

# **PPI Dual Drive Push-Pull MIG/MAG EN 60 974-7 Operating Instructions**



## Operating Instructions

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## 1 Designated Use

The PPI hand-held welding torches are used for welding of standard wire electrodes. They conform to EN 60 974-7 and are not considered devices having their own functions. Arc welding can only be carried out in connection with a welding power supply. These operating instructions only describe PPI welding torches. PPI welding torches may only be operating using original **ABICOR BINZEL** spare parts.

## 2 Technical Data

<b>Ambient temperature of welding</b>	- 10 °C to + 40 °C
<b>Transport and storage</b>	- 25 °C to + 55 °C
<b>Relative humidity</b>	up to 90 % at 20 °C
<b>Control device rating</b>	1 A AC / 250 V AC

Tab. 1 General Data

<b>Type of voltage</b>	DC direct voltage
<b>Polarity of the electrode</b>	Usually positive
<b>Wire types</b>	Commercially available round wires
<b>Type of use</b>	Manual
<b>Voltage rating</b>	113 V peak value
<b>Protection type of the machine-side connections</b>	IP2X, IP3X (EN 60 529)
<b>Shielding gas (DIN EN 439)</b>	CO <sub>2</sub> and mixed gas M21

Tab. 2 General torch data according to EN 60 974-7

Type	Type of cooling	Load*		Duty Cycle	Wire ø	Gas flow rate	Cooling data			
		CO <sub>2</sub>	M21				Flow max.	Flow min.	Flow Pressure min.	Flow Pressure max.
PPI		A	A	%	mm	l/m	° C	l/min	bar	bar
<b>36D</b>	air	300	270	60	0.8-1.6	10-20				
<b>401D</b>	liquid	400	350	100	0.8-1.6	10-20	50	1	1.5	3.5

Tab. 3 Product-specific torch data as laid out in EN 60974-7

\* For pulse welding reduce rating by 35%

<b>Standard length</b>	15 and 25 feet
<b>Cooling unit power</b>	min. 1200 W
<b>Control lead</b>	Multi-wire w/circular connector
<b>Weight/meter</b>	approx. 0.7 kg
<b>Machine-side connection</b>	Euro or Direct

Tab. 4 Cable assembly

Size	Groove
<b>.030" / .035" (0.8 / 0.9 mm)</b>	U
<b>0.47" / .062" (1.2 / 1.6 mm)</b>	U

Tab. 5 Wire feed rolls

## 2.1 Abbreviations

<b>MIG</b>	Metal Inert Gas
<b>MAG</b>	Metal Active Gas
<b>MAC</b>	Maximum allowable concentration of harmful substances at the workplace
<b>Voltage rating</b>	Classification of the insulation resistance, voltage strength and protection type
<b>PPi</b>	Hand-held Push-Pull welding torch with integrated drive and screwable interface between cable assembly and torch neck with replaceable tip adapter

Tab. 6 Abbreviations

## 2.2 Nameplate

The welding torch system PPi is identified by a sticker on the handle side housing. When making any inquiries, please remember the following information.

- Certificate of conformity, production stamp on the torch neck, for example PPi 36D, information on sticker.

**3 Safety Instruction** Please observe the attached safety instructions.

### 3.1 Classification

The warning signs used in the operating instructions are divided into four different levels and are shown prior to specific work steps. Arranged in descending order of importance, they have the following meaning:

#### **▲ DANGER**

Describes imminent threatening danger. If not avoided, it will result in fatal or extremely critical injuries.

#### **▲ WARNING**

Describes a potentially dangerous situation. If not avoided, it may result in serious injuries

#### **▲ CAUTION**

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

#### Note

Describes the risk of impairing work results or the risk that the work may result in material damage to the equipment.

