

## Ex-protected fans with EC technology.

Saving energy safely.

**ebm papst**

The engineer's choice



# Innovation in explosive areas.



## ebm-papst presents the first ex-protected EC fans.

Now ATEX applications can finally benefit from the advantages of modern EC technology, too. ebm-papst is the first manufacturer in the world to have specially developed highly efficient GreenTech EC fans for use in explosive areas. These are available as axial and centrifugal fans with backward-curved impeller blades. The products are based on our multiple award-winning HyBlade® and RadiPac product ranges, which have set global benchmarks for efficiency, noise and compactness.

Axial fans are available in sizes of 630–990 with up to 33,000 m<sup>3</sup>/h, centrifugal fans in sizes 400–630 with up to 15,000 m<sup>3</sup>/h.

**A highly developed plug & play system allows the fans to be ready for use quickly. This saves time and money:**

- Perfectly attuned components
- Pre-wired and pre-programmed
- No separate frequency converter and motor protection switch required
- Includes conformity declaration for motor and electronics

**Life cycle costs can also be significantly reduced through the use of GreenTech EC technology and system solutions:**

- Quick and easy commissioning
- Highly efficient GreenTech EC motor that exceeds efficiency class IE4
- 30 % average energy saving compared to AC technology



# Atmosphère Explosive.

## The European guideline on explosion protection.

### Certified safety.

ebm-papst's ex-protected fans are based on the proven 3 kW GreenTech EC external rotor motor and are tested and certified in line with the European product directive ATEX 2014/34/EU. They, therefore, meet all demands made of devices used in areas at risk of explosion. Our axial and centrifugal ex-protected fans are suitable for equipment group II (explosion-protected areas outside mining) and the gases and vapours substance group in explosion group IIB.

Our ex-protected fans can be used in hazard zones 1 and 2. They therefore correspond to category 2G (ATEX) and have the equipment protection level Gb (EN 60079-0).

As per the ATEX 1999/92/EC operating directive, the facility operator is responsible for the categorization of hazard zones. The corresponding equipment categorisation is performed by the manufacturer, i.e. ebm-papst.



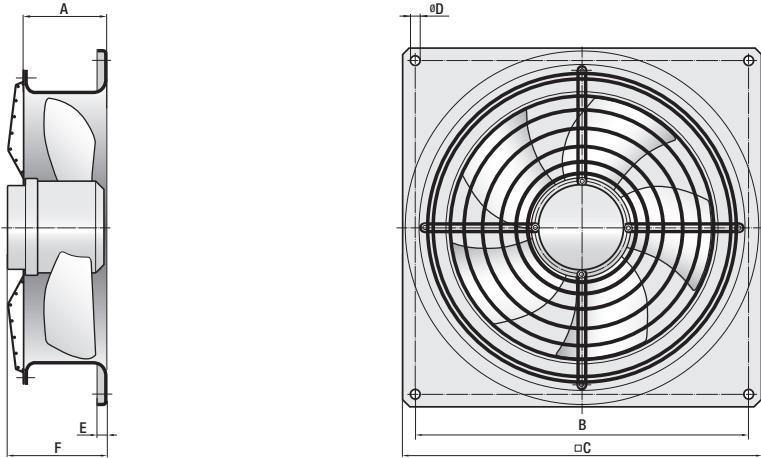
### Ex marking of the ebm-papst fans as per ATEX and EN 60079-0:

Ex marking	Group	Equipment category	Ignition protection types				Explosion group	Temperature classes	Equipment protection level	Escape of gases, fog and vapors (e.g. ammonia, methane, ethane, propane, town gas, acrylonitrile, hydrogen sulphide, ethyl ether, acetaldehyde)
			Pressure-resistant enclosure	Increased safety	Intrinsic safety	Protection level				
<b>ebm-papst</b>		<b>3G</b> Corresponding to Zone 2	<b>C</b> Increased protection	<b>IIA</b>	<b>T1</b> <b>T2</b>	<b>Gc</b>			<b>Zone 2</b> Hardly ever, rarely	
		<b>Ex</b>	<b>II 2G Ex</b>	<b>d e ib</b>	<b>IIB T3</b>	<b>Gb</b>			<b>Zone 1</b> Occasionally	
Required customer specification				Required customer specification						

The following requirements are not covered:

