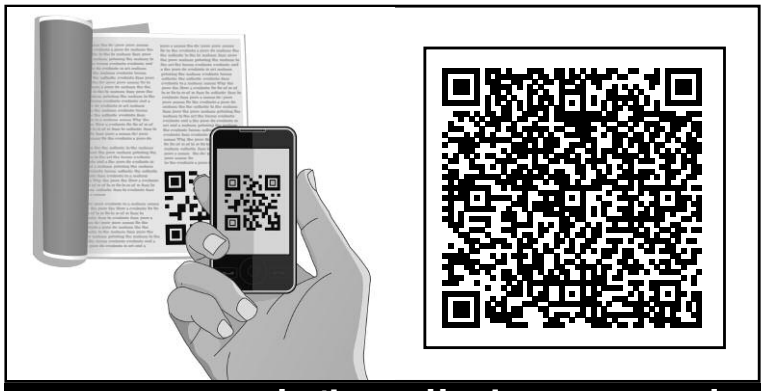
Katherm QK 1.42

Trench heating with EC cross-flow fan and KaControl

Assembly and Installation Instructions

Please keep safe for future use!



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I479/10/13/1 GB I Sap-Nummer 1174108

1.42 Ka*therm* QK - Cross-flow fan convection with compact EC motor

Ready-to-install floor duct convectors

Installation instructions

Explanation of symbols:

Caution! Danger!

Non-adherence to this manual can result in serious injury or damage to persons or property.

Danger of electrocution!

Non-adherence to this manual can result in serious injury or damage to persons or property by electrocution.

Please read this manual prior to commencing installation of these units!

All persons involved in the installation, commissioning and use of this product are obliged to pass this manual onto other trades working in parallel or subsequently on this equipment up to and including the end user or operator of the equipment. Please retain this manual until the equipment is finally decommissioned!

Amendments can be made to the content or design of this manual without prior notification!

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1. Correct and proper use

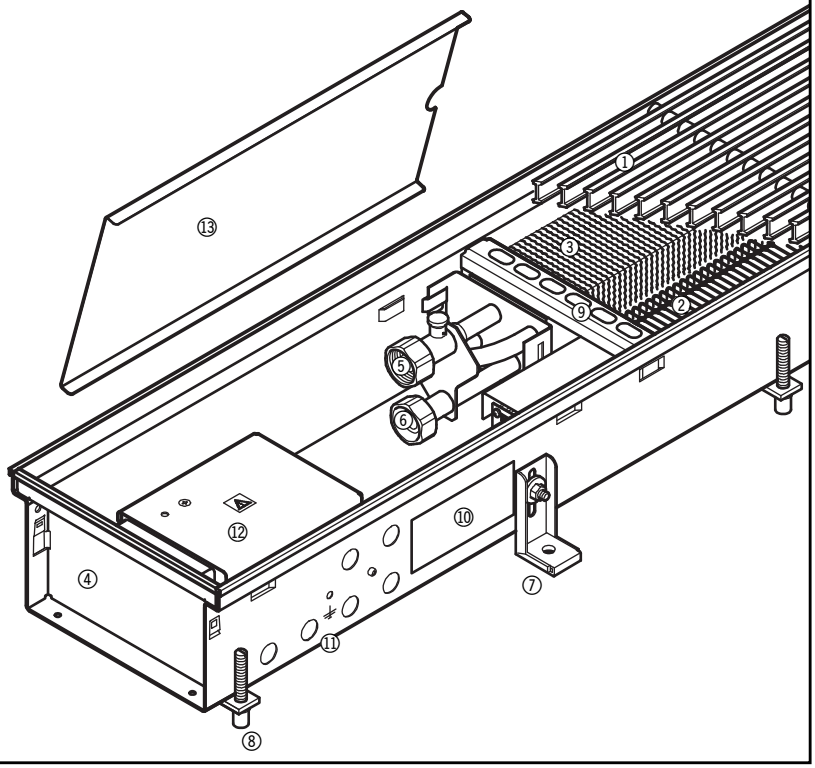
Kampmann **Ka***therm* QK are manufactured in accordance with the state of the art and recognised safety regulations. The use of these units can nevertheless result in danger to persons or damage to the equipment orother property if they are not installed and operated correctly and properly or are not used correctly.

Ka*therm* QK units are intended solely for use indoors (for instance in residential properties, offices, showrooms etc). They should not be used indamp areas, like swimming pools or outdoors. The units should be prevented from becoming wet or damp during installation. If in doubt, please contact the manufacturer. Any use beyond the aforementioned useshall be deemed to be improper and any damage resulting from this will be the sole responsibility of the operator of the equipment. Correct and proper use also includes adherence to the installation instructions given inmanual.

The installation of this product requires technical knowledge of heating, cooling and electronics. This knowledge is generally taught as part of acourse in one of the vocational fields listed in section 2 and is not described separately here. Connection faults or modifications can lead to damage to the unit! The manufacturer shall not be liable for any damage due to any faulty connection or/and improper handling.

Ka*therm* QK

① Roll-up grille (alternative: linear grille)
② Compact EC cross-flow fan
③ High-output convector Cu/Al
④ Floor duct
⑤ Flow connection, 1/2“, Eurokonus
⑥ Return connection, 1/2“, Eurokonus
⑦ Height adjustment feet mit sound insulation
⑧ Raised floor mounting feet
⑨ Supports
⑩ Pipe entries - water connection
⑪ Cable entries
⑫ Connection-ready electrical junction box
⑬ Terminal cover



Attention: do not remove supports

Example: **Ka*therm*** QK 207

2. Safety information

The installation and assembly, as well as maintenance of electrical equipment should only be performed by a qualified electrician in accordance with VDE guidelines. The units should be wired in accordance with applicable VDE regulations and guidelines issued by the relevant power supply company. Non-adherence to these regulations and the information contained in the installation manual can result in malfunctions with consequential damage and danger to personnel. There is a risk of fatal injury if the wires are swapped when connecting the units! Disconnect all parts of the system from the mains prior to wiring and servicing the units and prevent them from being reconnected! The unit should only be connected to fixed cables. Please read this manual in full to ensure correct and proper installation.

It is imperative that the following safety information is adhered to:

- Disconnect all parts of the system that you are working on from the mains power supply.
- Ensure that the equipment cannot be accidentally re-connected!
- Before commencing with the installation/servicing of the unit, wait until the fan has reached a standstill after the unit has been switched off.
- Attention! Pipes, casings and fittings can become very hot depending on the operating mode!
- Personnel should be qualified and possess adequate knowledge of the following:
- Safety prevention and accident prevention
- Guidelines and recognised technical regulations, such as VDE guidelines
- DIN and EN standards
- Accident prevention regulations VBG, VBG4, VBG9a
- DIN VDE 0100, DIN VDE 0105
- EN 60730 (Part 1)
- Technical regulations issued by the relevant power supply companies

Modifications to the equipment

Do not perform any modifications, conversions or additions to Katherm QK units without consulting the manufacturer, as this could impair the safety and correct operation of the units.

Do not carry out any work on the equipment that is not described in this manual. Fittings and cabling should be appropriate for the system!

Openings are provided on the floor duct for a potential balancing line.

3. Models/Scope of delivery

Floor ducts are supplied as standard with:

- Height adjustment feet, room-side, ① rubber pads for sound insulation ②, screws and rawlplugs provided by the customer
- Raised floor mounting feet ③

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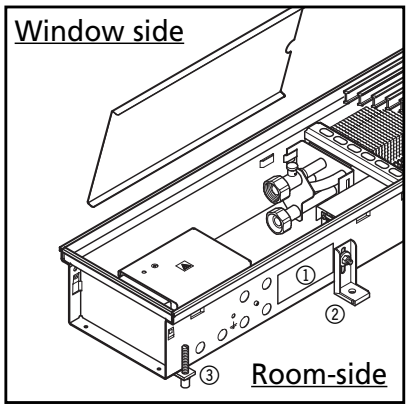

Example shown:
Ka*therm* QK 207

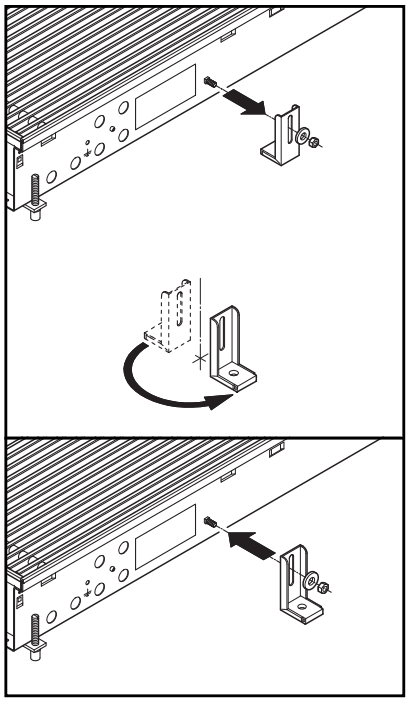

Fig.: Turning the height adjustment feet

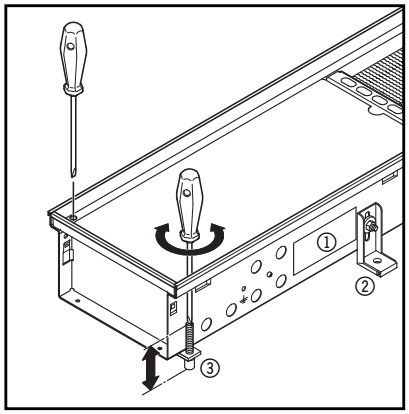

Fig.: Setting the height on the raised floor mounting feet

4. Levelling/Waterside connections

- Remove outer film and packaging cardboard.
- Open the transparent protective cover.

Attention : remove the transport protection between the fan motor(s) and convector. Do not remove the supports during assembly and operation.

- Arrange the Katherm QK with the PowerKon heat exchanger next to the window.

Attention : the height adjustment feet are already fitted to the floor duct. However, these were fastened to the foot underneath the duct for transportation purposes. The outer fastening nut of the height adjustment foot must be loosened and the height adjustment foot turned 180° so that the foot is pointing outwards (see Fig.).

- Then set the floor duct and align the height on the height adjustment feet and adjustment screws of the raised floor mounting feet with rubber pads for sound insulation ③.
- Fit the height adjustment feet on the room side ① with rubber underlays to isolate sound ②, using screws and dowels supplied by others.
- Use the stamped room-side pipe openings for the water-side connection. Remove the stamped pipe openings. Screw the thermostat valve and the return shut-off valve without any additional sealant to the Eurokonus connections on the convector.
- Then fit the flow and return pipework.
- Perform a pressure test.
- Ensure that this manual is clearly visible to subsequent trades on this equipment.
- Cover the grille and floor duct with the transparent protective cover to prevent it from becoming dirty or damaged by dirt or cement on site.

Attention : Grilles are suitable for foot traffic. Local bar loads (i.e. chair legs) must be avoided!

5. Thermoelectric actuator

The thermoelectric actuator can be connected directly to the control PCB in the connection-ready junction box in the trench heating.

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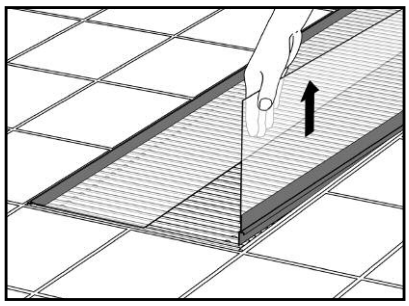
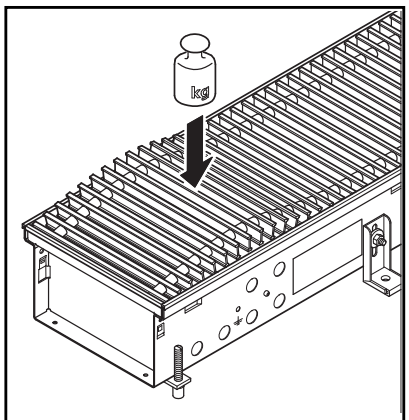


Installation cover: (Remove the transparent installation cover before commissioning the equipment)



Roll-up grilles are rolled up and packed separately when installation covers are ordered to protect the duct from becoming dirty/damaged. This may result in the grille appearing to be slightly too long due to the spring being stretched. Unroll the grille and lay it flat for several hours to allow it to regain its original length. Lay it into the duct, as shown above, by lifting it up and down to fit it into the frame.

6. Screeding

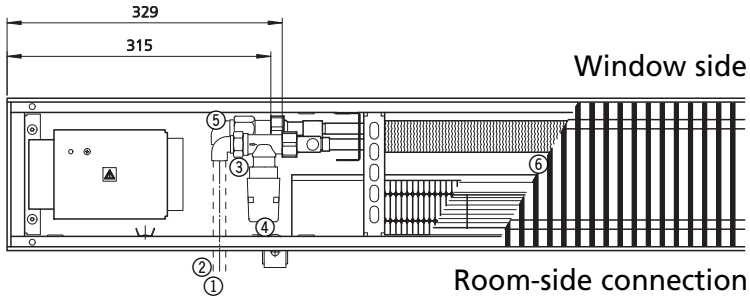
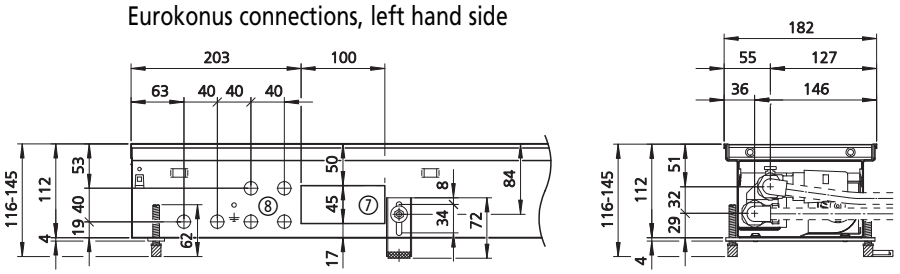
Prior to screeding, check whether

- The pipework has been connected up correctly,
- The wiring is correct,
- The floor duct is at the correct height and has the correct air outlet,
- The grille is covered (Important! Cement can damage the surface of the grille!),
- Sound insulation is fitted underneath the floor duct (not necessay with raised floors),
- There are no sound bridges to the concrete slab, particularly around the height adjustment feet,
- All openings and pre-punched openings in the floor duct are sealed from the ingress of screed using suitable material.
- Provide additional sealing to the openings and pre-punched openings on the floor duct if using floating screed or other viscous floor covering.

