

# Table of contents

Safety.....	42
Safety.....	42
General.....	43
General.....	43
Up/Down torch.....	43
JobMaster welding torch.....	44
Replacing the user interface.....	46
Mounting the Wearing Parts.....	47
Installing wearing parts, A-type.....	47
Installing wearing parts, P-type.....	48
Installing wearing parts, P / TFC-type.....	49
Installation and Startup.....	52
Attaching the Torch Body.....	52
Connecting the welding torch to the power source and cooling unit.....	52
Connecting the extension hosepack.....	53
Twisting the Torch Body.....	56
Changing the torch body – gas-cooled welding torches.....	56
Changing the torch body – water-cooled welding torches.....	57
Preventing the torch body from being changed.....	59
Notes on flexible torch bodies.....	61
General.....	61
Definition of torch body bending.....	61
Maximum number of torch body bends.....	62
Bending possibilities.....	63
Articulated torch bodies.....	64
General.....	64
Assembling and setting up articulated torch body.....	64
Service, maintenance and disposal.....	65
General.....	65
Maintenance at every start-up.....	66
Disposal.....	66
Troubleshooting.....	67
Troubleshooting.....	67
Technical data.....	70
General.....	70
Gas-cooled torch body - TTB 80, TTB 160, TTB 220, TTB 260.....	70
Water-cooled torch body - TTB 180, TTB 300, TTB 400, TTB 500.....	71
Gas-cooled hosepack – THP 160i, THP 220i, THP 260i.....	73
Water-cooled hosepack – THP 300i, THP 400i, THP 500i.....	74
Gas-cooled extension hosepack - HPT 220i G.....	75
Water-cooled extension hosepack- HPT 400i.....	75
Explanation of footnotes.....	76

# Safety

---

## Safety



### WARNING!

#### **Danger from incorrect operation and work that is not carried out properly.**

This can result in severe personal injury and damage to property.

- ▶ All the work and functions described in this document must only be carried out by trained and qualified personnel.
  - ▶ Read and understand this document.
  - ▶ Read and understand all the Operating Instructions for the system components, especially the safety rules.
- 



### WARNING!

#### **Danger from electrical current and danger of injury from emerging wire electrode.**

This can result in severe personal injury and damage to property.

- ▶ Switch the power switch on the power source to - O -.
  - ▶ Disconnect the power source from the grid.
  - ▶ Ensure that the power source remains disconnected from the grid until all work is complete.
- 



### WARNING!

#### **Danger from electrical current.**

This can result in severe personal injury and damage to property.

- ▶ All cables, leads, and hosepacks must always be securely connected, undamaged, correctly insulated, and adequately sized.
- 



### CAUTION!

#### **Burning hazard due to hot welding torch components and coolant.**

Serious burns may result.

- ▶ Allow all welding torch components and the coolant to cool down to room temperature (+25 °C or +77 °F) before starting any of the work described in these Operating Instructions.
- 



### CAUTION!

#### **Risk of damage from operation without coolant.**

Serious damage to property may result.

- ▶ Never use water-cooled welding torches without coolant.
  - ▶ The manufacturer is not responsible for any damage resulting from improper use. All warranty claims are considered void in such cases.
- 



### CAUTION!

#### **Danger from coolant escaping.**

This can result in severe personal injury and damage to property.

- ▶ When disconnecting a welding torch from the cooling unit or wirefeeder, always seal the coolant hoses using the plastic seal attached to the torch.
-

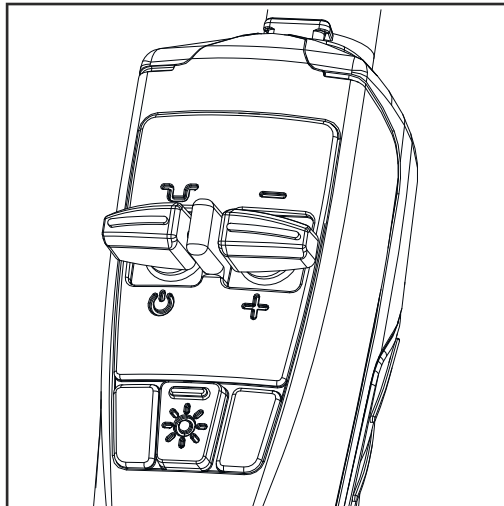
# General

## General

The TIG welding torches are especially robust and reliable. The ergonomic shell-type handle and optimal weight distribution allow you to work without becoming fatigued. The welding torches are available as gas and water-cooled units and can be adapted to suit a wide range of tasks.

The welding torches are primarily designed for manual series and single-lot production as well as for use in workshops.

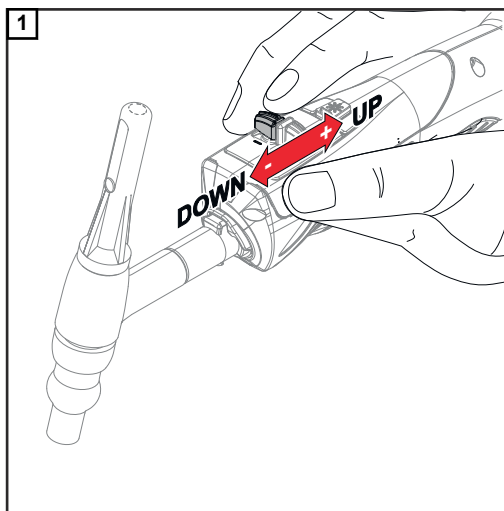
## Up/Down torch



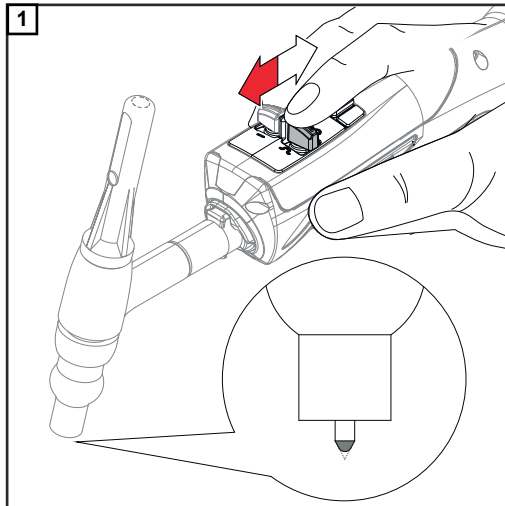
### The Up/Down torch has the following functions:

- Change the welding power using the up/down key (+/-)
- Illumination of the welding area via LED:  
Press button once - LED lights up for 5 seconds  
Hold button down - LED lights up continuously
- Cap-shaping in connection with the TIG AC welding process
- Intermediate lowering in connection with 4-step operating mode ( $I_1 > I_2$ )

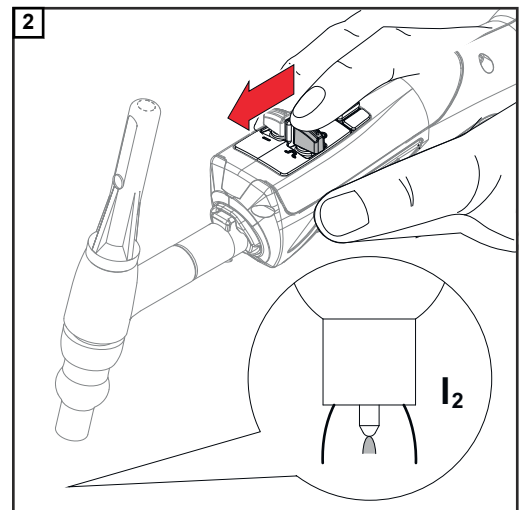
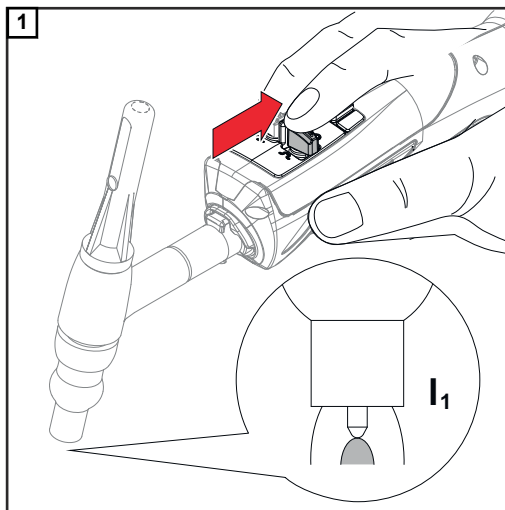
### Changing the welding power



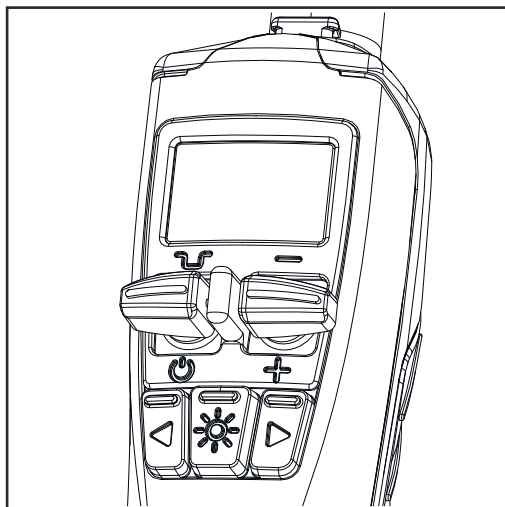
## Cap-shaping



## Intermediate lowering



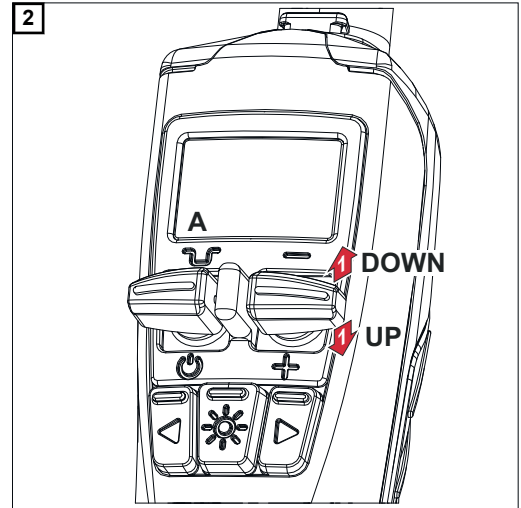
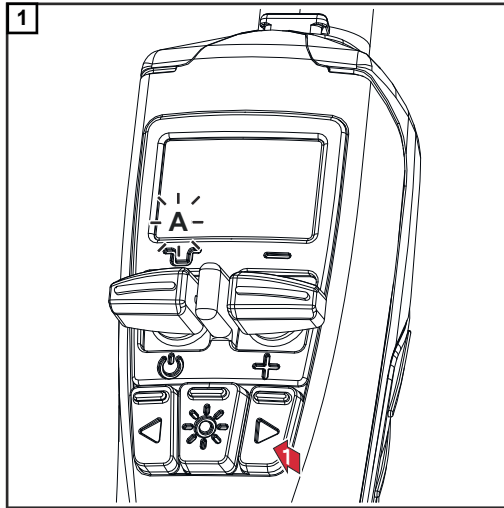
## JobMaster welding torch



