Operating instructions





welding torch

TIG-SR 300 GD HD

099-020967-EW501

Observe additional system documents!

15.03.2016

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# **General instructions**

#### CAUTION



### Read the operating instructions!

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

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

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

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

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 Safety instructions

#### Notes on the use of these operating instructions 2.1

# DANGER

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

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

# **WARNING**

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

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

# CAUTION

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

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

#### CAUTION

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

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

#### Special technical points which users must observe. R.

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.

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#### 2.2 **Explanation of icons**

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



#### 2.3 General

# **DANGER**



#### Electric shock!

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

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



#### **Electromagnetic fields!**

The power source may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.

- Observe the maintenance instructions > see 6 chapter!
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).





Risk of accidents due to non-compliance with the safety instructions! Non-compliance with the safety instructions can be fatal!

- Carefully read the safety instructions in this manual!
- Observe the accident prevention regulations and any regional regulations!
- Inform persons in the working area that they must comply with the regulations!



### Validity of the document!

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

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



#### Fire hazard!

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

Stray welding currents can also result in flames forming!

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

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# **WARNING**



Risk of injury due to radiation or heat!

Arc radiation results in injury to skin and eyes.

Contact with hot workpieces and sparks results in burns.

- Use welding shield or welding helmet with the appropriate safety level (depending on the application)!
- Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!
- Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!



Hazards due to improper usage!

Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!

- The equipment must only be used in line with proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!





#### Noise exposure!

Noise exceeding 70 dBA can cause permanent hearing damage!

- Wear suitable ear protection!
- Persons located within the working area must wear suitable ear protection!

#### CAUTION



Obligations of the operator!

The respective national directives and laws must be observed for operation of the machine!

- National implementation of the framework directive (89/391/EWG), as well as the associated individual directives.
- In particular, directive (89/655/EWG), on the minimum regulations for safety and health protection when staff members use equipment during work.
- The regulations regarding work safety and accident prevention for the respective country.
- Setting up and operating the machine according to IEC 60974-9.
- Check at regular intervals that users are working in a safety-conscious way.
- Regular checks of the machine according to IEC 60974-4.



Damage due to the use of non-genuine parts!

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

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



Trained personnel!

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

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# 2.4 Transport

### **CAUTION**



Damage due to supply lines not being disconnected!

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

Disconnect supply lines!

### 2.4.1 Scope of delivery

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

#### Receiving inspection

Check that the delivery is complete using the delivery note!

### In the event of damage to the packaging

· Check the delivery for damage (visual inspection)!

#### In the event of complaints

If the delivery has been damaged during transport:

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

#### Packaging for returns

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

#### 2.4.2 Ambient conditions

#### **CAUTION**



Equipment damage due to dirt accumulation!

Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.

- Avoid high volumes of smoke, vapour, oil vapour and grinding dust!
- Avoid ambient air containing salt (sea air)!

#### 2.4.2.1 In operation

Temperature range of the ambient air:

-10 °C to +40 °C

#### Relative air humidity:

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

# 2.4.2.2 Transport and storage

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

• -25 °C to +55 °C

#### Relative air humidity

Up to 90% at 20 °C

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# 3 Intended use

# **MARNING**



Hazards due to improper usage!

Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage!

- The equipment must only be used in line with proper usage and by trained or expert staff!
- Do not modify or convert the equipment improperly!

Welding torch for TIG welding with arc welding machines.

# 3.1 Documents which also apply

# 3.1.1 Warranty

For more information refer to the "Warranty registration" brochure supplied and our information regarding warranty, maintenance and testing at <a href="https://www.ewm-group.com">www.ewm-group.com</a>!

#### 3.1.2 Declaration of Conformity



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

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

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

# 3.1.3 Service documents (spare parts)

# / DANGER



Do not carry out any unauthorised repairs or modifications!

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

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

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

Spare parts can be obtained from the relevant authorised dealer.