### 3.2 Emergency information

In case of emergency, immediately interrupt the following supplies:

- Electricity, compressed gas

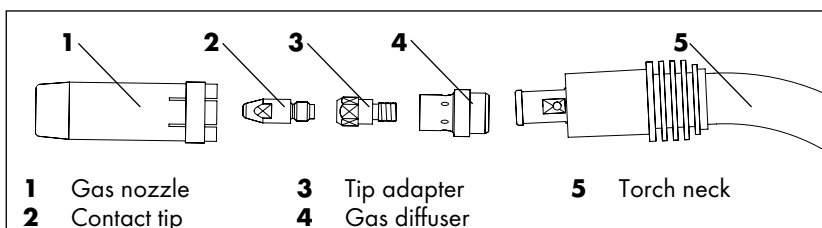
Further measures can be found in the "Power supply" operating instructions or in the documentation of further peripheral devices.

## 4 Putting into operation

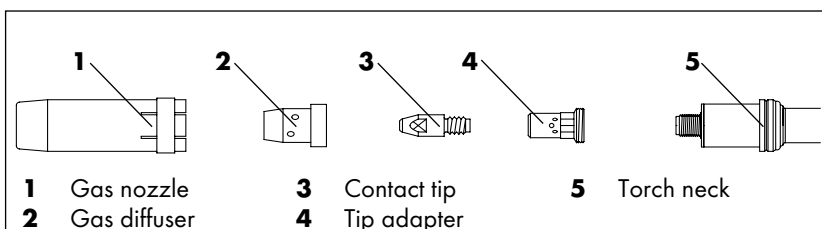
**⚠ DANGER****Risk of injury due to unexpected start-up.**

For the entire duration of maintenance, servicing, dismantling and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Close off the compressed gas supply.
- Pull the mains plug.

**4.1 Equipping the torch neck PPI 36D****Fig. 1** Equipping the torch

- 1** Screw gas diffuser (**4**), tip holder (**3**) and contact tip (**2**) into the torch neck (**5**).
- 2** Slide the gas nozzle (**1**) rotating it slightly clockwise. Insert the torch neck (**5**).

**4.2 Equipping the torch neck PPI 401D****Fig. 2** Equipping the torch

- 1** Screw tip adapter (**4**), contact tip (**3**) and gas diffuser (**2**) into the torch neck (**5**).
- 2** Slide the gas nozzle (**1**) rotating it slightly clockwise. Insert the torch neck (**5**).

### 4.3 Installing the cable liner

To be used for aluminum, copper, nickel and stainless steel wires.

#### Note

- New unused liners have to be shortened to the actual length of the cable assembly.

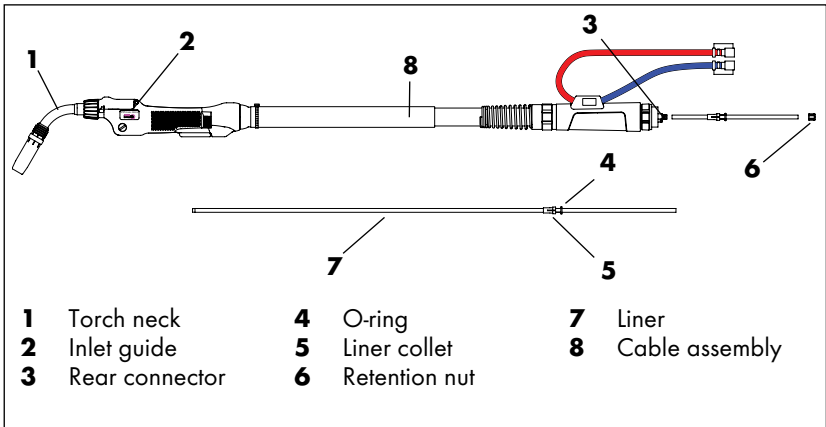


Fig. 3

#### Installing Cable Liner:

1. Laying torch out straight remove retention nut **(6)** from rear connector, then insert the liner **(7)**, tapered end first, all the way into torch until it stops. You should see the liner through the hole in the inlet guide **(2)**, which will help you to make sure liner is fully installed.

