

Operating Instructions

MTG Exento MTW Exento



EN-US Operating instructions



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Safety, information on correct use

Safety

🕂 WARNING!

Danger from incorrect operation and work that is not carried out properly.

This can result in serious personal injury and damage to property.

- All the work and functions described in this document must only be carried out by technically trained and qualified personnel.
- Read and understand this document in full.
- Read and understand all safety rules and user documentation for this equipment and all system components.

WARNING!

Danger from electrical current.

This can result in serious personal injury and damage to property.

- Before starting work, switch off all the devices and components involved and disconnect them from the grid.
- Secure all devices and components involved so they cannot be switched back on.

WARNING!

Danger due to hot system components and/or equipment.

This can result in serious burns or scalding.

- Before starting work, allow all hot system components and/or equipment to cool to +25°C/+77°F (e.g., coolant, water-cooled system components, wirefeeder drive motor, etc.).
- Wear suitable protective equipment (e.g., heat-resistant gloves, safety goggles, etc.) if cooling down is not possible.

WARNING!

Danger from contact with toxic welding fumes.

Serious personal injuries may result.

- Welding is not permitted without an extraction unit being switched on.
- It may not be sufficient to only use a fume extraction torch to reduce the concentration of noxious substances at the work station. In this case, install an additional extraction system to properly reduce the concentration of noxious substances at the work station.
- ▶ In case of doubt, the concentration of noxious substances at the work station should be assessed by a safety engineer.

▲ CAUTION!

Danger due to emerging wire electrode.

Personal injury may result.

- Hold the welding torch so that the tip of the welding torch points away from the face and body.
- Wear suitable protective goggles.
- Do not point the welding torch at people.
- Ensure that the wire electrode can only intentionally make contact with electrically conductive objects.

Intended use, requirements for the extraction system

Intended use	The MIG/MAG manual welding torch is intended exclusively for MIG/MAG weld- ing in conjunction with a sufficiently powerful extraction system (see section Re- quirements for the extraction system from page 8). Any other use is deemed to be "not in accordance with the intended purpose." The manufacturer accepts no liability for any damage resulting from improper use.		
	 Intended use also means: Reading these Operating Instructions in their entirety Following all instructions and safety rules in this document Carrying out all the specified inspection and maintenance work 		
Requirements for the extrac-	Only operate the welding torch with extraction systems that meet the following requirements:		
tion system	 Extraction capacity (extraction volumetric flow) of at least 70 - 110 m³/h (2472 - 3885 cfh); depending on the welding torch used if the value is lower, there is a risk that the welding fumes will not be ad- 		
	 a higher value means there is a risk that shielding gas will be unintention- ally sucked off the weld seam 		
	 Depending on the length of the extraction hose and the welding torch used, a negative pressure of at least 10 - 18 kPa (100 - 180 mbar) must be generated the shorter and thicker the extraction hose, the smaller the extraction unit can be dimensioned / the less extraction capacity must be provided to ensure that the welding fumes are optimally extracted 		
	- When the altitude increases, the extraction capacity must be reduced ac- cording to the altitude due to the changing environmental conditions (lower air pressure, etc.), for example by opening the air flow regulator of the weld- ing torch or reducing the extraction capacity		
	 in any case, the requirements for extraction must be met Use the Exentometer to determine the current extraction volumetric flow of the welding torch. For information on measuring the extraction volumetric flow with the Exentometer, refer to the Operating Instructions for the Exentometer . 		
	The exact requirements for extraction can be found on the rating plate of the re-		

The exact requirements for extraction can be found on the rating plate of the respective welding torch (see section **Extraction information on the rating plate** on page **10**) and in the technical data.



