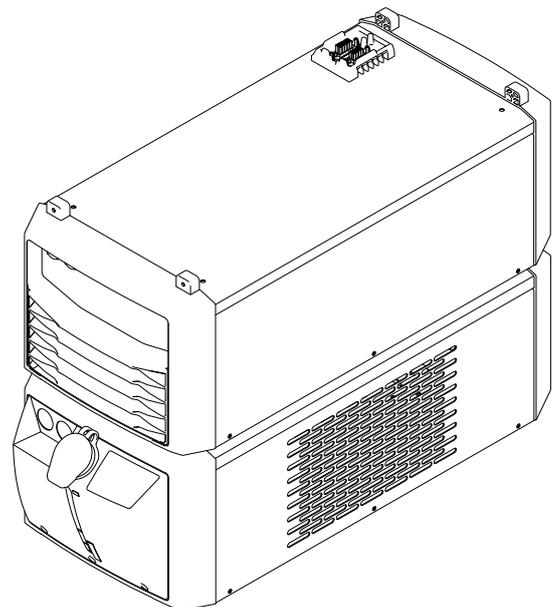


Operating Instructions

CU 2000i Pro /MC



EN | Operating Instructions



Contents

Safety rules.....	5
Explanation of safety notices	5
General.....	5
Proper use	6
Environmental conditions.....	6
Obligations of the operator.....	6
Obligations of personnel.....	6
Mains connection.....	7
Protecting yourself and others.....	7
Noise emission values	8
Danger from toxic gases and vapours.....	8
Danger from flying sparks.....	8
Risks from mains current and welding current.....	9
Meandering welding currents	10
EMC Device Classifications.....	10
EMC measures.....	10
EMF measures.....	11
Specific hazards.....	11
Requirement for the shielding gas.....	12
Danger from shielding gas cylinders.....	13
Danger from escaping shielding gas.....	13
Safety measures at the installation location and during transport.....	13
Safety measures in normal operation.....	14
Commissioning, maintenance and repair.....	15
Safety inspection.....	15
Disposal.....	15
Safety symbols.....	15
Data security.....	16
Copyright.....	16
General information	17
General.....	19
Device concept.....	19
Validity of "General Delivery and Payment Conditions".....	19
Coolant pump service life in cooling units for multi-shift operation	19
General.....	19
Information about the coolant.....	19
Warning notices on the device.....	20
Scope of supply and options.....	21
Scope of supply.....	21
OPT CU coolant filter.....	21
Function of the installed sensors	22
Function of the CU Flow-Thermo-Sensor.....	22
Function of the CU Level-Sensor	22
Connections and mechanical components	23
Connections and mechanical components	25
Connections and mechanical components: CU 2000i Pro /MC main part	25
Connections and mechanical components: CU 2000i Pro /MC cooling part	26
Installation and commissioning	27
Before installation and commissioning	29
Safety	29
Setup regulations.....	29
Information about the coolant.....	30
Guarantee provisions regarding the coolant pump.....	30
Proper use	30
Securing the cooling unit and power source to the trolley/upright console.....	31

Safety	31
Securing the cooling unit and power source to the trolley	31
Securing the cooling unit and power source to an upright console	32
Securing the cooling unit and power source to two upright consoles.....	33
Connect the coolant hoses to the cooling unit	34
Safety	34
Connecting the coolant hoses to the cooling unit.....	34
Filling and starting up the cooling unit	37
Filling the cooling unit.....	37
Starting up the cooling unit.....	38
Operating modes	38
Recommended application of the operating modes.....	39
Disconnecting the system components	41
Disconnecting the system components.....	43
Safety	43
Disconnecting the system components.....	43
Troubleshooting	45
Troubleshooting	47
Safety	47
Troubleshooting	47
Care, maintenance and disposal	49
Care, maintenance and disposal.....	51
Safety	51
General.....	51
Symbols for care and maintenance of the cooling unit.....	52
Maintenance intervals, maintenance work	52
Gas purging the cooler	53
Changing the coolant.....	54
Disposal.....	56
Technical data	57
Technical data.....	59
General	59
CU 2000i Pro /MC.....	59

Safety rules

Explanation of safety notices

DANGER!

Indicates immediate danger.

- ▶ If not avoided, death or serious injury will result.
-

WARNING!

Indicates a potentially hazardous situation.

- ▶ If not avoided, death or serious injury may result.
-

CAUTION!

Indicates a situation where damage or injury could occur.

- ▶ If not avoided, minor injury and/or damage to property may result.
-

NOTE!

Indicates a risk of flawed results and possible damage to the equipment.

General

The device is manufactured using state-of-the-art technology and according to recognised safety standards. If used incorrectly or misused, however, it can cause:

- injury or death to the operator or a third party,
 - damage to the device and other material assets belonging to the operating company,
 - inefficient operation of the device.
-

All persons involved in commissioning, operating, maintaining and servicing the device must:

- be suitably qualified,
 - have sufficient knowledge of welding and
 - read and follow these operating instructions carefully.
-

The operating instructions must always be at hand wherever the device is being used. In addition to the operating instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

All safety and danger notices on the device

- must be in a legible state,
 - must not be damaged,
 - must not be removed,
 - must not be covered, pasted or painted over.
-

For the location of the safety and danger notices on the device, refer to the section headed "General" in the operating instructions for the device.

Before switching on the device, rectify any faults that could compromise safety.

This is for your personal safety!

Proper use

The device is to be used exclusively for its intended purpose.

The device is intended solely for the welding processes specified on the rating plate.

Any use above and beyond this purpose is deemed improper. The manufacturer shall not be held liable for any damage arising from such usage.

Proper use includes:

- carefully reading and following all the instructions given in the operating instructions
- studying and obeying all safety and danger notices carefully
- performing all stipulated inspection and maintenance work.

Never use the device for the following purposes:

- Thawing out pipes
- Charging batteries
- Starting engines

The device is designed for use in industry and the workshop. The manufacturer accepts no responsibility for any damage caused through use in a domestic setting.

The manufacturer likewise accepts no liability for inadequate or incorrect results.

Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer shall not be held liable for any damage arising from such usage.

Ambient temperature range:

- during operation: -10 °C to + 40 °C (14 °F to 104 °F)
- during transport and storage: -20 °C to +55 °C (-4 °F to 131 °F)

Relative humidity:

- up to 50% at 40 °C (104 °F)
- up to 90% at 20 °C (68 °F)

The surrounding air must be free from dust, acids, corrosive gases or substances, etc.

Can be used at altitudes of up to 2000 m (6561 ft. 8.16 in.)

Obligations of the operator

The operator must only allow persons to work with the device who:

- are familiar with the fundamental instructions regarding safety at work and accident prevention and have been instructed in how to use the device
- have read and understood these operating instructions, especially the section "safety rules", and have confirmed as much with their signatures
- are trained to produce the required results.

Checks must be carried out at regular intervals to ensure that operators are working in a safety-conscious manner.

Obligations of personnel

Before using the device, all persons instructed to do so undertake:

- to observe the basic instructions regarding safety at work and accident prevention,
 - to read these operating instructions, especially the "Safety rules" section and sign to confirm that they have understood them and will follow them.
-

Before leaving the workplace, ensure that people or property cannot come to any harm in your absence.

Mains connection

Devices with a higher rating may affect the energy quality of the mains due to their current consumption.

This may affect a number device types in terms of:

- Connection restrictions
- Criteria with regard to the maximum permissible mains impedance ^{*)}
- Criteria with regard to the minimum short-circuit power requirement ^{*)}

^{*)} at the interface with the public grid
see "Technical data"

In this case, the plant operator or the person using the device should check whether the device may be connected, where appropriate by discussing the matter with the power supply company.

IMPORTANT! Ensure that the mains connection is earthed properly

Protecting yourself and others

Anyone working with the device exposes themselves to numerous risks, e.g.

- flying sparks and hot pieces of metal
- Arc radiation, which can damage eyes and skin
- Hazardous electromagnetic fields, which can endanger the lives of those using cardiac pacemakers
- Risk of electrocution from mains current and welding current
- Greater noise pollution
- Harmful welding fumes and gases

Suitable protective clothing must be worn when working with the device. The protective clothing must have the following properties:

- Flame-resistant
- Insulating and dry
- Covers the whole body, is undamaged and in good condition
- Safety helmet
- Trousers with no turn-ups

Protective clothing refers to a variety of different items. Operators should:

- Protect eyes and face from UV rays, heat and sparks using a protective visor and regulation filter
- Wear regulation protective goggles with side protection behind the protective visor
- Wear stout footwear that provides insulation even in wet conditions
- Protect the hands with suitable gloves (electrically insulated and providing protection against heat)
- Wear ear protection to reduce the harmful effects of noise and to prevent injury

Keep all persons, especially children, out of the working area while any devices are in operation or welding is in progress. If, however, there are people in the vicinity:

- Make them aware of all the dangers (risk of dazzling by the arc, injury from flying sparks, harmful welding fumes, noise, possible risks from mains current and welding current, etc.)
- Provide suitable protective equipment
- Alternatively, erect suitable safety screens/curtains.

Noise emission values

The device generates a maximum sound power level of <80 dB(A) (ref. 1pW) when idling and in the cooling phase following operation at the maximum permissible operating point under maximum rated load conditions according to EN 60974-1.

It is not possible to provide a workplace-related emission value during welding (or cutting) as this is influenced by both the process and the environment. All manner of different welding parameters come into play, including the welding process (MIG/MAG, TIG welding), the type of power selected (DC or AC), the power range, the type of weld metal, the resonance characteristics of the workpiece, the workplace environment, etc.

Danger from toxic gases and vapours

The fumes produced during welding contain harmful gases and vapours.

Welding fumes contain substances that cause cancer, as stated in Monograph 118 of the International Agency for Research on Cancer.

Use at-source extraction and a room extraction system.
If necessary, use a welding torch with an integrated extraction device.

Keep your face away from welding fumes and gases.

Fumes and hazardous gases

- must not be breathed in
- must be extracted from the working area using appropriate methods.

Ensure an adequate supply of fresh air. Ensure that there is a ventilation rate of at least 20 m³ per hour at all times.

Otherwise, a welding helmet with an air supply must be worn.

If there is any doubt about whether the extraction capacity is sufficient, the measured toxic emission values should be compared with the permissible limit values.

The following components are responsible, amongst other things, for the degree of toxicity of welding fumes:

- Metals used for the workpiece
- Electrodes
- Coatings
- Cleaners, degreasers, etc.
- Welding process used

The relevant material safety data sheets and manufacturer's specifications for the listed components should therefore be studied carefully.

Recommendations for trade fair scenarios, risk management measures and for identifying working conditions can be found on the European Welding Association website under Health & Safety (<https://european-welding.org>).

Flammable vapours (e.g. solvent fumes) should be kept away from the arc's radiation area.

Close the shielding gas cylinder valve or main gas supply if no welding is taking place.

Danger from flying sparks

Flying sparks may cause fires or explosions.

Never weld close to flammable materials.

Flammable materials must be at least 11 metres (36 ft. 1.07 in.) away from the arc, or alternatively covered with an approved cover.

A suitable, tested fire extinguisher must be available and ready for use.

Sparks and pieces of hot metal may also get into adjacent areas through small gaps or openings. Take appropriate precautions to prevent any danger of injury or fire.

