



Ceiling cassette KaCool D AF

► Installation and operating instructions

Keep these instructions in a safe place for future use!

3.25 KaCool D AF – Comfortable feeling of well-being, thanks to AtmosFeel

Chilled water air conditioning system

Installation and operating instructions

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1 General

1.1 About these instructions

These instructions ensure the safe and efficient handling of this equipment. These instructions form an integral part of the unit and must be kept in the direct vicinity of the unit and available to personnel at all times.

All personnel must have carefully read through these instructions prior to commencing all work on the equipment. A fundamental prerequisite for safe working is compliance with all the stated safety instructions and other instructions contained in this manual.

In addition all local occupational health and safety at work regulations apply, as do general safety provisions governing the use of the equipment.

Illustrations in this guide are intended to provide a basic understanding and may differ from the actual model.

1.2 Explanation of symbols

Important notes



DANGER!

This combination of symbol and signal word indicates an immediately dangerous situation, which will cause death or injuries if not avoided.



IMPORTANT NOTE!

This combination of symbol and signal word indicates a possible dangerous situation, which can cause material and environmental damage if not avoided.



This symbol highlights useful hints, recommendations and information for efficient and trouble-free operation.

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Other labels

The following labels are used in this manual to highlight instructions, results, listings, references and other elements:

Label	Explanation
	Step-by-step instructions
	Results of actions
	Reference to sections of the manual and other applicable documents
	Lists without specified sequence
<i>[Button]</i>	Operating elements (e.g. buttons, switches) Display elements (e.g. indicator lights)
<i>"Display"</i>	Display elements (e.g. buttons, assignment of function keys)

1.3 Copyright protection

The contents of this manual are protected by copyright. Their use is permitted when using the product. Any further use is not permitted without written permission from the manufacturer.

1.4 Customer service

Our Customer Service team is available is available for technical information:

Address	Kampmann GmbH & Co. KG Friedrich-Ebert-Str. 128–130 49811 Lingen (Ems) Germany
Phone	+49 591 7108 670
Fax	+49 591 7108 360
E-mail	service@kampmann.de
Website	www.kampmann.de

We are always interested in receiving information and experiences relating to the use of our products which could be of value for improving our products.

2 Safety

This section provides an overview of all important safety aspects to ensure optimum protection of personnel as well as safe and trouble-free operation. Additional order-related safety information is contained in the sections covering the individual phases of the product's life.

2.1 Intended use

The units are only intended to be used for heating and cooling air in frost-free and dry rooms. Within the room, the unit needs to be connected to the building's heating/cooling/ventilation system and to the building's waste water and power network.

Correct and proper use is also deemed to include compliance with all the instructions in this manual.

Any use beyond or other than the stated intended use is considered as misuse.

2.2 Limits of operation and use

Limits of operation		
Min./max. water temperature	°C	5-75
Min./max. air intake temperature	°C	15-35
Min./max. air humidity	%	15-75
Max. operating pressure	bar	8
Min./max. glycol percentage	%	25-50

We would refer to VDI-2035 Sheets 1 & 2, DIN EN 14336 and DIN EN 14868 with regard to the properties of the medium used to protect the equipment. The following values provide further guidance.

The water used should be free of contamination, such as suspended substances and reactive substances.

Water quality		
pH		8-9
Conductivity	µS/cm	< 700
Oxygen content (O ₂)	mg/l	< 0.1
Hardness	°dH	4-8.5
Sulphur ions (S)		not measurable
Sodium ions (Na ⁺)	mg/l	< 100
Iron ions (Fe ²⁺ , Fe ³⁺)	mg/l	< 0.1

Manganese ions (Mn ²⁺)	mg/l	<0.05
Ammonia ions (NH ₄ ⁺)	mg/l	< 0.1
Chlorine ions (Cl)	mg/l	< 100
CO ₂	ppm	< 50
Sulphate ions (SO ₄ ²⁻)	mg/l	< 50
Nitrite ions (NO ₂ ⁻)	mg/l	< 50
Nitrate ions (NO ₃ ⁻)	mg/l	< 50

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WARNING!

Warning of misuse!

- Never operate the unit in humid areas, such as swimming pools, wet areas etc.
- Never operate the unit in rooms with an explosive atmosphere.
- Never operate the unit in rooms with a high dust content.
- Never operate the unit in rooms that contain high-temperature gases.
- Never operate the unit in aggressive or corrosive atmospheres (e.g. sea air).
- Never operate the unit above electrical equipment, such as switch cabinets, computers or other electrical units, or contacts that are not drip-proof.
- Never operate the unit outdoors.
- Keep windows closed during operation.
- Only operate the unit fully assembled and connected to the relevant supply networks (waste water, heating/cooling, electricity).
- Never operate the unit beyond its technical specification (↪ *Chapter 3 "Technical data" on page 12*).
- Install the unit away from heaters or other heating equipment.
- Ensure that the airflow can circulate freely.
- Never place any objects on the unit.
- Never cover the unit.
- Always note the requirements for the installation site (↪ *Chapter 6.1 "Requirements governing the installation site" on page 27*).

2.3. Fundamental dangers

The following section lists residual risks that can be generated by the unit even when operated as intended.

Observe the following safety instructions and the safety information in the other sections of this manual to reduce the risk of injury and damage to property and avoid dangerous situations.

2.3.1 Danger from electrical energy

Electric current



DANGER!

Risk of fatal injury from electrocution!

Contact with live parts will lead to fatal injury from electrocution. Damage to the insulation or individual components can lead to a fatal injury.

- Only permit qualified electricians to work on the electrics.
- Immediately disconnect the system and repair it in the event of damage to the insulation.
- Keep live parts away from moisture. This can cause a short circuit.
- Properly earth the unit.

2.4 Responsibility of the operator

Duties of the operator

The unit is operated in the commercial sector. The operator of the unit is therefore subject to the legal obligations concerning occupational health and safety.

In addition to the safety instructions in these operating instructions, the valid safety, accident prevention and environmental protection regulations must be observed for the area of use of the unit.

The following applies in particular:

- The operator must be aware of the applicable health and safety regulations and determine in a risk assessment other hazards that may arise from the special working conditions at the site of operation. He then has to implement this in the form of operating instructions for the operation of the unit.
- The operator must regulate and specify the responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The operator must ensure that all staff who work on the unit have read and understood these instructions. In addition, he must also train personnel and inform them of the possible dangers at regular intervals.
- It is the responsibility of the operator to provide maintenance and repair personnel with the necessary personal protective equipment and advise them of the necessity to wear it.

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Furthermore, the operator is responsible for ensuring that the equipment is always in perfect condition.
The following therefore applies:

- The operator must ensure that the maintenance intervals described in this manual are adhered to.

Hygiene requirements

The operator must comply with the specifications in line with the pertinent legal standards and guidelines relating to hygiene applicable at the installation site. This includes ensuring that

- fresh and waste water are hygienically separated,
- the pertinent maintenance and test intervals are complied with,
- the requirements for air ducts and diffusers are complied with,
- the predefined filter grades are complied with.

2.5 Instruction

The manufacturer offers training for users. For contact details please refer to [Chapter 1.4 "Customer service" on page 6](#).

2.6 Personnel requirements

2.6.1 Qualifications

Only permit personnel to carry out work if they can be expected to carry out this work reliably. People with impaired reactions, possibly due to drugs, alcohol or medication, are not permitted to carry out work.

Qualified electrician

Qualified electricians have been trained for the specific environment in which they work and understand the pertinent standards and regulations.

Installation personnel

This training provides installation personnel with the technical knowledge and experience, as well as knowledge of the pertinent regulations, needed to carry out the assigned tasks and independently recognise possible dangers. Installation personnel have all the necessary equipment and tools.

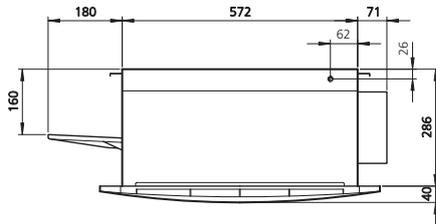
Caretakers/users

Caretakers/users have been instructed by the manufacturer in the tasks assigned to them and possible dangers of improper conduct. Caretakers/users are only permitted to carry out tasks that go beyond normal operation if this is specified in this manual.

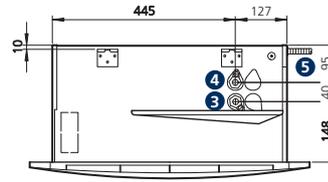
3 Technical data

3.1 Main dimensions

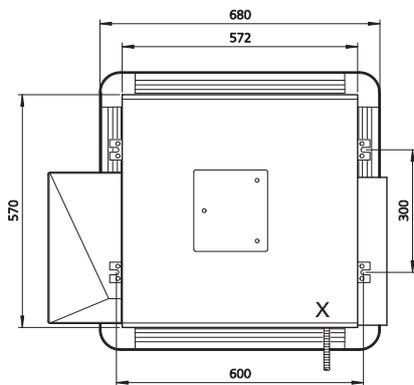
Models 1–4, with plastic design panel (dimensions in mm)



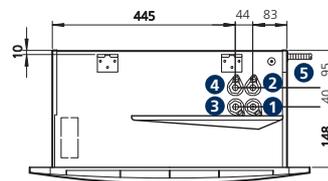
Front view



Water connection side 2-pipe



Top view



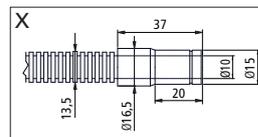
Water connection side 4-pipe

2-pipe:

- ③ Water inlet
- ④ Water outlet
- ⑤ Condensation drain

4-pipe:

- ① Hot water inlet
- ② Hot water outlet
- ③ Cold water inlet
- ④ Cold water outlet
- ⑤ Condensation drain



Water connections

Model	2-pipe	4-pipe
1	1/2"	1/2"
2-4	3/4"	1/2"

Weights

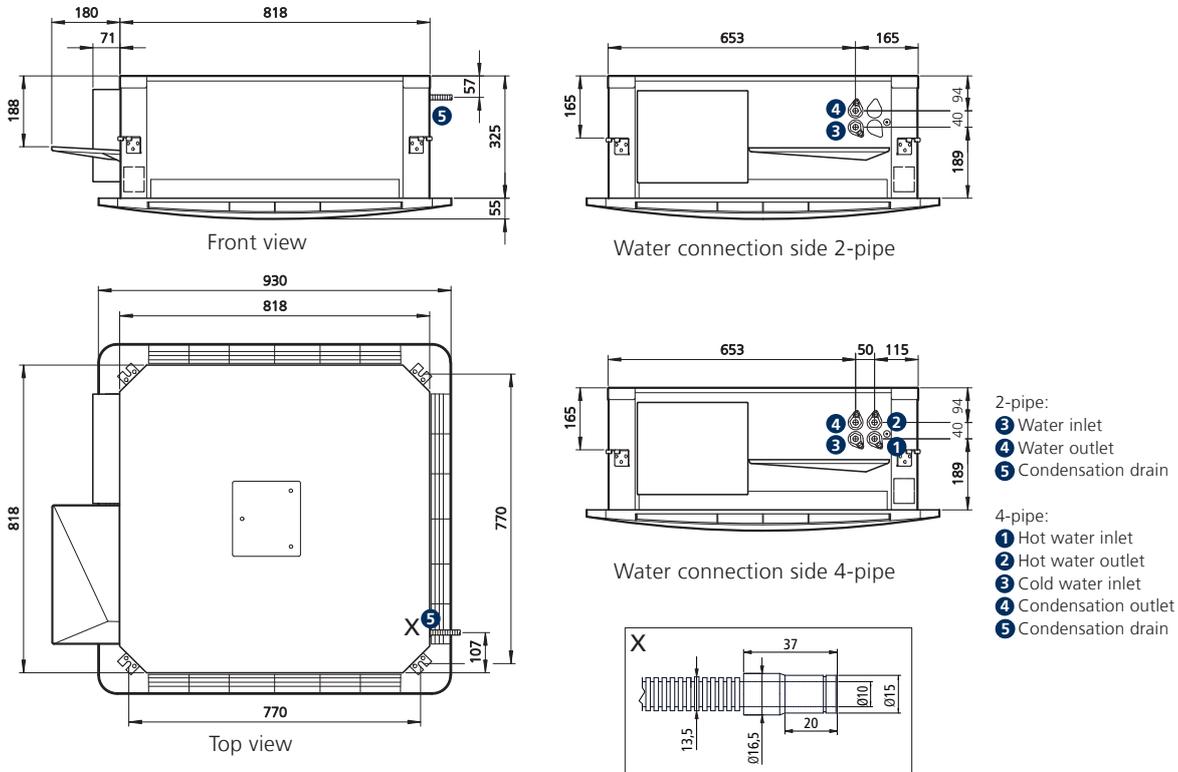
Model	Basic unit		Design panel	Total	
	2-pipe	4-pipe		2-pipe	4-pipe
	[kg]	[kg]	[kg]	[kg]	[kg]
1	21	24	3	24	27
2	23	24	3	26	27
3	23	24	3	26	27
4	24	24	3	27	27

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Models 5-7, with plastic design panel (dimensions in mm)



Water connections

Model	2-pipe	4-pipe
5-7	3/4"	3/4"

Weights

Model	Basic unit		Design panel	Total	
	2-pipe	4-pipe		2-pipe	4-pipe
	[kg]	[kg]	[kg]	[kg]	[kg]
5	40	43	5	45	48
6	45	48	5	50	53
7	45	48	5	50	53

3.2 Connection values

Unit size		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Mains voltage		230 V / 50 Hz						
Enclosure type		IP 21						
Protection class		I / Protective conductor connection						
AC fan model								
Max. power consumption	W	43	63	75	89	102	108	156
Max. power consumption	A	0.19	0.28	0.33	0.39	0.52	0.6	0.75
EC fan model								
Max. power consumption	W	11	26	45	65	81	89	155
Max. power consumption	A	0.11	0.22	0.33	0.47	0.52	0.55	0.72

3.3 Operating data

Valve configuration	2-pipe system		4-pipe system		Model	Dimensions (L x W)
	Cooling outputs ¹⁾	Heat outputs ²⁾	Cooling outputs ¹⁾	Heat outputs ²⁾		
	[kW]	[kW]	[kW]	[kW]		[mm]
AC, 230 V	1.97 – 2.71	3.85 – 5.27	1.89 – 2.75	2.45 – 3.50	1	680 x 680
	2.17 – 4.31	4.19 – 8.19	1.91 – 3.40	2.45 – 4.45	2	
	2.73 – 5.05	5.17 – 9.86	2.00 – 3.89	1.91 – 3.30	3	
	4.03 – 5.47	8.21 – 10.88	2.66 – 4.47	2.39 – 3.70	4	
	4.19 – 6.22	8.46 – 12.85	4.50 – 6.20	5.80 – 9.00	5	930 x 930
	5.38 – 9.56	9.22 – 17.30	4.30 – 7.20	6.30 – 10.50	6	
	5.38 – 11.00	10.09 – 22.66	4.50 – 8.80	6.80 – 12.50	7	
EC, 230 V	1.97 – 2.71	3.85 – 5.27	1.89 – 2.75	2.45 – 3.50	1	680 x 680
	2.17 – 4.31	4.19 – 8.19	1.91 – 3.40	2.45 – 4.45	2	
	2.73 – 5.05	5.17 – 9.86	2.00 – 3.89	1.91 – 3.30	3	
	4.03 – 5.47	8.21 – 10.88	2.66 – 4.47	2.39 – 3.70	4	
	4.19 – 6.22	8.46 – 12.85	4.50 – 6.20	5.80 – 9.00	5	930 x 930
	5.38 – 9.56	9.22 – 17.30	4.30 – 7.20	6.30 – 10.50	6	
	5.38 – 11.00	10.09 – 22.66	4.50 – 8.80	6.80 – 12.50	7	

¹⁾ at CHW 7 / 12, $t_{L1} = 27\text{ °C}$

²⁾ at LPHW 70/60, $t_{L1} = 20\text{ °C}$

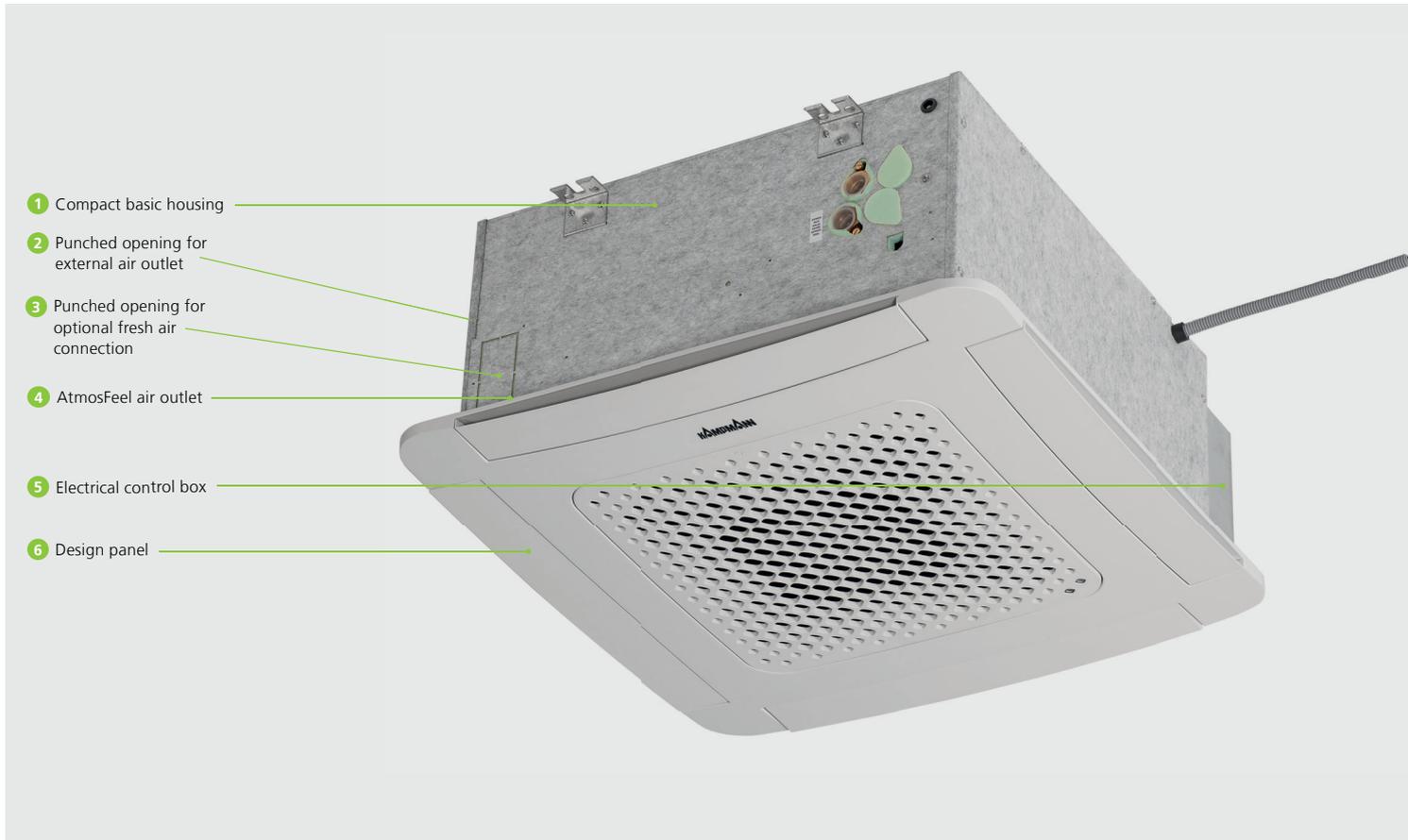
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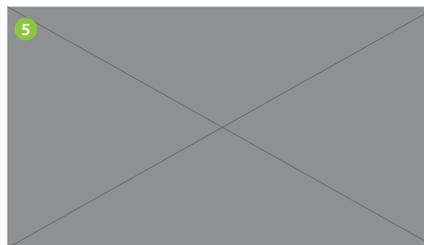
Installation and operating instructions

4 Construction and function

4.1 Overview



Features





Example; Models 1 – 4

- 1 Compact basic housing:**

 - ▶ galvanised steel
 - ▶ the outside has a fleece coating for improved insulation from the environment
 - ▶ the inside has high-grade 10 mm vapour diffusion-tight polyethylene foam matting
- 2 Punched holes for external air outlet:**

 - ▶ connection option for on-site air outlets
- 3 Punched hole for optional fresh air connection:**

 - ▶ model 1-4, per spigot (max. 2) 80 m³/h
 - ▶ model 5-7, (max. 1) 120 m³/h
- 4 AtmosFeel air outlet:**

 - ▶ four manually adjustable outlet air slats (model 1 - 4)
 - ▶ smooth plastic
 - ▶ easy to clean
- 5 Electrical junction box for control PCBs:**

 - ▶ KaControl
 - ▶ infra-red electronic receiver
 - ▶ terminals only, for on-site control
- 6 Design panel, similar to RAL 9016 (traffic white)**

 - ▶ outlet optimised for maximum comfort through side air outlets and utilisation of the Coanda effect
 - ▶ IR receiver concealed within the design panel (models 1 – 4)
- 7 Condensation connection:**

 - ▶ outer diameter 15 mm
 - ▶ inner diameter 10 mm
- 8 Air filter G1:**

 - ▶ simple to remove
 - ▶ easy to clean
- 9 Air intake grille**

 - ▶ large free cross-section to minimise pressure losses
- 10 Hydraulic connections:**

 - ▶ for CHW, LPHW and condensation drain
 - ▶ valve drip tray drains any condensation produced into the condensation tray
 - ▶ drip tray is supplied with the unit
 - ▶ optionally available with built-in valves with corresponding quantities
- 11 Condensation pump and float switch:**

 - ▶ easily accessible by removal of the polystyrene condensation tray
 - ▶ integrated condensation pump drains the condensation up to a max. head of 480 mm
 - ▶ pump activation by a two-stage float switch
 - ▶ the pump is switched on when the first stage is reached, and the second stage activates an evaluable alarm contact
- 12 Fans**

 - ▶ 3-stage AC fans
 - ▶ continuously variable EC fans
 - ▶ efficient and low-noise
 - ▶ protection class IP 44, insulation class B
 - ▶ integrated thermal contacts to prevent the motor from overheating
- 13 Heat exchanger**

 - ▶ copper pipe with aluminium fins
 - ▶ 2-/4-pipe version
 - ▶ vent and drain valves on the outside of the unit
- 14 Valves (optional):**

 - ▶ optionally factory-integrated

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4.2 Brief description

The KaCool D AF is a decentralised unit for heating, cooling and filtering air, including in hotels, offices and business premises. Thanks to the efficient, extremely quiet fan, the individual comfort temperature is quickly reached.

Operating mode

Secondary air is drawn into the central part of the cover panel. The air is routed first through the air intake grille to the filter. This cleans the secondary air of dust and thus protects the downstream components from dirt and impurities.

The air is drawn in by the fan, located directly downstream of the filter and pressed through the copper-aluminium heat exchanger. Depending on the temperature at which the medium flows through the heat exchanger, the air is either cooled or heated in the exchanger.

The air then passes through the outlet air slats into the room. The outlet air slats can be manually adjusted to the required direction.

Condensation can be produced at the heat exchanger when cooling with low water temperatures. This drips onto the heat exchanger and falls into the condensation tray below. The condensation collects in a corner here. The condensation level is monitored by a float switch. The condensation pump is activated when a certain level is exceeded. A condensation warning is emitted if a higher level is exceeded.

The valve kits available in the accessories can be connected to the side of the unit. The units include condensation trays, which can be installed under the valve kits. The condensation is guided and drained through the prepared opening into the condensation tray of the unit.

