

# LUNOS Domestic Ventilation Systems With Heat Recovery

Innovations for New Buildings and Redevelopment

$e^2 + e^{go}$



**LUNOS**  
energy-efficient

# Domestic Ventilation

## e<sup>2</sup> and ego in a de-centralized system

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System & Planning

### Ventilation with Heat Recovery:

In contrast to other ventilation systems, de-centralized ventilation is focused more on effectiveness and efficient enhancement of the different fans of a system. To ensure ideal implementation of ventilation in bathrooms, WCs and kitchens, the e<sup>2</sup> has been enhanced with the e<sup>90</sup>.

### The Principle of e<sup>2</sup> + e<sup>90</sup>

LUNOS ventilation systems with heat recovery can be used everywhere. On account of the de-centralized system, the individual ventilation units can be installed exactly where they are required. Combinations with classical exhaust air systems are also possible and can be designed using LUNOS ventilation tools pursuant to EnEV (Energy Saving Regulation) and DIN 1946-6.

e<sup>2</sup> fans are mainly installed in living rooms. Two units are continuously in operation in pairs. Therefore, an even number of ventilation units always has to be installed to ensure the units function properly.

Functional rooms such as bathrooms and kitchens can be ventilated using e<sup>90</sup>. Operation in pairs is not required because, in simple terms, two 'small' e<sup>2</sup>s in one ego provide simultaneous supply and exhaust air with heat recovery.

In the case of rooms with no walls to the outside, one exhaust air system (e.g. type, Silvento) has to be installed, since the e<sup>2</sup>/e<sup>90</sup> systems cannot be linked to a shaft or to piping. This is on account of the construction of the units and is unavoidable.



# with Heat Recovery

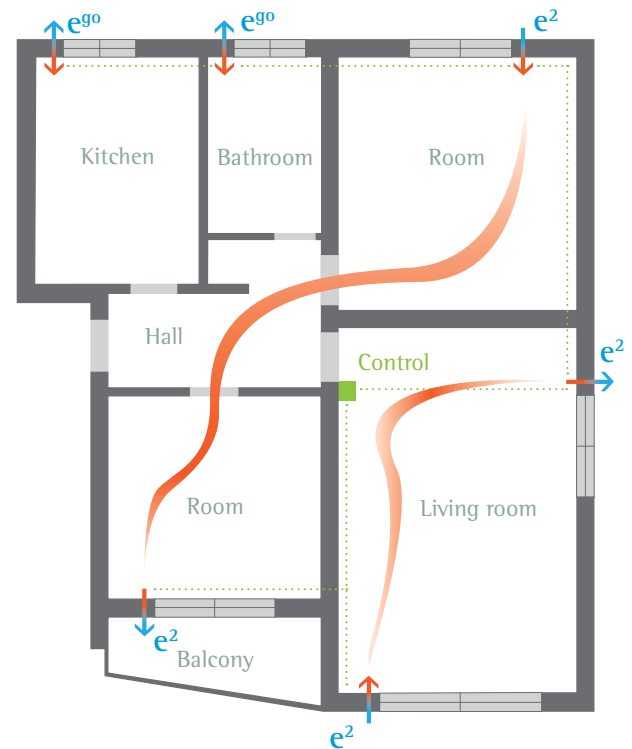


## Ventilation with $e^2$ in living rooms and bedrooms:

The  $e^2$  operates in accordance with the method of a regenerative heat exchanger. A storage element is charged, similar to a battery, with heat energy in reversing operation and transfers the heat to the outside air supplied. The ventilation unit with heat recovery has a very low power consumption of just 1.4 Watts in base load operation (0.09 W/m<sup>3</sup>/h) and an almost silent measuring surface sound pressure level of 16.5 dB(A).

## Ventilation with $e^{90}$ in the Bathroom, the WC and the Kitchen:

The  $e^{90}$  also operates in accordance with the principle of the regenerative heat exchanger. A storage element is charged with heat as for the  $e^2$ . However, this is so skillfully distributed via two fans so that supply and exhaust air can be transferred simultaneously. A second unit is not required for operation. This system can also be switched in an exhaust air mode in which a very high flow rate of 45 m<sup>3</sup>/h is discharged in order to enable swift inflow of fresh air into a room (e.g. WC or bathroom).



## Planning

Using LUNOS Planning Tools it is possible to intuitively design and plan domestic ventilation systems with heat recovery pursuant to DIN 146-6. All algorithms used in this norm are implemented and are explained in a simple manner via interactive help. As a result, the program provides clearly presented material lists and records for building owners, chimney sweeps and energy consultants/development banks.

When planning with de-centralized ventilation systems, pure heat recovery systems or so-called 'hybrid ventilation systems', a combination of exhaust air units and heat recovery, can be calculated. According to the calculation method developed by Lunos, corrections to the efficiency are made for hybrid systems, the overall efficiency generated effectively in practice is displayed and prepared for the Energy Balance calculation.



