



EN

welding torch

PM 301 W
PM 451 W
PM 551 W
PM 551 W Alu

099-700003-EW501

Observe additional system documents!

14.09.2020

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General instructions

WARNING



Read the operating instructions!

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

- Read and observe the operating instructions for all system components, especially the safety instructions and warning notices!
- Observe the accident prevention regulations and any regional regulations!
- The operating instructions must be kept at the location where the machine is operated.
- Safety and warning labels on the machine indicate any possible risks. Keep these labels clean and legible at all times.
- The machine has been constructed to state-of-the-art standards in line with any applicable regulations and industrial standards. Only trained personnel may operate, service and repair the machine.
- Technical changes due to further development in machine technology may lead to a differing welding behaviour.

In the event of queries on installation, commissioning, operation or special conditions at the installation site, or on usage, please contact your sales partner or our customer service department on +49 2680 181-0.

A list of authorised sales partners can be found at www.ewm-group.com/en/specialist-dealers.

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

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

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

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

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2 For your safety

2.1 Notes on using these operating instructions

DANGER

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

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

WARNING

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

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

CAUTION

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

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



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

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

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

2.2 Explanation of icons

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

2.2.1 Part of the complete documentation

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

The illustration shows a general example of a welding system.

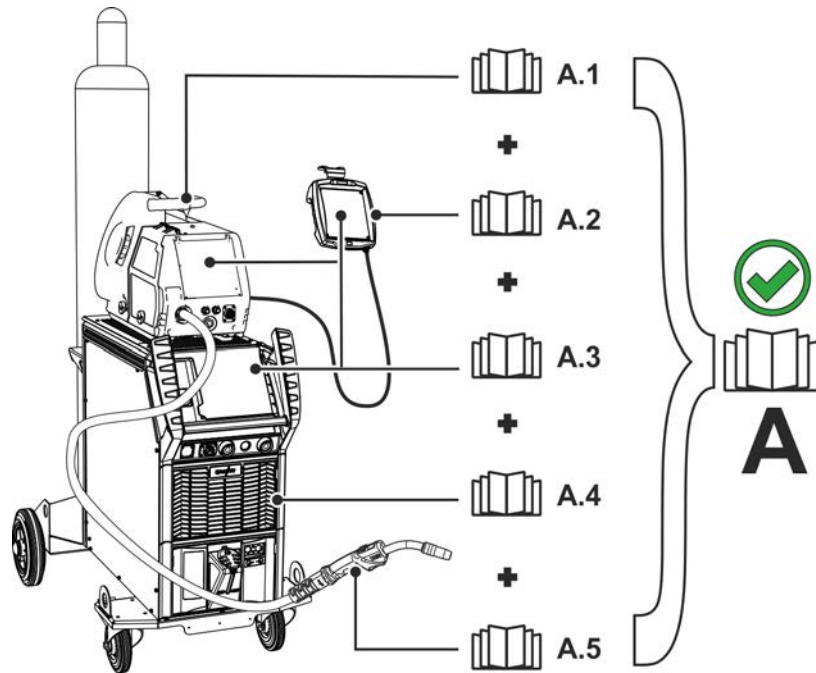


Figure 2-1

The illustration shows a general example of a welding system.

Item	Documentation
A.1	Wire feeder
A.2	Remote adjuster
A.3	Controller
A.4	Power source
A.5	Welding torch
A	Complete documentation

3 Intended use

WARNING



Hazards due to improper usage!

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

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

3.1 Applications

Welding torch of multi-process welding machines for arc welding covering the following welding procedures:

Machine series	Main procedure for MIG/MAG welding								
	Standard arc				Pulsed arc				
	MIG/MAG XQ	forceArc XQ	rootArc XQ	coldArc XQ	MIG/MAG pulse XQ	forceArc puls XQ	rootArc puls XQ	coldArc puls XQ	acArc puls XQ
PM 301 - 551 W	✓	✓	✓	✓	✓	✓	✓	✓	✗
PM 551 W Alu	✓	✓	✓	✓	✓	✓	✓	✓	✓

3.2 Documents which also apply

3.2.1 Warranty

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

3.2.2 Declaration of Conformity



This product corresponds in its design and construction to the EU directives listed in the declaration. The product comes with a relevant declaration of conformity in the original.

The manufacturer recommends carrying out the safety inspection according to national and international standards and guidelines every 12 months.

3.2.3 Service documents (spare parts)

WARNING



Do not carry out any unauthorised repairs or modifications!

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

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

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

Spare parts can be obtained from the relevant authorised dealer.

4 Product description – quick reference

4.1 Product variants

Version	Functions	Performance class
PM	Professional MIG	PM221/301/401G, PM301/451/551W
W	Water-cooled Switching the welding process on and off with torch trigger.	PM301/451/551W
G	Gas-cooled Switching the welding process on and off with torch trigger.	PM221/301/401G
S	Short torch neck	PM451/551W
L	Extended torch neck For welding operating points which are difficult to reach. High duty cycle.	PM451/551W
C	Interchangeable torch neck Torch neck can be continuously fixed through 360°.	PM221/301G PM301/451W
2U/D	2 up/down welding torch The welding power (welding current / wire feed speed) and the voltage correction or the program number can be changed on the welding torch.	PM221/301/401G, PM301/451/551W
RD2	Remote display-2-welding torch The welding power (welding current / wire feed speed) and the voltage correction or the program number can be changed on the welding torch. Values and changes are shown on the welding torch display.	PM221/301/401G, PM301/451/551W
RD3	Remote display-3-welding torch The welding power (welding current / wire feed speed), welding voltage correction, program number, dynamics and welding procedure can be changed from the welding torch. Values, changes, faults and error messages are displayed on the welding torch display.	PM221/301/401G, PM301/451/551W
X	X Technology Welding torch with X technology – function torch without separate control cable	PM221/301/401G, PM301/451/551W
Alu	Aluminium AC welding Equipped with contact tip (forced contact) and combined liner.	PM551W

4.2 Standard welding torch

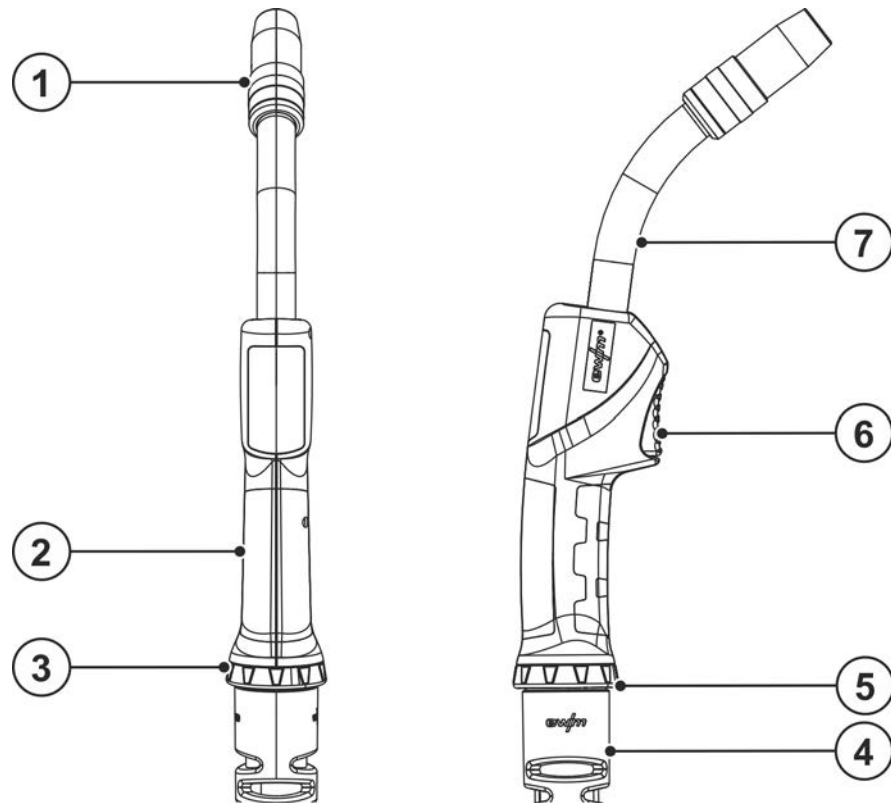


Figure 4-1

Item	Symbol	Description
1		Gas nozzle
2		Grip plate
3		Ball joint
4		Anti-kink device
5		Lock ring
6		Torch trigger
7		Torch neck 45°

4.3 Function torch

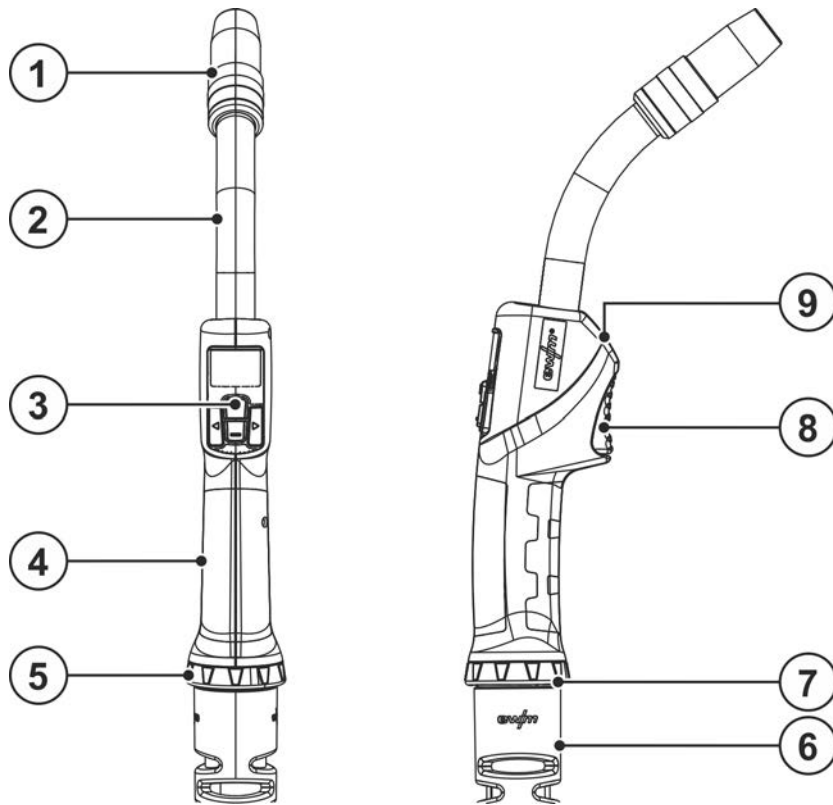


Figure 4-2

Item	Symbol	Description
1		Gas nozzle
2		Torch neck 45°
3		Operating elements
4		Grip plate
5		Ball joint
6		Anti-kink device
7		Lock ring
8		Torch trigger
9		LED lighting

4.3.1 Euro torch connector without control cable

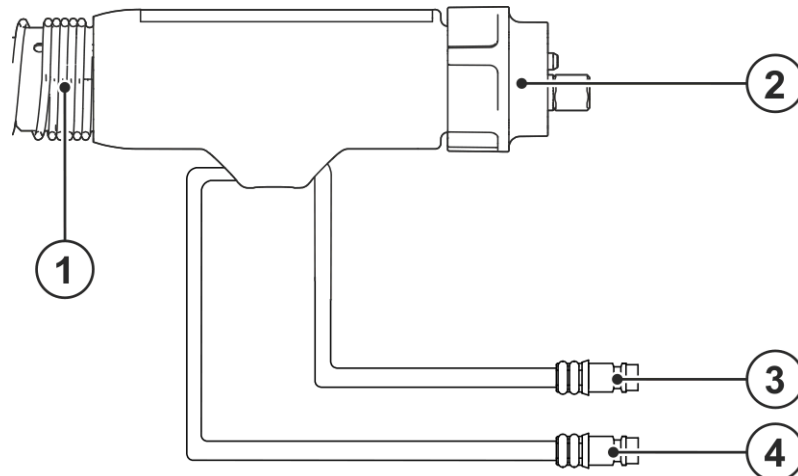


Figure 4-3

Item	Symbol	Description
1		Anti-kink spring
2		Euro central connection Welding current, shielding gas and torch trigger included
3		Quick connect coupling, blue (coolant supply)
4		Quick connect coupling, red (coolant return)

4.3.2 Euro torch connector with control cable

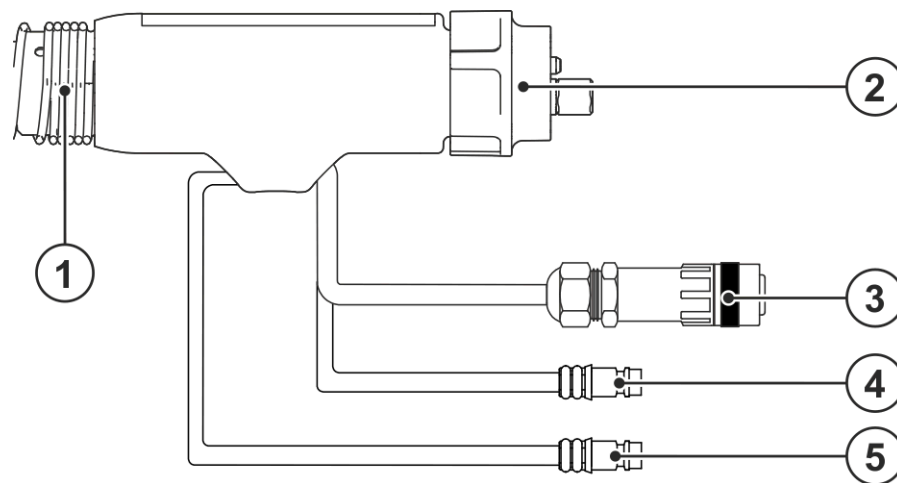


Figure 4-4

Item	Symbol	Description
1		Anti-kink spring
2		Euro central connection
3		Control cable plug Only for control variant 2U/D.
4		Quick connect coupling, blue (coolant supply)
5		Quick connect coupling, red (coolant return)

5 Design and function

WARNING



Risk of injury from electrical voltage!

Contact with live parts, e.g. power connections, can be fatal!

- Observe the safety information on the first pages of the operating instructions!
- Commissioning must be carried out by persons who are specifically trained in handling power sources!
- Connect connection or power cables while the machine is switched off!

CAUTION



Risk of injury due to moving parts!

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

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



Risk of injury due to welding wire escaping in an unpredictable manner!

Welding wire can be conveyed at very high speeds and, if conveyed incorrectly, may escape in an uncontrolled manner and injure persons!

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

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

5.1 Scope of delivery

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

Receiving inspection

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

In the event of damage to the packaging

- Check the delivery for damage (visual inspection)!

In the event of complaints

If the delivery has been damaged during transport:

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

Packaging for returns

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

5.2 Transport and installation

⚠ CAUTION



Risk of accidents due to supply lines!

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

- Disconnect all supply lines before transport!

5.2.1 Ambient conditions



Equipment damage due to contamination!

Unusually high amounts of dust, acids, corrosive gases or substances can damage the machine (observe maintenance intervals).

- Avoid large amounts of smoke, steam, oily fumes, grinding dust and corrosive ambient air!

5.2.1.1 In operation

Temperature range of the ambient air:

- -10 °C to +40 °C (-13 F to 104 F)^[1]

Relative humidity:

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

5.2.1.2 Transport and storage

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

- -25 °C to +55 °C (-13 F to 131 F)^[1]

Relative humidity

- up to 90 % at 20 °C (68 F)

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

5.2.2 Welding torch cooling system



Insufficient frost protection in the welding torch coolant.

Depending on the ambient conditions, different liquids are used to cool the welding torch. Coolant with frost protection (KF 37E or KF 23E) must be checked at regular intervals for sufficient frost protection to prevent damage to the machine or the accessory components.

- The coolant must be checked with the frost protection tester TYP 1 for sufficient frost protection.
- Replace coolant with insufficient frost protection if necessary.



Coolant mixtures!

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

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

Dispose of the coolant in accordance with local regulations and the material safety data sheets.

5.2.2.1 Permitted torch coolant

Coolant	Temperature range
KF 23E (Standard)	-10 °C to +40 °C (14 °F to +104 °F)
KF 37E	-20 °C to +30 °C (-4 °F to +86 °F)

5.2.2.2 Maximal hose package length

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

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

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

Pump: Pmax = 4.5 bar (0.45 MPa)

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

5.2.3 Settings

After the torch component has been connected, the control elements of the welding machine control are no longer in operation, other accessories for remote control must not be connected.

