WLK 21 Chiller

Specification and User Manual

Laird™
THERMAL SYSTEMS

www.lairdthermal.com

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Revision history

Date	Index	Reason for change	Name	Page
2014-06-05	1.0		Edom/Gimm	
17 Dec 2018	2.0	Replaced controller ST72 with ST710. Added updated electrical wiring diagram, updated controller pictures, settings and layout update	B. Kabasa	
29 Mar 2019	3.0	LED 2 and LED 3 logic updated and T2 hysteresis updated	B. Kabasa	
30 Apr 2019	4.0	Wiring diagram updated	B. Kabasa	
18 Aug 2021	5.0	Pictures and Table 14 update	B. Kabasa	
17 Nov 2021	5.0	First English release	N. Hult	
29 Nov 2021	6.0	Filling amount on page. 21 updated to 2.5kg. Illustration on page 42 updated for item 8. Label Picture updated. Updated user Manual to new LTS format Spare parts PN updated	A. Olsson A. Chomat	21, 42 9 42
23 Jan 2024	7.0	New motor, new internal part number	S. El Fadali	8,9,21,42

1. About these instructions

This document is the original operating instructions for the WLK 21 Chiller (known as the “device” in the following).

These operating instructions are intended for the device operating organization. They are to make safe operation of the device described easier. You must read them carefully and they must be stored so that the operator of the device may access them at any time.

In addition, you must comply with all valid national and local regulations, for example, accident prevention regulations, environmental regulations, and plant-internal safety codes.

You may read the individual sections of these operating instructions independent of one another and you may use these instructions for reference.

1.1 Warranty terms

LAIRD’s general terms of sales and delivery apply. The purchaser is familiar with these terms since the day of signing the purchase contract at the latest.

The warranty terms and duration for the device can be found in the general delivery terms.

Warranty claims and liability are null and void if the claims refer to one of the cases listed below:

- Misuse of the device
- Incorrect installation, putting into operation, operating, repair or maintenance of the product by personnel who are not authorized
- Use of the product with defective, incorrectly attached, or non-functioning safety equipment and guards
- Unauthorized changes, or those not allowed, to the electrical equipment of the device by the operating organization
- Unauthorized mechanical changes, or those not allowed, to the device by the operating organization
- Unauthorized changes, or those not allowed, to the operating parameters by the operating organization
- Use of unauthorized tools
- Use of unauthorized operating materials
- Exceeding the prescribed maintenance intervals
- Catastrophic events beyond human control and acts of God

NOTE

Every misuse of, and every structural change to, the device brought about by the operating organization without obtaining written permission from LAIRD in advance renders the warranty and the Declaration of Conformity null and void and releases LAIRD from product liability. This also applies to the setting of safety equipment.

In the case of authorized changes or when installing optional equipment parts, the customer is responsible for the correct installation of the required safety equipment.

1.3 Contacting Laird Thermal Systems

If you have questions about the device, reach out to the following contacts and specify the following data:

- Your name and mailing address
- The point of contact at your company?
- The data from the type label: Device type, serial number and year of manufacture

Company contact:

See contact details at www.lairdthermal.com

2. Product identification

2.1 Identification data of the device

You will find the identification data of the device here.

Manufacturer	Laird Thermal Systems s.r.o.
Product	Chiller
Device type	WLK 21
Item number	1421.71

Table 1 *Identification data of the device*

2.2 Type label

The device type label is located on the front of the device.

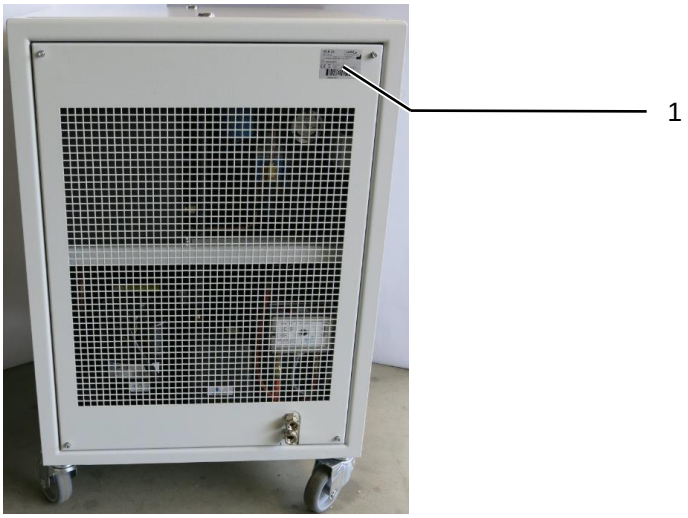


Fig. 1: *Location of the type label*

1	Type label

Type label of the device

Fig. 2: *Designations on the type label*

1	Device type and refrigerant	2	Item number
3	Serial number	4	Electrical specifications
5	Date of manufacture		

System identification label of the device

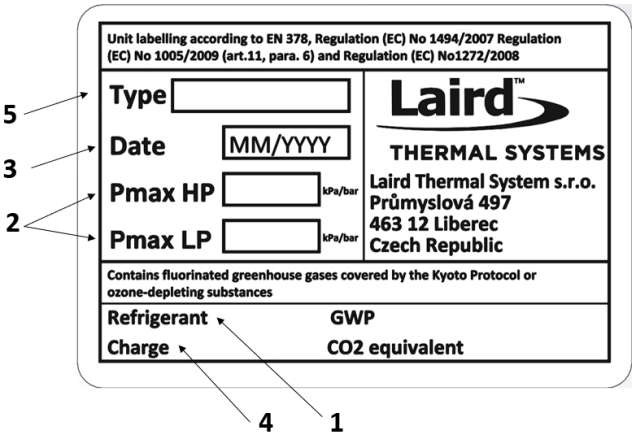


Fig. 3: *Designations on the system identification label*

1	Refrigerant type	2	Maximum pressures (high-pressure side and low-pressure side) in bar
3	Date of manufacture	4	Filling amount in kg
5	Device type		

3. Safety regulations

3.1 Hazard classes

Safety precautions are reproduced in this document using standardized descriptions and icons. Depending on the probability of occurrence and the severity of consequences, two hazard classes are used:

DANGER

Reference to an immediate risk to people.

If disregarded, may result in permanent injuries or death.

CAUTION

Reference to an identifiable risk to people or to possible property damage.

If disregarded, may result in injuries or property damage.

3.2 Safety icons

In these operating instructions, specific safety precautions are provided to indicate the unavoidable remaining risks when operating the device. These remaining risks contain risks to:

- people
- product and device
- environment

The following safety icons are used in these operating instructions. These icons should primarily draw the attention of the reader to the text in the adjacent safety precaution.

Icon	Meaning
	Warning of a general risk or property damage.
	Warning of a hazard presented by electrical voltage.

Table 2: *Warning signs*

Icon	Meaning
	This icon indicates that safety goggles must be worn.
	This icon indicates that safety gloves must be worn.
	This icon indicates that electricity must be completely disconnected.

Table 3: *Mandatory personal protection equipment signs*

3.3 Notes on safe operation

NOTE

Perform regular inspections!
Doing this allow you to make sure that safety procedures are followed.

The device is safe to operate. It was constructed using the best available technology.

