

Katherm HK 1.43

KaControl for Katherm HK



Assembly and installation instructions

Please retain this manual carefully for future use!
Read prior to commissioning!

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.....	3
2. Important information/Safety information	4
3. Operation of KaController	5
3.1 Operating keys, display elements.....	6
3.2 Operation.....	8
3.2.1 Switching on/off controller.....	9
3.2.2 Setting the temperature	10
3.2.3 Setting the fan.....	11
3.2.4 Setting the time.....	12
3.2.5 Timer programs	13
3.2.6 Operating modes (Mode key).....	16
4. Alarm messages	
4.1 Katherm HK	17
4.2 KaController control electronics.....	17
5. Frost protection function, motor protection, condensation alarm	18
5.1 Room frost protection function.....	18
5.2 Unit frost protection function	18
5.3 Motor protection.....	18
5.4 Condensation alarm	18
6. Cabling	19
6.1 General information.....	19
6.2 Single-circuit control of up to 6 units.....	20
6.3 Single-circuit control of up to 30 units	21
6.3.1 Terminal resistance in a CAN bus system	22
6.3.2 Bus connections between Katherm HK.....	22
6.4 KaController	22
6.5 External room temperature sensor	23
6.6 Inputs for processing of external contacts (e.g. window contact, card reader etc.)	23
6.7 Condensation pump.....	23
7. Installation, wiring of Katherm HK, KaController, clip-on sensor.....	24
7.1 Katherm HK	24
7.2 Clip-on temperature sensor	24
7.3 KaController	25
8. Maximum fan speed setting using potentiometer	26
9. Addressing	26
9.1 Single-circuit control	26
9.1.1 Maximum 6 Katherm HK in one control zone	26
9.1.2 Maximum 30 Katherm HK in one control zone	27
10. Unit setting with DIP switches	28
11. Parameter settings	31
11.1 General.....	31
11.2 Calling up the Service menu	31
11.3 Parameter settings	32
11.3.1 Display of setpoint temperature/room temperature.....	32

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.2	Setting of absolute setpoint temperature or ± 3 K.....	32
11.3.3	Locking operating functions	33
11.3.4	ON/OFF, Eco/Day function	33
11.3.5	Setpoint changeover to base setpoint	34
11.3.6	Temperature setpoint in Eco mode	34
11.3.7	Heating/cooling changeover using clip-on sensor in 2-pipe systems	35
11.3.7.1	Configuration of DIP switch no. 3, DIP switch no. 4....	35
11.3.7.2	Setting of automatic heating/cooling changeover mode	35
11.3.7.3	Heating mode limit values	36
11.3.7.4	Cooling mode limit values	36
11.3.7.5	Cyclic opening and closing of straight-way valves.	37
11.3.8	Sensor calibration	37
11.3.9	Fan control	38
11.3.9.1	Maximum fan speed using parameter P50	38
11.3.9.2	Maximum fan speed using potentiometer	38
11.3.9.3	Minimum fan speed	39
11.3.9.4	Fan speed limitation in automatic and manual operation	39
11.3.9.5	Maximum run-time of manual fan operation.....	39
11.3.9.6	Continuous fan operation	39
11.3.9.7	Locking fan stages.....	40
11.3.10	Auto-Eco function.....	41
11.3.10.1	Water temperature limit values in heating mode	41
11.3.10.2	Water temperature limit values in cooling mode	41
11.3.11	Display of heating/cooling symbol	41
11.3.12	Automatic temperature setting	42
11.3.13	Automatic mode setting in 4-pipe systems	42
11.3.14	Function of digital inputs DI1 and DI2	43
11.3.14.1	Function of DI1	43
11.3.14.2	Function of DI2.....	43
11.3.15	Function of digital outputs V1 and V2	45
11.3.15.1	Digital output V1	45
11.3.15.2	Digital output V2	45
11.3.15.3	Valve control via PWM.....	45
11.3.16	Function of multifunctional inputs AI1, AI2, AI3.....	46
11.3.16.1	Function of AI1	46
11.3.16.2	Function of AI2.....	46
11.3.16.3	Function of AI3.....	47
11.3.17	External control using 0..10 V	48
11.3.18	Locking of operating options or functions, parameter 38.	49
11.4	Programming keys.....	50
12.	PCB parameter list	51
13.	Functional testing of connected assemblies.....	55
14.	KaController parameters.....	56
14.1	General.....	56
14.2	Calling up parameter menu	56
14.3	KaController parameter list	57



1. Correct and proper use

Kampmann KaControllers and Katherm HK 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 or other property if they are not installed and operated correctly and properly or are not used correctly.

KaControllers are intended solely for use indoors (for instance in residential properties, offices, showrooms etc).

They should not be used

- outdoors
- in damp areas, like swimming pools or outdoors
- in areas where there is a risk of explosion
- in areas where there is a significant dust content
- in rooms with an aggressive atmosphere

Katherm HK are intended solely for use indoors (for instance in residential properties, offices, showrooms etc.) and should not be used in damp areas, like swimming pools or outdoors.

During installation, prevent the units from becoming wet or damp. If in doubt, please contact the manufacturer. Any use over and above the aforementioned use shall 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 in manual.

KaControllers should only be used as room control units in conjunction with Kampmann systems.

Specialist knowledge

The installation of this product requires technical knowledge of heating, cooling and electronics. This knowledge is generally taught as part of a course in one of the above vocational fields and is not described separately here. Damage resulting from improper or incorrect installation is the sole responsibility of the operator.

The installer of this unit should have adequate knowledge gained in vocational training of:

- Safety and accident prevention regulations
- Guidelines and recognised technical regulations, such as VDE regulations, DIN and EN standards.

Purpose and validity of the manual

This manual contains information for the operation of the KaController. The information contained in this manual can be changed without prior notification.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL



2. Important information/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 re-connected!

Please read this manual in full to ensure correct and proper installation and operation of the KaController.

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.
- Caution! Pipes, casings and fittings can become either very hot or very cold depending on the operating mode!
- Personnel should be qualified and possess adequate knowledge of the following:
 - Safety prevention and accident prevention regulations
 - 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

During installation, prevent the units from becoming wet or damp during installation. If in doubt, please contact the manufacturer. Any use over and above the aforementioned use shall 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 in manual.

Modifications to the equipment

Do not perform any modifications, conversions or additions to KaController or Katherm HK 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!

3. Operation of KaController

KaControllers control the wide range of Kampmann systems, KaControllers are equipped with the latest technology and offer users the possibility of adapting the air conditioning of buildings to their individual needs.

Up to two switching on/off times can be configured for each day, thereby ensuring demand-led room temperature control by the user.



Product features:

- Integral temperature sensor
- Large LCD multifunctional display
- LED auto-switching background lighting
- Large 7-segment display for visualisation of room setpoint temperature
- Real-time clock with integral timer programs
- 2 switching on/off times per day
- Alarm display on screen
- Individual screen design possible
- Push/turn dial with endless/click function
- Single-dial operation of all all functions
- Connection of Kampmann system components via bus line
- Password-protected service level
- Language-independent display - perfect for international use



1.43 Katherm HK

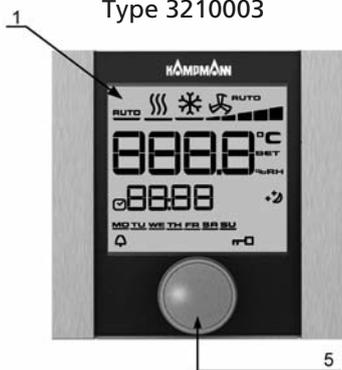
KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

KaController with operating keys
Type 3210002
Type 3210004



KaController without operating keys
(single-dial operation)
Type 3210001
Type 3210003



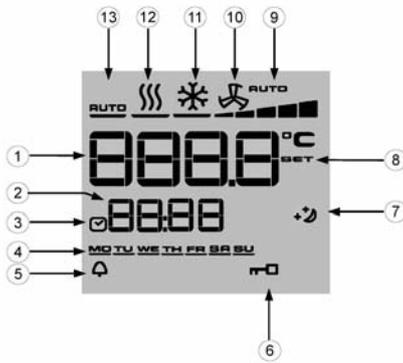
3.1 Operating keys, display elements

1. Display with LED background lighting
2. ON/OFF key (depending on setting)
 - ON/OFF (factory setting)
 - Eco mode/Day mode
3. TIMER key
 - Set time
 - Set timer programs
4. ESC key
 - Back to default view
5. Navigator dial
 - Change settings
 - Call up menus
6. MODE key
 - Set operating modes
(Disabled with 2-pipe applications)
7. FAN key
 - Adjust fan control

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

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

LCD display symbols



1	Display of room temperature setpoint
2	Current time
3	Timer program enabled
4	Day
5	Alarm
6	Selected function is locked
7	Eco mode 
8	Setpoint setting enabled
9	Fan 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 shown on the display are dependent on the application (2-pipe, 4-pipe etc.) and on the parameters set.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

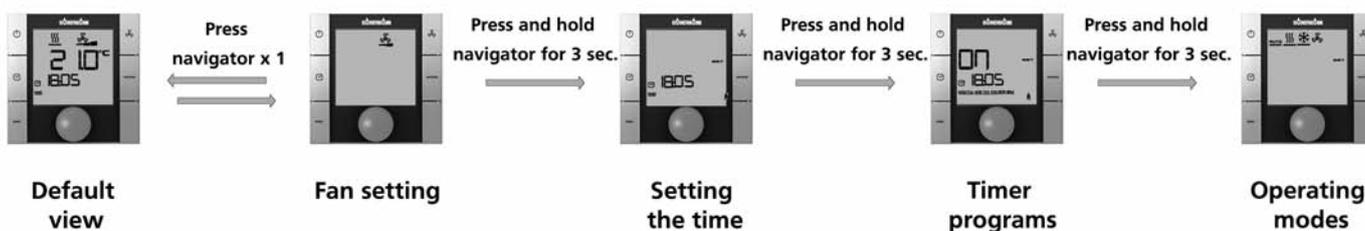
3.2 Operation

The KaController is operated using the navigator dial and operating keys.

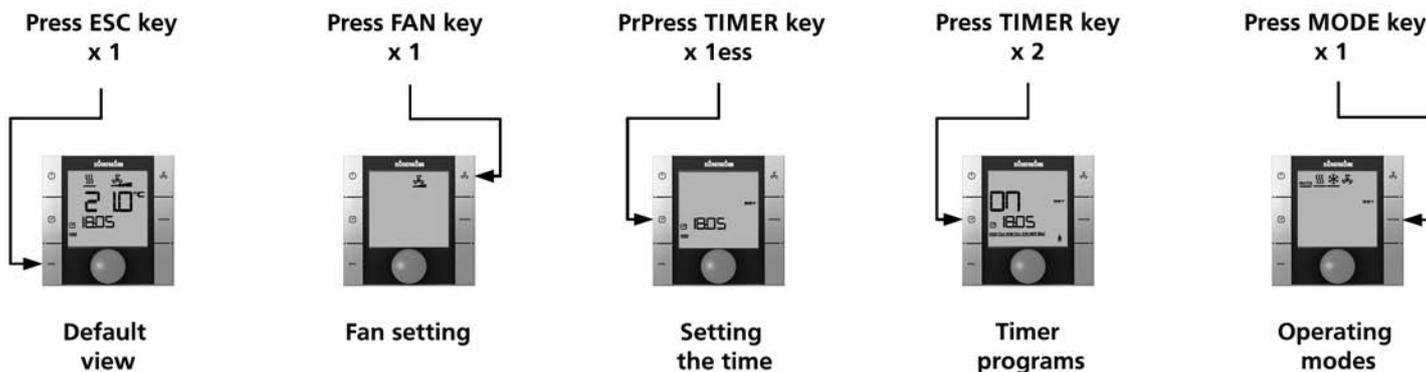
The functions that can be called up and set using the dial are identical on both models (with/without side operating keys), and so to aid understanding, the illustration of the KaController with side operating keys will be used in the rest of this manual.

