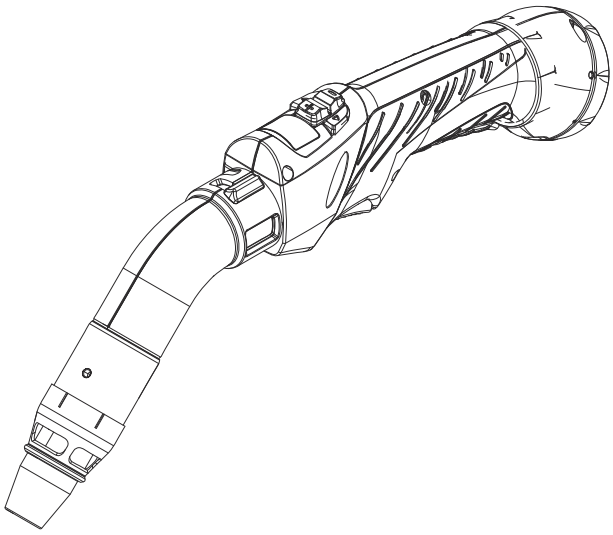
Operating Instructions

manuals.fronius.com/html/4204260459

e-Manual

MTG Exento
MTW Exento



EN-US | Operating instructions

42,0426,0459,EA 006-22082023

Table of contents

Safety, information on correct use

Safety

Safety

⚠ WARNING!

Danger from incorrect operation and work that is not carried out properly.
This can result in serious personal injury and damage to property.
- ▶ All the work and functions described in this document must only be carried out by technically trained and qualified personnel.
- ▶ Read and understand this document in full.
- ▶ Read and understand all safety rules and user documentation for this equipment and all system components.

⚠ WARNING!

Danger from electrical current.
This can result in serious personal injury and damage to property.
- ▶ Before starting work, switch off all the devices and components involved and disconnect them from the grid.
- ▶ Secure all devices and components involved so they cannot be switched back on.

⚠ WARNING!

Danger due to emerging wire electrode.
Serious personal injuries may result.
- ▶ Hold the welding torch so that the tip of the welding torch points away from the face and body.
- ▶ Wear suitable protective goggles.
- ▶ Do not point the welding torch at people.
- ▶ Ensure that the wire electrode can only intentionally make contact with electrically conductive objects.

⚠ WARNING!

Danger due to hot system components and/or equipment.
This can result in serious burns or scalding.
- ▶ Before starting work, allow all hot system components and/or equipment to cool to +25°C/+77°F (e.g., coolant, water-cooled system components, wirefeeder drive motor, etc.).
- ▶ Wear suitable protective equipment (e.g., heat-resistant gloves, safety goggles, etc.) if cooling down is not possible.

⚠ WARNING!

Danger from contact with toxic welding fumes.
Serious personal injuries may result.
- ▶ Welding is not permitted without an extraction unit being switched on.
- ▶ It may not be sufficient to only use a fume extraction torch to reduce the concentration of noxious substances at the work station. In this case, install an additional extraction system to properly reduce the concentration of noxious substances at the work station.
- ▶ In case of doubt, the concentration of noxious substances at the work station should be assessed by a safety engineer.

Intended use, requirements for the extraction system

Intended use

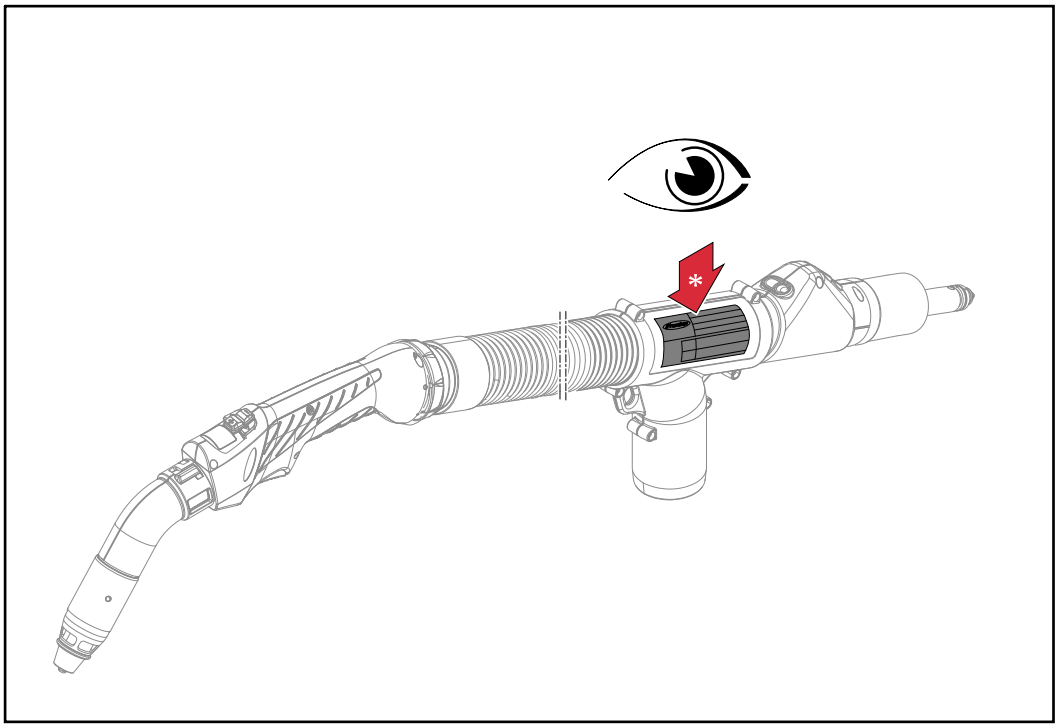
The MIG/MAG manual welding torch is intended exclusively for MIG/MAG welding in conjunction with a sufficiently powerful extraction system (see section **Requirements for the extraction system** from page **8**). Any other use is deemed to be "not in accordance with the intended purpose." The manufacturer accepts no liability for any damage resulting from improper use.

Intended use also means:
- Reading these Operating Instructions in their entirety
- Following all instructions and safety rules in this document
- Carrying out all the specified inspection and maintenance work

Requirements for the extraction system

Only operate Schweißbrenner with extraction systems that meet the following requirements:
- Extraction capacity (extraction volumetric flow) of at least 70 - 110 m^3/h (2472 - 3885 cfh); depending on the welding torch used
  - if the value is lower, there is a risk that the welding fumes will not be adequately extracted
  - a higher value means there is a risk that shielding gas will be unintentionally sucked off the weld seam
- Depending on the length of the extraction hose and the welding torch used, a negative pressure of at least 10 - 18 kPa (100 - 180 mbar) must be generated
  - the shorter and thicker the extraction hose, the smaller the extraction unit can be dimensioned / the less extraction capacity must be provided to ensure that the welding fumes are optimally extracted
- When the altitude increases, the extraction capacity must be reduced according to the altitude due to the changing environmental conditions (lower air pressure, etc.), for example by opening the air flow regulator of the welding torch or reducing the extraction capacity
  - in any case, the requirements for extraction must be met
  - use the Exentometer to determine the current extraction volumetric flow of the welding torch - for this, see section **Measuring the extraction capacity (extraction volumetric flow) with the Exentometer** from page **35**

The exact requirements for extraction can be found on the rating plate of the respective welding torch (see section **Extraction information on the rating plate** on page **10**) and in the technical data.



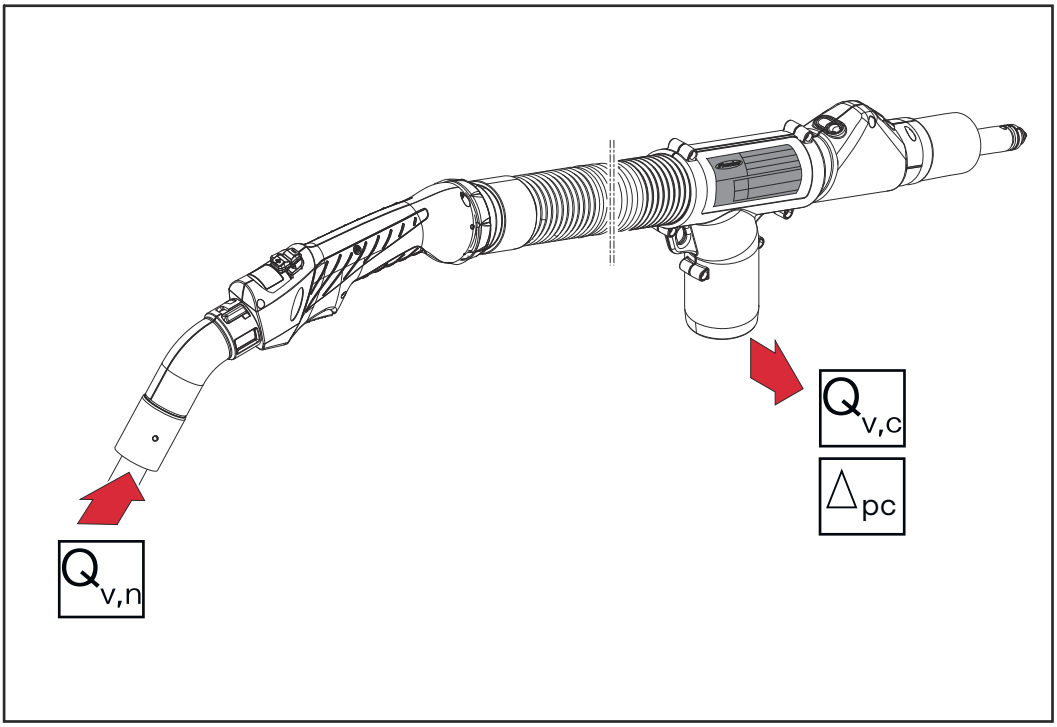
Rating plate on the welding torch

Extraction information on the rating plate

Fronius www.fronius.com		Type			
		Art.No.			
		Charge No.			
CE		EN ISO 21904-1		EN IEC 60974-7/-10 Cl.A	
		X (40°C)			
		I2	CO2		
			MIXED		
	Check			Δp_c [kPa]	$Q_{v,c}$ [m³/h]	$Q_{v,n}$ [m³/h]
				11,0	94	57

Example of a rating plate

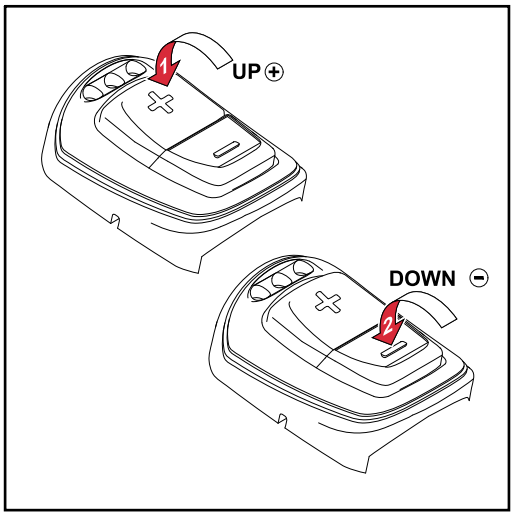
Extraction information on the rating plate	
$Q_{v,n}$	Extraction volumetric flow at the front end of the welding torch (= the extraction volumetric flow provided by the welding torch)
$Q_{v,c}$	Extraction volumetric flow at the extraction connection of the welding torch (= the extraction volumetric flow that the extraction system must provide)
Δ_{pc}	Required negative pressure at the extraction connection of the welding torch (= the negative pressure that the extraction system must generate)



Available interfaces, functions of the torch trigger

Available interfaces

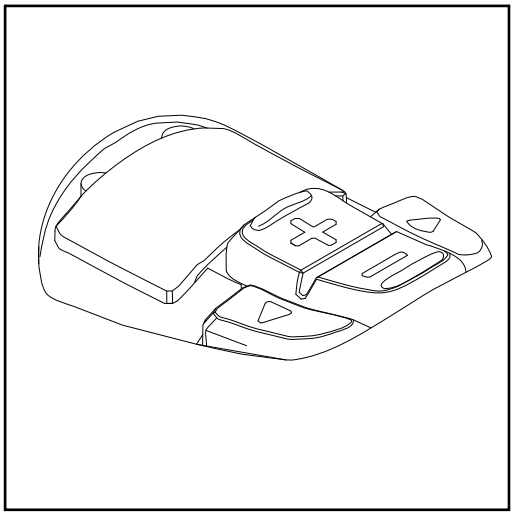
Up/Down-function



The Up/Down torch has the following functions:

- Changing the welding power in synergic operation by means of up/down buttons
- Error display:
  - in the event of a system error, all the LEDs turn red
  - in the event of a data communication error, all the LEDs flash red.
- Self-testing in the start-up sequence:
  - all the LEDs briefly light up in succession.

JobMaster-function

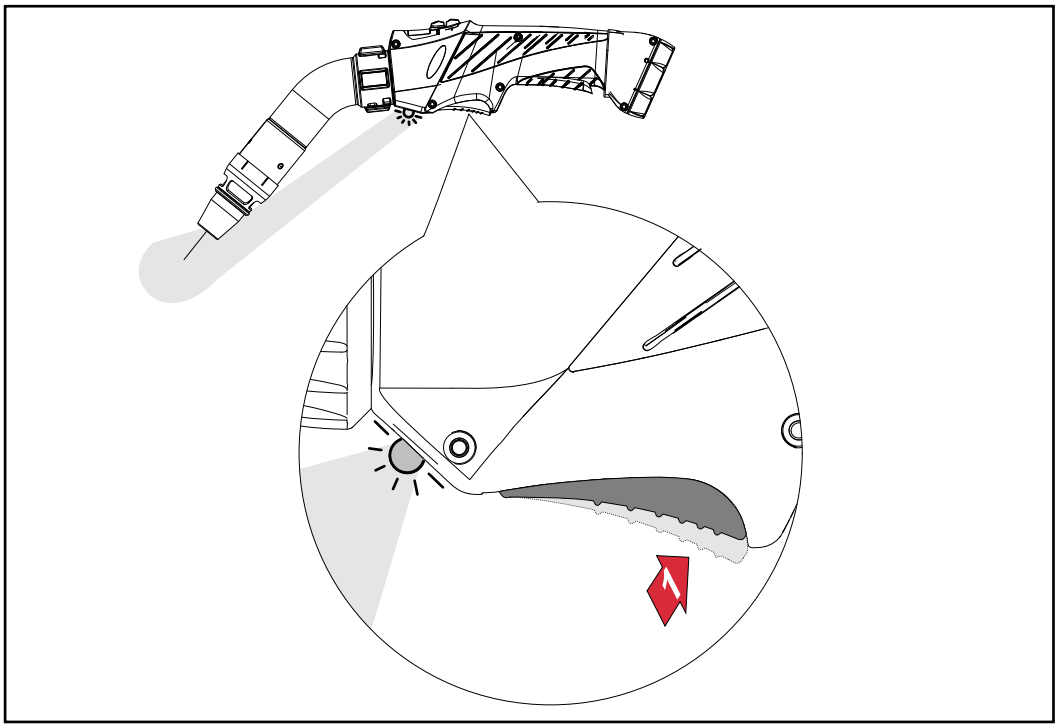


The JobMaster welding torch has the following functions:

- The desired parameters are chosen via arrow keys at the power source
- Use the +/- keys to change the selected parameters
- The display shows the current parameters and value

Functions of the torch trigger

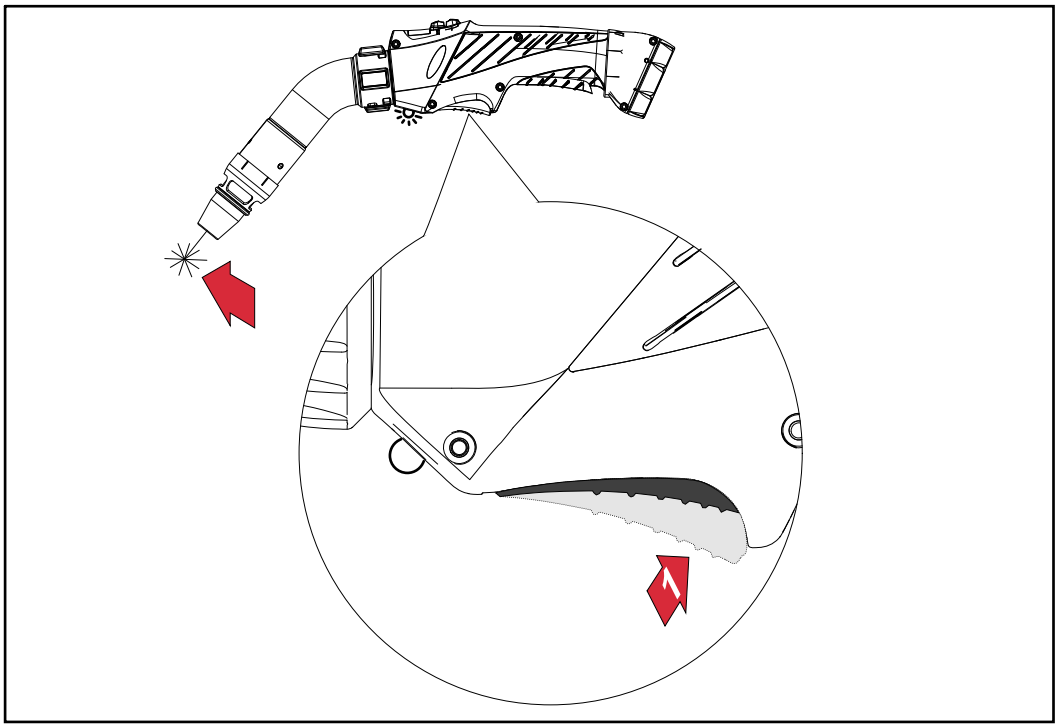
Functions of the two-staged torch trigger



Function of the torch trigger at switch position 1 (torch trigger pushed halfway down) = LED lights up

NOTE!

An LED on the welding torch does not work for welding torches with optional top torch trigger.

