



**EN**

### Power source

Tetrix XQ 350 AC/DC puls  
Tetrix XQ 400 AC/DC puls  
Tetrix XQ 500 AC/DC puls

099-005674-EW501

Observe additional system documents!

28.06.2022

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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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### **Data security**

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

## 1 Contents

<b>1</b>	<b>Contents</b> .....	<b>3</b>
<b>2</b>	<b>For your safety</b> .....	<b>6</b>
2.1	Notes on using these operating instructions.....	6
2.2	Explanation of icons.....	7
2.3	Safety instructions.....	8
2.4	Transport and installation .....	11
<b>3</b>	<b>Intended use</b> .....	<b>13</b>
3.1	Applications.....	13
3.2	Documents which also apply .....	13
3.2.1	Warranty .....	13
3.2.2	Declaration of Conformity.....	13
3.2.3	Welding in environments with increased electrical hazards.....	13
3.2.4	Service documents (spare parts and circuit diagrams).....	13
3.2.5	Calibration/Validation .....	13
3.2.6	Part of the complete documentation.....	14
<b>4</b>	<b>Machine description – quick overview</b> .....	<b>15</b>
4.1	Machine configuration.....	15
4.2	Front view / side view from the right .....	16
4.3	Rear view / side view from left .....	18
<b>5</b>	<b>Design and function</b> .....	<b>20</b>
5.1	Transport and installation .....	20
5.1.1	Lifting by crane .....	20
5.1.2	Craning principle.....	21
5.1.3	Ambient conditions .....	21
5.1.4	Machine cooling.....	21
5.1.5	Workpiece lead, general.....	22
5.1.6	Welding torch cooling system.....	22
5.1.6.1	Functional characteristics .....	22
5.1.6.2	Permitted torch coolant .....	22
5.1.6.3	Maximal hose package length .....	23
5.1.6.4	Adding coolant .....	24
5.1.7	Notes on the installation of welding current leads.....	25
5.1.8	Stray welding currents .....	26
5.1.9	Mains connection.....	27
5.1.9.1	Mains configuration .....	27
5.1.10	Switching on and system diagnosis .....	27
5.1.10.1	LED status bar - display of operating status .....	28
5.1.11	Protective flap, welding machine control.....	28
5.2	TIG welding.....	29
5.2.1	Welding torch and workpiece line connection .....	29
5.2.1.1	Control lead connection .....	30
5.2.2	Shielding gas supply (shielding gas cylinder for welding machine) .....	30
5.2.2.1	Pressure regulator connection .....	31
5.2.2.2	Shielding gas hose connection .....	31
5.2.2.3	Gas test – setting the shielding gas volume .....	31
5.2.3	Welding task selection.....	31
5.3	MMA welding .....	32
5.3.1	Connecting the electrode holder and workpiece lead .....	32
5.4	Remote control.....	32
5.5	Interfaces for automation .....	33
5.5.1	Automation interface .....	33
5.5.2	Remote control connection socket, 19-pole .....	34
5.6	PC interface .....	34
5.6.1	Connection .....	35
5.7	Network connection .....	35
<b>6</b>	<b>Maintenance, care and disposal</b> .....	<b>36</b>
6.1	General .....	36

6.2	Explanation of icons .....	37
6.3	Maintenance schedule .....	37
6.3.1	Dirt filter.....	39
6.3.2	Coolant error.....	40
6.3.3	Heat exchanger (torch cooling) .....	42
6.3.4	Power source (inverter) .....	43
6.3.5	Annual test (inspection and testing during operation) .....	43
6.4	Disposing of equipment.....	44
<b>7</b>	<b>Rectifying faults.....</b>	<b>45</b>
7.1	Error messages (power source).....	45
7.2	Warnings .....	51
7.3	Checklist for rectifying faults .....	53
7.4	Vent coolant circuit.....	55
7.5	Fixing the pump shaft (coolant circuit) .....	56
<b>8</b>	<b>Technical data.....</b>	<b>57</b>
8.1	Dimensions and weighte .....	57
8.1.1	Welding torch cooling system.....	57
8.2	Performance data.....	58
8.2.1	Tetrix XQ 350 puls AC/DC.....	58
8.2.2	Tetrix XQ 400 puls AC/DC.....	59
8.2.3	Tetrix XQ 500 puls AC/DC.....	60
<b>9</b>	<b>Accessories .....</b>	<b>61</b>
9.1	Welding torch cooling system .....	61
9.1.1	Coolant - type blueCool .....	61
9.1.2	Coolant - type KF.....	61
9.2	Remote controls and accessories.....	61
9.2.1	Connection cables .....	61
9.2.2	Extension cable .....	61
9.3	Options.....	62
9.4	General accessories .....	62
9.5	Shielding gas supply (shielding gas cylinder for welding machine).....	62
9.6	Networking / Xnet.....	62
<b>10</b>	<b>Appendix .....</b>	<b>63</b>
10.1	Searching for a dealer.....	63



## 2 For your safety

### 2.1 Notes on using these operating instructions

#### **DANGER**

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

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

#### **WARNING**

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

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

#### **CAUTION**

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

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
























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

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

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

## 2.2 Explanation of icons

Symbol	Description	Symbol	Description
	Indicates technical aspects which the user must observe.		Activate and release / Tap / Tip
	Switch off machine		Release
	Switch on machine		Press and hold
			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 Safety instructions

### **WARNING**



**Risk of accidents due to non-compliance with the safety instructions!**

**Non-compliance with the safety instructions can be fatal!**

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



**Risk of injury from electrical voltage!**

**Voltages can cause potentially fatal electric shocks and burns on contact. Even low voltages can cause a shock and lead to accidents.**

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



**Hazard when interconnecting multiple power sources!**

**If a number of power sources are to be connected in parallel or in series, only a technical specialist may interconnect the sources as per standard IEC 60974-9:2010: Installation and use and German Accident Prevention Regulation BVG D1 (formerly VBG 15) or country-specific regulations.**

**Before commencing arc welding, a test must verify that the equipment cannot exceed the maximum permitted open circuit voltage.**

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



**Risk of injury due to radiation or heat!**

**Arc radiation can lead to skin and eye injuries.**

**Contact with hot workpieces and sparks can lead to burns.**

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



**⚠ WARNING****Risk of injury due to improper clothing!**

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

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

**Explosion risk!**

**Apparently harmless substances in closed containers may generate excessive pressure when heated.**

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

**Fire hazard!**

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

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

## ⚠ CAUTION



### Smoke and gases!

**Smoke and gases 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 6.3 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).

**⚠ CAUTION****Obligations of the operator!**

**The respective national directives and laws must be complied with when operating the machine!**

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



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

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

**Requirements for connection to the public mains network**

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

## 2.4 Transport and installation

**⚠ WARNING****Risk of injury due to improper handling of shielding gas cylinders!**

**Improper handling and insufficient securing of shielding gas cylinders can cause serious injuries!**

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

## CAUTION



### **Risk of accidents due to supply lines!**

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

- Disconnect all supply lines before transport!



### **Risk of tipping!**

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

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



### **Risk of accidents due to incorrectly installed leads!**

**Incorrectly installed leads (mains, control and welding leads or intermediate hose packages ) can present a tripping hazard.**

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



### **Risk of injury from heated coolant and its connections!**

**The coolant used and its connection or connection points can heat up significantly during operation (water-cooled version). When opening the coolant circuit, escaping coolant may cause scalding.**

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



***The units are designed for operation in an upright position!***

***Operation in non-permissible positions can cause equipment damage.***

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



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

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



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

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

### 3 Intended use

#### WARNING



##### Hazards due to improper usage!

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

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

### 3.1 Applications

Arc welding machine for TIG DC and AC welding with lift arc (touch starting) or HF ignition (contactless) and MMA welding as secondary process. It may be possible to expand the functionality by using accessories (see the documentation in the relevant chapter).

### 3.2 Documents which also apply

#### 3.2.1 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)!

#### 3.2.2 Declaration of Conformity



This product corresponds in its design and construction to the EU directives listed in the declaration. The product comes with a relevant declaration of conformity in the original.

The manufacturer recommends carrying out the safety inspection according to national and international standards and guidelines every 12 months.

#### 3.2.3 Welding in environments with increased electrical hazards



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

#### 3.2.4 Service documents (spare parts and circuit diagrams)

#### WARNING



##### No improper repairs and modifications!

To prevent injuries and damage to the machine, only competent personnel (authorised service personnel) are allowed to repair or modify the machine.

**Unauthorised manipulations will invalidate the warranty!**

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

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

Spare parts can be obtained from the relevant authorised dealer.

#### 3.2.5 Calibration/Validation

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

**3.2.6 Part of the complete documentation**

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

The illustration shows a general example of a welding system.

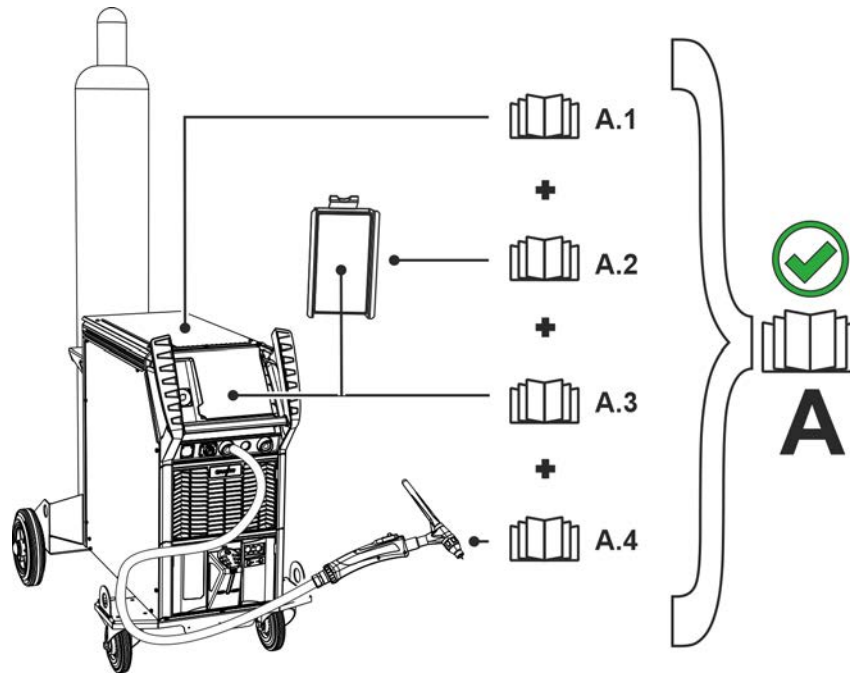


Figure 3-1

Item	Documentation
A.1	Power source
A.2	Remote control
A.3	Control
A.4	Welding torch
A	Complete documentation

## 4 Machine description – quick overview

### 4.1 Machine configuration

The following table shows the different design variants (expansion stages) of the device series XQ:

Type			Figure	Transport properties				Torch cooling		
				Wheel kit, narrow track, without cylinder bracket	Pallet bottom, without cylinder bracket	Wheel kit, single cylinder bracket	Wheel kit, double cylinder bracket	Gas	Water (coolant)	Water (coolant), reinforced pump
F06	R1	G		✗	✗	✓	✗	✓	✗	✗
F06	R1	W		✗	✗	✓	✗	✗	✓	✗
F06	R1	WRF		✗	✗	✓	✗	✗	✗	✓
F06	R2	G		✗	✗	✗	✓	✓	✗	✗
F06	R2	W		✗	✗	✗	✓	✗	✓	✗
F06	R2	WRF		✗	✗	✗	✓	✗	✗	✓
F06	RS	G		✓	✗	✗	✗	✓	✗	✗
F06	RS	W		✓	✗	✗	✗	✗	✓	✗
F06	RS	WRF		✓	✗	✗	✗	✗	✗	✓
F06	P	G		✗	✓	✗	✗	✓	✗	✗
F06	P	W		✗	✓	✗	✗	✗	✓	✗
F06	P	WRF		✗	✓	✗	✗	✗	✗	✓

