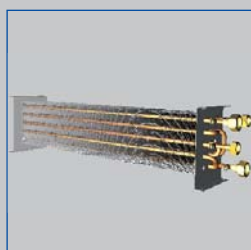


Under sill units

Type FSL-B-SEK



Levelling foot



FSL-B-SEK, heat exchanger



Filter chamber cover



Tested to VDI 6022



Secondary air unit with heat exchanger for installation under the sill

Ready-to-operate decentralised ventilation unit that provides good comfort levels

- Acoustically optimised EC fan with low specific fan powers, SFP = 1 according to EN 13779
- Heat exchanger for heating and cooling as 2-pipe or 4-pipe system
- G3 filter fleece to protect the unit
- Condensate drip tray with condensate drain

Optional equipment and accessories

- Modular control system X-AIRCONTROL, specially for decentralised ventilation systems
- Various fixing systems to fix the unit to the floor or wall
- Powder coating in many different colours, e.g. RAL CLASSIC

Type		Page
FSL-B-SEK	General information	6.1 – 2
	Order code	6.1 – 5
	Quick sizing	6.1 – 6
	Dimensions	6.1 – 8
	Specification text	6.1 – 10
	Basic information and nomenclature	9.2 – 1

Installation examples

Installation example



Installation example



Description



FSL-B-SEK

Application

- 2-pipe or 4-pipe heat exchangers enable good comfort levels
- Inducing displacement flow
- Energy-efficient solution since water is used as a medium for heating and cooling
- For new buildings and refurbishment projects
- Installation under the sill
- Typical installation locations include offices and meeting rooms

Variants

- Traungasse project (Vienna, Austria)
- Bennigsenplatz project (Düsseldorf, Germany)
- Laimer Würfel project (Munich, Germany)

Construction

- Powder-coated RAL 9005, black, gloss level 70 %
- P1: Powder-coated in any other RAL colour, gloss level 70 %

Nominal sizes

- 1085 × 630 × 319 mm (B × H × T) (Traungasse)
- 1590 × 503 × 400 mm (B × H × T) (Bennigsenplatz)
- 949 × 586 × 491 mm (B × H × T) (Laimer Würfel)

Useful additions

- Modular control system X-AIRCONTROL, specially for decentralised ventilation systems
- Connecting hoses

Special features

- Air-water heat exchanger as 2-pipe or 4-pipe system, with G½" union nuts and flat seals
- 4 levelling feet (optional)
- Installation into a frame as an option
- Condensate drip tray with condensate drain
- Easy filter change with quick release fasteners, no tools required
- Compact construction, hence particularly suitable for refurbishment projects

Construction features

- 1 energy-efficient EC fan with low specific fan powers, SFP = 1 according to EN 13779
- The supply air is discharged to the room as an inducing displacement flow from the lower front part of the unit

Materials and surfaces

- Casing, filter chamber cover, fans and levelling feet are made of galvanised sheet steel
- Heat exchanger with copper tubes and aluminium fins
- Casing is powder-coated RAL 9005, black, or in any other RAL colour
- Mineral wool lining to DIN 4102, fire rating class A, faced with glass fibre fabric as a protection against erosion, effective with airflow velocities up to 20 m/s
- Closed cell sealing strips

Installation and commissioning

- Under sill installation either standing on the floor or hanging on the wall
- Level adjustment using the 4 levelling feet (+45 mm, optional)
- Façade installation of the optional frame that can accommodate the function box
- 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 water for the heat exchanger must comply with VDI 2035

Standards and guidelines

- Façade ventilation units of Type FSL-B-SEK conform to VDI 6035 and VDMA 24390
- Hygiene certificate to VDI 6022
- Heating/cooling medium conforms to VDI 2035