The different selection menus are called up using the navigator dial or side operating keys.

Menu selection using navigator dial



Menu selection via operating keys



If the unit has not been operated for longer than 3 seconds via the navigator dial or operating keys, the last change of value will be saved and the default view will be called up.

3.2.1 Switching on/off controller

Once the controller has been switched on, the default screen will appear with the current room temperature setpoint and set fan stage.



Default display



The time is not shown on the default screen after initial commissioning (see "Time setting" selection menu).

Switching off the controller:

There are 3 options for switching off the controller:

1. Press the ON/OFF key.
2. Turn the dial to the left until OFF is displayed.
3. Hold down the dial until OIFF is displayed.



Default display

Switching on the controller:

There are 2 options for switching on the controller:

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



Controller OFF display

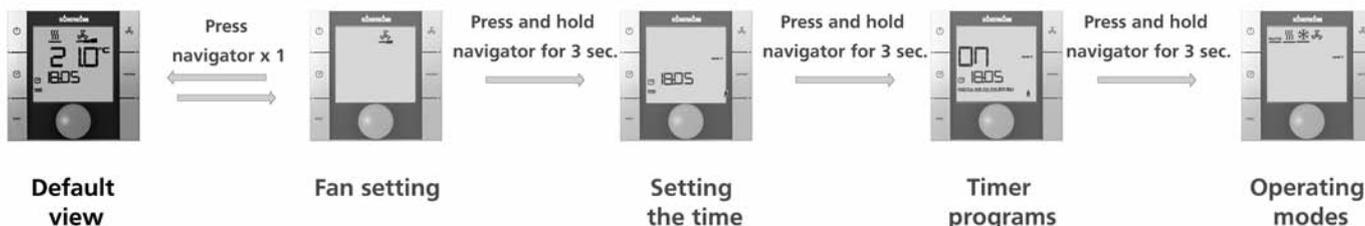
1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

3.2.2 Setting the temperature

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



Entering the temperature setpoint:

It is possible to enter a new temperature setpoint by turning the dial in the default display. Pressing the dial confirms the setting and calls up the default display.



If the unit has not been operated for longer than 3 seconds via the dial or operating keys, the last change of value will be saved and the default view will be called up.



Default display

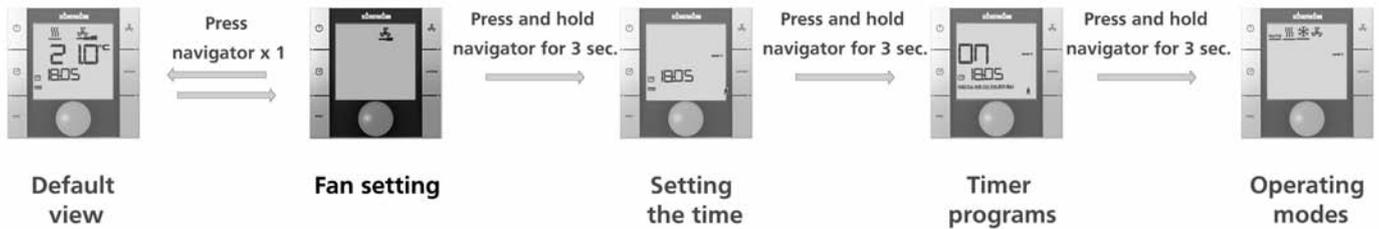


Temperature setpoint setting

3.2.3 Setting the fan

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

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



In automatic mode, the room temperature is initially controlled by natural convection and then by constant adjustment of the fan speed.

Users also have the option of setting the fan speeds Auto-0-1-2-3-4-5 if required.



Fan stage 3

Pressing the dial in the default display switches the display to the "Fan setting" menu.

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

You can also enable the selected fan stage by pressing the dial.



If the unit has not been operated for longer than 3 seconds via the dial or operating keys, the last change of value will be saved and the default view will be called up.

1.43 Katherm HK

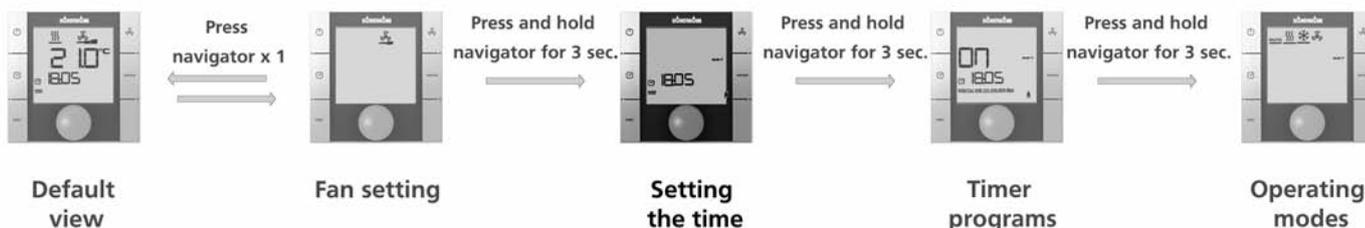
KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

3.2.4 Setting the time

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

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



Setting the time:

Enter the following figures using the dial:

1. Current hour
2. Current minute
3. Current weekday



Time setting display



The "Timer programs" menu will automatically appear once the current day has been confirmed by pressing the dial.



If the unit has not been operated for longer than 7 seconds via the dial or operating keys, the last change of value will be saved and the default view will be called up..



Setting to hide time in the standard display



*The time is not shown in the default view following initial commissioning of the KaController.
The current time is only shown in the default display once the time has been set!
If the values "-- : --" are entered for hour and minute, the real-time clock is disabled and the time is hidden in the standard display.*

3.2.5 Timer programs

KaControllers offer the option of managing switching on/off times by means of a timer program, if certain rooms only require air conditioning at certain times of the day. Unlike conventional thermostat controllers, you can not only select a switching on/off time using the KaController but also set two switching on/off times per day.



Set the time in the "Time setting" menu prior to parameterising the switching on/off times.

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 weekly timer program



Display elements in Timer menu

KaControllers can process 2 switching on and 2 switching off times per weekday. The switching on and off times can be entered either as a block or for each individual day.



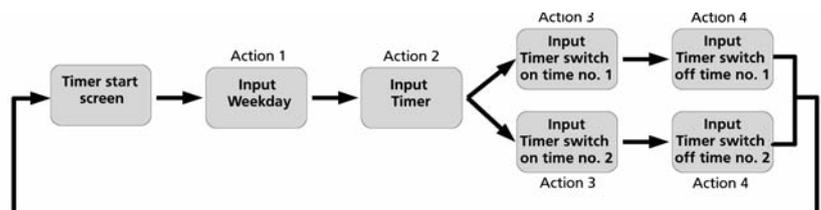
The controller is switched on and off by the timer program depending on the times entered. When the controller is switched off by the timer program, users have the option of switching on the controller using the ON/OFF key or the dial.

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/off time
4	Day
5	If no switching on/off time is entered in the timer matrix, the "Clock" symbol is hidden in the default display.



If no switching on/off time is entered in the timer matrix, the "Clock" symbol is hidden in the default display.

Below is the diagrammatical sequence for setting the timer programs. Actions 1 - 4 are described in more detail in the following section.



Press the dial for 3 seconds in the Timer start screen or do not touch the KaController for 15 seconds to exit the "Timer programs" menu.

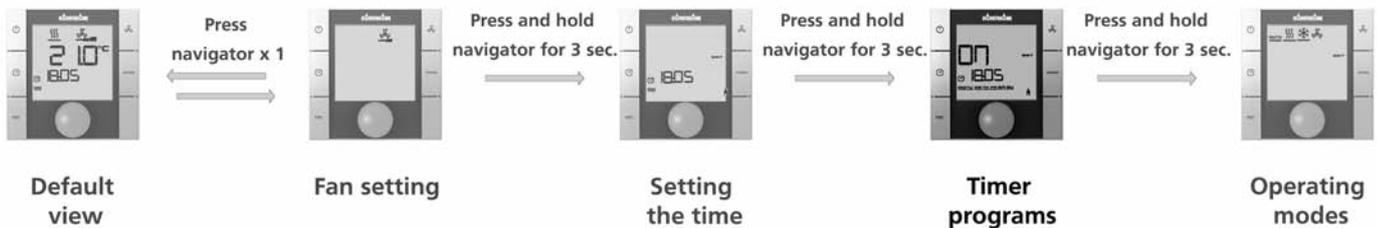
1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

Press the TIMER key twice (quick access) or use the dial to call up the "Timer programs" menu.

Calling up the "Timer programs" menu using the dial.



Timer start screen

Step 1:

Turn the dial to select a day for which you wish to program a switching on/off time.

You have the option of selecting days as a block (MO – FR, SA – SU, MO – SU) or individually.

Press the dial to apply the value entered (e.g.: MO – FR) and call up the next input screen.



Timer program no. input screen

Step 2:

Turn the dial to select the number of timer program (No. 1 or No. 2).

Press the dial to apply the value entered (e.g.: Timer program no. 1) and call up the next input screen.



Switching on time input screen

Step 3:

Turn the dial to set the **switching on time** required.

Once you have entered the minutes, press the dial to apply the **switching on time** required and call up the input screen for the switching off time of the selected timer program number.



Switching-off time input screen

Step 4:

Turn the dial to set the **switching off time** required.

Once the minutes have been entered, press the dial to apply the **switching off time** entered and call up the timer program start screen (→ Step 1).



To delete the switching on and off times entered, call up the respective day and associated timer program no. (Step 1 and Step 2). Replace the switching on and off times entered with the value "--:--" (Step 3 and Step 4).

Important: It is not possible to delete a block of times!



It is possible to overwrite entered times at any time. This can be done as a block or for individual days.



Switching on and off times can only be called up for each day. The block calling up of switching on and off times is not possible where there are different time entries for the respective days of the week and the time will be shown as "- :- -".



Press the dial for 3 seconds in the Timer start screen or do not touch the KaController for 15 seconds to exit the "Timer programs" menu.