Welding must not be performed in areas that are subject to fire or explosion or near sealed tanks, vessels or pipes unless these have been prepared in accordance with the relevant national and international standards.

Do not carry out welding on containers that are being or have been used to store gases, propellants, mineral oils or similar products. Residues pose an explosive hazard.

Risks from mains current and welding current

An electric shock is potentially life threatening and can be fatal.

Do not touch live parts either inside or outside the device.

During MIG/MAG welding and TIG welding, the welding wire, the wire spool, the feed rollers and all pieces of metal that are in contact with the welding wire are live.

Always set the wirefeeder up on a sufficiently insulated surface or use a suitable, insulated wirefeeder holder.

Make sure that you and others are protected with an adequately insulated, dry base or cover for the earth or ground potential. This base or cover must extend over the entire area between the body and the earth or ground potential.

All cables and leads must be secured, undamaged, insulated and adequately dimensioned. Replace loose connections and scorched, damaged, or inadequately dimensioned cables and leads immediately.

Use the handle to ensure the power connections are tight before every use. In the case of power cables with a bayonet connector, rotate the power cable around the longitudinal axis by at least 180° and pretension.

Do not wrap cables or leads around the body or parts of the body.

The electrode (rod electrode, tungsten electrode, welding wire, etc.) must

- never be immersed in liquid for cooling
 - never be touched when the welding system is switched on.
-

Double the open circuit voltage of a welding system can occur between the welding electrodes of two welding systems. Touching the potentials of both electrodes at the same time may be fatal under certain circumstances.

Arrange for the mains cable to be checked regularly by a qualified electrician to ensure the ground conductor is functioning properly.

Protection class I devices require a mains supply with ground conductor and a connector system with ground conductor contact for proper operation.

Operation of the device on a mains supply without ground conductor and on a socket without ground conductor contact is only permitted if all national regulations for protective separation are observed.

Otherwise, this is considered gross negligence. The manufacturer shall not be held liable for any damage arising from such usage.

If necessary, provide adequate earthing for the workpiece.

Switch off unused devices.

Wear a safety harness if working at height.

Before working on the device, switch it off and pull out the mains plug.

Attach a clearly legible and easy-to-understand warning sign to the device to prevent anyone from plugging the mains plug back in and switching it on again.

After opening the device:

- Discharge all live components
 - Ensure that all components in the device are de-energised.
-

If work on live parts is required, have a second person switch off the main switch at the right moment.

Meandering welding currents

If the following instructions are ignored, meandering welding currents can develop with the following consequences:

- Fire hazard
 - Overheating of parts connected to the workpiece
 - Damage to ground conductors
 - Damage to device and other electrical equipment
-

Ensure that the workpiece is held securely by the workpiece clamp.

Attach the workpiece clamp as close as possible to the area that is to be welded.

Position the device with sufficient insulation against electrically conductive environments, such as insulation against conductive floor or insulation to conductive racks.

If power distribution boards, twin-head mounts, etc., are being used, note the following: The electrode of the welding torch / electrode holder that is not used is also live. Make sure that the welding torch / electrode holder that is not used is kept sufficiently insulated.

In the case of automated MIG/MAG applications, ensure that only an insulated wire electrode is routed from the welding wire drum, large wirefeeder spool or wirespool to the wirefeeder.

EMC Device Classifications

Devices in emission class A:

- Are only designed for use in industrial settings
 - Can cause line-bound and radiated interference in other areas
-

Devices in emission class B:

- Satisfy the emissions criteria for residential and industrial areas. This is also true for residential areas in which the energy is supplied from the public low-voltage mains.
-

EMC device classification as per the rating plate or technical data.

EMC measures

In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g. when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers).

If this is the case, then the operator is obliged to take appropriate action to rectify the situation.

Check and evaluate the immunity to interference of nearby devices according to national and international regulations. Examples of equipment that may be susceptible to interference from the device include:

- Safety devices
 - Network, signal and data transfer lines
 - IT and telecommunications devices
 - Measuring and calibrating devices
-

Supporting measures for avoidance of EMC problems:

1. Mains supply
 - If electromagnetic interference arises despite the correct mains connection, additional measures are necessary (e.g. use of a suitable line filter)
 2. Welding power-leads
 - must be kept as short as possible
 - must be laid close together (to avoid EMF problems)
 - must be kept well apart from other leads
 3. Equipotential bonding
 4. Earthing of the workpiece
 - If necessary, establish an earth connection using suitable capacitors.
 5. Shield, if necessary
 - Shield other devices nearby
 - Shield the entire welding installation
-

EMF measures

Electromagnetic fields may pose as yet unknown risks to health:

- Effects on the health of persons in the vicinity, e.g. those with pacemakers and hearing aids
 - Individuals with pacemakers must seek advice from their doctor before approaching the device or any welding that is in progress
 - For safety reasons, maintain as large a distance as possible between the welding power-leads and the head/torso of the welder
 - Do not carry welding power-leads and hosepacks over the shoulders or wind them around any part of the body
-

Specific hazards

Keep hands, hair, clothing and tools away from moving parts. For example:

- Fans
 - Cogs
 - Rollers
 - Shafts
 - Wire spools and welding wires
-

Do not reach into the rotating cogs of the wire drive or into rotating drive components.

Covers and side panels may only be opened/removed while maintenance or repair work is being carried out.

During operation

- Ensure that all covers are closed and all side panels are fitted properly.
 - Keep all covers and side panels closed.
-

The welding wire emerging from the welding torch poses a high risk of injury (piercing of the hand, injuries to the face and eyes, etc.).

Therefore, always keep the welding torch facing away from the body (devices with wirefeeder) and wear suitable protective goggles.

Never touch the workpiece during or after welding - risk of burns.

Slag can jump off cooling workpieces. The specified protective equipment must therefore also be worn when reworking workpieces, and steps must be taken to ensure that other people are also adequately protected.

Welding torches and other parts with a high operating temperature must be allowed to cool down before handling.

Special provisions apply in areas at risk of fire or explosion
- observe relevant national and international regulations.

Welding machines for work in areas with increased electrical risk (e.g. near boilers) must carry the 'Safety' sign. However, the welding machine must not be located in such areas.

Risk of scalding from escaping coolant. Switch off cooling unit before disconnecting coolant flow or return lines.

Observe the information on the coolant safety data sheet when handling coolant. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

Use only suitable load-carrying equipment supplied by the manufacturer when transporting devices by crane.

- Hook chains or ropes onto all suspension points provided on the suitable load-carrying equipment.
 - Chains or ropes must be at the smallest angle possible to the vertical.
 - Remove gas cylinder and wirefeeder (MIG/MAG and TIG devices).
-

If the wirefeeder is attached to a crane holder during welding, always use a suitable, insulated wirefeeder hoisting attachment (MIG/MAG and TIG devices).

Welding with the device during crane transport is only permitted if this is clearly stated in the intended use of the device.

If the device has a carrying strap or handle, this is intended solely for carrying by hand. The carrying strap is not to be used if transporting with a crane, counter-balanced lift truck or other mechanical hoist.

All lifting tackle (straps, handles, chains, etc.) used in connection with the device or its components must be tested regularly (e.g. for mechanical damage, corrosion or changes caused by other environmental factors).

The testing interval and scope of testing must comply with applicable national standards and directives as a minimum.

Odourless and colourless shielding gas may escape unnoticed if an adapter is used for the shielding gas connection. Prior to assembly, seal the device-side thread of the adapter for the shielding gas connection using suitable Teflon tape.

Requirement for the shielding gas

Especially with ring lines, contaminated shielding gas can cause damage to equipment and reduce welding quality.

Meet the following requirements regarding shielding gas quality:

- Solid particle size < 40 µm
 - Pressure condensation point < -20 °C
 - Max. oil content < 25 mg/m³
-

Use filters if necessary.

Danger from shielding gas cylinders

Shielding gas cylinders contain gas under pressure and can explode if damaged. As the shielding gas cylinders are part of the welding equipment, they must be handled with the greatest of care.

Protect shielding gas cylinders containing compressed gas from excessive heat, mechanical impact, slag, naked flames, sparks and arcs.

Mount the shielding gas cylinders vertically and secure according to instructions to prevent them falling over.

Keep the shielding gas cylinders well away from any welding or other electrical circuits.

Never hang a welding torch on a shielding gas cylinder.

Never touch a shielding gas cylinder with an electrode.

Risk of explosion - never attempt to weld a pressurised shielding gas cylinder.

Only use shielding gas cylinders suitable for the application in hand, along with the correct and appropriate accessories (regulator, hoses and fittings). Only use shielding gas cylinders and accessories that are in good condition.

Turn your face to one side when opening the valve of a shielding gas cylinder.

Close the shielding gas cylinder valve if no welding is taking place.

If the shielding gas cylinder is not connected, leave the valve cap in place on the cylinder.

The manufacturer's instructions must be observed as well as applicable national and international regulations for shielding gas cylinders and accessories.

Danger from escaping shielding gas

Risk of suffocation from the uncontrolled escape of shielding gas

Shielding gas is colourless and odourless and, in the event of a leak, can displace the oxygen in the ambient air.

- Ensure an adequate supply of fresh air with a ventilation rate of at least 20 m³/hour.
 - Observe safety and maintenance instructions on the shielding gas cylinder or the main gas supply.
 - Close the shielding gas cylinder valve or main gas supply if no welding is taking place.
 - Check the shielding gas cylinder or main gas supply for uncontrolled gas leakage before every start-up.
-

Safety measures at the installation location and during transport

A device toppling over could easily kill someone. Place the device on a solid, level surface such that it remains stable

- The maximum permissible tilt angle is 10°.
-

Special regulations apply in rooms at risk of fire or explosion

- Observe relevant national and international regulations.
-

Use internal directives and checks to ensure that the workplace environment is always clean and clearly laid out.

Only set up and operate the device in accordance with the degree of protection shown on the rating plate.

When setting up the device, ensure there is an all-round clearance of 0.5 m (1 ft. 7.69 in.) to ensure that cooling air can flow in and out freely.

When transporting the device, observe the relevant national and local guidelines and accident prevention regulations. This applies especially to guidelines regarding the risks arising during transport.

Do not lift or transport operational devices. Switch off and disconnect devices from the grid before transport or lifting.

Before transporting the device, allow coolant to drain completely and detach the following components:

- Wirefeeder
 - Wirespool
 - Shielding gas cylinder
-

After transporting the device, the device must be visually inspected for damage before commissioning. Any damage must be repaired by trained service technicians before commissioning the device.

**Safety measures
in normal operation**

Only operate the device when all safety devices are fully functional. If the safety devices are not fully functional, there is a risk of

- injury or death to the operator or a third party
 - damage to the device and other material assets belonging to the operator
 - inefficient operation of the device
-

Any safety devices that are not functioning properly must be repaired before switching on the device.

Never bypass or disable safety devices.

Before switching on the device, ensure that no one is likely to be endangered.

Check the device at least once a week for obvious damage and proper functioning of safety devices.

Always fasten the shielding gas cylinder securely and remove it beforehand if the device is to be transported by crane.

Only the manufacturer's original coolant is suitable for use with our devices due to its properties (electrical conductivity, anti-freeze agent, material compatibility, flammability, etc.).

Only use suitable original coolant from the manufacturer.

Do not mix the manufacturer's original coolant with other coolants.

Only connect the manufacturer's system components to the cooling circuit.

