WOLF

Installation and operating instructions WRS-K

Air conditioning and ventilation module KLM
Programming module BMK
Remote control unit BMK-F
(Translation of the original)

Valid for software version 3.0.000 or higher.

Index

1. Documentation information

1.1 Other applicable documents

Operating instructions for the KLM air conditioning and ventilation module and BMK programming module.

The instructions for all accessory modules and further accessories may also apply.

1.2 Safekeeping of these documents

The system operator or user should ensure the safekeeping of all instruction manuals.

→ Pass on these operating instructions as well as all other applicable manuals.

1.3 Symbols and warnings

The following symbols are used in conjunction with these important instructions concerning personal safety, as well as operational reliability.

"Safety instructions" are instructions with which you must comply exactly, to prevent risks and injuries to individuals and material losses.

Danger through 'live' electrical components!
NB: Switch OFF the ON / OFF switch before removing the casing.

Never touch electrical components or contacts when the ON / OFF switch is in the ON position! This results in a risk of electrocution that may lead to injury or death.

The supply terminals are 'live' even when the ON / OFF switch is in the OFF position.
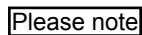
Please note | "Please note" indicates technical instructions that you must observe to prevent material losses and boiler malfunctions.

Warning structure

You will recognise warnings in this manual by a pictogram with a line above and below respectively. These warnings are structured according to the following principle:

Signal word
Type and source of the risk.
Explanation of the risk.
→ Action to prevent the risk.

1.4 Applicability of these instructions

These operating instructions apply to the Wolf KLM air conditioning and ventilation module, to the BMK programming module and to the BMK-F remote control.

The boiler and control accessories comply with the following regulations:

EC Directives
- 2006/95/EC Low Voltage Directive
- 2004/108/EC EMC Directive

EN Standards
- EN 55014-1 Emissions
- EN 55014-2 Immunity
- EN 55022 Radio disturbance characteristics
- EN 55024 Immunity characteristics
- EN 60730-1 Automatic electrical controls for household and similar use
- EN 60730-2-9 Particular requirements for temperature sensing controls
- EN 61000-6-1 Immunity for residential, commercial and light-industrial environment
- EN 61000-6-2 Immunity for industrial environments
- EN 61000-6-3 EMC Emission standard for residential, commercial and light-industrial environments
- EN 61000-6-4 Emission standard for industrial environments
- EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use

2.1 Installation / commissioning

- According to DIN EN 50110-1, only qualified electricians may carry out the installation and commissioning of the air conditioning control unit and connected accessories.
- Observe all regulations stipulated by your local power supply utility and all VDE or local regulations.
- DIN VDE 0100 regulations regarding the installation of high voltage systems up to 1000 V.
- DIN VDE 0105-100 Operation of electrical systems.

Please note | Where the system is not commissioned by Wolf, check all inputs and outputs for correct wiring and function. For example:

- Frost protection
- Fan rotational direction
- Outside air dampers rotational direction
- Plausibility of sensor values
- Checking motor currents
- Overload relay (thermal contacts / cold conductor)
- Air flow monitor
- Filter monitor
- Heat recovery dampers (rotational direction)
- Mixer air dampers (rotational direction)
- Actuators, heating / cooling
- Heating circuit pump / cooling circuit pump
- As well as all other system-specific functions

The Wolf warranty will be void if the function test is not carried out correctly.

2.2 Warnings

- Never remove, bypass or disable safety and monitoring equipment.
- Only operate the system in perfect technical condition. Immediately remove / remedy any faults and damage that may impact on safety.

2.3 Service / repair Please note - Regularly check the perfect function of all electrical equipment.
- Only qualified personnel may remove faults or repair damage.
- Only replace faulty components or equipment with original Wolf spare parts.
- Maintain specified fuse rating (see specification).
If technical modifications are carried out on Wolf control units, Wolf will not be liable for any consequential losses that may occur as a result.

2.4 Disposal For the disposal of faulty system components or the system and recycling at the end of the product service life, observe the following information: Dispose of all equipment in accordance with applicable regulations, i.e. separate material groups correctly. The aim should be the maximum possible recycling of basic materials with the least environmental impact. Never throw electrical or electronic scrap into the household waste, but recycle it appropriately.

Generally, dispose of materials in the most environmentally responsible manner according to environmental, recycling and disposal standards.

The air conditioning and ventilation module KLM is designed for the control of air conditioning and ventilation systems.

The controller is matched to the system at the factory.

The air conditioning programming module BMK is designed to display and operate the KLM-M or KLM-L air conditioning and ventilation modules. The BMK is available for mounting into the front of control panel doors (part no. 2744742) and for wall mounting (part no. 2744743).
Up to 2 programming modules can be connected to one controller.

The BMK- F remote control (part no. 2744751) is designed to start / stop the system and to adjust the fan speed, temperature and the fresh air proportion. Furthermore, an extension to the time in use and peak ventilation may be activated. System faults are displayed at the programming module.

3.1 KLM assignment

Air conditioning and ventilation module KLM
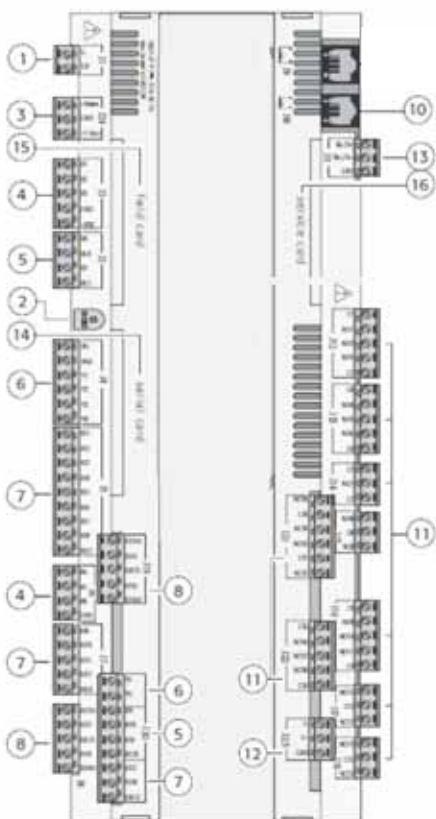
Key:
1. Supply plug [G (+), G0 (-)]
2. Yellow supply LED and 3 LEDs for the local pLAN network
3. Additional supply for programming module and ratio-metric 0...5 V sensor
4. Universal analogue inputs (NTC-, 0...1 V-, 0...5 V, 0...10 V-, 0...20 mA-, 4...20 mA-)
5. Passive analogue inputs (NTC-, PT1000)
6. Analogue outputs (0...10 V-)
7. Digital inputs (24 VAC / VDC-)
8. Digital inputs (230 VAC- or 24 VAC / VDC-)
10. Plug-in connection for BMK programming module
11. Digital relay outputs
12. Plug-in connection for connecting the KLM-E extension module
13. pLAN plug-in connector
14. Flap to insert the optional interface module (BACnet-, LON-, Modbus- oder Ethernet-interface)
16. Flap to insert the optional service module (memory extension)

4.1 Wall mounted installation

To mount the programming module on the wall, proceed as follows:

1. Mount the wall mounting base on the wall using screws (A).

2. Install the cable and secure using the strain relief (B) supplied.

3. Guide the ends of the cable through aperture (C) in the back panel of the programming module.

4. Secure the back panel to the wall mounting base using screws (D).

5. Connect the cable as follows:

```
  ⊘   ⊘    ⊘    ⊘
  -  +  GND VL
```
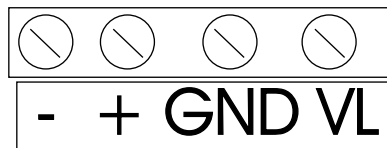
VL / GND	+	-
Supply voltage via KLM controller (see wiring diagram)	Databus (pLAN) Tx+/Rx+	Databus (pLAN) Tx-/Rx-

6. Secure the programming module to the back panel using screws (E).

7. Fit the cover (F; clicks into place).
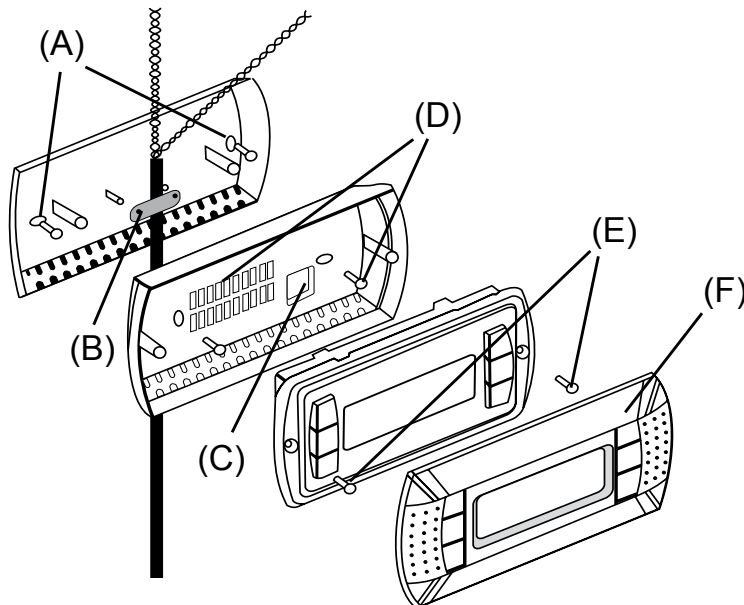
The BMK programming module has 6 function keys:

(1) Displaying and acknowledging active fault messages

(2) Displaying the system operating data (set / actual values)

(3) Access to the main menu

(4) Forward scrolling within a menu and increasing values

(5) Switching the system on and off, selecting menu points, confirming inputs

(6) Backwards scrolling within a menu and reducing values
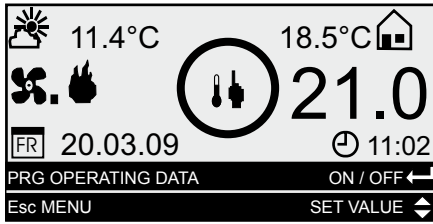
Here, the current operating mode is indicated.

Manual mode
The system runs with the set values that are pre-defined via the programming module for manual mode. In the case of an additional BMS connection, the set values can be matched via offsets.

7-day program
The system runs with the times and set values that are pre-defined in the 7-day program. In the case of an additional BMS connection, the set values can be matched via offsets.

BMS mode
The system runs with the set values that are pre-defined via the BMS. The system is started and shut down via the BMS.
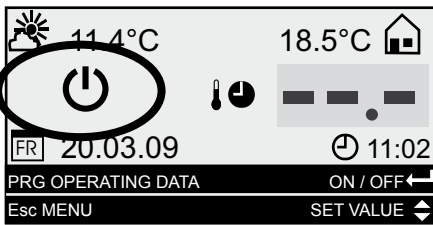
Here, the current system status is indicated.

Standby
System shut down via enter key on the BMK. Only safety functions, such as frost protection, weather-compensated heating circuit pump start and anti-seizing protection are still active.

Off via remote control
System shut down via remote control.
All special functions (night ventilation, backup mode heating / cooling, holiday program, ext. utilisation time, air quality control, hygrostat function) as well as all safety functions are active.

Off via external enabling
System shut down via external enabling.
Only safety functions, such as frost protection, weather-compensated heating circuit pump start and anti-seizing protection are still active.
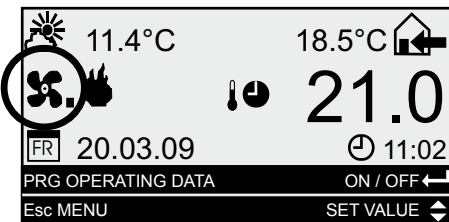
Here, the current speed or fan stage is displayed.

Stepped fan runs with stage 1

Stepped fan runs with stage 2

Stepped fan runs with stage 3

Variable speed fan

```
☀ 11.4°C        18.5°C🏠
❄🔥         ↕↓    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF↵
Esc MENU                SET VALUE ⬍
```
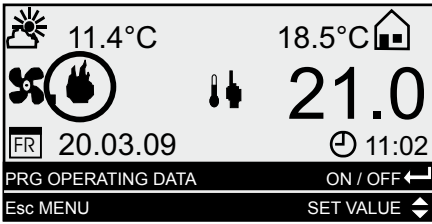
Here, the current operating mode is indicated.

🔥   Enable operating mode, heating

❄   Enable operating mode, cooling

```
☀ 11.4°C        18.5°C🏠←
❄🔥         ↕●    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF↵
Esc MENU                SET VALUE ⬍
```
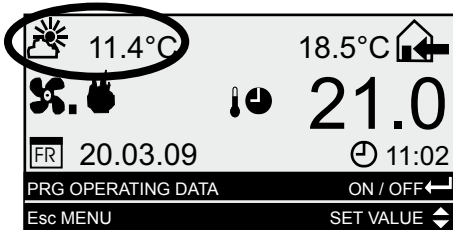
Here, the current outside temperature is indicated.

```
☀ 11.4°C        18.5°C🏠
❄🔥         ↕↓    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF↵
Esc MENU                SET VALUE ⬍
```
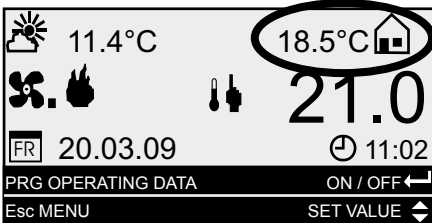
Here, the current control variable is indicated.

Subject to the type of control, either the current room temperature (room ventilation air cascade), the ventilation air temperature (ventilation air control) or the extract air temperature (extract air / ventilation air cascade) are displayed.

🏠   Room temperature

🏠←   Ventilation air temperature

🏠→   Extract air temperature

```
☀ 11.4°C        18.5°C🏠←
❄🔥         ↕●    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF↵
Esc MENU                SET VALUE ⬍
```

Here, the current set temperature is indicated.

```
☀ 11.4°C        18.5°C🏠←
❄🔥         ↕●    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF
Esc MENU                SET VALUE ⬍
```

Here, the current time is indicated.

```
☀ 11.4°C        18.5°C🏠←
❄🔥         ↕●    21.0
FR 20.03.09          ⏰ 11:02
PRG OPERATING DATA      ON / OFF↵
Esc MENU                SET VALUE ⬍
```

Here, the current day and date are indicated.

