

EN **Operating instructions**



xFUME[®] ABIROB[®] AF500

EN **Welding torch system**

Table of contents

1	Identification	EN-3
1.1	Marking	EN-3
1.2	Signs and Symbols Used.....	EN-3
2	Safety	EN-3
2.1	Designated use.....	EN-3
2.2	Obligations of the operator	EN-3
2.3	Basic safety instructions	EN-4
2.4	Safety instructions for electrical components.....	EN-4
2.5	Safety instructions for welding	EN-4
2.6	Safety instructions for extraction (according to ISO 21904).....	EN-5
2.7	Safety instructions for personal protective equipment	EN-5
2.8	Classification of the warnings	EN-5
3	Scope of Delivery	EN-5
3.1	Emergency information.....	EN-6
4	Product Description	EN-6
4.1	Setup and functional description	EN-7
4.2	Technical Data.....	EN-8
5	Putting into operation	EN-9
5.1	Setting up the torch neck	EN-10
5.2	Setting up the cable assembly	EN-10
5.3	Attaching the machine-side connector	EN-11
5.4	Setting the shielding gas volume	EN-11
5.5	Introducing the wire	EN-11
6	Operation	EN-12
6.1	Carrying out the welding process	EN-12
7	Decommissioning	EN-12
8	Maintenance and cleaning	EN-12
8.1	Cleaning the wire guide	EN-13
8.2	Mounting and shortening the liner	EN-13
8.3	Cleaning the torch neck.....	EN-14
9	Troubleshooting	EN-14
10	Disassembly	EN-15
11	Disposal	EN-15
11.1	Disposing of materials	EN-15
11.2	Disposing of consumables.....	EN-15

1 Identification

The xFUME® ABIROB® AF500 welding torch system is used in the industry and in the trade for shielding gas welding using inert (MIG) or active (MAG) gases. This version is air cooled and can be used in all welding positions.

These operating instructions only describe the xFUME® ABIROB® AF500 welding torch system. The welding torch system may only be operated with original ABICOR BINZEL spare parts.

1.1 Marking

This product fulfills the requirements that apply to the market to which it has been introduced. A corresponding marketing has been affixed to the product, if required.

1.2 Signs and Symbols Used

The following signs and symbols are used in the operating instructions:

- ▶ General instructions.
- 1 Action(s) to be carried out in succession.
- Lists.
- ⇒ Cross-reference symbol refers to detailed, supplementary or further information.
- A Caption, item description.

2 Safety

This chapter describes the essential safety requirements and warns of residual hazards that should be kept in mind to operate the product safely.

Non-observance of the safety instructions may result in risks to the life and health of personnel, and environmental damage or material damage.

2.1 Designated use

The device described in these operating instructions may be used only for the purpose and in the manner described in these operating instructions. The device is used to extract welding fumes and dust that is generated during welding. The device can be used to extract welding fumes that contain CMR substances and to extract welding fumes that do not contain CMR substances. When extracting welding fumes that contain CMR substances, the welding torch must be operated together with a suitable W3-certified fume extraction system. Any other use is considered improper. Unauthorized modifications or changes to enhance the performance are not permitted.

- ▶ Do not exceed the maximum load data as defined by the documentation supplied. Excessive loads lead to irreparable damage.
- ▶ Do not make any constructive changes to this product.
- ▶ Do not use or store the device outdoors where it is wet.
- ▶ During welding work outdoors, use suitable protection against the weather conditions.

2.2 Obligations of the operator

- ▶ Ensure that only qualified personnel are permitted to perform work on the device or system.
Authorized personnel are:
 - those who are familiar with the basic regulations on occupational safety and accident prevention;
 - those who have been instructed on how to handle the device;
 - those who have read and understood these operating instructions;
 - those who have been trained accordingly;
 - those who are able to recognize possible risks because of their special training, knowledge, and experience.
- ▶ Keep untrained persons out of the work area.

2.3 Basic safety instructions

The product has been developed and manufactured in accordance with state-of-the-art technology and the recognized safety standards and directives. Inevitable technical residual risks to the user, third parties, devices, or other material property are posed by the product. This document describes the essential safety requirements and warns of residual hazards that should be kept in mind to operate the product safely. Detailed product information and product-specific safety instructions are found in the separate operating instructions and in other product-specific documentation. Non-observance of the safety instructions may result in risks to the life and health of personnel, and environmental damage or material damage. The manufacturer will accept no liability for damage caused by non-observance of the documentation.

