

LUNOS Catalogue for residential Ventilation

Climate for a Feeling of Wellness with LUNOS Ventilation Systems



Lunos

LUNOS Catalogue

Efficient air exchange

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Fresh air for more than 50 years

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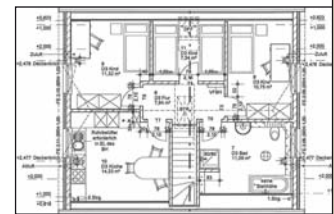
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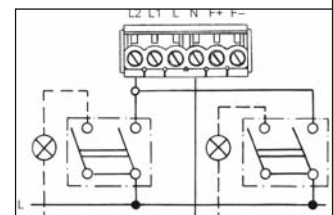
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For more than 50 years

A breath of fresh air

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Reliability and Trust

Quality is lasting reliability

At the beginning – at the times of the “economic miracle” – there was an innovation: LUNOS invented a ventilation stone as a passive ventilation system for kitchen cabinets ventilated from outside. Shortly after this LUNOS became one of the best-known manufacturers of residential ventilation systems. Providing ventilation solutions and components which ensure healthy buildings. Today, LUNOS designs develops and manufactures ventilation systems for the residential market from its location in Berlin offering a complete range of services.

LUNOS provides more than just a pleasant living climate

Our main competence is focussed on demand-driven residential ventilation. This requires customized solutions, LUNOS ventilation systems generate ideal, clean and hygienic ventilation of all rooms, ensuring dry walls free of condensation and mould. In addition, the system provides considerable savings in heating bills and cost effective advantage of low capital and running costs. The LUNOS name guarantees excellent quality and service, this philosophy has ensured us continuous strong growth – both in Germany and in international markets.



In the past

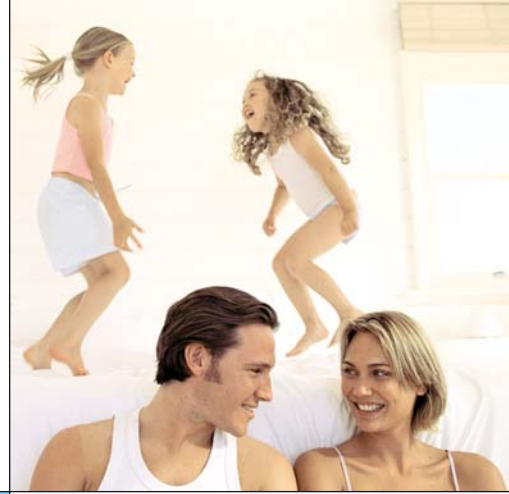
air exchange was made via numerous joints in the building shell, e.g. on the door or window. Moist and unclean ambient air could then escape. This often involved five air change per hour in the home. Condensation and perspiration water only formed on the cold window panes without any consequences. Ventilation occurred only as air escaped from rooms or windows. Infiltration of outside air took place via the leaks in the building. Ventilation in the rest of the home was also ensured through air permeability of the building shell.



in the past: air exchange up to 5 times through building leakage

With LUNOS your house breathes

for the benefit of residents and the building fabric



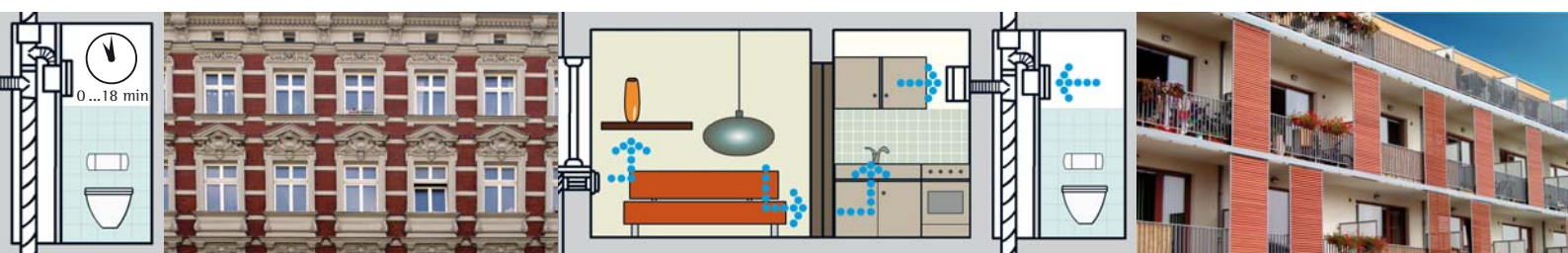
Foundations of residential Ventilation

Where do harmful substances and humidity come from?

Furniture, carpets and paints emit hazardous substances at a very low level. Humidity is generated by residents breathing, showering, household activities like washing, cooking and also from plants. In a four person household, around 10 litres of water evaporate every day, i.e. a full bucket of water.

Where to put the humid, unclean ambient air?

Air can only absorb a limited amount of humidity. The quantity depends on the temperature: warm air absorbs more than cold air. If the warm, humid air cools down, e.g. on a cold surface, this results in condensation. You can see this in summertime on your cool drinking glass. Danger of mold formation on the cooler areas of the external walls such as in the corners. Air humidity can fall as condensation, which is an ideal environment for mold fungus to flourish. It is necessary to protect from humidity damage through ventilation: The humidity contained in the ambient air can only be reduced by effective ventilation. And hazardous substances are also extracted together with the humidity.



Today

the Energy Saving Regulation (EnEV) applies for refurbished and new residential buildings. The buildings must be almost air-tight. This means that there is no ventilation via jointing, and the resident has to provide active ventilation. Effective window ventilation without unnecessary energy loss is almost impossible for the consumer. On account of high energy prices, however, too little ventilation takes place. Humidity damage is the result, which means that both the health of residents and the building substance suffer. Therefore, fresh air needs new channels. LUNOS provides home ventilation systems which supply the right amount of air in a regulated mode, and which transport exhaust air and all hazardous substances to the outside, quickly and discreetly. At the same time they keep air humidity low and mould fungus and mites have practically no chance. If you are an allergic, you can at last take a deep breath, since suspended particles remain outside thanks to the effective, filtered ventilation. Traffic noise is also kept outside thanks to the effective sound absorbers. LUNOS systems only allow the best of the environment into your home.



today: 0.5 times air exchange through the ventilation system

Current Standard

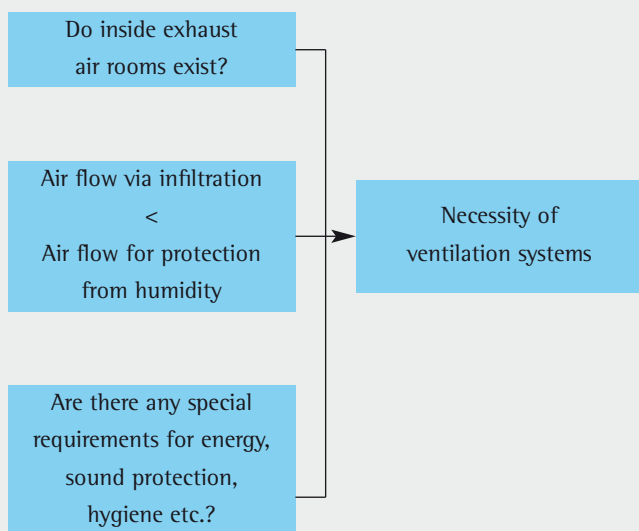
Standards and regulations

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Efficient ventilation

Ventilation of bathroom and WC pursuant to DIN 18017-3: 2009-09

Ventilation of inside bathrooms and WCs pursuant to DIN 18017 – 3 is the most simple form of home ventilation: in DIN 18017 – 3:2009-09 the requirement of continuous ventilation in the bathrooms has again been intensified. Only if high heat protection of the building is ensured and drying of washing does not take place in the home, may the bathroom ventilator have a switch-off function – with 15 min. lag at 60 m³/h. In all other buildings, bathrooms and toilets must now be ventilated in multi-stage mode with continuous exhaust air volume flow. The constant exhaust air flow in the bathroom also provides for continuous, minimal ventilation of the home as a first step to a user-independent home ventilation. Since building tightness of this norm was adjusted to state of the art technology, outside air flow now have to be planned and appropriate air transfer devices provided. With the aid of tables, such design can be executed quickly and simply. Compared to DIN 1946-6, the volume flow requirements of DIN 18017-3 are only related to exhaust air rooms, not to the entire house. A planning tool for this can be downloaded at www.lunos.de. Some extracts on this page and the following pages show important requirements.



DIN 1946-6:2009-05

The EnEV requires sufficient minimum air exchange in addition to continuous building tightness. Evidence of this air exchange can be provided using DIN 1946-6:2009-05. The most important tool of the revised norm is the ventilation concept, since it helps to answer a simple question: Will the new or modernized building be sufficiently ventilated via the building leaks, or which ventilation measures are required to ensure a user-independent air exchange? The answer to this questions results from two steps: first it is established whether ventilation measures are required, and then which ventilation systems are suitable for the implementation of the required measures. The norm also formulates requirements for favourable energetic ventilation systems: exhaust air systems must be equipped either with a user-independent, customized regulation or a heat pump.

Part 1 of the ventilation concept pursuant to DIN 1946-6

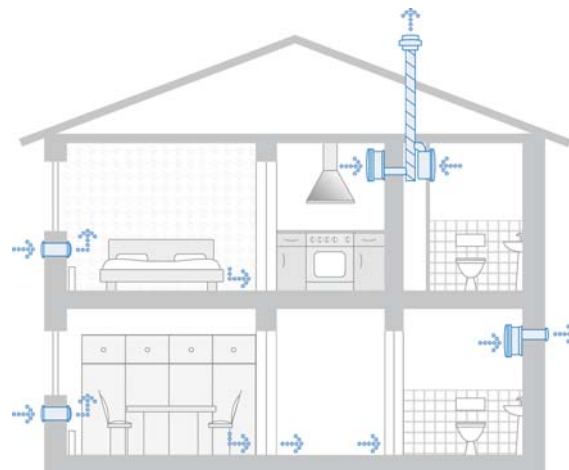
basic conditions



Legislation

At www.lunos.de LUNOS offers a simple planning tool as a download. This tool calculates using the algorithms of the DIN 1946-6 and supports you in planning your ventilation concept in the following points:

- Evidence of necessity of ventilation measures (VM)
- Design of outside air flow ventilation to protect from humidity, reduced, nominal and intensive ventilation
- Calculation of infiltration volume flows without and with VM
- Module design of ventilation system



ENEV 2009

Whether redevelopment or a new construction: Buildings have to be tight pursuant to the Energy Saving Regulation (EnEV). This legal regulation always applies, even for the redevelopment of old buildings, if at least 10 % of the area of the entire building is replaced or renewed. (The same applies when increasing the building volume by at least 30 m³ or extending a room.) (In addition there are building regulations concerning fire, sound protection and protection of historical monuments). In the EnEV 2009 the planned building is compared with a reference building. In the case of a deviation at one point from the reference building, compensation has to be found at another point. The reference building contains a regulated exhaust air systems and thus makes regulated home ventilations a standard.

Therefore, LUNOS: in line with the EnEV

LUNOS systems work in a controlled mode based on parameters of humidity and temperature. Depending on the exhaust air humidity, the volume flow either increases or decreases. In this way, as much as possible and as little as possible is ventilated. The preconditions for the setting-off of this reduced air exchange is provided by the Energy Saving regulation (EnEV) in connection with the DIN V 4701-10:

EnEV, Annex 1:

(...) 2.10. Precondition for setting-off of mechanically driven ventilation systems (re. § 3 para. 2)

Within the scope of calculation (...), off-setting of heat recovery or an air exchange rate reduced by regulation is permissible for mechanical ventilation systems (...).

DIN 4701-10, 5.2.4:

(...) A reduction of the system air exchange under n_A , norm=0.4 l/h

is only admissible within the scope of public verification procedure, if regulation of the air volume flow is made based on at least one suitable, effective reference variable irrespective of the user, and it can be proven via rules in accordance with state of the art that healthy hygienic and constructional air conditions are generated in the case of reduced air exchange. The minimum off settable system air exchange is thus $n_{A,min}= 0.35$ l/h.

This reduced system air exchange is used for calculating the ventilation heat losses in DIN V 4108-6.

DIN V 18599:

When calculating the energy requirements of residential buildings, a median system air exchange of 0.35 l/h can be used for regulated ventilation systems, pursuant to DIN V 18599-10 Point 5, Table 3. This is an advantage over manually regulated ventilation systems with a median system air exchange of 0.4 l/h.

LUNOS Ventilation System

demand-driven residential ventilation:

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System Technology

The Principle

LUNOS ventilation systems are based on a regulated flow across the entire home. According to requirements and the level of humidity, fans transport exhaust air from the bathroom, WC or wash room into the open, or into exhaust air chutes. This results in a slight low pressure in the living area. On account of the low pressure, fresh, filtered air flows through the air transfer devices into the living rooms and bedrooms, children's rooms and work rooms. Surplus flow openings in the doors ensure ventilation bond between supply air and exhaust air rooms. This means there is a continuous transport of fresh air: from the outside firstly into the living area, then into the exhaust air rooms. With no noise, no wind, no hazardous substances. And the wind pressure relief device and volume flow restrictors in the supply air elements ensure there is no draft. The integrated sound absorbers ensure that only fresh air comes into the house, instead of noise, on busy roads.

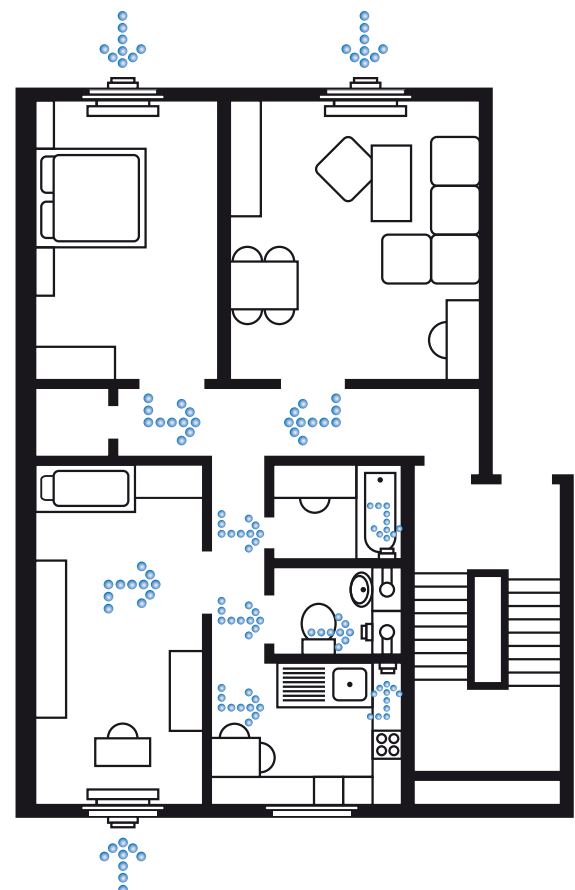
As a result, a ventilation system is developed from the individual room ventilation providing ventilation for the entire living area. If this system is operated with continuous primary ventilation, the step to residential ventilation has been made. By combining several fans, efficient ventilation systems are developed, also for larger apartments, which can be operated using various regulation systems:

- Three-stage operation
- Time lag with interval switching
- Humidity-regulated operation

Special consideration should be given to the humidity-regulated residential ventilation. With these officially approved systems, considerable ventilation heat losses can be saved in accordance with the EnEV.

Regulated, demand-driven residential ventilation with LUNOS

What comes in?	<ul style="list-style-type: none"> • Fresh, filtered air – always enough, with no draft
What goes out?	<ul style="list-style-type: none"> • Humid and odorous air from the kitchen, bathroom, WC etc. • Hazardous substances and solvent evaporation of paints, carpets, furniture etc.
What remains inside?	<ul style="list-style-type: none"> • Suspended particles (in filter inserts)
What remains outside?	<ul style="list-style-type: none"> • Schwebstoffe (durch Filtereinsätze) • Noise (via sound-insulated outside wall elements) • Wind (via wind pressure relief on the outside wall elements) • Mould fungus and household mites (via continuous, low air humidity)





It's the dosage that counts

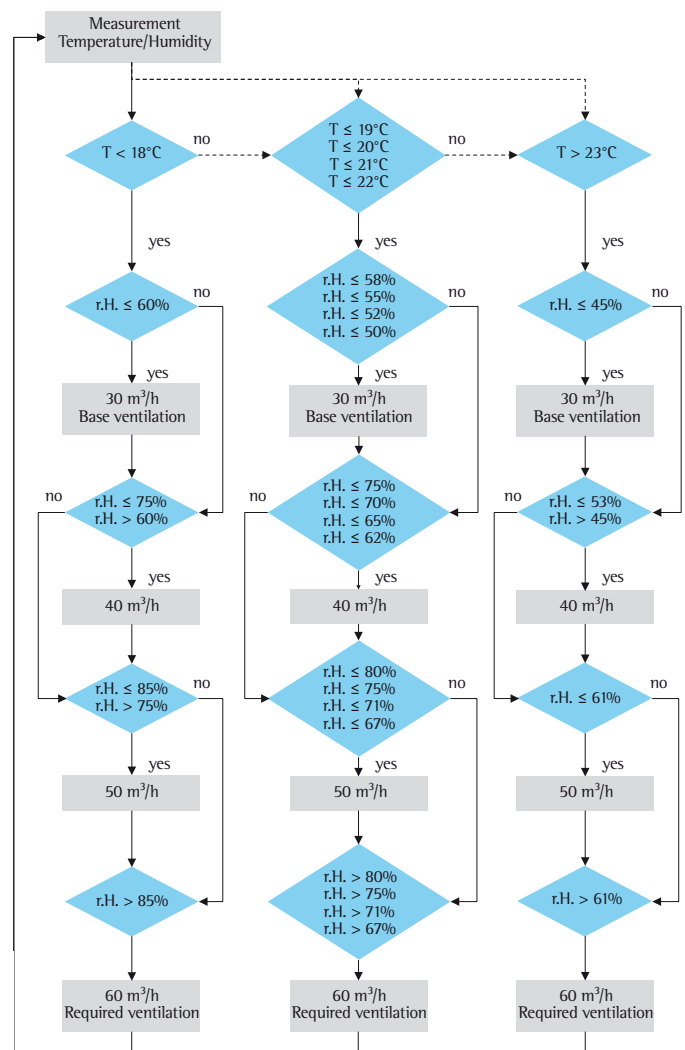
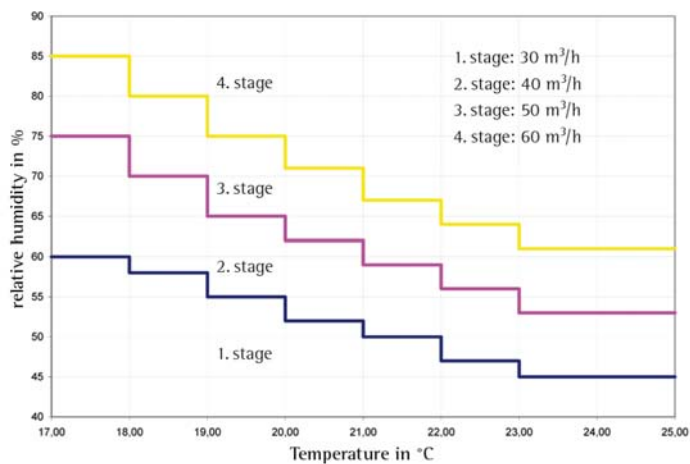
Requirement regulation: Humidity and Temperature

Innovative regulation: Humidity and temperature

Regulation of exhaust fans in line with respective requirements has been equipped for the first time with a humidity-temperature sensor. This innovative regulation automatically adjusts the fan stage to the ventilation requirement: depending on relative air humidity, the volume flow increases or decreases. This means that as much as is required and as little as is needed is always ventilated. The sensor integrated in the suction area of the exhaust fan, records the temperature and the humidity content of the exhaust air volume flow. Since the fan is integrated in the bathroom or the WC and more ambient air conditions are generated here than in the living area, simultaneous evaluation of temperature and humidity achieves fan triggering adjusted to the ambient air conditions in the living area: Therefore, the regulation not only considers the requirement in the bathroom, but also in the living rooms and thus provides effective protection against damage from humidity and mould formation. The automatic season switch sets the fan automatically to the lowest stage in summer, or back to humidity regulation in the transition period and in winter.

