



welding torch

**comfyTig 18-1 CW**  
**comfyTig 18-1 HW**

099-500142-EW501

Observe additional system documents!

05.04.2016

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# General instructions

## CAUTION



### **Read the operating instructions!**

**The operating instructions provide an introduction to the safe use of the products.**

- Read the operating instructions for all system components!
- Observe accident prevention regulations!
- Observe all local regulations!
- Confirm with a signature where appropriate.



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

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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.

#### **CAUTION**

**Working and operating procedures which must be followed precisely to avoid damaging or destroying the product.**

- The safety information includes the "CAUTION" keyword in its heading without a general warning symbol.
- The hazard is explained using a symbol at 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.

## 2.2 Explanation of icons

Symbol	Description
	Special technical points which users must observe.
	Correct
	Wrong
	Press
	Do not press
	Press and keep pressed
	Turn
	Switch
	Switch off machine
	Switch on machine
<b>ENTER</b>	enter the menu
<b>NAVIGATION</b>	Navigating in the menu
<b>EXIT</b>	Exit the menu
4 s 	Time display (example: wait 4s/press)
	Interruption in the menu display (other setting options possible)
	Tool not required/do not use
	Tool required/use

## 2.3 General

### **DANGER**



#### **Electric shock!**

**Welding machines use high voltages which can result in potentially fatal electric shocks and burns on contact. Even low voltages can cause you to get a shock and lead to accidents.**

- Do not touch any live parts in or on the machine!
- Connection cables and leads must be free of faults!
- Switching off alone is not sufficient!
- Place welding torch and stick electrode holder on an insulated surface!
- The unit should only be opened by specialist staff after the mains plug has been unplugged!
- Only wear dry protective clothing!
- Wait for 4 minutes until the capacitors have discharged!



#### **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 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).

### **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!



#### **Validity of the document!**

**This document is valid only in combination with the operating instructions for the product being used!**

- Read and observe the operating instructions for all system components, especially the safety instructions!



#### **Fire hazard!**

**Flames may arise as a result of the high temperatures, stray sparks, glowing-hot parts and hot slag produced during the welding process.**

**Stray welding currents can also result in flames forming!**

- Check for fire hazards in the working area!
- Do not carry any easily flammable objects such as matches or lighters.
- Keep appropriate fire extinguishing equipment to hand in the working area!
- Thoroughly remove any residue of flammable substances from the workpiece before starting welding.
- Only continue work on welded workpieces once they have cooled down.  
Do not allow to come into contact with flammable material!
- Connect welding leads correctly!

## 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!



### **Hazards due to improper usage!**

**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 proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

## 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!

## CAUTION



### **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/EEG), as well as the associated individual directives.
- In particular, directive (89/655/EEG), 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.



### **Damage due to the use of non-genuine parts!**

**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.



### **Trained personnel!**

**Commissioning is reserved for persons who have the relevant expertise of working with arc welding machines.**



## 2.4 Transport

### CAUTION



#### Damage due to supply lines not being disconnected!

During transport, supply lines which have not been disconnected (mains supply leads, control leads, etc.) may cause hazards such as connected equipment tipping over and injuring persons!

- Disconnect supply lines!

### 2.4.1 Scope of delivery

The delivery is checked and packaged carefully before dispatch, however it is not possible to exclude the possibility of damage during transit.

#### Receiving inspection

- Check that the delivery is complete using the delivery note!

#### In the event of damage to the packaging

- Check the delivery for damage (visual inspection)!

#### In the event of complaints

If the delivery has been damaged during transport:

- Please contact the last haulier immediately!
- Keep the packaging (for possible checking by the haulier or for the return shipment).

#### Packaging for returns

If possible, please use the original packaging and the original packaging material. If you have any queries on packaging and protection during transport, please contact your supplier.

### 2.4.2 Ambient conditions

### CAUTION



#### Equipment damage due to dirt accumulation!

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)!

#### 2.4.2.1 In operation

##### Temperature range of the ambient air:

- -10 °C to +40 °C

##### Relative air humidity:

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

#### 2.4.2.2 Transport and storage

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

- -25 °C to +55 °C

##### Relative air humidity

- Up to 90% at 20 °C

## 3 Intended use

**WARNING**

**Hazards due to improper usage!**  
**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 proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

Welding torch for TIG welding with arc welding machines.

### 3.1 Use and operation solely with the following machines

	comfyTig 18-1 CW	comfyTig 18-1 HW
tigSpeed drive 45 coldwire	☑	■
tigSpeed drive 45 hotwire	■	☑

☑ recommended

■ possible

### 3.2 Documents which also apply

#### 3.2.1 Warranty

For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at [www.ewm-group.com](http://www.ewm-group.com)!

#### 3.2.2 Declaration of Conformity

**CE** The designated machine conforms to EC Directives and standards in terms of its design and construction:

- EC Low Voltage Directive (2006/95/EC),
- EC EMC Directive (2004/108/EC),

This declaration shall become null and void in the event of unauthorised modifications, improperly conducted repairs, non-observance of the deadlines for the repetition test and / or non-permitted conversion work not specifically authorised by the manufacturer.

The original copy of the declaration of conformity is enclosed with the unit.

#### 3.2.3 Service documents (spare parts)

**DANGER**

**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)!

Spare parts can be obtained from the relevant authorised dealer.

## 4 Machine description – quick overview

### 4.1 Overview of device types

Version	Functions	Torch type
<b>CW</b>	<b>Cold wire</b> For cold wire welding	comfyTig 18-1
<b>HW</b>	<b>Hot wire</b> For hot wire welding	comfyTig 18-1

#### 4.1.1 TIG cold wire welding

##### comfyTig 18-1 CW

Cold wire welding is a variant of TIG welding featuring mechanically fed filler material. With this process, cold welding wire is melted, without power, in the arc of a tungsten electrode.

#### 4.1.2 TIG hot wire welding

##### comfyTig 18-1 HW

The TIG hot wire welding system technology is based on the TIG cold wire welding system technology.

A wire feed system transports the wire-like welding consumable, which is heated at the stick-out between contact tip and weld pool contact point by means of resistance heating. Its secondary power circuit is closed by the wire's permanent contact with the weld pool. The process of pre-heating the wire can be controlled in a wide range by the selected hot wire current.

By pre-heating the wire, the energy taken from the weld pool for melting the wire can be reduced. This allows a significantly larger amount of welding consumables to be used at a higher welding speed, thus reducing the energy per unit length.

## 4.2 comfyTig 18-1 CW

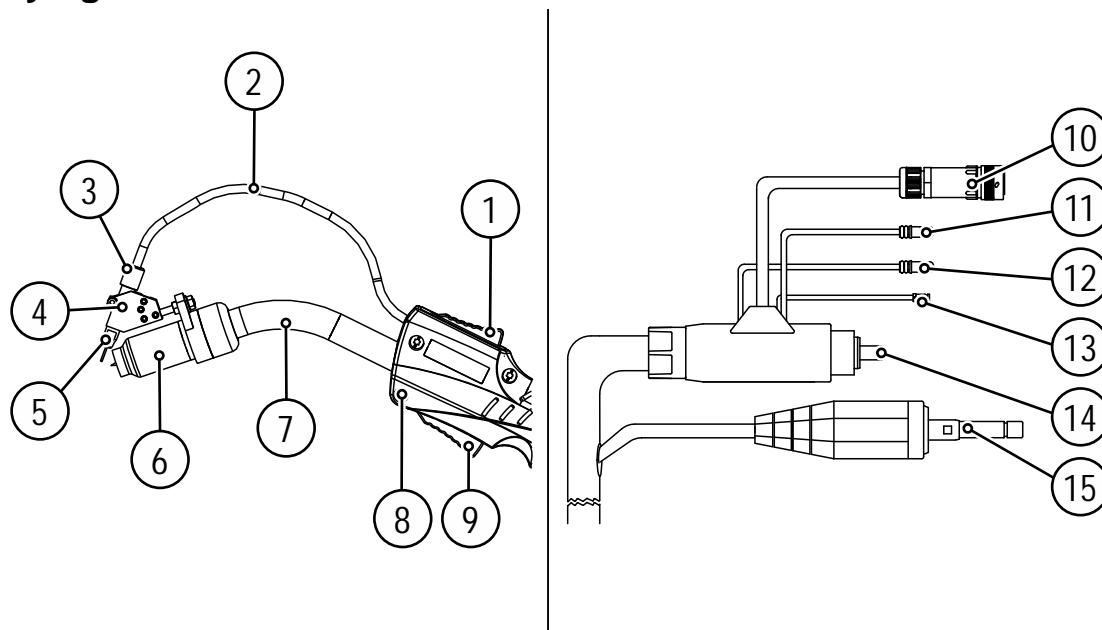


Figure 4-1

Item	Symbol	Description
1		<b>Torch trigger</b> BRT 1 – Welding current (start/stop)
2		<b>Wire guide tube</b>
3		<b>Crown nut</b>
4		<b>Wire feed angle</b>
5		<b>Contact tip (wire guide)</b>
6		<b>Gas nozzle</b>
7		<b>Torch neck 45°</b>
8		<b>Torch body</b>
9		<b>Torch trigger</b> BRT 2 – Wire control (start/stop)
10		<b>Control lead cable plug</b>
11		<b>Rapid-action closure nipple, blue</b> Coolant supply
12		<b>Rapid-action closure nipple, red</b> Coolant return
13		<b>Connecting nipple, shielding gas</b> Rapid-action closure
14	—	<b>Welding current connection (TIG)</b> decentralised, minus potential
15		<b>Wire guide connector plug</b>

## 4.3 comfyTig 18-1 HW

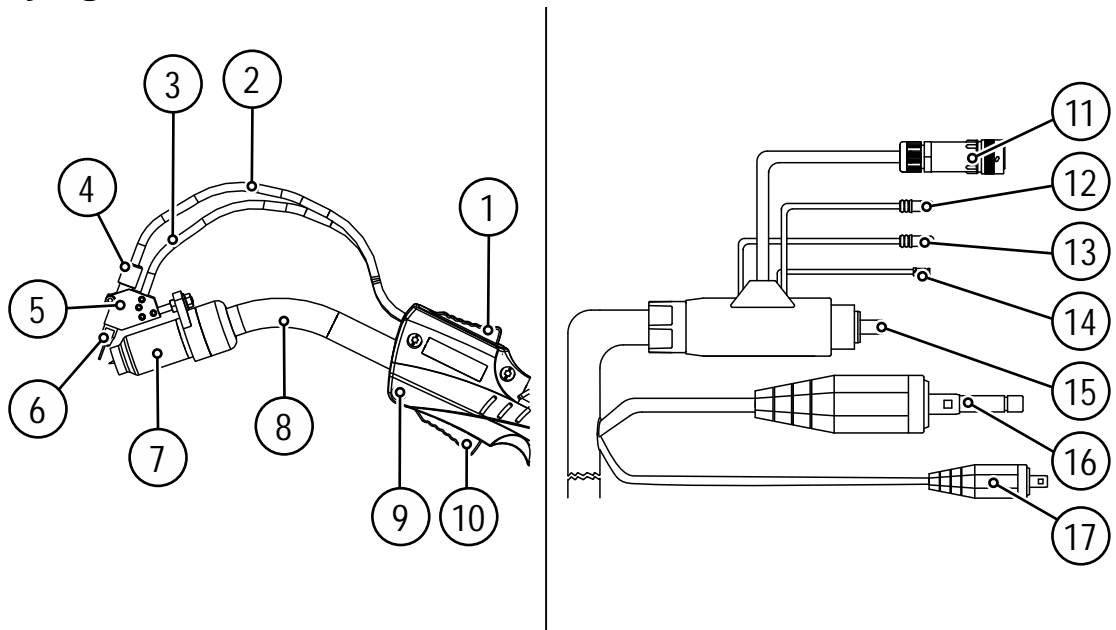


Figure 4-2

Item	Symbol	Description
1		<b>Torch trigger</b> BRT 1 – Welding current (start/stop)
2		<b>Wire guide tube</b>
3		<b>Hot wire current lead</b>
4		<b>Crown nut</b>
5		<b>Wire feed angle</b>
6		<b>Contact tip (wire guide)</b>
7		<b>Gas nozzle</b>
8		<b>Torch neck 45°</b>
9		<b>Torch body</b>
10		<b>Torch trigger</b> BRT 2 – Wire control (start/stop)
11		<b>Control lead cable plug</b>
12		<b>Rapid-action closure nipple, blue</b> Coolant supply
13		<b>Rapid-action closure nipple, red</b> Coolant return
14		<b>Connecting nipple, shielding gas</b> Rapid-action closure
15	—	<b>Welding current connection (TIG)</b> decentralised, minus potential
16		<b>Wire guide connector plug</b>
17		<b>Welding current connector plug (hot wire)</b> Minus potential