Rating plate on the welding torch

Extraction information on the rating plate

Fronius		Туре				
		Art.No.				
www.fro	nius.com	Charge	e No.			
((EN ISC	21904-1	EN I	EC 60974-	7/-10 CI.A
		Х (40°C)			
			CO2			
			MIXED			
	Check			Δ pc [kPa]	Q _{v,c} [m³/h]	Q _{v,n} [m³/h]
				11,0	94	57

Example of a rating plate

Extraction information on the rating plate		
Q _{v,n}	Extraction volumetric flow at the front end of the welding torch (= the extraction volumetric flow provided by the welding torch)	
Q _{v,c}	Extraction volumetric flow at the extraction connection of the weld- ing torch (= the extraction volumetric flow that the extraction sys- tem must provide)	
$\triangle_{\sf pc}$	Required negative pressure at the extraction connection of the weld- ing torch (= the negative pressure that the extraction system must generate)	



Available interfaces, functions of the torch trigger

Available interfaces

Up/Down-function



The Up/Down torch has the following functions:

- Change the welding power in synergic operation by means of Up/ Down buttons.
- Error display:
 - In the event of a system error, all the LEDs turn red.
 - In the event of a data communication error, all the LEDs flash red.
- Self-testing in the start-up sequence:
 - All the LEDs briefly light up in succession.

JobMaster-function



The JobMaster welding torch has the following functions:

- The desired parameters are chosen via arrow keys on the welding machine.
- Use the +/- keys to change the selected parameters.
- The display shows the current parameters and value.

Functions of the torch trigger



Function of the torch trigger at switch position 1 (torch trigger pushed halfway down) = LED lights up

NOTE!

An LED on the welding torch does not work for welding torches with optional top torch trigger.



Function of the torch trigger in switch position 2 (torch trigger pressed all the way down) = LED goes out, welding process starts

Commissioning

Commissioning procedure



* Check the clamping nipple before commissioning and every time the inner liner is changed. To do so, carry out a visual inspection:

- Left: Brass clamping nipple with seal ring. You cannot see through the seal ring.
- Right: Silver clamping nipple with visible bushing.

NOTE!

Incorrect or defective clamping nipple in push applications

This results in gas loss and poor weld properties.

- Use brass clamping nipples to minimize gas loss.
- Check that the seal ring is intact.

NOTE!

Incorrect clamping nipple in push-pull applications

Tangled wire and increased abrasion in the inner liner when using a clamping nipple with seal ring.

▶ Use silver clamping nipple to facilitate wirefeed.

Procedure for commissioning welding torches with Fronius System Connector

Perform the following ac	tivities for the correct	commissioning of the we	əlding
torch:			

- **1** Fit the inner liner—Description from page **19**
- 2 Connect the welding torch
 - Description of welding machine from page **32** Description of wirefeeder from page **33**
- Connect the welding torch to the extraction system—Description from page 35
- **4** Measure the extraction capacity—For description, see Operating Instructions Exentometer

If necessary, adjust the extraction capacity:

5 Set the extraction capacity directly on the welding torch—Description from page **36**

	6 Set the extraction capacity with external air flow regulator—Description from page 38
Procedure for commissioning welding torches with Euro con- nection	Perform the following activities for the correct commissioning of the welding torch: I Fit the inner liner - Description of steel inner liner from page 24 - Description of plastic inner liner from page 28
	 Connect the welding torch to the welding machine—Description from page 34 Connect the welding torch to the extraction system—Description from page 35
	4 Measure the extraction capacity—For description, see Operating Instruc- tions Exentometer
	If necessary, adjust the extraction capacity:
	5 Set the extraction capacity directly on the welding torch—Description from page 36
	6 Set the extraction capacity with external air flow regulator—Description from page 38

Fitting inner liner in welding torch with Fronius System Connector

Note on inner liner in gascooled welding torches

NOTE!

Risk due to incorrect wire-guide insert.

This can result in poor-quality weld properties.

- ▶ If a plastic inner liner with a bronze wire-guide insert is used in gas-cooled welding torches instead of a steel inner liner, the power data stated in the technical data of the welding torch must be reduced by 30%.
- In order to operate gas-cooled welding torches at maximum power, replace the 40 mm (1.575 in.) wire-guide insert with a 320 mm (12.598 in.) wire-guide insert.





