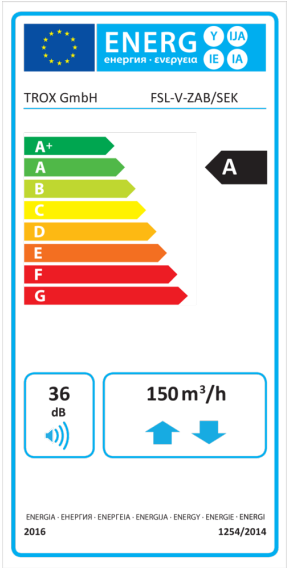




TESTED TO VDI 6022

Conforms to VDI 6022



Energy label

SCHOOLAIR-V-1800

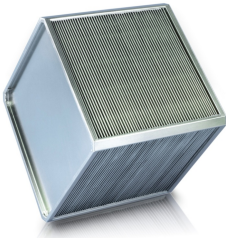
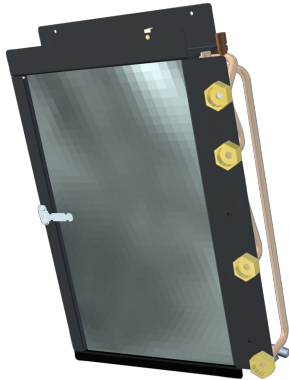


PLATE HEAT EXCHANGER

Cross flow heat recovery unit



HEAT EXCHANGER

Water connection



LEVELLING FOOT

Levelling foot

X-CUBE ROOMAIR-V-ZAB/SEK

SUPPLY AND EXTRACT AIR UNIT WITH HEAT EXCHANGER AND HEAT RECOVERY UNIT, SECONDARY AIR OPTION, FOR VERTICAL INSTALLATION ON AN EXTERNAL WALL, E.G. ADJACENT TO A WINDOW

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 flow heat recovery unit (heat recovery efficiency 61 %)
- Highly efficient heat exchanger for heating and cooling as 2-pipe or 4-pipe system
- Heat exchanger connection is on the right side of the room
- Condensate drip tray with condensate drain
- Heat recovery all year round (condensate drainage required on site)
- Unit floor space approx. 0.13 m²
- Reduction of fine dust and pollen contamination due to integral filters that conform to VDI 6022 3 filter class ISO ePM1 65% / ISO coarse 50%
- Service-friendly maintenance cover for filter changing and cleaning the heat recovery system
- 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)

TECHNICAL INFORMATION

Function, Technical data, Quick sizing, Specification text, Order code



Functional description

Decentralised supply and extract air units for room ventilation and for dissipating cooling loads and heat loads.

An EC centrifugal fan takes in the fresh air which then flows through the motorised shut-off damper and the F7 filter.

Once the fresh air has passed the fan, it flows through the recuperative heat exchanger for heat recovery; it is possible to bypass the heat exchanger in order to pre-heat it, or when it is sensible with regard to energy efficiency.

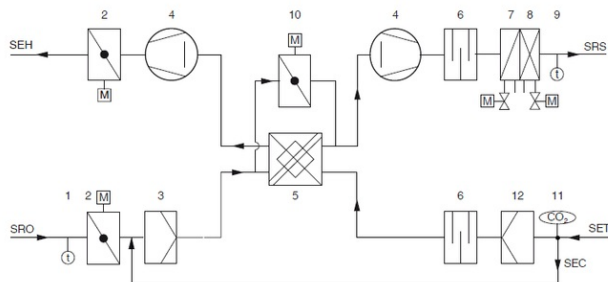
If necessary, the air is heated or cooled by the heat exchanger before it is discharged to the room as a displacement flow.

The extract air first passes a G3 filter (that protects the unit), then flows through the heat exchanger (for heat recovery), the extract air fan and the motorised shut-off damper before it is discharged to the outside as exhaust air.

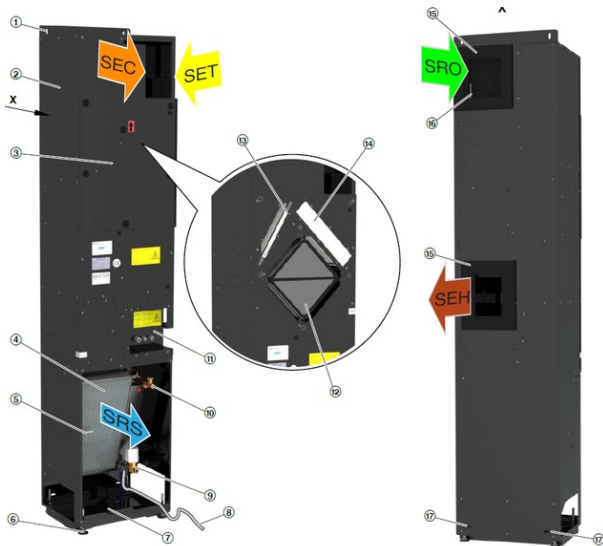
Automatic switching to secondary air mode (only with an air quality sensor) if the room air quality is sufficient.

