>
2		<b>Intermediate hose package</b>
3		<b>Power source welding current connector plug</b> Welding current connection between power source and wire feeder
4		<b>G<math>\frac{1}{4}</math>" connecting nipple, shielding gas connection</b>
5		<b>Quick connect coupling (red)</b> Coolant return
6		<b>7-pole connection socket (digital)</b> • Control lead for wire feed unit
7		<b>Quick connect coupling (blue)</b> Coolant feed
8		<b>Safety belt</b> Intermediate hose package strain relief

- Insert the hose package end through the intermediate hose package strain relief and secure with the safety belt as shown in the figure.
- Push the welding current cable socket onto the “welding current connecting plug” and lock by turning to the right.
- Connect crown nut of the shielding gas line to the G $\frac{1}{4}$ ” connecting nipple.
- 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).
- 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).

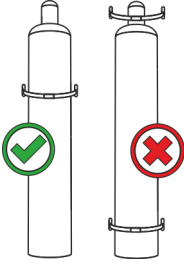
## 5.2.1 Shielding gas supply (shielding gas cylinder for welding machine)

**⚠ 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!**

- Place shielding gas cylinder into the designated holder and secure with fastening elements (chain/belt)!
- Attach the fastening elements within the upper half of the shielding gas cylinder!
- The fastening elements must tightly enclose the shielding gas cylinder!



**👉 An unhindered shielding gas supply from the shielding gas cylinder to the welding torch is a fundamental requirement for optimum welding results. In addition, a blocked shielding gas supply may result in the welding torch being destroyed.**

- Always re-fit the yellow protective cap when not using the shielding gas connection.
- All shielding gas connections must be gas tight.

## 5.2.2 Pressure regulator connection

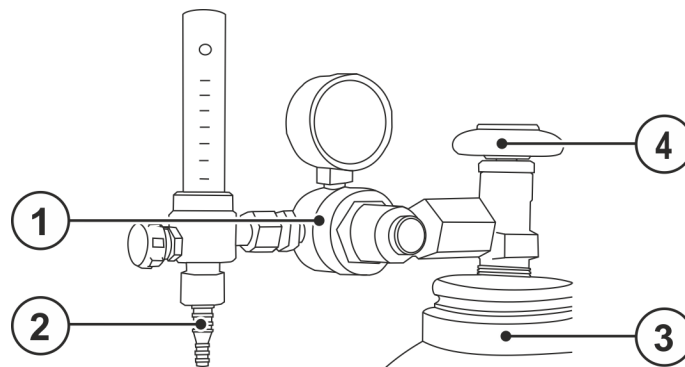


Figure 5-6

Item	Symbol	Description
1		Pressure regulator
2		Output side of the pressure regulator
3		Shielding gas cylinder
4		Cylinder valve

- Before connecting the pressure regulator to the gas cylinder, open the cylinder valve briefly to blow out any dirt.
- Tighten the pressure regulator screw connection on the gas bottle valve to be gas-tight.
- Screw gas hose connection crown nut onto the output side of the pressure regulator.

### 5.2.2.1 Gas test

The operating elements are installed under the protective cap of wire feed mechanism.

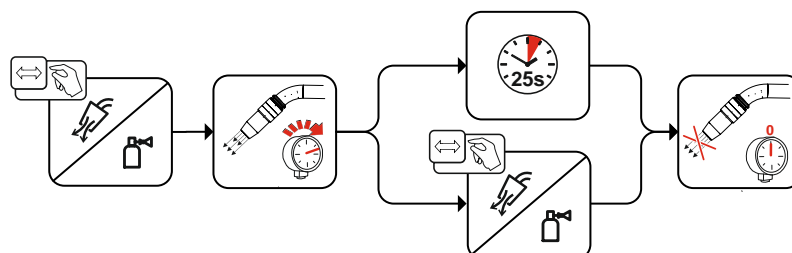


Figure 5-7

**5.2.2.2 Purge hose package**

The operating elements are installed under the protective cap of wire feed mechanism.

