

AL-KO

QUALITY FOR LIFE

EN



AIR HEATER

OPERATING AND ASSEMBLY INSTRUCTIONS

AL-KO EC AIR HEATERS PREMIUM CONTROLLER

Legal

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1 About this manual

- The German version is the original version of the operating instructions. All further language versions are translations of the original operating instructions.
- Read through these operating instructions prior to installation, 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.

The document is valid for all EC Air Heaters with PREMIUM Controller.

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 serious injury or even death.

WARNING



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

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.

1.1.2 Safety signs

Meaning	Sign
GENERAL DANGER SIGNS If the required safety instructions are not observed, this can lead to death, serious injuries and considerable property damage.	
IMPORTANT NOTICE Failure to observe this notice may result in problems with the unit.	
OBSERVE THE OPERATING AND ASSEMBLY INSTRUCTIONS Failure to observe the notices in the operating and assembly instructions may result in 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 serious injuries or even death due to falling.	
Warning of danger of slipping If the required safety instructions are not observed, this can lead to serious injuries or even death due to slipping.	
Warning of electrical voltage If the required safety instructions are not observed, this can lead to serious injuries or even death due to dangerous electrical voltage.	
Warning against suspended loads If the required safety instructions are not observed, this can lead to serious injuries or even death due to a suspended load.	
Warning of falling objects If the required safety instructions are not observed, this can lead to serious injuries or even death due to falling objects.	
Warning of hot surfaces If the required safety instructions are not observed, this can lead to serious injuries or even death due to hot surfaces.	
Warning of danger of crushing If the required safety instructions are not observed, this can lead to serious injuries or even death due to crushing.	

Meaning	Warning sign
<p>Warning of sharp objects If the required safety instructions are not observed, this can lead to serious injuries or even death due to sharp objects.</p>	
<p>Warning of hand injuries If the required safety instructions are not observed, this can lead to serious injuries or even death.</p>	
<p>Warning of poisonous substances If the required safety instructions are not observed, this can lead to serious injuries or even death due to poisonous substances.</p>	

Mandatory signs

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

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

1.1.3 Abbreviations

Abbreviation	Meaning
HMI	Human Machine Interface
BT-PREMIUM	Control panel PREMIUM
Kick mode	Starts the fan or pumps briefly to prevent mechanical parts from seizing (component protection).
LED	Light Emitting Diode
LH	Air heater
I&C system	Instrumentation and control system
PI controller	Proportional integral controller
PWW	Pump Warm Water
SP	Setpoint

2 Safety instructions

- The air heater controller may only be used for measuring, controlling and monitoring AL-KO THERM air heating and air cooling units.
- The air heater controller may only be connected to and used with components approved or recommended by the manufacturer, AL-KO THERM. As part of the overall configuration, the user of the components must observe all the safety instructions from the respective manufacturers.
- Units and system components may only be used in technically perfect condition. Malfunctions and damage that could affect safety must be rectified immediately.
- All applicable safety, building, accident prevention, installation and other relevant regulations that influence the safe use of the air heater controller must be observed when performing any work on or with the unit.
- The necessary protective measures against high contact voltages must be observed. Do not take any steps that could impair the effectiveness of existing protective measures.
- The air heater controller may only be commissioned and operated by persons who have read the operating instructions.
- Avoid electromagnetic and other disturbing influences on the signal and connecting lines.
- Install the system and plant components only in accordance with the installation and operating regulations.

2.1 Intended use

The air heater controller may only be used for measuring, controlling and monitoring AL-KO THERM air heating and air cooling units.

The temperature range within which the controller may be operated lies between -25°C and +40°C.

2.2 Foreseeable misuse

The air heater controller may only be operated within the range of the technical data specified by AL-KO THERM. Any use other than or going beyond that described in section “2.1 Intended use” on page 10 is regarded as contrary to the intended use. The manufacturer assumes no liability for damage resulting from this.

Possible misuse includes:

- Use in an explosive atmosphere.
- Use outside the specified temperature range.
- Installation in an environment with aggressive media (e.g. sea air) or extremely dusty media (desert).

2.3 General safety instructions

⚠ DANGER



Hazard due to electric current.

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

- Have the electrical connection carried out only 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 system.
- Use further protective equipment according to the work to be 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.
- Before opening the switch cabinet, switch off the power supply. Do not work while the equipment is energised.
- The system must be de-energised also when changing fuses. Use only the specified replacement types.
- The switch cabinet or terminal box may only be opened by electrical technicians.

⚠ WARNING



Risk of injury

- To prevent manipulation of the air heater controller, only authorised persons may be permitted to have access to the switch cabinet or terminal box.
- Safety equipment, safety features and monitoring equipment must not be removed, bypassed or disabled in any other way.
- Do not remove covers, housings or other protective equipment. Do not operate the system or its components if the standard protective equipment has failed or its function is impaired.

⚠ WARNING



The system must not be used to transport aggressive, explosive, liquid, adhesive, particle-laden and dusty media, etc.!

Use in potentially explosive atmospheres is prohibited.

⚠ CAUTION



Protect the electronic components, exposed printed circuit boards and unconnected electrical connections against static electricity. Take the necessary protective measures, such as earthing, equipotential bonding, conductive mats, and avoiding highly insulating materials, etc.

ATTENTION

The main switch mounted on the switch cabinet of the controller must not be used for switching the system on and off during normal operation. If it is used to switch off the system, frost protection of the hot water heater will no longer be ensured.

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

- Safety equipment, safety features and monitoring equipment must not be removed, bypassed or disabled in any other way.
- Do not remove covers, housings or other protective equipment. Do not operate the system or its components if the standard protective equipment has failed or its function is impaired.
- 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 the user's system, operating and working instructions apply in addition to these operating and assembly instructions.

2.3.1 Safety instructions for operation

- The air heater controller may only be operated in the performance range specified in the technical documents from AL-KO THERM.
- The air heater controller must be properly installed and used strictly according to our operating instructions.
- All applicable safety, building, accident prevention, installation and other relevant regulations that influence the safe operation the air heater controller must be observed during operation.
- The air heater controller may only be operated in a technically flawless condition. Malfunctions and damage that can affect safety must be rectified immediately and professionally.
- Avoid causing sparks in the vicinity of the air heater controller and the air heater.

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.
- Transport, unpacking and installation of the individual components: injuries can occur during this work due to crushing, cutting, stabbing or collisions.
- 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: Failure to observe safety instructions, standards and regulations.
- The air heater controller must not be installed in the vicinity of heat sources (e.g. radiators) or their heat flow; direct sunlight or heat radiation from similar sources (strong lights, halogen spotlights) must be avoided at all times.

2.4 Training

The owner/operator of the air heater controller is obliged to carry out further training of the personnel – in particular the operating personnel – and to ensure the following:

- Observance of the operating instructions as well as the legal regulations.
- Intended use of the air heater controller and the air heater.
- Observance of all company, operating and working instructions at the owner's/operator's installation location.
- What to do in an emergency.

3 Product description

The air heater controller is used to control the air heater.

The air heater controller has the following operating options:

- BT-PREMIUM (standard version)
- Room temperature sensor
- Frost protection thermostat (optional accessory)
- Condensate pump

The drives of the AL-KO THERM air heaters are equipped with variable-speed EC external rotor motors. The air heaters are designed for general indoor applications.

NOTE



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

3.1 Functional description

3.1.1 BT-PREMIUM

With the BT-PREMIUM, the entire system can be fully configured and put into operation according to the password level of the logged-in user. The control unit has a two-colour LCD with 8 x 30 characters, four operating buttons and a rotary knob. The BT-PREMIUM belongs to the standard configuration of the controller and is intended for remote installation in a control room.

The room control unit is available in 2 versions:

- With protection class IP31
- With protection class IP65 in a protective housing with transparent cover (not illustrated)



Fig. 1 BT-PREMIUM

- Pressing any button or turning the rotary knob activates the backlighting of the control panel.

No.	Designation	General function
1	INFO button with integrated LED	Press this button to call up the information overview and to return to the start page. The integrated LED indicates the system operating state.
2	ALARM button with integrated LED	Press this button to access the alarm pages. The integrated alarm LED indicates the alarm and acknowledgement status.
3	ESC button	Press this button to return to the previous page. Holding the ESC button depressed calls up the menu of the BT-PREMIUM. → The desired controller can be selected under "Ranking".
4	Rotary knob	<ul style="list-style-type: none"> ■ Turning the knob in clockwise direction corresponds to scrolling up in the menu or increasing a setting value. ■ Turning the knob in anti-clockwise direction corresponds to scrolling down in the menu or decreasing a setting value. ■ Press the rotary knob to confirm a new setting or to jump to a menu item or detail page.

3.1.2 Step switch version

Step switch outputs are connected to the controller via setpoint specification, external enable and connected accordingly. Operating, maintenance and fault messages are displayed on the step switch. It is enabled via room thermostat and timer switch.

3.1.3 Room temperature sensor IP30

Single-stage, mechanical single room controller with thermal feedback, suitable for temperature monitoring or control in dry rooms. The room temperature sensor IP30 must always be installed on the wall in the room to be heated.

We recommend a draught-free location away from doors, windows and gates, ideally in the middle of the room.

The technical data can be found in chapter "3.2.2 Room temperature sensor IP30" on page 17.



Fig. 2 Room temperature sensor IP30

3.1.3.1 Room temperature sensor IP65 with cable gland on the underside

Protection class IP65, screws and dowels are not included in the scope of supply.

The technical data can be found in chapter “3.2.3 Room temperature sensor IP65” on page 18.



Fig. 3 Room thermostat IP65 with cable gland on the underside

3.1.4 Frost protection thermostat

The frost protection monitor is suitable for monitoring the air or water temperature of air heaters to prevent freezing and frost damage, e.g. in ventilation and air conditioning ducts. All devices are intrinsically safe and have a sensor break detection function. If the capillary tube membrane system is damaged, the frost sensor automatically switches to the heating function.

The frost protection thermostat is attached to the outside of the air heater housing and the capillary sensor is mounted in the vicinity of the heat exchanger.

If the frost protection thermostat is tripped, the heater valve opens and the hot water heater pump starts.

The technical data can be found in chapter “3.2.4 Frost protection thermostat” on page 18.



Fig. 4 Frost protection thermostat

3.1.5 Condensate pump

The condensate pump can be used with air cooling units to pump off the condensate that forms. The pump set consists of the pump unit with inlet and outlet line and the internal control circuit with sensor.



Fig. 5 Condensate pump

3.2 Technical data

ATTENTION



Read the documentation supplied with the unit. Information on the technical and electrical data can be found there.

3.2.1 Air heater

Operating voltage:	230 V / 50 Hz (EC technology), optionally 400 V
Thermal class:	THCL 155
Protection class:	IP54
Heating medium flow temperature:	max. 80 °C
Ambient temperature:	up to 40°C
Installation location:	up to max. 2250 m above sea level

3.2.2 Room temperature sensor IP30

Control range	-30 to +70°C
Electrical connection	0.14 to 1.5 mm ²
Housing	Plastic, material ABS, colour pure white (similar to RAL 9010), optional
Housing dimensions	85 x 85 x 27 mm
Protection class	III (according to EN 60730-1)
Protection class	IP30 (according to EN 60529)
Standards	EMC Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU
Installation	Wall mounting or on flush-mounted box, diameter 55 mm, base with 4-hole, for mounting on vertically or horizontally installed flush-mounted boxes for cable entry at rear, with predetermined breaking point for cable entry at top/bottom with flush mounting

3.2.3 Room temperature sensor IP65

Electrical connection	0.14 to 1.5 mm ²
Housing	Plastic, UV-resistant, polyamide material, 30% glass bead reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions	72 x 64 x 37.8 mm (Tyr 1)
Housing temperature	-50 to +90°C
Protection class	III (according to EN 60730-1)
Protection class	IP65 (according to EN 60529)
Standards	EMC Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU

3.2.4 Frost protection thermostat

Electrical connection	0.14 to 2.5 mm ²
Housing	Plastic, UV-resistant, polyamide material, 30% glass bead reinforced, with quick-release screws (slotted/cross-head combination), colour traffic white (similar to RAL 9016)
Housing dimensions	126 x 90 x 50 mm (Tyr 2)
Housing temperature	-30 to +70°C
Protection class	I (according to EN 60730-1)
Protection class	IP65 (according to EN 60529)
Standards	EMC Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU

3.3 Condensate pump

Electrical connection	0.14 to 2.5 mm ²
Housing dimensions	273 x 52 x 64 mm
Housing temperature	0 to +40°C
Standards	EMC Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU

ATTENTION



If the operating limit range of 80°C heating medium flow temperature is exceeded, the heating medium supply must be interrupted when the fan is switched off and the fan must run on for at least 3 - 4 minutes (run-on circuit).