The right dosage of ventilation protects and saves

- mould can form as of a relative humidity of 60 %
- moist walls provide inferior insulation





Solutions

for apartment buildings

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Apartment buildings



Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.

ALD-R 110 $\dot{V}_{8Pa} = 10 \text{ m}^3/\text{h}$



Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.

ALD-R 160 $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$



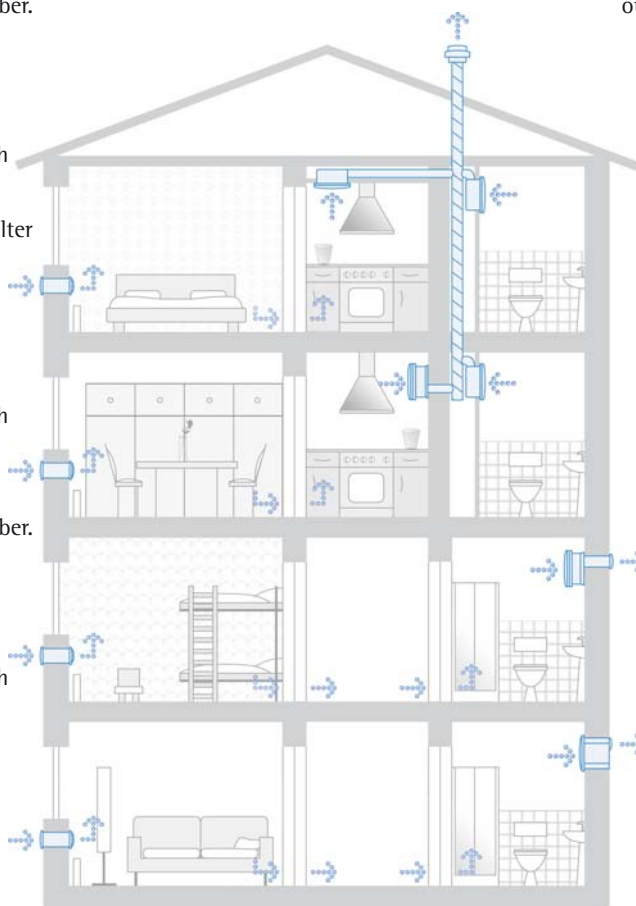
Air transfer device with angular cross-section. Wind pressure relief, filter and sound absorber.

ALD 36,5 $\dot{V}_{8Pa} = 24 \text{ m}^3/\text{h}$



Air transfer device with façade element with almost invisible outer surface.

LUNOotherm $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$,
 $D_{n,W,open}: 53 \text{ dB}$



Surface mount fan for assembly to wall. Ventilates in a line or outside through the wall.



Silvento
3/AP

Flush mount fan for fast and wall-flush assembly in the outside wall. Ventilates in a line or outside.



Silvento KL

Flush mount fan for flat and wall-flush assembly. Ventilates in a line.



Silvento
3/UP-R,
3/UP-A

Flush mount fan with fire protection casing for installation in chute walls with requirements for duration of fire resistance. Ventilates in a line.



Silvento
3/UP-BA,
3/UP-BR

In this example the air is extracted from the kitchen and bathroom via fans arranged de-centrally in these rooms, and emitted via a common exhaust line through the roof. This causes a slight low pressure in the living area, as a result of which fresh air flows into the living rooms and bedrooms through the air transfer devices. Surplus flow openings such as gaps at door saddle or similar devices provide a ventilation link between exhaust air and supply air rooms.



ALD-R 110

Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.
 $\dot{V}_{8Pa} = 10 \text{ m}^3/\text{h}$



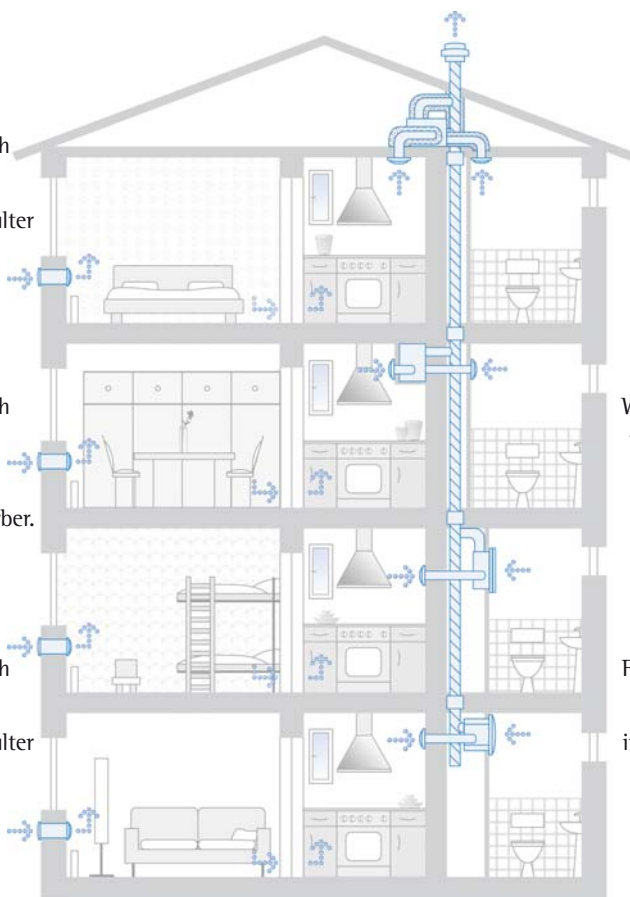
ALD-R 160

Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.
 $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$



ALD 36,5

Air transfer device with corner cross-section. Wind pressure relief, filter and sound absorber.
 $\dot{V}_{8Pa} = 24 \text{ m}^3/\text{h}$



Central fan for installation in partition wall, cabinet or ceiling area. Ventilates max. three rooms in one line or outwards.



LUNOMAT-F

With two-room set (3/S2) Flush mount fan for flat, wall-flush assembly. Ventilates two rooms in one line.



Silvento 3/UP-A, 3/UP-R

Flush mount fan with fire protection casing for installation in chute walls with requirements for duration of fire resistance. Ventilates two rooms in one line.



Silvento UP-2BA, UP-2BR

In this case, used air is also extracted from the kitchen and the bathroom. However, in this case this is achieved by means of exhaust devices installed centrally in the apartment which emit the air either through a common line or through the outside wall.



Solutions

for detached houses

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Detached Houses



Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.

ALD-R 110 $\dot{V}_{8Pa} = 10 \text{ m}^3/\text{h}$



Air transfer device with round cross-section. Wind pressure relief, filter and sound absorber.

ALD-R 160 $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$



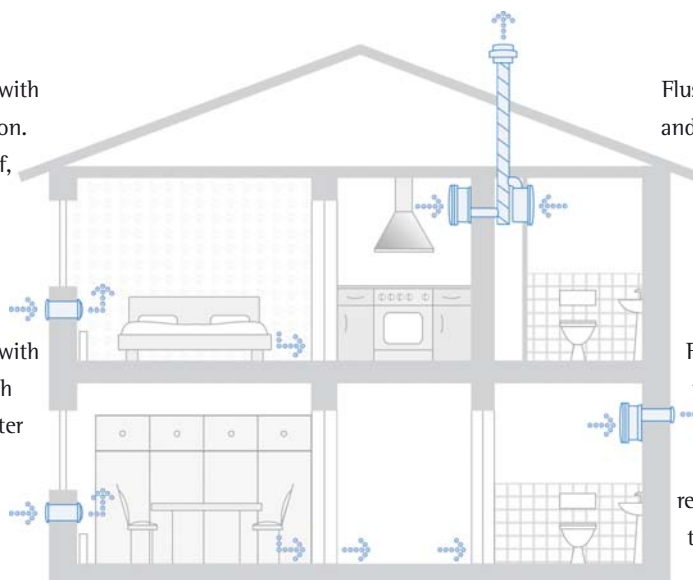
Air transfer device with angular cross-section. Wind pressure relief, filter and sound absorber.

ALD 36,5 $\dot{V}_{8Pa} = 24 \text{ m}^3/\text{h}$



Air transfer device with façade element with almost invisible outer surface.

LUNOotherm $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$,
 $D_{n,W,open} = 53 \text{ dB}$



Surface mount fan for assembly to wall. Ventilates in a line or outside through the wall.



Silvento
3/AP

Flush mount fan for fast and wall-flush assembly in the outside wall. Ventilates in a line or outside.



Silvento KL

Flush mount fan for flat and wall-flush assembly. Ventilates in a line or outwards.



Silvento
3/UP-R,
3/UP-A

Flush mount fan with fire protection casing for installation in chute walls with requirements for duration of fire resistance. Ventilates in a line.



Silvento
3/UP-BA,
3/UP-BR

In this example, used air from the kitchen or bathroom is either emitted via a short line via the roof, or fans are installed on or in the outside wall. Exhaust air is emitted directly to the outside.



Air transfer device with round cross-section.
Wind pressure relief, filter and sound absorber.

ALD-R 110 $\dot{V}_{8Pa} = 10 \text{ m}^3/\text{h}$



Air transfer device with round cross-section.
Wind pressure relief, filter and sound absorber.

ALD-R 160 $\dot{V}_{8Pa} = 30 \text{ m}^3/\text{h}$



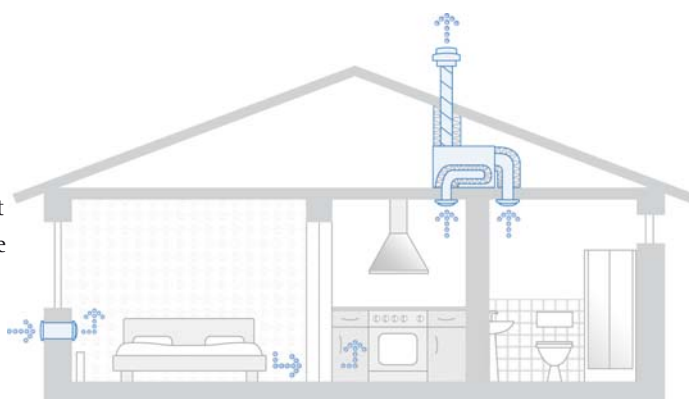
Air transfer device with angular cross-section.
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Air transfer device with façade element with almost invisible outer surface.

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 $D_{n,W,open} : 53 \text{ dB}$



Central fan for assembly in partition wall, cabinet or ceiling area. Ventilates max. three rooms in one line or outwards.



LUNOMAT-F

In this case, used air from the bathroom and kitchen is extracted via the LUNOMAT-F fans installed centrally in the ceiling area, and emitted through a short line via the roof.



Benefits and Costs

If you regulate your ventilation,

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Benefits and Costs

Cost estimates

Apartment buildings

3-room apartment,
Living space approx. 70 m².
Decentral ventilation e.g. with
– KL30-60FK from 900,- €
– KL30-60
– ALD-R160
– Switch

Ventilation per apartment
e.g. with
– LUNOMAT-F from 900,- €
– ALD-R160
– Switch

Solution for individual rooms
(no regulated apartment
ventilation)
e.g. with
– Junior from 90,- €
– Switch

for detached houses

4-room house, living area
approx. 90 m². Decentral venti-
lation (without piping) e.g. with
– 3/UP-A, V30-60 from 1.100,- €
– 30-60FK
– ALD-R160
– Switch

Central ventilation
e.g. with
– LUNOMAT-F from 1.250,- €
– ALD-R160
– Switch

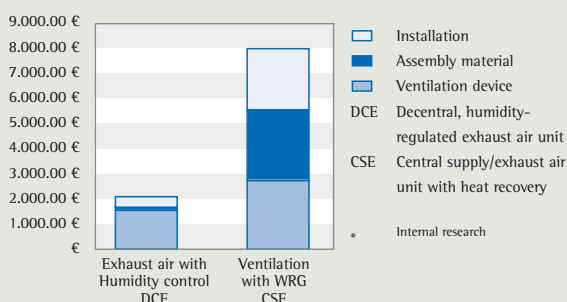
Solution for individual rooms
(no regulated ventilation in
living area)
e.g. with
– Junior from 90,-€
– Switch



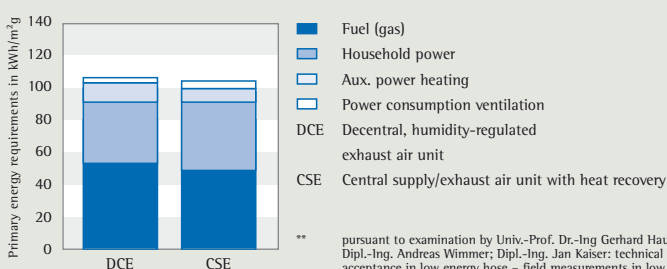
It's worth it: You can already save when planning.

The calculation example for a 120 m² detached house shows the advantages which LUNOS offers compared to other systems such as heat recovery. While operating costs are almost the same, you save considerably in terms of acquisition and installation costs.

Investment costs*



Operating costs**

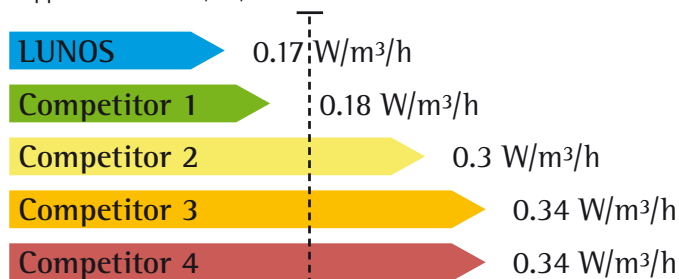


** pursuant to examination by Univ.-Prof. Dr.-Ing Gerhard Hausladen; Dipl.-Ing. Andreas Wimmer; Dipl.-Ing. Jan Kaiser; technical acceptance in low energy house – field measurements in low energy houses in Leipzig-Knauthain, 2002; database: heating period 2000/2001; 1.9.2000–31.5.2001 bei T outside <15°C

you reap the benefits

Financial support

Support from 0.2 W/m³/h



Comparison of volume-specific power consumption at 60 m³/h

Financial support for LUNOS ventilation systems 2009

LUNOS residential ventilation systems make a positive contribution to current legal requirements for energetic building standards and are now supported financially by the KfW programme 'Energieeffizient Sanieren' (Energy-efficient redevelopment), within the scope of an overall development project or as an individual measure. Home owners whose houses were completed by 31. December 1994, receive a subsidy for the execution of individual measures as well as the opportunity of a favourable loan.



The subsidy is 5 % of the investment costs subject to support, maximum 2,500 € per living unit. Further information from the KfW Support Bank for the programme: www.kfw-foerderbank.de. LUNOS ventilation systems regulated according to needs with humidity-temperature regulation are just as eligible for support as ventilation systems with heat recovery or compact units with air/air-heat transfer and exhaust air pump, since the specific electric power consumption is below Pel, Unit 0.20 W/(m³h).

The remarkable energy saving effects of a building when using residential ventilation have now been confirmed by the Bundesindustrieverband Haus-, Energie- und Umwelttechnik e.V., and the Fraunhofer Institut für Bauphysik*. As a result, these clear energy-saving features of regulated residential ventilation are now being rewarded by the legislator in the form of subsidies. The building owner can now benefit from a variety of other positive features of residential ventilation, in addition to the energetic effects: a healthy, cosy, consistently fresh ambient temperature and protection of the building substance, and thus added value to the property.

*The Fraunhofer Institut IBP carried out a study, 'Berechnung des Primärenergiebedarfs einer Zu- und Abluftanlage mit Wärmerückgewinnung im Vergleich zu einer bedarfsgeführten (feuchtegeführten) Abluftanlage' (Calculation of primary energy requirements of a supply and exhaust air system with heat recovery compared to a needs-regulated (humidity-controlled) exhaust air system), and found that the total primary energy requirements of the needs-controlled exhaust air

system for the model apartment examined in colder regions of Germany is almost identical with the supply and exhaust air system with heat recovery when using local/community heating from cogeneration of heat and power. When using regenerative energies, the needs-regulated exhaust air system is better than a supply and exhaust air system with heat recovery in terms of primary energy.

The New fan generation

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Silvento



No disturbing noises: low sound level

Living and traffic zones are moving closer and closer to each other. However, we only feel 'at home' in our 'quiet walls'. This is why the motors of Silvento have been optimized, the geometries of the impeller and air-treated components redesigned based on experimental studies, and greatly improved. The result is one of the most silent fans in the world. All Silventos excel on account of their minimal operating noise, which is hardly audible, since the sound level is just: **24 dB(A) at 30 m³/h (basic ventilation) and 35 dB(A) at 60 m³/h (needs ventilation).**



For the environment: minimal power consumption at maximum energy efficiency – in line with the EnEV.

Silvento counteracts increasing energy costs and rising pollution of the environment. On account of the development of more efficient drive units with high efficiency, the new generation of fans is typified by extremely low power consumption. At 3 volume flow levels, the power consumption amounts to just: **4.9/10.5 W at 30/60 m³/h delivery volume – maximum pressure difference 210 Pa**



For technology and comfort: humidity and temperature control

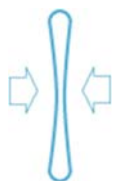
The regulation of exhaust air fans in relation to needs has been fitted for the first time with a humidity-temperature sensor. This innovative regulation can adjust the exhaust volume flow even better and more exactly to the existent living area conditions, and provides effective protection against damage from humidity and mould formation. The automatic season switch switches the fan automatically to the lowest level in summer, and back into the humidity regulation in the transition period and in winter. In addition to the automatic control, all Silventos also have central control and movement control thanks to an integrated presence sensor.



Friendly service and easy operation is guaranteed by the clearly visible LED which displays the filter exchange required and shows the operating status in connection with the humidity-temperature control.

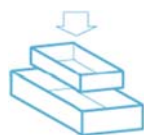
Silvento

the quietest, the most economical



Elegant low-key design

The design of the Silvento range has been deliberately kept simple in order to attract as little attention as possible in all rooms. Yet, it still has elegance. The air flow is still made on the rear side so that no dirt sediment is visible. The front screen is very flat and the dimensions show how compact the fan is: **Surface mount with 260 x 260 x 108 mm (W x H x D)** and **flush mount with 260 x 260 x 23 mm** and **flush housing with 235 x 235 x 92 mm**

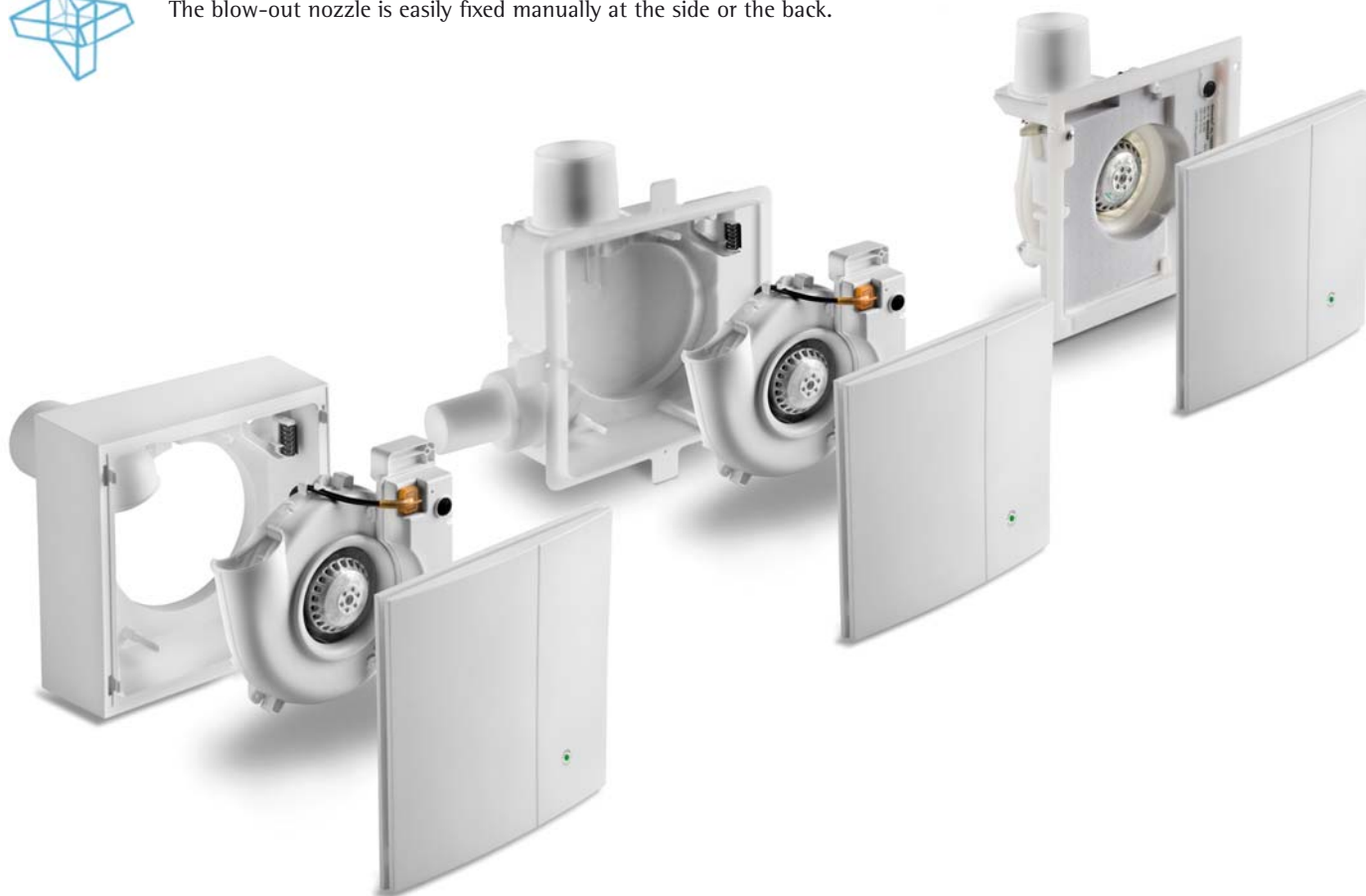


LUNOS Long-term compatibility

The Silvento flush mount fans are completely 100% downwards compatible with all former fan series of the old LUNOS generation. The Silvento clamp fan can be installed in the existing wall flush mount housing with and without fire protection, and enables swift adaptation to state of the art technology.



