AL-KO

QUALITY FOR LIFE

EN

AIR HEATER

OPERATING AND ASSEMBLY INSTRUCTIONS

AL-KO EC AIR HEATERS BASIC CONTROLLER

Legal

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Revision history

Version	Description	Date
1.0	First edition	09/07/2024
1.1	Revision	14/12/2024
1.2	Revision	25/09/2025

Table of contents

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 BASIC 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.

1.2 Safety signs

Meaning	Symbol
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 Observing this information will make it easier to work on the machine.	

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
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.	
Warning of hand injuries If the required safety instructions are not observed, this can lead to serious injuries or even death.	
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.	

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 Failure to disconnect the unit from all energy sources before starting maintenance or repair work can result in serious injuries.	

1.2.1 Abbreviations

Abbreviation	Meaning
LED	Light Emitting Diode
LH	Air heater
BT	Control panel

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

- 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.
- Devices 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.
- Only install the system and plant components in accordance with the installation and usage 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 9 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:

- Room control unit LH-BASIC with room thermostat (standard version)
- easy 3pw timer thermostat (optional accessory)
- Frost protection thermostat (optional accessory)

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 Room control unit LH-BASIC

Electronic room control unit for temperature control or monitoring. For heating or cooling, optionally as a continuous climate controller with manual fan speed control, setpoint setting and LED operating displays for dry rooms. The unit is suitable for wall mounting at a height of around 1.5 m.

The room control unit is available in 2 versions:

- With protection class IP30
- With protection class IP65 in a protective housing with transparent cover (not illustrated)

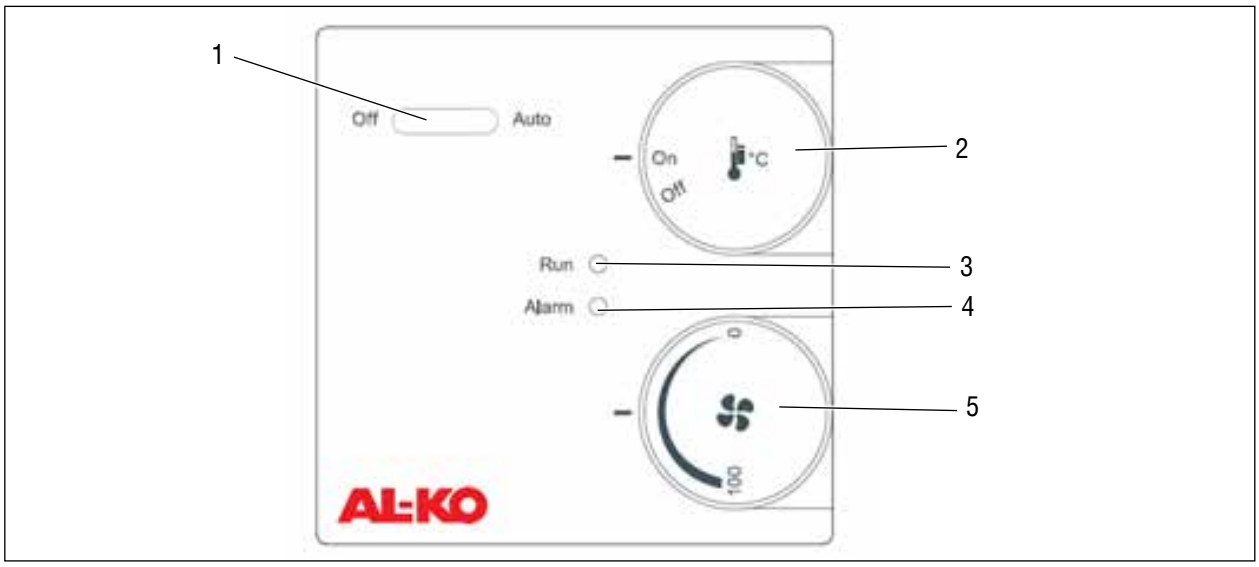


Fig. 1 Room control unit LH-BASIC

1	Rocker switch	4	Fault message
2	Rotary switch	5	Rotary knob
3	Operating message		

The fan in the air heater is switched off or to automatic (e.g. temperature control, time control) via rocker switch (1).

Rotary switch (2) switches the optional heating valve or cooling valve on or off.

The operating message (3) and fault message (4) are indicated by coloured LEDs. No operating or fault message possible for air heater/air cooler Industry 140 and air heater/air cooler Comfort 140 and 250.

Rotary knob (5) controls the speed of the air heater.

3.1.2 Room thermostat

Single-stage, mechanical single room controller with thermal feedback, suitable for temperature monitoring or control in dry rooms. The room thermostat 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 thermostat” on page 16.

Fig. 2 Room thermostat

3.1.2.1 Room thermostat IP65 with cable gland on the underside

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

In the versions with internal setting, the 0 to 40°C setpoint wheel is concealed inside the housing where it is tamper-proof.

The technical data can be found in chapter “3.2.3 Room thermostat IP65 with cable gland on the underside” on page 16.

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

3.1.3 easy 3pw timer thermostat

The timer thermostat is designed for wall mounting in the heated room.

The timer thermostat regulates the room temperature. In automatic mode, the integrated weekly timer is used to switch between comfort and reduced temperature (day/night). In addition, the green lamp lights up in reduced temperature mode.

If the room temperature drops below the set value, heating is started and the red lamp lights up. A timer thermostat allows time-dependent temperature control.

The technical data can be found in chapter “3.2.4 easy 3pw timer thermostat” on page 16.

Fig. 4 easy 3pw timer thermostat

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 temperature drops below the frost limit value, the fan is switched off. The valve is not affected.