Figure 4-1

## 4.2 Front view / side view from the right

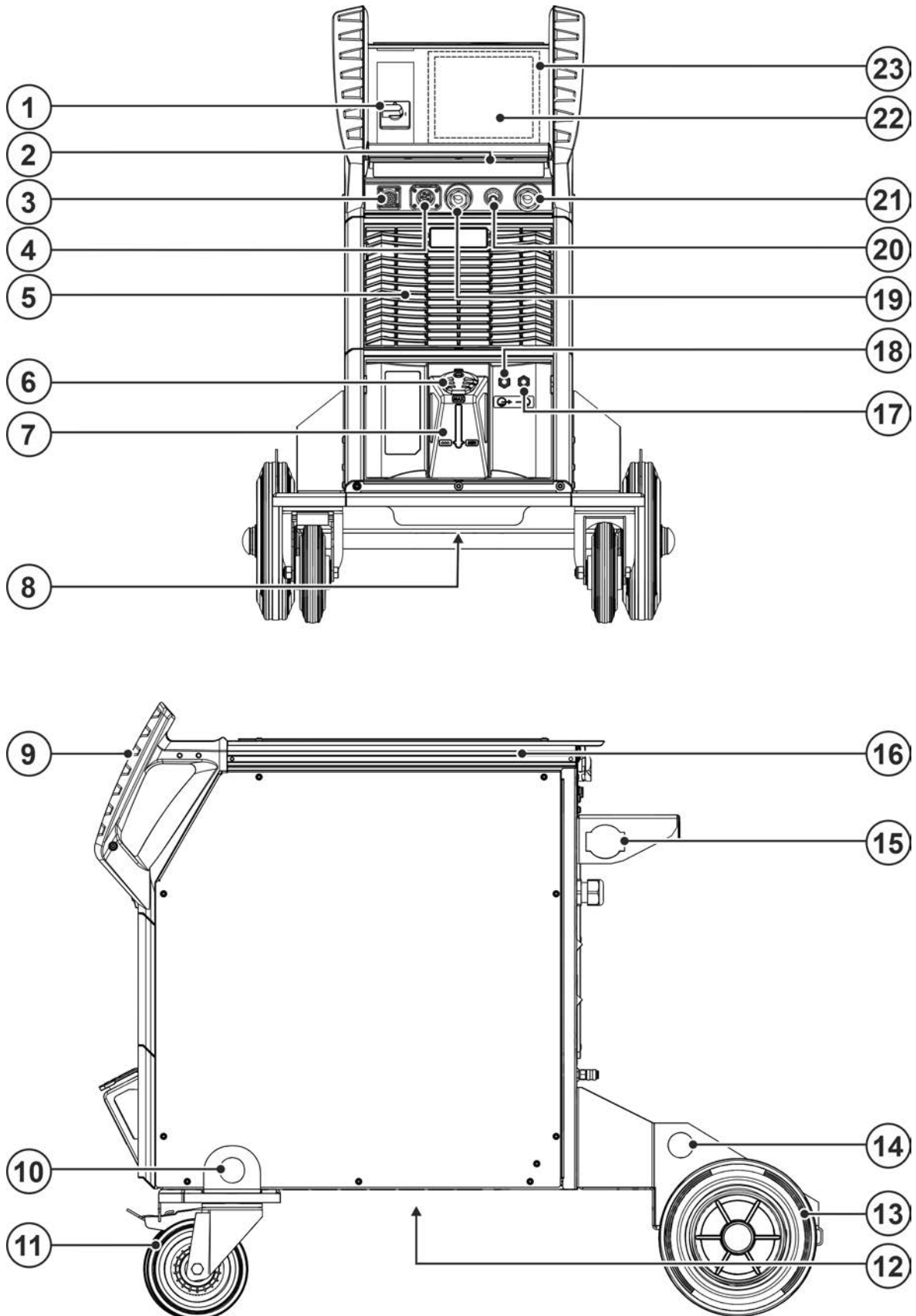








Figure 4-2



Item	Symbol	Description
1		<b>Main Switch</b> Switching the machine on or off.
2		<b>LED status bar - display of operating status</b> The operating status is indicated by a light guide > see 5.1.10.1 chapter.
3		<b>19-pole connection socket (analogue)</b> For connecting the control lead.
4		<b>Connection socket (welding torch control cable) &gt; see 5.2.1.1 chapter</b>
5		<b>Cooling air outlet</b>
6		<b>Coolant tank cap</b>
7		<b>Coolant tank &gt; see 5.1.6 chapter</b>
8		<b>Coolant drain plug &gt; see 6.3.2 chapter</b>
9		<b>Carrying handle</b>
10		<b>Lifting lug &gt; see 5.1.1 chapter</b>
11		<b>Wheels with locking brake</b>
12		<b>Inlet opening for cooling air (torch cooling)</b> Dirt filter can be retrofitted
13		<b>Wheels, fixed castors</b>
14		<b>Lifting lug &gt; see 5.1.1 chapter</b>
15		<b>Intermediate hose package strain relief</b>
16		<b>Aluminium extrusion profile flexFit</b> Individual mounting option for accessories and options
17		<b>Quick connect coupling (red)</b> coolant return
18		<b>Quick connect coupling (blue)</b> coolant supply
19		<b>Connection socket, “-” welding current</b> How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > see 5 chapter.
20		<b>Connection thread - G'¼"</b> Shielding gas connection (outlet)
21		<b>Connection socket, “+” welding current</b> How to connect the accessories depends on the welding procedure. Please observe the connection description for the corresponding welding procedure > see 5 chapter.
22		<b>Machine control (see the relevant control operating instructions)</b>
23		<b>Protective cap &gt; see 5.1.11 chapter</b>

## 4.3 Rear view / side view from left

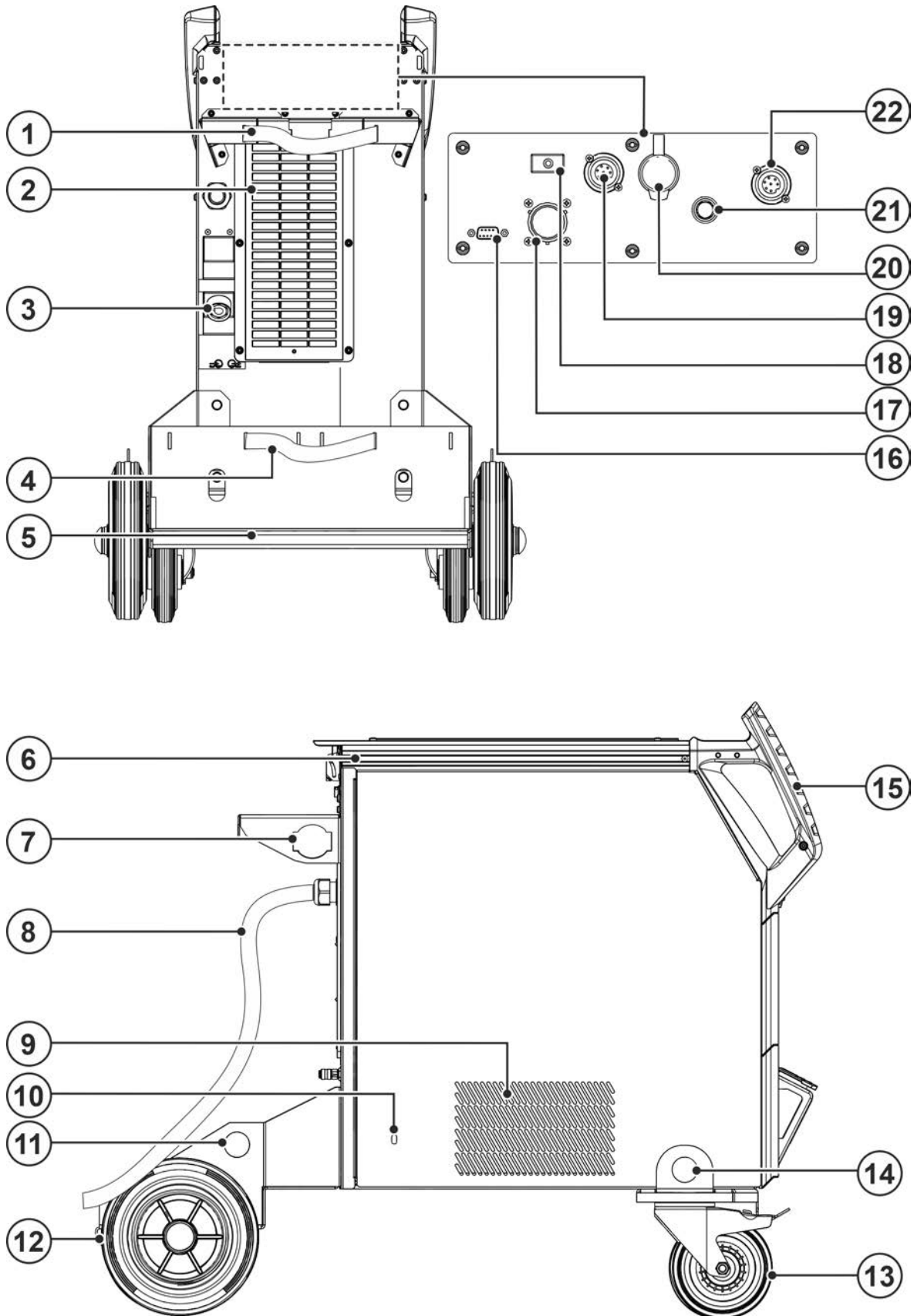










Figure 4-3

Item	Symbol	Description
1		<b>Securing elements for shielding gas cylinder (strap/chain)</b>
2		<b>Cooling air inlet</b> Dirt filter optional > see 6.3.1 chapter
3		<b>Connection socket, “-” welding current</b> Electrode holder connection
4		<b>Securing elements for shielding gas cylinder (strap/chain)</b>
5		<b>Bracket for shielding gas cylinder</b>
6		<b>Aluminium extrusion profile flexFit</b> Individual mounting option for accessories and options
7		<b>Intermediate hose package strain relief</b>
8		<b>Mains connection cable &gt; see 5.1.9 chapter</b>
9		<b>Outlet opening cooling air (torch cooling)</b>
10		<b>Service opening for coolant pump &gt; see 7.5 chapter</b>
11		<b>Lifting lug &gt; see 5.1.1 chapter</b>
12		<b>Wheels, fixed castors</b>
13		<b>Wheels, guide castors</b>
14		<b>Lifting lug &gt; see 5.1.1 chapter</b>
15		<b>Carrying handle</b>
16		<b>Connection socket (9-pole) - D-Sub</b> PC interface > see 5.6 chapter
17		<b>Connection socket- 19-pole, analogue - optional</b> Interface for automated welding > see 5.5.1 chapter
18		<b>"Automatic circuit-breaker" key button; fuse protection:</b> <ul style="list-style-type: none"> <li>• Gas valve</li> <li>• Peripheral devices on the 7-pole, digital interfaces (rear of the machine)</li> </ul> <b>Reset triggered automatic cutout by pressing</b>
19		<b>7-pole connection socket (digital)</b> For connecting digital accessory components
20		<b>Connection socket - RJ45 - Option</b> Network connection > see 5.7 chapter
21		<b>Connection thread - G¼"</b> Shielding gas connection (inlet)
22		<b>Added 7-pole connection socket (digital) - optional</b> For connecting digital accessory components

## 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

### 5.1.1 Lifting by crane

### WARNING



**Risk of injury during lifting by crane!**

**When lifting the machine by crane, persons may be severely injured by falling machines or mount-on components.**

- Simultaneous lifting of system components such as power source, wire feeder or cooling unit without suitable crane components is not allowed. Each system component has to be lifted separately!
- Remove any supply leads and accessories before lifting by crane (e.g. hose package, wire spool, shielding gas cylinder, toolbox, wire feeder, remote control, etc.)!
- Properly close and lock all casing covers and protective caps before lifting by crane!
- Use the correct number of hoisting equipment of the right size in the correct position! Observe craning principle > see 5.1.2 chapter!
- Devices with lifting eyes: Always lift all lifting eyes simultaneously!
- Devices with pallet bottom (feet): Pull the straps through the openings of the feet (hooking hoisting equipment in the openings is not sufficient).
- When using retrofitted craning frames etc.: always use at least two lifting points positioned as far apart as possible – observe option description.
- Avoid any jerky movements!
- Ensure that the load is distributed evenly! • Use chain hoists and chain slings of the same length only!
- Stay outside the danger zone underneath the machine!
- Observe the regulations regarding occupational safety and accident prevention for the respective country.

### 5.1.2 Craning principle

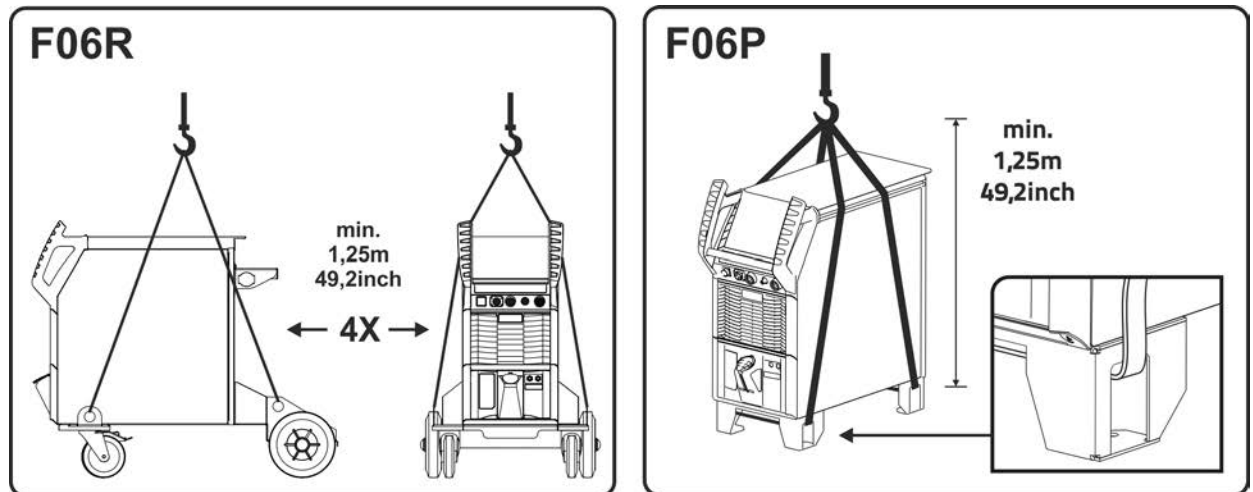


Figure 5-1

### 5.1.3 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 6.3 chapter).**
  - Avoid large amounts of smoke, steam, oily fumes, grinding dust and corrosive ambient air!

#### In operation

Temperature range of the ambient air:

- -25 °C to +40 °C (-13 °F to 104 °F) <sup>[1]</sup>

Relative humidity:

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

#### Transport and storage

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

- -30 °C to +70 °C (-22 °F to 158 °F) <sup>[1]</sup>

Relative humidity

- up to 90 % at 20 °C (68 °F)

<sup>[1]</sup> Ambient temperature dependent on coolant! Observe the coolant temperature range of the torch cooling

### 5.1.4 Machine cooling

- ☞ **Insufficient ventilation results in a reduction in performance and equipment damage.**
  - Observe the ambient conditions!
  - Keep the cooling air inlet and outlet clear!
  - Observe the minimum distance of 0.5 m from obstacles!

## 5.1.5 Workpiece lead, general

### ⚠ CAUTION



**Risk of burning due to incorrect welding current connection!**

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

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

## 5.1.6 Welding torch cooling system



**Material damage due to unsuitable coolants!**

**Unsuitable coolant, coolants mixed with other types / liquids or use in an unsuitable temperature range will result in material damage and loss of the manufacturer's warranty!**

- **Operation without coolant is not permitted! Dry running will destroy the cooling components such as the coolant pump, welding torch and hose packages.**
- **Only use the coolants described in these instructions for the specified ambient conditions (temperature range) > see 5.1.6.2 chapter.**
- **Do not mix coolants of different types (including those described in these instructions).**
- **When changing the coolant, all liquid must be replaced and the cooling system flushed.**

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

### 5.1.6.1 Functional characteristics

The cooling system of this machine series is designed to optimise the operating conditions and is temperature- and flow-monitored to protect against damage. Limit values > see 8.1.1 chapter for warnings and errors in the machine (adjustable depending on control system) are stored for monitoring and control of the cooling system. If the cooling system is faulty or overloaded, an error message appears and the welding process is switched off in a controlled manner.

