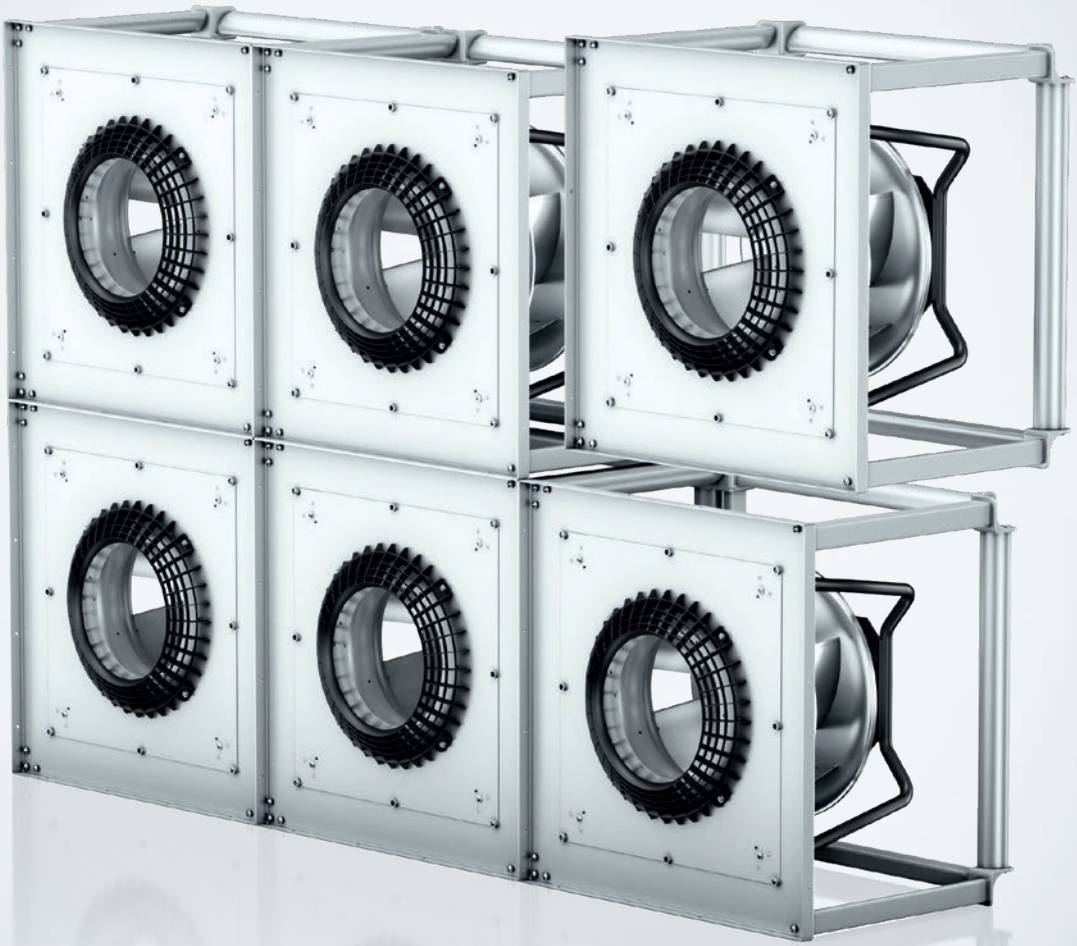
FanGrid design kit.

Modular solutions for high air performance levels.

ebmpapst

the engineer's choice



About ebm-papst.

ebm-papst is a leader in ventilation and drive engineering technology and a much sought-after engineering partner in many industries. With around 20,000 different products, we have the perfect solution for practically every requirement. We have placed the highest emphasis on economy and ecology for many years.

We believe the consistent further development of our highly-efficient GreenTech EC technology provides our customers with the best opportunities for the future in industrial digitization. With GreenIntelligence, ebm-papst already offers intelligent networked complete solutions that are unique anywhere in the world today and that secure our customers a decisive advantage.

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Six reasons that make us the ideal partner:

Our systems expertise.
You want the best solution for every project. The entire ventilation system must thus be considered as a whole. And that's what we do – with **motor technology** that sets standards, sophisticated **electronics** and **aerodynamic** designs – all from a single source and perfectly matched.

