Operating instructions

EN

Wire feed unit

tigSpeed continuous drive 45 hotwire

099-000236-EW501 | Observe additional system documents! | 22.3.2023

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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.

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

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

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

Data security

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

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2 For your safety

2.1 Notes on using these operating instructions

⚠ DANGER

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

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

⚠ WARNING

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

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

⚠ CAUTION

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

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

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

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

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

2.2 Explanation of icons

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

2.3 Safety instructions

⚠ WARNING



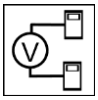
Risk of accidents due to non-compliance with the safety instructions!
Non-compliance with the safety instructions can be fatal!

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



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

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



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

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



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

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

⚠ WARNING



Risk of injury due to improper clothing!

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

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



Explosion risk!

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

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



Fire hazard!

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

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

⚠ CAUTION



Smoke and gases!

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

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



Noise exposure!

Noise exceeding 70 dBA can cause permanent hearing damage!

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



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



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



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

Setting up and operating

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

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

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

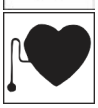
Recommendations for **reducing interference emission**

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



Electromagnetic fields!

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



- Follow the maintenance instructions > *see 6 chapter*!
- Unwind the welding leads completely!
- Shield radiation-sensitive equipment or facilities appropriately!
- The function of pacemakers may be impaired (seek medical advice if necessary).

⚠ CAUTION

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

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

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

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

Requirements for connection to the public mains network

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

2.4 Transport and installation

⚠ WARNING

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

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

⚠ CAUTION



Risk of accidents due to supply lines!

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

- Disconnect all supply lines before transport!



Risk of tipping!

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

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



Risk of accidents due to incorrectly installed leads!

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

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



Risk of injury from heated coolant and its connections!

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

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

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

Operation in non-permissible positions can cause equipment damage.

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

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

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

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

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

3 Intended use

⚠ WARNING

§

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

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

3.1 Use and operation solely with the following machines

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

This machine can be combined with any TIG welding machine.

3.2 Applications

Wire feeder for integration in a welding system for TIG cold / hot wire welding.

3.3 Documents which also apply

3.3.1 Warranty

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

3.3.2 Declaration of Conformity

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

3.3.3 Welding in environments with increased electrical hazards

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

3.3.4 Service documents (spare parts and circuit diagrams)

⚠ WARNING

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

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

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

3.3.5 Calibration/Validation

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

3.3.6 Part of the complete documentation

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

The illustration shows a general example of a welding system.

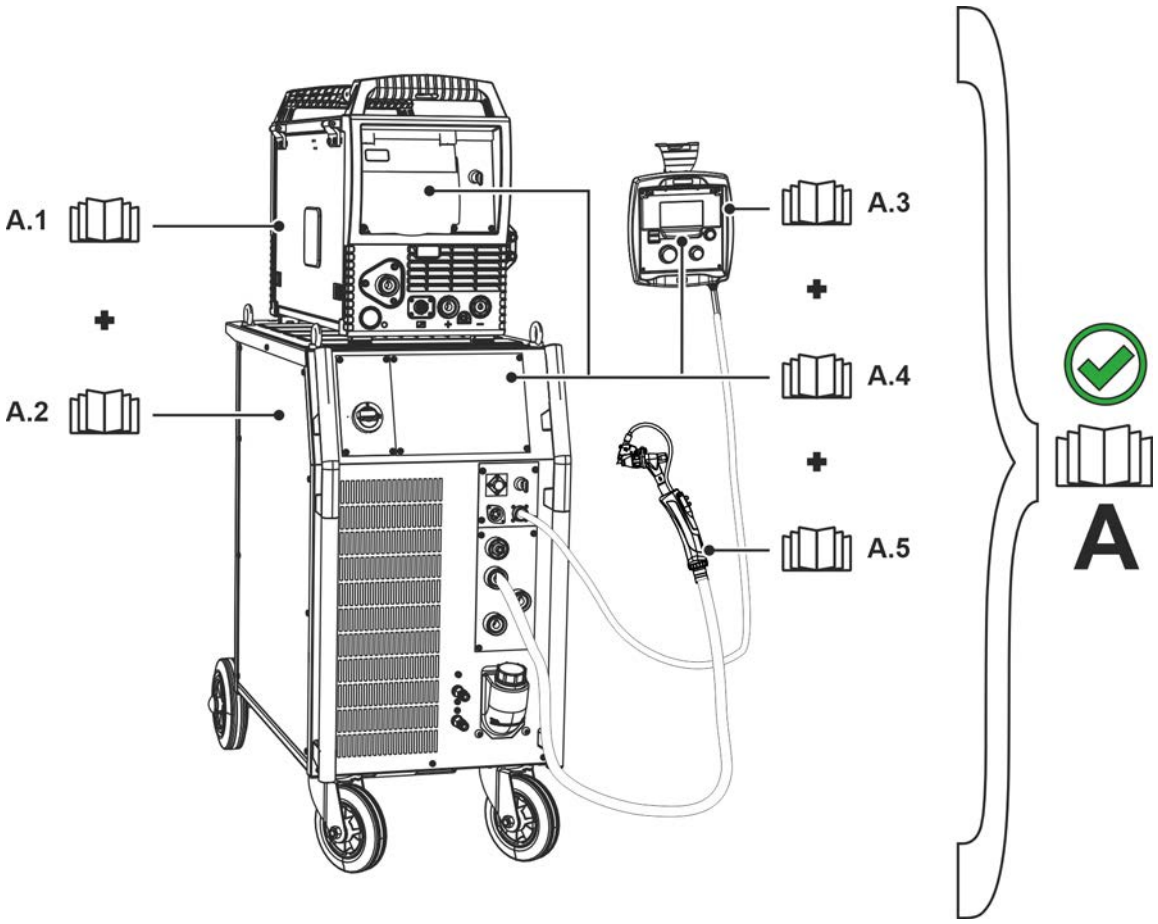


Figure 3-1

Item	Operating instructions
A.1	Wire feeder
A.2	Power source
A.3	Remote control
A.4	Control
A.5	Welding torch
A	Complete documentation

4 Machine description – quick overview

4.1 Front view / rear view

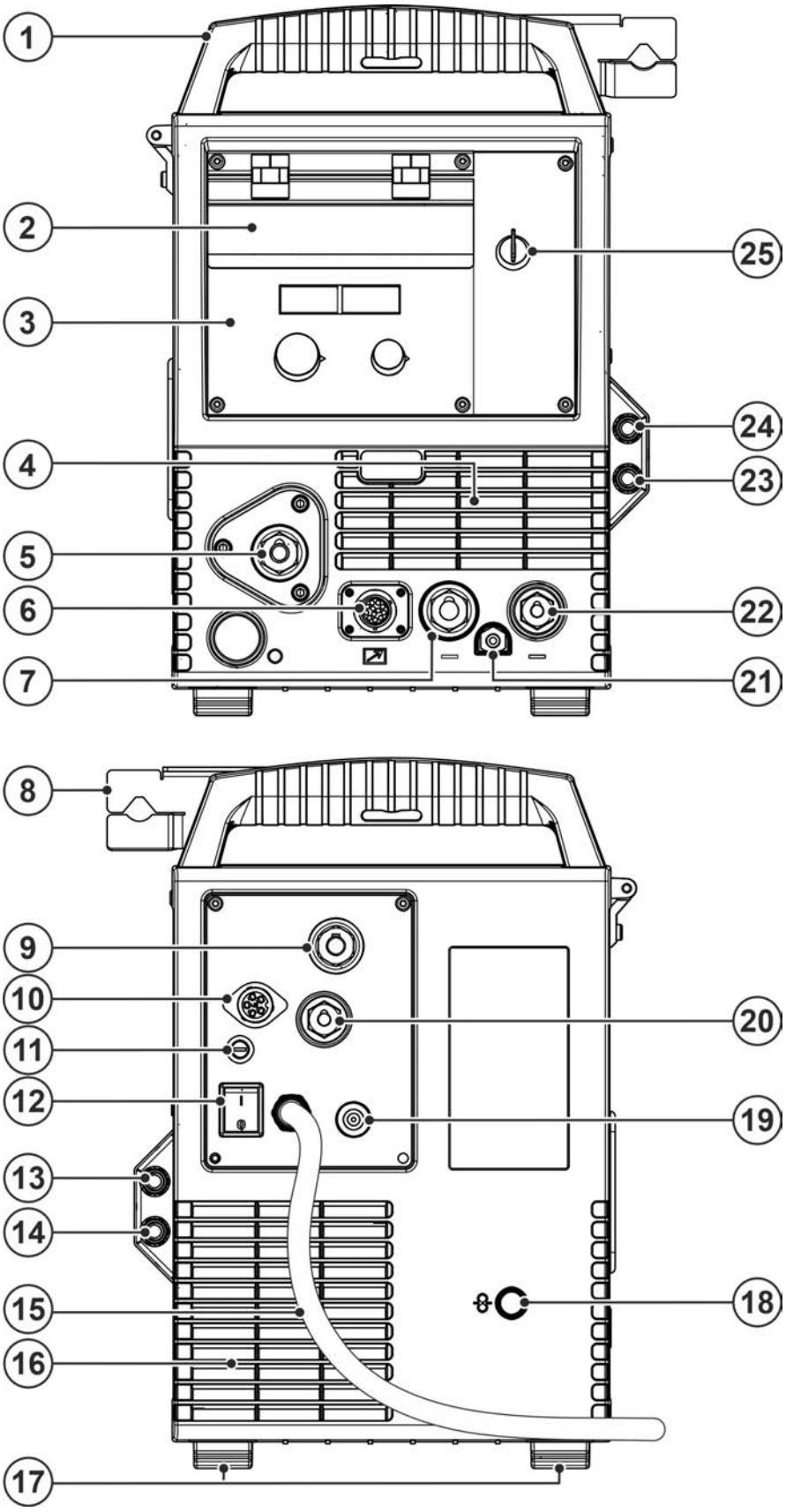


Figure 4-1

Item	Symbol	Description
1		**Carrying handle**
2		**Protective cap** > *see 5.1.1 chapter*
3		**Machine control** > *see 4.2 chapter*
4		**Cooling air outlet**
5		**Wire electrode connection** Welding torch wire feed
6		**Connection socket (12-pole)** Welding torch control lead
7		**Connection socket (TIG)** Welding current, minus potential
8		**Torch holder**
9		**Connector plug (TIG)** Welding current, minus potential
10		**Connector plug, 5-pole** Control lead
11		**Machine fuse (6,3 A)**
12		**Main Switch** Switching the machine on or off.
13		**Quick connect coupling (red)** coolant return
14		**Quick connect coupling (blue)** coolant supply
15		**Mains connection cable** > *see 5.1.7 chapter*
16		**Cooling air inlet**
17		**Machine feet**
18		**External wire feed inlet** Pre-cut casing inlet for external wire feed.
19		**Connection thread - G¼"** Shielding gas connection (inlet)
20		**Connection socket (TIG hot wire)** Hot wire power, plus potential, workpiece connection
21		**Quick connect coupling** Shielding gas
22		**Connection socket (TIG hot wire)** Hot wire power, minus potential
23		**Quick connect coupling (blue)** coolant supply
24		**Quick connect coupling (red)** coolant return
25		**Key switch for protection against unauthorised use** > *see 5.4 chapter* 1 ----------changes possible,G front drive-4x-EX 0 ----------changes not possible.

4.1.1 Operating elements in the machine

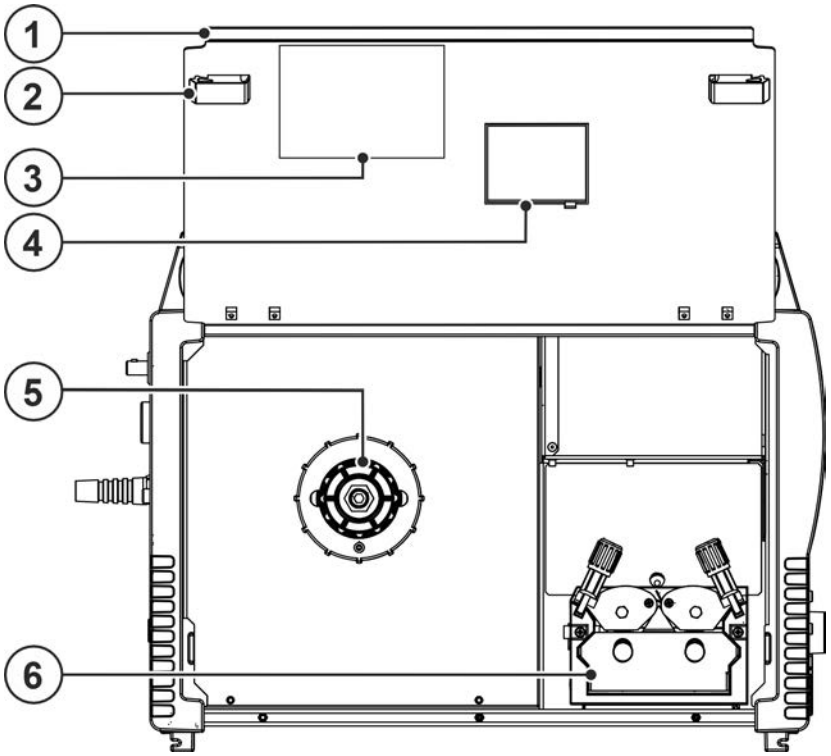


Figure 4-2

Item	Symbol	Description
1		**Protective cap, wire feed mechanism**
2		**Slide latch, lock for the protective cap**
3		**Label, Wire feed parts subject to wear**
4		**Wire spool inspection window** Check wire supply
5		**Wire spool holder**
6		**Wire feed unit > *see 5.1.12 chapter***