- ▶ Before using the system for the first time, please read the provided documentation carefully.
- ▶ Do not operate the product unless it is functioning properly and ensure compliance with all documents.
- ▶ Before carrying out specific work, for example, commissioning, operation, transport and maintenance, read the documentation carefully.
- ▶ Use suitable means to protect yourself and bystanders from the hazards listed in the documentation.
- ▶ Store the documentation within easy reach of the device for reference and enclose all documents when passing on the product.
- ▶ Consult the documentation for additional welding components.
- ▶ Information about how to handle gas cylinders can be found in the instructions provided by the gas manufacturer and the relevant local regulations, e.g., regulations that apply to compressed air.
- ▶ Observe the local accident prevention regulations.
- ▶ Only trained specialists should commission, operate, and service the device. Qualified personnel are persons who, based on their special training, knowledge, experience and due to their knowledge of the relevant standards, are able to assess the tasks assigned to them and identify possible dangers.
- ▶ Keep the work area in order. Ensure good lighting of the work area.
- ▶ Switch off the power supply, gas supply, and compressed air supply, and disconnect the mains connection for the entire duration of maintenance, commissioning, and repair activities.
- ▶ For disposal, observe the local regulations, laws, provisions, standards and directives.

2.4 Safety instructions for electrical components

- ▶ Check electric tools for damage and for its proper functioning in accordance with its designated use.
- ▶ Do not expose electric tools to rain and avoid a moist or wet environment.
- ▶ Protect yourself from electric shock by using insulating mats and wearing dry clothing.
- ▶ Do not use the electric tools in areas subject to fire or explosion hazards.

2.5 Safety instructions for welding

- ▶ Arc welding may cause damage to the eyes, skin and hearing. Note that other hazards may arise when the device is used with other welding components. Therefore, always wear the prescribed personal protective equipment as defined by local regulations.
- ▶ Any metal vapors, especially lead, cadmium, copper and beryllium are harmful. Ensure sufficient ventilation or extraction. Do not exceed the current occupational exposure limits (OEL).
- ▶ To prevent the formation of phosgene gas, rinse workpieces that have been degreased with chlorinated solvents using clean water. Do not place degreasing baths containing chlorine in the vicinity of the welding area.
- ▶ In connection with various welding torches, there may be other hazards, for example those caused by: electrical current (power supply, internal circuit), welding spatter with regard to combustible or explosive materials, UV radiation from the arc, smoke and vapors.
- ▶ Adhere to the general fire protection regulations and remove flammable materials from the vicinity of the welding work area prior to starting work. Provide appropriate fire extinguishing equipment in the workplace.

2.6 Safety instructions for extraction (according to ISO 21904)

- ▶ Ensure that all components have been properly installed on the fume extraction torch.
- ▶ Ensure that the fume extraction torch is connected to the fume extraction system prior to use.
- ▶ Use the fume extraction torch only with a fume extraction system that has been approved for use in the respective country.
- ▶ Observe the local occupational health and safety regulations and guidelines.
- ▶ Check the volume flow at the suction nozzle using the ABICOR BINZEL suction test pipe.
- ▶ Check the extraction hoses at regular intervals, at least once a week, for damage and contamination.
- ▶ Note that if additional hoses or hoses from other manufacturers are used, pressure loss in the fume extraction torch can result.
- ▶ Note that the applied vacuum depends on the geographic altitude of the operation site.
- ▶ Observe the warning signals and indicators on the fume extraction system. Warning signals and indicators can imply a saturated filter or a problem with/damage to the fume extraction torch.
- ▶ Replace the extraction-specific wear parts at regular intervals. The replacement interval required depends on the application conditions.
- ▶ Opening the air regulator is only intended to briefly reduce the volume flow at the suction nozzle. Close the air regulator immediately afterwards. The air regulator must be closed to ensure efficient capture of fumes.
- ▶ Observe the instructions on the adapter label for connecting components.
- ▶ When welding under particularly oily ambient conditions, creepage distances consisting of metal oxides from the welding fume can form locally on fume-carrying surfaces, which are potentially electrically conductive. Therefore, clean the welding fume-carrying surfaces on the fume extraction torch regularly.

2.7 Safety instructions for personal protective equipment

- ▶ Do not wear loose fitting clothing or jewelry.
- ▶ Use a hair net for long hair.
- ▶ Wear safety goggles, protective gloves and, if required, a breathing mask when the device is in use and when welding.

2.8 Classification of the warnings

The warnings used are divided into four different categories and are indicated prior to potentially dangerous work steps.

Depending on the type of danger, the following signal words will be used:

DANGER

Describes an imminent threatening danger. If not avoided, it may cause severe injuries or death.

WARNING

Describes a potentially dangerous situation. If not avoided, this may result in death or serious injuries.

