LUNOS

energy-efficient

The Catalogue

Imprint

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With publication of this product catalogue all catalogues from previous years lose their validity.

Pictures may differ from original products.

Welcome

Residential ventilation systems – Made in Berlin

Dear Reader,

LUNOS - for decades this name has been standing for quality, innovation and reliability. As world market leader in the field of decentralised home ventilation, we know exactly the requirements and demands our clients place on our products - and how to put them into practice. At present, around 80 staff work on the development, production and sales of our various ventilation systems. Our engineers are continuously developing new devices for efficient use in apartments and buildings - with success! Meanwhile LUNOS is represented worldwide in more than 30 countries and thus not only nationally, but also internationally very successful.

Our clients include housing associations and single or multi-family home builders as well as manufacturers and management of office and hotel buildings in many countries around the world. Whether small or large buildings, new constructions or redevelopment projects, our clients are convinced of the quality and longevity of our products.

LUNOS products are designed to use as little energy as possible and at the same time to generate as much benefit as possible for the end user. We have managed to develop solutions for every budget and almost every application.

We are very pleased to present you our well-tried classics as well as our newest products in this catalogue. We hope you enjoy reading and wish you every success in selecting and using our ventilation units.

Your Team of LUNOS Ventilation Systems

The Catalogue of
Efficient air exchange

List of Contents

Home Ventilation

and fresh air in every room

Confidence

Fresh air supply

The core competence of LUNOS

Quality passes the test of time

At the beginning - in the times of the "Economic Miracle" - there was an innovation: LUNOS invented a perforated brick as a passive ventilation element for kitchen cabinets ventilated by outside air. A little later LUNOS became one of the best known manufacturers of home ventilation systems - with solutions that were - and still are - widely compatible and durable and with components that provide a clearly improved indoor climate and healthy building substance. Today, LUNOS develops, produces and sells ventilation systems for residential construction at its location in Berlin-Spandau and also provides its expertise and well-known services.

LUNOS stands for more than room climate

Our core competence lies in controlled home ventilation. This requires client-oriented solutions. LUNOS ventilation systems provide customised, clean and hygienic ventilation of all residential rooms. In addition, they enable considerable savings in 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 continuously strong growth - both in Germany and on international markets.

Where do contamination and humidity come from?

Furniture, carpets and paints emit contaminants in miniscule amounts. Humidity is generated by residents breathing, showering, washing and drying, cooking and also by plants. In a four-person household, about 10 liters of water evaporate every day.

What to do with the humid, contaminated room air?

Air can only absorb a limited amount of humidity. The amount depends on the temperature: Hot air absorbs more than cold air. When the hot, humid air cools down, for instance on a cold surface, condensation occurs. The result is "condensation water". You can see it every summer on a cool drinking glass. There is a risk of mould growth on the cooler parts of the outer wall. Air humidity can condense in corners, an ideal environment for mildew. The humidity contained in the ambient air can only be reduced by effective ventilation. Together with humidity, contaminants in the room air are discharged at the same time.

› **Yesterday: Five x air exchange via building leakages**

in LUNOS
for generations

In the past

Air exchange took place via numerous gaps in the building envelope, e.g. at the door or at the window. This allowed humidity and contaminated room air to escape. In this way, the room air was exchanged up to five times per hour. Condensation or perspiration water only formed on the cold window panes, without any further consequences. Ventilation was carried out only as exhaust venting from rooms without windows. Inside baths without windows were vented when used in conjunction with a time lag. A backflow of outside air took place via the building leaks. In the rest of the apartment, ventilation was also ensured via air permeability in the building envelope.

Today

The Energy Saving Ordinance (EnEV), which applies for redeveloped and new residential buildings, has been placing ever higher demands on the overall balance of building projects: Effective window ventilation without unnecessary energy losses is almost impossible for the consumer. Due to high energy costs rooms are usually not aired often enough. This leads to damage from humidity which affects the health of residents and the building substance. Therefore, fresh air supply requires new approaches. LUNOS provides intelligent home ventilation systems, which ensure the controlled supply of clean air in accordance with the respective requirements and swiftly and discreetly discharge exhaust air and all contaminants outside. Thanks to our highly efficient heat recovery, our ventilation helps save heating costs and this makes a major contribution to fulfilling energetic requirements. Even though we attach great importance to very silent and efficient operation when developing our ventilation systems, we also offer solutions for special requirements in sound insulation making our ventilation systems especially quiet and effectively reducing any undesirable traffic noise. LUNOS systems only allow the good of the environment into your home.

The development – Silvento ec and the innovations of the 160 series

LUNOS products are continuously optimised and developed further. The Silvento series was extended by ec technology and has now become much more efficient and silent. At the same time, of course, the series remains compatible with the existing fans. Also in 2016, the LUNOS 160 wall-tube continues to be the basis for many innovations. As a result of the extension of the e^2 family and the new $Ne^{xx}t$ with recuperative heat exchanger, there is now a variety of ventilation devices using this wall-tube. The new e^2neo is particularly characterized by its extremely low running noise. In addition, it can be operated from 5 m^3/h. Equally suitable for redevelopment and new building projects, the fans of the 160 series are extremely attractive. Using the LUNOS Design Tool, the various 160 fans can be efficiently combined in the design of living spaces according to the latest standards, such as the EnEV and DIN 1946-6.

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

Basics of
Controlled home ventilation:

The principle

LUNOS ventilation systems are based on airflow through the entire living areas in accordance with specific requirements. For efficient ventilation, the decentralized fans can be combined into three different ventilation systems:

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

Exhaust air system

In accordance with the requirements and the level of humidity, fans discharge the exhaust air from the bathroom, kitchen, toilet or washroom into the open or into exhaust air shafts. These fans run permanently, thereby creating a negative pressure. As a result of this negative pressure, fresh, filtered air flows through the outer wall air vents into the living room and bedroom, children's rooms and work rooms. Particular attention is paid to humidity-regulated home ventilation. By means of this ventilation system, significant losses of ventilation heat can be saved in accordance with EnEV.

Hybrid system

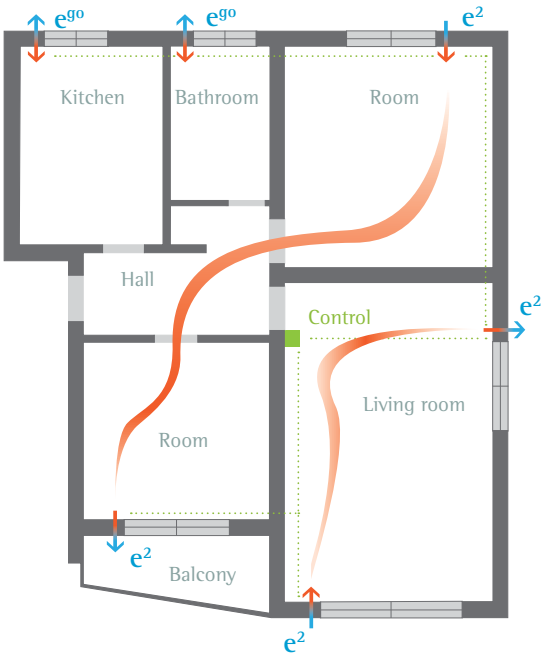
Hybrid ventilation systems are combinations of at least two different types of ventilation. Combinations of exhaust devices and ventilators with heat recovery are especially effective. The benefits of such hybrid combinations are obvious: while the living rooms are equipped with heat recovery devices, a low-cost air device, which is operated only when necessary, can be used in classical exhaust air rooms. In bathrooms and toilets without window, this is even required pursuant accordance with DIN 18017-3.

System with heat recovery

In this highly efficient system, all rooms of the apartment are equipped with heat recovery devices. With the ventilation units of LUNOS it is possible to operate ventilation and exhaust air systems with heat recovery via the outside wall even in classical exhaust air rooms.

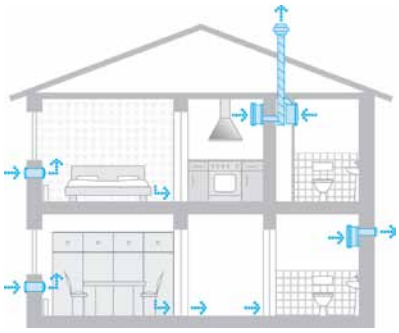
Needs-oriented, controlled home ventilation with LUNOS

Coming in:	• fresh, filtered air
Going out:	• moist and odour-loaded air from kitchen, bathroom, toilet etc. • contaminants and gas release from paints, carpets, furniture etc.
Stays inside:	• heating
Stays outside:	• suspended particles and insects (via filter inserts) • noise (via sound-absorbing outer wall elements) • wind (via wind pressure relief at the outer wall elements)



Home Ventilation

The right dimension is decisive



The energy saving ordinance EnEV

Whether it is redevelopment or a new construction: buildings must be impermeable according to the EnEV (Energieeinsparverordnung). This legal regulation is always applicable, even for redevelopment of old buildings. In the EnEV, the building planned is compared to a reference building. In the case of deviation from one item value of the reference building, respective compensation must be provided in another item.

Therefore LUNOS: Fully in line with the EnEV

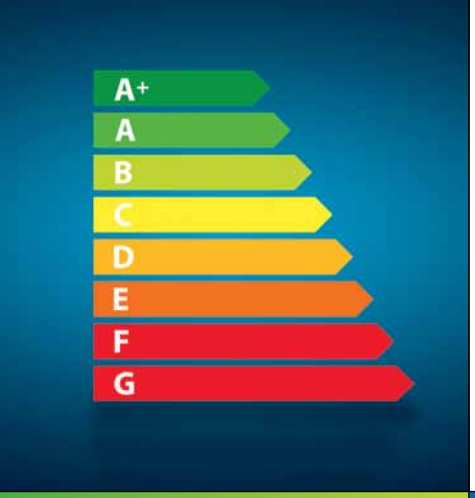
LUNOS systems operate in a controlled and customised way in accordance with the parameters of humidity and temperature. The airflow level increases or decreases depending on the exhaust air humidity. In this way, there is always as much ventilation as necessary and as little as possible. Preconditions for the calculation of the reduced air exchange are stipulated by the EnEV in conjunction with DIN V 4701-10.

Bathroom and WC ventilation according to DIN 18017-3

Ventilation of bathrooms and WCs without windows pursuant to DIN 18017-3 is the simplest type of home ventilation: This standard specifying the requirement of continuous ventilation in bathrooms has been tightened again. Only if high thermal insulation of the building is ensured and laundry drying is not carried out in the apartment is it allowed to install bathroom fans which can be switched off - with 15 minutes delay time at 60 m^3/h -. In all other buildings, bathrooms and toilets must now be equipped with multi-step ventilation providing a continuous flow of exhaust air. This continuous flow of exhaust air in the bathroom also provides a continuous, minimal ventilation of the apartment, as a first step to user-independent home ventilation. Since building impermeability of this standard has been adjusted to the state-of- the-art technology, outside airflows now need to be planned and respective outer wall air outlets provided. By the use of tables the design can be completed easily and quickly. Compared to DIN 1946-6, the airflow requirements of DIN 18017-3 only refer to exhaust air rooms, not to the entire apartment.

DIN 1946-6

In addition to permanent building impermeability, § 6 of the EnEV requires sufficient minimum air exchange. Evidence of this air exchange can be provided via DIN 1946-6. The most important tool of the revised standard is the ventilation concept. It helps to answer an easy question: Is the new or modernised building adequately ventilated via its leakages or which additional user-independent ventilation measures are necessary to ensure sufficient air exchange? The answer to this question arises from two steps: first, it is determined whether ventilation measures are necessary, and then which ventilation systems are appropriate to carry out the necessary measures. Moreover, the standard stipulates further requirements for energetically favourable ventilation systems: exhaust air systems must be equipped either with a user-independent, needs-oriented control or with a heat pump.



Ecodesign Directive

Classification of ventilation devices

The directive

Since 01 January 2016 the Directive 2009/125 / EC with Regulation (EU) no. 1253/2014 and the Delegated Regulation (EU) 1254/2014 have been bindingly implemented in the EU. This mandatory implementation has lead to some changes in the product declaration of ventilation systems and the addition of new product data sheets to the product documentation and, where appropriate, energy labels to identify the efficiency class of devices. The Directive on Energy Labelling 2010/30 / EU, which was adopted in 2010 and replaced the old EU Framework Directive 92/75 / EEC, is to make an important contribution to the increase of energy efficiency in Europe. Regulations for selected product groups, which include detailed, product-group-specific requirements and labelling information, are issued on this basis. These regulations apply directly in all EU Member States.The Regulations (EU) no. 1253/2014 and (EU) no. 1254/2014 apply for LUNOS ventilation devices.

This EU Regulation on the minimum efficiency of ventilation systems entered into force on 26 November 2014. It was issued in the context of a variety of other eco-design directives regulating the minimum energy efficiency of products.

The Ecodesign directive specifies that some of the ventilation units will have energy labels with energy efficiency classes in the future - equivalent to the already known refrigerator labels. The labels are divided into energy efficiency classes from A + to G, whereby A + is the best.

Labelled LUNOS products

Pursuant to the directive all ventilation devices with heat recovery are labelled. Furthermore, all devices with a maximum power consumption of more than 30 watts are labelled.

The new Silvento ec of LUNOS is so efficient that its maximum power consumption is 14.5 watts. Thus it does not fall under this requirement and therefore must explicitly not be labeled.

LUNOS guarantees compliance with all new regulations for the new product declaration and the completeness of all necessary documents. All documents are available on our homepage www.lunos.de.

Ventilation units with heat recovery

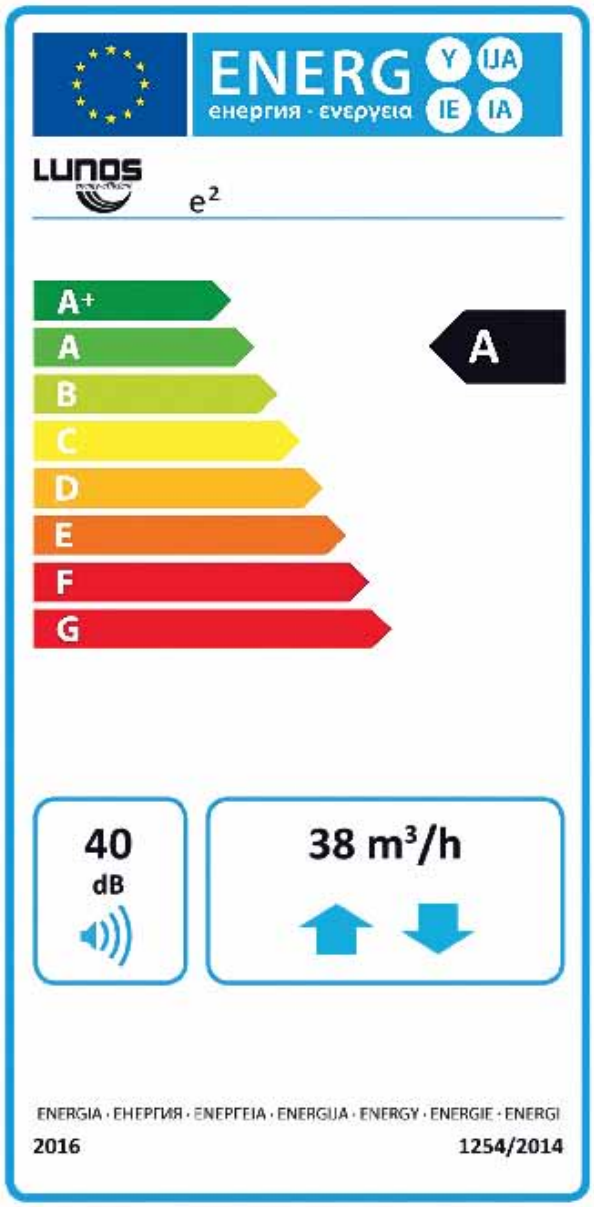
- e^2, e^2neo, e^2short, e^2mini
- e^{go}
- f^{go} (only with heat recovery)
- Ne^{xx}t

Maximum power consumption > 30 Watt

- Silvento AC

from 01 January 2016

Example: Energy label



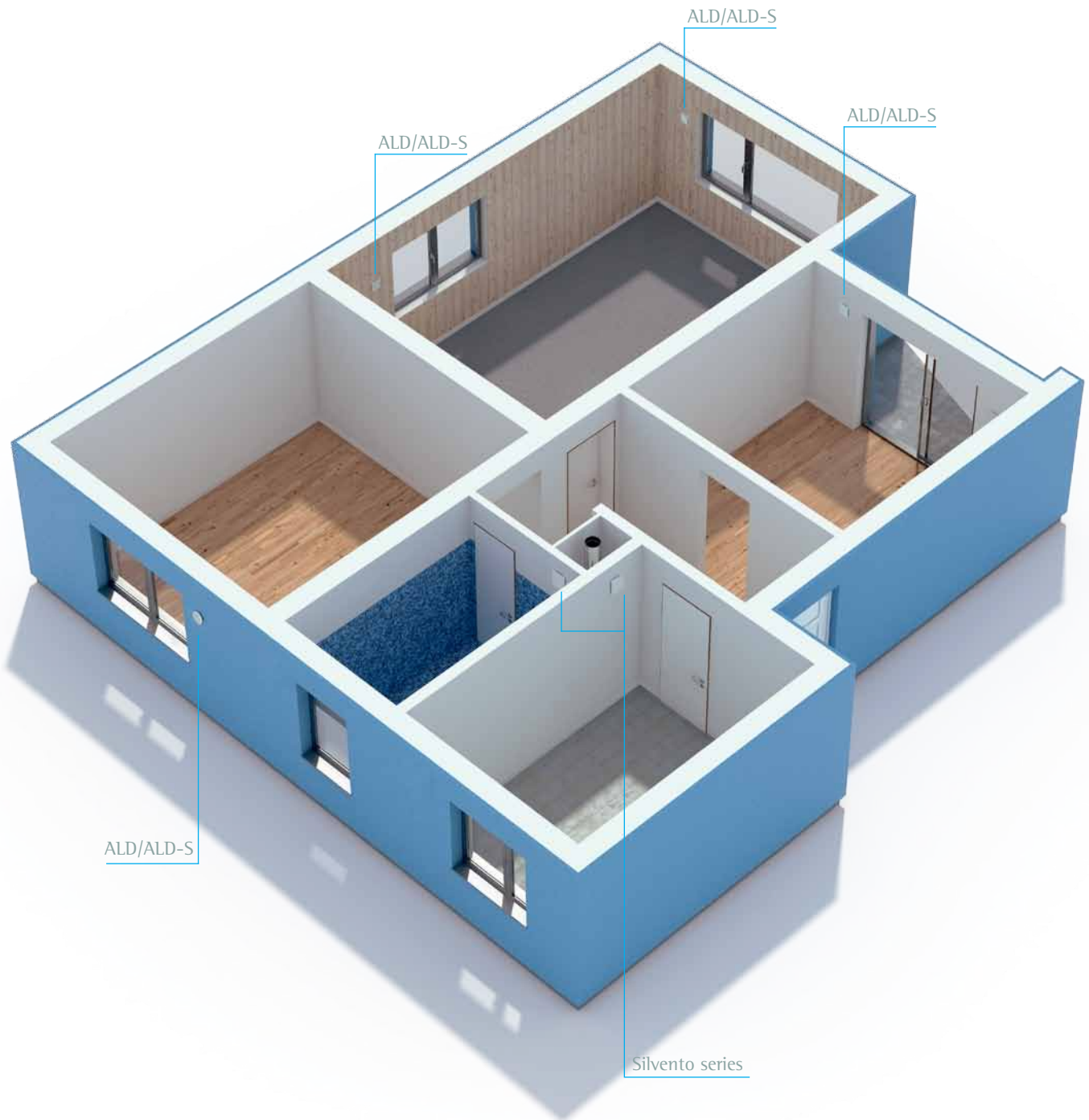
- Name of company and product
- Energy efficiency class of the product
- List of available energy efficiency classes
- Sound power level*
- Maximum airflow level
- Sort of ventilation: ventilation, exhaust or ventilation and exhaust

For more information see Ecodesign Directive (EU) no. 1254/2014

* Sound power level: At 70 % of the maximum airflow level pursuant to (EU 1253/1254/2014).
The sound power level indicates the "loudness“ of a device and is independent of the distance.

