

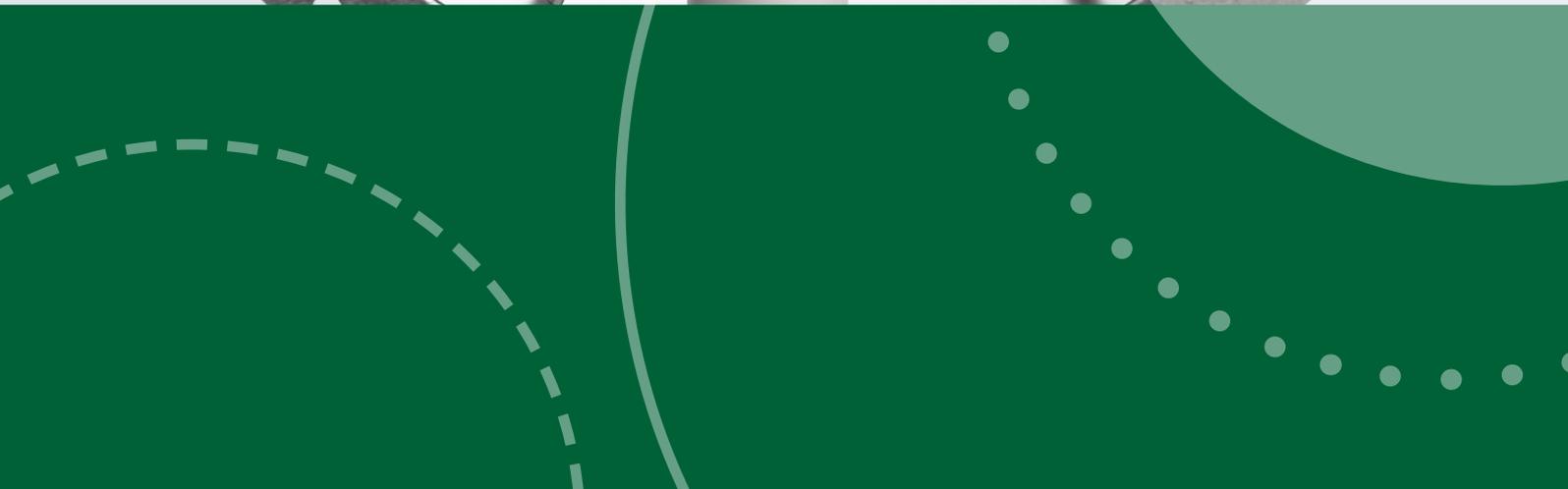
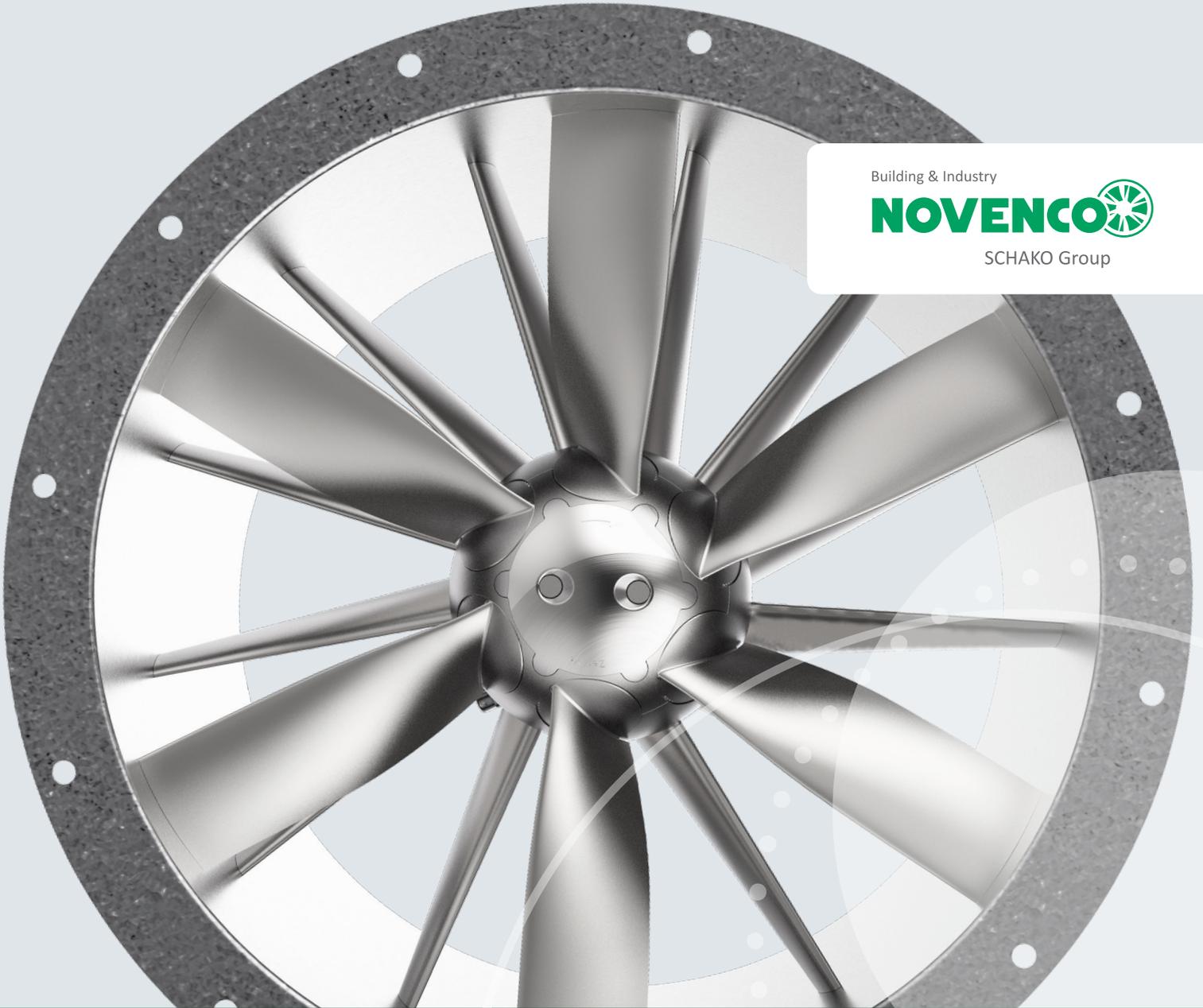
Pure competence in air.