Parameter changes are saved immediately and displayed on the welding machine control!

The full functional range of the PM function torch is only available in connection with the device series Titan XQ and the wire feeder drive XQ.

If the function torch is connected to another EWM device series using Multimatrix, the welding torch switches to compatibility mode and is restricted in its functions.

Depending on the torch version, the user can change the following welding parameters of the main programs.

	control welding torch		
	2U/D	RD2	RD3
Program switching	✓	✓	✓
JOB switching	✓	✓	✗
Process switching	✗	✗	✓
Operating mode	✗	✗	✓
Welding method	✗	✗	✓
Wire feed speed	✓	✓	✓
Voltage correction	✓	✓	✓
Dynamics	✗	✗	✓

5.2.4 Operating elements in the machine

This setting affects the torch types 2U/D, and RD2.

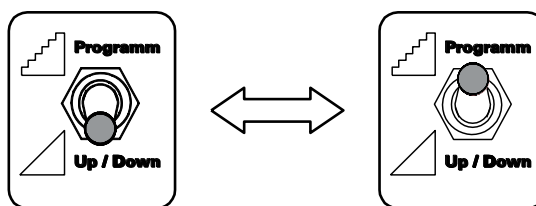


Figure 5-1

- Switch the "Program or up/down mode" changeover switch at the welding machine to the up/down or program mode position (see chapter "Design and function").

The 'Program or up/down function' changeover switch may look different on your machine. Use the operating instructions for your power source to operate the switch.

5.2.5 Operating elements 2 for up/down welding torch

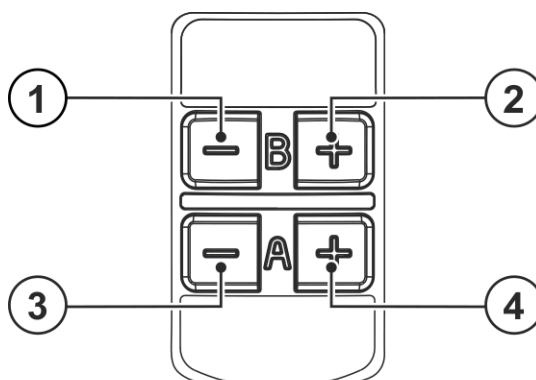


Figure 5-2

Item	Symbol	Description
1	—	"B -" button (program mode) Decrease JOB number "B -" button (up/down mode) Welding voltage correction, decrease value
2	+	"B +" button (program mode) Increase JOB number "B +" button (up/down mode) Welding voltage correction, increase value
3	—	"A -" button (Program mode) Decrease program number "A -" button (Up/Down mode) Reduce welding performance (welding current/wire-feed speed)
4	+	"A +" button (Program mode) Increase program number "A +" button (Up/Down mode) Increase welding performance (welding current/wire-feed speed)

5.2.6 Operating elements for RD2 welding torch

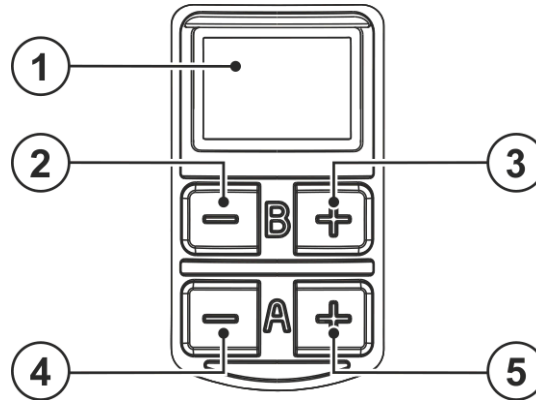


Figure 5-3

Item	Symbol	Description
1		OLED display Graphical display to show the functions.
2	—	"B -" button (program mode) Decrease JOB number "B -" button (up/down mode) Welding voltage correction, decrease value
3	+	"B +" button (program mode) Increase JOB number "B +" button (up/down mode) Welding voltage correction, increase value
4	—	"A -" button (Program mode) Decrease program number "A -" button (Up/Down mode) Reduce welding performance (welding current/wire-feed speed)
5	+	"A +" button (Program mode) Increase program number "A +" button (Up/Down mode) Increase welding performance (welding current/wire-feed speed)

5.2.7 Welding data display

The display shows the currently selected welding parameter and the corresponding parameter value.

When the welding machine is switched on, the display shows the nominal welding current set point set by the control unit.

During the up/down operation, the corresponding parameter value is shown on the display when the parameter is changed. If this parameter is not changed for more than approx. 5 s, the display switches back to the values set by the control unit.

Examples for welding parameters in the welding data display

Welding parameters	Display
Welding current	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 108 A </div>
Wire feed speed	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 3.0 m/min </div>
Voltage correction	<div style="border: 1px solid black; padding: 5px; text-align: center;"> -1.9 V </div>
Programs	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 2 PROG </div>
JOB number	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 169 JOB </div>

5.2.8 Operating elements for RD3 welding torch

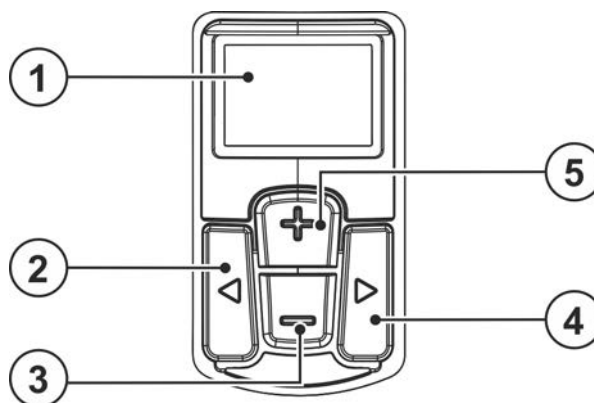


Figure 5-4

Item	Symbol	Description
1		OLED display Graphical display to show the functions.
2		Parameter selection push-button Welding parameters are selected one after the other.
3		Parameter selection push-button Welding parameters are selected one after the other.
4		Push-button “+” Increase JOB number or parameter value.
5		Push-button “-” Decrease JOB number or parameter value.

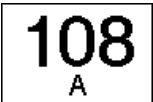






5.2.9 Welding data display

The display shows the currently selected welding parameter and the corresponding parameter value.

When the welding machine is switched on, the display shows the nominal welding current set point set by the control unit.

During the up/down operation, the corresponding parameter value is shown on the display when the parameter is changed. If this parameter is not changed for more than approx. 5 s, the display switches back to the values set by the control unit.

Examples for welding parameters in the welding data display

Welding parameters	Display
Welding current	
Wire feed speed	
Welding voltage	
Programs	
Welding procedure	
Dynamics	
Fault, error message	

5.2.9.1 Programs, setting operating points

Distinction is made between main and program level during the parameter setting.

After switching on the welding machine, you are always at the main level.

Process switching, program number, wire feed speed, dynamics (hard to soft arc), welding current and welding voltage are specified here.

Welding type (standard or pulse welding) and operating mode (2-cycle, 4-cycle, etc.) are set at the program level.

The following illustration is an example of use:

Main level

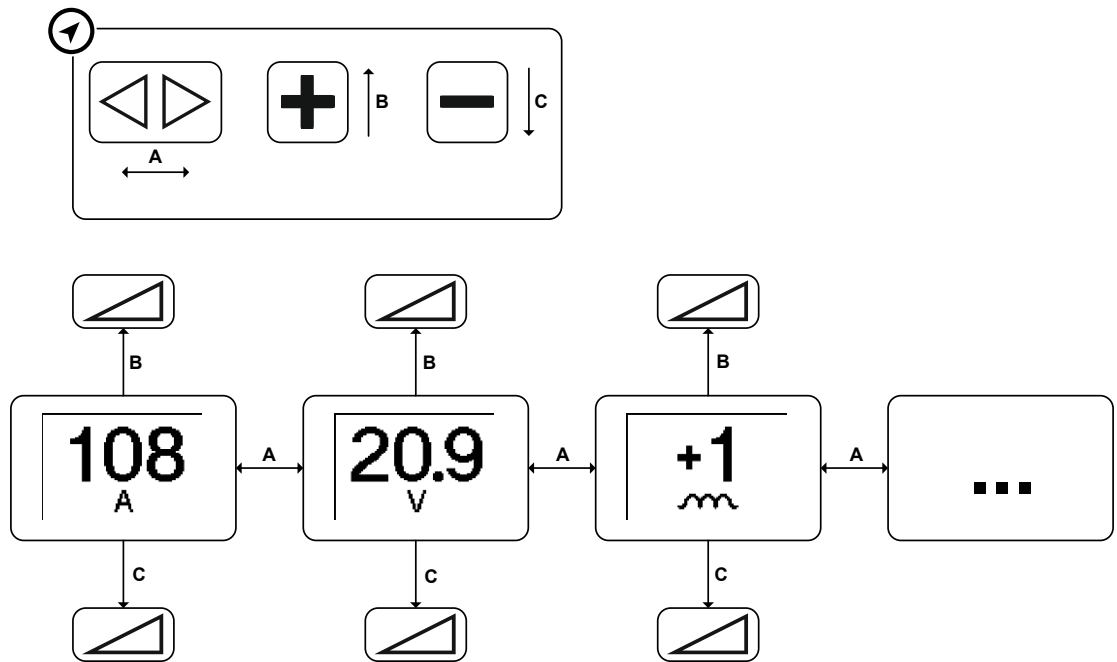


Figure 5-5

Program level

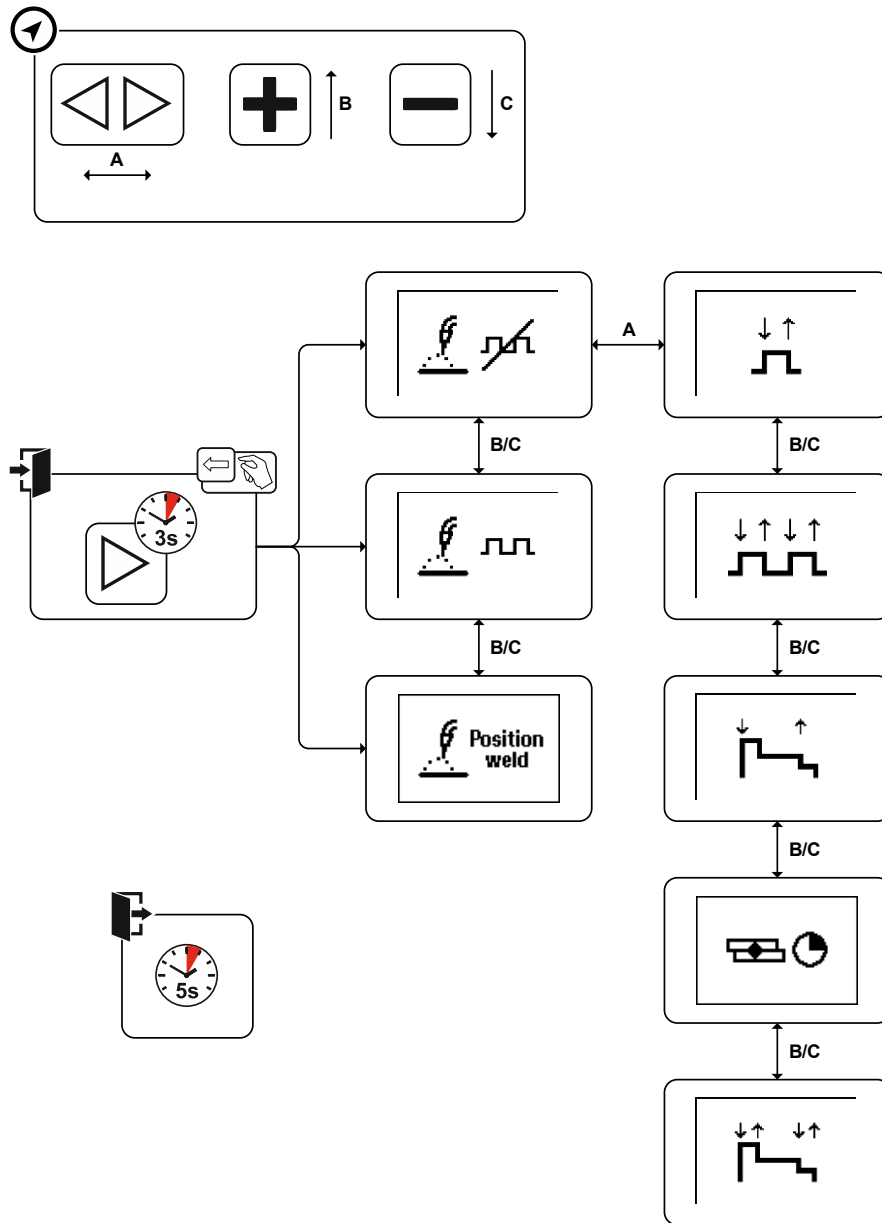


Figure 5-6

5.2.9.2 Component management on the welding torch

The Xnet component management software can be used to manage components, create welding sequence plans and assign WPS. The display shows seams and runs. After completion they can be acknowledged with the burner. A temporary exit (free-welding mode) from the seam sequence is possible by pressing a key on the torch.

The following illustration is an example of use:

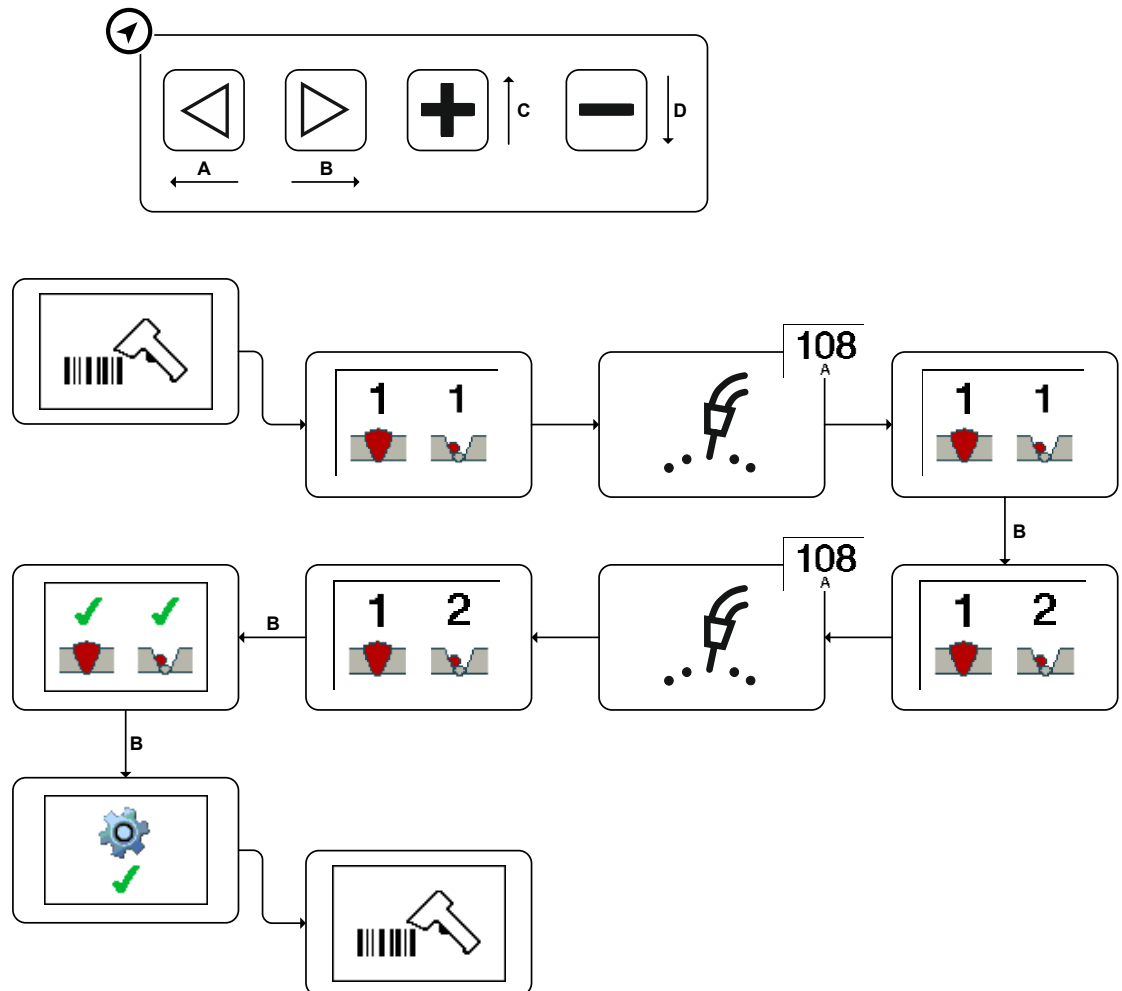


Figure 5-7

The arrow key on the right ► can be used to acknowledge welding beads. To enter the submenu, hold button ► for 3s. After 3s without selection, the component mode is displayed again.