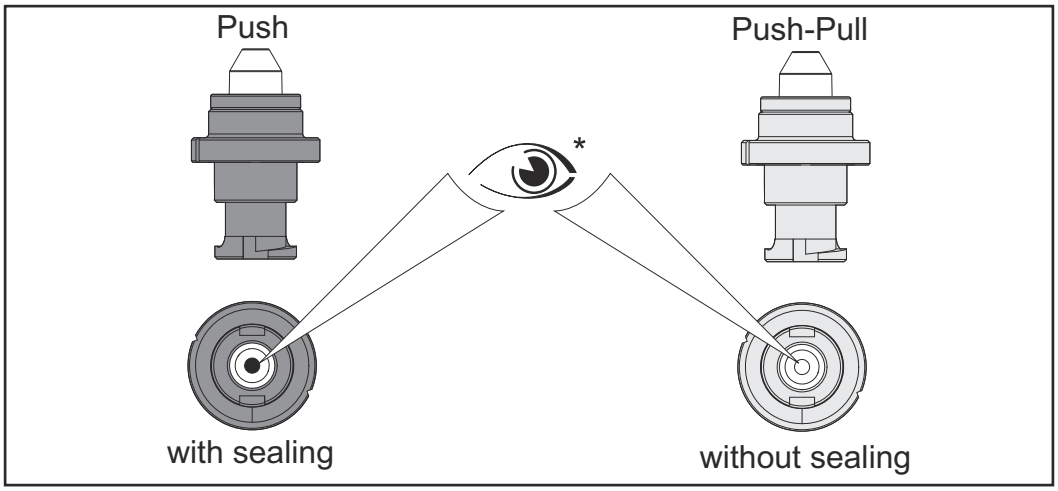


Function of the torch trigger in switch position 2 (torch trigger pressed all the way down) = LED goes out, welding process starts

Commissioning

Commissioning procedure

Checking the clamping nipple



* Check the clamping nipple before commissioning and every time the inner liner is changed. To do so, carry out a visual inspection:
- Left: Brass clamping nipple with seal ring. You cannot see through the seal ring.
- Right: Silver clamping nipple with visible bushing

NOTE!

Incorrect or defective clamping nipple in push applications
This results in gas loss and poor weld properties
▶ Use brass clamping nipples to minimize gas loss
▶ Check that the seal ring is intact

NOTE!

Incorrect clamping nipple in push-pull applications
Tangled wire and increased abrasion in the inner liner when using a clamping nipple with seal ring
▶ Use silver clamping nipple to facilitate the wire feed

Procedure for commissioning welding torches with Fronius System Connector

Perform the following activities for the correct commissioning of the welding torch:

1 **Fit the inner liner** - Description from page 19
2 **Connect the welding torch**
- Description of power source from page 32
- Description of wirefeeder from page 33

3 **Connect the welding torch to the extraction system** - Description from page 35
4 **Measure extraction capacity** - Description from page 35

If necessary, adjust the extraction capacity:

5 **Set the extraction capacity directly on the welding torch** - Description from page 38

6 **Set the extraction capacity with external air flow regulator** - Description from page **40**

Procedure for commissioning welding torches with Euro connection

Perform the following activities for the correct commissioning of the welding torch:

1 **Fit the inner liner**
- Description of steel inner liner from page **24**
- Description of plastic inner liner from page **28**

2 **Connect the welding torch to the power source** - Description from page **34**

3 **Connect the welding torch to the extraction system** - Description from page **35**

4 **Measure extraction capacity** - Description from page **35**

If necessary, adjust the extraction capacity:

5 **Set the extraction capacity directly on the welding torch** - Description from page **38**

6 **Set the extraction capacity with external air flow regulator** - Description from page **40**

Fitting inner liner in welding torch with Fronius System Connector

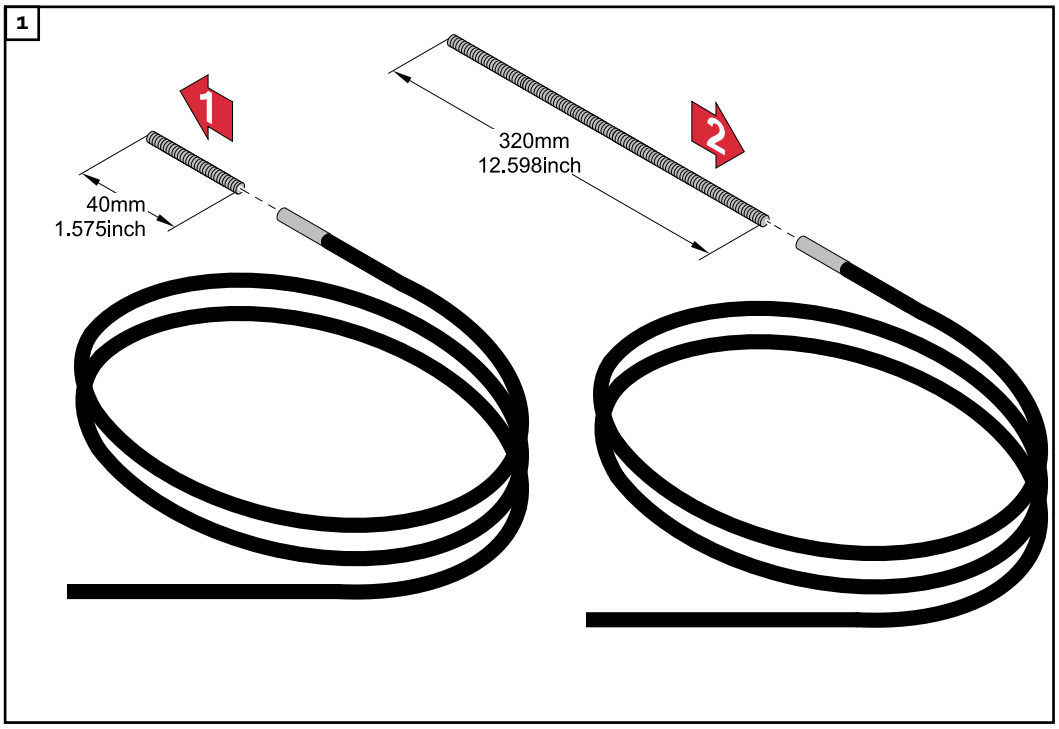
Note on inner liner in gas-cooled welding torches

NOTE!

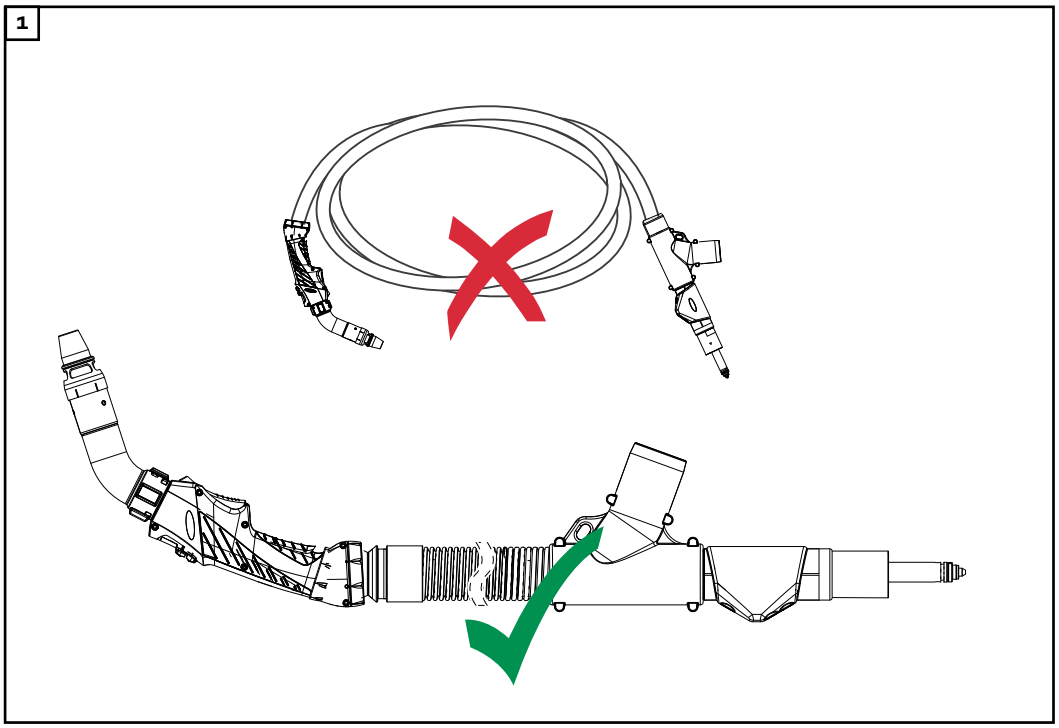
Risk due to incorrect wire-guide insert.
This can result in poor-quality weld properties.

- If a plastic inner liner with a bronze wire-guide insert is used in gascooled welding torches instead of a steel inner liner, the power data stated in the technical data of the welding torch must be reduced by 30%.
- In order to operate gascooled welding torches at maximum power, replace the 40 mm (1.575 in.) wire-guide insert with a 320 mm (12.598 in.) wire-guide insert.

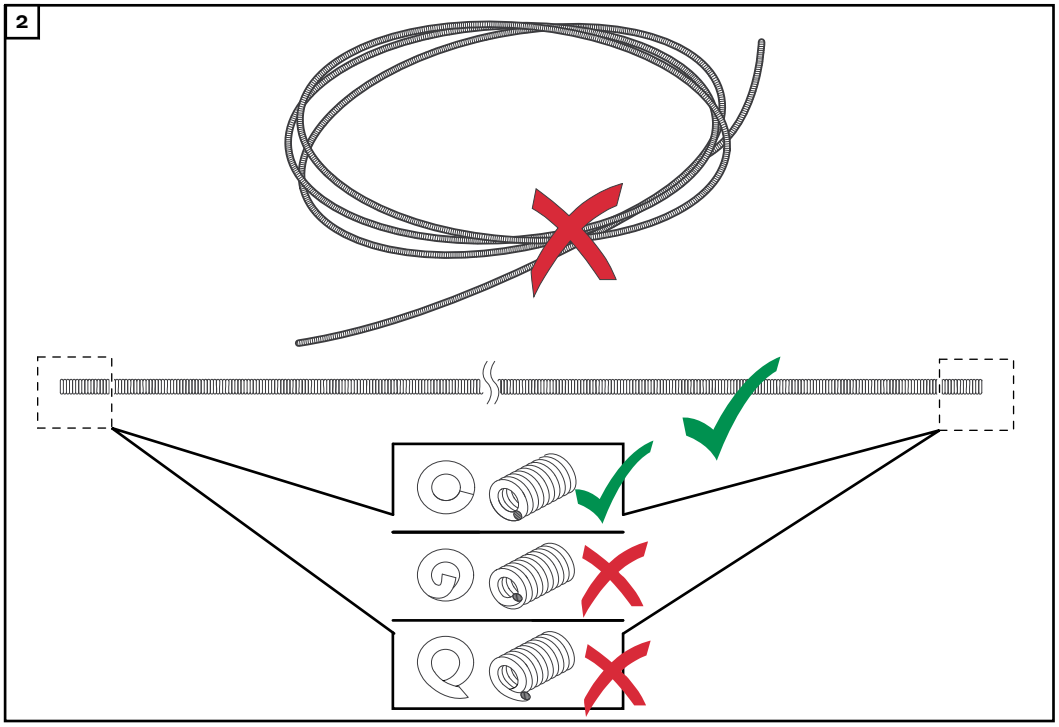
1



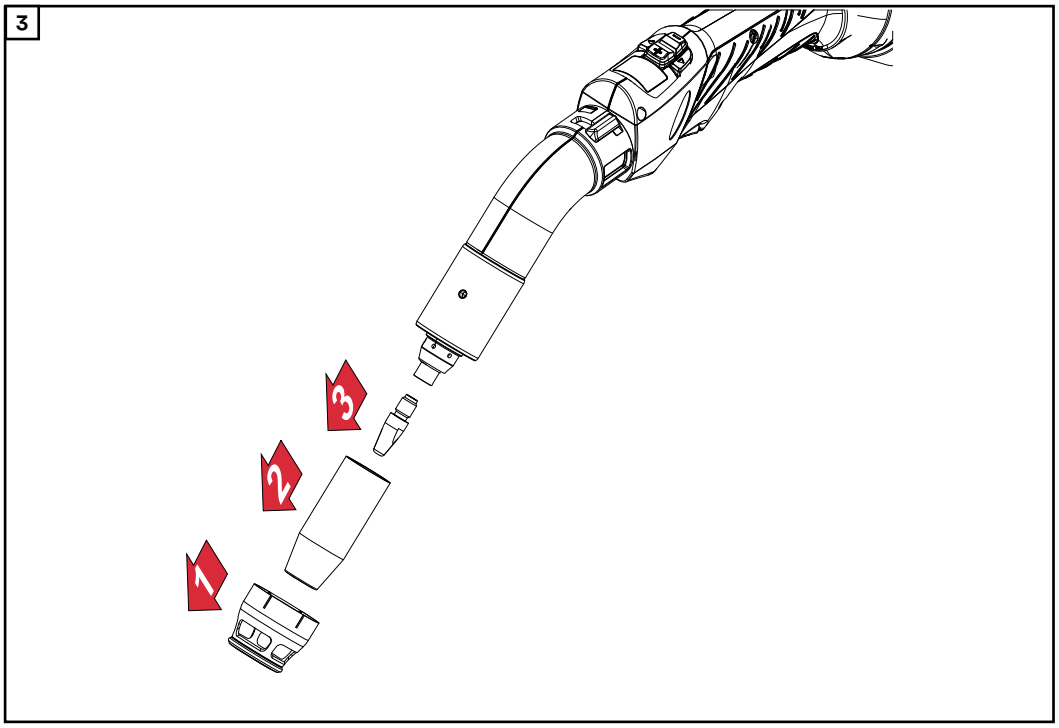
Fitting the inner liner



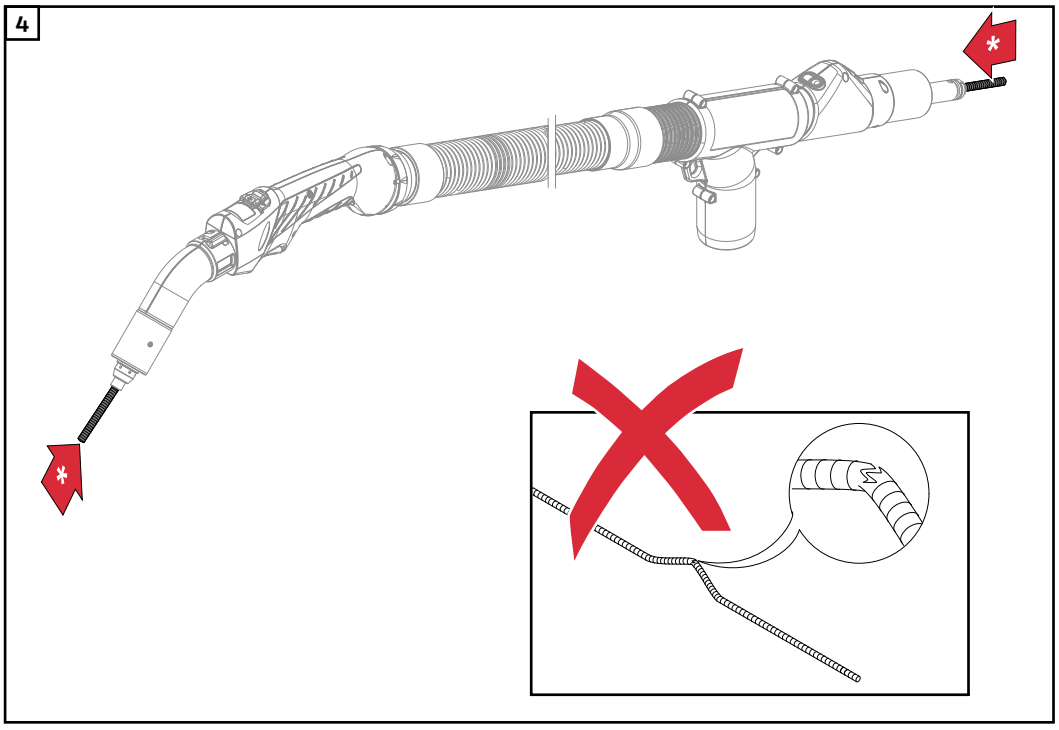
Lay out the welding torch straight



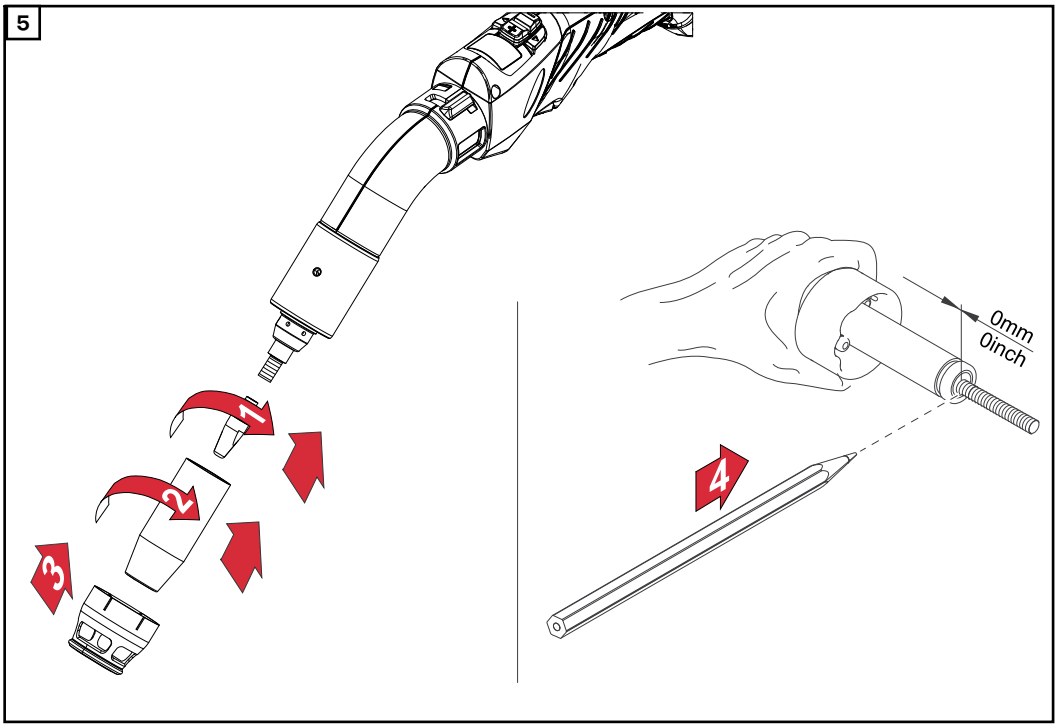
Lay out the inner liner straight; make sure that no burr protrudes into or out of the inner liner