The technical data can be found in chapter “3.2.5 Frost protection thermostat” on page 17.

Fig. 5 Frost protection thermostat

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)
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 thermostat

Control range	+5 to +30°C
Electrical connection	0.14 to 2.5 mm²
Housing	Plastic, material ABS, colour pure white (similar to RAL 9010)
Housing dimensions	75 x 75 x 25 mm (E1)
Protection class	II (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 thermostat IP65 with cable gland on the underside

Electrical connection	0.14 to 2.5 mm²
Housing	Plastic, UV-resistant, polyamide material, 30% glass bead reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions	108 x 70 x 73.5 mm (Thor 2)
Housing temperature	-35 to +65°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

3.2.4 easy 3pw timer thermostat

Electrical connection	0.14 to 2.5 mm²
Housing dimensions	160 x 80 x 36 mm
Housing temperature	-25 to +65°C
Protection class	II (according to EN 60730-1)
Protection class	IP30 (according to EN 60529)
Standards	EMC Directive 2014/30/EU, Low-Voltage Directive 2014/35/EU

3.2.5 Frost protection thermostat

Electrical connection	0.14 to 2.5 mm²
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

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).

3.3 Schematic layout

Example of 2 equal air heaters with common control unit and room thermostat:

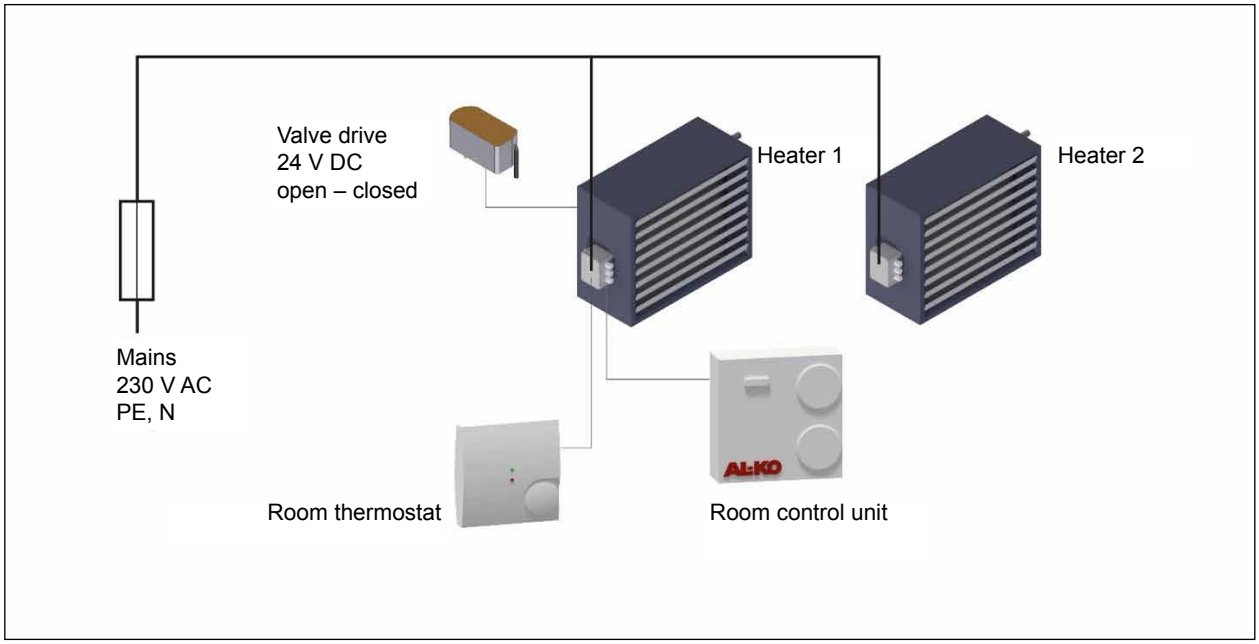


Fig. 6 Example of a schematic layout

ATTENTION

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

3.4 Terminal box BASIC

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 2 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.

Fig. 7 Terminal box

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

ATTENTION

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

3.5 Wiring diagram

NOTE

The wiring diagrams can be found from chapter “12 Original Wiring diagrams” on page 35.

3.6 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 applicable safety conditions according to DGUV regulation 52 Cranes and DGUV Regulation 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.
- 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).

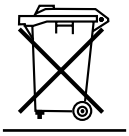
4.2.1 Transport under aggravated conditions

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 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
Controller type BASIC	Supply line 3 x 1.5 mm^2 to 2.5 mm^2
Air heater 2 supply line (optional)	3 x 1.5 mm^2 to 3 x 2.5 mm^2
Control panel	6 x 2 x 1 mm^2
Timer thermostat (optional)	2 x 1 mm^2
Room thermostat	2 x 1 mm^2
Frost protection thermostat (optional)	2 x 1 mm^2
Control unit or building control system	2 x 1 mm^2
Air heater 2 data cable (optional)	2 x 2 x 1 mm^2
Cooling/heating valve with spring return	2 x 1 mm^2
Cooling/heating valve WITHOUT spring return	3 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 “10 Spare parts” on page 32.

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 electrical 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 assembly, 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 as part of the unit documentation.

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 “10 Spare parts” on page 32.

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
Air Heater	Phone:	(+49) 82 25 / 39 - 2574
	E-mail:	Luftheizung@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 dismantling 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.

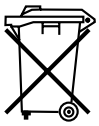
9.3 Disposal

⚠ 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 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.

