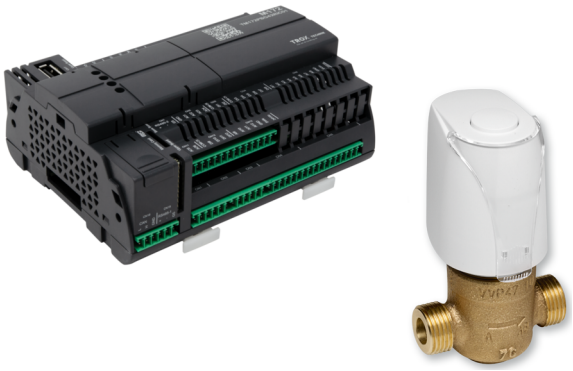
Installation and configuration manual GB/en

# Single room control system

## FSL-CONTROL III

for decentralised ventilation units from software version 6.0



TROX® TECHNIK

The art of handling air

Read the instructions prior to performing any task!

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A00000086251, 2, GB/en
12/2021

# General information

### About this manual

This manual enables personnel to correctly install and configure FSL-CONTROL III for the control of TROX decentralised ventilation units.

This manual is intended for use by network administrators, instructed persons, and qualified electricians or air conditioning technicians.

It is essential that these individuals read and fully understand this manual before starting any work. The basic prerequisite for safe working is to comply with the safety notes and all instructions in this manual.

The local regulations for health and safety at work and the general safety regulations for the area of application of the ventilation unit also apply.

This manual must be given to the system owner when handing over the system. The system owner must include the manual with the system documentation. The manual must be kept in a place that is accessible at all times.

Illustrations in this manual are mainly for information and may differ from the actual design.

### Other applicable documentation

- Operating and installation manual for the decentralised ventilation unit
- Project-specific documents (if any)

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To ensure that your request is processed as quickly as possible, please keep the following information ready:

- Product name
- TROX order number
- Delivery date
- Brief description of the fault

| | |
|---|---|
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### Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

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- Operation or handling by untrained individuals
- Unauthorised modifications
- Technical changes
- Use of non-approved replacement parts

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# Table of contents

# 1 Safety

## 1.1 Symbols used in this manual

### Safety notes

Symbols are used in this manual to alert readers to areas of potential hazard. Signal words express the degree of the hazard.

Comply with all safety instructions and proceed carefully to avoid accidents, injuries and damage to property.

**DANGER!**
Imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING!**
Potentially hazardous situation which, if not avoided, may result in death or serious injury.

**CAUTION!**
Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

**NOTICE!**
Potentially hazardous situation which, if not avoided, may result in property damage.

**ENVIRONMENT!**
Environmental pollution hazard.

### Safety notes as part of instructions

Safety notes may refer to individual instructions. In this case, safety notes will be included in the instructions and hence facilitate following the instructions. The above listed signal words will be used.

Example:

1. ▸ Loosen the screw.
2. ▸

   **CAUTION!**
   **Danger of finger entrapment when closing the lid.**

   Be careful when closing the lid.
3. ▸ Tighten the screw.

### Tips and recommendations

*Useful tips and recommendations as well as information for efficient and fault-free operation.*

### Additional markers

In order to highlight instructions, results, lists, references and other elements, the following markers are used in this manual:

| Marker | Explanation |
|---|---|
| 1., 2., 3. ... | Step-by-step instructions |
| ⇨ | Results of actions |
| | References to sections in this manual and to other applicable documents |
| ■ | Lists without a defined sequence |
| *[Switch]* | Operating elements (e.g. push buttons, switches), display elements (e.g. LEDs) |
| *'Display'* | Screen elements (e.g. buttons or menus) |

## 1.2 Correct use

The FSL-CONTROL III controller is designed exclusively for the control of TROX decentralised ventilation units.

Correct use also involves complying with all the information provided in this manual.

Any use that goes beyond the correct use or any different use of the unit is regarded as incorrect use.

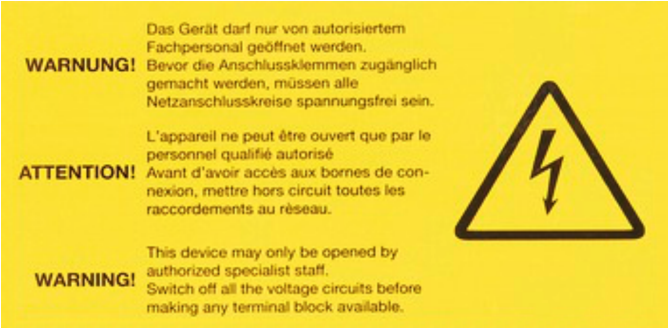
## 1.3 Safety signs

The following symbols and signs are found on the unit. They apply to the very location where they are found.

### Electrical voltage

Hazardous electrical voltage that is present in the ventilation unit. Only skilled qualified electricians are allowed to work on parts of the ventilation unit marked with this symbol. Such work must be carried out only by skilled qualified electricians or the technical service.

**Controls access panel**




Only skilled qualified electricians are allowed to open the controls access panel. Ensure that no voltage is present on any mains circuit before you open the cover to access the terminal connections.

## 1.4 Electric shock hazard

**Electric current**

**DANGER!**

**Danger of death due to electric current!**

Danger of electric shock! Do not touch any live components! Damaged insulation or damaged parts are a life threatening hazard.

- Only a skilled qualified electrician must work on the electrical systems.
- If the insulation is damaged, disconnect the power supply immediately and have the insulation repaired.
- Switch off the power supply before you carry out maintenance or cleaning.
- Ensure that live parts do not come into contact with moisture. Moisture can cause a short circuit.

## 1.5 Qualified staff

**Qualification**

The work described in this manual has to be carried out by individuals with the qualification, training, knowledge and experience described below:

**Network administrator**
Network administrators design, install, configure and maintain the IT infrastructure in companies or organisations.

**Skilled qualified electrician**
Skilled qualified electricians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on electrical systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

Any work has to be carried out by individuals who can be expected to carry out their assigned duties reliably. Individuals whose reaction time is delayed due to alcohol, drugs or other medication must not carry out any work.

# 2 Making electrical connections

**DANGER!**

**Electric shock hazard! Electrical equipment carries a dangerous electrical voltage!**

- Only skilled qualified electricians are allowed to work on the electrical system and to connect the unit to the mains.
- Disconnect the cable from the mains (all phases) and secure the unit against being switched on accidentally.
- Ensure that no voltage is present.
- Carry out assembly or connection jobs only as long as no voltage is present.

**Notes on the electrical installation**

Use only cables that are designed for the supply voltage for which they will be used. The length and cross section as well as any contact resistance may increase voltage losses. The power rating of each unit must also be considered. A skilled qualified electrician has to select the correct cable types and sizes. This job must only be carried out by specialist electrical companies.

- For the electrical connection comply with any applicable regulations and follow the code of good practice. Be sure to comply with the applicable guidelines for working on electrical and electronic equipment as well as with any applicabe local regulations.
- The connection data can be found on the rating plate or in the wiring diagrams.
- Protect any connections from physical damage.
- Feed cables through the cable glands on the ventilation unit.
- Ensure that the unit can be de-energised (all phases) for maintenance such that no voltage is present. This requires separators (e.g. fuses or RCBOs); the distance between contacts should be at least 3 mm.
- For units without integral controls from TROX follow the instructions of the controls provider.

## 2.1 Wiring

**Personnel:**

- Skilled qualified electrician

▸ Connect the ventilation unit according to the wiring diagrams. The position of the electrical connections (terminal box) can be found in the device-specific documentation.

### 2.1.1 Connection of the supply voltage

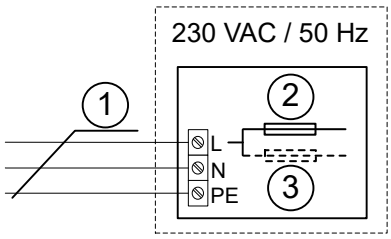



*Fig. 1: Connection of the supply voltage*

1 Connecting cable Ölflex Classic 100 3G 1.5 mm² ca. 1.0 m (supply package TROX)
2 Fuse 3.15 A
3 SCHOOLAIR-V-HV-EH only: fuse 9.0 A

**DANGER!**

**Risk to life from electrical voltage!**

The control box may not be opened, it is used for the internal electrical wiring and may only be opened by TROX Service personnel.

The electrical connection is made with the connecting cable leading from the control box.

### 2.1.2 Connection of the control panel

**Notes on control panels**

Select an installation location where the control panel is not affected by disturbances. Avoid solar gain and draughts.

Seal the end of the conduit in the junction box as otherwise a draught could occur in the conduit and affect the measurement results.

**Honeywell, 5-stage (0, 1, 2, 3, AUTO)**

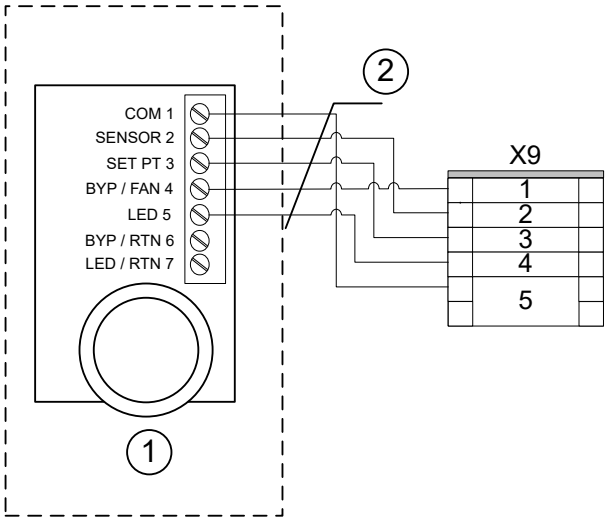



*Fig. 2: Wiring of Honeywell control panel, 5-stage to terminal X9*

1 Control panel with selector switch, for surface mounting, type: T7460F1000, TROX order no. M546FB8
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Schneider, without selector switch**

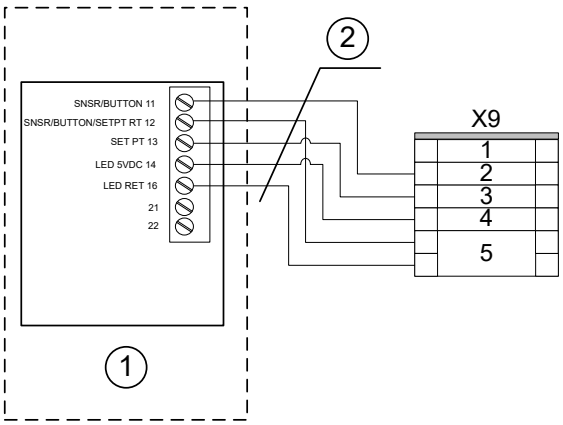



*Fig. 3: Wiring of control panel STR 504 to terminal X9*

1 Control panel without selector switch, for surface mounting, type: STR 504 TROX order no. M536BA4
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Thermokon, with selector switch, 5-stage**

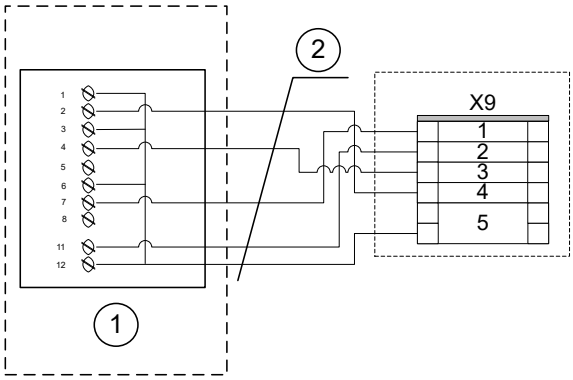



*Fig. 4: Wiring of Thermokon control panel (5-stage) to terminal X9*

1 Control panel with selector switch, for surface mounting, type WRF04 PSTD NTC20k 5k FS5 gn 5V SA, TROX order no. A00000082515
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Thermokon, without selector switch**

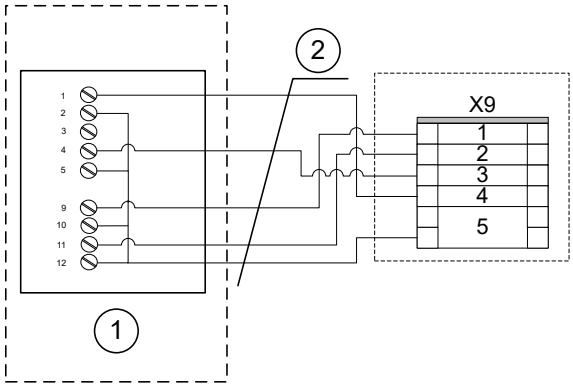



*Fig. 5: Wiring of Thermokon control panel to terminal X9*

1 Control panel without selector switch for surface mounting, type WRF04 PTD NTC 20k 5k gn, TROX order no. A00000079777
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Thermokon, without selector switch, Berker S.1 or Q.3**

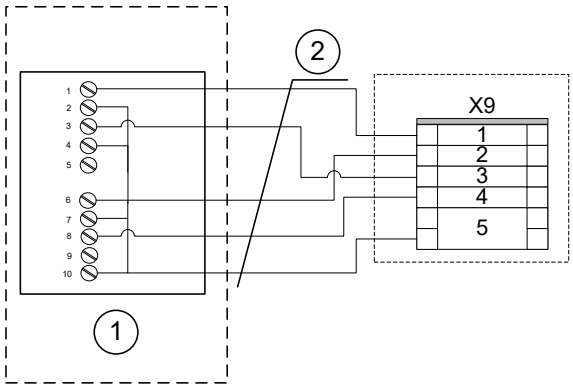



*Fig. 6: Wiring of Thermokon control panel to terminal X9*

1 Control panel without selector switch, for flush mounting, suitable for switch programme Berker S.1, type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000079778
1 Control panel without selector switch, for flush mounting, suitable for switch programme Berker Q.3, type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000081579
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Thermokon, without selector switch, Busch Jäger Futura**

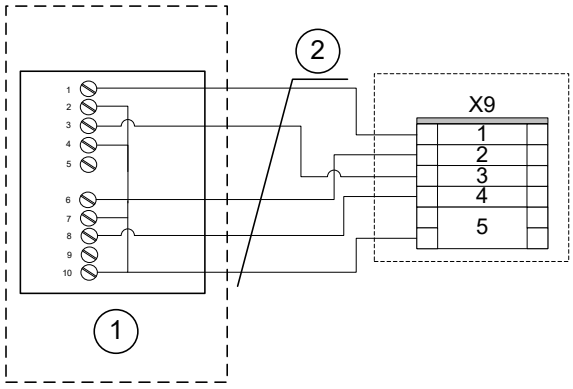



*Fig. 7: Wiring of Thermokon control panel to terminal X9*

1 Control panel without selector switch, for flush mounting, suitable for switch programme Busch Jäger Futura, type WRF07 PTD NTC 20k BType6 5k gn, TROX order no. A00000079779
2 LiYCY 5 x 0.5 mm² shielded (by others)

**Thermokon, without selector switch, without set-point value adjuster, Gira E2**

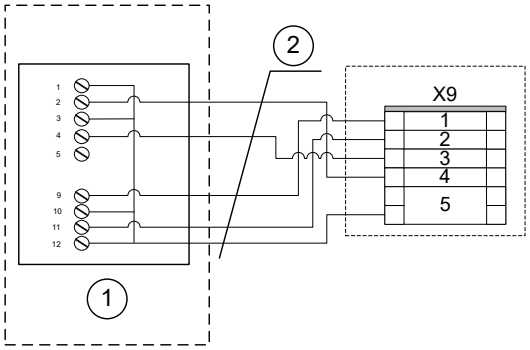



*Fig. 8: Wiring of Thermokon control panel to terminal X9*

1 Control panel without selector switch, for flush mounting, suitable for switch programme Gira E2, type WRF06 TD NTC 20k, TROX order no. A00000081503
2 LiYCY 5 x 0.5 mm² shielded (by others)

### 2.1.3 Connection of room temperature sensor

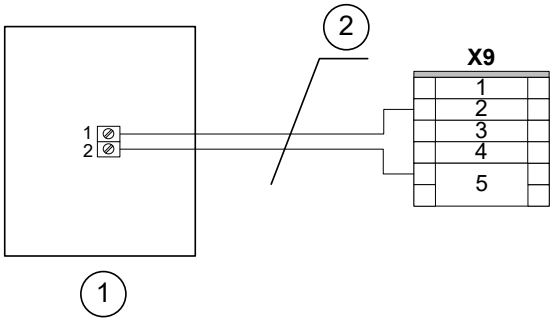



*Fig. 9: Connection of room temperature sensor*

1 Room temperature sensor, type RTF3-NTC10k, TROX order no. A00000059069
2 LiYCY 2 x 0.5 mm² shielded (by others)

## 2.1.4 Connection of external inputs and outputs

### External switch inputs

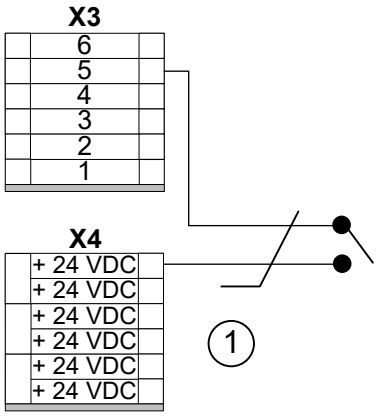



*Fig. 10: Wiring example of window contact*

1 Connecting cable LiYCY 2 x 0.5 mm² (by others)

**Terminal connections X3**

| No. | Function | Switch | |
|---|---|---|---|
| | | Open | Closed |
| 1 | Fume cupboard switch | Inactive | Active |
| 2 | Changeover [1] | Heating | Cooling |
| 3 | Operating enable | Off | Automatic |
| 4 | Fire emergency stop [1] | Off | Automatic |
| 5 | Window contact [1] | Off | Automatic |
| 6 | PIR sensor | Valid operating mode | Occupied |

1 cable break safety device

### External switch outputs

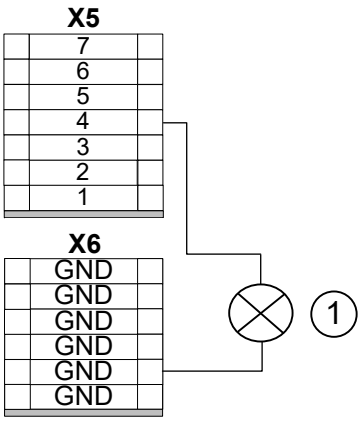



*Fig. 11: Wiring example B alarm*

1 Connecting cable LiYCY 2 x 0.5 mm² (by others)

**Terminal connections X5**

| No. | Connection | Voltage / Current consumption |
|---|---|---|
| 1 | Requirements of coolant [1] | 24 VDC, max. 250 mA |
| 2 | Requirements of heat transfer fluid [1] | |
| 3 | Operational readiness | |
| 4 | B alarm | |
| 5 | A alarm | |
| 6 | Enable heating ceiling | |
| 7 | Enable chilled ceiling | |

1 changeover mode only

## 2.1.5 Communication FSL-CONTROL III

### 2.1.5.1 Several controllers in a control zone

Up to 11 FSL-CONTROL III devices can be connected in one control zone (1 master device and up to 10 slave devices).

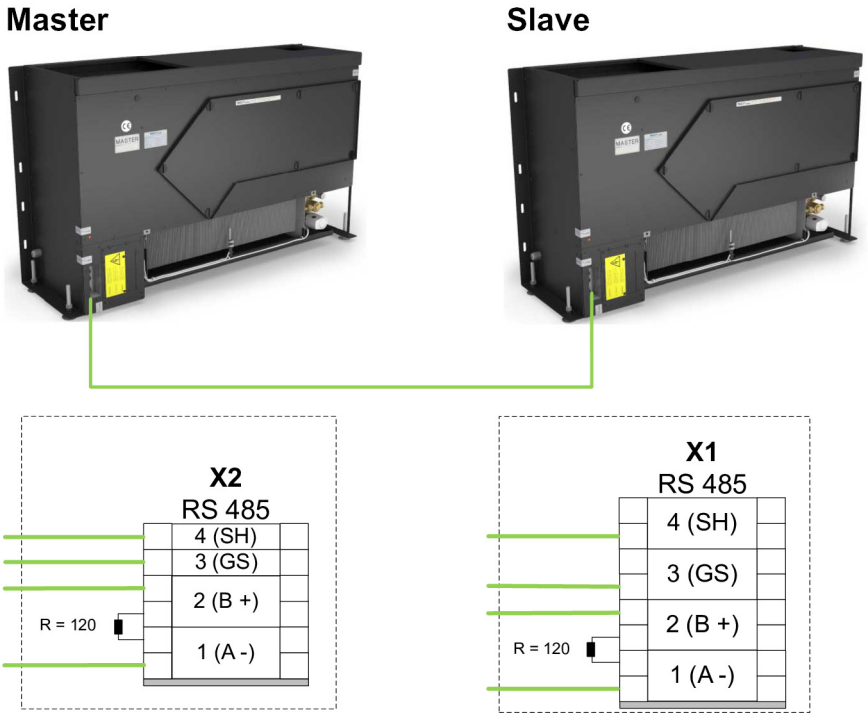



*Fig. 12: FSL-CONTROL III communication 2 devices*

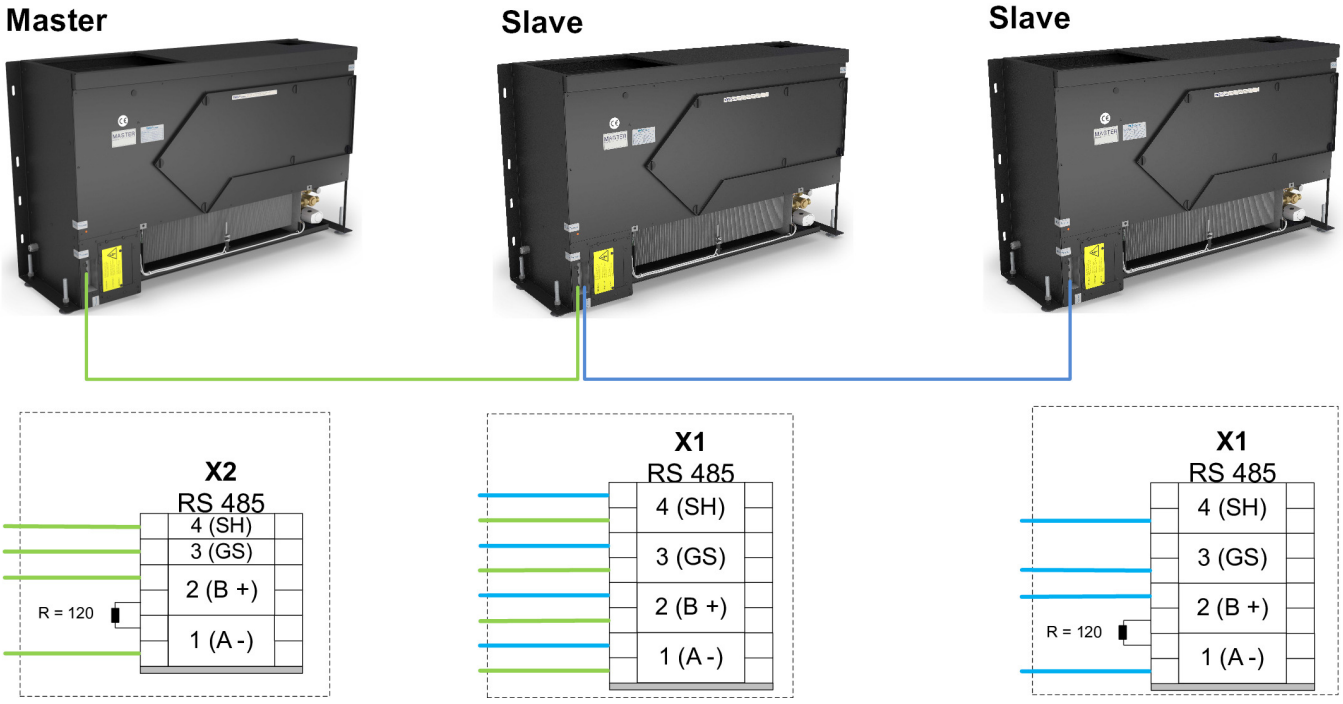



*Fig. 13: FSL-CONTROL III communication 3 devices*

The master device must be installed on one of the two ends of the network (as the first or last device).