# NOVENCO BUILDING & INDUSTRY PRODUCT BROCHURE

Building & Industry



SCHAKO Group



# ESSENCE

**Our consideration for the environment in the design and manufacturing of ventilation equipment and fans is a big concern for us. The resource friendly products reflect this dedication with long service life and environmentally safe production.**

## ABOUT US

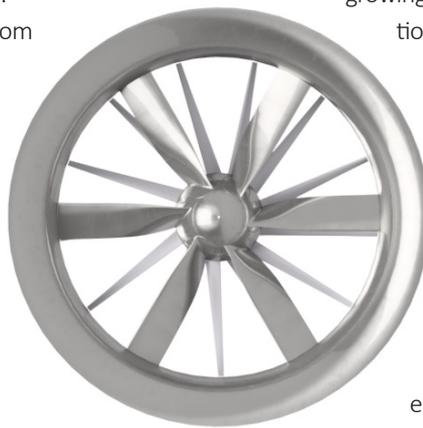
NOVENCO Building & Industry was founded 1947 in Denmark, and today is a proud member of SCHAKO Group. We manufacture a wide range of efficient and reliable products and systems for ventilation in our 20.000 m<sup>2</sup> production facility. The company counts approximately 200 employees and is continuously expanding. Our parent company is located in Naestved, Denmark, with subsidiaries in The Netherlands. We also have offices in Germany, United Kingdom and Dubai. Furthermore, our products and services are marketed and distributed through a network of subsidiaries and carefully chosen representatives.

## INNOVATION

Since the beginning our design, development and operation of ventilation products and systems have allowed us to amass vast experience. The efforts we put into research and development reflect our dedication and allow us to create products on the technological forefront with respect to performance and durability. This is what we consider necessary to stay in front in a world that changes constantly with new environment requirements and calls for innovative solutions from customers and the business environment. These challenges fuel our desire to create the next generation of ventilation products.

## GREEN FOCUS

The land based applications and markets are the focal point of our business. For these markets we develop and implement high efficient ventilation fans which require minimal resources to run and still be able to reduce the discharge of harmful substances. The carparks segment is a core business, which we in the 1990s revolutionised with our jet fans. These fans play central roles in a growing number of installations. Even in such critical situations as with fires, the environment remains in focus, as the amount of energy for the systems is minimum. This true 2-in-1 system feature protects lives and spares the environment.



## QUALITY AND ENVIRONMENT

The production facilities are located in Denmark and are in agreement with the environmental standards according to ISO 9001 and ISO 14001. We lower the strain put on the environment as we reduce energy consumption, improve waste sorting, minimise steel scrap and evaluate our product range and suppliers from an environmental point of view. The effort it takes to serve the environment and markets with the right products is a constantly growing challenge we commit ourselves to every day. All products and systems are certified in accordance with ISO 9001:2008 and ISO 14001:2004.