Our spirit of invention.
We are also always able to develop customized solutions for you with our versatile team of over 600 engineers and technicians.

Our lead in technology.
We are not only pioneers and trailblazers in the development of highly efficient EC technology, we also recognized the opportunities of digitization at an early stage. Therefore, we can offer solutions today that combine the highest energy efficiency with the advantages of IoT and digital networking.

Closeness to our customers.
ebm-papst has 25 production locations worldwide (including facilities in Germany, China and the USA), together with 49 sales offices, each of which has a dense network of sales representatives. You will always have a local contact, someone who speaks your language and knows your market.

Our standard of quality.
Our quality management is uncompromising, at every step in every process. This is underscored by our certification according to international standards including DIN EN ISO 9001, TS declaration of conformity and DIN EN ISO 14001.

Our sustainable approach.
Assuming responsibility for the environment, for our employees and for society is an integral part of our corporate philosophy. We develop products with an eye to maximum environmental compatibility, in particular resource-preserving production methods. We promote environmental awareness among our young staff and are actively involved in sports, culture and education. That's what makes us a leading company – and an ideal partner for you.

Modular FanGrid solution:
several fans – countless advantages.

These days, ventilation technology has moved beyond using large individual fans to generate high air performance levels and is moving increasingly towards leveraging several centrifugal or axial fans that operate in parallel inside "FanGrids". This type of arrangement is very flexible and efficient. What's more, the redundancy ensures a high level of operational reliability; if one fan fails, the other fans compensate for the missing air quantity. The GreenTech EC fans offered by ebm-papst also help to significantly reduce operation costs.

Another advantage is that flow through upstream – and especially downstream – components such as filter and heat exchangers is more even. This results in more efficient air filtering and improved heat transfer performance. Several small fans also require less space and are lighter than a single large fan. This reduces the cost of the system and makes replacing the fans simple.

Automatically the right amount of distance.
An important factor that tends to be overlooked in practice is the risk of installation losses. If fans are installed too closely together, they tend to influence one another. The rule of thumb is that the greater a fan's volume of air to be conveyed, the further apart the fans should be.

The dimensions of the FanGrid module with cube design are very generous and large enough to prevent installation losses.

All your advantages at a glance:
- Redundancy through parallel operation
- Optimal operating point
- Large amount of air flow
- Plug & play
- No installation losses

Recommendation:
The association of ventilation system producers "Raumlufttechnische Geräte e.V." suggests that the lateral distance between the impeller and any adjoining units should be as follows:

Average distance A_m should always be wider than 1/5 of fan impeller diameter D.

D_L = mean value of the blade outlet diameter at support plate (D_{st}) and cover plate (D_{sd})

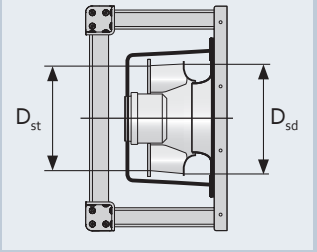
and $A_m = \frac{A_1 + A_2 + A_3 + A_4}{4}$

If you apply this recommendation to the FanGrid application, it is adhered to accordingly.

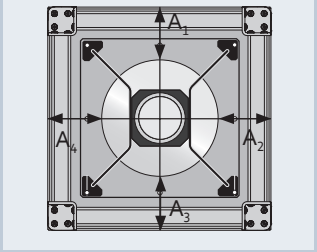
$$D_L = \frac{D_{sd} + D_{st}}{2}$$

$$A_m = \frac{A_1 + A_2 + A_3 + A_4}{4}$$

$$A_m \geq 0{,}2 \cdot D$$



D = Impeller diameter



A = Distance to the next FanGrid module

Get your *customized FanGrid solution* in just a few short steps.

Your route to obtaining a FanGrid module:

1.

Use our FanScout software to help you determine the type and number of fans that you require for your FanGrid solution.

2.

Once you're happy with the operating point and life cycle costs, you can place your order.

3.