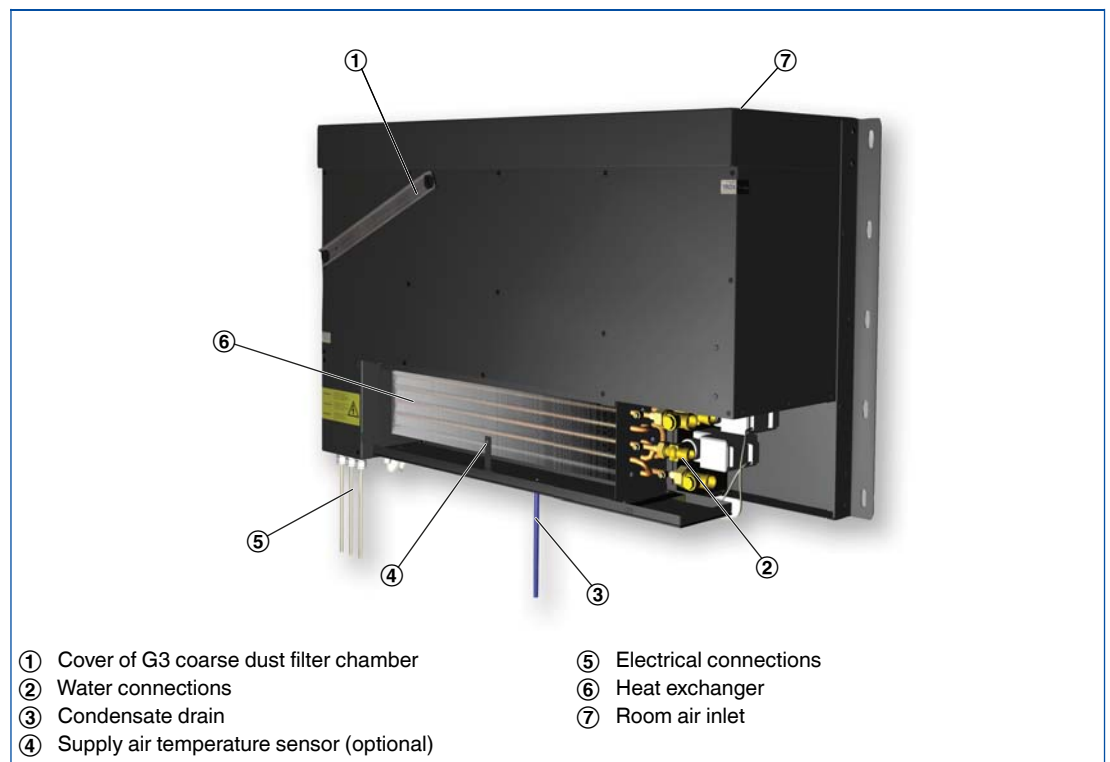
Maintenance

- VDI 6022, Part 1, applies (Hygiene requirements on air handling units and systems)
- The heat exchanger can be vacuumed with an industrial vacuum cleaner if necessary
- It can also be cleaned with commercial, non-aggressive cleaning agents

Technical data

	Traungasse	Bennigsenplatz	Laimer Würfel
Width	1085 mm	1590 mm	950 mm
Height	630 mm	503 mm	586 mm
Depth	319 mm	400 mm	491 mm
Fresh air flow rate	-	-	-
Supply air flow rate	Up to 150 m ³ /h	Up to 150 m ³ /h	Up to 200 m ³ /h
Cooling capacity	Up to 390 W	Up to 390 W	Up to 520 W
Heating capacity	Up to 830 W	Up to 940 W	Up to 1220 W
Max. operating pressure, water side	6 bar	6 bar	6 bar
Max. operating temperature	75 °C	75 °C	75 °C
Sound power level	27 – 37 dB(A)	26 – 35 dB(A)	36 – 43 dB(A)
Supply voltage	230 V AC ±10 %, 50/60 Hz	230 V AC ±10 %, 50/60 Hz	230 V AC ±10 %, 50/60 Hz

Schematic illustration of FSL-B-SEK (Traungasse project)

