

Industrial X-Ray

# Cooler Manual XRC-4523-OA 4500 Watt Oil to Air Cooler





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# 1. About this manual

This document is the manual for the cooling unit XRC-4523-OA. It is based on international safety regulations.

This operating manual addresses the needs of the user of the unit. Its intention is to allow the safe operation of the unit. Thus, it should be read carefully and be kept accessible for the users of the unit at any time.

All chapters of this operating manual can be read independently and thus can be used for look-up purposes.

## 1.1. Explanation of symbols and signs

### 1.1.1. Safety symbols

The safety symbols used in this operating manual are indicated below. The main reason for their use is to point the reader to the safety instruction given in the text field beside.

Symbol	Meaning
	Warning with respect to general danger or damage to property.
	Warning with respect to electrical hazard.

Table 1: Warning signs

Symbol	Meaning
	This symbol indicates the requirement of disconnecting from mains.
	This symbol indicates the requirement of wearing protective footwear.
	This symbol indicates the requirement of wearing protective gloves.
	This symbol indicates the requirement of wearing protective eyewear.

Table 2: Mandatory action signs

### 1.1.2. Warning instructions

In this operating manual concrete warning instructions are given in order to point out unavoidable residual risks when operating the unit. These risks include hazard for

- Human beings
- The unit and other equipment
- The environment

Warning instructions in this operating manual are identified using symbols. The warning instructions are introduced using signal words which express the scale of the hazard.

Always comply with the warning instructions and act cautiously in order to avoid accidents, injuries to persons and damage to property.

 <b>DANGER</b>	<b>DANGER</b>
	<p>Reference to immediate danger to human health.</p> <p>Failure to comply with this warning instruction will result in severe irreparable injury and even death.</p>

 <b>WARNING</b>	<b>WARNING</b>
	<p>Reference to recognizable hazard to human health.</p> <p>Failure to comply with this warning instruction may result in severe irreparable injury and even death.</p>

 <b>CAUTION</b>	<b>CAUTION</b>
	<p>Reference to recognizable hazard to human health.</p> <p>Failure to comply with this warning instruction may result in slight to medium injury.</p>

NOTE	
Reference to a material hazard.	
Failure to comply with this warning instruction may result in material damage.	

**Structure of the warning instructions**

The following information builds the warning instructions:

- Warning symbol
- Signal word
- Type and source of the hazard
- Causing
- Measure(s) to avoid the hazard

**Example:**

 <b>WARNING</b>	<b>WARNING</b>
	<p><b>Risk of burning and/or scalding due to possibly hot coolant.</b></p> <p>Coolant can reach high temperatures during operation and cause burns or scalding in the case of contact.</p> <p>Check whether the coolant is hot before handling it. If necessary, let it cool down to the ambient temperature, that there is no more risk of burns or scalding.</p>

**Important information and tips concerning operation of the unit**

 This symbol is used to highlight passages with important information and tips concerning operation of the unit.

### 1.1.3. Text designations

#### Text mark-ups

- Text that appears in **bold** refers to emphases and subheadings.

#### Step-by-step instructions

Step-by-step instructions have the following structure:

#### Objective for action

*Requirement(s)*

*Tools and material required*

#### Procedure

- Prompt to take action (indicated by a 1)
- Prompt to take action (indicated by a 2)  
(Preliminary) result
- Prompt to take action (indicated by a 3)
- Prompt to take action (indicated by a n)

*Result*

## 1.2. Illustrations

Illustrations in this operating manual are provided for general understanding and can be different from the actual version of the unit.

## 1.3. Terms of warranty

General sale and delivery terms of COMET apply. The buyer accepts these terms, at the latest when signing the contract of purchase.

The particular terms of warranty and duration of warranty of the unit in question can be taken from the contract documents as well as from the order confirmation.

Warranty claims and liability are excluded in case of one of the following situations:

- Use of the unit in an unintended way
- Inaccurate installation, putting into service, operation, repair or maintenance of the unit by people that are not fully authorized
- Use of the unit despite of defect, wrongly implemented or non-functional safety devices or protective gear
- Unauthorized or forbidden modifications by the user concerning the electrical equipment of the unit
- Unauthorized or forbidden modifications by the user concerning the mechanical structure of the unit
- Unauthorized or forbidden modifications by the user concerning the operating parameters
- Use of unauthorized tools
- Use of unauthorized operating supplies
- Exceedance of mandatory maintenance intervals
- Cases of disaster caused by foreign matter influence or act of nature beyond control

#### NOTE

Any form of unintended use of the unit and any structural change caused by the user without prior authorization in written form by COMET will lead to the termination of warranty as well the termination of the declaration of conformation and will free COMET from product liability. This concern includes safety devices as well.

In case of authorized changes or when adding optional equipment it is the sole responsibility of the customer to assure the accurate implementation of the safety devices required.

## 1.4. Contact information

If you have questions with respect to this unit please use the contact information given below. Always communicate the following:

- Your name and address
- Name of contact at your address
- Product data as on identification plate: Type of unit, serial number, article number and year of manufacture

#### Company contact:

Mail: COMET AG  
Herrengasse 10  
CH-3175 Flamatt

Internet: <http://www.comet-xray.com>

E-Mail: [info@comet.ch](mailto:info@comet.ch)

Phone: +41 31 744 9000

Fax: +41 31 744 9090

## 2. Safety

This chapter provides an overview of all important safety aspects for optimal protection of personnel as well as safe and trouble-free operation.

Disregarding this operating manual and warning instructions specified therein may result in considerable danger.

### 2.1. Hints for the safe operation

-  Conduct inspections on a regular time base. This will ensure that the appropriate measures will actually be carried out.

The unit is operational save. It was built according to the existing state of technology.

Despite this the unit could cause hazards, if it is

- used in a way it was not intended for
- used improperly
- operated under unsuitable conditions

#### 2.1.1. Prevent hazards

Hazards can be prevented by safety-conscious and anticipatory behavior of staff.

Everybody working with the unit should keep the following in mind:

- Make this operating manual available for everybody at the operational location of the unit in a complete and perfectly readable form!
- Use the unit exclusively for what it was intended!
- The unit must be operational and error free. Check the condition of the unit before working with it and within a regular time frame!
- Make sure that nobody can injure themselves by any part of the unit!
- Any disruption or recognizable change concerning the unit should be reported to the person responsible.
- Stick to the accident prevention regulations as well as any regional regulations!
- Use personal protection equipment!

#### 2.1.2. Hints regarding the electrical equipment

 <b>DANGER</b> 	<b>DANGER</b>
	<b>Electrical danger!</b> Work on electrical installations may be carried out by trained and authorized electricians only. <ul style="list-style-type: none"><li>→ Switch off the unit before starting your work.</li><li>→ Disconnect the unit from mains by pulling the mains plug.</li><li>→ Secure the unit against being switched on again.</li><li>→ Verify that the unit is dead.</li><li>→ Carry out earthing and short circuiting.</li><li>→ Keep unauthorized persons away from the working area.</li></ul>

When working on electrical installations the following principles should be observed:

- Works on the electrical installations may only be accomplished by qualified electrical staff.
- When connecting electrical equipment to mains regional regulations have to be observed. Be aware of the connection diagram information!
- The unit is powered by electricity. Electrical shock hazard exists, if the electrical installations are defective or the insulation fails during operation.
- When switched-off the unit is not disconnected from mains. This is only the case when the mains plug is pulled.
- Any changes regarding the control elements of the unit can have an influence on the safe operation. All changes intended must be authorized by the manufacturer.
- After the implementation of a change the operation of the safeguards must be verified.
- No unauthorized changes on the unit are allowed. All intended changes must be authorized by the manufacturer.

### 2.1.3. Inadmissible operating conditions

Operation of the unit under improper operational conditions is not permitted, since otherwise the operation safety cannot be granted.

When using the unit in a way not compliant with the intended use, hazardous situations may occur. Operation of the unit is not permitted under the following conditions:

- The unit is used for a purpose other than the one it is intended for.
- The unit or parts of it are damaged, the electrical installation is not correct or the insulation is broken.
- Protective or safety equipment is not functional or defect, improperly installed or missing.
- The unit is not working properly.
- The unit was modified without authorization or modified in a way that is not permitted.
- Controlling devices were modified in a way that is not permitted.
- Operational parameters were changed in a way that is not permitted.
- Operation in areas exposed to explosion hazards.
- Operation with cooling media not according to specification.
- Use of unauthorized tools.
- Exceedance of the compulsory maintenance intervals.

<b>NOTE</b>
The manufacturer is not liable for damage occurring when using the unit in a way it was not intended. When using the unit in a way it was not intended for, the manufacturer's warranty given by COMET will expire.

## 2.2. Responsibilities of the unit operator

### 2.2.1. Planning and monitoring the safety measures

It is a matter for the operator of the unit to plan the safety measures and to monitor their implementation.

The operator of the unit has to ensure that all persons involved with the unit have read and understood the operating instructions. He must also train the personnel.

## 2.2.2. Minimizing the risk of injury

To minimize the risk of injury the following measures have to be taken:

- Work on the unit may be carried out by qualified personnel only.
- The personnel involved with the unit have to be authorized and trained by the operator of the unit.
- The personnel have to be familiar with all safety devices, before starting work on the unit.
- The personnel have to be familiar with all operating elements of the unit, before starting work on the unit.
- The tidiness and cleanliness at the workplace and area immediately surrounding the unit has to be ensured.
- The personnel have to wear protective gear. The required protective gear is specified in this operating manual.
- During operation qualified skilled staff is available for first aid and rescue operations.
- The procedures, competence and responsibility have to be determined. Employees have to practice the procedures to be followed in the event of an incident.
- All warning and information signs on the unit have to be kept in legible condition. If a warning or information sign should be lost or difficult to read, it has to be replaced.