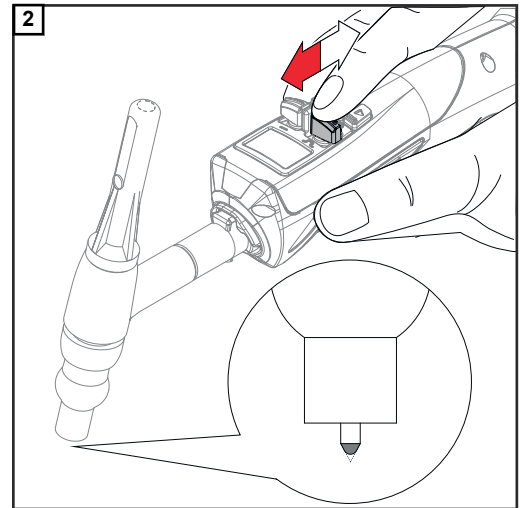
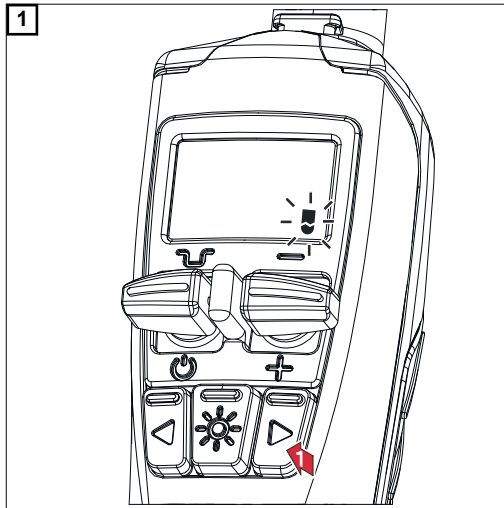
## The JobMaster welding torch has the following functions:

- Ergonomic display and adjustment of essential parameters directly on the welding torch
- Optimal control of the welding process without restricted handling
- Change the welding power using the up/down key (+/-)
- Illumination of the welding area via LED:  
Press button once - LED lights up for 5 seconds  
Hold button down - LED lights up continuously
- Cap-shaping in connection with the TIG AC welding process
- Intermediate lowering in connection with 4-step operating mode ( $I_1 > I_2$ )

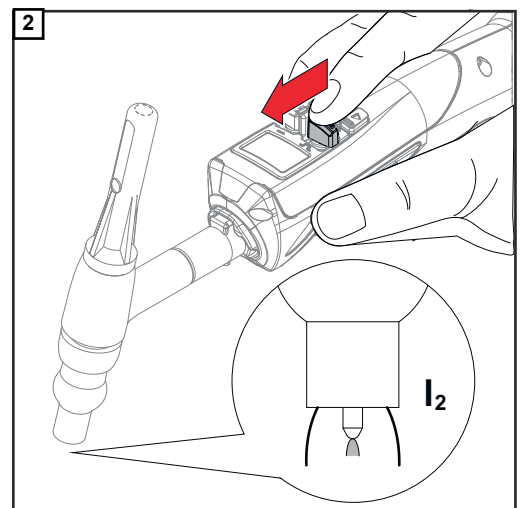
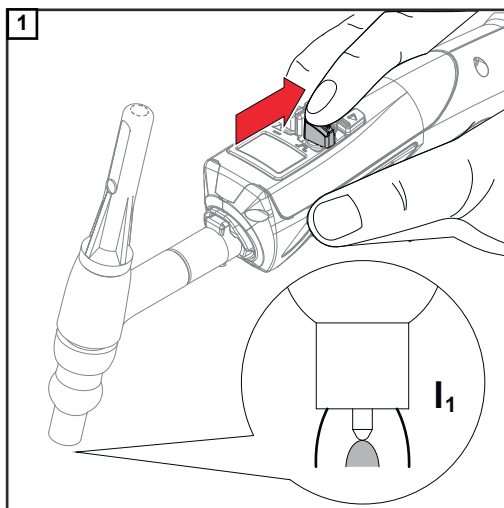
### Changing the welding power



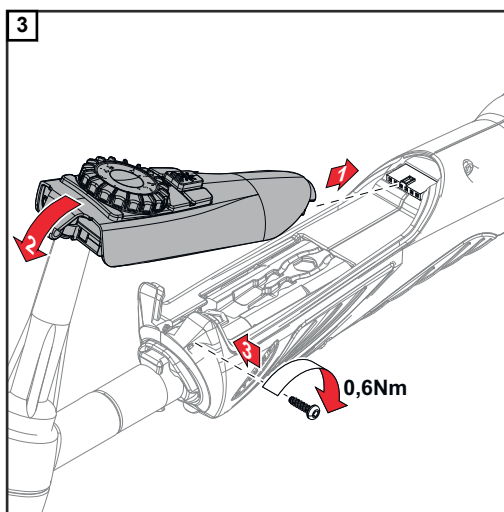
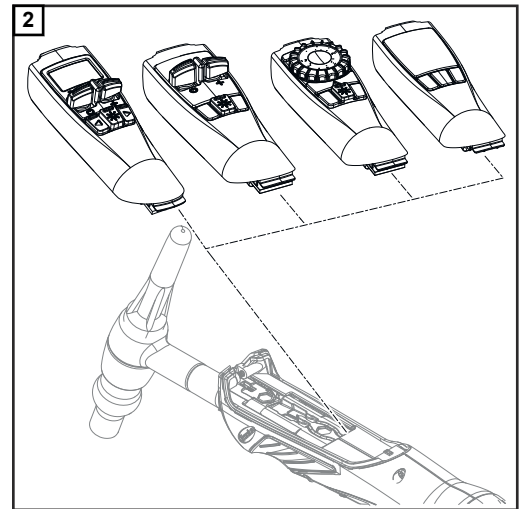
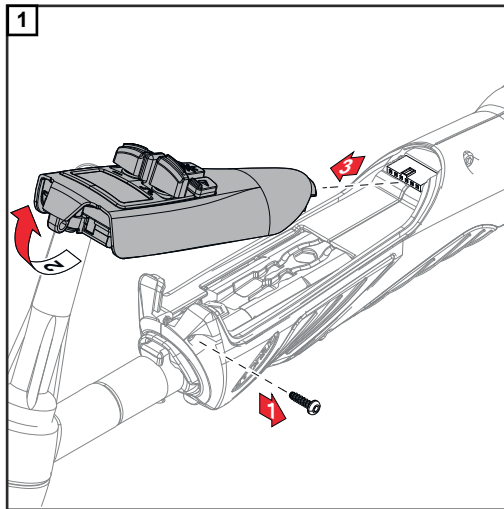
### Cap-shaping



### Intermediate lowering



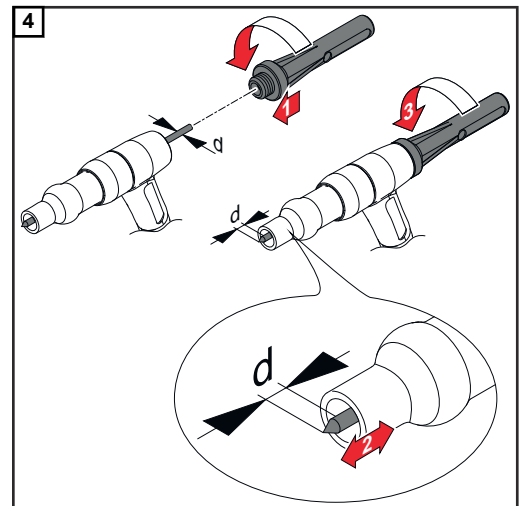
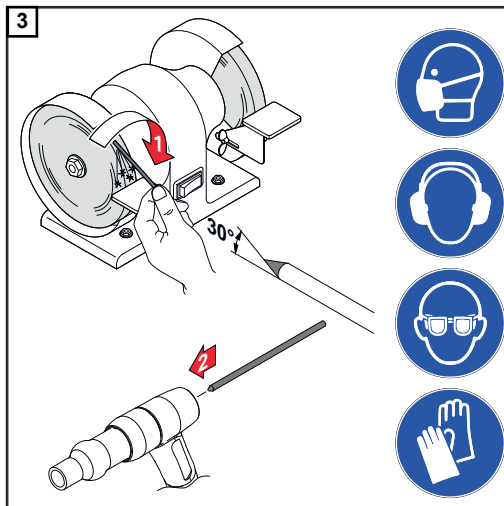
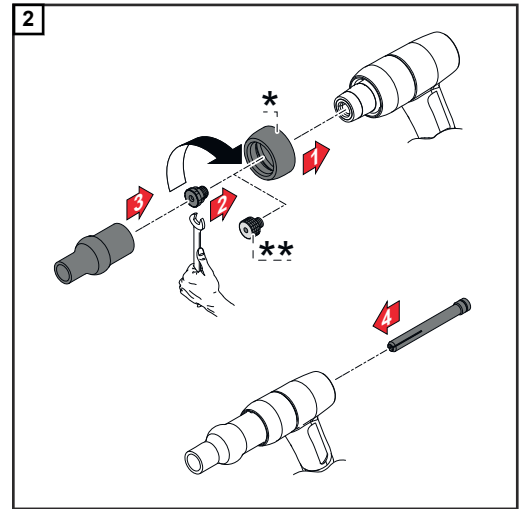
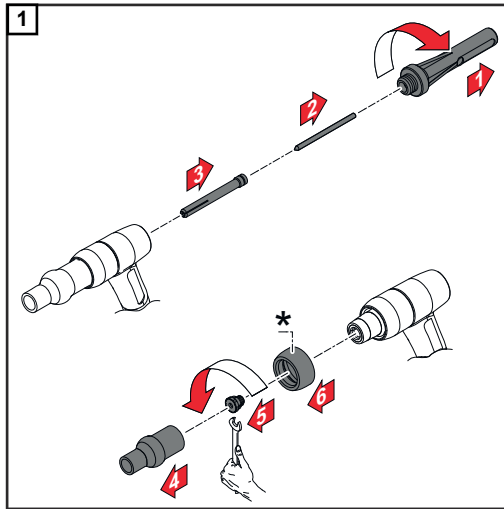
## Replacing the user interface



# Mounting the Wearing Parts

## Installing wearing parts, A-type

### Wearing part set-up, A-type gas nozzle (push-on type)



### NOTE!

Only tighten the torch cap enough so that the tungsten electrode can no longer be moved by hand.

\* Replaceable rubber sealing sleeve only for TTB 220 G/A

\*\* A gas lens may be used instead of the clamping nut, depending on the type of welding torch.

### ⚠ CAUTION!

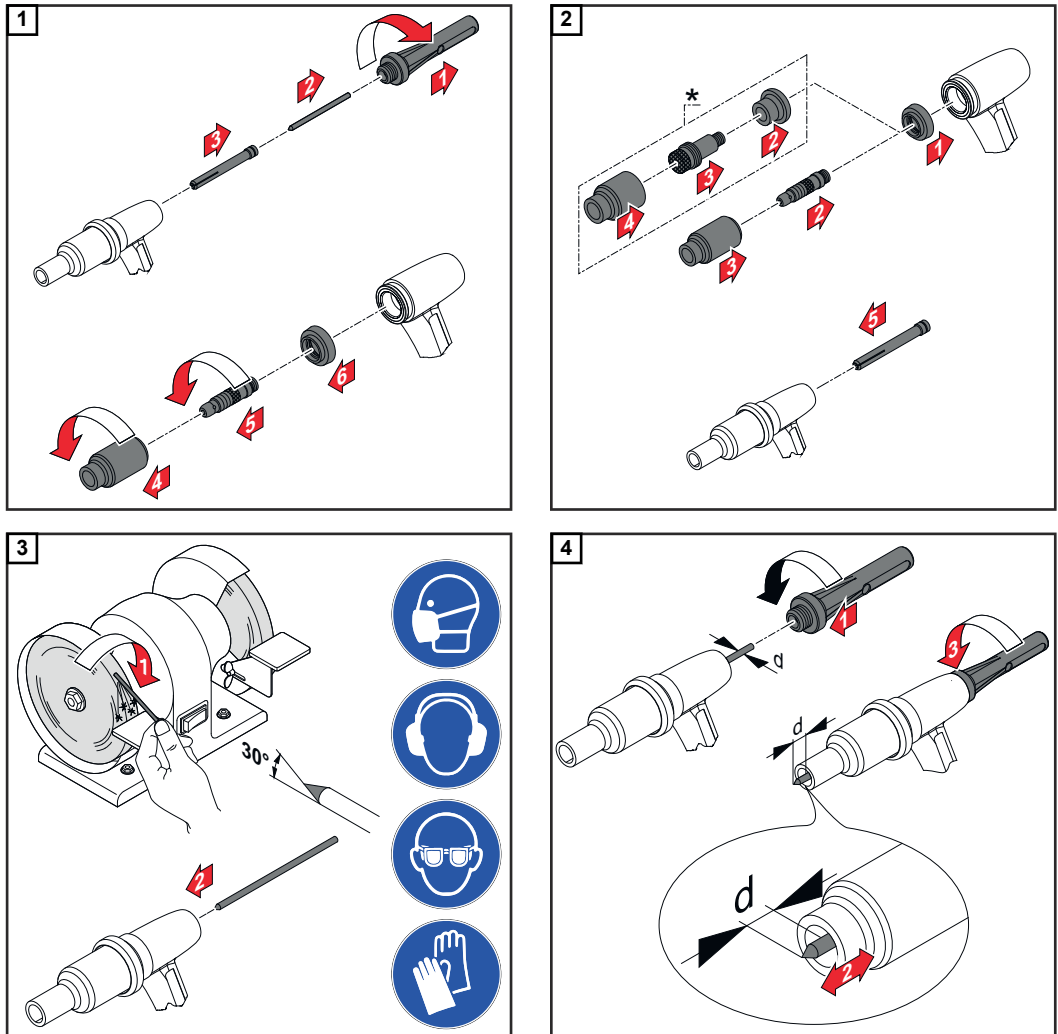
**Risk of damage due to excessive tightening torque!**

Damage to the thread may result.