Despite this, the device may present risks, especially if it

- is not used as intended
- is used improperly
- is operated under conditions that are not allowed

3.4 Avoiding dangerous situations

Dangerous situations can be avoided during operation by having the personnel behave in a safety-conscious, proactive manner.

The following notes are for everyone who works on or with the device:

- Keep a complete version of the operating instructions handy in an easily readable form for everyone at the location where the device is used.
- Only use the device as intended.
- The device must be functional and in proper condition. Check the state of the device before starting work and at regular intervals.
- Make sure that no one can be injured by parts of the device.
- Report malfunctions or recognizable changes to the device immediately to the responsible party.
- Comply with the accident prevention regulations and the local codes.
- Use personal protective equipment.

3.4.1 Notes on electrical equipment

DANGER

Risk of death due to electrocution when working on the electrical equipment of the device!

- Switch off the device before starting work!
- Remove all electrical power from the device by pulling the power plug!
- Make sure that there is no voltage present!
- Ground or short circuit the device!

The following principles apply to all work on electrical systems:

- Work on the electrical system may only be performed by qualified electricians.
- The electrical equipment is to be connected to the company's power system in accordance with local codes. Comply with the information on the schematic diagram.
- The device operates using electricity. If the electrical system is incorrectly installed or if the insulation should fail during operation, there is a risk of death.
- When the device is switched off, the power supply is not disconnected from the electricity-supply system. The device is disconnected by pulling the power plug from the mains.
- Changes to the control system may impair safe operation. All planned changes must be approved by the manufacturer.
- Functionality of the safety features must be checked after all work performed on the unit.
- Do not make any unauthorized changes to the device. All planned changes must be approved by the manufacturer.

3.4.2 Notes on environmental protection

Environmentally conscious and proactive behavior by the staff avoids any effects hazardous to the environment.

The following principles apply to environmentally conscious action:

- Toxic materials must not escape into the ground or the sewage system and are to be stored in suitable containers
- Toxic materials are to be sent for recycling or disposal in accordance with local regulations

Always comply with the safety data sheet of the appropriate manufacturer when handling operating materials.

3.4.3 Refrigerant R134a (tetrafluoroethane)

The refrigerant used in the device is classified as a slight water pollutant and contains fluorinated greenhouse gases.

- Do not let it get into water or the sewage system!
- Do not let it get into the atmosphere!
- Store only in suitable containers!
- Use only authorized specialist companies for disposal!

Always comply with the safety data sheet of the appropriate manufacturer when handling operating materials.

3.4.4 Exclusion criteria

NOTE

Operating personnel
The operating personnel is only authorized to operate the device. They may not open the device housing, remove parts, connect power or coolant or perform maintenance work.

3.4.5 Protective equipment

If applicable, use the following personal protective equipment when troubleshooting and when performing cleaning, maintenance, repairs and preventive maintenance tasks.

	Safety goggles
	Safety gloves

1.2 Safety devices

NOTE

The safety devices described in the following must, if not expressly described otherwise, be integrated into the control system of the device to be chilled by the customer on site. These tasks are to be performed only by trained specialists. You can find necessary information for the integration of the device in the schematic diagram in the Appendix.

You must not change, remove or render inoperative the safety devices. All safety devices must be easily accessible at all times.

Familiarize yourself with all safety devices – in case of emergency, this may prevent or minimize injuries and/or device failures.

3.4.6 Safety and signaling equipment on the device

The device is provided with safety equipment at points of danger:

3.4.6.1 The fill level in the supply tank is monitored by a level switch.
3.4.6.2 The coolant throughput is monitored using a flow monitor that is to be connected into the isolated safety circuit of the device to be chilled.
3.4.6.3 The coolant temperature is monitored by an electronic thermostat. The coolant temperature exceeding the set maximum is signaled to the device to be chilled by way of a safety circuit.
3.4.6.4 The maximum pump pressure is limited by a bypass valve that diverts the fluid flow into a bypass line if the preset pressure is exceeded.
3.4.6.5 The antifreeze function thermostat prevents the coolant from being cooled too much (protection against freezing).
3.4.6.6 The cooling circuit is monitored by a high-pressure switch (pressostat).

The device is provided with the following signaling equipment:

- If the fill level in the supply tank is too low, the “Water level low” warning lamp lights. The device then switches off and the safety circuit outputs an alarm signal.

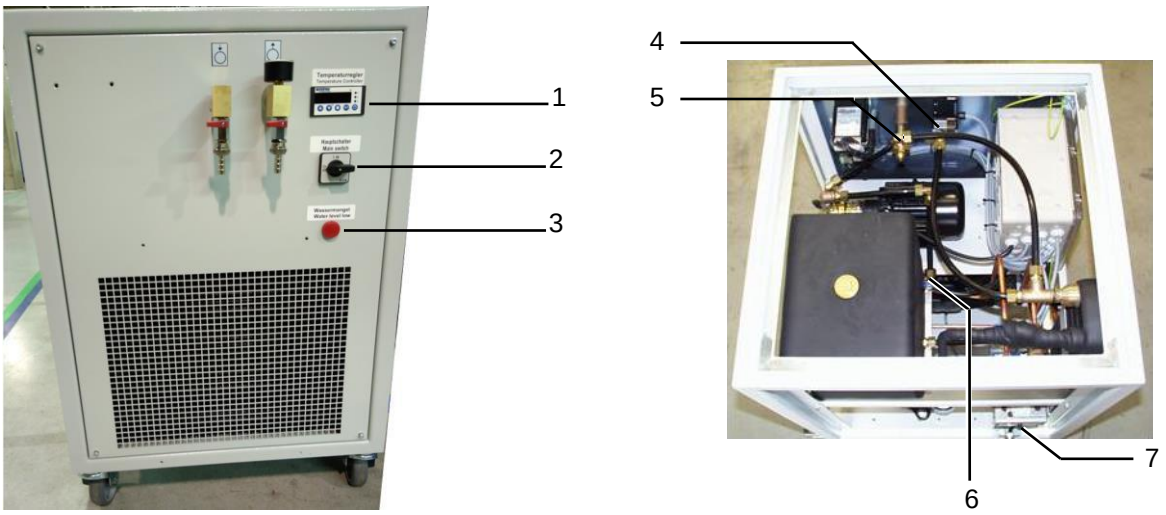


Fig. 4: *Safety devices*

1	Control panel of the temperature controller	2	Main switch
3	“Water too low” warning lamp	4	Flow switch
5	Bypass valve of the cooling circuit	6	Level switch
7	Pressostat (protection of the refrigeration circuit)		

3.4.7 Guards

The device housing prevents direct access to hazardous areas of the device. Only remove the covers for maintenance or repair work and reinstall them before putting the device back into operation. All maintenance covers are locked using two cam locks each. You can open them using the square key supplied in the delivery. Take care of the earthing leads connected to the guards.

