



**EN**

welding torch

PM 221 G  
PM 301 G  
PM 401 G

099-700000-EW501

Observe additional system documents!

22.09.2020

**Register now  
and benefit!**  
**Jetzt Registrieren  
und Profitieren!**

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



## 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](http://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.

#### **© EWM AG**

Dr. Günter-Henle-Strasse 8  
56271 Mündersbach Germany  
Tel.: +49 2680 181-0, Fax: -244  
Email: [info@ewm-group.com](mailto:info@ewm-group.com)  
**[www.ewm-group.com](http://www.ewm-group.com)**

The copyright to this document remains the property of the manufacturer.

Copying, including extracts, only permitted with written approval.

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

# 1 Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Contents</b> .....                                  | <b>3</b>  |
| <b>2</b> | <b>For your safety</b> .....                           | <b>5</b>  |
| 2.1      | Notes on using these operating instructions.....       | 5         |
| 2.2      | Explanation of icons.....                              | 6         |
| 2.3      | Part of the complete documentation.....                | 7         |
| <b>3</b> | <b>Intended use</b> .....                              | <b>8</b>  |
| 3.1      | Applications.....                                      | 8         |
| 3.2      | Documents which also apply .....                       | 8         |
| 3.2.1    | Warranty.....  | 8         |
| 3.2.2    | Declaration of Conformity.....                         | 8         |
| 3.2.3    | Service documents (spare parts) .....                  | 8         |
| <b>4</b> | <b>Product description – quick reference</b> .....     | <b>9</b>  |
| 4.1      | Product variants .....                                 | 9         |
| 4.2      | Standard welding torch .....                           | 10        |
| 4.3      | Function torch .....                                   | 11        |
| 4.4      | Euro torch connector without control cable.....        | 11        |
| 4.5      | Euro torch connector with control cable.....           | 12        |
| <b>5</b> | <b>Design and function</b> .....                       | <b>13</b> |
| 5.1      | Transport and installation .....                       | 13        |
| 5.1.1    | Ambient conditions .....                               | 13        |
| 5.1.1.1  | In operation .....                                     | 13        |
| 5.1.1.2  | Transport and storage.....                             | 14        |
| 5.1.2    | Settings.....  | 14        |
| 5.1.3    | Operating elements in the machine.....                 | 14        |
| 5.1.4    | Operating elements 2 for up/down welding torch.....    | 15        |
| 5.1.5    | Operating elements for RD2 welding torch .....         | 15        |
| 5.1.6    | Welding data display .....                             | 16        |
| 5.1.7    | Operating elements for RD3 welding torch .....         | 17        |
| 5.1.8    | Welding data display .....                             | 18        |
| 5.1.8.1  | Programs, setting operating points .....               | 19        |
| 5.1.8.2  | Component management on the welding torch .....        | 21        |
| 5.1.9    | LED lighting .....                                     | 22        |
| 5.2      | Configure welding torch .....                          | 22        |
| 5.2.1    | Turning the torch neck.....                            | 23        |
| 5.2.2    | Changing the torch neck.....                           | 23        |
| 5.3      | Equipment recommendations .....                        | 25        |
| 5.4      | Adapting the Euro torch connection on the device ..... | 26        |
| 5.4.1    | Liner.....   | 26        |
| 5.4.2    | Replace steel liner .....                              | 26        |
| 5.5      | Assemble the wire guide.....                           | 26        |
| 5.5.1    | Liner.....   | 27        |
| 5.5.2    | Guide spiral .....                                     | 30        |
| <b>6</b> | <b>Maintenance, care and disposal</b> .....            | <b>33</b> |
| 6.1      | General .....  | 33        |
| 6.2      | Maintenance work, intervals .....                      | 34        |
| 6.2.1    | Daily maintenance tasks.....                           | 34        |
| 6.2.2    | Monthly maintenance tasks.....                         | 34        |
| 6.3      | Maintenance work.....                                  | 34        |
| 6.4      | Disposing of equipment .....                           | 35        |
| <b>7</b> | <b>Rectifying faults</b> .....                         | <b>36</b> |
| 7.1      | Checklist for rectifying faults .....                  | 36        |
| <b>8</b> | <b>Technical data</b> .....                            | <b>37</b> |
| 8.1      | PM 221-, 301-, 401 G .....                             | 37        |
| <b>9</b> | <b>Accessories</b> .....                               | <b>38</b> |
| 9.1      | General accessories .....                              | 38        |

---

|   |           |
|---|-----------|
| <b>10 Replaceable parts</b> .....         | <b>39</b> |
| 10.1 PM 221 G .....                       | 39        |
| 10.2 PM 301 G .....                       | 40        |
| 10.3 PM 401 G .....                       | 42        |
| <b>11 Service documents</b> .....         | <b>44</b> |
| 11.1 Circuit diagrams .....               | 44        |
| 11.1.1 PM 301 - 551 W .....               | 44        |
| 11.1.2 PM 301 - 551 W LED .....           | 45        |
| 11.1.3 PM 301 - 551 W TT .....            | 46        |
| 11.1.4 PM 301 - 551 W TT LED .....        | 47        |
| 11.1.5 PM 301 - 551 W 2U/D.....           | 48        |
| 11.1.6 PM 301 - 551 W 2U/DX .....         | 49        |
| 11.1.7 PM 301 - 551 W RD2 X .....         | 50        |
| 11.1.8 PM 301 - 551 W RD3 X .....         | 51        |
| <b>12 Appendix</b> .....                  | <b>52</b> |
| 12.1 Display, explanation of symbols..... | 52        |
| 12.2 Searching for a dealer.....          | 54        |

## 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   |        |                                  |

## 2.3 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.

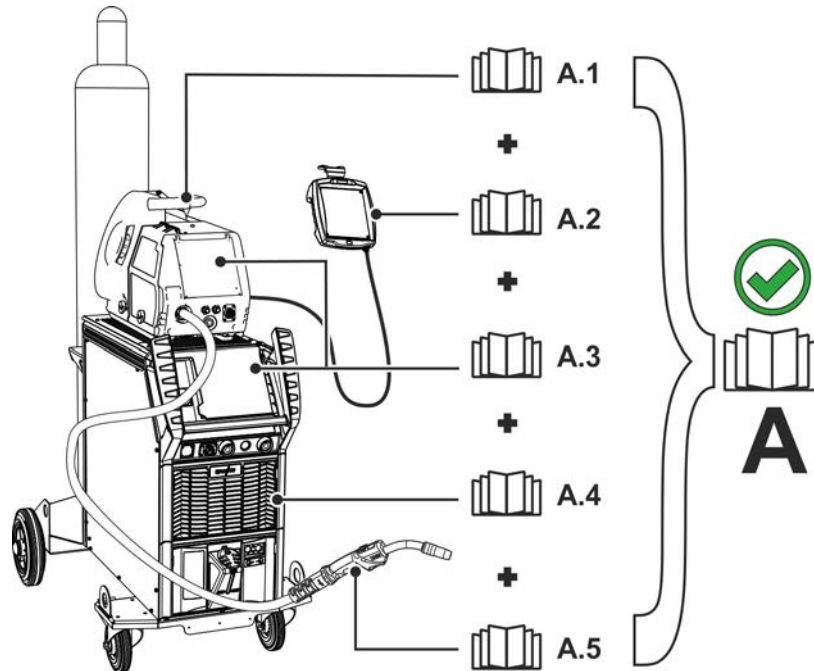


Figure 2-1

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 for arc welding machines for GMAW.

### 3.2 Documents which also apply

#### 3.2.1 Warranty

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

#### 3.2.2 Declaration of Conformity



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                 |
|-------------|--|-----------------------------------|
| <b>PM</b>   | <b>Professional MIG</b>  | PM221/301/401G,<br>PM301/451/551W |
| <b>W</b>    | <b>Water-cooled</b><br>You use the torch trigger to switch the welding process on and off. Interchangeable contact tip holder.   | PM301/451/551W                    |
| <b>G</b>    | <b>Gas-cooled</b><br>You use the torch trigger to switch the welding process on and off. Interchangeable contact tip holder.   | PM221/301/401G                    |
| <b>S</b>    | <b>Short torch neck</b><br>For welding narrow operating points.  | PM451/551W                        |
| <b>L</b>    | <b>Extended torch neck</b><br>For welding operating points which are difficult to reach.<br>High duty cycle.   | PM451/551W                        |
| <b>C</b>    | <b>Interchangeable torch neck</b><br>Torch neck can be continuously fixed through 360°.  | PM221/301G<br>PM301/451W          |
| <b>2U/D</b> | <b>2 up/down welding torch</b><br>The welding power (welding current/wire feed speed) and the voltage correction or the JOB number and program number can be adjusted on the welding torch.  | PM221/301/401G,<br>PM301/451/551W |
| <b>RD2</b>  | <b>Remote display 2-welding torch</b><br>The welding power (welding current/wire feed speed) and the voltage correction or the JOB number and program number can be adjusted on the welding torch. Values and changes are shown on the welding torch display.  | PM221/301/401G,<br>PM301/451/551W |
| <b>RD3</b>  | <b>Remote display 3-welding torch</b><br>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,<br>PM301/451/551W |
| <b>X</b>    | <b>X Technology</b><br>Welding torch with X technology – function torch without separate control cable   | PM221/301/401G,<br>PM301/451/551W |

