

# LUNOS Catalog For Home Ventilation

Feeling good at Home with LUNOS Ventilation Systems



**LUNOS**  
energy-efficient





# Welcome to Your Home Ventilation

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## Imprint

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## Introduction

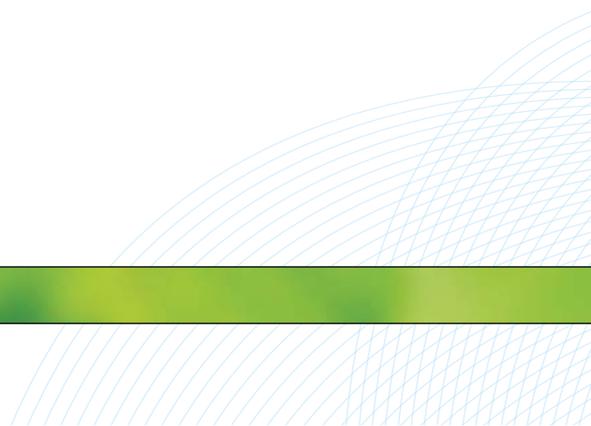
Dear Reader,

LUNOS is a traditional Berlin company, well-known throughout the world as a manufacturer of innovative ventilation systems for more than 56 years. Around 70 staff are employed in Berlin-Spandau, in the most western part of Berlin, handling the development, production and sales of a wide range of ventilation systems for worldwide application. Our engineers are continuously developing new devices for application in the home or in apartment buildings.

Our clients include i.e. housing societies and house or apartment block builders as well as manufacturers and management of office and hotel buildings in many countries around the world. Whether buildings are small or large, new constructions or redevelopment projects, our clients are convinced of the quality and long service life of our products.

Against the backdrop of the current energy change it is important for all of us to ensure we waste as little energy as possible. Our systems can contribute to this effort in many ways. Our portfolio includes the right ventilation system for every budget and almost every application. A wide range of different ventilation methods to suit your requirements are provided in the form of exhaust air systems, small decentralized heat recovery systems or devices completely integrated into windows.

This year's catalog not only has a new Appearance. You will also find out about our new modular system for the 160 series which enhances application potential of our devices considerably. And with our new control concepts, we also meet the requirements of the 'smart home' .



# LUNOS

Supplier – Made in Berlin



In addition to modern bus systems and smaller more efficient controls, Lunos now provides a new control, the so-called TAC (Touch Air Comfort), with our own developed operating system, the LUN.OS. This ensures that practically every wish of the client with regard to control options and the linking of various devices and functions can be fulfilled.

We are pleased to be able to present all new products and ventilation concepts in this catalog. We hope you enjoy reading and wish you success in selecting and using our ventilation devices and systems.



› Our company location has been at the heart of Berlin-.Spandau since 1956



› The production area



› Impressions from the 1960s



# LUNOS Catalog

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# for Cosy, Pleasant Home Ventilation

and fresh air in every room without noise from the outside



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# Confidence

## Fresh Air for more

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Confidence

### Quality passes the Test of Time

At the beginning – in the times of the Economic Miracle – there was an innovation: LUNOS invented a ventilation unit as a passive ventilation system for kitchen cabinets ventilated from the outside. A short while later LUNOS became one of the best known manufacturers of home ventilation systems – with solutions which, were, and still are, widely compatible and with a very long service life – with components which provide a more pleasant indoor climate and healthy building substance. Today, LUNOS develops, produces and sells ventilation systems for house building at its location in Berlin-Spandau and provides know-how and extensive services.

### LUNOS is more than just pleasant indoor Climate

Our core competence is in controlled home ventilation. This requires customized solutions! LUNOS Ventilation systems generate customized, clean and hygienic ventilation of all residential rooms and guarantee dry walls free of mold. In addition, they also ensure considerable savings in terms of heating costs – with low acquisition and operating costs and of course with the quality and safety our good name stands for. This philosophy has ensured us continuous growth – both in Germany and on international markets.

### In the past

Air exchange took place via numerous joints in the building shell, e.g. at the door or at the window. This enabled humid and contaminated room air to escape. This often involved an air exchange of five times per hour in the apartment or house. Condensation water only formed on the cold window panes, without any further consequences. Ventilation was only made as exhaust venting from rooms without windows. Inside bathrooms without windows were vented when used by means of a time lag. Air supply of outside air was made via vents in the building. Ventilation in the rest of the apartment was also ensured via air permeability in the building shell.

### Where do contamination and humidity come from?

Furniture, carpets and paints evaporate a very small amount of contaminants. Humidity is caused by the breathing of residents, showering, doing the washing and drying, cooking and also from plants. In a four-person household, about 10 liters of water evaporate every day, i.e. one floor bucket full.

› Yesterday – 5 x air exchange via building leakages

in LUNOS  
than 50 years



## Principles of Home Ventilation

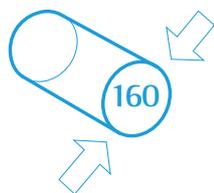
### Where should the humid, contaminated air go?

Air can only absorb a limited amount of humidity. The amount depends on the respective temperature: hot air absorbs more than cold air. If the hot, humid air cools down, e.g. on a cold surface, condensation arises. "Condensation water" is the result. You can see it every summer on your cool drinks glass. Risk of mold formation on the cooler parts of the outside wall, e.g. air humidity can settle as condensation in corners, an ideal environment for mildew. Protection against damage from humidity by means of ventilation: the humidity in the room air can be reduced via effective ventilation. Not only humidity, but also contaminants in the room air are discharged.

### Today

The Energy Savings Ordinance (Energieeinsparverordnung (EnEV)) applies today for redeveloped and new buildings and requires more and more of the overall balance of your building project. Effective window ventilation without unnecessary loss of energy is almost impossible for the consumer. As a result of high energy prices, however, not enough ventilation is carried out. This results in damage from humidity which affects both the health of residents and the building substances. Therefore, fresh air requires new methods and passages. LUNOS provides intelligent home ventilation systems which ensure controlled supply of clean air in accordance with your requirements and which discharge exhaust air and all contaminants swiftly and de-centrally outside. Thanks to our highly efficient heat recovery, our ventilation helps save heating costs and this makes a large contribution to fulfilling energetic requirements. Even though we pay great attention to silent, efficient operation when developing our products, we also offer solutions for special requirements concerning noise protection making our ventilation systems practically inaudible and effectively absorbing any disturbing traffic noise. LUNOS only allows the good in the environment into your home.

### The Development – the 160 Modular system



The 160 tube, a well-known component for LUNOS clients, can take in a wide range of technology. Meanwhile there are five different ventilators which can operate in this tube. Suitable for redevelopment and new construction, the 160 series is now even more appealing. Each 160 fan consists of 4 optional components: insert, tube, inside panel and outside grille. You can select these in line with the specific requirements of your project. The various 160 fans can be efficiently combined when designing your rooms with the aid of the LUNOS Planning Tool in accordance with current standards such as EnEV and DIN 1946-6.

- › Today: 0.5 x air exchange via the ventilation system

# LUNOS Ventilation

## Controlled home ventilation:

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Principles

### Principles

LUNOS ventilation systems are based on air flow of the entire residential areas in line with specific needs. The decentralized fans of LUNOS can be combined into three different ventilation systems for efficient ventilation:

- › Exhaust air system
- › Hybrid system
- › System with heat recovery

### Exhaust Air System

Fans discharge the exhaust air from the bathroom, WC or wash-room into the open or into exhaust air shafts in accordance with requirements and the level of humidity. This results in a slight under-pressure in the living area. As a result of this under-pressure, fresh, filtered air flows through the outside wall vents into the living room and bedroom, children's room and the work rooms. Special attention is paid to moisture-regulated home ventilation. Using this system, approved by the building authorities, a considerable amount of loss of ventilation heat can be saved in accordance with EnEV.

### Needs-driven, controlled home ventilation with LUNOS

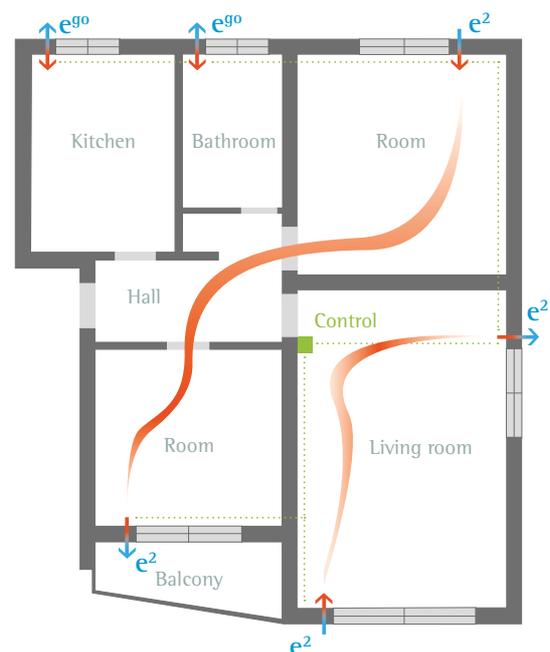
- |                       |                                                                                                                                                                                                                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Coming in:</b>     | <ul style="list-style-type: none"> <li>• fresh, filtered air – always of sufficient amount without draft</li> </ul>                                                                                                                                                                                          |
| <b>Going out:</b>     | <ul style="list-style-type: none"> <li>• moist and odor-intensive air from the kitchen, bathroom, WC etc.,</li> <li>• contaminants and evaporations of paint, carpets, furniture etc.</li> </ul>                                                                                                             |
| <b>Stays inside:</b>  | <ul style="list-style-type: none"> <li>• heating</li> </ul>                                                                                                                                                                                                                                                  |
| <b>Stays outside:</b> | <ul style="list-style-type: none"> <li>• particles and insects (via filter inserts)</li> <li>• noise (via noise-reduced outside wall elements)</li> <li>• wind (via wind pressure resistance on the outside wall elements)</li> <li>• mildew and house dust mites (via continuously low humidity)</li> </ul> |

### Hybrid System

Hybrid ventilation systems are combinations of at least two different types of ventilation. Combination of exhaust air devices and fans with heat recovery are especially effective. The benefits of such hybrid combinations are clear: while living areas are equipped with heat recovery devices, the more favorably priced exhaust air device can be used in classical exhaust air rooms such as the bathroom, WC or kitchen which are only used when required. For bathrooms and WCs without windows, this is even prescribed pursuant to DIN 18017-3.

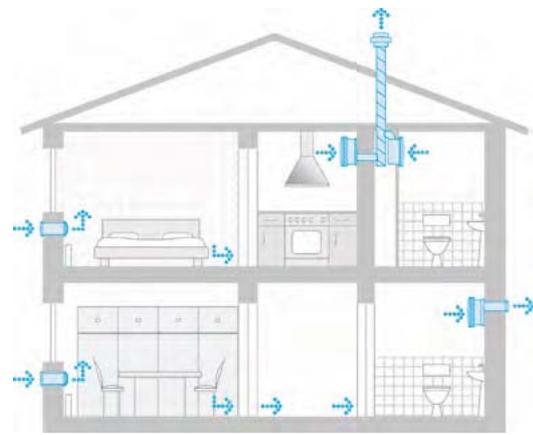
### System with Heat Recovery

All living room areas are equipped with heat recovery units in this extremely efficient system. The new  $e^{90}$  also enables ventilation of classical exhaust air rooms using this device. Living room areas are equipped with the well-proven  $e^2$ , as in hybrid ventilation.



# system

the right dimension is decisive



## Standards and Ordinances

### Bathroom and WC ventilation pursuant to DIN 18017-3

Ventilation of bathrooms and WCS without windows pursuant to DIN 18017-3 is the simplest form of home ventilation: in DIN 18017-3, the demand for continuous ventilation in the bathroom has been intensified. Only if high thermal insulation of the building is ensured and washing is not dried inside the apartment is it allowed to have a bathroom ventilator which can be switched off – with 15 minutes time lag at 60 m<sup>3</sup>/h. In all other buildings, bathrooms and toilets must now have multi-step ventilation with a continuous flow of exhaust air. The continuous flow of exhaust air in the bathroom at the same time results in a continuous, minimal ventilation of the apartment as a first step to user-dependent home ventilation. Since building impermeability of this standard has been adjusted to state of the art technology, outside air flows now have to be planned and respective outside vents provided. This design can be completed swiftly and easily using tables. Compared to DIN 1946-6, the flow volume requirements of DIN 18017-3 only relate to exhaust air rooms, not to the entire home.

### DIN 1946-6

§ 6 of the EnEV requires sufficient minimum air exchange, in addition to continuous building impermeability. Evidence of such air exchange can be provided via the DIN 1946-6. The most important tool of the revised standard of the ventilation concept, namely by answering a simple question: is the new or renovated building sufficiently ventilated via its vents or which ventilation measures are required to ensure sufficient air exchange in line with the residents' needs? The answer to this question arises from two steps: first it is identified whether ventilations measures are required, and then which ventilation systems are suitable for implementing the measures required. The standard also formulates requirements concerning energetically favorable ventilation systems: exhaust air systems have to be equipped wither with a needs-driven control in line with user requirements or with a heat pump.

## ENEV

Whether its redevelopment or a new building: buildings must be impermeable pursuant to the energy savings ordinance (EnEV). This legal regulations always applies, even for redevelopment of old buildings. In the EnEVm the building planned is compared to a reference building. In the case of deviation in one item from the reference building, respective compensation must be provided in another item.

### Therefore LUNOS: fully in line with the EnEV

LUNOS systems operate on a needs-driven basis in accordance with the parameters of humidity and temperature. Depending on the respective exhaust air humidity, the volume flow either increases or decreases. This means the flow contains as much and as little air as required. Pre-conditions for the calculation of the reduced air exchange is provided by the energy saving ordinance (EnEV) in connection with DIN V 4701-10.



- › LUNOS provides a simple planning tool as a download at [www.lunos.de](http://www.lunos.de). This tool calculates with the algorithms of the DIN 1946-6 and supports your planning work when preparing ventilation concepts in connection with the following issues.
  - verification of necessity of ventilation measures (LTM)
  - design of outside air flow for nominal ventilation
  - calculation of infiltration air flow without and with LTM
  - component design of the ventilation system, materials list

# Controlled

with LUNOS



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Exhaust air systems



# Home Ventilation

## exhaust air systems



### > The exhaust air side



#### Silvento series

Each Silvento series can be used, depending on the respective application or requirement: surface-mounted, flush-mounted or clamp fan



#### AB 30/60

Outside wall fan with two ventilation steps and all-round cross-section. Can be combined with LUNOthem façade element



#### RA 15-60

Radial outside wall fan with four ventilation steps and round cross-section. Can be combined with LUNOthem façade element

### > The supply air side



#### ALD-R 160

Outside wall inlet with wind pressure resistance, filter and sound absorber



#### 9/MRD

Surface-mount wall unit for the outside wall inlet ALD-R160.  
HxWxD in mm:  
240 x 210 x wall thickness



#### LUNOthem + ALD-R160L

Outside wall inlet with façade element, almost invisible from the outside

### Innovative Control: Humidity and Temperature

Needs-driven regulation of the Silvento exhaust air fans has been fitted with a humidity-temperature sensor. This innovative regulation adjusts the fan stage automatically to the ventilation requirements: the air flow increases or decreases depending on the relative humidity. This ensures that as much ventilation is made as required and as little as possible.

