



AIR HEATING/AIR COOLING UNITS

CONTROL MODULE L4B2

Operating and installation instructions






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1 About this manual

- Please read this document before installation and start-up. This is essential for safe working and trouble-free handling.
- Comply with the safety and warning instructions in this documentation and on the product.
- This document is a permanent component of the described product, and must remain with the machine if it is sold to someone else.

1.1 Explanation of symbols

	Warning! This symbol indicates safety measures that must be complied with in order to avoid injury to personnel!
	Important! This symbol indicates safety measures that must be complied with in order to avoid damage to property!
	Special instructions for ease of understanding and regarding handling.

1.2 Regulations and standards

The following standards and directives were applied during design and apply during installation, start-up, operation and maintenance:

DIN EN 60204-1 (DIN VDE 0113)	Safety of machinery - Electrical equipment of machines Part 1: General requirements
DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN VDE 0100-100	Low-voltage electrical installations Part 1: Fundamental principles, assessment of general characteristics, definitions
DIN VDE 0100-530	Erection of low-voltage installations - Part 530: Selection and erection of electrical equipment - Switchgear and controlgear
2006/95/EC	Low-Voltage Directive
2004/108/EC	Electromagnetic Compatibility

1.3 Legal notes

All of the specified data applies exclusively to the product description. No statement can be derived from this information about any particular composition or suitability for a particular purpose. The information does not release the user from its responsibility to conduct its own assessments and tests.

2 Safety instructions

Comply with these points in order to avoid injuries, fire and other danger as a result of incorrect use and operation of the unit:



Warning!

Transport, installation, electrical connection, power supply connection, maintenance, start-up, repair, etc. are only allowed to be carried out by trained specialist personnel!

Before conducting any work on the control module, make sure that the building's electrical power supply is switched off (deactivation of all poles), and measures have been taken to prevent reactivation.

Only operate the control module when it is completely assembled and provided with effective protection against reaching in.

All claims for compensation and warranty claims shall be excluded in the event of installation contrary to our regulations, and if there is a causal connection between the defects/damage and incorrect use, processing or other treatment. The customer must demonstrate that the defect that arose was not attributable to incorrect installation.

Installation and mounting on electrical devices is only allowed to be carried out by an electrician as defined by VDE and the regulations of the power utility.

Failure to comply with the regulations and operating instructions can give rise to malfunctions with consequential damage and danger to personnel.

The generally applicable rules of technology apply, especially DIN VDE0100-100 and DIN VDE 0100-530. The currently valid national legislation and regulations must be complied with.



Important!

AL-KO Therm GmbH does not accept any liability for damage attributable to failure to comply with the safety instructions!

The control module is not allowed to be operated in a potentially explosive area, nor is it allowed to be installed for single-phase AC motors.

It is necessary to ensure that everyone involved in the process has read and understood the operating and installation instructions in full, and complies with them!

To avoid dangers in the company, not only these operating instructions but also all works, company and working instructions of the user apply.

Personal protective equipment must be used when working on the control module!

2.1 Designated use

The control module is only suitable for air heating/cooling units from AL-KO THERM.

2.2 Possible misuse

The AL-KO control module is exclusively allowed to be operated within the scope of the technical data specified by AL-KO. Any other use, or use beyond that described in the "Designated use" point is regarded as not in accordance with the designated use. The manufacturer cannot be held liable for damage resulting from this.

Possible misuse includes:

- Use in a potentially explosive atmosphere
- Use with motors that are **not** suitable for operation with a frequency converter!
- Use with single-phase AC motors!

2.3 Residual dangers

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

Residual dangers are potential dangers that are not obviously apparent, such as:

- Injuries caused by failure to comply with the safety instructions, standards, directives or regulations
- Injuries caused by uncoordinated work
- Danger caused by working on the electrical system, cables and connections

2.4 Delivery

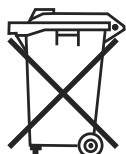
- The control module is generally delivered mounted on the AL-KO air heating/cooling units.
- Optionally, the control module can also be ordered separately.

