

Power source

Tetrix 300 Comfort 2.0 puls TM

Tetrix 300 AC/DC Comfort 2.0 puls TM

Tetrix 300 AC/DC Comfort 2.0 puls TM (AUS)

099-000235-EW501

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12.07.2016

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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 site of operation.
- Safety and warning labels at the machine indicate any possible risks. Keep these labels clean and legible at all times.
- The machine has been constructed to the state of the art and any regulations and standards applicable. It may be operated, serviced and repaired by trained personnel only.



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.

Liability relating to the operation of this equipment is restricted solely to the function of the equipment. No other form of liability, regardless of type, shall be accepted. This exclusion of liability shall be deemed accepted by the user on commissioning the equipment.

The manufacturer is unable to monitor whether or not these instructions or the conditions and methods are observed during installation, operation, usage and maintenance of the equipment.

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

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

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2 Safety instructions

2.1 Notes on the use of these operating instructions

DANGER

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

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

WARNING

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

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

CAUTION

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

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




Special technical points which users must observe.

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.

2.1.1 Complete documentation

 ***This document is part of the complete documentation and valid only in combination with the "Control" operating instructions for the product being used!***
Read and observe the operating instructions for all system components, especially the safety instructions!

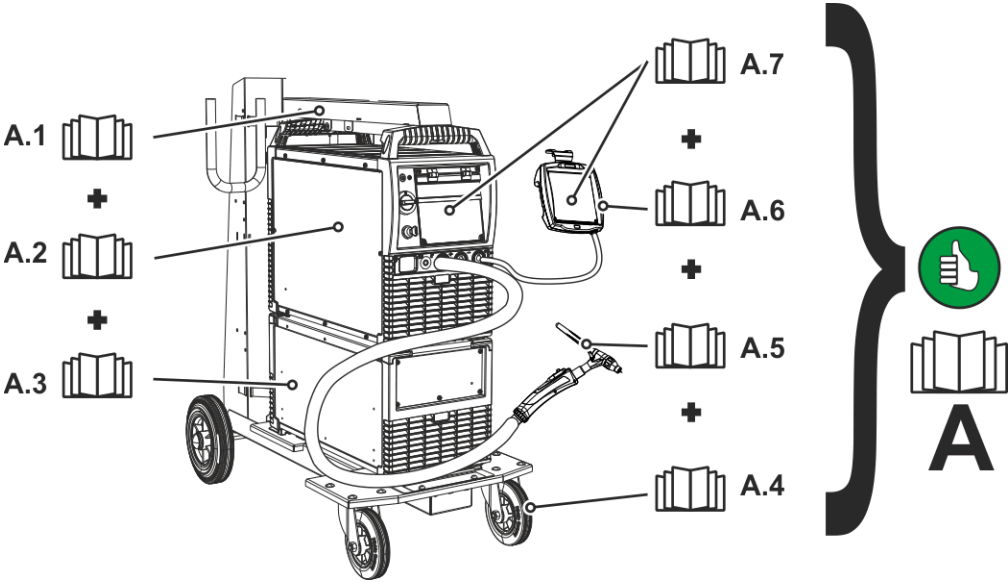






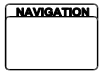

















Figure 2-1

The illustration shows a general example of a welding system.

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

2.1.2 Explanation of icons

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

Symbol	Description
	Activate and release/tap/tip
	Release/do not activate
	Press and hold
	switch
	Turn
	Numerical value – adjustable
	Signal light lights up in green
	Signal light flashes green
	Signal light lights up in red
	Signal light flashes red

2.2 General

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!

2.3 Personal protective equipment

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.

2.4 Electrical hazards

WARNING



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!



Danger when coupling multiple power sources!

Coupling multiple power sources in parallel or in series has to be carried out by qualified personnel and in accordance with the manufacturer's guidelines. Before bringing the power sources into service for arc welding operations, a test has to verify that they cannot exceed the maximum allowed open circuit voltage.

- Connection of the machine may be carried out by qualified personnel only!
- When decommissioning individual power sources, all mains and welding current leads have to be safely disconnected from the welding system as a whole. (Danger due to inverse voltages!)
- Do not couple welding machines with pole reversing switch (PWS series) or machines for AC welding, as a minor error in operation can cause the welding voltages to be combined.

2.5 Radiation and heat

⚠ WARNING



Risk of injury due to radiation or heat!

Arc radiation results in injury to skin and eyes.

Contact with hot workpieces and sparks results in burns.

- Use welding shield or welding helmet with the appropriate safety level (depending on the application)!
- Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!
- Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!

2.6 Fire and risk of explosion

⚠ WARNING



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!

2.7 Smoke and gases

⚠ 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!



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).

2.8 Noise

CAUTION



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!

2.9 EMC classification

CAUTION



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

2.10 Other hazards



Obligations of the operator!

The respective national directives and laws must be observed for operation of the machine!

- **National implementation of the framework directive (89/391/EWG), as well as the associated individual directives.**
- **In particular, directive (89/655/EWG), on the minimum regulations for safety and health protection when staff members use equipment during work.**
- **The regulations regarding work safety and accident prevention for the respective country.**
- **Setting up and operating the machine according to IEC 60974-9.**
- **Check at regular intervals that users are working in a safety-conscious way.**
- **Regular checks of the machine according to 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.**



Stray welding currents can destroy protective earth conductors, damage equipment and electronic devices and cause overheating of components leading to fire.

- **Make sure all welding leads are securely connected and check regularly.**
- **Always ensure a proper and secure electrical connection to the workpiece!**
- **Set up, attach or suspend all conductive power source components like casing, transport vehicle and crane frames so they are insulated!**
- **Do not place any other electronic devices such as drillers or angle grinders, etc., 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!**



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.

2.11 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.



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!

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).

3.1 Documents which also apply

3.1.1 Warranty



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

3.1.2 Declaration of Conformity



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

- Low Voltage Directive (LVD) 2014/35/EC
- Electromagnetic Compatibility Directive (EMC) 2014/30/EC
- Restriction of Hazardous Substance (RoHS) 2011/65/EC

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

3.1.3 Welding in environments with increased electrical hazards



In compliance with IEC / DIN EN 60974, VDE 0544 the machines can be used in environments with an increased electrical hazard.

3.1.4 Service documents (spare parts and circuit diagrams)

WARNING



Do not carry out any unauthorised repairs or modifications!

To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons!

The warranty becomes null and void in the event of unauthorised interference.

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

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

Spare parts can be obtained from the relevant authorised dealer.