Controlled

Exhaust air systems



Home Ventilation

Exhaust air systems

› The exhaust air side

Silvento ec
Depending on the application or operation purpose, any Silvento ec fan can be surface-mounted or flush-mounted or used as clamp-in fan.

Silvento AC F
Depending on the application or operation purpose, any Silvento fan can be surface-mounted or flush-mounted or used as clamp-in fan.

RA 15-60
Radial outer wall fan with four ventilation steps and a circular cross section. Combinable with façade element LUNOtherm.

› The supply air side

ALD and ALD-S
Outer wall air outlet with wind pressure relief, filter and sound absorber.

9/MRD
Wall installation housing to hold the 160 wall-tube 9/R 160.
H x W x D:
240 x 210 x 500 mm.

LUNOtherm + ALD or ALD-S
Outer wall air outlet with façade element, almost invisible from the outside.

The Silvento ec

Ventilates more economically and quietly than its predecessors, since it works much more efficiently and can be operated at lower airflow levels. The lowest ventilation step is 15 m^3/h.

The needs-oriented control of the Silvento exhaust fans can be equipped with a comfort board. This innovative control adjusts the fan speed automatically to the required ventilation: temperature and humidity measurements influence the airflow level to provide an optimal climate so that mould formation can be effectively prevented.

The sensor, which is integrated in the intake area of the exhaust fan, records the temperature and humidity content of the air. Since the fan is installed in the bathroom or WC, where ambient air conditions are different from the living room area, fan control (stepless from 0-60 m^3/h) adjusted to the room air conditions in the living area is ensured via the simultaneous evaluation of temperature and humidity. In this way, the control considers not only the ventilation required in the bathroom, but also the needs in the living rooms and thus provides effective protection against humidity damage and mould formation.

LUNOS products are eligible for financial support

The remarkable energy savings of a building by the use of home ventilation have recently been confirmed once again by the German Industry Association for Building, Energy and Environmental e.V. and by the Fraunhofer Institute for Building Physics. Consequently, the unique energy-saving features of regulated home ventilation are now being rewarded by the legislator in the form of a financial subsidy. In addition to the energetic benefits, the building owner may also look forward to a variety of other plus points of home ventilation: A healthy, cosy room climate always full of fresh air and protection of the building substance, which increases the property value.

It goes without saying that decentralised ventilation systems continue to be eligible for financial support in 2017.

The exhaust series Silvento has to be used for functional areas without windows, such as bathroom, WC or kitchen.

Controlled

Hybrid systems

Home Ventilation

Hybrid systems

› Supply & exhaust air with HR

e², e²neo, e²short A A+

Axial outer wall fans with regenerative heat recovery for living rooms and bedrooms, combinable with LUNOtherm.

e²mini A

Axial outer wall fan with regenerative heat recovery for living rooms and bedrooms.

Ne^xt A

Radial outer wall fan with recuperative heat recovery for living rooms and bedrooms. Wall duct via 160 wall-tube.

› The exhaust air side

Silvento ec

Depending on the application or operation purpose, any Silvento fan can be surface-mounted, flush-mounted or used as clamp-in fan.

F

Silvento AC

Depending on the application or operation purpose, any Silvento fan can be surface-mounted, flush-mounted or used as clamp-in fan.

RA 15-60

Radial outer wall fan with four ventilation steps and a circular cross section. Combinable with façade element LUNOtherm.

Combination of the different series

The 160 modular system makes it easier to plan and implement hybrid ventilation. If the Silvento series does not have to be included in the planning for exhaust air, the same wall duct can be used for each ventilation device of the building project. The exhaust air series Silvento is used for bathrooms or kitchens without windows in multi-floor residential buildings.

The benefits of the hybrid combination are obvious: while the living rooms are equipped with heat recovery unit e², a low-cost air device, which is only operated when needed, can be used in classical exhaust air rooms such as bathroom, WC or kitchen. In bathrooms and WCs without windows this is even required pursuant to DIN 18017-3.

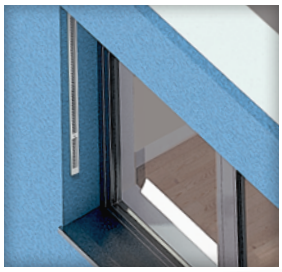
The cost-benefit advantage of a combination with classical exhaust air systems is convincing and can be designed using the LUNOS Design Tool according to EnEV and DIN 1946-6.

The exhaust fans of the 160 series

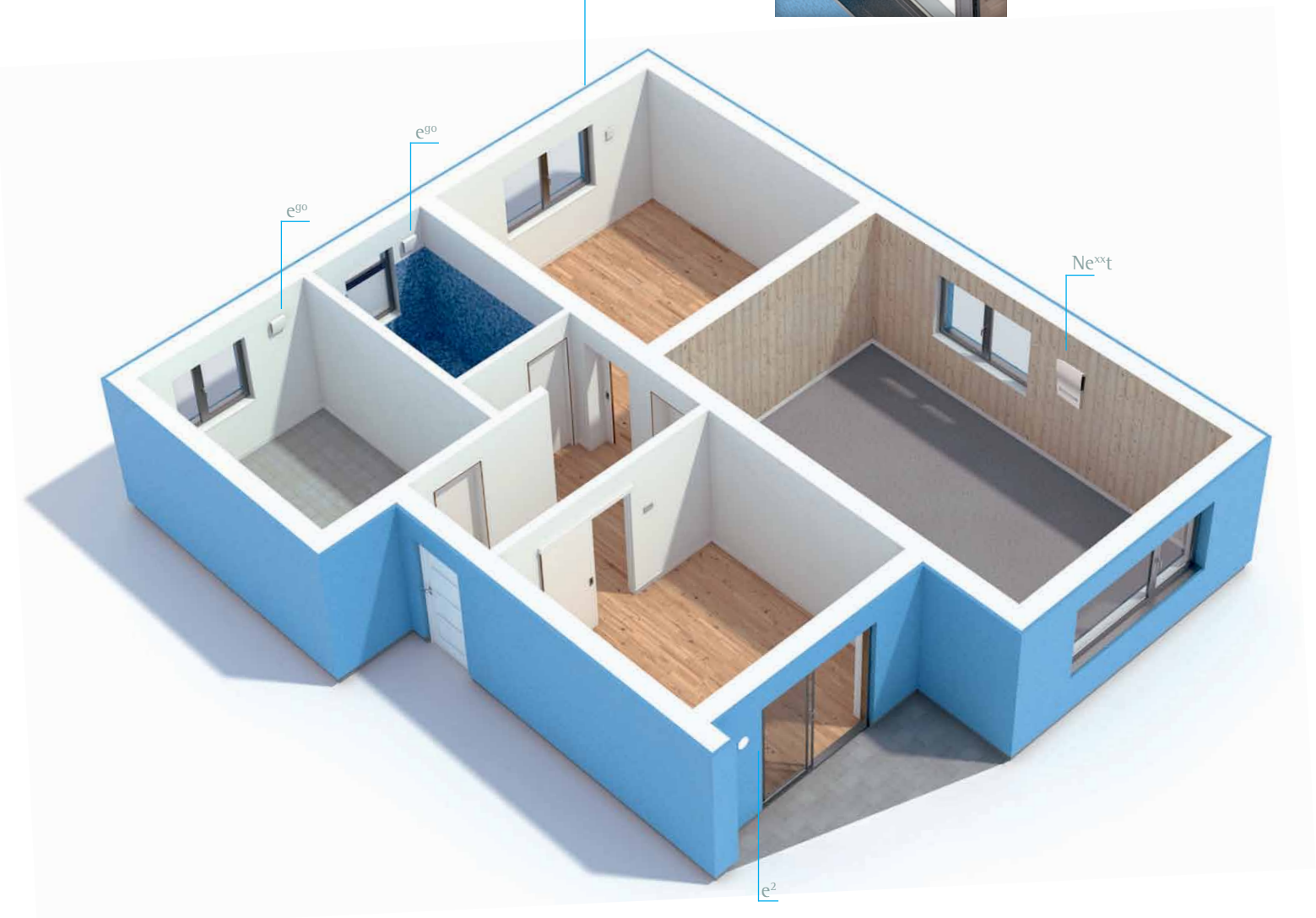
With the RA 15-60, LUNOS provides an ideal complement to the 160 series in classical exhaust air rooms exposed to humidity, such as bathroom, WC and kitchen. Considering the aesthetic perception of homeowners, the engineers of the company LUNOS attached great importance to the design when developing the fan. The fan presents itself just like the e²: Inner screen, filters and the outer grille originate from the same product family. Due to its radial motor, the RA 15-60 is also the more pressure-stable alternative to the Silvento series.

The radial fans of the Silvento series can be used for exhaust air rooms without windows. We recommend the use of the delay timer and interval function to ensure the efficiency of the fans with heat recovery.

Controlled
Systems with



› e^2 with LUNOtherm



Home Ventilation

heat recovery

› Supply & exhaust air with HR

e^2, e^2neo, e^2short A A+

Axial outer wall fans with regenerative heat recovery for living rooms and bedrooms, combinable with LUNOtherm.

e^{go} A

Axial outer wall fan with regenerative heat recovery for functional rooms.

Ne^{xx}t A

Radial outer wall fan with recuperative heat recovery for living rooms, bedrooms and functional rooms. Wall duct via 160 wall-tube.

e^2mini A

Axial outer wall fan with regenerative heat recovery for living rooms and bedrooms.

9/MRD

Wall installation housing to hold the 160 wall-tube.
H x W x D:
240 x 210 x 500 mm.

e^2, e^2neo and e^2short + LUNOtherm

Wall installation housing to hold the 160 wall-tube.
H x W x D in mm:
240 x 210 x masonry thickness.

The principle of regenerative heat recovery

The e^{go} is the perfect enhancement to the e^2 family in a ventilation system with heat recovery. By reason of the decentralised alignment, the individual ventilation devices can be used exactly where they are required.

Except for the e^2mini, the e^2 family can also be combined with the LUNOtherm façade element. When using the façade element the outer grille is not required. What remains is a narrow ventilation gap in the reveal or in the lintel.

The Ne^{xx}t with recuperative heat recovery

The Ne^{xx}t makes it possible to provide ventilation and air exhaust in large rooms with just one device. Two extremely quiet radial fans achieve up to 90 m³/h. You can choose between two versions with crossflow or counterflow heat exchanger.

Living rooms and bedrooms:

The Ne^{xx}t and the e^2 family are ideally suited for use in living rooms and bedrooms.

Bathroom, WC, utility room (UR) and kitchen:

The e^{go} is used for functional areas such as bathroom, WC, utility room and kitchen. Thanks to the two separate air channels in one unit, a second fan is not required here. The e^{go} can be operated both in heat recovery operation and in the exhaust air mode (airflow level 45 m³/h).

Benefits and
Regulated home ventilation

› Cost estimates

Living space approx. 70 - 90 m²
Sample calculation

Exhaust air system

e.g. with
- Silvento KL-EC with 5/EC-FK
- Silvento KL-EC with 5/EC-ZI or KL 30/60
- ALD-R 160
- Switch

Material price from 900 € plus VAT

Hybrid system

e.g. with
- e²neo, e², e²short or e²mini with heat recover
- Silvento KL-EC with 5/EC-ZI, KL 30/60 (extract ventilation with rising duct) or RA 15-60 (outer wall)
- Universal control
- Switch

Material price from 2.300 € plus VAT

System with heat recovery

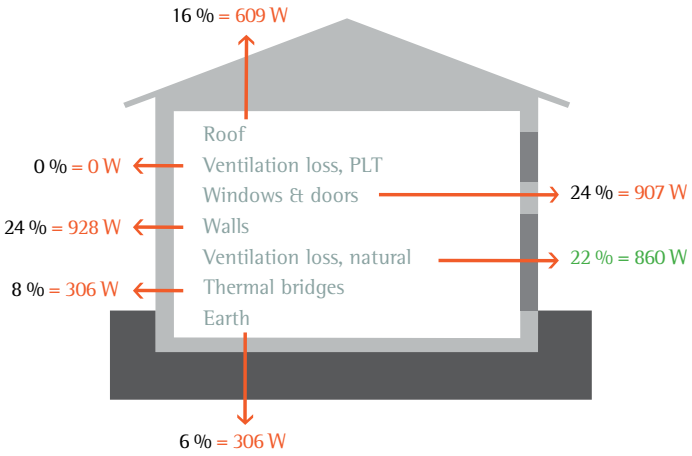
e.g. with
- e²neo, e², e²short or e²mini with heat recover
- e^{go} with heat recovery
- Universal control
- Switch

Material price from 2.300 € plus VAT

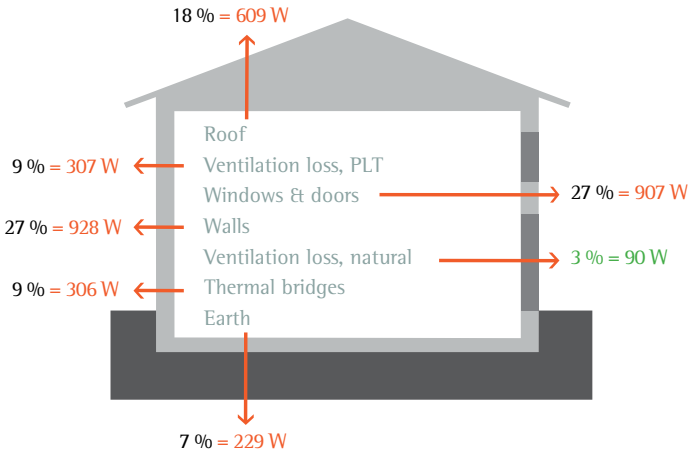
Costs
enjoys many advantages

› Comparison of unregulated ventilation with a model of heat recovery in a detached house

Heating load and ventilation heat loss in unregulated ventilation



Heating load and ventilation heat loss when using the e² with heat recovery



Result of the calculation:

By using the e² in combination with the exhaust fan RA 15-60, the heating load is reduced by 15 %. The ventilation heat loss is reduced to 43 % (57 % savings). The heating load calculation is usually performed by a specialist planner, who can calculate how much the owner can save per year based on the percentage savings.