1.43 Katherm HK

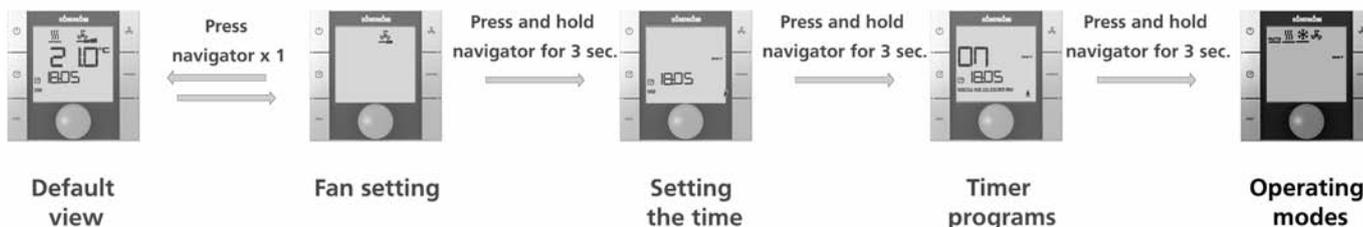
KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

3.2.6 Operating modes (Mode key)

Press the MODE key (quick access) or use the dial to call up the "Modes" menu..

Calling up the "Modes" menu using the dial.



Use the dial to set the operating mode according to the parameter setting.

- Automatic mode: The controller automatically switches between heating mode and cooling mode while maintaining a neutral zone.
- Heating mode: The controller operates solely in heating mode
- Cooling mode: The controller operates solely in cooling mode

Select the mode you require by turning the dial in the "Mode" selection menu.



Heating mode setting

Activate the selected mode by pressing the dial.



The MODE key is locked with 2-pipe applications as Heating and Cooling mode are prescribed by an external contact or a clip-on sensor. It is not possible as standard to adjust the mode using the KaController in 2-pipe applications.



If the dial has not been operated for longer than 2 seconds, the last changed value is saved and the default display is called up.

4. Alarm messages

KaControllers display operational malfunctions with the alarm messages listed in the following tables. The alarm messages are displayed according to priority in the display.

In the event of an alarm, note the alarm message and contact the responsible personnel to eliminate the fault quickly (System Administrator or installer/maintenance engineer).

4.1 Katherm HK

Katherm HK alarm table



"Motor fault" alarm display

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

4.2 KaController control electronics

KaController control electronics alarm table



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



Should faults occur simultaneously on the KaController control electronics, the alarm messages will be displayed alternately on the display.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

5. Frost protection, motor protection, condensation alarm

5.1 Room frost protection function

In every operating mode, the room temperature is monitored at a limit value of 8°C. Should the room temperature fall below 8°C, this then triggers the room frost protection function. The heating valve opens and the fan is switched on at stage 1. The room frost protection function is disabled when the room temperature rises above the limit value of 8°C.



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

5.2 Unit frost protection function

If a clip-on sensor is fitted in the Katherm HK, this clip-on sensor is monitored in every operating mode at a limit value of 4°C. If the temperature falls below 4°C, the unit frost protection function is activated, the heating valve opens and the fan is switched off.

The unit frost protection function is disabled when the temperature at the clip-on sensor rises above the limit value of 4°C. If the room temperature falls again below 4°C, the unit frost protection function is reactivated.



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

5.3 Motor protection

Any fault in the motor of a Katherm HK is displayed by message "A12" on the KaController. The Katherm HK with the motor fault switches off automatically. Once a motor fault has been identified, check whether a fan blade is blocked. Disconnect the Katherm HK from the mains supply and eliminate the source of the fault. The Katherm HK should run again once the mains power supply has been re-connected and a fan stage selected. Contact a service technician if the motor fault is still displayed on the screen.



Faults in the motor of a slave unit are not shown on the KaController - it only shows faults in the motor of a master unit.

5.4 Condensation alarm

The condensation alarm of a Katherm HK is displayed on the KaController with message "A14". A Katherm HK with a condensation alarm automatically switches off the cooling valve. Once the condensation alarm has been identified, check that the condensation pump is operating correctly and that the water level in the condensation tray is correct.

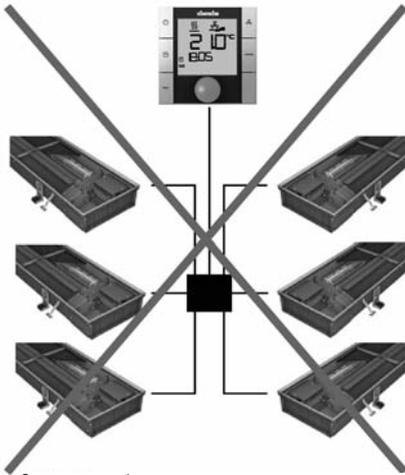


The condensation alarm of a slave unit is not shown on the KaController - it only shows the condensation alarm of a master unit.

6. Cabling

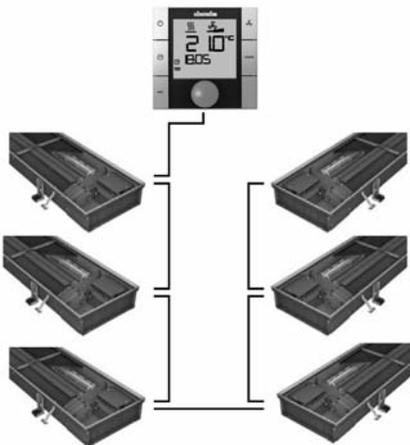
6.1 General information

- Lay all low-voltage lines along the shortest route.
- Lay low-voltage and high-voltage lines separately, for instance by inserting metallic separating rods on cable trays.
- Only use shielded cables as low-voltage cables and bus cables
- Lay all BUS lines in a linear arrangement. Star-shaped cabling is not permitted (see figure of left).
- The KaController is connected to the respective Katherm HK by a bus line and should be wired to each Katherm HK PCB.



Incorrect:

Star-shaped cabling of bus cables



Correct:

Line-shaped cabling of bus cables



Shielded paired cables should be used as BUS lines, such as CAT5 (AWG23), or equivalent.



The formation of star points in junction boxes should be avoided when laying the bus lines. The cables should be looped through the Katherm HK units!

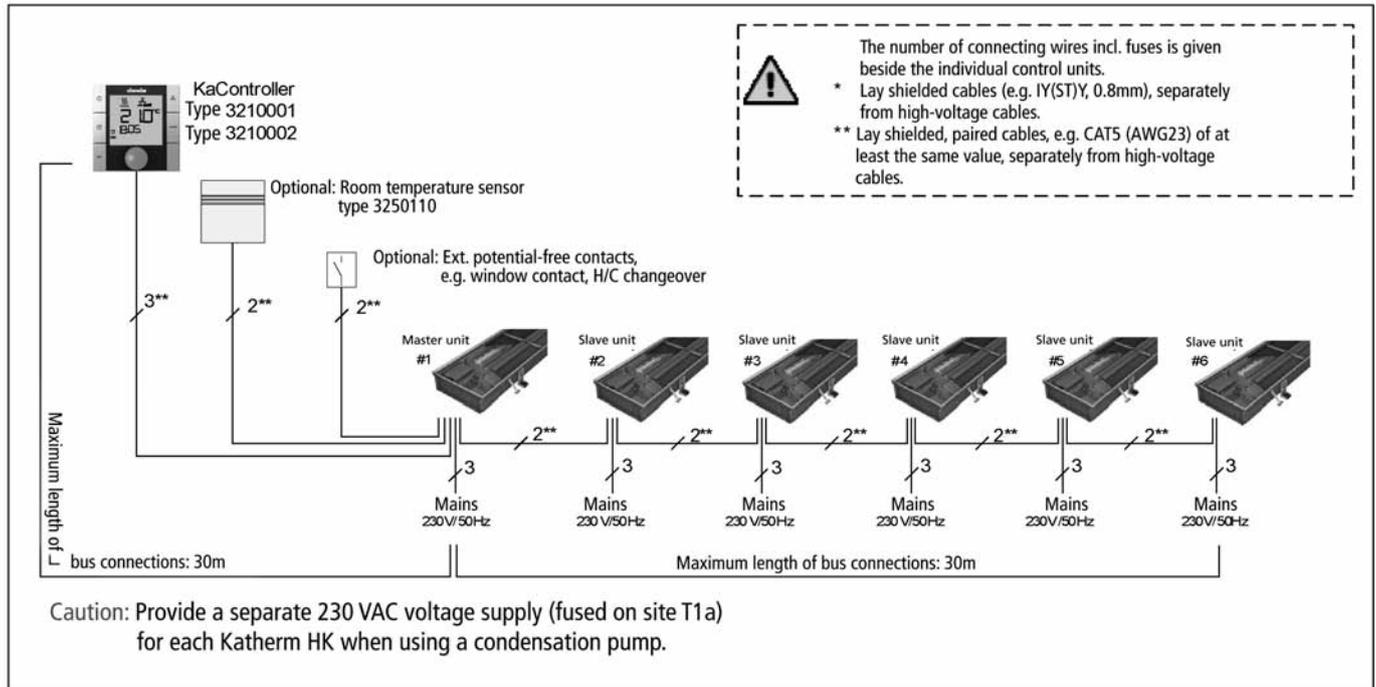
1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

6.2 Single-circuit control of up to 6 units

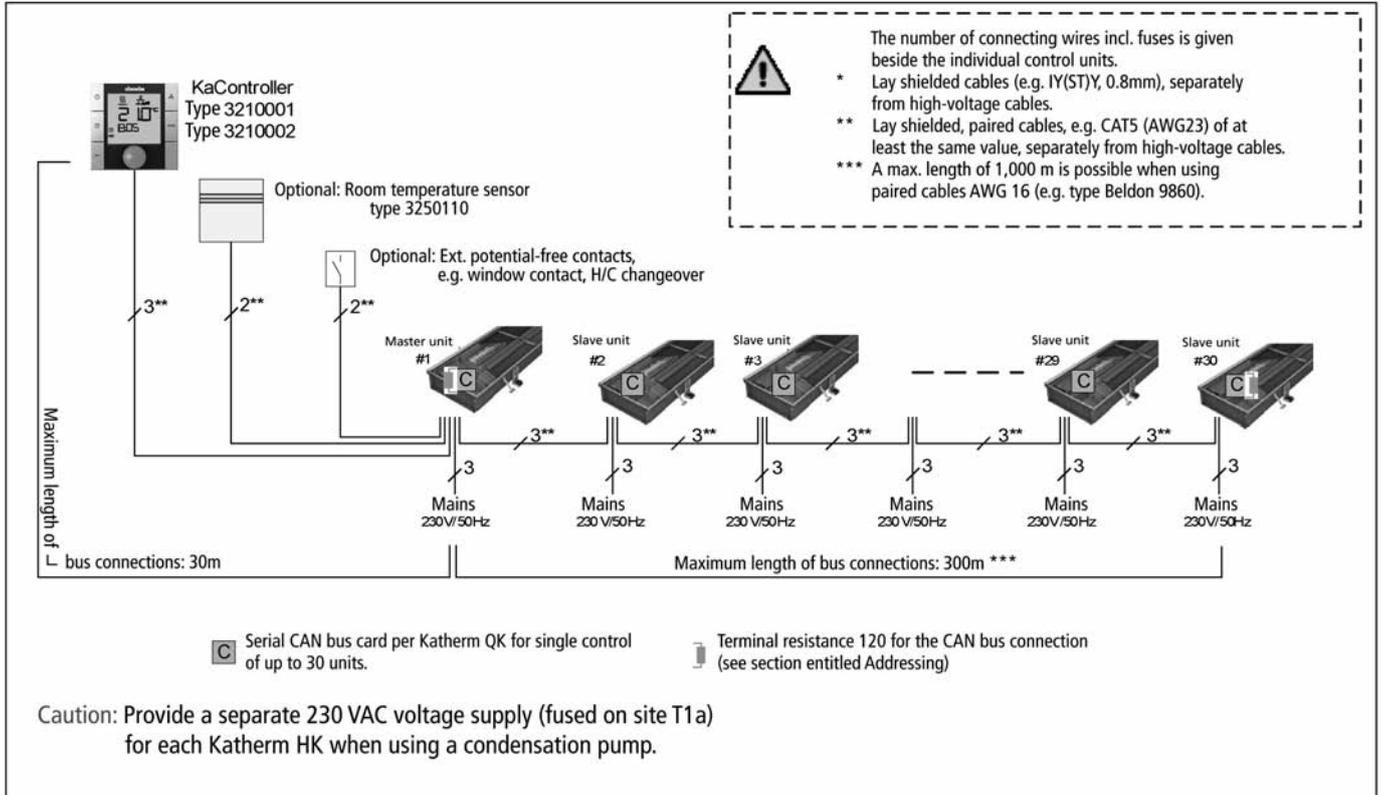
Katherm HK with KaController
single-circuit control, maximum 6 Katherm HK