## 4.2 Standard welding torch

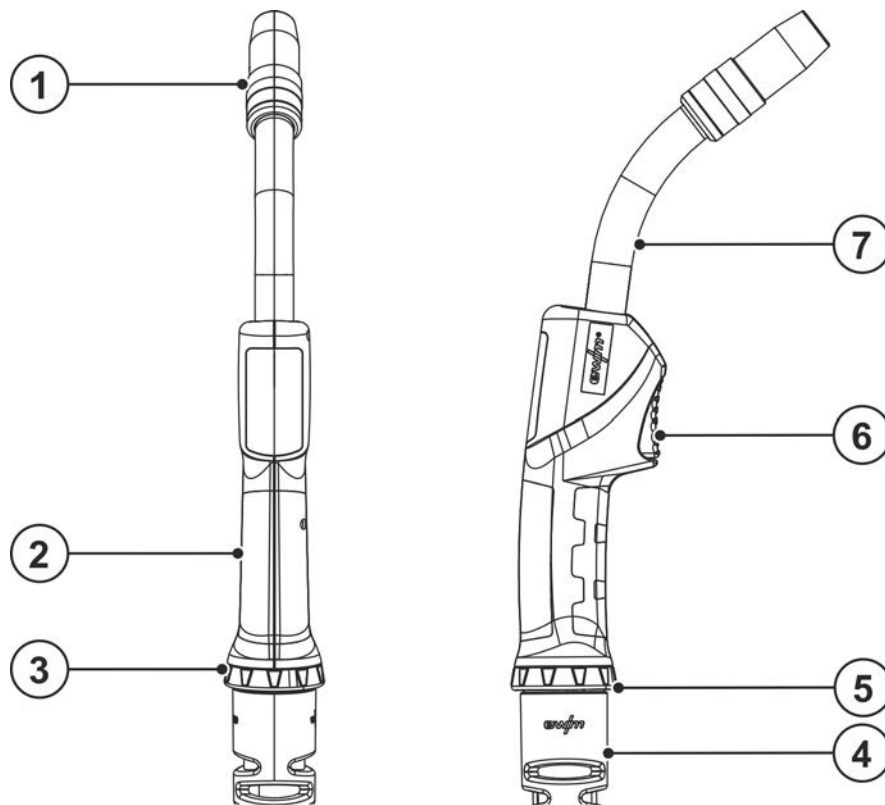


Figure 4-1

| 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°   |

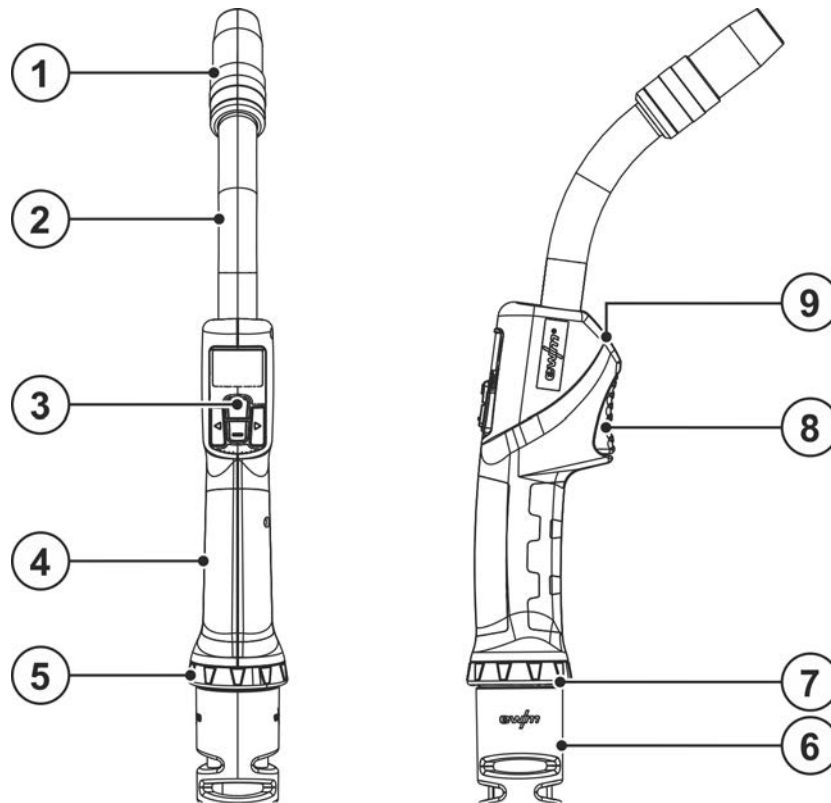
**4.3 Function torch**


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       |

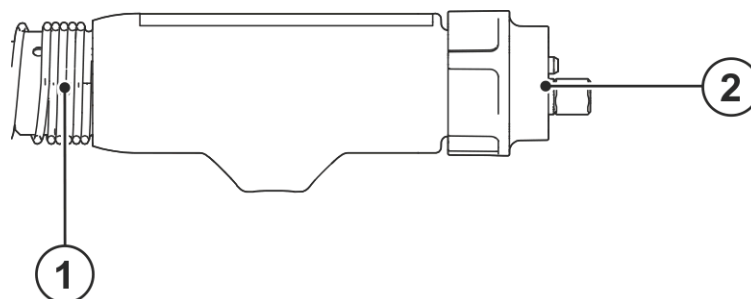

**4.4 Euro torch connector without control cable**


Figure 4-3

| Item | Symbol  | Description   |
|------|---|---|
| 1    |   | Anti-kink spring  |
| 2    |  | <b>Euro central connection</b><br>Welding current, shielding gas and torch trigger included |

## 4.5 Euro torch connector with control cable

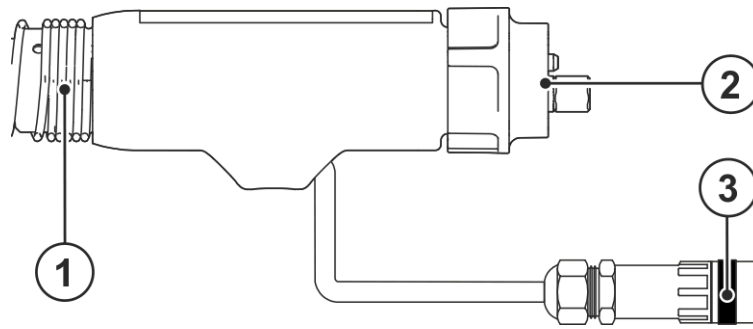


Figure 4-4

| Item | Symbol | Description   |
|------|--------|---|
| 1    |        | <b>Anti-kink spring</b>                                     |
| 2    |        | <b>Euro central connection</b>                              |
| 3    |        | <b>Control cable plug</b><br>Only for control variant 2U/D. |

Version with control cable only with control variant 2U/D.

## 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 from electrical current!**

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

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



**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 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!

#### 5.1.1 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!**

##### 5.1.1.1 In operation

**Temperature range of the ambient air:**

- -10 °C to +40 °C (-13 F to 104 F)<sup>[1]</sup>

**Relative humidity:**

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

## 5.1.1.2 Transport and storage

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

- -25 °C to +55 °C (-13 F to 131 F)<sup>[1]</sup>

### Relative humidity

- up to 90 % at 20 °C (68 F)

<sup>[1]</sup> Ambient temperature dependent on coolant! Observe the coolant temperature range of the torch cooling

## 5.1.2 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           | ✗                     | ✗   | ✓   |

## 5.1.3 Operating elements in the machine

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

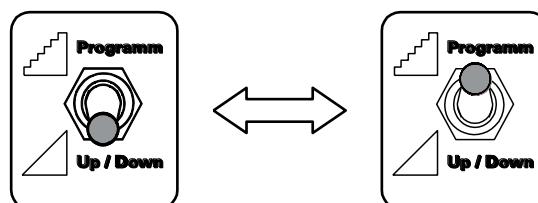


Figure 5-1

- 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.**

## 5.1.4 Operating elements 2 for up/down welding torch

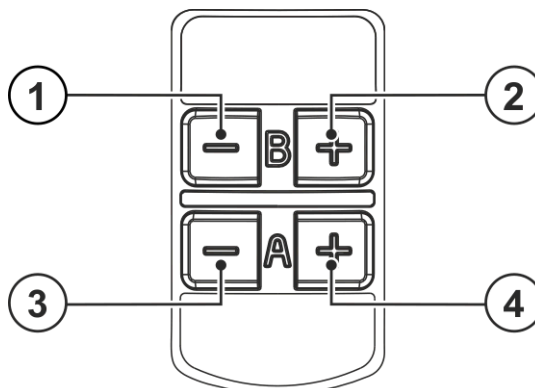


Figure 5-2

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

## 5.1.5 Operating elements for RD2 welding torch

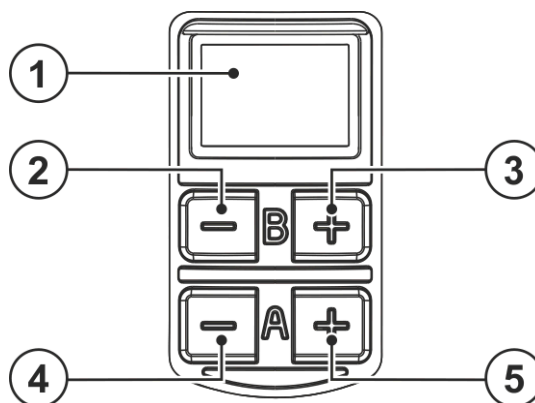





Figure 5-3

| Item | Symbol | Description   |
|------|--------|---|
| 1    |        | <b>OLED display</b><br>Graphical display to show the functions.   |
| 2    | —      | <b>"B -" button (program mode)</b><br>Decrease JOB number<br><b>"B -" button (up/down mode)</b><br>Welding voltage correction, decrease value |

| Item | Symbol  | Description   |
|------|---|---|
| 3    |  | "B +" button (program mode)<br>Increase JOB number<br>"B +" button (up/down mode)<br>Welding voltage correction, increase value                         |
| 4    |  | "A -" button (Program mode)<br>Decrease program number<br>"A -" button (Up/Down mode)<br>Reduce welding performance (welding current/wire-feed speed)   |
| 5    |  | "A +" button (Program mode)<br>Increase program number<br>"A +" button (Up/Down mode)<br>Increase welding performance (welding current/wire-feed speed) |

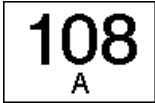




## 5.1.6 Welding data display

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    |  |
| Voltage correction |  |
| Programs           |  |
| JOB number         |  |



