

Lasting Connections

MIG MAG WELDING TORCH





Functions





MT G MT W

Operating instructions - MIG/MAG Torches

TRANSLATION OF THE ORIGINAL OPERATING INSTRUCTIONS

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1. IDENTIFICATION

MIG-MAG manual welding torches are used to safely weld low and high-alloy materials. They consist of the torch neck with equipment parts and wear parts, the torch handle and the cable assembly with a central connection. They conform to EN 60 974-7 and are not considered devices that independently fulfil functions.

Arc welding can only be carried out in connection with a welding power source.

1.1. Marking

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

2. SAFETY

2.1. Safety Instructions

DANGER	\triangle

- » Before using the system for the first time, please read these operating instructions carefully.
- » These operating instructions provide you with all the information you need for trouble-free and safe operation. The product has been developed and manufactured in accordance with state-of-the-art methods and the recognized safety standards and guidelines.
- » The operating instructions warn you against unavoidable residual hazards for user, third parties, devices or other material property. The safety instructions used, which must be adhered to, point out construction related unavoidable residual hazards.
- » Non-observance of these safety instructions may result in risks to the life or health of personnel, environmental damage or material damage. The product may only be operated in a technically perfect condition in compliance with the operating instructions.
- » The manufacturer will accept no liability for damage caused by nonobservance of the operating instructions.
- » Use suitable means to protect yourself and bystanders from the hazards listed in chapter on safety.

Basic:

- » Before carrying out specific work, for example putting into operation, operation, transport and maintenance, read the operating instructions carefully and be sure to follow them.
- » Keep the operating instructions within easy reach at the device for reference.
- » Enclose the operating instructions when handing over the product.
- » Please observe the operating instructions of the individual welding components, such as: Welding power supply and wire feeding device.
- » When handling gas cylinders, consult the instructions from the gas manufacturers and the pressurized gas regulations.
- » Please observe the accident prevention regulations of the country in question.
- Putting into operation, operating and maintenance work may only be carried out by qualified personnel. 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.

Electro-technical:

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

Welding:

- » Arc welding may cause damage to eyes, skin and hearing! Please always wear the required safety clothing, eye and ear protection in compliance with the relevant regulations in the country in question.
- » Any metal vapors, especially lead, cadmium, copper and beryllium are harmful! Ensure sufficient ventilation or extraction. Do not exceed the current MAC values.
- » Rinse work-pieces that have been degreased with chlorinated solvents with clear water. Otherwise there is a risk of phosgene gas formation. For the same reason, no degreasing baths containing chlorine must be placed 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 inflammable materials from the surroundings of the welding work area, prior to starting work. Even hours after finishing the welding work, there is a risk of late ignition caused by sparks. Place appropriate fire extinguishing equipment in the workplace within easy reach.

Technical State:

- » Do not exceed the maximum limit values of the load data. Overloading leads to torch destruction.
- » Do not make any constructive changes to this device.
- » During welding work outdoors, use suitable protection against the effects of weather.

Protective clothing:

- » Do not wear loose fitting clothing or jewelry.
- » Use a hair net for long hair.
- » During operation of the welding torches and in connection with the welding process, always wear safety goggles, protective gloves and, if required, a breathing mask.

2.2. Designated use:

- » The device described in these instructions may be used only for the purpose and in the manner described in these instructions. In doing so, observe the operating, maintenance and servicing conditions.
- » Any other use is considered improper.
- » Unauthorised modifications or changes to enhance the performance are not permitted.

2.3. Classification of the warnings:

The warnings used in the operating instructions are divided into four different levels and shown prior to potentially dangerous work steps. Arranged in descending order of importance, they have the following meanings:



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



Describes a potentially dangerous situation. If not avoided, this may result in 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 potential material damage to the equipment.

2.4. Emergency information:

In the event of an emergency, immediately disconnect the following supplies:

- » Switch off the power source
- » Coolant supply
- » Gas supply

Further measures can be found in the operating instructions for the power source or the documentation for other peripheral devices.