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

6.3 Single-circuit control of up to 30 units

Katherm HK with KaController
single-circuit control, maximum 30 Katherm HK



Maximum permitted cable lengths

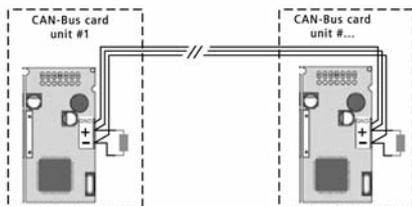
Total length of bus cables between Katherm HK units	max. 300 m (CAT5) max. 1000 m (Beldon 9860)
Total length of bus cable between room control unit and master unit	max. 30 m
Total length of cable between Katherm HK and the external potential-free contacts e.g. window contact, external ON/OFF etc.	max.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

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

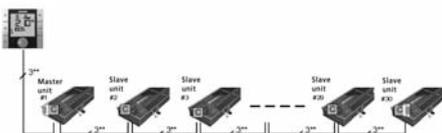
6.3.1 Terminal resistance in a CAN bus system



- The bus cables between the CAN bus cards must be linear.
- Disconnect the Katherm HK from the mains power supply before adjusting the terminal resistors.
- A terminal resistor should be connected between the first and last CAN bus card in a bus line between terminals "+" and "-".
- Resistance of terminal resistor: 120 Ohm

6.3.2 Bus cables between Katherm HK

Single-circuit control
(maximum 30 units)
Communication between
Katherm HKs via CAN-bus,
bus connection on the CAN-bus card



- Bus communication between Katherm HKs with Can bus cards is solely via the CAN bus. The tLAN bus communication between Katherm HKs in single-circuit control is not connected.
- Refer to the technical data sheet for CAB bus cards for wiring information on CAN bus cards.

6.4 KaController

Flush-mounted
backbox

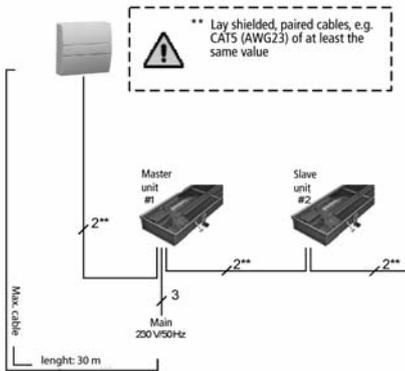


⚠ Lay shielded, paired cables, e.g. CAT5 (AWG23) of at least the same value



- Provide a back box for the KaController.
- Connect the KaController to the nearest Katherm HK according to the wiring diagram. The maximum bus length between the KaController and Katherm HK is 30 m.
- Connecting a KaController to a Katherm HK automatically converts it to being the master unit in the control circuit.

6.5 External room temperature sensor



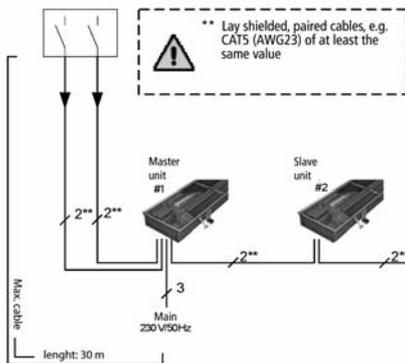
- All Katherm HK master units have an analog input for connection of an external room temperature sensor.
- Connect the cables as per the wiring diagram and configure the functions using the KaController.
- The cable length between the master unit and room temperature sensor should not exceed 30 m.



It is not possible to connect an external room temperature sensor to the master units.

Set the DIP switch no. 6 as described in section 10 if using an external room temperature sensor on a master unit.

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

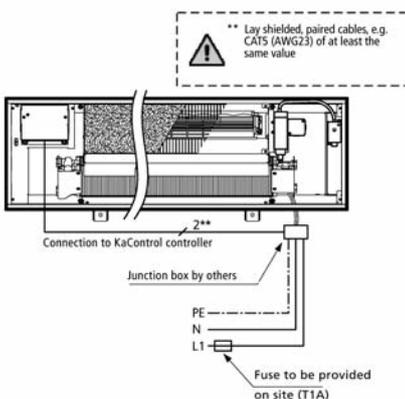


- All Katherm HK master units have multifunctional inputs that can be assigned different functions during commissioning. Connect the cables as per the wiring diagram and configure the functions using the KaController.
- Connect the cables as per the wiring diagram and configure the functions using the KaController.
- The cable length between the master unit and room temperature sensor should not exceed 30 m.



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

6.7 Condensation pump



- Provide a separate voltage supply (T1A fuse by others) when using a condensation pump.
- Provide a cable between the connection point on the condensation pump and KaControl unit.
- Connect the cables as per the wiring diagram and configure the functions using the KaController.



The condensation alarm message must also be connected on the slave units.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

7. Installation, wiring of Katherm HK, KaController, clip- on sensor

7.1 Katherm HK



- The electrical connection points in the Katherm HK are located in the control unit.
- To connect the cables, open the control unit, route in the cables and connect up as shown on the wiring diagram.



Disconnect the Katherm HK from the mains power supply prior to commencing wiring!



Only connect up the bus lines when the KaControl Katherm HK is disconnected

7.2 Clip-on sensor



Clip-on sensor

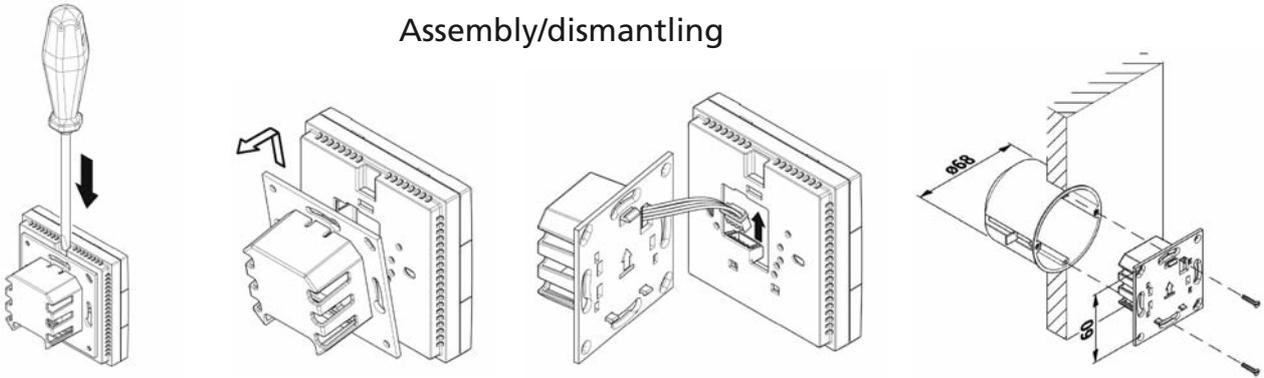
- The clip-on sensors can be fitted to the flow pipe (heating/cooling) with a strap. The temperature sensor and the strap form one unit ensuring that the sensor is simple to fit.
- To connect the electrical connection cable (cable length = 3 m), open the control unit, route in the cables and connect up as shown on the wiring diagram.



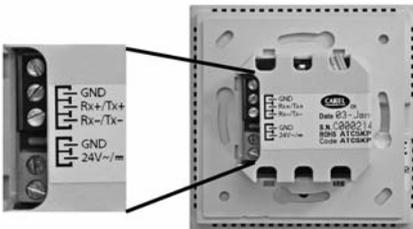
Disconnect the Katherm HK from the mains power supply prior to commencing wiring!

7.3 KaController

Assembly/dismantling



Wiring



KaController terminals

- Connect the KaController to the nearest Katherm HK as per the wiring diagram.
The maximum bus length between the KaController and Katherm HK is 30 m.
- Connection of a KaController automatically converts the respective Katherm HK into the master unit in the control circuit.

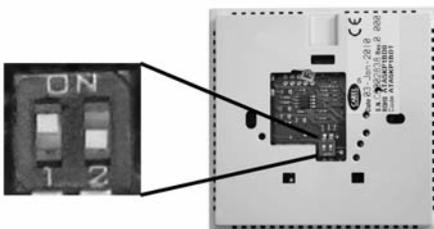


Disconnect the Katherm HK from the mains power supply prior to commencing wiring!



Only connect up the bus lines when the KaControl Katherm HK is disconnected

Setting the DIP switches



DIP switch setting on KaController

DIP switch no. 1: ON
DIP switch no. 2: OFF

- Set the DIP switches on the rear of the KaController as shown on the diagram to the left:

DIP switch no. 1: ON
DIP switch no. 2: OFF

1.43 Katherm HK

KaControl for Katherm HK

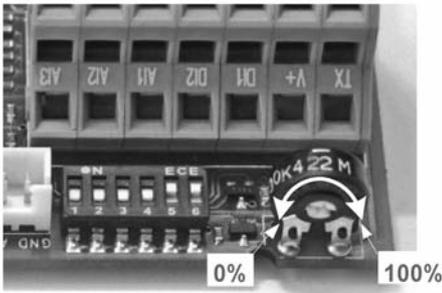
INSTALLATION AND OPERATING MANUAL

8. Maximum fan speed setting with potentiometer

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

Potentiometer adjustment:

- Disconnect the controller from the mains voltage supply before starting to adjust the potentiometer.
- To adjust the potentiometer, remove the cover of the control unit. The potentiometer is located on the PCB adjacent to the DIP switches. The potentiometer can be used to limit the maximum fan speed.