### 5.1.6.2 Permitted torch coolant

Coolant	Temperature range
blueCool -10	-10 °C to +40 °C (14 °F to +104 °F)
KF 23E (Standard)	-10 °C to +40 °C (14 °F to +104 °F)
KF 37E	-20 °C to +30 °C (-4 °F to +86 °F)
blueCool -30	-30 °C to +40 °C (-22 °F to +104 °F)

### 5.1.6.3 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.

## 5.1.6.4 Adding coolant

After switching on the machine, the coolant pump runs for a defined time (filling the hose package). If the machine does not detect sufficient coolant flow during this time, the coolant pump is switched off (protection against damage caused by dry running). At the same time, the welding data display signals the coolant error. If there is sufficient coolant flow, the coolant pump is switched off before the defined time has elapsed (operational readiness).

**If there is less coolant in the coolant tank than the minimum required you may need to vent the coolant circuit. In this case the welding machine will automatically shut down the coolant pump and signal an error, > see 7.4 chapter.**

The unit is supplied ex works with a minimum level of coolant.



**The level of coolant must never fall below the "MIN" mark.**

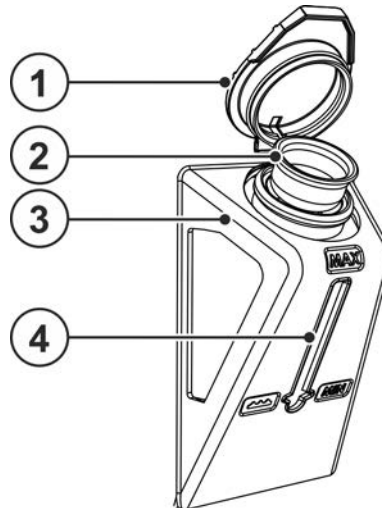


Figure 5-2

Item	Symbol	Description
1		Coolant tank cap
2		Coolant filter sieve
3		Coolant tank > see 5.1.6 chapter
4		Filling level display MIN----- minimum coolant level MAX----- maximum coolant level

- Pull off the coolant tank sealing cover.
- Check filter sieve for cleanliness, clean if necessary and reinsert.
- Top up coolant up to the upper filling level gauge "MAX" and push sealing cover back on.
- Switch on the power source at the main switch.



## 5.1.7 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).

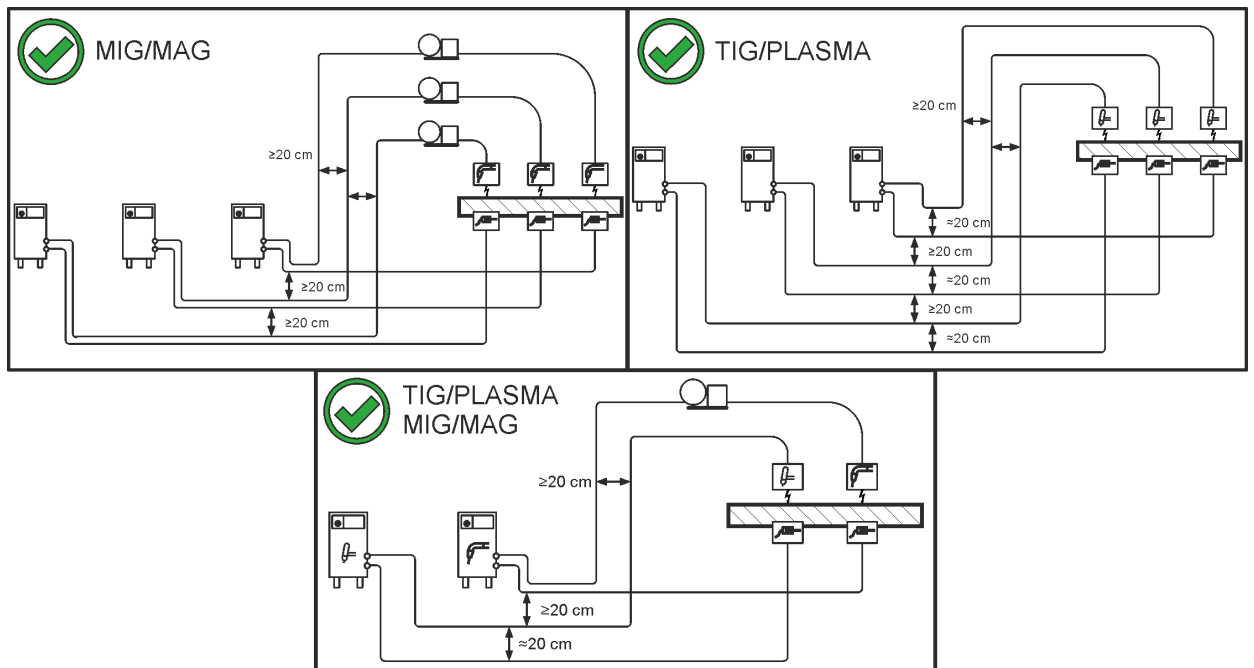


Figure 5-3

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

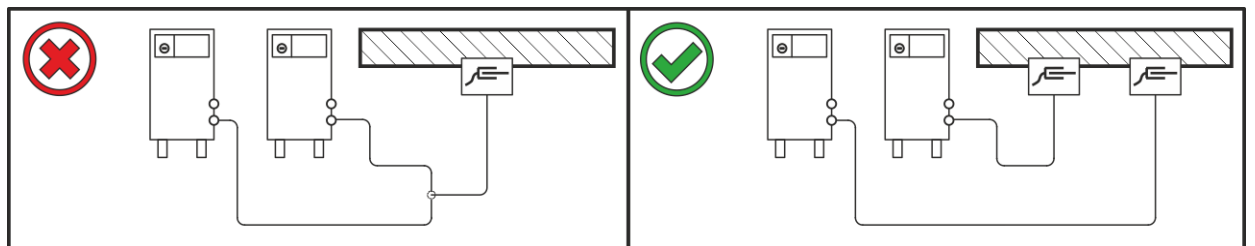


Figure 5-4

- 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.

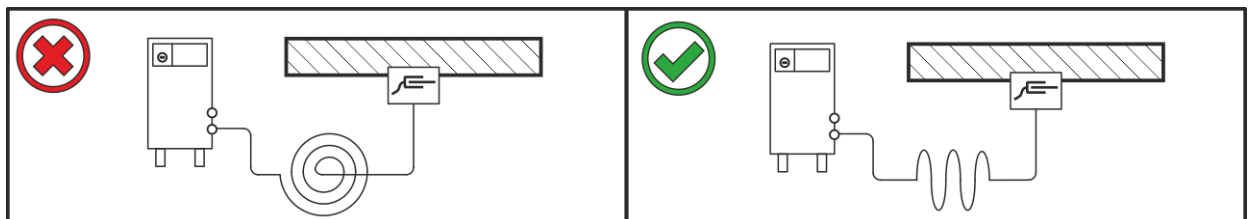


Figure 5-5

## 5.1.8 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.

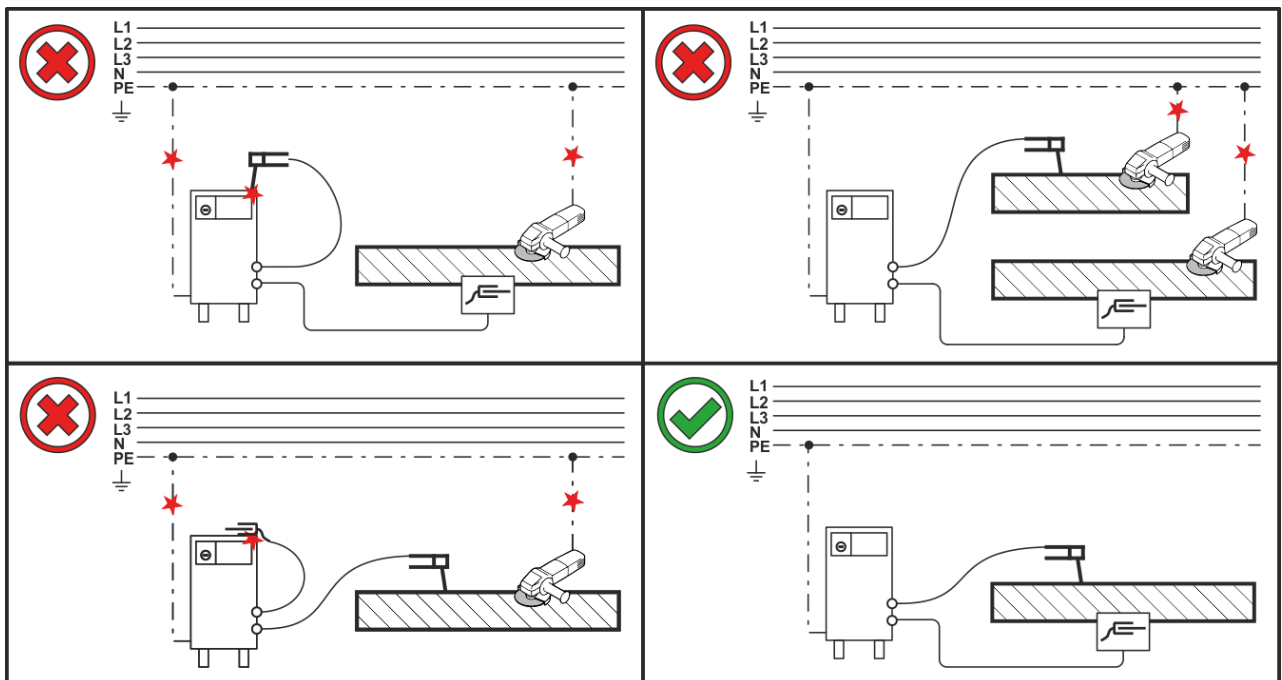


Figure 5-6

## 5.1.9 Mains connection

### DANGER



#### Hazards caused by improper mains connection!

#### An improper mains connection can cause injuries or damage property!

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

### 5.1.9.1 Mains configuration

The machine may be connected to:

- a three-phase system with four conductors and an earthed neutral conductor
- a three-phase system with three conductors of which any one can be earthed, e.g. the outer conductor

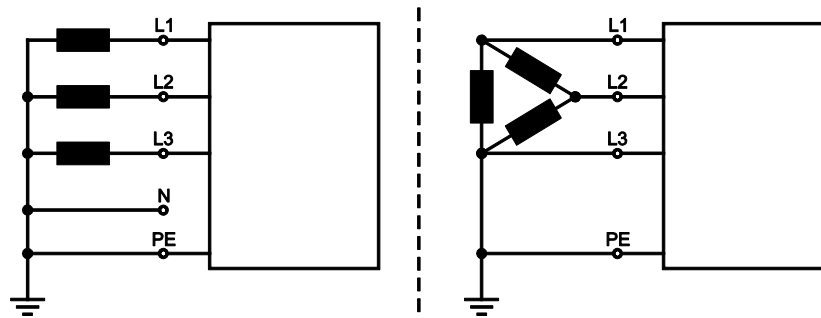


Figure 5-7

#### Legend

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

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

### 5.1.10 Switching on and system diagnosis

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

#### Operation of machine fan and coolant pump

The machine fan and coolant pump in this machine series are temperature- and state-controlled. This ensures that subsystems of the welding machine run only when they are needed. After each switching on, the machine fans run at full power for approx. 2 s, e.g. to blow out dust deposits.

## 5.1.10.1 LED status bar - display of operating status

A light guide on the front of the housing (LED status bar) shows the user the current operating status of the device.

Colour of the LED status bar	Operating status
white (change: light/dark)	Booting (switching on up to welding readiness)
blue	Ready for welding
blue (change: light/dark)	Power-saving mode Standby
green	Welding
yellow	Warning > see 7.2 chapter
red	Error > see 7.1 chapter

## 5.1.11 Protective flap, welding machine control

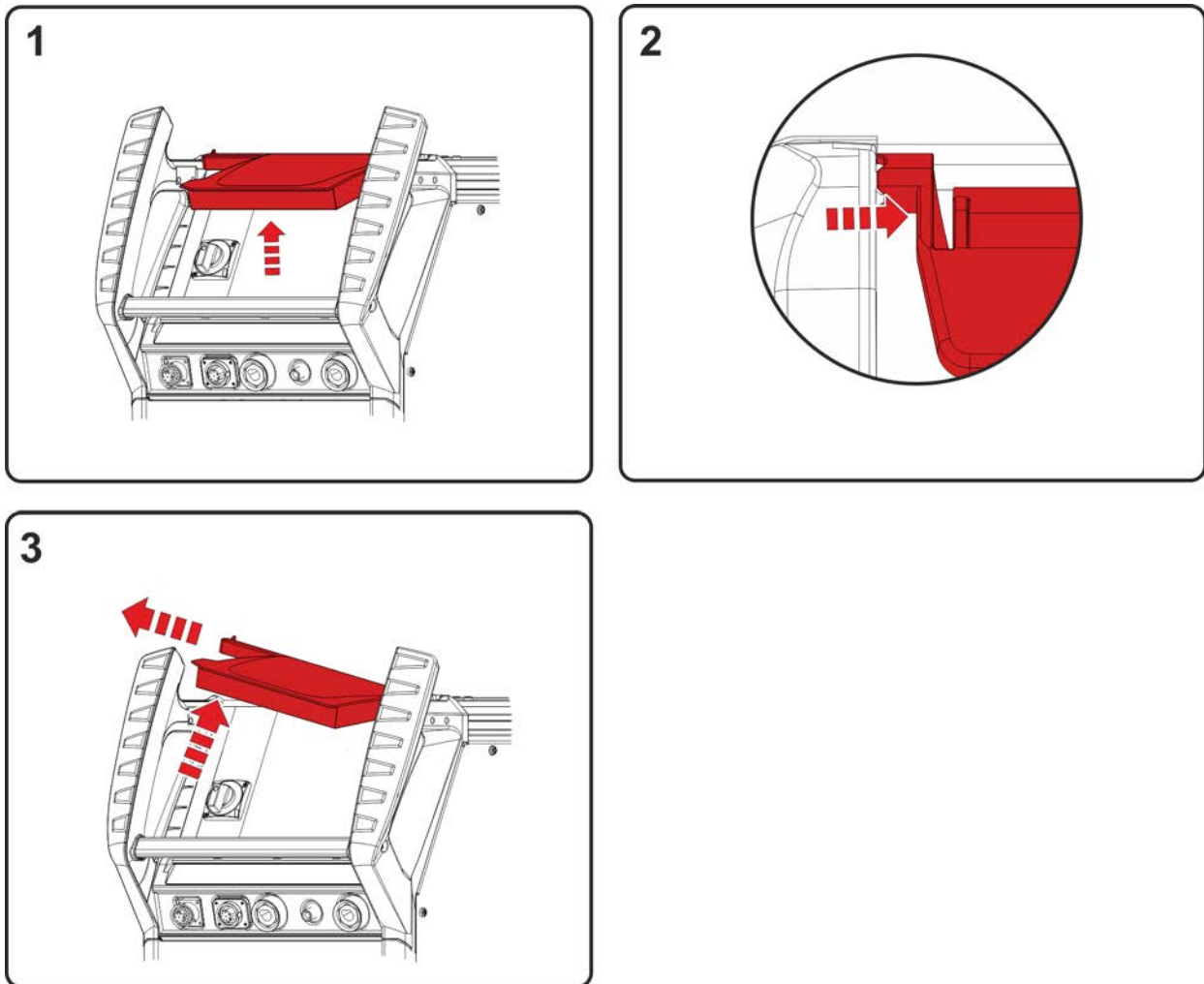


Figure 5-8

- Open the protective cap.
- Apply slight pressure on the left connecting bridge (figure) until the flap's fastening pin can be removed to the left, from top.