- English -

3. 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 or modify the device to enhance its performance without authorisation.
- » Only qualified personnel are permitted to perform work on the device or system.

3.1. Technical data

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Transport and storage	-25 °C to +55°C
Relative humidity	up to 90% at 20°C

Tab. 1 Ambient conditions during operation

Type of voltage	DC
DC polarity of the electrodes	Usually positive
Shielding gas (DIN EN ISO 14175)	CO ₂ and mixed gas M21
Wire types	Commercially available round wires
Voltage rating	Peak value of 113 V
Protection type of the machine-side connectors (EN 60 529)	IP3X
Control device in torch handle	For 42 V and 0.1 to 1 A

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

Туре	Type of cooling	Load		DC	Wire Ø	Gas flow	Cooling		Flow pressure	
	Single circuit	Standard light arc								
		CO ⁵	M21				Max. supply temp.	Min. flow rate	Min.	Max.
		A	A	%	mm	l/min	°C	l/min	bar	bar
MT G serie										
150	Air	170	170	60	0.6 - 1.0					
250	Air	230	220	60	0.8 - 1.2					
300	Air	280	260	60	0.8 - 1.2					
350	Air	330	310	60	1.0 - 1.6					
MT W serie										
440	Liquid	500	450	100	0.8 - 1.6	10 - 20	50	1.5	1.5	3.5
540	Liquid	600	550	100	1.0 - 1.6	10 - 20	50	1.5	1.5	3.5

Tab. 3 Product-specific torch data (EN 60 974-7) MT G and MT W

Standard length L	3.00 m / 4.00 m
Coolant connection	Plug-in nipple, nom. diam. 5mm
Cooling unit power	Min. 800 W
Control lead	2-wire

Tab. 4 Cable assembly

3.2. Signs and symbols used:

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

Symbol	Description
»	Bullet symbol for instructions and lists
->	Cross reference symbol refers to detailed, supplementary or further information
1.	Step(s) described in the text to be carried out in succession

4. PUTTING INTO OPERATION



Risk of injury due to unexpected start-up

The following instructions must be adhered to throughout all maintenance, servicing, assembly, disassembly and repair work:

- » Switch off the power source.
- » Close off the gas supply.
- » Close off the coolant supply.
- » Disconnect all electrical connections.



<u>Risk of injury and machine damage when handled by</u> <u>unauthorised persons</u>

Improper repair work and modifications to the product may lead to serious injuries and damages to the device. The product warranty will be rendered invalid if the unit is handled by unauthorised persons.

» Only qualified personnel are permitted to perform work on the device or system.

NOTICE

Please take note of the following instructions: -> 3. PRODUCT DESCRIPTION on page 12

4.1. Setting up the torch

CAUTION!

Risk of injury

Puncture or cut-in wounds may be caused by the wire electrode.

- » Keep your hands out of the danger zone.
- » Wear the correct protective gloves.

4.2. MT G with pluggable gas nozzle and contact tip holder

Setting up MT G (Fig. 1 / p. 3)

- 1 Pluggable gas nozzle
- 2 Contact tip
- 3 Pluggable contact tip holder
- 4 Manifold

4.3. MT W liquid-cooled

- Setting up MT W (Fig. 2 / p. 3):
- 1 Gas nozzle
- 2 Spatter protector (if in place)
- 3 Contact tip
- 4 Contact tip holder
- 5 Torch neck

Set up the torch neck according to the figure (Fig. 2 / p. 3):

- Screw the replaceable contact tip holder (4) onto the torch neck (5) and tighten the contact tip holder (4) with the provided wrench.
- 2. Screw the contact tip (3) into the contact tip holder (4).
- 3. Tighten the contact tip (3) with the provided wrench.
- If a spatter protector is not yet mounted:
- 4. Insert the spatter protector (2) into the gas nozzle (1) from the back.
- 5. Screw together the gas nozzle (1) and the spatter protector (2). The spatter protector (2) moves into the correct position within the gas nozzle (1).