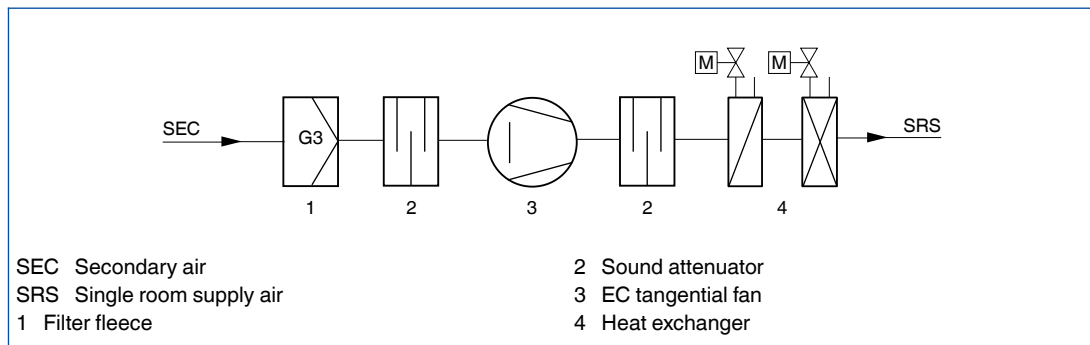


Function

Functional description

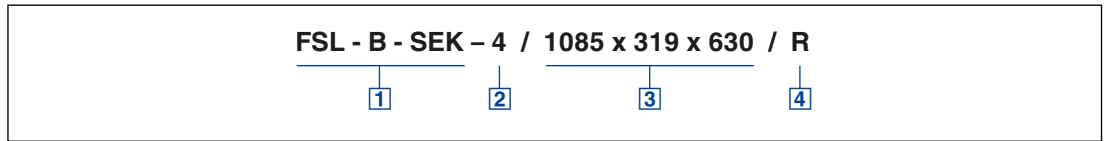
Decentralised secondary air units dissipate cooling loads and heat loads. The room air is taken in by an EC centrifugal fan and passes through a filter fleece. The air is subsequently heated or cooled by the heat exchanger and eventually supplied to the room as an inducing displacement flow.

Ventilation diagram for FSL-B-SEK



Order code

FSL-B-SEK



1 Type

FSL-B-SEK Decentralised under sill ventilation units

2 Heat exchanger

2 2-pipe
4 4-pipe

3 Dimensions [mm]

B x H x T
1085 x 630 x 319
1590 x 503 x 400
949 x 586 x 491

4 Control equipment

No entry: none
R With

Order information

Decentralised ventilation units are technically advanced products of high quality and with a wide range of configuration options. For specification details regarding your project please contact your nearest TROX branch or subsidiary.

Quick sizing

FSL-B-SEK (Traungasse)

Supply air flow rate	m ³ /h	90	120	150
Fresh air flow rate	m ³ /h	0	0	0
Total cooling capacity	W	240	320	390
Internal cooling capacity	W	240	320	390
Temperature of the air in the unit	°C	26.0	26.0	26.0
Relative humidity	%	50.0	50.0	50.0
Water content of the dry air	g/kg	10.5	10.5	10.5
Supply air temperature	°C	18	18	18
Condensation	g/h	0	0	0
Chilled water flow rate	l/h	100	150	210
Water temperature, inlet	°C	16	16	16
Water temperature, outlet	°C	18.0	17.8	17.6
Pressure drop, water side	kPa	<3	<3	<5
Total heating capacity	W	540	690	830
Internal heating capacity	W	540	690	830
Temperature of the air in the unit	°C	20.0	20.0	20.0
Supply air temperature	°C	37.9	37	36.5
Hot water flow rate	l/h	50	70	100
Water temperature, inlet	°C	60	60	60
Water temperature, outlet	°C	50.5	51.4	52.7
Pressure drop, water side	kPa	<3	<3	<3
Sound power level L _{WA}	dB (A)	27	32	37
Sound pressure level with 8 dB room attenuation	dB (A)	19	24	29

FSL-B-SEK (Bennigsenplatz)

Supply air flow rate	m ³ /h	90	120	150
Fresh air flow rate	m ³ /h	0	0	0
Total cooling capacity	W	240	320	390
Internal cooling capacity	W	240	320	390
Temperature of the air in the unit	°C	26.0	26.0	26.0
Relative humidity	%	50.0	50.0	50.0
Water content of the dry air	g/kg	10.5	10.5	10.5
Supply air temperature	°C	18	18	18
Condensation	g/h	0	0	0
Chilled water flow rate	l/h	80	130	180
Water temperature, inlet	°C	16	16	16
Water temperature, outlet	°C	18.6	18.1	17.9
Pressure drop, water side	kPa	<3	<3	<5
Total heating capacity	W	580	770	940
Internal heating capacity	W	580	770	940
Temperature of the air in the unit	°C	20.0	20.0	20.0
Supply air temperature	°C	39.2	39	38.7
Hot water flow rate	l/h	50	90	150
Water temperature, inlet	°C	60	60	60
Water temperature, outlet	°C	49.9	52.5	54.5
Pressure drop, water side	kPa	<3	<3	<5
Sound power level L _{WA}	dB (A)	26	30	35
Sound pressure level with 8 dB room attenuation	dB (A)	18	22	27