► Only tighten the clamping nut or gas lens slightly.

**Installing wearing parts, P-type**

**Wearing part set-up, P-type gas nozzle (screw type)**



**NOTE!**

**Only tighten the torch cap enough so that the tungsten electrode can no longer be moved by hand.**

\* Replaceable rubber sealing sleeve only for TTB 220 G/P

\*\* A gas lens may be used instead of the clamping nut, depending on the type of welding torch.

**CAUTION!**

**Risk of damage due to excessive tightening torque!**

Damage to the thread may result.

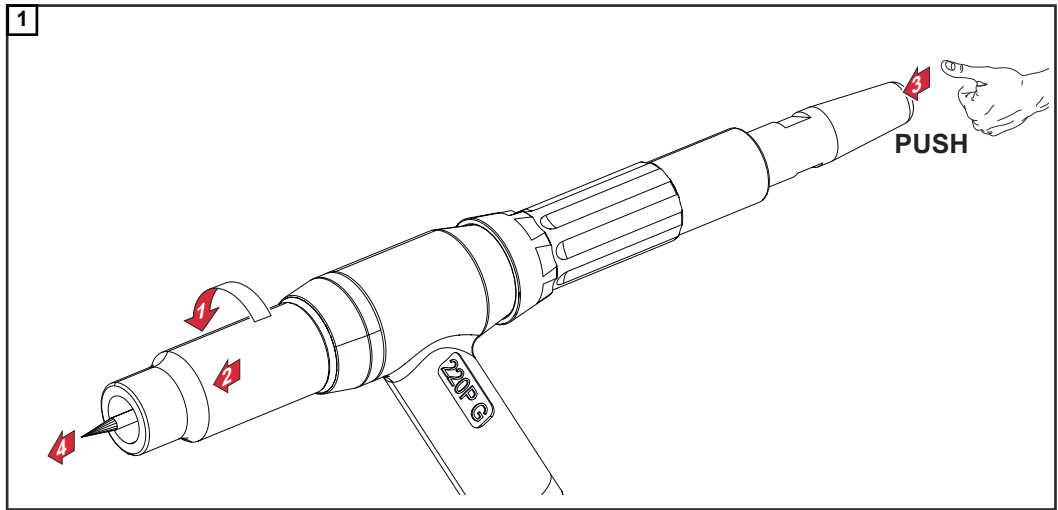
► Only tighten the clamping nut or gas lens slightly.



**Installing wearing parts, P / TFC-type**

Wearing part set-up, P-type with gas nozzle (screw type)  
TFC = Tungsten Fast Clamp

**Removal:**

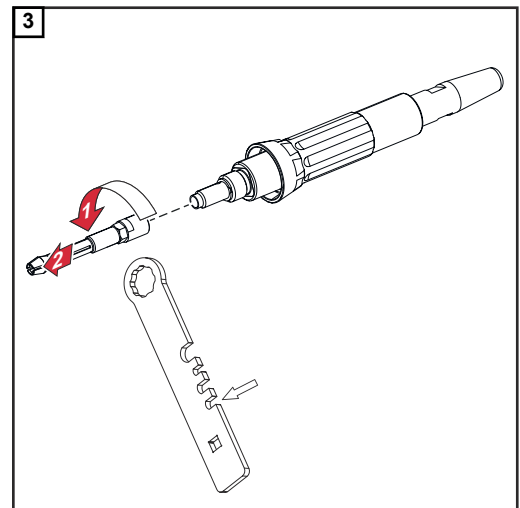
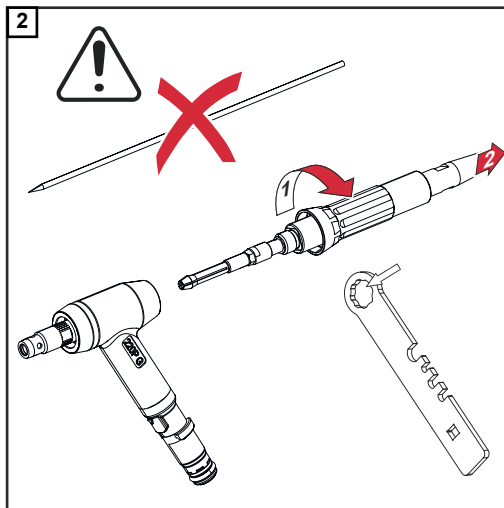


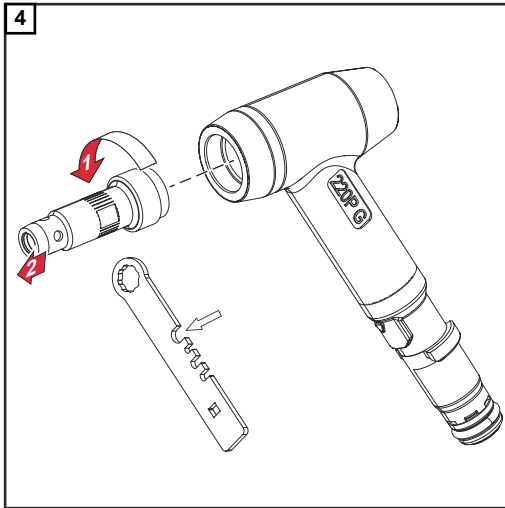
**⚠ CAUTION!**

**Risk of damage to clamping unit and collet chuck!**

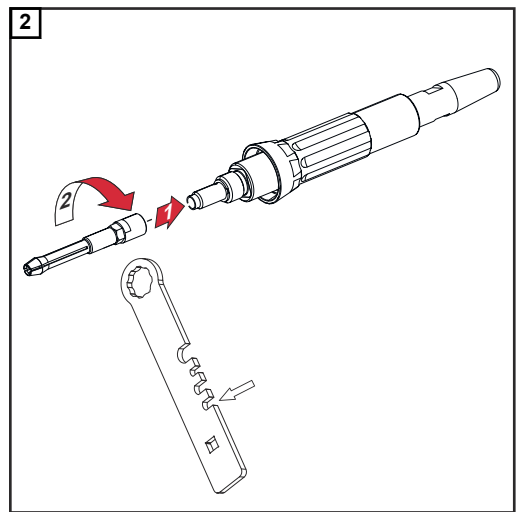
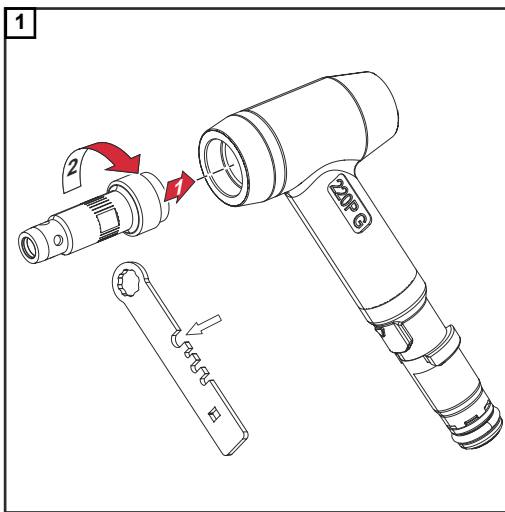
An inserted tungsten electrode leads to severe damage during disassembly and installation of the clamping unit and collet chuck.

- ▶ Always disassemble or install the clamping unit and collet without tungsten electrode!





**Installation:**

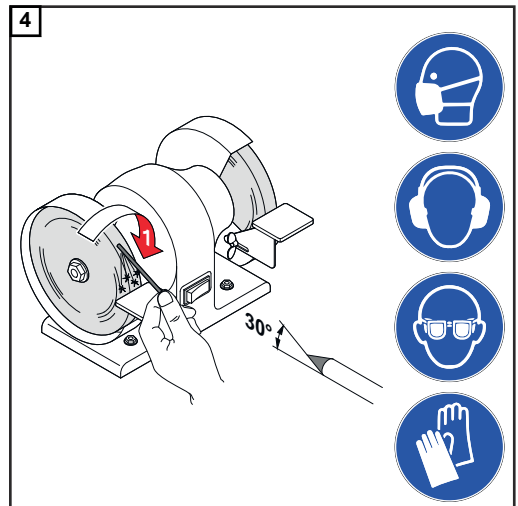
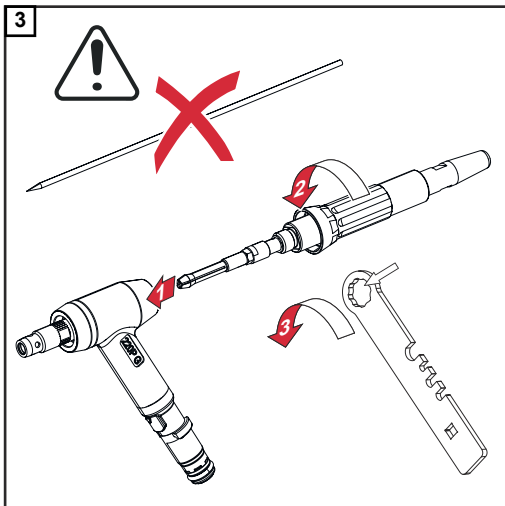