4.3 Accessories

Figure	Article	Properties	Suitable for	Art. no.
Valves				
	2-way valve kit	Open / Close 2-pipe 230 V drive	KaCool D AF without KaControl, model 0 – 1	325009012110
			KaCool D AF without KaControl, model 2 – 4	325009022110
			KaCool D AF without KaControl, model 5	325009032110
			KaCool D AF without KaControl, model 6 – 7	325009042110
		Open / Close 2-pipe 24 V drive	KaCool D AF with KaControl, model 0 – 1	325009012112
			KaCool D AF with KaControl, model 2 – 4	325009022112
			KaCool D AF with KaControl, model 5	325009032112
			KaCool D AF with KaControl, model 6 – 7	325009042112
		Open / Close 4-pipe with 230 V drive	KaCool D AF without KaControl, model 0 – 4	325009014110
			KaCool D AF without KaControl, model 5 – 7	325009024110
		Open / Close 4-pipe 24 V drive	KaCool D AF with KaControl, model 0 – 4	325009014112
			KaCool D AF with KaControl, model 5 – 7	325009024112
	3-way valve kit	Open / Close 2-pipe with 230 V drive	KaCool D AF without KaControl, model 0 – 1	325009012120
			KaCool D AF without KaControl, model 2 – 4	325009022120
			KaCool D AF without KaControl, model 5	325009032120
			KaCool D AF without KaControl, model 6 – 7	325009042120
		Open / Close 2-pipe 24 V drive	KaCool D AF with KaControl, model 0 – 1	325009012122
			KaCool D AF with KaControl, model 2 – 4	325009022122
			KaCool D AF with KaControl, model 5	325009032122
			KaCool D AF with KaControl, model 6 – 7	325009042122
		Open / Close 4-pipe with 230 V drive	KaCool D AF without KaControl, model 0 – 4	325009014120
			KaCool D AF without KaControl, model 5 – 7	325009024120
		Open / Close 4-pipe 24 V drive	KaCool D AF with KaControl, model 0 – 4	325009014122
			KaCool D AF with KaControl, model 5 – 7	325009024122

[more »](#)

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Figure	Article	Properties	Suitable for	Art. no.
Connections				
	Primary air connection spigot	For the connection of external primary air	KaCool D AF model 0 - 4	325009010300
			KaCool D AF model 5 - 8	325009020300
	ABS design panel RAL 9010	Included with units with article number 325008XXX001XX.	KaCool D AF model 0 - 4, without IR remote control	Included as standard
			KaCool D AF model 0 - 4, with IR remote control	
			KaCool D AF model 5 - 8, without IR remote control	
			KaCool D AF model 5 - 8, with IR remote control	
	RAL 9010 metal panel	The ABS design panel is included with ceiling cassettes with article number 325008XXX001XX. To order these units without design panel, replace the 1 in the article number by a 0 and order the metal panel separately.	KaCool D AF model 0 - 4, without IR remote control	325009010020
			KaCool D AF model 0 - 4, with IR remote control	325009010021
			KaCool D AF model 5 - 8, without IR remote control	325009020020
			KaCool D AF model 5 - 8, with IR remote control	325009020020
Control accessories, electro-mechanical				
	Electromechanical room thermostat	Only suitable for cooling with 3-stage fan speed switch Colour: white Voltage: 230 V, 50 Hz, max. 3 A W x H x D: 170x70x44 mm	All models, 2-pipe AC valve configuration	196000148918
		Electromechanical room thermostat with manual cooling/heating switch, with 3-stage fan speed switch Colour: white Voltage: 230 V, 50 Hz, max. 3 A W x H x D: 170x70x44 mm	All models, 2-pipe AC valve configuration	196000148917
		Electromechanical room thermostat with automatic cooling/heating switch, with 3-stage fan speed switch Colour: white Voltage: 230 V, 50 Hz, max. 3 A W x H x D: 170x70x44 mm	All models, 2-pipe or 4-pipe AC valve configuration	196000148916
	EC climate controller	Heating/cooling climate controller 2-/4-pipe systems. Operating modes AUTO / MAN / OFF. Fan speed can be set using 3-stage switch (programmable). Room frost protection function, internal temperature sensor, DIP switch for function selection. Plastic housing, pure white, similar to RAL 9010, surface-mounted Three inputs for: external flow sensor (47 kOhm) / heating/cooling changeover contact, external room temperature sensor (47 kOhm), ECO/Day or On/Off changeover Three outputs for: Speed control (0 - 10 VDC/5 mA), valve actuators (230 VAC/ 5(1) A) Operating voltage: 230 V AC/50 Hz/<2 VA Protection class IP30 Dimensions W x H x D: 110 x 111 x 26 mm	Ceiling cassettes with EC fan without KaControl, only in conjunction with valve kits with 230 V actuator	196000030155

more »

Figure	Article	Properties	Suitable for	Art. no.
	EC climate controller with clock	Climate controller for heating / cooling systems in 2-/4-pipe configurations with timer programme. Summer/winter time changeover, mode switch (with room frost protection monitoring), manual 10-stage speed switch. Flush-mounted, pure white, similar to RAL 9010. Two inputs for: external dewpoint sensor, external flow sensor, external room temperature sensor, heating/cooling, ECO/Day or On/Off changeover Analogue output: 0-10 V/5 mA 2 switching contacts per 230 V/3 (0.5) A Control range: 5-30 °C heating and 18...40 °C cooling Power reserve: approx. 3 days Operating voltage: 230 V/50 Hz/<2.2 VA Protection class: IP 30 Dimensions W x H x D: 81 x 85 x 18 mm (installation height, +29 mm installation height, flush)	Ceiling cassettes with EC fan without KaControl. only in conjunction with valve kits with 230 V actuator	19600030256
	Relay box	For group formation (max. 4 units) with electromechanical control	All models with AC fan	196000148919
KaControl accessories				
	KaController operating unit with one-touch operation	Operating unit, wall-mounted, high-grade design, plastic housing, colour similar to RAL 9010, large LCD multifunctional display, integrated room temperature sensor, communication interface to Kampmann T-LAN bus system, automatically switching LED backlight, press/turn dial with click stop function, individually adjustable basic display, integrated day, night and week program, password-protected parameter level for C1 control option	All models	196003210001
	KaController operating unit with side operating keys	For quick access to fan settings, operating modes, Eco mode, time and timer program, otherwise as art. no. 196003210001	All models	196003210002
	KaController without function keys, black	Room control unit for wall mounting, high-quality design, plastic housing, Traffic black (similar to RAL 9017), otherwise as art. no. 196003210001	All KaControl secondary units	196003210006

[more »](#)

3.25 KaCool D AF – Comfortable feeling of well-being, thanks to AtmosFeel

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Figure	Article	Properties	Suitable for	Art. no.
KaControl accessories				
	KaControl SEL panel without BACnet	KaControl electronics housed in a surface-mounted wall housing, wired ready-for-use, including KaControl operating unit for the central control of Kampmann products via a serial bus communication (Modbus); for integration of a maximum of 24 units (Modbus subscribers) (optionally with a maximum of 6 BACnet objects in a BACnet/IP network)	All models	196003232122
	KaControl SEL panel with BACnet			196003232123
	KaControl room temperature sensor	For wall mounting, IP30 surface-mounted, white RAL 9010, alternative to the temperature sensor in the KaController	All models	196003250110
	Pipe clip-on sensor	For detecting the temperature of the medium, including strap, 3 m cable, to protect the unit from frost	All models	196003250115
	Serial CAN bus card	To increase the number of units in a single-circuit control system	All models	196003260101
	Serial Modbus card	For connection to Modbus networks	All models	196003260101
	Serial Konnex card	For integration into KNX-/EIB networks	All models	196003260701
	Serial LON FTT10A card	For integration into LON FTT10A networks	All models	196003260501

Actuators

Power supply	Current consumption	Power consumption
	[A]	[W]
230 V	0.25	1.8
24 V	0.35	1.8

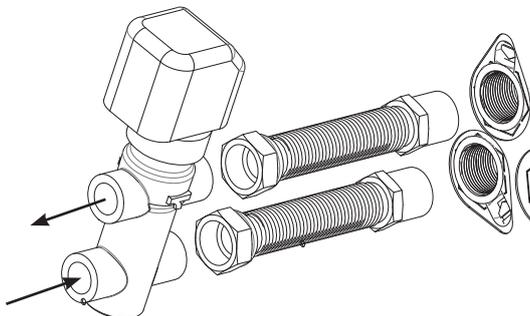
Valve lift 2.5 mm
 M 30 x 1.5 threaded connection
 Actuator mode: On / Off, NC (normally closed)

Valves

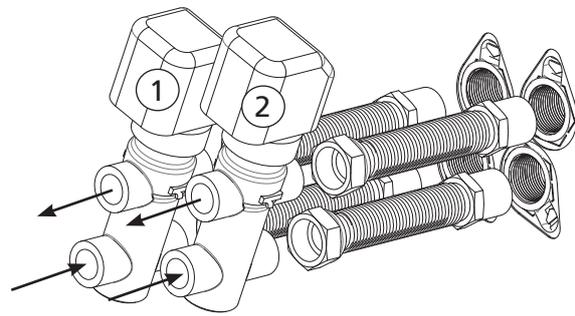
Model	Connection		KVS value	
	2-pipe	4-pipe	2-pipe	4-pipe
1	1/2"	2x1/2"	1.7	1.7
2	3/4"	2x1/2"	2.8	1.7
3	3/4"	2x1/2"	2.8	1.7
4	3/4"	2x1/2"	2.8	1.7
5	3/4"	2x3/4"	2.8	2.8
6	3/4"	2x3/4"	4.0	2.8
7	3/4"	2x3/4"	4.0	2.8

4-pipe connection Heating/Cooling	4-pipe connection Heating/Cooling	
	Cooling	Heating
Model 1–4	1	2
Model 5–7	2	1

Assembly of 3-way valve

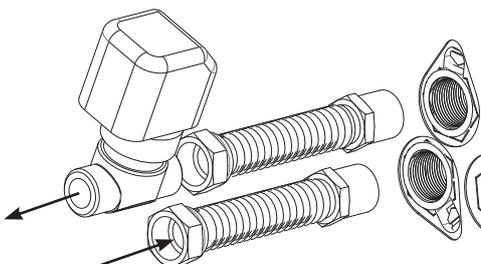


2-Leiter
2-pipe

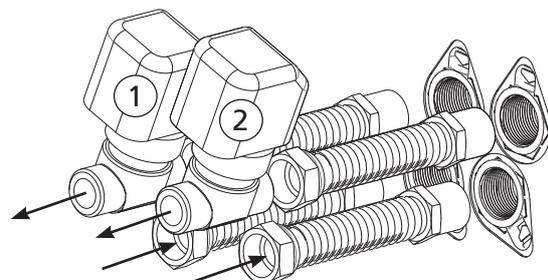


4-Leiter
4-pipe

Assembly of 2-way valve



2-pipe



4-pipe

3.25 KaCool D AF – Comfortable feeling of well-being, thanks to AtmosFeel

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Installation and operating instructions

5 Transport, packaging and storage

5.1 Safety information for transport

Risk of injury



WARNING!

Risk of injury from sharp edges or broken transport elements!

Improper use of parts of the unit to carry the equipment can lead to personal injury and material damage.

- 2 people are needed to transport the unit.
- Wear personal protective clothing when transporting the unit.
- Only lift the unit on both sides and only by the basic unit (not by the valves).
- Use suitable transport equipment to transport the unit to prevent damage to health and the equipment.

Incorrect transport



IMPORTANT NOTE!

Material damage caused by incorrect transport!

Units being transported can drop or topple over if transported wrongly. This can cause serious material damage.

- Proceed carefully when unloading the equipment and when transporting the equipment within the company.
- Note the symbols and information on the packaging.
- Only use the holding points provided.
- Only attach lifting equipment to the unit. Ensure that the weight is evenly distributed.
- Only remove packaging shortly before assembling the unit.

Scope of delivery (depending on model ordered)

Basic housing:

- Basic housing
- Fixing material
- Condensation tray/valves
- Instructions/wiring diagram

Design panel:

- Panel
- Fixing material

Valve kit:

- Connecting pipework
- Valve
- Actuator
- Instructions

5.2 Transport inspection

Check on delivery for completeness and transport damage.

Proceed as follows in the event of visible damage:

Do not accept delivery or only accept with reservations. Record any transport damage on the transportation documents or on the transport company's delivery note.

- Lodge a complaint with the freight forwarder.
- Lodge a complaint about all defects and faults as soon as they are detected.



Warranty claims can only be made within the applicable period for complaints.

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5.3 Packaging

Packaging information

The individual items are packaged in accordance with the transport conditions expected.

The packaging is intended to protect the individual components from damage during transit, corrosion and other damage before they are assembled. Therefore do not destroy the packaging and only remove shortly before installation.

Handling packaging materials

Dispose of packaging material in accordance with the respective legislation and local regulations.



IMPORTANT NOTE!

Environmental hazard from incorrect disposal!

Packaging materials are valuable raw materials and, in many cases, can be reused or sensibly reconditioned and reused. Incorrect disposal of packaging materials can present a hazard to the environment.

- Dispose of packaging materials in an environmentally-friendly manner.
- Note the locally applicable regulations governing disposal. You may wish to consider contracting a specialist company to dispose of the materials.

5.4 Storage

Storage of packaged goods

Store packaging under the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free place.
- Do not expose to aggressive media.
- Protect from direct sunlight.
- Avoid mechanical vibrations and shocks.
- Storage temperature: 15 to 35 °C.
- Relative air humidity: max. 60%.



Under certain circumstances, packages can carry storage instructions that go beyond the requirements listed here. Comply with these instructions accordingly.

6 Installation and connection

6.1 Requirements governing the installation site

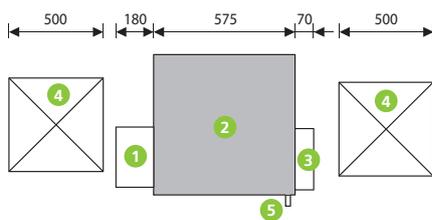
Only install and assemble the unit if the following conditions are met:

- The installation site can bear the weight of the unit (↳ Chapter 3 "Technical data" on pages 12-14).
- The load-proof and vibration-free position of the unit is guaranteed (possibly call in the services of an architect or structural engineer, also in connection with openings to be made through walls and ceilings).
- Comply with the minimum clearances from the unit to the wall/ceiling/floor (page 29).
- Ensure that the airflow can circulate freely.
- Make sure that drilling positions for installing the unit are free from electrical wiring or pipes.
- Provide for adequate space for flow and return water connections on site (↳ Chapter 3 "Technical data" on page 12 ff.).
- Ensure that the unit can be installed without mechanical torsion or tension when installed.
- There is a power supply on site (↳ Chapter 3 "Technical data" on page 14).

6.2 Service openings with sealed ceilings

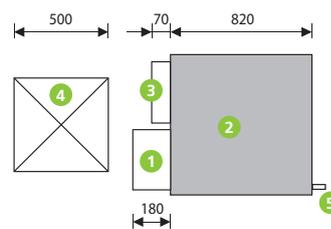
Service opening connection

Model 1–4



Appropriate service openings are needed to service and maintain units installed in permanently sealed ceilings.

Model 5–7



- 1 Condensation tray for valves
- 2 Ceiling cassette
- 3 Electrical junction box
- 4 Service openings (suggested 500x500)
- 5 Condensation connection (it may be necessary to provide for an additional service opening depending on the design of the transition between the condensation connection and the on-site condensation line)

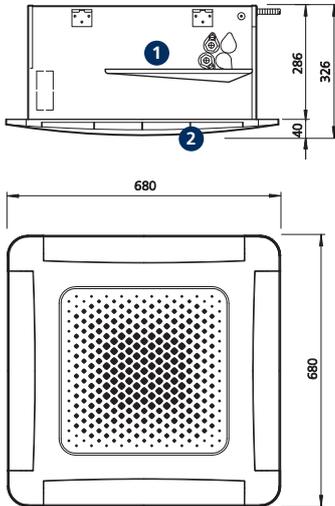
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Installation and operating instructions

Installation (General)

Model 1–4



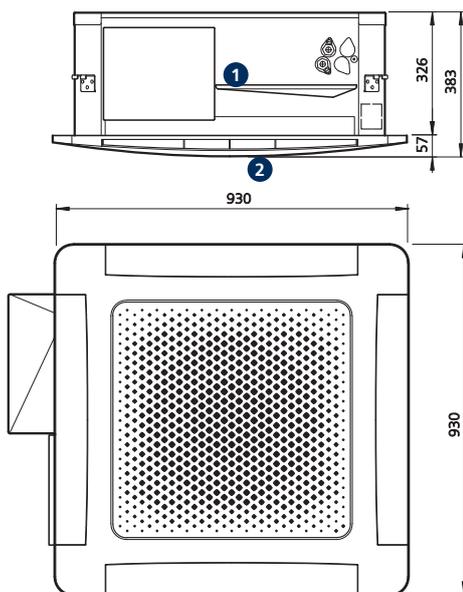
The ceiling cassette can be installed within a suspended ceiling or underneath the ceiling slab (without suspended ceiling construction).

Firstly, the cooling and/or heating load of the room needs to be determined and the appropriate ceiling cassette selected (also from an acoustic point of view).

Determine the optimum position in the room after selecting the cassette. Make sure that there are no draughts and do not install the cassettes close to walls (min. 1.4 m distance). If more than one cassette is installed in a room, they should be networked together and installed at a minimum spacing of 4 metres.

Install the ceiling cassette horizontally. There needs to be a minimum spacing of 10 mm between the ceiling slab and the cassette.

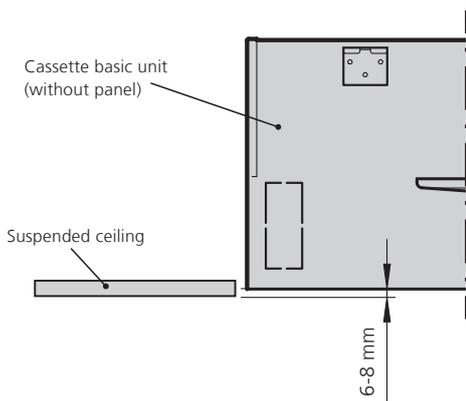
Model 5–7



No objects that have an impact on the air flow or could be damaged by escaping water should be located directly under the ceiling cassette.

Avoid direct thermal radiation by lamps or windows onto the cassette (and temperature sensor).

- 1 Condensation drip tray for valve assembly
- 2 Design panel in RAL 9010 (pure white)



ATTENTION:

Installation height within the suspended ceiling

Please note that the bottom edge of the cassette unit (without panel) must not be fitted flush with the suspended ceiling.

A distance of 6 - 8 mm must be provided between bottom edge of the suspended ceiling and bottom edge of the cassette unit!

Suspending the unit

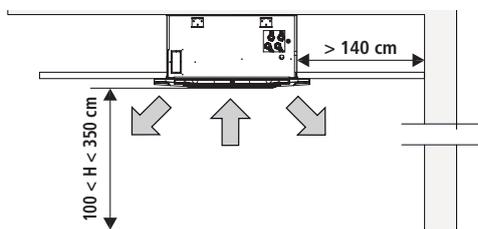
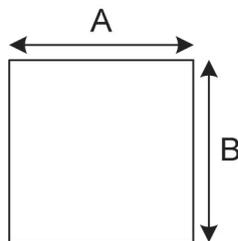
The ceiling needs to be opened once the installation location has been selected.

Ceiling structures with inlay panels are largely removed around the cassette.

With rigid plasterboard ceilings, an appropriate cut-out is made with the adjacent dimensions.

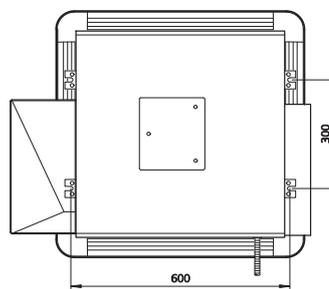
The service openings can also be made based on the drawing on page 27.

Ceiling opening		Model 1-4	Model 5-7
A	mm	640	770
B	mm	640	770

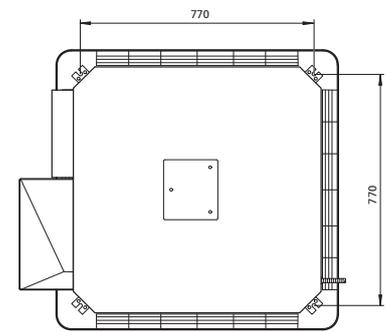


Now drill the holes for the fixing dowels into the concrete ceiling slab. Then fix the dowels and threaded rods in place.

Model 1-4

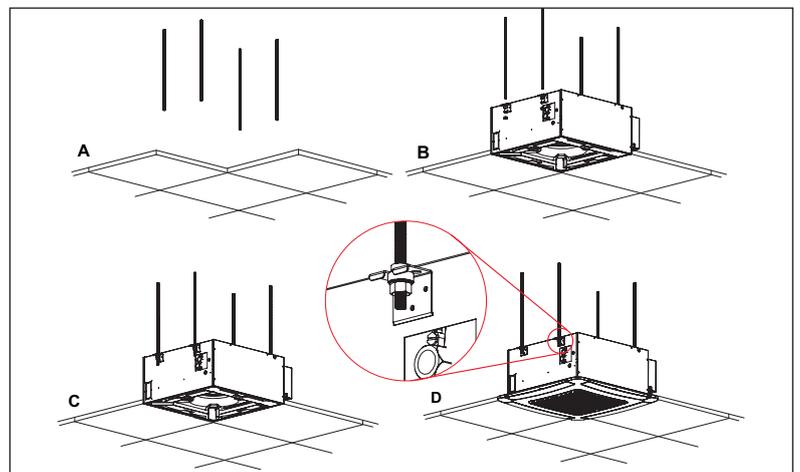


Model 5-7



The installation brackets of the ceiling cassette (included) are fixed to the threaded rods at an appropriate height. The installation brackets are positioned on a rubber pad for vibration decoupling and are fixed in place using nuts and washers.

The ceiling cassette can now be positioned in the ceiling construction with the help of two people or appropriate lifting equipment and suspended in the first two installation brackets. The two other installation brackets are now fixed onto the ceiling cassette and secured in place with the screws supplied. The water, condensation and electrical connections can now be done.



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Installation and operating instructions

Waterside connection



If ordered, the separate valve kit is now fitted in the ceiling cassette. Use the sealing material provided.

When the threaded connection is tightened, the counterpart is tightened on the cassette!

Details on the valves on page 23.

The condensation tray valve can now be fitted.

The on-site pipe can then be connected to the valve kit. Avoid tension and vibrations of the pipework system being transferred onto the ceiling cassette.

Insulate the pipework to be vapour-proof as far as the condensation tray valve. We recommend leading the pipework to the side of the unit. In this case, a larger section of the pipework is protected by the condensation tray.

If necessary, install shut-off devices and balancing valves (e.g. TacoSetter) upstream of the ceiling cassette for hydraulic balancing and for maintenance purposes.

Condensation connection

The condensation produced at the heat exchanger and at the valves is drained off by a condensation pump integrated in the cassette.

A 2-stage float switch is used to detect the condensation.

1st stage: Switches on/off the condensation pump

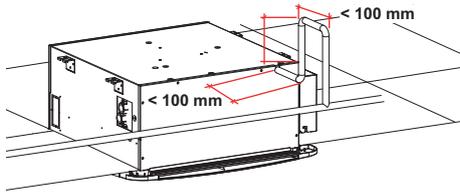
2nd stage: Condensation drain fault

A condensation drain fault (depending on the on-site control) needs to be used to switch off the cooling valve!

The cassette's condensation hose has an inner diameter of 10 mm and an outer diameter of 15 mm and can be firmly connected to the on-site main line by means of an appropriate hose nozzle.