The sensor integrated in the suction section of the exhaust air fan records the temperature as well as the humidity content of the exhaust air flow. Since the fan is installed in the bathroom or WC where different room air conditions arise compared to the living room areas, the simultaneous evaluation of temperature and humidity ensures ventilation (step 1 to 4) adjusted to the room air conditions in the living room areas.

Therefore, this control not only considers the requirements in the bathroom, but also the needs in the living room area and provides effective protection against moisture damage and mold formation. The automatic seasonal time switch adjusts the fan automatically to the lowest stage in summer and back to humidity control in the transition period and winter season.

### Financial Support for LUNOS exhaust air systems

The remarkable energy saving effects of a building by using home ventilation have been confirmed by the Federal Industrial Association of Germany for House, Energy and Environmental Technology and by the Fraunhofer Institute for Building Physics. As a result, the energy saving features of regulated home ventilation are being rewarded by the legislator in the form of a financial subsidy. In addition to the energetic benefits, the building owner can also benefit from a range of other plus points: a healthy, cosy indoor climate which is always full of fresh air, and protection of the building substance, which increases the value of the property.

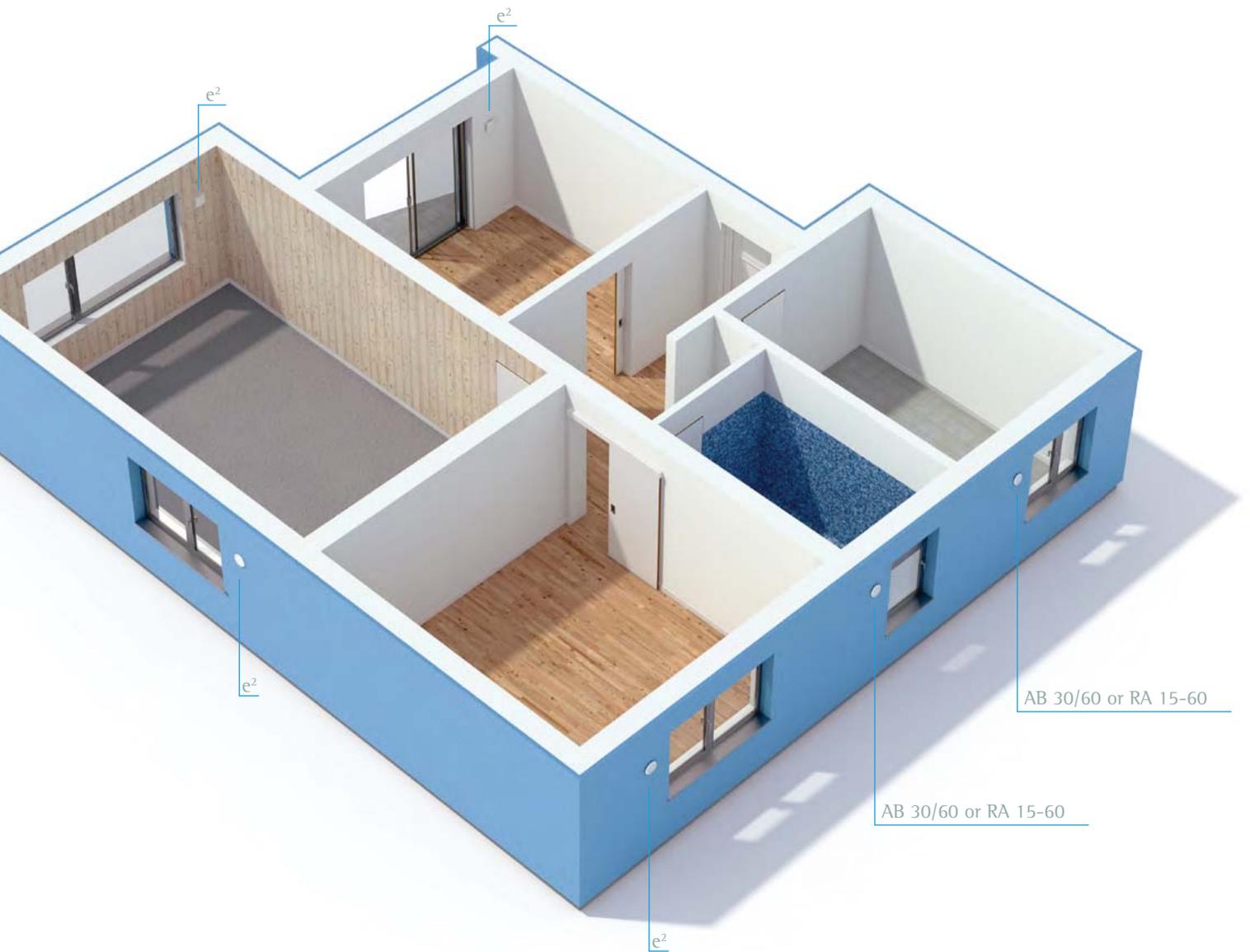
If functional rooms such as bathroom, WC or kitchen have no windows, the exhaust air series Silvento has to be used.



# Regulated With

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Hybrid Systems



# Home Ventilation

## hybrid system



### > Supply air and exhaust air with HR



**e<sup>2</sup>**  
Axial outside wall fan with regenerative heat recovery for living rooms and bedrooms



**9/MRD**  
wall installation housing for e<sup>2</sup> and e<sup>90</sup>.  
HxWxD in mm:  
240 x 210 x wall thickness



**e<sup>2</sup> + LUNOtherm**  
e<sup>2</sup> with façade element, without disturbing fan grille on the façade.

### > The exhaust air side



**Silvento series**  
Each Silvento series can be used, depending on the respective application or requirements: surface-mounted, flush-mounted or clamp fan



**AB 30/60**  
Outside wall fan with two ventilation steps and all-round cross-section. Can be combined with LUNOtherm façade element



**RA 15-60**  
Radial outside wall fan with four ventilation steps and round cross-section. Can be combined with LUNOtherm façade element

### Combining with different Systems

The 160 modular system makes it easier to plan and implement hybrid ventilation. If the Silvento series does not have to be included in planning, you can use the same installation tube for each ventilation unit of your building project. The exhaust air series Silvento is used for bathrooms and kitchens without windows in apartment buildings.

The benefits of the hybrid combination are clear: while living room areas are equipped with the heat recovery device e<sup>2</sup>, a lower priced exhaust air device can be used in classical exhaust air rooms such as the bathroom, WC or kitchen which is only used when needed. This is required by law for bathrooms and WCS without windows pursuant to DIN 18017-3.

### The e<sup>2</sup> Principle

LUNOS ventilation systems with heat recovery can be used everywhere. As a result of the decentralized concept, the individual fans can be installed where they are required. The fans of the e<sup>2</sup> series operate in accordance with the well-known principle of regenerative heat exchange which has been practically perfected by the LUNOS company.

Combination with classical exhaust air systems provides a convincing benefit in terms of cost and use and can be organized pursuant to EnEV and DIN 1946 using the LUNOS planning tool.

### The exhaust air fans of the 160 series

With its new products AB/30 and RA 15-60, LUNOS provides an ideal enhancement to the 160 series in classical exhaust air rooms subjected to humidity, such as the bathroom, WC and the kitchen. With the aesthetic dreams of house and apartment owners in mind, engineers at LUNOS also focused on the design when developing the new fans. These fans present themselves like their 'big brother' e<sup>2</sup>: inside panel, filter and outside grille are from the same product family, whereby the RA 15-60 is more pressure-resistant than its alternative, the AB 30/60.



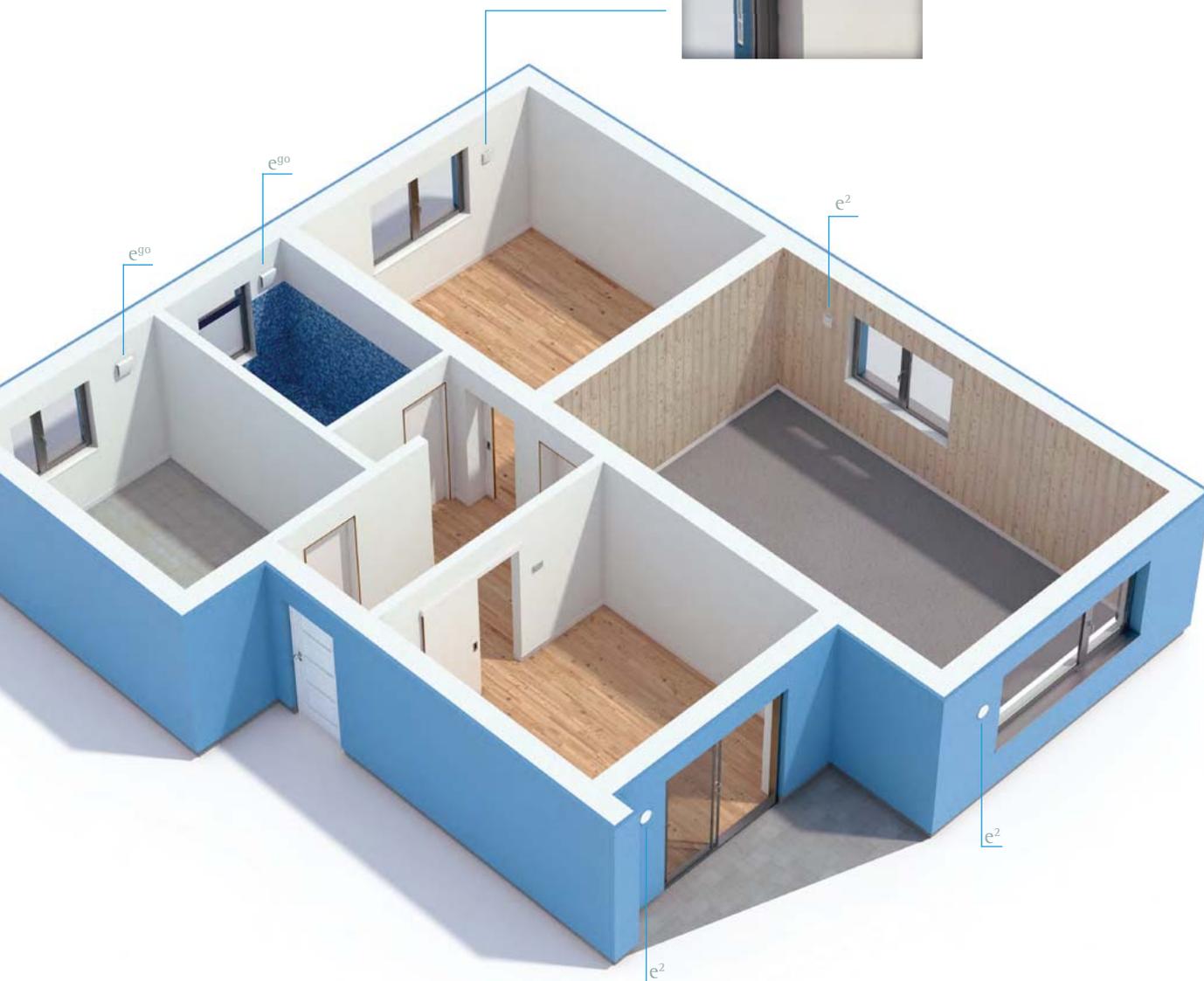
# Regulated with

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Systems with HR



› The  $e^2$  can also be combined with the LUNOthem façade element. The outside grille disappears from the outside wall: what remains is merely a narrow vent slit in the reveal or in the lintel.



# Home Ventilation

## Heat Recovery



### > Supply and exhaust air with HR



**e<sup>2</sup>**  
Axial outside wall fan with regenerative heat recovery for living rooms and bedrooms



**9/MRD**  
wall installation housing for e<sup>2</sup> and e<sup>90</sup>.  
HxWxD in mm:  
240 x 210 x wall thickness



**e<sup>90</sup>**  
Axial outside wall fan with regenerative heat recovery and simultaneous ventilation



**e<sup>2</sup> + LUNOthem**  
e<sup>2</sup> with façade element, without disturbing fan grille on the façade.

### The e<sup>2</sup> and e<sup>90</sup> principle in ventilation systems with heat recovery

Via the e<sup>90</sup>, the e<sup>2</sup> can be used to optimum effect in a ventilation system with heat recovery. On account of the decentralized concept, the individual fans can be installed exactly where they are required.

e<sup>2</sup> fans are used in living room areas, and two units are always in operation as pairs. Therefore, an even number of units must always be installed to ensure the units work properly.

Functional rooms such as bathrooms and kitchens are ventilated via the e<sup>90</sup>. Operation in pairs is not required, since two 'small' e<sup>2</sup> in the e<sup>90</sup> ensure supply and exhaust air with heat recovery.

### Ventilation in living rooms is applied as in bedrooms, with e<sup>2</sup>:

The e<sup>2</sup> operates in accordance with the principle of the regenerative heat exchanger. A storage element charges in a similar way to a battery with heat energy in reversing operation and transfers the heat to the outside air supplied. The fan with heat recovery has a power consumption of just 1.4 Watts in base load operation (0.09 W/m<sup>3</sup>/h)

### Ventilation in the bathroom, WC and kitchen with e<sup>90</sup>:

The e<sup>90</sup> also operates in accordance with the principle of the regenerative heat exchanger. A storage element charges with heat as in the well-known e<sup>2</sup>. However, this is distributed skillfully with two fans so that supply and exhaust air are provided simultaneously. A second device is not required for operation. The system can also be switched to exhaust air mode in which a very high flow of 45 m<sup>3</sup>/h is discharged in order to enable fresh air to flow into the room quickly (e.g. WC or bathroom).



# Benefits and

## If you regulate ventilation,

### > Cost estimates

#### Apartment building

3-room apartment, floor space approx. 70 m<sup>2</sup>

##### Exhaust air system

e.g. with

- KL 30-60FK
- KL 30-60
- ALD-R 160
- switch

from 900 €

##### Hybrid system

e.g. with

- e<sup>2</sup> with HR
- KL 30/60
- Bundle universal control
- switch

from 2.300 €

##### System with heat recovery

e.g. with

- e<sup>2</sup> with HR
- e<sup>90</sup> with HR
- Bundle universal control
- switch

from 3.000 €

#### Detached House

4- room detached house, floor space approx. 90 m<sup>2</sup>

##### Exhaust air system

e.g. with

- KL 30-60FK
- KL 30/60
- ALD-R 160
- switch

from 900 €

##### Hybrid system

e.g. with

- e<sup>2</sup> with HR
- RA 15-60
- Bundle universal control
- switch

from 2.300 €

##### System with heat recovery

e.g. with

- e<sup>2</sup> with HR
- e<sup>90</sup> with HR
- Bundle universal control
- switch

from 3.000 €

The remarkable energy saving effects of a building by using home ventilation have been confirmed by the Federal Industrial Association of Germany for House, Energy and Environmental Technology and by the Fraunhofer Institute for Building Physics. As a consequence, these clear energy saving features of regulated home ventilation are being rewarded by the legislator in the form of subsidies. The building owner can enjoy a wide range of other plus points of home ventilation, in addition to the energetic benefits: a healthy, cosy room climate with fresh air, protection of the building substance and thus an increase in value of the property.

