

## Axial Fans

All Systemair axial fans at a glance

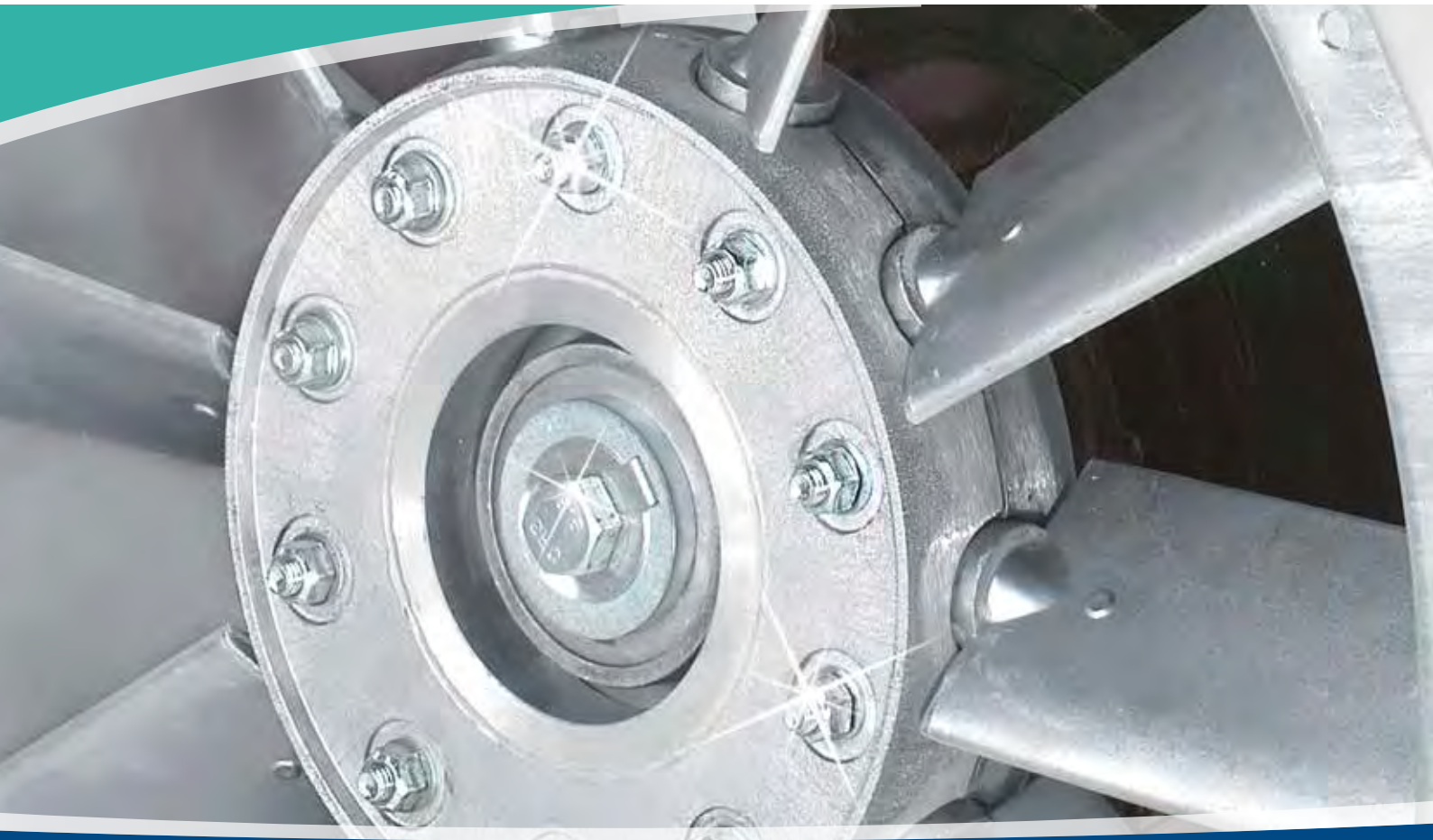


 **systemair**

**MMP**

PT. MAKSWEL MEGAH PERKASA

## Disclose the secret of fresh air!



Since 1974 Systemair cares for the purity of an essential resource. Today Systemair is one of the leading ventilation companies worldwide. A success story, which started in Skinnskatteberg, Sweden, with the invention of the inline duct fan. This invention revolutionised the ventilation world.

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Since then the company has continuously advanced and now offers a comprehensive range of products for all ventilation and air conditioning requirements. The experts of Systemair know the conditions and see the point whatever you need - the ventilation concept of a shopping centre, domestic ventilation of a single family house or the ventilation of tunnels and metro stations. Over 4500 employees in more than 57 subsidiaries and 45 countries are available for the essential proximity to the customers.

This brochure presents the wide range of our medium pressure axial fans. For further information about our axial fan range and all the other Systemair products you can contact our experts in your local Systemair company or you can just visit our online catalogue on [www.systemair.com](http://www.systemair.com).

# All Systemair axial fans at a glance

Systemair offers a wide range of axial fans in various designs. For most applications in the ventilating or air conditioning sector as well as in a lot of industrial and commercial applications a Systemair fan can be selected. Some examples are: mining, tunnel ventilation, car park ventilation, applications in explosion hazardous areas and high temperature fans to extract heat and smoke in case of a fire.

Finding the right solution is important from many aspects: Trust in the product and producer, safety in the application, lowest possible energy consumption, good and matching functionality, the cost benefit ratio, a space saving design, the delivery just in time and many more. Our experts will be pleased to help you in all these questions and be at your disposal.

This brochure gives you an overview of our complete axial fan product range, so you can choose the right fan for your application. Performance curves and technical details for the required fan duties are available from our selection software, which is available in an online version and can also be downloaded from our homepage [www.systemair.com](http://www.systemair.com).

## Systemair is working in accordance with the following standards:

### Quality:

ISO 9001: Quality management system, monitored by TÜV Süd. Certificate on [www.systemair.com](http://www.systemair.com).

ISO 14001: Environmental management system, monitored by TÜV Süd. Certificate on [www.systemair.com](http://www.systemair.com)

DIN 24166: Technical terms of delivery for fans.

### CE-marking:

The CE marking is a mandatory conformity mark in the European Economic Area. By affixing the CE marking, the manufacturer asserts that the item meets all the essential requirements of the relevant European Directive(s).

### Testing:

ISO 5801: "Industrial fans, performance testing..."

DIN 24163: "Fans, performance testing..."

AMCA 210-07: "Laboratory methods of testing fans for aerodynamic performance rating"

EN 12101-3: "Smoke and heat control systems - powered smoke and heat exhaust..."

ISO 13350: Jet fans

EN certificates on [www.systemair.com](http://www.systemair.com)

### • As per EC Machinery Directive 98/37/EEC Annex IIA, fans for ventilation... the following harmonized standards are used:

- EN 60 204-1: "Safety of machinery - electrical equipment, general requirements"

- EN 292-1: "Safety of machinery, design"  
EN ISO 12100:2011-3

- EN 294: "Safety of machinery, safety distances"  
EN ISO 13857:2008-06

- EN 60 034-1: "Rotating electric machinery, ratings and performance"

### • As per EC Low Voltage Directive 73/23/EEC and 93/68/EEC the following harmonized standards are used:

- EN 60 204-1: "Safety of machinery - electrical equipment, general requirements"

- EN 60 034-5: "Rotating electric machinery, protection classification"

### • As per EMC-directive 89/336/EEC and EMC-directive 93/68/EEC the following harmonized standards are used:

- EN 61000-6-1 and 6-2: Electromagnetic compatibility

## Available fan ranges

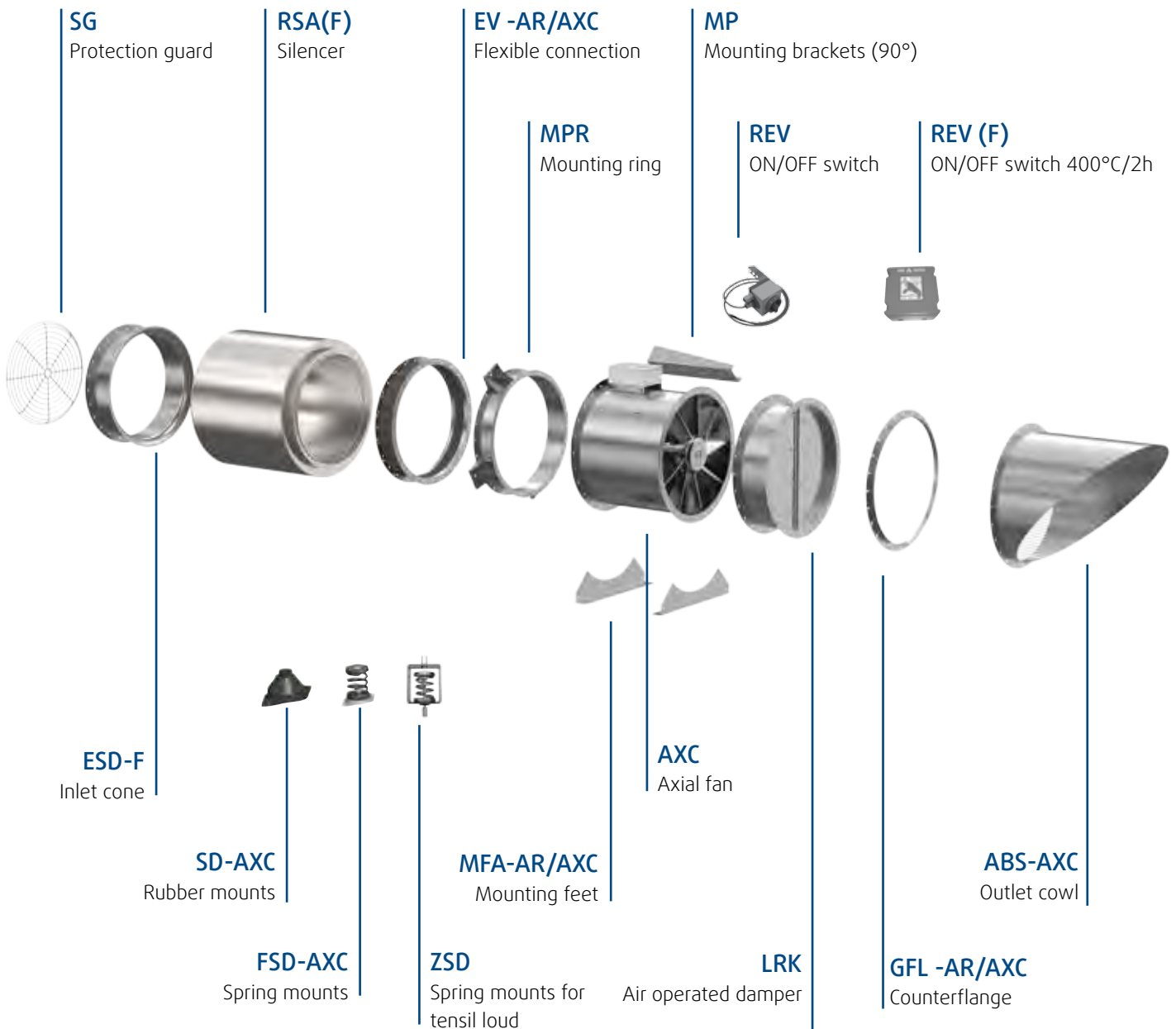
Fan range	Application	Impeller diameter (mm)	-20° to 55°C ∞	200°C ∞	250°C/ 120 min.	300°C/ 120 min.	400°C/ 120 min.	Car Park Jet Fans	Tunnel Jet Fans	Explosive atmosphere
AXC	supply/exhaust	315 - 2.240	•							
AXC (B)	exhaust	315 - 1.600	•			•				
AXC (F)	exhaust	315 - 1.600	•				•			
AXCBF	exhaust	250 - 800	•	•						
AXR	supply/exhaust	315 - 2.240	•							
AXR (K)	supply/exhaust	1500 - 2.240	•		•					
AXR (B)	supply/exhaust	315 - 1.600	•			•				
AXR (F)	supply/exhaust	315 - 1.600	•				•			
AJ8	impulse ventilation	315 - 400	•					•		
AJR -TR	impulse ventilation reversible	315 - 400	•					•		
AJ8 (B)	impulse ventilation	315 - 400	•			•		•		
AJR (B) -TR	impulse ventilation reversible	315 - 400	•			•		•		
AJR (F) -TR	impulse ventilation reversible	315 - 400	•				•	•		
AXC -EX*	supply/exhaust	315 - 1.600								•
AXCBF -EX*	exhaust	250 - 800								•
AJ	impulse ventilation reversible	500 - 1.600	•						•	
AJ (K)	impulse ventilation reversible	500 - 1.600	•		•				•	
AJ (B)	impulse ventilation reversible	500 - 1.600	•			•			•	
AJ (F)	impulse ventilation reversible	500 - 1.600	•				•		•	
...-G	two in series	315 - 2.000	•		•	•	•			
...-P	wall mounting	315 - 1.000	•		•	•				
...-D	roof mounting	315 - 1.250	•		•	•	•			
...-Box	sound insulated	315 - 1.000	•		•	•	•			

\* -20°C to +40°C



# System solution for axial fans of Systemair

Matched perfectly to your requirements





# Go quickly to the right axial fan!

You can use our **selection program** to choose the perfect fans, compact air handling units and diffusers for your application quickly and with a precise operating point.

You can find an overview of all our products with the necessary technical data in our **online catalogue**. To complete your ventilation package, in the catalogue you will also find our comprehensive range of accessories to complement each product.

You can find this and much more useful and interesting information at **[www.systemair.com](http://www.systemair.com)**.

Take a look for yourself and discover the world of ventilation and air conditioning!

The screenshot displays the Systemair Product Selector web application. The top navigation bar includes links for Products, Solutions, Support, News, and About us. The main content area is titled 'Product Selector' and features a 'Fan' tab. The interface is divided into several sections: 'Selection criteria' (including Required point, Selection method, Voltage source, and Performance demands), 'Fan type' (with icons for different fan models), 'Classification' (with input fields for temperature, pressure, and application), and 'Selection results' (showing a table of results and three performance graphs). The table of results has columns for Index, Name, Fan number, Air flow (m³/s), Static pressure (Pa), Total pressure (Pa), Power (W), Current (A), Noise (dB(A)), Efficiency (%), Voltage (V), and Price (€). The three graphs show the performance of different fan models (100, 100H, 100L) at different air flow rates (100, 200, 300 m³/s).



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# Technical description

## Fan sizes and duties

Systemair axial fans are offered in sizes from 315 mm up to 2.240 mm diameter. Air volumes of up to 500.000 m<sup>3</sup>/h and static pressure of up to 2.800 Pa can be achieved. Higher pressures can be offered with two fans installed in series (AXC-G models on request). Fan performance in accordance with ISO 5801, part 1, category D.

## Casing

The casing and motor fixation is manufactured from galvanized steel. The terminal box is fitted on the outside of the casing.

## Impellers

The impellers (hub and blades) are manufactured from highly resistant aluminium alloy. The blades have an aerodynamic profile to guarantee high efficiencies and a low noise level.

