

Design of ventilation systems according to



The Building Regulations 2010

Ventilation

APPROVED DOCUMENT

F1 Means of ventilation

F

Prepared for

GUIDANCE

2010 edition
incorporating 2010 and
2013 amendments

ONLINE VERSION

A revision will take place in 2020 but the required volume flows will not change.

There are 3 selection criteria for selecting the required volume flows.

1. Exhaust air volume flows by room

Table 5.1a Extract ventilation rates

Room	Intermittent extract		Continuous extract
	Minimum rate	Minimum high rate	Minimum low rate
Kitchen	30 l/s adjacent to hob; or 60 l/s elsewhere	13 l/s	
Utility room	30 l/s	8 l/s	Total extract rate should be at least the whole dwelling ventilation rate given in Table 5.1b
Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

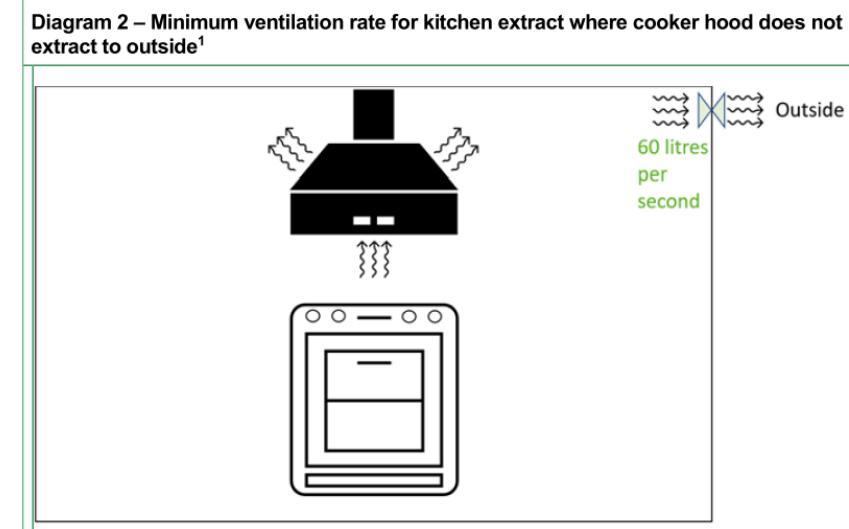
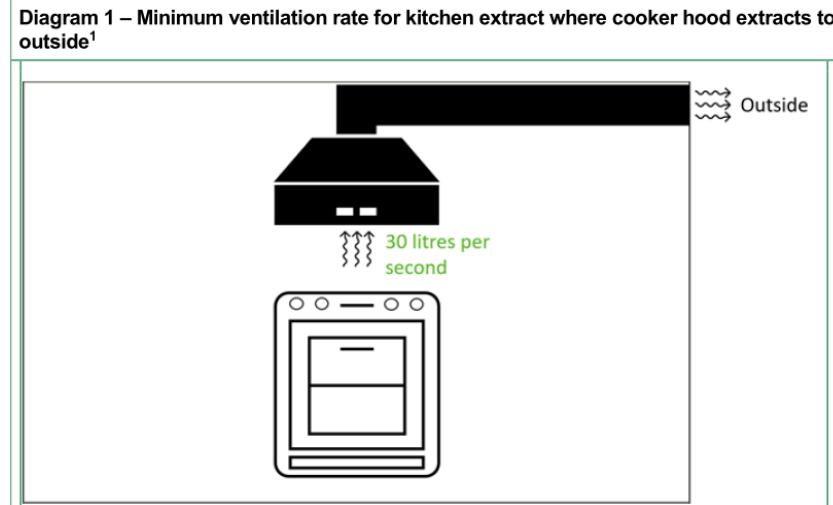
2. Ventilation rate by number of bedrooms