## 2.3. Personnel requirements

### 2.3.1. Qualifications

All works on the unit require an in-depth knowledge and skills of the personnel.

All persons working with or on the unit have to fulfill the following requirements:

- They have to be personally reliable and professionally suitable.
- They have been instructed on how to professionally handle the unit.
- They are familiar with the safety devices and how they functions.
- They are familiar with this operating manual and observe all warning instructions present in this operating manual.
- They are familiar with the fundamental regulations on work safety and accident prevention.

Generally, all persons have to meet the following minimum qualification requirements:

- They are specialists in their area and are able to undertake works to the unit themselves.
- They have had sufficient instruction and are able to undertake works to the unit under the instruction and supervision of a qualified specialist.

### 2.3.2. User groups

This operating manual distinguishes between the following user groups:

Personal	Qualifications
Operating personnel	Adequate specific training in the following areas: <ul style="list-style-type: none"><li>• The operation of the unit</li><li>• Operating sequences</li></ul>
	Specific experience in the following areas:

	<ul style="list-style-type: none"> <li>• Specific competencies and responsibilities, which are essential for the work on and with the unit</li> <li>• Adequate behavior at an emergency</li> </ul>
Maintenance personnel	Deep knowledge in the fields of: <ul style="list-style-type: none"> <li>• Mechanical engineering</li> <li>• Electrical engineering</li> </ul>
	Authorization for performance of the following tasks according to the standards of safety technology: <ul style="list-style-type: none"> <li>• Commissioning units</li> <li>• Grounding units</li> <li>• Designating units</li> </ul>
	A sound knowledge of the structure and functionality of unit.

Table 3: User groups

### 2.3.3. Specialized knowledge

NOTE
Authorized persons The technical information about the unit settings, maintenance and electrics is directed to the licensed specialists. Unauthorized persons are not allowed to carry out the activities stated therein.

The following activities may be carried out by personnel with specialized knowledge only:

Activities	Qualifications
Working on hydraulic installations	Specialized knowledge and experience in hydraulics
Working on electrical installations and equipment	Skilled electrician
Working on mechanical installations	Industrial technician or sufficient instructed personnel, which are able to undertake works to the unit under the instruction and supervision of an industrial technician according to the standards of safety technology

Table 4: Activities and specialized knowledge

### 2.3.4. Exclusion criteria

NOTE
Operating personnel Operating personnel are only allowed to operate the unit. They are neither allowed to open the unit chassis, remove parts, connect or disconnect power or coolant fluids nor to do maintenance

Persons allowed to operate and to maintain the unit must not be under the influence of intoxicating substances (e.g. alcohol, drugs or medicine).

## 2.4. Personal protective gear

Wearing the personal protective gear is required when handling the unit to minimize the health hazards.

The following personal protective gear must always be worn when handling the unit:

	<b>Protective footwear</b> for the protection against heavy parts falling down and from slipping on slippery surface.
-----------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------

When performing cleaning, maintenance or repair work on the unit, the following specific personal protective gear is required:

	<b>Protective gloves</b> to protect the hands from rubbing, abrasions, cuts or more profound injuries, as well as when touching possibly hot coolant.
	<b>Protective eyewear</b> to protect the eyes against parts flying around or splashing of coolant.

## 2.5. Safety and signaling equipment included in the unit

The unit is equipped with the following safety equipment (see Figure 1):

- The maximum pump pressure is limited by a pressure relief valve that returns the coolant stream back into the coolant tank, when the pre-set pressure is exceeded.
- The coolant temperature is monitored by a thermostat. When the coolant temperature exceeds the maximum set point this is indicated by the potential-free safety circuit.
- The circulated coolant amount is monitored by a flow switch that has to be integrated in the potential-free safety circuit of the device that is to be cooled.



Figure 1: Mounting position of the safety equipment of the unit

- (1) Pressure relief valve
- (2) Thermostat
- (3) Flow switch

## 2.6. Guards

Direct access to hazardous parts or areas of the unit is restricted by the unit cover. The unit cover may only be removed for the purpose of maintenance or repair works and shall be replaced prior to taking the unit back into operation (see "Removing and mounting the unit cover").

## 2.7. Caution label

Danger spots on the unit are indicated corresponding to German safety regulation DGUV Vorschrift 9 "Sicherheits- und Gesundheitsschutzkennzeichnung am Arbeitsplatz"

Caution labels on the unit must be easily readable at all times. Illegible caution labels must be exchanged without delay.

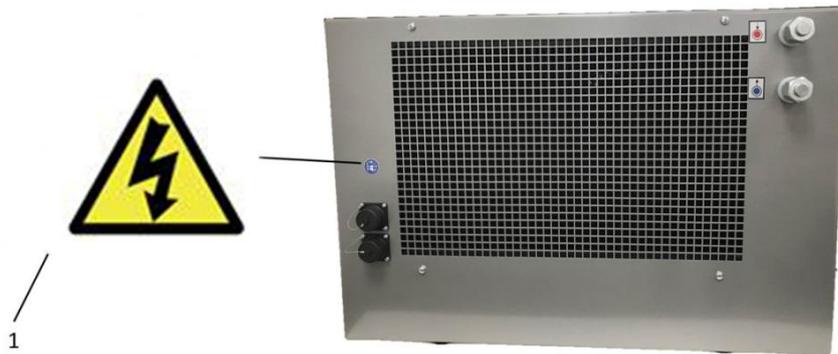


Figure 2: Caution labels on the unit

(1) Warning of hazardous electrical voltage

## 2.8. In case of accidents

Should you or another person be injured when working with the unit:

- Stay calm.
- Render first aid.
- Call the company first-aider without exception.
- If necessary, call your local emergency number.

### First aid at accidents with oil

The unit employs oil as a coolant in a closed-loop configuration. In case of damage oil can leak from the circuit and cause hazards.

- Long term or repeated contact with skin without appropriate cleaning may obstruct the skin pores and may lead to irregularities as oil acne or folliculitis.

When exposed to oil always observe the safety data sheet of the manufacturer.

## 2.9. Environmental issues

Environmentally conscious and anticipatory behavior of staff avoids environmentally hazardous impacts.

The following principles apply for environmentally conscious behavior:

- Environmentally hazardous substances must not get into the soil or into the drains. They should be kept in appropriate containers.
- Environmentally hazardous substances must be brought to utilization or disposal according to regional regulations.
- When dealing with working fluids always keep aware of the safety data sheet of the corresponding manufacturer.

Always adhere to manufacturer safety requirements when handling operating supplies.

## 3. Product identification

### 3.1. Unit specifications

The following table provides information about the unit.

Manufacturer:	Laird Technologies, Průmyslová 497, 462 11 Liberec, Czech Republic
Distributor:	COMET
Type of product:	4500 watt oil to air cooler
Type of unit:	XRC-4523-OA

### 3.2. Identification plate

The identification plate is attached to the housing of the unit and contains the following specifications:

- Unit name, e.g. XRC-4523-OA
- Name and address of the manufacturer
- Name and address of the distributor
- Article number
- Manufacture date
- Serial number
- CE marking
- Electrical specifications

## 4. Unit description

### 4.1. Intended use

The cooling unit XRC-4523-OA is used for cooling a coolant circuit. The coolant circulates between the unit and the device to be cooled. The coolant is cooled down by an air-cooled heat exchanger. The maximum cooling capacity depends on the coolant outlet temperature and the ambient air temperature (see "Technical specifications").

The unit is exclusively intended for use in industrial and commercial environments.

The intended use also includes the observance and following of all hints given in this operating manual, as well as all requirements for setup, initial operation and maintenance at the required time intervals and the safety regulations.

Any use beyond these limits is not regarded as intended use.

Any use other than the intended use is explicitly prohibited.

### 4.2. Non-conformity with the intended use

Operation of the unit under improper operational conditions is not permitted, since otherwise the operation safety cannot be granted.

When using the unit in a way not compliant with the intended use, hazardous situations may occur. Operation of the unit is not permitted under the following conditions:

- The unit is used for a purpose other than the one it is intended for.
- The unit or parts of it are damaged, the electrical installation is not correct or the insulation is broken.
- Protective or safety equipment is not functional or defect, improperly installed or missing.
- The unit is not working properly.
- The unit was modified without authorization or modified in a way that is not permitted.
- Controlling devices were modified in a way that is not permitted.
- Operational parameters were changed in a way that is not permitted.
- Operation in areas exposed to explosion hazards.
- Operation with cooling media not according to specification.
- Use of unauthorized tools.
- Exceedance of the compulsory maintenance intervals.

<b>NOTE</b>
The manufacturer is not liable for damage occurring when using the unit in a way it was not intended. When using the unit in a way it was not intended for, the manufacturer's warranty given by COMET will expire.

### 4.3. Predictable errors during operation

The unit may not be used to cool a different coolant than detailed in its technical specifications, see "Technical specifications". Furthermore the unit may only be operated in its defined temperature range.

## 4.4. Unit components

The unit mainly consists of the following subassemblies. Additional unit information can be found in the diagrams contained in the addendum.

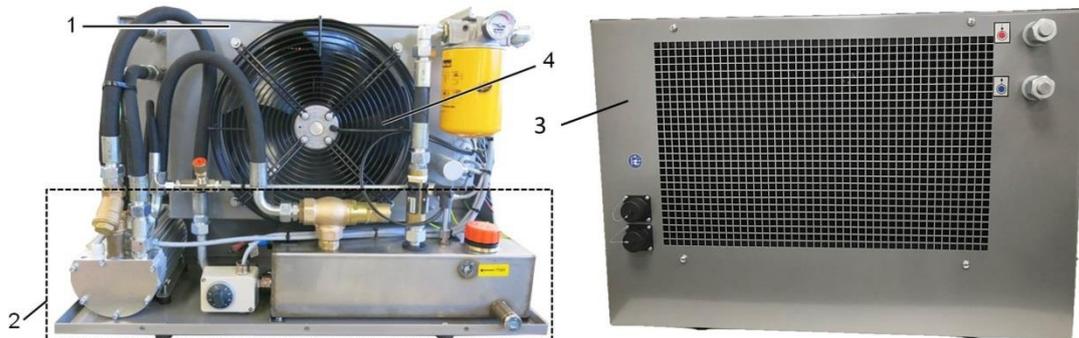


Figure 4: Subassemblies

(1) Heat exchanger    (2) Cooling circuit    (3) Casing    (4) Fan

### 4.4.1. Cooling circuit

In the cooling circuit the coolant is driven by the pump to the device that is to be cooled and back via the return flow. The heat is dissipated into the ambient air by an air-cooled heat exchanger.