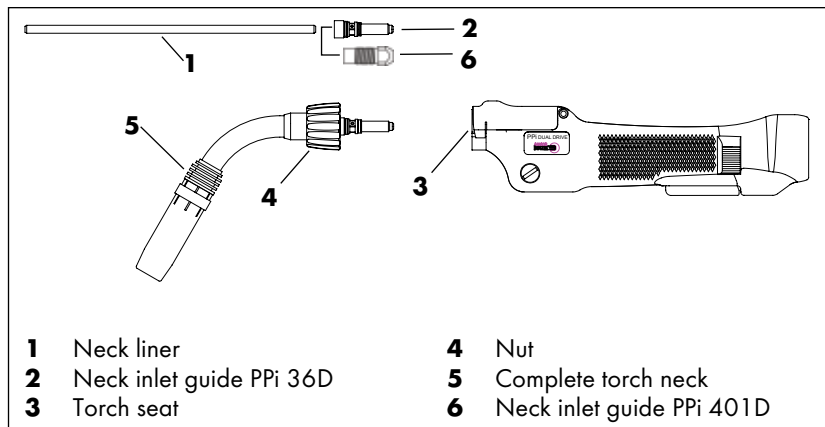
2. While torch is still laying out straight adjust the O-ring **(4)** and collet **(5)** so that they will fit up inside of the rear connector when retention nut is installed. There should be a slight compression on the cable liner once installed.

3. Reinstall the retention nut **(6)** securely, then trim rest of liner **(7)** as close as possible to the feeder drive rolls or outlet guide.

Note: In case of Euro connection torches, liners smaller than 4.3mm OD should be fitted with the hollow brass support tube which is included with the Binzel Euro adaptor kits.

#### 4.4 Installing the neck liner in the torch neck

The neck liners are pre-cut to length, according to the neck. Please be sure to order the correct neck liner in order to avoid feeding issues



**Fig. 4** Mounting the neck liner in the torch neck

1. Unscrew the nut **(4)** to remove the torch neck **(5)**, and then remove the inlet guide **(2 or 6)**.

⇒ for PPi 36D

2. (Reference 4.1 Fig. 1 and 4.4 Fig 4) With all consumables **except** the gas diffuser removed from the front end, insert the square end of the neck liner into the front of the neck, leaving approx. 1" sticking out. Place the tip adaptor onto the protruding neck liner's tapered end and then thread the tip adaptor into the torch neck and tighten with supplied wrench. Install the contact tip and nozzle.

3. The square end of the neck liner should now be protruding out the rear of the neck. Place the neck inlet guide **(2)** over the protruding neck liner and thread the inlet guide into the neck. There should be a slight compression on the neck liner.

4. Fasten the torch neck **(5)** to the torch seat **(3)** by means of the nut **(4)**.

⇒ for PPi 401D

2. (Reference 4.1 Fig. 1 and 4.4 Fig 4) With all consumables **except** the gas diffuser and tip holder removed from the front end, insert the square end of the neck liner into the front of the tip holder, leaving approx. 1" sticking out. Place the contact tip onto the protruding neck liner's tapered end and then thread the contact tip into the tip holder and tighten with supplied wrench. Install the nozzle.

3. The square end of the neck liner should now be protruding approximately 1mm out the rear of the neck. Place the neck inlet guide **(6)** over the protruding neck liner and thread the inlet guide fully into the neck. There should be a slight compression on the neck liner.

4. Fasten the torch neck **(5)** to the torch seat **(3)** by means of the nut **(4)**.



## 4.5 Connecting the cable assembly

1. Insert the rear connector into the receptacle at the wire feed unit and secure it by means provided by feeder manufacturer (typically a thumb screw for direct mount torches).
2. Properly mount the connections for water supply/return, shielding gas and control lead plug as required. (See pg 9 Fig. 5)