You can order the FanGrid modules as a complete assembly kit or in individual components. You'll find the corresponding item numbers in this brochure from page 7 onwards. Starting with your chosen fan size, choose the parts that you need.

This is also where you'll find the right type of assembly material for connecting the FanGrid modules. Make sure to note down the corresponding item numbers for these as well, along with the required quantities.

4.

The final step is to reach out to your ebm-papst contact person and provide them with your item numbers and the quantity of the individual components. All done!

You can find more details in our information video and our request form at **ebmpapst.com/fanorder**

FanGrids made to measure: **the ebm-papst FanScout.**

Choosing fans the easy way.
ebm-papst has a flexible selection tool to help you find your optimal combination of fans: the ebm-papst FanScout. With the help of this selection software, ebm-papst or you, the customer, is able to determine the most economical FanGrid for your needs. You need to provide the operating point and operation time parameters as a minimum – both important for operation. Optionally, you can supply further details about the amount of available installation space, redundancy requirements and the permissible number of fans. FanScout then analyzes all of the potential sizes and the number of fans that could be used based on the expected yearly energy consumption. This is how the operating costs are calculated, to which the capital and service costs can be added in order to obtain the life cycle costs over a defined period. This cost consideration is the ideal starting point from which you can make your decision.

Functions and advantages of the software:
- Operating point can be positioned anywhere in the characteristics map
- Dynamic display of operating data at the operating points
- Comparison of different fan types
- Display of operating and nominal data
- Display of characteristic curves for conditions such as a constant efficiency level
- Calculation of life cycle costs

Superior fan technology.
Perfectly combined.

Our modular cube system

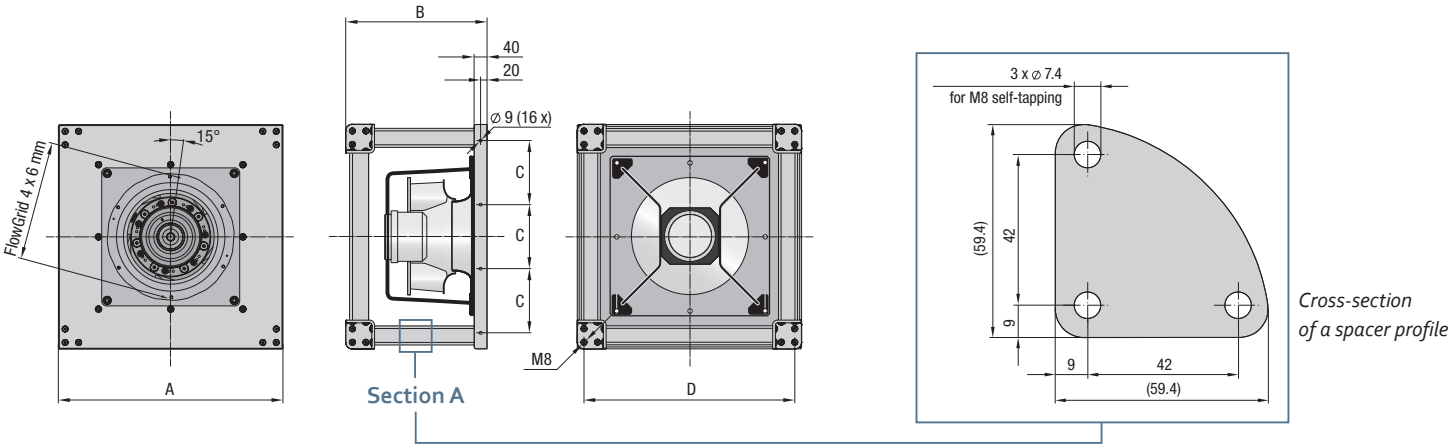
Simple handling
- Easy to transport and assemble
- Connecting elements can be purchased separately
- Customized assembly and scalability
- Mount up to five modules one on top of the other
- Direct connection of centrifugal and axial fan units
- Easy to connect

Worry-free operation
- Service-friendly modules
- Maintenance-free fans
- Operational reliability thanks to redundancy (N+x)
- Uniform flow through upstream and downstream components (filter, heat exchanger, etc.)
- Individual stepless control for each fan
- Control and monitoring via MODBUS-RTU communication

Innovative design
- High-strength, lightweight material
- Customized cube sizes possible
- Aerodynamically optimized design to prevent installation losses

Immense power range
- Power range up to ∞ m³/h

Structure of a FanGrid.