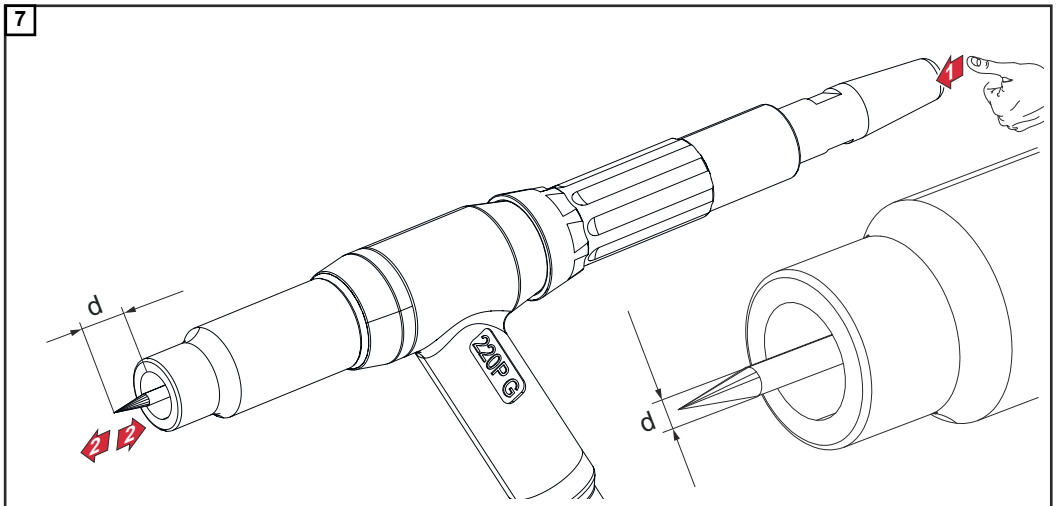
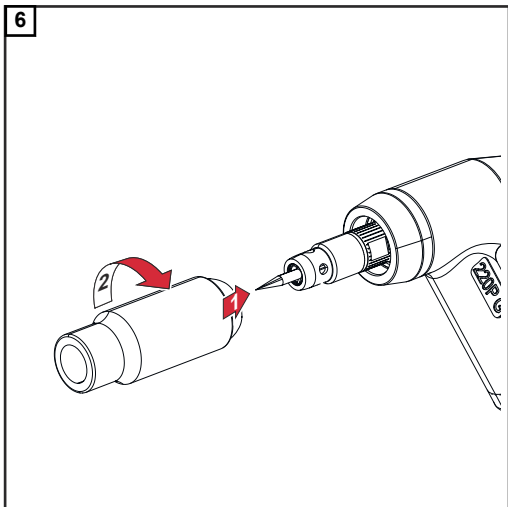
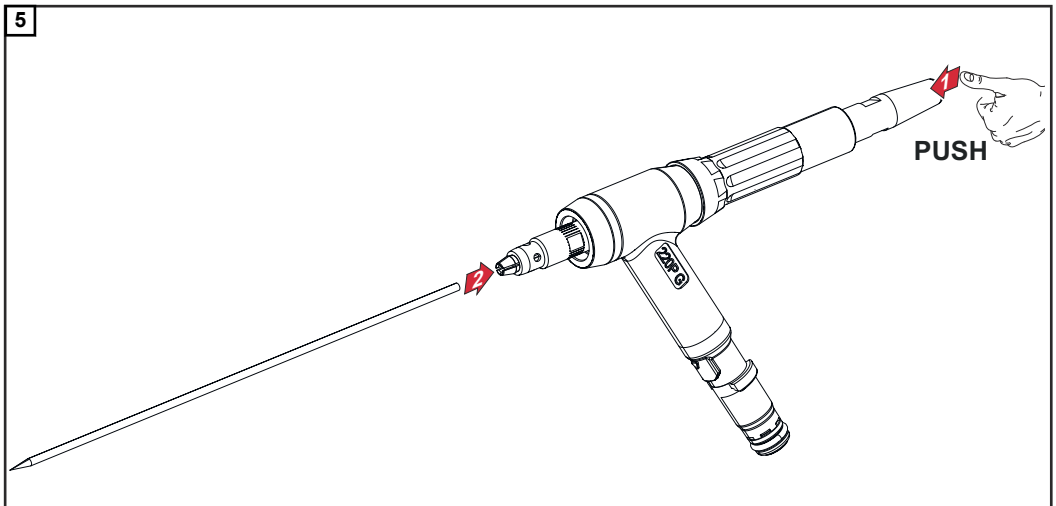
**⚠ CAUTION!**

**Risk of damage to clamping unit and collet chuck!**

An inserted tungsten electrode leads to severe damage during disassembly and installation of the clamping unit and collet chuck.

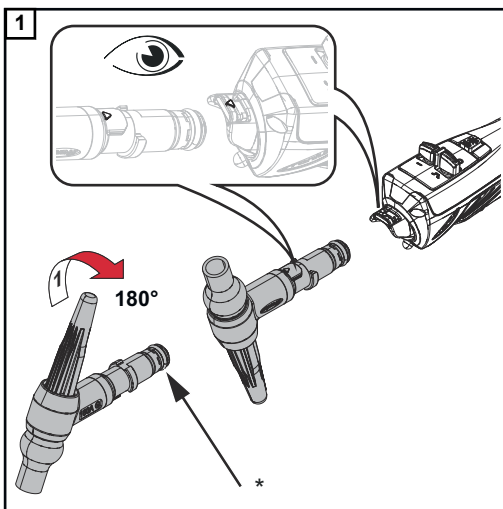
- ▶ Always disassemble or install the clamping unit and collet without tungsten electrode!



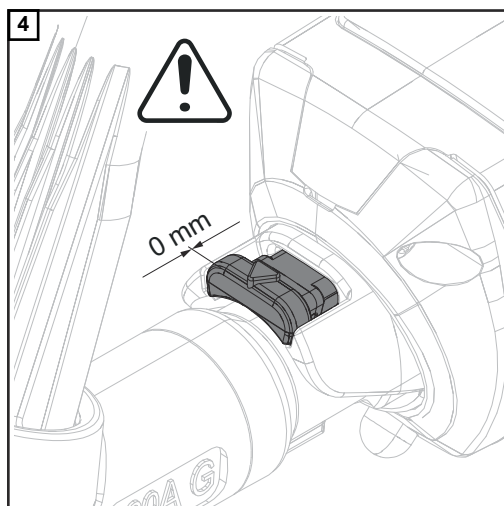
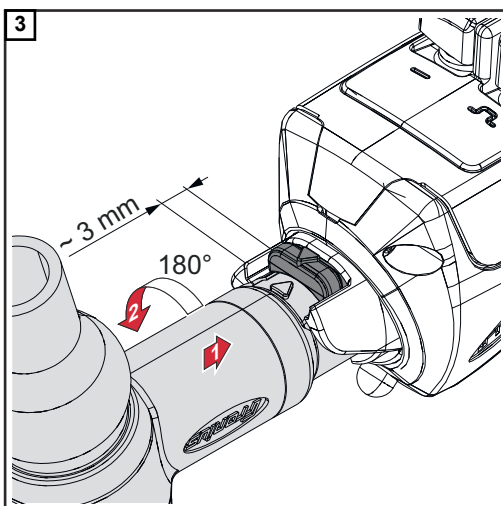
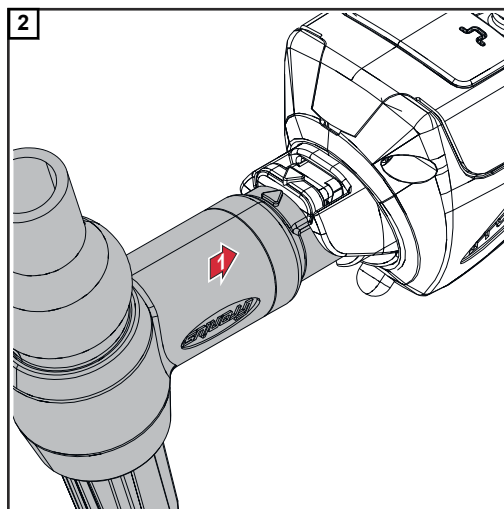


# Installation and Startup

## Attaching the Torch Body

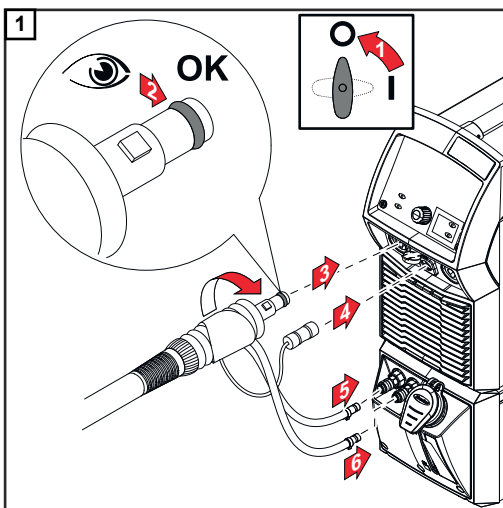


\* Grease the O-ring before installation!



**IMPORTANT!** When installing the torch body, ensure that it is pushed all the way in and snaps into place.

## Connecting the welding torch to the power source and cooling unit



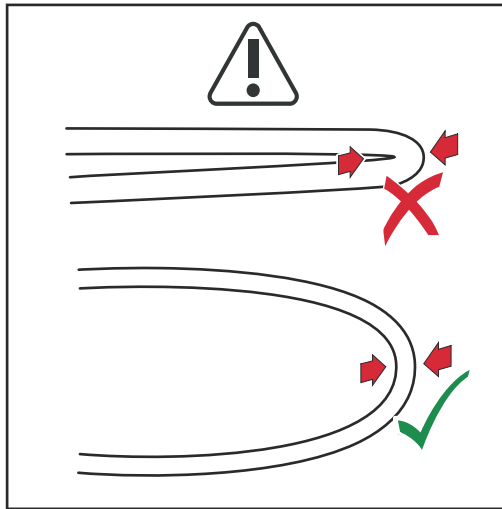
### NOTE!

Before commissioning, check the sealing ring on the welding torch connection and the coolant level.

Check the coolant flow during welding operation at regular intervals.

## Connecting the extension hosepack

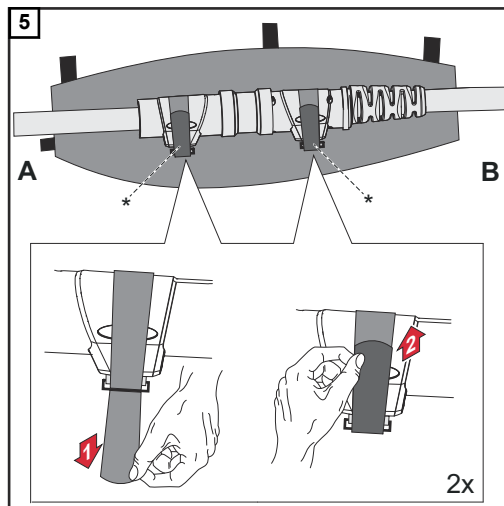
The extension hosepack is supplied with a protective bag, in which the interface between the extension hosepack and the torch hosepack must be laid.



### NOTE!

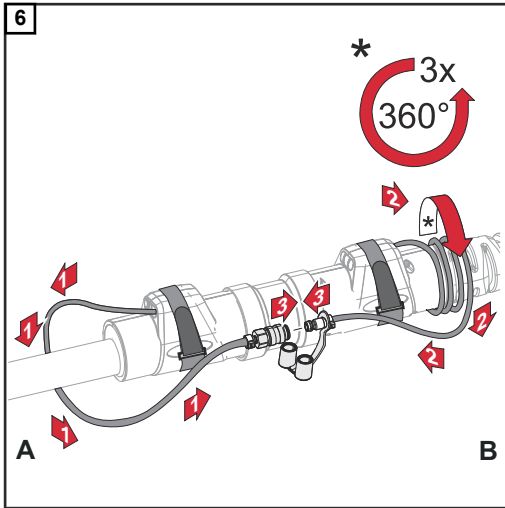
When performing the following activities, ensure that the cables and hoses are not trapped, kinked, cut, or otherwise damaged.

