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Product information

Decentralised underfloor ventilation units FSL-U-ZUS · FSL-U-ZAB · FSL-U-SEK Underfloor induction diffuser Type BID



Front view of "Hofgarten Palais"

Room-high glass façades place particular demands on the technical building equipment. Ventilation units integrated into the false floors of modern office buildings, for example, offer a clever solution.

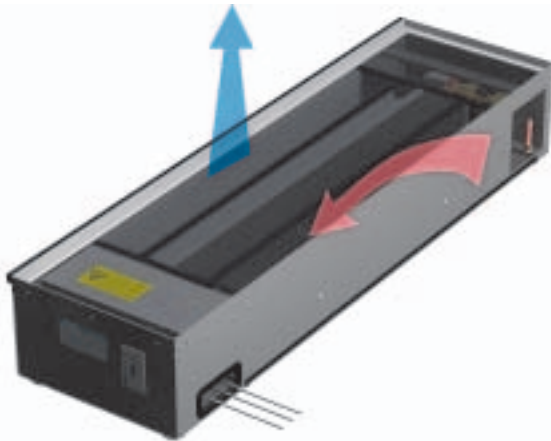
Underfloor ventilation units

In modern office buildings, false floors are a part of the standard equipment. The entire hollow space underneath the false floor, however, is not required for the laying of electrical and data lines. For this reason, the integration of the ventilation technology into false floors can be extremely interesting.

Since no ventilation ducting is installed into false ceilings, the false ceilings are either not required or their height is reduced.

In the following, four underfloor ventilation units for various room air distribution solutions are described in detail. The grille of the units are available either as linear grilles or as roll down grilles in various materials (aluminium, steel, or stainless steel).

Secondary ventilation unit Type FSL-U-SEK

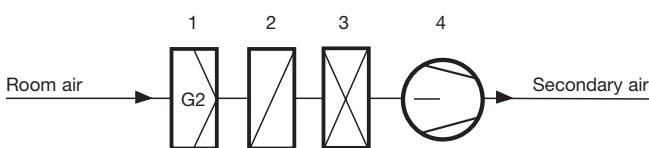


Decentralised ventilation unit Type FSL-U-SEK dissipates thermal loads and is operated without outdoor air. It is mainly used to heat and cool rooms.

Functional description

For the discharge of the air, the unit has a fan. The fan takes in the room air and discharges it through the heat exchanger to heat and cool the air. A coarse dust filter protects the fan and heat exchanger from dirt. Similar to displacement flow, the secondary air flows through the grille into the room.

Ventilation diagram FSL-U-SEK



- 1 Coarse dust filter G2
- 2 Air heater
- 3 Chiller
- 4 EC tangential fan

Dimensions

Height	212	mm
Depth	340	mm
Width	from 1200	mm

Technical data

Supply air flow rate	80 – 300	m ³ /h
Cooling capacity	214 – 792	W
Heating capacity	494 – 1613	W
Sound power	24 – 42	dB(A)

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Underfloor induction diffuser Type BID



The administration building of the European Investment Bank in Luxembourg, which reopened in 2008, was equipped with Type BID underfloor induction diffusers. In the modern 10-story office building, about 800 employees work under comfortable conditions.

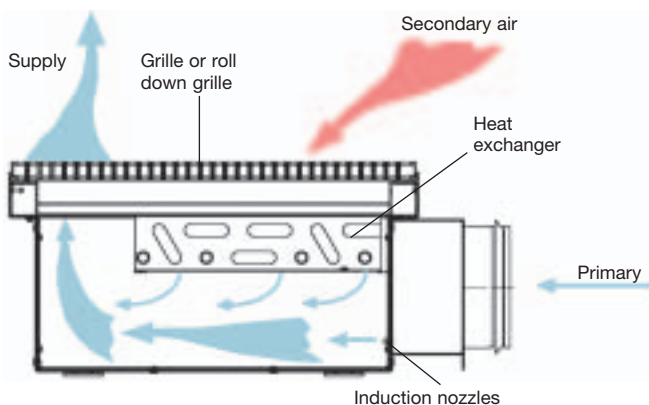
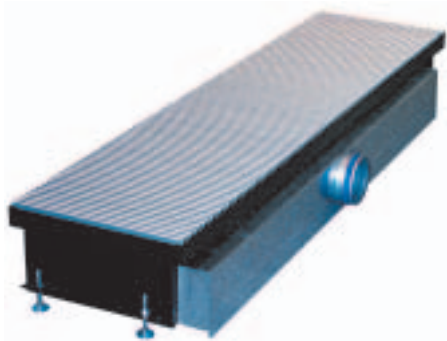
Underfloor induction diffuser Type BID for air-water systems provide modern ventilation technology for buildings with room-high glass façades. The energetic advantages of load dissipation (heating/cooling) through the medium of water makes economic air conditioning possible.