10 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		
	3911662	BASIC terminal box with power supply unit
Repair switch		
	3912026	Repair switch for BASIC terminal box
BASIC Operating element		
	3483638	BT-BASIC 30 (IP30)
BASIC Operating element with housing for damp rooms		
	3911988	BT-BASIC 65 (IP65)

11 Certifications

The following EC Declaration of Incorporation and EC Declaration of Conformity will be issued per order, according to their validity.

If both the order number and the position of the unit are specified, the issued document must be assigned to the respective unit.

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

EG-KONFORMITÄTSERKLÄRUNG

EC DECLARATION OF CONFORMITY
DÉCLARATION DE CONFORMITÉ CE

Hersteller / *Manufacturer* / *Fabricant:* **AL-KO THERM GMBH I Hauptstraße 248-250 I 89343 Jettingen-Scheppach I 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- / Luftkühlgeräte, Deckenlüfter EC BASIC / EC PREMIUM
Air heating / air cooling devices, Ceiling fan EC BASIC / EC Premium
Aérotherme / refroidisseur d'air, ventilateur de plafond EC BASIC / EC PREMIUM

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

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*

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*

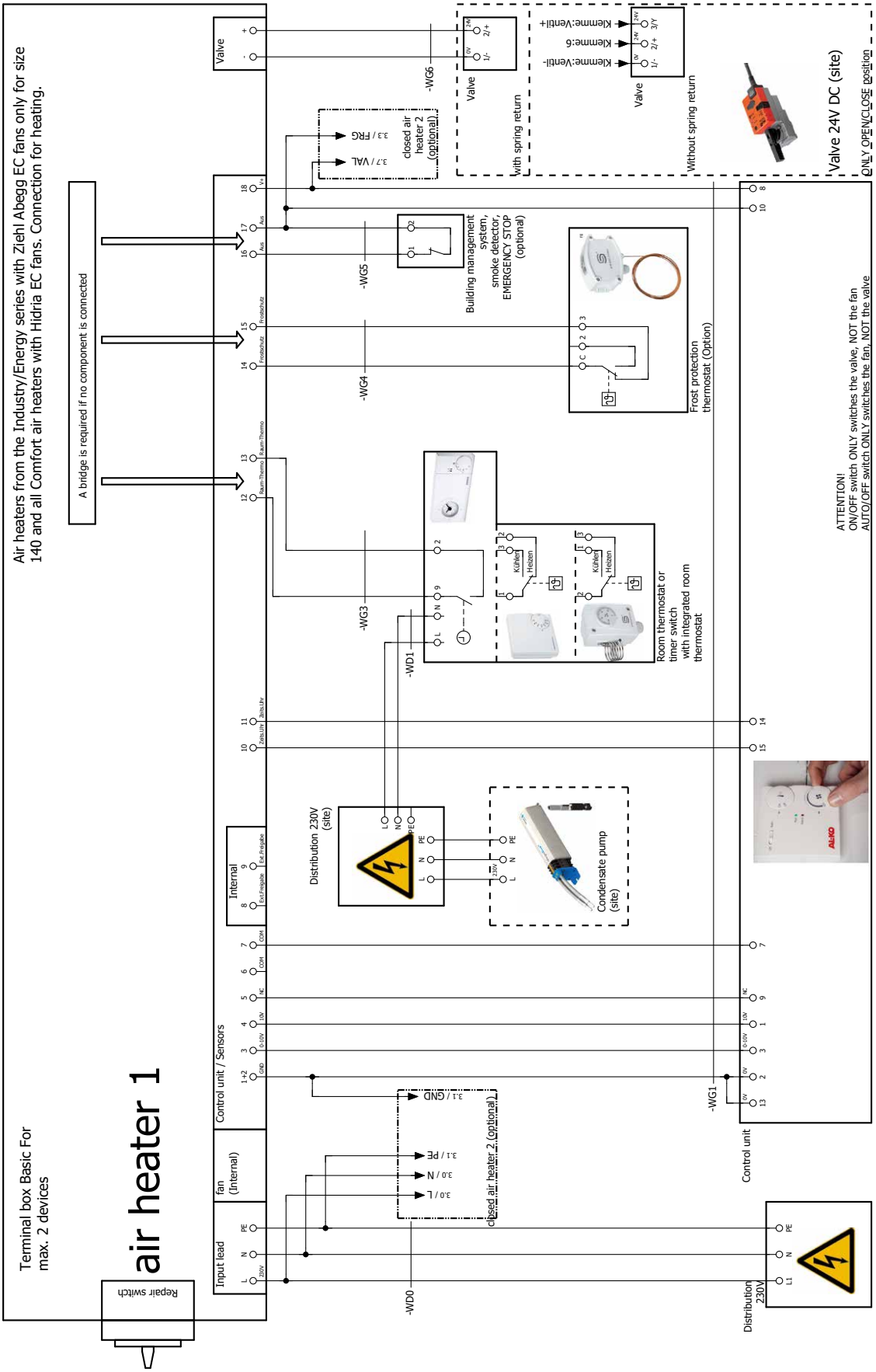
Jettingen-Scheppach, 02.12.2024

Leiter der Abteilung Entwicklung
Head of Development Department
Chef du département de développement