4.2 Machine control – Operating elements

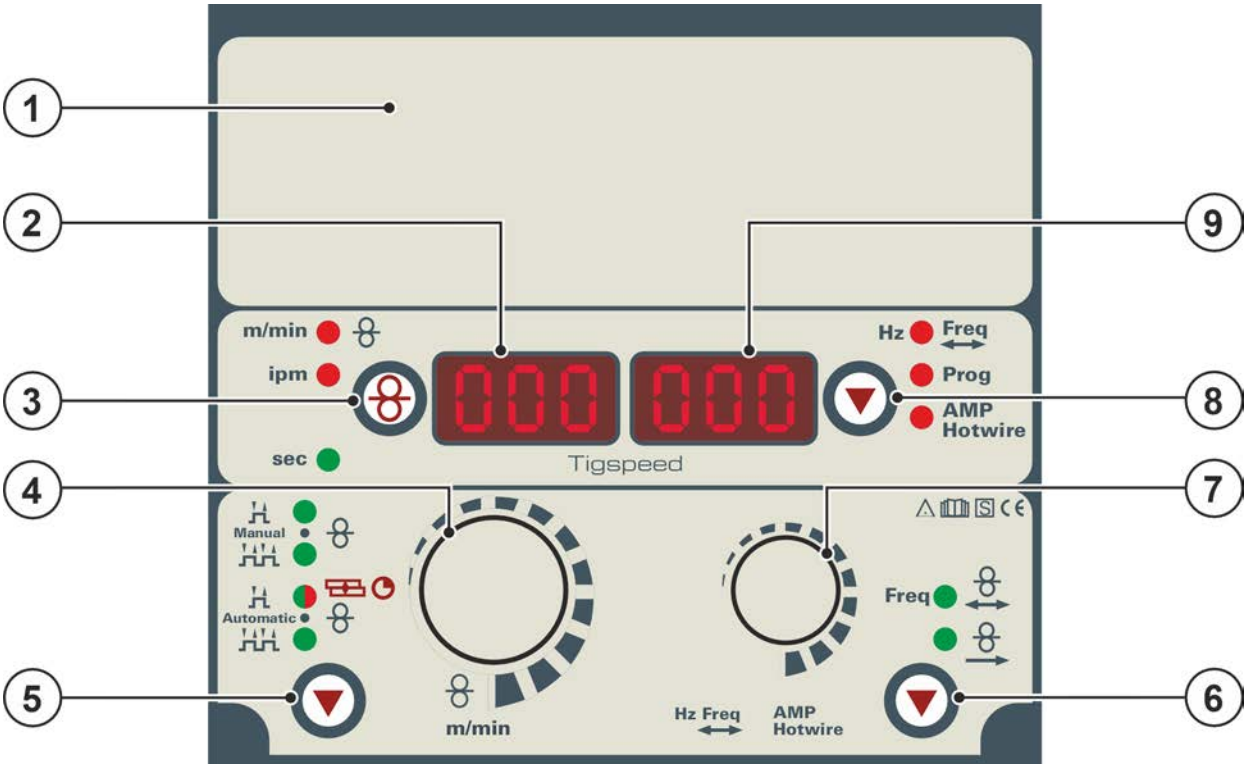


Figure 4-3

Item	Symbol	Description
1		**Lid** ***> see 4.2.1 chapter***
2	000	**Display, left** Wire feed speed
3		**Push-button for switching the wire feed speed display** m/min ---Wire feed speed in meters per minute. ipm -------Wire feed speed in inch per minute.
4		**Rotary dial, welding parameter setting** To set the wire feed speed and other welding parameters.
5		**Operating mode push-button** H ---------Non-latched, manual HH--------Latched, manual H ---------Non-latched automatic HH--------Latched automatic ---Signal light is red: Tack welding
6		**Without function in this machine version.**
7		**Rotary knob to set the parameters for hot wire current/program number** • Selection of the hot wire current 40 A–180 A • Selection of the program number
8		**Push-button for display switching** Prog------Display of the program number AMP Hotwire--Display of hot-wire current
9	000	**Display, right** Hot-wire current, program number

4.2.1 Machine control – Concealed operating elements

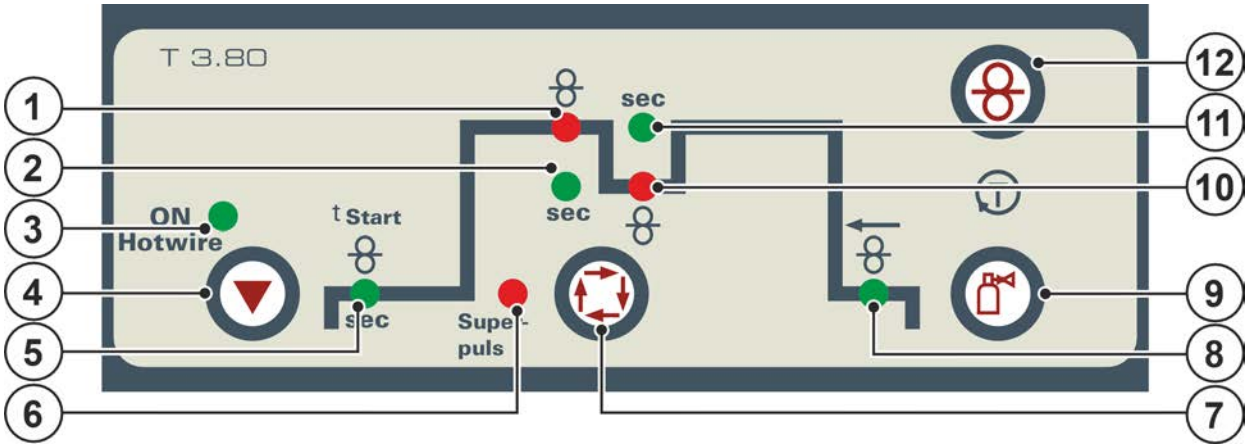


Figure 4-4

Item	Symbol	Description
1		**Signal light, wire feed speed of main program (P_A)**
2	sec	**Signal light, duration of main program P_A** Setting range 0.1 s to 20.0 s (0.1 s increments). Used e.g. in connection with the super pulse function
3		**Signal light, ON Hotwire** Lights up when the Hotwire function is active.
4		**Push-button, ON Hotwire** Switch Hotwire function on/off.
5	t Start 	**Signal light, wire feeder start delay** Setting range 0.0 s to 20.0 s
6	Super-puls	**Signal lamp, super pulse function** Lights up when the super pulse function is active.
7		**Select welding parameters button** This button is used to select the welding parameters depending on the welding process and operating mode used.
8		**Signal light, wire return** Setting range from 0.0 mm to 50.0 mm
9		**Push-button gas test / rinse hose package > *see 5.1.13 chapter***
10		**Signal light, wire feed speed of reduced main program (P_B)**
11	sec	**Signal light, duration of reduced main program P_B** Setting range: 0.1 s to 20.0 s (0.1 s increments). Use in conjunction with the SuperPulse function or tack welding.
12		**Push-button, wire inching** Potential- and gas-free inching of the wire electrode through the hose package to the welding torch > *see 5.1.12.3 chapter*.

4.3 Connection plan

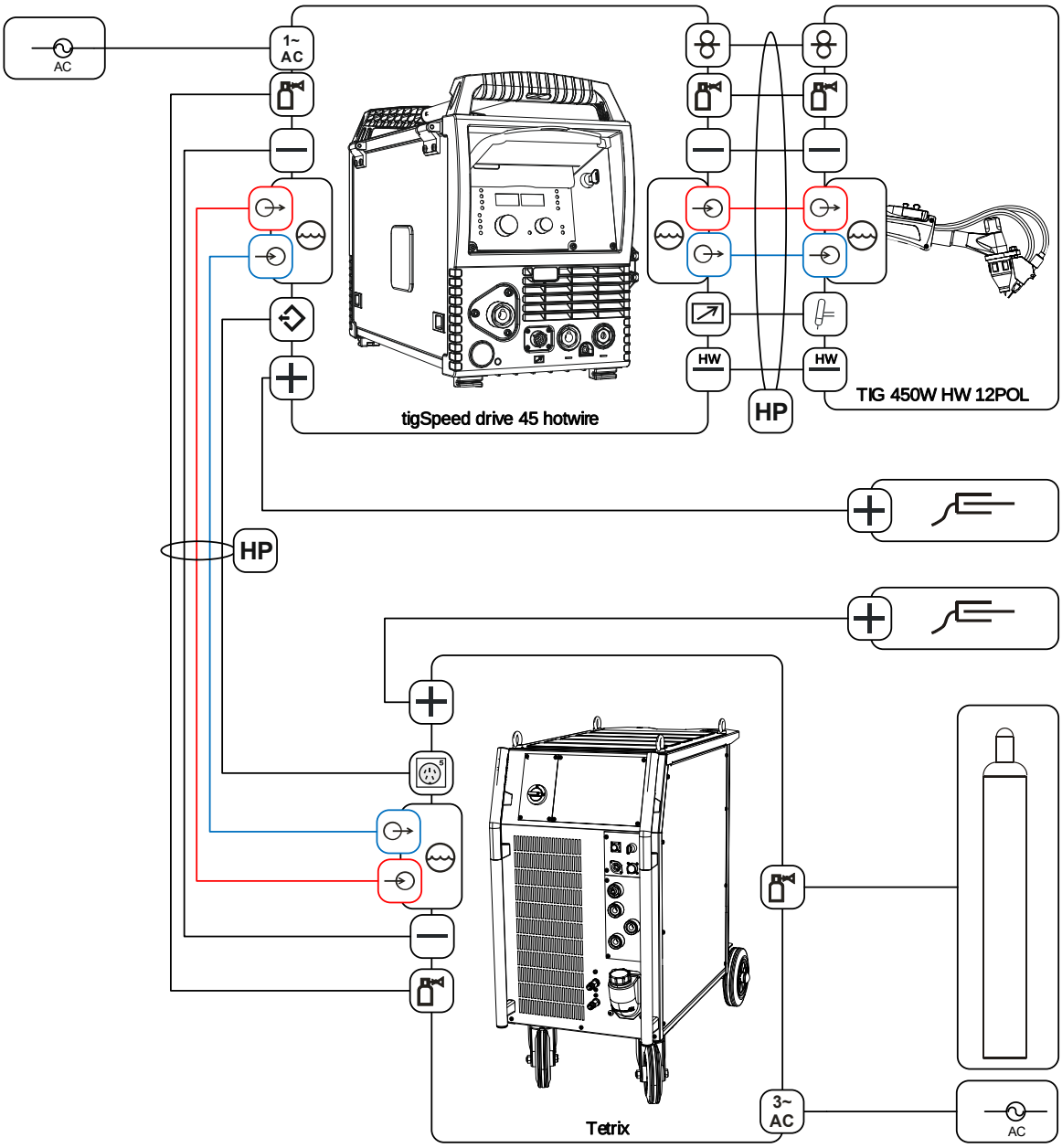


Figure 4-5

4.3.1 Legend

Symol	Description
	**Shielding gas**
	**Welding current (minus potential)**
	**Coolant inlet (colour-coded)**
	**Coolant outlet (colour-coded)**
	**Hose package (HP = hose package)**
	**Welding current (plus potential, workpiece)**
	**Control cable, hot wire (signal input, 5-pole)**
	**Control cable, hot wire (signal output, 5-pole)**
	**Supply voltage connection (1-phase)**
	**Supply voltage connection (3-phase)**
	**Welding torch control cable connection (12-pole)**
	**Hot wire current, (minus potential, TIG hot wire)**
	**Welding torch control cable (12-pole)**
	**Wire feeding**

5 Design and function

⚠ WARNING

Risk of injury from electrical voltage!
Contact with live parts, e.g. power connections, can be fatal!
- Observe the safety information on the first pages of the operating instructions!
- Commissioning must be carried out by persons who are specifically trained in handling power sources!
- Connect connection or power cables while the machine is switched off!

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

5.1 Transport and installation

⚠ WARNING

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

☞ ***Damage to the machine due to improper transport!***
The machine can be damaged by tensile or lateral forces if it is set down or picked up in a non-vertical position!
- ***Do not drag the machine horizontally on the machine feet!***
- ***Always pick up the machine vertically and set it down carefully.***

5.1.1 Protective flap, welding machine control

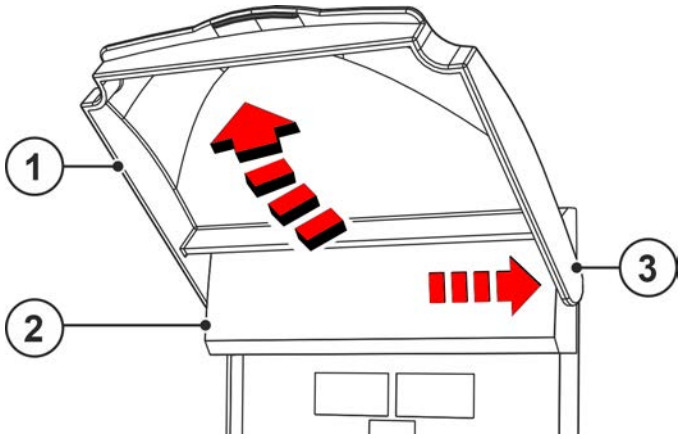


Figure 5-1

Item	Symbol	Description
1		**Protective cap**
2		**Lid**
3		**Bracket, protective cap**

- Push the right-hand bracket of the protective cap to the right and remove the protective cap.

5.1.2 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) [1]

Relative humidity:

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

Transport and storage

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

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

Relative humidity

- up to 90 % at 20 °C (68 °F)

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

5.1.3 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!***

5.1.4 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!

5.1.5 Notes on the installation of welding current leads

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

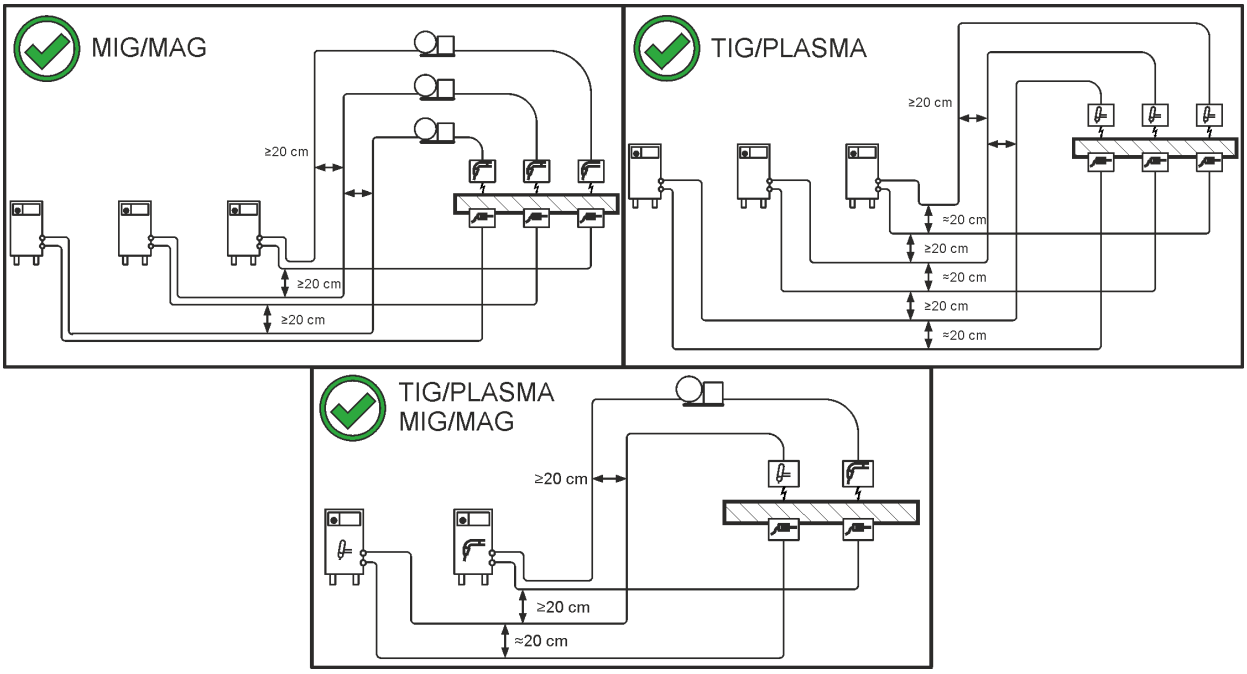


Figure 5-2

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

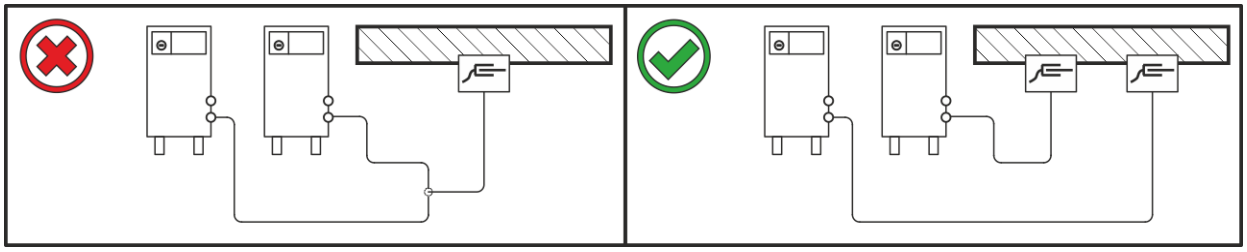


Figure 5-3

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

Lay any excess cable lengths in meanders.