3.4 Schematic layout

Example of 3 equal air heaters with common control unit and room thermostat:

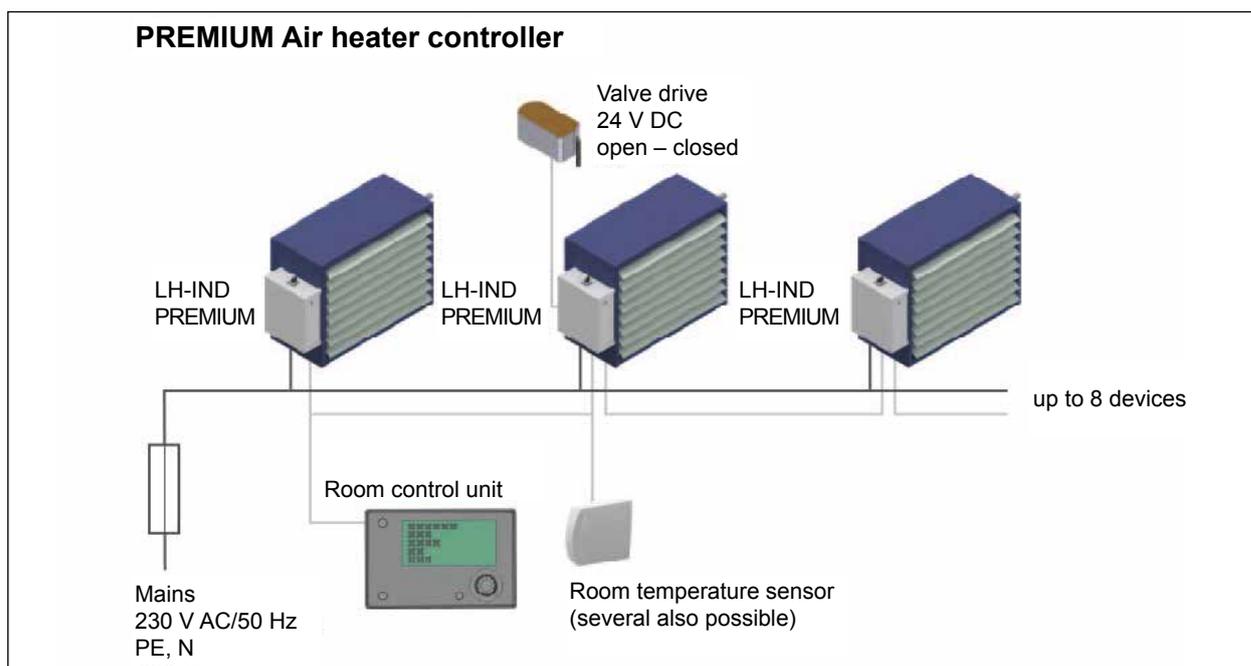


Fig. 6 Example of a schematic layout

ATTENTION



The cable length between heater 1 and heater 2 must not exceed 700 metres.

3.5 Terminal box PREMIUM

A terminal box with protection class IP65 is installed on the air heater at the factory. This contains all the necessary connection terminals for the mains-side power supply and all connectable field devices.

Unused screw holes must be sealed to prevent the ingress of dust.

A maximum of 8 air heaters can be connected in parallel to a room control unit (common setpoints).

A repair switch is installed on the terminal box for service purposes; this switch isolates the fan including 24V power supply unit with controller.

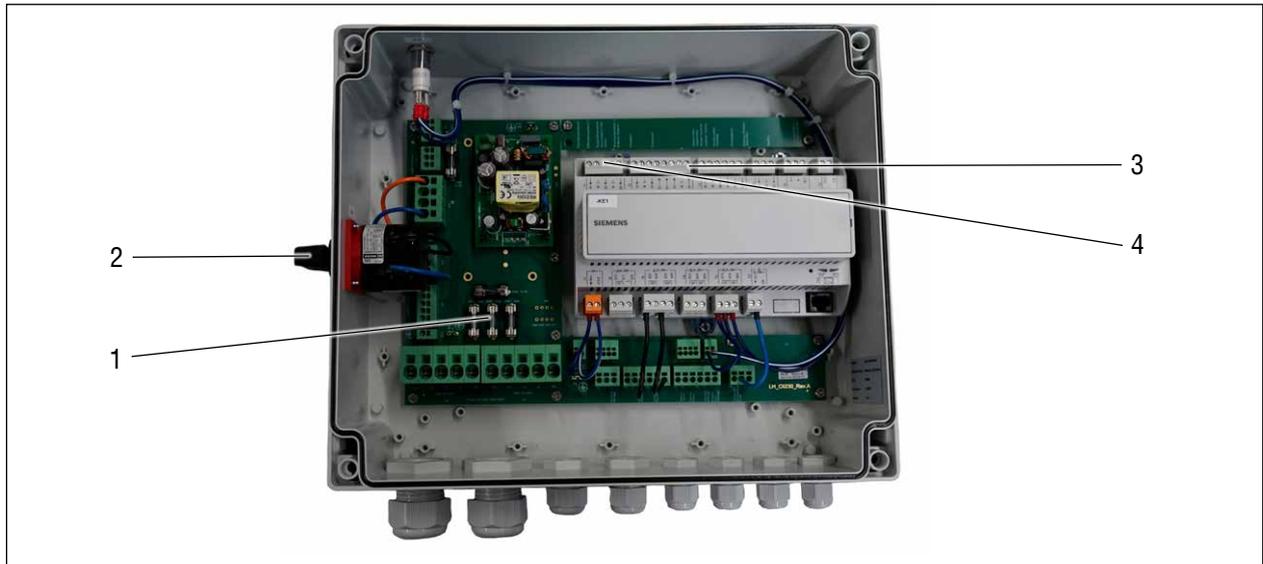


Fig. 7 Terminal box PREMIUM

1	Fuses	3	Fan terminals
2	Repair switch	4	Control unit/sensor connections

ATTENTION



Please note that the input terminals and repair switch are always live (under mains voltage).

3.6 Wiring diagrams

3.6.1 Power supply

The air heater controller PREMIUM can be operated with 230 V and 400 V.

230 V connection:

A phase L, the neutral conductor N and earth PE are required to operate the air heater with the PREMIUM controller with 230 V. In this case, L is connected to terminal L1, N to terminal N and PE to the PE terminal of terminal block -X1. A jumper must then be inserted between T1, T2 and T3 on terminal block -X4.

Cables connected to terminal block -X4 must not be removed.

400 V connection:

Three phases L1, L2 and L3, the neutral conductor N and earth PE are required to operate the air heater with the PREMIUM controller with 400 V. In this case, L is connected to terminal L1, L2 to terminal L2, L3 to terminal L3, N to terminal N and PE to the PE terminal of terminal block -X1.

The following connections must then be wired:

- between terminal block -X3 terminal L2 and the main switch (connection 4)
- between terminal block -X3 terminal L3 and the main switch (connection 6)
- between terminal block -X4 terminal T2 and the main switch (connection 3)
- between terminal block -X3 terminal T3 and the main switch (connection 5)

No jumpers are required between T1, T2 and T3 of terminal block -X4; if these jumpers have been installed at the factory, they must be removed.

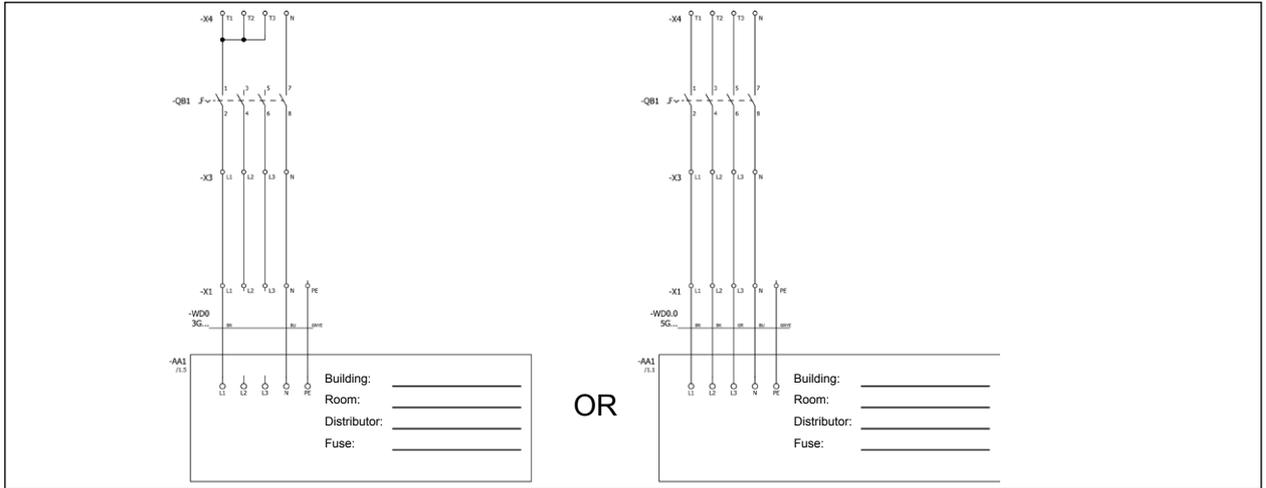


Fig. 8 Power supply plan 230 V/400 V

ATTENTION



If the PREMIUM controller is to be operated with 400 V, the terminals must be connected as shown in circuit diagram “Fig. 8 Power supply plan 230 V/400 V” on page 21 or in chapter “21 Original wiring diagrams” on page 60.

No jumpers are required between T1, T2 and T3 of terminal block -X4; if these jumpers have been installed at the factory, they must be removed.

