



# AIRUNIT GEMINI

Decentralised domestic ventilation



**Assembly / disassembly instructions**

# Assembly / disassembly instructions AIRUNIT GEMINI

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## 1. Delivery state

The **AIRUNIT GEMINI** is a device for home ventilation with heat recovery and additional exhaust air function. In heat recovery mode, the room is ventilated and exhausted in a balanced manner, thus ensuring a pleasant indoor climate and consistently high air quality.

### 1.1 Scope of delivery

- Ventilation unit **AIRUNIT GEMINI**
- Installation instructions

The following products are also required for the overall system **AIRUNIT**:

- **AIRUNIT** Control
- Air quality sensors (optional)

## 2. Information for users

The unit may only be used for its intended purpose. Improper use, inadequately performed installation or maintenance work as well as structural modifications may impair the function and safety of the ventilation unit and will void any warranty claims.

Before installing the device, check the delivery for completeness and intactness and contact your supplier directly if any parts are missing or damaged.

### 2.1 Safety and warning instructions

- Read these instructions carefully and completely before starting the installation.
- Transport: To protect all parts from damage, they should remain in their original packaging until they reach the installation site. Internal parts may be damaged by shock or falling.
- Damaged devices or parts must not be put into operation.
- The safety stickers and type plates must not be removed.
- The device is not ready for operation when delivered and must first be connected by a qualified electrician.
- Assembly and maintenance work on the ventilation unit may only be carried out by trained specialists in compliance with the regulations on occupational safety and accident prevention.
- All assembly and installation work must always be carried out in a de-energised state.
- **AIRUNIT** ventilation systems may only be installed and operated inside the building.  
When selecting the unit location, ensure that the ventilation unit is accessible for inspection and maintenance work.
- The device must not be installed near flammable liquids or gases.
- When installing the ventilation units, observe the recognized rules of technology (ARdT) with regard to equipment installation, electrical work, fire protection and the specifications for the ventilation of living spaces (DIN 1946-6).

### 2.1.1 Intended use


**AIRUNIT** ventilation systems with heat recovery are designed for controlled room ventilation. The units may only be used for conveying air. The conveyance of aggressive, flammable or highly dusty media is not permitted. Never operate the units without the filter installed in the unit.

The connection of ventilation lines is not permitted. **AIRUNIT** ventilation systems are not suitable for drying out buildings; the units should only be operated after the construction work has been completed.

Appliance operation in conjunction with fireplaces may require additional safety equipment (Feuerungsverordnung FeuV). You can obtain the relevant information from your regional chimney sweep.

### 2.1.2 Symbols and notation

A warning is composed of a signal word and a warning symbol as well as text describing the extent of the hazard:

<b>SIGNAL WORD</b>	<b>Type and source of hazard</b>
	Consequences of not observing the warning. <ul style="list-style-type: none"><li>• Countermeasure that must be taken to avoid the hazard.</li><li>• further countermeasures, if necessary ...</li></ul>

The following hazard levels are present:

<b>DANGER</b>	indicates an immediate hazard that will result in death or serious injury if not avoided.
<b>WARNING</b>	indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
<b>CAUTION</b>	indicates a hazard that may result in minor or moderate injury if not avoided.

<b>Attention!</b>	indicates a hazard that can result in malfunctions and / or damage to property if it is not avoided.
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<b>Notice</b>	indicates useful and further information as well as application tips, but not safety instructions.
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## 2.2 Function and application

The decentralised ventilation system of type **AIRUNIT GEMINI** is a device for domestic ventilation with and without heat recovery. The fans in the decentralised ventilation unit of type **GEMINI** run simultaneously in opposite directions of rotation (push-pull operation), i.e. one fan conveys outside air into the installation room of the ventilation unit, while the other fan conveys exhaust air from the installation room into the open air. There is no mixing of the air flows at any time. A decentralised ventilation system of the type **GEMINI** thus consists of two individual ventilation units in one housing, which are equipped with a central control system. The air ducts of both units are structurally separated from each other and sealed. Mixing of supply and exhaust air flows is therefore not possible. In the venting cycle, the thermal energy of the exhaust air volume flow is loaded into the heat exchanger. The absorbed heat energy is released back to the supply air in the ventilation cycle. In this phase, regenerative heat transfer takes place, whereby the outside air is heated and fed back to the installation room as supply air. In this way, heat recovery of up to 98 % is achieved. The cycle time for changing the direction of rotation of the axial fans is approx. 70 seconds.