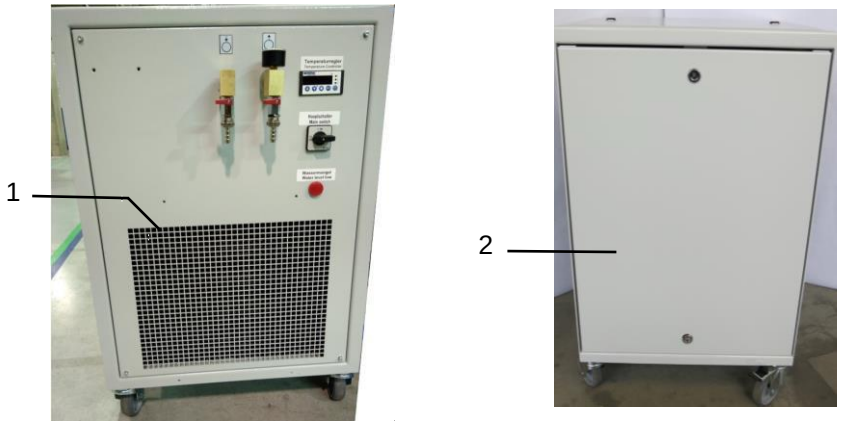


Fig. 5: *Guards*

1	Device casing	2	Maintenance covers with cam lock (left, right and top)

3.4.8 Warning labels

Warning labels in accordance with the German Professional Association regulation A8 entitled “Safety and health protection identification at the workplace” identify hazardous points on the device.

Warning labels and other notifications on the device must always be easily legible. Replace unreadable safety signs immediately.

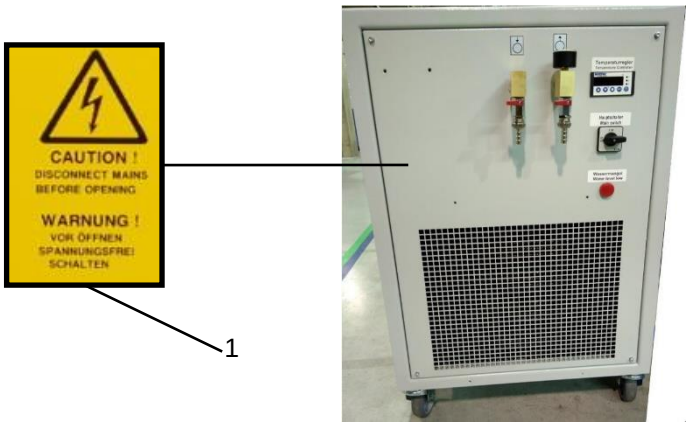


Fig. 6: *Warning labels attached to the device*

1	Warning against high electrical voltage (inside on the electrical connection box)

3.5 Accident procedure

If you or another person is injured when working on or with the device:

- Keep calm
- Provide first aid
- In any case, contact the company responder team

First aid in the event of accidents with tetrafluoroethane

The refrigerant tetrafluoroethane (R134a) is in a closed circuit in the device. If the circuit is damaged, refrigerant may escape and present a hazard:

- Quick evaporation of the liquid can cause frostbite.
- Vapors are heavier than air and may cause suffocation by displacing oxygen in the air.

Comply with the safety data sheet of the manufacturer when handling escaping refrigerant.

4. Product description

4.1 Intended use

The WLK 21 Chiller is used for cooling a coolant circuit. Coolant circulates in a secondary circuit between the chiller and the device to be cooled. The coolant is re-cooled in the primary cooling circuit by way of an air-cooled chiller. The maximum cooling capacity depends on the ambient temperature (see Technical data on page 21).

The device is intended for industrial and commercial use.

In addition to complying with and obeying all notes in these operating instructions, intended use includes compliance with the installation, removal, putting into operation, operating, preventive maintenance and maintenance tasks prescribed by the manufacturer in the given time intervals as well as all safety precautions.

Every use beyond these is considered misuse. Any use other than the intended

use is prohibited.

4.2 Misuse

Operational safety of the device cannot be guaranteed under operating conditions that are not allowed. These are prohibited for this reason and must be avoided in any case.

Dangerous situations may occur if the device is misused. Operating the device is not

permitted under the following conditions:

4.2.1 The device is being used for a purpose other than that intended.
4.2.2 The device or part of the device is damaged, the electrical system is installed incorrectly, or the insulation is damaged.
4.2.3 Protective and safety equipment are not operational or defective, attached improperly or missing.
4.2.4 The device is not operating error-free.
4.2.5 The device was modified without authorization or changed in a manner not allowed.
4.2.6 The control system was changed in a manner not allowed.
4.2.7 Operating parameters were changed in a manner not allowed.
4.2.8 Operation in potentially explosive areas
4.2.9 Operation using media that do not correspond to the specification
4.2.10 Use of unauthorized tools
4.2.11 Exceeding the prescribed maintenance intervals

NOTE

The manufacturer is not liable for damages resulting from misuse of the device. The manufacturer’s warranty from LAIRD is null and void in the event of misuse.

4.2 Foreseeable misuse

The device must not be used to cool media other than those specified in the Technical data. Furthermore, the device may only be operated in the specified temperature range.

4.3 Assemblies of the device

The device consists essentially of the assemblies listed below. You can find additional device information in the flowchart in the Appendix of this document.

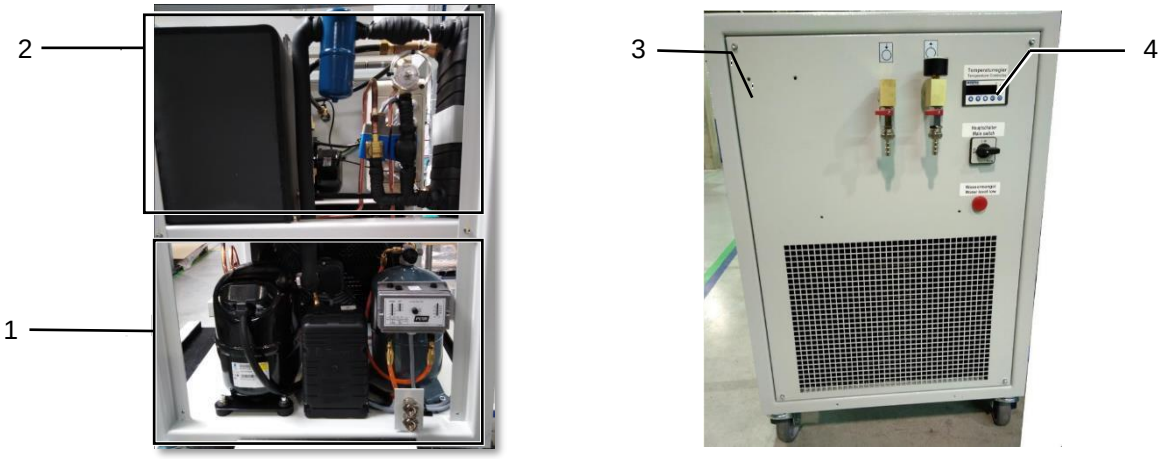


Fig. 7: *Assemblies*

1	Refrigeration circuit	2	Cooling circuit
3	Device housing	4	Control panel with display

4.4.1 Refrigeration circuit (Primary circuit)

The refrigeration circuit transfers the thermal energy from the cooling circuit to the ambient air. The refrigerant R134a absorbs heat from the coolant of the secondary circuit in the evaporator, which is designed as a counter-flow plate heat exchanger. The coolant evaporates and is transported from the compressor into the condenser. The condenser consists of a heat exchanger combined with a fan that condenses the refrigerant in the heat exchanger by way of air cooling. The heat is dissipated by the ambient air pushed through the device housing by the fan.

