AL-KO

QUALITY FOR LIFE

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CENTRAL VENTILATION AND AIR HANDLING UNITS

OPERATING AND ASSEMBLY INSTRUCTIONS

HYDRO-OPT® M

Legal

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2.0	3061955_BA_DE_HydroOpt_M_V2.0	28/02/2024

Table of contents

1 About this manual

- The German version is the original operating instructions. All further language versions are translations of the original operating instructions.
- Read these operating and assembly instructions carefully before assembly, commissioning and maintenance. This is the prerequisite for safe work and trouble-free handling.
- Observe the safety instructions and warnings in this documentation and on the product.
- This documentation is a permanent part of the described product, and must be handed over to the buyer if the product is sold.

1.1 Explanation of symbols

1.1.1 Safety instructions

⚠ DANGER

This signal word is used to indicate an imminently dangerous situation which, if not avoided, will result in death or severe injury.

⚠ WARNING

This signal word is used to indicate a potentially dangerous situation which, if not avoided, could result in death or severe injury.

⚠ CAUTION

This signal word is used to indicate a potentially dangerous situation which, if not avoided, could result in a minor injury.

ATTENTION

This signal word is used to indicate a potential risk of property damage.

NOTE

Special instructions for ease of understanding and handling.

1.2 Safety signs

Meaning	Sign
GENERAL DANGER SIGNS If the required safety instructions are not observed, this can lead to death, severe injuries and serious property damage.	
IMPORTANT NOTICE If you do not heed this notice, this can lead to problems with the unit.	
OBSERVE THE OPERATING AND ASSEMBLY INSTRUCTIONS If you do not heed the notices in the operating and assembly instructions, this can lead to problems with the unit.	
INFORMATION Heeding this information makes working with the machine easier.	

Warning sign

The warning signs used in these operating and assembly instructions draw attention to specific hazards.

Meaning	Warning sign
Warning of danger of falling If the required safety instructions are not observed, this can lead to death or severe injuries due to falling.	
Warning of danger of slipping If the required safety instructions are not observed, this can lead to death or severe injuries due to slipping.	
Warning of electrical voltage If the required safety instructions are not observed, this can lead to death or severe injuries due to dangerous electrical voltage.	
Warning against suspended loads If the required safety instructions are not observed, this can lead to death or severe injuries due to a suspended load.	
Warning of falling objects If the required safety instructions are not observed, this can lead to death or severe injuries due to falling objects.	
Warning of hot surfaces If the required safety instructions are not observed, this can lead to death or severe injuries due to hot surfaces.	
Warning of danger of crushing If the required safety instructions are not observed, this can lead to death or severe injuries due to crushing.	

Meaning	Warning sign
Warning of sharp objects If the required safety instructions are not observed, this can lead to death or severe injuries due to sharp objects.	
Warning of hand injuries If the required safety instructions are not observed, this can lead to death or severe injuries.	
Warning of poisonous substances If the required safety instructions are not observed, this can lead to death or severe injuries due to poisonous substances.	
Warning of potentially explosive substances If the required safety instructions are not observed, this can lead to death or severe injuries due to explosion.	

Mandatory signs

The mandatory signs in these operating and assembly instructions draw attention to instructions to be observed.

Meaning	Mandatory signs
Wear eye protection If you do not wear eye protection, there is a risk of eye injuries.	
Wear foot protection If you do not wear foot protection, there is a risk of foot injuries.	
Wear hand protection If you do not wear hand protection, there is a risk of hand injuries.	
Wear head protection If you do not wear head protection, there is a risk of head injuries.	
Wear a mask If you do not wear respiratory protection, this can lead to poisoning and chemical burns to the lungs.	
Isolate before maintenance or repair If you do not isolate the unit before maintenance or repair from all energy sources, this can result in serious injuries.	

1.2.1 Abbreviations

Abbreviation	Meaning
PPE	Personal protective equipment, such as cut-proof gloves, safety goggles, work gloves, ear protection, safety helmet, breathing mask
KVS	Circulating coil system
PWW	Pump warm water heater
EHE	Exhaust air heat exchanger
Hrec	Heat recovery

1.3 Legal notices

All specified data serve solely to describe the product. No statement on a specific characteristic or suitability for a specific purpose can be derived from these data. The data do not exempt the user from his own judgement and checks.

2 Safety instructions

2.1 Intended use

These devices are used exclusively for heat recovery from the exhaust air flow of a central ventilation unit. It may only be operated within a pressure range of 4–6 bar. Deviating ranges of application must be agreed with the manufacturer.

- Set up the unit horizontally. Otherwise there is a risk that puddles may form, among other things.
- Use only original spare parts.
- Children and people who are not familiar with the unit may not use it.
- Observe the accident prevention regulations and fire protection regulations.
- The ladders, steps, scaffolding and platforms required for operating and accessing the installation are not included in the scope of delivery of AL-KO THERM and must be provided on-site.

2.2 Foreseeable misuse

HYDRO-OPT® M only be operated within the scope of the technical data specified by AL-KO THERM. Any use other or more extensive than that described in the section “2.1 Intended use” on page 9 is regarded as not in accordance with the intended use. The manufacturer cannot be held liable for damage resulting from this.

Possible misuse includes:

- Non-horizontal setup of the unit.
- Conveying media with impermissibly high or low temperatures.
- Conveying aggressive or heavily dust-containing media.
- Installation in an environment with aggressive media (e.g. sea air) or heavily dust-containing media (coast).
- Use in an explosive atmosphere.
- Installation of a non-permissible joint seal.
- Non-compliance with the static limits (customer supplied).

2.3 General safety instructions

⚠ WARNING

Risk of serious injury or death due to working without personal protective equipment!

Working on the HYDRO-OPT® M without personal protective equipment can result in serious injury or death.

- Observe the safety instructions in this operating and assembly instructions.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out.

⚠ WARNING

Risk of severe injuries or death!

Working on the HYDRO-OPT® M can result in serious injury or death.

- Only allow assembly, installation, commissioning, repair, maintenance and servicing work to be carried out by qualified staff.
- Before repair and maintenance work, disconnect the HYDRO-OPT® M from the mains on all poles and secure to prevent restart.
- Integrate weatherproof units into the lightning protection concept when installed outdoors.
- Avoid sparks and flying sparks in the intake area of the installation.
- Observe the working instructions and these operating and assembly instructions.
- Work with care.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out.

⚠ WARNING

Risk of injury due to falling, and falling modules.

When installing the modules or installing them on platforms or on the roof, persons may fall off and/or modules may fall down.

- Only allow assembly, installation, commissioning, repair, maintenance and servicing work to be carried out by qualified staff.
- Observe the assembly instructions in these operating and assembly instructions.
- Use only tested ladders, scaffolding or suitable platforms.
- Only use suitable lifting equipment.
- Only use approved fasteners when installing the HYDRO-OPT® M.
- Use personal protective equipment at all times when working on the installation.

⚠ WARNING

Risk of injury due to unauthorised opening.

- Keep the inspection doors/inspection covers closed during operation.
- Never open the unit during operation.
- Open the inspection doors/inspection covers using the relevant tool if necessary.
- Observe the hazard warnings on the inspection doors/inspection covers.

⚠ WARNING

Risk of poisoning when working with sealants, adhesives and pre-treatment agents.

- Do not touch the sealant, adhesive or pre-treatment agent.
- Work with care.
- Do not swallow the sealant, adhesive or pre-treatment agent.
- Ensure that there is adequate ventilation at the workplace.
- Observe the safety data sheets and operating procedures in accordance with the Ordinance on Hazardous Substances.
- Use personal protective equipment at all times when working on the installation.

⚠ WARNING

Risk of injury from falling from ladders, scaffolding or work platforms.

- Only use suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

Observe the safety instructions in these operating and assembly instructions to avoid injuries, fires and other hazards due to improper use and improper operation of the unit:

- If installation is performed contrary to our regulations, and the defect/damage which has occurred is attributable to improperly modification, processing or any other treatment, all damage compensation or warranty claims are ruled out. The orderer must prove that improper installation did not cause the defect which has occurred.
- Safety and monitoring equipment must not be removed, bridged or disabled in any other way.
- All authorised persons must have read and understood the operating and assembly instructions in full before starting work on the unit and must observe them at all times.
- To avoid dangers during operation, all of the user's plant, operating and working instructions apply in addition to these operating and assembly instructions.

2.3.1 Safety instructions for operation

- The HYDRO-OPT® M must only be operated with completely closed inspection doors/inspection covers.
- No unauthorised persons are permitted to have access to the HYDRO-OPT® M during operation.
- The HYDRO-OPT® M may only be operated in the performance range specified in the technical documents from AL-KO THERM.
- The HYDRO-OPT® M must be installed properly and used subject to precise observation of our operating and assembly instructions.
- The HYDRO-OPT® M may only be operated in a technically flawless condition. Malfunctions and damage that can affect safety must be rectified immediately and professionally.
- Avoid sparking in the vicinity of the HYDRO-OPT® M.
- Wear personal protective equipment (e.g. ear protection) during operation of the HYDRO-OPT® M.

2.3.2 Safety instructions for maintenance

- Damaged parts are only permitted to be replaced with original spare parts.
- During repair and maintenance work, the HYDRO-OPT® M is to be disconnected from the mains on all poles and secured against restart.
- General maintenance instructions in the operating and assembly instructions from AL-KO THERM must be observed under all circumstances.

2.3.3 Personal safety instructions

- The HYDRO-OPT® M may only be operated by persons who are trained in operating it and expressly authorised to use it.
- Personal protective equipment must be used when working on the HYDRO-OPT® M.
- To avoid dangers during operation, all of the operator's plant, operating and working instructions apply in addition to these operating and assembly instructions.
- The operating and assembly instructions must be kept at a suitable, known place in the workplace.
- The operator of the HYDRO-OPT® M must draw up operating procedures in an understandable form and in the language of the employees, taking the operating and assembly instructions and the operating conditions into consideration.

2.4 Residual dangers

The installation may present a danger if it is not operated by trained personnel and/or is used improperly or not used according to its designated use.

Residual dangers are potential hazards that are not immediately apparent, such as:

- Injuries due to failure to observe the safety instructions, standards, directives or regulations.
- Injuries caused by uncoordinated work.
- Danger caused by working on the electrical installation, cables and connections.
- Transporting, unpacking and setting up the unit: these may result in crushing, cutting, puncture or impact injuries.
- Tipping of the unit: uneven and loose surfaces promote unit tipping.
- There is a risk of stumbling, slipping, falling and falling down when setting up the unit and the accessory parts.
- There is a danger of electric shock due to damaged and defective electrical components.
- Electrical connection cable: Danger due to stumbling, falling and slipping.
- Noise (hearing damage).
- Human misconduct: Non-observance of safety instructions, standards and regulations.
- Operation or transport without suitable safety measures.

2.5 Training

The operator of the HYDRO-OPT® M must regularly train its personnel on the following topics:

- Compliance with the operating and assembly instructions as well as the legal regulations.
- Intended operation of the HYDRO-OPT® M.
- Compliance with all company, operating and working instructions at the operator's installation site.
- What to do in an emergency.

3 Product description

The hydraulic station is used for highly efficient heat and cold recovery in circulating coil systems (KVS).

In winter, heat is extracted from the exhaust air flow from an exhaust air unit and transferred to a heat exchanger in the central supply air unit.

The integrated controller monitors the operating conditions and regulates the optimum brine circulation amount. Frost on the exhaust air heat exchanger and freezing of an optional heat feed are prevented by the control system.

Power control is achieved by a frequency-controlled pump and a power regulating valve.

The brine circulation amount is continuously recorded and can be used together with the temperature measurement for heat quantity metering.

The decision whether heat recovery is possible and how much heat should be recovered must be made by a higher-level building management system.

Together with the building management system, the station thus makes a significant contribution to saving energy and reducing operating costs.

Optional components for extended use are:

- Plate heat exchanger for heat feed
- Plate heat exchanger for cold feed
- Redundancy pump for increased operational safety

Warnings and malfunctions are displayed and forwarded via potential-free contacts.

The control system can be easily integrated into higher-level systems via permanently configured bus systems: Modbus, Bacnet/TCP-IP are available.

NOTE

Our products are subject to continuous quality control, and comply with the applicable regulations.