The Silvento housing can be used universally. It can be installed in all positions, The blow-out nozzle is easily fixed manually at the side or the back.





Exhaust air fans

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Overview

Silvento: Technical Data

Silvento Type	Volume flow	Power consumption	Sound level	Time lag	Interval	Inverse operation	Movement sensor	Humidity regulation range
V ¹⁾ or KL ²⁾	[m³/h]	[W]	[dB(A)]	[min.]	[h]			[% r.H.]
30-60-100	30/60/100	4,9/10,5/36,5	24/35/44					
30-60B	30/60	4,9/10,5	24/35				yes	
30-60ZII	30/60	4,9/10,5	24/35	6/ 15 ³⁾	4	yes		
30-60BZII	30/60	4,9/10,5	24/35	6/ 15 ³⁾	4	yes	yes	
60ZII	60	10,5	35	6/ 15 ³⁾	4	yes		
60BZII	60	10,5	35	6/ 15 ³⁾	4	yes	yes	
30-100ZII	30/100	4,9/36,5	24/44	6/ 15 ³⁾	4	yes		
30-100BZII	30/100	4,9/36,5	24/44	6/ 15 ³⁾	4	yes	yes	
100ZII	100	36,5	44	6/ 15 ³⁾	4	yes		
100BZII	100	36,5	44	6/ 15 ³⁾	4	yes	yes	
30-60 FK	30/40/50/60	5,3/7,2/8,9/10,9	24/27/32/35					50 - 70

1) Silvento V are fan inserts which require a flush or surface housing.

2) Silvento KL are complete single-pipe fans clamped into the front-wall constructions.

Silvento KL single-pipe fans fit into the flush housing of the series LUNOS Skalar.

3) The updated DIN 18017-3 specifies a time lag of at least 15 minutes at 60 m³/h after leaving the room.

Overview: Technical Data

Reverse Compatibility

Compatibility Silvento: Exchange of series Skalar and Saphir

Old fan: Saphir or Skalar	New fan: Silvento	New housing
Saphir-60	V 30-60-100	3/AP
Saphir-60 ZI	V 60ZII	3/AP
Saphir-60 LZI	V 60BZII	3/AP
Saphir-100	V 30-60-100	3/AP
Saphir-100 ZI	V 100ZII	3/AP
Saphir-100 LZI	V 100BZII	3/AP
Saphir-F	V 30-60FK	3/AP
Skalar-G	KL 30-60-100	-
Skalar-VG	KL 30-60-100	Fits in exist. housing
Skalar-ZI	KL 60ZII	-
Skalar-VZI	KL 60ZII	Fits in exist. housing
Skalar-F	KL 30-60FK	-
Skalar-VF	KL 30-60FK	Fits in exist. housing
Skalar-2VG	KL2 30-60-100	Fits in exist. housing
Skalar-2VZI	KL2 100ZII	Fits in exist. housing

When using the surface mount ventilation unit a new housing and appropriate fan insert has to be selected, also refer to Overview Table.

The flush mount housings of the Skalar series do not need to be replaced. The new Silvento clamp fan fits into the housings 3/LS, 3/LB, 3/LS2, 3/LB2 and the wall section of the Skalar clamp fan.





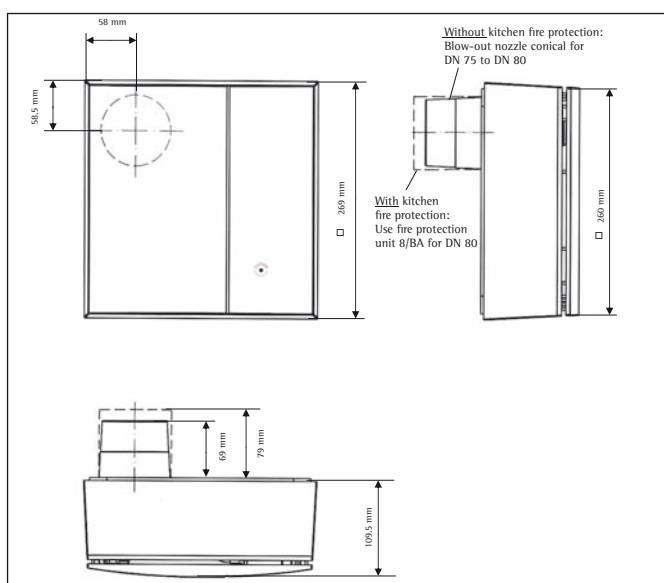
Exhaust Fans

Overview

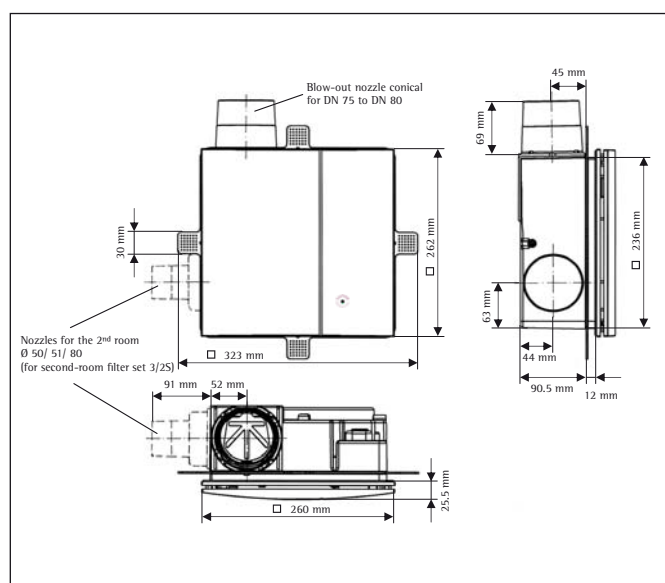
20 · 21

Overview

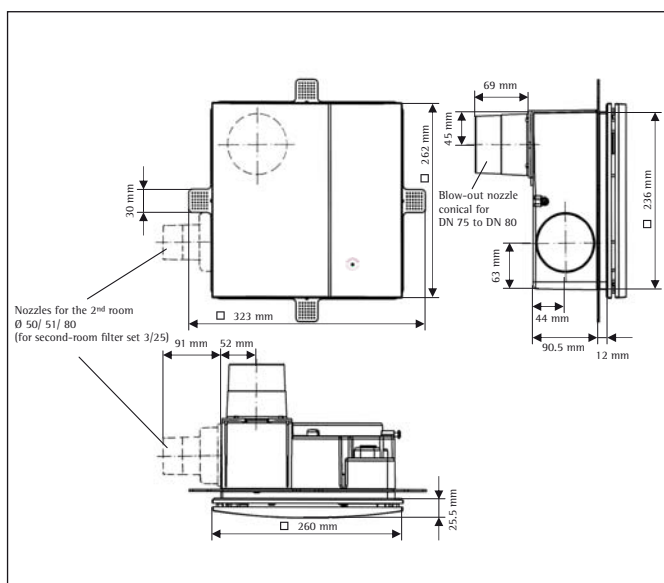
Silvento with AP Housing



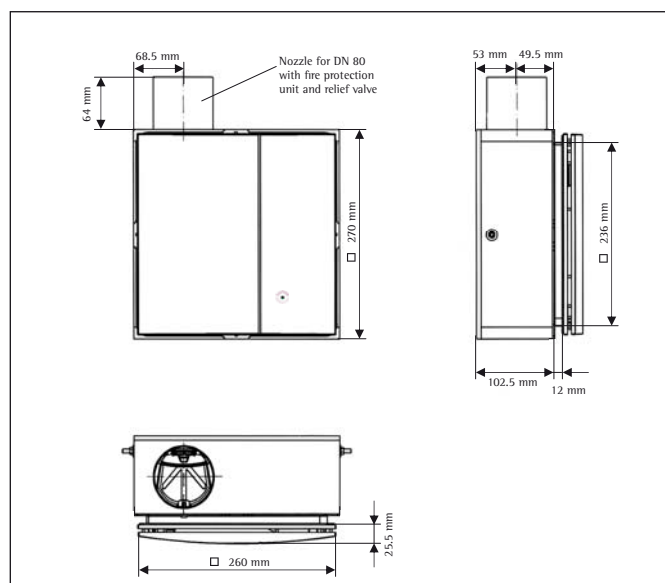
Silvento with UP-R Housing



Silvento with UP-A Housing



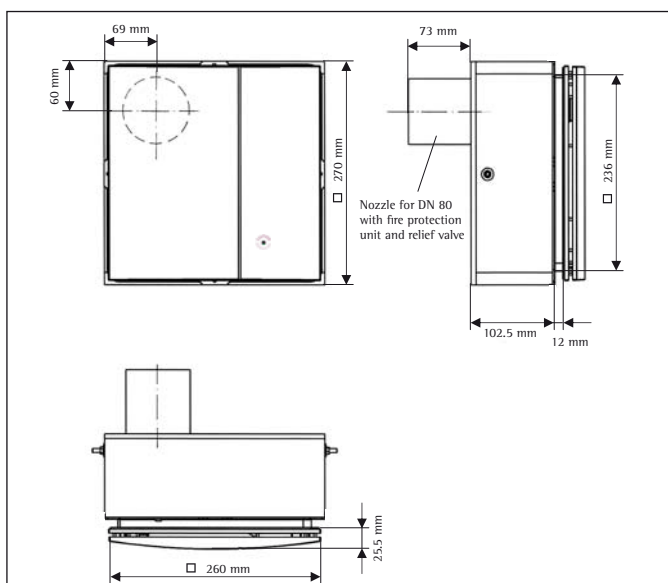
Silvento with UP-BR Housing



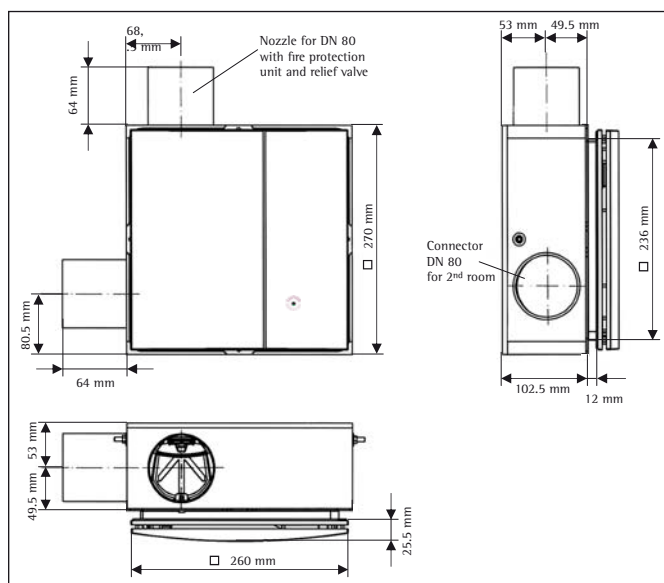
When replacing the surface mount ventilation unit a new housing and fitting ventilator insert have to be selected, also refer to Overview Table.

The flush mount housing of the Skalar series do not have to be replaced. The new Silvento clamp fan fits into the housings 3/LS, 3/LB, 3/LS2, 3/LB2 and the wall section of the Skalar clamp fan.

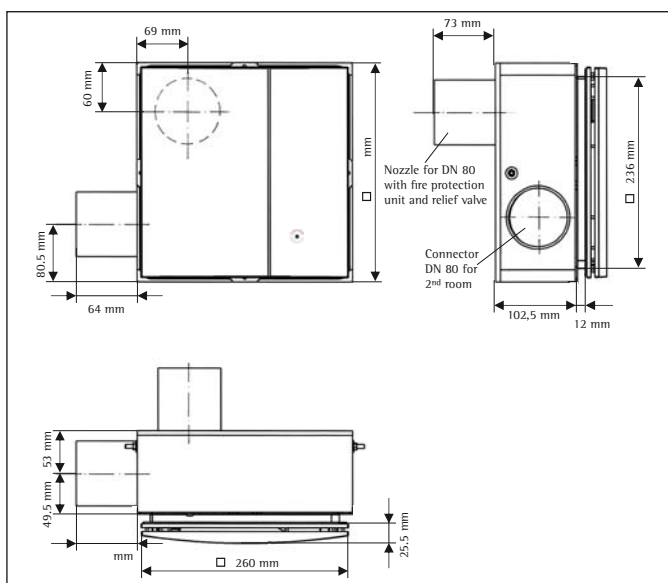
Silvento with UP-BA Housing



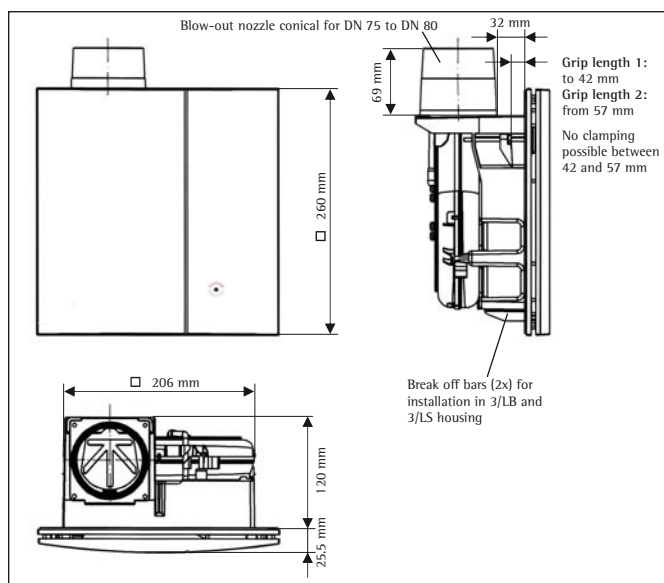
Silvento with UP-2BR Housing



Silvento with UP-2BA Housing



Silvento KL and KL2



Exhaust fans

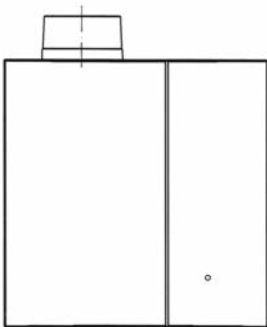
Mounting positions and layout

22 · 23

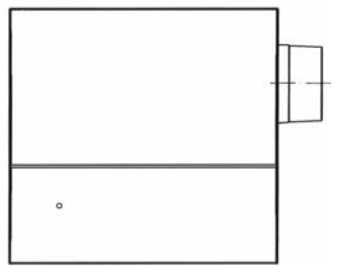
Mounting positions

Possible mounting positions

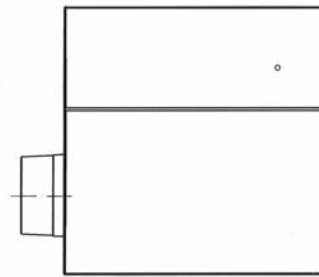
❖ Blow-out: Radial



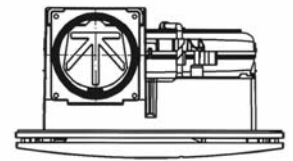
Mounting position:
'Blow-out top'



Mounting position:
'Blow-out right'

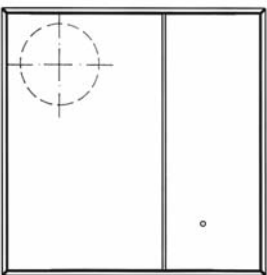


Mounting position:
'Blow-out left'

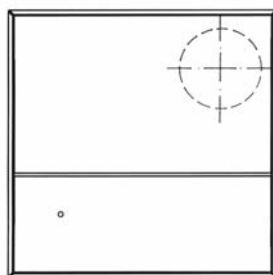


Mounting position:
'Ceiling installation'

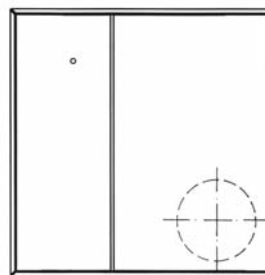
❖ Blow-out: Axial



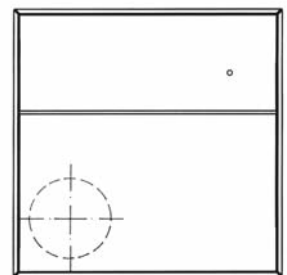
Mounting position:
'Blow-out top left'



Mounting position:
'Blow-out top right'



Mounting position:
'Blow-out bottom right'



Mounting position:
'Blow-out bottom left'

of the main line diameter



Main line

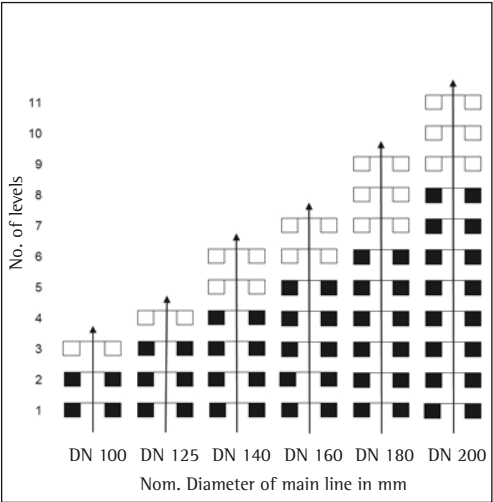
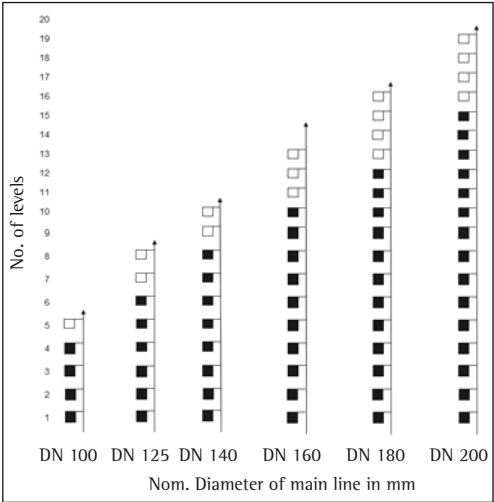
Layout of the main line diameter

Installation of 1 unit per level with concurrent use of all units

Installation of 2 units per level with concurrent use of all units

For a planned volume flow of 60 m³/h:

