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## 2. Proper use

The welding torch system is intended exclusively for automatic shielded arc welding with inert gases (MIG) or active gases (MAG) by qualified personnel in industrial and commercial applications.

The welding torch series can be used in any welding position.

The welding torch system is air cooled.

The welding torch system may only be used with original **ABICOR BINZEL®** spare parts.



The operator must ensure that the welding torch system and power source comply with the EC Electromagnetic Compatibility Directive (89/336/EEC).

The welding torch system is intended exclusively for the application described above. Any other use is prohibited.

Proper use includes compliance with the manufacturer's operating, servicing and maintenance specifications.

The warranty does not cover consumables or damage due to overloading or improper handling.

Unauthorized conversions and modifications are prohibited for reasons of safety and liability.

The work described in these operating instructions is explained in such a way that it can only be performed by qualified personnel.

According to the definition found in EN-60204-1:

*Qualified personnel are persons who, based on their special training, knowledge and experience and due to their knowledge of the relevant standards, are able to assess the tasks assigned to them and identify possible dangers.*



EU Declaration of conformity pursuant to the EU Low Voltage Directive 73/23/EEC. We hereby declare that the design of the MIG/MAG welding torch system as delivered complies with the above regulations and the DIN EN standard EN 60974-7.

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### 3. Technical data

#### General torch data (EN 60 974-7)

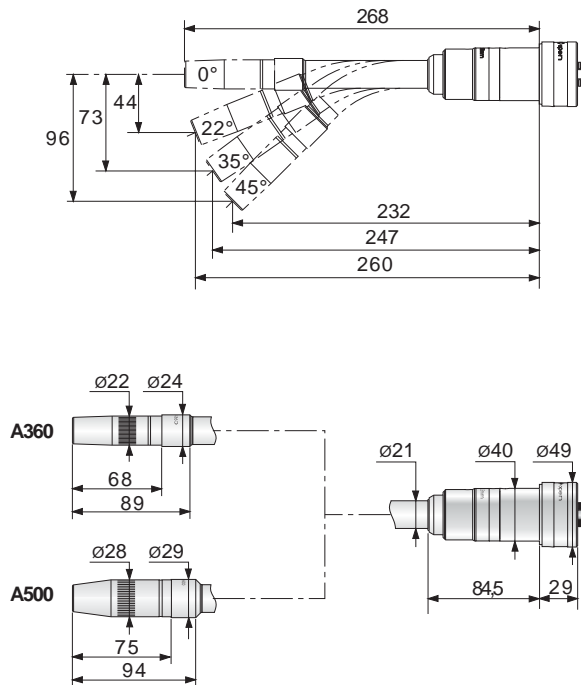
Type of voltage:	DC
Polarity of electrode:	usually positive
Types of wire:	normal commercial round wires
Type of guiding:	machine-guided
Rated voltage:	141 V peak value
Safety class of machine-side connections (EN 60 529):	IP2X
Shielding gas:	CO <sub>2</sub> and gas mixtures M21 according to DIN EN 439

#### Product-specific torch data (EN 60 974-7)

Type	Duty cycle (%)	Rating		Wire $\varnothing$ (mm)	Gas flow (l/min)	Weight (max. g)
		CO <sub>2</sub> (A)	M21 (A)			
<b>ABIROB® A360</b>	100	360	290	0.8-1.2	10-20	800
<b>ABIROB® A500</b>	100	500	400	0.8-1.6	10-30	900

The rating must be reduced by 35% for pulse welding.

#### Swan neck geometry ABIROB® A360 / ABIROB® A500





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### Cable assembly

Lengths:	1.0 - 3.15 m (3' -10') or other according to order
Weight per metre:	for 3.0 m (10') assembly complete: 3,200 g (7 lbs) / Bikox per metre 900 g (1.98 lbs)
Machine connections:	– central connector – 10-wire control cable – airblast G 3/8"

### General data

Ambient temperature	
– during welding	– 10°C to + 40°C (-14° F to 104° F)
– during shipment and storage	– 25°C to + 55°C (-13° F to 131° F)
Relative air humidity:	up to 90% at 20°C (68° F)

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## 4. Delivery package

The delivery package for **initial use** contains a cable assembly with:

1. torch-side antikink protection and integrated switch cover
2. machine-side antikink protection with central connector
3. operating instructions.