# Machine description – quick overview Machine variants



### Machine description – quick overview 4

#### **Machine variants** 4.1

Version	Functions	Performance class
SR	Silicone rubber	TIG 17, TIG 26,
	Standard torch for common welding tasks	TIG 300
GD	Gas-cooled	TIG 17, TIG 26, TIG 150,
	With decentralised connector	TIG 200, TIG 300
HD	Heavy-duty	TIG 300
	Designed for heavy-duty use	
GDV	Rotary gas valve	TIG 17, TIG 26
	To regulate the gas volume	
GRIP	GRIP grip	TIG 17, TIG 26,
	Ergonomic grip for secure handling	TIG 150, TIG 200
KOMBI	Hose package	TIG 26
	Euro torch connector with additional welding current lead for	
	polarity change	
F	Flexible torch neck	TIG 200, TIG 300
HFL	Highly flexible hose package	TIG 150, TIG 200
U/D	Up/down control	TIG 150, TIG 200
	The welding performance (welding current) can be infinitely	
	increased/decreased during welding	
RETOX	RETOX control	TIG 150, TIG 200
	U/D functions and additional display of the set welding current	
	or the selected JOB number	
EZA	Euro torch connector	TIG 150, TIG 200

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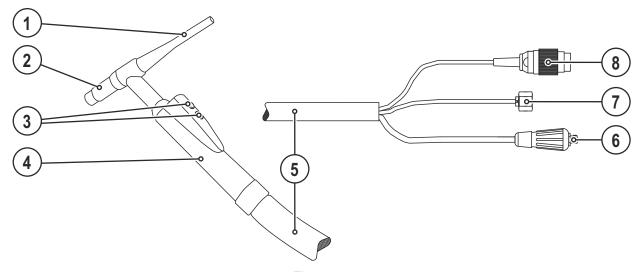


Figure 4-1

Item	Symbol	Description
1		Back cap
2		Gas nozzle
3		Torch trigger
4		Grip plate
5		Hose package
6		Welding current connection Decentral
7		Shielding gas hose Crown nut G 1/4"
8	5	Connector plug, 5-pole Control lead



# 5 Design and function

# 5.1 General

# MARNING .



Risk of injury from electric shock!

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

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

# **CAUTION**



Risk of burns on the welding current connection!

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

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



Risk from electrical current!

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

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

#### **CAUTION**



Damage due to incorrect connection!

Accessory components and the power source itself can be damaged by incorrect connection!

- Only insert and lock accessory components into the relevant connection socket when the machine is switched off.
- Comprehensive descriptions can be found in the operating instructions for the relevant accessory components.
- Accessory components are detected automatically after the power source is switched on.



Using protective dust caps!

Protective dust caps protect the connection sockets and therefore the machine against dirt and damage.

- The protective dust cap must be fitted if there is no accessory component being operated on that connection.
- The cap must be replaced if faulty or if lost!

Observe documentation of other system components when connecting!

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#### **Equipping the welding torch** 5.2

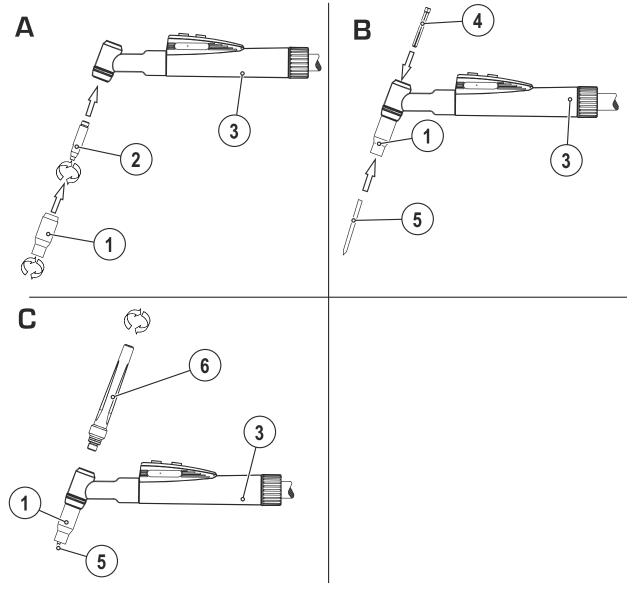


Figure 5-1

Item	Symbol	Description
1		Gas nozzle
2		Collet casing
3		Grip plate
4		Collet
5		Electrode
6		Back cap



# 5.3 General

TIG torches are connected to the power source via the hose package. The following components are guided through the hose package:

- · welding current lead
- · shielding gas supply
- control cable

In TIG welding, the welding consumable is usually added manually in form of a stick. With fully automatic machines, the welding consumable is usually added as a wire by a separate wire feeder.