CAUTION

Describes a potentially harmful situation. If not avoided, this may result in slight or minor injuries.

NOTICE

Describes the risk of impairing work results or material damage and indicates irreparable damage to the device or equipment.

3 Scope of Delivery

The following components are included in the scope of supply:

- 1x xFUME® ABIROB® AF500 welding torch system
- 1x torch-sided cable support with integrated switch housing cover
- 1x machine-side cable support with central connector
- 1x operating instructions

The xFUME® ABIROB® AF500 requires additional, welding-task dependent components for the initial set-up. These including the following:

- 1x torch mounting bracket (required for attachment to the robot/cobot)
- fume extractor

The cable assemblies for the xFUME® ABIROB® AF500 welding torch system are available in standard lengths of 9, 12, and 15 ft. as well as customer-specific lengths.

- ▶ Order the equipment parts and wear parts separately.
- ▶ The order data and ID numbers for the equipment parts and wear parts can be found in the current catalog.
- ▶ For more information about points of contact, consultation, and orders, visit www.binzel-abicor.com.

Although the items delivered are carefully checked and packaged, it is not possible to fully rule out the risk of transport damage.

Goods-in inspection

- ▶ Check for order completeness by checking the delivery note.
- ▶ Check the delivered goods for damage (visual inspection).

Claim process

- ▶ If goods are damaged, contact the final carrier.
- ▶ Keep the packaging for possible checks by the carrier.

Returns

- ▶ Use original packaging and packing material for returns.
- ▶ If you have questions concerning the packaging or how to secure the device, contact your supplier, carrier or transport company.

3.1 Emergency information

- ▶ In the event of an emergency, immediately disconnect the following supplies: electrical power supply, compressed air supply, coolant supply and shielding gas supply.
- ▶ Consult the documentation for welding components.

4 Product Description

WARNING

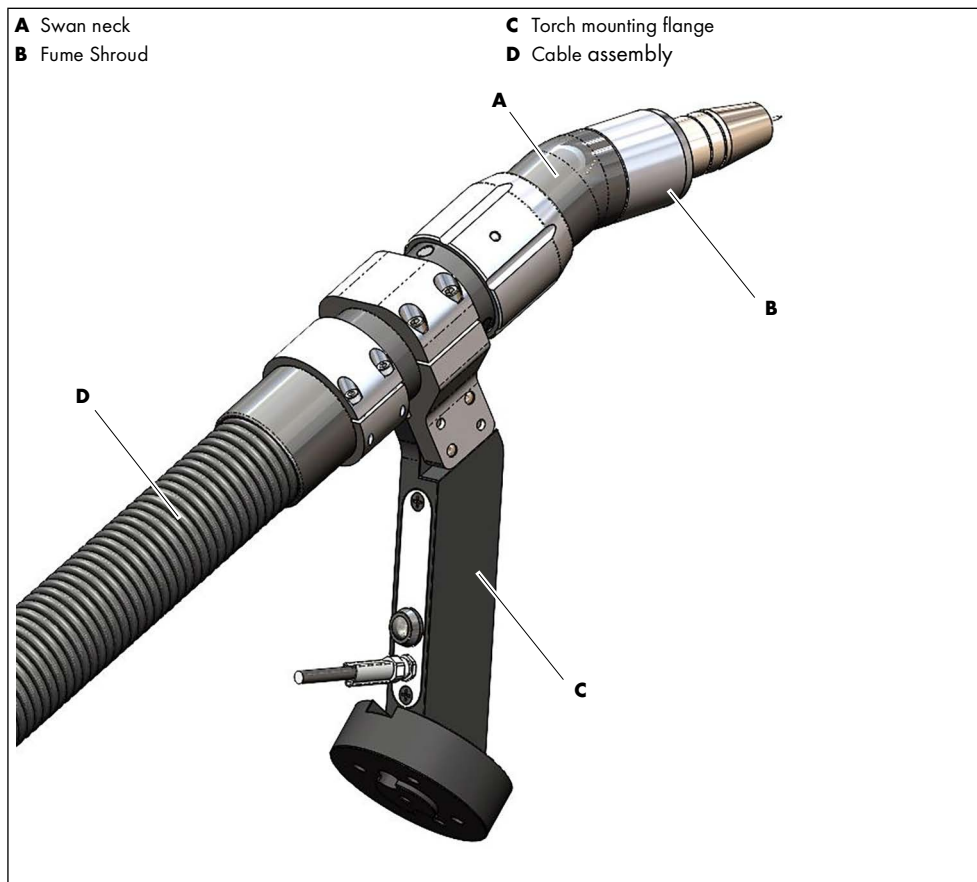
Hazards caused by improper use

If improperly used, the device can present risks to persons, animals, and material property.