Potentiometer on the PCB



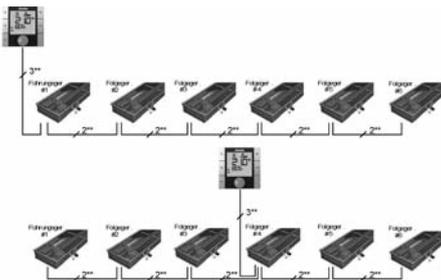
The maximum fan speed can also be adjusted using parameter P50. Please note the instructions in sections 11.3.9 "Fan control".

9. Addressing

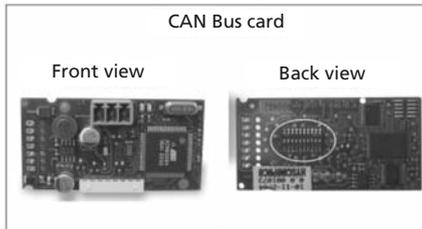
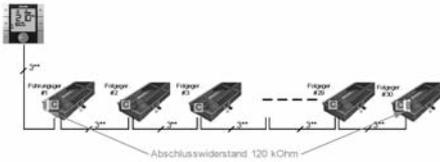
9.1 Single-circuit control

9.1.1 Maximum 6 Katherm HK in one control zone

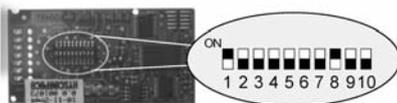
- Katherm HK units in a single-circuit control group with a maximum of 6 units do not need to be addressed.
- Master units/slave units are defined by the wiring of the KaController.
- The relevant Katherm HK automatically becomes the master unit in a control circuit when a KaController is connected.
- A master unit need not necessarily be arranged at the end of a bus system.
- All BUS lines must be laid in a linear manner. Star-shaped wiring is not permitted.



9.1.2 Maximum 30 Katherm HK in one control zone



DIP switch 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

- Katherm HK in single-circuit control groups with more than 6 units need to be addressed.
- Addressing is done using DIP switch settings on the CAN bus card.
- Master units/slave units are defined by the wiring of the KaController.
- The relevant Katherm HK automatically becomes the master unit in a control circuit when a KaController is connected.



All CAN bus cards are given the same CAN address by means of the configuration described below and work identically in the control zone.

Configuration of the CAN bus card by means of the DIP switch setting (identical for all CAN bus cards):

1. Disconnect Katherm HK from the mains power supply.
2. Remove CAN bus card from the base plate.
3. Adjust DIP switches in accordance with the illustration.
4. Replace CAN bus card on the base plate.
5. Connect bus line.
6. Reconnect Katherm HK to the mains power supply.

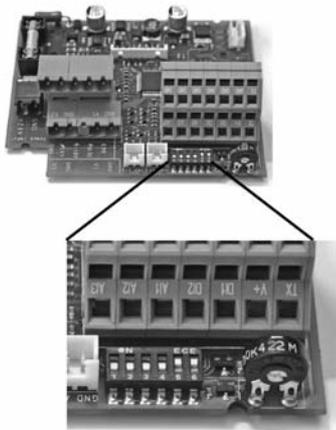
- The DIP switches on all CAN bus cards in one control circuit need to be set identically!

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

10. Unit setting with DIP switches



The configuration of a Katherm HK is set using the DIP switches on the PCB.

Once the DIP switches have been set, all of the basic functions of a unit are parametrised and the Katherm HK is immediately ready for operation.

Special setting options, such as lowering of the temperature setpoint during Eco mode need to be parameterised in the Service menu. This parameterisation can be done using the KaController.

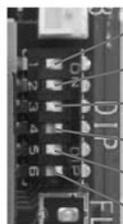
The control unit has to be operated to check and possibly set the DIP switches.

The DIP switches are factory-fitted to meet the unit's configuration!!

Disconnect the controller before you start setting the DIP switches.



Functional table of DIP switch settings on the PCB



DIP1	OFF = --- ON = 0..10 V activation by MSR (by others)
DIP2	OFF = --- ON = Activation by potentiometer 0..100 kOhm
DIP3	OFF = Clip-on sensor not fitted ON = Clip-on sensor
DIP4	OFF = --- ON = Heating/cooling changeover by DI2
DIP5	OFF = 2-pipe system ON = 4-pipe system
DIP6	OFF = Room control on external room sensor ON = Room control on sensor in KaController



With slave units, the DIP switch no. 6 has to be set to ON!

DIP switch no. 1

DIP switch no. 1 has to be switched to ON to activate a Katherm HK using a BMS (by others) using 0..10V signals.

The parameter settings needed are described in section 11.3.17.

Factory setting:

DIP1 = OFF

DIP switch no. 2

It is imperative that DIP switch no.2 is switched 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 performed by a clip-on sensor:

1. Enabling of fan stages, if there is hot or cold water in the heating element in accordance with the controller (Auto-Eco function, see section 11.3.10)
2. Heating/cooling changeover in a 2-pipe system (see section 11.3.7)
3. Unit frost protection (see section 5.2)

If a clip-on sensor is installed, then DIP switch no. 3 is switched to ON.

Katherm HK 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, the heating/cooling changeover is activated by default by switching digital input DI2, and the following operating modes are performed according to 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 heating/cooling changeover in a 2-pipe system can be activated by a clip-on sensor. DIP switch no. 4 must be set to DIP4 = OFF with this version (see section 11.3.7).

DIP switch no. 5

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

Factory setting:

2-pipe system → DIP5 = OFF

4-pipe system → DIP5 = ON

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

DIP switch no. 6

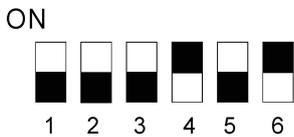
There is an option of using the KaController internal temperature sensor or an external room temperature sensor for room temperature control.

DIP switch no. 6 = OFF → Room temperature control on an ext. room temperature sensor

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

Factory setting:

DIP6 = ON



DIP switch factory setting
Katherm HK 2-pipe
control option -C1

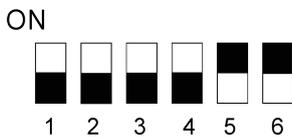
DIP switch factory settings Katherm HK 2-pipe system Control option -C1

DIP	2-pipe C1	Functions
DIP1	OFF	OFF = ---- ON = 0..10 V activation by MSR (by others)
DIP2	OFF	OFF = ---- ON = Activation via potentiometer 0..100 kOhm
DIP3	OFF	OFF = Clip-on sensor not fitted ON = Clip-on sensor fitted
DIP4	ON	OFF = ---- ON = Heating/cooling changover via DI2
DIP5	OFF	OFF = 2-pipe system ON = 4-pipe system
DIP6	ON	OFF = Room control on ext. room sensor ON = Room control on KaController sensor



With slave units, DIP switch no. 6 has to be set to ON!

DIP switch factory settings Katherm HK 4-pipe system Control option -C1



DIP switch factory setting
Katherm HK 4-pipe
control option -C1

DIP	4-pipe C1	Functions
DIP1	OFF	OFF = ---- ON = 0..10 V activation by MSR (by others)
DIP2	OFF	OFF = ---- ON = Activation via potentiometer 0..100 kOhm
DIP3	OFF	OFF = Clip-on sensor not fitted ON = Clip-on sensor fitted
DIP4	OFF	OFF = ---- ON = Heating/cooling changover via DI2
DIP5	ON	OFF = 2-pipe system ON = 4-pipe system
DIP6	ON	OFF = Room control on ext. room sensor ON = Room control on KaController sensor



With slave units, DIP switch no. 6 has to be set to ON!

11. Parameter settings

11.1 General

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

Special system requirements can be:

- Display: Room temperature or setpoint temperature
- Locking of operating functions
- Adjustment of absolute setpoint temperature or ± 3 K
- Setting parameters in Eco/Day mode
- Sensor calibration

The required settings can be entered using the KaController.

11.2 Calling up the Service menu

Perform the following steps to set the parameters:

1. Switch off the Katherm HK by:
 - Pressing the ON/OFF key
 - or
 - Pressing and holding down the dial for at least 5 sec or
 - Turning the dial to the left until OFF is displayed
2. Call up the Service menu by pressing the dial for at least 10 seconds. The display shows "Para" and then "CODE" with the figure 000.
3. Turning the dial, select password (Code) 22 and confirm by pressing. You are now in Service level 1 and the display shows the current software version (P000=...).
4. You can adjust the parameters using the dial.
5. Adjusting parameters:
 - Turn the dial to select the parametr.
 - Press the dial to call up Edit mode.
 - Turn the dial to enter the value you require.
 - Press the dial to save the new value.
6. There are 3 ways to exit the Service level and call up the default view:
 - Do not touch the dial for more than 2 minutes.
 - Press and hold down the dial for at least 5 seconds.
 - Turn the dial, select "ESC" on the screen and press the dial to confirm.



1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3 Parameter settings

11.3.1 Display of setpoint temperature/room temperature

Parameter P37

The following different values can be shown using the large seven-segment display.

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

X =Function is locked, factory setting P37=1



Parameter P36=0
Setting "absolute" setpoint temperature



Parameter P36=1
Setting setpoint temperature \pm 3 K

11.3.2 Setting absolute setpoint temperature or \pm 3 K

Parameter P36

It may be necessary with office or hotel applications, for instance, for the system operator to specify a base setpoint. The user then has the option of changing the setpoint temperature by \pm 3 K to allow for varying perceptions of the room temperature. Alternatively an absolute setpoint figure can be entered.

The method of setting the setpoint is configured using parameter P36.

	Function	Default	Min	Max	Unit
P36	Setpoint setting 0 = "Absolute" setpoint setting 1 = Setpoint setting \pm 3 K	0	0	1	

Parameter P01 is used to configure the base setpoint for the "Setpoint setting \pm 3 K".

	Function	Default	Min	Max	Unit
P01	Base setpoint for setpoint setting \pm 3 K	22	8	35	$^{\circ}$ C



*When setting the parameters
P37=1 \rightarrow Setpoint temperature displayed
P36=1 \rightarrow Setpoint setting \pm 3 K
No setpoint is displayed in the default view!*

11.3.3 Locking operating functions

Parameter P117

Certain functions and setting options can be locked for office and hotel applications, for example, to guarantee a simpler and more energy-efficient operation of the unit.

Function	P117=0	P117=1	P117=2	P117=3	P117=4	P117=5	P117=6
ON/OFF (Day/Eco) key					X		X
Fan setting						X	X
Timer functions		X		X	X	X	X
Specification of 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.

Adjust parameter P38 to use the Eco/Day function using the timer program in the KaController.

11.3.4 ON/OFF, Eco/Day function

Parameter P38

Parameter P38 controls the function of the ON/OFF key and the timer programs.

The ON/OFF key and timer programs are used to switch the unit on and off or to switch between Eco and Day mode.

Option 1:

Use the ON/OFF key and the timer programs to switch between Eco and Day mode.

Option 2:

Use the ON/OFF key and the timer programs to switch the Katherm ON and OFF.

Adjust parameter P38 for the "Heating/cooling changeover using clip-on sensor" function (section 11.3.7).