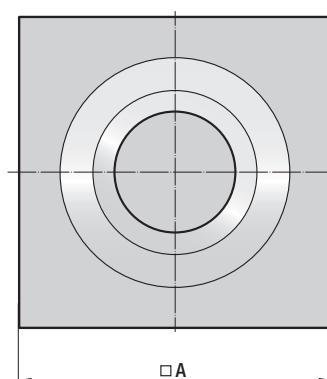
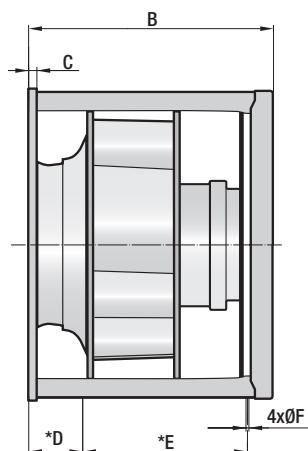
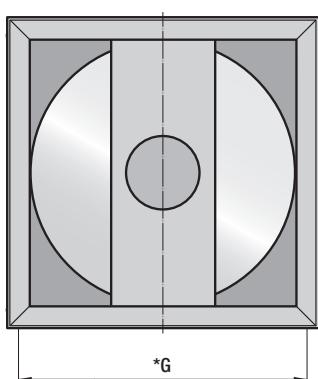
Not available	<b>1G</b> Corresponding to Zone 0	<b>p m o q</b>	<b>a</b> Very high protection	<b>IIC</b>	<b>T4</b> <b>T5</b> <b>T6</b>	<b>Ga</b>	<b>Zone 0</b> Constantly, often
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## Outer dimensions ...



HyBlade®	Size	A	B	C	D	E	F
W3G630 GU23 91	630	150	750	805	Ø 11 (4x)	20	321
W3G710 GU21 91	710	170	810	850	Ø 14.5 (4x)	20	341
W3G800 GV01 91	800	190	910	970	Ø 14.5 (4x)	17	380
W3G910 GV02 91	910	205	1,010	1,070	Ø 14.5 (4x)	20	373
W3G990 GZ02 91	990	225	1,110	1,170	Ø 14.5 (4x)	20	406

Dimensions in mm



RadiPac	Size	A	B	C	D	E	F	G
K3G400 AQ23 90	400	500	475	15	106	331	Ø 9 (4x)	435
K3G450 AQ24 90	450	630	504	15	108	357	Ø 9 (4x)	565
K3G500 AP25 90	500	630	517	15	109	369	Ø 9 (4x)	565
K3G560 AP23 90	560	760	568	15	123	339	Ø 9 (4x)	688
K3G630 AP01 90	630	760	700	15	254	340	Ø 9 (4x)	688

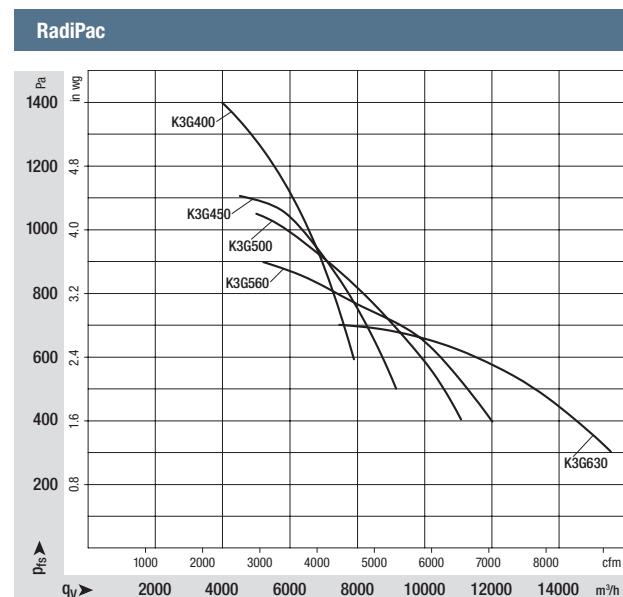
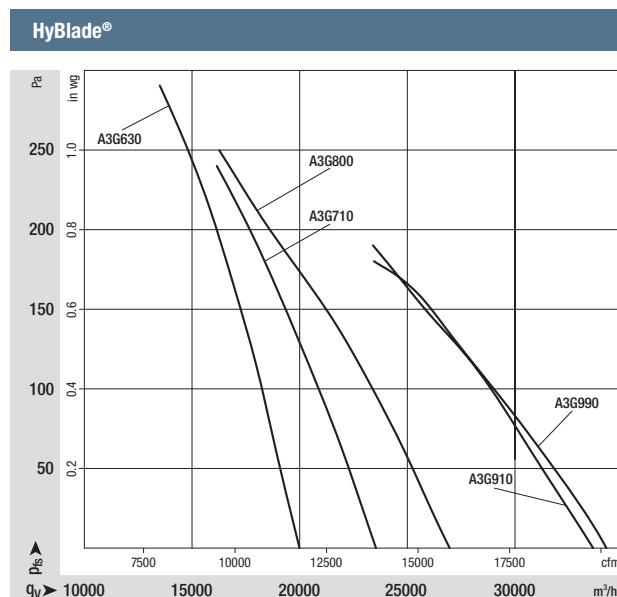
Dimensions in mm

\*Screw-on position for vibration and/or spring elements. Floor mounting only for horizontal shaft position.

## ... and inner values.

The performance measurements for all fans are conducted on cutting edge airflow test rigs. The entire fan unit, consisting of the motor, the control electronics and the impeller, is measured at different load levels. This provides us with reliable data, meaning that when you are choosing your fans, you can count on these values being met.

This rules out any nasty surprises when commissioning the fans. The measurement data form the basis for the design program available on request. Use this software to calculate expected operating costs or conduct a cost analysis for the life cycle.