Quick sizing

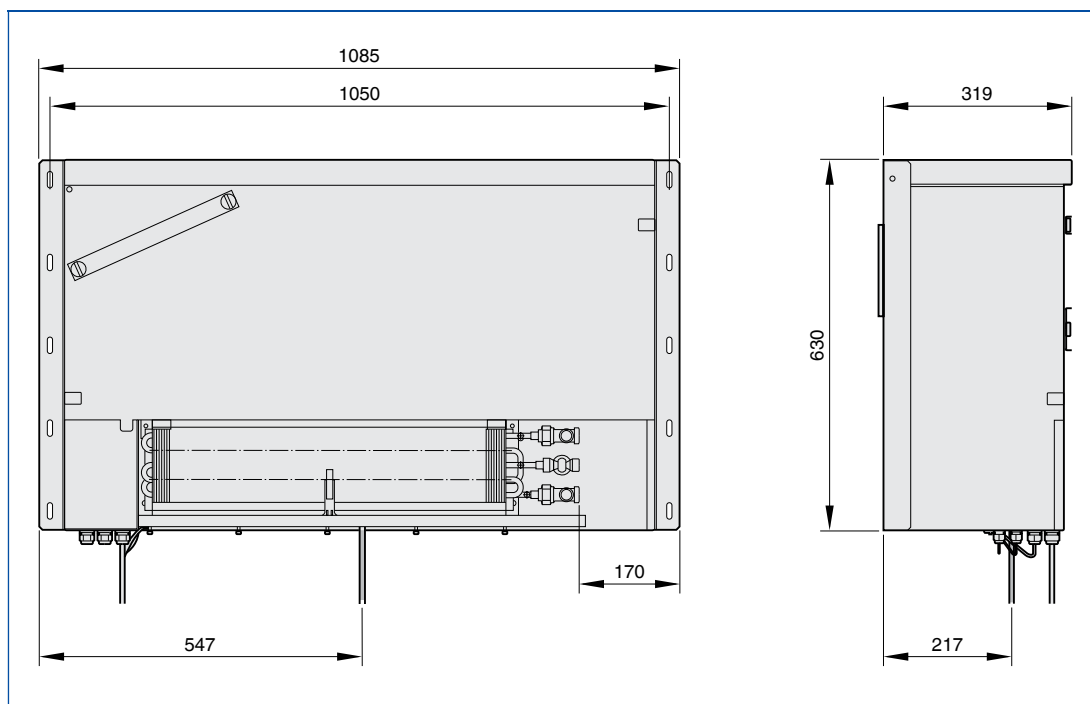
FSL-B-SEK (Laimer Würfel)

Supply air flow rate	m ³ /h	100	150	200
Fresh air flow rate	m ³ /h	0	0	0
Total cooling capacity	W	260	390	520
Internal cooling capacity	W	260	390	520
Temperature of the air in the unit	°C	26.0	26.0	26.0
Relative humidity	%	50.0	50.0	50.0
Water content of the dry air	g/kg	10.5	10.5	10.5
Supply air temperature	°C	18	18	18
Condensation	g/h	0	0	0
Chilled water flow rate	l/h	60	120	185
Water temperature, inlet	°C	16	16	16
Water temperature, outlet	°C	19.8	18.8	18.5
Pressure drop, water side	kPa	<3	<3	<6
Total heating capacity	W	650	970	1220
Internal heating capacity	W	650	970	1220
Temperature of the air in the unit	°C	20.0	20.0	20.0
Supply air temperature	°C	39.2	39.2	38.2
Hot water flow rate	l/h	40	100	150
Water temperature, inlet	°C	60	60	60
Water temperature, outlet	°C	45.9	51.5	52.9
Pressure drop, water side	kPa	<3	<5	<9
Sound power level L _{WA}	dB (A)	36	38	43
Sound pressure level with 8 dB room attenuation	dB (A)	28	30	35