3.1 Station structure (example)

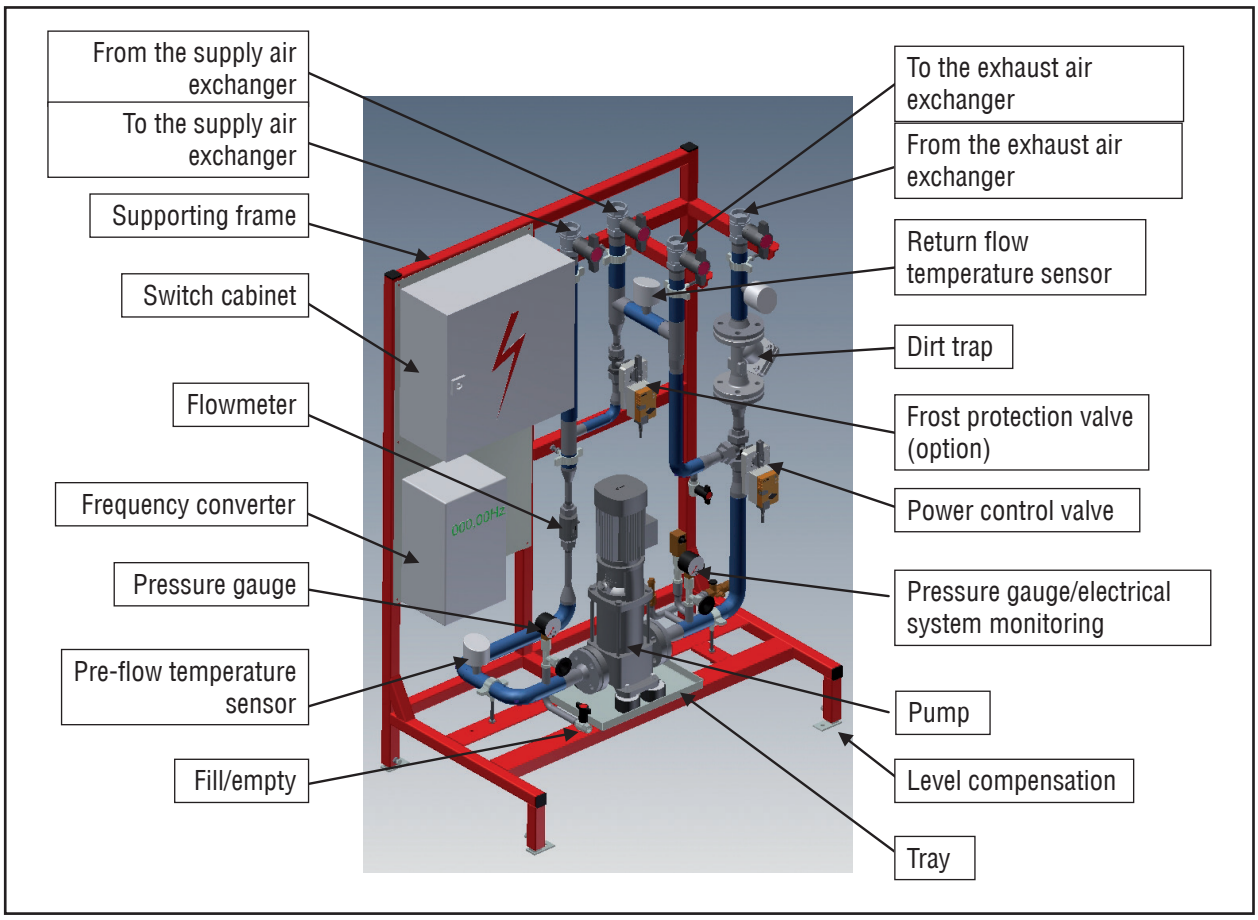


Fig. 1 Overview

3.1.1 Schematic with one exhaust air device (example)

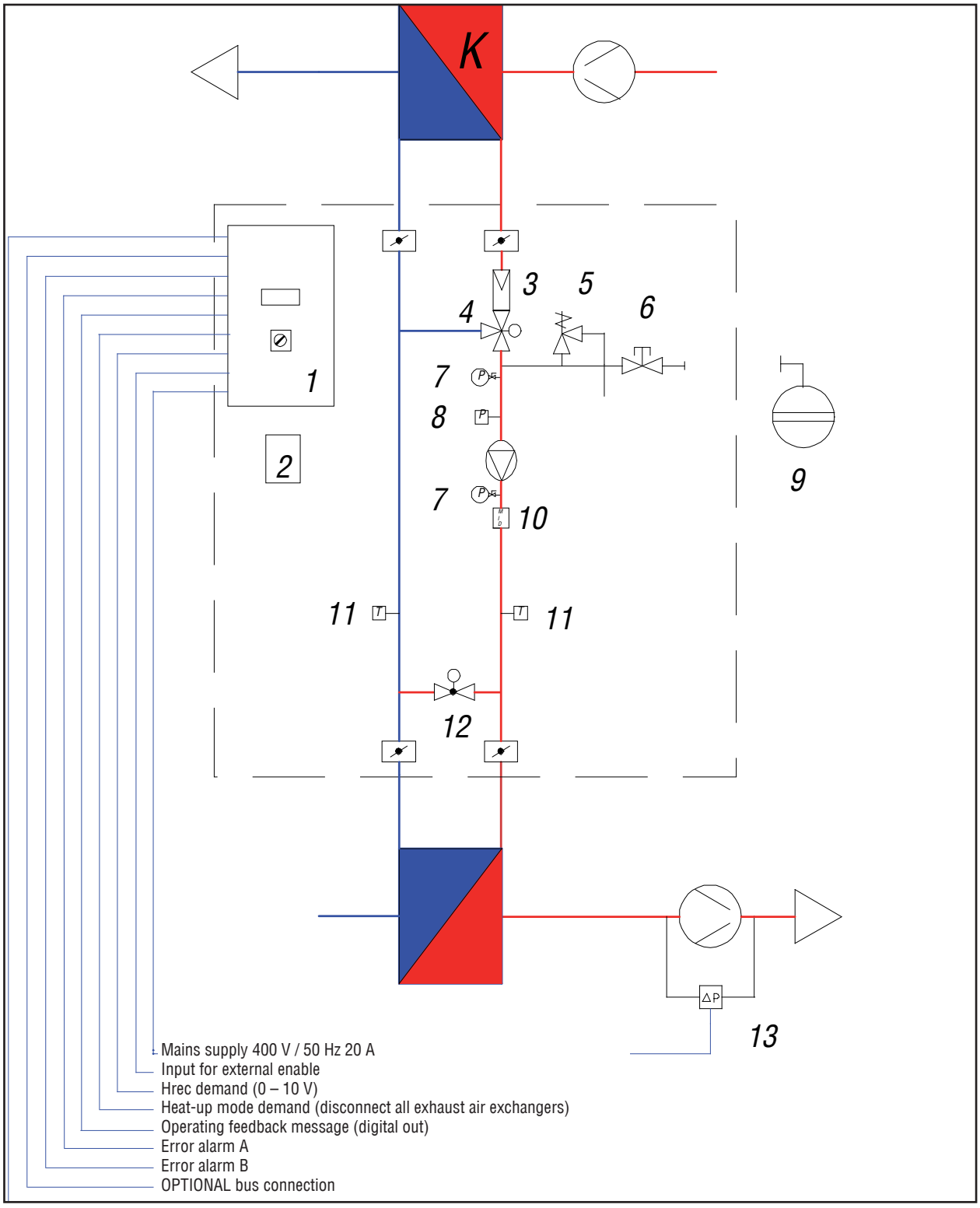


Fig. 2 Schematic illustration

1	Switch cabinet	8	Pressure monitor
2	Frequency converter	9	Expansion tank installation on the intake side
3	Dirt trap	10	Flowmeter
4	Power control valve	11	Temperature sensor
5	Safety valve 6 bar	12	Frost valve
6	Filling connection	13	Eff. pressure fan differential pressure sensor
7	Pressure gauge		

Schematic with one exhaust air device and feed option (example)

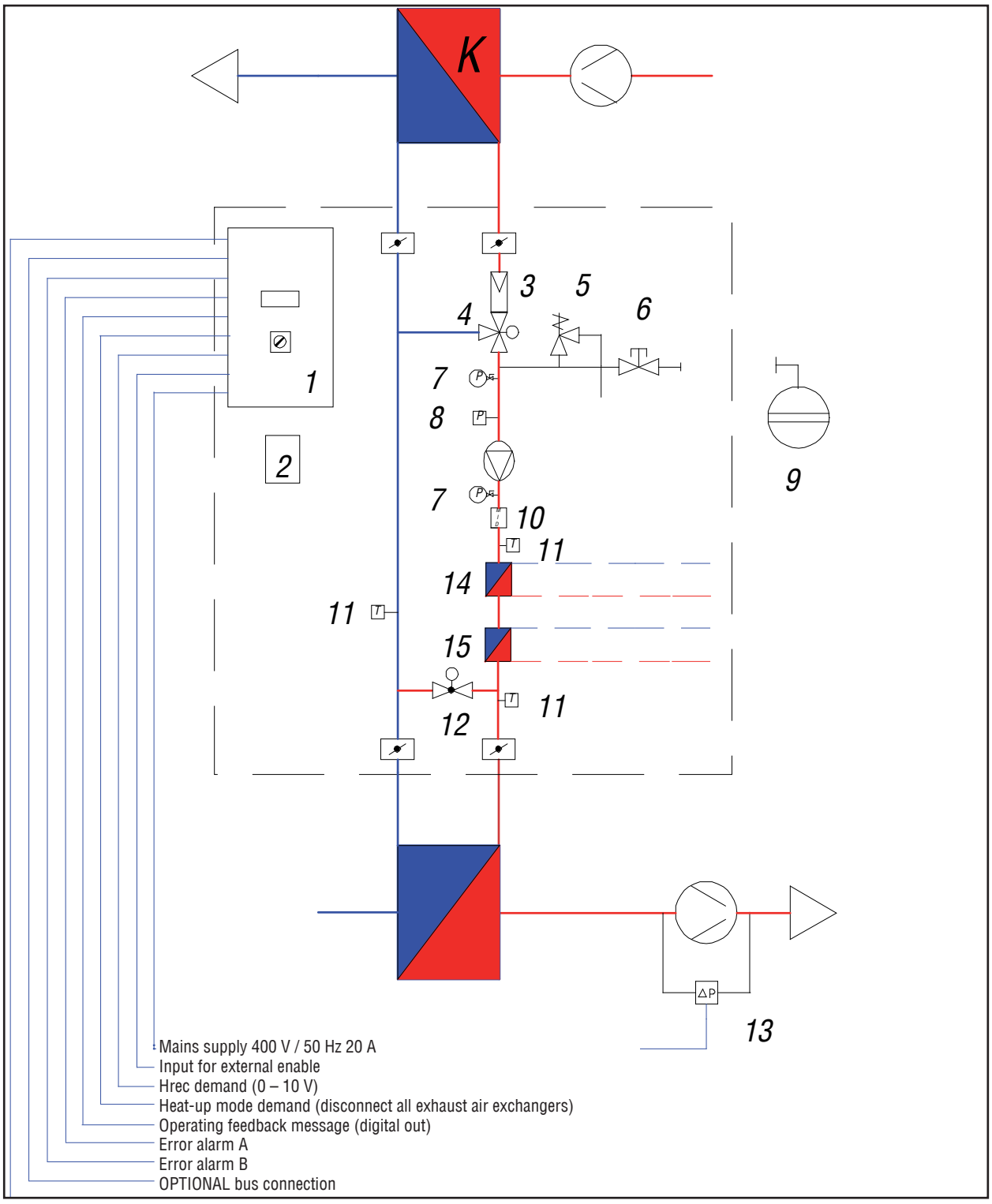


Fig. 3 Schematic illustration

1	Switch cabinet	9	Expansion tank installation on the intake side
2	Frequency converter	10	Flowmeter
3	Dirt trap	11	Temperature sensor
4	Power control valve	12	Frost valve
5	Safety valve 6 bar	13	Eff. pressure fan differential pressure sensor
6	Filling connection	14	Plate heat exchanger, heat feed
7	Pressure gauge	15	Plate heat exchanger, cold feed
8	Pressure monitor		

3.2 Technical data

The station is available in 5 sizes depending on the required quantity of brine being circulated:
(see drawing)

System pressure: 4 to 6 bar
Supply voltage: 3 Ph/400 V/50 Hz
Fuse, max.: 20 A slow

The maximum on-site back-up fuse is specified on the enclosed circuit diagram.

The exact dimensioning of the pump and the calculation of the necessary system pressure is carried out by AL-KO THERM after the order is placed.