Lay out the inner liner straight; make sure that no burr protrudes into or out of the inner liner



If the extraction nozzle, gas nozzle, and contact tip are already mounted, remove them



Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped



Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; mark the inner liner at the end of the welding torch.



Pull inner liner 10 cm (3.94 in.) out of the welding torch.



Left inner liner made of steel, right plastic: Cut and deburr the inner liner at the previously marked position; make sure that no burr protrudes into or out of the inner liner



Screw the clamping nipple onto the inner liner up to the stop (the inner liner needs to be visible through the bore in the clamping nipple); push the clamping nipple into the welding torch and secure.

Fitting steel inner liner in welding torch with Euro connection



Lay out the inner liner straight; make sure that no burr protrudes into or out of the inner liner



If already mounted, remove the extraction nozzle, gas nozzle, contact tip, and clamping nipple from the Euro connection.



Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped



Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; mark the inner liner at the end of the welding torch



Pull inner liner 10 cm (3.94 in.) out of the welding torch, cut, and deburr; make sure that no burr protrudes into or out of the inner liner



Screw the clamping nipple onto the inner liner up to the stop; screw the clamping nipple into the welding torch.

Fitting plastic inner liner in welding torch with Euro connection

Note on inner liner in gascooled welding torches

NOTE!

Risk due to incorrect wire-guide insert.

This can result in poor-quality weld properties.

- ▶ If a plastic inner liner with a bronze wire-guide insert is used in gas-cooled welding torches instead of a steel inner liner, the power data stated in the technical data of the welding torch must be reduced by 30%.
- In order to operate gas-cooled welding torches at maximum power, replace the 40 mm (1.575 in.) wire-guide insert with a 320 mm (12.598 in.) wire-guide insert.





Lay out the inner liner straight; ensure that no burr protrudes into or out of the wire-guide insert.



If already mounted, remove the extraction nozzle, gas nozzle, contact tip, and clamping nipple from the Euro connection.



Push the inner liner into the welding torch (*this can be done from both sides) until it protrudes from the front and rear of the welding torch; make sure that the inner liner is not kinked or snapped



Push the inner liner with the contact tip back into the torch body; mount the contact tip, gas nozzle, and extraction nozzle; secure the inner liner in the welding torch

6 Refer to the user documentation of the wirefeeder or welding machine used for instructions on how to correctly cut the inner liner to length.

Connecting welding torches to devices with Fronius System Connector



* only with water-cooled welding torches

chine



Connecting the welding torch to the wirefeeder



* only with water-cooled welding torches

Connecting welding torches to devices with Euro connection



 * only with water-cooled welding torches; connect welding torch to the cooling unit

** the control line must be provided with the required control plug by the customer. The installer is responsible for the correct execution of the work.

Connecting the welding torch to the extraction system

Connecting the welding torch to the extraction system The welding torch can be connected to an external extraction unit as well as to a central extraction system. The welding torch is always connected in the same way.



Connecting welding torch to external extraction unit

* Recommendations for the extraction hose:

- Use Fronius extraction hoses. The design and material composition of Fronius extraction hoses ensure maximum compatibility and leak-tightness.
- Keep the extraction hose as short as possible. The shorter the extraction hose, the less energy the extraction unit has to apply to achieve the required extraction values (for more information on the required extraction values, see section Requirements for the extraction system from page 8 and technical data).

Adjusting the extraction capacity

Setting the extraction capacity on the welding torch The air flow regulator can be opened to reduce the extraction capacity. If the air flow regulator is fully open, this reduces the extraction capacity of the welding torch by 40%.



Left: Air flow regulator closed = extraction capacity 100%; right: Air flow regulator open = extraction capacity 60%

Applications of the air flow regulator:

- When welding in corners or fillet welds, it is possible for the welding fumes to be optimally extracted even with reduced extraction capacity. In this case, it is recommended to open the air flow regulator and thereby reduce the extraction capacity.
- In this case, too high an extraction capacity could lead to unintentional extraction of the shielding gas.