Volume of condensation produced per cassette

Air intake:	27°C / 48%			30°C / 75%
Water temperature:	6 / 12°C	7 / 12°C	10 / 16°C	6 / 12°C
Model	[l/h]	[l/h]	[l/h]	[l/h]
1	1.3	1.1	0.6	5.6
2	2.3	2.2	0.7	9.3
3	2.5	2.4	0.9	11
4	2.6	2.6	1	11.2
5	2.7	2.6	1.1	13
6	5.2	5.1	1.5	21
7	5.5	5.4	2.2	23



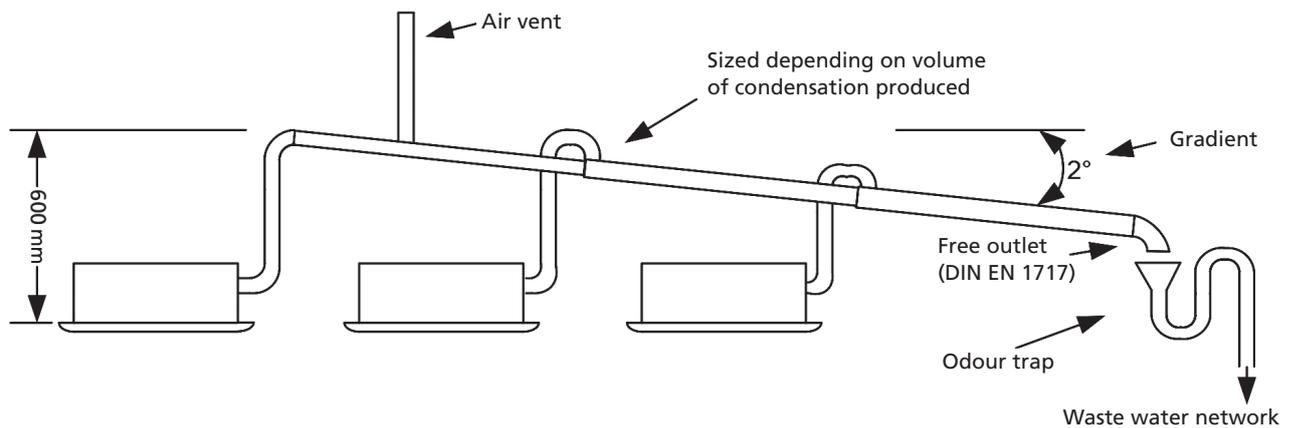
Lay the drain pipe in accordance with the applicable regulations and standards.

Ventilation of the pipe is essential and should preferably be high, but a minimum of 30 cm above the highest point of the condensation line. Prevent condensation from escaping through the outlet. The rise pipe should rise vertically upwards from the cassette – horizontal or inclined pipe routing from the cassette to the final riser is not permitted.

The pipe needs to be made of strong and sufficiently sized pipe material (note the table giving the volumes of condensation produced) (do not route the hose).

Maintain the slope along the entire section – making sure that there are no lower sections.

Depending on the pipe material, cold insulation for the condensation line is needed to avoid condensation. Ensure that the connection to the waste water pipe is designed as a free outlet for hygienic reasons.



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Installation and operating instructions

Installation of casing panel



Position the casing panel under the cassette and hook into place.



Fix the casing panel in place using four screws.



Insert the filter.



Fix the retainer for the filter.



Flap up the grille and snap into place.



In the same way, follow steps in the order **6**, **5**, **4** and **3** to remove the filter for cleaning and maintenance work. After cleaning the filter, carry out steps **3** – **6**.

Primary air spigots for the fresh air supply

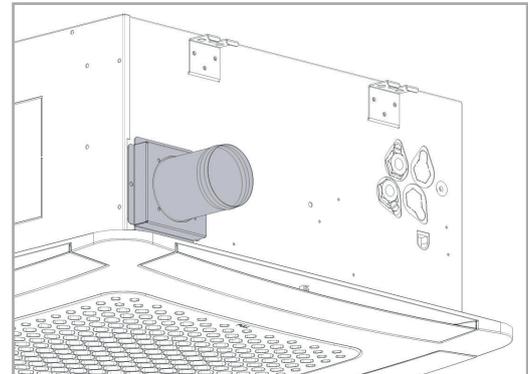
KaCool D AF units can be supplied with primary air, which is then supplied to the room through the heat exchanger.

The pre-conditioned air needs to be cleaned and have a minimum temperature of 14 °C and a maximum temperature of 25 °C.

A primary air spigot, available as an accessory, is needed for the connection. It is fixed to the side of the cassette. The connection diameter is 80 mm.

Model 1 – 4: max. two primary air connections, each 80 m³/h

Model 5 – 7: one primary air connection, max. 120 m³/h

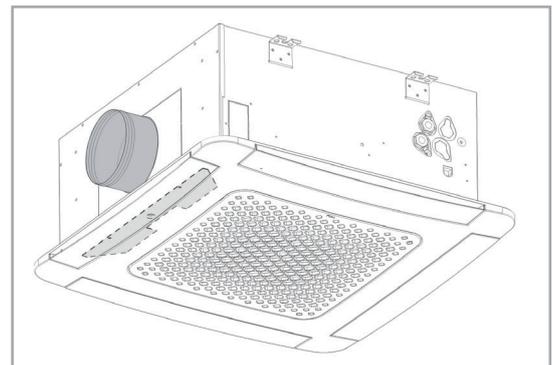


Fresh air connection, model 1 – 4

External air outlet

An air line can be connected to the ceiling cassette to provide adjacent rooms (e.g. changing rooms) with conditioned air. A pre-punched opening with a diameter of 150 mm needs to be removed on the side of the cassette to which an on-site flange must be fitted. An insulated air line and outlets can be connected to it. Seal the respective air outlets with adhesive tape.

Make sure that you keep the pressure loss at the outlet and air line as low as possible (max. 15 Pa total pressure loss). As a result, up to 15% of the total air volume of the ceiling cassette can be moved.



Models 1 – 4

Accessories for external condensation pump art. no. 325007000410

Should the max. lifting height (600 mm) of the condensation pumps integrated in the cassettes be insufficient, there is an option to use an additional external condensation pump. This can be fitted beside or on the cassette. The cassette's condensation hose is inserted into the external pump's collection tank. Please refer to the data sheet form the external condensation alarm for further technical data on the pump.

Voltage is supplied by a separate power feed cable. The interference contact must be incorporated in the control for the cooling valve and switch it off in the event of a fault.

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Technical data:	
Max. pumping head	4.6 metres
Maximum number of connected cassettes	2 no.

The external condensation pump creates a louder noise. This needs to be taken into consideration when choosing the installation site.

6.3 Electrical wiring

Personnel: ■ Installation personnel
■ Qualified electrician

Protective equipment: ■ Safety shoes
■ Protective gloves
■ Workwear



Only allow qualified electricians to perform electrical work.

Further connections, for instance to building control systems or external controllers, may be necessary. Refer to the manufacturer's literature in this respect.

- Wire the unit in accordance with the enclosed wiring diagram.
- Only wire the unit in accordance with currently applicable VDE and EN guidelines, as well as Technical Wiring Regulations stipulated by the regional energy supply companies.
- Only connect the unit to fixed cables.



IMPORTANT NOTE!

Non-compliance with the regulations and operating instructions can result in the units malfunctioning with consequential damage and danger to people.

There is a danger of fatal injury caused by wires being crossed due to incorrect wiring! Disconnect all parts of the system from the mains power supply and prevent them from being reconnected before starting any connection and maintenance work!

Please read these instructions in full to ensure correct and proper installation and the correct operation of the KaController.

Please note the following safety-relevant information

- Disconnect all parts of the system that are being worked on.
- Ensure that the system cannot be accidentally re-connected!
- Before commencing with installation/maintenance work, wait until the fan has come to a standstill once the unit has been switched off.
- Attention! Pipes, casings and fittings can become very hot or very cold depending on the operating mode!
- Qualified personnel must have undergone training to provide them with adequate knowledge of the following:
 - Safety and accident prevention regulations
 - Guidelines and recognised technical regulations, i.e. Association of German Electricians (VDE)
 - DIN and EN standards
 - Accident prevention regulations VBG, VBG4, VBG9a
 - DIN VDE 0100, DIN VDE 0105
 - EN 60730 (Part 1)
 - Technical wiring regulations (TABs) issued by the regional electricity providers

Protect the products from any moisture during installation. Check the application with the manufacturer in case of any doubt.

Any use other than the use specified above is deemed not to be correct and proper. The operator of the unit is solely responsible for any damage arising as a result of this. Intended use is deemed to include observing the installation instructions described in these instructions.

Modifications to the unit

Do not undertake any modifications or upgrades to the KaController or KaCool D AF without discussing them with the manufacturer as they can impair the safety and operation of the unit.

Do not carry out any measures on the unit not described in this manual. Make sure that on-site systems and cabling are suitable for connection to the intended system!

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Important:

Provide an all-pole mains separator in the wiring on site that can be reliably secured to avoid the system being reconnected (e.g. a lockable switch with a contact opening of at least 3 mm up to a rated voltage of 480 V).

No protective measures are indicated in the Kampmann wiring diagrams. These must be provided additionally when installing the system and when connecting the units in accordance with VDE 0100 and the regulations of each of the respective energy supply companies.

6.4 Overview of controls



The unit comes in a series of different electrical versions. Connect it via a terminal strip in the electrical junction box, which is located on the opposite side of the unit's water connection.

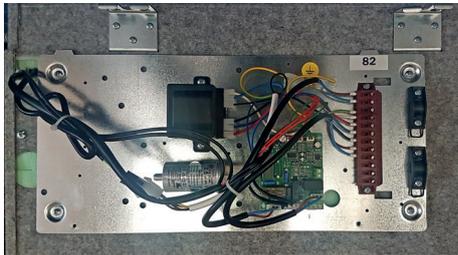
Wire the unit as per the wiring diagram, which is different for each version.

Design	Art. no. suffix
AC fans, electro-mechanical model	_00
EC fans, electro-mechanical model	_00
EC fans, infra-red control	_IR
EC fans, KaControl control electronics	_C1

Example:

325008232001C1 -> KaControl.

6.5 Electro-mechanical model with AC fan



Electrical junction box

The required room temperature, fan stage and, if necessary, heating or cooling mode, are set on the room thermostats. If the set room temperature deviates by a specific figure from the actual value, the fan runs at the set speed and the thermoelectric actuator opens the water-side valve.

If a condensation alarm is fitted, the PCB fitted in the cassette for the condensation pump closes the cooling valve and opens the max. 24 V AC/2 A potential-free alarm contact.



Terminals for the condensation alarm contact

The various room thermostats enable operation and temperature regulation of a KaCool D AF (electro-mechanical version 230 V with AC fan).

The room temperature is set using the dial.

3-stage fan speed setting using the slider switch.

A separate room temperature sensor type 148921 and a potential-free contact for switchover to ECO mode or On/Off mode can be fitted onto the room thermostats type 148916 for 2- and 4-pipe systems, and a clip-on sensor type 148922 in conjunction with 3-way valves and a potential-free contact for heating/cooling switchover for 2-pipe systems.

A relay box type 148919 is needed for a maximum of 4 cassettes for the parallel operation of the KaCool D AF cassettes with 1 room thermostat.



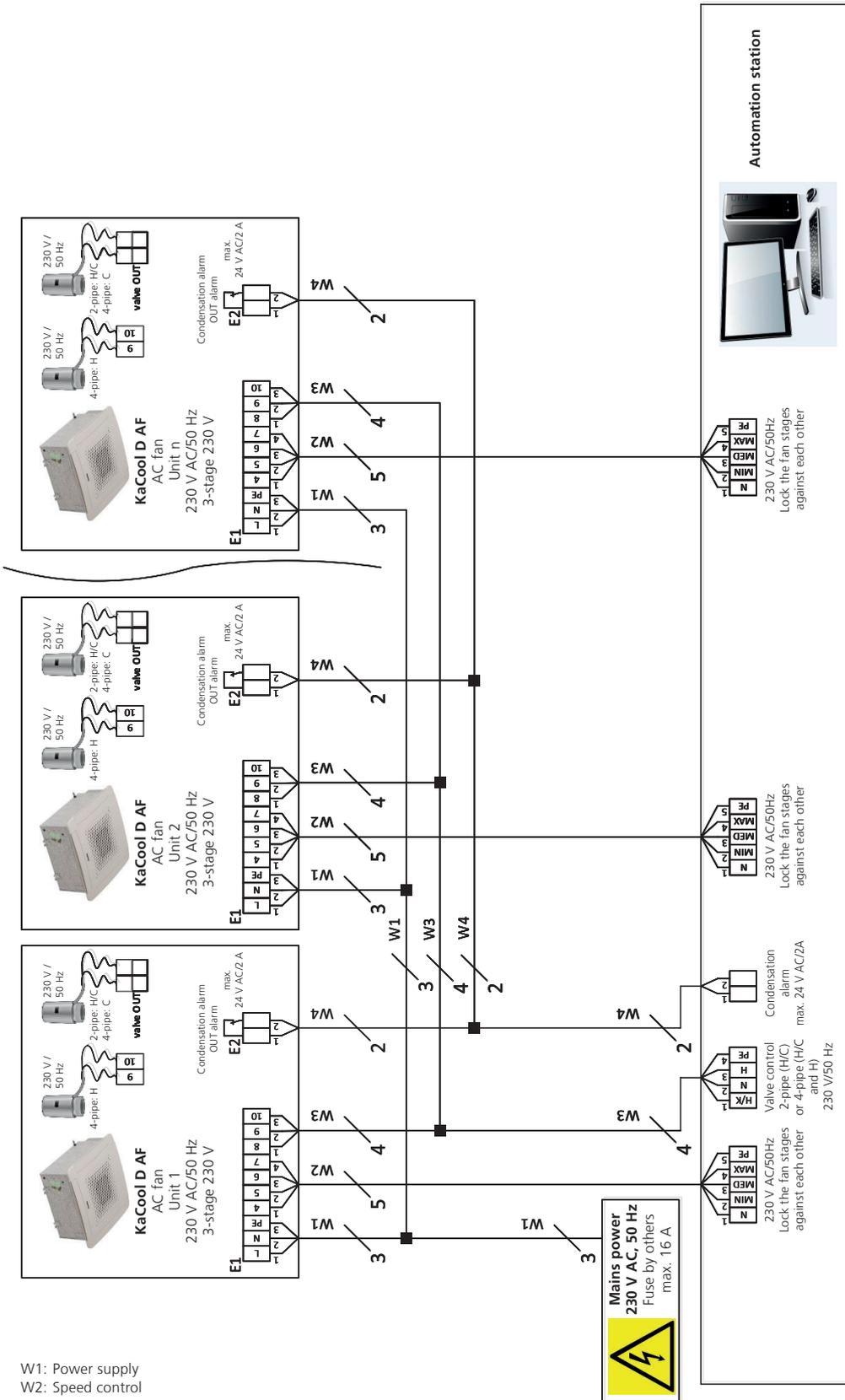
Room thermostat e.g. type 148916

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Electrical cabling – BMS control

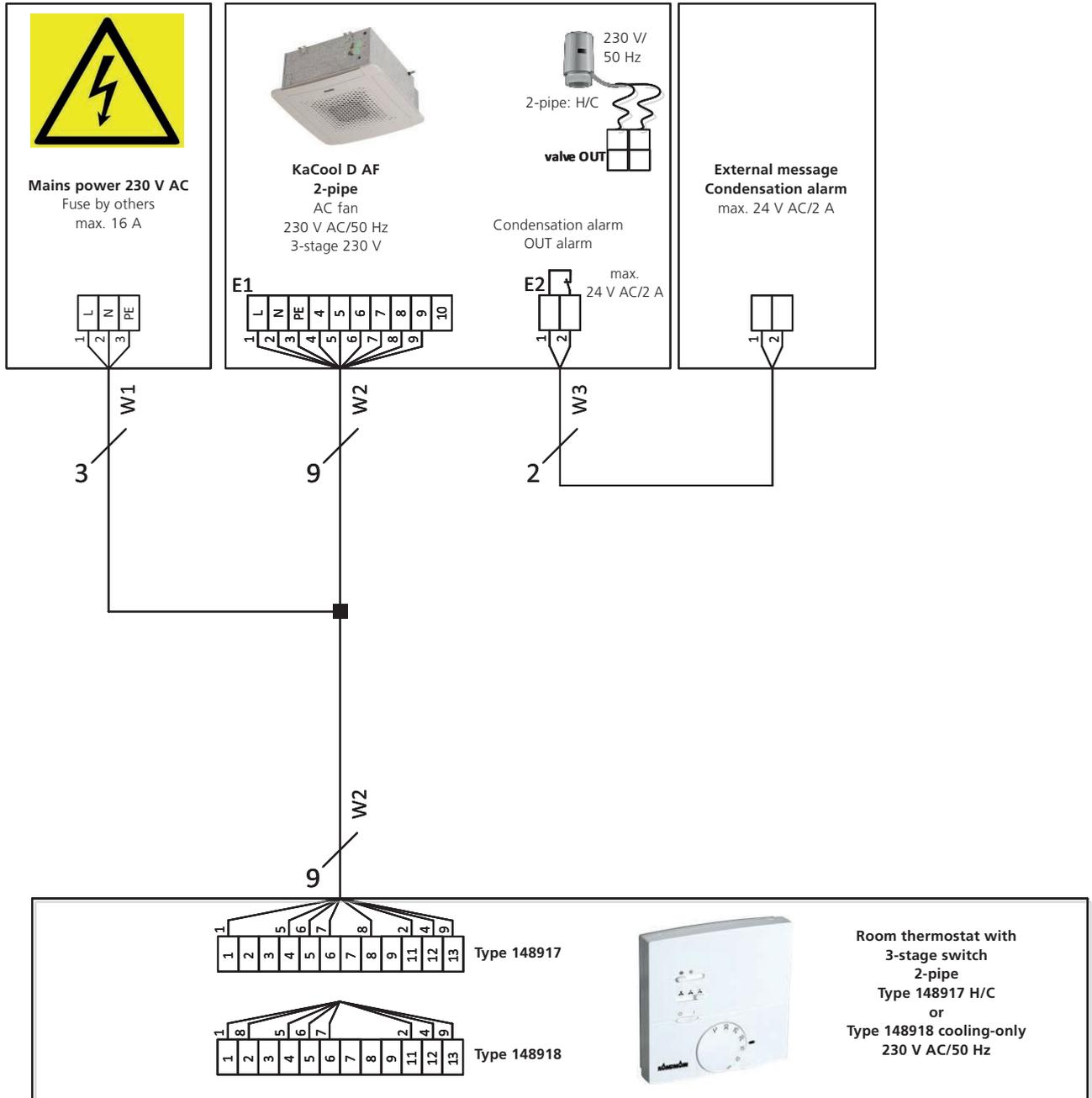


- W1: Power supply
- W2: Speed control
- W3: Valve control
- W4: Condensation alarm message

The number of connecting wires required including fuses is given on the individual control units.
Electrical supply: Observe the technical connection requirements laid down by utility companies!

Electrical cabling – Room thermostat control

Stand-alone unit, stage thermostat



W1: Power supply

W2: Voltage supply, fan control, valve control

W3: Condensation alarm message to external control

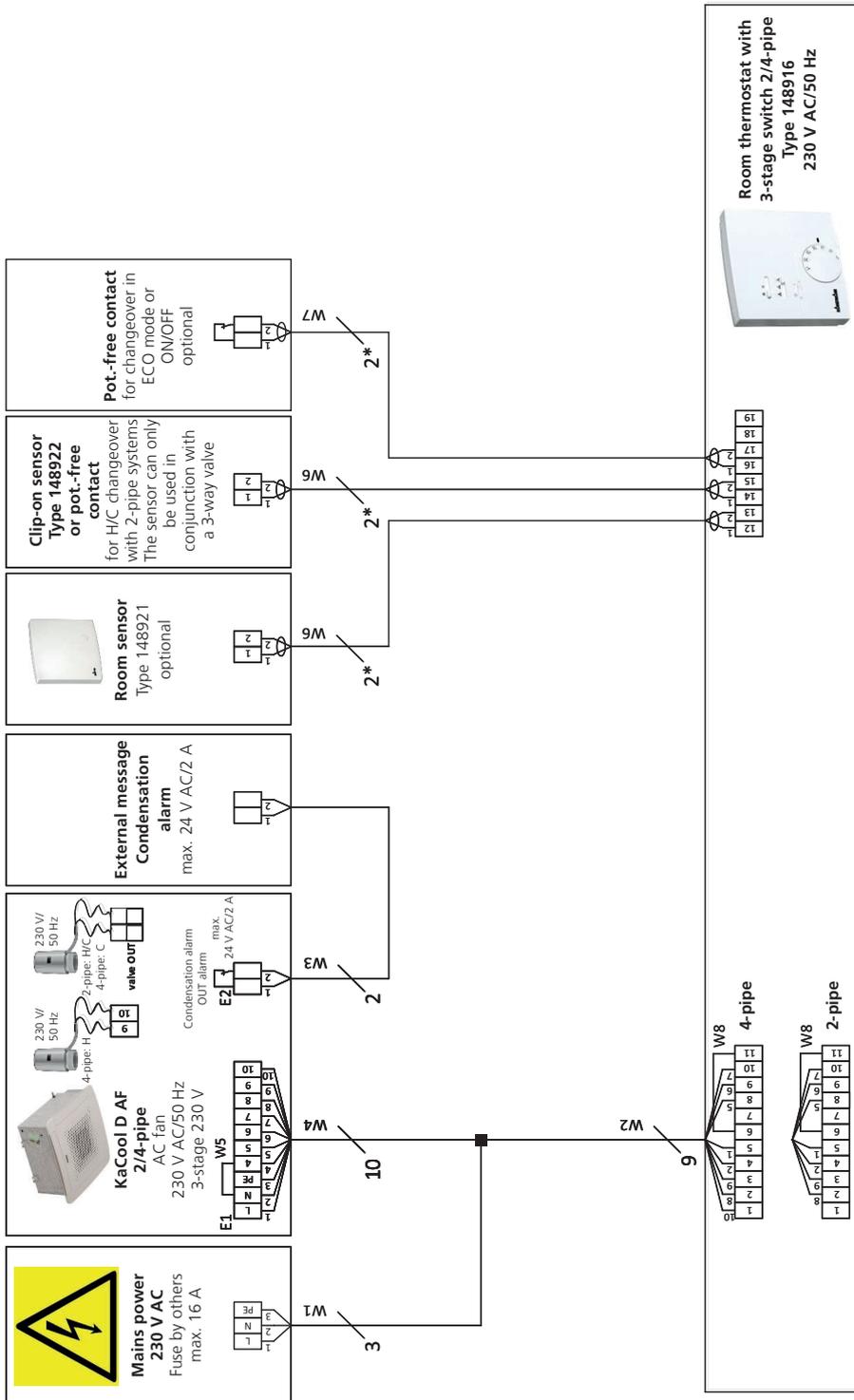
The number of connecting wires required including fuses is given on the individual control units.

Electrical supply: Observe the technical connection requirements laid down by utility companies!

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*) Lay shielded cables 0.5 mm² e.g. J-Y(ST)Y, 2 x 2 x 0.8 mm, max. 50 m, separately from power cables!