- Layout with maximum 9 m/s flow speed
- Layout with maximum pressing

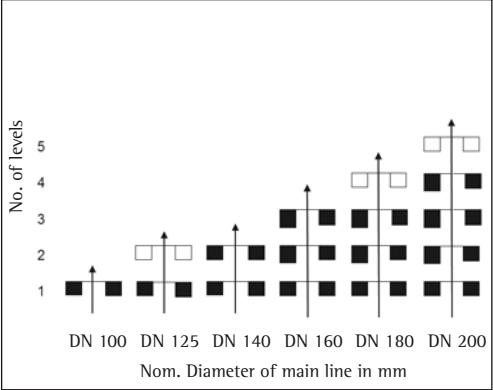
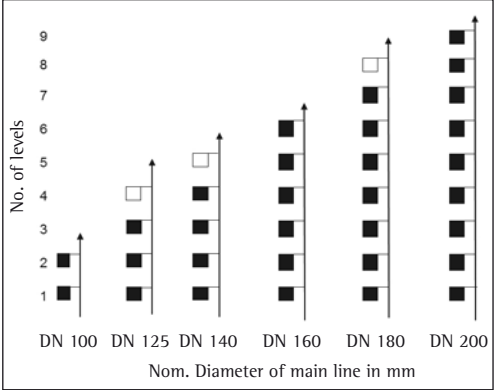


Installation of 1 unit per level with concurrent use of all units

Installation of 2 units per level with concurrent use of all units

For a planned volume flow of 100 m³/h:

- Layout with maximum 9 m/s flow speed
- Layout with maximum pressing





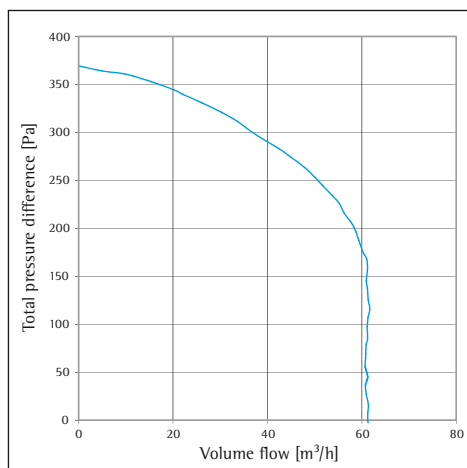
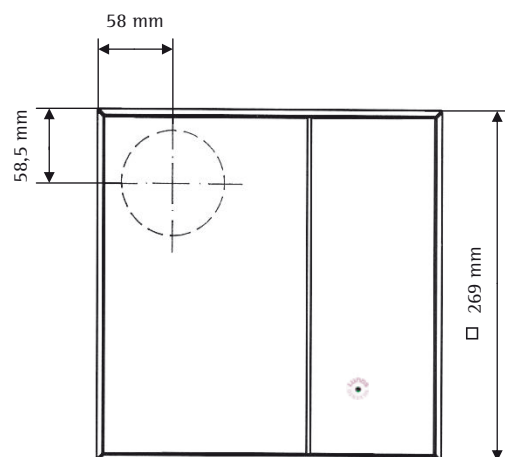
Exhaust fans

Silvento with surface mount housing 3/AP

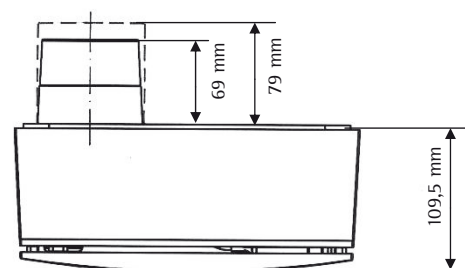
24 · 25

3/AP

- Housing for the surface mount of UV-resistant plastic, Order No. 039 144
- Suitable for wall and ceiling installation
- With conical blow-out nozzle (DN 75 to DN 80) and air-tight relief valve
- Mounting position of blow-out nozzle: top left, top right, bottom left or bottom right, adjustment of relief valve to mounting position via simple re-plugging
- All fan inserts of Silvento series can be used (page 30)
- Static pressure available: 221 Pa
- Incl. assembly accessories and sound absorbers

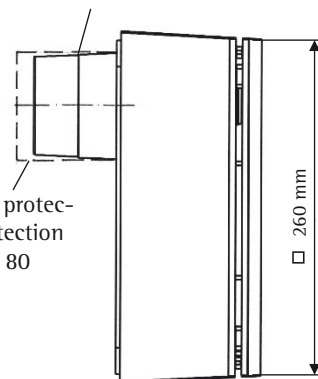


Pressure-volume flow curve AP,
Calculated by TÜV SÜD



Without kitchen fire protection: Blow-out nozzle conical for DN 75 to DN 80

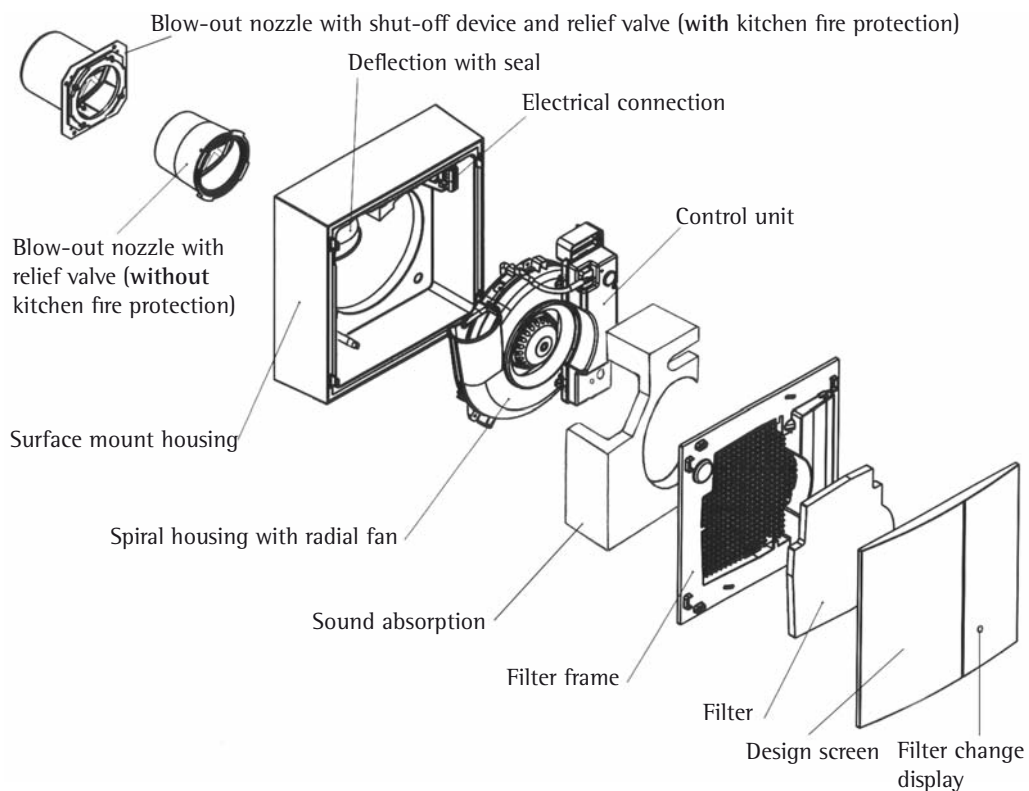
With kitchen fire protection: Use fire protection unit 8/BA for DN 80



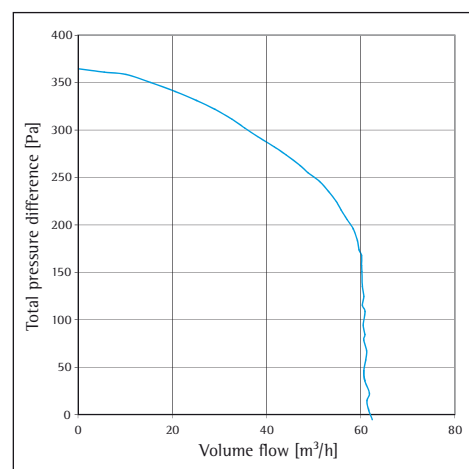
– with kitchen fire protection unit 3/AP-B

3/AP-B

- Housing for flush-mount assembly of UV-resistant plastic, Order No. 039 152
- With shut-off device K90 18017, suitable for installation in home kitchens, connection diameter DN 80, with air-tight relief valve
- Metallic blow-out nozzle
- Mounting position of shut-off device in relation to surface mount housing: top left, top right, bottom left or bottom right
- All fan inserts of Silvento series can be used (page 30)
- Static pressure available: 216 Pa
- Incl. assembly accessories and sound absorbers



Silvento surface mount fan without/with kitchen fire protection



Pressure-volume flow curve AP-B, calculated by TÜV SÜD

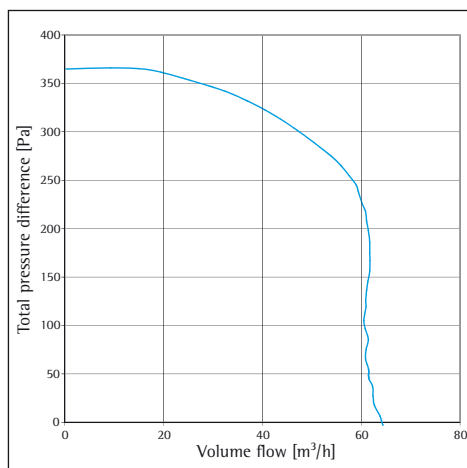
Exhaust fans

Silvento with flush mount housing 3/UP-R

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3/UP-Radial

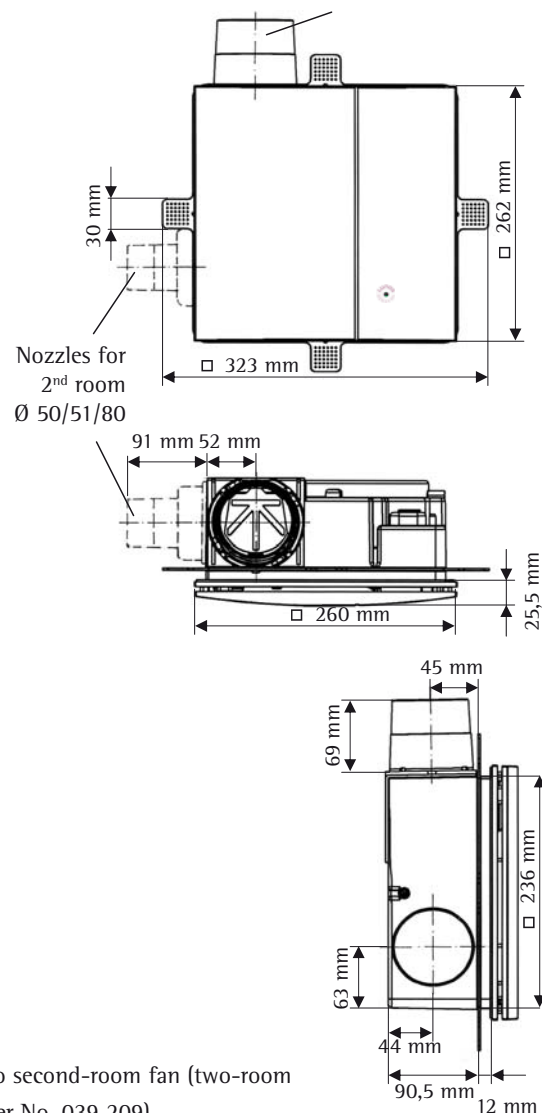
- Plastic flush mount housing for installation in chute walls and lightweight walls without requirements on fire resistance duration and in suspended ceilings, Order No. 039 128
- With conical blow-out nozzle (DN 75 to DN 80) and air-tight relief valve
- Installation of flush mount housing with blow-out nozzle to left, top or right possible, adjustment of relief valve to mounting position via simple re-plugging
- All fan inserts of Silvento series can be used (page 30)
- Static pressure available: 233 Pa
- With plaster protection lid for protection against dirt during shell construction phase
- Installation depth 90.5 mm incl. assembly accessories and sound absorbers



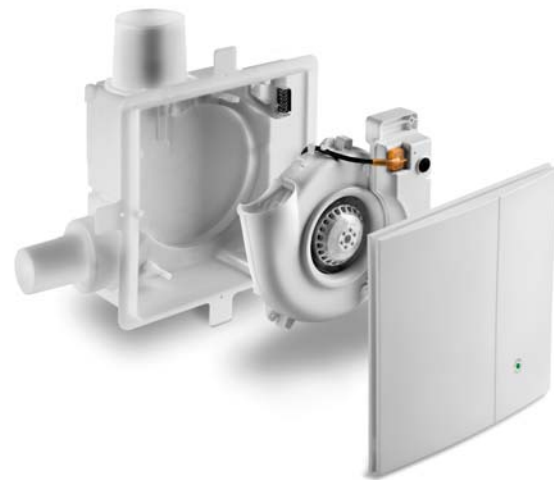
Pressure-volume flow curve UP-R, calculated by TÜV SÜD



Blow-out nozzles conical for DN 75 to DN 80



- Convertible to second-room fan (two-room set 3/S2, Order No. 039 209)
- For plug-in assembly of second-room nozzle (DN 50/51/8), the pre-fabricated opening via set breaking points is to be made on the flush mount housing, depending on the mounting position of the second-room connection bottom, left, right or top
- Distribution of volume flow: 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$



with kitchen fire protection device 3/UP-BR

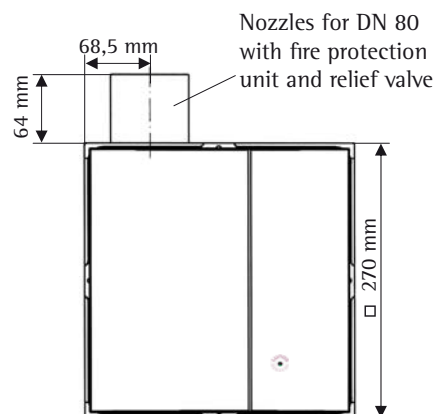
3/UP Fire Protection Radial

- Plastic flush mount housing with fire protection casing for installation in chute walls with requirements on fire resistance duration blow-out radial, Order No. 039 160

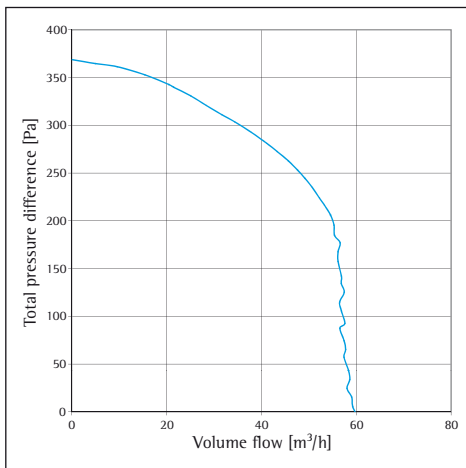


- Shut-off device K90 18017, also suitable for home kitchens

- With metallic blow-out nozzle DN 80 and air-tight relief valve



- Installation of flush mount housing with blow-out nozzle to left, top or right possible, adjustment of relief valve to mounting position by turning the insert



Pressure-volume flow curve UP-BR, calculated by TÜV SÜD

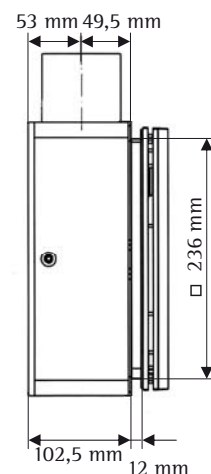
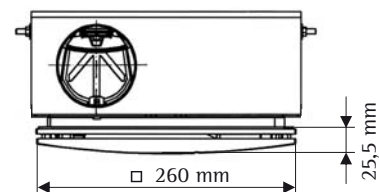
- All fan inserts of Silvento series can be used (page 30)

- Static pressure available: 233 Pa

- With plaster protection lid for protection against dirt during shell construction phase

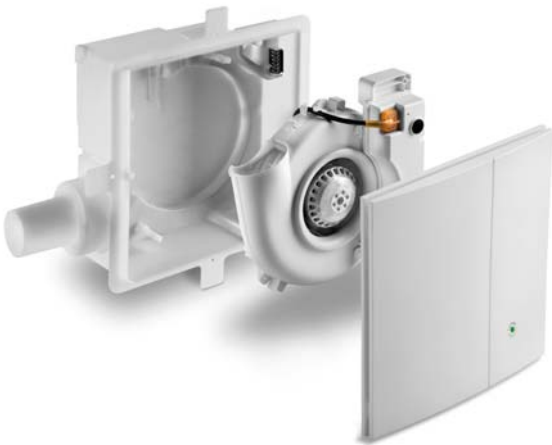


- Housing depth 102.5 mm incl. assembly accessories and sound absorbers



- Two-room fan with fire protection casing (3/UP-2BR, Order No. 039 187)

- depending on the mounting position of the second-room connection bottom, left or top; Distribution of volume flow: 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$



Exhaust fans

Silvento with flush mount housing 3/UP-A

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3/UP-Axial

- Plastic flush mount housing with axial blow-out for installation in chute walls and light-weight walls without requirements on fire resistance duration and in suspended ceilings, Order No. 039 136

- With conical blow-out nozzle (DN 75 to DN 80) and air-tight relief valve

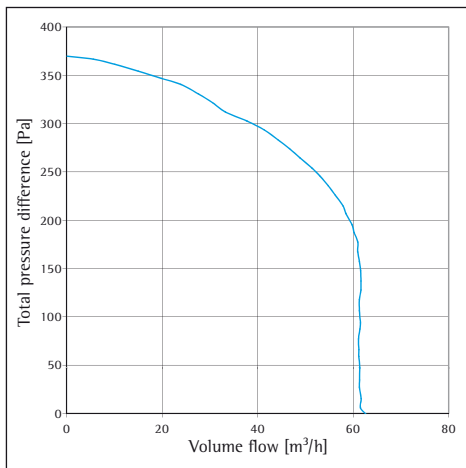
- Installation of flush mount housing with blow-out nozzle to top left, top right, bottom left or bottom right possible, adjustment of relief valve to mounting position via simple re-plugging

- All fan inserts of Silvento series can be used (page 30)

- Static pressure available: 227 Pa

- With plaster protection lid for protection against dirt during shell construction phase

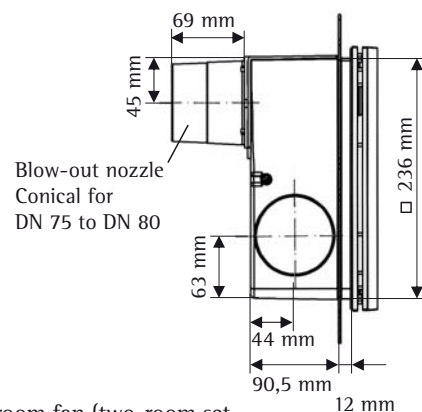
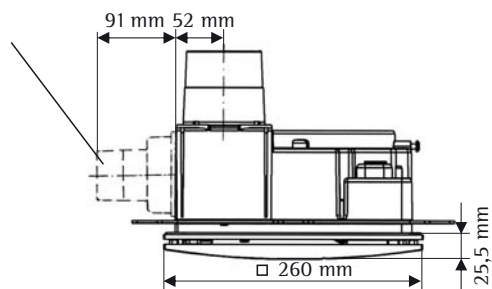
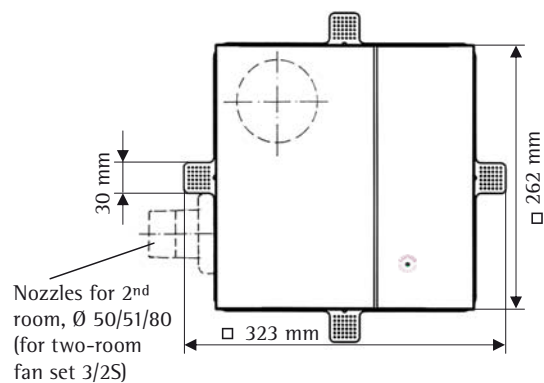
- Installation depth 90.5 mm without blow-out nozzles incl. assembly accessories and sound absorbers



Pressure-volume flow curve UP-A, calculated by TÜV SÜD



Blow-out nozzles conical for DN 75 to DN 80



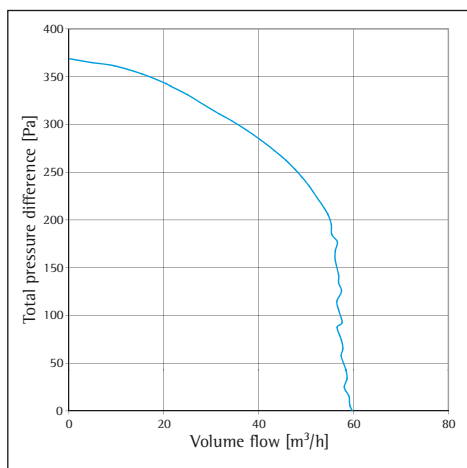
Blow-out nozzle
Conical for
DN 75 to DN 80