### Terminal resistor

For smooth data exchange between the controllers, a resistance of 120 Ohm must be set on the first and last subscriber, remove the resistances in the other devices (if available).

Installation location of terminal resistor Fig. 12 , Fig. 13

Master devices - Terminal block X2, terminals 1 and 2

Slave devices - Terminal block X1, terminals 1 and 2

### Information on network connection

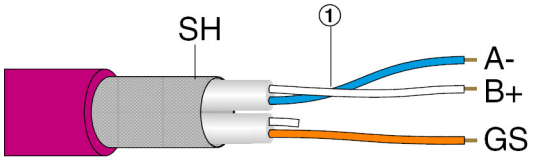



*Fig. 14: Wiring*

All network connections via shielded cables.

**Note:** For A- and B+, use a twisted pair ①!

**Recommended network cable (by others):** e.g. Unitronic BUS LD 2 x 2 x 0.25 mm² or equivalent

### 2.1.5.2 Network with several control zones

**Building a network**

Control zones can be networked using one of four existing network protocols (Modbus RTU, Modbus TCP, BACnet MS/TP or BACnet IP). This requires a bus interface card to be connected to the FSL-CONTROL III master controller in the factory.

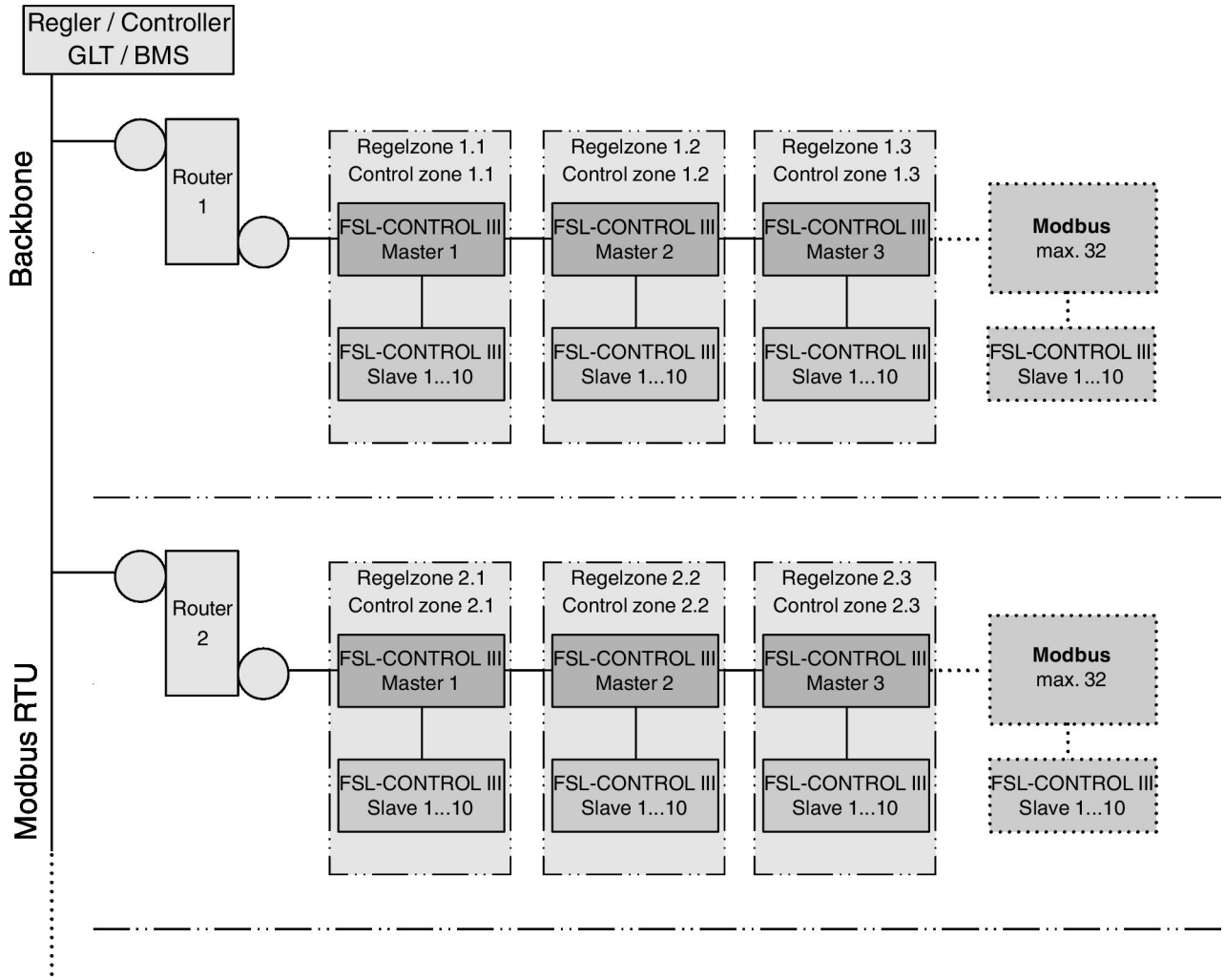



*Fig. 15: FSL-CONTROL III network configuration, example Modbus RTU; BACnet MS/TP*

*If the master controller is integrated in a central BMS (by others), it acts as a slave within the bus network, but as a master within the FSL-CONTROL III system.*

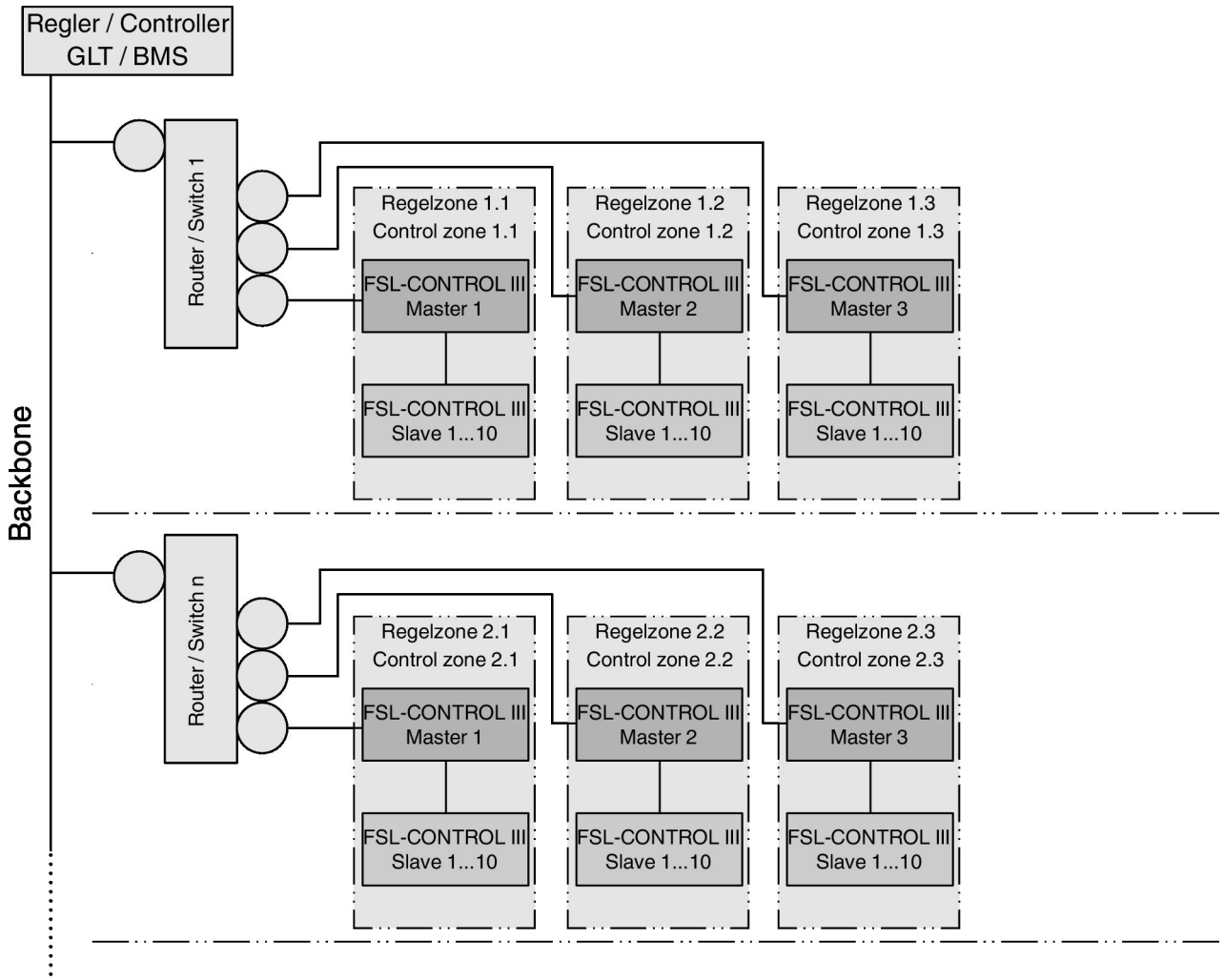



*Fig. 16: FSL-CONTROL III network configuration, Modbus TCP; BACnet IP*

## 2.2 Connection to the central building management system (central BMS)

### 2.2.1 Modbus RTU / BACnet MS/TP

**Connection of data cables**

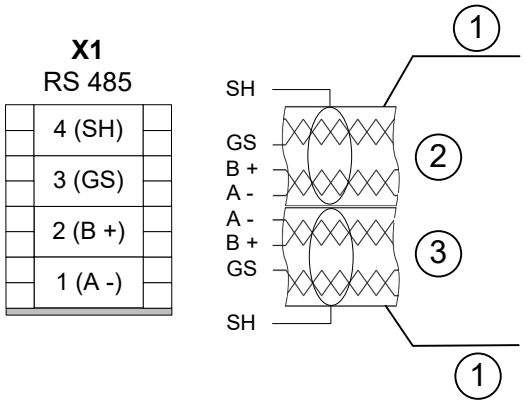



*Fig. 17: Connection of central BMS to the master device with Modbus RTU / BACnet MS/TP interface*

1 Network cable Unitronic BUS LD 2 x 2 x 0.22 (or equivalent, by others)
2 (coming) from the central building management system
3 (going) to the next BUS subscriber of the central BMS
Count up the terminal position from the grey end plate (direction of the arrow)

The Modbus RTU / BACnet MS/TP interface has terminals for max. two cables of an EIA-485 network. A maximum of 32 devices can be operated on one network segment.

**Personnel:**

- Network administrator

**Materials:**

- Software for bus communication
- Browser

1. ▸ Strip the insulation from the cable (at least three wires), insert the bare wires into the terminals and tighten the screws by hand (only use twisted pair for B+ and A-).

   Make sure that the polarity of the conductor pairs is correct. Incorrect polarity will result in inverted data signals and hence communication errors.

2. ▸ Fix the data cables to the casing using the wire clamping bracket.

3. ▸ Connect the shield to the SH terminals.

   **Note:** Within a chain (channel) connect the shield only at one point to the earth. Earthing the shield at every controller will lead to voltage disturbances.

4. ▸ To avoid cable reflections, network segments must be terminated at both ends with 120 Ω bus terminal resistors. Alternatively, the terminal resistors can be enabled or disabled on the PCB.

**Recommended bus cables**

Unitronic BUS LD 2 x 2 x 0.22 (or equivalent)

### 2.2.2 Modbus TCP / BACnet IP

**Connection of data cables**

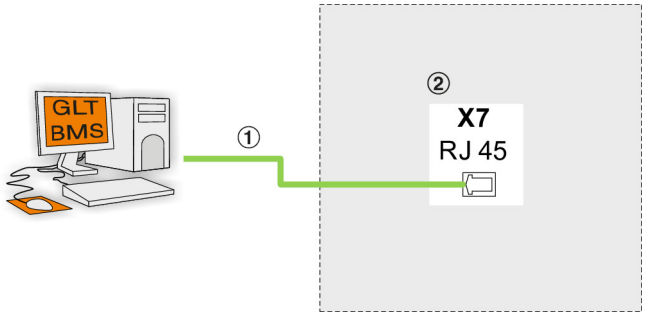



*Fig. 18: Connection of central BMS to the master device with Modbus TCP / BACnet IP interface*

1 Network cable (coming) from the central building management system
Network cable min. Cat 5e RJ45 (or equivalent, by others)
2 Terminal block X7 RJ45 interface

The devices have an RJ45 interface for star-shaped connection of devices to a Modbus TCP / BACnet IP network.

**Personnel:**

- Network administrator

**Materials:**

- Software for bus communication
- Browser

▸ Insert the RJ45 connector for the cable into the intended bush (X7).

Each master must be connected with a separate cable.

***Special feature of external control box e. g. FSL-U-ZAS, FSL-U-SEK)***

*To simplify maintenance, connection X7 on the ventilation unit has a double construction One connection is connected to the controller box by a network cable. The second connection can be used for interfacing to the central BMS. Internally, both connections are connected, which means that communication with the BMS is guaranteed.*

**Recommended bus cables**

Network cable min. Cat. 5e RJ45

### 2.2.2.1 Setting the network address

**Personnel:**

- Network administrator

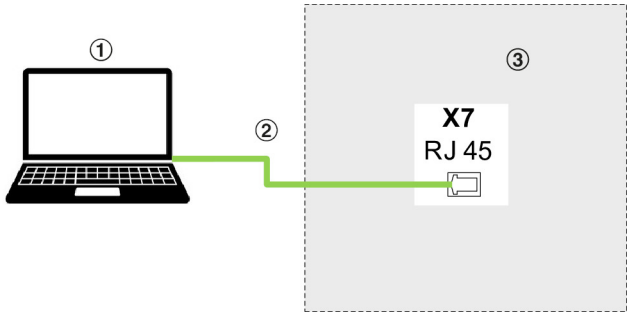



*Fig. 19: Connect laptop to the ventilation unit*

1 Mobile computer with Ethernet interface
2 Network cable min. Cat 5e RJ45
3 Junction box for network cable

Before operation, the interface for the devices must be adapted to the existing network structure. The configuration is carries out via the browser, .

**Factory settings SL1 connection X1 serial bus**

| Address | Who | Value |
|---|---|---|
| 16124 | Address | 1 |
| 16129 | Baud rate X1 | 2 |
| 16126 | Data bits X1 | 8 |
| 16127 | Stop bits X1 | 1 |
| 16128 | Parity X1 | 2 |

**Master device configuration of the serial connection to the central BMS (Modbus RTU, BACnet MS/TP)**

**Address of terminal X1**

This is used for the addressing of all master devices in the network. Each device is given a unique address. In a network segment, a maximum of 32 network addresses (devices) can be used. The permitted address range is 1 – 128.

For setting information, see

**Slave device configuration for connection to the master device**

**Address of terminal X1**

This is used for the addressing of the slave devices in the master / slave network. If only one slave is connected to a master device, no settings are needed. If several slave devices (max. 10 units) are connected to a master device, each slave device must be given a unique address.

Addressing example:

Slave 1 - Value `2` Modbus address 2

Slave 2 - Value `3` Modbus address 3

Slave n - Value `n+1` Modbus address n+1

Slave 10 - Value `11` Modbus address 11

**Settings X1**

| Address | Who | Value |
|---|---|---|
| 16129 | Baud rate<br>⇒ 38400 Baud<br>**Note:** No settings are needed, for communication between the master and slave, only 38400 baud is supported. | 2 |
| 16126 | Data bits<br>The FSL-CONTROL III controller only supports 8 data bits. | 8 |
| 16127 | Stop bits<br>The FSL-CONTROL III controller only supports 1 stop bit. | 1 |
| 16128 | Parity<br>⇒ Even<br>**Note:** No settings required. Only "Even" is used for communication between master and slave. | 2 |

**Modbus address terminal X2**

The following settings are factory set and do not need to be changed.

| Address | Who | Value |
|---|---|---|
| 15774 | Modbus address terminal X2 | 1 |

# 3 Control of the ventilation unit

## 3.1 FSL-CONTROL III control system

**System overview**

FSL-CONTROL III is a dedicated single room control system for decentralised TROX ventilation systems.

The FSL-CONTROL III controller can be used to combine the following concepts:

- Room temperature control using the room or extract air temperature
- Control of the supply air temperature (isothermal)
- Room air quality control (optional)

### 3.1.1 Control components

The modular design of the hardware allows for adding optional equipment to the range of functions of the FSL-CONTROL III controller.

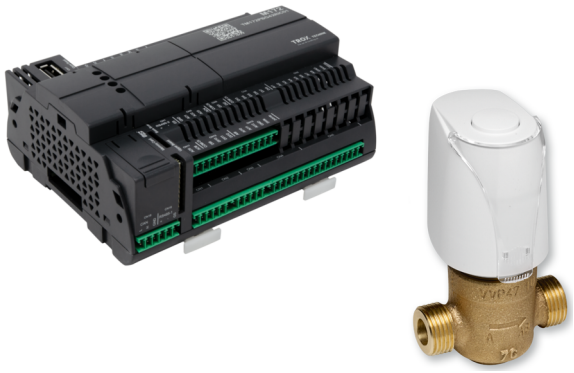


*Fig. 20: Controller, valve with thermoelectric actuator*

**Basic equipment**

- Controller for master or slave operation
- Heating and/or cooling valves, including thermoelectric actuators and lockshields; alternatively: electric reheater
- Supply air temperature sensor

**Optional equipment**

- Control panel including setpoint value adjuster and room temperature sensor
- Outdoor temperature sensor
- Air quality sensor ($CO_2$ / VOC)
- Clock and timer
- Valve actuators
- Pressure-independent control valve
- Interfaces to the central building management system
  - Modbus RTU interface
  - Modbus TCP interface
  - BACnet MS/TP interface card
  - BACnet IP interface
  - Digital switch contacts (inputs and outputs)

### 3.1.2 Functional description

#### 3.1.2.1 General

The FSL-CONTROL III controller is used to control various parameters for individual rooms.

It is primarily used to control the room temperature, i.e. to maintain the set parameters and a comfortable room climate. Alternatively, the supply air can be provided to the room with a constant temperature. With an air quality sensor (optional) it is possible to control the outdoor air flow rate based on the air quality.

***Configuration in the web browser***

*The devices are configured using the IP interface and web browser.*

#### 3.1.2.2 Room temperature control

The FSL-CONTROL III controller ensures that the comfort temperature range for each operating mode is maintained. Cascade control ensures that the comfort temperature range is quickly achieved. The supply air temperature is controlled within the set range and with internal and external loads being accounted for. This is how the comfort requirements are met.

Room temperature control requires that the following values are measured:

- Room temperature, e.g. from an optional control panel or from the central BMS
- Outdoor temperature, e.g. from the central BMS or from an optional temperature sensor in the outdoor air intake of the master unit
- Supply air temperature

*Room temperature control works best when the room temperature is measured at a carefully selected point. The control panel is ideally installed about 1.5 m above the floor. Select an installation location where the control equipment is not affected by disturbances (e.g. solar gain or draughts). We recommend adjusting the flow temperature based on the outdoor temperature in heating and in cooling mode.*

**Sample standard factory settings for room temperature control**

| Settings | Operating mode | |
|---|---|---|
| | Occupied | Unoccupied |
| Room temperature setpoint value, heating | 21.8 °C | 18.0 °C |
| Room temperature setpoint value, cooling | 22.2 °C | 28.0 °C |
| Comfort temperature range | 21.8 °C to 22.2 °C | 18.0 °C to 28.0 °C |
| Upper limit of supply air temperature (heating) | 42.0 °C | 42.0 °C |
| Lower limit of supply air temperature (cooling) | 18.0 °C | 13.0 °C |

***Demand-based settings***

*These factory settings have been selected for their energy efficiency but can be changed in the web browser.*

*For a comfortable room climate the supply air temperature in 'Occupied' mode should be at least 18 °C. In heating mode a comfortable room climate can be achieved with supply air temperatures of up to 42 °C.*

*The minimum permitted supply air temperature for night ventilation is 2K under the supply air temperature threshold for unoccupied mode.*

To prevent the system from constantly changing between heating and cooling mode, the room temperature is not controlled to a fixed value, but within a comfort temperature range.

When cooling, the room temperature setpoint value depends on:

- Room temperature
- Operating mode
- Temperature offset (central BMS & control panel)
- Outdoor temperature

When heating, the room temperature setpoint value depends on:

- Room temperature
- Operating mode
- Temperature offset (central BMS & control panel)
- Outdoor temperature
- Winter compensation

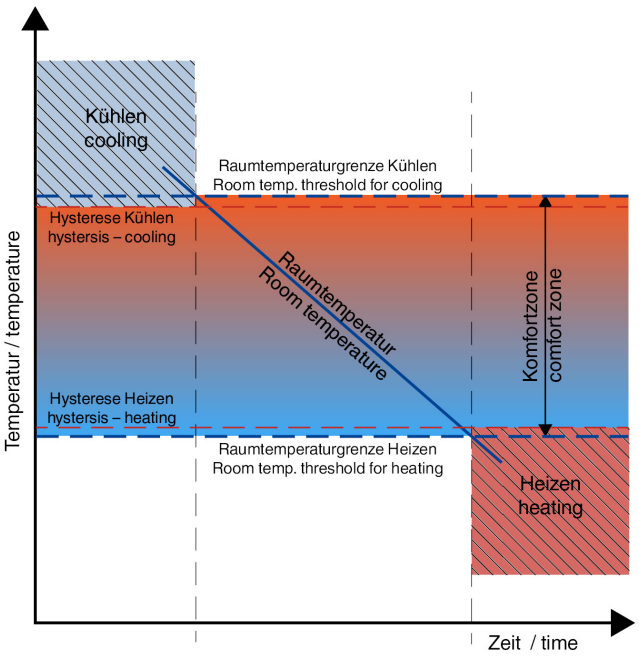



*Fig. 21: Room temperature control*

**Control response for room temperature outside the comfort temperature range:**

| Room temperature | Control response |
|---|---|
| Below Comfort temperature range | Heating active, the room temperature setpoint value for heating is set. |
| Above Comfort temperature range | Cooling active, the room temperature setpoint value for cooling is set. |

If the room temperature is within the comfort temperature range, the room temperature setpoint value is set depending on the outside air temperature.

**Control response for room temperature within the comfort temperature range:**

| Outdoor temperature | Control response |
|---|---|
| Below Comfort temperature range | Heating active, the room temperature setpoint value for heating is set. |
| Above Comfort temperature range | Cooling active, the room temperature setpoint value for cooling is set. |

If the outdoor temperature is also within the comfort temperature range, the room temperature setpoint value is based on the cooling and heating sequence.

If the room temperature setpoint value is changed on a control panel (e.g. by entering +2 K), both room temperature limits and hence the comfort temperature range are also changed (e.g. by +2 K) as a consequence.

If the operating mode is set to 'Occupied', the temperature control is suspended as soon as the room temperature is within the comfort temperature range.

### 3.1.2.3 Supply air temperature control

In addition to room temperature control, it is also possible to blow the supply air into the room at a constant temperature. The supply air temperature control is primarily for isothermal applications.
The setpoint value for the supply air temperature is a function of the set temperature limits for heating and cooling and the current supply air temperature.
If the supply air temperature is below the set lower limit, the device regulates the lower limit of the comfort band as the set supply air temperature.
If the supply air temperature is above the set lower limit, the device regulates the upper limit of the comfort band as the set supply air temperature.
To ensure the isothermal air supply, the same temperatures must be stored for the heating and cooling temperature limits.

***Note:***

- *The heating load of the room must be covered by a separate heating source.*
- *The extract air temperature sensor must basically be activated.*

***In addition, please note** that, for devices with supply air temperature control in automatic mode, the individual fan stages are only determined on the basis of the air quality. It is therefore advisable to store a minimum fan stage for the Occupied mode. If the devices are to be ventilated during the Unoccupied operating mode, a minimum fan stage must also be stored here, but the devices ventilate exclusively in Outdoor Air mode.*

### 3.1.2.4 Constant bypass on heat recovery unit

The ventilation units that are equipped with a cross flow or cross counter flow heat recovery unit have a constant bypass (0…100%). The bypass is controlled automatically.