4.4.2 Cooling circuit (Secondary circuit)

In the cooling circuit, the coolant is moved by the pump via the supply line to the device to be cooled and further by way of the return line to the evaporator (that is, the plate heat exchanger). The heat is transferred to the refrigerant and the coolant is pumped back into the supply tank. A bypass circuit prevents the pump pressure from exceeding the maximum permissible value.

The coolant temperature is monitored by an electronic thermostat. An antifreeze thermostat prevents the coolant in the supply from cooling to below the permissible minimum temperature. The coolant throughput is monitored using a flow monitor.

4.4.3 Control panel with display

The control panel consists of a numeric display showing the target and actual temperatures as well as three LEDs as status displays for the operating states. You can change the target values using three control buttons.

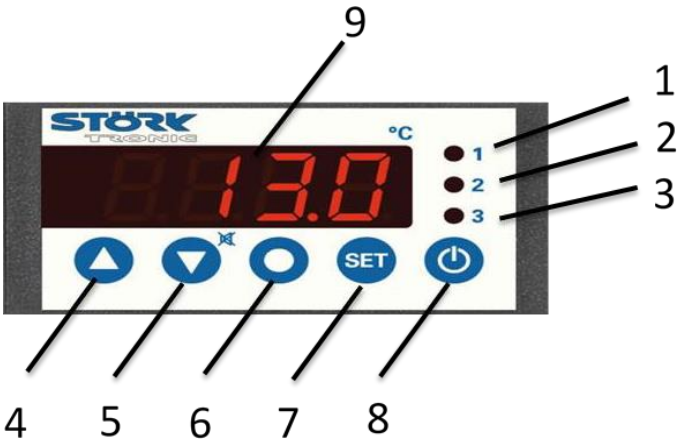


Fig. 8: *Control panel with display*

1	LED 1	2	LED 2
3	LED 3	4	*UP* button
5	*DOWN* button	6	Not used
7	*SET* button	8	Not used
9	Display in °C		

You can make changes to the system settings on the control panel. During normal operation, the display shows the current temperature of the secondary cooling circuit. When you are making changes, the display shows the appropriate parameter.

LED 1	**On:** Cooling on	**Off:** Refrigeration circuit in heating mode
LED 2	**On:** Temperature within the power range	**Off:** Maximum temperature exceeded (also has an effect on the safety circuit)
LED 3	**On:** Antifreeze function active, refrigeration circuit cannot be put into operation	**Off:** System is ready to operate, antifreeze function not triggered
DOWN button	Lowers the value of the selected parameter in steps	
UP button	Raises the value of the selected parameter in steps	
SET button	Selects parameters	

Table 4: *Operation of the buttons and LEDs on the control panel*

4.4 Technical data

Sizes and weights

Length:	590 mm
Width:	612 mm
Height:	925 mm
Weight:	118 kg (empty)

Table 5: *Sizes and weights*

Performance data

Cooling power:	2000 W at 40 °C ambient temperature
Throughput:	> 5.5 l/min at 4.0 bar
Power line voltage:	230 VAC, 50/60 Hz
Current consumption:	7.6 A
IP rating:	IP 21
Noise emission:	≤ 71 ± 2 dB(A) at a distance of 1 m

Table 6: *Performance data*

Environmental conditions

Operating temperature:	+5 °C to +40 °C
Storage temperature:	-25 °C to +70 °C when filled with antifreeze
Rel. humidity:	20% to 80%

Table 7: *Environmental conditions*

Refrigeration circuit

Refrigerant:	R 134a
Filling amount	2.5 kg

Table 8: *Refrigeration circuit*

Cooling circuit

Coolant:	Glysantin G48 and water, 2:3 ratio
Capacity:	About 14 liters

Table 9: *Cooling circuit*

Settings

Maximum pressure:	≤ 9.0 bar
Coolant supply line (T1):	20 ± 2 °C
Maximum temperature (T2):	30 ± 2 °C
Antifreeze protection (T3):	5 °C

Table 10: *Settings*

4.5 Requirements on the installation location

4.6.1 Location

- The location of the device must be level.
- You must select the setup location so that the flow of cooling air is not impeded, the connections for the supply and return lines are easily accessible and the supply and drain lines can be routed without kinks.

4.6.2 Environmental conditions and climate

CAUTION

There is the risk of damage due to unsuitable environmental conditions!

This can lead to property damage and corrosion for which the manufacturer does not assume any liability.

- The device is exclusively approved for operation indoors.
- You must not store or operate the device in an aggressive, humid environment!
- You must not store or operate the device outdoors!

Obey the information regarding permissible ambient conditions in the Technical data on page 21.

4.6.3 Infrastructure

The following infrastructure is necessary for connecting the device:

Connection components	Rated value
Operating voltage	230 VAC ± 10% 50/60 Hz

Table 11: *Requirements on the infrastructure*

5. Transport

5.1 Safety precautions for transport and installation

CAUTION

Risk of injury when lifting the device!
When filled, the device weighs more than 120 kg.
- Do not lift the device manually!
- To lift the device, use only appropriate aids such as forklifts or lift trucks!
- When transporting over short distances, push the device to the installation location on the casters!
- Lock the device in place at the installation location using the caster locks!

CAUTION

Risk of damage from improper transport!
The mounting brackets of various components inside the device do not have transport locks. In the event of improper transport, these items may be damaged beyond repair and must be replaced.
- Transport the device upright!
- Do not tilt the device and do not expose it to impacts!

5.2 Transport of the device

The device is delivered packed in foil on a transport pallet. Leave the device on the pallet until it is being put into operation. Move it to the installation location using a forklift or lift truck.

The device has casters and can be moved on these after being unpacked.

5.3 Unpacking and disposal of the packaging

Before you set up the device, remove the foil.

Check the device with regard to

5.3.1 Transport damage

5.3.2 Completeness of the shipment

Lift the device from the transport pallet using a forklift or lift truck. Dispose of the packaging material in accordance with the applicable local regulations.

NOTE

LAIRD recommends saving the transport pallet for subsequent transport of the device.

6. Putting into operation

6.1 Safety precautions for putting into operation

CAUTION

There is the risk of malfunctions while putting into operation due to faulty connections!

These may lead to uncontrolled operation of the device.

Before switching the device on, make sure that

- all safety equipment of the device is installed and capable of functioning
- all connections are installed correctly
- no one can be in jeopardy when the device starts

Comply with the notes in Section Safety regulations, page 10.

6.2 Putting into operation for the first time

6.2.1 Setup

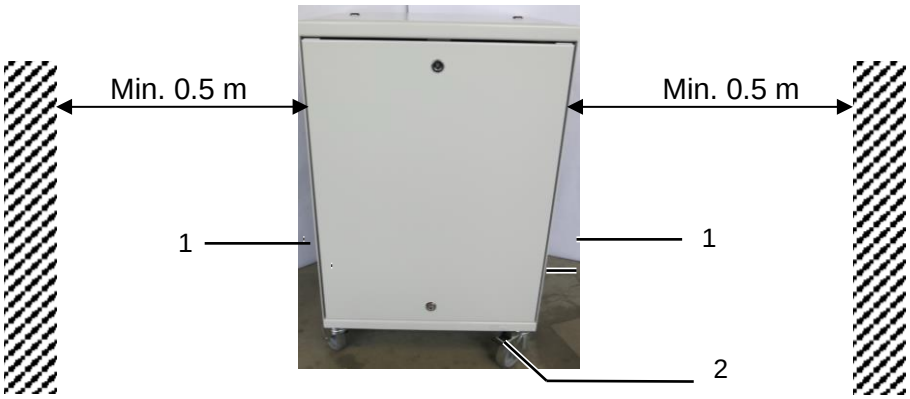


Fig. 9: *Minimum required clearances for air entry and exit*

1	Ventilation grille	2	Four casters (two with locks)

1) Bring the device to its installation location as described in Section 5.2.
2) Lock the two casters using the brakes.
3) Set the device up so that air entry and exit are not impeded. The clearance to the wall must not be less than 0.5 m. Otherwise, the cooling power may be impaired.