3.1.5 Calibration/Validation

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

4 Machine description – quick overview

4.1 Front view

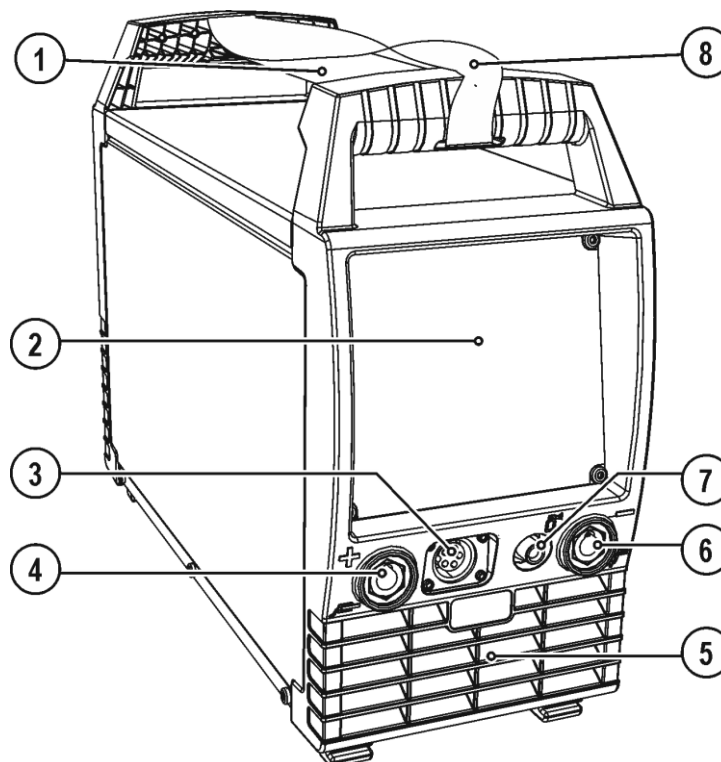





Figure 4-1

Item	Symbol	Description
1		Carrying handle
2		Machine control, see the relevant control operating instructions
3	 	Connection socket, 5-pole/8-pole (depending on variant) 5-pole: -- Control cable TIG standard torch 8-pole: -- Control cable TIG up/down or potentiometer torch
4	+	Connection socket, "+" welding current <ul style="list-style-type: none"> TIG: Connection for workpiece lead MMA: Electrode holder or workpiece lead connection
5		Cooling air inlet
6		Connection socket, "-" welding current <ul style="list-style-type: none"> TIG: TIG welding torch connection MMA: Electrode holder or workpiece lead connection
7		G$\frac{1}{4}$" connecting nipple, "-" welding current Shielding gas connection (with yellow insulating cap) for TIG welding torch
8		Carrying strap > see 5.1.4 chapter

4.2 Rear view

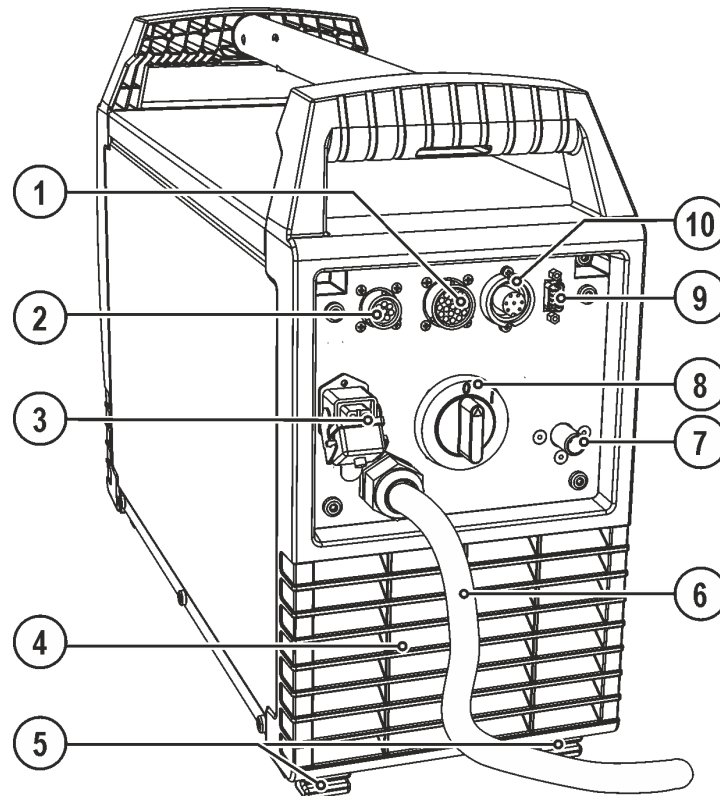









Figure 4-2

Item	Symbol	Description
1		Connection socket, 19-pole Remote control connection
2		8-pole connection socket Cooling unit control lead
3		4-pole connection socket Cooling unit voltage supply
4		Cooling air outlet
5		Machine feet
6		Mains connection cable > see 5.1.7 chapter
7		G 1/4" connecting nipple Shielding gas connection on the pressure regulator.
8		Main switch, machine on/off
9		PC interface, serial (D-Sub connection socket, 9-pole)
10		7-pole connection socket (digital) For connecting digital accessory components

5 Design and function

5.1 Transport and installation

WARNING



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

- The machine may not be lifted by crane or suspended!

5.1.1 Ambient conditions



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

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



Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.

- Avoid high volumes of smoke, vapour, oil vapour and grinding dust!
- Avoid ambient air containing salt (sea air)!

5.1.1.1 In operation

Temperature range of the ambient air:

- -25 °C to +40 °C

Relative air humidity:

- Up to 50% at 40 °C
- Up to 90% at 20 °C

5.1.1.2 Transport and storage

Storage in an enclosed space, temperature range of the ambient air:

- -30 °C to +70 °C

Relative air humidity

- Up to 90% at 20 °C

5.1.2 Machine cooling



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

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

5.1.3 Workpiece lead, general

CAUTION



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

- Check welding current connections on a daily basis and lock by turning to the right, when required.
- Thoroughly clean workpiece connection and secure properly. Do not use construction parts of the workpiece as welding current return lead!

5.1.4 Adjusting the length of the carrying strap



To demonstrate adjustment, lengthening the strap is shown in the figure. To shorten, the strap's loops must be inched in the opposite direction.

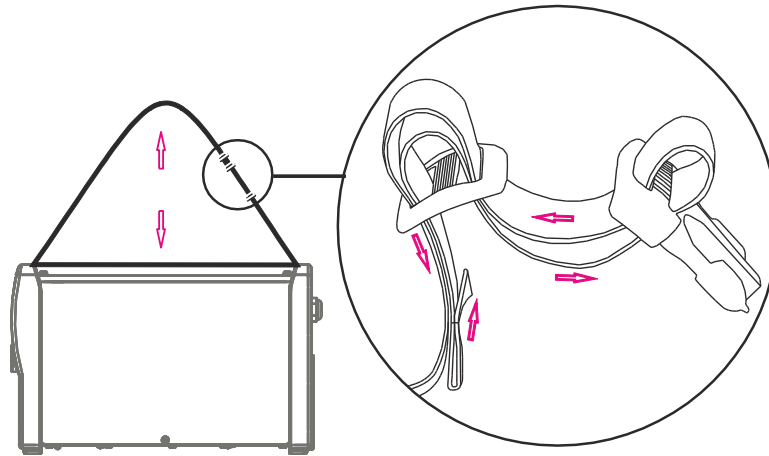


Figure 5-1

5.1.5 Welding torch cooling system



Please note the relevant documentation of the accessory components.