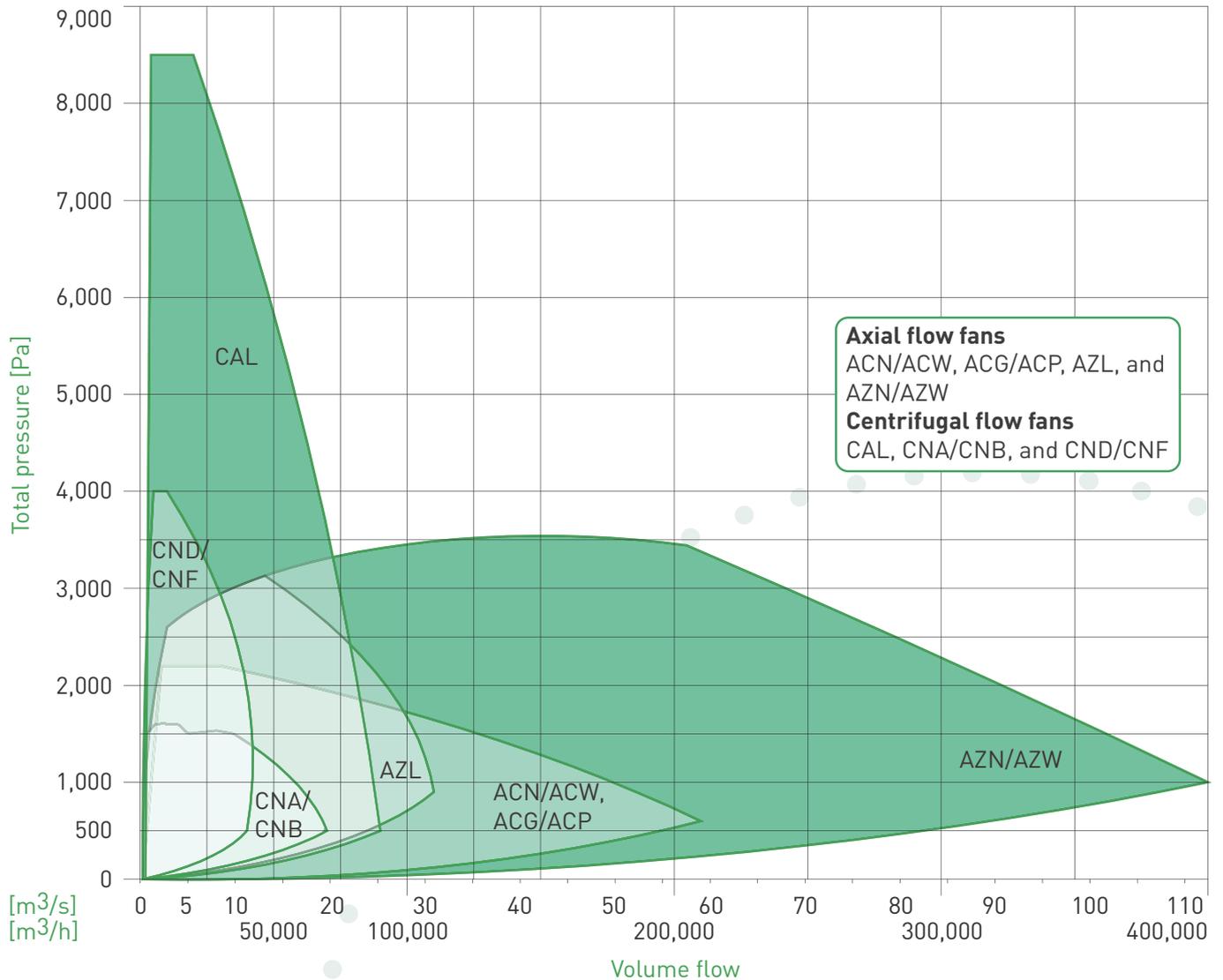
# SELECTION OF FANS

Fans are selected based on the requirements for air quantities and total pressure.

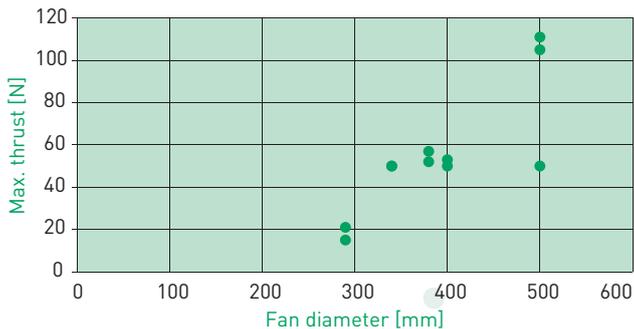
Jet fans are selected based on the requirement for thrust.

The below figures show NOVENCO fans and jet fans.