Via the integrated humidity sensor or alternatively via a switch, the unit can be set to pure exhaust air operation, resulting in an exhaust air volume flow of 40 m<sup>3</sup>/h.

## 2.3 General

With **AIRUNIT GEMINI** ventilation units, the following ventilation options are available:

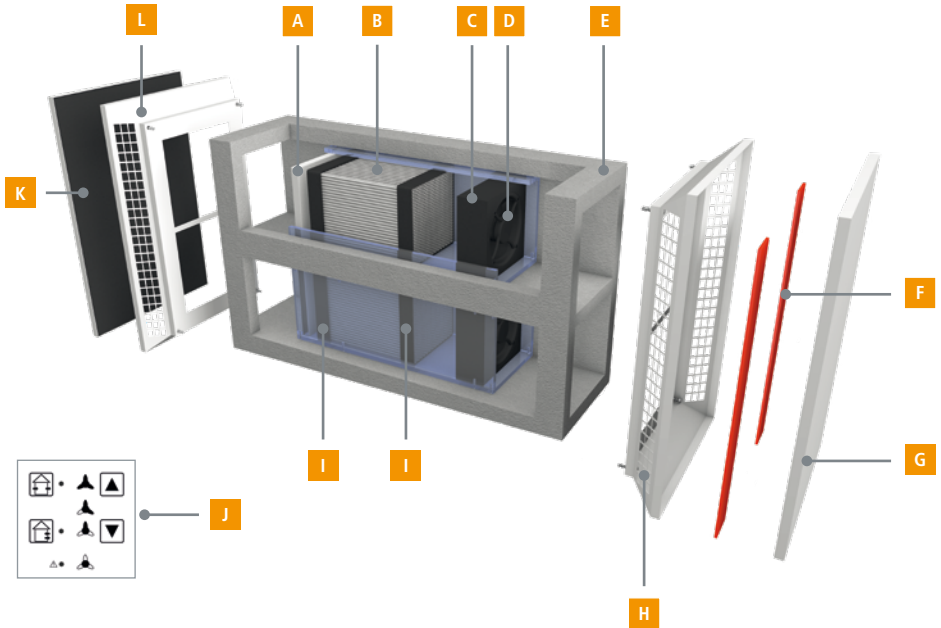
- Ventilation of a room / living unit with a ventilation unit,
- in the interval alternating supply / exhaust air operation with heat recovery,
- Cross ventilation without heat recovery and
- Exhaust air operation without heat recovery.

**AIRUNIT GEMINI** ventilation units are suitable for ventilating apartments or comparable utilization units. This is possible due to the fans in the ventilation unit working in push-pull mode, which in total ensure a balanced volume flow of supply and exhaust air.

In interior, windowless exhaust air rooms such as kitchens, bathrooms and toilets, **AIRUNIT GEMINI** units must not be used, as it is not permissible to connect the units to a shaft or duct. Here, the use of an exhaust fan is recommended (according to DIN 18017 T.3). Unit installation in basement rooms with light wells is also not possible, as recirculation of the exhaust air cannot be ruled out. To avoid recirculation when the units are installed on a facade, a minimum distance of 1.0 m should be maintained between individual units. We recommend not using the unit if the building is exposed to wind (average wind speed > 5 m/s). To avoid drafts caused by the operation of the ventilation units, room-side air outlets should not be arranged directly above seating areas or similar. Ensure that the room-side air diffuser is not obstructed by furniture or curtains.

### 3. Overview AIRUNIT GEMINI

- |                                     |   |
|-------------------------------------|---|
| <b>A</b> Filter ISO Coarse 50% (G3) | <b>G</b> Inner panel                          |
| <b>B</b> Heat exchanger             | <b>H</b> Room side air diffuser               |
| <b>C</b> Fan support                | <b>I</b> Waterproofing                        |
| <b>D</b> Fan                        | <b>J</b> Regulation                           |
| <b>E</b> Wall duct angular          | <b>K</b> Outer hood (weather protection hood) |
| <b>F</b> Closure strip              | <b>L</b> Wall bracket                         |



A complete **AIRUNIT GEMINI** ventilation unit consists of a square or round wall duct with integrated slope and two fan units.