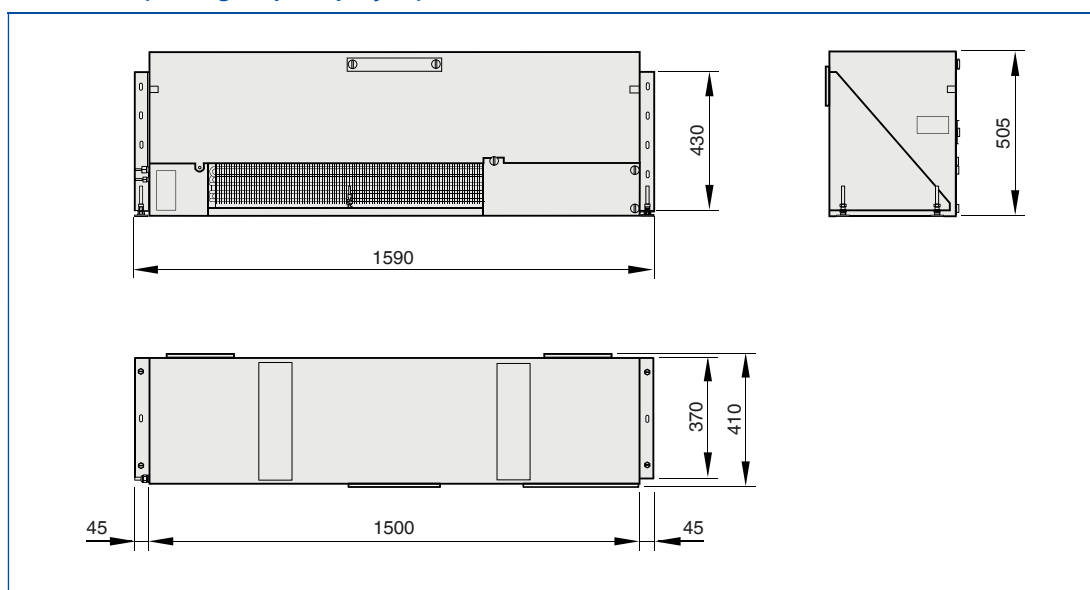
Dimensions

Weight upon request

FSL-B-SEK (Traungasse project)



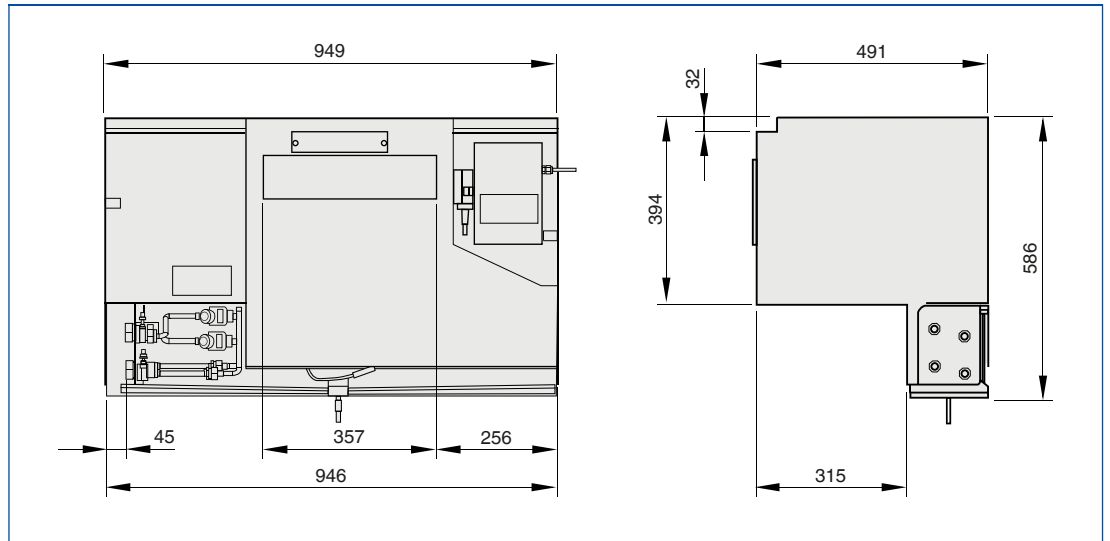
FSL-B-SEK (Bennigsenplatz project)



Dimensions

Weight upon request

FSL-B-SEK (Laimer Würfel project)



Description

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

Decentralised secondary air units of Type FSL-B-SEK, with heat exchanger, for installation under the sill.

Special features

- Air-water heat exchanger as 2-pipe or 4-pipe system, with G $\frac{1}{2}$ " union nuts and flat seals
- 4 levelling feet (optional)
- Installation into a frame as an option
- Condensate drip tray with condensate drain
- Easy filter change with quick release fasteners, no tools required
- Compact construction, hence particularly suitable for refurbishment projects

Materials and surfaces

- Casing, filter chamber cover, fans and levelling feet are made of galvanised sheet steel
- Heat exchanger with copper tubes and aluminium fins
- Casing is powder-coated RAL 9005, black, or in any other RAL colour
- Mineral wool lining to DIN 4102, fire rating class A, faced with glass fibre fabric as a protection against erosion, effective with airflow velocities up to 20 m/s
- Closed cell sealing strips