Table 5.1b Whole dwelling ventilation rates

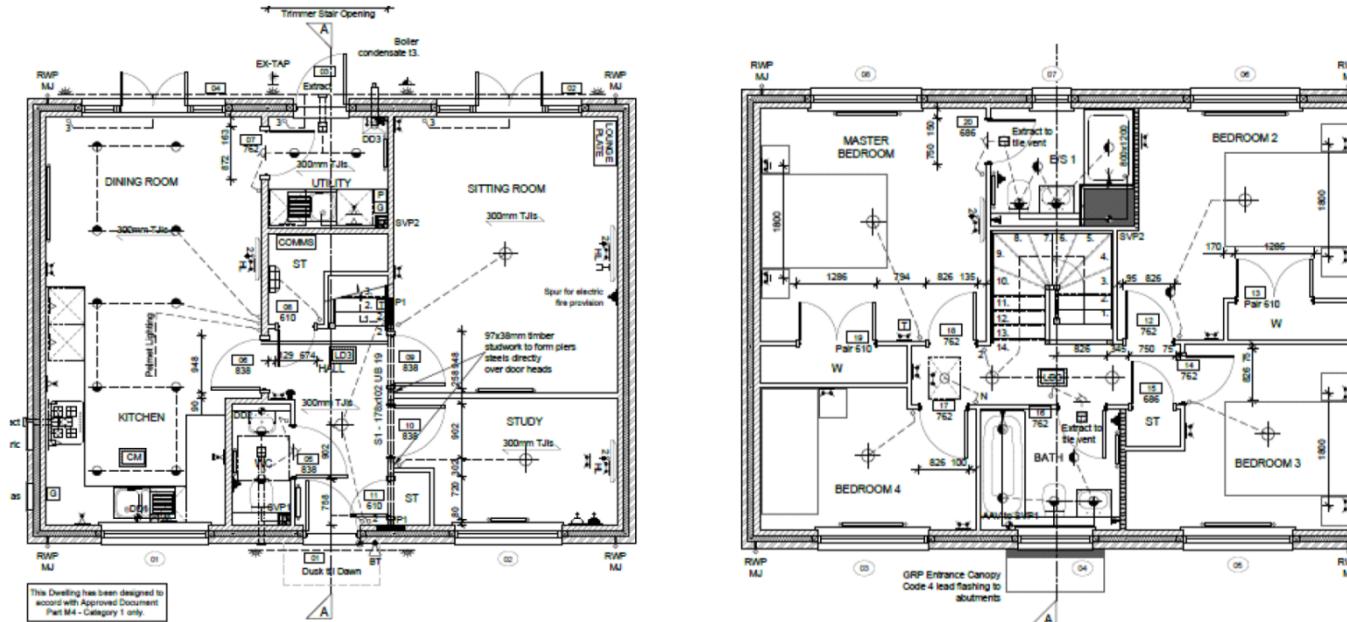
	Number of bedrooms in dwelling				
	1	2	3	4	5
Whole dwelling ventilation rate ^{a,b} (l/s)	13	17	21	25	29
Notes:					
a. In addition, the minimum ventilation rate should be not less than 0.3 l/s per m ² of internal floor area. (This includes all floors, e.g. for a two-storey building add the ground and first floor areas.)					
b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected add 4 l/s per occupant.					

3. the minimum ventilation rate of 0,3 l/(s*m²)

Different qualities in the kitchen



Example



Living area $2 \times 64.1 \text{ m}^2 = 128.2 \text{ m}^2$

Dimensioning Exhaust Air / Intermittent extract

1. Exhaust air volume flows by room

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Exhaust air is to high for AirUnit -> use external exhaust air fans