Parameter of the sample calculation:
ventilated living space: 124,90 m², ventilated room volume: 312,25 m³, average room height: 2,50 m, standard indoor and outdoor temperature: Θ_i= 20°C and Θ_a=-12°C, new building detached house, KFW70 standard, assumed heat passage coefficient (U- value): outer wall U= 0,16 W/m²K, window U= 1,10 W/m²K, roof U= 0,20 W/m²K, base plate U= 0,23 W/m²K

The Exhaust

Silvento ec

The Silvento ec – quieter, more efficient and newly designed

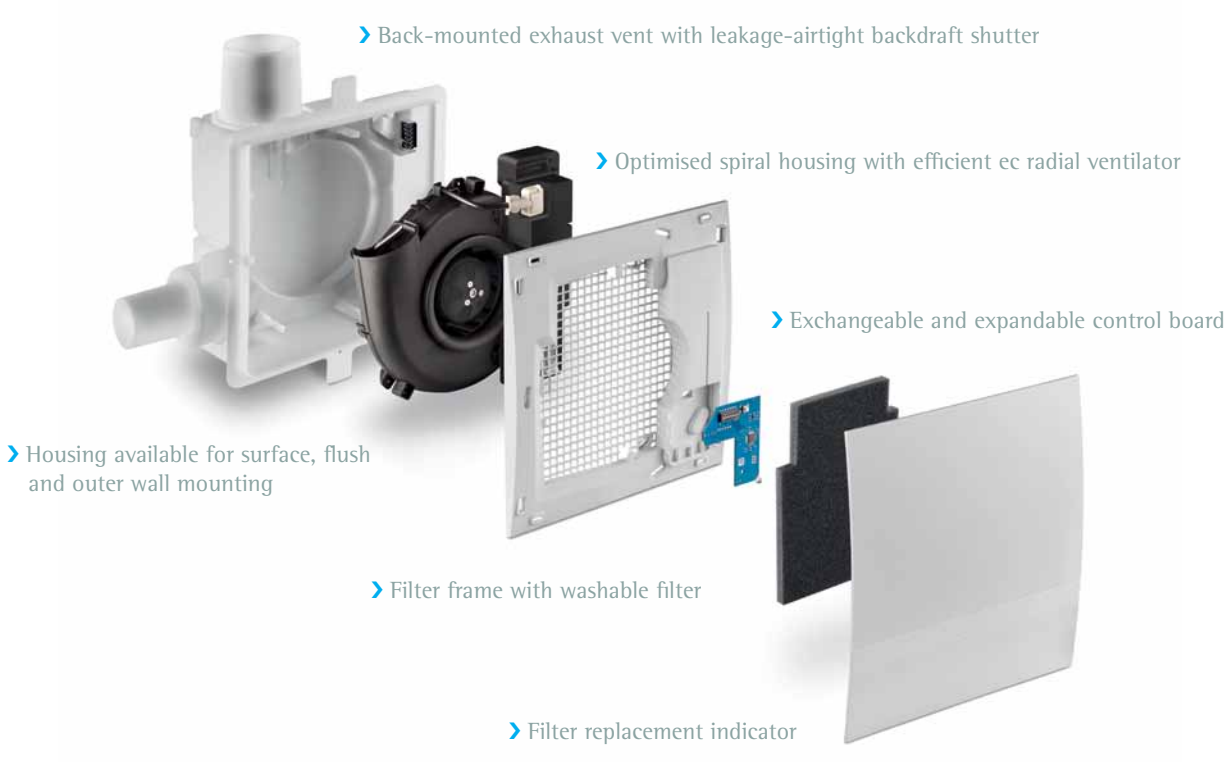
Thanks to ec-technology, the power consumption has been significantly reduced. The Silvento ec is also quieter than its predecessors, since it is considerably more efficient and can be operated with lower airflow levels.

The functions of the Silvento ec can be selected by the use of two control boards:

Basic board: The Silvento ec has seven ventilation steps between 15 to 60 m^3/h. They can additionally be combined with delay time, interval circuit and switch-on delay.

Comfort board: In addition to the features of the basic board, the comfort board is equipped with a humidity and temperature sensor. There has never been a more refined and individual humidity control regulating the fan even without permanent basic ventilation.

Both boards can be combined with attachable expansion modules: The radar-based motion detector module renders switches superfluous. All control functions of the basic module can be triggered by the motion detector. By use of the optional wireless module, the Silvento ec can be remotely controlled via radio by external controls, sensors or wireless switches without additional cabling. The new Silvento ec is of course 100 % compatible with the accessories of its predecessors. Thus old devices can be quickly and easily replaced by new ones, if desired.



PLUS X AWARD®
2018 achieved for:
Innovation
High Quality
Design
Ease of Use
Functionality
Ecology

Air System
Silvento ec

QUIET

› Low sound level

Residential and traffic areas are moving closer together. But we only feel good within our four "silent walls". Therefore, the motors of the Silvento were changed to ec technology and the geometry of the impeller and the air-suffused components further optimised and thus greatly improved. This is how one of the quietest fans in the world was created. All Silvento ec fans convince by their minimal operating volume which is barely audible because the sound power level amounts to only:
20 dB (A) at 15 m³/h (basic ventilation) and 35 dB (A) at 60 m³/h (regulated ventilation).

ECO-FRIENDLY

› High efficiency

The Silvento ec counteracts rising energy costs and increasing contamination of the environment. Thanks to the newly developed, highly efficient ec motor the new generation of fans stands out for their extremely low power consumption. For the airflow levels, power consumption is only:
1.8 to 6.2 W at 15 - 60 m³/h flow volume - maximum pressure difference 400 Pa.

INNOVATIVE

› The new control technology of the Silvento ec

The new innovative control boards make it easy to select the right fan. All airflow levels, delay times, intervals and switch-on delays are available via basic and comfort boards. The comfort board is chosen for its humidity-temperature sensor. This innovative regulation can adjust the exhaust airflow level even better and more exactly to the conditions in the living room. The automatic season switch of the comfort board shifts the fan automatically to its lowest level in summer and back to humidity control in the transitional period and in winter. Both boards can be additionally equipped with a radio module or the radar-based motion detector module.

SLIM

› LUNOS design line

Silvento ec continues the current design language of LUNOS products: plain and elegant. The fan is thus perceived as a stylish element of domestic technology. The inflow of air continues to be located on the rear side, so that no deposits of dirt are visible. The front screen is flat and the dimensions show how compact the fans are:
Surface 260 x 260 x 108 mm (W x H x D)
Screen with 260 x 260 x 23 mm and flush-mounted housing with 235 x 235 x 92 mm.

COMPATIBLE

› LUNOS long-term compatibility

The Silvento ec flush-mounted fans are 100 % downwardly compatible with the built-in devices of Silvento AC. In the existing flush-mounted housings, with and without fire protection, the Silvento clamp-in fan can easily be inserted, thereby enabling an easy adaptation to state-of-the-art technology.

UNIVERSAL

› The Silvento housings can be used universally

They can be installed in various positions.

Exhaust Air Fans

Silvento series

› Silvento: Technical data

Silvento Type V-EC[1] or KL-EC[2]	Basic board 5/EC-ZI	Comfort board 5/EC-FK	AC version V[1] and KL[2] 30/60
Airflow Level [m³/h]	0/15/20/30/40/45/50/60	0-60	30/60
Power Consumption [W][3]	1,8-6,2	1,8-6,2	5,2/10,9
Noise pressure level* [dB(A)][3]	20-35	20-35	24/35
Delay time [min.]	15/30[4]	15/30[4]	
Interval [min.] per [h]	OFF/15 per 2/30 per 4	OFF/15 per 2/30 per 4	
Wireless sensor[5]	optional	optional	
Motion sensor[5]	optional	optional	
Humidity Control level [% r.h.]		45-75	
Energy efficiency class	-	-	F

1) Silvento V are fan sets which require a flush-mounted or surface-mounted housing.
2) Silvento KL are complete single-tube fans, which are clamped into pre-wall constructions.
Silvento KL single-tube fans fit into the flush-mounted housing of series LUNOS Scalar.
3) Free blowing (with no exhaust line attached)
4) The DIN 18017-3 prescribes a delay time of at least 15 minutes at 60 m³/h after leaving the room.
5) Either a wireless sensor or a motion sensor can be used.

* Sound power level: The sound power level indicates the "loudness" of a device and is independent of the distance.

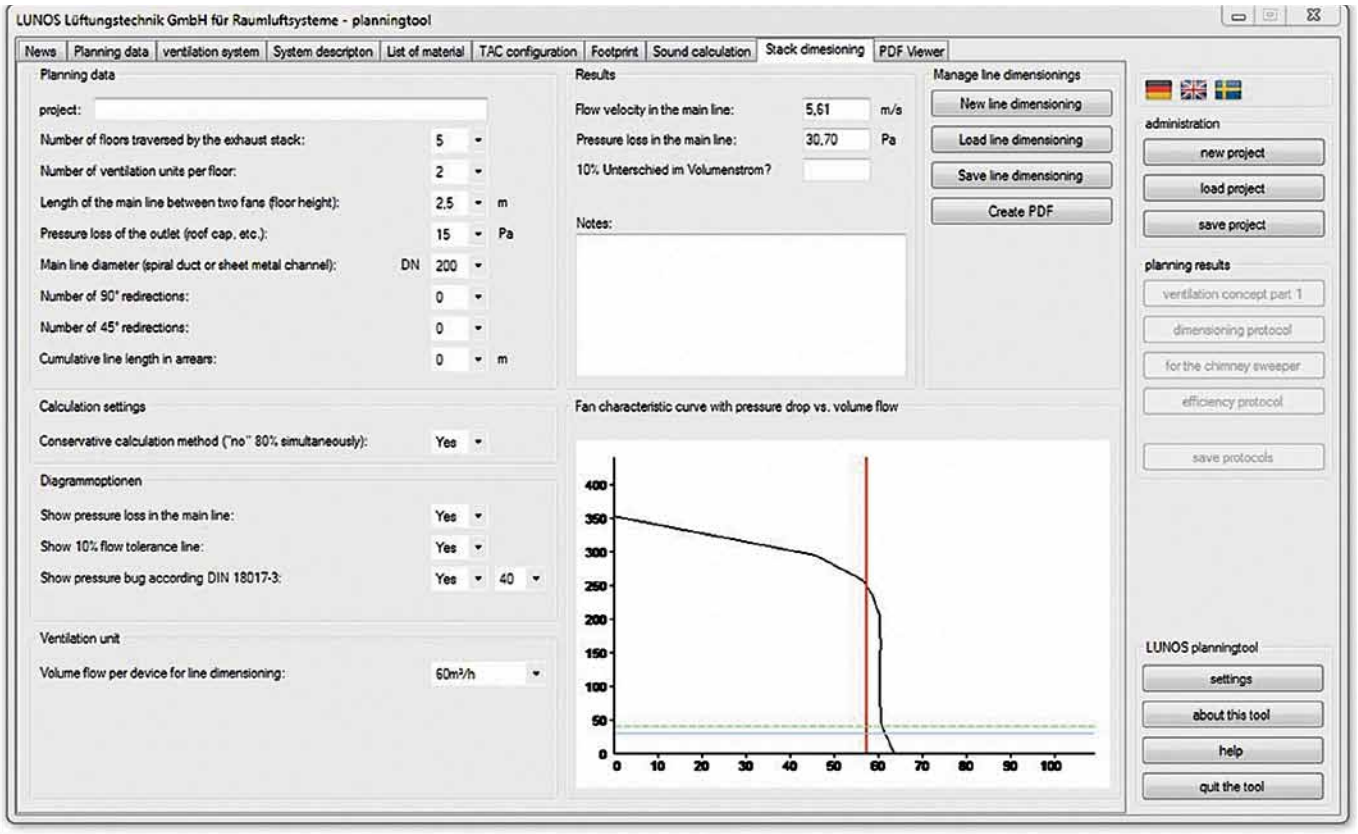
overview: Technical data

Design of the main line diameter

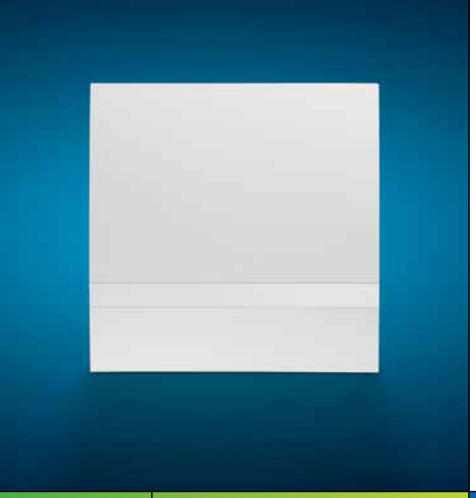
Since there are many influencing variables to be considered when calculating the nominal diameter of the main line, no simplified duct schemes should be used. LUNOS provides on its website a calculation tool for the design, which takes the various parameters such as main cable types, roof hoods etc. into account.

Individual dimensions

Today also fans with low airflow levels are used for duct installation in controlled home ventilation. Often, the fans run at a permanent base load and are switched up when required. Therefore, the duct design has to be calculated individually and cannot be obtained from existing tables. The Design Tool providing stored pressure characteristic curves offers a good way of calculating a duct. The results of the dimensioning can be stored in processed form with characteristic curves as a PDF file.



The Design Tool is available free of charge under www.lunos.de



Exhaust Air Fans

Silvento ec: The modular system

› Functions

The control board is integrated in the filter frame. It is easily accessible after removing the front screen.
An exchange is thus possible with little effort.

Basic and Comfort board enable numerous control functions:

Basic board 5/EC-ZI

- Choice of seven different airflow levels for basic ventilation and regulated ventilation:
  0, 15, 20, 30, 40, 45, 50, 60 m^3/h
- Delay time adjustable to 0, 15 or 30 minutes
- Interval switching can be activated to 30 minutes regulated ventilation
  every four hours or 15 minutes regulated ventilation every two hours
- Start-up delay on OFF, 45 or 120 seconds adjustable
- Slot for an optional module:
  - Radar-supported motion detector 5/BM
  - Radio module FM-EO with bidirectional wireless technology for integration
    of wireless sensors or wireless switches
- 230 V~50 Hz
- Power consumption from 1.8 to 6.2 W, free blowing
- Sound power level 20-35 dB (A), free blowing
- Filter change indicator on the front screen

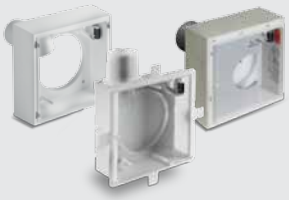
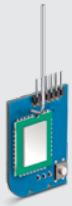
Comfort board 5/EC-FK

- All functions as in basic board 5/EC-ZI
- Stepless comfort-humidity-temperature control,
  airflow levels 0 - 60 m^3/h
- 230 V~50 Hz
- Power consumption from 1.8 to 6.2 W, free blowing
- Sound power level from 20 to 35 dB (A), free blowing
- Filter change indicator on the front screen

# of fan insert and clamp-in fan

› Fan insert and clamp-in fan

With the new modular system of the Silvento ec, ventilation functions and mounting conditions can be combined in the simplest manner:

Fan insert/ Clamp-in fan	Housing	Control Board	Additional Module (one slot available)
Fan insert V-EC 	3/UP-R, 3/UP-A, 3/AP, 3/UP-BR, 3/UP-BA 	Basic Board 5/EC-ZI  or Comfort Board 5/EC-FK 	Motion Detector 5/BM  or Wireless Module FM-EO 
Clamp-in fan KL-EC 	not required		

Use of the control boards

The control boards are integrated in the filter frame. They can easily be configured and, if necessary, replaced by taking off the design screen. There is a slot on both the basic board and the comfort board, which can be equipped with an additional module.

Exhaust Air Fans

Silvento series with surface-mounted housing 3/AP

› Silvento 3/AP

- Housing for surface-mounted assembly of UV resistant plastic
- Suitable for wall and ceiling installation
- With conical exhaust vent (DN 75 to DN 80) and leakageairtight backdraft shutter
- Mounting position of the back-mounted axial exhaust vent: top left, top right, bottom left or bottom right, adjustment of backdraft shutter to the mounting position by simply changing
- All fan inserts of the Silvento ec and AC series can be used
- Including mounting accessories and sound absorbers

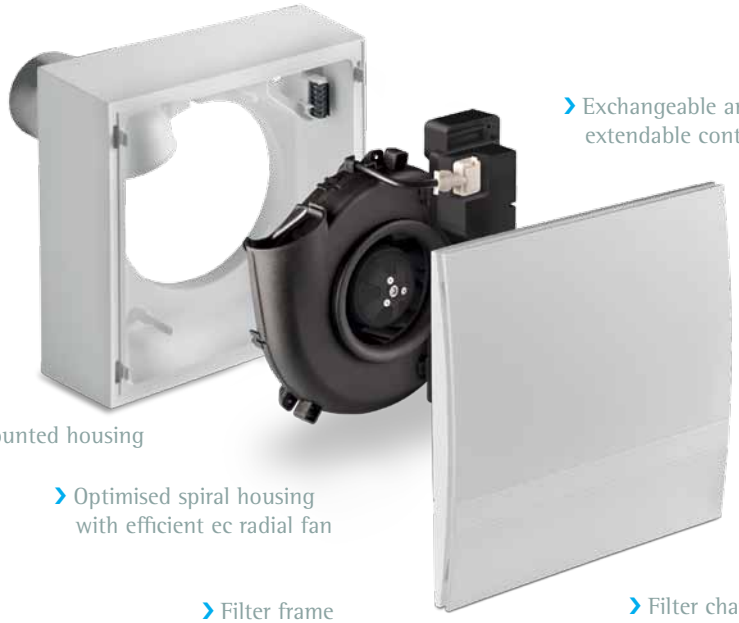
Silvento surface-mounted housing 3/AP

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

› Silvento with fire prevention 3/AP-B

- Housing for surface-mounted assembly of UV resistant plastic
- With shut-off device K90-18017, suitable for installation in eat-in kitchens, connection diameter DN 80, with leakage-airtight backdraft shutter
- Metallic axial exhaust vent
- Installation positions of the shut-off device related to the surface-mounted housing: top left, top right, bottom left or bottom right
- All fan inserts of the series Silvento ec and AC can be used
- Including mounting accessories and sound absorbers

› ear side exhaust vent with leakage-airtight backdraft shutter for kitchen fire protection



› Exchangeable and extendable control board

› Surface mounted housing

› Optimised spiral housing with efficient ec radial fan

› Filter frame with washable filter

› Filter change indicator

Exhaust Air Fans

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

› Silvento 3/UP-R

- Plastic flush-mounted housing with radial exhaust vent for installation in shafts and lightweight walls and in suspended ceilings (no requirements for fire resistance duration)
- With conical exhaust vent (DN 75 to DN 80) and leakage-airtight backdraft shutter
- Installation of the flush-mounted housing with exhaust vent possible to left, top or right, adjustment of backdraft shutter to installation position by simple repositioning
- All fan inserts of the series Silvento ec and AC can be used
- With plaster protection cap to protect against contamination during shell construction phase
- Installation depth 90.5 mm including assembly accessories and sound absorbers
- The LUNOS team will be pleased to inform you on demand about the possibilities of two-room systems