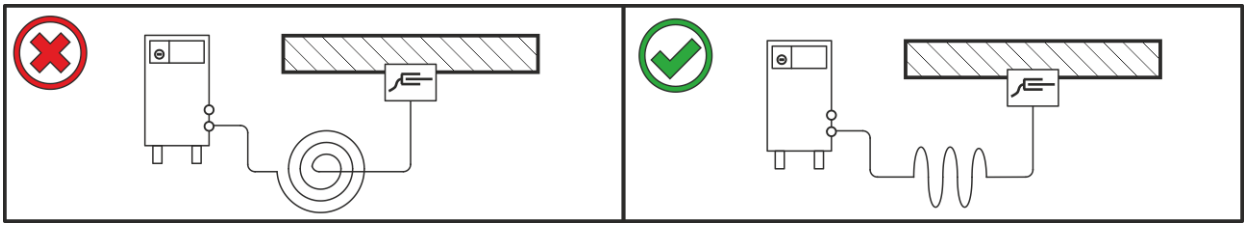


Figure 5-4

5.1.6 Stray welding currents

⚠ WARNING

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

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

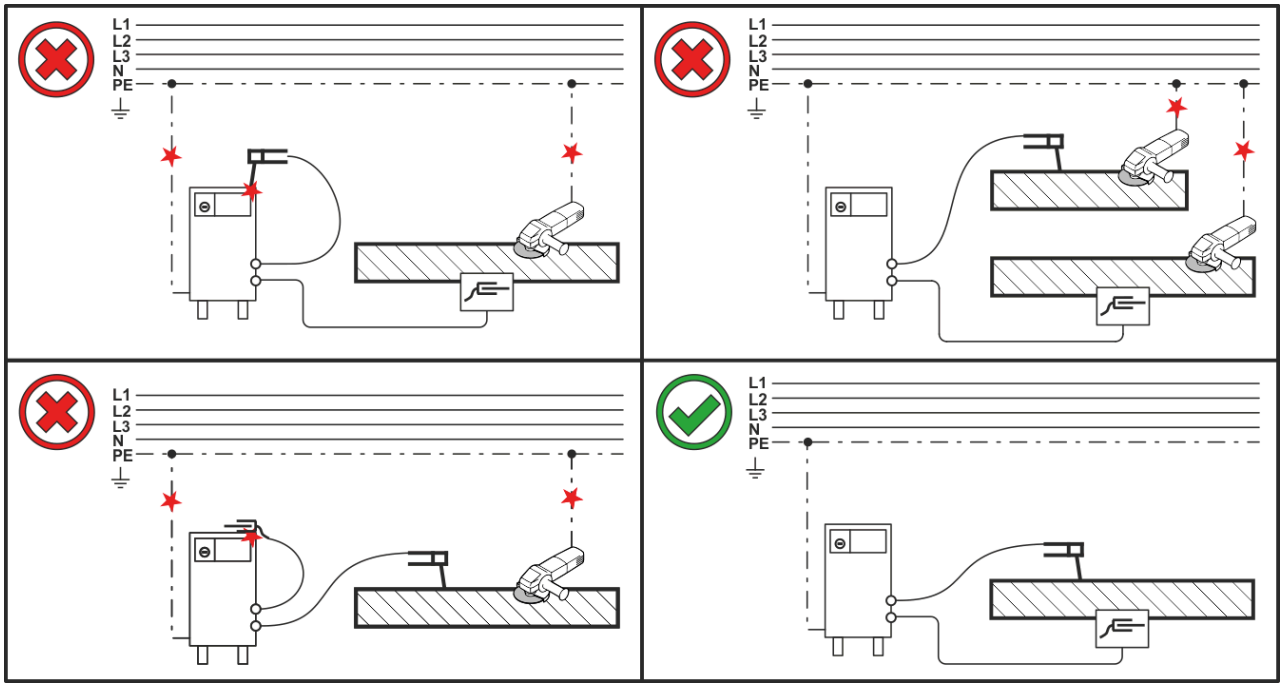


Figure 5-5

5.1.7 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.

5.1.7.1 Mains configuration

☞ ***The machine may only be connected to a one-phase system with two conductors and an earthed neutral conductor.***

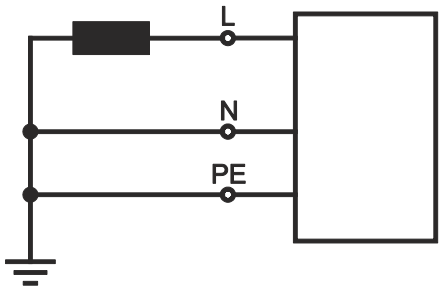


Figure 5-6

Legend

Item	Designation	Colour code
L	Outer conductor	brown
N	Neutral conductor	blue
PE	Protective conductor	green-yellow

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

5.1.8 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 5.1.8.1 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.

5.1.8.1 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)

5.1.8.2 Maximal hose package length

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

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

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

Pump: Pmax = 4.5 bar (0.45 MPa)

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

5.1.9 Intermediate hose package connection

☞ ***Property damage due to strain relief not installed or not installed correctly!***
The strain relief absorbs tensile forces on cables, plugs and sockets.
If strain reliefs are not installed or not installed correctly, the connector plugs or sockets may be damaged.

- ***The attachment must always take place on both sides of the intermediate hose package!***
- ***The connections of the hose package must be locked properly!***

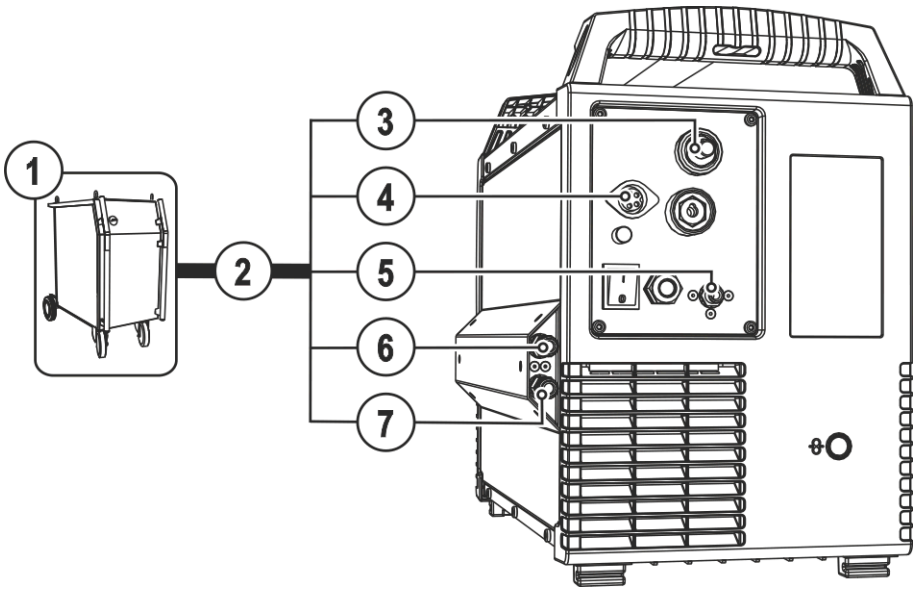


Figure 5-7

Item	Symbol	Description
1		**Power source**
2		**Intermediate hose package**
3		**Connector plug (TIG)** Welding current, minus potential
4		**Connector plug, 5-pole** Control lead
5		**Connection thread - G¼"** Shielding gas connection (inlet)
6	Red	**Quick connect coupling (red)** coolant return
7	Blue	**Quick connect coupling (blue)** coolant supply

- Secure both hose package ends with the appropriate strain relief > *see 5.1.9.1 chapter*.
- Push the cable socket for the welding current (TIG) onto the connector plug (TIG) and lock by turnng to the right.
- Lock connecting nipples of the cooling water tubes into the corresponding quick connect couplings: Return line red to quick connect coupling, red (coolant return) and supply line blue to quick connect coupling, blue (coolant supply).
- Insert the control cable plug into the connection socket (5-pole) and secure (the plug can only be inserted into the connection socket in one position).
- Screw the crown nut on the shielding gas lead gastight to the connecting thread (G¼").

5.1.9.1 Intermediate hose package strain relief

The available attachment points of the intermediate hose package depend on the corresponding system configuration. Depending on the system configuration, suitable options for retrofitting (ON) are available.

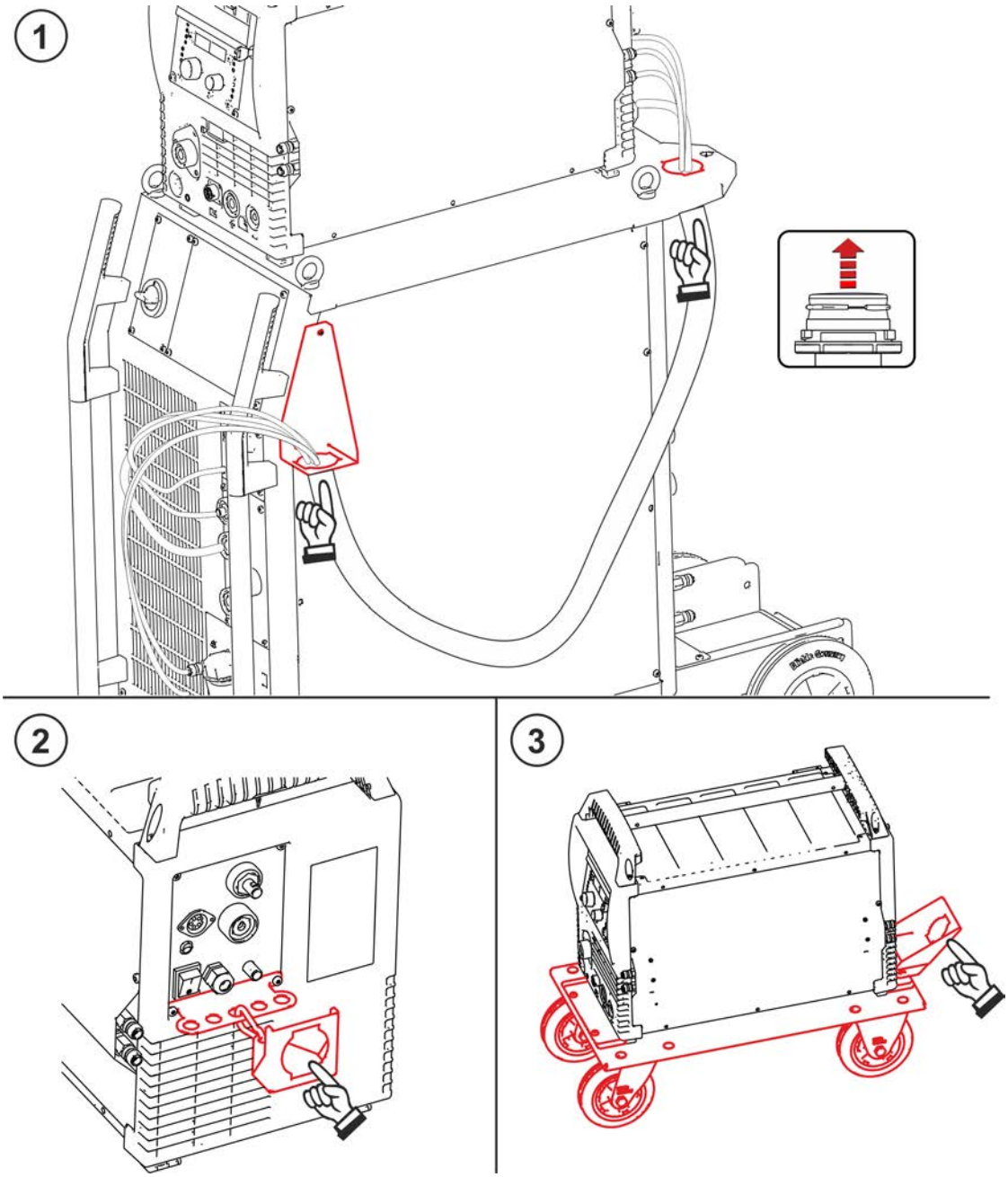


Figure 5-8

Item	Symbol	Description
1		**ON SR** Combination with mobile power sources
2		**ON AS SR tigSpeed** Universal combination
3		**ON WAK tigSpeed** Combination with transport system

5.1.9.2 Locking the strain relief

EWM intermediate hose package

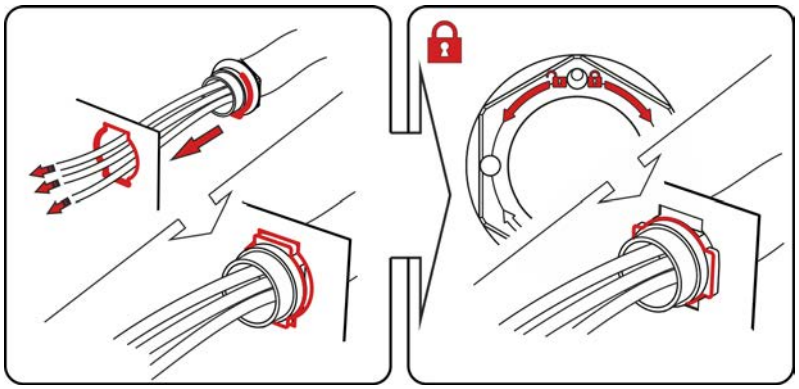


Figure 5-9

5.1.9.3 Control cable pin configuration

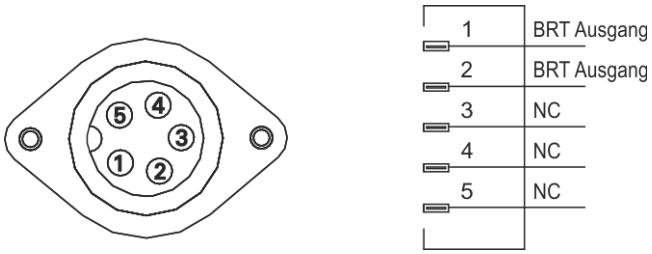


Figure 5-10

Output (make contact) for torch trigger input of the power source (floating contact)

5.1.10 Connection for workpiece lead

The item described in the following is part of the machine´s scope of delivery.