**5.1.7 Operating elements for RD3 welding torch**

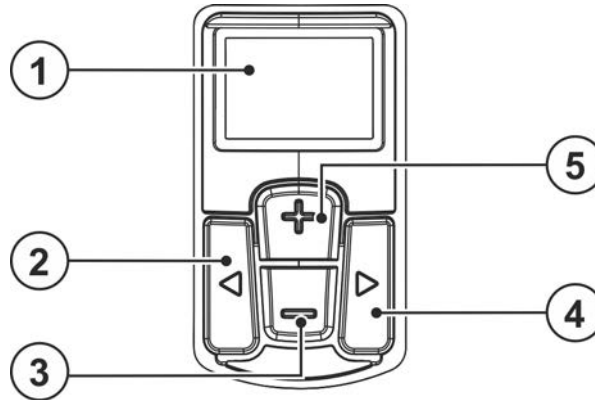


Figure 5-4

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

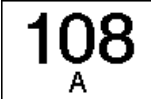




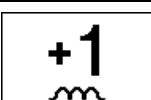

## 5.1.8 Welding data display

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 |  |

## 5.1.8.1 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

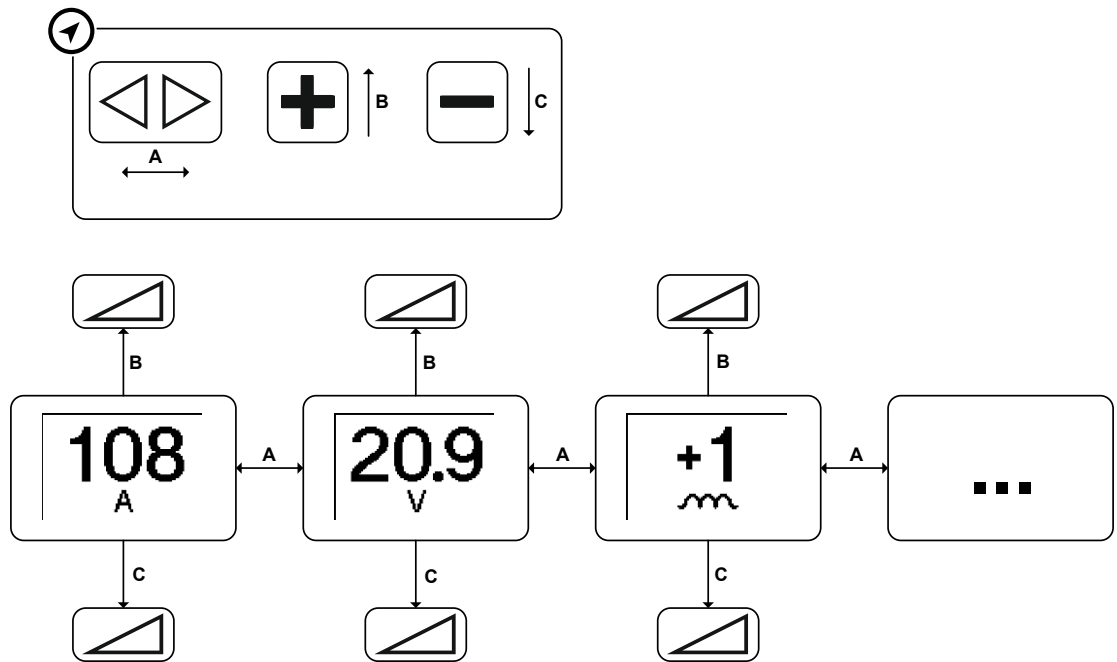


Figure 5-5

**Program level**

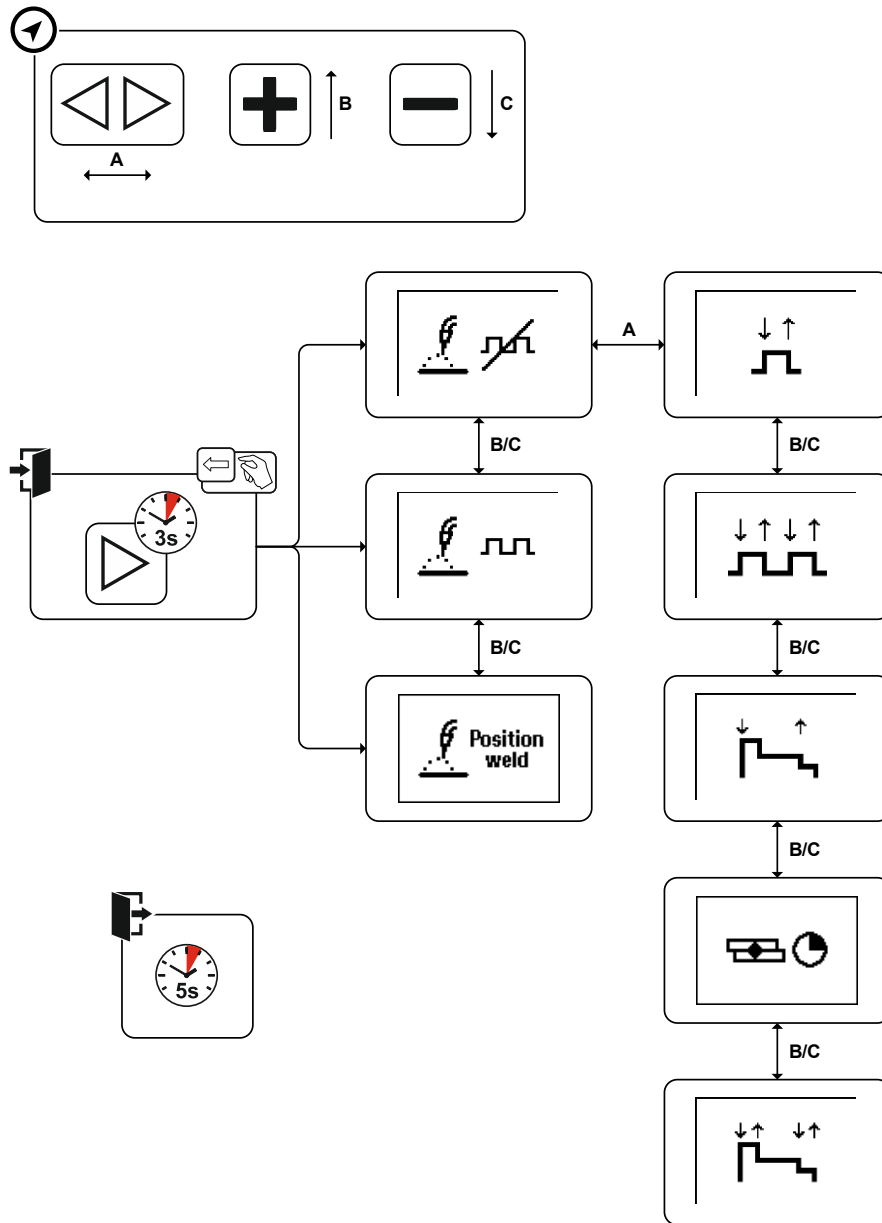


Figure 5-6

### 5.1.8.2 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:

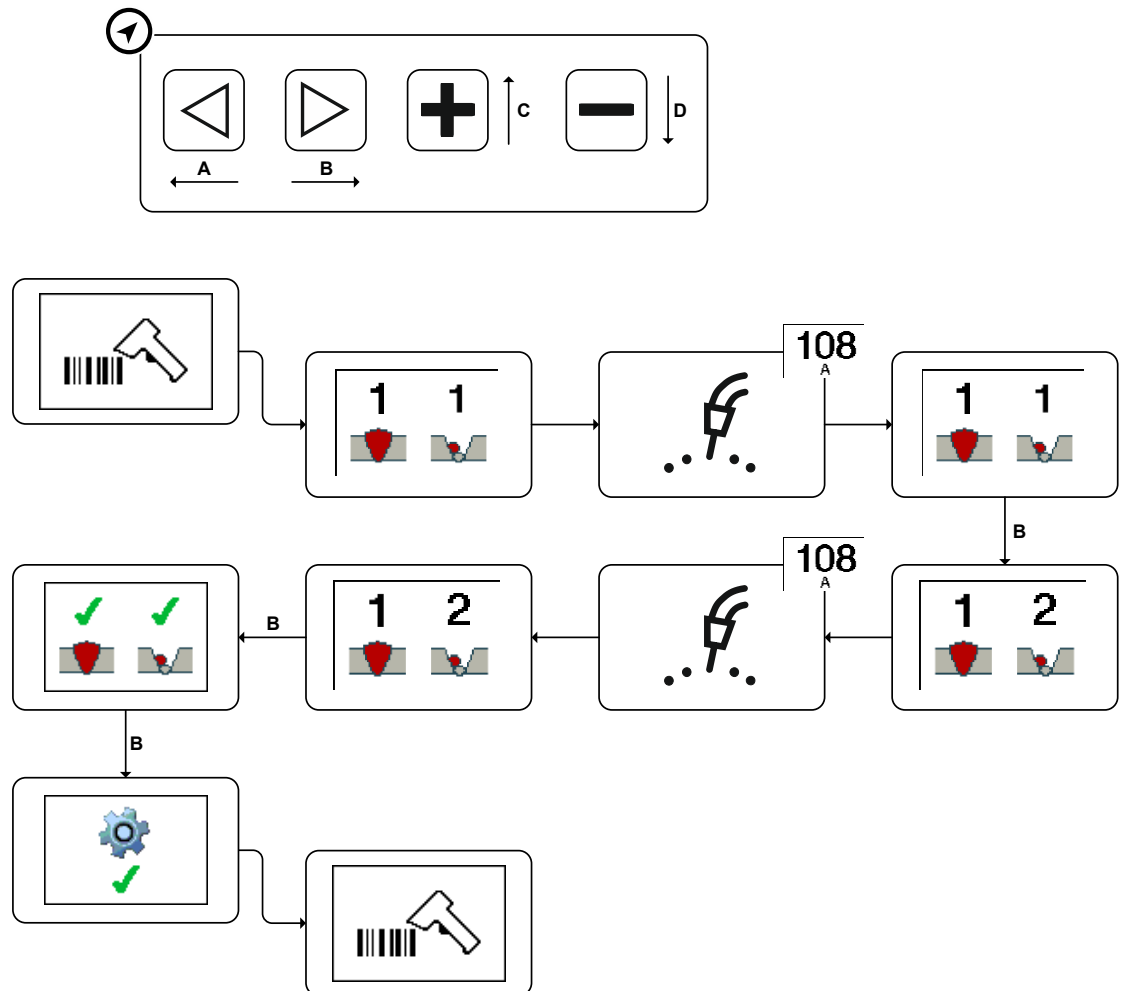


Figure 5-7

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.

## 5.1.9 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.

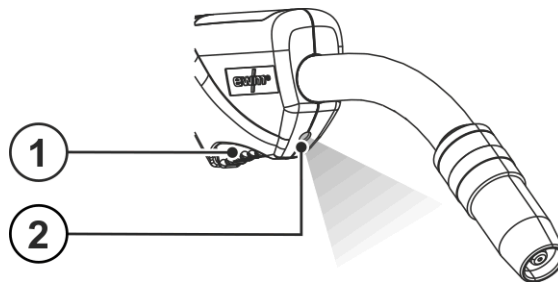


Figure 5-8

| Item | Symbol | Description   |
|------|--------|---------------|
| 1    |        | Torch trigger |
| 2    |        | LED lighting  |