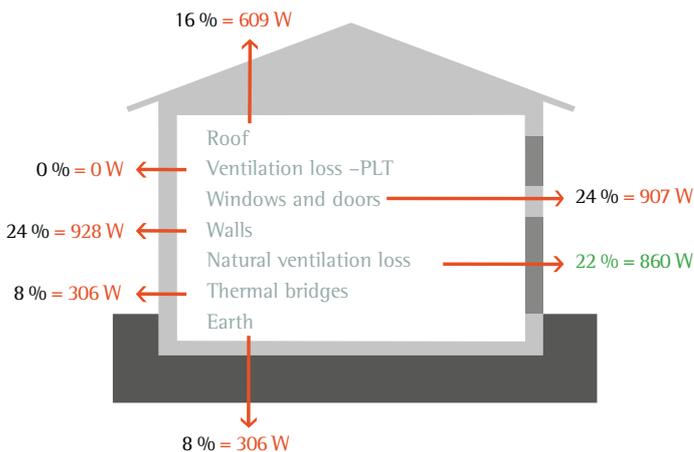
# Costs

you benefit enormously

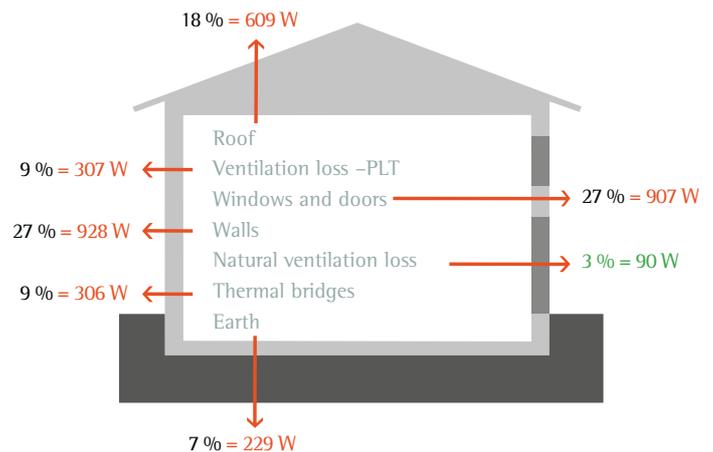


## > Comparison of unregulated ventilation with a model of heat recovery - based on a detached house

Heating load and ventilation heat loss in unregulated ventilation



Heating load and ventilation heat loss when using the e<sup>2</sup> - with heat recovery



### Result of the calculation:

by using the e<sup>2</sup> in combination with the exhaust air device AB 30/60, the heating load is reduced by 15%, the ventilation heat loss is reduced to 43% (57 % savings). The heating loss calculation is normally carried out by a specialist planner and he/she can calculate how much the owner can save (financially) per year based on the percentage savings calculated.

#### Parameters of the calculation example:

ventilated area: 124.90 m<sup>2</sup>, ventilated room volume: 312.25 m<sup>3</sup>, mean room height: 2.50 m, Normal, inside and outside temperature:  $\Theta_i = 20^\circ\text{C}$  and  $\Theta_a = -12^\circ\text{C}$ , new construction detached house, KFW70 standard, Heat passage coefficient (U value): outside wall  $U = 0.16 \text{ W/m}^2\text{K}$ , window  $U = 1.10 \text{ W/m}^2\text{K}$ , roof  $U = 0.20 \text{ W/m}^2\text{K}$ , base plate  $U = 0.23 \text{ W/m}^2\text{K}$

# The Exhaust Air with the products of Silvento,

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Silvento



## › No disturbing noise: low noise level

Residential and traffic areas are moving ever closer together. However, we only have a good feeling when we are within 'silent walls'. That is why the motors of the Silvento have been optimized, the geometry of the impellers supplied with air re-designed and improved based on experimental testing. This has resulted in one of the most silent fans in the world. All Silvento items convince by way of their minimal operating noise which is hardly audible, since the noise level is just 24 dB(A) at 30 m<sup>3</sup>/h (basic ventilation) and 35 dB(A) at 60 m<sup>3</sup>/h (regulated ventilation).



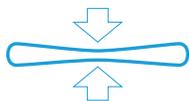
## › For the environment: minimal power consumption with maximum energy efficiency – in line with the EnEVne der EnEV

The Silvento counteracts rising energy costs and increasing contamination of the environment. The new fan generation excels on account of the development of even more efficient drive units with high efficiency and extremely low power consumption. For 3 flow levels, power consumption amounts to just: 5.2/10.9 W at 30/60 m<sup>3</sup>/h flow volume – maximum pressure difference 210 Pa.



## › For Technology and Comfort: regulation of humidity and temperature

Needs-driven regulation of the exhaust air fans has been equipped with a humidity-temperature sensor. This innovative regulation can adjust the exhaust air flow even better and more exactly to the conditions in the living room area, and provides effective protection against moisture damage and mold formation. The automatic seasonal switch shifts the fan automatically to the lowest level in summer and returns it to respective humidity control in the transition period and for winter.

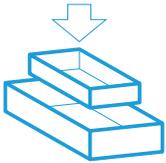


## › Elegant – inconspicuous design

The design of the Silvento series has been deliberately kept simple in order to draw as little attention to units as possible in all rooms. And yet it still radiates stylish elegance. Air flow is still from the rear so that no dirt sediment can be seen. The front panel is ultra-flat and the dimensions show how compact the fan really is: surface-mounting with 260x260x108 mm (WxHxD) and flush mounting panel with 260 x 260 x 23 mm and flush-mounted housing with 235 x 235 x 92 mm.

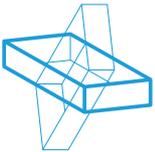
# System

AB 30/60, RA 15-60, ALD-R 160



## > LUNOS Long-term compatibility

Silvento flush-mounted fans are 100 % downward compatible with the fan inserts of the old LUNOS generation. The Silvento clamp fan can be inserted easily into the existing old flush-mounted housing with and without fire protection and this enables easy adjustment to state of the art technology.



## > The Silvento housing can be applied everywhere

It can be installed in any position you require.





# Exhaust

## ilvento Series

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Overview

### › Silvento: Technical Data

Silvento Type V <sup>1)</sup> or KL <sup>2)</sup>	30/60	30/60ZII	30/60BZII	60ZII	60BZII	100ZII	30-60FK
Flow rate [m <sup>3</sup> /h]	30/60/100	30/60	30/60	60	60	100	30/40/50/60
Power consumption [W]	5,2/10,9/36,5	5,5/11,4	6/12,2	11,8	12,2	36,2	5,3/7,2/8,9/10,9
Noise pressure level [dB(A)]	24/35/44	24/35	24/35	35	35	44	24/27/32/
Time lag [min.]		6/15 <sup>3)</sup>					
Interval [h]		4	4	4	4	4	
Inverse operation		yes	yes	yes	yes	yes	
Motion sensor			yes		yes		
Humidity Control level [% r.F.]							50-70

1) Silvento V are fan sets which require a flush-mounted or surface-mounted housing

2) Silvento KL are complete single tube fans clamped into pre-wall constructions

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

3) 1)The DIN 18012 - 3 prescribes a time lag of at least 15 minutes at 60 m<sup>3</sup>/h after exiting the room.



IP X5

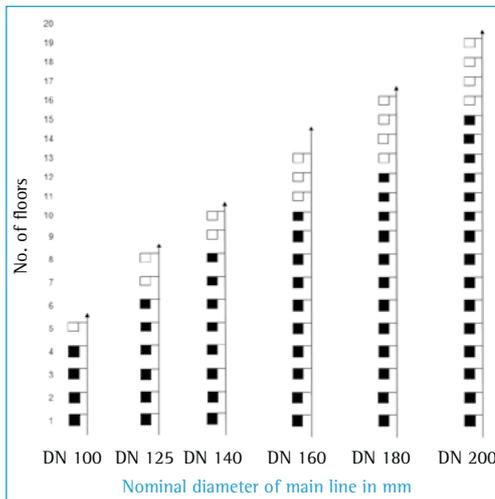
# Air Fans

## Overview: Technical Data

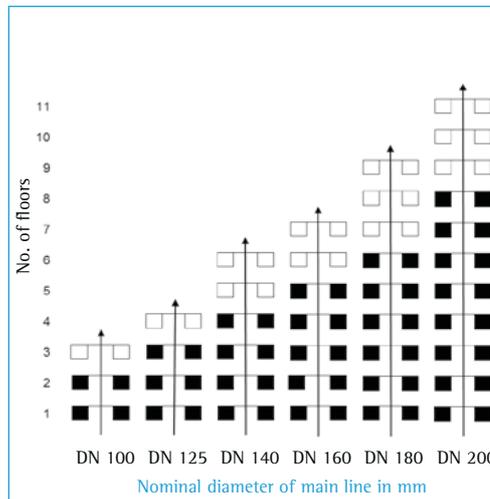
Main line

### > Design of the main line diameter

Installation of one unit per level with simultaneous operation of all units



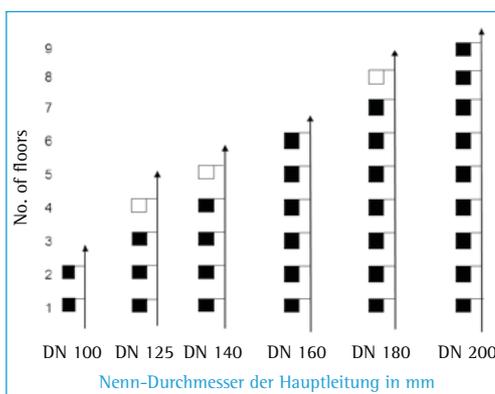
Installation of one unit per level with simultaneous operation of all units



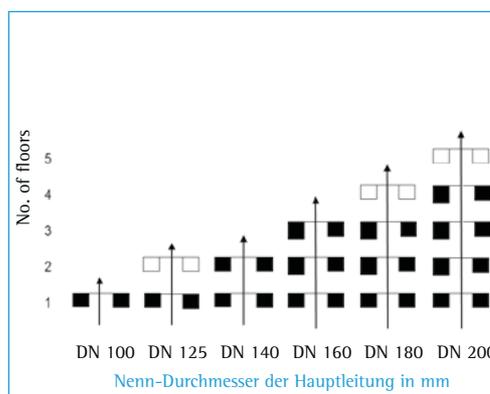
For a planned flow rate of 60 m<sup>3</sup>/h

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

Installation of two units per level with simultaneous operation of all units



Installation of two units per level with simultaneous operation of all units



For a planned flow rate of 100 m<sup>3</sup>/h

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

# Exhaust

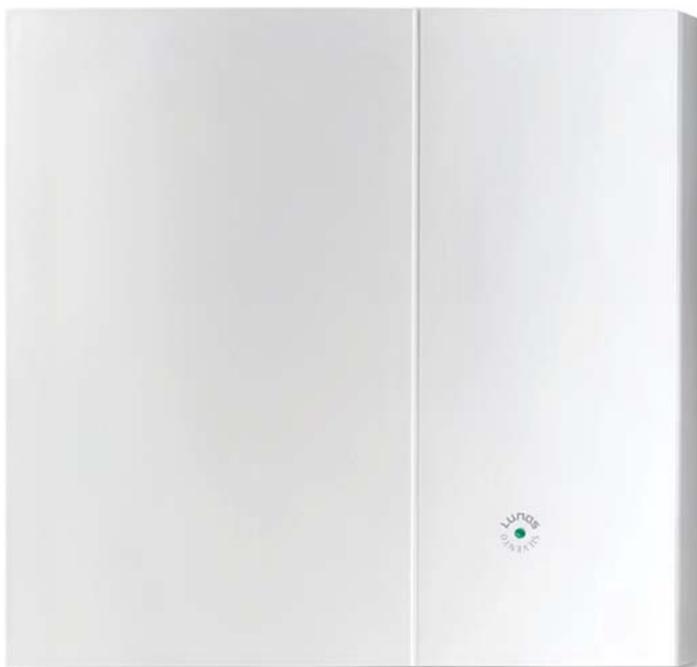
## Silvento with surface-mounted housing 3/AP

22 · 23

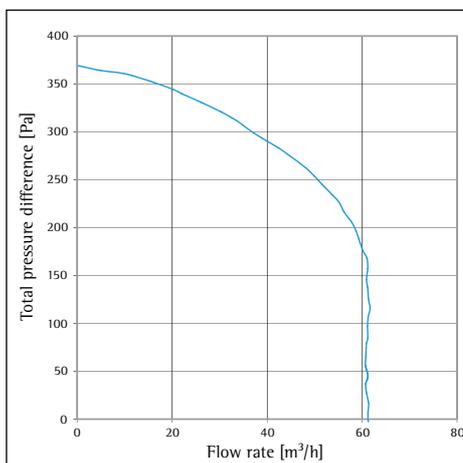
3/AP

### › Silvento 3/AP

- Housing for surface-mounted assembly of UV-resistant plastic.  
Order No. 039 144
- Suitable for wall and ceiling installation
- With conical exhaust vents / DN 75 to DIN 80) and air-tight non-return flap
- Installation position of rear, axial exhaust vent: top left, top right, bottom left or bottom right, adjustment of non-return flap to installation position via simple repositioning.
- All fan inserts of the Silvento series can be used
- Static pressure available: 221 Pa
- Including assembly accessories and sound absorbers



Silvento surface-mounted housing 3/AP



Pressure Flow rate characteristic curve AP, calculated by TÜV SÜD

# Air Fans

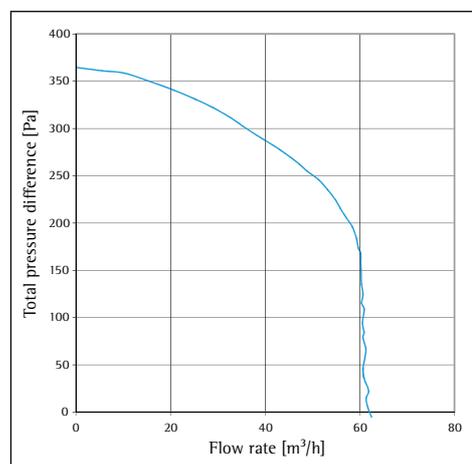
– with fire prevention pursuant to K90-18017 3/AP-B

3/AP-B

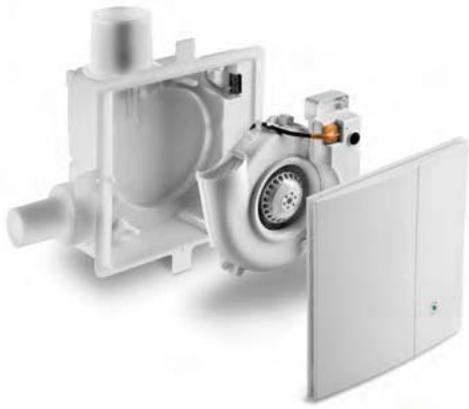
## > Silvento with fire protection 3/AP-B