	Function	Default	Min	Max	Unit
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)	72	0	255	



Alternatively the Katherm HK can be switched on and off or between Eco and Day mode by an external potential-free contact! The configuration is described in section 11.3.14.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.5 Setpoint changeover to base setpoint

It is sensible for energy-saving operation in hotels and offices, for example, to reset the setpoints to a base setpoint at the start of an operating phase.

This function ensures that no unnecessarily high heating or low cooling setpoints are carried over in every operating phase. Parameter P57 is used to reset the temperature setpoint to the base setpoint (see P01) at the start of every operating phase.

Changes of operating phase include:

On → Off

Off → On

Eco → Day

Day → Eco

	Function	Default	Min	Max	Unit
P57	Reset temperature setpoint to base setpoint following change of operating phase 0 = Function is disabled 1 = Function is enabled	0	0	1	

11.3.6 Temperature setpoint in Eco mode

Parameter P18, P19

Parameter P18 is used to set the temperature rise in cooling mode in Eco mode.

Parameter P19 is used to set the temperature drop in heating mode in Eco mode.

The cooling setpoint is raised as standard by 3.0 °C in Eco mode.

The heating setpoint falls as standard by 3.0 °C in Eco mode.

	Function	Default	Min	Max	Unit
P18	Temperature rise of cooling setpoint in Eco mode	30	0	255	°C/10
P19	Temperature drop of heating setpoint in Eco mode	30	0	255	°C/10



Parameter P38 is used to adjust the use of the Eco/Day function using the timer programs in the KaController (On/OFF, Eco/Day function).

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

In 2-pipe systems, the heating/cooling changeover is activated by default by an external contact and the digital input DI2.

If there is no external contact available for the heating/cooling changeover, changeover can alternatively be activated by a clip-on sensor.

The clip-on sensor should be ordered separately and wired after installation to the analog input AI2 on the PCB (as per the wiring diagram). The configuration is described in the following description.



The slave units within one control zone should also be fitted with a clip-on sensor to perform the "Heating/cooling changeover by clip-on sensor" function.

11.3.7.1 Configuring DIP switch no. 3, DIP switch no. 4

If the changeover between heating/cooling is activated by a clip-on sensor, the DIP switches should be configured as follows:

DIP switch no. 3 = ON

DIP switch no. 4 = OFF

The functions of the DIP switches are described in section 10 "Setting unit configuration using DIP switches".

11.3.7.2 Setting automatic heating/cooling changeover mode

Parameter P38

Parameter P38 is used to fix automatic operating mode as the heating and cooling operating modes can solely be activated by the clip-on sensor.

Parameter P38 is also used for the "ON/OFF and Eco/Day" function (see section 11.3.4).

The settings for parameter P38 are shown in the following table!

	Function	Default	Min	Max	Unit
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)	72	0	255	



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

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUALS

11.3.7.3 Heating mode limit values

Parameters P10, P11, P12

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

	Function	Default	Min	Max	Unit
P10	Limit value temperature for activation of fan stages 1 and 2 in heating mode	26	0	255	°C
P11	Limit value temperature for activation of fan stages 3 and 4 in heating mode	28	0	255	°C
P12	Limit value temperature for activation of fan stage 5 in heating mode	30	0	255	°C



The controller monitors the water temperature continuously and only enables heating mode and the fan stages when the water temperature has exceeded the set limit values. If after a maximum of 5 minutes the limit value temperature according to P10 has not been reached, the valve closes and opens after 4 hours again for 5 minutes (see section on opening and closing of the valve). If heating mode cannot be switched on because of the water temperature, the heating symbol will flash on the display.

11.3.7.4 Cooling mode limit values

Parameter P14

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

	Function	Default	Min	Max	Unit
P14	Limit value temperature for activation of fan stages in cooling mode	18	0	255	°C



The controller monitors the water temperature continuously and only enables cooling mode and the fan stages when the water temperature has fallen below the set limit values. If after a maximum of 5 minutes the temperature has not fallen below the limit value temperature according to P14, the valve closes and opens after 4 hours again for 5 minutes (see section on opening and closing of the valve). If cooling mode cannot be switched on, the cooling symbol flashes in the display.

11.3.7.5 Cyclic opening and closing of straight-way valve

Parameters P107, P108

In 2-pipe applications using a straight-way valve, the clip-on sensor can only measure the water temperature correctly if the straight-way valve is opened cyclically.

Parameters P107 and 108 are used to set the cyclic opening and closing of the valve to monitor the water temperature.

	Function	Default	Min	Max	Unit
P107	Duration of valve opened to monitor water temperature	0	0	255	minutes
P108	Duration of valve closed	0	35	255	minutes



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

This setting opens the valve every four hours for 5 minutes to be able to measure the water temperature in the pipework correctly.

11.3.8 Sensor calibration

Parameters P58, P61, P62, P64

Parameters P58, P61, P62 and P64 are used to calibrate the sensor. The temperature sensor should be calibrated during initial commissioning and at each service.

	Function	Default	Min	Max	Unit
P58	Offset analog input AI1 (ext. room temperature sensor)	0	-99	127	°C/10
P61	Offset sensor in KaController	0	-99	127	°C/10
P62	Offset analog input AI2 (clip-on sensor)	0	-99	127	°C/10
P64	Offset analog input AI3 (clip-on sensor)	0	-99	127	°C/10



The temperature setpoint is displayed by default in the display. The room temperature measured needs to be shown to calibrate the sensor.

Parameter P37 should be set to 2 to display the room temperature (Room temperature display screen, see section 11.3.1).

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.9 Fan control

Fan control can be adapted using various parameters settings to meet the user's needs.

11.3.9.1 Maximum fan speed using parameter P50

Parameter P50

Parameter P50 is used to set and limit the maximum fan speed.

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



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

Example:

P50 = 80 %

Potentiometer = 50 %

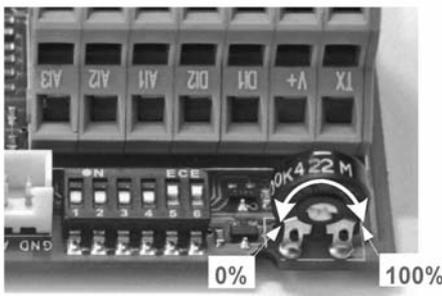
→ maximum fan speed = 50 %

11.3.9.2 Maximum fan speed using potentiometer

The potentiometer setting can alternatively be used to fix the maximum fan speed.

The potentiometer setting is set by default to 100 %.

Potentiometer setting:



Potentiometer setting on the PCB

- Disconnect the controller before starting to set the potentiometer.
- Remove the lid of the control unit to set the potentiometer. The potentiometer is located on the PCB directly adjacent to the DIP switches.
- The potentiometer can be used to limit the maximum fan speed (note parameter P50!).

11.3.9.3 Minimum fan speed

Parameter P51

Parameter P51 is used to set and limit the minimum fan speed.

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

11.3.9.4 Fan speed limitation in automatic and manual fan operation

Parameter P52

Parameter P52 is used to limit the fan speed for automatic fan operation only or also for manual fan operation.

	Function	Default	Min	Max	Unit
P52	Fan speed limitation 0 = Fan speed limitation in automatic fan operation and in manual fan mode enabled 1 = Fan speed limitation is only enabled in automatic fan operation	0	0	1	

11.3.9.5 Maximum run-time of manual fan operation

Parameter P27

Parameter P27 is used to set the maximum run-time of manual fan operation.

If manual fan operation is selected, the controller returns to automatic fan mode at the latest after completion of the time set by parameter P27.

	Function	Default	Min	Max	Unit
P27	Maximum run-time of manual fan operation 0 = Function is disabled	0	0	255	minutes



Select the Fan menu and set automatic fan operation using the KaController to end manual fan operation early.

11.3.9.6 Continuous fan operation

Parameter P29 is used to enable continuous fan operation. With continuous fan operation, the fan remains switched on at the pre-selected fan stage even when the room temperature has reached the setpoint (in automatic fan mode, stage1 remains enabled).

Parameter P29

Parameter P29 is used to set continuous fan operation.

	Function	Default	Min	Max	Unit
P29	0 = Continuous fan mode disabled 1 = Continuous fan mode enabled	0	0	1	

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.9.7 Locking fan stages

Parameter P42

Parameter 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	Default	Min	Max	Unit
P42	Parameter to lock fan stages	0	0	127	

A defined value is assigned to every fan stage.

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

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

Fan stage	Value	
Automatic fan	1	
Stage 0 (OFF)	2	
Stage 1	4	
Stage 2	8	
Stage 3	16	
Stage 4	32	32
Stage 5	64	64
Parameter P42 setting: (example)		96

Example shows the locking of fan stages 4 and 5

11.3.10 Auto-Eco function

A clip-on sensor can be used to lock the fan stages depending on the water temperature. This application permits the central lowering or raising of water temperatures in the building to be detected and processed in the respective Katherm HK units themselves.



When using a clip-on sensor, DIP switch no. 3 must be set to ON (see section "Setting unit configuration using DIP switches").

Slave units should also be fitted with a clip-on sensor to perform this function.

11.3.10.1 Water temperature limit values in heating mode

Parameters P10, P11, P12

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

	Function	Default	Min	Max	Unit
P10	Temperature limit value for activating fan stages 1 and 2 in heating mode	26	0	255	°C
P11	Temperature limit value for activating fan stages 3 and 4 in heating mode	28	0	255	°C
P12	Temperature limit value for activating fan stage 5 in heating mode	30	0	255	°C

11.3.10.2 Water temperature limit values in cooling mode

Parameter P14

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

	Function	Default	Min	Max	Unit
P14	Temperature limit value for activating fan stages in cooling mode	18	0	255	°C

11.3.11 Display of heating symbol/cooling symbol

Parameter P55

Parameter P55 is used to switch the display of the heating and cooling symbol in automatic mode on and off.

	Function	Default	Min	Max	Unit
P55	0 = Heating and cooling symbol are continuously hidden 1 = Heating and cooling symbol are shown if required	1	0	1	

1.43 Katherm HK

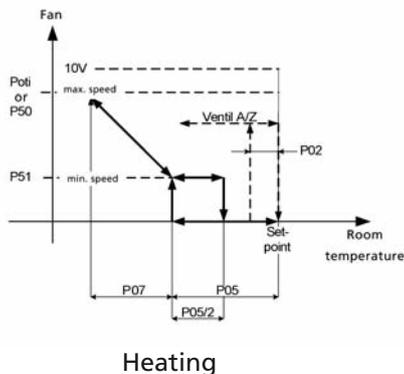
KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.12 Automatic temperature setting

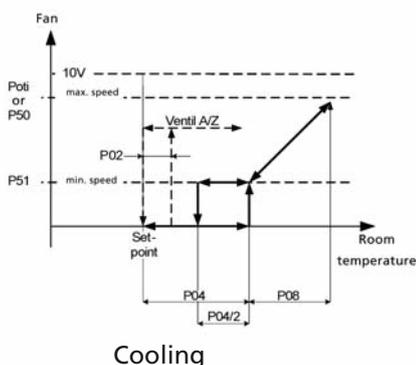
Parameter can be used to set automatic temperatures.