The manufacturer accepts no liability for damage resulting from use of other system components or a different coolant. In addition, all warranty claims will be forfeited.

Cooling Liquid FCL 10/20 does not ignite. The ethanol-based coolant can ignite under certain conditions. Transport the coolant only in its original, sealed containers and keep well away from any sources of ignition.

Used coolant must be disposed of properly in accordance with the relevant national and international regulations. The coolant safety data sheet may be obtained from your service centre or downloaded from the manufacturer's website.

Check the coolant level before starting to weld, while the system is still cool.

Commissioning, maintenance and repair

It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made of them, or that they satisfy safety requirements.

- Use only original spare and wearing parts (also applies to standard parts).
- Do not carry out any modifications, alterations, etc. to the device without the manufacturer's consent.
- Components that are not in perfect condition must be replaced immediately.
- When ordering, please give the exact designation and part number as shown in the spare parts list, as well as the serial number of your device.

The housing screws provide the ground conductor connection for earthing the housing parts.

Only use original housing screws in the correct number and tightened to the specified torque.

Safety inspection

The manufacturer recommends that a safety inspection of the device be performed at least once every 12 months.

The manufacturer recommends that the welding system be calibrated during the same 12-month period.

A safety inspection should be carried out by a qualified electrician

- after any changes are made
- after any additional parts are installed, or after any conversions
- after repair, care and maintenance are carried out
- at least every twelve months.

For safety inspections, follow the appropriate national and international standards and directives.

Further details on safety inspection and calibration can be obtained from your service centre. They will provide you with any documents you may require, on request.

Disposal

Waste electrical and electronic equipment must be collected separately and recycled in an environmentally responsible manner in accordance with the EU Directive and national law. Used equipment must be returned to the distributor or through a local, authorised collection and disposal system. Correct disposal of the used device promotes sustainable recycling of resources and prevents negative effects on health and the environment.

Packaging materials

- Collect separately
- Observe locally valid regulations
- Compress the cardboard box to reduce volume

Safety symbols

Devices with the CE mark satisfy the essential requirements of the low-voltage and electromagnetic compatibility directives (e.g. relevant product standards of the EN 60 974 series).

Fronius International GmbH hereby declares that the device is compliant with Directive 2014/53/EU. The full text on the EU Declaration of Conformity can be found at the following address: <http://www.fronius.com>

Devices marked with the CSA test mark satisfy the requirements of the relevant standards for Canada and the USA.

Data security

With regard to data security, the user is responsible for:

- backing up any changes made to the factory settings
- saving and retaining personal settings

Copyright

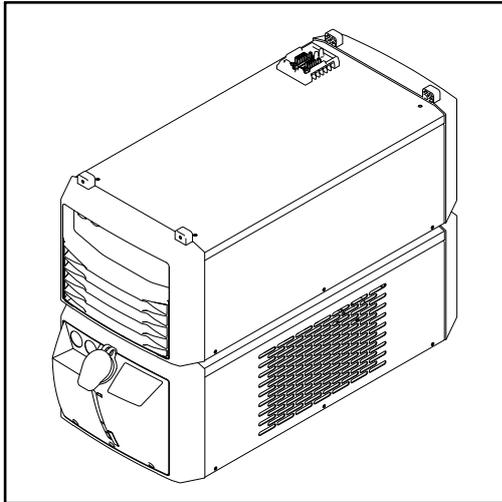
Copyright of these operating instructions remains with the manufacturer.

Text and illustrations were accurate at the time of printing, subject to change. We are grateful for suggestions for improvement and information regarding any discrepancies in the operating instructions.

General information

General

Device concept



The cooling unit consists of two parts:

- Main part, see [Connections and mechanical components: CU 2000i Pro /MC main part](#) on page [25](#)
- Cooling part, see [Connections and mechanical components: CU 2000i Pro /MC cooling part](#) on page [26](#)

The cooling unit and the power source form a unit. As with the standalone power source, the power source/cooling unit combination can be mounted on the trolley.

Validity of "General Delivery and Payment Conditions"

With regard to cooling units, the "General Delivery and Payment Conditions" according to the price list only apply under the conditions listed below:

- for multi-shift operation
 - if only original coolant from the manufacturer is used
 - with regular maintenance and regular change of coolant
-

Coolant pump service life in cooling units for multi-shift operation

Depending on the operating mode used, the coolant pump will have a service life of approx. 30,000 operating hours assuming it is used properly. After the end of its nominal service life, the coolant pump may develop a fault. To avoid a lengthy period of work disruption, the pump should be scheduled for replacement after approx. 30,000 operating hours.

General

As a result of firmware updates, you may find that your device has certain functions that are not described in these operating instructions, or vice versa. Certain illustrations may also differ slightly from the actual controls on your device, but these controls function in exactly the same way.

Information about the coolant

CAUTION!

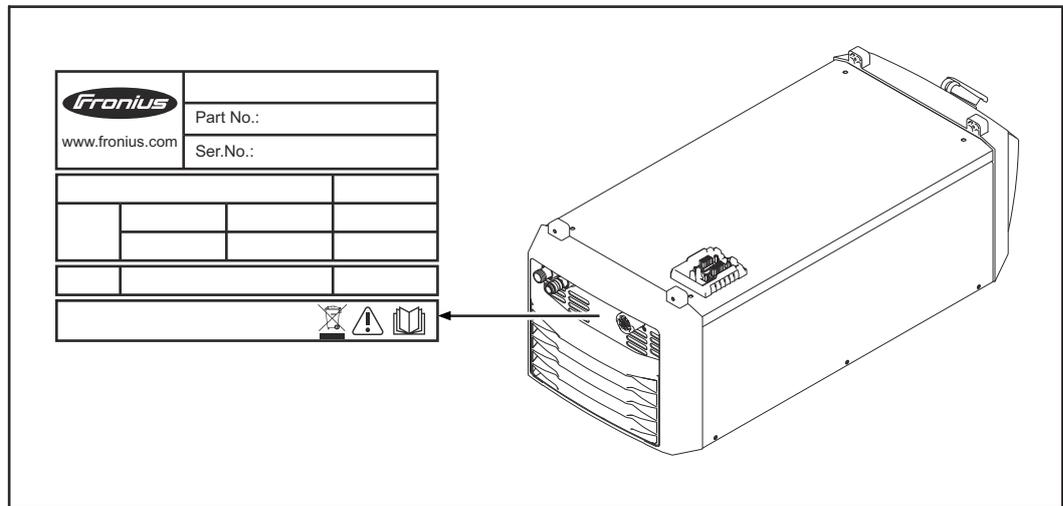
Danger from using non-permitted coolant.

This can result in serious damage to property.

- ▶ Only use coolant available from the manufacturer.
 - ▶ Do not mix different coolants.
 - ▶ When changing the coolant, make sure all the coolant is replaced.
 - ▶ When switching from ethanol-based coolant to FCL 10 coolant, Change Kit FCL10 must be used and the instructions provided must be followed.
-

Warning notices on the device

The cooling unit is fitted with safety symbols and a rating plate. The rating plate and safety symbols must not be removed or painted over. The symbols warn against operating the equipment incorrectly, as this may result in serious injury and damage.



Welding is dangerous. The following basic requirements must be met to ensure the equipment is used properly:

- Welders must be sufficiently qualified
- Suitable protective equipment must be used
- All persons not involved must be kept at a safe distance from the cooling unit and the welding process



Do not use the functions described here until you have fully read and understood the following documents:

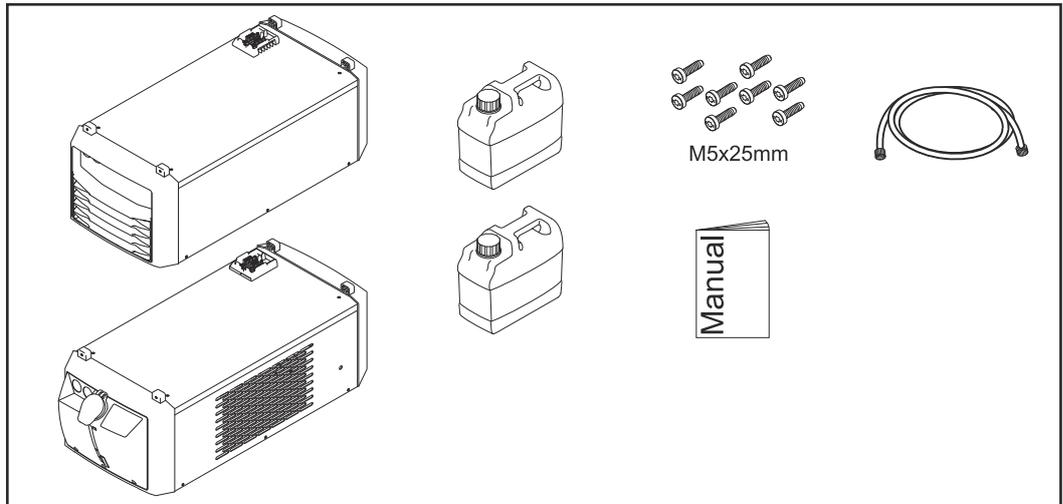
- this document
- all documents relating to the system components, especially the safety rules



Do not dispose of used devices with domestic waste. Dispose of them according to the safety rules.

Scope of supply and options

Scope of supply



OPT CU coolant filter

The coolant filter is equipped with a CrNi screen; its function is to filter dirt particles above 100 micrometres in size from the coolant. This ensures that no coarse dirt particles can pass into the coolant circuit. The coolant filter is fitted to the coolant return connection on the cooling unit.

The coolant filter is available as an option for the cooling unit.

Function of the installed sensors

Function of the CU Flow-Thermo-Sensor

The Flow-Thermo-Sensor (coolant temperature monitoring and flow monitoring) is installed in the cooling unit at the factory.

Coolant temperature monitoring

A temperature sensor monitors the coolant return temperature during welding.

How it works:

- If the temperature of the coolant reaches 68 °C (154.4 °F)
 - the power source outputs a warning
 - the welding current is not interrupted
 - the cooling unit remains operational

- If the temperature of the coolant exceeds 70 °C (158 °F)
 - the power source outputs an error message
 - the temperature sensor interrupts the welding current
 - the cooling unit remains operational

- The temperature sensor restores the welding current when the coolant temperature falls to 65 °C (149 °F)

Flow monitoring

A flow sensor monitors the coolant flow during welding.

How it works:

- If the coolant flow falls to between 1 and 0.7 l/min (0.26 - 0.18 gal./min [US])
 - the power source outputs a warning
 - the welding current is not interrupted
 - the cooling unit remains operational

- If the coolant flow drops below 0.7 l/min (0.18 gal./min [US])
 - the power source outputs an error message
 - flow monitoring interrupts the welding current
 - the cooling unit is switched off

Function of the CU Level-Sensor

The Level-Sensor is installed in the cooling unit at the factory and monitors the coolant level in the cooling unit.