- ▶ Use the device according to its designated use only.
- ▶ Do not convert and modify the device to enhance its performance without authorization.
- ▶ Only qualified personnel are permitted to perform work on the device or system.

4.1 Setup and functional description

Tab. 1 Torch system



The xFUME® ABIROB® AF500 provides an arc for welding when supplied with the appropriate consumables. The welding wire required for welding is fed through the welding torch system all the way to the contact tip. The contact tip transmits the welding current to the welding wire, producing an arc between the welding wire and the workpiece. The arc and the molten pool are protected by the inert gas (MIG) and the active gas (MAG).

The standard torch neck types are available in the geometries straight, 22°, and 45° bends. The uniform interface at the connection module makes all torch necks compatible with one another.

The connection module establishes the connection between the welding torch and the cable assembly. The mounting flange is used to attach the welding torch system to the robot. The air-cooled cable assembly provides the welding torch with all the components required for welding, e. g. the welding current, shielding gas and air. A fume hose is included but must be connected to an extractor for at source fume extraction.

4.2 Technical Data

Tab. 2 Ambient conditions for transport and storage

Temperature (storage in a closed environment)	-10 °C to +40 °C
Temperature (transport)	-25 °C to +55 °C
Relative humidity	Up to 90 % at +20 °C

Tab. 3 Ambient conditions during operation

Temperature	-10 °C to +40 °C
Relative humidity	Up to 90 % at +20 °C

Tab. 4 General torch data according to EN 60 974-7

xFUME® ABIROB® AF500	
Type of voltage	DC
Polarity of the wire electrode for DC	Usually positive
Wire types	Commercially available round wires
Type of use	Automatic
Voltage rating	Peak value of 141 V
Protection type of the device connections (EN 60529)	IP3X
Shielding gas (EN ISO 14175)	CO ₂ and mixed gas M21

Tab. 5 Product-specific torch data (EN 60974-7 and EN ISO 21904-1)

xFUME® ABIROB® AF500	
Type of Cooling	Air
Load¹	
CO ₂	500 A
M21	450 A
DC	100 %
Wire Ø	0.8 - 1.6 mm
Gas flow rate	10 - 30 l/min
Volume flow² (for induced speed 0.35 m/s)	
Suction nozzle	103.9 m ³ /h
Connector	118.3 m ³ /h
Required vacuum at the connector (for induced speed 0.35 m/s)	11 kPa
Torch neck type	Swan neck
Torch mount type	Solid

1 For pulse arcs, the load data are reduced by up to 35 %.

2 When used with welding fume extraction systems of the XFume series.

The volume the torch-integrated extraction system collects depends on many factors, such as the position of the suction nozzle, the welding geometry and the gas emission rate of the welding process. Under optimal conditions, over 95 % of the welding fumes can be captured in accordance with ISO 21904-3.

Tab. 6 Torch neck geometry

xFUME® ABIROB® AF500						
cx	X1	X2	Y1	Y2	TCP (X)	Y
0 °	189.7 mm	204.8 mm	-	-	14.2"/360 mm	-
22 °	181.5 mm	195.4 mm	44.1 mm	49.8 mm	14.2"/360 mm	5.7"/145.6 mm
45 °	Contact Sales	Contact Sales	Contact Sales	Contact Sales	15.75"/400 mm	-