- 1 Position the protective bag so that the Fronius logo is visible and the loops are at the top:  
left = power source side (A)  
right = welding torch side (B)
- 2 Open the protective bag:
  - Position both zip pulls to the right as far as they will go
  - Pull the bottom tape end out of the zip pulls
- 3 Connect the power/gas connections of the extension hosepack and the torch hosepack to one another (bayonet latch)
- 4 Place the interface in the inside pocket of the protective bag



Secure the interface in the inside pocket with 2 Velcro strips

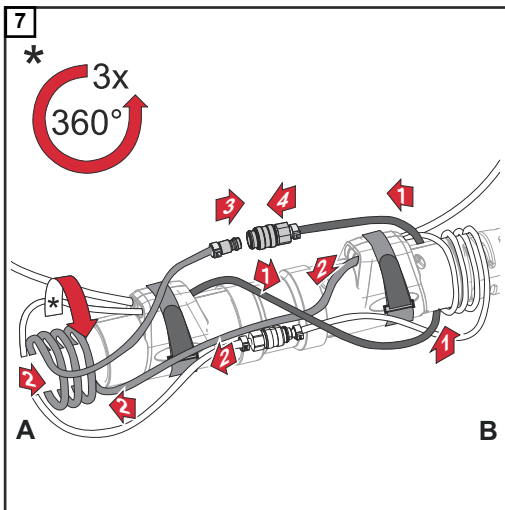
\* Velcro strips on the inside pocket (inside pocket not shown)



Route the coolant hose from the extension hosepack to the interface as shown

Wrap coolant hose from torch hosepack around the torch hosepack 3 times and route to interface

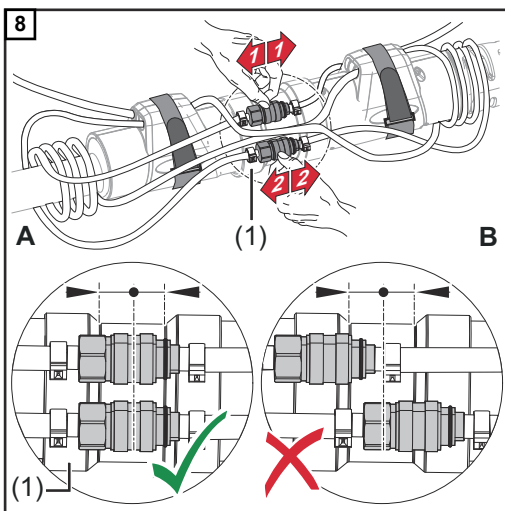
Connect the coolant hoses



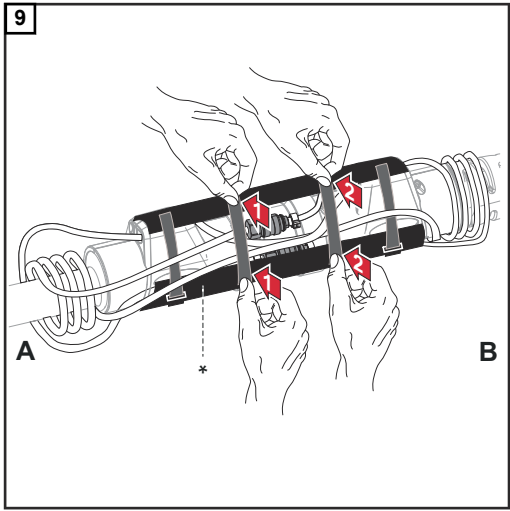
Route the second coolant hose from the torch hosepack to the extension hosepack as shown, wrap around the extension hosepack 3 times and route it back to the interface

Route the second coolant hose from the extension hosepack around the torch hosepack to the interface as shown

Connect the coolant hoses

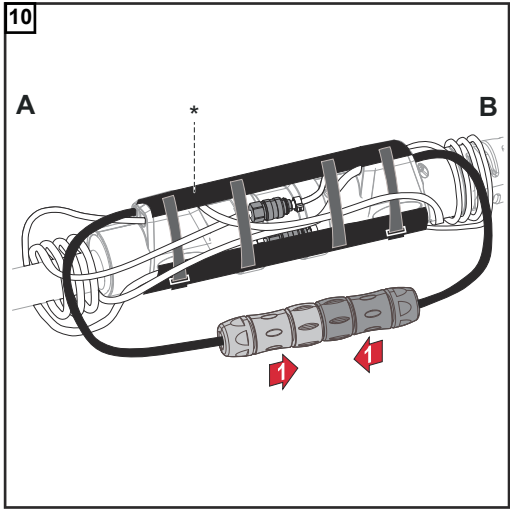


Align the coolant connections with each other and in the center of the insulating tube (1)



Attach the two Velcro strips supplied to the inside pocket

\* Inside pocket



Connect the TIG Multi Connector and position it next to the inside pocket

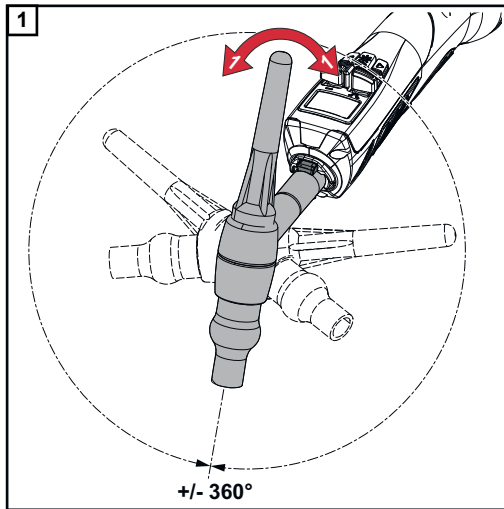
\* Inside pocket

11 Close the protective bag

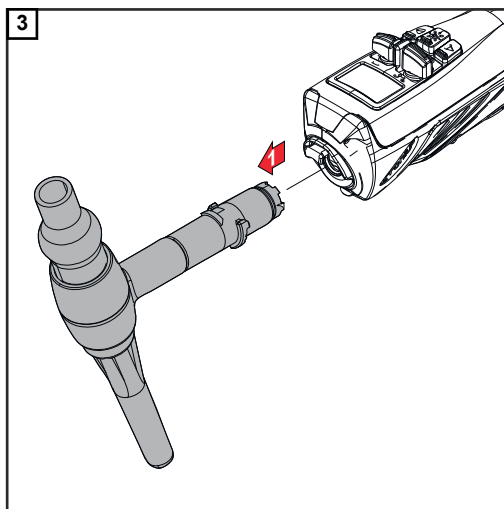
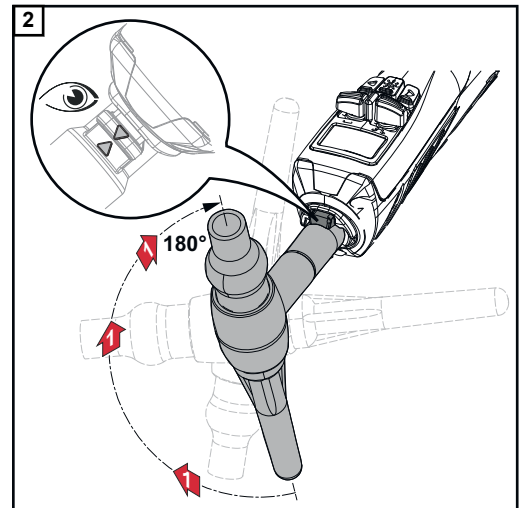
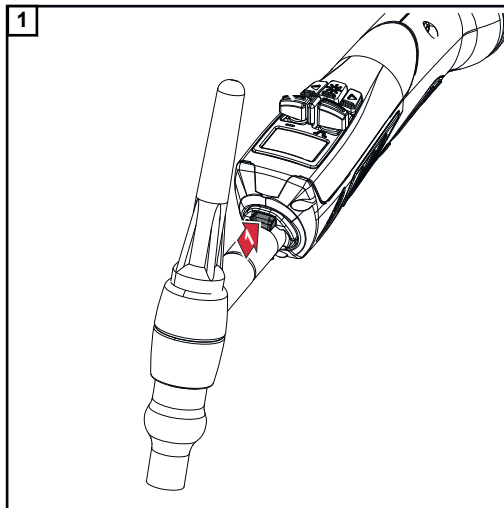
**NOTE!**

- When operating with water-cooled extension hosepacks, observe the following:**
- ▶ Following commissioning, as soon as the power source in the coolant container of the cooling unit shows a good return flow, make sure that there is sufficient coolant in the cooling unit.
  - ▶ In conjunction with a MultiControl cooling unit, a fully filled coolant tank can overflow when the hosepack is emptied - risk of slipping!
  - ▶ Observe the Operating Instructions for the cooling unit!

**Twisting the Torch Body**



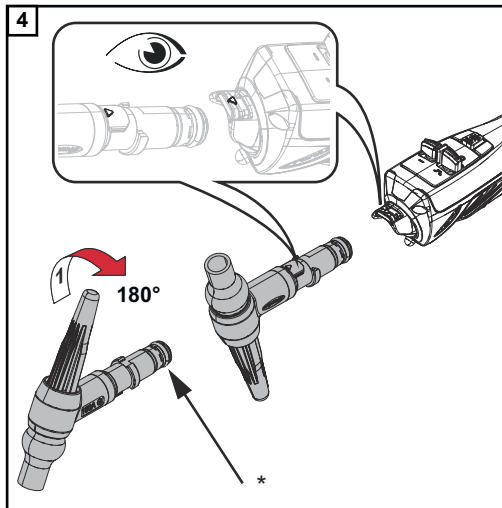
**Changing the torch body – gas-cooled welding torches**



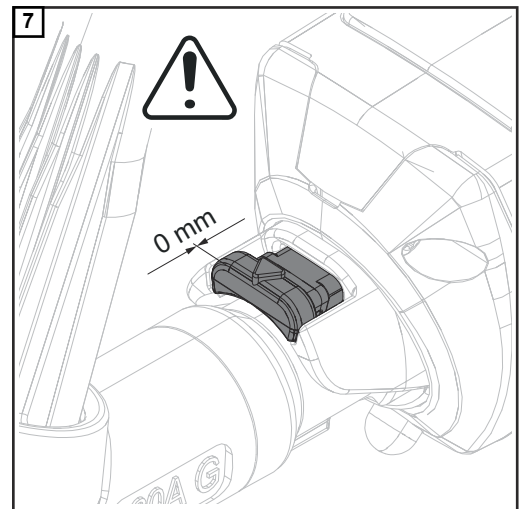
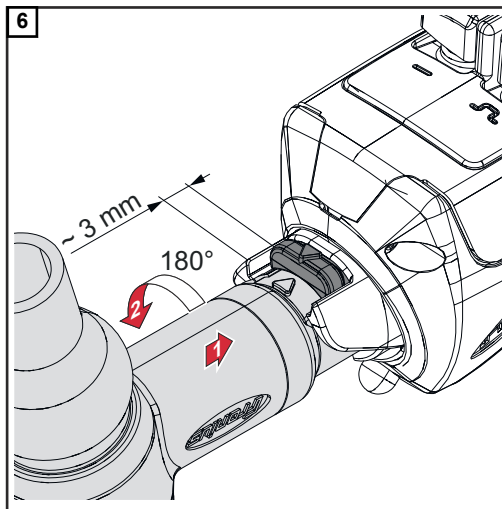
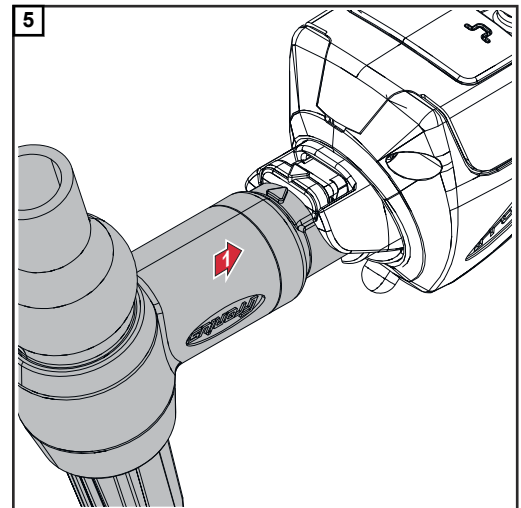
**NOTE!**

**When changing the torch body, ensure that only the related systems are installed.**  
▶ Do not install gas-cooled torch bodies on water-cooled hosepacks or vice versa.