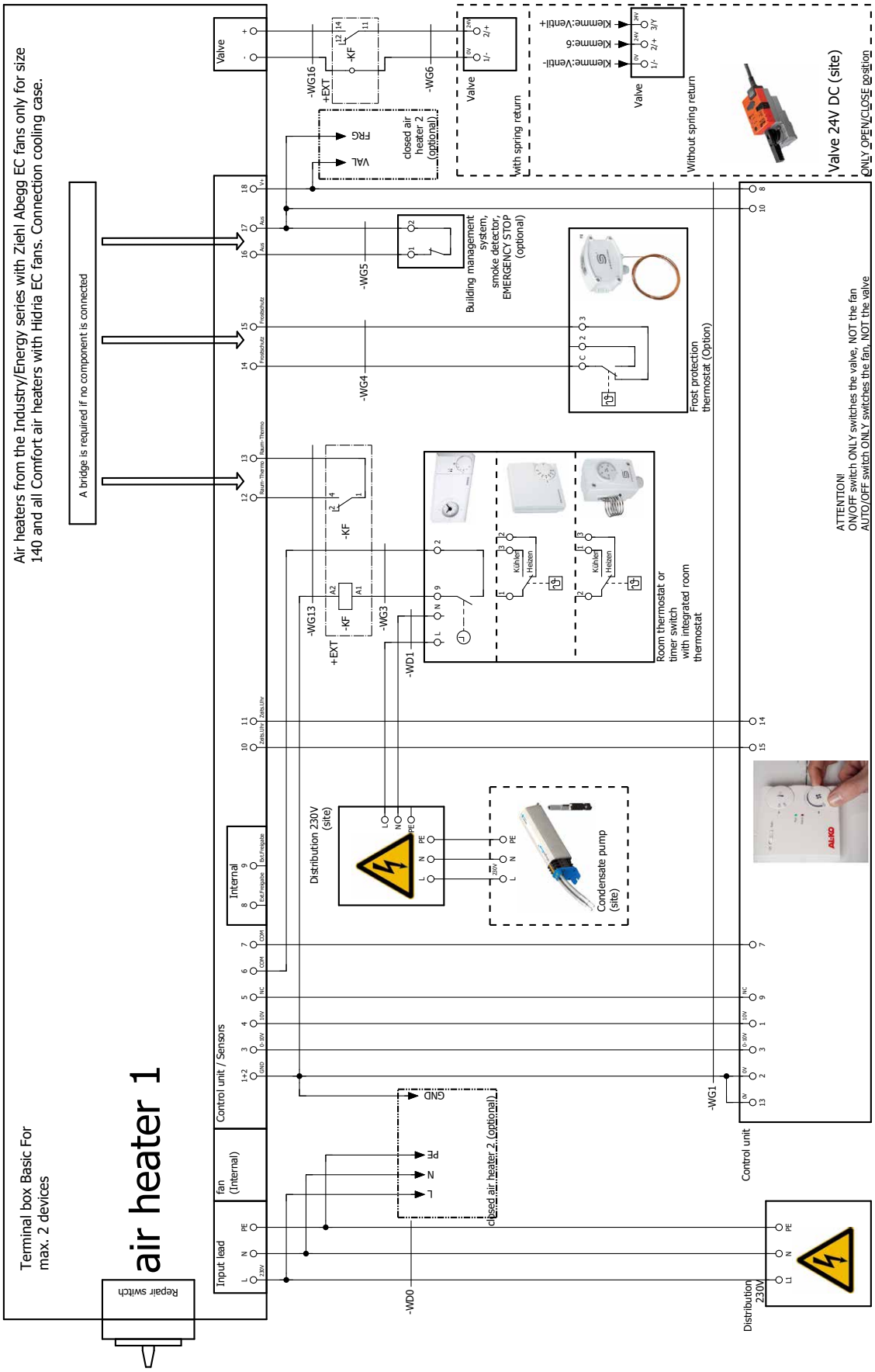
Stephan Hafner
Geschäftsführer/*Managing Director/Directeur géné*

12 Original Wiring diagrams

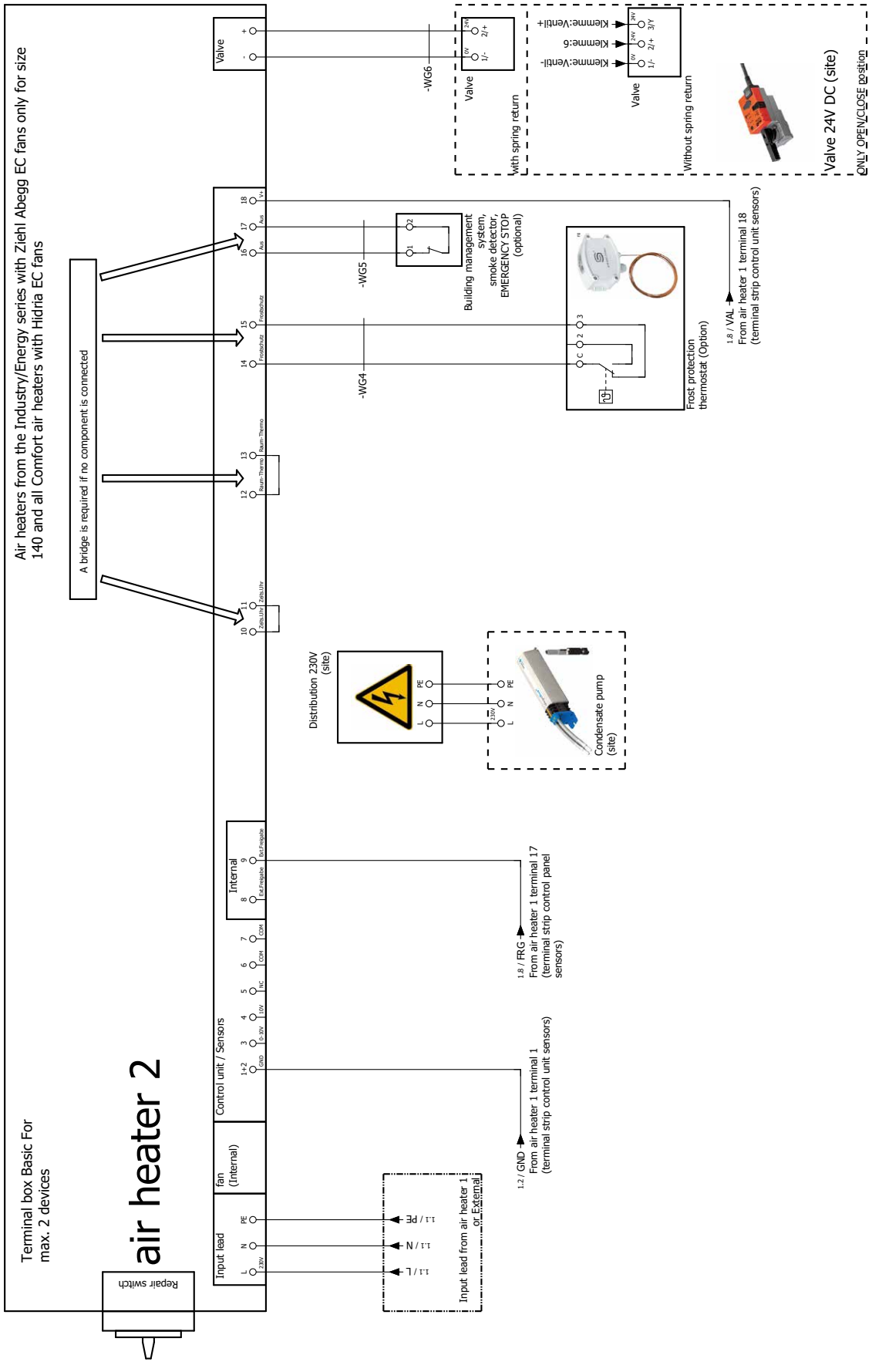
12.1 Industrial/energy air heater with Ziehl Abegg EC fan for size 140, heating case