The hub design allows adjustment of the blade angle during assembly of the fan in the factory, in order to achieve the optimum working point. This further increases the possible fan duties per diameter. In the performance curves P<sub>2max</sub> is indicated, the maximum absorbed power of the impeller, related to the relevant blade angle setting.

## Motors

Systemair uses 400 V/50 Hz three phase motors in accordance with IEC standard 34-1. The motors are suitable for medium temperatures from -20 °C up to +55°C and are equipped with cold conductors for motor protection. Protection class IP55, insulation class F. Other medium temperatures, protection classes or isolation classes are available on request. The standard motor range includes single and two speed motors.

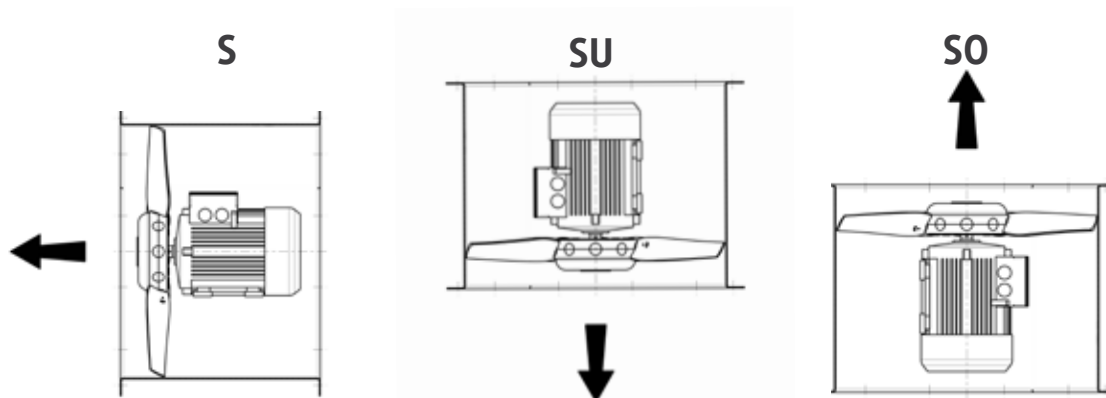
## Mounting position and airflow direction

Systemair axial fans AXC can be installed in different mounting positions. Should there be no different information in your order, the fans will be supplied in airflow direction "S", see pictures below. You will find arrows indicating the direction of rotation and airflow direction at the outside of the casing. For bigger motor powers (guideline: from IEC 160, 11 [kW]) it is important to inform us with your order in case the fans are to be installed in a different airflow direction than "S", as the motor bearings then are subject to a higher stress which we have to take into account.

## Accessories

Systemair offers a wide range of accessories, such as:

- protection guards
- mounting feet (horizontal installation) or mounting brackets (vertical installation)
- counter flanges
- flexible connections
- inlet cones
- automatic shutters
- anti vibration mounts
- isolators for single or two-speed motors
- silencers (with and without core)

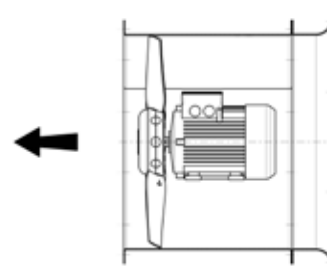




# Installation types

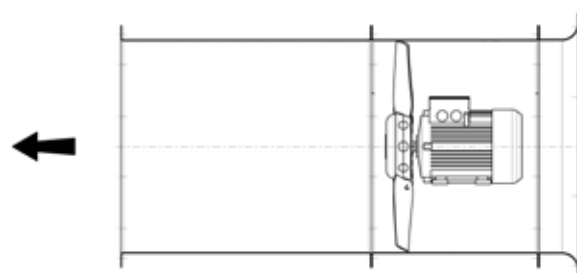
A

free inlet  
free outlet



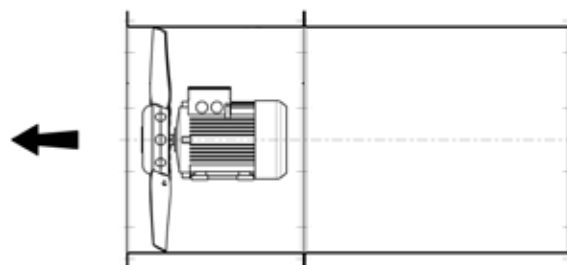
B

free inlet  
ducted outlet side



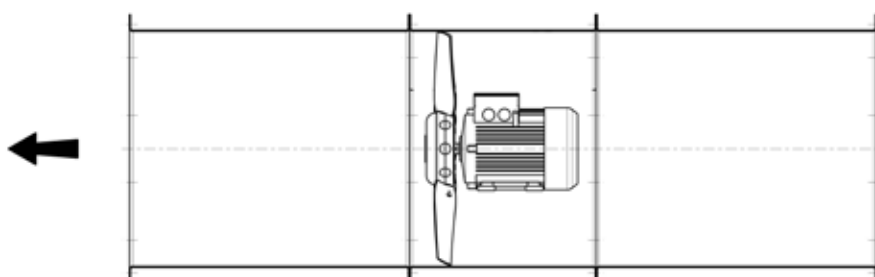
C

ducted inlet side  
free outlet



D

ducted inlet side  
ducted outlet side



Installation types according to ISO 5801

# Axial fans

## AXC, AXR



AXC



AXC-E, AXC-EK

- AXC with aerofoil impeller, adjustable pitch angle for maximum efficiency
- Hub and blades are manufactured from highly resistant aluminium alloy
- Terminal box in IP65 mounted at the outside of the casing for easy wiring (AXC-E without terminal box)
- Suitable for operating temperatures between -20°C and +55°C
- Inspection hole to verify correct direction of rotation
- 60Hz range available

The Systemair AXC/AXR range of long cased medium pressure axial fans is available in sizes from 315 up to 2.240 mm nominal diameter. The adjustable pitch angle setting offers a wide performance and maximum flexibility to match precisely individual airflow requirements. The AXC/AXR axial fans have been performance tested in accordance with DIN ISO 5801, DIN 24163 and AMCA 210-07 on the Systemair fan test rig.

### High efficiency impellers

The AXC die cast aerofoil aluminium impellers can be offered with full or fractional solidities, maximum efficiencies can be obtained. Different impeller/hub configurations allow high operating pressures. AXR impellers are truly reversible.

### Sturdy casing

Casings are heavy gauge, galvanized, with spun flanges for high rigidity (AXC-E and AXC-EK is made of pre-galvanised sheet steel). Long cased execution as standard stock range. Also available with short casing and with an acoustically insulated box.

### Motors

The built-in motors are equipped with PTC thermistors for optimum motor protection. Single or two speed motors. Speed controllable by frequency converter.

### Multi stage fans

For higher pressure drops two stage fans are offered. Two fans in series increase the available static operational pressure.

### Quality

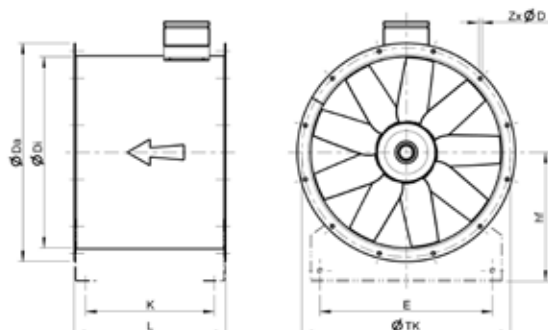
Systemair is certified according to ISO 9001:2008 and ISO 14001:2004. The Systemair quality system is regularly monitored by TÜV Süd.



### Warranty

Systemair offers a three year warranty on all AXC/AXR fan models. The Systemair general terms and conditions apply.

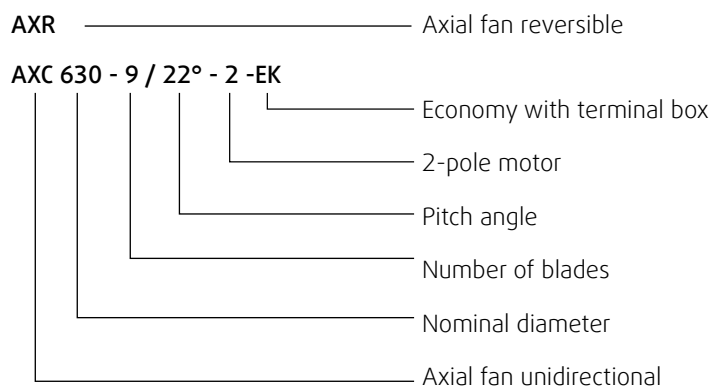
## Dimensions



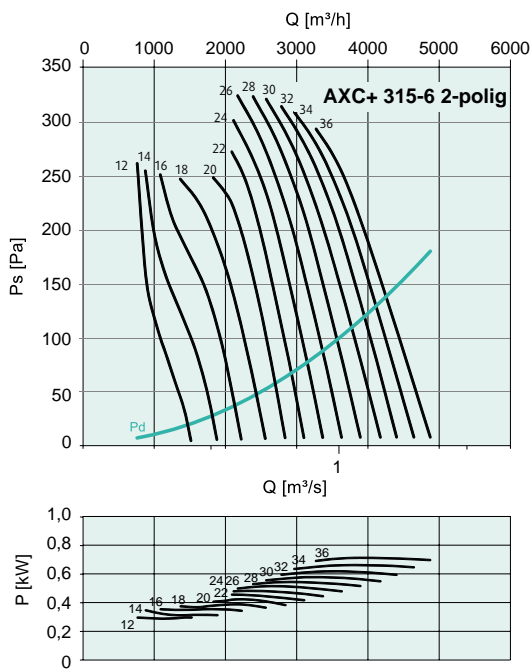
AXC	$\phi Di$	$\phi Da$	$\phi Tk$	$\phi d$	L	hF	E	K
AXC 315	315	395	355	8x10	375	235	265	310
AXC 355	355	435	395	8x10	375	250	305	310
AXC 400	400	480	450	8x12	450	280	350	385
AXC 450	450	530	500	8x12	500	315	400	435
AXC 500	500	590	560	12x12	540	335	440	464
AXC 560	560	650	620	12x12	500/750	375	500	424/674
AXC 630	630	720	690	12x12	500/750	425	570	424/674
AXC 710	710	800	770	16x12	500/700/800	450	650	424/624/722
AXC 800	800	890	860	16x12	500/700/800	530	730	414/614/722
AXC 900	900	1005	970	16x15	640/850	560	830	552/762
AXC 1000	1000	1105	1070	16x15	640/850	670	930	552/762
AXC 1200	1120	1260	1190	20x15	700/1000	710	1030	612/910
AXC 1250	1250	1390	1320	20x15	850/1050	800	1180	740/938
AXC 1400	1400	1540	1470	20x15	950/1360	900	1300	820/1228
AXC 1600	1600	1740	1680	24x19	950/1360	1000	1500	800/1208

Dimensions L + K depend on motor frame size

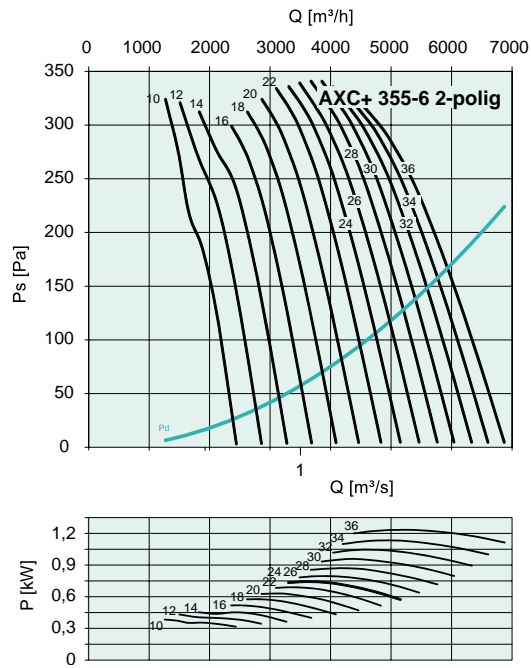
## Ordering code



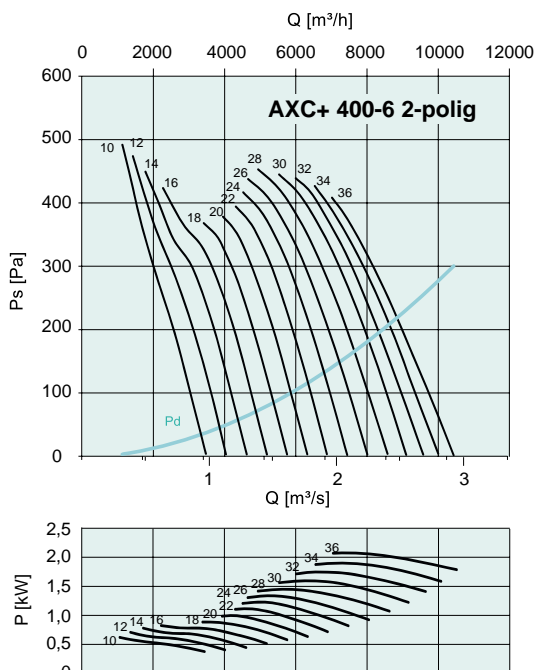
## Quick selection



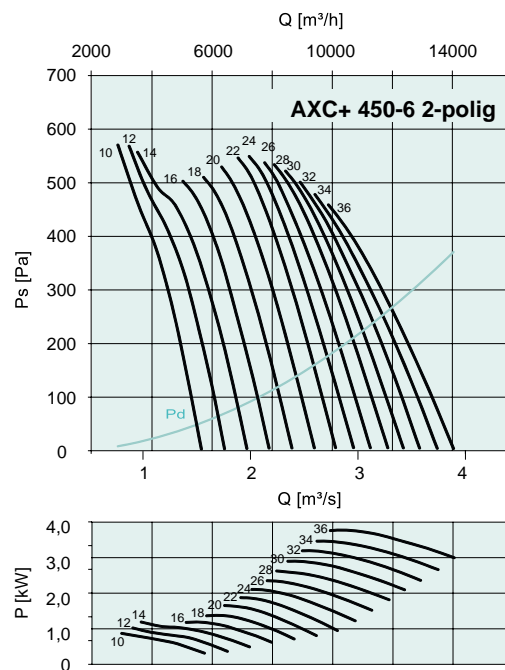
Art. no.	Size *
CAX+31501IE3	AXC+ 315-6-2 (0.75kW IE3)



Art. no.	Size *
CAX+35501IE3	AXC+ 355-6-2 (0.75kW IE3)
CAX+35502IE3	AXC+ 355-6-2 (1.1kW IE3)
CAX+35503IE3	AXC+ 355-6-2 (1.5kW IE3)