3.6.2 Wiring diagram PREMIUM controller Version 1

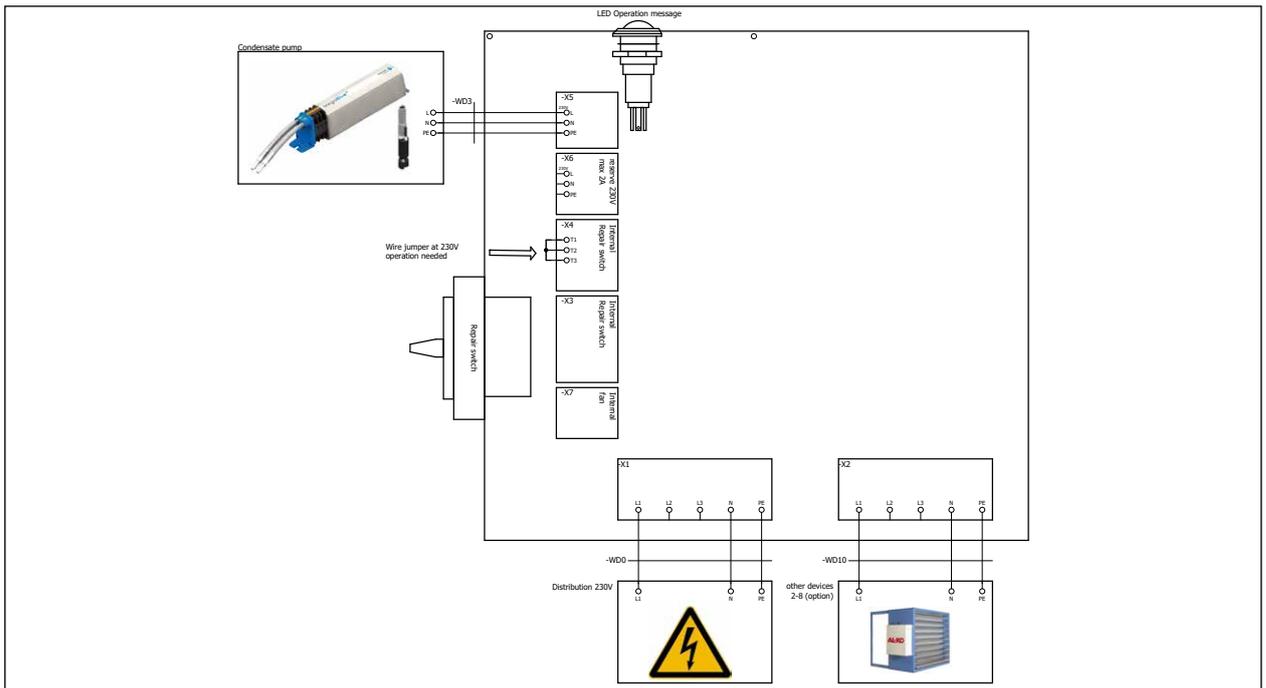


Fig. 9 Wiring diagram PREMIUM controller Version 1

3.6.3 Wiring diagram PREMIUM controller Version 2

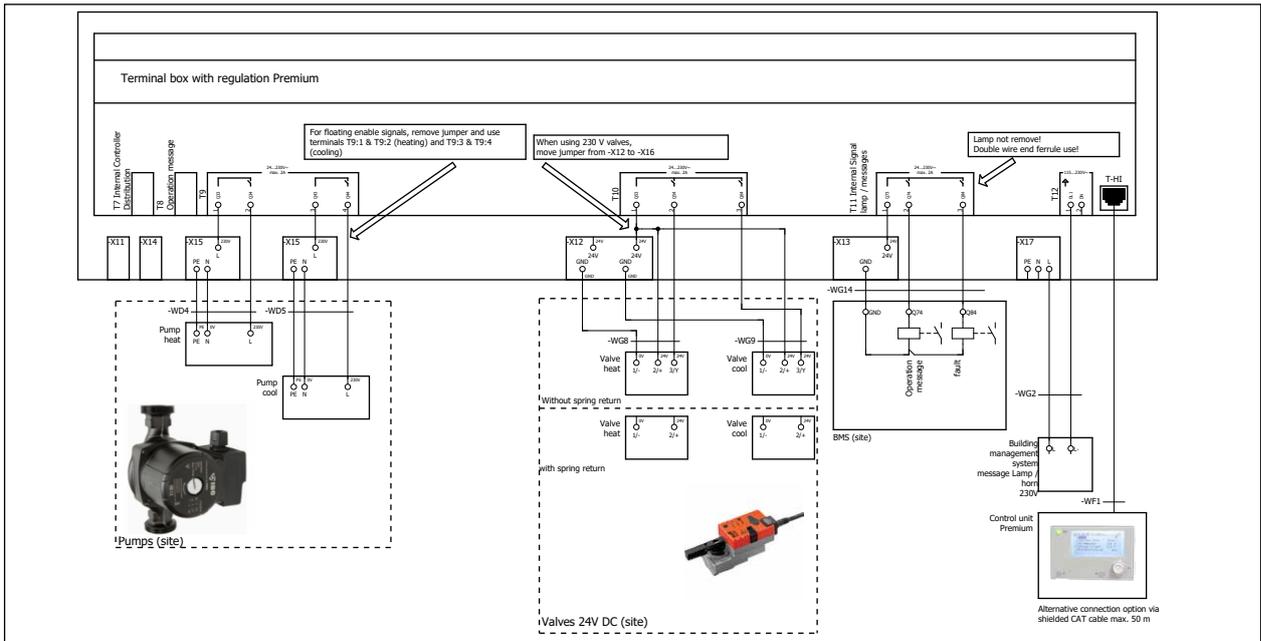


Fig. 10 Wiring diagram PREMIUM controller Version 2

3.6.4 Wiring diagram PREMIUM controller Version 3

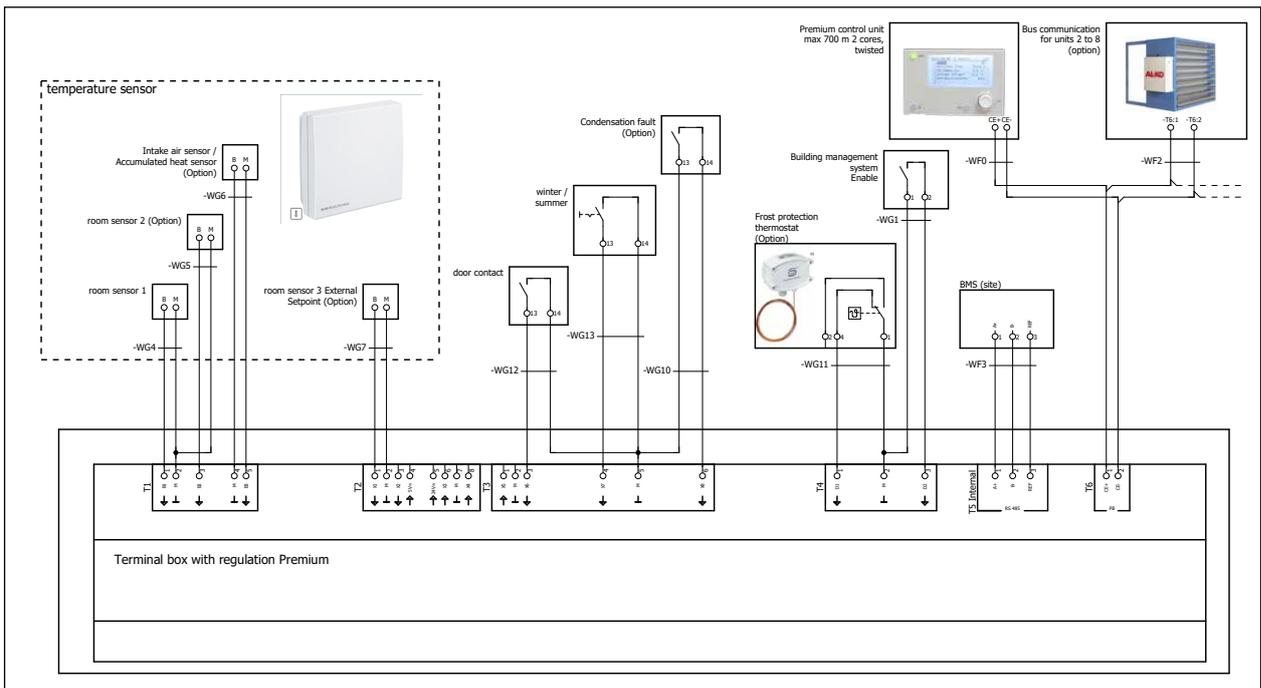


Fig. 11 Wiring diagram PREMIUM controller Version 3

NOTE

The wiring diagrams show all available options.

3.7 Motor protection

The standard motors are equipped with integrated active temperature management.

Operating voltage: 1 x 230 V / 50 Hz (EC technology)

4 Delivery, transport, storage

4.1 Delivery

- The air heaters and the air heater controller consist of components and are packed accordingly.

4.2 Transport

⚠ WARNING



Risk of death – Suspended loads.

For crane transport, all valid safety conditions according to DGUV regulation 52 Cranes and DGUV Control unit 109-017 must be observed.

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

⚠ CAUTION



Risk of injury due to the units falling 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.
- Work only on on-site surfaces that are suitable for installation preparations and lifting.

ATTENTION



- Uniform lifting of the unit components must be ensured!
- 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 inspected 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 system may only be moved with the transport equipment provided for this purpose.
- Use only suitable transport devices and suitable industrial trucks.
- Inspection doors must be kept closed at all times during transport.

- Avoid damage to the housing or other damage.
- Damage resulting from improper packaging and transport is at the expense of the initiator.
- The air heater controller must only be transported and installed within the operating temperature limits (-25°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.

4.3 Storage prior to assembly

- Store the individual functional parts in their original packaging in a dry and weatherproof location.
- Store the functional parts in the temperature range of -25°C to +40°C.
- Avoid damage to the housing or other damage.
- Store the control unit in a way that prevents damage from ambient conditions. Constant and, above all, abrupt temperature changes must be prevented during storage. This is especially harmful if moisture is able to form condensation.
- Damage resulting from improper packaging and storage is at the expense of the party responsible.

4.4 Disposal of packaging



Dispose of the packaging in accordance with the relevant local environmental and waste disposal regulations applicable at the time of the work.

5 Installation

5.1 Safety instructions for assembly

⚠ WARNING



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

- Have installation, commissioning, maintenance and repair work carried out only by qualified specialist personnel!
- Observe the working instructions and these operating and assembly instructions.
- Work with care.
- Use personal protective equipment at all times when working on the system.
- Use other protective equipment according to the work carried out (cut-proof gloves).

⚠ WARNING



Risk of injury when mounting units on walls or ceilings.

When mounting the units, the tool/housing material may fall off in the event of carelessness. Due to the working height, there is a danger of falling.



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

⚠ CAUTION



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



- Have installation, commissioning, maintenance and repair work carried out only by qualified specialist personnel!
- 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.

5.2 Preparations

- The air heater controller is delivered with its components pre-assembled by AL-KO THERM. Depending on the size and configuration of the air heater, it can be supplied in different states of disassembly.
- Assembly or disassembly work may only be carried out by persons with appropriate training, knowledge and experience.

ATTENTION



The cable length between heater 1 and heater 2 must not exceed 50 metres.

5.3 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.

- Have the electrical connection carried out only 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 system.
 - Use further protective equipment according to the work to be 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.
-
- The electrical connection of the AL-KO THERM air heaters/air coolers must be performed according to the wiring diagrams. When connecting, only use the circuit diagram specific to the unit.
 - The units must be grounded.
 - It must be possible to perform an all-pole shutdown of the supply line with a repair switch.
 - Fluctuations or deviations in the mains voltage may not exceed the tolerances specified in the technical data, or else malfunctions cannot be ruled out.
 - With the exception of the LH 140 units (LH Industry 140 EC, LH Comfort 140 EC, 250 EC), all electric motors of the fans are equipped with a thermal contact as standard. It must be integrated into the controller.

5.4 Installation in switch cabinet

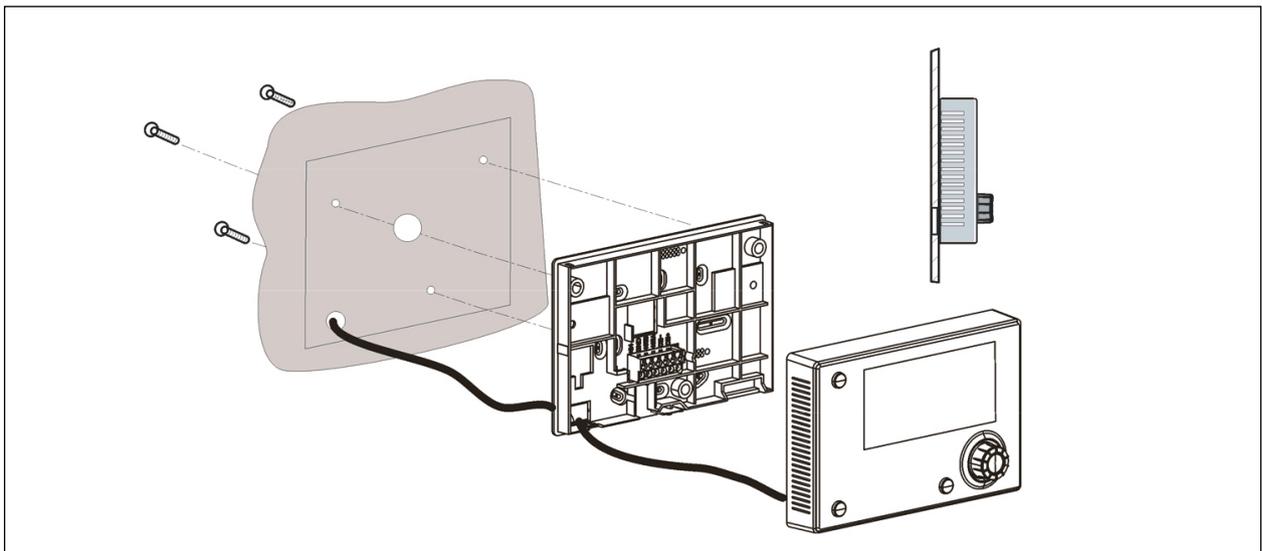


Fig. 12 Installation in switch cabinet

5.5 Wall mounting

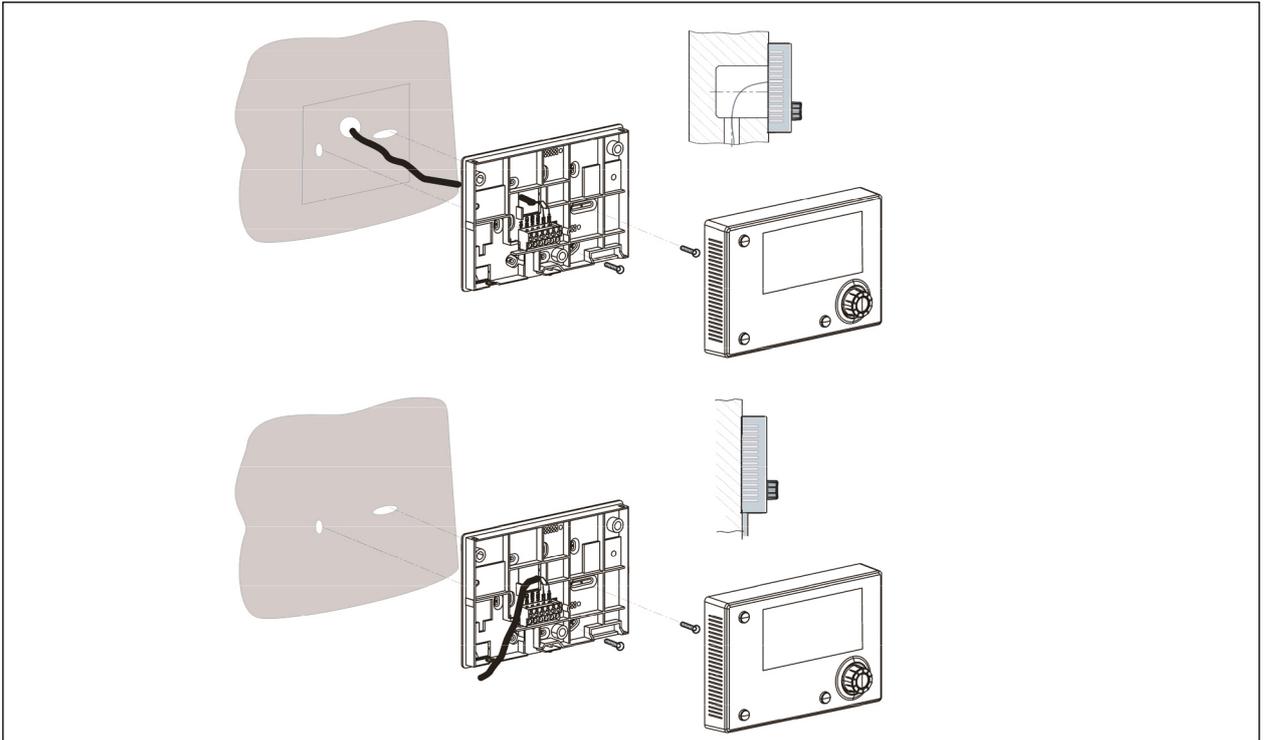


Fig. 13 Wall mounting

5.6 Cable list

NOTE



The cable cross-sections are provided with no liability.
The type of installation and possible cumulations have not been taken into account!

Depending on the control type, the following cable cross-sections can be connected:

	Cable
Supply line PREMIUM	Supply line 3 x 1.5 mm ² to 2.5 mm ²
Supply line air heaters 2 to 8 (optional with 230 V)	3 x 1.5 mm ² to 3 x 16 mm ²
Supply line air heaters 2 to 8 (optional with 400 V)	5 x 1.5 mm ² to 5 x 16 mm ²
Control unit	2 x 2 x 1 mm ² Patch cable 4 x 2 x 0.25 mm ² (RJ 45)
Room temperature sensor (optional)	2 x 1 mm ²
Frost protection thermostat (optional)	2 x 1 mm ²
Building management system	2 x 1 mm ²
Data cable air heaters 2 to 8 (optional)	2 x 2 x 1 mm ²
Condensate pump	3 x 1.5 mm ²
Cooling/heating valve with spring return	2 x 1 mm ²
Cooling/heating valve WITHOUHT spring return	3 x 1 mm ²
Cooling/heating pump	3 x 1.5 mm ²
Condensation fault	2 x 1 mm ²
Door contact	2 x 1 mm ²
Winter/summer	2 x 1 mm ²

6 Commissioning

6.1 Safety instructions for commissioning

DANGER



Hazard due to electric current.

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

- Have the electrical connection carried out only 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 system.
- Use further protective equipment according to the work to be 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 injury

- To prevent manipulation of the air heater controller, only authorised persons may be permitted to have access to the switch cabinet and terminal box.
- Safety equipment, safety features and monitoring equipment must not be removed, bypassed or disabled in any other way.
- Do not remove covers, housings or other protective equipment. Do not operate the system or its components if the standard protective equipment has failed or its function is impaired.

WARNING



The system must not be used to transport aggressive, explosive, liquid, adhesive, particle-laden and dusty media, etc.!

Use in potentially explosive atmospheres is prohibited.

CAUTION



Protect the electronic components, exposed printed circuit boards and unconnected electrical connections against static electricity. Take the necessary protective measures, such as earthing, equipotential bonding, conductive mats, and avoiding highly insulating materials, etc.

ATTENTION



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

6.2 Before system start

Before starting the system, carry out a brief check of the function of the individual components and a visual inspection; remove and replace any defective components or defective cables.