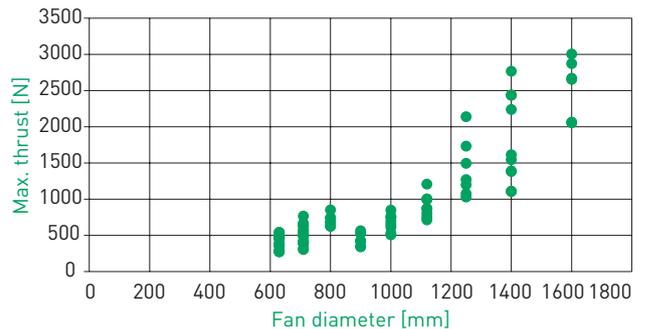
## Fan comparison chart



## Car park fan comparison chart



## Tunnel fan comparison chart



# PRODUCT OVERVIEW

**NOVENCO Building & Industry manufactures a wide range of products and systems for ventilation. The products and systems are built on our experience and deliver superb reliability with low energy consumption.**

## **AIR HEATERS**

Air heaters represent an ideal solution for installation of heat systems in rooms and buildings where centrally controlled systems with long ductworks are needlessly expensive or even unsuitable.

Typical applications are in industrial buildings, workshops, halls, warehouses, large sports centers etc.



## **ATEX FANS**

ATEX fans are axial flow fans optimised for installation in hazardous environments with high requirements for safety.



## **AXIAL FLOW FANS**

Axial flow fans are for very diverse applications within almost all sectors on land and offshore. Often fans are part of systems for comfort, industrial air handling, process, parking, tunnel ventilation etc.



## **CAR PARK FANS**

Car park fans are for ventilation and fire control in roofed facilities like underground car parks, car park tower blocks etc.

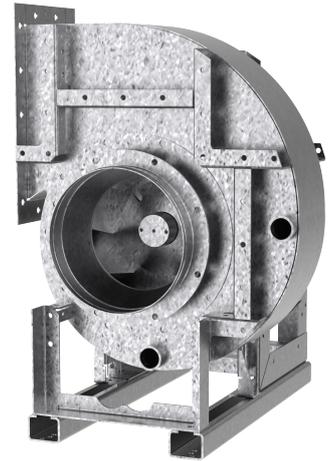
The system is unique as it is without ducts and uses the impulse principle to move air. Often the designs include axial flow fans for supply or exhaust air. The advantages are lower construction cost and better space utilisation.



### CENTRIFUGAL FANS

Centrifugal fans are for industrial installations, which require low or medium pressures. Facilities like composting plants and greenhouses are examples of industries that use centrifugal fans.

The design is robust, compact and suited to meet the requirements for long-life, service in corrosive environments and continuous operation.



### SMOKE FANS

Smoke fans are axial flow fans optimised for operation in high temperature conditions. Typical use is as exhaust fans installed in ducts, where they double-function as part of normal operation and as smoke exhaust fans. The fans are compact, robust and certified for operation at 200, 300 or 400 °C according to EN 12101 part 3.



### TUNNEL FANS

Tunnel fans are for ventilation and fire control in tunnel facilities.

The units use the impulse principle to move air through the tunnels, which then function as oversized ducts. Some system designs include axial flow fans for supply or exhaust. Ventilation with tunnel fans have low construction cost and good space utilisation.



### ACCESSORIES

The accessories extend and supplement the fan functions.

The range include components for regulation and adjustment of airflows, for protection of duct openings and for removal of noise.



# AIR HEATERS VMA

The NOVENCO NoVa air heaters series integrate water heating coils and axial flow fans in common cabinets. The units are made in five sizes with three coil sizes each. They are designed for heating of large rooms and have a number of advantages as far as space, operation and economy is concerned. As such they take up little space and can be located in almost any place in warehouses and other high-ceiling facilities as well as on board ships.

The extensive accessory program allows for design and installation of solutions that fit all purposes.



Specifications	4-	5-	6-	7-	8-
Dimensions- square with side lengths [mm]	460	560	660	760	860
Dimensions- depths [mm]	546	571	596	621	646
Materials	<b>Cabinet:</b> Galvanised and powder coated sheet steel <b>Heating coil:</b> Copper pipes with aluminium fins <b>Fan blades:</b> Aluminium, steel or plastic				
Max. weight [kg]	20	30	40	50	67
Drive	Direct-coupled				
Heat source	Hot water				
Approvals	CE and ISO				
Corrosion category- acc. to EN 12944-2	C3				
Performance					
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.5 (1800)	0.8 (2880)	1.2 (4320)	1.7 (6120)	2.2 (7920)
Heat outputs [kW]	21.9	35.8	56.9	74.2	103.7

Accessories - installation	- regulation	- service
Air distributor	Dynamic flow valve (water)	Filter section
Fresh air duct or hood	Hand regulator (air)	
Injection nozzle	Multi-stage switch	
Mixing housing	Stepless regulator	
Return air duct	Temperature regulator	
Wall grating	Thermo actuator for valve	
Front louvre	Thermostat	

# AXIAL FLOW FANS ZERAX® AZN

The ZerAx® AZN fans are designed for duct installation with or without free inlets. They are well-suited for transport of air in connection with accommodation and industrial ventilation. Ventilation of hazardous gases is also possible with ATEX or Ex versions in zones 1 and 2.