The fresh air damper closes, the self-powered secondary air damper opens and the extract air fan is switched off.

The unit always starts in secondary air mode, which is more energy efficient.



- 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 flow plate heat exchanger
- 6 Sound attenuator
- 7 Heating coil
- 8 Cooling coil
- 9 Supply air temperature sensor
- 10 Bypass damper with actuator
- 11 CO2 sensor (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)



- 1 mounting bracket (sliding)
- 2 Casing
- 3 Inspection access panel
- 4 Heat exchanger 2- or 4-pipe
- 5 Supply air temperature sensor
- 6 Levelling feet
- 7 Condensate drip tray
- 8 Supply voltage connecting cable
- 9 Control valve
- 10 Lockshield
- 11 Access panel control
- 12 Cross flow heat recovery
- 13 Extract air filter ISO coarse 50%
- 14 Outdoor air filter ISO ePM1 65%
- 15 Seal on the wall side
- 16 Outdoor air temperature sensor (optional)
- 17 Lower fixing holes
- SEH Single room exhaust air
- SET Single room extract air
- SRO Single room outdoor air
- SRS Single room supply air
- SEC Secondary air (optional)

Width	400 mm
Height	1800 mm
Depth	320 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 flow rate and 8 dB room attenuation	32 dB(A)
Sound power level	30 – 44 dB(A)
Heat recovery efficiency	61%
Maximum operating pressure, water side	6 bar
Maximum operating temperature	75 °C
Supply voltage	230 V AC ±10 %, 50/60 Hz
Power rating	240 VA
Weight	60 kg

Sizing example 1

Supply air flow rate	m³/h	75	90	120	150
Total cooling capacity	W	350	420	550	690
Room cooling capacity	W	205	243	325	401
Air temperature inside the unit	°C	32	32	32	32
Relative humidity	%	40	40	40	40
Water content of the dry air	g/kg	11.9	11.9	11.9	11.9
Supply air temperature	°C	17.8	17.9	17.9	18
Condensation	g/h				
Chilled water flow rate	l/h	50	70	110	150
Water temperature, inlet	°C	16	16	16	16
Water temperature, outlet	°C	22	21.1	20.3	19.9
Water side pressure drop	kPa	2.1	3.7	8.2	14.1
Total heating capacity	W	1480	1740	2280	2770
Room heating capacity	W	383	433	545	611
Air temperature inside the unit	°C	-16	-16	-16	-16
Supply air temperature	°C	35.3	34.4	33.6	32.2
Hot water flow rate	l/h	40	50	80	110
Water temperature, inlet	°C	60	60	60	60
Water temperature, outlet	°C	27.9	29.8	35.2	38
Water side pressure drop	kPa	2.6	3.8	8.5	14.7
Sound power level LWA	dB(A)	30	33	39	44
Sound pressure level including 8 dB system attenuation	dB(A)	22	25	31	36
Active power P _{el}	W	20	23	27	35

Luftseitige Daten Kühlbetrieb:

- Temperatur/relative Feuchte Außenluft: 32 °C/40 %
- Temperatur/relative Feuchte Raumluft: 26 °C/50 %

Luftseitige Daten Heizbetrieb:

- Temperatur/relative Feuchte Außenluft: -16 °C/90 %
- Temperatur/relative Feuchte Raumluft: 20 °C/35 %

Alle Angaben ohne Berücksichtigung der WRG!