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

› Silvento with fire prevention 3/UP-BR

- Plastic flush-mounted housing with fire prevention casing for installation in shaft walls with requirements for fire resistance duration, exhaust vent radial
- With shut-off device K90-18017, suitable for installation in eat-in kitchens, connection diameter DN 80, with leakage-airtight backdraft shutter
- Metallic, radial exhaust vent
- Installation of the flush-mounted housing with exhaust vent possible to left, top or right, adjustment of backdraft shutter to installation position by turning the insert
- All fan inserts of the series Silvento ec and AC can be used
- With plaster protection cap to protect against contamination during shell construction phase
- Housing depth 102.5 mm including assembly accessories and sound absorbers
- The LUNOS team will be pleased to inform you on demand about the possibilities of two-room systems

Exhaust Air Fans

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

› Silvento 3/UP-A

- Plastic flush-mounted housing for installation in shaft and lightweight walls and in suspended ceilings (without requirements for fire resistance duration)
- With conical axial exhaust vent (DN 75 to DN 80) and leakage-airtight backdraft shutter
- Installation of the flush-mounted housing with exhaust vent possible to left top, right top, left bottom or right bottom, adjustment of backdraft shutter to installation position by simple repositioning
- All fan inserts of the series Silvento ec and AC can be used
- With plaster protection cap to protect against contamination during shell construction phase
- Installation depth 90.5 mm (without exhaust vent) including mounting accessories and sound absorbers
- The LUNOS team will be pleased to inform you on demand about the possibilities of two-room systems

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

› Silvento with fire prevention 3/UP-BA

- Plastic flush-mounted housing with fire prevention casing for installation in shaft walls with requirements for fire resistance duration, exhaust vent axial
- With shut-off device K90-18017, suitable for installation in eat-in kitchens, connection diameter DN 80, with leakage-airtight backdraft shutter
- Metallic, axial exhaust vent
- Installation of the flush-mounted housing with exhaust vent possible to left top, right top, left bottom or right bottom, adjustment of the backdraft shutter to the installation position by turning the insert
- All fan inserts of the series Silvento ec and AC can be used
- With plaster protection cap to protect against contamination during shell construction phase
- Housing depth 102.5 mm, with exhaust vent 187.5 mm including assembly accessories and sound absorbers
- The LUNOS team will be pleased to inform you on demand about the possibilities of two-room systems

Exhaust Air Fans

Silvento AC:

› Silvento V 30/60

The fan insert can be combined with a Silvento housing of your choice.

Step switching

- Nominal and/or base load operation possible
- Airflow levels switchable to 30/60 m^3/h
- 230 V AC 50 Hz
- Power consumption from 5.2 and 10.9 W, free blowing
- Sound power level* 24 und 35 dB(A), free blowing
- Filter change indicator in the front screen
- Regenerative filter as standard

F

fan insert and clamp-in fan

› Silvento KL 30/60

This one-room flush-mounted fan is suitable for quick installation in sanitary modules, light-weight walls and suspended ceilings. The clamping length can be up to 42 mm, higher clamping lengths on demand.

Step switching

- Nominal and/or base load operation possible
- Airflow levels switchable to 30/60 m^3/h
- 230 V AC 50 Hz
- Power consumption from 5.2 and 10.9 W, free blowing
- Sound power level* 24 und 35 dB(A), free blowing
- Filter change indicator in the front screen
- Regenerative filter as standard
- Also as replacement for the fan type Skalar-VG in the existing wall installation housings 3/LS or 3/LB (the required exhaust seal is supplied with the unit)

F

* Sound power level: The sound power level indicates the "loudness" of a device and is independent of the distance.

AB 30/60 – Axial Fan

Cost-efficient home ventilation

› Axial fan

› Outer grille with insect screen and façade protection ring

› Super-silent ventilator unit in sound-absorbing Basotect chassis

› Sound absorber for extra-quiet noise leve

› Three sound absorbers against

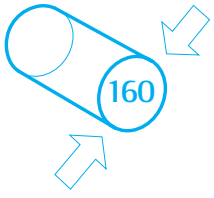
› Flow-optimised inner screen with washable G3 filter

› All 160 single-channel fans can be combined with the new inner screens of the 160 series

of the 160 series
with the AB 30/60

› Technical data AB 30/60

Airflow level	30/60 m³/h
Power consumption	1,5/4,9 W, free blowing
Motor type	ec for direct connection to AC voltage
Supply voltage/frequency	230 V/50 Hz
Sound power level*	28/45 dB, free blowing Standard sound level difference up to 46 dB
Fan	Ø 98 mm
Fan insert (including sound insulation)	Ø 155 mm
Minimum wall thickness	200 mm
Core hole drilling	Ø 162 mm
Size of inner screen	□ 180 x 35 mm
or sound insulation hood 9/IBS	□ 250 x 78 mm
Outer grille	180 mm, LUNOtherm, or outer hood
Protection class	IP44



State-of-the-art motor technology

The novel ec motor with integrated electronics allows direct connection to the power grid without any additional components. The airflow level can be selected between the two ventilation steps of 30 and 60 m³/h and switched via a customary two-rocker switch. Without much effort, the connecting cables can be directly connected to the fan. Necessary terminals and a protection hood are supplied.

Lowest noise levels: Axial fans can be so different

Axial fans are widely known for their loud noise level. However, thanks to computer-optimised fan blades in combination with a newly developed flow channel and lots of sound-insulating material the AB 30/60 is unexpectedly quiet and provides optimum sound protection from the outside.

Best performance for the environment

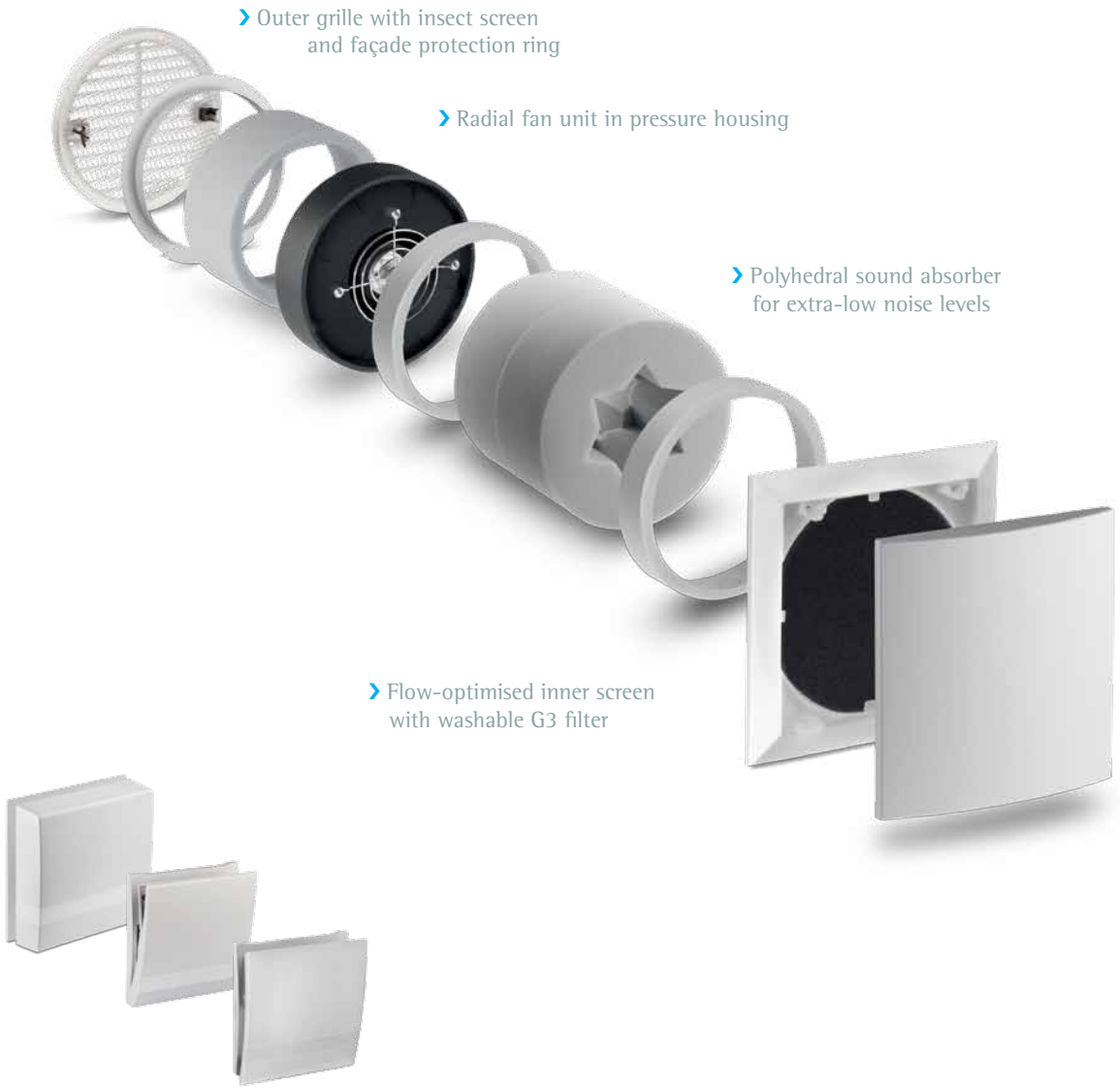
Thanks to its low power consumption the AB 30/60 is very energy-efficient, thus making an active contribution to environmental protection.

* Sound power level: The sound power level indicates the "loudness" of a device and is independent of the distance.

RA 15-60 – Radial Fan

The combination of pressure consistency

› The radial fan of the 160 series: RA 15-60

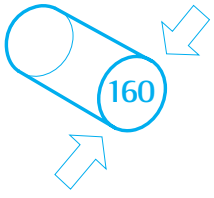


› All 160 single-channel fans can be combined with the new inner screens of the 160 series

of the 160 series
and renovation-friendliness

› Technical data RA 15-60

Airflow level	15/30/45/60 m³/h
Power consumption	0,6/1,3/3,5/7,2 W, free blowing
Motor type	ec motor for connection to 12 V control
Supply voltage	12 V DC SELV
Sound power level	19,5/31,5/36,0/40,5 dB, free blowing
Standard sound level difference	up to 46 dB
Fan insert (including sound insulation)	Ø 153 mm
Minimum wall thickness (reduced noise protection)	170 mm
Core hole drilling	Ø 162 mm
Size of inner screen	☐ 180 x 35 mm
or sound insulation hood 9/IBS:	☐ 250 x 78 mm
Outer grille	Ø 180 mm, LUNOtherm, or outer hood
Protection class	IP20



Exhaust air system or hybrid ventilation system: The RA 15-60 is suitable for many purposes

The radial fan for exhaust air rooms is an essential part of the growing 160 family. Like the AB 30/60, it is an exhaust air unit with an ec motor, which can also be combined with the LUNOtherm façade element or the outer hood.

By reason of the same design structure, the fans e², RA 15-60 and AB 30/60 are particularly suitable for hybrid ventilation, which combines ventilation with heat recovery and the exhaust air technology in a cost- and energy-efficient manner.

Lowest noise: Quiet with a high pressure build-up

Radial fans are already well known from the exhaust series of LUNOS. By using the 160 tube the benefits of the two types are linked: the silent and pressure-consistent operation of the radial fan combined with the renovation-friendly installation dimensions of the tube fan. Additionally, the aerodynamically optimised fan impeller in combination with the polyhedral sound absorbers of the RA 15-60 provide extra-low noise levels as well as optimum sound insulation from the outside.

State-of-the-art motor technology

The radial ec motor in conjunction with the pressure housing provide the RA 15-60 with an excellent good pressure curve. The airflow level can be set to three or four steps depending on the control program (15, 30, 45 and 60 m³/h).

Best performance for the environment

Thanks to its low power consumption the RA 15-60, too, is extremely energy-efficient, thus making an active contribution to environmental protection.

* Sound power level: The sound power level indicates the "loudness" of a device and is independent of the distance.

ALD & ALD-S

Fresh air supply

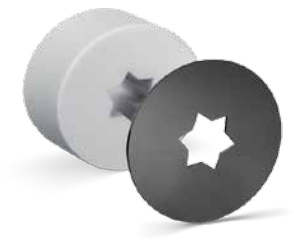
› Pleasant indoor climate in airtight buildings

The basis for a pleasant, healthy room climate is an adequate supply of fresh air without drafts. A cozy, pleasant feeling depends largely on the temperature and humidity content of the room air. The LUNOS ventilation system ensures this comfort by providing constant, intelligent air exchange.

Our houses are leak-proof. Whether modernised or newly built, there is very low leakage in the building envelope. Only with a leak-proof construction form is it possible to build energy-saving buildings such as the low-energy house (LEH) according to the EnEV.

However, a leak-proof building excludes ventilation via air leakage. This means that in about 20 % of all redeveloped apartments mould infestation has been registered due to insufficient ventilation, and this figure is rising.

› ALD: The wind pressure relief prevents draft



› ALD-S: The integrated sound absorber with sound reflector keeps traffic noise outside

› The modern design of the inner screen, optional glass screen 9/IBG

Outer Wall Air Vents
in each room

› Comfort thanks to noise protection

Urban and inter-urban traffic affect our living environment. Streets, railways or airports are built near residential areas in order to ensure convenient transport connections. In addition, the volume of traffic is steadily increasing. To provide a high level of residential comfort, noise protection measures must be integrated in the building, in the walls and windows as well as in the fresh air supply system. In this sector as well, air exchange is achieved without impairment to a pleasant and comfortable room climate by the excellent noise protection measures of the LUNOS ventilation system.

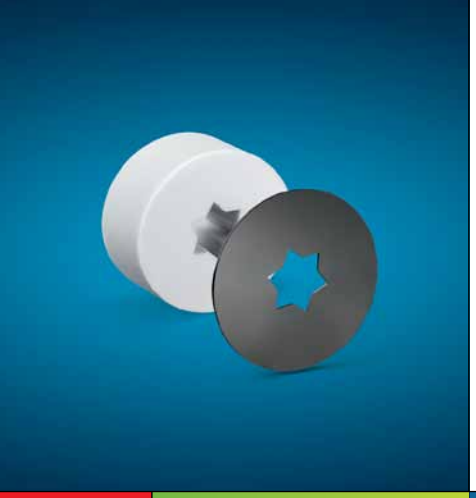
Calculation of the resultant sound reduction index of a composite outer wall pursuant to DIN 4109:

The outer wall is considered for the noise-related calculation. The building groups of outer wall, window and outer wall air vent are added up with regard to their area percentages and noise insulation features and form the resultant noise insulation index for the outer wall.

The calculation software is integrated in the LUNOS Design Tool and available under www.lunos.de. It enables fast calculation of the rooms in question.

