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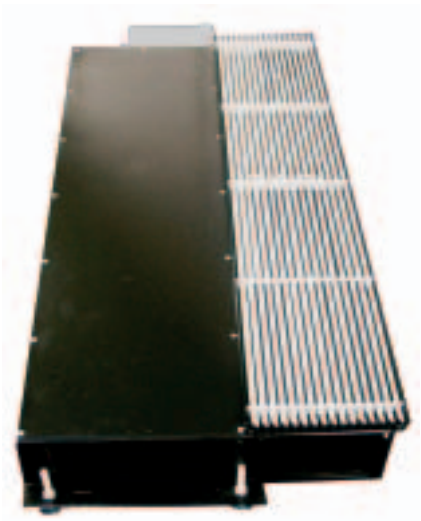
FassadenSystemLüftung
FSL
A Trox Group Company

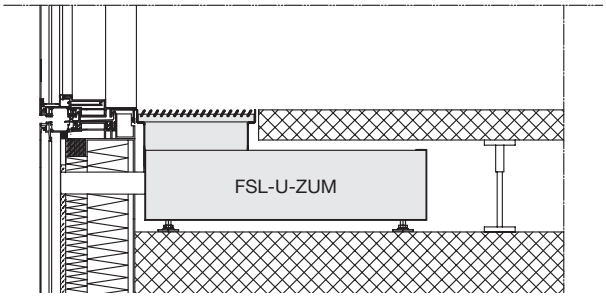
Product information

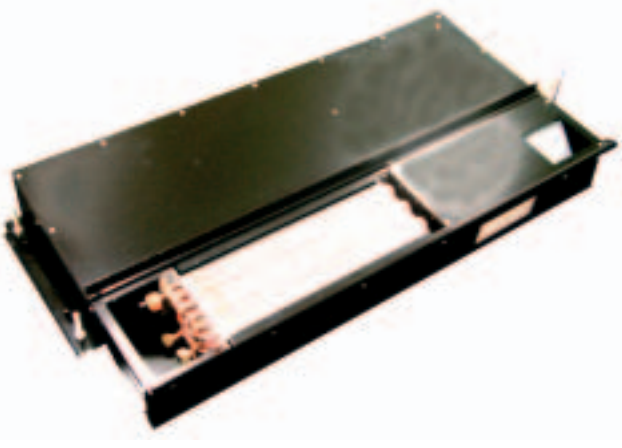
Decentralised underfloor ventilation units Type FSL-U-ZUM

PI/FSL/10/EN/1



Underfloor ventilation units type FSL-U-ZUM with linear grille





Underfloor ventilation unit type FSL-U-ZUM without grille

The system

Type FSL-U-ZUM underfloor ventilation units with supply and recirculated air functions provide decentralised ventilation for individual rooms and complete buildings. The units have a low overall height of only 141 mm and are installed in the underfloor void directly against the façade.

In addition to fresh air supply the units provide filtration, heating and cooling functions. With increased heating or cooling requirements air recirculation is used to optimise energy usage. In addition to heating or cooling using recirculated air the unit can operate in a fresh air only mode.

The benefits

The type FSL-U-ZUM units can be adjusted to provide the required fresh air flow rate or a minimum room air change rate. An automatic flow rate controller limits the fresh air flow rate. Recirculated air is automatically added by increasing the supply flow rate above the preset fresh air value.
An improved heating and/or cooling performance can be achieved by increasing the supply air flow rate to optimise the energy used in the heating and cooling modes.

In the winter, the mixing of the warm air from the room provides additional protection against the coil freezing up. In the summer, the potential for cooling coil condensation is reduced or prevented due to the mixing process.
In addition, it is possible to achieve free heating or cooling for a large part of the year because the mixed fresh and recirculated air does not have to be heated or cooled.
As a result of the suction of air at one point, the risk of short circuits is reduced to a minimum even with a spply flow rate of 200 m^3/h.

At positive pressures of up to 500 Pa on the façade, the fresh air volume flow is kept constant by means of the automatic limiter. In this case the required heating or cooling performance is provided with a reduced fresh air flow rate. A backdraught damper prevents back flow of conditioned air to the outside of the building.

Standard construction includes a supply fan with an AC motor, however, there is an option of a DC motor which offers an energy saving. The fan ensures a constant supply air flow rate within a defined pressure range.

A further advantage of the unit is that both fresh air and recirculated air is filtered using a fine dust filter F6 rating for the fresh air and a coarse dust filter G3 rating for the recirculated air respectively.
This reduces the contamination of the unit, in particular of the coils.
The decentralized underfloor ventilation units comply with the hygienie requirements of VDI 6022.