Welding of a fillet weld; air flow regulator open = extraction capacity reduced

When welding on open surfaces (such as square butt welds), it may be necessary to close the air flow regulator and thus use the maximum extraction capacity. This provides the best possible extraction of welding fumes.



Welding of a square butt weld; air flow regulator closed = maximum extraction capacity

WARNING!

Danger from contact with toxic welding fumes.

Serious personal injuries may result.

 Always ensure that all welding fumes are extracted, regardless of the welding task.

Setting extraction capacity with external air flow regulator

Particularly in the case of central extraction systems, it may be necessary to adjust the extraction capacity manually using the optionally available external air flow regulator:

- By completely opening the external air flow regulator, the air flow remains almost unchanged.
- By completely closing the external air flow regulator, the air flow is reduced to a minimum level.





2 After adjusting the air flow, always measure the extraction capacity of the welding torch. Information on measuring the extraction capacity with the Exentometer can be found in the Operating Instructions for the **Exentometer**.

Fault diagnosis, troubleshooting, maintenance

Troubleshooting

Troubleshooting

Porosity	of weld	seam
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Cause:	Extraction too strong	
Remedy:	Reduce extraction	
Extraction	n too low	
Cause:	Holes in the extraction hose	
Remedy:	Replace extraction hose	
Cause:	Displaced extraction unit filter	
Remedy:	Replace extraction unit filter	
Cause:	Air passages otherwise blocked	
Remedy:	Remove blockages	
Cause:	Extraction capacity of extraction unit too low	
Remedy:	Use extraction unit with higher extraction capacity	
No weldin	No welding current	

Power switch of the welding machine switched on, indicators on the welding machine light up, shielding gas present

Cause:	Incorrect ground connection
Remedy:	Establish proper ground connection

Cause: Power cable in the welding torch interrupted Remedy: Replace welding torch

No shielding gas

All other functions present

Cause:	Gas cylinder empty
Remedy:	Change gas cylinder
Cause:	Gas pressure regulator faulty
Remedy:	Replace gas pressure regulator
Cause:	Gas hose kinked, damaged, or not attached
Remedy:	Attach and straighten gas hose. Replace faulty gas hose
Cause:	Welding torch faulty
Remedy:	Replace welding torch
Cause:	Gas solenoid valve faulty
Remedy:	Contact service team (have gas solenoid valve replaced)

No function after pressing torch trigger

Power switch of the welding machine switched on, indicators on the welding machine light up

Cause:	FSC ("Fronius System Connector"—central connector) not inserted up to the stop
Remedy:	Insert FSC up to the stop
Cause: Remedy:	Welding torch or welding torch control line faulty Replace welding torch
Cause: Remedy:	Interconnecting hosepack not properly connected or faulty Connect interconnecting hosepack properly Replace faulty interconnecting hosepack
Cause: Remedy:	Welding machine faulty Notify service team

Poor-quali	ty weld properties
Cause:	Incorrect welding parameters
Remedy:	Correct settings
Cause:	Poor ground earth connection
Remedy:	Establish good contact with workpiece
Cause:	Too little or no shielding gas
Remedy:	Check pressure regulator, gas hose, gas solenoid valve, and welding torch gas connection. For gas-cooled welding torches, check gas seal, use suitable inner liner
Cause:	Welding torch leaks
Remedy:	Replace welding torch
Cause: Remedy:	Excessively large or heavily worn contact tip Change contact tip
Cause:	Incorrect wire alloy or incorrect wire diameter
Remedy:	Check the inserted wire spool/basket-type spool
Cause:	Incorrect wire alloy or incorrect wire diameter
Remedy:	Check the weldability of the parent material
Cause:	Shielding gas not suitable for wire alloy
Remedy:	Use correct shielding gas
Cause:	Unfavorable welding conditions: Shielding gas contaminated (mois- ture, air), inadequate gas shield (weld pool "boiling", draft), impurities in the workpiece (rust, paint, grease)
Remedy:	Optimize welding conditions
Cause:	Shielding gas escaping at clamping nipple
Remedy:	Use the correct clamping nipple
Cause:	Clamping nipple seal ring defective, shielding gas escaping at clamp- ing nipple
Remedy:	Replace clamping nipple to ensure gas tightness
Cause:	Welding spatter in the gas nozzle
Remedy:	Remove welding spatter
Cause:	Turbulence due to excessively high quantity of shielding gas
Remedy:	Reduce quantity of shielding gas; recommended: shielding gas quantity (l/min) = wirespool diameter (mm) x 10 (for example 16 l/min for 1.6 mm wire electrode)
Cause:	Excessively large distance between welding torch and workpiece
Remedy:	Reduce distance between welding torch and workpiece (approx. 10– 15 mm/0.39–0.59 in.)
Cause: Remedy:	Excessively large work angle of the welding torch Reduce work angle of the welding torch