## 5.2 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!

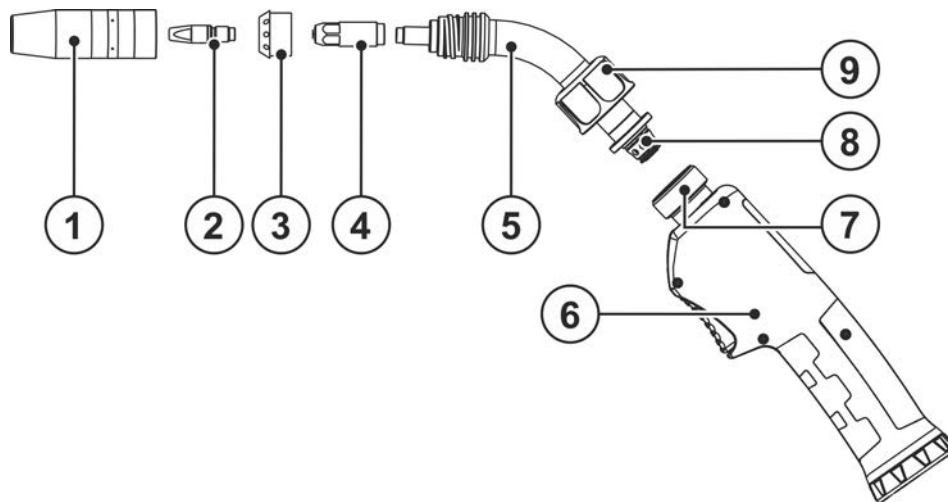


Figure 5-9

| 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.**

**5.2.1 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.

**5.2.2 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.

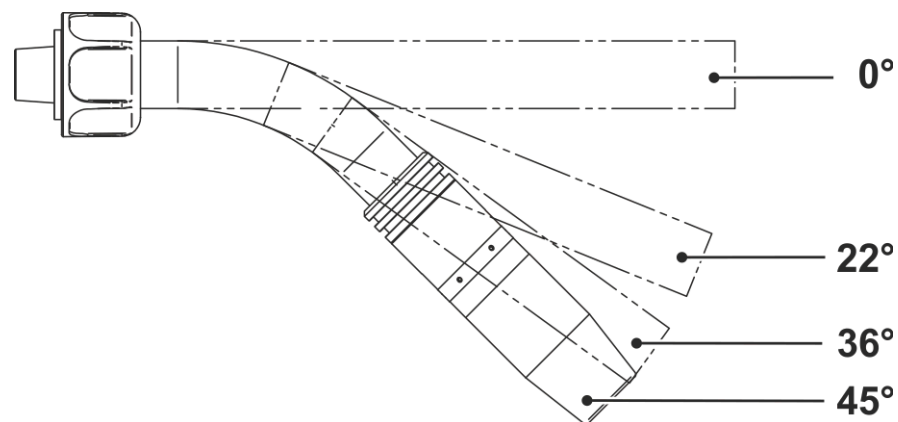


Figure 5-10

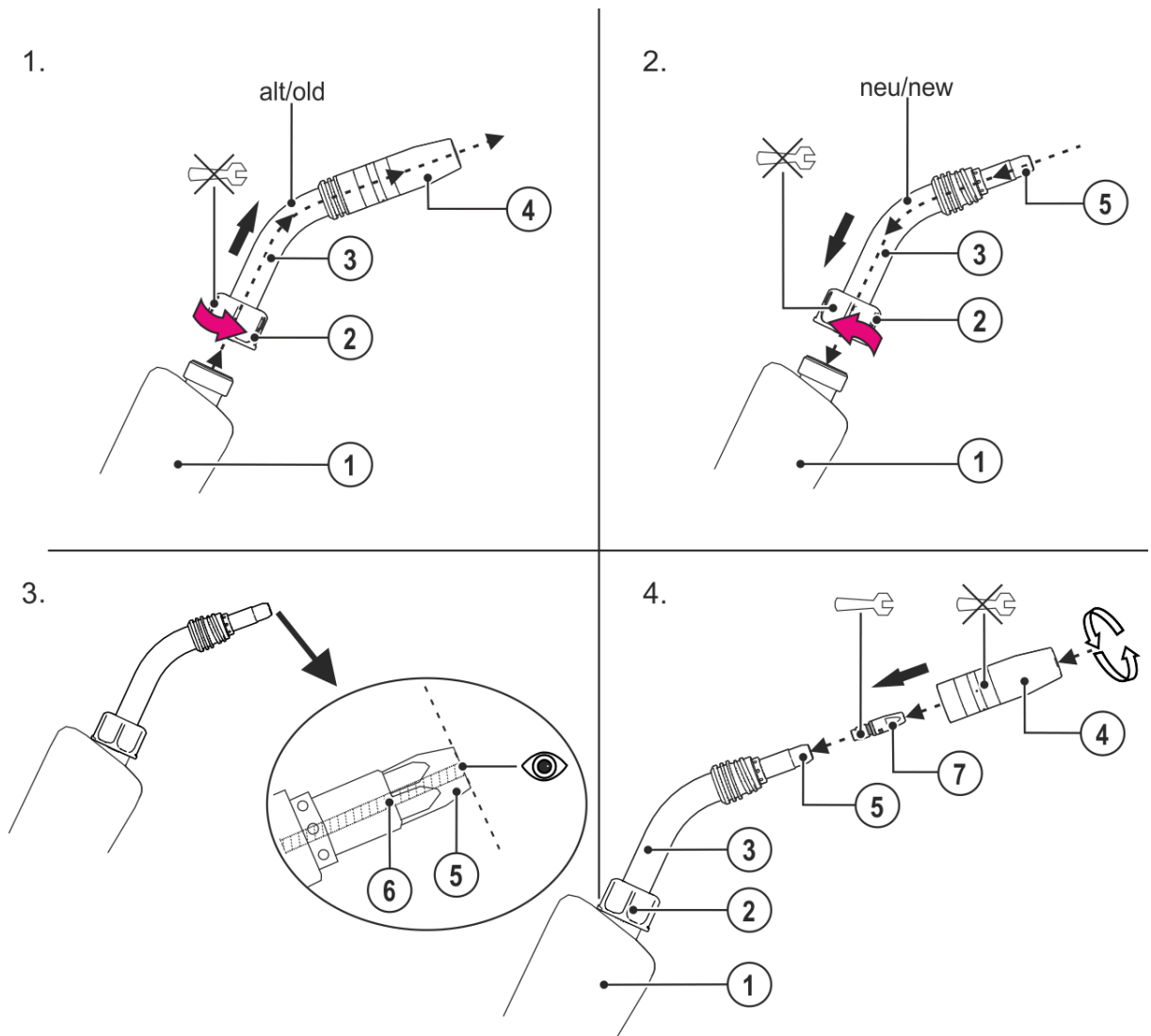


Figure 5-11

| 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        |

Connect welding torch after performing the maintenance and rinse using the "Gas Test" with shield gas.



### 5.3 Equipment recommendations

|                      | Material        | Dia-<br>meter<br>wire | Contact tip     | Dimension<br>liner | Liner                    | Length<br>brass<br>spiral | Wire guide<br>equipment      | Wire<br>feed<br>roller |                   |
|----------------------|-----------------|-----------------------|-----------------|--------------------|--------------------------|---------------------------|------------------------------|------------------------|-------------------|
| GMAW Solid Wire      | Un-alloyed      | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | Steel liner<br>insulated | /                         | ①<br>Euro torch<br>connector | V groove               | capillary<br>tube |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,6                   |                 | 2,4 x 4,5          |                          |                           |                              |                        |                   |
|                      | Medium-alloyed  | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | PA combi liner           | 200 mm                    | Euro torch<br>connector      | V groove               | guide<br>tube     |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      | Hardfacing      | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | PA combi liner           | 200 mm                    | Euro torch<br>connector      | V groove               | guide<br>tube     |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      | Stainless Steel | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | PA combi liner           | 200 mm                    | Euro torch<br>connector      | V groove               | guide<br>tube     |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      | Aluminium       | 0,8                   | EWM Alu<br>E-Cu | 1,5 x 4,0          | PA combi liner           | 30 mm                     | ②<br>Torch neck              | U groove               | guide<br>tube     |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
| Copper               | 0,8             | EWM<br>CuCrZr         | 1,5 x 4,0       | PA combi liner     | 200 mm                   | Euro torch<br>connector   | V groove                     | guide<br>tube          |                   |
|                      | 1,0             |                       | 1,5 x 4,0       |                    |                          |                           |                              |                        |                   |
|                      | 1,2             |                       | 2,0 x 4,0       |                    |                          |                           |                              |                        |                   |
| FCAW Flux Cored Wire | Un-alloyed      | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | Steel liner<br>insulated | /                         | Euro torch<br>connector      | knurled V<br>groove    | capillary<br>tube |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,6                   |                 | 2,4 x 4,5          |                          |                           |                              |                        |                   |
|                      | Stainless Steel | 0,8                   | EWM<br>CuCrZr   | 1,5 x 4,0          | PA combi liner           | 200 mm                    | Euro torch<br>connector      | knurled V<br>groove    | guide<br>tube     |
|                      |                 | 1,0                   |                 | 1,5 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,2                   |                 | 2,0 x 4,0          |                          |                           |                              |                        |                   |
|                      |                 | 1,6                   |                 | 2,3 x 4,7          |                          |                           |                              |                        |                   |

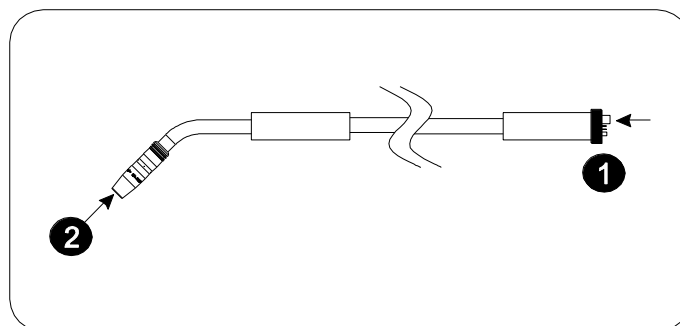
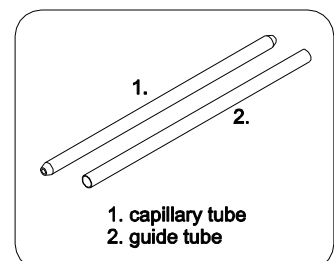
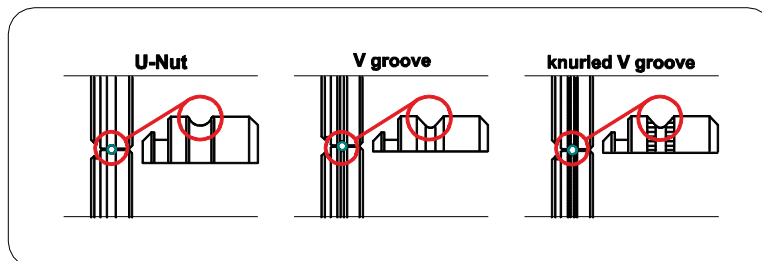


Figure 5-12

## 5.4 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!**

### 5.4.1 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!

### 5.4.2 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.

## 5.5 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 .**

## 5.5.1 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.

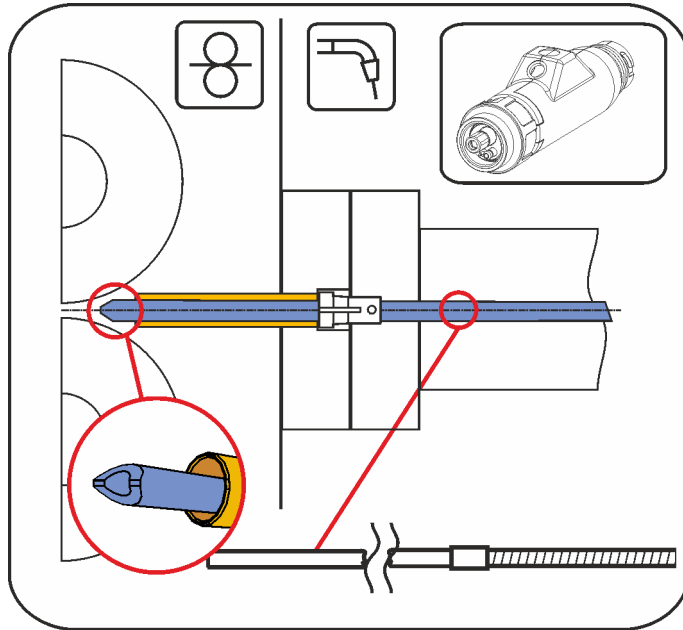


Figure 5-13

1.

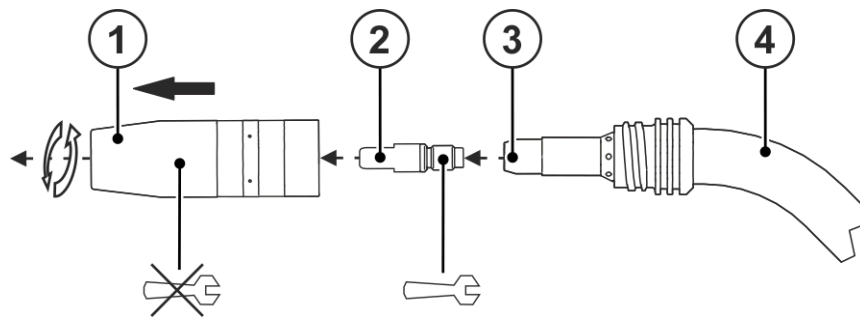


Figure 5-14

2.

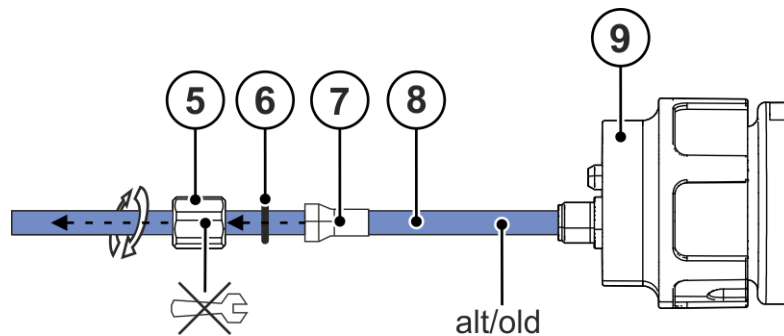


Figure 5-15

3.