- Housing for surface-mounted assembly of UV-resistant plastic.  
Order No. 039 152
- With shut-off device, suitable for wall and ceiling installation, connection diameter DN 80 with airtight non-return flap
- Metallic axial exhaust vents
- Installation position of shut-off devices related to the surface-mounted housing: top left, top right, bottom left or bottom right.
- All fan inserts of the Silvento series can be used
- Static pressure available: 216 Pa
- Including assembly accessories and sound absorbers

> Rear side exhaust vent with airtight non-return valve for kitchen fire prevention



Pressure Flow rate characteristic curve AP-B, calculated by TÜV SÜD



# Exhaust

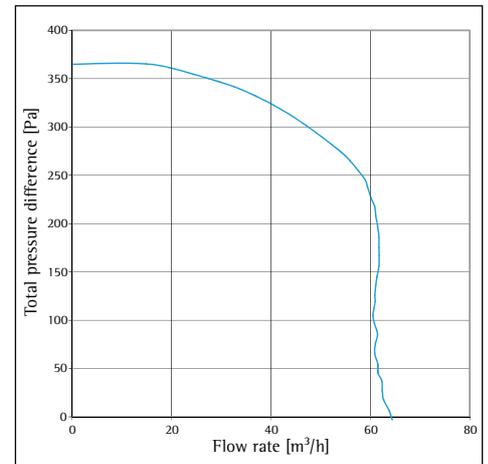
## Silvento with flush-mounted housing 3/UP-R

24 · 25

3/UP-Radial

### › Silvento 3/UP-R

- Plastic flush-mounted housing with radial exhaust vents for installation in shaft and drywall (without requirements for duration of fire resistance) and in suspended ceilings  
[Order No. 039-128](#)
- With conical exhaust vents (DN 75 to DIN 80) and airtight non-return flap
- Installation position of flush-mounted housing with exhaust vents possible to left, top or right, adjustment of non-return flap to installation position via simple repositioning.
- All fan inserts of the Silvento series can be used
- Static pressure available: 233 Pa
- With plaster protection cap to protect against contamination during shell construction phase
- Installation depth 90.5 mm including assembly accessories and sound absorbers



Pressure Flow rate characteristic curve UP-R, calculated by TÜV SÜD

### › Option – Two-room fan



- Convertible to two-room fan (Two room set 3/S2, [Order No. 039 209](#))
- For plug-in assembly of the two-room vent (DN 50/51/80) the opening prefabricated by break point is to be prepared at the flush-mounted housing, depending on the installation position of the two room connection bottom, left, right or top
- Distribution of flow rate:  
1. Room  $\frac{2}{3}$ , 2. Room  $\frac{1}{3}$

# Air Fans

– with fire protection pursuant to K90-18017 3/UP-BR

3/UP Fire Prevention Radial

## › Silvento with Fire Prevention 3/UP-BR

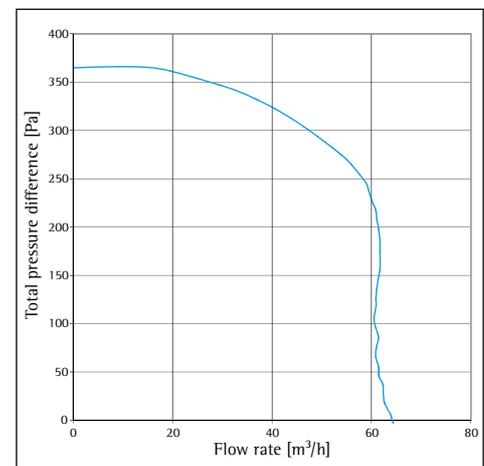
- Plastic flush-mounted housing with fire prevention casing for installation in shafts with requirements of duration of fire resistance, vent radial  
Order No. 039-160



- With shut-off device K90 – 18017, suitable for installation in eat-in kitchens, connection diameter DN 80, with airtight non-return flap

- Metallic, radial exhaust vents

- Installation position of flush-mounted housing with exhaust vents possible to left, top or right, adjustment of non-return flap to installation position via simply turning the insert



Pressure Flow rate characteristic curve UP-BR, calculated by TÜV SÜD

## › Option – Two-room fan

- All fan inserts of the Silvento series can be used
- Static pressure available: 233 Pa
- With plaster protection cap to protect against contamination during shell construction phase
- Installation depth 102.5 mm including assembly accessories and sound absorbers



- Convertible to two-room fan Fire prevention casing (3/UP-2BR, Order No. 039 187) and Fire prevention set (8/B2, Order No. 039 543)
- Depending on the installation position of the two room connection bottom, left, right or top
- Distribution of flow rate:  
1. Room  $\frac{2}{3}$ , 2. Room  $\frac{1}{3}$

# Exhaust

## Silvento with flush-mounted housing 3/UP-A



26 · 27

3/UP-Axial

### › Silvento 3/UP-A

- Plastic flush-mounted housing with radial exhaust vents for installation in shaft and drywall (without requirements for duration of fire resistance) and in suspended ceilings  
[Order No. 039 136](#)

- With conical exhaust vents (DN 75 to DIN 80) and air-tight non-return flap

Installation position of

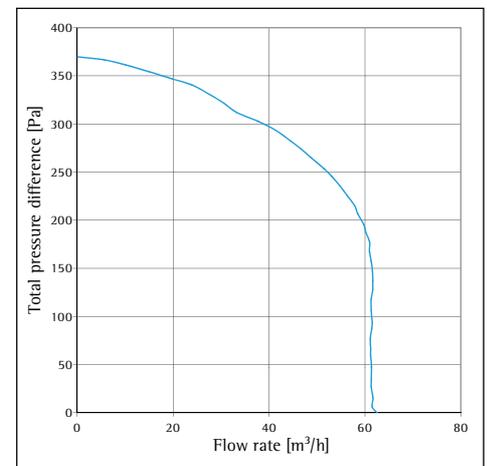
- flush-mounted housing with exhaust vents possible to left, top or right, adjustment of non-return flap to installation position via simple repositioning.

- All fan inserts of the Silvento series can be used

- Static pressure available: 227 Pa

- With plaster protection cap to protect against contamination during shell construction phase

- Installation depth 90.5 mm (without vents) including assembly accessories and sound absorbers



Pressure Flow rate characteristic curve UP-A, calculated by TÜV SÜD

### › Option – Two-room fan



- Convertible to two-room fan (Two room set 3/S2, [Order No. 039 209](#))
- For plug-in assembly of the two-room vent (DN 50/51/80) the opening prefabricated by break point is to be prepared at the flush-mounted housing, depending on the installation position of the two room connection bottom, left, right or top
- Distribution of flow rate:
  1. Room  $\frac{2}{3}$ , 2. Room  $\frac{1}{3}$

# Air Fans

– with Fire Prevention pursuant to K90-18107 3/UP-BA

3/UP Fire Prevention Axial

## › Silvento with Fire Prevention 3/UP-BA

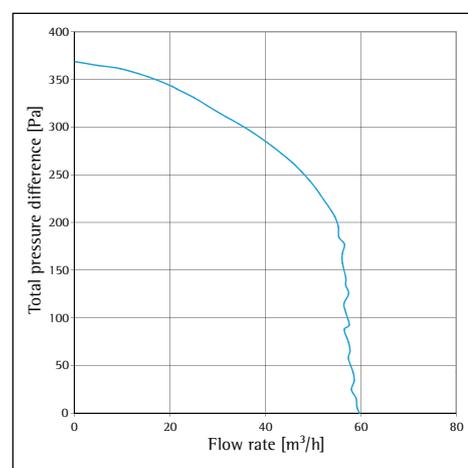
- Plastic flush-mounted housing with fire prevention casing for installation in shafts with requirements of duration of fire resistance, vent axial  
[Order No. 039 179](#)



- With shut-off device K90 – 18017, suitable for installation in eat-in kitchens, connection diameter DN 80, with airtight non-return flap

- Metallic, axial exhaust vents
- Installation position of flush-mounted housing with exhaust vents possible to left, top or right, adjustment of non-return flap to installation position via simply turning the insert

- All fan inserts of the Silvento series can be used
- Static pressure available: 212 Pa
- With plaster protection cap to protect against contamination during shell construction phase
- Installation depth 102.5 mm with exhaust vents 187.5 mm including assembly accessories and sound absorbers



Pressure Flow rate characteristic curve UP-BA, calculated by TÜV SÜD

## › Option – Two-room fan



- Two-room fan with fire prevention casing (3/UP-2BA, [Order No. 039 195](#)) and Fire preventions et (8/B2, [Order No. 039 543](#))
- Depending on the installation position of the two room connection bottom, left, right or top
- Distribution of flow rate:  
1. Room  $\frac{2}{3}$ , 2. Room  $\frac{1}{3}$



# Fan Inserts

## Fitting for all Silvento flush

28 · 29

Silvento V

### › Combine fan inserts

You can combine the fan inserts with the Silvento housings of your choice and receive fans tailor-made to your needs.



#### Step switching

- Nominal and/or base load operation possible
- Switchable manually to 30 m<sup>3</sup>/h and/or 60 m<sup>3</sup>/h
- 230 V – 50 Hz
- Power consumption of 5.2 W and 10.9 W (36.5 W at 100 m<sup>3</sup>/h)
- Noise pressure level 24 and 35 dB(A)
- Filter change display in front panel

Name: V 30/60

Order No. 039 217

#### Step switching with time lag

- Switchable nominal load and continuous base load possible , depending on type
- Manual switching of nominal load (60 or 100 m<sup>3</sup>/h) with time lag function
- Time lag with activation delay, interval and inverse mode
- 230 V – 50 Hz
- Power consumption of 5.5 W and 11.4 W (36.2 W at 100 m<sup>3</sup>/h)
- Sound pressure level 24 and 35 dB(A)
- Filter change display in front panel

Name: V 30/60ZII,  
V 60ZII,  
V 100ZII,

Order No. 039 233

Order No. 039 268

Order No. 039 314

## -mounted and surface-mounted housings

Tested Safety

### Step switching with motion sensor regulated time lag

- Nominal and/or base load operation possible, depending on type
- Switching (60 m<sup>3</sup>/h) via motion sensor and time lag function
- Time lag with activation delay, lag, interval and inverse operation
- 230 V ~ 50 Hz
- Power consumption of 6.0 W and 12.2 W
- Noise pressure level 24 and 35 dB(A)
- Filter change display in front panel

Name: V 30/60BZII, Order No. 039 241  
V 60BZII, Order No. 039 284

### Humidity/Temperature Regulation

- Humidity and temperature dependent regulation in four steps
- Steps switchable to nominal load mode (60 m<sup>3</sup>/h)
- Operating status display via LED
- Adjustment to summer/winter mode possible via switch or programming
- Convenient filter change display
- Connection for central control
- Anti-freeze switch (T < 15°C)
- 230 V – 50 Hz
- Power consumption of 5.3/7.2/8.9/10.9 W
- Sound pressure level 24/27/32/35 dB(A)

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

### › Certification

All Silvento fans are certified pursuant to approval  
Z – 51.1 – 215 and fitted with Protection Class IP X5



IP X5

# Exhaust

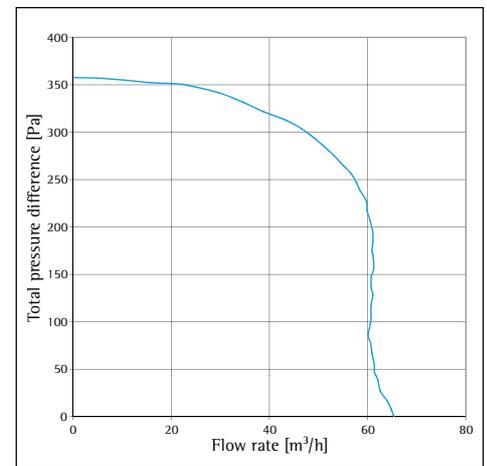
## Silvento flush-mounted

30 · 31

Silvento KL

### › Silvento KL 30/60 – Step switching

- Single room flush-mounted fan for sanitary cells, drywalls and ceiling installation in suspended ceilings  
Order No. 039 357
- Simple clamp assembly: clamp length up to 42 mm, larger clamp lengths on request
- With conical exhaust vents (DN 75 to DIN 80) and air-tight non-return flap
- Installation position of flush-mounted housing with exhaust vents possible to left, top or right, adjustment of non-return flap to installation position via simple repositioning.
- Filter change display in front panel with washable filter of Filter Class G2
- Also as substitute for fans of the Skalar series
- Including sound absorbers
- Three flow rate levels 30, 60 and 100 m<sup>3</sup>/h
- Static pressure available: 234 Pa
- Power consumption: 5.2/10.9/36.5 W



Pressure Flow rate characteristic curve KL, calculated by TÜV SÜD

### › Option – Two-room fan KL2 30/60



- Two-room flush-mounted fan with filter change display in front panel for use in flush-mounted housings 3/LS2 or 3/LB2 or as a substitute for Skalar – 2VF  
Order No. 039 365)
- Simple clamp assembly, depending on the installation position of the two room connection bottom, left, right or top
- Distribution of flow rate:  
1. Room  $\frac{2}{3}$ , 2. Room  $\frac{1}{3}$
- three flow rate levels: 30, 60 and 100 m<sup>3</sup>/h
- Static pressure available: 150 Pa
- Power consumption: 5.2/10.9/36.5 W

# Air Fans

clamp filters: simple, swift installation

KL B/ZII/FK

## > Silvento KL Step switching with time lag and motion sensor

### KL 30/60ZII time lag

- Single room flush-mounted fan with filter change display in the front panel, [Order No. 039 381](#)
- Two flow rate levels 30, 60 m<sup>3</sup>/h (time lag controlled)
- time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 5.5/11.4
- Can also be used with the wall installation housing 3/LS or 3/LB (vent seal required is also supplied)

### KL 60ZII time lag

- Single room flush-mounted fan with filter change display in the front panel, [Order No. 039 411](#)
- flow rate 60 m<sup>3</sup>/h (time lag controlled)
- time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 11.8 W
- Can also be used as a substitute for the fan type Skalar-ZI and the fan type Skalar-VZI in wall installation housings 3/LS or 3/LB (vent seal required is also supplied)

### KL 60BZII motion sensor and time lag

- Single room flush-mounted fan with motion sensor and filter change display in the front panel, [Order No. 039 438](#)
- Two flow rate levels 60 m<sup>3</sup>/h (controlled via motion sensor and time lag)
- time lag with interval and inverse function
- Static pressure available: 234 Pa
- Power consumption: 12.2 W
- Can also be used with the wall installation housing 3/LS or 3/LB (vent seal required is also supplied)

### KL 30-60FK Humidity-Temperature regulation

- Single room flush-mounted fan with mode status and filter change display in the front panel, [Order No. 039 497](#)
- Automatic convenient humidity-temperature control, four-step, flow rate levels 30, 40, 50, 60 m<sup>3</sup>/h /time lag controlled)
- Control range: 50-70 % r.H
- Summer reduction mode, automatic via programmed date or can be switched manually, fn as remote control item 0-12 V = (SELV)
- Static pressure available: 234 Pa
- Power consumption: 5.3/7.2/8.9/10.9 W
- Can also be used as substitute for the fan type Skalar F and the fan type Skalar VF in the wall installation housing 3/LS or 3/LB (vent seal required is also supplied)



# Economical Small Room fans

Economical home ventilation

32 · 33

AB 30/60

› An axial fan with the advantages of a radial fan



› Outside grille with insect screen

› Silent fan unit in sound-absorbing Basotect chassis

› Flow-optimized inside panel with washable G3 or pollen filter

› Can be combined with the sound protection cover 9/IBS

# of the 160 Series

with the new LUNOS AB 30/60



## › Technical data AB 30/60

Flow rate	30/60 m <sup>3</sup> /h
Power consumption	1,5/4,9 W
Motor type	EC for direct connection to alternating current
Specific power consumption	0,05-0,08 W/m <sup>3</sup> /h
Supply voltage/frequency	115-230 V/50-60 Hz
Sound pressure level (at 1 m distance)	28/45 dB
Standard sound pressure difference	up to 46 dB
Ø Fan insert	98 mm
Ø Fan insert (including sound insulation)	155 mm
minimum wall thickness	200 mm
delivery length (can be shortened)	300 mm
Ø Core hole	162 mm
Size of inside panel	□ 180 x 180 mm
Ø outside grille	180 mm or LUNOtherm
Protection Class	IP44

- RoHS and WEEE compliant
- EnEV and DIN 1946-6 compliant
- Can be used in low-energy buildings

## Hybrid ventilation System with e<sup>2</sup> and AB 30/60

The new development of the LUNOS company for optimized enhancement of the e<sup>2</sup> series in classical exhaust air rooms such as the bathroom, EC and kitchen. The AB 30/60 has a similar appearance to its big 'brother e<sup>2</sup>': inside panel with filter and outside grille are from the same product family and have the same dimensions. On account of the same design structure, the fans e<sup>2</sup> and AB 30/60 are predestined for hybrid ventilation in which ventilation and heat recovery combines with exhaust air technology in a cost and energy efficient manner.