Cause:	Wirefeed components do not correspond to the diameter of the wire electrode/the material of the wire electrode	
Remedy:	Use correct wirefeed components	
Poor wiref	eeding	
Cause:	Depending on the system, brakes in the wirefeeder or welding ma- chine set too tightly	
Remedy:	Set the brakes to be looser	
Cause:	Bore in the contact tip displaced	
Remedy:	Replace contact tip	
Cause:	Faulty inner liner or wire-guide insert	
Remedy:	Check inner liner or wire-guide insert for kinks, soiling, etc. Defective inner liner, replace defective wire-guide insert	
Cause:	Feed rollers not suitable for wire electrode used	
Remedy:	Use suitable feed rollers	
Cause:	Incorrect contact pressure of the feed rollers	
Remedy:	Optimize contact pressure	
Cause:	Feed rollers soiled or damaged	
Remedy:	Clean or replace feed rollers	
Cause:	Inner liner displaced or kinked	
Remedy:	Replace inner liner	
Cause:	Inner liner too short after cutting to length	
Remedy:	Replace inner liner and cut new inner liner to correct length	
Cause:	Wear of the wire electrode due to excessive contact pressure at the feed rollers	
Remedy:	Reduce contact pressure at the feed rollers	
Cause:	Wire electrode soiled or rusted	
Remedy:	Use high-quality wire electrode without soiling	
Cause:	For steel inner liners: use of uncoated inner liner	
Remedy:	Use coated inner liner	
Cause:	Clamping nipple deformed in wire entry and exit area (oval, worn out), shielding gas escaping at clamping nipple	
Remedy:	Replace clamping nipple to ensure gas tightness	
Gas nozzle	e gets very hot	
Cause:	No heat dissipation due to gas nozzle being fitted too loosely	

Remedy: Screw the gas nozzle tightly up to the stop

Welding torch gets very hot		
Cause:	Only in multi-lock welding torches: Union nut of the torch body loose	
Remedy:	Tighten union nut	
Cause:	Welding torch has been operated above the maximum welding cur- rent	
Remedy:	Reduce welding power or use more powerful welding torch	
Cause:	Welding torch is inadequately sized	
Remedy:	Observe duty cycle and load limits	
Cause:	For water-cooled systems only: Coolant flow too low	
Remedy:	Check coolant level, coolant flow, coolant contamination, displace- ment of the hosepack, etc.	
Cause:	Tip of the welding torch too close to the arc	
Remedy:	Increase stick out	
Short servi	ce life of the contact tip	
Cause:	Incorrect feed rollers	
Remedy:	Use correct feed rollers	
Cause:	Wear of the wire electrode due to excessive contact pressure at the feed rollers	
Remedy:	Reduce contact pressure at the feed rollers	
Cause:	Wire electrode soiled/rusted	
Remedy:	Use high-quality wire electrode without soiling	
Cause:	Uncoated wire electrode	
Remedy:	Use wire electrode with suitable coating	
Cause:	Incorrect dimensions of the contact tip	
Remedy:	Use contact tip of the correct size	
Cause:	Duty cycle of the welding torch too long	
Remedy:	Reduce duty cycle or use more powerful welding torch	
Cause:	Contact tip overheats. No heat dissipation due to contact tip being fitted too loosely	
Remedy:	Tighten contact tip	

NOTE!