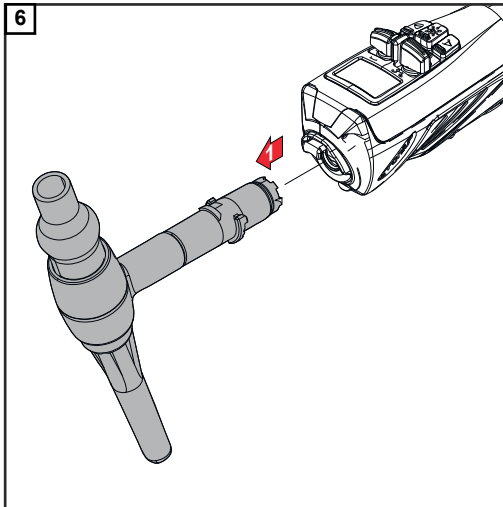
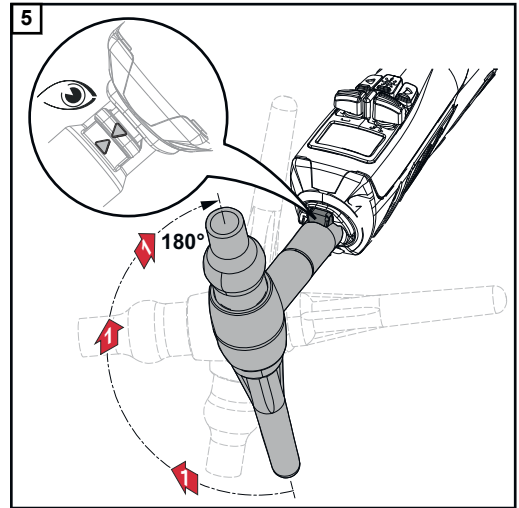
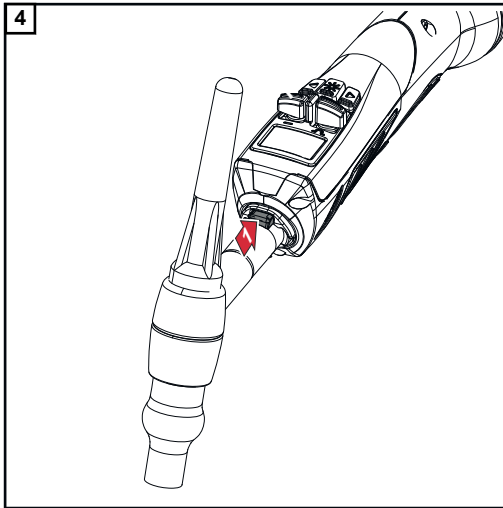
\* Grease the O-ring before installation!



**IMPORTANT!** When installing the torch body, ensure that it is pushed all the way in and snaps into place.

### Changing the torch body – water-cooled welding torches

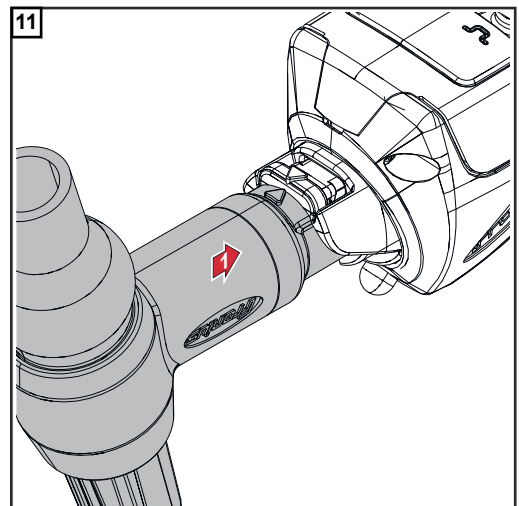
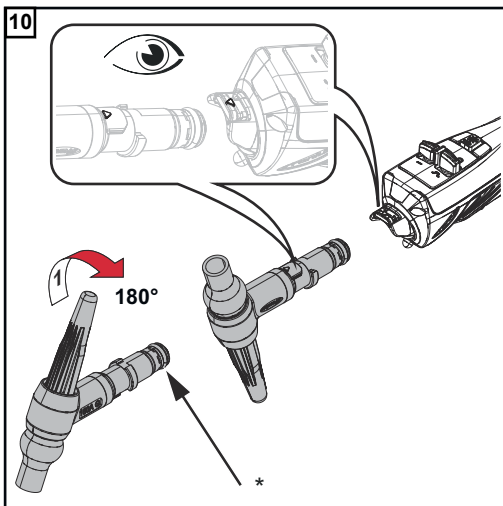
- 1 Switch off the power source and disconnect from the grid; wait for the after-run phase of the cooling system
- 2 For a CU 600 MC cooling unit:  
empty the torch hosepack using the power source or welding torch  
  
For other cooling units:  
disconnect the coolant supply hose from the cooling unit
- 3 Purge the coolant supply hose with max. 4 bar compressed air so that the majority of the coolant flows back into the coolant container



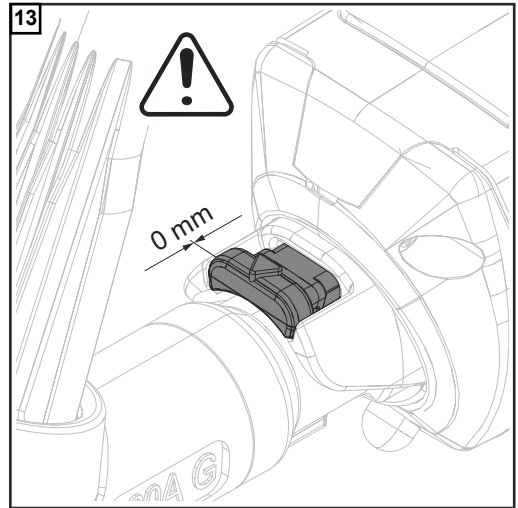
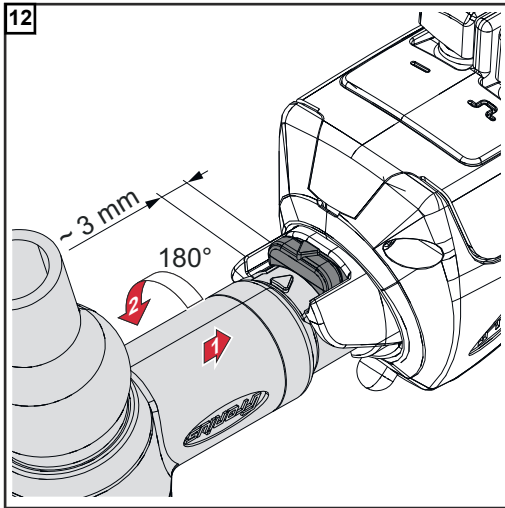
- 7 Clean the interface on the hosepack using compressed air
- 8 Dry the torch body with a cloth
- 9 Attach the safety cap to the torch body

**NOTE!**

**When changing the torch body, ensure that only the related systems are installed.**  
 ► Do not install gas-cooled torch bodies on water-cooled hosepacks or vice versa.



\* Grease the O-ring before installation!



**IMPORTANT!** When installing the torch body, ensure that it is pushed all the way in and snaps into place.

**14** Connect the power source to the grid and switch on

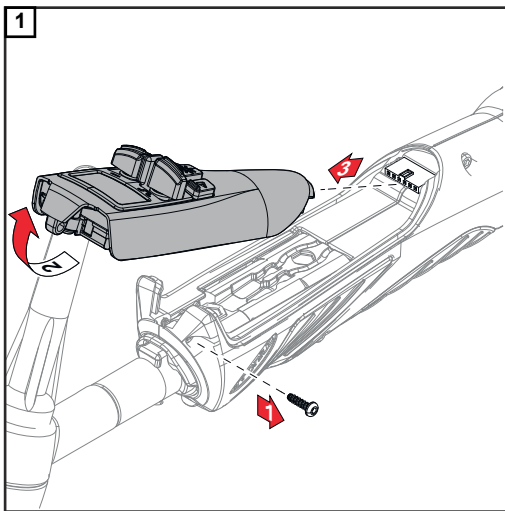
**15** Press the gas-test button on the power source

Shielding gas flows out for 30 s.

**16** Check the coolant flow:  
you must be able to see a strong return flow into the coolant container.

**17** Perform a test weld and check the quality of the weld seam

### Preventing the torch body from being changed





# Notes on flexible torch bodies

---

## General

The flexible TIG torch bodies can be bent in all directions and thus individually adapted to a wide variety of situations and applications.

Flexible torch bodies are used, for example, in cases of limited component accessibility or difficult welding positions.

However, the material of a flexible torch body is weakened with every change in shape, so the number of times it can be bent is also limited.

Bending and number of bends are explained in the following sections.

---

## Definition of torch body bending

A bend is a one-time change in shape that deviates from the original shape by at least  $20^\circ$ .

A smallest possible bending radius has been defined so that the bending action does not occur at a few certain points but as uniformly as possible over a long length.

The bending radius must not be less than this.

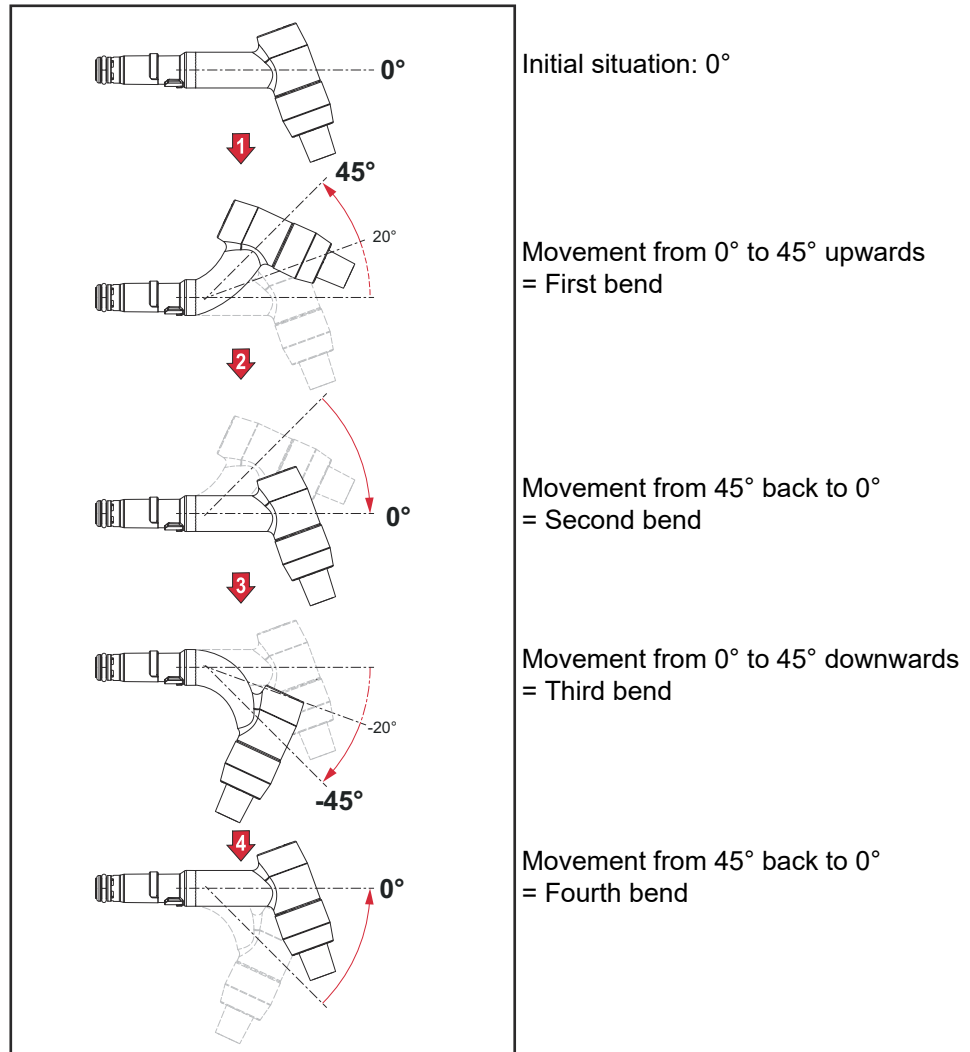
The smallest possible bending radius is 25 mm / 1 inch.

A bend must not exceed a maximum bending angle.

The maximum bending angle is  $45^\circ$ .

Bending back to the original shape is considered a bend in its own right.

