

e:energycarbon

energy efficient ceiling heating



AirUnit residential ventilation
systems



Reasons for ventilation of residential areas

Avoidance of sick building syndrome

improving indoor air quality

Ensuring sufficient air exchange



How do we notice a lack of ventilation...?



Condensate production



Mould



Homeoffice



Homeschooling

Changing the airtightness of residential buildings

Existing buildings until approx. 1970

Measured user-independent air change = 3 to 7 h⁻¹



multi-family house, new construction

for buildings without ventilation systems 3.0 h⁻¹ and

for buildings with ventilation systems 1.5 h⁻¹



Renovation

Replacing the windows alone reduces the user-independent air

air exchange rate is reduced by up to 40%.



In practice it looks like this...



**Exterior component
air outlets**



**Window rebate
ventilation**



Air to Air heat pump



**Central supply /
exhaust air**

Arguments for controlled living space ventilation with heat recovery

Energy saving

- Reduction of ventilation heat losses

Health / hygiene

- No mold, no pollen, fewer pollutants

Comfort

- No opening windows, no drafts, no mosquitoes

Security

- Burglary protection and value preservation

Arguments for decentralised ventilation systems

Easy assembly

Since no piping is necessary

Low procurement costs

Since no piping is necessary

Quick planning

Since no piping is necessary

Low follow-up and maintenance costs

Since no piping is necessary

Both in the new buildings and in refurbishments

Since no piping is necessary

How it works

Phase 1

- » In the first phase, the stale room air is led outside. The integrated heat exchanger absorbs the heat from the room air and stores it.



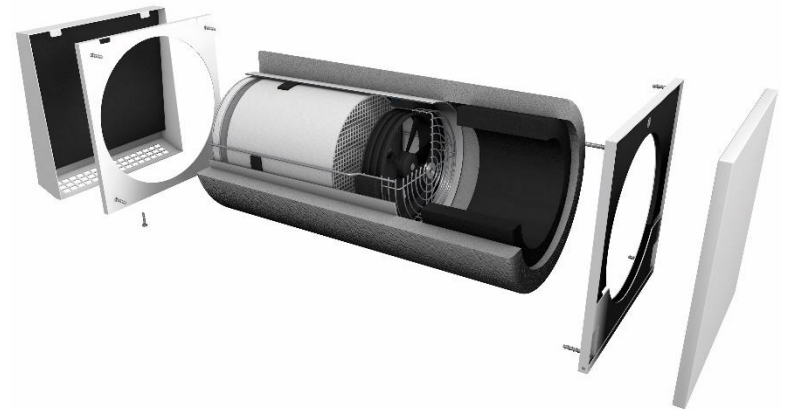
Phase 2

- » In the second phase, the fan changes direction. Here, fresh outside air flows through the heat exchanger and is supplied to the room preheated. In this way, a heat recovery of up to 90.3% can be achieved.