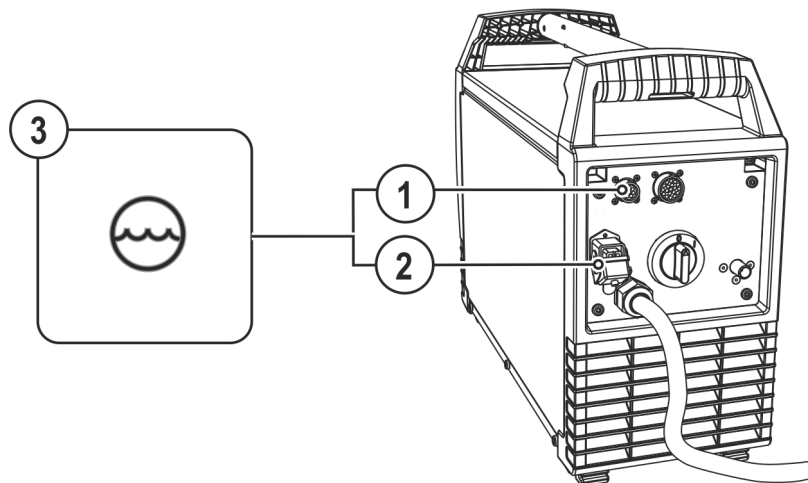





Figure 5-2






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

Control and supply lead to the welding machine

The cooling module and welding machine are connected using two leads.

- Insert the control lead plug on the welding machine.
- Insert the power supply lead plug on the welding machine.

5.1.6 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).**

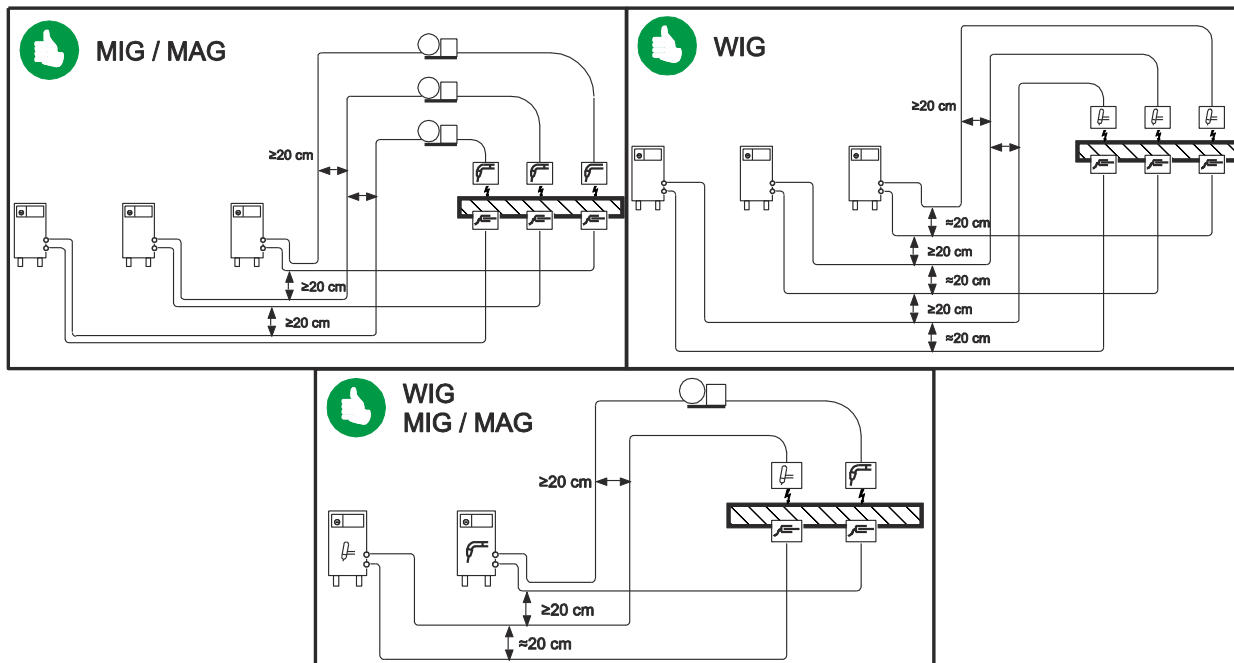


Figure 5-3

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

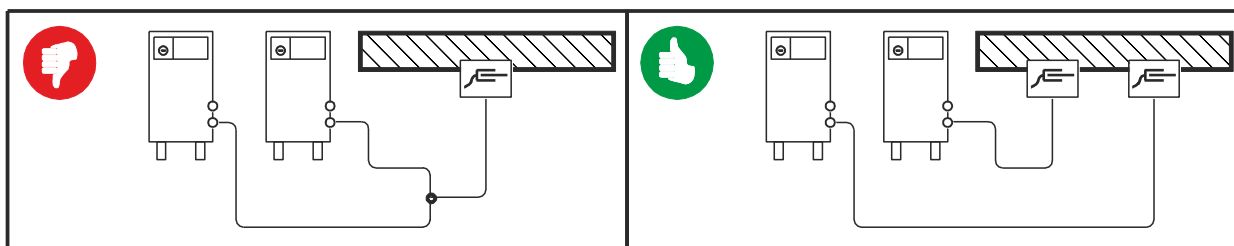





Figure 5-4

-  **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.**

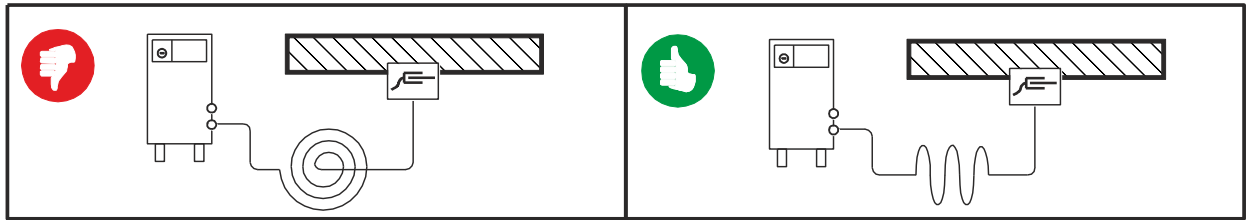



Figure 5-5

-  **Stray welding currents can destroy protective earth conductors, damage equipment and electronic devices and cause overheating of components leading to fire.**
 - **Make sure all welding leads are securely connected and check regularly.**
 - **Always ensure a proper and secure electrical connection to the workpiece!**
 - **Set up, attach or suspend all conductive power source components like casing, transport vehicle and crane frames so they are insulated!**
 - **Do not place any other electronic devices such as drillers or angle grinders, etc., 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!**