Fig. 1 Torch neck geometry

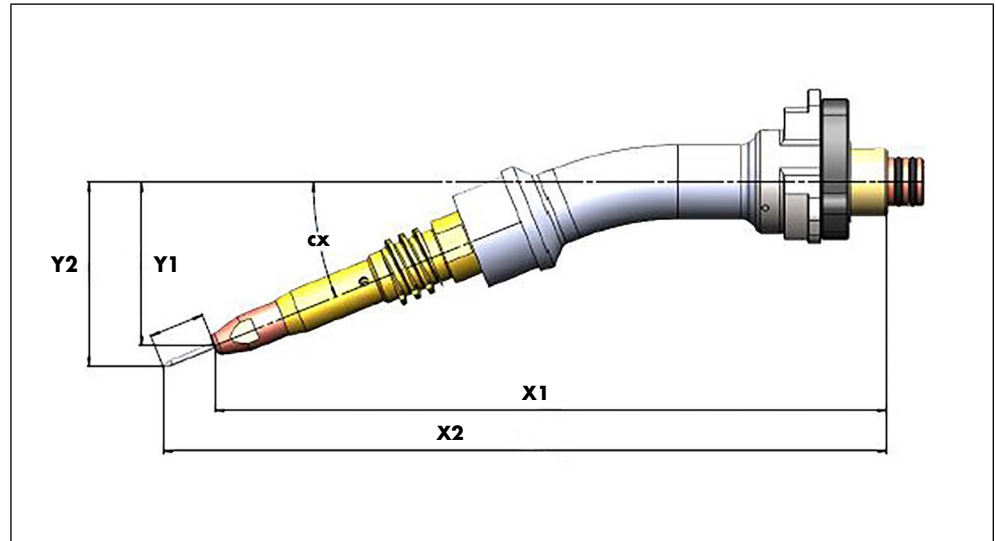
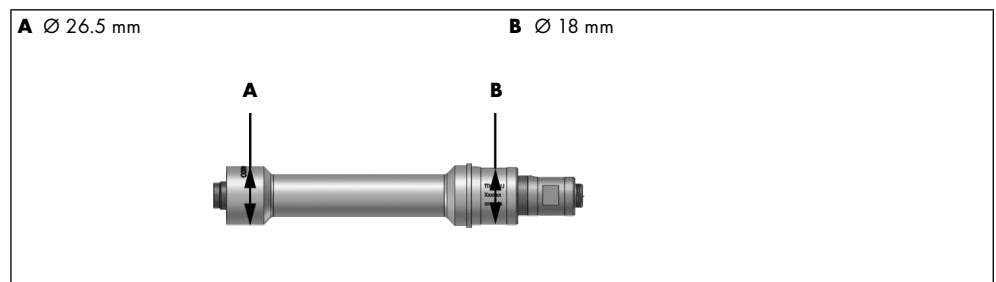


Fig. 2 Torch neck diameter



5 Putting into operation

CAUTION

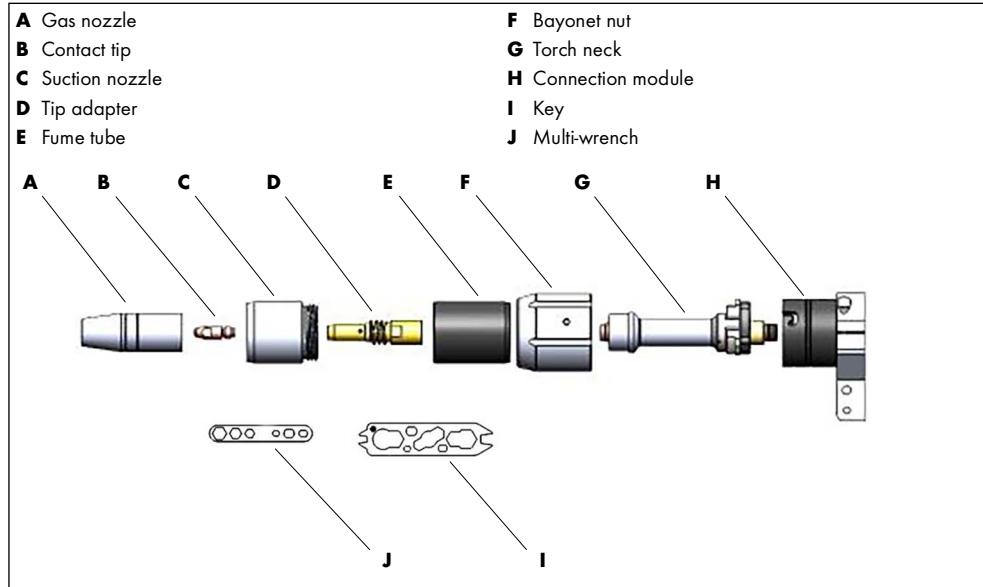
Risk of injury due to unexpected start

If power is supplied during maintenance, cleaning or disassembly, parts can start running unexpectedly and lead to injuries.

- ▶ Switch off the device.
- ▶ Close all supply lines.
- ▶ Disconnect the electrical power supply.