› Washable filter

› Various outer grilles and outer hoods selectable



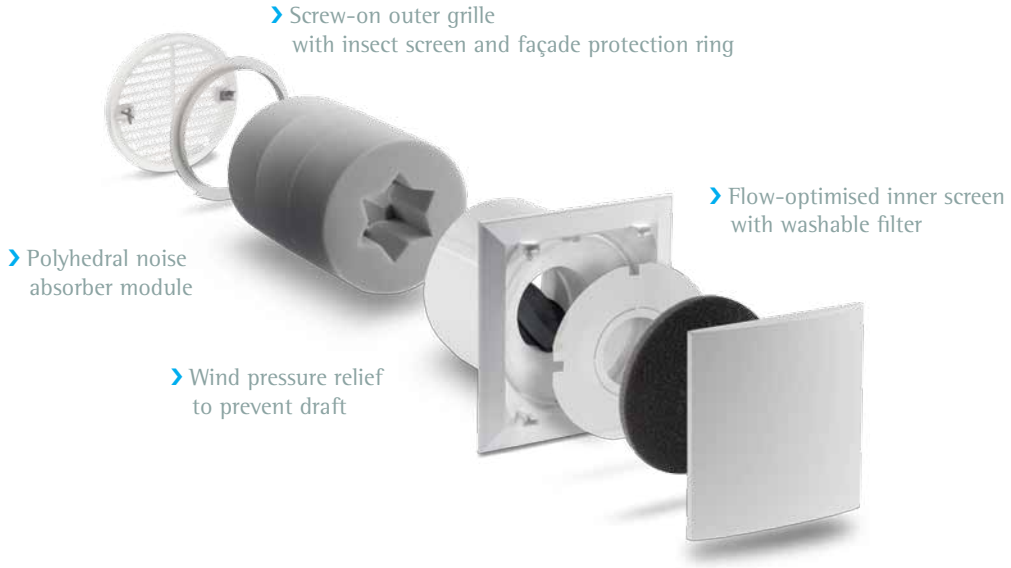
ALD Outer Wall

For renovation and new buildings – sound

NEW | ALD & ALD-S

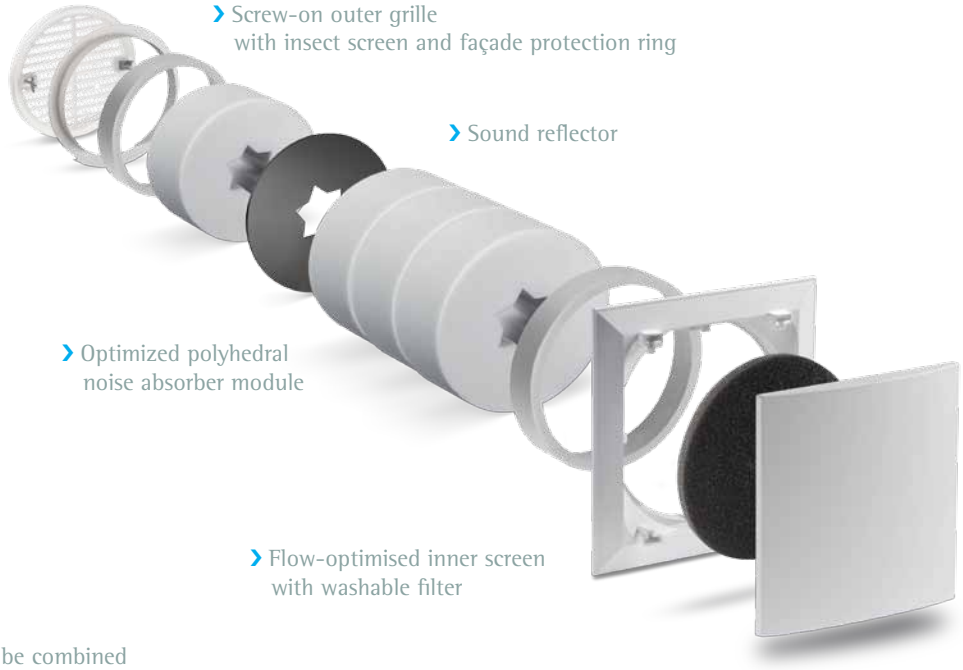
ALD

The ALD for all applications: Proven and efficient in the use in living rooms and bedrooms



ALD-S NEW

The ALD-S for high sound insulation requirements



› All 160 single-channel fans can be combined with the new inner screens of the 160 series

Air Vents

optimised and weatherproof

› Technical data ALD

Length built-in device:	360 mm	
Ø:	154 mm	
V̇:	at 8 Pa	at 4 Pa
⊠	25 m³/h	18 m³/h
◯	20 m³/h	13,5 m³/h
◎	15 m³/h	10 m³/h

Sound insulation		
$D_{n,W,open}$	wall thickness	add. noise absorber
50 - 52 dB	360 mm	-
53 - 57 dB	500 mm	+2

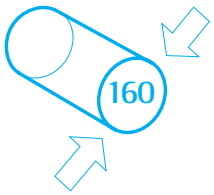
› Technical data ALD-S

Length built-in device:	360 mm	
Ø:	154 mm	
V̇:	at 8 Pa	at 4 Pa
	15 m³/h	10 m³/h

Sound insulation		
$D_{n,W,open}$	wall thickness	add. noise absorber
53 - 58 dB	360 mm	-
62 - 64 dB	500 mm	+2

The sound insulation values apply at the above airflow levels with a wall-tube completely filled with sound absorbers.

› Due to the airflow reduction screen the air volume can be adjusted to individual requirements.



The ALD with weather protection grille for renovation and new buildings

Since its development in 2002, the ALD has been one of the best-selling outer wall air vents of LUNOS. 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 renovation where the ALD was installed subsequently by core drilling.

ALD & ALD-S

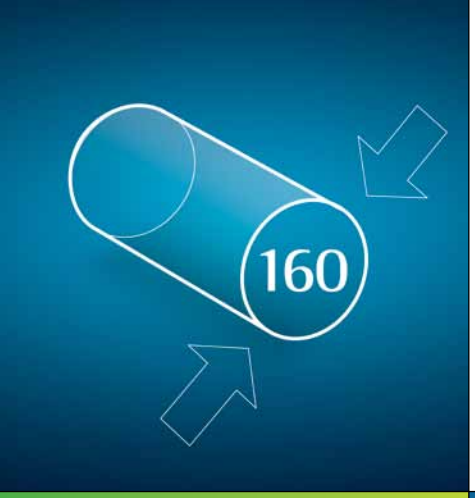
In the development of the ALD-S special emphasis was placed on sound insulation in order to significantly exceed the already excellent reference of the ALD. Of course, both ALDs remain compatible with each other, so that exchange continues to be easily possible. The basis of these fans is the 160 wall-tube, which also allows the combination with the LUNOtherm façade element.

The ALD-S with sound reflector

The excellent sound insulation values of the ALD-S could only be achieved by using several methods. We succeeded in optimising the shape and size of the sound absorbers. A further improvement was due to the high efficiency of the new sound reflector. Thanks to these measures, the ALD-S achieves the particularly high Dn,W values of 53 and 61 dB with wall thicknesses of 36 cm and 50 cm.

Two ALDs for all areas of application

The ALD is equipped for all fields of application.
By means of its reduction screen, three airflow levels can be set: 15, 20 and 25 m³/h. The ALD is thus able to provide ideal and comfortable ventilation of varying room sizes with different air requirements. The ALD-S is the first choice for particularly high sound insulation requirements.



The 160 Series

A variety of combination options for

› The 160 series of LUNOS

Decentralized ventilation depends on the versatility of its components. If the system components are interchangeable by the use of a standardised installation housing, the variety of combinations will be limitless. The LUNOS 160 wall-tube provides a platform which simplifies ventilation planning and eases installation on site. LUNOS provides the appropriate 160 fan for virtually any ventilation scenario.

Configuration of the 160 series

A complete fan of the 160 series consists of four components: Built-in device, wall-tube, inner screen and external closure. One product needs to be chosen for each of the four components, so that the selection is complete. As external grille also the LUNOtherm façade element can be selected. The e^{go} is an exception, since it is always supplied with inner screen. In addition, the e^{go} has to be equipped with a specially developed two-way outer screen.

LUNOtherm

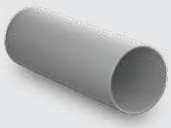
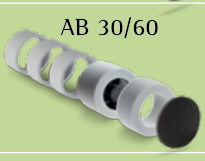
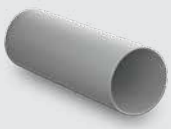
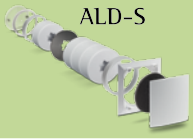
As external grille also the LUNOtherm façade element can be selected, which is available in four basic types and many wall thicknesses for different insulation thicknesses and thermal insulation systems, see also pages 56-57:

› LUNOtherm A

› LUNOtherm B

decentralised ventilation technology

› Configuration table

1. Built-in device	2. Wall-tube	3. Inner screen	4. External closure or LUNOtherm
e²neo A+ 	9-R 160-500 length 500 mm 	9/IBE 	Plastic, round 1/WE 180, 1/RE 180, 1/BE 180 
e² A 		9/IBK 	Metal, round 1/RME 175, 1/RMK 175 
e² short A 			Metal, angular 1/QME 228, 1/QMK 228 
RA 15-60 		9/IBG 	Sanded, for plastering 
AB 30/60 	9-R 160-700 length 700 mm 		
ALD 		9/IBS 	Outer hood, metal 1/HWE, 1/HAZ 
ALD-S 			
e^go A  Two-way external closures required		Two-way screen 2/EGI (included in delivery of e^go) 	Outer two-way hood, metal 1/HWE-2 1/HAZ-2  Outer two-way screen, plastic 1/EGA 

Home Ventilation with

Ne^{xx}t, the evolution

The LUNOS Ne^{xx}t – all features at the highest level

The Ne^{xx}t is a decentralized heat recovery unit, which combines the advantages of centralized and decentralized ventilation and, at the same time, one of the quietest units that currently exist in this class. From now on, several rooms can be operated with only one device. The Ne^{xx}t achieves a heat recovery rate of up to 90 %. The heat transfer is effected by a crossflow heat exchanger or, optionally, by a counterflow heat exchanger. The power consumption starts from 5 watts and airflow levels of more than 90 m³/h can be achieved.

The Ne^{xx}t is topped off by a completely new operating concept. Placed behind an elegant screen, the control, when operated, provides a clear but subtle feedback by backlighting. By default, the Ne^{xx}t is controlled via humidity or temperature sensors. It is installed directly in the outer wall. Both a surface-mounted and a flush-mounted version are available. The well-known 160 wall-tube is used for the duct to the outside.

Heat Recovery

in the decentralised system

QUIET

› Low noise level thanks to ec technology

While the well-known e² with its axial ec technology has already achieved top ratings, the radial ec motors of the Ne^{xx}t are convincing all along the line. Nestled in a flow-optimised EPP chassis, the ec motors, which are already very quiet, are virtually "silenced". Thereby, the Nexxt is currently one of the quietest units in its class.

ECO-FRIENDLY

› Efficiency

Thanks to its very low power consumption, the Ne^{xx}t is very energy-efficient, thus making an active contribution to environmental protection. The highly efficient ec technology enables a low power consumption.

INNOVATIVE

› Heat recovery & control technology

The key component of the Ne^{xx}t is the built-in device with heat exchanger, which is available in two versions:

NXT-K: The crossflow heat exchanger achieves heat recovery levels of up to 80 %.

NXT-G: The bigger counterflow heat exchanger has a significantly higher efficiency providing a heat recovery level of up to 90 %.

The integrated control provides for perfect interaction of the various components. Equipped with humidity-temperature sensors, even the standard version of the automatic control ensures efficient ventilation with humidity protection. Optional sensors such as, for example, the CO_2 sensor can be integrated or connected by the bidirectional radio technology.

SLIM

› LUNOS design line

The Ne^{xx}t adds the waveform to the current design language of LUNOS products while maintaining its basic principles and recognition value. With an inner screen size of 510 x 510 mm, the fan thus remains a stylish element of home technology. The front screen also contains the plainly designed control panel. The total depth of 240 mm can be lowered up to 67 mm into the outer wall.

COMPATIBLE

› LUNOS compatibility

By using the 160 LUNOS standard wall-tube as wall duct, the Ne^{xx}t is compatible with the fans of the 160 series. Only for the outer covering a two-way outer screen or outer hood must be used. In the surface-mounted version, it is particularly easy to replace a 160 fan by the Ne^{xx}t.

UNIVERSAL

› The Ne^{xx}t-housings can be used universally

Developed for the outer wall, the fan can be installed in the surface-mounted or flush-mounted version. The flush-mounted version requires a wall thickness of at least 240 mm.

Tested according to EN 13141-8
Conforming to standards: All device data of the ErP product data sheet and the energy labels have been determined according to EN 13141-8

DESIGN AWARD 2016 · PLUS X AWARD honoured as: BEST PRODUCT 2016/2017 · PLUS X AWARD 2016 achieved for: Innovation, High Quality, Design, Functionality, Ecology · INDUSTRIE PREIS 2016 BEST OF · GERMAN DESIGN AWARD SPECIAL 2017

Ne^{xx}t
A modular system for

› Functions

In both versions of the built-in device, the Ne^{xx}t is equipped as standard with humidity-temperature sensors both on the supply air and the exhaust air side. Thereby, the rooms are always ventilated automatically and in accordance with the respective requirements. Manual intervention is not necessary. For additional sensors and the radio module 5/FM there are slots available on the control board. The Ne^{xx}t can be integrated into a bidirectional wireless network via the radio module and thus receive information from external sensors. In addition, a WiFi module will be available by which the Ne^{xx}t can be remotely controlled via WLAN. There are two inner screens for the operation of the Ne^{xx}t available for your selection. They are equipped with the following functions:

- Airflow levels adjustable: Ne^{xx}t K 0-110 m³/h and Ne^{xx}t G 0-90 m³/h
- Automatic: Activation of the humidity-temperature control
- Summer mode: The humidity-temperature control automatically switches the fan down to a lower step
- Anti-freeze function: The airflow level is reduced to prevent freezing of the heat exchanger
- Filter change indicator

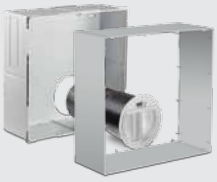
	Ne^{xx}t K	Ne^{xx}t G
Average thermal efficiency level*	62 %	84 %
Air flow	15-110 m³/h (stagelessly adjustable)	15-90 m³/h (stagelessly adjustable)
Power consumption**	22 Watt	20 Watt
Supply voltage	230 V / 50 Hz 115 V / 60 Hz US version (available on request)	230 V / 50 Hz 115 V / 60 Hz US version (available on request)
Sound power level**	40 dB(A)	39 dB(A)
Core hole drilling	162 mm	
Minimum wall thickness (surface mounting/flush mounting)	110 mm / 280 mm	
Depth in wall installation	172 mm housing + 105 mm flap closure in wall duct	
Cutout installation housing	mind. 482 mm x 482 mm	
Dimensions of the unit	480 mm x 480 mm x 170 mm	
Size of the inner screen	510 mm x 510 mm x 66 mm	
Size of the outer hood	235 mm x 205 mm x 72 mm	
Energy efficiency class	A	

* according to EN 13141-8
** at 70 % of the maximum airflow volume, according to ErP Directive EU Regulation 1254, measured with M5 filters.

the perfect fan

› Configuration Ne^{xx}t

The modular system of the Ne^{xx}t enables easy combination of the various components with the two built-in devices. Five components are required to complete one fan. One product needs to be chosen for each component, so that the selection is complete:

Built-in device	Housing	Wall-tube + adapter *	Inner screen	External closure
Built-in device NXT-G 	Built-in housing without surface mounting set: 3/NXT  or	500 mm length: 9/R 160-500  Adapter 2/AD 160  or	With membrane keyboard: 9/NXT-IBF 	Two-way outer screen: 1/EGA  or
Built-in device NXT-K 	Built-in housing with surface mounting set: 3/NXT + 3/NXT-AP 	700 mm length: 9/R 160-700  Adapter 2/AD 160 		Two-way outer hood: White 1/HWE-2 Anthracite 1/HAZ-2 

* An adapter is required per each 10 cm wall-tube or part thereof

Electric flap closure

The electric flap closure 9/KVEN-2 for the Ne^{xx}t based on the 160 pipe is available as an option. It can be used to close the wall duct automatically if required.

e²neo

Home Ventilation with e²neo

The e²neo – the reference in reverse technology

LUNOS works according to the principle of continuous improvement - this is how the e² was revolutionised: the new e²neo works from an extremely quiet operation of 5 m³/h. This was made possible by a the development of a new motor with a significantly reduced operating noise, which can be controlled even more finely.

Therefore, the e²neo is not only quieter than the successful e² generation, but also more efficient. The approved and reliable effectiveness of the e² has, of course, been retained.

› All 160 fans of the e² family can be combined with the new inner screens of the 160 series

Heat Recovery

from the e² family

Reverse technology: The heat recovery of the e² family for residential rooms

All fans of the e² family work according to the method of regenerative heat exchange. In reversing operation, a storage element charges up with thermal energy similar to a rechargeable battery and transfers the heat to the incoming outside air. e² fans are preferably used in living rooms. There are always two devices running in paired operation, so that an even number of fans needs to be installed for the e²s to function properly.

QUIET

› New ec technology and motor control

The new EC motor of the e²neo has been tuned even more finely to reverse technology requirements. The result is an even more precise control of the ventilation steps and an optimised change of air direction. The revised fan blades enable even lower running noises.

ECO-FRIENDY

› Efficiency

With the lower power consumption of its new ec motor, the e²neo has a particularly high efficiency thus ensuring significant energy savings in the heat supply. The e²neo thus achieves energy efficiency class A according to the ERP directive.

INNOVATIVE

› Heat recovery

The compact heat store made of a ceramic composite material provides a heat provision level of more than 80 %.

SLIM

› Small dimensions

In its class, the e²neo is among the world's smallest fans in decentralised home ventilation with heat recovery. The small, flat inner screens have approximately the size of a CD.

COMPATIBLE

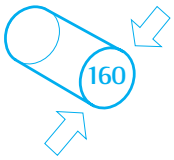
› Compatibility with other devices

If a LUNOS ventilation system has already been installed, an existing fan of the 160 series can be replaced by the e²neo. This is possible by the use of the same wall duct.

UNIVERSAL

› Versatile installation options

All fans of the e² family can be used in new buildings as well as in modernisation work. In new buildings they are placed between the bricks by use of a wall installation housing. In modernisation work they are installed by means of a 162 mm core hole drilling. The wall must to be at least 300 mm thick.

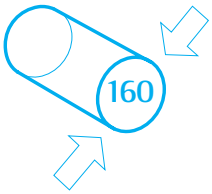


Home Ventilation with

e², e²short & e²mini

e²

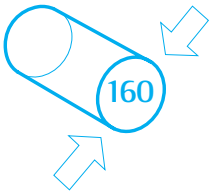
The classic one: proven and efficient for use in living rooms and bedrooms.



A

e²short

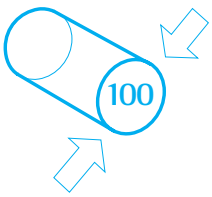
The short one: for narrow outer walls from 200 mm wall thickness



A

e²mini

The small one: for confined space conditions, from 167 mm to maximum 300 mm wall thickness



A

Heat Recovery

from the e² family

The classics of the e² family, three fans for all application purposes

No fan has characterised decentralised ventilation with heat recovery as strongly as the LUNOS e². It is universally applicable and can be used even for high sound protection requirements. The e²short and e²mini were developed for an even more flexible application range of the e² family. Thanks to these two fans even very narrow walls can be equipped with efficient ventilation devices.

QUIET

› Low noise level thanks to ec technology

Highly efficient motors with the state-of-the-art ec-technology combined with flow-optimised and specially balanced fans have eliminated nearly all running noises. The result is a low self-noise level.

ECO-FRIENDLY

› Efficiency

Due to their very low power consumption, e², e²short and e²mini are particularly energy-efficient. The units thus achieve very good energy efficiency classes.

INNOVATIVE

› Heat recovery

The units of the e² family have a very low energy consumption. Using state-of-the-art production methods, LUNOS succeeded in developing a compact heat store of a ceramic composite material, which provides a heat recovery rate of up to 90 %.