7.1. Menu structure, operating level 1

Only those menu points are shown that are relevant to the system concerned.

Standard mask

Prg   Esc

Operating data
Extract air/ set room temerature
Set temp. set value transducer
Room temperature
Extract air temp
Set temp, vent. air
Vent. air temperature
Set value room/ extract air humidity
Set value, vent air rh
Rel. humidity (room)
Rel. hum., extract air
Rel. hum., vent. air
Pressure
Flow rate
Proportion fresh air

Main menu
Standard settings
Displays
Time functions
Heating contractor

See page 20

Password 1234

Standard settings
Temperature manual mode
Fan stage/ enable manual mode
Fan speed manual mode
Pressure manual mode
Flow rate manual mode
Fresh air manual mode
Speed for ext. demand
Pressure for ext. demand
Flow rate für ext. demand
Automatic start via external demand YES/NO
Set value, humidity
7-day programm YES/NO
Backup mode, heating YES/NO
Bachup mode, cooling YES/NO
Mixed air damper operating mode
Natural coolin YES/NO
Night ventilation YES/NO
Ext. utilisation time YES/NO
Peak ventilation YES/NO
Air quality control YES/NO
Air quality control YES/NO
Hygrostat function YES/NO
Continuous hygrostat function YES/NO

Displays
Sensors
Components
Hours run
Other...

Time functions
7-day program
Day program
Set values
Holiday program
Date / time

Sensors
Room temperature
Rel. humidity (room)
Vent. air temperature
Rel. hum., vent air
Extract air temp
Rel. hum., extract air
Outside temperature
Icing-up sensor
Outside temperature, day
Outside temperature, total
Air quality
Air pressure
Flow rate
Set value transducer

Components
Fan stage
Fan speed
Pump, heating circuit
Heating water valve
Pump, cooling circuit
Cold water valve
Heat pump
Electric heater bank
Direct evaporator
Mixer air damper
Heat recovery
Humidifier
Ext. enabling
KGWO
No reheater bank

Hours run
Total system
Fans
Heating water pump
Cold water pump
Direct evaporator
Electric heater bank
Heat pump
No reheater bank
Last filter test

Others
Software version
System configuration
Language selection

7.2 Operating data

Pressing **Prg** leads to the operating data, where pressing ↑↓ displays the following set and actual system values in sequence.

Overview:
→ Extract air / set room temperature
→ Set temp. set value transducer
→ Room temperature
→ Extract air temp
→ Set temp, vent. air
→ Vent. air temperature
→ Set value room / extract air humidity
→ Set value, vent air rh
→ Rel. humidity (room)
→ Rel. hum., extract air
→ Rel. hum., vent. air
→ Pressure
→ Flow rate
→ Proportion fresh air

7.3 Main menu

```
          Main menus

  Standard settings
 ▲Display                        ↵
  Time functions
  Heating contractor
 Esc BACK    ↵ SELECTION  DISPLAY ▲▼
```
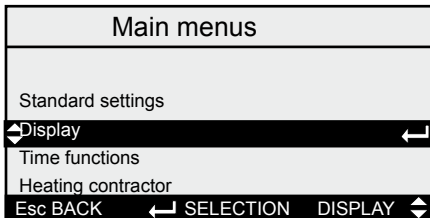
By pressing **Esc** you reach the main menu. There, by pressing ↑↓ you select from the menu points displayed in the overview. After selecting the required menu point, you enter the required sub-menu by pressing ↵. Pressing **Esc** returns you to the standard display. If no adjustment is made for more than 2 minutes, the standard display will return automatically.

Overview:

→ Standard settings
→ Display
→ Time functions
→ Heating contractor

Standard settings

Standard mask ⬚Esc⟩ **Main menu** ⬚↵⟩ **Standard settings**

The most fundamental functions of the air conditioning system, such as 7-day program, backup mode, night ventilation and natural cooling can be enabled or disabled here. Furthermore, the set temperature and the fan speed as well as the fresh air proportion for manual mode are determined in the standard settings.

Pressing ↑↓ enables you to select the following standard settings in sequence.

Set temp value for manual mode

```
 STANDARD SETTING         GE-01

  Set temp value for
  manual mode

 ▮         ▮ 21.0°C

 Esc BACK    ↵ SELECTION  DISPLAY ▲▼
```
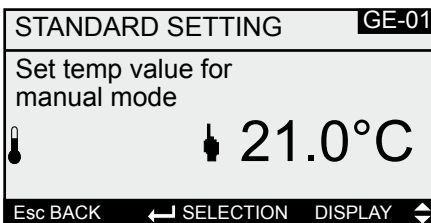
Pressing ↵ highlights the temperature that can then be changed with ↑↓ in steps of 0.5 °C. Finally confirm the selected value with ↵.

⬚Please note⬚ The selected set temperature only applies in manual mode.

Fan stage / fan enable for manual mode

```
 STANDARD SETTING         GE-02

  Fan, manual mode

 �.¹    < OFF >

 Esc BACK    ↵ SELECTION  DISPLAY ▲▼
```
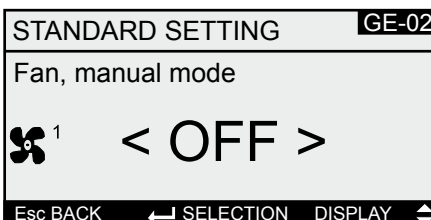
Pressing ↵ changes the fan stage for stepped fans; for variable speed fans the fan will be enabled or disabled.

⬚Please note⬚ The selected value only applies in manual mode.

Fan speed for manual mode

```
STANDARD SETTING        GE-03
Vent. air speed
for manual mode
✹ ¹              ♦020%

Esc BACK    ↵ SELECTION  DISPLAY  ↕
```
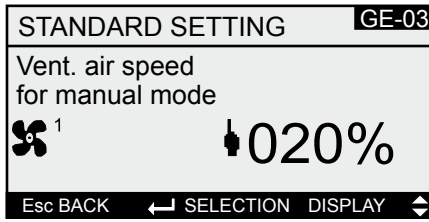
Pressing ↵ highlights the fan speed that can then be changed with ↑↓ in steps of 0.1%. Finally confirm the selected value with ↵.

For ventilation systems, the pressure figures for ventilation and extract air are changed separately.

Please note The selected fan speed only applies in manual mode.

Pressure for manual mode
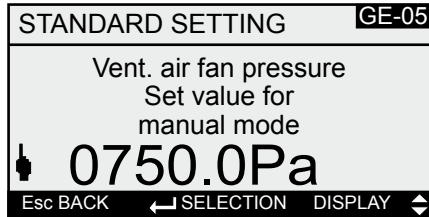
```
STANDARD SETTING        GE-05
      Vent. air fan pressure
         Set value for
         manual mode
♦  0750.0Pa

Esc BACK    ↵ SELECTION  DISPLAY  ↕
```

Pressing ↵ highlights the set pressure that can then be changed with ↑↓. Finally confirm the selected value with ↵.

For ventilation systems, the fan pressure for ventilation and extract air are changed separately.

Please note The selected set pressure only applies in manual mode.

Flow rate for manual mode

```
STANDARD SETTING        GE-07
       Vent. air flow rate
         Set value for
         manual mode
♦  001500m³/h

Esc BACK    ↵ SELECTION  DISPLAY  ↕
```

Pressing ↵ highlights the set flow rate that can then be changed with ↑↓. Finally confirm the selected value with ↵.

For ventilation systems, the set flow rates for ventilation and extract air are changed separately.

Please note The selected set flow rate only applies in manual mode.

Fresh air proportion for manual mode

```
STANDARD SETTING        GE-09
       Prop. fresh air
       for manual mode
☀       ♦
                   060%

Esc BACK    ↵SELECTION   DISPLAY  ↕
```

Pressing ↵ highlights the fresh air proportion that can then be adjusted in steps with the ↑↓ keys. Finally confirm the selected value with ↵.

Please note The selected set fresh air proportion only applies to manual mode.

Speed for external demand

```
STANDARD SETTING        GE-10
Vent. air speed for        ⌐
external demand             |
      Stage 3:    100.0%
      Stage 2:    060.0%
      Stage 1:    030.0%
Esc BACK    ↵SELECTION   DISPLAY  ↕
```
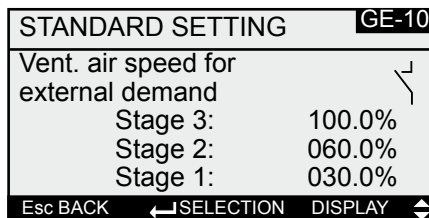
Pressing ↵ highlights the speed that can then be changed with ↑↓. Finally confirm the selected value with ↵.

For ventilation systems, the speeds for ventilation and extract air for external demand are changed separately.

Pressure for external demand
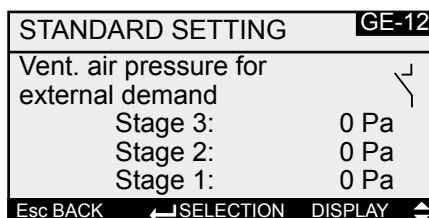
```
STANDARD SETTING        GE-12
Vent. air pressure for     ⌐
external demand             |
      Stage 3:      0 Pa
      Stage 2:      0 Pa
      Stage 1:      0 Pa
Esc BACK    ↵SELECTION   DISPLAY  ↕
```

Pressing ↵ highlights the set pressure that can then be changed with ↑↓. Finally confirm the selected value with ↵.

For ventilation systems, the pressures for ventilation and extract air for external demand are changed separately.

Flow rate for external demand

```
STANDARD SETTING              GE-14
Flow rate vent. air for
external demand
        Stage 3:      0 m³/h
        Stage 2:      0 m³/h
        Stage 1:      0 m³/h
 Esc BACK    ↵ SELECTION   DISPLAY  ◆
```
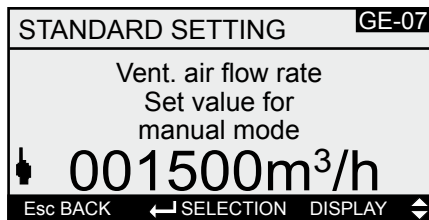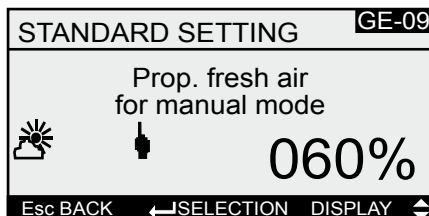
Pressing ↵ highlights the flow rate that can then be changed with ↑↓.
Finally confirm the selected value with ↵.

For ventilation systems, the flow rates for ventilation and extract air for external demand are changed separately.

Automatic start via external demand

```
STANDARD SETTING              GE-30

Automatic start via external demand

        ☑   (YES)


 Esc ZURÜCK  ↵ AUSWAHL    ANZEIGEN ◆
```

Pressing ↵ enables the functionality of the external stage demand to be defined. If this parameter is set to "Yes", the system will start even if a demand falls outside the period defined by the 7-day program.
If this parameter is set to "No", the stage demand only becomes active during the operating hours.

Set humidity level

```
STANDARD SETTING              GE-16

Set value, vent air rh

        50% r.h.

 Esc BACK    ↵ SELECTION   DISPLAY  ◆
```

Pressing ↵ highlights the set humidity level that can then be changed with ↑↓.
Finally confirm the selected value with ↵.

7-day program operating mode

```
STANDARD SETTING              GE-18


 🕐   7-day program active


 Esc BACK    ↵ SELECTION   DISPLAY  ◆
```

Pressing the ↵ button highlights the operating mode, which can then be adjusted with the ↑↓ buttons.

Please note The 7-day program is activated at the factory.

**Enabling / disabling
backup mode, heating**

```
STANDARD SETTING              GE-19
Backup mode,
heating active
        ☑   (YES)

 Esc BACK    ↵ SELECTION   DISPLAY  ◆
```

Pressing ↵ enables the backup mode, heating to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Backup mode**.

**Enabling / disabling
backup mode, cooling**

```
STANDARD SETTING              GE-20
Backup mode,
cooling active
        ☑   (YES)

 Esc BACK    ↵ SELECTION   DISPLAY  ◆
```

Pressing ↵ enables the backup mode, cooling to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Backup mode**.

Mixer air dampers operating mode

STANDARD SETTING	GE-21
Fresh air damper	
Fresh air mode	
Fixed prop. fresh air	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the selection of the mixing air damper operating mode. For adjustment options and changes, see chapter **Air dampers**.

Enabling / disabling natural cooling

STANDARD SETTING	GE-22
Natural cooling	
Cooling active	
☑ (YES)	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the natural cooling to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Temperature control**.

Enabling / disabling night ventilation

STANDARD SETTING	GE-23
Night vent. active	
☐ (NO)	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the night ventilation function to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Night ventilation**.

Extension of utilisation time

STANDARD SETTING	GE-24
Ext. utilisation time	
☑ (YES)	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the extension of utilisation time to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Extension of utilisation time**.

Peak ventilation

STANDARD SETTING	GE-25
Peak ventilation	
☑ (YES)	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the peak ventilation to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Peak ventilation**.

Air quality control

STANDARD SETTING	GE-26
Air quality control	
active	
☐ (NO)	
Esc BACK ↵SELECTION DISPLAY ◆	

Pressing ↵ enables the air quality control to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Air quality control**.

Hygrostat function

```
STANDARD SETTING          GE-27

Hygrostat function
active
        □ (NO)

Esc BACK   ↵ SELECTION   DISPLAY  ↕
```
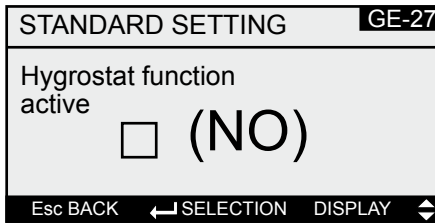
Pressing ↵ enables the hygrostat function to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Humidity control**.

Continuous hygrostat function

```
STANDARD SETTING          GE-28

Hygrostat function
continuous active
        □ (NO)

Esc BACK   ↵ SELECTION   DISPLAY  ↕
```
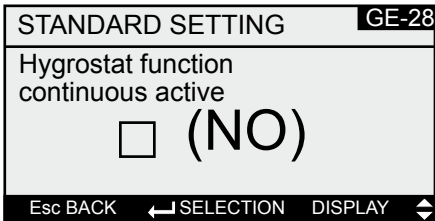
Pressing ↵ enables the continuous hygrostat function to be enabled or, by pressing again, to be disabled. For adjustment options and changes, see chapter **Humidity control**.