The bypass is used to reach the supply air temperature setpoint value in heating and cooling mode. When the "Night Purge" function is active, the bypass is open. The volume flow rate to be heated by the heat recovery unit is controlled by the bypass.

If, for example, the outdoor temperature is low, but an internal space has to be cooled anyway, use of the cooling coil can be reduced to a minimum as only a small portion or even no portion of the air has to pass the heat recovery unit.

### 3.1.2.5 Rotary heat recovery unit

In ventilation units with a rotary heat recovery unit, the rotor speed is automatically adjusted so that the supply air temperature setpoint value can be reached. During "Night purge", the rotary motion of the rotor is switched off.

Due to variable control, use of the cooling coil can be reduced to a minimum in transition times, i.e. if the outdoor temperature is low but the internal space has to be cooled anyway.

### 3.1.2.6 Fan stages

The FSL-CONTROL III controller automatically selects the correct fan stage based on temperature control or indoor air quality (optional). The fan stage can also be pre-set by the central BMS (by others) or from a control panel.

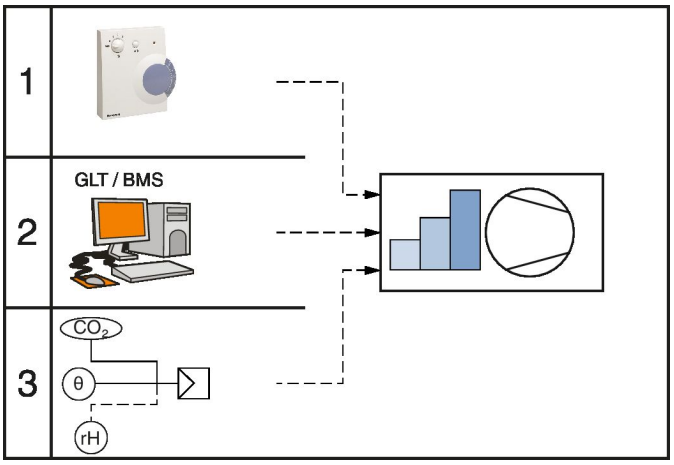



*Fig. 22: Fan stages – priority*

### 3.1.2.7 Air quality control (optional)

Air quality control means that the outdoor air flow rate is controlled based on the room air quality.

This type of control is only possible with an air quality sensor (optional equipment or by others). The internal sensor optionally detects the $CO_2$ concentration or the VOC content of the extract air. Air quality control is always active in the *'Occupied'* operating mode. In the *'Unoccupied'* operating mode, air quality control is inactive.

**Air quality control – factory settings**

| $CO_2$ value [ppm] | Fan stage | |
|---|---|---|
| | Outdoor air | Secondary air |
| < 500 | | 1-3 |
| 500 – 750 | 1 | |
| 750 – 900 | 2 | |
| > 900 | 3 | |

The system owner can adjust the air quality values.

***Secondary air and outdoor air modes***

*If the current measured value of the indoor air quality is under the first limit while the bypass is inactive, this means that secondary air operation is active. As soon as the configured limit of air quality for fan stage 1 is exceeded, the unit automatically switches to outdoor air mode. Preset minimum periods of time ensure that not too many quick changes between the fan stages occur.*

***Outdoor Air mode***

*When Outdoor Air mode is activated, the ventilation unit exclusively conveys outdoor air regardless of the first limit value. The fan stages continue to be raised depending on the limit values. Outdoor Air mode can be stored as a fixed parameter, activated on the control panel (configuration of the push button) or set using the central BMS.*

### 3.1.2.8 Operating mode

The operating modes are used for higher-level control of the devices.

The following operating modes are available:

- OFF
- Automatic
- MANUAL

The above-mentioned operating modes can be set in the central BMS, on the digital control panel (CP Type01_Digital), in the web browser and using digital switching inputs (OFF and Automatic only).
The Manual operating mode can only be activated via the web browser.

#### OFF operating mode

In the OFF operating mode, the fans are always switched off and the outdoor air and exhaust air dampers are closed. Only self-protection functions such as frost protection are still active.
OFF can be used as an operating enable if a device is to be controlled independently of the operation on the control panel, as well as independently of the internal clock.

***Recommended***

*OFF serves exclusively the self-protection of the device and can be selected for longer standstill periods, such as holidays. In particular, the protection of the building protection must be safeguarded by other heat sources.*

#### Automatic operating mode

The Automatic operating mode is the standard operating mode for ventilation units.

The control of the ventilation unit can be influenced by the following signal transmitters:

- Central BMS
- Real time clock (RTC)
- Control panel
- Digital input

#### Manual operating mode

The Manual operating mode is used for commissioning or equipment maintenance.
It can only be activated on the device itself by accessing the web server.
In the Manual operating mode, individual actuators can be controlled manually, e.g. valves for hydraulic balancing.

### 3.1.2.9 Operating modes / operating mode override

Automatic operating modes:

- Standby
- Occupied
- Unoccupied

Operating mode override:

- Boost
- Exercise
- Night purge
- Fan force

*With an operating mode override, the current automatic operating mode is overridden.*
*Once this override has been completed, the device returns to automatic mode.*

The specified operating modes and overrides can be set using the optional real-time clock and the central BMS. In addition, the Occupied and Unoccupied operating modes as well as the Boost and Exercise overrides can be activated from the control panel.

Various comfort temperature ranges can be defined for the operating modes Occupied and Unoccupied. You can define daily schedules and enter a start time for each operating mode. Using the optional real time clock (RTC) allows for defining 10 switching points per day. If no RTC is used, operating modes must be changed by the central BMS or on the control panel. The comfort temperature range for the Occupied mode can be modified on the control panel and by the central BMS.

### Standby operating mode

Standby is selected if the room is not occupied and the ventilation units are not used to maintain the temperature, e.g. at night.

***Recommended:***

*Standby is used exclusively for the self-protection of the device and should only be selected if the protection of the building protection is safeguarded by other heat sources.*

### Occupied operating mode

The Occupied mode is used for occupied rooms.

The following parameters can be set:

- Comfort temperature range for Occupied
- Supply air temperature limits for heating/cooling

***Recommended***

*All-day use (e.g. 7 am to 5 pm)*

### Unoccupied operating mode

The Unoccupied mode is used for unoccupied rooms.

The following parameters can be set:

- Comfort temperature range for Unoccupied
- Supply air temperature limits for heating/cooling

***Unoccupied***

– *This operating mode is used to protect the building; it is required for night purge.*
– *Air quality control is not possible with this operating mode.*

### Boost operating mode override

Boost can be selected to quickly ventilate a room, e.g. during break times. The device ensures supply air/ extract air operation to improve the indoor air quality. Afterwards, the device returns to the Occupied operating mode.

The following parameters can be set:

- Fan setting (default: stage 4)
- Duration (default: 15 min.)

***Boost***

*Boost mode can be enabled using the control panel or central BMS. The same setpoint values that are used for Occupied mode are used for the comfort temperature range and supply air temperature limits.*

### Exercise operating mode override

Exercise can be selected if acoustically optimised operation is required. The device conveys a slightly reduced volume flow rate in supply air/extract air operation to improve the indoor air quality. Afterwards, the device returns to the Occupied operating mode.

The following parameters can be set:

- Fan setting (default: stage 2)
- Duration (default: 60 min.)

***Exercise***

*Exercise mode can be enabled using the control panel or the central BMS The same setpoint values that are used for Occupied mode are used for the comfort temperature range and supply air temperature limits.*

### Nigh purge operating mode override

With the Night purge function, the room is passively cooled with outdoor air. The minimum supply air temperature corresponds to the supply air temperature limit for heating in Unoccupied mode of -2K. The fans are controlled in the configured stage for night ventilation. The max. fan stage for Unoccupied operating mode is ignored for the duration of night ventilation.

The following conditions must be simultaneously fulfilled:

- Night purge is activated
- The current month is in the range Start – End – Month (default: May – September)
- Activated by RTC, central BMS or DI
- Outdoor air temperature > minimum outdoor air temperature for Night purge (default = 12 °C)
- Outdoor air temperature < as a setpoint value for cooling in the Occupied operating mode
- Outdoor air temperature < current room temperature
- Supply air temperature > minimum supply air temperature limit for heating in the Unoccupied operating mode

The Night purge function ends when one of the following conditions are fulfilled:

- Frost protection
- Window contact
- Fire protection
- Fan force

- Switch of operating mode to Standby or Occupied
- Switch of operating mode to Off or Manual

> ***Note***
>
> *When the Night purge operating mode override ends, the device switches to Unoccupied. Secondary air units do not execute this override.*

**Fan force override (fume cupboard switching)**

With the Fan force function, there is an override of the fans via the DI, RTC or central BMS. For the duration of the activation, the fans are operated separately from one another in a configurable stage for supply air and extract air.

> ***Fume cupboards***
>
> *Fume cupboards, e.g. in seminar rooms, can dissipate high volume flow rates. Override control can help to achieve balanced volume flow rates.*
>
> *The volume flow rates of fume cupboards must be specified when planning devices.*
>
> *When Fan force is active, the Occupancy button and the default fan setting are deactivated on the control panel.*

### 3.1.2.10 Functions

The following functions of control are factory set on the basis of customer-specific requirements. TROX HGI Service can change the factory settings at a later stage.

#### 3.1.2.10.1 Winter compensation

Winter compensation is the automatic adjustment of the comfort temperature range depending on the outdoor air temperature.

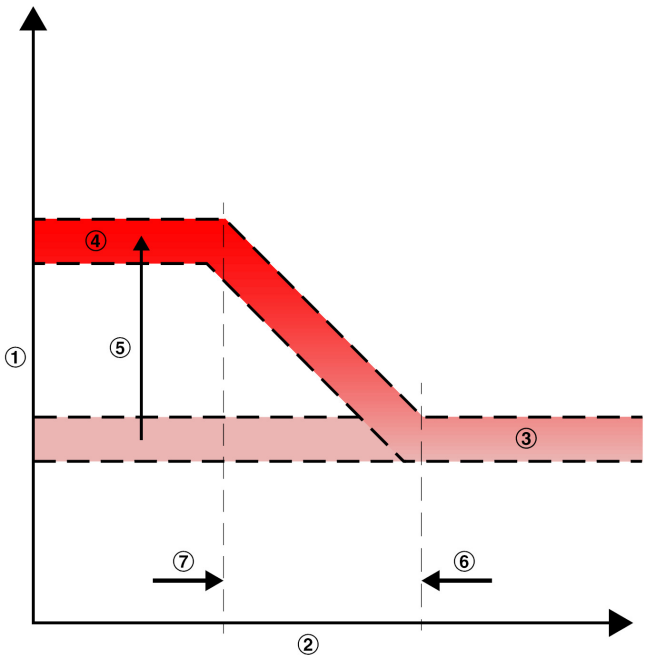



*Fig. 23: Sample configuration of winter compensation*

1 Room temperature setpoint value
2 Outdoor temperature
3 Comfort temperature range without winter compensation
4 Comfort temperature range with winter compensation
5 Max. increase in setpoint value
Default temperature for winter compensation start
Maximum winter compensation

> ***Recommended***
>
> *Winter compensation active*

#### 3.1.2.10.2 Minimum fan stages

The minimum ventilation stage function enables forced ventilation in the various operating modes. There is a choice between fan stages 0-5 for operation of the device in the respective operating mode.

> ***Recommended***
>
> – *Occupied – fan stage 1*
> – *Unoccupied – fan stage 0*

#### 3.1.2.10.3 Secondary air function

If the indoor air quality is good, the controller switches to secondary air mode, which is more energy efficient. The shut-off dampers are closed and the supply air fan remains switched on.

The controller compares the indoor air quality limit value to the ACTUAL values measured by the air quality sensor and switches automatically between outdoor air and secondary air mode.

Secondary air changeover is an option and only possible with air quality measurement (integral function or as a data point of the central BMS).

The secondary air function is not available for all unit variants.

***Recommended***

*Limit value: 500 ppm*

### 3.1.2.10.4 Frost protection

The FSL-CONTROL III controller has frost protection functions to protect the building and device. When the temperature of the outdoor air, supply air or room is too low, frost protection is implemented.

The device carries out the following actions:

- Operating mode = Automatic
- Operating mode = Standby
- Outdoor air and exhaust air dampers closed
- Fan(s) switched off
- Heating valve 100% open

#### Room temperature frost protection

Devices with room temperature control have the room temperaturefrost protection function. Room temperaturefrost protection is dependent on the room temperature that is either measured by the control panel or by the central BMS as a data point. When the room temperature (central BMS) or measured room temperatures are below a pre-set limit (default = 8 °C), the frost protection function is activated and the actions described above are executed. The device will only return to its original configuration after a configured waiting period (default =360 s) and when a room temperature of at least 1 K (configurable) over the room temperaturefrost limit is reached.

***Recommended***

*Room temperature limit: 8 °C*

*For connection to the central BMS: ensure transmission of data points!*

#### Supply air temperature frost protection

To prevent the heat exchanger from freezing and becoming damaged as a consequence, the supply air temperature is measured immediately after the heat exchanger. When the pre-set limit for the supply air temperature Frost 1 (default = 12 °C) is not reached, the Frost 1 supply air temperature alarm is activated. Other actions are not executed at this temperature. If the temperature does not reach the pre-set Frost 2 supply air temperature limit (default = 8 °C), the frost protection function is activated and the actions described above are executed. The device will only return to its original configuration after a configured waiting period (default = 360 s) and when the supply air temperature goes above the supply air temperature Frost 2 limit, with a minimum difference of 1 K (configurable).

***Recommended***

*Frost 1 supply air temperature limit: 12 °C*

*Frost 2 supply air temperature limit: 8 °C*

#### Frost protection

If the outdoor temperature is ≤ -20 °C (can be configured), the ventilation unit is switched off to protect the device components when operating temperatures are too low.

***Recommended***

*Limit value: -20 °C*

#### Heat recovery frost protection

When outdoor air temperatures are low (default = -6 °C depending on the heat recovery unit used), there is the risk that the heat recovery unit will no longer provide ventilation or provide insufficient ventilation on the extract air side due to condensate.

The controller opens the motorised bypass damper to completely bypass the heat recovery. The bypass remains open until the outdoor air temperature has risen to at least 1 K (can be configured) above the limit.

***Recommendation depending on the type of heat recovery unit***

*Cross flow: -6 °C*

*Cross counterflow: -4 °C*

***Heat recovery all year round***

*In devices with a condensate drain, the heat recovery unit can also be operated when outdoor air temperatures are low. Here, there is a regular switch between supply/extract air operation and secondary air operation. During secondary air operation, ice that has formed could melt and drain off. The device then returns to supply air and extract air operation. A drain for condensate is therefore essential.*

### 3.1.2.10.5 Priming (start-up delay in winter)

To prevent frost damage to heat exchangers after a device restart, ending of the frost protection function or a switch of fan stage from 0 to 1 in supply/extract air operation, the ventilation unit has a start-up delay in winter function. With this function, the device primes during the winter months (November to March, configurable) or when outdoor air temperatures are under 3 °C (configurable) with the heating coil switched on.

The start-up delay in winter is executed before commissioning of the fans when one of the following conditions are fulfilled:

- Current month is between November and March
- Outdoor air temperature < limit (default = 3 °C)

To heat the heating coil, the heating coil is 100% opened for 300 seconds (configurable). Ventilation units with constant bypass close the bypass, devices with rotary heat recovery units switch on the rotor. Once the pre-heating time has ended, the heating valve is limited for 45 seconds to 60% (configurable). The device then returns to the specified operating mode.

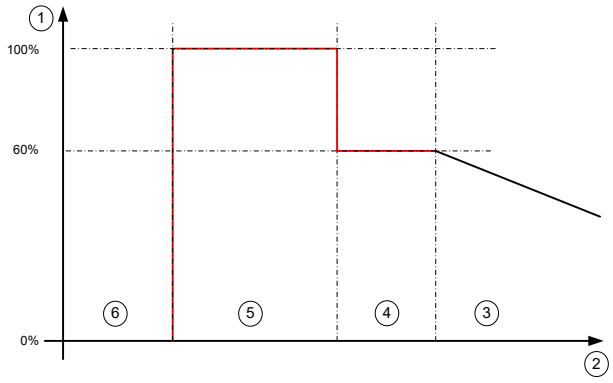



*Fig. 24: Diagram of heating valve control signal*

1 Control signal
2 Time
3 Control system
4 Limitation
5 Priming
6 Standby

***Recommended***

– *Limit temperature for outdoor air: 3 °C (all year)*
– *Duration of priming: 300 seconds*
– *Duration of limitation: 45 seconds*
– *Valve setting limitation: 60%*

### 3.1.2.10.6 Night ventilation

With the Night purge function, the building can be cooled at night during the summer as long as the outdoor air offers sufficient cooling potential.

The following requirements must be fulfilled:

- Night purge is configured in the device
- Current month is in the start-end-month range for Night purge
- Activated by RTC, central BMS or DI
- Outdoor air temperature < setpoint value for cooling for Occupied mode (difference can be configured)
- Outdoor air temperature < room temperature (difference can be configured)
- Outdoor air temperature > minimum outdoor air temperature for Night purge (default = 8 °C, configurable) supply air temperature > minimum supply air temperature - heating limit in Unoccupied mode -2K

**ENVIRONMENT!**

**Saving energy**

Night purge provides a high energy savings potential as rooms can be 'pre-cooled' at night without using a cooling coil.

***Recommended***

– *Highest fan stage*
– *Start month: May*
– *End month: October*

### 3.1.2.10.7 Filter change alert

The *'Monitoring filter replacement interval'* function (i.e. filter change alert) alerts users in each of the following cases that a filter change is due:

- The number of operating hours exceeds the preset value (factory set to 2500 h, adjustable)
- The differential pressure at the outdoor air filter exceeds the preset value (only for unit variants *-HE and *-HV)

The need for a filter change is signalled by a double flashing of the LED on the control panel or in the web browser via "Operating hours of remaining filter time" (11251)
When connected to the central BMS, the filter change is output as a B alarm.

***Note***

*If the permitted differential pressure on the outdoor air filter is exceeded, the "Operating hours of remaining filter time" (11251) is reset to 0 h in the software.*

**Differential pressure monitoring**

The ventilation units (master only ) variants *-HE and *-HV come with a differential pressure monitoring function. This function monitors the differential pressure of the outdoor air filter up to the nominal air volume (usually stage 3) If the differential pressure exceeds the preset value for at least 30 minutes, the filter change alert is activated (see above). In the Boost, Fan Force and Night Purge operating mode overrides, the differential pressure monitoring function is inactive to prevent unnecessary filter changes.

***Filter checks***

*Differential pressure monitoring is not supposed to replace any regular checks of the outdoor air filter or checks due to hygiene reasons.*

**Resetting the filter change alert**

The filter change interval has to be reset after each filter change using one of the following methods:

- On the analogue control panel -> press and hold the Occupied button (for 15 - 20 sec.)
- In the web browser *'menu*
  ➔ *Reset filter hours, address 10006'*
- Central BMS by others

### 3.1.2.10.8 Fan force

*'Fan force override (fume cupboard switching)' on page 22*

### 3.1.2.11 Interfaces

Master devices have 6 digital inputs and 7 digital outputs. All contacts can be configured as NO or NC contacts. You can use these for the following functions, for example:

- Digital inputs
  - **Window contact:** As soon as a monitored window is opened, the master and slave devices in the room are switched off (default: normally open).
  - **Changeover function:** Allows for changing from heating to cooling and vice versa in 2-pipe-heat exchangers (default: NC contact).
    **Logic:**
    Open = Heat transfer fluid present
    Closed= Coolant present
  - **Fire emergency stop:** Master and slave devices are switched off if a signal is received at the corresponding input (default: normally open).
  - **PIR:** Manual activation of Occupied operating mode (default: NO contact) e.g. by a PIR sensor.
    **Logic:**
    Open = Device in valid operating mode
    Closed = Device in Occupied
  - **Fume cupboard switching:** Manual activation of Fan Force (default: NO contact).
  - **Enable:** Enable operation of the device. If there is no Enable, the device cannot be put into operation (higher-level OFF)

***Digital inputs***

*Wiring of digital inputs with 24 VDC 2.5 mA for connecting volt-free contacts.*

- Digital outputs
  - **A alarm**
  - **B Alarm**
  - **Secondary cooling system:** enable for chilled ceiling
  - **Secondary heating system:** enable for heating system
  - **Operational (standby) message**
  - **Heat transfer fluid requirements:**for changeover mode
  - **Coolant requirements:** for changeover mode

***Digital outputs:***

*Permitted load of digital outputs: 24 VDC / 250 mA.*

# 4 Description of software

To set up the FSL-CONTROL III controller, a PC can be connected to the ventilation unit using the IP interface. Typically, the ventilation units are integrated into the building network via the BUS interface during installation. The devices can then be reached by the central BMS computer.

The control parameters are set and configured in the web browser. The web browser is also used for maintenance work.

To connect a PC to the FSL-CONTROL III controller, a patch cable is needed.