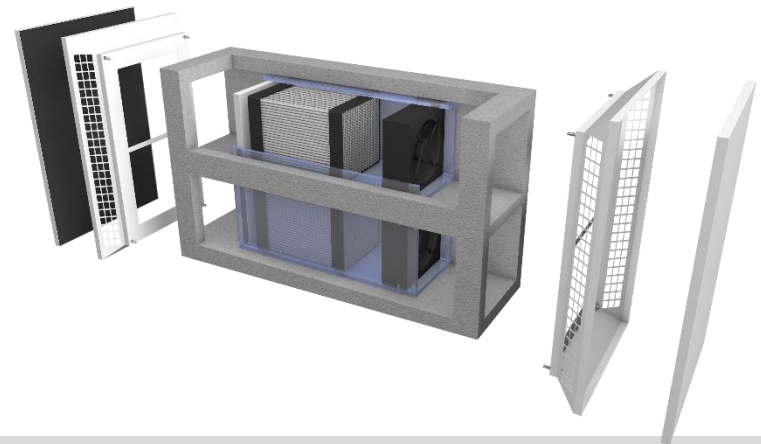
AirUnit residential ventilation systems



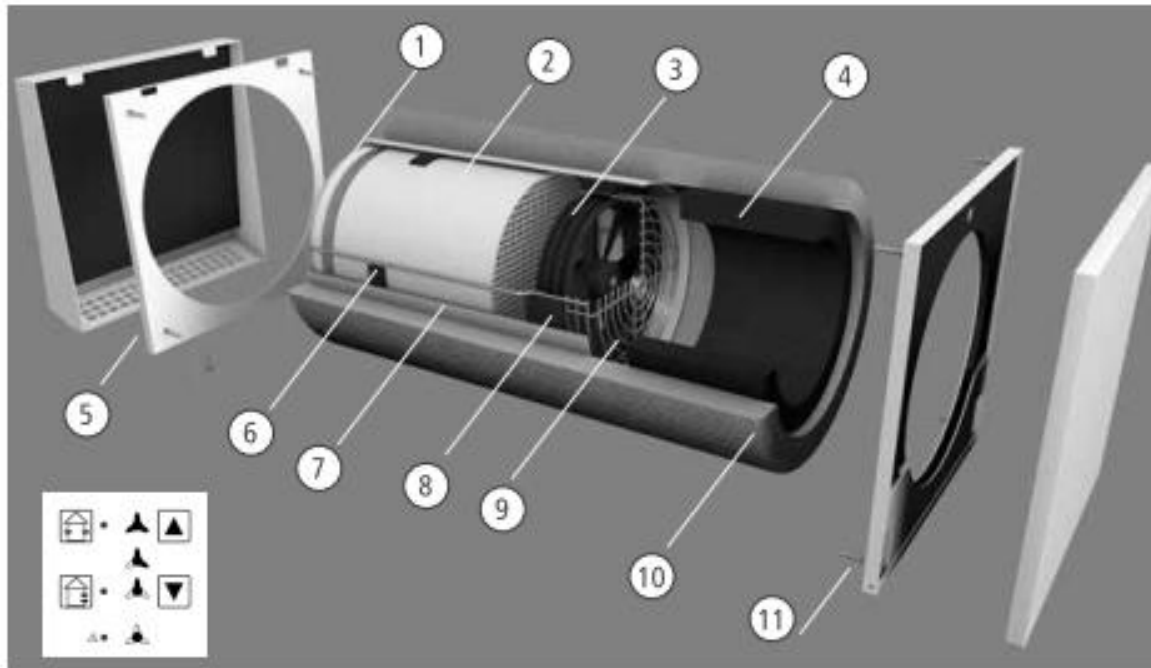
AirUnit SOLUS



AirUnit GEMINI



AirUnit SOLUS – Detailed structure of the push-pull technology



- | | |
|--|---|
| 1 • Filter (G3) | 6 • Sealing ring (heat accumulator) |
| 2 • Ceramic heat accumulators for heat recovery | 7 • Housing pipe |
| 3 • Ventilator (12 V/DC) | 8 • Sealing ring (ventilator) |
| 4 • Sound insulation mat | 9 • Wire assembly incl. protection grid |
| 5 • Exterior hood (weather protection screen in RAL 9016 or stainless steel) | 10 • Wall duct (495 or 1000 mm) |
| | 11 • Interior design screen |

AirUnit SOLUS

Specifications:

- » Air flow 15 | 20 | 30 | 40 m³/h
- » Power consumption 0,8 | 1,1 | 1,7 | 2,7 W
- » Sound pressure level (3m) 12 | 18 | 22 | 30 dB(A)
- » Heat recovery efficiency bis 90%
- » Filter G3, regenerierbar
- » DIBt Approval Z-51.3-363



Dimensions:

- » Wall duct Ø 198 mm, Length 495 mm
 - » NEOPOR with integrated slope, easy length adjustment
- » Wall duct square 210 x 210 x 500 mm
 - » EPS with integrated slope, easy length adjustment
 - » Min. wall thickness 260 mm (without sound insulation mat)
 - » Inner cover hinged or fixed white (RAL9016), lockable
- » Outer hood white (RAL 9016) or stainless steel

Operation AirUnit Solus

Single room solution

2 units per room
large living/dining room
Bathroom

Across several rooms

Minimum 1 unit per room

Combined systems

Exhaust air rooms are equipped with demand-controlled exhaust air fans
All other rooms are equipped with decentralized units with heat recovery



Installation Rough assembly set



Installation Final assembly set



Special features of AirUnit SOLUS

- Heat heat recovery of up to 90% - cost advantage for end users
- Insulated (thermally decoupled) shell set with integrated slope - significantly faster installation
- Expandable control for up to 16 units - flexibility in small and large residential units.
- Coordinated operation with extract air fans is possible due to a uniform control concept

In daily sales:

1. the room types

- Living room, study, bedroom are supply air rooms
- Kitchens, bathrooms and WCs are classic exhaust air rooms

2. the required air exchange

- 0.5 times air exchange (air volume of the room) per hour

3. approximate design with AirUnit Solus

- Supply air rooms: 1 unit is required for every 15 m² of living space.
- Extract air rooms: Flat rate 2 units or 0 units. In practice: 0 units -> Use as a hybrid solution with conventional bathroom fan.
- One control unit per floor or per living unit (then with extension set)

4. more exact design

Support from mfh systems

FAQ AirUnit (1)

What are the main advantages of the AirUnit Solus compared to other typical building products?

- Efficiency of over 90% - Cost advantage for end user, **Insulated** (thermally decoupled) shell set with **integrated slope**
 - Significantly faster installation Expandable control for up to **16** units - flexibility in small and large residential units

Can I still open the window?

- Yes, of course

How do the costs compare to central systems?

- Relative to one (1) residential unit, approx. 50% lower costs.

Can the system be integrated into a BMS?

- Yes, the control system has a Modbus interface

FAQ AirUnit (2)

Does the system also have to work in summer?

- Yes, in order to guarantee the air exchange. In addition, it reduces the heating rate of the building. The process works in the opposite direction, i.e. the heat exchanger slightly reduces the temperature of the incoming air.

What else can I do in summer to reduce the building temperature with the system ?

- There is a cross-ventilation function for the night. This can be activated at night to reduce the temperature. The program runs for 8 hours and then switches off again..

Should I switch off the system if I feel I don't need it?

- No, the ventilation system is a protection for the building fabric. It must always run from the idea

Does the system consume a lot of electricity due to continuous operation?