The welding torch system is not yet operable with the cable assembly alone!

For initial use you still need other components, which depend on your welding jobs:

- swan necks in preferred size and geometry
- the connection module for connection of the cable assembly to the welding torch
- torch mounts of various types for fastening to the robot
- fittings and consumables (please order separately).

These operating instructions also describe installation and use of these products!

Please refer to the separate order documents and delivery note for ordering information and code numbers.

- Operating instructions **BAL.0125**:  
Please read these operating instructions completely prior to use to ensure proper operation and to avoid potential hazards and misuse.
-

## 5. Safety instructions

### 5.1 Explanations

**Danger!**

A procedure which if not followed may lead to serious injury to operators or bystanders.

**Warning!**

A procedure which if not followed may lead to damage to the product or the installation.

**NB!**

Technical information which explains the effective use, application, operation and maintenance of this product to the user or maintenance personnel in their work or draws attention to special processes.

English

### 5.2 Identification marking

The information given in these operating instructions only applies to this product series.

It is important that you give the following details whenever you have any questions:

- certificate of conformity
- label on the machine-side connection box
- product marking on the swan neck, e.g. *ABIROB® A360 22*.

### 5.3 Terminology

MIG	= Metal inert gas
MAG	= Metal active gas
MAC	= Maximum admissible concentration of harmful substances at the workplace
Rated voltage	= Insulation resistance, electric strength and safety class classification
TCP	= Tool center point

### 5.4 Safety standards

The welding torch system was built in compliance with the German versions of the following regulations.

**EU Directive: EMC**

DIN EN 60974-1	Arc welding equipment - Welding power sources
DIN EN 60974-10	Arc welding equipment - Electromagnetic compatibility requirements

**EU Directive: Low Voltage**

DIN EN 60974-7	Arc welding equipment - Part 7: Torches
DIN EN 60974-12	Arc welding equipment - Part 12: Coupling devices for welding cables



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## 5. Safety instructions (continued)

### 5.5 Production tests

The welding torch system is subjected to constant quality control according to the requirements of DIN EN ISO 9001 at every stage of production and assembly.

Unauthorised manipulations or unauthorised conversions and modifications invalidate the manufacturer's warranty and product liability.

### 5.6 Responsibilities of the user



In the EEA (European Economic Area) national implementation of the framework directive 89/391/EEC and related individual directives, in particular the directive 89/655/EEC concerning the minimum safety and health requirements for the use of work equipment by workers at work, as amended, are to be observed and adhered to. In Germany the Plant Safety Regulation of October 2002 must be observed (translation of the above-mentioned directive into national law) (BGV D1, BGV D1 DA).

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## 6. Safety warnings



Observe applicable safety regulations when using the welding torch:

- Only operators with the relevant knowledge of arc welding equipment and in possession of a valid welder's certificate of competency should use the system.
  - Arc welding can cause damage to the eyes, skin and hearing! The protective clothing, eye and ear protection prescribed by the relevant regulations in your country must therefore always be worn (e.g. in Germany BGV D1).
  - The ratings given represent maximum limit values. Overloading can damage the welding torch up to complete destruction of it.
  - Switch off the power source before cleaning or replacing consumables.
  - Follow the operating instructions for the individual welding components, e.g. welding power source, wire feeder.
  - Do not pull the cable assembly over sharp edges or set it down in the spatter area or on hot work pieces.
  - Use curtains or partitions to protect others not involved in the welding process from radiation and the danger of arc flashing.
  - See the instructions of the gas cylinder manufacturer and compressed gas regulations for information on the handling of gas cylinders.
-

**6. Safety warnings**  
(continued)



- Work pieces that have been degreased using chlorinated solvents must be cleaned thoroughly with clear water before welding to avoid the risk of phosgene gas forming. For the same reason no degreasing baths containing chlorine may be placed in the vicinity of the welding area.
- Only use the welding torch in suitable areas. Use suitable protection against all weather conditions when using the torch in the open.
- When welding in confined spaces, the electrical hazard is increased. Protect yourself accordingly by using insulating mats, wearing dry clothing and ensuring there is adequate ventilation (good supply and removal of air).
- All metallic fumes produced when welding, especially lead, cadmium, copper and beryllium, are harmful! Use ventilation or an extraction system to ensure that specified MAC values are not exceeded.
- Place suitable fire extinguishing within easy reach at the workplace.