The free-welding mode is activated via the arrow key on the left of ◀. Press and hold button ◀ 3s. The display shows a ◻ symbol. Free-welding mode for e. g. tacking is now activated. Pressing and holding repeatedly will get you back to component mode.

The keys + and - allow the navigation of the seams and runs. Long pressing of the + button skips to the last not yet acknowledged weld bead.

5.2.10 LED lighting

Integrated LED lighting makes welding in corners and dark areas of the working area easier. The lighting switches on independently of the burner button when the burner is moved. After approx. 10 seconds without movement, the light switches off automatically.

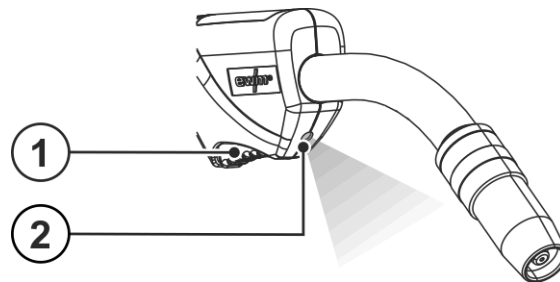


Figure 5-8

Item	Symbol	Description
1		Torch trigger
2		LED lighting

5.3 Configure welding torch

⚠ WARNING



Risk of burns and electric shock on the welding torch!

Welding torch (torch neck or torch head) and coolant (water-cooled version) heat up strongly during the welding process. During assembly work, you may come into touch with electrical voltage or hot components.



- Wear proper protective equipment!

- Switch off the power source or torch cooling and allow the welding torch to cool!

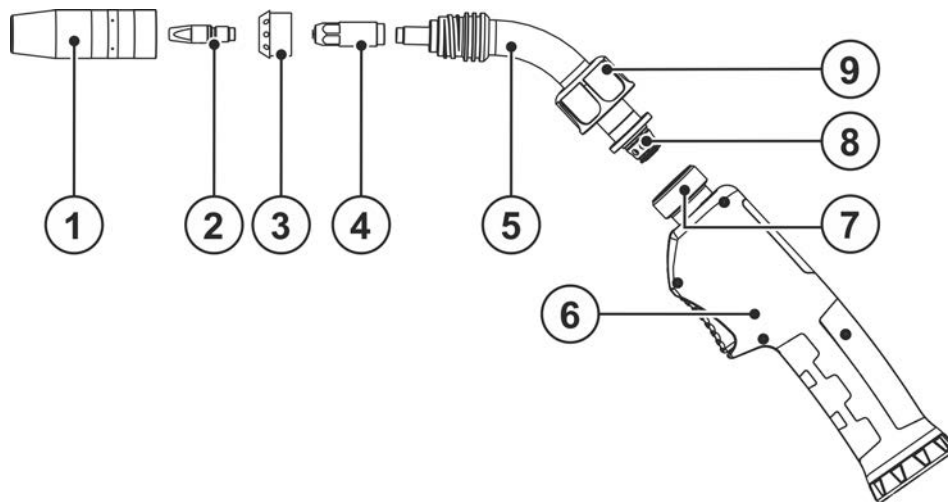


Figure 5-9

Item	Symbol	Description
1		Gas nozzle
2		Gas distributor
3		Contact tip
4		Contact tip holder
5		Torch neck 45°
6		Grip plate
7		Torch connection block
8		O-ring
9		Crown nut



Equipment damage and impurities of the welding result due to worn O-rings.

Worn O-rings have a negative impact on the torch cooling. Insufficient cooling causes damage to the welding torch. Gas losses and the penetration of atmospheric oxygen can also occur and can adversely affect the welding result.

- **Check the O-rings every time the welding torch is converted and grease or replace if necessary.**

5.3.1 Turning the torch neck

This function is only available with the "CG" and "CW" version!

- Unfasten the crown nut by several turns from the handle until the torch neck can move freely.
- Rotate the torch neck into the required position.
- Tighten the crown nut hand-tight until the torch neck can no longer be moved.

5.3.2 Changing the torch neck

Welding torches can be fitted with a 45°, 36°, 22° and 0° angled torch neck as an option. To replace the torch neck follow these instructions.

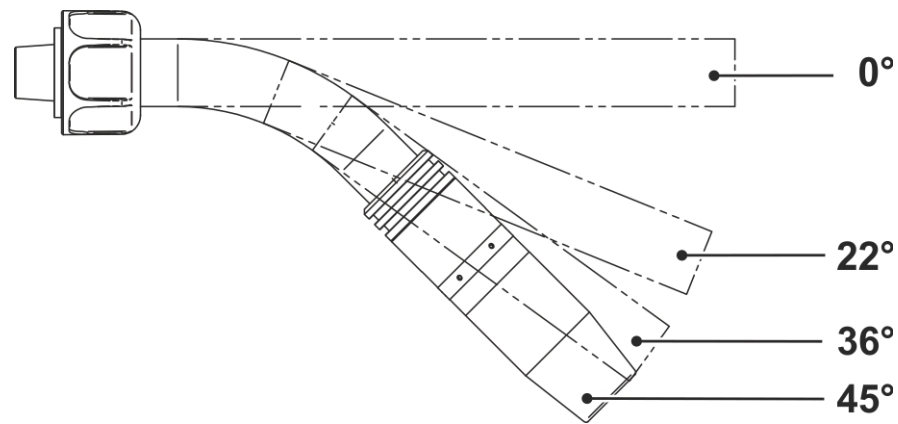


Figure 5-10

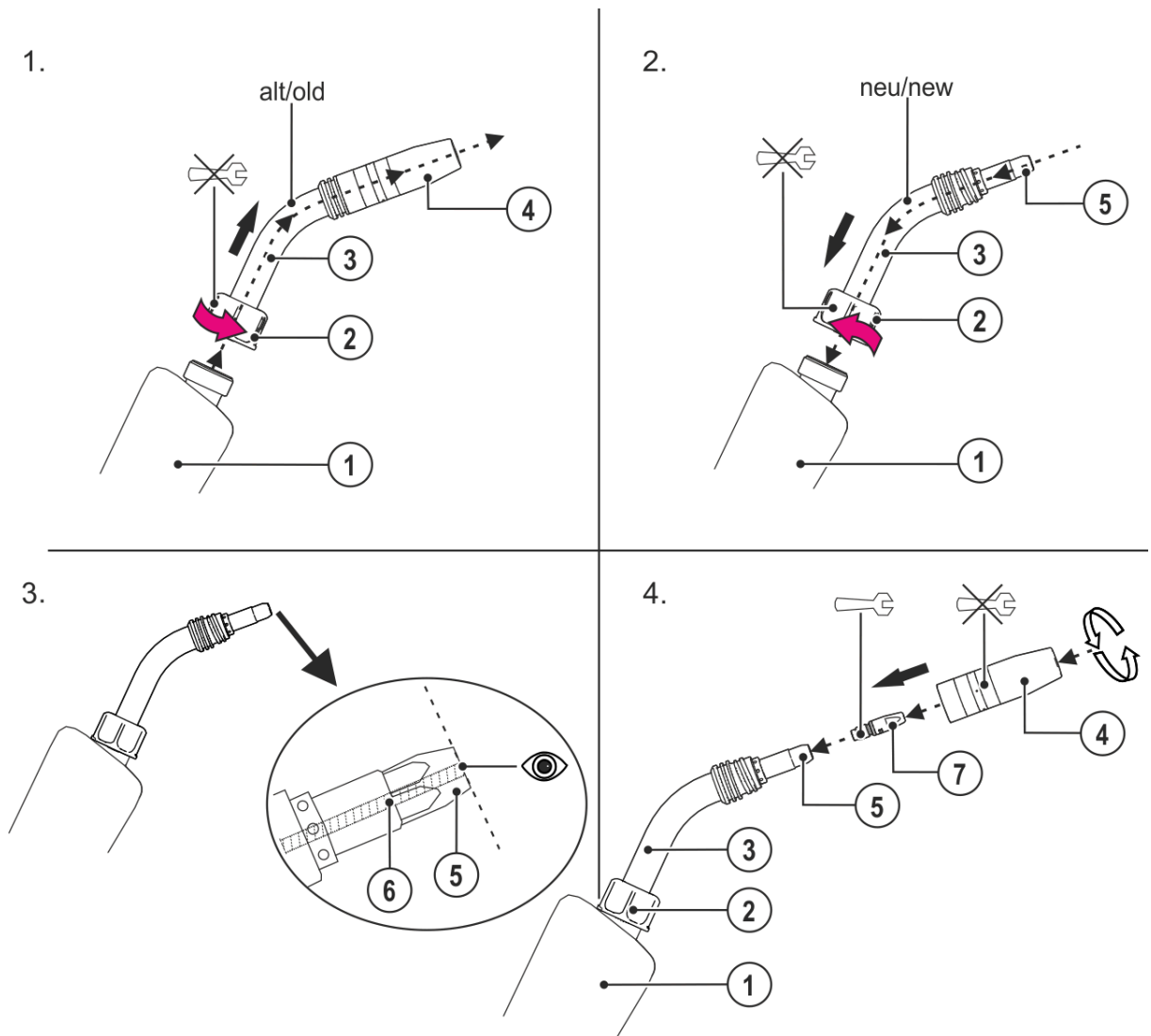


Figure 5-11

Item	Symbol	Description
1		Grip plate
2		Crown nut
3		Torch neck 45°
4		Gas nozzle
5		Contact tip holder
6		Liner
7		Contact tip

Re-connect the welding torch after completing any maintenance work, use the 'gas test' function to purge with shielding gas and vent.

5.4 Equipment recommendations

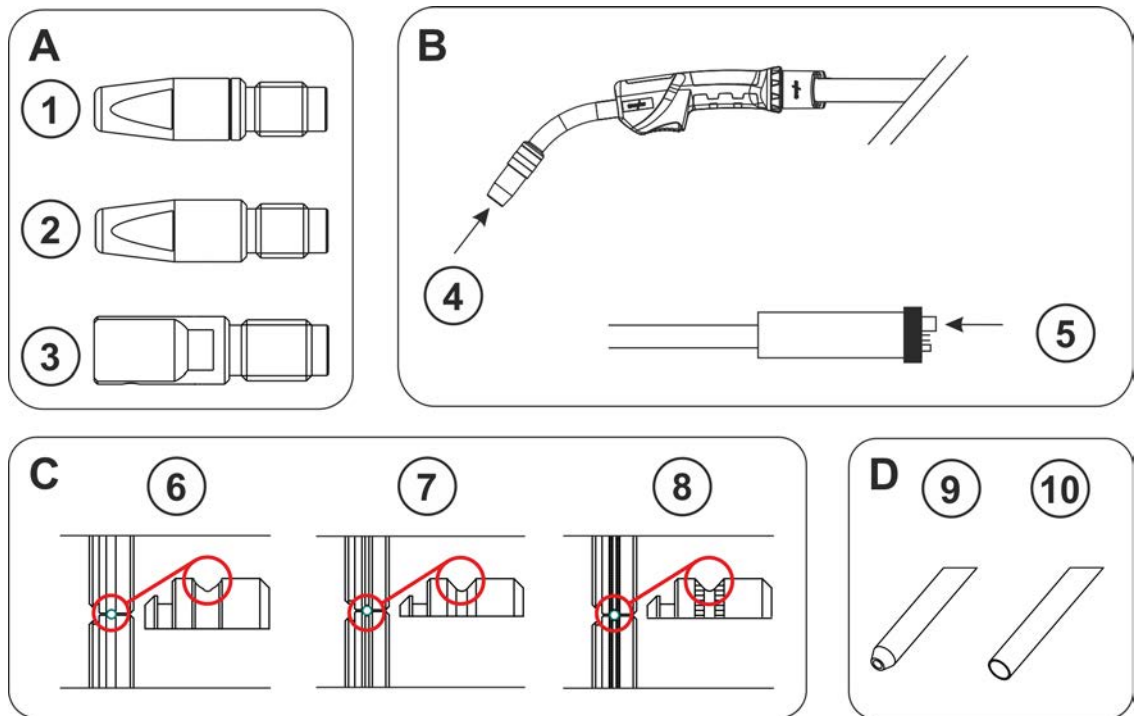


Figure 5-12

	Material	Design of contact tip (A)	Equipment side (B)	Wire feed rolls (C)	Capillary tube ^⑨ / guide tube ^⑩ (D)
DWire electrodes	Low-alloy	① CT CuCrZr	⑤	⑦ V-groove	⑨
	medium-alloy	① CT CuCrZr	⑤	⑦ V-groove	⑩
	Hardfacing	① CT CuCrZr	⑤	⑦ V-groove	⑩
	High-alloy	① CT CuCrZr	⑤	⑦ V-groove	⑩
	Aluminium	② CTAL E-Cu	④	⑥ U-groove	⑩
	Aluminium (AC)	③ CT ZWK CuCrZr	④	⑥ U-groove	⑩
	Copper alloy	① CT CuCrZr	⑤	⑦ V-groove	⑩
Flux cored wire electrode	Low-alloy	① CT CuCrZr	⑤	⑧ V-groove knurled	⑨
	High-alloy	① CT CuCrZr	⑤	⑧ V-groove knurled	⑩

	Material	Ø Wire	Ø Wire guide	Liner	Length of brass liner
Wire electrodes	Low-alloy	0.8	1.5 x 4.0	Steel liner	
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.4 x 4.5		
	medium-alloy	0.8	1.5 x 4.0	Combined liner	200 mm
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.3 x 4.7		
	Hardfacing	0.8	1.5 x 4.0	Combined liner	200 mm
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.3 x 4.7		
	High-alloy	0.8	1.5 x 4.0	Combined liner	200 mm
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.3 x 4.7		
	Aluminium	0.8	1.5 x 4.0	Combined liner	30 mm
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.3 x 4.7		
Aluminium AC welding	0.8	1.5 x 4.0	Combined liner	100 mm	
	1.0	1.5 x 4.0			
	1.2	2.0 x 4.0			
	1.6	2.3 x 4.7			
Copper alloy	0.8	1.5 x 4.0	Combined liner	200 mm	
	1.0	1.5 x 4.0			
	1.2	2.0 x 4.0			
	1.6	2.3 x 4.7			
Flux cored wire electrode	Low-alloy	0.8	1.5 x 4.0	Steel liner	
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.4 x 4.5		
	High-alloy	0.8	1.5 x 4.0	Combined liner	200 mm
		1.0	1.5 x 4.0		
		1.2	2.0 x 4.0		
		1.6	2.3 x 4.7		

5.4.1 acArc puls XQ

The basic requirement for optimum welding results is the application-specific equipment of the wire feed system. For the acArc puls XQ welding process, the entire wire feed system of the Titan XQ AC series is factory-equipped with components for aluminium welding consumables! Recommended system components:

- Power source of type Titan XQ 400 AC puls D
- Wire feeder of type Drive XQ AC
- Welding torch series of type PM 551 W Alu

Note the following equipment and setting features of the wire feed system:

- Wire feed rolls (set contact pressure depending on welding consumables and hose package lengths)
- Central torch connection (use guide tube instead of capillary tube)
- Combined liner (PA liner with matching inner diameter for welding consumables)
- Use contact tips with forced contact

5.5 Adapting the Euro torch connection on the device

On delivery, the Euro torch connector is fitted with a capillary tube for welding torches with steel liners!

5.5.1 Liner

- Push forward the capillary tube on the wire feed side in the direction of the Euro torch connector and remove it there.
- Insert the guide tube from the Euro torch connection.
- Insert the welding torch connector with the excessively long liner carefully into the Euro torch connector and screw hand-tight using the crown nut.
- Cut off the liner using a special cutter or sharp knife just before the wire feed roller, making sure not to pinch it.
- Loosen the welding torch connector and remove.
- Cleanly trim the separated end of the liner!