## 4.4 Wire feed angle

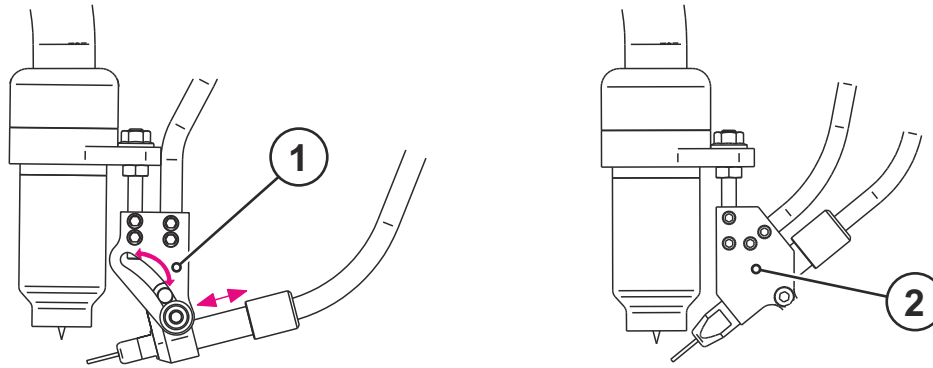


Figure 4-3

Item	Symbol	Description
1		Flexible wire feed angle (15°–41°)
2		Fixed wire feed angles 30°/39°/42°

## 4.5 Equipment recommendations

	Material	Wire diameter	Contact tip	Wire guide diameter	Liner	Brass liner length	Equipment side	Wire feed rolls
Wire fed	Low-alloy	0.8	EWM CuCrZr	1.5 x 4.0	Liner	/	Dinse connecto r	V-groove
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
	Medium-alloy	0.8	EWM CuCrZr	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	V-groove
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
	Hardfacing	0.8	EWM CuCrZr	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	V-groove
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
	High-alloy	0.8	EWM CuCrZr	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	V-groove
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
	Aluminium	0.8	EWM Alu E-Cu	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	U-groove
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
Copper alloy	0.8	EWM CuCrZr	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	V-groove	
	1.0		1.5 x 4.0					
	1.2		2.0 x 4.0					
Flux cored wire fed	Low-alloy	0.8	EWM CuCrZr	1.5 x 4.0	Liner	/	Dinse connecto r	V- groove/knu rled
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				
	High-alloy	0.8	EWM CuCrZr	1.5 x 4.0	Combined PA liner	30 mm	Torch neck	V- groove/knu rled
		1.0		1.5 x 4.0				
		1.2		2.0 x 4.0				

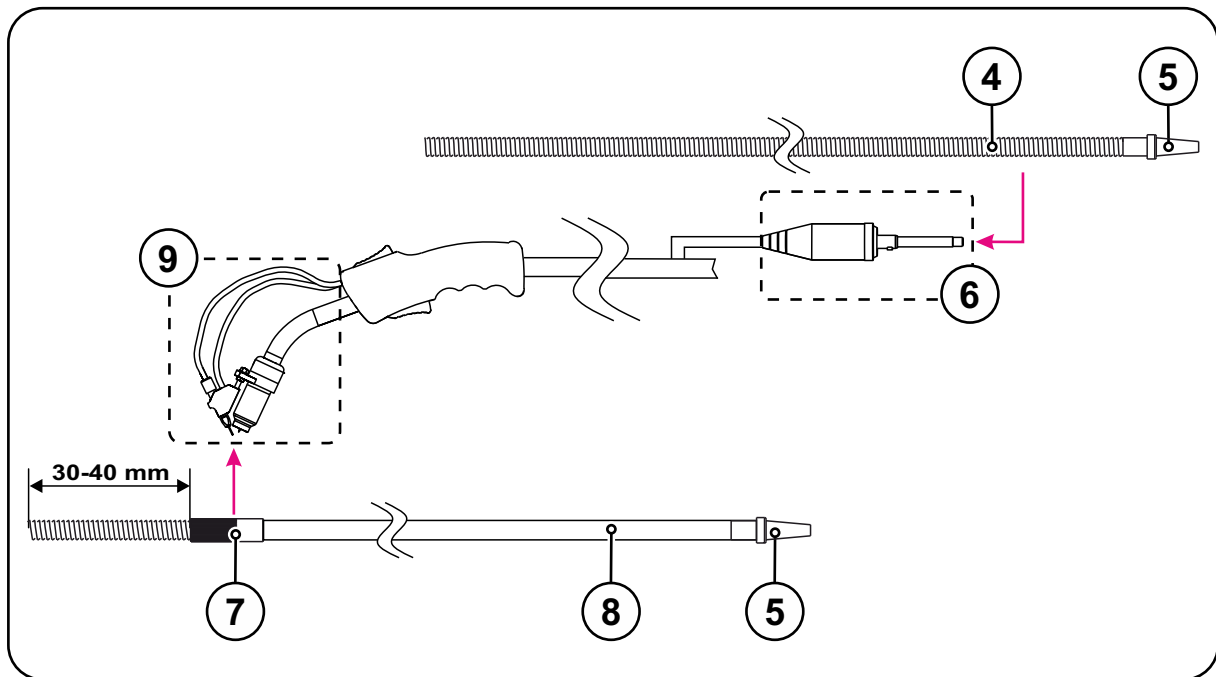
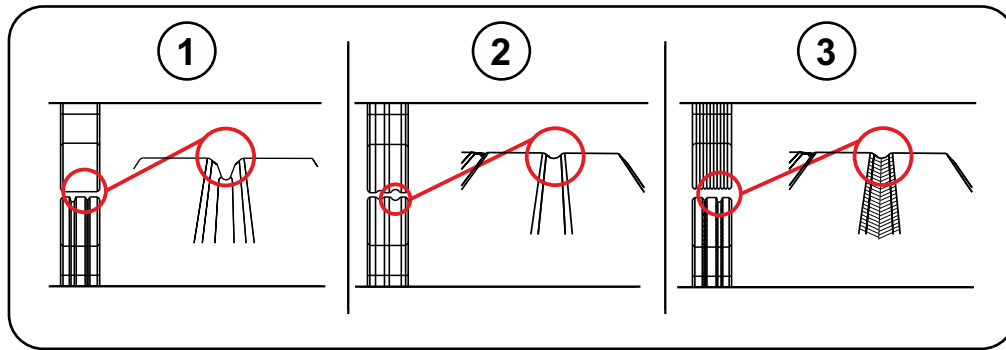


Figure 4-4

Item	Symbol	Description
1		V-groove
2		U-groove
3		Knurled V-groove
4		Steel liner
5		Wire feed nipple
6		Equipment side – Dinse connector
7		Connecting sleeve
8		Combined liner
9		Equipment side – torch neck



**A steel liner is installed at the connection side, whereas a combined liner is installed at the torch side.**



## 5 Design and function

### 5.1 General

#### WARNING



##### **Risk of injury from electric shock!**

**Contact with live parts, e.g. welding current sockets, is potentially fatal!**

- Follow safety instructions on the opening pages of the operating instructions.
- Commissioning may only be carried out by persons who have the relevant expertise of working with arc welding machines!
- Connection and welding leads (e.g. electrode holder, welding torch, workpiece lead, interfaces) may only be connected when the machine is switched off!

#### CAUTION



##### **Insulate the arc welder from welding voltage!**

**Not all active parts of the welding current circuit can be shielded from direct contact. To avoid any associated risks it is vital for the welder to adhere to the relevant safety regulations. Even low voltages can cause a shock and lead to accidents.**

- Wear dry and undamaged protective clothing (shoes with rubber soles/welder's gloves made from leather without any studs or braces)!
- Avoid direct contact with non-insulated connection sockets or connectors!
- Always place torches and electrode holders on an insulated surface!



##### **Risk of burns on the welding current connection!**

**If the welding current connections are not locked, connections and leads heat up and can cause burns, if touched!**

- Check the welding current connections every day and lock by turning in clockwise direction, if necessary.



##### **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!
- Remove the pressure rollers from the wire feeder if no welding torch is fitted!
- Check wire guide at regular intervals!
- Keep all casing covers or protective caps closed during operation!



##### **Risk from electrical current!**

**If welding is carried out alternately using different methods and if a welding torch and an electrode holder remain connected to the machine, the open-circuit/welding voltage is applied simultaneously on all cables.**

- The torch and the electrode holder should therefore always be placed on an insulated surface before starting work and during breaks.

## CAUTION



### **Damage due to incorrect connection!**

**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.



### **Using protective dust caps!**

**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!



***Observe documentation of other system components when connecting!***

## 5.2 Welding torch cooling system

### CAUTION



#### Coolant mixtures!

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

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



#### Insufficient frost protection in the welding torch coolant!

Depending on the ambient conditions, different liquids are used for cooling the welding torch > see 5.2.1 chapter.

Coolants with frost protection (KF 37E or KF 23E) must be checked regularly to ensure that the frost protection is adequate to prevent damage to the machine or the accessory components.

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



**The disposal of coolant must be carried out according to official regulations and observing the relevant safety data sheets (German waste code number: 70104)!**

**Coolant must not be disposed of together with household waste.**

**Coolant must not be discharged into the sewerage system.**

**Recommended cleaning agent: water, if necessary with cleaning agent added.**

### 5.2.1 List of coolants

The following coolants may be used :

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

### 5.2.2 Maximal hose package length

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

Data as a rule refer to the entire hose package length

including welding torch. The pump output is shown on the type plate (parameter: Pmax).

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

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

## 5.3 Welding torch connection

### CAUTION



**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 5.2.2 chapter.
- When using a gas-cooled welding torch, use a hose bridge to establish the coolant circuit .