# Domestic Ventilation

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

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e<sup>2</sup> & e<sup>90</sup>

## › Features

### SILENT



Highly efficient motors, with the latest EC technology combined with specially balanced fans which have been reworked with regard to fluid mechanics have almost completely eliminated any air noise. This has resulted in low measuring surface sound pressure levels:

### ENVIRONMENT-FRIENDLY



e<sup>2</sup> and e<sup>90</sup> have a very low power consumption ensuring they are unique in terms of energy efficiency, making an active contribution to environmental protection and at the same time saving you money. The efficiency figures for e<sup>2</sup> and e<sup>90</sup> are far below the limits required pursuant to the current DIN 1946-6 for devices of Efficiency Class E.

### INNOVATIVE



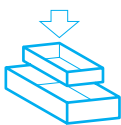
e<sup>2</sup> and e<sup>90</sup> operate in accordance with the well-known principle of the regenerative heat exchanger which has been almost perfected by the Lunos company. The so-called acuvent storage stone is located at the center of the airflow of an EC motor with axial fan. By means of a reversing airflow arising via systematic change of direction of the fan, the ceramic is charged with the thermal energy of the room air and transfers this back to the outside air supplied.

### SLIM



e<sup>2</sup> and e<sup>90</sup> are among the smallest de-centralized fans for domestic ventilation with heat recovery in the world. By applying state of the art production processes we have managed to develop compact heat storage of ceramic composite material which provides a mean thermal efficiency of 90.6 or 85 %.

### COMPATIBLE



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

### UNIVERSAL



e<sup>2</sup> and e<sup>90</sup> can be used in new constructions and in redevelopment work. In new constructions, they are installed between the bricks with the aid of a wall rack or installed subsequently e.g. in the case of redevelopment work using a 162 mm large core drill hole. The wall must be at least 30 cm thick.



# with Heat Recovery



e<sup>2</sup>

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

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

One reversing airflow operates per e<sup>2</sup>.  
At least two or one even number of e<sup>2</sup>  
should be used for a balanced supply and  
exhaust air balance.

Fan size: Ø x length 160 x 300 up to  
max. 700 mm heat recovery efficiency  
of 90.6 %

Compatible with all 160 systems incl.  
LUNOtherm as external closure.

Can be installed in new buildings and in  
redevelopment work, wall thickness at  
least 300 mm.

e<sup>90</sup>

23 dB at 5 m<sup>3</sup>/h  
34 dB at 10 m<sup>3</sup>/h  
43 dB at 20 m<sup>3</sup>/h  
43 dB bei 45 m<sup>3</sup>/h exhaust air mode

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

Two EC motors provide two reversing  
airflows at the same time for ventilation.

Fan size: Ø x length 160 x 300 up to  
max. 700 mm heat recovery efficiency of  
up to 85 %

Compatible with other 160 systems pro-  
vided e<sup>90</sup> internal and external panels can  
be used.

Can be used in new buildings and in re-  
development work, wall thickness at least  
300 mm.



# Domestic Ventilation

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

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System Engineering with HC

e<sup>2</sup>



› Outside grille with insect screen

› EPP heat insulation elements with 0.038 W/mk

› Highly efficient ceramic heat storage with heat recovery efficiency of 90.6 %

› Fan unit, quiet as a whisper, in sound-insulating EPP chassis

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



**kiwa**  
Partner for progress



# with Heat Recovery



e<sup>90</sup>



› Weather grille outside panel with separate airflow and insect screen

› Highly efficient ceramic heat storage with heat recovery efficiency of 85 %

› Fan units, quite as a whisper, structured in counter-flow design for simultaneous supply and exhaust ventilation.

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



› Improved efficiency as a result of the honeycomb structure of the storage stone

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LUNOS again sets standards with the new e<sup>90</sup>:  
the smallest fan with heat recovery with simultaneous supply and exhaust ventilation can also be operated in purely ventilation mode at 45 m<sup>3</sup>/h.

# Accessories for the 160 series with Heat Recovery



## > Controls:

### Universal control

Control for e<sup>2</sup>, e<sup>90</sup> and RA 15 – 60. Various switch functions can be selected per ventilation unit via a coding switch. Up to ten e<sup>2</sup>s or up to five e<sup>90</sup>s can be switched via one control. 0-10 V input for connection to TAC control or remote control.

### Touch Air Comfort (TAC)

Control for e<sup>2</sup>, e<sup>90</sup> and RA 15-60. AB 30/60 and the Silvento series can be connected via a 230 V module. Functions: energy-efficient E-Ink display, integrated humidity/temperature sensor, USB interface; Convenience functions: night reduction and summer ventilation

### KNX

Bus system control for e<sup>2</sup> and ego, other ventilation series are integrated successively. Functions: various programs can be connected (CO<sub>2</sub>, humidity, temperature, etc.), complete integration into the energy-efficient KNX home automation concept is provided, can also be installed as a standalone solution.

## > Sound insulation:

### e<sup>2</sup>

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

Sound insulation set 9/SW: increase of standardized sound level difference by up to 2 dB, reduction of intrinsic noise.

## > Outside Grille / LUNOtherm

### e<sup>2</sup>

Outside grilles are available in different colors and materials as well as special versions for plastering. The LUNOtherm can be used instead of an outside grille. By using the LUNOtherm, the outside grille can be removed from the façade.

### e<sup>90</sup>

Depending on the respective functions involved, only the standard inside and outside screens can be installed.



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