W1: Power supply

W2: Voltage supply, fan speed control, valve control; only 8 wires with 2-pipe systems – wire 10 is omitted

W3: Condensation alarm message to external control

W4: Voltage supply, fan speed control, valve control; only 9 wires with 2-pipe systems – wire 10 is omitted

W5: Insert wire jumpers on site or route wire 4 to the on-site intermediate junction box

W6: Low voltage signal

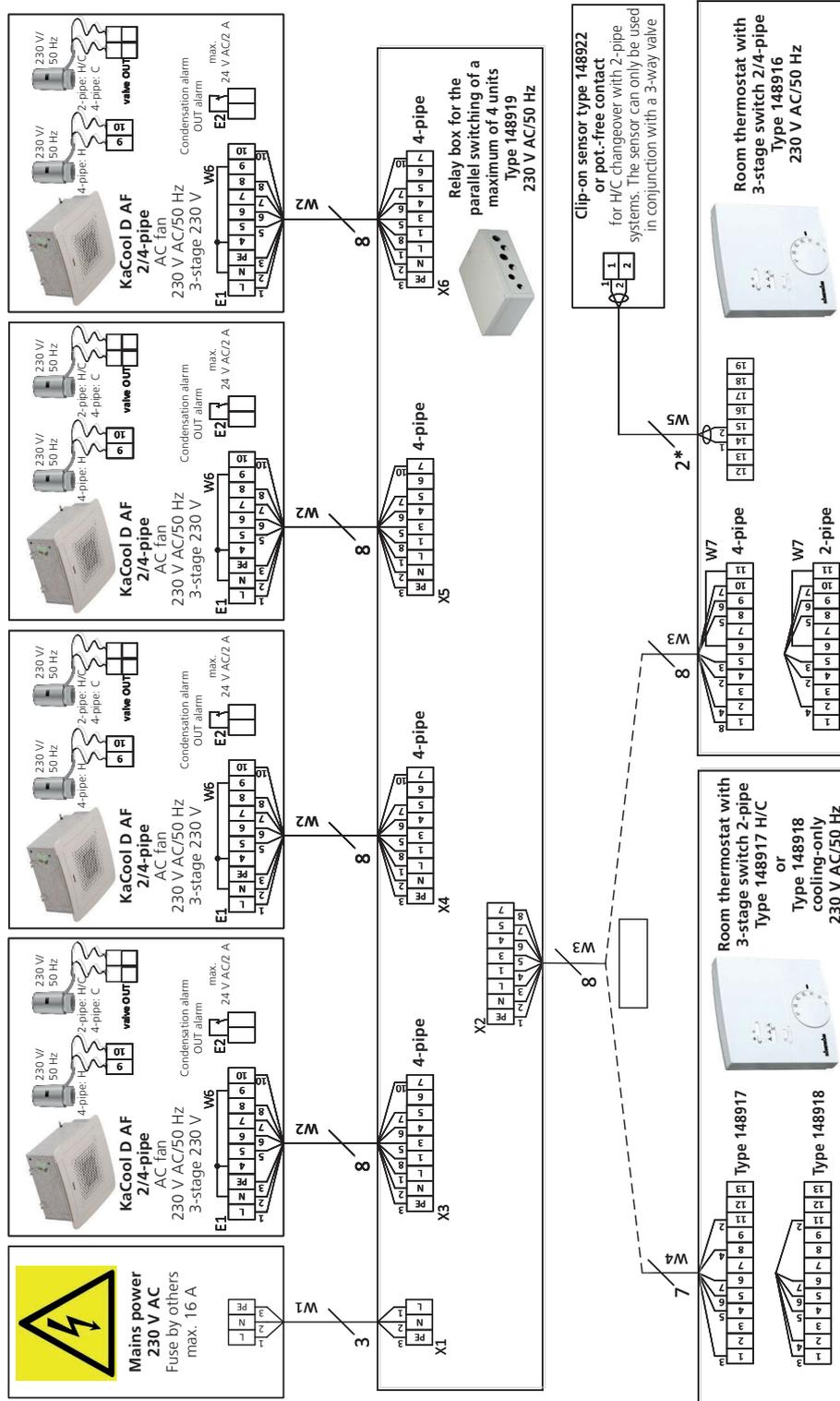
W7: Low voltage signal; a wire jumper needs to be inserted if the input is not used

W8: Insert on-site wire jumper

The number of connecting wires required including fuses is given on the individual control units.

Electrical supply: Observe the technical connection requirements laid down by utility companies!

Group formation, stage thermostat



*) Lay shielded cables 0.5 mm² e.g. J-Y(ST)Y, 2 x 2 x 0.8 mm, max. 50 m, separately from power cables!

W1: Power supply

W2: Voltage supply, fan speed control, valve control; only 7 wires with 2-pipe systems – wire 10 is omitted

W3: Voltage supply, fan speed control, valve control; only 7 wires with 2-pipe systems – wire 8 is omitted

W4: Voltage supply, fan control, valve control

W5: Low voltage signal

W6, W7: Insert on-site wire jumper

The number of connecting wires required including fuses is given on the individual control units.

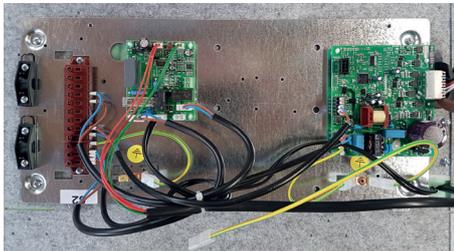
Electrical supply: Observe the technical connection requirements laid down by the utility companies!

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6.6 Electro-mechanical model with EC fan



Electrical junction box



Terminals for the condensation alarm contact



EC climate controller type 30155



EC climate controller with clock type 30256

The required room temperature and fan stage and, if necessary, heating or cooling mode are set on the climate controller. The fan runs from a certain difference between the set room temperature and the actual value and the thermoelectric actuator opens the water-side valve.

If a condensation alarm is fitted, the PCB fitted in the cassette for the condensation pump closes the cooling valve and opens the max. 24 V AC/2 A potential-free alarm contact.

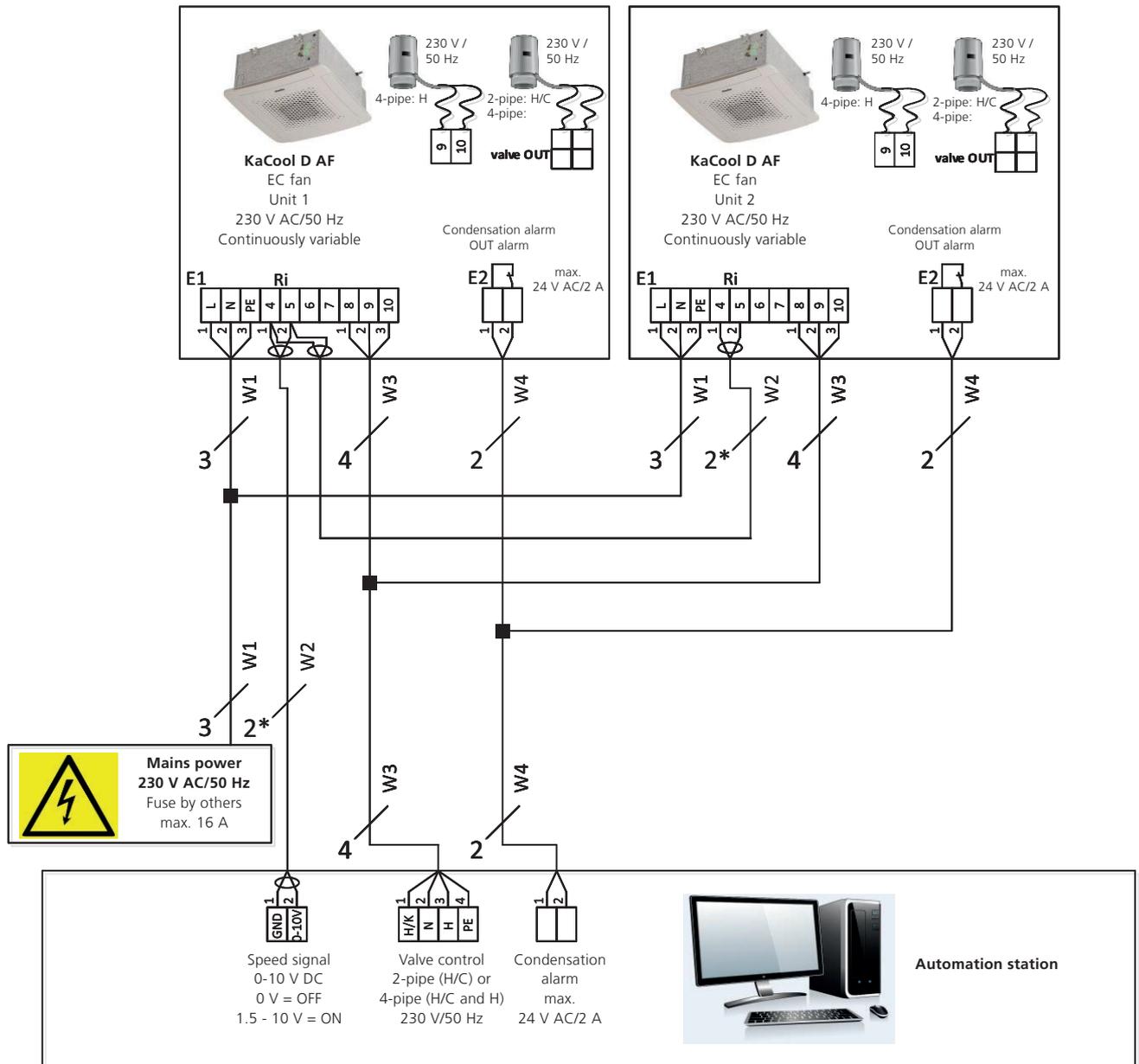
The climate controller type 30155 and type 30256 enables the operation and temperature control of a max. of 2 parallel wired KaCool D AF (230 V electromechanical version with EC fan).

Set the room temperature on the climate controller type 30155 using the dial and fan stage in manual mode via a 3-stage slider switch or continuously variably in automatic mode.

The room temperature is set on the climate controller with clock type 30256 using sensor-controlled function keys. With manual 10-stage fan speed adjustment, automatic summer/winter changeover and a day or week program.

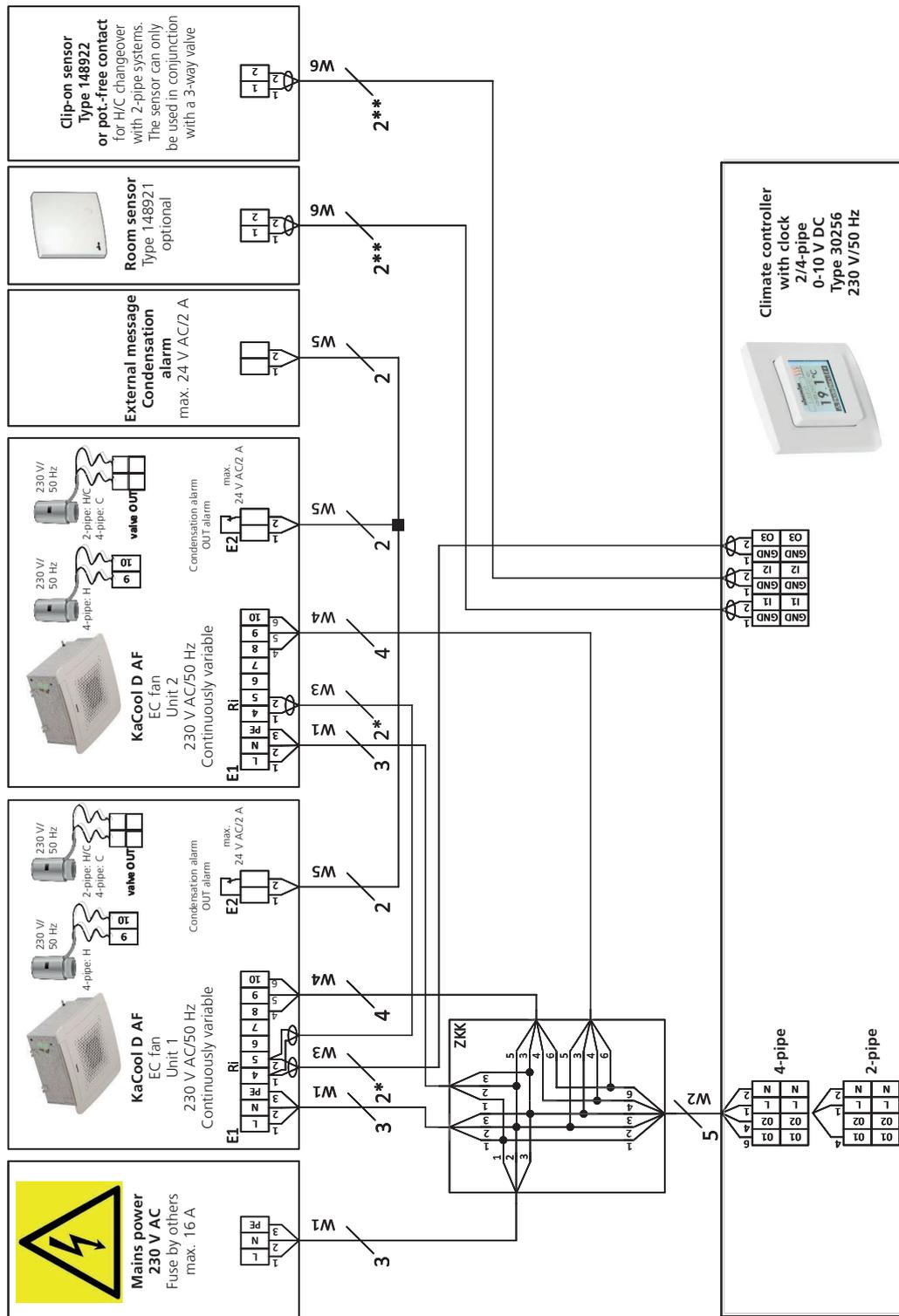
A separate room temperature sensor type 148921, a potential-free contact can be connected to both climate controllers for switchover to ECO mode or On/Off and, with 2-pipe systems, a clip-on sensor type 148922 can be connected in conjunction with a 3-way valve or a potential-free contact for heating/cooling switchover, although there are only 2 inputs available on the climate controller type 30256 which can be used depending on the configuration.

Electrical cabling – BMS control, max. 2 units



*) Lay shielded cables e.g. B. J-Y(St)Y, 0.8 mm separately from power cables.
 W1: Power supply
 W2: Fan speed signal 0-10 V DC, Ri = 100 kOhm, max. line length 10 m from the BMS system to the 2nd unit
 W3: Valve control
 W4: Condensation alarm message
 The number of connecting wires required including fuses is given on the individual control units.
 Electrical supply: Observe the technical connection requirements laid down by utility companies!

Electrical cabling – Control by climate controller with clock type 30256, max. 2 units



*) Lay shielded cables e.g. B. J-Y(ST)Y, 0,8 mm separately from power cables!

**) Lay shielded cables 0,5 mm² e.g. J-Y(ST)Y, 2 x 2 x 0,8 mm, max. 50 m, separately from power cables!

W1: Power supply

W2: Voltage supply, valve control; only 4 wires with 2-pipe systems – wire 6 is omitted

W3: Fan speed signal 0-10 V DC, Ri = 100 kOhm, max. line length 10 m from the climate controller to the 2nd unit

W4: Valve control; only 3 wires with 2-pipe systems – wire 6 is omitted

W5: Condensation alarm message to external control

W6: Low voltage signal; if the input is to remain inoperational, the ECO function needs to be selected and the input unwired.

The number of connecting wires required including fuses is given on the individual control units.

Electrical supply: Observe the technical connection requirements laid down by utility companies!

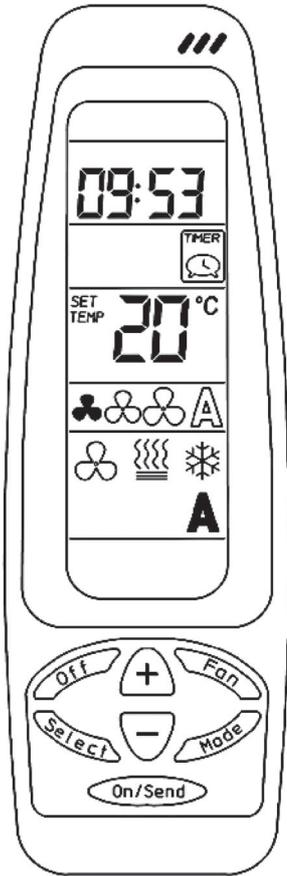
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6.7 Model with infra-red remote control

Infra-red transmitter/remote control



The operation of the cassette can be changed using the remote control keys. The display first changes to remote control by pressing the keys. After all the required changes have been made, they are transmitted by pressing the On/Send key on the cassette. The settings will not be transmitted to the cassette without pressing the On/Send key.

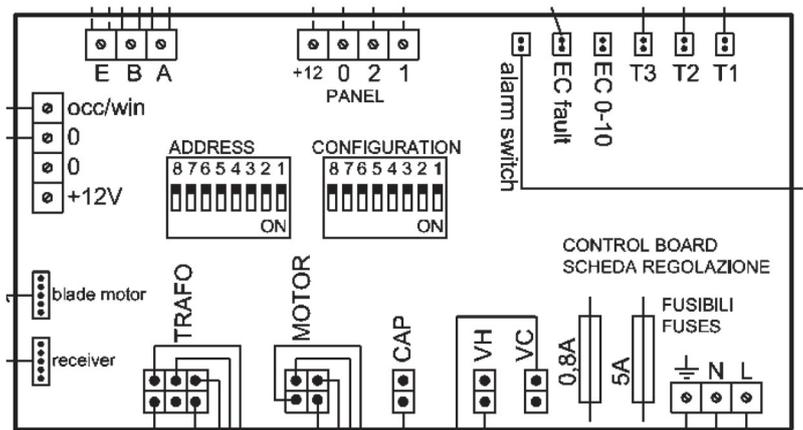
Key functions		
Key	Description	Display
OFF:	Disable ceiling cassette	---
FAN	Change fan speed	
MODE	Change operating mode	
Select	Time setting (save with On/Send)	
On/Send	Send changed data	
+	Raise setting values (e.g. temperature)	---
-	Lower setting values (e.g. temperature)	---

Meaning of speed display	
Setting value	Meaning
	Low fan speed, low air volume and output
	Medium fan speed, medium air volume and output
	High fan speed, high air volume and output
	Automatic fan adjustment following deviation of the room temperature from the target temperature

Meaning of operating mode display	
Setting value	Meaning
	Recirculation mode only – only the fan is operated
	Heating mode, the cassette heats the room to target temperature
	Cooling mode, the cassette cools the room to target temperature
	Automatic mode, the cassette automatically changes depending on the room temperature difference between heating and cooling mode. Only suitable for 4-pipe systems.

 Timer mode setting		
Display	Action	Description
	Press Select 2x	"Programme & Start" appears in the display
	Press +/-	The required hour is set on the clock
	Press Select 1x	Confirm hour, change to the minute
	Press +/-	The required minute is set on the clock
	Press Select 1x	"Programme & Stop" appears in the display
	Press +/-	The required hour is set
	Press Select 1x	Confirm hour, change to the minute
	Press +/-	The required minute is set
	Press Select 1x	Confirm the entry
	On/Send	Send changed data

Functional description of the infra-red PCB



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“CONFIGURATION” DIP switch

The configuration Dip switch adjusts the cassette to the system. All switches are dipped to “OFF” in the delivery state.

DIP no.	Function	ON	OFF
1	System/pipe	4-pipe	2-pipe
2	Heating valve/Electric heating element	Electric heating element	Heating valves
3	Control unit	Cable remote control	Infra-red remote control
4	Motor	AC stage	EC continuously variable
5	Valve operation, cooling mode	ON/OFF according to room temperature	Continuous mode
6	Valve operation, heating mode	ON/OFF according to room temperature	Continuous mode
7	Switch-off time of fan when the setpoint is reached	None	3 min. delay
8	Master/Slave	Master	Slave

“ADDRESS” DIP switch

The addressing Dip switch is used to assign the address to the respective cassette with group formation. Every address can only occur once in a group.

Address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DIP to “ON”	1	2	1,2	3	1,3	2,3	1,2,3	4	1,4	2,4	1,2,4	3,4	1,3,4	2,3,4	1,2,3,4	5

Jumper function

JUMPER No.	Function	Open	Closed
JP1	In heating mode, fans reach minimum speed at the setpoint Ton = 1 min Toff = 5 min	Active	Not active
JP2	End of the network	Resistor 120 Ohm not inserted	Resistor 120 Ohm inserted

LED on IR receiver

LED lights up blue	Cooling mode active
LED lights up red	Heating mode active
LED off	Off or recirculation mode
LED flashes blue	Window contact open
LED flashes red	Water temperature T2 not reached, waiting mode

ALARM-LED on receiver

Red LED flashes 2x	Float switch alarm Condensation water alarm
Red LED flashes 3x	EC fan motor alarm
Red LED flashes 4x	Water temperature alarm $T3 \geq 75\text{ °C}$ $T3 \leq 4\text{ °C}$
Red LED flashes 5x	Temperature sensor (air intake) T1 faulty
Red LED flashes 6x	Temperature sensor (water/changeover) T2 faulty
Red LED flashes 7x	Temperature sensor (heat exchanger) T3 faulty

Sensor

Units with IR remote control model have 3 sensors as standard:

T1 Air intake sensor: measures the temperature on the air intake and is used to determine the air intake or room temperature.

T2 Water temperature/changeover sensor: determines the medium temperature for changeover between cooling and heating mode (with appropriate DIP switch setting)

$T2 < 15\text{ °C}$	Cooling mode
$T2 > 30\text{ °C}$	Heating mode
$15\text{ °C} < T2 < 30\text{ °C}$	Standby/Service mode

T3 Heat exchanger sensor: determines the emperature of the heat exchanger. The temperature needs to guarantee that the cassette operates within the limits of operation (4-75 °C).

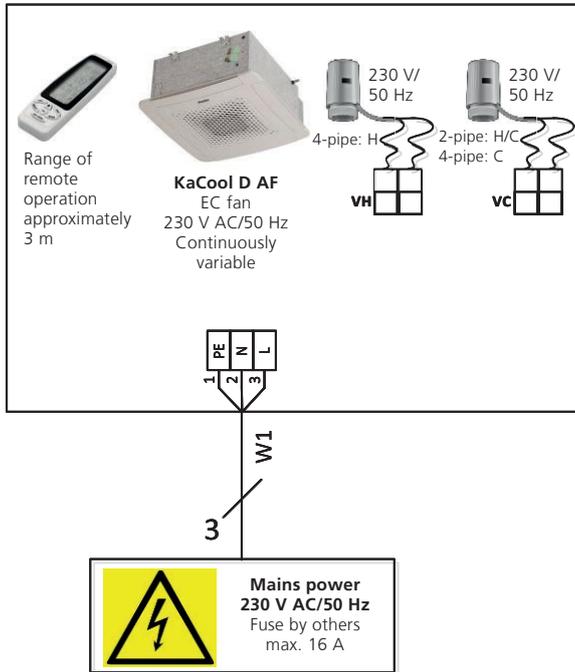
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Cabling – Infra-red remote control actuation

Single unit, infra-red remote control

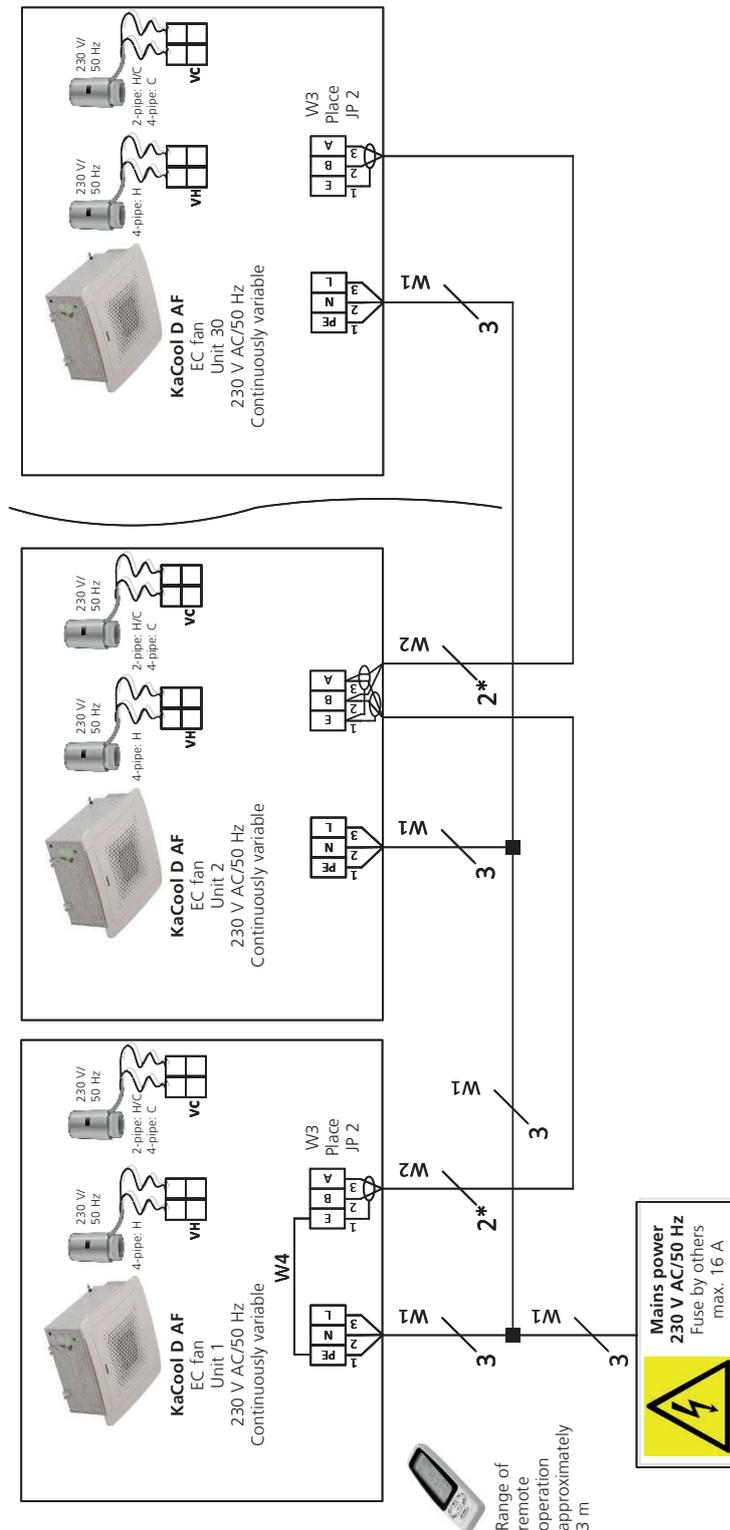


W1: Power supply

The number of connecting wires required including fuses is given on the individual control units.