The fan units consist of

- one reversible fan each (D) 12 V/DC,
- Ceramic heat accumulator (B) for heat recovery,
- the device electronics, filter (ISO Coarse 50% / G3, optional pollen filter ePM1 55%) and
- Sealing tapes enclosed in a square housing.

The room-side air diffuser (G) is provided by a closable and sound-insulated inner screen (F). The outdoor air diffuser is provided by an outdoor hood or weather protection hood (J). The unit is operated via the wired **AIRUNIT** control (J) (accessories).

## 4. Installation

### 4.1 Preparation

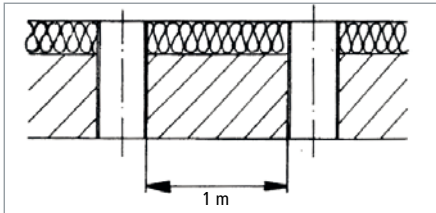
Notice	Before installing <b>AIRUNIT GEMINI</b> ventilation units, a ventilation concept should be prepared from which
	<ul style="list-style-type: none"><li>• the number of ventilation units,</li><li>• their installation location and</li><li>• the position / number of the associated <b>AIRUNIT</b> regulations are to be taken.</li></ul>

When selecting the installation location, pay attention to the exterior view of the building. To ensure that the units blend harmoniously into the building facade, the units should be installed at the same height / at the same distance from windows, for example.

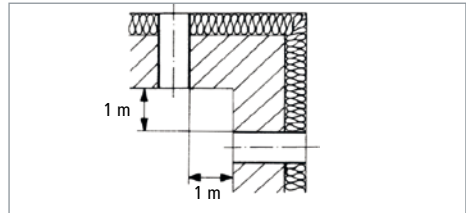
Observe the dimensions of the air diffusers on the outside or room side. It is **recommended to keep a minimum distance of 200 mm around the wall duct to adjacent facade components / elements and room corners!**

**Attention!** The **AIRUNIT GEMINI** units must not be covered by furniture or curtains.

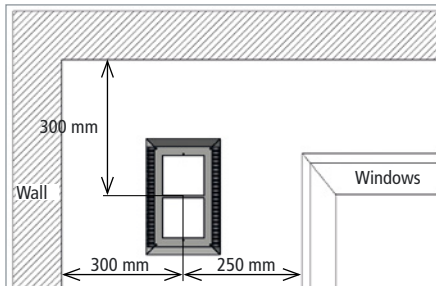
Minimum distances during installation:



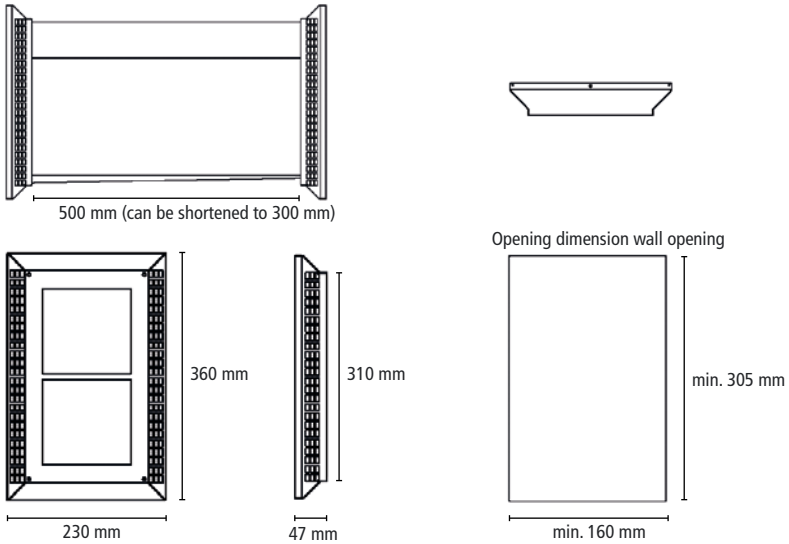
Recommended minimum distance when installing in a wall.



Recommended minimum distance when installing across corner.



