

# Instructions

8000.083.2059

## Cooler



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## Legal note

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### Translation of the original Instructions

These operating instructions are a translation of the original Instructions. The original Instructions were generated in German language.

### Document history

No.	Change No.	Date	Description
d	10009218	17.12.18	Generation of the Instructions; Translation of the original instruction

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## Index of abbreviations

Table 1: Index of abbreviations

Abbreviation	Explanation
BGV	Trade union provision [Berufsgenossenschaftliche Vorschrift]
Cd	Cadmium
CE	Conformité Européenne (European standardisation)
EC	European Community
EN	European standard
EU	European Union
Hg	Mercury
Pb	Lead

# 1 Introduction

## 1.1 Important information pertaining to the Instructions

These operating instructions apply to the Cooler.

The Instructions are a separate part of the technical documentation and are a constituent part of the product.

As the operator of the Cooler, the Instructions should provide you with information for the safe and efficient use of the Cooler.

Read these operating instructions carefully. The understanding of these operating instructions is a prerequisite for the proper use of the Cooler. Always adhere to the instructions and information contained within these and always follow the safety instructions carefully. Do not rely on individual points of information from individual chapters without taking the entirety of the operating instructions into account.

Reference is made to other documents in these Instructions. Observe the content of these documents.

Some illustrations in these Instructions are intended for the clarification of technical details. The colours shown may deviate from the original colours.

Always store these Instructions in a filing system that is accessible at all times.

In the event that the Instructions are passed on in digital form and there is an in-house requirement for a paper printout and this situation does not infringe the copyright, such printouts must be carried out in colour as some information is only complete when the whole content is printed out in colour.

## 1.2 Liability

Refer to the contractual conditions for this project for information pertaining to liability and warranty claims. The manufacturer shall not be liable for any delays or damage caused by a disregard of the Instructions.

The manufacturer shall not be liable for any errors in these Instructions. Liability for direct and indirect damages, which arise in conjunction with the supply or use of these Instructions, is excluded insofar as this is legally permissible.

Any change that deviates from the original delivery condition of the cooler and that has not been carried out by the manufacturer or by a person authorised by the manufacturer and that has not been expressly approved, shall result in the voiding of any warranty or liability claims. This likewise applies to damage arising through incorrect operation and/or due to improper use.

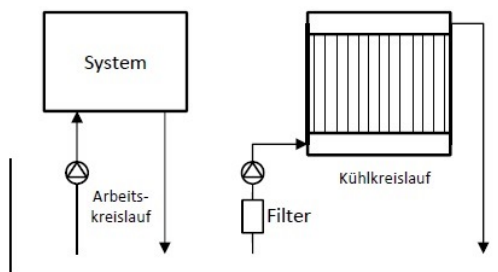


## 1.3 Warranty

Unless otherwise agreed, the "General terms of sales and delivery" of AKG Thermotechnik International GmbH & Co. KG shall apply.

**i** According to the manufacturer's information, the carbon brushes, which are not replaceable, in the axial fan have a service life of 1000 operating hours.  
These attachment parts have a warranty period of 1000 operating hours or max. 12 months after delivery.

## 1.4 Manner of operation of the Cooler



Manner of operation of the Cooler

The Cooler is used for cooling liquids that are approved by the manufacturer.

The Cooler essentially comprises a heat sink and a fan. The Cooler works in accordance with the heat exchange principle.

The heat sink is made from aluminium material which has a high thermal conductivity. Inside the housing of the heat sink there is an internal cooling system constructed as a pipework and plate/bar design. The fluid to be cooled is fed through the cooling system under pressure.

Ambient air is used as the coolant. The ambient air is drawn in by the fan and flows through the cooling system as cooling air. This process draws the heat out of the fluid and into the cooling air. The heated cooling air is transported out of the heat sink by the incoming cooling air.

## 1.5 Intended use

The Cooler is intended for cooling liquids that are approved by the manufacturer. Ensure that there is an adequate temperature difference between the ambient air drawn in as coolant and the fluid temperature.

Any use deviating from the proper intended use shall be considered misuse.

### 1.5.1 Operating conditions

**i** Note that the operating conditions for the Cooler are binding. Obtain approval from the manufacturer before operating the Cooler under any other operating conditions.

Ambient temperature	Max. 60	°C
Surrounding atmosphere	Non-explosive	
Max. relative humidity	< 60	%
Max. installation altitude (above sea level)	1,000	m
Storage	AKG-Standard 8000.083.2060	

### 1.5.2 Temperature regulation

It is essential that a sudden inflow of hot medium to be cooled into the cold cooler is avoided.

The temperature of the medium to be cooled can be regulated by a temperature-dependent by-pass valve or by switching the fan motor on and off or by varying the fan speed. When using a temperature regulator, the opening temperature must be max. 45 °C and complete opening must be achieved at 50 °C. This will prevent thermal shocks. With intermittent fan operation, the on-off control must be selected such that the inlet temperature of the cooling medium fluctuates by no more than 5 K and is max. 65°C. The switching is implemented by a thermostat (pos. not included in the scope of supply), which must be installed at a suitable point in the circuit of the cooling medium.

## 1.6 Reasonably foreseeable misuses

"Reasonably foreseeable misuse" is the use of the Cooler in a manner not covered by the Instructions but which nonetheless may arise due to readily predictable human behaviour.

Reasonably foreseeable misuses:

- The fluid to be cooled does not have the required properties (e.g.: temperature, viscosity, etc.).
- The arrangement and installation conditions for the Cooler were not observed.
- The Cooler was inadequately dimensioned for the application.
- There are inputs in the control and regulation system that could lead to conflicts at the Cooler.
- The field assembly personnel can mix up the fluid connections for the Cooler.
- The field assembly personnel can connect the electrics of the Cooler's fan incorrectly.
- Maintenance personnel can inadvertently leave tools or objects in/on the Cooler. These tools or objects may be missed during the re-commissioning procedure.
- Maintenance personnel can carry out activities on the Cooler and its components, although the Cooler is operating.
- Personnel can tamper with protective equipment.
- Personnel can remove separating protective equipment and then start up the Cooler.
- Personnel can disregard the obligation to wear personal protective equipment.

The points cited here represent only a few instances of reasonably foreseeable misuses and do not purport to be exhaustive. The list is based on the experience of the manufacturer.

## 1.7 Required qualifications for the use of the Cooler

Qualifications are stipulated in the Instructions for various activity areas.

### **Cleaning personnel**

Cleaning personnel have been trained by the operator for the activities assigned to them and have been instructed as to the possible dangers of improper use. Cleaning personnel are responsible for cleaning the Cooler.

### **Electrical specialist**

Electrical specialists are able to carry out the work on the electrical system assigned to them and independently recognise and avoid possible dangers due to their professional training, specialist knowledge and experience, as well as their extensive knowledge of the applicable standards and regulations.

Electrical specialists are trained for the particular equipment location where they are active and know the relevant standards and regulations.

### **Mechanical maintenance specialist**

Mechanical maintenance specialists are able to carry out mechanical work on the Cooler assigned to them and independently recognise and avoid possible dangers due to their professional training, specialist knowledge and experience, as well as their extensive knowledge of the applicable standards and regulations.

Mechanical maintenance specialists are trained for the particular equipment location where they are active and know the relevant standards and regulations.

### **Specialist with authority to give orders**

Such specialists have been authorised to give orders to the specialist personnel by the operating company due to their professional training and are responsible for carrying out checks. Specialists, with authority to give orders, simultaneously coordinate activities and processes.



*The assignment of the qualifications to the activities in the various life phases can be found in the "Activities and qualifications" chapter for the respective life phase.*

## 2 Safety information

The Cooler was designed and manufactured to the latest technological standards and in accordance with recognised safety regulations. Hazards may arise nonetheless for personnel and property because not all hazardous points can be avoided whilst maintaining effective functionality. However, you can still prevent accidents due to these hazards and faults by applying the contents of these Instructions and fully briefing your personnel on the information contained within them. Furthermore, the proper application of these Instructions allows you to utilise the full scope of the performance of the Cooler and to avoid unnecessary faults.

A prerequisite for the safe and trouble-free operation of the Cooler is the complete knowledge of the safety instructions and the safety regulations.

For this reason, read through this chapter carefully before starting any activities on the Cooler. Likewise, observe the safety instructions and warnings, which you find at the corresponding points in the text of the following chapter. The manufacturer shall not be held responsible in the event of the instructions and warnings being disregarded.

Alongside the instructions in these Instructions, the regulations of the legislature shall also be taken into account, in particular the safety regulations and the German accident prevention regulations.

### 2.1 Symbols in the Instructions

Symbols and colour-coding that must be observed, are used in these Instructions and on the Cooler. The meanings and appearance of the symbols used are explained below.