6.2.1 Commissioning of the air heater

Please refer to the operating instructions of the air heater for information on commissioning the air heater.

6.3 Switching the controller/system on/off

The controller or the system is switched on and off at the main switch. The repair switch is only suitable for service applications (service and maintenance work).

7 Service and maintenance

7.1 Safety instructions for service and maintenance

⚠ WARNING



Risk of injuries.

- Disconnect the air heater controller from the mains on all poles and secure it to prevent restarting before starting any repair and maintenance work.
- Observe the applicable safety rules.
- Have installation, commissioning, maintenance and repair 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 or on the system.
- Before restarting the system, ensure that all factory-installed protective measures are functioning correctly.

⚠ WARNING



Risk of cuts

There is a risk of cuts during maintenance and cleaning of the air heater controller.

- 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.

- Use only suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

⚠ CAUTION



Risk of burns due to contact with hot surfaces and media (heat exchanger)

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

NOTE



The owner/operator of the air heater controller is obliged to have the system maintained regularly by qualified staff.

If a maintenance contract is concluded, AL-KO THERM undertakes these tasks.

Air Heater

Fon: +49 8225 39 - 2145

E-mail: Luftheizung@alko-air.com

Web: www.alko-airtech.com

ATTENTION

Use only OEM 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 in chapter "20 Spare parts" on page 59.

Air Heater

Fon: +49 8225 39 - 2145

E-mail: Luftheizung@alko-air.com

Web: www.alko-airtech.com

ATTENTION

All safety components must be subjected to an inspection at least 1x per year in accordance with DIN EN IEC 62061.

ATTENTION

Safety-relevant components must be replaced after 20 years of operation from the Dat code in accordance with DIN EN ISO 13849-1.

- Maintenance of the air heater controller is limited to regular cleaning and inspection of the clamping and plug-in connections. During maintenance, check that all clamping and plug-in connections are firmly seated and make perfect contact.
- The built-in parts inside the switch cabinet are best freed of dust and other contamination during the regular maintenance tasks. The outside of the switch cabinet can be cleaned with a moist (not wet), soft lint-free cloth when necessary. Commercially available dishwashing detergent or a neutral cleaner can be used as a cleaning agent.
- Never use abrasive cleaning agents or cleaning agents that can dissolve plastics. Avoid acidic or alkaline solvents, spray water, impacts or jolts.
- Diagnostics, fault elimination and recommissioning may only be carried out by authorised persons. This also applies to work performed inside the switch cabinet (e.g. inspections, fuse changing).
- Unauthorised activities may result in the loss of the manufacturer's warranty. Any damage to the system and the associated secondary damage are the responsibility of the party causing such damage.

7.1.1 Qualifications of personnel

Work may only be carried out by personnel trained and instructed by AL-KO THERM. The owner/operator is obliged to carry out further training of the personnel. Appropriate qualification of the personnel (specialist personnel) is a prerequisite for long-term compliance with the maintenance requirements and the implementation of the necessary operating and service measures in air heaters.

7.1.2 Replacing components

⚠ DANGER



Hazard due to electric current.

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

- Have the electrical connection carried out only 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 system.
- Use further protective equipment according to the work to be 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.
- Have installation, maintenance and repair carried out only by qualified staff.
- Wear personal protective equipment.

ATTENTION



Use only OEM 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 in chapter "20 Spare parts" on page 59.

Air Heater

Fon: +49 8225 39 - 2145

E-mail: Luftheizung@alko-air.com

Web: www.alko-airtech.com

NOTE



Only complete units/components are replaced.

The only exceptions are fuses that may be replaced individually.

Component replacement may only be carried out by trained and qualified staff.

The spare parts list can be found in chapter "20 Spare parts" on page 59.

8 Emergencies and malfunctions

8.1 Emergency

WARNING



First measures in an emergency:

- Disconnect the air heater controller from the central mains power supply line on all poles and secure it against restarting.



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 system in a potentially dangerous state. There is then a risk of injuries and even electric shock.

- Have work on electrical equipment (e.g. test work, replacement of fuses) carried out only by qualified staff.
- Have diagnosis, troubleshooting and recommissioning carried out only by authorised persons.
- Use personal protective equipment at all times when working on the system.
- Use further protective equipment according to the work to be carried out.

8.3 Contact for malfunctions

For all questions relating to our products, please contact one of our branches or us directly, as follows:

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

DANGER



Hazard due to electric current.

Before starting work, de-energize the system (all-pole shutdown) and secure it against unauthorised restarting.

9.2 Dismantling

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

DANGER



Hazard due to electric current.

Before starting work, de-energize the system (all-pole shutdown) and secure it against unauthorised restarting.

WARNING



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

- Use only suitable and tested ladders, steps, scaffolding and work platforms.
- Work with care.

WARNING



Risk of injury when dismantling electrical and thermal components.

- Have disassembly work carried out only by trained and qualified staff.
- Before starting work, disconnect the system from the central power supply line.
- Work with care.
- Use personal protective equipment at all times when working on the system.
- Absorb spills immediately.

10 Menu guidance

10.1 Overview of the entire structure

This section describes the first three levels of the menu structure. Some menu items are only visible in the appropriate password level.

NOTE



Some menu items are only available if the configuration and/or system equipment requires them.

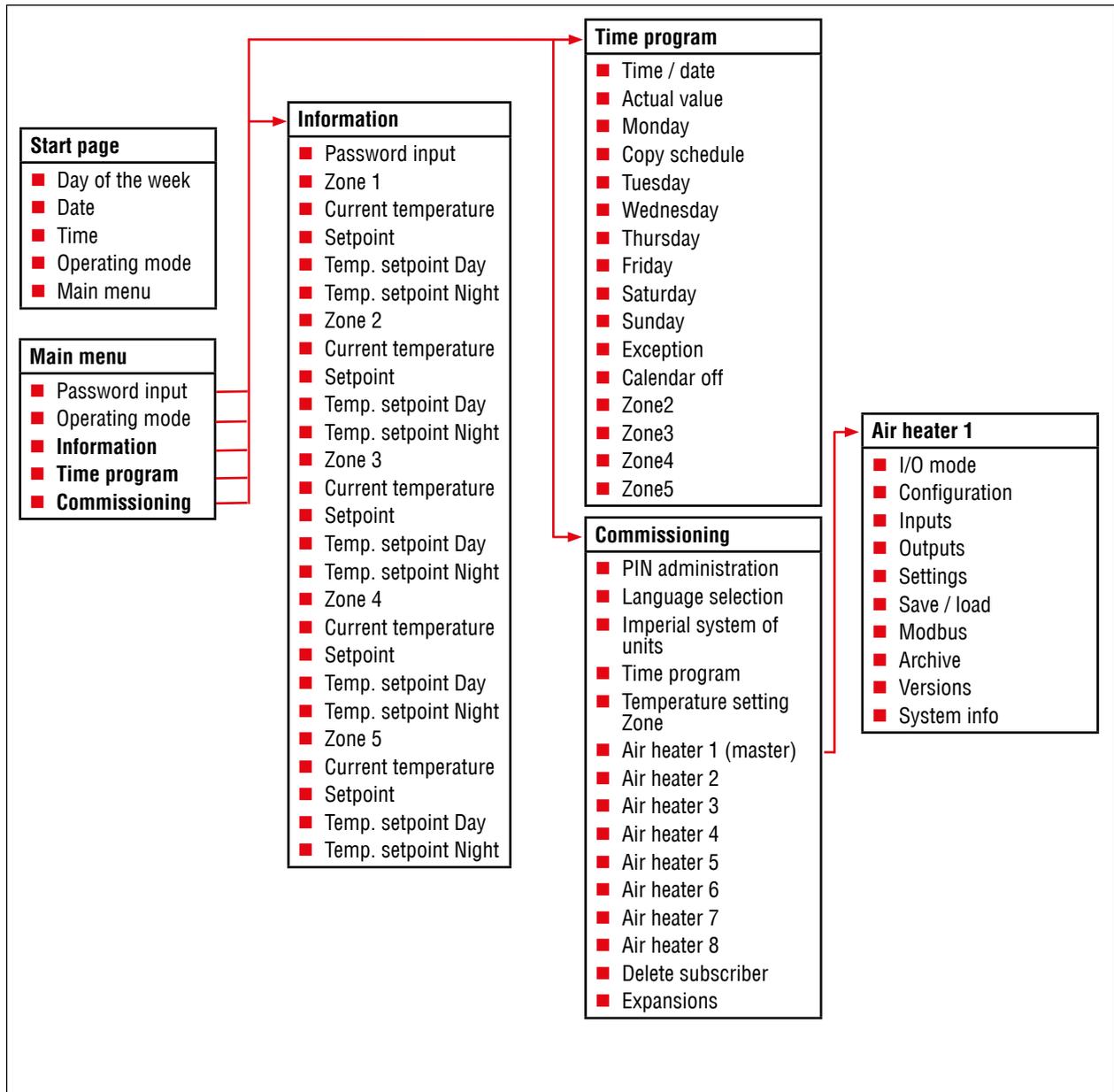


Fig. 14 Menu structure

10.2 Main menu overview

Menu item “Main menu” on the start page takes you from the start page to the main menu. It contains the following menu items.

Menu item	Contents
Password input	Log in with a password
Operating mode	<ul style="list-style-type: none"> ■ Set operating mode (Select between OFF/Auto/Day/Night/Manual) ■ Setting of the fan speed in manual mode ■ Setting of heating or cooling in manual mode
Information	<ul style="list-style-type: none"> ■ Read off the current temperatures for the individual zones ■ Read off the current setpoints for the individual zones ■ Change the setpoints for Day and Night mode (with the corresponding password)
Time program	<ul style="list-style-type: none"> ■ Set system time ■ Set weekly program ■ Set calendar
Commissioning	<ul style="list-style-type: none"> ■ Selection of the air heaters for configuration and settings, and choice of language ■ Selection of the system of units (°C / °F) ■ Selection of the time programs for the zones ■ Temperature settings for the zones

10.3 Password levels

To log in with a password, proceed as follows:

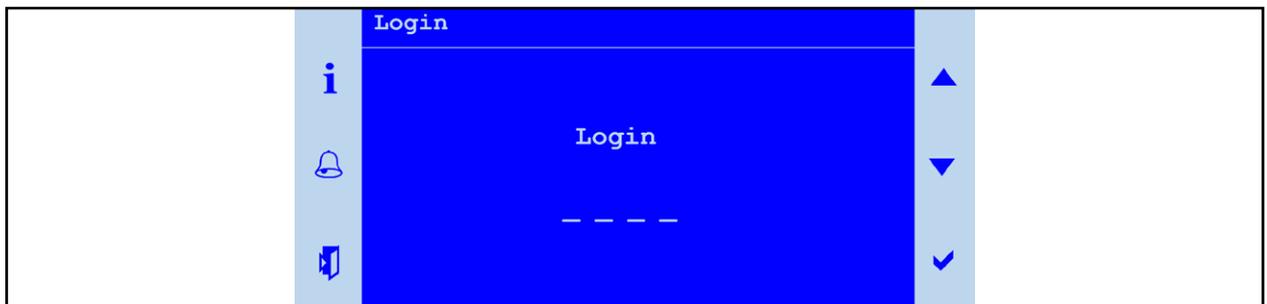


Fig. 15 Password input

Step	Description
1	Go to the following menu item: Main menu > Password input
2	Using the rotary knob, enter the four individual digits and confirm each digit by pressing the rotary knob.

The logged-in password level is shown at the top right of the display in the form of key symbols.

NOTE



Always change the default password to a password of your choice to prevent unauthorised access. Never disclose passwords to unauthorised persons.

The following password levels are stored:

User	Level	Symbol	Default password	Typical settings
User (operator)	6		1 0 0 0 (changeable)	<ul style="list-style-type: none"> ■ Change temperature setpoints ■ Set time program
Service	4		2 0 0 0 (changeable)	<ul style="list-style-type: none"> ■ Commissioning and configuration of sensors, actuators and functions ■ Make settings for special functions
Factory (Manufacturer)	2		* * * *	<ul style="list-style-type: none"> ■ Advanced functions, settings and diagnostic options reserved for the manufacturer

The passwords can be changed in the following menu item:

Main menu > Password input

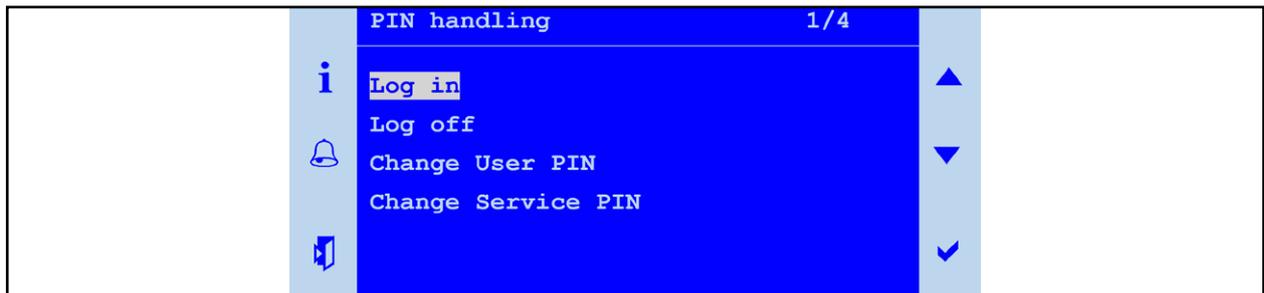


Fig. 16 Password change

11 Display

11.1 Start page

If no input is made at the control unit for an extended period, the display goes back the start page. The most important information on the system can be found here.