Important note! Do not allow the floor duct to be compressed by screed or the floor. Provide expansion joints if need be.

7. Water connections · Pipe openings

Ka*therm* QK 182

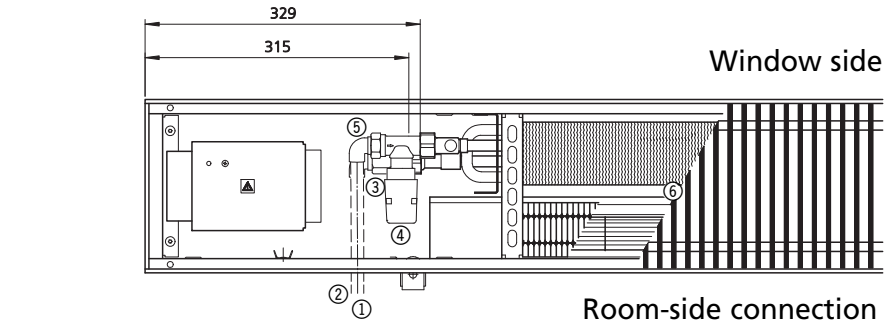
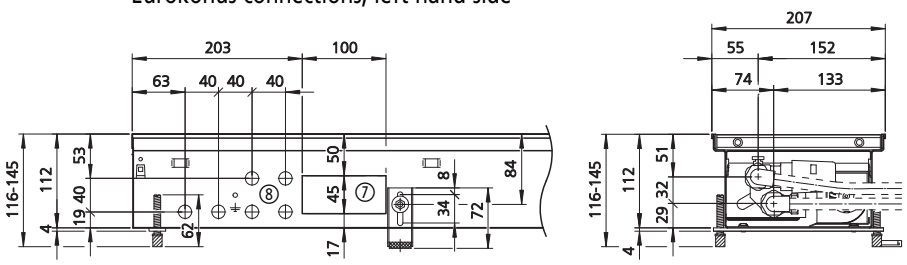
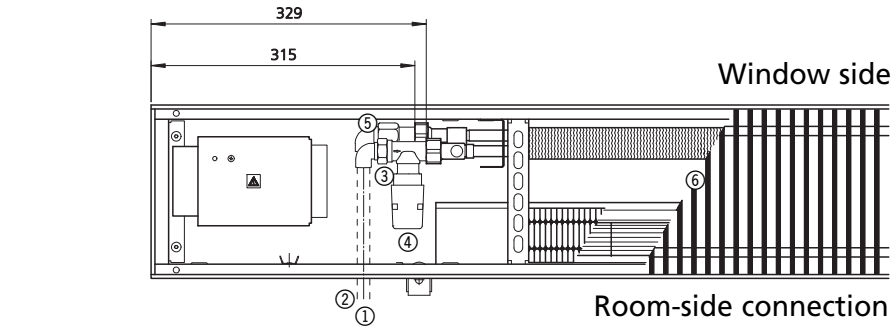
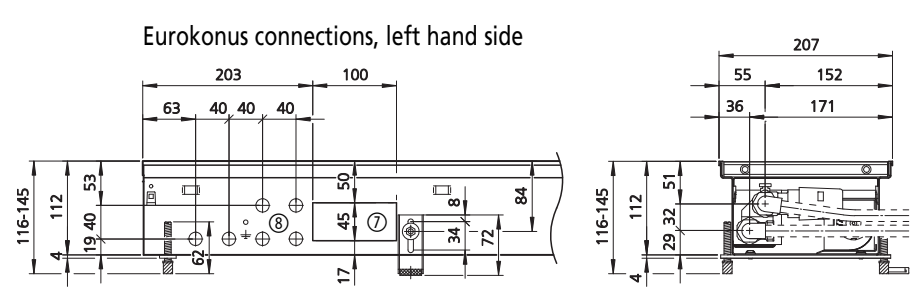
Design	Room-side pipe connections
Ka*therm* QK 182 ① Flow ② Return ③ Valve body, straight, type 146909 or type 346909 (presettable) ④ Thermoelectric actuator, type 146906 ⑤ Return shut-off valve, straight, type 145952 ⑥ Unit shown with roll-up grille ⑦ Pipe conduits, cut-out ⑧ Cable conduits	 Eurokonus connections, left hand side 

1.42 Ka*therm* QK - Cross-flow fan convection with compact EC motor

Ready-to-install floor duct convectors

Installation instructions

Ka*therm* QK 207, Ka*therm* QK 207s

Design	Room-side pipe connections
Ka*therm* QK 207 ① Flow ② Return ③ Valve body, straight, type 146909 or type 346909 (presettable) ④ Thermoelectric actuator, type 146906 ⑤ Return shut-off valve, straight, type 145952 ⑥ Unit shown with roll-up grille ⑦ Pipe conduits, cut-out ⑧ Cable conduits	 Eurokonus connections, left hand side 
Ka*therm* QK 207s ① Flow ② Return ③ Valve body, straight, type 146909 or type 346909 (presettable) ④ Thermoelectric actuator, type 146906 ⑤ Return shut-off valve, straight, type 145952 ⑥ Unit shown with roll-up grille ⑦ Pipe conduits, cut-out ⑧ Cable conduits	 Eurokonus connections, left hand side 

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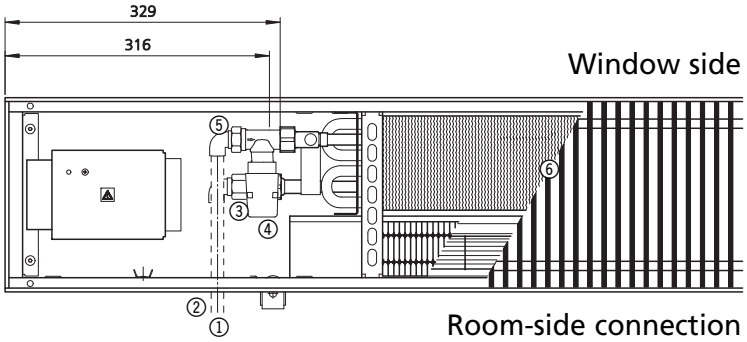
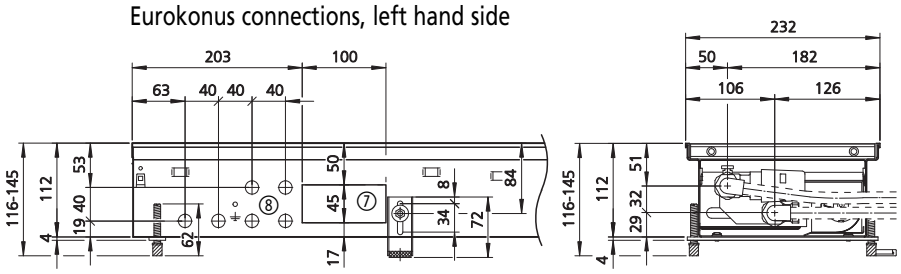
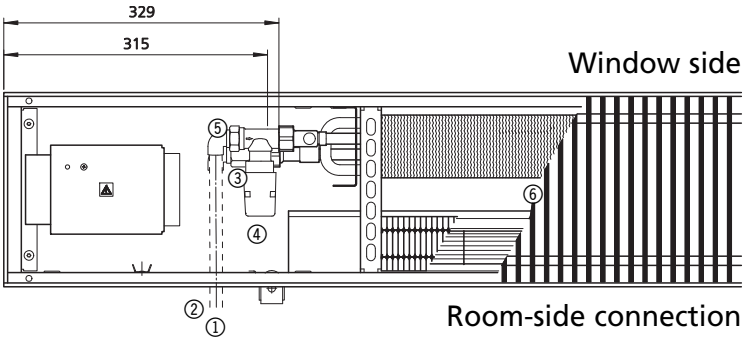
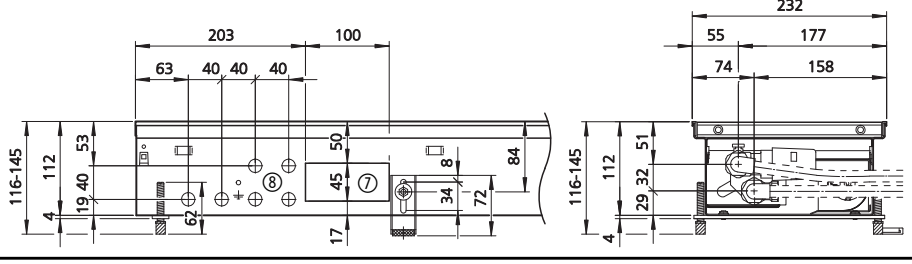
Ka*therm* QK 232, Ka*therm* QK 232s

Design	Room-side pipe connections
Ka*therm* QK 232 ① Flow ② Return ③ Valve body, straight, type 146909 or type 346909 (presettable) ④ Thermoelectric actuator, type 146906 ⑤ Return shut-off valve, straight, type 145952 ⑥ Unit shown with roll-up grille ⑦ Pipe conduits, cut-out ⑧ Cable conduits	 Eurokonus connections, left hand side 
Ka*therm* QK 232s ① Flow ② Return ③ Valve body, straight, type 146909 or type 346909 (presettable) ④ Thermoelectric actuator, type 146906 ⑤ Return shut-off valve, straight, type 145952 ⑥ Unit shown with roll-up grille ⑦ Pipe conduits, cut-out ⑧ Cable conduits	 Eurokonus connections, left hand side 

8. Number of height adjustment feet and raised floor mounting feet

Duct length [mm]	Number of height adjustment feet	Number of raised floor mounting feet
1000	2	2
1200	2	3
1400	2	3
1600	2	3
1800	2	3
2000	2	4
2200	2	4
2400	2	4
2600	2	5
2800	2	5
3000	2	5
3200	2	5

9. Maintenance

Important note

Ka*therm* QK floor ducts should only be maintained and serviced by trained and qualified personnel and noting the information provided in the installation and operating manual, as well as all applicable regulations. Regular servicing and maintenance is needed to ensure the correct operation and performance of **Ka***therm* QK units.

Fans

- Check the crossflow fans every six months for dirt and damage (visual inspection).
- Clean the fan cylinder carefully with a cloth if dirty.

Heat exchanger

- Check the integral heat exchanger every six months for dirt and possible damage. A visual inspection will suffice here too.
- If dirty, carefully vacuum the heat exchanger.

Valves

- Also inspect the valves every 12 months and check that they are tight (visual inspection)!

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1. Intended Use

The Kampmann KaController and Katherm QK are built in line with the state of the art and recognised safety regulations. Nevertheless, its use can result in danger to people or damage to the unit or other material assets if the unit is not appropriately installed and operated or correctly and properly used.

Applications
The KaController should only be used as a room control unit in conjunction with Kampmann systems.

KaControllers should only be used
- indoors (e.g. living space and offices, showrooms etc.).

KaControllers should not be used
- outdoors,
- in humid areas, such as swimming pools,
- in wet areas,
- in areas where there is a risk of explosion,
- in areas with high dust concentration and in
- areas with an aggressive atmosphere

Katherm QK should only be used indoors (e.g. living space and offices, showrooms etc.) and not in humid areas, such as swimming pools or outdoors.
The products should be protected from any moisture during installation. Check the application with the manufacturer in case of any doubt. Any use other than the uses specified above is regarded as improper use.
Any damage resulting from this shall be the sole responsibility of the operator of the unit. Correct and proper use is also deemed to include observing the installation information described in these instructions.

Specialist knowledge
The installation of this product requires specialist knowledge of heating, cooling, ventilation and electrical engineering. This knowledge, generally learned in vocational training in one of the fields mentioned above, is not described separately. Damage caused by improper installation is the sole responsibility of the operator.
The installer of this unit should have adequate knowledge about safety and accident prevention regulations and recognised technical regulations, such as VDE regulations, DIN and EN standards, gained from specialist vocational training.

Purpose and scope of application of these instructions
These instructions contain information on the operation of the KaController. The information contained in these instructions can be changed without prior notification.

2. Important Information / Safety Information

Installation, assembly and maintenance work on electrical units should only be performed by a qualified electrician in compliance with VDE guidelines and wiring should comply with the applicable VDE regulations and provisions laid down by the regional electricity providers.
Non-compliance with the regulations and the operating instructions could result in the unit malfunctioning with consequential damage and damage to people. The units can be incorrectly wired by the wires being swapped – danger of fatal injury! All parts of the system should be disconnected from the mains power supply and prevented from being reconnected before wiring and maintenance work can be started!
Read the instructions in full to ensure that the units are installed properly and the KaController can be operated without any problems.

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 after the unit has been switched off.
- Caution! Pipes, casings and fittings can become very hot of very cold depending on the mode of operation!
- 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) regulations
  - 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

Check the application with the manufacturer in case of any doubt. Any use other than the uses 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. Correct and proper use is deemed to include observing the installation information described in these instructions.

Modifications to the equipment
Do not undertake any modifications, renovations or additions to the KaController or Katherm QK without discussing these with the manufacturer as this could impair the safety and operation of the unit. Do not undertake any work on the unit that is not described in these instructions. On-site systems and cabling must be suitable for connection to the intended system!