#### 2.1.1 Information



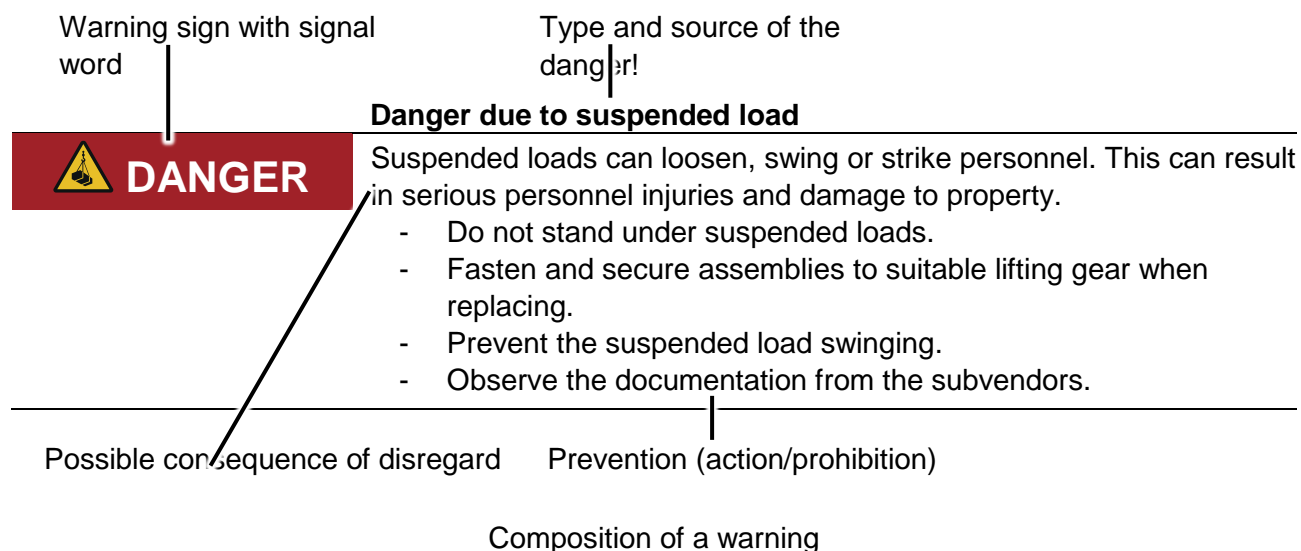
*This symbol indicates useful advice, explanations and supplements to the handling of the Cooler.*






*This symbol refers to a chapter in these Instructions or to further external documentation/information.*

## 2.1.2 Warnings

### 2.1.2.1 Composition of a warning



	<b>DANGER</b> Indicates a dangerous situation. Failure to implement the safety precautions associated with this warning can greatly increase the likelihood of accidents with fatal outcomes or serious injuries.
	<b>WARNING</b> Indicates a dangerous situation. Failure to implement the safety precautions associated with this warning can result in accidents with fatal outcomes or serious injuries.
	<b>CAUTION</b> Indicates a dangerous situation. Failure to implement the safety precautions associated with this warning can result in accidents. There is a risk of injury; however, death or serious injuries are not possible.
<b>ATTENTION</b>	<b>ATTENTION</b> Indicates a situation that could result in property damage. Failure to implement the safety precautions associated with this warning can result in property damage. The signal word will not be combined with a warning sign.

### 2.1.2.2 Warning signs

Warning signs identify hazardous situations.



**Warning: Hazard point**

This warning symbol indicates hazard points for which there is no standardised pictogram. If the hazard is not immediately evident, an additional sign with an explanation should be attached under the warning symbol.



**Warning: Electrical energy**

This warning symbol warns about danger zones associated with electric voltage. The warning symbol should be attached, to switch cabinets for example.



**Warning: Hot surface**

This warning symbol warns of hot surfaces. The warning symbol is attached to the housing of the Cooler, for example.



**Warning: Suspended load**

This warning symbol warns of suspended loads (e.g.: load transportation by crane systems).



**Warning: Automatic start-up**

This warning symbol warns of mechanical hazards (e.g.: catching, drawing in or entanglement by the fan) and warns of automatic start-up.

### 2.1.3 Mandatory action signs



#### General mandatory action sign

This sign is used in combination with a supplementary sign. It is essential that the instructions shown on the supplementary sign are complied with.



#### Observe instructions

This sign refers to the obligation to comply with the operating instructions. Refer to the operating instructions for the information on the required operating steps.



#### Hearing protection

Wear hearing protection when carrying out activities in an area in which the daily noise exposure level of 80 dB(A) and/or the peak noise pressure level of 135 dB(C) will be exceeded.



#### Eye protection

Wear eye protection during activities performed in an environment where liquids may fly into the eyes under pressure.



#### Hand protection

Wear hand protection when carrying out activities where there is a potential risk of injury due to cutting, penetrating, pinching, temperature influences and substances.

### 2.1.4 Hazardous substances and disposal symbols



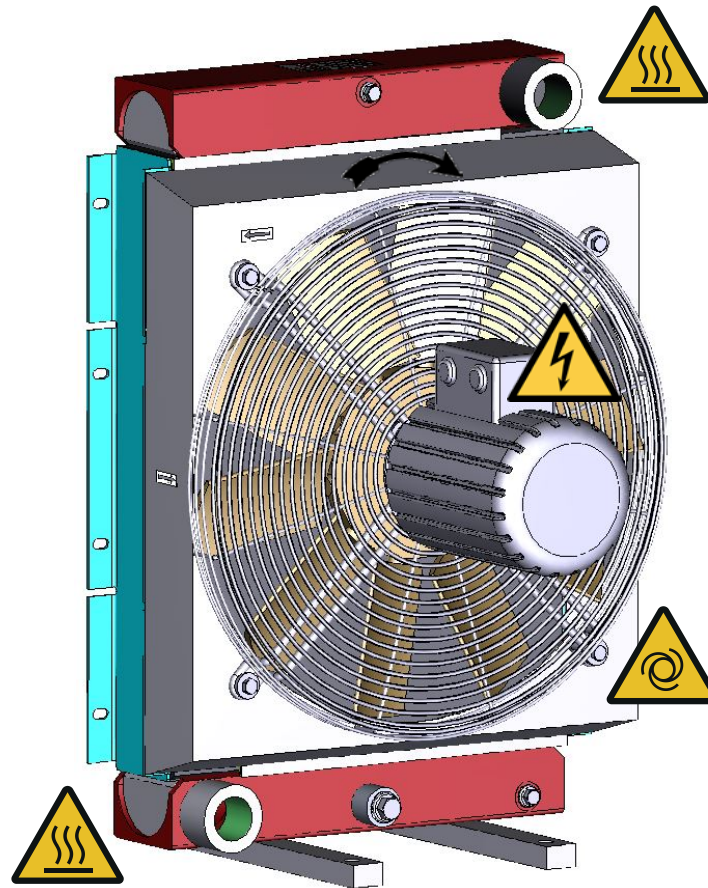
#### Environmentally hazardous

This hazardous substances symbol refers to substances that have environmentally harmful properties.







## 2.2 Signs on the Cooler

**i** Ensure that the labelling and signs on the Cooler are always easily identifiable and legible.



Signs on the cooler (examples)  
[General illustration (cooler incl. fan)]





Table 2: Signs on the Cooler (examples)

Item	Symbol	Description	Location
01		<b>Warning: Electrical energy</b> This warning symbol warns about danger zones associated with electric voltage.	On the electrical terminal box of the electric motor
02		<b>Warning: Hot surface</b> This warning symbol warns about thermal hazards and burning due to hot surfaces.	On the Cooler
03		<b>Warning of rotating fan</b> This warning symbol warns of mechanical hazards on the fan.	On the fan
04		<b>Direction of rotation arrow</b> This symbol indicates the direction of rotation.	On the electric motor

## 2.3 Personal protective equipment

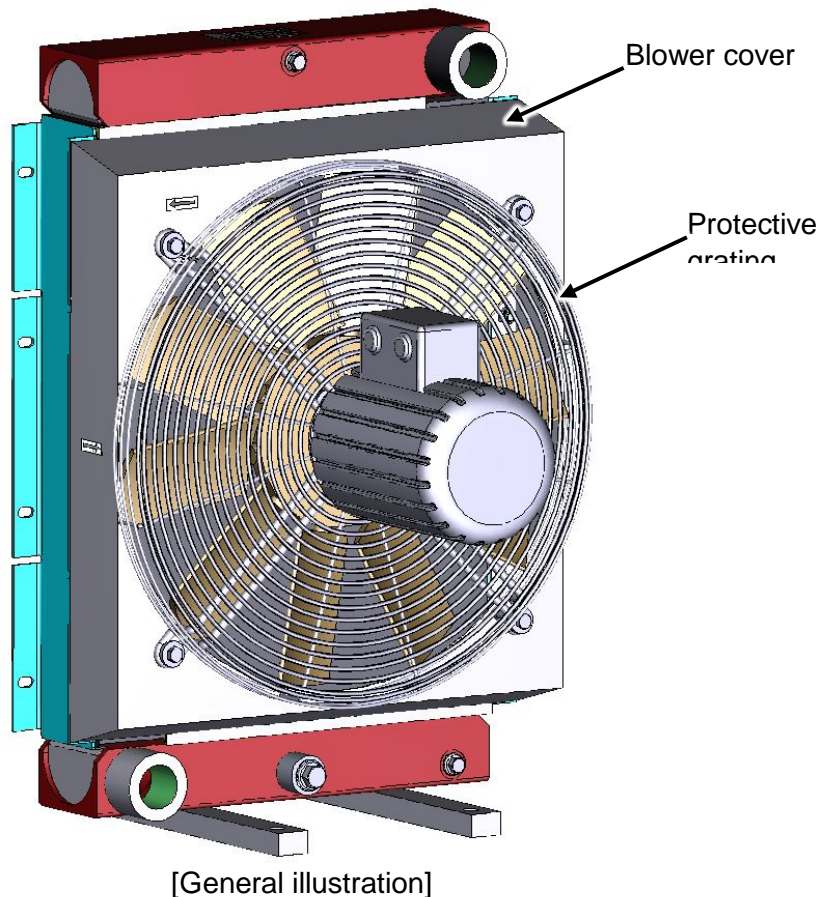
Persons working on or with the machine are to be issued with personal protective equipment appropriate to the respective life phase. The use of personal protective equipment will be discussed in detail in the following chapters of these Instructions, which correspond to the individual life phases.

Table 3: Personal protective equipment for the respective life phase

Personal protective equipment		Life phase								
Symbol	Designation	Transport/storage	Assembly/installation/connection	Commissioning	Operation	Faults, fault-finding and fault rectification	Maintenance	Repair	Decommissioning	Disassembly
	Hearing protection			X	X	X				
	Eye protection			X		X	X	X		
	Hand protection	X	X	X	X	X	X	X	X	X
	Safety footwear	X	X	X	X	X	X	X	X	X

## 2.4 Protective devices on the Cooler

### 2.4.1 Separating protective devices (optional)



#### 2.4.1.1 Protective grating and blower cover

In the case of the cooler incl. fan, the potentially hazardous movements of the fan are safeguarded by a screwed-on separating protective grill and the blower cover. The protective grill is firmly screwed to the blower cover. The blower cover also protects against direct contact with the cooling system (fan).