## State of the art Motor Technology

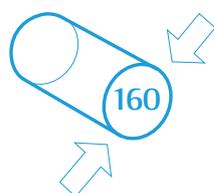
The innovative EC motor with integrated electronics facilitates direct connection to the power grid without any additional components. The flow rate can be selected between the two ventilation steps of 30 and 60 m<sup>3</sup>/h and switched via a conventional rocker switch. The connection lines can be connected quickly and easily to the fan. Terminals and a protection hood required are supplied.

## Lowest noise level: Even axial fans can be silent

Axial fans are widely known for their relatively loud noise level. However, computer-optimized fan blades combined with a new developed channel of flow and extensive sound absorption material ensure the AB 30/60 emits only a low noise level and also has ideal noise protection from the outside.

## Best Efficiency for the Environment

With a converted power consumption of only 0.05-0.08 W/m<sup>3</sup>/h, the AB 30/60 is outstanding in terms of energy efficiency and makes an active contribution to environmental protection, and also saves you money.



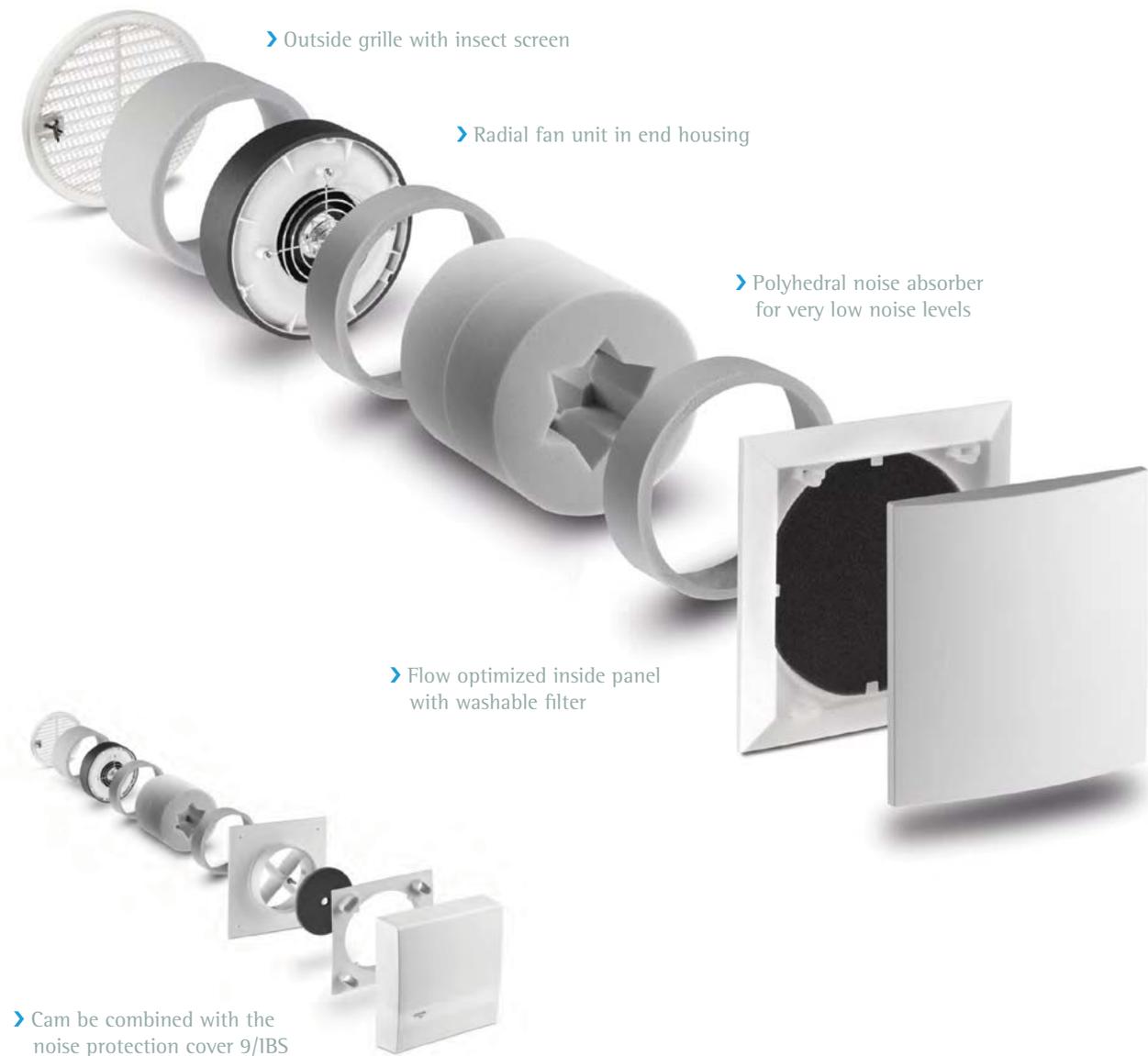
# RA 15 – 60 – the new radial fans

A combination of pressure consistency

34 · 35

RA 15-60

## › The new Radial Fans of the 160 Series: RA 15-60



# of the 160 Series and easier Renovation



## › Technical Data RA 15-60

Flow rate	30-60 m <sup>3</sup> /h
Power consumption	0,6-7,2 W
Motor type	EC for direct connection to 12 V control
Specific power consumption	0,04-0,12 W/m <sup>3</sup> /h
Supply voltage/frequency	12 V
Sound pressure level (at 1 m distance)	22-35 dB
Standard sound pressure difference	up to 46 dB
Ø Fan insert (including noise insulation)	153 mm
Minimum wall thickness (reduced noise protection)	170 mm
Delivery length (can be shortened)	300 mm
Ø Core hole	162 mm
Size of inside panel	□ 180 x 180 mm without noise insulating cover 9/IBS:
Ø outside grille	□ 250 x 250 mm, Grille: Ø 180mm or with LUNOtherm
Protection Class	IP20

- RoHS and WEEE compliant
- EeEV and DIN 1946-6 compliant
- Can be used in low-energy buildings

## Exhaust air system or Hybrid ventilation system: The RA 15 – 60 is a versatile product

The new development from the LUNOS company for exhaust air rooms such as the bathroom, WC and kitchen becomes part of the growing 160 family. Just like the AB 30/60 this involves an exhaust air unit with an EC motor which can also be combined with the LUNOtherm facade element.

On account of the similar design structure, the fans e<sup>2</sup>, RA 15-60 and AB 30/60 are predestined for hybrid ventilation in which ventilation with heat recovery combines with exhaust air technology in a cost and energy efficient manner.

## Lowest noise levels. Silent with high pressure build-up

Radial fans are well known from the exhaust air series from LUNOS. However, for the first time, a radial system has now been installed in a 160 tube. This links the benefits of both design forms: the silent and pressure-consistent operation of the radial fan combined with the installation dimensions of the tube fan. In addition, aerodynamically optimized fan blades combined with polyhedron noise absorbers ensure the RA 15-60 emits very low noise levels and also has ideal noise protection from the outside.

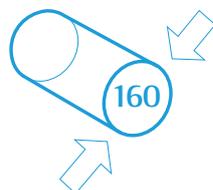
## State of the art Motor Technology

The new radial EC motor combined with the end housing provides the RA 15-60 series with an outstanding pressure curve.

The flow rate can be set to three or four steps depending on the control program (15, 20, 45 and 60 m<sup>3</sup>/h).

## Best Efficiency for the environment

With a converted power consumption rate of only 0.04-0.12 W/m<sup>3</sup>/h, the RA 15-60 is outstanding in terms of energy efficiency and makes an active contribution to environmental protection, and also saves you money.



# LUNOS Outside Wall

Fresh air in every room with

## › Pleasant indoor climate in dense Buildings

The basis for a pleasant, healthy indoor climate is sufficient supply of fresh air without any form of draft. A cosy, pleasant feeling is also very much dependent on the temperature and humidity content of room air. This cosy and comfortable feeling is ensured with the LUNOS ventilation system applying constant, intelligent air exchange.

Our buildings are leak-proof. Whether modernized or newly built, they record very low leakage of the building shell. Only with a leak-proof construction form is it possible to build energy saving buildings such as the low energy house (LEH) pursuant to the EnEV.

A leak-proof building, however, excludes natural ventilation via joint leaks. On account of this, mold infestation has been registered in more than 20 % of redeveloped apartments due to insufficient ventilation, and this figure is rising.

## › LUNOS ALD for Modernization and New Construction

These supply air elements are an important component of regulated apartment ventilation from LUNOS. Only with these components is it possible to ensure draft-free supply of outside air into the living area, without any disturbing environmental impacts such as draft, noise and dirt penetrating the living area.



› The wind-resistant element ensures a non-draft supply



› The integrated noise absorber keeps traffic noise outside



› Modern design of the inside panel

# Air Vents

no noise from the outside



Noise Protection

## › Comfort due to Noise Protection

City and out-of-town traffic impair our living climate. Streets, railways or airports are built near to residential areas to ensure favorable transport connections. And the volume of traffic is steadily increasing. To ensure a high standard of living climate, noise protection measures have to be installed in the building, in wall structures and in windows as well as in the fresh air supply system. The excellent noise protection measures of the LUNOS ventilation system ensure air exchange without impairment to a comfortable and pleasant living climate in this sector.

### Calculation of resultant noise insulation measure of a composite outside wall pursuant to DIN 4109:

The entire building section, outside wall, is considered for the noise-related calculation. The building groups of outside wall, window and outside wall air vent are added up in terms of their noise insulation features and surface shares and form the resultant noise insulation measure for the outside wall. The internal insulation behavior based on room geometry is included in the requirement for the noise insulate measure.

The calculation software has been integrated in the new planning tool. It ensures fast calculation of critical rooms.



› Washable filter



› Insect screen

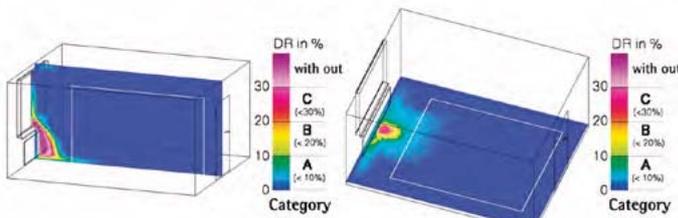


## › Comfort with outside wall air vents

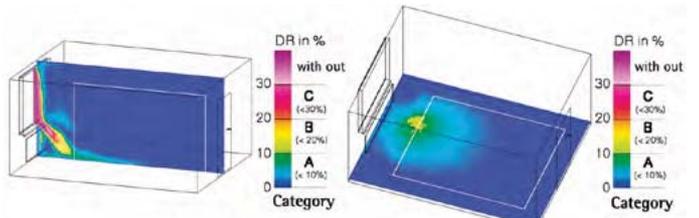
Comfort in living room areas depends to a great extent on the positioning and quality of the outside wall air vents. All LUNOS ALD are therefore fitted with wind-resistant elements and screens ensuring favorable flow in order to enable draft-free, diffused air supply. However, the installation position must be carefully planned.

If the supply air is heated quickly and outside the living area, the risk of draft can be excluded. Ideal arrangement of the ALD in relation to the heating area is required. Therefore, the draft risk DR (Draft-Risk) has been selected as a quality criterion for the simulations shown below by the TOU Dresden. It must not exceed 15 % in the living area (white frame). i.e. for 15 % of 100 persons it can be expected that they will complain of a draft at this place in the room. An outside temperature of  $-5^{\circ}\text{C}$  (mean value of a cold winter) has been selected for the simulations.

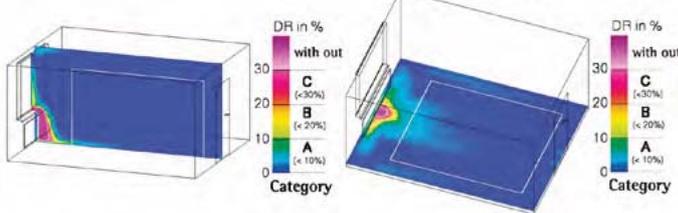
Position above radiator and beneath window, 0.25 x air exchange



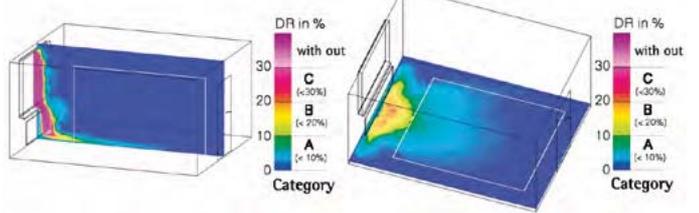
Position above heater and window, 0.25 x air exchange



0.5 x air exchange



0.5 x air exchange



In the ideal position, the ALD is mounted above the radiator beneath the window. The incoming air can be heated immediately by the radiator and no draft risk is to be expected in the living area. The difference between a 0.25 x (top) and a 0.5 x air exchange (bottom) is not noticeable in the living area.

Positioning of the ALD above the radiator above the window is also uncritical. Fresh air enters above the window, falls and is heated by the radiator until it reaches the living room area. A very low draft risk ( $< 5\%$ ) results there on the floor. Again, there is hardly any difference noticeable between the 0.25 x (top) and 0.5 x air exchange (bottom) in the living room area. A higher draft rate (up to 20%) was only recorded directly beneath the ALD with a 0.5 x rate of air exchange.