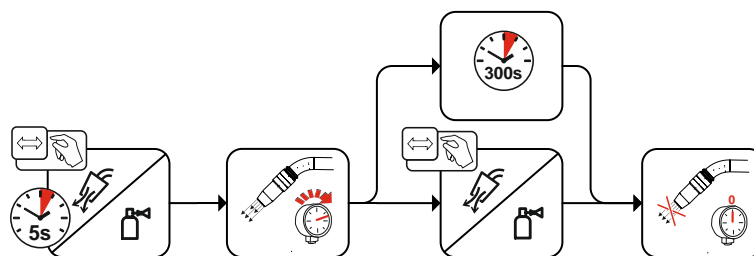


Figure 5-8

**5.2.3 Protective flap, welding machine control**

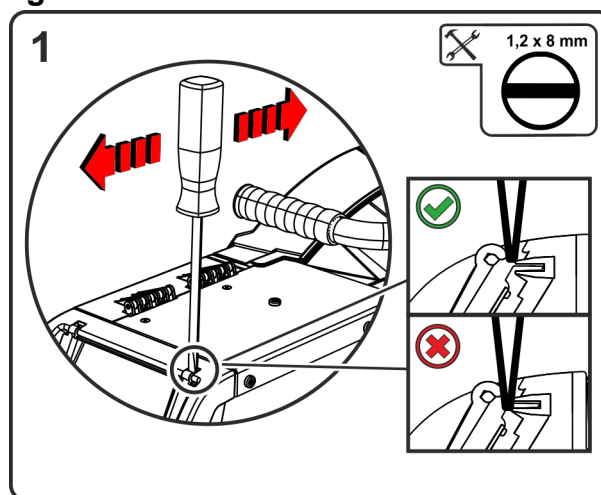


Figure 5-9

Item	Symbol	Description
1		Protective cap

- Carefully click the suspension of the protective cap towards front top.

