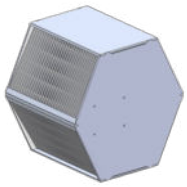
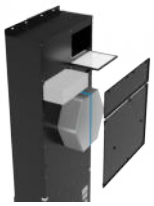
Conforms to VDI 6022



Cross counter flow heat recovery unit



Revision filter and cross-counterflow heat recovery unit

Water and electrical connection

Optional control FSL-CONTROL III

Dezentrale Lüftung

FSL-V-ZAB/SEK-HE

Supply and extract air unit with switchover option to secondary air mode, including heat recovery (HRU) and heat exchanger for vertical installation in front of the sill

Ready-to-operate decentralised ventilation unit for comfortable room temperature control and ventilation of rooms

- Acoustically optimised EC fans with low specific fan power, acc. to DIN EN 16798-3 SFP = 0
- Cross-counterflow heat recuperator (heat recovery efficiency 83 %)
- With highly efficient 2- or 4-pipe heat exchanger for heating and/or cooling
- Mirror image version possible
- Condensate drip tray with condensate drain
- Year-round use of the HRU possible (condensate connection required on site)
- Very low unit depth of only 260 mm
- Unit floor space approx. 0.16 m²
- Reduction of fine dust and pollen contamination due to integral filters that conform to VDI 6022 – filter class ISO ePM1 65 %/ISO Coarse 50 %
- Inspection access panel simplifies filter change and cleaning of the heat exchanger
- Motorised shut-off dampers, normally closed (NC)
- Automatic switching to secondary air mode (based on air quality)

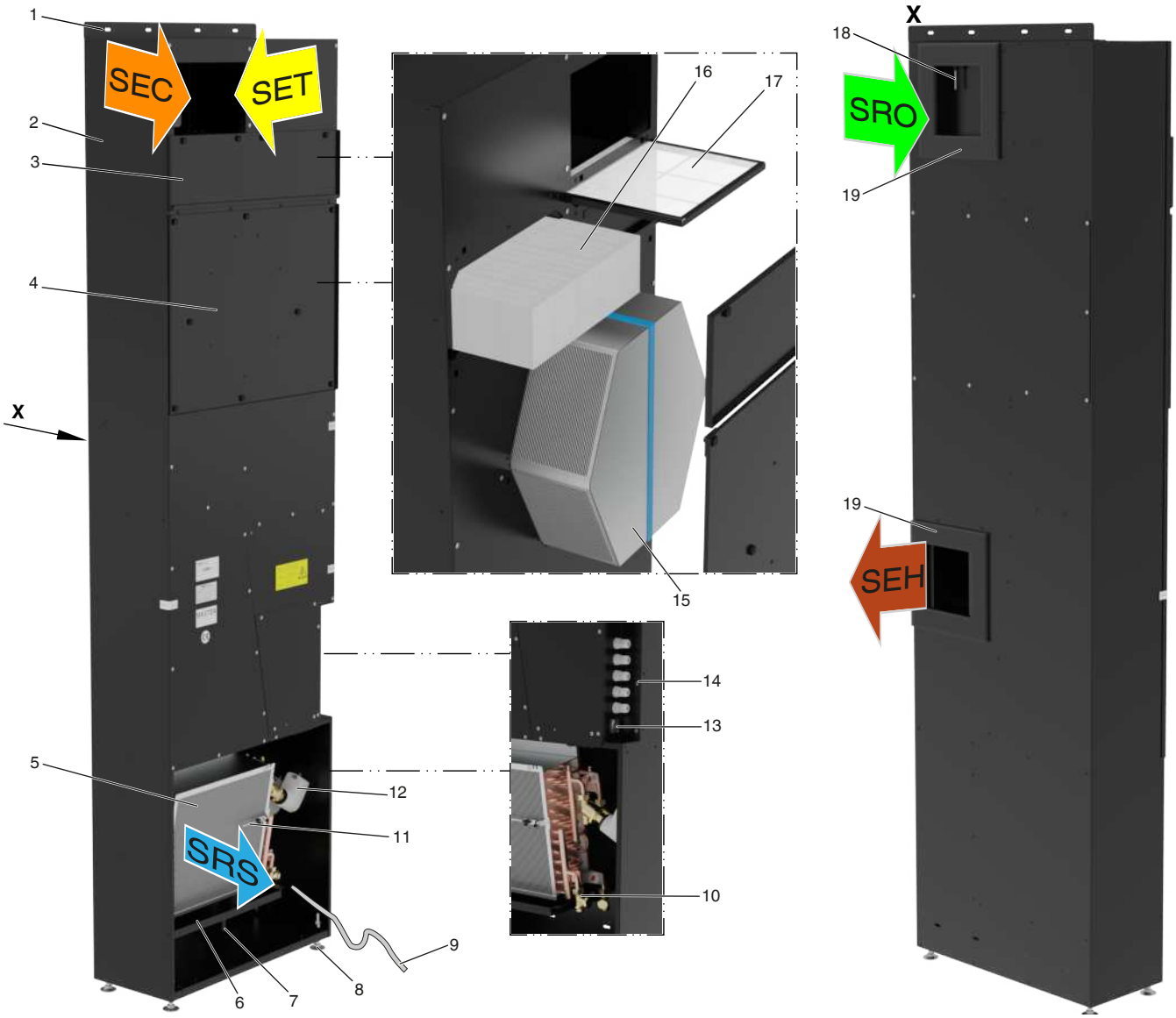
Optional equipment and accessories

- Control system FSL-CONTROL III, specially designed and modularly constructed for decentralised ventilation systems
- Wood panelling covers in various colours, with TROX ventilation grilles for supply and extract air (self-assembly kit)