2.5 Obligations on the owner

The owner of AL-KO THERM products must regularly train its personnel in the following subjects:

- Compliance with and use of the operating and installation instructions as well as statutory regulations.
- Designated use of the control module.
- If necessary, comply with the instructions for plant protection and the owner's company instructions.
- What to do in an emergency

2.6 Disposal of the packaging



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

3 Product description

The control module comprises a housing with built-in CB-RSH (connection board with isolator switch) and an AMD (frequency converter) for AL-KO air heating/cooling units with 3x400 VAC three-phase motors. The control unit makes it possible to connect AL-KO control accessories and potential-free contacts for various operating messages.



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

3.1 Declaration of conformity

Manufacturer's Name and Address:

AL-KO THERM GMBH
Hauptstraße 248-250
89343 Jettingen-Scheppach
(Germany)

EC Declaration of Conformity

According to EC Low Voltage Directive 2006/95/EC, Appendix III, Section B of December 12, 2006.

We hereby declare that by design and construction the following

Electr. Equipment: Control module

Type: L4B2

complies with the following applicable standards and directives.

EC Directive 2006/95/EG	Low Voltage Directive
EC Directive 2004/108/EC	Electromagnetic Compatibility (EMC)

Applicable Harmonized Standards, in particular:

DIN EN 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
DIN EN ISO 12100	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN VDE 0100-100	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions
DIN VDE 0100-530	Erection of low-voltage installations - Part 530: Selection and erection of electrical equipment - Switchgear and controlgear

This declaration shall be null and void in case the machine is altered or modified without the manufacturer's prior written permission.

Jettingen-Scheppach, February 01, 2015

Dr. B. Müller; CEO

3.2 Technical data

Permitted operating temperature:	0 to 55 °C
Permitted storage temperature:	-10 to 65°C
Perm. ambient temperature:	-10 to 65°C
Dimensions:	350x230x120 mm (W x H x D)
Index of protection:	IP54
Operating voltage:	3 x 400 VAC, 50 Hz (3P+N+PE)
Rated current (In):	max. 10 A at 3 x 400 VAC
Control voltage:	24 VDC or 10 VDC

3.3 Possible connections

- Automatic regulator and control unit TMC
- 4-stage switch HS-4 or HST-4
- Manual controller HR-2
- Remove switch heating/cooling HSK
- Frost protection thermostat QAF 81.6 or KP 61
- Room thermostat RTA/SR121 or RTI for temperature-dependent control
- Potential-free contacts for fault messages
- Potential-free contacts for operating messages
- Other devices with control module with rotation speed control
- External control, step switching or infinitely variable control

4 Installation



Warning!

Installation, electrical connection, etc. are only allowed to be carried out by trained and authorised specialist personnel!

- If the L4B2 control module has not been installed on the device, it must be installed in such a way that the malfunction and operating lights in the base of the housing can be seen from the floor level.
- The L4B2 control module must be protected against dirt during installation.
- The electrical connection must be carried out according to the included circuit diagrams.
- The cable lead-ins must be sealed correctly.
- The cover must be closed using the supplied screws.
- Three-pole 400 V fusing must be provided in the building.