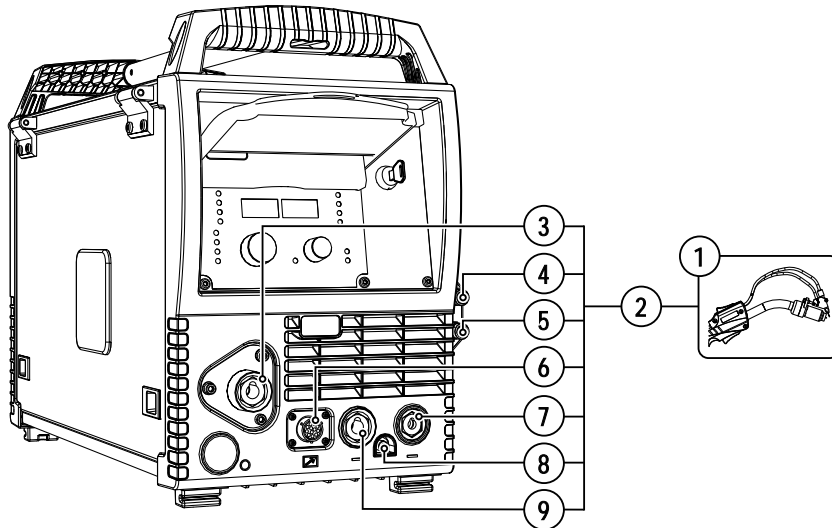


Figure 5-1

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

### 5.3.1 Control cable pin configuration

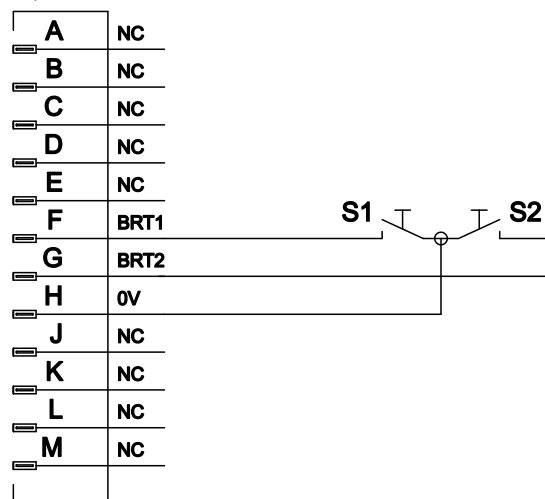


Figure 5-2

## 5.4 Convert welding torch

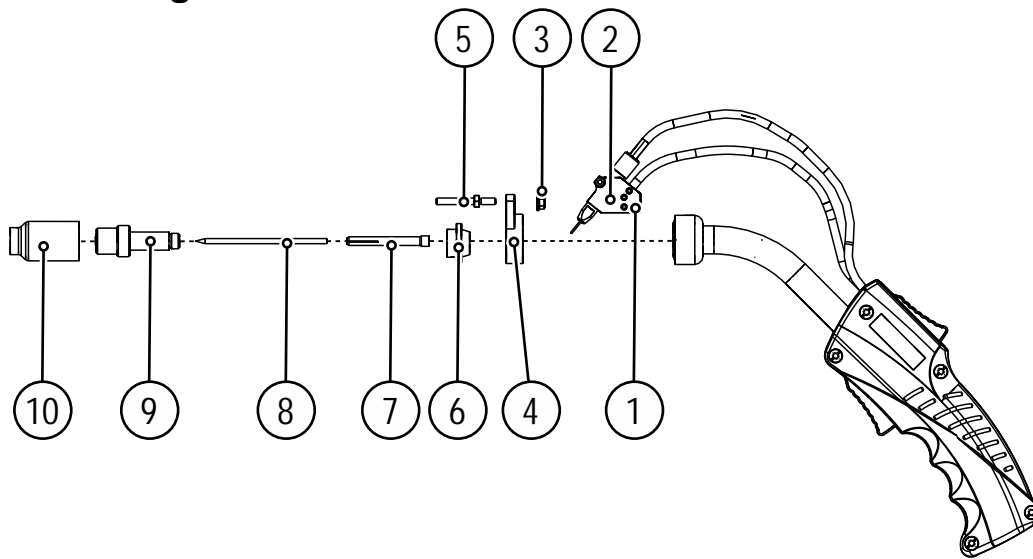


Figure 5-3

Item	Symbol	Description
1		Allen screw
2		Filler wire guide
3		Hexagon nut
4		Support plate
5		Stud bolts, M4 x 10 SW7 L26 MM, - L36 MM, - L41 MM
6		Plastic insulation
7		Collet
8		Tungsten electrode
9		Gas diffuser
10		Gas nozzle

- Unscrew gas nozzle and gas diffuser.
- Remove collet and tungsten electrode.
- Loosen the hexagonal socket screw of the filler wire guide and remove the filler wire guide from the stud bolt.

### 5.4.1 Conversion kit for bottle-neck or standard version

- Position the gas nozzle bracket on the torch body in such a way that the flat side faces away from the torch body.
- Insert plastic insulation with the slanted end into the bracket.
- Insert tungsten electrode into collet.
- Insert collet into gas diffuser.
- Insert gas diffuser into torch body and screw finger tight.
- Plug the gas nozzle onto the gas diffuser and screw finger tight.
- Screw the stud bolt into the bracket and secure with the nut.
- Plug the filler wire guide onto the stud bolt and secure with the hexagonal socket screws.

## 5.5 Assemble the wire guide

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

Recommendation:

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

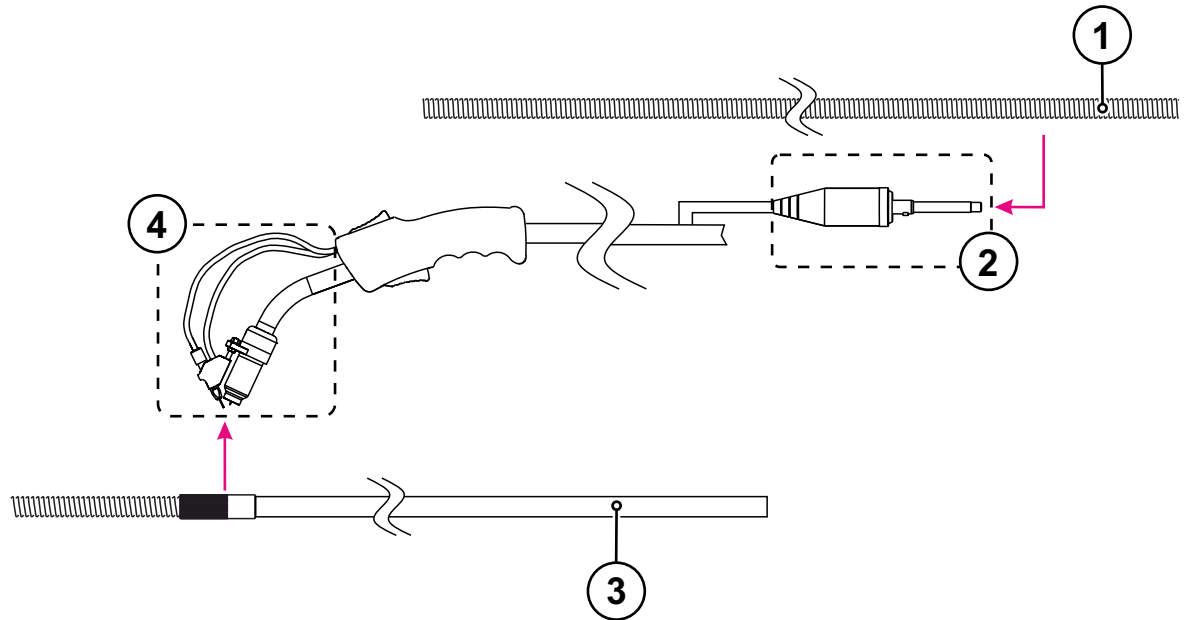


Figure 5-4

Item	Symbol	Description
1		Steel liner
2		Equipment side – Dinse connector
3		Combined liner
4		Equipment side – torch neck



Always make sure the the hose package is straight when replacing the wire guide.



A steel liner is installed at the connection side, whereas a combined liner is installed at the torch side.

## 5.5.1 Replace steel liner

The welding torch shown is an example only. Depending on the type used, torches may vary.

Item	Symbol	Description
1		Crown nut
2		Connecting sleeve
3		Welding wire
4		Collet chuck
5		Insulation piece
6		Steel liner
7		Wire feed tube
8		New steel liner
9		Wire feed nipple

1.

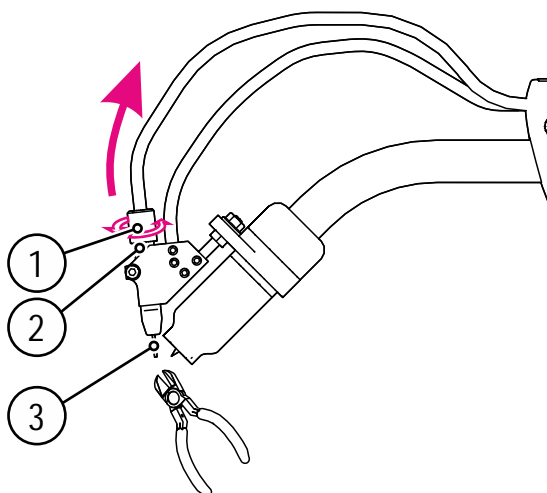


Figure 5-5

- Cut off the welding wire tip.
- Loosen the crown nut of the jointing sleeve.
- Pull out steel liner
- Remove the welding wire completely from the torch hose package.



2.

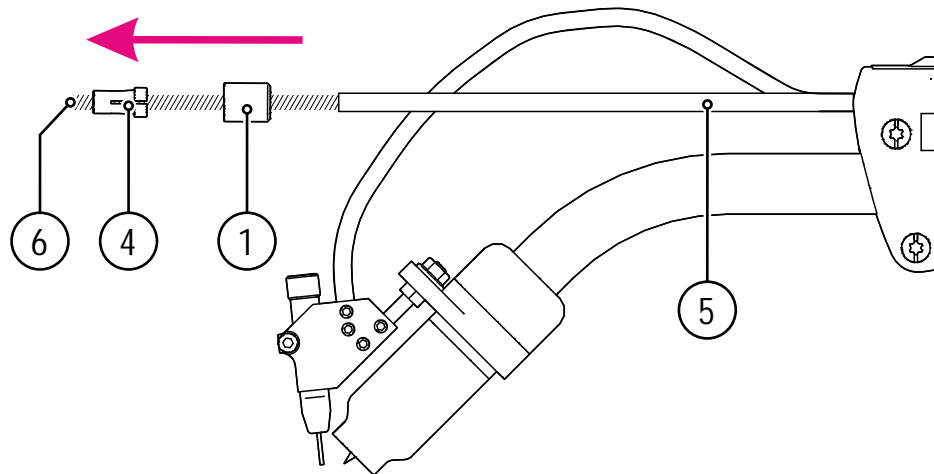


Figure 5-6

- Remove the crown nut, collet chuck and insulating tube from the steel liner.

3.