5.5.2 Replace steel liner

Check the Euro torch connector for correct seating of the capillary tube!

- Insert the welding torch connector into the Euro torch connector and screw hand-tight using the crown nut.

5.6 Assemble the wire guide

Use the correct wire guide from spool to molten pool!

The wire guide has to be adjusted to the wire electrode type and diameter in order to achieve good welding results!

- Equip the wire feeder according to wire electrode type and diameter!
- Refer to the manufacturer instructions for the right wire feed unit equipment. Refer to Annex 1 in these operating instructions for the right EWM machine equipment.
- Use a steel liner inside the torch hose package to guide hard, unalloyed wire electrodes (steel)!
- Use a plastic liner inside the torch hose package to guide soft or alloyed wire electrodes!

Which equipment side must be used for a steel liner or liner, see .

5.6.1 Liner / combined liner

Observe permissible torque!

The distance between the plastic liner and drive rollers should be as short as possible.

Use only sharp, stable knives or special tongs for cutting to ensure that the plastic liner does not become misshapen!

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

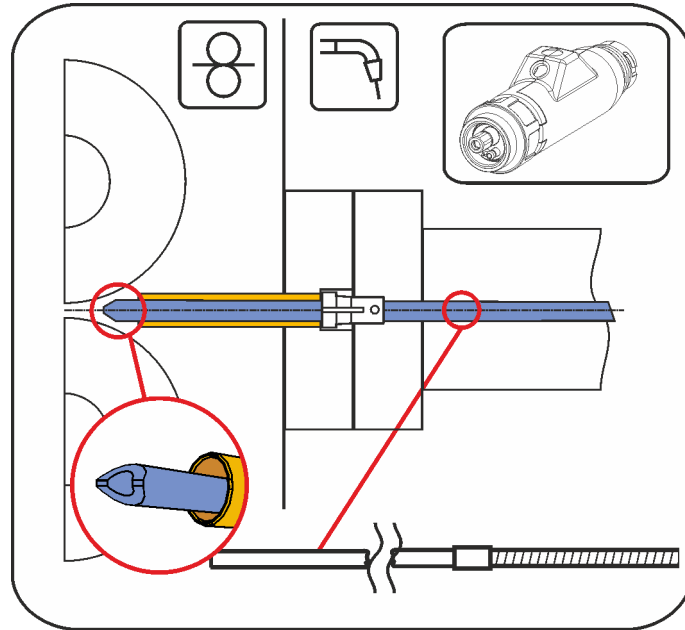


Figure 5-13

1.

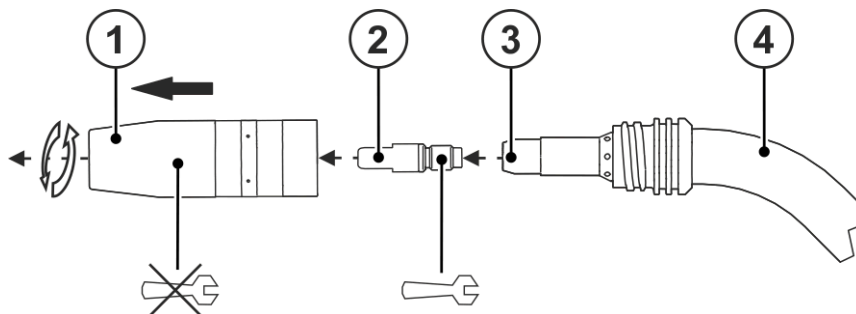


Figure 5-14

2.

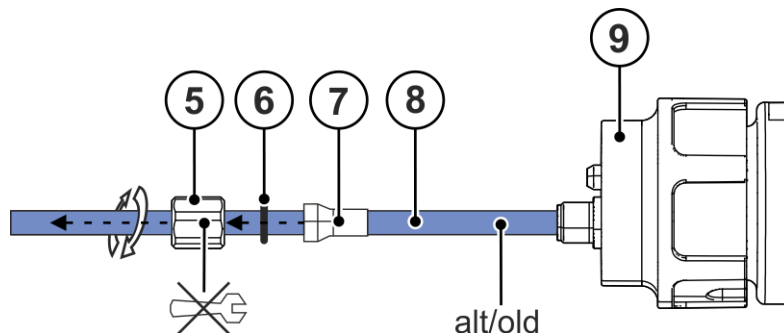


Figure 5-15

3.

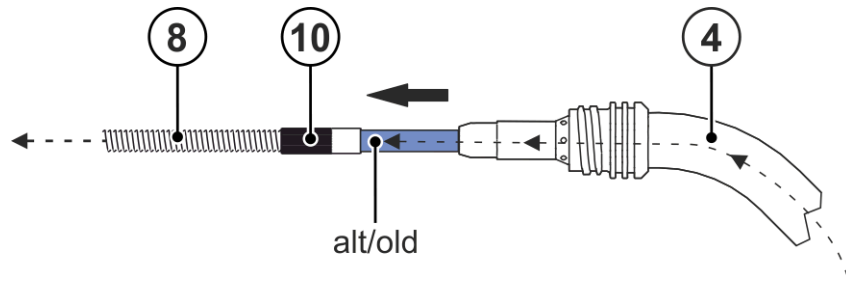


Figure 5-16

4.

Adjust the brass liner .

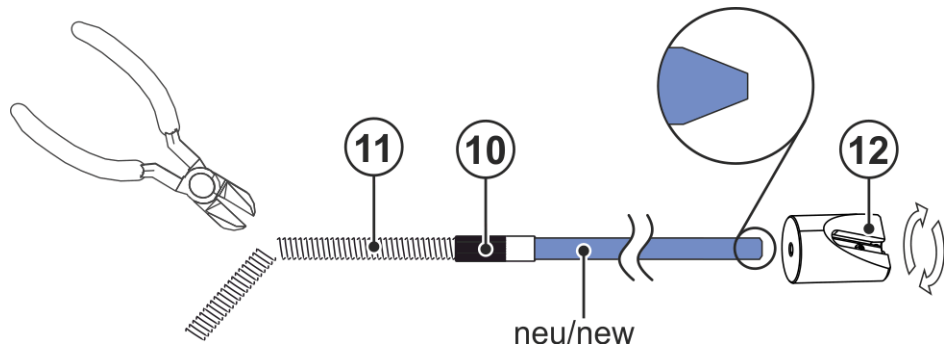


Figure 5-17

5.

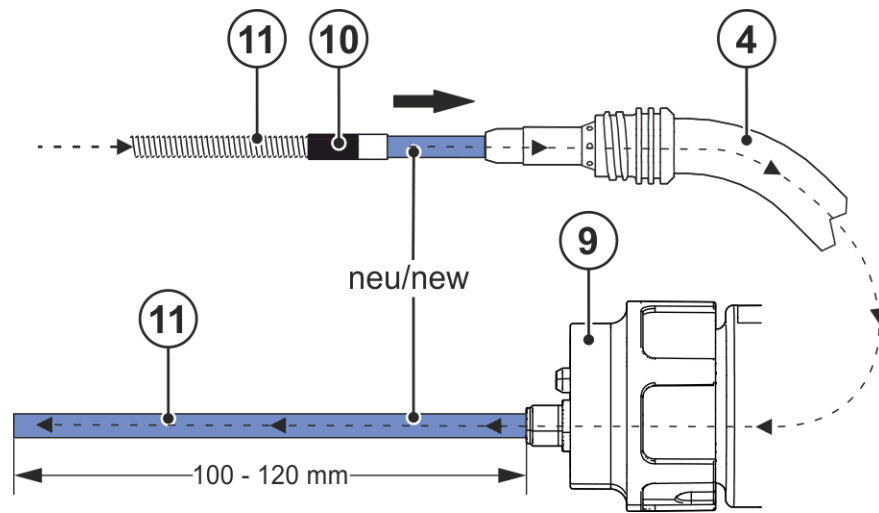


Figure 5-18

6.

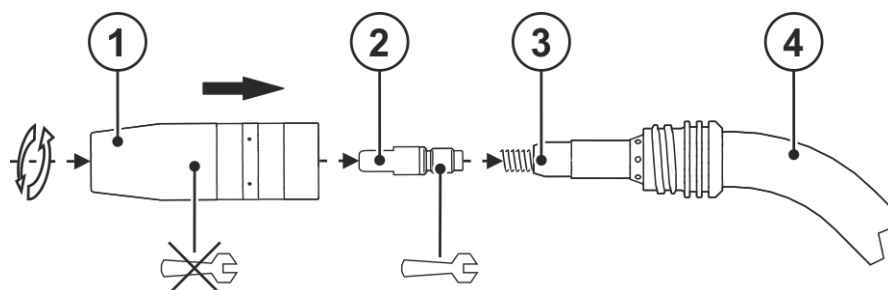


Figure 5-19

7.

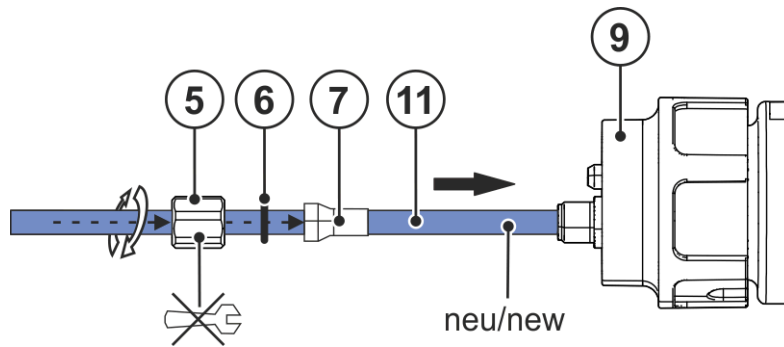


Figure 5-20

8.

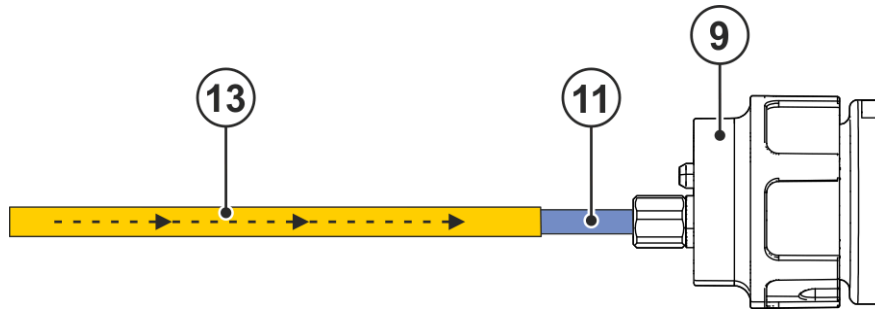



Figure 5-21

Item	Symbol	Description
1		Gas nozzle
2		Contact tip
3		Contact tip holder
4		Torch neck 45°
5		Crown nut
6		O-ring
7		Collet
8		Combined liner
9		Euro central connection
10		Connecting sleeve
11		New combined liner
12		Liner sharpener
13		Guiding tube for welding torch Euro torch connector

5.6.2 Guide spiral

 **Observe permissible torque!**

Insert the grinded end towards the contact tip holder to ensure tight fit with the contact tip.
Always make sure the the hose package is straight when replacing the wire guide.

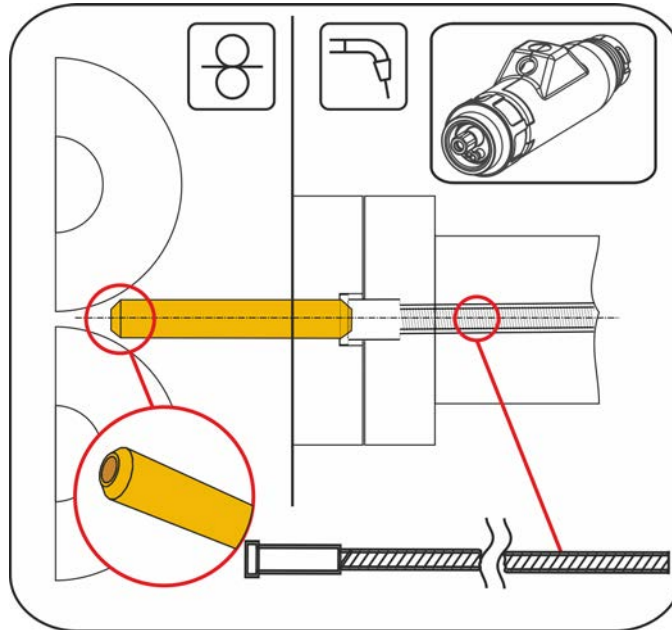


Figure 5-22

1.

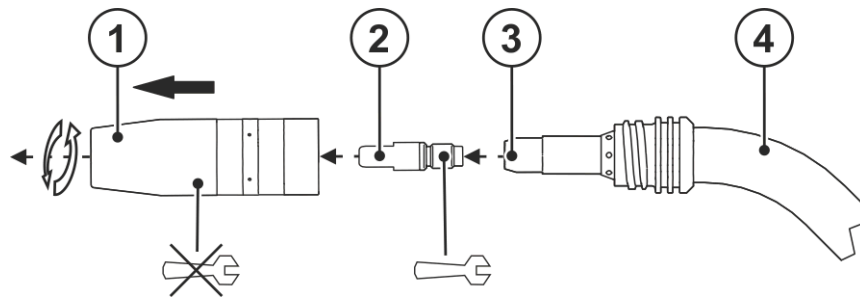


Figure 5-23

2.

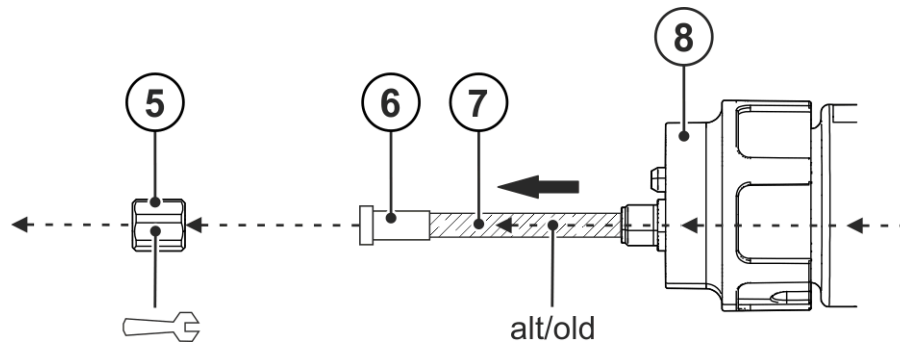


Figure 5-24

3.

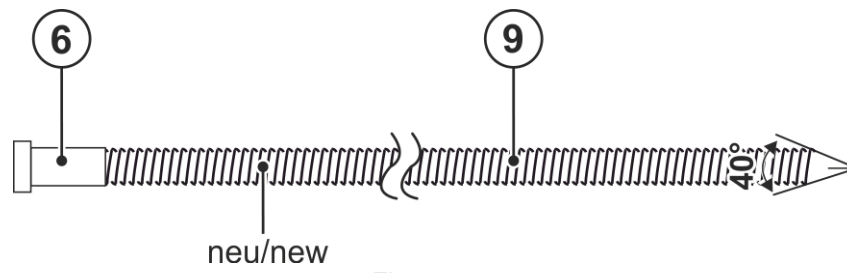


Figure 5-25

4.

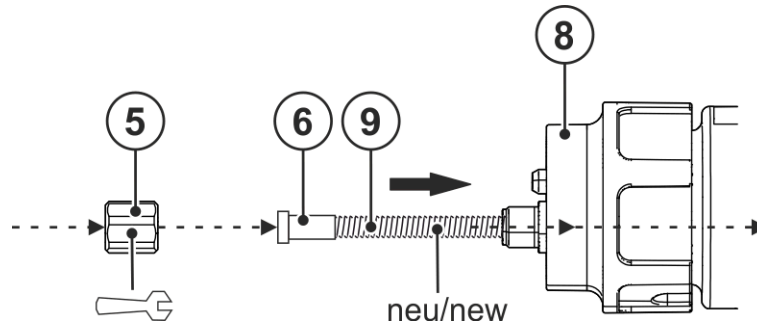


Figure 5-26

5.