**7. Shipment and packaging**

Although the components in the delivery package are checked carefully before shipment, they may nevertheless become damaged during shipping.

**Receiving inspection**

- Check the shipment against the shipping note to ensure that it is complete!

**In case of damage**

- Check the package and components for damage (visual inspection)!

**In case of complaints**

If the package and/or components were damaged during shipment:

- Contact the last carrier immediately!
- Keep the packaging (for possible checks by the carrier or supplier or for returning the goods)!

**Packaging for return shipment**

Use the original packaging and original packaging material if possible.

Please consult the supplier if you have questions concerning packaging and protection of the equipment for shipment.

**Storage in an enclosed space**

Ambient temperature

for shipment and storage:

- 25°C to + 55°C (-13° F to 131° F)

Relative air humidity:

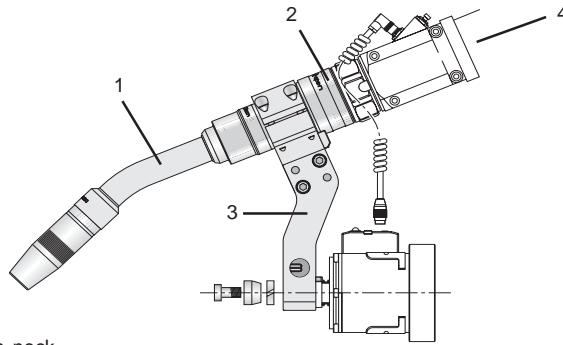
up to 90% at 20°C (68° F)



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## 8. Description of the system

The welding torch system consists of the following components:



1. Swan neck
  2. Connection module
  3. Torch mount
  4. Cable assembly
- as well as fittings and consumables

All elements together form a functional unit, which, when supplied with appropriate operating resources, produces an arc for welding. In shielded gas welding a wire electrode is fed through the welding torch system with the arc and melt being protected by inert gas (MIG) or active gas (MAG).

The wire electrode is a solid or filler wire that is fed through the contact tip and melted off by the energy of the arc. The contact tip transmits the welding current to the wire electrode. The arc is formed between the wire electrode and the work piece.

### 8.1 Swan neck (1)

Four standard swan necks are available per model in straight (0°) or bent versions (22°, 35° and 45°). They can be adapted to the connection module with the standard interface.

Select the equipment parts (gas nozzle, contact tip, nozzle insulator, etc.) for your application from the order documents.

### 8.2 Intermediate module (2)

This component is used to connect the welding torch to the cable assembly.

### 8.3 Torch mount (3)


The torch mount is used to fasten the system to the robot via the robot mount CAT 2.

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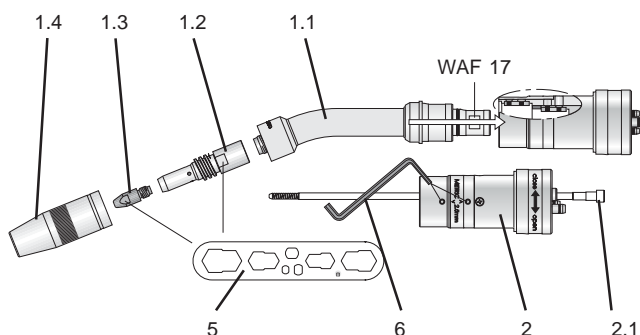
#### 8.4 Cable assembly (4)

The cable assembly is air cooled and available in standard lengths of 1 - 3.15 m (3' - 10') or other lengths according to order.

 An alignment jig is needed to complete the system. It must be ordered separately according to the configuration.

#### 9. Assembly / Start-up procedure


#### Swan neck ABIROB® A360 / A500



- 1 Swan neck with fittings
- 1.1 Swan neck
- 1.2 Tip holder/diffusor
- 1.3 Contact tip
- 1.4 Gas nozzle
- 2 Intermediate module
- 2.1 Neck liner
- 5 Universal wrench
- 6 Allen key

Assemble the swan neck:

1. Screw the exchangeable tip holder (1.2) on to the swan neck (1.1) and fasten with the universal wrench (5).
2. Screw the contact tip (1.3) tight into the tip holder (1.2).
3. Screw the gas nozzle (1.4) finger-tight on to the nozzle insulator (1.2).
4. Push the swan neck (1.1) into the intermediate module (2) up to the stop and fasten with the two hexagon socket head screws using the Allen key (6).
5. Push the neck liner (2.1) through the intermediate module (2) into the swan neck (1.1).