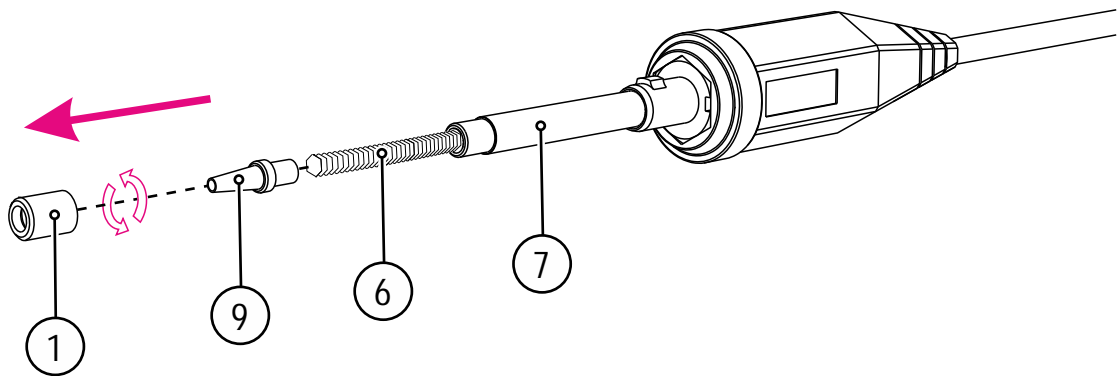


Figure 5-7

- Disconnect the torch connector from the wire feeding.
- Unscrew the crown nut from the inlet tube.
- Extend and lay out the torch hose package.
- Pull out steel liner

## 4.

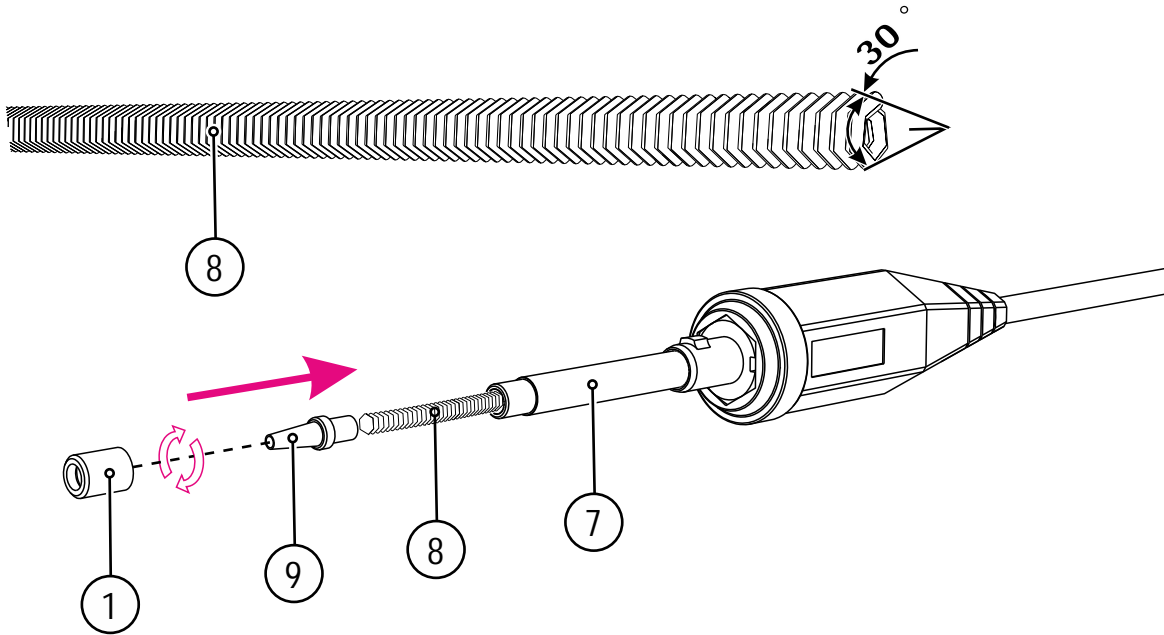


Figure 5-8

- Chamfer the steel liner on one side at 30°.
- Screw a suitable inlet guide tightly to the new steel liner on the side that is not chamfered, if necessary.
- Blow out the new steel liner with shielding gas or water- and oil-free compressed air.
- Insert the new steel liner with the chamfered side into the inlet tube and push through with slight pressure.
- Tighten the crown nut by hand.

## 5.

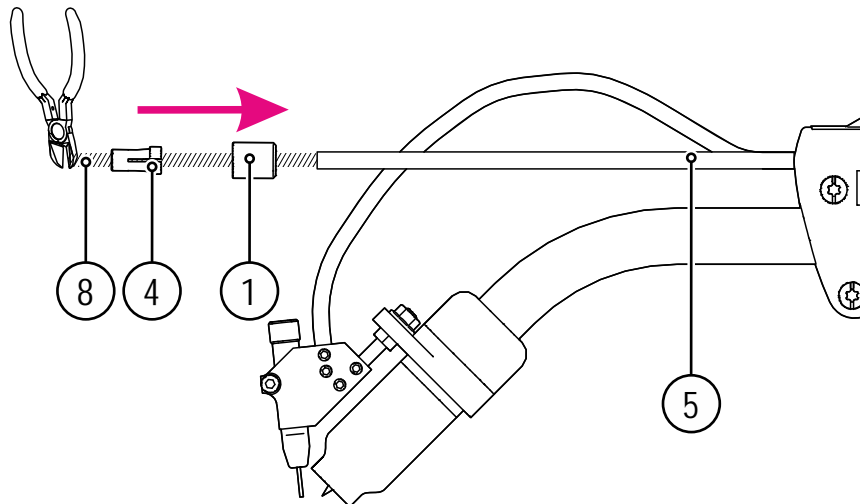


Figure 5-9

- Cut off the new steel liner so that it has a length of at least 250 mm.
- Plug the insulating tube onto the new steel liner.
- Plug the crown nut onto the new steel liner.
- Screw the collet chuck onto the new steel liner until the new steel liner protrudes 7 mm.

6.

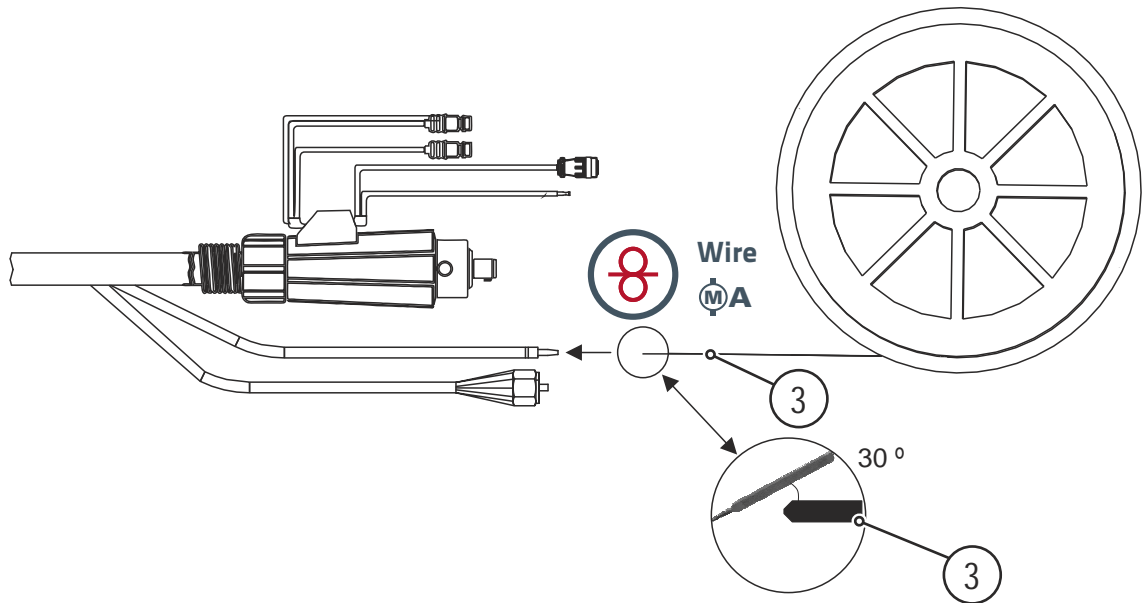


Figure 5-10

- Chamfer the welding wire at 30° before inserting into the new steel liner.
- Connect the torch connector to the wire feeding (see chapter "Connecting the welding torch").  
> see 5.3 chapter
- Using the wire feeding, insert the welding wire into the new steel liner until it protrudes 40 mm at the end of the steel liner.

7.

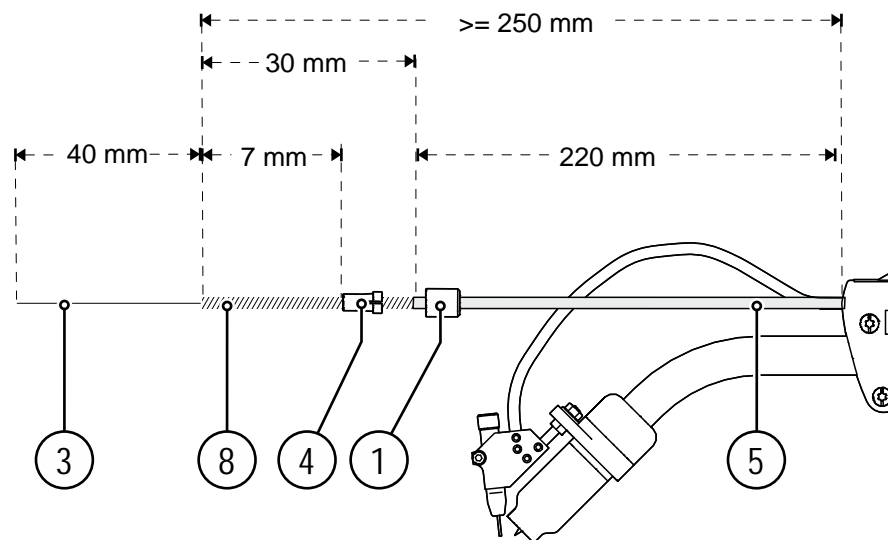


Figure 5-11

8.

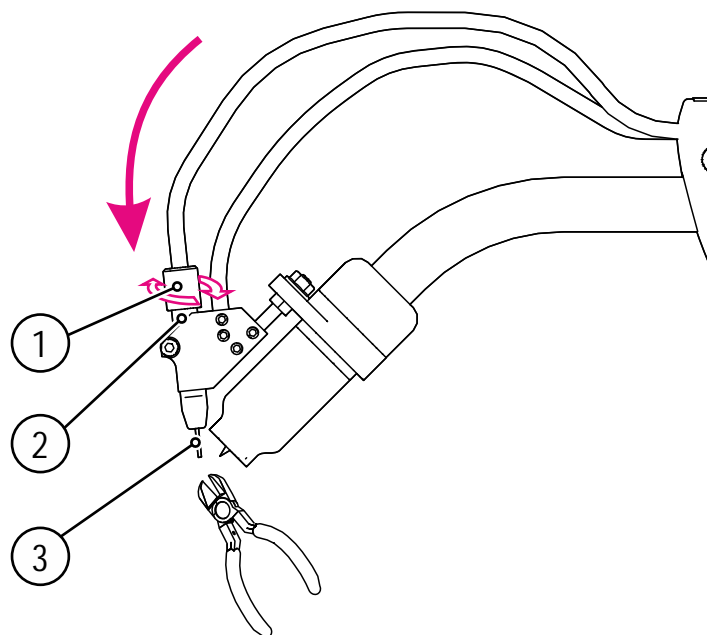


Figure 5-12

- Insert the new steel liner into the jointing sleeve as far as it goes.
- Tighten the crown nut by hand.

### 5.5.2 Plastic liner



The welding torch shown is an example only. Depending on the type used, torches may vary.

Item	Symbol	Description
1		Crown nut
2		Connecting sleeve
3		Welding wire
4		Collet chuck
5		Insulation piece
6		Combined liner
7		Wire feed tube
8		New combined liner
9		Wire feed nipple

1.

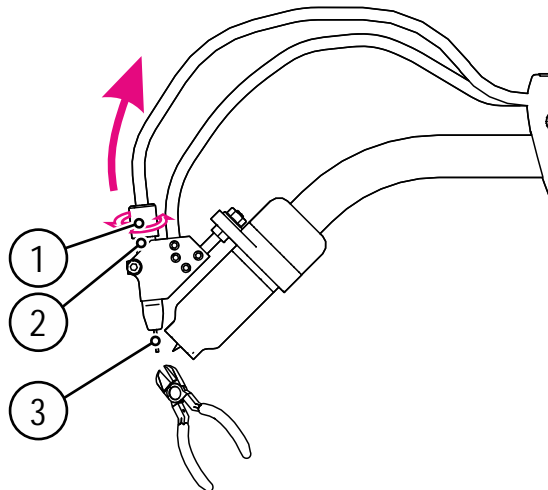


Figure 5-13

- Disconnect the torch connector from the wire feeding.
- Cut off the welding wire tip.
- Loosen the crown nut of the jointing sleeve.
- Remove the combined liner from the jointing sleeve.
- Remove the welding wire completely from the torch hose package.

2.