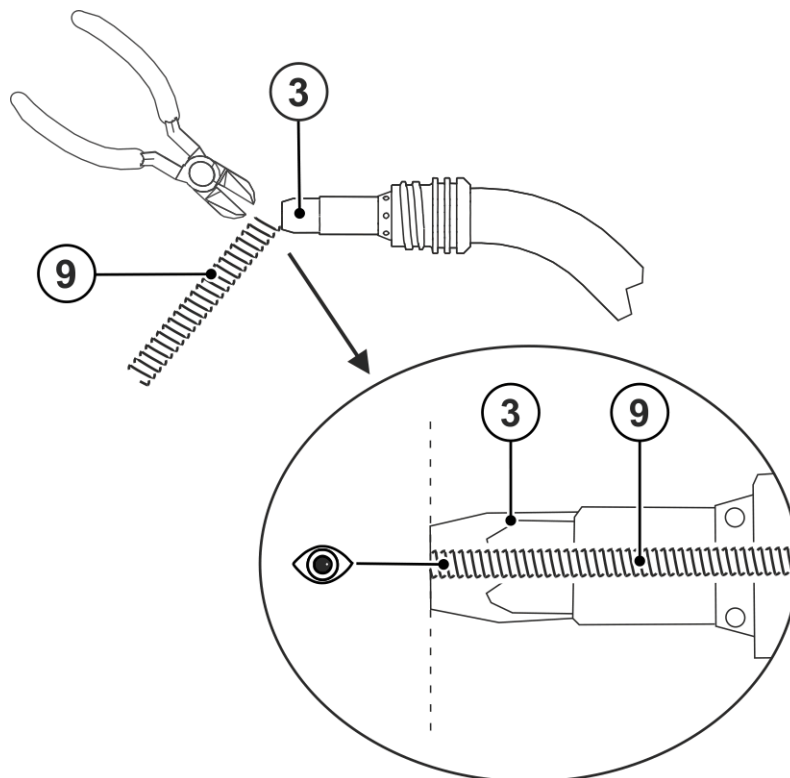


Figure 5-27

6.

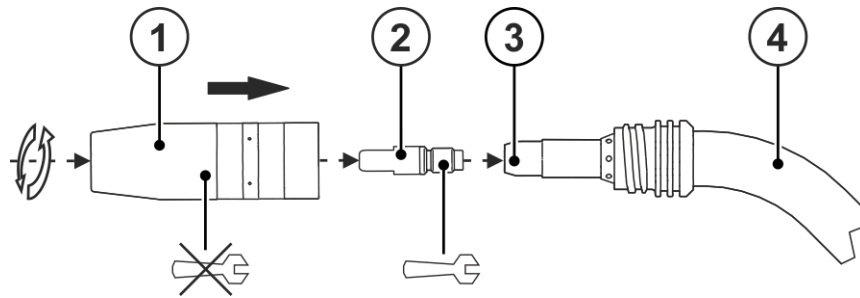


Figure 5-28

7.

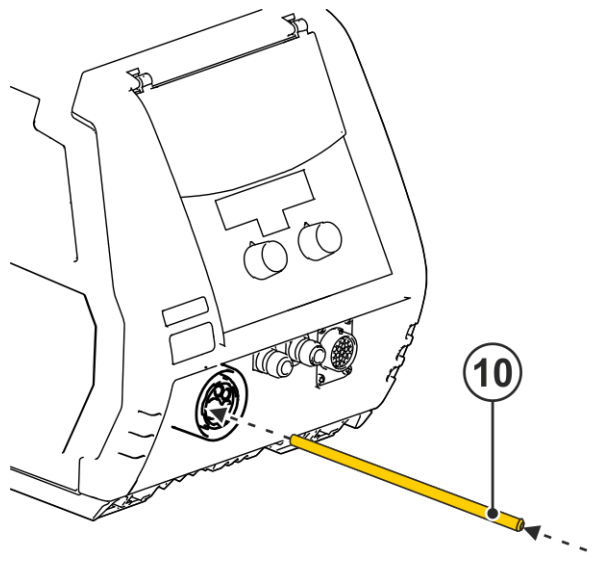



Figure 5-29

Item	Symbol	Description
1		Gas nozzle
2		Contact tip
3		Contact tip holder
4		Welding torch neck
5		Crown nut
6		Centring sleeve
7		old spiral guide
8		Euro central connection
9		new spiral guide
10		Capillary tube

6 Maintenance, care and disposal

6.1 General

DANGER



Risk of injury due to electrical voltage after switching off!

Working on an open machine can lead to fatal injuries!

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

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

WARNING



Incorrect maintenance, testing and repair!

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

Observe the maintenance instructions > see 6.2 chapter.

- In the event that the provisions of one of the below-stated tests are not met, the machine must not be operated again until it has been repaired and a new test has been carried out!

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

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

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

6.2 Maintenance work, intervals

6.2.1 Daily maintenance tasks

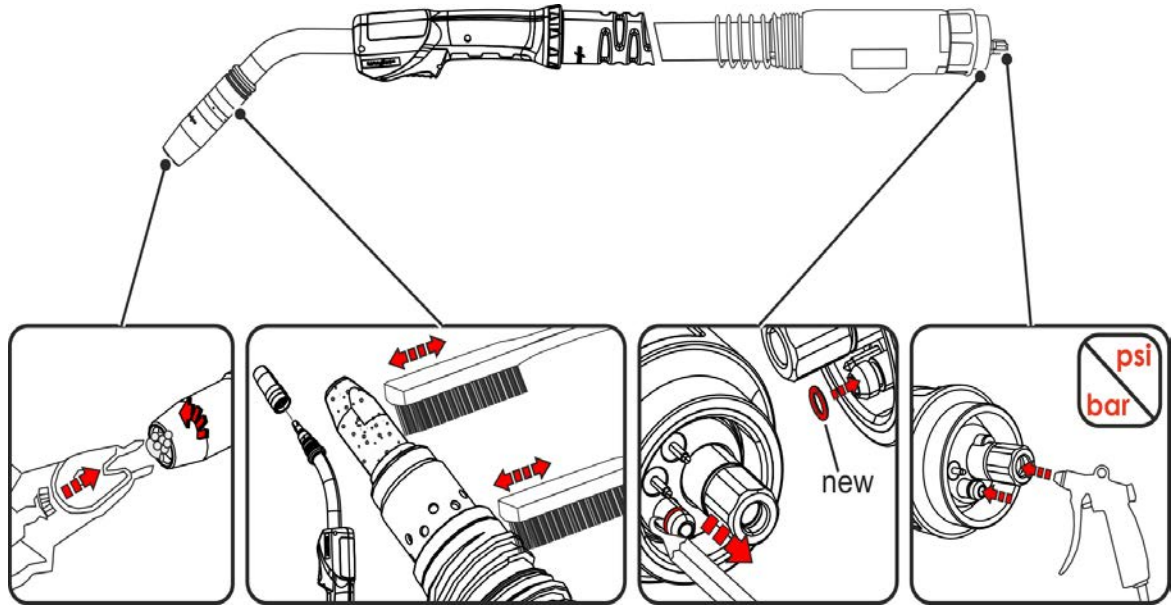


Figure 6-1

- Purge the wire guide from the direction of the Euro torch connector with oil- and condensate-free compressed air or shielding gas.
- Check that coolant connections are tight.
- Check that the welding torch, and where applicable the power source cooling, are functioning correctly.
- Check the coolant level.
- Check whether there is the O-ring on the gas nipple of the Euro torch connector and whether it is not damaged. Replace defective O-ring.
- Check torch, hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!
- Check the wearing parts in the torch.

6.2.2 Monthly maintenance tasks

- Check the coolant container for sludge deposits and check the coolant for cloudiness. Clean the coolant container if contaminated, and change the coolant.
- If the coolant is dirty, rinse through the welding torch alternately several times with fresh coolant using the coolant return and supply.
- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- Check and clean the welding torch. Deposits in the torch can cause short circuits and have a negative impact on the welding result, ultimately causing damage to the torch.
- Check the wire guide.
- Check that all screw and plug connections and replaceable parts are secured correctly, tighten if necessary.

6.3 Maintenance work



Electric current!

Repairs may only be carried out by authorised specialist staff!

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

6.4 Disposing of equipment



Proper disposal!

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

- Do not dispose of in household waste!
- Observe the local regulations regarding disposal!
- According to European provisions (Directive 2012/19/EU on Waste of Electrical and Electronic Equipment), used electric and electronic equipment may no longer be placed in unsorted municipal waste. It must be collected separately. The symbol depicting a waste container on wheels indicates that the equipment must be collected separately.
This machine has to be disposed of, or recycled, in accordance with the waste separation systems in use.
- According to German law (law governing the distribution, taking back and environmentally correct disposal of electric and electronic equipment (ElektroG)), used machines are to be placed in a collection system separate from unsorted municipal waste. The public waste management utilities (communities) have created collection points at which used equipment from private households can be disposed of free of charge.
- Information about returning used equipment or about collections can be obtained from the respective municipal administration office.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

7 Rectifying faults

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

7.1 Checklist for rectifying faults

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

Legend	Symbol	Description
	↗	Fault/Cause
	✘	Remedy

Welding torch overheated

- ✘ Check coolant flow rate
- ↗ Insufficient coolant flow
 - ✘ Check coolant level and refill if necessary
 - ✘ Eliminate kinks in conduit system (hose packages)
 - ✘ Completely unroll the hose package and the torch hose package
 - ✘ Vent coolant circuit > see 7.2 chapter
- ↗ Loose welding current connections
 - ✘ Tighten power connections on the torch and/or on the workpiece
 - ✘ Screw contact tip holder and gas nozzle tightly into place correctly
- ↗ Overload
 - ✘ Check and correct welding current setting
 - ✘ Use a more powerful welding torch

Functional error with the welding torch operating elements

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

Wire feed problems

- ↗ Unsuitable or worn welding torch equipment
 - ✘ Adjust contact tip to wire diameter and -material and replace if necessary
 - ✘ Adjust wire guide to material in use, blow through and replace if necessary
- ↗ Kinked hose packages
 - ✘ Extend and lay out the torch hose package
- ↗ Incompatible parameter settings
 - ✘ Check settings and correct if necessary

Unstable arc

- ✓ Unsuitable or worn welding torch equipment
 - ✗ Adjust contact tip to wire diameter and -material and replace if necessary
 - ✗ Adjust wire guide to material in use, blow through and replace if necessary
- ✓ Incompatible parameter settings
 - ✗ Check settings and correct if necessary

Pore formation

- ✓ Inadequate or missing gas shielding
 - ✗ Check shielding gas setting and replace shielding gas cylinder if necessary
 - ✗ Shield welding site with protective screens (draughts affect the welding result)
- ✓ Unsuitable or worn welding torch equipment
 - ✗ Check size of gas nozzle and replace if necessary
- ✓ Condensation (hydrogen) in the gas tube
 - ✗ Purge hose package with gas or replace
- ✓ Splashes in the gas nozzle
- ✓ Gas distributor out of order or missing

7.2 Vent coolant circuit

To vent the cooling system always use the blue coolant connection, which is located as deep as possible inside the system (close to the coolant tank)!

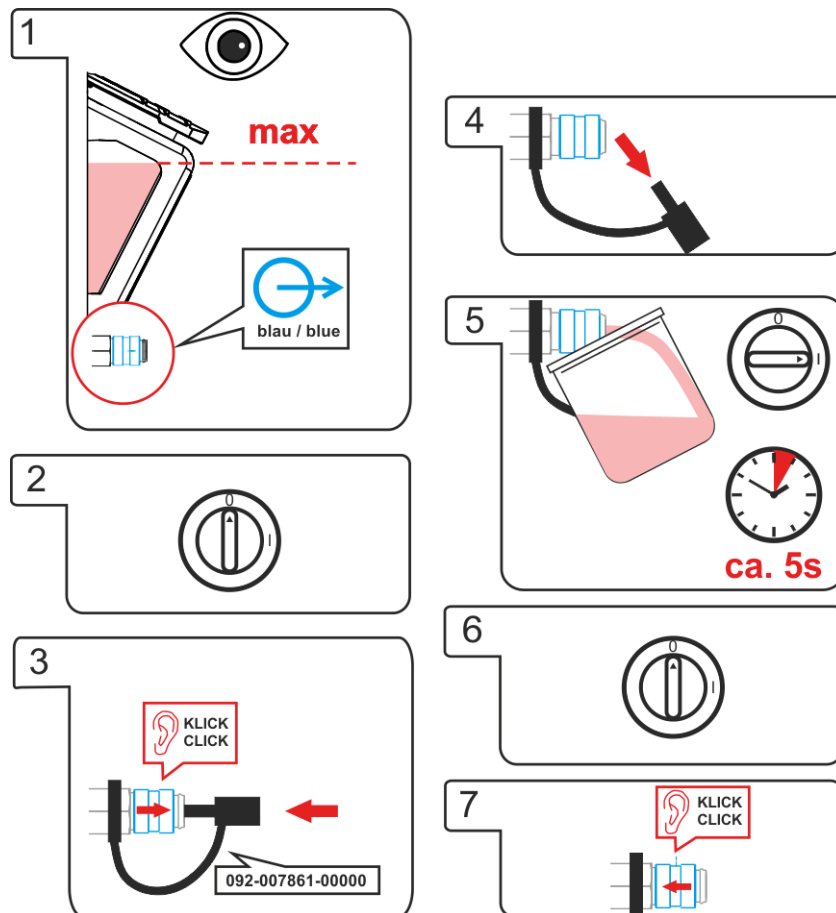


Figure 7-1

Complete the following steps to vent the welding torch:

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

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

8 Technical data

8.1 PM 301 / 451 / 551 W

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

Typ	PM 301 W	PM 451 W	PM 551 W
Welding torch polarity	Usually positive		
Guide type	Manually operated		
Voltage type	Direct voltage		
Shielding gas	Shielding gas according to ISO 14175		
Duty cycle DC at 40° C [1]	100 %		
Maximum welding current M21	290 A	450 A	550 A
Maximum welding current M21, pulse	250 A	350 A	500 A
Maximum welding current CO2	330 A	500 A	650 A
Microswitch for switching voltage	15 V		
Microswitch for switching current	10 mA		
Cooling capacity	min. 800 W		
max. Flow temperature	65 °C		
Torch input pressure, coolant	3 to 6 bar (min.-max.)		
Flow volume min.	1,2 l/min 0,31 gal./min	1,4 l/min 0,37 gal./min	
Wire types	Standard round wires		
Wire diameter	0,8 to 1,2 mm 0,03 to 0,047 inch	0,8 to 1,6 mm 0,03 to 0,063 inch	0,8 to 2,0 mm 0,03 to 0,079inch
Ambient temperature	-10 °C to + 40 °C		
Voltage measurement	113 V Peak value		
Protection classification for the machine connections (EN 60529)	IP3X		
Gas flow	10 to 25 l/min 2,6 gal./min to 6,6 gal./min		
Hose package length	1,5-, 3-, 4-, 5-, 6,5 m 39,4-, 78,7-, 118,1-, 157,5, 196,9-, 236,2 inch		
Tightening torque Contact tip holder	15 Nm	20 Nm	
Tightening torque Contact tip	10 Nm	15 Nm	
Connection	Euro torch connector		
Safety marking	CE		
Standards used	See declaration of conformity (appliance documents)		
Operating weight	1,03 kg 2.27 lb.	1,09 kg 2.4 lb.	1,1 kg 2.43 lb.