 The choice of contact tip, gas nozzle and neck liner depends on your application.



**9. Assembly /  
Start-up  
procedure**  
(continued)

**Connecting and equipping the cable assembly**

Fasten the torch side of the cable assembly to the intermediate module (use a little silicon-free grease for the O-rings). With the cable assembly laid out straight, push the wire guide in from the central connector (4.1) up to the stop and screw the union nut tight.

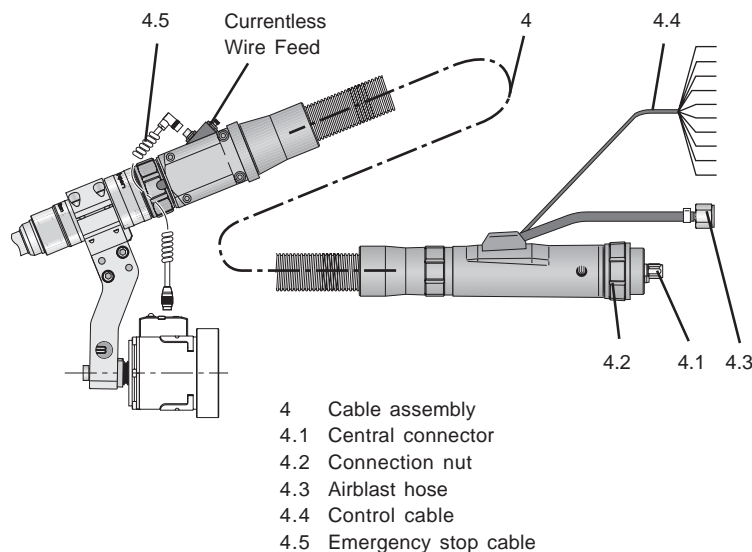
If required, connect the EMERGENCY STOP cable (4.5) of the Binzel robot mount CAT to the cable assembly (see the section "Connecting the control cable" for the control cable configuration).

Select the type of wire and suitable wire guide for your application.



See chapter 11 "Servicing" for information on how to cut new wire guides to length and on correct fitting.

- |                     |   |   |
|---------------------|---|---|
| Spiral guide liners | - | for steel and stainless steel wires                     |
| Synthetic liners    | - | for aluminium, copper, nickel and stainless steel wires |



**Machine-side connection**

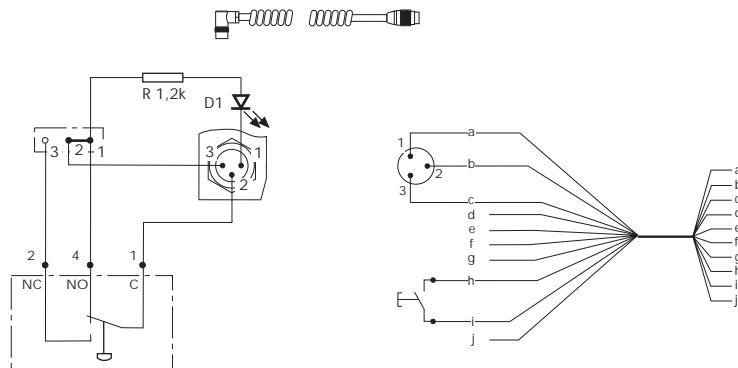
1. Check the wire guide again to see whether it is fastened correctly.
2. Join the central connector (4.1) and socket at the wire feeder and secure this connection by tightening the connection nut (4.2).
3. Fasten the airblast hose (4.3) to the airblast and spray unit or to the airblast valve.

Fasten the airblast hose to the solenoid valve or seal the connection air tight if the option "Airblast" is not going to be used.

**9. Assembly / Start-up procedure**  
(continued)

**Connecting the control cable**

The machine side of the control cable is open. It is up to the customer to connect a suitable connector. If complete details are given, the cable is supplied ready for connection. Otherwise select a connector compatible to your power source and solder it to the wires according to the configuration plan.