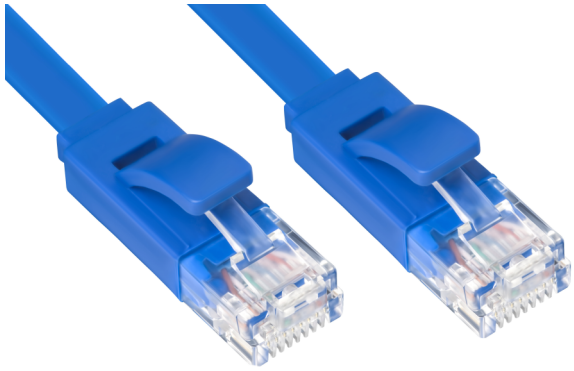


*Fig. 25: Patch cable min. Cat. 5 S/FTP RJ45*

***Standard network address***

*To call up the software to the address line of the browser, enter the IP address of the FSL-CONTROL III controller.*

*Factory settings:*

- *IP address master:* `10.2.100.242`
- *IP address slave:* `10.2.100.243`
- *User name:* `TROX`
- *Password:* `FSL`
- *IP gateway:* `10.2.20.1`
- *Subnet mask:* `255.255.255.0`

*The FSL-CONTROL III controller does not have a DHCP, if necessary change the DHCP settings of the Ethernet connection.*

## 4.1 Start screen – Diagnostics

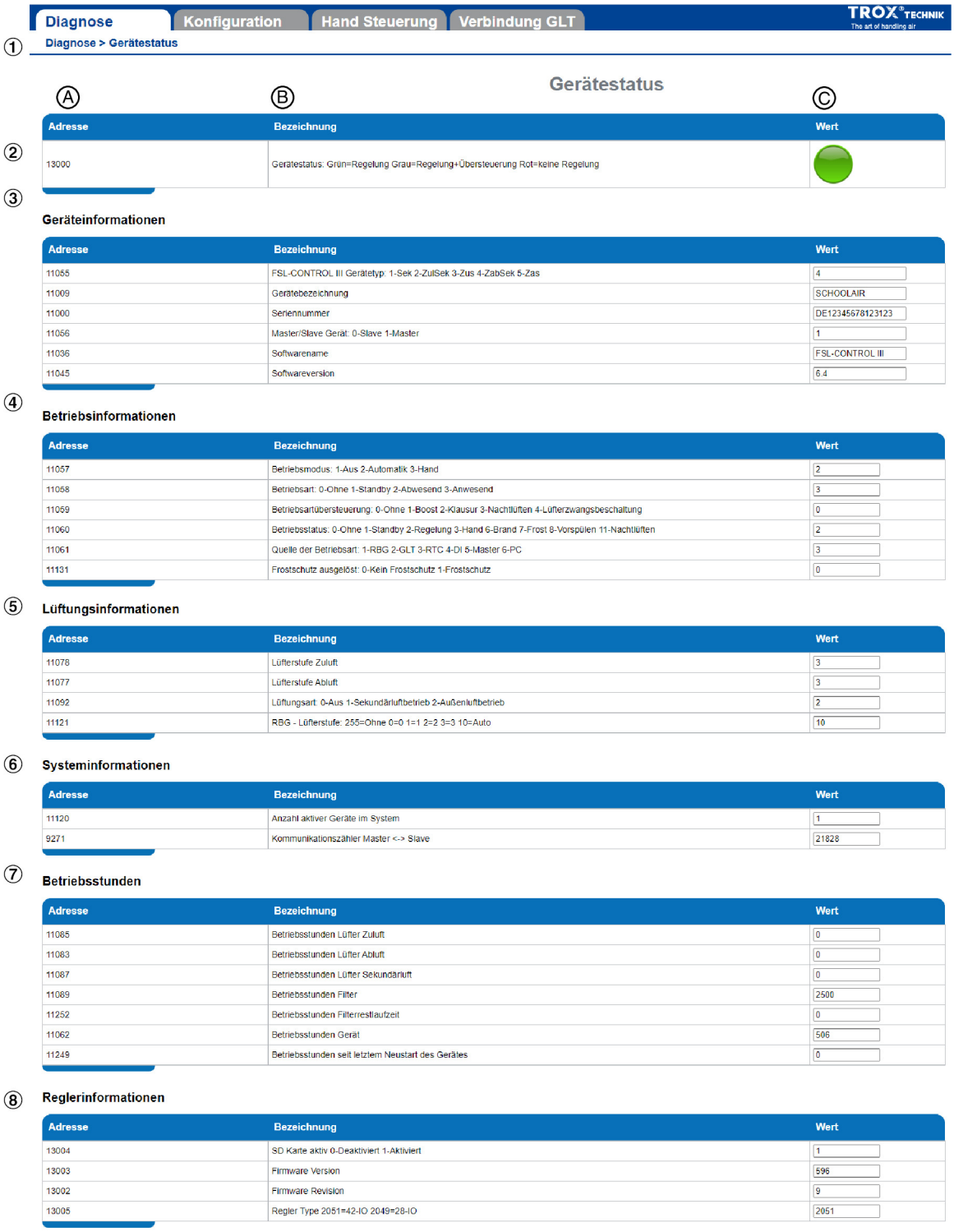



*Fig. 26: Start screen for web browser FSL-CONTROL III*

① Main menu, Diagnostics, Configuration, Manual (Control), (Connection to) Central BMS
② Display of device status in traffic light form
③ Display of device information
④ Display of operating information
⑤ Display of ventilation information
⑥ Display of system information
⑦ Display of operating hours
⑧ Display of controller information
A Modbus register
B Description
C Value / condition

**Main menu structure**

| Diagnosis | Configuration | Manual | Connection to central BMS |
|---|---|---|---|
| ▪ Device status<br>▪ Temperature control<br>▪ Fan control<br>▪ Alarms and filter reset | ▪ Device description<br>▪ Temperature control<br>▪ Clock and timer<br>▪ Fan control<br>▪ Interfaces | ▪ Commands | ▪ Device => central BMS<br>▪ Central BMS => device |

Menu items with *+ are protected with a password and are only available to TROX Service.

## 4.2 Diagnostics menu

### 4.2.1 *'Device status ➔ diagnostics'*

**Device status**

| Address | Who | Value | Explanation |
|---|---|---|---|
| 13000 | Device status | Green | ▪ Automatic mode<br>▪ Device OK |
| | | Grey | ▪ Override active<br>▪ Device OK |
| | | Red | Device inactive (e.g. as a result of frost protection) |

**Device information**

| Address | Who |
|---|---|
| 11055 | **Display of device type**<br>1 = Secondary air unit<br>2 = Supply and secondary air unit with option of changeover to secondary air<br>3 = Supply air and secondary air unit<br>4 = Supply air and extract air unit with heat recovery and option of changeover to secondary air<br>5 = Supply air and extract air unit with heat recovery and secondary air mixture |
| 11009 | **Device description**<br>Individual device description |
| 11000 | **Serial number**<br>Serial number of the device |
| 11056 | **Master / slave**<br>0 = Slave device<br>1 = Master device |
| 11036 | **Software name**<br>FSL-CONTROL III |
| 11045 | **Software version**<br>Display of software version |

**Operating information**

| Address | Explanation |
|---|---|
| 11057 | **Operating mode**<br>1 = Off<br>2 = Automatic<br>3 = Manual mode |
| 11058 | **Operating mode**<br>0 = No default<br>1 = Standby<br>2 = Unoccupied<br>3 = Occupied |
| 11059 | **Operating mode override**<br>0 = No override active<br>1 = Boost activated<br>2 = Exercise activated<br>3 = Night purge activated<br>4 = Fan force activated |
| 11060 | **Operating state**<br>0 = None<br>1 = Standby<br>2 = Control system<br>3 = Manual mode<br>6 = Fire emergency stop<br>7 = Frost alarm<br>8 = Priming<br>11 = Night purge |

| Address | Explanation |
|---|---|
| 11061 | **Setting of operating mode by…**<br>1 = Control panel<br>2 = Central BMS<br>3 = Real time clock<br>4 = Digital input<br>5 = Master<br>6 = PC |
| 11131 | **Frost protection**<br>0 = Frost protection inactive<br>1 = Frost protection active |

**Ventilation information**

| Address | Explanation |
|---|---|
| 11078 | **Supply air fan stage**<br>Setting of active fan stage for supply air fan. |
| 11077 | **Extract air fan stage**<br>Setting of active fan stage for extract air fan |
| 11092 | **Type of ventilation**<br>0 = No ventilation<br>1 = Secondary air operation<br>2 = Outdoor air operation |
| 11121 | **Specification of the fan stages for TROX control panels**<br>255 = None (control panel without stage selector)<br>1 = 0<br>2 = 1<br>3 = 2<br>4 = 3<br>10 = Automatic |

**System information**

| Address | Explanation |
|---|---|
| 11120 | **Number of active devices in the system**<br>Display of recognised master-slave devices in the TROX network |
| 9271 | **Communication counter master–slave**<br>Used for monitoring communication between the master device and the connected slave devices |

**Operating information**

| Address | Explanation |
|---|---|
| 11085 | **Operating hours of supply air fan**<br>Display of operating hours of supply air fan |
| 11083 | **Operating hours of extract air fan**<br>Display of operating hours of extract air fan. |
| 11087 | **Operating hours of secondary air fan**<br>Display of operating hours of secondary air fan (if available) |
| 11089 | **Operating hours of filter**<br>Display of operating hours of outdoor air filter. |
| 11062 | **Operating hours of device**<br>Display of total operating hours of the ventilation unit. |
| 11248 | **Operating hours since the device was last restarted**<br>Display of operating hours since the device was last restarted. |

**Controller information**

| Address | Explanation |
|---|---|
| 13004 | **SD card**<br>0 = SD card inactive<br>1 = SD card active |
| 13003 | **Firmware version**<br>Output of the current controller firmware |
| 13002 | **Firmware revision**<br>Output of the current controller revision |
| 13005 | **Controller type**<br>Output of the controller type |

### 4.2.2 *'Temperature control ➔ diagnostics'*

**Temperature control**

| Address | Explanation |
|---|---|
| 17305 | Output of the configured control strategy<br>0 = Supply air temperature control (an extract air temperature sensor must be configured for supply air temperature control).<br>1 = Room temperature control<br>2 = Extract air temperature control |
| 11104 | Output of the current control sequence<br>1 = Cooling<br>2 = Cooling with heat recovery<br>3 = Heating with heat recovery<br>4 = Heating |
| 11133 | Output of current outdoor air temperature |

| Address | Explanation |
|---|---|
| 11138 | Output of current flow temperature |
| 11137 | Output of current return temperature |
| 11124 | Output of the temperature offset configured on the control panel |

***Temperature sensor***

*If there is no measured value, e.g. no temperature sensor, the value 32767 is output.*

**Room / supply air temperatures**

| Address | Who |
|---|---|
| 11095 | Upper temperature limit for cooling, comfort temperature range [1/10 °C]* |
| 11096 | Lower temperature limit for heating, comfort temperature range [1/10 °C]* |
| 11134 | Room temperature actual value [1/10 °C] |
| 11093 | Room temperature setpoint value [1/10 °C]. |
| 11132 | Supply air temperature actual value [1/10 °C] |
| 11097 | Supply air temperature setpoint value [1/10°C] |
| * An upper and lower temperature limit is usually set for Occupied and Unoccupied.<br>For room temperature control to an absolute value, the setpoint value is displayed here.<br>For supply air temperature control, the setpoint value is displayed here. | |

**Control variables**

| Address | Who |
|---|---|
| 11140 | Actual value of heating valve control [1/10%] * |
| 11141 | Actual value of cooling valve control [1/10%] * |
| 11145 | Actual value of bypass damper control [1/10%]<br>Bypass or RWT [1/10%] heat recovery* |
| *Display depends on the device equipment | |

### 4.2.3 *'Fan control ➔ diagnostics'*

**Type of ventilation**

| Address | Who |
|---|---|
| 11092 | **Type of ventilation:**<br>0 = No ventilation<br>1 = Secondary air operation<br>2 = Outdoor air operation |
| 111989 | **Outdoor air dampers position**<br>0 = Closed<br>1 = Open |
| 11254 | Outdoor air automatic<br>0 = Disabled<br>1 = Enabled |
| 11078 | Output of calculated fan stage supply air |
| 11077 | Output of calculated fan stage extract air |
| 11079 | Output of calculated fan stage secondary air |
| 11081 | Output of supply air fan speed [rpm] |
| 11080 | Output of extract air fan speed [rpm] |

**Fan stages**

| Address | Who |
|---|---|
| 11106 | Fan stage off temperature control |
| 11107 | Fan stage off air humidity control |
| 11111 | Fan stage off air quality control |

**Humidity/air quality measured values**

| Address | Who |
|---|---|
| 11110 | Room air humidity [%] |
| 11113 | Indoor air quality [ppm] |

### 4.2.4 *'Alarms and filter reset ➔ diagnostics'*

**Reset filter hours**

| Address | Who |
|---|---|
| 10006 | Reset filter hours:<br>0 = No default<br>1 = Reset |

**A alarm standby**

| Address | Who |
|---|---|
| 11252 | A alarm fan block – device in standby<br>0 = Inactive<br>1 = Active |

**A alarm**

Category A alarms can sometimes result in devices being switched off.

The alarm is always output in the form of a consolidated alarm (address 11160) and individually (address 11146 – 11159).

In the case of the consolidated alarm (address 11160), this is a 16-digit bit string made up of all category A alarms. It is output as a decimal number that must be converted to the binary number system. The following alarms are shown depending on the bit used:

Bit 0 = Master – slave version conflict
Bit 1 = No communication with expansion module
Bit 2 = Missing communication CP Type01_Digital
Bit 3 = Currently not in use
Bit 4 = Group alarm of connected slave devices when there is an A alarm
Bit 5 = Supply air fan blockage
Bit 6 = Extract air fan blockage
Bit 7 = Currently not in use
Bit 8 = Currently not in use
Bit 9 = Supply air temperature sensor measured value outside tolerance
Bit 10 = Fire emergency stop
Bit 11 = Indoor air temperature sensor measured value outside tolerance
Bit 12 = Mixed flow air distribution temperature sensor measured value outside tolerance
Bit 13 = Outdoor air temperature sensor measured value outside tolerance
Bit 14 = Currently not in use
Bit 15 = Currently not in use

**Examples:**

1) **Address 11160** ⇒ 32 (decimal) ⇒ 0000000000**1**0000 (binary)

Bit 5 = 1 ⇒ Supply air fan blockage

2) **Address 11160** ⇒ 8224 (decimal) ⇒ 0000**1**0000**1**0000 (binary)

Bit 5 = 1 ⇒ Supply air fan blockage

Bit 11 = 1 ⇒ Indoor air temperature sensor measured value outside tolerance

The alarms of category A are individually listed below.

Alarm status of the respective alarms

Value 0 - No alarm

Value 1 - Alarm present

**A alarm**

| Address | Who |
|---|---|
| 11160 | Alarm A consolidated alarm, see above for description |
| 11146 | Master – slave version conflict |
| 11147 | No communication with expansion module |
| 11148 | Missing communication CP Type01_Digital |
| 11149 | Not used |
| 11150 | Group alarm A alarms slaves (A1, A2, A3, etc.) > 0) |
| 11151 | Supply air fan blockage |
| 11152 | Extract air fan blockage |
| 11153 | Not used |
| 11154 | Not used |
| 11156 | Fire protection |
| 11155 | Supply air temperature sensor measured value outside tolerance |
| 11157 | Indoor air temperature sensor measured value outside tolerance |
| 11158 | Mixed air temperature sensor measured value outside tolerance |
| 11159 | Outdoor air temperature sensor measured value outside tolerance |

**B Alarm**

If there is an alarm in category B, an alert is issued. The devices continue to run in the current operating mode.

The alarm is always output in the form of a consolidated alarm (address 11173) and individually (address 11161 – 11171). 11173 consolidated alarm.

In the case of the consolidated alarm (address 11173), This is a 16-digit bit string made up of all category B alarms. It is output as a decimal number that must be converted to the binary number system. The following alarms are shown depending on the bit used:

Bit 0 = No heat transfer fluid / coolant
Bit 1 = Filter change / filter pressure monitoring triggered

Bit 2 = Frost return temperature
Bit 3 = Frost outdoor air temperature
Bit 4 = Frost indoor / extract air temperature
Bit 5 = Frost 1 supply air temperature (< 12°C)
Bit 6 = Frost 2 supply air temperature (< 8°C)
Bit 7 = Extract air temperature sensor measured value outside tolerance
Bit 8 = Return air temperature sensor measured value outside tolerance
Bit 9 = Flow temperature sensor measured value outside tolerance
Bit 10 = Humidity sensor measured value outside tolerance
Bit 11 = Air quality sensor measured value outside tolerance
Bit 12 = Currently not in use
Bit 13 = Currently not in use
Bit 14 = Currently not in use
Bit 15 = Currently not in use

**Examples**

1) **Address 11173** ⇒ 32 (decimal) ⇒ 0000000000**1**0000 (binary)

Bit 5 = 1 ⇒Frost 1 supply air temperature

2) **Address 11173** ⇒ 8224 (decimal) ⇒ 000**1**0000000**1**0000 (binary)

Bit 5 = 1 ⇒ Frost 1 supply air temperature

Bit 11 = 1 ⇒ Air quality sensor measured value outside tolerance

**B Alarm**

| Address | Who |
|---|---|
| 11173 | Alarm B consolidated alarm |
| 11161 | No heat transfer fluid / coolant |
| 11162 | Filter change reached or pressure monitoring triggered |
| 11163 | Frost return temperature |
| 11164 | Frost outdoor temperature |
| 11165 | Frost indoor / extract air temperature |
| 11166 | Frost supply air temperature 1 (limit 12°C) |
| 11167 | Frost supply air temperature 2 (limit 8°C) |
| 11168 | Extract air temperature sensor measured value outside tolerance |
| 11169 | Return air temperature sensor measured value outside tolerance |
| 11170 | Flow temperature sensor measured value outside tolerance |
| 11172 | Humidity sensor measured value outside tolerance |
| 11171 | Air quality sensor measured value outside tolerance |

### 4.2.5 *'Diagnostics ➔ Remaining run times*+'*

This page provides an overview of all running timers.

**Reset times**

In this way, all timers can be reset to "0".
If the device is in frost protection mode, for example, because the outdoor temperature was missing and this temperature is now present, the waiting time can be shortened. Use only for commissioning!

**Operating mode overrides**

| Address | Who |
|---|---|
| 11227 | Display of the remaining time in the Boost operating mode override |
| 11228 | Display of the remaining time in the Exercise operating mode override |
| 11229 | Display of the remaining time after activation of overtime |
| 11230 | Display of the minimum run time in the Night Purge operating mode override |

**Fan**

| Address | Who |
|---|---|
| 11231 | Display of remaining running time when switching from SEK to AUL or AUL to SEK |
| 11233 | Display of the start-up delay of the supply air fan when the shut-off dampers open and the fan was previously switched off. |
| 11234 | Display of the start-up delay of the extract air fan when the shut-off dampers open and the fan was previously switched off. |
| 11232 | Display of the remaining run time when switching the fan stages. |

**Frost mode**

| Address | Who |
|---|---|
| 11235 | Display until the renewed check as to whether the supply air temperature is still < 12°C. |
| 11236 | Display until the renewed check as to whether the supply air temperature is still < 8°C. |

| Address | Who |
|---|---|
| 11237 | Display until the renewed check as to whether the condition for room temperature frost (default: 8°C) is still present.<br>Room temperature frost is also displayed if there is no information about the extract air temperature even though the value is required (supply air or extract air temperature control is active). |
| 11238 | Display until the renewed check as to whether the condition for outdoor temperature frost (default: -20°C) is still present. |
| 11238 | Display until the renewed check as to whether the condition for outdoor temperature frost (default: -20°C) is still present. |
| 11239 | Display until the renewed check as to whether the condition for return temperature frost (default: 8°C) is still present. Currently in use. |
| 11240 | Display until the renewed check as to whether the condition for HRU temperature frost is still present. Different temperatures are stored for the different heat recovery units:<br>**Cross-flow HRU:** -6°C (If the outdoor temperature is lower than -6°C, the bypass is switched or, if active, the secondary air cycle is executed).<br>**Cross-counterflow:** -4°C (If the outdoor temperature is lower than -6°C, the bypass is switched or, if active, the secondary air cycle is executed).<br>**Rotary HRU:** -20 °C (This switches off the HRU temperature frost, as rotors cannot ice up). |
| 11241 | Display of run time in outdoor air mode with the secondary air cycle activated |
| 11242 | Display of run time in secondary air mode with the secondary air cycle activated |
| 11244 | Display of the remaining duration of the pre-purge process |

**Filter**

| Address | Who |
|---|---|
| 11243 | Display of the minimum duration until the filter change is displayed for filter pressure monitoring. Filter pressure monitoring is only active on the master units of the *-HE and *-HV variants. |

### 4.2.6 *'Diagnostics ➔ IO connections*+'*

This page gives an overview of the status of all analogue and digital inputs and outputs.

For all non-configured inputs and outputs, "0" or "32767" is displayed.
The designations refer to the standard wiring of the unit type ZAB.
The wiring of the ZAS devices deviates from this standard wiring; in this case, please always check the wiring diagrams.

**AO**

| Address | Who |
|---|---|
| 11175 | Heating valve control signal |
| 11176 | Bypass damper control signal / rotary heat recovery unit |
| 11177 | Supply air fan control signal |
| 11178 | Extract air fan control signal |
| 11179 | Control input signal of LED control panel |
| 11180 | Cooling valve control signal |
| 11181 | Secondary air damper/fan control signal |
| 11182 | Free |

**AI**

| Address | Who |
|---|---|
| 11185 | Actual supply air temperature |
| 11186 | Current outdoor air temperature |
| 11187 | Current air quality |
| 11188 | Current humidity |
| 11189 | Current resistance setpoint value adjuster |
| 11190 | Current resistance button (only CP Type02)<br>If CP Type03 is configured, then *'32767'*<br>At the press of the button = *'0'* |
| 11191 | Current room air temperature |
| 11192 | Current extract air temperature (temperature sensor = NTC10k) |
| 11193 | Current return temperature |
| 11194 | Current flow temperature |
| 11195 | Current flow sensor measured value |
| 11196 | Current extract air temperature (temperature sensor = 0…10 VDC) |

**DO**

| Address | Who |
|---|---|
| 11199 | Condition of the shut-off dampers |
| 11200 | A alarm output |
| 11201 | B alarm output |
| 11202 | "In operation" signal output<br>1 = Occupied / Unoccupied<br>0 = Standby |
| 11203 | Reheater enable (currently not in use) |
| 11204 | Heat transfer fluid request<br>Use only in case of changeover! |
| 11205 | Coolant request<br>Use only in case of changeover! |
| 11206 | Humidification request (currently not in use) |
| 11207 | Preheater enable (currently not in use) |
| 11208 | Heating ceiling enable (room related!) |
| 11209 | Chilled ceiling enable (room related!) |

**DI**

The wiring status is basically displayed here.
1 = Wired
0 = Not wired

| Address | Who |
|---|---|
| 11211 | Supply air fan speed signal |
| 11212 | Extract air fan speed signal |
| 11213 | Secondary air speed signal<br>For ZAS devices with a separate SEK fan, the speed signal is not detected.<br>For SEK devices, the speed signal is output as a supply air fan speed signal. |
| 11214 | Presence switch<br>1 = Occupied (override of RTC, CP, central BMS)<br>0 = Occupied / Unoccupied control via CP, RTC or central BMS |
| 11215 | Window contact<br>1 = Contact closed, device functioning<br>0 = Contact open, operating mode = OFF |
| 11216 | Fire protection<br>1 = Contact closed, device functioning<br>0 = Contact open, operating mode = OFF, operating status = fire |
| 11217 | Release<br>1 = Contact closed, device functioning<br>0 = Contact open, operating mode = OFF |
| 11218 | Changeover<br>1 = Cooling<br>0 = Heating |
| 11219 | Frost protection sensor<br>Not supported. |
| 11220 | Filter monitoring<br>1 = Triggered (time and/or pressure)<br>0 = Not triggered |
| 11221 | Night purge<br>Not supported. |
| 11222 | Fume cupboard switch<br>1 = Fan force active<br>0 = Fan force inactive<br>Note: The fan force function must be activated via fan control*+, address 17472. |

### 4.2.7 *'Diagnostics ➔ Secondary air addition*+'*

**Mixed air temperature control**

| Address | Who |
|---|---|
| 11136 | Current mixed air temperature<br>Output when mixed air temperature sensor is configured. |
| 11098 | Setpoint value of mixed air temperature<br>0 = No mixed air temperature control active |
| 11144 | Output signal for SEK damper<br>0 = No mixed air temperature control active |
| 11091 | Increase of the control voltage for ZUL-Vent with SEK addition if condensate prevention is active. |

**Ventilation**

| Address | Who |
|---|---|
| 11092 | Type of ventilation<br>0 = Off<br>1 = Secondary air operation<br>2 = Outdoor air operation |
| 11078 | Calculated fan stage ZUL, depending on temperature and air quality |
| 11077 | Calculated fan stage ABL, depending on temperature and air quality |
| 11078 | Calculated fan stage SEK, depending on temperature and air quality |

**Measured values for condensate prevention**

| Address | Who |
|---|---|
| 11110 | Humidity (measured at the ABL) |
| 11135 | Current extract air temperature (measured at the humidity + temperature combination sensor) |

**Help information for fan control**

| Address | Who |
|---|---|
| 11251 | Fan control<br>To check which control function is currently being performed.<br>A flow chart is required for interpretation! |

## 4.3 Configuration menu

### 4.3.1 *'Configuration ➔ Device description'*

| Address | Who |
|---|---|
| 17009 | Entry of project-specific device description (max.16 characters) |

### 4.3.2 *'Configuration ➔ Temperature control'*

**Temperature setpoint values**

Entry of temperature setpoint values for heating and cooling for Occupied and Unoccupied modes. The range between the setpoint value for heating and the setpoint value for cooling is the comfort temperature range.