Construction

- Powder-coated RAL 9005, black, gloss level 70 %
- P1: Powder-coated in any other RAL colour, gloss level 70 %

Technical data

- Width: 1085, 1590, 950 mm
- Height: 630, 503, 586 mm
- Depth: 319, 400, 491 mm
- Fresh air flow rate: -
- Supply air flow rate: up to 200 m³/h
- Cooling capacity: up to 520 W
- Heating capacity: up to 1220 W
- Max. operating pressure: 6 bar
- Max. operating temperature: 75 °C
- Sound power level: 26 – 43 dB(A)
- Supply voltage: 230 V AC \pm 10 %, 50/60 Hz
- Rating: up to 27 VA
- Power consumption: 18 W with boost level, 10 W with medium speed (nominal volume flow rate)

1 Type

FSL-B-SEK Decentralised under sill ventilation units

2 Heat exchanger

- 2 2-pipe
- 4 4-pipe

3 Dimensions [mm]

B x H x T

- 1085 x 630 x 319
- 1590 x 503 x 400
- 949 x 586 x 491

4 Control equipment

No entry: none

- R With

Decentralised ventilation

Basic information and nomenclature



- Product selection
- Principal dimensions
- Nomenclature

Decentralised ventilation

Basic information and nomenclature

Product selection

	Façade ventilation units						
	FSL-U-SEK	FSL-U-ZUS	FSL-U-ZAB	FSL-U-ZAS	FSL-B-SEK	FSL-B-ZUS	FSL-B-ZAB
Installation details							
Under floor (false floor)	●	●	●	●			
Under the sill					●	●	●
Ventilation functions							
Secondary air	●	●		●	●	●	
Supply air			●	●		●	●
Extract air							●
Heat exchanger							
2-pipe or 4-pipe heat exchanger	●	●	●	●	●	●	●
F7 filter			●	●			●
Heat recovery with bypass							
●	Possible						
	Not possible						

Product selection

	Façade ventilation units					
	FSL-B-ZAS	SCHOOLAIR-B	FSL-V-ZUS	FSL-V-ZAB	SCHOOLAIR-V	SCHOOLAIR-D
Installation details						
Under the sill	●	●				
Vertical installation on an external wall, e.g. adjacent to a window			●	●	●	
Ceiling						●
Ventilation functions						
Secondary air	●		●			
Supply air	●	●		●	●	●
Extract air		●		●	●	●
Heat exchanger						
2-pipe or 4-pipe heat exchanger	●	●	●	●	●	●
F7 filter						
Heat recovery with bypass						
●	Possible					
	Not possible					

Decentralised ventilation

Basic information and nomenclature

Principal dimensions

L_N [mm]
Nominal length

Nomenclature

t_R [°C]
Room temperature

t_{Pr} [°C]
Primary air temperature

t_{wK} [°C]
Water flow temperature – cooling

\dot{V}_{wK} [l/h]
Water flow rate – cooling

t_{wH} [°C]
Water flow temperature – heating

t_{wV} [°C]
Water flow temperature

\dot{V}_{wH} [l/h]
Water flow rate – heating

\dot{V}_{Pr} [m³/h]
Primary air volume flow rate

Δp_r [Pa]