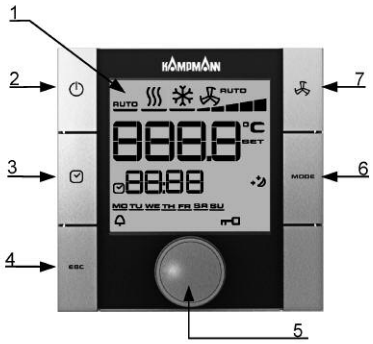
3. Operation of the KaController

The KaController is capable of controlling a wide range of Kampmann systems. The KaController is equipped with the latest technology and provides users with the option of adapting the air conditioning of buildings to their individual needs. Up to two switching on and switching off times can be configured for every weekday so that the room temperature can be regulated to meet the demands of the user.

Product features:

- Integral temperature sensor
- Large LCD multifunctional display
- Automatic LED background lighting
- Large seven-segment display for visualisation of setpoint room temperature
- Real-time clock with integral timer programs
- 2 switching on and switching off times per day
- Alarm display
- Individually adjustable basic display
- Press/turn button with endless turn/rest function
- One-touch operation of all functions
- Connection of Kampmann system components using a bus connection
- Password-protected service level
- Language-independent display, ideal for international use

KaController with function keys
Type 3210002
Type 3210004



KaController without function keys
(one-touch operation)
Type 3210001
Type 3210003

3.1 Function keys, display elements

1. Display with LED background lighting

2. ON/OFF key (depending on setting)
   - ON / OFF (factory setting)
   - Eco mode / Day mode

3. TIMER key
   - Setting the time
   - Setting timer programs

4. ESC key
   - back to default view

5. Navigator
   - changing settings
   - calling up the menus

6. MODE key
   - setting operating modes
     (disabled with 2-pipe applications)

7. FAN key
   - setting fan control

All menus can be selected and set using the navigator.

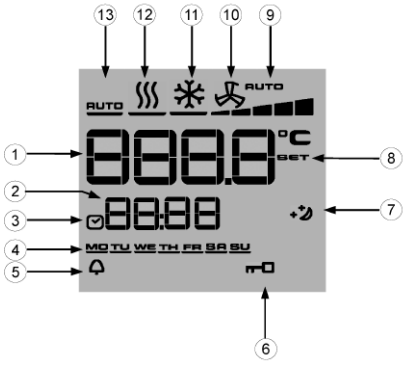
The LED background lighting is automatically switched off 5 seconds after the KaController is last used. The LED background lighting can be permanently disabled via a parameter setting.

1.42 Ka*therm* QK - Cross-flow fan convection with compact EC motor

Ready-to-install floor duct convectors

Installation instructions

LCD display symbols



1	Display of setpoint room temperature
2	Current time
3	Timer program enabled
4	Weekday
5	Alarm
6	Selected function is locked
7	Eco mode
8	Setpoint setting enabled
9	Fan control setting Auto-0-1-2-3-4-5
10	Ventilation mode
11	Cooling mode
12	Heating mode
13	Automatic heating/cooling changeover mode

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

KAMPMANN
Genau mein Klima.

3.2 Operation

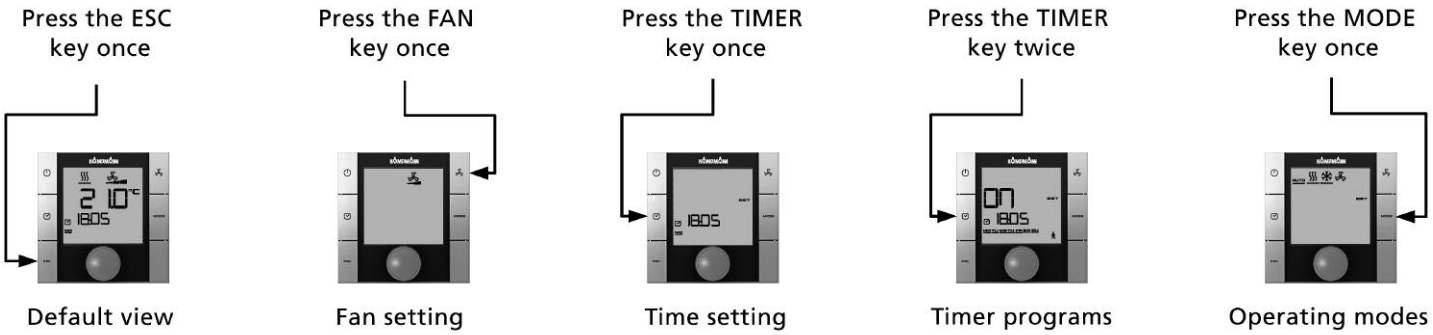
The KaController is operated using the navigator and the function keys.

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

The different selection menus are called up using the navigator or the function keys on the side.

Menu selection using the navigator

Menu selection using function keys



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

3.2.1 Switching the controller off and on

Default view

Once the controller has been switched on, the default view appears on the display showing the current room temperature setpoint and the fan stage set.

When the KaController is started up for the first time, the time is not shown in the default view (see "Time setting" selection menu).

Default view

Switching the controller off:

There are 3 options to switch off the controller:

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

Controller OFF view

Switching the controller on:

There are 2 options to switch on the controller:

1. Press the ON/OFF key
2. Press the navigator

3.2.2 Temperature setting

The temperature setpoint is entered from the default view. To call up the default view, press the ESC key or do not use the KaController for 3 seconds.

Default view

Setting the temperature setpoint:

A new temperature setpoint can be set by turning the navigator in the default view. The figure is applied by pressing the navigator and the default view is called up.

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

Setting the temperature setpoint

3.2.3 Fan setting

To call up the "Fan setting" selection menu, press the FAN key (quick access) or use the navigator.

Calling up the "Fan setting" menu using the navigator:

In automatic mode, the room temperature is initially controlled with natural convection and then by continual adjustment of the fan speed. The user also has the option of setting the fan speeds Auto-0-1-2-3-4-5 as required.

Fan stage 3

The display switches to the "Fan setting" menu by pressing the navigator in the default view.

By turning the navigator you can select the fan speed Auto-0-1-2-3-4-5 that you require.

The selected fan speed can be enabled by pressing the navigator.

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

3.2.4 Time setting

To call up the "Time setting" selection menu, press the TIMER key once (quick access) or use the navigator

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

Time setting view

Setting the time:

Use the navigator to set the following values:
1. Current hour
2. Current minute
3. Current weekday

The "Timer program" selection menu is automatically called up by pressing the navigator after confirming the current weekday.

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

Setting to hide the time in the default view

When the KaController is started up for the first time, the time is not shown in the default view. Only when the time has been set is the current time shown in the default view!
If the values "- -: - -" are entered for hour and minute, the real-time clock is disabled and the time is hidden in the default view.

3.2.5 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, it is not just possible to set one on and off time each day, but you can also enter two on and off times per day.

Set the time in the "Time setting" selection menu before parameterising the switching on and off times.

The KaController can manage 2 switching on and 2 switching off times per weekday. The switching on and off times can be entered in blocks or individually for each day. The timer program switches the controller on and off according to set time intervals.

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.

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	- - : - -	- - : - -	- - : - -	- - : - -

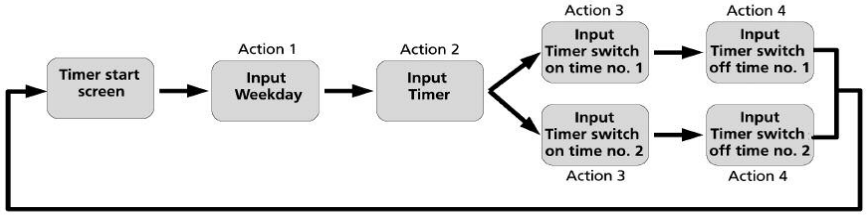
Example of a weekly timer program

Display elements in the "Timer programs" selection menu

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

If no switching on or off time is entered into the timer matrix, the "clock" symbol is hidden in the default view.

The diagram below shows the sequence for setting the timer programs. 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 for 3 seconds in the timer program start screen or do not use the KaController for 15 seconds.

To call up the "Timer programs" selection menu, press the TIMER key twice (quick access) or use the navigator.

Calling up the "Timer programs" menu using the navigator:

Timer start screen

Step 1:

Turn the navigator to select a weekday for which you would like to program a switching 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.

The figure is applied by pressing the navigator
(for instance: MO-FR) and the next input screen is called up.

Input screen for timer no.

Step 2:

Select the number of the timer program (no. 1 or no.2) by turning the navigator.

The figure is applied by pressing the navigator (for instance: timer program no. 1) and the next input screen is called up.

Input screen for switching on time

Step 3:

It is possible to set the **switching on time** you require by turning the navigator.

Once the minutes have been entered, the set **switching on time** is applied by pressing the navigator and the input screen for the switching off time of the selected timer no. is called up.

Input screen for switching off time

Step 4:

It is possible to set the **switching off time** you require by turning the navigator.

Once the minutes have been entered, the set **switching off time** is applied by pressing the navigator and the timer start screen is called up (-> Step 1).

The respective weekday and associated timer program no. must be called up to delete the switching on and off times entered (Step 1 + Step 2). The switching on or off time entered should be replaced by " - -:- -" (Step 3 +Step 4).
Important: the block-wise deletion of timer entries is not possible!

Timer entries can be overwritten at any time and this can be done for a block as well as for each day. Switching on and off times should only be requested singly for each day.

The block-wise requesting of switching on and off times is not possible with different timer entries for the respective weekdays and the time is displayed with " - -:- -"!

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

3.2.6 Operating modes (Mode key)

The MODE key is locked with Katherm QK applications as only the heating mode can be enabled. The operating mode cannot be set using the KaController (see section 11.3.11.2)!

4. Alarm Messages

The KaController displays faults by means of the alarm messages listed in the table below. The alarm messages are displayed according to their priority.
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.

4.1 Katherm QK

View of "Motor fault" alarm

Katherm QK alarm table

Code	Alarm	Priority
A11	Faulty control sensor	1
A12	Motor fault	2
A13	Room frost protection	3
A14	Condensation alarm	4
A15	General alarm	5
A16	Faulty AI1, AI2 or AI3 sensor	6
A17	Unit frost protection	7
A18	Faulty EEPROM	8
A19	Offline slave in the CAN bus network	9

4.2 KaController control electronics

View of "Real-time fault in the KaController"

KaController control electronics alarm table

Code	Alarm
tAL1	Faulty temperature sensor in the KaController
tAL3	Faulty real-time clock in the KaController
tAL4	Faulty EEPROM in the KaController
Cn	Communication fault with the external control PCB

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

5. Frost Protection Function, Motor Protection

5.1 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 heating valve is started up and fan stage 1 is switched on. The room frost protection function is disabled if the room temperature increases above a limit of 8°C.

The room frost protection is fixed at a limit of 8°C and cannot be changed.

5.2 Unit frost protection function

If a clip-on sensor is installed in the Katherm QK, this clip-on sensor is monitored at each phase in the system to a limit of 4°C. The unit frost protection function is enabled if the temperature drops below 4°C. The heating valve is started up and the fan is switched off. The unit frost protection function is disabled if the temperature on the clip-on sensor increases above a limit of 4°C. The unit frost protection function is also enabled if the room temperature drops below 4°C.

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

5.3 Motor protection

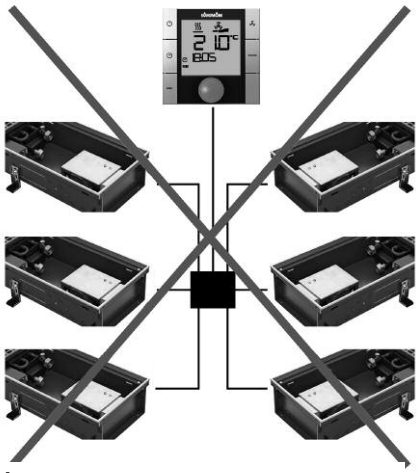
Any motor fault on a Katherm QK is shown on the KaController by means of the "A12" on-screen display. The Katherm QK with the motor fault shuts down automatically. When a motor fault has occurred, check whether an impeller is blocked.
Disconnect the Katherm QK to remedy the cause of the fault and eliminate the source of the fault.
The Katherm QK should then restart after reconnecting the power supply and switching on a fan stage.
Contact a Service Technician should the motor fault continue to be shown on the display.

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

6. Cabling

6.1 General information

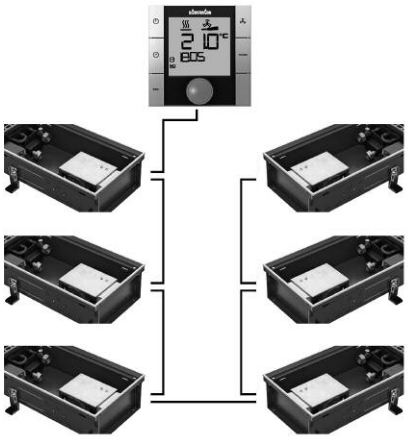
- All low voltage cables should be laid along the shortest route.
- Ensure that low voltage and high voltage cables are separated, for instance using metal planking on cable trays.
- Only shielded cables should be used as low voltage and bus cables.
- All BUS cables must be laid in a linear pattern. Star-shaped wiring is not permitted (illustration on left).
- The KaController is connected to the respective Katherm QK using a bus connection and must be connected to the respective control PCB of the Katherm QK.



Incorrect:
Star-shaped cabling of bus cables

⚠ Shielded, paired cables should be used as BUS cables, for instance CAT5 (AWG23), but at least of the same value.