SLIM

› Small dimensions

The e²mini belongs to the smallest decentralised fans in the field of home ventilation with heat recovery. The 160 fans e² and e²short are extremely compact in their class and convince by their small dimensions.

COMPATIBLE

› Compatibility with other devices

If a LUNOS ventilation system has already been installed, an existing fan of the 160 series can be replaced by the e²neo, e² and e²short. This is possible by the use of the same wall duct.

UNIVERSAL

› Versatile installation options

In new buildings as well as modernisation work, all fans of the e² family can be used.
In new buildings they are placed between the bricks by use of a wall installation housing. In modernisation work they are installed by means of a 162 mm or 100 mm (e²mini) core hole drilling.

Home Ventilation with

Technical data

› Characteristics		e²neo A+
QUIET	Measuring surface sound pressure level* (Sound power level)**	From 11 dB (38 dB)
ECO-FRIENDLY	Power consumption	From 0,3 W
INNOVATIVE	Average thermal efficiency level	Heat provision level according to scavenging air procedure: 82,6 %
SLIM	Dimensions	Fan size: Ø 154 x 243 mm
COMPATIBLE	Compatibility with other devices	All 160 systems incl. LUNOtherm and outer hoods as external closure
UNIVERSAL	Versatile installation options	Usable in new buildings and modernisation work, wall thickness from 280 mm

Definitions for sound:
* Measuring surface sound pressure level: indicates how high the sound pressure level is on a measurement surface (hemisphere) around the inner screen of a fan in 1 m distance. The higher the value, the louder is the unit. This value cannot be measured directly, it is a calculated value.
** Sound power level: At 70 % of the maximum airflow according to (EU 1253/1254/2014). The sound power level indicates the "loudness" of a device and is independent of the distance.

Heat Recovery

of the e² family

e² A	e²short A	e²mini A
From 17 dB (40 dB)	From 17 dB (40 dB)	From 18 dB (40 dB)
From 1,4 W	From 1,0 W	From 0,6 W
Heat provision level according to scavenging air procedure: 90,6 %	Heat provision level according to scavenging air procedure: 82.7 %	Heat provision level according to scavenging air procedure: 74.4 %
Fan size: Ø 154 x 243 mm	Fan size: Ø 154 x 168 mm	Fan size: Ø 98 x 160 mm
All 160 systems incl. LUNOtherm and outer hoods as external closure	All 160 systems incl. LUNOtherm and outer hoods as external closure	Compatible with wall-tubes with an inside diameter of 100 mm
Usable in new buildings and modernisation work, wall thickness from 280 mm	Usable in new buildings and modernisation work, wall thickness from 200 mm	Usable in new buildings and modernisation work, wall thickness from 167 mm to max. 300 mm

Home Ventilation with

e^go: Ventilation

The e^go – reverse technology for exhaust air rooms

LUNOS developed the e^go for optimum ventilation with heat recovery in bathrooms, WCs and kitchens.

Paired operation is not required, because in an e^go two small fans provide air supply and exhaust air with heat recovery at the same time.

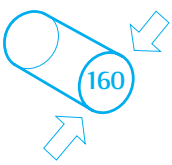
› Weatherproof outer screen with separate airflows and insect screen

› Highly efficient ceramic heat store with a heat provision level of 81.4 %

› Quiet fan units in counterflow arrangement for simultaneous supply and exhaust ventilation

› Flow-optimised inner screen with separate supply and exhaust air vents and washable G3 or pollen filter

› On the façade side combinable with the new two-way outer hoods



A

Heat Recovery

in functional rooms

Function of the reverse technology in exhaust air rooms

Like the all fans of the e^2 family, the e^{go} uses the principle of regenerative heat exchange. However, the ego uses two fans operating in opposite direction so that supply and exhaust air are moved at the same time. A second device is not required for operation. Additionally, the system can be switched to an exhaust mode in which an airflow level of 45 m^3/h is removed to quickly allow fresh air to flow into a room.

QUIET	**› Low noise level thanks to ec technology** Highly efficient ec motors with flow-optimised fans ensure low running noises. This results in low sound values. Indication of the enveloping surface sound pressure level* (sound power level)**	From 17 dB (47 dB)
ECO-FRIENDLY	**› Efficiency** The very low power consumption ensures high energy-efficiency. The e^{go} thus achieves the energy efficiency class B.	From 1,0 W
INNOVATIVE	**› Heat recovery** The compact heat store made of a ceramic composite material with an extraordinary honeycomb structure provides a high thermal efficiency.	Heat provision level according to scavenging air procedure: 81.4 %
SLIM	**› Small dimensions** The e^{go} belongs to the worldwide smallest fans in home ventilation with heat recovery in the class of two-way devices.	Fan size: Ø 154 x 300 mm
COMPATIBLE	**› Compatibility with other devices** If a LUNOS ventilation system has already been installed, an existing fan of the 160 series can possibly be replaced by the e^{go}.	Only when using e^{go} inner screens and two-way outer screens
UNIVERSAL	**› Versatile installation options** The e^{go} can be used in new buildings as well as in modernisation work. In new buildings it is placed between the bricks using a wall installation housing. In modernisation work it is installed by means of a 162 mm core hole drilling - minimum wall thickness: 300 mm.	Usable in new buildings and modernisation work, wall thickness from 300 mm

Definitions for sound:
* Measuring surface sound pressure level: indicates how high the sound pressure level is on a measurement surface (hemisphere) around the inner screen of a fan in 1 m distance. The higher the value, the louder is the unit. This value cannot be measured directly, it is a calculated value.
** Sound power level: At 70 % of the maximum airflow according to (EU 1253/1254/2014). The sound power level indicates the "loudness" of a device and is independent of the distance.

LUNOS Façade Elements

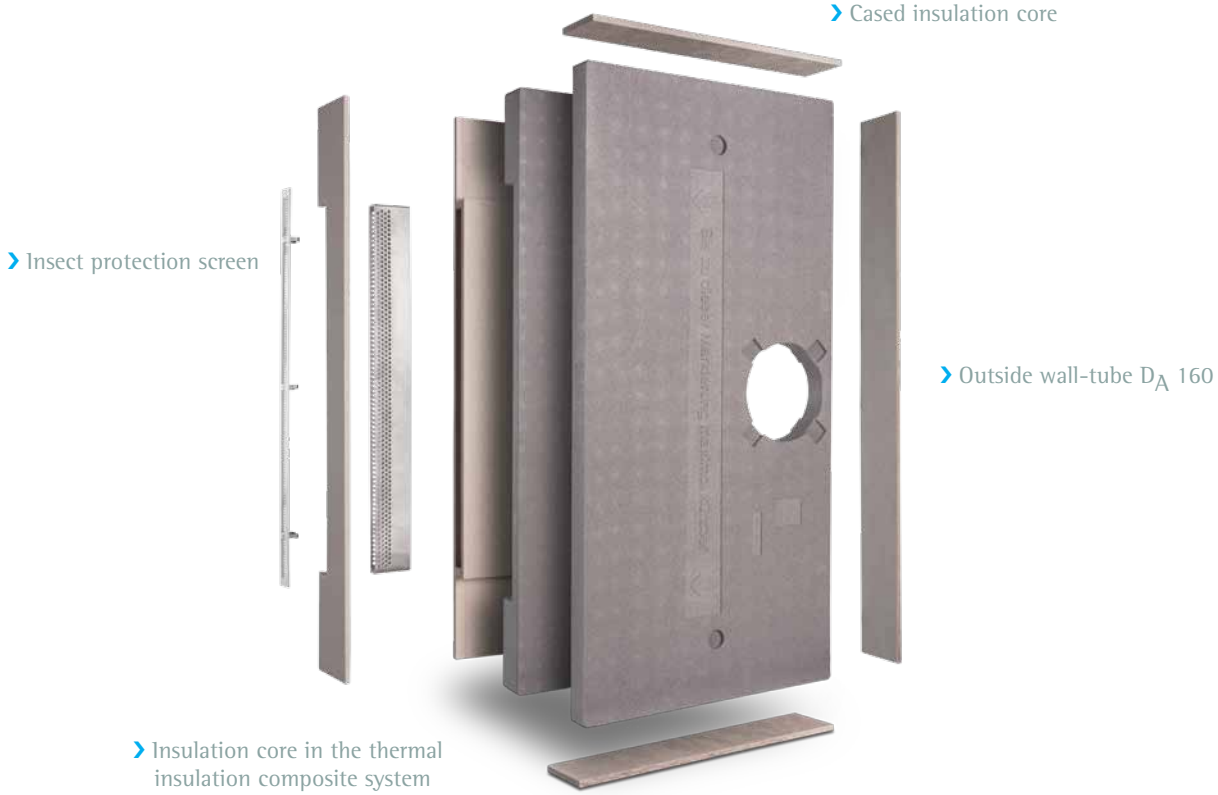
The Fans of the 160 series with LUNOtherm:

160 Series with LUNOtherm

› The 160 series for modernisation work and new buildings with LUNOtherm and LUNOtherm FS

Fan grilles on the outer wall are often considered to be undesirable elements in the outward appearance. By using the LUNOtherm façade element, the supply vent disappears from the wall surface. The use of the LUNOtherm enables an unrestricted façade design. All benefits of the LUNOS 160 ventilation units, such as high air throughput, hygiene and noise protection can be combined with a façade without undesirable fan grilles.

For this purpose, the LUNO-therm as a closing element of the 160 series is integrated in the insulation layer of the thermal insulation composite system. The air vent is then located in the window lintel, in the window reveal or under the window. The installation can be done above, to the side or under the window, so that it can also be easily combined with a roller shutter casing.



– LUNOtherm

your building project decides

› Characteristics

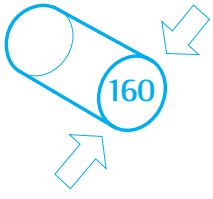
The LUNOtherm A60 can also be fitted easily into the brickwork of new buildings by providing a respective recess in the brickwork.

Due to the very low thermal conductivity of the sealing core of the LUNOtherm of = 0,030 W/mK, the reduction of the thermal insulation layer in the area of the ventilation gap is compensated.

The LUNOtherm can be processed using a variety of façade elements: thin or thick layered plaster systems, rear-ventilated façades or also with brickwork facings.

The outer grille can be selected accordingly – depending on the façade colour. It can be painted and thus perfectly integrated.

The LUNOtherm is supplied in insulating material thickness. It is processed by the façade builder in the same way as an insulating board of the exterior thermal insulation composite system (ETICS). Detailed assembly instructions are provided on request. Since the LUNOtherm is installed in the fire flashover section, compliant suitability within the building approval of DIBt was tested. The LUNOtherm A can be installed in a non-combustible ETICS with a fire behaviour of the classes A1 or A2-5 pursuant to DIN-EN 13501-1 and the LUNOtherm B in flame-resistant ETICS pursuant to DIN 4102-1 B1 up to an insulating thickness of 300 mm.



› Options

160 series with LUNOtherm A
Application in non-combustible ETICS.
Insulating thickness: 60 –300 mm
W x H: 980 x 490 mm

160 series with LUNOtherm A FS
Application in non-combustible ETICS.
For mounting below the window.
Insulating thickness: 60 –300 mm
W x H: 980 x 505 mm

160 series with LUNOtherm B
Application in flame-resistant ETICS.
The sealing core is protected by a mineral casing.
Insulating thickness: 60 –300 mm
W x H: 1000 x 500 mm

160 series with LUNOtherm B FS
Application in flame-resistant ETICS.
The insulation core is protected by a mineral casing.
For mounting below the window.
Insulating thickness: 60 –300 mm
W x H: 1000 x 515 mm

Ventilation Control

Smart Comfort and universal control

NEW

Smart Comfort

› The new Smart Comfort for the e^2 family, e^{go} and RA 15-60

Ventilation at the push of a button - exactly as required. The Smart Comfort control is particularly easy to operate. Developed further on the basis of the universal control, the different ventilation modes can now be set directly at the touch of a button. This includes, of course, also the humidity-temperature mode, which is recommended for continuous operation.

In this ventilation mode, the ventilation system works particularly efficiently and keeps the room climate at an optimum level.
The Smart Comfort can control all 12 Volt fans from LUNOS. The connected fan type and the desired function can be set. See page 61 for an excerpt from the variety of settings.

Functions

- With humidity-temperature sensor and filter change indicator
- Four different lower limits of the humidity range can be set
- Automatic humidity control, intensive ventilation, night reduction and summer ventilation can be set
- Functions for humidity and frost protection
- 0-10 V input for connection to the Touch Air Comfort control
- Fan type and functions of the devices connected can be set
- Up to ten e^2, five e^{go} or two RA 15-60 can be switched via one control
- Suitable for installation in a 60 mm deep switchbox

Power supply options for Smart Comfort and universal control

Smart Comfort and universal control are operated via a 12 V power supply unit. Three power packs are available for this purpose:

When using the 18 W power pack, type 5/NT 18, you can connect a maximum of three e^{go} or six e^2 (three pairs) or one RA 15-60 to a control. When using the 60 W power pack, type 5/NT 60, you can connect a maximum of five e^{go} or ten e^2 (five pairs) or two RA 15-60 to a control. When using a 100 W power pack, type 5/NT 100, you connect the fan devices to at least two Smart Comfort-/universal controls, e.g. two controls with ten e^2 (5 pairs) each or five e^{go}.

Accessories

- Power pack 5/NT 18 with 18 W
- Power pack 5/NT 60 with 60 W
- Power pack 5/NT 100 with 100 W

› Ventilation modes

The different ventilation modes are selected directly on the control via the push buttons that are marked accordingly.
There are four different modes to choose from.

Systems

with humidity and temperature sensors

› The universal control 5/UNI-FT for the e^2 family, e^{go} and RA 15-60

By use of the universal control 5/UNI-FT everything can be controlled automatically. It is equipped with the humidity control mode and delay timer as standard and can also be switched to the summer mode. Optionally, wireless sensors and switches can be connected via the attachable radio module UNI-EO.

The universal control is a multifunctional 12 Volt control operated via a simple two-pole series switch. The fan type connected and the desired function have to be set. Various programs can be selected for each fan type. An overview of the programs and respective modifications is provided on page 61.

Functions

- With humidity-temperature sensor and filter change indicator
- Three different humidity ranges can be set
- Manual control via series switch (3 step)
- 0-10 V input for connection to the Touch Air Comfort control
- Integrated delay time with interval operation
- Radio module connectable
- Fan type and functions of the devices connected can be set via code switch
- Up to ten e^2, five e^{go} or two RA 15-60 can be switched via one control
- Suitable for installation in a deep 60 switchbox and for assembly in a switch cabinet

Accessories

- Power pack 5/NT 18 with 18 W
- Power pack 5/NT 60 with 60 W
- Power pack 5/NT 100 with 100 W
- Switch 5/W2U for control of up to four ventilation steps and/or setting to summer ventilation
- Radio module UNI-EO

› Humidity-temperature control, delay timer and interval control

The settings for the various ventilation modes can be made directly on the control via DIP switches. There are various settings for delay time and interval control as well as three ranges of humidity control available for selection.

LUNOS Ventilation

Touch Air Comfort,

› The Touch Air Comfort (TAC)

This control is the multi-talent from LUNOS. Both the 12 V fans of the 160 series and the Silvento ec can be connected directly. Alternatively, almost any number of fans can be connected via universal controls, which can be operated via the TAC. Additionally, LUNOS 230 V fans can also be easily connected using the additional module 5/ACM.

The TAC can be configured for various fan scenarios. It proves to be an energy-efficient combination artist: Either different fans, the 230 V module 5/ACM for Silvento AC or individual universal controls are connected to the three outlets of the control.

The integrated power pack is absolutely sufficient for e.g. a three-room apartment where four e^2 in the living rooms and one Silvento ec in the bathroom can be controlled. If more fans are required to supply larger apartments or single-family homes, the Touch Air Comfort can regulate several universal controls. Numerous universal controls can be connected to each outlet of the TAC control. In this way, almost any number of fans can be controlled via one Touch Air Comfort.

Functions/features

- E-Ink display for lowest power consumption
- Integrated humidity/temperature sensor
- CO_2 module SCO_2-TAC can be connected
- Direct operation of up to four e^2 or two e^{go} or one RA 15-60
- Silvento ec fans can be directly connected and controlled via the low volt input
- All Silvento AC fans and AB 30/60 can be connected via the additional 5/ACM
- Further devices can be controlled via connected universal controls
- Comfort functions such as night reduction and summer ventilation
- Functions for humidity and frost protection
- USB interface for export of recorded ventilation data, software-updates and language options
- Dimensions: (W x H x D) 97 x 155 x 20 mm (wall installation)
- Incl. deep electronic-box, horizontal installation, dimensions: (W x H x D) 143 x 70 x 75 mm

LUNOS service

If you have a design made by LUNOS, you will receive the individual configuration codes of the TACs of your building projects. Alternatively, the code can be generated on www.lunos.de.