Versions with free inlets or outlets are made through fitting of cones or diffusers.

Prominent features include low power consumption, high efficiency and low sound levels.



Specifications		AZN
Hub sizes [mm] <sup>1</sup>		Ø160 Ø350 (+ ATEX / Ex) Ø560
Impeller diameters [mm]	Ø160 hubs Ø350 hubs Ø560 hubs	Ø250- Ø280- Ø315- Ø355- Ø400- Ø450- Ø500 Ø500- Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000- Ø1120- Ø1250 Ø1000- Ø1120- Ø1250- Ø1400- Ø1600- Ø1800- Ø2000
Casing thicknesses [mm] <sup>2</sup>		2 or 4
Flange standard		Eurovent 1/2
Materials		<b>Rotor and guide vanes:</b> Aluminium <b>Casing:</b> AluZink (2 mm) or hot-dip galvanised steel (4 mm)
Executions		Standard, ATEX or Ex
Approvals		CE
Direction of airflow		Impeller-> motor
Reversible airflow		For shorter periods and with reduced performance
Corrosion category- acc. to EN 12944-2		C3, optionally C4 or C5
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	Ø160 hubs Ø350 hubs Ø560 hubs	0.1- 5.5 (360- 19800) 0.1- 40 (360- 144000) 0.1- 110 (360- 396000)
Max. total pressures [Pa]	Ø160 hubs Ø350 hubs Ø560 hubs	1300 3400 3400
Max. efficiency [%]		92

- Hub sizes Ø160 and Ø560 have 1° adjustable blades while Ø350 hubs have welded blades in 5° steps.
- The casing thickness depends on fan and motor size. Hub size Ø160 is only available with 2 mm casing.

Accessories - features	- features	- connection	- external
Acoustic diffusers with or without cores	Certificates (works, weight, balancing, test)	Counter flanges	Dampers
Fan casing extensions	Marine motor classification	Duct spigots	Roof hoods
Hub covers	Space heater for motor	Extension duct	
Inlet cones with wire guards	Thermistor	Flexible connection (PERL / Maritex)	
Painted impellers for C4/5 environments	<b>- mounting</b>	Measuring pipes	
Short or long diffusers	Anti-vibration mountings		
Silencers with or without cores	Horizontal mounting feet		
Wire guards for inlet and outlet	Vertical mounting plates		

# AXIAL FLOW FANS ZERAX® AZW

The ZerAx® AZW fans are designed for duct installation with or without free inlets in harsh maritime environments. The materials are extra durable in order to cope with the often tough requirements.

Fields of application are for transport of air as well as for accommodation and industrial ventilation.

Versions with free inlets or outlets are made through fitting of cones or diffusers.

Prominent features include low power consumption, high efficiency and low sound levels.



Specifications		AZW
Hub sizes [mm] <sup>1</sup>		Ø350- Ø560
Impeller diameters [mm]	Ø350 hubs Ø560 hubs	Ø500- Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000- Ø1120- Ø1250 Ø1000- Ø1120- Ø1250- Ø1400- Ø1600- Ø1800- Ø2000
Casing thicknesses [mm]		10
Flange standard		DIN 24154 R4
Materials		<b>Rotor and guide vanes:</b> Aluminium <b>Casing:</b> Hot-dip galvanised steel
Executions		Standard or Ex
Approvals		CE
Direction of airflow		Impeller-> motor
Reversible airflow		For shorter periods and with reduced performance
Corrosion category- acc. to EN 12944-2		C3, optionally C4 or C5
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	Ø350 hubs Ø560 hubs	0.1- 40 (360- 144000) 0.1- 110 (360- 396000)
Max. total pressures [Pa]		3400
Max. efficiency [%]		92

1. Hub sizes Ø350 have welded blades.

Accessories - features	- mounting	- connection	- external
Certificates (works, weight, balancing, test)	Anti-vibration mountings	Counter flanges	Dampers
Fan casing extensions		Duct spigots	Roof hoods
Hub covers		Flexible connection (PERL / Maritex)	
Inlet cones with wire guards			
Marine motor classification			
Painted impellers for C4/5 environments			
Silencers with or without cores			
Space heater for motor			
Thermistor			
Wire guards for inlet and outlet			

# AXIAL FLOW FANS ZERAX® AZL

The ZerAx® AZL are compact fans fitted with integrated inlet cones and designed for building in to air handling units and for wall mounting.