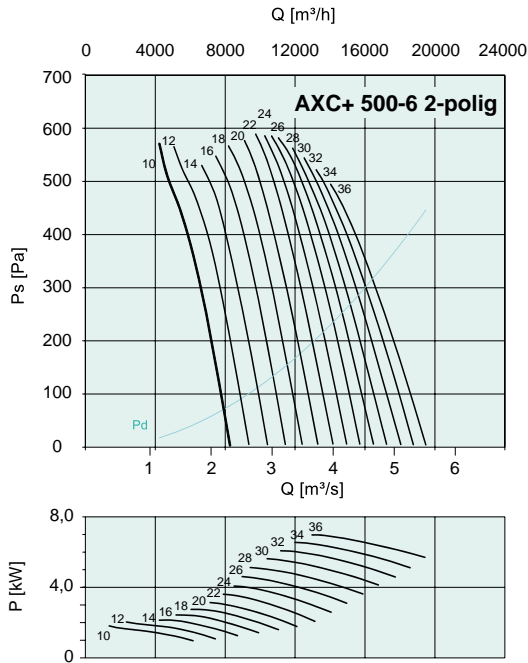


Art. no.	Size *
CAX+40001IE3	AXC+ 400-6-2 (0.75kW IE3)
CAX+40002IE3	AXC+ 400-6-2 (1.1kW IE3)
CAX+40003IE3	AXC+ 400-6-2 (1.5kW IE3)
CAX+40004IE3	AXC+ 400-6-2 (2.2kW IE3)

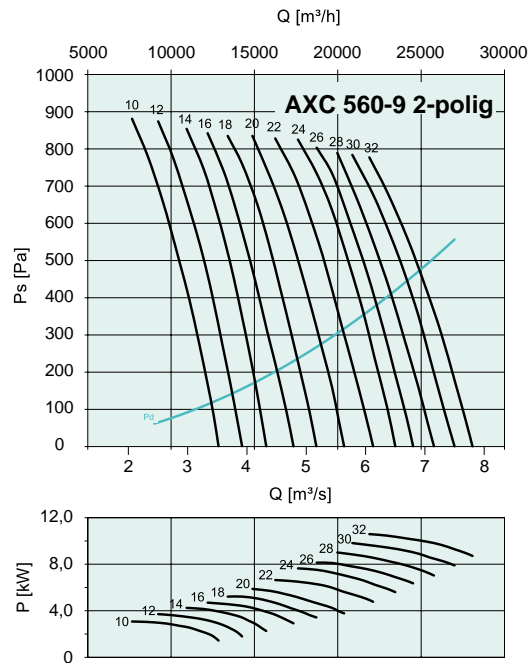


Art. no.	Size *
CAX+45001IE3	AXC+ 450-6-2 (0.75kW IE3)
CAX+45002IE3	AXC+ 450-6-2 (1.1kW IE3)
CAX+45003IE3	AXC+ 450-6-2 (1.5kW IE3)
CAX+45004IE3	AXC+ 450-6-2 (2.2kW IE3)
CAX+45005IE3	AXC+ 450-6-2 (3.0kW IE3)
CAX+45006IE3	AXC+ 450-6-2 (4.0kW IE3)

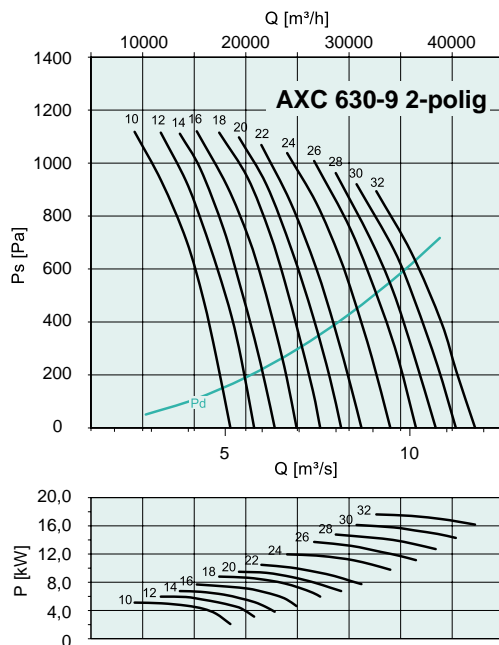
\* Further performance curves in the selection program



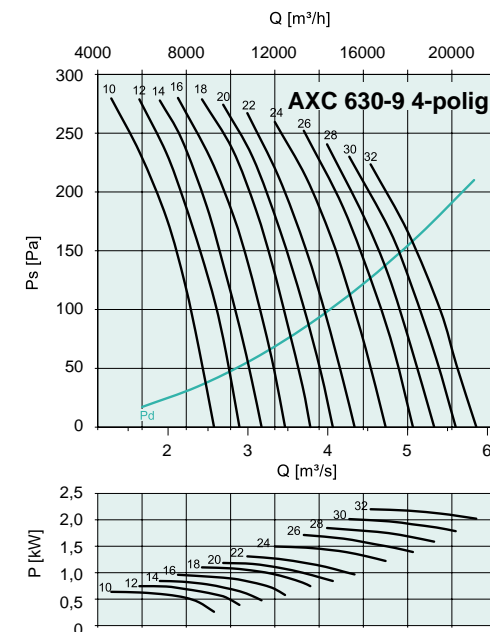
Art. no.	Size *
CAX+50001IE3	AXC+ 500-6-2 (1.1kW IE3)
CAX+50002IE3	AXC+ 500-6-2 (1.5kW IE3)
CAX+50003IE3	AXC+ 500-6-2 (2.2kW IE3)
CAX+50004IE3	AXC+ 500-6-2 (3.0kW IE3)
CAX+50005IE3	AXC+ 500-6-2 (4.0kW IE3)
CAX+50006IE3	AXC+ 500-6-2 (5.5kW IE3)
CAX+50007IE3	AXC+ 500-6-2 (7.5kW IE3)



Art. no.	Size *
CAX56019IE3	AXC 560-9-2 (1.1kW IE3)
CAX56020IE3	AXC 560-9-2 (1.5kW IE3)
CAX56021IE3	AXC 560-9-2 (2.2kW IE3)
CAX56022IE3	AXC 560-9-2 (3.0kW IE3)
CAX56023IE3	AXC 560-9-2 (4.0kW IE3)
CAX56024IE3	AXC 560-9-2 (5.5kW IE3)
CAX56025IE3	AXC 560-9-2 (7.5kW IE3)
CAX56026IE3	AXC 560-9-2 (11kW IE3)
CAX56027IE3	AXC 560-9-2 (15kW IE3)

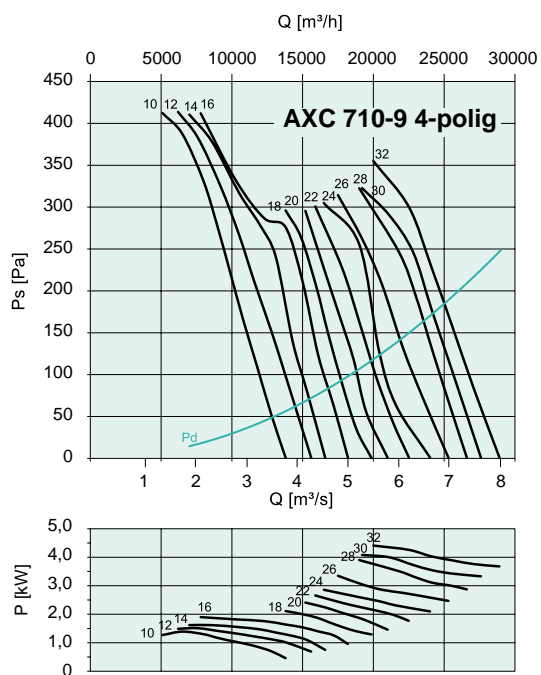


Art. no.	Size *
CAX63017IE3	AXC 630-9-2 (2.2kW IE3)
CAX63018IE3	AXC 630-9-2 (3kW IE3)
CAX63019IE3	AXC 630-9-2 (4kW IE3)
CAX63020IE3	AXC 630-9-2 (5.5kW IE3)
CAX63021IE3	AXC 630-9-2 (7.5kW IE3)
CAX63022IE3	AXC 630-9-2 (11kW IE3)
CAX63023IE3	AXC 630-9-2 (15kW IE3)
CAX63024IE3	AXC 630-9-2 (18.5kW IE3)

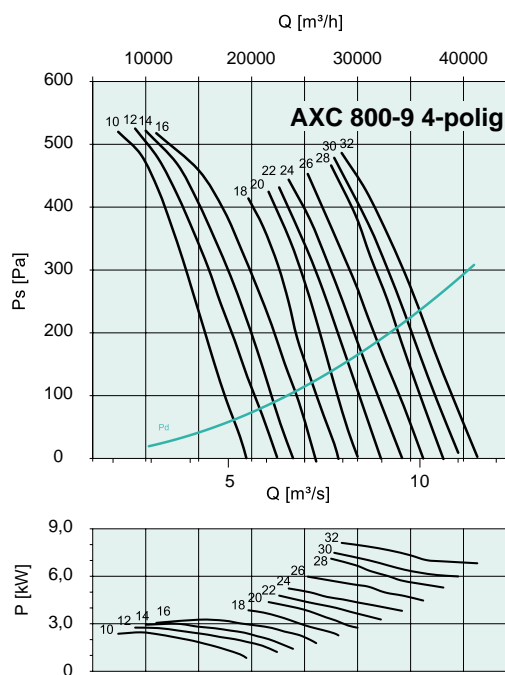


Art. no.	Size *
CAX63029IE3	AXC 630-9-4 (2.2kW IE3)
CAX63030IE3	AXC 630-9-4 (3kW IE3)

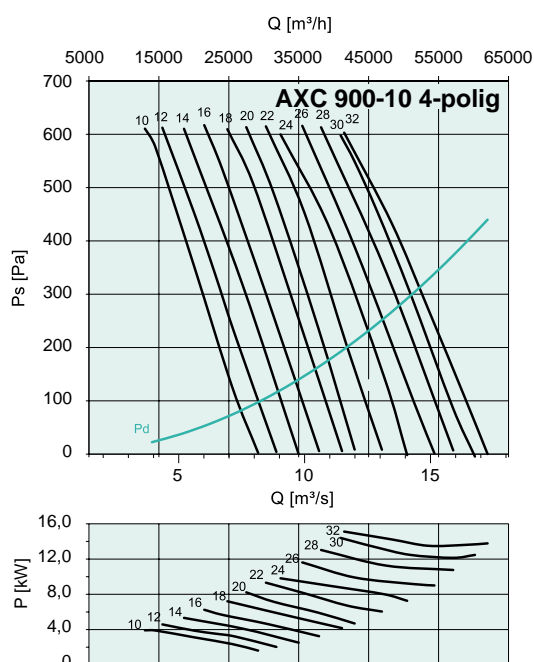
\* Further performance curves in the selection program



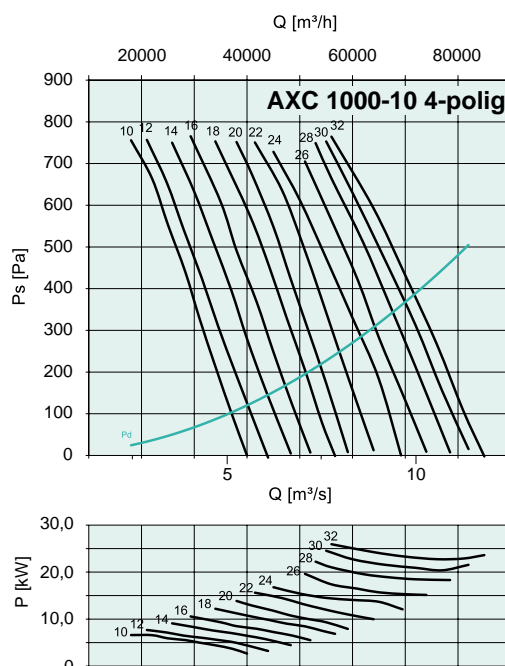
Art. no.	Size *
CAX71009IE3	AXC 710-9-4 (2.2kW IE3)
CAX71010IE3	AXC 710-9-4 (3kW IE3)
CAX71011IE3	AXC 710-9-4 (4kW IE3)
CAX71012IE3	AXC 710-9-4 (5.5kW IE3)



Art. no.	Size *
CAX80011IE3	AXC 800-9-4 (2.2kW IE3)
CAX80012IE3	AXC 800-9-4 (3kW IE3)
CAX80013IE3	AXC 800-9-4 (4kW IE3)
CAX80014IE3	AXC 800-9-4 (5.5kW IE3)
CAX80015IE3	AXC 800-9-4 (7.5kW IE3)

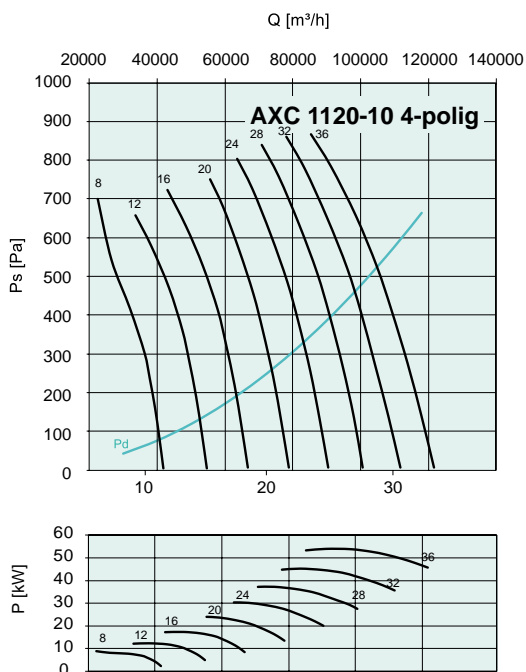


Art. no.	Size *
CAX90008IE3	AXC 900-10-4 (2.2kW IE3)
CAX90009IE3	AXC 900-10-4 (3kW IE3)
CAX90010IE3	AXC 900-10-4 (4kW IE3)
CAX90011IE3	AXC 900-10-4 (5.5kW IE3)
CAX90012IE3	AXC 900-10-4 (7.5kW IE3)
CAX90013IE3	AXC 900-10-4 (11kW IE3)
CAX90014IE3	AXC 900-10-4 (15kW IE3)



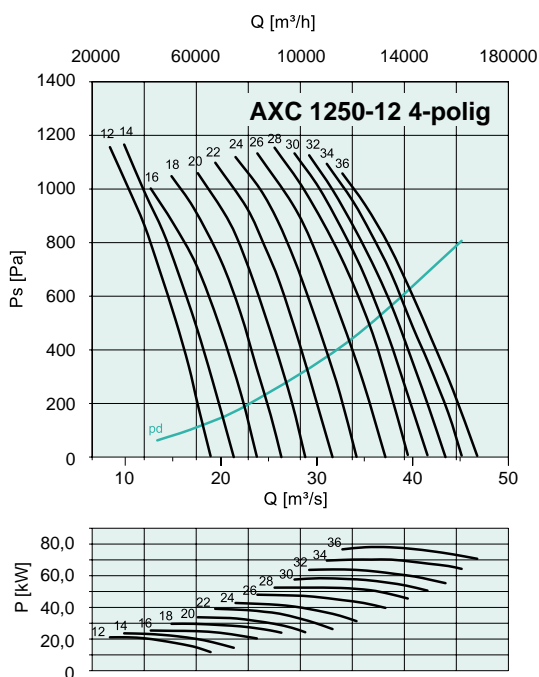
Art. no.	Size *
CAX100007IE3	AXC 1000-10-4 (4kW IE3)
CAX100008IE3	AXC 1000-10-4 (5.5kW IE3)
CAX100009IE3	AXC 1000-10-4 (7.7kW IE3)
CAX100010IE3	AXC 1000-10-4 (11kW IE3)
CAX100011IE3	AXC 1000-10-4 (15kW IE3)
CAX100012IE3	AXC 1000-10-4 (18.5kW IE3)
CAX100013IE3	AXC 1000-10-4 (22kW IE3)
CAX100014IE3	AXC 1000-10-4 (30kW IE3)