Exceedance of the maximum pump pressure is prevented by a by-pass circuit. The coolant temperature is controlled by a thermal switch, whereas coolant throughput is controlled by a flow switch. Both indications are provided potential-free and must be integrated into the safety circuit of the device to be cooled.

## 4.5. Technical specifications

Dimensions, weight and color	
Length:	778mm (see detailed dimension drawings)
Width:	390 mm (see detailed dimension drawings)
Height:	539 mm (see detailed dimension drawings)
Weight (without coolant): Weight (with coolant):	53 kg 65,5 kg
Casing color:	Grey aluminum (RAL 9007)

Coolant circuit	
Coolant:	Oil, Shell Diala S4 ZX-I
Coolant capacity:	12.5 l, operating volume 7.2 l

<b>Performance data</b>	
Cooling capacity:	4500 W at $\Delta T_1 = 11$ K temperature difference between the coolant outlet temperature and the ambient air temperature
Throughput:	> 14 l/min at < 800 kPa (8 bars) (max. 25 l/min at 350 kPa (3,5 bars))
Mains voltage:	230 V AC + 10% / - 15%, 50/60 Hz
Power input:	0,785 kW ( $P_{max}$ : 230 V; 50 Hz) 1,058 kW ( $P_{max}$ : 230 V; 60 Hz)
Air flow at 50Hz (60Hz):	2200 m <sup>3</sup> /h (2600 m <sup>3</sup> /h)
Operating noise:	65 dB(A) measured at a distance of 1 m
Protection class:	IP21

<b>Environment specifications</b>	
Operation above Normal null (NN):	Up to 4000 meters above sea level
Operating temperature:	-10°C up to +40°C
Storage temperature:	-25°C up to +70°C
Rel. humidity:	20% up to 90% (non-condensing)

<b>Settings</b>	
Maximum pressure:	950 ± 20 kPa (9,5± 0,2 bars)
Flow switch open:	≥ 20,5 l/min
Flow switch close:	≥ 22,0 l/min
Thermal switch open:	> 50°C
Thermal switch close:	< 47°C

Table 5: Specifications

## 5. Transport, packing and storage

### 5.1. Safety

 <b>WARNING</b>	<b>WARNING</b>
	<b>Damage due to improper transportation!</b> Injuries to persons and significant damage to property can occur in the case of improper transportation. → When unloading the packed unit on delivery, as well as in-house transport, proceed very carefully and obey the symbols and instructions on the packaging. → Remove the packing material only immediately before installing the unit.

<b>NOTE</b>
<b>Risk of damage through improper transportation!</b> The mounting suspensions of different components inside the unit are not secured with transportation locks. In case of improper transportation these can be damaged without repair and would need to be replaced. → Transport the unit upright. → Unit is not to be tilted or subjected to mechanical impact.

### 5.2. Checking the delivery condition

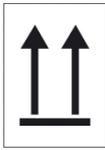
Check the delivery immediately on receipt for possible transport damage and completeness.

If any transport damage is noticed, proceed as follows:

- Refuse the delivery or accept it with reservation.
- Note extent of damage on the transport documents or on the delivery note.
- Inform the manufacturer immediately of any damage incurred during transport.

### 5.3. Symbols on the packaging

The following symbols are attached to the packaging:

Symbol	Meaning
	<b>Top</b> The arrows mark the top of the package. The package has to be stored and transported in such a way that the arrows always point upwards.
	<b>Fragile, Handle with care</b> This symbol marks fragile, easily breakable goods. Goods marked with this symbol have to be handled carefully and should never be rolled over or tied tightly.
	<b>Keep dry</b> This symbol marks goods which are sensitive to moisture/humidity. Goods marked with this symbol have to be protected from overly high air humidity levels.

### 5.4. Packing

NOTE
<b>Hazard for environment due to improper disposal!</b> Packing materials are valuable raw materials and can continue to be used in many cases or sensibly reconditioned and recycled. → Dispose of packing materials environmentally. → Follow the locally valid waste disposal regulations. If necessary employ a special waste disposal company to dispose of packing material.

The unit has been packed according to the anticipated transportation conditions (e.g. packed in sealed plastic or cardboard box on a transport pallet). The packing has the function to protect the unit against damage and corrosion until it is finally installed. The packing material should only be removed just before the installation takes place.

 COMET advises to keep the transport pallet (if provided) for later transportation of the unit.

Dispose packing material in accordance with environment protection requirements.

## 5.5. Manual handling

 <b>WARNING</b>	<b>WARNING</b>
	<b>Danger due to lifting and carrying heavy loads!</b> Manual handling of the loads (lifting, pushing, and carrying) has to be avoided. → Unit weight: see "Technical specifications" → Use only suitable means of transport (e.g. industrial truck, lift truck or sack truck).

## 5.6. Handling with industrial truck

 <b>WARNING</b>	<b>WARNING</b>
	<b>Danger of injury due to tipping or falling loads!</b> Bruises. Bone fracture. When Handling with industrial truck, observe the following basic rules: → Wear the personal protective gear (e.g. protective footwear, protective gloves). → Do not walk or stand under a suspended load. → Use only suitable means of transport (e.g. industrial truck or lift truck). → Use only industrial trucks with sufficient capacity for loading (unit weight: see "Technical specifications"). → Secure the unit so that it cannot tip or fall.

For in-house transport lift the unit and transport it by means of suitable industrial truck or lift truck.

## 5.7. Storing the unit

These storage conditions apply to the following cases:

- To new units.
- To units that are already in operation and were prepared for a temporary placing out of operation, see "Temporary placing out of operation"

Store the units under the following conditions:

- Indoors.
- Dry.
- Dust-free.
- Low vibration.
- Protected against direct sunlight.
- Protected against any aggressive medium.
- Storage temperature and relative humidity: see "Technical specifications".
- In the case of storing the units for longer than 3 months, the general condition of all parts and the packing have to be checked regularly.
- The packaging has only to be removed just before installation takes place.
- Protection caps for the coolant inlet and coolant outlet connections have only to be removed just before installation takes place.
- In order to store the units for more than 6 months, please consult COMET.

## 5.8. Preparing the unit for the further transport

 <b>DANGER</b> 	<b>DANGER</b>
	<b>Electrical danger!</b> Work on electrical installations may be carried out by trained and authorized electricians only. <ul style="list-style-type: none"><li>→ Switch off the unit before starting your work.</li><li>→ Disconnect the unit from mains by pulling the mains plug.</li><li>→ Secure the unit against being switched on again.</li><li>→ Verify that the unit is dead.</li><li>→ Carry out earthing and short circuiting.</li><li>→ Keep unauthorized persons away from the working area.</li></ul>

### NOTE

#### **Risk of damage due to improper transportation!**

A coolant that has not been drained or a packaging with inappropriate dimensions may cause damage during transport.

- Drain the coolant before transporting the unit, see "Draining the coolant".
- Use proper packaging.

### Transporting the unit (after use)

#### *Requirements*

- ✓ Cooling operation finished.
- ✓ Unit switched off.
- ✓ Unit and coolant cooled down to the ambient temperature.
- ✓ Coolant hoses disconnected from the unit, see "Disconnecting the coolant hoses"
- ✓ Coolant drained, see "Draining the coolant"
- ✓ Unit cover removed, see "Removing and mounting the unit cover".

#### *Tools and material required*

- Slot screwdriver

#### *Procedure*

- Dismount the vent plug.
- Mount the transport plug using the slot screwdriver.
- Mount the unit cover, see "Removing and mounting the unit cover"
- Pack the unit according to the transport conditions that can be expected.



COMET advises to use original packaging, if available, or an equivalent packaging.

- Mark the packaging with appropriate symbols, see "Symbols on the packaging"

*The unit can now be transported.*

## 6. Installation and commissioning

### 6.1. Requirements concerning the installation location

#### 6.1.1. Installation location

- The surface of the location must be even.
- When choosing the installation location the following must be kept in mind: the flow of the cooling air must not be restricted, coolant inlet and coolant outlet connections must be easily accessible and all hoses must be installed without sharp bends.

#### 6.1.2. Environmental conditions

NOTE

**Risk of damage through unsuitable environmental conditions!**

Damage to unit and corrosion damage may result and are not covered by manufacturer's liability.

- The unit is only authorized for use in indoor environments.
- The unit must not be stored or operated in aggressive, humid environments.
- The unit must not be stored or operated outdoor.

☞ Environmental conditions: see "Technical specifications".

#### 6.1.3. Infrastructure

The following infrastructure is required for connecting the unit:

Parameter	Rated value
Operating voltage	230 VAC + 10% / - 15%, 50/60 Hz

#### 6.1.4. Placing the unit

Place the unit in a way that air intake and air discharge are not obstructed. Otherwise the cooling capacity may be restricted. The clearance with the wall of the unit is shown in the figure 5.



Figure 5: Required clearance with the wall of the unit

(1) Ventilation grids

## 6.2. Using the unit for the first time

NOTE

### **Risk of damage to the unit due to temperature fluctuations!**

In case the unit is stored outside the operating temperature for a longer period of time, let the unit rest at the installation location so long, until it has reached ambient temperature. Only then can the unit be put into operation.