- a green
- b white
- c brown
- d yellow (insulated)
- e grey (insulated)
- f blue (insulated)
- g pink (insulated)
- h black
- i violet
- j red (insulated)

**Setting the shielding gas quantity**

Draw the shielding gas from cylinders or a closed circuit and set the gas quantity at the pressure regulator. The type and quantity of shielding gas depend on the welding job.



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## 10. Operation

### Check

- the cable assembly before connecting it to the wire feeder to see whether a suitable wire guide - spiral guide liner or synthetic liner - is fitted for the type and diameter of wire being used.
- the fittings in the welding torch to see whether a suitable neck liner and correct contact tip are fitted for the type and diameter of wire being used.

### Insert the wire

- Make sure during every wire change that there are no burrs at the beginning of the wire.
- Insert the wire into the wire feeder according to the manufacturer's instructions.
- To insert the wire, press the wire advance (inch) button on the wire feeder or torch-side on the cable assembly.



During welding the wire feed is activated by the robot control system as programmed.

### Welding process



Check your personal protective equipment and the surrounding area for possible dangers as outlined in chapter 6 before starting to weld!



Make sure that all the necessary parameters for MIG/MAG welding, e.g. welding current, wire feed, etc., have been set at the welding power source for your particular welding job. You can find information and tips on the welding process itself (technique, materials, heat, etc.) in the relevant technical literature and not in these operating instructions.

### Shutdown

At the end of welding:

1. Wait for the end of the shielding gas post flow time.
  2. Switch off the power source.
  3. Close the shut-off valve for the gas supply.
-

## 11. Servicing / Cleaning



The following shutdown procedure must be followed before carrying out cleaning, servicing or repair work.

1. Switch off the power source.
2. Shut off the gas supply.

**Make sure that this operational state remains unchanged for the duration of your work!**

### Cable assembly

- Check that all screw connections are firm.
- Clean the disconnection point and smear the O-rings with silicon-free sealing grease.
- Replace the wire guide if worn or dirty.
- Replace damaged, deformed or worn parts.
- If repairs are necessary, you can send your torch in to **ABICOR BINZEL®** for factory repair.

### Replacing the wire guide

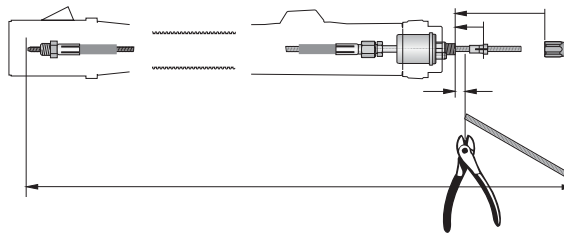
- Disconnect the cable assembly at the machine side and lay it out in a stretched state.
- Unscrew the union nut and pull out the spiral guide liner or synthetic liner.
- Blow through the wire feed hose from both sides with compressed air to remove abraded wire particles.
- Push the spiral guide liner or synthetic liner (cut to fit the length of the cable assembly) into the wire feed hose and screw on the union nut again.



New, unused spiral guide liners or synthetic liners must be shortened to fit the actual length of the cable assembly.

Note the following tips and recommendations in this regard.

### Spiral guide liner

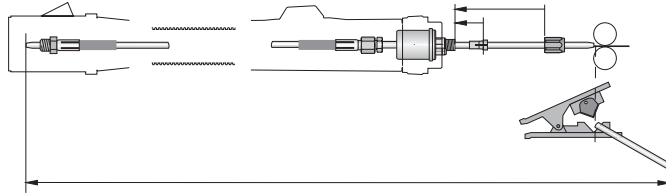


1. Push the spiral guide liner through the wire feed hose up to the connection fitting in the change body (noticeable stop).
2. Measure the overall length  $x$  at the central connector and pull the spiral guide liner out again.
3. Shorten the spiral guide liner by the measure  $x$  and debur the cut end. Grind the start of the spiral at an angle of approx.  $40^\circ$ .
4. Fit the shortened spiral guide liner and fasten it with the union nut of the central connector. A noticeable counter-pressure must be felt when fastening when the cable assembly is in a stretched state.