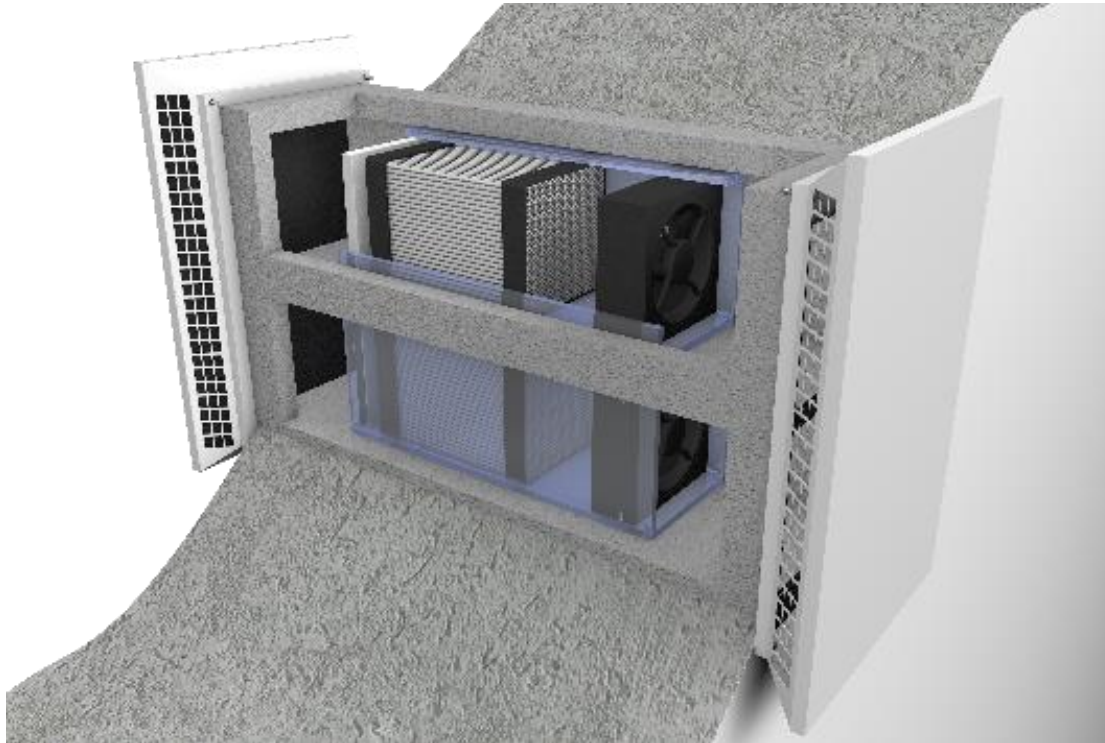
- No, the fans are energetically optimized and have only a low power consumption; furthermore, the energy saving through the heat recovery system is approx. 8 times higher compared to window ventilation. .

What do I do if the noise in the bedroom disturbs me?

- The system has a sleep timer that deactivates the system for 2 hours (to fall asleep) and then switches it on again.



Decentralised individual room solution AirUnit GEMINI



AirUnit GEMINI

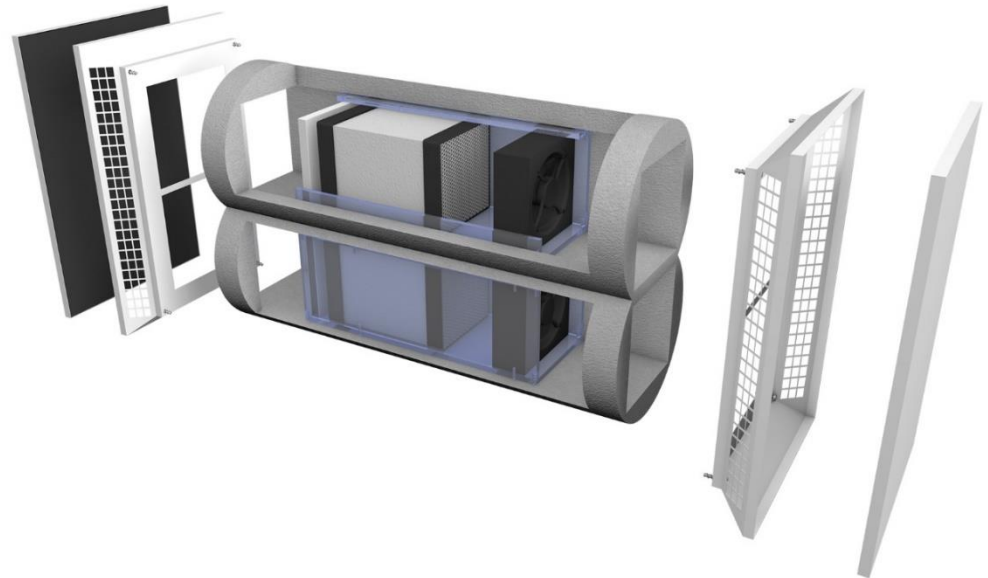
Date

- » Air Flow Rate 5 | 10 | 21 | 30 m³/h
- » Power consumption 0.8 | 1.7 | 2.7 | 4.1 W
- » Intensive ventilation 30 m³/h
- » Exhaust air operation 40 m³/h
- » Heat supply level up to 98%
- » Heat supply level at reference point 85%
- » Filter G3, regeneratable