The outlet can be free or directly to duct.

As the other fans in the ZerAx® family, they feature low power consumption, very high efficiency and low sound levels.



Specifications		AZL
Hub sizes [mm] <sup>1</sup>		Ø160 Ø350
Impeller diameters [mm]	Ø160 hubs Ø350 hubs	Ø250- Ø280- Ø315- Ø355- Ø400- Ø450- Ø500 Ø500- Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000
Casing thicknesses [mm] <sup>2</sup>		2 or 3
Flange standard		Eurovent 1/2
Materials		<b>Rotor and guide vanes:</b> Aluminium <b>Casing:</b> AluZink or hot-dip or hot-dip galvanised steel
Executions		Standard
Approvals		CE
Direction of airflow		Impeller-> motor
Reversible airflow		For shorter periods and with reduced performance
Corrosion category- acc. to EN 12944-2		C3, optionally C4 or C5
Performance		
Air quantities [m³/s (m³/h)]	Ø160 hubs Ø350 hubs	0.1- 7 (360- 25000) 0.1- 33 (360- 119000)
Max. total pressures [Pa]	Ø160 hubs Ø350 hubs	1300 3400
Max. efficiency [%]		92

1. Hub sizes Ø160 have adjustable blades while Ø350 hubs have welded blades.

2. The casing thickness depends on fan and motor size.

Accessories - features	- mounting	- connection	- external
Acoustic diffusers with or without cores	Horizontal mounting feet	Counter flanges	Dampers
Certificates (works, weight, balancing, test)	Vertical mounting plate	Duct spigots	
Fan casing extensions		Extension duct	
Hub covers		Flexible connection (PERL)	
Marine motor classification		Measuring pipes	
Painted impellers for C4/5 environments			
Short or long diffusers			
Silencers with or without cores			
Space heater for motor			
Thermistor			
Wire guards for inlet and outlet			

# AXIAL FLOW FANS NOVAX ACN/ARN

The NovAx ACN fans are compact and robust axial flow fans with pre-settable blades for transport of air. The application is for duct installation with or without free inlets in ventilation systems for land, marine and offshore. Versions with free inlets or outlets are made through fitting of cones or diffusers.

Removal of hazardous gases is also possible with ATEX or Ex versions. Hot smoke versions are also available.

The fans are easy to install and feature high operational reliability and high efficiencies.



Specifications	ACN	ARN
Hub sizes [mm]	Ø160- Ø230- Ø280- Ø330- Ø380- Ø403-Ø578	Ø403- Ø578
Impeller diameters [mm] <sup>1</sup>	Ø160 hubs Ø230 hubs Ø280 and Ø330 hubs Ø380 hubs Ø403 hubs Ø578 hubs	Ø250- Ø315- Ø400- Ø500 Ø400- Ø500- Ø560- Ø630- Ø710- Ø800 Ø500- Ø560- Ø630- Ø710- Ø800- Ø900 Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000 Ø900- Ø1000- Ø1120- Ø1250- Ø1400 Ø900- Ø1000- Ø1120- Ø1250- Ø1400- Ø1600
Casing thicknesses [mm] <sup>2</sup>	2, 3 or 4	2 or 4
Flange standard	Eurovent 1/2	
Materials	<b>Rotor blades:</b> Aluminium or GRP polyester <b>Casing:</b> Hot-dip galvanised steel or stainless steel	
Executions <sup>3</sup>	Standard, hot smoke, ATEX, Ex or spark-proof	
High temperature classes	F200, F300 or F400	
Approvals	CE, and EN ISO 12101-3	
Direction of airflow	Impeller-> motor	
Reversible airflow	For shorter periods and with reduced performance	Fully
Corrosion category- acc. to EN 12944-2	C3, optionally C4 or C5	
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.1- 65 (360- 234000)	1.5- 50 (5000- 180000)
Max. total pressures (standard / smoke) [Pa]	2000 / 1800	1200
Max. efficiency [%]	83	75

1. Some hub-impeller combinations are unavailable for standard and hot smoke fans. Refer to NovAx catalogue.

2. The casing thickness depends on fan and motor size.

3. ATEX and Ex versions are only available as ACN fans.

Accessories - features	- features	- connection	- external
Acoustic diffusers with or without cores	Certificates (works, weight, balancing, test)	Counter flanges	Dampers
Inlet cones with wire guards	Inspection hatch	Duct spigots	Roof hoods
Short or long diffusers for outlet	Marine motor classification	Flexible connections (PERL / Maritex)	
Silencers with or without cores	Spark-proof lining		
Space heater for motor	Thermistor		
Wire flange	<b>- mounting</b>		
Wire guards in casings and ducts	Anti-vibration mountings		
	Horizontal mounting feet		
	Vertical mounting plate		

# AXIAL FLOW FANS NOVAX ACW

The NovAx ACW fans are compact and heavy duty axial flow fans designed for transport of air in maritime environments. The fans are for duct installation with or without free inlets and suitable for land, marine and offshore. Versions with free inlets or outlets are made through fitting of cones or diffusers.