Pressure drop, air side of the induction unit

\dot{Q}_{tot} [W]
Thermal output – total

\dot{Q}_{wK} [W]
Thermal output, cooling (cooling capacity) – water side

\dot{Q}_{wH} [W]
Thermal output, heating (heating capacity) – water side

\dot{Q}_{Pr} [W]
Thermal output – air side

Δt_w [K]
Temperature difference – water circuit

Δp_w [kPa]
Pressure drop – water side

L_{WA} [dB(A)]
Sound power level

Decentralised ventilation

Basic information and nomenclature

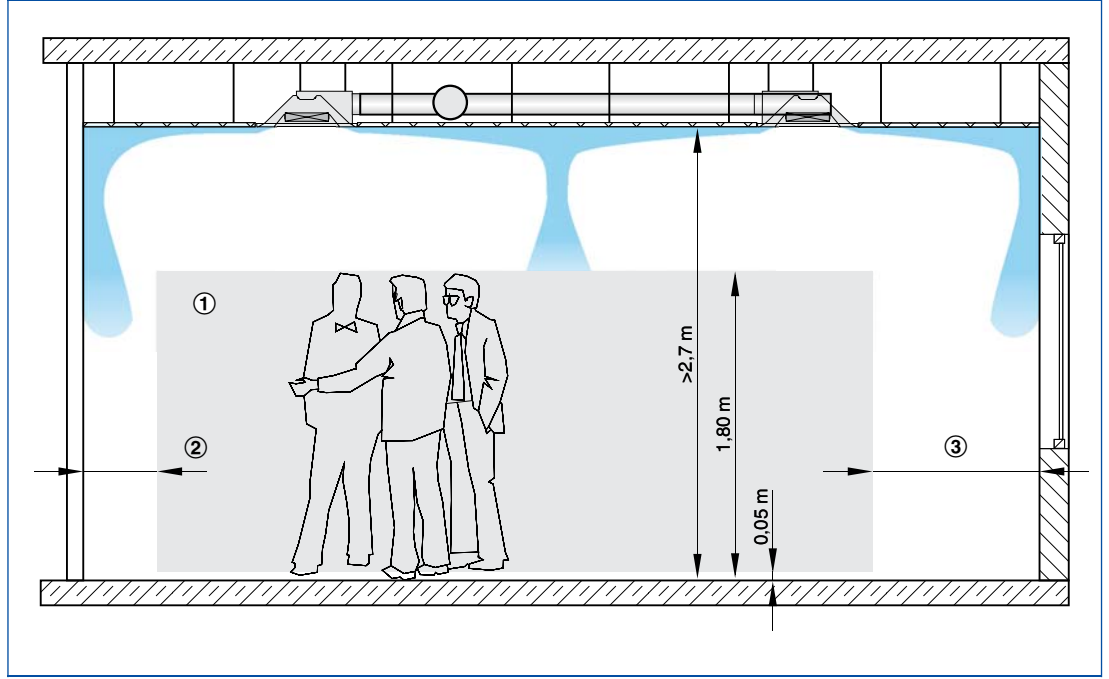
Types of ventilation

Mixed flow

The supply air is discharged from the diffuser into the space with a velocity between 2 and 5 m/s. The resulting air jet mixes with the room air, ventilating the entire space. Mixed flow systems typically provide a uniform temperature

distribution and air quality within the space. The originally high velocity of the turbulent air jet decreases rapidly due to the high induction levels of mixed flow systems.

Schematic illustration of mixed flow ventilation

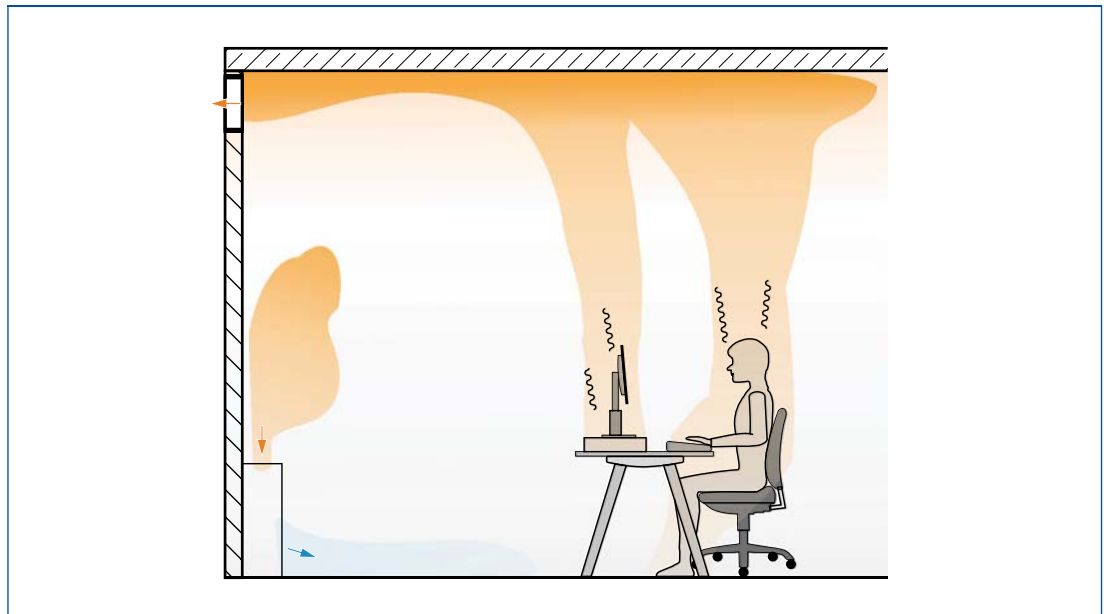


Displacement flow

Die Zuluft strömt möglichst bodennah mit velocity between 0.15 and 0.20 m/s and as close as possible to the floor; the result is a pool of fresh air over the entire floor area. The convection from people and other heat sources causes the fresh air from the pool to rise and create comfortable

conditions in the occupied zone. Displacement flow ventilation is characterised by low airflow velocities and low turbulence. The air quality in the occupied zone is very high. The extract air should ideally be removed near the ceiling.