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

9 Accessories**9.1 General accessories**

Type	Designation	Item no.
ON TT PM Standard	Conversion kit, upper torch trigger, for PM standard welding torch	092-007938-00000
ON HSS Ø 18-10 mm	Heat shield for PM/MT welding torch	094-025359-00000
ON TH PM	Optional pistol grip	092-007944-00000
ON TV PM LED	Torch trigger extension for PM welding torch with LED	094-023891-00000
ON TT PM LED	Torch trigger, on top with LED for PM welding torch	092-007939-00000
ON LED PM Standard	Retrofit kit LED lighting for PM standard welding torch	092-007940-00000
ON KB STD TV PM-SERIE	Torch trigger extension for PM welding torch without LED	094-022327-00000

10 Replaceable parts



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

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

10.1 PM 301 W

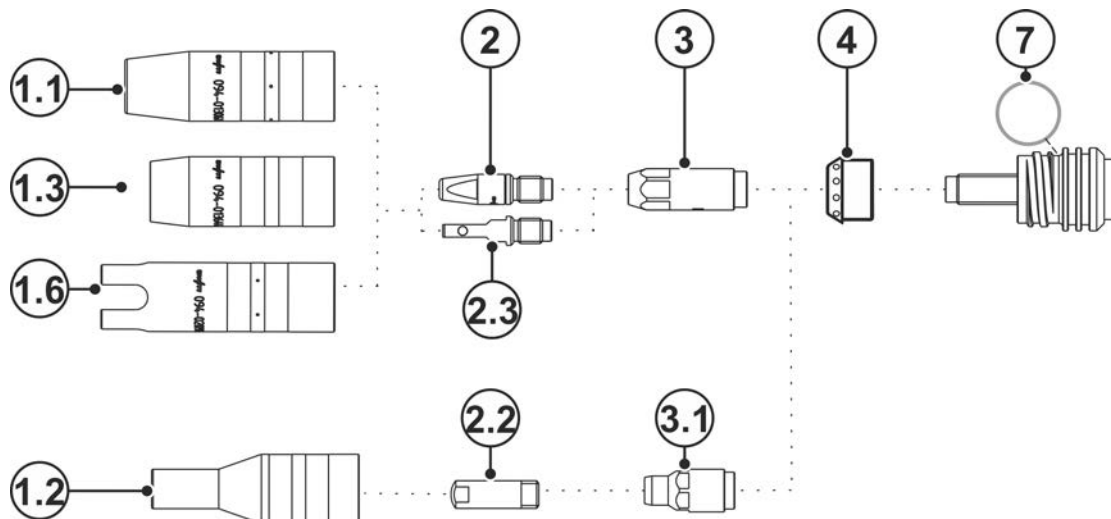


Figure 10-1

Item	Order number	Type	Name
1.1	094-013061-00001	GN TR 20 66mm D=13mm	Gas nozzle
1.1	094-013062-00001	GN TR 20 66mm D=11mm	Gas nozzle
1.1	094-013063-00001	GN TR 20 66mm D=16mm	Gas nozzle
1.2	094-020136-00000	GN TR 20x4 68mm D=10,5mm	Gas nozzle, cylinder neck
1.3	094-013644-00000	GN FCW TR 20 58mm	Gas nozzle, inner shield
1.6	094-020944-00000	GN TR 20, 75 mm, D=18 mm	Spot welding nozzle
2	094-013071-00000	CT M6 CuCrZr, D=0,8 mm	Contact tip
2	094-013072-00000	CT M6 CuCrZr, D=1,0 mm, L=28 mm	Contact tip
2	094-013122-00000	CT M6 CuCrZr, D=0,9 mm	Contact tip
2	094-013535-00001	CT CUCRZR M7X30MM D=0.8MM	Contact tip
2	094-013536-00001	CT CUCRZR M7X30MM D=0.9MM	Contact tip
2	094-013537-00001	CT CUCRZR M7X30MM D=1.0MM	Contact tip
2	094-013538-00001	CT CUCRZR M7X30MM D=1.2MM	Contact tip
2	094-013550-00000	CTAL E-CU M7X30MM D=0.8MM	Contact tip, aluminium welding
2	094-013551-00000	CTAL E-CU M7X30MM D=0.9MM	Contact tip, aluminium welding
2	094-013552-00000	CTAL E-CU M7X30MM D=1.0MM	Contact tip, aluminium welding
2	094-013553-00000	CTAL E-CU M7X30MM D=1.2MM	Contact tip, aluminium welding
2	094-014317-00000	CT M6 CuCrZr D=1,2 mm	Contact tip
2	094-016101-00000	CT M6x28mm 0.8mm E-CU	Contact tip
2	094-016102-00000	CT M6x28mm 0.9mm E-CU	Contact tip
2	094-016103-00000	CT M6x28mm 1.0mm E-CU	Contact tip
2	094-016104-00000	CT M6x28mm 1.2mm E-CU	Contact tip
2	094-016105-00000	CTAL E-CU M6X28MM D=0.8MM	Contact tip, aluminium welding
2	094-016106-00000	CTAL E-CU M6X28MM D=0.9MM	Contact tip, aluminium welding
2	094-016107-00000	CTAL E-CU M6X28MM D=1.0MM	Contact tip, aluminium welding

Item	Order number	Type	Name
2	094-016108-00000	CTAL E-CU M6X28MM D=1.2MM	Contact tip, aluminium welding
2.2	094-005403-00000	CT M6 x 25 mm, 0.6 mm, CuCrZr	Contact tip
2.2	094-020689-00000	CT M6 x 25 mm, 0.8 mm, CuCrZr	Contact tip
2.2	094-020690-00000	CT M6 x 25 mm, 1.0 mm, CuCrZr	Contact tip
2.2	094-020691-00000	CT M6 x 25 mm, 0.6 mm, E-Cu	Contact tip
2.2	094-020692-00000	CT M6 x 25 mm, 0.8 mm, E-Cu	Contact tip
2.2	094-020693-00000	CT M6 x 25 mm, 0.9 mm, E-Cu	Contact tip
2.2	094-020694-00000	CT M6 x 25 mm, 1.0 mm, E-Cu	Contact tip
2.2	094-020695-00000	CT M6 x 25 mm, 0.6 mm, E-Cu (Alu)	Contact tip, aluminium welding
2.2	094-020696-00000	CT M6 x 25 mm, 0.8 mm, E-Cu (Alu)	Contact tip, aluminium welding
2.2	094-020697-00000	CT M6 x 25 mm, 0.9 mm, E-Cu (Alu)	Contact tip, aluminium welding
2.2	094-020698-00000	CT M6 x 25 mm, 1.0 mm, E-Cu (Alu)	Contact tip, aluminium welding
2.3	094-025535-00000	CT ZWK CuCrZr M7x30 mm Ø 1,0mm	Contact tip, forced contact
2.3	094-025536-00000	CT ZWK CuCrZr M7x30 mm Ø 1,2mm	Contact tip, forced contact
3	094-013069-00002	CTH CUCRZR M6 L=30.5MM	Contact tip holder
3	094-013070-00002	CTH CUCRZR M6 L=33.5MM	Contact tip holder
3	094-013541-00002	CTH CUCRZR M7 L=31.5MM	Contact tip holder
3	094-013542-00002	CTH CUCRZR M7 L=34.5MM	Contact tip holder
3.1	094-020562-00000	CTH M6 CuCrZr 30.5mm	Contact tip holder
4	094-013094-00004	GD PM / MT 221G / 301W	Gas diffuser
7	094-025320-00000	17 mm x 1,8 mm	O-ring for gas nozzle holder
	094-016038-00001	TT SW5-SW12MM	Torch key
	094-013967-00000	4,0MMX1,0MM	O-ring for Euro torch connector
	098-005149-00000	O-Ring Picker	O-ring for picker

10.2 PM 451 W

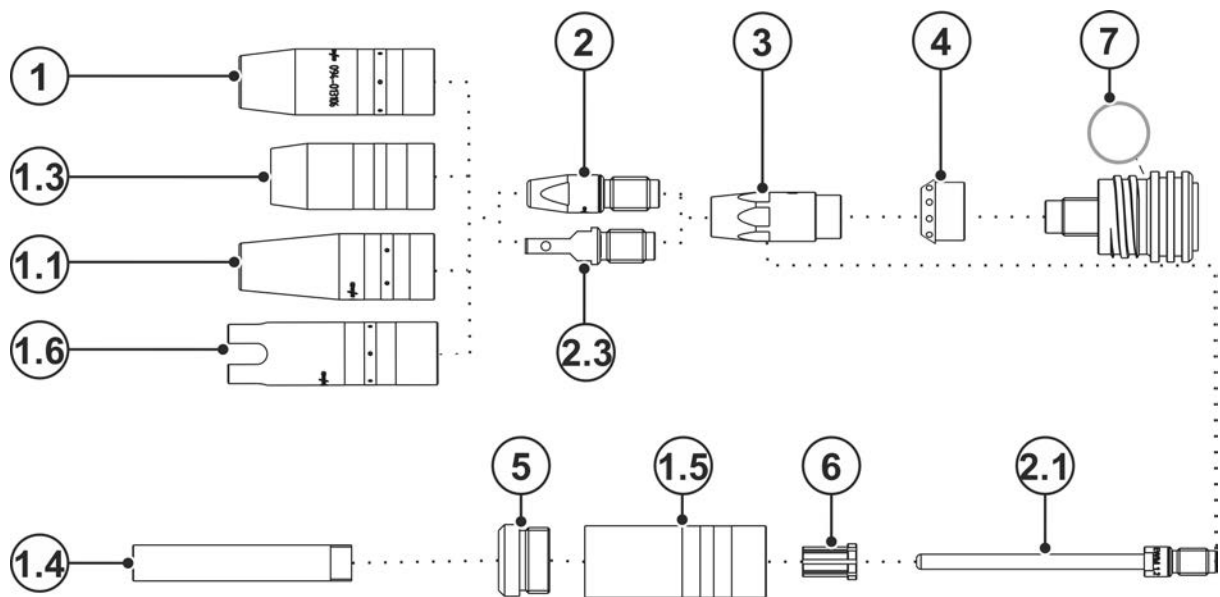


Figure 10-2

Item	Order number	Type	Name
1	094-013105-00001	GN TR 22 71mm D=13mm	Gas nozzle
1	094-013106-00001	GN TR 22 71mm D=15mm	Gas nozzle
1	094-013107-00001	GN TR 22 71mm D=18mm	Gas nozzle

Item	Order number	Type	Name
1	094-019821-00001	GN TR 22 65mm D=15mm	Gas nozzle, short
1	094-019822-00001	GN TR 22 65mm D=18mm	Gas nozzle, short
1.1	094-019853-00001	GN NG TR22X4 71mm D=13mm	Highly conical gas nozzle, narrow gap welding
1.3	094-019554-00000	GN FCW TR 22x4 59.5MM	Gas nozzle, inner shield
1.4	094-019626-00000	GN NG M12 73mm	Gas nozzle, narrow gap welding
1.4	094-022226-00000	GN NG M12 76mm	Gas nozzle, narrow gap welding
1.5	094-019623-00000	GNC TR22x4	Gas nozzle body
1.6	094-020945-00000	GN TR 22, 80 mm, D=20 mm	Spot welding nozzle
2	094-007238-00000	CT E-CU M8X30MM D=1.2MM	Contact tip
2	094-013113-00000	CT M8 CuCrZr 30mm, 1.2mm	Contact tip
2	094-013129-00000	CT CUCRZR M8X30MM D=0.9MM	Contact tip
2	094-013528-00001	CT CUCRZR M9X35MM D=0.8MM	Contact tip
2	094-013529-00001	CT CUCRZR M9X35MM D=0.9MM	Contact tip
2	094-013530-00001	CT M9 CuCrZr 1.0mm	Contact tip
2	094-013531-00001	CT CUCRZR M9X35MM D=1.2MM	Contact tip
2	094-013532-00001	CT CUCRZR M9X35MM D=1.4MM	Contact tip
2	094-013533-00001	CT CUCRZR M9X35MM D=1.6MM	Contact tip
2	094-013543-00000	CTAL E-CU M9X35MM D=0.8MM	Contact tip, aluminium welding
2	094-013544-00000	CTAL E-CU M9X35MM D=0.9MM	Contact tip, aluminium welding
2	094-013545-00000	CTAL E-CU M9X35MM D=1.0MM	Contact tip, aluminium welding
2	094-013546-00000	CTAL E-CU M9X35MM D=1.2MM	Contact tip, aluminium welding
2	094-013547-00000	CTAL E-CU M9X35MM D=1.4MM	Contact tip, aluminium welding
2	094-013548-00000	CTAL E-CU M9X35MM D=1.6MM	Contact tip, aluminium welding
2	094-014024-00000	CT CUCRZR M8X30MM D=0.8MM	Contact tip
2	094-014191-00000	CT CUCRZR M8X30MM D=1.4MM	Contact tip
2	094-014192-00000	CT CUCRZR M8X30MM D=1.6MM	Contact tip
2	094-014222-00000	CT CUCRZR M8X30MM D=1.0MM	Contact tip
2	094-016109-00000	CT E-CU M8X30MM D=0.8MM	Contact tip
2	094-016110-00000	CT E-CU M8X30MM D=0.9MM	Contact tip
2	094-016111-00000	CT E-CU M8X30MM D=1.0MM	Contact tip
2	094-016112-00000	CT E-CU M8X30MM D=1.4MM	Contact tip
2	094-016113-00000	CT E-CU M8X30MM D=1.6MM	Contact tip
2	094-016115-00000	CTAL E-CU M8X30MM D=0.8MM	Contact tip, aluminium welding
2	094-016116-00000	CTAL E-CU M8X30MM D=0.9MM	Contact tip, aluminium welding
2	094-016117-00000	CTAL E-CU M8X30MM D=1.0MM	Contact tip, aluminium welding
2	094-016118-00000	CTAL E-CU M8X30MM D=1.2MM	Contact tip, aluminium welding
2	094-016119-00000	CTAL E-CU M8X30MM D=1.4MM	Contact tip, aluminium welding
2	094-016120-00000	CTAL E-CU M8X30MM D=1.6MM	Contact tip, aluminium welding
2.1	094-019616-00000	CT M9 x 100 mm; Ø 1,0 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-019617-00000	CT M9 x 100 mm; Ø 1,2 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-019618-00000	CT M9 x 100 mm; Ø 1,6 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-020019-00000	CT M9 x 100 mm; Ø 1,4 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-021189-00000	CT M9 x 100 mm; Ø 0,8 mm CuCrZr	Contact tip, narrow gap welding
2.3	094-017007-00001	CT ZWK CuCrZr M9x35 mm Ø 1,0 mm	Contact tip, forced contact
2.3	094-016159-00001	CT ZWK CuCrZr M9x35 mm Ø 1,2 mm	Contact tip, forced contact

Item	Order number	Type	Name
2.3	094-025533-00001	CT ZWK CuCrZr M9x35 mm Ø 1,6 mm	Contact tip, forced contact
3	094-013109-00002	CTH CUCRZR M8 L=34.1MM	Contact tip holder
3	094-013110-00002	CTH CUCRZR M8 L=37.1MM	Contact tip holder
3	094-013539-00002	CTH M9 CuCrZr 34.5mm	Contact tip holder
3	094-013540-00002	CTH M9 CuCrZr 37.5mm	Contact tip holder
4	094-013096-00004	GD Ø11,7 mm, L=14 mm	Gas diffuser
5	094-019625-00000	IT ES M22X1,5 M12X1	Insulation part
6	094-019627-00000	ZH GDE ID=5MM AD=10MM L=15MM	Centring sleeve
7	094-025089-00000	18,5 mm x 2 mm	O-ring for gas nozzle holder
	094-016038-00001	TT SW5-SW12MM	Torch key
	094-013967-00000	4,0MMX1,0MM	O-ring for Euro torch connector
	098-005149-00000	O-Ring Picker	O-ring for picker