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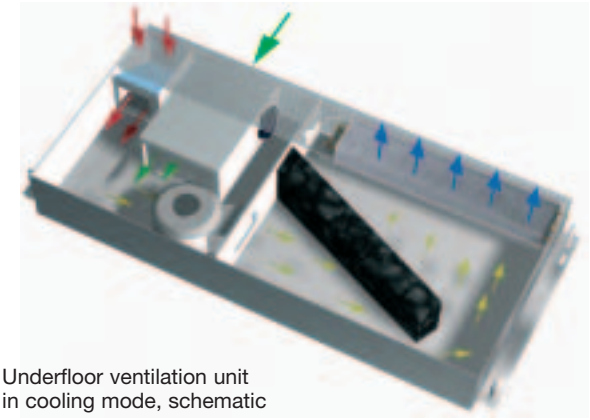
Design and mode of operation

The outside/fresh air is induced directly trough the façade. A backdraught damper and shut-off damper ① and ② are located in the intake spigot. The motorised shut-off damper is fitted with a spring return actuator which closes the inlet when the unit is not operating or in the event of a power failure. The backdraught damper prevents reverse flow of conditioned air in the event of a high negative pressure occurring on the external face of the façade. After the dampers the fresh air passes through the F6 fine dust filter ③. There is then a flow rate controller ④ which can be adjusted to control the fresh air between volume flow rates of 50 to 120 m³/h. The radial flow fan ⑧ provides the necessary pressure development to give the fresh air flow rate and, if required, the recirculated air flow rate.
The standard fan has three speed settings.



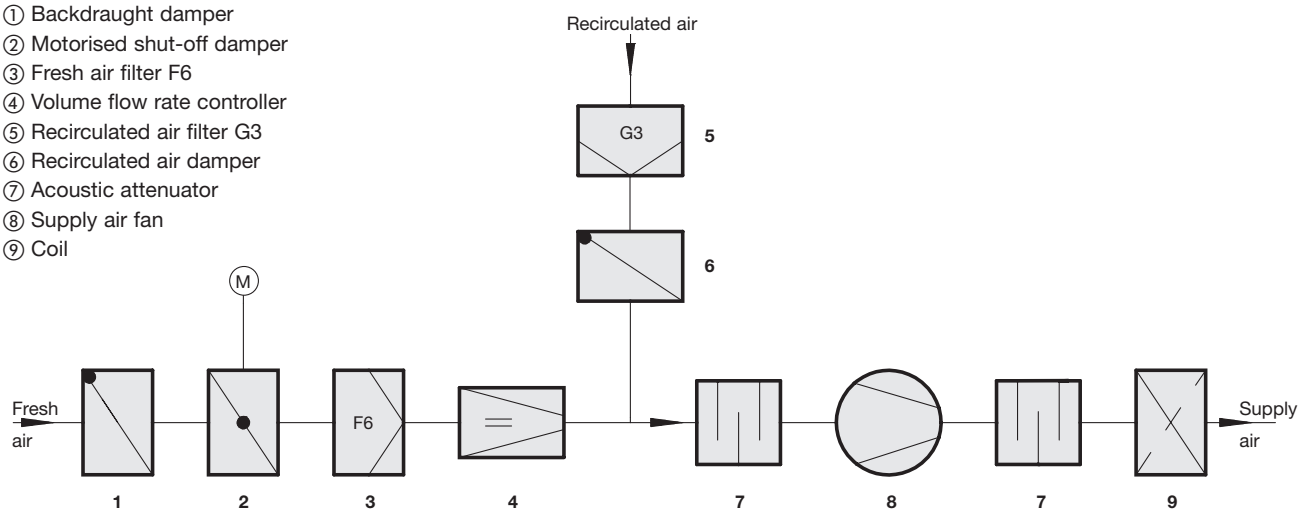
Underfloor ventilation unit
in cooling mode, schematic

The recirculated air enters the unit at the opposite end to the supply air grille. It then passes through the G3 coarse dust filter ⑤ and through the recirculation damper ⑥ and is mixed with the fresh air prior to passing through an attenuation section ⑦, the supply fan ⑧ and another attenuation section ⑦ and finally through a coil ⑨ which can either be a 2 or 4 pipe configuration. The conditioned supply air is discharged into the space via an angle bladed floor grille. All areas of the unit which come into contact with the fresh air are lined with glassfibre covered mineral wool. This is non flammable and erosion resistant up to air velocities of 20 m/s. It does prevent any hygiene risks and is used to provide insulation and unit noise control. The entire casing is made from powder-coated galvanised sheet steel and is torsionally stiff and suitable for human traffic.