*Procedure*

- Connect the coolant hoses, see "Connecting the coolant hoses".
- If necessary, add the coolant, see "Adding coolant".
- Connect the unit electrically; see "Connecting the unit electrically".

*The unit can now be put into operation, see "Putting the unit into operation".*

## 6.3. Connecting the unit electrically

 <b>DANGER</b> 	<b>DANGER</b>
	<b>Electrical danger!</b> Work on electrical installations may be carried out by trained and authorized electricians only. <ul style="list-style-type: none"><li>→ Switch off the unit before starting your work.</li><li>→ Disconnect the unit from mains by pulling the mains plug.</li><li>→ Secure the unit against being switched on again.</li><li>→ Verify that the unit is dead.</li><li>→ Carry out earthing and short circuiting.</li><li>→ Keep unauthorized persons away from the working area.</li></ul>

NOTE

### **Risk of damage through improper connections!**

Improper integration of the unit into the safety circuit of the device to be cooled will lead to the inoperativeness of the safety equipment included in the unit.

- Incorporate all required connections according to the wiring diagram shown in the addendum.
- Ensure that all connected safety equipment is properly functioning.
- All tasks should be carried out only by expert staff.

NOTE

The electrical connection as well as the integration into the safety circuit of the device to be cooled are the customer's responsibility and must be accomplished by expert staff.

Information required can be taken from the technical specifications and the wiring diagram available in the addendum.

### **Connecting the unit electrically**

*Requirements*

- ✓ Coolant hoses connected, see "Connecting the coolant hoses".
- ✓ Coolant added, see "Adding coolant".

*Procedure*

- Connect the unit to mains by inserting the mains plug or making a mains connection as required by the particular periphery.

*The unit is now connected electrically*

## 6.4. Putting the unit into operation

**NOTE**

**Danger of malfunction caused by faulty connections during initial operation!**

Before switching on the unit make sure that:

- All safety equipment of the unit is implemented and functional.
- All connections were properly made.
- Nobody is endangered by the start-up of the unit.

**NOTE**

**Lack of coolant may impair cooling capacity and destroy the pump!**

- Only operate the unit with correct coolant level.
- Check the coolant level regularly.

### Starting up the unit

*Requirements*

- ✓ Coolant hoses connected, see "Connecting the coolant hoses".
- ✓ Coolant added, see "Adding coolant".
- ✓ Unit connected electrically, see "Connecting the unit electrically".
- ✓ Unit cover removed, see "Removing and mounting the unit cover".

*Procedure*

- Manually open the needle valve counterclockwise.
- Start the unit using the controls of the device to be cooled.
- Let the unit run for approximately 10 minutes with coolant filler plug mounted.
- Switch off the unit using the controls of the device to be cooled.
- Dismount the coolant filler plug.
- Check coolant level and top up, if necessary, see "Adding coolant".
- Manually close the needle valve clockwise.
- Mount the coolant filler plug.
- Mount the unit cover, see "Removing and mounting the unit cover".
- Restart the unit.
- Check whether the operating specifications are met; see "Technical specifications".

*The unit is operational.*



Figure 7: Mounting position of the needle valve

(1) Needle valve

## 7. Controlling the unit

The unit is controlled by using the controls of the device that is to be cooled.

All alarm and error signaling is only indicated on the control panel of the device that is to be cooled.

### 7.1. Switching on the unit

#### Switching on the unit

##### Requirements

- ✓ The unit is ready to be switched on.

##### Procedure

- Switch on the unit about 1 minute prior to operation of the device to be cooled.
- Check whether the operating specifications are met; see "Technical specifications".

*The unit has been switched on.*

### 7.2. Switching off the unit

#### Switching off the unit

##### Requirements

- ✓ Cooling operation finished.

##### Procedure

- Switch of the unit using the controls of the device to be cooled.
- Close all valves that may exist in the extension of the hoses running to and from the unit.

*The unit has been switched off.*

### 7.3. Settings

NOTE
The monitoring units are set according to technical specifications and sealed. Any modifications to these settings lie in the sole responsibility of the customer and must only be carried out by expert staff.

#### 7.3.1. Flow switch

NOTE
The adjusting of the flow switch should not be made without the help of proper measuring equipment, as the switching point must be adjusted in a controlled way. Otherwise the function of the safety circuit might not be reliable and, as a result, the device to be cooled might get damaged.

The flow switch contains a closing contact with two adjustable switch heads. The set switch-off threshold: see "Technical specifications". If necessary, the angled connector can be repositioned.

## Repositioning the angled connector

### Procedure

- Loosen the finger screw of the angled connector.
- Remove the angled connector from the switching head.
- Push the angled connector onto the desired switching head.
- Tighten the finger screw.

*The angled connector has been repositioned.*

## Adjusting the switch contact

### Procedure

- Please use demagnetized tools only.
- Please do not knock on switch contact with tools or hand(s).
- Loosen the seal and the set screw.
- Push the switching head into the flow direction to adjust the switch contact at a higher flow.
- Push the switching head against the flow direction to adjust the switch contact at a lower flow.
- Tighten the set screw.

*The switch contact is now adjusted.*



*Figure 8: Flow switch with two adjustable switch heads*

(1) Adjustable switching head

(2) Angled connector

## 7.3.2. Pressure relief valve

The pressure control valve is set by the manufacturer to a maximum pressure (factory setting: see "Technical specifications"). If any modification to this setting should be required, please contact the COMET service department to receive a briefing.

### NOTE

The maximum pressure, which is reached by the device to be cooled, is affected by the length of the coolant hoses.

### Setting the maximum pressure

#### Tools and material required

- Spanner (size 19)
- Spanner (size 32)
- Spanner (size 36)

## Procedure

- Remove the cover nut using the spanner (size 32). Use the spanner (size 36) to hold the valve in place.
- Loosen the counter nut using the spanner (size 32).
- Turn the adjusting screw clockwise by using spanner (size 19) to increase the maximum pressure.
- Turn the adjusting screw counterclockwise by using spanner (size 19) to decrease the maximum pressure.
- Tighten the counter nut.
- Re-install the cover nut and tighten it.
- Check the maximum pressure again and repeat the setting, if necessary.

*The maximum pressure is now set.*

### 7.3.3. Thermostat

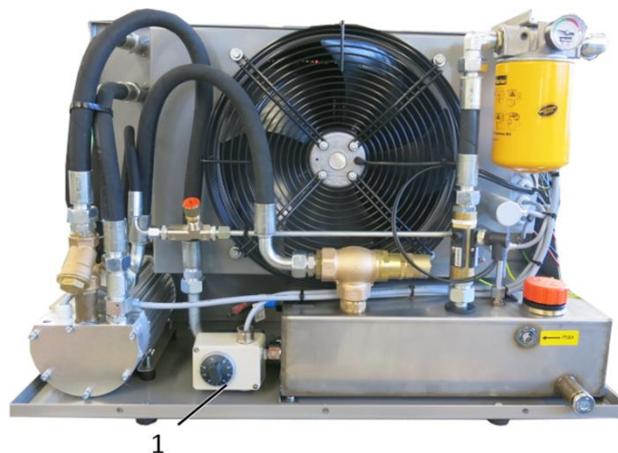
The coolant outlet temperature is monitored by a thermostat. Factory setting: see "Technical specifications". To meet changing needs the switching point of the thermostat can be corrected using the adjustment knob.

#### Setting the maximum value of the coolant outlet temperature

##### Procedure

- Turn the adjustment knob clockwise to increase the maximum value of the coolant outlet temperature.
- Turn the adjustment knob counterclockwise to decrease the maximum value of the coolant outlet temperature.

*The maximum value of the coolant outlet temperature is now set.*



*Figure 9: Mounting position of the thermostat*

(1) Adjustment knob of the thermostat

## 8. Disruptions

### 8.1. Safety

Adhere to the safety regulations detailed in chapter "Safety".

In the event of fault diagnostics follow the guidelines detailed below:

- Only sufficiently qualified personnel may perform maintenance on the unit.
- If you cannot determine the error, please contact COMET services.

### 8.2. Disruption in operation

The most common reason for disruption in operation of the unit is improper maintenance. Maintenance should be carried out regularly according to the maintenance intervals defined in chapter "Maintenance and cleaning", see "Maintenance and cleaning".

In case of disruption start with checking the following:

- Coolant polluted?
- Low coolant contents because of leakage, evaporation or an extended cooling circuit with long hoses?
- Heat exchanger polluted?
- Fan polluted or blocked?

More help can be found in the following paragraph.

In case you do not succeed in identifying the problem cause by means of this manual, please contact the service department of COMET.

#### 8.2.1. Troubleshooting

For trouble shooting you may rely on the following:

- Alarm signaling within the safety circuit of the unit to be cooled
- Wiring diagram
- Flow chart
- Trouble shooting table given below

**Fault table**

<b>Fault</b>	<b>Possible cause</b>	<b>Corrective measures</b>	<b>Clearance by</b>
Unit does not start	Power not applied. Electrical connection not correct or no mains connection	Check power supply and ensure proper voltage in the line. Check connection, insert mains plug.	Operator
Unit running but cooling capacity is not available or too low	Coolant hoses buckled or pitched	Install the hoses with a larger radius in order to avoid sharp bends.	Operator
	Unit not placed properly	Required clearance with the wall of the unit see "Placing the unit".	Operator
	Heat exchanger polluted	Clean heat exchanger, see "Cleaning the heat exchanger".	Operator
	Coolant level too low	Check coolant level and top up, if necessary, see "Adding coolant".	Operator
	Coolant hoses not connected	Connect the coolant hoses, see "Connecting the coolant hoses".	Operator
	Filter strainer dirty	Clean filter strainer, see "Cleaning the filter strainer".	Operator
	No flow in cooling circuit	Flow is signaled potential-free by the safety equipment of the unit and can be indicated by the controls of the device to be cooled.	Operator
	Fan does not turn	Check, if fan is mechanically blocked.	Operator
	Fan blades damaged	Replace damaged fan	Skilled employee
Noise	Ambient air temperature too high	Check specifications; see "Technical specifications".	Operator
	Coolant level too low	Check coolant level and top up, if necessary, see "Adding coolant".	Operator
	Cooling circuit blocked	Ensure that cooling circuit is not blocked.	Operator
	Filter strainer dirty	Clean filter strainer, see "Cleaning the filter strainer".	Operator
	Heat exchanger polluted	Clean heat exchanger, see "Cleaning the heat exchanger".	Operator
	Coolant hoses buckled or pitched	Ensure that coolant hoses are not buckled or pitched.	Operator

Table 5: Troubleshooting

## 9. Maintenance and cleaning

Diligent maintenance is the prime factor for assuring an error-free and efficient operation of the unit. All the maintenance tasks contained in this chapter have to be performed according to the maintenance intervals.