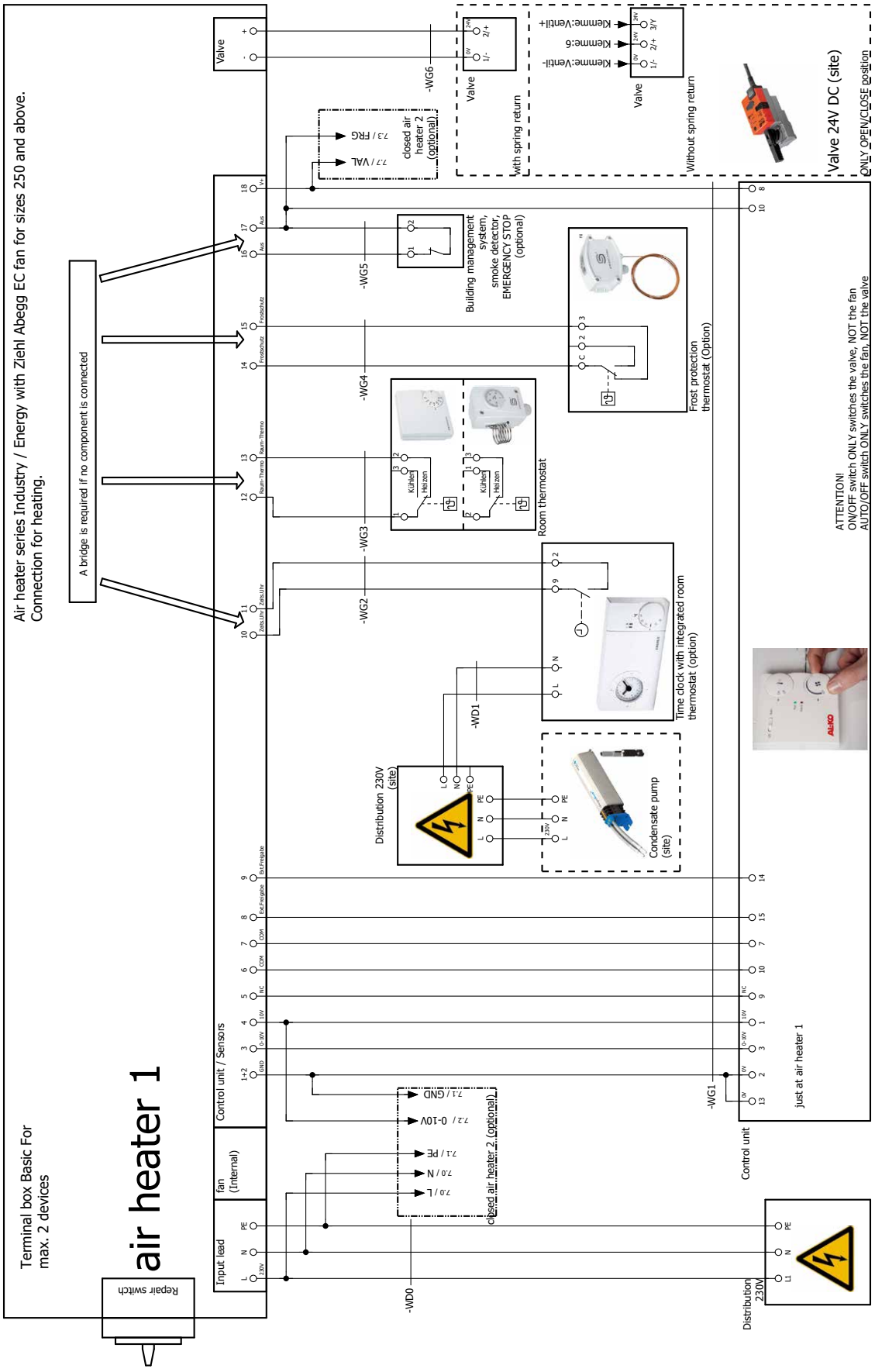
12.2 Industrial/energy air heater with Ziehl Abegg EC fan for size 140, cooling case, also all comfort versions