### 2.4.2 Protective devices for electrical components

#### 2.4.2.1 Motor circuit breaker

The electric motor is protected from thermal overload in the event of a mechanical overload or the failure of one or more external conductors by a motor protection breaker.

### **2.4.3 Monitoring the fluid (optional)**

#### **2.4.3.1 Pressure-controlled by-pass valve**

If the pressure is too high, the integrated pressure-controlled by-pass valve routes the fluid past the Cooler and directly into the on-going line. The valve reduces the danger of the Cooler being damaged, for example in the event of a cold start of the Cooler or during peaks in pressure or throughput.

#### **2.4.3.2 Thermal switch**

The thermal switch monitors the temperature of the fluid. Upon reaching the limit temperature, the fan is automatically switched off. Upon reaching the target value, the fan is automatically switched on.

#### **2.4.3.3 Temperature-controlled by-pass valve**

If the temperature is too high, the temperature-controlled by-pass valve routes the fluid past the Cooler and directly into the on-going line. The valve reduces the danger of the Cooler being damaged by overtemperature.

### **2.4.4 Notes and labelling/identification**

Special hazard areas or protective devices are identified through suitable means.

## 2.5 Overview of residual risks

Table 4 shows the residual risks on the Cooler.

**Table 4: Overview of residual risks**

No.	Hazard situation	Hazard	Measures
01	Contact with the fan of the Cooler when commissioning, during operation as well as during fault-finding and fault rectification	Crushing, pinching, shearing, catching, entanglement or noise	Special training: Handling the Cooler Wear personal protective equipment: Hand protection, protective footwear, hearing protection Inclusion in the operating instructions: Ensure that activities are carried out only by trained personnel
02	All activities on the Cooler	Human error	Inclusion in the operating instructions: Safe behaviour on the Cooler
03	Contact with electrical components	Direct contact with active parts	Special training: Hazards when dealing with electrical equipment
04	Contact with hot surfaces on the Cooler	Burns	Wear personal protective equipment: Hand protection
05	Contact with the fluid	Hazards due to contact with or inhalation of hazardous liquids	Note on the wearing of special personal protective equipment in the operating instructions: Hand protection
06	All activities on the Cooler	Hazard due to bypassing safety devices	Special training: Danger due to protective measures being tampered with

## 2.6 Fundamental safety instructions

**i** *The fundamental safety instructions are prerequisites for the safe use of the Cooler. Use the fundamental safety instructions for the safety training of your personnel. Passing on the fundamental safety instructions ensures that your personnel behave in a safety-oriented manner and enables the transfer of responsibilities.*

### **Intended use**

Disregard of the proper intended use can lead to significant personal injury and property damage.

- Use the Cooler exclusively in accordance with the proper intended use per chapter 1.5 "Intended use".

### **Qualified and authorised personnel**

The execution of activities on the Cooler by inadequately qualified or unauthorised personnel can lead to significant personal injury and property damage.

- Ensure that only qualified and authorised personnel are permitted to carry out activities on the Cooler.

### **Personal protective equipment**

Missing, faulty or improperly used personal protective equipment can lead to significant personal injury.

- Train your personnel in the correct handling of the personal protective equipment.
- Check the personal protective equipment at regular intervals for damage and for any expiry dates that may be relevant.
- Replace the personal protective equipment in the event of damage or if an expiry date has passed.
- Provide the personnel with the personal protective equipment required for the respective individual life phase.

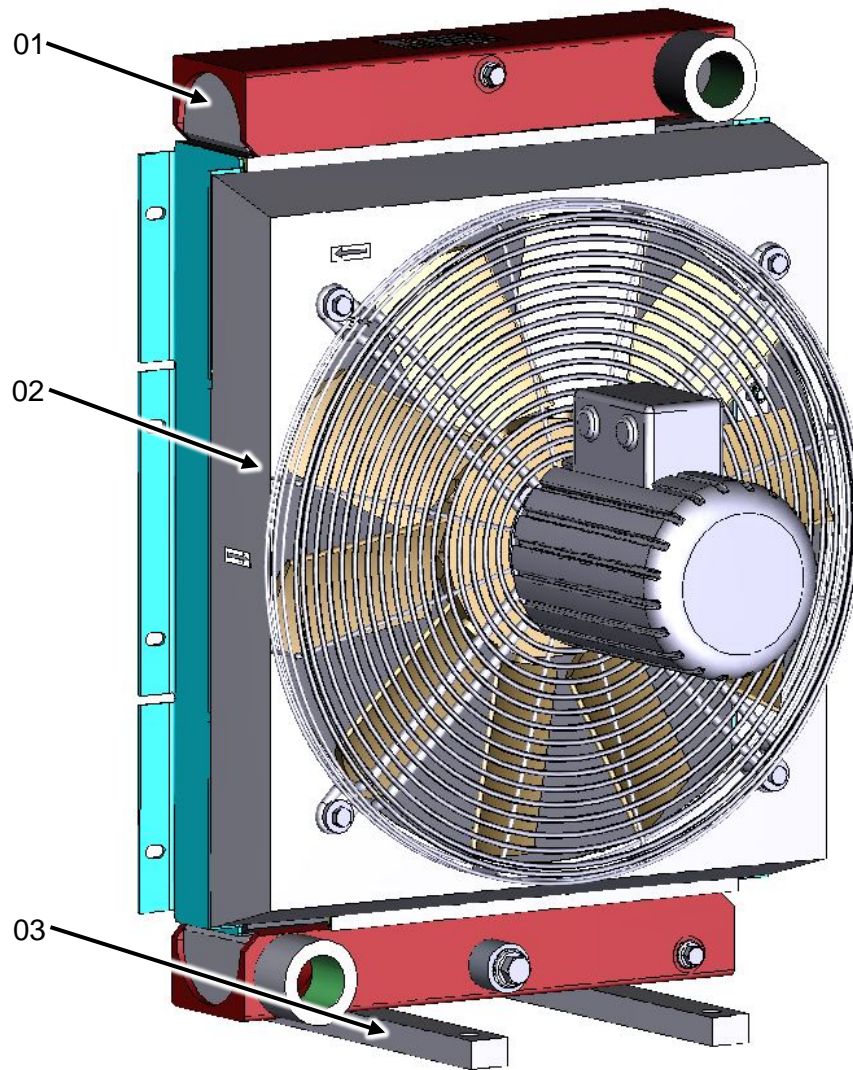
### **Explosive atmospheres**

Use of the Cooler in a potentially explosive atmosphere can lead to an explosion with significant personal injury and property damage.

- Do not operate the Cooler in potentially explosive atmospheres.



### 3 Description of the cooler



Main components  
[General illustration]

The Cooler comprises the following main components:

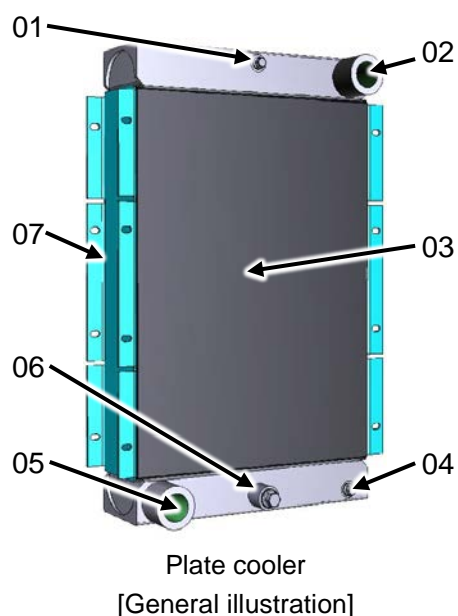
Table 5: Main components of the cooler

Item	Designation	Chapter
01	Cooler with connections	3.1
02	Fan (optional)	3.2
03	Fastening feet (on the left and right side)	-----

### 3.1 Cooler with connections

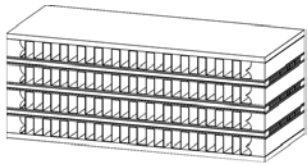
There are 2 cooler variants available, depending on the customer.

#### Variant 1: Plate cooler



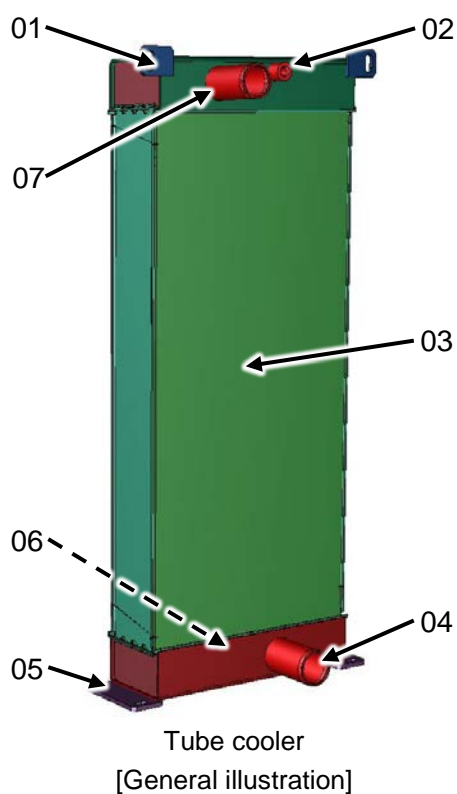
The plate cooler comprises the following main components:

**Table 6: Components of the plate cooler**

Item	Description	
01	Vent plug 1	----- --
02	Fluid connection	----- --
03	Plate cooler core	
04	Vent plug 2	----- --
05	Fluid connection	----- --
06	Drain screw	----- --
07	Mounting rail	2 pcs. (right and left side)