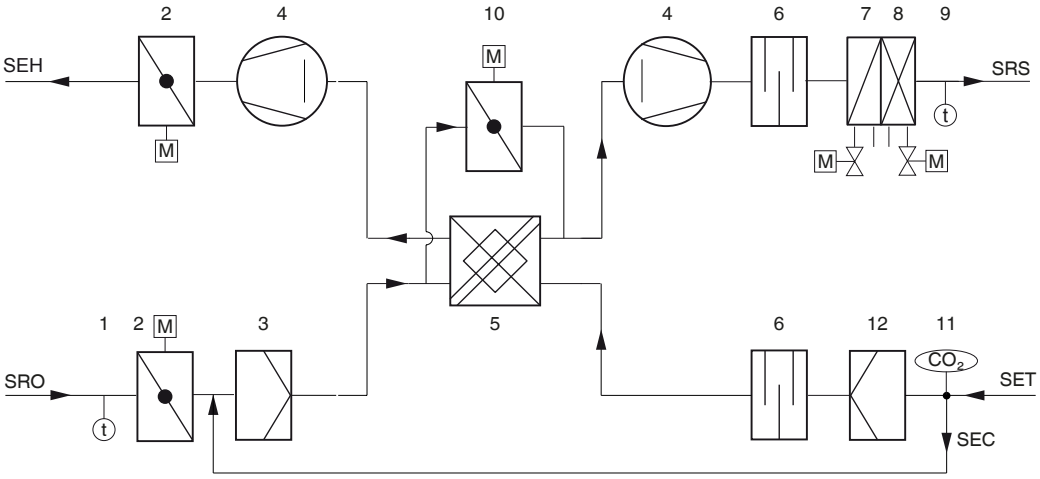
Function

Decentralised supply and extract air units for room ventilation and for dissipating cooling loads and heat loads. An EC centrifugal fan takes in the outdoor air which then flows through the motorised shut-off damper and the outdoor air filter. Then the outside air flows through the cross-counterflow heat recuperator, which can be bypassed in energetically sensible operating situations and for unit protection. Before the supply air flows into the room like displacement flow, it is heated or cooled in the heat exchanger if required. The extract air flows through the extract air filter before it is conveyed outside by the cross-counterflow heat recuperator, the extract air fan and the motorised shut-off damper. If the indoor air quality is sufficient, FSL-CONTROL III closes the outdoor air dampers to change into the more energy efficient secondary air operation mode. The control system compares the room air quality setpoint value to the actual value measured by the CO_2-Senses and switches automatically between outdoor air and secondary air operation. In case of a power failure, the outdoor air and exhaust air dampers are closed to ensure fire protection, frost protection and to avoid draughts. This is ensured by a capacitor in each actuator.Near the external wall, the supply air is discharged into the room with a medium velocity between 1.0 and 1.5 m/s. Due to the induction effect, the supply air velocity is rapidly reduced after entering the room. As a result, in cooling mode, the supply air spreads out like displacement ventilation over the entire floor area. Near heat sources such as people or equipment, a lift current is formed by natural convection, so that the air is exchanged primarily in these areas.

Function



1 Fixing brackets
2 Casing
3 Filter chamber cover
4 Inspection access panel
5 2- or 4-pipe heat exchanger
6 Condensate drip tray
7 Condensate drain
8 Levelling feet
9 Supply voltage connecting cable
10 Return screw connection (located in the flow)
11 Supply air temperature sensor
12 Control valve (located in return)
13 Network connection for service area
14 Screw connections for customer-side connections
15 Cross-counterflow heat recuperator
16 Outdoor air filter ISO ePM1 65%
17 Extract air filter ISO coarse 50%
18 Outdoor air temperature sensor (optional)
19 Seal on the wall side
SEH Single room exhaust air
SET Single room extract air
SRO Single room outdoor air
SRS Single room supply air
SEC Secondary air (optional)



1 Outdoor air temperature sensor (optional)
2 Shut-off damper with actuator (exhaust air and outdoor air)
3 Outdoor air filter
4 Fans (supply air and extract air)
5 Recuperative cross-countercurrent heat recuperator
6 Sound attenuator
7 Heating coil
8 Cooling coil
9 Supply air temperature sensor
10 Bypass damper with actuator
11 CO_2sensor (optional)
12 Extract air filter
SEH Single room exhaust air
SET Single room extract air
SRO Single room outdoor air
SRS Single room supply air
SEC Secondary air (optional)

Technical data

Width	604 mm
Height	2200 mm
Depth	260 mm
Volume flow rate	75, 90, 120 m³/h (boost 150 m³/h)
Nominal volume flow rate	120 m³/h
Sound pressure level at nominal volume flow rate and 8 dB room attenuation	33 dB(A)
Sound power level	30 – 45 dB(A)
Heat recovery efficiency	83 %
Maximum operating pressure, water side	6 bar
Maximum operating temperature	75 °C
Supply voltage	230 V AC ±10 %, 50/60 Hz
Power rating	275 VA
Weight	70 kg