Sizing example 2 with year-round heat recovery utilisation

Supply air volume flow	m³/h	75	90	120	150
Total cooling capacity	W	320	390	520	660
Room cooling capacity	W	200	240	321	401
Air temperature inside the unit	°C	28	28.1	28.3	28.4
relative humidity	%	50.2	50	49.5	49.3
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	104	133	162	207
Chilled water flow rate	l/h	40	55	88	112
Water inlet temperature	°C	12	12	12	12
Water outlet temperature	°C	18.8	18	17.1	17.1
Water side pressure drop	kPa	1.4	2.4	5.5	8.4
Total heating capacity	W	620	780	1030	1290
Room heating capacity	W	318	388	493	541
Air temperature inside the unit	°C	9.8	9.2	8.8	7.4
Supply air temperature	°C	33.7	33.9	33.3	31.8
Condensate	g/h	200	200	200	300
Hot water flow rate	l/h	35	50	80	100
Water inlet temperature	°C	45	45	45	45
Water outlet temperature	°C	29.5	31.5	33.8	33.8
Water side pressure drop	kPa	2	3.6	8.2	12.2
Sound power level $L_{w,a}$	dB(A)	30	33	39	44
Sound pressure level including 8 dB room attenuation	dB(A)	22	25	31	36
Active power P_{el}	W	20	23	27	35

Luftseitige Daten Kühlbetrieb:

- Temperatur/relative Feuchte Außenluft: 32 °C/40 %
- Temperatur/relative Feuchte Raumluft: 26 °C/50 %

Luftseitige Daten Heizbetrieb:

- Temperatur/relative Feuchte Außenluft: -12 °C/90 %
- Temperatur/relative Feuchte Raumluft: 21 °C/40 %

Alle Angaben mit Berücksichtigung der WRG!

X-CUBE ROOMAIR-V-ZAB/SEK-4-KM/400×1800×320/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 parameters for standard control of a classroom according to our control system description are stored in the controller

FSL-V-ZAB/SEK with automatic secondary air changeover function - master unit

TROX FSL-V-ZAB/SEK vertical decentralised ventilation unit with supply and extract air function and switchover option to secondary air operation (depending on air quality), heat recovery as well as heating and cooling function for mounting 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 on-site fastening, adjustable L-bracket on the top of the unit with 2 slotted holes and slotted holes behind the heat exchanger in the lower part of the unit
- 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 on the rear side of the unit, $w \times d = 50 \times 10$ mm, 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 the TROX scope of delivery)
- Use of 2 energy-saving EC centrifugal blowers, supply and extract air fan classified in category SFP 0 (< 500 W/(m³/s) according to DIN EN 16798-3: electrical power consumption of the entire unit at nominal volume flow 120 m³/h < 27 W, a connected load of 240 VA must be taken into account for dimensioning the connecting cable
- 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)
- Sound power level in supply/exhaust air mode at 60/90/120/150 m³/h = 30/33/39/44 dB(A) (corresponds to a sound pressure level of = 22/25/31/36 dB(A) with a room attenuation of 8 dB). The measurement values refer to sound power measurements of a single unit in a reverberation chamber according to accuracy class 1. Results may vary depending for some installation situation
- Integrated recuperative, cross-flow heat exchanger for heat recovery in seawater-resistant aluminium design, with high efficiency due to special plate structure, plate spacing and package length, including condensate tray and discharge into the heat exchanger condensate tray. Accessibility for maintenance purposes via separate service cover possible without removing the unit cover
- With electromotive bypass, which bypasses the heat recovery unit, 24 V drive (continuous), 100 % open-close, control via unit-internal individual room control system
- 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 CO₂ sensor, 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 on-site connection (connection not included in TROX scope of delivery) of the power supply (L, N, PE) with wire end ferrules led approx. 1 m out of the unit, as a transfer point to the on-site electrical installation:
 - Supply voltage (230 V): 3 wires, 3×1.5 mm² (L, N, PE)
- Integration with bus system as an option, connection of control panels etc. in the customer area of the control system. As a transfer point to the controls provided by others:
 - Rail mount terminals type Wago 260 for the connection (by others) of
 - Digital inputs DI
 - Digital outputs DO
 - Master-slave connection RS485
 - Central BMS connection (optional) RS485
 - Room control panel
- RJ45 socket as service access to the user interface or for BMS connection (optional) Ethernet
- The following sensors are included in the unit as part of the single room control system (the actual room temperature is captured at the control panel):
 - Indoor air quality sensor CO₂
 - Supply air temperature measurement downstream of the heat exchanger
 - Outdoor air temperature measurement in the outdoor air intake
- 4-pipe aluminium-copper heat exchanger for air heating or air cooling, matched to the project-specific data, easily removable for cleaning (decisive is the on-site connection to the main piping, not included in TROX's scope of supply), drainage and venting option per heating/cooling circuit, arrangement on the right-hand side of the room. We recommend a connection to the on-site pipe network with flexible hoses (not included in the TROX scope of delivery), so that the heat exchanger can be easily removed 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 $\varnothing 12 \times 1$ [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 from high-quality, wet-strengthened glass fibre paper are pleated, the spacers are made from thermoplastic hot melt adhesive and ensure uniform spacing (4 mm) between the pleats
 - The frame is made of moisture-resistant fleece with pull-out tabs and must not reduce the flow cross-section (filter size = flow cross-section)
 - Filter area ≥ 1.8 m²
- Extract air filter class G3 (coarse dust filter) as flat filter medium, filter class according to ISO 16890: 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-pored sealing tapes for sealing and adaptation to the on-site cladding are not included in the TROX scope of delivery
- 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 exhaust air intake must also be arranged in the upper area of the cladding
- Clear distance of approx. 30 mm between the front edge of the unit and the inner edge of the under sill trim
- The front of the device must be completely accessible after disassembly of the outer casing