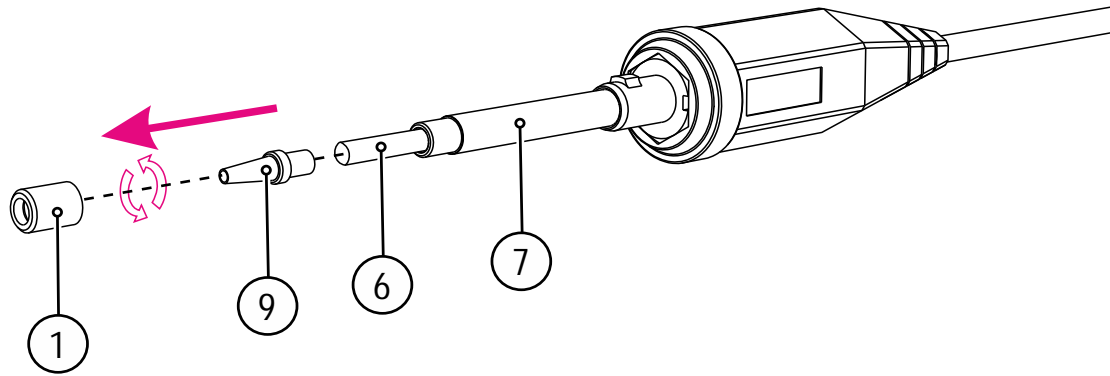


Figure 5-14

- Unscrew the crown nut from the inlet tube.
- Remove existing wire feed nipple.

3.

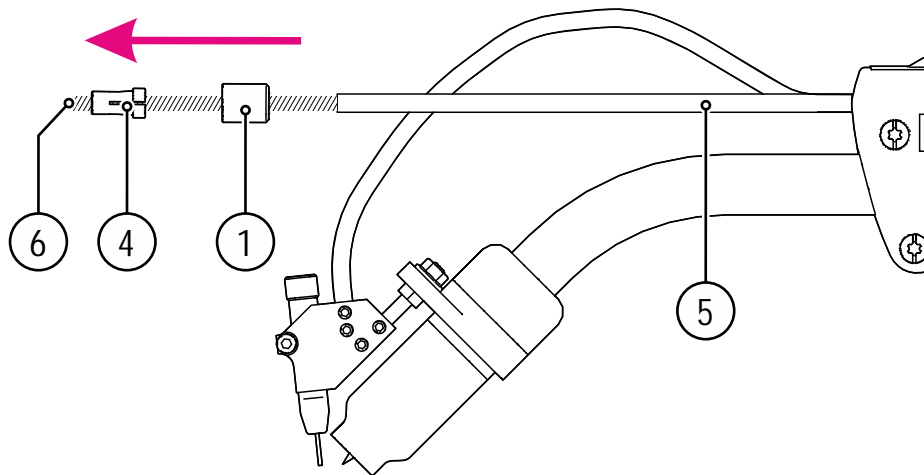


Figure 5-15

- Remove the crown nut, collet chuck and insulating tube from the combined liner.
- Extend and lay out the torch hose package.
- Remove the combined liner completely from the torch hose package.

4.

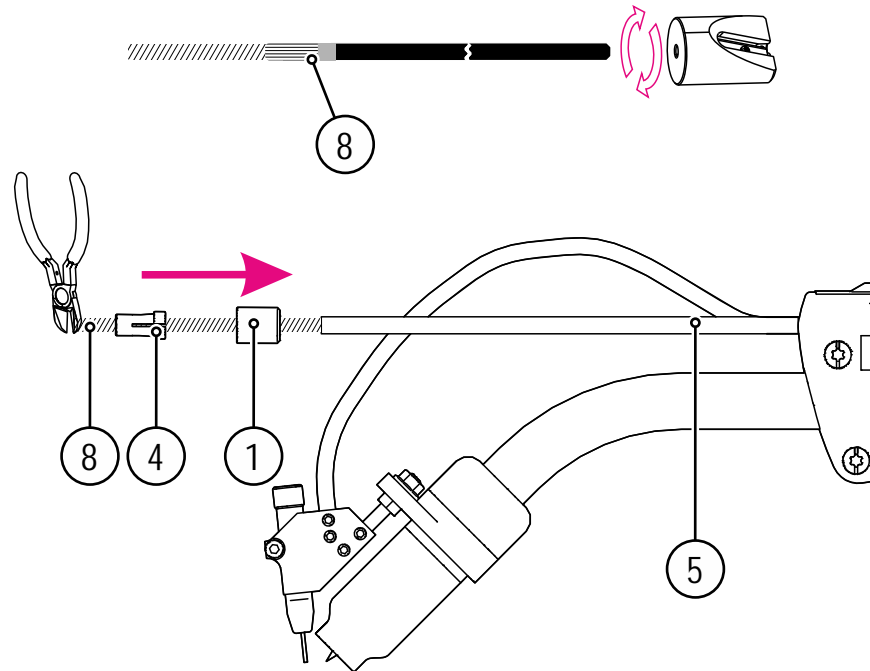


Figure 5-16

- Sharpen the new combined liner with a liner sharpener.
- Cut off the new combined liner to a length of at least 250 mm.
- Blow out the new combined liner with shielding gas or water- and oil-free compressed air.
- Push the new combined liner through the welding torch and the torch hose package as far as it goes.
- Plug the insulating tube and crown nut onto the new combined liner.
- Screw the collet chuck onto the new combined liner until the new combined liner protrudes 7 mm.

5.

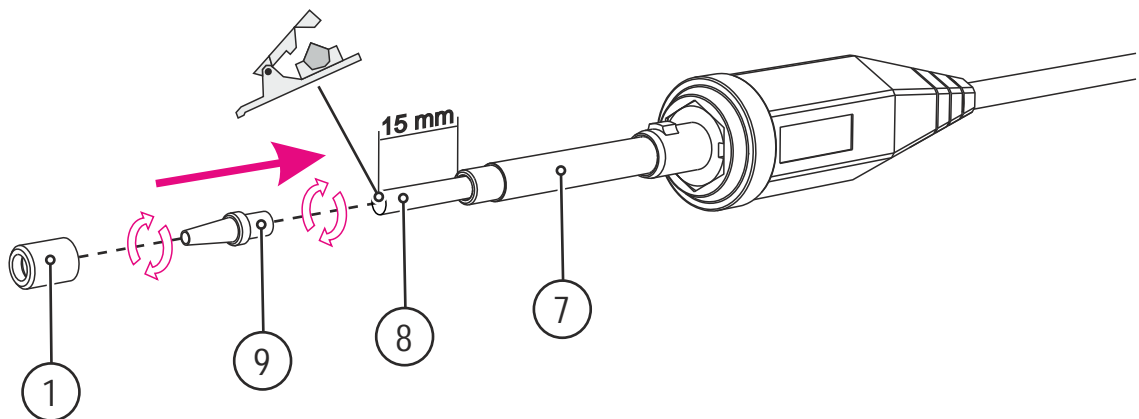


Figure 5-17

- Cut off the new combined liner with a tube cutter to a length of 15 mm.
- Manually screw the inlet guide onto the new combined liner.
- Plug the crown nut onto the inlet guide and manually screw to the inlet tube.

6.

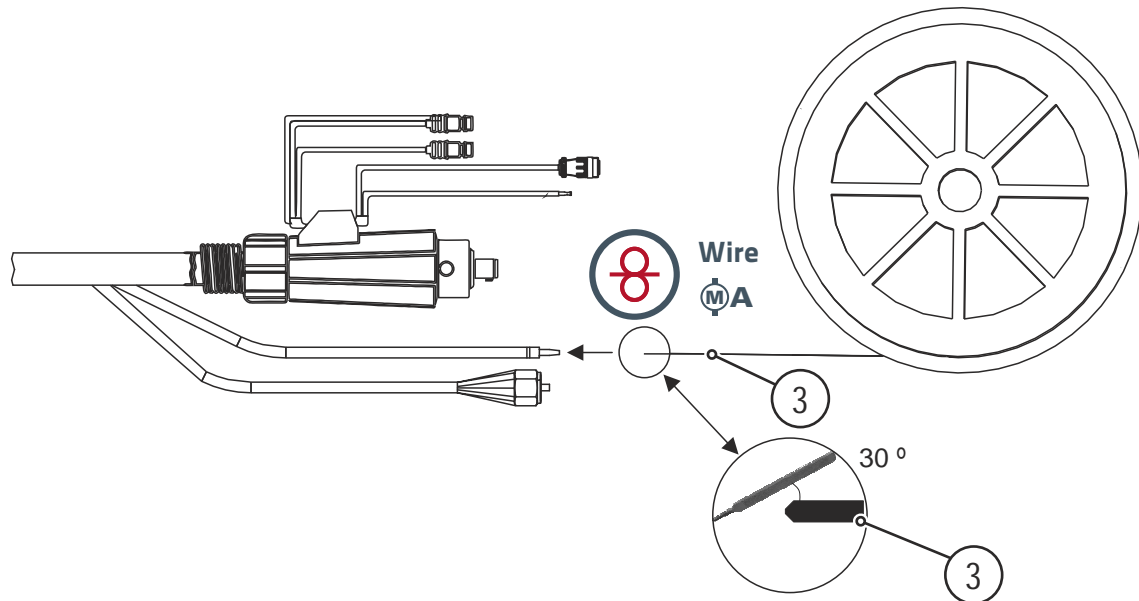


Figure 5-18

- Chamfer the welding wire at 30° before inserting into the new combined liner.
- Connect the torch connector to the wire feeding (see chapter "Connecting the welding torch").  
> see 5.3 chapter
- Using the wire feeding, insert the welding wire into the new combined liner until it protrudes at the welding torch.

7.

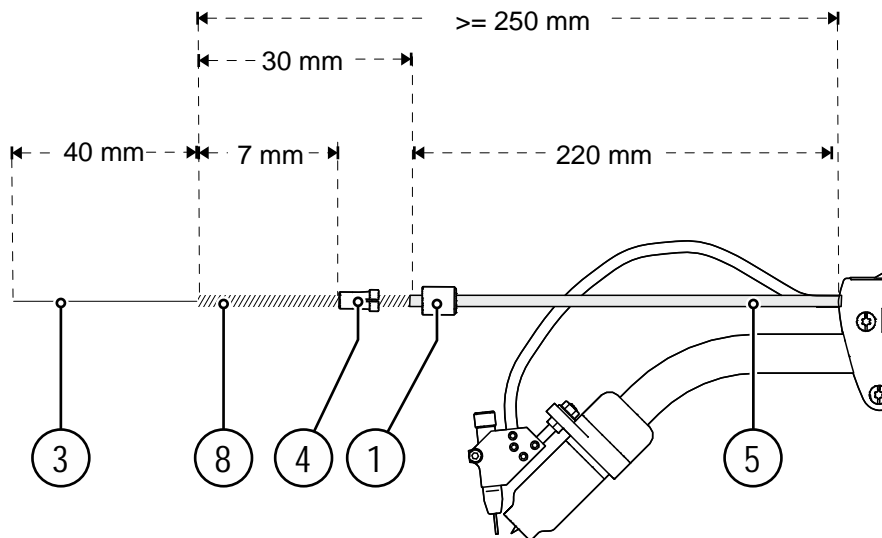
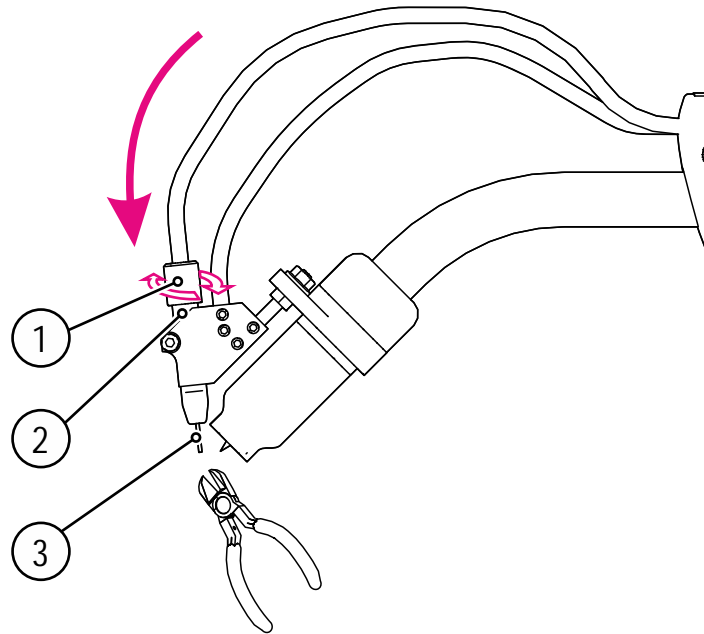


Figure 5-19



8.