## 4.2 Dimensions AIRUNIT GEMINI



## 4.3 Creating a core hole for wall penetration



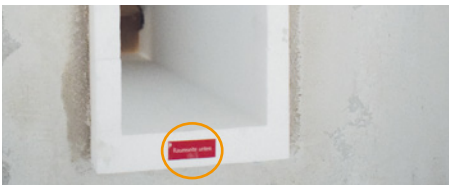
Create two core drill holes with a diameter  $\geq 160$  mm for the angular wall penetration and remove the hatched area to obtain a wall opening of min. 160 x 305 mm (W x H).

**Notice:** Alternatively, brick the wall bushing squarely into the masonry. In both cases, make a cable slot on the upper right edge for the connection cable. For the round wall duct, you need two core drill holes with a diameter of  $\geq 180$  mm.

## 4.4 Wall duct

Wall ducts are available in two different designs for the **AIRUNIT GEMINI** ventilation units:

- angular (length 500 or 1000 mm) or round (500 mm)



All wall ducts are manufactured with an integrated slope to the outside to drain condensate (note marking for the room side, see fig. left).



### 4.4.1 Mounting the wall duct



Slide the wall duct into the wall opening and, if required (e.g. for additional plaster or insulation layers), allow the wall duct to protrude accordingly on the room and facade sides.

**Attention!** To ensure stress-free assembly / disassembly (maintenance) of the fan / heat accumulator in the wall duct, deformations of the wall duct due to external pressure / tension must be avoided! Always ensure that the wall duct is installed with a **gradient to the outside!**

Seal the wall duct to the masonry inside and outside with a suitable sealing compound.

**Notice:** For larger wall openings, the cavities between the wall opening and the wall duct can be filled with non-pressing installation foam. The wall penetration can be shortened flush with a carpet knife after completion of the wall.

### 4.4.2 Inserting the connection cable into the wall duct



Insert the connection cable (min. J-Y(ST)Y 2x2x0.6 mm<sup>2</sup>) above (right / view room side) into the wall bushing.

**Notice:** Leave the connecting cable at **length of the wall duct** over.



Close the wall duct on the inside and outside with the supplied plaster covers to prevent soiling of the wall duct.

## 4.5 Finished assembly



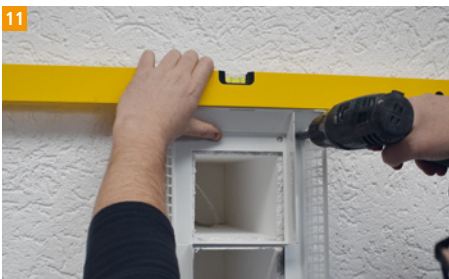
After completion of the insulation / plastering work, remove the plaster covers on the inside and outside. Adjust the wall duct to the dimension of the finished wall by shortening the wall duct flush with the wall using a carpet knife or a hot wire **room and facade side**.



To protect against water penetration into the wall opening, seal the transition on the facade side to the wall duct **all around** with a suitable sealing material.



Stick the supplied sealing tape all around the back of the outer wall bracket.

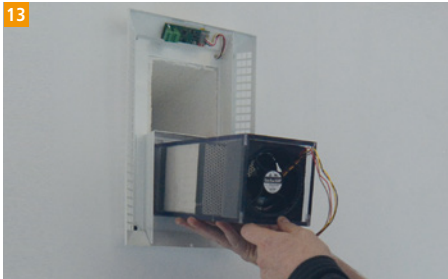


Mount the wall bracket (see chap. **Overview AIRUNIT GEMINI**, letter L) of the weather protection hood using suitable fasteners.



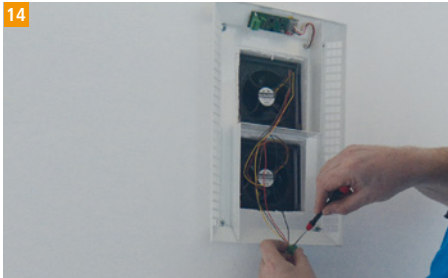
Install the outer hood (weather protection hood) of the **AIRUNIT GEMINI** ventilation unit (see chap. **Overview AIRUNIT GEMINI**, letter K).