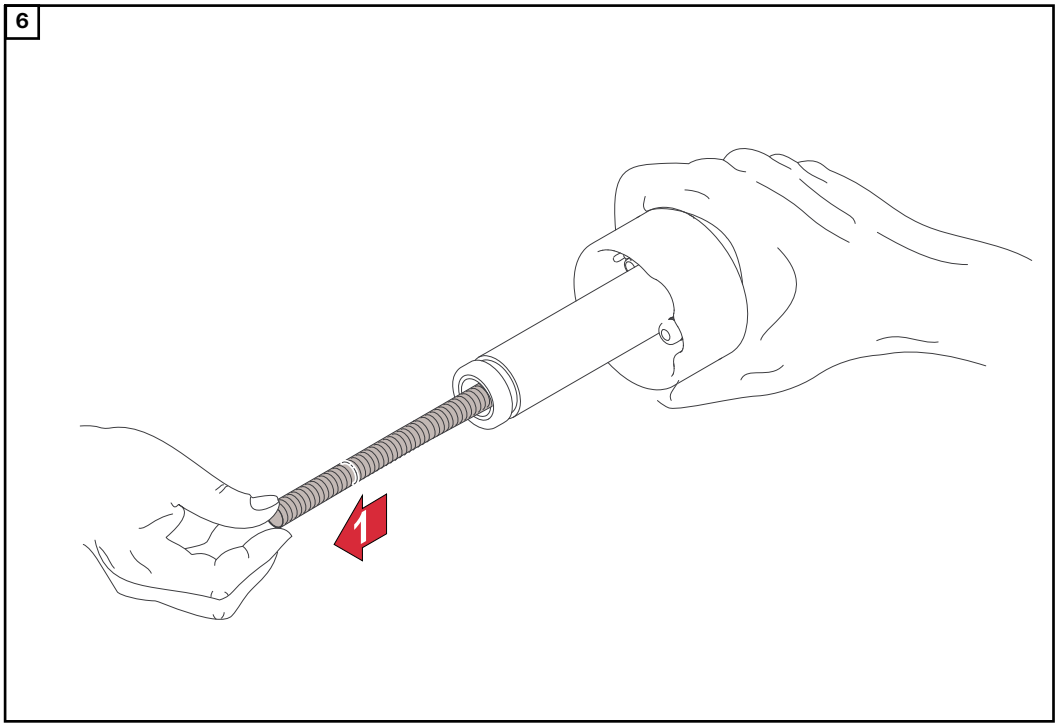
If the extraction nozzle, gas nozzle, and contact tip are already mounted, remove them



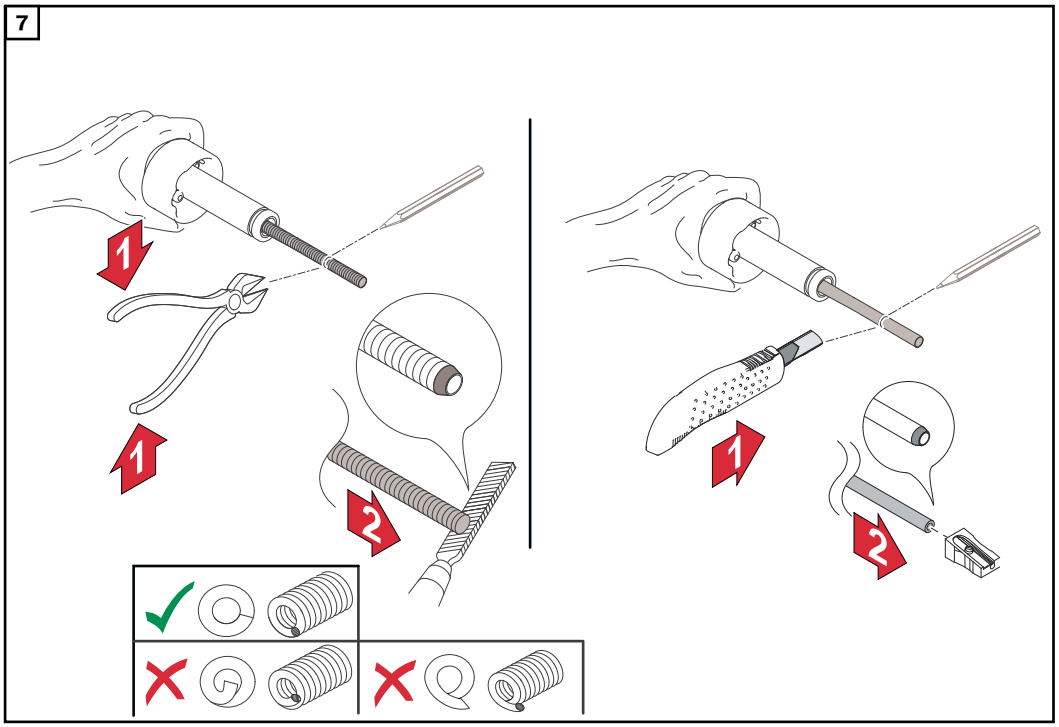
*Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped*



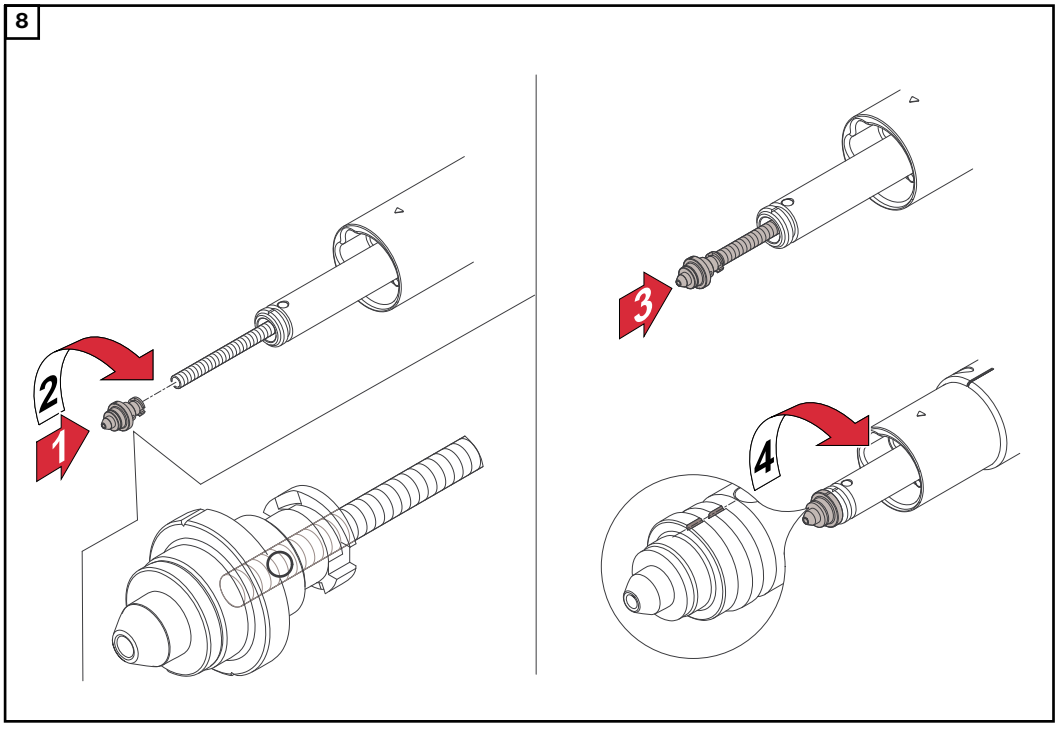
Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; mark the inner liner at the end of the Schweißbrenners



Pull inner liner 10 cm (3.94 in.) out of the welding torch



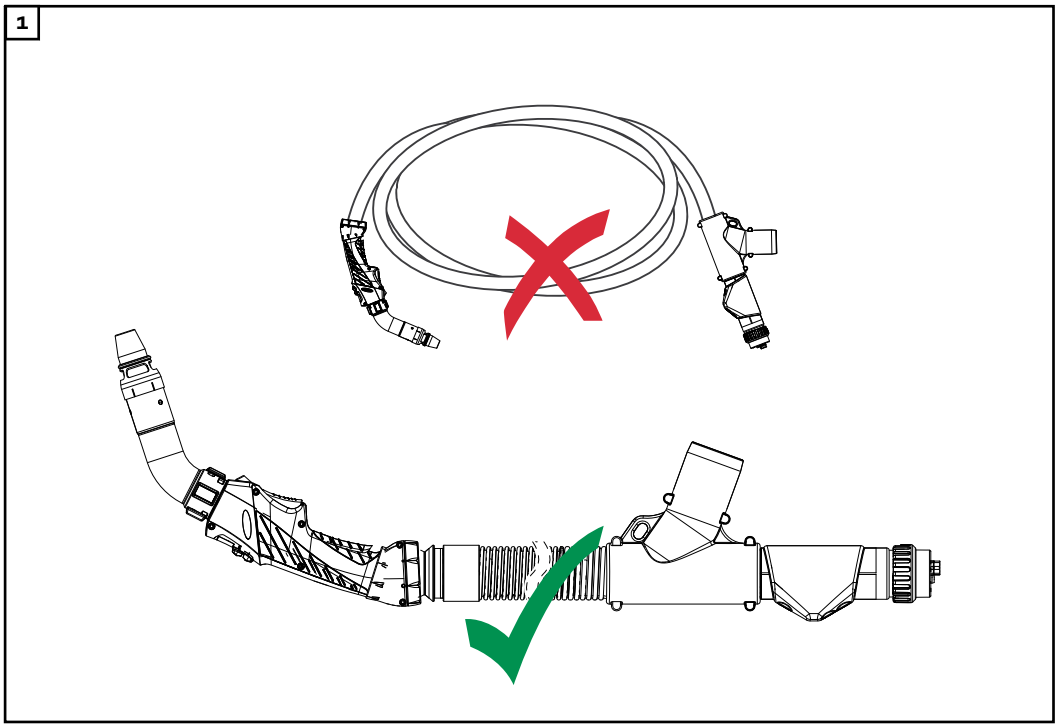
Left inner liner made of steel, right plastic: Cut and deburr the inner liner at the previously marked position; make sure that no burr protrudes into or out of the inner liner



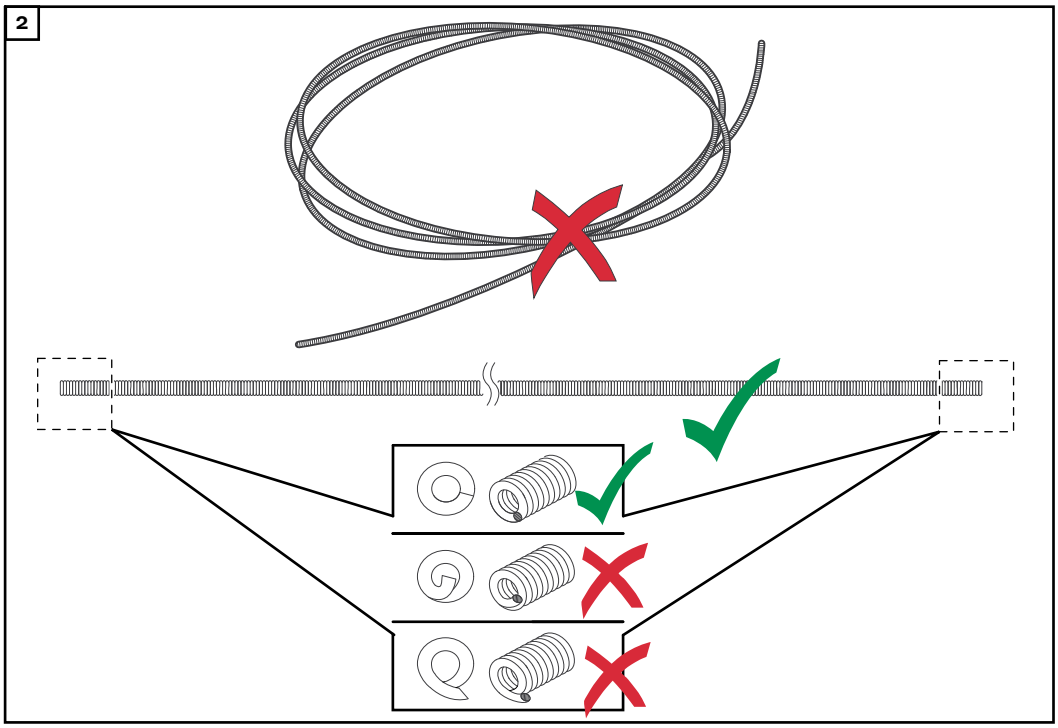
Screw the cap onto the inner liner up to the stop (the inner liner needs to be visible through the hole in the cap); push the cap into the welding torch and secure

Fitting steel inner liner in welding torch with Euro connection

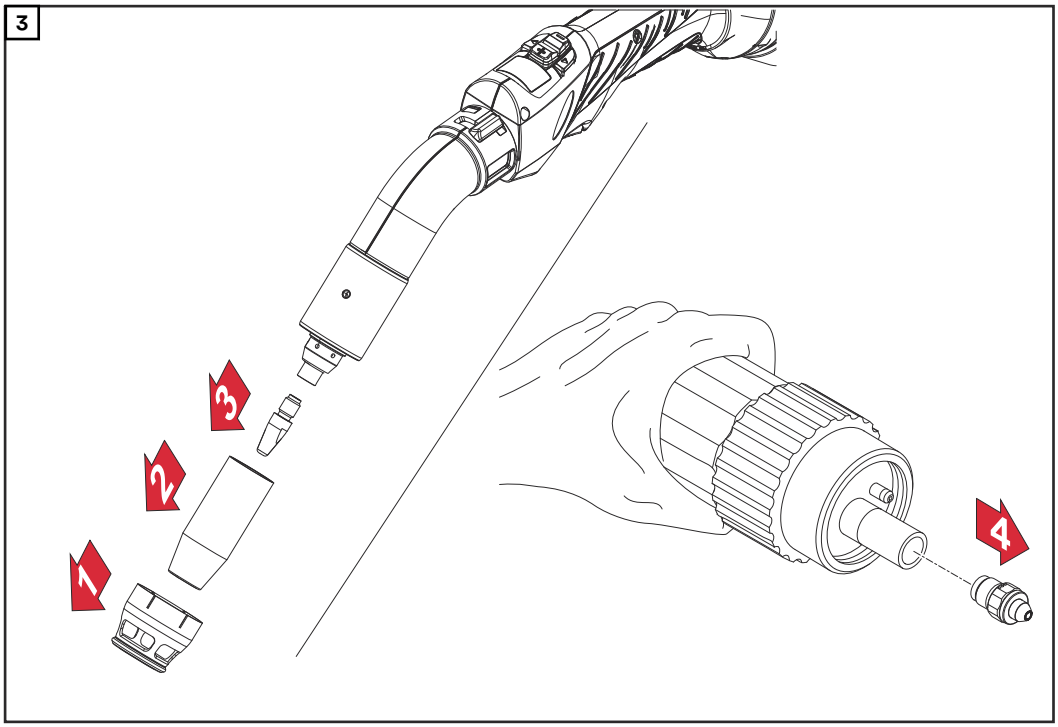
Fitting the steel inner liner



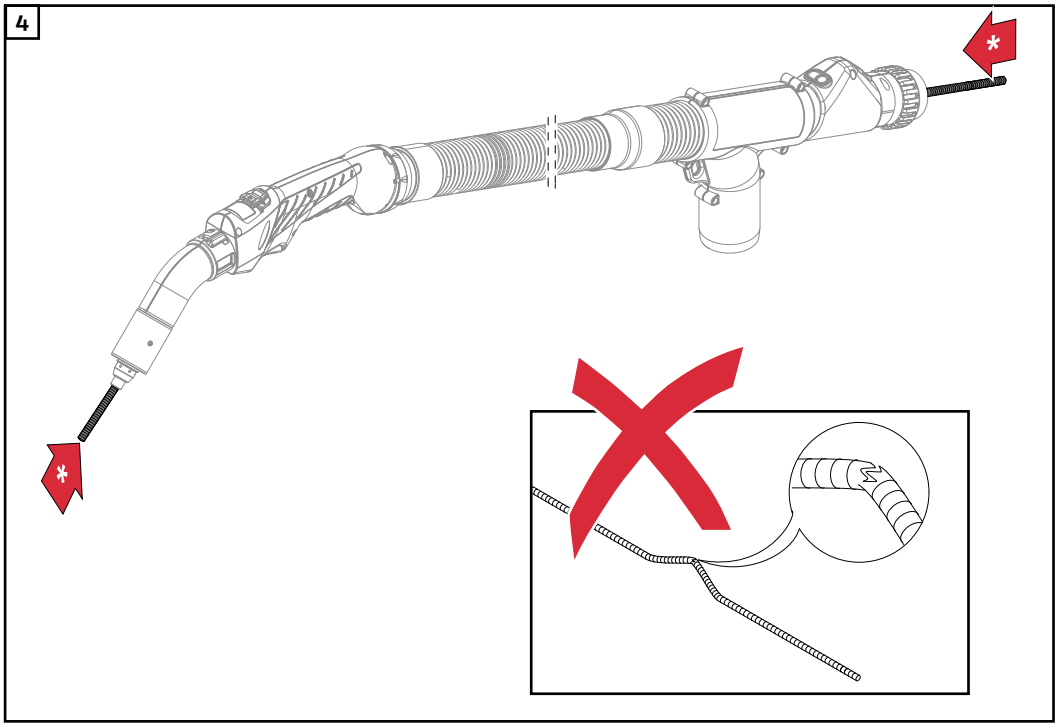
Lay out the welding torch straight



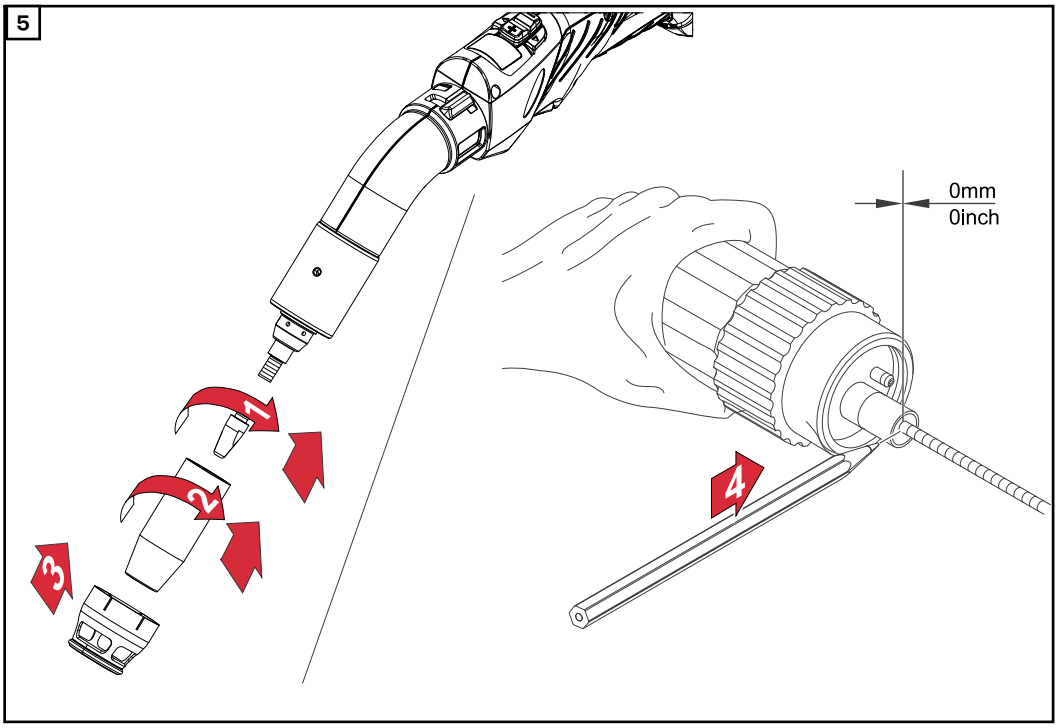
Lay out the inner liner straight; make sure that no burr protrudes into or out of the inner liner