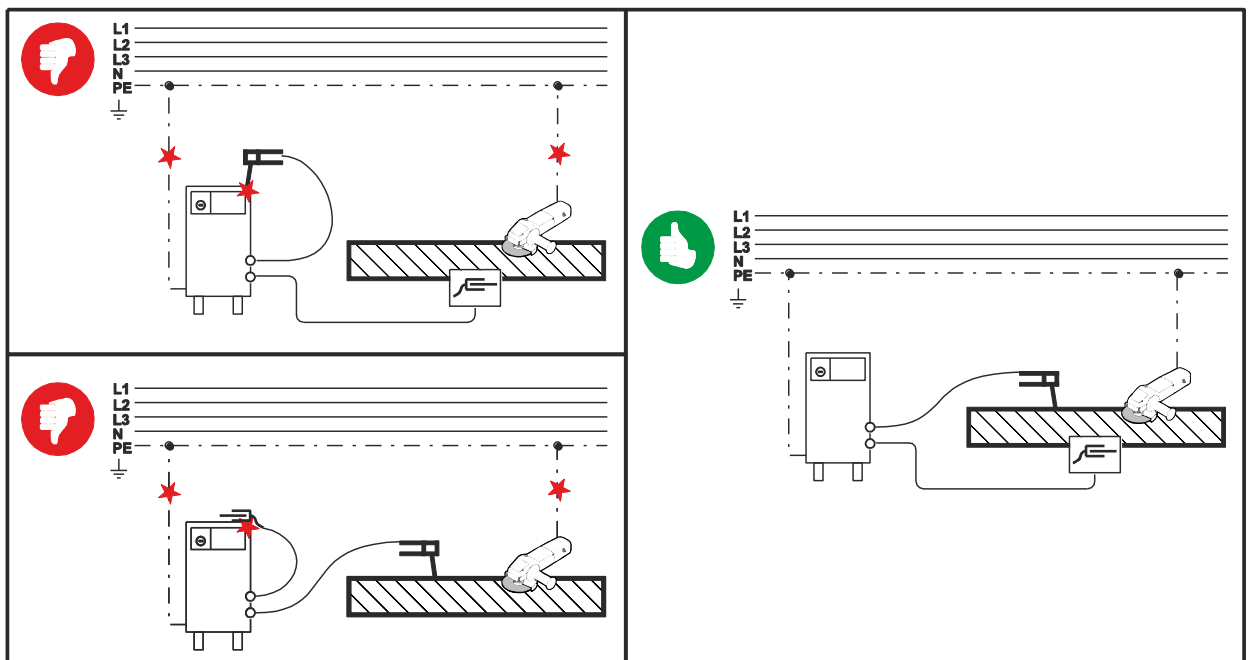


Figure 5-6

5.1.7 Mains connection

DANGER



Hazard caused by improper mains connection!

An improper mains connection can cause injuries or damage property!

- Only use machine with a plug socket that has a correctly fitted protective conductor.
- If a mains plug must be fitted, this may only be carried out by an electrician in accordance with the relevant national provisions or regulations!
- Mains plug, socket and lead must be checked regularly by an electrician!
- When operating the generator always ensure it is earthed as stated in the operating instructions. The resulting network has to be suitable for operating devices according to protection class 1.

5.1.7.1 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

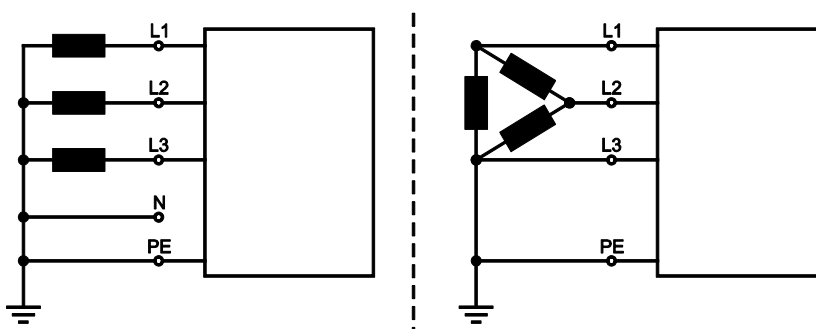


Figure 5-7

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



The operating voltage shown on the rating plate must be consistent with the mains voltage, in order to avoid damage to the machine > see 8 chapter!

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

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).

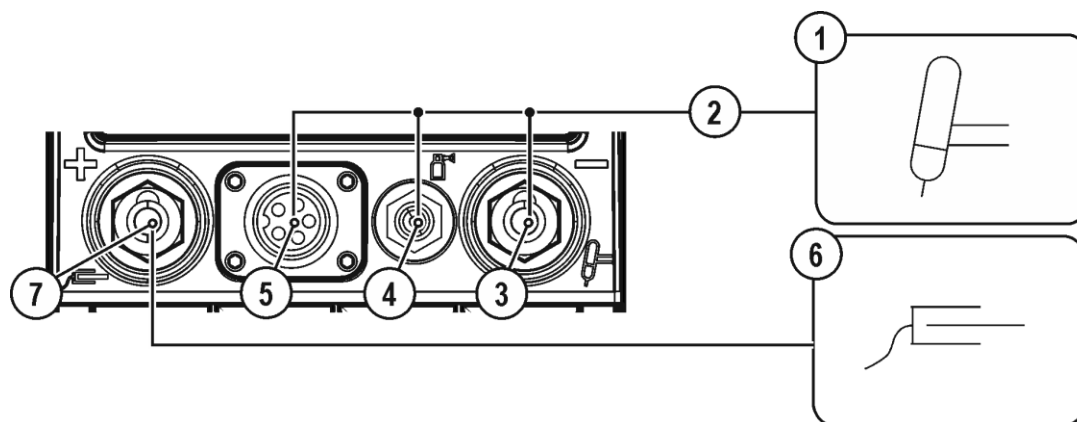


Figure 5-8

Item	Symbol	Description
1		Welding torch
2		Welding torch hose package
3		Connection socket, "-" welding current Welding current lead connection for TIG welding torch
4		G $\frac{1}{4}$ " connecting nipple TIG welding torch shielding gas connection
5	 	Connection socket, 5-pole/8-pole (depending on variant) 5-pole: --- Control cable TIG standard torch 8-pole: --- Control cable TIG up/down or potentiometer torch
6		Workpiece
7		Connection socket for "+" welding current Workpiece lead connection

- Insert the welding current plug on the welding torch into the welding current connection socket and lock by turning to the right.
- Remove yellow protective cap on G $\frac{1}{4}$ connecting nipple.
- Screw welding torch shielding gas connection tightly onto the G $\frac{1}{4}$ " connection nipple.
- Insert control lead plus on the welding torch into the connection socket for the welding torch control lead (5-pole for a standard torch, 8-pole for up/down or potentiometer torches) and tighten.
- 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).



Please note the relevant documentation of the accessory components.