Quick sizing

Sizing example 1

Supply air volume flow	m³/h	75	90	120	150
Total cooling capacity	W	220	260	360	450
Room cooling capacity	W	200	241	321	401
Air temperature inside the unit	°C	26.7	26.7	26.9	27
relative humidity	%	54.3	54.3	53.7	53.4
Water content of dry air	g/kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	18	18	18	18
Condensate	g/h				
Chilled water flow rate	l/h	50	80	130	180
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	19.7	18.8	18.4	18.1
Water side pressure drop	kPa	1.5	3.4	7.9	13.9
Total heating capacity	W	140	170	240	340
Room heating capacity	W	78	78	100	70
Air temperature inside the unit	°C	18.4	18.1	17.6	15.7
Supply air temperature	°C	24.1	23.6	23.5	22.4
Condensate	g/h	300	300	400	600
Hot water flow rate	l/h	20	25	40	60
Water temperature, inlet	°C	35	35	35	35
Water temperature, outlet	°C	28.8	29.2	29.8	30.1
Water side pressure drop	kPa	0.5	0.6	1.2	2.5
Sound power level Lw,a	dB(A)	30	35	41	45
Sound pressure level including 8 dB room attenuation	dB(A)	22	27	33	37
Active power P_{el}	W	12	14	19	26

Sizing example 2

Supply air volume flow	m³/h	75	90	120	150
Total cooling capacity	W	220	260	360	450
Room cooling capacity	W	200	241	321	401
Air temperature inside the unit	°C	26.7	26.7	26.9	27
relative humidity	%	54.3	54.3	53.7	53.4
Water content of dry air	g/kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	18	18	18	18
Condensate	g/h				
Chilled water flow rate	l/h	50	80	130	180
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	19.7	18.8	18.4	18.1
Water side pressure drop	kPa	1.5	3.4	7.9	13.9
Total heating capacity	W	480	620	790	990
Room heating capacity	W	411	523	645	696
Air temperature inside the unit	°C	18.4	18.1	17.6	15.7
Supply air temperature	°C	37.4	38.4	37.1	34.9
Condensate	g/h	300	300	400	600
Hot water flow rate	l/h	40	80	130	180
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	49.5	53.3	54.7	55.2
Water side pressure drop	kPa	1.1	3.6	8.4	14.8
Sound power level Lw,a	dB(A)	30	35	41	45
Sound pressure level including 8 dB room attenuation	dB(A)	22	27	33	37
Active power P_{el}	W	12	14	19	26

Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design program.

FSL-V-ZAB/SEK-HE-4-KR/604x2200x260/C3
Under sill units for vertical installation on an external wall
Please note: The vertical decentralised ventilation unit variant described is equipped with an individual room control located in the unit for self-sufficient room operation. The supplied controllers contain the parameters of the standard control for operation according to our control description.
FSL-V-ZAB/SEK-HE with automatic secondary air changeover function - master unit
TROX FSL-V-ZAB/SEK-HE vertical decentralised ventilation unit with supply and extract air function and switchover option to secondary air operation (depending on air quality), WRG as well as heating and cooling function for installation on on-site facade construction:

- Casing made of galvanised sheet steel, cover and sheet metal connections with deep-drawn threads and stainless steel cross-head screws, internal ducts sealed and lined as required, internal cable penetrations sealed, exposed surface powder-coated (RAL 9005, jet black)
- For fastening the unit on site:
  - On the top of the unit: L-bracket with slotted holes
  - In the lower part of the unit: oblong holes below the heat exchanger
- Opening on the room side in the upper area for the extract air and secondary air intake, without sealing tape, sealing to the sill panelling by means of closed-pored sealing tape to prevent air short-circuits (sealing tape not included in TROX scope of delivery) is required
- Sound- and heat-insulating lining on suction and discharge side made of mineral wool faced with glass fibre scrim (material classification A, non-combustible according to DIN 4102, T1), erosion resistant up to air velocities of 20 m/s, or closed cell insulation material
- The unit meets the hygiene requirements of VDI 6022
- Levelling feet, +40 mm
- Connection to the on-site fresh air and exhaust air openings of the façade by means of a circumferential, closed-pore sealing tape (40 mm wide, 10 mm thick) on the rear side of the unit. The intake and discharge resistance of the on-site construction should not exceed 20 Pa at nominal volume flow. The weather protection must be provided on the façade side and serves to protect the unit (weather protection not included in TROX scope of delivery)
- Use of 2 energy-saving EC centrifugal blowers, supply and extract air fan classified in category SFP 0 (< 300 W/(m³/s)) according to DIN EN 16798-3:2017-11
- Suitable for 4 speed levels (e.g. 60, 90, 120 and 150 m³/h), control via unit-internal individual room control, volume flow rate level correction by adjusting the control voltage subsequently possible
- Meets the requirements of EU Regulation 1253/2014 (ErP Directive)
- Low sound power level in supply/extract air mode and secondary air mode
- Integrated recuperative, cross-counterflow heat recovery unit, heat recovery efficiency > 82 %, including condensate drip tray and discharge into the heat exchanger condensate drip tray. Accessibility for maintenance purposes via separate service cover possible without removing the unit cover
- With electric motor bypass, which bypasses the air volume flow to the WRG, drive 24 V (continuous), 0 - 100 %, control via unit-internal single room control
- Motorised shut-off dampers in fresh air and exhaust air areas, normally closed in inactive state via energy storage, 230 V drive, open-close, control via unit-internal individual room control system
- Automatic switching to secondary air mode (only with an air quality sensor) if the room air quality (measured with the integral CO_2sensor, for example) is within the defined limits. The outdoor air damper closes, the self-powered secondary air damper opens and the extract air fan is switched off.
- Integral electrical components are completely wired with FSL-CONTROL III, control components are integrated. Cable for connection (connection by others) to the power supply (L, N, PE), with wire end ferrules, approx. 1 m routed out of the casing:
  - Supply voltage (230 V): 3 wires, 3 × 1.5 mm² (L, N, PE)
- Connection option for bus communication (optional), connection of room control unit etc. after opening the customer area of the control. As a transfer point to the on-site trade measurement/control/regulation:
  - Rail mount terminals type Wago 260 for the connection (by others) of
    - Digital inputs DI
    - Digital outputs DO
    - Master-slave connection RS485
    - Optional connection to building automation (GA) via RS485 (Modbus/BACnet)
    - Room control panel
    - RJ45 socket as service access to the user interface
    - Optional connection to GA via Ethernet (Modbus/ BACnet)
- The following sensors are arranged in the unit to control the individual room control (the actual room temperature is recorded on the room control unit or (optionally) transmitted via the GA):
  - Indoor air quality sensor CO_2
  - Supply air temperature measurement downstream of the heat exchanger
  - Outdoor air temperature measurement in the outdoor air intake
- 2- or 4-pipe aluminium copper tube heat exchanger for air heating or air cooling, matched to project-specific data, easily removable for cleaning (depends on the connection to the main pipe - by others, not included in the TROX supply