Measurements:

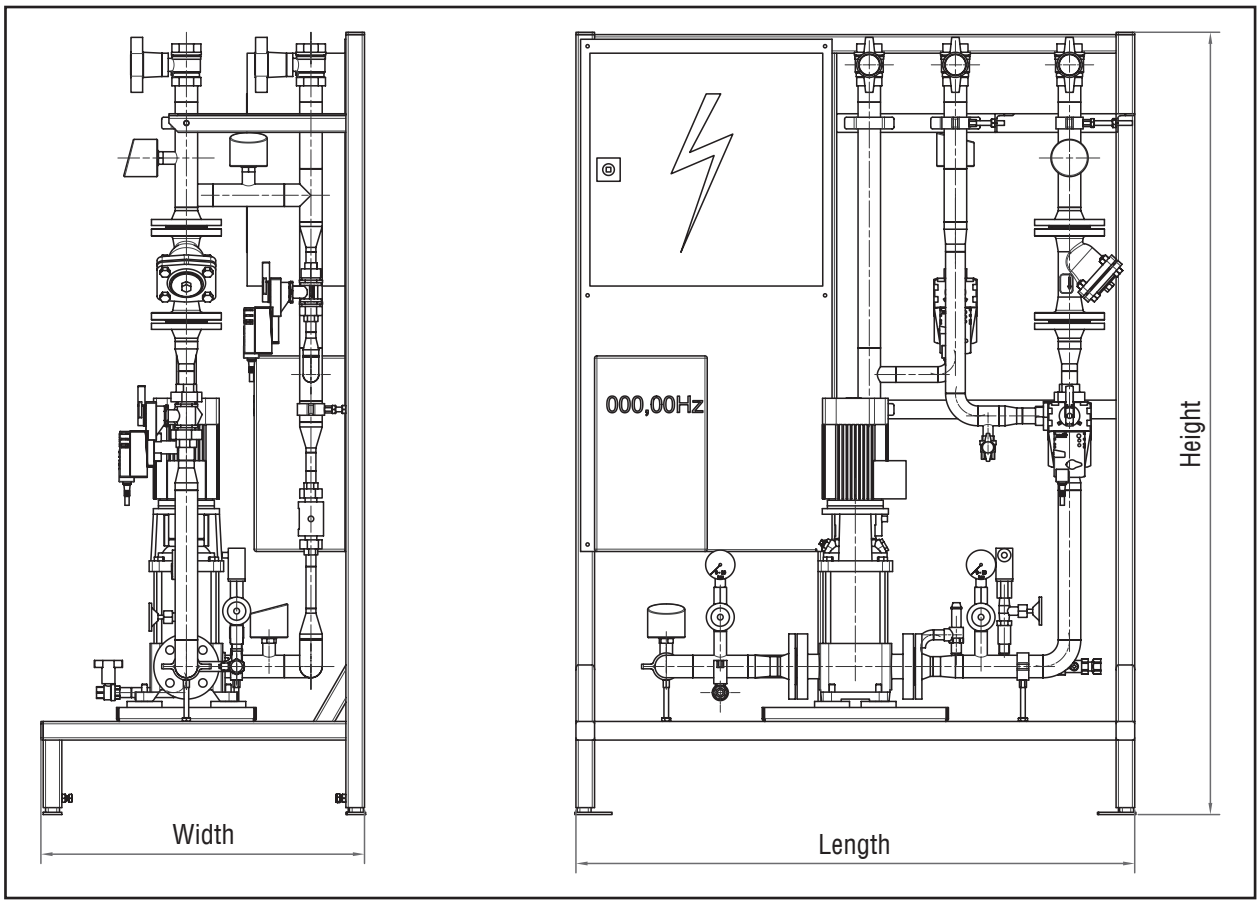


Fig. 4 Dimensions

Compact control units						
Type	**Dimension**	**Flow rate m³/h**	**Length mm**	**Width mm**	**Height mm**	**Weight kg**
2	DN 32	0.5 – 1.9	1330	695	1680	170
5	DN 40	2.0 – 4.9	1330	695	1680	178
10	DN 50	5.0 – 9.9	1330	695	1680	205
15	DN 65	10.0 – 14.9	1630	895	1880	307
25	DN 80	15.0 – 25.0	1630	895	1880	380

Weight varies depending on equipment and pump size.

4 Delivery, transport, storage

4.1 Delivery

- The HYDRO-OPT® M is delivered on a one-way pallet.

4.2 Transport

⚠ WARNING

Risk of injury due to impacts, cutting or piercing during loading, unloading and transport of the modules.

- Observe the working instructions and these operating and assembly instructions.
- Work with care.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out (cut-proof gloves).

⚠ WARNING

Danger of death – Suspended loads.

For crane transport, all valid safety conditions according to DGUV regulation 52 Cranes and DGUV Control unit 100–500 chapter 2.8 must be observed.

- Do not walk under suspended loads.
- Use the specified attachment and mounting points.
- Observe the weight specifications.
- Only use suitable lifting equipment.

⚠ CAUTION

Risk of injury due to the module tilting or tipping over.

Failure to observe the safety instructions, standards, directives and regulations leads to a risk of injury due to the unit tipping over.

- Observe the relevant standards, directives and regulations.
- Observe the instructions in these operating and assembly instructions.
- Use the specified attachment and mounting points.
- Observe the weight specifications.
- Only work on on-site surfaces that are suitable for installation preparations and lifting.

ATTENTION

- Uniform lifting of the unit components must be ensured.
- Transport is only permitted using the attachment points given below.
- Only approved lifting equipment with a sufficient load capacity may be used.
- The lifting equipment must be in perfect condition.
- The lifting gear must be checked for load-bearing capacity and damage before use.
- Secure the load during transport.
- Use only suitable transport locks.
- If the maximum weights to be lifted are exceeded (per person), plan for a second person to help.
- The individual components of the installation may only be moved with the transport equipment provided for this purpose.
- Use only suitable transport devices and suitable industrial trucks.
- Maintenance doors must be kept closed at all times during transport.

- Ensure sufficient visibility during transport (accompanying persons, if necessary).
- No persons must be allowed to remain in the transport area.
- The HYDRO-OPT® M station may only be transported by properly trained and qualified personnel who are also familiar with the information in the “Safety” section.
- If using transport devices that require a driving licence, the personnel operating these units must have an applicable, valid driving licence for this.
- During transport, observe the instructions in these operating and assembly instructions and the relevant regulations on occupational safety and environmental protection.
- Note that the position of the centre of gravity is not exactly central.
- Only transport the unit upright and secure the unit against tipping and slipping.
- Use suitable intermediate layer pads to avoid damage to the paint.
- Avoid distorting the housing or other damage.
- Damage that results from improper packaging and transport are at the expense of the initiator.
- As described in chapter “4.2.2 Fork-lift truck/pallet truck” on page 19, the unit can be transported using a forklift or a crane.
- The HYDRO-OPT® M is only permitted to be transported, lifted and set up within the temperature limits for use (-20°C to +40°C).

4.2.1 Transport under aggravated conditions

When transporting under aggravated conditions (e.g. on open vehicles, under unusual vibration stresses, transport by sea or in subtropical countries), additional packaging must be used that will protect the unit from these particular influences.

4.2.2 Fork-lift truck/pallet truck

- Transport within the building can be performed by a lift truck or a forklift. The forks can be inserted under the cross profiles of the supporting frame.
- Suitable fork lengths must be used to prevent damage to the unit.

4.2.3 Crane transport

All HYDRO-OPT® M units have an option for crane transport.

⚠ WARNING

Danger of death – Suspended loads and crane transport!

Observe the local and legal regulations and the rules of the professional associations.

- Do not walk under suspended loads.
- Do not work under suspended loads.
- Use the specified attachment and mounting points.
- Observe the weight specifications.
- Use suitable lifting equipment.
- Only use suitable industrial trucks and lifting equipment (crane).
- Only use suitable positioning tools.
- Attach suitable load securing equipment before lifting the load.
- Wear personal protective equipment.

4.3 Storage prior to assembly

- The station must be stored in a dry location, protected against the weather. The functional units must be protected against debris (e.g. swarf, stones, wires, etc.) and strong UV exposure. The HYDRO-OPT® M station is delivered unfilled and is thus frost-proof.
- Constant and, above all, abrupt temperature changes must be prevented during storage. This is especially harmful if moisture is able to form condensation.
- Damage that results from improper packaging, storage, and transport are at the expense of the person responsible.
- Avoid distorting the housing and other damage during storage.
- Store the individual functional parts in a dry and weatherproof location in their original packaging.
- Store the functional parts in the temperature range of -20°C to +40°C.

4.4 Disposal of packaging

When disposing of the packaging, comply with the relevant local environmental and recycling regulations in your country and community that are applicable at the time when the activity is undertaken.

5 Assembly

5.1 Safety instructions for assembly

⚠ WARNING

Risk of injury from falling from ladders, scaffolding or work platforms.

- Only use suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

⚠ WARNING

Risk of slipping! Leaked medium/condensate.

- Immediately take up the spill quantity and dispose of it properly.

⚠ WARNING

Risk of explosion of the hydraulic station.

The hydraulic station is not explosion-protected. There is a risk of explosion when it is operated in potentially explosive atmospheres.

- Never set up the HYDRO-OPT® M in potentially explosive atmospheres.

⚠ WARNING

Risk of injury due to impact, cutting or stabbing during assembly/installation of the modules.

- Have installation, commissioning, servicing and maintenance work carried out only by qualified staff.
- Electrical connections must only be undertaken by a certified electrician under consideration of the valid DIN and VDE regulations as well as the directives of the local energy supply company.
- Observe the working instructions and these operating and assembly instructions.
- Work with care.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out (cut-proof gloves).

⚠ WARNING

Risk of injury when installing the unit modules on platforms or on the roof.

When assembling the unit modules, the tool/housing material can fall off in the event of careless operation.

Due to the working height, there is a risk of falling.

- Use only suitable industrial trucks and lifting equipment (crane) and suitable positioning aids.
- Only use suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.
- Wear personal protective equipment.

⚠ CAUTION

Risk of crushing the limbs and cutting injuries on sharp edges during assembly/ installation of the modules.

- Have installation, commissioning, servicing and maintenance work carried out only by qualified staff.
- Use assembly aids when installing the modules and components.
- Work with care.
- Wear personal protective equipment (cut-proof gloves).

ATTENTION

Before installation and commissioning, it is essential to read and observe the operating and assembly instructions.

- The HYDRO-OPT® M is delivered with its components pre-assembled.

5.2 General information

All hydraulic components are pre-mounted and piped on the supporting frame. All pipe parts and fittings at risk from condensation are insulated against cold and steam.

5.3 Setup

- The station must be checked for transport damage upon delivery.
- The condition of the ground must be taken into account.
- The station should be vertical, the level can be adjusted by the height-adjustable feet.
- The station must be bolted to the floor at the feet in a vibration-decoupled manner.
- Connect piping to the heat exchangers.
- Make sure that no contaminants get into the system.
- Take into account the reverse flow principle.
- Once the piping is complete, the installation must be flushed out.

ATTENTION

Components that come loose during transport can lead to malfunctions or damage.

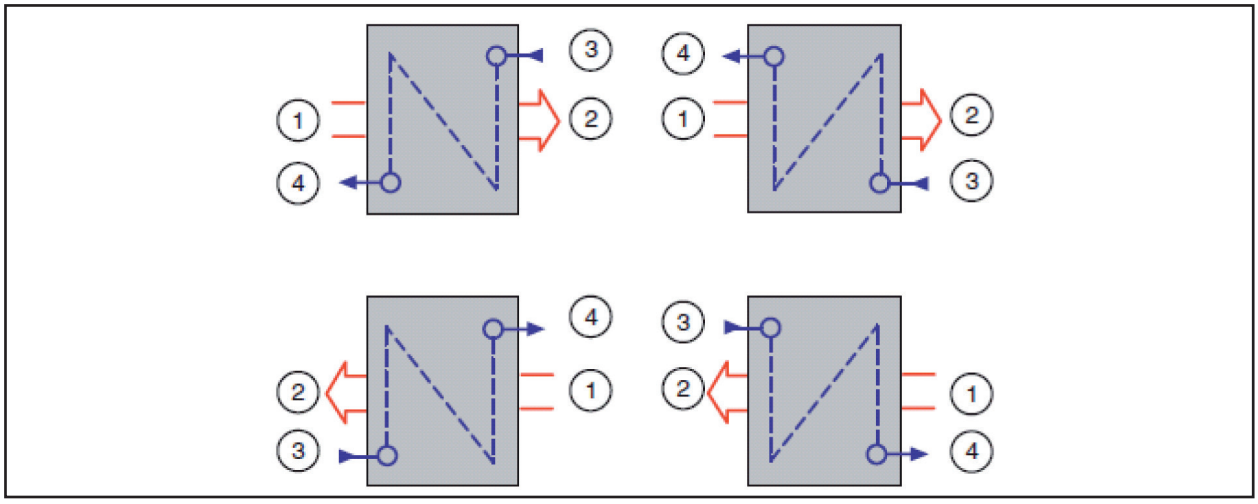


Fig. 5 Counterflow principle

1	Air inlet	3	Brine inlet
2	Air outlet	4	Brine outlet

5.4 Filling and venting

⚠ WARNING

Risk of poisoning when filling the installation.