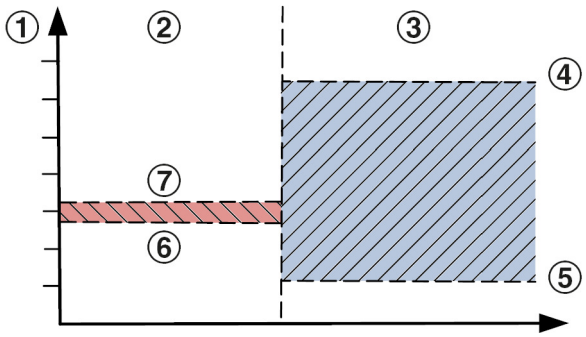



*Fig. 27: Comfort temperature range*

Red Comfort temperature range for Occupied
blue Comfort temperature range for Unoccupied
1 Room temperature setpoint value
2 Occupied
3 Unoccupied
4 Cooling setpoint value for Unoccupied
5 Heating setpoint value Unoccupied
6 Heating setpoint value for Occupied
7 Cooling setpoint value for Occupied

| Address | Who |
|---|---|
| 17322 | Cooling temperature setpoint value for Occupied |
| 17323 | Heating temperature setpoint value for Occupied |
| 17324 | Cooling temperature setpoint value for Unoccupied |
| 17325 | Heating temperature setpoint value for Unoccupied |

*For values marked with [1/10 °C], the values are always entered with a factor of 10.*

***Example:** 17322 cooling temperature setpoint value for Occupied = 26 °C*

***Entry** : 260*

**Supply air temperature limits**

Entry of minimum and maximum supply air temperature for Occupied and Unoccupied modes.

| Address | Who |
|---|---|
| 17311 | Supply air temperature upper limit for Unoccupied |
| 17309 | Supply air temperature lower limit for Unoccupied |
| 17310 | Supply air temperature upper limit for Occupied |
| 17308 | Supply air temperature lower limit for Occupied |

**Winter compensation**

Entry of parameters for the winter compensation function.

| Address | Who |
|---|---|
| 11478 | Activation of winter compensation<br>0 = Winter compensation inactive<br>1 = Winter compensation active |
| 17479 | Entry of start temperature |
| 17480 | Entry of end temperature |
| 17481 | Entry of maximum setpoint value increase |

**Temperature sensor offset**

*The temperature sensor offset is used as a corrective value when there are temperature deviations.*

*The entered value is a constant and always has the same effect.*

*Recommendation: Offset = 0*

| Address | Who |
|---|---|
| 17273 | Entry of supply air temperature sensor correction |
| 17276 | Entry of room temperature sensor correction |

### 4.3.3 *'Configuration ➔ Clock and timer'*

**Current date and time on the device**

Display of the date and time saved on the FSL-CONTROL III controller.

**Set internal clock**

Decentralised ventilation unit from TROX can be delivered from the factory with the pre-set date and time. However, it can be necessary to change settings or correct deviations.

| Address | Who |
|---|---|
| 10008 | Default current date |
| 10010 | Default current time |
| 10007 | Set date and time<br>0 = No takeover<br>1 = Transfer to the controller |
| 18077 | Summertime setting<br>0 = Inactive<br>1 = Active |

***Number format***

*Date: ddmmyy [6 digits without separators]*

*Time: hhmmss [6 digits without separators]*

*The data is taken over by entering "1" and Return in the input field (address 10007).*

**Weekly program**

An individual profile can be selected for each weekday.

| Address | Who |
|---|---|
| 18000 | Profile for Monday |
| 18001 | Profile for Tuesday |
| 18002 | Profile for Wednesday |
| 18003 | Profile for Thursday |
| 18004 | Profile for Friday |

| Address | Who |
|---|---|
| 18005 | Profile for Saturday |
| 18006 | Profile for Sunday |

**Profile 1 – 7**

For each profile, 10 different switching points can be freely selected.

The following operating modes and overrides are available:

1 - Standby

2 - Unoccupied

3 - Occupied

4 - Boost

5 - Exercise

6 - Night ventilation

7 - Fan force

| Address | Who |
|---|---|
| 18007 | Switching point 1 |
| 18008 | Switching point 2 |
| 18009 | Switching point 3 |
| 18010 | Switching point 4 |
| 18011 | Switching point 5 |
| 18012 | Switching point 6 |
| 18013 | Switching point 7 |
| 18014 | Switching point 8 |
| 18015 | Switching point 9 |
| 18016 | Switching point 10 |

*Always start the profile entry at 00:00 in 'Unoccupied' mode,*

*We recommend separate profiles for weekdays, weekends and holidays.*

*For supply air temperature control, please replace the operating mode 'Unoccupied' with 'Standby'. The switching points are always active until the following switching point is reached.*

*Entry is always a combination of time and operating mode or override.*

*Prefixed zeros are not displayed after entry.*

***Example 1**: entry of Unoccupied at 00:00*

*Entry = `00002` Display = `2`*

***Example 2:** Entry of Night purge at 02:00*

*Entry = `2006` Display = `2006`*

**Example for office**

Office hours: 8:00 am – 5:00 pm

| | | |
|---|---|---|
| 12:00 am | - | Start Unoccupied ⇒ 2 |
| 2:00 am | - | Start Night purge ⇒ 2006 |
| 5:00 am | - | End Night purge (Unoccupied) ⇒ 5002 |
| 7:00 am | - | Pre-tempering (Occupied) ⇒ 7003 |
| 7:45 am | - | Flush with fresh air (Boost) ⇒ 7454 |
| 8:00 am | - | Normal operation (Occupied) ⇒ 8003 |
| 12:30 pm | - | Lunch (Unoccupied) ⇒ 12302 |
| 1:30 pm | - | Normal operation (Occupied) ⇒ 13303 |
| 5:00 pm | - | Unoccupied ⇒ 17002 |
| 9:00 pm | - | Rep. Unoccupied ⇒ 21002 |

***Further information***

*3.1.2.9 'Operating modes / operating mode override' on page 20*

## 4.3.4 *'Configuration ➔ Fan control'*

**Air quality control (optional)**

Air quality control means that the outdoor air flow rate is controlled based on the room air quality.

This type of control is only possible with an air quality sensor (optional equipment or by others). The internal sensor optionally detects the $CO_2$ concentration or the VOC content of the extract air. Air quality control is always active in the *'Occupied'* operating mode. In the *'Unoccupied'* operating mode, air quality control is inactive.

Activation of the function in the *'Unoccupied'* operating mode in address line 17378.

The switching thresholds apply for both *'Occupied'* and *'Unoccupied'* operating modes. If a switching threshold is exceeded, the configured fan stage is activated.

***Secondary air function***

*For devices with secondary air switching, secondary operation is active until the first switching threshold is reached. If the air quality measured value exceeds the first switching threshold, supply air and extract air operation is activated. When the other switching thresholds are reached, the fan speed is increased.*

| Address | Who |
|---|---|
| 17378 | Enable air quality control in Unoccupied<br>0 = Inactive<br>1 = Active |
| 17380 | First switching threshold for air quality<br>0..2000 ppm |
| 17381 | Second switching threshold for air quality<br>0..2000 ppm |
| 17382 | Third switching threshold for air quality<br>0..2000 ppm |
| 17383 | Fourth switching threshold for air quality<br>0..2000 ppm |
| 17384 | Fifth switching threshold for air quality<br>0..2000 ppm |

***Recommended***

*Limit value for first fan stage: 500 ppm*

*Limit value for second fan stage: 750 ppm*

*Limit value for third fan stage: 900 ppm*

*Limit value for fourth fan stage: 2100 ppm*

*Limit value for fifth fan stage: 2100 ppm*

**Humidity control**

Humidity control is currently not supported.

## 4.3.5 *'Configuration ➔ Interfaces'*

| Address | Who |
|---|---|
| 10003 | Device restart<br>0 = No default<br>1 = Restart |

***Device restart***

*To change some settings, the controller will need to be restarted. To restart, enter 1 in the input field for address 10003 and confirm with Return.*

**Slave devices**

| Address | Who |
|---|---|
| 17048 | Entry of the number (!) of connected devices<br>For master in combination with one slave = 1, for several slaves = number of slaves. For slave devices, the value corresponds to the number of following slave devices. |

**Settings SL1 connection X1 serial bus**

The connection SL1 / terminal X1 is used in master devices to connect devices to the central building management system.

1 – 127 is available as the address range. A serial bus string can consist of max. 32 subscribers. With slave devices, the master device is connected at connections SL1 / terminal X1.

***Factory-set Modbus address***

*Modbus address 2 is entered in the factory. In the case of connection from a master device to exactly 1 slave device, no settings are required. If several slave devices are connected to a master device: for every slave device connected, the Modbus address is incremented by "1".*

*Example slave 1 = Modbus address terminal X1 = 2*

*Slave 2 = Modbus address terminal X1 = 3*

*Slave n = Modbus address terminal X1 = n + 1*

| Addr. | Who | Explanation |
|---|---|---|
| 16124 | Entry of Modbus address terminal X1 | |
| 16125 | Serial protocol type<br>3 = Modbus RTU<br>4 = BACnet MS/TP | |

| Addr. | Who | Explanation |
|---|---|---|
| 16129 | Baud rate X1 (RS485-1)<br>0 = 9600<br>1 = 19200<br>2 = 38400<br>3 = 57600<br>4 = 76800 baud | For master devices that correspond to the serial bus system provided by others<br>For slave devices, the baud rate is exclusively 38400 baud (value = 2). |
| 16126 | Data bits X1 (RS485-1) | For master devices that correspond to the serial bus system provided by others<br>For slave devices, the number of data bits is exclusively 8 (value = 8). |
| 16127 | Stop bits X1 (RS485-1) | For master devices that correspond to the serial bus system provided by others<br>For slave devices, the number of stop bits is exclusively 1 (value = 1). |
| 16128 | Parity X1 (RS485-1)<br>0 = Neutral<br>1 = Odd<br>2 = Even | For master devices that correspond to the serial bus system provided by others<br>For slave devices, the parity is exclusively Even (value = 2) |

### Settings SL2 connection X2 serial bus

The connection SL 2 / terminal X2 is used for master devices to connect the first slave devices

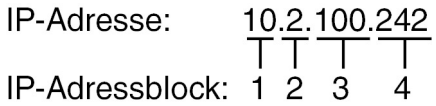
The Modbus address SL 2 / terminal X2 is always 1, no settings are needed.

| Address | Who |
|---|---|
| 15774 | Address |

### IP address

The input fields are used to set the IP address of the FSL-CONTROL III controller. For the entry, the IP address is divided into four address blocks (points).

### Entry of IP address




IP address factory setting

Master devices - 10.2.100.242

Slave devices - 10.2.100.243

| Address | Who |
|---|---|
| 15798 | IP address block 1 |
| 15799 | IP address block 2 |
| 15800 | IP address block 3 |
| 15801 | IP address block 4 |

***Access with PC and web browser***

*Connect the ventilation unit and PC with a patch cable and enter the IP address into the address line of the web browser to get access to the ventilation unit. Here, conditions can be checked, values can be read out and settings can be configured.*

### Accepting network settings

| Address | Who |
|---|---|
| 10023 | To accept changes to the factory preset IP address, IP gateway and IP network mask, please confirm with "1" and Return. |

### IP gateway

The address of the IP gateway is entered in the input fields. The input syntax follows the IP address; see *'IP address' on page 40*.

| Address | Who |
|---|---|
| 15802 | IP gateway block 1 |
| 15803 | IP gateway block 2 |
| 15804 | IP gateway block 3 |
| 15805 | IP gateway block 4 |

### IP network mask

The address of the IP network mask is entered in the input fields. The input syntax follows the IP address; see *'IP address' on page 40*.

| Address | Who |
|---|---|
| 15802 | IP network mask block 1 |
| 15803 | IP network mask block 2 |
| 15804 | IP network mask block 3 |
| 15805 | IP network mask block 4 |

**BACnet**

*In BACnet, the instance number is displayed as the sum of BACnet identifier + 65536.*
*The BACnet ObjectName describes the device name in BACnet.*

*In addition, the BACnet identifier and BACnet Object_Name can be used for their own settings. Please ensure uniqueness in the network.*

| Address | Who |
|---|---|
| 17565 | Enter the BACnet identifier as an integer. In BACnet, the identifier is displayed as the instance number according to the logic "65536" + BACnet identifier. E.g.: Address 17565 = 7, instance = 65536 + 7 = 65543. |
| 17570 | The BACnet Object Name is displayed as the device name. |

### 4.3.6 *'Configuration ➔ Temperature control*+'*

**Basic settings**

| Address | Who |
|---|---|
| 17305 | Control strategy<br>0 = Supply air temperature control<br>For isothermal introduction of the supply air. Devices only cover the ventilation heat loss. It is important that the integrated extract air temperature sensor is activated, otherwise room air/extract air frost is active.<br>1 = Room temperature control<br>In connection with room temperature via CP or central BMS.<br>2 = Extract air temperature control<br>In conjunction with integrated extract air temperature sensor. |
| 17306 | Register type<br>0 = No register<br>1 = Changeover<br>In Changeover mode, the device requires information about the medium via DI or the central BMS. If no information is available, the valves are not controlled.<br>2 = 2-pipe heating<br>Also enter for isothermal supply air intake.<br>3 = 2-pipe cooling<br>4 = 4-pipe heat exchanger<br>5 = Electric heating register only for SCHOOLAIR-V-HV-EH. |
| 17327 | Minimum outdoor temperature to enable the active cooling sequence presetting: 10°C] |
| 17328 | Delay in switchover between heating and cooling presetting: 1 min. |
| 17110 | Room / extract air temperature deviation for max. fan speed presetting: 3 K.<br>This means that, if the deviation is > 3 K, the devices switch to the third fan stage. All other stages according to the resulting characteristic curve. |

**Temperature setpoint values**

| Address | Who |
|---|---|
| 17322 – 17325 | *'Temperature setpoint values' on page 36* |
| 17318 | Hysteresis threshold for supply air temperature presetting: 0.2 K; i.e., the supply air temperature may deviate from the specified supply air temperature by this value. |

**Master controller**

The master controller affects the deviation between the setpoint and actual room temperature.
The valves are not affected at this point. Settings of the valves via addresses 17312, 17313, 17315, 17316.

| Address | Who |
|---|---|
| 17319 | Cascade control proportionality coefficient presetting: 15 |
| 17320 | Cascade control integration time presetting: 400 |

### Supply air temperature limits

| Address | Who |
|---|---|
| 17311 | Entry of the supply air temperature upper limit for Unoccupied |
| 17309 | Entry of the supply air temperature lower limit for Unoccupied |
| 17310 | Entry of the supply air temperature upper limit for Occupied |
| 17308 | Entry of the supply air temperature lower limit for Occupied |

### Winter compensation

| Address | Who |
|---|---|
| 17478 | Winter compensation enable<br>0 = inactive<br>1 = active (default)<br>Entry of the parameters for winter compensation via addresses 17479, 17480 and 17481. |

### Cooling coil

| Address | Who |
|---|---|
| 17312 – 17330 | No changes to the presettings are required. |

### Heat recovery

| Address | Who |
|---|---|
| 17336 | HRU type<br>1 = Plate-type HRU<br>Setting for the following unit types:<br>■ All FSL units<br>■ SCHOOLAIR-B<br>■ SCHOOLAIR-B-HE<br>■ SCHOOLAIR-V-0-2L / -4L<br>■ SCHOOLAIR-V-1800<br>■ SCHOOLAIR-V-HE<br>■ SCHOOLAIR-D-0-2L / -4L<br>2 = Rotary heat recovery unit<br>Setting for the following unit types:<br>■ SCHOOLAIR-B-HV<br>■ SCHOOLAIR-V-HV<br>■ SCHOOLAIR-V-HV-EH<br>■ SCHOOLAIR-D-HV |
| 17337 | HRU proportionality coefficient<br>No changes to the presettings are required. |
| 17338 | HRU integration time: No changes to the presettings are required. |
| 17339 | HRU throughout the year<br>0 = inactive<br>For all devices with a plate-type heat recovery unit and without a condensate drain. Condensate is avoided because the bypass opens when the outdoor temperature is too cold and the air goes directly to the heat exchanger. The available water-side output must cover the entire ventilation heat loss.<br>1“ = Active<br>Basically for all *-HV unit variants, as the rotary heat recovery unit does not generate any condensate to the outside. A condensate connection is mandatory for devices with plate-type heat recovery units. In addition, the frost protection cycle (Configuration -> Frost protection*+) must be activated. |
| 17340 | Minimum setpoint value of HRU: No changes to the presettings are required. |
| 17341 | Maximum setpoint value of HRU: No changes to the presettings are required. |
| 17344 | Heat recovery rate of HRU<br>Settings as follows:<br>60%<br>■ All FSL units<br>■ SCHOOLAIR-B-0-2L / -4L<br>■ SCHOOLAIR-V-0-2L /- 4L<br>■ SCHOOLAIR-V-1800<br>■ SCHOOLAIR-D-0-2L / 4L<br>84%<br>■ SCHOOLAIR-B-HE<br>■ SCHOOLAIR-V-HE<br>75%<br>■ SCHOOLAIR-B-HV<br>■ SCHOOLAIR-V-HV<br>■ SCHOOLAIR-D-HV |
| 17342 | Minimum temperature difference: No changes to the presettings are required. |
| 17343 | Waiting time if there are favourable temperature conditions |

### Heating coil

| Address | Who |
|---|---|
| 17315 – 17316<br>17331 – 17332 | No changes to the presettings are required. |

**Electric heating register**

| Address | Who |
|---|---|
| 17378 | Electric heating register Dynamic enable<br>Dynamic influences the maximum heating capacity of the electric heating register depending on the outdoor air temperature and the fan stage.<br>0 = inactive<br>1 = Active<br>Only for SCHOOLAIR-V-HV-EH. |
| 17579 | Electric heating register proportion Dynamic<br>Information on proportion Dynamic. |

**Temperature sensor offset**

For the correction of various temperature sensors. Please make sure that the offset affects the entire temperature range.

| Address | Who |
|---|---|
| 17273 | Supply air temperature offset |
| 17274 | Outdoor air temperature offset |
| 17276 | Room air temperature offset<br>Insofar as a correction of the measurement must be made in the control panel. Please check the installation location of the control panel. |
| 17277 | Extract air temperature offset<br>Input AI8 is used here, which is always used for extract air temperature if the extract air temperature sensor is an NTC 10k, i.e., for all CO2 / temperature combination sensors. |
| 17278 | Return temperature offset |
| 17279 | Flow temperature offset |
| 17280 | Extract air temperature<br>Input AI12 is used here, which is always used for the extract air temperature if the extract air temperature sensor emits a 0...10 VDC signal, i.e., for all CO2 / humidity / temperature combination sensors. Primarily in FSL-U-ZAS. |

## 4.3.7 *'Configuration ➔ Air control*+'*

**Air quality control**

| Address | Who |
|---|---|
| 17290 | Type of sensor<br>0 = None, for all slaves. For master devices, if the integrated CO2 sensor is not used.<br>1 = IAQ2000 Not included in delivery.<br>2 = Titec CO2 The devices are supplied with a CO2 sensor as standard.<br>3 = Titec VOC |
| 17376 | Air quality control enable<br>0 = Inactive For master devices without an internal sensor or on-site sensor, including transmission via the central BMS.<br>1 = Active<br>For master devices with integrated sensors and for master devices without internal sensors with simultaneous transmission of measured values via the on-site central BMS. The master decides itself which fan stage is active based on the measured values. |
| 17377 | Enable air quality control enable in Occupied<br>0 = Inactive during Occupied<br>1 = Active during Occupied (= default setting) |
| 17378 | Enable air quality control in Unoccupied<br>0 = Inactive during Unoccupied (= default setting)<br>1 = Active during Unoccupied |
| 17111 | Outdoor air automatic<br>0 = Inactive If the measured value for the indoor air quality is below the first threshold value, the device ventilates with secondary air in Occupied.<br>1 = Active<br>Regardless of the indoor air quality, the device always ventilates with outside air when it is present. |
| 17380 | First switching threshold for air quality<br>If the measured value is below the first switching threshold, the device ventilates with secondary air, provided that outdoor air automatic = 0. If the measured value is above the first switching threshold, the device ventilates with outdoor air. Fan stage = Stage 1. |
| 17381 | Second switching threshold air quality If the measured value is above the second switching threshold, the device ventilates with outdoor air in the second stage. |
| 17382 | Third switching threshold air quality If the measured value is above the third switching threshold, the device ventilates with outdoor air in the third stage. |

| Address | Who |
|---|---|
| 17383 | Fourth switching threshold air quality If the measured value is above the fourth switching threshold, the device ventilates with outdoor air in the fourth stage. |
| 17384 | Fifth switching threshold air quality If the measured value is above the fifth switching threshold, the device ventilates with outdoor air in the fifth stage. |

**Humidity control**

Humidity control is not currently supported.

**Fan stages**

| Address | Who |
|---|---|
| 17072 | Minimum fan stage during Occupied<br>1 = Default setting, fans always run during Occupied. |
| 17074 | Maximum fan stage during Occupied<br>3 = Default setting; this setting limits the available fan stages to 3 stages during Occupied. |
| 17071 | Minimum fan stage during Unoccupied<br>0 = Default setting, the fans can be switched off provided that the room temperature is within the set point range. |
| 17073 | Maximum fan stage during Unoccupied<br>4 = Default setting; this setting limits the available fan stages to 4 stages during Unoccupied. The fourth fan stage is activated during Night Purge. |
| 17112 | Reduction in fan stage temperature without cooling<br>If the devices are not cooling (2-pipe - heating), this parameter can be used to reduce the fan stage so that the rooms are not heated up too much when the outdoor temperatures are too high. |

**Operating mode override settings**

| Address | Who |
|---|---|
| 17462 | Boost enable<br>0 = inactive<br>1 = Active |
| 17463 | Fan level during Boost; entry of the active fan stage for Boost mode. Default stage = stage 4. During Boost, ventilation always uses with outdoor air. |
| 17467 | Exercise enable<br>0 = inactive<br>1 = Active |
| 17468 | Fan level during Exercise; entry of the active fan stage for Exercise mode. Default stage = stage 2. During Exercise, ventilation always uses with outdoor air. |
| 17450 | Night Purge enable<br>0 = inactive<br>1 = Active |
| 17456 | Fan level during Night Purge; entry of the active fan stage for Night Purge mode. Default stage = stage 4. During Exercise, ventilation always uses with outdoor air. Activation via RTC or central BMS required. |
| 17472 | Enable Fan Force mode operation For combination with fume cupboards or separate, time-limited extract air.<br>0 = inactive<br>1 = Active Activation is always via DI or central BMS. |
| 17473 | Fan stage, Fan Force mode, supply air, entry of fan stage for supply air fan. |
| 17474 | Fan stage, Fan Force mode, extract air, entry of fan stage for extract air fan. The stage should always be > 0. |

**Electric heating register**

| Address | Who |
|---|---|
| 17105 | Minimum time in current fan stage To prevent the device from jumping too quickly between different stages. |
| 17061 | Outside damper running time The fans are only put into operation after this time has elapsed. No change required. |
| 17359 | Locking time secondary air - fresh air changeover The device can only switch from outdoor air mode to secondary air mode, or vice versa, after this locking time has elapsed. |

### 4.3.8 *'Configuration ➔ Secondary air addition damper*+'*

These settings are only necessary for the FSL-U-ZAS.

**Secondary air damper**

| Address | Who |
|---|---|
| 17345 | Secondary air damper enable<br>0 = inactive<br>1 = Active Secondary air damper must be active. |
| 17352 | Minimum resting time in current direction of action No changes possible. |

**Condensate prevention**

The FSL-U-ZAS does not require a condensate drain, as condensate forming is prevented by the temperature control. For this purpose, the air temperature upstream of the heat recovery unit is raised by mixing in secondary air to such an extent that no condensate is formed.

| Address | Who |
|---|---|
| 17346 | Prevention of condensation - minimum temperature difference (between extract air and outdoor air temperature) for activation Default setting = 5 K. No change required. The outdoor air must be at least 5 K cooler than the extract air temperature. |
| 17347 | Prevention of condensation - temperature offset with regard to the calculated minimum mixed air temperature<br>Default setting = 2 K. For safety, the mixing air temperature to be achieved is raised by 2 K and therefore more secondary air is added. |
| 17349 | Maximum total control input signal of supply air fan<br>For mixing, the control voltage of the supply air fan is increased so that it draws in more air in total. This value limits the maximum possible control voltage for acoustic reasons. |

**Mixed air temperature control**

| Address | Who |
|---|---|
| 17330 – 17351 | No change required. |

**Fan stages**

These settings affect the fan stages in regard to air quality.

| Address | Who |
|---|---|
| 17106 | Minimum outdoor air stage<br>Default setting = 1<br>The device always ventilates with outdoor air at stage 1 during Occupied mode. This means that pure secondary air operation is not possible during Occupied. |
| 17107 | Maximum outdoor air stage<br>Default setting = 3<br>For limiting the fan stage with outdoor air. If further fan stages are permitted, the difference is covered by secondary air. |
| 17109 | Maximum supply air - extract air<br>Default setting = 3 |

### 4.3.9 *'Configuration ➔ Secondary air addition fan*+'*

These settings are only necessary for the FSL-B-ZAB +SEK.