Displays

```
      Menus - Displays

  Sensors
↕ Components                    ↵
  Hours run
  Other...
Esc BACK   ↵ SELECTION   DISPLAY  ↕
```
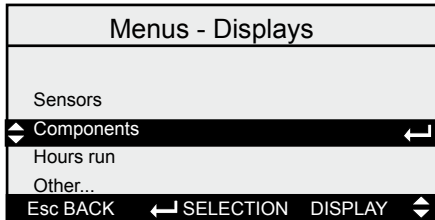
Standard mask Esc⟩ Main menu ↵⟩ Displays

All available sensors and components are displayed.
In addition, the software version and the system configuration can be called up; the menu language can also be changed.

Pressing ↑↓ enables selection between the overview of the illustrated menu points. After selecting the menu point required, pressing ↵ leads you to the selected sub-menu.

Overview:

→ **Sensors**
→ **Components**
→ **Hours run**
→ **Other…**

Sensors

```
Displays                  AS-01

      Room temperature

🌡🏠    18.0°C

Esc BACK   ↵ SELECTION   DISPLAY  ↕
```
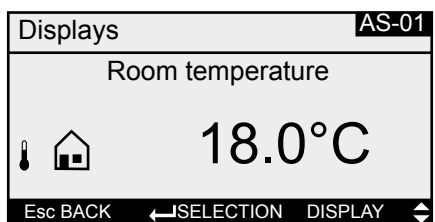
Pressing ↑↓ enables the display in sequence of the actual values of connected sensors.

Overview:

→ Room temperature   → Icing-up sensor
→ Rel. humidity (room)   → Outside temperature, day
→ Vent. air temperature   → Outside temperature, total
→ Rel. hum., vent. air   → Air quality
→ Extract air temp   → Air pressure
→ Rel. hum., extract air   → Flow rate
→ Outside temperature   → Set value transducer

Components

```
Displays                  AK-01

        Fan stage

🌀¹     < OFF >

              ↵           ↕
```
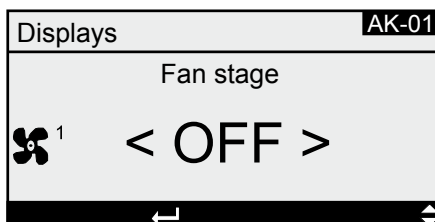
Pressing ↑↓ enables the display in sequence of the current status, subject to the connected components.

Overview:

→ Fan stage   → Mixer air damper
→ Fan speed   → Heat recovery
→ Pump, heating circuit   → Humidifier
→ Heating water valve   → Ext. enabling
→ Pump, cooling circuit
→ Cold water valve
→ Electric heater bank
→ Direct evaporator

Hours run

```
Displays                          AB-01

              Hours run

System                    0 h
Fan                       0 h

  Esc BACK    ↵SELECTION  DISPLAY  ⬍
```

Pressing ↑↓ shows in sequence the hours run by the installed components.

→   Total system
→   Fans
→   Heating water pump
→   Cold water pump
→   Direct evaporator
→   Electric heater bank
→   Heat pump
→   No reheater bank
→   Last filter test

Others

Pressing ↑↓ shows in sequence first the software version and then the system configuration.

```
Displays                          AI-01

Software:      KG Control
Version:       3.0.000
Date:          06.10.2011


 Esc ZURÜCK  ↵ AUSWAHL   ANZEIGEN ⬍
```

Once the language selection menu point is selected, the relevant language can be highlighted by pressing the key. The key enables the selection of the required language, which is adopted by pressing the key again.

Time functions

```
           Time functions

   7-day program
   Day program
 ⬍ Set values                      ↵
   Holiday program
   Date / time
  Esc BACK    ↵ SELECTION  DISPLAY ⬍
```

Standard mask ⌨Esc⟩ **Main menu** ⌨↵⟩ **Time function**

This is where settings are made regarding the time-controlled operation, date and time.

Pressing ↑↓ enables selection between the overview of the illustrated menu points. After selecting the menu point required, pressing ↵ leads you to the selected sub-menu.

Overview:

→   7-day program
→   Day program
→   Set values
→   Holiday program
→   Date / time

7-day program

```
   Program overview              WP-01


Mon Tue Wed Thu Fri  Sat  Sun
P1  P1  P1  P1  P1   P1   P1



  Esc BACK    ↵ SELECTION  DISPLAY ⬍
```

Individual programs are assigned to the individual days of the week via the 7-day program. If no program is assigned to a specific day of the week, then the system will remain switched off for the whole day.

Pressing ↵ highlights Monday to which one of the 4 day programs (P1 - P4) can be assigned with ↑↓. If the system should remain off on that day, select "--". Further pressing of ↵ enables a day program to be assigned to the next day in the week as described above. Once all settings or changes have been made, terminate the process by pressing **Esc**. The cursor then returns into its home position (top l.h. corner). One more push of **Esc** exits the 7-day program.

Day programs

```
        Day program 1            TP-01
                          %  !  ☀
  06:00   18:00            _  目  □
  00:00   00:00
  00:00   00:00
  00:00   00:00
  00:00   00:00
```

Example

```
        Day program 1            TP-01
                          %  !  ☀
  06:00   18:00            _  目  □
  12:00   12:30               目  □
  00:00   00:00
  00:00   00:00
  00:00   00:00
```

Set values

```
      Set values, time prog
          Temperatures
  目 21.7°C          目  20.0°C
  □ 18.5°C          _  16.0°C
  目 = Set room transducer
  Esc BACK    ↵ SELECTION  DISPLAY  ⬍
```

Holiday program

```
  Holiday program            UR-01
  Holiday time 1
  Start:        00:00      00:00
  End:          00:00      00:00
  !□           ☀_          %_
  Esc BACK    ↵ SELECTION  DISPLAY  ⬍
```

Date / time

```
        Time function
          Date / time
  📅
  1🕐  dd.mm.yy        hh:mm
      18  02  09      11  48

  Esc BACK    ↵ SELECTION  DISPLAY  ⬍
```

In all, there are 4 adjustable day programs available (factory setting: T1 = 6 - 18 h / T2 = 6 - 14 h / T3 = 11 - 14 h and 17 - 22 h / T4 = 0 - 23:59 h). A day program can be split into a max. of 5 day sections, to each of which a start and end time (resolution 1 min) can be assigned. The 5 day sections can also overlap (see example), i.e. if one time lies in two or more sections, the set values of the lower section take priority. 4 adjustable values (bars) respectively can be defined as set values, fan stage or speed, temperature and fresh air rate.

Example:
With this setting, the system will run from 06:00 h until 12:00 h with the settings of day section 1. From 12:00 h to 12:30 h with the settings of day section 2 and from 12:30 h until 18:00 h with the settings of section 1 again.

Pressing ↑↓ shows in sequence the 4 day programs. Pressing ↵ highlights the start time (hours) of the first day section of the selected day program. Pressing ↑↓ enables you to set the required value. Confirm the selected value with ↵. At that time, the cursor jumps to the start time (min), to which you assign the required value as described above. As a next step, set the end time in the same manner. Once both times have been defined, the set fan speed, the set temperature and the set fresh air proportion (if mixer air dampers are installed) should be set using the bars. You can cancel any time by pressing *Esc*. In that case, the cursor returns to the home position where you can either change the day program or exit the day program by pressing *Esc*.

This is where the set values for temperature, fan speed, pressure, Flow rate and fresh air proportion are assigned to the bars used in the day programs.

Pressing ↑↓ enables the selection of which control variable should be assigned to the set value.
Pressing ↵ again shows in sequence the four stages of the control variable. With ↑↓, a specific set value can be assigned to the highlighted stages. You can cancel by pressing *Esc*. In that case, the cursor returns to the home position (l.h. top corner) where you can exit the menu by pressing *Esc* again.

Please note
If a set value transducer is fitted, it will only be active if bars are activated in day program 4.

In the holiday program, 5 fixed periods (comprising a date and time) can be defined. Corresponding set values can be assigned to these periods.

Pressing ↑↓ enables the selection from the 5 holiday programs. Pressing ↵ highlights the start time for the selected holiday program. First, by pressing ↑↓ the date and then the time are set. Confirm the selected day, month, hour and minute respectively with ↵. Define the end time in the same way.
Finally, the fan speed, temperature and fresh air proportion are assigned to the selected period, using the set values defined to the bars.

Setting the date and time

Pressing ↵ several times highlights in sequence the day of the week, the date, the month, the year, the hour and minutes of the current time. The highlighted value can be adjusted with ↑↓.

Changes from winter to summer time and vice-versa are made automatically.

8.1. Menu structure operating level 2
Only the masks that are relevant for the system will be shown.

Heating contractor menus
- Alarm management
- Service
- Backup mode
- Night ventilation
- Limits
- Preheat program
- Pump control
- Air dampers
- Cooling
- Compensation
- Temperature control
- Ext. utilisation time
- Peak ventilation
- Air quality
- Pressure/flow rate ctl
- Humidity control
- Other...

Alarm management
- Filter monitor
- Frost protection
- Air flow monitor
- Alarm memory

Alarm memory
- Alarm log
- Alarm 01
- ...
- Alarm 10
- Reset, alarm memory

Air flow monitor
- Alarm delay

Frost protection
- Restart
- Auto. restart
- Enabling, frost prot. vent. air
- Frost prot. limit

Filter monitor
- Interval
- Fan stage
- Fan speed
- Alarm delay

Service
- Hours run
- Sensor adjustment
- Manual mode
- Digital inputs

Digital inputs
- Malfunction FI
- ...
- Service humidifier

Manual mode
- Ventilation/extract air dampers
- Ventilation fan
- Extract fan
- Mixer air dampers
- DHW pump control
- Electric heater bank
- KGWO
- Cold water pump bank
- Direct evaporator
- Heat recovery
- Humidifier

Sensor adjustment
- Room temperature
- Vent. air temperature
- Extract air temp
- Outside temperature
- Rel. hum., vent. air
- Rel. humidity (room)
- Rel. hum., extract air
- Air quality CO_2
- Diff. pressure, supply air
- Diff. pressure, extract air

Hours run
- System limits
- Fan limits
- Heating pump limits
- Cooling pump limits
- Limit direct evaporator
- El heater bank limits
- Heat pump limit
- Reheater bank limit
- Reset hours run

Backup mode
- Backup temp. heating
- Fan stage, heating
- Fan speed, heating
- Pressure, heating
- Flow rate, heating
- Backup temp. cooling
- Fan stage, cooling
- Fan speed, cooling
- Pressure, cooling
- Flow rate, cooling

Night ventilation
- Enabling
- Room temp settings
- Outside temp/room temp
- Enable from outside
- Fan speed
- Fan stage
- Pressure
- Flow rate

Limits
- Set value limits
- Ventilation air limit
- Ventilation fan
- Extract fan
- KGWO - fan speed
- KGWO - fan stage
- KGWO - damper position

Preheat program
- Enabling
- Outside temperature
- Preheat time

Pump control
- PWW* mode
- PWW Limit, outside temp.
- PWW run on time
- Heating valve control
- PKW** operating mode
- PKW run on time
- Pump, DHW
- Cyclical pump start

Air dampers
- Start delay fan
- Start time, recirculation mode
- Min. proportion fresh air
- Modulating reduction
- Energy optimised

Cooling
- Demand cooling source
- Minimum runtime, coolng
- Minimum runtime, direct evaporator
- Switching points, direct evaporator
- Block via vent. air temp
- Block stage 1 via outside temp
- Block stage 2 via outside temp
- Forced control, fresh air
- Cooling source integrated
- Min. fan stage
- Min. fan speed
- Max. cooling source output
- Max. stage cooling source

Compensation
- Summer compensation
- Winter compensation

Temperature control
- Offset, heating/cooling
- Interlock, heating/cooling
- Outside temp. enabling
- Temperature difference for natural cooling
- Speed reduction

Ext. utilisation time
- Extension time
- Setback mode
- Outside temp limit for setback mode

Peak ventilation
- Runtime
- Proportion fresh air
- Fan stage
- Fan speed
- Pressure
- Flow rate

Air quality
- Control range
- Max. fan speed
- Max. fan stage
- Max. proportion fresh air
- Automatic start

Pressure/flow rate ctl
- Diff. pressure sensors
- Diff. extract fan
- Flow rate, supp. air
- Extr. air flow rate

Humidity control
- Fresh air with hygrostat
- Fan stage with hygrostat
- Fan speed with hygrostat
- Pressure with hygrostat
- Flow rate with hygrostat
- Control range continuous hyg.
- Max. speed continuous hyg.
- Max. stage continuous hyg.
- Max. fresh air continuous hyg.
- Auto start via hygrostat
- Set humidity level
- Max. rel. hum., vent. air
- Minimum control, hum.
- Minimum runtime, hum.
- Fan run-on time
- Block via outside temp
- Pre-switching, temp
- Humidifier start delay
- Ref. temp. set humidity level

Ice guard
- Exhaust air temperature limit
- Outside temperature limit
- Enable air volumes imbalance
- Max air volumes imbalance
- Enable winter start HR
- Lead time winter start
- Enable defrost function
- Run-on time, defrost function
- Extract air fan speed in winter start/defrost function.