Dimensions

Wall bushing 155 mm x 300 mm, length 500 mm

- » EPS with integrated slope, easy length adjustment
- » Min. wall thickness 300 mm (without sound insulation mat)
- » Inner and outer hoods 230 x 360 x 50 mm (lockable)



AirUnit GEMINI - Application examples

Single room solution

Exhaust air rooms (e.g. bathroom)

Large rooms 25 - 30 m²

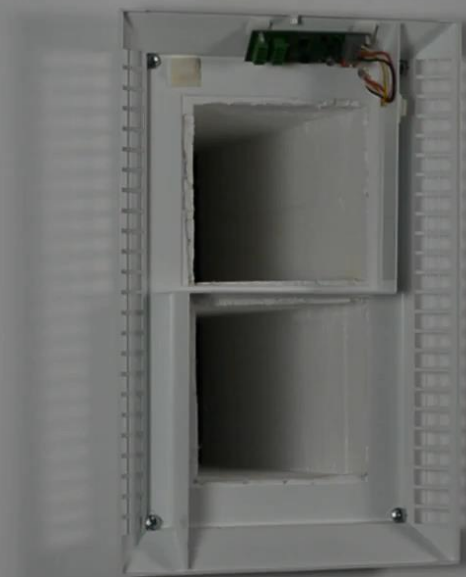
Fulfilment of the equality of pairing

If the number of individual devices is uneven,
Gemini provides compensation





Installation AirUnit GEMINI



Special features of AirUnit GEMINI

- Heat supply efficiency of up to 98% at 10m³/h, the market-leading value of a single room ventilation unit to date
- Fully automatic operation (sensor-controlled) due to integrated humidity sensor
- Operation is possible from 15.2 dB(A), making it one of the quietest single room ventilation units on the market.
- One unit can be used in rooms of up to 25 m²
- Coordinated operation with AIRUNIT SOLUS is through a uniform control concept.

AirUnit compact control PRO



AirUnit –Controller PRO

Funktionalität

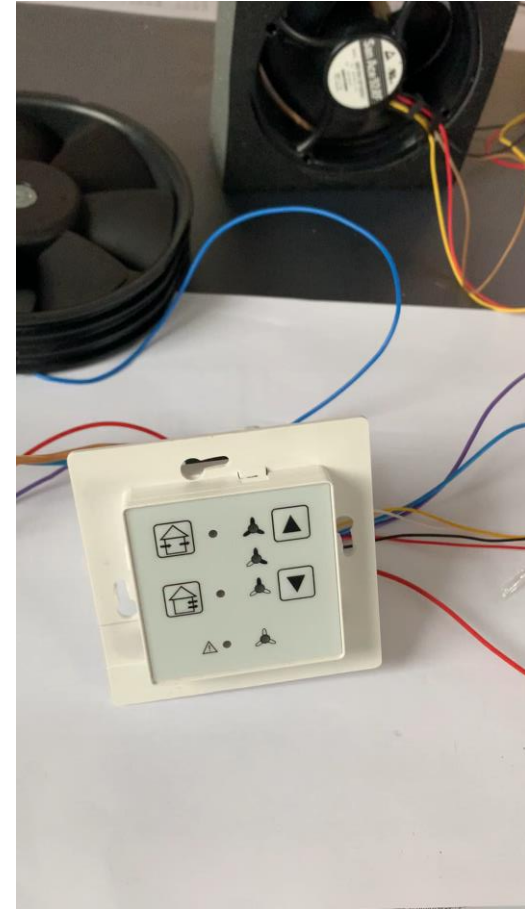
- 4 power levels + OFF
 - Operating modes
 - Winter operation incl. heat recovery
 - Cross-ventilation (e.g. as night-time cooling 8 h))
 - Status display (filter change)
 - For 4 devices
 - Expandable to 16 devices with expansion set
 - Including cover frame (not compatible with switch ranges)
 - Dimensions 80 x 80 x 49 mm (simple wall box)
 - RS-485 interface
 - Modbus interface
 - Integration into BUS system
 - USB service interface
- Sleep timer (2 h)
 - Integration of exhaust fans

Electrical connection

- Supply voltage 230 V / 50 Hz
- Output 12 V (min. 3 x 0,6 mm²to the ventilation units)