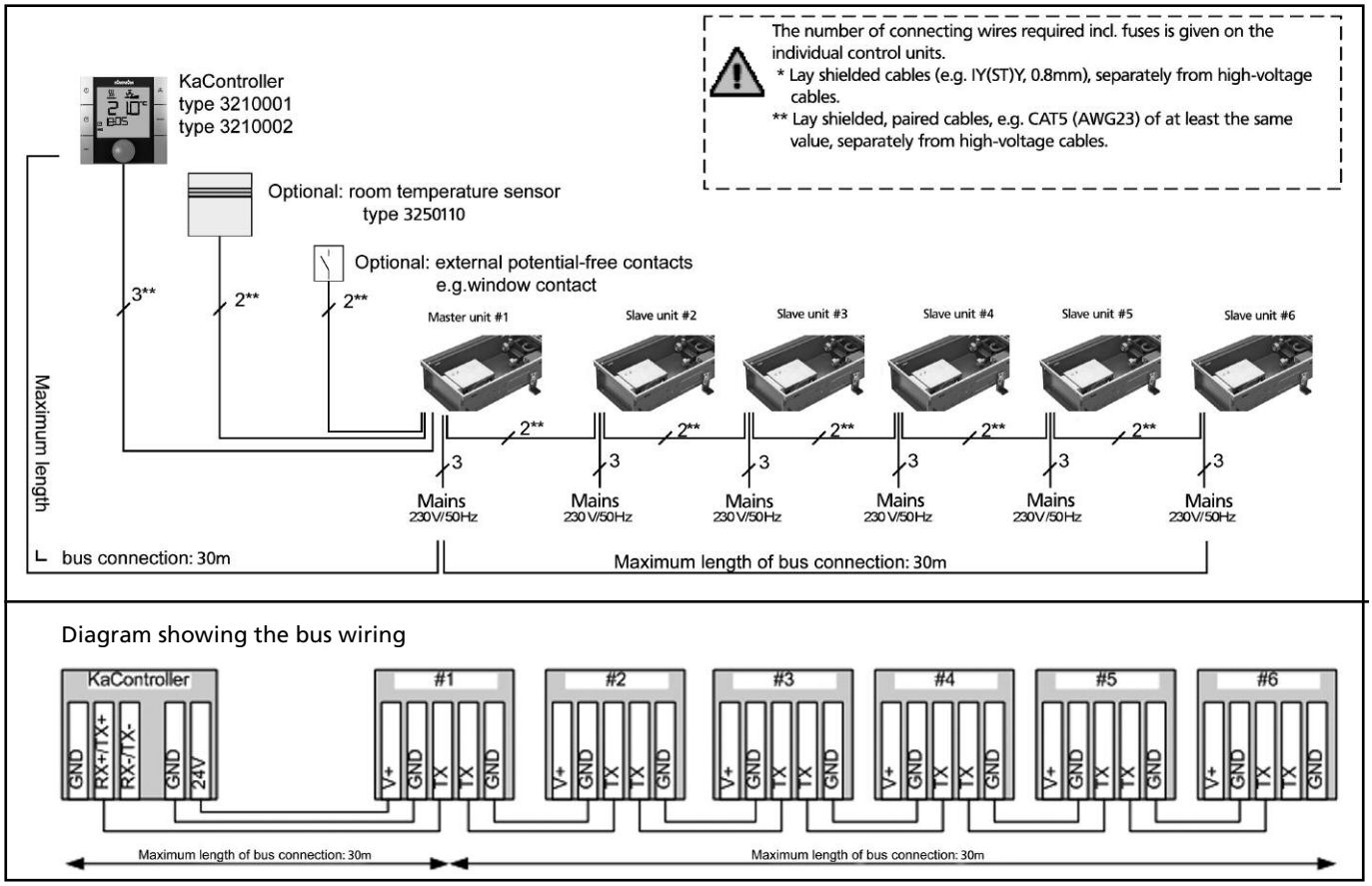
⚠ When laying bus cables the formation of star points, for instance in junction boxes, should be avoided. The cables should be passed through to the units (Katherm QK)!



Correct:
Line-shaped cabling of bus cables

6.2 Single-circuit controls of up to 6 units

Katherm QK with a KaController
Single-circuit control, maximum 6 Katherm QK



Wiring diagram: Example Katherm QK. The same assignments apply to Katherm QX.

Maximum permissible cable lengths

Total length of bus cables between the Katherm QK units	max. 30 m
Total length of bus cable between the room control unit and the master unit	max. 30 m
Total length between the Katherm QK and the external potential-free contacts e.g. window contact etc.	max. 30 m
Total length between the Katherm QK and the separate room temperature sensor	max. 30 m

6.3 Single-circuit controls of up to 30 units

Katherm QK with a KaController
Single-circuit control, maximum 30 Katherm QK

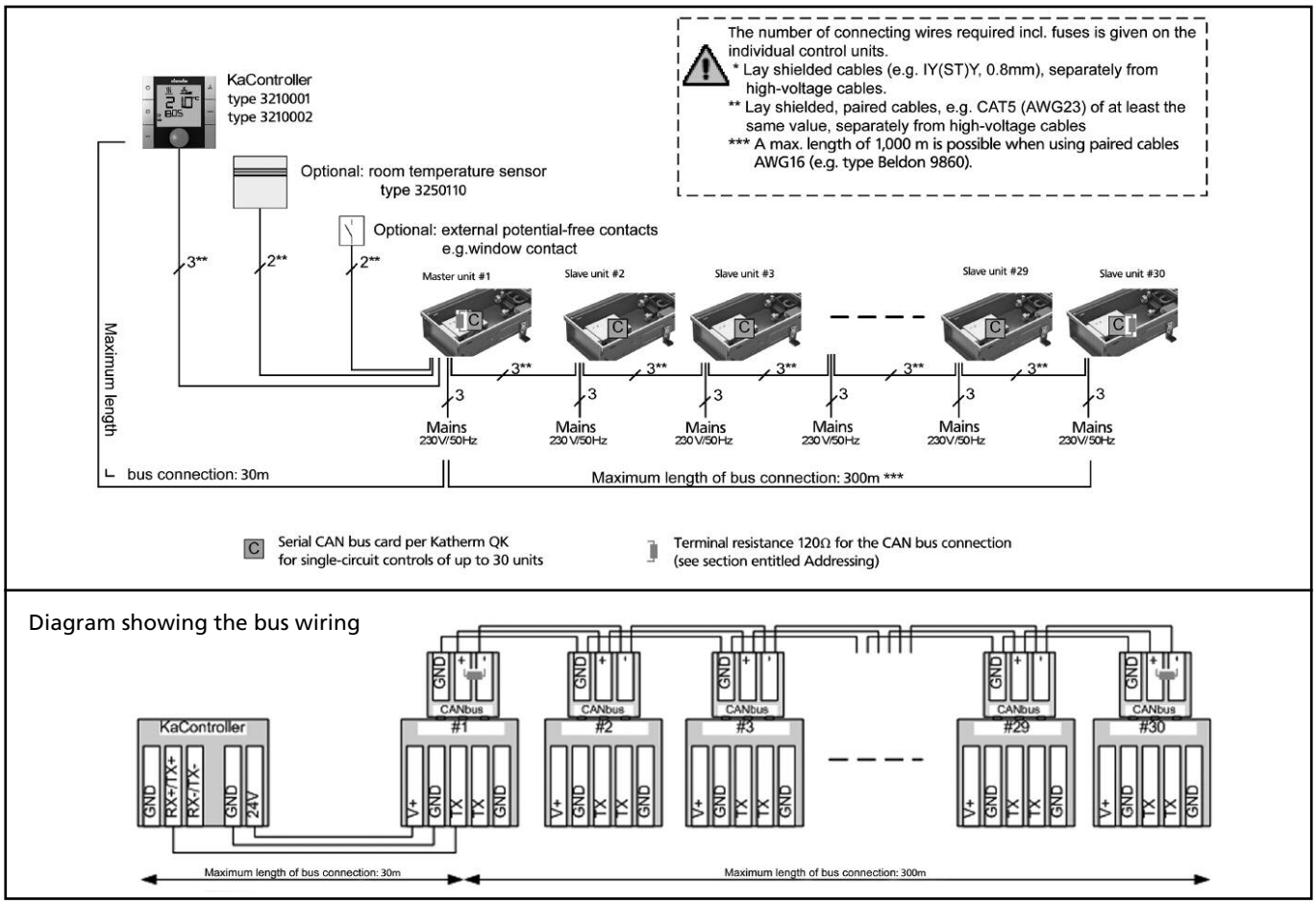
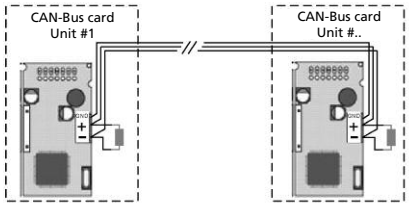


Diagram showing the bus wiring

Wiring diagram: Example Katherm QK. The same assignments apply to Katherm QX.

Maximum permissible cable lengths

Total length of bus cables between the Katherm QK units	max. 300 m (CAT5) max. 1000 m (Beldon 9860)
Total length of bus cable between the room control unit and master unit	max. 30 m
Total length between the Katherm QK and the external potential-free contacts e.g. window contact, external ON/OFF etc.	max. 30 m
Total length between the Katherm QK and the separate max. room temperature sensor	max. 30 m

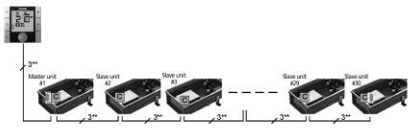


6.3.1 Terminal resistors in a CAN bus system

- The bus cables between the CAN bus cards must be linear.
- Disconnect the Katherm QK before adjusting the final resistors.
- A terminal resistor must be connected to the first and last CAN bus card in a bus cable between terminals "+" and "-".
- Resistance value of terminal resistance: 120 Ohm

6.3.2 Bus connections between Katherm QK

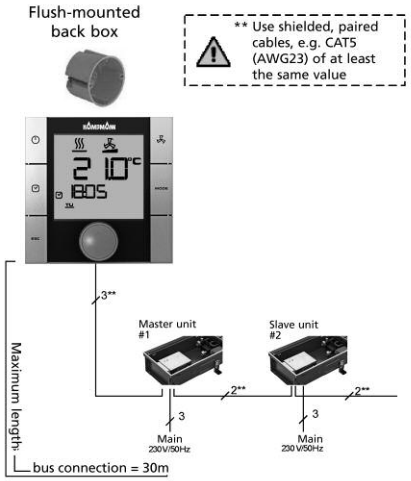
Single-circuit controls
(maximum 30 units)
Communication between the Katherm QK using CAN bus, bus connection to the CAN bus card



- Bus communication between the Katherm QK with CAN bus cards is solely by means of the CAN bus
  The tLAN bus communication in single-circuit controls between the Katherm QK is not connected.

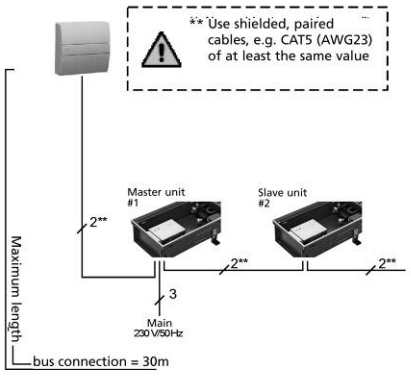
- Refer to the technical datasheet on the CAN bus cards for the connection conditions of the CAN bus cards.

6.4 KaController



- A flush-mounted back box is required for the KaController.
- Connect the KaController to the nearest Katherm QK according to the wiring diagram.
  The maximum bus length between the KaController and Katherm QK is 30 m.
- The respective Katherm QK automatically becomes the master unit in the control circuit when a KaController is connected to it.

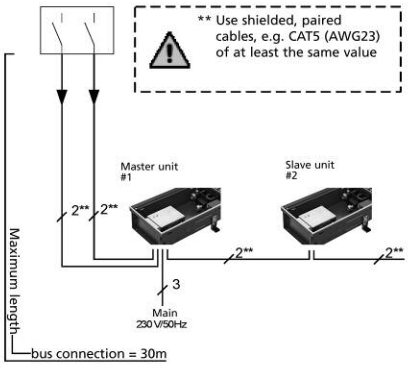
6.5 External room temperature sensor



- All Katherm QK master units have an analog input to connect an external room temperature sensor.
- Connect up the cables according to the wiring diagram and configure the functions by means of the KaController.
- The maximum cable length between the master unit and the room temperature sensor must not exceed 30 m.

A room temperature sensor cannot be connected to slave units. When an external room temperature sensor is used on a master unit, DIP switch no. 6 should be set according to section 10.

6.6 Inputs for processing external contacts (e.g. window contact, card reader etc.)



- All Katherm QK master units have multifunctional inputs that can be assigned different functions during commissioning.
- Connect up the cables according to the wiring diagram and configure the functions by means of the KaController.
- The maximum cable length between the master unit and the external potential-free contacts must not exceed 30 m.

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

7. Installation, Katherm QK Electrical Connection, Room Control Unit

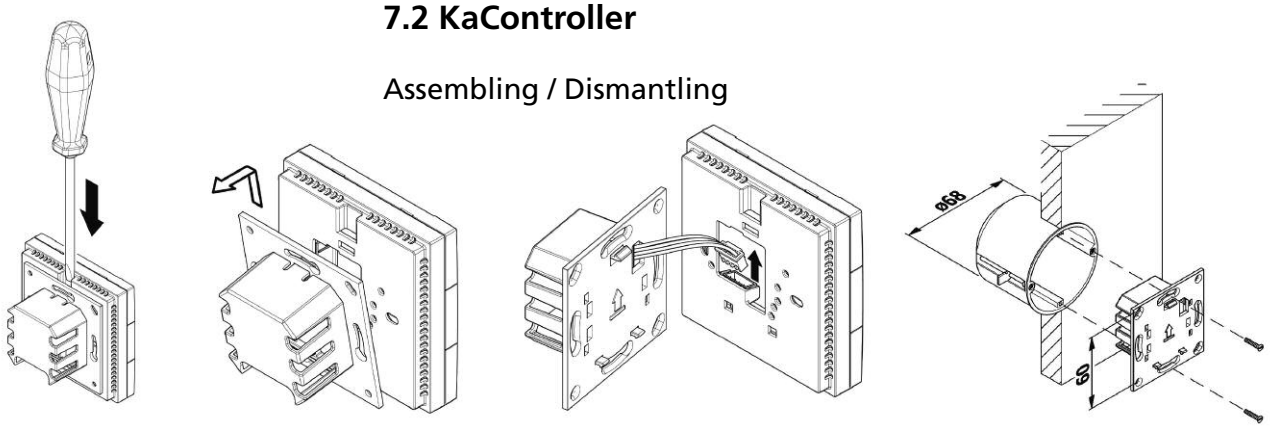
7.1 Katherm QK

- The electrical cables are connected to the Katherm QK in the electrical control box.
- To connect the electrical cables, open the electrical control box, insert the cables and connect them up according to the wiring diagram.