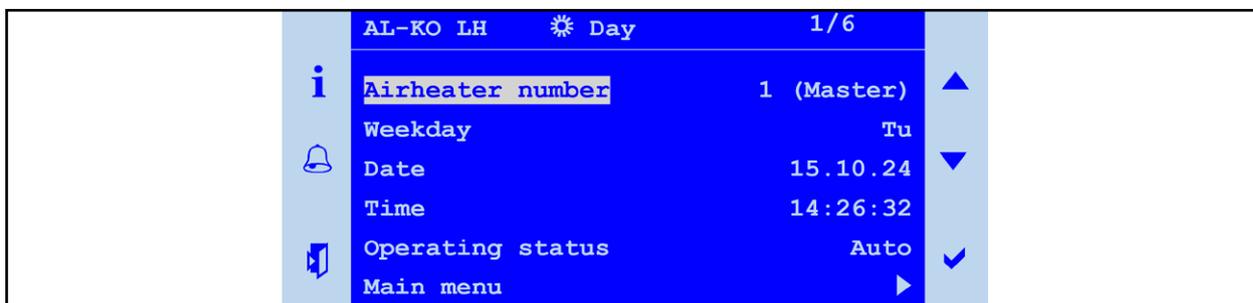


Fig. 17 Start page

Display	Values	Description
AL-KO LH		Information: You are working with an AL-KO THERM air heater controller
Symbol in the title line		Indicates the current system status: <ul style="list-style-type: none"> ■ System OFF ■ System in DAY mode ■ System in NIGHT mode ■ System in MANUAL mode ■ System in FROST PROTECTION mode ■ Alarm
Text in the title line	<ul style="list-style-type: none"> ■ Off ■ Day ■ Night ■ Manual ■ Frost ■ Alarm 	Indicates the current operating mode. <ul style="list-style-type: none"> ■ System OFF ■ System in DAY mode ■ System in NIGHT mode ■ System in MANUAL mode ■ System in FROST PROTECTION mode ■ System has an alarm
Air heater number	<ul style="list-style-type: none"> ■ 1 to 8 	<ul style="list-style-type: none"> ■ Indicates the number of the air heater
Day of the week	<ul style="list-style-type: none"> ■ Monday ■ Tuesday ■ Wednesday ■ etc. 	Current day of the week
Date		Current date
Time		Current time
Operating status display	<ul style="list-style-type: none"> ■ OFF ■ Auto ■ Day ■ Night ■ Manual 	Display of the current operating mode
Main menu		Switch to main menu

11.2 INFO LED

The INFO key on the control unit (BT-PREMIUM) has an integrated LED. This provides an initial indication of the system status.

LED	Status	Description
	Off	System is OFF
	Green	System is ON
	Orange/green flashing	Manual mode active
	Orange flashing	System is not functional, configuration has not been completed.

11.3 Alarm LED

The ALARM key on the control unit (BT-PREMIUM) has an integrated LED. This provides an initial overview of the alarm status of the system.

LED	State	Description
	Off	No alarm
	Red flashing	Alarm active
	Red	Alarm is still active and an attempt has been made to acknowledge it.

11.4 Set language

To set the HMI language, go to the following menu item:

Main menu > Commissioning > Language selection



Fig. 18 Language selection

The following languages are available.

Language	
[EN]	English
[DE]	Deutsch
[IT]	Italiano
[PL]	Polski
[FR]	Français
[NL]	Nederlands

12 Setting the time program and time

A weekly program is available in the control. Up to eight switching points can be set for each day of the week. Each switching time can be assigned to one or more days. In this operating mode, the air heater automatically switches between day and night mode according to the programmed switching times.

12.1 Set time and date

To view and/or change the settings, open the following menu item:

Main menu > Time program > Date/time setting

NOTE



The user password is required to change the weekly program. Ensure that the system clock is running. If the date is showing 2003 and/or the clock is not running, the system clock must be set. To do this, use the rotary knob to select the system time and press the rotary knob. Then use the rotary knob to set the individual digits of the system time and confirm each individual digit by pressing the rotary knob.

12.2 Set time program

12.2.1 Weekly program

A weekly program is available in the control. Up to eight switching points can be set for each day of the week.

To view and/or change the settings, open the following menu item:

Main menu > Time program

NOTE



The user password is required to change the weekly program.

Display	Values	Description
Actual value	<ul style="list-style-type: none"> ■ Off ■ Day ■ Night 	Indicates the operating mode currently requested by the time program <ul style="list-style-type: none"> ■ System OFF ■ System ON in Day mode ■ System ON in Night mode
Monday	<ul style="list-style-type: none"> ■ Passive ■ Active 	Indicates whether, according to the system clock, today is Monday and the corresponding time switch catalogue is therefore active. <ul style="list-style-type: none"> ■ It is not Monday, the corresponding time switch catalogue is not active ■ It is Monday and the corresponding time switch catalogue is active

Copy schedule	<ul style="list-style-type: none"> ■ Mon closed ■ Tue-Fri ■ Tue-Sun ■ Tue ■ Wed ■ Thu ■ Fri ■ Sat ■ Sun ■ Exception 	<p>Copy function to transfer the time switch catalogue from Monday to other days. This saves time when entering data.</p> <ul style="list-style-type: none"> ■ Do not copy ■ Copy now from Monday to Tuesday through Friday ■ Copy now from Monday to Tuesday through Sunday ■ Copy now from Monday to Tuesday ■ Copy now from Monday to Wednesday ■ Copy now from Monday to Thursday ■ Copy now from Monday to Friday ■ Copy now from Monday to Saturday ■ Copy now from Monday to Sunday ■ Copy now from Monday to exception day
Tuesday - Sunday	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates, as for Monday, whether today is Tuesday ... Sunday according to the system clock and the corresponding time switch catalogue is therefore active.</p> <ul style="list-style-type: none"> ■ It is not Tuesday ... Sunday; the corresponding time switch catalogue is not active ■ It is Tuesday ... Sunday; the corresponding time switch catalogue is active
Exception calendar	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates whether exception periods (e.g.holidays) are currently set.</p> <ul style="list-style-type: none"> ■ No period is set ■ At least one period is set <p> The function of the calendar is described below. See chapter "12.2.2 Calendar" on page 43.</p>
Exception day	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates whether the system time is currently in an exception period and the corresponding time switch catalogue is therefore active.</p> <ul style="list-style-type: none"> ■ It is not an exception day and the corresponding time switch catalogue is not active ■ It is an exception day and the corresponding time switch catalogue is active <p> The function of the calendar is described below. See chapter "12.2.2 Calendar" on page 43.</p>
Fix-off calendar	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates whether fix-off periods are currently set, i.e. the system is OFF.</p> <ul style="list-style-type: none"> ■ No period is set ■ At least one period is set <p> The function of the calendar is described below. See chapter "12.2.2 Calendar" on page 43.</p>

To view and/or change the time switch catalogue of a day of the week, go to the day of the week in question using the rotary knob and confirm it by pressing the rotary knob.

NOTE



The user password is required to change time switch catalogues.

Display	Values	Description
Time 1	■ 00:00	Switching time 1 is always set to 00:00
Value 1	<ul style="list-style-type: none"> ■ Off ■ Day ■ Night 	<p>Indicates the operating mode corresponding to switching time 1. Set here the operating mode to which the system should switch at the beginning of the day. "Off" is recommended, unless the system is to start running or be operating at 00:00.</p> <ul style="list-style-type: none"> ■ System OFF ■ System ON in Day mode ■ System ON in Night mode
Time 2 – Time 6	<ul style="list-style-type: none"> ■ *: * ■ 00:00 - 23:59 	<p>Indicates the switching times 2 to 6:</p> <ul style="list-style-type: none"> ■ The switching time is not used ■ Entered switching time
Value 2 – Value 6	<ul style="list-style-type: none"> ■ Off ■ Day ■ Night 	<p>Indicates the operating modes 2 to 6 for the corresponding switching times 2 to 6.</p> <ul style="list-style-type: none"> ■ System OFF ■ System ON in Day mode ■ System ON in Night mode The corresponding time switch catalogue is active

12.2.2 Calendar

In addition to the weekly program, a calendar is available in the controller:

- Exception calendar

The exception calendar is intended for storing exception periods (e.g. holidays). In an exception period, the time switch catalogue stored for the exception day applies, i.e. the priority is higher than the weekly program.

The fix-off calendar always switches the system off and therefore has an even higher priority than the exception calendar.

Up to ten periods can be set per calendar.

To set the time switch catalogue for the exception day, open the following menu item:

Main menu > Time program > Calendar off

NOTE



The user password is required to change the calendar.

Display	Values	Description
Actual value	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates whether a period (e.g. holidays) is set in the calendar.</p> <ul style="list-style-type: none"> ■ No period is set ■ At least one period is set
+Choice-1 ... +Choice-10	<ul style="list-style-type: none"> ■ Date ■ Range ■ Day of the week ■ Off 	<p>Indicates the type of input for the corresponding period.</p> <ul style="list-style-type: none"> ■ A special date/day ■ A time period (e.g. holiday) ■ An exact day of the week ■ Entries for the period are not valid

(Start) date	<ul style="list-style-type: none"> ■ * ■ Mon – Sun ■ * ■ DD.MM.YYYY 	<p>The Start date is entered under Range here. The exact date is entered under Date here.</p> <ul style="list-style-type: none"> ■ The day of the week is disregarded ■ The day of the week is not disregarded ■ Not possible! Please enter the date. ■ Date input <p> To make an input, turn the rotary knob to the appropriate line and press the rotary knob. Select the desired value by turning the rotary knob and confirm the value by pressing the rotary knob. The cursor automatically moves to the next value in the same line. Select the value again and confirm it, etc.</p>
End date	<ul style="list-style-type: none"> ■ Passive ■ Active 	<p>Indicates, as for Monday, whether today is Tuesday ... Sunday according to the system clock and the corresponding time switch catalogue is therefore active.</p> <ul style="list-style-type: none"> ■ It is not Tuesday ... Sunday; the corresponding time switch catalogue is not active ■ It is Tuesday ... Sunday; the corresponding time switch catalogue is active <p> To make an input, turn the rotary knob to the appropriate line and press the rotary knob. Select the desired value by turning the rotary knob and confirm the value by pressing the rotary knob. The cursor automatically moves to the next value in the same line. Select the value again and confirm it, etc.</p>
Day of the week	<ul style="list-style-type: none"> ■ * ■ 1. ■ 2. ■ 3. ■ 4. ■ 5. ■ Last ■ * ■ Mon – Sun ■ * ■ Even ■ Odd ■ Jan – Dec 	<p>The day of the week is entered under Day of the week here. The input is made with three values.</p> <ul style="list-style-type: none"> ■ Every one ■ First ■ Second ■ Third ■ Fourth ■ Fifth ■ Last ■ Not possible! ■ Monday... Sunday ■ In every month ■ In even months ■ In odd months ■ In January... December <p> To make an input, turn the rotary knob to the appropriate line and press the rotary knob. Select the desired value by turning the rotary knob and confirm the value by pressing the rotary knob. The cursor automatically moves to the next value in the same line. Select the value again and confirm it, etc.</p>

13 Operating modes

13.1 Operating modes and switching priorities

The system has the following operating modes:

Display	Description
Off (=standby)	The system is off (frost protection function is active, if installed)
Auto	The system is in Automatic mode (time program or external enable)
Day	The system is on and operating with the Day temperature setpoint
Night	The system is on and operating with the Night temperature setpoint
Manual	The system is in Manual mode and operating with the set fan power

13.1.1 Switching priorities

The available operating modes can be selected via the following points:

Switching point	Priority
Full-scale control unit (BT-PREMIUM)	Highest
External enable to digital input (presence detector)	Second
Time switch program Configuration!	Third

13.2 Manually at the control unit

To control the system manually via the control unit (BT-PREMIUM), first open the 'Operating mode' item in the main menu. Then use the rotary knob to move to the operating mode switch:

Start page > Main menu > Operating mode > Operating mode

NOTE

The User password is required to change the operating mode.

The screenshot shows a blue menu interface. At the top, it says 'Operating mode 1/5'. Below that, 'Operating mode' is highlighted in white with 'Manual' selected. Other menu items include 'Operating Manual', 'Fan 20.0%', and 'Heating/Cooling heat'. Navigation arrows are visible on the right side of the menu.

Fig. 19 Operating mode

Display	Values	Description
Operating mode switch	<ul style="list-style-type: none"> ■ Off ■ Auto ■ Day ■ Night ■ Manual 	<p>Switch to the operating mode with the highest priority on the control panel.</p> <ul style="list-style-type: none"> ■ System OFF ■ Automatic mode ■ The system is ON and operating with the Day temperature setpoint ■ The system is ON and operating with the Night temperature setpoint ■ The system is ON in Manual mode

13.3 External enable

NOTE



Some displays are only available with certain equipment and configurations of the system.

The air heater is switched on via a presence detector supplied as an option or supplied by the customer. For presence detectors without built-in run-on time, the run-on time can also be set on the controller. Only the digital input “External enable” is used for the function. (Manual operating mode prolongation)

The run-on time can be set individually for each air heater.

Main menu > Commissioning > Air heater 1...8 > Settings > External enable shutdown delay

14 Software commissioning

14.1 Initialisation

NOTE



The Service password is required for access to the initialisation.

NOTE



If a BT-PREMIUM is used with a two-wire cable, ensure that it always has contact to the master controller.

14.1.1 Initialisation of air heater 1 (master)

Connect the HMI to the controller that is to act as Air heater 1 (master), then connect it to the power supply.

ATTENTION



When using the BT-PREMIUM, go to the menu of the HMI by holding the ESC key pressed and select the name of the master controller under “Ranking”.

Make the basic settings for the master under:

Main menu > Commissioning > Air heater 1 (master) > Configuration

Air heater 1 must be set to Air heater 1 under “Air heater number”!

Then carry out the configuration according to the system equipment, see chapter “14.2 Configuration” on page 48. A restart is necessary at the end of the configuration!

14.1.2 Initialisation of air heaters 2 – 8

ATTENTION



When using the BT-PREMIUM, go to the menu of the HMI by holding the ESC key pressed and select the name of the master controller under “Ranking”.

NOTE



If a BT-PREMIUM is used with a two-wire cable, ensure that it always has contact to the master controller.

After successful configuration of air heater 1, the other air heaters can always be switched on individually.