### 9.1. Safety

#### Working on the electrical equipment

 <b>DANGER</b> 	<b>DANGER</b>
	<p>Electrical danger!</p> <p>Work on electrical installations may be carried out by trained and authorized electricians only.</p> <ul style="list-style-type: none"><li>→ Switch off the unit before starting your work.</li><li>→ Disconnect the unit from mains by pulling the mains plug.</li><li>→ Secure the unit against being switched on again.</li><li>→ Verify that the unit is dead.</li><li>→ Carry out earthing and short circuiting.</li><li>→ Keep unauthorized persons away from the working area.</li></ul>

When working on electrical installations the following principles should be observed:

- Works on the electrical installations may only be accomplished by qualified electrical staff.
- When connecting electrical equipment to mains regional regulations have to be observed. Be aware of the connection diagram information!
- The unit is powered by electricity. Electrical shock hazard exists, if the electrical installations are defective or the insulation fails during operation.
- When switched-off the unit is not disconnected from mains. This is only the case when the mains plug is pulled.
- Any changes regarding the control elements of the unit can have an influence on the safe operation. All changes intended must be authorized by the manufacturer.
- After the implementation of a change the operation of the safeguards must be verified.
- No unauthorized changes on the unit are allowed. All intended changes must be authorized by the manufacturer.

## Improper maintenance

 <b>WARNING</b>	<b>WARNING</b>
	<p>Danger of injury due to improperly performed maintenance. Improper maintenance can lead to personal injury or material damage.</p> <ul style="list-style-type: none"><li>→ Disconnect the unit from all sources of power during maintenance work.</li><li>→ Ensure the sufficient working area at the beginning of the maintenance work.</li><li>→ Provide all components and tools required for maintenance work.</li><li>→ Keep the working area clean and tidy. Loose components and tools, which are lying on each other or lying around, are sources of accidents.</li><li>→ Check all components for soiling and damage. Do not use damaged or incorrect components.</li><li>→ Handle the components with care, in order to avoid damage.</li><li>→ Assemble components properly. Comply with specified screw tightening torques.</li><li>→ Secure components, in order to prevent them from falling or tipping over.</li><li>→ Only perform maintenance work using conventional tools. Improper or damaged tools can result in personal injury.</li></ul>

## Handling with coolant

 <b>WARNING</b>	<b>WARNING</b>
	<p>Risk of burning and/or scalding due to possibly hot coolant. Coolant can reach high temperatures during operation and cause burns or scalding in the case of contact.</p> <ul style="list-style-type: none"><li>→ Check whether the coolant is hot before handling it. If necessary, let it cool down to the ambient temperature, that there is no more risk of burns or scalding.</li></ul>

 <b>CAUTION</b>	<b>CAUTION</b>
	<p>Danger of slipping or endangering the environment due to spilled coolant. Spilled coolant can cause slipping and endanger the environment.</p> <ul style="list-style-type: none"><li>→ Do not spill coolant.</li><li>→ Immediately remove the spilled coolant with an appropriate bonding agent.</li><li>→ Dispose the bonding agent and coolant mixture in accordance with regulations.</li></ul>

<b>NOTE</b>
<p>Testing and replacing coolant hoses. Coolant hoses can become brittle through age and have to be checked at regular intervals.</p> <ul style="list-style-type: none"><li>→ Observe the specifications of the coolant hoses manufacturer.</li></ul>

## Environmental issues

### NOTE

Danger to the environment due to improper handling!

Environmentally conscious and anticipatory behavior of staff avoids environmentally hazardous impacts.

The following principles apply for environmentally conscious behavior:

- Environmentally hazardous substances must not get into the soil or into the drains. They should be kept in appropriate containers.
- Environmentally hazardous substances must be brought to utilization or disposal according to regional regulations.
- When dealing with working fluids always keep aware of the safety data sheet of the corresponding manufacturer.

### Personnel

Unless otherwise noted, all maintenance tasks described in this chapter can be performed by the operator of the unit.

Other maintenance tasks have to be performed by specially trained qualified personnel. This is specially noted in the description of the single maintenance task.

### Personal protective gear

The following personal protective gear for all maintenance work has to be worn:

- Protective footwear
- Protective gloves
- Protective eyewear

## 9.2. Maintenance schedule

The maintenance tasks necessary to ensure proper operation of the unit are described in the maintenance schedule.

The maintenance intervals are as follows:

- regularly
- every 3 months
- every 6 months

If increased wear of single components or component groups has been determined during regular inspections, the operator of the unit has to reduce the required maintenance intervals on the basis of the actual signs of wear. Deviations from normal operation of the unit lead to the assumption that the functions are impaired. These then have to be subjected to an inspection by specialized staff.

### Maintenance table

Interval	Activities to be carried out	Criteria	Personnel
Regularly	Clean heat exchanger, see "Cleaning the heat exchanger".	Plate fins and ventilation grids polluted	Skilled employee
	Check the coolant level and replenish it, if necessary, see "Adding coolant".	Coolant level well above mesh	Operating personnel

	Inspect coolant hoses, connections and pipes for cracks and for leakages (visual inspection)	Coolant hoses, pipes and connections are leaking	Operating personnel
	Inspect the coolant quality (visual inspection)	Turbidity, airborne particles	Operating personnel
	Replace the coolant filter, see "Replacing the coolant filter".	The contamination indicator for the coolant filter goes into the red zone	Operating personnel
Every 3 months	Clean or replace the filter strainer, see "Cleaning the filter strainer".	Filter strainer damaged or dirty	Skilled employee

Table 6: Maintenance

### 9.3. Preparing the unit for maintenance

All necessary safety measures have to be taken to prevent accidents when carrying out the maintenance. The following preparations have to be made:

- Terminate the cooling operation.
- Let the unit and its coolant cool down to the ambient temperature.
- Switch off the unit.
- Disconnect the unit from mains by pulling the mains plug.
- Secure the unit against being switched on again.
- Verify that the unit is disconnected.
- Carry out earthing and short circuiting.
- Keep unauthorized persons away from the working area.
- Place the unit on a level surface.

### 9.4. Disconnecting the coolant hoses

The coolant hoses are connected to the unit by means of screw-in connectors. Coolant inlet and coolant outlet are labeled with respective symbols.

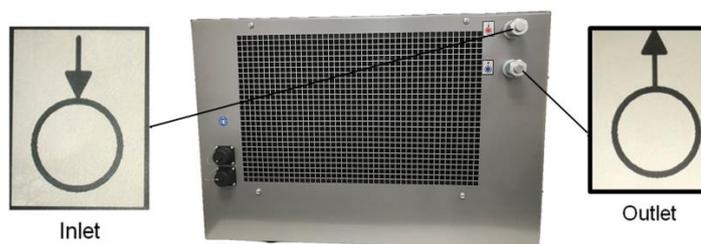


Figure 10: Labeling of coolant inlet and coolant outlet

#### Disconnecting the coolant hoses

##### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Coolant drained, see "Draining the coolant".

✓ Coolant cooled down to the ambient temperature.

#### *Tools and material required*

- Spanner (size 32)
- Spanner (size 27)
- Absorbent cloth
- Bonding agent
- Protection caps

#### *Procedure*

- Unscrew the connection screws for connecting the coolant hoses to the unit using the spanner (size 32). Use the spanner (size 27) for countering, in order to avoid the hydraulic line from being destroyed.
- Secure the coolant inlet and coolant outlet connections with protection caps against soiling.

*The coolant hoses are now disconnected from the unit.*

## 9.5. Connecting the coolant hoses

### NOTE

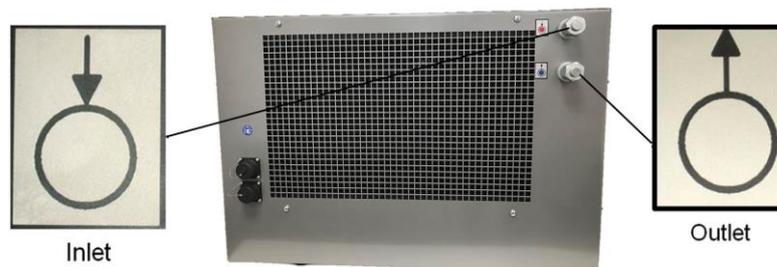
Risk of damage by using improper or faulty coolant hoses! This may lead to damage to persons, damage to property or corrosion damage.

- When choosing coolant hoses pay attention to sufficient burst strength and compatibility with coolant.
- Only use coolant hoses without any signs of damage.
- In case water is being used as coolant, ensure that non-transparent hoses are used to prevent algae growth in the water. Otherwise appropriate additives have to be used.

### NOTE

When connecting the coolant hoses pay attention to flow direction. Follow the documentation released by the manufacturer of the unit to be cooled. Transparent coolant hoses stimulate algae growth that may increase the error-proneness of the components built into the unit. Thus, only use non-transparent coolant hoses.