The FSL-U-ZUM units have been constructed in a manner to optimise the maintenance functions. All components requiring regular maintenance are located below the supply air grille. Both filters can be easily changed after opening the access panel. The coil can be removed without tools to facilitate cleaning. This also exposes the condensate tray for cleaning.

The type FSL-U-ZUM units can be supplied with an integrated FSL-CONTROL system. The specification of the units described here as well as further information on the FSL-CONTROL system can be found on the internet at www.trox.de on the product page: FSL-Decentralised ventilation systems.

① Backdraught damper
② Motorised shut-off damper
③ Fresh air filter F6
④ Volume flow rate controller
⑤ Recirculated air filter G3
⑥ Recirculated air damper
⑦ Acoustic attenuator
⑧ Supply air fan
⑨ Coil



Schematic diagram for underfloor ventilation units, supply and recirculated air type

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PI/FSL/10/EN/1

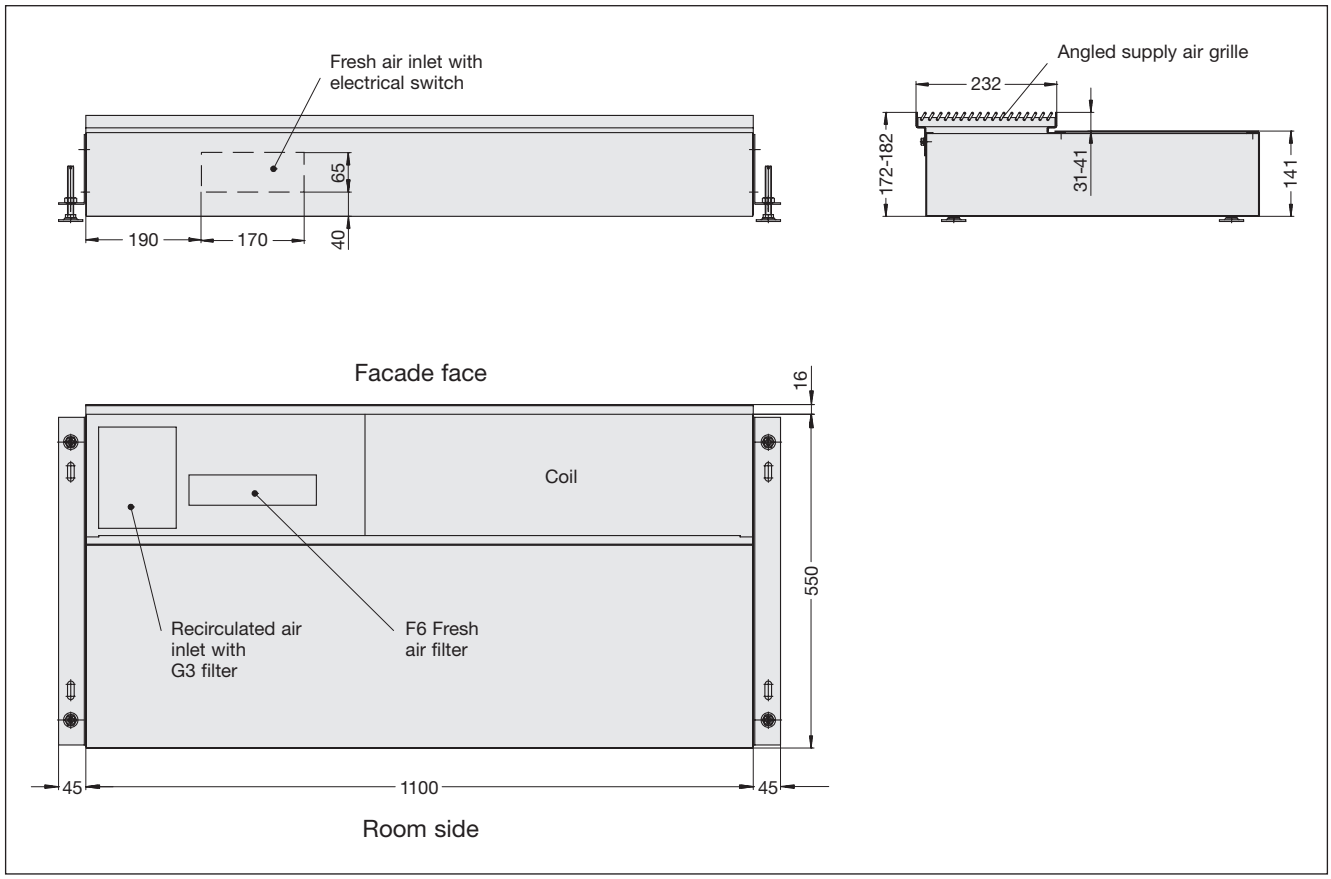
Construction

The two-piece structure of the unit permits a very low height construction of 141 mm in the underfloor void. The part of the unit adjacent to the facade which is visible in the room has been kept as narrow as possible. The supply air grille has a width of 226 mm. The length and width of the grilles can be altered to meet room architectural requirements, alternatively continuous linear or flexible roll down grilles can be supplied. To compensate for structural tolerances the support feet (which are strong enough to support human loads) are adjustable in height by up to 30 mm.