**Notice:** The outer hood (weather protection hood) is hooked into the attached tabs on the upper edge of the wall bracket and fixed to the underside of the wall bracket with the supplied fixing screw.



Mount the console of the design panel with suitable fastening elements with the unit electronics facing upwards. Carefully slide the fan units (fan pointing towards the room) into the wall bushing.

**Attention!** Make sure that the connecting cable of the fan is not kinked / damaged in the process.



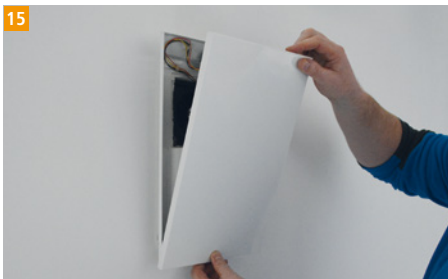
Connect the connection cables of the fans with the plug connections of the electronics and fasten the connection cables in the cable holders provided.

**DANGER**

**Risk of injury from electricity!**



- Before carrying out electrical work, the power supply must be disconnected and secured against reconnection.



Close the outer hood (weather protection hood) and secure it with the fastening screw on the top.

## 5. Electrical connection

**DANGER**



### **Risk of injury from electricity!**

There is a risk of injury from electric current.

- Before carrying out electrical work, disconnect the power supply to and secure it against reconnection.
- The device is not ready for operation when delivered and must first be connected by a qualified electrician.
- The electrical installation may only be carried out by competent persons in accordance with the applicable legal requirements.
- Installation must comply with national and/or local electrical codes.
- A residual current circuit breaker (rated residual current  $\leq 30$  mA) is required for each current circuit.

The supply voltage of the **AIRUNIT** control is 230 V/50 Hz. The following specifications must be observed:

- The ventilation units are controlled by 12 V direct voltage (DC), therefore the ventilation units must never be connected to the 230 V mains voltage of the control electronics.
- As a connection cable for the **AIRUNIT GEMINI** ventilation units, a cable min. J-Y(ST)Y 2x2x0.6 mm<sup>2</sup> up to a connection length of 30 meters is recommended.
- A sheathed cable 3 x 1.5 mm<sup>2</sup> (e.g. NYM-J 3 x 1.5 mm<sup>2</sup>) is recommended as the supply cable.

The **AIRUNIT** control must be connected as stationary equipment with permanently installed cables (for further information on the installation and electrical connection of the **AIRUNIT** control, see the installation and operating instructions).

## 6. Setting

### 6.1 Setting the DIP switches

When connecting several **GEMINI** ventilation units, the address must be set on the unit electronics. The DIP switches must be set as follows:



1 OFF | 2 OFF (factory setting)



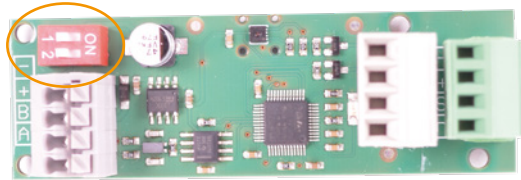
1 ON | 2 OFF



1 OFF | 2 ON



1 AN | 2 AN



#### Attention!

Each address can only be assigned once. A maximum of 4 **GEMINI** ventilation units can be operated in one system.

## 7. Commissioning

After completion of the assembly activity, the device function must be checked.

#### Attention!

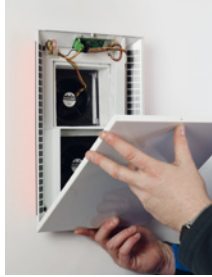
Before checking, make sure that the airways of the ventilation unit are free of assembly residues / foreign bodies and that all electrical work has been carried out and completed properly!

After switching on the power supply (usually via the circuit breaker of the electrical installation), the **AIRUNIT GEMINI** can be put into operation via the control panel of the **AIRUNIT** control. During commissioning, check all device functions described in the operating instructions of the control. During the check, make sure that the fan motor runs smoothly and evenly.

Any malfunctions or faults detected in the **AIRUNIT** fans must be rectified before the unit is finally put into operation. Possible causes of faults and their rectification are described in the chapter **Malfunctions** (see control operating instructions). Document the properly performed installation / functional test of the ventilation unit(s) in the commissioning log.