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Art. no.	Size *
CAX112006IE3	AXC 1120-10-4 (5.5kW IE3)
CAX112007IE3	AXC 1120-10-4 (7.5kW IE3)
CAX112008IE3	AXC 1120-10-4 (11kW IE3)
CAX112009IE3	AXC 1120-10-4 (15kW IE3)
CAX112010IE3	AXC 1120-10-4 (18.5kW IE3)



Art. no.	Size *
CAX125007IE3	AXC 1250-12-4 (11kW IE3)
CAX125008IE3	AXC 1250-12-4 (15kW IE3)
CAX125009IE3	AXC 1250-12-4 (18.5kW IE3)
CAX125010IE3	AXC 1250-12-4 (22kW IE3)
CAX125011IE3	AXC 1250-12-4 (30kW IE3)
CAX125012IE3	AXC 1250-12-4 (37kW IE3)
CAX125013IE3	AXC 1250-12-4 (45kW IE3)
CAX125014IE3	AXC 1250-12-4 (55kW IE3)

\* Further performance curves in the selection program

# Smoke extract axial fans

## AXC (B), AXR (B)



AXC (B)



AXC (B)-EK



AXC (B), AXR (B) Smoke extract axial fans certified for **300°C/120 min.** in accordance with EN 12101-3

- AXC with aerofoil impeller, adjustable pitch angle for max. efficiency
- Hub and blades are manufactured from highly resistant aluminium alloy
- Terminal box in IP65 mounted at the outside of the casing for easy wiring
- Suitable for operating temperatures of up to -20/55°C continuous or once for 300°C/120 min.
- Inspection hole to verify correct direction of rotation
- Truly reversible version AXR (B) on request

The Systemair AXC (B)/AXR (B) range of long cased smoke extract axial fans is available in sizes from 315 up to 1.600 mm nominal diameter. The adjustable pitch angle setting offers a wide performance and maximum flexibility to match precisely individual airflow requirements. The AXC (B) and AXR (B) axial fans have been performance tested in accordance with DIN ISO 5801, DIN 24163 and AMCA 210-07 on the Systemair fan test rig. High temperature testing in accordance with EN 12101-3. All AXC (B) fans are labeled with the CE-mark.

### High efficiency impellers

The aerodynamically-shaped impellers made from high-strength aluminium cast alloy with flexible blade arrangements provide optimum efficiency. A range of different blade/hub configurations enables high operating pressures.

### Sturdy casing

The housing is made from hot-dip galvanised sheet steel in accordance with DIN EN ISO 1461 (AXC(B)-EK made from pre-galvanised steel sheet). The flanges pressed onto both sides in accordance with Eurovent 1/2 provide additional stability. Standard version as long shaft housing.

### Motors

IP54/55 motors, insulation class H, according to EN 60034-5. Motor in the airflow. Available as single and dual speed motors (switchable poles). Application with frequency converter for standard ventilation available on request. (IE2 motor available on request).

### Multi stage fans

For higher pressure drops two stage fans are offered. Two fans in series increase the available static operational pressure.

### Quality

Systemair is certified according to ISO 9001:2008 and ISO 14001:2004. The Systemair quality system is regularly monitored by TÜV Süd.



### Warranty

Systemair offers a three year warranty on all AXC (B) and AXR (B) fan models. The Systemair general terms and conditions apply.

You can find performance curves in our online-catalogue [www.systemair.de](http://www.systemair.de)



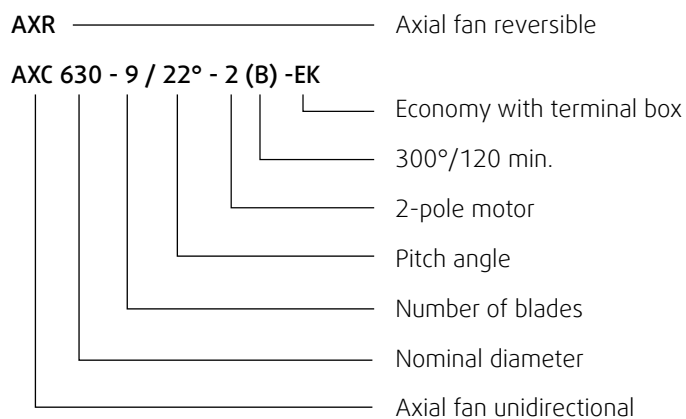


References: Mercedes-Benz Arena in Stuttgart, Germany

Mercedes-Benz Arena with approximately 60,000 seats is used for concerts of different global super stars such as Rolling Stones, Genesis and Jon Bon Jovi. In order to host other sporting events as handball, basketball or volleyball there was built a new event hall under the stands of the soccer stadium. The so-called SCHARrena is about 7,900 square meters and

up to 2,000 spectators are able to follow the different matches. Systemair delivered 17 axial fans for smoke extraction and ventilation in case of fire. Besides 34 speed controlled circular duct fans and two MUB-EC-fans of Systemair are installed in the Mercedes-Benz arena and SCHARrena.

### Ordering code



# Smoke extract axial fans

## AXC (F), AXR (F)



AXC (F)



AXC (F), AXR (F) Smoke extract axial fans certified for **400°C/120 min.** in accordance with EN 12101-3

- AXC with aerofoil impeller, adjustable pitch angle
- Hub and blades are manufactured from highly resistant aluminium alloy
- Terminal box in IP65 mounted at the outside of the casing for easy wiring
- Suitable for operating temperatures of up to -20/55°C continuous or once for 400°C/120 min.
- Inspection hole to verify correct direction of rotation
- Truly reversible version AXR (F) on request
- All aluminium blades for the AXR (F) are x-rayed before assembly to ensure that the quality of the material is perfect ("X-rayed")

The Systemair AXC (F)/AXR (F) range of long cased smoke extract axial fans is available in sizes from 315 up to 1.600 mm nominal diameter. The adjustable pitch angle setting at the factory offers a wide performance and maximum flexibility to match precisely individual airflow requirements. The AXC (F)/AXR (F) axial fans have been performance tested in accordance with DIN ISO 5801, DIN 24163 and AMCA 210-07 on the Systemair fan test rig. High temperature testing in accordance with EN 12010-3. All AXC (F)/AXR (F) fans are labeled with the CE-mark.

### High efficiency impellers

The AXC aerofoil aluminium impellers can be offered with full or fractional solidities, maximum efficiencies can be obtained.

### Sturdy casing

AXC (F)/AXR (F) axial fan casings are heavy gauge, hot dip galvanized, with spun flanges for high rigidity. Long cased execution as standard range.

### Motors

Motor in the air stream. Frequency converter controllable only for standard ventilation on request. Single or two speed motors.

### Multi stage fans

For higher pressure drops two stage fans are offered. Two fans in series increase the available static operational pressure.

### Quality

Systemair is certified according to ISO 9001:2008 and ISO 14001:2004. The Systemair quality system is regularly monitored by TÜV Süd.



### Warranty

Systemair offers a three year warranty on all AXC (F)/AXR (F) fan models. The Systemair general terms and conditions apply.

You can find performance curves in our online-catalogue [www.systemair.de](http://www.systemair.de)





## Ordering code

**AXR** ————— Axial fan reversible

**AXC 630 - 9 / 22° - 2 (F)**

400°/120 min.

2-pole motor

Pitch angle

Number of blades

Nominal diameter

Axial fan unidirectional



# Thermo axial fans

## AXCBF



AXCBF



- Aerofoil impeller
- Die cast aluminium hub and blades
- Suitable for operating temperatures of up to 200°C
- Maximum ambiente air temperature 55°C

The Systemair AXCBF range of bifurcated medium pressure axial fans has been developed for applications with an atmosphere which would either require special motors or reduce the lifetime of a standard motor. The motors of AXCBF are out of the airstream. Available in sizes from 250 up to 800 mm nominal diameter.

### Sturdy casing

Dual-shaft housing made from hot-dip galvanised sheet steel in accordance with DIN EN ISO 1461. The motor shaft can be opened from both sides for ease of access to the motor connection box. The motor is completely separate from the airflow. Terminal box on the motor.

### Motors

Three-phase motor according to IEC standard. IP55 degree of protection, insulation class F, according to EN 60034-5. The motors are equipped with PTC thermistors for optimum motor protection. Available as a single and dual speed motor (switchable poles). Speed control of the standard motors is possible using a frequency converter.

### Quality

Systemair is certified according to ISO 9001:2008 and ISO 14001:2004.

The Systemair quality system is regularly monitored by TÜV Süd.



### Warranty

Systemair offers a three year warranty on all AXCBF fan models. The Systemair general terms and conditions conditions apply.

You can find performance curves in our online-catalogue [www.systemair.de](http://www.systemair.de)



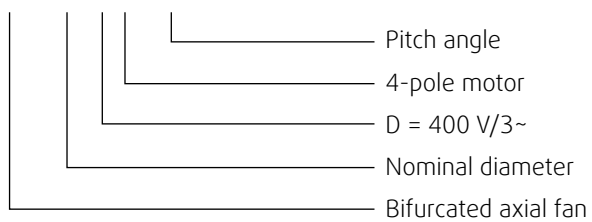


## Standard range AXCBF

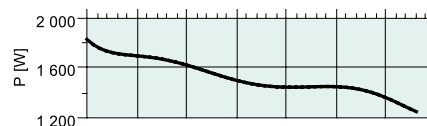
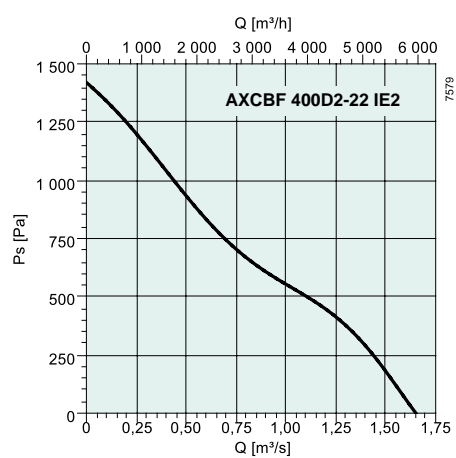
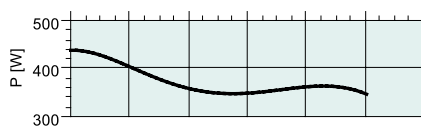
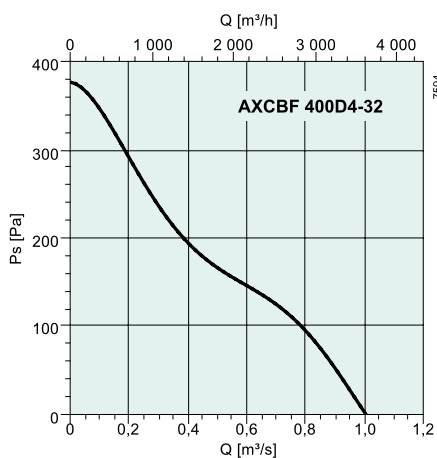
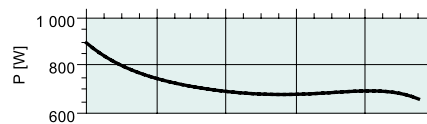
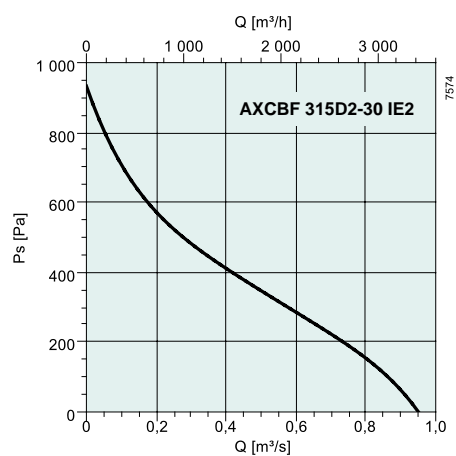
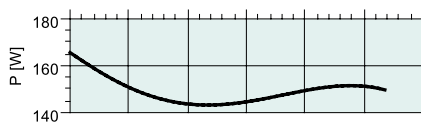
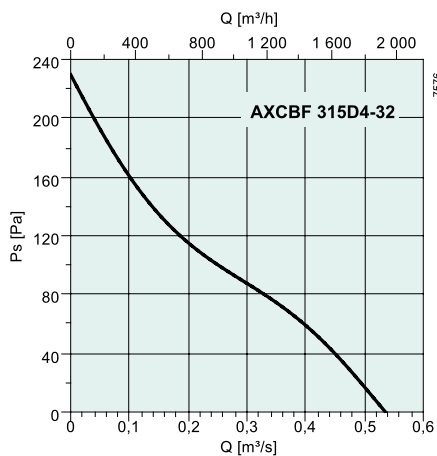
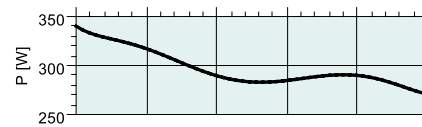
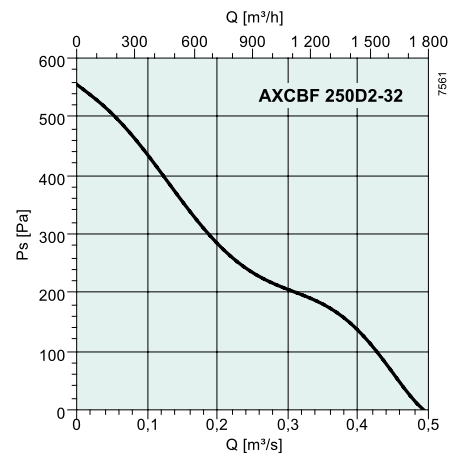
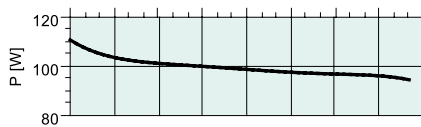
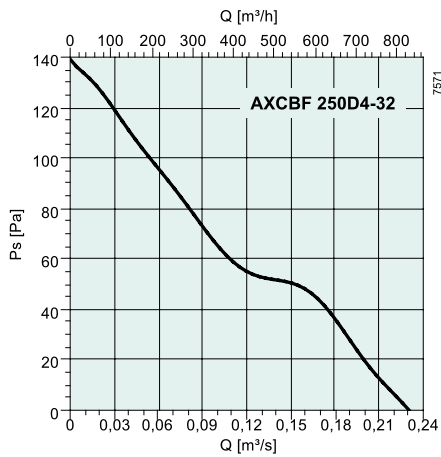
Model	Art.No.	Voltage/frequency V/Hz	Installed motor [kW]	Integrated motor protection
AXCBF 250D2-32	32456	400/50	0.37	PTC
AXCBF 250D4-32	32458	400/50	0.25	PTC
AXCBF 315D2-30 IE2	34146	400/50	0.75	PTC
AXCBF 315D4-32	32462	400/50	0.25	PTC
AXCBF 400D2-22 IE2	34147	400/50	2.2	PTC
AXCBF 400D4-32	32483	400/50	0.55	PTC
AXCBF 500D2-20 IE2	34148	400/50	4.0	PTC
AXCBF 500D4-32 IE2	34152	400/50	1.1	PTC
AXCBF 630D4-26 IE2	34155	400/50	2.2	PTC
AXCBF 800D4-18 IE2	34156	400/50	4.0	PTC