The 4 pipe coil for the unit variant without FSL-CONTROL is equipped with a ½″ internal thread connections.
The maximum operating pressure of the coil is 10 bar, the maximum operating temperature is 90°C.
Further constructions with identical dimensions are available upon request, for example:

- Pure recirculated air unit
- Recirculated air units with steam humidifier
- Supply and recirculated air unit with ionization

Dimensions



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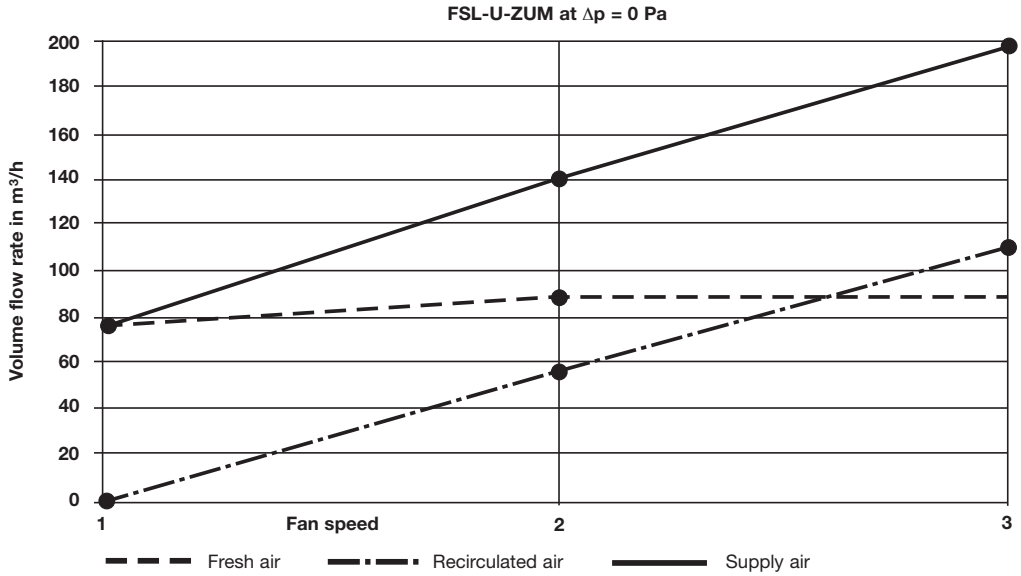
Technical data

The diagram below shows a typical unit configuration with a volume flow rate controller adjusted to 90 m³/h. With fan speed 1 the supply air volume flow rate is 80 m³/h (all fresh air), fan speed 2 the supply air is 140 m³/h (90 m³/h fresh air) and fan speed 3 the supply air is 200 m³/h (90 m³/h fresh air).



The following table shows unit performance data. The performance data may differ depending on the amount of fresh air and/or on the warm and chilled water flow temperature. Project-specific selections can be obtained upon request.

		operation with fresh air only	operation with recirculated air only	operation with mixed air[2)]
Volume flow rate	m³/h	90	120	200
Cooling capacity	W	432	335	715
Air inlet temperature[1)]	°C	32	26	28,4
Relative humidity	%	40	40	40
Air outlet temperature	°C	18	18	18
Chilled water volume flow rate	l/h	48	48	144
Water flow temperature	°C	16	16	16
Water return temperature	°C	23,9	22,1	20,3
Pressure drop water side	kPa	0,3	0,3	3,0
Heating capacity	W	1459	805	1987
Air inlet temperature[1)]	°C	–12	20	7,2
Air outlet temperature	°C	36,3	40	36,9
Warm water volume flow rate	l/h	60	30	138
Water flow temperature	°C	75	75	75
Water return temperature	°C	54	51	62,3
Pressure drop water side	kPa	0,9	0,3	3,9
Sound power level	dB(A)	35	43	48
Room sound pressure level (with 8 dB room attenuation)	dB(A)	27	35	40
Supply voltage	V	230 V / 50 Hz		
AC motor electrical power consumption	W	21	27	49
EC motor electrical power consumption	W	5	11	19

1) corresponds to the air inlet temperature in the coil
2) with 80 m³/h fresh air