4.1 Dimensions

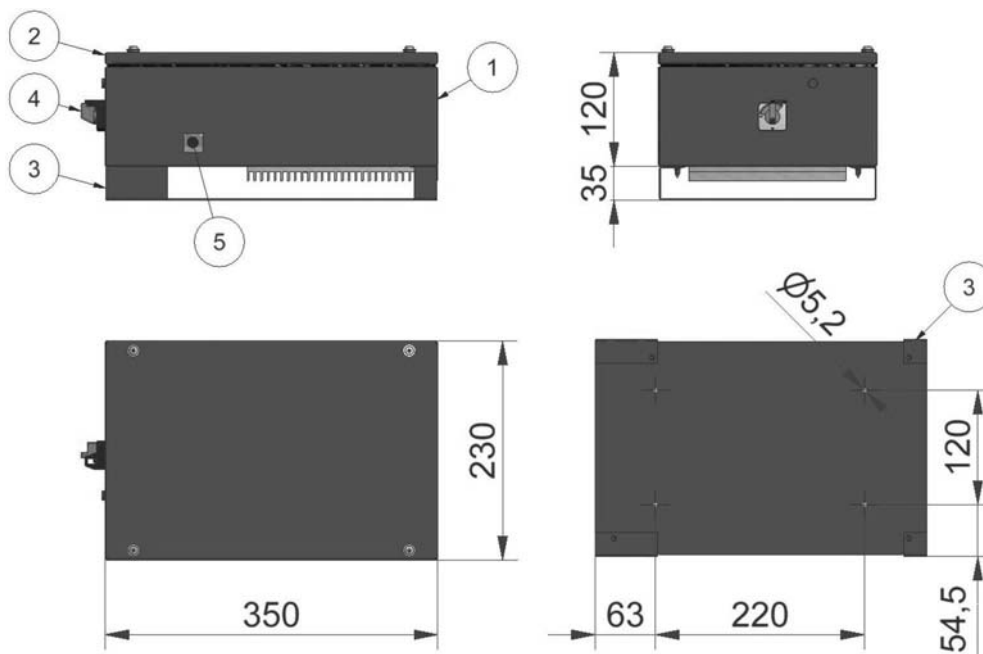


Fig.: Dimensions

1	Housing	4	Isolator switch
2	Cover	5	Sight glass LED
3	Screw-on plate		

4.2 Mounting examples

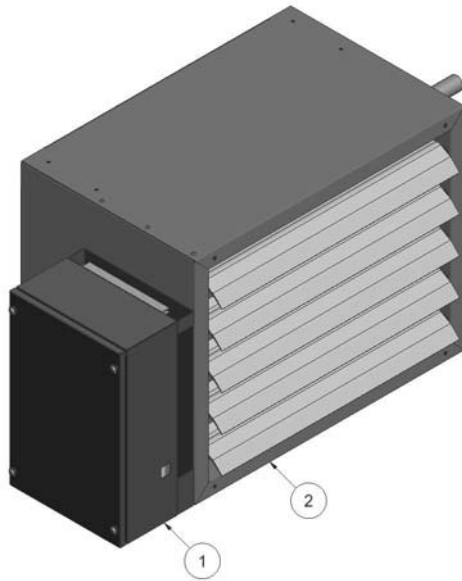


Fig. 4-1: Mounting example LH-INDUSTRY

1	L4B2 control module	2	LH-INDUSTRY
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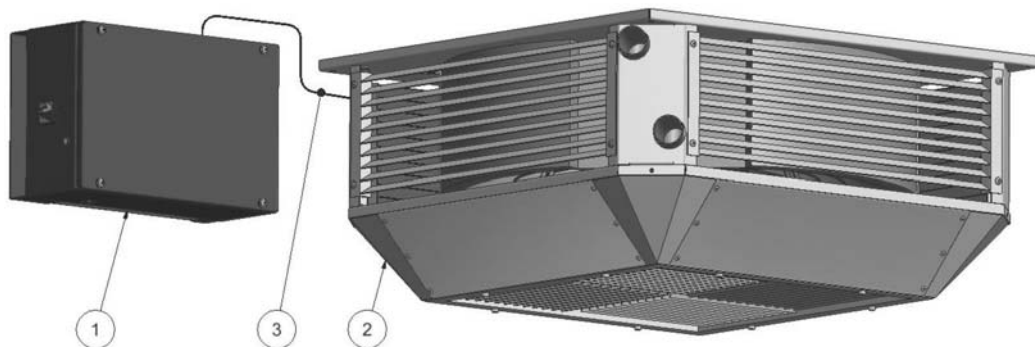


Fig. 4-2: Mounting example LH-COMFORT

1	L4B2 control module	3	Cable connection
2	LH-COMFORT		

5 Operation

The isolator switch is used for switching on and off the mains voltage of the AMD rotation speed control (400 VAC, 50 Hz).



Warning!

The mains voltage at the input terminals as well as the control voltage of the CB-RSH remain live even when the switch is switched off.
Interventions in the AMD / CB-RSH and the fan are only permitted when they are not live.