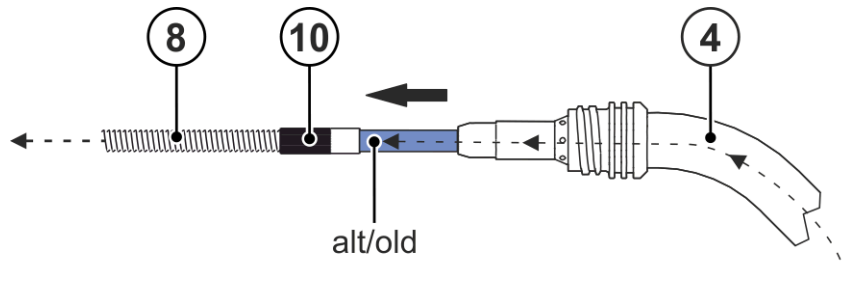


Figure 5-16

4.

Adjust the brass liner .

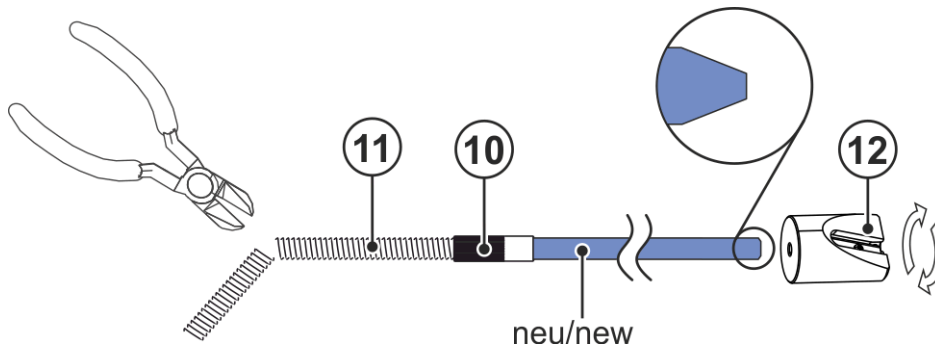


Figure 5-17

5.

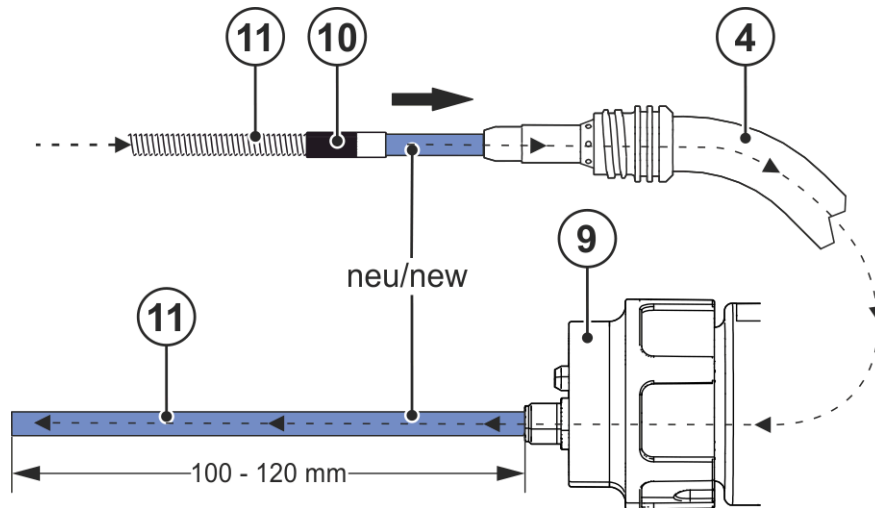


Figure 5-18

6.

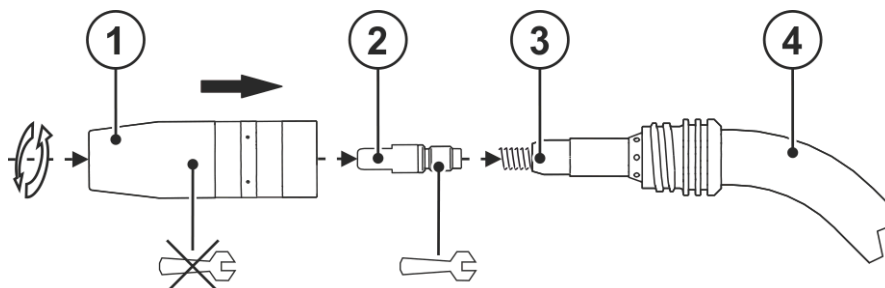


Figure 5-19

7.

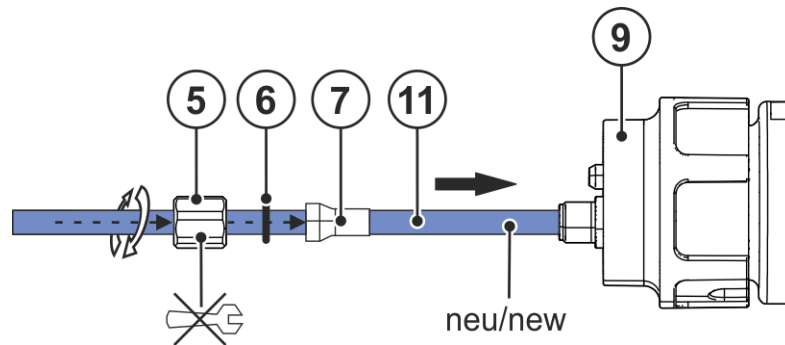


Figure 5-20

8.

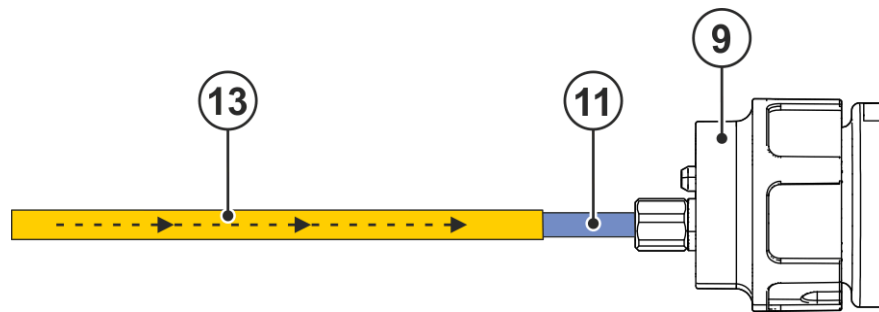


Figure 5-21

| 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 |

## 5.5.2 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.

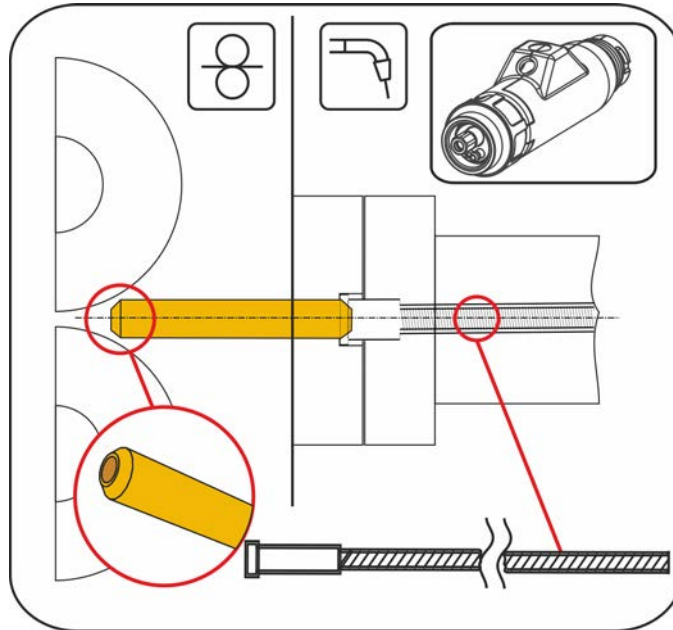


Figure 5-22

1.

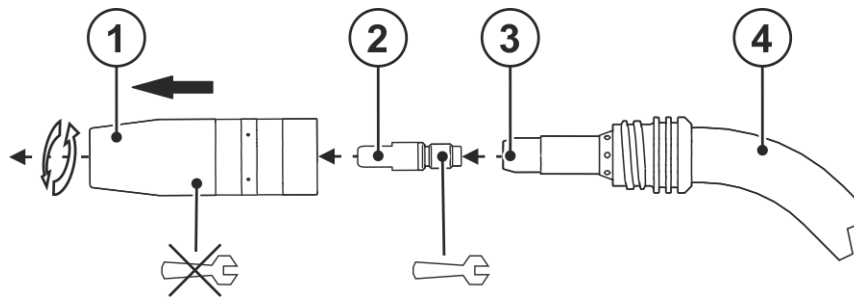


Figure 5-23

2.

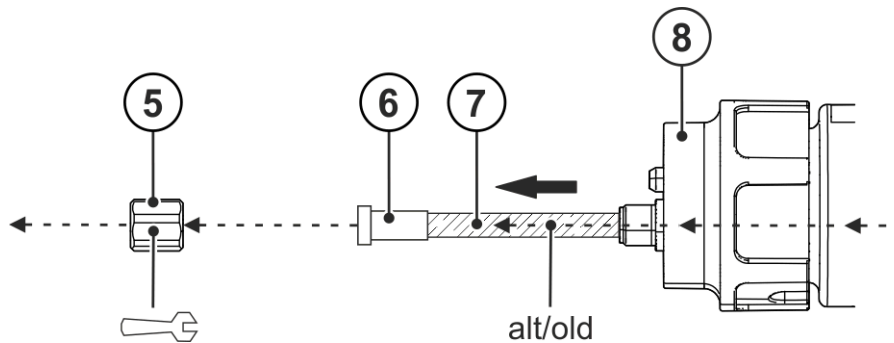


Figure 5-24

3.

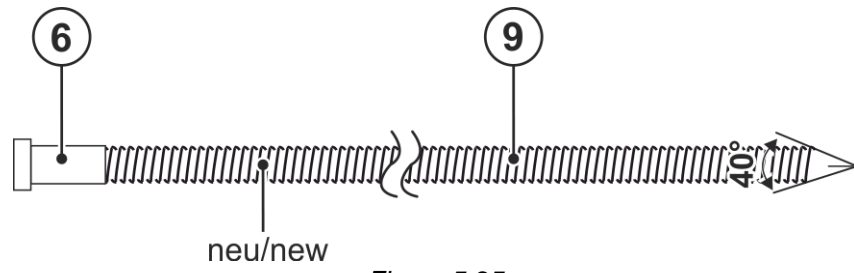


Figure 5-25

4.

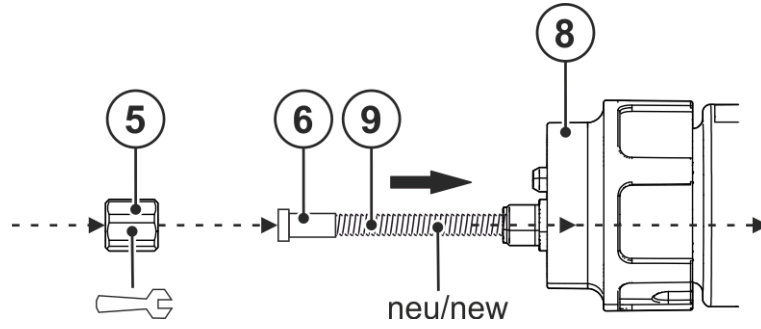


Figure 5-26

5.