If a further air heater is connected via the process bus, a restart must then be carried out at this controller (switch the voltage on and off). The air heater can then be configured via the commissioning menu of the master controller according to its equipment.

The air heaters are numbered from 2 to 8 in the order of their connection and then initialised in this order.

14.2 Configuration

ATTENTION



The configuration may only be changed when the system is switched off. A change to the configuration requires a restart of the controller.

NOTE



The Service password is required for access to the configuration.

NOTE



Some points can be skipped, depending on the system equipment and configuration.

Proceed as follows to configure the individual air heaters:

Main menu > Commissioning > Air heaters 1 – 8 > Configuration

The configuration is always valid for the selected air heater.

Display	Values	Description
Temp setting/Room 3	<ul style="list-style-type: none"> ■ No ■ External setpoint setting ■ Room sensor 3 ■ TMC 	<ul style="list-style-type: none"> ■ No sensor connected to this input ■ Temperature setpoint via external setpoint setting ■ Temperature sensor 3 connected ■ TMC controller connected
Temperature sensors	<ul style="list-style-type: none"> ■ Room sensor 1 ■ Room sensor 2 ■ Intake air sensor ■ Frost detector 	<ul style="list-style-type: none"> ■ Temperature sensor 1 connected ■ Temperature sensor 2 connected ■ Intake air temperature sensor connected ■ Frost detector connected
Heating/cooling	<ul style="list-style-type: none"> ■ Heating valve ■ Heating pump ■ Cooling valve ■ Cooling pump ■ Accumulated heat 	<ul style="list-style-type: none"> ■ Valve for heating mode connected ■ Pump for heating mode connected ■ Valve for cooling mode connected ■ Pump for cooling mode connected ■ Accumulated heat mode
Fan alarm	<ul style="list-style-type: none"> ■ No ■ Digital ■ Analogue 	<ul style="list-style-type: none"> ■ No fan alarm ■ Fan alarm via digital input ■ Fan alarm via analogue input
Alarms	<ul style="list-style-type: none"> ■ Condensate ■ Service 	<ul style="list-style-type: none"> ■ Condensate pump alarm ■ Service alarm
Additional inputs	<ul style="list-style-type: none"> ■ External enable ■ Door contact ■ Heating/cooling 	<ul style="list-style-type: none"> ■ System enable via external device (presence detector) ■ For air curtain function ■ External switching of heating/cooling (e.g. TMC)

Smoke detector/Emergency off	<ul style="list-style-type: none"> ■ No ■ Smoke detector ■ Emergency off 	<ul style="list-style-type: none"> ■ No smoke detector or emergency off connected ■ Smoke detector connected ■ Emergency off connected
Flaps	<ul style="list-style-type: none"> ■ External operating message ■ Flap 	<ul style="list-style-type: none"> ■ Connection of an external operating message ■ Flap connected
Additional functions	<ul style="list-style-type: none"> ■ Fan % ■ Fan speeds ■ Overheating protection ■ Cooling protection ■ Gate air curtain ■ Draught limitation ■ Kick heating ■ Kick cooling 	<ul style="list-style-type: none"> ■ Fan speed can be set in % in Manual mode ■ Fan speed can be set via speed selection in Manual mode ■ Overheating protection ■ Cooling protection ■ Gate air curtain (only in combination with door contact) ■ Fan speed is reduced if intake air temperature is too low ■ Kick function heating valve/pump ■ Kick function cooling valve/pump
Temp Min/Max/Average	<ul style="list-style-type: none"> ■ Average value ■ Minimum value ■ Maximum value 	<ul style="list-style-type: none"> ■ Temperature control to average value ■ Temperature control to minimum value ■ Temperature control to maximum value
Zone selection (Only possible if included in scope of supply)	<ul style="list-style-type: none"> ■ Single ■ Zone1 ■ Zone2 ■ Zone3 ■ Zone4 ■ Zone5 	<ul style="list-style-type: none"> ■ Air heater as stand-alone device without zone assignment ■ Air heater is in zone 1 (master always zone 1) ■ Air heater is in zone 2 ■ Air heater is in zone 3 ■ Air heater is in zone 4 ■ Air heater is in zone 5

14.3 Inputs

NOTE



The Service password is required for access.

NOTE



The setting options are limited for air heaters 2-8. For more extensive settings, the respective controller must be accessed directly via the HMI.

Display of the configured inputs and setting options such as NO/NC, alarm configuration, etc.

14.4 Outputs

NOTE



The Service password is required for access.

NOTE

The setting options are limited for air heaters 2-8. For more extensive settings, the respective controller must be accessed directly via the HMI.

Display of the configured outputs and setting options such as NO/NC, alarm configuration, etc.

14.5 Settings

NOTE

The Service password is required for access.

NOTE

The setting options are limited for air heaters 2-8. For more extensive settings, the respective controller must be accessed directly via the HMI.

NOTE

Some displays are only available with certain equipment and configurations of the system.

Setting options for controllers and times:

Display	Values	Description
Temperature		<ul style="list-style-type: none"> ■ Setting of the temperature setpoints and dead zones
Fan		<ul style="list-style-type: none"> ■ Settings for the fan PI controller ■ In manual mode with level setting, setting of the individual fan speed levels. ■ Minimum running time ■ Start delay ■ Stop delay ■ Operating hour limit
Heating valve		<ul style="list-style-type: none"> ■ Setting for the heating PI controller
Minimum pump running time	...s	<ul style="list-style-type: none"> ■ Setting of the minimum running time for the heating pump
Cooling valve		<ul style="list-style-type: none"> ■ Setting for the cooling PI controller
Minimum pump running time	...s	<ul style="list-style-type: none"> ■ Setting of the minimum running time for the cooling pump
External enable shutdown delay	...min	<ul style="list-style-type: none"> ■ Setting of the shutdown delay for the external enable (presence detector)
Date/time settings		<ul style="list-style-type: none"> ■ Date and time settings

15 Functions

15.1 Fan control

This is a temperature-dependent speed control.

In automatic mode, the fan controller is coupled to the temperature controller.

If the setpoint is reached, the fan speed is reduced to 0%.

The fan regulates its speed independently, depending on the temperature. If the setpoint is not reached, the fan speed is increased. If the temperature rises (heating) or drops (cooling), the fan speed is automatically adjusted accordingly.

The reaction speed can be influenced by the PI controller of the heating or cooling valve and the PI controller of the fan.

NOTE



A shutdown delay must be activated with PWW temperatures above 70°C.

In manual mode, the fan can be controlled either from 20-100% or from speed 1-8.

15.2 Temperature control

With a single device: Temperature control with up to 3 room temperature sensors.

Zone devices: Temperature control is possible for up to a maximum of 3 room temperature sensors per air heater in the zone. All air heaters in a zone use the temperature sensors of the zone together. The air heaters in the zone to which temperature sensors are connected can be freely selected.

The following temperature control options are available for each zone and each individual device:

- Average value: Control to an average value of the temperature sensors, allowing for an adjustable dead zone.
- Minimum value: Control to the lowest temperature value of the sensors, allowing for an adjustable dead zone
- Maximum value: Control to the highest temperature value of the sensors, allowing for an adjustable dead zone.

Automatic switching between heating and cooling or preselection via the HMI or via digital input Heating/cooling possible

15.2.1 Heating

The room temperature is continuously compared with the temperature setpoint and corrected if there is a deviation.

If the room setpoint is not reached in heating mode, allowing for an adjustable dead zone, proceed as follows: The fan speed is increased to an adjustable maximum to increase the air throw.

15.2.2 Cooling

The room temperature is continuously compared with the temperature setpoint and corrected if there is a deviation.

If the room setpoint is not reached in cooling mode, allowing for an adjustable dead zone, proceed as follows: The fan speed is increased to an adjustable maximum to increase the air throw.

15.3 External setpoint setting

Separate scalable 0-10 V input for setting the temperature setpoint, matching the selected temperature control strategy.

15.4 Cooling/overheating protection

If the system is switched off (Standby), the controller monitors whether the room temperature drops below an adjustable limit value or rises above an adjustable limit value. The system then starts automatically and regulates the temperature to an adjustable heating setpoint or cooling setpoint. This function operates independently of the time program.

15.5 Door contact (gate air curtain)

When the door is closed, the temperature control is in normal mode. If the door is open, the fan speed is increased to 100%.

Heating valve and heating pump are always activated.

NOTE



The function is always possible only for the air heater to which a door contact is connected.

15.6 Draught limitation

NOTE



A sensor is required for the intake air temperature!

If the intake air temperature is too low, the fan speed is reduced to avoid draughts.

Heating: lower limit temperature default 34°C

Cooling: lower limit temperature default 15°C

15.7 Hot water heater

During heating, the valve is opened via the digital output.

The pump of the hot water heater is started when the heating requirement is 5% or more and is stopped again when the heating requirement is below 1%.

15.8 Cold water cooler

During cooling, the valve is opened via the digital output.

The pump of the cold water cooler is started when the cooling requirement is 5% or more and is stopped again when the cooling requirement is below 1%.

If included in the scope of supply, a condensate message is displayed on the controller. The condensate pump is self-regulating. If the condensate cannot be drained, cooling must be stopped (e.g. if the pump is defective or there is too much condensate - fill level alarm).

15.9 Frost protection for hot water heater

The hot water heater is monitored for freezing by means of a frost protection detector. If it trips, the control valve is opened and the pump is started.

15.10 Kick function

To prevent mechanical damage, the heating/cooling valve and the pump are started after an adjustable interval for an adjustable period. Alternatively, a fixed day of the week and a fixed time can be set for the kick.

For the kick function, open the following menu item:

Main menu > Commissioning > Air heater 1...8 > Settings > Kick functions

NOTE



The Service password is required for access.
A valve or pump must be configured.

Display	Values	Description
Heating		
> Date /	<input type="checkbox"/> * * : * <input type="checkbox"/> Mon ... Sun	Indicates the day of the week and/or the time defined for the kick <input type="checkbox"/> No definition <input type="checkbox"/> Day of the week
> Time	00:00 ... 23:59	Time is set
> Interval	0.0 ... 36000.0 h	Indicates the interval defined for the kick.
> Duration	0 ... 36000 s	Indicates the duration defined for the kick.
Cooling		
> Date /	<input type="checkbox"/> * * : * <input type="checkbox"/> Mon ... Sun	Indicates the day of the week and/or the time defined for the kick <input type="checkbox"/> No definition <input type="checkbox"/> Day of the week
> Time	00:00 ... 23:59	Time is set
> Interval	0.0 ... 36000.0 h	Indicates the interval defined for the kick.
> Duration	0 ... 36000 s	Indicates the duration defined for the kick.

15.11 TMC

The system is compatible with the TMC.

To use this, go to Commissioning > Configuration > Temp. setting /Room3 and select the TMC option.

An external enable and heating/cooling switching must also be parameterised under Commissioning > Configuration > Additional inputs.

16 Parameter sets

16.1 SD card

The controller has a slot for an SD card. This can be used to store parameter sets on an SD card or to load them from an SD card.

The SD card must satisfy the following criteria: max. 32 GB and FAT32 formatting.

The SD card can be removed after commissioning and kept as a parameter backup.

Go to the following menu item:

Main menu > Commissioning > Air heater 1 > Save/load

NOTE



The Service password is required for access.

Loading of a parameter set from an SD card requires at least one restart of the controller. In the event of a malfunction, it may be necessary to restart the controller a second time.

Display	Values	Description
External memory	<ul style="list-style-type: none"> ■ NoCard ■ ReadWrite ■ Read Only 	<p>Indicates whether an SD card has been inserted into the controller.</p> <ul style="list-style-type: none"> ■ No card inserted ■ Card inserted from which parameters can be loaded and to which parameters can be saved ■ Card inserted to which parameters may not be saved
>Save parameters -> SD	<ul style="list-style-type: none"> ■ ■ Execute 	<p>The parameter set can be saved to the SD card here.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Save the parameter set now
>	<ul style="list-style-type: none"> ■ ■ Done 	<p>Indicates the status when saving the parameter set to the SD card.</p> <ul style="list-style-type: none"> ■ No display indicates that saving is still in progress ■ This display indicates that saving has been completed
>Load parameters <- SD	<ul style="list-style-type: none"> ■ ■ Execute 	<p>The parameter set can be loaded from the SD card here.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Now load the parameter set
>	<ul style="list-style-type: none"> ■ ■ Done 	<p>Indicates the status when loading the parameter set from the SD card.</p> <ul style="list-style-type: none"> ■ No display indicates that loading is still in progress ■ This display indicates that loading has been completed
Filter	<ul style="list-style-type: none"> ■ Archive ■ Time prog. ■ Comm.mod. ■ EnableObj ■ Done 	<p>Makes it possible to load the parameters from the SD card selectively:</p> <ul style="list-style-type: none"> ■ A ✓ symbol means that no data logging configuration is loaded ■ A ✓ symbol means that no time programs are loaded ■ A ✓ symbol means that no parameters from communication modules (BACnet, Modbus, etc.) are loaded ■ A ✓ symbol means that no system configuration is loaded. ■ Accept the changes. <p> Turn the rotary knob to the appropriate line and press the rotary knob to set a ✓ symbol or to delete it again. To accept a change, turn the rotary knob to "Done" and confirm the change by pressing the rotary knob.</p>
Restart required	<ul style="list-style-type: none"> ■ ■ Execute 	<p>A restart of the controller can be triggered here.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Restart now

16.2 Internal memory

The controller has two internal memories. One is a service memory for storing the parameter set after commissioning, optimisation or expansion/changes on-site in the controller or to upload this status again. The other memory is a factory memory that contains the factory settings.

Go to the following menu item:

Main menu > Commissioning > Air heater 1 > Save/load

NOTE



The Service password is required for access.