The unit may contain media that are hazardous to health, such as coolants.

- The media may only be filled and stored in approved containers.
- Work with care.
- Avoid skin and eye contact with the media, do not swallow media and observe the safety data sheets.
- Wear personal protective equipment.
- Absorb spills immediately.

- The vent and drain devices for the heat exchangers must be set up on-site.
- The pipe system must be resistant to ethylene glycol (N).
- The glycol content must be prepared according to the manufacturer's data.
- Note: The glycol mixture must be renewed after a certain elapsed time according to the manufacturer's data.
- The glycol/water mixture must already be mixed before filling. Otherwise, subsequent mixing is not guaranteed.
- Feed and return flow lines must be connected according to professional standards and properly insulated.
- The complete piping system must be checked for leak-tightness.
- When setting up the heat recovery system, the manufacturer's data regarding the heat carrier used (brine) must be taken into account.
- To protect drinking water, avoid the discharge of heat transfer fluid into watercourses. Discharge into the drain system must be coordinated with the regional disposal company.

5.5 Electrical connection

⚠ DANGER

Hazard due to electric current.

Incorrect connection to the energy supply or incorrect installation of electrical components can result in electric shock.

- Only have the electrical connection carried out by an approved electrician.
- Perform the connection exactly according to the circuit diagram and the assignment plan.
- Observe the valid DIN and VDE regulations.
- Observe the directives of the local energy supply company.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out.
- Do not operate the unit with defective or damaged cables or plugs.
- Regularly check the connection cables for damaged areas.
- Use only the permissible tool.
- Shut off the energy supply for maintenance work and secure it to prevent restart.
- Observe the electrical safety regulations.

⚠ WARNING

Risk of injuries due to incorrect or faulty connection work.

- Electrical connections must only be undertaken by a certified electrician under consideration of the valid DIN and VDE regulations as well as the directives of the local energy supply company.
- Only have assembly, servicing and maintenance carried out by qualified staff.
- Wear personal protective equipment.

ATTENTION

Main switch or repair switch

It must be possible to shut down the supply line on all poles via a main switch and/or a repair switch.

The operating and assembly instructions for the individual field devices must be observed.

- Make sure that the components and the connection cable at the setup location cannot be either damaged or contaminated by oil or other materials.
- Check fuses, clamping connections, contactors, and circuit boards to ensure that they are seated firmly.
- Re-secure any loose components.
- Protect the pump motor against overload.
- The electrical connection must be made according to the circuit diagram provided.

5.5.1 Cabling to the on-site control technology

The following cabling is required along with the 3-phase supply:

Coming from the on-site building management system:

Release signal	potential-free contact
Power control signal	0–10 V analogue signal
Air volume-proportional signal	4–20 mA analogue signal usually from the supply pressure transmitter**
Heat-up mode demand*	potential-free contact

Outgoing to the on-site building management system:

Heat recovery operating message	potential-free contact
Heat recovery warning message	potential-free contact
Heat recovery fault message	potential-free contact

** only optional for installations with heat input via plate heat exchanger*
*** mounted on the air handling unit or enclosed loose*

The cabling of the control lines is connected to the terminal rows in the station switch cabinet.

5.5.2 Bus model assembly (option)

As an option, the control system can be integrated in a superordinate network.

The following bus modules are optionally available for this:

- Modbus
- BACnet, TCP/IP

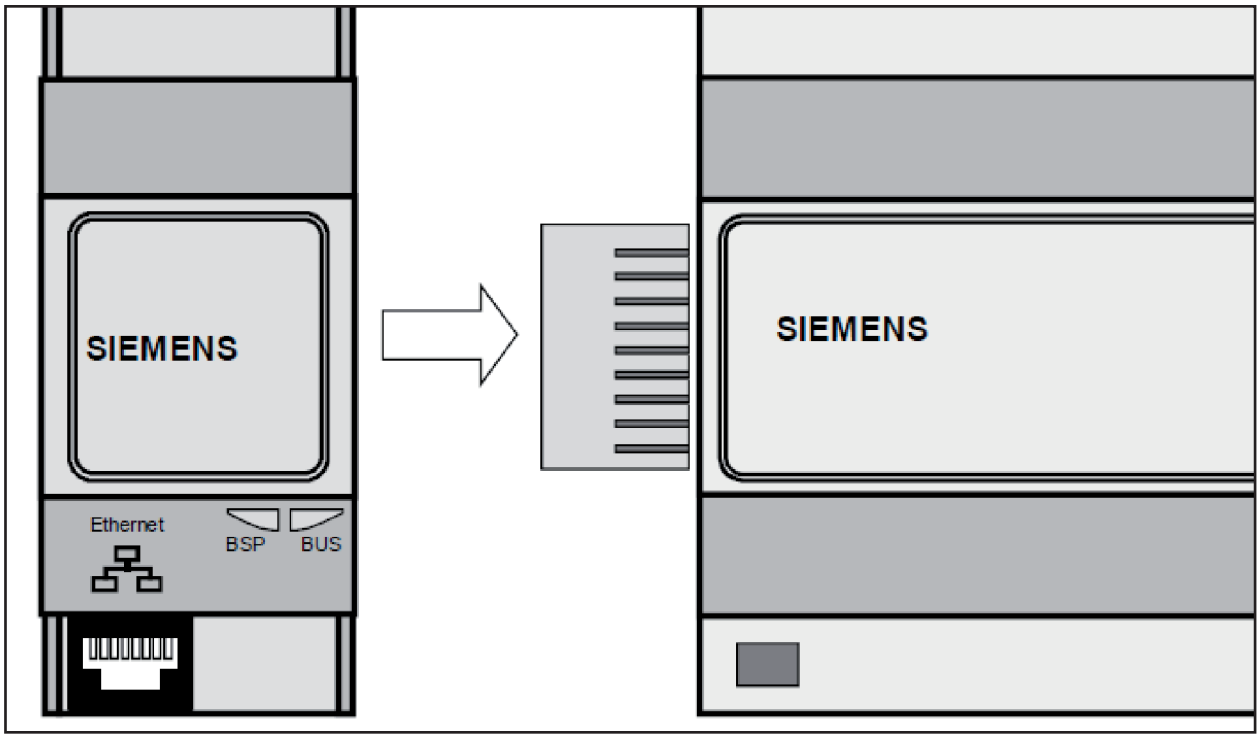


Fig. 6 Bus connection

- The figure shows the Climatix BACnet/POL908.00 IP module/STD. It is connected to the Climatix control system via the internal communication expansion bus. This takes place via a plug connection on the left side of the control system.
- When plugging in a bus module, the controller must be de-energised.
- Please also refer to the introductory manuals of Climatix™.

6 Commissioning

ATTENTION

Commissioning protocol

During commissioning, all functions are checked, logged and signed by the operator. Transfer of the operating and assembly instructions is also confirmed on signing. These documents must be attached to the unit documentation.

6.1 Principles

⚠ WARNING

Risk of slipping! Leaked medium/condensate.

- Immediately take up the spill quantity and dispose of it properly.

⚠ WARNING

Accident and injury risk due to human misconduct.

Failure to observe the safety instructions, standards, directives and regulations leads to a risk of injury.

- Before all repair and maintenance work, disconnect the HYDRO-OPT® M from the mains on all poles and secure to prevent restart.
- Wear personal protective equipment.
- The maintenance instructions in the operating and assembly instructions for central air handling units of the HYDRO-OPT® M series of the AL-KO THERM company must be observed under all circumstances.
- Have installation, commissioning, servicing and maintenance work carried out only by qualified staff.
- Observe standards and directives.

NOTE

Observe the operating and assembly instructions for the individual field devices/components.

Before commissioning, always ensure the following:

- that the unit has been installed as described in these operating and assembly instructions (see chapter “5 Assembly” on page 21).
- that the duct system and the water and drain pipe are properly connected to the unit.
- that the electrical installations have been implemented completely and professionally.
- that all media connections have been professionally connected and are leak-tight.
- After extended standstill times, check the venting state again before commissioning, especially of the pump.

6.2 Requirements

ATTENTION

Venting the rotary pump.

It is essential that the rotary pump has been vented according to the manufacturer's information. To do so, the venting screw on the pump must remain open until brine comes out free of bubbles.

The lack of (or improper) venting leads to damage to the pump and to system malfunctions.

For commissioning the HYDRO-OPT® M station, the following actions must already have been completed on site:

- The supply and exhaust air system must be operational.
- The air quantities must have already been measured.
- The glycol content of the installation must already have been determined.
- The system pressure must correspond to the specified idle pressure.
- All isolation devices on the station and any on the heat exchangers must be open.
- The electrical supply of the station must have been checked. The protective earth conductor and neutral conductor in particular must be in place.

6.3 Procedure for commissioning

- After turning on the main switch, the pump can be manually operated on the frequency converter for a brief time. The direction of rotation must be checked. The corresponding directional arrow is marked on the pump.
- The analogue pressure monitor attached upstream of the pump protects the pump from running dry due to lost brine. The switching threshold was set in the factory to approx. 1.5 bar (warning) and to 0.5 bar media overpressure (malfunction).
- Finally, reset the frequency converter to automatic operation (AUTO).
- The pressure transmitter attached to the supply air device must be connected to the inlet nozzle and the device ring line on the intake side. The pressure transmitter must be set to 4–20 mA.
- The measuring range (factory setting 2500 Pa) may have to be adapted.
- The pressure transmitter measures the differential pressure at the inlet nozzle and outputs this pressure linearly (not square root).
- The measuring range end value of the flowmeter is set to approx. 1.4 x the nominal brine volume at the factory, as the brine volume is raised above the nominal fluid volume even for a short time if there is a risk of frost.
- Give the on-site enable signal and bring the on-site power control signal to 10 V.
- In normal control operation, the "Optimizing active" is active if no other operating conditions are active (e.g. defrost protection). The brine volume is then optimised on the basis of the supply air quantity.
- 1 m^3/h brine corresponds to about 3300 m^3/h air.
- This optimisation process can take several minutes.
- If the power control signal is set to below 90 % (9 V), this initially reduces the pump speed. If this reaches a lower limit of 12 Hz, the brine is also directed past the exhaust air heat exchanger via the power control valve (bypass operation).

6.4 Control-oriented integration of the HYDRO-OPT® M into the on-site MSR

The circulating coil system (KVS) covers the majority of the heat output during operation by recovering heat from the exhaust air flow.

Due to the inertia of the system, any existing pump hot water heater (PWW) must be rinsed before starting the central ventilation system.

After a rinsing period to warm up the on-site pipeline system, the air shut-off dampers must be opened.

Only then may the fans be put into operation and the enable signal issued for the KVS.

After the enable contact, an analogue request signal (0–10 V) is required on-site for operating the closed-cycle system. The heat recovery output can be controlled proportionally from 0–100 % via the signal.

Thus the complete station behaves like a (albeit sluggish) heating valve with a continuous valve drive and can be easily integrated in the on-site control strategy.

The decision whether the heat recovery can take place must be made by the on-site control system by comparing the air temperature.