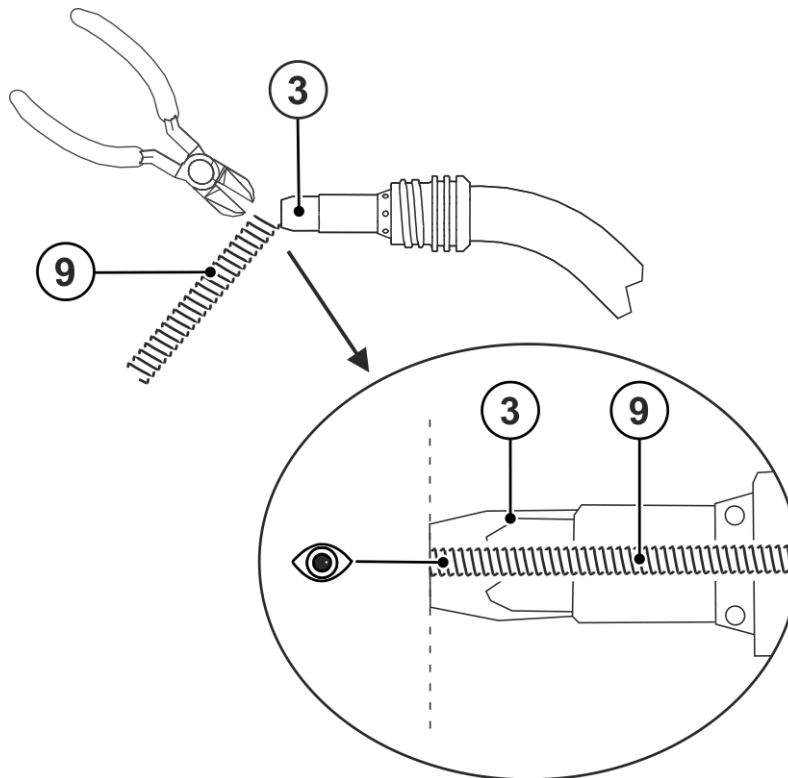


Figure 5-27

6.

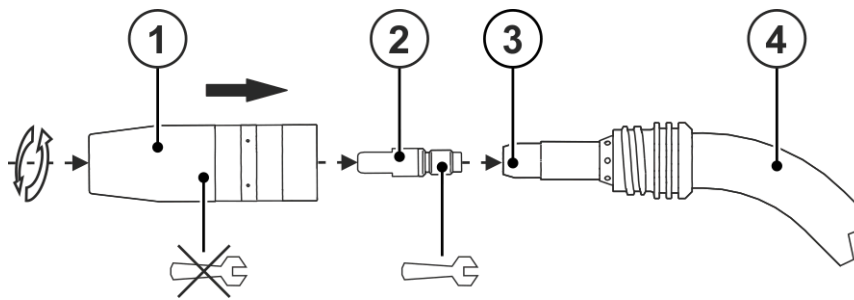


Figure 5-28

7.

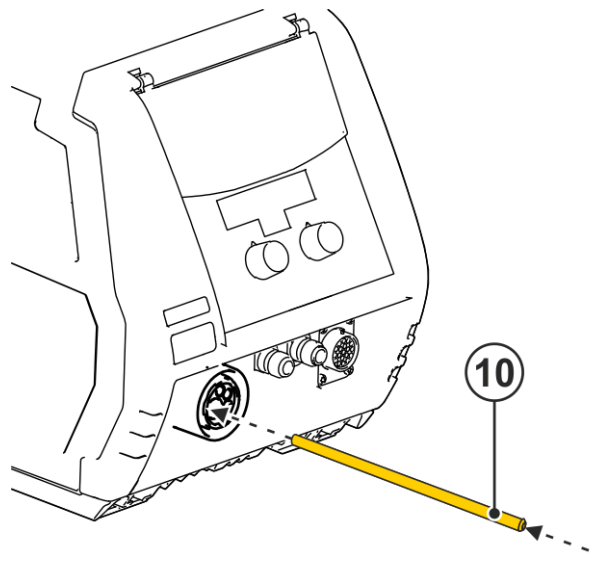



Figure 5-29

| 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 last 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

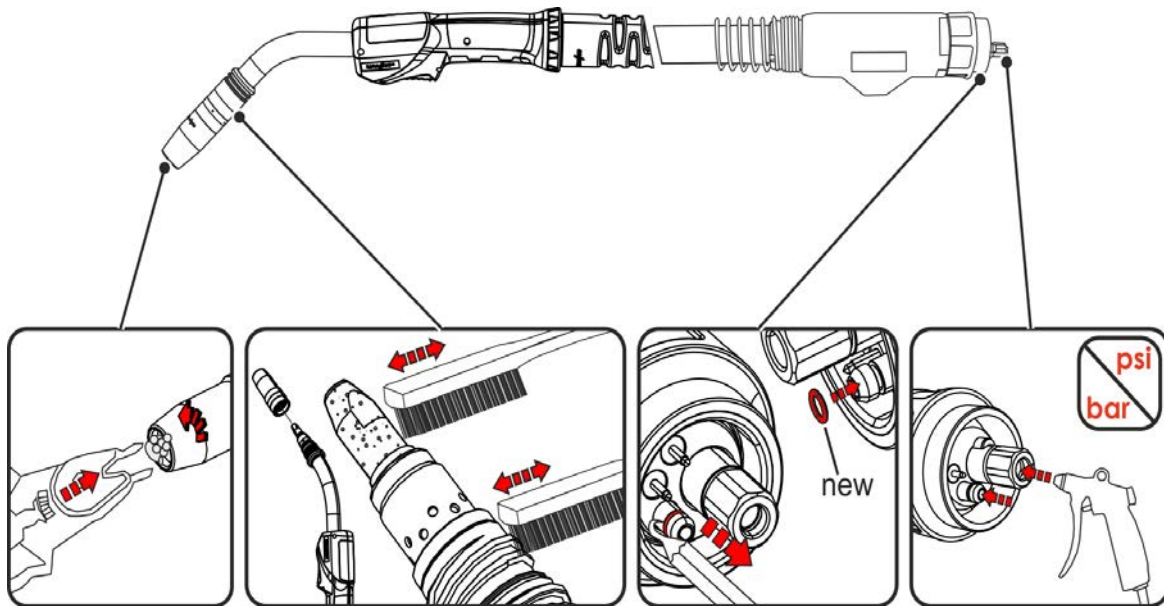


Figure 6-1

- 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

- ↘ 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
  - ✘ Tighten contact tip correctly
- ↘ Overload
  - ✘ Check and correct welding current setting
  - ✘ Use a more powerful welding torch

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

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

#### Wire feed problems

- ↘ Unsuitable or worn welding torch equipment
  - ✘ Adjust contact tip 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

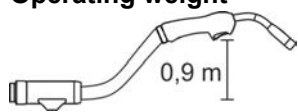
- ↘ Inadequate or missing gas shielding
  - ✘ Check shielding gas setting and replace shielding gas cylinder if necessary
  - ✘ Shield welding site with protective screens (draughts affect the welding result)
- ↘ Unsuitable or worn welding torch equipment
  - ✘ Check size of gas nozzle and replace if 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

## 8 Technical data

### 8.1 PM 221-, 301-, 401 G

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

| Typ  | - 221 G  | - 301 G                             | - 401 G                            |
|--|--|-------------------------------------|------------------------------------|
| 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 <sup>[1]</sup>                            | 60 %   |                                     | 35 %                               |
| Maximum welding current M21                                      | 220 A  | 300 A                               | 400 A                              |
| Maximum welding current M21, pulse                               | 150 A  | 210 A                               | 260 A                              |
| Maximum welding current CO2                                      | 250 A  | 330 A                               | 450 A                              |
| Microswitch for switching voltage                                | 15 V   |                                     |                                    |
| Microswitch for switching current                                | 10 mA  |                                     |                                    |
| Wire types   | Standard round wires   |                                     |                                    |
| Wire diameter  | 0,8 to 1,2 mm<br>0,03 to 0,047 inch                          | 0,8 to 1,6 mm<br>0,03 to 0,063 inch | 0,8 to 2,0 mm<br>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 20 l/min<br>2,6 gal./min to 6,6 gal./min               |                                     |                                    |
| Hose package length  | 1,5-, 3-, 4-, 5 m<br>39,4-, 78,7-, 118,1-, 157,5, 196,9 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   | 1,09 kg<br>2.4 lb.   | 1,16 kg<br>2.56 lb.                 | 1,3 kg<br>2.86 lb.                 |



<sup>[1]</sup> 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



**Parts and / or wearing parts may only be replaced when the components have cooled down and switched off!**

### 10.1 PM 221 G

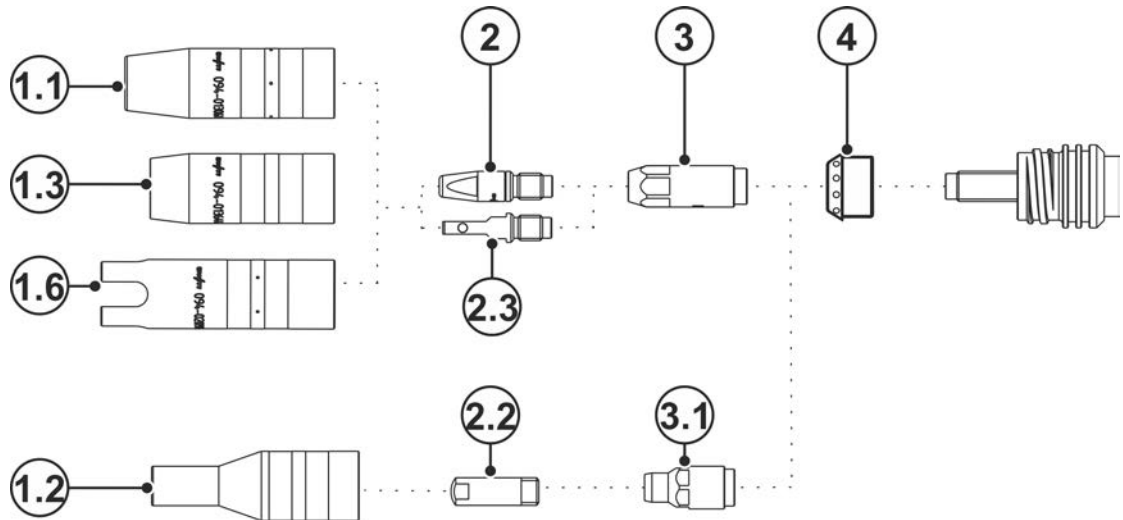


Figure 10-1

| 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, Bottleneck         |
| 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 |
| 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                    |

| Item | Order number     | Type                              | Name                            |
|------|------------------|-----------------------------------|---------------------------------|
| 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 zwangskontaktiert   |
| 2.3  | 094-025536-00000 | CT ZWK CuCrZr M7x30 mm Ø 1,2mm    | Contact tip zwangskontaktiert   |
| 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                    |
| -    | 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 Picker                   |