### **WARNING**

#### **Risk of burns**

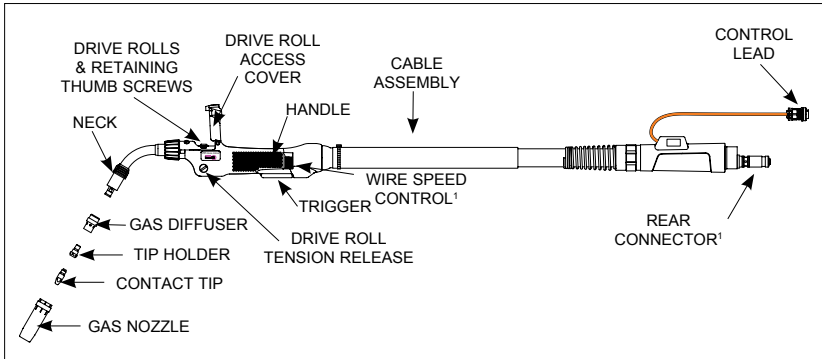
Liquid-cooled welding torches will become overheated if the coolant level is too low.

- Wear protective gloves.
- Check the coolant level at regular intervals.

### **Note**

- Check the minimum coolant level of the cooling unit.
- Make sure that the coolant supply and return have been installed properly. Coolant supply = blue, Coolant return = red.
- Do not use any deionized or demineralized water as coolant or for tightness or flow tests.  
This may impair the service life of your welding torch.
- For liquid-cooled PPI welding torches, we recommend using ABICOR BINZEL coolants.
- Each time the device is commissioned or after each cable assembly change, the cooling system must be purged of any air: Disconnect the coolant return hose from the re-circulating cooling unit and hold it over a collecting device. Close opening at the coolant return. Open it again by repeatedly and abruptly releasing it, until the coolant is flowing continuously and without air bubbles.

## 4.6 Connecting the PPI control lead



<sup>1</sup> - Options vary by machine

**Fig. 5** Connecting the PPI control lead

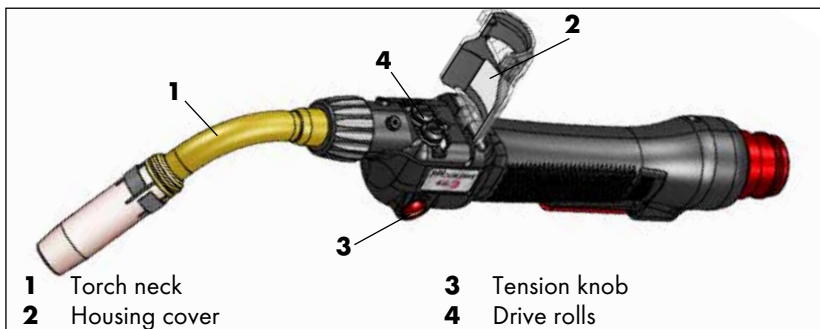
1. Power source must be "off" and power cord disconnected.
2. Connect Push-Pull gun to wire feeder by attaching rear connector to the machine.
3. Connect control lead to power source receptacle or control box.
4. Reconnect power and turn on machine and gas supply.

## 4.7 Setting the shielding gas

### Note

- The type and quantity of the shielding gas depends on the welding task and the gas nozzle geometry.
- Make all shielding gas connections leak free.
- To prevent the shielding gas supply from becoming clogged by impurities, the cylinder valve must be opened briefly, before connecting the cylinder. This will blow out any impurities that may be present.

## 4.8 Feeding in the wire



**Fig. 6** Feeding in the wire

## Note

- Each time the wire is changed, make sure that the wire end is free of burrs or sharp edges which can gouge the neck liner.
- Make sure that the wire feed rolls and consumables comply with the diameter of the inserted wire electrode.  
⇒ 8.1 Replacing the wire feed roll on page 12

1. Insert the wire in the wire feeder as specified by the manufacturer.
2. Open the housing cover **(2)** at the handle.
3. Rotate the drive tension release knob **(3)** counter-clockwise until any free play is taken up & resistance felt, then rotate knob another 1/2 turn counter-clockwise.
4. Depress the torch trigger until the wire comes out at the torch drive rolls and then release trigger quickly. *Note: Feeding the wire slowly (<300ipm) will help to avoid bird nesting of the wire. You may need to manually guide the wire during initial set-up to avoid wire jams.*
5. Rotate the drive tension knob **(3)** clockwise until it stops and verify the wire is in both drive rolls grooves. *Note: The required contact pressure is automatically pre-set via the pressure adjustment knob **(3)**.*
6. Depress the torch trigger and feed welding wire through the neck.