# COMFORT

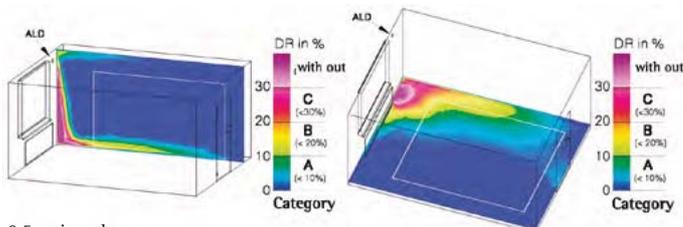
## high Air Quality



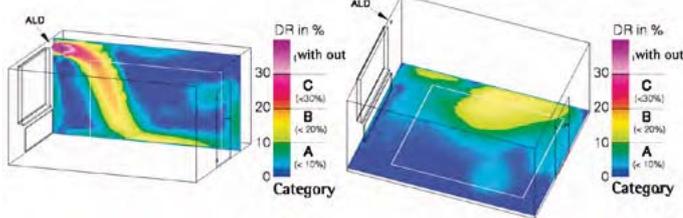
On closer examination, positioning of the ALD above the radiator to the side at the top, next to the window is also uncritical. At a base air exchange rate of 0.25 1/h (top) the air mainly falls down at the ALD. A small share settles on the ceiling. However, heating continues to take place outside of the living area, resulting in a draft risk of under 15 % in a corner of the living room area. At an air exchange rate of 0.5 x, the incoming air is still conveyed into the room. The critical range remains outside of the living room area. The draft risk in the living room area is below 15 % and is restricted to a small side area.

Combination of ALD with floor heating is also possible. As a result of low convection, the room flows are not as good, but at an air exchange rate of 0.25 these are still uncritical. If the ALD is positioned beneath the window (top), the air falls down at the ALD. Heating again takes place outside the living room area. If the ALD is positioned at the side on top, next to the window (bottom), the situation is less favorable. The incoming air continues to be conveyed into the room and bear to the floor there may be a draft risk of up to 20 % in a corner of the living room area.

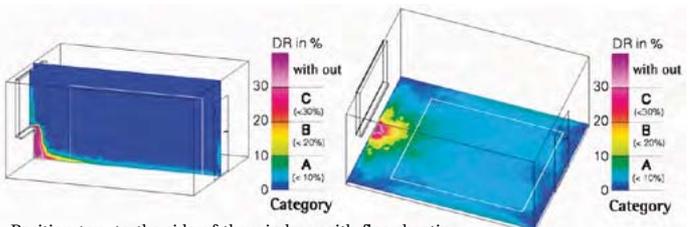
Position above the radiator and to the side of the window 0.25 x air exchange



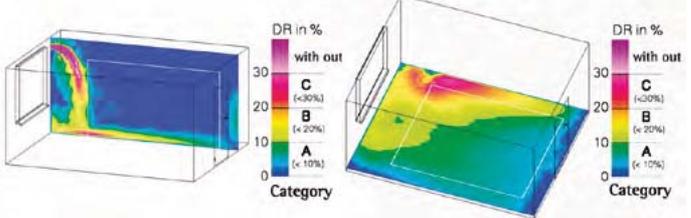
0.5 x air exchange



Position beneath the window, with floor heating



Position top, to the side of the window, with floor heating



### Real Installation Situation

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

Source: Prof. Dr.-Ing. Wolfgang Richter, Expert in heating, Ventilation and Air-Conditioning, Institute for Energy Technology, TU Dresden



# ALD-R 160

For modernization and new

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ALD-R 160

## › The outside wall vent for the 160 Series



# Outside Wall Vent

buildings- noise-optimized and weatherproof

## > Technical Data ALD-R 160

Length	300 mm	
∅	160 mm	
<hr/>		
V:	at 8 Pa	at 4 Pa
⊗	25 m <sup>3</sup> /h	18 m <sup>3</sup> /h
⊙	20 m <sup>3</sup> /h	13,5 m <sup>3</sup> /h
⊚	15 m <sup>3</sup> /h	10 m <sup>3</sup> /h

### Noise protection

D <sub>n,W,offen</sub>	Wall thickness
50 dB	360 mm (with 4 noise modules)
53 dB	425 mm (with 5 noise modules)
55 dB	500 mm (with 6 noise modules)

High requirements are made of the ALDs especially with regard to noise protection and the comfort achieved in the living room area

## The new ALD-R 160 with weatherproof screen for modernization and new buildings

The ALD-R 160 has been one of the best-selling ALDS at LUNOS since its development in the year 2002. Its versatility has been proven in a wide range of applications such as e.g. in new buildings with the fitting installation block 9/MRD and in many cases of modernization in which the ALD was installed subsequently by means of core boring. It can also be easily combined with the facade element LUNOthem.

### Compatibility

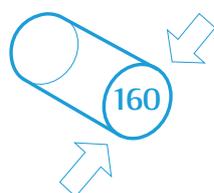
The objective when re-developing the ALD-R 160 was to achieve higher versatility and greater noise protection. The ALDs available from LUNOS up to now, in their various design forms and flow rates, are to be replaced by an ALD which is also compatible with the new e<sup>2</sup> and AB 30/60 fans. The basis for these various fans is the 160 circular tube which also enables combination with the LUNOthem façade element.

### New noise absorbers

To improve the good values for noise protection even further, a range of experiments were carried out with regard to the various forms of noise absorbers. The most efficient option proved to be an arrangement of polyhedron noise absorber modules. Using these sound absorbers D<sub>n,W</sub> values of 50 and 55 dB are achieved with wall thicknesses of 36 and 50 cm.

### One for all – An ALD for all areas of application

While increasing comfort, attention is also paid to a more flexible application of the ALD. Up to now, LUNOS had three different ALD which covered different areas of application and which were different on account of varying flow rates. The new, optimized ALD-R 160 is now equipped for all fields of application. By means of a new reduction screen, three flow rates can be set: 15, 20 and 25 m<sup>3</sup>/h. This ensures ideal, comfortable and pleasant ventilation of varying room sizes with different air requirements via the new ALD-R 160.



# Home Ventilation

e<sup>2</sup> and e<sup>90</sup>

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System & Planning

## Ventilation with Heat recovery:

Decentralized ventilation involves efficiency and effective enhancement of the different fans of a system more than for other ventilation systems. The e<sup>90</sup> has been developed to enhance the e<sup>2</sup> for ideal implementation of ventilation in bathrooms, WCs and kitchens.

## The Principle e<sup>2</sup> and e<sup>90</sup>

LUNOS ventilation systems with heat recovery can be applied everywhere. On account of the decentralized design, the individual ventilation devices can be installed exactly where you need them. Even combinations with classical exhaust air systems are possible and can be designed pursuant to EnEV and DIN 1946 – 6 using the LUNOS ventilation tool.

e<sup>2</sup> fans are preferably used in living room areas, whereby two devices always run in parallel. Therefore, an even number of ventilation devices must always be installed to ensure the system functions properly.

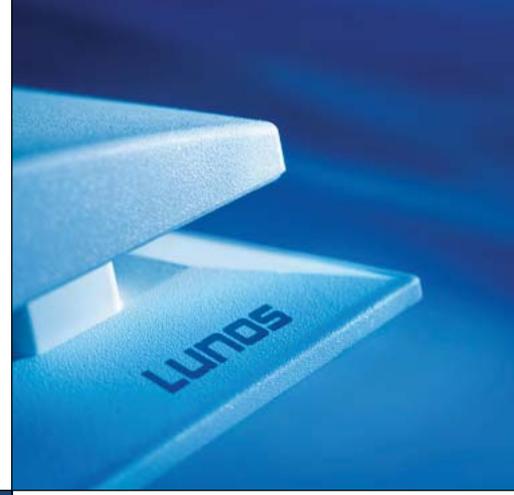
Functional rooms such as bathrooms and kitchens can be continuously ventilated by the e<sup>90</sup>. Parallel operation in pairs is not required, since, in simple terms, there are two 'small' e<sup>2</sup> s in one e<sup>90</sup> which ensure simultaneous supply and exhaust air with heat recovery.

If you have rooms without windows, a respective exhaust air system (e.g. Silvento type) has to be installed, since the e<sup>2</sup>/e<sup>90</sup> systems must not be connected to a shaft or pipelines. This is due to the design of the devices and is, unfortunately, unavoidable.



# with Heat Recovery

## in a decentralized system

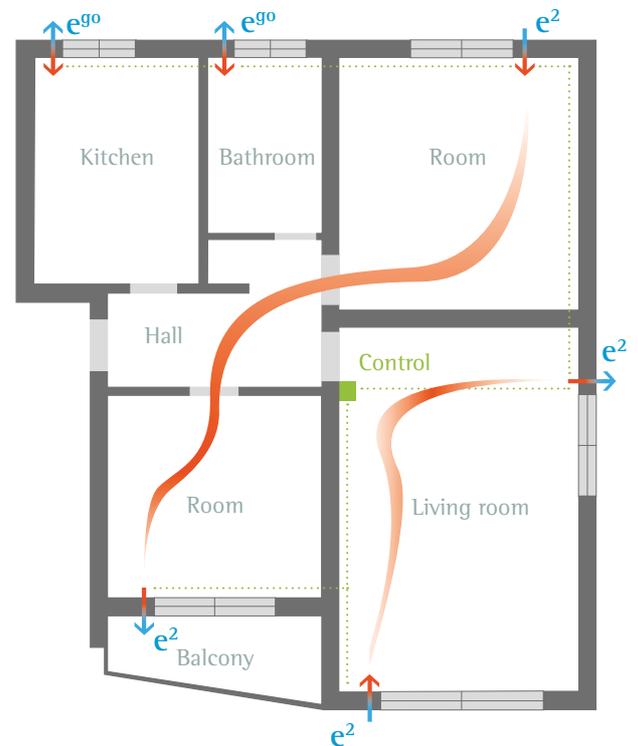


### Ventilation in Living rooms and Bedrooms with the $e^2$ :

The  $e^2$  operates in accordance with the method of a regenerative heat exchanger. A storage element charges itself, similar to a battery, with heat energy in reversing operation and transfers the heat to the outside air supplied. The fan with heat recovery has a power consumption of just 1.4 Watt in base load mode (0.09 W/m<sup>3</sup>/h) with a hardly audible surface sound pressure level of 16.5 dB(A).

### Ventilation in the bathroom, WC and Kitchen with the $e^{g0}$ :

The  $e^{g0}$  also applies the principle of the regenerative heat exchanger. A storage element charges itself with heat, as in the well-known  $e^2$ . However, this is skilfully distributed with two fans so that supply and exhaust air are conveyed simultaneously. A second device is not required for operation. The system can also be switched to an exhaust air mode by requesting very high flow rate of 45 m<sup>3</sup>/h in order to allow fresh air to flow into a room faster (e.g. WC or bathroom).



### Planning

Home ventilation systems with heat recovery pursuant to DIN 1946-6 can be intuitively designed and planned using the LUNOS planning tool. All algorithms used in the standard are implemented and explained by means of interactive support. As a result, the program provides clear material lists and records for the building owner, chimney sweep and energy consultant/supporting banks.

When planning with decentralized ventilation systems, pure heat recovery systems or also so-called 'hybrid ventilation systems', the combination of exhaust air fans and heat recovery, can be calculated. In accordance with the calculation method developed by LUNOS, corrections to efficiency are made for hybrid systems, the overall efficiency level resulting in practice is displayed and prepared for the energy balance calculation.



# Home Ventilation

## The Benefits

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e<sup>2</sup> and e<sup>90</sup>

### › Features

#### SILENT



Highly efficient motors, with state of the art EC technology combined with flow-revised and specially balanced fans have eliminated the hitherto known operating noises almost completely. The result is a very low sound pressure level.

#### ENVIRONMENT-FRIENDLY



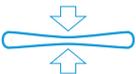
The e<sup>2</sup> and e<sup>90</sup> have a very low power consumption and are outstanding in terms of energy efficient, making an active contribution to environmental protection and at the same time save you money. The requirements of the current DIN 1946- 6 for devices of Efficiency Class E are underscored by far.

#### INNOVATIVE



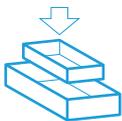
e<sup>2</sup> and e<sup>90</sup> function in line with the principle of the regenerative heat exchanger which has been practically perfected by the LUNOS company. The so-called acuent storage block is located in the middle of the air flow of an EC motor with axial fan. By means of a reversing air flow arising from targeted change of direction of the fan, ceramic is charged with the eat energy of room air and transfers this to the outside air supplied.

#### LEAN



e<sup>2</sup> and e<sup>90</sup> are among the smallest decentralized fans for home ventilation with heat recovery in the world. Using state of the art production technology we have managed to develop a compact heat storage unit of ceramic composite which provides an efficiency up to 99,5 or 87,7 %.

#### COMPATIBLE



If a LUNOS ventilation has already been installed, e<sup>2</sup> and ego can be used in existing outside wall air vents of the types ALD-R 160. ALD-R 160 with LUNOthem can only be use together with e<sup>2</sup>. The LUNOS e<sup>2</sup> can also be combined with all LUNOthem elements in new buildings. On account of its mode of function, the e<sup>90</sup> cannot be combined with LUNOthem façade elements.

#### UNIVERSAL



e<sup>2</sup> and e<sup>90</sup> can be used in new buildings and in modernization work. They are either placed between the bricks in new buildings with the aid of a wall installation housing or installed subsequently e.g. in modernization work with the aid of a 162 mm core boring. The wall must be at least 30 cm thick.

# with Heat Recovery

of e<sup>2</sup> and e<sup>90</sup>



e<sup>2</sup>

16,5 dB at 18 m<sup>3</sup>/h  
19,5 dB at 31 m<sup>3</sup>/h  
26 dB at 38 m<sup>3</sup>/h

1,4 W at 18 m<sup>3</sup>/h  
2,8 W at 31 m<sup>3</sup>/h  
3,3 W at 38 m<sup>3</sup>/h

One reversing air flow function per e<sup>2</sup>.  
For balances supply and exhaust air,  
at least two or an even number  
of devices should be installed.

Fan size: Ø x length 160 x 300 to  
max. 700 mm, heat recovery rate up to  
99,5 %

Compatible with all 160 series incl.  
LUNOtherm as outside end.

Can be installed in new buildings  
and modernization work.  
Wall thickness minimum 300 mm

e<sup>90</sup>

16,8 dB at 5 m<sup>3</sup>/h  
24,0 dB at 10 m<sup>3</sup>/h  
38,1 dB at 20 m<sup>3</sup>/h  
38,1 dB at 45 m<sup>3</sup>/h exhaust air mode

1,0 W at 5 m<sup>3</sup>/h  
1,7 W at 10 m<sup>3</sup>/h  
4,5 W at 20 m<sup>3</sup>/h  
4,9 W at 45 m<sup>3</sup>/h exhaust air mode

Two EC motors provide two reversing air  
flows for ventilation simultaneously.