- Convertible to second-room fan (two-room set 3/S2, Order No. 039 209)
- For plug-in assembly of second-room nozzle (DN 50/51/80), the pre-fabricated opening via set breaking points is to be made on the flush mount housing, depending on the mounting position of the second-room connection bottom, left, right or top
- Distribution of volume flow: 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$

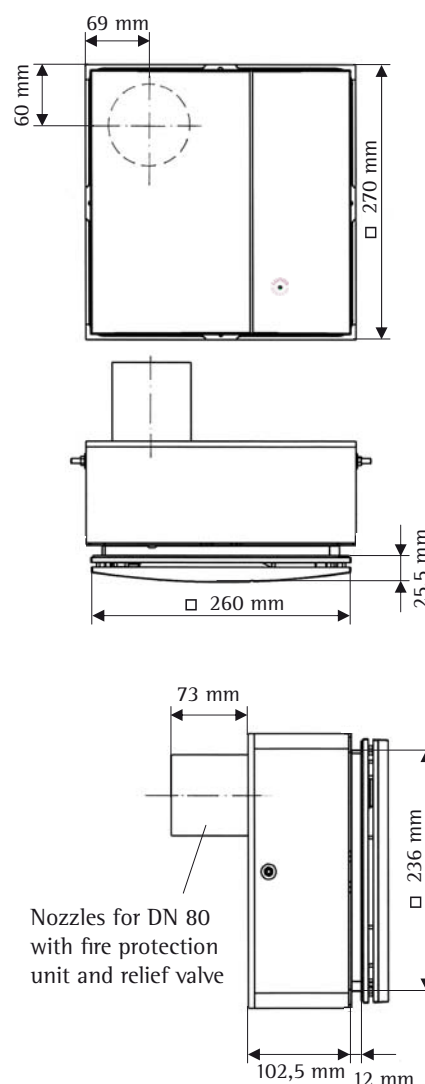
with kitchen fire protection unit 3/UP-BA

3/UP Fire Protection axial

- Plastic flush mount housing with fire protection casing for installation in chute walls with requirements on fire resistance duration, axial blow-out, Order No. 039 179
- Shut-off device K90-18017, also suitable for home kitchens
- With metallic blow-out nozzle DN 80 and air-tight relief valve
- Installation of flush mount housing with blow-out nozzle to top left, top right, bottom left or bottom right possible, adjustment of relief valve to mounting position via turning of insert
- All fan inserts of Silvento series can be used (page 30)
- Static pressure available: 212 Pa
- With plaster protection lid for protection against dirt during shell construction phase
- Housing depth 102.5 mm, with blow-out nozzle 187.5 mm incl. assembly accessories and sound absorbers



Pressure-volume flow curve UP-BR,
Calculated by TÜV SÜD



- Two-room fan with fire protection casing (3/UP-2BA, Order No. 039 195)
- depending on the mounting position of the second-room connection bottom, left, right or top
- Distribution of volume flow: 1st room $\frac{2}{3}$, 2nd $\frac{1}{3}$



Fan insertion modules

Fitting for all Silvento

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Combinable



You can combine the fan insertion modules with the Silvento housing of your choice, making sure you get the fans to meet your requirements:

Multiple with motion detector

- Nominal and/or basic load operation possible
- Nominal load can be triggered via motion detector
- 230 V – 50 Hz
- Power consumption of 4.9 W and 10.5 W (36.5 W at 100 m³/h)
- Sound pressure level 24 and 35 dB(A)
- Filter change display in front screen

Description:

V 30/60 B, Order No. 039 225

Multiple switching with time lag

- Switchable nominal and continuous basic load possible
- Nominal load can be regulated manually (60 m³/h) with time lag function
- Time lag with activation delay, time lag, interval and inverse operation
- 230 V – 50 Hz
- Power consumption of 4.9 W and 10.5 W (36.5 W at 100 m³/h)
- Sound pressure level 24 and 35 dB(A)
- Filter change display in front screen

Description:

V 30/60 ZII, Order No. 039 233

V 30/100 ZII, Order No. 039 292

V 60 ZII, Order No. 039 268

V 100 ZII, Order No. 039 314

Multiple switching

- Nominal and/or basic load operation possible
- Can be regulated manually to 30 m³/h and/or 60 m³/h
- 230 V ~ 50 Hz
- Power consumption of 4.9 W and 10.5 W (36.5 W at 100 m³/h)
- Sound pressure level 24 and 35 dB(A)
- Filter change display in front screen

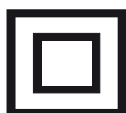
Description:

V 30/60, Order No. 039 217

Flush mount and surface mount housings

Approved safety

General technical
approval Z-51.1-215



IP X4



Multiple switching with motion detector controlled time lag

- Switchable nominal and continuous basic load possible
- Switchable nominal load (60 m³/h) via motion detector with time lag function
- Time lag with activation delay, time lag, interval and inverse operation
- 230 V – 50 Hz
- Power consumption of 4.9 W and 10.5 W (36.5 W at 100 m³/h)
- Sound pressure level 24 and 35 dB(A)
- Filter change display in front screen

Description:

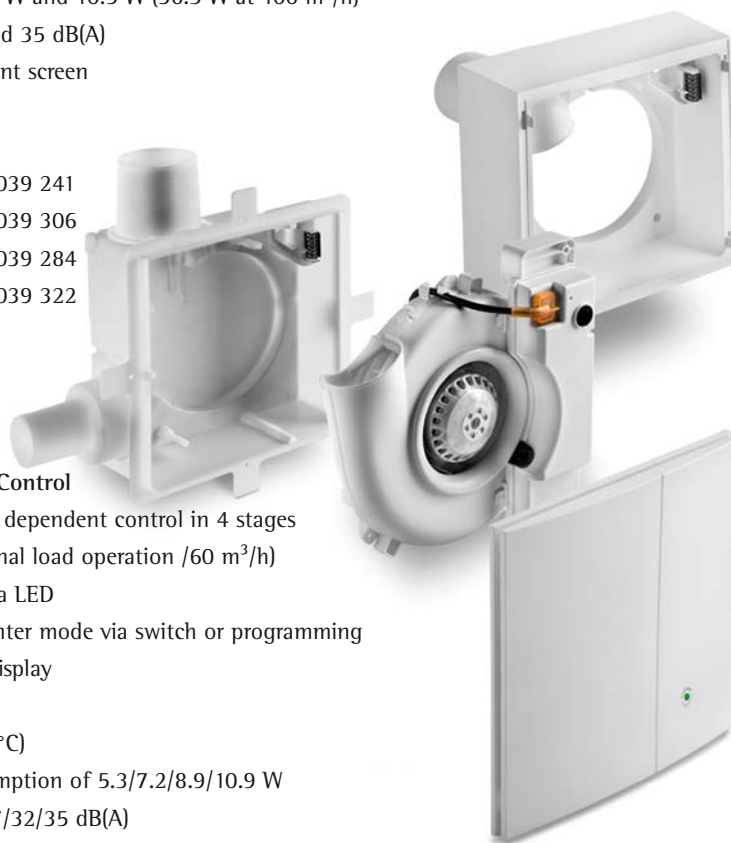
- V 30/60 BZII, Order No. 039 241
- V 30/100 BZII, Order No. 039 306
- V 60 BZII, Order No. 039 284
- V 100 BZII, Order No. 039 322

Humidity/Temperature Control

- Humidity and temperature dependent control in 4 stages
- Switchable stages to nominal load operation /60 m³/h)
- Operation status display via LED
- Adjustment to summer/winter mode via switch or programming
- Convenient filter change display
- Central control
- Anti-freeze switch (T < 15°C)
- 230 – 50 Hz power consumption of 5.3/7.2/8.9/10.9 W
- Sound pressure level 24/27/32/35 dB(A)

Description:

- V 30-60 FK, Order No. 039 330



Exhaust fans

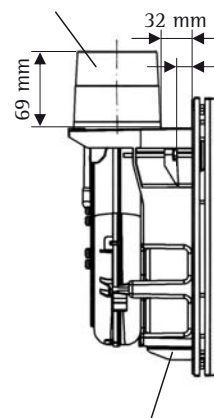
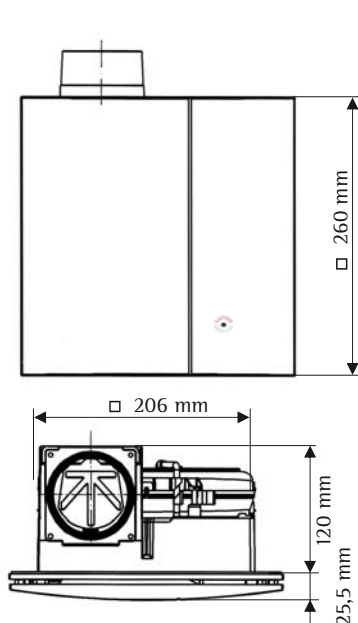
Silvento Flush mount clamp fan:

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KL 30-60



Blow-out nozzles conical for DN 75 to DN 80



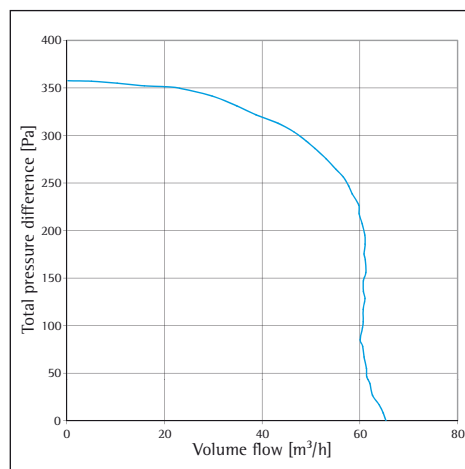
Grip length 1:
to 42 mm
Grip length 2:
from 57 mm

No clamping
possible be-
tween 42 mm
and 57 mm

Break off bar (2x) on installa-
tion in housings 3/LB and 3/LS

KL 30-60

- Single-room flush mount fan for sanitary cell and light-weight walls, Order No. 039 357
- For ceiling installation in suspended ceilings
- Simple grip assembly; grip length to 42 mm, larger grip lengths on request
- Shapely white front screen of UV-resistant plastic
- Washable filter of filter class G2
- With conical blow-out nozzle (DN 75 to DN 80) and air-tight relief valve
- Installation of flush mount housing with blow-out nozzle to left, top, or right possible, adjustment of relief valve to mounting position via simple re-plugging
- Filter change display in front screen
- Pluggable network connection
- Three volume flow levels 30, 60 and 100 m³/h
- Static pressure available: 234 Pa
- Power consumption: 4.9/10.5/36.5 W
- Incl. sound absorbers
- Also as substitute for fan type Skalar-G and for fan type Skalar-VG in wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

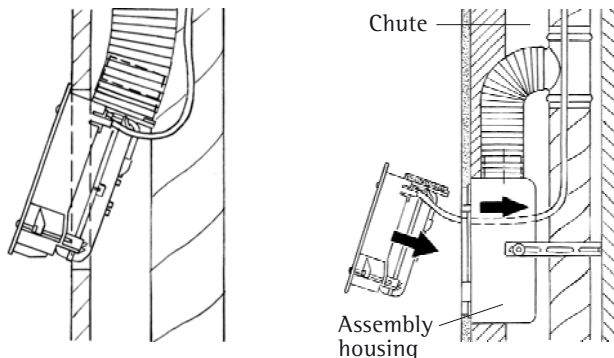


Pressure-volume flow curve KL,
calculated by TÜV SÜD

swift and easy installation

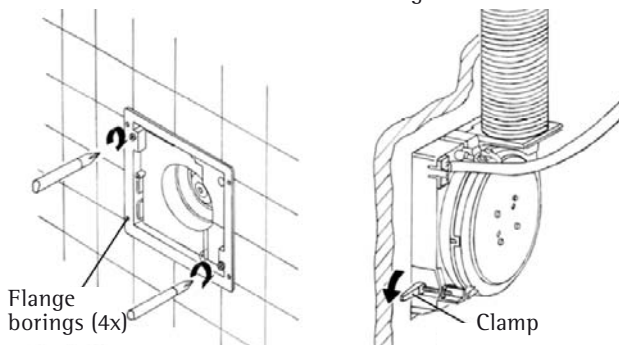


KL 30-60 (B/ZII)



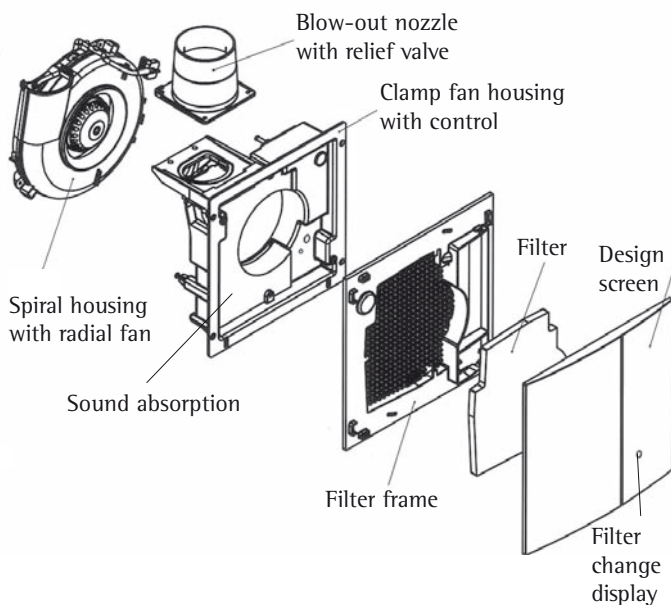
KL 30-60B

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 373
- Three volume flow levels 30, 60 (regulated via motion sensor) and 100 m³/h
- Static pressure available: 234 Pa
- Power consumption: 4.9/10.5/36.5 W
- Can also be used with wall installation housing 3/LS



KL 30-60BZII

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 403
- Three volume flow levels 30, 60 (regulated via motion sensor) and 100 m³/h
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 4.9/10.5/36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)



KL 30-60ZII

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 381
- Three volume flow levels 30, 60 (regulated via time lag) and 100 m³/h
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 4.9/10.5/36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)



Exhaust fans

Silvento flush mount clamp fans

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KL 60 (ZII/B)

KL 60ZII

- Single-room flush mount fan with filter change display in front screen, Order No. 039 411
- Two volume flow levels 60 (regulated via time lag) and 100 m³/h
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 10.5 and 36.5 W
- Also as substitute for fan type Skalar-ZI and fan type Skalar-VZI in wall installation housings 3/LS or 3/LB (blow-out seal required is supplied)

KL 30-100ZII

- Single-room flush mount fan with filter change display in front screen, Order No. 039 446
- Two volume flow levels 30 and 100 m³/h
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 4.9 and 36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

KL 100ZII

- Single-room flush mount fan with filter change display in front screen, Order No. 039 462
- Volume flow level 100 m³/h (regulated via time lag)
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 36.5 W

KL 60BZII

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 438
- Two volume flow levels 60 (regulated via motion sensor and time lag) and 100 m³/h time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 10.5 and 36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

KL 30-100BZII

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 454
- Two volume flow levels 30, and 100 m³/h (regulated via motion sensor and time lag)
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 4.9 and 36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

KL 100BZII

- Single-room flush mount fan with motion sensor and filter change display in front screen, Order No. 039 489
- Volume flow level 100 m³/h (regulated via motion sensor and time lag)
- Time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 36.5 W
- Can also be used with wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

Multiple switching with time lag and motion sensor

KL 30-60FK, KL2

KL 30-60FK

- Single-room flush mount fan with operating status and filter change display in front screen, Order No. 039 497
- Automatic comfort-humidity-temperature control, four stage, volume flow levels 30, 40, 50, 60m³/h
- Control range: 50 – 70 % r. H.
- Summer reduction mode automatically via programmed date or manually, fan can be remote controlled 0 – 12 V = (SELV)
- Static pressure available: 234 Pa
- Power consumption: 5.3/7.2/8.9/10.9 W
- Also as substitute for fan type Skalar-F and fan type Skalar-VF in wall installation housing 3/LS or 3/LB (blow-out seal required is supplied)

KL2 30-60

- Two-room flush mount fan with filter change display in front screen for use in flush mount housings 3/LS2 or 3/LB2 or as replacement for Skalar-2VF, Order No. 039 365
- Simple grip assembly
- Depending on mounting position of two-room connection bottom, left or top
- Distribution of volume flow 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$
- Three volume flow levels 30, 60 and 100 m³/h
- Static pressure available: 150 Pa
- Power consumption: 4.9/10.5/36.5 W

KL2 30-60FK

- Two-room flush mount fan with operating status and filterchange display in front screen for use in flush mount housings 3/LS2 or 3/LB2 or as replacement for Skalar-2VF, Order No. 039 497
- Simple grip assembly
- Depending on mounting position of two-room connection bottom, left or top
- Distribution of volume flow 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$
- Automatic comfort-humidity-temperature control, four stage, volume flow levels 30, 40, 50, 60m³/h

- Control range: 50 – 70 % r. H.
- Summer reduction mode automatically via programmed date or manually, fan can be remote controlled 0 – 12 V = (SELV)
- Static pressure available: 150 Pa
- Power consumption: 5.3/7.2/8.9/10.9 W

KL2 100ZII

- Two-room flush mount fan with filter change display in front screen for use in flush mount housings 3/LS2 or 3/LB2 or as replacement for Skalar-2VF, Order No. 039 470
- Simple grip assembly
- Depending on mounting position of two-room connection bottom, left or top
- Distribution of volume flow 1st room $\frac{2}{3}$, 2nd room $\frac{1}{3}$
- Volume flow levels 100 m³/h (time lag regulated)
- Static pressure available: 63 Pa
- Power consumption: 36.5 W



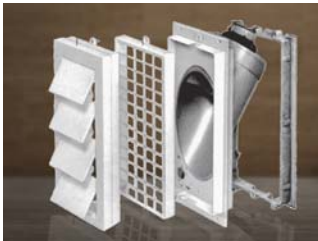
Axial fans

Mini, outside wall and chute fans



Mini fans

Can be used universally for ventilation of small rooms of 90 m³/h. For installation in outside walls, ceilings, and chutes. The fan fits into pipes, flexible tubes and hollow walls with an inside diameter of 100 to 110 mm.



Chute fans

For ventilation of sanitary rooms in apartments and commercial premises. Suitable for all chutes and for connection of pipes and tubes DN 100.



Mini-fan Type J...:

- Pipe Ø 9.8 cm outside, 7 cm deep
- Inside lock white, 16.5 x 16.5 cm, 3 cm high
- Types JZ and JEZ with time lag: continuous setting 2-20 minutes

Type	Order No.	el. inside lock*	Motor type	Volume flow	Power consumption
J0	035 904	no	4/J0	Ventilation 90 m ³ /h	18 W
JE	035 858	yes	4/J0	Ventilation 90 m ³ /h	18 W
JZ**	035 866	no	4/J0	Ventilation 90 m ³ /h	18 W
JEZ**	035 831	yes	4/J0	Ventilation 90 m ³ /h	18 W

* Flap drive via bi-metal spring bar, preventing backflow on motor standstill. ** with time lag

Chute inclined tube fan Types JB.../JK...

- With plaster frame for chutes without or with little brickwork
- Frame (W x H: 11.5 x 25.5 cm) with inclined tube Ø 9.8 cm outside
- Installation depth 10.5 cm for pipe connection DN 100 or direct chute insertion
- With flap top 2/JKY (W x H: 10.5 x 22.5) or white grid top 2/JB (W x H: 10.5 x 22.5), both with optional pull switch

Type	Order No.	Inside lock	Pull switch	Motor type	Volume flow	Power consumption
JB0	022 187	2/JB	no	4/J	Ventilation 95 m ³ /h	18 W
JB1	022 179	2/JB	yes	4/J	Ventilation 95 m ³ /h	18 W
JK0	022 195	2/JKY	no	4/J	Ventilation 95 m ³ /h	18 W
JK1	022 209	2/JKY	yes	4/J	Ventilation 95 m ³ /h	18 W

Chute mini-fan for wall installation Type JV...