## 5 Handle operating elements

## Note

- As the MIG/MAG welding torches are integrated into a welding system, the operating instructions of the welding components, such as the welding power supply, must be observed during operation.

Using a standard welding torch, the two-cycle mode of the trigger can be activated. Further operating modes and handle modules depend on the corresponding welding power supply and must be ordered separately.

### 5.1 2-cycle function of the trigger

1. Press the trigger on the handle and keep it pressed = welding is started.
2. Release the trigger = welding is stopped.

## 6 Putting into operation

1. Open the shielding gas cylinder.
2. Switch on the power supply
3. Set the welding parameters.
4. Start welding.

## Note

- Liquid-cooled hose assemblies will start leaking if the return coolant temperature is exceeded. Make sure not to exceed a return coolant temperature of 60° C.

## 7 Putting out operation

### Note

- Liquid-cooled hose assemblies will start leaking if overheated. This is why the cooling unit should continue running for approx. 5 min. after welding.

1. Stop welding.
2. Wait until the shielding gas flow has subsided and then switch off the power supply.
3. Close the valve of the shielding gas cylinder.

## 8 Maintenance and cleaning

### **⚠ DANGER**

#### **Risk of injury due to unexpected start-up.**

For the entire duration of maintenance, servicing, dismantling and repair work, the following instructions must be adhered to:

- Switch off the power supply.
- Close off the compressed gas supply.
- Pull the mains plug.

### **⚠ DANGER**

#### **Electric shock**

Dangerous voltage due to defective cables.

- Switch off the power supply.
- Check all live cables and connections for proper installation.
- Replace any damaged, deformed or worn parts.

### Note

- Maintenance and cleaning work may only be carried out by qualified and trained specialists.
- Check coolant hoses, seals and connections for damage and tightness and replace them, if necessary.
- Always wear your personal protective clothing when performing maintenance and cleaning work.

### 8.1 Replacing the drive rolls

⇒ Fig. 6 Feeding in the wire on page 10.

#### Note

- Make sure that the drive rolls comply with the diameter of the inserted wire electrode.

1. Open the housing cover **(2)** and unscrew the two drive roll slotted thumb screws.
2. Rotate the tension knob **(3)** counter-clockwise.
3. Pull up on the drive rolls to remove them. If necessary, a small flat blade screwdriver can be used to pry up on the drive rolls.
4. Replace the drive rolls and secure them on the motor shaft using the slotted thumb screws. The drive rolls are designed for two different wire sizes and are stamped with the wire sizes on each end. The correct wire size stamp should be facing up when properly installed.
5. Rotate the tension knob **(3)** clockwise until it stops and close the housing cover **(2)**.

### 8.2 Cleaning the wire conduit

1. Unscrew the cable assembly on the machine side and bring it into a stretched position.  
⇒ See Fig. 3 on page 7.
2. Unscrew the retention nut **(6)** and pull out the liner **(7)** and replace it, if necessary.

#### WARNING

##### Risk of injury

Serious injuries caused by parts swirling around.

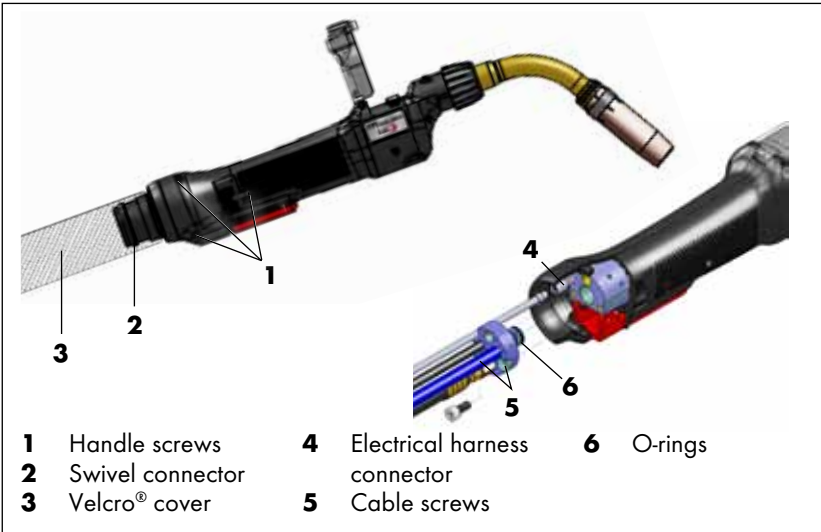
- When cleaning the wire guide with compressed air, wear suitable protective clothing, in particular safety goggles.