The coolant hoses are connected to the unit by means of screw-in connectors. Coolant inlet and coolant outlet are labeled with respective symbols.



*Figure 11: Labeling of coolant inlet and coolant outlet*

## Connecting the coolant hoses

### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".

### Tools and material required

- Spanner (size 32)
- Spanner (size 27)

### Procedure

- Remove the protection caps from the coolant inlet and coolant outlet connections of the unit.
- Connect an appropriate coolant hose to the coolant inlet and coolant outlet respectively.
- Screw the connection screws for connecting the coolant hoses to the unit using the spanner (size 32). Use the spanner (size 27) for countering, in order to avoid the hydraulic line from being destroyed.
- Connect the coolant hoses to the corresponding connections of the unit to be cooled.

*The coolant hoses are now connected to the unit.*

## 9.6. Draining the coolant

### Draining the coolant

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Coolant cooled down to the ambient temperature.

#### Tools and material required

- Allen wrench (size 10)
- Collection container
- Filling funnel
- Absorbent cloth
- Bonding agent

#### Procedure

- Place a suitable container below the coolant drain plug to collect the coolant.
- Dismount the coolant filler plug.
- Unscrew the coolant drain plug using the Allen wrench.
- Drain the coolant into the container placed below.
- Mount the coolant drain plug using the Allen wrench.  
The recommended torque is approx. 40 Nm.
- Mount the coolant filler plug.

*The coolant is now drained.*



Figure 12: Mounting position of the coolant drain plug

(1) Coolant drain plug

## 9.7. Adding coolant

### NOTE

When operating the unit make sure only to use the vent plug. This plug allows the pressure equilibrium in the cooling system (breathing). Save the transport plug for later transportation purposes (e.g. when sending the unit back for repair).

### Adding coolant

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Coolant hoses connected to the unit, see "Connecting the coolant hoses".
- ✓ Unit cover removed, see "Removing and mounting the unit cover".

#### Tools and material required

- Filling funnel
- Measuring cup
- Absorbent cloth

#### Procedure

- Dismount the coolant filler plug.
- Add coolant up to the center of the fill level indicator.  
Coolant and quantity see "Technical specifications".
- Use a filling funnel in order not to moisten any current-carrying components with coolant.
- Mount the coolant filler plug.

The coolant is now added.



Figure 13: Mounting position of the coolant filler plug

(1) Vent plug    (2) Transport plug    (3) Coolant filler opening    (4) Fill level indicator

## 9.8. Removing and mounting the unit cover

### NOTE

#### Damage to the unit.

The fastening screws on the connection side of the unit may not be removed, otherwise, the heat exchanger will be dismantled.

→ Do not remove the fastening screws on the connection side of the unit (see figure 14).

### Removing the unit cover

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".

#### Tools and material required

- Spanner (size 10)
- Phillips screwdriver (model PH 2)

#### Procedure

- Remove the ten fastening screws on the back side of the housing using the spanner (size 10).
- Carefully tip the back side of the housing towards you.
- Disconnect the grounding cable from the grounding bolt.
- Carefully lift off the back side of the housing and lay it aside.
- Remove the nine fastening screws of the unit cover using the Philips screwdriver (model PH 2).
- Disconnect the grounding cable from the grounding bolt.
- Carefully lift off the unit cover and lay it aside.

The unit cover has been removed.

☞ Mounting is the reverse order.

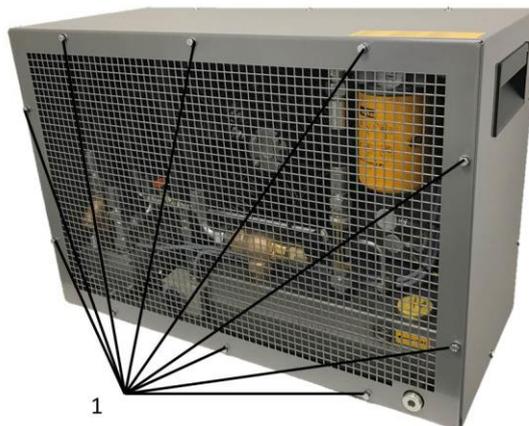


Figure 14: Mounted unit cover

(1) Fastening screws

## 9.9. Cleaning the filter strainer

 <b>WARNING</b>	<b>WARNING</b>
	<b>Risk of burning and/or scalding due to possibly hot coolant.</b> Coolant can reach high temperatures during operation and cause burns or scalding in the case of contact. → Check whether the coolant is hot before handling it. If necessary, let it cool down to the ambient temperature, that there is no more risk of burns or scalding.

### Cleaning the filter strainer

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Coolant cooled down to the ambient temperature.
- ✓ Unit cover removed, see "Removing and mounting the unit cover".

#### Tools and material required

- Spanner (size 24)
- Absorbent cloth

#### Procedure

- Place an absorbent cloth below the filter strainer to collect the coolant
  - Unscrew the cap of the filter strainer using the spanner (size 24).
  - Remove the filter strainer and clean it.
  - Check the filter strainer for damage.
- ☞ Damaged filter strainer has to be replaced immediately.
- ☞ If the filter strainer cannot be cleaned, replace the filter strainer.
- ☞ If the seal of the cap of the filter strainer is damaged, replace the filter strainer.
- Insert the cleaned or a new filter strainer.
  - Screw the cap of the filter strainer back on using the spanner (size 24).  
The recommended torque is approx. 125inlb (14 Nm).
  - Collect any coolant that emerges using an absorbent cloth.
  - Check coolant level and top up, if necessary, see "Adding coolant".
  - Start up the unit, see "Putting the unit into operation".

*The filter strainer is now clean.*

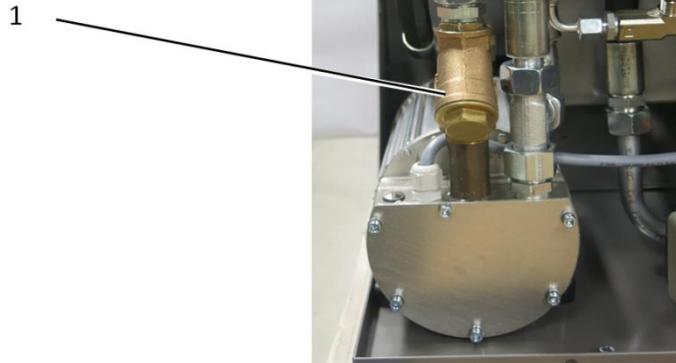


Figure 15: Mounting position of the filter strainer

(1) Screw cap of the filter strainer

## 9.10. Cleaning the heat exchanger

Cooling capacity is heavily reduced, if the heat exchanger is contaminated. The heat exchanger has to be checked for contamination regularly and be cleaned, if required.

- ☐ The cleaning of the heat exchanger has to be performed in accordance with the maintenance intervals.

 <b>DANGER</b>	<b>DANGER</b>
	<p>The use of water for cleaning the heat exchanger can cause short circuit and damage the fan</p> <p>The use of water for cleaning the heat exchanger can damage the fan and result in a short circuit. In this case persons are in danger to get an electric shock.</p> <p>→ Do not clean the heat exchanger with water.</p>

### NOTE

Damage to the fins of the heat exchanger due to improper handling of the unit.

Damaged fins of the heat exchanger lead to a reduced cooling capacity.

- Take care not to damage the fins of the heat exchanger when cleaning the heat exchanger.
- If the fins of the heat exchanger are not in a suitable condition, you must only start to use the unit when the damage has been rectified.

### Cleaning the heat exchanger

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Unit cover removed, see "Removing and mounting the unit cover".

### Tools and material required

- Vacuum cleaner
- Hand brush
- Brush

### Procedure

- Clean the heat exchanger with a vacuum cleaner, hand brush or brush.
- Remove any contamination from the ventilation grid.
- Start up the unit, see "Putting the unit into operation".

*The heat exchanger is now clean.*

## 9.11.Replacing the coolant filter

### Replacing the coolant filter

#### Requirements

- ✓ Unit prepared for maintenance, see "Preparing the unit for maintenance".
- ✓ Unit cover removed, see "Removing and mounting the unit cover".
- ✓ The contamination indicator for the oil filter goes into the red zone.

#### Procedure

- Turn the filter to be replaced to the left and remove it from its mounting.
- Insert a new filter into the mounting and turn it to the right.

*The coolant filter has been replaced.*

➡ After replacing the filter the contamination indicator will be automatically reset.

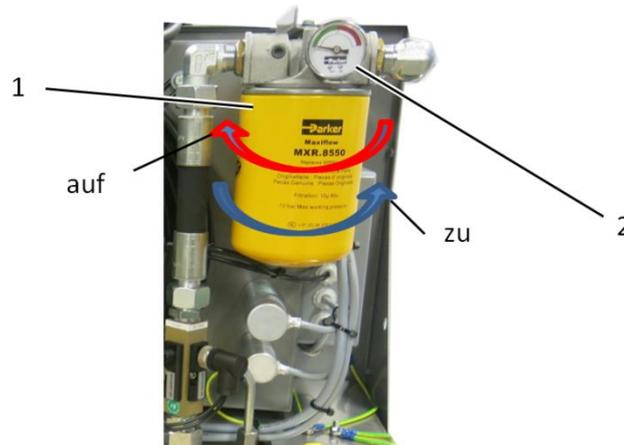


Figure 16: Mounting position of the coolant filter

(1) Filter cartridge

(2) Contamination indicator

## 9.12. Cleaning the casing

NOTE

### **Risk of damage by use of improper cleansing material!**

When using aggressive or abrasive cleaning agents corrosion damage may occur as result of a damaged paint film.

- For cleaning the unit body only use mild cleaning agents (e.g. dish washing detergents).
- Use clean and lint less cloth for cleaning.

Regularly remove dirt from the casing of the unit to prevent corrosion damage and clogging of the air grids. Pay attention that all plates at the unit are always clean and legible.