Dimensioning Supply Air

2. Ventilation rate by number of bedrooms

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	Number of bedrooms in dwelling				
	1	2	3	4	5
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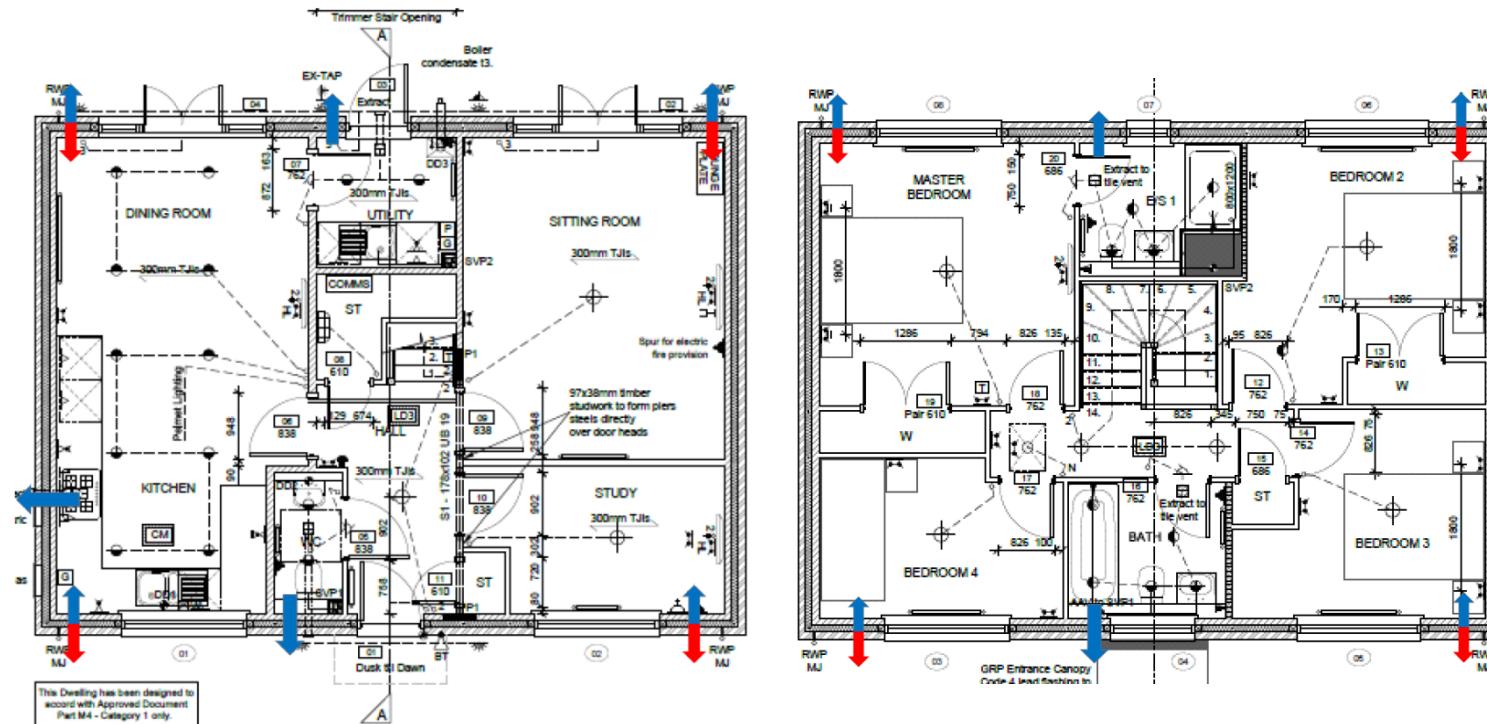
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3. the minimum ventilation rate of 0,3 l/(s*m²)

$$128,2 \text{ m}^2 \times 0,3 \text{ l}/(\text{s} \cdot \text{m}^2) = 38,5 \text{ l/s}$$

-> Ventilation system has to fulfill 38,5 l/s (138,6 m³/h) in the supply air rooms

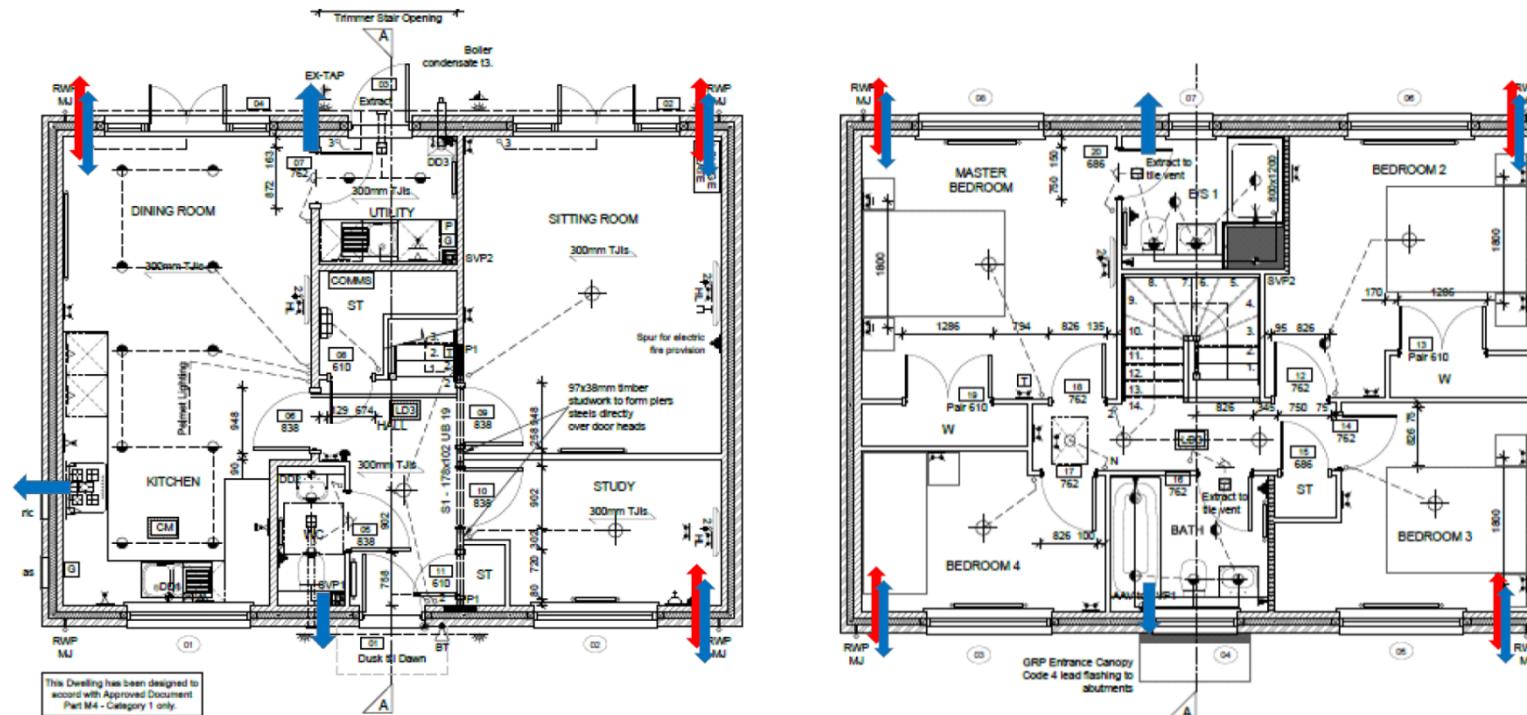
Example - AirUnit Solus and external exhaust air fans