- Disconnect the Katherm QK prior to embarking on "any" wiring work.
  The bus cables should also only be connected to the Katherm QK when the unit is fully disconnected.

7.2 KaController

Assembling / Dismantling



7.3 Wire electrical connections

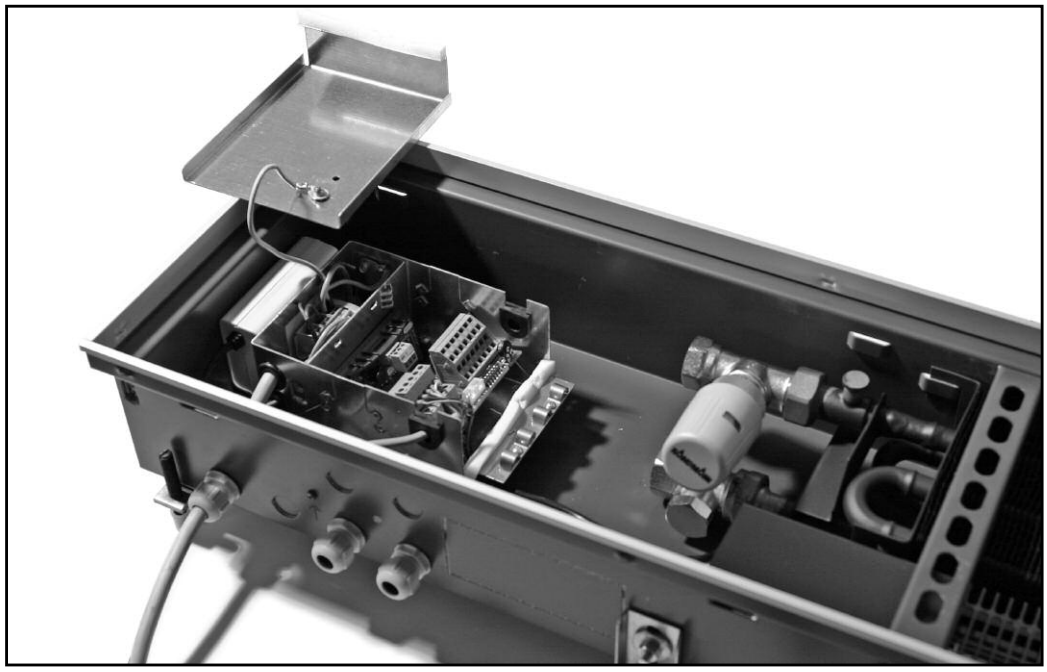


Fig. Katherm QK with terminal box and power supply cable:

The connection for the electrical cables is located in the terminal box. To connect the electrical cables, open the terminal box, insert the cables and connect them up according to the wiring diagram (provided with the unit).

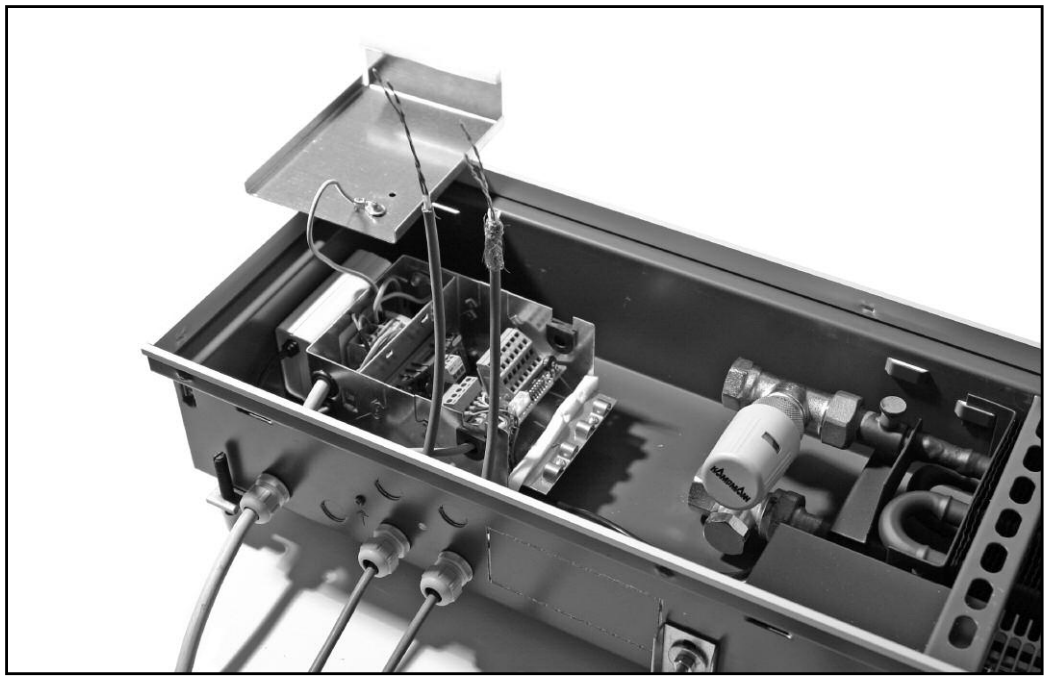


Fig. Stripping the control cables:

1. Insert and strip the control cables.
2. Draw back and remove the shielding on the control cable over the cable sheathing.

Caution: Only place the control cable shielding on one side! For example, simply fit the shielding of the control cable between the master unit and slave unit to the terminal box in the master unit.

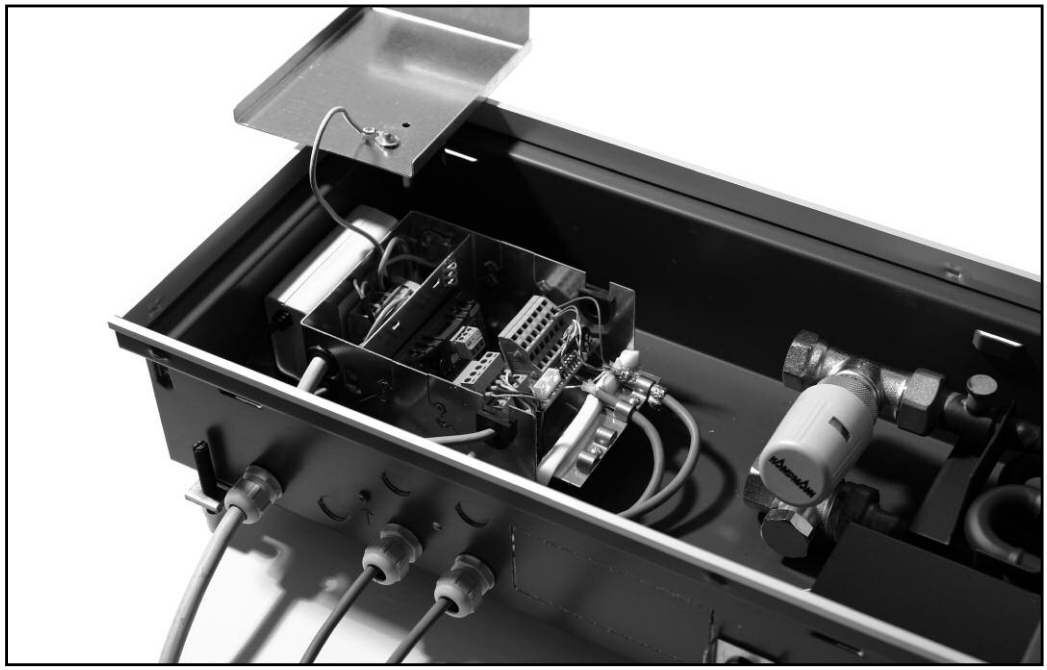


Fig. Terminal box with power and control cables:

Attach the control cables under the mains earth connection and wire them up according to the wiring diagram (provided with the device).

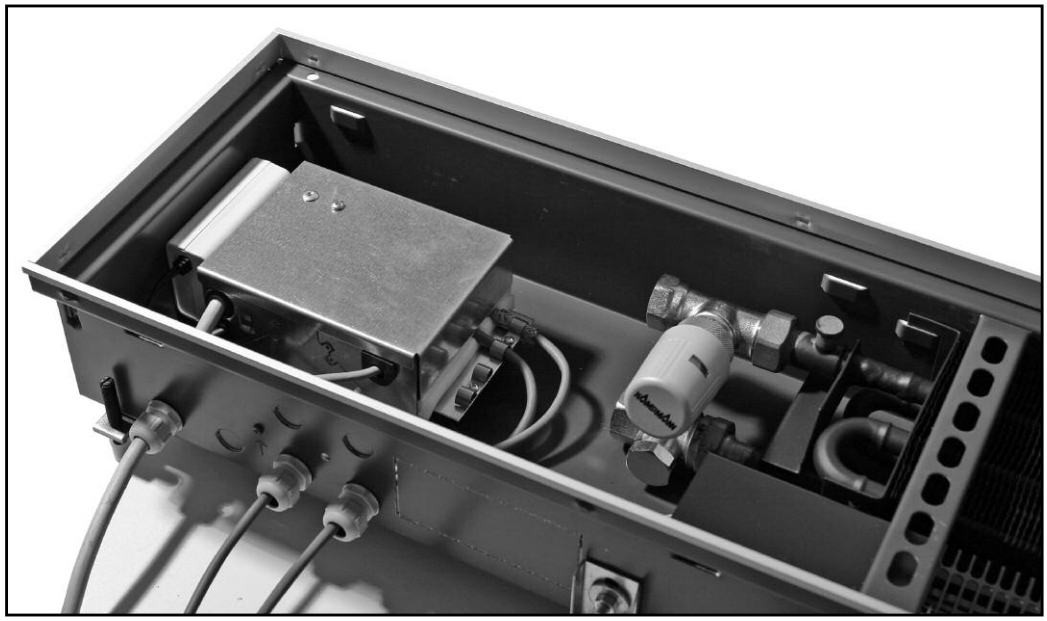
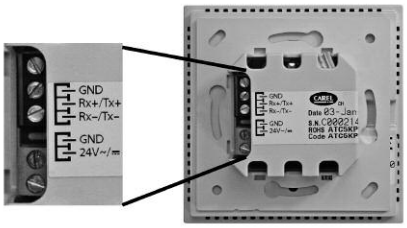


Fig. Wired and closed terminal box:

1. Wire up the valve actuator according to the wiring diagram (provided with the device).
2. Close the terminal box housing.

Installation instructions

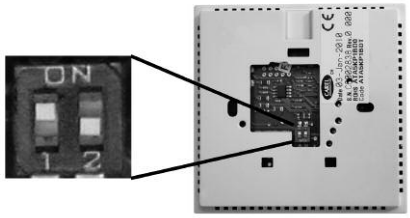


KaController terminals

Electrical connection

- Connect the KaController to the nearest Katherm QK according to the wiring diagram.
- The maximum bus length between the KaController and Katherm QK is 30 m.
- The respective Katherm QK automatically becomes the master unit in the control circuit when a KaController is connected to it.

- Disconnect the Katherm QK prior to embarking on "any" wiring work.
  The bus cables should only be connected to the KaController when the Katherm QK is fully disconnected.

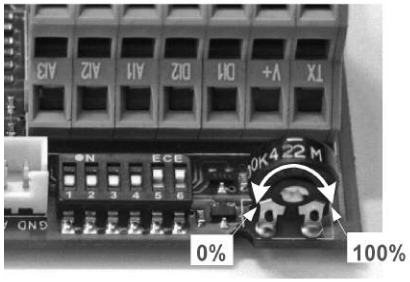


DIP switch setting on the KaController
DIP switch no.1: ON
Dip switch no.2: OFF

DIP switch setting

- The DIP switches on the rear of the KaController should be set according to the illustration at the side:

8. Setting the Maximum Fan Speed by means of a Potentiometer



Potentiometer on the control PCB

The maximum fan speed can be set using a potentiometer on the control PCB .

Potentiometer setting:

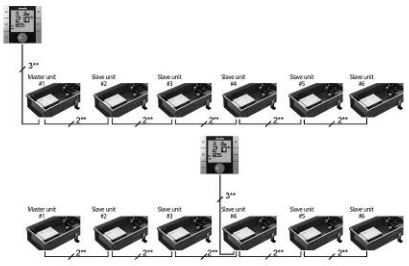
- Disconnect the controls before starting to set the potentiometer.
- Remove the cover on the control unit to set the potentiometer. The potentiometer is located on the control PCB right next to the DIP switches.
- The maximum speed can be restricted using the potentiometer.

The maximum fan speed can also be set via parameter P50. Refer to information in sections 11.3.8.1 and 11.3.8.2 on "Setting the maximum fan speed."

9. Addressing

9.1 Single-circuit controls of up to 6 units

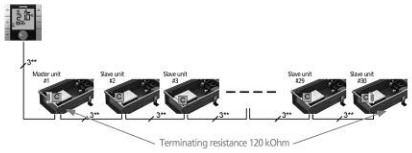
9.1.1 Maximum 6 Katherm QK in one control zone

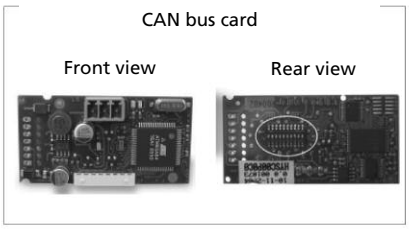


- Katherm QK in single-circuits with a maximum of 6 units need not be addressed.
- The master unit / slave unit is defined by the connection of the KaController
- The respective Katherm QK automatically becomes the master unit in the control circuit when a KaController is connected to it.
- A master unit must not necessarily be arranged at the end of a bus system.
- All BUS cables must be laid in a linear pattern. Star-shaped wiring is not permitted.