## 8. Decommissioning

When the unit is shut down or on instruction (e.g. fire department), the inner panel of the unit can be closed mechanically. This prevents outside air from entering the installation room when the unit is switched off.



Disassemble the inner panel of the **AIRUNIT GEMINI** ventilation unit (see chap. **Overview AIRUNIT GEMINI**, letter G).



Pull off the first sealing strip in the inner panel (see chap. **Overview AIRUNIT GEMINI**, letter F).



Glue the first sealing strip from the outside onto the room-side air diffuser (see chap. **Overview AIRUNIT GEMINI**, letter H), to mechanically seal the inner panel.



Pull off the second closure strip in the inner panel.

5



Glue the second sealing strip from the outside onto the room-side air diffuser (see chap. **Overview AIRUNIT GEMINI**, letter H) to mechanically close the inner panel.

6



Mount the inner panel of the **AIRUNIT GEMINI** ventilation unit.

7



The inner panel of the unit is mechanically closed and no outside air enters the installation room when the unit is switched off.

## 9. Disassembly

**DANGER**



### **Risk of injury from electricity!**

There is a risk of injury from electric current.

- Before carrying out electrical work, disconnect the power supply to and secure it against reconnection.
- The device is not ready for operation when delivered and must first be connected by a qualified electrician.
- The electrical installation may only be carried out by competent persons in accordance with the applicable legal requirements.
- Installation must comply with national and/or local electrical codes.
- A residual current circuit breaker (rated residual current  $\leq 30$  mA) is required for each current circuit.

	Tool
A	Phillips screwdriver small
B	Slotted screwdriver small
C	Putty knife
D	Side cutter (for cutting through cables or wires)
E	Cutter
F	Hammer and chisel

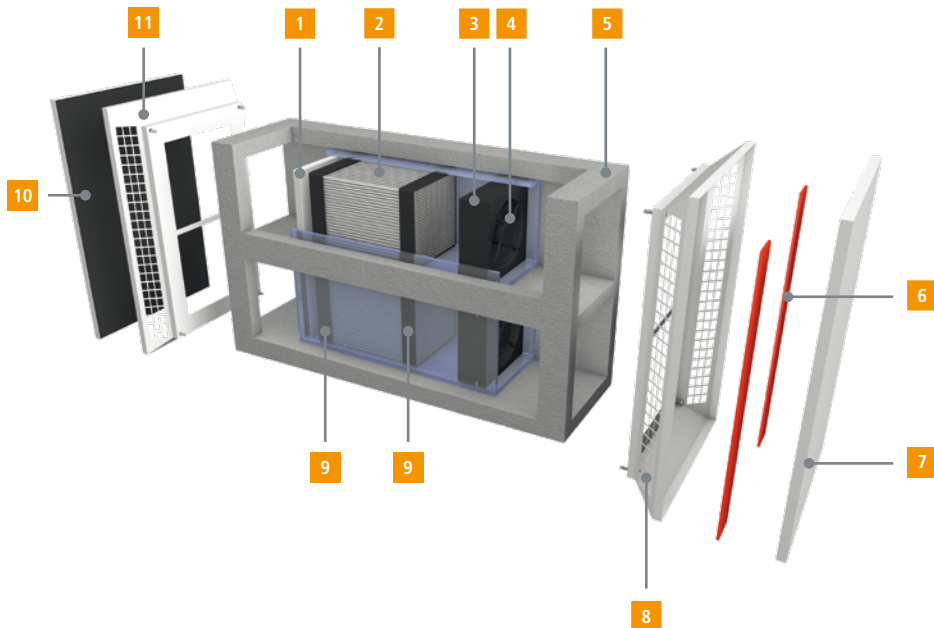
**Notice**

The letter designation of the tool required for the current disassembly step is listed in brackets on the next page.