package), drainage and venting option per heating/cooling circuit, arrangement on the room side on the right. We recommend flexible hoses (not part of the supply package) to connect the unit to the existing pipe network (by others) as they simplify removal of the heat exchanger for cleaning
- Transfer points are the manually pre-assembled control components
  - Valves in the return: transfer with G ½" external thread, flat seal
  - Lockshields in the flow: transfer with G ½" external thread, flat seal
- Easy-to-clean condensate pan made of galvanised sheet steel, powder-coated RAL 9005, with condensate drain Ø 12 × 1 [mm]
- Outdoor air filter as Mini Pleat filter, class ePM1 (fine dust filter):
  - Filter class to ISO 16890: ISO ePM1 65%
  - Eurovent-certified
  - ePM1 filter media made of high-quality, wet-strength fibreglass paper are laid in tight pleats, the spacers are made of thermoplastic hot-melt adhesive and ensure that the pleats are evenly spaced (4 mm) from each other
  - The frame is made from moisture-resistant non-woven fibre with brackets (for pulling it out) and must not reduce the flow cross-section (filter size = flow cross-section)
  - Filter area ≥ 1.8 m²
- Extract air filter (coarse dust filter) as flat filter medium, filter class according to ISO16890: ISO coarse 50 %
- Easy inspection of the filters and the heat recovery unit due to the compact arrangement of the components behind the service cover. The service lid can be opened without tools via user-friendly quarter-turn fasteners. Accessibility must not be restricted by the on-site parapet cladding
- Closed cell sealing tapes for sealing and adaptation to the outer casing provided by others (not included in the TROX supply package)
- The sill cladding provided by the customer shall have perforations in areas of the heat exchanger to be specified for the introduction of supply air into the room and shall not restrict maintenance work or unit assembly/disassembly on the front side of the unit. An opening for extract air intake must also be arranged in the upper area of the cladding
- The clear distance between the front edge of the unit and the inner edge of the parapet cladding should not be less than approx. 30 mm
- The front of the device must be completely accessible after disassembly of the outer casing

FSL-CONTROL III controller

Including control system FSL-CONTROL III, as described below: FSL-CONTROL III is a stand-alone single room control system with a simple timer. Optional expansions, such as connection to the central BAS/MCD provided by others via Modbus TCP / Modbus RTU, BACnet MS/TP or BACnet IP, humidity sensors, return flow temperature sensors, electromotive valve actuators or pressure-independent control valves are included in the product range, but must be replaced with the standard components in the following description. A room temperature signal is also required. Various room control panels and sensors are available to provide this signal. Suitable optional equipment is described in the appendix to the following standard equipment for stand-alone operation. We recommend commissioning by our technical service. You will find related text modules below.
TROX control module FSL-CONTROL III (order code ...-C3-MA ...):
- Single room controller that can be mounted on a DIN mounting rail in the ventilation unit or in a separate control equipment box
- 42 digital or analogue inputs and outputs
- MicroSD card (at least 2 GB) as integral flash memory. The trend data are stored there and can be retrieved via the RJ45 socket
- Equipped at the factory with a software package for master units specially developed for decentralised ventilation units. The software enables simple master-slave communication via Modbus RTU
- Up to 10 slave devices can be connected to one master device
- The software provides 3 types of operation (Off, Automatic and Manual), 3 operating modes (Occupied, Unoccupied and Standby) and 4 operating mode overrides (Boost, Class, Night Ventilation and Fan Forced Circuit)
- Two strategies, either room temperature control by controlling heating and cooling valves or modulating bypass damper, or supply air temperature control for isothermal ventilation
- CO_2- guided air quality control
- Heat recovery all year round
- Filter monitoring
- Configurable DI for on-site connection of presence detectors, window contacts, holiday switching, etc.
- Alarm messages: Type A (shutdowns) and Type B (notifications)

Real time clock (RTC)

Real Time Clock (RTC/real time clock) (order code ...-T/...):
- Component of the Master Software Package
- Enables a simple timer
  - 7 days with 10 switching points each
  - Automatic summer / winter time changeover
  - Temporal activation of night purge

CO2 sensor

CO_2 sensor (order code…/C/…):
- Sensor arranged in the extract air intake of the master unit for recording the indoor air quality and corresponding control of the outdoor air flow rate
- Measurement via an NDIR sensor, which works on an infrared basis and compensates for any contamination by its 2-beam measurement principle
- Measuring range 0 – 2000 ppm