9.1.2 Maximum 30 Katherm QK in one control zone

Using DIP switches to set addresses on the CAN bus card

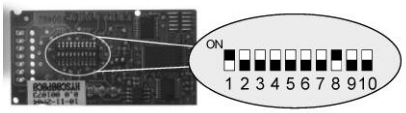




- Katherm QK in single-circuits with more than 6 units must be addressed.
- They are addressed by means of DIP switch settings on the CAN bus card.
- The master unit / slave unit is defined by the connection of the KaController.
- The respective Katherm QK automatically becomes the master unit in the control circuit when a KaController is connected to it.
- Procedure for setting the address by means of a DIP switch setting on the Can bus card:

  1. Disconnect the Katherm QK.
  2. Remove the CAN bus card from the basic PCB
  3. Set the DIP switch according to the illustration.
  4. Refit the CAN bus card to the basic PCB.
  5. Connect the bus cable.
  6. Switch on the power supply for the Katherm QK.

DIP switches on the rear of the CAN bus card

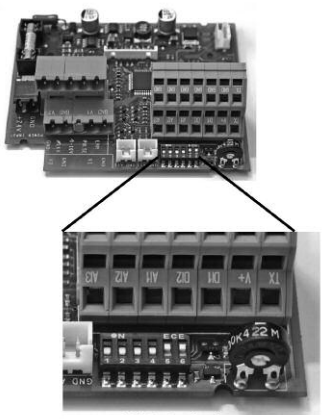


DIP1 = ON
DIP2 = OFF
DIP3 = OFF
DIP4 = OFF
DIP5 = OFF
DIP6 = OFF
DIP7 = OFF
DIP8 = ON
DIP9 = OFF
DIP10 = OFF

- The DIP switches on all CAN bus cards in one control circuit must be set identically!

10. Setting the Unit Configuration by means of DIP Switches

PCB



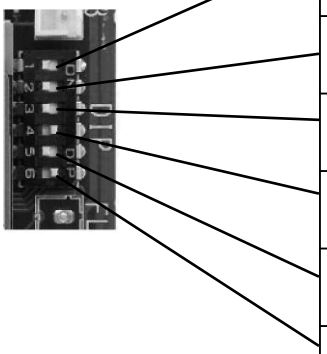
DIP switch

The configuration of a Katherm QK unit is set on the control PCB by means of DIP switches. Once the DIP switches have been set, all of the basic functions required to configure the unit are parameterised and the Katherm QK is immediately ready to use. Special setting options, such as lowering the temperature setpoint in Eco mode, must be parameterised in the Service menu. This parameterisation is possible by means of the KaController.
The control unit should be opened to check and set the DIP switches if applicable.

The DIP switches are factory-set according to the unit configuration!!

Disconnect the controller before starting to set the DIP switches.

Function table for DIP switch settings on the basic PCB



DIP1	OFF = ---- ON = Actuation 0..10 V using a measurement and control system provided by others
DIP2	OFF = ---- ON = Actuation using a potentiometer 0..10 K Ohm
DIP3	OFF = Clip-on sensor not available ON = Clip-on sensor available
DIP4	OFF = ---- ON = Heating/cooling changeover via DI2
DIP5	OFF = 2-pipe system ON = 4-pipe system
DIP6	OFF = Room controls on external room sensor ON = Room controls on sensor in the KaController

Dip switch no.6 must be set to ON with slave units!

DIP switch no. 1
Dip switch no. 1 must be set to ON to actuate a Katherm QK via a building automation system provided by others using 0..10 V signals.
The parameter settings required are described in section 11.3.14.

Factory setting: DIP1 = OFF

DIP switch no.2
DIP switch no. 2 must be set to OFF.

Factory setting: DIP2 = OFF

DIP switch no.3

A clip-on sensor can optionally be installed to monitor the water temperature. The following functions can be triggered by the clip-on sensor:

1. Enabling of the fan stages if there is hot water in the element according to the controller (Auto, Eco function, see section 11.3.9)
2. Unit frost protection function (see section 5.2)

Dip switch no. 3 must be set to ON if a clip-on sensor is installed. Katherm QK are delivered as standard without a clip-on sensor and DIP switch no.3 has the setting DIP3=OFF.

Factory setting: DIP3 = OFF

Dip switch no. 4

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

External contact open → heating mode

External contact closed → cooling mode

If DIP4=ON and digital input DI2 is not connected (= external contact open), the controller works automatically in heating mode.

Factory setting: DIP4 = ON

Dip switch no. 5

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

2-pipe system → DIP5=OFF

4-pipe system → DIP5=ON

Factory setting: DIP5 = OFF

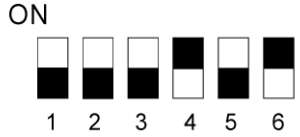
Dip switch no. 6

The internal temperature sensor of the KaController or an external room temperature sensor can be used to control the room temperature.

DIP6 = OFF → Room temperature controls on an external room temperature sensor

DIP6 = ON →Room temperature controls on the internal sensor of the KaController

Factory setting: DIP6 = ON



DIP switch factory setting
Katherm QK
Control option C1

Dip switch no.6 must be set to ON with slave units!

DIP switch factory setting Katherm QK
Control option C1

DIP	C1	Function
DIP1	**OFF =** ON =	**----** Actuation via 0..10 V by means of a measurement and control system provided by others
DIP2	**OFF =** ON =	**----** Actuation using a potentiometer 0..100 K Ohm
DIP3	**OFF =** ON =	**Clip-on sensor not available** Clip-on sensor available
DIP4	OFF = **ON =**	---- **Changeover between heating and cooling via DI2**
DIP5	**OFF =** ON =	**2-pipe system** 4-pipe system
DIP6	OFF = **ON =**	Room controls on an external room sensor **Room controls on the sensor in the KaController**

11. Parameter Settings

11.1 General

Special system requirements can be configured using parameter settings in the Service menu. Special system requirements may include:
- Display: room temperature or setpoint temperature
- Locking operating functions
- Setting the absolute setpoint temperature or ± 3K
- Setting parameters in Eco / Day mode
- Sensor calibration
- The required settings can be made by means of the KaController.

11.2 Calling up the Service menu

The following steps are needed to set the parameters:

1. Switch off the Katherm QK by
   - pressing the ON/OFF key or
   - pressing the navigator for a minimum of 5 seconds or
   - turning the navigator to the left until OFF appears
2. Call up the Service menu by pressing the navigator for a minimum of 10 seconds. The display shows "Para" and then "CODE" with the value 000 in sequence.
3. Select the password (Code) 22 by turning the navigator and confirm by pressing the navigator
   . You are now in Service level 1 and the display shows the current software version (P000=...).
4. Parameters can now be set using the navigator.
5. Setting parameters:
   - Select the parameter by turning the navigator
   - Call up Edit mode by pressing the navigator
   - Set the required value by turning the navigator
   - Save the new value by pressing the navigator
6. There are 3 ways to exit the Service menu and call up the default view:
   - If no action is carried out using the navigator for 2 seconds
   - Hold down the navigator for 5 seconds
   - By turning the navigator, select "ESC" on the display and confirm the selection by pressing the navigator

KAMPMANN
Genau mein Klima.

11.3 Parameter settings

11.3.1 Display setpoint temperature/room temperature

Display setpoint temperature - room temperature

Parameter P37

Different values can be displayed using the large seven-segment display.

Function	P37=0	P37=1	P37=2	P37=3	P37=4	P37=5	P37=6
No display	X						
Setpoint room temperature		X					
Current room temperature			X				
Temperature measurement AI1				X			
Temperature measurement AI2					X		
Temperature measurement AI3						X	
Fan actuation 0..100%							X

X = value is displayed, **factory setting P37=1**

Parameter P36 = 0
Setting the "absolute" setpoint temperature

Parameter P36 = 1
Setting the setpoint temperature ± 3K

11.3.2 Setting the absolute setpoint temperature or ± 3K

Setting the absolute setpoint temperature or ± 3K

Parameter P36
It may be necessary for the system operator to specify a base setpoint in the case of office or hotel applications. The user has the option of changing the setpoint temperature by ±3 K to compensate for a differing perception of the room temperature.
Alternatively the setpoint can be set in absolute values.

The setpoint setting can be configured via parameter P36.

	Function	Standard	Min	Max	Unit
P36	Setpoint setting 0 = absolute setpoint setting 1 = setpoint adjustment ± 3k	0	0	1	

The base setpoint for the "Setpoint setting ± 3K" can be configured via parameter P01.

	Function	Standard	Min	Max	Unit
P01	Base setpoint for Setpoint adjustment at ± 3K	22	8	35	°C

When setting parameters
P37=1--> Display setpoint temperature
P36=1 --> Setpoint adjustment ± 3K
no setpoint is shown in the default view!

11.3.3 Locking operating functions

Locking operating functions

Parameter P117
Certain functions and settings can be locked, for instance with office or hotel applications, to ensure that the system is easy to operate and energy is optimised.

Function	P117=0	P117=1	P117=2	P117=3	P117=4	P117=5	P117=6
ON/OFF (Eco/Day) key					X		X
Fan setting					X	X	
Time functions		X		X	X	X	X
Selecting operating modes (Mode)			X	X	X	X	X

X = function is locked, **factory setting P117=0**

Example:

Set parameter P117 to = 1 to lock the timer functions.

The use of the Eco/Day function via the timer program in the KaController can be set via parameter P38.

11.3.4 Function ON/OFF, Eco//Day

Parameter P38
The ON/OFF key function and the timer programs are set via parameter P38.
The ON/OFF key and the timer programs can be used to switch the unit ON and OFF or switch 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:
The ON/OFF key and timer programs are used to switch the Katherm QK on and off.

The following table shows the settings of parameter P38!

Functions	P38=0	P38=64
Eco/Day mode changeover function	X	
ON/OFF changeover function		X

Factory setting P38=64

Alternatively the Katherm QK can be switched on and off or between Eco and Day mode using an external potential-free contact. The configuration is described in section 11.3.11.

11.3.5 Setpoint changeover to base setpoint

For example, it makes sense to reset the setpoint to a base setpoint at the start of an operating phase for energy-saving operation in the case of office and hotel applications.
Parameter P57 can be used to reset the temperature setpoint to the base setpoint (see P01) at every change in the operating phase.
Changes in the operating phase include:
ON --> Off
Off --> On
Eco --> Day
Day --> Eco

	Function	Standard	Min	Max	Unit
P57	Resetting the temperature setpoint to a base - setpoint after changing an operating phase 0 = function is disabled 1 = function is enabled	0	0	1	

11.3.6 Lowering the temperature in Eco mode

Parameter P19
Parameter P19 can be used to lower the temperature in heating mode whilst in Eco mode.

	Function	Standard	Min	Max	Unit
P19	Lowering the temperature of the heating setpoint in Eco mode	30	0	255	°C/10

The heating setpoint is lowered by 3 °C as standard whilst in Eco mode!

The use of the Eco/Day function via the timer program in the KaController can be set by means of parameter P38 (function ON/OFF, Eco/Day).

11.3.7 Sensor calibration

Parameter P58, P61, P62
Parameter P58, P61 and P62 can be used to calibrate the sensor. The temperature sensor should be calibrated during initial commissioning and at every service.

	Function	Standard	Min	Max	Unit
P58	Offset analog input AI1 (external room temperature sensor)	0	-99	127	°C/10
P61	Offset sensor in the KaController	0	-99	127	°C/10
P62	Offset analog input AI2 (clip-on sensor)	0	-99	127	°C/10

The temperature setpoint is shown as standard on the display. The measured room temperature must be displayed to calibrate the sensor.
Parameter P37 = 2 must be set, for instance, so that the room temperature can be displayed (room temperature display, see section 11.3.1).

11.3.8 Fan actuation

The fan actuation can be adjusted to the needs of the users via different parameter settings.

11.3.8.1 Maximum fan speed via parameter 50

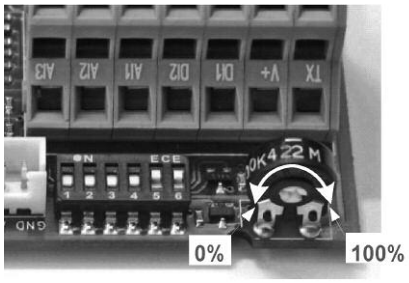
Parameter P50
The maximum fan speed can be set and restricted via parameter P50.

	Function	Standard	Min	Max	Unit
P50	Maximum fan speed	100	0	100	%

Alternatively the maximum fan speed can be set on the control PCB using the potentiometer. The minimum value set from P50 and the potentiometer is configured as the maximum fan speed!

Example: P50 = 80 %
Potentiometer = 50 %
--> Maximum fan speed = 50 %

11.3.8.2 Maximum fan speed using a potentiometer



Potentiometer setting on the control PCB

Alternatively the potentiometer position can be used to specify the maximum fan speed.
The potentiometer position is set to 100% as standard.

Potentiometer setting:
- Disconnect the controls before starting to set the potentiometer.
- Remove the cover on the control unit to set the potentiometer. The potentiometer is located on the control PCB right next to the DIP switches.
- The maximum fan speed can be restricted using the potentiometer (refer to parameter P50!).

11.3.8.3 Minimum fan speed

Parameter P51
The minimum fan speed can be set and restricted via parameter P51.

	Function	Standard	Min	Max	Unit
P51	Minimum fan speed	0	0	100	%

11.3.8.4 Speed restriction in automatic and manual fan mode

Parameter P52
Parameter P52 can be used to restrict the fan speed not only for automatic fan mode but also for manual fan mode.