In CrNi applications, greater contact tip wear may occur due to the surface finish of the CrNi wire electrode.

Malfunctio	on of the torch trigger
Cause:	Faulty plug connections between the welding torch and the welding machine
Remedy:	Establish correct plug connections/send welding machine or welding torch to service team
Cause:	Soiling between torch trigger and torch trigger housing
Remedy:	Remove soiling
Cause:	Faulty control line
Remedy:	Notify service team
Porosity of	f weld seam
Cause:	Spattering in the gas nozzle, causing inadequate gas shield for weld seam
Remedy:	Remove welding spatter
Cause:	Holes in gas hose or imprecise gas hose connection
Remedy:	Replace gas hose
Cause:	O-ring at central connector is cut or faulty
Remedy:	Replace O-ring
Cause:	Moisture/condensate in the gas line
Remedy:	Dry gas line
Cause:	Gas flow too strong or weak
Remedy:	Correct gas flow
Cause:	Inadequate quantity of gas at the start or end of welding
Remedy:	Increase gas pre-flow and gas post-flow
Cause:	Rusted or poor quality wire electrode
Remedy:	Use high-quality wire electrode without soiling
Cause:	Applies to gas-cooled welding torches: Gas leakage with non-isolated inner liners
Remedy:	For gas-cooled welding torches, only use isolated inner liners
Cause:	Too much parting agent applied
Remedy:	Remove excess parting agent/apply less parting agent

Maintenance

Detecting defective wear parts



- 1. Nozzle fitting
 - Burnt outer edges, notches
 - Heavily coated with welding spatter
- 2. Spatter guard (only for water-cooled welding torches)
 - Burnt outer edges, notches
- 3. Extraction nozzle
 - Burnt outer edges, notches
- 4. Contact tip
 - Ground (oval) wire entry and wire exit bores
 - Heavily coated with welding spatter
 - Penetration at the tip of the contact tip
- 5. Gas nozzle
 - Heavily coated with welding spatter
 - Burnt outer edges
 - Notches
- 6. Insulating parts
 - Burnt outer edges, notches

Maintenance at the beginning of each working day



Clean gas nozzle, contact tip, spatter guard (only for water-cooled welding torches), nozzle fitting, and insulating parts from welding splatter, check for damage, and replace damaged parts:



In addition to the steps listed above, prior to starting up water-cooled welding torches always:

- Ensure that all coolant connections are leak-tight.
- Ensure that there is a proper coolant return flow; refer to the user documentation of the cooling unit for more information.

Maintenance every 48 hours: 1 Switch on the extraction system 2 Image: Constraint of the extraction system

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If the air inlets are dirty and / or the air flow regulator can no longer be opened smoothly, clean the air inlets with compressed air:



Ensure that any particles released during cleaning are picked up by the extraction system



Clean the wirefeeding hose with reduced compressed air:



Dismantle the wear parts.

2 Switch on the extraction system



Clean the hosepack; ensure that any particles released during cleaning are picked up by the extraction system.



Recommended—When replacing the inner liner, clean the wear parts before reinstalling the inner liner:

Clean the contact tip, spatter guard, and nozzle fitting with compressed air; ensure that any particles released during cleaning are picked up by the extraction system.



Clean extraction nozzle and gas nozzle with brush.