NOTE

Before installation, let the device sit at the installation location for about four hours. This is to allow any condensate to evaporate.

6.2.2 Connecting and filling the cooling circuit

CAUTION

There is the risk of damage if unsuitable coolant hoses are used! This can lead to injuries, property damage and corrosion.

- Pay attention to the proof pressure of the coolant hoses and their durability with respect to the coolant used!
- Use only coolant hoses that do not show any damage.
- If using water as the coolant, use opaque coolant hoses to prevent algae from forming in the water. Otherwise, use appropriate additives.

The coolant hoses are attached to the device using barbed hose nozzles (1/2 inch). The supply and return nozzles are marked with appropriate icons.

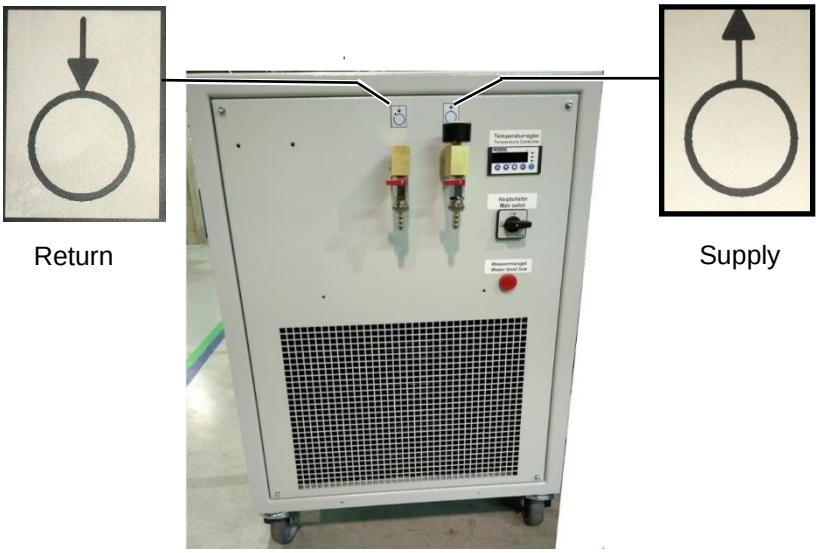


Fig. 10: *Identification, supply and return nozzles*

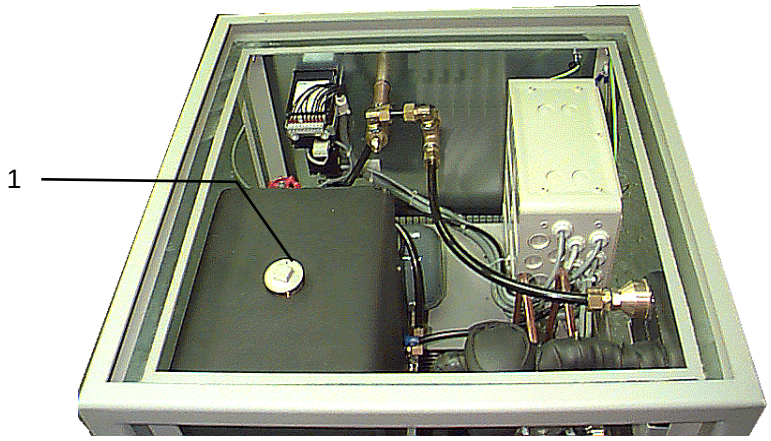


Fig. 11: *Tank cap and filler connection, coolant supply tank*

1	Filler connection of the coolant supply tank

1) Open both cam locks of the lid using the square key and remove the lid.
2) Place a suitable hose on the supply and return hose nozzles and secure each using an appropriate hose clamp.
3) Attach the hoses to the corresponding connections of the device to be cooled.

NOTE

When connecting the cooling hoses, pay attention to the flow direction. Obey the manufacturer's documentation of the device to be cooled.

4) Using an open-ended wrench, remove the tank cap of the supply tank.
5) Fill the supply tank with coolant up to a level of about 3 cm below the opening of the filler connection. This corresponds to a capacity of about 14 liters. Use a funnel to prevent wetting live components with coolant.
6) Close the supply tank using the tank cap.

6.2.3 Electrical connection

DANGER

Risk of death due to electrocution when working on the electrical equipment of the device!

- Switch off the device before starting work!
- Remove all electrical power from the device by pulling the power plug!
- Make sure that there is no voltage present!
- Ground or short circuit the device!

CAUTION

There is the risk of damage due to inadequate connection!

Improper linking of the device into the safety circuit of the device to be cooled leads to the safety equipment described in Section 3.4 becoming ineffective.

- Make all necessary connections according to the schematic diagram in the Appendix!
- Make sure that the connected safety equipment functions properly!
- Have all work performed only by specialists!

NOTE

The device is supplied without connecting cables. The customer must make the electrical connection and the link into the safety circuit of the device to be cooled using an appropriate specialist.
You can find the necessary information in Technical data (page 21) and in the schematic diagram in the Appendix.

After the connection cable has been installed, connect the device by inserting the power plug.

6.2.4 Putting into operation for the first time

CAUTION

A lack of coolant in the secondary circuit can result in destruction of the pump!
- Only operate the device with the correct fill level in the coolant supply tank!
- Regularly check the level in the coolant supply bank!

Once the cooling circuit has been connected, the coolant container filled and the device electrically connected, perform the following steps for putting into operation for the first time:

1) Switch the device on by rotating the main switch to position <**I**>.
2) Let the device run for a few minutes to fill and vent the cooling circuit.
3) Switch the device off by rotating the main switch to position <**0**>.
4) Open the operating tank cap and check the tank fill level. If necessary, top up the coolant to a fill level about 3 cm beneath the opening of the filler connection. Use a funnel to prevent wetting live components with coolant.
5) Close the supply tank and install the casing plates.
6) Switch the device on again and check whether the operating parameters are being maintained.

⇨ The device is ready to operate.

6.3 Putting into operation daily

Switch the device on for normal daily operation with the main switch and let it run for about 1 minute.

6.4 Putting into operation after storage

The device is after storage in a manner similar to putting it into operation for the first time (see Section 6.2).

7. Operation

The device is operated using the controls on the device.

There are light-emitting diodes (LEDs) directly on the device to indicate the status. Alarms and error messages are shown on the display of the device and, if applicable, on the device to be cooled that is connected to the chiller.

7.1 Safety instructions for operating the device

CAUTION

There is a risk of damage if there is a lack of coolant!
A lack of coolant in the secondary circuit can result in destruction of the pump!
- Only operate the device with the correct fill level in the coolant supply tank!
- Regularly check the fill level in the coolant supply tank!