- Pipe Ø 9.8 cm outside for pipe connection DN 100 for horizontal or vertical installation with plaster surface
- 11 x 11 cm, installation depth 9, 13 or 19 cm
- With flap top 2/J2Y or grid top 2/J (both W x H: 11 x 11 cm)

Type	Order No.	Inside lock	Motor type	Volume flow	Power consumption
JV9G	028 258	2/J	4/J	Ventilation 105 m ³ /h	18 W
JV13G	022 152	2/J	4/J	Ventilation 105 m ³ /h	18 W
JV19G	022 225	2/J	4/J	Ventilation 105 m ³ /h	18 W
JV9K	028 274	2/J2Y	4/J	Ventilation 105 m ³ /h	18 W
JV13K	030 104	2/J2Y	4/J	Ventilation 105 m ³ /h	18 W
JV19K	032 220	2/J2Y	4/J	Ventilation 105 m ³ /h	18 W

Can be used universally for ventilation of bathrooms and WCs, living areas and business premises.



Axial fans

Round channel filter 'Super' Type L...

- Pipe Ø 17.4 cm outside for wall thicknesses 24, 30 or 36.5 cm with bottom lateral cable duct
- Inside lock Type 2/2Y or 2/VEN
- Sanded, rain-repellent outside lock 18 x 18 cm

Type	Order No.	Inside lock	Motor type	Volume flow	Power consumption
L24	022 071	2/2Y	4/S	Ventilation 240 m³/h	35 W
L30	022 098	2/2Y	4/S	Ventilation 240 m³/h	35 W
L36,5	022 101	2/2Y	4/S	Ventilation 240 m³/h	35 W
L24-VRK	026 115	2/2Y	4/VRK	Ventilation 320 m³/h*	50 W
L30-VRK	026 123	2/2Y	4/VRK	Ventilation 320 m³/h*	50 W
L365-VRK	026 131	2/2Y	4/VRK	Ventilation 320 m³/h*	50 W
L24-VEN	031 836	2/VEN	4/S	Ventilation 120 m³/h	35 W
L30-VEN	031 844	2/VEN	4/S	Ventilation 120 m³/h	35 W
L365-VEN	031 852	2/VEN	4/S	Ventilation 120 m³/h	35 W
L24VRK-VEN	031 860	2/VEN	4/VRK	Ventilation 160 m³/h	50 W
L30VRK-VEN	031 879	2/VEN	4/VRK	Ventilation 160 m³/h	50 W
L365VRK-VEN	031 917	2/VEN	4/VRK	Ventilation 160 m³/h	50 W

* Supply ventilation 290 m³/h

Round channel fan 'Junior' Type JH...

- Pipe Ø 9.8 cm outside for wall thicknesses 24, 30 or 36.5 cm with bottom lateral cable duct,
- sanded rain-repellent outside lock 11 x 11 cm and latching white flap top 11 x 11 cm 2/J2Y.

Type	Order No.	Inside lock	Motor type	Volume flow	Power consumption
JH24	022 012	2/J2Y	4/J	Ventilation 90 m³/h	18 W
JH30	022 020	2/J2Y	4/J	Ventilation 90 m³/h	18 W
JH36,5	022 039	2/J2Y	4/J	Ventilation 90 m³/h	18 W

Pipe insertion fan

- Pipe insertion fans for pipes DN 100 for ventilation of kitchens, bathrooms and WC
- Pipe Ø 9.8 cm outside with motor bracket for motor 4/J, length 13 cm , and motor type 4/J with fan impeller
- Inside and outside locks from contractor or from LUNOS accessories (refer to Price List)

Description	Type	Order No.	Volume flow	Power consumption
Pipe insertion fan	JR100	037 249	Ventilation 105 m³/h	18 W

Outside wall fan

Can be used universally for the ventilation of kitchens, bathrooms and WCs. Also convertible as ventilation for business rooms, restaurants or workshops.



LUNOS Air transfer devices

Fresh air in every room

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ALD Overview

❖ Pleasant room temperature in dense buildings

The foundation for pleasant, healthy room temperature is sufficient supply of fresh air without draft.

A cosy feeling is also dependent on the temperature and humidity of the ambient air. LUNOS ventilation systems ensures such a pleasant feeling by means of continuous, intelligent air exchange.

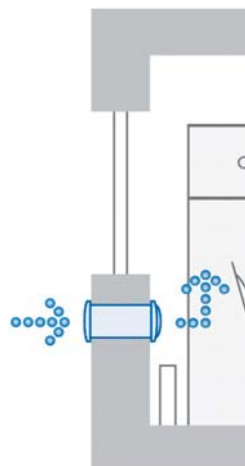
Our houses are air-tight. Whether modernized or newly built, they have a very low level of leakage of the building shell. Only with air-tight construction can energy-saving buildings such as the low-energy house (LEH) be constructed in accordance with the EnEV.

An air-tight building, however, also excludes ventilation via the jointings. This results in the fact that mould formation is registered in 20 % of redeveloped apartments due to insufficient ventilation, with a rising tendency.

❖ LUNOS ALD for redevelopment and new buildings

These supply air elements are an important component of regulated home ventilation by LUNOS. Only with these elements can there be a flow of outside air into the living area without a draft, and without environmental impact such as draft, noise or dirt penetrating the living area.

- Wind pressure relief guarantees there is no draft
- Integrated sound absorbers keep noise outside
- Modern design
- Can be regulate manually
- Protection against insects
- Air filter



without noise from the outside



Noise protection

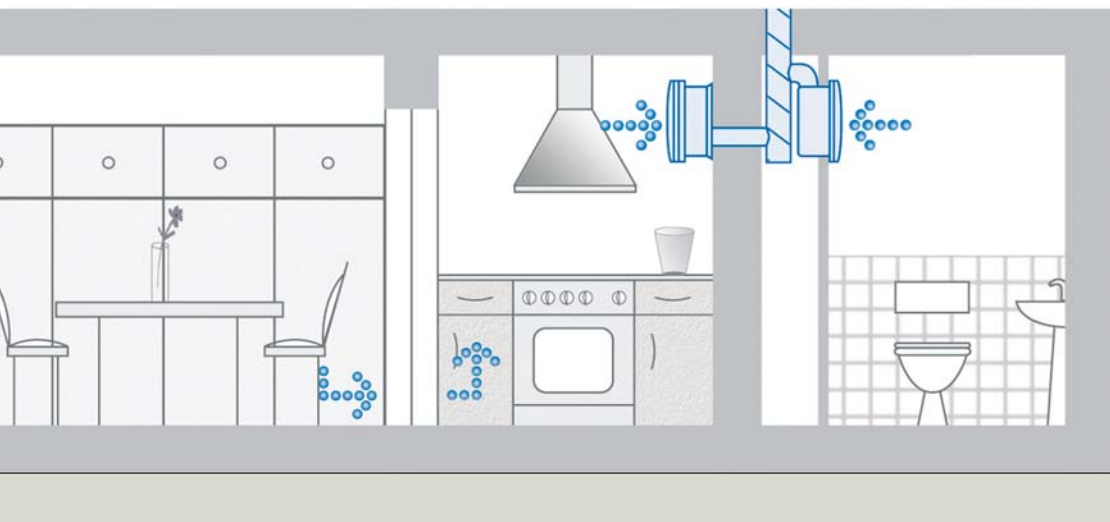
❖ Comfort from noise protection

Town and country traffic restricts our living atmosphere. Streets, tracks or airports are built near to residential areas in order to ensure good traffic connections. And traffic volume is growing. To ensure a pleasant living atmosphere, sound protection measures have to be integrated into the building, in the walls and windows, and in terms of fresh air supply. The excellent noise insulation dimensions of LUNOS ventilation systems ensures air exchange without affecting the comfort of living.

Calculation of resultant sound insulation dimensions of a composite outside wall pursuant to DIN 4109:

The entire component of the outside wall is considered for the sound technical calculation. The building components of outside wall, window and air transfer device are added up with their dampening features and respective areas and form the resultant noise insulation dimension of the outside wall. The internal damping behaviour resulting from the room geometry is included in the requirement of the noise insulation dimension.

LUNOS provides an Excel-based tool for such calculation. It enables swift calculation of the critical rooms.





The LUNOS

A cosy feeling with

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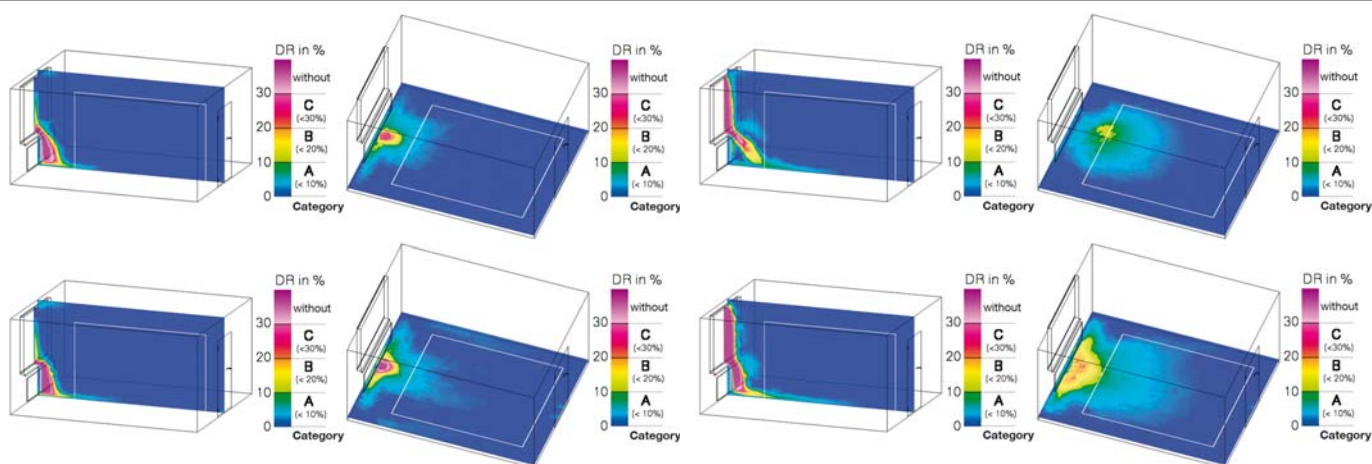
ALD Positioning



A cosy feeling with air transfer devices

A cosy feeling in the living area is greatly dependent on the positioning and quality of air transfer devices. All LUNOS ALD are therefore equipped with wind pressure relief and screens which ensure favourable flow of air, in order to ensure a diffuse flow of air without a draft. However, careful planning is of vital importance.

If the incoming air heats up as quickly as possible outside the place where you are, the risk of a draft is excluded. Therefore, ideal positioning of the ALD in relation to the heating areas is required. The quality criterion selected is therefore the draft risk (DR) in the simulations of the TU Dresden, as shown below. The figure of 15 % must not be exceeded in the area used (white frame). I.e. for 15 out of 100 persons it is to be expected that they will complain of a draft in this room. For these simulations, an outside temperature of -5°C (cold winter median) has been selected.



In its ideal position, the ALD is mounted above the radiator below the window. The incoming air can be heated immediately by the radiator and no risk of draft is to be expected in the room. The difference between a 0.25 times (top) and 0.5 times air exchange (bottom) is not noticeable in the room used.

Positioning the ALD above the radiator above the window is also not critical. The fresh air enters above the window, falls and is heated by the radiator until moving into the room. On the floor there is a very low risk of draft ($<5\%$). Here again, the difference between a 0.25 times (top) and 0.5 times air exchanges (bottom) is hardly noticeable in the room being used. Only directly beneath the ALD can a higher draft risk (up to 20 %) be recognized at an air exchange of 0.5 times.

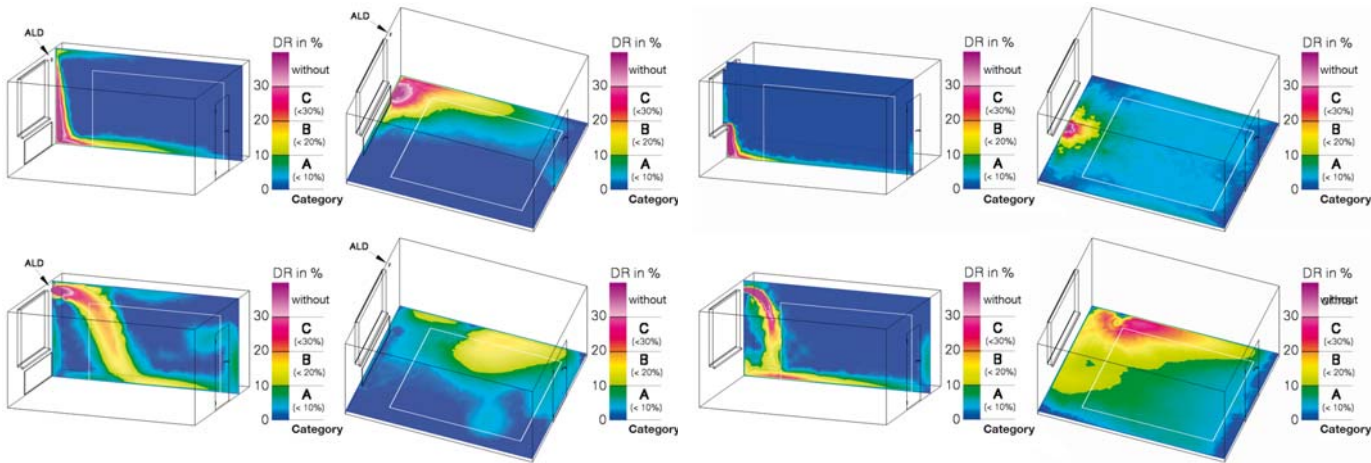
Real installation scenario

The simulations have all been calculated for empty rooms. In real life, furniture and curtains have a positive effect on the flow of outside air at the ALD. For example, curtains act like a chimney and provide faster heating of the outside air.

Source: Prof. Dr.-Ing. habil. Wolfgang Richter, Expert in Heating and Room Ventilation Technology, Institut für Energietechnik, TU Dresden

Comfort

high air quality



Positioning of the ALD above the radiator at the side, top, next to the window can also be considered as not critical. In the case of a base air exchange of 0.25 l/h (top) the air at the ALD mainly declines. A small part remains on the ceiling. Heating, however, continues to take place outside the rooms used, meaning that there is a draft risk of 15 % at one corner in the room. In the case of 0.5 time air exchange (bottom), the incoming air continues to flow into the room. The critical range is still outside the room. The draft risk in the room is below 15 % and is restricted to a small side area.

Combination of ALD with under-floor heating is possible. Slightly worse room flows result on account of the low convection, but this can be considered uncritical at 0.25 times air exchange. When positioning the ALD below the window (top), the air on the ALD falls downwards. Heating takes place outside the area where you are. If the ALD is positioned at the side at the top, next to the window (bottom), the situation is slightly less favourable. The incoming air is carried on into the room and near to the floor there can be a draft risk of 20 % in a corner of the room used.

LUNOS Air transfer

ALD with protective grating

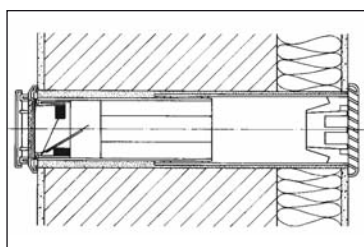
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ALD with protective grating



LUNOS ALD with protective grating for redevelopments and new constructions

ALD are available in angular or round design. While the angular constructions fit into normal stone dimensions, the round constructions are ideal for redevelopment projects where core hole drilling is usual. The façade-side face is formed by a protective grating available in various designs.



ALD-R 110:

Round ALD with sound absorption, wind pressure protection and filter

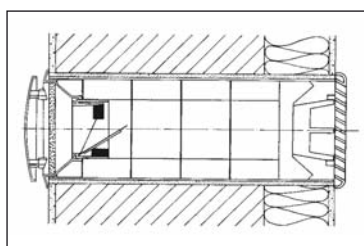
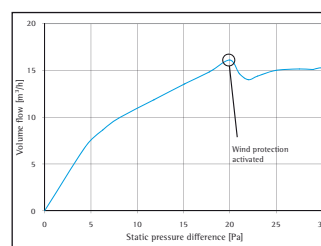
L: 305-535 mm

Ø: 110 mm

\dot{V} : 10 m³/h at 8 Pa

7 m³/h at 4 Pa

$D_{n,W,open}$: 48 dB



ALD-R 160:

Round ALD with sound absorption, wind pressure protection and filter

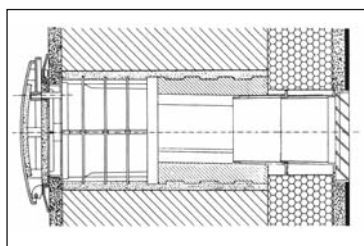
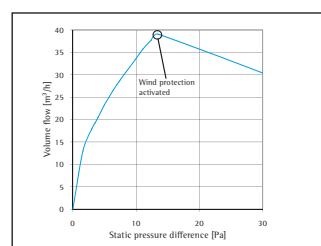
L: 500 mm

Ø: 160 mm

\dot{V} : 30 m³/h at 8 Pa

21 m³/h at 4 Pa

$D_{n,W,open}$: 52 dB



ALD 36,5:

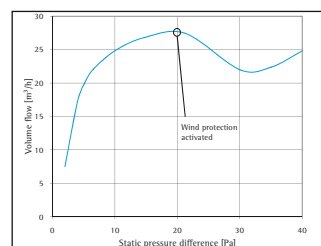
Angular ALD with sound absorption, wind pressure protection and filter

LxBxH: 360 x 250 x 125 mm

\dot{V} : 24 m³/h at 8 Pa

18 m³/h at 4 Pa

$D_{n,W,open}$: 46 dB



devices



Installation

Protective grating for LUNOS ALD is available in n various shapes and colours and can therefore be fitted ideally to and façade



Core hole drilling can be applied quickly and easily into the building shell afterwards, even if the building is being lived in.

In new constructions, the ALD are installed together with the brickwork. LUNOS ALD provides in stone dimension or adapters for the round ALD-R 110 and ALD-R 160.



LUNOS Air transfer devices

ALD with LUNOtherm:

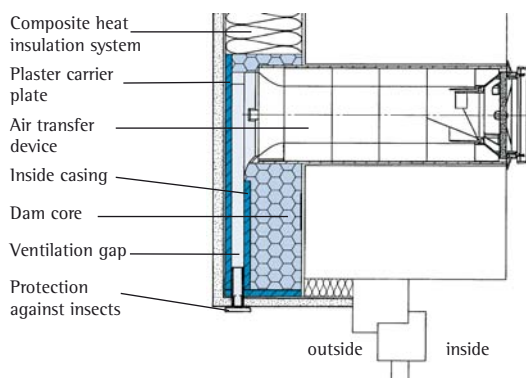
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ALD with LUNOtherm



LUNOS ALD for redevelopment and new constructions with LUNOtherm

Air transfer devices in the outside wall are often perceived as a disturbance to the appearance. The new LUNOtherm façade element ensures that the inflow opening disappears from the wall surface. By developing the LUNOtherm façade elements, LUNOS has satisfied the wish for inconspicuous façade form. For the first time, all benefits of air transfer devices, such as high air throughput, no draft, hygiene and sound protection can be realized in connection with an almost invisible outer appearance. For this purpose, the LUNOtherm is integrated in the insulation layer of the heat composite insulation system as a final element of the ALD. Supply air is then located in the window lintel and the reveal. It can be mounted above or to the side of the window, which also enables combination with a rolling shutter box.



ALD-R 160 L with LUNOtherm A

Use in non-combustible WDVS pursuant to DIN 4102-A. The dam core is protected by an inner mineral casing.

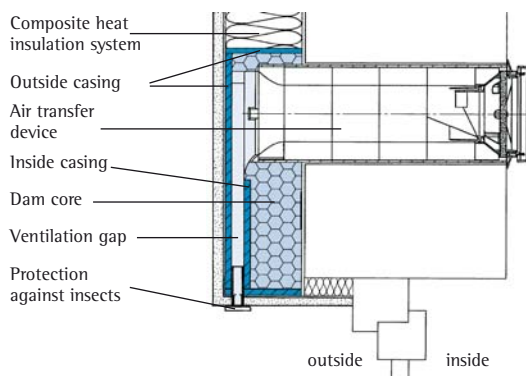
Dam thickness: 60-300 mm

WxH: 980 x 490 (min. 300) mm

\dot{V} : 21 m³/h at 4 Pa

30 m³/h at 8 Pa

$D_{n,W,open}$: 53 dB



ALD-R 160 L with LUNOtherm B

Use in flame resistant WDVS pursuant to DIN 4102-B1. The dam core is protected by an inner and outer mineral casing.