Technical data

Technical data of water-cooled welding torches

General	Voltage rating (V-peak): - For hand-held welding torches: 113 V - For machine-guided welding torches: 141 V
	Torch trigger technical data: - U _{max} = 5 V - I _{max} = 10 mA
	The torch trigger can only be operated within the limits of the technical data.
	 This product meets the requirements set out in standard EN IEC 60974-7 / - 10 CI. A and EN ISO 21904-1.
	 The welding fume detection efficiency of torch-integrated extraction systems (according to EN ISO 21904-3) depends on several influencing factors, such as Workpiece quality and the associated fume formation during welding Welding process Welding direction (trailing or leading) Welding positions (PA, PC, PF, etc.) Workpiece geometry (open or closed design, etc.) Volumetric flow of the shielding gas Work angle of the welding torch Environmental conditions

MTW Exento	MTW 300i Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
technical data	Welding current at 10 min / 40 °C (104 °F); Values apply with CO_2 and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 300 A	
	Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)	
	Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	95 m ³ /h (1837 cfh)	
	Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	13.5 kPa (135 mbar)	
	Required minimum cooling power according to standard IEC 60974-2	700 W	
	Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)	
	Required minimum coolant pressure p _{min}	3 bar (43 psi)	
	Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)	
	Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)	

MTW 300i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 300 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	100 m ³ /h (3532 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	15 kPa (150 mbar)
Required minimum cooling power according to standard IEC 60974-2	900 W
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p _{min}	3 bar (43 psi)
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTW 300d Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 300 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	95 m ³ /h (1837 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	13.5 kPa (135 mbar)
Required minimum cooling power according to standard IEC 60974-2	700 W
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p _{min}	3 bar (43 psi)
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)

MTW 300d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 300 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	100 m ³ /h (3532 cfh)

MTW 300d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	15 kPa (150 mbar)	
Required minimum cooling power according to standard IEC 60974-2	900 W	
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)	
Required minimum coolant pressure p _{min}	3 bar (43 psi)	
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)	
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)	

MTW 500i Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 400 A 40% D.C. ¹⁾ / 500 A	
Extraction volumetric flow at the front end of the welding torch $\rm Q_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	100 m ³ /h (3532 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11.9 kPa (119 mbar)	
Required minimum cooling power according to standard IEC 60974-2	1000 W	
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)	
Required minimum coolant pressure p _{min}	3 bar (43 psi)	
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)	
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)	

MTW 500i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 400 A 40% D.C. ¹⁾ / 500 A	
Extraction volumetric flow at the front end of the welding torch $\rm Q_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	105 m ³ /h (3709 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	14 kPa (140 mbar)	
Required minimum cooling power according to standard IEC 60974-2	1200 W	
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)	
Required minimum coolant pressure p _{min}	3 bar (43 psi)	

MTW 500i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)	
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

MTW 500d Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)	
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 400 A 40% D.C. ¹⁾ / 500 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	100 m ³ /h (3532 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11.9 kPa (119 mbar)
Required minimum cooling power according to standard IEC 60974-2	1000 W
Required minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)
Required minimum coolant pressure p _{min}	3 bar (43 psi)
Maximum permissible coolant pressure p _{max}	5.5 bar (79 psi)
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)

MTW 500d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ and mixed gas as shielding gas (EN ISO 14175)	100% D.C. ¹⁾ / 400 A 40% D.C. ¹⁾ / 500 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	105 m ³ /h (3709 cfh)	
Required negative pressure Δp_c of the extraction system (EN IEC ISO 21904-1)	14 kPa (140 mbar)	
Minimum cooling power according to standard IEC 60974-2	1200 W	
Minimum coolant flow Q _{min}	1 l/min (0.26 gal. [US]/min)	
Minimum coolant pressure p _{min}	3 bar (43 psi)	
Maximum coolant pressure p _{max}	5.5 bar (79 psi)	
Permissible wire electrodes (diameter)	1 - 1.6 mm (0.039 - 0.063 in.)	