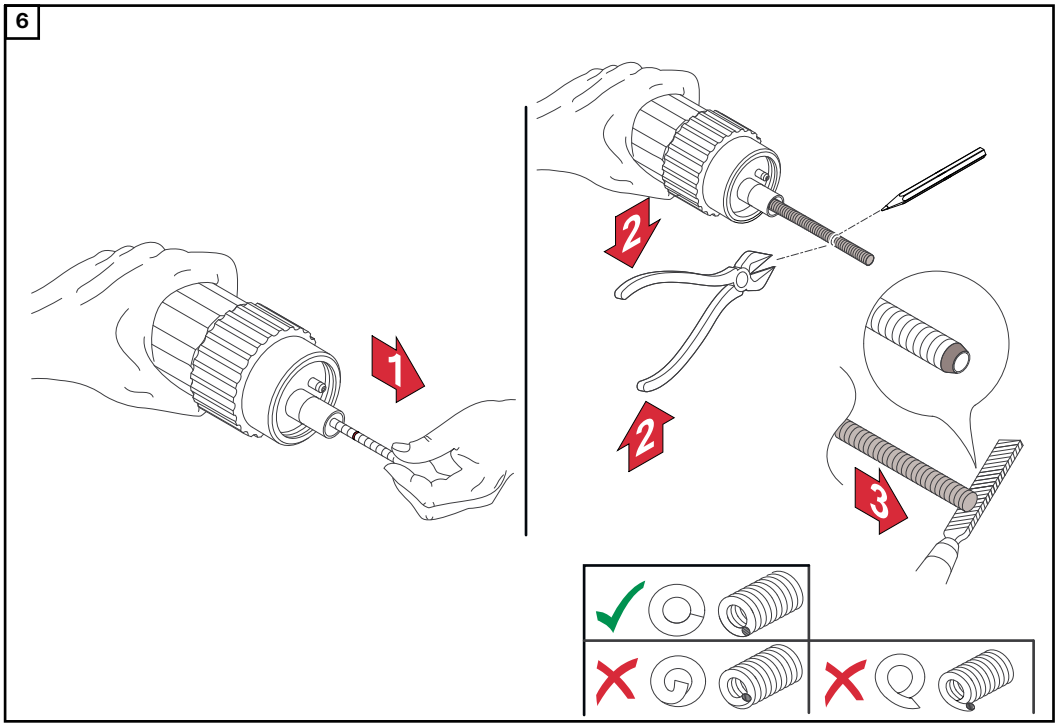
If already mounted, remove the extraction nozzle, gas nozzle, contact tip, and cap from the Euro connection



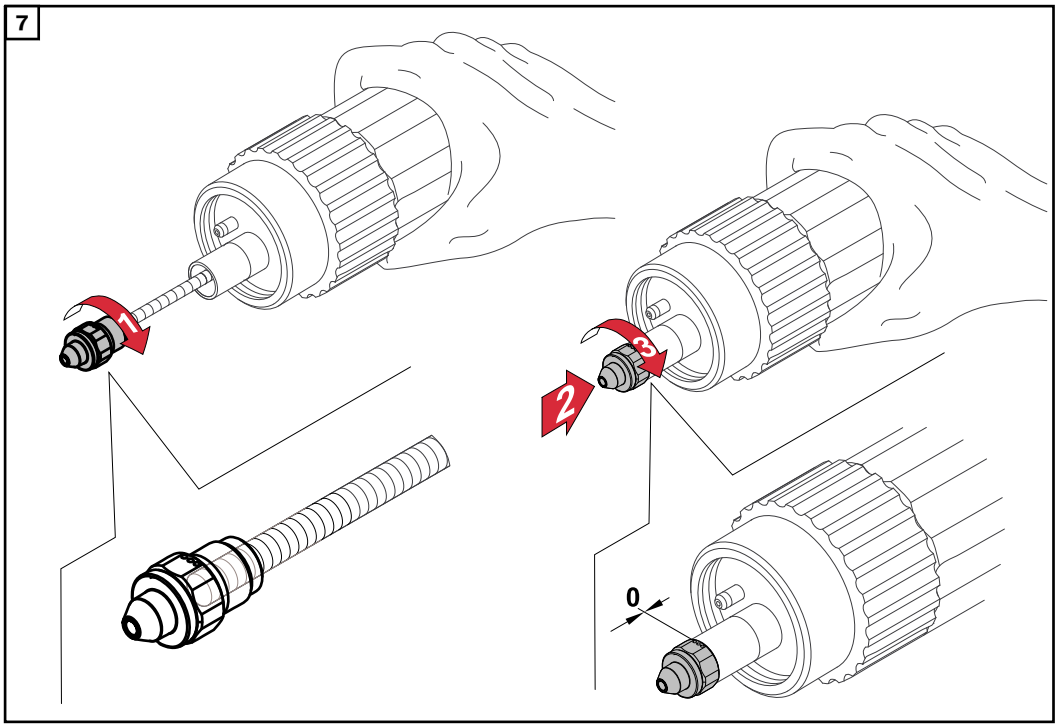
*Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped*



Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; mark the inner liner at the end of the welding torch



Pull inner liner 10 cm (3.94 in.) out of the welding torch, cut, and deburr; make sure that no burr protrudes into or out of the inner liner



Screw the cap onto the inner liner up to the stop; screw the cap into the welding torch

Fitting plastic inner liner in welding torch with Euro connection

Note on inner liner in gas-cooled welding torches

NOTE!

Risk due to incorrect wire-guide insert.
This can result in poor-quality weld properties.

- ▶ If a plastic inner liner with a bronze wire-guide insert is used in gascooled welding torches instead of a steel inner liner, the power data stated in the technical data of the welding torch must be reduced by 30%.
- ▶ In order to operate gascooled welding torches at maximum power, replace the 40 mm (1.575 in.) wire-guide insert with a 320 mm (12.598 in.) wire-guide insert.

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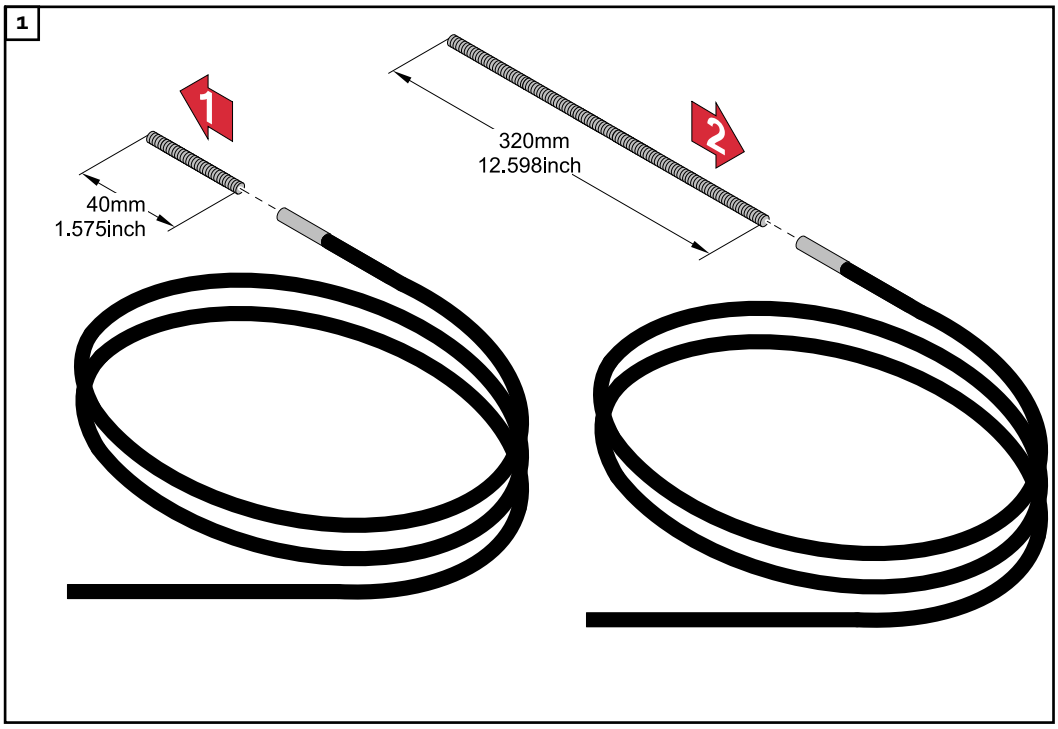
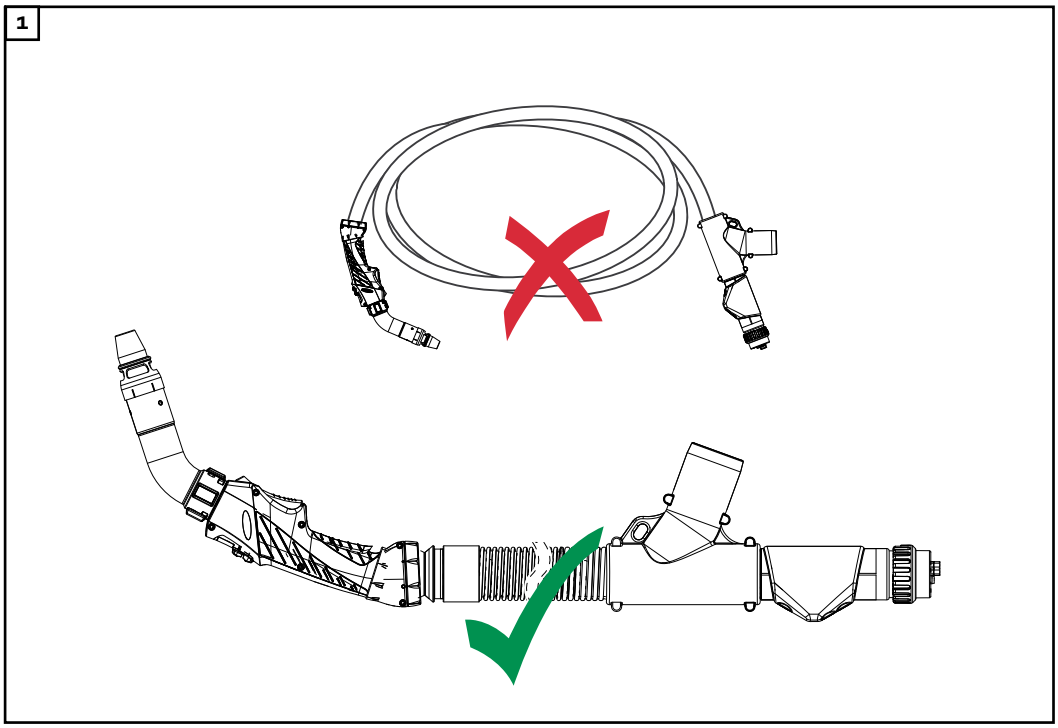
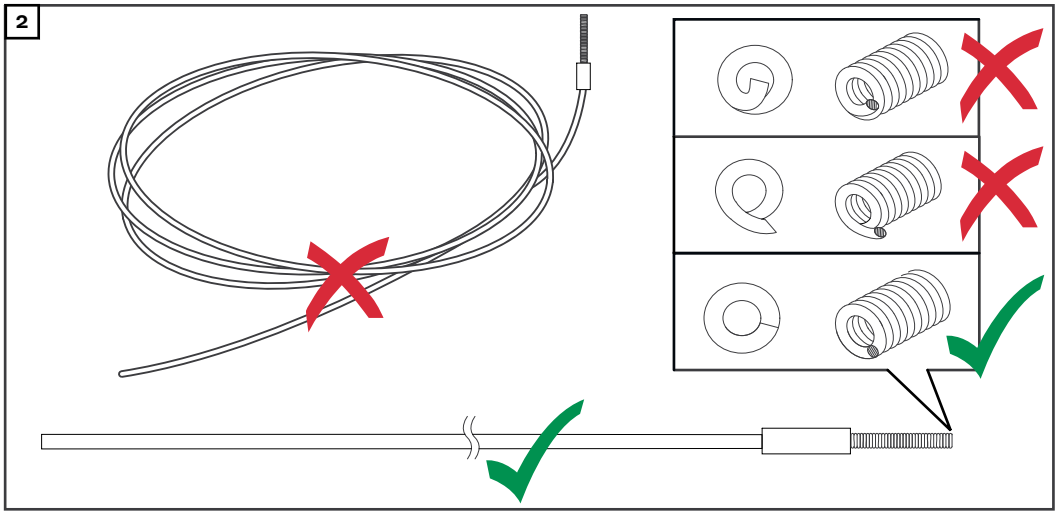


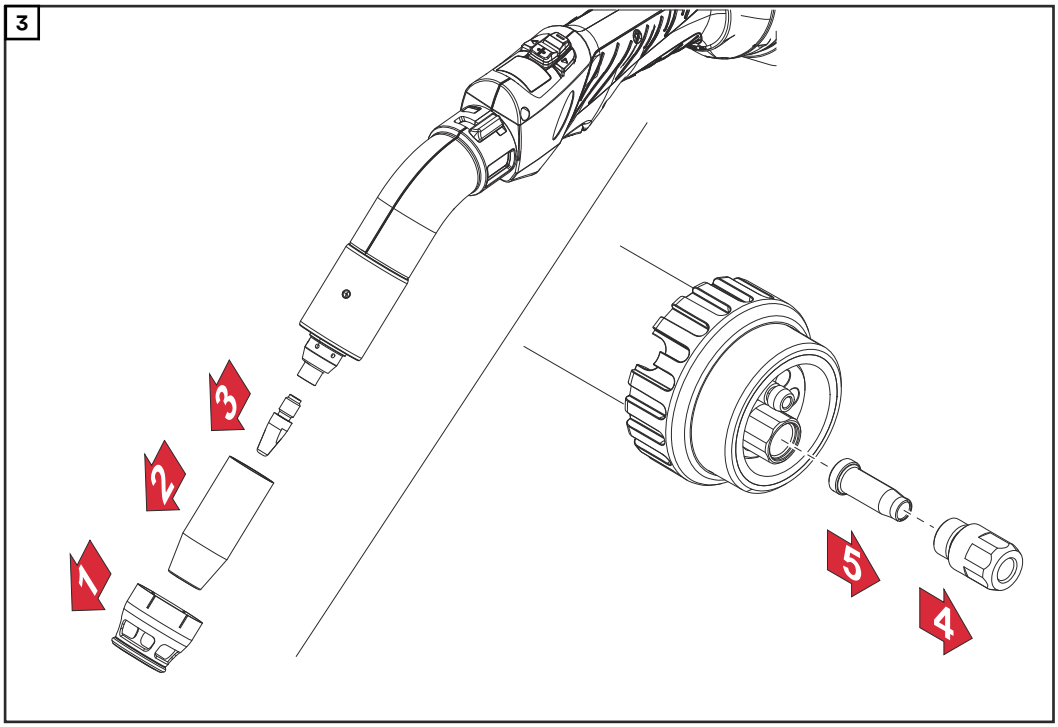
Fitting the plastic inner liner



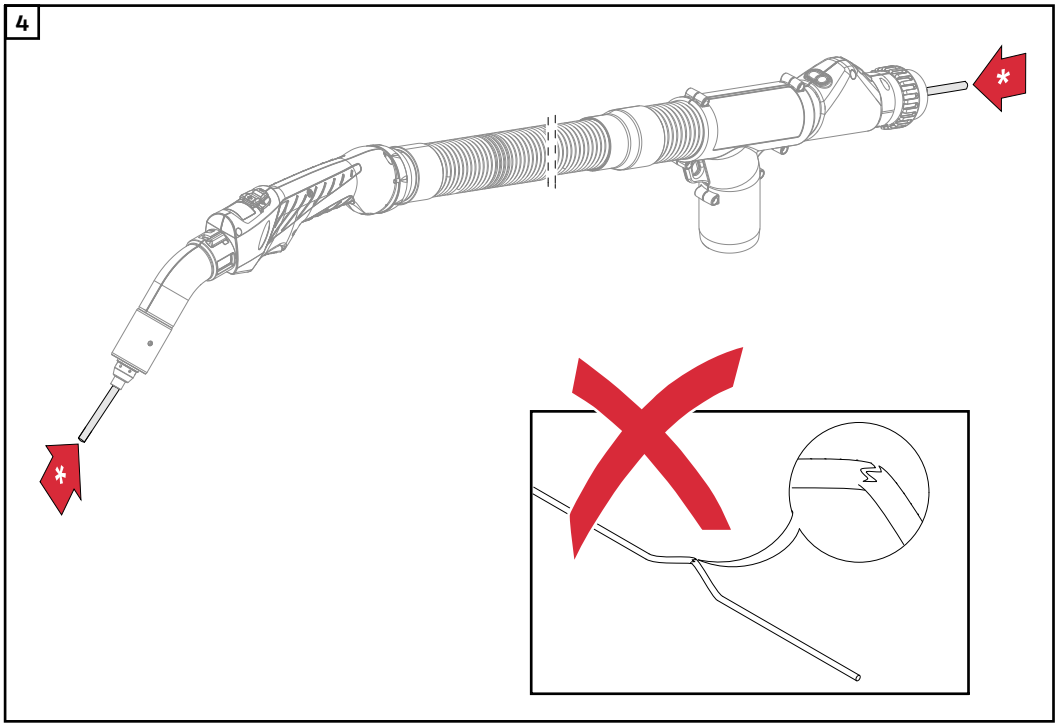
Lay out the welding torch straight



Lay out the inner liner straight; ensure that no burr protrudes into or out of the wire-guide insert