	Function	Standard	Min	Max	Unit
P52	Fan speed restriction 0 = fan speed restriction is enabled in automatic and manual fan mode 1 = fan speed restriction is only enabled in automatic fan mode	0	0	1	

11.3.8.5 Maximum run time of manual fan mode

Parameter P27
Parameter P27 can be used to set the maximum run time of the manual fan mode. If manual fan mode is selected, the controller switches back to automatic fan mode once the time has elapsed according to parameter P27.

	Function	Standard	Min	Max	Unit
P27	Maximum run time of the manual fan mode 0 = function is disabled	0	0	255	minutes

Select the Fan menu using the KaController and set the automatic fan mode in order to exit the manual fan mode ahead of schedule.

11.3.8.6 Locking fan stages

Parameter P42
P42 can be used to lock individual fan stages (0, 1, 2, 3, 4, 5, AUTO).
Locked fan stages cannot be selected manually using the KaController.

	Function	Standard	Min	Max	Unit
P42	Parameters to lock the fan stages	0	0	127	

Each fan stage is allocated a defined value.

Fan stage	Value	
Automatic fan mode	1	
Stage 0 (AUS)	2	
Stage 1	4	
Stage 2	8	
Stage 3	16	
Stage 4	32	
Stage 5	64	

Example:
Locking fan stages 4 and 5

The values of the locked fan stages must be added together and assigned to parameter P42

Fan stage	Value	
Automatic fan mode	1	
Stage 0 (AUS)	2	
Stage 1	4	
Stage 2	8	
Stage 3	16	
Stage 4	32	32
Stage 5	64	64
Setting parameter P42: (Example)		96

11.3.9 Auto-Eco function

The fan stages can be locked using the clip-on sensor depending on the water temperature. This application enables the centralised lowering of water temperatures within the building to be detected and managed on the respective Katherm QK.

When a clip-on sensor is used, DIP switch no. 3 must be set to ON (see section 10 "Setting Unit Configuration by means of DIP Switches").

11.3.9.1 Limit of water temperature in heating mode

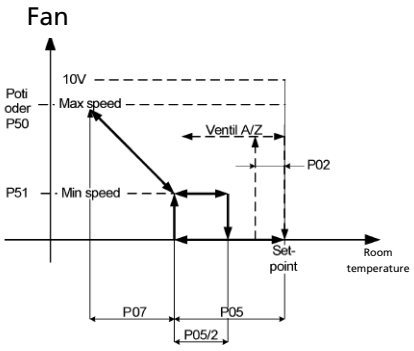
Parameter P10, P11, P12
Parameters P10, P11 and P12 can be used to set the limits for switching on the fan stages in heating mode.

	Function	Standard	Min	Max	Unit
P10	Limit temperature to enable fan stages 1 and 2 in heating mode	29	0	255	°C
P11	Limit temperature to enable fan stages 3 and 4 in heating mode	31	0	255	°C
P12	Limit temperature to enable fan stage 5 in heating mode	33	0	255	°C

11.3.10 Setting the automatic temperature

The automatic temperature can be set via parameters.

Parameter setting for the automatic temperature



Heating

	Function	Standard	Min	Max	Unit
P02	Hysteresis valve OPEN/SHUT	1	0	255	°C/10
P05	Natural convection heating	3	0	255	°C/10
P07	P-band for heating	17	0	255	°C/10
P50**	Maximum fan speed	100	0	100	%
P51	Minimum fan speed	0	0	100	%

** Please ensure that the maximum fan speed is set using the potentiometer setting or via parameter P50 (min. selection)!

Parameter settings for a PI controller

A PI controller to actuate the fan in automatic fan mode can be enabled for special applications via parameter P41 as an alternative to the P controller.
The PI controller is only enabled in automatic fan mode.
Ensure that the P-band (P07) and reset time (P41) are definitely aligned to the behaviour of the control zone to avoid any fluctuation of the PI controller.

	Function	Standard	Min	Max	Unit
P41	PI controller reset time If P41=0 a P controller is enabled. Recommended reset time when using a PI controller: Reset time = 13 minutes	0	0	20	Minutes

13.3.11 Function of digital inputs DI1 and DI2

The function of digital inputs DI1 and DI2 can be configured via parameter settings.

11.3.11.1 Function of DI1

Parameter P43
The function of digital input DI1 can be set via parameter 43.

	Function	Standard	Min	Max	Unit
P43	Function of DI1 0 = No function 1 = ON /OFF. . . . . (contact open --> ON) 2 = Changeover between heating and cooling . . . . . (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 = External frost protection monitor (contact open --> no frost) 8 = ON /OFF. . . . . (contact closed --> ON) 9 = Changeover between heating and cooling . . . . . (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 = External frost protection monitor (contact closed --> no frost)	1	0	14	

11.3.11.2 Function of DI2

Digital input DI1 should primarily be used to perform certain functions. If the use of digital input DI2 is needed, the following settings should be made:
1. Set DIP switch no.4 to OFF
2. Configuration of the digital input DI2 via parameter settings P44
3. Set "heating mode" at the KaController

If DIP switch no.4 is set to ON, only heating mode is activated automatically. If DIP switch no.4 is set to OFF, the operating mode is to be set via the KaController!

Parameter P44
Parameter P44 can be used to set the function of the digital input DI2 if DIP switch no.4 is set to OFF.

	Function	Standard	Min	Max	Unit
P44	Function of DI2 0 = No function 1 = ON /OFF . . . . . (contact open --> ON) 2 = Changeover between heating and cooling. . . . . (contact open --> heating) 3 = Eco/Day mode . . . . . (contact open --> day) 4 = No function . . . . . (contact open --> no function)	2	0	14	

	Function	Standard	Min	Max	Unit
P44	Function of DI2 5 = Condensation alarm ..... (contact open --> no condensation) 6 = General alarm ..... (contact open --> no alarm) 7 = External frost protection monitor (contact open --> no frost) 8 = ON /OFF ..... (contact closed --> ON) 9 = Changeover between heating and cooling..... (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 = External frost protection monitor (contact closed --> no frost)	2	0	14	

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

	Function	Standard	Min	Max	Unit
P56	Polarity of DI2 if DIP2=ON (heating/cooling changeover via DI2) 0 = contact closed --> heating contact open --> cooling 1 = contact open --> heating contact closed --> cooling	1	0	1	

11.3.12 Function of digital outputs V1 and V2

The function of digital outputs V1 and V2 can be configured via parameter settings.

11.3.12.1 Valve actuation V1 by means of pulse width modulation

The heating valve is connected to output V1 as standard. Valve actuation with pulse width modulation (PWM) can be configured via parameters so that the heat output can be set to intermediate values in the area of natural convection (heating without fan support).
The PWM actuation of the heating valve is not enabled as standard.

	Function	Standard	Min	Max	Unit
P40	Valve actuation by means of pulse width modulation 0 = function is disabled 1 = function is enabled	0	0	1	
P53	Valve switching cycle	15	10	30	Minutes
P101	P-band for control valve actuation by means of PWM in heating mode	15	0	100	°C/10
P103	Reset time of PI controller valve actuation by means of PWM If P103 = 0 a P controller is enabled. Recommended reset time when using a PI controller: Reset time = 13 minutes	0	0	20	Minutes
P104	Minimum switching on time for the heating valve in PWM mode	3	0	20	Minutes

11.3.12.2 Function of V2

Parameter P39
Parameter P39 can be used to set the function of digital output V2.

	Function	Standard	Min	Max	Unit
P39	Function of V2 0 = no function 1 = heating requirement 2 = cooling requirement 3 = alarm	0	0	3	

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

11.3.13 Function of multifunctional inputs AI1, AI2 and AI3

The function of multifunctional inputs AI1, AI2 and AI3 can be configured via parameter settings.

11.3.13.1 Function of AI1

Parameter P15
Parameter P15 can be used to set the function of multifunctional input AI1.

Multifunctional input AI1 can only be set via parameter P15 if DIP switch no. 6 is set to ON! The setting of DIP switches is described in section 10.

	Function	Standard	Min	Max	Unit
P15	Function of AI1 0 = Not used (input disabled) 1 = NTC outside air sensor 2 = NTC cold/hot water sensor (clip-on sensor) 3 = NTC cold water sensor (clip-on sensor) 4 = NTC hot water sensor 5 = NTC external room temperature sensor / inlet air sensor 6 = 0..100 K Ohm fan actuation 7 = 0..100 K Ohm temperature setpoint 8 = 0..10V BMS control for heating/cooling 9 = 0..10V BMS control for heating 10 = Eco/Day mode . . . . . (contact open --> day) 11 = no function . . . . . (contact open --> no function) 12 = Condensation alarm . . . . (contact open --> no condensation) 13 = General alarm . . . . . (contact open --> no alarm) 14 = External frost protection monitor . . . . . (contact open --> no frost) 15 = Eco/Day mode . . . . . (contact closed --> day) 16 = no function . . . . . (contact closed --> no function) 17 = Condensation alarm . . . . (contact closed --> no condensation) 18 = General alarm . . . . . (contact closed --> no alarm) 19 = External frost protection monitor . . . . . (contact closed --> no frost)	0	0	19	

11.3.13.2 Function of AI2

Parameter P16
Parameter P16 can be used to set the function of multifunctional input AI2.

Multifunctional input AI2 can only be set via parameter P16 if DIP switch no. 3 is set to OFF! The setting of DIP switches is described in section 10.

	Function	Standard	Min	Max	Unit
P16	Function of AI2: see P15	0	0	19	

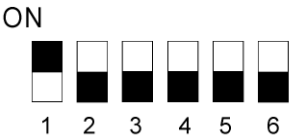
11.3.13.3 Function of AI3

Parameter P17
P17 can be used to set the function of multifunctional input AI3.

Multifunctional input AI3 can only be set via parameter P17 if DIP switch no. 3 is set to OFF! The setting of DIP switches is described in section 10.

Multifunctional input AI3 can only process analog signals as opposed to inputs AI1 and AI2.

	Function	Standard	Min	Max	Unit
P17	Function AI3 0 = Not used (input disabled) 1 = NTC outside air sensor 2 = NTC cold/hot water sensor (clip-on sensor) 3 = NTC cold water sensor (clip-on sensor) 4 = NTC hot water sensor 5 = NTC external room temperature sensor / inlet air sensor 6 = 0..100 K Ohm fan actuation 7 = 0..100 K Ohm temperature setpoint 8 = 0..10V BMS control for heating/cooling 9 = 0..10V BMS control for heating	0	0	9	



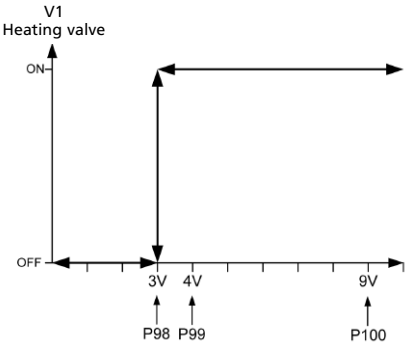
DIP switch setting
2-pipe application with
actuation by means of 0..10 V

11.3.14 External actuation via 0..10 Volts

It is possible to actuate the valve and EC fan by means of a 0.. 10 Volt signal via the analog input AI2.

The DIP switches must be set according to the illustration for actuation by means of a 0..10 Volt signal.
The control signal 0.. 10 V should be connected to the analog input AI2.

Heating 0..10 V --> analog input AI2

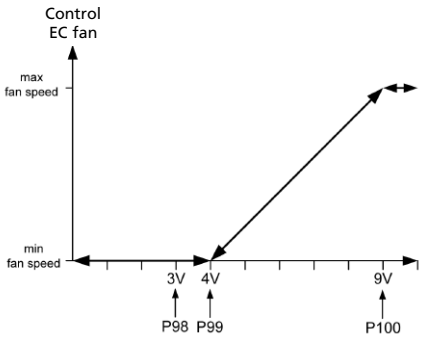


Valve actuation for heating

Parameter setting to actuate the Katherm by means of a 0..10 Volt signal provided by others

	Function	Standard	Min	Max	Unit
P50**	Maximum fan speed	100	0	100	%
P51	Minimum fan speed	0	0	100	%
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

** Please note that the maximum fan speed is set by means of the potentiometer setting or via parameter P50 (min. selection)!



Fan actuation

11.3.15 Locking operating options or functions, parameter 38

Parameter P38 can be used to lock individual operating options or functions.
Parameter P38 must be set to the ON/OFF, Eco/Day function, amongst others, according to the description in section 11.3.4.

	Function	Standard	Min	Max	Unit
P38	Locking operating options or functions	64	0	255	

Every operating option or function is allocated a defined value.

	Value	
Automatic operating mode	1	
Cooling mode	2	
Real-time clock	4	
Ventilation-only operating mode	8	
Heating mode	16	
Automatic fan function	32	
Eco/Day function	64	
Timer programs	128	

Example: Locking
- Eco/Day function

The values of the locked operating options or functions must be added together and assigned to parameter P38.

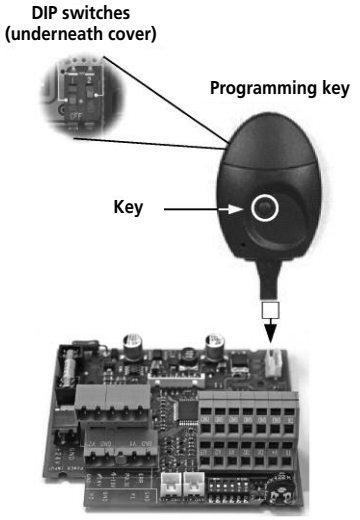
	Value	
Automatic operating mode	1	-
Cooling mode	2	-
Real-time clock	4	-
Ventilation-only operating mode	8	-
Heating mode	16	-
Automatic fan function	32	-
Eco/Day function	64	64
Timer programs	128	-
Setting parameter P38: (Example)		64

If the Eco/Day function is locked, the ON/OFF function is automatically enabled (see section 11.3.4).