Supply air temperature sensor

Supply air temperature sensor (order code .../Z/...):
- Supply air temperature sensor with NTC thermistor as sensing element, resistance 10 kΩ at 25 °C, measuring range 0 – 50 °C
- Especially fast response time due to perforated measuring tip

Fresh air temperature sensor

Outdoor air temperature sensor (order code .../A/...):
- Outdoor air temperature sensor with NTC thermistor as sensing element, resistance 10 kΩ at 25 °C, measuring range -30 – 50 °C

Water side components

Water-side components (order code…/HV-R-…/KV-R-…):
Valve actuators:
- 2 × thermoelectric actuators for opening and closing valves, with position indicator, including pluggable connection power, operating voltage 24 V DC, control voltage 0 - 10 V DC, power consumption 1 W, protection class: IP 54

Straight-way valves:
- 2 × straight through small valves ½" standard, hand-tight pre-assembled, PN 16, DN 10, k_{vs} 0.4 (alternatively 0.25, 0.63 or 1.0 m³/h - please state the required k_{vs}-Value), valve body straight through with external thread on both sides ½" flat sealing, medium temperature 1 - 110 °C

Lockshields:
- 2 × return fittings on both sides ½", hand-tight pre-assembled, nominal width DN 15; valve body straight through with external thread on both sides ½" flat sealing, for regulation and shut-off, media temperature max. 120 °C

Optional control accessories

Optional equipment to increase the comfort of the FSL-CONTROL III:
TROX control panels for FSL-CONTROL III:
At least one room temperature signal is required per room. There are several variants of TROX control panels available, optionally with or without step switching. Additionally we offer a room temperature sensor RTF without control elements. Alternative room control units provided by the customer must be connected via bus communication.
Digital control panels for surface mounting:
For operation and adjustment of the ventilation units.
- Supplied loose as an accessory. Connection to master unit via Modbus Serial line. Project-specific software including setpoint value adjuster, various status displays, selector switch, CO_2-Traffic light. Touch-sensitive colour display 3.5" 320 × 240 pixels. Sensor: NTC 10 kΩ. Degree of protection: IP 20. Type: Schneider TM172DCLWT. Dimensions (H × W × D): 120 × 86 × 25 mm, weight: 340 g, colour: white. Installation: Surface mounting or on a standard flush box. Supply voltage: 24 V DC. Power consumption: 3.2 VA/1.3 W. Other design frames are available upon request and for a surcharge.

Control panels with selector switch for surface mounting
Control panel with selector switch, for surface mounting, type Thermokon
- Supplied loose as an accessory, with room temperature sensor, setpoint adjuster, override button, LED and 3-step switch as well as off and automatic, housing made of PVC0 pure white (RAL 9010), mounting on 60 mm flush-mounted box or directly on the wall, NTC thermistor as sensor element, resistance 20 kΩ at 25 °C, dimensions (W × H × D): 84.5 × 84.5 × 25 mm, operating temperature: -35 - 70 °C

Control panels without selector switch for surface mounting
Control panel without selector switch, for surface mounting, type Thermokon:
- Supplied loose as accessory, with mode indicator, push-button and setpoint adjustment, sensor NTC 20 kΩ, protection class: IP 20, dimensions (W × H × D) 84.5 × 84.5 × 25 mm

Room temperature sensor for surface mounting
Room temperature sensor TROX RTF, surface mounting:
- Supplied loose as an accessory, room sensor without control elements, measuring range: -35 - 70°C, sensor NTC 10 kΩ, connection terminal screw terminal, d = 1.5 mm, protection class IP 20, mounting on wall or on 70 mm flush-mounted box, dimensions (W × H × D) 85 × 85 × 30 mm, housing ABS in RAL 9010

Control panels without selector switch for flush mounting:
Manual operation of the ventilation units, high-quality appearance, matching design frames from various switch ranges. The units are particularly suitable for design-oriented interiors.
Control panel without selector switch, for flush mounting, type Thermokon, switch from Berker S.1 range, polar white
- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, NTC sensor 20 kΩ, protection level: IP 20

Control panel without selector switch, for flush mounting, type Thermokon, switch from Berker Q.3 range, white
- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, NTC sensor 20 kΩ, protection level: IP 20

Control panel without selector switch, for flush mounting, type Thermokon, switch from Busch Jäger future linear range, white
- Supplied loose as an accessory, with mode display, push button and setpoint adjuster, NTC sensor 20 kΩ, protection level: IP 20
- Other switch programmes on request

Control panels without selector switch and without setpoint value adjuster, for flush mounting:
Control panel without selector switch and without setpoint value adjuster, type Thermokon, for flush mounting, switch from Gira E2 range
- Supplied loose as an accessory, with mode display and push button, NTC sensor 20 kΩ, protection level: IP 20
- Other switch programmes on request

Electromotive valve actuators as an alternative to the thermoelectric actuators installed as standard:
- 2 x electromotive actuators for opening and closing valves, supply voltage AC/DC 24 V, maximum power consumption 2.5 VA, signalling of control signal 3-point DC 0 – 10 V, permitted operating fluid temperature 1 – 110 °C

Pressure-independent control valves as an alternative to the through small valves installed as standard:
- 2 x pressure-independent control valves, manually pre-assembled with modulating open and close control in combination with an externally adjustable dynamic volume flow controller, with full valve authority, nominal width DN 10, ½ inch, valve casing straight through with male thread on both ends, flat seal, fluid temperature 0 - 120 °C

Interface for connection to on-site building automation (GA):
Modbus TCP interface including web server (order code .../MT/...)