5.1 Setting up the torch neck

Fig. 3 Setting up the torch neck



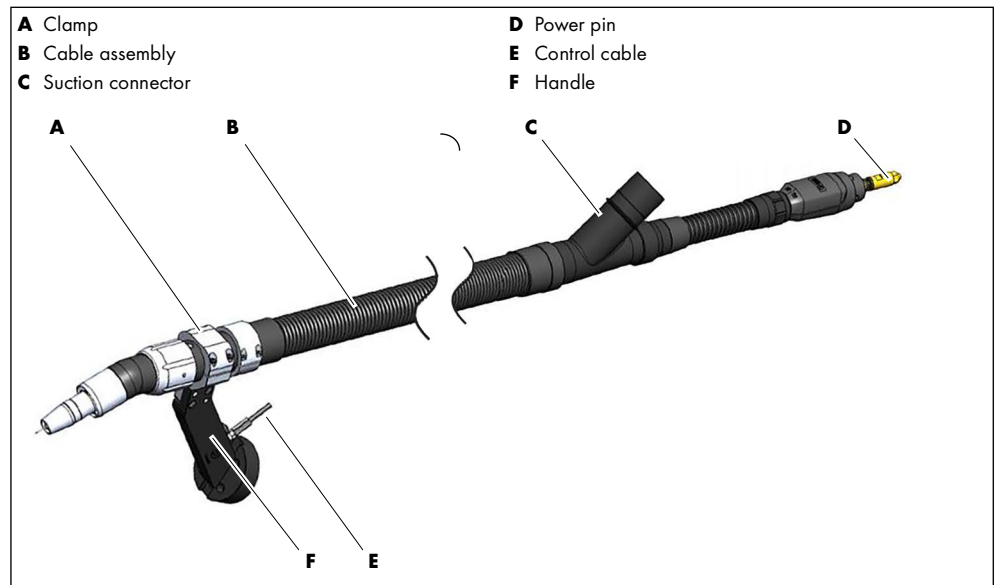
- 1 Screw the replaceable tip adapter (**D**) onto the torch neck (**G**) using the multi-wrench (**J**).
- 2 Screw the contact tip (**B**) into the tip adapter (**D**) and tighten using the multi-wrench (**J**).
- 3 Grease the torch neck O-rings.
- 4 Insert the torch neck (**G**) into the connection module (**H**) until reaching the stop.
- 5 Screw the bayonet nut (**F**) onto the connection module (**H**) locking the 3 pins in place.
- 6 Insert the fume tube (**E**) into the bayonet nut (**F**) until reaching the stop.
- 7 Screw the suction nozzle (**C**) into the fume tube (**E**) hand tight.
- 8 Screw the gas nozzle (**A**) onto the tip adapter (**D**) hand tight.

5.2 Setting up the cable assembly

- ▶ Select the correct wire type and appropriate wire guide for your application.
- ▶ For information on cutting the wire to size and correctly assembling the wire guide, see the following section:
 - ⇒ 8 Maintenance and cleaning on page EN-12

Tab. 7 Liner type

Steel and stainless steels	Spiral liners
Aluminum, copper, nickel and stainless steels	PA liners

Fig. 4 Setting up the cable assembly

- 1 Lay out the cable assembly **(B)** straight and attach to the handle **(A), (F)**.
- 2 Attach control cable **(E)**.
- 3 Insert power pin **(D)** into the wire feeder.
- 4 Connect the extraction hose to the suction connector **(C)**.

5.3 Attaching the machine-side connector

- 1 Check once again whether the wire guide has been fitted correctly.
- 2 Join the power pin **(D)** to the wire feeder.

5.4 Setting the shielding gas volume

The type and amount of shielding gas used depend on the welding task and the gas nozzle geometry.

- 1 To prevent the shielding gas supply from becoming clogged by impurities, briefly open the cylinder valve before connecting the cylinder. This will expel any impurities that may be present.
- 2 Make all shielding gas connections gas-tight.
- 3 Connect the shielding gas cylinder to the wire feeder.
- 4 Set the gas quantity on the shielding gas cylinder's pressure reducer.

5.5 Introducing the wire

- 1 Each time the wire is replaced, ensure that the start of the wire is free of burrs and not bent.
- 2 Insert the wire in the wire feeder as specified by the manufacturer.
- 3 Press the button <zero-current wire feed> on the wire feeder.

6 Operation

6.1 Carrying out the welding process

WARNING

Shortness of breath and poisoning caused by inhaling phosgene gas

When welding workpieces that have been degreased with chlorinated solvents, phosgene gas is formed. It can damage the respiratory tract when inhaled.

- ▶ Do not inhale fumes and vapors.
- ▶ Check and wear your personal protective equipment.
- ▶ Ensure a sufficient supply of fresh air.
- ▶ Rinse the workpieces with clean water prior to welding.
- ▶ Do not place degreasing baths containing chlorine in the vicinity of the welding area.

WARNING

Risk of burns from sparks

During welding activities, sparks, glowing workpieces or hot slag can produce flames. This may result in serious burns.

- ▶ Check the work area for flashpoints.
- ▶ Check and wear your personal protective equipment.
- ▶ Provide appropriate fire extinguishing equipment in the workplace.
- ▶ Allow workpieces to cool down after welding.
- ▶ Prior to performing welding work, properly fasten the ground clamp to the workpiece or welding table.