- 1 Filter ISO Coarse 50% (G3)
- 2 Heat exchanger
- 3 Fan support
- 4 Fan
- 5 Wall duct square
- 6 Closure strip

- 7 Inner panel
- 8 Room side air diffuser
- 9 Waterproofing
- 10 Outer hood (weather protection hood)
- 11 Wall bracket



- Remove the cover of the inner panel (A)
- Cut out the insulation of the hood (C)
- Disassembling the inner wall console
- Disconnect the plug connection
- Plug connection of the power supply cable and disconnect fan (B)
- Remove fan unit from wall duct
- Remove the screws of the fan units (A)
- Remove heat exchanger with sealing ring
- Remove sealing ring from heat exchanger (C)
- Remove filter
- Separate fan holder and fan
- Remove outer hood from wall console (A)
- Remove insulation from outer hood (C)
- Remove outer wall bracket (C)
- Remove wall duct from outer wall (E, F)

## 10. Technical data

AIRUNIT fan unit	
Air performance	5   10   21   30 m <sup>3</sup> /h in WRG operation / 40 m <sup>3</sup> /h in exhaust air operation
Sound power level	23   34.5   49   55 dBA / 49 dBA in exhaust air mode
Sound pressure level at a distance of 1 meter	15.2   26.5   41.0   47.2 dBA / 41.0 dBA in exhaust air mode
Power consumption	0.8   1.7   2.7   4.1 W / 2.7 watts in exhaust air mode
Regulation	4 power levels + exhaust air mode
Filter class	Filter ISO Coarse 50% (G3), regenerable
Supply voltage	230 V / 50 Hz
Heat recovery	up to 98
Remote control	yes
DIBt approval	Z-51.3-466
Mains voltage	200-250 AC / 50-60 Hz
Fan	12 V / EC, direct current
Dimensions ventilation unit	155 x 300 mm (W x H) Length 500 mm (can be shortened to 300 mm)
Membrane keypad	Power levels, winter & summer operation, filter level indicator
Power section	80 x 80 x 49 mm including cover frame, cannot be combined with other switch ranges

# Folding instructions plaster cover



## AIRUNIT – Decentralised domestic ventilation

### ErP data sheet

	Description	Values		
a	Supplier	mfh systems GmbH		
b	Model identifier	AIRUNIT GEMINI		
c	SEV class / Specific energy consumption [kWh/m <sup>2</sup> a]	cold	-82.5	
		average	A	-41.1
		warm		-17.3
d	Ventilation type	Living space ventilation system (WLA) + two-direction-Ventilation system (ZLA)		
e	Type of drive	Multi-stage drive		
f	Type heat recovery system	Regenerative		
g	Degree of temperature change $\eta_t$ [%]	75 %		
h	Highest air volume flow [m <sup>3</sup> /h]	30		
i	Electrical input power (incl. control) [W].	4		
j	Sound power level $L_{wa}$ [dB(A)]	49		
k	Reference air volume flow [m <sup>3</sup> /h]	21		
l	Reference pressure difference [Pa]	0		
m	SEL [W/m <sup>3</sup> /h]	0.13		
n	Control factor	Control according to local need		
o	Internal and external air leakage rate [%].	0		
p	Mixing rate [%]	0		
q	Location and description of the filter change indicator Please change / clean the filter regularly, to maintain the device characteristics	Control (optical display)		
r	Instructions for controllable supply and exhaust air grilles on the facade (one-directional LG only)	–		
s	Internet address	<a href="http://www.airunit.info">www.airunit.info</a>		
t	Pressure fluctuation sensitivity [%]	40		
u	Airtightness between inside and outside [m <sup>3</sup> /h]	3.6		
v	Annual electricity consumption [kWh/(m <sup>2</sup> a)]	0.9		
w	Annual heating energy savings [kWh/(m <sup>2</sup> a)]	cold	84.7	
		average	43.3	
		warm	19.6	



## EU Declaration of Conformity EU Declaration of Conformity

Residential ventilation *ventilation unit*

### **Manufacturer** *Manufacturer:*

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

The undersigned hereby confirms that the device(s) designated below comply with the following relevant EU directives. Any modification of the device(s) will invalidate this declaration.

*The undersigned hereby certifies that the following device(s) complies with the applicable EU directives. This certification loses its validity if the device(s) is/are modified.*

### **Designation**

Decentralized ventilation unit with heat recovery  
AIRUNIT GEMINI

### *Designation*

*Local ventilation unit with heat recovery  
AIRUNIT GEMINI*

### **EU Directives** *EU Directives*

EMC Directive 2014/30/EU  
EMC Directive 2014/30/EU

Belm-Vehrte, 03.01.2020

Place and Date of issue

Daniel Schuschan  
Managing Partner | Shareholder MD





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