10.3 PM 551 W

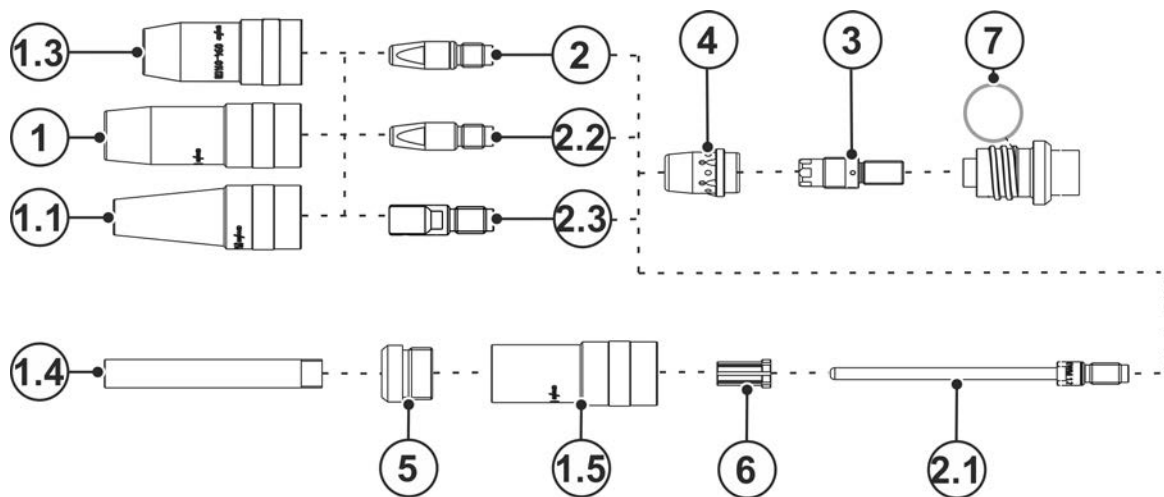


Figure 10-3

Item	Order number	Type	Name
1	094-014177-00001	GN TR 23 63mm D=15mm	Gas nozzle
1	094-014178-00001	GN TR 23 66mm D=15mm	Gas nozzle
1	094-014179-00001	GN TR 23 63mm D=17mm	Gas nozzle
1	094-014180-00001	GN TR 23 66mm D=17mm	Gas nozzle
1	094-014181-00001	GN TR 23 63mm D=19mm	Gas nozzle
1	094-014182-00001	GN TR 23 66mm D=19mm	Gas nozzle
1.1	094-019702-00000	GN NG TR23X4 63mm D=13mm	Highly conical gas nozzle, narrow gap welding
1.1	094-022227-00000	GN NG TR23X4 66mm D=13mm	Highly conical gas nozzle, narrow gap welding
*1.3	094-014178-00001	GD TR23X4 NW=15MM L=66MM	Gas nozzle
1.4	094-019626-00000	GN NG M12 73mm	Gas nozzle, narrow gap welding
1.4	094-022226-00000	GN NG M12 76mm	Gas nozzle, narrow gap welding
1.5	094-019624-00000	GNC TR23x4	Gas nozzle body
2	094-013528-00000	CT CUCRZR M9X35MM D=0.8MM	Contact tip
2	094-013529-00000	CT CUCRZR M9X35MM D=0.9MM	Contact tip
2	094-013530-00000	CT M9 CuCrZr 1.0mm	Contact tip
2	094-013531-00000	CT CUCRZR M9X35MM D=1.2MM	Contact tip

Item	Order number	Type	Name
2	094-013532-00000	CT CUCRZR M9X35MM D=1.4MM	Contact tip
2	094-013533-00000	CT CUCRZR M9X35MM D=1.6MM	Contact tip
2	094-013534-00000	CT CUCRZR M9X35MM D=2.0MM	Contact tip
2	094-014024-00000	CT CUCRZR M8X30MM D=0.8MM	Contact tip
2	094-013129-00000	CT CUCRZR M8X30MM D=0.9MM	Contact tip
2	094-014222-00000	CT CUCRZR M8X30MM D=1.0MM	Contact tip
2	094-013113-00000	CT M8 CuCrZr 30mm, 1.2mm	Contact tip
2	094-014191-00000	CT CUCRZR M8X30MM D=1.4MM	Contact tip
2	094-014192-00000	CT CUCRZR M8X30MM D=1.6MM	Contact tip
2	094-014193-00000	CT CUCRZR M8X30MM D=2.0MM	Contact tip
2	094-016109-00000	CT E-CU M8X30MM D=0.8MM	Contact tip
2	094-016110-00000	CT E-CU M8X30MM D=0.9MM	Contact tip
2	094-016111-00000	CT E-CU M8X30MM D=1.0MM	Contact tip
2	094-007238-00000	CT E-CU M8X30MM D=1.2MM	Contact tip
2	094-016112-00000	CT E-CU M8X30MM D=1.4MM	Contact tip
2	094-016113-00000	CT E-CU M8X30MM D=1.6MM	Contact tip
2	094-016114-00000	CT E-CU M8X30MM D=2.0MM	Contact tip
2.1	094-019616-00000	CT M9 x 100 mm; Ø 1,0 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-019617-00000	CT M9 x 100 mm; Ø 1,2 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-019618-00000	CT M9 x 100 mm; Ø 1,6 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-020019-00000	CT M9 x 100 mm; Ø 1,4 mm CuCrZr	Contact tip, narrow gap welding
2.1	094-021189-00000	CT M9 x 100 mm; Ø 0,8 mm CuCrZr	Contact tip, narrow gap welding
2.2	094-013543-00000	CTAL E-CU M9X35MM D=0.8MM	Contact tip, aluminium welding
2.2	094-013544-00000	CTAL E-CU M9X35MM D=0.9MM	Contact tip, aluminium welding
2.2	094-013545-00000	CTAL E-CU M9X35MM D=1.0MM	Contact tip, aluminium welding
2.2	094-013546-00000	CTAL E-CU M9X35MM D=1.2MM	Contact tip, aluminium welding
2.2	094-013547-00000	CTAL E-CU M9X35MM D=1.4MM	Contact tip, aluminium welding
2.2	094-013548-00000	CTAL E-CU M9X35MM D=1.6MM	Contact tip, aluminium welding
2.2	094-013549-00000	CTAL E-CU M9X35MM D=2.0MM	Contact tip, aluminium welding
2.2	094-016115-00000	CTAL E-CU M8X30MM D=0.8MM	Contact tip, aluminium welding
2.2	094-016116-00000	CTAL E-CU M8X30MM D=0.9MM	Contact tip, aluminium welding
2.2	094-016117-00000	CTAL E-CU M8X30MM D=1.0MM	Contact tip, aluminium welding
2.2	094-016118-00000	CTAL E-CU M8X30MM D=1.2MM	Contact tip, aluminium welding
2.2	094-016119-00000	CTAL E-CU M8X30MM D=1.4MM	Contact tip, aluminium welding
2.2	094-016120-00000	CTAL E-CU M8X30MM D=1.6MM	Contact tip, aluminium welding
2.2	094-016920-00000	CTAL E-CU M8X30MM D=2.0MM	Contact tip, aluminium welding
*2.3	094-017007-00001	CT ZWK CuCrZr M9 x 35 mm Ø 1,0 mm	Contact tip, forced contact
*2.3	094-016159-00001	CT ZWK CuCrZr M9 x 35 mm Ø 1,2 mm	Contact tip, forced contact
*2.3	094-025533-00000	CT ZWK CuCrZr M9 x 35 mm Ø 1,6 mm	Contact tip, forced contact
*2.3	094-025524-00000	CT ZWK CuCrZr M8 x 30 mm Ø 1,0 mm	Contact tip, forced contact
*2.3	094-025525-00000	CT ZWK CuCrZr M8 x 30 mm Ø 1,2 mm	Contact tip, forced contact
*2.3	094-025534-00000	CT ZWK CuCrZr M8 x 30 mm Ø 1,6 mm	Contact tip, forced contact
3	094-013856-00003	CTH CUCRZR M9 L=35MM	Contact tip holder

Item	Order number	Type	Name
3	094-016425-00003	CTH CUCRZR M9 L=38MM	Contact tip holder
3	094-015489-00003	CTH M8 x 35 mm, CuCrZr	Contact tip holder
3	094-016018-00003	CTH M8 x 37,5 mm, CuCrZr	Contact tip holder
4	094-013111-00002	GD D=20,2 mm; 25 mm	Gas diffuser
5	094-019625-00000	IT ES M22X1,5 M12X1	Insulation part
6	094-019627-00000	ZH GDE ID=5MM AD=10MM L=15MM	Centring sleeve
7	094-022875-00000	O-RING 18,8X2,4MM FPM 75	O-ring for gas nozzle holder
	094-016038-00001	TT SW5-SW12MM	Torch key
	094-013967-00000	4,0MMX1,0MM	O-ring for Euro torch connector
	098-005149-00000	O-Ring Picker	O-ring for picker

* Welding torch equipment for aluminium AC welding.

11 Service documents

11.1 Circuit diagrams

The circuit diagrams are only intended for authorised service personnel!

11.1.1 PM 301 - 551 W

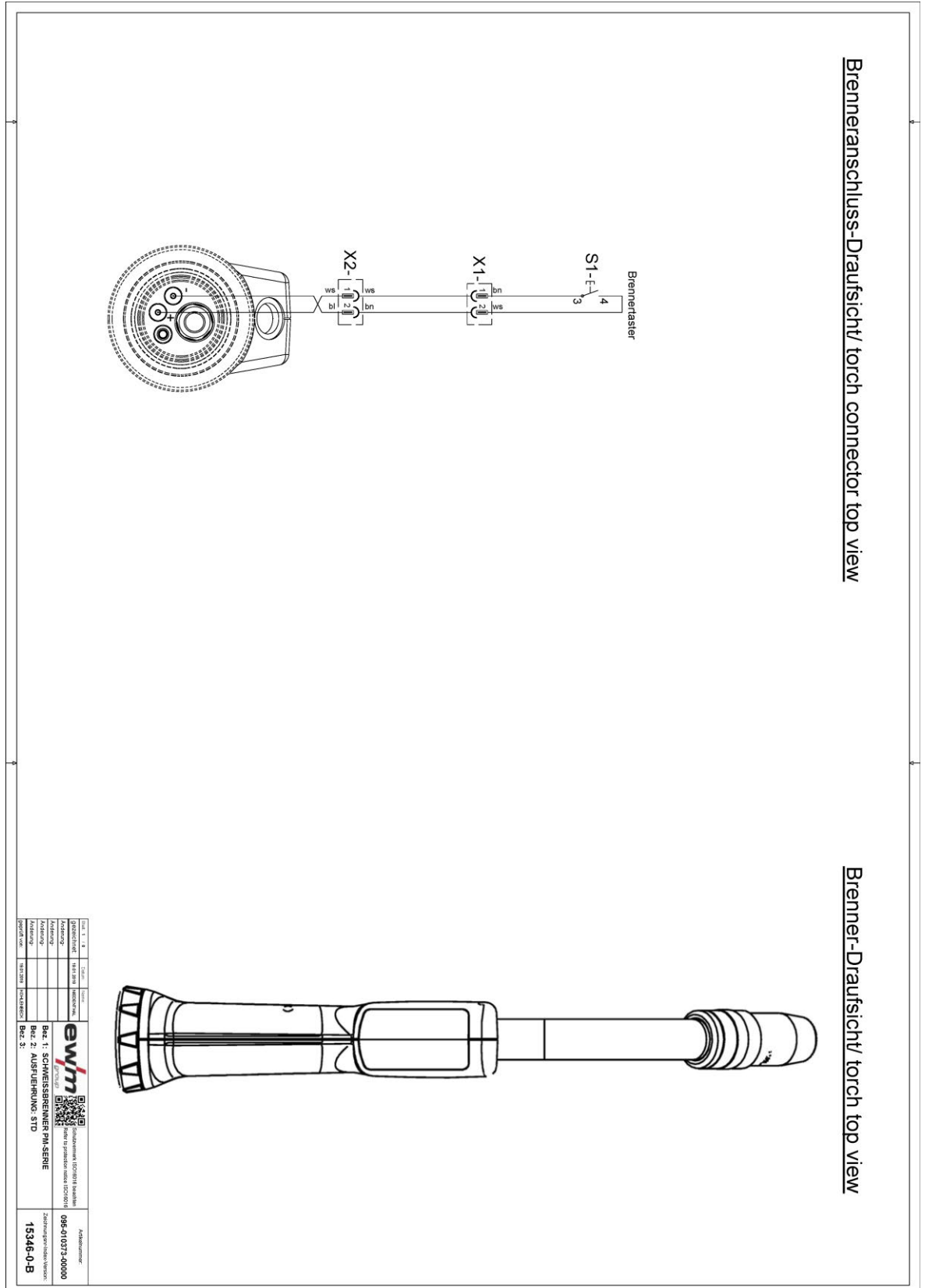
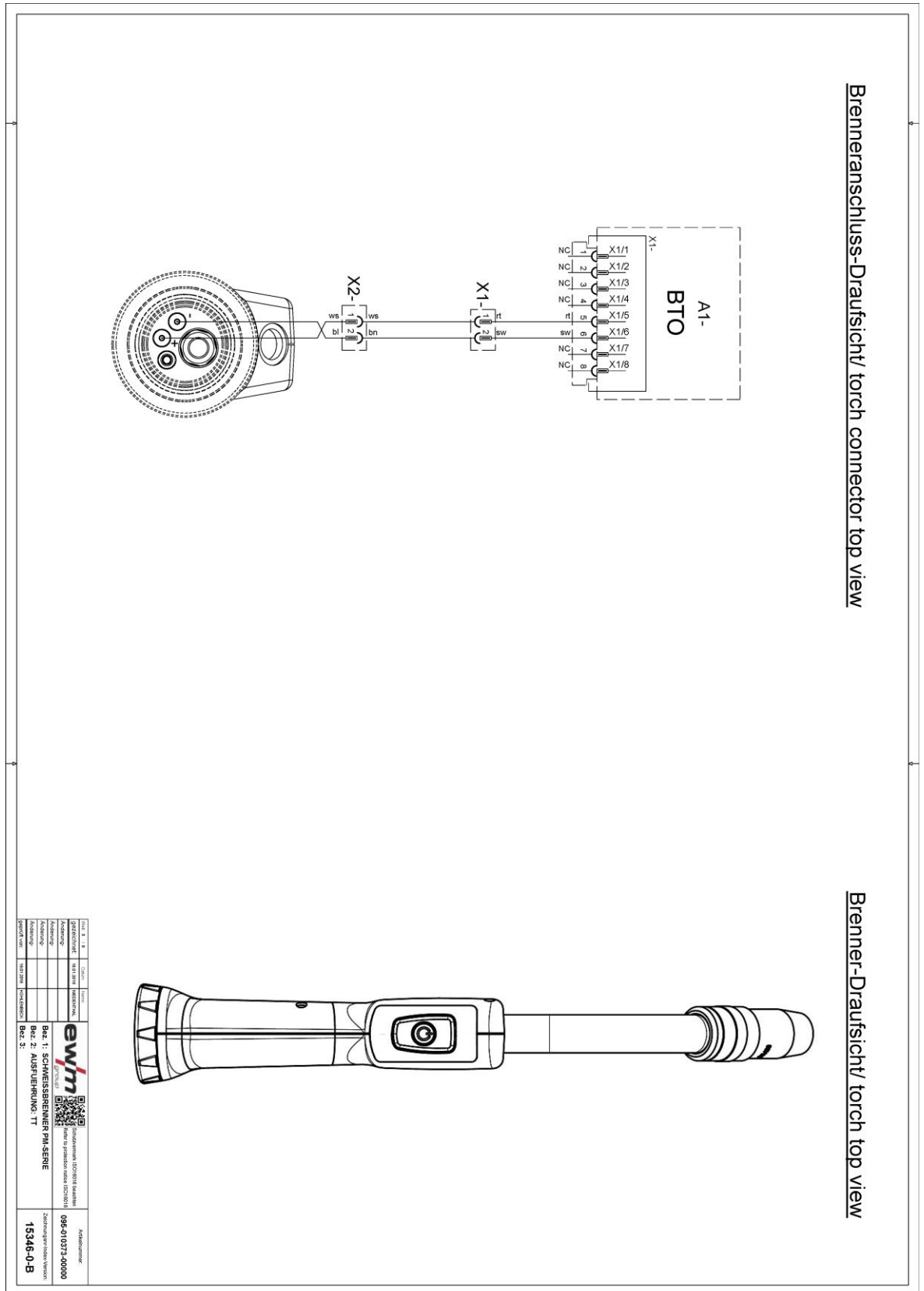


Figure 11-1

11.1.3 PM 301 - 551 W TT



Brenneranschluss-Draufsicht/ torch connector top view

Brenner-Draufsicht/ torch top view

Produktname	PM 301 - 551 W TT	Produktcode	15346-0-B
Produktfamilie	SCHWEISSBREMNER PM-SERIE	Produkttyp	SCHWEISSBREMNER
Produktbeschreibung	Brenner für Schweißbrenner PM-SERIE	Produktgruppe	SCHWEISSBREMNER
Produktversion	Rev. 3:	Produktstatus	Produkt
Produkttyp	SCHWEISSBREMNER	Produktcode	15346-0-B
Produktname	PM 301 - 551 W TT	Produktcode	15346-0-B
Produktfamilie	SCHWEISSBREMNER PM-SERIE	Produkttyp	SCHWEISSBREMNER
Produktbeschreibung	Brenner für Schweißbrenner PM-SERIE	Produktgruppe	SCHWEISSBREMNER
Produktversion	Rev. 3:	Produktstatus	Produkt