WARNING

Risk of arc eye

The arc produced by welding can damage the eyes.

- ▶ Check and wear your personal protective equipment (eye protection).

- 1 Open the shielding gas cylinder.
- 2 Switch on the power source.

7 Decommissioning

- 1 Stop the welding process.
- 2 Wait until the shielding gas post-flow time has passed.
- 3 Switch off the power source.
- 4 Close the shielding gas cylinder valve.

8 Maintenance and cleaning

CAUTION

Risk of injury due to unexpected start

If power is supplied during maintenance, cleaning or disassembly, parts can start running unexpectedly and lead to injuries.

- ▶ Switch off the device.
- ▶ Close all supply lines.
- ▶ Disconnect the electrical power supply.

⚠ WARNING**Electric shock due to defective cables**

Damaged or improperly installed cables can lead to fatal electric shock.

- ▶ Check all live cables and connections for proper installation and damage.
- ▶ Damaged, deformed or worn parts should only be replaced by a qualified electrician.

- 1 Remove weld spatter.
- 2 Check that all threaded fittings are tight.

8.1 Cleaning the wire guide**⚠ WARNING****Risk of injury caused by parts swirling around**

The use of compressed air for cleaning purposes can cause device parts to come loose and cause serious injuries.

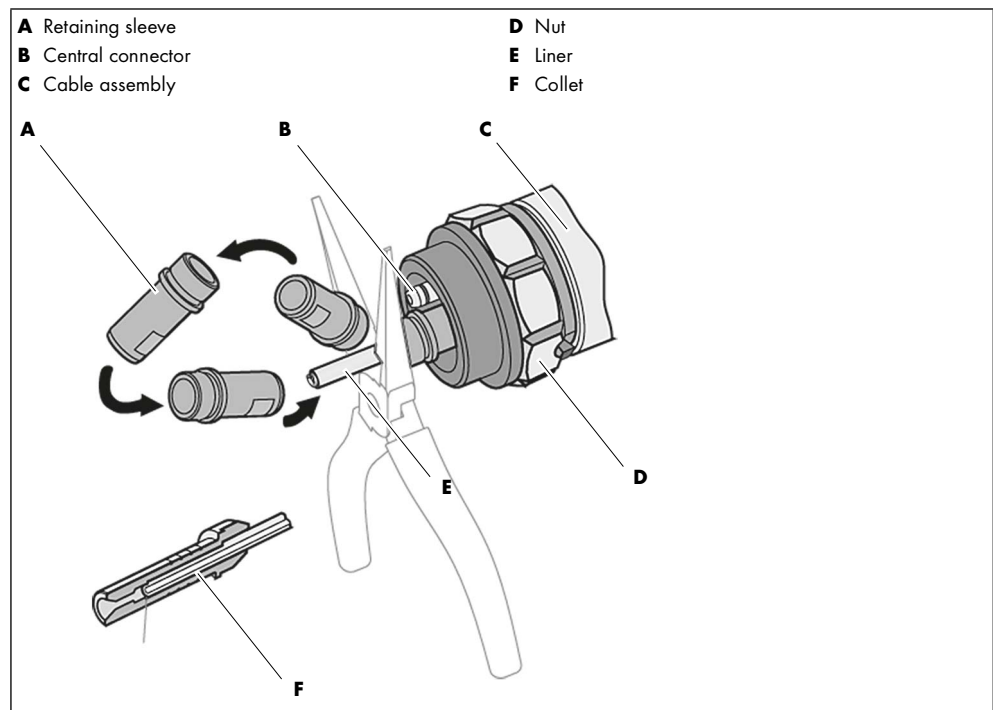
- ▶ When cleaning the wire guide with air, wear suitable protective clothing, in particular safety goggles.

- 1 Unscrew the cable assembly on the machine side and lay it out straight.
- 2 Unscrew the nut and pull out the liner.
- 3 Clean the wire conduit from both sides with compressed air.
- 4 Slide the adjusted liner into the wire conduit and secure with a nut.

8.2 Mounting and shortening the liner

New and unused liners must be shortened to the actual length of the cable assembly.

Fig. 5 Mounting and shortening the liner



- 1 Lay out the cable assembly (**C**) straight.
- 2 Disconnect the central connector (**B**) from the feed unit.
- 3 Screw on the retaining sleeve (**A**).
- 4 Replace the old liner (**E**) with a new one and insert the stripped side into the central connector (**B**).
- 5 Place the retaining sleeve (**A**) inverted by 180 ° onto the new liner (**E**) (side without thread).