AirUnit – compact control PRO

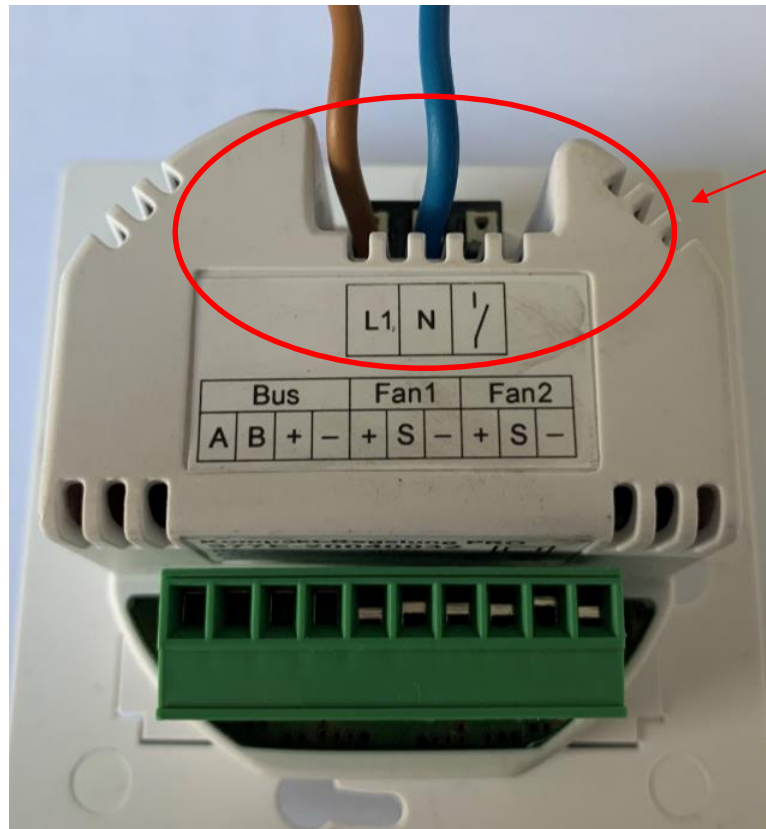


Connection of the ventilation units in detail

Power supply

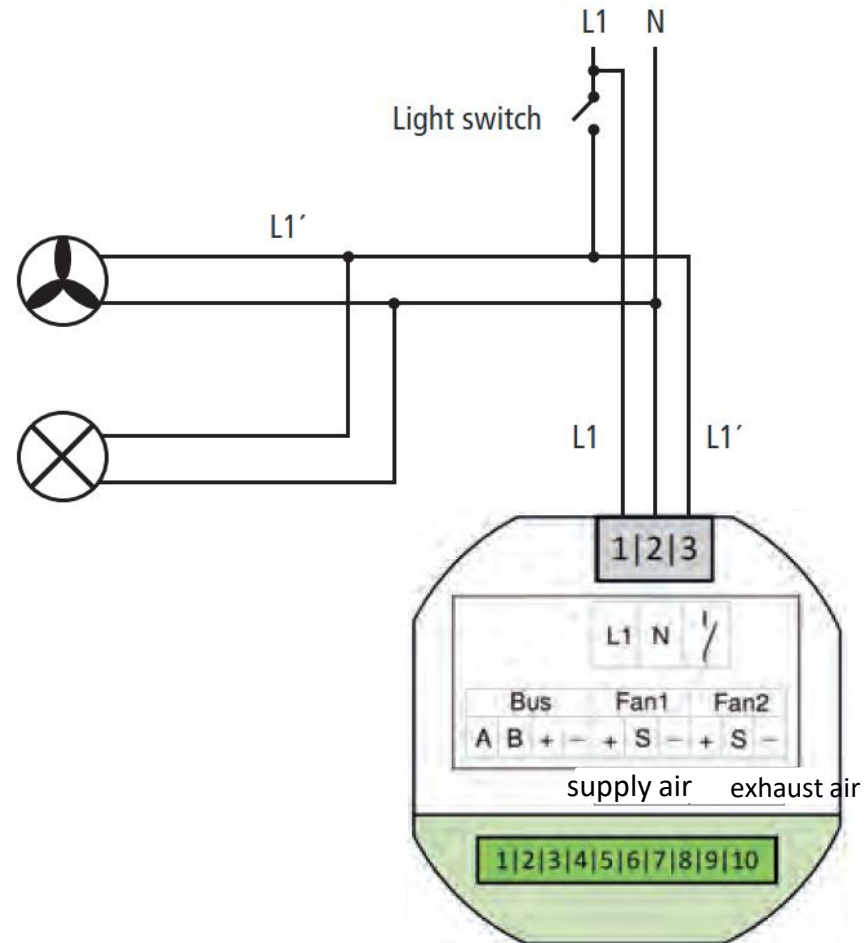
No earth wire required

External digital input
(Bath fan operation)



230 volts

External digital input (bath fan operation)



Connection of the ventilation units in detail

BUS

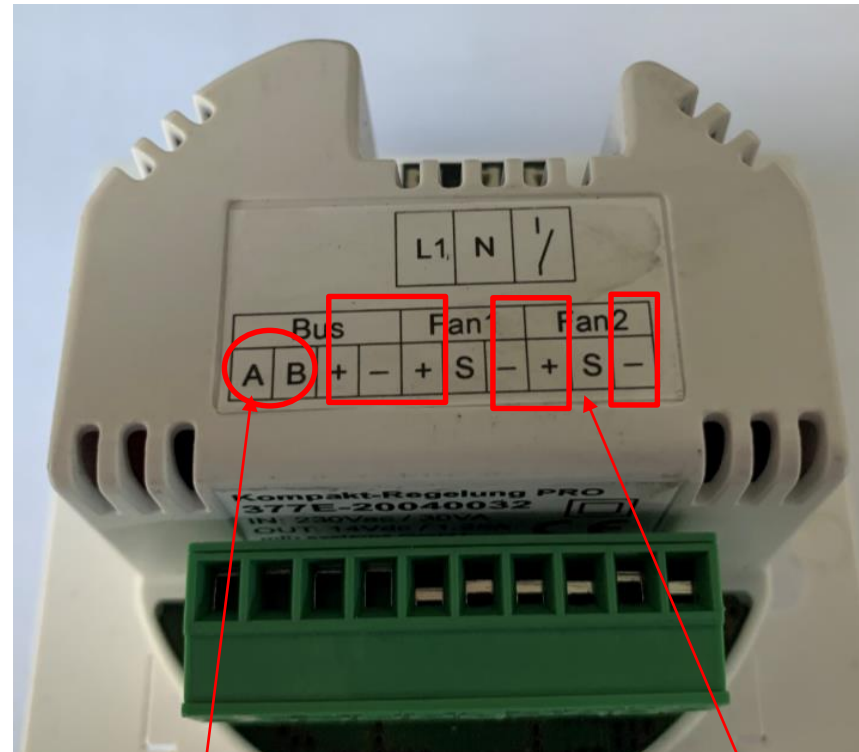
- For connecting the Gemini and the external sensors