**Secondary air fan**

| Address | Who |
|---|---|
| 17354 | Secondary air fan enable<br>0 = inactive<br>1 = Active The secondary air fan must be activated. |

**Fan stages**

| Address | Who |
|---|---|
| 17355 | Minimum secondary air stage Default setting = 1. This means that the secondary air fan always runs at stage 1 so that the supply air is not forced back by the secondary air fan. |
| 17356 | Maximum secondary air stage Setting according to the number of fan stages. . |
| 17108 | Minimum supply/extract air stage To ensure the minimum outdoor air volume. Usually stage 1 |
| 17109 | Maximum supply/extract air stage Setting according to the number of fan stages. If a maximum outdoor air volume has been defined in the project, this volume can be set here. |

## 4.3.10 *'Configuration ➔ Characteristics*+'*

**Control input signal fan supply air**

| Address | Who |
|---|---|
| 17080 – 17084 | For entering the control voltage of the supply air fan for up to 5 stages. Stage 1 – 3 represent normal operation, Stage 4 for Boost and Night Purge. Control voltages according to table, *'Control voltages ' on page 47 .* |

**Volume flow rate fan supply air**

| Address | Who |
|---|---|
| 17075 – 17079 | For entering the volume flow rate in the individual fan stages for supply air. This value is output to the central BMS. |

**Control input signal fan control extract air**

| Address | Who |
|---|---|
| 17090 – 17094 | For entering the control voltage of the extract air fan for up to 5 stages. Stage 1 – 3 represent normal operation, Stage 4 for Boost and Night Purge. Control voltages according to table, *'Control voltages ' on page 47 .* |

**Volume flow rate fan extract air**

| Address | Who |
|---|---|
| 17075 – 17079 | For entering the volume flow rate in the individual fan stages for extract air. This value is output to the central BMS. |

**Control input signal fan secondary air**

| Address | Who |
|---|---|
| 17095 – 17099 | For entering the control voltage of the secondary air fan for up to 5 stages. |

**Control voltages**

**SCHOOLAIR-B control voltages [V]**

| Volume flow rate | | SA-B-0 | | SA-B-HE | | SA-B-HV | |
|---|---|---|---|---|---|---|---|
| (m³/h) | [l/s] | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) |
| 150 | 42 | 42 | 40 | 26 | 29 | 26 | 29 |
| 200 | 56 | 52 | 50 | 32 | 37 | 30 | 33 |
| 250 | 69 | 62 | 60 | 39 | 44 | 34 | 37 |
| 300 | 83 | 72 | 70 | 45 | 52 | 38 | 41 |
| 320 | 89 | 76 | 74 | 47 | 56 | 39 | 43 |
| 350 | 97 | | | 51 | 60 | 42 | 45 |
| 400 | 111 | | | 58 | 68 | 46 | 49 |
| 450 | 125 | | | 64 | 76 | 49 | 54 |
| 500 | 139 | | | | | 53 | 58 |
| 550 | 153 | | | | | 57 | 62 |
| 600 | 167 | | | | | 61 | 66 |

**SCHOOLAIR-V control voltages [V]**

| Volume flow rate | | SA-V-0-2L / -4L | | SA-V-1800-2L / -4L | | SA-V-HE-2L / -4L | | SA-V-HV-2L / -4L | | SA-V-HV-EH | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (m³/h) | [l/s] | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) |
| 150 | 42 | 44 | 44 | 40 | 43 | 27 | 25 | 29 | 26 | 29 | 26 |
| 200 | 56 | 56 | 56 | 50 | 53 | 35 | 32 | 33 | 30 | 33 | 30 |
| 230 | 64 | 64 | 64 | 56 | 59 | 39 | 37 | 36 | 33 | 36 | 33 |
| 240 | 67 | 66 | 66 | 58 | 61 | 41 | 38 | 37 | 34 | 37 | 34 |
| 250 | 69 | 68 | 68 | 60 | 63 | 42 | 40 | 38 | 34 | 38 | 34 |
| 280 | 78 | 76 | 76 | 66 | 69 | 47 | 44 | 40 | 37 | 40 | 37 |
| 300 | 83 | 80 | 80 | 70 | 73 | 50 | 47 | 42 | 38 | 42 | 38 |
| 320 | 89 | 85 | 85 | 74 | 77 | 52 | 50 | 44 | 40 | 44 | 40 |
| 350 | 97 | | | 80 | 83 | 57 | 55 | 46 | 42 | 46 | 42 |
| 360 | 100 | | | | | 58 | 56 | 47 | 43 | 47 | 43 |
| 400 | 111 | | | | | | | 51 | 46 | 51 | 46 |
| 450 | 125 | | | | | | | 55 | 50 | 55 | 50 |
| 500 | 139 | | | | | | | 60 | 54 | 60 | 54 |
| 550 | 153 | | | | | | | 64 | 58 | 64 | 58 |
| 600 | 167 | | | | | | | 68 | 62 | 68 | 62 |

**SCHOOLAIR-D control voltages [V]**

| Volume flow rate | | SA-D-0 | | SA-D-HV | |
|---|---|---|---|---|---|
| (m³/h) | [l/s] | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) |
| 150 | 42 | 49 | 53 | | |
| 200 | 56 | 63 | 66 | | |
| 250 | 69 | 76 | 80 | 21 | 18 |
| 300 | 83 | 90 | 94 | 25 | 22 |
| 320 | 89 | 95 | 100 | 26 | 23 |
| 400 | 111 | | | 32 | 29 |
| 500 | 139 | | | 38 | 36 |
| 600 | 167 | | | 45 | 43 |
| 700 | 194 | | | 52 | 51 |
| 800 | 222 | | | 59 | 58 |
| 900 | 250 | | | 66 | 65 |
| 1000 | 278 | | | 73 | 72 |
| 1100 | 306 | | | 79 | 79 |

**FSL device control voltages [V]**

| Volume flow rate | | FSL-U-ZAS | | FSL-B-ZAB+SEK | | |
|---|---|---|---|---|---|---|
| (m³/h) | [l/s] | ZUL (SUP) | FOL (EHA) | ZUL (SUP) | FOL (EHA) | SEK |
| 60 | 17 | 28 | 30 | 19 | 21 | 31 |
| 90 | 25 | 39 | 40 | 31 | 32 | 39 |
| 120 | 33 | 49 | 51 | 43 | 44 | 47 |
| 150 | 42 | 59 | 61 | | | |

**Heating valve characteristic**

The settings depend on the valve-valve drive combination used.

| Actuator | Valve | | | | | |
|---|---|---|---|---|---|---|
| | Siemens | | | Frese | | |
| **Möhlenhoff, thermoelectric** | **X** | | | **X** | | |
| **Siemens SSP 61, electromotorised** | | **X** | | | **X** | |
| **Möhlenhoff, electromotorised** | | | **X** | | | **X** |
| Address 17229 | 100 | 0 | 100 | 0 | 100 | 0 |
| Address 17230 | 13 | 100 | 0 | 100 | 0 | 100 |

**Characteristic bypass/rotary heat exchangers**

The settings depend on the design implementation in the device.

Please note the following table:

**Rotary HRU (SCHOOLAIR-B / -V / -D – HV)**

| Address | Who |
|---|---|
| 17231 | AO2 characteristic min. = 22 |
| 17232 | AO2 characteristic max. = 100 |

**Plate-type HRU (all other device variants)**

| Address | SA-B-2L/4L | SA-V-2L/4L | SA-V-1800-2L/4L | SA-V-HE-2L/4L | SA-D-2L/4L |
|---|---|---|---|---|---|
| 17231 | 100 | 100 | 0 | 100 | 0 |
| 17232 | 0 | 0 | 100 | 0 | 100 |

**Note**

During the function test (service tool), the control input signal of the heat recovery unit has the following meaning:

100% - 100% bypass / 0% HRU

0% - 0% bypass / 100% HRU

Special case SCHOOLAIR-V-0-2L / -4L: Damper open = 100% heat recovery!

**Cooling valve characteristics**

| Address | Who |
|---|---|
| 17239 – 17340 | Usually, the same settings must be made here as for the heating valve. |

**Characteristic secondary air damper on AO5**

Please note that the LED for the CP is connected to AO5, exception: FSL-U-ZAS.

| Address | Who |
|---|---|
| 17237 | AO5 characteristic min. = 0 |
| 17238 | AO5 characteristic max. = 60<br>Limitation to 6 VDC, as the LED at the CP is operated with 5 VDC. |

**Characteristic secondary air damper on AO7**

| Address | Who |
|---|---|
| 17241 | AO7 characteristic min. = 0 |
| 17242 | AO7 characteristic max. = 100 |

### 4.3.11 *'Configuration ➔ IO connections*+'*

The configuration described below represents the standard wiring of decentralised ventilation units. Deviations are documented with the wiring diagrams.

**Occupancy analogue inputs**

| Address | Who |
|---|---|
| 17177 | Occupancy AI1 = 1<br>(Supply air temperature, NTC 10k) |
| 17178 | Occupancy AI2 = 2<br>(Outdoor air temperature, NTC 10k) |
| 17179 | Occupancy AI3 = 8<br>(CO2 sensor, 0 … 10 VDC signal) |
| 17180 | Occupancy AI4 = 9<br>(Humidity sensor, 0 … 10 VDC signal) |
| 17181 | Occupancy AI5 = 12<br>(Analogue control panel setpoint value adjuster, 5k) |

| Address | Who |
|---|---|
| 17182 | Occupancy AI6 = 13<br>(Analogue control panel fan stage selector or push button) |
| 17183 | Occupancy AI7 = 14<br>(Analogue CP, room temperature, NTC 10k or 20k) |
| 17184 | Occupancy AI8 = 6<br>(Extract air temperature, NTC 10k) |
| 17185 | Occupancy AI9 = 5<br>(Return temperature, NTC 10k) |
| 17186 | Occupancy AI10 = 4<br>(Flow temperature, NTC 10k) |
| 17187 | Occupancy AI11 = Currently not in use |
| 17188 | Occupancy AI12 = 7<br>(Extract air temperature, 0 … 10 VDC signal, FSL-U-ZAS!) |
| 17189 | Occupancy AI13 = 3<br>(Mixed air temperature, NTC 10k, FSL-U-ZAS) |
| 17190 | Occupancy AI14 = Currently not in use |

**Occupancy analogue outputs**

| Address | Who |
|---|---|
| 17219 | Occupancy AO1 = 1<br>(Heating valve, 0 … 10 VDC) |
| 17220 | Occupancy AO2 = 5 / 7<br>(Bypass damper / rotary HRU) |
| 17221 | Occupancy AO3 = 3<br>(Fan supply air, 0 … 10 VDC) |
| 17222 | Occupancy AO4 = 4<br>(Fan extract air, 0 … 10 VDC) |
| 17223 | Occupancy AO5 = 14<br>(LED control panel, 0 … 10 VDC) |
| 17224 | Occupancy AO6 = 2<br>(Cooling valve, 0 … 10 VDC) |
| 17225 | Occupancy AO7 = 6<br>(Fan secondary air, 0 … 10 V) |
| 17226 | Occupancy AO8 = 1<br>(Output volume flow rate, 0 … 10 VDC) |
| 17227 | Occupancy AO9 = Currently not in use |
| 17228 | Occupancy AO10 = Currently not in use |

**Occupancy digital inputs**

| Address | Who |
|---|---|
| 17116 | Occupancy DI1 = 1<br>(Speed signal fan supply air) |
| 17117 | Occupancy DI2 = 2<br>(Speed signal fan extract air) |
| 17118 | Occupancy DI3 = Currently not in use |
| 17119 | Occupancy DI4 = 10 (occupancy push button)<br>Wiring:<br>Open = valid operating mode (RTC, DI, central BMS)<br>Closed = Occupied |

**Occupied**

| Address | Who |
|---|---|
| 17120 | Occupancy DI5 = 5 (window contact)<br>Wiring:<br>Open = Device OFF,<br>Closed = Automatic |
| 17121 | Occupancy DI6 = 6 (fire emergency stop)<br>Wiring:<br>Open = Device OFF,<br>Closed = Automatic |
| 17122 | Occupancy DI7 = 7 (external enable)<br>Wiring:<br>Open = Device OFF,<br>Closed = Automatic |
| 17123 | Occupancy DI8 = 8 (changeover)<br>Wiring:<br>Open = Heating,<br>Closed = Cooling |
| 17124 | Occupancy DI9 = 9 (frost protection monitors) |
| 17125 | Occupancy DI10 = 4 (filter pressure monitoring) |
| 17126 | Occupancy DI11 = 11 (Night Purge) |
| 17127 | Occupancy DI12 = 12 (Fan Force)<br>Wiring:<br>Open = Inactive<br>Closed = Active |
| 17128 | Occupancy DI13 = 2 (currently not in use) |
| 17129 | Occupancy DI14 = 2 (currently not in use) |
| 17130 | Occupancy DI15 = 2 (currently not in use) |
| 17131 | Occupancy DI16 = 2 (currently not in use) |

**DI**

NC-NO contacts

Normally Closed - 0

Normally Open - 1

To perform the functions correctly, the DIs must be configured as follows.

| Address | Who |
|---|---|
| 17132 | DI1 switch type = 1 |
| 17133 | DI2 switch type = 1 |
| 17134 | DI3 switch type = 1 |
| 17135 | DI4 switch type = 1 |
| 17136 | DI5 switch type = 0 |
| 17137 | DI6 switch type = 0 |
| 17138 | DI7 switch type = 1 |
| 17139 | DI8 switch type = 0 |
| 17140 | DI9 switch type = 1 |
| 17141 | DI10 switch type = 1 |
| 17142 | DI11 switch type = 1 |
| 17143 | DI12 switch type = 1 |
| 17144 | DI13 switch type = 1 |
| 17145 | DI14 switch type = 1 |
| 17146 | DI15 switch type = 1 |
| 17147 | DI16 switch type = 1 |

**Occupancy digital outputs**

| Address | Who |
|---|---|
| 17153 | Occupancy DO1 = 1 (shut-off dampers) |
| 17154 | Occupancy DO2 = 2 (A alarm)<br>Wiring:<br>Open = Inactive<br>Closed = A alarm present |
| 17155 | Occupancy DO3 = 3 (B alarm)<br>Wiring:<br>Open = Inactive<br>Closed = B alarm present |
| 17156 | Occupancy DO4 = 4 (operational readiness)<br>Wiring:<br>Open = Inactive<br>Closed = Device active |
| 17157 | Occupancy DO5 = Currently not in use |
| 17158 | Occupancy DO6 = 7 (heating request, related to the valve) |
| 17159 | Occupancy DO7 = 8 (cooling request, related to the valve) |
| 17160 | Occupancy DO8 = Currently not in use |
| 17161 | Occupancy DO9 = Currently not in use |
| 17162 | Occupancy DO10 = 11 (heating request/ enable, related to the room)<br>Wiring:<br>Open = Inactive<br>Closed = Enable for external heat transfer fluid |
| 17163 | Occupancy DO11 = 12 (cooling request/ enable, related to the room)<br>Wiring:<br>Open = Inactive<br>Closed = Enable for external coolant |
| 17164 | Occupancy DO12 = Currently not in use |

**DO occupancy digital outputs**

NC-NO contacts

Normally Closed - 0

Normally Open - 1

To perform the functions correctly, the DOs must be configured as follows.

| Address | Who |
|---|---|
| 17165 | DO1 switch type = 1 |
| 17166 | DO2 switch type = 1 |
| 17167 | DO3 switch type = 1 |
| 17168 | DO4 switch type = 1 |
| 17169 | DO5 switch type = 1 |
| 17170 | DO6 switch type = 1 |
| 17171 | DO7 switch type = 1 |
| 17172 | DO8 switch type = 1 |
| 17173 | DO9 switch type = 1 |
| 17174 | DO10 switch type = 1 |
| 17175 | DO11 switch type = 1 |
| 17176 | DO12 switch type = 1 |

To implement the wiring of the DI / DO according to the wiring documents:

| X3 | Function | Open | Closed | Cable breakage resistance | Physical address controller | Used for | | DI switch type | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Address | | Address | |
| 1 | Fume cupboard switch | Inactive | Active | | DI 12 | 17127 | 12 | 17143 | 1 |
| 2 | Changeover | Heating | Cooling | Yes | DI 8 | 17123 | 8 | 17139 | 0 |
| 3 | Operating enable | Off | Automatic | | DI 7 | 17122 | 7 | 17138 | 1 |
| 4 | Fire emergency stop | Off | Automatic | Yes | DI 6 | 17121 | 6 | 17137 | 0 |
| 5 | Window contact | Off | Automatic | Yes | DI 5 | 17120 | 5 | 17136 | 0 |
| 6 | PIR sensor | Valid operating mode | Occupied | | DI 4 | 17125 | 10 | 17141 | 1 |

| X5 | Function | Open | Closed | Cable breakage resistance | Physical address controller | Used for | | DI switch type | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Address | | Address | |
| 1 | Coolant request | Inactive | Active | | DO7 | 17159 | 7 | 17171 | 0 |
| 2 | Heat transfer fluid request | Inactive | Active | | DO6 | 17158 | 6 | 17170 | 0 |
| 3 | Operational readiness | Device inactive | Device active | | DO4 | 17156 | 4 | 17168 | 0 |
| 4 | B Alarm | No alarm | Alarm | | DO3 | 17155 | 3 | 17167 | 1 |
| 5 | A alarm | No alarm | Alarm | | DO2 | 17154 | 2 | 17166 | 1 |
| 6 | Enable of heating function, room-related | No release | Release | | DO10 | 17162 | 11 | 17174 | 0 |
| 6 | Enable of cooling function, room-related | No release | Release | | DO11 | 17163 | 12 | 17175 | 0 |

### 4.3.12 *'Configuration ➔ Device configuration*+'*

Please restart the controller after making any changes!

| Address | Who |
|---|---|
| 17036 | FSL-CONTROL III device type<br>1 = Secondary air units (e.g. FSL-U-SEK)<br>2 = Supply and secondary air unit with separate secondary air fan (currently not available)<br>3 = Supply and secondary air unit (SEK via mixing damper), (e.g. FSL-U-ZUS)<br>4 = Supply and extract air unit (almost all FSL and SCHOOLAIR devices)<br>5 = Supply and extract air unit with admixture of secondary air (e.g. FSL-U-ZAS, FSL-B-ZAB+SEK) |
| 17042 | Master enable<br>This setting determines whether the device is a master (1) or a slave (0) device. |

| Address | Who |
|---|---|
| | 1 = Master<br>0 = Slave |
| 17358 | Secondary air changeover enable<br>1 = Active<br>0 = inactive<br>Usually activated |
| 17046 | Control panel type<br>0 = No CP<br>All master devices without a control panel. Often in case of connection to the central BMS. Instead of room temperature control, extract air temperature can also be activated.<br>Fundamentally for all slave devices<br>1 = Digital control panel<br>2 = Analogue control panel with 20k temperature sensor<br>- All CPs are surface-mounted CPs with selector switch<br>- All CPs for flush mounting<br>3 = Analogue control panel with 10k temperature sensor<br>- Schneider STR504 |
| 17044 | Start operating mode<br>Refers to the behaviour of the devices after restarting the controller.<br>1 = Off<br>2 = Automatic<br>3 = Manual<br>Only "2" is permitted here. |
| 17045 | Start operating mode<br>Refers to the behaviour of the devices after restarting the controller.<br>1 = Standby<br>2 = Unoccupied<br>3 = Occupied<br>"3" must be selected here. |
| 17047 | Number of IO modules<br>Currently only applies to FSL-U-ZAS and FSL-B-ZAB+SEK with 4-pipe heat exchanger and control panel connection. In this case, the IOs on the controller are not sufficient and an additional module is required. Only then is a "1" to be entered here.<br>Default setting = 0. |

### 4.3.13 *'Configuration ➔ Functions*+'*

**Night purge**

Please note: Night Purge must be additionally activated by either the RTC or the central BMS.

| Address | Who |
|---|---|
| 17450 | Night Purge enable<br>0 = Night Purge inactive<br>1 = Night Purge active |
| 17451 | Start month<br>To determine the period during which Night Purge may be carried out at all. |
| 17452 | End month<br>To determine the period during which Night Purge may be carried out at all. |
| 17453 | Minimum outdoor temperature<br>Setting of the lower limit of the outdoor temperature. |
| 17454 | Start delta outdoor temperature cooling setpoint value<br>The outdoor temperature must be lower than the cooling setpoint value for Occupied by this amount. |
| 17455 | Stop delta outdoor temperature room temperature<br>If the difference between the outdoor temperature and the room temperature is smaller than the set value, Night Purge is terminated. |
| 17456 | Fan stage<br>Setting of the fan stage during Night Purge. Usually stage 4. |
| 17458 | Minimum time for Night Purge<br>Setting of the minimum duration of Night Purge. Usually 30 minutes. |

**Filter monitoring**

| Address | Who |
|---|---|
| 17494 | Filter monitoring enable<br>0 = No filter monitoring<br>1 = Filter monitoring active<br>No distinction is made here about the type of filter monitoring, but filter monitoring is activated in principle. |
| 17495 | Time monitoring of filter change interval<br>Setting of the time span after which the filter change is displayed.<br>Usually 2,500 h. |

| Address | Who |
|---|---|
| 17496 | Pressure monitoring<br>Affects all unit types: - HE, HV and HV-EH must be activated.<br>In addition, filter monitoring (4) must be set for DI10 and Normally Closed must be selected as the switch type. |
| 17497 | Pressure monitoring message delay<br>Enter the duration for which the pressure monitoring must have been triggered before the message is sent. Usually 30 minutes.<br>For preventing gusts of wind from causing triggering. |

**Priming**

| Address | Who |
|---|---|
| 17422 | First month for priming<br>Determination of the months in which priming is carried out. |
| 17423 | Last month for priming<br>Determination of the months in which priming is carried out.<br>Please note that priming is always (!) carried out within this period. We therefore do not use this function, but only the temperature-controlled activation of the priming process. |
| 17415 | Minimum outdoor temperature<br>Specifies the outdoor temperature at which the priming process is activated, i.e. priming takes place if the temperature falls below the entered value. |
| 17416 | Max. priming time<br>Setting of the duration of the priming process. Usually 3 minutes (180 sec.). |
| 17418 | Heating valve setting at the end of the process<br>The valve is set to this value after priming so that the supply air temperature setpoint value is reached more quickly. |
| 17419 | Holding tie for heating valve setting<br>After the priming process, the valve is moved to the setpoint value (17418) and held for the duration of the value specified here. Regulation of the supply air temperature does not take place during this period. |
| 17414 | Minimum priming duration with return temperature monitoring<br>Currently not in use. |
| 17421 | Minimum return temperature for termination<br>Currently not in use. |

**Logging**

The devices permanently log all existing data. E.g. sensor values, operating status, central BMS.

| Address | Who |
|---|---|
| 17558 | Logging enable<br>0 = inactive<br>1 = Active = Default setting |
| 17562 | Number of files<br>31, i.e., a separate file is created for each day of the month. Thus, the last 31 days are always logged. |
| 17559 | Logging interval<br>20, i.e., data is written every 20 seconds. Please do not make any changes, as the resulting amount of data can still be processed very well. |
| 17561 | Lines per file<br>4320, corresponds to logging every 20 sec within 24 hours. |
| 17560 | Lines per write process<br>10 so that the SD card is not accessed too often. |

**FTP**

| Address | Who |
|---|---|
| 17564 | Enable FTP access to the controller<br>1, the controller can be accessed via the service tool, e.g. for software updates. |
| 16138 | FTP volume enable<br>0 = Flash memory<br>1 = SD card<br>To read the data from the SD card, "1" must be entered here. |

### 4.3.14 *'Configuration ➔ Alarms*+'*

Individual alarm messages can be suppressed here. No settings are necessary.