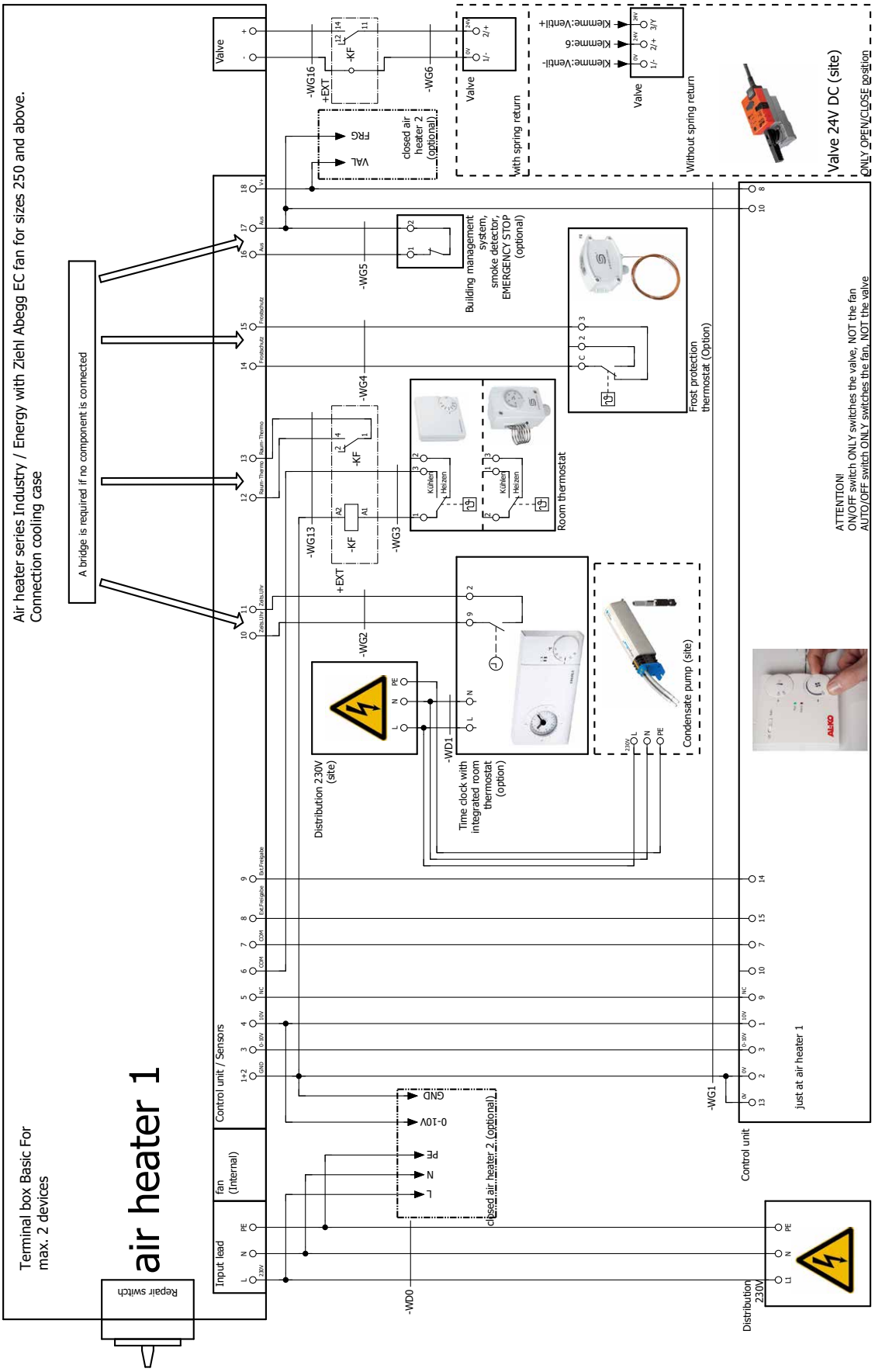
12.3 Industrial/energy air heater with Ziehl Abegg EC fan for size 140, also all comfort models