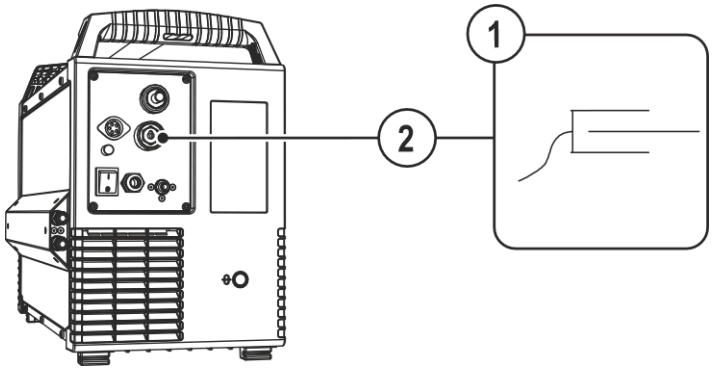


Figure 5-11

Item	Symbol	Description
1		**Workpiece**
2		**Connection socket (TIG hot wire)** Hot wire power, plus potential, workpiece connection

- Push the cable plug for the hot wire current onto the connection socket (TIG hot wire) and lock by turning to the right.

5.1.11 Welding torch connection

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

- ***Connect all coolant pipes correctly!***
- ***Completely unroll the hose package and the torch hose package!***
- ***Observe maximal hose package length > see 5.1.8.2 chapter.***
- ***When using a gas-cooled welding torch, use a hose bridge to establish the coolant circuit > see 9 chapter.***

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

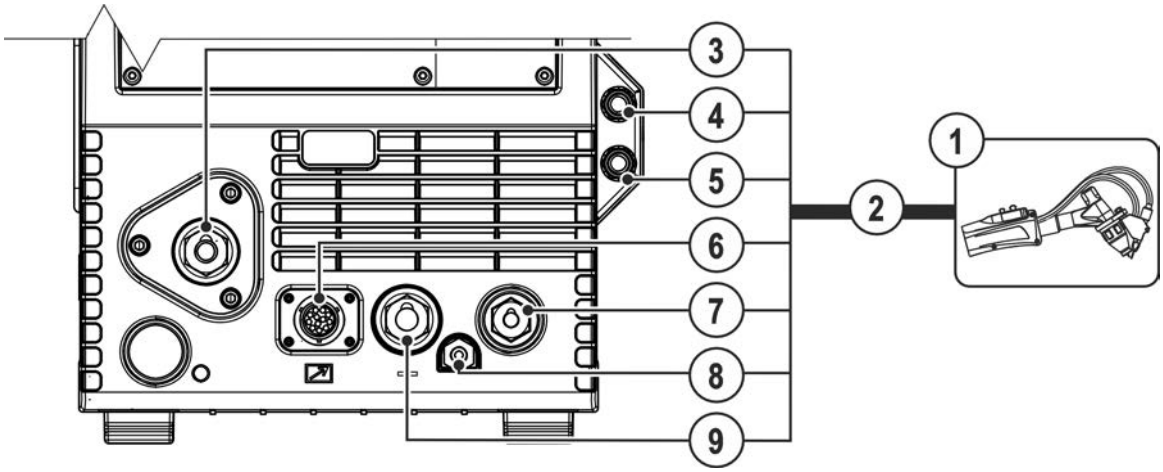


Figure 5-12

Item	Symbol	Description
1		**Welding torch** Observe additional system documents!
2		**Welding torch hose package**
3		**Wire electrode connection** Welding torch wire feed
4	Red	**Quick connect coupling (red)** coolant return
5	Blue	**Quick connect coupling (blue)** coolant supply
6		**Connection socket (12-pole)** Welding torch control lead
7		**Connection socket (TIG hot wire)** Hot wire power, minus potential
8		**Quick connect coupling** Shielding gas
9		**Connection socket (TIG)** Welding current, minus potential

- Extend and lay out the torch hose package.
- Insert the wire feed plug of the welding torch into the wire electrode connector and lock by turning to the right.
- Push the cable plug for the welding current (TIG) onto the connection socket (TIG) and lock by turning to the right.
- Insert shielding gas rapid-action closure nipple in the quick connect coupling and engage.
- Insert welding torch control lead into the 12-pole connection socket and secure with the crown nut.

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).
- Push the cable plug for the hot wire current onto the connection socket (TIG hot wire) and lock by turning to the right.

5.1.11.1 Control cable pin configuration

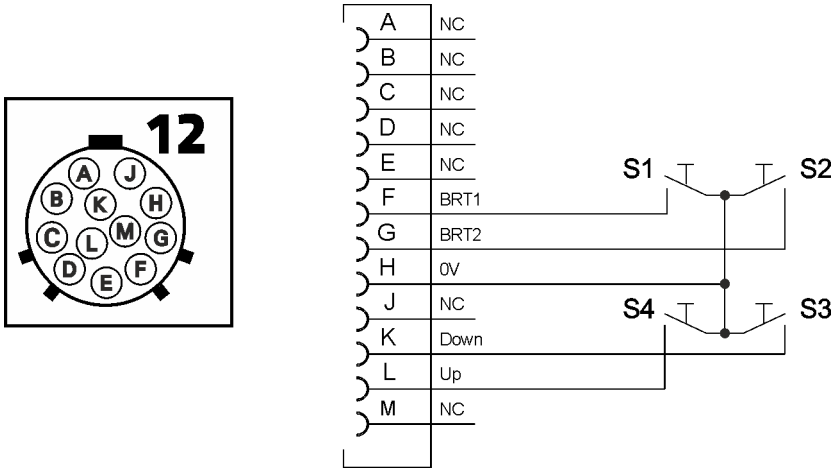


Figure 5-13

5.1.12 Wire feed

⚠ CAUTION

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

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

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

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

5.1.12.1 Inserting the wire spool

⚠ CAUTION

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

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

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

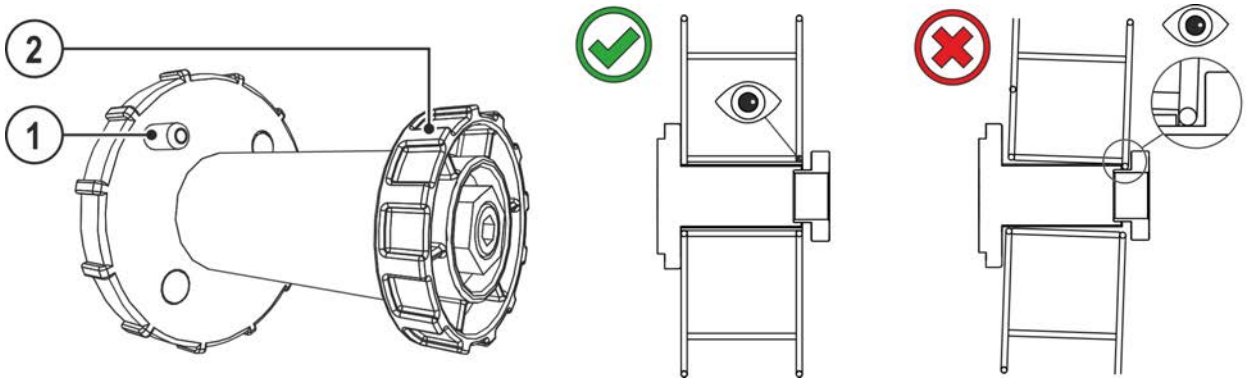


Figure 5-14

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

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

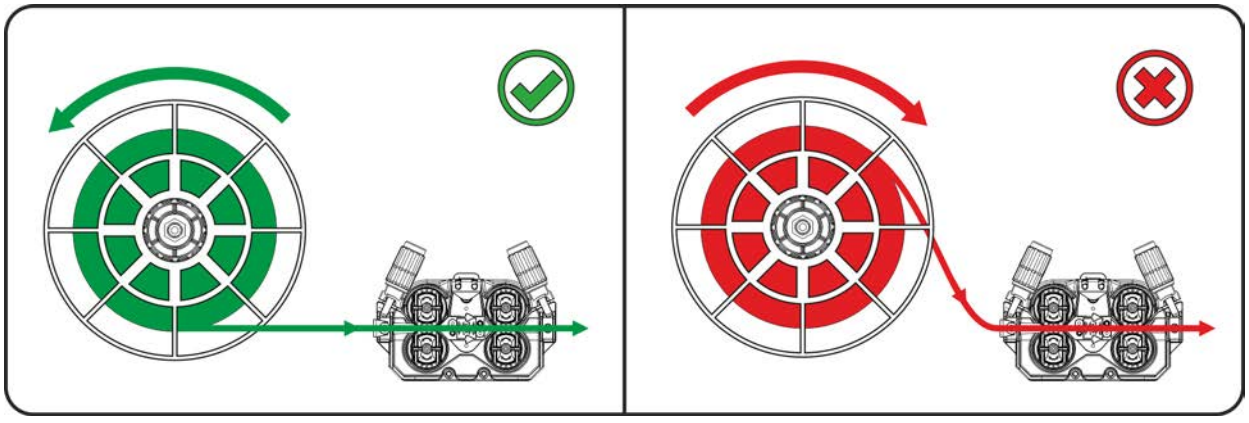


Figure 5-15

Observe the unwinding direction of the wire spool.

5.1.12.2 Changing the wire feed rollers

Poor welding results due to faulty wire feeding! Wire feed rolls must be suitable for the diameter of the wire and the material.

- Check the label of the rolls whether they fit the wire diameter.
  If necessary, turn or change!
- Use V-groove rolls for steel wires and other hard wires.
- Use driven rolls with U-groove for aluminium wires and other soft, alloyed wires.
- Use driven rolls with knurled U-groove for flux cored wires.
- Slide new drive rollers into place so that the diameter of the wire used is visible on the drive roller.
- Screw the drive rollers in place with knurled screws.

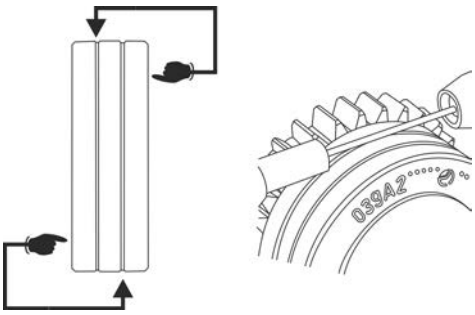


Figure 5-16

5.1.12.3 Inching the wire electrode

⚠ CAUTION



Risk of injury due to welding wire escaping from the welding torch!
The welding wire can escape from the welding torch at high speed and cause bodily injury including injuries to the face and eyes!

- Never direct the welding torch towards your own body or towards other persons!

☞ ***Improper contact pressure increases wear on the wire feed rolls.***
Adjust the contact pressure on the adjusting nuts of the feed roll tensioners so that the wire electrode is fed but slips when the wire spool is blocked.

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

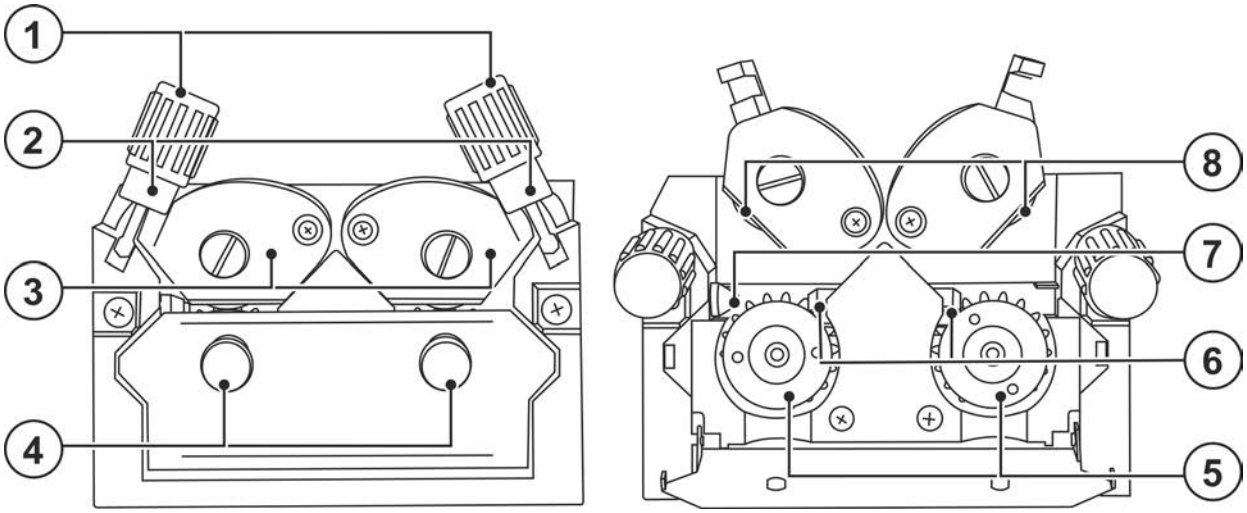


Figure 5-17

Item	Symbol	Description
1		Adjusting nut

Item	Symbol	Description
2		**Feed roll tensioner** Fixing the clamping unit and setting the pressure.
3		**Clamping unit**
4		**Knurled screw**
5		**Drive roller**
6		**Guide tube**
7		**Wire feed nipple**
8		**Pressure roller**

- Extend and lay out the torch hose package.
- Unfasten pressure units and fold out (clamping units and pressure rollers will automatically flip upwards).
- Unwind welding wire carefully from the wire spool and insert through the wire inlet nipple over the drive roller grooves and the guide pipe into the capillary tube and Teflon core using guide pipe.
- Press the clamping element with the pressure roller back downwards and fold the wire units back up again (wire electrode should be in the groove on the drive roller).
- Set the contact pressure with the adjusting nuts of the pressure unit.
- Press the wire inching button until the wire electrode projects out of the welding torch.