Example: Locking
- Eco/Day function
- Timer programs

	Value	
Automatic operating mode	1	-
Cooling mode	2	-
Real-time clock	4	-
Ventilation-only operating mode	8	-
Heating mode	16	-
Automatic fan function	32	-
Eco/Day function	64	64
Timer programs	128	128
Setting parameter P38: (Example)		192

11.4 Programming key



Note:
Disconnect Katherm QK KaControl circuit board before connecting the programming key

Programming key

After the parameters have been set, the setup can simply be copied to other Katherm QK KaControl control units with the aid of the programming key. Please follow the steps below to copy the setup:

1. Disconnect the previously programmed Katherm QK KaControl circuit board.

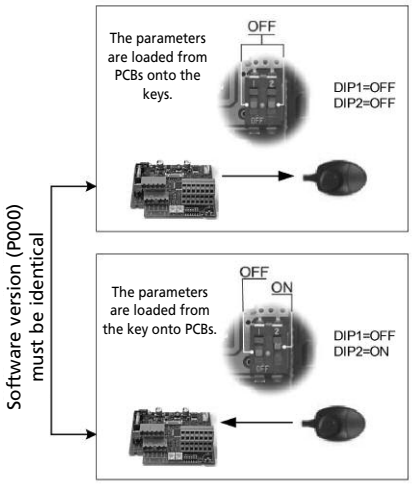
Reading parameters

2. Set the DIP switch of the programming key to Read mode (DIP1=OFF, DIP2=OFF). The DIP switches are located underneath the cover!
3. Plug the key into the 4-pin plug on the Katherm QK circuit board.
4. Press the button on the programming key. If the copy is successful, the red LED will light up followed by the green LED.

Loading parameters

5. Remove the programming key and set the internal DIP switches of the programming key to Write mode (DIP1=OFF, DIP2=ON)
6. Repeat steps 3 and 4 to write the parameters on the new KaControl circuit board.

Important:
The new Katherm QK KaControl circuit board should also be disconnected before writing the parameters.



The programming key is not included in the delivery and can be ordered from Kampmann Customer Service as a special accessory.

The software versions of the control circuit boards must be identical when reading and writing the parameter sets (see parameter P000). It is not possible to read parameters from a control circuit board using software version "P000=33" for instance and then write the parameters to a control circuit board using software version "P000=37".

12. Control Board Parameter List

The parameters can be called up in the Service menu and adapted to meet the needs of the system. The steps to call up the Service menu are described in section 11.2.

	Function	Standard	Min	Max	Unit	Reference
P000	Software version (read-only)		0	255		
P001	Base setpoint for setpoint entry ± 3K	22	8	32	°C	Page 39, 41
P002	Switching on / off hysteresis valves	1	0	255	°C/10	Page 46
P003	Neutral zone in a 4-pipe system	3	0	255	°C/10	
P004	Cooling without fan support	0	0	255	°C/10	
P005	Heating without fan support	3	0	255	°C/10	Page 46
P006	Hysteresis fan On/Off (ventilation-only mode)	5	0	255	°C/10	
P007	P-band for heating	17	0	100	°C/10	Page 46
P008	P-band for cooling	20	0	100	°C/10	
P009	Offset to the base setpoint for setpoint entry ± 3K	3	0	10	°C/10	
P010	Clip-on sensor: limit temperature to enable fan stages 1 and 2 in heating mode	29	0	255	°C	Page 45
P011	Clip-on sensor: limit temperature to enable fan stages 3 and 2 in heating mode	31	0	255	°C	Page 45
P012	Clip-on sensor: limit temperature to enable fan stage 5 in heating mode	33	0	255	°C	Page 45
P013	Clip-on sensor: hysteresis for limit - temperatures P010, P011, P012 and P014	10	0	255	°C/10	
P014	Clip-on sensor: limit temperature to enable the fan stages in cooling mode	18	0	255	°C	
P015	Function of input AI1	0	0	19	-	Page 49
P016	Function of input AI2	0	0	19	-	Page 50
P017	Function of input AI3	0	0	9	-	Page 50
P018	Temperature raising of cooling setpoint in Eco mode	30	0	255	°C/10	
P019	Temperature lowering of heating setpoint in Eco mode	30	0	255	°C/10	Page 41
P020	Default value must be set	6	0	15	-	
P021	Default value must be set	6	0	15	-	
P022	Default value must be set	0	0	1	-	
P023	Default value must be set	0	-99	127	°C/10	
P024	Default value must be set	0	-20	20	1/10	
P025	Default value must be set	0	-99	127	°C/10	
P026	Default value must be set	0	-20	20	1/10	
P027	Fan setting: maximum run time manual fan mode	0	0	255	min	Page 43
P028	Rinsing function: fan stage during the rinsing function	2	1	5	-	
P029	Default value must be set	0	0	1	-	
P030	Default value must be set	12	0	255	°C	
P031	Default value must be set	27	0	255	°C	
P032	Rinsing function: maximum idle time of fan	15	0	255	min	
P033	Rinsing function: duration of rinsing function	240	0	255	S	

	Function	Standard	Min	Max	Unit	Reference
P034	Rinsing function: activation in operating modes 0 = Rinse function disabled 1 = Rinsing function is enabled in: - cooling mode - automatic mode 2 = Rinsing function is enabled in: - heating mode - automatic mode 3 = Rinsing function is enabled in: - cooling mode - heating mode - automatic mode	0	0	3	-	
P035	Default value must be set	0	0	255	s	
P036	Setpoint setting 0 = absolute setpoint setting 1 = setpoint setting + 3k	0	0	1	-	Page 39
P037	Display: 0 = no display 1 = display of setpoint temperature 2 = display of room temperature 3 = display of sensor AI1 4 = display of sensor AI2 5 = display of sensor AI3 6 = display of fan speed in %	1	0	6	-	Page 39
P038	Parameter P38: P38=0 Eco/Day changeover function P38=64 ON/OFF changeover function	64	0	255	-	Page 40, 52
P039	Digital output V2: 0 = no function 1 = heating requirement 2 = cooling requirement 3 = alarm	0	0	3	-	Page 49
P040	Valve actuation by means of pulse width modulation 0 = function is disabled 1 = function is enabled	0	0	1	-	Page 48
P041	Reset time of PI controller to actuate the fan in automatic fan mode If P41=0 a P controller is enabled. Recommended reset time when using a PI controller: Reset time = 13 minutes	0	0	20	min	Page 46
P042	Fan setting: locking and enabling of fan stages	0	0	127	-	Page 44

Installation instructions

	Function	Standard	Min	Max	Unit	Reference
P043	Digital input DI1	1	0	14	-	Page 47
P044	Digital input DI2	2	0	14	-	Page 47
P045	Default value must be set	10	0	100	kOhm	
P046	Default value must be set	18	12	34	°C	
P047	Default value must be set	24	13	35	°C	
P048	Default value must be set	10	0	100	kOhm	
P049	Default value must be set	90	0	100	kOhm	
P050	Fan setting: max fan speed	100	0	100	%	Page 42
P051	Fan setting: min fan speed	0	0	90	%	Page 42
P052	Fan setting: restricting the fan speed 0 = restricting the fan speed is enabled in automatic and manual mode 1 = restricting the fan speed is only enabled in automatic mode	0	0	1	-	Page 43
P053	Valve actuation by means of pulse width modulation Valve switching cycle	15	10	30	min	Page 48
P055	Display heating/cooling symbols: in automatic mode 0 = heating/cooling symbols disabled in automatic mode 1 = heating/cooling symbols enabled in automatic mode	0	0	1	-	
P056	Setting DI2: if DIP4=ON 0 = contact closed → heating contact open → cooling 1 = contact closed → cooling contact open → heating	1	0	1	-	Page 48
P057	Setpoint setting on the value of P01 after switching from Eco/Day or ON/OFF: 0 = function is disabled 1 = function is enabled	0	0	1	-	Page 41
P058	Sensor calibration: sensor AI1	0	-99	127	°C/10	Page 41
P061	Sensor calibration: sensor in the KaController	0	-99	127	°C/10	Page 41
P062	Sensor calibration: sensor AI2	0	-99	127	°C/10	Page 41
P064	Sensor calibration: sensor AI3	0	-99	127	°C/10	
P093	Default value must be set	0	0	3	-	
P094	Default value must be set	60	1	255	min	
P095	Default value must be set	0	0	1	-	

	Function	Standard	Min	Max	Unit	Reference
P097	Reading DIP switches (read-only): Display the DIP switch settings as a decimal number. The decimal number must be converted to a binary number. Example: display: 37 (decimal) Conversion: 100101 (binary) DIP switch setting: DIP1 = ON DIP2 = OFF DIP3 = OFF DIP4 = ON DIP5 = OFF DIP6 = ON		0	63		
P098	Actuation 0..10V: switch on limit of valves	30	0	100	V/10	Page 51
P099	Actuation 0..10V: switch on limit of min. fan speed	40	0	100	V/10	Page 51
P100	Actuation 0..10V: switch on limit of max. fan speed	90	0	100	V/10	Page 51
P101	Valve actuation by means of pulse width modulation. P-band in heating mode	15	0	100	°C/10	Page 48
P102	Default value must be set	15	0	100	°C/10	
P103	Valve actuation by means of pulse width modulation Reset time of PI controller If P103=0 a P controller is enabled. Recommended reset time when using a PI controller: Reset time = 13 minutes	0	0	20	min	Page 48
P104	Valve actuation by means of pulse width modulation Minimum switching on time for the heating valve in PWM mode	0	0	20	min	Page 48
P105	Default value must be set	20	0			
P106	Default value must be set	26	0			
P107	Default value must be set	5	0	255	min	
P108	Default value must be set	240	35	255	min	
P117	Function buttons: locking and enabling	0	0	7		Page 40

13. Functional Testing

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 enabled and checked using inputs on the KaController.

Hardware-related locks should be observed during the functional testing (refer to the respective wiring diagram!).

The functional testing of the connected assemblies is called up and implemented by the following operating steps:

1. Switch off the Katherm QK by
   - pressing the ON/OFF key
     or
   - pressing the navigator for a minimum of 5 seconds
     or
   - turning the navigator to the left until OFF appears
2. Call up the Parameter menu by pressing the navigator 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 and confirm by pressing the navigator.
4. "L01" is shown on the display and the functional testing of the connected assemblies can start.

   Note: the individual test steps are called up by pressing the navigator.
   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 in order
L02*	Input AI2	Sensor faulty	Sensor in order
L03*	Input AI3	Sensor faulty	Sensor in order
L04	Input DI1	Contact open	Contact closed
L05	Input DI2	Contact open	Contact closed
L06	Fan speed	--	Increased actuation
	0..10 V		Fan 0 V --> 10 V
L07	Valve outlet 1	--	Outlet V1 enabled
L08	Valve outlet 2	--	Outlet V1 enabled

* The controls automatically detect the requisite sensors on the analog inputs AI1-AI3 via the DIP switch settings. If sensors are defective or not connected, this fault function is shown by the respective display (L01-L03) flashing.

Hardware-related locks should be observed during the functional testing (refer to the respective wiring diagram!).

14. KaController Parameters

14.1 General

Specific user requirements can be enabled and disabled via parameter settings in the KaController. For instance, the minimum and maximum setpoint temperature can be set via parameters in the KaController.

14.2 Calling up the KaController parameter menu

The following steps are needed to set the parameters:

1. Switch off the Katherm QK by
   - pressing the ON/OFF key or
   - pressing the navigator for a minimum of 5 seconds or
   - turning the navigator to the left until OFF appears

2. Call up the Parameter menu by pressing the navigator for a minimum of 10 seconds. The display shows "Para" and then "CODE" with the value 000 in sequence.

3. Select the password (Code) 11 by turning the navigator and confirm by pressing the navigator. You are now in the KaController's parameter menu.

4. Parameters can now be set using the navigator.

Setting parameters:

- Select the parameter by turning the navigator
- Call up Edit mode by pressing the navigator
- Select the required value by turning the navigator
- Save the new value by pressing the navigator

There are 3 ways to exit the Parameter menu and call up the default view:

- If no action is carried out using the navigator for longer than 2 seconds
- Hold down the navigator for 5 seconds
- By turning the navigator, select "ESC" on the display and confirm the selection by pressing the navigator

14.3. KaController parameter list

(access code: 11)

	Function	Standard	Min	Max	Unit	Reference
t001	Serial address	1	0	207	–	
t002	Baud rate 0 = Baud rate 4800 1 = Baud rate 9600 2 = Baud rate 19200	2	0	2	–	
t003	Background lighting function 0 = slow fade in, fast fade out 1 = slow fade in, slow fade out 2 = quick fade in, quick fade out	0	0	2	–	
t004	Strong background lighting	4	0	5	–	
t005	Sensor calibration of KaController sensor	0	-60	60	°C	
t006	LCD display contrast	15	0	15		
t007	Setting the BEEP 0 = BEEP ON 1 = BEEP OFF	0	0	1		
t008	Password for the KaController parameter menu	11	0	999	–	
t009	Minimum settable setpoint temperature	8	0	20	°C	
t010	Maximum settable setpoint temperature	35	10	40	°C	
t011	Interval of setpoint setting 0 = automatic setting depending on PCB (parameterisable, freely programmable) 1 = Interval of 1°C (parameterisable PCBs) 2 = Interval of 0.5°C (freely programmable PCBs)	0	0	2	–	
t012	Date/Time setting: year	9	0	99	–	
t013	Date/Time setting: month	1	1	12	–	
t014	Date/Time setting: day in the month	1	1	31	–	
t015	Date/Time setting: weekday	1	1	7	–	
t016	Date/Time setting: hour	0	0	23	–	
t017	Date/Time setting: minute	0	0	59	–	

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