Fan size: Ø x length 160 x 300 to max.  
700 mm, heat recovery rate up to 87,7 %

Compatible with all 160 series, provided  
e<sup>90</sup> inside and outside panels can be used.

Can be installed in new buildings  
and modernization work.  
Wall thickness minimum 300 mm



# Home Ventilation

e<sup>2</sup> and e<sup>90</sup>

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System technology with HR

e<sup>2</sup>

› Outside grille with insect screen

› EPP heat insulation element with 0.038 W/mK

› Highly efficient ceramic heat storage element with heat provision level up to 99,5 %

› Silent fan unit in sound insulating EPP chassis

› Flow-optimized inside panel with washable G3 or pollen filter

› Can be combined with the protection cover 9/IBS



# with Heat Recovery

in detail



e<sup>go</sup>



› Weatherproof outside panel with separate air flow and insect screen

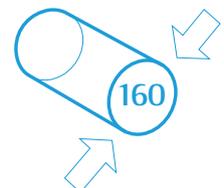
› Highly efficient ceramic heat storage element with heat provision level up to 87,7 %

› Silent fan units in counter-flow design for simultaneous supply and exhaust ventilation

› Flow-optimized inside panel with separate supply and exhaust air vents and washable G3 or pollen filter



› Efficiency increase via innovative honeycomb structure of storage element



New standards have again been set by LUNOS with the e<sup>go</sup>: The smallest fan with heat recovery with simultaneous supply and exhaust ventilation can also be operated in pure exhaust air operation at 45 m<sup>3</sup>/h.



# Ventilation Control

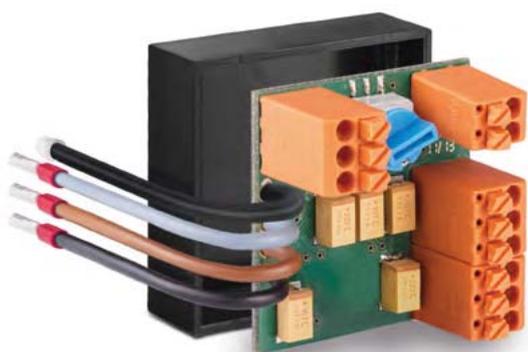
## Universal Control

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Universal Control

### › Universal control for e<sup>2</sup>, e<sup>90</sup> and RA 15-60

The universal control is a multi-functional 12 V control operated via a simple two-pole series switch. Different programs can be selected for each fan type. An overview of the programs and respective modifications is provided on the opposite page. The fan type connected has to be set accordingly.



### Functions

- manual control via series switch (3 step)
- 0-10 V input for connection to the Touch Air Comfort control or remote control
- Fan type and functions of the devices connected can be set via the code switch (refer to Table)
- up to ten e<sup>2</sup> and five e<sup>90</sup> or two RA 15-60 can be switched via a control
- suitable for installation in a deep 60 switchbox or for assembly in a switch cabinet

### Power Supply Options

The universal control requires power supply via a power pack. Two power packs are available for this purpose:

When using the power pack with 18 W, type 5/NT 18, you can connect a maximum of three e<sup>90</sup> or six e<sup>2</sup> (3 pairs) or one RA 15-60 to a universal control. When using the power pack with 60 W, 5/NT 60, you can connect a maximum of five e<sup>90</sup> or ten e<sup>2</sup> (five pairs) or two RA 15-60 to the universal control. With the new e<sup>90</sup> it is now possible to ventilate classical exhaust air rooms with one unit. The living room areas are fitted with the well-proven e<sup>2</sup>, as for hybrid ventilation.

### Accessories

- Power pack 5/NT 18 with 18 W
- Power pack 5/NT 60 with 60 W
- Switch 5/W2U for control of up to four ventilation steps and/or setting to summer ventilation

# Systems from LUNOS

– the multifunctional 12 V Control



## › Code settings

Code setting/ Program content	Fan type	Functional Description	Rocker 1-OFF Rocker 2-OFF	Rocker 1-ON Rocker 2-OFF	Rocker 1-OFF Rocker 2-ON	Rocker 1 – ON Rocker 2 – ON	Rockers W 2
0	RA 15-60	OFF, three- step	OFF	15 m <sup>3</sup> /h	30 m <sup>3</sup> /h	45 m <sup>3</sup> /h	60 m <sup>3</sup> /h
1	RA 15-60	OFF, three- step	OFF	15 m <sup>3</sup> /h	30 m <sup>3</sup> /h	60 m <sup>3</sup> /h	
2	RA 15-60	Four-step	15 m <sup>3</sup> /h	30 m <sup>3</sup> /h	45 m <sup>3</sup> /h	60 m <sup>3</sup> /h	
3	e <sup>2</sup>	OFF, three-step	OFF	15 m <sup>3</sup> /h	30 m <sup>3</sup> /h	38 m <sup>3</sup> /h	Summer ventilation
4	e <sup>2</sup>	Four-step	15 m <sup>3</sup> /h	20 m <sup>3</sup> /h	30 m <sup>3</sup> /h	38 m <sup>3</sup> /h	Summer ventilation
5	e <sup>2</sup> short	OFF, three-step	OFF	15 m <sup>3</sup> /h	30 m <sup>3</sup> /h	38 m <sup>3</sup> /h	Summer ventilation
6	e <sup>2</sup> USA	OFF, three-step	OFF	10 cfm	15 cfm	20 cfm	Summer ventilation
7	e <sup>2</sup> USA short	OFF, three-step	OFF	10 cfm	15 cfm	20 cfm	Summer ventilation
8	e <sup>2</sup> mini	OFF, three-step	OFF	5 m <sup>3</sup> /h	10 m <sup>3</sup> /h	20 m <sup>3</sup> /h	Summer ventilation
9	e <sup>90</sup>	OFF, three-step	OFF	5 m <sup>3</sup> /h	10 m <sup>3</sup> /h	20 m <sup>3</sup> /h	Summer ventilation
A	e <sup>90</sup>	Four-step	5 m <sup>3</sup> /h	10 m <sup>3</sup> /h	15 m <sup>3</sup> /h	20 m <sup>3</sup> /h	Summer ventilation
B	e <sup>90</sup>	Three-step and exhaust air	5 m <sup>3</sup> /h	10 m <sup>3</sup> /h	20 m <sup>3</sup> /h	45 m <sup>3</sup> /h (exhaust air)	Summer ventilation
C	e <sup>90</sup>	OFF, two-step and exhaust air	OFF	5 m <sup>3</sup> /h	10 m <sup>3</sup> /h	45 m <sup>3</sup> /h (exhaust air)	Summer ventilation

# Ventilation Control

## Touch Air Comfort,

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Touch Air Comfort

### › The Touch Air Comfort (TAC)

This control is the multi-talent from LUNOS. The 12 V fans of the 160 series, just like the Silvento 30-60 FK, can be connected directly. Alternatively, any number of universal controls can be connected which can be operated easily via TAC. The 230 V fans from LUNOS can also be connected easily using a respective module.

The TAC can be configured for a wide range of fan scenarios. And it reveals itself as an energy efficient combination artist:

Either different fans, the 230 V module 5/ACM for the Silvento series or individual universal controls are connected to three outlets of the control.

The integrated power pack is e.g. completely sufficient for a three-room apartment in which four e<sup>2</sup> in the living room areas and one Silvento FK in the bathroom can be triggered.

If more fans are required to supply larger apartments or detached houses, the Touch Air Comfort can regulate numerous universal controls. Several universal controls can be connected to each outlet of the TAC control. This means that any number of fans can be controlled via the Touch Air Comfort.



### Functions/features

- E-Ink display for lowest power consumption
- integrated humidity/temperature sensor
- CO<sub>2</sub> module 5/SCO can be connected
- direct operation of up to four e<sup>2</sup> or two e<sup>90</sup> or one RA 15-60
- Silvento FK fans can be connected directly via the low volt input
- Other devices can be controlled via connected universal controls
- All Silvento fans can be connected via the additional module 5/ACM
- Comfort functions such as night reduction and summer ventilation
- Functions for humidity prevention and anti-freeze
- USB interface to export ventilation data recorded, software updates and language options
- Dimensions:  
(WxHxD) 97 mm x 155 mm x 20 mm (wall installation)
- including electronic box, horizontal installation,  
Dimensions: (WxHxD) 143 mm x 70 mm x 75 mm

# Systems from LUNOS

all fans – one control



## › Extract of the variety of Combinations available

	Outlets Comfort Control		
	S1	S2	S3
Heat recovery	Direct 2 x e <sup>2</sup> (1 pair)	Direct 2 x e <sup>2</sup> (1 pair)	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup>
Heat recovery and exhaust air	Direct 1 x RA 15-60	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup>	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup>
Heat recovery and exhaust air	Direct 1 x Silvento 30-60FK or 1 x RA 15-60	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup>	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup>
Heat recovery and exhaust air	1 x additional module with: 1 x Silvento 30/60/100 or 1 x AB 30/60	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup> (Group 1)	1 x universal control 1 x power pack max. 60 W max. 5 x e <sup>90</sup> (Group 2)



## LUNOS Service

If you have had planning made by LUNOS with TAC controls, you will receive the individual configuration codes of the TACs of your building project.

# Ventilation Control

LUNOS

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KNX Control

## › The KNX Standard

Intelligent building systems are used to improve the features of buildings in the fields of operating costs, safety and flexibility of use. The KNX standard has a large market share among items for building networking.

### Why KNX?

There are several bus methods available on the market which all have their justifications and benefits for specific fields of application. However, we concentrate here on the well-proven.

### The reasons:

- All strong brands of the electrical installation sector are pushing KNX
- KNX is a system which has been especially designed for the requirements of electrical installation. Sales and distribution is mostly expected in three steps. Some devices are available as 'shelf products' at the electrical wholesaler.
- Installation and programming/parameterizing of devices can be implemented by the trade.
- KNX has been established in the German market for many years, the scope of functions available is immense.
- With almost 7000 KNX certified products, almost all applications in the field of building management technology are covered.
- End consumers can rely on a widespread network of specialists with sound knowledge of KNX. Their qualification is verified by a certificate issued by a certified training center.
- KNX is well-established in Europe, USA, China and in the most important norm and standardization bodies.

# Systems from LUNOS

KNX Standard



## > Ventilation Functions of the KNX system

- Voltage supply of fans from low voltage 24..32 VDC
- Operation of two pairs of fans (four fans) with one module
- Several modules cascable (Master/Slave)
- Control of fan steps and directions as well as heat recovery
- Manual setting of fan steps via key inputs or KNX telegrams
- Adjustment of fan capacity and heat recovery to respective parameters:
  - relative air humidity (inside) for moisture discharge
  - absolute humidity (inside/outside) for drying basement
  - temperature (inside) for building protection
  - temperature (inside/outside) to optimize heat recovery
  - temperature (inside/outside/plan) for heating/cooling support
  - CO2 concentration
- The parameters temperature (inside/outside), humidity and CO2 concentration have to be provided by other KNX components
- Supply air mode, to support separate exhaust air devices
- Exhaust air mode
- Compensation of line resistances (in the case of longer line lengths) possible
- Operation in HVAC mode pursuant to KNX standard: Operating modes:  
Comfort mode/Stand-by mode/Night mode/Temperature protection mode/  
Shock ventilation/Pause/Summer mode/Night mode
- Automatic filter change display when reaching the change interval
- The filter change has to be acknowledged in order to reset the filter change alarm



### Our partner:

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Rigaerstr. 88  
10247 Berlin

Tel.: 030/25933914  
Fax: 030/25933915  
[www.arcus-eds.de](http://www.arcus-eds.de)  
[info@arcus-eds.de](mailto:info@arcus-eds.de)

# Ventilation Control

KNX



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KNX Control

## › KNX CONTROL 4

The module KNX LUNOS CONTROL 4 enables triggering of the decentralized ventilation units with heat recovery e<sup>2</sup> and e90 and the exhaust air fan RA 15-60 via the KNX bus. Up to four fans can be operated with one module. Several modules can be linked to each other via the KNX bus to enable coordinate operation. Direct control of the fans is possible via the key inputs available.

The module has an integrated KNX bus coupler and requires an external supply voltage. It is located in a plastic housing which can be installed into a switch box. The module can be controlled via the KNX display Touch-IT r directly using a series switch. Automatic control without a switch via humidity or CO<sub>2</sub> sensor is also possible. The Protection Class corresponds to IP 20.



## › KNX Climate Sensor CO<sub>2</sub>-TF

The measuring system of our KNX climate sensor records the carbon dioxide value measured via the CO<sub>2</sub> sensor and the room climate with the values for temperature and humidity. Based on these values, the dew point temperature and absolute air humidity are calculated. Regulations can be made via a PI or two-point control, optionally with pulsed outlets.

Initiation of the KNX sensors is made via the ETS (EIB Tool Software) in connection with the respective application program. The devices are not programmed when delivered. All functions are parameterized via the ETS and programmed. The controllers can be switched on or off via activation or blocking items via the KNX bus.



# Systems from LUNOS

## Control Elements

### > KNX Display Touch-IT

The 3.5" TFT color display with touchscreen serves to provide visualization and control in the KNX bus. The display has a resolution of 320x240 pixels with 256 K colors (RGB). The heart is a 32 bit ARM processor with 200MHz clock rate. It is fitted with a Linux operating system and has a mini USB port and one micro SD slot for data storage.



In addition to the control of LUNOS KNX-compatible fans, a wide range of other functions can also be selected:

- switching and dimming, RGB control
- switching on and off of various devices, display, of statuses and conditions
- alarm functions, password protection for sites and control elements
- control standards for room temperatures and climate
- multi-room functions
- clock timer, astronomic clock
- data logging, customized adjustments possible

# LUNOS Outside wall

## The Fans of the 160 Series with LUNOtherm:

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160 Series with LUNOtherm

### › The 160 series for modernization and new buildings with LUNOtherm and LUNOtherm FS

Fan grilles on the outside wall are often considered as a disturbing element. By using the LUNOtherm façade element, the supply vent disappears from the wall surface. Further development of the LUNOtherm has made unrestricted façade design possible. For the first time, all benefits of the LUNOS 160 series of fans, such as high air throughput, draft-free operation, hygiene and noise protection can be combined with a façade without an disturbing ventilation grille.

To facilitate this, a closing element of the 160 series, LUNOtherm, is integrated in the insulation layer of the external thermal insulation composite system. The air vent is then located in the window lintel, in the reveal or under the window. It can be mounted above, to the side or under the window which means it can also be easily combined with a roller shutter casing.



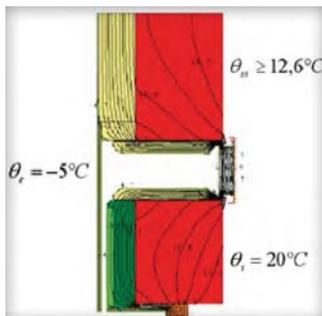
# – Air Vents

your building project decides



The LUNOtherm A60 can also be fitted easily into the brickwork of new buildings.

A respective recess is provided in the brickwork



As a result of very low thermal conductivity of the sealing core of LUNOtherm of  $\lambda = 0,030$  W/mK, the reduction of the layer of heating insulation in the section of the vent slit is compensated. The temperature difference on the façade is at max. 2.5 K.