Electrical supply: Note the technical connection conditions as stipulated by your energy supply company!

Group formation, infra-red remote control, max. 30 units



*) Lay shielded data cable, twisted pairs, e.g. UNITRONIC® BUS LD 1 x 2 x 0.22 mm² or similar, linear but separate from power lines!

W1: Power supply

W2: Bus signal RS485, max. cable length 700 m

W3: Place JP 2 "End of the line" for 120 Ohm terminal resistance at the first and last unit

W4: Insert on-site wire jumper

The number of connecting wires required including fuses is given on the individual control units.

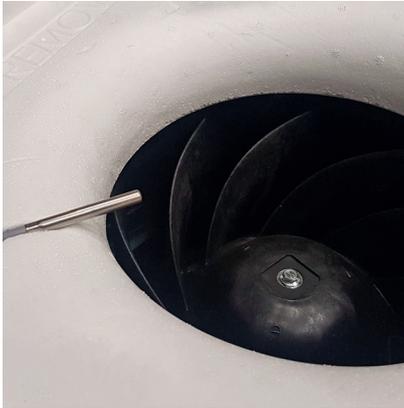
Electrical supply: Observe the technical connection requirements laid down by utility companies!

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6.8 KaControl model



The KaControl version provides the option of controlling and networking the KaCool D AF by means of a control unit supplied separately or on-site building management technology.

A number of different settings and configurations are possible using the DIP switches on the PCB and parameters that can be set by the control unit.

The KaControl system offers the option of single-circuit and multi-circuit control and connection to building management control systems via optional interface cards.

Every KaCool D AF with KaControl has a temperature sensor for recording the room temperature.

Lay control lines separately from power lines. Use UNITRONIC® BUS LD 2x2x0.22 or similar as data cables.

Wire the unit in series: star cabling is not allowed.



Important:

These instructions only outline a few of the possible options.

All the setting options can be found in the complete instructions for the KaControl at "www.Kampmann.de/kathermboard"

6.8.1 Operation of the KaController

The KaController is capable of controlling the wide range of Kampmann systems. KaControllers are equipped with state of the art technology and offer users the option of adapting the air conditioning of buildings to individual needs.

Up to two switch-on and switch-off times can be configured for every day of the week so that demand-led temperature control can be set by the user.

Product features:

- integral NTC temperature sensor for room temperature control
- large LCD multifunctional display with clearly arranged icons
- selection of value to be displayed (room temperature, setpoint, offset setpoint)
- automatic LED background lighting
- large seven-segment display for visualisation of the value to be displayed
- real-time clock with integral timer programs
- 2 switching on and 2 switching off times per day
- Eco/day changeover
- alarm display
- key lock (limited functions for offices, hotels..)
- manual or automatic mode
- press/turn navigator dial with endless turn/rest function
- one-touch operation of all functions
- connection of Kampmann system components via a bus connection
- password-protected service level
- language-independent display, ideal for international use



KaController without function keys, white



KaController with function keys, white



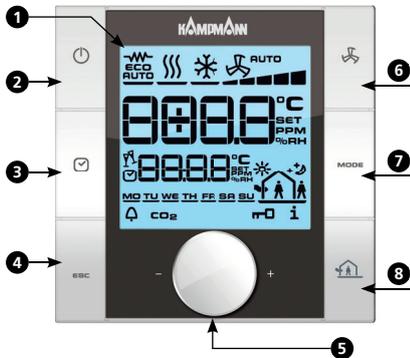
KaController without function keys, black

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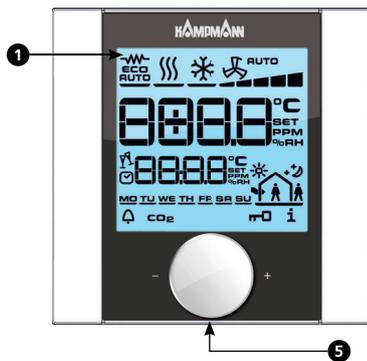
Installation and operating instructions

6.8.2.1 Function keys, display elements



KaController with function keys
Type 3210022

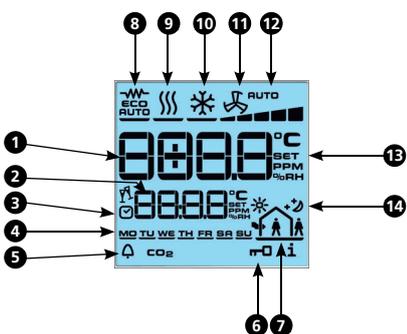
- ❶ Display with LED background lighting
- ❷ ON/OFF button (depending on setting)
 - ON / OFF (factory setting)
 - Eco mode/Day mode
- ❸ TIMER button
 - set the time
 - set timer programs
- ❹ ESC button
 - back to the standard display
- ❺ Navigator dial
 - change settings
 - call up menus
- ❻ FAN button
 - set fan control
- ❼ MODE button
 - set operating modes (disabled with 2-pipe uses)
- ❽ HOUSE key
 - external ventilation ON/OFF



KaController without function keys
(single-button operation)
Type 3210021
Type 3210026

All menus can be selected and set using the navigator dial.

The LED background lighting is automatically switched off 5 seconds after the KaController is last used. The LED background lighting can be permanently disabled by means of a parameter setting.



Display

- ❶ Display of setpoint room temperature
- ❷ Current time
- ❸ Timer program activated
- ❹ Weekday
- ❺ Alarm
- ❻ Selected function is locked
- ❼ External ventilation active operating mode
- ❽ Fan control setting Auto-0-1-2-3-4-5
- ❾ Ventilation mode
- ❿ Cooling mode
- ⓫ Heating mode
- ⓫ Automatic Heating/Cooling changeover mode
- ⓫ Setpoint setting activated
- ⓫ Eco mode

The symbols shown on the display depend on the application (2-pipe, 4-pipe etc.) and the parameters set.

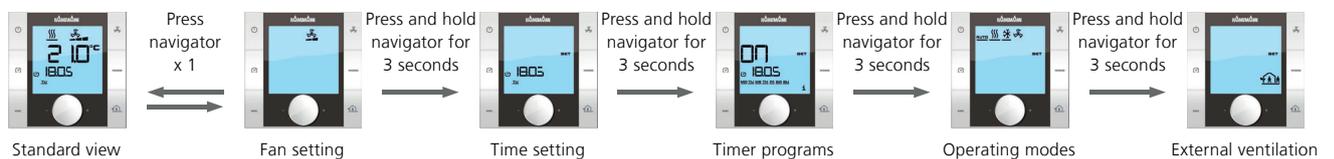
6.8.1.2 Operation

The KaController is operated by the navigator dial and the function keys.

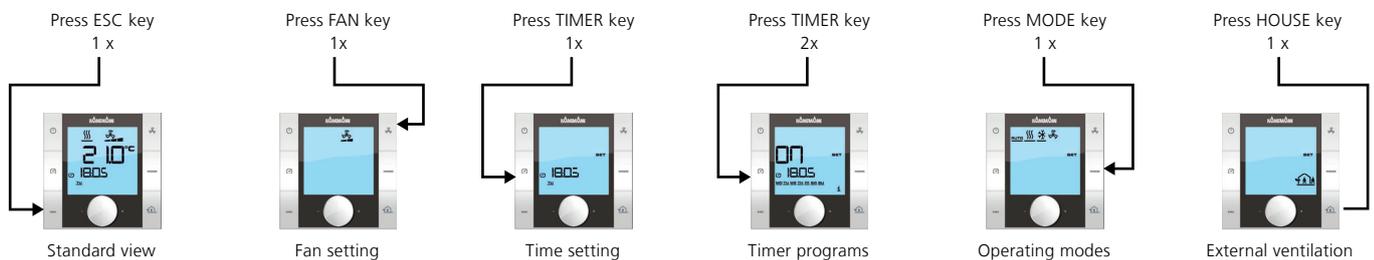
The functions that can be called up and set using the navigator dial are identical with both versions (with side function keys, without side function keys). An illustration of the KaController with the function keys at the side is used throughout these instructions for ease of understanding.

The navigator dial or side function keys are also used to select the various selection menus.

Menu selection using the navigator dial



Menu selection using function keys



i If no action is carried out using the navigator dial or the functional keys for longer than 3 seconds, the last change made is saved and the standard view is called up.

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6.8.1.2 Switching control off and on

When the controller is switched on, the display shows the default view with the current room temperature setpoint and the fan stage set.



Following initial commissioning of the KaController, the time is no longer shown in the default view (see "Time setting" selection menu).



Standard view

Deactivating the control:

There are 3 options for switching off the control:

1. Press the ON/OFF button.
2. Turn the navigator dial to the left until OFF appears.
3. Press and hold down the navigator dial until OFF appears.



Controller OFF view

Activating the control:

There are 2 options for switching on the control:

1. Press the ON/OFF button.
2. Press the navigator dial.

6.8.1.2.2 Temperature setting (absolute value)

The temperature setpoint is entered from the standard view.

To call up the standard view, press ESC or do not touch the KaController for 3 seconds.



Standard view

Temperature setpoint setting:

A new temperature setpoint can be set by turning the navigator in the standard view.

Apply the set value by pressing the navigator dial and calling up the standard view.



If no action is carried out using the navigator dial or the functional keys for longer than 3 seconds, the last change made is saved and the standard view is called up.



Setting the temperature setpoint

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6.8.1.2.3 Temperature setting (relative value, comfort control)

The temperature setpoint is entered from the standard view.
 To call up the standard view, press ESC or do not touch the KaController for 3 seconds.
 The setpoint was defined at installation, however with Comfort control, the user has the option to increase or decrease the setpoint by 3 °C to compensate for different perceptions of room temperature.



Standard view

Setting the temperature setpoint:

A new temperature setpoint can be set by turning the navigator in the standard view.
 Apply the set value by pressing the navigator dial and calling up the standard view.

i If no action is carried out using the navigator dial or the functional keys for longer than 3 seconds, the last change made is saved and the standard view is called up.



Temperature setpoint shift setting

6.8.1.2.4 Fan setting

Press the FAN key (quick access) or use the navigator dial to call up the “Fan setting” selection menu.

Calling up the “Fan setting” menu using the navigator dial:



Fan stage 3

The room temperature is initially controlled with natural convection in automatic mode and then by continually adjusting the fan speed. Users also have the option of setting fan stages Auto-0-1-2-3-4-5 as required.

Pressing the navigator dial in the default view switches the display to the “Fan setting” menu.

You can select the required fan stage Auto-0-1-2-3-4-5- by turning the navigator dial.

Pressing the navigator dial activates the selected fan stage.



If no action is carried out using the navigator dial or the functional keys for longer than 3 seconds, the last change made is saved and the standard view is called up.

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6.8.1.2.5 Time setting

Press the TIMER key (quick access) or use the navigator dial to call up the "Time setting" selection menu.

Calling up the "Time setting" menu using the navigator dial:



Time setting view



Setting to hide the time in the standard view

Setting the time

Use the navigator dial to set the following:

1. Current hour
2. Current minute
3. Current day

i The "Timer programs" selection menu is automatically called up once the current day has been confirmed by pressing the navigator dial.

i If no action is carried out using the navigator dial or the functional keys for longer than 7 seconds, the last change made is saved and the standard view is called up.

i Following initial commissioning of the KaController, the time is no longer shown in the standard view. Only when the time has been set, is the current time shown in the standard view. If ":-:-" is entered for hours and minutes, the real-time clock is disabled and the time is hidden in the standard view.

6.8.1.2.6 Timer programs

The KaController provides the option of programming switching on and off times using a timer program if rooms are only to be air conditioned during certain times of the day. Unlike with conventional thermostatic controllers where only one switching on and off time can be selected, two switching on and off times can be set for each day.

Timer matrix

	ON1	OFF1	ON2	OFF2
MO	6 : 00	18 : 00	-- : --	-- : --
TU	6 : 00	18 : 00	-- : --	-- : --
WE	6 : 00	18 : 00	-- : --	-- : --
TH	6 : 00	18 : 00	-- : --	-- : --
FR	6 : 00	18 : 00	-- : --	-- : --
SA	8 : 00	14 : 00	-- : --	-- : --
SU	-- : --	-- : --	-- : --	-- : --

Example of a weekly timer program



Display elements in the "Timer programs" selection menu

- 1 ON = SWITCH ON timer program
OFF = SWITCH OFF timer program
- 2 1 = Timer program no. 1
2 = Timer program no. 2
- 3 Switching on/switching off time
- 4 Weekday
- 5 If no switch-on or off time is entered in the timer program matrix, the "Clock" symbol is hidden in the standard view.



Set the time in the "Time setting" selection menu before parametrising the switch-on and off times.

The KaController can manage 2 switch-on and 2 switch-off times per day. The switching on and off times can be entered as a block or individually for each day.

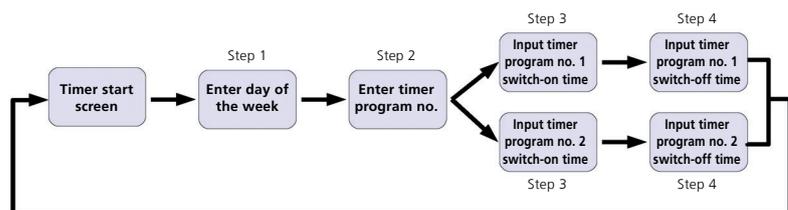


The timer program switches the controller on and off in accordance with the timer entries. After switching off the controller using the timer program, the user then has the option of switching the controller on using the ON/OFF key or the navigator dial.



If no switch-on or off time is entered in the timer program matrix, the "Clock" symbol is hidden in the default view.

The diagram below shows the sequence for setting the timer program. Steps 1-4 are described in more detail in the next section.



To exit the "Timer programs" selection menu, press and hold down the navigator dial for 3 seconds in the timer program start screen or do not use the KaController for 15 seconds.

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Press the TIMER key twice (quick access) or use the navigator dial to call up the “Timer programs” selection menu.

Use the navigator dial to call up the “Timer programs” menu:



Timer start screen

Step 1:

Turn the navigator dial to select a weekday for which you would like to program a switch-on or off time.
You have the option of selecting the days of the week as a block (MO-FR, SA-SU, MO-SU) or individually.
Press the navigator dial to apply the figure (for instance: MO-FR) and to call up the next input screen.



Enter timer program no.

Step 2:

Turn the navigator dial to select the number of the timer program (no. 1 or no. 2).
Press the navigator dial to apply the figure (for instance: Timer program no. 1) and to call up the next input screen.



Input screen for **switch-on time**

Step 3:

Set the **switch-on time** you require by turning the navigator dial.
Once the minutes have been set, the set **switching-on time** is carried over by pressing the navigator dial and the input screen for the switch-off time of the selected timer switching program no. is called up.



Input screen for **switch-off time**

Step 4:

Set the **switch-off time** you require by turning the navigator dial. Once the minutes have been set, press the navigator dial (⇒ Step 1) to apply the **switch-off time** and call up the timer start screen.

IMPORTANT NOTE!

- Call up the respective weekday and associated timer program no. to delete the switching-on and switching-off times entered (Step 1 + Step 2). Replace the switch-on or off time entered by “- - : - -” (Step 3 + Step 4).
- You can overwrite timer entries at any time either as a block or for each day.
- Only request switch-on and off times singly for each day. It is not possible to request switching-on and off times as a block where there are differing time entries for the respective days of the week and the time is then shown by “- - : - -”!
- To exit the "Timer programs" selection menu, press and hold down the navigator dial for 3 seconds in the timer program start screen or do not use the KaController for 15 seconds.

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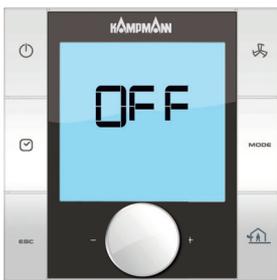
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6.8.1.2.7 Deleting all timer programs and the time



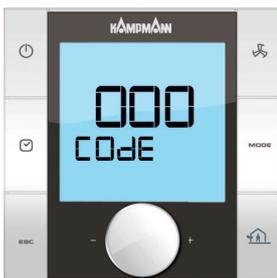
Standard view



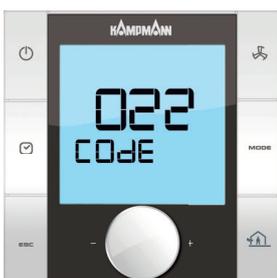
Controller OFF view



Call up parameter level view



Call up parameter level password request view



Call up parameter level password entry view

Perform the following steps to delete all timer programs and the time:

1. Switch off the KaController by:
 - Pressing the ON/OFF key
 - Pressing the navigator for a minimum of 5 seconds
 - Turning the navigator dial to the left until OFF appears
2. Press the navigator dial for a minimum of 10 seconds to call up the Service menu. The display shows "Para" and then "CODE" with the value 000 in sequence.
3. Select the code 44 by turning the navigator dial and confirm by pressing the navigator dial. Now all timer programs and the time are deleted.
4. There are 3 options for exiting the Service menu and calling up the standard view:
 - If no action has been carried out using the navigator dial for longer than 2 minutes.
 - Hold down the navigator dial for 5 seconds.
 - Turn the navigator dial, select "ESC" on the display and confirm the selection by pressing the navigator dial.
5. Disconnect the unit for approx. 1 minute to apply the change.

6.8.1.2.8 Cooling mode / heating mode changeover

Press the MODE key (quick access) or use the navigator dial to call up the "Operating modes" selection menu.

Calling up the "Operating modes" menu using the navigator dial:



Use the navigator dial to set the operating mode depending on the parameter setting.

- Heating mode: The control only works in heating mode.
- Cooling mode: The control only works in cooling mode.



Setting heating operating mode

The operating mode required can be selected by turning the navigator dial in the 'Operating mode' selection menu.

Pressing the navigator dial activates the selected operating mode.

i The MODE key is locked with 2-pipe applications, as heating and cooling mode is specified by an external contact or clip-on sensor. As a rule, it is not possible to alter the operating mode using the KaController in 2-pipe applications.

i If no action is carried out using the navigator dial for longer than 3 seconds, the last change made is saved and the standard view is called up.

i If the symbols for heating or cooling operating mode are flashing, it means that the water temperature to activate the selected operating mode has not yet been reached.

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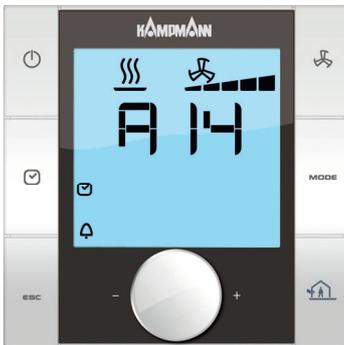
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6.9 Alarm messages

The KaController displays faults by means of the alarm messages listed in the table below. The alarm messages appear on the display in the order shown in the table below.

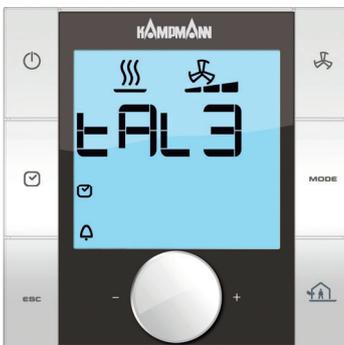
In the event of an alarm, note down the alarm message and contact the responsible member of staff (System Administrator or Installer/Service Technician) to fix the fault quickly.



View of "Condensation alarm" (Alarm A14 shown)

KaCool D AF alarm table

Code	Alarm
A11	Faulty control sensor
A13	Room frost protection
A14	Condensation alarm
A15	General alarm
A16	Faulty AI1, AI2 or AI3 sensor
A17	Unit frost protection
A18	Faulty EEPROM
A19	Offline slave in the CAN bus network

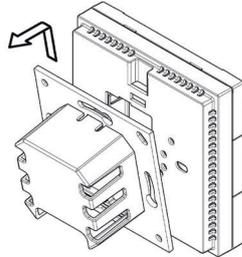
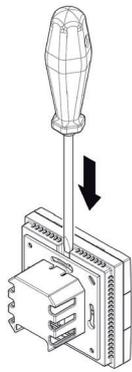


KaController alarm table

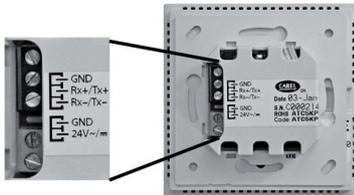
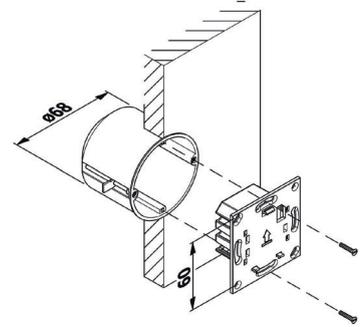
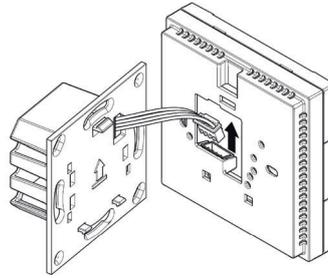
Code	Alarm
Code	Alarm
tAL1	Temperature sensor in KaController faulty
tAL3	Real-time clock in KaController faulty
tAL4	EEPROM in the KaController faulty
Cn	Communication fault with the external control

Should more than one fault occur simultaneously in the KaController control electronics, the alarm messages are displayed alternately in the display.

6.10 KaController installation



Installation/dismantling



KaController terminals

Electrical wiring

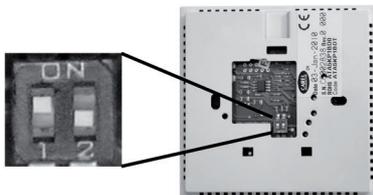
- Connect the KaController to the nearest KaControl in accordance with the wiring diagram. The maximum bus length between the KaController and the KaControl is 30 m.
- Connecting a KaController to it automatically converts the respective KaControl into the master unit in the control circuit.



Disconnect the unit prior to embarking on "all" wiring work!



Only connect the bus lines to the KaControl when the unit is fully disconnected.



DIP switch setting
KaController
DIP switch no. 1: **ON**
DIP switch no. 2: **OFF**

DIP switch setting

- The DIP switches on the rear of the KaController should be set according to the illustration at the side:
DIP switch no. 1: **ON**
DIP switch no. 2: **OFF**

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6.10.1 Troubleshooting A11 – A17

Faults in the motor of a slave unit are not shown on the KaController. Only a motor fault in a master unit is shown on the KaController.