- 6 Cut off the overlapping liner **(E)** flush with the retaining sleeve **(A)**.
- 7 Screw the collet **(F)** onto the liner **(E)** as far as it will go.
Use the sight bore on the collet **(F)** to check the position of the wire guide.
- 8 Slide the collet **(F)** and liner **(E)** into the central connector **(B)** as far as they will go.
- 9 Screw the threaded side of the retaining sleeve **(A)** into the central connector **(B)** and tighten.
- 10 Use the nut **(D)** to secure the cable assembly **(C)** to the central connector **(B)**.

8.3 Cleaning the torch neck

To increase the system availability of the welding robot, ABICOR BINZEL offers automated torch cleaning.

- 1 Remove the gas nozzle.
- 2 Remove the weld spatter and spray with ABICOR BINZEL anti-spatter fluid.
- 3 Check the wear parts for visible damage and replace them if necessary.
- 4 Replace the equipment kit when worn or soiled.
- 5 Clean the separating point and O-rings with silicone-free seal grease.
- 6 Check the TCP after each use or after a collision in the WH alignment jig.

9 Troubleshooting

CAUTION

Risk of injury and device damage when handled by unauthorized persons

Improper repair work and modifications to the product may lead to serious injuries and damage to the device. The product warranty will be rendered invalid if work is carried out on the product by unauthorized persons.

- ▶ Consult the documentation for the welding components.

Tab. 8 Troubleshooting

Fault	Cause	Troubleshooting
Torch neck gets hot.	Contact tip loose.	▶ Check and tighten.
	Contact tip loose on torch side and toward the workpiece.	
No trigger function.	Control lead interrupted/defective.	▶ Check/repair.
Wire burned solid in the contact tip.	Wrong parameters set.	▶ Check and correct setting.
	Contact tip worn out.	▶ Replace.
Irregular wire feed.	Liner clogged.	▶ Clean both directions with compressed air or replace if necessary. ▶ Replace the contact tip.
	Contact tip and wire diameter not aligned.	
	Wrong contact pressure set on the wire feeder.	▶ Correct as specified by the manufacturer.
	Spatter bridge between the contact tip and the gas nozzle.	▶ Clean and spray the gas nozzle interior.
Arc between the gas nozzle and the workpiece.	Contact tip not tailored to the wire diameter or contact tip worn out.	▶ Check the contact tip.
Erratic arc.	Wrong welding parameters set.	▶ Correct the welding parameters.
	Wire guide unit worn out.	▶ Replace the wire guide.
	Strong weld spatter build-up in the gas nozzle.	▶ Clean the gas nozzle.
Pore formation.	Insufficient or no gas coverage.	▶ Check the gas cylinder contents and pressure setting.
	Air current blows shielding gas away.	▶ Use partitions to shield the welding area.

10 Disassembly

CAUTION

Risk of injury due to unexpected start

If power is supplied during maintenance, cleaning or disassembly, parts can start running unexpectedly and lead to injuries.

- ▶ Switch off the device.
- ▶ Close all supply lines.
- ▶ Disconnect the electrical power supply.

- 1 Disconnect the cable assembly from the wire feeder.
- 2 Remove the parts to be disconnected (change body, bracket, torch neck).

11 Disposal



Equipment marked with this symbol is covered by European Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

- ▶ Do not dispose of electrical and electronic equipment with household waste.
- ▶ Disassemble electrical equipment prior to proper disposal.
 - ⇒ 10 Disassembly on page EN-15
- ▶ Collect components of electrical separately and recycle in an environmentally responsible manner.
- ▶ Observe local regulations, laws, provisions, standards and guidelines.
- ▶ Please consult your local authority for information about collection and return of electrical devices.

11.1 Disposing of materials

This product is mainly made of metallic materials that can be melted in steel and iron works and are thus almost infinitely recyclable. The plastic materials used are labeled in preparation for their sorting and separation for later recycling.

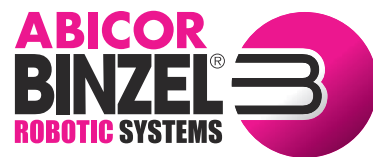
11.2 Disposing of consumables

Oil, greases and cleaning agents must not contaminate the ground or enter the sewage system. These substances must be stored, transported and disposed of in suitable containers. Contaminated cleaning tools (brushes, rags, etc.) must also be disposed of in accordance with the information provided by the consumables' manufacturer.

- ▶ Observe the relevant local regulations and disposal instructions in the safety data sheets specified by the manufacturer of the consumables.

The disposal of dust collecting bags and disposal bags is subject to special waste regulations. The dust must not enter sewage systems or be disposed of together with normal household waste.

- ▶ Observe the local and official regulations.



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