

**Project information – Imtech-Haus –
 Decentralised sill ventilation units FSL-B-ZUM
 PI/FSL/13/EN/1**



Imtech-Haus · Hamburg

The building

The new Imtech administration building on the corner of Hammer Strasse and Pappelallee in the Hamburg district of Wandsbeck offers space for around 550 staff in its 16,000 m² floor area.

The contemporary office building has attracted interest due to the high flexibility of the room partitioning and can be used either as open plan or as cellular offices. The offices in the new, twin-block Imtech Haus are equipped with controllable, external solar protection systems.

The rounded corners of the building and red banding set off by shiny metallic rings make an enormous impression.

The ventilation concept

The offices in the five upper storeys are individually and mechanically ventilated by approximately 1,100 decentralised FSL-B-ZUM type ventilation units built in beneath the window sills.

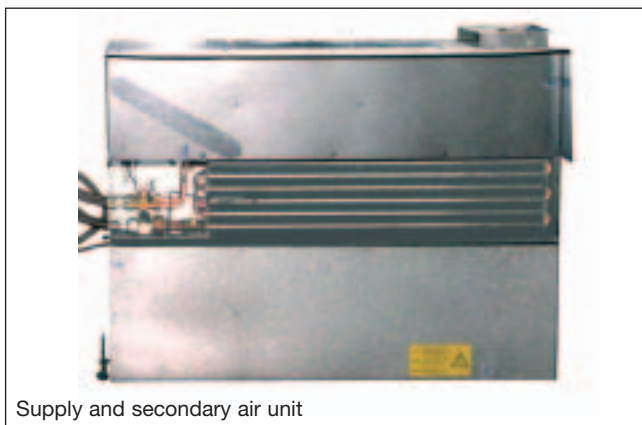
These units have been developed to meet the requirements of the project, such as the local weather conditions in Hamburg, the dimensions of the building structure, the interior trim and the user specifications relating to the external air ventilation rates, cooling and heating performance.

Following comprehensive tests in the Imtech laboratories, this FSL unit development won plaudits as a unique solution by comparison with the original plan to use fan coil units with ventilation air mixing boxes.

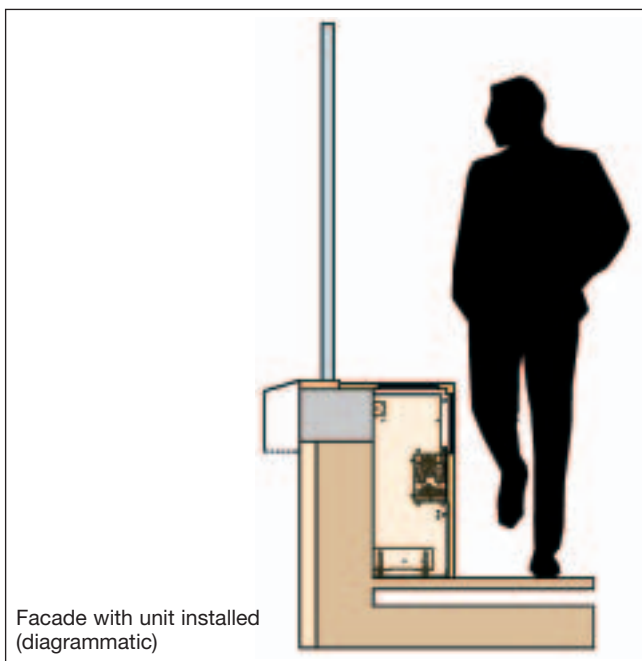
The unit also won friends with its very low noise characteristics, its stable supply of outside ventilation air whatever the weather and wind situation, the optimum provision of supply air and the rapid response times in terms of the provision of cold or warm air depending on requirements.

These units provide mechanical ventilation of the offices with filtered air, heating and cooling. The building structure itself has embedded elements which provide the background tempering of the rooms. The exhaust air passes out of the building through a network of ducting and a central extract system.

The users can additionally open their windows to allow individual natural ventilation.