HyBlade® nominal data				Nominal voltage range	Frequency	Speed <sup>(1)</sup>	Max. input power <sup>(1)</sup>	Max. input current <sup>(1)</sup>	Perm. ambient temperature	Weight	Max. back pressure
Article number	Motor	VAC	Hz	min <sup>-1</sup>	W	A	°C	kg	P <sub>fs</sub>		
<b>W3G630 GU23 91</b>	M3G 150-IF	3 ~ 380–440	50/60	1,510	3,140	4.8	-40...+60	47	290		
<b>W3G710 GU21 91</b>	M3G 150-IF	3 ~ 380–440	50/60	1,250	2,830	4.3	-40...+60	49	240		
<b>W3G800 GV01 91</b>	M3G 150-NA	3 ~ 380–440	50/60	1,090	2,780	4.2	-40...+60	60	250		
<b>W3G910 GV02 91</b>	M3G 150-NA	3 ~ 380–440	50/60	1,000	2,760	4.2	-40...+60	63	190		
<b>W3G990 GZ02 91</b>	M3G 150-NA	3 ~ 380–440	50/60	960	2,450	3.7	-40...+60	69	180		
RadiPac nominal data											
<b>K3G400 AQ23 90</b>	M3G 150-FF	3 ~ 380–440	50/60	2,550	3,100	4.7	-25...+50	48			
<b>K3G450 AQ24 90</b>	M3G 150-FF	3 ~ 380–440	50/60	2,040	2,950	4.5	-25...+50	57			
<b>K3G500 AP25 90</b>	M3G 150-FF	3 ~ 380–440	50/60	1,780	2,960	4.5	-25...+50	63			
<b>K3G560 AP23 90</b>	M3G 150-IF	3 ~ 380–440	50/60	1,500	2,940	4.5	-25...+50	79			
<b>K3G630 AP01 90</b>	M3G 150-NA	3 ~ 380–440	50/60	1,130	2,970	4.6	-25...+50	89			

(1) Nominal data at operating point with maximum load and 400 VAC



## Two model series – one drive.

### HyBlade® axial fan

#### **+** Aerodynamics

- Full bell mouth integrated on the intake side
- Efficiency-boosting blade profile
- High degree of efficiency
- Low noise levels

#### **+** Robust design

- Wall plate made from Sendzimir-galvanized sheet steel, painted

#### **+** Flexible installation

- Installation with horizontal and vertical motor shaft

#### **+** Innovative materials

- Blades made of fibreglass-reinforced composite material
- Core made from corrosion-resistant aluminium structure

#### **+** Low vibration

- Motor-impeller unit dynamically balanced in two planes

#### **+** Explosion protection



- Impeller strength surpasses standard requirement
- Pre-set ring gap between wall plate and impeller ensured as per ATEX 2014/34/EU standard
- Earth connection for dissipating electrostatic charges
- Impeller blades with special anti-static surface
- Safe steel-plastic material pairing as per EN14986

### Electronics

#### **+** Simple commissioning

- Pre-programmed ex-works
- Central terminal area for mains connection, alarm relay, control and bus system

#### **+** Versatile

- Continuously variable speed settings
- Control signal 0–10 V DC, PWM, 4–20 mA and MODBUS-RTU
- Integrated PID controller

#### **+** Explosion protection



- Pressure-resistant encapsulation of performance electronics
- ATEX-certified spring clamp terminal block (special tool not included)
- Improved heat dissipation
- Additional protection and sensor electronics via Ex-certified components (cable glands, etc.)



Noise



Sustainability



Compactness



Efficiency





#### GreenTech EC motor

##### **Unrivaled compact design**

- Impeller mounted directly on the external rotor
- No external frequency converter needed thanks to EC technology

##### **High efficiency**

- Low copper and iron losses
- No slip losses thanks to synchronous running
- Use of permanent magnets means no magnetic reversal losses in the rotor

##### **Economical operation**

- Improved commutation results in greater partial-load operation
- Highly efficient operation even at partial load
- Long service life thanks to maintenance-free ball bearings and brushless commutation

##### **Sustainable operation**

- No rare earth magnets

##### **Explosion protection**



- Ignition protection type "Increased safety" as per ATEX in the motor area



#### RadiPac centrifugal fan

##### **Aerodynamics**

- High static efficiency
- Aerodynamically optimized blade channel
- Low noise emissions
- Diagonal trailing edge for optimized flow control
- Integrated rotating diffuser
- Inlet ring adjusted to impeller

##### **Operating characteristics**

- Low vibration
- Dynamic balancing of the motor impeller rotor unit
- Minimal structure-borne noise generation
- Low impeller weight reduces bearing load

##### **Robust design**

- Stable cube-shaped assembly frame
- Suitable for permanently high tip speeds
- Corrosion-resistant aluminium
- Entirely robot-welded blades

##### **Explosion protection**



- Impeller strength surpasses standard requirement
- Pre-set ring gap between inlet ring and impeller ensured as per ATEX 2014/34/EU standard
- Safe aluminium-aluminium material pairing as per EN14986



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