To increase comfort, we recommend integration into an on-site control system. FSL-CONTROL III offers the possibility of being connected to an on-site GA via Modbus TCP protocol. Additionally incl. web server for simplified configuration, commissioning and remote monitoring of the device. The BAS/MCD is not included in the TROX scope of delivery, only the previously listed interfaces are available here.

- Modbus TCP interface (Ethernet)

BACnet IP interface including web server (order code .../BI/...):
To increase comfort, we recommend integration into an on-site building management system. FSL-CONTROL III offers the option of being connected to an on-site control centre via the BACnet IP protocol. Additionally incl. web server for simplified configuration, commissioning and remote monitoring of the device. The BAS/MCD is not included in the TROX scope of delivery, only the previously listed interfaces are available here.

- BACnet IP interface (Ethernet)

Modbus RTU (order code .../MR/...):
To increase comfort, we recommend integration into an on-site GA. FSL-CONTROL III offers the possibility of being connected to an on-site GA via Modbus RTU. The BAS/MCD is not included in the TROX scope of delivery, only the previously listed interfaces are available here.

- Modbus RTU interface (RS485)

BACnet MS/TP (order code .../BM/...):
To increase comfort, we recommend integration into an on-site control system. FSL-CONTROL III offers the option of being connected to an on-site GA via BACnet MS/TP. The BAS/MCD is not included in the TROX scope of delivery, only the previously listed interfaces are available here.

- BACnet MS/TP interface (RS485)

Commissioning of the decentralised ventilation units

Commissioning/parameterisation of the decentralised ventilation units without connection to the GA

- Visual inspection of the unit connections carried out by others for compliance with the respective installation specifications from the installation and configuration instructions: air connections, heating/cooling connection, electrical connections, integration into the installed outer casing, connections of external components
- Checking and, if necessary, adapting the project parameters pre-set in the factory with regard to customer-specific adaptations
- Functional test of the individual components (control elements, fans, valves, dampers, sensors)
- Checking the project-specific control functions including any special functions such as volt-free switch contacts
- Documentation of the device settings as well as their use in a service report. The service report must be signed by your company as the customer or your representative
- The invoice is made as a flat rate, derived from the number of devices and distance

Commissioning/parameterisation of the decentralised ventilation units with connection to the GA

- Visual inspection of the unit connections carried out by others for compliance with the respective installation specifications from the installation and configuration instructions: air connections, heating/cooling connection, electrical connections, integration into the installed outer casing, connections of external components, connections of BAS/MCD
- Checking and, if necessary, adapting the project parameters pre-set in the factory with regard to customer-specific adaptations
- Functional test of the individual components (control elements, fans, valves, dampers, sensors)
- Checking the project-specific control functions including any special functions such as volt-free switch contacts
- Functional test of the communication to the GA in cooperation with the appointed MSR company:
  - Checking that the settings that are provided by others comply with the specifications in the installation and configuration instructions
  - Input test of the data points sent by the customer
  - Output test of the output data points
  - Trial operation of the operating states that can be switched by the GA
- Documentation of the device settings as well as their use in a service report. The service report must be signed by your company as the customer or your representative
- The invoice is made as a flat rate, derived from the number of devices and distance

Instruction in operation and maintenance

- One-off instruction for the operation of the decentralised ventilation units consisting of:
  - Description of the equipment functions on the unit that has already been put into operation
  - Description of the room control panel and the room conditions that can be influenced by it
  - Description of the maintenance work
- The invoice is a flat rate and is carried out by the responsible sales representative

Order code

FSL-V-ZAB/SEK – HE – 4 – KR / 604 × 2200 × 260 / C3 / MA – T / MR / C / Z / A / HV – R – 0.4 / KV – R – 0.25

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

1 Type
FSL-V-ZAB/SEK Vertical under sill ventilation unit

2 Variant
HE High degree of heat recovery

3 Heat exchanger
2 2-pipe
4 4-pipe

4 Construction
KR with condensate drain, extract air opening on the right when seen from the room
KL with condensate drain, extract air opening on the left when seen from the room

5 Dimensions [mm]
Width × height × depth
604 × 2200 × 260

6 Control system
OR without control system
C3 with FSL-CONTROL III

7 Control function
MA Master
SL Slave

8 Real time clock
Only with control function MA
No entry: without real time clock
T with real time clock

9 Interface
No entry: without interface
MT with Modbus TCP
MR with Modbus RTU (only with control function MA)
BI with BACnet IP
BM with BACnet MS/TP (only with control function MA)

10 Air quality sensor
Only with control function MA
No entry: without air quality sensor
C with CO_2sensor
V with VOC sensor

11 Supply air temperature sensor
Z with supply air temperature sensor

12 Outdoor air temperature sensor
Only with control function MA
No entry: without outdoor air temperature sensor
A with outdoor air temperature sensor

13 Heating valve
HV with heating valve

14 Lockshield – heating circuit
R with lockshield

15 kVS value – heating valve
0.25 (straight-way valve)
0.40 (straight-way valve)
0.63 (straight-way valve)
1.00 (straight-way valve)
F0.50 (pressure-independent control valve)

16 Cooling valve
With heat exchanger '4' only
KV with cooling valve

17 Lockshield – cooling circuit
R with lockshield

18 kVS value – cooling valve
0.25 (straight-way valve)
0.40 (straight-way valve)
0.63 (straight-way valve)
1.00 (straight-way valve)
F0.50 (pressure-independent control valve)