How it works:

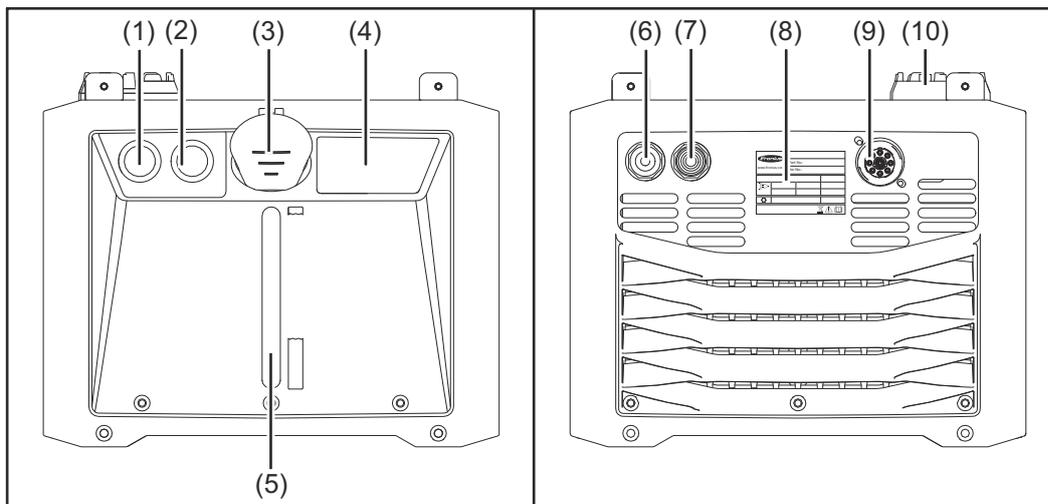
If the coolant drops below the minimum level

- the power source outputs a warning
- the welding current is not interrupted
- the cooling unit remains operational

Connections and mechanical components

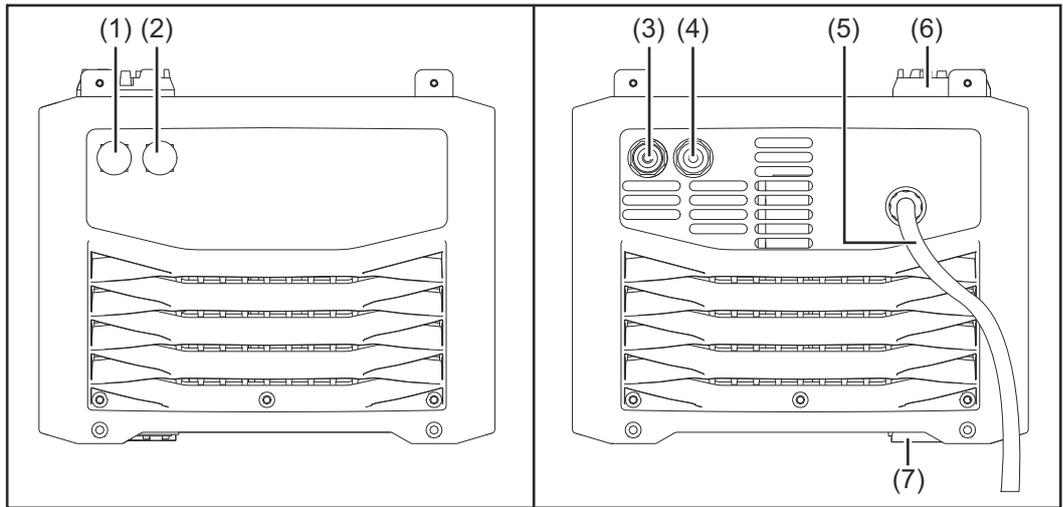
Connections and mechanical components

Connections and mechanical components: CU 2000i Pro /MC main part



-
- (1) **Blanking cover**
-
- (2) **Blanking cover**
-
- (3) **Screw cap for coolant container**
-
- (4) **Operating and maintenance instructions**
-
- (5) **Coolant viewing window**
-
- (6) **Coolant return connection (red)**
-
- (7) **Coolant flow connection (blue)**
-
- (8) **Rating plate**
-
- (9) **Connection**
to connect to the CU 2000i Pro /MC cooling part
-
- (10) **Cooling unit/power source connection**
Depending on the design of the welding system, to connect to the CU 2000i Pro /MC cooling part or a power source
-

Connections and mechanical components: CU 2000i Pro /MC cooling part



-
- (1) Blanking cover**
-
- (2) Blanking cover**
-
- (3) Coolant return connection (red)**
-
- (4) Coolant flow connection (blue)**
-
- (5) Connection cable**
to connect to the CU 2000i Pro /MC main part
-
- (6) Power source connection**
to connect to a power source
-
- (7) Cooling unit connection**
to connect to the CU 2000i Pro /MC main part
-

Installation and commissioning

Before installation and commissioning

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 device and all system components.
-

Setup regulations

WARNING!

Danger from machines falling or toppling over.

This can result in serious injury and damage to property.

- ▶ Place all system components on a solid, level surface in such a way that they remain stable.
-

WARNING!

Danger from electric current.

An electric shock can be fatal.

- ▶ Ensure the cooling unit is properly insulated.
 - ▶ Always ensure that there is no electrically conductive connection between the base plate of the cooling unit and the surface.
 - ▶ Before installing the cooling unit, remove all electrically conductive parts between the base plate of the cooling unit and the surface.
-

The device is tested to IP 23 protection, meaning:

- Protection against penetration by solid foreign bodies with diameters > 12.5 mm (0.49 in.)
- Protection against spraywater at any angle up to 60° to the vertical

Cooling air

The system must be set up in such a way that the cooling air can flow unimpeded through the slots in the side panels. Ensure that there is always an all-round clearance of 0.5 m (1 ft 7.69 in.) around the device.

CAUTION!

Risk from insufficient cooling air supply.

This can result in serious damage to property.

- ▶ Air inlets and outlets must never be covered, not even partially.
-

Dust

Ensure that any metallic dust, for example from grinding work, is not sucked into the system by the fan.

Outdoor operation

The device can be set up and operated outdoors in accordance with degree of protection IP23. Avoid direct wetting (e.g. from rain).

Information about the coolant

The cooling unit is delivered empty.

Use only original Fronius coolant (Cooling Liquid FCL 10/20 or torch coolant) when filling the cooling unit. Other coolants are not recommended for electrical conductivity and material compatibility reasons.

Guarantee provisions regarding the coolant pump

The coolant pump may only be used with original coolant supplied by the manufacturer. Do not allow the coolant pump to run dry (even for a very short time), as this will destroy the coolant pump. The manufacturer accepts no liability for damage caused in such cases.

Proper use

The device is intended solely for use in conjunction with Fronius system components.

The device is to be used exclusively for its intended purpose.

Any use above and beyond this purpose is deemed improper. The manufacturer is not liable for any damage, or unexpected or incorrect results arising out of such misuse.

Proper use also includes:

- carefully reading these operating instructions
- following all the instructions and safety rules in these operating instructions
- performing all stipulated inspection and maintenance work

The device is designed for use in industry and the workshop. The manufacturer accepts no responsibility for any damage caused through use in a domestic setting.

Securing the cooling unit and power source to the trolley/upright console

Safety

WARNING!

Danger from electrical current.

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

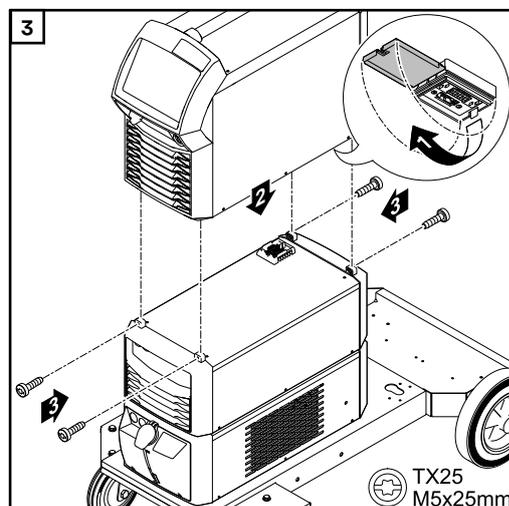
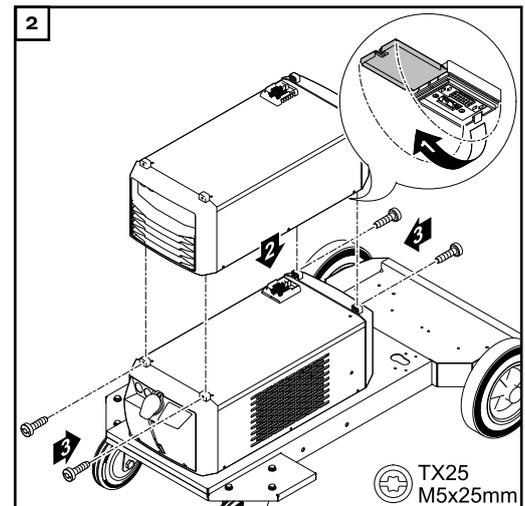
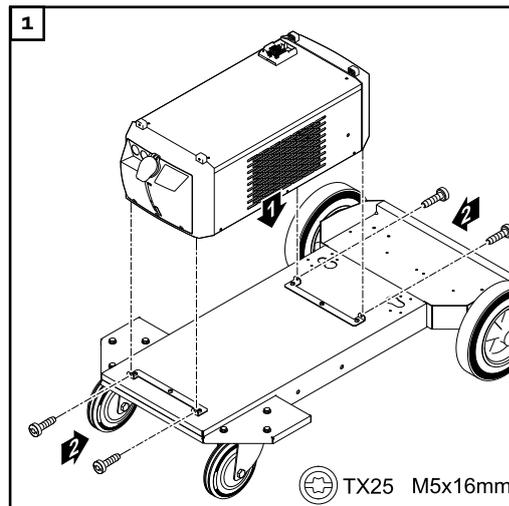
- ▶ Before starting work, switch off all devices and components involved and disconnect them from the grid.
- ▶ Secure all devices and components involved so they cannot be switched back on.

Securing the cooling unit and power source to the trolley

NOTE!

The screws for securing the cooling unit to the trolley are supplied with the trolley.

The rest of the screws required are supplied with the cooling unit.

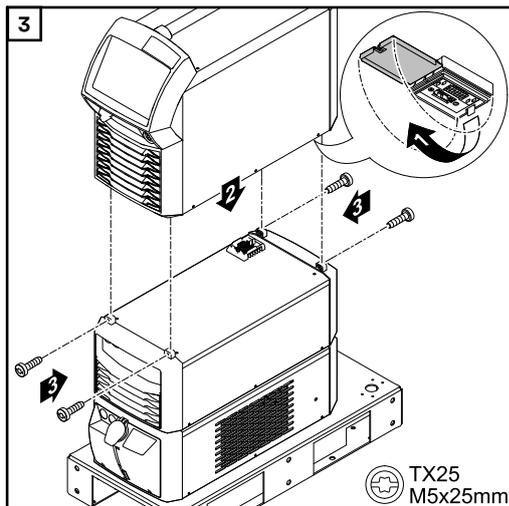
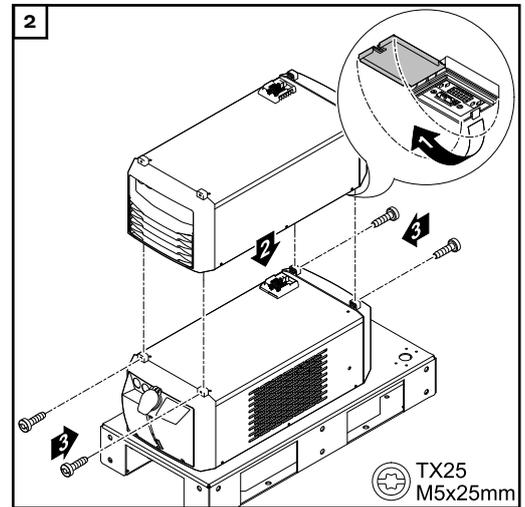
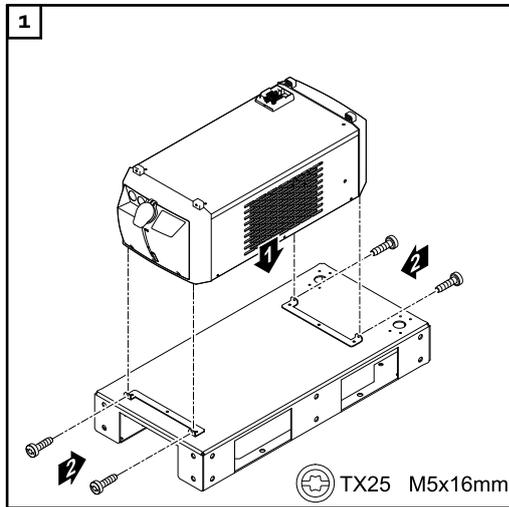


Securing the cooling unit and power source to an upright console

NOTE!