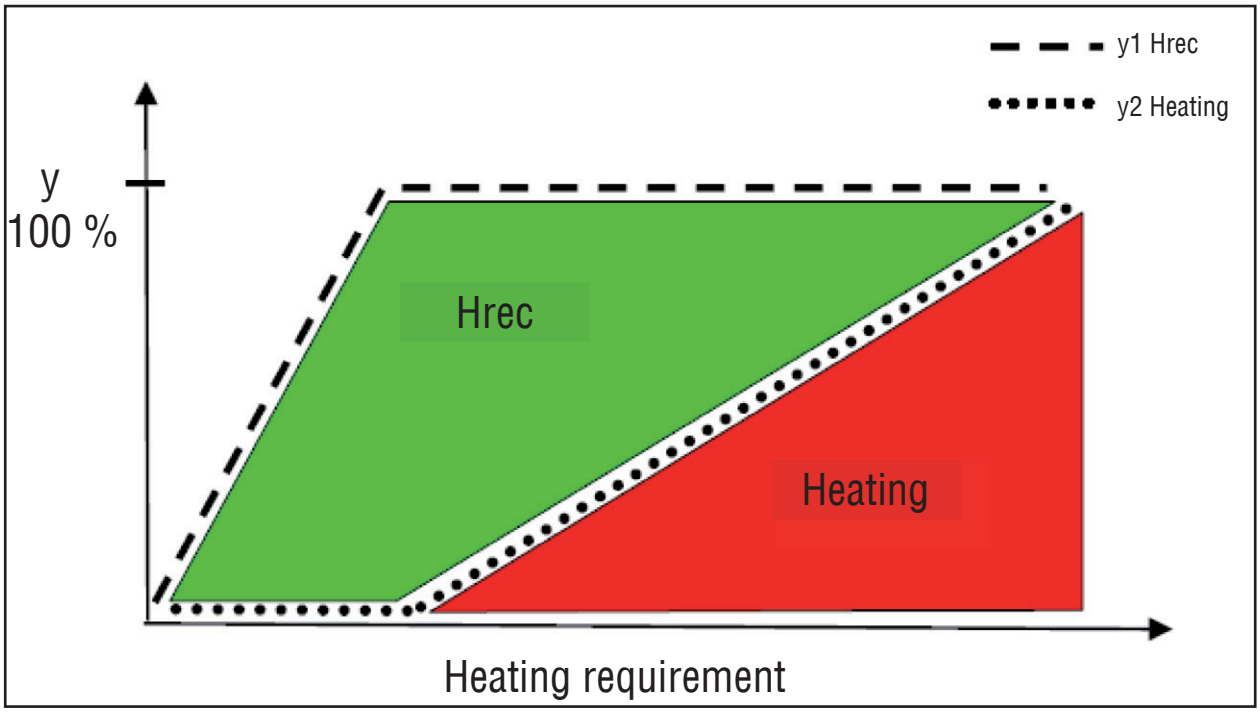


Fig. 7 Control strategy for controlling the KVS HYDRO-OPT® M

6.5 Operation

6.5.1 Operating unit

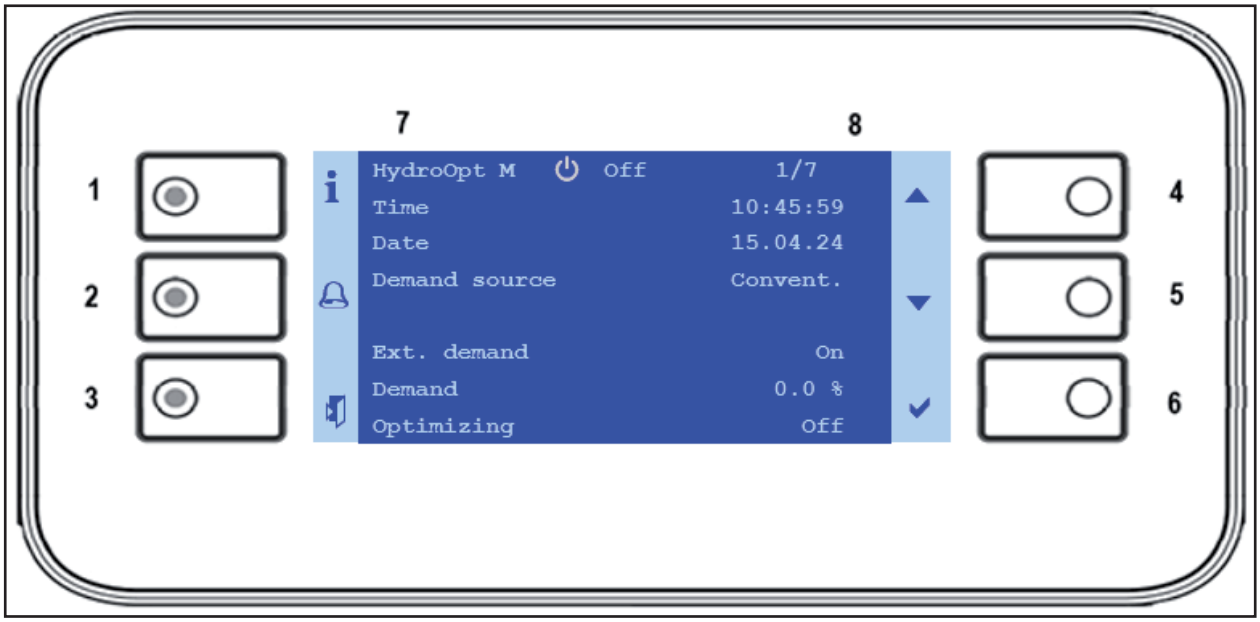


Fig. 8 Operating unit

The operation is menu-driven and is carried out via the buttons on the control unit or an optional remote control panel.

No.	Designation	General function
1	INFO button with integrated LED	This button can be used to navigate from any menu item to the main menu.
2	ALARM button with integrated LED	This button can be used to navigate from any menu item to the alarms. The integrated LED also indicates the alarm and acknowledgement status (see chapter “8 Emergencies and malfunctions” on page 43).
3	ESC button	This button can be used to exit the currently displayed menu item.
4	UP button	This button can be used to scroll up in the current menu or to increase the setting value.
5	DOWN button	This button can be used to scroll down in the current menu or to reduce the setting value.
6	ENTER button	This button can be used to confirm a new setting and activate the new setting value.
7	Line	The number of the line that is currently marked is shown here. The number after the slash indicates the total number of lines on this page.
8	Page	The name of the page on which you are located is shown here.

6.5.2 Alarm message/Warning message

The actions and status displays for the arrival, acknowledgement and resetting of an alarm are listed below:

- Each alarm is indicated by the alarm LED flashing red.
- By pressing the Alarm button, the alarm is displayed in plain text including alarm class, date and time.
- Each new alarm generates a line in the alarm list as well as in the alarm history. The alarm history is displayed by pressing the Alarm button several times.

NOTE

An acknowledged but still active alarm is present when the alarm LED on the control panel on the switch cabinet lights up constantly.

- Reset alarms:
  - Alarm list: The line is deleted.
  - Alarm history: Display as an “outgoing” alarm

Alarm types:

The following table describes all of the alarms that can be displayed. Class B does not lead to a shut-down, but merely serves as a warning.

Alarm text	Class	Description/Remedy
Feed temp.	A	Sensor defective or cable break → Sensor test required
Return temp.	A	Sensor defective or cable break → Sensor test required
Temp. After feed	A	Sensor defective or cable break → Sensor test required
Eff. pressure 1	A	Sensor defective or cable break → Sensor test required
Eff. pressure 2	A	Sensor defective or cable break → Sensor test required
Fluid volume	B	Brine volume implausible The brine circulation is checked within a defined period of time. If the brine volume is implausible, the installation is switched off with an A alarm
Pump 1	B	The pump's frequency converter has tripped → System test required

Alarm text	Class	Description/Remedy
Pump 2	B	The pump's frequency converter has tripped → System test required
Pump 1 + 2	A	If both pumps have a malfunction, the installation shuts down → Frequency converter of the pump is faulty → System test required
Warning fluid pressure	B	Pressure sensor reports low system pressure → System test required
Alarm fluid pressure	A	Pressure sensor reports low system pressure → System test required

NOTE

Class A alarms lead to system shut-down.

6.5.3 Display menu

NOTE

The screens that are not described must be skipped with the Enter button when they appear.

The **Start menu** visualises the current status with symbols in the top line. The digital enable is shown in “Ext. demand” and the analogue request signal in “Demand”. The Optimizing display indicates whether or not the optimisation is active.

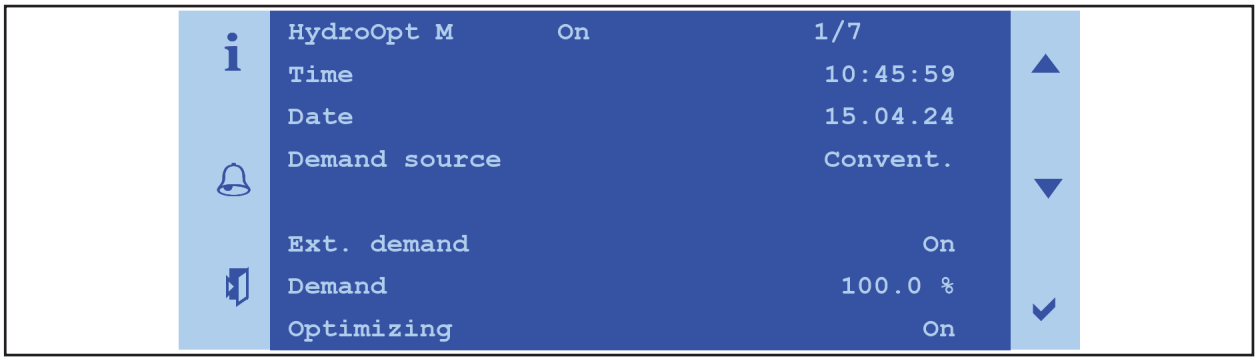


Fig. 9

If the higher-level controller does not enable it, “Off” appears in the main menu.

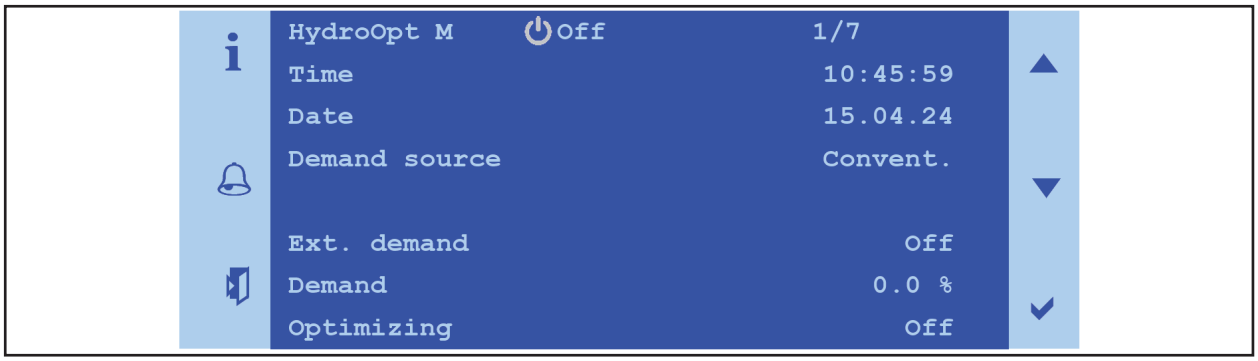


Fig. 10

In the main menu, the access level can be logged in, settings adjusted and system information retrieved.

The displayed language can be changed with the service password in the main menu.

Fig. 11

System information, e.g. temperatures and brine/air volumes, can be viewed in the main menu under “Information”. These can vary depending on the expansion stage.

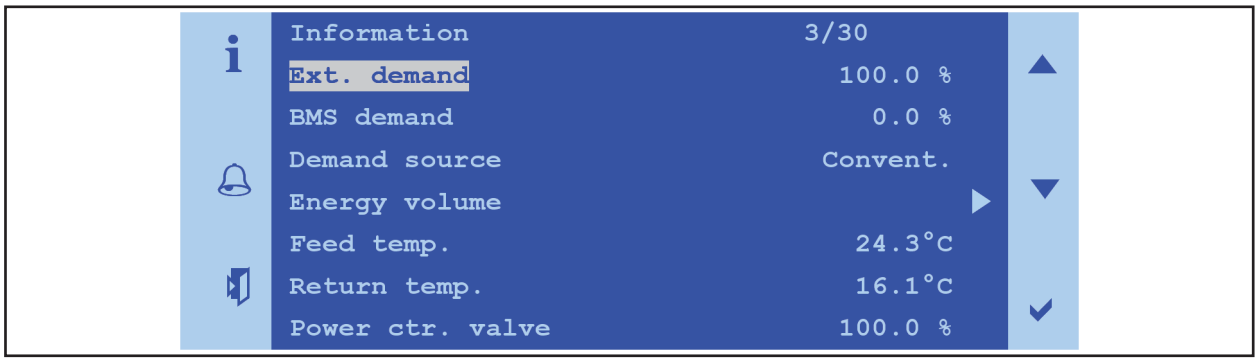


Fig. 12

Information about energy volumes can be found under the "Energy volume” menu item.