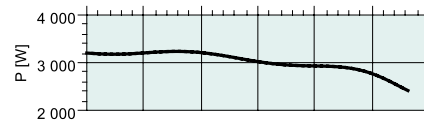
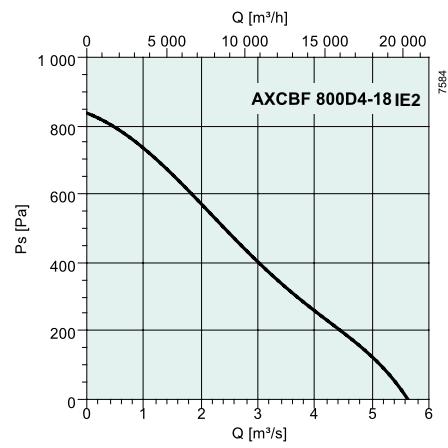
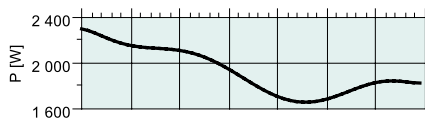
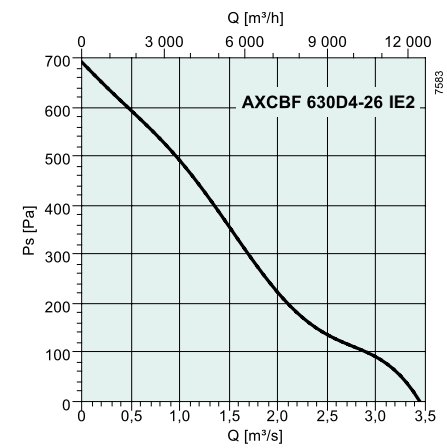
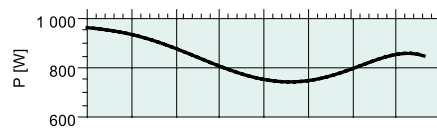
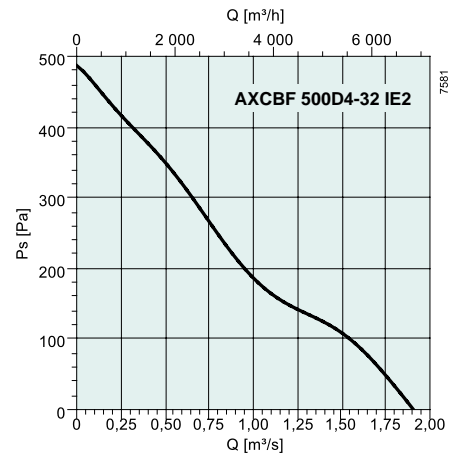
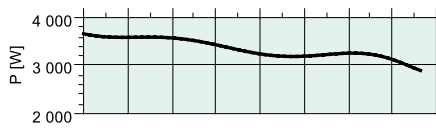
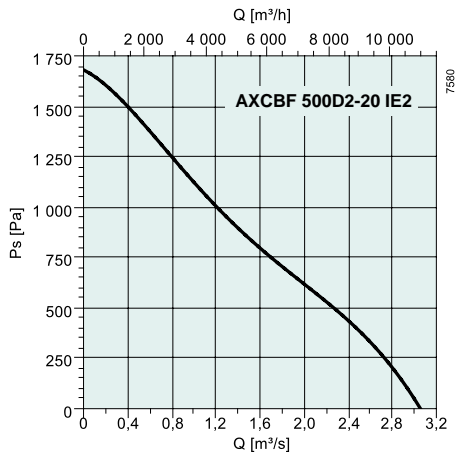
## Ordering code

AXCBF 630 D 4 - 26°



## Quick selection





# Explosion proof axial fans

## AXC-EX / AXCBF-EX



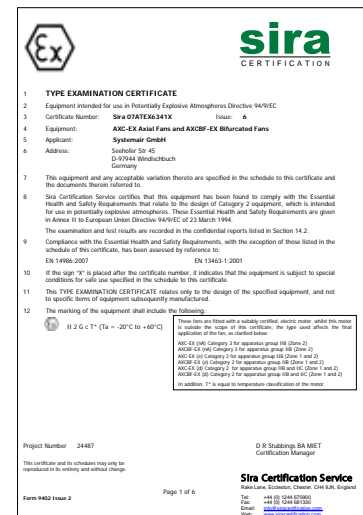
AXC-EX



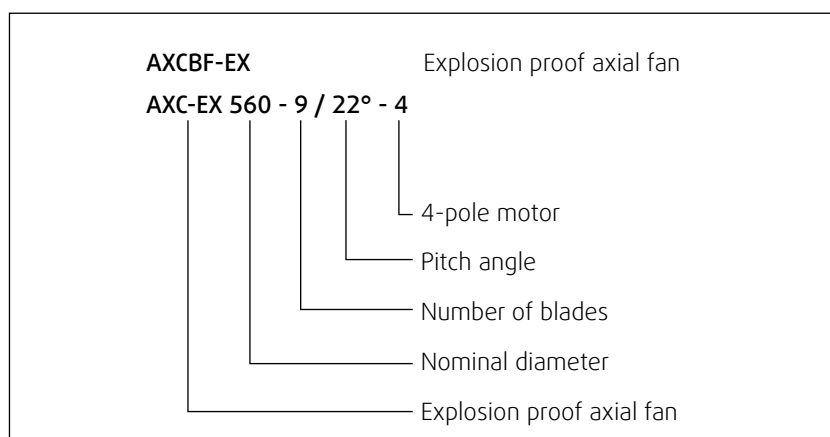
AXCBF-EX

Explosion proof axial fans with ATEX certification in accordance with RL 94/9/EG, EN 14986 and 13463-1

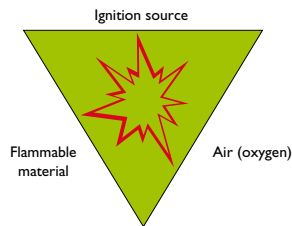
- Explosion classification II 2G c Ex d IIC T4
- Die cast aluminium hub and blades
- Casing made of hot dip galvanized steel to DIN EN ISO 1461
- Flanges to Eurovent 1/2
- Three phase motors, IP55, insulation class F, in accordance with EN 60034. Supplied with Ex-terminal box mounted at the outer side of the casing (AXC-EX). Admissible ambient temperatures from -20° to +40°C, other temperatures on request
- Motor Ex d speed controllable by frequency converter
- Motor EX e on request
- AXCBF-EX with motor outside the airstream



### Ordering code



## Explosion protection



Gases, vapours and mists which occur during storage, production or processing of flammable substances, together with the oxygen in the air, form an explosive atmosphere. In case this atmosphere is ignited, explosions take place which can be harmful to human beings and damage property. Ignition sources can be for example hot temperatures on surfaces, mechanically generated sparks, static electricity or electrical installations.

Protective standards have been developed in a lot of countries to ensure a high level of safety. In the European Union regulations have been harmonized in EC-directives 94/9/EG (ATEX 95, equipment directive, manufacturers or importers) and 99/92/EG (ATEX 137, workplace directive: operation of installations, users).



In short, those directives define the measures to be taken to avoid the ignition of potentially explosive atmospheres, i.e. atmospheres which could become explosive due to local and operational conditions. The required safety level depends on the danger potential in the very installation.

In the EC-directives hazardous areas are divided into classes/zones, defining the probability of an explosive atmosphere (in accordance with IEC 60079-10).

	Zone	Duration of the occurrence of an explosive atmosphere	Equipment category
Gases, vapours, mists	0	continuously, for a long period, frequently	1G
	1	occasionally	2G
	2	rarely and for a short period	3G

The NEC (National Electrical Code) of USA and the CEC (Canadian Electrical Code) of Canada divide into Classes and Divisions, which might deviate from the EC directives. Gases, vapours or mists are classified in Class 1, then divided into Divisions 1 or 2, then into Gas Groups. Please pay attention which standard has been applied (EC-directives or NEC/CEC). Manufacturers of equipment with a potential ignition source (like electric motors, rotating parts) have to ensure that the equipment fulfils the safety requirements given in the relevant directives and codes (grouping and category).

The EC-directives then divide the equipment into Groups. Equipment group I covers mining systems, where a very high or high degree of safety is required. Equipment group II covers other explosive areas and is divided into categories from category 1 (very high degree of safety, even for independently occurring faults), category 2 (high degree of safety, even for occurrence of a fault) and category 3 (normal degree of safety – in normal operation conditions). **Electrical equipment of category 2 must undergo an EC type examination, carried out by a notified body.** For electrical equipment of category 3 and non-electrical equipment the manufacturer is authorized to document conformity with the requirements of the EC-directive. CE-marking of the equipment confirms that it has been manufactured in compliance with all relevant EC-directives.

Equipment group II is further classified into groups. The IEC system is applied in Europe, where IIA is the lowest hazardous gas group, IIB medium and IIC the most group. The NEC directives of North America define it the opposite way, where Group A is the most hazardous gas group.

### Temperature classes

Temperature classes determine the maximum surface temperature of a product at an ambient temperature of max. 40°C, for example an electrical apparatus, which should always be lower than the ignition temperature of the gas/air or vapour/air mixture in which it is used. The ignition temperature is the lowest temperature at which a hot surface can ignite a respective explosive atmosphere. Flammable gases and vapours are classified into temperature classes according to their inflammability. Temperature classes range from T1 to T6.

Max. surface temperature for individual temperature classes

Temperature class	Ignition temperature of different gas mixtures	Max. surface temperature of electrical equipment
T1	> 450°C	450°C
T2	> 300...> 450°C	300°C
T3	> 200...> 300°C	200°C
T4	> 135...> 200°C	135°C
T5	> 100...> 135°C	100°C
T6	> 85...> 100°C	85°C

Groups and temperature classes, some examples:

Material	Explosive limit (Vol. %, LEL-UEL)*	Temperature class	Groups
Propane	1.7 - 10.8	T1	IIA
Ethanol	3.3 - 19	T2	IIB
Hydrogen	4 - 77	T1	IIC
Acetylene	2.3 - 100	T2	IIC
Methane	4.4 - 17	T1	IIA

\*extract from the table flammable liquids and gases by E.Brandes and W. Möller, UEG - OEG (lower explosive limit, upper explosive limit)

Type of ignition protection	Nomenclature	Region	Installation location	Principle	Standard applied
Non sparking apparatus "nA"	Ex nA	IEC, EU	Zone 2	Prevent occurrence of sparks	IEC/EN 60079-15
Increased safety "e"	Ex e	IEC, EU	Zone 1	Prevent excessive temperatures and the occurrence of sparks	IEC/EN 60079-7
Flameproof enclosure "d"	Ex d	IEC, EU	Zone 1	Enclosure withstanding an explosion from within the apparatus	IEC/EN 60079-1

## Explosion Proof Axial Fans AXC-EX, AXCBF-EX

### Marking of an explosion protected fan

In Europe the label must show as a minimum:

- the CE-mark
- the code no. of the certifying body
- the Ex mark, equipment group, category and indication relating to gases (G) or dust (D)
- temperature range of ambient air

### Quality

Systemair is ISO 9001:2008, 14001:2004 and DIN EN ISO/IEC 80079-34:2009 approved.

### Warranty

Systemair offers a three year warranty on all AXC-EX/AXCBF-EX fan models. The Systemair general terms and conditions apply.

### Prototype testing institute:

SIRA Test and certification Ltd.  
Rake Lane, Ecclestone  
Chester; CH4 9JN; England  
Registration no. 0518

Inspection certificate no. of EC-  
prototype testing  
(SIRA 07ATEX6341X)

### Monitoring institute

ZELM Ex e. K.  
Prüf- und Zertifizierungsstelle  
Siekgraben 56

D – 38124 Braunschweig

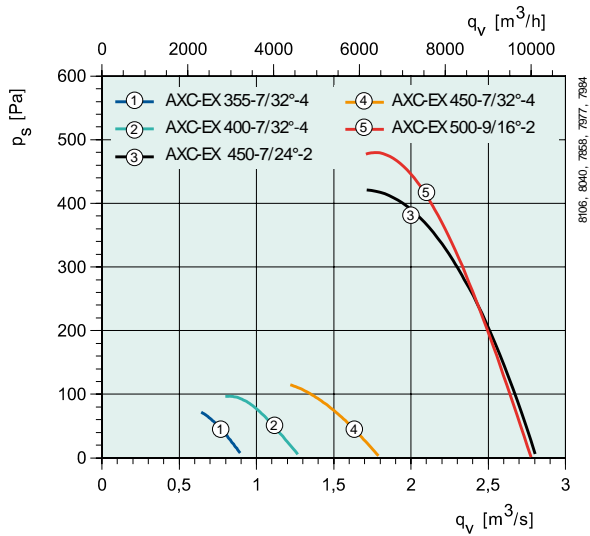
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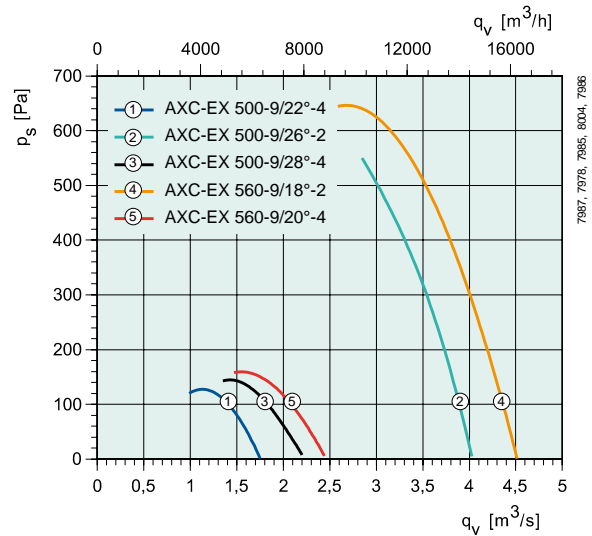
Size	Art. no.	Pole	Pitch angle	Motor [kW]
355	33007	4	32°	0.37
355	35758	4	12°	0.37
400	33008	4	32°	0.37
400	35759	4	14°	0.37
450	33001	2	24°	2.2
450	33009	4	32°	0.55
450	35760	2	17°	1.5
450	35761	2	28°	3
450	35762	4	14°	0.23
500	33002	2	16°	3
500	33010	4	22°	0.55
500	35763	2	36°	7.5
500	33003	2	26°	5.5
500	33011	4	28°	0.75
560	33004	2	18°	5.5
560	33012	4	20°	0.75
560	33005	2	24°	7.5
560	33013	4	26°	1.1
560	35764	2	30°	11
630	33006	2	16°	7.5
630	33014	4	18°	1.1
630	33015	4	30°	3
630	35765	2	20°	11
710	33016	4	30°	4
710	35766	4	26°	2.2
800	37334	4	28°	5.9
800	33017	4	18°	4
800	33018	4	28°	7.5
900	33019	4	18°	7.5
900	33020	4	26°	11
900	35767	4	30°	15