## 5.3 MIG/MAG welding

### 5.3.1 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 spiral guide:**

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

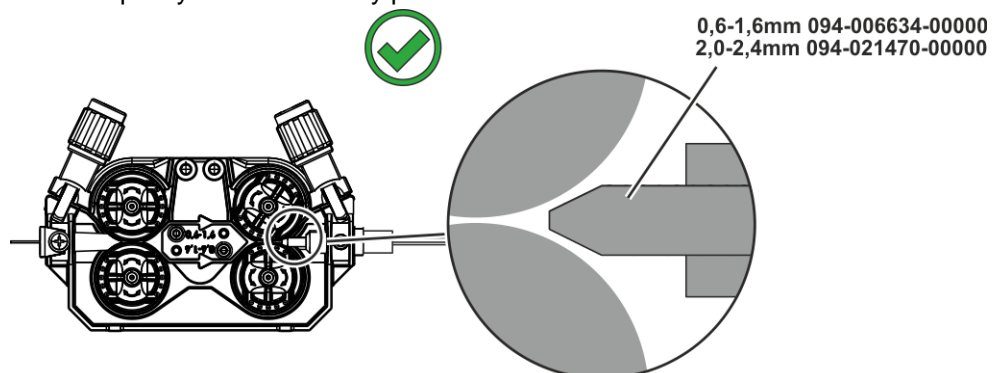


Figure 5-10

**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.

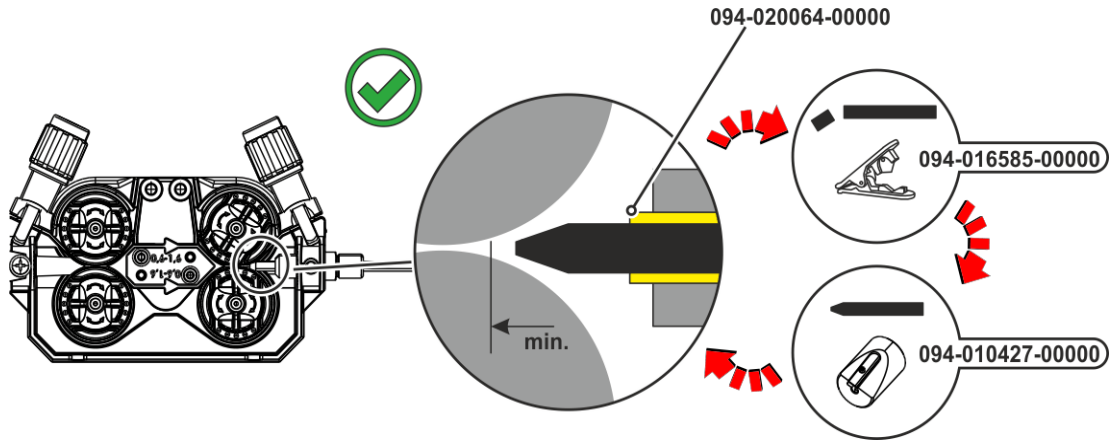


Figure 5-11

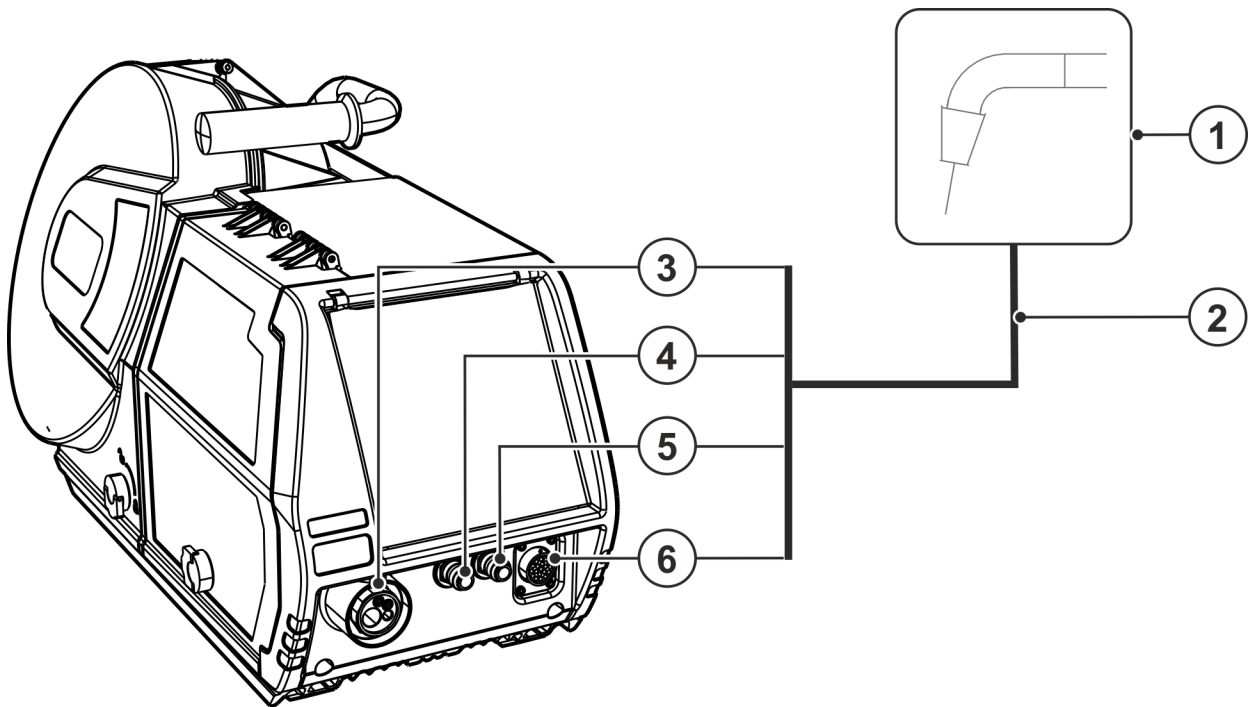


Figure 5-12

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

- 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).
- Insert the welding torch control cable into the 19-pole connection socket and lock (MIG/MAG torches with additional control cables only).