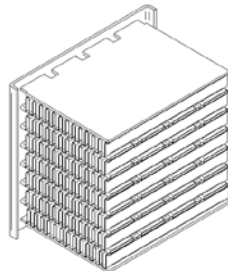


## Variant 2: Tube cooler



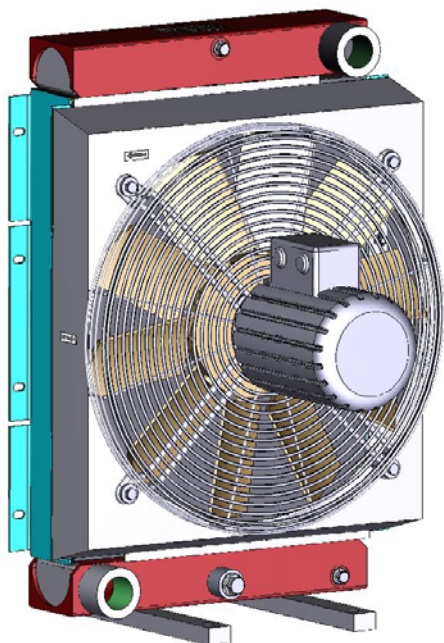
The tube cooler comprises the following main components:

Table 7: Components of the tube cooler

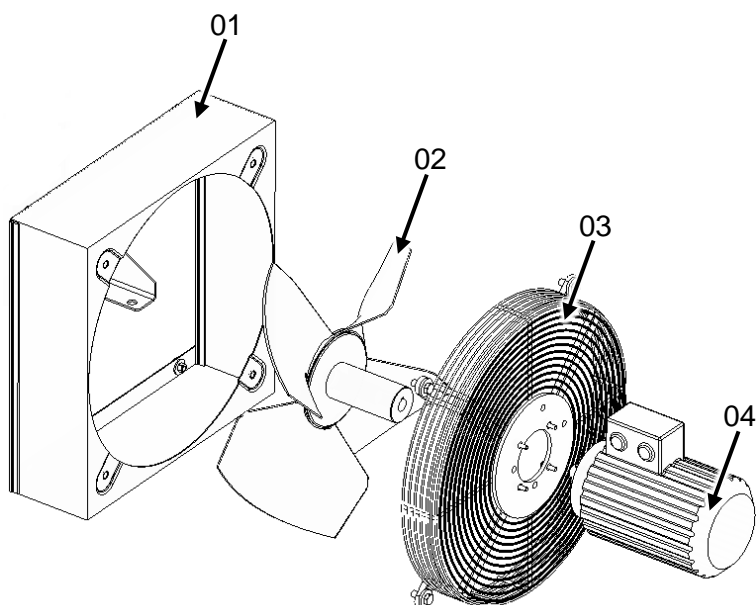
Item	Description	
01	Mounting plate 1	2 pcs. (right and left side)
02	Vent plug	----- --
03	Plate cooler core	
04	Fluid connection	----- --
05	Mounting plate 2	2 pcs. (right and left side)
06	Drain screw	----- --
07	Fluid connection	----- --

## 3.2 Fan (optional)

The respective cooler is equipped with a fan to support the cooling process.



[General illustration]



Fan components

The fan comprises the following components:

**Table 8: Components of the fan**



Item	Designation
01	Blower cover
02	Fan blade
03	Protective grating
04	Electric motor / hydraulic motor

## 4 Technical data



Refer to the drawing, which is part of the delivery, for dimensions and technical data.

### 4.1 Rating plate - identification

 AKG Thermo-technik International GmbH & Co. KG D-34399 Hofgeismar				
Manfct.No.				
Cust.No.				
Man. Date				
				
Module				
Fl.-Grp.				
PS bar				
TS C				
TS C				
V L				
PT bar				

(Example)

The rating plate provides identification for the Cooler. The following data can be found on the type plate:

- Name of the manufacturer
- Address of the manufacturer
- Serial number
- Customer number
- Date of manufacture
- Manufacturer's type number
- Technical data
- Module
- Max. operating pressure, static
- Max. operating temperature
- Nominal volume
- Test pressure (1.43 x nominal pressure)
- CE mark

### 4.2 Emissions

#### 4.2.1 Noise level

Assembly	Cooler	
Measuring surface sound pressure at 1 m distance LpA	< 110	dB(A)

## 5 Transport and storage

**i** *This chapter provides fundamental information and should be considered only basic information.*

**i** *Observe the contractually agreed transfer of risk for the delivery of the Cooler.*

For technical assistance, please contact the customer service department of the manufacturer:

**AKG Thermotechnik International GmbH & Co. KG**

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### 5.1 Safety notes

#### **Collapse loads, static stress analysis**

Exceeding the load-bearing capacity can lead to significant personal injury and property damage.

- When unloading, pay attention to the load-bearing capacity (static stress analysis) of the floor or substructure.

#### **Transportation facilities**

Use of unsuitable transportation equipment can lead to significant personal injury and property damage.

- When using transportation equipment, observe the applicable regulations, e.g. the German accident prevention regulations "Cranes" (BGV D 6), "Industrial trucks" (BGV D 27) and "Vehicles" (BGV D 29).

## 5.2 Personal protective equipment



### Hand protection

Wear hand protection when carrying out activities where there is a potential risk of injury due to cutting, penetrating, pinching, temperature influences and substances.



### Safety footwear

Use safety footwear for activities where there is a potential hazard due to falling or jammed objects, penetration by pointed objects, the effects of temperature and substances.

## 5.3 Activities and qualifications

Table 9: Transport - Activities and qualifications

Activity	Qualification
Transport, crane operation, operation of industrial trucks	Specialist personnel with verification that they are entitled to control and deal with the transport and lifting equipment used. Furthermore, only specialist personnel who can be verified as having been trained in the safe fastening of the components at the attachment points as well as the use of the load suspension devices and lashing gear, shall be used for the unloading and lifting of components
Coordination of the various activities	Specialist with authority to give orders

## 5.4 Transporting the Cooler

This chapter describes the transport of the Cooler after the risk has transferred to the operating company in accordance with the delivery conditions.

### **Danger due to improper securing of loads**

**DANGER**

Loads that have not been properly secured or that have not been loaded taking into account the centre of gravity, can slide and fall from the transport vehicle.

- Secure the load properly using approved aids.
- Pay attention to the centre of gravity of the load.
- Pay attention to the condition and load-bearing capacity of the transport vehicle.

### **Danger due to suspended load**

**DANGER**

Suspended loads can loosen, swing or strike personnel. This can result in serious personnel injuries and damage to property.

- Do not stand under suspended loads.
- Fasten and secure assemblies to suitable lifting gear when replacing.
- Prevent the suspended load swinging.
- Observe the documentation from the subvendors.


### **Danger due to improper lifting and transportation**

**DANGER**

Improper lifting and transportation can result in serious injuries and damage to components of the Cooler.

- Use only lifting gear, load-bearing equipment and lashing gear with sufficient load bearing capacity.
- Use only the holes provided for load rings for transporting and lifting the Cooler. Load suspension gear and load attachment rigging must be in acceptable condition and shall be attached only at the lifting lugs provided.
- Refrain from knotting steel ropes and round chains.
- Do not connect fibre ropes by knotting.
- Untwist any twisted ropes before lifting.
- Do not kink ropes at crimp connectors.
- Ensure thimbles, cable eyes, lifting rings and other suspension elements are free to move in the load hook.
- Do not lift loads over personnel.
- Any auxiliary lifting eyes, e.g. on the drives, etc., are to be used exclusively for lifting the respective individual component.

### 5.4.1 Lifting and transportation

 *Observe the applicable German accident prevention regulations and the generally accepted national approved technical practice for lifting and transporting the Cooler.*

Transporting the cooler:

- Transport the cooler only in suitable packaging.
- Avoid impacts and shocks when transporting the cooler.

After unloading the Cooler:

- Remove the packaging (depending on the implementation of the transport).
- Check the Cooler for damage.
- Check that all accessories are present with the help of the dispatch note.
- Transport the the Cooler to the installation location or warehouse using suitable hoist / transportation facilities.

In the case of HGV transport to the installation location:

- Transport the cooler only in suitable packaging.
- Avoid impacts and shocks when transporting the cooler.
- Lift the Cooler (including packaging) with suitable hoist onto the load bay.
- Secure the Cooler to prevent it sliding/slipping.

#### 5.4.1.1 Load-bearing equipment

- Lift and transport the Cooler exclusively with suitable hoist / transportation facilities.
- The cooler is equipped with holes for screwing in load rings.
- Attach the load attachment rigging exclusively to the load rings.
- Attach the load attachment rigging carefully in order to avoid damaging components.
- Do not attach the load attachment rigging to the drive elements. This would damage the Cooler and void the manufacturer's warranty.
- Use only load attachment rigging with the same length and ensure that the weight is evenly distributed. The attachment angle shall not exceed a value of 45°.

## 5.5 Packaging

The Cooler is packaged in the factory in accordance with requirements:

- Transport route
- Storage at the customer's premises
- Customer requirement

Types of packaging:

- On a pallet
- Directly on an HGV
- Packaging in a closed wooden crate
- In a container

Carry out further transportation of the Cooler exclusively with protective measures through:

- Transportation securing device
- Protective covering (film)
- Dehumidification material

The protective measures "protective covering (film)" and "dehumidification material" prevent foreign matter or moisture reaching the interior of the Cooler or the electrical components.



*Refer to the AKG standard "8000.083.2060." for further information on the packaging. If necessary, request a copy of the AKG standard from AKG Thermotechnik International GmbH & Co. KG.*



*Collect and separate all of the different pack(aging) materials in correspondingly identified containers and ensure that they are disposed of properly.*



## 5.6 Receiving inspection - shipping damage

Check the Cooler including accessories after delivery for shipping damage and packaging damage.

Report shipping damage to the manufacturer and the shipping agent immediately.

Check that the delivery is complete with the help of the accompanying dispatch note.

In addition, refer to the manufacturer's terms of sale and delivery.



*The Instructions are also included in the scope of supply.*

## 5.7 Storage of the Cooler

### ATTENTION

#### Damage to property due to improper storage conditions

Temperatures dropping below the dewpoint and corrosive atmospheres can lead to corrosion on the Cooler and cause significant property damage.