The LUNOtherm can be processed using various façade elements: thin or thick layered plaster systems, facing with air space or with a facing wall. The insect screen can be selected in accordance with color requirements which means that the supply air vent is almost invisible.



The outside grille can be selected accordingly, depending on the respective façade color, the grille can be painted and can therefore be perfectly integrated.

## › Options

### 160er series with LUNOtherm A

Application in non-combustible ETICS pursuant to DIN 4102 – A. The sealing core is protected via inner mineral casing.

Insulating thickness: 60–300 mm  
W x H: 980 x 490 mm

### 160er series with LUNOtherm A FS

Application in non-combustible ETICS pursuant to DIN 4102 – A. The sealing core is protected via inner mineral casing.

For mounting below the window.  
Insulating thickness: 60–300 mm  
W x H: 980 x 505 mm

### 160er series with LUNOtherm B

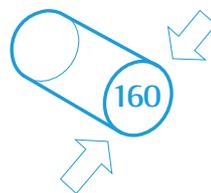
Application in flame resistant ETICS pursuant to DIN 4102 – B1. The sealing core is protected via inner and outer mineral casing.

Insulating thickness: 60–300 mm  
W x H: 1000 x 500 mm

### 160er series with LUNOtherm B FS

Application in flame resistant ETICS pursuant to DIN 4102 – B1. The sealing core is protected via inner and outer mineral casing.

For mounting below the window.  
Insulating thickness: 60–300 mm  
W x H: 1000 x 515 mm



The LUNOtherm is supplied in insulating material thickness and is processed by the façade builder in the same way as an insulating panel of ETICS. Please request detailed assembly instructions. Since the LUNOtherm is installed in the fire flashover section, compliant suitability within the general building approval of DIBt was tested. The LUNOtherm A can be installed in a non-combustible ETICS pursuant to DIN 4102-A and the LUNOtherm B in a flame resistant ETICS pursuant to DIN 4102-B1 up to an insulating thickness of 300 mm.

# Accessories

## Outside Grille

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Accessories

### › Outside Grille



#### Metal grille □ 228 mm

for tubes 160-200 mm, insect screen, to clip-on

Type: 1/QME 228 stainless steel (Order No. 039 911)

Type: 1/QMK 228 copper (Order No. 039 912)



#### Metal grille Ø 175 mm

for tubes 125-160 mm, insect screen, to clip-on

Type: 1/RME 175 stainless steel (Order No. 039 909)

Type: 1/RMK 175 copper (Order No. 039 910)



#### Metal grille Ø 150 mm

for tubes 80-125 mm, insect screen, to clip-on

Type: 1/RME 150 stainless steel (Order No. 039 907)

Type: 1/RMK 150 copper (Order No. 039 908)



#### Plastic grille □ 180 mm

for plastering, sanding, optional adhesion with gauze

Type: 1 completely sanded (Order No. 020 001)

Type: 1/D round-sanded in white (Order No. 020 036)



#### Plastic grille Ø 180 mm

with claw fastening and insect screen

Type: 1/BE 180 sanded (Order No. 039 917)

Type: 1/WE 180 white (Order No. 039 852)

Type: 1/RE 180 red-brown (Order No. 039 854)



#### Plastic grille Ø 115 mm

for inside Ø 90 mm, with insect screen, to screw on

Type: 1/BE 115 sanded (Order No. 039 953)

Type: 1/WE 115 white (Order No. 039 951)

Type: 1/RE 115 red-brown (Order No. 039 952)

## and 160 Series



### Plastic grille □ 110 mm

for plastering, sanding, optional adhesion with gauze

Type: 1/J completely sanded (Order No. 020 141)

Type: 1/JD edge-sanded in white (Order No. 020 184)

## › Inside panels for the 160 series



### Standard inside panel

Type: 9/IBE (HxWxD) 180 x 180 x 35 mm (Order No. 039 851)



### Noise protection screen

incl. washable filter per one pce. Filter Class G2 and G3

Sound insulation jacket 9/IBS: increase of standardized sound level difference by up to 9 dB, reduction of intrinsic noise.

Type: 9/IBS (HxWxD) 250 x 250 x 78 mm (Order No. 039 947)

## › Wall installation housing for the 160 series



### Wall installation housing 9/MRD

Type: 9/MRD 18 cm (HxWxD) 240 x 210 x 180 mm (Order No.038 903)

Type: 9/MRD 24 cm (HxWxD) 240 x 210 x 240 mm (Order No.038 768)

Type: 9/MRD 30 cm (HxWxD) 240 x 210 x 300 mm (Order No.038 911)

Type: 9/MRD 36 cm (HxWxD) 240 x 210 x 360 mm (Order No.038 776)

## › Tubes for the 160 Series



### Tubular channel

for all devices of the 160 series (can also be used with LUNOthem)

Type: 9/R 160 (Ø x L) 160 x 500 mm (Order No. 036 765)

Type: 9/R 160-700 (Ø x L) 160 x 700 mm (Order No. 036 891)

› Further accessories, refer to Price List



› New building: Residential park at the ‘Wuhle Ufer’ in Berlin



**Type of Building:** New building comprising 9 apartment buildings with 123 apartments and community rooms for social, cultural and sports activities

**Building owner:** Beamten-Wohnungs-Verein zu Köpenick eG

**Ventilation concept:** regulated apartment ventilation with heat recovery in a decentralized hybrid system

**Supply and exhaust air:** e<sup>2</sup> with heat recovery and end on façade side via the façade element LUNOStherm

**Exhaust air:** Exhaust air devices of the Silvento series are installed in functional rooms

**Execution:** November 2013

**Energy standard:** KFW 55 Standard: triple glazed windows, hybrid ventilation system with heat recovery. Energy, heating and hot water generation for building via own combined heat and power plant

› New building: 3 apartment buildings on Bremen Werder



**Building type:** New construction of apartment buildings

**Ventilation concept:** regulated apartment ventilation with heat recovery in decentralized hybrid system with exhaust air fans in the functional rooms

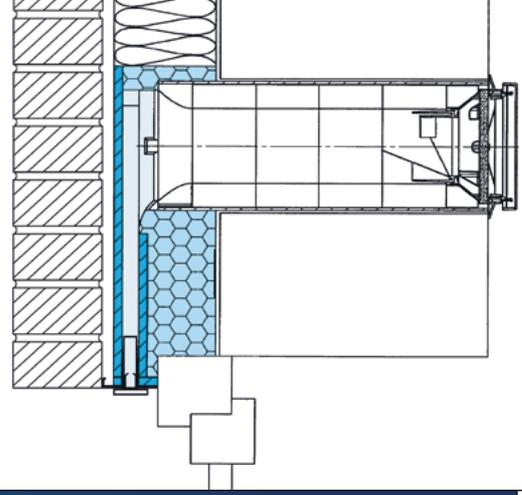
**Supply and exhaust air:** e<sup>2</sup> with heat recovery

**Exhaust air:** Silvento UP series

**Completion:** April 2012

# - Building Projects

## energy-efficient ventilation

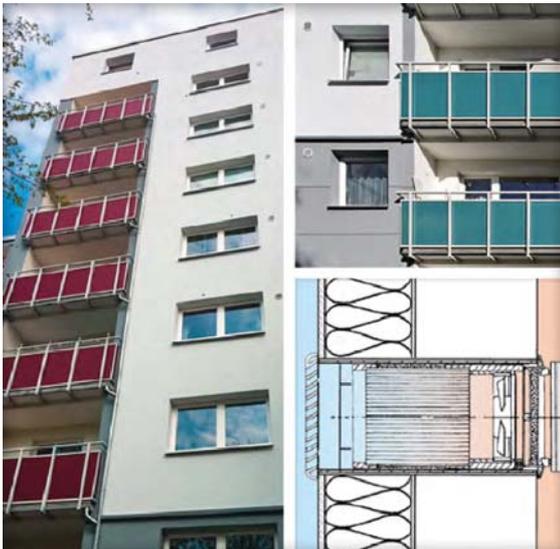


### > New building: Apartment building Düsseldorf Str. 24 in Berlin



- Building type:** New construction of an apartment building with tenants' meeting area
- Building owner:** Märkische Scholle Wohnungsunternehmen eG, Berlin
- Ventilation concept:** regulated apartment ventilation with heat recovery in decentralized hybrid system
- Supply and exhaust air:** e<sup>2</sup> with heat recovery and end on façade side via the façade element LUNOStherm
- Exhaust air:** Exhaust air devices of the Silvento UP series are installed in the functional rooms
- Execution:** April 2013
- Energy standard:** KfW Standard: extensive heat insulation (200 mm), triple glazed windows, hybrid ventilation system with heat recovery. Heating and hot water generation in system via district heating and solar heat

### > Redevelopment: Norderstraße 51/53, Eckernförde

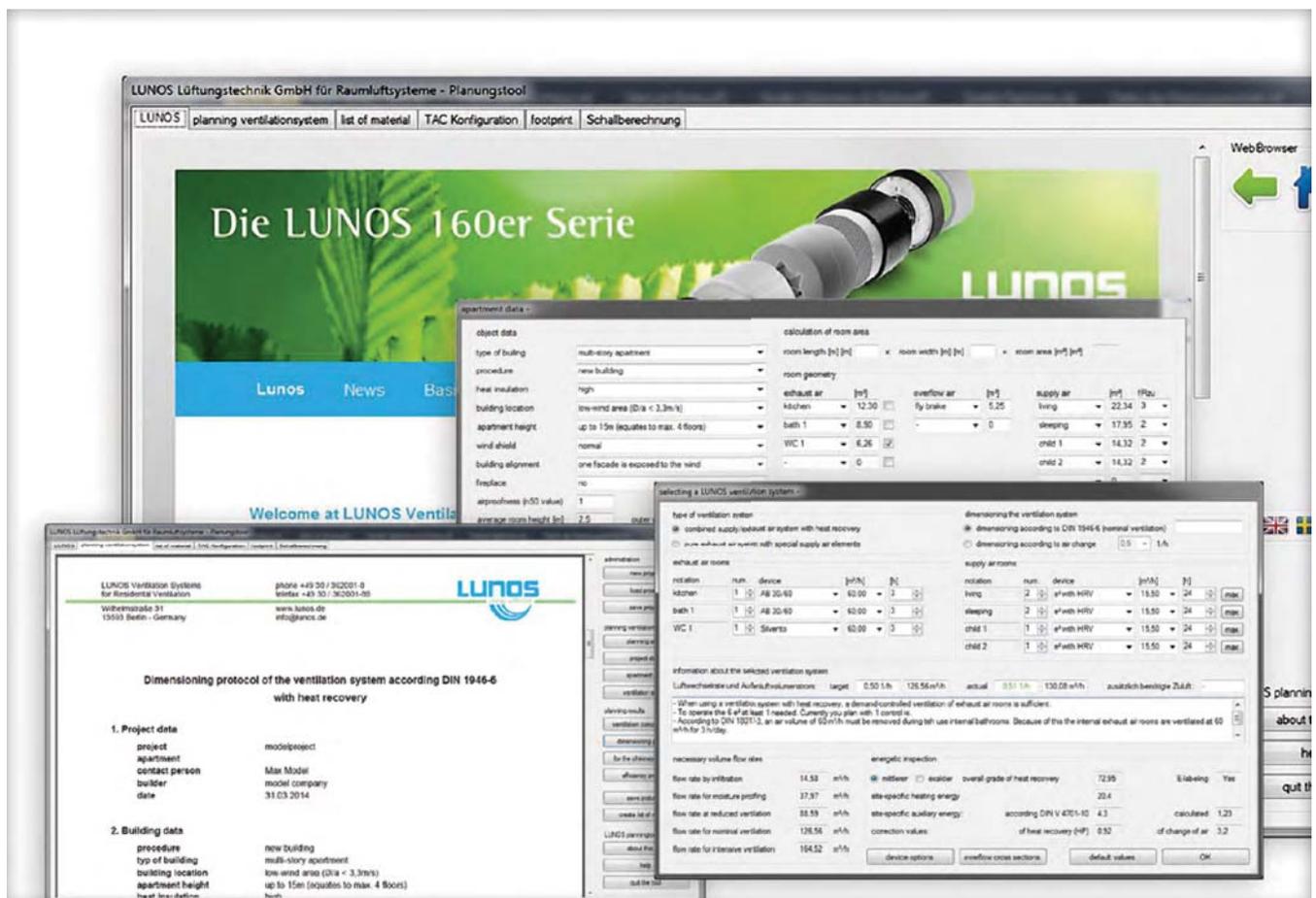


- Building type:** redevelopment of two multi-storey apartment buildings from the 1970s
- Ventilation concept:** regulated apartment ventilation with heat recovery in the living rooms and exhaust air systems in functional rooms without windows
- Supply and exhaust air:** e<sup>2</sup> with heat recovery
- Exhaust air:** exhaust air system pursuant to DIN 18017
- Completion:** September 2011
- Energy standard:** extensive heat insulation (200 mm), windows with triple thermal glazing ( $U_g = 0.8 \text{ W/m}^2\text{K}$ )

### › Planning with LUNOS pursuant to DIN 1946-6

Correct planning in accordance with state of the art technology pursuant to DIN 1946-6. This calculated the flow rates required to ensure the minimum air exchange pursuant to EnEV. These flow rates depend on the number of exhaust air rooms, the floor space as well as the leak tightness, position and direction of the building.

Planning of mechanical home ventilation is made in accordance with the nominal ventilation stage which covers the air exchange required for normal usage. The ventilation system can also be planned for intensive ventilation. However, to reduce peak loads, windows are then normally opened.



# - Software Tool

## your home ventilation



LUNOS Planning Tool

### > LUNOS Planning Tool

To help you plan your regulated home ventilation, LUNOS provides a planning tool based on the algorithms of DIN 1946-6.

- verification of necessity of ventilation-related measures (LTM)
- planning related to exhaust air rooms or floor space
- planning of exhaust air flow rates
- ventilation for humidity prevention, reduced ventilation, nominal and intensive ventilation.
- calculation of infiltration flow rates with or without LTM
- component planning for the ventilation system such as fans, outside air vents and excess flow cross-section
- consideration of the requirements of exhaust air systems in connection with fireplaces
- calculation of efficiency and effectiveness of the ventilation system planned
- preparation of complete material lists
- calculation of noise insulation of an outside wall in connection with ventilation components

All calculation results are printed out by the planning tool in a clear record in PDF format.

### TAC Configuration made easy



One completely new feature of our planning tool is the preparation of a DC code (Digital Configuration Code). This is required for initial setting up and fast configuration of the TAC (Touch Air Comfort) control. The TAC is informed via the 15 digit code which fan unit is connected to which outlet and which volume rate levels the user may switch. Special function settings are also communicated, such as e.g. after-run time of a fan, humidity or C=2 limit for regulation selected and/or the behavior of the  $e^2$  in the supply air section when the exhaust air device/s is/are switched on.

After successful configuration, the planning tool prepares a connection plan for the TAC especially adjusted to your system, with a summary of the settings requested.





# LUNOS – Our national

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National

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