The red LED on the housing side is used for indicating a motor malfunction.

The fan speed can be adjusted infinitely variably or in stages by means of various control elements with the frequency converter.

5.1 Fan speed limiting

Fan speed control can be undertaken using the KEYPAD. For this purpose, the drive must be in STOP status, and the maximum permitted frequency set on the KEYPAD under PAR. In this case, parameter P1.2 is not allowed to be set higher than the default value (50 Hz).

Please contact your particular service partner in this regard.

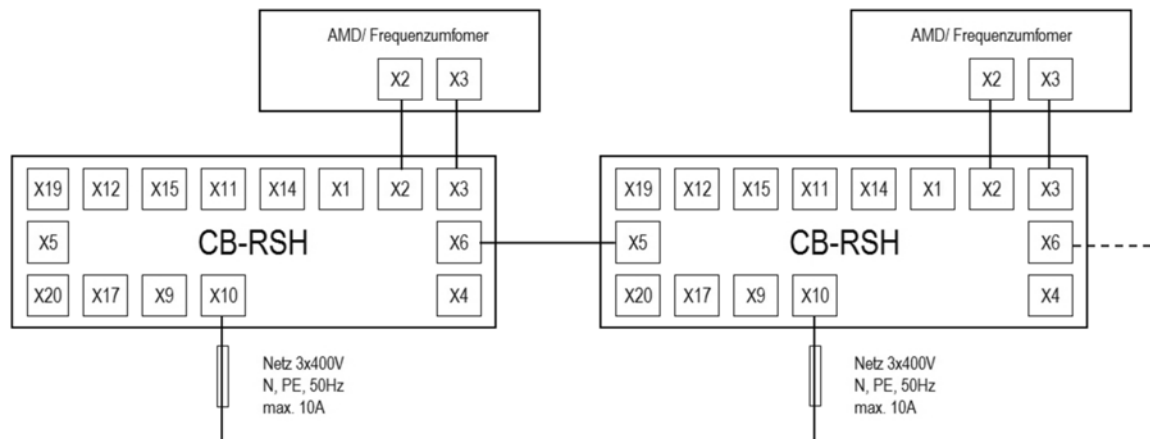


Fig.: Vacon keypad

100%	50 Hz
90%	45 Hz
80%	40 Hz
70%	35 Hz
60%	30 Hz
50%	25 Hz

6 Appendix

6.1 Schematic diagram for a room zone



Connection terminals

X1	Preselection heating/cooling 3 x 24 VDC (3 x 0.35 mm ²)
X2	Electrical power supply for MD/AMD 3x400 V, PE, 50 Hz (4x1.5 mm ²)
X3	MD/AMD / frequency converter interface 10x24 VDC (10x0.35 mm ²)
X4	Connection TMC, HR-2, HS or HST, 8-9x24 VDC (8-9x0.35 mm ²)
X5	Inputs for connection from other CB-RS, 12x24 VDC (12x0.35 mm ²) frost protection thermostat, room thermostat, optional condensation pump
X6	Outputs for connection to other CB-RS, 12x24 VDC (12x0.35 mm ²) frost protection thermostat, room thermostat, optional condensation pump
X9	General operating message, NC and NO switches, potential-free contact, max. 230 VAC, 2 A
X10	Mains connection, 3x400 V, PE, 50 Hz, CCW rotating field (4x1.5 mm ²)
X11	Heating/cooling operating message, potential-free contact, max. 230 VAC, 2 A
X12	General operating message, NO switch, potential-free contact, max. 230 VAC, 2 A
X13	LED operating message, LED motor malfunction
X14	Frost feedback, potential-free contact, max. 230 VAC, 2 A
X15	Motor malfunction, potential-free contact, max. 230 VAC, 2 A
X17	Neutral conductor
X19	PE conductor
X20	Phase



For optimising the electrical installation (short cable lengths), it does not matter which CB-RSH within the same room zone the units are connected to, as well as the potential-free contacts.

The L4B2 air heater control can be combined with the previous L4B air heater control as expansion module, and used as a replacement control. Please comply with the connection diagrams and use the connection terminals provided for this purpose.

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