Parameter setting for automatic temperatures



	Function	Default	Min	Max	Unit
P02	Valve OPEN/CLOSE hysteresis	1	0	255	°C/10
P04	Natural convection cooling	0	0	255	°C/10
P05	Natural convection heating	3	0	255	°C/10
P07	Heating P-band	17	0	255	°C/10
P08	Cooling P-band	20	0	255	°C/10
P50**	Maximum fan speed	100	0	255	%
P51	Minimum fan speed	0	0	255	%

**Please note that the maximum fan speed is fixed by the potentiometer setting or using parameter P50 (minimum selection)!



Parameter setting of PI controller

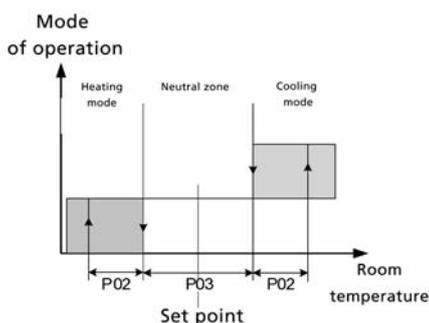
A PI controller can be activated by parameter P41 to control the fan in automatic fan mode as an alternative to the P controller for special applications. The PI controller is only active in automatic mode.

To avoid fluctuations in the PI controller, the heating P-band (P07), cooling P-band (P08) and adjustment time (P41) can be adapted to the behaviour of the control zone.

	Function	Default	Min	Max	Units
P41	Adjustment time of PI controller When P41 = 0, a P controller is active. Recommended adjustment time when using a PI controller: adjustment time = 13 minutes	0	0	20	minutes

11.3.13 Automatic mode settings in 4-pipe systems

In 4-pipe systems, the controller automatically fixes the operating mode according to the room temperature and the set setpoint in automatic mode. Parameters P02 and P03 can be used to set automatic mode.



	Function	Default	Min	Max	Unit
P02	see diagram	1	0	255	°C/10
P03	see diagram	3	0	255	°C/10

Automatic mode in 4-pipe systems

11.3.14 Function of digital inputs DI1 and DI2

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

11.3.14.1 Function of DI1

Parameter P43

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

	Function	Default	Min	Max	Unit
P43	Function of DI1	5	0	14	
	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 = Gen. alarm (Contact open → no alarm)				
	7 = Ext. frost prot. 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 = Gen. alarm (Contact closed → no alarm)				
	14 = Ext. frost prot. monitor (Contact closed → no frost)				

11.3.14.2 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



If DIP switch no. 4 is set to ON, digital input DI2 is used to switch between heating and cooling in 2-pipe systems.

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

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	Default	Min	Max	Unit
P44	Function of DI2	0	0	14	
	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 = Gen. alarm (Contact open → no alarm)				
	7 = Ext. frost prot. 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 = Gen. alarm (Contact closed → no alarm)				
	14 = Ext. frost prot. monitor (Contact closed → no frost)				

Parameter P56

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

Parameter P56 is used to set the polarity of the digital input DI2 when setting DIP switch no. 4 to ON.

11.3.15 Function of digital outputs V1 and V2

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

11.3.15.1 Digital output V1

Digital output V1 is used for the following function depending on its use:

2-pipe system → V1 = Heating/cooling valve

4-pipe system → V1 = Cooling valve

11.3.15.2 Digital output V2

In 4-pipe systems, the digital output V2 is used to activate the heating valve.

In 2-pipe systems, the digital output V2 is used to configure parameter P39.

	Function	Default	Min	Max	Unit
P39	Function of V2 in a 2-pipe system 0 = No function 1 = Heating requirement 2 = Cooling requirement 3 = Unit alarm	0	0	3	



24 VDC is switched on the digital output V2. The digital output is not a potential-free contact and can only be used when it is wired correspondingly!

11.3.15.3 Valve activation by PWM

Parameters can be used to activate the valve with pulse width modulation (PWM) to be able to set the output at intermediate values with natural convection. PWM activation is not enabled by default.

	Function	Default	Min	Max	Unit
P40	Valve activation by pulse width modulation 0 = Function disabled 1 = Function enabled	0	0	1	
P53	Valve switching cycle	15	10	30	minutes
P101	P-band for valve activation controller via PWM in heating mode	15	0	100	°C/10
P102	P-band for valve activation controller via PWM in cooling mode	15	0	100	°C/10
P103	Adjustment time of PI controller for valve activation via PWM If P103 = 0, a P controller is enabled. Recommended adjustment time when using a PI controller: Adjustment time = 13 minutes	0	0	20	minutes
P104	Minimum switching time for valves in PWM mode	3	0	20	minutes

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.16 Function of multifunctional inputs AI1, AI2, AI3

The function of the multifunctional inputs AI1, AI2 and AI3 can be configured using parameter settings

11.3.16.1 Function of AI1

Parameter P15

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



Parameter P15 can only be used to set the multifunctional input AI1 if the DIP switch no. 6 is set to ON! The setting of the DIP switches is described in section 10.

	Function	Default	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 ext. room temperature sensor/induction sensor 6 = 0..100 kOhm fan control 7 = 0..100 kOhm temperature setpoint 8 = 0..100V BMS heating/cooling controller 9 = 0..100V BMS heating controller 10 = Eco/day mode -----Contact open → day 11 = No function-----Contact open → no function 12 = Condensation alarm -----Contact open → no condensation 13 = Gen. alarm -----Contact open → no alarm 14 = Ext. frost prot. 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 = Gen. alarm -----Contact closed → no alarm 19 = Ext. frost prot. monitor-----Contact closed → no frost	0	0	19	

11.3.16.2 Function of AI2

Parameter P16

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



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

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

11.3.16.3 Function of AI3

Parameter P17

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



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



The multifunctional input AI3 can only process analog signals compared with inputs AI1 and AI2.

	Function	Default	Min	Max	Unit
P17	Function of 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 ext. room temperature sensor/induction sensor 6 = 0..100 kOhm fan control 7 = 0..100 kOhm temperature setpoint 8 = 0..100V BMS heating/cooling controller 9 = 0..100V BMS heating controller	0	0	9	

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.3.17 External control using 0...10 V

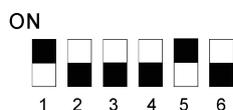
Analog inputs AI2 and AI3 can be used to activate the valves and the EC fan using 0..10 V signals.

The DIP switches must be set as per the diagram for activation using 0...10 V signals.

The control signals 0..10 V should be connected to the analog inputs AI2 and AI3.



DIP switch setting for 2-pipe system activation via 0..10V



DIP switch setting for 4-pipe system activation via 0..10V

2-pipe system:

Heating/cooling 0..10V → Analog input AI2

4-pipe system:

Cooling 0..10V → Analog input AI2

Heating 0..10V → Analog input AI3

Parameter setting to activate Katherm HK via a 0..10 V signal (provided by others)

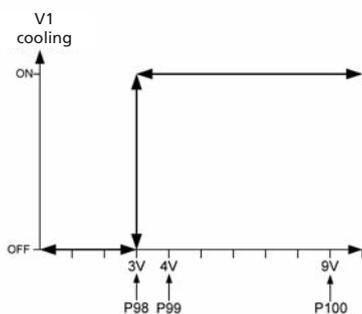
Function of standard setting:

	Function	Default	Min	Max	Unit
P98	Valve switch-on limit value	30	0	100	V/10
P99	Starting point of fan speed (min)	40	0	100	V/10
P100	End point of fan speed (max)	90	0	100	V/10

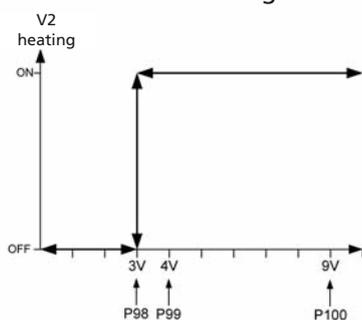
0V...1V Valve CLOSED, fan OFF

1V...2V Valve OPEN, fan OFF

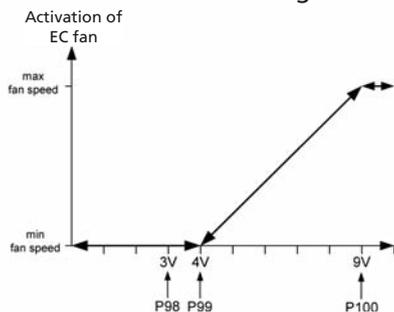
2V...9V Valve OPEN, fan speed 0...100 %



Activation of cooling valve



Activation of heating valve



Valve activation

11.3.18 Locking operating options or functions, parameter 38

Parameter P38 can be used to lock individual operating options or functions.

Parameter P38 must be set, among other things, for

- the ON/OFF, Eco/Day function as described in section 11.3.4
- the Heating/Cooling changeover function in a 2-pipe system as described in section 11.3.7

	Function	Default	Min	Max	Unit
P38	Locking operating options or functions	72	0	255	

Every operating option or function is assigned a defined value.

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

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

Example of locking

- Eco/Day function
- Ventilation-only mode

	Value	
Automatic mode	1	-
Cooling-only mode	2	-
Real-time clock	4	-
Ventilation-only mode	8	8
Heating-only mode	16	-
Automatic fan mode	32	-
Eco/Day function	64	64
Timer programs	128	-
Parameter P38 setting: (example)		72

Example of locking

- Eco/Day function
- Ventilation-only mode
- Cooling-only mode
- Heating-only mode

	Value	
Automatic mode	1	-
Cooling-only mode	2	2
Real-time clock	4	-
Ventilation-only mode	8	8
Heating-only mode	16	16
Automatic fan mode	32	-
Eco/Day function	64	64
Timer programs	128	-
Parameter P38 setting: (example)		90



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

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

11.4 Programming keys

Following parameter setting, the setup can be simply copied to other Katherm HK PCBs using the programming key. Please proceed as follows to copy:

1. Disconnect the Katherm HK PCB that has been connected previously.

Reading parameters

2. Set the DIP switches of the programming key to Read mode (DIP1 = OFF, DIP2 = OFF).

The DIP switches are located underneath the cover!

3. Insert the key into the 4-pin plug on the Katherm HK PCB.
4. Press the button on the programming key.

When the data has been copied successfully, the red LED lights up followed by the green LED.

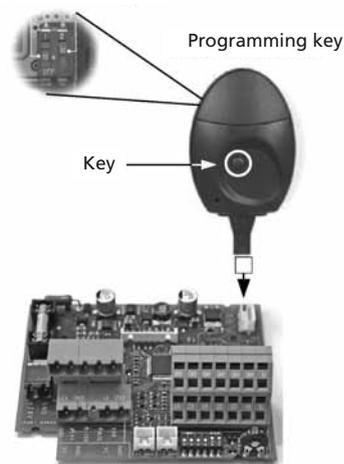
Loading parameters

5. Remove the programming key and set the internal DIP switch on the programming key to Write mode (DIP1 = OFF, DIP2 = ON)
6. Repeat steps 3 and 4 to write the parameters to the new Katherm PCB.