Figure 11-3

11.1.4 PM 301 - 551 W TT LED

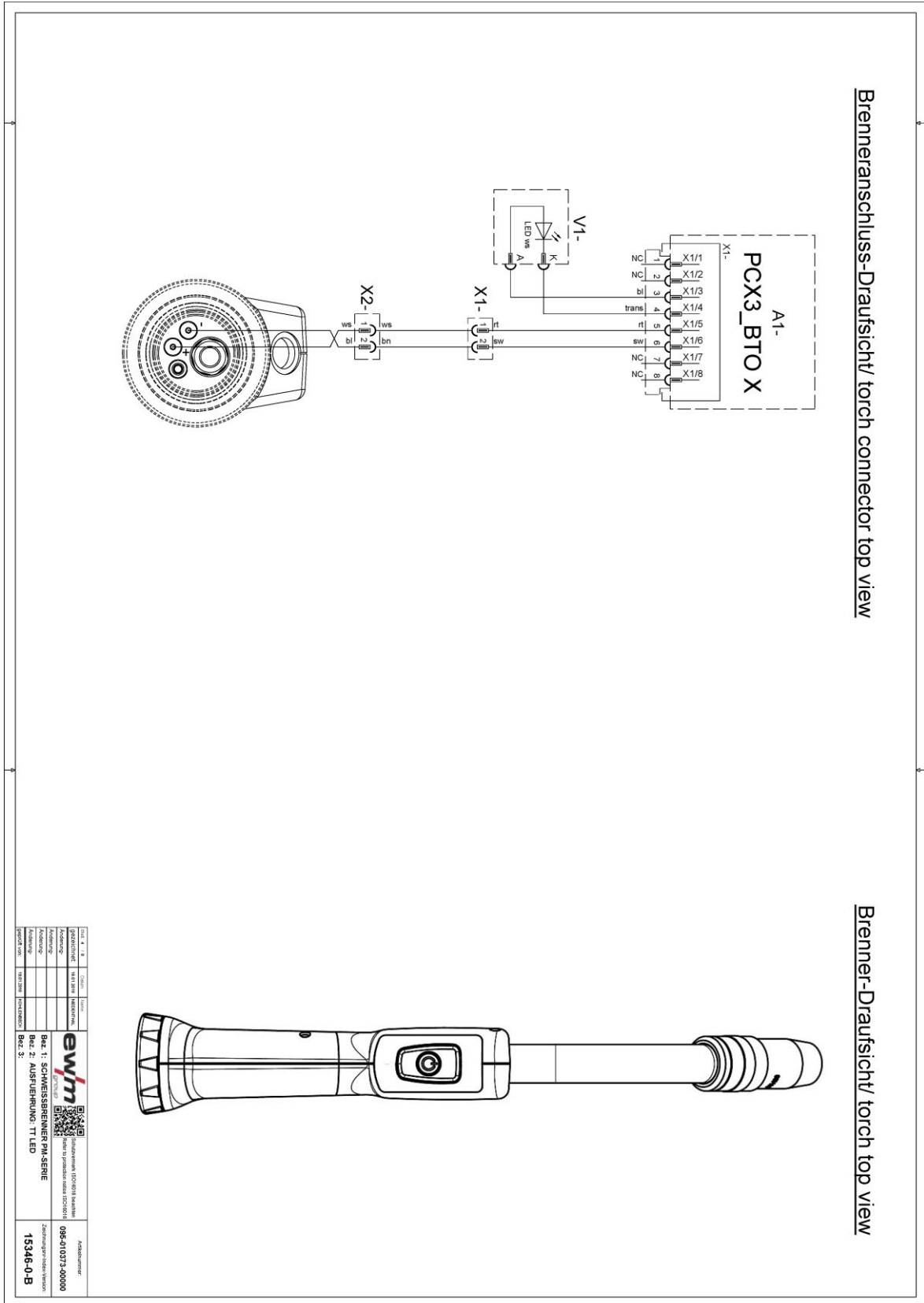


Figure 11-4

11.1.5 PM 301 - 551 W 2U/D

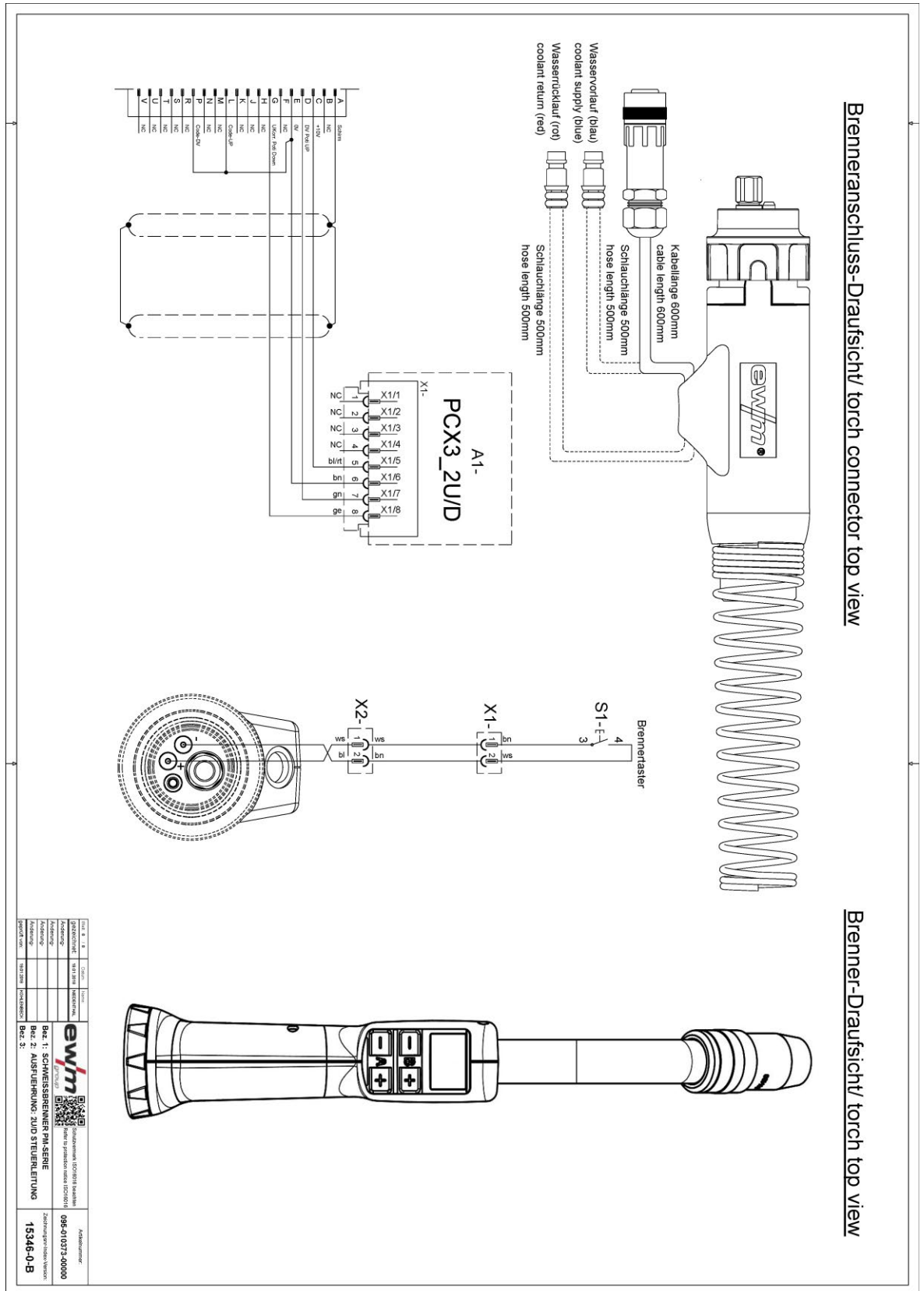


Figure 11-5

11.1.7 PM 301 - 551 W RD2 X

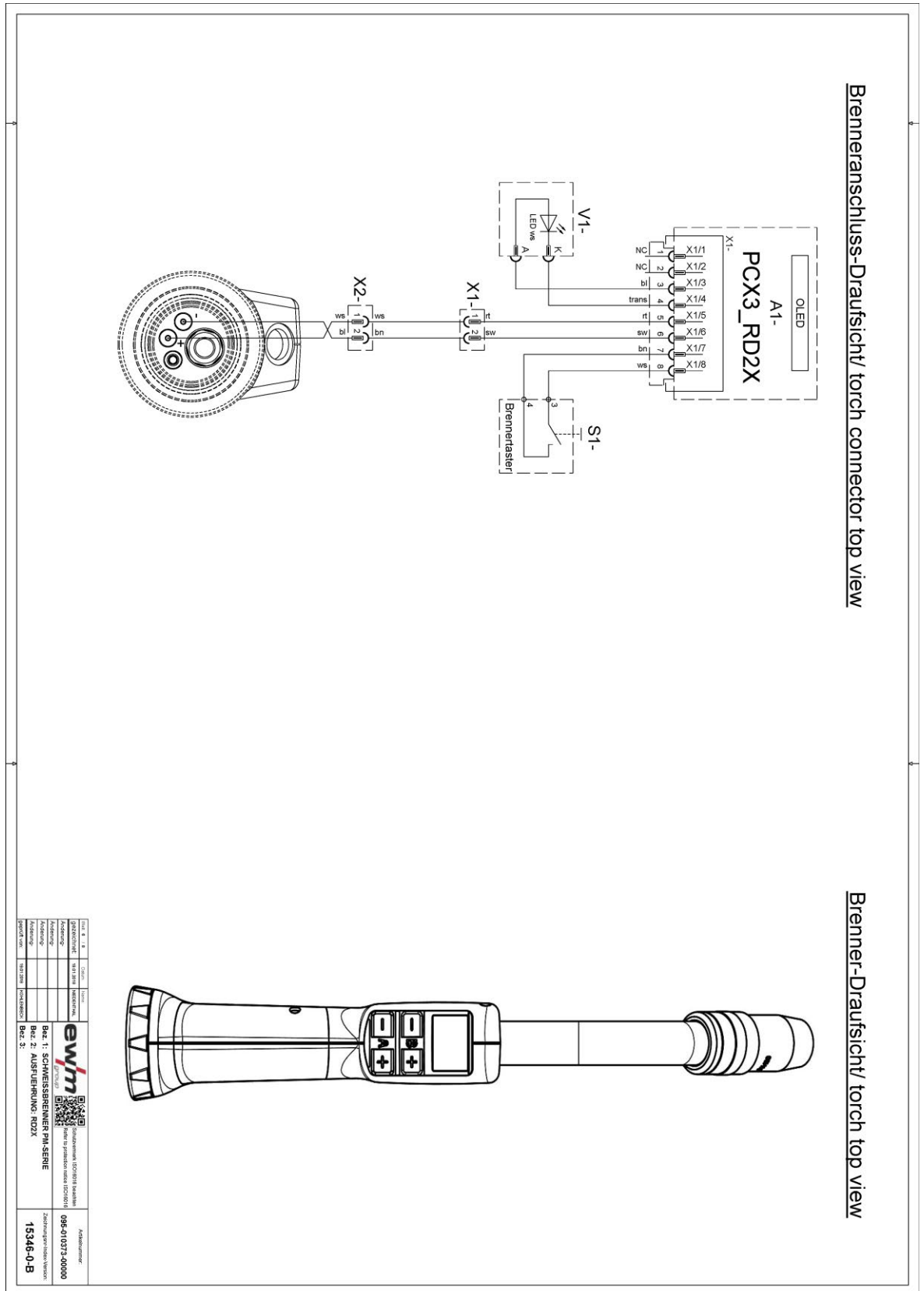


Figure 11-7

11.1.8 PM 301 - 551 W RD3 X

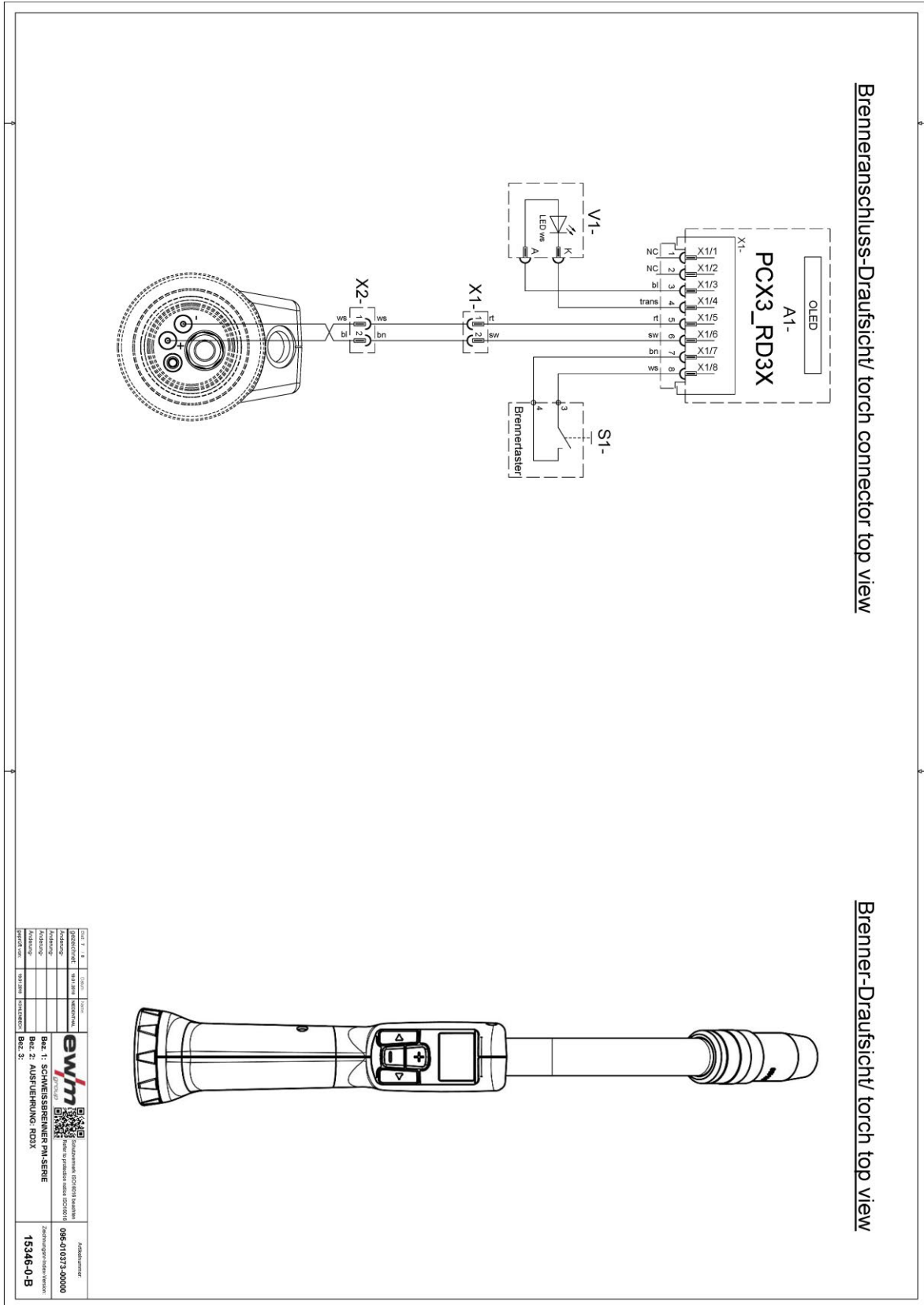


Figure 11-8

12 Appendix

12.1 Display, explanation of symbols






Main level

Display	Setting/selection
	Welding current
	Welding voltage
	Welding voltage correction
	Dynamics
	Wire feed speed Unit: m/min
	Wire feed speed Unit: ipm
	Program selection
	Welding procedure MIG/MAG
	Welding procedure forceArc
	Welding procedure wiredArc
	Welding procedure rootArc
	Welding procedure coldArc
	JOB selection












Program level

Display	Setting/selection
	Welding method Standard
	Welding method Pulse
	Welding method Position weld
	Operating mode Non-latched
	Operating mode Latched
	Operating mode Special non-latched
	Operating mode Special latched
	Operating mode Spot welding

Error messages, warnings

Display	Setting/selection
	Error
	Error - temperature
	Error - water
	Warning
	Warning wire end

Component management, Miscellaneous

Display	Setting/selection
	Unit completed
	Scan component
	Free-welding mode
	Hold value
	Correction mode
	Seam run
	Seam end
	End of component
	End of component, confirmation
	WPS End
	Standby

12.2 Searching for a dealer

Sales & service partners
www.ewm-group.com/en/specialist-dealers



"More than 400 EWM sales partners worldwide"