Other
- New password
- Key lock activ
- BMS-Protocol
- Remote control installed?
- Touch panel present
- Air quality sensor present
- Vent. air press. sens. present
- Extr. air press. sens. present
- Configuration

* PWW = DHW pump
**PKW = Cold water pump

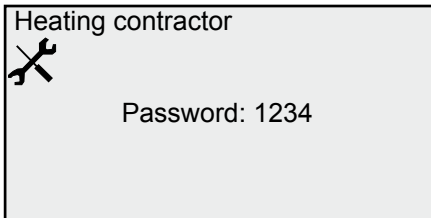## 8.2 Heating contractor menu

wolf-heiztechnik.de

Heating contractor

Password: 1234

Heating contractor menus

Alarm management
Service
Backup mode   ↵
Night ventilation
Limits
Esc BACK   ↵ SELECTION   DISPLAY ⬍

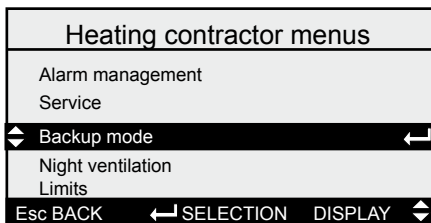**Standard mask** `Esc`⟩ **Main menu** ↵⟩ **Heating contractor**

Setting heating contractor parameters

The Wolf logo will be displayed. Pressing ↵ prompts entry of the heating contractor password (1234), which can then be changed with ↑↓. By confirming with ↵ you reach the heating contractor menu. There, by pressing ↑↓ you select from the menu points displayed. After selecting the required menu point you enter the required sub-menu by pressing ↵. Pressing *Esc* returns you to the standard display. If no adjustment was made for more than 2 minutes, the standard display will return automatically.
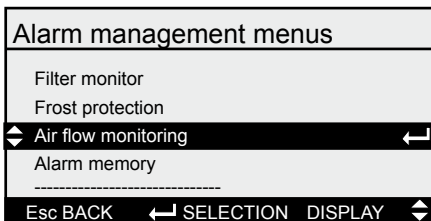
Overview:

→   **Alarm management**
→   **Service**
→   **Backup mode**
→   **Night ventilation**
→   **Limits**
→   **Preheat program**
→   **Pump control**
→   **Air dampers**
→   **Cooling**
→   **Compensation**
→   **Temperature control**
→   **Extension time**
→   **Peak ventilation**
→   **Air quality**
→   **Pressure / flow rate ctl**
→   **Humidity control**
→   **Ice guard**
→   **Other…**

Alarm management

Alarm management menus

Filter monitor
Frost protection
Air flow monitoring   ↵
Alarm memory

Esc BACK   ↵ SELECTION   DISPLAY ⬍

Standard mask `Esc`⟩ **Main menu** ↵⟩ **Heating contractor**
↵⟩ **Alarm management**

Adjusting parameters concerning alarm messages and functions as well as displaying the alarm history.

Pressing ↑↓ enables selection between the overview of the illustrated menu points. After selecting the required parameter you enter the required sub-menu by pressing ↵.

Overview:

→   **Filter monitor**
→   **Frost protection**
→   **Air flow monitor**
→   **Alarm memory**

Filter monitor

```
Filter test                    FT-01

Interval:              028 days
Time:                    05:00

Esc BACK    ↵ SELECTION  DISPLAY  ◆
```

The filter is monitored for contamination.
For systems with single stage fans, a message is issued (filter dirty) when the contact is open. The system continues to operate.
For systems with variable speed or multi-stage fans, the fan is switched to a predefined speed or stage at a time that can be freely selected. A message is displayed (filter dirty) if, during this time or during controlled operation, the contact opens. After 30 s, the system continues to operate under normal control.
If the system has stopped at that time, the filter test will be carried out when the system starts again (exception if a special operating mode is enabled).

Parameter	Setting range	Factory setting
Interval	1 - 365 days	28 days
Time	0:00 - 23:59 h	5:00 h
Fan stage	1 - 3	2 - 3
Fan speed during filter test	20 - 100%	100%
Alarm delay Filter monitor	0 - 30 s	10 s

Frost protection

```
Frost protection               FS-01
Restart
automatic



Esc BACK    ↵ SELECTION  DISPLAY  ◆
```

The frost protection function prevents damage to the heater bank at low outside temperatures. In addition to monitoring via the frost stats, the ventilation air is also checked for a drop below the set value.
A parameter enables the pre-selection as to whether, following a frost protection function, the system should restart automatically or only after the corresponding fault message has been acknowledged.

Frost thermostat:
The frost protection function remains active as long as the contact is open. The system shuts down if automatic restart has been selected and the frost stat repeatedly responds within an adjustable time frame.
In any case, a fault message will be displayed and remains visible until it has been acknowledged.

Frost protection via ventilation air temperature:
The frost protection function is active for an adjustable time. The system shuts down if automatic restart has been selected and the ventilation air limit is not repeatedly reached. In any case, a fault message will be displayed and remains visible until it has been acknowledged.

The frost protection function is always active (even if the system is in standby mode).

Parameter	Setting range	Factory setting
Restart	After acknowledgement / automatic	Automatic
Frost thermostat auto. restart repeats	2 - 10	5
Within	20 - 180 min	30 min
Frost prot. above vent. air temperature	Yes / No	No
Limits	0 - 10 °C	6.0 °C
Runtime	1 - 99 min	5 min
Frost protection ventilation air automatic restart repeats	2 - 10	5
Within	20 - 180 min	60 min

Air flow monitor

```
┌─────────────────────────────────────┐
│ Air flow                      LS-01  │
│                                      │
│           Alarm delay                │
│ - at the start:               180s   │
│ - in operation:               030s   │
│ Esc BACK    ↵ SELECTION  DISPLAY  ▲▼ │
└─────────────────────────────────────┘
```

The air flow monitoring checks for drive belt failures or mechanical fan blockages. This operates with a delay to prevent a fault shutdown from being generated when the fan starts or when the fan speed changes. The delay is adjustable.

| Please note | On systems with an electric heater bank, this delay should not be set to more than 5 s, otherwise the bank could be damaged.

| Parameter	Setting range	Factory setting
Alarm delay at the start	0 - 600 s	180 s (with electric heater bank 5 s)
Alarm delay in operation	0 - 600 s	30 s (with electric heater bank 5 s)

Alarm memory

```
┌─────────────────────────────────────┐
│ Alarm memory                  AS-00  │
│                                      │
│ - sorted acc. to date                │
│                                      │
│ 1 = latest alarm                     │
│ 10 = oldest alarm                    │
│ Esc BACK    ↵ SELECTION  DISPLAY  ▲▼ │
└─────────────────────────────────────┘
```

The last 10 alarm messages are saved in a list in the order of their occurrence. These are displayed with the date and time of their occurrence.
At the end of the alarm list, the alarm memory can be reset.

Service

```
┌─────────────────────────────────────┐
│             Service                  │
│                                      │
│ -----------------------------        │
│ Hours run                            │
│ ▲ Sensor adjustment             ↵    │
│ Manual mode                          │
│ Digital inputs                       │
│ Esc BACK    ↵ SELECTION  DISPLAY  ▲▼ │
└─────────────────────────────────────┘
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Service**

Service settings and displays.

Pressing ↑↓ enables selection between the overview of the illustrated menu points. After selecting the required parameter you enter the required sub-menu by pressing ↵.

Overview:

→ **Hours run**
→ **Sensor adjustment**
→ **Manual mode**
→ **Digital inputs**

Hours run

```
┌─────────────────────────────────────┐
│ Hours run                     BS-01  │
│                                      │
│ System :        0 h                  │
│ Limit   :       0 h                  │
│                                      │
│                                      │
│ Esc BACK    ↵ SELECTION  DISPLAY  ▲▼ │
└─────────────────────────────────────┘
```

The hours run by the entire system, by all fans, pumps and the stages of the electric heater bank as well as the direct evaporator are recorded. A service message is triggered when a set limit has been exceeded. All hours run can be reset.

Here, sensor corrections can be carried out.

Parameter	Setting range	Factory setting
Room temperature	-5 - 5 K	0 K
Vent. air temperature	-5 - 5 K	0 K
Extract air temp	-5 - 5 K	0 K
Outside temperature	-5 - 5 K	0 K
Ventilation air humidity	-20 - 20% r.h.	0% r.h.
Rel. humidity (room)	-20 - 20% r.h.	0% r.h.
Rel. hum., extract air	-20 - 20% r.h.	0% r.h.
Air quality CO_2	-200 - 200 ppm.	0 ppm.
Diff. pressure sensors, supply air	-100 - 100 Pa	0 Pa
Diff. pressure sensors, extract air	-100 - 100 Pa	0 Pa

Sensor adjustment

```
Sensor adjustment              FA-01

            Room temperature

                          0.0K


 Esc BACK      ↵ SELECTION   DISPLAY  ⬍
```

**Manual mode
(condition: system switched OFF)**

```
Manual mode                    HB-02

Ventilation fan
Stage 1 :                       OFF
Stage 2 :                       OFF
Stage 3:                        OFF
 DISPLAY       ↵ SELECTION  Esc BACK  ⬍
```

Here, every drive can be activated manually.

Please note   As a safety precaution, the parameters for activating the electric heater bank or the direct evaporator are only shown when the fan runs (in the case of single stage fans, this must receive a control signal of at least 2 V).

In the case of flaps that can be either only open or closed, the fan activation parameters will only be displayed when the flaps are open.

Digital inputs

```
Digital inputs                 DE-01

Fault, inv. vent. fan
ID15 KLM - M/L             ⌐⌐
Fault, EC mtr,vent. air    ⌐⌐
ID--
 Esc BACK      ↵ SELECTION   DISPLAY  ⬍
```

Here, all digital inputs (faults, operating messages) are displayed with their current status (contact closed or contact open).

**Backup mode
(condition: room temp sensor present)**

```
Backup mode                    SB-01
          Heating
Enabling:                    (YES)
Backup temperature          18.0°C

 Esc BACK    ↵ SELECTION   DISPLAY  ⬍
```
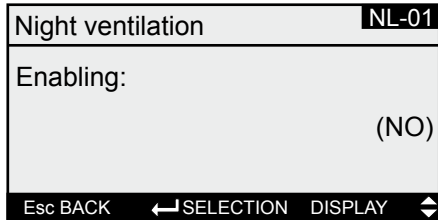
Standard mask [Esc] ⟩ **Main menu** [↵] ⟩ **Heating contractor** [↵] ⟩ **Backup mode**

Backup mode is active if Enabling = YES and the system is in the operating mode OFF, either via the time program, manual mode or BMS mode.
A room temperature can be entered respectively for "Backup temperature, heating" and "Backup temperature, cooling". "Backup mode, heating" is activated when the actual room temperature falls below the value for "Backup temperature, heating". For this, the fan is switched to a pre-selected stage (in the case of multi-stage fans), speed (in the case of variable speed fans), pressure (in the case of pressure control) or flow rate (in the case of flow rate control). The supply air temperature is regulated to the maximum supply air temperature. "Backup mode, cooling" will be activated if the actual room temperature exceeds the value for "Backup temperature, cooling". For this, the fan is switched to a pre-selected stage (in the case of multi-stage fans), speed (in the case of variable speed fans), pressure (in the case of pressure control) or flow rate (in the case of flow rate control). The supply air temperature is regulated to the minimum supply air temperature.

Parameter	Setting range	Factory setting
Heating: Enabling	Yes / No	Yes
Heating: Backup temperature	5 - 30 °C	18 °C
Heating: Fan stage	1 - 3	1
Heating: Fan speed	20 - 100%	50%
Heating: Pressure	0 - 6000 Pa	0 Pa
Heating: Flow rate	0 - 120,000 m³/h	0 m³/h
Cooling: Enabling	Yes / No	Yes
Cooling: Backup temperature	10 - 40 °C	28 °C
Cooling: Fan stage	1 - 3	1
Cooling: Fan speed	20 - 100%	50%
Cooling: Pressure	0 - 6000 Pa	0 Pa
Cooling: Flow rate	0 - 120,000 m³/h	0 m³/h

**Night ventilation
(condition: outside and room
temperature sensor installed)**

```
Night ventilation              NL-01
Enabling:

                         (NO)

Esc BACK    ↵SELECTION  DISPLAY   ⬍
```

Standard mask ⟨Esc⟩⟩ **Main menu** ⟨↵⟩⟩ **Heating contractor** ⟨↵⟩⟩ **Night ventilation**

Night ventilation can be activated via a parameter. In summer, cooling energy is saved with night ventilation by pre-cooling rooms at night (system in manual mode, time program or GLT off) with cool outside air for the following day.
This function is active when the outside temperature exceeds an adjustable temperature (minimum outside temperature).
Night ventilation is activated if, under the above conditions, the room temperature exceeds an adjustable temperature (start value, room temperature), and the outside temperature < room temperature - delta outside temperature / room temperature (adjustable):
- Fan on (with adjustable speed or stage)
- Fresh air, exhaust air damper open, mixing damper closed
Night ventilation remains active, until the room temperature < start value room temperature - differential room temperature or outside temperature ≥ room temperature - (delta outside temperature / room temperature - differential delta outside temperature / room temperature).

Parameter	Setting range	Factory setting
Enabling	Yes / No	No
Start value, room temperature	5 – 50 °C	22 °C
Differential	1 – 10 K	2 K
Delta outside temp / room temp.	2 - 20 K	5 K
Differential	2 - 20 K	2 K
Enable from outside t	10 – 20 °C	15 °C
Fan speed	20 – 100%	60%
Fan stage	1 - 3	2
Pressure	0 - 6000 Pa	0 Pa
Flow rate	0 - 120,000 m³/h	0 m³/h

Limits

```
Limits                          GW-01
Set value limits
maximum                     28.0°C
minimum                     16.0°C


Esc BACK      ↵SELECTION   DISPLAY   ↕
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Limits**

Limits can be defined for the air conditioning system via the following parameters. Settings for the KGWO are made here.

KGWO

The parameters ensure that when the KGWO is active, a minimum air flow across the heat exchanger is safeguarded.

Parameter	Setting range	Factory setting
Set value limits, maximum	22 - 70 °C	28 °C*/29 °C**
Set value limits, minimum	14-20°C* / 10C°**	16 °C*/10 °C**
Ventilation air limit, maximum temperature	22 - 60 °C	42 °C
Ventilation air limit, minimum temperature	14 - 20 °C	16 °C*/10 °C**
Min. speed, ventilation fan	1 - 100%	20%
Max. speed, ventilation fan	1 - 100%	100%
Min. speed, extract fan	1 - 100%	20%
Max. speed, extract fan	1 - 100%	100%
Min. fan speed by active KGWO	0 - 100%	30%
Min. fan stage by active KGOW	1 - 3	1
Min. damper position when KGWO active	0 - 100%	20%

* in systems without room set value transducer
** in systems with room set value transducer

Preheat program
(condition: outside temperature sensor present)

```
Preheat program                    VW-01

Enable preheat program


                                      Yes

 Esc BACK    ↵ SELECTION   DISPLAY    ⬍
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Preheat program**

The preheat program can be activated via a parameter.
With the preheat program activated, blowing cold air into the room can be prevented during system start (heater bank cooled down).

Prior to the fan starting, the system checks whether the outside temperature lies below an adjustable limit. If that is the case, the heating circuit pump starts for a programmed time, and the valve opens.

The preheat program cannot be activated on systems with an electric heater bank.

Parameter	Setting range	Factory setting
Enable, preheat program	Yes / No	Yes
Preheat below outside temperature	-20 - 15 °C	10 °C
Preheat time, heater bank	1 - 30 min	2 min

Pump control

```
Pump control                       PS-01

Pump, DHW

Operating mode:
Demand-dependent

 Esc BACK    ↵ SELECTION   DISPLAY    ⬍
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Pump control**

The heating circuit / cooling circuit pumps can be operated in various modes.