- Ensure that the Cooler is stored in a suitable storage location with maximum humidity level of < 60% and free of corrosive atmospheres throughout the entire period of its storage.
- Check the condition of the stored Cooler at regular intervals.
- Avoid the formation of condensation water if the cooler is packaged.

Procedures for storage:

- Store the Cooler with transport packaging in a dry and temperature-controlled area with a temperature range from +5 °C to +45 °C.
- Protect the Cooler from mechanical damage, UV radiation and vibrations.
- Protect bare metallic surfaces with a preservative agent for ferrous and non-ferrous metals.
- Observe the general information for the storage of aluminium.



*The manufacturer provides no warranty for corrosion damage and damage caused by improper storage, e.g. through storing in a damp room or under similarly adverse conditions.*

## 6 Arrangement, installation and connection



*This chapter provides fundamental information and should be considered only basic information.*

For technical assistance, please contact the customer service department of the manufacturer:

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Website: [www.akg-group.com](http://www.akg-group.com)

### 6.1 Safety notes

#### **Ambient temperature of the Cooler**

Exceeding the permissible ambient temperature and the impairment of the cooling of the Cooler can lead to significant personal injury and property damage.

- Before positioning the cooler, check the environmental conditions of the installation location, e.g. temperature and the type of atmosphere present.
- Do not position the surface-cooled electric motor directly against a wall.
- Note that the cooling capability is dependent on the temperature difference between the cooling air and the fluid. Ensure that adequate cool ambient air can be drawn into the cooler by the fan.

#### **Collapse loads, static stress analysis**

Exceeding the load-bearing capacity can lead to significant personal injury and property damage.

- When unloading, pay attention to the load-bearing capacity (static stress analysis) of the floor or substructure.

### Transportation facilities

Use of unsuitable transportation equipment can lead to significant personal injury and property damage.

- When using transportation equipment, observe the applicable regulations, e.g. the German accident prevention regulations "Cranes" (BGV D 6), "Industrial trucks" (BGV D 27) and "Vehicles" (BGV D 29).

## 6.2 Personal protective equipment



### Hand protection

Wear hand protection when carrying out activities where there is a potential risk of injury due to cutting, penetrating, pinching, temperature influences and substances.



### Safety footwear

Use safety footwear for activities where there is a potential hazard due to falling or jammed objects, penetration by pointed objects, the effects of temperature and substances.



### Hearing protection

Wear hearing protection when carrying out activities in an area in which the daily noise exposure level of 80 dB(A) and/or the peak noise pressure level of 135 dB(C) will be exceeded.

## 6.3 Activities and qualifications

Table 10: Assembly - Activities and qualifications

Activity	Qualification
Crane operation, operation of industrial trucks	Specialist personnel with verification that they are entitled to control and deal with the transport and lifting equipment used. Furthermore, only specialist personnel who can be verified as having been trained in the safe fastening of the components at the attachment points as well as the use of the load suspension devices and lashing gear, shall be used for the unloading and lifting of components
Assembly and mechanical mounting of the Cooler	Specialist personnel with verification that authorises them to carry out the mechanical mounting of the Cooler
Fluid connections	Specialist personnel with verification that authorises them to carry out the fluid connection of the Cooler
Electrical connections	Electrical specialist
Integration of the Cooler into the control and regulation system	Specialist personnel with verification that authorises them to integrate the Cooler into the control and regulation system
Checking, testing and acceptance of the mechanical components of the Cooler	Specialist personnel with verification that authorises them to carry out the checking, testing and acceptance of the mechanical components of the Cooler
Checking, testing and acceptance of the components of the fluid system of the Cooler	Specialist personnel with verification that authorises them to carry out the checking, testing and acceptance of the fluid system of the Cooler
Checking, testing and acceptance of the electrical components of the Cooler	Electrical specialists with verification that authorises them to carry out the checking, testing and acceptance of the electrical components of the Cooler
Cleaning (with the exception of electrical parts)	Cleaning personnel
Cleaning of electrical parts, e.g. the interior of the switch cabinet	Electrical specialist
Coordination of the various activities	Specialist with authority to give orders

## 6.4 Assembling, mounting the Cooler

The Cooler has been constructed, tested and delivered for the design conditions stipulated when ordered. The specification of the operating conditions can be found in chapter 1.5.1 "Operating conditions".

### Danger due to suspended load


**DANGER**

Suspended loads can loosen, swing or strike personnel. This can result in serious personnel injuries and damage to property.

- Do not stand under suspended loads.
- Fasten and secure assemblies to suitable lifting gear when replacing.
- Prevent the suspended load swinging.
- Observe the documentation from the subvendors.

### Danger due to improper lifting and transportation


**DANGER**

Improper lifting and transportation can result in serious injuries and damage to components of the Cooler.

- Use only lifting gear, load-bearing equipment and lashing gear with sufficient load bearing capacity.
- Use only the holes provided for load rings for transporting and lifting the Cooler. Load suspension gear and load attachment rigging must be in acceptable condition and shall be attached only at the lifting lugs provided.
- Refrain from knotting steel ropes and round chains.
- Do not connect fibre ropes by knotting.
- Untwist any twisted ropes before lifting.
- Do not kink ropes at crimp connectors.
- Ensure thimbles, cable eyes, lifting rings and other suspension elements are free to move in the load hook.
- Do not lift loads over personnel.
- Any auxiliary lifting eyes, e.g. on the drives, etc., are to be used exclusively for lifting the respective individual component.

### 6.4.1 Installation conditions

#### Property damage due to unsuitable installation location

##### **ATTENTION**

Installation of the Cooler outdoors or in a chemically aggressive atmosphere can result in damage to the components of the Cooler and to significant property damage.

- Install the Cooler in a suitable installation location. Observe the operating conditions in accordance with the specifications on the rating plate or the drawing.

Observe the following installation conditions and ambient conditions:

- Avoid compromising the comfort or health of personnel through draughts and noise from the fan.
- Ensure that the cooling air can flow in and out of the cooler unimpeded. Avoid backflow of the warmed cooling air.
- Ensure that there is a corresponding safety clearance to the heated cooling air that emerges.
- Ensure that there is adequate free room for the entry and exit of the cooling air for the electrical motor.
- Ensure that there is adequate free room for assembly, maintenance and repair work.
- To avoid environmental damage, install the cooler in a liquid-tight tub.

In addition, observe the following information when installing the cooler in enclosed spaces:

- Ensure sufficient ventilation. The amount of heat discharged to the surroundings shall not exceed room temperature.

In addition, observe the following information when installing the cooler outdoors:

- Protect electrical components, e.g. the electric motor, from environmental influences.
- Note that the viscosity of the oil rises at low ambient temperatures. When restarting the customer-provided systems there may be pressure peaks that lead to the system being overloaded. In this case a pressure by-pass valve should be provided. Alternatively, a temperature-controlled heating system with continuous circulation can be provided.

It may be necessary to add suitable corrosion-protection and frost-protection agents in adequate quantities. Introduce corrosion-protection and frost-protection agents in accordance with the stipulations of the product manufacturer.

### 6.4.2 Location

Steel bases, foundation pads and concrete foundations that guarantee shake-free, low-vibration and deformation-free operation of the Cooler are suitable bases for the installation of the Cooler. It is also necessary to ensure that the base for the Cooler guarantees the exact alignment of the Cooler in the horizontal and vertical axes as well as its secure fastening.

Plan the Cooler with adequate clearance to surrounding walls and components.


Check the dimensions of the foundations with the help of the dimensional drawing for the Cooler and the foundation plan.

Note the ambient conditions for the Cooler and ensure that:

- There is adequate free space for changing tools, installation activities, maintenance activities and repair activities.
- There is adequate free space for the entry and exit of the cooling air for the drive motors.
- There is adequate sunlight protection for the Cooler.
- The cooler is mounted in a liquid-tight tub.

Mounting materials such as compensating shims, mounting screws etc. can be obtained from the manufacturer.

## 6.5 Connecting supply media

 Carry out the connection of the supply media for the Cooler in accordance with the respective applicable national standards.


### 6.5.1 Connection to the power supply network

#### **Danger due to electrical energy**

**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Observe the documentation for the electric motor.
- De-energise and disconnect the electrical components affected. These electrical components include main switches, circuit breakers and automatic circuit breakers.
- Earth the de-energised and disconnected circuits for the duration of the activity.
- Short-circuit the de-energised and disconnected circuits for the duration of the activity.
- Cover and/or enclose neighbouring live parts.
- Attach corresponding warning signs.
- Check that the area for the activity has been de-energised.
- After the activities have been completed, ensure that the area affected is free of faults and functioning properly.
- After the activities have been completed, remove the safety precautions (by-passes, jumpers, etc.).

 Observe the regulations and connecting conditions from the local electrical power utility for the power supply of the Cooler.



Refer to the electrical circuit diagrams, which are a constituent part of the technical documentation, for the connection data.

Check that the line voltage and line frequency present match with the voltage and line frequency cited on the rating plate.



Observe the electrical documentation from the manufacturer and implement this information in a workmanlike manner.



## 6.5.2 Connecting the hydraulic motor

### Danger due to hydraulic fluids



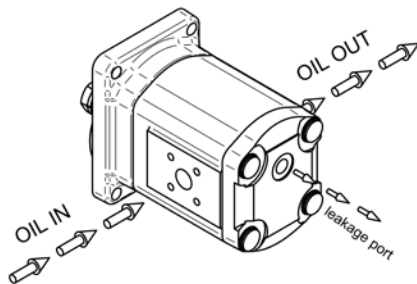
**DANGER**

Hydraulic liquid can escape at high speed and cause serious injuries if there is damage on the system or if working on pressurised systems.

- Route and mount the hydraulic lines in a workmanlike manner.
- Establish tension-free and vibration-free connections.
- Observe the flow diagram.
- Before starting activities on the hydraulic system, depressurise the affected system area.



*Refer to the hydraulic diagrams, which are a constituent part of the technical documentation, for the connection data.*



The connections for the supply and return for the hydraulic motor shall be implemented in accordance with the sketch.