Also comply with the notes in Section Safety regulations, starting on page 10.

7.2 Switching on the device

➢ The device is ready to be switched on.

1) Switch the device on with the main switch before the device to be cooled and let it run for about 1 minute.
2) Check whether the required operating data are being met (see Technical data on page 21).

⇨ The device has started.

7.3 Switching off the device

➢ Cooling operation has ended.

1) Switch the device off by rotating the main switch to position <**0**>.
2) Close all the valves on the supply and drain hoses.

⇨ The device has been switched off.

7.4 Settings

NOTE

The antifreeze thermostat is set at the factory and must not be changed. If it becomes necessary to set the antifreeze monitor, contact LAIRD Service.
The temperature control system has been set at the factory in accordance with customer specifications.

If it becomes necessary to set the inlet temperature, the temperature monitor (temperature controller Max T2) or the antifreeze function (T3), proceed as follows:

Fig. 12: *Control panel for the temperature controller*

1	Temperature display	2	Increase/decrease set values
3	SET button		

7.4.1 Setting the desired inlet temperature (T1)

NOTE

The hysteresis for T1 has been set at the factory to 4 K symmetrically around the set value T1.

1) Press the SET button and hold it during the entire setting process.
   ⇨ The preset value appears, setting mode is activated.
2) Using the ▲ and ▼ buttons, set the desired value.
3) Release the SET button.
   ⇨ You have exited setting mode. The current value of the inlet temperature is displayed.

⇨ The inlet temperature has been set.

7.4.2 Setting the thermostat (temperature controller Max T2)

NOTE

Between triggering the alarm signal when the maximum temperature is exceeded and the alarm signal terminating, there is a hysteresis of 5 K symmetrical around the set value. Example:
Set value for the maximum temperature: 27.5 °C
Alarm signal ON appears at 30.0 °C
Alarm signal OFF appears at 25.0 °C

1) Press the ▲ and ▼ buttons at the same time for 4 seconds.

   ⇨ The set maximum value of the inlet temperature is displayed.

2) Press the SET button and hold it during the entire setting process.

   ⇨ The setting mode is activated.

3) Using the ▲ and ▼ buttons, set the desired value for the maximum temperature (thermostat trigger value) (the triggering point is affected by the hysteresis).

4) Release the SET button.

   ⇨ You have exited the setting mode; the set value is adopted.

5) Press the ▲ and ▼ buttons at the same time for 4 seconds to return to operating mode.

NOTE

If there is no change, the controller automatically switches back to operating mode after 60 seconds.

⇨ The temperature T2 for the thermostat function has been set.

7.4.3 Setting the antifreeze function (T3)

NOTE

There is hysteresis of 4 K symmetrically around the set antifreeze function value. Example:
Set antifreeze function value: 5 °C
The device does not cool again until 9 °C.

1) Press the ▲ and ▼ buttons at the same time for 4 seconds.

   ⇨ The set maximum value of the inlet temperature is displayed.

2) Use the ▲ to select the parameter P30.

3) Press the SET button and hold it during the entire setting process.

   ⇨ The setting mode is activated.

4) Using the ▲ and ▼ buttons, set the desired antifreeze function value (the triggering point is affected by the hysteresis).

5) Release the SET button.

   ⇨ You have exited the setting mode; the set value is adopted.

6) Press the ▲ and ▼ buttons at the same time for 4 seconds to return to operating mode.

NOTE

If there is no change, the controller automatically switches back to operating mode after 60 seconds.

⇨ The temperature T3 for the antifreeze function has been set.

8. Malfunctions

8.1 Safety precautions for malfunctions

Comply with the notes in Section Safety regulations, starting on page 10.

The following principles apply when troubleshooting or eliminating

malfunctions:

8.1.1 Only personnel with sufficient qualifications may perform these tasks on the device.

8.1.2 Do not perform any tasks on the refrigeration system.

8.1.3 If you are unable to remedy a fault by yourself, contact LAIRD Service.

8.2 Malfunctions during operation

Inadequate maintenance is the most frequent cause of device malfunctions during operation. Perform maintenance work regularly according to the maintenance intervals specified in Section 9.

In the event of malfunctions in operation, first check the following:

8.2.1 Is the pump strainer dirty or clogged?

8.2.2 Is the fan dirty or clogged?

8.2.3 Is the coolant contaminated?

8.2.4 Is there a lack of coolant due to leaks, evaporation or a cooling circuit that is too long?

Other clues on the following pages will provide you with troubleshooting help.

If you are not able to determine the cause of the malfunction using these operating instructions, contact LAIRD Service.

8.2.1 Troubleshooting help

The following are available as troubleshooting aids:

- Alarms and error messages of the safety circuit in the device to be cooled.
- Schematic diagram
- Flowchart
- Fault lists (see below)

Fault	Cause	Corrective action
The device does not start.	Is the main connection cable connected?	Plug it in → Page 27.
	Is the device filled with coolant? The red warning lamp indicates a lack of coolant.	Check the fill level in the supply tank, top off the coolant if necessary → Page 25
	Is the device switched on (main switch)?	Rotate the main switch to position <**I**>.
The device is running but has no or very little cooling power.	Are the external hoses kinked?	Route the hoses with large radii until there are no more kinks.
	Location of the chiller?	The clearance to the wall must not be less than 0.5 m → Page 24
	Is the condenser dirty?	Clean the condenser using compressed air → Page 36
	Does the device have enough coolant? The red warning lamp indicates a lack of coolant.	Check the fill level in the supply tank, top off the coolant if necessary → Page 25
	Are the coolant hoses connected?	Connect the hoses. While doing this, pay attention to the direction of flow → Page 25
	Is the strainer in the pump dirty?	Clean the pump strainer → Page 36
	Is the cooling circuit flowing?	This is indicated by the safety circuit connected to your load. This indication is not on the device but rather in the control system of your load.
	Is the fan rotating?	Hold a sheet of paper on the front ventilation grille of the condenser. If the sheet is drawn in and sticks on the ventilation grille, the fan is working.
	Is the ambient temperature too high?	See the Technical data for the maximum value → Page 21
	Has the pressure switch been activated?	1. Press Reset on the pressure switch. 2. If the compressor starts and you can hear it running, there is a defect in the refrigeration circuit and the device must be sent in for repair.
The device is loud.	There is not enough coolant in the cooling container	Top off the coolant
	The pump strainer is dirty	Clean the pump strainer → Page 36

Table 12: *Troubleshooting help*

9. Maintenance and cleaning

Conscientious maintenance contributes to ensuring smooth, efficient cooling operation. The operating personnel can perform these tasks after being given appropriate instructions.

9.1 Safety precautions for maintenance

Comply with the notes in Section Safety regulations, starting on page 10.

9.2 Maintenance schedule

Component	Activity	Interval	Criteria	Tools	Performing persons
Heat exchanger	Clean	At least once a week (if needed, daily)	The blades and the ventilation grille are dirty	Open-ended wrench, square key, compressed-air gun, vacuum cleaner	Operating organization
Supply tank	Check	Weekly	The coolant level is 3 cm below the filler connection	Square key, funnel, measuring cup	Operating organization
Pump strainer	Clean	3 months	Cooling power, pump pressure	Square key, open-ended wrench	Operating organization
Coolant quality	Perform a visual inspection	Weekly	Clouding, suspended particles	Visual evaluation	Operating organization

Table 13: *Maintenance schedule*

9.3 Cleaning the heat exchanger

A dirty heat exchanger has a significant detrimental effect on the cooling power. Inspect the heat exchanger regularly for dirt and clean it if necessary.