Display	Values	Description
Load factory parameters	<ul style="list-style-type: none"> ■ ■ Execute 	<p>The parameter set can be loaded from the factory memory here. This restores the factory settings.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Now load the parameter set <p> The Service password is required for access. After loading, the controller starts again automatically.</p>
Load service parameters	<ul style="list-style-type: none"> ■ ■ Execute 	<p>The parameter set can be loaded from the Service memory here.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Now load the parameter set <p> The memory has no data stored on leaving the factory. After loading, the controller starts again automatically.</p>
Save service parameters	<ul style="list-style-type: none"> ■ ■ Execute 	<p>The parameter set can be saved to the Service memory here.</p> <ul style="list-style-type: none"> ■ Do nothing ■ Save the parameter set now <p> The Service password is required for access. After saving, the controller starts again automatically.</p>

17 Alarms

17.1 Page navigation

The ALARM button can be used to cycle through the following alarm pages.

Page	Description
Alarm list detail	Indicates the name, priority and time of occurrence of the selected alarm. The following priorities are possible: <ul style="list-style-type: none"> ■ Danger / system OFF (A) ■ Critical (A) ■ Low (B) ■ Warning (C)
Alarm list	Displays the list of pending alarms. The list has a maximum of 50 entries. Turn the rotary knob to an entry and press the rotary knob to view the details of the alarm.
Alarm history	Displays the list of historic alarms. The list has a maximum of 50 entries. The prefix + indicates an alarm that appeared. The prefix – indicates an alarm that disappeared. Turn the rotary knob to an entry and press the rotary knob to view the details of the alarm.
Alarm history detail	Indicates the name (incl. prefix), priority and time when it appeared and disappeared. The following priorities are possible: <ul style="list-style-type: none"> ■ Danger / system OFF (A) ■ Critical (A) ■ Low (B) ■ Warning (C)
Alarm signalling	Display options for sorting the alarm list and alarm history. From here, ENTER can be used to open the alarm list or alarm history by making the necessary selection.

17.2 Acknowledge

First press the ALARM button repeatedly until the alarm list page appears. The top line shows Acknowledge. Ensure that the Acknowledge line is marked by turning the rotary knob and press the rotary knob.

Then turn the rotary knob to “Execute” and press the rotary knob again to confirm.

The alarm is acknowledged.

If the alarm does not disappear after acknowledge is selected, the fault has not yet been rectified.

18 Modbus RS485

A Modbus RS485 interface is available for communication with the building management system.

All RS485 communication parameters (slave address, baud rate, parity, etc.) are adjustable.

To view or change the settings, open the following menu item:

Main menu > Commissioning > Air heater 1 > Modbus

19 Disposal

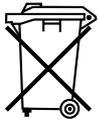
WARNING



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 air heater controller, operating equipment and accessories, proceed according to the relevant local environmental and waste disposal regulations applicable at the time of the work.

20 Spare parts**ATTENTION**

Use only OEM 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 in the section below.

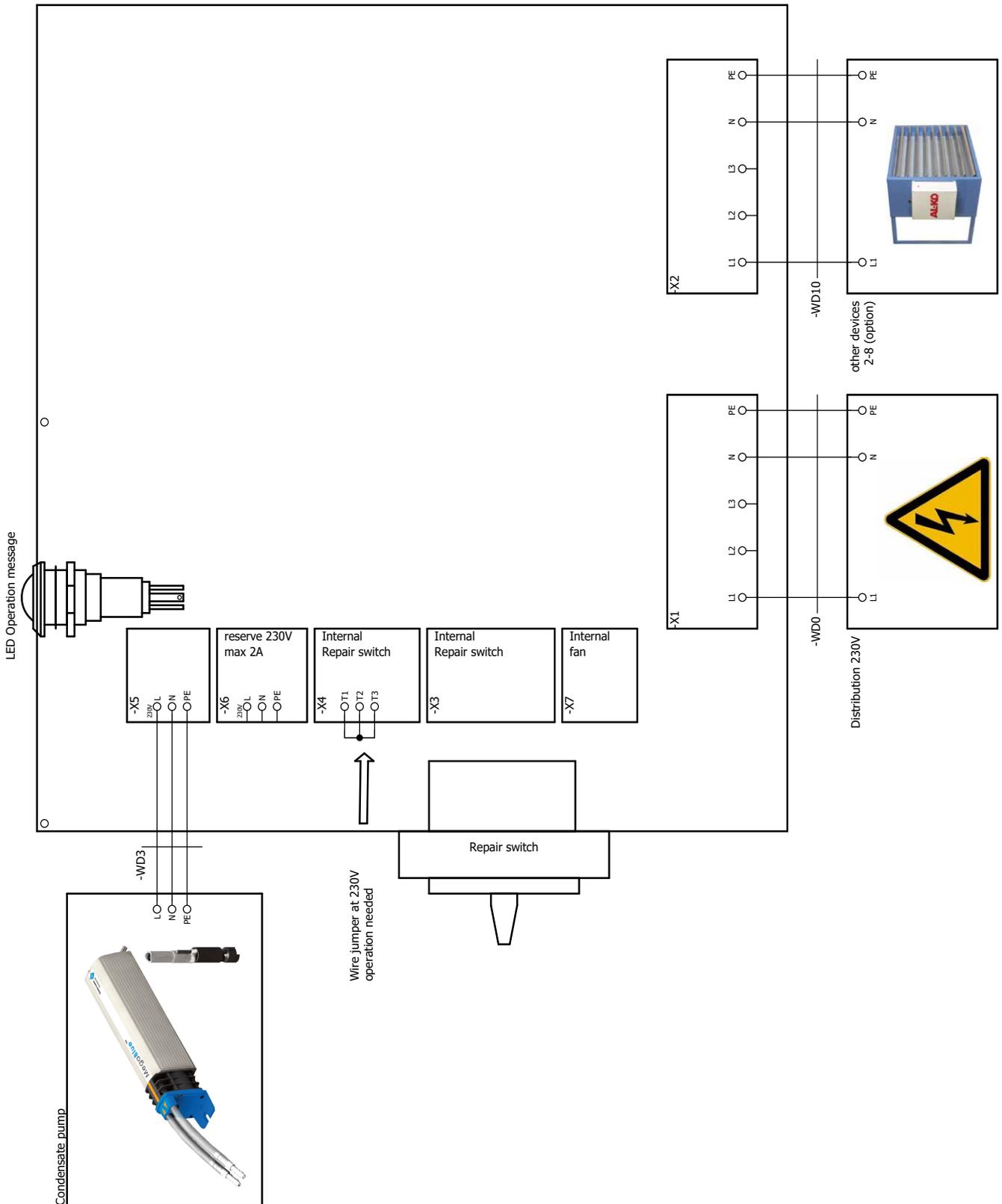
ATTENTION

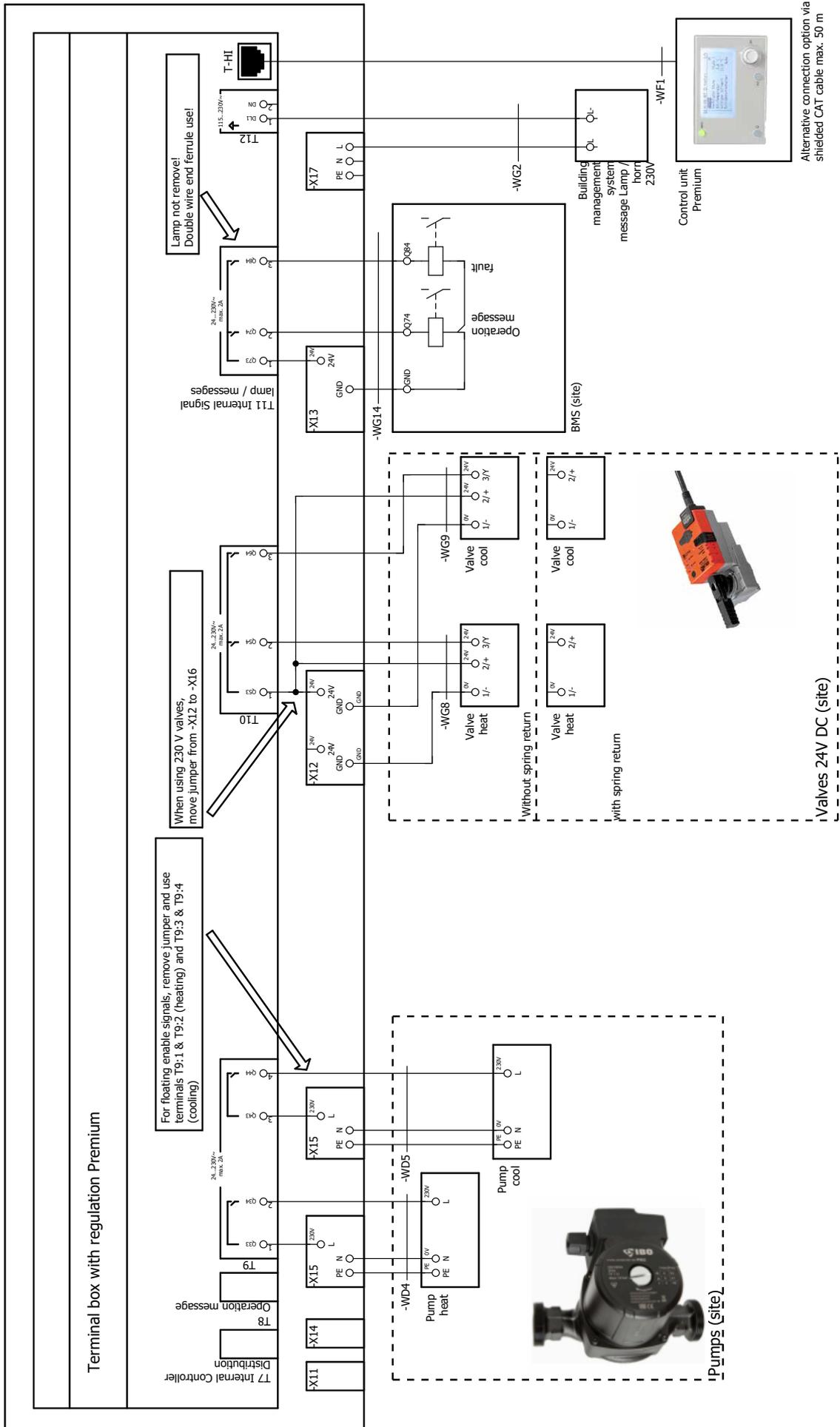
If third-party spare parts are installed or changes are made without consultation with the manufacturer, a new conformity assessment must be carried out by a qualified person. After carrying out the evaluation, it must be documented in accordance with the Machinery Directive. The Declaration of Conformity and Declaration of Incorporation will be invalidated in the event of a modification to the air heater controller or air heater not approved by AL-KO THERM. The warranty may also be invalidated.

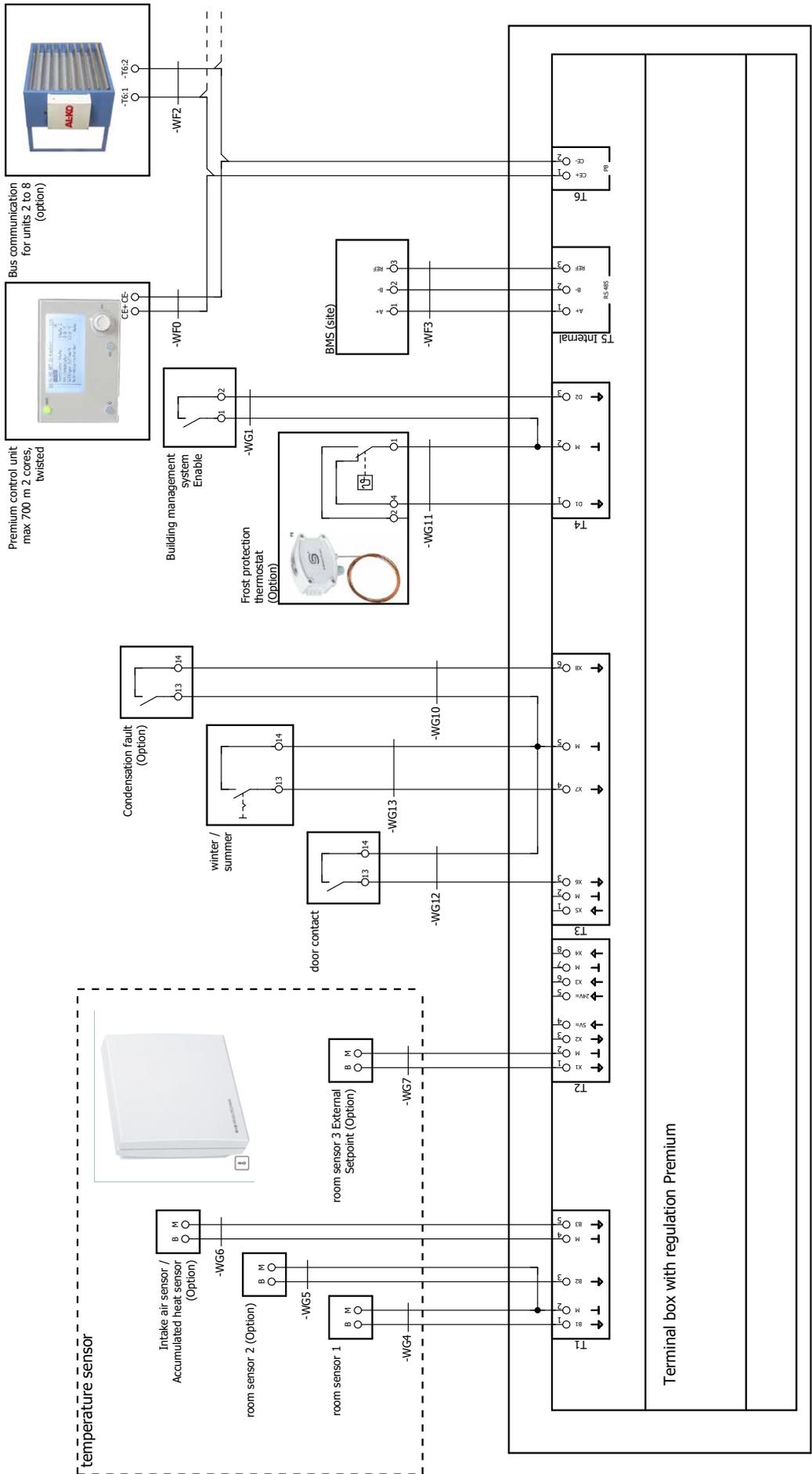
AL-KO THERM GMBH	Phone:	(+49) 82 25 / 39 - 0
Hauptstraße 248-250	Fax:	(+49) 82 25 / 39 - 2113
89343 Jettingen-Scheppach	E-mail:	klima.technik@alko-air.com
Germany	Web:	www.alko-airtech.com
Air Heater	Phone:	(+49) 82 25 / 39 - 2145
	E-mail:	Luftheizung@alko-air.com