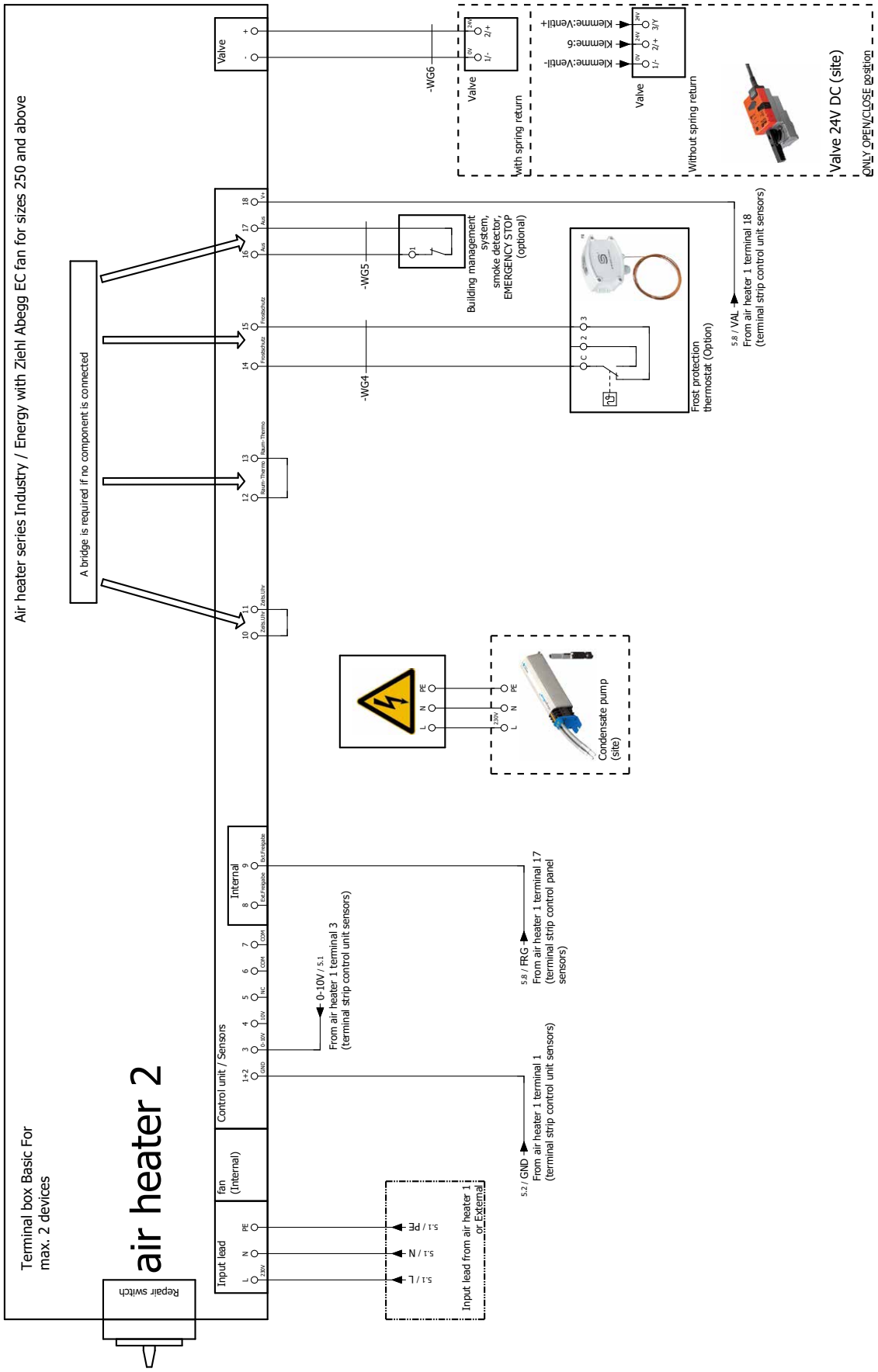
12.4 Industrial/energy air heater with Ziehl Abegg EC fan for size 250 and above, heating case