Heating circuit pump:
- Demand-dependent (on where there is heat demand, otherwise off).
- Weather-compensated: where outside temperature < set value, pump on.
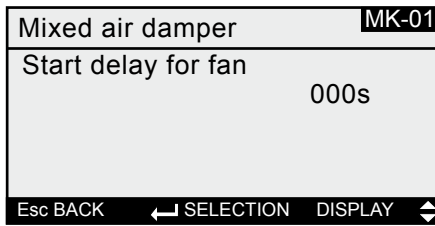- Constant operation: pump always on when the system is operational.

Cooling circuit pump:
- Demand-dependent (on where there is cooling demand, otherwise off).
- Constant operation: pump always on when the system is operational.

You may also set a run-on time for both pumps.

Parameter	Setting range	Factory setting
Pump, DHW, operating mode:	Demand-dependent / Outside temperature / Constant operation	Demand-dependent
Pump, DHW, limit, outside temperature	-20 - 15 °C	2 °C
Heating valve control with weather-compensated pump operating mode	0 - 100%	0%
Pump, DHW, run-on time	0 - 60 min	2 min
Pump, cold water, operating mode:	Demand-dependent / Constant operation	Demand-dependent
Pump, cold water, run-on time	0 - 60 min	2 min
Pump reheater bank run-on time	0 - 60 min.	2 min.
Cyclical pump start	0:00 - 23:59 h	5:00 h
After hours	2 - 99 Hour	24 Hour
After seconds	0 - 99 sek.	5 sek.

Air dampers

```
Mixed air damper                    MK-01
Start delay for fan
                        000s


Esc BACK      ↵ SELECTION   DISPLAY   ⬍
```

Standard mask [Esc]⟹ Main menu [↵]⟹ Heating contractor

[↵]⟹ **Air dampers**

3 operating modes can be selected for outside, discharge and mixed air dampers:

a. Fixed fresh air proportion

The system always operates with this fresh air proportion, except functions are active that would overrule this value (e.g. frost protection, natural cooling, air quality control).

b. Modulating reduction of the fresh air proportion at lower outside temperatures

The fresh air proportion entered is the fixed fresh air proportion which is active in standard mode, except functions are active that would overrule this value (e.g. frost protection, natural cooling, air quality control).

When an adjustable outside temperature is not reached (switching point 1), the fresh air proportion is reduced (modulating) down to an adjustable minimum proportion at switching point 2.

Furthermore settings relating to the system start can be made.

Parameter "Start delay for fan" prevents the fan from pushing against a closed damper.

With parameter "Start time for recirc. mode" the system starts in recirculating mode; the outside air damper will only open after expiry of this time.
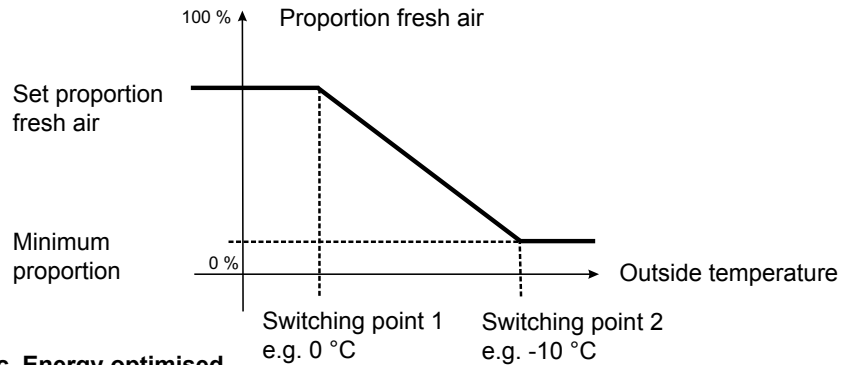
c. Energy optimised

To save heating or cooling energy, energy optimised control of the mixed air damper can be set up.

In the case of energy optimised control of the fresh air damper, the fresh air proportion during active cooling and with an outside temperature > room or extract air temperature + parameter "Energy optimised cooling" is reduced to the minimum fresh air proportion. When heating mode is enabled and the outside temperature is < room or extract air temperature – energy optimised heating, the fresh air is also reduced to the minimum proportion, unless functions that override this are enabled (e.g. air **quality control**, hygrostat function).

Parameter	Setting range	Factory setting
Start delay for fan	0 - 180 s	0 s*/30 s**

Parameter	Setting range	Factory setting
Start time for recirc. mode	0 - 180 min	0 min

Parameter	Setting range	Factory setting
Min. proportion fresh air with modulating reduction	0 - 100%	10%

Parameter	Setting range	Factory setting
Modulating reduction, Min. proportion fresh air with outside temp. standard fresh air proportion	-10 - 30 °C	0 °C
Reduced fresh air proportion	-10 - 30 °C	-10 °C

Parameter	Setting range	Factory setting
Energy saving - heating	0 - 30 K	10 K
- cooling	0 - 30 K	10 K

* for installations without dampers (mixing dampers only)
** for installations with dampers

Cooling

```
Cooling                          KE-01

Switching time for
chiller demand
Stage 2                     050.0%

Esc BACK      ↵ SELECTION   DISPLAY  ⬍
```

Demand, cooling source

A demand will also be issued to the cooling source as soon as a demand is issued to the cooling circuit pump. The demand is a two stage demand, subject to control deviation. A minimum runtime is adjustable. Both outputs are switched when a demand for stage 2 is issued.

Switching the direct evaporator

If a direct evaporator has been configured, this will be switched subject to the prevailing cooling demand. In other words, if the actual ventilation air temperature falls by the value set for "Direct evaporator ON stage 1" below the set ventilation air temperature, that stage starts. Stage 1 will be switched off again when the ventilation air temperature fall below the set ventilation air temperature by the value selected for "Direct evaporator OFF stage 1". The switching points for stage 2 are set in the same way. In addition, a time for "Minimum ON" and "Minimum OFF" can be adjusted. The parameter "Forced control of the fresh air damper 100%" has the effect that in systems with cooling, where the condenser is in the air stream, the outside air and the discharge air dampers are opened 100% during active cooling (full air stream across the condenser). The compressor can be blocked if a set ventilation air temperature is not achieved as well as when the outside temperature is low.

Control of integrated cooling source

With an existing direct evaporator, there is a parameter to select whether or not this is integrated in the air conditioning unit. If a cooling unit is integrated, prevent a cooling unit high pressure alarm by paying attention to the maximum air flow during active cooling. If the parameter "Cooling source integrated" is set to yes, further parameters are displayed. Parameter "Forced control of the fresh air 100%": With forced control of the fresh air damper, the mixed air damper is controlled to 100% for as long as the cooling source is required. Parameter "Min. speed or stage": This ensures that, during active cooling, the fan speed or fan stage is controlled at least with the preset value.

Parameter "Max. output or stage": This ensures that the cooling capacity is limited to the preset output or stage.

| Parameter	Setting range	Factory setting
Switching time for chiller demand, stage 2	2 - 100%	50%
Minimum runtime, stage	0 - 20 min	6 min
Times, stages Minimum ON	0 - 999 s	420 s
Minimum OFF	0 - 999 s	420 s
Switching points, direct evaporator ON stage 1	- 9.9 - 9.9 K	0.5 K
Switching points, direct evaporator OFF stage 1	- 9.9 - 9.9 K	- 0.5 K
Switching points, direct evaporator ON stage 2	- 9.9 - 9.9 K	1.5 K
Switching points, direct evaporator OFF stage 2	- 9.9 - 9.9 K	- 0.5 K
Compressor block via ventilation air ON	10 - 24 °C	18 °C
Compressor block via ventilation air OFF	2 - 20 °C	8 °C
Enable compressor block	Yes / No	Yes
Compressor 1 block via outside air ON	0 - 30 °C	0 °C
Compressor 1 block via outside air OFF	0 - 30 °C	0 °C
Compressor 2 block via outside air ON	0 - 30 °C	0 °C
Compressor 2 block via outside air OFF	0 - 30 °C	0 °C
Integrated chiller	Yes / No	Yes
Fan min. stage	1-3	3
Fan min. speed	20 - 100%	100%
Chiller max. output	20 - 100%	100%
Chiller max. stage	1 - 2 stage	2 stage
Forced control of the fresh air damper 100%	Yes / No	Yes

**Compensation
(condition: outside and room
temperature sensor installed)**

```
SP compensation              SW-01
Summer:                 0.0K

START at:               24.0°C

END at:                 36.0°C
Esc BACK    ↵ SELECTION  DISPLAY  ⬍
```

Standard mask ⎋Esc⟩ **Main menu** ↵⟩ **Heating contractor**
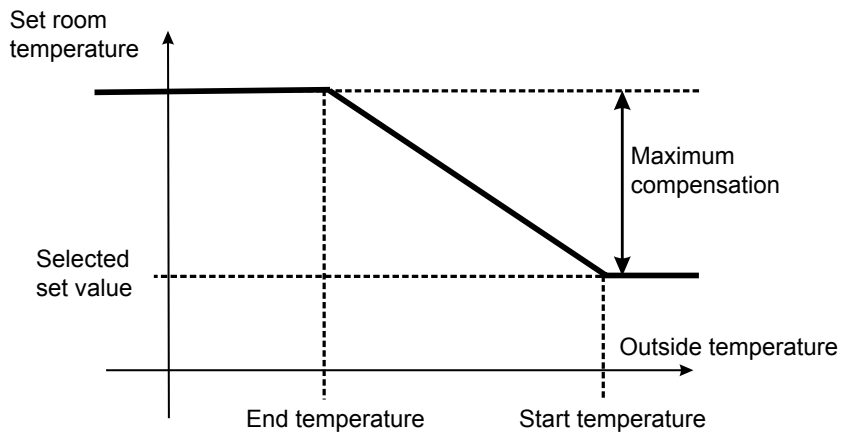↵⟩ **Compensation**

Summer compensation:
In cooling mode, the set room temperature is adjusted subject to outside
temperature. In other words, at high outside temperatures, the room temperature
is raised in accordance with these parameters. This prevents excessively high
temperature differentials between the room temperature and the outside temperature.
In addition, this reduces the energy expended on cooling.
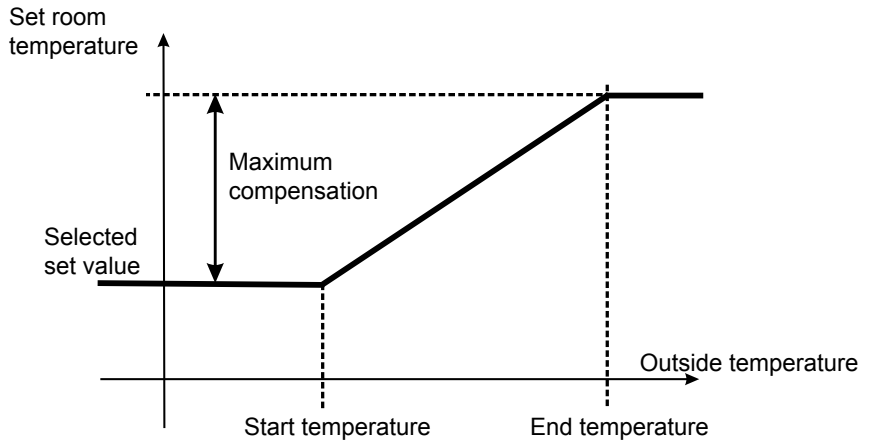
Winter compensation
In heating mode, the set room temperature is adjusted subject to outside
temperature. This increases the set room temperature when outside temperatures
are very low.

Please note In "Summer" or "Winter" = 0 this function is disabled (no
compensation).

Parameter	Setting range	Factory setting
Summer	0 - 4 K	0 K
Start at outside temperature	2 - 42 °C	24 °C
End at outside temperature	2 - 42 °C	36 °C

Parameter	Setting range	Factory setting
Winter	0 - 4 K	0 K
Start at outside temperature	-15 - 15 °C	5 °C
End at outside temperature	-15 - 15 °C	-15 °C

Temperature control

```
┌─────────────────────────────────────┐
│ Temperature control          T - 01 │
├─────────────────────────────────────┤
│ Set value deviation                 │
│                                     │
│ Offset, heating:          00.0K     │
│ Offset, cooling           02.0K     │
│                                     │
│ Esc BACK    ↵ SELECTION  DISPLAY  ⇕ │
└─────────────────────────────────────┘
```

Standard mask ⟨Esc⟩▷ Main menu ⟨↵⟩▷ Heating contractor
⟨↵⟩▷ Temperature control

Temperature control
Temperature control either utilises a ventilation air temperature control with a fixed set value for the ventilation air or room temperature control as room / (or extract air) ventilation air cascade. For the room / (or extract air) ventilation air cascade, the set ventilation air temperature is determined by means of a deviation from the set room temperature to the actual room or extract air value. Minimum and maximum limits of the ventilation air are being maintained. A dead zone exists between the heating and cooling sequence. ON offset, heating and ON offset, cooling can be adjusted.
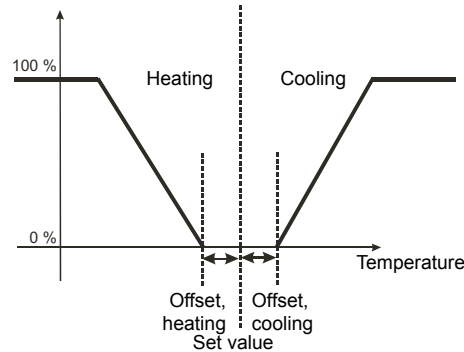
Weather-compensated enabling
In addition, the heating or cooling operation can be blocked subject to outside temperature. For example, if the outside temperature exceeds the total comprising the set room temperature and offset, heating (adjustable), then heating mode will be stopped. That means, the heating circuit pump or electric heater bank are switched off, the mixer closes and the heat source demand stops.