*Figure 5-20*

- Insert the new combined liner into the jointing sleeve as far as it goes.
- Tighten the crown nut by hand.

## 5.6 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.

1. Cold or hot wire welding process (Hotwire = on/off)
2. Forward/backward motion selection (Freq = on/off)

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

### 5.6.1 Function sequences/operating modes



**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).**

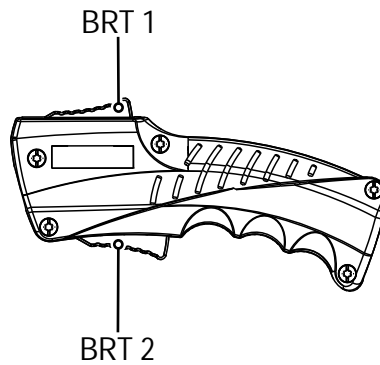


Figure 5-21

#### 5.6.1.1 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 <sub>START</sub>	Start program
P <sub>A</sub>	Main program
P <sub>B</sub>	Reduced main program
P <sub>END</sub>	End program
	Wire feeding

## 5.6.1.2 Non-latched Manual

 The welding machine has to be set to a latched operating mode.

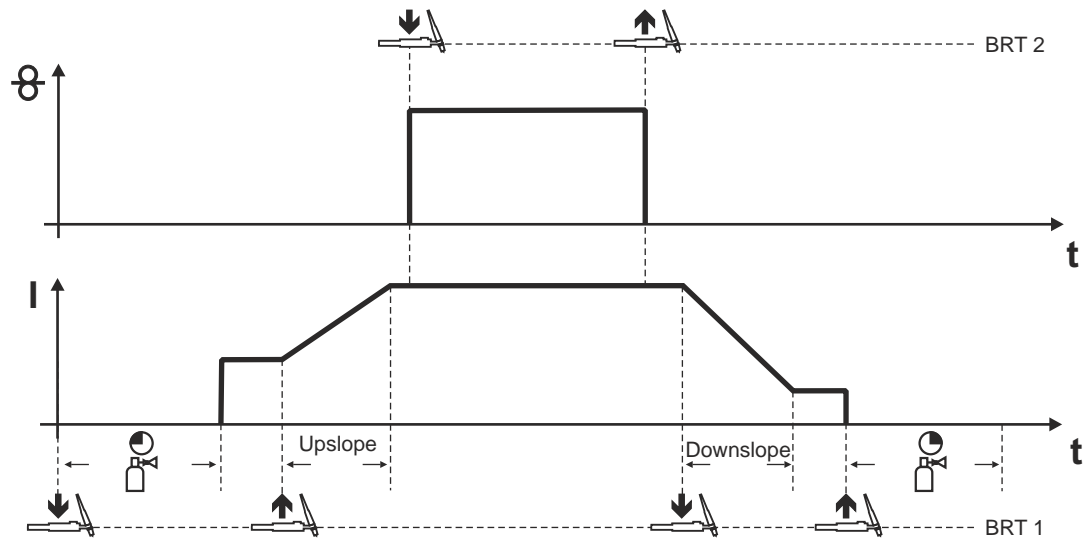


Figure 5-22

**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.

## 5.6.1.3 Latched manual

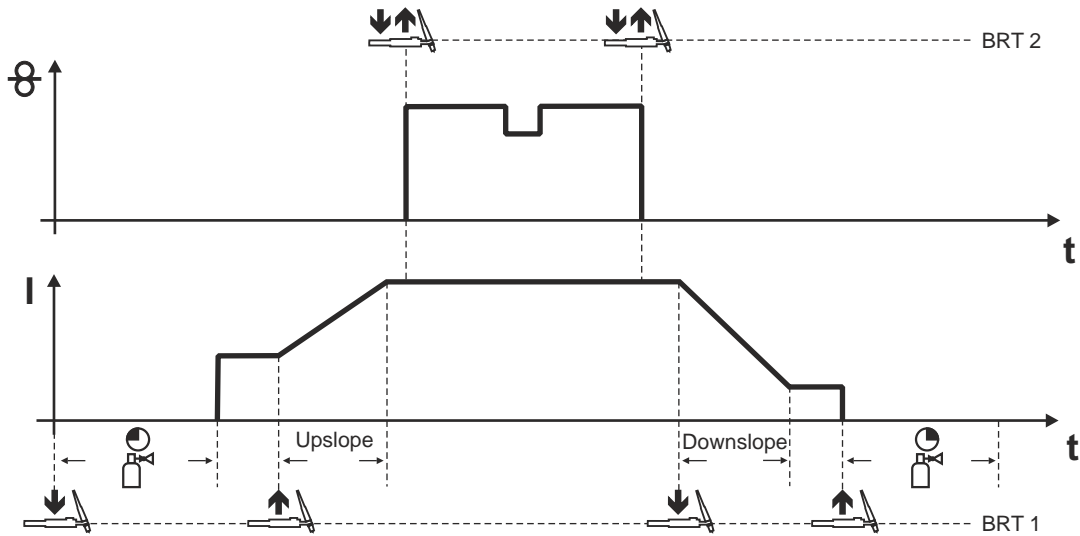


Figure 5-23

**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.



**Swiftly tap the torch trigger to change the function.**

**The tapping time set determines the functionality of the tapping function.**

## 5.6.1.4 Non-latched automatic

 **The welding current has to be set to a non-latched operating mode at the welding machine.**

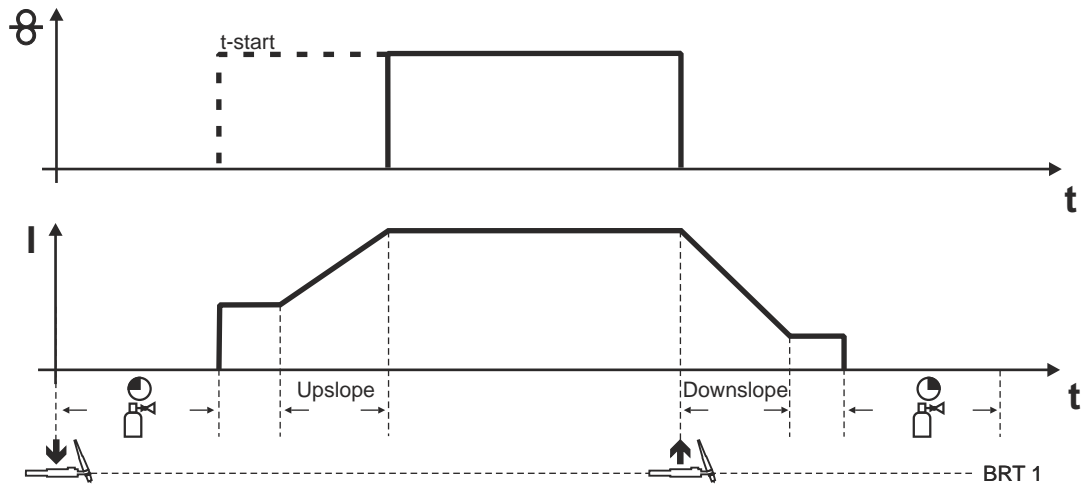


Figure 5-24


**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.

## 5.6.1.5 Latched automatic

 **The welding machine has to be set to a latched operating mode.**

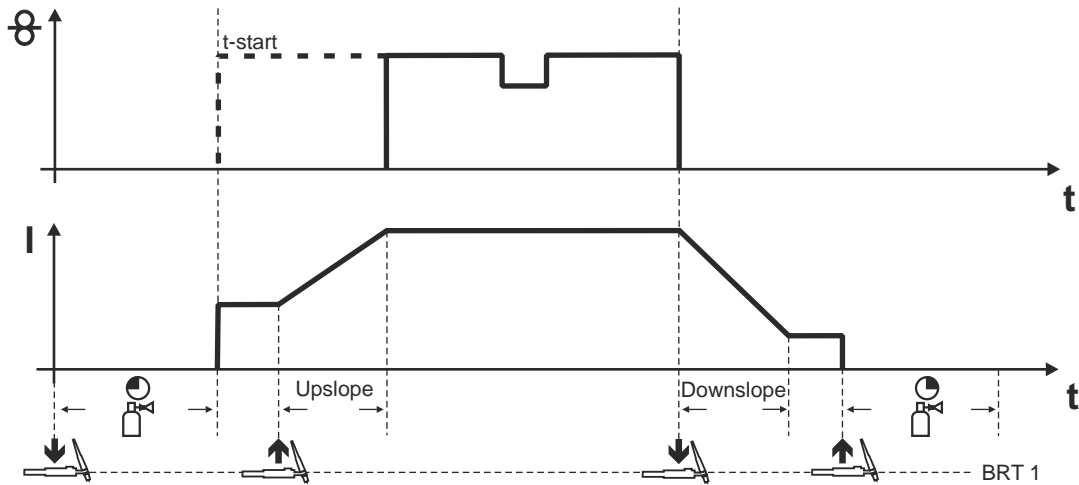


Figure 5-25

### 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.

## 5.6.1.6 TIG tacking

 **The welding current has to be set to a non-latched operating mode at the welding machine.**

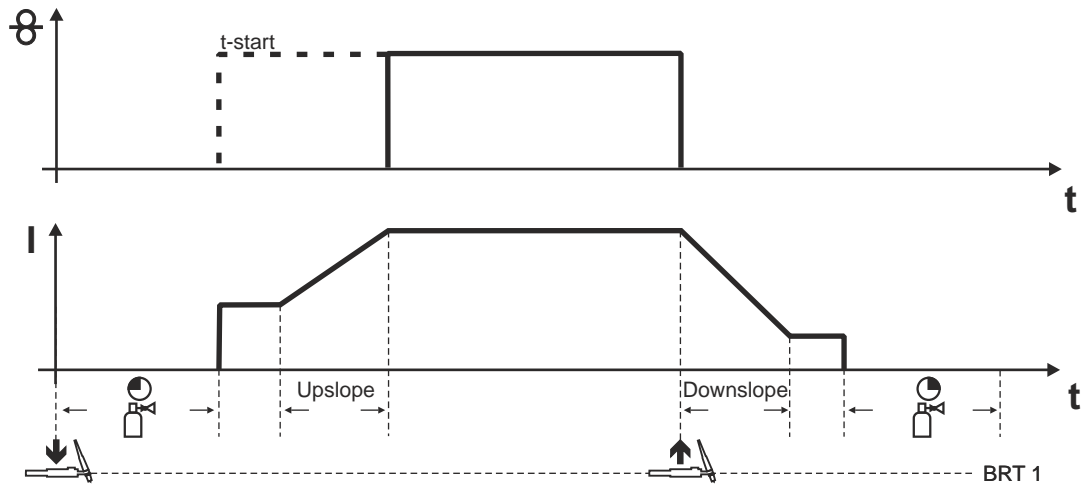


Figure 5-26

**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.

## 5.6.1.7 superPuls

The two functions **superPuls** and **superimposed forward/backward motion of the wire** can not be used simultaneously.