0 - The alarm is not output

1 - The alarm is output

## 4.3.15 *'Configuration ➔ Frost protection*+'*

### Supply air frost protection

| Address | Who |
|---|---|
| 17403 | Supply air frost protection start temperature<br>Entry of the minimum supply air temperature. The frost protection function is carried out if the temperature falls below this value. Default value = 8°C |
| 17389 | Duration<br>Duration of the frost protection function caused by supply air frost. Default value = 360 seconds |
| 17390 | Restart frost protection delta supply air<br>Enter the temperature at which frost protection is exited. Default value = 1K. |

### Room frost protection

| Address | Who |
|---|---|
| 17391 | Room frost protection start temperature<br>Entry of the minimum room temperature. The frost protection function is carried out if the temperature falls below this value. Default value = 8°C |
| 17392 | Duration<br>Duration of the frost protection function caused by room frost. Default value = 360 seconds |
| 17393 | Restart frost protection delta room<br>Enter the temperature at which frost protection is exited. Default value = 1K. |

### Outdoor temperature frost protection

| Address | Who |
|---|---|
| 17394 | Outdoor temperature frost protection<br>Start temperature Enter the minimum outdoor air temperature. The frost protection function is carried out if the temperature falls below this value. Default value = -20°C |
| 17395 | Duration<br>Duration of the frost protection function caused by supply air frost. Default value = 900 seconds |
| 17396 | Restart frost protection delta outdoor temperature<br>Enter the temperature at which frost protection is exited. Default value = 2K. |

### Heat recovery unit frost protection

| Address | Who |
|---|---|
| 17397 | HRU frost protection start temperature<br>Entry of the minimum outdoor air temperature:<br>If the value falls below this value, the bypass is opened or the frost protection cycle is carried out (with year-round heat recovery in conjunction with plate-type heat recovery unit). Different values must be set for the different heat recovery systems:<br>Cross-flow HRU = -6°C<br>Cross counterflow HRU = -4°C<br>Rotary HRU = -20°C (rotor does not produce condensate that has to be discharged!) |
| 17399 | Duration<br>Duration of the frost protection function caused by HRU frost. Default value = 360 seconds |
| 17398 | Delta temperature close bypass<br>Enter the temperature at which the bypass is closed.<br>Default value = 1K. |

### HRU frost protection cycle

| Address | Who |
|---|---|
| 17409 | Frost protection cycle enable<br>This function enables year-round heat recovery with plate-type heat recovery units.<br>Please note that this function generates condensate and the devices must (!) have a condensate connection.<br>0 = inactive<br>1 = Active |
| 17410 | Secondary air operating time<br>The secondary air is used to defrost the heat recovery unit if necessary.<br>Default value = 20 minutes. |
| 17411 | Outdoor air operating time<br>Definition of the maximum duration in supply air and extract air mode until switching to secondary air.<br>Default value = 180 min. (i.e. switching takes place every 3 h at the latest). |

### 4.3.16 *'Configuration ➔ Control panel*+'*

Setpoint value adjuster / push button / selector switch The settings can be found in the following table:

| Address | Honeywell, 5-stage M546FB8 | Schneider STR504 M536BA4 | Titec RTF3-NTC20k-P5k-T-L Axx59067 | Titec RTF3-NTC10k Axx59069 | Thermokon, WRF06-TD-20k Axx81503 | Titec BS1-NTC20k-P5k-T-L Axx74476 | Thermokon WRF07 PTD NTC20k BTyp6 5k-gn Axx79778 Axx79779 Axx81579 |
|---|---|---|---|---|---|---|---|
| | Value | Value | Value | Value | Value | Value | Value |
| 17425 | 1 | 1 | 1 | 0 | 0 | 1 | 1 |
| 17434 | 30 | 30 | 30 | 0 | 30 | 30 | 30 |
| 17433 | -30 | -30 | -30 | 0 | -30 | -30 | -30 |
| 17436 | 5500 | 5500 | 2650 | 0 | 2500 | 2160 | 2500 |
| 17437 | 4785 | 4785 | 3050 | 0 | 3000 | 2600 | 3000 |
| 17435 | 100 | 100 | 100 | 0 | 100 | 100 | 100 |
| 17426 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 17427 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 17428 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 17424 | 1 | 0 | 1 | 0 | 1 | 1 | 1 |

**Times**

| Address | Who |
|---|---|
| 17439 | Run time of overtime operation<br>Determination of the duration for overtime. Function must be activated, see address 17426<br>Default value = 60 minutes. |
| 17464 | Boost run time<br>Default value = 15 minutes. |
| 17469 | Exercise run time<br>Default value = 60 minutes. |

### 4.3.17 *'Configuration ➔ Options*+'*

For activating / deactivating the internal clock for executing the timers or for enabling the Modbus or BACnet interface to the central BMS. Please ensure that only one interface to the central BMS is active at any one time, provided the devices are connected to a central BMS. These options are chargeable and therefore protected from access with separate passwords.

#### 4.3.17.1 *'Configuration ➔ Overall configuration*+'*

After commissioning, a protocol with all settings can be generated here. Using the Print command in the browser and the selection of a *pdf printer, a *.pdf can be generated and transferred to the customer with the protocol for the commissioning.

## 4.4 Manual control menu

### 4.4.1 *'Manual control ➔ Commands'*

**Safety instructions for manual control**

**NOTICE!**

**Damage to property due to manual control!**

In manual control, the safety functions are disabled. The device must be permanently monitored, e.g. as the frost protection monitoring function is disabled.

**Manual mode**

The purpose of manual control is to control actuators individually and to check their functioning. Entries are made exclusively via the web browser. The function test of actuators is carried out on site at the device.

To end manual control, enter `2` (auto) in the address field (address 10000) and then restart the device. To restart the device, enter `1` in the input field (address 10003) and confirm with the Return key.

***Hydraulic balancing***

*For commissioning, the values can be opened in the manual control operating mode for hydraulic balancing.*

| Address | Who |
|---|---|
| 10000 | Operating mode:<br>0 = No default<br>1 = Off<br>2 = Auto<br>3 = Manual |
| 10003 | Device restart:<br>0 = No default<br>1 = Restart |

Device status operating mode *'Off'*

| | | |
|---|---|---|
| Fans | - | OFF |
| Shut-off dampers | - | Closed |
| Valves | - | Closed |
| Frost control | - | active |
| Digital inputs | - | Switching deactivated |

**Reset filter hours**

After a filter change, the operating hours counter can be reset using this function.

| Address | Who |
|---|---|
| 10006 | Reset filter operating hours<br>0 = No default<br>1 = Perform reset |

**Variables of actuators (only in manual operating mode)**

The actuators can be individually started in the manual control operating mode using the following functions.

| Address | Who |
|---|---|
| 10012 | Bypass/RWT 0..100 [%] |
| 10013 | Outside damper 0/100 [%]<br>0 = Closed<br>100 = Open |
| 10015 | Heating valve 0..100 [%] |
| 10016 | Cooling valve 0..100 [%] |
| 10017 | Supply air fan<br>Stage 0..5 or information in percent 6..100 [%] |
| 10018 | Extract air fan<br>Stage 0..5 or information in percent 6..100 [%] |
| 10019 | Secondary air fan<br>Stage 0..5 or information in percent 6..100 [%] |

## 4.5 Menu for connection to central BMS

The ventilation units can be connected to the central BMS using Modbus RTU, Modbus TCP, BACnet MS/TP or BACnet IP. All the available data points are displayed via the menu for connection to central BMS. The address in the tables corresponds to the Modbus address.

### 4.5.1 Connection to the central BMS via Modbus

#### 4.5.1.1 Communication commands

Settings for communication via Modbus:

- *Chapter 2.2.2 'Modbus TCP / BACnet IP' on page 15*
- IP address for Modbus TCP *'IP address' on page 40*
- Enter `502` as the port.

The following commands are supported by the controller:

| Modbus command | Description |
|---|---|
| 03 (0x03) | Read holding registers |
| 16 (0x10) | Write multiple holding registers |

### 4.5.2 *'Connection to central BMS ➔ Device => central BMS'*

*Depending on the software used for communication with the central BMS, an offset must be set and thereby reduce the address by 1.*

***Example:** Query of operating status*

*Software used = Modbus Poll*

*Address tab = 9102*

The following table shows all data points that can be accessed via the web server. The data points are the same as the ones in the Modbus protocol.

| no. | Address | Who | Notes |
|---|---|---|---|
| 1 | 9100 | eOutOperatingMode<br>Operating mode | Output operating mode<br>1 = Off<br>2 = Automatic mode<br>3 = Manual mode |
| 2 | 9101 | eOutOperatingType<br>Operating mode | Output operating mode<br>0 = No operating mode<br>1 = Standby<br>2 = Unoccupied<br>3 = Occupied |
| 3 | 9102 | fOutOperatingTypeOverriding<br>Operating mode override | Output operating mode override<br>0 = No operating mode override<br>1 = Boost<br>2 = Exercise<br>3 = Night purge<br>4 = Fan force |
| 4 | 9103 | fOutOperatingState<br>Operating state | Output operating state<br>1 = Standby<br>2 = Control system<br>3 = Manual mode<br>6 = Fire emergency stop<br>7 = Frost protection<br>8 = Priming<br>11 = Night purge |
| 5 | 9104 | eOutVentilationType<br>Type of ventilation | Output type of ventilation<br>0 = No ventilation<br>1 = Secondary air operation<br>2 = Outdoor air operation |
| 6 | 9105 | fOutTempSupply<br>Actual supply air temperature | Measured value = Value 1/10, example:<br>Value 185 ⇒ measured value = 18.5°C<br>Value = 32767 = Measured value not available |
| 7 | 9106 | fOutTempOda<br>Current outdoor temperature | Measured value = Value 1/10, example:<br>Value 125 ⇒ measured value = 12.5°C<br>Value = 32767 = Measured value not available |
| 8 | 9107 | fOutTempRoom<br>Room temperature actual value | Measured value = Value 1/10, example:<br>Value 225 ⇒ measured value = 22.5°C<br>Value = 32767 = Measured value not available |
| 9 | 9108 | fOutTempReturnFlow<br>Current return temperature | Measured value = Value 1/10, example:<br>Value 335 ⇒ measured value = 33.5°C<br>Value = 32767 = Measured value not available |

| no. | Address | Who | Notes |
|---|---|---|---|
| 10 | 9109 | fOutTempFlow<br>Current flow temperature | Measured value = Value 1/10, example:<br>Value 600 ⇒ measured value = 60°C<br>Value = 32767 = Measured value not available |
| 11 | 9110 | fOutTempOffset<br>Current room / supply air temperature offset | Offset = Value 1/10, example:<br>Value 10 ⇒ Offset = 1°C<br>Value = 32767 = Measured value not available |
| 12 | 9111 | bOutExtratime<br>Overtime activation | Output overtime activation<br>0 = Disabled<br>1 = Enabled |
| 13 | 9112 | fOutTempRangeCooling<br>Temperature upper limit, cooling | Temperature limit = Value 1/10, example:<br>Value 420 ⇒ upper limit = 42°C |
| 14 | 9113 | fOutTempRangeHeating<br>Temperature lower limit, heating | Temperature limit = Value 1/10, example:<br>Value 180 ⇒ upper limit = 18°C |
| 15 | 9114 | fOutTempSetPointSupply<br>Supply air temperature setpoint value | Supply air temperature setpoint value = Value 1/10, example:<br>Value 250 ⇒ supply air temperature setpoint value = 25°C |
| 16 | 9115 | fOutFanLevel<br>Fan stage | Output fan stage<br>2 = Stage 1 manual mode<br>3 = Stage 2 manual mode<br>4 = Stage 3 manual mode<br>5 = Stage 4 manual mode<br>6 = Stage 5 manual mode<br>8 = Stage 1 automatic mode<br>9 = Stage 2 automatic mode<br>10 = Stage 3 automatic mode<br>11 = Stage 4 automatic mode<br>12 = Stage 5 automatic mode |
| 17 | 9116 | fOutHumidityRoom<br>Current room humidity | Room air humidity in % = Value, example:<br>Value 50 ⇒ room air humidity = 50%<br>Value 32767 = Measured value not available |
| 18 | 9117 | fOutAirQualityRoom<br>Current indoor air quality | Indoor air quality in ppm or ppm $CO^2$ equivalent = Value, example:<br>Value 580 ⇒ indoor air quality = 580ppm<br>Value 32767 = Measured value not available |
| 19 | 9118 | fOutVolumeFlowOda<br>Fresh air volume flow rate | Output current fresh air volume flow rate in [l/s] |
| 20 | 9119 | fOutVolumeFlowExhaust<br>Extract air volume flow rate | Output of current extract air volume flow rate in [l/s] |
| 21 | 9120 | fOutAlarmA<br>Alarm A consolidated alarm | Output consolidated alarm as bit string ↬ *'A alarm' on page 32* |
| 22 | 9121 | fOutAlarmB<br>Alarm B consolidated alarm | Output consolidated alarm as bit string ↬ *'B Alarm' on page 32* |
| 24 | 9123 | bOutWindow<br>Window contact | Output window contact<br>0 = Inactive<br>1 = Active |
| 25 | 9124 | bOutFire<br>Fire alarm | Output fire emergency stop<br>0 = Inactive<br>1 = Active |

| no. | Address | Who | Notes |
|---|---|---|---|
| 26 | 9125 | fOutSystemDevices<br>Number of devices in the system | Output of device number in the network<br>Example 1 master + 1 slave output = 2 |
| 27 | 9126 | eOutDemandRoom<br>Room requirements | Output of heating and cooling requirements for room<br>1 = Room must be heated<br>2 = Room must be cooled |
| 28 | 9127 | eOutDemandValve<br>Valve requirements | Output of heating and cooling requirements for implementing the supply air temperature<br>1 = Supply air is heated<br>2 = Supply air is cooled |
| 29 | 9128 | fOutValvePositionHeatingMaster<br>Control input signal of master heating valve | Output control of heating valve = Value 1/10, example:<br>Value = 400 ⇒ control input signal = 40 % |
| 30 | 9129 | fOutValvePositionCoolingMaster<br>Control of master cooling valve | Output control of cooling valve = Value 1/10, example:<br>Value = 400 ⇒ control input signal = 40 % |
| 31 | 9130 | fOutTempSupplySlave01<br>Supply air temperature slave 1 | Display of current supply air temperature slave (x) = Value 1/10, example:<br>Value 275 ⇒ measured value = 27.5°C<br>Value = 32767 = Measured value not available |
| 32 | 9131 | fOutTempSupplySlave02<br>Supply air temperature slave 2 | |
| 33 | 9132 | fOutTempSupplySlave03<br>Supply air temperature slave 3 | |
| 34 | 9133 | fOutTempSupplySlave04<br>Supply air temperature slave 4 | |
| 35 | 9134 | fOutTempSupplySlave05<br>Supply air temperature slave 5 | |
| 36 | 9135 | fOutTempSupplySlave06<br>Supply air temperature slave 6 | |
| 37 | 9136 | fOutTempSupplySlave07<br>Supply air temperature slave 7 | |
| 38 | 9137 | fOutTempSupplySlave08<br>Supply air temperature slave 8 | |
| 39 | 9138 | fOutTempSupplySlave09<br>Supply air temperature slave 9 | |
| 40 | 9139 | fOutTempSupplySlave10<br>Supply air temperature slave 10 | |
| 41 | 9140 | fOutValvePositionHeatingSlave01<br>Heating valve slave 1 | Display of current control of heating valve slave (x) = Value 1/10, example:<br>Value 250 ⇒ control input signal = 25%<br>Value = 32767 = Measured value not available |
| 42 | 9141 | fOutValvePositionHeatingSlave02<br>Heating valve slave 2 | |
| 43 | 9142 | fOutValvePositionHeatingSlave03<br>Heating valve slave 3 | |

| no. | Address | Who | Notes |
|---|---|---|---|
| 44 | 9143 | fOutValvePositionHeatingSlave04<br>Heating valve slave 4 | |
| 45 | 9144 | fOutValvePositionHeatingSlave05 heating valve slave 5 | |
| 46 | 9145 | fOutValvePositionHeatingSlave06<br>Heating valve slave 6 | |
| 47 | 9146 | fOutValvePositionHeatingSlave07 heating valve slave 7 | |
| 48 | 9147 | fOutValvePositionHeatingSlave08<br>Heating valve slave 8 | |
| 49 | 9148 | fOutValvePositionHeatingSlave09 heating valve slave 9 | |
| 50 | 9149 | fOutValvePositionHeatingSlave10<br>Heating valve slave 10 | |
| 51 | 9150 | fOutValvePositionCoolingSlave01<br>Cooling valve slave 1 | Display of current control of cooling valve slave (x) = Value 1/10, example:<br>Value 650 ⇒ control input signal = 65%<br>Value = 32767 = Measured value not available |
| 52 | 9151 | fOutValvePositionCoolingSlave02<br>Cooling valve slave 2 | |
| 53 | 9152 | fOutValvePositionCoolingSlave03<br>Cooling valve slave 3 | |
| 54 | 9153 | fOutValvePositionCoolingSlave04<br>Cooling valve slave 4 | |
| 55 | 9154 | fOutValvePositionCoolingSlave05<br>Cooling valve slave 5 | |
| 56 | 9155 | fOutValvePositionCoolingSlave06<br>Cooling valve slave 6 | |
| 57 | 9156 | fOutValvePositionCoolingSlave07<br>Cooling valve slave 7 | |
| 58 | 9157 | fOutValvePositionCoolingSlave08<br>Cooling valve slave 8 | |
| 59 | 9158 | fOutValvePositionCoolingSlave09<br>Cooling valve slave 9 | |
| 60 | 9159 | fOutValvePositionCoolingSlave10<br>Cooling valve slave 10 | |

### 4.5.3 *'Connection to central BMS ➔ Central BMS => device'*

The following table shows all data points that can be sent from the central BMS to the device.

> ***Note***
>
> *For test purposes, entries can be made directly in the web browser if the central BMS has not yet been connected. For example, communication with the central BMS can be tested without the central BMS being completed. In some instances, data points are reset to the value `32767` after entry and processing. To check that a command has been taken over, the corresponding diagnostics page is provided.*
> *The prerequisite for the test via web browser is the activation of the Modbus interface for communication via the central BMS. If the BACnet interface is active, it is not possible to enter commands via the web browser.*

| no. | Address | Who | Notes |
|---|---|---|---|
| 1 | 9000 | eInOperatingMode<br>Default operating mode | Default operating mode<br>1 = Off<br>2 = Automatic |
| 2 | 9001 | eInOperatingType<br>Default operating mode | Specification of operating mode<br>1 = Standby<br>2 = Unoccupied<br>3 = Occupied |
| 3 | 9002 | eInOperatingTypOverinding<br>Operating mode override | Default operating mode override<br>0 = No operating mode override<br>1 = Boost<br>2 = Exercise<br>3 = Night purge<br>4 = Fan Force (fume cupboard switching) |
| 4 | 9003 | fInPvTempOda current<br>Outdoor temperature | Default current outdoor air temperature = Value 1/10, example:<br>Value `125` ⇒ default = 12.5°C |
| 5 | 9004 | fInSpTempRangeCooling<br>Temperature limit cooling | Default temperature limit cooling = Value 1/10, example:<br>Value `225` ⇒ default = 22.5°C |
| 6 | 9005 | fInSpTempRangeHeating<br>Temperature limit heating | Default temperature limit heating = Value 1/10, example:<br>Value `218` ⇒ default = 21.8°C |
| 7 | 9006 | fInPvTempRoom<br>Room temperature actual value | Default current room temperature = Value 1/10, example:<br>Value `235` ⇒ default = 23.5°C |
| 8 | 9007 | fInSPTempRoom<br>Room air temperature setpoint | Default room air temperature setpoint = Value 1/10, example:<br>Value `220` ⇒ default = 22.0°C |
| 9 | 9008 | fInSpOffsetRoom<br>Offset to the room temperature setpoint | Default offset to the room temperature setpoint = Value 1/10, example:<br>Value `10` ⇒ Offset = 1°C |
| 10 | 9009 | fInSpTempSupplyAir<br>Supply air temperature setpoint value | Transmission of supply air temperature setpoint value = Value 1/10, example:<br>Value `230` ⇒ default = 23°C |
| 11 | 9010 | fInSpOffsetSuppyAir<br>Offset to the supply air temperature setpoint | Default offset to the supply air temperature setpoint = Value 1/10, example:<br>Value `10` ⇒ Offset = 1°C |

| no. | Address | Who | Notes |
|---|---|---|---|
| 12 | 9011 | fInPvHumRoom<br>Current relative room air humidity | Default current relative room air humidity in %<br>= Value, example:<br>Value 45 ⇒ room air humidity = 45% |
| 13 | 9012 | eInChangeOver<br>Changeover mode | Message on the medium<br>1 = Heat transfer fluid present<br>2 = Coolant present |
| 14 | 9013 | fInSpFanLevel<br>Fan stage | Default fan stage<br>1 = Stage 1<br>2 = Stage 2<br>3 = Stage 3<br>4 = Stage 4<br>5 = Stage 5 |
| 15 | 9014 | fInPvAqRoom<br>Indoor air quality (internal) | Default indoor air quality |
| 16 | 9015 | fInPvAqOda<br>Outdoor air quality (external) | Default outdoor air quality |
| 17 | 9016 | fInPvVolumeFlowDifference<br>Volume flow rate difference | Default volume flow rate difference |
| 18 | 9017 | bInFire<br>Fire emergency stop | Default fire emergency stop<br>0 = Inactive<br>1 = Active |
| 19 | 9018 | bInWindow<br>Window contact | Default window contact<br>0 = Inactive<br>1 = Active |
| 20 | 9020 | bInExtratime<br>Overtime | Overtime function activation<br>0 = Inactive<br>1 = Active |
| 21 | 9021 | bInFilterReset<br>Default for filter reset | Resetting the filter change alert<br>0 = Inactive<br>1 = Active |
| 22 | 9022 | eInOdaAutomatic<br>Default automatic fresh air system | Activation of the fresh air function<br>0 = Inactive<br>1 = Active |

## 4.5.4 Connection to central BMS via BACnet

### 4.5.4.1 Protocol Implementation Conformance Statement (PICS)

The data points of the BACnet protocol are described in this chapter.

The BACnet capabilities of the FSL-CONTROL III controller are described below.

| | | |
|---|---|---|
| Date | - | 2020-01-10 |
| Vendor name | - | Schneider Electric |
| Product name | - | M172 |
| Application software version | - | 1.0 |
| Firmware revision | - | 596.9 |
| BACnet Protocol Revision | - | 12 |

**Product description**

- Schneider Electric BACnet IP and MS/TP Interface

**BACnet Standardized Device Profile (Annex L):**

- BACnet Advanced Application Controller (B-AAC)

**List all BACnet Interoperability Building Blocks Supported (Annex K):**

- Data Sharing-ReadProperty-B (DS-RP-B)
- Data Sharing-WriteProperty-B (DS-WP-B)
- Data Sharing-ReadPropertyMultiple-B (DS-RPM-B)
- Data Sharing-WritePropertyMultiple-B (DS-WPM-B)
- Data Sharing-COV-B (DS-COV-B)

**Segmentation Capability**

- Able to transmit segmented messages Window Size 1476 Byte/seg

**Standard Object Types Supported**

- Analogue Input
- Analogue Output
- Analogue Value
- Binary Value
- Calendar
- Device
- Multistate Input
- Multistate Value
- Notification class
- Schedule

**Data Link Layer Options**

- BACnet IP, 100 MBPS
- MS/TP master (Clause 9), baud rate(s): 9600, 19200, 38400, 56700, 76800

**Device Address Binding**

- Static device binding not supported

**Networking Options**

- BACnet/IP Broadcast Management Device (BBMD)
  The BBMD support registrations by Foreign Devices.