Fan 1

- in cross ventilation Supply air

Fan 2

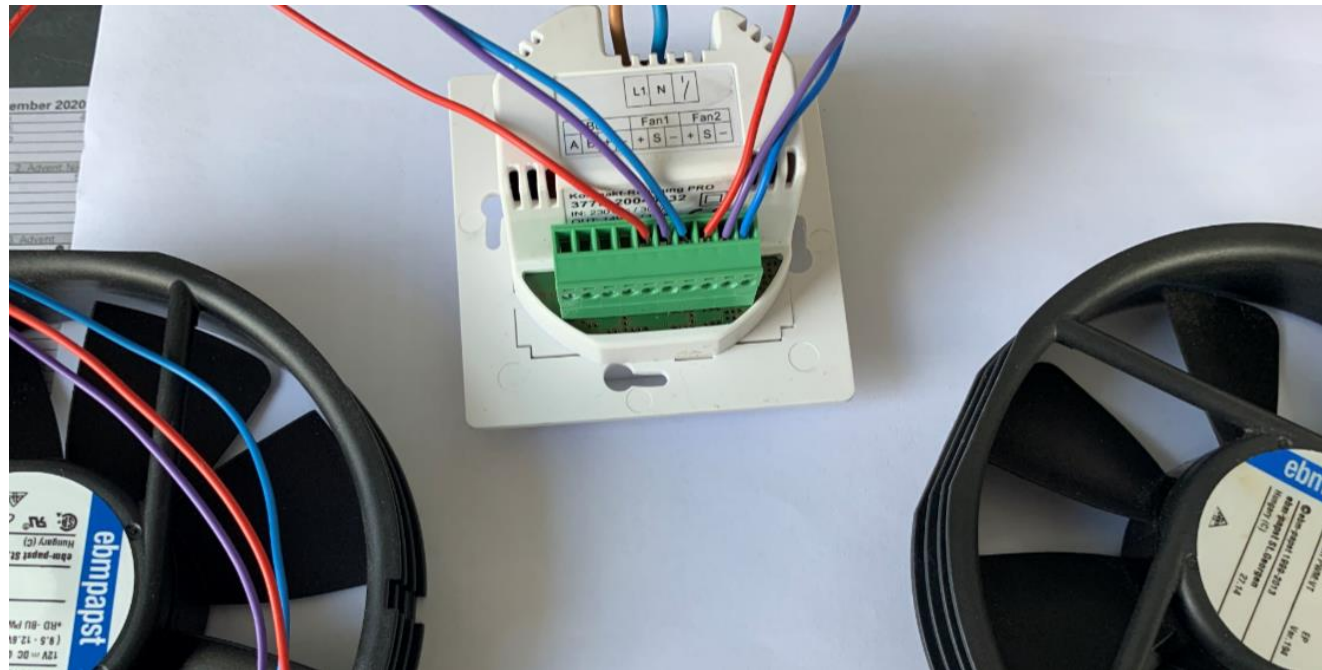
- in cross ventilation exhaust air



Communication

12 volts

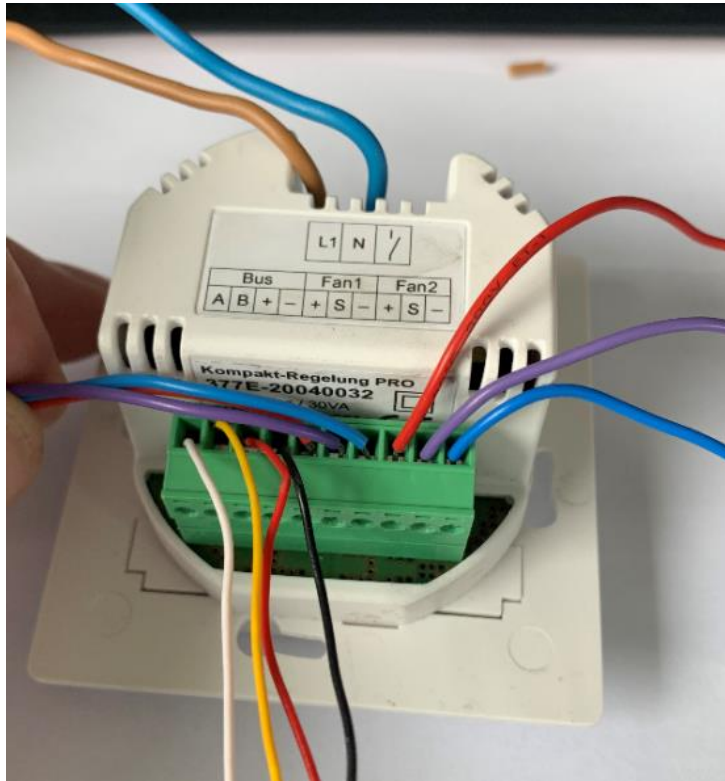
Connection of the ventilation units in detail