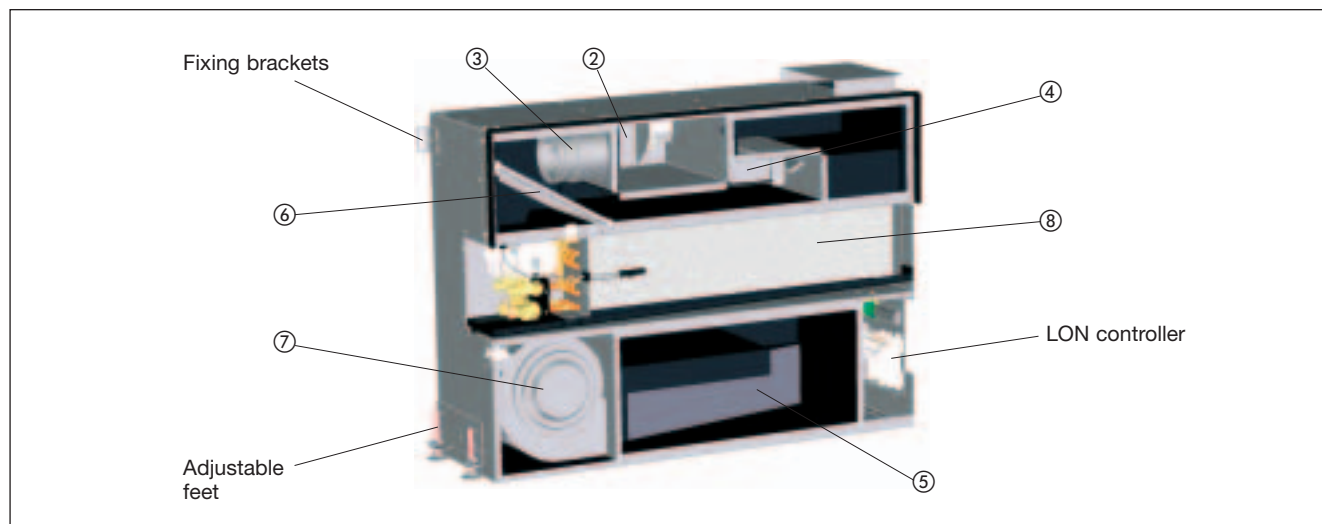
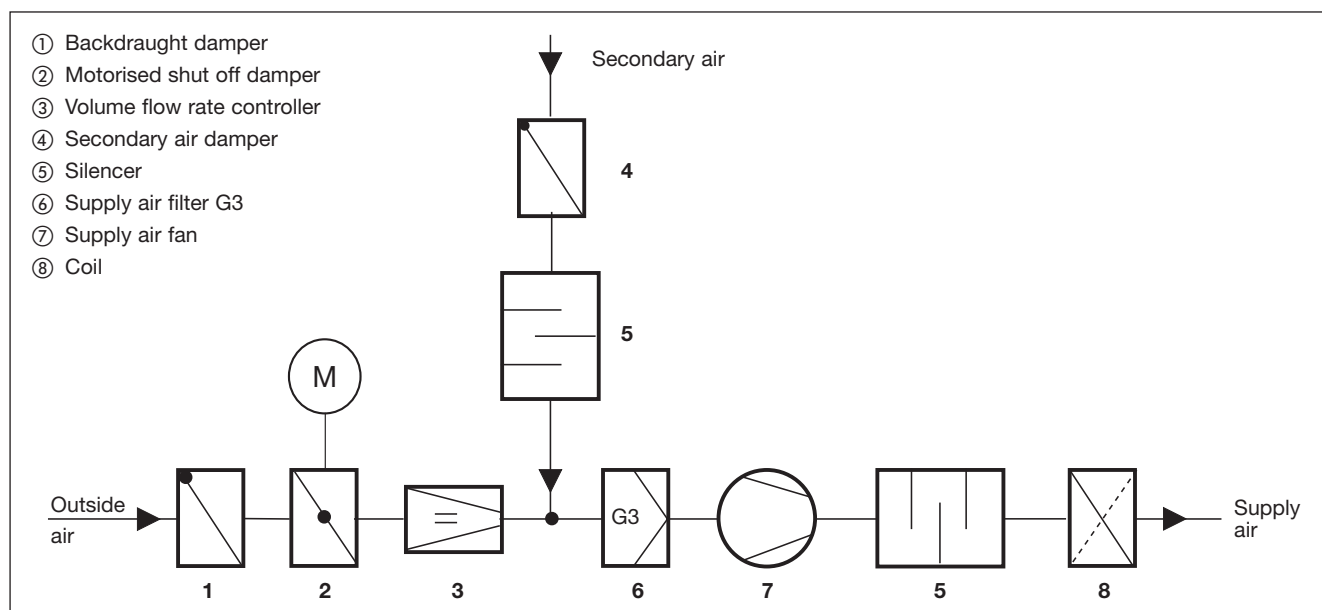


Supply and secondary air unit



Facade with unit installed
 (diagrammatic)

Ventilation schematic type FSL-B-ZUM



The undersill ventilation units – construction

The undersill ventilation units have a galvanised sheet steel casing. The units have glass fibre fabric faced mineral wool for acoustic and thermal insulation. This material is non-flammable (material class A), erosion resistant and presents no health issues.