5.2.1.1 Torch connection options and pin assignments

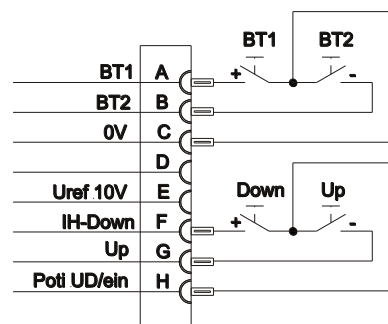
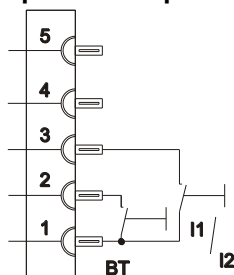


Figure 5-9

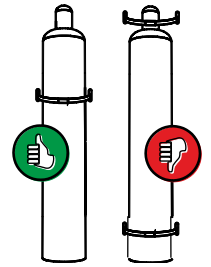
5.2.2 Shielding gas supply (shielding gas cylinder for welding machine)

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!**

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



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

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



Before connecting the pressure regulator to the gas cylinder, open the cylinder valve briefly to expel any dirt.

5.2.2.1 Connecting the shielding gas supply

- Place the shielding gas cylinder into the relevant cylinder bracket.
- Secure the shielding gas cylinder using a securing chain.

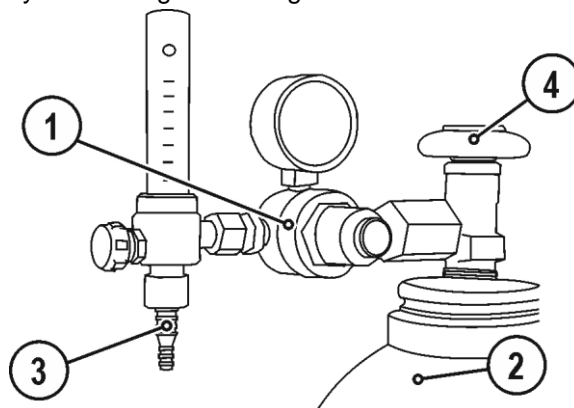


Figure 5-10

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

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

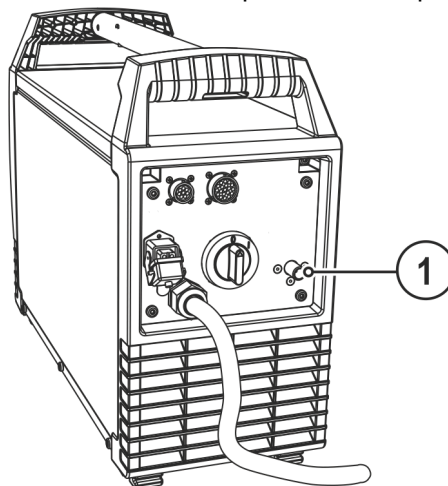



Figure 5-11

Item	Symbol	Description
1		Connecting nipple G $\frac{1}{4}$ ", shielding gas connection

- Connect crown nut of the shielding gas line to the G $\frac{1}{4}$ " connecting nipple.

5.2.3 Arc ignition

5.2.3.1 HF ignition

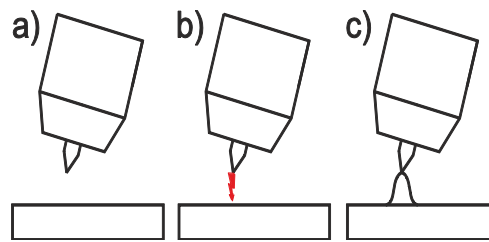


Figure 5-12

The arc is started without contact from high-voltage ignition pulses.

- Position the welding torch in welding position over the workpiece (distance between the electrode tip and workpiece should be approx. 2-3mm).
- Press the torch trigger (high voltage ignition pulses ignite the arc).
- Ignition current flows, and the welding process is continued depending on the operating mode selected.

End the welding process: Release or press the torch trigger depending on the operating mode selected.

5.2.3.2 Liftarc

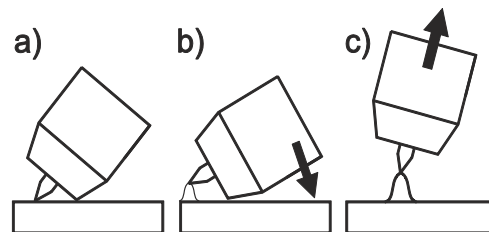


Figure 5-13

The arc is ignited on contact with the workpiece:

- Carefully place the torch gas nozzle and tungsten electrode tip onto the workpiece and press the torch trigger (liftarc current flowing, regardless of the main current set).
- Incline the torch over the torch gas nozzle to produce a gap of approx. 2-3 mm between the electrode tip and the workpiece. The arc ignites and the welding current is increased, depending on the operating mode set, to the ignition or main current set.
- Lift off the torch and swivel to the normal position.

Ending the welding process: Release or press the torch trigger depending on the operating mode selected.

5.2.3.3 Automatic cut-out



The automatic cut-out function will be triggered by two conditions during the welding process:

- During the ignition phase (ignition fault) If there is no welding current within 3s after starting the welding.**
- During the welding phase (arc interruption) If the arc is interrupted for longer than 3s.**

In both cases, the welding machine ends the ignition or welding process immediately.

5.3 MMA welding

⚠ CAUTION



Risk of being crushed or burnt.

When replacing spent or new stick electrodes

- Switch off machine at the main switch
- Wear appropriate safety gloves
- Use insulated tongs to remove spent stick electrodes or to move welded workpieces and
- Always put the electrode holder down on an insulated surface.



Shielding gas connection!

During MMA welding open circuit voltage is applied at the shielding gas connection (G $\frac{1}{4}$ " connecting nipple).

- Place yellow insulating cap on the G $\frac{1}{4}$ " connection nipple (protects against electrical voltage and dirt).