5.1.12.4 Spool brake setting

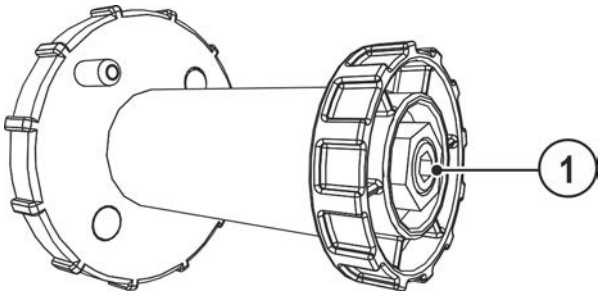


Figure 5-18

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

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

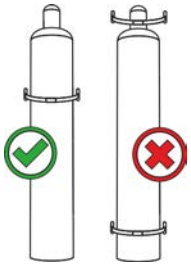
Tighten the spool brake until the wire spool no longer turns when the wire feed motor stops but without it jamming during operation!

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

⚠ WARNING

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

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



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

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

5.1.13.1 Connection

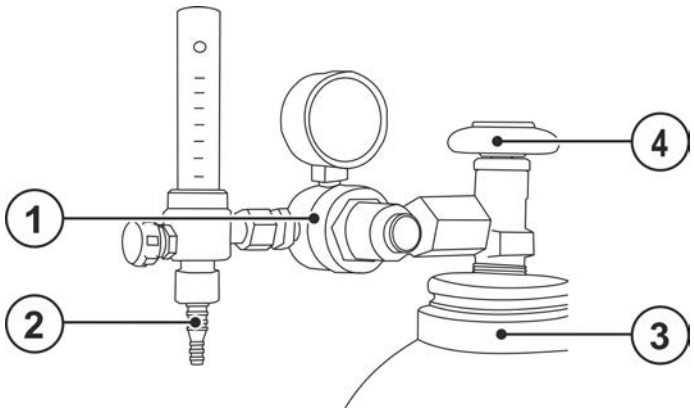


Figure 5-19

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

- Place the shielding gas cylinder into the relevant cylinder bracket.
- Secure the shielding gas cylinder using a securing chain.
- Tighten the pressure regulator screw connection on the gas bottle valve to be gas-tight.
- Tighten gas hose on pressure regulator to be gas tight.
- Fasten the gas hose to the shielding gas connecting nipple at the back of the machine using the crown nut.

5.1.14 Shielding gas volume settings

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

- Slowly open the gas cylinder valve.
- Open the pressure regulator.
- Switch on the power source at the main switch.
- Trigger gas test > *see 5.1.14.1 chapter* function (welding voltage and wire feed motor remain switched off – no accidental arc ignition).
- Set the relevant gas quantity for the application on the pressure regulator.

Setting instructions

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

Helium-rich gas mixtures require a higher gas volume!

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

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

5.1.14.1 Gas test

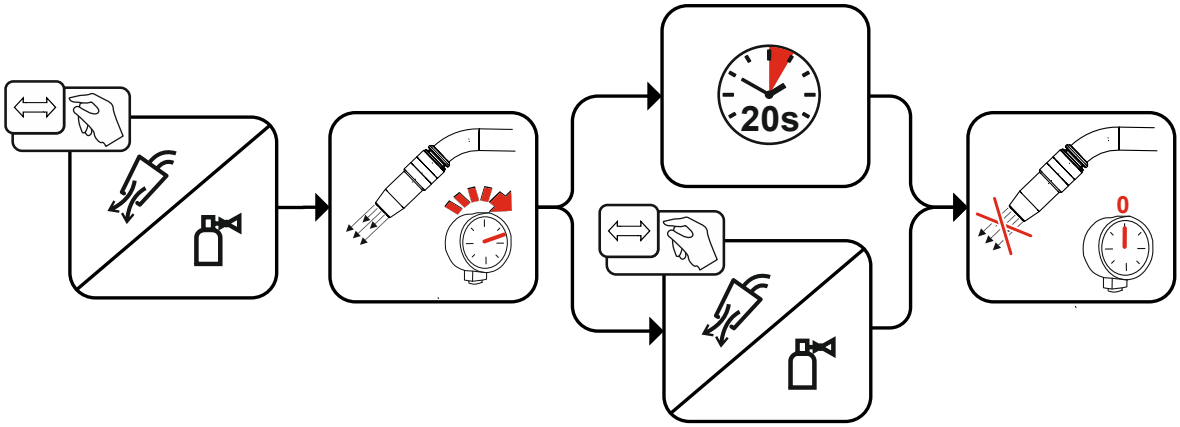


Figure 5-20

5.1.14.2 Purge hose package

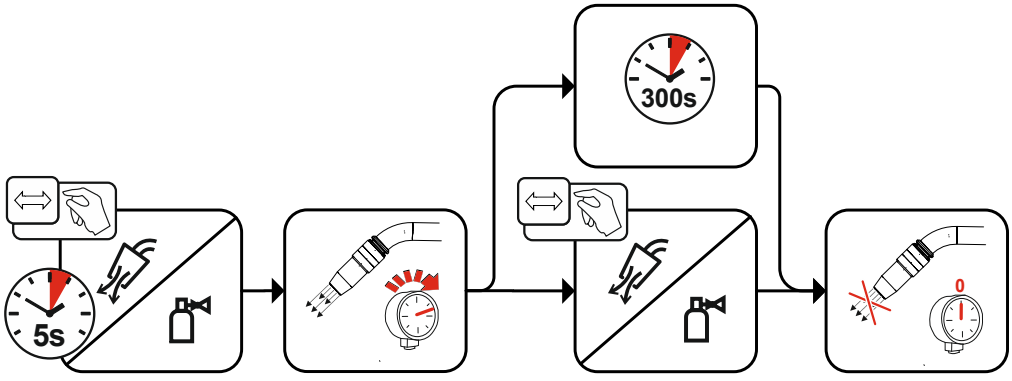


Figure 5-21

5.2 Configuring the welding machine for mechanical arc fusion welding

The welding machine must be configured before commissioning for the first time for mechanical arc fusion welding (cold or hot wire welding). The basic settings are configured directly at the welding machine control.

Cold or hot wire welding process (Hotwire = on/off)

In addition, the wire return can be adjusted if necessary.

5.2.1 Selection and adjustment

To set the welding programs, you can use the machine control. The left hand display shows the wire feed speed, the right hand display shows further parameter settings such as program number or hot wire current (for hotwire only). The operating mode is identical for all programs.

The following selection is an example of use:

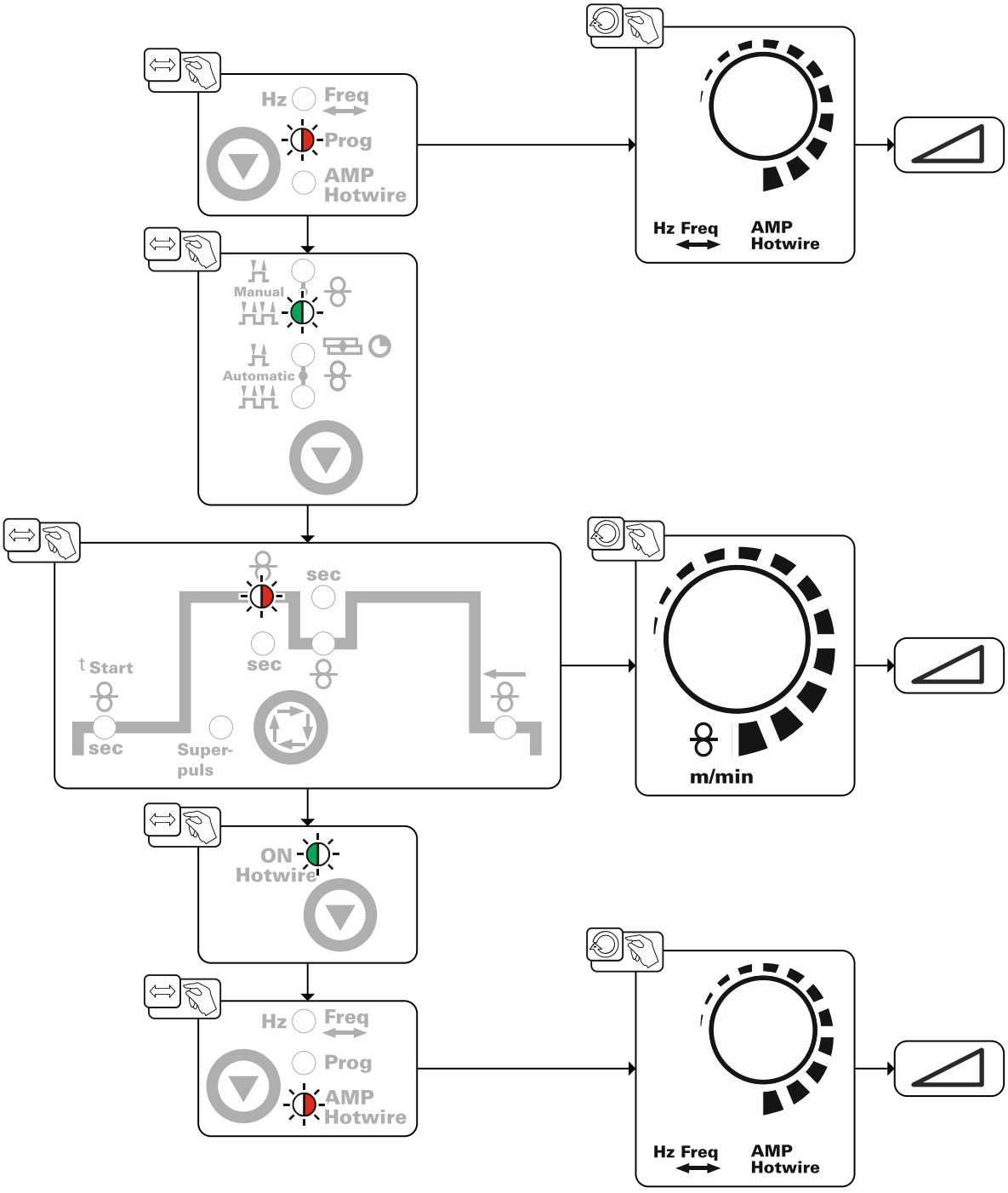


Figure 5-22

5.2.1.1 superPuls

The EWM superPuls function enables automatic switching between two operating points in a process.

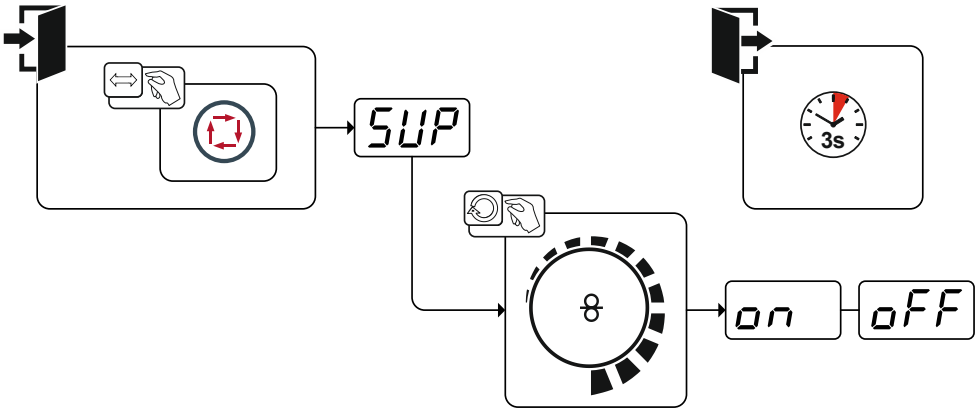


Figure 5-23

Display	Setting/selection
SUP	**Selects superPuls** Switches function on or off.
on	**Switch on** Switching on machine function
oFF	**Switch off** Switching off machine function

5.2.2 Operating modes (functional sequences)

Torch trigger 1 (BRT 1) switches the welding current on or off.

Torch trigger 2 (BRT 2) switches the wire feeding on or off.

In addition, you can inch the wire by pressing torch trigger 2 (BRT 2) or reverse inch the wire by tapping it.

You can choose between four operating modes (see the following functional sequences). Wire feeding is infinitely adjustable by means of torch triggers 3 and 4 (BRT 3 and BRT 4).

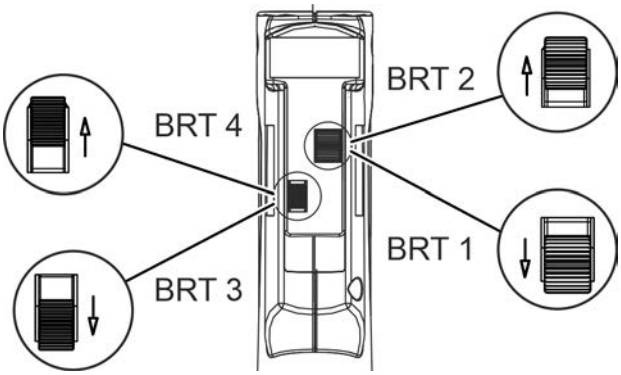


Figure 5-24

5.2.2.1 Explanation of symbols

Symbol	Meaning
	Press torch trigger
	Release torch trigger
	Tap torch trigger (quick pressing and releasing)
	Shielding gas flowing
I	Welding performance
	Non-latched, manual
	Latched, manual
	Non-latched automatic
	Latched automatic
t	Time
P_{START}	Start program
P_A	Main program
P_B	Reduced main program
P_{END}	End program
	Wire feeding

5.2.2.2 Non-latched Manual

The welding machine (power source) must be set to operating mode “latched”.