Natural cooling (prerequisite: outside, room and extract air sensors available)
This parameter in the standard settings enables natural cooling. Natural cooling helps to save cooling energy by utilising the temperature differential between the room air and the outside air. The outside temperature is compared with the room/extract air temperature. If the outside air is cooler than the room air by an adjustable value, then the fresh air proportion is raised during cooling operation. Temperature control then affects the mixer air damper. The cooling unit will only be started if more cooling energy is required and the outside air damper is 100% open.

Speed reduction
If the supply air temperature does not achieve the minimum supply air limit within the set time or delay, in spite of 100 % heat demand, the fan speed will be steadily reduced down to the set minimum speed. Any previously selected imbalance between supply and extract air will be maintained (e.g. through heat recovery ice guard).schutz WRG).

Parameter	Setting range	Factory setting
Set value deviation, offset, heating	0 - 20 K	0 K
Set value deviation, offset, cooling	0 - 20 K	2 K
Interlock between, heating / cooling	0 - 99 min	0 min
Enable acc. to outside temperature	Yes / No	No
Offset, heating	-20 – 20 K	5 K
Offset, cooling	-20 – 20 K	5 K
Temp. diff. for natural cooling	1 - 20 K	2 K
Speed reduction enabling	Yes / No	Yes
Delay	0 - 30 min.	5 min.

Extension time

```
Extension time                    N-01

Extension time
                        30 min


Esc BACK      ↵ SELECTION   DISPLAY  ▲▼
```

The extension of utilisation time can be activated either in the standard settings or via the BMK-F remote control. The system runs on by at least the selected time, if the extension of utilisation time is activated. The time of the extension can be selected at the remote control, if the extension of utilisation time is activated via the BMK-F remote control. If the extension of utilisation time is activated whilst the system is shut down, it will start for the selected time. The set values last active in the time program will be active.

Any setback mode that overlaps the shutdown times if the time program subject to outside temperature can be enabled or disabled.

This function counteracts any formation of ice on the external units, since moisture rising through the duct is permanently removed from the appliance.

This function will be active when it is enabled and the outside temperature lies below the set limit.

During this time, the fans will run at the set minimum speed and the fresh air damper will be switched to minimum fresh air proportion.

Special operating modes that increase the speed or fresh air proportion (for example air quality regulation etc.) remain disabled during setback mode.

Parameter	Setting range	Factory setting
Extension time	5 - 720 min	30 min
Enable setback mode	Yes / No	No
Outside temp limit for setback mode	-20 - 50 °C	0°C

Peak ventilation

```
Peak ventilation                  SL-01

Runtime              20 min


Esc BACK      ↵ SELECTION   DISPLAY  ▲▼
```
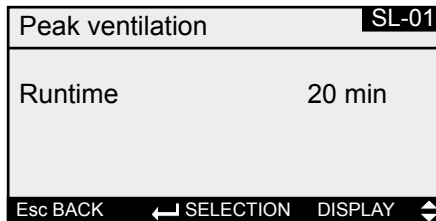
The peak ventilation can be activated either in the standard settings or via the BMK-F remote control. When peak ventilation is active, the fresh air proportion, the fan stage, the fan speed, the pressure or the air volume are increased to a programmed value. The "Runtime" parameter will only be valid if the activation took place at the programming module. The time can be selected at the remote control, if the activation was made at the BMK-F remote control.

Parameter	Setting range	Factory setting
Runtime	5 - 300 min	20 min
Fresh air	0 - 100%	100%
Fan stage	Stage 1 - 3	Stage 3
Fan speed	0 - 100%	100%
Pressure	0 - 1000 Pa	0 Pa
Flow rate	0 - 120,000 m³/h	0 m³/h

Air quality control

```
Air quality                    LQ-01
─────────────────────────────────────
Control range
Start                          4.0V
End                            8.0V


Esc BACK      ↵ SELECTION   DISPLAY  ▲▼
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Air quality**

Air quality control can be activated in the standard settings. An air quality sensor then captures the air quality of the room air or the extract air. A drop in air quality results in an increase in the fan speed or in the selection of a higher fan stage. The fresh air proportion is increased by a constant opening of the outside air and discharge air damper (if installed). As soon as the selected air quality limit (air quality start) is exceeded, the speed and the fresh air proportion increase up to the maximum set speed and the maximum selected fresh air proportion (air quality, maximum). The values for start and maximum are adjustable. When the actual air quality < "Air quality, start", the system returns to standard operation (time program or manual mode). That the system starts when the air quality is poor can be enabled by means of a parameter.

| Please note | In systems with single stage fans or in the case of pressure / and flow rate control, only the fresh air proportion is increased if the air quality control is active.

Parameter	Setting range	Factory setting
Control range start (VOC)	0-10 V	4 V
Control range end (VOC)	0-10 V	8 V
Control range start (CO_2)	0 - 2000 ppm	700 ppm
Control range end (CO_2)	0 - 2000 ppm	1000 ppm
Max. speed	20 - 100%	100%
Max. fan stage	1 - 3	3
Max. proportion fresh air	0 - 100%	100%
System ON via air quality	Yes / No	No

Pressure / flow rate

```
┌─────────────────────────────────┐
│ Pressure / flow rate ctl  DV-01 │
├─────────────────────────────────┤
│ Diff. pressure sensors          │
│ Number               -2-        │
│ Type 0/10V                      │
│ Range: 0/1000.0Pa               │
├─────────────────────────────────┤
│ Esc BACK  ↵ SELECTION  DISPLAY ◆│
└─────────────────────────────────┘
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Heating contractor** [↵]⟩ **Pressure / flow rate ctl**

The number of pressure transducers and the measuring range can be defaulted via a parameter.

The number of pressure transducers and the measuring range can be defaulted via a parameter.

In ventilation systems with a pressure transducer, the ventilation air pressure is captured and compared with the selected set value. The ventilation air fan is then switched in line with the deviation. The extract air fan is switched according to the switching of the ventilation air fan (in %) + "Diff. extract fan". By entering the k factor, the captured pressure will be converted into flow rate.

For this, the respective fan type must be selected for every fan.

[Please note] The k factor is stated on the fan type plate.

Fan type 1 corresponds to the formula
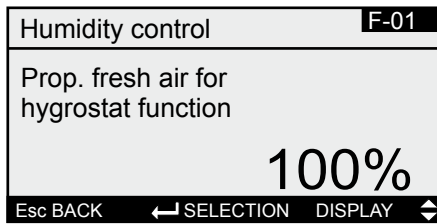
$$V = k \cdot \sqrt{\Delta p}$$

Fan type 2 corresponds to the formula

$$V = k \cdot \sqrt{\frac{2}{1,2} \cdot \Delta p}$$

The formulae for calculating the flow rate can also be found on the fan type plate.

Parameter	Setting range	Factory setting
Diff. pressure sensors, number	1 - 2	2
Range	0 - 6000 Pa	0 - 1000 Pa
Diff. extract fan	-50 - 50%	0%
Supply fan k factor	0 - 2000	0
Fan type	1 - 2	1
Extract fan k factor	0 - 2000	0
Fan type	1 - 2	1

Humidity control

```
┌─────────────────────────────────┐
│ Humidity control          F-01  │
│─────────────────────────────────│
│ Prop. fresh air for             │
│ hygrostat function              │
│                                 │
│                        100%     │
│ Esc BACK    ↵ SELECTION  DISPLAY ⬍│
└─────────────────────────────────┘
```

Standard mask $\boxed{Esc}$⟩ Main menu $\boxed{↵}$⟩ Contractor $\boxed{↵}$⟩ Humidity control

Hygrostat function
A room or duct hygrostat switches when a specific humidity level is exceeded. When the contact is closed, the following actions will be performed:
When the system is operational, the fresh air proportion and the speed or stage of the fan are increased to a selected value. Only the speed will be increased on systems without mixer air damper.
When the system is switched off, it will be activated with the selected values when the automatic sequence is activated. In that case, the set value programmed for manual mode will be used as set temperature.

Continuous hygrostat function
The continuous hygrostat function can be enabled in the standard settings. Via a moisture sensor, the relative humidity of the room or the extract air is captured. When the relative humidity in the room or extract air rises, the fan speed increases or switches to a higher stage and the fresh air proportion increases by opening the outside and discharge air damper (if installed). In single stage fans or in the case of pressure or flow rate control, only the fresh air proportion is increased. If the system is switched off, it starts when the "Humidity start" limit is exceeded.

$\boxed{\text{Please note}}$ The hygrostat function takes priority when combined with an external stage demand.

Humidification
Isothermal and adiabatic humidity systems can be used.

Controlling the ventilation air
The control unit will attempt to achieve a constant level of humidity in the ventilation air.
For systems with variable ventilation air temperature (room / extract air / ventilation air cascade) the absolute humidity will be defaulted as a set value.
The value resulting from the required relative humidity at the required room temperature is entered as the set value for absolute humidity. For example, if the ventilation air temperature must be reduced because of insolation, the relative humidity will, nevertheless, remain constant. The same applies of the ventilation air temperature being 40 °C, for example.
At a constant ventilation air temperature (ventilation air temperature control), an absolute or relative humidity can be entered.
Ventilation air control is always appropriate if no representative room humidity level can be captured, e.g. if several rooms are supplied together.

Room humidity control (extract air humidity control)
The system regulates a constant relative humidity, whereby a maximum ventilation air humidity will not be exceeded.
A set value for the absolute ventilation air humidity is calculated from the deviation between the set and the actual room humidity. The greater the deviation, the greater the change of the set ventilation air humidity.
Control of the room humidity relative to the actual room temperature:
The set value for the absolute ventilation air humidity is calculated from the deviation between the set and actual relative humidity and the actual room temperature. As a result, the relative room humidity remains constant, even when the actual room temperature changes.
This is important for processes that demand a constant relative humidity.
Control of the room humidity relative to the set room temperature:
The set value for the absolute ventilation air humidity is calculated from the deviation between the set and actual relative humidity and the set room temperature. The relative humidity drops, if the room temperature rises above the set value, however the absolute room humidity remains the same. This prevents the air from being humidified when temperatures are high. In occupied rooms, a lower room humidity at high temperature is often perceived to be more pleasant.

Priority for temperature control with adiabatic humidifiers:
The humidification level is reduced after expiry of an adjustable interval if the operation of the humidifier precludes the set ventilation air temperature from being achieved. Sizing the humidifier for cold (dry) outside air with a high outside air proportion can result in controllability problems at higher outside temperatures. The option is therefore provided to enable the control only up to an adjustable outside temperature. The system runs on for an adjustable time to dry it out if it shuts down whilst the humidifier is active.

Parameter	Setting range	Factory setting
Prop. fresh air for hygrostat function	0-100%	100%
Fan stage for hygrostat function	1 - 3	3
Fan speed for hygrostat function	0-100%	80%
Continuous hygrostat funktion Start	0 - 100% r.h.	60% r.h.
End	0 - 100% r.h.	80% r.h.
Continuous hygrostat function Max. speed	20 - 100%	100%
Continuous hygrostat function Max. stage	Stage 1-3	Stage 3
Continuous hygrostat funktion Max. fresh air rate	0 - 100%	100%
Automatic start for hygrostat function	Yes / No	No
Set humidity (relative)	10 - 95% r.h.	50% r.h.
Set humidity (absolute)	2 - 30 g/kg	8 g/kg
Max. r.h., vent. air	50 - 100% r.h.	90% r.h.
Minimum humidifier control	0 - 100%	35%
Minimum humidifier runtime	0 - 99 min	0 min.* / 10 min.**
Humidifier run-on time, drying	0 - 99 min	10 min.* / 2 min.**
Enable below outside temperature	Yes / No	No
Enable below outside temperature	0 - 40 °C	15 °C
Delay, temperature priority control	0 - 60 min	5 min.
Humidifier start delay	0 - 99 min	5 min.* / 2 min.**
Reference temp. for set humidity level	Actual temperature / set temperature	Actual temperature

* with adiabatic humidifier
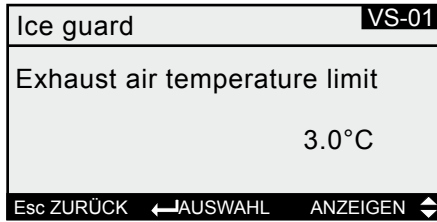** with isothermal humidifier

Please note To determine the absolute humidity, use the h,x diagram.
As an example, the absolute humidity (9,4 g/kg) at a temperature of 24 °C and a relative humidity of 50% has been calculated.

Ice guard

```
┌─────────────────────────────────┐
│ Ice guard                 VS-01 │
│                                 │
│ Exhaust air temperature limit   │
│                                 │
│                         3.0°C   │
│                                 │
│ Esc ZURÜCK   ↵AUSWAHL  ANZEIGEN ⬍│
└─────────────────────────────────┘
```

Standard mask [Esc]⟩ **Main menu** [↵]⟩ **Contractor** [↵]⟩ **Ice guard**

With heat recovery via plate heat exchangers or in run-around coil systems, a temperature sensor is fitted into the exhaust air path, which is used to recognise icing-up. Heat recovery will be reduced if the exhaust air temperature falls below the set limit. Where an imbalance between the supply and extract air can be accepted (negative pressure inside the interior is prevented), the supply air fan speed will initially be reduced to the maximum permissible imbalance. With active flow rate imbalance, the entire air flow can still be routed via the heat recovery, even when outside temperatures are relatively low.

All functions in the "Ice guard" menu are active only if the outside temperature < "Outside temperature limit".

Please note | Air flow rate imbalance should be enabled only in accordance with local conditions (e.g. smoke extraction in open fireplaces).
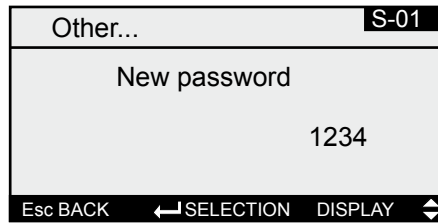
Winter start HR
When winter start HR is enabled, the heat recovery will be preheated by initially switching the extract air fan for an adjustable delay.
Defrost function
When enabling the defrost function, the heat recovery will be fully defrosted by letting the extract air fan run on for an adjustable period after shutdown.