To clean the heat exchanger:

1) Switch off the device using the main switch.
2) Unscrew the side cover plates using the square key and remove them.
3) Blow the dirt out of the heat exchanger against the direction of flow (from the inside to the outside) using compressed air.
4) Remove any dirt from the ventilation grille using a vacuum cleaner.
5) Finally, reinstall the cover plates.

⇨ The device is ready to operate.

9.4 Topping off the supply tank

The cooling circuit is an open system. For this reason, evaporation of the coolant is possible. As a result, regularly check the fill level in the supply tank and top off the coolant if necessary as described in Section 6.2.2 on page 24.

9.5 Cleaning the pump strainer

CAUTION

If the filter is dirty, there is the risk of destroying the pump and motor!
Comply with the specified maintenance and cleaning intervals!

NOTE

If the pump must be exchanged following a defect, you must grease the pump shaft using the supplied grease!

Clean the pump strainer in intervals of about 3 months. Use a shorter time interval if the coolant is very dirty.

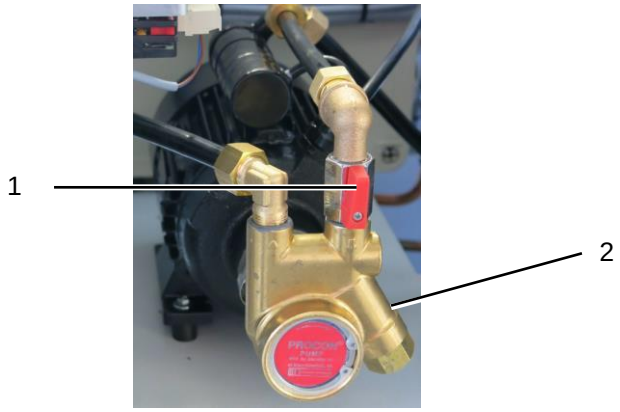


Fig. 13: *Cleaning the pump strainer*

1	Stopcock	2	Pump strainer

1) Remove the coolant hoses and secure them to prevent the coolant from draining.
2) Remove the lid and the casing on the pump side by loosening the cam locks using the square key and removing the plates.
3) Close the stopcock above the pump by rotating it to be perpendicular to the direction of flow.
4) Open the lock for the pump strainer using a square key.

NOTE

Some coolant will escape. Collect this using a suitable vessel.

5) Remove the pump strainer and rinse it using clean water.
6) Reinsert the pump strainer.

CAUTION

If the O-ring in the strainer lock in the pump housing is damaged while being inserted, this results in coolant leaking at the pump.

- Check the O ring before inserting it for damages and dirt!
- When inserting the O-ring, make sure it seats properly!
- Replace a damaged or dirty O-ring!

7) Screw the pump lock on again and tighten it using an open-ended wrench.
8) Reinstall the cooling hoses on the device. While doing so, make sure that the supply and return connections are correct.
9) Rotate the stopcock above the pump back into the vertical position.
10) Check the fill level in the supply tank and top it off with coolant if necessary (see Section 6.2.2).

⇨ The pump is again ready for operation.

9.6 Cleaning the device housing

CAUTION

There is the risk of damage by using the incorrect cleaning agents!

Using aggressive or abrasive cleaning agents can damage the paint.

- For cleaning the device housing, only use mild cleaning agents (for example, household detergent)!
- Use clean, lint-free cloths for cleaning!

Regularly remove dirt from the device housing to prevent corrosion and to reduce clogging of the ventilation grille. Make sure that all signs on the device are always in a proper, readable state.

10. Repairs

10.1 Safety precautions for repairs

Comply with the notes in Section Safety regulations, starting on page 10.

10.2 Performing repairs

NOTE

Do not perform any work on the refrigeration circuit. Return the device for repairs of the refrigeration circuit to LAIRD Service (for contact information, see page 7).

All repairs may only be performed by qualified specialists.

LAIRD does not have any further restrictions regarding repairs by the customer.

NOTE

In the event of repairs, obey Section Warranty terms (Page 6).

11. Disassembly, disposal, storage

11.1 Taking out of operation temporarily

To take the device out of operation for maintenance and repair work or plant shutdowns, proceed as follows:

➢ Cooling operation has ended.

1) Switch off the device using the main switch.
2) If applicable, close any coolant valves on upstream and downstream components.
3) Disconnect the supply and drain hoses from the device.
4) Attach a hose nozzle to the supply line, put a container beneath it.
5) Switch on the device using the main switch to empty the supply tank using the pump.
6) Switch off the device again using the main switch.
7) Disconnect the device by pulling the power plug from the power supply.

NOTE

If using glycol as coolant, it must be collected and disposed of it in accordance with local regulations.

8) Clean the device.

⇨ The device is now out of operation.

11.2 Repacking the device

To prevent any remaining coolant from leaking during transport, the transport tank lock must be reattached.

➢ The device is switched off, any remaining fluid is removed (see Section 11.1) and the cover plates have been removed.

1) Remove the operating tank lock from the coolant supply tank.
2) Install the transport tank lock.
3) Reinstall the cover plates on the device.
4) Place the dust caps on the hose nozzles.
5) Coil the connection cable and attach it to the top of the device using adhesive tape.
6) Lift the device using a lift truck and put it down on the transport pallet.
7) Pack the device including the transport pallet in heat-shrink foil and shrink this foil tightly.

⇨ The device is ready for transport.

11.3 Device storage

The storage areas for the device must be level and chosen so that no device components rest on an edge or the like. Always use the caster locks.

You can find the environmental conditions for storing the device in Section Technical data, page 21.

11.4 Disposal

The device is mostly made of materials that can be recycled.

Send the individual components of the device to a qualified disposal and recycling firm.

Contact LAIRD regarding returning the device (see Contacting Laird Thermal Systems, page 7) or contract with a qualified specialist firm for disposal and recycling of the entire device.

11.5 Disposal of the operating materials

The operating materials of the device (refrigerant, antifreeze, greases) can be hazardous to the environment and health.

Send the operating materials for disposal or recycling in accordance with local regulations.

11.6 Returning the device to LAIRD

NOTE

Declaration of Decontamination
Before delivering the device to LAIRD, you must send LAIRD a Declaration of Decontamination.

11.7 Wearing parts and spare parts

Spare parts must satisfy the technical requirements specified by LAIRD. Original LAIRD parts are subject to strict conditions and satisfy these requirements.

LAIRD provides no warranty for damage resulting from the use of spare parts from other manufacturers.

NOTE

Identification data of the device and spare parts
You can find the device type and the item number on the type label of the device. You can find the item number and the part designation in the parts lists.

Please direct your requests and orders to LAIRD with the following information (see Contacting Laird Thermal Systems, page 7).