Schematic illustration of displacement flow ventilation



Decentralised ventilation

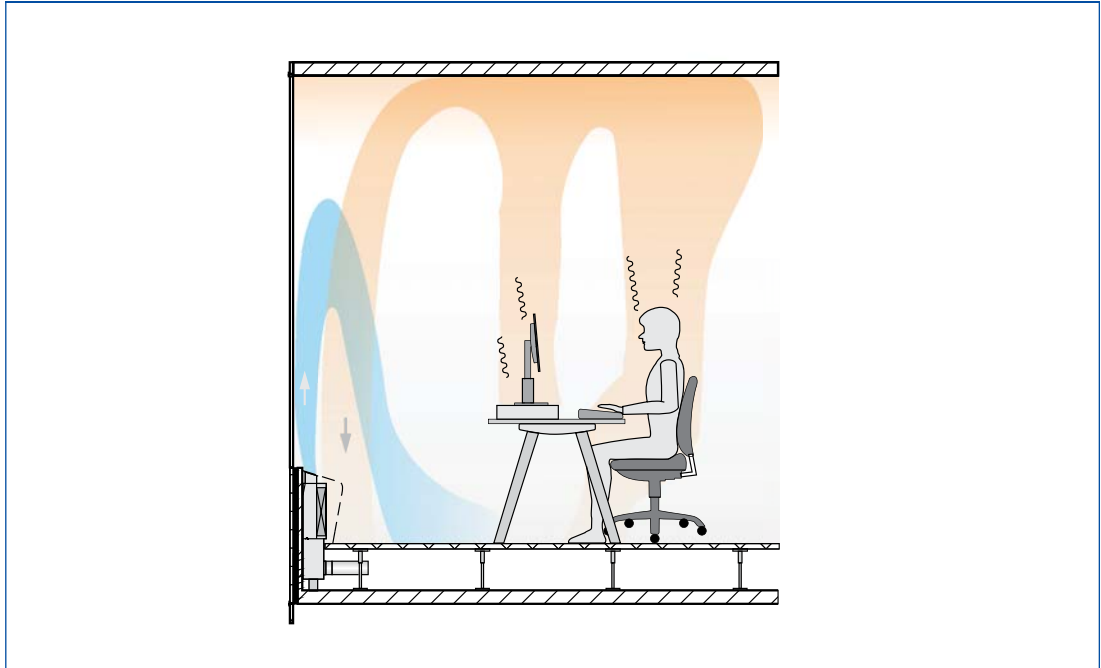
Basic information and nomenclature

Inducing displacement flow

The supply air is discharged near the external wall and with a medium velocity between 1.0 and 1.5 m/s. Due to the induction effect the supply air velocity is rapidly reduced such that, in cooling mode, the supply air displaces the room

air over the entire floor area. The convection from people and other heat sources causes the fresh air from the pool to rise and create comfortable conditions in the occupied zone.

Schematic illustration of inducing displacement flow ventilation



Decentralised ventilation

Basic information and nomenclature

Heat exchanger

Heat exchanger

The maximum water-side operating pressure for all heat exchangers is 6 bar.
The maximum water flow temperature (heating circuit) for all heat exchangers is 75 °C; if flexible hoses are used, the water flow temperature should not exceed 55 °C. Units for other pressures and temperatures are available on request.

The water flow temperature (cooling circuit) should be at least 16 °C such that it does not permanently fall below the dew point. For units with a condensate drip tray the water flow temperature may be reduced to 15 °C.

Heat exchanger as 2-pipe system

Air-water systems with a 2-pipe heat exchanger may be used for either heating or cooling. In changeover mode it is possible to use all units within a water circuit exclusively for cooling in summer and exclusively for heating in winter.

Heat exchanger as 2-pipe system



Heat exchanger as 4-pipe system

Air-water systems with a 4-pipe heat exchanger may be used for both heating and cooling. Depending on the season, i.e. especially in spring and autumn, it may be possible that an office has to be heated in the morning and cooled in the afternoon.

Heat exchanger as 4-pipe system