- Pulling
(Supply air)

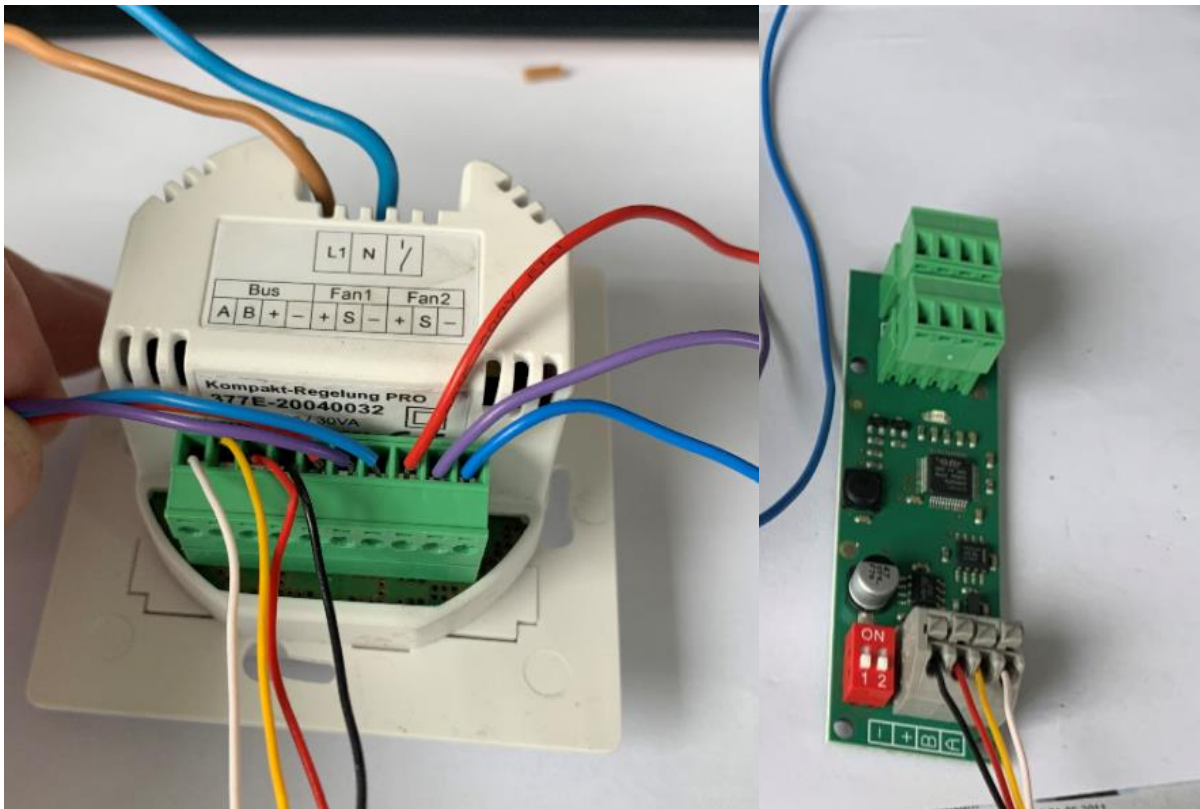
- Pushing
(exhaust air)

Connection of the ventilation units in detail



- For connecting the Gemini and the external sensors

Connection of the ventilation units in detail



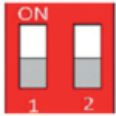
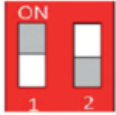
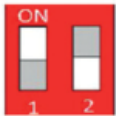

Connection of the ventilation units in detail

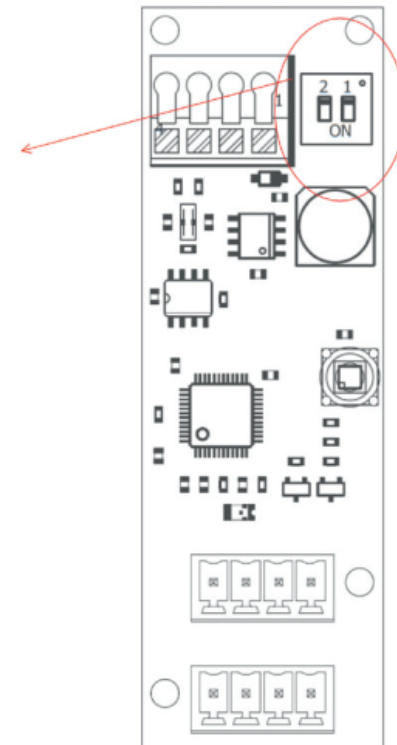


Address AirUnit Gemini

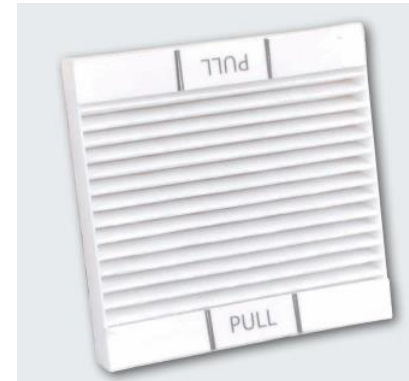
If several **GEMINI ventilation units** are connected, the address must be set on the circuit board; the DIP switches must be set as described. **Attention:** Each address can only be assigned once. A maximum of 4 **GEMINI ventilation units** can be operated in one system.