### 5.4 TIG torch

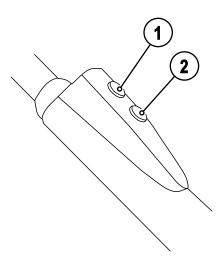


Figure 5-2

Item	Symbol	Description
1		Torch trigger
		Welding current ON/OFF
2		Torch trigger Reduce welding current
		Troduce welding current

TIG torches are equipped with a torch trigger. This trigger is used to:

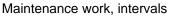
- switch the welding current on and off,
- reduce the current during welding to a secondary current by tapping it.

Swiftly tap the torch trigger to change the function.

The torch mode set determines the operating mode of the tapping function.

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#### 6 Maintenance, care and disposal





**Electrical current!** 

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

Disconnect the welding torch from the connected device, before maintenance. 

#### 6.1 Maintenance work, intervals

#### 6.1.1 **Daily maintenance tasks**

- Purge the wire guide from the direction of the Euro torch connector with oil- and condensate-free compressed air or shielding gas.
- Purge the wire guide from the direction of the Euro torch connector with oil- and condensate-free compressed air or shielding gas.
- Check that all connections and wearing parts are hand-tight and tighten if necessary.
- Remove any spatter.

#### 6.1.2 Monthly maintenance tasks

- 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 torch, hose package and power connections for exterior damage and replace or have repaired by specialist staff as necessary!

#### 6.2 **Maintenance work**

#### CAUTION



#### **Electric current!**

Repairs may only be carried out by authorised specialist staff!

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

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# Maintenance, care and disposal

Disposing of equipment



# 6.3 Disposing of equipment

Proper disposal!

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



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

#### 6.3.1 Manufacturer's declaration to the end user

- According to European provisions (guideline 2002/96/EG of the European Parliament and the Council
  of January, 27th 2003), used electric and electronic equipment may no longer be placed in unsorted
  municipal waste. It must be collected separately. The symbol depicting a waste container on wheels
  indicates that the equipment must be collected separately.
  - This machine is to be placed for disposal or recycling in the waste separation systems provided for this purpose.
- According to German law (law governing the distribution, taking back and environmentally correct
  disposal of electric and electronic equipment (ElektroG) from 16.03.2005), used machines are to be
  placed in a collection system separate from unsorted municipal waste. The public waste management
  utilities (communities) have created collection points at which used equipment from private
  households can be disposed of free of charge.
- Information about giving back used equipment or about collections can be obtained from the respective municipal administration office.
- EWM participates in an approved waste disposal and recycling system and is registered in the Used Electrical Equipment Register (EAR) under number WEEE DE 57686922.
- In addition to this, returns are also possible throughout Europe via EWM sales partners.

# 6.4 Meeting the requirements of RoHS

We, EWM AG Mündersbach, hereby confirm that all products supplied by us which are affected by the RoHS Directive, meet the requirements of the RoHS (Directive 2011/65/EU).

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# 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

B

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
  - ★ 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.

#### Unstable arc

- M Material inclusions in the tungsten electrode due to contact with filler material or workpiece
  - \* Regrind or replace the tungsten electrode
- ✓ Incompatible parameter settings
  - Check settings and correct if necessary
- ✓ Metal vapour on the gas nozzle
  - ☆ Clean and change gas nozzle

#### Pore formation

- ✓ Inadequate or missing gas shielding
  - \* Check shielding gas setting and replace shielding gas cylinder if necessary
  - \$\times\$ 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