A11 control sensor faulty

The room temperature is regulated on the selected control sensor, that is to say that the external room sensor/intake sensor can be faulty, depending on the DIP switch setting. If the room sensor in the KaController is faulty, this display alternates to tAL1.

Effect of this alarm:

The fan is switched off and the valves close.

A13 Room frost protection function

The room temperature is monitored at each phase in the system to a limit of 8 °C. The room frost protection function is enabled if the room temperature drops below 8 °C. The room frost protection function is disabled when the room temperature rises above the limit of 8 °C.



The limit of 8 °C is fixed for the room frost protection function and cannot be changed.

Effect of this alarm:

The heating valve opens and fan stage 1 is switched on.

A14 Condensation alarm

The condensation alarm of a unit is shown on the KaController by the display "A14". A unit with an active condensation alarm automatically closes the cooling valve.

Check the correct operation of the dewpoint monitor or the condensation pump and the water level in the condensation tank if a condensation alarm occurs.

Effect of this alarm:

The cooling valve opens and fan stage 1 is switched on.

A15 General alarm

The general alarm with units with KaControl is only triggered if the inputs on the KaControl have been correspondingly parametrised.

Effect of this alarm:

The valves are close and the fan switched off.

A16 Faulty AI1, AI2 or AI3 sensor

The sensor alarm is displayed if one of the active sensors does not transmit any plausible measured values to the KaControl.

Check the correct wiring of the KaControl and check the sensor.

Effect of this alarm:

The valves are close and the fan switched off.

A17 Unit frost protection function

The temperature at the temperature sensor is monitored at each phase in the system to a limit of 4 °C. The unit frost protection function is activated if the temperature drops below 4 °C.

The unit frost protection function is disabled when the temperature at the sensor rises above the limit of 4 °C. The unit frost protection function is also activated if the room temperature drops below 4 °C.



The limit of 4 °C is fixed for the unit frost protection function and cannot be changed.

Effect of this alarm:

The cooling or heating valve opens and fan is switched off.

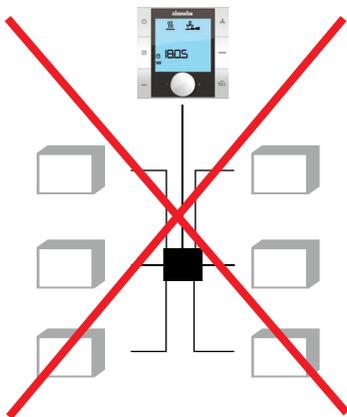
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6.11 Cabling

6.11.1 General information



Wrong!
Star-shaped wiring of the bus lines.

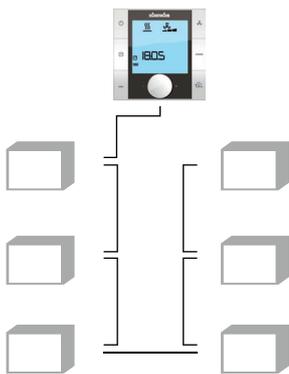
- Route all low voltage cables along the shortest route.
- Ensure that low-voltage and power cables are separated, using metal partitions on cable harnesses.
- Use only shielded cables as low-voltage and bus cables.
- Lay all BUS cables in a linear pattern. Star-shaped wiring is not permitted (figure on left).
- The KaController is connected via a bus connection to the respective control PCB on the unit.



Use shielded, paired cables as bus cables, for instance UNITRONIC® BUS LD 2x2x0.22, but at least of the same value or higher.



When laying bus cables, avoid the formation of star points, for instance in junction boxes. Loop the cables through to the unit!



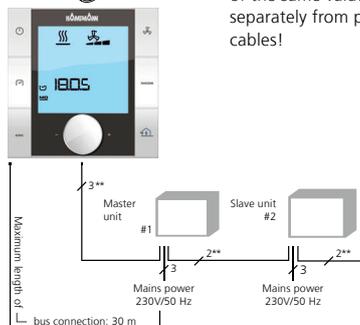
Right!
Linear wiring of the bus lines.

6.11.2 KaController

Flush-mounted back box

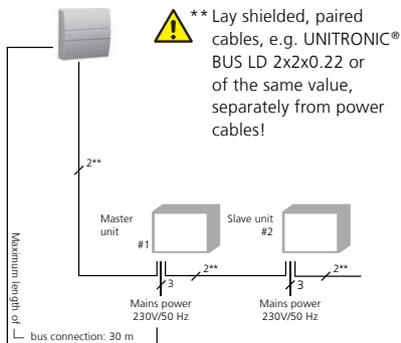


- **Warning!** Lay shielded, paired cables, e.g. UNITRONIC® BUS LD 2x2x0.22 or of the same value, separately from power cables!



- A flush-mounted back box is required for the KaController.
- Connect the KaController to the nearest KaControl as per the wiring diagram. The maximum bus length between the KaController and the KaControl unit is 30 m.
- Connecting a KaController to it automatically converts the respective KaControl into the master unit in the control circuit.

6.11.3 External room temperature sensor

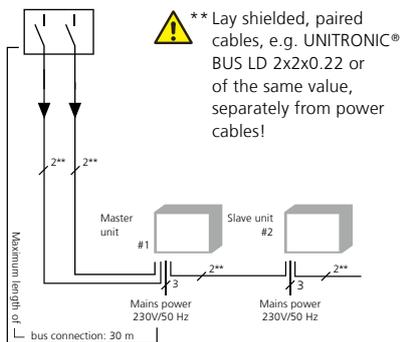


- All KaControl master units have an analogue input to connect an external room temperature sensor.
- Connect up the cables in accordance with the wiring diagram and use the DIP switch and KaController to configure the functions.
- The maximum cable length between the master unit and the room temperature sensor is 30 m.



The DIP switch no. 6 is factory-set by default to OFF and the temperature measurement is activated by the sensors inside the unit.

6.11.4 Inputs for processing external contacts (e.g. on-site BMS etc.)

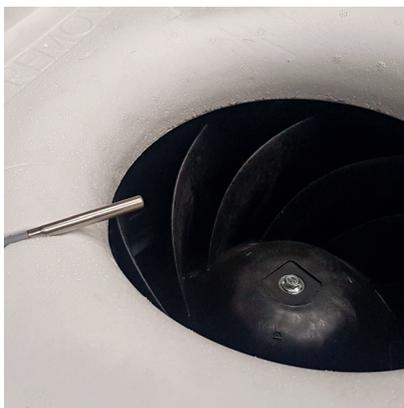


- All KaControl master units have multifunctional inputs that can be assigned different functions during commissioning.
- Connect up the cables in accordance with the wiring diagram and use the KaController to configure the functions.
- The maximum cable length between the master unit and the external potential-free contacts is 30 m.



No external contacts (e.g. window contact, card reader etc.) can be connected to the slave units.

6.11.5 Internal temperature sensor / air intake sensor



- All KaControl units have multifunctional inputs that can be assigned different functions during commissioning.
- A temperature sensor to measure the air intake temperature or room temperature is factory-installed in all KaCool D AF with KaControl.



The internal sensor in the unit is factory-defined as an internal room temperature sensor and DIP switch no. 6 is set to OFF.

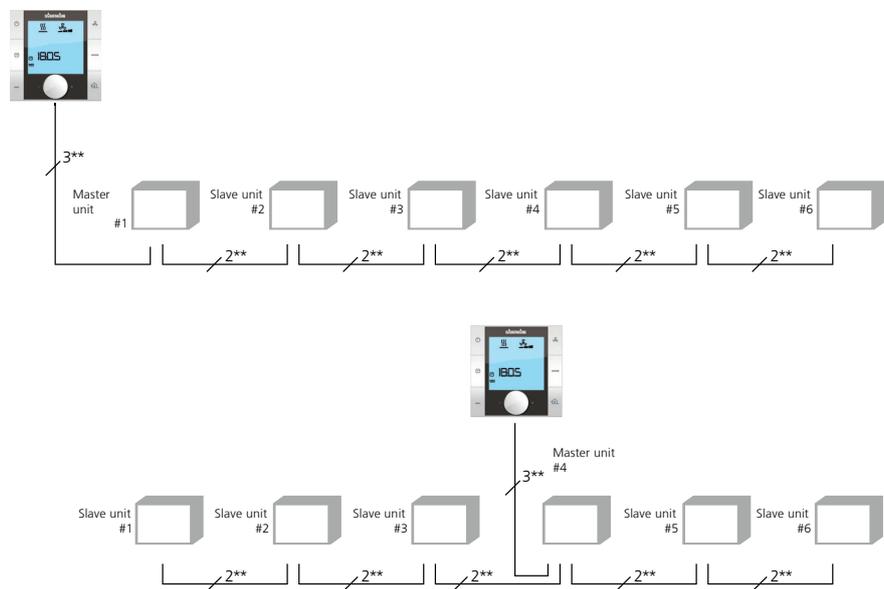
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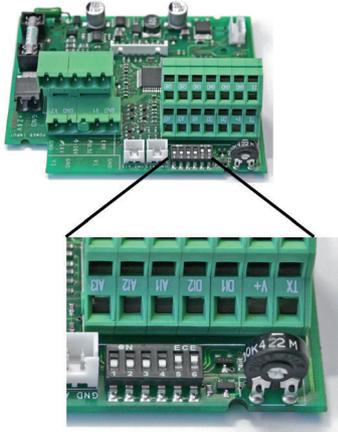
Installation and operating instructions

6.12 Addressing – Single-circuit controls

- KaControl units in single-circuit controls with a maximum of 6 units need not be addressed.
- Define the master unit/slave unit by connecting the KaController.
- The respective KaControl automatically becomes the master unit in the control circuit when a KaController is connected to it.
- A master unit need not necessarily be arranged at the end of a bus system.
- Lay all BUS cables in a linear pattern. Star-shaped wiring is not permitted.



6.13 Setting the unit configuration by means of DIP switches



Set the configuration of a KaControl unit using the DIP switch on the PCB. Once the DIP switch has been set, all the basic functions of the configuration have been parametrised and the KaControl can be operated immediately.

Special setting options, such as lowering the temperature setpoint during Eco mode, have to be parametrised in the Service menu. This parametrisation is possible using the KaController.

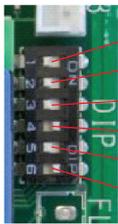
Open the control unit to check and possibly adjust the DIP switches.

The DIP switches are factory-set in accordance with the unit configuration!



Disconnect the control before starting to adjust the DIP switches.

Functional table of DIP switch settings on the PCB



DIP1	OFF = --- ON = 0..10 V actuation by on-site MSR
DIP2	OFF = --- ON = Activation by potentiometer 0..100 kOhm
DIP3	OFF = Clip-on sensor not fitted ON = Clip-on sensor fitted
DIP4	OFF = 4-pipe or winter/summer changeover with clip-on sensor ON = Winter/summer changeover via DI2
DIP5	OFF = 2-pipe system ON = 4-pipe system
DIP6	OFF = Room control on intake air/ext. room sensor ON = Room control to sensor in the KaController



With slave units, the DIP switch no. 6 has to be set to ON if the room temperature is detected via an external room sensor or the KaController.

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DIP switch no. 1

DIP switch no. 1 must be set to ON to actuate a KaControl by means of 0...10 V signals within a building management system provided by others. The parameter settings required are described in Section 6.1.5.7.

■ Factory setting: DIP = OFF

DIP switch no. 2

It is essential that DIP switch no. 2 is set to OFF.

■ Factory setting: DIP2 = OFF

DIP switch no. 3

Optionally install a clip-on sensor to monitor the water temperature. The following functions can be triggered by a clip-on sensor:

1. Actuation of the fan stages when the hot or cold water is registered on the heating element (Auto-Eco function, see section 10.3.10, manual I537).
2. Heating/cooling changeover function in a 2-pipe system (see section 6.15.3)
3. Unit frost protection (see section 6.10.1, Troubleshooting A17)

If a clip-on sensor is fitted, DIP switch no. 3 must be set to ON.

KaControl units are delivered as standard without a clip-on sensor and DIP switch no.3 is set to DIP3 = OFF.

■ Factory setting: DIP3 = OFF

DIP switch no. 4

In a 2-pipe system, changeover between heating and cooling is activated as standard by the switching of the digital input DI2, with the following operating modes being executed depending on the external contact:

DIP4 = ON + ext. Contact open ⇒ Heating mode

DIP4 = ON + ext. Contact closed ⇒ Cooling mode

■ Factory setting: 2-pipe system DIP4 = ON
4-pipe system DIP4 = OFF

Alternatively the changeover between heating and cooling in a 2-pipe system can also be activated by a clip-on sensor. In this version, DIP switch no. 4 must be set to DIP 4 = OFF (see section 6.15.3).

DIP switch no. 5

The convector configuration (2-pipe/ 4-pipe) is set by means of DIP switch no. 5.

■ Factory setting: 2-pipe system DIP5 = OFF
4-pipe system DIP5 = ON

DIP switch no. 6

There is an option of using the internal sensor in the KaController or an external room temperature sensor for room temperature control.

DIP switch no. 6 = OFF ⇒ Room temperature control on a suction/external room sensor

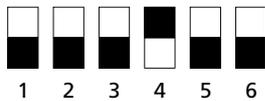
DIP switch no. 6 = ON ⇒ Room temperature control on the internal sensor of the KaController

Factory setting: 2-pipe system ⇒ DIP6 = OFF

4-pipe system ⇒ DIP6 = ON

DIP switch factory settings, KaControl, 2-pipe system, control configuration -C1

ON

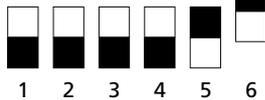


DIP switch factory settings, KaControl, 2-pipe system, control configuration -C1

DIP	2-pipe C1	Functions
DIP1	OFF	OFF = --- ON = 0..10 V actuation by on-site MSR
DIP2	OFF	OFF = --- ON = Activation by potentiometer 0..100 kOhm
DIP3	OFF	OFF = Clip-on sensor not fitted ON = Clip-on sensor fitted
DIP4	ON	OFF = 4-pipe or heating/cooling changeover with clip-on sensor ON = Heating/cooling via DI2
DIP5	OFF	OFF = 2-pipe system ON = 4-pipe system
DIP6	OFF	OFF = Room control on intake air/ext. room sensor ON = Room control on sensor in the KaController

DIP switch factory settings, KaControl, 4-pipe system, control configuration -C1

ON



DIP switch factory settings, KaControl, 4-pipe system, control configuration -C1

DIP	4-pipe C1	Functions
DIP1	OFF	OFF = --- ON = 0..10 V actuation by on-site MSR
DIP2	OFF	OFF = --- ON = Actuation by potentiometer 0..100 kOhm
DIP3	OFF	OFF = Clip-on sensor not fitted ON = Clip-on sensor fitted
DIP4	OFF	OFF = 4-pipe or heating/cooling changeover with clip-on sensor ON = Heating/cooling via DI2
DIP5	ON	OFF = 2-pipe system ON = 4-pipe system
DIP6	ON	OFF = Room control on intake air/ext. room sensor ON = Room control on sensor in the KaController



With slave units, DIP switch no. 6 must be set to ON if the room temperature is detected via an external room sensor or the KaController.

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6.14 Parameter settings

Special system requirements can be configured using parameter settings in the Service menu.

Special system requirements may include:

- Display: room temperature or setpoint temperature
- Lock operating functions
- Set absolute setpoint temperature or ± 3 K
- Setting parameters in Eco / Day mode
- Sensor calibration

The required settings can be made using the KaController.

Service menu

The following steps are needed to set the parameters:

1. Switch off the KaControl unit by:
 - Pressing the ON/OFF key
 - or
 - Pressing the navigator dial for a minimum of 5 seconds
 - or
 - Turning the navigator dial to the left until OFF appears
2. Press the navigator dial for a minimum of 10 seconds to call up the Service menu. The display shows "Para" and then "CODE" with the value 000 in sequence.
3. Select the password (code) 22 by turning the navigator dial and confirm by pressing the navigator dial. You are now in Service level 1 and the display shows the current software version (P000=V1.19).
4. Parameters can now be set using the navigator dial.
5. Setting parameters:
 - Turn the navigator dial to select the parameter
 - Press the navigator dial to call up Edit mode
 - Set the required value by turning the navigator dial
 - Press the navigator dial to save the new value
6. There are 3 options for exiting the Service menu and calling up the standard view:
 - If no action has been carried out using the navigator dial for longer than 2 minutes
 - Hold down the navigator dial for 5 seconds
 - Turn the navigator dial, select "ESC" on the display and confirm the selection by pressing the navigator dial



Parameter changes within the Service menu are only transmitted in the master unit.
Connect a KaController to the respective slave unit to change the parameters on slave units.

6.15 Parameter settings

6.15.1 Setting absolute setpoint temperature or ± 3 K



Parameter P36=0
Setting of "absolute" setpoint temperature



Parameter P36=1
Setting of setpoint temperature ± 3 K

Parameter P36

It may be necessary in office or hotel applications for the system operator to specify a base setpoint. The user has the option of changing the setpoint temperature by ± 3 K to compensate for any different perception of room temperature.

Alternatively the setpoint can be set in absolute values.

Parameter P36 is used to configure the setpoint setting.

	Function
P36	Setpoint setting 0 = Absolute setpoint setting 1 = Setpoint setting ± 3 K

Use parameter P01 to configure the base setpoint for the "Setpoint setting ± 3 K".

	Function
P01	Base setpoint for setpoint entry ± 3 K



When the parameters are set
 P37=1 \Rightarrow Display setpoint temperature
 P36=1 \Rightarrow Setpoint setting ± 3 K
 no setpoint is shown in the standard display!

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6.15.2 ON/OFF, Eco/Day function

Parameter P38

The ON/OFF key function and the timer programs are specified using parameter P38.

Use the ON/OFF button and the timer programs to switch the unit ON and OFF or between Eco and Day mode.

Option 1:

The ON/OFF key and timer programs are used to switch between Eco mode and Day mode.

Option 2:

Use the ON/OFF key and the timer programs to switch the KaControl on and off.

Parameter P38 can also be set for the "Heating/Cooling changeover using clip-on sensor" function (Section 6.15.3).

	Function
P38	8 = Eco/Day mode changeover 26 = Eco/Day mode changeover + Heating/Cooling changeover via clip-on sensor (2-pipe system) 72 = ON/OFF changeover 90 = ON/OFF changeover + Heating/Cooling changeover via clip-on sensor (2-pipe system)



Alternatively the KaControl unit can be switched on and off via an external potential-free contact or between Eco mode and Day mode. The configuration is described in Section 6.15.4.

6.15.3 Heating/cooling changeover via clip-on sensor in 2-pipe systems

The changeover between heating and cooling is performed as standard in 2-pipe systems via an external contact and the digital input DI2.

If there is no external contact to change over between heating and cooling, the changeover can be made via a clip-on sensor.

Order the clip-on sensor separately and, after installation, wire it to the analogue input AI2 of the KathermBoard (as per the wiring diagram). The configuration is documented in the following description.



The slave units in one control zone have to be fitted with a clip-on sensor to provide the function of "Heating/Cooling changeover using a clip-on sensor".



The installation of a 3-way valve is recommended when using a clip-on sensor for heating/cooling changeover.

6.15.3.1 Setting DIP switch no. 3, DIP switch no. 4

If the changeover between heating and cooling is performed by a clip-on sensor, then the DIP switches must be set to

DIP switch no. 3 = ON

DIP switch no. 4 = OFF.

The functions of the DIP switches are described in Section 6.13 "Adjusting the unit configuration using DIP switches".

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6.15.3.2. Automatic heating/cooling changeover mode setting

Parameter P38

Parameter P38 is used to set Automatic mode, as Heating and Cooling modes can only be specified via the clip-on sensor.

Parameter P38 can also be set for the "ON/OFF and Eco/Day" function (see Section 6.15.2).

The following table shows the settings of parameter P38!

	Function
P38	8 = Eco/Day mode changeover 26 = Eco/Day mode changeover + Heating/Cooling changeover via clip-on sensor (2-pipe system) 72 = ON/OFF changeover 90 = ON/OFF changeover + Heating/Cooling changeover via clip-on sensor (2-pipe system)



If a clip-on sensor is used for changeover in a 2-pipe system, parameter P38 must be set to P38=26 or P38=90 as required.



The installation of a 3-way valve is recommended when using a clip-on sensor.

6.15.3.3 Heating mode limit values

Parameters P10, P11, P12

Parameters P10, P11 and P12 can be used to set the limit values for switching on the fan stages in heating mode.

	Function
P10	Limit temperature to activate fan stage 1 and 2 in heating mode
P11	Limit temperature to activate fan stage 3 and 4 in heating mode
P12	Limit temperature to activate fan stage 5 in heating mode



The controller permanently monitors the water temperature and only activates heating mode and the fan stages when the water temperature has exceeded the set limits. If the limit temperature as per P10 is not reached after at most 5 minutes, the valve is closed and then reopened for 5 minutes after 4 hours (see cyclic opening and shutting of the valve).
The heating symbol flashes on the display if heating mode cannot be switched on because of the water temperature.

6.15.3.4 Cooling mode limit values

Parameter P14

Parameter P14 is used to set the limit value for switching on the fan stages in cooling mode.

	Function
P14	Limit value temperature to activate the fan stages in cooling mode



The controller permanently monitors the water temperature and only activates cooling mode and the fan stages when the water temperature has fallen below the set limit value. If the temperature as per P14 has not fallen below the limit value temperature after at most 5 minutes, the valve is closed and then reopened for 5 minutes after 4 hours (see cyclic opening and shutting of the valve).

The cooling symbol flashes on the display if cooling mode cannot be switched on because of the water temperature.

6.15.3.5 Cyclic opening and closing of the straight valve or 3-way valve

Parameter P107, P108

The clip-on sensor can only measure the water temperature correctly in 2-pipe systems with a straight valve if the straight valve is cyclically opened. The use of a 3-way valve is recommended for optimum detection of the medium temperature.

Parameters P107 and 108 can be set to cyclically open and close the valve to check the water temperature.

	Function
P107	Duration of valve opening to check water temperature
P108	Duration of valve closed



If the heating/cooling changeover is actuated by a clip-on sensor in a 2-pipe system, then parameters P107=5 and P108=240 have to be set!

This setting opens the valve every 4 hours for 5 minutes to measure the water temperature correctly in the pipe system.

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6.15.4 Function of digital inputs DI1 and DI2

The function of digital inputs DI1 and DI2 can be configured using parameters settings.

6.15.4.1 Function of DI1

Parameter P43

Parameter P43 is used to set the function of the digital input DI1.

	Function	Standard	Min.	Max.	Unit
P43	Function of DI1 0 = No function 1 = ON/OFF (contact open ⇔ ON) 2 = Winter/Summer (contact open ⇔ heating) 3 = Eco/Day mode (contact open ⇔ day) 4 = No function (contact open ⇔ no function) 5 = Condensation alarm (contact open ⇔ no condensation) 6 = General alarm (contact open ⇔ no alarm) 7 = Ext. frost protection monitor (contact open ⇔ no frost) 8 = ON/OFF (contact closed ⇔ ON) 9 = Heating/Cooling changeover (contact closed ⇔ heating) 10 = Eco/Day mode (contact closed ⇔ day) 11 = No function (contact closed ⇔ no function) 12 = Condensation alarm (contact closed ⇔ no condensation) 13 = General alarm (contact closed ⇔ no alarm) 14 = Ext. frost protection monitor (contact closed ⇔ no frost)	1	0	14	

6.15.4.2 Function of DI2



With the KaCool D AF, the digital input DI2 is connected to GND via a factory-inserted electrical jumper. The KaCool D AF is therefore pre-set as a cooling unit.

The digital input DI1 is predominantly used to execute specific functions. If the use of the digital input DI2 is needed, then the following settings have to be made:

1. Set DIP switch no. 4 to OFF.
2. Configuration of the digital input DI2 using parameter settings P44.



If DIP switch no. 4 is set to ON, digital input DI2 changes over from heating to cooling in a 2-pipe system.