If already mounted, remove the extraction nozzle, gas nozzle, contact tip, and cap from the Euro connection



*Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped*

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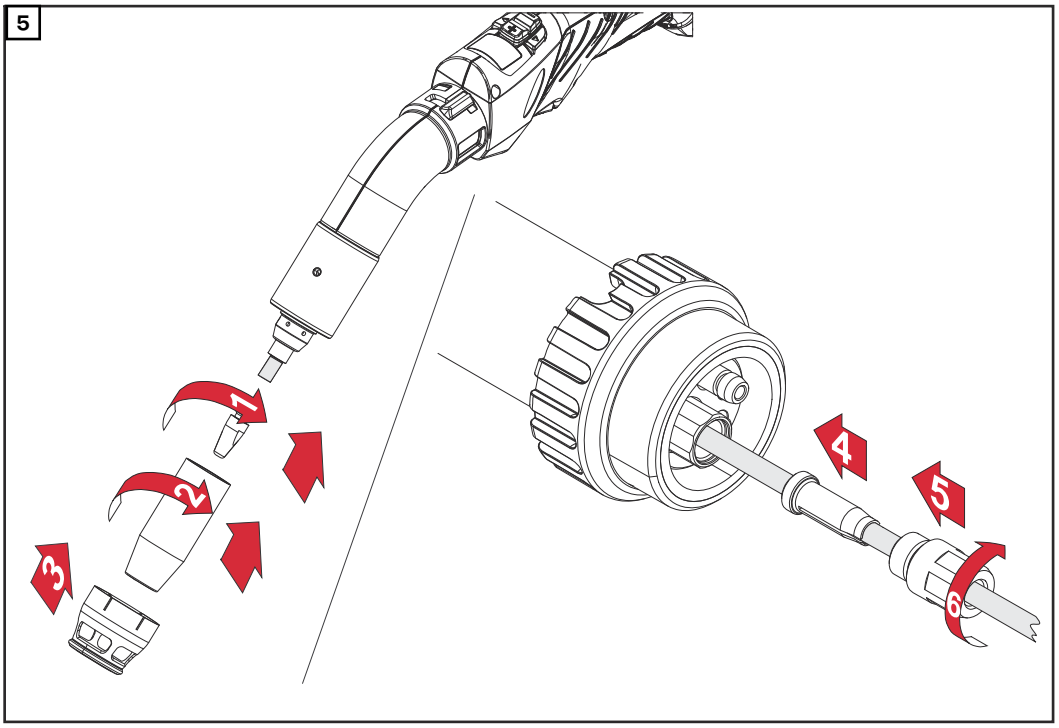
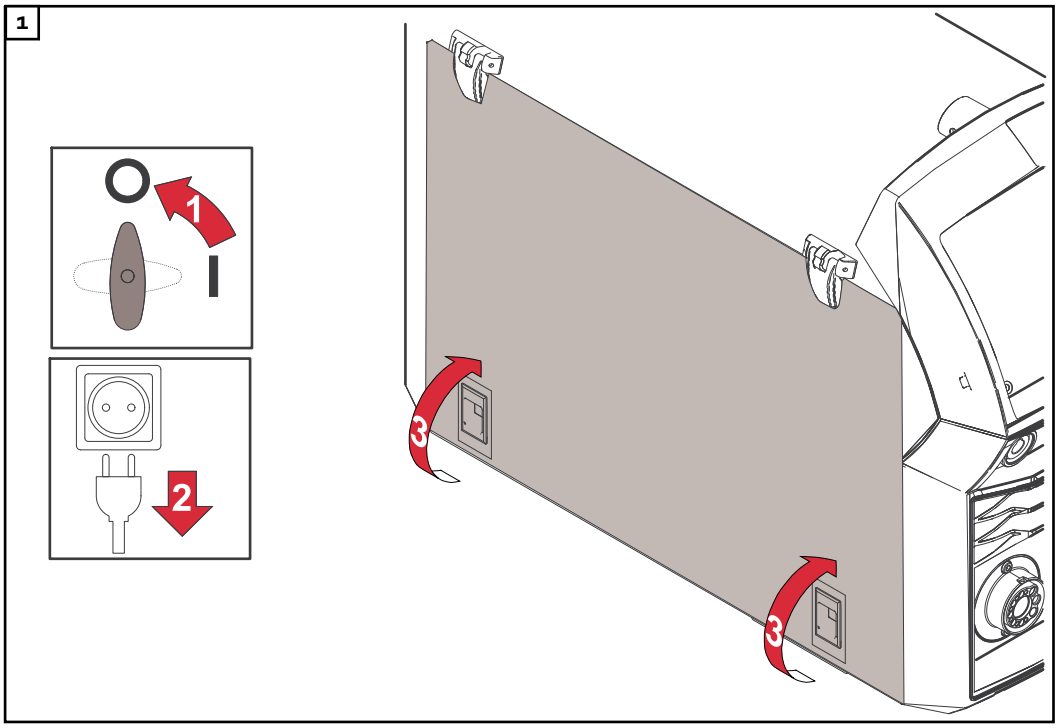


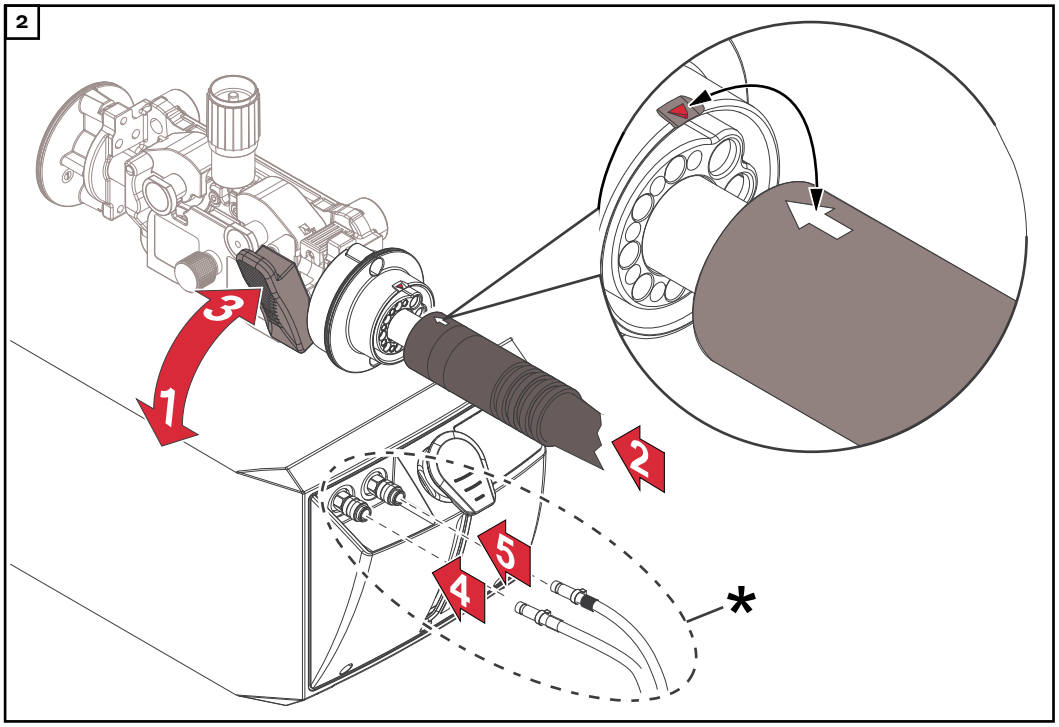
Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; secure the inner liner in the welding torch

6 Refer to the user documentation of the wirefeeder / power source used for instructions on how to correctly cut the inner liner to length

Connecting welding torches to devices with Fronius System Connector

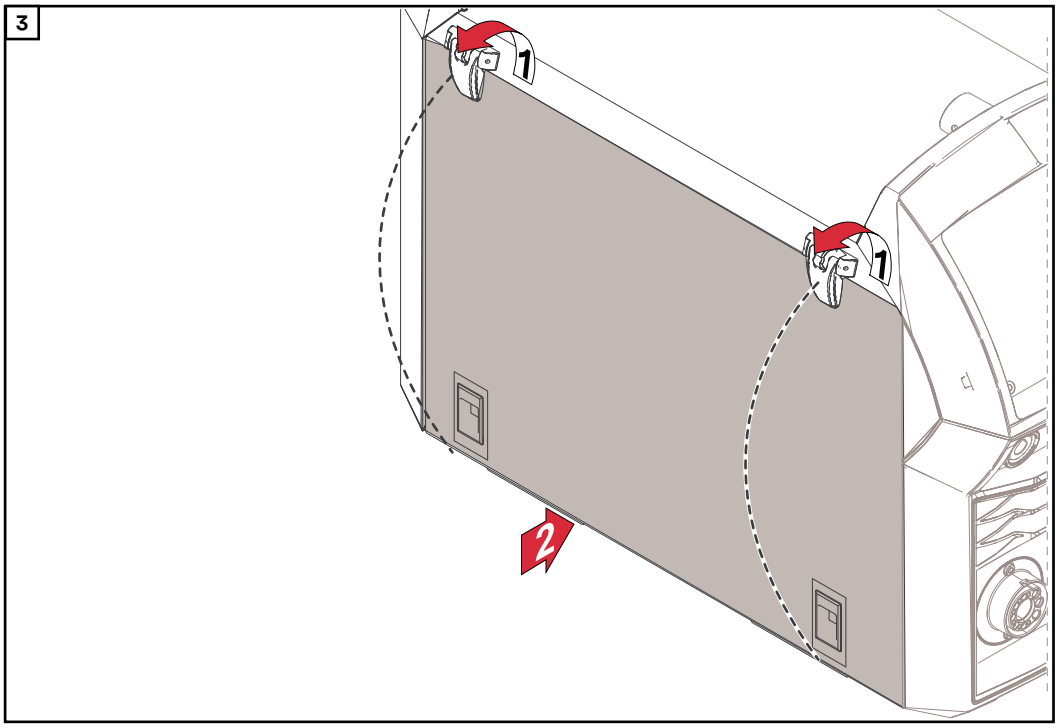
Connecting the welding torch to the power source





** only with water-cooled welding torches*

3



Connecting the welding torch to the wirefeeder

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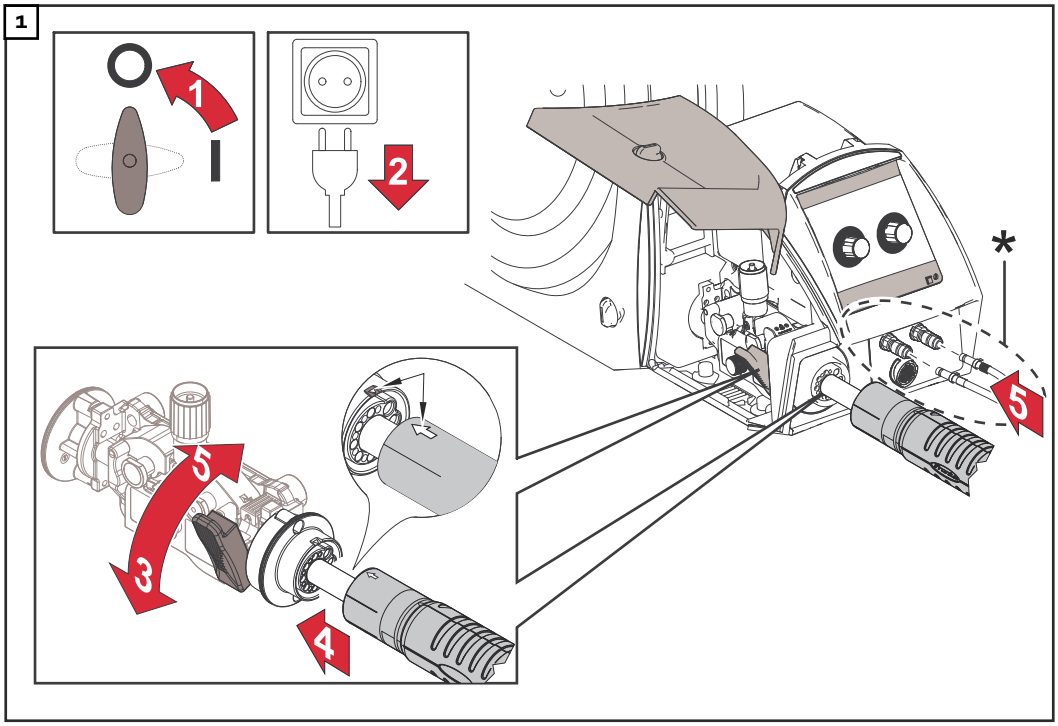
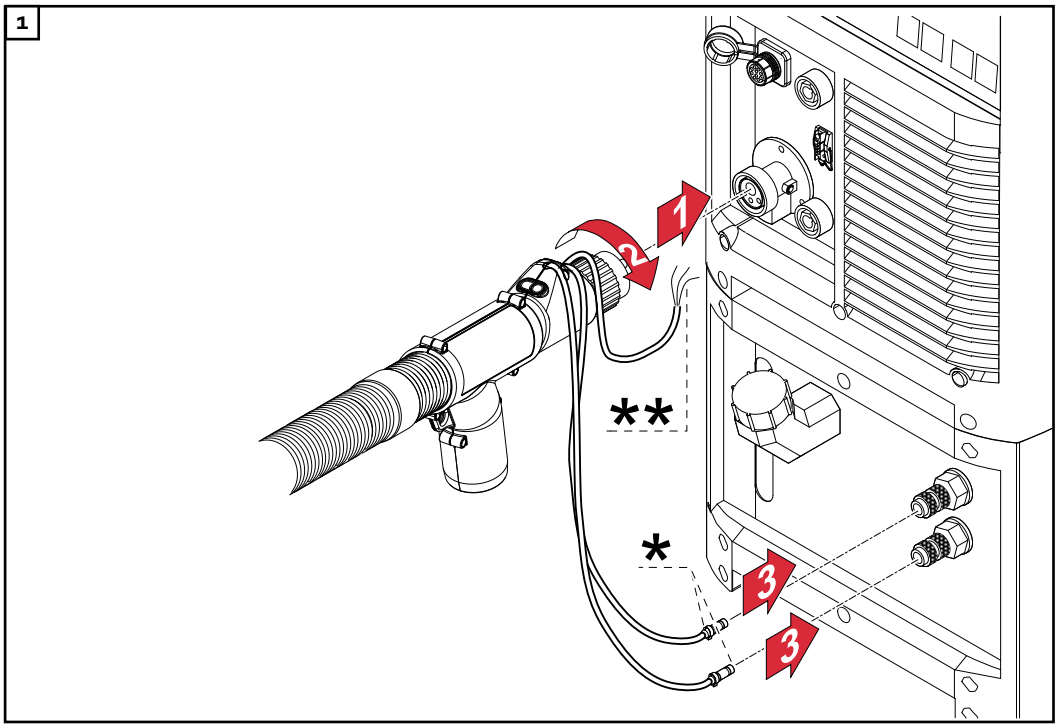


** only with water-cooled welding torches*

Connecting welding torches to devices with Euro connection

Connecting the welding torch



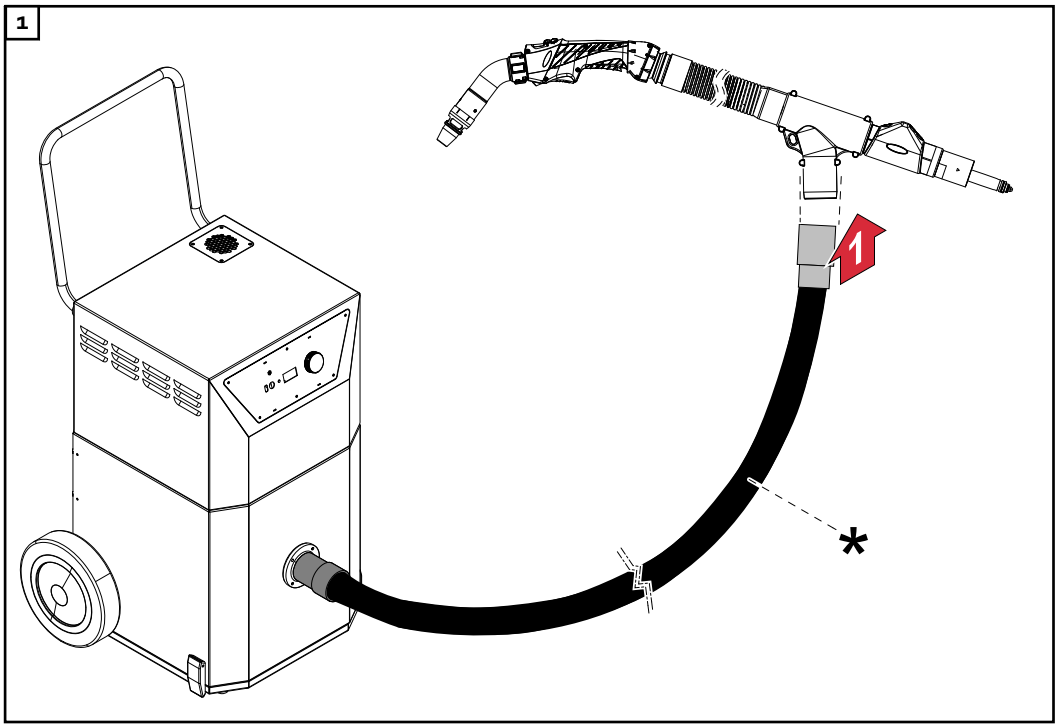
* only with water-cooled welding torches; connect welding torch to the cooling unit

** the control line must be provided with the required control plug by the customer. The installer is responsible for the correct execution of the work.