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

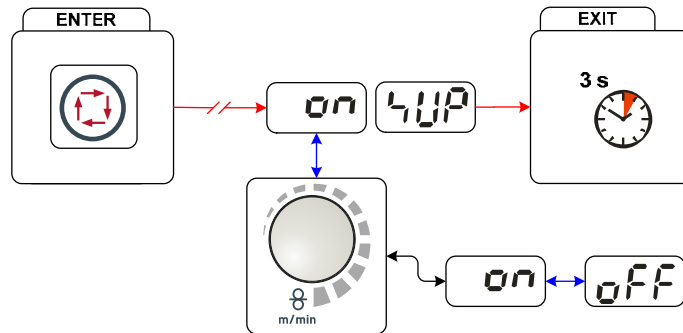


Figure 5-27

Display	Setting/selection
	<b>Switch on</b> Switching on machine function
	<b>Selects superPuls</b> Switches function on or off.
	<b>Switch off</b> Switching off machine function



## 6 Maintenance, care and disposal

### ⚠ CAUTION

**Electrical current!**

The following work must always be carried out with the power source switched off.

### 6.1 Maintenance work, intervals

#### 6.1.1 Daily maintenance tasks

- Purge the wire guide from the direction of the Euro torch connector with oil- and condensate-free compressed air or shielding gas.
- Check that coolant connections are tight.
- Check that the welding torch, and where applicable the power source cooling, are functioning correctly.
- Check the coolant level.
- Check torch, hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!
- Check the wearing parts in the torch.

#### 6.1.2 Monthly maintenance tasks

- Check the coolant container for sludge deposits and check the coolant for cloudiness. Clean the coolant container if contaminated, and change the coolant.
- If the coolant is dirty, rinse through the welding torch alternately several times with fresh coolant using the coolant return and supply.
- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- 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.
- Check the wire guide.
- Check that all screw and plug connections and replaceable parts are secured correctly, tighten if necessary.

### 6.2 Maintenance work

### CAUTION

**Electric current!****Repairs may only be carried out by authorised specialist staff!**

- Do not remove the torch from the hose package!
- Never clamp the torch body in a vice or similar, as this can cause the torch to be irreparably destroyed!
- If damage occurs to the torch or to the hose package which cannot be corrected as part of the maintenance work, the entire torch must be returned to the manufacturer

## 6.3 Disposing of equipment



### **Proper disposal!**

**The machine contains valuable raw materials, which should be recycled, and electronic components, which must be disposed of.**

- **Do not dispose of in household waste!**
- **Observe the local regulations regarding disposal!**



### 6.3.1 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.

## 6.4 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

#### Welding torch overheated

- ↘ Insufficient coolant flow
  - ✘ Check coolant level and refill if necessary
  - ✘ Eliminate kinks in conduit system (hose packages)
  - ✘ Completely unroll the hose package and the torch hose package
  - ✘ Observe maximal hose package length (see chapter "Welding torch cooling")
    - > see 5.2 chapter
- ↘ 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

#### Functional error with the welding torch operating elements

- ↘ Connection problems
  - ✘ Make control lead connections and check that they are fitted correctly.

#### 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
  - ✘ Enlarge liner or steel liner radius
- ↘ Kinked hose packages
  - ✘ Extend and lay out the torch hose package
- ↘ Incompatible parameter settings
  - ✘ Check settings and correct if necessary
- ↘ Lose inlet guide
  - ✘ Tighten inlet guide
- ↘ Torn or worn inlet guide
  - ✘ Replace inlet guide
- ↘ Torn jointing sleeve of the combined liner
  - ✘ Replace or reattach jointing sleeve
- ↘ Setting the spool brake
  - ✘ Check settings and correct if necessary
- ↘ Setting pressure units
  - ✘ Check settings and correct if necessary

## 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
- ✓ Arc between gas nozzle and workpiece (metal vapour on the gas nozzle)
  - ✘ Replace gas nozzle
- ✓ 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

 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)!

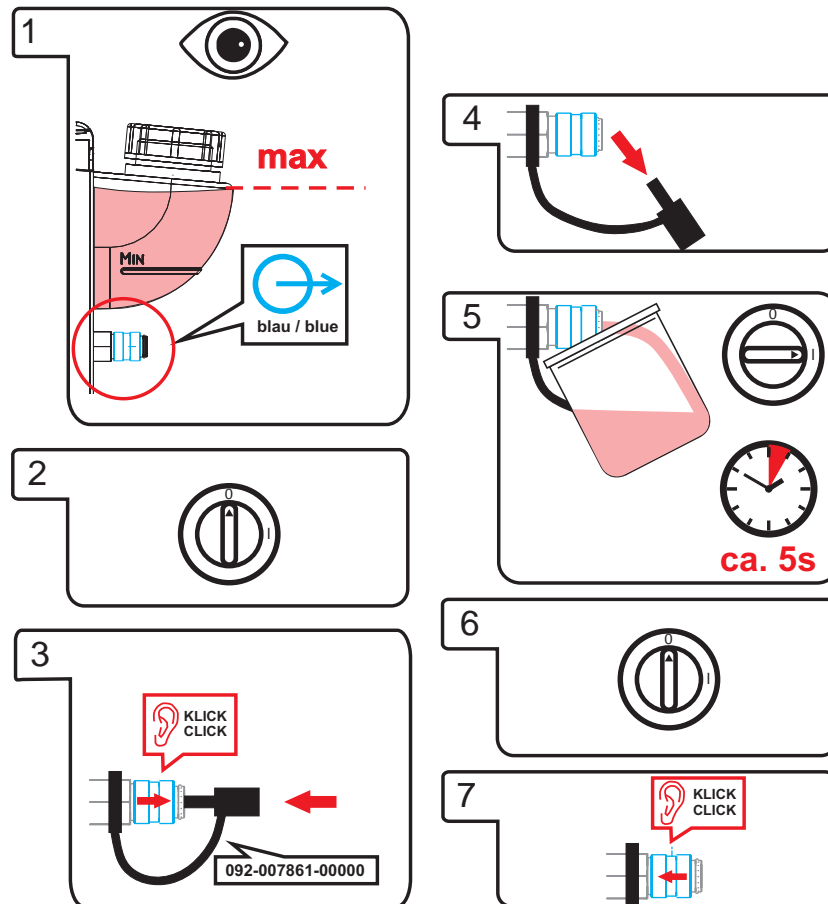


Figure 7-1

 Complete the following steps to vent the welding torch:

- Connect the welding torch to the cooling unit
- Switch on the welding machine
- Tap the torch trigger

Venting the welding torch starts and lasts for approx. 5 to 6 minutes.

## 8 Technical data

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

### 8.1 comfyTig 18-1 CW/HW

Type	CW (cold wire)	HW (hot wire)
Electrode polarity with DC	Normally negative	
Guide type	Manually operated	
Voltage type	DC or AC	
Duty cycle (DC)	300 A/100%	
Duty cycle (AC)	210 A/100%	
Voltage measurement	113 V peak value	
Max. arc ignition and voltage rating	12 kV	
Switching voltage push-button	0.02–42 V	
Switching current push-button	0.01–100 mA	
Switching power push-button	Max. 1 W (ohmic load)	
Required cooling capacity	Min. 800 W	
Max. supply line temperature	50 °C	
Torch input pressure, coolant	2.5–3.5 bar (min.–max.)	
Electrode diameter	0.5.–4.0 mm (standard TIG electrodes)	
Flow quantity (min.)	1.2 l/min	
Gas flow	10–20 l/min	
Hose package length	3 m/4 m	
Type of connection	Decentral	
Ambient temperature*	-10 °C to +40 °C	
Shielding gas	Shielding gas EN 439	
Protection rating for the machine connections (EN 60529)	IP3X	
Constructed to standard	IEC 60974-7	

 **\*Ambient temperature depends on coolant! Observe the coolant temperature range for the welding torch cooling!**

## 9 Replaceable parts

### 9.1 comfyTig 18-1 CW/HW

#### CAUTION



**Damage due to the use of non-genuine parts!**

**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.

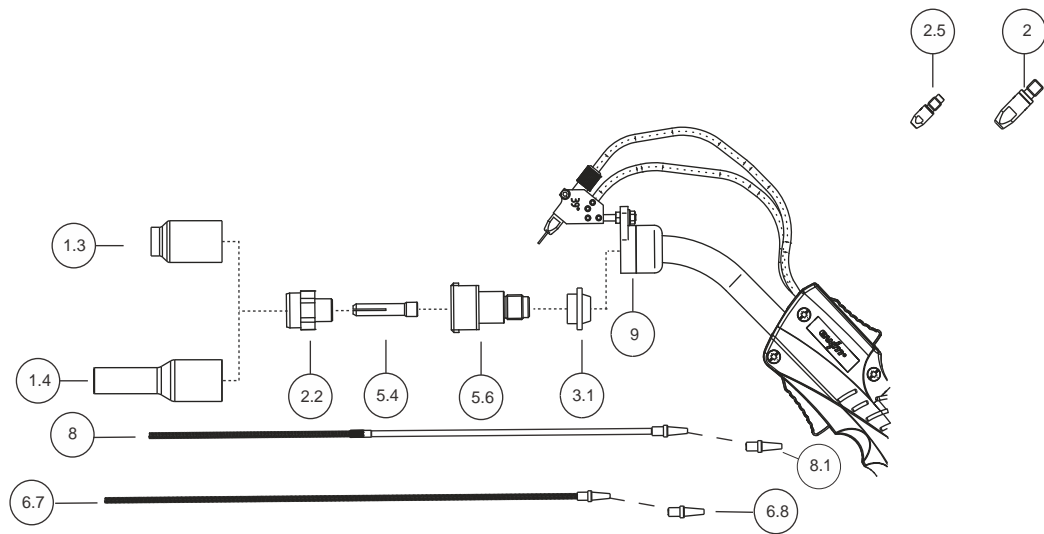


Figure 9-1

Item	Order number	Type	Designation
1.3	094-001195-00000	GNDIF TIG 17/18/26/18SC 11x47mm	Gas nozzle for gas lens
1.3	094-001196-00000	GNDIF TIG 17/18/26/18SC 12.5x47mm	Gas nozzle for gas lens
1.3	094-001320-00000	GNDIF TIG 17/18/26/18SC 6.5x42mm	Gas nozzle for gas lens
1.3	094-001321-00000	GNDIF TIG 17/18/26/18SC 8x42mm	Gas nozzle for gas lens
1.3	094-001322-00000	GNDIF TIG 17/18/26/18SC 9.5x42mm	Gas nozzle for gas lens
1.3	094-001323-00000	GNDIF TIG 17/18/26/18SC 16x42mm	Gas nozzle for gas lens
1.4	094-011135-00000	GNDIF TIG 17/18/26/18SC 8.0x76.0mm	Gas nozzle for gas lens
1.4	094-011136-00000	GNDIF TIG 17/18/26/18SC 9.5x76.0mm	Gas nozzle for gas lens
1.4	094-012694-00000	GNDIF TIG 17/18/26/18SC 11.0x76.0mm	Gas nozzle for gas lens
2	094-013071-00000	CT M6 CuCrZr, D=0,8 mm	Contact tip
2	094-013072-00000	CT M6 CuCrZr, D=1,0 mm, L=28 mm	Contact tip
2	094-013122-00000	CT M6 CuCrZr, D=0,9 mm	Contact tip
2	094-014317-00000	CT M6 CuCrZr D=1,2 mm	Contact tip
2.2	094-001362-00000	COLB DIF 18SC D=3.2MM	Collet body with gas lens
2.2	094-001363-00000	COLB DIF 18SC D=4.0MM	Collet body with gas lens
2.2	094-012698-00000	COLB DIF 18SC D=1.6MM	Collet body with gas lens
2.2	094-012699-00000	COLB DIF 18SC D=2.4MM	Collet body with gas lens
2.5	094-016758-00000	CT M5X19 mm CuCrZr D=1,0 mm	Contact tip
2.5	094-016775-00000	CT M5X19 mm CuCrZr D=0,8 mm	Contact tip
2.5	094-016776-00000	CT M5X19 mm CuCrZr D=1,2 mm	Contact tip
3.1	094-001194-00000	INS TIG 17/18/26 XL	Adapters