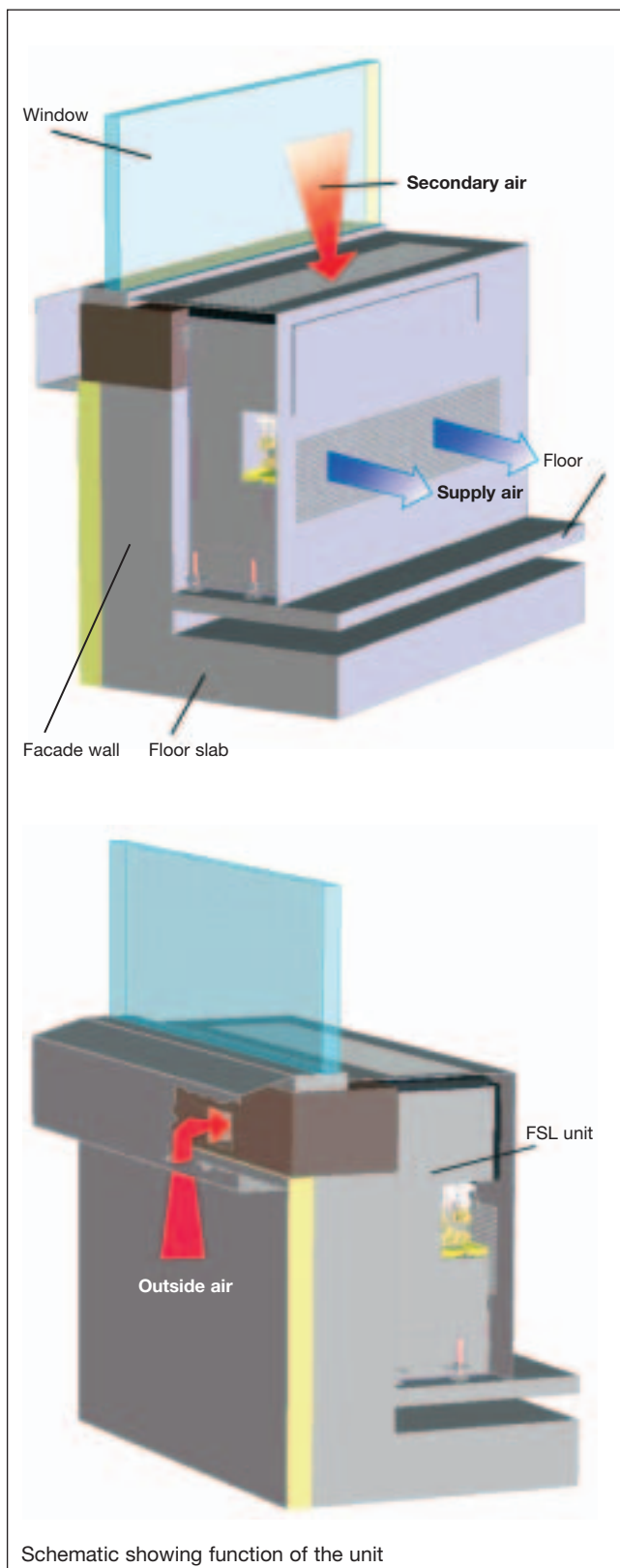
The unit is set up and aligned with the feet located to the side and beneath the unit. The fixing brackets fitted to the side at the top are used to secure the unit to the facade.

In addition to the combined backdraught and spring return motorised dampers, the units have a mechanical automatic volume flow controller, a radial flow fan and a 4-pipe copper-aluminium coil which has a powder coated galvanised sheet steel condensate tray fitted beneath it.

The integral FSL-CONTROL unit includes the heating and cooling valves, valve actuators, water balancing controls in return pipework, LON controller and supply air temperature sensor. There is also a control panel for the client to fix to the room wall. This was supplied in a special Imtech design.

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Function of the supply and secondary air unit (FSL-B-ZUM)