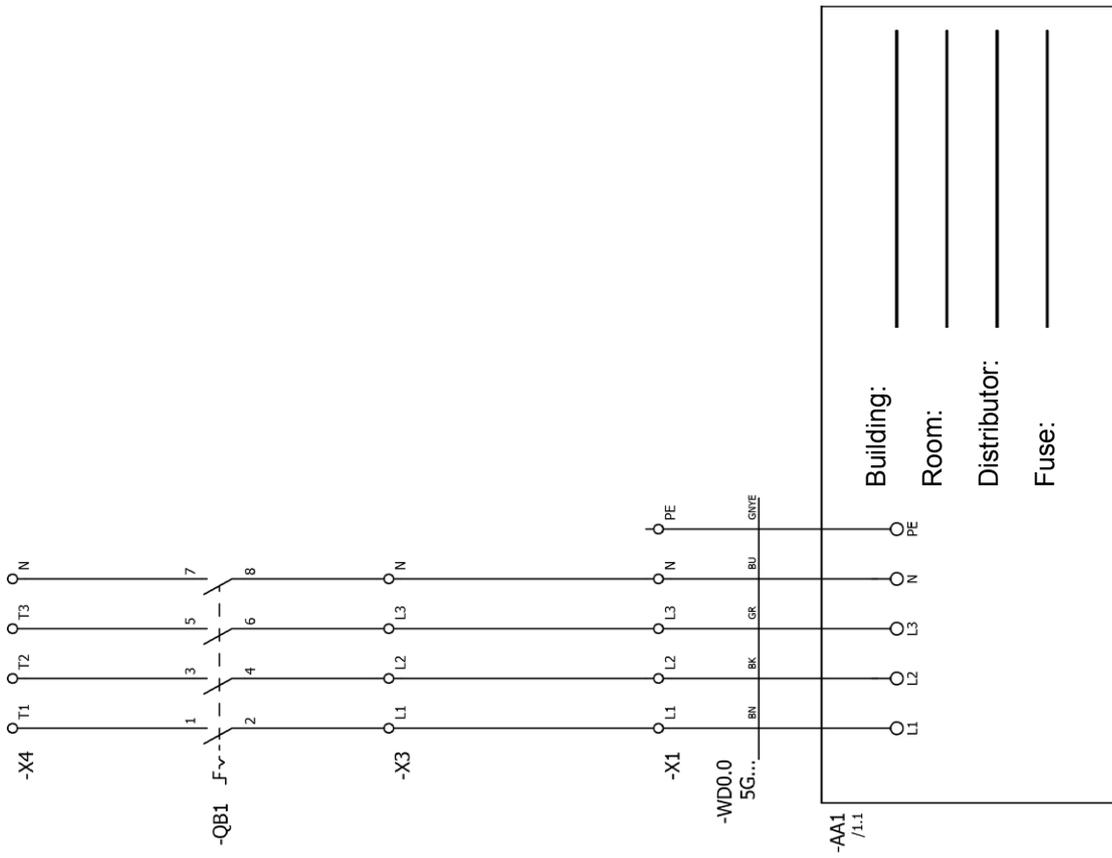
	Article No.	Designation
Terminal box		
	3912099	PREMIUM terminal box with power supply unit
Repair switch		
	3911637	Repair switch for PREMIUM terminal box
PREMIUM Operating element		
	3912023	BT-PREMIUM 31 (IP31)
PREMIUM Operating element with housing for damp rooms		
	3911991	BT-PREMIUM 65 (IP65)

21 Original wiring diagrams



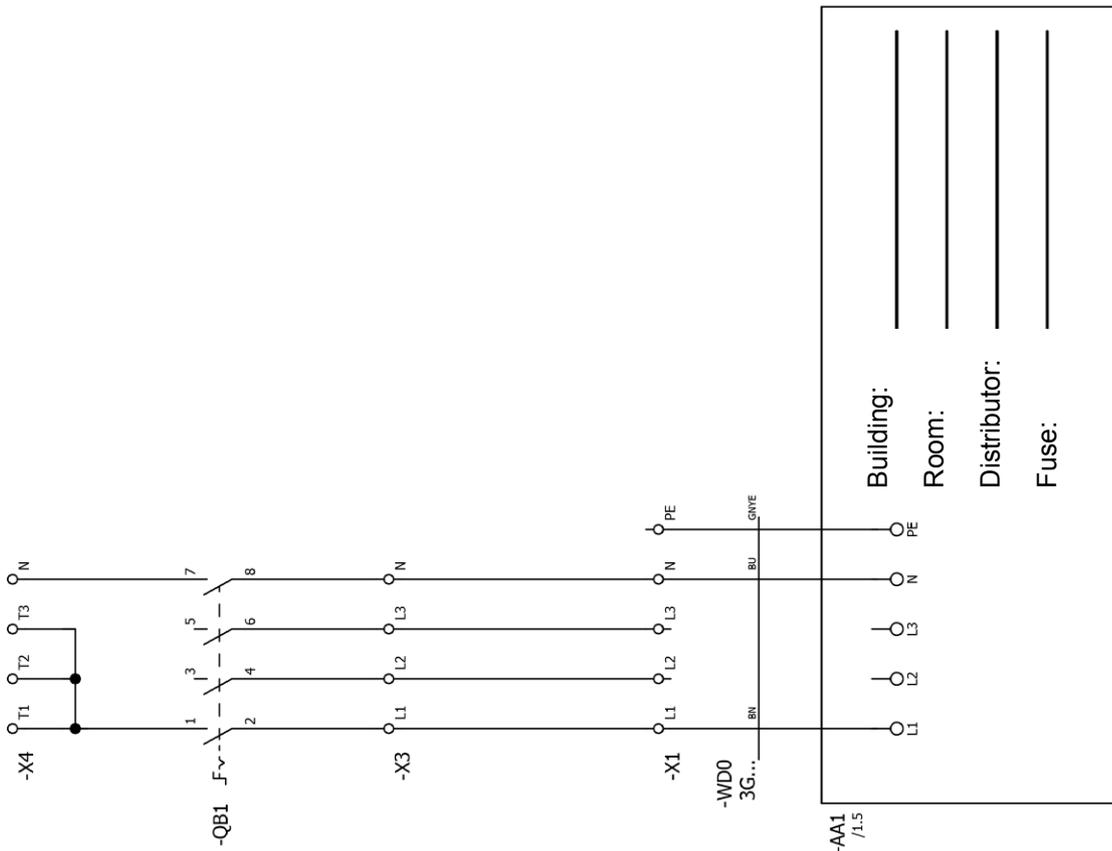






Einspeisung

OR



Einspeisung

22 Certifications

The following EC Declaration of Conformity applies to the control unit

22.1 EC Declaration of Conformity conforming to 2006/42/EC

EG-KONFORMITÄTSERKLÄRUNG

EC DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ CE



QUALITY FOR LIFE

Hersteller / Manufacturer / Fabricant: **AL-KO THERM GMBH | Hauptstraße 248-250 | 89343 Jettingen-Scheppach | Germany**

Im Sinne der EG-Maschinenrichtlinie 2006/42/EG, Anhang II, Teil 1, Abschnitt A

As defined in EC Machinery Directive 2006/42/EC, Annex II, Part 1, Section A
Au sens de la directive Machines CE 2006/42/CE, annexe II, partie 1, section A

Maschine / Machine / Machine :	Luftheiz- / Luftkühlergeräte, Deckenlüfter EC BASIC / EC PREMIUM <i>Air heating / air cooling devices, Ceiling fan EC BASIC / EC Premium</i> <i>Aérotherme / refroidisseur d'air, ventilateur de plafond EC BASIC / EC PREMIUM</i>	
Serie / Series / Série :	KOMFORT BASIC / PREMIUM	K EC, K/H EC, K/O EC
	COMFORT BASIC / PREMIUM	K EC, K/H EC, K/O EC
	COMFORT BASIC / PREMIUM	K EC, K/H EC, K/O EC
	Typ / type / Type: 140, 250, 400, 650	
	DL ENERGIE BASIC / PREMIUM	DL ENERGIE ...EC
	DL ENERGY BASIC / PREMIUM	DL ENERGIE ...EC
	DL ÉNERGIE BASIC / PREMIUM	DL ÉNERGIE ...EC
	Typ / type / Type: 140, 250, 400, 650	
	INDUSTRIE BASIC / PREMIUM	LH IND ...N EC, H EC, D EC, E EC, NF EC, HF EC, DF EC, EF EC, LK IND ...N EC, NF EC
	INDUSTRIE BASIC / PREMIUM	LH IND ...N EC, H EC, D EC, E EC, NF EC, HF EC, DF EC, EF EC, LK IND ...N EC, NF EC
	INDUSTRIE BASIC / PREMIUM	LH IND ...N EC, H EC, D EC, E EC, NF EC, HF EC, DF EC, EF EC, LK IND ...N EC, NF EC
	Typ / type / Type: 140; 250; 400; 650; 1000	

Hiermit erklären wir, dass die oben genannte Maschine alle sicherheitstechnischen Anforderungen der folgenden anwendbaren EG/EU- Richtlinien erfüllt:

We hereby declare that the above-mentioned machine conforms to all relevant safety-provisions of the following EG/EC directives:

Nous déclarons par la présente que la machine susmentionnée correspond à toutes les des exigences de sécurité pertinentes de la directive CE/UE suivante:

Maschinenrichtlinie 2006/42/EG / Machinery Directive 2006/42/EC / Directive Machines CE 2006/42/CE

Elektromagnetische Verträglichkeit 2014/30/EU / Electromagnetic Compatibility 2014/30/EU / Compatibilité électromagnétique 2014/30/UE

Druckgeräterichtlinie 2014/68/EU / Pressure Equipment Directive 2014/68/EU / Directive sur les appareils sous pression 2014/68/UE

(gilt nur für die Geräteausführungen/applicable only for instrument version/applicable seulement pour la version de l'appareil: LH-IND...D EC;-DF EC)

Angewandte harmonisierte Normen / Applied harmonized standards / Normes harmonisées appliquées:

- DIN EN ISO 12100, 2011-03	Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung <i>Safety of machinery – General principles for design – Risk assessment and risk reduction</i> <i>Sécurité des machines – Principes généraux de conception – Appréciation et réduction du risque</i>
- DIN EN 60204-1, 2019-06	Sicherheit von Maschinen – Elektrische Ausrüstung von Maschinen – Teil 1: Allgemeine Anforderungen <i>Safety of machinery - Electrical equipment of machines - Part 1: General requirements</i> <i>Sécurité des machines – Equipement électrique des machines – Partie 1 : exigences générales</i>
- DIN EN ISO 13854, 2020-01	Sicherheit von Maschinen - Mindestabstände zur Vermeidung des Quetschens von Körperteilen <i>Safety of machinery - Minimum gaps to avoid crushing of parts of the human body</i> <i>Sécurité des machines – Distances minimales de prévention des contusions de parties du corps humain</i>
- DIN EN ISO 13857, 2020-04	Sicherheit von Maschinen – Sicherheitsabstände gegen das Erreichen von Gefährdungsbereichen mit den oberen und unteren Gliedmaßen <i>Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs</i> <i>Sécurité des machines – Distances de sécurité empêchant l'entrée dans les zones dangereuses des membres supérieurs et inférieurs</i>
- DIN EN IEC 61000-6-1, 2019-11	Störfestigkeit für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe <i>Immunity standard for residential, commercial and light-industrial environments</i> <i>Résistance au brouillage pour le domaine d'habitation, les locaux commerciaux et professionnels ainsi que les petites exploitations</i>
- DIN EN IEC 61000-6-2, 2019-11	Störfestigkeit für Industriebereiche <i>Immunity standard for industrial environments</i> <i>Résistance au brouillage pour les zones industrielles</i>
- DIN EN IEC 61000-6-3, 2022-06	Störaussendung von Geräten in Wohnbereichen <i>Emission standard for equipment in residential environments</i> <i>Norme sur l'émission relative aux appareils utilisés dans les environnements résidentiels</i>
- DIN EN IEC 61000-6-4, 2020-09	Störaussendung für Industriebereiche <i>Emission standard for industrial environments</i> <i>Émission d'interférences pour les zones industrielles</i>

Zusätzlich angewendete nationale Normen und techn. Spezifikationen / Additional applied national standards and technical specifications / Les normes nationales et spécifications techniques. utilisées supplémentaires

- VDMA 24167, 1994-10	Ventilatoren – Sicherheitsanforderungen / Fans - Safety requirements / Ventilateurs – Exigences de sécurité
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Bei einer mit uns nicht abgestimmten Änderung der Maschine verliert diese Erklärung ihre Gültigkeit.

Any modification of this machine without confirmation shall automatically annul this declaration.

En cas de modification de la machine non convenue avec nous, la présente déclaration perd sa validité.

Bevollmächtigter für die Zusammenstellung der technischen Unterlagen:

Authorized representative in charge of the technical document compilation:

Personne autorisée à constituer le dossier technique

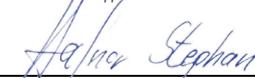
Anschrift siehe Hersteller / see manufacturer's address above / Adresse, voir fabricant

Leiter der Abteilung Entwicklung

Head of Development Department

Chef du département de développement

Jettingen-Scheppach, 02.12.2024


Stephan Hafrler
Geschäftsführer/Managing Director/Directeur général

Notes

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We reserve the right to make technical changes that do not impair the function.

3552886/November 2025