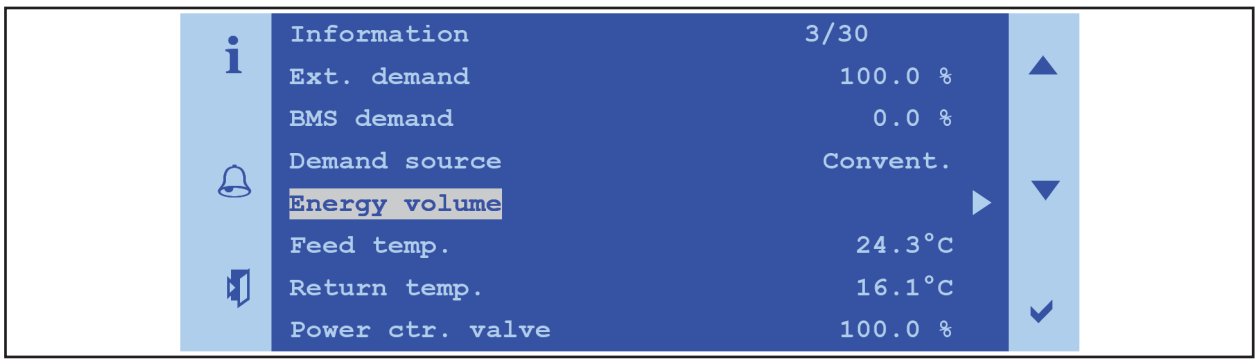


Fig. 13

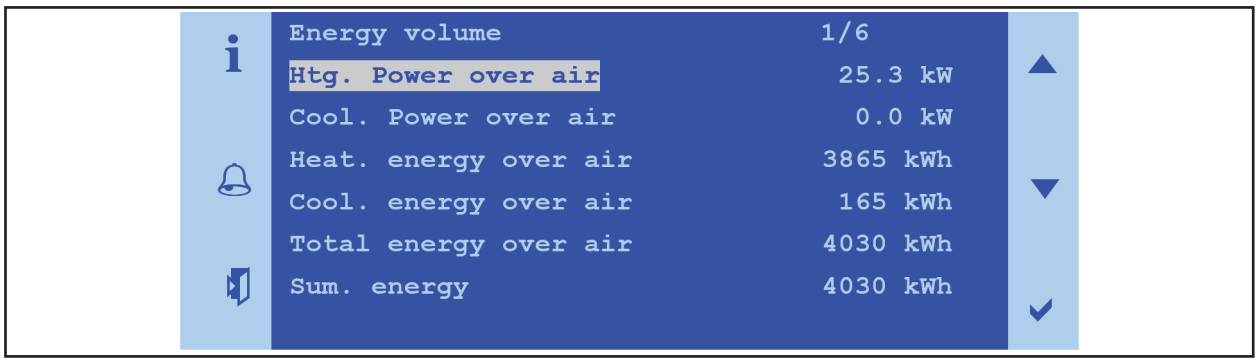


Fig. 14

6.5.4 Main menu (Info button)

The selection of menu items changes depending on the access level:

- Enter password
- Information
- Settings
- Versions

The display of the screens depends on the system configuration. Only the screens required for the system configuration are displayed.

6.5.4.1 Password menu

Access rights are delivered from the factory as follows:

Level	Default password	Description
User	1000	Level for the operator to select the setpoint source and alarm acknowledgement
Service	****	Level for service technicians with multiple parameter settings
Factory	****	Manufacturer level for fixed parameters that are set in the factory

The password can be changed in the corresponding access level.

Example:

If the factory user password is entered in “Enter password”, a key symbol appears at the top right of the control unit as an indicator of the “User” access level. Two keys are displayed when the service password is entered.

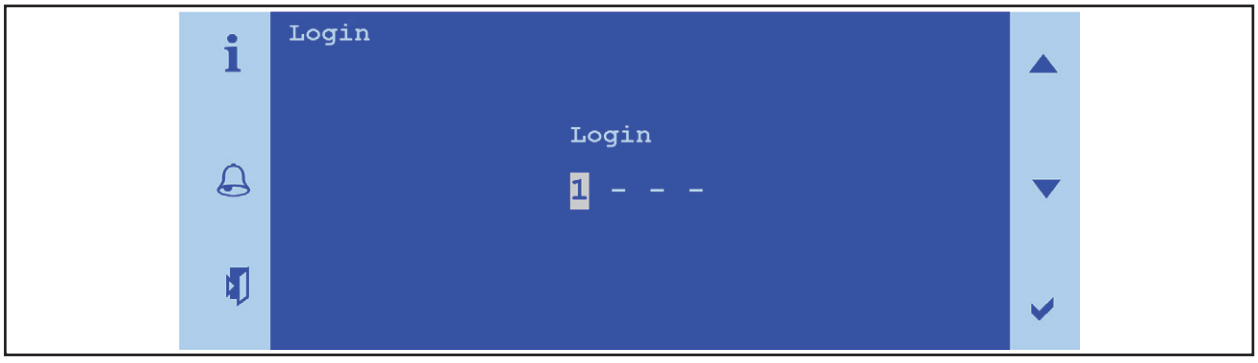


Fig. 15

6.5.5 Settings

The setting options vary depending on the expansion stage. The date and time can be changed with the user password. All other settings fall under service applications.

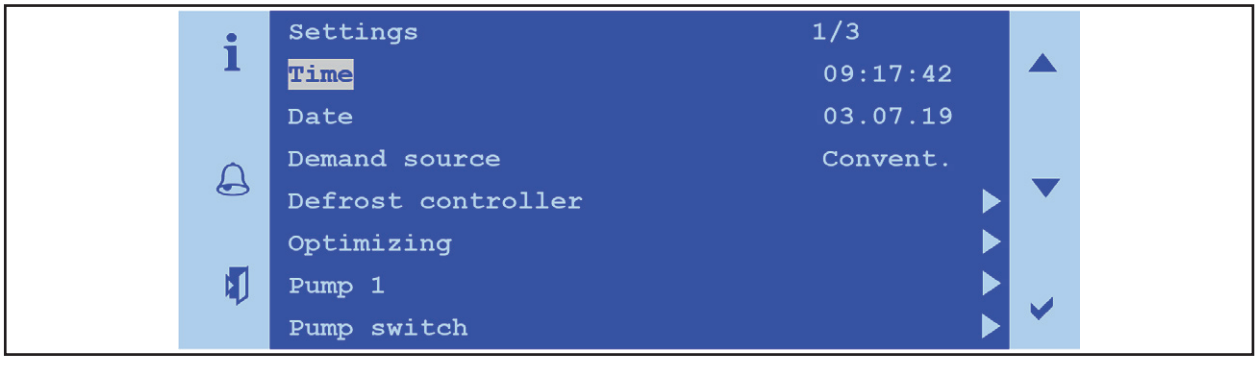


Fig. 16

Under “Settings”, the service technician can adjust the installation parameters in the service level.

NOTE

Always set a valid date or the correct time in order to obtain all functions.

6.5.5.1 Commissioning menu

NOTE

The safety functions of the software can be deactivated if incorrect settings are made.

Commissioning can only be achieved by entering the service password.

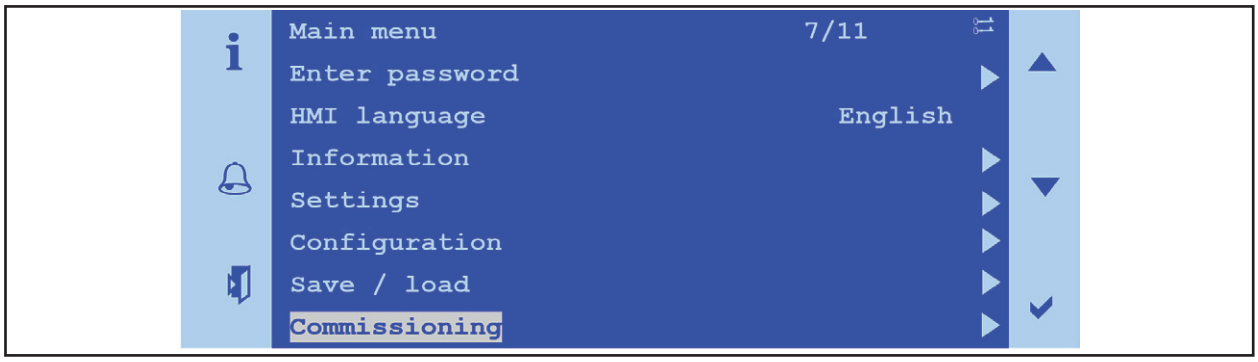


Fig. 17

During commissioning, measurement and control signals can be checked for plausibility with the service password.

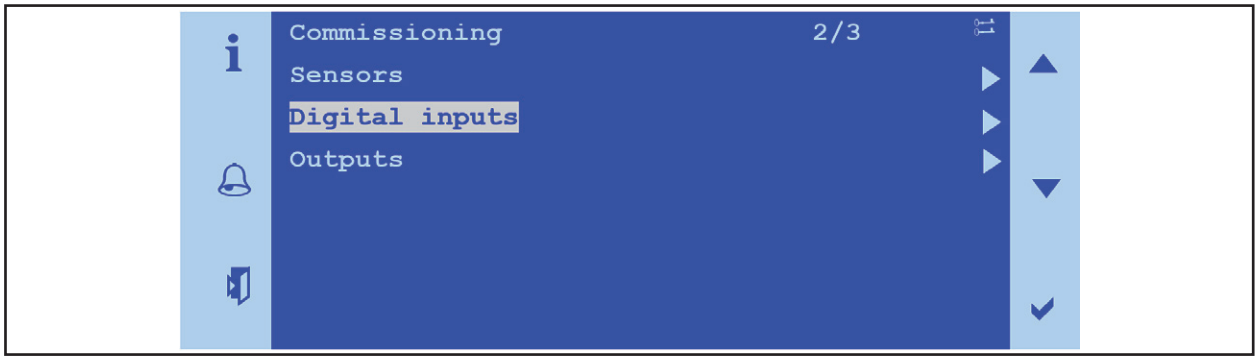


Fig. 18

Example of a manual value specification.

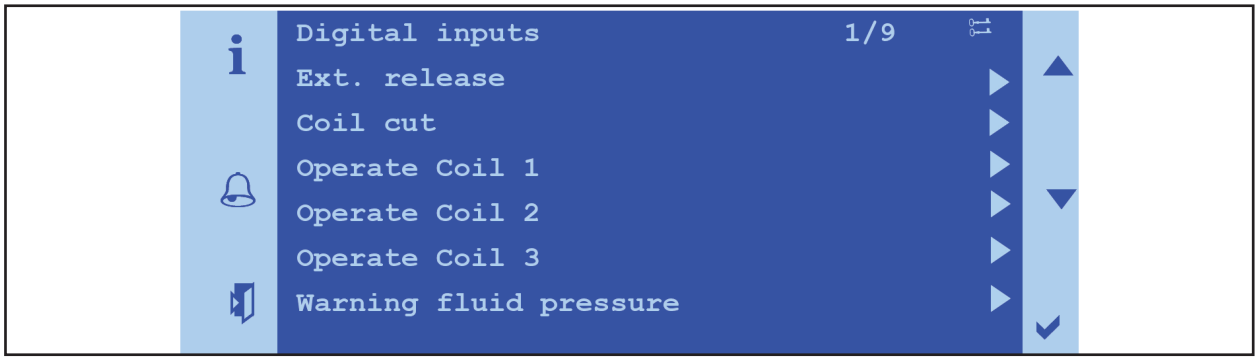


Fig. 19

“Out of service” must be set to “Active”. The actual value can then be entered manually.

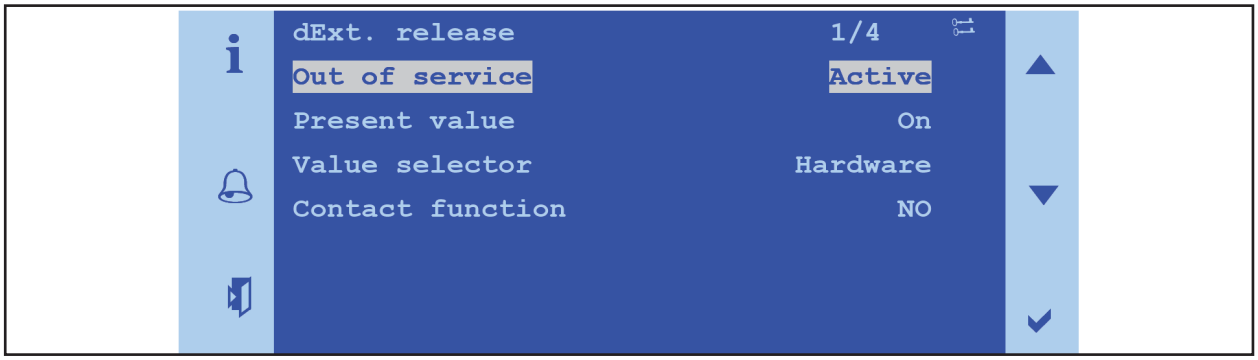


Fig. 20

The presence of a manual value entry can be indicated by orange/red flashing of the Info LED.

NOTE

Please reset this function for regular system operation again by setting “Out of service” back to “Passive”.

6.5.5.2 System information

The version number can be found in the main menu. The currently installed software versions are documented in versions.