Dam thickness: 60-300 mm

WxH: 1000 x 500 (min. 310) mm

\dot{V} : 21 m³/h at 4 Pa

30 m³/h at 8 Pa

$D_{n,W,open}$: 53 dB

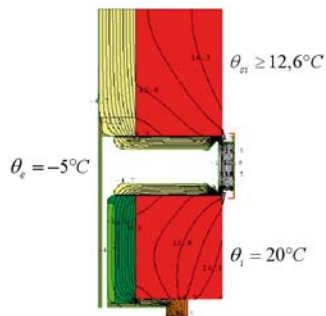
Your building project decides



The LUNOthem is supplied insulation thickness and is processed by the façade builder in the same way as an insulation plate of WDVS. Please request the detailed assembly instructions. Since the LUNOthem is mounted in the flashover range, suitability has been tested within the scope of general constructional admissibility of DIBt. Therefore, LUNOthem A may be mounted in non-combustible WDVS pursuant to DIN 4102-A, and LUNOthem B in flame resistant WDVS pursuant to DIN 4102-B1 up to an insulation thickness of 300 mm.



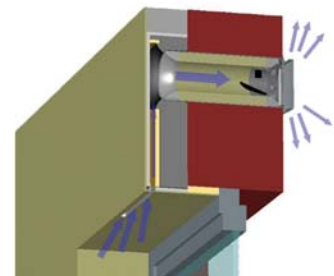
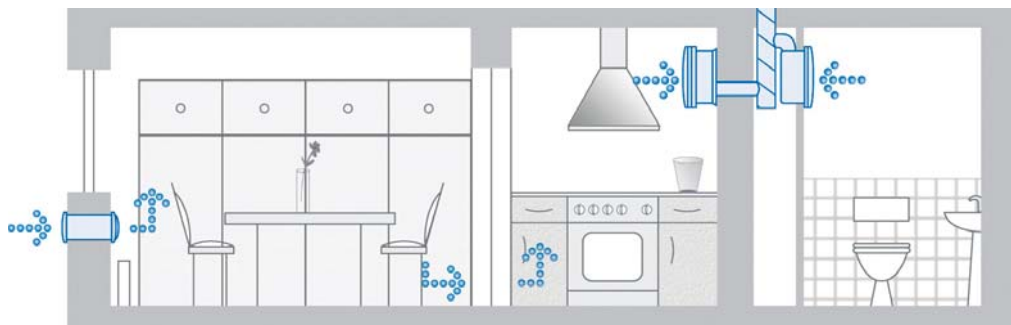
The LUNOthem A 60 can also be fitted easily into the brick-work for new constructions. The bricks are appropriately recessed.



On account of the very low heat conductivity of the dam core of LUNOthem of $\lambda = 0.035 \text{ W/mK}$, the reduction of the heating insulation layer in the area of the ventilation gap is compensated. The temperature difference on the façade is max. 2.5 K.



The LUNOthem can be processed with various façade systems: thin or thick plaster systems, ventilated façades or even with a facing wall. The grating for protection from insects can be adapted in terms of colour, making the inlet opening as inconspicuous as possible.





Accessories

Product description

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Accessories

❖ Outer grating



9/1W

Outer grating angular, colour white, to screw on
Also available in light grey or red-brown,
Cross section: 153 x 245 mm



9/1D

Outer grating angular, also available in light grey,
sanded or red-brown,
Cross section: 115 x 195 mm



1/RW 145

Standard outer grating round, colour white,
including insect screen,
also available in light grey and red-brown,
Cross section: 145 mm



1/JD

Outer grating pluggable into pipes d = 98 mm
colour white, also available in light grey, sanded
or red-brown,
Cross section: 110 x 110 mm



1/RW 180

Standard outer grating round, colour white,
Including insect screen,
also available in light grey and red-brown,
Cross section: 180 mm

1/W

Outer grating angular, colour white, to screw on
Also available in light grey and red-brown,
Cross section: 240 x 240 mm



1/D

Outer grating angular, colour white, also available
in light grey, sanded or red-brown,
Cross section: 180 x 180 mm



❖ Wall insertion block for new buildings

9/VEW

Wall insertion housing for mounting into concrete or brick walls.
Included in delivery of ALD 36,5. Dimensions in mm (H x W x D):
130 x 250 x 377 (can be shortened or extended in length,
depending on mounting situation)



9/MRD

Wall insertion housing for mounting into concrete or brick walls
to house air transfer devices ALD-R 160 and ALD-R 160L.
Dimensions in mm (H x W x D): 240 x 210 x wall thickness
(different lengths available in steps of 6 cm)



❖ Inside locks, round channels, fire protection shut-off devices,
axial fan motors, replacement filters (ling-term filter, pollen filter, ...): please refer to Price List.

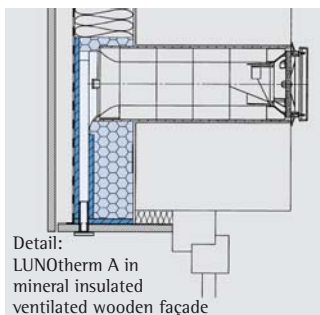


LUNOS – Building Projects

Examples of

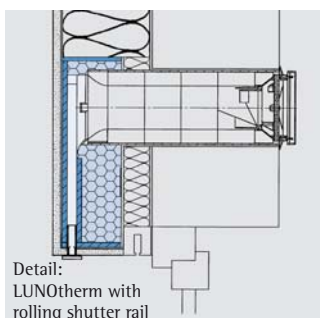
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Details and References



❖ New building: Apartment Building Erasmusstraße, Wiesbaden

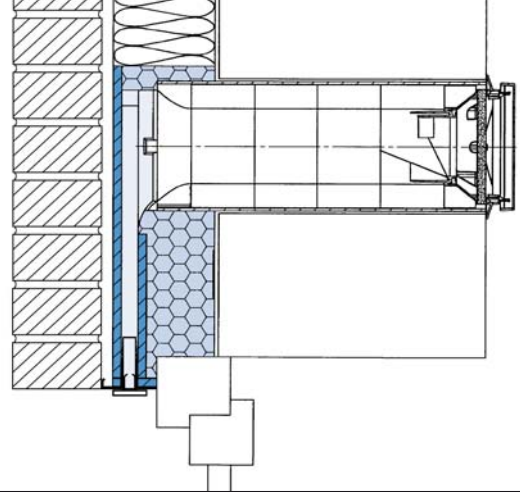
Type of building:	New apartment building
Building owner:	Supplementary Pension Fund of Baugewerbe VVaG, SOKA-Bau
Ventilation concept:	Regulated apartment ventilation with exhaust air system and air transfer devices for supply air
Supply air:	LUNOtherm B120 in ventilated wooden façade with air transfer device ALD-R160L
Building period:	June 2007 to January 2008
Energy standard:	EnEV 2007



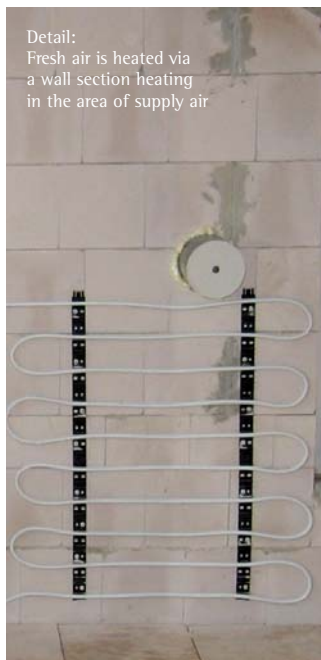
❖ New building: Apartment building Bärenschanze, Nuremberg

Type of building:	New town apartments building with approx. 110 apartments and planning of 68 rented flats, public-funded, with basement garage
Architect:	Grabow + Hofmann Architektenpartner- schaft, Nuremberg
Ventilation concept:	Regulated apartment ventilation with exhaust air system and air transfer devices for supply air
Supply air:	LUNOtherm B 160 with air transfer device ALD-R160L
Building period:	July to September 2008
Energy standard:	KfW 40 Standard: High heat insulation (160 mm), triple-glazed windows, exhaust air system with air transfer devices and use of community heating

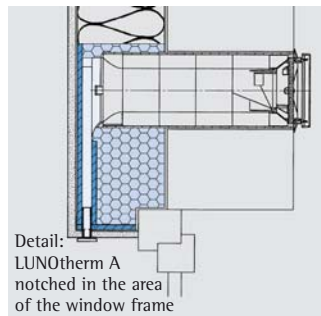
Energy-efficient ventilation



Details Supply Air Systems



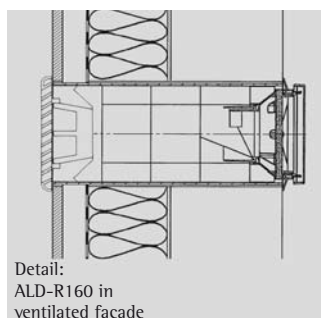
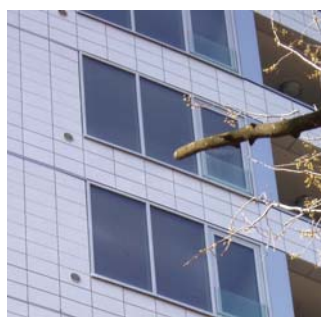
Detail:
Fresh air is heated via
a wall section heating
in the area of supply air



Detail:
LUNOtherm A
notched in the area
of the window frame

❖ New building: Detached house Haydnallee 60, Falkensee

- Type of building: New detached house, KFW40
- Ventilation concept: Regulated apartment ventilation with humidity-regulated exhaust air fans
- Supply air: LUNOtherm A200 and A120 with air transfer device ALD-R160L
- Exhaust air: Flush mount fan LUNOMAT-F
- Building period: End of 2007
- Energy standard: KFW 40 Standard: High heat insulation (200 mm), triple-glazed windows, humidity-regulated exhaust air system with air transfer devices, heating and hot water generation in system via pellet boiler and solar heat



Detail:
ALD-R160 in
ventilated façade

❖ New building: III Towers, Bratislava, Slavakia

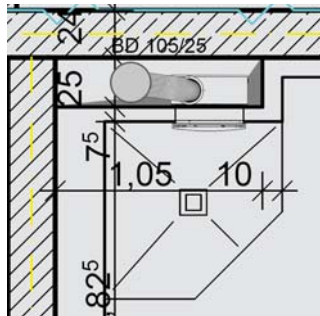
- Type of building: New apartment and office building complex with 3 elliptic apartment towers
- Investor: Quinlan Private, London
- Ventilation concept: Regulated apartment ventilation with exhaust air system and air transfer devices for supply air
- Supply air: Air transfer device ALD-R160
- Building period: April 2006 to November 2009

LUNOS – Building Projects

Examples of

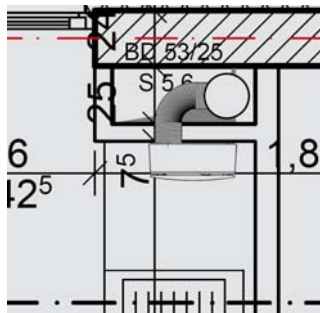
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Details and References



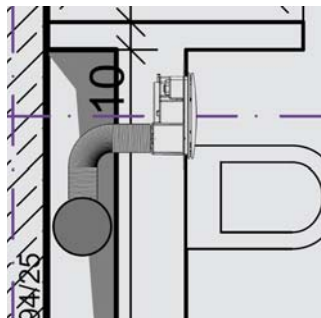
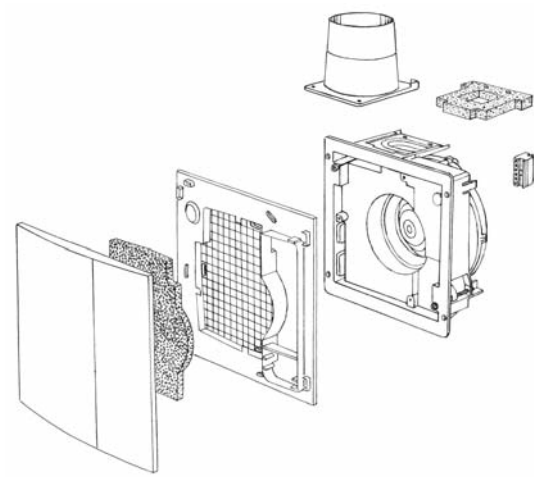
❖ New building: Apartment Building Prague 6, Liboc, Czech Republic

- Type of building: New multi-storey apartment building
Ventilation concept: Regulated apartment ventilation with exhaust air system and air transfer devices for supply air
Supply air: Air transfer device ALD-36,5
Exhaust air: Flush-mount Skalar-SG, design with 2-stage control
Building period: July to October 2006



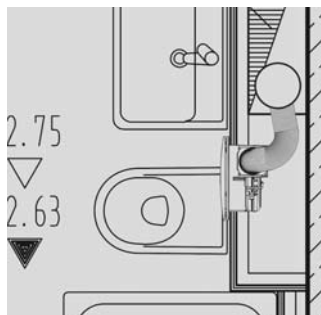
❖ New building: 4 apartment buildings in Peking, China

- Type of building: Apartment buildings with 28 levels
Ventilation concept: Regulated apartment ventilation with humidity-regulated exhaust air fans
Supply air: Air transfer device ALD-36,5
Exhaust air: Surface-mount Saphir-F with humidity control and Saphir-60 with 2-stage control
Building period: September 2005 to March 2006



❖ New building: Office building Octopus, Bratislava, Slovakia

Type of building:	New office building with apartments in top floors
Architect:	Ing. arch. Peter Sticzay-Gromski und A4ARCHITECTURE, s. r. o., Bratislava
Ventilation concept:	Regulated apartment ventilation with humidity-regulated exhaust air fans and air transfer devices for supply air
Supply air:	LUNOtherm A 140 with air transfer device ALD-R160L
Exhaust air:	Flush-mount fan Skalar-SF with humidity control and Skalar-SG with 2-stage control
Building period:	June 2006 to March 2007



❖ Redevelopment: Apartment Building Fuhneweg 18, Brunswick

Type of building:	Redevelopment of a multi-storey apartment building erected in the 1960s
Building owner:	Supplementary Pension Fund of Baugewerbe VVaG, SOKA-Bau
Ventilation concept:	Regulated apartment ventilation with humidity-regulated exhaust air fans and air transfer devices for supply air
Supply air:	LUNOtherm B 100 with air transfer device ALD-R160L
Exhaust air:	Flush-mount fan Skalar-F in fire protection design with humidity control and Skalar-G with 2-stage control
Building period:	June to August 2006
Energy standard:	EnEV 2002



Planning –

Planning of home ventilation

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Planning

❖ Planning made simple

One exhaust unit is installed in the exhaust air rooms, bathroom, WC, kitchen and broom cupboard respectively when planning residential ventilation. These operate continuously on a low base level, and via manual switching or needs-regulated humidity control it is possible to increase the exhaust air volume flow in the case of higher ventilation requirement.

The living room, bedroom, children's rooms, work rooms and guest rooms all have at least one air transfer device (ALD) each, for supply of fresh outside air in accordance with the following table.

Living space	Max. exhaust air volume flow	Number of air transfer devices required		
		ALD-R 110	ALD 36,5	ALD-R 160
m ²	m ³ /h	Pces.	Pces.	Pces.
50	60	4	2	1-2
80	120	9	4	3
120	180	13	5-6	4-5

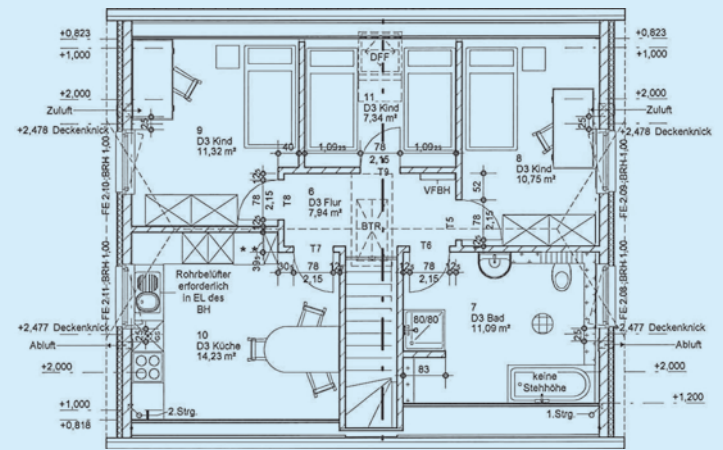
The doors are shortened by around 1 cm to enable ventilation of the home.

❖ Planning in accordance with DIN 1946-6:2009-05

Correct planning in accordance with state of the art technology is made pursuant to DIN 1946-6, Issue May 2009. This defines the volume flows required to ensure minimum air exchange pursuant to EnEV § 6. These volume flows depend on the number of exhaust air rooms, the living space, the number of persons, as well as the density, location and design of the building.

Planning of automatic residential ventilation is made in accordance with the nominal ventilation level which covers the air exchange required in the case of normal use. The ventilation system can also be designed for intensive ventilation. In such cases, the windows are normally opened to relieve the peak loads.

Software Tool



LUNOS Planning Tool

LUNOS provides an Excel tool based on DIN 1946-6:2009-05 which can be downloaded on ‘www.lunos.de/download/berechnungshilfen’, for the planning of regulated residential ventilation:

- Evidence of necessity of ventilation measures (VM)
- Design related to exhaust rooms, space or number of users
- Design of outside air volume flows
- Ventilation for protection from humidity, reduced, nominal and intensive ventilation
- Calculation of infiltration volume flows without and with VM
- Component design of ventilation system such as fans, air transfer devices and surplus supply openings
- Consideration of requirements for exhaust air systems in connection with ventilation-dependent fireplaces

Calculation of sound insulation of an outside wall

To check if a required sound insulation dimension is observed, you require the resultant sound insulation dimension of an outside wall including wall, windows, rolling shutters and the ventilation facility.

The Excel calculation tool (which you can download on www.lunos.de/download/berechnungshilfen/) helps you calculate the resultant sound insulation dimensions pursuant to DIN 4109. The sound insulation dimension of each component is added up in terms of logarithms relating to area. As support, the norm sound level differences of the LUNOS air transfer devices are displayed for various wall thicknesses. The result of the calculation can be immediately compared with the respective requirement.

Circuit Diagrams

Electrical connections

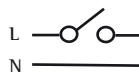
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Connection diagrams

Electrical connections

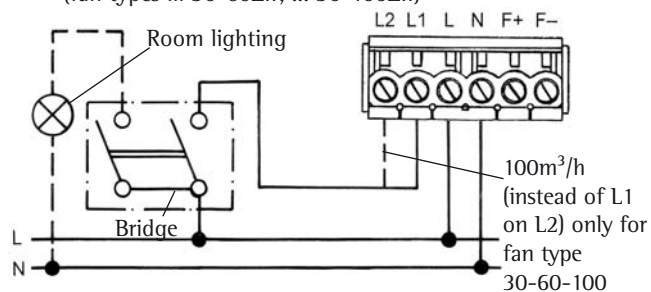
All installation work must only be carried out when the power supply has been cut off! The ventilation unit is shockproof pursuant to Protection Class II. An earth conductor is not required.

Before connecting the ventilation device to the power supply, all connection lines should be separated from any voltage supply! (Separation from power supply with at least 3 mm contact opening, e.g. electrical fuse).

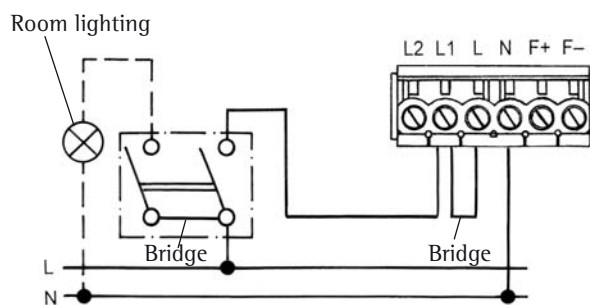


Connection diagrams for other fan functions available on request!