Size	Art. no.	Pole	Pitch angle	Motor [kW]
250	33021	2	28°	0.37
315	33022	2	30°	0.75
400	33023	2	22°	2.2
500	33024	2	18°	2.2
250	33025	4	28°	0.25
315	33026	4	32°	0.25
400	33027	4	32°	0.55
500	33028	4	30°	1.1
630	33029	4	26°	2.2
800	33030	4	18°	4

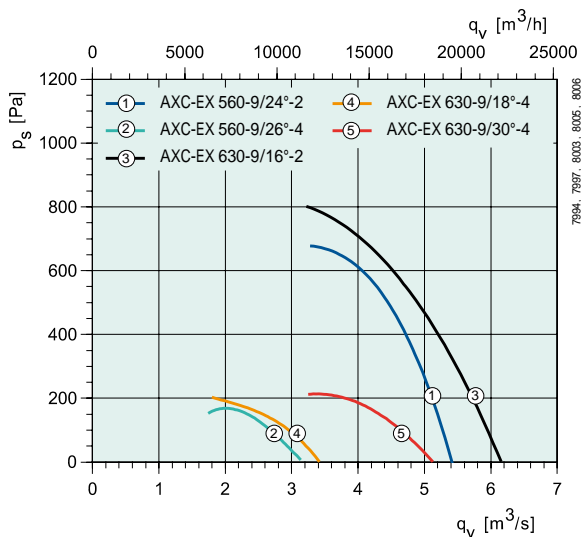
## Quick selection AXC-EX



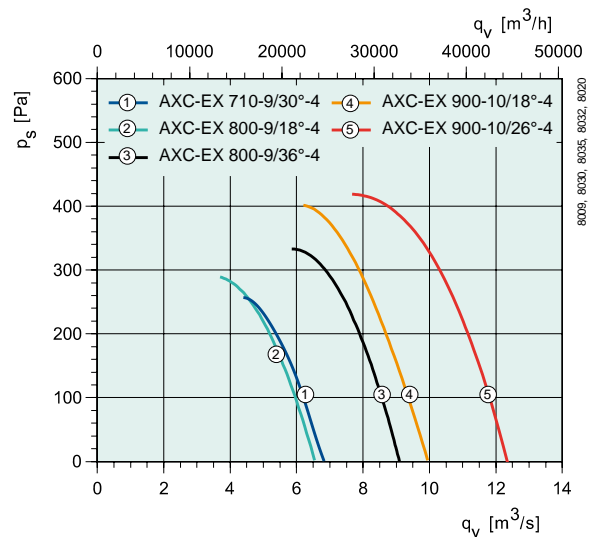
dB(A)	Tot	Frequency bands [Hz]							
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k	
AXC-EX									
355-7/32°-4	74	69	68	69	68	67	64	59	53
400-7/32°-4	77	72	71	72	71	70	67	62	56
450-7/24°-2	96	91	86	89	91	88	88	84	78
450-7/32°-4	82	77	76	77	76	75	72	67	61
500-9/16°-2	100	95	90	93	95	93	92	88	82



dB(A)	Tot	Frequency bands [Hz]							
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k	
AXC-EX									
500-9/22°-4	86	81	80	81	80	79	76	71	65
500-9/26°-2	102	97	92	95	97	95	94	90	84
500-9/28°-4	87	82	81	82	81	80	77	72	66
560-9/18°-2	106	101	96	99	101	99	98	94	88
560-9/20°-4	91	86	85	86	85	84	81	76	70

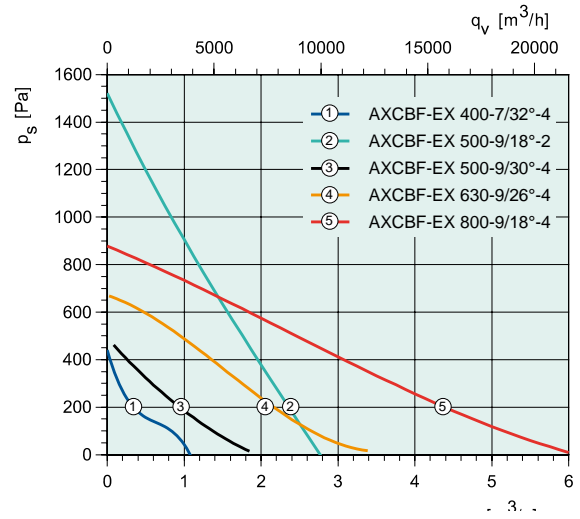
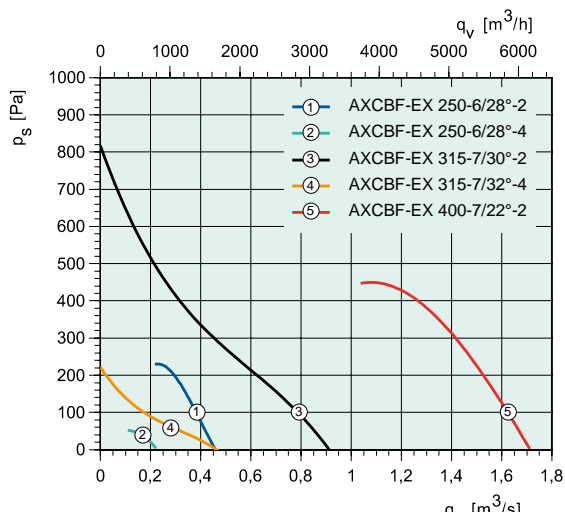


dB(A)	Tot	Frequency bands [Hz]							
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k	
AXC-EX									
560-9/24°-2	108	103	98	101	103	101	100	96	90
560-9/26°-4	93	88	87	88	87	86	83	78	72
630-9/16°-2	111	106	101	104	106	104	103	99	93
630-9/18°-4	96	91	90	91	90	89	86	81	75
630-9/30°-4	99	94	93	94	93	92	89	84	78



dB(A)	Tot	Frequency bands [Hz]							
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k	
AXC-EX									
710-9/30°-4	93	88	87	88	87	86	83	78	72
800-9/18°-4	97	92	91	92	91	90	87	82	76
800-9/36°-4	100	95	94	95	94	93	90	85	79
900-10/18°-4	101	91	89	95	96	94	91	86	80
900-10/26°-4	104	94	97	99	97	96	92	86	80

# Quick selection AXCBF-EX



dB(A)	Tot	Frequency bands [Hz]						
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k
AXCBF-EX								
250-6/28°-2	86	79	76	79	79	75	73	71
250-6/28°-4	71	62	63	67	59	58	56	53
315-7/30°-2	86	81	76	79	81	79	78	74
315-7/32°-4	71	66	65	66	65	64	61	56
400-7/22°-2	93	88	83	86	88	86	85	81

dB(A)	Tot	Frequency bands [Hz]						
$L_{WA}$ Inlet/Outlet	63	125	250	500	1k	2k	4k	8k
AXCBF-EX								
400-7/32°-4	82	77	76	77	76	75	72	67
500-9/18°-2	101	90	88	91	95	96	94	92
500-9/30°-4	91	86	85	86	85	84	81	76
630-9/26°-4	93	88	87	88	87	86	83	78
800-9/18°-4	98	93	92	93	92	91	88	83

# Jet fans for Car Park Ventilation

## Custom-designed systems



**Jet fan AJR-TR**  
Thrust: 23-55 N



**Jet fan AJ8**  
Thrust: 23-80 N



**Jet fan IV**  
Thrust 50-85 N



**Jet fan priojet**  
Thrust: 12 N

Improved air quality, lower investment and operational costs, as well as optimum safety in the case of fire are only a few of the advantages of a jet fan system for underground car parks. As system supplier, Systemair provides all the necessary components from a single source and customised especially for the project: jet fans, ventilation fans, as well as the control system.



Already in the planning phase, we provide support to our customers through valuable CFD simulations (Computational Fluid Dynamics), in order to ensure efficient operation when required. Systemair jet fans are tested according to EN 12101-3 and correspond to the temperature class F300-300°C/120min, and F400-400°C/120 min.

You can find more Jet fans in our online-catalogue [www.systemair.de](http://www.systemair.de)



### Jet Fan Systems

You can find more information about the Systemair jet fan systems in our catalogue.



Reference: Dubai Mall, United Arab Emirates

"Dubai Mall" so far is the largest shopping mall in the world. It was opened in January 2008. Systemair provided more than 1.800 jet fans of the type AJR for ventilation of the car parks. These were customized using a specific, white powder coating. The mall provides parking garages for approximately 16.000 vehicles.



# Tunnel fans

## Heavy duty complete systems

Our tunnel fans provide safety and comfort in road, metro and railway tunnels. The fans demonstrate their power right from the construction phase of the tunnel project and aerate the building site with fresh air.

Tunnel fans extract exhaust gases, dust and heat to the outside and provide a clear view and acceptable conditions for men and machine. In case of fire they keep escape and rescue routes free from smoke gases and heat. Our tunnel smoke extract fans are tested according to EN 12101-3 and are temperature resistant up to 400°C for 120 min. As a contemporary solution for demanding requirements on the market, Systemair offers complete systems including frequency converters, filters, fans and accessories. Fans can be realized with diameters up to 2,24 m.

You can find more Tunnel fans in our online-catalogue [www.systemair.de](http://www.systemair.de)



**Axial fan AXC / AXR**

Single and multiple level



**Tunnel-Jet fan AJ**

Thrust up to 2.300 N



### Tunnel Ventilation

You can find more information about the Systemair tunnel ventilation systems in our catalogue.



Reference: A2 or "Egnatia Odos," Greece

Motorway 2 (E 90) is considered to be the largest infrastructure project in modern Greece. It connects the Igoumenitsa port in Western Greece with the Turkish border in the East. The 670 km mostly cross very difficult terrain; therefore, the construction includes, in addition to the many bridges, 76 tunnels of a total length of 49.5 km. Between 2004 and 2009, Systemair delivered more than 300 tunnel jet fans of the AJ(T) type with a diameter of 710 and 1.120 mm. They are 100% reversible and powder-coated in red.



# Special applications

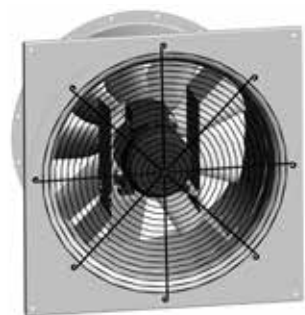


AXC-G

## Two-stage fans

AXC...-G  
 AXC...(B) -G  
 AXC...(F) -G

- Two Fans mounted in series to reach higher pressure.
- Fan execution according to AXC-, AXC (B)-, AXC (F) -standard.



AXC-P

## Wall mounted axial fans

AXC...-P  
 AXC...(B)-P

- Square wall plate with inlet cone manufactured from steel, hot dip galva,niced.
- IEC standard or smoke extract motors, single or two speed. Protection guard on motor side.
- Terminal box supplied loose.
- Up to impeller diameter 1000.
- AXC: Adjustable aluminium impellers.



AXC-D

## Axial roof fans (exhaust and supply fans)

AXC...-D  
 AXC...(B)-D  
 AXC...(F)-D

- Casing manufactured from steel, hot dip galvanised upon completion.
- Delivered with roof cowl and base frame.
- No wind or snow load testing required for this design.

## Ordering code

... - G	Two fans mounted in series
... - P	Wall mounted axial fans
... - D	Axial roof fans
... - Box	Axial fan with insulated box



# Axial fan in sound insulated box

## AXC-Box

- The complete fan unit is mounted in a vibration insulated box, made of removable, double skin galvanised steel panels with 20 mm, non-combustible mineral wool insulation. Panels on duct connection sides are single skin without insulation
- Box frame, including corners, completely made of aluminium. Fan access possible via maintenance door (selectable access side).
- Standard execution made for horizontal installation, execution for vertical installation on request
- Weather roof for outdoor installation available
- Sound attenuation values for surrounding, see table

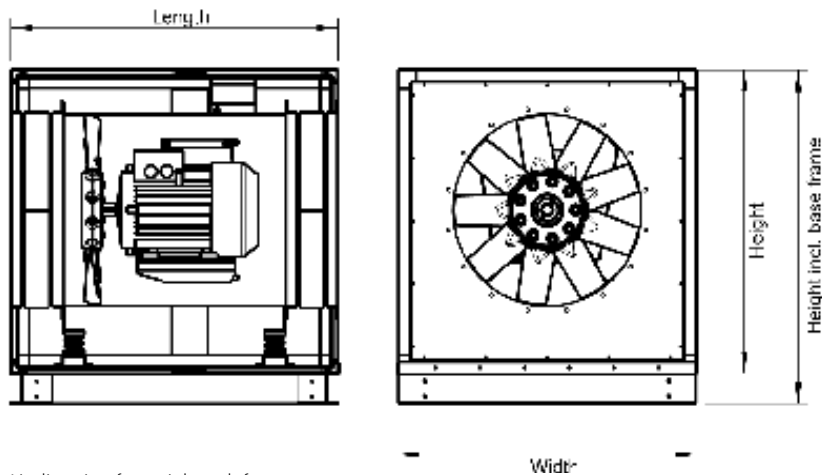


Insertion loss DIN EN 1886	Hz	125	250	500	1000	2000	4000	8000
Wall thickness 20 mm	dB	12	14	18	27	22	25	33
Panele 50 mm	dB	27	34	43	38	34	38	40

## Overview Dimensions AXC-Box

Size	Motor size	Length	Width	Height	Size with base frame	Diameter	Gross weight min.	Gross weight max.
AXC 315 (l=375)*	71-90	670	670	670	-	315	70	80
AXC 355 (l=375)*	71-90	670	670	670	-	355	75	85
AXC 400 (l=450)*	71-100	752	670	670	-	400	80	100
AXC 450 (l=500)*	71-112	800	800	800	-	450	100	130
AXC 500 (l=540)*	71-132	858	800	800	-	500	120	160
AXC 560 (l=500)*	80-112	800	1000	1000	1100	560	125	255
AXC 560 (l=750)*	132-160	1100	1000	1000	1100	560	130	260
AXC 630 (l=500)*	80-112	800	1000	1000	1100	630	130	265
AXC 630 (l=750)*	132-180	1100	1000	1000	1100	630	135	270
AXC 710 (l=500)*	80-112	800	1270	1270	1370	710	190	390
AXC 710 (l=700)*	132-160	1000	1270	1270	1370	710	195	395
AXC 710 (l=800)*	160-180	1100	1270	1270	1370	710	200	400
AXC 800 (l=500)*	90-112	800	1270	1270	1370	800	220	440
AXC 800 (l=700)*	132-160	1000	1270	1270	1370	800	225	445
AXC 900 (l=640)*	100-132	1000	1270	1270	1370	900	230	450
AXC 900 (l=850)*	160-200	1170	1270	1270	1370	900	235	455
AXC 1000 (l=640)*	100-132	1000	1340	1600	1700	1000	260	480
AXC 1000 (l=850)*	160-200	1170	1340	1600	1700	1000	265	485