The screws for securing the cooling unit to the upright console are supplied with the upright console.

The rest of the screws required are supplied with the cooling unit.



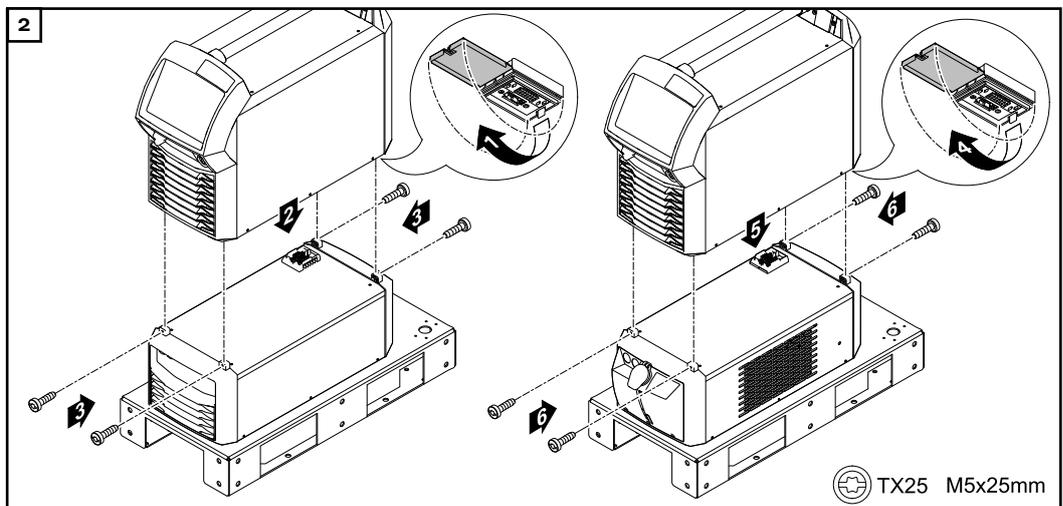
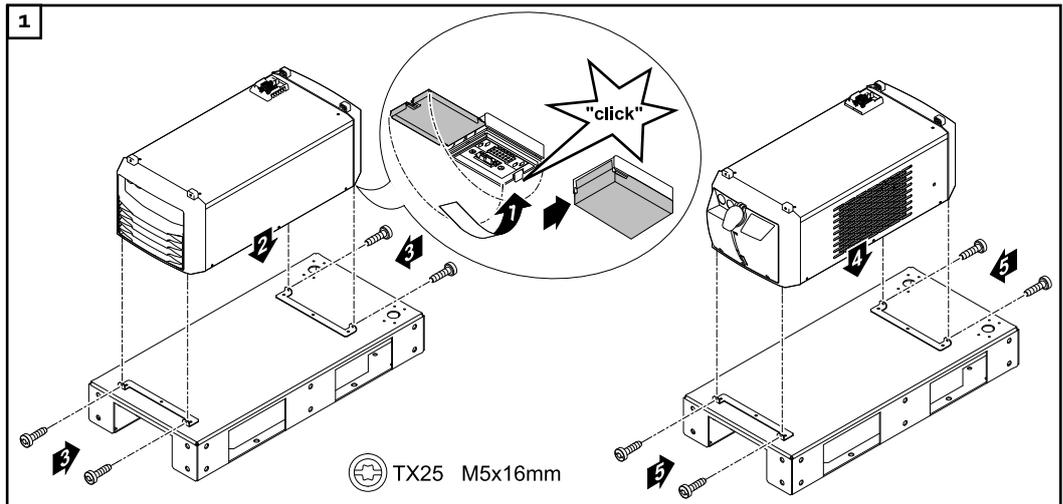
Securing the cooling unit and power source to two upright consoles

NOTE!

The screws for securing the cooling unit to the upright consoles are supplied with the upright consoles. The rest of the screws required are supplied with the cooling unit.

NOTE!

On the main part of the cooling unit, only screw the power source which has the OPT/i TPS 2. NT242 CU 1400i.



NOTE!

If two upright consoles are being used, always position the welding systems so that the air outlet openings on the cooling units point outwards.

Connect the coolant hoses to the cooling unit

Safety

WARNING!

Danger from electrical current.

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

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

Connecting the coolant hoses to the cooling unit

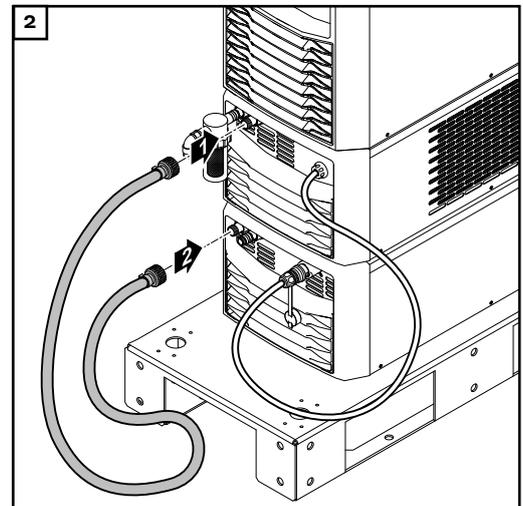
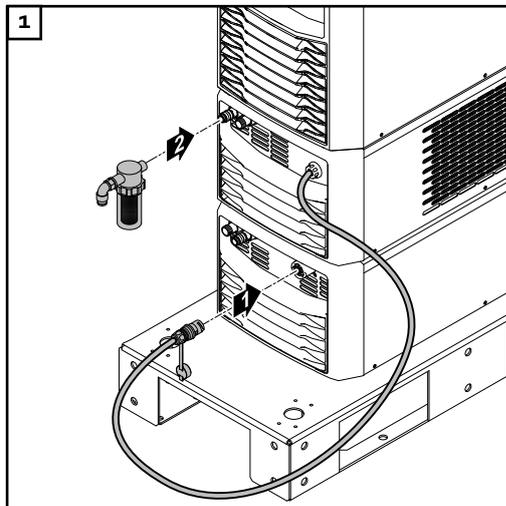
NOTE!

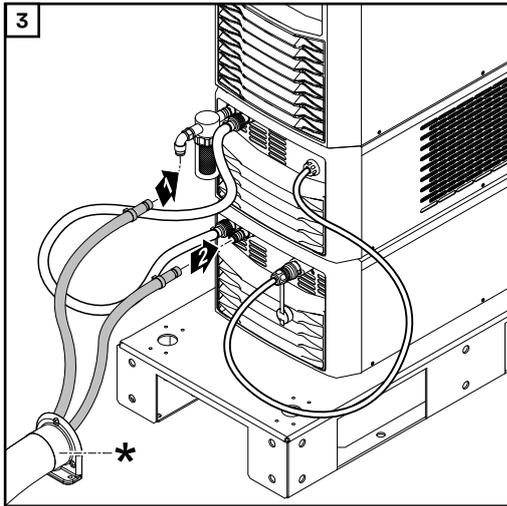
Connect the coloured coolant hoses to the corresponding coolant flow and return connections on the cooling unit.

NOTE!

The coolant filter pictured below is available as an option.

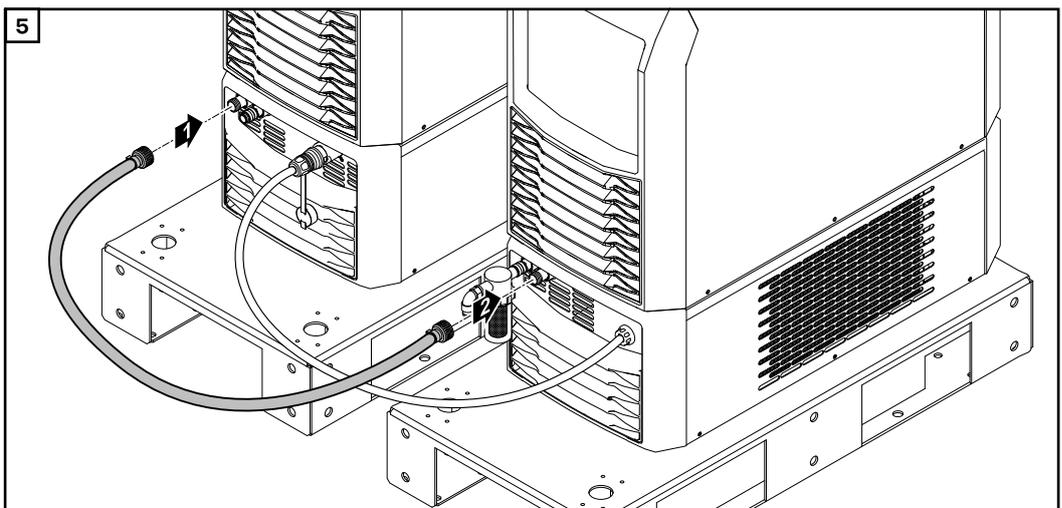
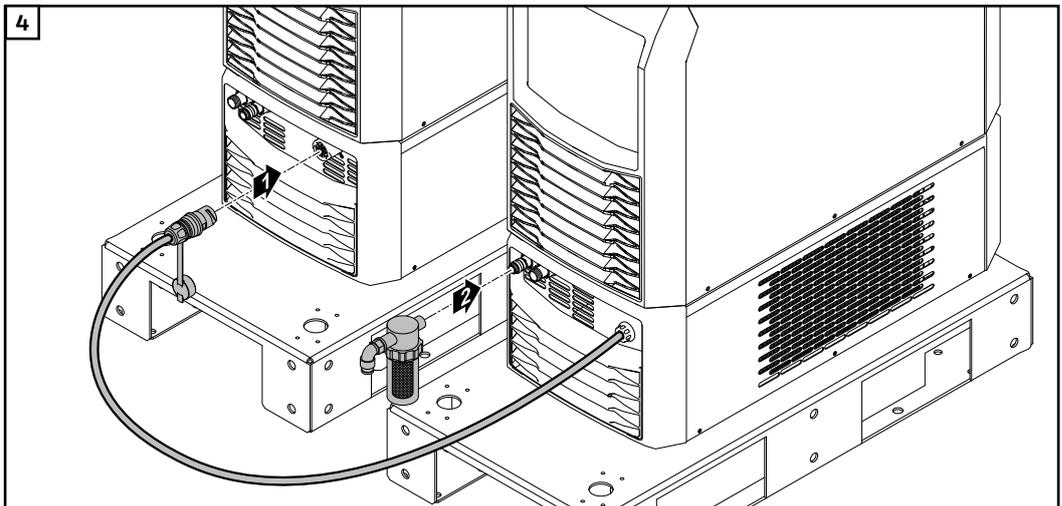
Connecting the coolant hoses to the cooling unit/welding system mounted on trolley or an upright console:

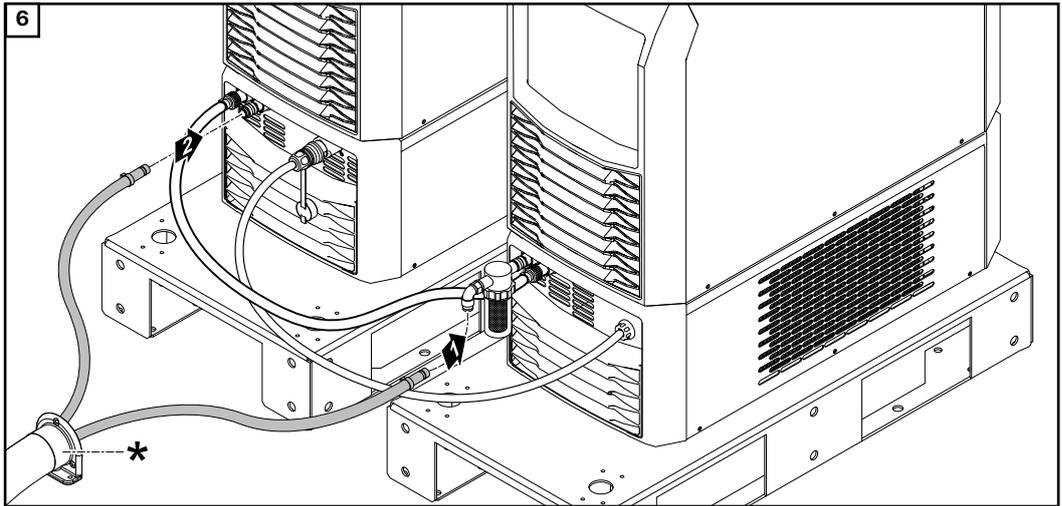




* = Interconnecting hosepack

Connecting the coolant hoses to the cooling unit/welding system mounted on two upright consoles:





* = Interconnecting hosepack

Filling and starting up the cooling unit

Filling the cooling unit

WARNING!

Danger from electric current.

An electric shock can be fatal.

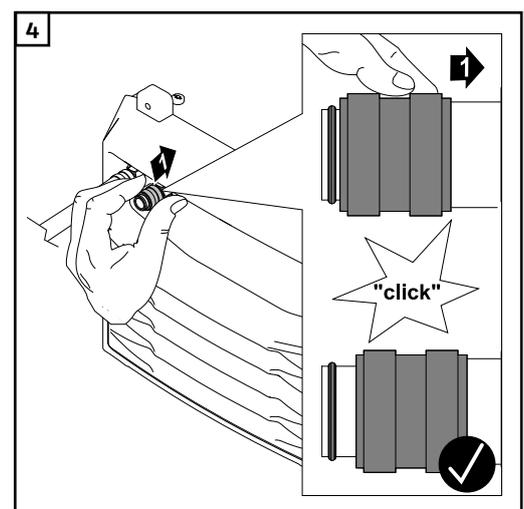
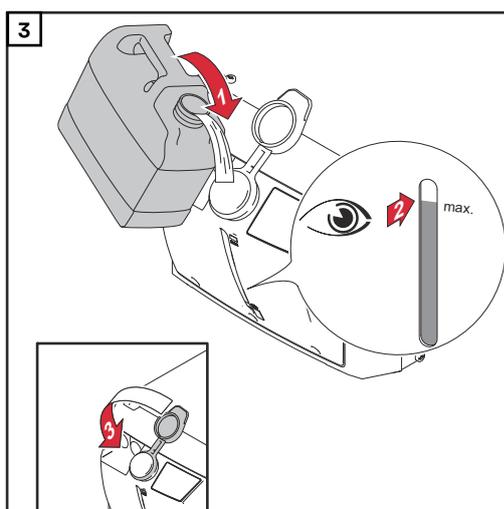
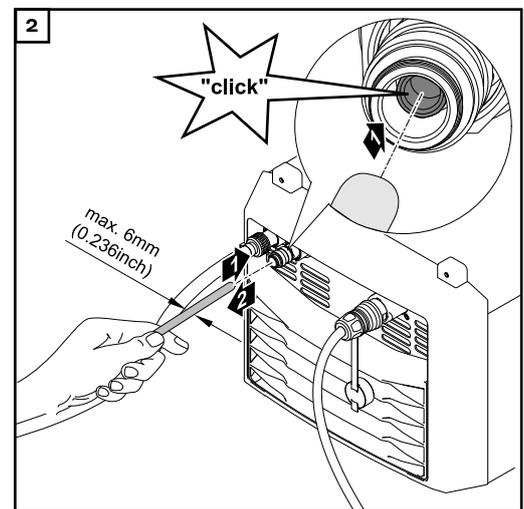
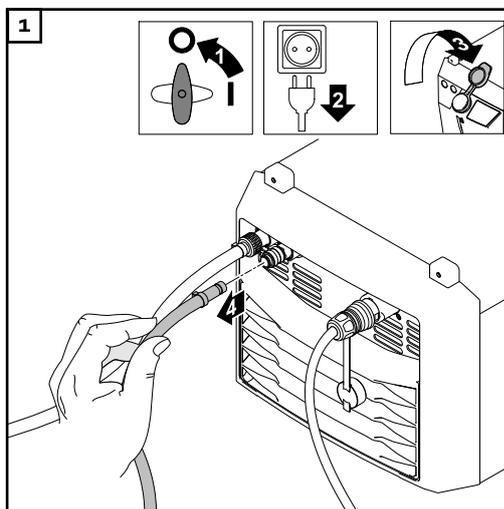
Before starting the work described below:

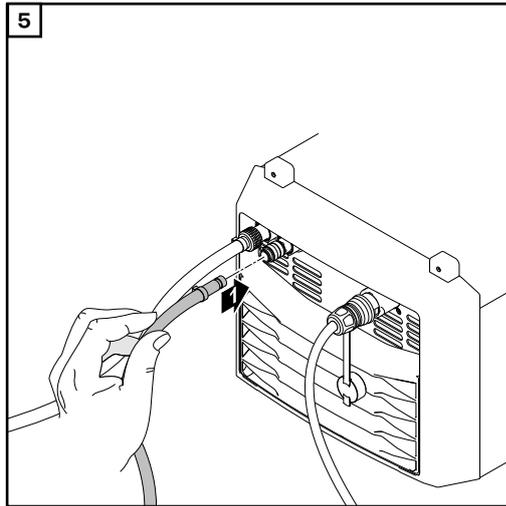
- ▶ turn the power source mains switch to the "O" position
- ▶ disconnect the power source from the mains
- ▶ ensure that the power source remains disconnected from the mains until all work has been completed

NOTE!

Make sure that no coolant enters the device.

If there is any coolant on the exterior of the cooling unit, remove it immediately.





Starting up the cooling unit

NOTE!

Before starting up the cooling unit, first check that it contains an adequate amount of coolant and that the coolant is clean and uncontaminated.

NOTE!

During welding, check at regular intervals that the coolant is circulating properly.

You should be able to see a steady return flow of coolant into the coolant container.

The cooling unit is powered and controlled by the power source. If the power source mains switch is turned to position "I", the cooling unit will start to operate as described below.

- The fans run for approx. 5 seconds.
- The coolant pump runs for approx. 3 minutes. The coolant pump and the fans switch off again if welding does not start after roughly 3 minutes.

NOTE!

Long hosepacks may cause the Level-Sensor to issue an error message after starting the device for the first time.

If this happens, top up the coolant.

Operating modes

NOTE!

The individual operating modes are selected on the power source.

on

- As soon as the power source is switched on the coolant pump starts working and is controlled electronically depending on the coolant return temperature and the coolant flow. The coolant pump pumps at least 1.1 l/min (0.29 gal./min [US]) of coolant.
- The fans work at full load.
- The coolant pump and fans remain on until the power source is switched off.

off

- Inoperative, even when welding starts.

**auto
(factory setting)**

- The coolant pump and fans start working when welding starts.
- At the end of welding the coolant pump and fans continue to work for 2 minutes.

eco

- The coolant pump starts working when welding starts and is controlled electronically depending on the coolant return temperature and the coolant flow. The coolant pump pumps at least 1 l/min (0.26 gal./min [US]) of coolant.
- The fans in the main part start working from a coolant return temperature of 40 °C (104 °F) and are controlled electronically depending on the coolant return temperature.
- The fans in the cooling part start working from a coolant return temperature of 40 °C (104 °F) at full load.
- At the end of welding the coolant pump and fans in the main part continue to work for 2 minutes depending on the coolant return temperature. The fans in the cooling part continue to work at full load. After these 2 minutes have passed, all the fans and the coolant pump are switched off.

Recommended application of the operating modes

Operating mode	Recommended application
on	For high performance welding (maximum cooling power of the cooling unit)
eco	For energy-efficient cooling: <ul style="list-style-type: none"> - Longer service life of the coolant pump - Less soiling of the cooler in the cooling unit - Lower noise emissions - Reduced power consumption

Disconnecting the system components

Disconnecting the system components

Safety

WARNING!

Danger from electrical current.

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

- ▶ Before starting work, switch off all 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 from hot coolant.

This can result in serious burns or scalding.

- ▶ Before carrying out any work, allow the coolant to cool to +25 °C / +77 °F.
-

WARNING!

Danger from coolant leakage.

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

- ▶ If there is any coolant on the exterior of the cooling unit, remove it immediately.
 - ▶ Make sure that no coolant gets into the interior of the cooling unit.
-

Disconnecting the system components

NOTE!