### 5.3.2 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!

#### 5.3.2.1 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.

#### 5.3.2.2 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.

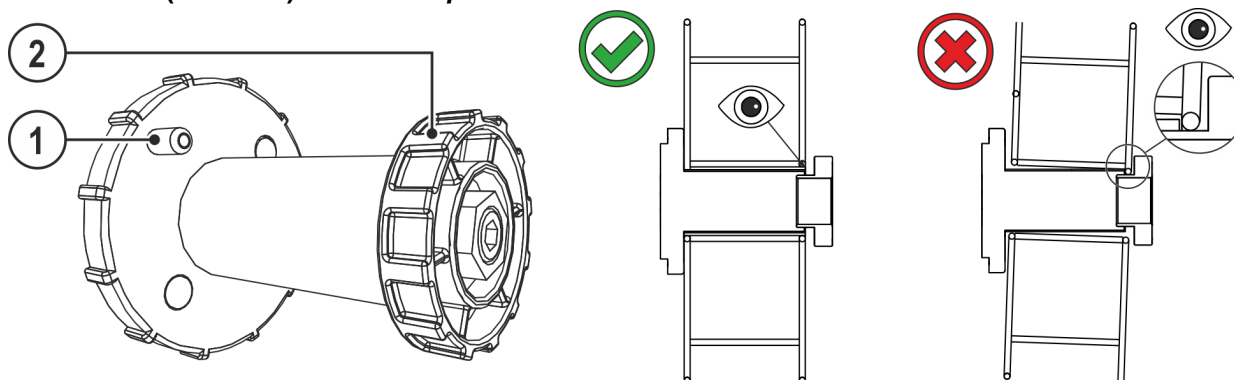


Figure 5-13

Item	Symbol	Description
1		<b>Carrier pin</b> For fixing the wire spool
2		<b>Knurled nut</b> 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.