Underfloor induction diffuser Type BID is connected to ducts of the centralised ventilation system and thus supplies the rooms with outdoor air. It needs no own fan and no openings in the façade like decentralised underfloor ventilation units.

Functional description

Underfloor induction diffusers are installed in the false flooring next to the outer façade and supply the perimeter zone or external rooms with centrally conditioned outdoor air (supply air) to maintain the air quality and cover the cooling and/or heating load with heat exchangers.

The supply air flows into the mixing chamber through nozzles. In the process, the room air that is taken into the mixing chambers from the room through the induction grille and heat exchanger is induced. Both air flows mix and flow into the room through a grille at low speed.



Operating modes

- Cooling
- Heating
- Heating operation without supply air

Dimensions

Height	210	mm
Depth	403	mm
Width	1100 to 1800	mm

Technical data

Primary air flow rate	14 – 144	m ³ /h
Cooling capacity, total	229 – 1031	W
Heating capacity, total	244 – 1224	W
Sound power	< 20 – 46	dB(A)

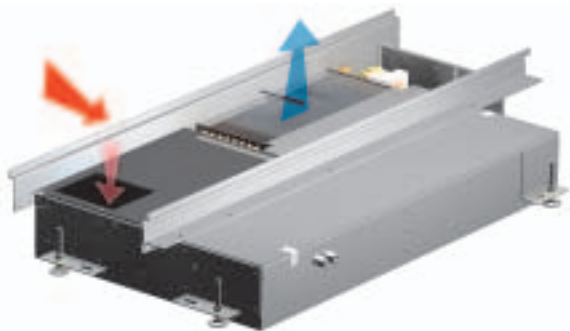
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Decentralised underfloor ventilation units
FSL-U-ZUS · FSL-U-ZAB · FSL-U-SEK
Underfloor induction diffuser Type BID

Supply air unit with secondary air · FSL-U-ZUS



In the new DEG headquarters in Cologne, Germany, about 400 employees work together in a single building. The underfloor ventilation units provided by TROX/FSL for this project are characterised by the low construction height of about 135 mm below the flooring.



Ventilation units Type FSL-U-ZUS supply the building with conditioned outdoor air. For the dissipation of higher thermal loads, room air is mixed with the outdoor air. In this way, the air flowing through the heat exchanger increases, as does the cooling capacity as a result.

Functional description

Supply air units maintain a high air quality in rooms by supplying outdoor air to the room. For the discharge of the air, the unit has a radial fan.

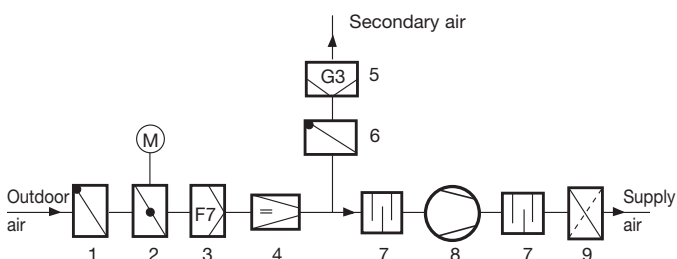
The fan takes in outdoor air, which flows through a volume flow limiter, a non-return damper, a shut-off damper and a fine dust filter. These components prevent the exceeding of the dimensioned outdoor air flow through wind pressure, the switching of the flow direction in case of a negative pressure on the façade and uncontrolled flows when the device is turned off. The F7 fine dust filter complies with the hygiene requirements of VDI 6022.

For the thermal conditioning of the outdoor air heat exchangers for air heating and cooling are used.

For output adjustment, the fan is operated in three stages. In stages 2 and 3, the supply air is greater than the outdoor air flow. The difference is taken in as room air near the floor and admixed to the outdoor air. A system-powered secondary air damper controls the room air flow rate.

Similar to displacement flow, the supply air flows into the room through the grille.