- ② • Continuous operation 30 m³/h, switchable to 60 m³/h or 100 m³/h (fan types ... 30-60-100)
- Time lag regulated 60 m³/h or 100 m³/h (fan types ... 60BZII; ... 100BZII)
 - Continuous operation 30 m³/h with switchable time lag regulated 60 m³/h or 100 m³/h (fan types ... 30-60ZII; ... 30-100ZII)

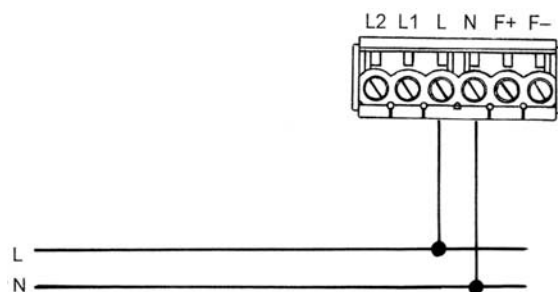


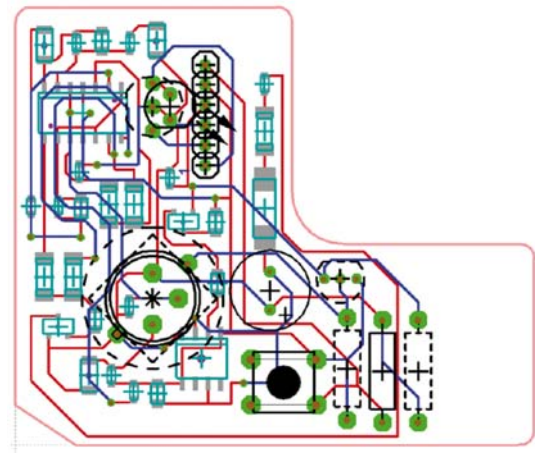
- ① • One-stage operation, switchable to 60 m³/h (fan types ... 30-60-100)



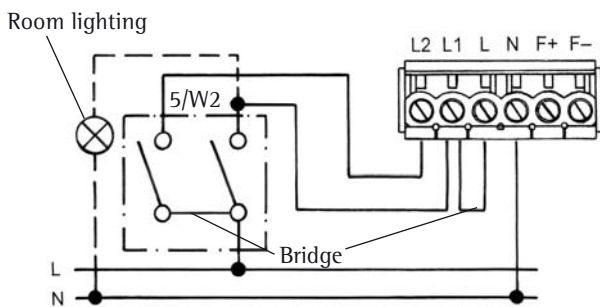
- ③ • With motion sensor

Note: For all switches with motion sensor (fan types ... 60BZII; ... 100BZII; ... 30-60BZII; ... 30-100BZII; ... 30-60B)



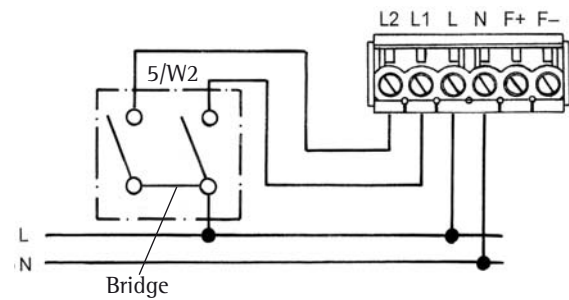


- ④ • Two-stage operation, switchable to 60 m³/h and 100m³/h ON/OFF (fan types ... 30-60-100)



- ⑤ • Three-stage operation: continuous operation 30 m³/h, switchable to 60 m³/h and 100 m³/h (fan types ... 30-60-100)

Note: NO light coupling possible

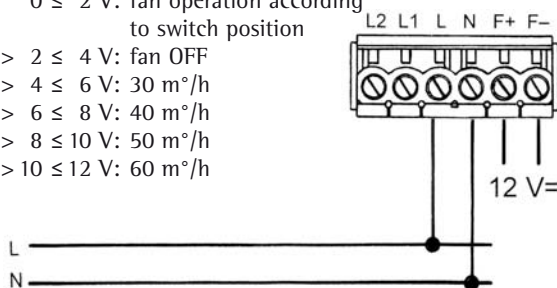


- ⑥ • With remote control (fan types ... FK)

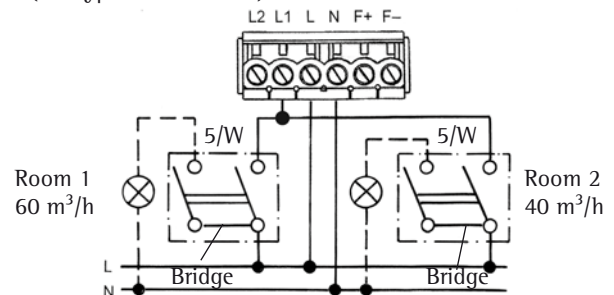
Note: Other switches also possible e.g. via L1 or L2, remote control always has priority

0 ≤ 2 V: fan operation according to switch position

- > 2 ≤ 4 V: fan OFF
- > 4 ≤ 6 V: 30 m³/h
- > 6 ≤ 8 V: 40 m³/h
- > 8 ≤ 10 V: 50 m³/h
- > 10 ≤ 12 V: 60 m³/h



- ⑦ • Two-room fan with time lag:
 • Time lag regulated 100 m³/h, switchable from 2 rooms (fan types ... 100ZII)
 • Continuous operation 40m³/h with time lag regulated 100 m³/h, switchable from 2 rooms (fan types ... 30-100ZII)

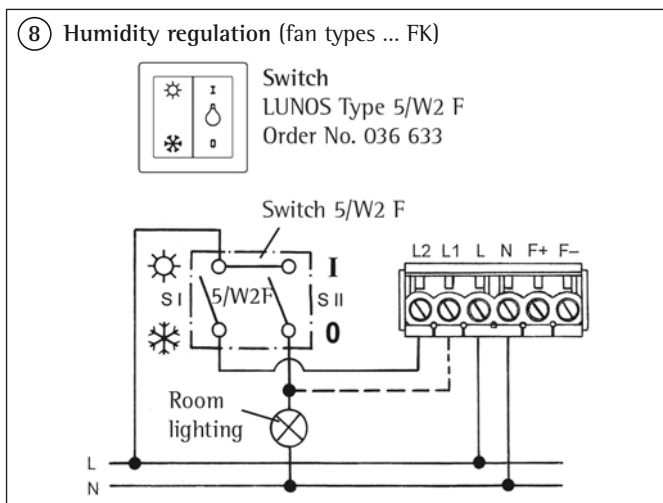


Circuit Diagrams

Electric connections

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Connection diagrams



For ventilation devices with humidity regulation, the air volume flow discharged is ideally regulated via air humidity and temperature in the room.

- ☀ Switch for summer mode, reduced mode: Volume flow 30 m³/h irrespective of the room air humidity and room temperature, the increased outside air humidity does not make intensified ventilation sensible.
- ❄ Switch for winter mode: Volume flow 30/40/50/60 m³/h, humidity regulation activated. During the cold season and transition period it prevents too high humidity in the home, thus avoiding damage to the building and mould. The system regulates itself automatically and ensures ideal cosy atmosphere in the room to be ventilated by means of continuous adjustment of the exhaust air volume flow to the ambient humidity and room temperature. As much ventilation as is required and as little ventilation as possible is provided, thus saving energy. The fan never switches off completely in order to ensure a minimum air exchange.

Functional description of rocker switch SII

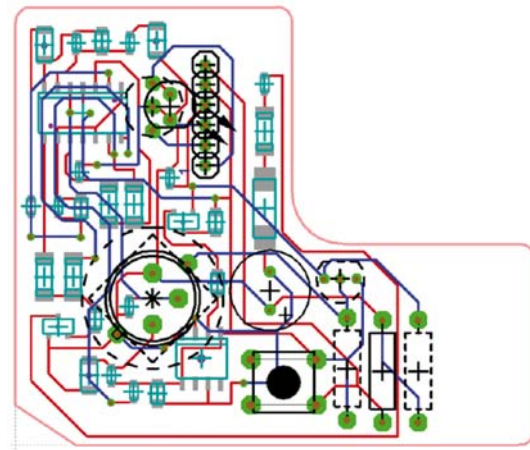
I Switch Ventilation needs ON:
Volume flow 60 m³/h, possible coupling with L1. Attention: On coupling, intensive ventilation is always activated (needs ventilation) with the light. Ventilation at 60 m³/h is superordinate to summer and winter mode by means of a priority switch.

O Switch Ventilation needs OFF:
On coupling with L1: fan operation in accordance with position of rocker switch SI. The fan runs in summer and winter mode.

Extended functional potential

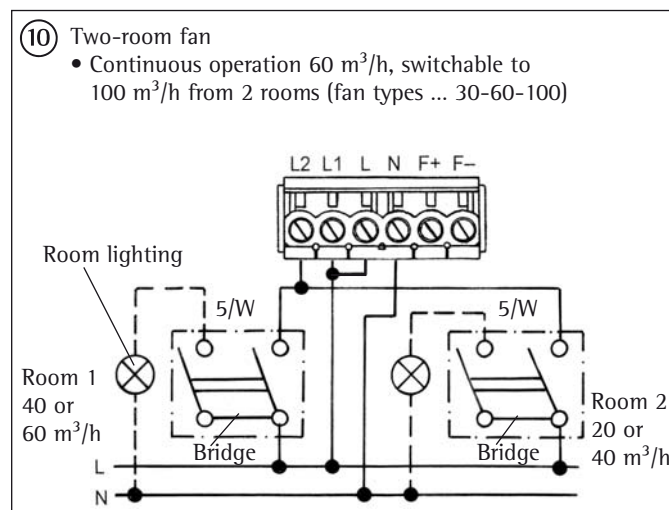
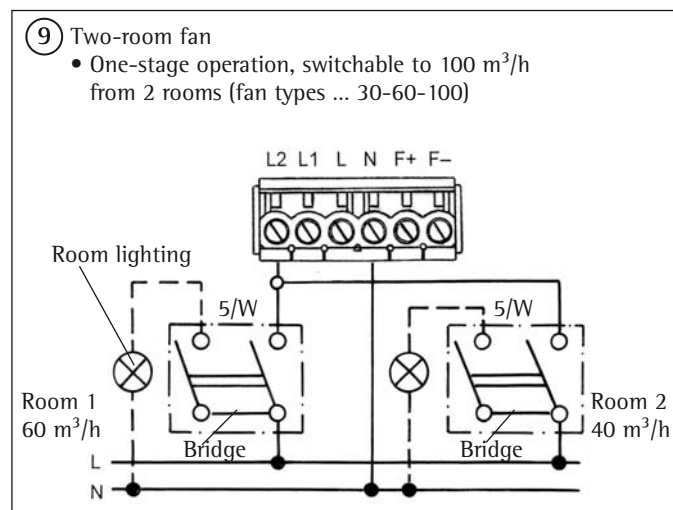
The fan has an automatic summer/winter switchover. The light display is green when the humidity regulation is active, and red when the filter is dirty. The current month for automatic summer/winter switchover is programmed via the switch on the display board (refer to 'Filter change'). By pressing for 10 seconds, the programme mode is activated, and the light display conforms this via a green light. The current month can then be set via the appropriate switches, e.g. pressing the key 6 x means the month of June. 5 seconds after programming, the light displays confirms this via the number of flashes (June: 6 x flash). The fan operates in summer mode from May to October, and in winter mode from November to April. The fan is pre-set on delivery to 'January'. The operating mode set by month via the switch is subordinate to the rocker switch SI in operation with the switch, 5/W2F:

- **Summer mode switch:** The fan runs at 30 m³/h until the winter mode switch is actuated.
- **Winter mode switch:** Humidity regulation active.



Remote control: The fan type ... FK can be operated via remote control via the connections F+ and F- from 0 to 12 V (0–2 V: an operation in accordance with power supply; 2–4 V: fan OFF; 4–6 V: 30 m³/h; 6–8 V: 40 m³/h; 8–10 V: 50 m³/h; 10–12 V: 60 m³/h).

Temperature shut-off: The fans deactivate at an ambient temperature of below 15 °C, thus helping to prevent freezing in the radiators.



Time lag setting: for fans with time lag 5/ZNII

Protective cap

White switch knob

Remove protective cap with screw driver

Electric housing

↓	↑	↓	↑	Interval ON every 4 hrs. for 30 min.
↓	↑	↓	↑	Interval OFF
↓	↑	↓	↑	Lag time 15 min.
↓	↑	↓	↑	Lag time 6 min.
↓	↑	↓	↑	Inverse operation ON 30 min. lag time after leaving bath
↓	↑	↓	↑	Inverse OFF
↓	↑	↓	↑	Activation delay 120 sec.
↓	↑	↓	↑	Activation delay 0 sec.

1
2
3
4

Attention! Only readjust when fan is in zero-potential state!

Factory setting:

- Activation delay 120 sec.
- Time lag 6 min.
- Inverse operation OFF
- Interval switch OFF



LUNOS –

Our representatives

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National

LUNOS Plant Berlin

LUNOS Lüftungstechnik GmbH
für Raumluftsysteme
Wilhelmstraße 31
13593 Berlin
phone +49(0)30 362001-0
fax +49(0)30 362001-89
www.lunos.de
info@unos.de

Saxony, Thuringia

Handelsvertretung Morgenstern
Siedlung 14
01809 Dohna
phone +49(0)3529 515092
fax +49(0)3529 535865
hv-morgenstern@gmx.de

Berlin, Brandenburg

Jedzik Industrievertretung
15366 Dahwitz-Hoppegarten
phone +49(0)3342 308458
fax +49(0)3342 308460
a.jedzik@gmx.de

Mecklenburg-Vorpommern

Uwe Benz
Theodor-Körner-Straße 8
19288 Wöbbelin
phone +49(0)38753 80008
fax +49(0)38753 80018
uwe-benz@web.de

Hamburg, Schleswig-Holstein

R. Rücker
Billeweg 9
21465 Wentorf
phone +49(0)40 7223077
fax +49(0)40 7228477
r.ruecker.hamburg@arcor.de

Bremen, North Lower Saxony

Norbert Lankenau
von Glan Straße 2
26842 Ostrhauderfehn
phone +49(0)4952 4177
fax +49(0)4952 68150
norbert.lankenau@t-online.de

Lower Saxony, North Hesse, Sachsen-Anhalt

Dassler GmbH
An der Salzwiese 2
37581 Bad Gandersheim
phone +49(0)5382 2317
fax +49(0)5382 4478
dasslergmbh@t-online.de

South Northrhine Westfalia

Torsten Küppers
41352 Korschenbroich
Raitz-von-Frentz-Straße 6
phone +49(0)2161 4029823
fax +49(0)2161 4029829
kueppers.t@t-online.de

West Lower Saxony, North Northrhine-Westfalia

Theo Caffier
Spessartstraße 3
49809 Lingen
phone +49(0)591 61062083
fax +49(0)591 61062088
innotec-lingen@ewetel.net

Rhineland-Palatinate, Saarland

Bernd Paries GmbH
Dieselstraße 10
66130 Saarbrücken
phone +49(0)681 48081
fax +49(0)681 48083
info@paries-gmbh.de

Hesse, West. Franconia

Rolf van Venrooy
Rheinstraße 17
68766 Hockenheim
phone +49(0)6205 7581
fax +49(0)6205 12831
TBIvanVenrooy@aol.com

Baden-Württemberg

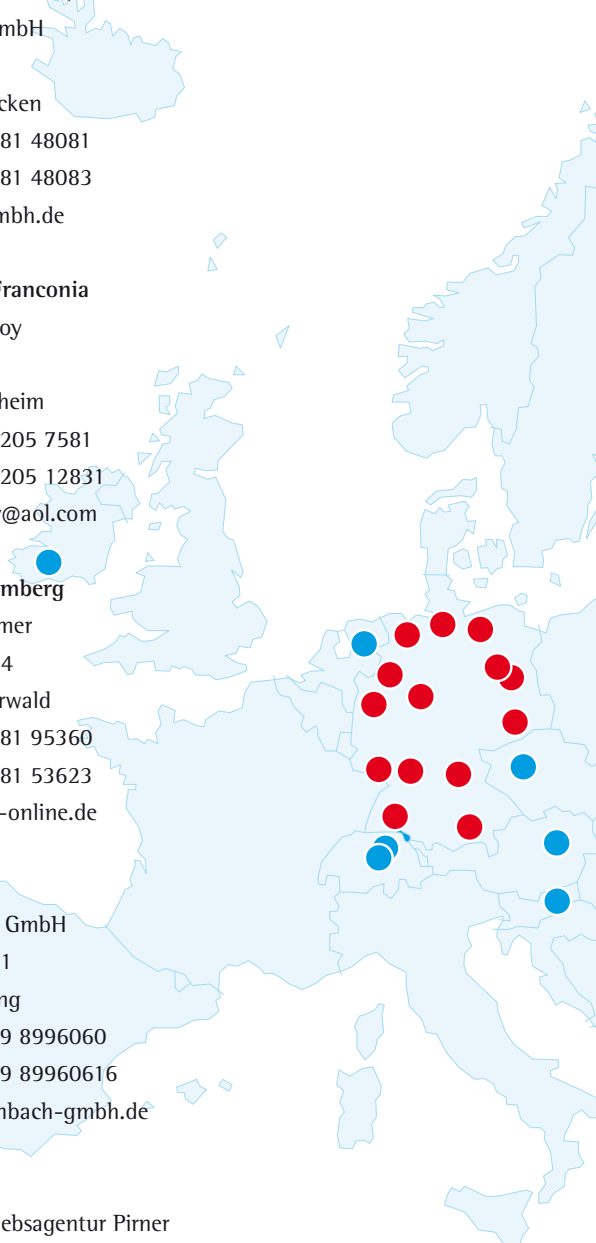
Karl-Heinz Fißmer
Schutterstraße 4
77746 Schutterwald
phone +49(0)781 95360
fax +49(0)781 53623
fissmer-info@t-online.de

Bavaria

Schreckenbach GmbH
Goethestraße 11
82110 Germering
phone +49(0)89 8996060
fax +49(0)89 89960616
info@schreckenbach-gmbh.de

Franconia

x-ecoline Vertriebsagentur Pirmser
Kursberg 11
91236 Alfeld
phone +49(0)9157 9279845
fax +49(0)9157 9279847
info@x-ecoline.de



Your contact



			International	
	Austria Ing. Gerald Fischer Lufttechnik Mühlgasse 13 2340 Mödling phone +43(0)2236 860582 fax +43(0)2236 4505151 office@fischer-et.at	VR China S D Y GmbH Room 302 Xin Hua Xin Building No. 5 Ying Hua Yuan East Road Chao Yang District 100029 Beijing phone +86(0)10 64452057 fax +86(0)10 64452056 lunos@126.com	Ireland Energy Efficient Construction Dunkerron Templehill Carrigrohane, Cork phone +35(0)87 2317167 info@energyefficient.ie	Serbia AVIT d.o.o. SCG-n24300 Backa Topola Ulica József Attila 8 info@avit.co.yu
	Croatia AVK Skupina Cesta 24. junija 23 1231 Ljubljana Slovenia phone +386(0)1 5603056 fax +386(0)1 5603055 info@avk-skupina.si	Lithuania UAB Litmaxas Ateities 10 LT-08303 Vilnius phone +370(0)2 712302 fax +370(0)2 712302 info@lunos.lt www.lunos.lt	Slovakia Grolmus a spol.s.r.o M. Gorkého 245/14 971 05 Prievidza 5 phone +421(0)46 2389021 fax +421(0)46 2389020 roman@grolmus.sk	
	Czech Republic RAAMI s.r.o. 14700 Praha 4 U Zátiši 545/1 phone +42(0)2 41771228 fax +42(0)2 41772959 raami@email.cz	Netherlands Quairo B.V. Gildenweg 18 8304 BC Emmeloord phone +31(0)527 636 154 fax +31(0)527 636 155 visser@quairo.nl www.quairo.nl	Slovenia LUNOS, d.o.o. Robbova ulica 2 1000 Ljubljana phone +386(0)1 6204300 info@lunos.si www.lunos.si	
	Hungary Kompel Kft. 1105 Budapest Vaspálya u. 20 a phone +36(0)1 4319640 fax +36(0)1 4319648 info@kompel.net	Poland PHU IGLOTECH L. Bystrzycki, R. Ostrowski Torunska 41 82500 Kwidzyn phone +48(0)55 6457300 fax +48(0)55 6457328 kwidzyn@iglotech.com.pl	Switzerland KAPAG Kälte-Wärme AG Schwäntenmos 6 8126 Zumikon phone +41(0)44 9187250 fax +41(0)44 9187255 info@kapag.ch	
			Ukraine TEKO INTERFACE TOB 03058 Kiev ul. Lewanewskowo 6 phone +38(0)44 4010990 info@tekointerface.com	



LUNOS Lüftungstechnik GmbH
für Raumlufsysteme
Wilhelmstraße 31 · 13593 Berlin
Postfach 20 04 54 · 13514 Berlin

Telephone +49(0)30 362001-0
Telefax +49(0)30 362001-89

www.lunos.de · info@lunos.de

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