Connecting welding torch to extraction system and measuring extraction capacity

Connecting the welding torch to the extraction system

The welding torch can be connected to an external extraction unit as well as to a central extraction system. The welding torch is always connected in the same way.



Connecting welding torch to external extraction unit

*** Recommendations for the extraction hose:**

- Use Fronius extraction hoses. The design and material composition of Fronius extraction hoses ensure maximum compatibility and leak-tightness
- Keep the extraction hose as short as possible; the shorter the extraction hose, the less energy the extraction unit has to apply to achieve the required extraction values (for more information on the required extraction values, see section **Requirements for the extraction system** from page **8** and technical data)

Measuring the extraction capacity (extraction volumetric flow) with the Exentometer

The extraction volumetric flow is used as a measured value for the extraction capacity of the welding torch. The extraction volumetric flow is measured with the Exentometer .

Measure the extraction capacity (extraction volumetric flow):

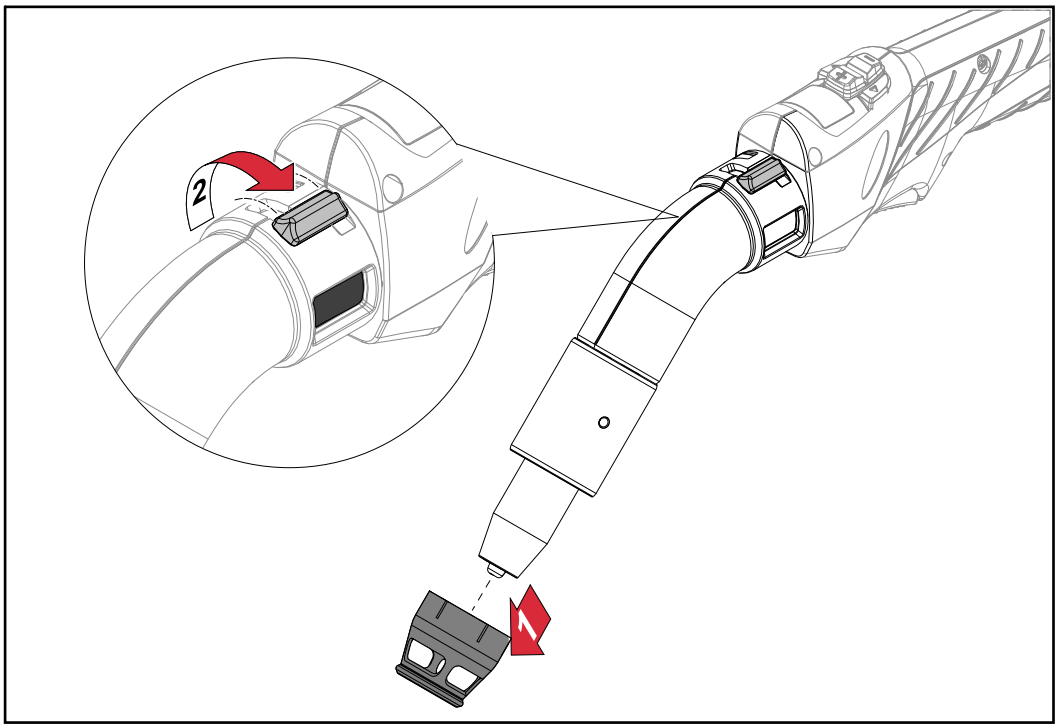
1 Switch on the extraction system

2 Read off the required extraction volumetric flow ($Q_{v,n}$) - on the rating plate of the welding torch - see also **Extraction information on the rating plate** on page **10**) or in the technical data

3 Ensure that the welding torch (including hosepack) and the extraction hose do not have any holes, cracks, or other damage

4 Ensure that external adjustment devices do not falsify the check of the extraction capacity (for example, external air flow regulators - see section **Setting extraction capacity with external air flow regulator** from page **40**, ...)

5 Remove the extraction nozzle and close the air flow regulator - see the figure below

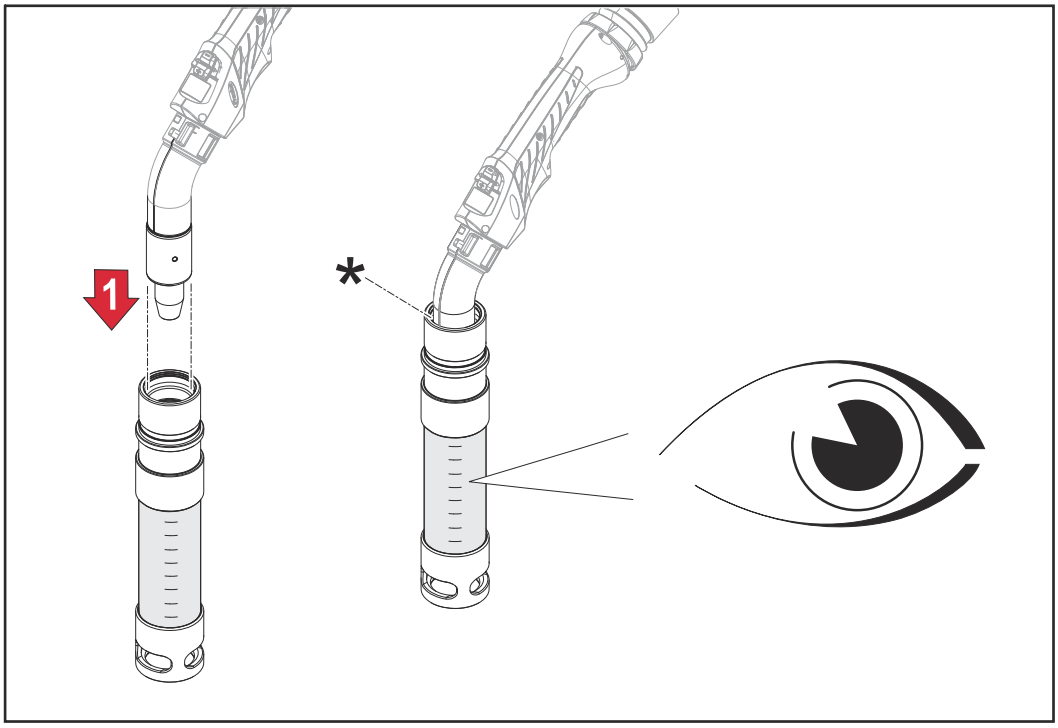


Removing extraction nozzle and closing air flow regulator

6 Place the Exentometer upright on a solid surface (for example, on a workbench)

7 Insert the welding torch into the Exentometer as far as it will go
- Since the extraction system is already running, the Exentometer immediately displays the current extraction capacity

8 * Ensure that the welding torch is fully inserted into the Exentometer and that no air can escape between the welding torch and the Exentometer
- This ensures that the displayed value for the extraction capacity is not distorted



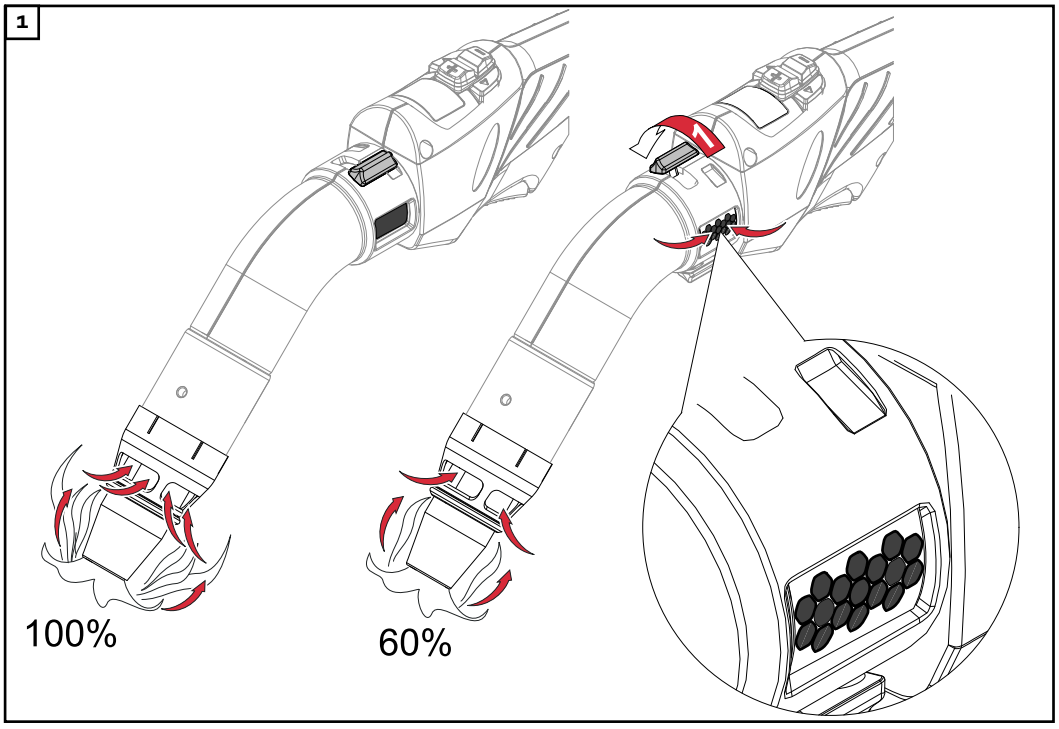
Putting welding torch in the Exentometer

9 Compare the measured extraction volumetric flow with the required extraction volumetric flow
- if the two values match, no further measures are necessary
- if the two values do not match, increase or reduce the power of the extraction system until the extraction volumetric flow is in the correct range
  - if the extraction volumetric flow is too low, there is a risk that the welding fumes will not be optimally extracted
  - an excessively high extraction volumetric flow means there is a risk that shielding gas will be unintentionally sucked off the weld seam

Adjusting the extraction capacity

Setting the extraction capacity on the welding torch

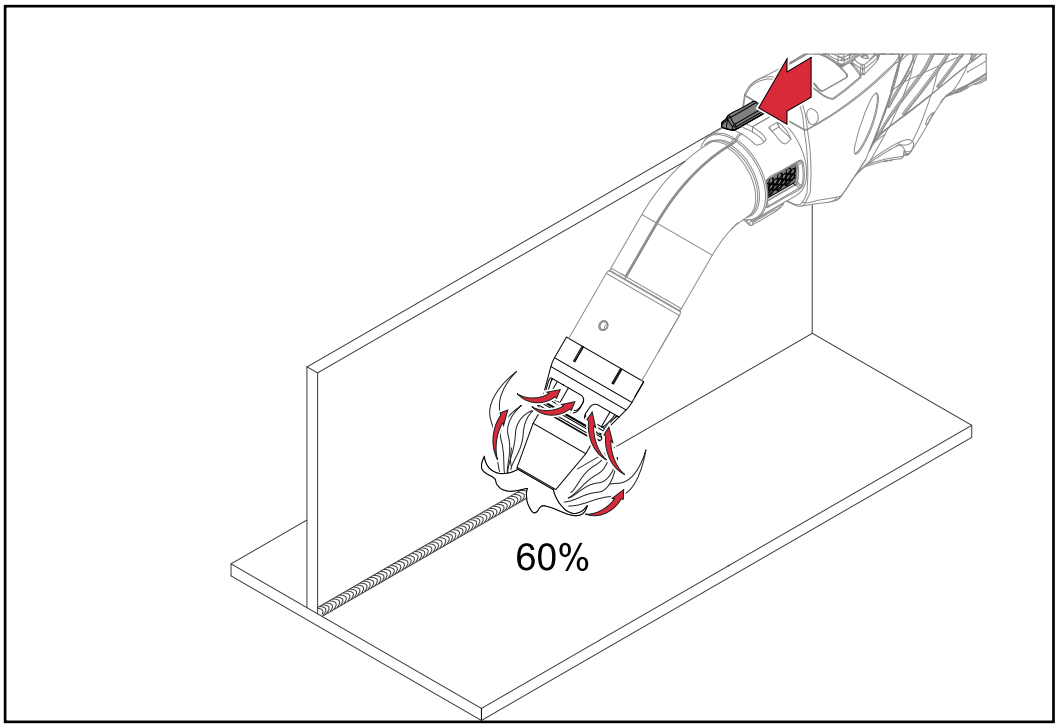
The air flow regulator can be opened to reduce the extraction capacity. If the air flow regulator is fully open, this reduces the extraction capacity of the welding torch by 40%.



Left: air flow regulator closed = extraction capacity 100%; right: air flow regulator open = extraction capacity 60%

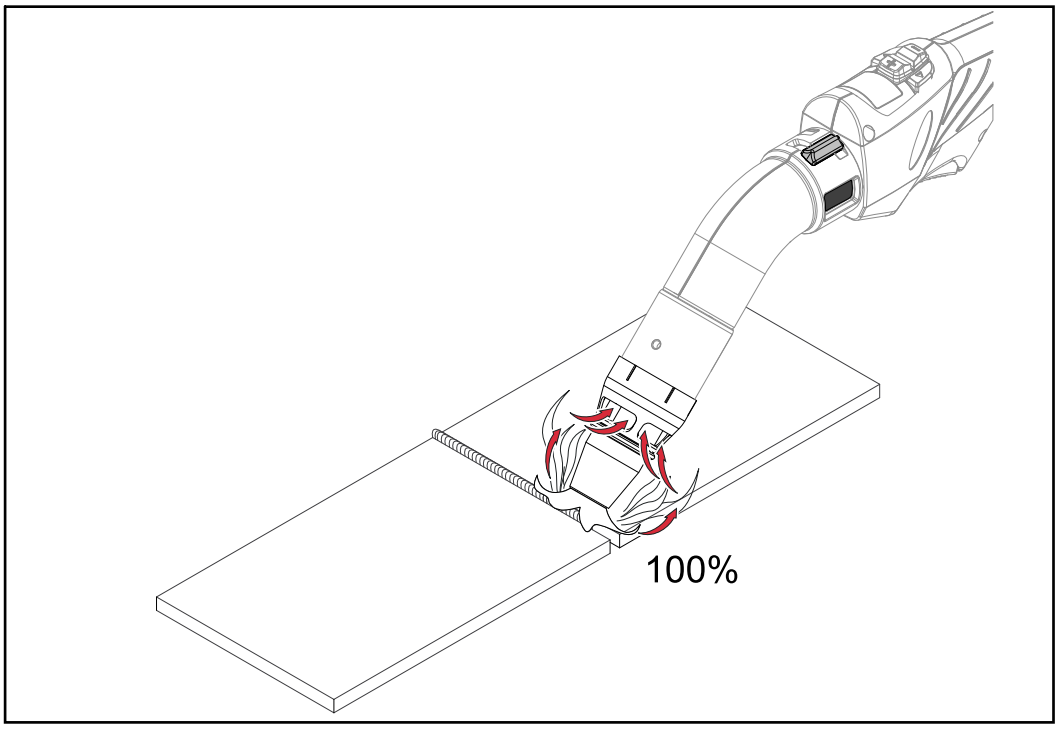
Applications of the air flow regulator:

- When welding in corners or fillet welds, it is possible for the welding fumes to be optimally extracted even with reduced extraction capacity
- In this case, too high an extraction capacity could lead to unintentional extraction of the shielding gas
- In this case, it is recommended to open the air flow regulator and thereby reduce the extraction capacity



Welding of a fillet weld; air flow regulator open = extraction capacity reduced

When welding on open surfaces (such as square butt welds), it may be necessary to close the air flow regulator and thus use the maximum extraction capacity. This provides the best possible extraction of welding fumes.



Welding of a square butt weld; air flow regulator closed = maximum extraction capacity

⚠ WARNING!

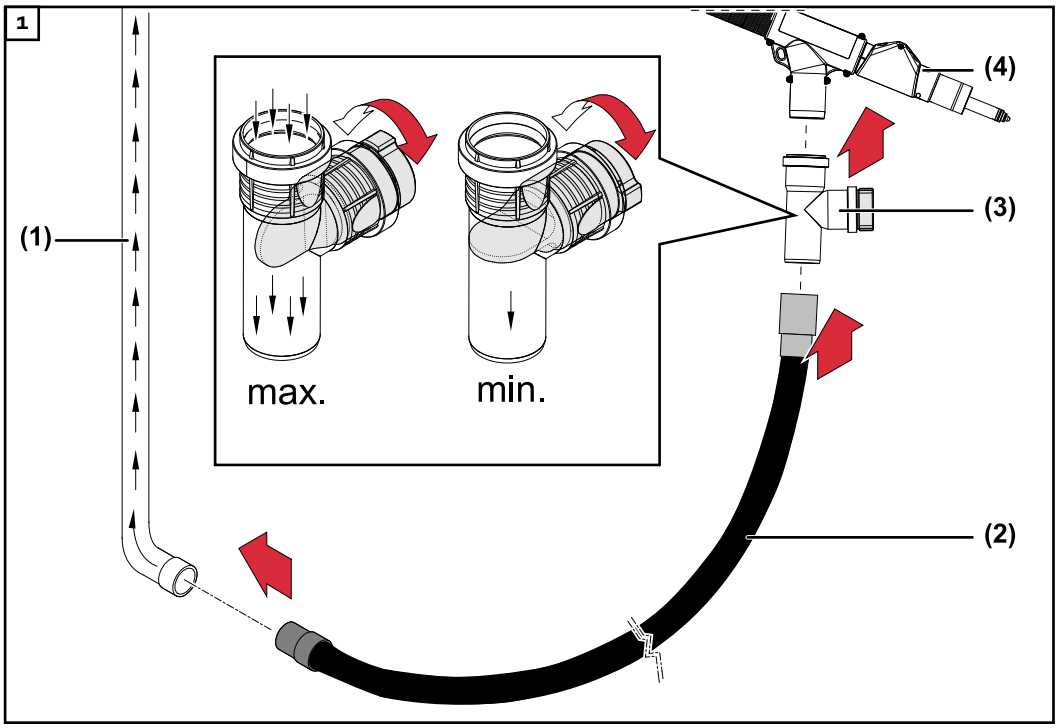
Danger from contact with toxic welding fumes.
Serious personal injuries may result.