3. Clean the cable assembly **(10)**, internally from both sides with compressed air.
4. Slide liner **(7)** into rear connector **(3)** and secure it with the retention nut **(6)**.  
⇒ See liner 4.3.1 on page 7
5. Connect cable assembly to the wire feed unit.

### 8.3 Torch neck

1. Remove gas nozzle.
2. Remove welding spatter and spray gas nozzle with ABICOR BINZEL anti-spatter agent.
3. Check wear parts for visible damage and replace them, if required.
4. Replace neck liner or wire guide when worn or soiled.
5. Clean the neck interface and grease O-rings with silicone-free sealing grease.

## 8.4 Cable replacement



**Fig. 7** Cable replacement







1. Remove the three rear most screws (**1**) in the handle, and pull back on the cable swivel connector to disengage it from the handle.
2. Open the Velcro® cover (**3**) for about two feet behind the swivel connection and then pull the swivel connection back about one foot from the handle.
3. Remove the tape covering the electrical harness connector and disconnect the electrical harness at the handle by depressing the connector tab (**4**) on the cable side connector and pulling rearward on the cable side electrical harness. NOTE: Use .035" or smaller wire, paper clip or similar to depress the connector tab.
4. With a ball end 4 mm Allen wrench, remove the two screws (**5**) securing the front cable block to the handle assembly.
5. Pull rearward on the cable assembly to disengage it from the handle assembly.
6. Reverse procedure to install new cable and be sure to grease the cable O-rings (**6**). NOTE: The 4mm Allen screw torque value is 64 in lbs.

## 9 Troubleshooting

Note	
<ul style="list-style-type: none"> <li>• If the measures described below are not successful, please consult your dealer or the manufacturer.</li> <li>• Please also consult the operating instructions for the welding components, such as power supply.</li> </ul>	

Fault	Cause	Solution
Torch neck or handle gets too hot	<ul style="list-style-type: none"> <li>• Contact tip/tip adapter not tighten</li> <li>• Power connections loose on the torch or the work-piece</li> <li>• Coolant flow too low</li> <li>• Pulse welding derates the torch by 35%</li> <li>• Duty-cycle or amperage exceeded</li> </ul>	<ul style="list-style-type: none"> <li>• Check and tighten</li> <li>• Check and tighten</li> <li>• Check cooling system, increase coolant flow</li> <li>• Change parameters reduce duty-cycle and/or switch to water-cooled</li> <li>• Change parameters reduce duty-cycle and/or switch to water-cooled</li> </ul>
No trigger function	<ul style="list-style-type: none"> <li>• Control lead interrupted/defective</li> <li>• Flow control valve in the re-circulating cooling unit was triggered</li> </ul>	<ul style="list-style-type: none"> <li>• Check/repair</li> <li>• Check coolant level and top off, if necessary</li> </ul>
Wire burn-back in the contact tip	<ul style="list-style-type: none"> <li>• Wrong parameters set</li> <li>• Contact tip worn out</li> <li>• Wire burn-back function set incorrectly</li> <li>• Trim setting incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Check or correct setting</li> <li>• Replace</li> <li>• Correct</li> <li>• Correct</li> </ul>
Irregular wire feed	<ul style="list-style-type: none"> <li>• Liner clogged</li> <li>• Drive rolls upside down</li> <li>• Contact tip and wire diameter not matched</li> <li>• Wrong contact pressure set on the wire feed unit</li> </ul>	<ul style="list-style-type: none"> <li>• Clean both directions with compressed air or replace it, if necessary</li> <li>• Check and correct, if necessary</li> <li>• Replace contact tip</li> <li>• Increase or reduce contact pressure</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 and spray gas nozzle interior</li> </ul>
Erratic arc	<ul style="list-style-type: none"> <li>• Contact tip not matched to the wire diameter or contact diameter enlarged</li> <li>• Wrong welding parameters set</li> <li>• Liners clogged or worn out</li> </ul>	<ul style="list-style-type: none"> <li>• Check the contact tip and replace it, if necessary</li> <li>• Correct welding parameters</li> <li>• Replace liners</li> </ul>
Porosity formation	<ul style="list-style-type: none"> <li>• Spatter build-up in the gas nozzle</li> <li>• Insufficient or lack of gas coverage</li> <li>• Air currents blowing shielding gas away</li> <li>• Contaminated base metal</li> </ul>	<ul style="list-style-type: none"> <li>• Clean gas nozzle</li> <li>• Check gas cylinder contents and pressure setting</li> <li>• Shield welding area with partitions</li> <li>• Prepare/clean metal properly prior to welding</li> </ul>