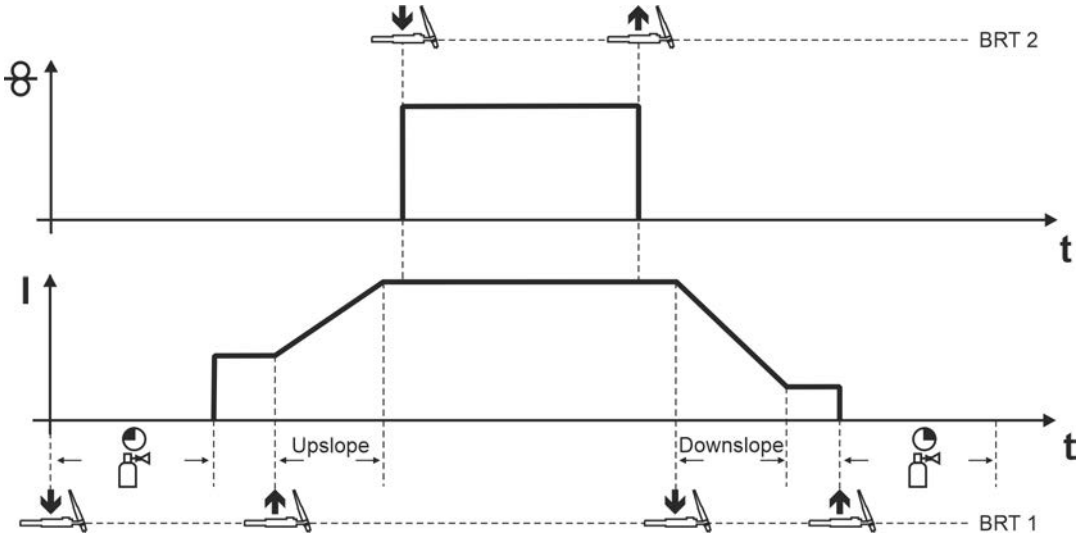


Figure 5-25

First cycle (current)

- Press torch trigger 1 (BRT 1), the gas pre-flow time elapses.
- HF ignition pulses jump from the tungsten electrode to the workpiece. The arc ignites.
- Welding current flows.

Second cycle (current)

- BRT 1 Release .
- The welding current ramps up to the main current AMP in the selected up-slope time.

First cycle (wire)

- Press torch trigger 2 (BRT 2).
  Wire electrode is fed.

Second cycle (wire)

- BRT 2 Release .
  Wire electrode feeding is stopped, wire electrode is returned by the set wire return value.

Third cycle (current)

- BRT 1 Press .
- The main current is reduced in the selected down-slope time.

Fourth cycle (current)

- BRT 1 Release , the arc extinguishes.
- Shielding gas continues to flow in the selected gas post-flow time.

5.2.2.3 Latched manual

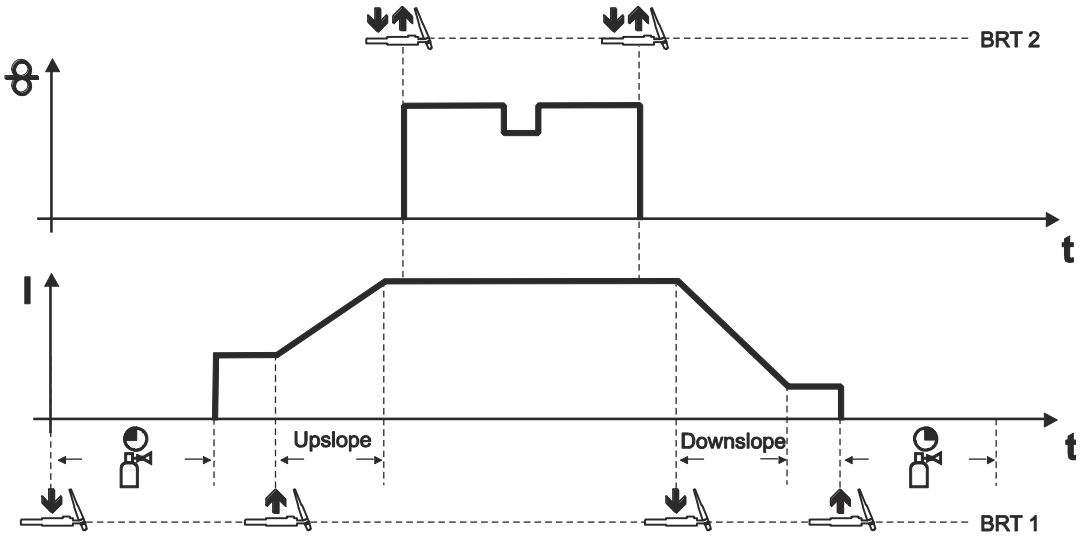


Figure 5-26

This operating mode differs from non-latched operation in the following ways:

- Wire feeding is started by pressing and releasing (tapping) BRT 2.
- By tapping you can switch to the reduced wire feeding.
- By pressing and releasing (tapping) BRT 2 again, wire feeding will stop. (It is not necessary to keep the torch trigger pressed. This is especially helpful with long welding seams.)

Stopping the welding process:

- Keep BRT 1 pressed for a period longer than the set tapping time.

The wire feeding can be stopped prematurely by pressing BRT2.

For this, the parameter “3-stroke” must be activated **> *see 5.3 chapter*.**

5.2.2.4 Non-latched automatic

The welding machine (power source) must be set to operating mode “non-latched”.

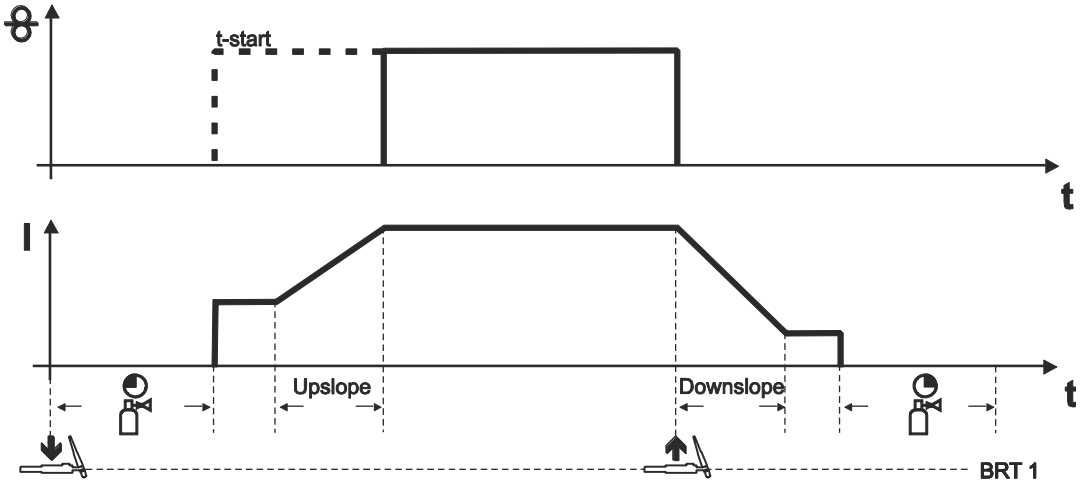


Figure 5-27

First cycle (current)

- Press torch trigger 1 (BRT 1) and keep pressed.
- The gas pre-flow time elapses.
- HF ignition pulses jump from the electrode to the workpiece. The arc ignites.
- The welding current flows and immediately assumes the value of the starting current I_{start}.
- HF switches off.
- The welding current increases in the set up-slope time to the main current AMP.
- The wire electrode is fed once the delay time (t-start) has elapsed.

Second cycle (current)

- Release BRT 1.
- Wire electrode feeding is stopped, wire electrode is returned by the set wire return value.
- The main current is reduced in the selected down-slope time, the arc is extinguished.
- Shielding gas continues to flow in the selected gas post-flow time.

5.2.2.5 Latched automatic

The welding machine (power source) must be set to operating mode “latched”.

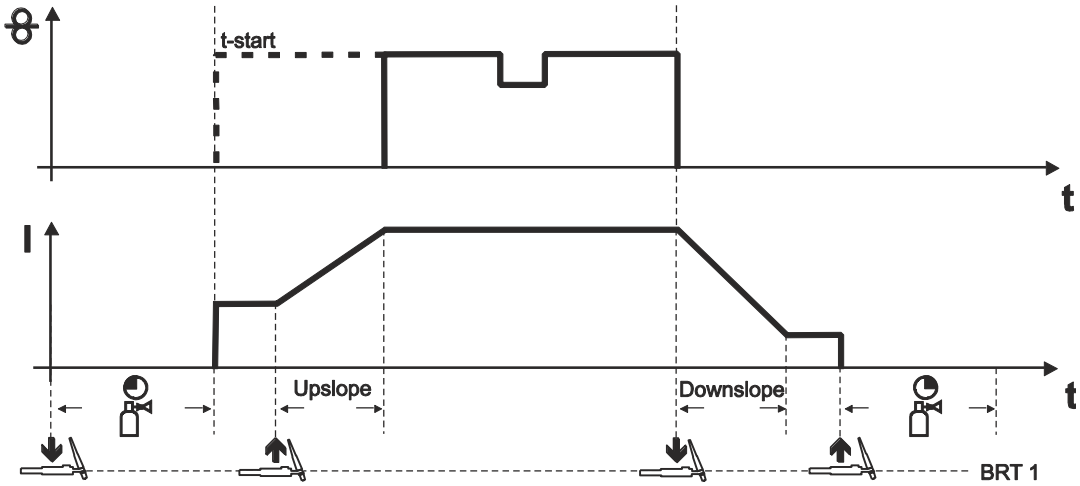


Figure 5-28

1. cycle (current)

- Press torch trigger 1 (BRT 1), the gas pre-flow time elapses.
- HF ignition pulses jump from the tungsten electrode to the workpiece. The arc ignites.
- Welding current flows.

2. cycle (current)

Release BRT 1.

- The welding current ramps up to the main current AMP in the selected up-slope time.

1. cycle (wire)

- The wire electrode is fed once the delay time (t-start) has elapsed.

3. cycle (current)

- Press BRT 1.
- The main current is reduced in the selected down-slope time.

2. cycle (wire)

- Wire electrode feeding is stopped, wire electrode is returned by the set wire return value.

4. cycle (current)

- Release BRT 1, the arc extinguishes.
- Shielding gas continues to flow in the selected gas post-flow time.
- By tapping you can switch to the reduced wire feeding.
- By pressing and releasing (tapping) BRT 1 again, wire feeding will stop. (It is not necessary to keep the torch trigger pressed. This is especially helpful with long welding seams.)

Stopping the welding process:

- Keep BRT 1 pressed for a period longer than the set tapping time.

5.2.2.6 Tack welding

The welding machine (power source) must be set to operating mode “non-latched”.

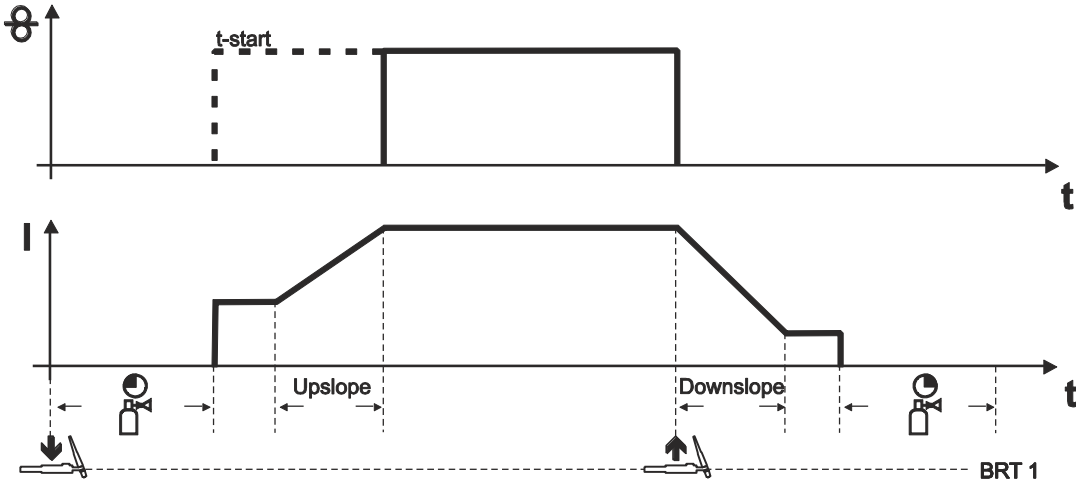


Figure 5-29

Sequence:

- Press torch trigger 1 (BRT 1) and keep pressed.
- The gas pre-flow time elapses.
- HF ignition pulses jump from the electrode to the workpiece. The arc ignites.
- The welding current flows and immediately assumes the value of the starting current I_{start}.
- HF switches off.
- The welding current increases in the set up-slope time to the main current AMP.
- The wire electrode is fed once the delay time (t-start) has elapsed.
- Release BRT 1.
- Wire electrode feeding is stopped, wire electrode is returned by the set wire return value.
- The main current is reduced in the selected down-slope time, the arc is extinguished.
- Shielding gas continues to flow in the selected gas post-flow time.

5.3 Menus and sub-menus on the machine control

5.3.1 Direct menus (direct access to parameters)

Functions, parameters and their values can be accessed directly, e.g. can be selected by pressing a button once.

5.3.2 Expert menu

The Expert menu has adjustable parameters stored that don't require regular setting. The number of parameters shown may be limited, e.g. if a function is deactivated.

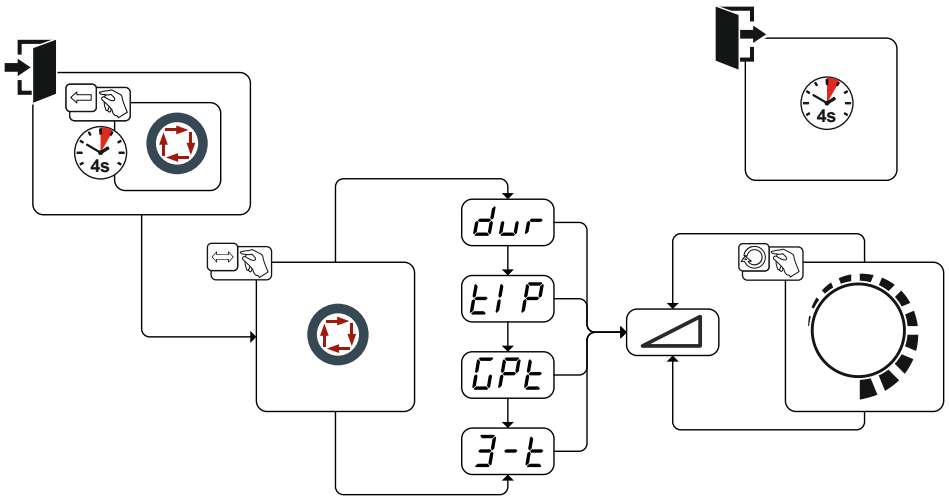


Figure 5-30

Display	Setting/selection
dur	**Wire return** • Increase value = more wire return • Decrease value = less wire return
tIP	**Tapping time** Setting range: 0.0 s to 0.6 s (0.1 s increments).
GPt	**Gas post-flow time** Setting range: 0.0 s to 40.0 s (0.1 s increments).
3-t	**Wire stop with manual latched operation** • on = wire stops in the 3rd cycle • off = wire stops in the 4th cycle (ex works)

5.4 Access control

To prevent people from unauthorised or inadvertent changing of the welding parameters at the machine, entering values on the control can be blocked by using the key switch.