Parameter P44

Parameter P44 is used to set the function of the digital input DI2 when DIP switch no. 4 = OFF.

	Function	Standard	Min.	Max.	Unit
P44	Function of DI2	0	0	22	
	0 = No function				
	1 = ON/OFF (contact open ⇨ ON)				
	2 = Heating/Cooling changeover (contact open ⇨ heating)				
	3 = Eco/Day mode (contact open ⇨ day)				
	4 = No function (contact open ⇨ no function)				
	5 = Condensation alarm (contact open ⇨ no condensation)				
	6 = General alarm (contact open ⇨ no alarm)				
	7 = Ext. frost protection monitor (contact open ⇨ no frost)				
	8 = ON/OFF (contact closed ⇨ ON)				
	9 = Heating/Cooling changeover (contact closed ⇨ heating)				
	10 = Eco/Day mode (contact closed ⇨ day)				
	11 = No function (contact closed ⇨ no function)				
	12 = Condensation alarm (contact closed ⇨ no condensation)				
	13 = General alarm (contact closed ⇨ no alarm)				
	14 = Ext. frost protection monitor (contact closed ⇨ no frost)				
	15 = Special mode (contact open ⇨ special mode active)				
	16 = Special mode (contact closed ⇨ special mode active)				
	17 = Fan stage increase (contact open ⇨ no fan stage increase)				
	18 = Fan speed increase (contact closed ⇨ no fan stage increase)				
	19 = Heating/Ventilation changeover (contact open ⇨ heating)				
	20 = Heating/Ventilation changeover (contact closed ⇨ heating)				
	21 = Cooling/Ventilation changeover (contact open ⇨ cooling)				
	21 = Cooling/Ventilation changeover (contact closed ⇨ cooling)				

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Parameter P56

The polarity of digital input DI2 is set using parameter P56 when setting DIP switch no. 4 to ON.

	Function	Standard	Min.	Max.	Unit
P56	Polarity of DI2 when DIP4 = ON (Heating/Cooling changeover using DI2) 0 = Contact closed ⇒ Heating Contact open ⇒ Cooling 1 = Contact open ⇒ Heating Contact closed ⇒ Cooling	1	0	2	

6.15.5 Function of digital outputs V1 and V2

The function of the digital output V1 is fixed depending on the system (2-pipe / 4-pipe).

The function of the digital output V2 can be configured using parameters.

6.15.5.1 Digital output V1

The digital output V1 is used for the following function, depending on the application;

2-pipe system ⇒ V1 = Heating/Cooling valve

4-pipe system ⇒ V1 = Cooling valve

6.15.5.2 Digital output V2

The digital output V2 is used to control the heating valve in a 4-pipe system.

The digital output V2 can be configured using parameter P39 in a 2-pipe system.

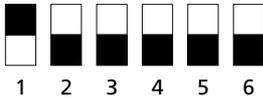
	Function	Standard	Min.	Max.	Unit
P39	Function V2 in a 2-pipe system 0 = No function 1 = Heat requirement 2 = Cooling requirement 3 = Unit alarm 4 = 3-point actuator 5 = External ventilation active	0	0	5	



24 V DC is connected to digital output V2. The digital output is not a potential-free contact and can only be used with appropriate wiring!

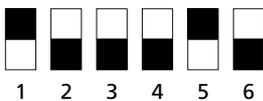
6.15.6 External control via 0..10 Volts

ON

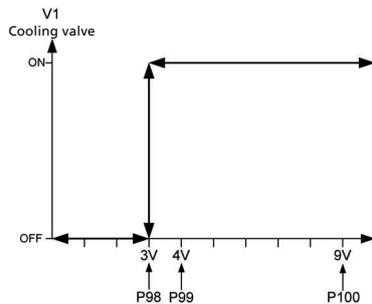


Setting of DIP switches in 2-pipe system control using 0..10 V

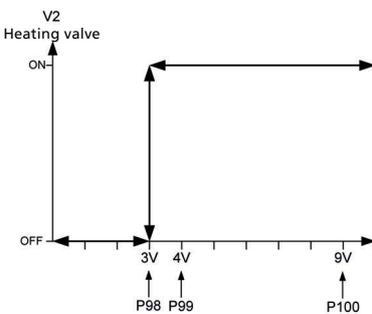
ON



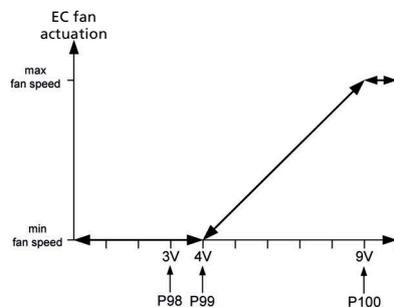
Setting of DIP switches in 4-pipe system control using 0..10 V



Cooling valve actuation



Heating valve actuation



Valve actuation

The analogue inputs AI2 and AI3 offer the option of actuating the valves and the EC fan by means of 0..10 Volt signals.

Set the DIP switches in accordance with the diagram with actuation using 0...10 Volt signals.

Connect the control signals 0...10 V to the analogue inputs AI2 and AI3.

2-pipe system:

Heating/Cooling 0..10 V ⇒ Analogue input AI2

4-pipe system:

Cooling 0..10 V ⇒ Analogue input AI2

Heating 0..10 V ⇒ Analogue input AI3

Parameter setting for actuation of the KaControl unit using an 0..10 V signal on site.

	Function	Standard	Min.	Max.	Unit
P98	Switching on limit of valve	30	0	100	V/10
P99	Starting point fan speed (min)	40	0	100	V/10
P100	End point fan speed (max)	90	0	100	V/10

Function of standard setting:

0 V...3 V valve CLOSED, fan OFF

3 V...4 V valve OPEN, fan OFF

4 V...9 V valve OPEN, fan speed min ⇒ max



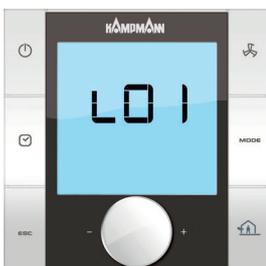
Connect a KaController to configure the parameters.

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6.16 Functional testing of connected assemblies



The KaController provides the option of checking the function of the external units connected independently of the software application. The function of individual assemblies, such as the EC fan, can be directly activated and checked by means of inputs on the KaController.

The functional checks of the connected assemblies are called up and performed by the following operating steps:

1. Switch off the KaController by:
 - Pressing the ON/OFF key
 - or
 - Pressing the navigator for a minimum of 5 seconds
 - or
 - Turn the navigator dial to the left until OFF appears
2. Call up the Parameter menu by pressing the navigator dial for a minimum of 10 seconds. The display shows "Para" and then "CODE" with the value 000 in sequence.
3. Select the password (code) 77 by turning the navigator dial and confirm by pressing the navigator dial.
4. "L01" is shown on the display and the functional testing of the connected assemblies can start.

Important:

The individual test steps are called up by pressing the navigator dial. The default view with an "OFF" on-screen display is shown once the testing has been completed (L08).

Step	Input/Output	Display flashes	Display does not flash
L01*	Input AI1	Sensor faulty	Sensor OK
L02*	Input AI2	Sensor faulty	Sensor OK
L03*	Input AI3	Sensor faulty	Sensor OK
L04	Input DI1	Contact open	Contact closed
L05	Input DI2	Contact open	Contact closed
L06	Fan speed 0 – 10 V	--	Increased actuation Fan 0 V ⇒ 10 V
L07	Valve output V1	--	Output V1 activated
L08	Valve output 2	--	Output V2 activated

* The control automatically detects the requisite sensors on the analogue inputs AI1 - AI3 using the DIP switch settings. The respective display (L01-L03) flashes if sensors are faulty or not connected.



Observe hardware-related locks during functional testing (refer to the respective wiring diagram!)

6.17 Control PCB parameter list

	Function	Standard	Min.	Max.	Unit	KaCool D AF (9000265)
P000	Software version	V1.19	0	255	-	-
P001	Base setpoint for setpoint entry ± 3 K	22	8	32	°C	22
P002	Switching on/off hysteresis for valves	3	0	255	K/10	10
P003	Neutral zone in a 4-pipe system (only in automatic mode)	3	0	255	K/10	5
P004	Cooling without fan assistance (natural convection)	0	0	255	K/10	0
P005	Heating without fan assistance (natural convection)	5	0	255	K/10	3
P006	Fan On/Off hysteresis (only in ventilation mode)	5	0	255	K/10	5
P007	P-band, heating	15	0	100	K/10	17
P008	P-band, cooling	20	0	100	K/10	20
P009	Offset to the base setpoint for setpoint input ± 3 K	3	0	10	K	3
P010	Clip-on sensor: Limit temperature to activate fan stages 1 and 2 in heating mode	29	0	255	°C	26
P011	Clip-on sensor: Limit temperature to activate fan stages 3 and 4 in heating mode	31	0	255	°C	28
P012	Clip-on sensor: Limit temperature to activate fan stage 5 in heating mode	33	0	255	°C	30
P013	Clip-on sensor: hysteresis for limit temperatures P010, P011, P012, P014	10	0	255	K/10	10
P014	Clip-on sensor: limit value temperature to activate the fan stages in cooling mode	18	0	255	°C	18
P015	Function of input AI1	0	0	19	-	0
P016	Function of input AI2	0	0	19	-	0
P017	Function of input AI3	0	0	9	-	0
P018	Raise temperature of cooling setpoint in Eco mode	30	0	255	K/10	30
P019	Lower temperature of heating setpoint in Eco mode	30	0	255	K/10	30
P020	ADC limit coefficient	6	0	15	-	6
P021	ADC average coefficient	6	0	15	-	6
P022	Activation/deactivation of sun symbol in Comfort mode	0	0	1	-	0
P023	Difference for compensation during cooling	0	-99	127	K/10	0
P024	Coefficient for compensation during heating	0	-20	20	1/10	0
P025	Difference for compensation during heating	0	-99	127	K/10	0
P026	Coefficient for compensation during heating	0	-20	20	1/10	0
P027	Fan setting: maximum run-time for manual fan mode	0	0	255	Min.	0
P028	Flushing function: Fan stage during the flushing function	2	1	5	-	1
P029	Activation of continuous fan mode	0	0	1	-	0
P030	Ventilate temperature activation	12	0	255	°C	12
P031	Ventilation interval	27	0	255	°C	27
P032	Flushing function: maximum idle time of fan	15	0	255	Min.	15
P033	Flushing function: duration of flushing function	240	0	255	s	120
P034	Flushing function: activation in operating modes	0	0	3	-	3
P035	Time the fan runs at Stage 1 after change of operating mode	0	0	255	s	0
P036	Type of setpoint setting	0	0	1	-	0
P037	Display	1	0	7	-	1
P038	Lock/disable function on control unit	64	0	255	-	72
P039	Function of digital output V2 (in 2-pipe system)	0	0	3	-	0
P040	Valve actuation by means of pulse width modulation	0	0	1	-	0
P041	Reset time of PI controller to actuate the fan in automatic fan mode	0	0	20	Min.	0
P042	Fan setting: lock and activate fan stages	0	0	127	-	0
P043	Function of digital input DI1	1	0	14	-	12

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	Function	Standard	Min.	Max.	Unit	KaCool D AF (9000265)
P044	Function of digital input DI2	0	0	14	-	0
P045	Threshold voltage for potentiometer, which switches on unit	10	0	100	kOhm	10
P046	Temperature setting corresponds to minimum resistance value = 10 kOhm in potentiometer	18	12	34	°C	18
P047	Temperature setting corresponds to maximum resistance value = 100 kOhm in potentiometer	24	13	35	°C	24
P048	Threshold voltage for potentiometer for starting up fans	10	0	100	kOhm	10
P049	Threshold voltage for potentiometer for maximum fan speed	90	0	100	kOhm	90
P050	Fan setting: max. fan speed	100	0	100	%	100
P051	Fan setting: min. fan speed	0	0	90	%	15
P052	Fan setting: speed limitation activated	0	0	1	-	1
P053	Valve actuation by pulse width modulation of valve switching cycle	15	10	30	Min.	15
P054	Configuration of bus system	0	0	2	-	0
P055	Display of heating/cooling symbols in automatic mode	0	0	1	-	1
P056	DI2 setting (polarity) when DIP 4 = ON	1	0	1	-	1
P057	Reset setpoint setting to the value of P01 (after changing operating program)	0	0	1	-	0
P058	Sensor calibration: Sensor AI1	0	-99	127	K/10	0
P059	Reserved	-	-	-	-	-
P060	Reserved	-	-	-	-	-
P061	Sensor calibration: Sensor in the KaController	0	-99	127	K/10	0
P062	Sensor calibration: Sensor AI2	0	-99	127	K/10	0
P063	Reserved	-	-	-	-	-
P064	Sensor calibration: Sensor AI3	0	-99	127	K/10	0
P065	Reserved	-	-	-	-	-
P066	Master/Slave assignment in CAN bus	0	0	1	-	0
P067	CANBus serial address	1	1	125	-	1
P068	Logic of idronic algorithms	0	0	7	-	0
P069	Network address	1	0	207	-	1
P070	Dependence of idronic algorithm (for slave units0	0	0	7	-	0
P071	Serial address of Slave 1	0	0	207	-	0
P072	Serial address of Slave 2	0	0	207	-	0
P073	Serial address of Slave 3	0	0	207	-	0
P074	Serial address of Slave 4	0	0	207	-	0
P075	Serial address of Slave 5	0	0	207	-	0
P076	Serial address of Slave 6	0	0	207	-	0
P077	Serial address of Slave 7	0	0	207	-	0
P078	Serial address of Slave 8	0	0	207	-	0
P079	Serial address of Slave 9	0	0	207	-	0
P080	Serial address of Slave 10	0	0	207	-	0
P081	Dependence of idronic algorithms Slave 1	0	0	7	-	0
P082	Dependence of idronic algorithms Slave 2	0	0	7	-	0
P083	Dependence of idronic algorithms Slave 3	0	0	7	-	0
P084	Dependence of idronic algorithms Slave 4	0	0	7	-	0
P085	Dependence of idronic algorithms Slave 5	0	0	7	-	0
P086	Dependence of idronic algorithms Slave 6	0	0	7	-	0
P087	Dependence of idronic algorithms Slave 7	0	0	7	-	0

	Function	Standard	Min.	Max.	Unit	KaCool D AF (9000265)
P088	Dependence of idronic algorithms Slave 8	0	0	7	-	0
P089	Dependence of idronic algorithms Slave 9	0	0	7	-	0
P090	Dependence of idronic algorithms Slave 10	0	0	7	-	0
P091	Upload of default values	0	0	255	-	0
P092	Password management	0	0	255	-	0
P093	Type of pre-comfort (room occupancy)	0	0	3	-	0
P094	Pre-comfort timer	60	1	255	Min.	60
P095	DIP switch settings switched off	0	0	1	-	0
P096	Reserved	-	-	-	-	-
P097	Reading of DIP switch	-	0	63	-	-
P098	Actuation 0..10V: switch on limit of valves	30	0	100	V/10	30
P099	Actuation 0..10V: switch on limit for min. fan speed	40	0	100	V/10	40
P100	Actuation 0..10V: switch on limit for max. fan speed	90	0	100	V/10	90
P101	Valve actuation by pulse width modulation of P-band in heating mode	15	0	100	K/10	15
P102	Valve actuation by pulse width modulation of P-band in cooling mode	15	0	100	K/10	15
P103	Valve actuation by pulse width modulation of reset time of PI controller	0	0	20	Min.	0
P104	Minimum ON time with valve actuation PWM	3	0	20	Min.	3
P105	Reserved	-	-	-	-	-
P106	Reserved	-	-	-	-	-
P107	Duration of valve open to check water temperature	5	0	255	Min.	5
P108	Duration of valve closed	240	35	255	Min.	240
P109	Reserved	-	-	-	-	-
P110	Reserved	-	-	-	-	-
P111	Reserved	-	-	-	-	-
P112	Reserved	-	-	-	-	-
P113	Reserved	-	-	-	-	-
P114	Reserved	-	-	-	-	-
P115	Reserved	-	-	-	-	-
P116	Reserved	-	-	-	-	-
P117	Locking operating functions (function keys on KaController)	0	0	7	-	0
P118	Reserved	-	-	-	-	-
P119	Reserved	-	-	-	-	-
P120	Reserved	-	-	-	-	-
P121	Reserved	-	-	-	-	-
P122	Reserved	-	-	-	-	-
P123	Reserved	-	-	-	-	-
P124	Reserved	-	-	-	-	-
P125	Reserved	-	-	-	-	-

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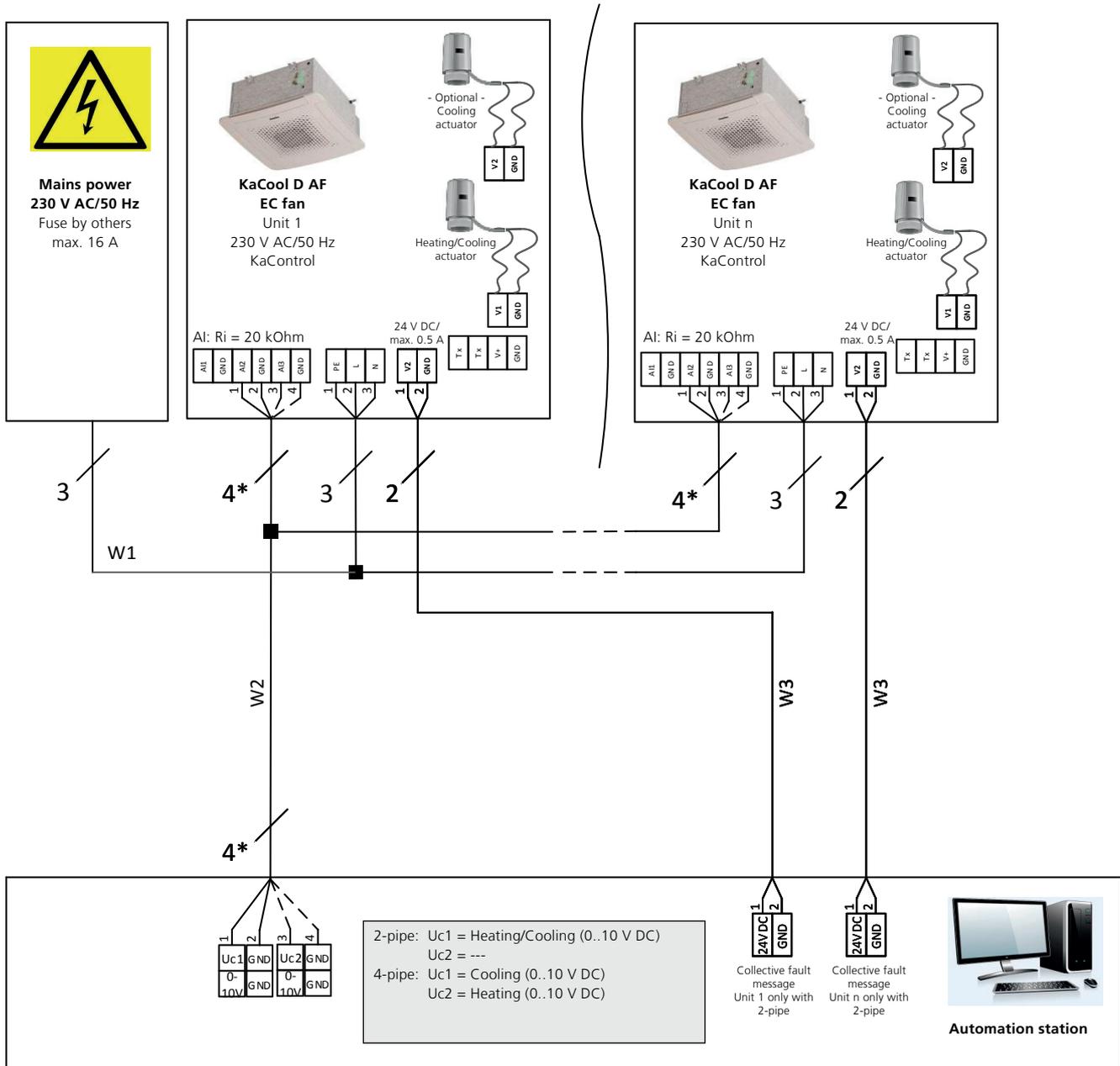
Chilled water air conditioning system

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6.18 KaController parameters

Cabling – KaControl actuation

BMS, KaControl



*) Low voltage line, lay separately from power cables!

W1: Power supply

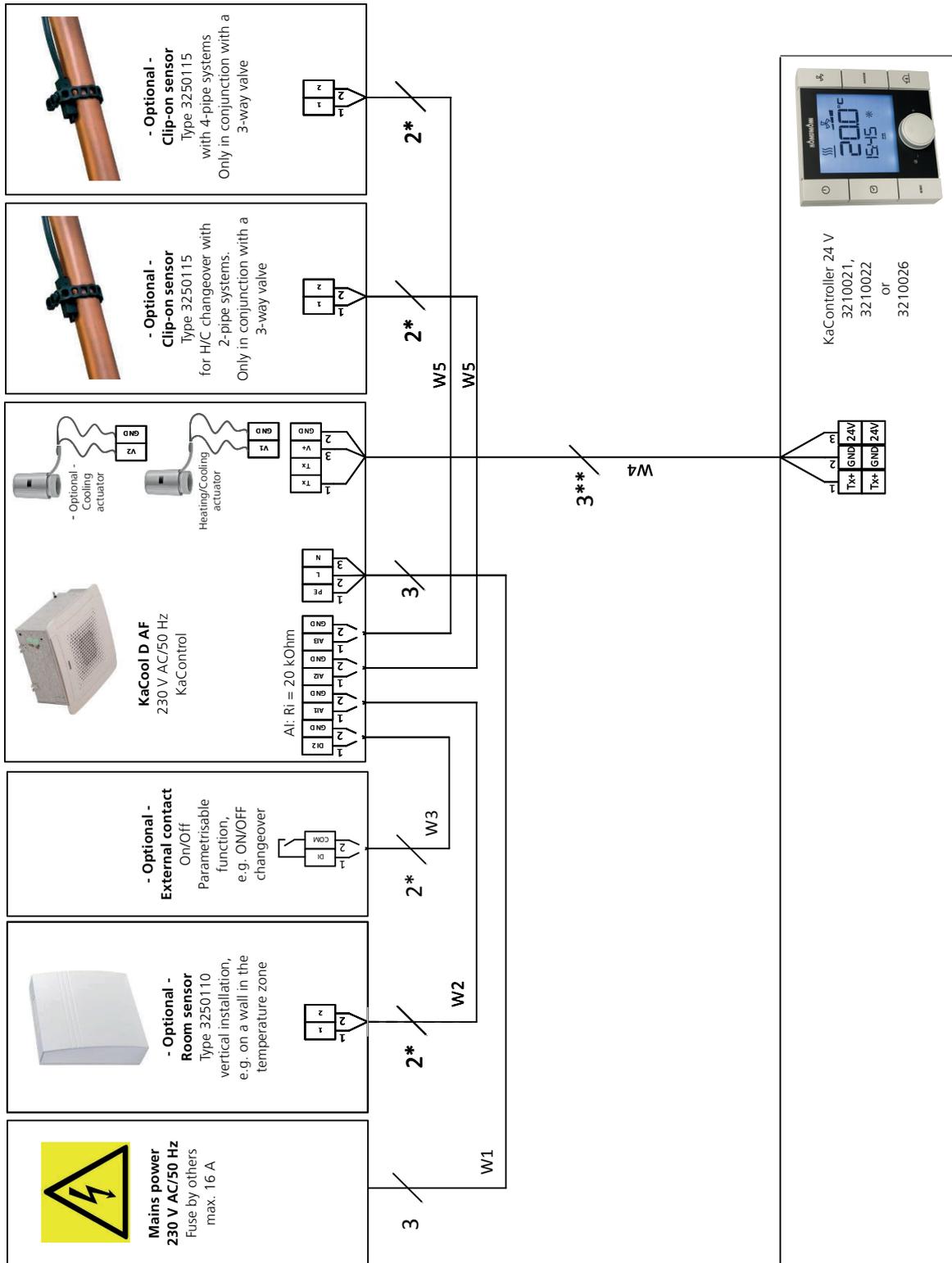
W2: Control signal for fan and actuators

W3: Collective fault message, only with 2-pipe units, non-floating, 24 V DC/max. 0.5A

The number of connecting wires required including fuses is given on the individual control units.