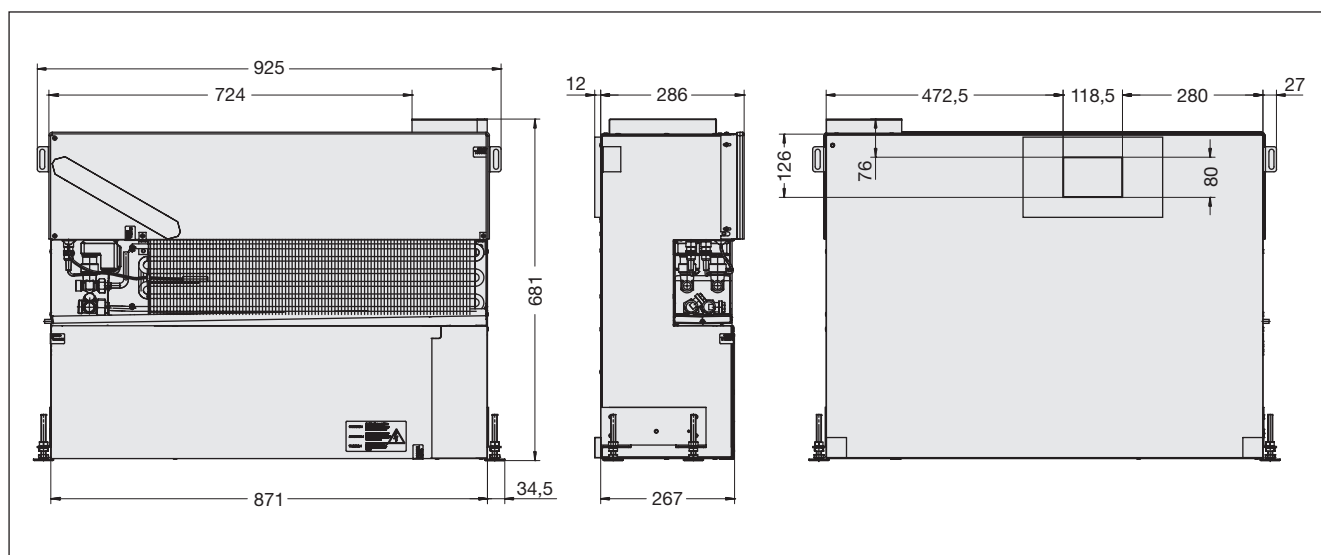
The outside air is taken in through the noise control element built into the facade between the sill and the window. The backdraught damper ① prevents the room air being sucked through the unit to the outside if there is negative pressure on the facade. The motorised shut-off damper with spring return actuator ② also mounted on the fresh air inlet closes the inlet on the unit if the unit is inactive or in the event of power failure. The mechanical automatic flow controller ③ limits the outside air flow to the set value. This prevents, in mixed flow operation, excessive external air flow which could occur due to high wind pressure on the facade which could then change the mixing ratio and, in the extreme case, result in draughts occurring in the room.

Once the supply air has been cleaned in the G3 coarse dust filter ④, the radial flow fan discharges the air through the silencer ⑤. This reduces the fan generated noise and also reduces noise entering the duct work from outside the building. The supply air is heated or cooled in the downstream 4-pipe coil ⑥ and then passes through the sill trim fitted by the client into the room as a displacement flow.

If the supply air fan delivers a greater supply air volume flow than the flow rate controller for the outside air is set to allow, the increased negative pressure will open the secondary air damper ④, room air will be sucked in at the top of the unit through the perforated section of the window sill and this secondary air will be mixed with outside air upstream of the supply air filter. In this way, the supply air volume flow and therefore also the heating and cooling performance of the units can be increased with the proportion of outside air remaining constant and matched to the demands of the room.

The FSL CONTROL system built into the units looks after room temperature regulation by means of controlling the supply air temperature. It also provides frost protection for the coil. The system allows three automatic operating modes each with different room temperature set points, supply air temperature limits and minimum ventilation levels. It regulates the units to ensure that the desired temperature selected for the room is achieved at a guaranteed minimum ventilation rate without exceeding or falling below the specified supply air temperature. The desired room temperature can be varied by +/-5K on the room controls and levels 0/1/2/3 be selected manually.

Dimensions



Technical Data

The acoustic, aerodynamic and thermal optimisation of the under sill units are based on project specific requirements.

The coil selection was based on the required thermal performance and volume flows. The performance of the unit is summarised below.

		Supply and secondary air unit		
Supply air volume flow	m ³ /h	60	90	150
Outside air volume flow	m ³ /h	30	30	30
Sound power level	dB(A)	35	37	43.5
Sound pressure level with 8dB room attenuation	dB(A)	27	29	35.5
Electrical power consumption in operation	W	7	11	20
Total unit cooling capacity	W	340	430	570
Cooling capacity, internal, sensible	W	200	300	500
Outside air temperature	°C	32	32	32
Room temperature	°C	26	26	26
Supply air temperature	°C	16	16	16
Chilled water volume flow	l/h	80	135	150
Chilled water flow temperature	°C	13	13	13
Total unit heating capacity	W	770	820	1030
Internal heating capacity	W	440	480	700
Outside air temperature	°C	-12	-12	-12
Room temperature	°C	20	20	20
Supply air temperature	°C	42	36	34
Hot water volume flow	l/h	30	30	40
Hot water flow temperature	°C	70	70	70