Key position 1 = All parameters can be set

Key position 0 = The following controls/functions cannot be changed:

- Push-button for switching the wire feed speed display
- Parameter value " hot wire current " can be displayed but not changed
- Parameter value "forward/backward motion" can be displayed but not changed
- Parameter values in the functional sequence can be displayed but not changed

5.5 Welding torch holder

The item described in the following is part of the machine´s scope of delivery.

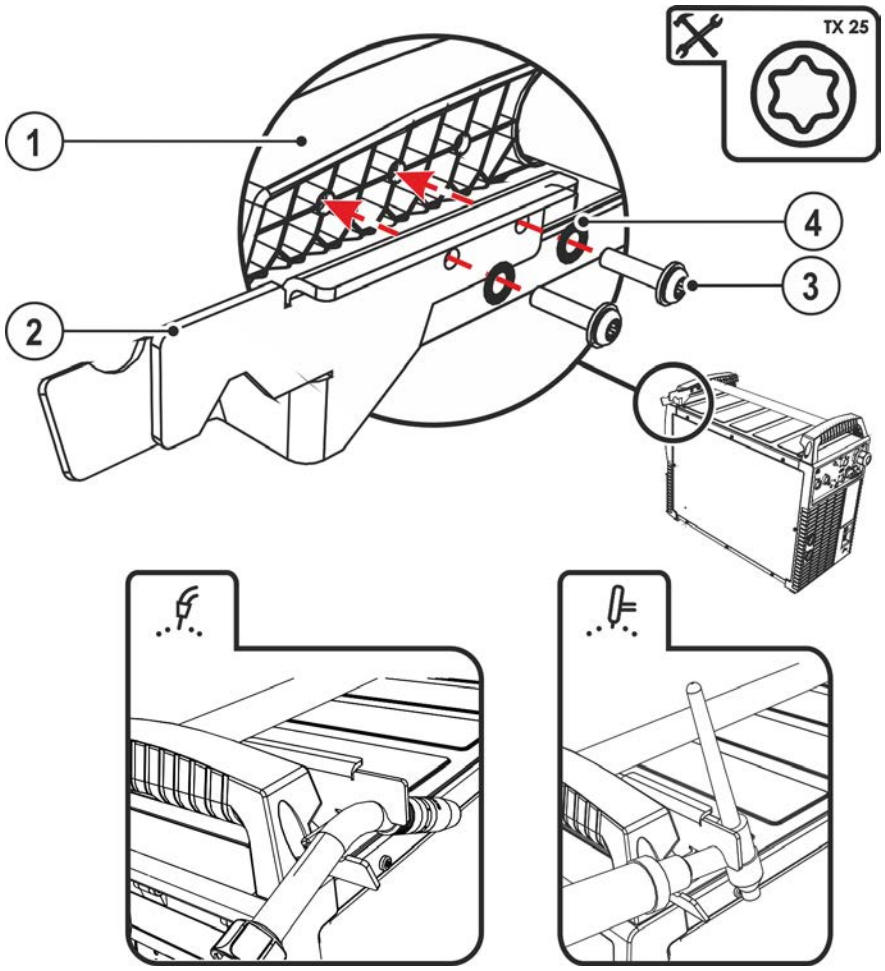


Figure 5-31

Item	Symbol	Description
1		Crossmember of the transport handle
2		Torch holder
3		Fixing screws (x 4)
4		Fan-type lock washers

- Use the mounting screws to screw the torch holder onto the crossmember of the transport handle.
- Insert the welding torch into the welding torch holder as shown.

6 Maintenance, care and disposal

6.1 General

⚠ DANGER



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

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

⚠ WARNING



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

- Follow the maintenance instructions > *see 6.3 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.

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.

6.2.1 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 remove at regular intervals and cleaned by blowing out with compressed air (depending on the level of soiling).

6.3 Maintenance work, intervals

6.3.1 Daily maintenance tasks

Visual inspection

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

Functional test

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

6.3.2 Monthly maintenance tasks

Visual inspection

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

Functional test

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

6.3.3 Annual test (inspection and testing during operation)

A periodic test according to IEC 60974-4 "Periodic inspection and test" has to be carried out. In addition to the regulations on testing given here, the relevant local laws and regulations must also be observed.

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

6.4 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.

7.1 Checklist for rectifying faults

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

Legend	Symbol	Description
	↯	Fault/Cause
	🛠	Remedy

Coolant error/no coolant flowing

- ↯ Insufficient coolant flow
  - 🛠 Check coolant level and refill if necessary
  - 🛠 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*

Functional errors

- ↯ All machine control signal lights are illuminated after switching on
- ↯ No machine control signal light is illuminated after switching on
- ↯ No welding power
  - 🛠 Phase failure > check mains connection (fuses)
- ↯ Several parameters cannot be set (machines with access block)
  - 🛠 Entry level is blocked, disable access lock > *see 5.4 chapter*
- ↯ 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

Unstable arc

- ↯ Unsuitable or worn welding torch equipment
  - 🛠 Adjust contact tip to wire diameter and -material and replace if necessary
  - 🛠 Adjust wire guide to material in use, blow through and replace if necessary
- ↯ 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

Wire feed problems

- Unsuitable or worn welding torch equipment
  - Adjust contact tip (cold wire/hot wire) to wire diameter, blow through and replace if necessary
  - Adjust wire guide to material in use, blow through and replace if necessary
- Contact tip blocked
  - Clean and, if necessary, replace.
- Setting the spool brake *> see 5.1.12.4 chapter*
  - Check settings and correct if necessary
- Setting pressure units *> see 5.1.12.3 chapter*
  - Check settings and correct if necessary
- Worn wire rolls
  - Check and replace if necessary
- Wire feed motor without supply voltage (automatic cutout triggered by overloading)
  - Reset triggered fuse (rear of the power source) by pressing the key button
- Kinked hose packages
  - Extend and lay out the torch hose package
- Incompatible parameter settings
  - Check settings and correct if necessary
- Arc between gas nozzle and workpiece (metal vapour on the gas nozzle)
  - Replace gas nozzle

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
  - Replace hose package

7.2 Error messages

A welding machine error is indicated by the collective fault signal lamp (A1) lighting up and an error code (see table) being displayed in the machine control display. In the event of a machine error, the power unit shuts down.

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

- Document machine errors and inform service staff as necessary.

Error message	Possible cause	Remedy
Err 3	Speedometer error	Check wire guide/hose package
Err 10	PE error	Switch the machine off and on again. If the error persists, notify the service department.
Err 34	Hot wire inverter	Switch the machine off and on again. If the error persists, notify the service department.

7.3 Resetting welding parameters to the factory settings

All customised welding parameters that are stored will be replaced by the factory settings.

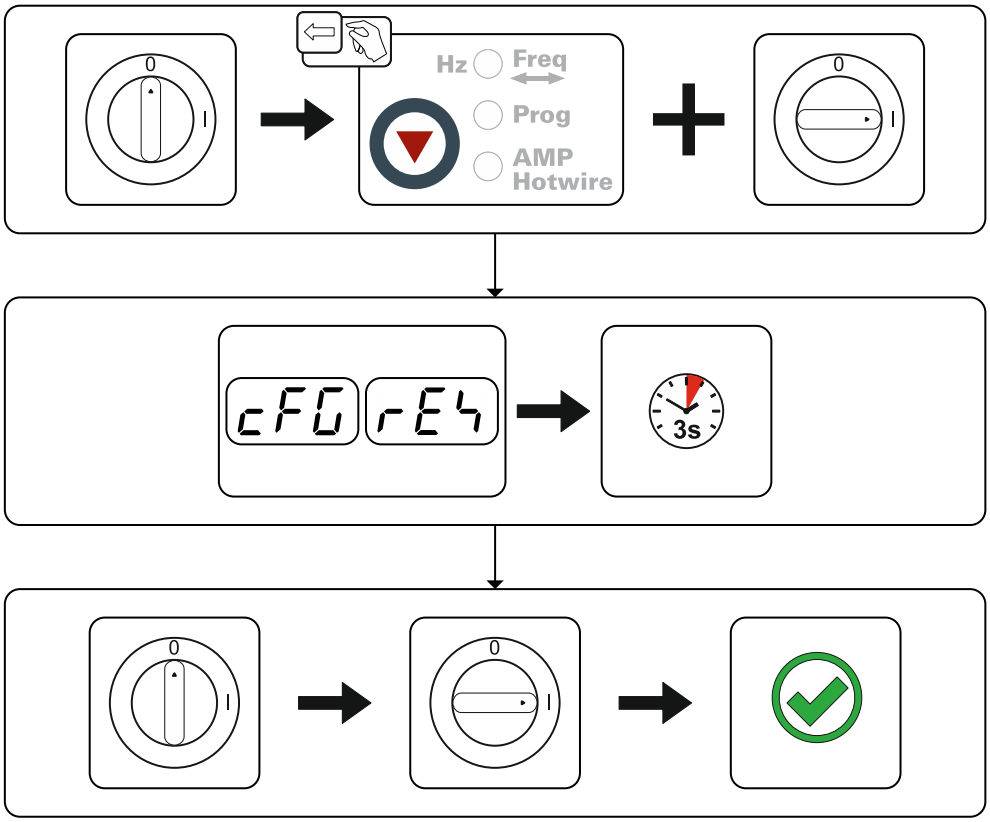


Figure 7-1

7.4 Vent coolant circuit

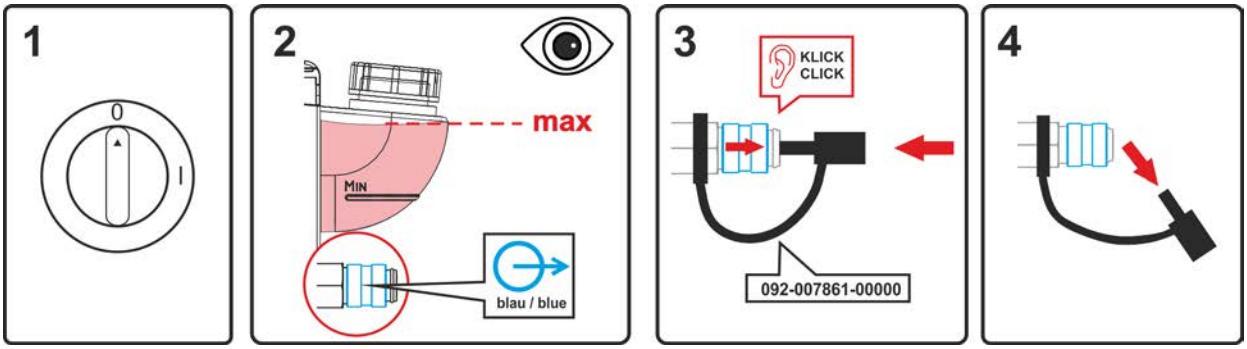


Figure 7-2

- 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)!

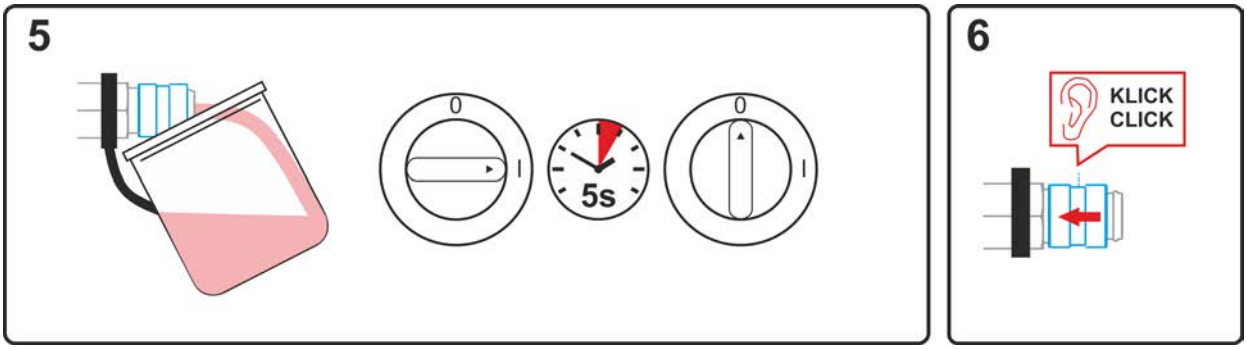


Figure 7-3

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

8 Technical data

8.1 tigSpeed continuous drive 45 hotwire

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

Hot wire current setting range	40 A to 180 A
max.Hot wire voltage	10 V
Duty cycle DC at 40° C [1]	180 A (35 %) / 150 A (60 %) / 130 A (100 %)
Open circuit voltage (U_0)	82 V
Open circuit voltage (U_r)	<50 V
Mains voltage (Tolerance)	1 x 230 V (-40 % to +15 %)
Frequency	50/60 Hz
mains fuse [2]	1 x 10 A
Mains connection cable	H07RN-F3G2,5
max. Connected load (S_1)	2,7 kVA
Generator rating (Rec.)	3,6 kVA
Cos φ / efficiency	0,99 / 86 %
Protection class / Overvoltage category	I / III
Contamination level	3
Insulation class / protection classification	H / IP 23
Residual current circuit breaker	Type B (recommended)
Noise level [3]	<70 dB(A)
Ambient temperature [4]	-25 °C to +40 °C
Machine cooling / Torch cooling	Fan (AF) / gas
Wire feed speed	0,3 m/min to 20 m/min
Factory-installed roll equipment	1,0/1,2 mm for steel wire
Drive	4 rollers (37 mm)
Wire spool diameter	Standardised wire spools up to 300 mm
Welding torch connection	Decentralised connection
Workpiece lead Hot wire current	25 mm^2
EMC class	A
Test mark	CE / S / EAC / UKCA
Standards used	See declaration of conformity (appliance documents)
Dimensions (l x b x h)	625 x 377 x 531 mm 24.6 x 14.8 x 20.9 inch
Weight	31,5 kg 69.4 lb.