Control Systems

multiple combination options of LUNOS controls

› Combination options of Smart Comfort and universal control

Fan type	5/SC-FT Fan selection	Functional description	5/UNI-FT Coding switch setting	Functional description
RA 15-60	Display ●●●●	OFF, four-step 15/30/45/60 m^3/h and special functions	0	OFF, three-step 15/30/45/60 m^3/h
e^2/e^2neo	Display ●ooo	OFF, four-step 15/20/30/38 m^3/h and special functions	3	OFF, three-step 15/30/38 m^3/h, summer ventilation
e^2neo	Display o●oo	OFF, four-step 5/15/30/38 m^3/h and special functions	6	vierstufig 5/15/30/38 m^3/h, summer ventilation
e^2short	Display oo●o	OFF, four-step 15/20/30/38 m^3/h and special functions	7	OFF, three-step 15/30/38 m^3/h, summer ventilation
e^2mini	Display ooo●	OFF, four-step 5/10/15/20 m^3/h and special functions	8	OFF, three-step 5/10/20 m^3/h, summer ventilation
e^{go}	Display ●●●o	OFF, three-step 5/10/20/45 m^3/h and special functions	B	three-step 5/10/20 m^3/h, exhaust air 45 m^3/h, summer ventilation

› Connection options of the TAC control

	Outlets Comfort Control		
	S1	S2	S3
Heat recovery	Direct 2 x e^2	Direct 2 x e^2 (1 pair)	1 x universal control 1 x power pack max. 60 W max. 5 x e^{go}
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^{go} (Group 1)	1 x universal control 1 x power pack max. 60 W max. 5 pairs e^2 (Group 2)
Heat recovery and exhaust air	Direct 1 x Silvento ec	1 x universal control 1 x power pack max. 60 W max. 5 x e^{go} (Group 1)	1 x universal control 1 x power pack max. 60 W max. 5 pairs e^2 (Group 2)
Heat recovery and exhaust air	1 x additional module with: 1 x Silvento 30/60 or 1 x AB 30/60	1 x universal control 1 x power pack max. 60 W max. 5 x e^{go} (Group 1)	1 x universal control 1 x power pack max. 60 W max. 5 pairs e^2 (Group 2)

LUNOS Ventilation

with bidirectional

NEW

Radio technology

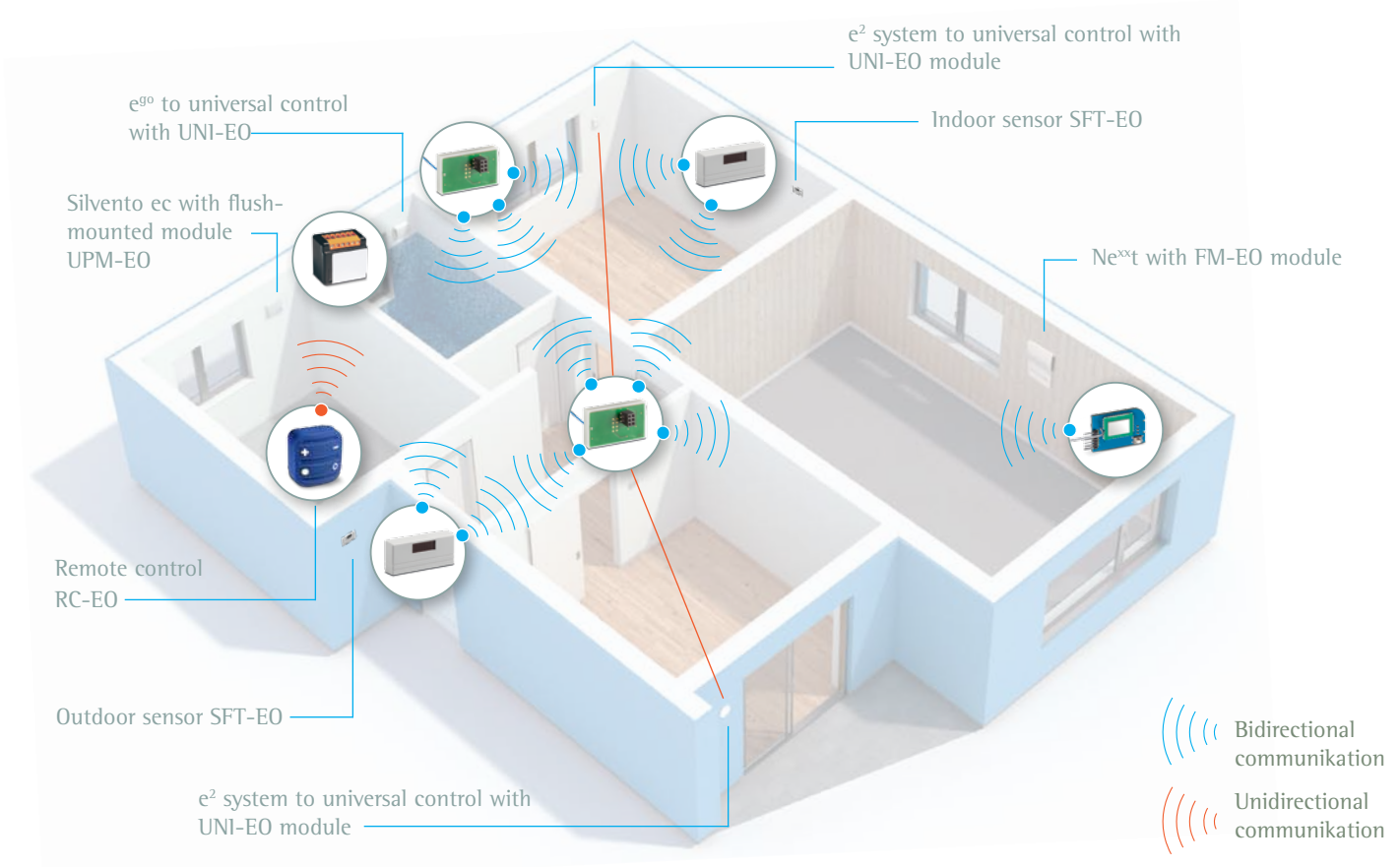
› The bidirectional radio technology

A radio technology that meets the high requirements of LUNOS must be extremely energy-efficient. The bidirectional radio technology is proven to deliver reliable signals with very small amounts of energy. The transmitters can therefore be operated without batteries and require little maintenance. The necessary energy is generated by means of the piezoelectricity of switches, from solar cells or from the kinetic energy of electrodynamic energy converters. The underlying technology was ratified by the International Electrotechnical Commission (IEC) as international standard already in 2012 and is regarded as a safe radio standard for the monitoring and control of home and building technology.

Benefits of radio technology

- Internationally recognized standard developed in Germany
- Battery-free and, therefore, energy-efficient and low-maintenance technology
- Safe and reliable radio technology for building equipment and appliances

› Communication of the LUNOS wireless products



Control Systems

radio technology

NEW

Remote control RC-EO

The RC-EO remote control is maintenance-free, shock-resistant and splash-proof, making it suitable for all areas of everyday life. Connected to the UPM-EO module, all connected 230 V devices can be controlled by radio command. The two available channels can be used to switch stages and/or to activate and deactivate Silvento special functions.

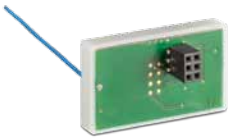
NEW

Flush-mounted module UPM-EO

The flush-mounted module UPM-EO is a receiver for radio signals. Connected to an AB30/60 or a Silvento, the exhaust air fan acquires radio capability. In particular, during refurbishment manual operation of the fan can be enabled retroactively without the need for complex cable laying.

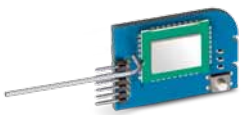
External humidity and temperature sensor SFT-EO

This external sensor can be installed almost anywhere and does not require any additional power supply. Altered sensor values are immediately sent to linked devices. As an indoor sensor coupled to the modules UNI-EO or FM-EO, the values of the radio sensor and the indoor sensors are matched and ventilation is carried out according to the prevailing climatic conditions.
As an outdoor sensor coupled to the UNI-EO module, the intelligent control matches the absolute values of the indoor and outdoor climate and adjusts the ventilation accordingly. In addition, automatic summer ventilation can also be implemented. At cooler night-time temperatures, the system ensures a lowering of room temperatures by means of a refreshing cross-ventilation.



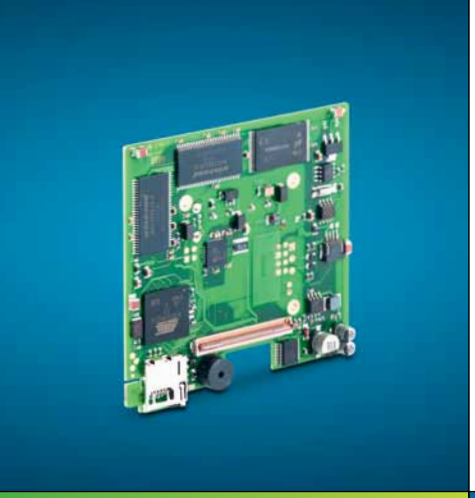
Radio module for the universal control UNI-EO

The radio module for the universal control enables communication of the universal control unit 5/UNI-FT with the coupled LUNOS wireless components. This includes the processing of received sensor values and switching commands, as well as the transmission of system states. Automatic modes can be extended and optimised. However, the control can also adapt the operation of the connected devices to linked ventilation components. For example, connected e^2 devices can actively provide supply air if an exhaust air fan transmits a switched regulated ventilation by radio command.



Radio module for Silvento ec and Ne^{xx}t FM-EO

All Silvento ec and Ne^{xx}t models can be equipped with the FM-EO. In the exhaust air system the Silvento ec can optimise the ventilation behaviour with a coupled outdoor sensor SFT-EO.
In connection with e^2 fans at a universal control with UNI-EO module, sensor values can be exchanged and the ventilation operation of the systems can be coordinated. The same applies to the combination Ne^{xx}t and Silvento ec. If more than one Ne^{xx}t are operated in one utilisation unit, a temperature-controlled fan mode can be achieved by targeted cross-ventilation between the devices. In this way it is also possible to react efficiently to different external temperatures and to maintain a consistent internal temperature.



LUNOS Ventilation

LUNOS

KNX Control

› The KNX standard

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

Why KNX?

There are several bus technologies available on the market which all have their justifications and benefits for particular areas of application. However, in this series we focus on the well-known KNX system.

The reasons:

- All strong brands of the electrical installation sector have been pushing KNX.
- KNX is a system which has been designed especially for the requirements of electrical installation.
- Installation and programming/parameterising of the devices can be carried out in accordance with the rules of the trade.
- KNX has been established in Germany for many years, the scope of functions available is enormous.
- With almost 7000 KNX certified products almost all applications in the area of building automation are covered.
- End consumers can rely on a widespread network of specialists with profound knowledge of KNX.
- KNX is well-established in Europe, USA, China und worldwide in the most important standardisation bodies.

› Ventilation functions of the KNX system

- Voltage supply of the fans from low voltage 24-32 V DC
- Bus-system control for the e^2 family, e^{go}, RA 15-60, AB 30/60, Silvento 30/60 and Silvento ec
- Several modules cascadable (Master/Slave)
- Control of the fan steps and directions as well as heat recovery
- Manual setting of fan steps via key inputs or KNX-telegrams
- Adjustment of fan performance and heat recovery according to the parameters:
  - Humidity, relative (inside) for moisture discharge
  - Humidity, absolute (inside/outside) to dry the basement
  - Temperature (inside) for building protection
  - Temperature (inside/outside) to optimise heat recovery
  - Temperature (inside/outside/target) for heating/cooling support
  - CO_2-concentration
- The parameters temperature (inside/outside), humidity and CO_2-concentration have to be provided by other KNX components, e.g. climate sensor
- Supply air mode to support separate exhaust air devices
- Exhaust air mode
- Compensation of line resistances (in the case of high line lengths) possible
- Operation in HVAC-mode according to KNX-standard, operating modes: Comfort mode, stand-by-mode, night mode, temperature protection mode, shock ventilation, Silence, summer mode
- Automatic filter change indicator when reaching the change interval
- The filter change has to be confirmed to reset the filter alarm

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Control Systems

KNX standard

› KNX Control4

The module KNX LUNOS Control4 enables control of the decentralised ventilation units with heat recovery and the exhaust air fans via the KNX bus. Several modules can be linked to one another to enable coordinated operation. Direct control of the ventilation units can be carried out 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 inserted in a switch box. The module can be controlled via the KNX Display Touch-IT or directly by the use of a series switch. Automatic control without switch via a humidity or CO_2 sensor is also possible. The protection class corresponds to IP 20.

› KNX climate sensor CO_2-TF

The measuring system of our KNX climate sensor records the carbon dioxide value, which is measures via the CO_2 sensor, and the room climate with the values for temperature and humidity. From these measured values, the dew point temperature and absolute air humidity are calculated.

The initial operation of the KNX sensors is performed via the ETS (EIB Tool Software) in connection with the respective application program. When delivered, the devices are not programmed. All functions are parameterised via the ETS and programmed. The controllers can be switched on and off via the KNX bus by the use of activation or disabling objects.

› KNX Display Touch-IT

The 3,5“ TFT colour display with touchscreen serves to provide visualisation and control in the KNX-bus. The display has a resolution of 320 x 240 pixels with 256 K colours (RGB). Its heart is a 32 bit ARM-processor with 200 MHz clock rate. It is equipped with a Linux operating system and has a mini USB port and a micro-SD slot for data storage.

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

- Switching and dimming, RGB-control
- Switching on and off of various devices, display of modes
- Alarm functions, password protection for page and control elements
- Control standards for room temperatures and climate
- Multi-room functions
- Clock timer, astronomic clock
- Data logging, customised adjustments possible

Accessories

160 screens and

› The comfort inner screens for the 160 series

Comfort inner screen

Thanks to the new design the direct noise input to the residents is reduced - the result is a more comfortable ambiance. The glass version of the new screen also stands out by its elegant design.

Plastic design
Designation: 9/IBK (H x W x D) 191 x 180 x 60 mm

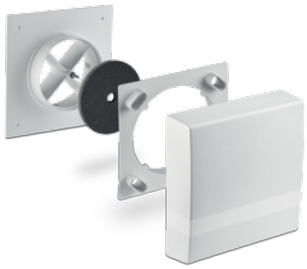
Glass design
Designation: 9/IBG (H x W x D)) 197 x 185 x 66 mm

PLUS X AWARD
2016 achieved for:
Innovation
High Quality
Design
Functionality

› Inner screens for the 160 series

Standard inner screen

Designation: 9/IBE (H x W x D) 180 x 180 x 35 mm



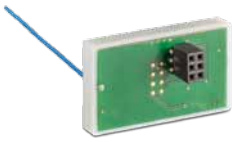
Noise protection inner screen

Sound insulation hood 9/IBS: increase of the standard sound level difference by up to 9 dB, reduction of self-noise, including washable filters of filter classes G2 and G3 1 pc each.

Designation: 9/IBS (H x W x D) 250 x 250 x 78 mm

* All inner screens are lockable

› Accessories for the universal control 5/UNI-FT



Radio module with bidirectional radio technology

Communication between control, fans and external sensors has now become possible. By means of the radio module, the universal controller can optimally adjust the ventilation to the requirements through the use of the transmitted data.

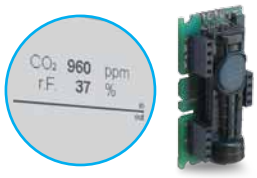
Designation: UNI-EO

External humidity-temperature sensor with bidirectional radio technology

This external sensor can be fixed almost anywhere and does not require additional power supply thanks to its extremely efficient solar cells. It can be linked to all LUNOS radio network modules.

Designation: SFT-EO (H x W x D) 45 x 96 x 20 mm

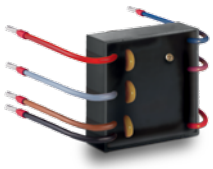
› Accessories for Touch Air Comfort (TAC)



CO_2 module

Permanent measurements of the CO_2-values enable the TAC to control the fans according to the air quality. The control range is adjustable, which allows fine-tuning towards various room conditions. The CO_2 program can be set concurrently with the humidity-temperature program. The automatic function will then react to the requirement that occurs first.

Designation: SCO2-TAC



Additional module for 230 V fans

By transmitting the control signal of the Comfort control TAC to 230 VAC the additional module enables the connection of the fan types Silvento AC und AB 30/60.