The fans are easy to install and feature high operational reliability and high efficiencies.



Specifications		ACW
Hub sizes [mm]		Ø160- Ø230- Ø280- Ø330- Ø380- Ø403-Ø578
Impeller diameters [mm] <sup>1</sup>	Ø160 hubs Ø230 hubs Ø280 and Ø330 hubs Ø380 hubs Ø403 hubs Ø578 hubs	Ø250- Ø315- Ø400- Ø500 Ø400- Ø500- Ø560- Ø630- Ø710- Ø800 Ø500- Ø560- Ø630- Ø710- Ø800- Ø900 Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000 Ø900- Ø1000- Ø1120- Ø1250- Ø1400 Ø900- Ø1000- Ø1120- Ø1250- Ø1400- Ø1600
Casing thicknesses [mm] <sup>2</sup>		6 or 10
Flange standard		DIN 24154 R4
Materials		<b>Rotor blades:</b> Aluminium or GRP polyester <b>Casing:</b> Hot-dip galvanised steel or stainless steel (6 mm)
Executions		Standard, ATEX, Ex or spark-proof
Approvals		CE
Direction of airflow		Impeller-> motor
Reversible airflow		For shorter periods and with reduced performance
Corrosion category- acc. to EN 12944-2		C3, optionally C4 or C5
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]		0.1- 65 (360- 234000)
Max. total pressures [Pa]		2000
Max. efficiency [%]		83

1. Not all hub-impeller combinations are available for all fans. Refer to the NovAx catalogue.
2. The casing thickness depends on fan and motor size.

Accessories - features	- features	- connection	- external
Acoustic diffusers with or without cores	Certificates (works, weight, balancing, test)	Counter flanges	Dampers
Fan casing extensions	Inspection hatch	Downstream guide vane arrangement	Roof hoods
Hub covers	Marine motor classification	Duct spigots	
Inlet cones with wire guards	Spark-proof lining	Duct spigots for welding	
Short or long diffusers for outlet	Thermistor	Extension ducts	
Silencers with or without cores	- mounting	Flexible connections (PERL / Maritex)	
Space heater for motor	Anti-vibration mountings		
Wire flange	Horizontal mounting feet		
Wire guards in casings and ducts	Vertical mounting plate		

# AXIAL FLOW FANS NOVAX ACG/ACP

The NovAx ACG/ACP fans are partially reversible, compact and robust axial flow fans with pre-settable blades. The fields of installation cover ventilation systems for land, marine and offshore. Systems include comfort systems, industrial, process, parking and tunnel ventilation as well as environment-enhancement systems.

The fans require little space, are easy to install and offer high operational reliability. Hot smoke versions are also available.

The ACG fans are fitted with guide vanes, which give the higher max. total pressure.



Specifications	ACG	ACP
Hub sizes [mm]	Ø160- Ø230- Ø280- Ø330- Ø380- Ø403-Ø578	
Impeller diameters [mm] <sup>1</sup>	Ø160 hubs Ø230 hubs Ø280 and Ø330 hubs Ø380 hubs Ø403 hubs Ø578 hubs	Ø250- Ø315- Ø400- Ø500 Ø400- Ø500- Ø560- Ø630- Ø710- Ø800 Ø500- Ø560- Ø630- Ø710- Ø800- Ø900 Ø560- Ø630- Ø710- Ø800- Ø900- Ø1000 Ø900- Ø1000- Ø1120- Ø1250- Ø1400 Ø900- Ø1000- Ø1120- Ø1250- Ø1400- Ø1600
Casing thicknesses [mm] <sup>2</sup>	2,5 , 3 or 4	
Flange standard	Eurovent 1/2	
Materials	<b>Rotor:</b> Aluminium or GRP polyester <b>Casing:</b> Hot-dip galvanised steel or stainless steel	
Executions	Standard or hot smoke	
Approvals	CE and EN ISO 12101-3	
Direction of airflow	Motor-> impeller	
Reversible airflow	For shorter periods and with reduced performance	
Corrosion category- acc. to EN 12944-2	C3, optionally C4 or C5	
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.1- 65 (360- 234000)	
Max. total pressures [Pa]	2000	1600
Max. efficiency [%]	83	