Standard mode: 8 x AirUnit Solus $15 \text{ m}^3/\text{h} = 120 \text{ m}^3/\text{h} = 33,3 \text{ l/s} < 38,5 \text{ l/s}$

Blast mode: 8 x AirUnit Solus $20 \text{ m}^3/\text{h} = 160 \text{ m}^3/\text{h} = 44,4 \text{ l/s} > 38,5 \text{ l/s}$

Example - AirUnit GeMini and external exhaust air fans



Standard mode: 7 x AirUnit GeMini 21 m³/h = 147 m³/h = 40,8 l/s > 38,5 l/s

Dimensioning Exhaust Air / Mixing Intermittent and Continuous extract

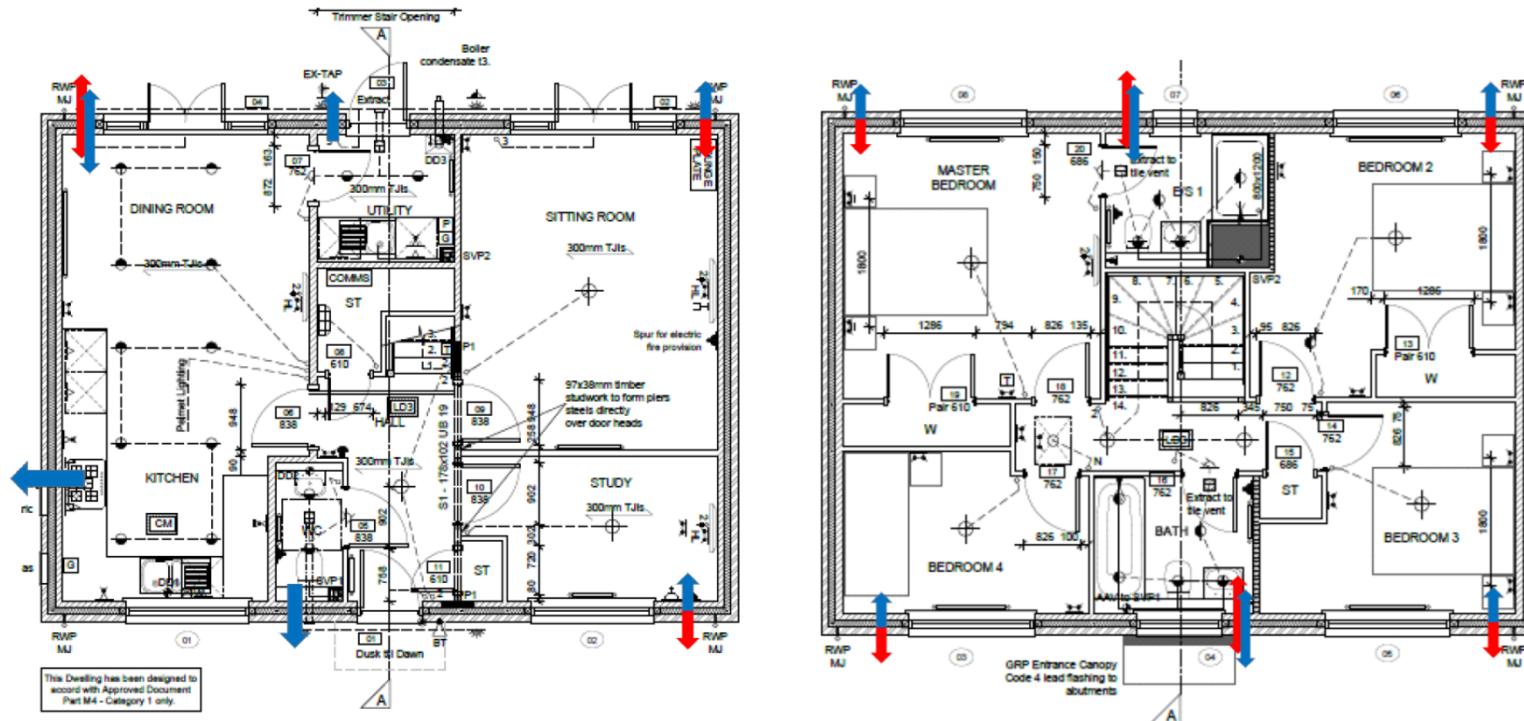
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Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