# 10. Repair

## 10.1. Safety

Ensure to adhere to safety regulations as detailed in chapter "Safety".

## 10.2. Repair procedures

In case of malfunctioning during the warranty period the unit must be sent to the COMET service department for repair ([see "Contact information"](#) or the COMET services website under <http://www.comet-xray.com/Service/Contact-Form>).

When warranty has expired, no restrictions from the side of COMET exist with respect to repair work carried out by the customer, as long as warranty and warranty conditions remain untouched. In any case only expert staff is authorized for doing repair work.

-  When doing repair work on the unit always be aware of the terms of warranty as defined in chapter "Terms of warranty".

# 11. Decommissioning and disposal

## 11.1. Temporary placing out of operation

 <b>DANGER</b> 	<b>DANGER</b>
	<p>Electrical danger!</p> <p>Work on electrical installations may be carried out by trained and authorized electricians only.</p> <ul style="list-style-type: none"><li>→ Switch off the unit before starting your work.</li><li>→ Disconnect the unit from mains by pulling the mains plug.</li><li>→ Secure the unit against being switched on again.</li><li>→ Verify that the unit is dead.</li><li>→ Carry out earthing and short circuiting.</li><li>→ Keep unauthorized persons away from the working area.</li></ul>

The decommissioned unit has to be stored in a dry and dust-free room.

 For recommended storage conditions see "Storing the unit".

### Prior to decommissioning

#### Procedure

- Finish the cooling operation.
- Disconnect the unit from mains.
- Let the unit and the coolant cool down.
- Disconnect coolant hoses from the unit, see "Disconnecting the coolant hoses".
- Drain the coolant, see "Draining the coolant".
- Clean the unit, see "Maintenance and cleaning".
- Secure the coolant inlet and coolant outlet connections with protection caps against soiling.

*The unit has now been decommissioned.*

## 11.2. Returning the unit to service after decommissioning

#### Procedure

- Thoroughly clean the unit, see "Maintenance and cleaning".
- Check that the unit is in perfect condition.
- Install the unit and put it into operation, see "Installation and commissioning".

### 11.3. Final decommissioning, disposal

Final decommissioning or disposal of the unit has to be performed in accordance with the regulations of the country of use.

The unit was manufactured mainly from recyclable material. Make sure the components of the unit end up at a qualified company for disposal and recycling.

Contact COMET for take back of end-of-life units (see "[Contact information](#)") or the official COMET services website at <http://www.comet-xray.com/Service/Contact-Form>) or ask a company destined for disposal and recycling.

### 11.4. Disposal of operating materials

The operating materials of the unit can be hazardous to the environment and to health.

- Make sure the operating materials are disposed of or recycled according to local regulations.
- Also, the safety specifications of the coolant manufacturer must be obeyed.

### 11.5. Return of the unit to COMET

NOTE

**Declaration of decontamination**

Before re-shipment of the unit a declaration of decontamination must be sent to COMET.

## 12. Wear parts and spare parts

Spare parts must comply with the technical specifications defined by COMET. Original COMET parts are subject to strict obligations and fulfill these requirements. COMET does not provide warranty service in case of damages caused by the use of spare parts made by manufacturers other than COMET.



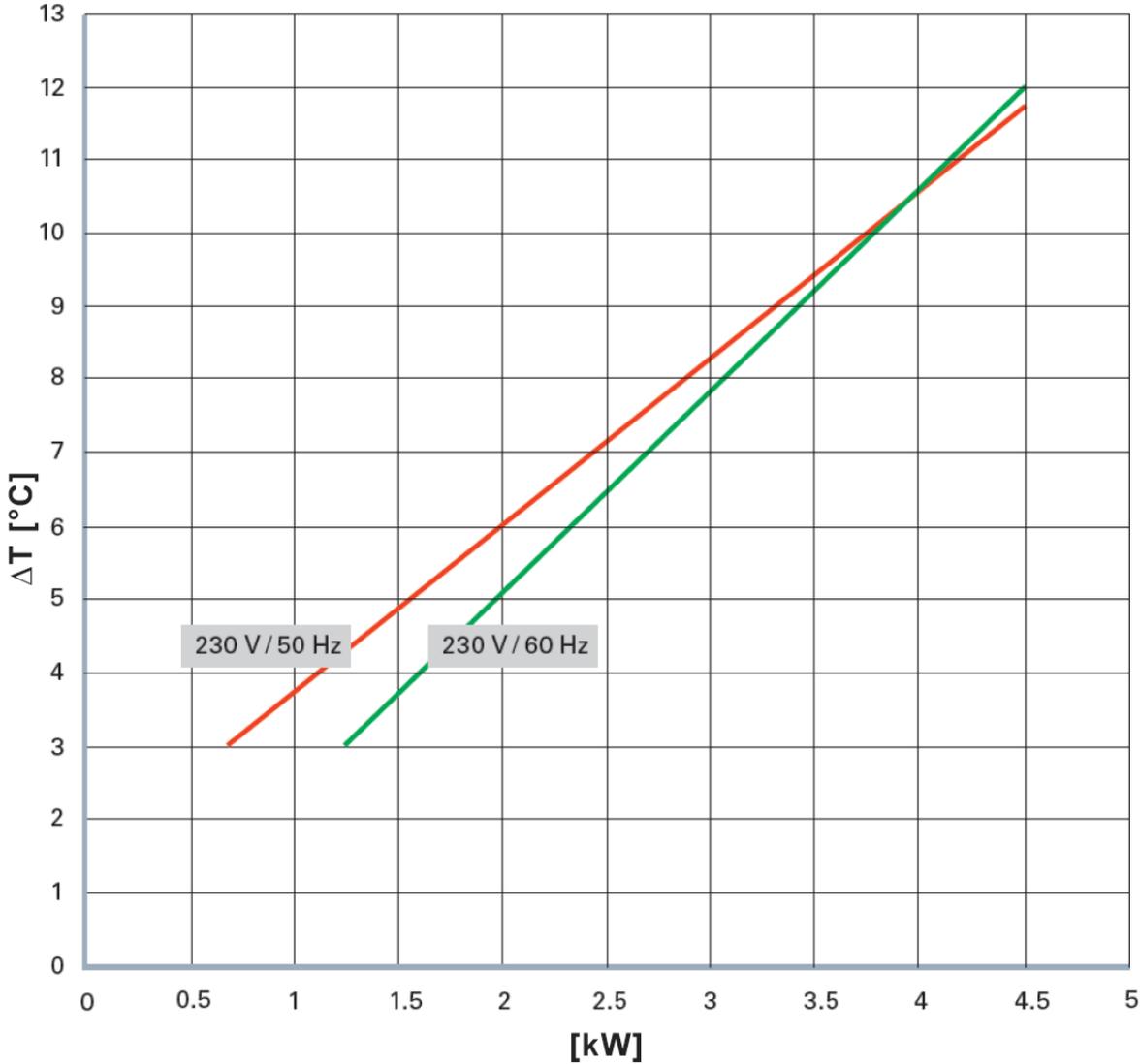
The type of the unit and the article number can be found on the identification plate of the unit. The corresponding numbers shown in drawings below as well as the part description are listed in the spare part list (table 7).

Please direct your inquiries and orders to COMET (see "Contact information") with the following detailed information:

- Type of unit
- Article number
- Serial number
- Part description
- Quantity
- Shipping details
- Picture of the item in question