5.3.2.3 Changing the wire feed rollers

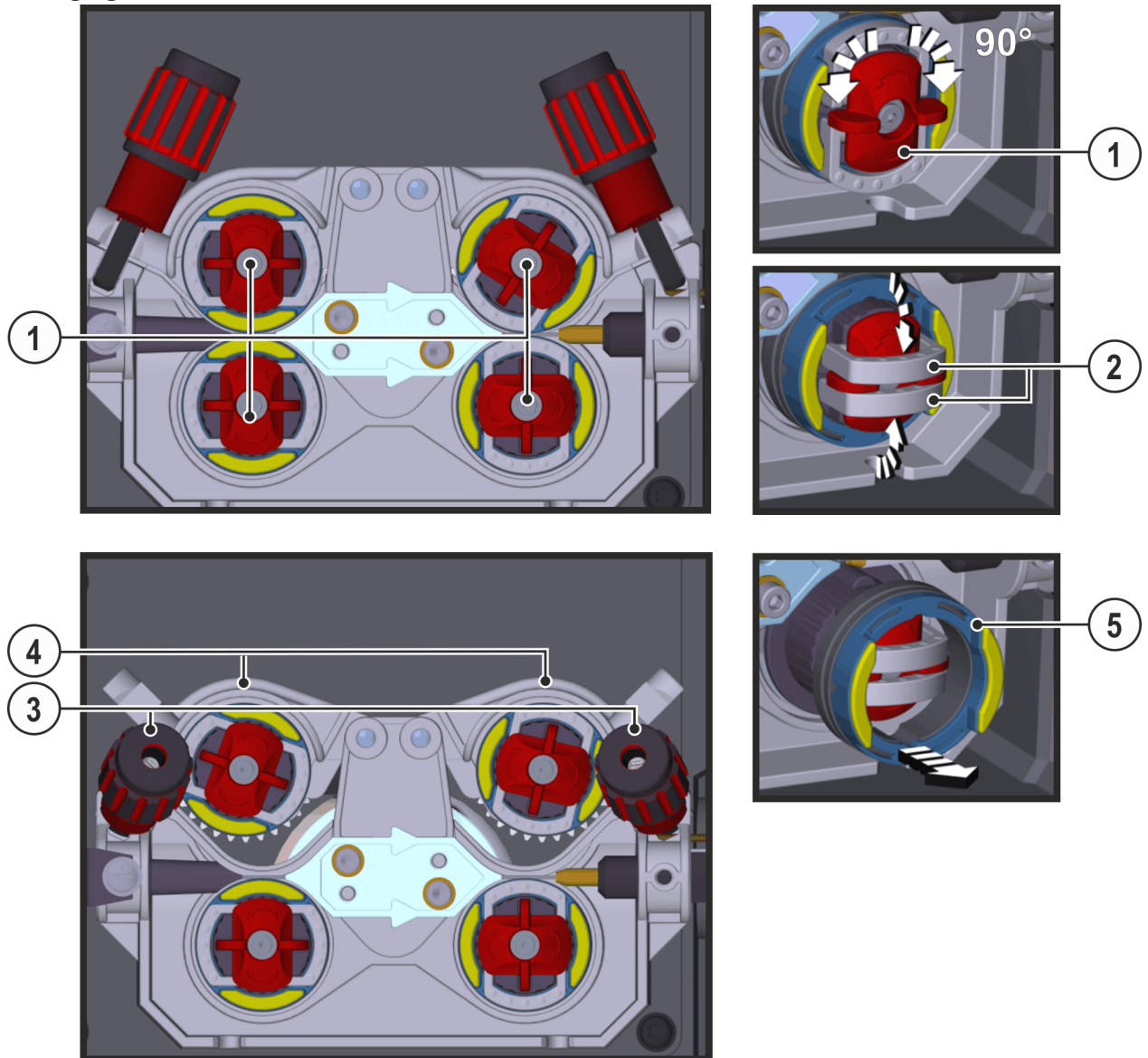


Figure 5-14

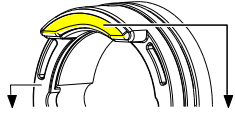
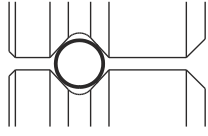
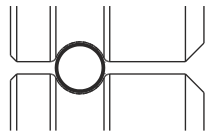
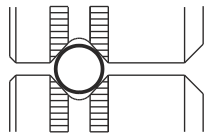
Item	Symbol	Description
1		<b>Tommy</b> The tommy is used to secure the closure brackets of the wire feed rollers.
2		<b>Closure bracket</b> The closure brackets are used to secure the wire feed rollers.
3		<b>Feed roll tensioner</b> Fixing the clamping unit and setting the pressure.
4		<b>Clamping unit</b>
5		<b>Wire feed roller</b> 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 according 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	
	Ø mm	Ø inch				
Steel Stainless steel Brazing	0.6	.023	monochrome	light pink	-	 V-groove
	0.8	.030		white		
	0.8	.030	bicolour	white	blue	
	0.9	.035		blue	red	
	1.0	.040				
	1.0	.040	monochrome	green	-	
	1.2	.045		black		
	1.4	.052		grey		
	1.6	.060		brown		
	2.0	.080		light green		
	2.4	.095	purple	purple		
2.8	.110					
3.2	.125					
Aluminium	0.8	.030	bicolour	white	yellow	 U-groove
	0.9	.035		blue		
	1.0	.040		red		
	1.2	.045		black		
	1.6	.060		grey		
	2.0	.080		brown		
	2.4	.095		light green		
	2.8	.110		purple		
3.2	.125	purple				
Flux cored wire	0.8	.030	bicolour	white	orange	 V-groove, knurled
	0.9	.035		blue		
	1.0	.040		red		
	1.2	.045		green		
	1.4	.052		black		
	1.6	.060		grey		
	2.0	.080		brown		
2.4	.095	brown				

5.3.2.4 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!