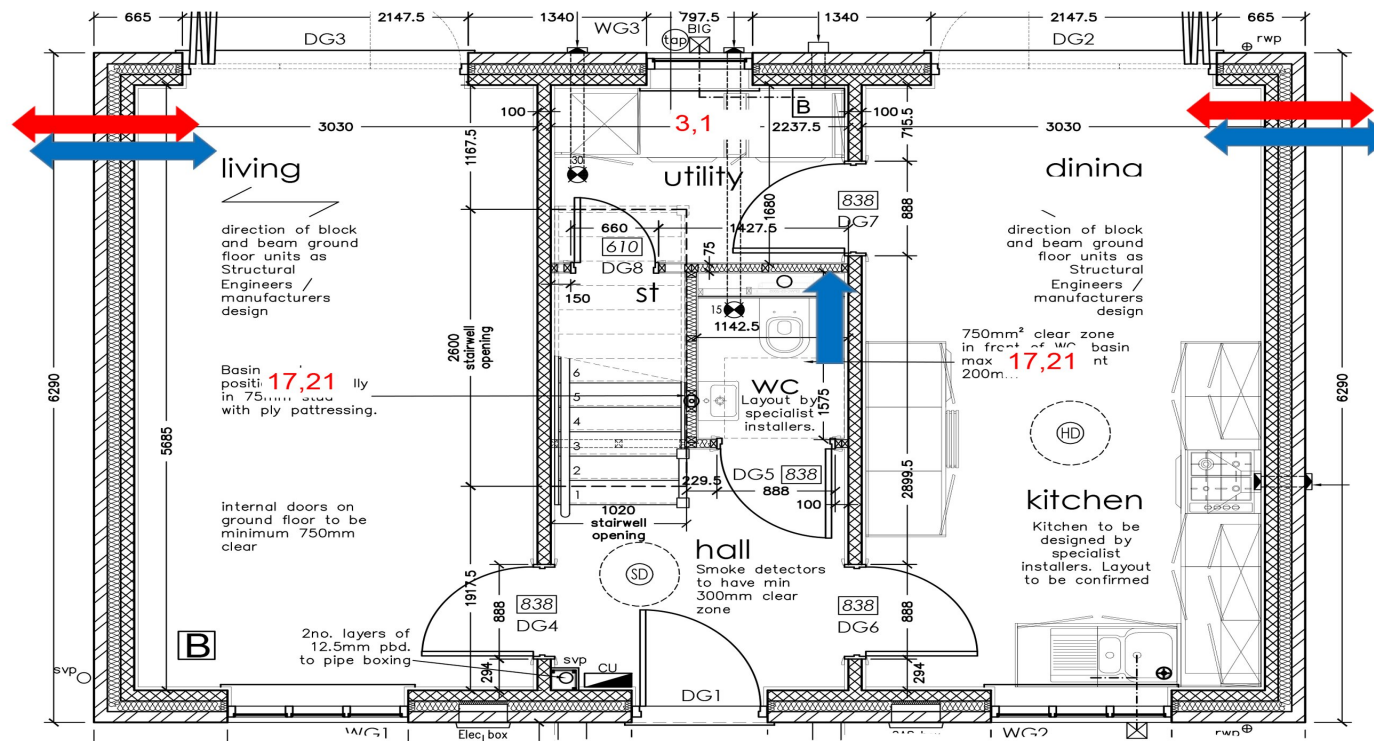


Address	Setting	Dual device no.
	1 OFF 2 OFF (Factory setting)	1
	1 ON 2 OFF	2
	1 OFF 2 ON	3
	1 ON 2 ON	4



Installation Fine fine particle filter « F7





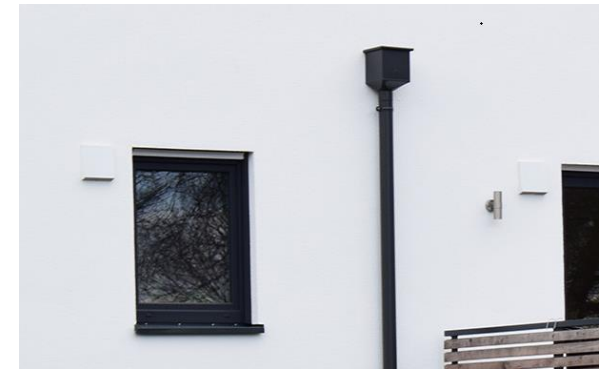
AirUnit configuration and setup software



Features

- » Easy connection using a standard USB to USB type B cable
- » Quick adaptation to customer requirements
- » Operating hours always in view
- » Clearly arranged structure

AirUnit ventilation in practice







Energy Carbon Ltd.,
Kemp House, 152-160, City
Road,
London. EC1V 2NX

0203 507 1659
www.energycarbon.co.uk

Sole UK distributors for

mfh systems GmbH · Hager Feld 8 · 49191 Belm
Fon +49 (0) 54 06 | 6 99 95-10 · Fax +49 (0) 54 06 | 6 99 95-90
mail@mfh-systems.com · www.mfh-systems.com