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## 11. Servicing / Cleaning (continued)

### Synthetic liner



1. Sharpen the tip of the synthetic liner at an angle of approx. 40° with the **ABICOR BINZEL®** sharpener.
2. Push the synthetic core liner through the wire feed hose up to the connection fitting in the change body (noticeable stop).
3. Put the collet, O-ring and union nut on to the synthetic liner, keep them tensioned and screw the union nut tight.
4. Pass the central connector with the extra long synthetic liner through the central connector up into the wire feeder. Mark the synthetic liner directly before the rolls and disconnect the central connector again.
5. Cut the synthetic liner at the marking with the **ABICOR BINZEL®** cutter.
6. Sharpen the cut with the **ABICOR BINZEL®** sharpener.

### Welding torch

- Clean the inside of the gas nozzle of welding spatter and spray it with an original **ABICOR BINZEL®** anti-spatter spray.
- Check the consumables for visible damage and replace them if necessary.
- Replace the neck liner if worn or dirty.
- Clean the disconnection point and smear the O-rings with silicon-free sealing grease.
- Check the TCP in the adjusting device after every use and after collisions.

### Automatic cleaning



To raise the availability of the welding robot, **ABICOR BINZEL®** offers the possibility of automatic torch cleaning.

## 12. Troubleshooting



The list below describes various problems, their possible causes and solutions. If the measures described below are not successful, please contact your dealer or the manufacturer.  
Please also consult the operating instructions for the other welding components, e.g. power source, wire feeder, etc.

Problem	Cause	Remedy
Swan neck gets too hot	<ul style="list-style-type: none"> <li>– Contact tip / collet not properly tight</li> <li>– Current connections, torch-side and to work piece, loose</li> </ul>	<ul style="list-style-type: none"> <li>– Check and tighten!</li> <li>– Check and tighten!</li> </ul>
Button does not work	<ul style="list-style-type: none"> <li>– Control cable disconnected / defective</li> </ul>	<ul style="list-style-type: none"> <li>– Check / Repair!</li> </ul>
Wire fuses with the contact tip in the contact tip	<ul style="list-style-type: none"> <li>– Wrong parameter setting</li> <li>– Worn contact tip</li> </ul>	<ul style="list-style-type: none"> <li>– Check setting and correct!</li> <li>– Replace!</li> </ul>
Irregular wire feed	<ul style="list-style-type: none"> <li>– Spiral guide liner / synthetic liner blocked</li> <li>– Contact tip does not match the wire diameter</li> <li>– Wrong pressing force set at the wire feeder</li> </ul>	<ul style="list-style-type: none"> <li>– Blow out from handle side!</li> <li>– Change contact tip!</li> <li>– Correct according to manufacturer's instructions!</li> </ul>
Arc between gas nozzle and work piece	<ul style="list-style-type: none"> <li>– Spatter bridge between contact tip and gas nozzle</li> </ul>	<ul style="list-style-type: none"> <li>– Clean inside of gas nozzle and spray with anti-spatter!</li> </ul>
Unsteady arc	<ul style="list-style-type: none"> <li>– Contact tip does not match the wire diameter or contact tip expended</li> <li>– Wrong welding parameter settings</li> <li>– Wire guide worn</li> </ul>	<ul style="list-style-type: none"> <li>– Check contact tip and replace!</li> <li>– Correct welding parameters!</li> <li>– Replace wire guide!</li> </ul>
Pore formation	<ul style="list-style-type: none"> <li>– Strong spatter formation in the gas nozzle</li> <li>– Inadequate or no gas shielding</li> <li>– Draft blowing shielding gas away</li> </ul>	<ul style="list-style-type: none"> <li>– Clean gas nozzle!</li> <li>– Check if gas cylinder is empty and check pressure setting!</li> <li>– Protect workplace with protective walls!</li> </ul>



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**13. Disassembly / Disposal**

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The welding torch system is mainly made of steel, plastic and non-ferrous metals and must be disposed of in accordance with local environmental protection regulations.  
The coolant must also be disposed of in accordance with local regulations.

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**14. In the event of an emergency**

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In the event of an emergency the power supply must be switched off immediately.  
For further action in such circumstances, please see the operating instructions for the power source.

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**15. Warranty**

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The welding torch system is an original **ABICOR BINZEL®** product.

The manufacturer, Alexander BINZEL® Schweisstechnik GmbH & Co. KG, warrants fault-free production and provides a manufacturer production and function warranty for this product upon delivery in line with the current state of the art of technology and applicable regulations.

The warranty only covers manufacturing faults. It does not cover damage resulting from natural wear and tear or improper installation or use.

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