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# **Technical data**

Checklist for rectifying faults



# 8 Technical data

REF

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

Welding torch polarity	Normally negative
Guide type	Manually operated
Voltage type	DC or AC
Shielding gas	Shielding gas DIN EN 439
Duty cycle	35%
Maximum welding current, DC	300 A
Maximum welding current, AC	250 A
Switching voltage microswitch	10 V
Switching current microswitch	15 mA
Electrode types	Standard tungsten electrodes
Ambient temperature	-10 °C to +40 °C
Voltage measurement	113 V peak value
Max. arc ignition and stabilisation voltage	12 kV
Protection classification of the machine connections (EN 60529)	IP3X
Gas flow	10–20 l/min
Tungsten electrodes	1.6–4.0 mm
Hose package length	4/8 m
Type of connection	Decentralised connection
Constructed to standard	IEC 60974-7



# 9 Replaceable parts

# 9.1 TIG-SR 300 GD HD

#### **CAUTION**



Damage due to the use of non-genuine parts!

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

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

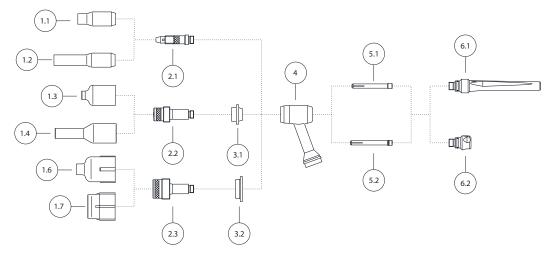


Figure 9-1

ltem	Description	Size	Electrode Ø in mm	Nozzle Ø in mm	Length in mm	Material	Pcs per PU	ltem No.
1.1	Gas nozzle	4	-	6.5	47	Ceramic	10	094-001316-00000
1.1	Gas nozzle	5	-	8	47	Ceramic	10	094-000926-00000
1.1	Gas nozzle	6	-	9.5	47	Ceramic	10	094-001317-00000
1.1	Gas nozzle	7	-	11	47	Ceramic	10	094-000927-00000
1.1	Gas nozzle	8	-	12.5	47	Ceramic	10	094-000929-00000
1.1	Gas nozzle	10	-	16	47	Ceramic	10	094-001318-00000
1.1	Gas nozzle	12	1	19.5	50	Ceramic	10	094-001319-00000
1.2	Gas nozzle	5	ı	8	76	Ceramic	10	094-012691-00000
1.2	Gas nozzle	6	ı	9.5	76	Ceramic	10	094-012692-00000
1.2	Gas nozzle	7	-	11	76	Ceramic	10	094-012693-00000
1.3	Gas nozzle for gas lens	4	ı	6.5	42	Ceramic	10	094-001320-00000
1.3	Gas nozzle for gas lens	5	-	8	42	Ceramic	10	094-001321-00000
1.3	Gas nozzle for gas lens	6	-	9.5	42	Ceramic	10	094-001322-00000
1.3	Gas nozzle for gas lens	7	-	11	42	Ceramic	10	094-001195-00000
1.3	Gas nozzle for gas lens	8	ī	12.5	42	Ceramic	10	094-001196-00000
1.3	Gas nozzle for gas lens	12	-	19.5	42	Ceramic	10	094-001323-00000
1.4	Gas nozzle for gas lens	5	-	8	76	Ceramic	10	094-011135-00000