Parameter	Setting range	Factory setting
Exhaust air temperature limit	-20 - 10°C	3°C
Outside temperature limit	-20 - 10°C	-3°C
Enable air volumes imbalance	Yes / No	No
Max air volumes imbalance	- 30 - 0%	-30%
Enable winter start HR	Yes / No	Yes
Lead time winter start	0 - 10 min.	2 min.
Enable defrost function	Yes / No	Yes
Run-on time, defrost function	0 - 60 min.	20 min.
Extract air fan speed in winter start/defrost function	0 - 100%	25%

Other...

```
┌─────────────────────────────────┐
│  Other...                 S-01  │
│                                 │
│      New password               │
│                                 │
│                        1234     │
│                                 │
│ Esc BACK    ↵ SELECTION  DISPLAY ⬍│
└─────────────────────────────────┘
```

User settings and interfaces can be adjusted and additional sensors can be configured later.

Password
The password for the contractor level can be matched to individual customer requirements.

Tastensperre
Key lock
If this parameter is set to "Yes", the key lock is enabled after 2 minutes without any intervention.
With active key lock, keys ↑↓ enable only the set temperature to be adjusted.
Holding down *Esc* (for approx. 3 s) cancels the key lock temporarily.
To disable the key lock permanently, set this parameter to "No".
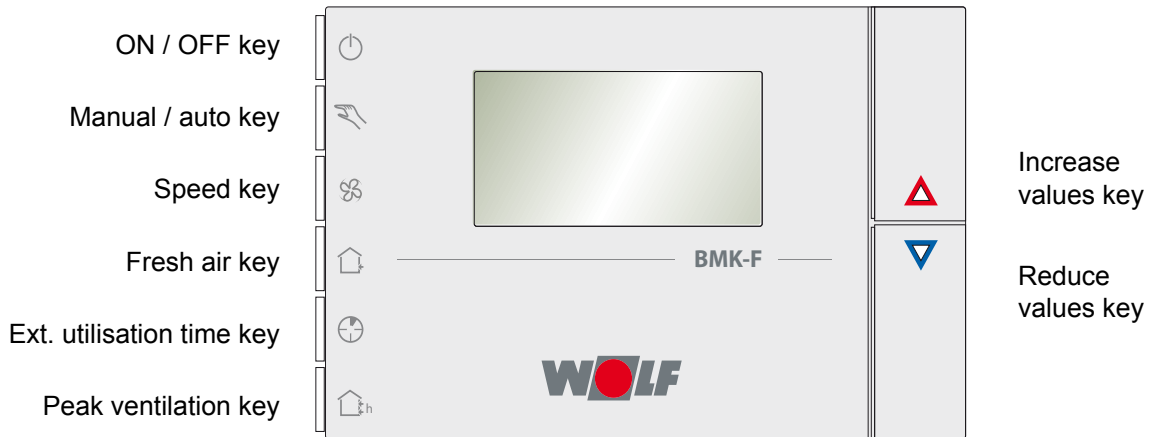
Configuration later
A remote control, touch panel, air quality sensor and a process pressure sensor may be retrofitted, if required.
Fundamental function extensions, such as cooling function or pressure regulation, for example, require a reconfiguration of the controller.

Parameter	Setting range	Factory setting
New password	0 - 9999	1234
Button lock active	Yes / No	No
BMS-Protokoll	No Proto./LON-Works/ BACnet/pCO Manager/ Modbus/Ethernet	According to order
Transfer rate	1200/2400/4800/ 9600/19200/38400	4800* 19200**
BMS - Protocol	0 - 200	1
Remote control installed	Yes / No	According to order
Touch panel present	Yes / No	According to order
Air quality sensor present	Yes / No	No
Vent. air press. sens. present	Yes / No	No
Extr. air press. sens. present	Yes / No	No
Configuration	Yes / No	No

* with existing LON-Interface
** with existing BACnet-Interface

9.1 Overview

ON / OFF key	
Manual / auto key	
Speed key	Increase values key
Fresh air key	Reduce values key
Ext. utilisation time key	
Peak ventilation key	

BMK-F

ON / OFF key

The system can be switched on and off with the ON / OFF key.
When the system is shut down, the indication "OFF" will be shown on the display instead of the set temperature. Special operating modes (back-up mode etc.) remain active.

Manual / Auto key

The manual / auto key enables a changeover between manual mode and automatic mode.
Manual mode means operation with the values selected in the standard settings without a time limit.
Automatic mode means operation with the selected values and in accordance with the selected time program and the corresponding set values.
Subject to the currently active operating mode, the auto symbol for automatic mode or ☼ for manual mode will be displayed.

Speed key

Pressing the speed key allows a change to the fan stage (up to 3 stages). In the case of variable speed fans, the speed is also defaulted in stages (slow - medium - fast). The speeds corresponding to these 3 stages can be adjusted at the BMK programming module as parameters (standard setting).

The selected speed remains active until a correction is made, either manually or by the time program.

Fresh air key

With the fresh air key, the fresh air proportion can be changed (except whilst air quality control, natural cooling and mixer damper control with modulating reduction are active).
After pressing this key, the current fresh air proportion is displayed in % on the large display. Keys "Increase values" or "Reduce values" enable the fresh air proportion to be changed.
The system automatically returns to the standard display if no entry is made for 2 s.
The selected speed remains active until a correction is made, either manually or by the time program.

Extension of utilisation time key

This key can be used to activate an extension of utilisation time. During the extension of utilisation time, the system operates with the operating data from the last used time program.
After activation, the clock symbol will be superimposed. Pressing this key several times determines the duration of the extension of utilisation time. The small display shows the duration in hours together with the "HR" indication. With each push, the duration increases by one hour (up to 9 h).
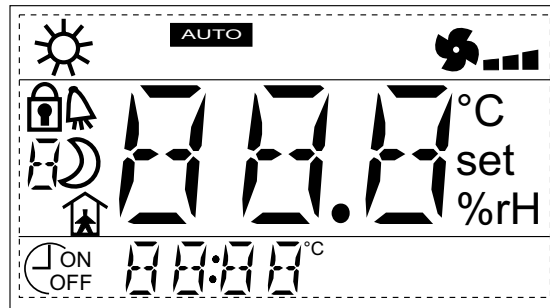
Peak ventilation key

Pressing this key activates peak ventilation.
Active peak ventilation is indicated in the standard display by a flashing house symbol. During peak ventilation, the system operates with a programmed fresh air proportion and fan speed or fan stage. Peak ventilation can only be activated during a time program.
As for the extension of utilisation time, the peak ventilation runtime can be selected as follows:
After pressing the key, the clock symbol will be superimposed. Pressing this key several times determines the duration of peak ventilation. The small display shows the duration. With each push, the duration increases by 1/4 hour (up to 3 3/4 h). Peak ventilation ends after expiry of the time or when another operating mode is activated.
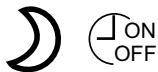
9.2 Standard display BMK- F

Symbol	Description
☼	Manual mode active
AUTO	Time program active
🌀▪▪▪	Fan stages
🌙 / ON OFF	Extension of utilisation time active
8	Duration, ext. utilisation time / peak ventilation
⌂	Peak ventilation active
🔔	Fault
🔒	Key lock active
88.8	Current set temperature

10.1 Room temperature sensor with set value transducer

As an option, a room temperature sensor with set value transducer can be connected to the control unit.

In the case of room / ventilation air cascade control, the room temperature is captured by the integral room temperature sensor and defaulted via the set value transducer as set room temperature. The set value can be defaulted between 10 - 29 °C.

For systems with ventilation air temperature control, the room temperature sensor with set value transducer can also be used. The integral room temperature sensor can be connected at the appropriate terminal and will then only be used for display purposes. In that case, the selected set value is the set ventilation air temperature.

For systems with extract air / ventilation air cascade control, the room temperature sensor can also be connected for display purposes. In that case, the selected set value is the set extract air temperature.

| Please note | If the scale needs adjusting, proceed as follows:

- Set rotary selector, for example, to 20 °C.
- Remove the casing cover.
- Carefully pull the rotary selector from the r.h. retainer and insert it into the l.h. retainer.
- Turn the rotary selector until 20 °C is also displayed by the programming module (top r.h. corner).
- Carefully return the rotary selector into the r.h. retainer and close the casing cover.

10.2 External enabling / stage demand

External enabling:
The system can be enabled by a higher ranking control via an external zero volt contact (e.g. switch).

The system cannot be started by an external demand if it has been shut down locally (by using enter key on the programming module).

| Please note | Special operating modes (backup mode etc.) are no longer active when the contact is open.

External stage demand:
The fan stages (in addition to and higher ranking than the control via the programming module) can be activated via two external zero volt contacts (e.g. switch). The system continues to operate in automatic mode with the preset stages. This function is effective for multi-stage and variable speed fans.

When the system is shut down, it is started with the activated stage via an external stage demand (if this has been selected in the standard settings). The system then operates with the set values for temperature and fresh air proportion programmed in the standard settings.

For variable speed fans, a speed must be assigned to each stage (see page 13).

The stages are switched via both contacts as follows:

Contact 1	Contact 2	Stage
Open	Open	Automatic (no external demand)
Closed	Open	Stage 1
Open	Closed	Stage 2
Closed	Closed	Stage 3

11.1 Air conditioning and ventilation module KLM

Specification	Type KLM-M	Type KLM-L
Dimensions	110 x 315 x 60 mm	110 x 315 x 60 mm

Digital inputs		
Type	Opto-isolated	Opto-isolated
Total	14	18
24 VAC or 24 VDC	12	14
24 VAC / DC or 230 VAC	2	4

Analogue inputs		
Total	8	10
Universal (0 - 10 V, 0 - 1 V, 4 - 20 mA, 0 - 20 mA, 0 - 5 V ratio-metric, NTC10k, NTC5k)	6	6
Passive (NTC10k, NTC5k, PT1000)	2	4

Analogue outputs		
Type	0…10 VDC opto-isolated	0…10 VDC opto-isolated
Number	4	6
External supply	24 VAC / DC	24 VAC / DC
Resolution	8 bit	8 bit
Maximum load	100 VA / 1 kOhm (10 mA)	100 VA / 1 kOhm (10 mA)

Digital outputs		
Type	Relay outputs	Relay outputs
Total	13	18
Single pole	10	13
Changeover	3	5

Power supply	28…36 VDC and 24 VAC/50-60 Hz
Connections	Via plug-in connector (part no. 2744746), max. voltage: 250 VAC, for 0.5 - 2.5 mm² cross-section
Network / programming module connection	
Type	Asynchronous half duplex RS485 (pLAN)
Transfer speed	62.5 kbps or 115.2 kbps (adjustable via software)
Connection, programming module BMK	6-pole telephone plug
Network connection (pLAN) / graphic programming module	3-pole plug-in connector
Max. distance between KLM and BMK	
Telephone cable	Max. line length 50 m (supply from the KLM)
AWG24 cable, screened	Max. line length 200 m (supply from the KLM)
AWG20/22 cable, screened	Max. line length 500 m (requires separate supply)
Other characteristics	
Storage conditions	- 40 - 70 °C, 90% r.h., non-condensing
Operating conditions	- 25 - 70 °C, 90% r.h., non-condensing
Protection	IP20

11.2 Extension module KLM-E

Dimensions	110 x 70 x 60 mm
Power supply	28 VDC +10/-20% and 24 VAC +10/-15% 50 - 60 Hz
Connections	Via plug-in connector (part no. 2744750), max. voltage: 250 VAC, for 0.5 - 2.5 mm² cross-section
Power consumption	Max. 6 W
Digital inputs	
Type	Opto-isolated
Number	4 (24 VAC or 24 VDC)
Analogue inputs	
Number	4 (0 - 1 V, 0 - 5 V, 4 - 20 mA, 0 - 20 mA, NTC10k, NTC5k)
Analogue outputs	
Type	0…10 VDC opto-isolated
Number	1
External supply	24 VAC / DC
Resolution	8 bit
Maximum load	100 VA / 1 kOhm (10 mA)
Digital outputs	
Type	Relay outputs
Number	4 (changeover, 250 V, 8 A)
Network (connection to KLM-L)	
Type	Asynchronous half duplex RS485 (pLAN)
Connection	Via 3-pole plug-in connection
Max. distance KLM-E to KLM-L	
Telephone cable (<= 0.14 Ω/m)	600 m
Telephone cable (<= 0.25 Ω/m)	400 m
AWG24 cable, screened (<= 0.078 Ω/m)	600 m
Other characteristics	
Storage conditions	-20 - 70 °C, 90% r.h., non-condensing
Operating conditions	-10 - 60 °C, 90% r.h., non-condensing
Protection	IP20

11.3 Programming module BMK

|	
Type	FSTN graphics
Illumination	Backlit (white)
Resolution	132 x 64 pixel
Symbol height	3.5 mm / 7.5 mm
Size	72 x 36 mm
Active area	66 x 32 mm
Key illumination	4 x LED (green) (keys ↑, ↓, L, Esc) 2 x LED (red / orange) (keys Prg, Alarm)
Interface	6-pole RJ12 plug or external supply 18/30 VDC
Max. power consumption	0.8 W
Maximum cable length	50 m with telephone cable, 500 m with AWG22 twisted pair and TCONN6J000 distributor
Protection	IP65 (part no. 2744742) IP40 (part no. 2744743)
Operating conditions	-20 - 60 °C, 90% r.h. non-condensing
Storage conditions	-20 - 70 °C, 90% r.h. non-condensing

11.4 Remote control unit BMK-F

Power supply	24 VAC +/- 15%, 50/60 Hz
Current consumption	70 mA
Interface	RS485 (pLAN), 3-pole
Dimensions (W x H x D)	135 x 86 x 30 mm
Power consumption	1.5 VA
Room temperature sensor	Integral
Accuracy of temperature capture	+/- 2 K
Protection	IP30
Maximum cable length	50 m with telephone cable, 500 m with AWG22 twisted pair and TCONN6J000 distributor
Operating conditions	0 - 50 °C, 10 - 85% r.h.
Storage conditions	-20 - 70 °C, 10 - 85% r.h.