## 5.2 TIG welding

### 5.2.1 Welding torch and workpiece line connection

Prepare welding torch according to the welding task in hand (see operating instructions for the torch).

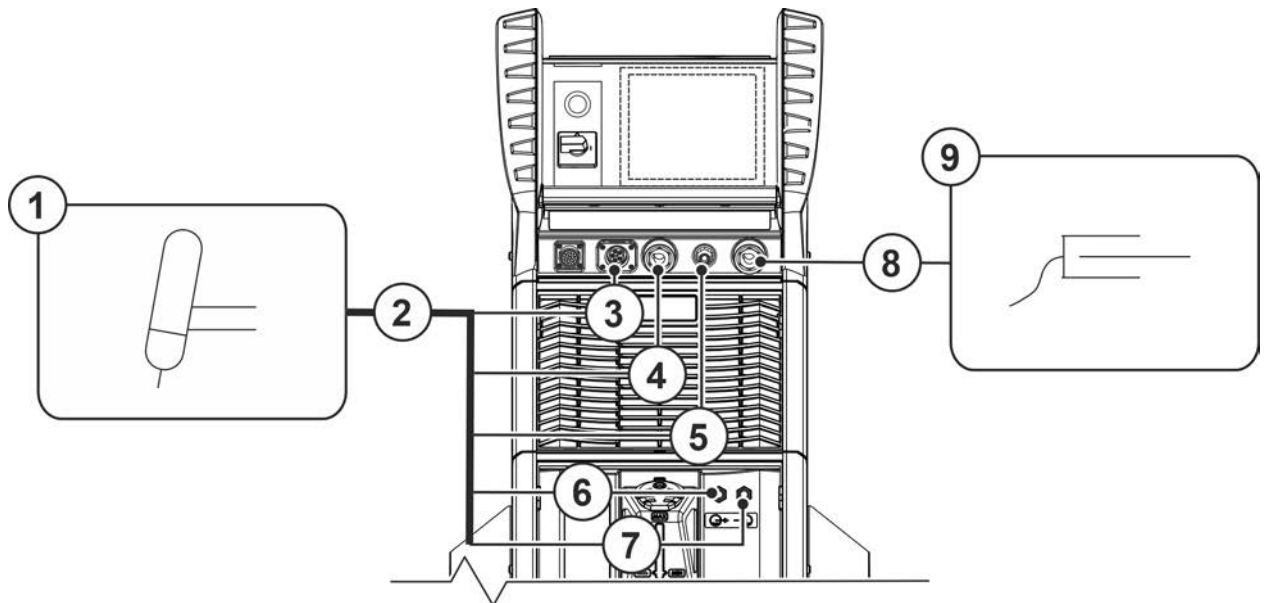


Figure 5-9

Item	Symbol	Description
1		<b>Welding torch</b>
2		<b>Welding torch hose package</b>
3		<b>Connection socket (welding torch control cable) &gt; see 5.2.1.1 chapter</b>
4		<b>Connection socket, "-" welding current</b> Welding current lead connection for TIG welding torch
5		<b>Connection thread - G<math>\frac{1}{4}</math>"</b> Shielding gas connection (outlet)
6		<b>Quick connect coupling (blue)</b> coolant supply
7		<b>Quick connect coupling (red)</b> coolant return
8		<b>Connection socket for "+" welding current</b> Workpiece lead connection
9		<b>Workpiece</b>

- Remove yellow protective cap on G $\frac{1}{4}$  connecting nipple.
- Insert the welding current plug on the welding torch into the welding current connection socket and lock by turning to the right.
- Screw welding torch shielding gas connection tightly onto the G $\frac{1}{4}$ " connection nipple.
- Plug the welding torch control cable plug into the welding torch control cable connection socket and secure.
- Insert the cable plug on the work piece lead into the "+" welding current connection socket and lock by turning to the right.

If fitted:

- 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).

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

## 5.2.1.1 Control lead connection

All standard 5- and 8-pin TIG welding torches can be connected to this machine and operated (except for 8-pin potentiometer torches). 5-pin EWM function torches with X-TECHNOLOGIE are also supported.

TIG welding machines are equipped ex works with a dedicated connection socket for the welding torch control cable (5- or 8-pole). As mobile machines offer more free space, they may even feature two control cable connection sockets. The functionality increases with the number of poles.

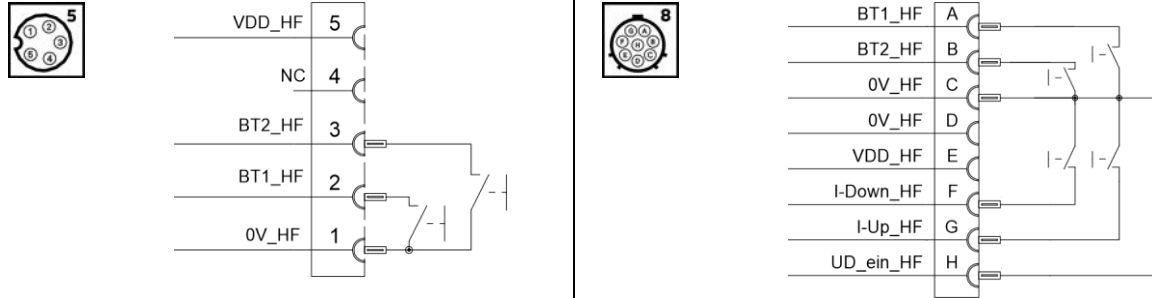


Figure 5-10

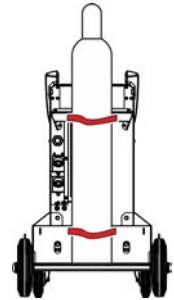
## 5.2.2 Shielding gas supply (shielding gas cylinder for welding machine)

### **⚠ 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!**

- Observe the instructions from the gas manufacturer and any relevant regulations concerning the use of compressed air!
- Lift the shielding gas cylinder onto the receptacle of the shielding gas cylinder and secure with both safety belts provided on the device as standard! Belts must be tight.
- Do not attach any element to the shielding gas cylinder valve!
- Prevent the shielding gas cylinder from heating up.



**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.**

- **All shielding gas connections must be gas tight.**

### 5.2.2.1 Pressure regulator connection

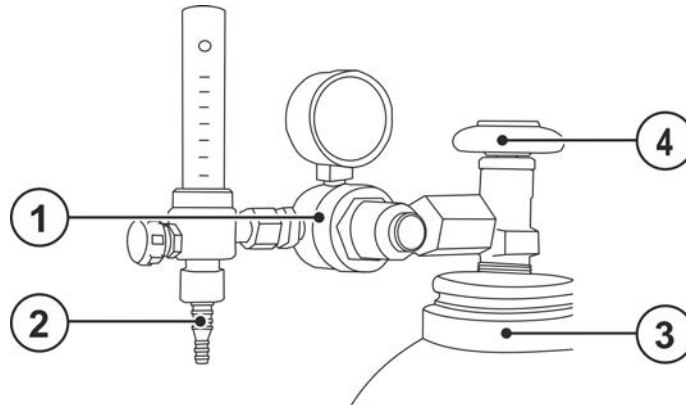


Figure 5-11

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 the gas hose connection to the outlet side of the pressure regulator gas-tight.

### 5.2.2.2 Shielding gas hose connection

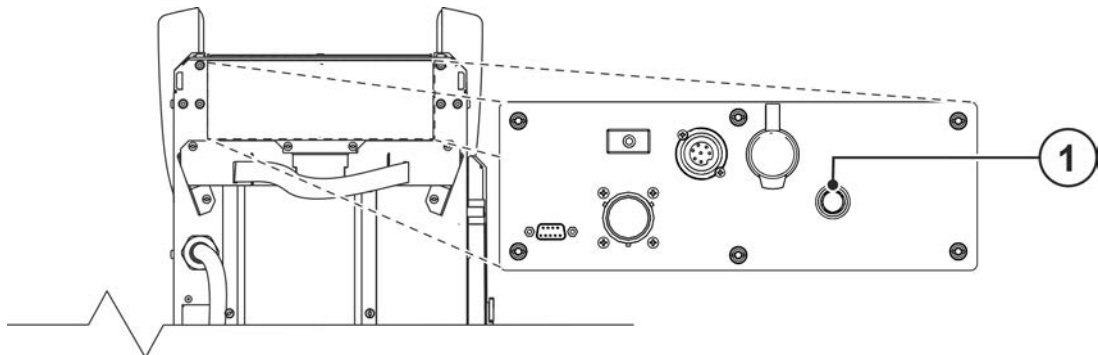


Figure 5-12

Item	Symbol	Description
1		Connection thread - G $\frac{1}{4}$ " Shielding gas connection (inlet)

- Screw the gas hose connection to the shielding gas connection (inlet) on the machine gas-tight.

### 5.2.2.3 Gas test – setting the shielding gas volume

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!

Rule of thumb for the gas flow rate:

Diameter of gas nozzle in mm corresponds to gas flow in l/min.

Example: 7mm gas nozzle corresponds to 7l/min gas flow.

- Trigger the gas test function on the device control (see control operating instructions). Ignition and welding voltage remain switched off (no accidental ignition of the arc).
- Set the relevant gas quantity for the application on the pressure regulator.

### 5.2.3 Welding task selection

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

## 5.3 MMA welding

### 5.3.1 Connecting the electrode holder and workpiece lead

#### ⚠ CAUTION



**Risk of crushing and burns!**

**When changing stick electrodes there is a risk of crushing and burns!**

- Wear appropriate and dry protective gloves.
- Use an insulated pair of tongs to remove the used stick electrode or to move welded workpieces.

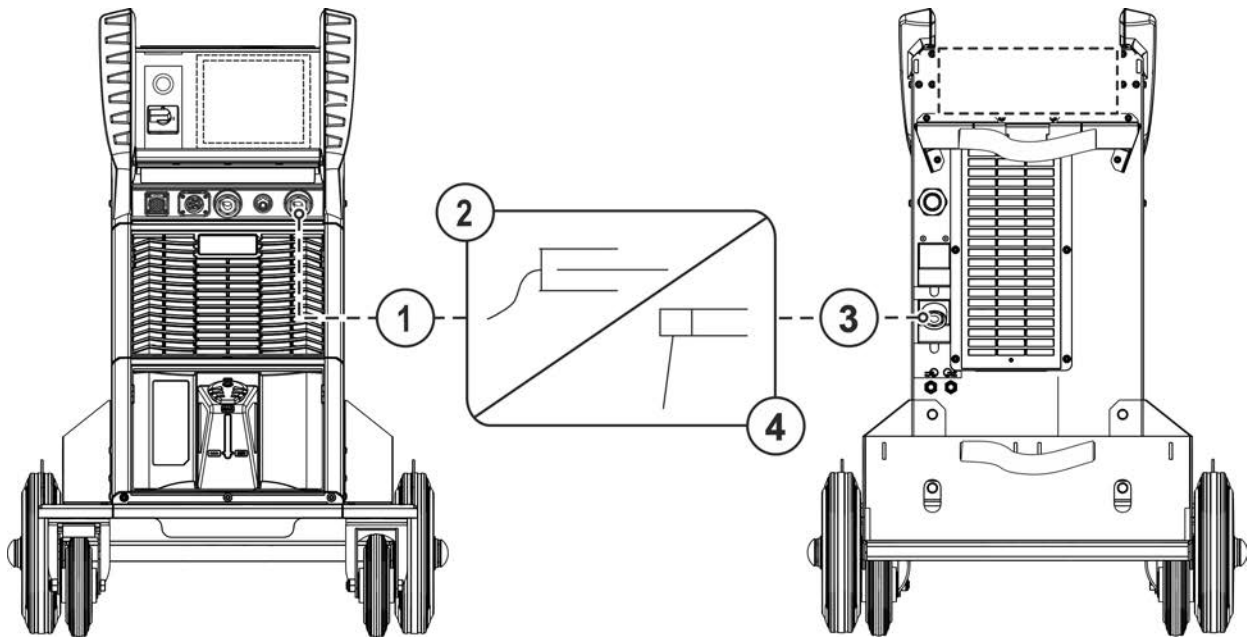


Figure 5-13

Item	Symbol	Description
1		Connection socket, “+” welding current
2		Workpiece
3		Connection socket, welding current “-”
4		Electrode holder

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

## 5.4 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!**



## 5.5 Interfaces for automation



**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).

### 5.5.1 Automation interface

These accessory components can be retrofitted as an option > see 9 chapter.

#### **WARNING**



**No function of the external interrupt equipment (emergency stop switch)!**

If the emergency stop circuit has been set up using an external interrupt equipment connected to the interface for automated welding, the machine must be configured for this setup. If this is not observed, the power source will ignore the external interrupt equipment and will not shut down!

- Remove jumper 1 on the corresponding control board (to be done only by qualified service personnel)!