4.4. Attaching the wire guide

NOTICE

- » Only use gas-tight, plastic-insulated wire guides to ensure a secure shielding gas cover and a defined current contact.
- » Bare liners give rise to a loss of shielding gas.

4.4.1. Liner

NOTICE

- » New and unused liners must be abridged to the actual length of the cable assembly.
- » If the torch has a fixed torch neck, only through-hole liners are used.
- » To install the wire guide with a little preload, excess length is required.

MT G/ MT W

- For use of steel wires with undivided wire guide.
- Stretch out the cable assembly and unscrew the gas nozzle and contact tip from the torch neck.
- Unscrew the nut from the central connector or direct connector and slide the liner through the cable assembly up to the retaining nipple.
- Screw down the nut again, tighten using the provided wrench and cut off excess length of the liner flush with the contact tip holder.
- 4. Mount contact tip and gas nozzle.

4.4.2. PA liner

NOTICE

- » New, as yet unused PA liners have to be abridged to the actual length of the cable assembly.
- » For PA liners with an outer diameter of 4.00 mm, the capillary tube in the distance adaptor must be replaced with a guide tube.
- » For changeable and repluggable torch necks and torch necks that cannot be changed, combined wire guides with integral brass liner are used.
- » For changeable torch necks, a neck-liner made of brass is used.

For use with aluminium, copper, nickel and stainless steel wires:

- 1. Lay out cable assembly straight, screw in contact tip.
- Slide wire guide containing the brass liner first through the cable assembly until a noticeable resistance is felt at the contact tip.
- 3. Slide clamp nipple, O-ring and nut onto PA liner and tighten the nut under tension.
- 4. Mark overlength of the PA liner in front of the wire feed rolls and cut it off at the mark using the cutter.

4.5. Attaching the cable assembly on the machine side

- Join the central connector and the central socket at the wire feeder.
- 2. Use the connection nut to secure both of these.
- 3. Attach the coolant supply and return connectors to the **MT W**.
- 4. Attach the shielding gas and control lead connectors in the case of other machine connections.

4.6. Connecting the coolant





Risk of burns

The cable assembly overheats if the coolant level is too low. » Wear the correct protective gloves.

WARNING

» Check the coolant level at regular intervals.

Connecting the coolant (Fig. 3 / p. 3)

- 1 Control lead
- 2 Coolant supply hose
- 3 Coolant recirculator
- 4 Coolant return hose

NOTICE

- » Ensure that the coolant supply and return hoses have been correctly installed. Coolant supply = blue, coolant return = red.
- » Do not use deionised or demineralised water as coolant or for leak and flow tests. This may shorten your welding torch's service life.
- » We recommend the use of Böhler Welding coolant for liquidcooled welding torches.
- » The cooling system must be purged of any air each time the device is commissioned and after every cable assembly change: disconnect the coolant return hose from the coolant recirculator and hold it over a collection receptacle. Close the opening on the coolant return hose. Then re-open it by abruptly releasing it. Repeat until the coolant flows into the collection receptacle continuously and without air bubbles.

4.7. Setting the shielding gas volume

NOTICE

- » The type and amount of shielding gas used depend on the welding task and the gas nozzle geometry.
- » Make all shielding gas connections gas-tight.
- » To prevent the shielding gas supply from becoming clogged by impurities, the cylinder valve must be opened briefly before connecting the cylinder. This will expel any impurities that may be present.

4.8. Feeding in the wire

CAUTION!

Risk of injury

Puncture or cut-in wounds may be caused by the wire electrode.

- » Keep your hands out of the danger zone.
- » Wear the correct protective gloves.

NOTICE

- » Each time the wire is replaced, make sure that the start of the wire is free of burrs and not bent.
- Lay the cable assembly connected to the machine side out straight.
- Insert the wire into the wire feeder as specified by the manufacturer.
- Press the 'zero-current wire feed' trigger on the wire feeder until the wire comes out of the contact tip.