The leakage line (leakage port) must be implemented such that it is free of pressure and cut off from the return line or other leakage lines so that the motor housing remains filled at all times.

Connection of the fluid system to the hydraulic pump



*Observe the documentation from the manufacturer and implement this information in a workmanlike manner.*

### 6.5.3 Connecting the fluid system

#### Dangers due to the fluid system



#### DANGER

Fluid can escape at high speed and cause serious injuries if there is damage on the system or if working on pressurised systems.

- Route and mount the fluid lines in a workmanlike manner.
- Establish tension-free and vibration-free connections.
- Observe the flow diagram.
- Before starting activities on the fluid system, depressurise the affected system area.

#### Danger due to screw plugs or closure cover



#### DANGER

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

#### Property damage due to coolant

#### ATTENTION

The use of unsuitable coolant and incorrect handling of coolant can lead to property damage on the Cooler.

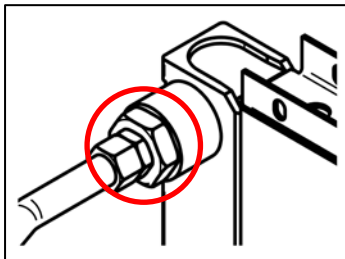
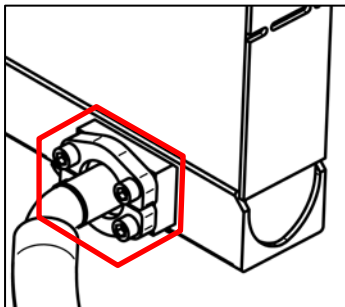
- Do not use coolant that contains silicate.
- Observe AKG standard "8002.027.0000" with the selection and concentration of coolants.
- Avoid hot medium suddenly flowing into the cold cooler.
- Use suitable overpressure and check valves for cooling circuits with compressible media (after-cooler). In doing so, observe the country-specific regulations.
- Do not use oils with very low electrical conductivity ( $<500 \text{ pS/m}$ ) as this may result in damage to components of the hydraulic circuit due to electrostatic discharge.



*Refer to AKG standard "8002.027.0000" for further information on the selection and concentration of coolants. If necessary, request a copy of this AKG standard from AKG Thermotechnik International GmbH & Co. KG.*



*It is not permitted to stress the cooler at the connections due to the fluid lines. Use tension-free and vibration-free connections.*

	1. Remove the transport seals at the connections.
	2. Route the fluid lines to the connection points.  Ensure that there is no offset between the fluid line and the respective connection.
 Connection with bushing	3. Connect the fluid lines with the cooler without load.  (There are two different types of connection)
 Connection with screw coupling	
	<b>Result:</b> The fluid lines are connected with the connection points on the cooler.

## 6.6 General checks and tests

### Danger due to electrical energy

**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Observe the documentation for the electric motor.
- De-energise and disconnect the electrical components affected. These electrical components include main switches, circuit breakers and automatic circuit breakers.
- Earth the de-energised and disconnected circuits for the duration of the activity.
- Short-circuit the de-energised and disconnected circuits for the duration of the activity.
- Cover and/or enclose neighbouring live parts.
- Attach corresponding warning signs.
- Check that the area for the activity has been de-energised.
- After the activities have been completed, ensure that the area affected is free of faults and functioning properly.
- After the activities have been completed, remove the safety precautions (by-passes, jumpers, etc.).

Note that, despite the main switch being switched off, certain components could still be live, e.g.:

- The supply lines from the mains supply
- The receptacles inside and outside the main switch cabinet
- The lighting of the main control cabinet
- The main control cabinet fan

### Dangers due to the fluid system

**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

### Danger due to screw plugs or closure cover

**DANGER**

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

### Warning - Risk of burns

**WARNING**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.

Table 11: General checks and tests

Seq. no.	Checks/tests	Activity
1	Mechanical checks	<p><b>Carry out a general visual inspection of the Cooler and ensure that:</b></p> <ul style="list-style-type: none"> <li>- There are no mechanical faults (e.g. the fan cannot be turned by hand).</li> <li>- All components (electric motor, temperature monitoring, vibration dampening elements, etc.) are correctly fastened and positioned.</li> <li>- The safety devices are correctly installed and in their protective position.</li> <li>- The screwed connections are firmly tightened.</li> <li>- The complete area of the Cooler is clean and in particular is free of oil or grease spots, waste, equipment or cloths.</li> <li>- All safety devices and monitoring units are correctly positioned, fastened and in their protective position.</li> </ul>
2	Electrical checks	<ul style="list-style-type: none"> <li>- Carry out a visual inspection to check the condition of the electrical connections and cables. In the event of damage or incorrect installations being detected, re-establish the correct conditions.</li> <li>- Check the power supply against the required parameters on the rating plates.</li> <li>- Check that the earth connections and equipotential bonding connections are correctly implemented.</li> <li>- Check the correct status of the neutral line.</li> <li>- Check the fastening of cables and terminals.</li> <li>- Check whether all of the terminal boxes and cable ducts present have been sealed and whether all cables have been connected.</li> <li>- Check that the rotating field of the electric motor matches with the arrow showing the direction of rotation.</li> </ul>
3	Fluid system checks	<ul style="list-style-type: none"> <li>- Carry out a visual inspection to check the condition of the fluid connections, components and lines. In the event of damage or incorrect installations being detected, re-establish the correct conditions.</li> <li>- Check whether the fluid lines have been properly routed and installed.</li> </ul>

## 7 Commissioning



*This chapter provides fundamental information and should be considered only basic information.*

For technical assistance, please contact the customer service department of the manufacturer:

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Website: [www.akg-group.com](http://www.akg-group.com)

### 7.1 Personal protective equipment



**Hearing protection**

Wear hearing protection when carrying out activities in an area in which the daily noise exposure level of 80 dB(A) and/or the peak noise pressure level of 135 dB(C) will be exceeded.



**Eye protection**

Wear eye protection during activities performed in an environment where liquids, pressurised gases or particles may fly into the eyes.



**Hand protection**

Wear hand protection when carrying out activities where there is a potential risk of injury due to cutting, penetrating, pinching, temperature influences and substances.



**Safety footwear**

Use safety footwear for activities where there is a potential hazard due to falling or jammed objects, penetration by pointed objects, the effects of temperature and substances.

## 7.2 Activities and qualifications

Table 12: Commissioning - Activities and qualifications

Activity	Qualification
Commissioning the Cooler	Specialist personnel with verification that authorises them to carry out the commissioning of the Cooler
Commissioning the electric motor	Electrical specialists with verification that authorises them to carry out the commissioning of electrical components
Commissioning the fluid system	Specialist personnel with verification that authorises them to carry out the commissioning of the components of the fluid system
Coordination of the various activities	Specialist with authority to give orders

## 7.3 Commissioning the Cooler

The Cooler is prepared for its proper intended use within the course of the commissioning. The commissioning is concluded with the first proper use.

### Dangers due to the fluid system



**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

### Danger due to electrical energy



**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Please pay careful attention to the hazard areas of the live components.

### Damage to property due to improper temperature control

**ATTENTION**

A sudden inflow of hot medium to be cooled into the cold cooler can result in damage to the Cooler.

- Pressure peaks must be prevented.
- Thermal shocks must be excluded.
- The temperature of the medium to be cooled and the coolant shall not change suddenly.



*The seals of the screw plugs, or the closure cover are to be fully wetted with a water glycol mixture (coolant) each time before commissioning the cooler. Furthermore, every time a connection is opened, all of the aluminium sealing rings must be replaced with new ones.*

*New aluminium sealing rings are likewise to be fully wetted with a water glycol mixture (coolant). Before re-coupling, the sealing surfaces of the filler connections must be checked for damage and repaired if necessary. The function can only be guaranteed if the top and bottom sealing surfaces are smooth and clean. The seals of the closure cover must be free of damage. The seals must be fully wetted with a water glycol mixture (coolant) prior to being re-fitted. The correct function of*

*the closure cover must be checked after fitting.*

### 7.3.1 Test run

- Carry out a test run within the course of the commissioning, checking all of the protective equipment.
- Check for unusual noises and vibrations.
- Check the quantity of fluid to be cooled.
- Check the cooling air feed and the exhaust air from the fan.
- Check the cleanliness of the cooling surfaces.
- Check the inlet temperature of the fluid to be cooled and the coolant.

### 7.3.2 Rotational direction check

#### **Danger due to electrical energy**



**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Please pay careful attention to the hazard areas of the live components.
- Only the tester is permitted to remain in the hazard area of the fan during the rotational direction check.
- Ensure that the electric motor has been completely de-energised.
- Secure the electric motor to prevent restart.
- Mark the hazard area with a warning sign.
- Check that the system is de-energised.

#### **Dangers due to the fluid system**



**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

#### **Warning - Risk of burns**



**WARNING**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.

- Check whether the impeller can be turned by hand.
- Switch on the electric motor or the hydraulic motor.
- Check the direction of rotation matches with the arrow showing the direction of rotation on the back of the electric motor.
- Change the rotating field of the electric motor in the event of an incorrect direction of rotation.



## 8 Using the Cooler

For technical assistance, please contact the customer service department of the manufacturer:

**AKG Thermotechnik International GmbH & Co. KG**

Am Hohlen Weg 31  
34369 Hofgeismar

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Website: [www.akg-group.com](http://www.akg-group.com)

### 8.1 Safety notes

#### **Standing under suspended loads**

Suspended loads can loosen, swing or strike personnel. This can cause serious injuries.

- Do not stand under suspended loads.
- Do not stand in the hazard areas underneath suspended loads.
- Fasten and secure assemblies to suitable lifting gear when replacing.

#### **Investigating and rectifying the causes of faults**

If the investigation and rectification of the causes of faults is to be carried out in only one subsection of the Cooler, the complete Cooler must also be taken into account along with this subsection. Disregard can lead to significant personal injury and property damage.

- Pay attention to the entire surroundings of the Cooler whilst investigating and rectifying the causes of faults.

#### **Decommissioning the Cooler**

If dismantling activities are carried out on the Cooler without decommissioning having been fully completed first, serious injuries can result.