\*l=Fan length depending on motor frame size

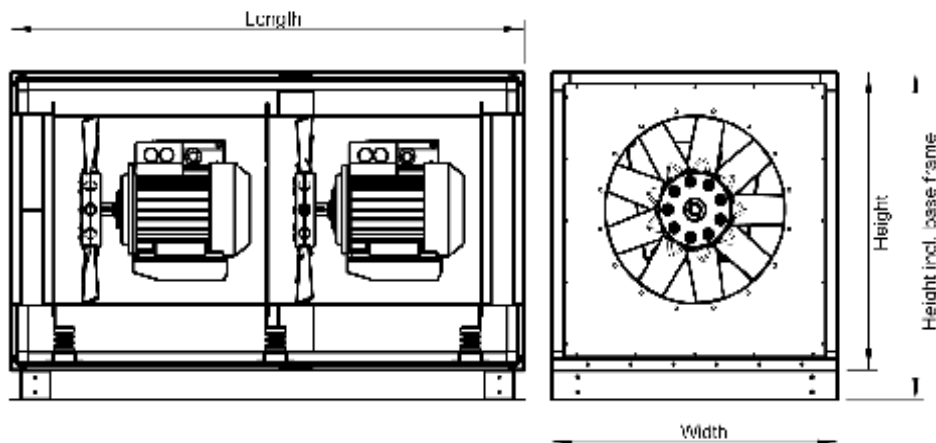


Air direction from right to left

## Overview Dimensions AXC-G-Box

Size	Motor size	Length	Width	Height	Size with base frame	Diameter	Gross weight min.	Gross weight max.
AXC-G 315 (l=750)*	71-90	1052	670	670	-	315	140	160
AXC-G 355 (l=750)*	71-90	1052	670	670	-	355	150	170
AXC-G 400 (l=900)*	71-100	1198	670	670	-	400	160	200
AXC-G 450 (l=1000)*	71-112	1300	800	800	-	450	200	260
AXC-G 500 (l=1080)*	71-132	1400	800	800	900	500	240	320
AXC-G 560 (l=1000)*	80-112	1300	1000	1000	1100	560	250	510
AXC-G 560 (l=1500)*	132-180	1800	1000	1000	1100	560	265	535
AXC-G 630 (l=1000)*	80-112	1300	1000	1000	1100	630	260	530
AXC-G 630 (l=1500)*	132-180	1800	1000	1000	1100	630	265	535
AXC-G 710 (l=1000)*	80-112	1300	1270	1270	1370	710	380	780
AXC-G 710 (l=1400)*	132-160	1700	1270	1270	1370	710	385	785
AXC-G 710 (l=1600)*	160-180	1900	1270	1270	1370	710	390	790
AXC-G 800 (l=1000)*	90-112	1300	1270	1270	1370	800	440	780
AXC-G 800 (l=1400)*	132-160	1698	1270	1270	1370	800	445	785
AXC-G 900 (l=1280)*	100-132	1600	1270	1270	1370	900	460	900
AXC-G 900 (l=1700)*	160-200	2016	1270	1270	1370	900	465	905
AXC-G 1000 (l=1280)*	100-132	1600	1340	1600	1700	1000	520	960
AXC-G 1000 (l=1700)*	160-200	2016	1340	1600	1700	1000	525	965

\*l= Fan length depending on motor frame size



Air direction from right to left

# Diffusers for axial fans



- Optimal use of energy input
- Fit for future: Active reduction of CO2 emissions
- Up to 55% less operating costs depending installation type



## What are diffusers?

Diffusers are components which symmetrically enlarge the fan outlet diameter. Used in the right way diffusers reduce the required motor power of the ventilation system, as they regain constructively caused energy losses. By doing so the used energy can be utilised in an optimal way and the operating costs of the system are significantly lowered.

## Functional principle

The total pressure of a ventilation system is divided into two parts and defines the required motor power of a fan: The static pressure, defined by the duct system and built-in components, and the dynamic pressure, defined by the air velocity in the system. Diffusers reduce the air velocity and, therefore, the dynamic pressure.

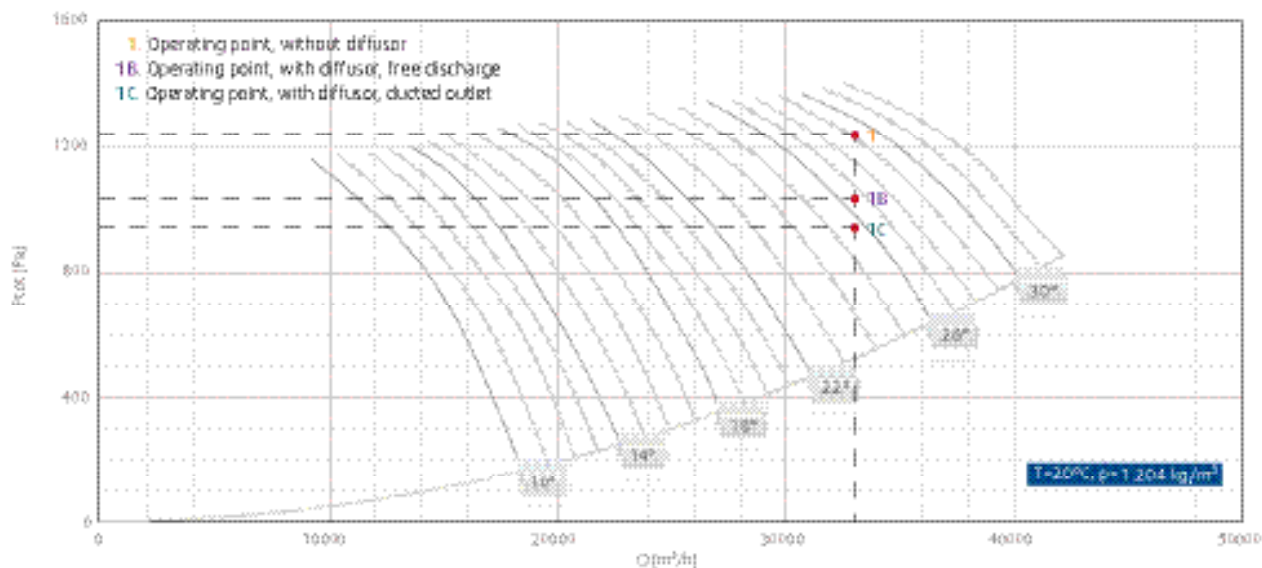
## Example of a free discharge fan

The velocity energy (kinetic energy) of a free discharge fan is considered as a loss. The outlet speed directly defines the extent of the energy loss. A diffuser converts part of this energy loss into usable energy (= stat. pressure). The pressure in the system can be lowered by this "pressure regain". This is done by reducing the original impeller pitch angle of the fan defined without diffuser.

**Thus a diffuser reduces the motor power, which in turn can significantly reduce the running costs of the system.**

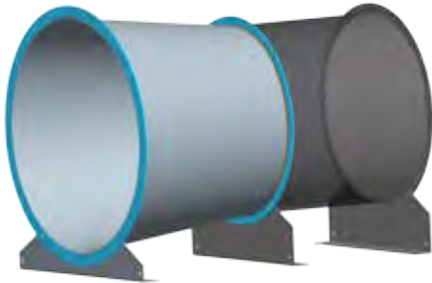
## Example

AXC 630-9/x°-2

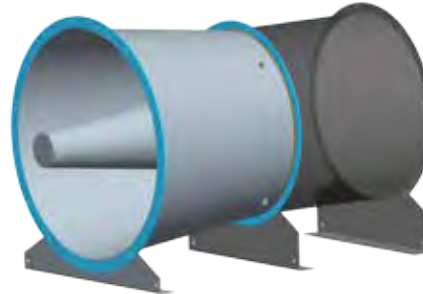


## Dimensions

Diffuser A



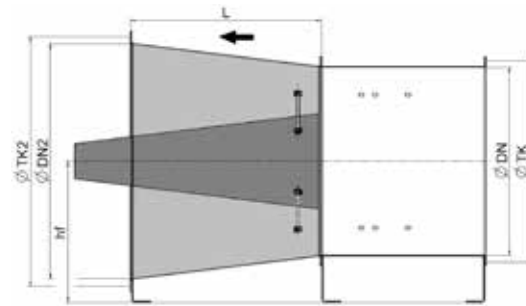
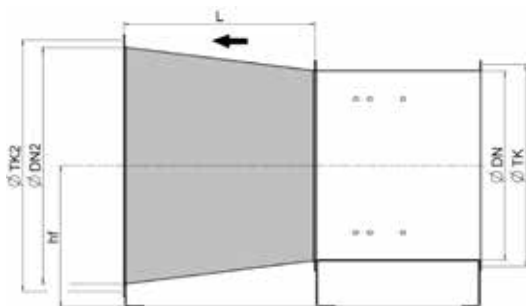
Diffuser B



Dimensions table diffusers A + B

DN	DN	DN <sub>2</sub>	L	hf	Tk	zxØd	T <sub>K2</sub>	z <sub>2</sub> x Ød <sub>2</sub>	Weights Diffusers* (kg)	
	Inlet	Outlet			Inlet		Outlet		A	B
560	560	710	611	425	620	12 x Ø12	770	16 x Ø12	36	39
630	630	800	692	475	690	12 x Ø12	860	16 x Ø12	44	49
710	710	900	774	530	770	16 x Ø12	970	16 x Ø15	56	62
800	800	1.000	814	600	860	16 x Ø12	1.070	16 x Ø15	82	99
900	900	1.120	896	670	970	16 x Ø15	1.190	20 x Ø15	110	127
1.000	1.000	1.250	1.018	750	1.070	16 x Ø15	1.320	20 x Ø15	133	150
1.120	1.120	1.400	1.140	850	1.190	20 x Ø15	1.470	20 x Ø15	173	190
1.250	1.250	1.600	1.425	900	1.320	20 x Ø15	1.680	24 x Ø19	246	280
1.400	1.400	1.800	1.629	1.060	1.470	20 x Ø15	1.880	24 x Ø19	335	370
1.600	1.600	2.000	1.629	1.120	1.680	24 x Ø19	2.080	24 x Ø19	353	403

Weights\*: Diffusor incl. MFA(E) + MFA(A)



## Recommendations

Diffusers are recommended in case the fan selection gives the following or higher values:

Dyn. pressure portion at the operating point	$\Delta P_d > 150$ [Pa]	
Medium flow velocity	$c > 16.5$ [m/s]	
Daily operating time	3 h or more	
Type of installation	Free exhaust (A + B, DIN 24163 part 1)	Saving of operation costs up to 55 %
	Ducted inlet or ducted outlet (C + D, DIN 24163 part 1)	Saving of operation costs up to 35 %

# Vibration monitoring for fans

## For machine vibration monitoring

### Vibration monitoring concept

Continuous vibration control according to ISO 10816-3, 14694, 14695, 13350

With permanent vibration monitoring changes in operating conditions of fans can be located early and corrected when necessary. At an early stage possible machine damages can be avoided and necessary maintenance and repair work can be planned economically.

### Systemair vibration monitoring

Versions and designs													
Code		Description											
Version	Type	motor size	Position 1: on motor	Position 2: on fan casing	Position 3: position 1+2	Position 4: on bearing shields	Number of sensors	Sensor type	Analysis signal 4-20 [mA]	Limit value setting	1 Digital switch signal <sup>3)</sup>	Display LED green: on LED yellow: switching status <sup>3)</sup>	According to DIN ISO 10816-3 / 14694
A	1	160 - 250	X				1	VTV 122	X				yes
	2			X			1	VKV 021	X	X	X	X	<sup>1)</sup>
	3				X		1	VTV 122	X				yes
							1	VKV 021	X	X	X	X	<sup>2)</sup>
B	4	ab 250				X	2	VTV 122	X				yes

<sup>1)</sup> System monitoring

<sup>2)</sup> Complete system monitoring

<sup>3)</sup> e.g. fan switch off

4 [mA] = 0 [mm/s]  
20 [mA] = 25 [mm/s]

#### Version A :

VTV122: Signal input by sensor on motor, VKV 021: signal input on fan casing ( see type A1-3)  
(possible exception A2 of Jet-fan → VTV 122 to ISO 13350, on request)

#### Version B :

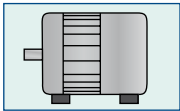
VTV 122 : Signal input by sensors on motor bearing shield (Drive End and Non Drive End)  
(see type B4)

## Vibration causes

### Electric motor

Misalignment, electrical motor defect, unbalanced rotor, bearing defective, lubrication problems

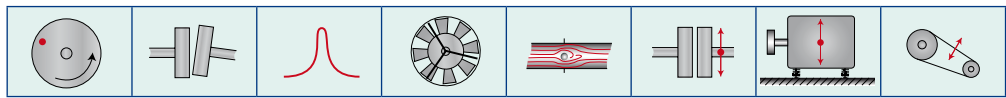
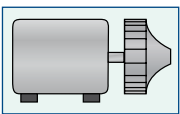
Electric motor



### Fans

Unbalance (wear and tear, pollution) misalignment, blade passing frequency, turbulent flow, electric motor, belt drive, natural frequency of belts

Fans



## Vibration velocity limits

Sensor VTV 122 –

signal without critical value setting

Sensor VKV 021 –

signal with critical value setting

switch point RMS 0 – 25 [mm/s]

switch point delay time 1 – 60 [s]

switch out put: opening contact when exceeding critical limit

There is also the possibility to transfer a signal over a screened line to the DDC-building management system (BMS).  
Thereby limit settings can be set. (DDC-Direct Digital Control)

### e.g. ISO 10816-3 Vibration velocity limits

								v r.m.s. in [mm/s]	v r.m.s. in [in/s]	Vibration velocity 10-1000 Hz n> 600 [1/min] (2-1000 Hz n> 120 [1/min])
								11	0,433	
								7,1	0,280	
								4,5	0,177	
								3,5	0,138	
								2,8	0,110	
								2,3	0,091	
								1,4	0,055	
								0,71	0,028	
rigid	soft	rigid	soft	rigid	soft	rigid	soft	Base		
pumps > 15[kW] radial, axial, diagonal				medium sized machines 15 [kW] < P ≤ 300 [kW]		large machines 300 [kW] < P < 50MW		Machine type		
direct drive		counter shaft / belt drive		motors 160 mm ≤ H < 315 mm		motors 315 mm ≤ H				
group 4		group 3		group 2		group 1		Group		



start up



unlimited long-term operation

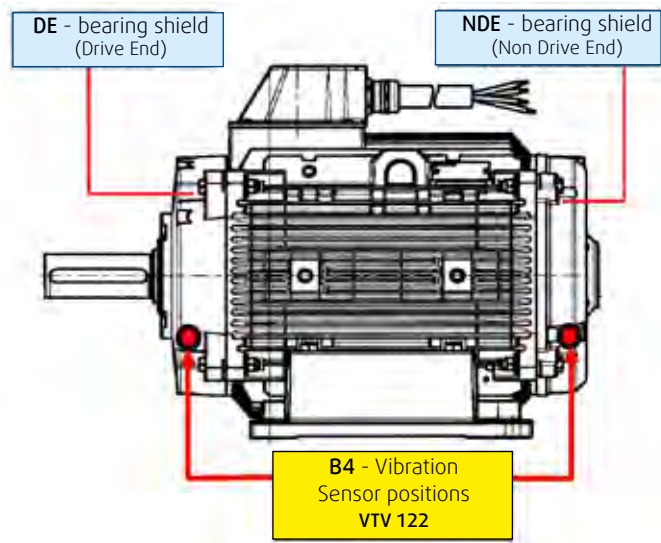


short-term operation

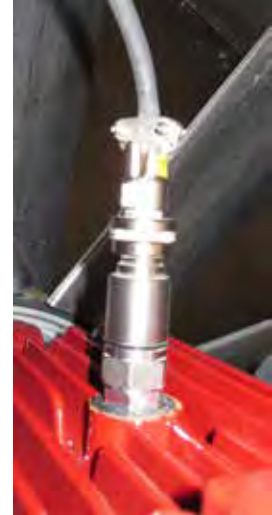


vibrations cause damages





Sensor positions on bearing shields ( B4 : VTV 122)