Pin	Signal form	Designation	Drawing
<b>A</b>	Output	Connection for the cable screen	
<b>B</b>	Input	Digital signal controls a configurable function <sup>[1]</sup>	
<b>C + J</b>	Output	Switching output in case of device error (relay contact) <sup>[1]</sup>	
<b>D + G</b>	Output	Current-flows-signal I>0 (relay contact). Closed $\triangleq$ welding current flows.	
<b>E + R</b>	Input	Emergency stop for switching off the power source (activation by competent service personnel)	
<b>F</b>	Input	Control voltage specification for the secondary current (0-10 V) <sup>[1]</sup>	
<b>H</b>	Output	Actual value of the welding voltage (0 V - 10 V $\triangleq$ 0 V - 100 V)	
<b>K</b>	Output	Reserved for special applications	
<b>L</b>	Input	Start / stop welding current (+15 V $\triangleq$ Start, 0 V $\triangleq$ Stop)	
<b>M</b>	Output	Power supply +15 V( max 75 mA)	
<b>N</b>	Input	Control voltage specification for the main current (0-10 V)	
<b>P</b>	Input	Analogue signal controls a configurable function <sup>[1]</sup>	
<b>S</b>	Output	Reference potential for signals from pins B, F, H, K, L, M, N, P and T	
<b>T</b>	Output	Actual value of the welding current (0 V - 10 V $\triangleq$ 0 A - 1000 A)	
<b>U</b>	-	Not assigned	
<b>V</b>	-	Not assigned	

<sup>[1]</sup> Configurable in the machine configuration menu

## 5.5.2 Remote control connection socket, 19-pole

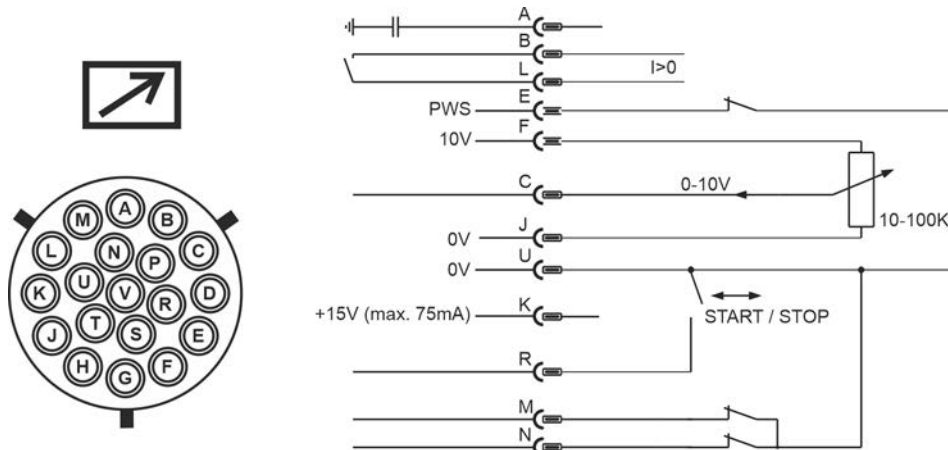


Figure 5-14

Pin	Signal form	Designation
A	Output	Connection for cable shielding (PE)
B/L	Output	Current flow signal $I > 0$ , potential-free (max. $\pm 15 \text{ V} / 100 \text{ mA}$ )
E	Input	Switching of welding current potential (PWS) only for AC machines (reference potential 0 V)
F	Output	Reference voltage for potentiometer 10 V (max 10 mA)
C	Input	Reference voltage specification for main current 0-10 V ( $0\text{V} = I_{\min} / 10 \text{ V} = I_{\max}$ )
J/U	Output	Reference potential 0 V
K	Output	Power supply +15 V, max 75 mA
R	Input	Welding current start/stop
M/N	Input	Control voltage specification activation To activate the external control voltage specification for the main and secondary current, the signals M and N must be set to reference potential 0 V.

## 5.6 PC interface

### Welding parameter software

Set all welding parameters on the PC and simply transfer to one or more welding machines (accessory, set consisting of software, interface, connection leads)

- Data exchange between power source and PC
- Welding task administration (JOBS)
- Online-data exchange
- Default settings for welding data monitoring
- Update function for new welding parameters

## 5.6.1 Connection



**Equipment damage or faults may occur if the PC is connected incorrectly!**

**Not using the SECINT X10USB interface results in equipment damage or faults in signal transmission. The PC may be destroyed due to high frequency ignition pulses.**

- **Interface SECINT X10USB must be connected between the PC and the welding machine!**
- **The connection must only be made using the cables supplied (do not use any additional extension cables)!**

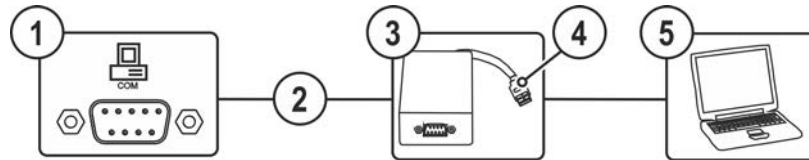


Figure 5-15

Item	Symbol	Description
1		<b>Connection socket (9-pole) - D-Sub</b> PC interface
2		<b>Connection cable, 9-pole, serial</b>
3		<b>SECINT X10 USB</b>
4		<b>USB connection</b> Connecting a Windows PC to SECINT X10 USB
5		<b>Windows PC</b>

## 5.7 Network connection

**This accessory component is only available as a “factory-fit option”.**

The network connection allows the integration of the product into an existing network and exchanging data using the quality-management software Xnet. Some features of the software:

- Real-time display of the welding parameters
- Recording / documentation
- Monitoring of welding parameters
- Maintenance
- Calculations
- WPS management
- Welder management
- xButton management
- Component management

The functionality of the software is in constant development (see the documentation for Xnet).

As standard, welding machines are supplied with a fixed IP address.

Depending on the machine version, the IP address is displayed in the device control or shown on a sticker either below the rating plate or near the control.

**The gateway and the server / computer must be in the same network or IP address range to allow the configuration of the gateway.**

## 6 Maintenance, care and disposal

### 6.1 General

#### **WARNING**



##### **Improper maintenance, testing and repairs!**

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

- Follow the maintenance instructions > see 6.3 chapter.
- If any of the test requirements below are not met, the unit must not be put back into operation until it has been repaired and tested again.

As a rule, contact your specialised dealer, i.e. the supplier of the machine, with respect to all servicing matters. Any return deliveries in the case of warranty claims can be made via your specialised dealer only.

Only use original spare parts to replace any part. When ordering a spare part, always specify the type, serial number and article number of the machine, and the type designation and article 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.

## 6.2 Explanation of icons

Personnel	
	Welder / operator
	Qualified person (authorised service personnel)
Tests	
	Visual inspection
	Functional test
Period, interval	
	One-shift operation
	Multi-shift operation
	Every 8 hours
	Daily
	Weekly
	Monthly
	Every 6 months
	Annually

## 6.3 Maintenance schedule

Inspector	Type of inspection			Maintenance step	Repairer
				<p><b>!</b> Only personnel designated as inspectors or repairers due to their training are allowed to carry out the relevant work step! Non-applicable inspection points are omitted.</p> <ul style="list-style-type: none"> <li>Check and clean the welding torch. Deposits in the welding torch may cause short circuits, impair the welding result and lead to welding torch damage!</li> <li>Check wire drive, welding torches, and liner elements for application-related equipment and setting.</li> <li>Clean the wire feed rolls on a regular basis (depending on the degree of soiling). Replace worn wire feed rolls.</li> <li>Connections of the welding current leads (check for tight and locked seating).</li> <li>Is shielding gas cylinder with gas cylinder securing elements (chain/belt) secured?</li> <li>Strain relief: Are hose packages secured with strain relief?</li> </ul>	
				<ul style="list-style-type: none"> <li>Checking all supply lines and their connections (pipes, hoses, hose packages) for damage or leaks.</li> <li>Checking the welding system for damage to the housing.</li> </ul>	

Inspector	Type of inspection			Maintenance step	Repairer
				<p><b>!</b> Only personnel designated as inspectors or repairers due to their training are allowed to carry out the relevant work step! Non-applicable inspection points are omitted.</p>	
				<ul style="list-style-type: none"> <li>• Transport elements (strap, lifting eyes, handle, wheels, parking brake) corresponding safety elements (if necessary fuse caps) are present and flawless?</li> </ul>	
				<ul style="list-style-type: none"> <li>• Cleaning connections of coolant pipes (quick connect coupling, connections) from impurities and install protective caps when not in use.</li> <li>• Gas test that the solenoid valve opens and closes properly.</li> <li>• Checking operating, signalling and indicator lights, protective devices and actuators.</li> </ul>	
				<ul style="list-style-type: none"> <li>• Check wire feed roll holder (wire feed rolls must be firmly seated on their holders and must not have any play)</li> <li>• Cleaning dirt filter (if applicable) &gt; see 6.3.1 chapter</li> </ul>	
				<ul style="list-style-type: none"> <li>• Checking correct mounting of the wire spool.</li> </ul>	
				<ul style="list-style-type: none"> <li>• Clean external surfaces with a damp cloth (do not use aggressive cleaning agents).</li> </ul>	
				<ul style="list-style-type: none"> <li>• Cleaning the power source (inverter) &gt; see 6.3.4 chapter</li> </ul>	
				<ul style="list-style-type: none"> <li>• Cleaning heat exchanger (torch cooling) &gt; see 6.3.3 chapter</li> </ul>	
				<ul style="list-style-type: none"> <li>• Coolant change (torch cooling) &gt; see 6.3.2 chapter</li> </ul>	
				<ul style="list-style-type: none"> <li>• Periodic inspection and testing &gt; see 6.3.5 chapter</li> </ul>	
				<ul style="list-style-type: none"> <li>• The coolant must be checked using the appropriate frost protection tester TYP 1 (KF) or FSP (blueCool) for sufficient frost protection and replaced if necessary (accessories).</li> </ul>	

## 6.3.1 Dirt filter

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

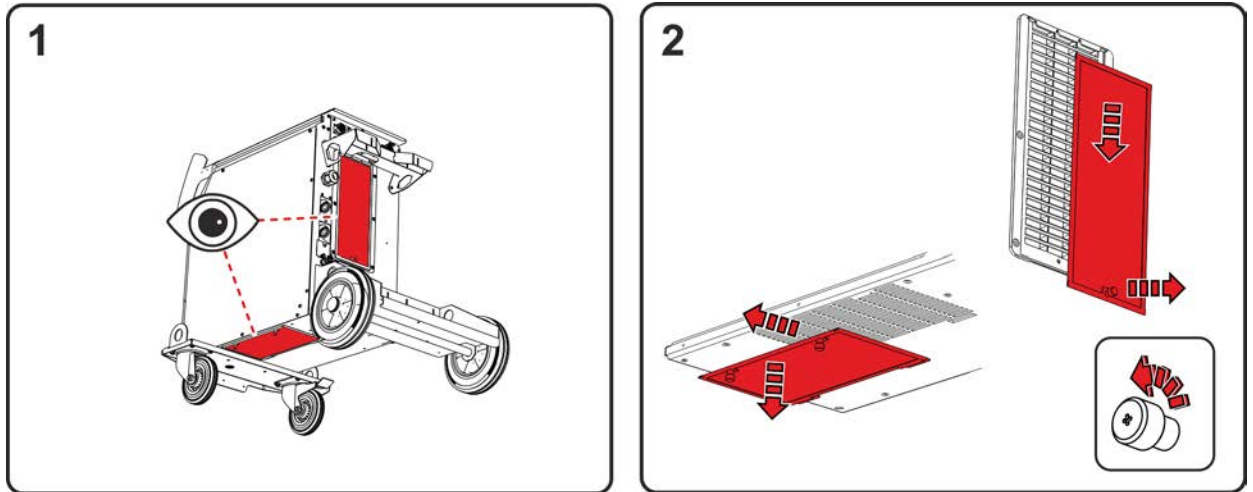


Figure 6-1

- Two dirt filters (option for retrofitting) can be installed on the machine. One at the air inlet of the power unit (inverter) and one at the air inlet of the heat exchanger (torch cooling).
- Loosen the locking screws of the filters (pull the filter of the power unit downwards and then backwards and the filter of the heat exchanger downwards and then to the side).

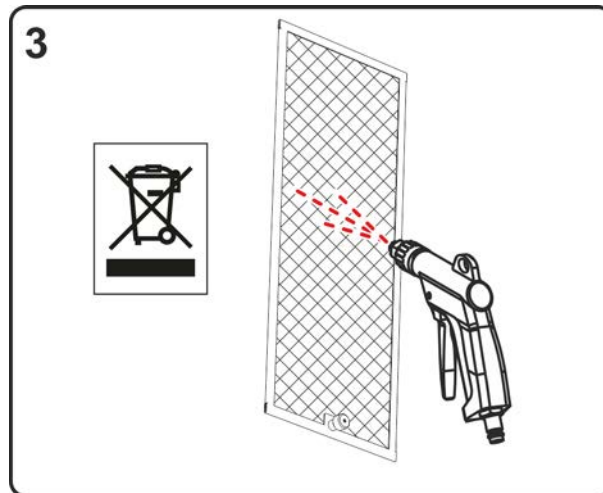


Figure 6-2

- Blow out the dirt filter with compressed air free of oil and water.

### **Follow official regulations on disposal!**

- After cleaning, refit the filters in reverse order.

## 6.3.2 Coolant error

Observe all instructions for handling, use and disposal of torch coolant > see 5.1.6 chapter.

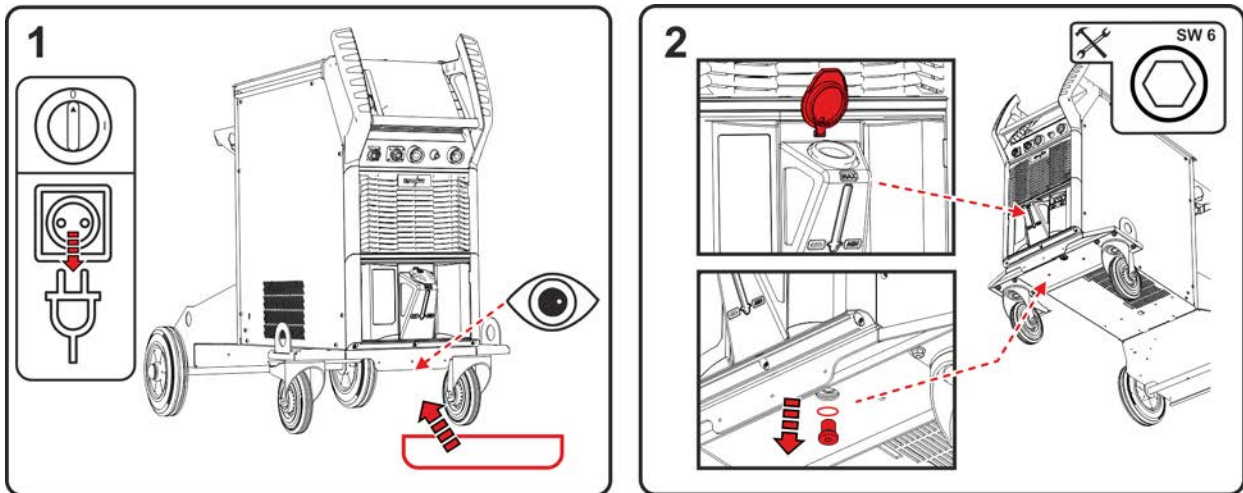


Figure 6-3

- Switch off the machine and disconnect the mains plug. Position a suitable collecting container under the drain plug of the coolant tank.
- Unscrew the drain plug of the coolant tank (remove the tank cap to ventilate).