Dimensions

Size	Item number	A	B	C	D
FanGrid 400	**K3G 400-PA27-W4**	700	522	200	658
FanGrid 450	**K3G 450-PA31-W3**	800	620	200	758
FanGrid 500	**K3G 500-PB24-W3**	900	650	225	858
FanGrid 560	**K3G 560-PB31-W3**	1,000	722	250	958

All dimensions in mm, data sheets on request. Subject to technical changes.

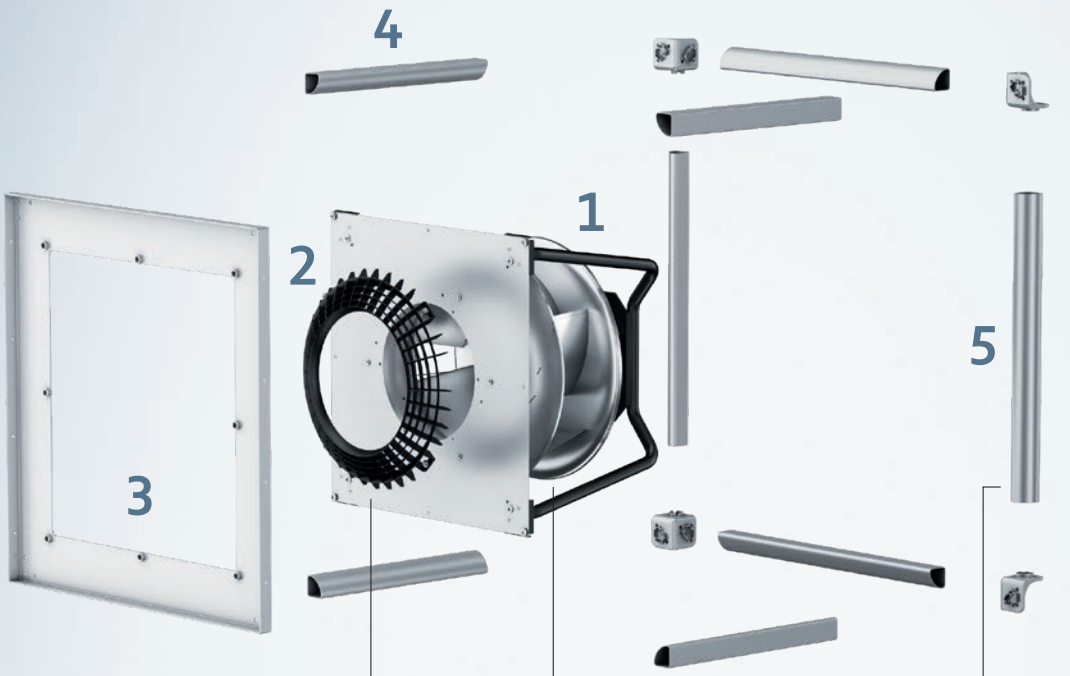
To give an example, these would be the assembly parts that you would need for a FanGrid consisting of one, two or four FanGrid elements:

Assembly parts

93570-2-4060	**Angle connector**		4	4	4
93572-2-4060	**Side connector**			2	4
93574-2-4060	**Cross connector**				1

You can add the necessary assembly parts for your FanGrid solution to your main order. Each item has its own item number. Please always state the quantity of items required.
For a second row of fans or more, we recommend using fittings for installation of the top layer. There are four holes on the edge of the flange plate for screws.
Screws must be ordered separately. You do not need to order additional screws for fixing the fans to the FanGrid cube. For this, you can use the screws from the mounting bracket.