Designation: 5/ACM (H x W x D) 42 x 42 x 14 mm

Accessories

Outer grilles and

› Outer grilles

NEW

Plastic grille Ø 180 mm

for wall-tubes Ø 160 mm
NEW with façade protection ring, claw fixing and insect screen
Designation: 1/BE 180 sanded
Designation: 1/WE 180 white
Designation: 1/AZ 180 anthracite

Outer hood aluminium

(H x B x T) 235 x 205 x 72 mm
For wall-tubes Ø 160 mm, insect screen, with sound insulation, to screw on.
Increase of standardised sound level difference by up to 6 dB.
Designation: 1/HWE white powder-coated
Designation: 1/HAZ anthracite powder-coated

Plastic grille □ 180 mm

for plastering, sanded, optional adhesion with insect screen
Designation: 1 completely sanded
Designation: 1/D edge-sanded in white

Metal grille □ 228 mm

for wall-tubes Ø 160 mm, insect protection, to clip on
Designation: 1/QME 228 stainless steel
Designation: 1/QMK 228 copper

Plastic grille □ 110 mm

for plastering, sanded, optional adhesion with insect screen
Designation: 1/J completely sanded

Metal grille Ø 175 mm

for wall-tubes Ø 125-160 mm, insect screen, to clip on
Designation: 1/RME 175 stainless steel
Designation: 1/RMK 175 copper

Plastic grille Ø 115 mm

for wall-tubes Ø 90-100 mm, insect screen, with claw fixing
Designation: 1/BE 115 sanded
Designation: 1/WE 115 white
Designation: 1/AZ 115 anthracite

Metal grille Ø 150 mm

for wall-tubes Ø 80-125 mm, insect screen, to clip on
Designation: 1/RME 150 stainless steel
Designation: 1/RMK 150 copper

wall ducts

› Outer screens for 160 two-way systems

Two-way outer screen, plastic

For wall-tubes Ø 160 mm, insect screen, with sound insulation, to screw on.
Designation: 1/EGA (H x W x D) 217 x 257 x 63 mm

Two-way outer hood, aluminium

(H x W x D) 235 x 205 x 72 mm
For wall-tubes Ø 160 mm, insect screen, with sound insulation, to screw on.
Increase of standardised sound level difference by up to 6 dB.
Designation: 1/HWE-2 white powder-coated
Designation: 1/HAZ-2 anthracite powder-coated

› Wall installation housings for the 160 series

NEW

Wall installation housing 9/MRD

Wall installation housing made of EPS with a slope towards the outside.
Suitable for all devices of the 160 series. Can also be used with LUNOtherm.
Steplessly shortenable.
Designation: 9/MRD (H x B x T) 240 x 210 x 500 mm

› Wall-tubes for the 160 series

Wall-tube

for all devices of the 160 series (can also be used with LUNOtherm)
Designation: 9/R 160-500 (Ø x L) 160 x 500 mm
Designation: 9/R 160-700 (Ø x L) 160 x 700 mm

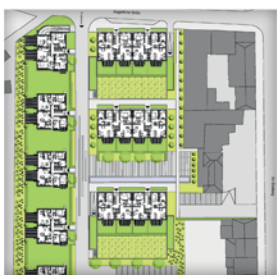
References

Examples of

› New building: KFW 40 project Lautizia, Berlin

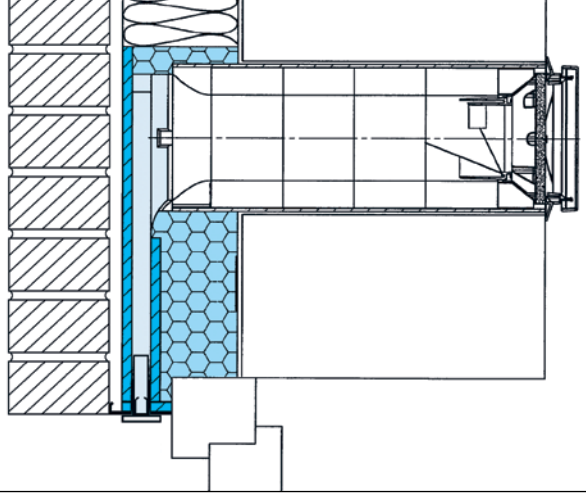
Building type:	New construction of 14 multi-family houses in a classic Berlin perimeter block quarter comprising 271 residential units, making it the largest KFW 40 project in Berlin.
Building owner:	AccoNarva GmbH, Berlin
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised hybrid system with exhaust air fans in the functional rooms
Supply and exhaust air:	e^2 with heat recovery and end on façade side via the façade element LUNOtherm
Exhaust air:	Exhaust air devices of the Silvento UP series are installed in the functional rooms.
Completion:	Completion in summer 2016
Energy standard:	KFW 40 standard: High thermal insulation, hybrid ventilation system with heat recovery and ecological energy concept with photovoltaic and geothermal energy system

› New building: Climate protection estates "am Wasserturm", Mönchengladbach, Germany



Building type:	New construction of eight apartment buildings. The first construction stage comprises 36 residential units with a total living space of ca. 2600 m^2. 77 rental apartments will be available after completion of all eight apartment buildings.
Building owner:	GEWOGE 1897, Mönchengladbach
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised hybrid system with exhaust fans in the functional rooms
Supply and exhaust air:	e^2 with heat recovery and end on façade side via the façade element LUNOtherm
Exhaust air:	Exhaust air devices of the Silvento UP series are installed in the functional rooms.
Completion:	Completion of the first construction stage with four buildings in July 2015

energy-efficient ventilation



› New building: Passive house in Fischbach, Black Forest, Germany

Building type:	New building of a single-family home in passive house standard, in 2014 Hugo-Häring-Award, Federal German Association of Architects (BDA), State Association Baden-Württemberg
Building owner:	Private owner
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised hybrid system
Supply and exhaust air:	e^2 with heat recovery
Exhaust air:	Exhaust air devices of the series 160 are installed in the functional rooms.
Completion:	2014
Energy standard:	Passive house standard: High level of heat insulation, windows with triple thermal glazing, decentralised, hybrid ventilation with heat recovery, soil-sole-heat pump, roof-integrated photovoltaics

› Redevelopment: Plus-Energy apartment building, Bern, Switzerland

Building type:	An apartment building from the 1950s is turned into a small power plant. According to the data of the cantonal building program in Switzerland, it is the first building in the city of Bern to meet the highest energetic requirements. Apartment building with five family's apartments and two attic apartments
Building owner:	Quadrat AG, Zollikofen
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised system
Supply and exhaust air:	Living rooms: e^2 with heat recovery Functional rooms: e^{go} with heat recovery
Completion:	May 2014
Energy standard:	Plus-Energy-Building of the GEAK category AA (GEAK = cantonal building energy performance certificate comparable with Dena energy certificate): Triple glazed windows, ventilation system with heat recovery, solar thermal system and photovoltaic system with a power surplus of 7 %

References

Examples of

› Redevelopment: Container project Ripple, Dublin, Ireland

Building type:	Conversion of an overseas container into an apartment to be used as homeless shelter by the St. Vincent de Paul Church. It was completed in just three days as part of the Ripple Container Homes project. The container house has six beds, a bath unit, kitchen, living room and an outdoor terrace.
Building owner:	RIPPLE Container Build Team
Ventilation concept:	Regulated apartment ventilation with heat recovery
Supply and exhaust air:	Living rooms: e^2 with heat recovery Functional rooms: e^{go} with heat recovery
Completion:	November 2014
Energy standard:	High level of heat insulation, ventilation system with heat recovery and solar thermal system

› Redevelopment: Apartment building Horner Landstraße, Hamburg, Germany

Building type:	Redevelopment of a non-detached apartment building from 1953 with four full storeys and nine apartment units considering the specifications of Backsteinoffensive Hamburg
Building owner:	CO2SPARHAUS GmbH, Hamburg
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised hybrid system with exhaust fans in the functional rooms
Supply and exhaust air:	e^2 with heat recovery
Exhaust air:	Exhaust air devices of the Silvento UP series are installed in the functional rooms.
Completion:	Completion of the first construction stage with four buildings in July 2015
Energy standard:	"KfW Effizienzhaus 70": Renewal and replacement of windows and balcony doors (Uw-value of 0.95), hybrid ventilation system with heat recovery, high level of heat insulation preserving the brick finish on the street side, central hot water production

energy-efficient ventilation

› New building: Residential park at the Wuhle-Ufer, Berlin, Germany

Building type:	New construction of 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 decentralised hybrid system
Supply and exhaust air:	e^2 with heat recovery and end on façade side via the façade element LUNOtherm
Exhaust air:	Exhaust air devices of the series Silvento UP are installed in the functional rooms.
Completion:	November 2013
Energy standard:	KFW 55 standard: triple glazed windows, hybrid ventilation system with heat recovery. Energy, heating and hot water generation for the buildings via own combined heat and power unit

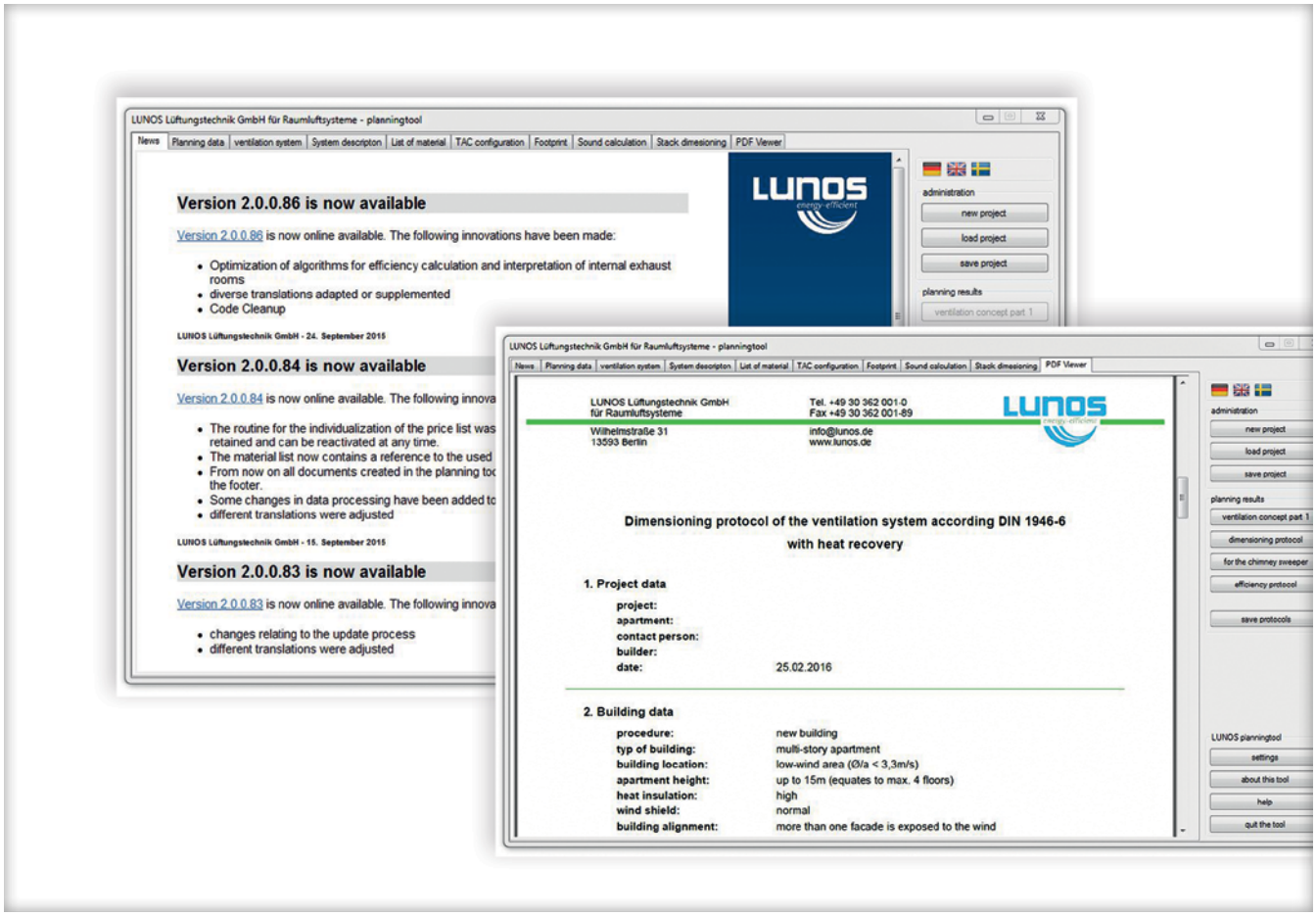
› New building: Apartment building Düsseldorfer Straße, Berlin, Germany

Building type:	New construction of an apartment building with a meeting place for the tenants
Building owner:	Märkische Scholle Wohnungsunternehmen eG, Berlin
Ventilation concept:	Regulated apartment ventilation with heat recovery in a decentralised hybrid system
Supply and exhaust air:	e^2 with heat recovery and end on façade side via the façade element LUNOtherm
Exhaust air:	Exhaust air devices of the series Silvento UP are installed in the functional rooms.
Execution:	April 2013
Energy standard:	KFW 55 standard: High level of 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

› Designing with LUNOS pursuant to DIN 1946-6

The correct design in accordance with the state-of-the-art technology is performed pursuant to DIN 1946-6. In this way, the airflow levels ensuring the minimum air exchange according to the EnEV are determined. These airflow levels depend on the number of exhaust air rooms, the living space as well as the leak tightness, position and orientation of the building.

The design of mechanical home ventilation is made in accordance with the nominal ventilation stage which covers the air exchange required for normal usage.



Design Tool

of your home ventilation

LUNOS Design Tool

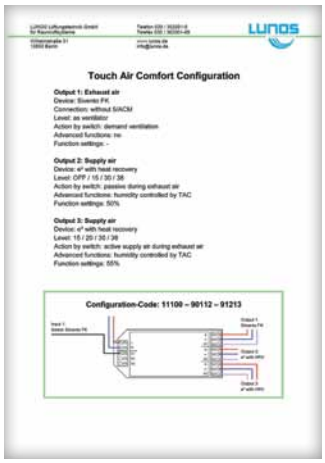
› LUNOS Design Tool

To help you design your regulated home ventilation,
LUNOS provides a Design Tool based on the algorithms of:

- Verification of necessity of ventilation-related measures
- Design related to exhaust air rooms or floor space
- Design of outside airflow levels
- Ventilation for humidity protection, reduced ventilation, nominal and intensive ventilation
- Calculation of infiltration airflow levels
- Component design of the ventilation system such as fans, outer wall air vents and excess flow cross-sections
- Consideration of the requirements of exhaust air systems in connection with fireplaces
- Calculation of efficiency levels and effectiveness of the ventilation system planned
- Drawing up of complete material lists
- Calculation of noise insulation of an outer wall in connection with ventilation components

The Design Tool provides clear printouts of all calculation results in PDF format.

TAC Configuration made easy

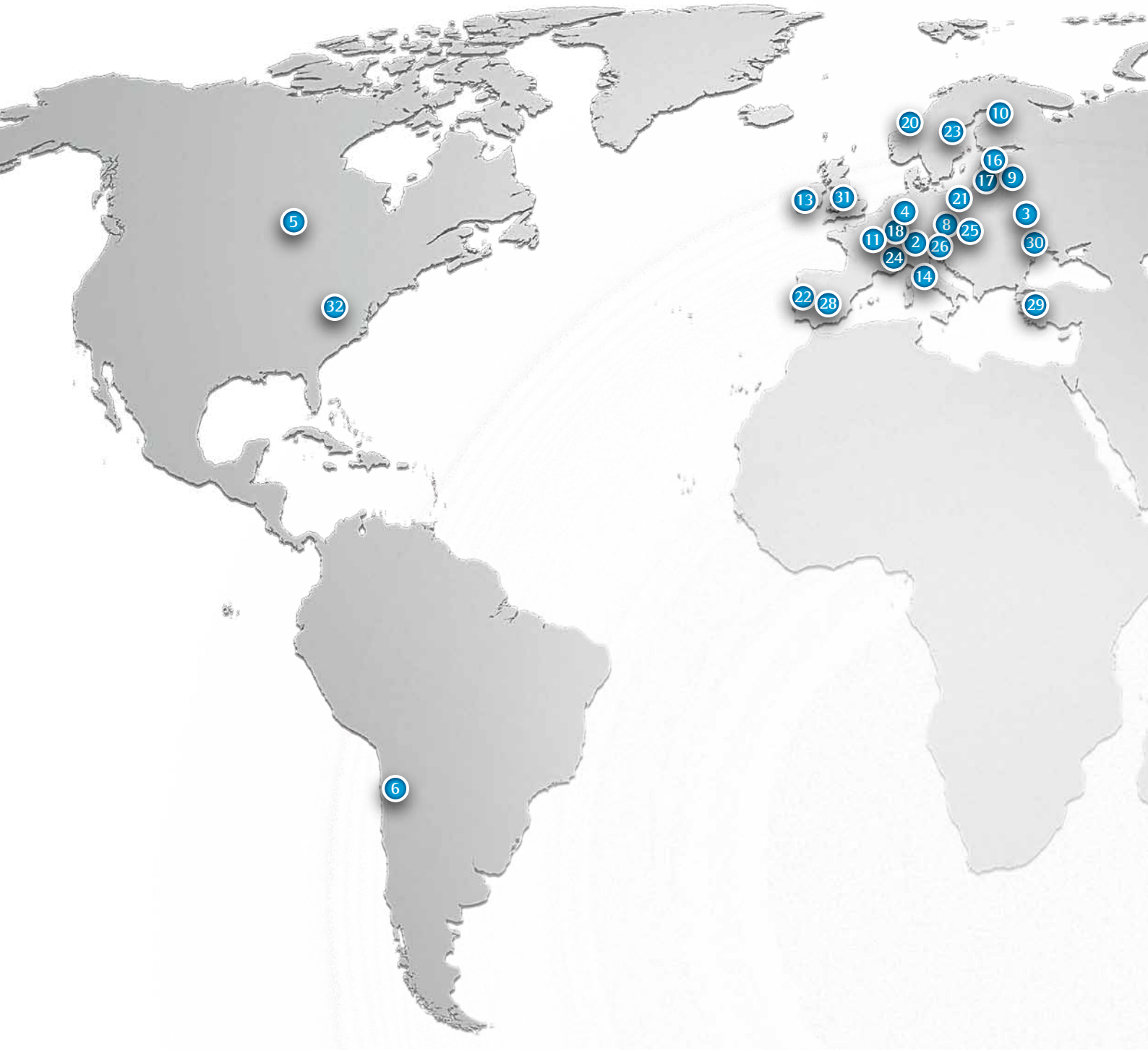


The Design Tool enables the creation of a DC-code (digital- configuration-code). This code is required for the initial setting up and quick configuration of the TAC (Touch Air Comfort) control. The TAC is informed via the 15 digit code as to which fan is connected to which outlet and which airflow level can be switched by the user. Special functions are also communicated, such as e.g. the delay time of a fan, the humidity or CO_2 limit for a regulation selected and/or the behaviour of the e^2 in the supply air section when the exhaust air device(s) is/are switched on.

After successful configuration, the Design Tool creates a connection plan for the TAC especially adjusted to the ventilation system designed, including a summary of the desired settings.

Representatives

LUNOS



– international

International representatives:

1 Australia
2 Austria
3 Belarus
4 Belgium
5 Canada
6 Chile
7 China
8 Czech Republic
9 Estonia
10 Finland
11 France
12 India
13 Ireland
14 Italy
15 Japan
16 Latvia
17 Lithuania
18 Luxembourg
19 New Zealand
20 Norway
21 Poland
22 Portugal
23 Sweden
24 Switzerland
25 Slovakia
26 Slovenia
27 South Korea
28 Spain
29 Turkey
30 Ukraine
31 United Kingdom
32 USA

Notes

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