- ▶ Always ensure that all welding fumes are extracted, regardless of the welding task.

Setting extraction capacity with external air flow regulator

Particularly in the case of central extraction systems, it may be necessary to adjust the extraction capacity manually using the optionally available external air flow regulator:

- by completely opening the external air flow regulator, the air flow remains almost unchanged
- by completely closing the external air flow regulator, the air flow is reduced to a minimum level



(1) central extraction system, (2) extraction hose, (3) external air flow regulator, (4) welding torch

2 After adjusting the air flow, always measure the extraction capacity of the welding torch - for this, see section **Measuring the extraction capacity (extraction volumetric flow) with the Exentometer** from page **35**

Fault diagnosis, troubleshooting, maintenance

Troubleshooting

Troubleshooting

Porosity of weld seam

Cause: Extraction too strong
Remedy: Reduce extraction

Extraction too low

Cause: Holes in the extraction hose
Remedy: Replace extraction hose

Cause: Displaced extraction unit filter
Remedy: Replace extraction unit filter

Cause: Air passages otherwise blocked
Remedy: Remove blockages

Cause: Extraction capacity of extraction unit too low
Remedy: Use extraction unit with higher extraction capacity

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 damaged or broken.
Remedy: Replace welding torch

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)

No function after pressing torch trigger

Power source switched on, power source indication illuminates

Cause: FSC ('Fronius System Connector'—central connector) not inserted up to the stop

Remedy: Insert FSC up to the stop

Cause: Welding torch or welding torch control line faulty

Remedy: Replace welding torch

Cause: Interconnecting hosepack not properly connected or faulty

Remedy: Connect interconnecting hosepack properly
Replace faulty interconnecting hosepack

Cause: Faulty power source

Remedy: Notify service provider

Poor-quality weld properties

Cause: Incorrect welding parameters
Remedy: Correct settings

Cause: Poor ground earth connection
Remedy: Establish good contact with workpiece

Cause: Too little or no shielding gas
Remedy: Check pressure regulator, gas hose, gas solenoid valve, and welding torch gas connection. For gas-cooled welding torches, check gas seal, use suitable inner liner

Cause: Welding torch leaks
Remedy: Replace welding torch

Cause: Excessively large or heavily worn contact tip
Remedy: Change contact tip

Cause: Incorrect wire alloy or incorrect wire diameter
Remedy: Check the inserted wire spool/basket-type spool

Cause: Incorrect wire alloy or incorrect wire diameter
Remedy: Check the weldability of the parent material

Cause: Shielding gas not suitable for wire alloy
Remedy: Use correct shielding gas

Cause: Unfavorable welding conditions: Shielding gas contaminated (moisture, air), inadequate gas shield (weld pool "boiling", draft), impurities in the workpiece (rust, paint, grease)
Remedy: Optimize welding conditions

Cause: Shielding gas escaping at clamping nipple
Remedy: Use the correct clamping nipple

Cause: Clamping nipple seal ring defective, shielding gas escaping at clamping nipple
Remedy: Replace clamping nipple to ensure gas tightness

Cause: Welding spatter in the gas nozzle
Remedy: Remove welding spatter

Cause: Turbulence due to excessively high quantity of shielding gas
Remedy: Reduce quantity of shielding gas; recommended:
shielding gas quantity (l/min) = wirespool diameter (mm) x 10
(for example 16 l/min for 1.6 mm wire electrode)

Cause: Excessively large distance between welding torch and workpiece
Remedy: Reduce distance between welding torch and workpiece (approx. 10–15 mm/0.39–0.59 in.)

Cause: Excessively large work angle of the welding torch
Remedy: Reduce work angle of the welding torch

Cause: Wirefeed components do not correspond to the diameter of the wire electrode/the material of the wire electrode

Remedy: Use correct wirefeed components

Poor wirefeeding

Cause: Depending on the system, brakes in the wirefeeder or power source set too tightly

Remedy: Set the brakes to be looser

Cause: Hole in the contact tip displaced

Remedy: Replace contact tip

Cause: Faulty inner liner or wire-guide insert

Remedy: Check inner liner or wire-guide insert for kinks, soiling, etc.
Defective inner liner, replace defective wire-guide insert

Cause: Feed rollers not suitable for wire electrode used

Remedy: Use suitable feed rollers

Cause: Incorrect contact pressure of the feed rollers

Remedy: Optimize contact pressure

Cause: Feed rollers soiled or damaged

Remedy: Clean or replace feed rollers

Cause: Inner liner displaced or kinked

Remedy: Replace inner liner

Cause: Inner liner too short after cutting to length

Remedy: Replace inner liner and cut new inner liner to correct length

Cause: Wear of the wire electrode due to excessive contact pressure at the feed rollers

Remedy: Reduce contact pressure at the feed rollers

Cause: Wire electrode soiled or rusted

Remedy: Use high-quality wire electrode without soiling

Cause: For steel inner liners: use of uncoated inner liner

Remedy: Use coated inner liner

Cause: Clamping nipple deformed in wire entry and exit area (oval, worn out), shielding gas escaping at clamping nipple

Remedy: Replace clamping nipple to ensure gas tightness

Gas nozzle gets very hot

Cause: No heat dissipation due to gas nozzle being fitted too loosely

Remedy: Screw the gas nozzle tightly up to the stop

Welding torch gets very hot

Cause: Only in multi-lock welding torches: Union nut of the torch body loose

Remedy: Tighten union nut

Cause: Welding torch has been operated above the maximum welding current

Remedy: Reduce welding power or use more powerful welding torch

Cause: Welding torch is inadequately sized

Remedy: Observe duty cycle and load limits

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

Remedy: Check coolant level, coolant flow, coolant contamination, displacement of the hosepack, etc.

Cause: Tip of the welding torch too close to the arc

Remedy: Increase stick out

Short service life of the contact tip

Cause: Incorrect feed rollers

Remedy: Use correct feed rollers

Cause: Wear of the wire electrode due to excessive contact pressure at the feed rollers

Remedy: Reduce contact pressure at the feed rollers

Cause: Wire electrode soiled/rusted

Remedy: Use high-quality wire electrode without soiling

Cause: Uncoated wire electrode

Remedy: Use wire electrode with suitable coating

Cause: Incorrect dimensions of the contact tip

Remedy: Use contact tip of the correct size

Cause: Duty cycle of the welding torch too long

Remedy: Reduce duty cycle or use more powerful welding torch

Cause: Contact tip overheats. No heat dissipation due to contact tip being fitted too loosely

Remedy: Tighten contact tip

NOTE!

In CrNi applications, greater contact tip wear may occur due to the surface finish of the CrNi wire electrode.

Malfunction of the torch trigger

Cause: Faulty plug connections between the welding torch and the power source

Remedy: Establish correct plug connections/send power source or welding torch to service team

Cause: Soiling between torch trigger and torch trigger housing

Remedy: Remove soiling

Cause: Faulty control line

Remedy: Notify service provider

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: Rusted or poor quality wire electrode

Remedy: Use high-quality wire electrode without soiling

Cause: Applies to gas-cooled welding torches: Gas leakage with non-isolated inner liners

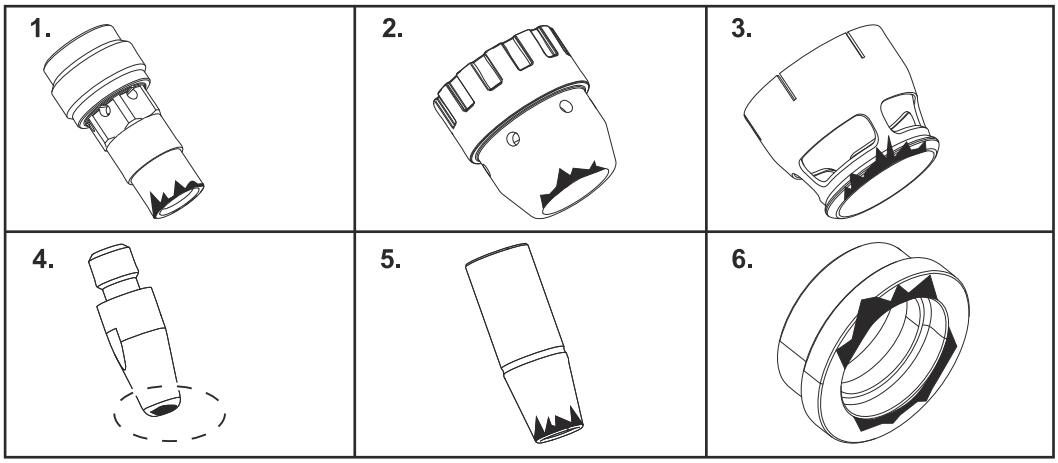
Remedy: For gas-cooled welding torches, only use isolated inner liners

Cause: Too much parting agent applied

Remedy: Remove excess parting agent/apply less parting agent

Maintenance

Detecting defective wear parts

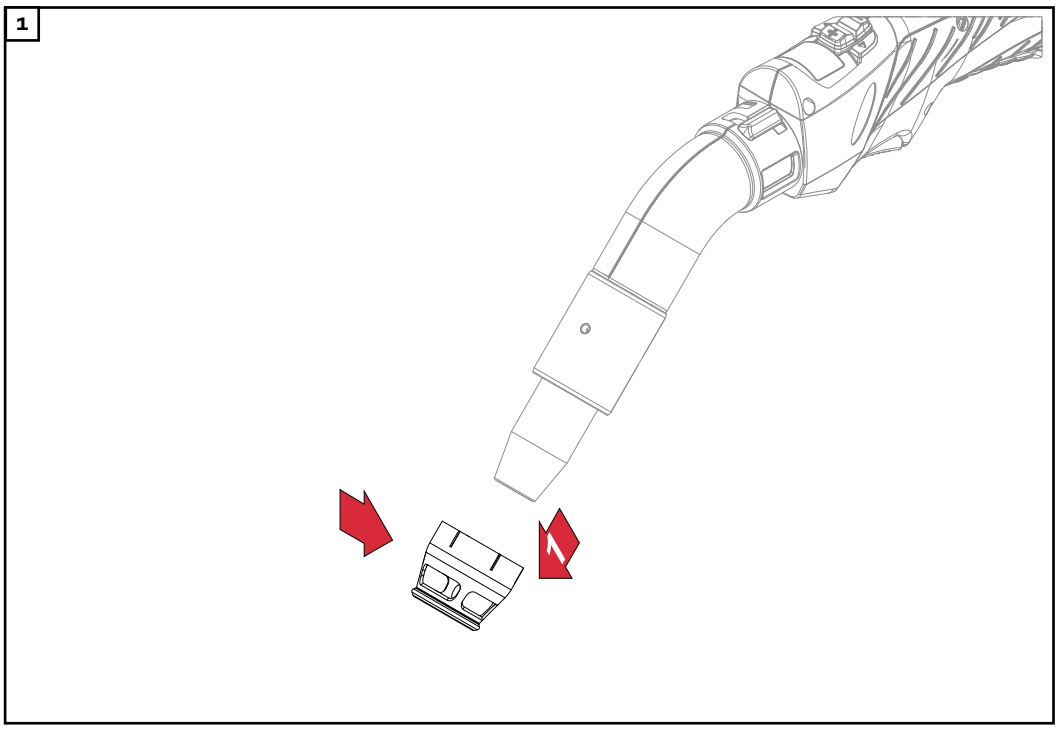


1. Nozzle fitting
   - Burnt outer edges, notches
   - Heavily coated with welding spatter
2. Spatter guard (only for water-cooled welding torches)
   - Burnt outer edges, notches
3. Extraction nozzle
   - Burnt outer edges, notches
4. Contact tip
   - Ground (oval) wire entry and wire exit bores
   - Heavily coated with welding spatter
   - Penetration at the tip of the contact tip
5. Gas nozzle
   - Heavily coated with welding spatter
   - Burnt outer edges
   - Notches
6. Insulating parts
   - Burnt outer edges, notches

Maintenance at the beginning of each working day

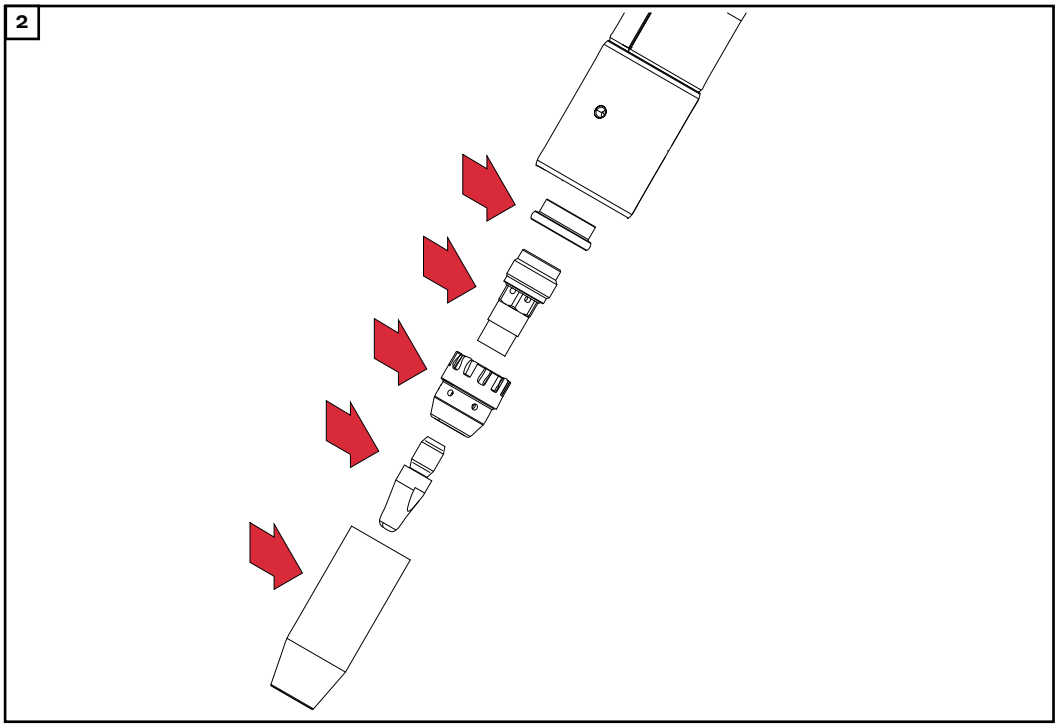
Check extraction nozzle and replace if damaged:

1



Clean gas nozzle, contact tip, spatter guard (only for water-cooled welding torches), nozzle fitting, and insulating parts from welding splatter, check for damage, and replace damaged parts:

2



3 In addition to the steps listed above, prior to starting up water-cooled welding torches always:

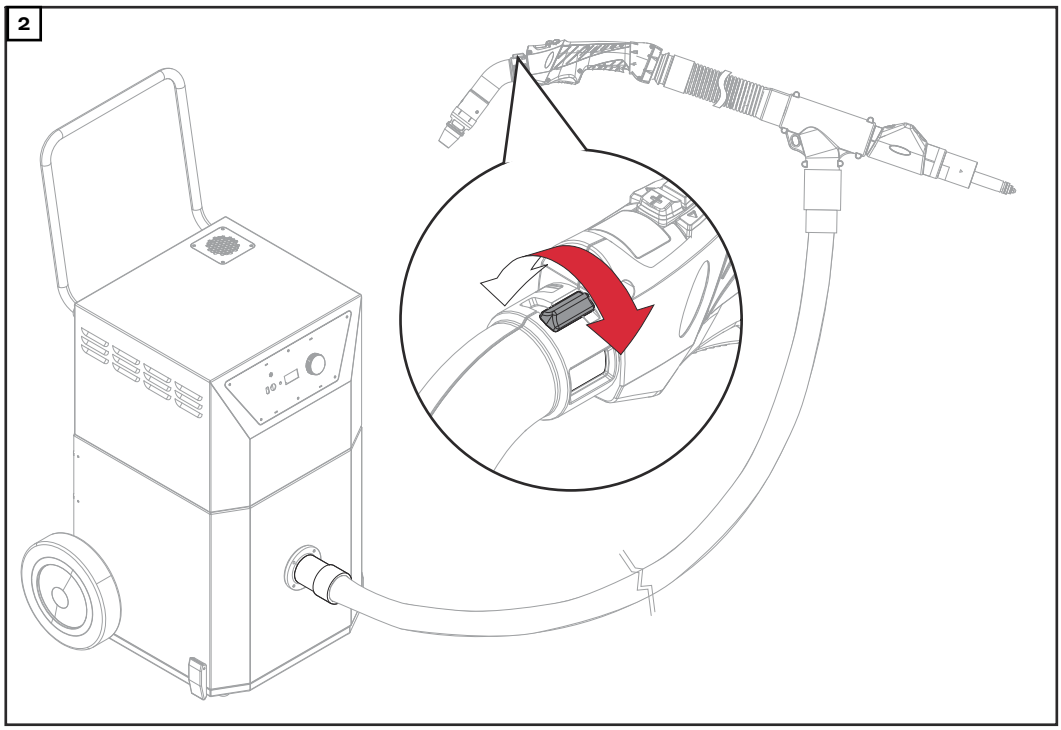
- Ensure that all coolant connections are leak-tight
- Ensure that there is a proper coolant return flow - refer to the user documentation of the cooling unit for more information

Maintenance every 48 hours

Open and close the air flow regulator every 48 hours:

1 Switch on the extraction system

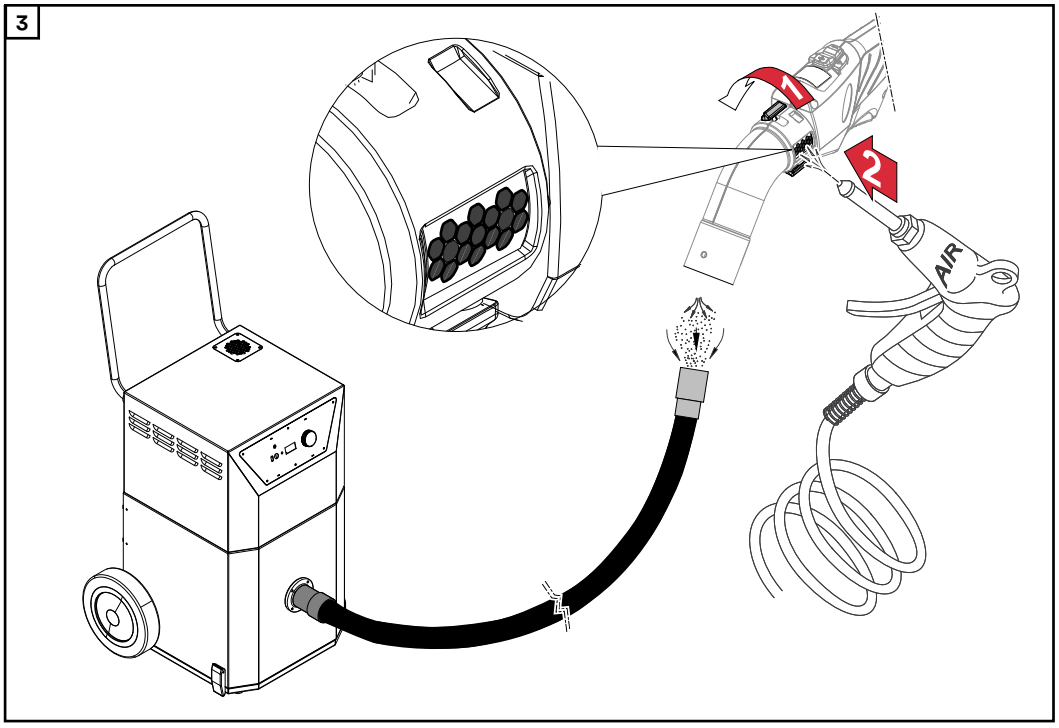
2



Opening and closing the air flow regulator

If the air inlets are dirty and / or the air flow regulator can no longer be opened smoothly, clean the air inlets with compressed air:

3

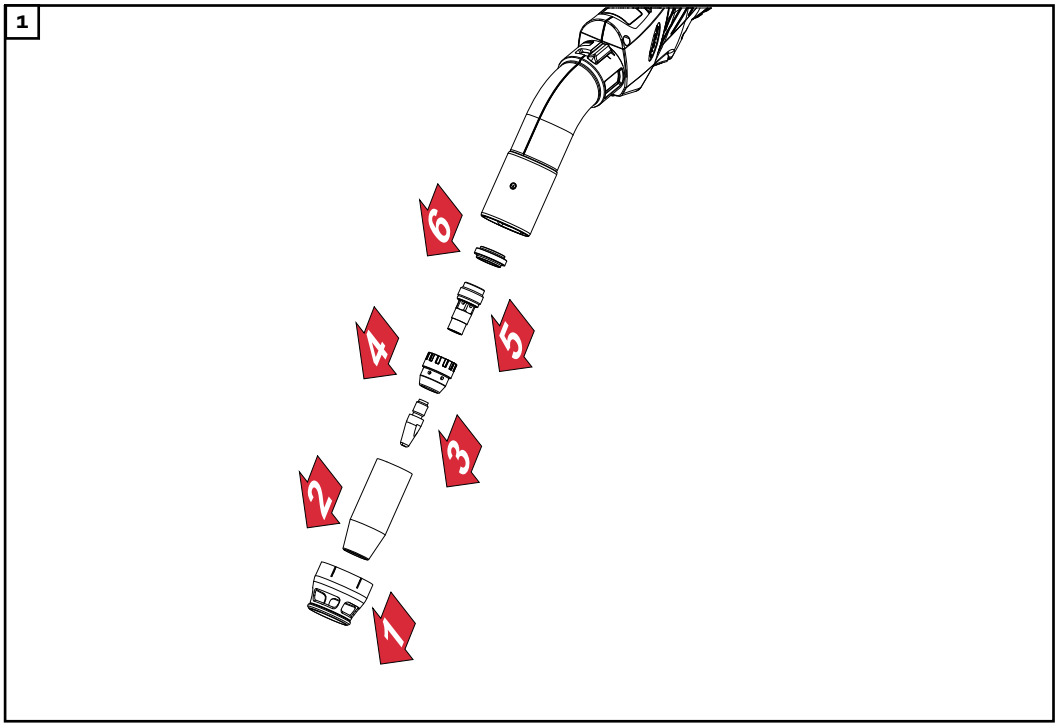


Ensure that any particles released during cleaning are picked up by the extraction system

Maintenance at every wirespool/ basket-type spool replacement

Clean the wirefeeding hose with reduced compressed air:

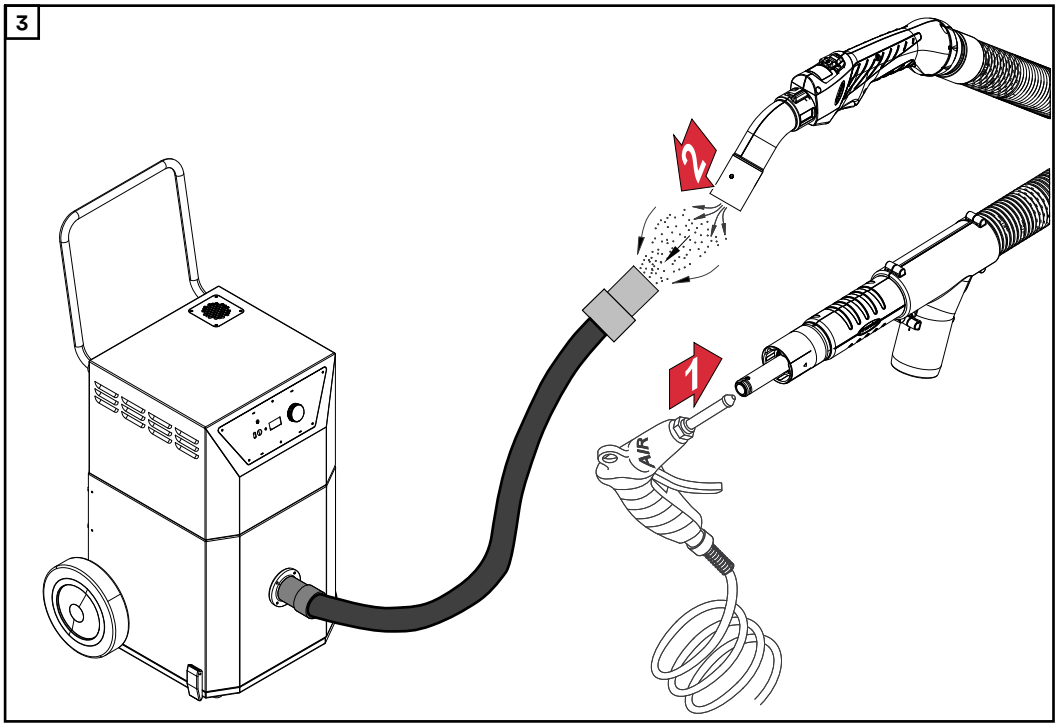
1



Dismantling the wearing parts

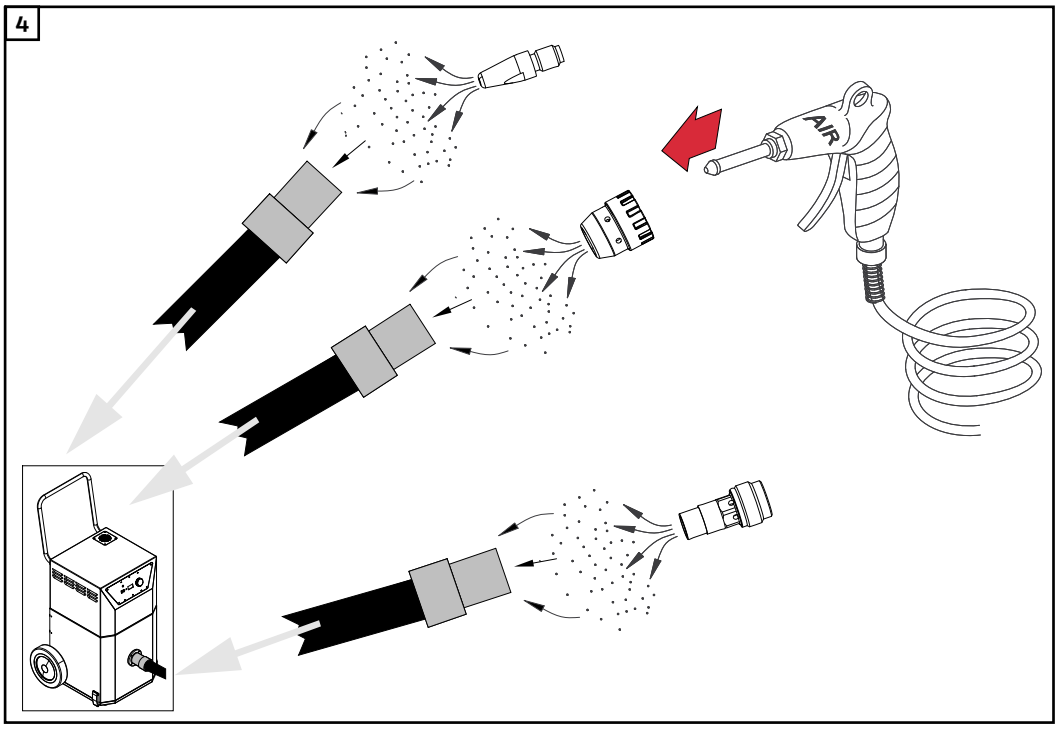
2 Switch on the extraction system

3

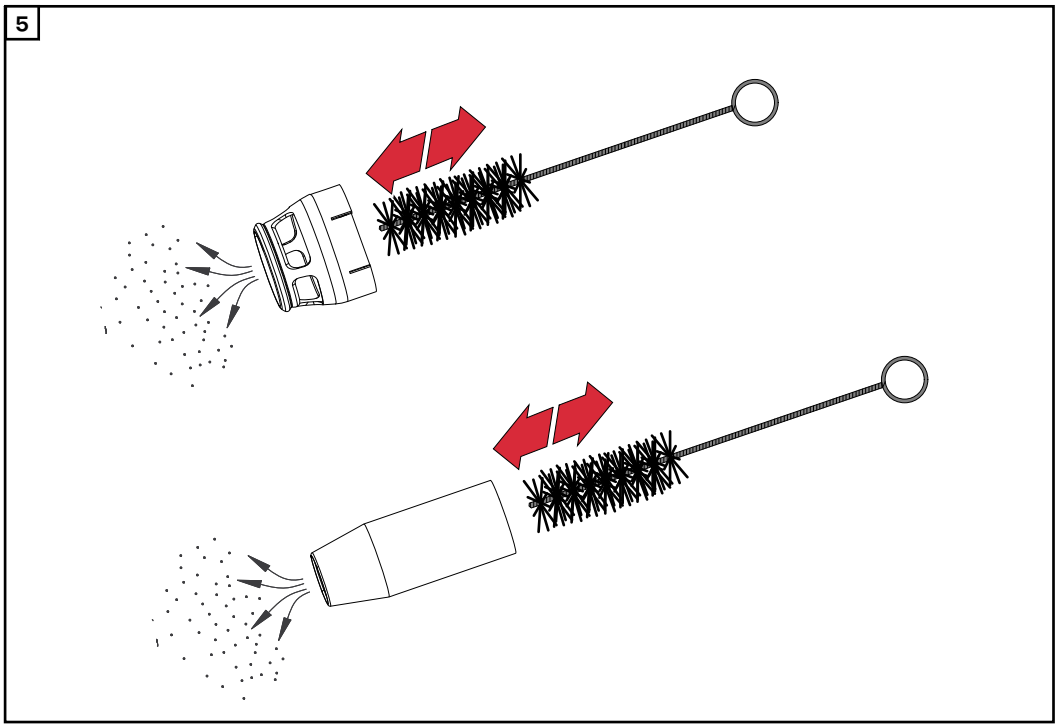


Cleaning the hosepack; ensure that any particles released during cleaning are picked up by the extraction system

Recommended - When replacing the inner liner, clean the wearing parts before re-installing the inner liner:



Cleaning the contact tip, spatter guard, and nozzle fitting with compressed air; ensure that any particles released during cleaning are picked up by the extraction system



Cleaning extraction nozzle and gas nozzle with brush

Technical data

Technical data of water-cooled welding torches

General

Voltage rating (V-peak):
- For hand-held welding torches: 113 V
- For machine-guided welding torches: 141 V

Torch trigger technical data:
- U_{max} = 5 V
- I_{max} = 10 mA

The torch trigger can only be operated within the limits of the technical data.

This product meets the requirements set out in standard
- EN IEC 60974-7 / - 10 CI. A and
- EN ISO 21904-1.

The welding fume detection efficiency of torch-integrated extraction systems (according to EN ISO 21904-3) depends on several influencing factors, such as:
- Workpiece quality and the associated fume formation during welding
- Welding process
- Welding direction (trailing or leading)
- Welding positions (PA, PC, PF, etc.)
- Workpiece geometry (open or closed design, etc.)
- Volumetric flow of the shielding gas
- Work angle of the welding torch
- Environmental conditions
- ...

MTW Exento welding torch technical data

MTW 300i Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 300 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	95 m^3/h (1837 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	13.5 kPa (135 mbar)
Required minimum cooling power according to standard IEC 60974-2	700 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTW 300i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 300 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	100 m^3/h (3532 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	15 kPa (150 mbar)
Required minimum cooling power according to standard IEC 60974-2	900 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTW 300d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 300 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
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MTW 300d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 300 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	100 m^3/h (3532 cfh)

MTW 300d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	15 kPa (150 mbar)
Required minimum cooling power according to standard IEC 60974-2	900 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTW 500i Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 400 A 40% D.C.[1] / 500 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	100 m^3/h (3532 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11.9 kPa (119 mbar)
Required minimum cooling power according to standard IEC 60974-2	1000 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

MTW 500i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 400 A 40% D.C.[1] / 500 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	105 m^3/h (3709 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	14 kPa (140 mbar)
Required minimum cooling power according to standard IEC 60974-2	1200 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)

MTW 500i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

MTW 500d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 400 A 40% D.C.[1] / 500 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	100 m^3/h (3532 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11.9 kPa (119 mbar)
Required minimum cooling power according to standard IEC 60974-2	1000 W
Required minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum permissible coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

MTW 500d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C.[1] / 400 A 40% D.C.[1] / 500 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	105 m^3/h (3709 cfh)
Required negative pressure Δp_c of the extraction system (EN IEC ISO 21904-1)	14 kPa (140 mbar)
Minimum cooling power according to standard IEC 60974-2	1200 W
Minimum coolant flow Q_{min}	1 l/min (0.26 gal. [US]/min)
Minimum coolant pressure p_{min}	3 bar (43 psi)
Maximum coolant pressure p_{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

1) ED = Duty cycle; after-run time of extraction system after end of welding = 30 seconds

Technical data of gascooled welding torches

General

Voltage rating (V-peak):
- For hand-held welding torches: 113 V
- For machine-guided welding torches: 141 V

Torch trigger technical data:
- U_{max} = 5 V
- I_{max} = 10 mA

The torch trigger can only be operated within the limits of the technical data.

This product meets the requirements set out in standard
- EN IEC 60974-7 / - 10 CI. A and
- EN ISO 21904-1.

The welding fume detection efficiency of torch-integrated extraction systems (according to EN ISO 21904-3) depends on several influencing factors, such as:
- Workpiece quality and the associated fume formation during welding
- Welding process
- Welding direction (trailing or leading)
- Welding positions (PA, PC, PF, etc.)
- Workpiece geometry (open or closed design, etc.)
- Volumetric flow of the shielding gas
- Work angle of the welding torch
- Environmental conditions
- ...

MTG Exento welding torch technical data

MTG 250i Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	70 m^3/h (2472 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10 kPa (100 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTG 250i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A

MTG 250i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	80 m^3/h (2526 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.8 kPa (108 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTG 250d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 200 A 60% D.C.[1] / 160 A 100% D.C.[1] / 120 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	70 m^3/h (2472 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10 kPa (100 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTG 250d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 250 A 60% D.C.[1] / 210 A 100% D.C.[1] / 170 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 200 A 60% D.C.[1] / 160 A 100% D.C.[1] / 120 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	52 m^3/h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	80 m^3/h (2526 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.8 kPa (108 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTG 320i Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	90 m^3/h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 320i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	94 m^3/h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 320d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 260 A 60% D.C.[1] / 210 A 100% D.C.[1] / 160 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	90 m^3/h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)

MTG 320d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 320d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	40% D.C.[1] / 320 A 60% D.C.[1] / 260 A 100% D.C.[1] / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C.[1] / 260 A 60% D.C.[1] / 210 A 100% D.C.[1] / 160 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	94 m^3/h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400i Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	30% D.C.[1] / 400 A 60% D.C.[1] / 320 A 100% D.C.[1] / 260 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C.[1] / 400 A 60% D.C.[1] / 320 A 100% D.C.[1] / 260 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	90 m^3/h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	30% D.C.[1] / 400 A 60% D.C.[1] / 320 A 100% D.C.[1] / 260 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C.[1] / 400 A 60% D.C.[1] / 320 A 100% D.C.[1] / 260 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)

MTG 400i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	94 m^3/h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	30% D.C.[1)] / 400 A 60% D.C.[1)] / 320 A 100% D.C.[1)] / 260 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C.[1)] / 320 A 60% D.C.[1)] / 260 A 100% D.C.[1)] / 210 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	90 m^3/h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400d Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F): Values apply with CO_2 as shielding gas (EN ISO 14175)	30% D.C.[1)] / 400 A 60% D.C.[1)] / 320 A 100% D.C.[1)] / 260 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C.[1)] / 320 A 60% D.C.[1)] / 260 A 100% D.C.[1)] / 210 A
Extraction volumetric flow at the front end of the welding torch $Q_{v,n}$ (EN IEC ISO 21904-1)	57 m^3/h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	94 m^3/h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

1) ED = Duty cycle; after-run time of extraction system after end of welding = 30 seconds

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