6.5.5.3 System integrator

Modbus (optional)

The HYDRO-OPT® M controller can be connected to a higher-level controller via a communication interface. The service password is required for this. The Modbus variant is explained below.

To set the interface, navigate to the following menu item:

Main menu (press the INFO button) > System integrator > Modbus

Name	Range	Explanation
MB Typ	None Slave	No connection via Modbus HYDRO-OPT® M controller as slave for a higher-level controller
Address	0…247	Address of the HYDRO-OPT® M controller
MB ComType	RTU Int TCP/IP	Modbus RTU (via serial RS485 interface) Modbus TCP/IP (via the IP network)
Baud rate	2400 4800 9600 19200 38400	Baud rate for communication in the Modbus system (Modbus RTU only)
Parity		Parity for communication in the Modbus system (Modbus RTU only)
Stop bits		Number of stop bits for communication in the Modbus system (Modbus RTU only)
Termination	Passive Active	Terminal resistance at the serial interface in the controller deactivated Terminal resistance at the serial interface activated in the controller
Restart required !	Execute	After changes have been made to the parameters, the controller must be restarted with “Execute” to accept the data.

If the Modbus connection is used via the IP network, network settings can be found under the following menu item:

Main menu (press the INFO button) > System integrator > IP Config

Name	Range	Explanation
DHCP	Active Passive	Setting the type of address reference: Obtain the address from the DHCP server. Permanently set IP address.
Actual IP		Display of the controller IP address
Actual Mask		Display of the subnet mask
Act.Gateway		Display of the gateway address
Given IP	XXX.XXX.XXX.XXX	Entry of the controller IP address if DHCP is set to passive
Given Mask	XXX.XXX.XXX.XXX	Entry of the subnet mask
Giv Gateway	XXX.XXX.XXX.XXX	Entry of the gateway address
Primary DNS	XXX.XXX.XXX.XXX	Entry of the primary DNS server
Secondary DNS	XXX.XXX.XXX.XXX	Entry of the secondary DNS server
Name		Display of the controller name
MAC		Display of the controller MAC address.
Link	Active Passive	No connection to Ethernet. Connection to Ethernet.
100 Mbit	Active Passive	Switching the transmission speed: 10 Mbit 100 Mbit
Advanced		Change the access data (user names, passwords)
After changing values		
Restart required !	Execute	After changes have been made to the parameters, the controller must be restarted with “Execute” to accept the data.

6.6 Further operating options

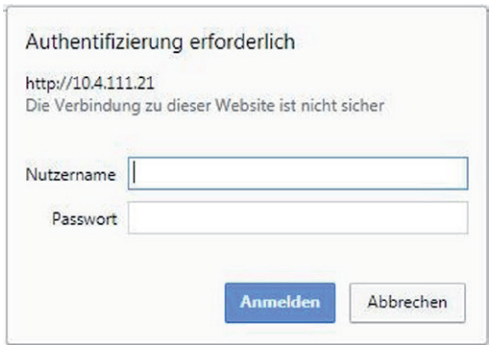
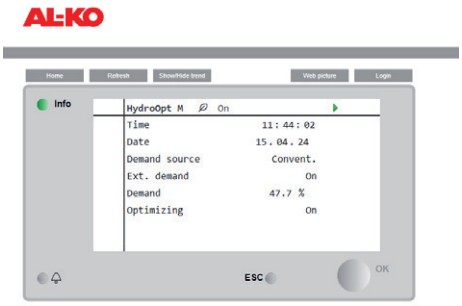
6.6.1 HMI Web

With the HMI Web, the entire installation can be fully configured and put into operation according to the logged-in password level. HMI Web is part of the standard controller equipment.

It can be accessed via the network connection of the controller via a terminal device provided on-site (PC, notebook, tablet) with a web browser. The menu structure and password levels are identical to HMI Basic.

This access is also possible wirelessly by using a commercially available WLAN router.

Step	Description
1	Make sure that the controller and the on-site terminal device (PC, notebook, tablet) with which you want to access the Web interface are in the same network. Settings such as DHCP may be necessary. If you have connection problems, contact the responsible network administrator.
2	Open an HTML5-enabled web browser on the terminal device. The following browsers are tested and supported: Google Chrome, Mozilla Firefox, Microsoft Edge.

Step	Description
3	Enter the IP address of the controller in the address bar of the web browser. The IP address of the controller can be read from the local control unit. 
4	Enter username and password. Default username: WEB Default password: SBTAdmin! Username and password can be changed. The Web interface appears. 
5	For the extended activation of the plant diagram (Web Picture): Enter the username: ADMIN and the order-specific password.

Visually, the display of the HMI Web in the web browser is based on the HMI Facility. The buttons described below can be pressed with the mouse button (PC, notebook) or by touch (tablet), depending on the terminal device used. Menu items or detail pages can be selected directly. Use the mouse wheel (PC, notebook) or gestures (tablet) in the menu to scroll up and down.

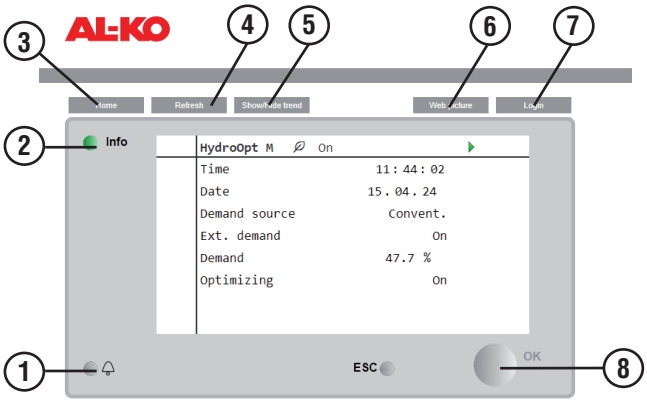


Fig. 21

No.	Designation	General function
1	ALARM button with integrated LED	Press this button to access the alarm pages. The integrated alarm LED indicates the alarm and acknowledgement status.
2	INFO button with integrated LED	Press this button to return to the home page. The integrated LED indicates the plant operating state.
3	Home	Press this button to return to the home page.
4	Refresh	Updates the browser window.

No.	Designation	General function
5	Show/Hide Trend	Shows or hides the online trend window below the user interface. To record a value (e.g. supply air temperature), press a value directly. When the trend window is displayed, it is immediately displayed in the window. Up to five values can be simultaneously recorded online. The online trend function is used for commissioning and diagnostics. The data will not be saved.
6	Plant diagram (Web Picture)	The system display is visualised graphically.
7	Login	Press this button to enter the password.
8	ESC button	Press this button to return to the previous page.

6.6.2 Plant diagram (optional)

Once this option has been enabled, the installation can be visualised on the PC using the plant graphic via a LAN connection.

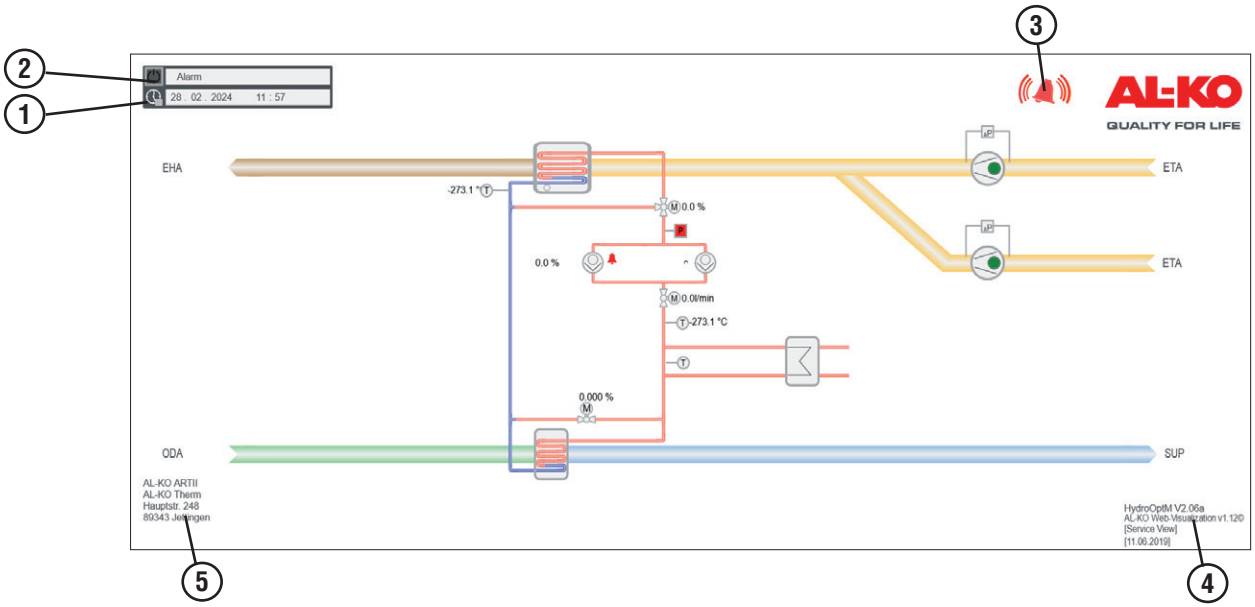


Fig. 22

No.	Sign	Description
1		Display of the name and version of the controller software
		Display of the system time of the controller (date)
		Display of the system time of the controller (time)
2		Display of the current operating mode: Off On Defrost Optimizing
3		Group A (danger/urgent)
		Group B (low)
		Group C (warning)
4		Version number of the visualisation system
5		Location description of the installation (change in the controller possible)

7 Service and maintenance

7.1 Safety instructions for servicing and maintenance

⚠ WARNING

Risk of injuries.

- Before all repair and maintenance work, disconnect the HYDRO-OPT® M from the mains on all poles and secure to prevent restart.
- Close the media supply (water, gas, etc.) before all repair and maintenance work.
- Follow the applicable safety regulations.
- Have installation, commissioning, servicing and maintenance work carried out only by qualified staff.

To be carried out by the person responsible:

- After carrying out the work, ensure that there are no longer any persons in the installation.
- Before restarting the installation, ensure that all factory-installed protective measures are functioning correctly.

⚠ WARNING

Risk of cuts.

There is a risk of cutting injuries during cleaning and maintenance of the HYDRO-OPT® M.

- Wear personal protective equipment (cut-proof gloves).

⚠ WARNING

Risk of slipping! Leaked medium/condensate.

- Immediately take up the spill quantity and dispose of it properly.

⚠ WARNING

Risk of injury from falling from ladders, scaffolding or work platforms.

- Only use suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

⚠ WARNING

Risk of injuries due to run-on of fans.

- Only open the inspection doors only when the fans are switched off and stationary.
- Observe the delay time of the fans. Observe a waiting time of at least 3 minutes, until the fan impellers are stationary, before opening the inspection doors.
- Never brake the impellers of the fans by hand or using an object.

⚠ CAUTION

Risk of burns due to contact with hot surfaces and media.

- Wait until the hot surfaces have cooled down.
- Wear personal protective equipment.

NOTE

The operator of an AC installation is obliged to have the installation maintained regularly by trained qualified staff.

AL-KO THERM recommends that maintenance is carried out in accordance with German VDI 6022 and VDMA 24186.

Upon conclusion of a maintenance contract, AL-KO THERM undertakes these tasks.

Customer Service
Phone: +49 8225 39 - 2574
E-mail: service.center@alko-air.com
Web: www.alko-airtech.com

ATTENTION

Only use original consumables and spare parts. This is the only way to ensure safe operation.

Otherwise the warranty will be voided.

A spare parts list can be found as part of the unit documentation.

After Sales
Phone: +49 8225 39 - 2600
E-mail: airtech.after-sales@alko-air.com
Web: www.alko-airtech.com

7.1.1 Qualifications of personnel

Assembly, commissioning, operation, maintenance, decommissioning and disposal may only be performed by qualified staff.

7.2 Maintenance instructions as per VDMA 24186

- The operator is obliged to have the installation maintained regularly by qualified staff.
- The operating and assembly instructions for the installed parts must be observed under all circumstances (request them if necessary).