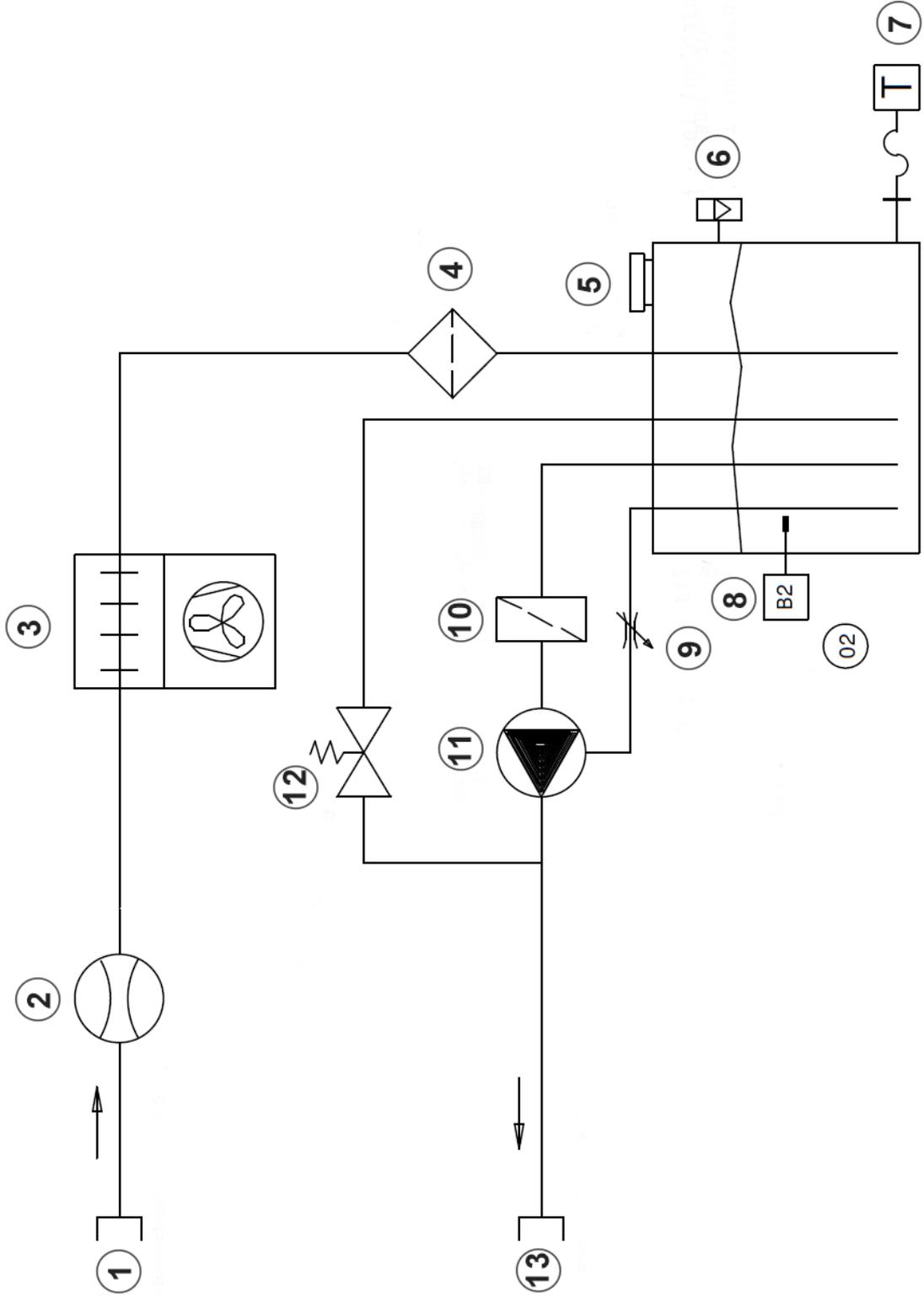
# 13. Addendum

## 13.1. Performance diagram



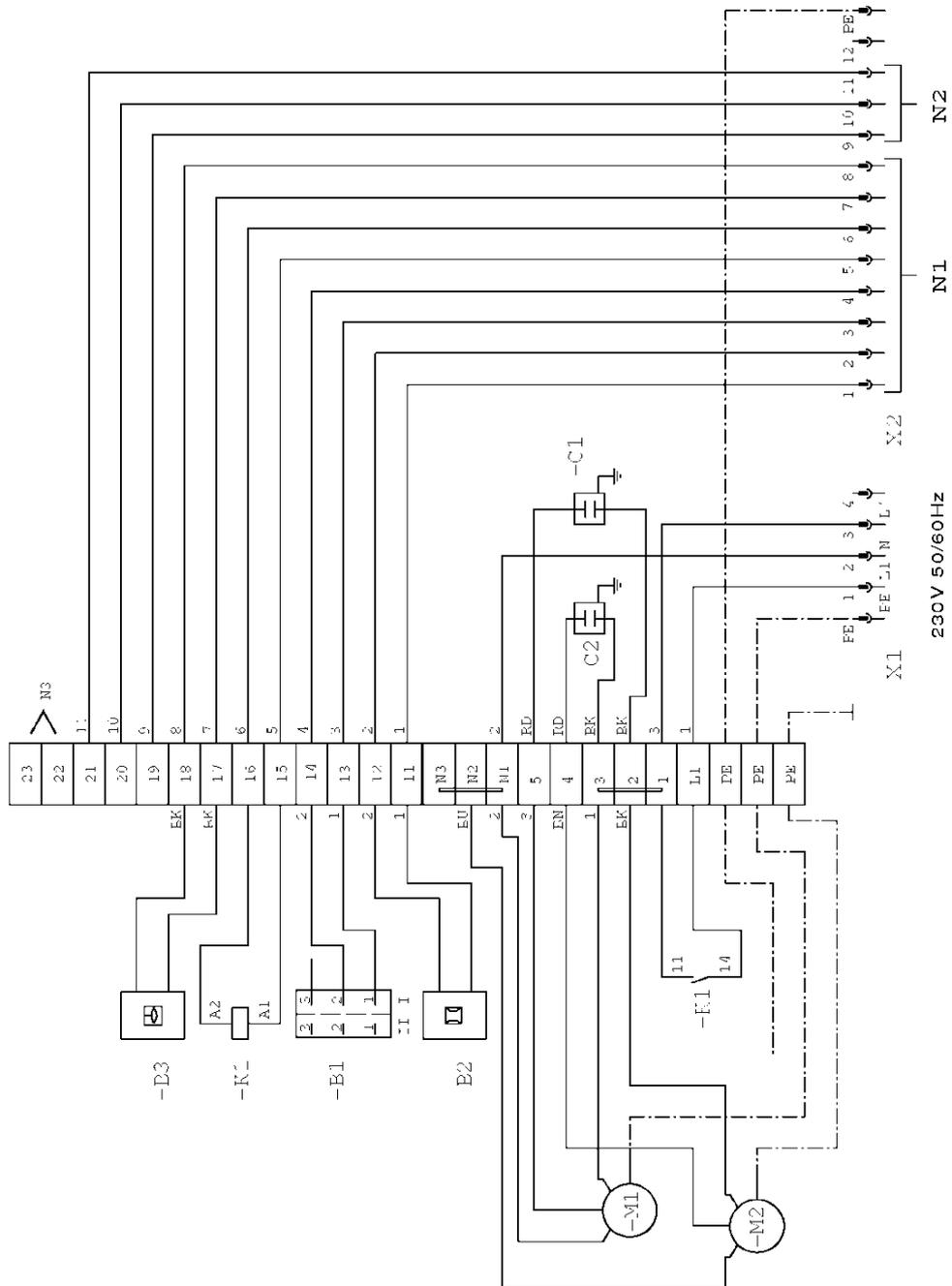
Item	Designation
$\Delta T$ [°C]	Temperature difference: forward - ambient
[kW]	Cooling capacity in kW

13.2. Flow chart



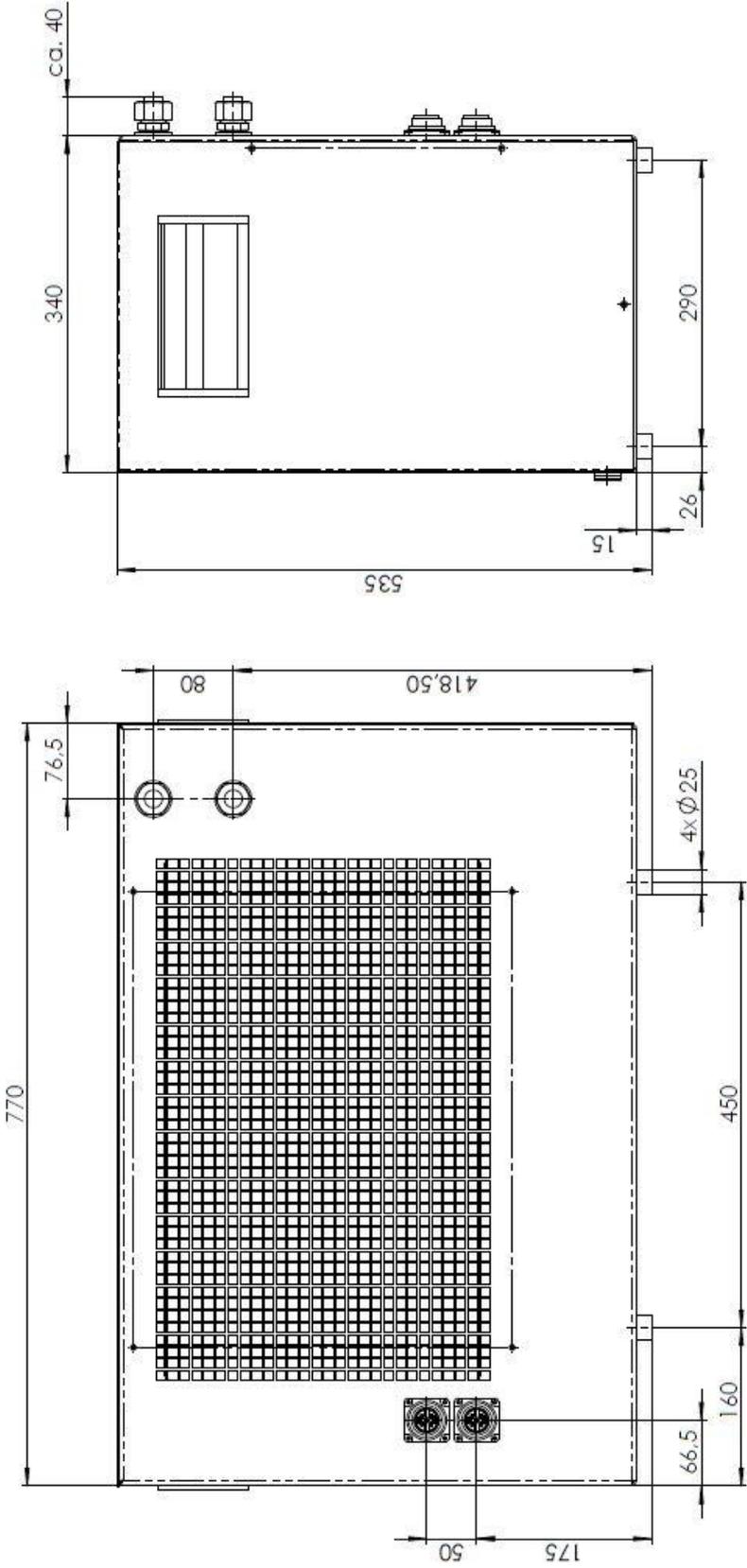
Item	Designation
1	Inlet (screw connection M26 x 1,5)
2	Flow controller
3	Heat exchanger
4	Filter
5	Container (Tank)
6	Level indicator
7	Thermal switch
8	Level sensor
9	Throttle valve
10	Splash guard
11	Pump
12	Relief valve
13	Outlet (screw connection M26 x 1,5)

### 13.3. Wiring diagram



Item	Designation
B1	Thermal switch
B2	Flow switch
B3	Level sensor
C1	Capacitor
C2	Capacitor
K1	Relay
M1	Pump
M2	Fan
N1	Safety circuit
N2	i-Cooler node
N3	Spare clamp

### 13.4. Dimension drawing



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