## 10.2 PM 301 G

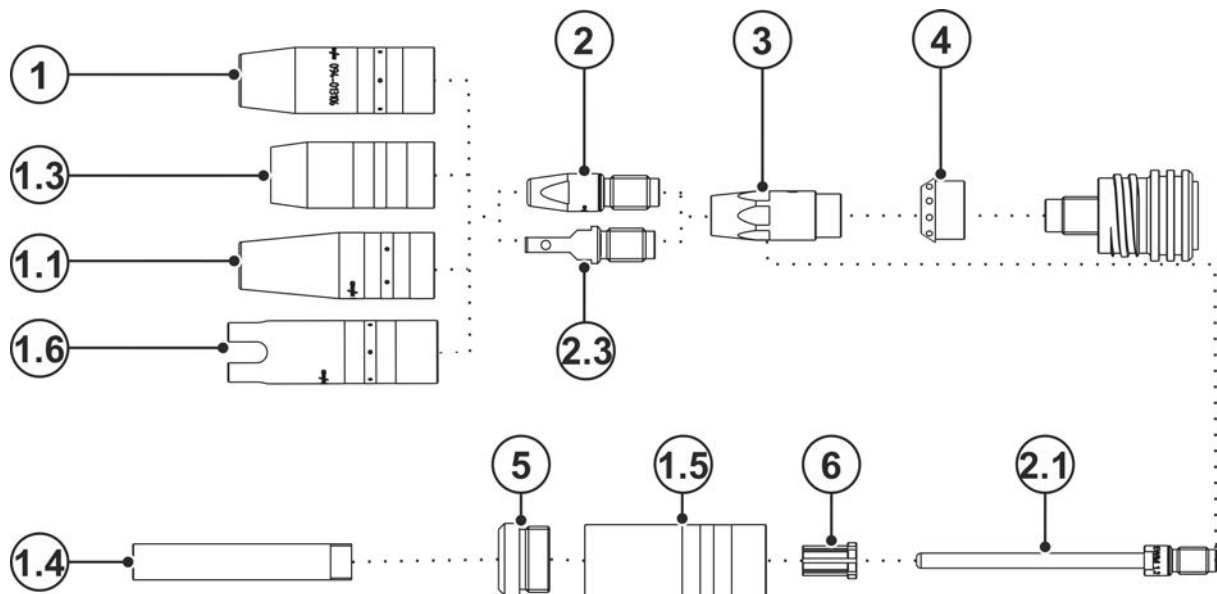


Figure 10-2

| 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                                    |
| 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 | Gas nozzle Highly conical, Narrow gap welding |



| Item | Order number     | Type                            | Name                            |
|------|------------------|---------------------------------|---------------------------------|
| 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, zwangskontaktiert  |
| 2.3  | 094-025533-00001 | CT ZWK CuCrZr M9x35 mm Ø 1,6 mm | Contact tip, zwangskontaktiert  |
| 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              |

| Item | Order number     | Type                         | Name                            |
|------|------------------|------------------------------|---------------------------------|
| 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                 |
| -    | 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 Picker                   |

## 10.3 PM 401 G

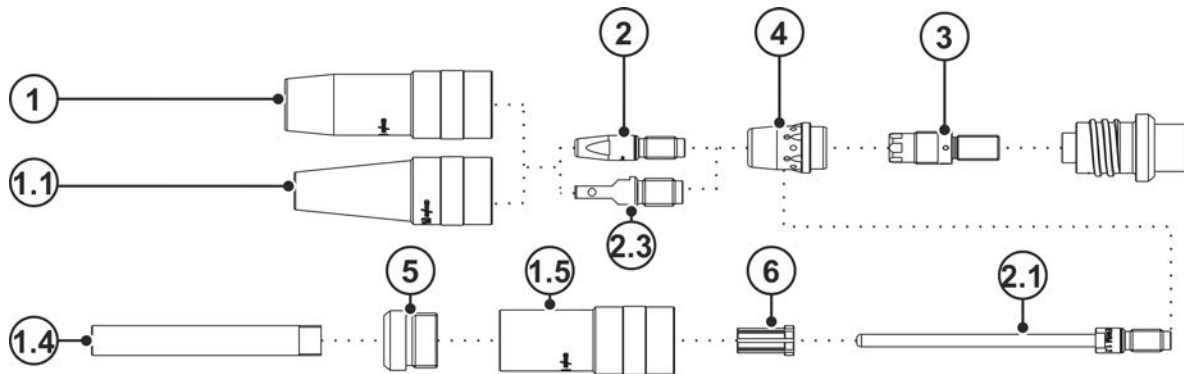


Figure 10-3

| 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  | Gas nozzle Highly conical, narrow gap welding |
| 1.1  | 094-022227-00000 | GN NG TR23X4 66mm D=13mm  | Gas nozzle Highly conical, Narrow gap welding |
| 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    | 094-007238-00000 | 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    | 094-013534-00001 | CT CUCRZR M9X35MM D=2.0MM | Contact tip                                   |
| 2    | 094-013543-00001 | CTAL E-CU M9X35MM D=0.8MM | Contact tip, Aluminium welding                |
| 2    | 094-013544-00001 | CTAL E-CU M9X35MM D=0.9MM | Contact tip, Aluminium welding                |
| 2    | 094-013545-00001 | CTAL E-CU M9X35MM D=1.0MM | Contact tip, Aluminium welding                |
| 2    | 094-013546-00001 | CTAL E-CU M9X35MM D=1.2MM | Contact tip, Aluminium welding                |
| 2    | 094-013547-00001 | CTAL E-CU M9X35MM D=1.4MM | Contact tip, Aluminium welding                |

| Item | Order number     | Type                            | Name                            |
|------|------------------|---------------------------------|---------------------------------|
| 2    | 094-013548-00001 | CTAL E-CU M9X35MM D=1.6MM       | Contact tip, Aluminium welding  |
| 2    | 094-013549-00001 | CTAL E-CU M9X35MM D=2.0MM       | 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    | 094-014193-00000 | CT CUCRZR M8X30MM D=2.0MM       | 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    | 094-016114-00000 | CT E-CU M8X30MM D=2.0MM         | 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    | 094-016920-00000 | CTAL E-CU M8X30MM D=2.0MM       | 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 zwangskontaktiert   |
| 2.4  | 094-025533-00000 | CT ZWK CuCrZr M9x35 mm Ø 1,6 mm | Contact tip zwangskontaktiert   |
| 3    | 094-013856-00003 | CTH CUCRZR M9 L=35MM            | 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              |
| 3    | 094-016425-00003 | CTH CUCRZR M9 L=38MM            | Contact tip holder              |
| 4    | 094-013111-00002 | GD D=20,2; 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                 |
| -    | 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 Picker                   |