5.3.1 Connecting the electrode holder and workpiece lead



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

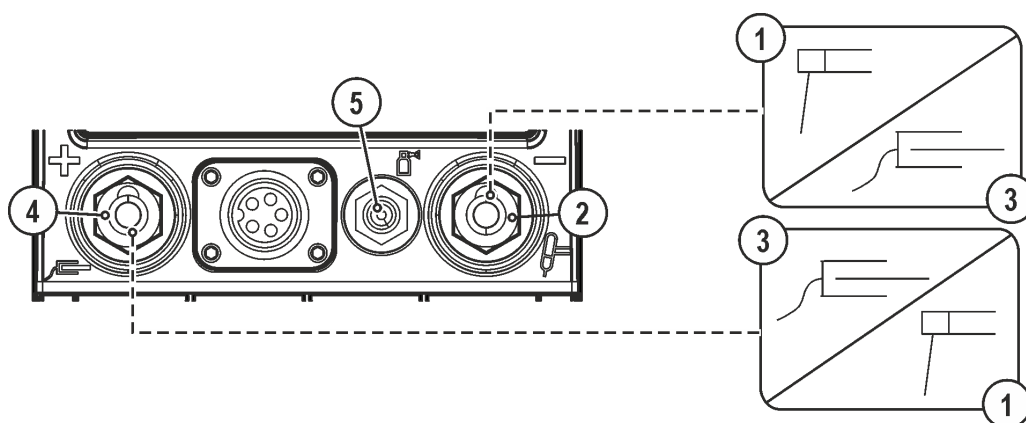


Figure 5-14

Item	Symbol	Description
1		Electrode holder
2		Connection socket, "-" welding current Workpiece lead or electrode holder connection
3		Workpiece
4		Connection socket for "+" welding current Electrode holder or workpiece lead connection
5		Connecting nipple G $\frac{1}{4}$, shielding gas connection

- Fit yellow protective cap onto G $\frac{1}{4}$ " connecting nipple.
- Insert cable plug of the electrode holder into either the "+" or "-" welding current connection socket and lock by turning to the right.
- Insert cable plug of the workpiece lead into either the "+" or "-" welding current connection socket and lock by turning to the right.

5.4 Remote control



The remote controls are operated on the 19-pole remote control connection socket (analogue).

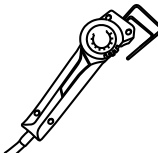
5.4.1 RT1 19POL



Functions

- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.

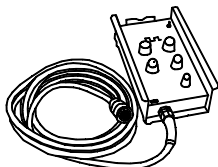
5.4.2 RTG1 19POL



Functions

- Infinite setting of the welding current (0% to 100%) depending on the main current preselected at the welding machine

5.4.3 RTP1 19POL



Functions

- TIG/MMA
- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- Pulse/spot/normal
- Pulse, spot and break times are infinitely adjustable.

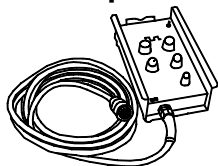
5.4.4 RTP 2



Functions

- TIG/MMA.
- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- Pulse/spot/normal
- Frequency and spot times infinitely adjustable.
- Coarse adjustment of the cycle frequency.
- Pulse/pause ratio (balance) adjustable from 10% to 90%.

5.4.5 RTP3 spotArc 19POL

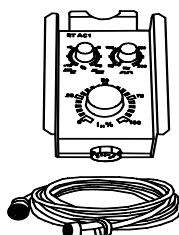


Functions

- TIG / MMA.
- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- Pulse / SpotArc spots / normal
- Frequency and spot time infinitely adjustable.
- Coarse adjustment of the pulse frequency.
- Pulse/pause ratio (balance) adjustable from 10% to 90%.

5.4.6 RT AC 1 19POL

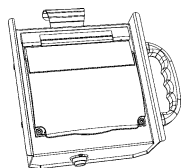
Suitable for machines with AC welding type only.



Functions

- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- AC frequency of welding current infinitely adjustable.
- AC balance (positive/negative half-wave ratio) can be set from +15% to -15%.

5.4.7 RT50 7POL



Functions

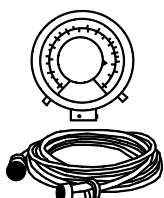
- Remote control for all welding machine and accessory functions.



Please note the relevant documentation of the accessory components.

5.4.8 RT PWS 1 19POL

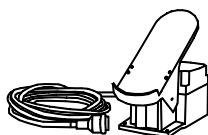
Suitable for machines with AC welding type only.



Functions

- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current at the welding machine
- Pole reversing switch, suitable for machines with PWS function

5.4.9 RTF1 19POL



Functions

- Infinitely adjustable welding current (0% to 100%) depending on the preselected main current on the welding machine.
- Start/stop welding operation (TIG)

ActivArc welding is not possible in combination with the foot-operated remote control.

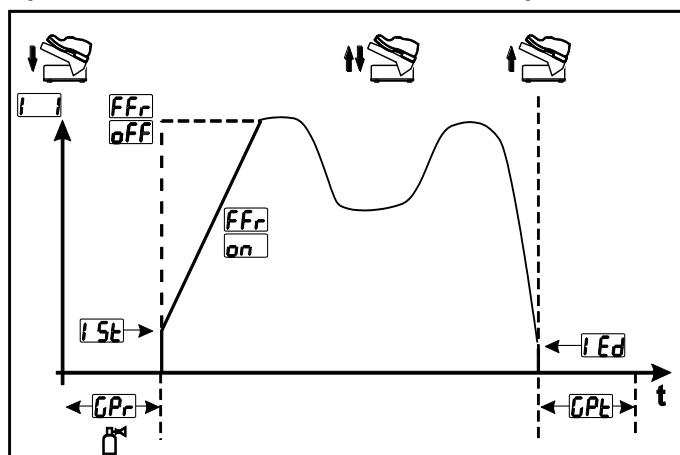


Figure 5-15

Symbol	Meaning
	Actuate foot-operated remote control (start welding process)
	Operate foot-operated remote control (set welding current according to application)
	Release foot-operated remote control (end welding process)
FFr	Ramp function parameters (RTF) on ----- Welding current rises to the specified main current level in a ramp function off ----- Welding current immediately jumps to the specified main current level Settings are made in the machine configuration menu on the machine control

5.5 Voltage reducing device

The voltage reducing device is a requirement in some countries and in many internal company safety guidelines for power sources.

The voltage reduction device is only active on VRD/AUS/RU machine versions.

To increase safety, particularly in hazardous environments (like shipbuilding, pipe construction or mining), the machine is equipped with the VRD (Voltage-reducing device) voltage reduction device.

The VRD > see 4.1 chapter signal light is illuminated, when the voltage reduction device is operating without fault and the output voltage is reduced to a value specified in the relevant standard (see technical data > see 8 chapter).

5.6 PC interface



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)!***



Please note the relevant documentation of the accessory components.

5.7 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).