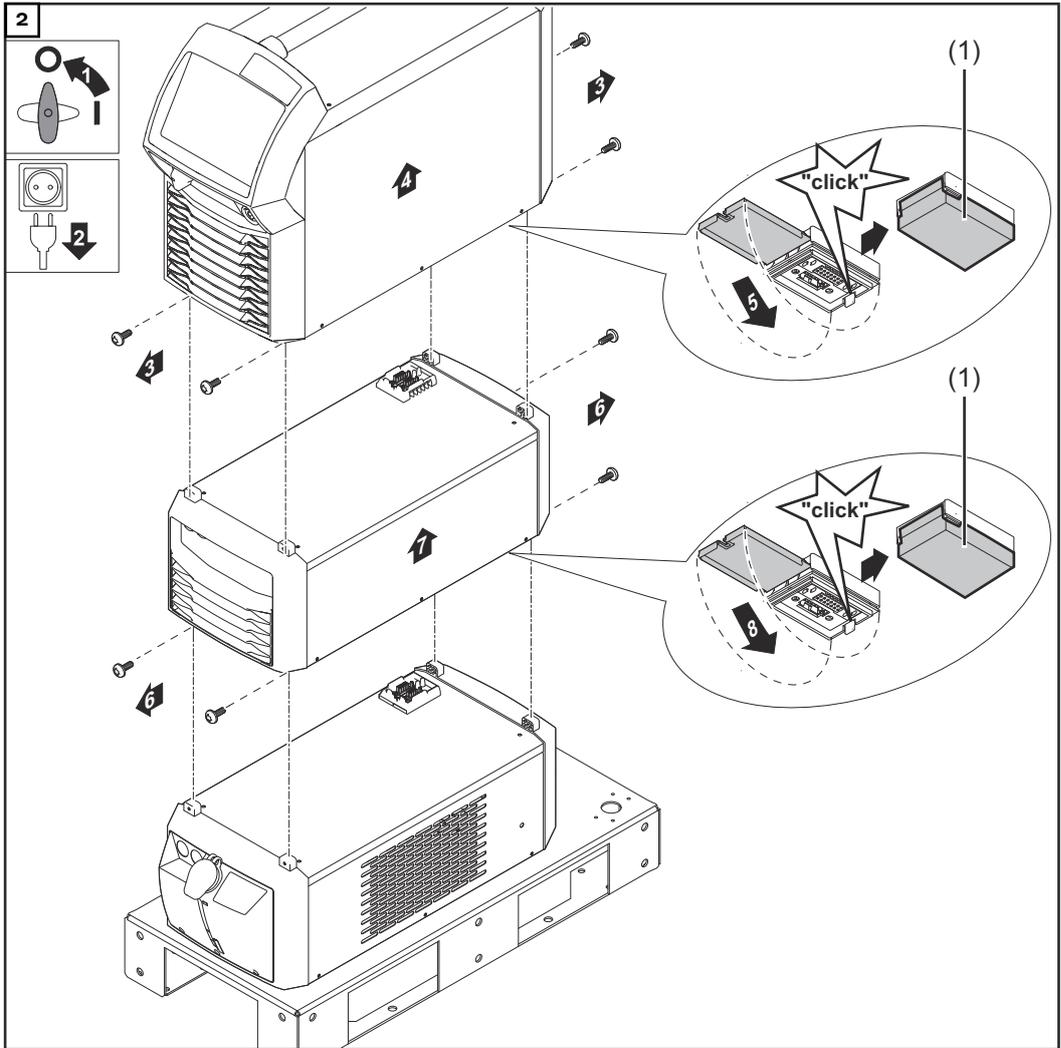
The following information must be observed for all possible system designs (welding system on trolley, welding system on two upright consoles, etc.).

CAUTION!

Risk of injury and damage due to short circuits at the connection on the underside of the power source/cooling unit.

Dirt and damage can cause short circuits at the connection. After dismantling the power source/cooling unit, always close the flap on the cover (1).

- 1 Disconnecting the coolant hoses from the cooling unit



Troubleshooting

Troubleshooting

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 device 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 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 insufficient ground conductor connection.

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

- ▶ The housing screws provide a suitable ground conductor connection for grounding the housing.
 - ▶ The housing screws must not under any circumstances be replaced by other screws without a reliable ground conductor connection.
-

WARNING!

Danger from coolant leakage.

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

- ▶ If there is any coolant on the exterior of the cooling unit, remove it immediately.
 - ▶ Make sure that no coolant gets into the interior of the cooling unit.
-

WARNING!

Danger from hot coolant.

This can result in serious burns or scalding.

- ▶ Before carrying out any work, allow the coolant to cool to +25 °C / +77 °F.
-

Troubleshooting

Make a note of the serial number and configuration of the device and contact our After-Sales Service team with a detailed description of the error, if

- errors occur that are not listed below
- the troubleshooting measures listed are unsuccessful

Insufficient or no coolant flow

Cause: Coolant level too low

Remedy: Top up coolant

Cause: Constriction or foreign body in cooling circuit

Remedy: Remove constriction or foreign body

Cause: Coolant contaminated

Remedy: change coolant, see [Changing the coolant](#) on page 54.

Cause: Coolant filter displaced when connecting coolant return

Remedy: Clean coolant filter using clean tap water or change filter element

Cause: Coolant pump defective

Remedy: Contact After-Sales Service

Insufficient cooling power

Cause: Cooler contaminated

Remedy: Gas purge cooler with dry compressed air

Cause: Faulty fan

Remedy: Contact After-Sales Service

Cause: Coolant pump defective

Remedy: Contact After-Sales Service

High operating noise level

Cause: Coolant level too low

Remedy: Top up coolant

Cause: Coolant pump defective

Remedy: Contact After-Sales Service

Welding torch becomes very hot

Cause: The specification of the cooling unit is inadequate

Remedy: Observe the duty cycle and loading limits

Cause: The specification of the welding torch is inadequate

Remedy: Observe the duty cycle and loading limits

Cause: Inadequate coolant flow

Remedy: Check coolant level. Top up with coolant if necessary.
Check coolant for contamination. Change coolant if necessary, see [Changing the coolant](#) on page 54.

Cause: Inadequate coolant flow - coolant pump jammed

Remedy: Contact After-Sales Service

Care, maintenance and disposal

Care, maintenance and disposal

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 device 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 devices and components involved and disconnect them from the grid.
 - ▶ Secure all devices and components involved so they cannot be switched back on.
 - ▶ After opening the device, use a suitable measuring instrument to check that electrically charged components (such as capacitors) have been discharged.
-

WARNING!

Danger due to insufficient ground conductor connection.

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

- ▶ The housing screws provide a suitable ground conductor connection for grounding the housing.
 - ▶ The housing screws must not under any circumstances be replaced by other screws without a reliable ground conductor connection.
-

WARNING!

Danger from coolant leakage.

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

- ▶ Immediately remove any coolant that enters the device or spills onto its exterior during the work described in the following.
-

WARNING!

Danger from hot coolant.

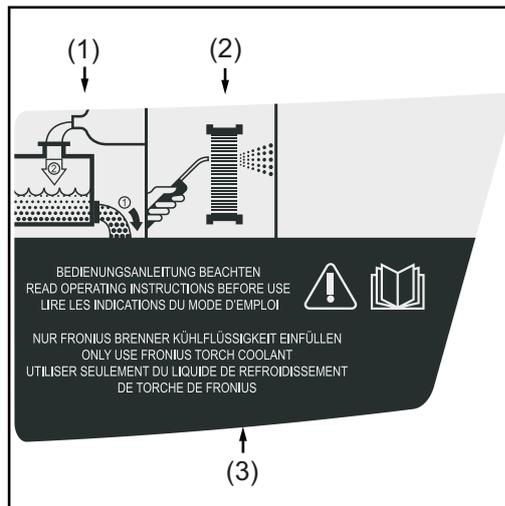
This can result in serious burns or scalding.

- ▶ Before carrying out any work, allow the coolant to cool to +25 °C / +77 °F.
-

General

Under normal operating conditions, the device requires only a minimum of care and maintenance. However, it is vital to observe some important points to ensure the welding system remains in a usable condition for many years.

Symbols for care and maintenance of the cooling unit



- (1) Changing the coolant
- (2) Gas purging the cooler
- (3) Read operating instructions

The relevant maintenance intervals and maintenance work are described in detail over the following pages.

Maintenance intervals, maintenance work

At every start-up

⚠ CAUTION!

Risk due to start-up without coolant.

This can result in serious damage to property.

- ▶ If water-cooled system components are operated without coolant, this will normally result in the failure of the system components. Fronius shall not be liable for any damage resulting from such action. In addition, no warranty claims will be entertained.

- Ensure that all the hosepacks, the welding torch and the ground earth connection are undamaged
- Check that there is an all-round clearance of 0.5 m (1 ft 7.69 in.) to ensure that cooling air can flow in and out freely
- Check the screw connections between all system components for tightness
- Check all the coolant connections of the welding system for tightness
- Monitor the coolant return flow in the coolant container
 - If no coolant is returning to the container, identify and remedy the cause

Once a week

- Check coolant level. If the coolant level is below the "min" mark, top up with coolant
- Check the purity of the coolant. Change the coolant if necessary

⚠ CAUTION!

Risk from non-permitted coolant.

This can result in serious damage to property.

- ▶ Use only original Fronius coolant (Cooling Liquid FCL 10/20 or torch coolant) when filling the cooling unit.
- ▶ Other coolants are not recommended for electrical conductivity and material compatibility reasons.

Every 2 months

- If present: Check the coolant filter for dirt and clean if necessary

Every 6 months

- Gas purge the cooler

Every 6 months in 3-shift operation with ethanol-based coolant

- Gas purge the cooler
- Change the coolant

Every 12 months in single-shift operation with ethanol-based coolant

- Change the ethanol-based coolant

Every 12 months in 3-shift operation with FCL 10/20 coolant

- Change the coolant

Every 24 months in single-shift operation with FCL 10/20 coolant

- Change the coolant

Gas purging the cooler



Gas purging the cooler

NOTE!

For the sake of clarity, the cooling unit is shown in the following figures without the power source.

However, the power source can remain on the cooling unit when gas purging the cooler.

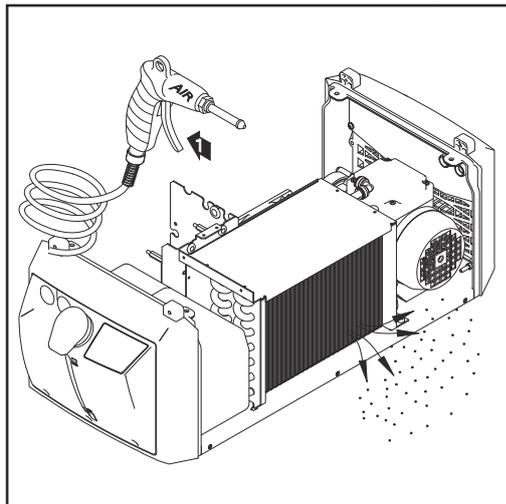
Always follow the instructions in the "Safety" section at the start of the "Care, maintenance and disposal" chapter.

⚠ CAUTION!

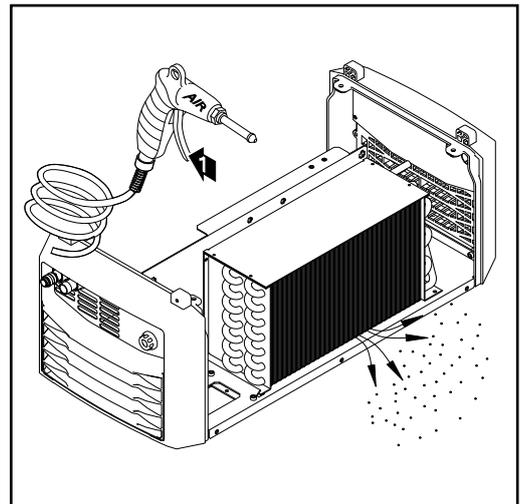
Danger of damage to electronic components.

- ▶ Do not bring the air nozzle too close to electronic components.

- 1 Remove the device side panels and clean the cooler
- 2 If a large amount of dust has accumulated: Remove device side panels and clean inside of device with dry, reduced compressed air



Main part



Cooling part

Changing the coolant



To change the coolant:

CAUTION!

Risk of injury and damage from the welding current and accidental ignition of an arc.