One system – *so many possibilities.*



Individual components:
1 RadiPac fan
2 FlowGrid air inlet grill
3 Bulkhead plate
4 Spacer profile A
5 Spacer profile B
6 Corner connector

FlowGrid air inlet grill

- Reduces tonal noise
- Eliminates installation-induced turbulence
- Compact design
- Quick installation
- Robust design

RadiPac centrifugal fan

- Tried-and-tested support bracket
- Unrivaled compactness
- Great energy efficiency
- Low heat transfer
- Low noise emission
- Safe and maintenance-free operation
- Stepless speed control characteristics
- Control and monitoring via MODBUS-RTU and/or 0–10 V / PWM

Innovative profile design

- High-strength, lightweight material
- Flexible dimensions
- Aerodynamically optimized shape

The FanGrid cube as a *kit.*

Our FanGrid modules can be ordered as a complete kit or component by component.

Fig. no.	1	2	3	4	5	6
						
Element	RadiPac fan	FlowGrid air inlet grill	Bulkhead plate	Spacer profile A	Spacer profile B	Corner connector

What you need for a complete cube:

Size	Fig. no.	Element	Item number	Quantity
400	1	RadiPac fan	K3G 400-PA27-62	1
	2	FlowGrid air inlet grill	35505-2-2957	1
		Screws for FlowGrid	69674-7-6215	4
	3	Bulkhead plate	15456-2-4021	1
		Screws for bulkhead plate	30000-7-6203	8
	4	Spacer profile A	30410-1-2550	4
	5	Spacer profile B	30400-1-2550	4
	6	Corner connector	09700-2-2525	4
		Screws for mounting bracket	61000-7-6203	48
450	1	RadiPac fan	K3G 450-PA31-61	1
	2	FlowGrid air inlet grill	35505-2-2957	1
		Screws for FlowGrid	69674-7-6215	4
	3	Bulkhead plate	15457-2-4021	1
		Screws for bulkhead plate	30000-7-6203	8
	4	Spacer profile A	30460-1-2550	4
	5	Spacer profile B	30451-1-2550	4
	6	Corner connector	09700-2-2525	4
		Screws for mounting bracket	61000-7-6203	48
500	1	RadiPac fan	K3G 500-PB24-61	1
	2	FlowGrid air inlet grill	35505-2-2957	1
		Screws for FlowGrid	69674-7-6215	4
	3	Bulkhead plate	15458-2-4021	1
		Screws for bulkhead plate	30000-7-6203	8
	4	Spacer profile A	30510-1-2550	4
	5	Spacer profile B	30501-1-2550	4
	6	Corner connector	09700-2-2525	4
		Screws for mounting bracket	61000-7-6203	48
560	1	RadiPac fan	K3G 560-PB31-61	1
	2	FlowGrid air inlet grill	00630-2-2957	1
		Screws for FlowGrid	69674-7-6215	4
	3	Bulkhead plate	15459-2-4021	1
		Screws for bulkhead plate	30000-7-6203	8
	4	Spacer profile A	30570-1-2550	4
	5	Spacer profile B	30560-1-2550	4
	6	Corner connector	09700-2-2525	4
		Screws for mounting bracket	61000-7-6203	48

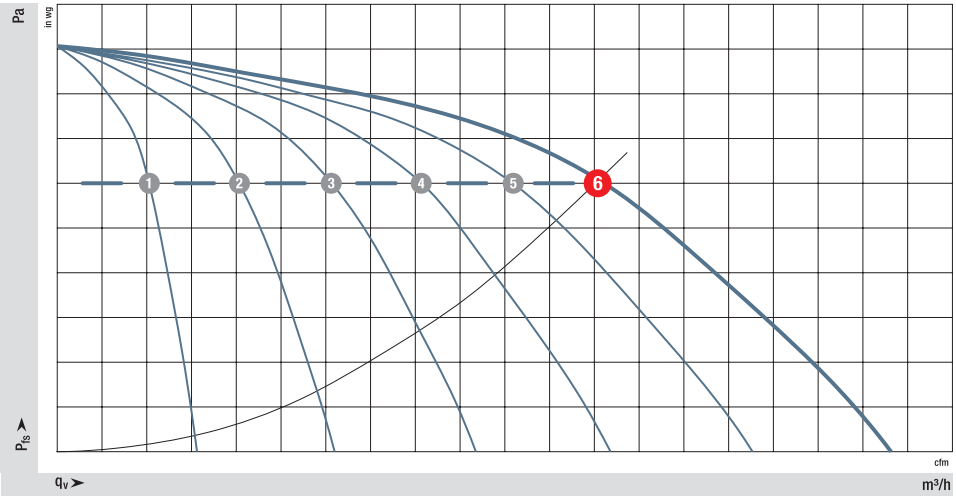
The tightening torque of the screws in the aluminum profile screw channel is 30 Nm ± 4.5 Nm.