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.

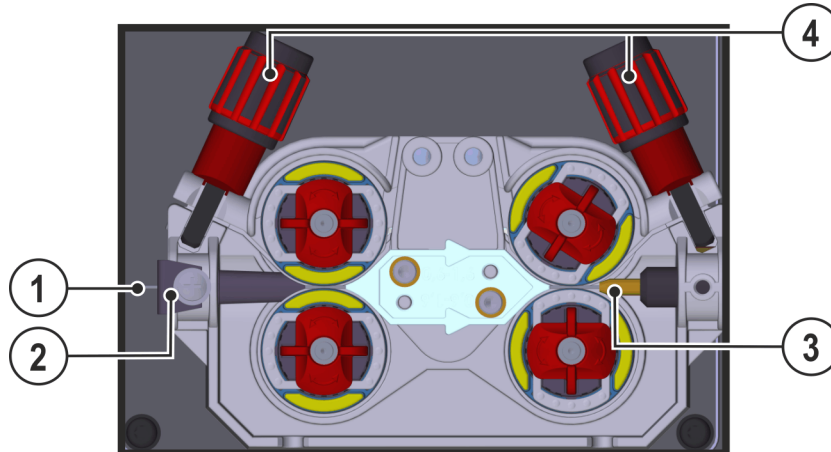


Figure 5-15

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 chapter.

A prerequisite for the automatic inching process is the correct steel preparation of the wire guide, especially in the capillary and wire guide tube area > see 5.3.1 chapter.



**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 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**

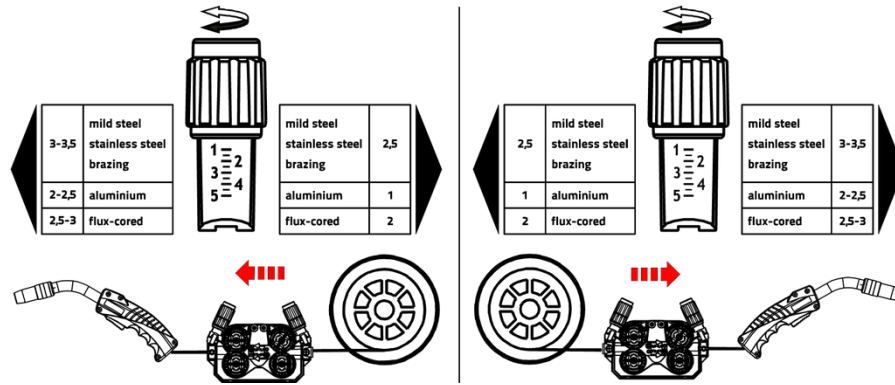


Figure 5-16

**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.

**5.3.2.5 Spool brake setting**

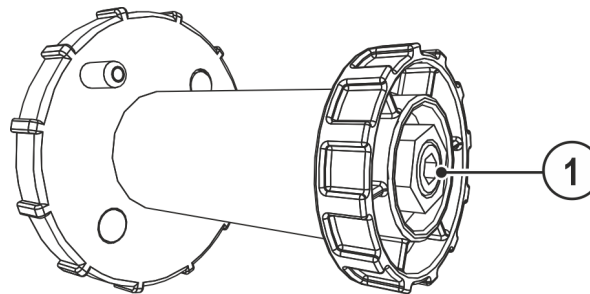


Figure 5-17

Item	Symbol	Description
1		<b>Allen screw</b> 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!**

**5.3.3 Standard MIG/MAG torch**

The MIG welding torch trigger is essentially used to start and stop the welding process.

Operating elements	Functions
Torch trigger	<ul style="list-style-type: none"> <li>• Start/stop welding</li> </ul>

### 5.3.4 MIG/MAG special-torches

#### 5.3.4.1 Switching between Push/Pull and intermediate drive

**⚠ 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)!



**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!

The plugs are located directly on the M3.7X printed circuit board.