**Network Security Options:**

- Non-secure Device - is capable of operating without BACnet Network Security

**Character Sets Supported**

- Indicating support for multiple character sets does not imply that they can all be supported simultaneously.
  – ISO 8859-1

**Description of device object**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | 65536 + BACnet Identifier | RW-E |
| Object_Name | Default = "FSL-CONTROL III", BACnet ObjectName | RW-E |
| Object_Type | Device (8) | R |
| System_Status | OPERATIONAL (0) | R |
| Vendor_Name | “Schneider Electric” | R |
| Vendor_Identifier | 10 | R |
| Model_Name | M172 | R |
| Firmware_Revision | “596.9” | R |
| Application_Software_Version | “1.0” | R |
| Protocol_Version 1 R | 1 | R |
| Protocol_Revision | 12 | R |
| Protocol_Services_Supported | read-property, write-property, device-communication-control, reinitialize-device, who-has, who-is | R |
| Protocol_Object_Types_Supported | DEVICE, ANALOG_INPUT,ANALOG_VALUE, BINARY_VALUE, MULTISTATE_INPUT,MULTI-STATE_VALUE | R |
| Object_List | device, analogue-input 0…50, analog value 0..13, | R |
| Max_APDU_Length_Accepted | binary-value 0 …7, multistate_input 0…4; multistate-value 0…3 | R |
| Segmentation_Supported | 1476 | R |
| APDU_Timeout | NO_SEGMENTATION (3) | R |
| Number_Of_APDU_Retries | 3000 | R |
| Device_Address_Binding | 3 | R |
| Database_Revision | - | R |
| Description Controller Type | 0 | R |
| Max_Master default | Default 127 | RW-E |
| Max_Info_Frames | Default 1 | RW-E |

R:Read Property, W: Write Property, -E: Storage in EEPROM

***Note***

***Object name***

*FSLCONTROLIII is pre-set as the object name (Object_Name).*

*3.1.2.11 ‘Interfaces’ on page 25 .*

***Object Identifier***

*The object identifier is formed from the sum "65536" + BACnet identifier (address 17565).*

#### 4.5.4.2 Communication from device to central BMS

Display of all data points that can be transferred via BACnet from the device to the central building management system.

**Analogue Input Object**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | Analogue Input Value, instance 1 … 50 | R |
| Object_Name | | R |
| Object_Type | ANALOG_INPUT_VALUE (0) | R |
| Present_Value | | R |
| Status_Flags | IN_ALARM: | |
| Vendor_Identifier | FAULT: | |
| Model_Name | OVERRIDDEN: | |
| Firmware_Revision | OUT_OF_SERVICE: | |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) | R |
| Units | | R |

R:Read Property, W: Write Property

| Object_Type | Instance | Object_Name | Object_Description_DE | Units | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|
| AI | 0 | fOutFanLevel | Output fan stage<br>1 = 0_Manual<br>2 = 1_Manual<br>3 = 2_Manual<br>4 = 3_Manual<br>5 = 4_Manual<br>6 = 5_Manual<br>7 = 0_AUTO<br>8 = 1_AUTO<br>9 = 2_AUTO<br>10 = 3_AUTO<br>11 = 4_AUTO<br>12 = 5_AUTO | no units (95) | 327.67 | R |
| AI | 1 | fOutOperatingState | Output operating state<br>0 = Off<br>1 = Standby<br>2 = Control<br>3 = Manual<br>4 = Device Startup<br>5 = Shutdown<br>6 = Fire Protection<br>7 = Frost Protection<br>8 = Startup Circuity<br>9 = Error<br>10 = Valve Kick<br>11 = Night Purge | no units (95) | 327.67 | R |

| Object_Type | Instance | Object_Name | Object_Description_DE | Units | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|
| AI | 2 | fOutOperatingTypeOverriding | Output operating mode override<br>0 = None<br>1 = Boost<br>2 = Exercise<br>3 = Night Purge<br>4 = Fan Force | no units (95) | 327.67 | R |
| AI | 3 | fOutValvePositionCoolingSlave03 | Output control of cooling valve slave 3 | percent (98) | 327.67 | R |
| AI | 4 | fOutValvePositionHeatingSlave03 | Output position of heating valve slave 3 | percent (98) | 327.67 | R |
| AI | 5 | fOutTempSupplySlave03 | Output supply air temperature slave 3 | degrees Celsius (62) | 327.67 | R |
| AI | 6 | fOutTempSupplySlave02 | Output supply air temperature slave 2 | degrees Celsius (62) | 327.67 | R |
| AI | 7 | fOutValvePositionHeatingSlave02 | Output position of heating valve slave 2 | percent (98) | 327.67 | R |
| AI | 8 | fOutValvePositionCoolingSlave02 | Output control of cooling valve slave 2 | percent (98) | 327.67 | R |
| AI | 9 | fOutValvePositionCoolingSlave01 | Output control of cooling valve slave 1 | percent (98) | 327.67 | R |
| AI | 10 | fOutValvePositionHeatingSlave01 | Output position of heating valve slave 1 | percent (98) | 327.67 | R |
| AI | 11 | fOutTempSupplySlave01 | Output supply air temperature slave 1 | degrees Celsius (62) | 327.67 | R |
| AI | 12 | fOutAlarmB | Output consolidated alarm B | no units (95) | 327.67 | R |
| AI | 13 | fOutAlarmA | Output consolidated alarm A | no units (95) | 327.67 | R |
| AI | 14 | fOutValvePositionCoolingMaster | Output position of master cooling valve | percent (98) | 327.67 | R |
| AI | 15 | fOutValvePositionHeatingMaster | Output position of heating valve master | percent (98) | 327.67 | R |
| AI | 16 | fOutSystemDevices | Output number of connected devices | no units (95) | 327.67 | R |
| AI | 17 | fOutVolumeFlowExhaust | Output extract air flow rate | l/s (87) | 65535 | R |
| AI | 18 | fOutVolumeFlowOda | Output supply air flow rate | l/s (87) | 65535 | R |
| AI | 19 | fOutAirQualityRoom | Output air quality | parts per million (96) | 65535 | R |
| AI | 20 | fOutHumidityRoom | Output relative humidity | percent relative humidity (29) | 327.67 | R |
| AI | 21 | fOutTempSetPointSupply | Output supply air set-point temperature | degrees Celsius (62) | 327.67 | R |
| AI | 22 | fOutTempRangeHeating | Output temperature lower limit | degrees Celsius (62) | 327.67 | R |

| Object_Type | Instance | Object_Name | Object_Description_DE | Units | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|
| AI | 23 | fOutTempRange-Cooling | Output temperature upper limit | degrees Celsius (62) | 327.67 | R |
| AI | 24 | fOutTempOffset | Output temperature offset | degrees Kelvin (63) | 327.67 | R |
| AI | 25 | fOutTempFlow | Output flow temperature | degrees Celsius (62) | 327.67 | R |
| AI | 26 | fOutTempReturnFlow | Output return temperature | degrees Celsius (62) | 327.67 | R |
| AI | 27 | fOutTempRoom | Output room temperature | degrees Celsius (62) | 327.67 | R |
| AI | 28 | fOutTempOda | Output outdoor air temperature | degrees Celsius (62) | 327.67 | R |
| AI | 29 | fOutTempSupply | Output supply air temperature | degrees Celsius (62) | 327.67 | R |

**Binary Value**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | binary-output, instance 1 … 7 | R |
| Object_Name | | R |
| Object_Type | BINARY_VALUE (5) | R |
| Present_Value | INACTIVE (0, Initial) / ACTIVE (1) | |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | R |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) | R |
| Inactive_Text | | |
| Active_Text | | R |

R: Read Property, W: Write Property, COVU: Unsolicited Change of Value Notification

| Object_Type | Inst. | Object_Name | Object_Description_DE | Inactive_Text | Active Text | Present_Value |
|---|---|---|---|---|---|---|
| BV | 5 | bOutFire | Output fire emergency stop | "normal" | "fire" | R |
| BV | 6 | bOutWindow | Output window contact | "closed" | "open" | R |
| BV | 7 | bOutExtratime | Output overtime | "inactive" | "active" | R |

**Multistate Input Object**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | Multistate-Input Value, instance 0 … 4 | R |
| Object_Name | | R |
| Object_Type | MULTISTATE_INPUT_VALUE (7) | R |
| Present_Value | State | |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | |
| Event_State | NORMAL (0) | |
| Out_Of_Service | FALSE (0) | |
| Number_Of_States | | |
| State_Text | | R |

R: Read Property, W: Write Property, -E: Storage in EEPROM

| Object_Type | Inst. | Object_Name | Object_Description_DE | Number_Of_States | State | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|---|
| MI | 0 | eOutOperatingMode | Output operating mode | 3 | 1 | "Off" | R |
| | | | | | 2 | "Automatic" | |
| | | | | | 3 | "Manually" | |
| MI | 1 | eOutOperatingType | Output operating mode | 4 | 1 | "None" | R |
| | | | | | 2 | "Standby" | |
| | | | | | 3 | "Unoccupied" | |
| | | | | | 4 | "Occupied" | |
| MI | 2 | eOutVentilationType | Output type of ventilation | 3 | 1 | "None" | R |
| | | | | | 2 | "Secondary Air" | |
| | | | | | 3 | "Outside Air" | |
| MI | 3 | eOutDemandRoom | Room requirements | 3 | 1 | "None" | R |
| | | | | | 2 | "Heating" | |
| | | | | | 3 | "Cooling" | |
| MI | 4 | eOutDemandValve | Valve requirements | 3 | 1 | "None" | R |
| | | | | | 2 | "Heating" | |
| | | | | | 3 | "Cooling" | |

#### 4.5.4.3 Communication from central BMS to device

Display of all data points that can be transferred via BACnet from the central building management system to the devices.

**Analogue Value Object**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | Analogue-Value, Instance 0 … 13 | R |
| Object_Name | | R |
| Object_Type | ANALOG_VALUE (2) | R |
| Present_Value | | R |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | |
| Vendor_Identifier | NORMAL (0) | |
| Model_Name | FALSE (0) | |
| Firmware_Revision | | |
| Event_State | Analogue-Value, Instance 0 … 13 | R |
| Out_Of_Service | | R |
| Units | | R |

R:Read Property, W: Write Property

| Object_Type | Instance | Object_Name | Object_Description_DE | Units | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|
| AV | 0 | fInSpTempRange-Cooling | Default temperature limit cooling | degrees Celsius (62) | 327.67 | RW |
| AV | 1 | fInSpTempRange-Heating | Default temperature limit heating | degrees Celsius (62) | 327.67 | RW |
| AV | 2 | fInPvTempRoom | Default current room temperature | degrees Celsius (62) | 327.67 | RW |
| AV | 3 | fInSPTempRoom | Default room temperature setpoint value | degrees Celsius (62) | 327.67 | RW |
| AV | 4 | fInSpOffsetRoom | Default offset to room temperature setpoint value | degrees Kelvin (63) | 327.67 | RW |
| AV | 5 | fInSpTempSupply | Default supply air temperature setpoint value | degrees Celsius (62) | 327.67 | RW |
| AV | 6 | fInSpOffsetSupply | Default offset to supply air temperature setpoint value | degrees Kelvin (63) | 327.67 | RW |
| AV | 7 | fInPvHumidityRoom | Default relative room air humidity | percent relative humidity (29) | 327.67 | RW |

| Object_Type | Instance | Object_Name | Object_Description_DE | Units | Initial Present_Value | Present_Value |
|---|---|---|---|---|---|---|
| AV | 8 | fInSpFanLevel | Default fan stage<br>1 = Stage 1<br>2 = Stage 2<br>3 = Stage 3<br>4 = Stage 4<br>5 = Stage 5 | no units (95) | 327.67 | RW |
| AV | 9 | fInPvAirQualityqRoom | Default air quality (room) | parts per million (96) | 327.67 | RW |
| AV | 10 | fInPvAirQualityOda | Default air quality (external) | parts per million (96) | 327.67 | RW |
| AV | 11 | fInPvVolumeFlowDifference | Default volume flow rate difference | l/s (87) | 327.67 | RW |
| AV | 12 | fInPvOperatingTypeOverriding | Default operating mode override<br>0 = Inactive<br>1 = Boost<br>2 = Exercise<br>3 = Night purge<br>4 = Fan force (fume cupboard switching) | no units (95) | 327.67 | RW |
| AV | 13 | fInPvTempOda | Default outdoor air temperature | degrees Celsius (62) | 327.67 | RW |

*All offset values can be transmitted as signed integer!*

*+1 K --> 1*

*-1 K --> -1*

**Binary Value Objects**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | Binary-Value, instance 0 … 7 | R |
| Object_Name | | R |
| Object_Type | BINARY_VALUE (5) | R |
| Present_Value | INACTIVE (0, Initial) / ACTIVE (1) | |
| Status_Flags | IN_ALARM:<br>0 FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) | R |
| Units | | R |

R: Read Property, W: Write Property, COVU: Unsolicited Change of Value Notification

| Object_Type | Inst. | Object_Name | Object_Description_DE | Inactive_Text | Active Text | Present_Value |
|---|---|---|---|---|---|---|
| BV | 0 | bInFire | Default fire emergency stop | "normal" | "fire" | RW |
| BV | 1 | bInWindow | Default window contact | "closed" | "open" | RW |
| BV | 2 | bInExtratime | Default overtime | "inactive" | "active" | RW |
| BV | 3 | bInFilterReset | Default filter change | "inactive" | "reset" | RW |
| BV | 4 | bInCondensation | Default condensate | "inactive" | "active" | RW |

**Multistate Value**

| Property | Remark / Value | RW |
|---|---|---|
| Object_Identifier | Multistate-Value, instance 0 … 3 | R |
| Object_Name | | R |
| Object_Type | MULTISTATE_VALUE (9) | R |
| Present_Value | State | |
| Status_Flags | IN_ALARM: 0<br>FAULT: 0<br>OVERRIDDEN: 0<br>OUT_OF_SERVICE: 0 | R |
| Event_State | NORMAL (0) | R |
| Out_Of_Service | FALSE (0) | R |
| Units R | | R |

R: Read Property, W: Write Property, -E: Storage in EEPROM

| Object_Type | Inst. | Object_Name | Object_Description_DE | Number_Of_States | State | State_Text | Present_Value |
|---|---|---|---|---|---|---|---|
| MV | 0 | eInOperatingMode | Default operating mode | 3 | 1 | "invalid" | RW |
| | | | | | 2 | "off" | |
| | | | | | 3 (initial) | "automatic" | |
| MV | 1 | eInOperatingType | Default operating mode | 4 | 1 | "invalid" | RW |
| | | | | | 2 | "standby" | |
| | | | | | 3 | "unoccupied" | |
| | | | | | 4 | "occupied" | |
| MV | 2 | eInChangeOver | Default changeover | 2 | 1 | "invalid" | RW |
| | | | | | 2 | "warm water" | |
| | | | | | 3 | "cold water" | |
| MV | 3 | eInCovMode | Default COV Mode | 4 | 1 | "invalid" | RW-E |
| | | | | | 2 | "disabled" | |
| | | | | | 3 | "local broadcast" | |
| | | | | | 4 | "global broadcast" | |
| MV | 4 | eInOdaAutomatic | Fresh air | 3 | 1 | "invalid" | RW |
| | | | | | 2 | "inactive" | |
| | | | | | 3 | "active" | |

# 5 Control panel

## 5.1 Overview of control panels

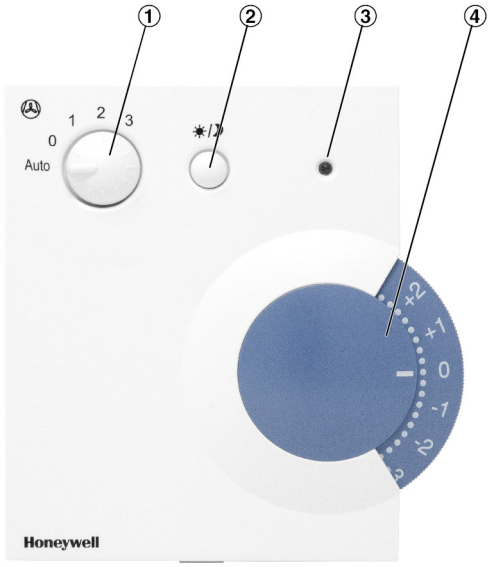



*Fig. 28: Control panel with selector switch, for surface mounting, type: T760F1000 article number: M546FB8*

① Fan stage selector
② Push button
③ LED
④ Setpoint value adjuster


*Fig. 29: Control panel with selector switch, for surface mounting, type: WRF04 PSTD NTC20k 5k FS5 gn 5V SA, article number: A00000082515*

① Fan stage selector
② Push button
③ LED
④ Setpoint value adjuster


*Fig. 30: Control panel without selector switch, for surface mounting, type: Schneider STR 504 article number: M536BA4*

② Push button
③ LED
④ Setpoint value adjuster

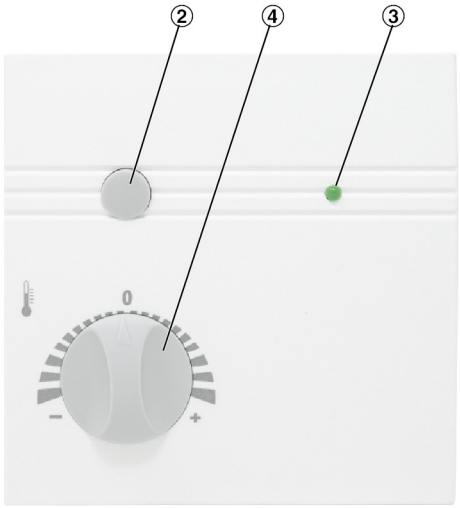



*Fig. 31: Control panel without selector switch, for surface mounting, type: WRF04 PTD NTC 20k 5k gn, article number: A00000079777*

② Push button
③ LED
④ Setpoint value adjuster

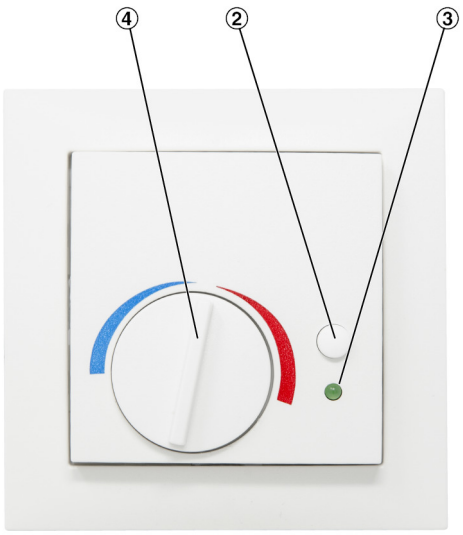



*Fig. 32: Control panel without selector switch, for flush mounting, suitable for switch programme Berker S.1, type: WRF07 PTD NTC20k BType6 5k gn, article number: A00000079778*

② Push button
③ LED
④ Setpoint value adjuster

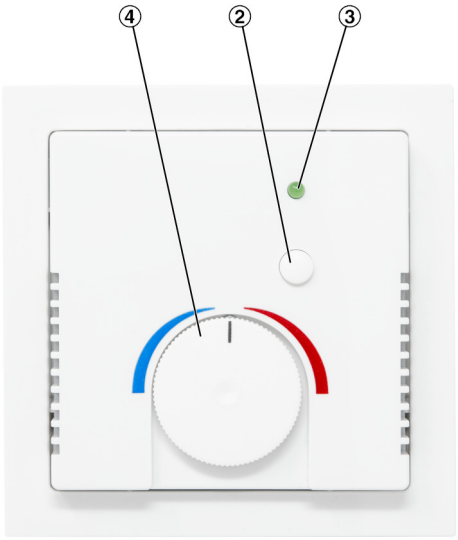



*Fig. 33: "Fig. 34: Control panel without selector switch, for flush mounting, suitable for switch programme Busch Jäger Future linear type: WRF07 PTD NTC20k BType6 5k gn, article number: A00000079779"*

② Push button
③ LED
④ Setpoint value adjuster

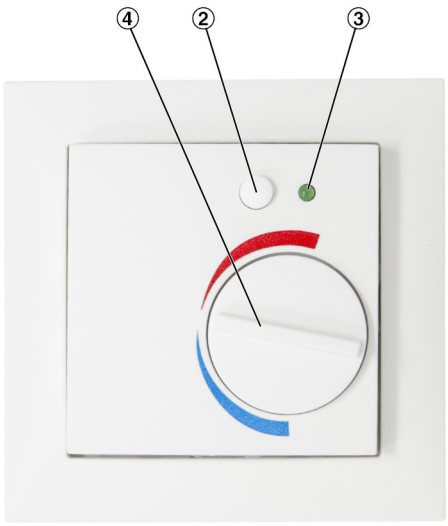



*Fig. 34: Control panel without selector switch, for flush mounting, suitable for switch programme Berker Q.3, type: WRF07 PTD NTC20k BType6 5k gn, article number: A00000081579*

② Push button
③ LED
④ Setpoint value adjuster

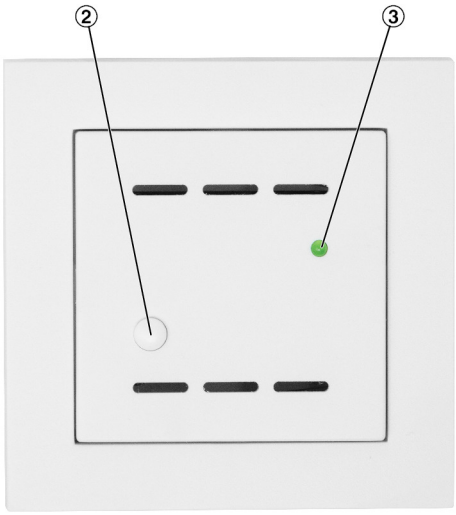



*Fig. 35: Control panel without selector switch and set-point value adjuster for flush mounting, suitable for switch programme Gira E2, type WRF06-TD-NTC20k, article number: A00000081503*

② Push button
③ LED

## 5.2 Control panel settings

| Function | Description | LED |
|---|---|---|
| Ventilation stages[1] | With the aid of the stage selector, the ventilation stage can be freely selected. The following functions are available:<br>■ Automatic (recommended), fan stages are automatically selected from the temperature control and air quality control (optional) -<br>■ 0: The device switches to Standby mode<br>■ 1: Fan stage 1 is selected<br>■ 2: Fan stage 2 is selected<br>■ 3: Fan stage 3 is selected<br>Note: After activation of Standby mode and subsequent switch to a fan stage or Automatic, the ventilation unit must also be switched to Occupied (using the Occupancy button or central BMS). | |
| Occupied/ Unoccupied [2] | If you want to change the operating mode from *'Occupied'* to *'Unoccupied'* or vice versa, press the Occupancy push button briefly.<br>This allows you, for example, to manually switch to *'Unoccupied'* mode when the room is not occupied..<br>Start-up delay: 1 to 2 minutes in summer, 6 to 7 minutes in winter. | Unoccupied: LED off<br>Occupied: LED on |
| Overtime [2] | If you want to manually switch on the Overtime function while the system is in *'Unoccupied'* mode, press the Occupancy push button briefly.<br>This allows you to set the ventilation unit to *'Occupied'* mode for a previously set period of time if, for example, overtime is required after regular office hours.<br>The overtime period can be configured. After the set period the unit resumes the previous operating mode (RTC/central BMS). | Unoccupied: LED off<br>Overtime: LED on |
| Boost | If you want to activate or deactivate rapid ventilation of the room, keep the Occupancy push button pressed (for 2-5 seconds). | LED flashes once per second |
| Exercise | For quiet work, the silence in the room is estimated. Pressing the Occupancy button (7-10 seconds), the Exercise function is activated. | LED in alternation 1 second ON, 1 second OFF. |
| Changing the filter | Double blinking of the LED indicates that a filter change is required (the number of operating hours can be configured; factory setting: after 2500 h).<br>Units with differential pressure sensor:<br>Activated if the preset maximum differential pressure or the preset number of operating hours is reached.<br>To reset the number of operating hours, either keep the occupancy push button pressed (> 10 sec) or use the web server | LED in alternation 1 second of double flashing, 1 second OFF. |
| Alarm | Frost alarm and hardware alarm. | LED flashes twice per second |

1) The stage selector is only available for the following control panels:
- Type T760F1000, article number: M546FB8
- Type WRF04 PSTD NTC20k 5k FS5 gn 5V SA, article number: A00000082515

2) The button on the control panel can either be used to switch between Occupied and Unoccupied or activate the overtime function. The configuration is carried out using the web browser and can be performed by personnel from TROX GmbH or TROX HGI

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TROX® TECHNIK

The art of handling air

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