Tab. 7 Troubleshooting

 <h1 style="margin: 0;">Danger</h1>	
<ul style="list-style-type: none"> <li>• Read and follow the manufacturer's instructions, employer's safety practices and Material Safety Data Sheets (MSDSs).</li> <li>• Only qualified personnel should install, use or service this material and/or equipment.</li> </ul>	 <p><b>ELECTRIC SHOCK can kill.</b></p> <ul style="list-style-type: none"> <li>• Always wear dry insulating gloves.</li> <li>• Do not touch live electrical parts.</li> <li>• Always disconnect power source before hooking up or changing electrodes, nozzles and other parts.</li> </ul>
 <p><b>WELDING SPARKS can cause fire or explosion.</b></p> <ul style="list-style-type: none"> <li>• Do not weld near flammable material.</li> <li>• Do not weld on closed containers.</li> <li>• Remove combustibles from the work area and/or provide a fire watch.</li> <li>• Avoid oily or greasy clothing as a spark may ignite them.</li> </ul>	 <p><b>FUMES AND GASES can be hazardous to your health.</b></p> <ul style="list-style-type: none"> <li>• Keep your head out of the fumes.</li> <li>• Use enough ventilation or exhaust at the arc to keep fumes and gases from your breathing zone, and the general area.</li> <li>• Fumes from welding and cutting can deplete air quality, causing injury or death. Always wear an air supplied respirator in confined areas or if breathing air is not safe.</li> </ul>
 <p><b>ARC RAYS can injure eyes and burn skin.</b></p> <ul style="list-style-type: none"> <li>• Always wear correct eye, ear and body protection.</li> <li>• Always wear a welding helmet with the proper grade filter lens. Protect yourself and others from spatter arc flash rays by using protective screens, barriers and welding curtains.</li> <li>• Always wear protective gloves and clothing to cover exposed skin. This will aid in the prevention of arc and spatter burns.</li> </ul>	 <p><b>LOUD NOISE can damage hearing.</b></p> <ul style="list-style-type: none"> <li>• Always wear protective hearing devices to ensure protection when noise levels exceed OSHA standards.</li> </ul>
<p><b>Do Not Remove This Label.</b></p>	
<p>ID 123-4567C1</p>	
<p><b>Alexander Binzel Corporation</b>          650 Medimmune Court, Suite 110, Frederick, MD 21703          Tel:(301)846-4196 Fax:(301)846-4497 www.binzel-abicor.com</p>	
<p><b>Read American National Standard Z49.1, "Safety in Welding, Cutting and Allied Processes" available from the American Welding Society, 8669 NW 36 St #130, Miami, FL 33166; OSHA Safety and Health Standards, available from U.S. Government Printing Office, Washington, DC 20402</b></p>	

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