1) ED = Duty cycle; after-run time of extraction system after end of welding = 30 seconds

Technical data of gascooled welding torches

General	Voltage rating (V-peak): - For hand-held welding torches: 113 V - For machine-guided welding torches: 141 V
	Torch trigger technical data: - U _{max} = 5 V - I _{max} = 10 mA
	The torch trigger can only be operated within the limits of the technical data.
	This product meets the requirements set out in standard - EN IEC 60974-7 / - 10 CI. A and - EN ISO 21904-1.
	 The welding fume detection efficiency of torch-integrated extraction systems (according to EN ISO 21904-3) depends on several influencing factors, such as: Workpiece quality and the associated fume formation during welding Welding process Welding direction (trailing or leading) Welding positions (PA, PC, PF, etc.) Workpiece geometry (open or closed design, etc.) Volumetric flow of the shielding gas Work angle of the welding torch Environmental conditions

MTG Exento	MTG 250i Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)	
technical data	Welding current at 10 min / 40 °C (104 °F); Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 250 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 170 A
	Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 250 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 170 A
	Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)
	Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	70 m ³ /h (2472 cfh)
	Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10 kPa (100 mbar)
	Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)
	MTG 250i Exento Welding torch length = 4.5 m (14 ft. 9	.17 in.)
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Welding current at 10 min / 40 °C (104 °F);	40% D.C. ¹⁾ / 250 A
Values apply with CO ₂ as shielding gas	60% D.C. ¹⁾ / 210 A
(EN ISO 14175)	100% D.C. ¹⁾ / 170 A

MTG 250i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 250 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 170 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	80 m ³ /h (2526 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.8 kPa (108 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)	

MTG 250d Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 250 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 170 A	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 200 A 60% D.C. ¹⁾ / 160 A 100% D.C. ¹⁾ / 120 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	70 m ³ /h (2472 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10 kPa (100 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)	

MTG 250d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 250 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 170 A	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 200 A 60% D.C. ¹⁾ / 160 A 100% D.C. ¹⁾ / 120 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	52 m ³ /h (1837 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	80 m ³ /h (2526 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.8 kPa (108 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.2 mm (0.032 - 0.047 in.)	

MTG 320i Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A	
Extraction volumetric flow at the front end of the welding torch $\rm Q_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	90 m ³ /h (3179 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)	

MTG 320i Exento | Welding torch length = 4.5 m (14 ft. 9.17 in.)

Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	94 m ³ /h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 320d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)

Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 260 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 160 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch $Q_{v,c}$ (EN IEC ISO 21904-1)	90 m ³ /h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)

MTG 320d Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)	
MTG 320d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		

Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	40% D.C. ¹⁾ / 260 A 60% D.C. ¹⁾ / 210 A 100% D.C. ¹⁾ / 160 A
Extraction volumetric flow at the front end of the welding torch $\rm Q_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	94 m ³ /h (3320 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400i Exento Welding torch length = 3.5 m (11 ft. 5.8 in.)		
Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	90 m ³ /h (3179 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)	

	MTG 400i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)	
	Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A
	Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A
	Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{\rm v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)

MTG 400i Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	94 m ³ /h (3320 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)	

MTG 400d Exento | Welding torch length = 3.5 m (11 ft. 5.8 in.)

Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	90 m ³ /h (3179 cfh)
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	10.2 kPa (102 mbar)
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)

MTG 400d Exento Welding torch length = 4.5 m (14 ft. 9.17 in.)		
Welding current at 10 min / 40 °C (104 °F): Values apply with CO ₂ as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 400 A 60% D.C. ¹⁾ / 320 A 100% D.C. ¹⁾ / 260 A	
Welding current at 10 min / 40 °C (104 °F); Values apply with mixed gas as shielding gas (EN ISO 14175)	30% D.C. ¹⁾ / 320 A 60% D.C. ¹⁾ / 260 A 100% D.C. ¹⁾ / 210 A	
Extraction volumetric flow at the front end of the welding torch ${\rm Q}_{v,n}$ (EN IEC ISO 21904-1)	57 m ³ /h (2013 cfh)	
Extraction volumetric flow at the extraction connection of the welding torch ${\rm Q}_{\rm v,c}$ (EN IEC ISO 21904-1)	94 m ³ /h (3320 cfh)	
Required negative pressure Δp_c at the extraction connection of the welding torch (EN IEC ISO 21904-1)	11 kPa (110 mbar)	
Permissible wire electrodes (diameter)	0.8 - 1.6 mm (0.032 - 0.063 in.)	

1) ED = Duty cycle; after-run time of extraction system after end of welding = 30 seconds



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