11.5 Room temperature sensor with set value transducer

Test range	-30…+90 °C
Sensor	NTC5K, curve in accordance with specification 88-0-0-992
Type of switching	4-conductor connection
Potentiometer	Potentiometer 100 Ohm with balancing potentiometer 2.2 kOhm
Scale	10 °C - 30 °C (in steps of 5 °C)
Potentiometer control path	0 - 180° (10 - 29 °C)
Test current	Approx. 1 mA
Connection casing	Plastic, pure white (similar to RAL9010),
Dimensions	79 x 81 x 26 mm
Installation	On flush box, d = 55 mm (similar to RAL9010)
Electrical connection	Via screw terminals 0.14 - 1.5 mm²
Connected voltage	Only to safety LV, max. 30 VAC, 42 VDC
Permissible air humidity	<95% r.h.
Protection class	III (to EN 60730)
Protection	IP30

11.6 NTC sensor resistances

Temp. °C	Resist. Ω	Temp. °C	Resist. Ω	Temp. °C	Resist. Ω	Temp. °C	Resist. Ω
-21	51393	14	8233	49	1870	84	552
-20	48487	15	7857	50	1800	85	535
-19	45762	16	7501	51	1733	86	519
-18	43207	17	7162	52	1669	87	503
-17	40810	18	6841	53	1608	88	487
-16	38560	19	6536	54	1549	89	472
-15	36447	20	6247	55	1493	90	458
-14	34463	21	5972	56	1438	91	444
-13	32599	22	5710	57	1387	92	431
-12	30846	23	5461	58	1337	93	418
-11	29198	24	5225	59	1289	94	406
-10	27648	25	5000	60	1244	95	393
-9	26189	26	4786	61	1200	96	382
-8	24816	27	4582	62	1158	97	371
-7	23523	28	4388	63	1117	98	360
-6	22305	29	4204	64	1078	99	349
-5	21157	30	4028	65	1041	100	339
-4	20075	31	3860	66	1005	101	330
-3	19054	32	3701	67	971	102	320
-2	18091	33	3549	68	938	103	311
-1	17183	34	3403	69	906	104	302
0	16325	35	3265	70	876	105	294
1	15515	36	3133	71	846	106	285
2	14750	37	3007	72	818	107	277
3	14027	38	2887	73	791	108	270
4	13344	39	2772	74	765	109	262
5	12697	40	2662	75	740	110	255
6	12086	41	2558	76	716	111	248
7	11508	42	2458	77	693	112	241
8	10961	43	2362	78	670	113	235
9	10442	44	2271	79	670	114	228
10	9952	45	2183	80	628	115	222
11	9487	46	2100	81	608	116	216
12	9046	47	2020	82	589	117	211
13	8629	48	1944	83	570	118	205

Mollier h,x – Diagramm
für feuchte Luft
Gesamtdruck 1000 mbar
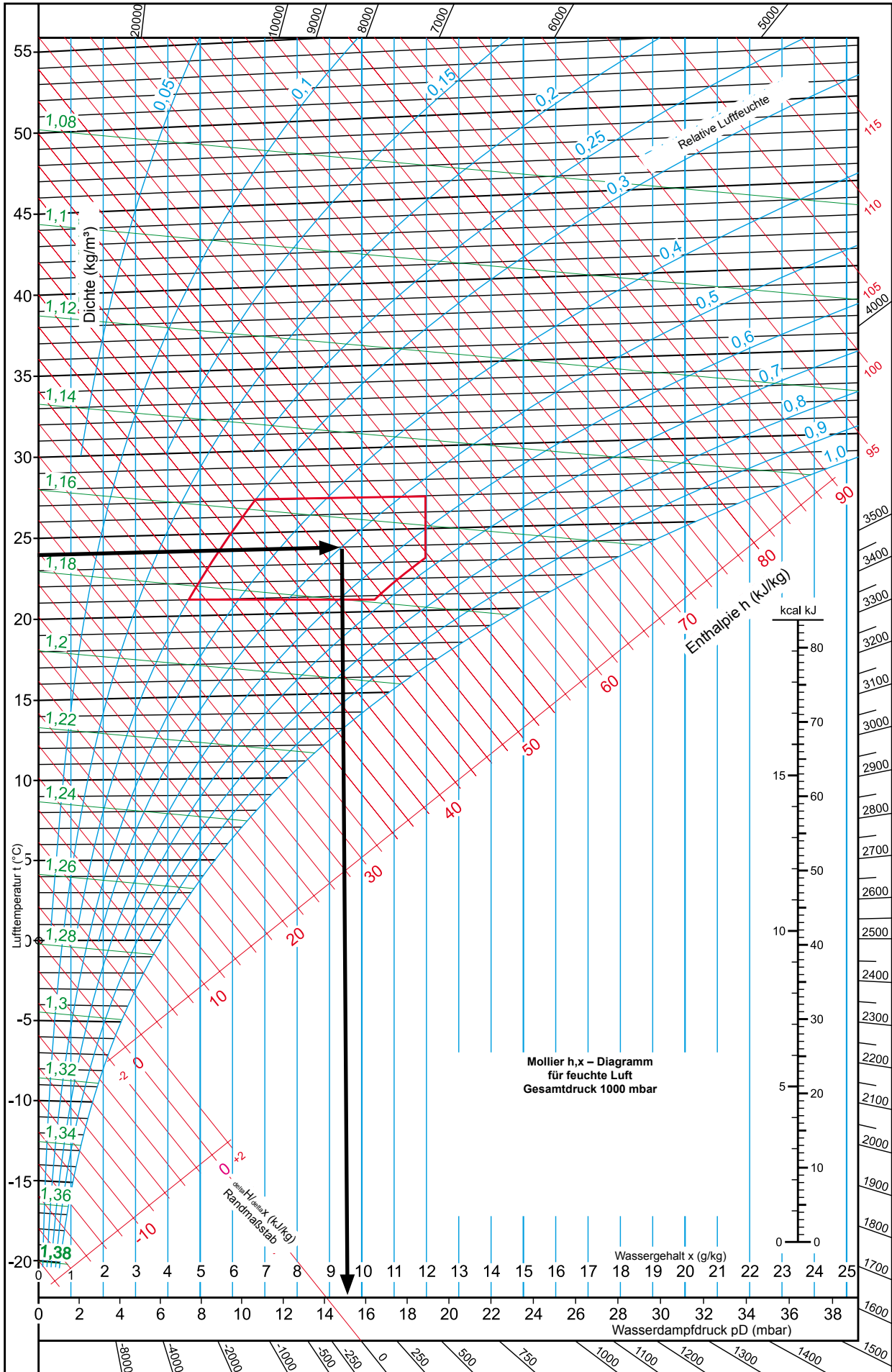
Alarms are signalled by the red LED flashing. Pressing the key displays the alarm in plain text; pressing the key on the alarm display again acknowledges remedied alarms. If several alarms are active, this is indicated by a symbol in the top r.h. corner. Further alarms can be called up by means of the scroll keys.

Alarm messages	Effects	Cause	Remedy
Fault, inverter, ventilation fan (AL01)	The system shuts down	Fault recognition through FU; FU faulty	Check inverter; acknowledge fault message
Fault, EC motor, ventilation fan (AL50)	The system shuts down	Fault recognition through EC motor; EC motor faulty	Check EC motor; acknowledge fault message
Motor temperature too high, ventilation fan (AL02)	The system shuts down	Fan motor temperature too high	Allow the motor to cool down until the cold conductor temperature has returned into the permissible range; check the power drawn by the ventilation air fan; if the fault repeats, check the motor, bearing and fan. Acknowledge fault messages
Repair switch, ventilation fan (AL03)	The system shuts down	Repair switch of ventilation air fan has switched off	Switch on repair switch of ventilation air fan, acknowledge fault message
Air flow monitor, ventilation air (AL04)	The system shuts down	Ventilation air fan belt torn; barometric cell or lead to barometric cell faulty	Replace drive belt; check barometric cell or lead; acknowledge fault message
Fault, inverter, extract fan (AL05)	The system shuts down	Fault recognition through FU; FU faulty	Check inverter; acknowledge fault message
Fault, EC motor, extract fan (AL51)	The system shuts down	Fault recognition through EC motor; EC motor faulty	Check EC motor; acknowledge fault message
Motor temperature too high, extract fan (AL06)	The system shuts down	Fan motor temperature too high	Allow the motor to cool down until the cold conductor temperature has returned into the permissible range; check the power drawn by the ventilation air fan; if the fault repeats, check the motor, bearing and fan. Acknowledge fault messages
Repair switch, extract fan (AL07)	The system shuts down	Repair switch of extract air fan has switched off	Switch on repair switch of extract air fan, acknowledge fault message
Air flow monitor, extract air (AL08)	The system shuts down	Extract air fan belt torn; barometric cell or lead to barometric cell faulty	Replace drive belt; check barometric cell or lead; acknowledge fault message
Outside air filter contaminated (AL09)	Display only	The outside air filter has exceeded its limit	Clean or replace filter element
Ventilation air filter contaminated (AL10)	Display only	The ventilation air filter has exceeded its limit	Clean or replace filter element
Extract air filter contaminated (AL11)	Display only	The extract air filter has exceeded its limit	Clean or replace filter element
Pump fault, DHW bank (AL12)	The system shuts down	An overload relay of an external heating circuit pump has responded	Reset overload relay; check power drawn by the pump, acknowledge fault message

Alarm messages	Effects	Cause	Remedy
Frost thermostat responded (AL13)	Fans are switched off; outside air damper is closed; heating circuit pump starts; heating circuit mixer is opened; heat source receives a demand	Temperature captured at the thermostat below limit	Check heating medium; check heating circuit pump; check frost stat, acknowledge fault message
Frost prot. temp. vent. air below set value (AL14)	Fans are switched off; outside air damper is closed; heating circuit pump starts; heating circuit mixer is opened; heat source receives a demand. With electric heater bank: System off	Ventilation air temperature too low	Check heating medium; check heating circuit pump; check parameters, acknowledge fault message
Temperature limiter, electric heater bank (AL15)	The system shuts down after a delay	Electric heater bank temperature too high	Check heater bank; acknowledge fault message
Safety temperature limiter elec. htr bank (AL16)	The system shuts down after a delay	Electric heater bank temperature too high	Check heater bank; acknowledge fault message
Fault, pump, cold water bank (AL17)	Pump off, cooling valve closed, demand chiller off	An overload relay of an external cooling circuit pump has responded	Reset overload relay; check power drawn by the pump; acknowledge fault message
Central fault ext refrigeration unit (AL18)	Chiller is switched off	Cooling unit / direct evaporator has recognised a fault; cooling unit / direct evaporator faulty	Check cooling unit / direct evaporator; acknowledge fault message
Fire damper no. 1 responded (AL29)	Subject to parameter settings, either system off, message only or smoke extraction	An external building fire protection system has responded. Personnel at risk from fire!	Reactivate fallen dampers, acknowledge fault message
Smoke detector responded (AL65)	Subject to parameter settings, either system OFF, only message or smoke extraction	Smoke detector has responded	Acknowledge fault message
Fire alarm system responded (AL19)	Subject to parameter settings, either system OFF, only message or smoke extraction	Smoke detector has responded	Acknowledge fault message
Icing-up sensor HR faulty or not connected (AL28)	Heat recovery switched off or does not control	Sensor or lead faulty	Check sensor and lead
KGWO burner fault (AL66)	System shuts down	Burner faulty	Check burner and acknowledge fault

Alarm messages	Effects	Cause	Remedy
Fault, heat recovery (AL61)	Heat recovery switched off or does not control	Heat recovery system faulty	Check system; acknowledge fault message
Vent. temp sensor faulty or not connected (AL20)	The system shuts down	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Room temp sensor faulty or not connected (AL22)	The system shuts down	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Extr. air temp sensor faulty or not connected (AL24)	If an extract air / ventilation air cascade is installed: System OFF otherwise message only	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Outside temp sensor faulty or not connected (AL26)	Message only; special function (night ventilation etc.) disabled	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Service required (AL59)	Display only	Component hours run exceeded	Service relevant components; reset hours run
Set value transd. not or incorrectly connected (AL58)	Set value transducer disabled	Set value transducer not or incorrectly connected	Check set value transducer and its wiring
Remote control not connected or databus fault (AL57)	Remote control disabled	Remote control not connected or databus fault	Check remote control and its wiring
Vent. air hum. sensor faulty or not connected (AL21)	Humidifier shuts down; system continues to operate	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Room air hum. sensor faulty or not connected (AL23)	Humidifier shuts down; system continues to operate	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Extr. air hum. sensor faulty or not connected (AL25)	Humidifier shuts down; system continues to operate	Sensor or lead faulty	Check sensor and lead, acknowledge fault message
Humidifier service (AL 62)	Message only	Humidifier requires a service	Service humidifier, acknowledge fault message
Humidifier fault (AL63)	Humidifier shuts down; system continues to operate	Fault recognition through humidifier; humidifier faulty	Check humidifier; acknowledge fault message
KLM-E address 1 (AL52) databus fault	The system shuts down	Extension module faulty; BUS cable faulty; incorrectly addressed	Check cable and address; change extension module, acknowledge fault message
KLM-E address 2 (AL53) databus fault	The system shuts down	Extension module faulty; BUS cable faulty; incorrectly addressed	Check cable and address; change extension module, acknowledge fault message
KLM-E address 3 (AL54) databus fault	The system shuts down	Extension module faulty; BUS cable faulty; incorrectly addressed	Check cable and address; change extension module, acknowledge fault message

Alarm messages	Effects	Cause	Remedy
KLM-E address 4 (AL55) databus fault	The system shuts down	Extension module faulty; BUS cable faulty; incorrectly addressed	Check cable and address; change extension module, acknowledge fault message
KLM-E address 5 (AL56) databus fault	The system shuts down	Extension module faulty; BUS cable faulty; incorrectly addressed	Check cable and address; change extension module, acknowledge fault message
Externe Störung (AL64)	Je nach Parametereinstellung Anlage Aus, nur Meldung	Störung von externer Baugruppe	Externe Baugruppe prüfen Störung quittieren
Fault (AL 74) Heat pump	During heating mode = system off During cooling mode = HP switches off	Fault Heat pump	Check heat pump, acknowledge fault message
Pump fault Reheater bank (AL 75)	Pump off, heating valve closed, heat source demand off	A motor overload relay of an external heating circuit pump has responded	Reset motor overload relay; check power drawn by the pump; acknowledge fault
Frost thermostat Reheater bank responded (AL 76)	System off, reheater bank pump on, reheater bank valve open, heat source demand on	Temperature captured at the thermostat below limit	Check heating medium; check heating circuit pump; check frost thermostat; acknowledge fault