Order example: FSL-V-ZAB/SEK-HE-4-KR/604×2200×260/C3/MA-T/MR/C/Z/A/HV-R-F0.40/KV-R-F0.25

Type	FSL-V-ZAB/SEK
Variant	High degree of heat recovery
Heat exchanger	4-pipe
Construction	Extract air opening right
Dimensions [mm]	Width 604, height 2200, depth 260
Control system	with FSL-CONTROL III
Control function	Master
Real time clock	with real time clock
Interface	with Modbus RTU
Air quality sensor	with CO_2-sensor
Supply air temperature sensor	with supply air temperature sensor
Outdoor air temperature sensor	with outdoor air temperature sensor
Heating valve	with heating valve
Lockshield – heating circuit	with lockshield
kVS value – heating valve	0.40 (straight-way valve)
Cooling valve	with cooling valve
Lockshield – cooling circuit	with lockshield
kVS value – cooling valve	0.25 (straight-way valve)

Bestellbeispiel: FSL-V-ZAB/SEK-HE-4-KL/604×2200×260/C3/SL-BI-Z/HV-R-0.40/KV-R-0.25

Type	FSL-V-ZAB/SEK
Variant	High degree of heat recovery
Heat exchanger	4-pipe
Construction	Extract air opening left
Dimensions [mm]	Width 604, height 2200, depth 260
Control system	with FSL-CONTROL III
Control function	Slave
Real time clock	-
Interface	with BACnet IP
Air quality sensor	-
Supply air temperature sensor	with supply air temperature sensor
Outdoor air temperature sensor	-
Heating valve	with heating valve
Lockshield – heating circuit	with lockshield
kVS value – heating valve	0.40 (straight-way valve)
Cooling valve	with cooling valve
Lockshield – cooling circuit	with lockshield
kVS value – cooling valve	0.25 (straight-way valve)

Variants

Construction KL (room view)

Construction KL (wall view)

- Extract air opening on the left when seen from the room
- Access to the integral single room control system on the right when seen from the room
- Heat exchanger water connection on the right when seen from the room
- Outdoor air and exhaust air openings on the left when seen from the wall

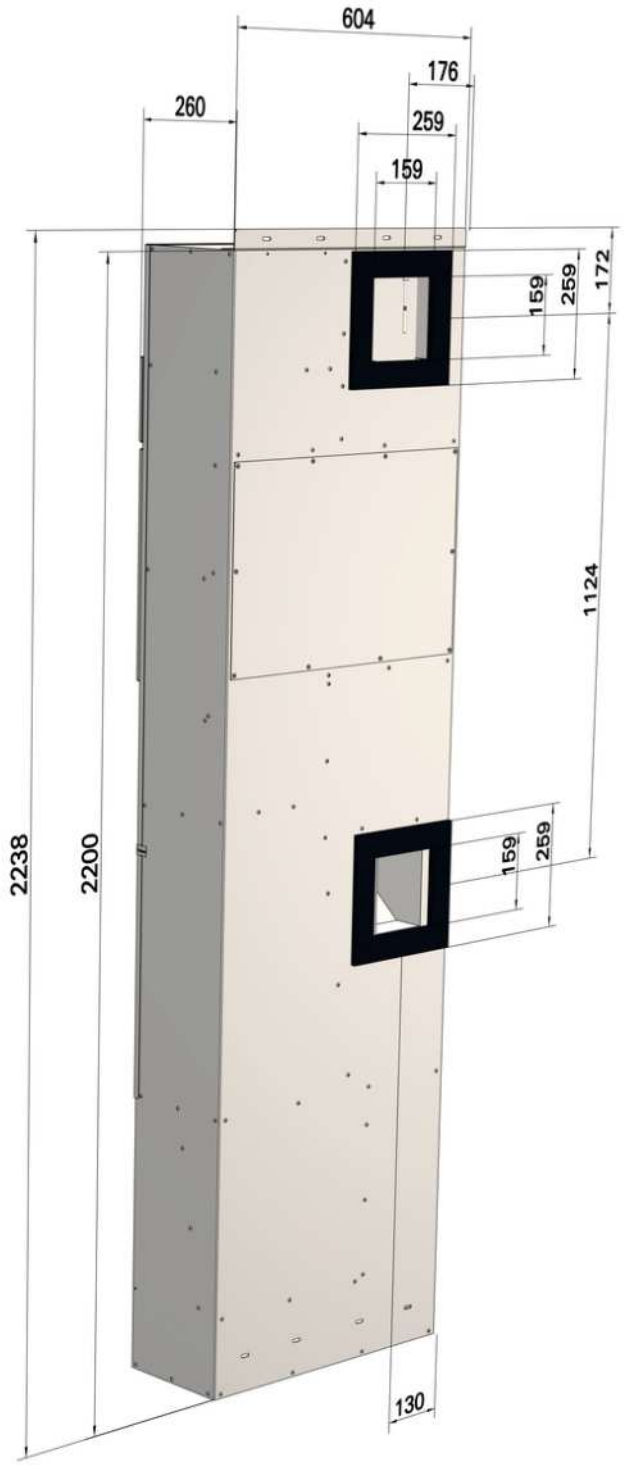
Construction KR (room view)

Construction KR (wall view)