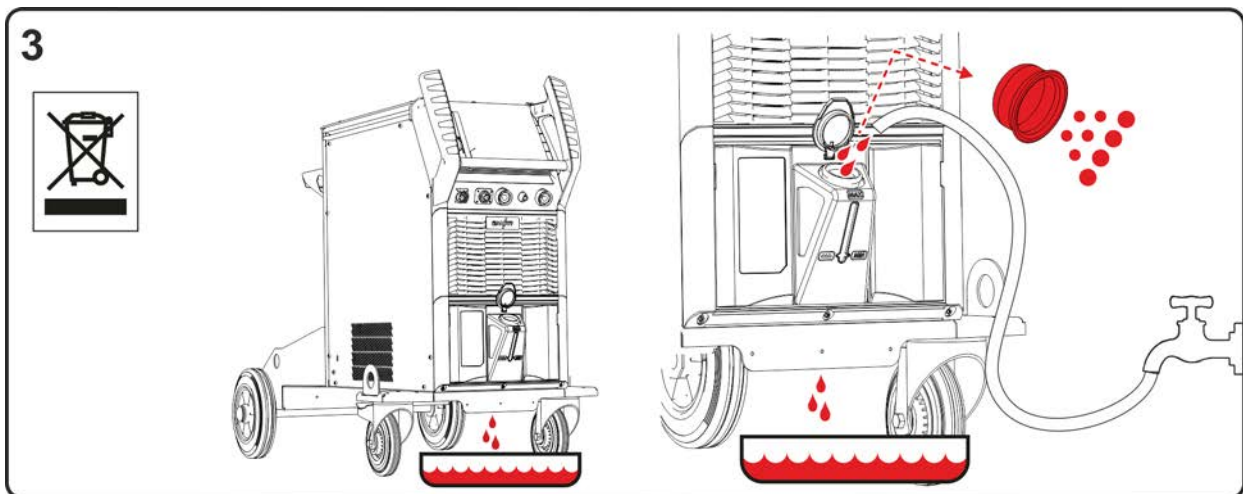


Figure 6-4

- Wait until the coolant has run out of the tank into the collection container.
- Remove the filter screen from the filler neck and clean.
- Then rinse the dirt out of the tank with water.

**Follow official regulations on disposal!**



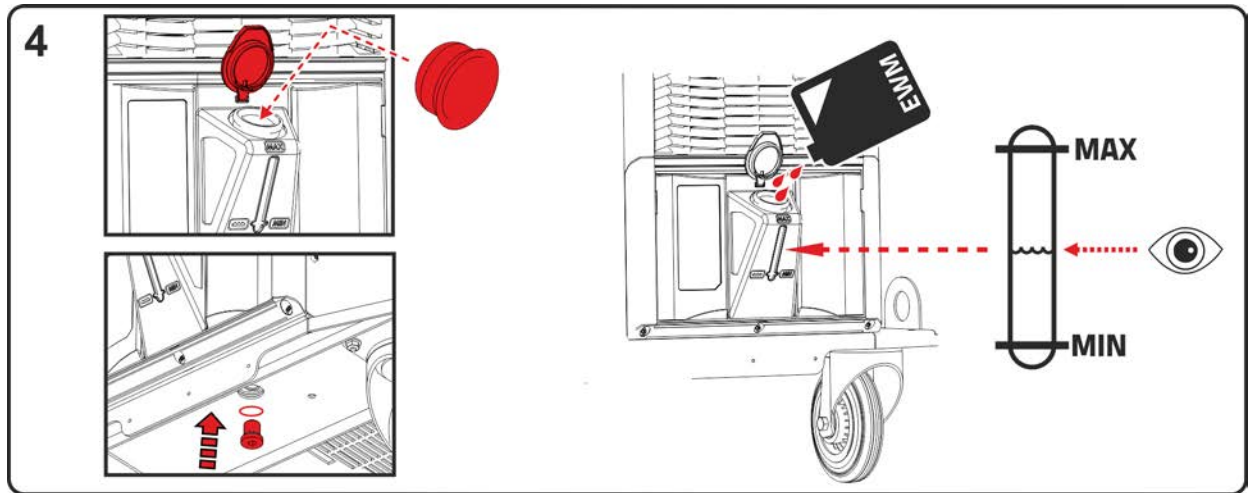


Figure 6-5

- Insert the cleaned filter screen into the filler neck and screw the drain plug with seal back into the tank.
- Fill the tank with original EWM coolant up to the maximum level. After filling, refit the tank cap and vent the coolant circuit > see 7.4 chapter.

## 6.3.3 Heat exchanger (torch cooling)

### ⚠ WARNING



**Risk of injury due to insufficient training!**

**Appropriate training is required for the following maintenance steps to prevent injuries.**

- Only authorised service personnel may carry out this maintenance step.
- Note the warnings and maintenance instructions at the beginning of this chapter!

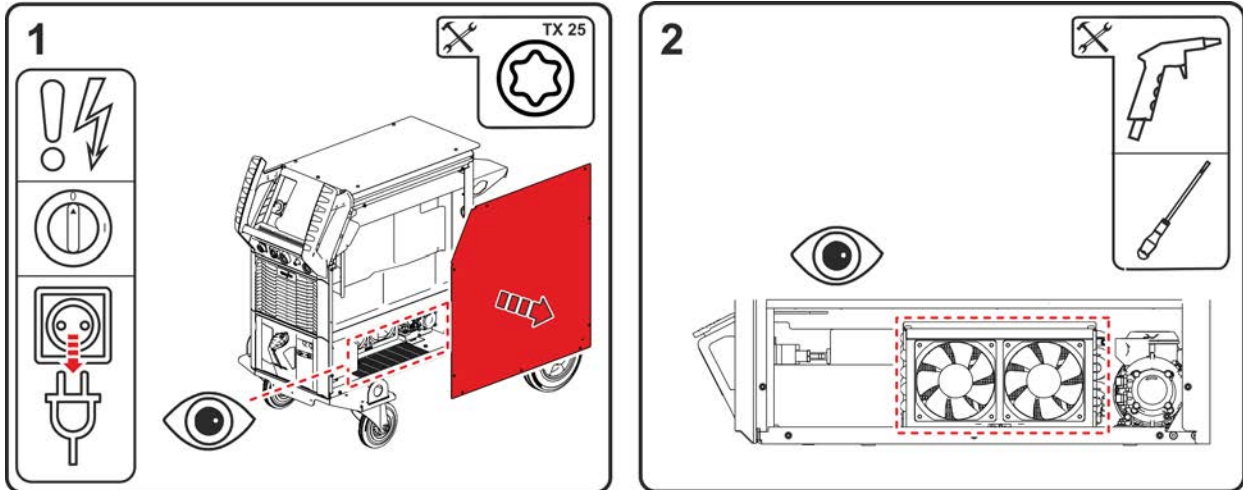


Figure 6-6

- Switch off the machine and disconnect the mains plug. Remove the screws of the side panel. Remove the side panel from the system (lift up and sideways).
- Use only compressed air free of water and oil. Do not blow on electronic components directly. The machine fans may over-rev due to the compressed air and thus become damaged. Therefore, use a screwdriver to block the machine fan mechanically. Please note: The strips of the heat exchanger behind the machine fans must not be damaged by the screwdriver.

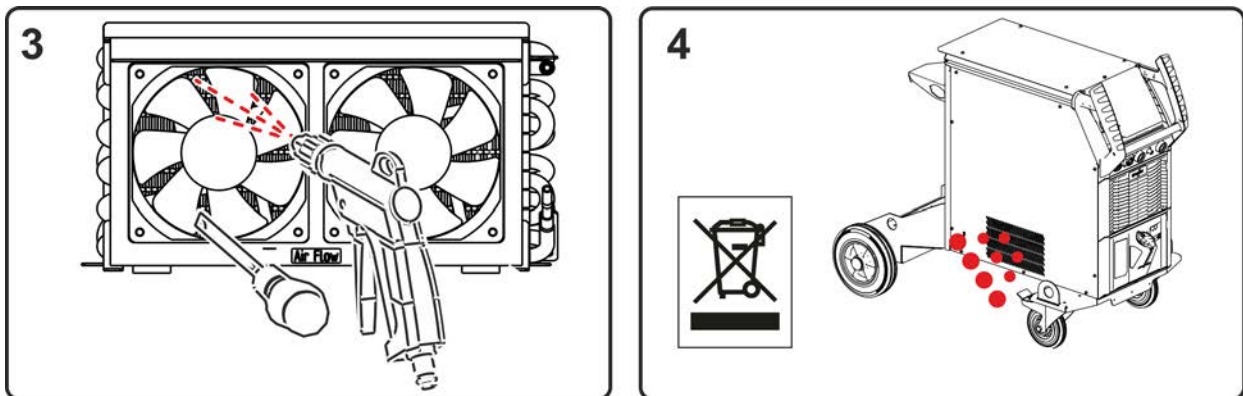


Figure 6-7

- Blow out the heat exchanger using the fans.
- The dirt escapes through the openings in the side panel.

### Follow official regulations on disposal!

- After cleaning, remove any mechanical blockages from the fans, close the machine in reverse order and check according to applicable regulations.

### 6.3.4 Power source (inverter)

#### ⚠ WARNING



**Risk of injury due to insufficient training!**

**Appropriate training is required for the following maintenance steps to prevent injuries.**

- Only authorised service personnel may carry out this maintenance step.
- Note the warnings and maintenance instructions at the beginning of this chapter!

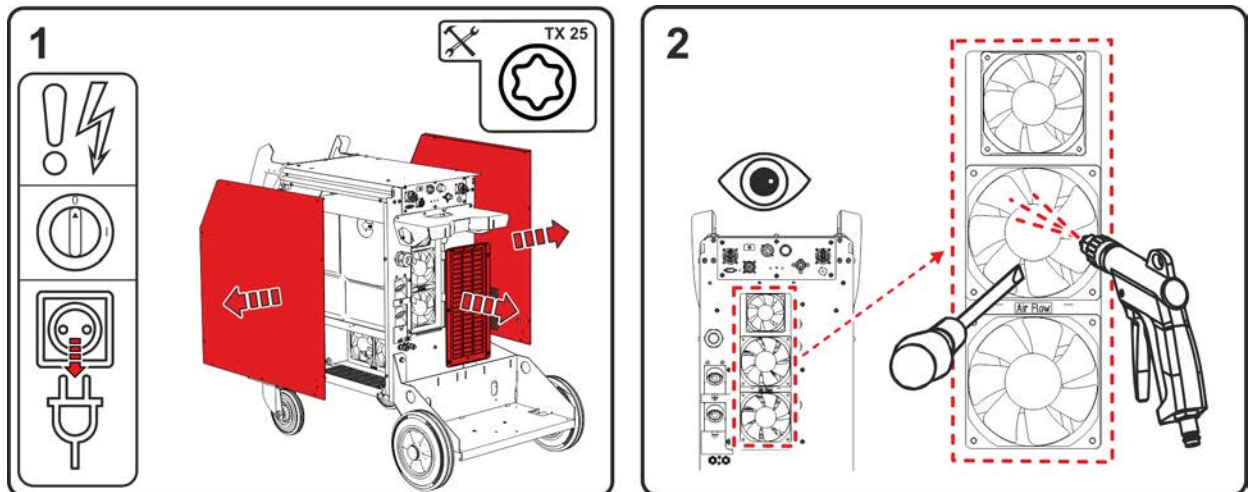


Figure 6-8

- Switch off the machine and disconnect the mains plug. Remove the screws of the side panels and the grille at the rear. Remove side panels (lift up and to the side). Remove louvre (remove downwards and to the back).
- Use only compressed air free of water and oil. Do not blow on electronic components directly. The machine fans may over-rev due to the compressed air and thus become damaged. Therefore, use a screwdriver to block the machine fan mechanically.

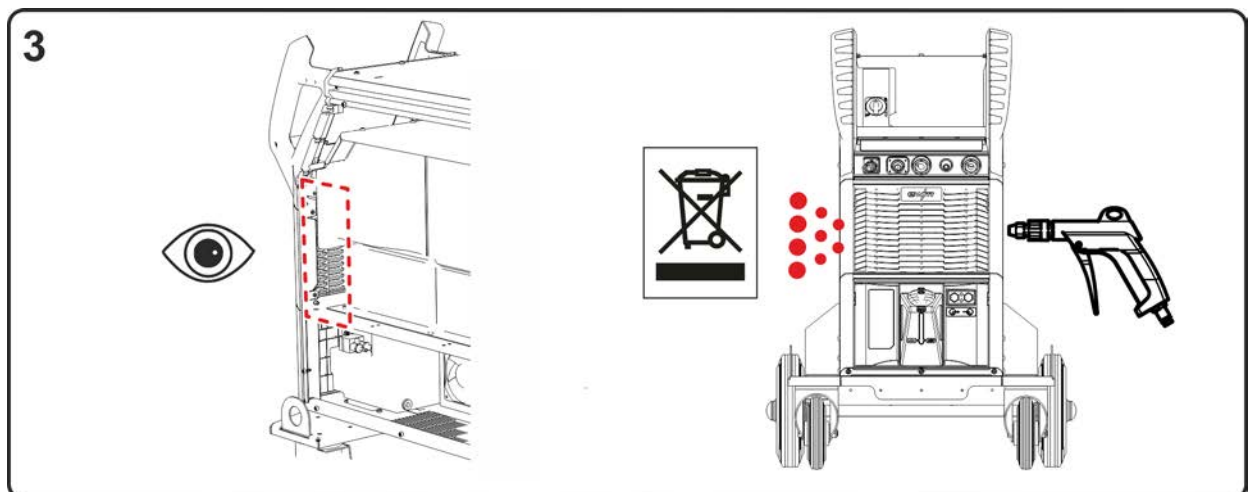


Figure 6-9

- Blow out the areas in front of the inverter from the side.