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

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

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

[4] 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 Options

Type	Designation	Item no.
ON WAK tigSpeed	Wheel assembly kit with strain relief	092-007927-00000
ON Filter TG.0003	Dirt filter	092-002662-00000
ON AS SR tigSpeed	Strain relief	092-003685-00000

9.2 General accessories

Type	Designation	Item no.
ADAP ZSP 5POLIG/500MM	Adapter for tigSpeed intermediate hose package for connection to equipment from other manufacturers	094-019463-00000
tigSpeed 95QMM W AW 5POL 2m	Intermediate hose package, water-cooled, filler wire, incl. strain relief	094-019139-00000
tigSpeed 95QMM W AW 5POL 5m	Intermediate hose package, water-cooled, filler wire, incl. strain relief	094-019139-00005
tigSpeed 95QMM W AW 5POL 10m	Intermediate hose package, water-cooled, filler wire, incl. strain relief	094-019139-00010
DM 842 Ar/CO2 230bar 30l D	Pressure regulator with manometer	394-002910-00030
GH 2X1/4" 2M	Gas hose	094-000010-00001
AK300	Wire spool adapter K300	094-001803-00001
ADAP CEE16/SCHUKO	Earth contact coupling/CEE16A plug	092-000812-00000
HOSE BRIDGE UNI	Tube bridge	092-007843-00000
ON AL D13/27	Cap for load sockets	092-003282-00000

9.3 Remote controls and accessories

Type	Designation	Item no.
RTG U/D 12POL 5m	Remote control	094-019921-00000

10 Replaceable parts

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

10.1 Wire feed rollers

10.1.1 Wire feed rollers for steel wire

Type	Designation	Item no.
FE 2DR4R 0,6+0,8	Drive rollers, 37 mm, steel	092-000839-00000
FE 2DR4R 0,8+1,0	Drive rollers, 37 mm, steel	092-000840-00000
FE 2DR4R 0,9+1,2	Drive rollers, 37 mm, steel	092-000841-00000
FE 2DR4R 1,0+1,2	Drive rollers, 37 mm, steel	092-000842-00000
FE 2DR4R 1,2+1,6	Drive rollers, 37 mm, steel	092-000843-00000
FE/AL 2GR4R SF	Pressure rollers, smooth, 37 mm	092-000414-00000

10.1.2 Conversion kit

Type	Designation	Item no.
URUE VERZ>UNVERZ FE/AL 4R SF	Conversion kit, 37mm, 4-roller drive on non-toothed rollers (steel/aluminium)	092-000415-00000

10.1.3 Wire feed rollers for aluminium wire

Type	Designation	Item no.
AL 4ZR4R 0,8+1,0	Twin rollers, 37 mm, for aluminium	092-000869-00000
AL 4ZR4R 1,0+1,2	Twin rollers, 37 mm, for aluminium	092-000848-00000
AL 4ZR4R 1,2+1,6	Twin rollers, 37 mm, for aluminium	092-000849-00000
AL 4ZR4R 2,4+3,2	Twin rollers, 37 mm, for aluminium	092-000870-00000

10.1.4 Conversion kit

Type	Designation	Item no.
URUE AL 4ZR4R 0,8+1,0 SF	Conversion kit, 37 mm, 4-roller drive for aluminium	092-002268-00000
URUE AL 4ZR4R 1,0+1,2 SF	Conversion kit, 37 mm, 4-roller drive for aluminium	092-002266-00000
URUE AL 4ZR4R 1,2+1,6 SF	Conversion kit, 37 mm, 4-roller drive for aluminium	092-002269-00000
URUE AL 4ZR4R 2,4+3,2 SF	Conversion kit, 37 mm, 4-roller drive for aluminium	092-002270-00000

10.1.5 Wire feed rollers for cored wire

Type	Designation	Item no.
ROE 2DR4R 0,8/0,9+0,8/0,9	Drive rollers, 37 mm, cored wire	092-000834-00000
ROE 2DR4R 1,0/1,2+1,4/1,6	Drive rollers, 37 mm, cored wire	092-000835-00000
ROE 2DR4R 1,4/1,6+2,0/2,4	Drive rollers, 37 mm, cored wire	092-000836-00000
ROE 2DR4R 2,8+3,2	Drive rollers, 37 mm, cored wire	092-000837-00000
ROE 2GR4R	Pressure rollers, knurled, 37mm	092-000838-00000

10.1.6 Conversion kit

Type	Designation	Item no.
URUE ROE 2DR4R 0,8/0,9+0,8/0,9 SF	Conversion kit, 37 mm, 4-roller drive for cored wire	092-000410-00000
URUE ROE 2DR4R 1,0/1,2+1,4/1,6 SF	Conversion kit, 37 mm, 4-roller drive for cored wire	092-000411-00000
URUE ROE 2DR4R 1,4/1,6+2,0/2,4 SF	Conversion kit, 37 mm, 4-roller drive for cored wire	092-000412-00000
URUE ROE 2DR4R 2,8+3,2 SF	Conversion kit, 37 mm, 4-roller drive for cored wire	092-000413-00000

11 Appendix

11.1 Setting instructions

The following lists help you to determine the parameters.
The actual parameters to be set depend on the joint and welding position.
The welding speed as well depends on the welding task and the parameters set.

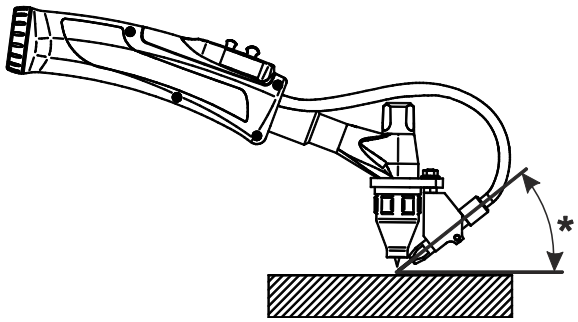


Figure 11-1

Item	Description
t	Material thickness in mm
Is	Welding current (TIG, power source)
Dv	Wire feed speed (tigSpeed)
Hz	Weave frequency (tigSpeed)
IH	Hot wire current (tigSpeed)
Vs	Welding speed
Welding torch°	Torch angle
Wire angle°	Wire feed angle

11.1.1 Continuous TIG cold wire welding

Fillet weld PB position							
Parent metal: Unalloyed/low-alloy							
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.8				Forehand 10–20	41-42
2	135	1.0				Forehand 10–20	41-42
4	180	1.8				Forehand 10–20	41-42
6	220	2.5				Forehand 10–20	41-42
8	260	3.5				Forehand 10–20	41-42
10	280	4.5				Forehand 10–20	41-42

Fillet weld PF position							
Parent metal: Unalloyed/low-alloy							
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.8				Forehand 10–20	41-42
2	135	1.0				Forehand 10–20	41-42
4	180	1.8				Forehand 10–20	41-42
6	220	2.5				Forehand 10–20	41-42
8	260	3.5				Forehand 10–20	41-42
10	280	4.5				Forehand 10–20	41-42

11.1.2 Continuous TIG hot wire welding

Fillet weld PB position							
Parent metal: Unalloyed/low-alloy							
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.9		80		Forehand 10–20	41-42
2	135	1.2		80		Forehand 10–20	41-42
4	180	2.0		80		Forehand 10–20	41-42
6	220	2.7		80		Forehand 10–20	41-42
8	260	4.0		80		Forehand 10–20	41-42
10	280	5.0		80		Forehand 10–20	41-42

Fillet weld PF position							
Parent metal: Unalloyed/low-alloy							
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.9		80		Forehand 10–20	41-42
2	135	1.2		80		Forehand 10–20	41-42
4	180	2.0		80		Forehand 10–20	41-42
6	220	2.7		80		Forehand 10–20	41-42
8	260	4.0		80		Forehand 10–20	41-42
10	280	5.0		80		Forehand 10–20	41-42

11.1.3 superPuls TIG cold wire welding

Fillet weld PB position									
Parent metal: Unalloyed/low-alloy									
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm									
t	**Is**	**Wf1/tWF1**		**Wf2/tWF2**		**IH**	**Vs**	**Welding torch**	**Wire angle**
[mm]	**[A]**	**[m/min]**	**[sec]**	**[m/min]**	**[sec]**	**[A]**	**[cm/min]**	**[°]**	**[°]**
1.5	100	1.9	0.15	0.0/off	0.35			Forehand 15	45
2	140	3.5	0.15	0.0/off	0.35			Forehand 15	45
4	190	4.0	0.15	0.0/off	0.35			Forehand 15	45
6	240	5.0	0.15	0.0/off	0.35			Forehand 15	45
8	280	6.5	0.15	0.0/off	0.35			Forehand 15	45
10	300	7.5	0.15	0.0/off	0.35			Forehand 15	45

Fillet weld PF position									
Parent metal: Unalloyed/low-alloy									
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm									
t	**Is**	**Wf1/tWF1**		**Wf2/tWF2**		**IH**	**Vs**	**Welding torch**	**Wire angle**
[mm]	**[A]**	**[m/min]**	**[sec]**	**[m/min]**	**[sec]**	**[A]**	**[cm/min]**	**[°]**	**[°]**
1.5	100	1.9	0.15	0.0/off	0.35			Forehand 15	45
2	140	3.5	0.15	0.0/off	0.35			Forehand 15	45
4	190	4.0	0.15	0.0/off	0.35			Forehand 15	45
6	240	5.0	0.15	0.0/off	0.35			Forehand 15	45
8	280	6.5	0.15	0.0/off	0.35			Forehand 15	45
10	300	7.5	0.15	0.0/off	0.35			Forehand 15	45

11.1.4 superPuls TIG hot wire welding

Fillet weld PB position									
Parent metal: Unalloyed/low-alloy									
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm									
t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[mm]	[A]
1.5	100	2.0	0.15	0.0/off	0.35	80		1.5	100
2	140	3.5	0.15	0.0/off	0.35	80		2	140
4	190	4.5	0.15	0.0/off	0.35	80		4	190
6	240	5.5	0.15	0.0/off	0.35	80		6	240
8	280	7.0	0.15	0.0/off	0.35	80		8	280
10	300	8.0	0.15	0.0/off	0.35	80		10	300

Fillet weld PF position									
Parent metal: Unalloyed/low-alloy									
Welding consumable: Unalloyed/low-alloy, Ø 1.0 mm									
t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[°]	[°]
1.5	100	2.0	0.15	0.0/off	0.35	80		Forehand 15	45
2	140	3.5	0.15	0.0/off	0.35	80		Forehand 15	45
4	190	4.5	0.15	0.0/off	0.35	80		Forehand 15	45
6	240	5.5	0.15	0.0/off	0.35	80		Forehand 15	45
8	280	7.0	0.15	0.0/off	0.35	80		Forehand 15	45
10	300	8.0	0.15	0.0/off	0.35	80		Forehand 15	45

11.1.5 Continuous TIG cold wire welding

Fillet weld PB position							
Parent metal: High-alloy							
Welding consumable: High-alloy. Ø 1.0 mm							
t [mm]	Is [A]	WF (m/min)	Hz [1/s]	IH [A]	Vs [cm/min]	Welding torch [°]	Wire angle [°]
1.5	90	0.8				Forehand 10–20	41-42
2	135	1.0				Forehand 10–20	41-42
4	180	1.8				Forehand 10–20	41-42
6	220	2.5				Forehand 10–20	41-42
8	260	3.5				Forehand 10–20	41-42
10	280	4.5				Forehand 10–20	41-42

Fillet weld PF position							
Parent metal: High-alloy							
Welding consumable: High-alloy. Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.8				Forehand 10–20	41-42
2	135	1.0				Forehand 10–20	41-42
4	180	1.8				Forehand 10–20	41-42
6	220	2.5				Forehand 10–20	41-42
8	260	3.5				Forehand 10–20	41-42
10	280	4.5				Forehand 10–20	41-42

11.1.6 Continuous TIG hot wire welding

Fillet weld PB position							
Parent metal: High-alloy							
Welding consumable: High-alloy. Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.9		80		Forehand 10–20	41-42
2	135	1.2		80		Forehand 10–20	41-42
4	180	2.0		80		Forehand 10–20	41-42
6	220	2.7		80		Forehand 10–20	41-42
8	260	4.0		80		Forehand 10–20	41-42
10	280	5.0		80		Forehand 10–20	41-42

Fillet weld PF position							
Parent metal: High-alloy							
Welding consumable: High-alloy. Ø 1.0 mm							
t [mm]	**Is [A]**	**WF (m/min)**	**Hz [1/s]**	**IH [A]**	**Vs [cm/min]**	**Welding torch [°]**	**Wire angle [°]**
1.5	90	0.9		80		Forehand 10–20	41-42
2	135	1.2		80		Forehand 10–20	41-42
4	180	2.0		80		Forehand 10–20	41-42
6	220	2.7		80		Forehand 10–20	41-42
8	260	4.0		80		Forehand 10–20	41-42
10	280	5.0		80		Forehand 10–20	41-42

11.1.7 superPuls TIG cold wire welding

Fillet weld PB position

Parent metal: High-alloy

Welding consumable: High-alloy. Ø 1.0 mm

t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[°]	[°]
1.5	90	1.9	0.15	0.0/off	0.35		32	Forehand 15	45
2	135	3.5	0.15	0.0/off	0.35		38	Forehand 15	45
4	180	4.0	0.15	0.0/off	0.35		41	Forehand 15	45
6	220	5.0	0.15	0.0/off	0.35		43	Forehand 15	45
8	260	6.5	0.15	0.0/off	0.35		43	Forehand 15	45
10	280	7.5	0.15	0.0/off	0.35		48	Forehand 15	45

Fillet weld PF position

Parent metal: High-alloy

Welding consumable: High-alloy. Ø 1.0 mm

t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[°]	[°]
1.5	90	1.9	0.15	0.0/off	0.35			Forehand 15	45
2	135	3.5	0.15	0.0/off	0.35			Forehand 15	45
4	180	4.0	0.15	0.0/off	0.35			Forehand 15	45
6	220	5.0	0.15	0.0/off	0.35			Forehand 15	45
8	260	6.5	0.15	0.0/off	0.35			Forehand 15	45
10	280	7.5	0.15	0.0/off	0.35			Forehand 15	45

11.1.8 superPuls TIG hot wire welding

Fillet weld PB position									
Parent metal: High-alloy									
Welding consumable: High-alloy. Ø 1.0 mm									
t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[°]	[°]
1.5	90	2.2	0.15	0.0/off	0.35	80	32	Forehand 15	45
2	135	3.5	0.15	0.0/off	0.35	80	38	Forehand 15	45
4	180	4.5	0.15	0.0/off	0.35	80	41	Forehand 15	45
6	220	5.5	0.15	0.0/off	0.35	80	43	Forehand 15	45
8	260	7.0	0.15	0.0/off	0.35	80	43	Forehand 15	45
10	280	8.0	0.15	0.0/off	0.35	80	48	Forehand 15	45

Fillet weld PF position									
Parent metal: High-alloy									
Welding consumable: High-alloy. Ø 1.0 mm									
t	Is	Wf1/tWF1		Wf2/tWF2		IH	Vs	Welding torch	Wire angle
[mm]	[A]	[m/min]	[sec]	[m/min]	[sec]	[A]	[cm/min]	[°]	[°]
1.5	90	2.2	0.15	0.0/off	0.35	80		Forehand 15	45
2	135	3.5	0.15	0.0/off	0.35	80		Forehand 15	45
4	180	4.5	0.15	0.0/off	0.35	80		Forehand 15	45
6	220	5.5	0.15	0.0/off	0.35	80		Forehand 15	45
8	260	7.0	0.15	0.0/off	0.35	80		Forehand 15	45
10	280	8.0	0.15	0.0/off	0.35	80		Forehand 15	45

11.2 Searching for a dealer

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