-> use external exhaust air fans in the ground floor

Example - AirUnit Solus and Gemini and external exhaust air fans



6 x AirUnit Solus 15 m³/h + 3 x AirUnit GeMini 21 m³/h = 153 m³/h = 42,5 l/s > 38,5 l/s
AirUnit Gemini is controlled by a humidity sensor with max. 11,6 l/s (Bathrooms???)

AirUnit Solus

Daten

- » 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 Zulassung Z-51.3-363

Maße

- » Wall duct Ø 198 mm, Length 495 mm
 - » NEOPOR mit integriertem Gefälle, einfache Längenanpassung
- » Wall duct square 250 x 250 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



Compact control PRO, wired

Daten

- » 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)



Electrical connection

- Supply voltage 230 V / 50 Hz
- » Output 12 V (min. 3 x 0,6 mm²) to the ventilation units)

Compact control PRO, wired

Additional functions

Sleptimer (2 h)
Operating hours counter
External digital input
(Bath fan operation)
RS-485 interface
Demand-driven sensor operation (humidity, CO₂,
Modbus interface
Integration into BUS system
USB service interface



Extension for the PRO control

Date compact in-wall power supply

- » For up to 6 additional ventilation units
- » Max. 2 extension sets to one PRO control
- » Max. 16 ventilation units (4+6+6)
- » Supply voltage 230 V / 50 Hz
- » Output 12 V (min. 3 x 0.6 mm² to the ventilation units)



Humidity sensor for PRO control

Date

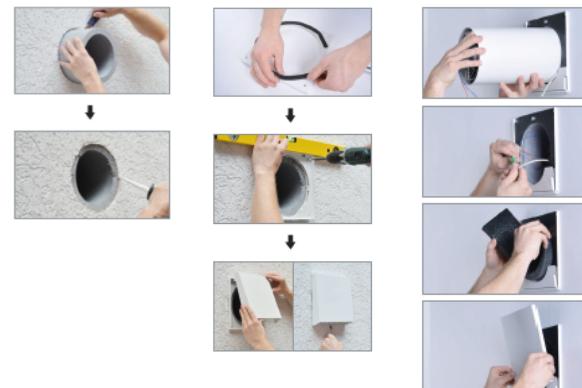
- » Air humidity sensor in flush-mounted h
- » Fully automatic sensor operation
- » Up to 4 sensors per control
- » Connection via BUS
- » Dimensions 80 x 80 mm