#### Follow official regulations on disposal!

- After cleaning, remove any mechanical blockages from the fans, close the machine in reverse order and check according to applicable regulations.

### 6.3.5 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)!

## 6.4 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 electrical and electronic equipment (ElektroG)), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.

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

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

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

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

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

## 7 Rectifying faults




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

Legend	Symbol	Description
	↗	Fault/Cause
	✘	Remedy

### 7.1 Error messages (power source)

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

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

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

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

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

#### Reset error (category legend)

<sup>A</sup> The error message disappears when the error is eliminated.

<sup>B</sup> The error message can be reset by pressing a push-button ◀.

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

#### Error 3: Tacho error

Category A, B

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

#### Error 4: Excess temperature

Category A

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

#### Error 5: Mains overvoltage

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

## **Error 6: Mains undervoltage**

↯ Mains voltage is too low.

- ✘ Check the mains voltages and compare them with the connection voltages of the power source.

## **Error 7: Low coolant level**

Category B

↯ Low flow rate.

- ✘ Fill with coolant.
- ✘ Check coolant flow - remove kinks in the hose package.
- ✘ Adjust the flow threshold <sup>[1]</sup>.
- ✘ Clean the cooler.

↯ Pump does not turn.

- ✘ Turn the pump shaft.

↯ Air in the coolant circuit.

- ✘ Vent the coolant circuit.

↯ The hose package is not filled with coolant.

- ✘ Switch the machine off and on > pump running > filling process.

↯ Operation with a gas-cooled welding torch.

- ✘ Deactivate the torch cooling.
- ✘ Connect the coolant feed and return with a hose bridge.

## **Error 8: Shielding gas error**

Category A, B

↯ No shielding gas.

- ✘ Check the shielding gas supply.

↯ The pre-pressure is too low.

- ✘ Remove kinks in the hose package (nominal value: 4-6 bar pre-pressure).

## **Error 9: Overvoltage on secondary**

↯ Overvoltage at the output: Inverter error.

- ✘ Request service.

## **Error 10: Earth fault (PE error)**

↯ Connection between welding wire and machine casing.

- ✘ Remove the electrical connection.

↯ Connection between welding circuit and machine casing.

- ✘ Check the connection and routing of the earth wire / welding torch.

## **Error 11: Fast shutdown**

Category A, B

↯ Remove the logical signal "Robot ready" during the process.

- ✘ Eliminate errors on the higher-level control.

**Error 16: Pilot-arc power source - collective error**

Category A

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

**Error 17: Cold wire error**

Category B

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

**Error 18: Plasma gas error**

Category B

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

**Error 19: Shielding gas error**

Category B

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

## **Error 20: Low coolant level**

Category B

- ✓ Low flow rate.
  - ✘ Fill with coolant.
  - ✘ Check coolant flow - remove kinks in the hose package.
  - ✘ Adjust the flow threshold <sup>[1]</sup>.
  - ✘ Clean the cooler.
- ✓ Pump does not turn.
  - ✘ Turn the pump shaft.
- ✓ Air in the coolant circuit.
  - ✘ Vent the coolant circuit.
- ✓ The hose package is not filled with coolant.
  - ✘ Switch the machine off and on > pump running > filling process.
- ✓ Operation with a gas-cooled welding torch.
  - ✘ Deactivate the torch cooling.
  - ✘ Connect the coolant feed and return with a hose bridge.

## **Error 22: Excess coolant temperature**

Category B

- ✓ Coolant is overheating <sup>[1]</sup>.
  - ✘ Allow the switched-on machine to cool.
- ✓ Fan is blocked, dirty or defective.
  - ✘ Check, clean or replace the fan.
- ✓ Air inlet or outlet is blocked.
  - ✘ Check the air inlet and outlet.

## **Error 23: Excess temperature of the HF choke**

Category A

- ✓ External XF ignition unit is overheating.
  - ✘ Allow the switched-on machine to cool.

## **Error 24: Pilot-arc ignition error**

Category B

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

## **Error 25: Forming gas error**

Category B

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

## **Error 26: Excess temperature of the pilot arc module**

Category A

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



**Error 32: Error I>0**

- ✓ Current recording is faulty.
- ✘ Request service.

**Error 33: Error UIST**


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


**Error 34: Electronics error**

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

**Error 35: Electronics error**

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

**Error 36:  errors**

- ✓  conditions violated.
- ✘ Switch the machine off and on.
- ✘ Request service.

**Error 37: Electronics error**

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

**Error 38: Error IIST**

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

**Error 39: Electronics error**

- ✓ Overvoltage on secondary
- ✘ Switch the machine off and on.
- ✘ Request service.

**Error 40: Electronics error**

- ✓ Error I>0
- ✘ Request service.

**Error 47: Error in the data interface with radio transmission**

Category B

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

## **Error 48: Ignition error**

Category B

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

## **Error 49: Arc interruption**

Category B

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

## **Error 50: Program number**

Category B

- ✓ Internal error.
  - ✘ Request service.

## **Error 51: Emergency stop**

Category A

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

## **Error 52: No wire feeder**

- ✓ After switching on the automated system, no wire feeder (DV) was detected.
  - ✘ Check or connect the control cables of the wire feeders.
  - ✘ Correct the identification number of the automated wire feeder (for 1DV: make sure it is number 1; for 2DV: a wire feeder with number 1 and a wire feeder with number 2).

## **Error 53: No wire feeder 2**

Category B

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

## **Error 54: VRD error**

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

## **Error 55: Excess current of the wire feeder**

Category B

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

## **Error 56: Mains phase failure**

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

### **Error 57: Slave tacho error**

Category B

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

### **Error 58: Short circuit**

Category B

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

### **Error 59: Incompatible machine**

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

### **Error 60: Incompatible software**

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

### **Error 61: Welding monitoring**

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

### **Error 62: System component**

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

### **Error 63: Mains voltage error**

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

[1] See technical data for values and other switching thresholds > see 8.2 chapter.

## 7.2 Warnings

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

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

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

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

Warning	Potential cause / remedy
1   Excess temperature	A shutdown is imminent due to excess temperature.

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

Warning		Potential cause / remedy
34	JOB unknown	JOB selection was not carried out because the JOB number is unknown.
35	Excess current on the wire feed motor slave	Excess current detected on wire feed motor slave (push/push system or intermediate drive).
36	Slave tacho error	Fault of wire feeder - permanent overload of the wire drive (push/push system or intermediate drive).
37	FAST bus failure	Wire feeder not connected (reset by actuating the automatic circuit-breaker of the wire feed motor).
38	Incomplete component information	Check the XNET component management.
39	Mains half-wave failure	Check supply voltage.
40	Weak power grid	Check supply voltage.
41	Cooling unit not recognised	Check the cooling unit connection.
47	Battery (remote control, type BT)	Battery level is low (replace battery)

<sup>[1]</sup> only for the XQ machine series

<sup>[2]</sup> See technical data for values and other switching thresholds > see 8.2 chapter.

## 7.3 Checklist for rectifying faults

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

Legend	Symbol	Description
	↗	Fault/Cause
	✘	Remedy

### Mains fuse triggers

- ↗ Mains fuse triggers - unsuitable mains fuse
- ✘ Set up recommended mains fuse > see 8.2 chapter.

### Functional errors

- ↗ Insufficient coolant flow
  - ✘ Check coolant level and refill if necessary
  - ✘ Eliminate kinks in conduit system (hose packages)
  - ✘ Reset automatic cutout of the coolant pump by activating
- ↗ Air in the coolant circuit
  - ✘ Vent coolant circuit > see 7.4 chapter
- ↗ Several parameters cannot be set (machines with access block)
  - ✘ Entry level is blocked, disable access lock
- ↗ 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)
- ↗ Connection problems
  - ✘ Make control lead connections and check that they are fitted correctly.

## Welding torch overheated

- ✓ Loose welding current connections
  - ✘ Tighten power connections on the torch and/or on the workpiece
- ✓ Overload
  - ✘ Check and correct welding current setting
  - ✘ Use a more powerful welding torch

## No arc ignition

- ✓ Incorrect ignition type setting.
  - ✘ Ignition type: Select "HF start". Depending on the machine, the setting is defined by the change-over switch for ignition types or the  $\text{HF}$  parameter in one of the machine menus (see the "Control operating instructions", if applicable).

## Bad arc ignition

- ✓ Material inclusions in the tungsten electrode due to contact with filler material or workpiece
  - ✘ Regrind or replace the tungsten electrode
- ✓ Bad current transfer on ignition
  - ✘ Check the setting on the "Tungsten electrode diameter/Ignition optimisation" rotary dial and increase if necessary (higher ignition energy).

## Unstable arc

- ✓ Material inclusions in the tungsten electrode due to contact with filler material or workpiece
  - ✘ Regrind or replace the tungsten electrode
- ✓ Incompatible parameter settings
  - ✘ Check settings and correct if necessary

## Pore formation

- ✓ Inadequate or missing gas shielding
  - ✘ Check shielding gas setting and replace shielding gas cylinder if necessary
  - ✘ Shield welding site with protective screens (draughts affect the welding result)
  - ✘ Use gas lens for aluminium applications and high-alloy steels
- ✓ Unsuitable or worn welding torch equipment
  - ✘ Check size of gas nozzle and replace if necessary
- ✓ Condensation in the gas tube
  - ✘ Purge hose package with gas or replace

## 7.4 Vent coolant circuit

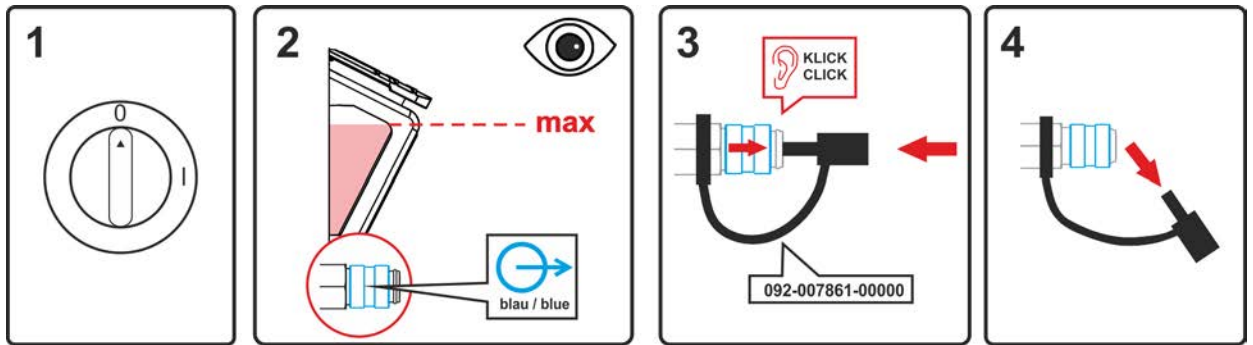


Figure 7-1

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

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

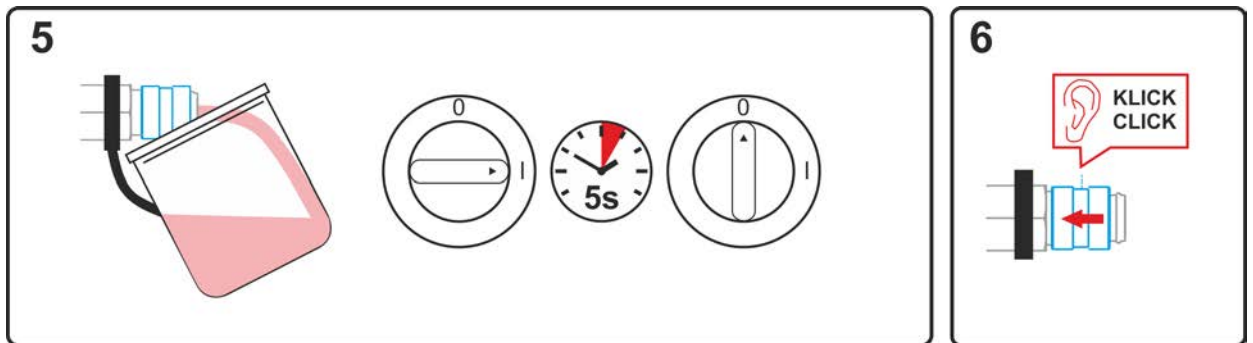


Figure 7-2

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

### 7.5 Fixing the pump shaft (coolant circuit)

Continuing non-use and impurities in the coolant may result in the the coolant pump not being in proper working order.

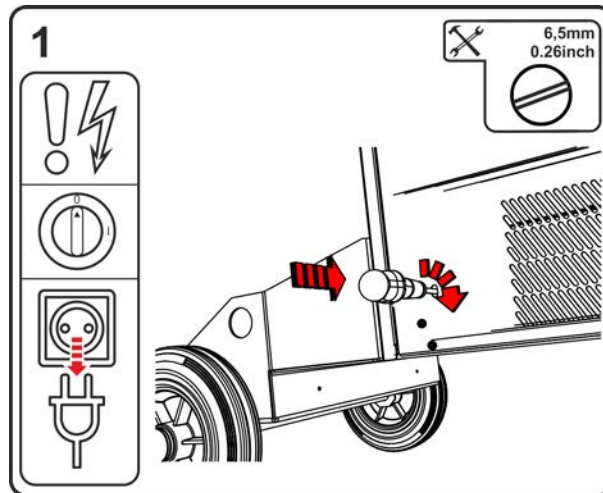


Figure 7-3

- Switch off machine at the main switch.
- Disconnect mains plug.
- Insert a plain slot screwdriver with a maximum tip width of 6.5 mm through the maintenance opening and place in the centre of the pump shaft. Turn the screwdriver clockwise until the pump shaft can be easily rotated again.
- Remove screwdriver.
- Insert mains plug of the switched-off machine into the appropriate socket.
- Switch on the power source at the main switch.