Plug	Function
on X24	Operation with Push/Pull welding torch (factory setting)
on X23	Operation with intermediate drive

### 5.3.5 Welding task selection

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

## 5.4 MMA welding or gouging

### 5.4.1 Connection of electrode holder or gouging torch

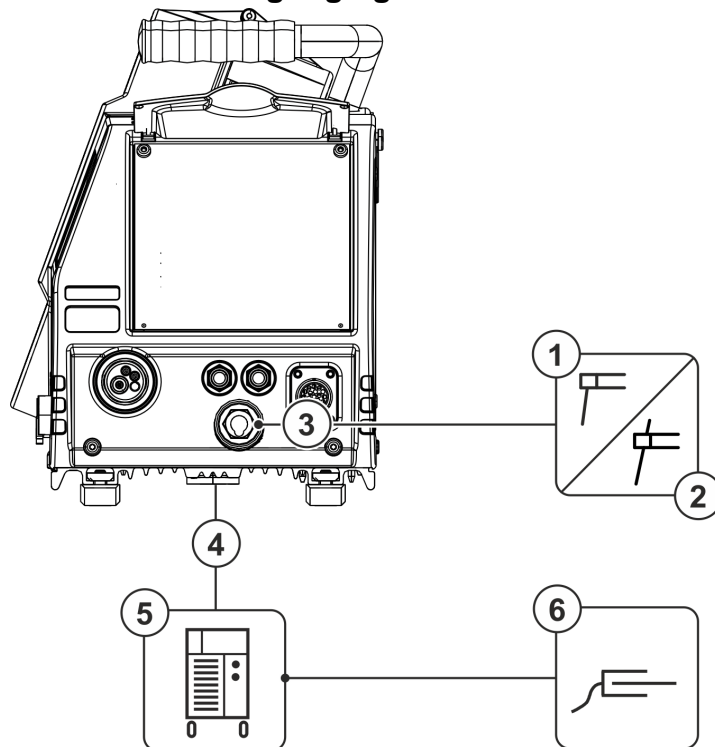






Figure 5-18

Item	Symbol	Description
1		Electrode holder
2		Gouging torch
3		<b>Connection socket, welding current</b> Welding current potential of the torch connector for MMA welding or gouging
4		<b>Intermediate hose package</b>
5		Power source
6		Workpiece

- Insert the electrode holder or gouge plug into the welding current connection socket (wire feeder) and lock in place by turning to the right. The welding current polarity is changed by reconnecting the welding power plug (intermediate hose package) at the power source.

Polarity depends on the instructions from the electrode manufacturer given on the electrode packaging.

#### 5.4.2 Connection for workpiece lead

For connection description, see the relevant "Power source" operating instructions.

#### 5.4.3 Welding task selection

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

## 5.5 Remote control



**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.**

Remote controls are used for the remote operation of various machine functions (see operating instructions for remote control). Depending on the machine design, the remote control connection can be 7- or 19-pole (connection see chapter Machine description > see 4 chapter).