If you need pre-assembled FanGrid modules, please find the relevant item numbers listed below, which include the same individual components as mentioned above (FlowGrid available to order separately):

Size	Item number
FanGrid 400	K3G 400-PA27-W4
FanGrid 450	K3G 450-PA31-W3
FanGrid 500	K3G 500-PB24-W3
FanGrid 560	K3G 560-PB31-W3

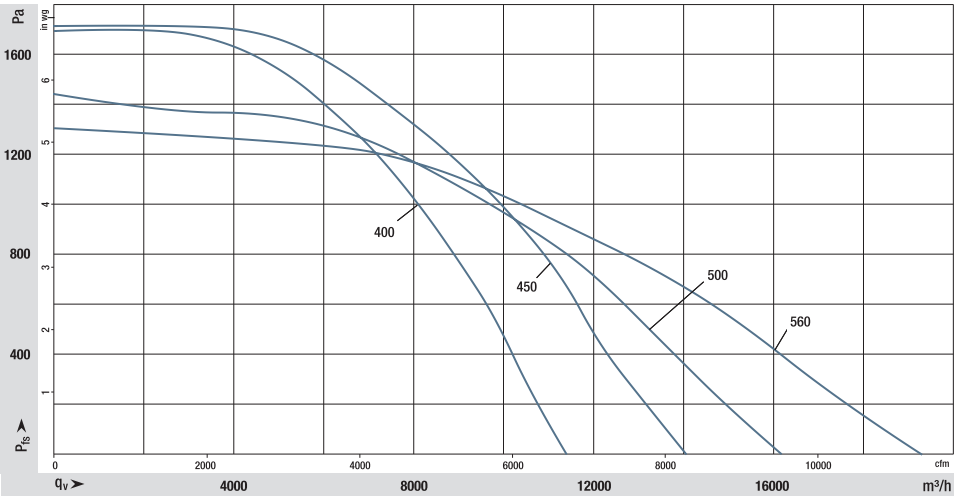
Comparison of *sizes.*

Parallel operation of fans



The following applies when operating several fans in parallel: the sum of the air flows from the individual fans equals the total air flow desired.

Air flow performance of the individual fans



Air flow performance curve by FanGrid size.

Nominal data

Size	Nominal voltage range	Frequency	Speed	Max. power consumption	Max. input current	Permitted ambient temperature	Weight
	VAC	Hz	rpm	W	A	°C	kg
FanGrid 400	3~ 380–480	50/60	2,800	3,800	5.8	–25 to +40	55.5
FanGrid 450	3~ 380–480	50/60	2,480	4,500	6.8	–25 to +40	65.5
FanGrid 500	3~ 380–480	50/60	2,000	4,200	6.4	–25 to +40	76.5
FanGrid 560	3~ 380–480	50/60	1,700	4,400	6.6	–25 to +40	88.5

Data sheets on request. Subject to technical changes.

Want to find out more?

We are happy to assist you:
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or follow us at:
www.ebmpapst.com/radipac

Supply/circulation *FanGrid.*

"Free cooling" is becoming an increasingly popular alternative for data centers, whereby multiple GreenTech EC centrifugal fans from the RadiPac or RadiCal product range operate in parallel to supply the necessary volume of air – in a manner that is particularly efficient.

Advantages of using GreenTech EC fans in FanGrids:
- Reduced energy consumption for low PUE value
- Scalable as needed thanks to modular design
- Redundancy facilitates greater operational reliability
- Control and monitoring via MODBUS-RTU and/or 0–10 V / PWM
- Uniform flow for upstream and downstream components
- Easy to integrate in DCIM systems
- All fans have stepless control characteristics
- Maintenance-free operation

In addition to the centrifugal modules, FanGrid modules with axial fans are also available on request.

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