7.3 Maintenance schedule

Maintenance, service of air handling units as per VDMA 24186

Item	Activity	Implementation	
		Periodically	As required
1	**Switch cabinets (according to VDMA 24186-4)**		
1.1	**Control part**		
1.1.1	Check for proper and functional installation and check ambient conditions	**12 mon**	
1.1.2	Check for dirt, damage, corrosion and secure fastening	**12 mon**	
1.1.3	Check protective covers	**12 mon**	
1.1.4	Function-preserving cleaning		**X**
1.1.5	Check connections	**12 mon**	
1.1.6	Check functional elements (e.g. operating and display equipment)	**12 mon**	
1.1.7	Check switching and control processes		**X**
2	**Field devices (according to VDMA 24186-4)**		
2.1	**Sensors (brine temperature sensor, magnetic ind. flow rate transmitter)**		
2.1.1	Check for proper and functional installation and check ambient conditions	**12 mon**	
2.1.2	Check for dirt, damage, corrosion and secure fastening	**12 mon**	
2.1.3	Function-preserving cleaning		**X**
2.1.4	Check measurement signals	**12 mon**	

Item	Activity	Implementation	
		Periodically	As required
3	**Controller (according to VDMA 24186-4)**		
3.1	**Controller (CPU HEHR Connector)**		
3.1.1	Check integral power supply (e.g. buffer battery)	**12 mon**	
3.1.2	Check functional elements (e.g. operating and display equipment)	**12 mon**	
3.1.3	Check input signals (e.g. sensors, remote dial, reference variable)	**12 mon**	
3.1.4	Check control loop and control signal	**12 mon**	
4	**Sub-stations (according to VDMA 24186-4)**		
4.1	**Sub-station**		
4.1.1	Check power failure and power recovery behaviour	**12 mon**	
5	**Pipe network (VDMA 24186-1)**		
5.1	**Pumps**		
5.1.1	Check exterior for dirt, damage, corrosion and secure fastening	**3 mon**	
5.1.2	Function-preserving cleaning (exterior)		**X**
5.1.3	Check functionality	**6 mon**	
5.1.4	Check leak-tightness (visual check)	**3 mon**	
5.1.5	Drive elements	**VDMA 24186-4**	
5.1.6	DDC technology	**VDMA 24186-4**	
5.2	**Shut-off, adjustment, and control fittings**		
5.2.1	Check exterior for damage and corrosion (visual check)	**3 mon**	
5.2.2	Check functionality	**6 mon**	
5.2.3	Check leak-tightness (visual check)	**3 mon**	
5.2.4	Actuators	**VDMA 24186-4**	
5.3	**Dirt trap**		
5.3.1	Check for soiling		**X**
5.3.2	Clean the sieve		**X**
5.3.3	Check the sieve for damage		**X**
5.4	**Pipelines and expansion tanks**		
5.4.1	Check the exterior of accessible pipelines for damage, leak-tightness and secure fastening	**3 mon**	
5.4.2	Check heat insulation for damage and completeness	**3 mon**	
5.4.3	Check temperature and pressure measurement devices for damage and display accuracy (plausibility check)	**3 mon**	
5.4.4	Check functionality of safety installation	**6 mon**	
5.4.5	Check compensators for damage and secure fastening (visual check)	**3 mon**	
5.4.6	Check fluid level	**3 mon**	
5.4.7	Top off fluid		**X**
5.4.8	Check the heat carrier of circulation-linked systems for frost resistance(1)	**12 mon**	
5.4.9	Check functionality of piping trace heating	**6 mon**	
5.4.10	Check functionality of venting valves	**6 mon**	
5.4.11	Venting		**X**
	(1) See overview sheet on HVE for specifications		
6	**Drive elements (according to VDMA 24186-1)**		
6.1	**Electric motors**		
6.1.1	Check the exterior for dirt, secure fastening, damage and corrosion	**3 mon**	
6.1.2	Function-preserving cleaning (exterior)		**X**
6.1.3	Check direction of rotation		**X**
6.1.4	Re-tighten connection terminals		**X**
6.1.5	Measure tension	**12 mon**	
6.1.6	Check connection terminals to ensure they are seated firmly	**12 mon**	

Item	Activity	Implementation	
		Periodically	As required
6.1.7	Measure power consumption	**12 mon**	
6.1.8	Measure phase symmetry	**12 mon**	
6.1.9	Check for smooth running and temperature increase	**12 mon**	
6.1.10	Check bearings for noise	**3 mon**	
6.1.11	Grease bearings using a relubrication device		**X**
6.1.12	Check the function of the protection device	**6 mon**	
7	**Documentation and marking (according to VDMA 24186-1)**		
7.1	**Maintenance-relevant documents**		
7.1.1	Overview sheet available in HVE	**3 mon**	
	Inventory documents folder available	**3 mon**	
8	**Documentation (according to VDMA 24186-4)**		
8.1	**Maintenance-relevant documents**		
8.1.1	Check for presence (circuit diagram, CHC operating instructions)	**12 mon**	
8.2	**Existing system markings (signage)**		
8.2.1	Check for availability	**12 mon**	

7.4 Maintaining and cleaning components

All installed components are either freely accessible for cleaning or can be pulled out of the unit or removed after opening the inspection doors/removing the inspection cover.

- Coarse dirt in the housing can be removed using an industrial vacuum cleaner.
- Remove other dirt with a damp cloth.

Cleaning

- Only lukewarm water, possibly with a mild detergent without perfume, should be used for cleaning.
  Do not use mechanical aids, e.g. sharp tools, grinding stones, wire brushes, files, steel wool made of unalloyed or low-alloy carbon steel, etc.
- Do not use a high-pressure cleaner for cleaning.
- Detergents must not penetrate into electrical or mechanical installation parts.
- If necessary, completely reinstall the protective and safety installations or coverings removed for cleaning and check their functionality. (Subsequent) damage resulting from a nonetheless carried out or incorrect application of corresponding disinfection or cleaning are at the expense of the initiator.

8 Emergencies and malfunctions

8.1 Emergency

ATTENTION

In case of fire, used building materials can develop toxicologically hazardous substances.

To protect against any released pollutants, rooms must only be entered with breathing masks.

Safety of persons has priority over safety of property.

8.2 Help in the event of malfunctions

⚠ WARNING

Risk of injury due to incorrectly implemented measures.

Incorrect or incorrectly executed measures can put the installation in a potentially dangerous state. There is then a risk of injuries and even electric shock.

- Only allow work on electrical equipment inside the switch cabinet (e.g. test work, replacement of fuses) to be carried out by qualified staff.
- Only allow diagnosis, troubleshooting and recommissioning to be carried out by authorised persons.
- Use personal protective equipment at all times when working on the installation.
- Use other protective equipment according to the work carried out.

A distinction is made between warning messages (heat recovery operation is maintained) and fault messages. Both are communicated to the BCS via potential-free contact and via bus.

A malfunction message must be acknowledged on-site after the error is corrected.

Error messages are shown on the controller in plain text.

8.3 Contact for malfunctions

For all questions that you have in connection with our products, please contact the manufacturer of your ventilation installation, one of our branches or directly to:

AL-KO THERM GMBH	Phone:	(+49) 82 25 / 39 - 0
Hauptstraße 248-250	Fax:	(+49) 82 25 / 39 - 2113
89343 Jettingen-Scheppach	E-mail:	klima.technik@alko-air.com
Germany	Web:	www.alko-airtech.com
Customer Service	Phone:	(+49) 82 25 / 39 - 2574
	E-mail:	service.center@alko-air.com

9 Shut-down

9.1 Decommissioning

The installation can remain permanently filled with the glycol/water mixture.

⚠ WARNING

Risk of injury due to pressurised parts.

- When decommissioning, note that certain installation parts are pressurised.
- Comply with the safety regulations!

ATTENTION

In winter, there is a general freezing hazard for all components. If necessary, take suitable measures such as fully draining the liquid media. At temperatures below freezing point, the installation must be either drained and blown out with compressed air, or filled with a commercially available antifreeze with corrosion inhibiting additive due to the risk of freezing and corrosion.

- If the installation is decommissioned for a long period of time, the instructions for the individual components must be observed.
- The information from the component manufacturers must also be followed (request this information if necessary).
- Before recommissioning, observe chapters “6 Commissioning” on page 26 and “7 Service and maintenance” on page 39.

9.2 Dismantling

- Dismantling must be carried out according to the currently valid and applicable occupational safety and accident prevention regulations.

⚠ WARNING

Risk of injury from falling from ladders, scaffolding or work platforms.

- Only use suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

⚠ WARNING

Risk of poisoning when draining the media.

The unit may contain media that are hazardous to health, such as coolants.

- The drained media may only be filled and stored in approved containers.
- Work with care.
- Avoid skin and eye contact with the media, do not swallow media and observe the safety data sheets.
- Wear personal protective equipment.
- Absorb spills immediately.

⚠ WARNING

Risk of injury when dismantling electrical and thermal components.

- Only have disassembly work carried out by trained qualified staff.
- Before starting work, disconnect the installation from the central supply line.
- When dismantling, note that certain parts of the installation are pressurised.
- Fix the impellers of the fans.
- Work with care.
- Use only suitable means of transport when transporting installation parts.
- Use personal protective equipment at all times when working on the installation.
- Absorb spills immediately.

9.3 Disposal

⚠ WARNING

Risk of poisoning when disposing of the media.

The unit may contain media that are hazardous to health, such as coolants.

- Work with care.
- Avoid skin and eye contact with the media, do not swallow media and observe the safety data sheets.
- Wear personal protective equipment.
- When disposing of the media, comply with the relevant local environmental and recycling regulations in your country and community that are applicable at the time when the activity is undertaken.
- The drained media may only be filled and stored in approved containers.

Do not dispose of worn-out units, spent batteries or rechargeable batteries in domestic waste!

When disposing of the HYDRO-OPT® M, operating materials and accessories, proceed according to the relevant local environmental and recycling regulations in your country and community that are applicable at the time when the activity is undertaken.

10 Spare parts

ATTENTION

Only use original consumables and spare parts. This is the only way to ensure safe operation.

Otherwise the warranty will be voided.

A spare parts list can be found as part of the unit documentation.

ATTENTION

If third-party spare parts are installed or changes are made without consultation with the manufacturer, a new conformity assessment must be carried out by a qualified person. After carrying out the evaluation, it must be documented in accordance with the Machinery Directive.

The Declaration of Conformity and Incorporation are invalidated in the event of a modification to the AC unit that is not coordinated with AL-KO THERM.

The warranty may also be invalidated.

NOTE

The valid spare parts list can be found as part of the unit documentation created on the basis of the order.

AL-KO THERM GMBH	Phone:	(+49) 82 25 / 39 - 0
Hauptstraße 248-250	Fax:	(+49) 82 25 / 39 - 2113
89343 Jettingen-Scheppach	E-mail:	klima.technik@alko-air.com
Germany	Web:	www.alko-airtech.com
After Sales	Phone:	(+49) 82 25 / 39 - 2600
	E-mail:	airtech.after-sales@alko-air.com

11 Appendix

11.1 Commissioning protocol

F.A.O.: **Company:**

In order to ensure a smooth commissioning process, the following work is necessary in advance:

Central ventilation unit:

	Yes	No
Central ventilation unit ready for operation	☐	☐
Connection on air side available	☐	☐
Air volume measurements carried out	☐	☐

Hydraulic station:

	Yes	No
Hydraulic station installed and piped	☐	☐
All heat exchangers connected in counterflow	☐	☐
Expansion vessel with safety valve installed	☐	☐
Installation filled with glycol/water mixture	☐	☐
Glycol content measured	____ %	
Read system fill pressure in idle state (specification on hydraulic station)	____ bar	
Hydraulics & heat exchanger correctly vented (observe venting valves in the HE unit)	☐	☐
Pump vented	☐	☐
Electrical mains supply: Voltage measurement performed	☐	☐
Exhaust air shut-off valves connected (only for installations with multiple exhaust air exchangers)	☐	☐
Enable and demand signal from BMS connected	☐	☐
Enable and demand signal checked	☐	☐

Optional functions:

	Yes	No
Supply air measurement of pressure transmitter 4-20 mA set and in operation?	☐	☐
Disconnect all heat exchangers signal tested	☐	☐
Signals for exhaust air exchangers 1, 2, 3 in operation and their shut-off valves 1, 2, 3	☐	☐

Functional test:

Optimisation function tested (set demand to 100% and test brine optimisation with variable air volume 1 m^3/h brine should correspond to approx. 3300 m^3/air)	☐	☐

Notes

Notes

Notes

Evidence of heat recovery

Supply air volume	_____	m^3/h
Exhaust air volume	_____	m^3/h
Outside air temperature	_____	°C
Temperature after Hrec SUP	_____	°C
Exhaust air temperature	_____	°C
Temperature after Hrec ETA	_____	°C
BMS power demand in	_____	%
Outdoor air amount	_____	%
Pump frequency	_____	Hz
Displayed Hrec power in	_____	kW

_____ _____

Place, date Name of commissioning person

AL-KO

QUALITY FOR LIFE

3522013 /February 2024

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Phone +49 8225 39-0 I Fax +49 8225 39-2113 I klima.technik@alko-air.com I **www.alko-airtech.com**