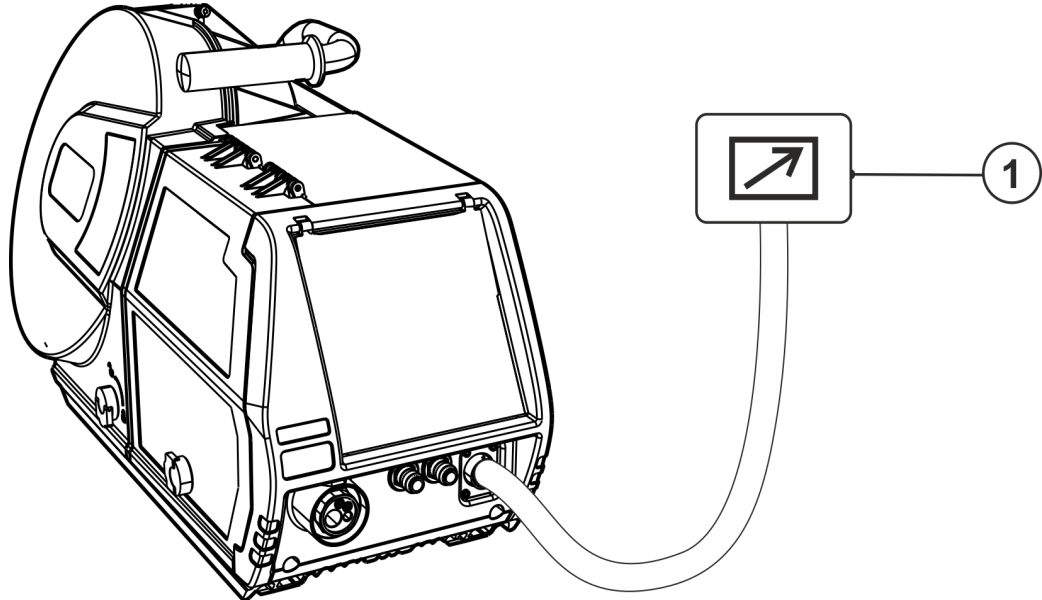


Figure 5-19

Item	Symbol	Description
1		Remote control

- Insert the remote control connector plug into the wire feeder remote control connection (19-pole) and lock by turning to the right.

## 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.

#### 6.1.2 Dirt filter

The duty cycle of the welding machine decreases as an effect of the reduced cooling air volume. The dirt filter must be removed 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 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](http://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 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
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
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.

## 7.2 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

### Wire feed problems

- ↘ Contact tip blocked
  - ✘ Clean, spray with anti-spatter spray and replace if necessary
- ↘ Setting the spool brake > see 5.3.2.5 chapter
  - ✘ Check settings and correct if necessary
- ↘ Setting pressure units > see 5.3.2.4 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
- ✓ 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

## 8 Technical data

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

### 8.1 Drive 4

<b>Supply voltage (from the welding machine)</b>	42 VAC
<b>Duty cycle at 40° C <sup>[1]</sup></b>	
60 %	550 A
100 %	430 A
<b>Wire feed speed</b>	0,5 m/min bis 25 m/min
<b>Factory-installed roll equipment</b>	1,0-1,2 mm (for steel wire)
<b>Drive</b>	4 rollers (37 mm)
<b>Wire spool diameter</b>	Standardised wire spools up to 300 mm
<b>Welding torch connection</b>	Euro torch connector
<b>Protection classification</b>	IP 23
<b>Ambient temperature <sup>[2]</sup></b>	-25 °C up to +40 °C
<b>EMC class</b>	A
<b>Safety marking</b>	CE / EAC
<b>Standards used</b>	See declaration of conformity (appliance documents)
<b>Dimensions</b>	660 x 280 x 380 mm 26.0 x 11.0 x 15.0 inch
<b>Weight</b>	15,0 kg 33.1 lb

<sup>[1]</sup> Load cycle: 10 min. (60 % DC = 6 min. welding, 4 min. pause).

<sup>[2]</sup> Ambient temperature is 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 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

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

### 9.3 Options

Type	Designation	Item no.
ON GK D01	Metal runners	092-003030-00000
ON WAK D01	Wheel assembly kit	092-002844-00000
ON PS EXT D01	Retrofit set: Extension turning mandrel, for holding a wire feeder with wheel kit ON WAK D01	092-002871-00000
ON RFAK D01	Rubber feet	092-002845-00000
ON CC D01	Transparent cover cap for protection of device control	092-002834-00000
ON TS D01/D02	Torch holder	092-002836-00000
ON CMF D01	Crane suspension	092-002833-00000
ON TCC D01	Set comprised of crane suspension and protective plate, for use of the wire feeder in lateral position	092-002835-00000
ON CONNECTOR D01/D02	Connection for wire feeding from drum	092-002842-00000

## 10 Replaceable 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 partners  
[www.ewm-group.com/en/specialist-dealers](http://www.ewm-group.com/en/specialist-dealers)



"More than 400 EWM sales partners worldwide"