11.1.2 PM 301 - 551 W LED

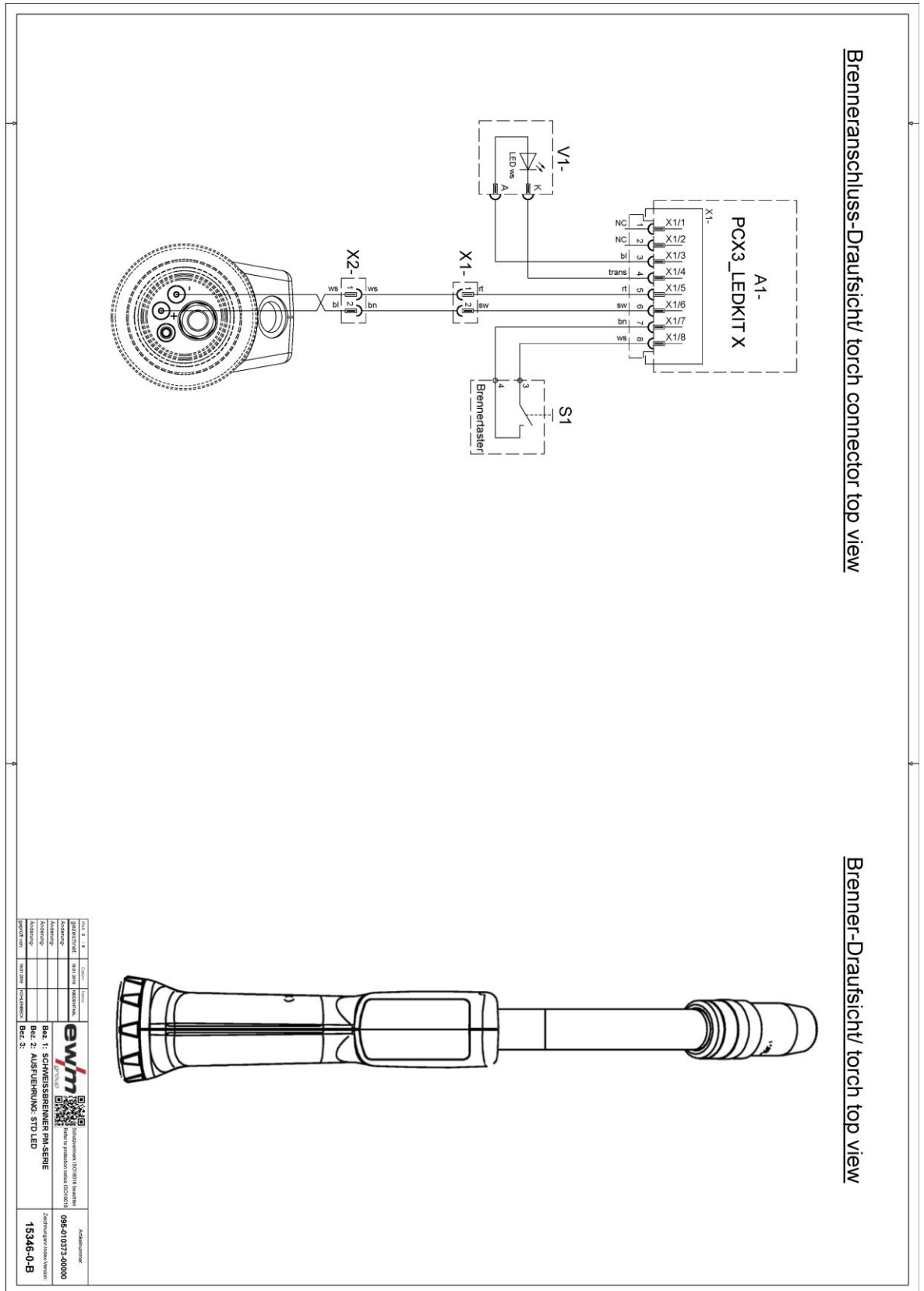


Figure 11-2

### 11.1.3 PM 301 - 551 W TT

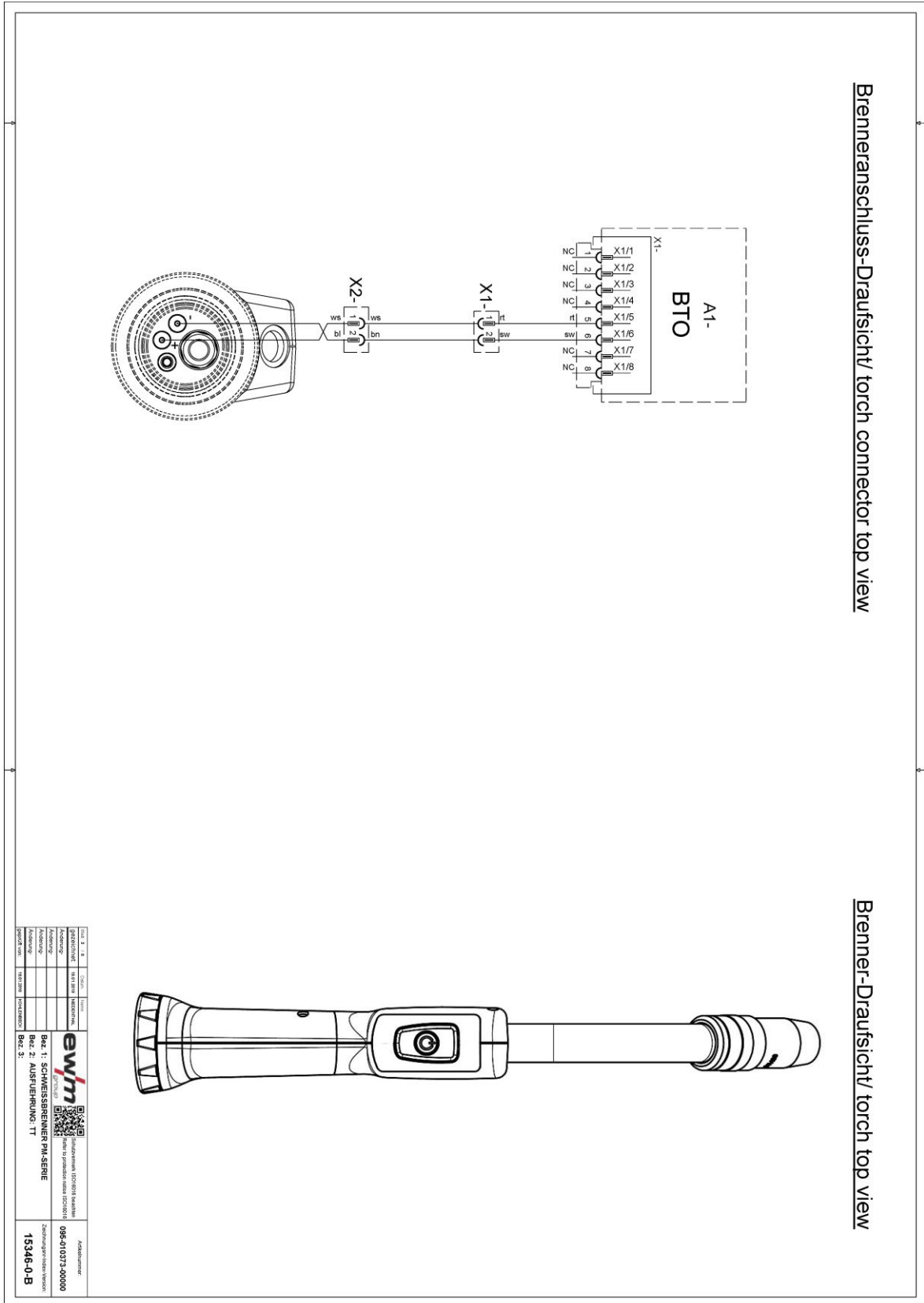


Figure 11-3









**11.1.6 PM 301 - 551 W 2U/DX**

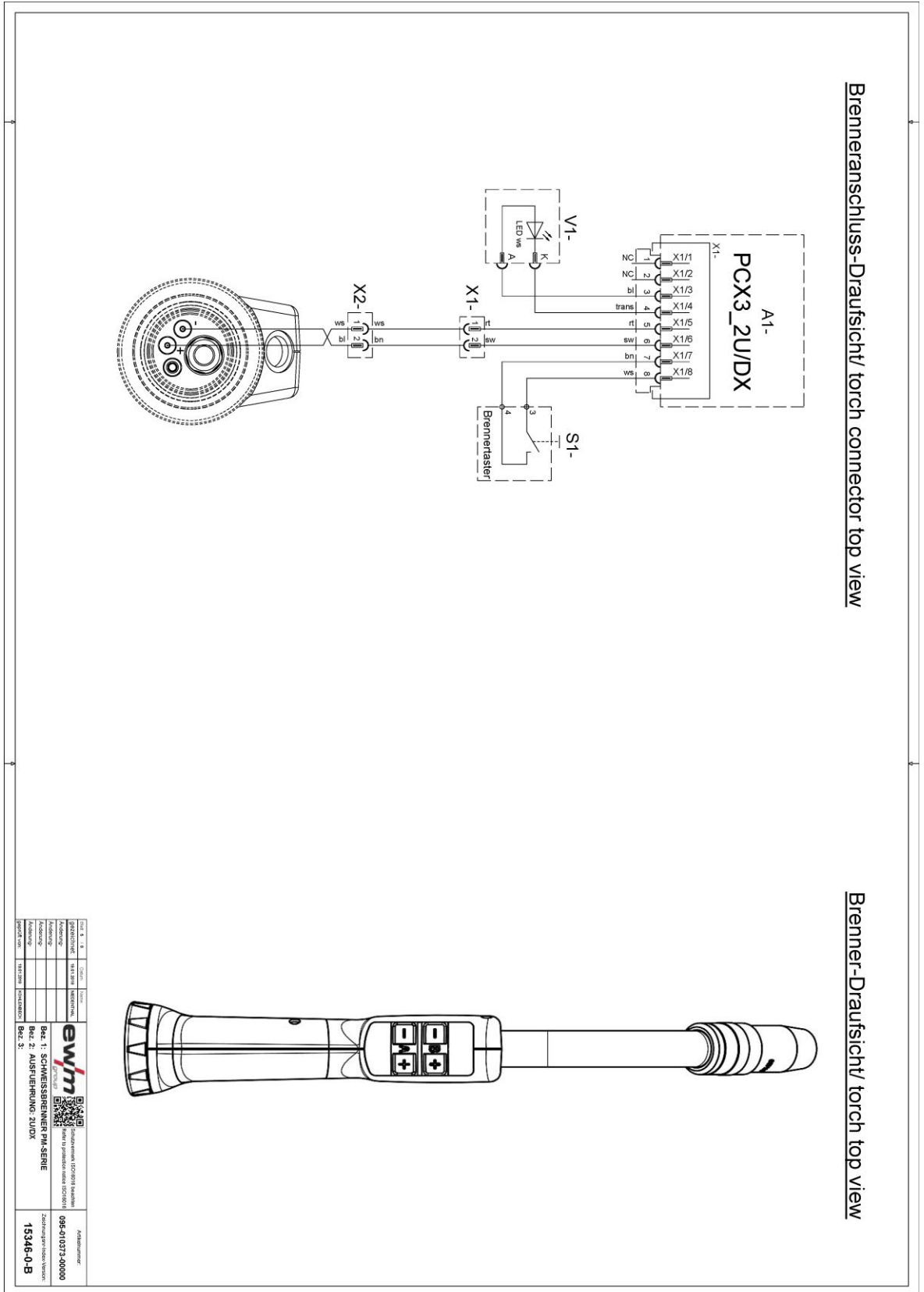


Figure 11-6

|                     |  |                |           |
|---------------------|--|----------------|-----------|
| Produktname         | PM 301 - 551 W 2U/DX   | Produktcode    | 15346-0-B |
| Produkttyp          | Schweißbrenner   | Produktfamilie | PM-SERIE  |
| Produktbeschreibung | Bes. 1: SCHWEISSBRENNER PM-SERIE<br>Bes. 2: AUSFUHRUNG: 2U/DX<br>Bes. 3: |                |           |
| Produktbild         |  |                |           |
| Produktlink         | <a href="https://www.ewm.com">www.ewm.com</a>                            |                |           |
| Produktgruppe       | Industriemaschinen > Schweißbrenner > Schweißbrenner PM-SERIE            |                |           |
| Produktstatus       | In der Produktion  |                |           |
| Produktversion      | 09S-01073-00000  |                |           |
| Produktrevision     | 15346-0-B  |                |           |

### 11.1.7 PM 301 - 551 W RD2 X

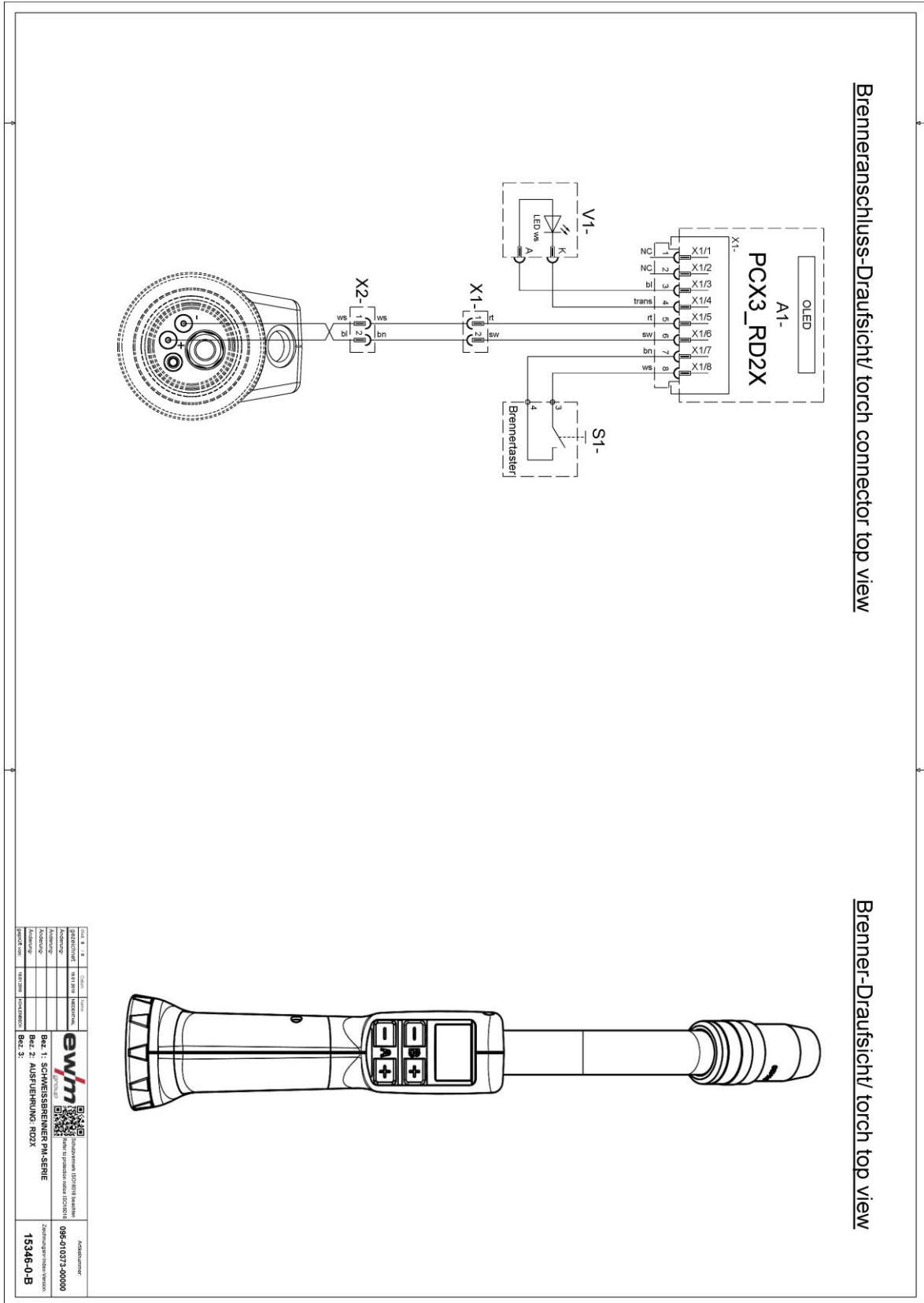















Figure 11-7











## 12 Appendix

### 12.1 Display, explanation of symbols

#### Main level

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

#### Program level

| Display   | Setting/selection                     |
|---|---------------------------------------|
|  | Welding method<br>Standard            |
|  | Welding method<br>Pulse               |
|  | Welding method<br>Position weld       |
|  | Operating mode<br>Non-latched         |
|  | Operating mode<br>Latched             |
|  | Operating mode<br>Special non-latched |
|  | Operating mode<br>Special latched     |
|  | Operating mode<br>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](http://www.ewm-group.com/en/specialist-dealers)



"More than 400 EWM sales partners worldwide"