Electrical supply: Observe the technical connection requirements laid down by the utility companies!

Stand-alone unit, KaControl



*) Lay shielded cable e.g. B. J-Y(St)Y, 0.8 mm separately from power cables.

**) Lay shielded data cable, twisted pairs, e.g. UNITRONIC® BUS LD 2 x 2 x 0.22 mm² or similar, linear but separate from power lines.

W1: Power supply

W2: Analogue input AI1 (optionally connectible), max. cable length 10 m, from 1 mm² 30 m, disconnect factory-fitted intake sensor.

W3: Digital input DI1 (optionally connectible), max. cable length 30 m, from 1 mm² 100 m

W4: Bus signal (tLan), max. cable length 30 m

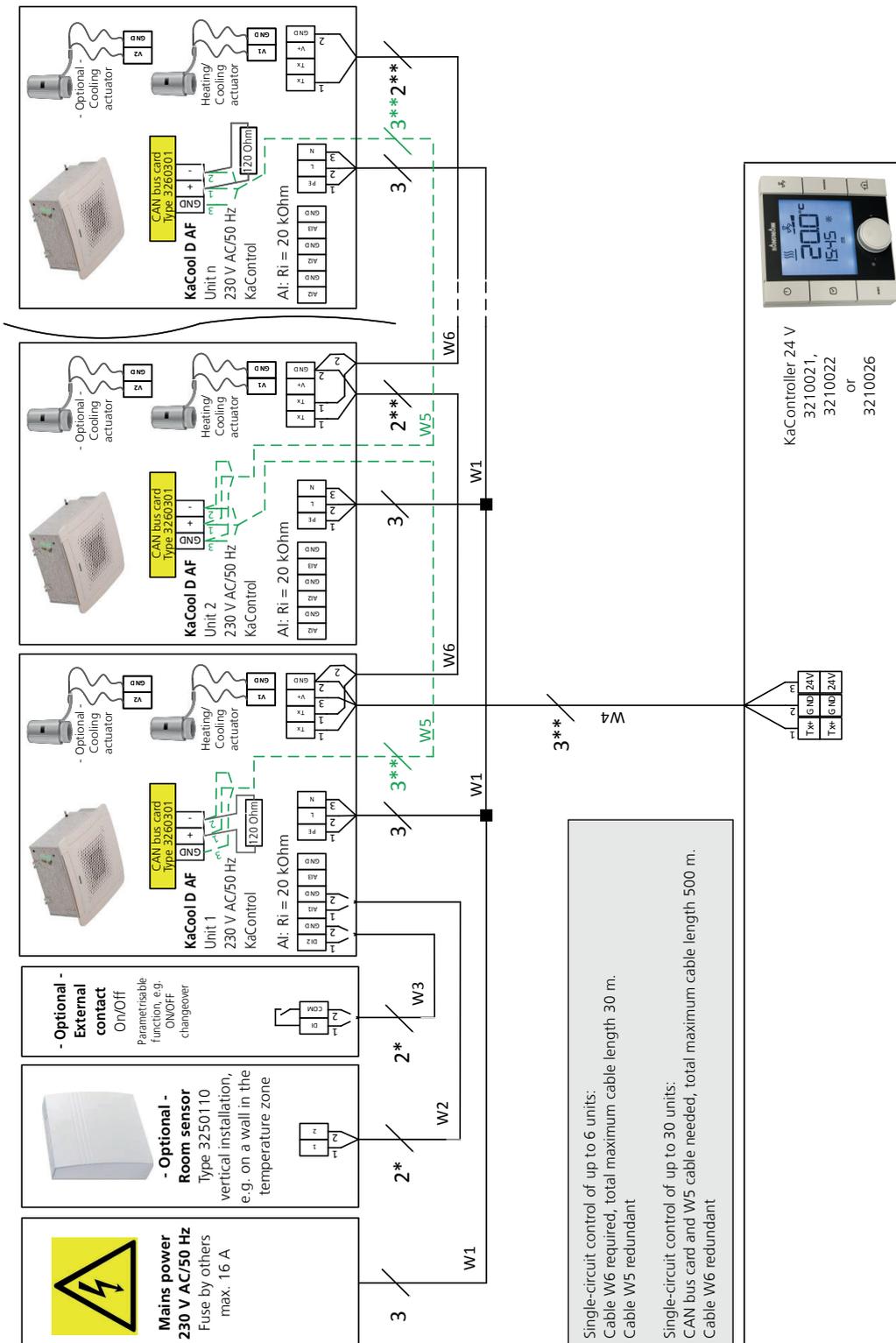
W5: Analogue input AI1 (optionally connectible), max. cable length 10 m, from 1 mm² 30 m

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KaControl group formation max. 6 units or 30 units with CAN bus card



*) Lay shielded cable e.g. B: J-Y(St)Y, 0.8 mm separately from power cables.

**) Lay shielded data cable, twisted pairs, e.g. UNITRONIC® BUS LD 2 x 2 x 0.22 mm² or similar, linear but separate from power lines.

W1: Power supply

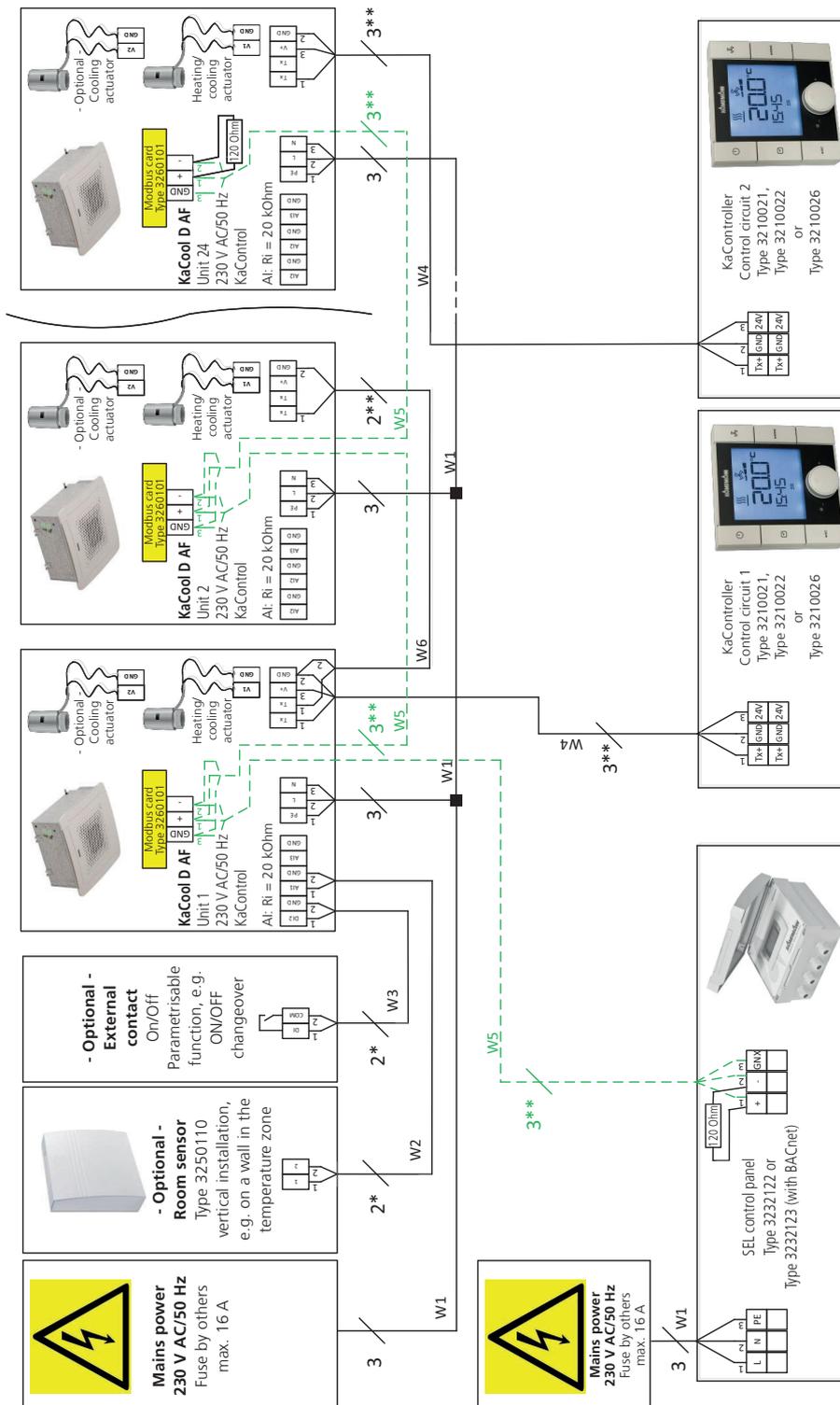
W2: Analogue input AI1 (optionally connectible), max. cable length 10 m, from 1 mm² 30 m, disconnect factory-fitted intake sensor

W3: Digital input DI1 (optionally connectible), max. cable length 30 m, from 1 mm² 100 m

W4, W6: Bus signal (tlan), max. cable length in each case 30 m

W5: Bus signal (CAN bus)

Electrical cabling – actuation via KaControl SEL control panel, max. 24 units with Modbus card



*) Lay shielded cables e.g. B: J-Y(St)Y, 0.8 mm separately from power cables.

**) Lay shielded data cable, twisted pairs, e.g. UNITRONIC® BUS LD 2 x 2 x 0.22 mm² or similar, linear but separate from power lines.

W1: Power supply

W2: Analogue input AI1 (optionally connectible), max. cable length 10 m, from 1 mm² 30 m, disconnect factory-fitted intake sensor

W3: Digital input DI1 (optionally connectible), max. cable length 30 m, from 1 mm² 100 m

W4, W6: Bus signal (tLan), max. cable length in each case 30 m

W5: Bus signal (Modbus)

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7 Operation and commissioning



IMPORTANT NOTE!

Refer to the separate instructions for operation using the Kampmann room controller.

7.1 Pre-commissioning checks



DANGER!

Before initial commissioning, check whether all necessary prerequisites are fulfilled to ensure that the unit can operate safely and properly.



Kampmann GmbH can also perform a functional check (optional). For contact details please refer to [Chapter 1.4 "Customer Service"](#) on page 6.

Structural checks:

- Is the unit installed mechanically securely?
- Are all accessories and the panel securely fitted?

Electrical checks:

- Is all cabling laid in accordance with the applicable regulations?
- Are all wires connected in accordance with the electric wiring diagrams?
- Is the protective conductor connected and wired throughout?

Water-side check:

- Is the flow and return pipework properly connected?
- Are the valves correctly fitted? (Note the permitted installation position of the actuators!)
- Are all valves and actuators fitted correctly?
- Are the shut-off valves on-site open?

Condensation drain (only with units with cooling function):

- Has the condensation drain been checked using the water fed in for test purposes?
- Clean the condensation tray before initial commissioning and remove dirt and site dust.

Check filter:

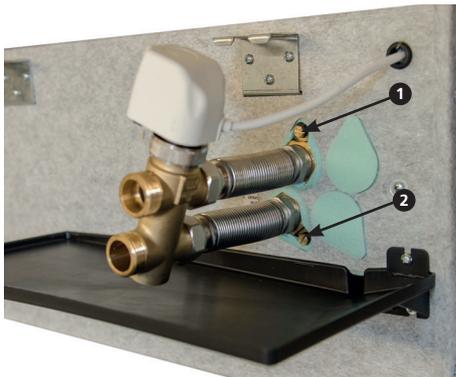
- Check the filter to ensure that it is clean prior to initial start-up and replace if dirty.



IMPORTANT NOTE!

Check the unit for any dirt (packaging remains, building dirt etc.) and remove if necessary. Then vent the heat exchanger.

7.2 Venting the heat exchanger



- Open all (on-site) shut-off devices and valves.
- Open the vent screw(s) ①, any escaping water being drained invisibly into the unit's main condensation tray. **Do NOT open the lower vent screws (② both with 2- and also 4-pipe units). They are not drained into the main condensation tray!**
- Close the vent screw when no more air escapes (a fact that should be checked by listening for noise).



IMPORTANT NOTE!

- Vent all other connecting lines on site.
- Top up the water level if necessary.
- Repeat this work depending on the type and design of the hydraulic network on site.

7.3 Switching on

- Switch on the mains voltage.
- Start up the unit using the control unit connected.
- Check the fan speeds by switching the stage selector.
- Check the correct operation of the heating or cooling valves by altering the room temperature setpoint. Take into account the different response times depending on the controller.
- Add water to the condensation tray - the pump should automatically switch on and off again.



Loud noises can occur with initial suction!

- Test the condensation alarm: add water until the externally connected device (warning message, shut-off device) is triggered.

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8 Maintenance

8.1 Securing against reconnection



WARNING!

Risk of death by unauthorised or uncontrolled restart!

Unauthorised or uncontrolled restarting of the equipment can result in serious injury or death.

- Before restarting, ensure that all safety devices are fitted and working properly and that there is no hazard to humans.
- Always follow the procedure described below to prevent accidental restart.

Securing against reconnection

1. ▶ Switch off the unit.
2. ▶ Switch off the energy supply.
3. ▶ Position a sign on the isolating switch from the supply network indicating that work is being performed in the hazard area and prohibiting the unit from being switched on. Provide the following information on the sign:
 - Switched off on:
 - Switched off at:
 - Switched off by:
 - Important: Do not switch on!
 - Important: Only switch on once you have ensured that there is no danger to personnel.

8.2 Maintenance

The sections below describe maintenance work needed for the proper and trouble-free operation of the equipment. If there are signs of increased wear during regular checks, adjust the required maintenance intervals to the actual wear and tear. Contact the manufacturer with any questions about maintenance work and intervals (↪ *Chapter 1.4 “Customer Service” on page 6*).

Interval	Maintenance task	Personnel
As required	Display on room control unit - first read the separate instructions for the room control unit	Caretaker/User
	Regular visual inspection of the fixings for damage	Caretaker/User
Quarterly	Visually inspect the filter and replace if necessary (↪ <i>Chapter 8.3.1. “Changing the filter” on page 105</i>)	Caretaker/User
Every six months	Clean the inside of the unit	Caretaker/User
Every six months	Check the water-side connections, valves and fittings	Caretaker/User
Every six months	Vent the heat exchanger	Caretaker/User
Every six months	Check the electrical wiring	Caretaker/User
Every six months	Clean the outlet grille and remove dirt from the airflow	Caretaker/User
Every six months	Check the antifreeze, if used	Caretaker/User
Every six months	Maintenance of the condensation pump	Caretaker/User

8.2.1 Filter cleaning

To remove and fit the filter, proceed as described on page 30. Clean the filter after removal by using a vacuum cleaner or pressurized air.

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9 Faults

The following chapter describes possible causes of faults and the work needed to rectify them.

Should faults occur frequently, shorten the maintenance intervals in line with the actual loading on the unit.

Contact the manufacturer with any faults that cannot be rectified using the following information (↪ *Chapter 1.4 "Customer service" on page 6*).

Behaviour in the event of faults

The following applies:

1. → Immediately switch off the unit with faults that pose an immediate danger to persons or property.
2. → Determine the cause of the fault.
3. → Switch off the unit and prevent it from being reconnected if rectifying the fault requires work in the hazard area. Immediately advise a supervisor on site about the fault.
4. → Either rectify the fault yourself or have it repaired by authorised personnel, depending on the nature of the fault.



The fault table (↪ Chapter 9.2 "Fault table" on page 97) provides information on who is authorised to rectify and remedy faults.

9.1 Fault display

The KaControl displays error messages. First read the separate instructions for the room control unit.

9.2 Fault table

Only permit authorised personnel to rectify operational faults!
The table below shows possible faults and the action needed to rectify them:

Fault	Possible cause	Actions	Personnel
Fan is not running	Unit switched off	Switch on the unit by the control	Qualified personnel
	No power supply	Check power supply and connect	
	Electrical cable not connected or incorrectly connected	Check electrical wiring and correct if necessary	
	No demand by controller, therefore fans switch off	Change controller settings, if required	
Unit too loud	Speed too high	Set lower fan speed	User/ Caretaker
	Air intake or air outlet openings blocked	Free air intake and outlet grilles	
	Filter dirty	Replace filter	
Unit is not heating or cooling sufficiently (LPHW/CPW)	Fan not switched on	Switch on fan at controller	User/ Caretaker
	Air volume too low	Set higher fan speed	
	Filter dirty	Replace filter	
	No heating or cooling medium	Switch on heating and/or cooling system, switch on circulation pump, vent unit(s)/ system	Qualified personnel
	Valves do not work	Replace faulty valves	
	Water volume too low	Check pump output, check hydraulics	
	Setpoint temperature on the controller set too low/high	Adjust temperature setting on controller	
	Control unit with integrated sensor and/or external sensor is exposed to direct sunlight or positioned over a heat source	Control unit with integrated sensor and/or external sensor in a suitable location	
Water escaping from unit	Condensation drain not properly installed	Check correct operation of condensation pump, check and clean condensation drain (if fitted)	Qualified personnel
	Chilled water line incorrectly insulated	Check insulation	
	Condensation drain outlets blocked	Clean condensation drains and check for adequate gradient	
	Hydraulic connection not properly done	Check flow and return and tighten, if necessary	

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10 Declaration of Conformity



EU-Konformitätserklärung

EU Declaration of Conformity
Déclaration de Conformité CE
Deklaracja zgodności CE
EU prohlášení o konformite

Wir (Name des Anbieters, Anschrift):

We (Supplier's Name, Address):
Nous (Nom du Fournisseur, Adresse):
My (Nazwa Dostawcy, adres):
My (Jméno dodavatele, adresa):

KAMPMANN GMBH & Co. KG
Friedrich-Ebert-Str. 128-130
49811 Lingen (Ems)

erklären in alleiniger Verantwortung, dass das Produkt:

declare under sole responsibility, that the product:
déclarons sous notre seule responsabilité, que le produit:
deklarujemy z pełną odpowiedzialnością, że produkt:
deklarujeme, vědomi si své odpovědnosti, že produkt:

Type, Modell, Artikel-Nr.:	KaCool W	324***
Type, Model, Articles No.:	KaCool D AF	325***
Type, Modèle, N° d'article:		
Typ, Model, Nr artykułu:		
Typ, Model, Číslo výrobku:		

auf das sich diese Erklärung bezieht, mit der / den folgenden Norm(en) oder normativen Dokumenten übereinstimmt:

to which this declaration relates is in conformity with the following standard(s) or other normative document(s):
auquel se réfère cette déclaration est conforme à la (aux) norme(s) ou autre(s) document(s) normatif(s):
do którego odnosi się niniejsza deklaracja, jest zgodny z następującymi normami lub innymi dokumentami normatywnymi:
na který se tato deklarace vztahuje, souhlasí s následující(mi) normou/normami nebo s normativními dokumenty:

DIN EN 1397	Wasserübertrager – Wasser-Luft-Ventilator-konvektoren –
DIN EN 55014-1; -2	Prüfverfahren zur Leistungsfeststellung
DIN EN 61000-3-2; -3-3	Elektromagnetische Verträglichkeit
DIN EN 60335-1; -2-40	Elektromagnetische Verträglichkeit
	Sicherheit elektr. Geräte f. den Hausgebrauch und
	ähnliche Zwecke

Kampmann GmbH & Co. KG
Friedrich-Ebert-Straße 128–130
49811 Lingen (Ems)

Registergericht: Osnabrück, HRA 205688
USt-IdNr: DE313505294
Kampmann.de

Persönlich haftende Gesellschafterin:
Kampmann Beteiligungsgesellschaft mbH
Sitz: Lingen (Ems)

Registergericht: Osnabrück, HRB 211684
Geschäftsführer: Hendrik Kampmann





Gemäß den Bestimmungen der Richtlinien:

Following the provisions of Directive:
Conformément aux dispositions de Directive:
Zgodnie z postanowieniami Dyrektywy:
Odpovídající ustanovení směrnice:

2014/30/EU **EMV-Richtlinie**
2014/35/EU **Niederspannungsrichtlinie**

Hendrik Kampmann

Lingen (Ems), den 01.09.2020

Ort und Datum der Ausstellung

Place and Date of Issue
Lieu et date d'établissement
Miejsce i data wystawienia
Místo a datum vystavení

Name und Unterschrift des Befugten

Name and Signature of authorized person
Nom et signature de la personne autorisée
Nazwisko i podpis osoby upoważnionej
Jméno a podpis oprávněné osoby

2/2

3.25 KaCool D AF – Comfortable feeling of well-being, thanks to AtmosFeel

Chilled water air conditioning system

Installation and operating instructions

Information requirements for fan coils according to regulation (EU) No 2016/2281
 Informationsanforderungen für Fan Coils gemäß Verordnung (EU) Nr. 2016/2281

KaCool D AF heating and cooling Heizen und Kühlen 2-pipe unit 2-Rohrsystem		cooling capacity (sensible) Kühlleistung (sensibel)	cooling capacity (latent) Kühlleistung (latent)	Heating capacity Wärmeleistung	Total electric power input Elektrische Gesamtleistungsaufnahme	Sound power level (per speed setting, if applicable) Schalleistungspegel (ggf. je Geschwindigkeits-einstellung)
Version	Size / Baugröße	$P_{rated,c}$ kW	$P_{rated,c}$ kW	$P_{rated,h}$ kW	P_{elec} kW	L_{WA} dB (A)
AC	1	2,1	2,8	2,4	0,037	34/41/44
	2	2,2	3,2	2,9	0,043	34/44/52
	3	2,7	3,8	3,4	0,052	39/49/58
	4	3,4	4,8	4,9	0,075	53/59/62
	5	3,6	5,1	5,0	0,050	36/53/50
	6	4,4	6,8	6,0	0,065	38/45/55
	7	6,3	9,1	8,7	0,093	44/50/60
EC	1	1,9	2,5	2,4	0,009	34/41/44
	2	2,2	3,2	2,9	0,011	34/44/52
	3	2,7	3,8	3,4	0,018	39/49/58
	4	3,4	4,8	4,9	0,042	53/59/62
	5	3,6	5,1	5,0	0,030	36/43/50
	6	4,4	6,8	6,0	0,033	38/45/55
	7	6,3	9,1	8,7	0,069	44/50/60

Standard rating conditions for fan coil units according to regulation (EU) No 2016/2281

Norm-Prüfbedingungen für Gebläsekonvektoren gemäß Verordnung (EU) Nr. 2016/2281

Cooling Test	Air temperature	27 °C (dry bulb) 19 °C (wet bulb)	Inlet water temperature	7 °C	Water temperature rise	5 °C
Test Kühlbetrieb	Luft-temperatur	27 °C (Trockenkugel) 19 °C (Feuchtkugel)	Wassertemperatur am Einlass		Anstieg der Wassertemperatur	
Heating Test	Air temperature	20 °C (dry bulb)	Inlet water temperature	45 °C for 2-pipe units 65 °C for 4-pipe units	Water temperature decrease	5 °C for 2-pipe units 10 °C for 4-pipe units
Test Heizbetrieb	Luft-temperatur	20 °C (Trockenkugel)	Wassertemperatur am Einlass	45 °C für 2- Rohrsysteme	Sinken der Wassertemperatur	5 °C für 2-Rohrsysteme 10 °C für 4-
Sound power test		At ambient conditions without water flow				
Test Schalleistungspegel		Bei Umgebungsbedingungen ohne Wasserdurchsatz				

Contact Details	Kampmann GmbH
Kontaktinformationen	Friedrich-Ebert-Straße 128-130, D-49811 Lingen (Ems), Germany

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Kampmann.eu/KaCool_D_AF
Kampmann.co.uk/KaCool_D_AF

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Genau mein Klima.