4.9. Torch handle control elements

NOTICE

- » Only qualified personnel are permitted to perform work on the device or system.
- » Consult the documentation for the welding components.

The trigger's two-cycle mode can be activated when using a standard welding torch. Further operating modes (e.g. 4-cycle) and torch handle modules depend on the welding power source and must be ordered separately.

4.9.1. Trigger function

- 1. Press and hold the trigger on the handle = start welding.
- 2. Release the trigger = stop welding.

5. OPERATION

- 1. Open the shielding gas cylinder.
- 2. Switch on the power source.
- 3. Switch on the coolant recirculator for MTW.
- 4. Rinse the shielding gas lines.
- Start the welding process by pressing and holding the torch trigger.

6. PUTTING OUT OF OPERATION

NOTICE

- » Consult the documentation for the welding components.
- » As liquid-cooled cable assemblies start to leak when they overheat, the coolant recirculator should continue running for approx. 5 min. after welding.
- 1. Wait until the shielding gas post-flow time has passed.
- 2. Close the shut-off-valve for the gas supply.
- 3. Switch off the power source.
- 4. Switch off the coolant recirculator.

7. MAINTENANCE AND CLEANING

Scheduled maintenance and cleaning are prerequisites for a long service life and trouble-free operation.



DANGER



Risk of injury due to unexpected start-up

The following instructions must be adhered to throughout all maintenance, servicing, assembly, disassembly and repair work:

- » Switch off the power source.
- » Close off the gas supply.
- » Close off the coolant supply.
- » Disconnect the coolant supply and return hoses.
- » Close off the compressed air supply.
- » Disconnect all electrical connections.

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DANGER



Electric shock

Dangerous voltage due to defective cables.

» Check all live cables and connections for proper installation and damage.

DANGER

» Replace any damaged, deformed or worn parts.



<u>Risk of burns</u>

Risk of burns from hot coolant and hot surfaces.

- » Switch off the coolant recirculator before starting maintenance, servicing, assembly, disassembly or repair work.
- Allow the welding torches to cool down.
- » Wear the correct protective gloves.

NOTICE

- » The specified maintenance intervals are guidance values and refer to single-shift operation.
- » Only qualified personnel are permitted to perform work on the device or system.
- » Check the coolant hoses, seals and connectors for damage or leaks and replace if necessary.
- » Check and clean the power contact surfaces on the torch neck and torch neck seat.
- » Check and wear your personal protective equipment.
- » Remove any adhering weld spatter.
- » Ensure that all threaded fittings are tight.

7.1 Replacing the torch neck

-> 4.1. SETTING UP THE TORCH on page 13

8. DISPOSAL

NOTICE

- » Do not dispose of the device with household waste.
- » For disposal, observe the local regulations, laws, provisions, standards and guidelines.

9. WARRANTY

This product is a Böhler Welding product. voestalpine Böhler Welding GmbH guarantees that the product has been manuafactured without defects and offers factory manufacturing and functional warranty for this procduct upon delivery in line with current state-of-the-art technology and the current regulations. To the extent that Böhler Welding is responsible for a deficiency in the product, Böhler Welding shall be obliged to choose, at its own discretion, to either repair the defect or deliver a replacement at its own expense. The warranty covers manufacturing faults, but not damage resulting from natural wear and tear, overloading or improper use. The warranty period is defined in the General Terms and Conditions. Exceptions in the case of specific products are regulated separately. Warranty will also be rendered invalid if spare parts and wearing parts are used that are not Böhler Welding parts and if the product has been repaired improperly by the user or a third party. Wearing parts are excluded in general from the warranty. In addition, Böhler Welding is not liable for damage caused by using our products. Questions about warranty and service can be addressed to the manufacturer or our distributors. For more information, www.voestalpine.com/welding