- 11.7.1 Device type
- 11.7.2 Item number
- 11.7.3 Serial number
- 11.7.4 Part designation
- 11.7.5 Quantity
- 11.7.6 Type of shipping
- 11.7.7 Photograph of the component

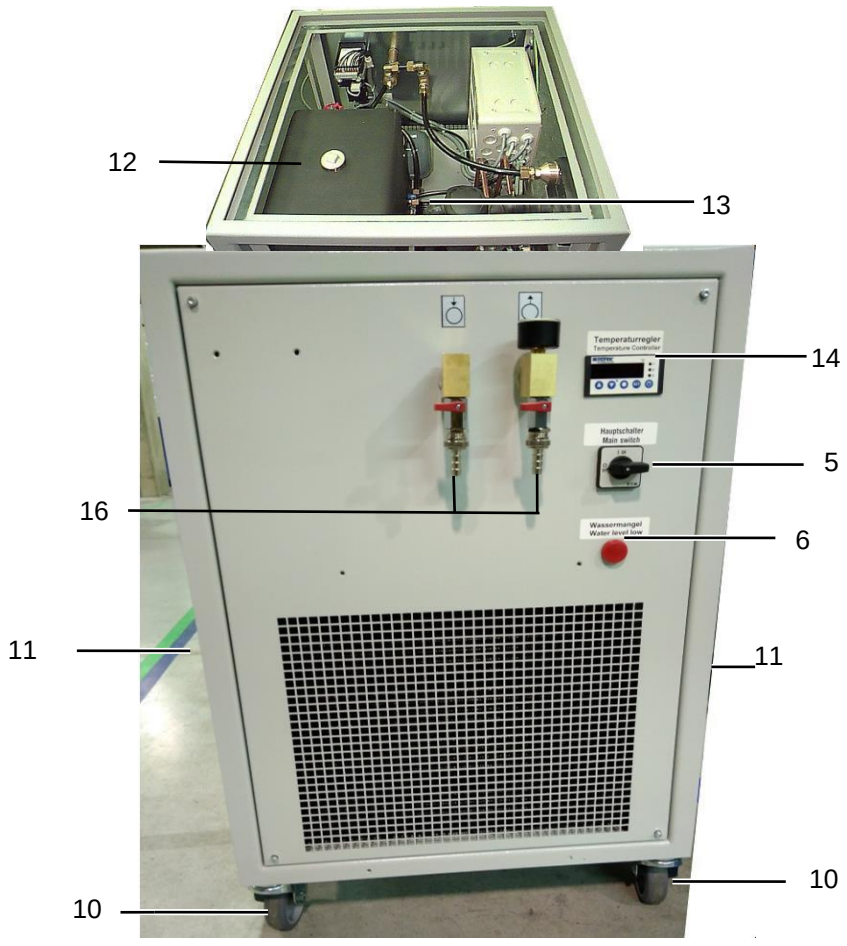


Fig. 14: *Spare parts overview 1*

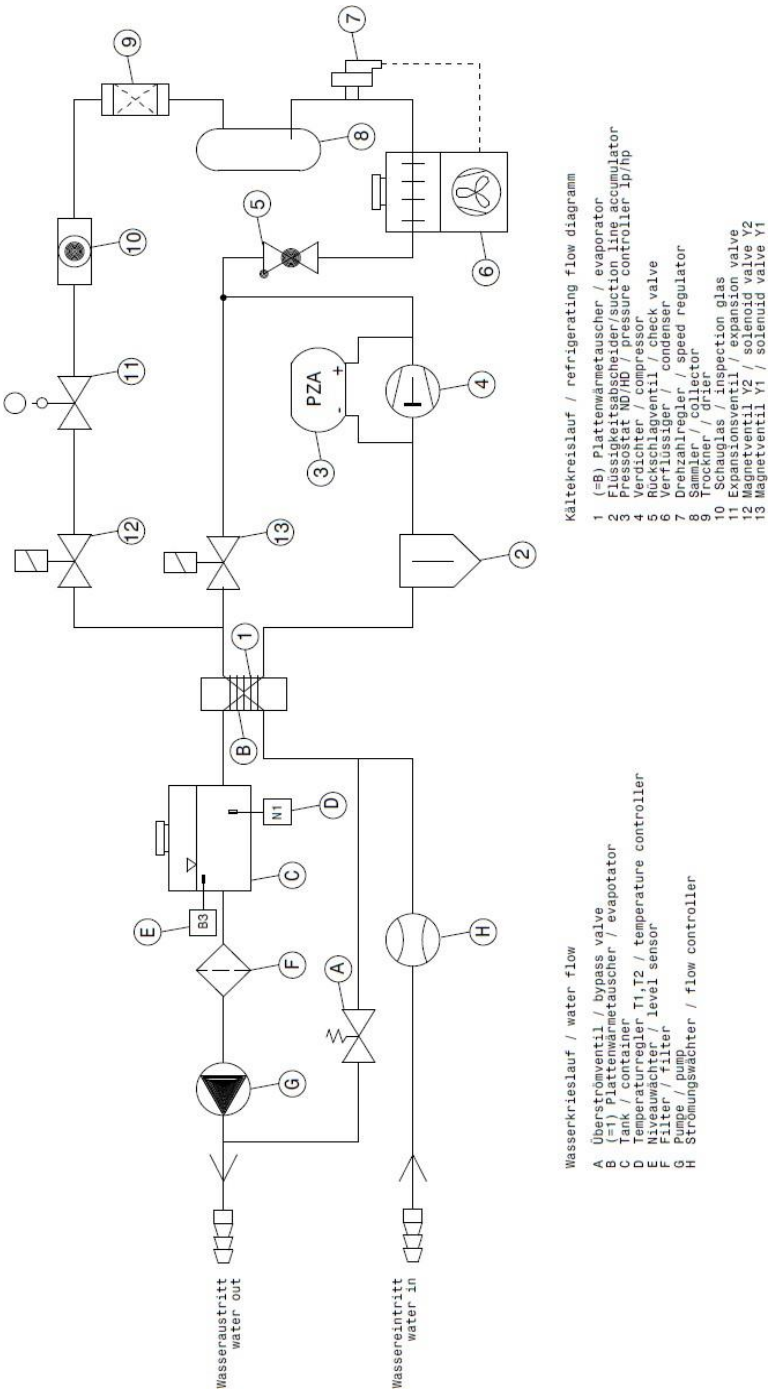
Fig. 15: *Spare parts overview 2*

Item	Quantity	Description	Item No.
1	1	Motor, 0.18 kW, 230 V, 50/60 Hz	2210.00
2	2	Industrial relay, 230 V	2142.00
3	1	Contactor, LC1D12P7	2143.00
4	1	LED element (top figure, used in Item 6)	2144.00
5	1	Main switch, 3-pole	2145.00
6	1	Indicator light, low-profile, red	2146.00
7	1	Repair set, pump	2147.00
8	4	Rubber metal buffer, D25, H15, M6x15	2148.00
9	1	Coil core, solenoid valve, 230 V, 50/60 Hz	2149.00
10	1	Caster with wheel lock	2150.00
11	1	Caster (not visible)	2151.00
12	1	Sealing screw with O-ring	2152.00
13	1	Level monitor, RW 16 PV	2153.00
14	1	Temperature controller, ST 710-KHJA.03	2154.00
15	1	Temperature sensor, D6 x 100	2155.00
16	1	Hose nozzle, 1/2”	2156.00
16	1	Knurled nut	2157.00
17	1	Relay, electromechanical, 230 V	2158.00

Table 14: *Spare parts*

12. Appendix

Flowchart



Schematic diagram