### Example: 45° bends

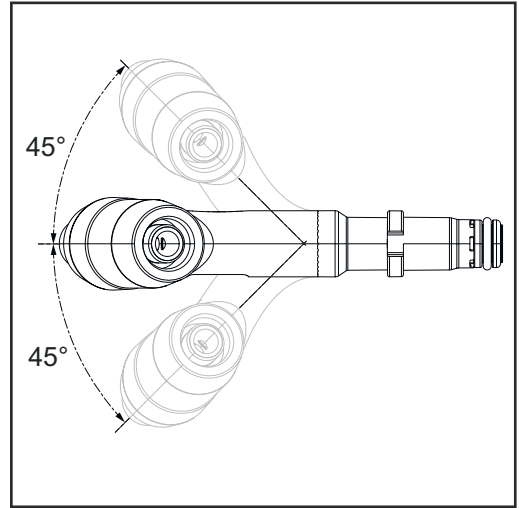
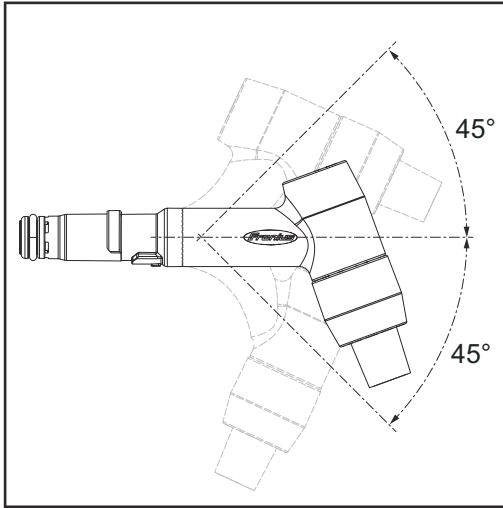


#### Maximum number of torch body bends

Taking into account a bending radius  $\geq 25$  mm / 1 inch and a maximum bending angle of 45°, the following number of bends are possible:

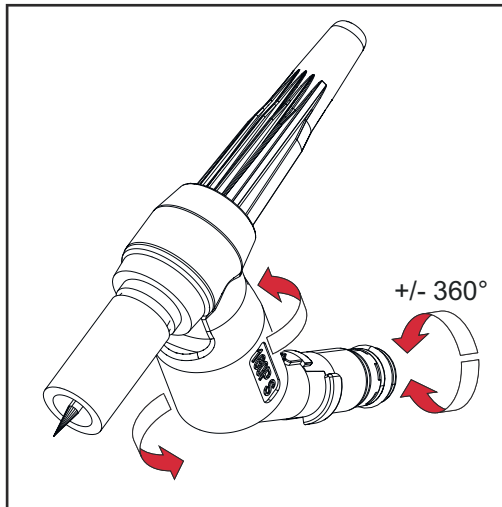
- Gas-cooled welding torches bent at least 1000 times
- Water-cooled welding torches bent at least 200 times

**Bending possibilities**



# Articulated torch bodies

## General



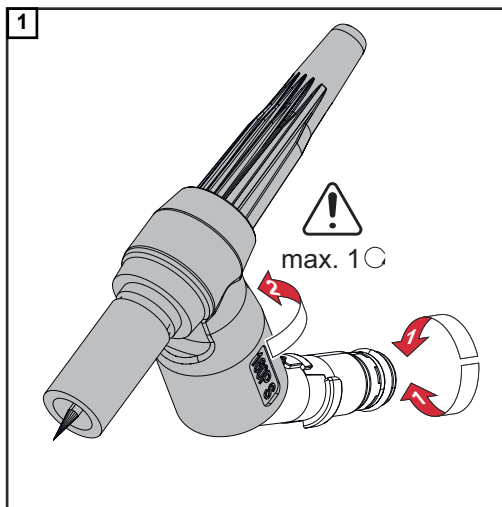
The articulated torch bodies can be individually adapted to a wide variety of situations and applications, for example in the case of restricted part accessibility or difficult welding positions.

Due to the articulated joint, the welder's hand is closer to the torch handle and thus to the torch triggers.

With the articulated welding torches, no material weakening occurs during setup.

## Assembling and setting up articulated torch body

The articulated torch body is assembled in the same way as a conventional torch body (see page 52).



**IMPORTANT!** When setting up the articulated torch body, only unscrew the front part until the desired working position is reached, but no more than one turn!

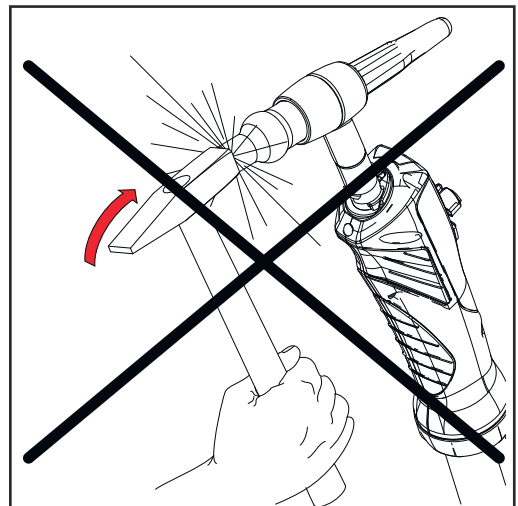
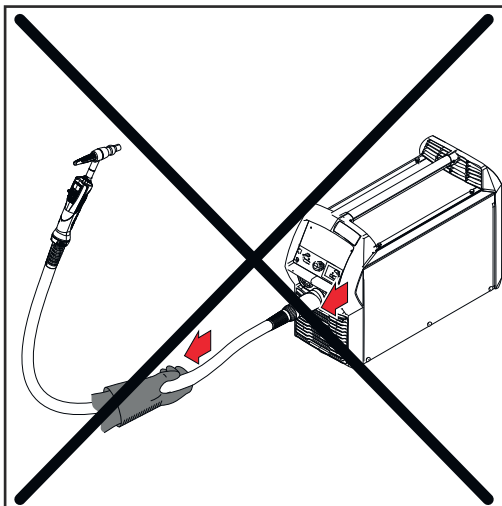
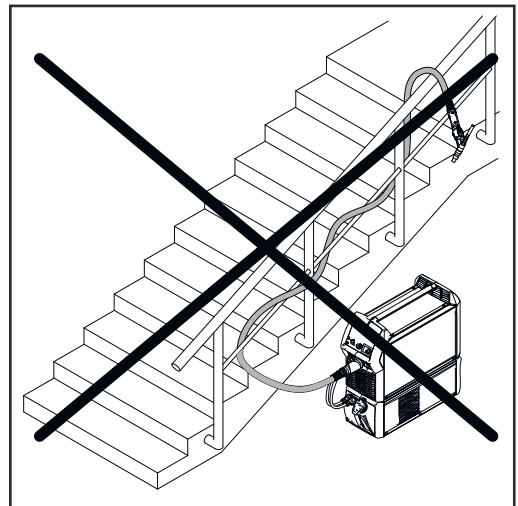
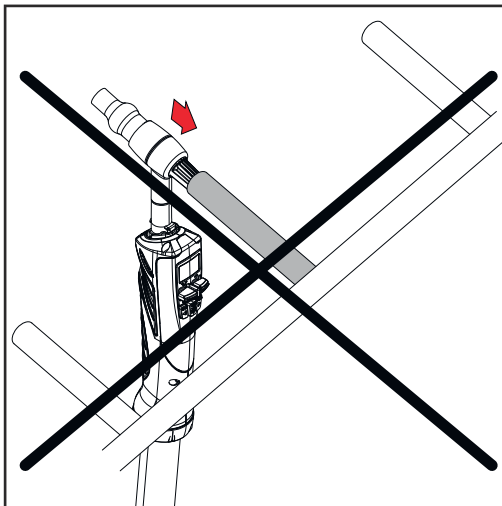
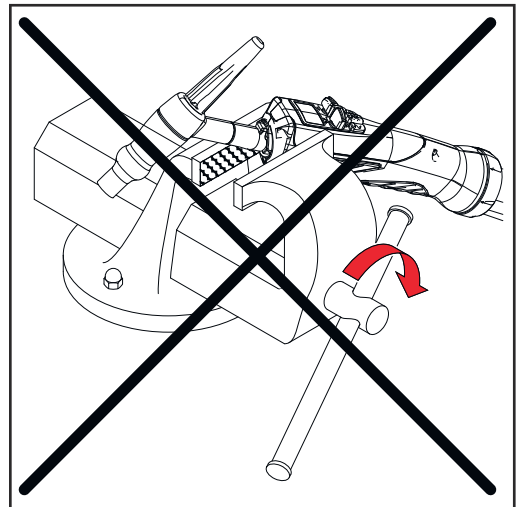
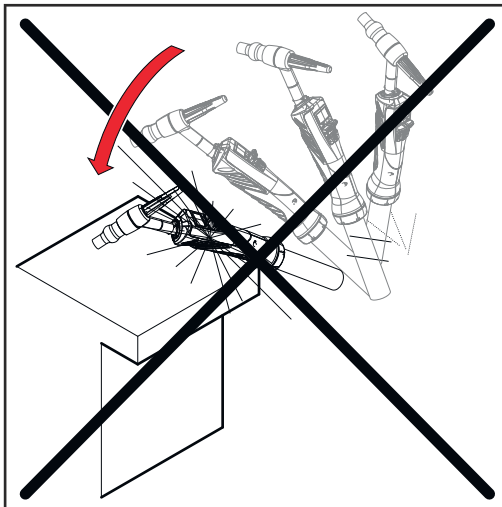
If the front part is unscrewed more than one turn:

- the welding torch can wear out faster
- the welding torch may heat up considerably during operation



# Service, maintenance and disposal

## General



EN-US

---

**Maintenance at every start-up**

- Check wearing parts, replace faulty wearing parts
- Purge the gas nozzle of welding spatter

In addition to the above list of steps to be carried out at every start-up, for water-cooled welding torches:

- Ensure that all coolant connections are leak-tight
  - Ensure that there is a proper coolant return flow
- 

**Disposal**

Materials should be disposed of according to valid local and national regulations.

# Troubleshooting

---

## Troubleshooting

---

### **Welding torch cannot be connected**

Cause: Bayonet lock bent

Remedy: Replace bayonet lock

---

### **No welding current**

Power source switched on, power source indication illuminates, shielding gas present

Cause: Incorrect ground connection

Remedy: Establish proper ground connection

Cause: Power cable in welding torch interrupted

Remedy: Replace welding torch

Cause: Tungsten electrode loose

Remedy: Tighten tungsten electrode using torch cap

Cause: Wearing parts loose

Remedy: Tighten wearing parts

---

### **No function after pressing torch trigger**

Power source switched on, power source indication illuminates, shielding gas present

Cause: Power plug not plugged in

Remedy: Plug in power plug

Cause: Welding torch or welding torch control line faulty

Remedy: Replace welding torch

Cause: Plug connections "torch trigger/control line/power source" faulty

Remedy: Check plug connection / send power source or welding torch to service team

Cause: PCB in welding torch faulty

Remedy: Replace PCB

---

### **HF flashover at welding torch connection**

Cause: Welding torch connection not sealed

Remedy: Replace O-ring on the bayonet lock

---

### **HF flashover at the shell-type handle**

Cause: Hosepack is not sealed

Remedy: Replace hosepack

Cause: Shielding gas hose connection to torch body not sealed

Remedy: Adjust and seal hose

---

**No shielding gas**

All other functions present

Cause: Gas cylinder empty

Remedy: Change gas cylinder

Cause: Gas pressure regulator faulty

Remedy: Replace gas pressure regulator

Cause: Gas hose kinked, damaged, or not attached

Remedy: Attach and straighten gas hose. Replace faulty gas hose

Cause: Welding torch faulty

Remedy: Replace welding torch

Cause: Gas solenoid valve faulty

Remedy: Contact service team (have gas solenoid valve replaced)

---

**Poor-quality weld properties**

Cause: Incorrect welding parameters

Remedy: Check settings

Cause: Incorrect ground connection

Remedy: Check ground connection and terminal for polarity

---

**Welding torch gets very hot**

Cause: Welding torch is inadequately dimensioned

Remedy: Observe duty cycle and load limits

Cause: For water-cooled systems only: Coolant flow too low

Remedy: Check water level, water flow rate, water contamination, etc. Coolant pump blocked: Switch on shaft of coolant pump at the gland using a screwdriver

Cause: For water-cooled systems only: "Cooling unit Ctrl" parameter is set to "OFF".