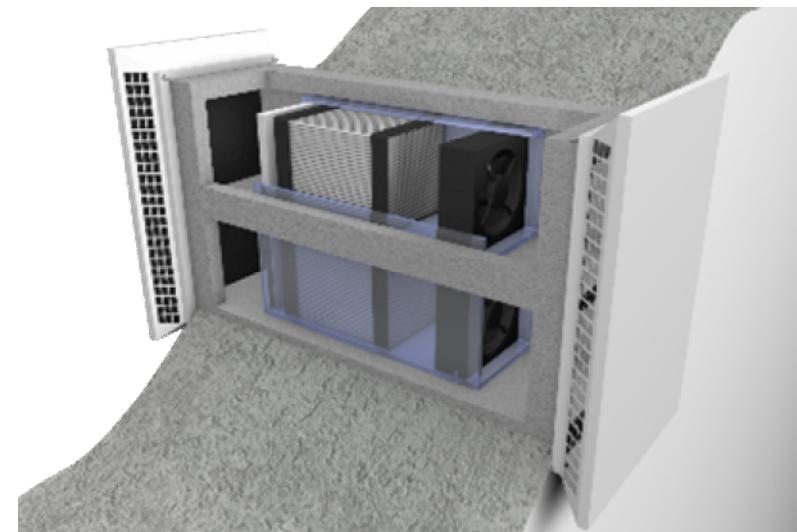
Installation Rough assembly set



Installation Final assembly set



AirUnit Gemini



Einsatz

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



AirUnit GEmini

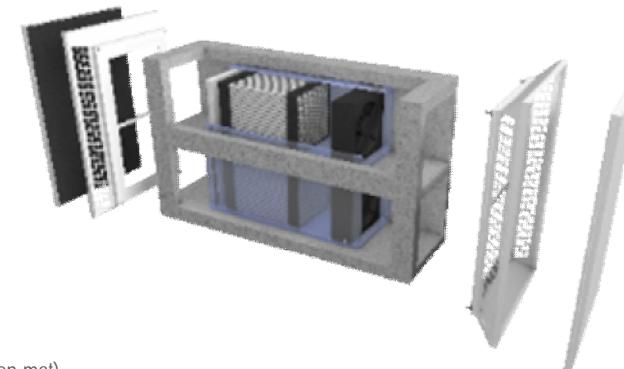
Date

- » 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, regenerable

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)



Regelung

Einbindung in die normale Regelung

- » 4 Leistungsstufen + Abluftbetrieb + AUS
- » Betriebsarten
 - » Winterbetrieb inkl. Warmerückgewinnung
 - » Querlüftung (z.B. als nächtliche Kühlung 8 h)
- » Statusanzeige (Filterwechsel)
- » Für 4 Ventilatoren z.B. 2 x AirUnit + 1 x GEmini
- » Inkl. Abdeckrahmen
- » Maße 80 x 80 x 49 mm (einfache Wanddose)



Elektrischer Anschluss

- » Versorgungsspannung 230 V / 50 Hz
- » Output 12 V (min. 4 x 0,8 mm² zu den Lüftungsgeräten)



Regelung

Zusatzfunktionen

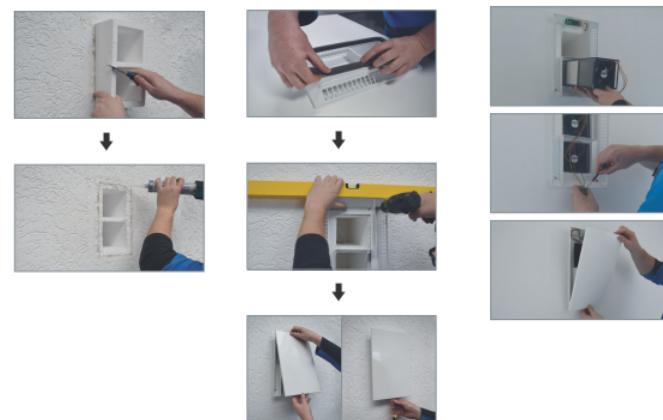
- » Sleeptimer (2 h)
- » Betriebsstundenzähler
- » Externer Digitaleingang
 - » (Badlüfterbetrieb)
- » RS-485 Schnittstelle
 - » Bedarfsgeführter Sensorbetrieb (Feuchte, CO₂, VOC)
- » Modbus-Schnittstelle
 - » Einbindung in BUS-System
- » USB Service-Schnittstelle



Installation Rough assembly set



Installation Final assembly set



Extended control - exhaust air operation

Integrated humidity sensor

The integrated humidity sensor measures only in the exhaust air phase
If required, Gemini automatically switches to pure exhaust air operation 40 m³/

External activation of the humidity sensor

Exhaust air operation can optionally be activated via a light switch

Control in the complete system

The other AirUnit Solus units switch to Disbalance