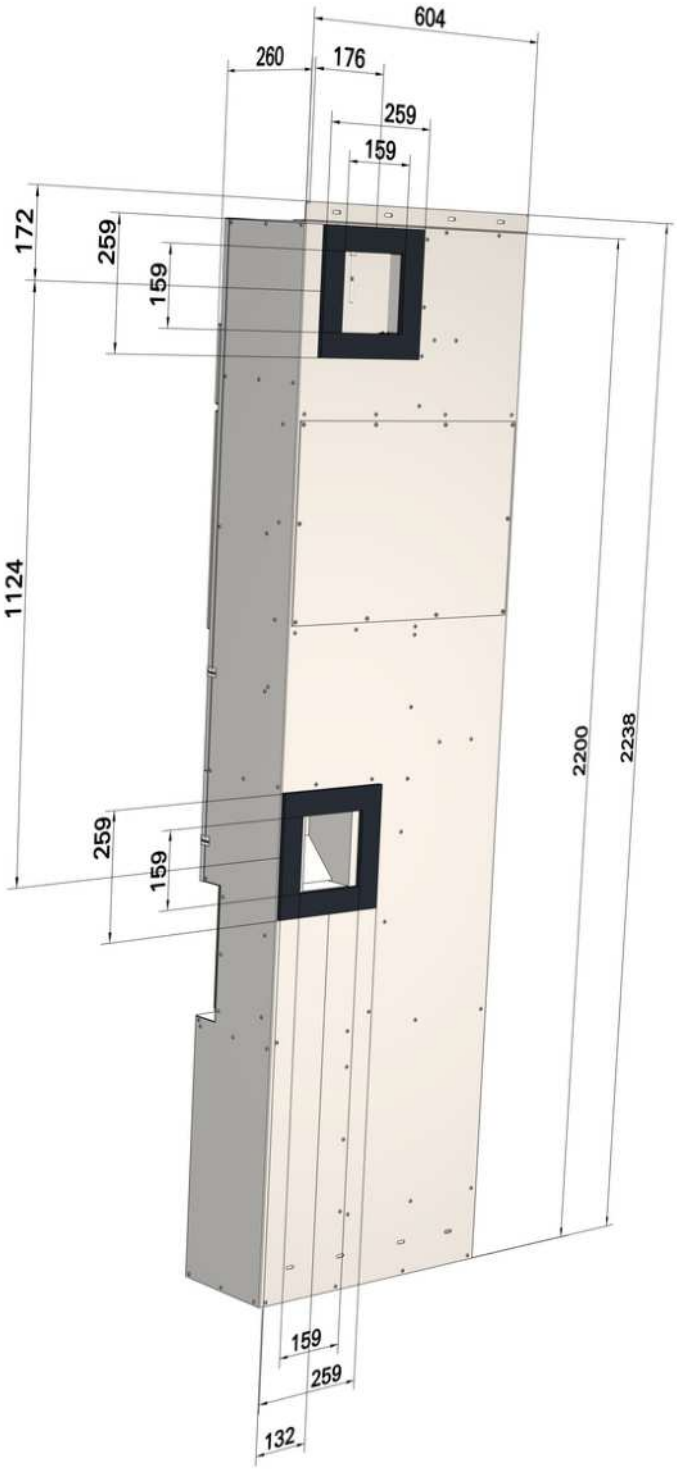
- Extract air opening on the right when seen from the room
- Access to the integral single room control system on the left when seen from the room
- Water connection of the heat exchanger on the left side of the room
- Outdoor air and exhaust air openings on the right when seen from the wall

Dimensions

Construction KR



Construction KL



Product details

Installation example

Installation example

Installation example

Installation example

Installation example

Einbau und Inbetriebnahme

- Aufstellung auf dem Fußboden vor der Außenwand
- Ausgleich von Rohbautoleranzen über die 4 Justierfüße (+40 mm)
- Befestigungswinkel an der Geräteoberseite zur Verschraubung mit dem Baukörper
- Unterhalb des Wärmeübertragers 2 Löcher zur Befestigung mit dem Baukörper
- Die Außenluftansaugung bzw. Fortluftausblasung erfolgt über 2 Fassadenöffnungen. Die Fassadenöffnungen müssen vom Kunden fachgerecht bereitgestellt werden und haben idealerweise ein Gefälle nach außen
- Freier Querschnitt der Lüftungsöffnungen 0,025 m² je Öffnung (Außen- und Fortluft) und 0,08 m² je Öffnung (Zu- und Abluft)
- Witterungsschutz der Außen- und Fortluftöffnung erfolgt als kundenseitige Leistung
- Einbau und Erstellung aller Anschlüsse und Lieferung des Befestigungs-, Verbindungs- und Dichtungsmaterials erfolgen kundenseitig
- Wasseranschlüsse für Vor- und Rücklauf befinden sich, vom Raum ausgesehen, auf der linken Geräteseite (Ausführung ../KR/..) bzw. rechten Geräteseite (Ausführung ../KL/..)
- Kundenseitig ist auf die Möglichkeit zur Entleerung und Entlüftung zu achten
- Elektroanschluss befindet sich, vom Raum aus gesehen, auf der linken Geräteseite (Ausführung ../KR/..) bzw. rechten Geräteseite (Ausführung ../KL/..)
- Für einen leichten Ausbau des Wärmeübertragers zu Reinigungszwecken empfehlen wir flexible Schläuche zur Anbindung an das bauseitige Rohrnetz
- Die bauseitige Brüstungsverkleidung darf auf der Gerätevorderseite Wartungsarbeiten und Gerätemontage bzw. -demontage nicht einschränken