- Carry out dismantling activities only after the decommissioning has been fully completed.
- Carry out dismantling activities only after release by an authorised party.

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**Disconnecting the Cooler from the power supply network**

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If the Cooler is not properly and completely disconnected from the power supply during the decommissioning, there is a risk of significant injuries and property damage.

- When disconnecting the Cooler from the power supply network, ensure that all connections are securely separated and that unintentional activation is prevented.
- 

---

**Maintenance interval**

---

Disregard of the maintenance intervals can lead to significant personal injury and property damage.

- Comply with the maintenance intervals in these Instructions.
  - Take into account the fact that the manufacturer of the Cooler cannot have any experience of long-term operation under your operating conditions. For this reason, supplement these Instructions with your own experiences.
- 

## 8.2 Personal protective equipment

**Hearing protection**

Wear hearing protection when carrying out activities in an area in which the daily noise exposure level of 80 dB(A) and/or the peak noise pressure level of 135 dB(C) will be exceeded.

**Eye protection**

Wear eye protection during activities performed in an environment where liquids, pressurised gases or particles may fly into the eyes.

**Hand protection**

Wear hand protection when carrying out activities where there is a potential risk of injury due to cutting, penetrating, pinching, temperature influences and substances.

**Safety footwear**

Use safety footwear for activities where there is a potential hazard due to falling or jammed objects, penetration by pointed objects, the effects of temperature and substances.

## 8.3 Activities and qualifications

Table 13: Using the cooler - Activities and qualifications

Activity	Qualification
Activities on mechanical components	Mechanical maintenance specialist
Activities on electrical components	Electrical specialist
Activities on components of the control and regulation system	Specialist personnel with verification that authorises them to carry out activities on components of the control and regulation system
Activities on components of the fluid system	Specialist personnel with verification that authorises them to carry out activities on components of the fluid system
Cleaning (with the exception of electrical parts)	Cleaning personnel
Coordination of the various activities	Specialist with authority to give orders

## 8.4 Faults, fault-finding and fault rectification

Inform the manufacturer immediately in the event of damage during the warranty period.

Have the information from the rating plate to hand before contacting the manufacturer.

Describe the fault and your observations as accurately as possible. The more accurately you are able to describe the details, the faster and more precisely the manufacturer can support you.

### 8.4.1 Error detection

Error detection is used to identify faults. In the event of a fault carry out error detection immediately.

#### **Danger due to electrical energy**

**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Please pay careful attention to the hazard areas of the live components.

**DANGER**

#### **Dangers due to the fluid system**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

**DANGER**

#### **Danger due to screw plugs or closure cover**

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

**WARNING**

#### **Warning - Risk of burns**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.

### 8.4.2 Corrective action

The corrective action is used to rectify faults on the Cooler. Corrective action must be carried out immediately after a fault is identified.



*If the fault identification results in parts of the Cooler having to be replaced, this replacement is considered a repair. Refer to chapter 8.6 "Repairs" for information on repairs.*

### 8.4.3 Faults

**Table 14: Faults**

Fault	Possible cause	Remedy
Fan runs noisily	Deposits on the fan	Clean fan carefully
	Fan worn	Replace fan
	Fan deformed due to thermal effects	Replace fan
Grinding noise on the fan	Impeller grinding against the protective grating	Loosen the protective grating and align anew
	Noise from the electric motor	Check the electric motor for bearing noise and replace the bearings if necessary
Fan does not start	Electric motor incorrectly connected	Check connection
	Electric motor defective	Check electric motor and replace if necessary
Cooling capability not be achieved	Design air temperature incorrect	Select larger model
	Incorrect electric motor direction of rotation	Check connection
	Air flow rate too low	Check connection
	Cooler clogged	Clean coolant
	Obstructions nearby	Maintain minimum distance
	Fluid flow too low	Increase flow
	Fluid line blocked	Cleaning
	Fluid circuit shut	Open shut-off valves and cocks

## 8.5 Maintenance

All types of maintenance tasks on the Cooler should be carried out by the manufacturer or an authorised workshop as a matter of principle. This ensures that only original spare parts are used and can significantly increase the service life of the Cooler. Quote all of the data cited on the rating plate when looking for technical information and for ordering spare parts.

### 8.5.1 Before beginning the maintenance work

Always carry out the following activities before starting maintenance work:

- Switch the Cooler off and secure the Cooler against being switched back on.
- Let heated areas (e.g. housing) cool down.
- Mark the Cooler with an information sign in order to prevent unauthorised reactivation.
- Before starting activities on the fluid system, depressurise the components of the fluid system.
- Note the operating conditions set or the control settings.
- Observe the safety instructions and material safety data sheets from the corresponding manufacturer when using oils/lubricants, cleaning agents and spare parts.

## 8.5.2 Cleaning the Cooler

Regular cleaning contributes to fault-free operation, safety and value retention of the Cooler - primarily the removal of dust, production residues, oil and grease. In doing so, note that improper cleaning can cause damage.

### Danger due to electrical energy



**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Please pay careful attention to the hazard areas of the live components.

### Dangers due to the fluid system



**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.
- Let the system cool down.

### Danger due to screw plugs or closure cover



**DANGER**

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

### Warning - Risk of burns



**WARNING**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.

### Damage to property due to improper cleaning

**ATTENTION**

Improper cleaning and incorrect handling of the cleaning agents can lead to property damage on the Cooler.

- Do not blow out the components of the Cooler with compressed air.
- Do not use high-pressure cleaners.
- Observe the instructions for use on the cleaning agents' containers.

**i** *The seals of the screw plugs, or the closure cover are to be fully wetted with a water glycol mixture (coolant) each time before commissioning the cooler.*

*Furthermore, every time a connection is opened, all of the aluminium sealing rings must be replaced with new ones.*

*New aluminium sealing rings are likewise to be fully wetted with a water glycol mixture (coolant).*

*Before re-coupling, the sealing surfaces of the filler connections must be checked for damage and repaired if necessary.*

*The function can only be guaranteed if the top and bottom sealing surfaces are smooth and clean. The seals of the closure cover must be free of damage.*

*The seals must be fully wetted with a water glycol mixture (coolant) prior to being re-fitted.*

*The correct function of the closure cover must be checked after fitting.*

#### 8.5.2.1 Cleaning blades

Oily or greasy contaminants can be washed off with a steam or hot water jet. Ensure that the power of the jet is adjusted to a gentle level in order to prevent the blades being deformed.

**i** If there are obstructions or contamination that cannot be removed, or deformed fin ribs present on more than 20% of the air surface on the cooler, the cooler must be replaced.

#### 8.5.2.2 Cleaning the interior of the cooler (e.g. oil side)

The process passages must be flushed with a suitable cleaning agent if they are contaminated. The cleaning agent must be suitable for the cooler material and must be compatible with the medium to be cooled. The flushing time must be adapted to suit the degree of contamination. After flushing, the flushing medium must be completely removed from the cooler, leaving no residue (e.g. with compressed air).



### 8.5.3 Servicing the Cooler

Preventative and diligent maintenance is a prerequisite for ensuring that the health and safety of the personnel in the vicinity of the Cooler are not impaired. Furthermore, the servicing is also necessary to maintain the functional capability of the Cooler.

#### **Danger due to electrical energy**


**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Please pay careful attention to the hazard areas of the live components.

#### **Dangers due to the fluid system**


**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

#### **Danger due to screw plugs or closure cover**


**DANGER**

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

#### **Warning - Risk of burns**


**WARNING**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.



*The seals of the screw plugs, or the closure cover are to be fully wetted with a water glycol mixture (coolant) each time before commissioning the cooler. Furthermore, every time a connection is opened, all of the aluminium sealing rings must be replaced with new ones.*

*New aluminium sealing rings are likewise to be fully wetted with a water glycol mixture (coolant).*

*Before re-coupling, the sealing surfaces of the filler connections must be checked for damage and repaired if necessary.*

*The function can only be guaranteed if the top and bottom sealing surfaces are smooth and clean. The seals of the closure cover must be free of damage.*

*The seals must be fully wetted with a water glycol mixture (coolant) prior to being re-fitted.*

*The correct function of the closure cover must be checked after fitting.*

## 8.5.4 Maintenance schedule

Table 15: Maintenance schedule

Maintenance at regular intervals					
Component	Activity	RP	EF	IF	FW
Coolant	Check the concentration and qualitative properties of the coolant.			X	
	- If necessary, replace the coolant.			X	
	- If necessary, establish the required concentration of coolant.			X	
Monthly maintenance					
Component	Activity	RP	EF	IF	FW
Housing	Check for clean and operationally safe condition	X			
	- If necessary clean soiled blades.	X			
	- If necessary, re-establish operationally safe conditions.		X	X	X
Fan	Check for unusual running noise	X			
	- If necessary, re-establish operationally safe conditions.		X	X	X
Protective grating	Check cleanliness, completeness and proper function.	X	X	X	
	- If necessary, clean the soiled protective grating.	X	X		
	- If necessary, re-establish operationally safe conditions.		X	X	X
Labelling and signs	Check that they are properly attached and legible.	X	X	X	
	- If necessary clean illegible components.	X			
	- If necessary fasten loose components.		X	X	

RP: Cleaning personnel  
EF: Electrical specialist

IF: Mechanical maintenance specialist  
FW: Specialist with authority to give orders

Monthly maintenance					
Component	Activity	RP	EF	IF	FW
Electrical cables, pressure hoses, pressure lines, connections and screw fittings	Check for damage, leaks and firm seating.		X		
	- If necessary fasten loose components.		X		
	- If necessary, replace damaged components.		X		
Monthly maintenance					
Component	Activity	RP	EF	IF	FW
Electric motor	Check for clean conditions and firm seating.	X			
	- If necessary, free the blower cover of contaminants.	X			
	- If necessary, free electrical motor of contaminants.	X			
	- If necessary, fasten the loosened electric motor.			X	
Annual maintenance					
Component	Activity	RP	EF	IF	FW
Cooler (All components)	Carry out a complete functional check and safety check (e.g. by the manufacturer).		X	X	
Cooler (electrical connections)	Check the energy connections for firm seating, damage and wear.		X		
	- If necessary fasten loose energy connections.		X		
	- If necessary replace energy connections.		X		
Cooler (fluid connections)	Check the energy connections for firm seating, damage and wear.		X	X	
	- If necessary fasten loose energy connections.			X	
	- If necessary replace energy connections.			X	

RP: Cleaning personnel  
EF: Electrical specialist

IF: Mechanical maintenance specialist  
FW: Specialist with authority to give orders

### 8.5.5 Measures after maintenance

After completing the maintenance work and prior to switching on the Cooler, carry out the following steps:

- Ensure that all components that were removed during the maintenance work have been properly re-attached.
- Make sure that all tools, materials and other equipment used have been removed from the working area again.
- Clean the working area and remove any substances that may have escaped, e.g. liquids or working materials.