Ventilation diagram FSL-U-ZUS



- | | |
|---------------------------------|------------------------|
| 1 Non-return damper | 6 Secondary air damper |
| 2 Shut-off damper with actuator | 7 Sound attenuator |
| 3 Outdoor air filter F7 | 8 Supply air fan |
| 4 Volume flow limiter | 9 Heat exchanger |
| 5 Secondary air filter G3 | |

Dimensions

Height	180 – 230 mm
Depth	550 – 640 mm
Width	from 1100 mm

Technical data

Supply air flow rate	80 – 200 m ³ /h
Cooling capacity, total	370 – 930 W
Heating capacity, total	530 – 1330 W
Sound power level	35 – 40 dB(A)
Filter (outdoor air)	F7

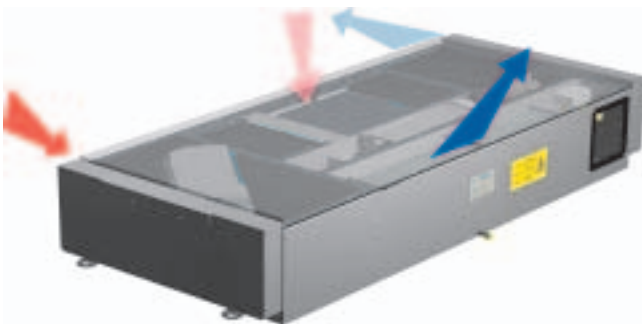
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Supply air unit with secondary air · FSL-U-ZAB

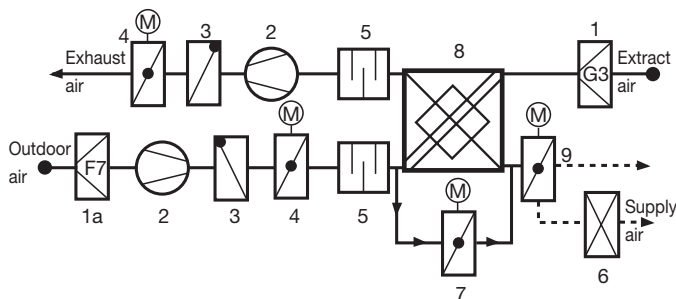


Night view of the "Hofgarten Palais"

The Hofgarten Palais project in Düsseldorf comprises a seven-story office building and three residential buildings. Within the scope of the ventilation concept, decentralised ventilation units Type FSL-U-SEK and FSL-U-ZAB were used. Both variants provide the user.



Ventilation diagram FSL-U-ZAB



- | | |
|---------------------------------|-------------------------------|
| 1 Coarse dust filter G3 | 5 Sound attenuator |
| 1a Fine dust filter F7 | 6 Heat exchanger |
| 2 Fan | 7 Bypass damper with actuator |
| 3 Non-return damper | 8 Heat recovery |
| 4 Shut-off damper with actuator | 9 Thermal switch |

A completely autarchic ventilation of the room is achieved using the so-called decentralised supply and extract air units Type FSL-U-ZAB. The units have the same functions as centralised ventilation systems, but offer the user more individual operation. As in the case of the abovementioned units, they are also installed into false floors so that the room-high window surfaces can be realised.

Functional description

Supply and extract air units maintain a high air quality in rooms by supplying conditioned outdoor air to the room. For the discharge of the air, the unit has two radial fans.

The supply air fan takes in outdoor air, which flows through a volume flow limiter, a non-return damper, a shut-off damper and a fine dust filter. These components prevent the exceeding of the dimensioned outdoor air flow through wind pressure, the switching of the flow direction in case of a negative pressure on the façade and uncontrolled flows when the device is turned off. The F7 fine dust filter complies with the hygiene requirements of VDI 6022.

For the thermal conditioning of the outdoor air heat exchangers for heat recovery, heating and cooling are used. The heat recovery takes place recuperatively using a plate heat exchanger. A part of the heat in the extract air is transferred to the outdoor air. In energetically sensible cases, a bypass damper opens the heat recovery bypass during the transitional period and for the prevention of freezing.

Similar to displacement flow, the supply air flows through the floor grille into the room.

The extract air fan takes in the room air near the floor and discharges it outdoor through the heat exchanger for heat recovery, the non-return damper and the shut-off damper. A coarse dust filter in the extract air protects the fan and heat exchanger from dirt.

Static heating operation without ventilation is possible. The integrated thermal switch closes and the unit works like an underfloor unit.

Dimensions

Height	200	mm
Depth	500	mm
Width	1200	mm

Technical data

Supply air flow rate	60 – 120	m ³ /h
Cooling capacity, total	280 – 560	W
Heating capacity, total	400 – 800	W
Sound power level	39 – 49	dB(A)
Filter (outdoor air)	F7	