5.7.1 Remote control connection socket, 19-pole

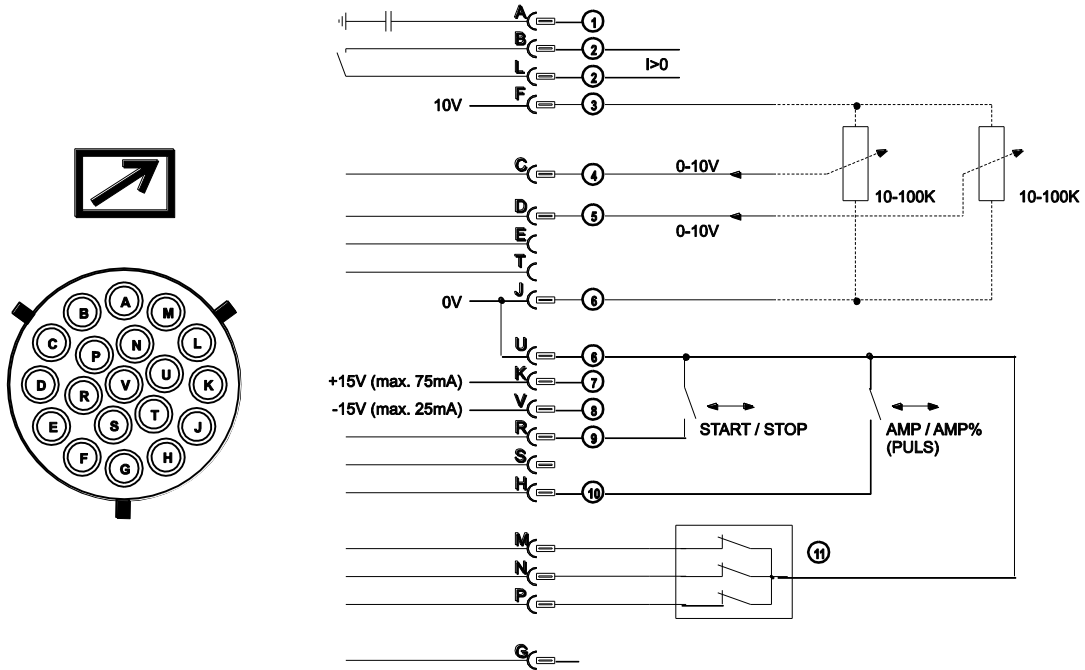


Figure 5-16

Pos.	Pin	Signal shape	Designation
1	A	Output	Connection for cable screen (PE)
2	B/L	Output	Current flows signal $I > 0$, galvanically isolated (max. $\pm 15V/100mA$)
3	F	Output	Reference voltage for potentiometer 10V (max. 10mA)
4	C	Input	Control value specification for main current, 0-10V ($0V = I_{min}$, $10V = I_{max}$)
5	D	Input	Control value specification for secondary current, 0-10V ($0V = I_{min}$, $10V = I_{max}$)
6	J/U	Output	Reference 0V
7	K	Output	Power supply +15V, max. 75mA
8	V	Output	Power supply -15V, max. 25mA
9	R	Input	Start/Stop welding current
10	H	Input	Switching between main and secondary welding currents (pulses)
11	M/N/P	Input	Activation of control voltage specification Set all 3 signals to reference potential 0V to activate external control voltage specification for main and secondary currents
12	G	Output	Measured value $I_{SETPOINT}$ ($1V = 100A$)

6 Maintenance, care and disposal

6.1 General

DANGER



Incorrect maintenance and testing!

The machine may be cleaned, repaired and tested by skilled and qualified personnel only. A qualified person is one who, due to their training, knowledge and experience, can detect any hazards and possible consequential damage when checking the machine, and can take the necessary safety measures.

- Observe the maintenance instructions > see 6.3 chapter!
- The machine may only be put into operation again once the testing has been successful.



Risk of injury due to electrical voltage after switching off!

Working on an open machine can lead to fatal injuries!

Capacitors are loaded with electrical voltage during operation. Voltage remains present for up to four minutes after the mains plug is removed.

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

WARNING



Cleaning, testing and repair!

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

- In the event of failure of any one of the following tests, the machine must not be operated again until it has been repaired and a new test has been carried out.

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

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

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

6.2 Cleaning

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

6.3 Maintenance work, intervals

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

6.3.1 Daily maintenance tasks

6.3.1.1 Visual inspection

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

6.3.1.2 Functional test

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

6.3.2 Monthly maintenance tasks

6.3.2.1 Visual inspection

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

6.3.2.2 Functional test

- Selector switches, command devices, emergency stop devices, voltage reducing devices, message and control lamps
- Check that the wire guide elements (inlet nipple, wire guide tube) are fitted securely.
- Check coolant tubes and their connections for impurities
- Check and clean the welding torch. Deposits in the torch can cause short circuits and have a negative impact on the welding result, ultimately causing damage to the torch.

6.3.3 Annual test (inspection and testing during operation)



The welding machine may only be tested by competent, capable persons! A capable person is one who, because of his training, knowledge and experience, is able to recognise the dangers that can occur while testing welding power sources as well as possible subsequent damage and who is able to implement the required safety procedures.



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

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.

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!**



6.4.1 Manufacturer's declaration to the end user

- According to European provisions (guideline 2002/96/EG of the European Parliament and the Council of January, 27th 2003), 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 is to be placed for disposal or recycling in the waste separation systems provided for this purpose.
- According to German law (law governing the distribution, taking back and environmentally correct disposal of electric and electronic equipment (ElektroG) from 16.03.2005), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.
- Information about giving back used equipment or about collections can be obtained from the respective municipal administration office.
- EWM participates in an approved waste disposal and recycling system and is registered in the Used Electrical Equipment Register (EAR) under number WEEE DE 57686922.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

6.5 Meeting the requirements of RoHS

We, EWM AG Mündersbach, hereby confirm that all products supplied by us which are affected by the RoHS Directive, meet the requirements of the RoHS (Directive 2011/65/EU).

7 Rectifying faults

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

7.1 Checklist for rectifying faults



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

Legend	Symbol	Description
	↗	Fault/Cause
	✕	Remedy

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 7.2 chapter
- ↗ 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
 - ✕ Tighten contact tip correctly
- ↗ 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 changeover switch for ignition types or the **HFI** 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 (hydrogen) in the gas tube
 - ✖ Purge hose package with gas or replace

7.2 Vent coolant circuit

-  **Coolant tank and quick connect coupling of coolant supply and return are only fitted in machines with water cooling.**
-  **To vent the cooling system always use the blue coolant connection, which is located as deep as possible inside the system (close to the coolant tank)!**