## 8 Technical data

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

### 8.1 Dimensions and weights

		F06R1/R2		F06RS		F06P	
Dimensions (l x b x h)		mm	inch	mm	inch	mm	inch
l		1152	45.3	854	33.6	854	33.6
b		686	27.0	590	23.2	400	15.7
h		976	38.4	976	38.4	881	34.7
Weight <sup>[1]</sup>		kg	lb.	kg	lb.	kg	lb.
F06G		114,9	253.3	104,7	230.8	89,5	197.3
F06W		129,5	285.4	119,3	263.0	104,1	229.5
F06WRF		133,5	294.3	123,3	271.8	108,1	238.3

<sup>[1]</sup> All weights refer to 5 m (16.4 ft.) machine versions Mains connection cable. For versions with longer mains connection cables, the weights increase.

10 m (32.8 ft.) = +2.5 kg (5.5 lb.)

15 m (49.2 ft.) = +5.0 kg (11.0 lb.)




#### 8.1.1 Welding torch cooling system

Torch cooling	F06W	F06WRF
Cooling capacity at 1 l/min (+25°C/77°F)	1,5 kW	
max. Flow rate	5 l/min 1.3 gal./min	20 l/min 5.2 gal./min
max. Delivery height	35 m 115 ft.	45 m 148 ft.
max. Pump pressure	3,5 bar 0.35 MPa	4,5 bar 0.45 MPa
Pump	Centrifugal pump	
max. Tank content	8 l 2.1 gal.	
Flow monitoring Error limit Warning limit <sup>[1]</sup>	0,6 l/min / 0.18 gal./min Offset +0,1 l/min / +0.03 gal./min	
Temperature monitoring Error limit Warning limit <sup>[1]</sup>	70°C / 158°F Offset -5°C / -9°F	

<sup>[1]</sup> Offset from the set error limit

## 8.2 Performance data

### 8.2.1 Tetrax XQ 350 puls AC/DC

Mains voltage <sup>[1]</sup>	3 x 380-400 V	3 x 440-460 V	3 x 480-500 V
Welding current (I <sub>2</sub> )	3 A to 350 A (TIG) 5 A to 350 A (MMA)		
Welding voltage according to standard (U <sub>2</sub> )	10,1 V to 24 V (TIG) 20,2 V to 34,0 V (MMA)		
Duty cycle DC at 40° C <sup>[2]</sup>	350 A (100%)		
Tolerance	-25 % to+20 %	-25 % to+15 %	-25 % to+10 %
mains fuse <sup>[3]</sup>	3 x 25 A		
Open circuit voltage (U <sub>0</sub> )	82 V	94 V	102 V
Frequency	50/60 Hz		
max. Connected load (S <sub>1</sub> )	10,9 kVA gas cooled - F06G (TIG)		
	11,2 kVA water cooled - F06W (TIG)		
	11,5 kVA water cooled, Reinforced - F06WRF (TIG)		
	15,5 kVA (MMA)		
Generator rating (Rec.)	20,8 kVA		
Power consumption P <sub>i</sub> <sup>[4]</sup>	25 W		
Maximum mains impedance (@PCC) <sup>[5]</sup>	107 mOhm		
Cos φ / efficiency	0,99 / 88 %		
Protection class / Overvoltage category	I / III		
Contamination level / Insulation class	3 / H		
protection classification / Residual current circuit breaker	IP 23 / Type B (recommended)		
Noise level <sup>[6]</sup>	<70 dB(A)		
Ambient temperature <sup>[7]</sup>	-25 °C to +40 °C		
Machine cooling / Torch cooling	Fan (AF) / gas or water		
Mains connection cable	H07RN-F4G6		
Workpiece lead (min.) / EMC class	70 mm <sup>2</sup> / A		
Test mark	CE /  /  / 		
Standards used	See declaration of conformity (appliance documents)		

<sup>[1]</sup> Factory-set mains voltage (cannot be configured later)

<sup>[2]</sup> Load cycle: 10 min. (60 % DC  $\pm$  6 min. welding, 4 min. pause)

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

<sup>[4]</sup> Power in idle mode without wire feeder.

<sup>[5]</sup> This welding equipment does not comply with IEC 61000-3-12. When connecting a welding machine to a public low-voltage supply system, the manufacturer or operator has to consult the electricity utilities to make sure the welding machine may be connected.

<sup>[6]</sup> Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.

<sup>[7]</sup> Ambient temperature dependent on coolant! Observe coolant temperature range!

**8.2.2 Tetrix XQ 400 puls AC/DC**

Mains voltage <sup>[1]</sup>	3 x 380-400 V	3 x 440-460 V	3 x 480-500 V
Welding current (I <sub>2</sub> )	3 A to 400 A (TIG) 5 A to 400 A (MMA)		
Welding voltage according to standard (U <sub>2</sub> )	10,1 V to 26 V (TIG) 20,2 V to 36,0 V (MMA)		
Duty cycle DC at 40° C <sup>[2]</sup>	400 A (80%) 370 A (100%)		
Tolerance	-25 % to+20 %	-25 % to+15 %	-25 % to+10 %
mains fuse <sup>[3]</sup>	3 x 25 A		
Open circuit voltage (U <sub>0</sub> )	82 V	94 V	102 V
Frequency	50/60 Hz		
max. Connected load (S <sub>1</sub> )	13,4 kVA gas cooled - F06G (TIG) 13,8 kVA water cooled - F06W (TIG) 14,0 kVA water cooled, Reinforced - F06WRF (TIG) 18,6 kVA (MMA)		
Generator rating (Rec.)	25,1 kVA		
Power consumption P <sub>i</sub> <sup>[4]</sup>	25 W		
Maximum mains impedance (@PCC) <sup>[5]</sup>	120 mOhm		
Cos φ / efficiency	0,99 / 88 %		
Protection class / Overvoltage category	I / III		
Contamination level / Insulation class	3 / H		
protection classification / Residual current circuit breaker	IP 23 / Type B (recommended)		
Noise level <sup>[6]</sup>	<70 dB(A)		
Ambient temperature <sup>[7]</sup>	-25 °C to +40 °C		
Machine cooling / Torch cooling	Fan (AF) / gas or water		
Mains connection cable	H07RN-F4G6		
Workpiece lead (min.) / EMC class	70 mm <sup>2</sup> / A		
Test mark	CE / [S] / EAC / UK		
Standards used	See declaration of conformity (appliance documents)		

<sup>[1]</sup> Factory-set mains voltage (cannot be configured later)

<sup>[2]</sup> Load cycle: 10 min. (60 % DC  $\pm$  6 min. welding, 4 min. pause)

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

<sup>[4]</sup> Power in idle mode without wire feeder.

<sup>[5]</sup> This welding equipment does not comply with IEC 61000-3-12. When connecting a welding machine to a public low-voltage supply system, the manufacturer or operator has to consult the electricity utilities to make sure the welding machine may be connected.

<sup>[6]</sup> Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.

<sup>[7]</sup> Ambient temperature dependent on coolant! Observe coolant temperature range!

## 8.2.3 Tetrax XQ 500 puls AC/DC

Mains voltage <sup>[1]</sup>	3 x 380-400 V	3 x 440-460 V	3 x 480-500 V
Welding current (I <sub>2</sub> )	3 A to 500 A (TIG) 5 A to 500 A (MMA)		
Welding voltage according to standard (U <sub>2</sub> )	10,1 V to 30 V (TIG) 20,2 V to 40,0 V (MMA)		
Duty cycle DC at 40° C <sup>[2]</sup>	500 A (40%) 400 A (80%) 370 A (100%)		
Tolerance	-25 % to+20 %	-25 % to+15 %	-25 % to+10 %
mains fuse <sup>[3]</sup>	3 x 25 A		
Open circuit voltage (U <sub>0</sub> )	82 V	94 V	102 V
Frequency	50/60 Hz		
max. Connected load (S <sub>1</sub> )	19,4 kVA gas cooled - F06G (TIG) 19,7 kVA water cooled - F06W (TIG) 20,0 kVA water cooled, Reinforced - F06WRF (TIG) 25,8 kVA (MMA)		
Generator rating (Rec.)	34,8 kVA		
Power consumption P <sub>i</sub> <sup>[4]</sup>	27 W		
Maximum mains impedance (@PCC) <sup>[5]</sup>	80 mOhm		
Cos φ / efficiency	0,99 / 88 %		
Protection class / Overvoltage category	I / III		
Contamination level / Insulation class	3 / H		
protection classification / Residual current circuit breaker	IP 23 / Type B (recommended)		
Noise level <sup>[6]</sup>	<70 dB(A)		
Ambient temperature <sup>[7]</sup>	-25 °C to +40 °C		
Machine cooling / Torch cooling	Fan (AF) / gas or water		
Mains connection cable	H07RN-F4G6		
Workpiece lead (min.) / EMC class	95 mm <sup>2</sup> / A		
Test mark	CE / [ ] / EAC / UK		
Standards used	See declaration of conformity (appliance documents)		

<sup>[1]</sup> Factory-set mains voltage (cannot be configured later)

<sup>[2]</sup> Load cycle: 10 min. (60 % DC  $\triangleq$  6 min. welding, 4 min. pause)

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

<sup>[4]</sup> Power in idle mode without wire feeder.

<sup>[5]</sup> This welding equipment does not comply with IEC 61000-3-12. When connecting a welding machine to a public low-voltage supply system, the manufacturer or operator has to consult the electricity utilities to make sure the welding machine may be connected.

<sup>[6]</sup> Noise level during idle mode and operation under standard load according to IEC 60974-1 at the maximum operating point.

<sup>[7]</sup> Ambient temperature dependent on coolant! Observe coolant temperature range!

## 9 Accessories

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

### 9.1 Welding torch cooling system

Type	Designation	Item no.
HOSE BRIDGE UNI	Tube bridge	092-007843-00000

#### 9.1.1 Coolant - type blueCool

Type	Designation	Item no.
blueCool -10 5 l	Coolant up to -10 °C (14 °F), 5 l	094-024141-00005
blueCool -10 25 l	Coolant up to -10 °C (14 °F), 25 l	094-024141-00025
blueCool -30 5 l	Coolant up to -30 °C (22 °F), 5 l	094-024142-00005
blueCool -30 25 l	Coolant up to -30 °C (22 °F), 25 l	094-024142-00025
FSP blueCool	Frost protection tester	094-026477-00000

#### 9.1.2 Coolant - type KF

Type	Designation	Item no.
KF 23E-5	Coolant up to -10 °C (14 °F), 5 l	094-000530-00005
KF 23E-200	Coolant (-10 °C), 200 litres	094-000530-00001
KF 37E-5	Coolant up to -20 °C (4 °F), 5 l	094-006256-00005
KF 37E-200	Coolant (-20 °C), 200 l	094-006256-00001
TYP1	Frost protection tester	094-014499-00000

### 9.2 Remote controls and accessories

Type	Designation	Item no.
RT1 19POL	Remote control current	090-008097-00000
RT PWS1 19POL	Remote control, vertical-down weld current, pole reversal	090-008199-00000
RTG1 19POL 5m	Remote control, current	090-008106-00000
RTG1 19POL 10m	Remote control, current	090-008106-00010
RTF1 19POL 5 M	Foot-operated remote control current with connection cable	094-006680-00000
RTF-X TIG 19pol 5 m	Foot-operated remote control, current, with connection cable	090-008855-00005
RTF-X TIG BT	Foot-operated remote control, current, Wireless	090-008854-00000

#### 9.2.1 Connection cables

Type	Designation	Item no.
RA5 19POL 5M	Remote control e.g. connection cable	092-001470-00005
RA10 19POL 10m	Remote control e.g. connection cable	092-001470-00010
RA10 19POL 15m	Remote control connection cable	092-001470-00015
RA20 19POL 20m	Remote control e.g. connection cable	092-001470-00020

#### 9.2.2 Extension cable

Type	Designation	Item no.
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

## 9.3 Options

Type	Designation	Item no.
ON Filter F06	Dirt filter for air inlet	092-003337-00000
ON Shock Protect F06	Ram protection	092-003334-00000
ON TS F06 R	Torch holder, right	092-003335-00000
ON TS F06 L	Torch holder, left	092-003360-00000
ON HS F06	Holder for holding long hose packages and welding torch	092-003333-00000
ON CS F.06	Crane frame	092-003485-00000
ON CC F.06	Transparent cover cap for protection of control	092-004198-00000
ON PDM TG.11 Comfort 3.0	Transparent protective screen for device control Comfort 3.0	092-004279-00000
ON PDM TG.11 Expert 3.0	Transparent protective screen for device control Expert 3.0	092-004278-00000
OU F06W	Conversion kit, water block	092-003492-00000
OU F06WRF	Conversion kit, water block with reinforced pump	092-003493-00000
OU F06R1/R2	Conversion kit, single cylinder holder to double cylinder holder	092-003494-00000
OU AIF F06	Conversion kit, 19-pole interface for automated welding	092-004415-00000
ON Water Filter K.06	Optional water filter	092-004051-00000
ON RPH TIG F.06	Holder for TIG welding rods for mounting on flexFit casing system	092-004388-00000

## 9.4 General accessories

Type	Designation	Item no.
32A 5POLE/CEE	Machine plug	094-000207-00000
KLF-L1-L2-L3-PE	Label of mains cable	094-023697-00000
ON AL D13/27	Cap for load sockets	092-003282-00000

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

Type	Designation	Item no.
Mod. 842 Ar/CO2 230bar 15l	Pressure regulator with manometer	394-002910-00015
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
GH 2X1/4" 2M	Gas hose	094-000010-00001
G1 G1/4 R 3M	Gas hose	094-000010-00003
GH 2X1/4" 5m	Gas hose	094-000010-00005
GH 2X1/4" 10 m	Gas hose	094-000010-00011

## 9.6 Networking / Xnet

Type	Designation	Item no.
Xnet LAN Gateway	LAN gateway in external casing	090-008833-00502
Xnet WiFi Gateway	WiFi gateway in external casing	090-008834-00502
Xnet Extended-Set LAN	Xnet retrofit set LAN: One machine licence, a LAN gateway and a network cable (10 m)	091-008833-00001
Xnet Extended-Set WiFi	Xnet retrofit set WiFi: One machine licence, one WiFi gateway, one 7-pole connection cable (5 m)	091-008834-00001

## 10 Appendix

### 10.1 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"