Remedy: In the Setup menu, set the "Cooling unit Ctrl" parameter to "Aut" or "ON".

---

**Porosity of weld seam**

Cause: Spattering in the gas nozzle, causing inadequate gas shield for weld seam

Remedy: Remove welding spatter

Cause: Holes in gas hose or imprecise gas hose connection

Remedy: Replace gas hose

Cause: O-ring at central connector is cut or faulty

Remedy: Replace O-ring

Cause: Moisture/condensate in the gas line

Remedy: Dry gas line

Cause: Gas flow too strong or weak

Remedy: Correct gas flow

Cause: Inadequate quantity of gas at the start or end of welding

Remedy: Increase gas pre-flow and gas post-flow

Cause: Too much parting agent applied

Remedy: Remove excess parting agent/apply less parting agent

---

**Poor ignition properties**

Cause: Unsuitable tungsten electrode (e.g., WP electrode for DC welding)

Remedy: Use suitable tungsten electrode

Cause: Wearing parts loose

Remedy: Screw on wearing parts tightly

---

**Gas nozzle is cracked**

Cause: Tungsten electrode not protruding far enough out of the gas nozzle

Remedy: Have tungsten electrode protrude more out of the gas nozzle

---

# Technical data

## General

This product meets the requirements set out in standard IEC 60974-7.

### NOTE!

**The welding current specifications only apply when using the standard wearing parts.**

When using gas lenses and shorter gas nozzles, the welding current is reduced.

### NOTE!

**For gas-cooled torch bodies, the welding current specifications only apply from a torch body length  $L \geq 65$  mm.**



When using shorter torch bodies, the welding current is reduced by 30%.



### NOTE!



**When welding at the power limit of the welding torch, use larger tungsten electrodes and gas nozzle opening diameters in order to increase the service life of the wearing parts.**

Take into account amperage, AC balance, and AC current offset as performance-enhancing factors.

## Gas-cooled torch body - TTB 80, TTB 160, TTB 220, TTB 260

	TTB 80 G	TTB 160 G / F	TTB 160 P S G *
DC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 80 A 60% D.C. <sup>1)</sup> / 60 A 100% D.C. <sup>1)</sup> / 50 A	35% D.C. <sup>1)</sup> / 160 A 60% D.C. <sup>1)</sup> / 120 A 100% D.C. <sup>1)</sup> / 90 A	35% D.C. <sup>1)</sup> / 160 A 60% D.C. <sup>1)</sup> / 120 A 100% D.C. <sup>1)</sup> / 90 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 30 A	35% D.C. <sup>1)</sup> / 120 A 60% D.C. <sup>1)</sup> / 90 A 100% D.C. <sup>1)</sup> / 70 A	35% D.C. <sup>1)</sup> / 120 A 60% D.C. <sup>1)</sup> / 90 A 100% D.C. <sup>1)</sup> / 70 A
	Argon (Standard EN 439)	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.




	TTB 220 G	TTB 220 A G F	TTB 220 P G F
DC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A	35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A	30% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 160 A 100% D.C. <sup>1)</sup> / 130 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 130 A 100% D.C. <sup>1)</sup> / 100 A	35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 120 A 100% D.C. <sup>1)</sup> / 100 A	30% D.C. <sup>1)</sup> / 170 A 60% D.C. <sup>1)</sup> / 120 A 100% D.C. <sup>1)</sup> / 100 A
	Argon (Standard EN 439)	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 4.0 mm 0.039 - 0.158 in.	1.0 - 4.0 mm 0.039 - 0.158 in.	1.0 - 4.0 mm 0.039 - 0.158 in.




	TTB 220 P S G *	TTB 220 P G TFC **	TTB 260 G
DC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A	35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A	35% D.C. <sup>1)</sup> / 260 A 60% D.C. <sup>1)</sup> / 200 A 100% D.C. <sup>1)</sup> / 150 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 130 A 100% D.C. <sup>1)</sup> / 100 A	35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 130 A 100% D.C. <sup>1)</sup> / 100 A	35% D.C. <sup>1)</sup> / 200 A 60% D.C. <sup>1)</sup> / 160 A 100% D.C. <sup>1)</sup> / 120 A
	Argon (Standard EN 439)	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 4.0 mm 0.039 - 0.158 in.	1.0 - 3.2 mm 0.039 - 0.126 in.	1.6 - 6.4 mm 0.063 - 0.252 in.

\* Articulated torch body

\*\* TFC clamping system


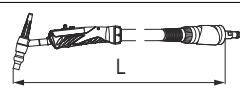
**Water-cooled  
torch body -  
TTB 180, TTB  
300, TTB 400,  
TTB 500**


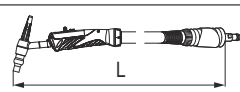
	TTB 180 W	TTB 300 W
DC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 180 A 100% D.C. <sup>1)</sup> / 140 A	60% D.C. <sup>1)</sup> / 300 A 100% D.C. <sup>1)</sup> / 230 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 140 A 100% D.C. <sup>1)</sup> / 110 A	60% D.C. <sup>1)</sup> / 250 A 100% D.C. <sup>1)</sup> / 190 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 3.2 mm 0.039 - 0.126 in.	1.0 - 3.2 mm 0.039 - 0.126 in.
 Q <sub>min</sub>	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min

	<b>TTB 400W F</b>	<b>TTB 500 W</b>
DC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 400 A 100% D.C. <sup>1)</sup> / 300 A	60% D.C. <sup>1)</sup> / 500 A 100% D.C. <sup>1)</sup> / 400 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 320 A 100% D.C. <sup>1)</sup> / 250 A	60% D.C. <sup>1)</sup> / 400 A 100% D.C. <sup>1)</sup> / 300 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	1.0 - 4.0 mm 0.039 - 0.157 in.	1.6 - 6.4 mm 0.063 - 0.252 in.
 Q <sub>min</sub>	1 l/min 0.26 gal./min	1 l/min 0.26 gal./min


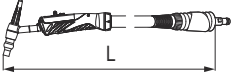







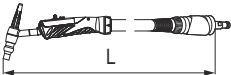




**Gas-cooled  
hosepack –  
THP 160i,  
THP 220i,  
THP 260i**

	<b>THP 160i</b>	<b>THP 220i</b>
DC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 160 A 60% D.C. <sup>1)</sup> / 120 A 100% D.C. <sup>1)</sup> / 90 A	35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A
AC welding current at 10 min / 40 °C (104 °F)	35% D.C. <sup>1)</sup> / 120 A 60% D.C. <sup>1)</sup> / 90 A 100% D.C. <sup>1)</sup> / 70 A	35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 130 A 100% D.C. <sup>1)</sup> / 100 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximum permitted open circuit voltage (U <sub>0</sub> )	113 V	113 V
Maximum permitted striking voltage (U <sub>P</sub> )	10 kV	10 kV

		<b>THP 260i</b>
Welding current at 10 min / 40 °C (104 °F) DC		35% D.C. <sup>1)</sup> / 260 A 60% D.C. <sup>1)</sup> / 200 A 100% D.C. <sup>1)</sup> / 150 A
Welding current at 10 min / 40 °C (104 °F) AC		35% D.C. <sup>1)</sup> / 200 A 60% D.C. <sup>1)</sup> / 160 A 100% D.C. <sup>1)</sup> / 120 A
		Argon (Standard EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
Maximum permitted open circuit voltage (U <sub>0</sub> )		113 V
Maximum permitted striking voltage (U <sub>P</sub> )		10 kV



**Water-cooled  
hosepack – THP  
300i,  
THP 400i,  
THP 500i**

	<b>THP 300i</b>	<b>THP 400i</b>
DC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 300 A 100% D.C. <sup>1)</sup> / 230 A	60% D.C. <sup>1)</sup> / 400 A 100% D.C. <sup>1)</sup> / 300 A
AC welding current at 10 min / 40 °C (104 °F)	60% D.C. <sup>1)</sup> / 250 A 100% D.C. <sup>1)</sup> / 190 A	60% D.C. <sup>1)</sup> / 350 A 100% D.C. <sup>1)</sup> / 270 A
	Argon (Standard EN 439)	Argon (Standard EN 439)
	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.	4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
$P_{min}$  [W] <sup>2)</sup>	650 / 650	950 / 950
$Q_{min}$  [l/min] [gal./min]	1 0.26	1 0.26
$p_{min}$  [bar] [psi]	3 43	3 43
$p_{max}$  [bar] [psi]	5.5 79	5.5 79
Maximum permitted open circuit voltage ( $U_0$ )	113 V	113 V
Maximum permitted striking voltage ( $U_P$ )	10 kV	10 kV


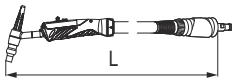




		<b>THP 500i</b>
DC welding current at 10 min / 40 °C (104 °F)		60% D.C. <sup>1)</sup> / 500 A 100% D.C. <sup>1)</sup> / 400 A
AC welding current at 10 min / 40 °C (104 °F)		60% D.C. <sup>1)</sup> / 400 A 100% D.C. <sup>1)</sup> / 300 A
		Argon (Standard EN 439)
		4.0 / 8.0 m 13 + 1.48 / 26 + 2.96 ft. + in.
$P_{min}$  [W] <sup>2)</sup>		1200 / 1750
$Q_{min}$  [l/min] [gal./min]		1 0.26
$p_{min}$  [bar] [psi]		3 43
$p_{max}$  [bar] [psi]		5.5 79
Maximum permitted open circuit voltage ( $U_0$ )		113 V

		<b>THP 500i</b>
Maximum permitted striking voltage ( $U_P$ )		10 kV

**Gas-cooled extension hosepack - HPT 220i G**

		<b>HPT 220i EXT G</b>
DC welding current at 10 min / 40 °C (104 °F)		35% D.C. <sup>1)</sup> / 220 A 60% D.C. <sup>1)</sup> / 170 A 100% D.C. <sup>1)</sup> / 130 A
AC welding current at 10 min / 40 °C (104 °F)		35% D.C. <sup>1)</sup> / 180 A 60% D.C. <sup>1)</sup> / 130 A 100% D.C. <sup>1)</sup> / 100 A
		Argon (Standard EN 439)
		10.0 m 32 + 9.70 ft. + in.
Maximum permitted open circuit voltage ( $U_0$ )		113 V
Maximum permitted striking voltage ( $U_P$ )		10 kV

**Water-cooled extension hosepack- HPT 400i**

		<b>HPT 400i EXT W</b>
DC welding current at 10 min / 40 °C (104 °F)		60% D.C. <sup>1)</sup> / 400 A 100% D.C. <sup>1)</sup> / 300 A
AC welding current at 10 min / 40 °C (104 °F)		60% D.C. <sup>1)</sup> / 350 A 100% D.C. <sup>1)</sup> / 270 A
		Argon (Standard EN 439)
		10.0 m 32 + 9.70 ft. + in.
$P_{min}$  [W] <sup>2)</sup>		750 / 750
$Q_{min}$  [l/min] [gal./min]		1 0.26
$p_{min}$  [bar] [psi]		3 43
$p_{max}$  [bar] [psi]		5.5 79
Maximum permitted open circuit voltage ( $U_0$ )		113 V
Maximum permitted striking voltage ( $U_P$ )		10 kV

---

**Explanation of footnotes**

- 1) D.C. = duty cycle
- 2) Lowest cooling power according to standard IEC 60974-2