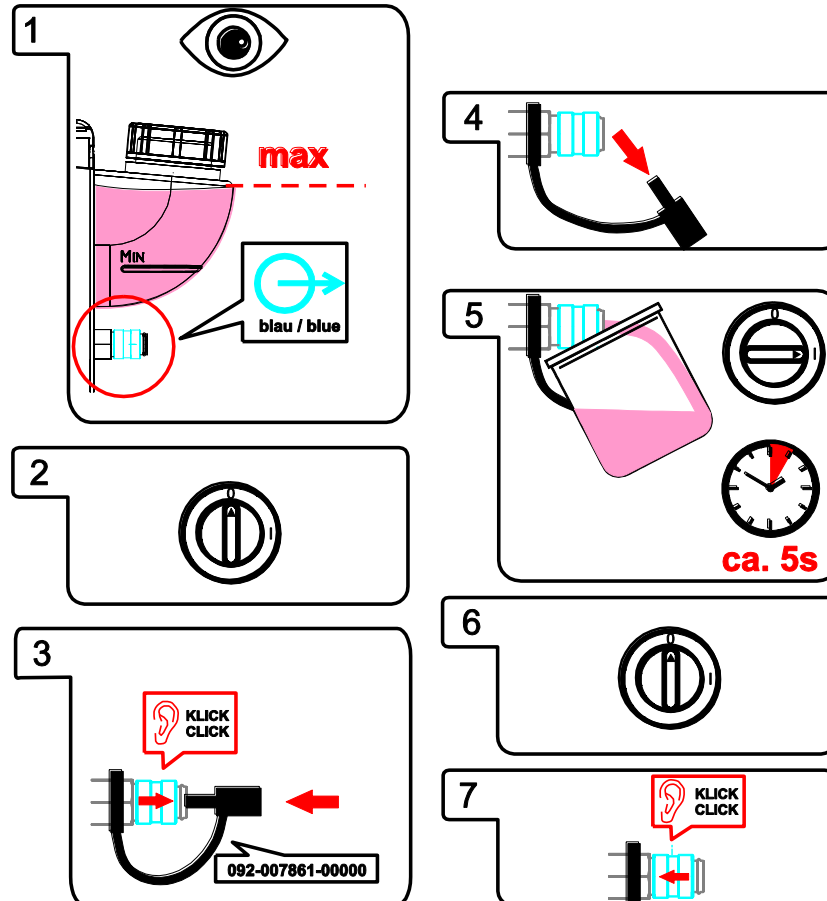




Figure 7-1

8 Technical data





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

8.1 Tetrix 300

	TIG	MMA
Setting range for welding current	5 A–300 A	
Setting range for welding voltage	10.2 V–22.0 V	20.2 V–32.0 V
Max. welding current		
30% DC	-	300 A
35% DC	300 A	-
60% DC	260 A	260 A
100% DC	210 A	210 A
Load cycle	10 min. (60% DC \wedge 6 min. welding, 4 min. pause)	
Open circuit voltage	63 V	
Mains voltage (tolerances)	3 x 400 V (-25% to +20%)	
Frequency	50/60 Hz	
Mains fuse (safety fuse, slow-blow)	3 x 16 A	
Mains connection lead	H07RN-F4G2,5	
Max. connected load	11.4 kVA	16.6 kVA
Recommended generator rating	22.4 kVA	
Noise level	< 70 dB(A)	
cos ϕ /efficiency	0.99/84 %	
Insulation class/protection classification	H/IP 23	
Ambient temperature	-25 °C to +40 °C	
Machine cooling/torch cooling	Fan/gas	
Workpiece lead	50 mm ²	
Dimensions L x W x H	539 x 210 x 415 mm	
	21.2 x 8.3 x 16.3 inch	
Weight	20.5 kg	
	49.8 lb	
EMC class	A	
Constructed to standard	IEC 60974-1, -3, -10;  	

8.2 Tetrix 300 AC/DC

	TIG	MMA
Setting range for welding current	5 A–300 A	
Setting range for welding voltage	10.2 V–22.0 V	20.2 V–32.0 V
Max. welding current		
30% DC	-	300 A
35% DC	300 A	-
60% DC	260 A	260 A
100% DC	210 A	210 A
Load cycle	10 min. (60% DC \wedge 6 min. welding, 4 min. pause)	
Open circuit voltage	63 V	
Reduced open circuit voltage	24 V – (AUS) machine variant	
Mains voltage (tolerances)	3 x 400 V (-25% to +20%)	
Frequency	50/60 Hz	
Mains fuse (safety fuse, slow-blow)	3 x 16 A	
Mains connection lead	H07RN-F4G2,5	
Max. connected load	11.7 kVA	17 kVA
Recommended generator rating	23 kVA	
Noise level	< 70 dB(A)	
cos ϕ /efficiency	0.99/84%	
Insulation class/protection classification	H/IP 23	
Ambient temperature	-25 °C to +40 °C	
Machine cooling/torch cooling	Fan/gas	
Workpiece lead	50 mm ²	
Dimensions L x W x H	539 x 210 x 415 mm	
	21.2 x 8.3 x 16.3 inch	
Weight	22.6 kg	
	49.8 lb	
EMC class	A	
Constructed to standard	IEC 60974-1, -3, -10;   (AUS) machine variant in addition: AS 1674.2	

9 Accessories



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

9.1 Remote controls and accessories

9.1.1 7-pole connection

Type	Designation	Item no.
RT50 7POL	Remote control, full functionality	090-008793-00000
FRV 7POL 0.5 m	Extension/connecting cable	092-000201-00004
FRV 7POL 1 m	Extension/connecting cable	092-000201-00002
FRV 7POL 5 m	Extension/connecting cable	092-000201-00003
FRV 7POL 10 m	Extension/connecting cable	092-000201-00000
FRV 7POL 20 m	Extension/connecting cable	092-000201-00001
FRV 7POL 25M	Extension/connecting cable	092-000201-00007

9.1.2 19-pole connection

Type	Designation	Item no.
RTF1 19POL 5 M	Foot-operated remote control current with connection cable	094-006680-00000
RT1 19POL	Remote control current	090-008097-00000
RTG1 19POL	Remote control, current	090-008106-00000
RTAC1 19POL	Remote control for current/balance/frequency Suitable for machines with AC welding type only.	090-008197-00000
RT PWS1 19POL	Remote control, vertical-down weld current, pole reversal Suitable for machines with AC welding type only.	090-008199-00000
RTP1 19POL	Remote control spot welding / pulses	090-008098-00000
RTP2 19POL	Remote control spot welding / pulses	090-008099-00000
RTP3 spotArc 19POL	spotArc remote control for spot welding / pulses	090-008211-00000
RA5 19POL 5M	Remote control e.g. connection cable	092-001470-00005
RA10 19POL 10M	Remote control e.g. connection cable	092-001470-00010
RA20 19POL 20M	Remote control e.g. connection cable	092-001470-00020
RV5M19 19POLE 5M	Extension cable	092-000857-00000

9.2 Welding torch cooling system

Type	Designation	Item no.
cool41 U31	Cooling module	090-008600-00502

9.3 Transport systems

Type	Designation	Item no.
Trolly 55-5	Transport cart, assembled	090-008632-00000
Trolly 35.2-2	Transport vehicle	090-008296-00000
Trolly 38-2 E	Transport vehicle, long wheelbase	090-008270-00000

9.4 General accessories

Type	Designation	Item no.
GH 2X1/4" 2M	Gas hose	094-000010-00001
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
5POLE/CEE/16A/M	Machine plug	094-000712-00000

9.5 Options

Type	Designation	Item no.
ON TR Trolley 55-5	Cross arm and holder for wire feeder	092-002700-00000
ON Filter TIG 200/300-2	Retrofit option, dirt filter for air inlet	092-002551-00000
ON PC PLUG	Protective cap for plug	092-003074-00000

9.6 Computer communication

Type	Designation	Item no.
PC300.Net	PC300.Net welding parameter software kit incl. cable and SECINT X10 USB interface	090-008777-00000

10 Appendix A

10.1 Overview of EWM branches

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 Plants

 Branches

 Liaison office

● More than 400 EWM sales partners worldwide