Units - dimensions and weight:

Width: approx. 400 mm

Height: approx. 1800 mm (without top mounting bracket, without height adjustment)

Depth: approx. 320 mm (without compressible façade seal on the back of the unit)

Weight: approx. 60 kg

Construction

- Powder-coated RAL 9005, black

Technical data

- Width: 396 mm
- Height: 1800 mm
- Depth: 319 mm
- Fresh air flow rate: 150 m³/h
- Supply air flow rate: up to 150 m³/h
- Cooling capacity: up to 720 W
- Heating capacity: up to 2650 W
- Room cooling capacity: up to 400 W
- Room heating capacity: up to 750 W
- Max. operating pressure: 6 bar
- Max. operating temperature: 75 °C
- Sound power level: 27 – 44 dB(A)
- Supply voltage: 230 V AC ±10 %, 50/60 Hz
- Rating: 87 VA
- Power consumption: nominal volume flow rate 27 W

RA-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
RA-V-ZAB/SEK vertical decentralised ventilation unit X-CUBE/ROOMAIR-V-ZAB/SEK

2 Variant
No entry: Standard
HE high degree of heat recovery

3 Heat exchanger
2 2-pipe
4 4-pipe

4 Construction
KM with condensate drain (only with standard variant)
KR with condensate drain, extract air on room side right (only with variant HE)
KL with condensate drain, extract air on room side left (only with variant HE)

5 Dimensions [mm]
Width × height × depth
400 × 1800 × 320 (only with standard variant)
604 × 2200 × 260 (only with variant HE)

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 CO₂-sensor

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)

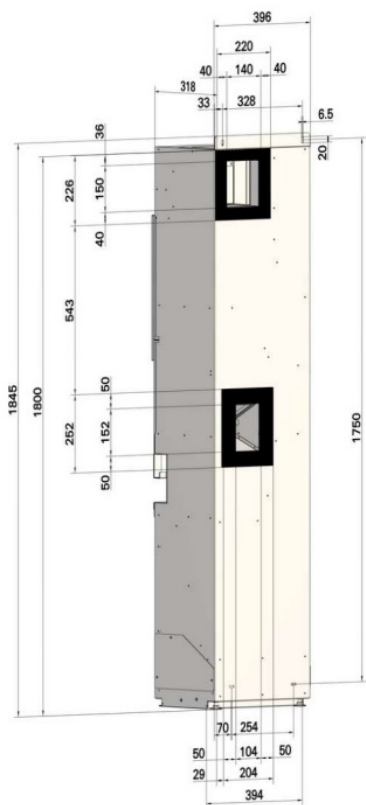
1.00 (straight-way valve)

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/ZEK
Variant	High heat recovery efficiency
Heat exchanger	4-pipe
Construction variant	with condensate drain on the 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 CO2sensor
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)

Dimensions, Produktdetails



Installation and commissioning

- Vertical installation on the façade or on an external wall
- Level adjustment using the 4 levelling feet (+40 mm)
- The fresh air connection is provided by two ventilation openings in the façade system or external wall (to be provided by others), preferably sloping towards the outside
- Weather protection for the fresh air and exhaust air openings to be provided by others
- Installation and connections to be performed by others; fixing, connection and sealing material to be provided by others
- The water flow and return connections are on the right-hand side of the unit when seen from the room
- Vents and drainage by others
- The electrical connection is on the right when seen from the room
- The under sill trim must not obstruct installation or deinstallation of the unit or maintenance access on the front of the unit