				ء				
	Description		Electrode Ø in mm	le Ø in mm	Length in mm	rial	per PU	Ö
ltem	Desc	Size	Elect mm	Nozzle	Leng	Material	Pcs	Item No.
1.4	Gas nozzle for gas lens	6		9.5	<u>7</u> 6	Ceramic	10	094-011136-00000
1.4	Gas nozzle for gas lens	7	-	11	76	Ceramic	10	094-012694-00000
1.6	Gas nozzle for gas lens, JUMBO	6	-	9.5	48	Ceramic	10	094-011642-00000
1.6	Gas nozzle for gas lens, JUMBO	8	-	12.5	48	Ceramic	10	094-011643-00000
1.6	Gas nozzle for gas lens, JUMBO	10	-	16	48	Ceramic	10	094-011644-00000
1.6	Gas nozzle for gas lens, JUMBO	12	-	19.5	48	Ceramic	10	094-003136-00000
1.7	Gas nozzle for gas lens, JUMBO	12	-	24	34	Ceramic	10	094-012686-00000
2.1	Collet body	-	1.6	-	-	Copper	10	094-000936-00000
2.1	Collet body	-	2 - 2.4	-	-	Copper	10	094-000937-00000
2.1	Collet body	-	3.2	-	-	Copper	10	094-000940-00000
2.1	Collet body	-	4	-	-	Copper	10	094-001315-00000
2.2	Collet body with gas lens	-	1.6	-	-	Brass	10	094-001325-00000
2.2	Collet body with gas lens	-	2 - 2.4	-	-	Brass	10	094-001192-00000
2.2	Collet body with gas lens	-	3.2	-	-	Brass	10	094-001193-00000
2.2	Collet body with gas lens	-	4	-	-	Brass	10	094-001326-00000
2.3	Collet body with gas lens, JUMBO	-	1.6	-	-	Brass	5	094-003137-00010
2.3	Collet body with gas lens, JUMBO	-	2.4	ı	-	Brass	5	094-003137-00000
2.3	Collet body with gas lens, JUMBO	-	3.2	1	-	Brass	5	094-000000-00000
2.3	Collet body with gas lens, JUMBO	-	4	-	-	Brass	5	094-011641-00000
3.1	Adapter	XL	-	1	-	Teflon	10	094-001194-00000
3.2	Adapter, JUMBO	XXL	-	ı	-	Teflon	5	094-003138-00000
4	Insulator	Standard	-	ı	-	Teflon	10	094-001307-00000
5.1	Collet	-	4	1	50	Copper	10	094-001312-00000
5.1	Collet	-	1.6	ı	50	Copper	10	094-000931-00000
5.1	Collet	-	2.4	-	50	Copper	10	094-000932-00000
5.1	Collet	-	3.2	-	50	Copper	10	094-000935-00000
5.2	Collet	-	1.6	-	52	-	10	094-003402-00000
5.2	Collet	-	2.4	ı	52	-	10	094-003241-00000
5.2	Collet	-	3.2	-	52	-	10	094-003242-00000
5.2	Collet	-	4	-	52	-	10	094-008583-00000
6.1	Back cap	Long	-	-	-	Plastic	10	094-001114-00000
6.2	Back cap	Short	-	-	-	Plastic	10	094-001120-00000



# 10 Circuit diagram

# 10.1 TIG-SR 300 GD HD

The circuit diagrams are only intended for authorised service personnel!

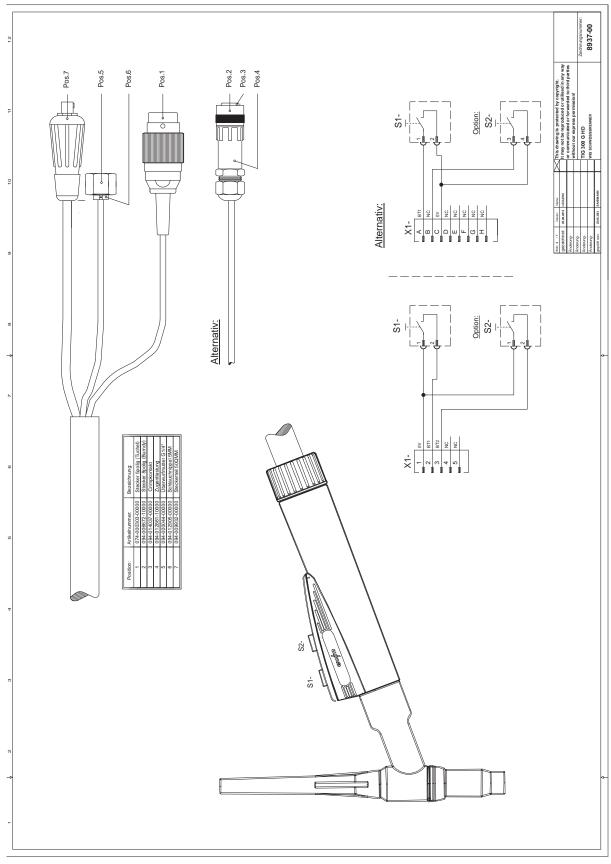


Figure 10-1



#### 11 **Appendix A**

# **Overview of EWM branches**

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Branches

**Liaison office** 

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