Item	Order number	Type	Designation
5.4	094-017284-00000	COL 17/18/26 D1.6MM L=29.5MM	Collet
5.4	094-017285-00000	COL 17/18/26 D2.4MM L=29.5MM	Collet
5.4	094-019288-00000	COL 17/18/26 D3,2 L=29,5MM	Collet
5.6	094-021094-00001	SCOL comfyTig	Collet body mount
6.7	092-018693-00003	D=2,0 x 4,0 mm, 3,5 m, St	Steel liner
6.7	092-018693-00004	D=2,0 x 4,0 mm, 4,5 m, St	Steel liner
6.7	092-018694-00003	D=2,0 x 4,0 mm, 3,5 m, CrNi	Steel liner, stainless steel
6.7	092-018694-00004	D=2,0 x 4,0 mm, 4,5 m, CrNi	Steel liner, stainless steel
6.7	092-018694-00005	DFS 2,0MM/4,0MM L=5,5M CRNI	Steel liner, stainless steel
6.7	092-018695-00003	D=1,5 x 3,3 mm, 3,5 m, St	Steel liner
6.7	092-018695-00004	D=1,5 x 3,3 mm, 4,5 m, St	Steel liner
6.7	092-018696-00003	D=1,5 x 3,3 mm, 3,5 m, CrNi	Steel liner, stainless steel
6.7	092-018696-00004	D=1,5 x 3,3 mm, 4,5 m, CrNi	Steel liner, stainless steel
6.7	092-018697-00003	D=2,0 x 4,0 mm, 3,5 m, CuZn	Steel liner, brass
6.7	092-018697-00004	D=2,0 x 4,0 mm, 4,5 m, CuZn	Steel liner, brass
6.8	094-020069-00000	ES 4,0MM	Inlet guide, spiral
6.8	094-020159-00000	ES 3,3MM	Inlet guide, spiral
8	092-018706-00003	LPA COMBI 2.0mm x 4.0mm 3.5m	Combined liner, PA
8	092-018706-00004	LPA COMBI 2.0mm x 4.0mm 4.5m	Combined liner, PA
8.1	094-014032-00001	WFN 4.0mm	Inlet guide, liner
9	094-008422-00000	O-RING 23.0x2.0	O-ring



# 10 Circuit diagram

## 10.1 comfyTig 18-1 CW/HW



The circuit diagrams are only intended for authorised service personnel!

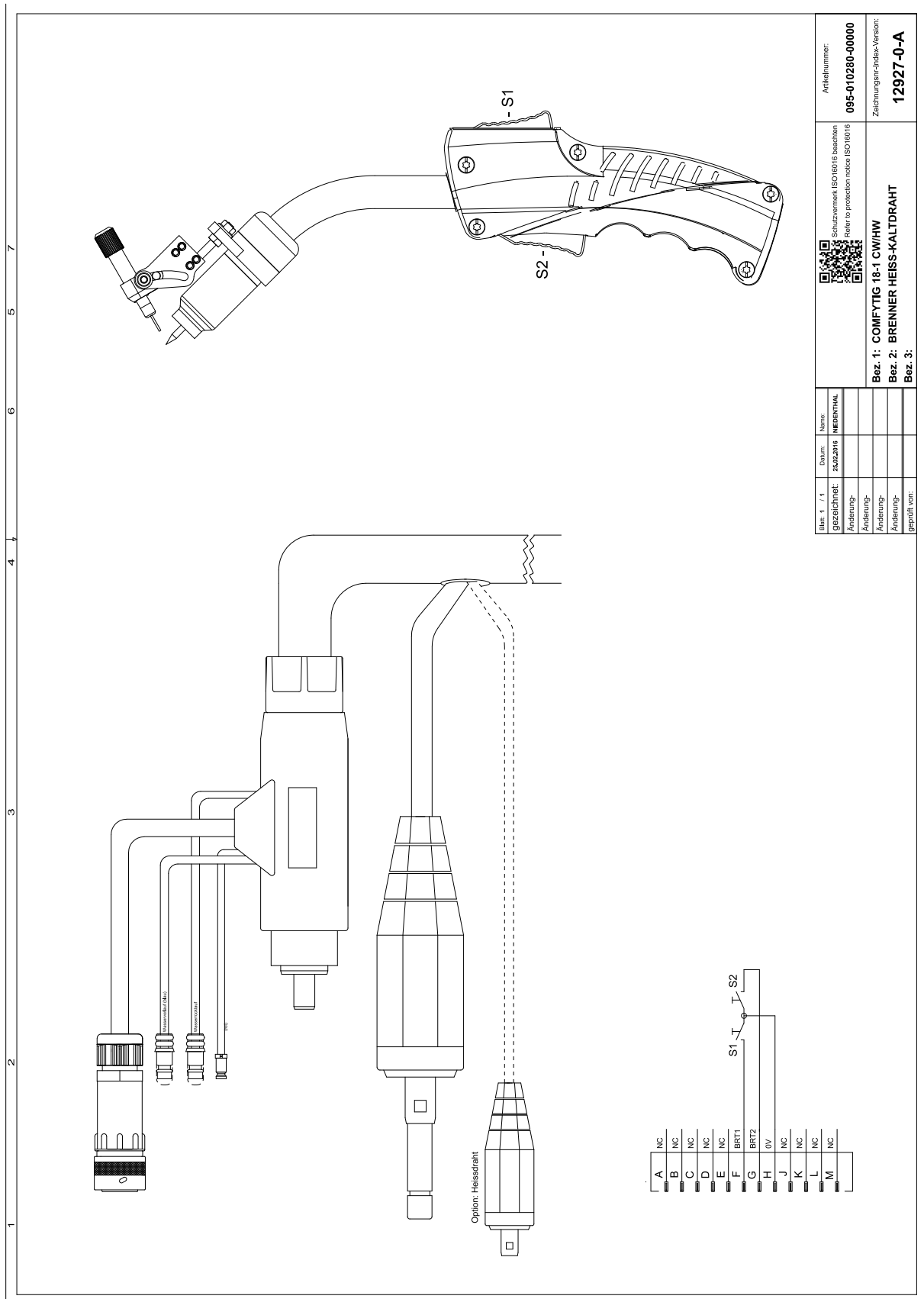


Figure 10-1

## 11 Appendix A

### 11.1 Overview of EWM branches

#### Headquarters

**EWM AG**  
Dr. Günter-Henle-Straße 8  
56271 Mündersbach · Germany  
Tel: +49 2680 181-0 · Fax: -244  
www.ewm-group.com · info@ewm-group.com

#### Technology centre

**EWM AG**  
Forststraße 7-13  
56271 Mündersbach · Germany  
Tel: +49 2680 181-0 · Fax: -144  
www.ewm-group.com · info@ewm-group.com



#### Production, Sales and Service

**EWM AG**  
Dr. Günter-Henle-Straße 8  
56271 Mündersbach · Germany  
Tel: +49 2680 181-0 · Fax: -244  
www.ewm-group.com · info@ewm-group.com

**EWM HIGHTEC WELDING s.r.o.**  
9. května 718 / 31  
407 53 Jiríkov · Czech Republic  
Tel.: +420 412 358-551 · Fax: -504  
www.ewm-jirikov.cz · info@ewm-jirikov.cz

**EWM HIGH TECHNOLOGY (Kunshan) Ltd.**  
10 Yuanshan Road, Kunshan · New & Hi-tech Industry Development Zone  
Kunshan City · Jiangsu · Post code 215300 · People's Republic of China  
Tel: +86 512 57867-188 · Fax: -182  
www.ewm.cn · info@ewm.cn · info@ewm-group.cn

#### Sales and Service Germany

**EWM AG**  
Sales and Technology Centre  
Grünauer Fenn 4  
14712 Rathenow · Tel: +49 3385 49402-0 · Fax: -20  
www.ewm-rathenow.de · info@ewm-rathenow.de

**EWM HIGHTEC WELDING GmbH**  
Sales and Technology Centre  
Draisstraße 2a  
69469 Weinheim · Tel: +49 6201 84557-0 · Fax: -20  
www.ewm-weinheim.de · info@ewm-weinheim.de

**EWM AG**  
Rudolf-Winkel-Straße 7-9  
37079 Göttingen · Tel: +49 551-3070713-0 · Fax: -20  
www.ewm-goettingen.de · info@ewm-goettingen.de

**EWM Schweißtechnik Handels GmbH**  
Karlsdorfer Straße 43  
88069 Tettngang · Tel: +49 7542 97998-0 · Fax: -29  
www.ewm-tettngang.de · info@ewm-tettngang.de

**EWM AG**  
Sachsstraße 28  
50259 Pulheim · Tel: +49 2234 697-047 · Fax: -048  
www.ewm-pulheim.de · info@ewm-pulheim.de

**EWM Schweißtechnik Handels GmbH**  
Heinkelstraße 8  
89231 Neu-Ulm · Tel: +49 731 7047939-0 · Fax: -15  
www.ewm-neu-ulm.de · info@ewm-neu-ulm.de

**EWM AG**  
August-Horch-Straße 13a  
56070 Koblenz · Tel: +49 261 963754-0 · Fax: -10  
www.ewm-koblenz.de · info@ewm-koblenz.de

**EWM AG**  
Eiserfelder Straße 300  
57080 Siegen · Tel: +49 271 3878103-0 · Fax: -9  
www.ewm-siegen.de · info@ewm-siegen.de

#### Sales and Service International

**EWM HIGH TECHNOLOGY (Kunshan) Ltd.**  
10 Yuanshan Road, Kunshan · New & Hi-tech Industry Development Zone  
Kunshan City · Jiangsu · Post code 215300 · People's Republic of China  
Tel: +86 512 57867-188 · Fax: -182  
www.ewm.cn · info@ewm.cn · info@ewm-group.cn

**EWM HIGHTEC WELDING UK Ltd.**  
Unit 2B Coopies Way · Coopies Lane Industrial Estate  
Morpeth · Northumberland · NE61 6JN · Great Britain  
Tel: +44 1670 505875 · Fax: -514305  
www.ewm-morpeth.co.uk · info@ewm-morpeth.co.uk

**EWM HIGHTEC WELDING GmbH**  
Wiesenstraße 27b  
4812 Pinsdorf · Austria · Tel: +43 7612 778 02-0 · Fax: -20  
www.ewm-austria.at · info@ewm-austria.at

**EWM HIGHTEC WELDING Sales s.r.o. / Prodejní a poradenské centrum**  
Tyršova 2106  
256 01 Benešov u Prahy · Czech Republic  
Tel: +420 317 729-517 · Fax: -712  
www.ewm-benesov.cz · info@ewm-benesov.cz

#### Liaison office Turkey

**EWM AG Türkiye İrtibat Bürosu**  
İkitelli OSB Mah. · Marmara Sanayi Sitesi P Blok Apt. No: 44  
Küçükçekmece / İstanbul Türkiye  
Tel.: +90 212 494 32 19  
www.ewm-istanbul.com.tr · info@ewm-istanbul.com.tr