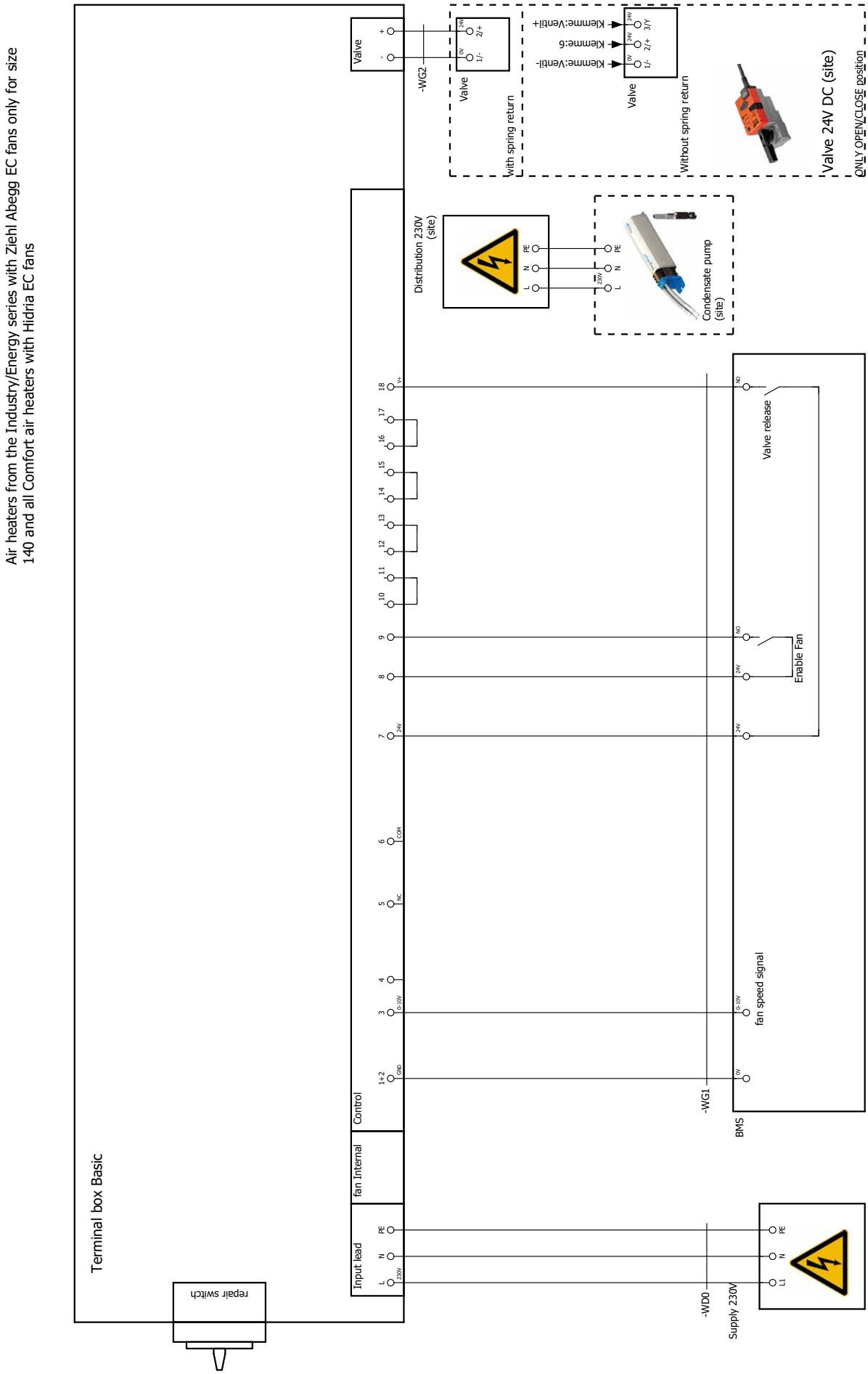


12.5 Industrial/energy air heater with Ziehl Abegg EC fan for size 250 and above, cooling case

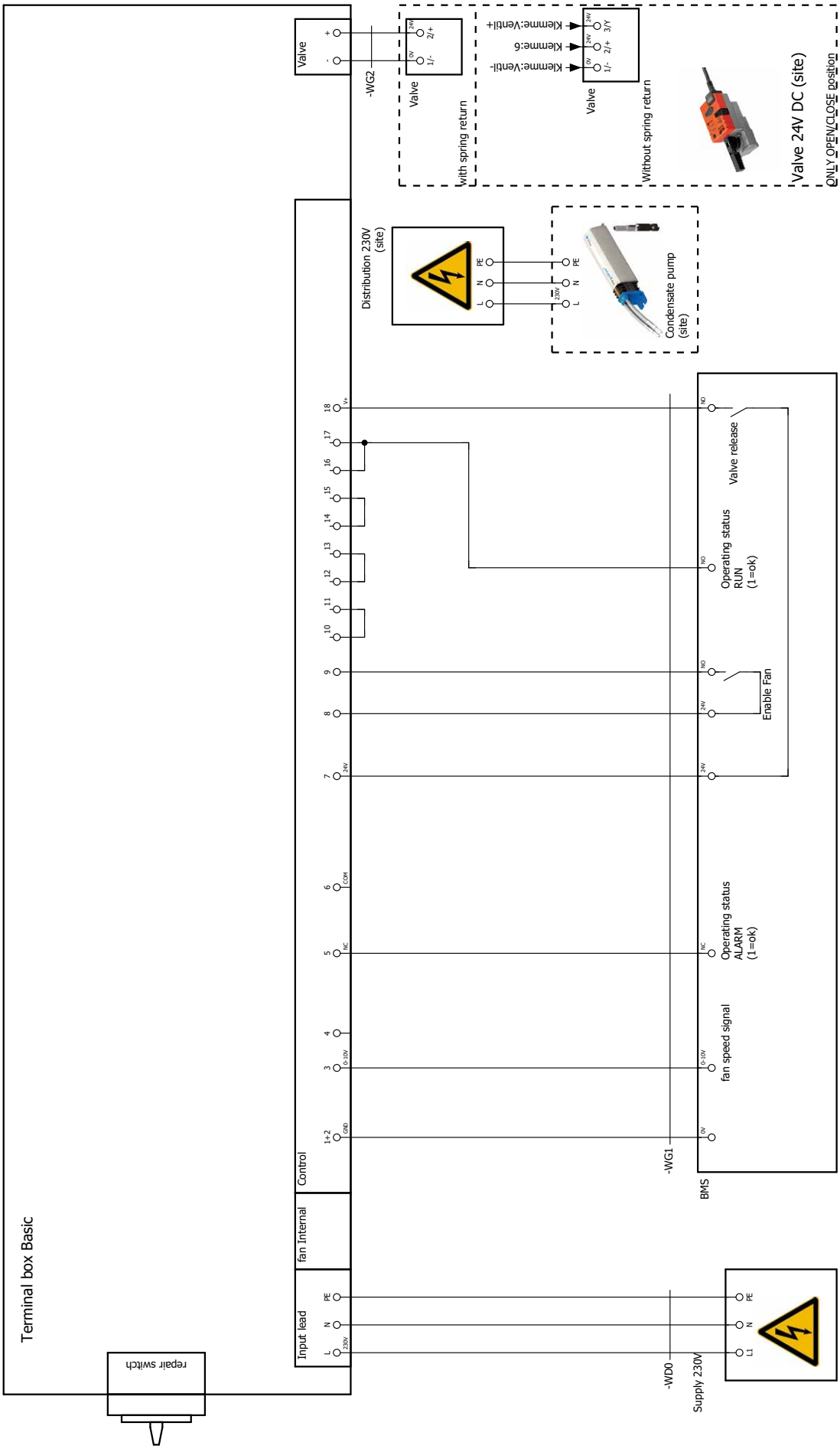


12.6 Industrial/ energy air heater with Ziehl Abegg EC fan for sizes from 250




Air heaters from the Industry/Energy series with Ziehl Abegg EC fans only for size 140 and all Comfort air heaters with Hidria EC fans
Terminal box Basic
repair switch
Input lead
fan Internal
Control
Valve
-WG2
Valve
with spring return
Klemme:Ventil-
Klemme:6
Klemme:Ventil+
Valve
Without spring return
Valve 24V DC (site)
ONLY OPEN/CLOSE position
Distribution 230V (site)
Condensate pump (site)
Valve release
Enable Fan
fan speed signal
-WG1
BMS
-WD0
Supply 230V

Air heater series Industry / Energy with Ziehl Abegg EC fan for sizes 250 and above



AL-KO

QUALITY FOR LIFE

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

3538543/September 2025

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