Before starting work:

- ▶ disconnect the ground earth connection between the welding system and the workpiece
- ▶ remove the wire electrode from the welding torch being used
- ▶ depending on the system, remove the wirepool or the basket-type spool from the power source or the wirefeeder

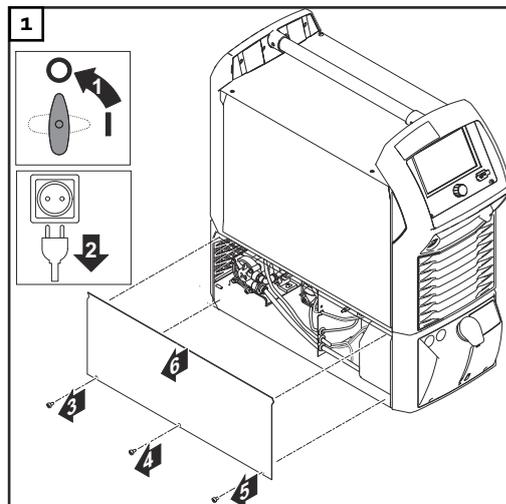
NOTE!

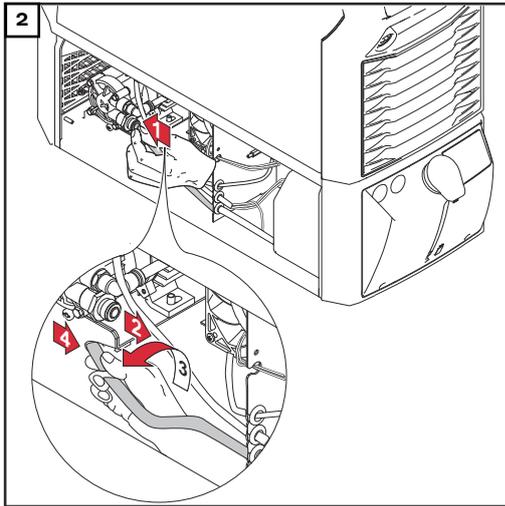
The coolant must not be disposed of in the public sewage system.

Dispose of coolant in accordance with the applicable local and national regulations.

NOTE!

Use only original Fronius coolant when refilling the cooling unit.

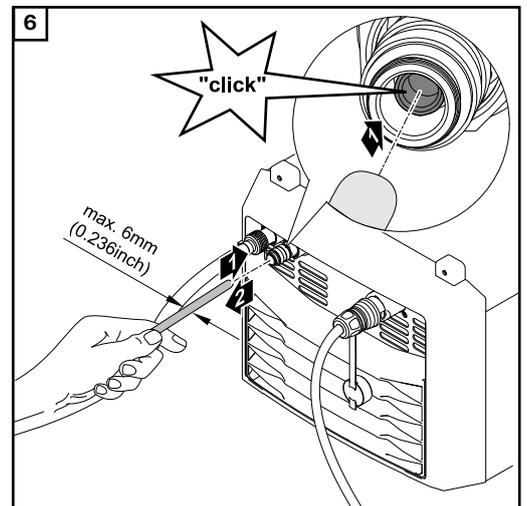
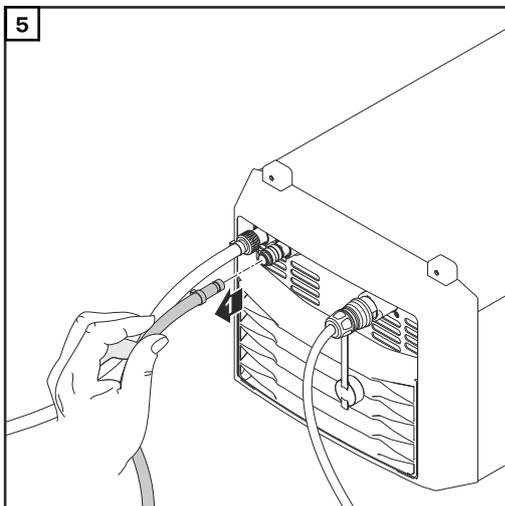
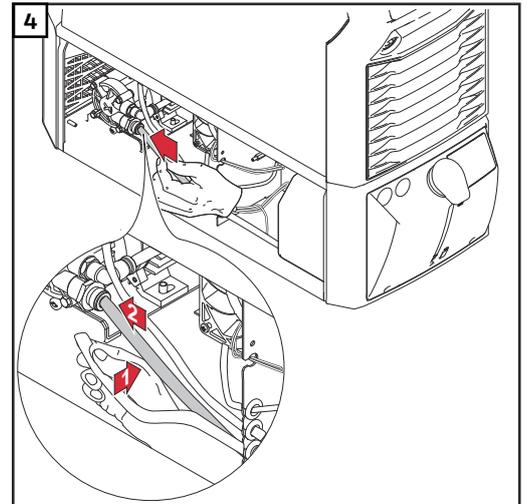
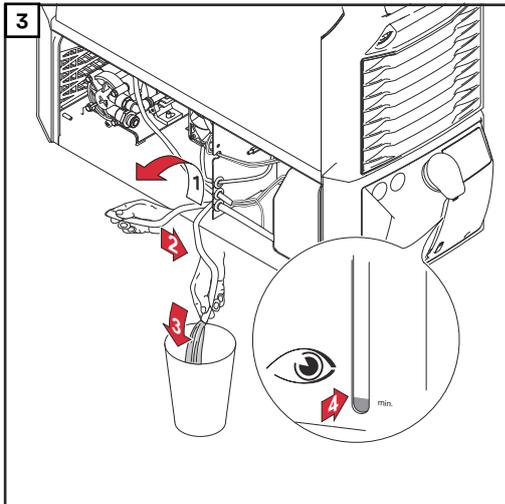


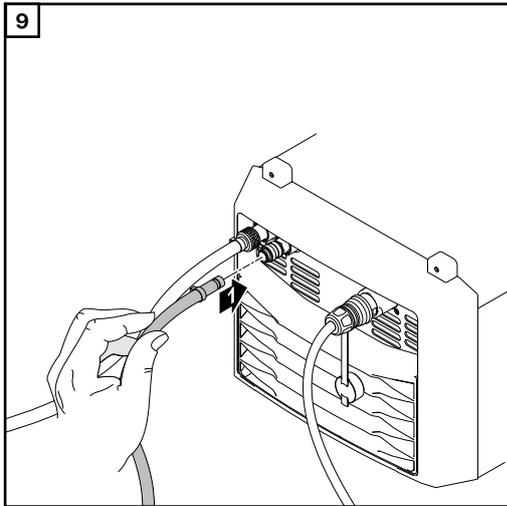
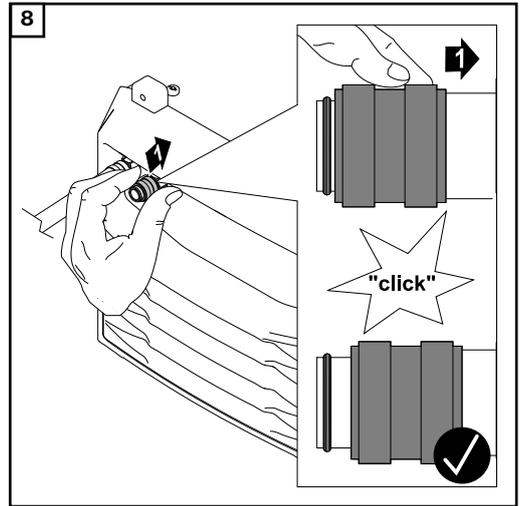
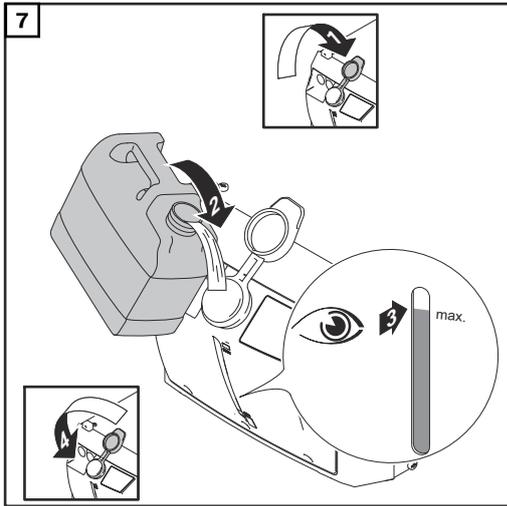


NOTE!

Seal off the coolant hose as soon as it is pulled out of the coolant pump connection.

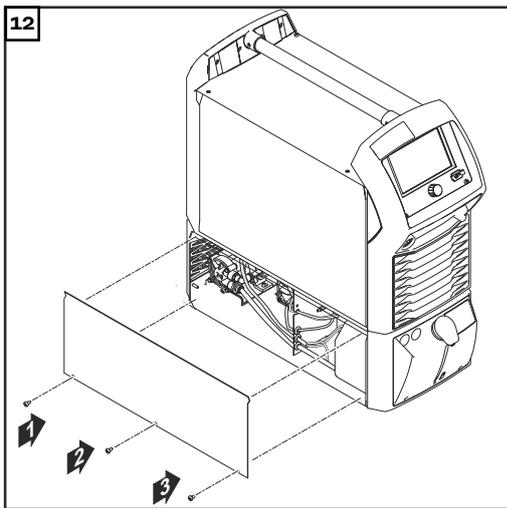
This will ensure that as little coolant as possible enters the device. Immediately remove any coolant that enters the device or spills onto its exterior.





10 Ensure that all hose connections are properly established and are not leaking

11 Ensure that there is no coolant inside the device or on its exterior



Disposal

Dispose of in accordance with the applicable national and local regulations.

Technical data

Technical data

General

The cooling capacity of a cooling unit depends on

- Ambient temperature
- Delivery head
- Flow rate Q (l/min) - The flow rate Q depends on the length of the interconnecting hosepack and the diameter of the hose.

CU 2000i Pro /MC

Supply voltage	24 V DC
Current consumption	max. 6.5 A
Cooling power at Q = 1 l/min + 25 °C (77 °F) Q = 1 l/min + 40 °C (104 °F) Q = max. + 25 °C (77 °F) Q = max. + 40 °C (104 °F)	2000 W 1500 W 3200 W 2400 W
Max. delivery head, at 5 bar (72.52 psi) pump pressure	up to 45 m 147 ft. 7.65 in.
Max. delivery rate	3 l/min 0.79 gal./min [US]
Max. pump pressure at 4750 rpm, auto operating mode	4 bar 58.02 psi
Max. pump pressure at up to 6500 rpm, eco and on operating mode	5 bar 72.52 psi
Pump	centrifugal pump with no seal
Pump service life	up to 30,000 hrs
Coolant capacity	6 l 1.59 gal. [US]
Degree of protection	IP 23
Dimensions of main part l/w/h	710/300/230 mm 27.95/11.81/9.06 in.
Dimensions of cooling part l/w/h	660/300/230 mm 25.98/11.81/9.06 in.
Weight (without coolant)	23 kg 50.71 lb.
Flow monitoring (sensor)	Warning between 1 and 0.7 l/min (0.26 - 0.18 gal./min [US]), error message below 0.7 l/min (0.18 gal./min [US])
Coolant temperature monitoring	Warning above 68 °C (154.4 °F), error message above 70 °C (158 °F)
Level-Sensor	Warning or error message
Marks of conformity	CE, CSA



Fronius International GmbH

Froniusstraße 1
4643 Pettenbach
Austria
contact@fronius.com
www.fronius.com

At www.fronius.com/contact you will find the contact details
of all Fronius subsidiaries and Sales & Service Partners.