## 8.6 Repair

All types of repair tasks on the Cooler should be carried out by the manufacturer or an authorised workshop as a matter of principle. This ensures that only original spare parts are used and can significantly increase the service life of the Cooler. Quote all of the data cited on the rating plate when looking for technical information and for ordering spare parts.

### 8.6.1 Implementation of repair tasks

#### **Before starting repair tasks:**

- De-energise and disconnect the electrical components.
- De-pressurise the components of the fluid system.
- Prepare the whole area and all necessary components to enable the work to be carried out in accordance with procedures.
- Have suitable removal/mounting fixtures and tools to hand.
- Keep the work area clean and tidy.
- Have replacement parts to hand (only those recommended by or supplied by the manufacturer).
- Observe the special operating instructions.

#### **During the execution of repair tasks:**

- Before loosening screwed connections:
  - Secure the components to be loosened to prevent them falling.
- Before removing components:
  - Secure the Cooler to prevent it toppling.
- Before disconnecting chains/ropes:
  - Slacken the chains/ropes.
  - Secure the chains/ropes against unwinding.
- Connect/disconnect the terminals for the electrical components after having de-energised these.
- Disconnect the components of the fluid system properly after having de-pressurised these.
- Note the weight of the components to be removed. Use suitable lifting gear, e.g. cranes or industrial trucks, if necessary.
- Observe the special manufacturer's instructions for screwed connections (tightening torques, screw threadlockers, etc.).

#### **After completion of repair tasks:**

- Switch on the Cooler only after release by the responsible party.
- Dispose of the replaced components properly.

## 8.6.2 Repairing the Cooler

Repairs on the Cooler reinstate the functional capability and operational safety.

### **Danger due to improper lifting and transportation**



#### **DANGER**

Improper lifting and transportation can result in serious injuries and damage to components of the Cooler.

- Use only lifting gear, load-bearing equipment and lashing gear with sufficient load bearing capacity.
- Use only the lifting lugs provided for transporting and lifting the Cooler. Load suspension gear and load attachment rigging must be in acceptable condition and shall be attached only at the lifting lugs provided.
- Refrain from knotting steel ropes and round chains.
- Do not connect fibre ropes by knotting.
- Untwist any twisted ropes before lifting.
- Do not kink ropes at crimp connectors.
- Ensure thimbles, cable eyes, lifting rings and other suspension elements are free to move in the load hook.
- Do not lift loads over personnel.
- Any auxiliary lifting eyes, e.g. on the drives, etc., are to be used exclusively for lifting the respective individual component.

### **Danger due to electrical energy**



#### **DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Observe the documentation for the electric motor.
- De-energise the electric motor.
- Earth the de-energised and disconnected circuits for the duration of the activity.
- Short-circuit the de-energised and disconnected circuits for the duration of the activity.
- Cover and/or enclose neighbouring live parts.
- Attach corresponding warning signs.
- Check that the area for the activity has been de-energised.
- After the activities have been completed, ensure that the area affected is free of faults and functioning properly.
- After the activities have been completed, remove the safety precautions (by-passes, jumpers, etc.).

### Dangers due to the fluid system



#### DANGER

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.

### Danger due to screw plugs or closure cover



#### DANGER

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
- Let the system cool down.

### Warning - Risk of burns



#### WARNING

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.

### Damage due to the use of non-original parts



#### WARNING

The use of non-original parts can result in damage on the Cooler and consequential injuries to personnel.

- Use only use original parts.



*The seals of the screw plugs, or the closure cover are to be fully wetted with a water glycol mixture (coolant) each time before commissioning the cooler. Furthermore, every time a connection is opened, all of the aluminium sealing rings must be replaced with new ones.*

*New aluminium sealing rings are likewise to be fully wetted with a water glycol mixture (coolant).*

*Before re-coupling, the sealing surfaces of the filler connections must be checked for damage and repaired if necessary.*

*The function can only be guaranteed if the top and bottom sealing surfaces are smooth and clean. The seals of the closure cover must be free of damage.*

*The seals must be fully wetted with a water glycol mixture (coolant) prior to being re-fitted.*

*The correct function of the closure cover must be checked after fitting.*

## 8.6.3 Spare parts

When ordering spare parts, please provide the following information:

- Designation of the component
- Manufacturer's type number
- Serial number

Refer to the rating plate for the manufacturer's type number and the manufacturer's serial number.

If required, send a sample of the component to be replaced to the

manufacturer.

## 8.7 Decommissioning

The decommissioning should be carried out by the manufacturer or an authorised workshop as a matter of principle. This safeguards any re-commissioning that may be required subsequently.

### 8.7.1 Decommissioning the cooler

The decommissioning removes the Cooler from the operational environment and disconnects it from the supply media. Further use can be the dismantling or the recommissioning at the same installation location.

#### **Danger due to electrical energy**



**DANGER**

It is possible to come into contact with live parts resulting in fatal injuries due to electrical energy.

- Observe the electrical documentation.
- De-energise and disconnect the electrical components affected. These electrical components include main switches, circuit breakers and automatic circuit breakers.
- Earth the de-energised and disconnected circuits for the duration of the activity.
- Short-circuit the de-energised and disconnected circuits for the duration of the activity.
- Cover and/or enclose neighbouring live parts.
- Attach corresponding warning signs.
- Check that the area for the activity has been de-energised.
- After the activities have been completed, ensure that the area affected is free of faults and functioning properly.
- After the activities have been completed, remove the safety precautions (by-passes, jumpers, etc.).

#### **Dangers due to the fluid system**



**DANGER**

If liquid escapes at high speed due to damage on the system or if working on pressurised systems, this can cause serious injuries.

- Before starting activities on the fluid system, depressurise the affected system area.



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**Danger due to screw plugs or closure cover**

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**DANGER**

If opening the cooler while it is hot or pressurised, the screw plugs or closure cover will be ejected at high speed and could cause serious injuries.

- Do not open the cooler while it is pressurised.
  - Let the system cool down.
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**Warning - Risk of burns**

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**WARNING**

The housing of the cooler becomes hot during operation.

- Do not touch the cooler until the housing has cooled down.
-

## 8.8 Disassembly

Disassembly dismantles the Cooler into the individual parts required for further use. Further use can be the scrapping or the re-installation of the cooler.

### 8.8.1 Disassembly of the cooler

The disassembly should be carried out by the manufacturer or a workshop authorised by the manufacturer, as a matter of principle. This ensures that the Cooler can be installed anew.

**i** *The disassembly shall only be started once all of the work required for decommissioning has been carried out and after release by an authorised specialist.*  
*If the Cooler is disassembled at a point in time after the handover and is re-installed at a new installation location, the activities required for this shall be carried out exclusively by the specialist personnel from the manufacturer.*

#### **Danger due to improper lifting and transportation**



#### **DANGER**

Improper lifting and transportation can result in serious injuries and damage to components of the Cooler.

- Use only lifting gear, load-bearing equipment and lashing gear with sufficient load bearing capacity.
- Use only the lifting lugs provided for transporting and lifting the Cooler. Load suspension gear and load attachment rigging must be in acceptable condition and shall be attached only at the lifting lugs provided.
- Refrain from knotting steel ropes and round chains.
- Do not connect fibre ropes by knotting.
- Untwist any twisted ropes before lifting.
- Do not kink ropes at crimp connectors.
- Ensure thimbles, cable eyes, lifting rings and other suspension elements are free to move in the load hook.
- Do not lift loads over personnel.
- Any auxiliary lifting eyes, e.g. on the drives, etc., are to be used exclusively for lifting the respective individual component.

## ATTENTION

### Warning of property damage due to improper storage conditions

If the Cooler is installed anew at a later point in time, improper storage conditions can result in material damage on the Cooler.

- Protect all constituent parts from corrosion.
- Cover the Cooler.

## 8.8.2 Disposal (scope of validity: EU member states)

**i** *The manufacturer will take back the electrical and electronic components for subsequent legally-compliant disposal. The costs for the return shall be borne by the operator.*

All of the components of the Cooler, including the electrical and electronic components as well as the operating materials in the Cooler required for the operational capability are to be disposed of exclusively in a proper and professional manner in compliance with the applicable legal requirements. Disposal via the household waste or general commercial waste is strictly forbidden!

### Electrical and electronic Components:

The European directive 2002/96/EC regarding waste electrical and electronic equipment and its implementation into national legislation applies to the disposal of electrical and electronic components. Accordingly, electrical and electronic components are to be collected and separated and passed on for environmentally friendly recycling.

### Operating materials:

Note the waste code number of the corresponding material safety data sheets for the disposal of operating materials. The waste code numbers are recommendations - final determination may have to be carried out in consultation with the proper authorities.

The disposal information relates to the specific product as well as its residue arising due to proper use. In the event of mixing with other substances or preparations, an individual case assessment is required.



*Collect and dispose of oils, greases or cloths / cotton rags contaminated with oil/grease properly and in appropriately labelled containers and ensure that these are disposed of properly.*

### 8.8.3 Disposal (scope of validity: non-EU member states)



*With all disposal procedures, observe the nationally applicable legal foundations and ordinances pertaining to waste management.*