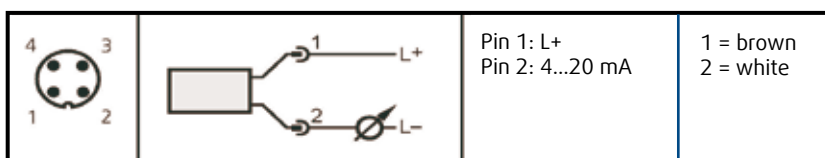
Sensor position on motor center (A1 : VTV 122)

**Sensor VTV 122 – technical data , wiring**

<b>Application</b>	Vibration transmitter Vrms to ISO 10816
<b>Electrical design</b>	DC
<b>Output</b>	4...20 mA analogue
Operating voltage [V]	9,6...32 DC
Load for analogue output [ $\Omega$ ]	max. ( $U_b = 9,6V$ ) x 50; 720 at $U_b = 24V$
Frequency range [Hz]	10...1000
Analogue output	4...20 mA
Accuracy [%]	$< \pm 3$
Repeatability	$< 0,5 \%$
Measuring range	4 mA = 0 mm/s...20 mA = 25 mm/s
Ambient temperature [ $^{\circ}C$ ]	-30...105
Protection	IP 69
EMC	EN 61000-4-2 ESD: 4 kV CD / 8 kV AD EN 61000-4-3 HF radiated: 10 V/m EN 61000-4-4 Burst: 2 kV EN 61000-4-6 HF conducted: 10 V
Housing materials	V4A (1.4404)
Connection	M8
Weight [kg]	0,125



Sensor VTV 122



## Sensor VKV 021 – technical Data , wiring

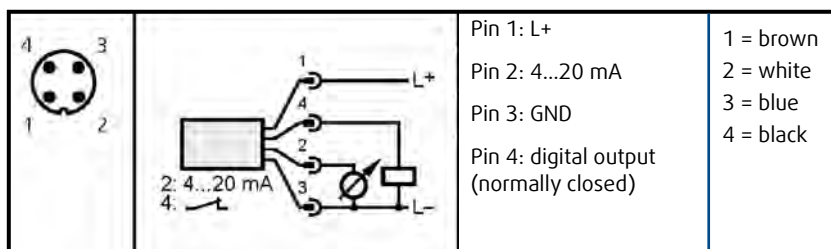
Application Output	Vibration monitor Vrms to ISO 10816 1 x normally / 1 x analogue 4...20 mA
Operating voltage [V]	18...32 DC
Current rating [mA]	500
Short-circuit protection	pulsed
Reverse polarity protection	yes
Overload protection	yes
Voltage drop [V]	< 2
Current consumption [mA]	< 50
Load for analogue output [ $\Omega$ ]	< 500
<b>Accuracy / deviations ( in % of the span)</b>	
Switch point accuracy	< $\pm 4$
Repeatability **)	< 1
Analogue output	4...20 mA
Accuracy [%]	< $\pm 5$
Repeatability	< 0,5 %
Adjustment range	Switch point RMS 0...25 mm/s; Switch point delay time 1...60 s
Ambient temperature [°C]	-25...80
Protection	IP 67
EMC	EN 61000-4-2 ESD: 4 kV CD / 8 kV AD EN 61000-4-3 HF radiated: 10 V/m EN 61000-4-4 Burst: 2 kV EN 61000-4-6 HF conducted: 10 V
Housing materials	PBT (Pocan); PC (Makrolon); FPM (Viton); V4A (1.4404)
Display	Operation: LED green Switching status: LED yellow
Connection	M8
Weight [kg]	0,114



Sensor position on fan casing. (A2 : VKV 021)



Sensor VKV 021



### Terminal box

Sensor signals are readable from the relevant serial terminal in the terminal box by multi functional measuring devices (wiring diagram in terminal box).



Terminal Box - Vibration control

### Vibration velocity measuring

The conversion of the linear current signal is done according to the following formula:

$$\text{Vibration velocity [mm/s]} = (\text{mA} - 4) / 0,6399$$

$$[\text{in/s}] = ((\text{mA} - 4) / 0,6399) / 25,4$$

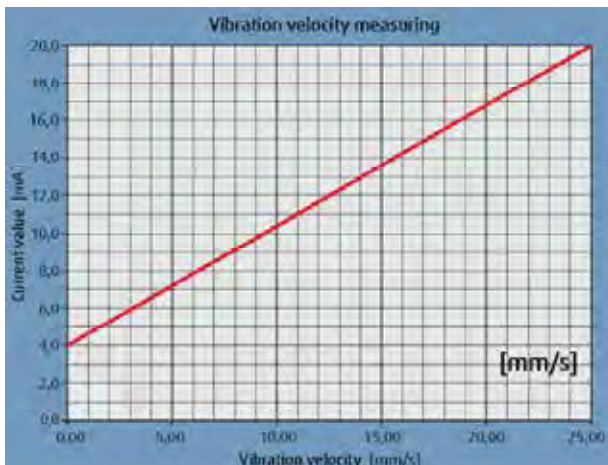


Table: Conversion of [mA] --> [mm/s]

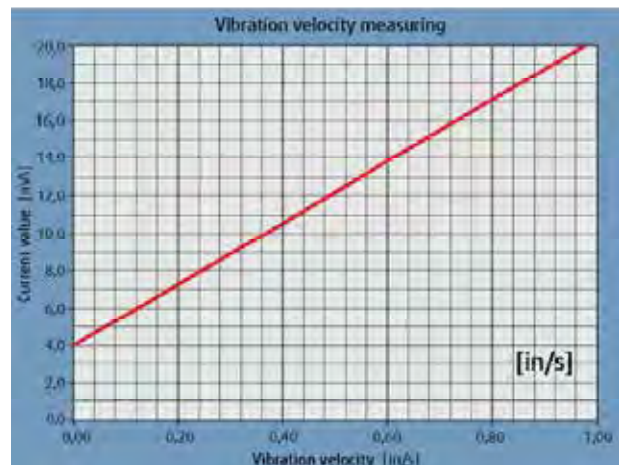


Table: Conversion of [mA] --> [in/s]

### Available versions

Vibration monitoring consisting of

#### Vibration monitoring A1

Art.-no. : 34261

- 1 pcs. Vibration controller/ sensor VTV 122  
10 Hz – 1kHz , Measuring range 25 [mm/s]
- 1 pcs. Adapter/ turned part
- 1 pcs. Sensor cable, cable plug 4pole  
Screened cable grey, 6 mm
- 1 pcs. Terminal box IP 65  
L125 x B 80 x T 57 mm in die cast aluminum  
Coated RAL 7035 with cable gland 2x M12x1,5 / 1x M16x1,5

**Vibration monitoring A2****Art.-Nr.: 34262**

- 1 pcs. Vibration controller / sensor VKV 021 incl. protection cap  
10 Hz – 1kHz , measuring range 25 [mm/s]  
2 adjustable switching points and opening contact
- 1 pcs. Sensor cable, cable plug 4pole  
Screened cable grey , 6 mm
- 1 pcs. Terminal box IP 65  
L125 x B 80 x T 57 mm in die cast aluminum  
Coated RAL 7035 with cable gland 2x M12x1,5 / 1x M16x1,5

**Vibration monitoring A3 <sup>(1)</sup>****Art.-Nr.: 34263**

- 1 pcs. vibration controller / sensor VTV 122  
10 Hz – 1kHz , measuring range 25 [mm/s]
- 1 pcs. Adapter/ turned part
- 1 pcs. Vibration controller / sensor VKV 021 incl. protection cap  
10 Hz – 1kHz , measuring range 25 mm/s  
2 adjustable switching points and opening contact
- 2 pcs. Sensor cable, cable plug 4pole  
Screened cable grey , 6 mm
- 1 pcs. Terminal box IP 65  
L125 x B 80 x T 57 mm in die cast aluminum  
Coated RAL 7035 with cable gland 2x M12x1,5 / 1x M16x1,5

**Vibration monitoring B4<sup>(1)</sup>****Art.-Nr.: 34264**

- 2 pcs. Vibration controller / sensor VTV 122  
10 Hz – 1kHz , measuring range 25 [mm/s]
- 2 pcs. Sensor cable, cable plug 4pole  
Screened cable grey , 6 mm
- 1 pcs. Terminal box IP 65  
L125 x B 80 x T 57 mm in die cast aluminum  
Coated RAL 7035 with cable gland 2x M12x1,5 / 1x M16x1,5

*More versions on request.*<sup>(1)</sup> Only possible when already mentioned with fan inquiry!

## Notes

## Notes

Subject to errors and technical modifications!



# Systemair Worldwide



## Systemair production facilities worldwide:

### Skinnskatteberg, Sweden:

Head office of the Systemair group, distribution center and largest production facility with one of Europe's most advanced R&D-centers. Frico's central warehouse is also located here.

### Windischbuch, Germany:

Production facility for fans and modular air handling units, specialized on engineered products (e.g. tunnel and jet fans). Distribution center.

### Langenfeld, Germany:

Production of air curtains.

### Mülheim an der Ruhr, Germany:

Menerga is a leading European producer of air handling units for swimming pool halls and comfort ventilation with extra high efficiency.

### Hässleholm, Sweden:

VEAB is the leading European manufacturer of electric duct heaters. Production of heating and cooling coils, electric and water based.

### Ukmerge, Lithuania:

Production of smaller air handling units with energy recovery systems.

### Maribor, Slovenia:

Specialized in centrifugal smoke extract fans, EN certified.

### Hasselager, Denmark:

Production of modular air handling units.

### Dal, Eidsvoll, Norway:

Production of air handling units for the Norwegian market.

### Bratislava, Slovakia:

The factory in Bratislava manufactures air distribution products and EN certified fire and smoke dampers.



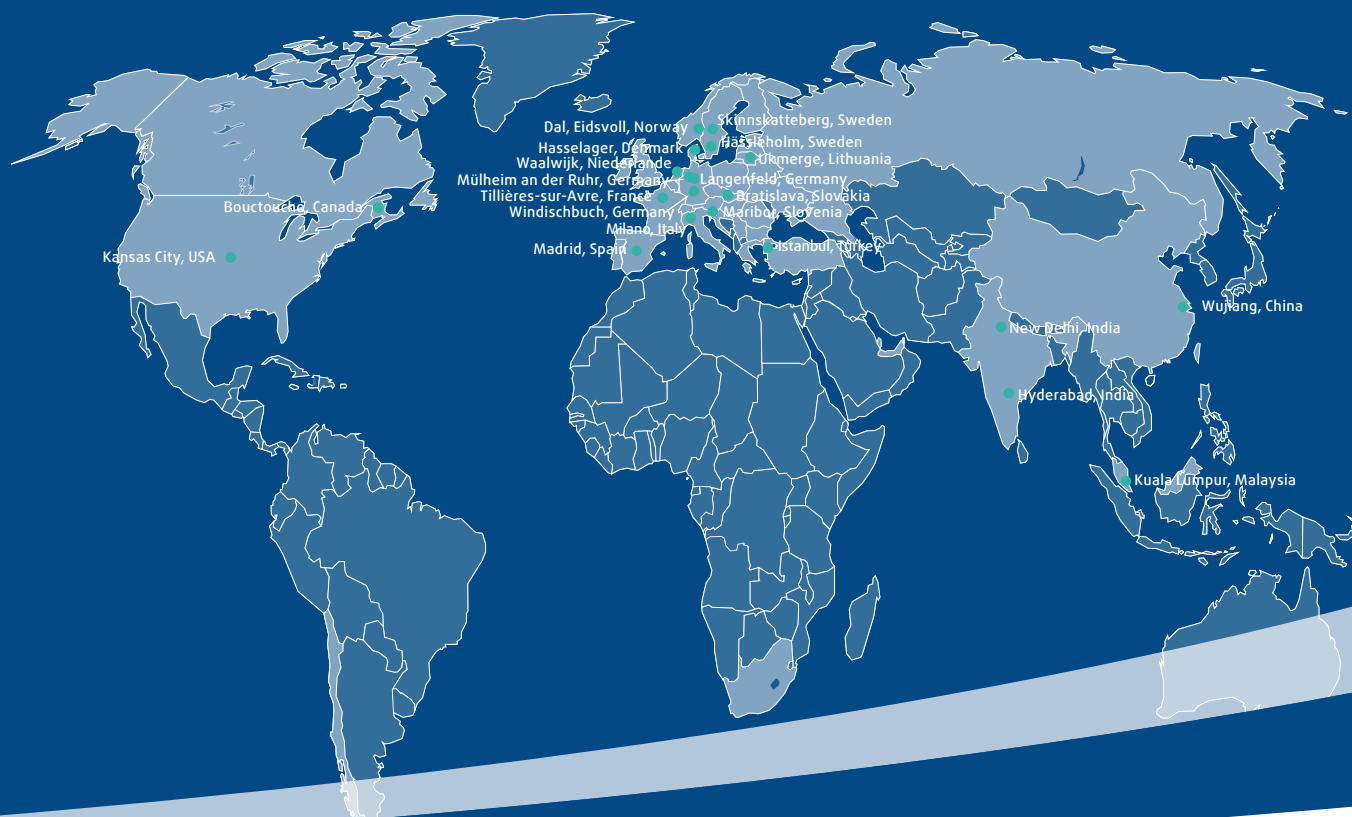


#### Quality:

Systemair is certified in accordance with ISO 9001; ISO 14001 and ATEX. Our research and development laboratories are one of the most modern in Europe; measurements are made in accordance with international standards like AMCA and ISO.

#### Save energy, lower running cost!

Our label "Green Ventilation" features products with a high energy saving potential. All products labelled with "Green Ventilation" combine energy economy with energy efficiency.



#### Madrid, Spain:

Production of air handling units for the southern European market.

#### Milan, Italy:

Our factory in Italy, Systemair AC, develops and manufactures a wide range of air conditioner.

#### Waalwijk, Netherlands:

Holland Heating is Netherlands leading manufacturer of air handling units.

#### Tillières-sur-Avre, France:

Production of air conditioning products.

#### Istanbul, Turkey:

Systemair-HSK is Turkey's leading manufacturer of air handling units.

#### Bouctouche, Canada:

Our main North American production facility of air handling units and inline fans for commercial and residential applications is located in Bouctouche.

#### Kansas City, USA:

Production of fans for the US market.

#### Kuala Lumpur, Malaysia :

Production and marketing of products for Tunnel and garage ventilation.

#### Hyderabad, India:

Production of air distribution products.

#### New Delhi, India:

The factories in New Delhi and Noida manufacture grilles and diffusers.

#### Wujiang, China:

Production of air handling units for the Asian market.



PT. MAKSWEI MEGAH PERKASA

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