Important:

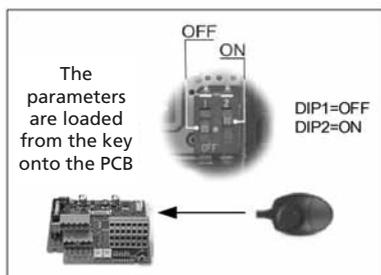
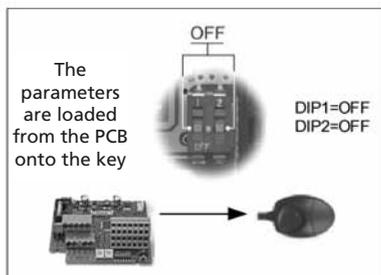
The new Katherm HK PCB also has to be disconnected before writing the parameters.

DIP switch
(below cover)



Important:

Disconnect the Katherm HK KaControl PCB before connecting the programming key!



The programming key is now included and can be ordered separately as an accessory from Kampmann Customer Service.



The software versions (see Parameter P000) of the PCBs must be identical when reading and writing the parameter sets. It is not possible to read the parameters from a PCB with software version "P000 = 10" and then write the parameters to a PCB with software version "P000 = 15", for example.

12. PCB parameter list

The parameters can be called up and adjusted according to the requirements of the system. The procedure for calling up the Service menu is described in section 11.2.

	Function	Default	Min	Max	Unit	Remarks
P000	Software version (read-only)		0	255	-	
P001	Base setpoint for setpoint input ± 3 K	22	8	32	°C	Page 32
P002	Valve switching on/off hysteresis	1	0	255	°C/10	Page 42
P003	Neutral zone in 4-pipe system	3	0	255	°C/10	Page 42
P004	Cooling without fan assistance	0	0	255	°C/10	Page 42
P005	Heating without fan assistance	3	0	255	°C/10	Page 42
P006	ON/OFF fan hysteresis (only in ventilation mode)	5	0	255	°C/10	
P007	Heating P-band	17	0	100	°C/10	Page 42
P008	Cooling P-band	20	0	100	°C/10	Page 42
P009	Offset to base setpoint for setpoint input ± 3 K	3	0	10	°C	
P010	Clip-on sensor: Temperature limit value for activating fan stages 1 and 2 in heating mode	26	0	255	°C	Page 36, 41
P011	Clip-on sensor: Temperature limit value for activating fan stages 3 and 4 in heating mode	28	0	255	°C	Page 36, 41
P012	Clip-on sensor: Temperature limit value for activating fan stage 5 in heating mode	30	0	255	°C	Page 36, 41
P013	Clip-on sensor: Hysteresis for limit temperatures P010, P011, P012, P014	10	0	255	°C/10	
P014	Clip-on sensor: Temperature limit for enabling fan stages in cooling mode	18	0	255	°C	Page 36, 41
P015	Input AI1 function	0	0	19	-	Page 46
P016	Input AI2 function	0	0	19	-	Page 46
P017	Input AI3 function	0	0	9	-	Page 47
P018	Temperature rise of cooling setpoint in Eco mode	30	0	255	°C/10	Page 34
P019	Temperature drop of heating setpoint in Eco mode	30	0	255	°C/10	Page 34
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 of manual fan operation	0	0	255	minutes	Page 39

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

	Function	Default	Min	Max	Unit	Remarks
P028	Flushing function: fan stage during flushing function	2	1	5	-	
P029	Activation of continuous fan operation	0	0	1	-	Page 39
P030	Default value must be set	12	0	255	°C	
P031	Default value must be set	27	0	255	°C	
P032	Flushing function: maximum fan idle time	15	0	255	min	
P033	Flushing function: duration of flushing function	240	0	255	s	
P034	Flushing function: activation in operating modes 0 = Flushing function: disabled 1 = Flushing function enabled in: - Cooling mode - Automatic mode 2 = Flushing function enabled in: - Heating mode - Automatic mode 3 = Flushing function 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 ± 3 K	0	0	1	-	Page 32
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 32
P038	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)	72	0	255	-	Page 33, 35, 49
P039	Digital output V2: 0 = No function 1 = Heating requirement 2 = Cooling requirement 3 = Unit alarm	0	0	3	-	Page 45
P040	Valve activation by pulse width modulation 0 = Function is disabled 1 = Function is eabled	0	0	1	-	Page 45
P041	Adjustment time of PI controller to activate the fan in automatic fan mode If P41 = 0, a P-controller is enabled. Recommended adjustment time when using a PI controller: adjustment time= 13 minutes	0	0	20	min	Page 42

	Function	Default	Min	Max	Unit	Remarks
P042	Fan setting: locking and enabling fan stages	0	0	127	-	Page 40
P043	Digital input DI1	5	0	14	-	Page 43
P044	Digital input DI2	0	0	14	-	Page 43
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	90	%	Page 26, 38
P052	Fan setting: Speed limit 0 = Fan speed limit is enabled in automatic fan mode and in manual fan mode 1 = Fan speed limit is only enabled in automatic fan mode	0	0	1	-	Page 39
P053	Valve control by pulse width modulation of valve switching cycle	15	10	30	Min	Page 45
P055	Display of heating/cooling symbols: in automatic mode 0 = Heating/cooling symbols in automatic mode disabled 1 = Heating/cooling symbols in automatic mode enabled	1	0	1	-	Page 41
P056	DI2 setting: when DIP4 = ON 0 = Contact closed → Heating Contact open → Cooling 1 = Contact closed → Cooling Contact open → Heating	1	0	1	-	Page 43, 44
P057	Setpoint setting to the value of P01 after switching of Eco/Tag or ON/OFF: 0 = Function is disabled 1 = Function is enabled	0	0	1	-	Page 34
P058	Sensor calibration: sensor AI1					
P061	Sensor calibration: sensor in KaController					
P062	Sensor calibration: sensor AI2					
P064	Sensor calibration: sensor AI3					
P093	Default value must be set					
P094	Default value must be set					
P095	Default value must be set					

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

	Function	Default	Min	Max	Unit	Remarks
P097	<p>Reading of DIP switches (read-only): Display of DIP switch settings as a decimal figure. The decimal figure must be converted into a binary code: For example, display: 37 (decimal) Conversion: 100101 (binary) Dip switch setting: DIP1 = ON DIP2 = OFF DIP3 = OFF DIP4 = ON DIP5 = OFF DIP6 = ON</p>	--	0	63	-	
P098	0..10V activation: valve switching-on limit	30	0	100	V/10	Page 48
P099	0..10V activation: minimum fan speed switching on limit	40	0	100	V/10	Page 48
P100	0..10V activation: maximum fan speed switching on limit	90	0	100	V/10	Page 48
P101	Valve activation by pulse width modulation of P-band in heating mode	15	0	100	°C/10	Page 45
P102	Valve activation by pulse width modulation of P-band in cooling mode	15	0	100	°C/10	
P103	<p>Valve activation by pulse width modulation of adjustment time of PI controller</p> <p>If P103=0, a P-controller is enabled.</p> <p>Recommended adjustment time when using a PI controller: adjustment time= 13 minutes</p>	0	0	20	min	Page 45
P104	<p>Valve activation by pulse width modulation</p> <p>Minimum switching on time for values in PWM mode</p>	3	0	20	min	Page 45
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	Functional keys: locking and releasing	0	0	7	-	Page 33

13. Functional testing of connected assemblies

The KaController provides the option of testing the functions of external devices connected independently of the software application. The function of individual assemblies, such as the EC fan, can be directly enabled, checked and tested by means of settings on the KaController.



The functional check of the assemblies connected is called up and performed using the following operating steps:

1. Switch off the Katherm HK by:
 - Pressing the ON/OFF key
 - or
 - Pressing the dial for a minimum of 5 seconds
 - or
 - Turning the dial to the left until OFF is displayed.
2. Calling up the parameter menu by pressing the dial for at least 10 seconds. The display shows the sequence "Para" followed by "CODE" showing the value 000.
3. Turn the dial and select the password (Code) **77** and confirm by pressing the dial.
4. The display shows "L01" and the functional test of the connected assemblies can start.

Important note:

Pressing the dial calls up the individual test stages. At the end of the test (L08), the default view is automatically displayed showing OFF.

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	--	Rising activation of fan 0V → 10V
L07	Valve output 1	--	Output V1 enabled
L08	Valve output 2	--	Output V2 enabled

*The control automatically identifies the necessary sensors at the analog inputs AI1-AI3 via the setting of the DIP-switches. If sensors are defective or not connected the malfunction is shown by flashing of the respective display (L01-L03).



Note any locked hardware components during the functional check (refer to the relevant wiring diagram).

1.43 Katherm HK

KaControl for Katherm HK

INSTALLATION AND OPERATING MANUAL

14. KaController parameters

14.1 General

Parameter settings in the KaController can be used to enable or disable specific user requirements, for instance users can set minimum and maximum setpoint temperatures on the KaController.

14.2 Calling up the parameter menu

The parameters can be set using the following operating steps:

1. Switch off the Katherm HK by:
 - Pressing the ON/OFF key
 - or
 - Pressing the dial for a minimum of 5 seconds
 - or
 - Turning the dial to the left until OFF is displayed.
2. Call up the parameter menu by pressing the dial for at least 10 seconds. The display shows the sequence "Para" followed by "CODE" showing the value 000.
3. Turn the dial and select the password (Code) 11 and confirm by pressing the dial. You are now in the KaController's parameter menu.
4. You can now set the parameters using the dial.

Setting parameters:

- Select the parameter by turning the dial.
- Call up Edit mode by pressing the dial.
- Set the value you require by turning the dial.
- Save the new value by pressing the dial.

There are 3 options for exiting the Parameter menu and calling up the default screen:

- Do not touch the dial for longer than 2 minutes.
- Hold down the dial for a minimum of 5 seconds.
- Turn the dial to select "ESC" on the display and confirm the selection by pressing the dial.



14.3 KaController parameter list

	Function	Default	Min	Max	Unit	Remarks
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	Operation of background lighting 0 = Slow glow, fast fade 1 = Slow glow, slow fade 2 = Fast glow, fast fade	0	0	2	-	
t004	Strong background lighting	4	0	5	-	
t005	Sensor calibration of sensor in KaController	0	-60	60	°C	
t006	Contrast on LCD display	15	0	15	-	
t007	BEEP setting 0 = BEEP ON 1 = BEEP Off	0	0	1	-	
t008	Password for KaController parameter menu	11	0	999	-	
t009	Minimum settable setpoint temperature	8	0	20	°C	
t010	Maximum settable setpoint temperatura	35	10	40	°C	
t011	Setpoint setting increment 0 = Automatic setting according to PCB (parameterisable, freely programmable) 1 = 1 °C increment (parameterisable boards) 2 = 0.5 °C increment (freely programable boards)	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 month	1	1	31	-	
t015	Date/time setting: day	1	1	7	-	
t016	Date/time setting: hour	0	0	23	-	
t017	Date/time setting: minute	0	0	59	-	



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