1. Not all hub-impeller combinations are available for all standard and hot smoke fans. Refer to the NovAx catalogue.

2. The casing thickness depends on fan and motor size.

Accessories - features	- mounting	- connection	- external
Acoustic diffusers with cores	Anti-vibration mountings	Air quantity meter	Dampers
Certificates (works, weight, balancing, test)	Horizontal mounting feet	Counter flanges	
Marine motor classification	Vertical mounting plate	Duct spigots	
Short or long diffusers		Flexible connections (PERL / Maritex)	
Silencers with or without cores		Measuring pipes	
Space heater for motor			
Thermistor			
Wire guards for casings, flanges or ducts			

# JET FANS ARP/AUZ/AUO/ARO

The jet fans with integrated silencers are designed for ventilation and efficient removal of polluted air and hot smoke in car parks. The design is characterised by the oval silencers to take up minimum amounts of space and keep sound levels low. The fans are tested and approved to meet the requirements for smoke exhaust. Two-speed motors are standard in all jet fans.



Specifications	ARP	AUZ	AUO	ARO
Rotor diameters [mm]	Ø340		Ø290- Ø380- Ø500	
Lengths [mm] <sup>3</sup>	2297	2070	2570- 2672- 2606	2823- 2918- 2854
Heights [mm] <sup>3</sup>	422		320- 420- 540	
Materials	<b>Fan casing:</b> Rolled steel tube in 3 mm sheet; <b>Outer casing:</b> 0.75 mm sheet in Aluzink <b>Impeller blades:</b> Aluminium alloy; <b>Hub:</b> Galv. steel [ARP-AUO-ARO] or aluminium [AUZ]			
Weights [kg] <sup>3</sup>	100	86	80- 110- 160	
Drive	Direct-coupled			
Executions	Standard			
Rated power [kW] <sup>3</sup>	0.3 / 1.3	0.3 / 1.3	0.1 / 0.5- 0.3 / 1.1- 0.5 / 2.2	
Operating temperatures [°C]	<b>Standard:</b> -20 to +40; <b>Max.:</b> +40 to +120			
High temperature classes	F200, F300 or F400 <sup>1</sup>			
Approvals	CE and EN ISO 12101-3			
Corrosion category- acc. to EN 12944-2	C3			
Reversible airflow	Yes	No	No	Yes
<b>Performance<sup>4</sup></b>				
Thrust [N] <sup>3</sup>	15 / 50	15 / 50	5 / 21- 15 / 57 27 / 105	4 / 15- 15 / 52 28 / 111
Sound pressure level [dB(A)] <sup>2,3</sup>	50 / 64	42 / 59	38 / 49 - 42 / 55 48 / 62	38 / 50 - 45 / 59 52 / 67

1. Fans in class F400 are only available for 50 Hz.
2. The level is at 3 m from the inlet of the jet fan under free field conditions at an angle of 45°.
3. Values for AUO and ARO are for each of the rotor diameters.
4. Data is for operation at low / high speeds.

## Accessories - features

Powder coated casing

# JET FANS

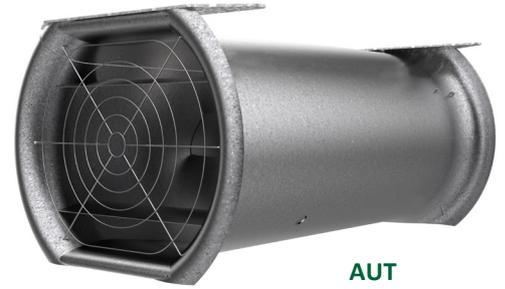
## AUT/ART/AZT/CGF

The jet fans are designed for ventilation and efficient removal of polluted air and hot smoke in car parks. The design is characterised by low height requirements and the use of silencing technology to keep sound levels low. The fans are tested and approved to meet the requirements for smoke exhaust.

Two-speed motors are standard in all jet fans.



AZT



AUT

Specifications	AUT	ART	AZT	CGF
Rotor diameters [mm]	Ø400		Ø450	Ø500
Lengths [mm]	854		1133	1297
Heights [mm]	423		530	262
Materials	<b>Fan casing:</b> Rolled steel tube in 3 mm sheet [AUT-ART], 2 mm AluZink sheets [AZT-CGF]; <b>Impeller blades:</b> Aluminium alloy; <b>Hub:</b> Galv. steel [AUT-ART], Alluminium [AZT], no hub [CGF]			
Weights [kg]	63		70	75
Drive	Direct-coupled			
Executions	Standard			
Rated power [kW]	0.3 / 1.1	0.3 / 1.3	0.5 / 2.2	0.3 / 1.2
Operating temperatures [°C]	<b>Standard:</b> -20 to +40; <b>Max.:</b> +40 to +120		<b>Standard:</b> -20 to +55; <b>Max.:</b> +40 to +120	<b>Standard:</b> -20 to +40; <b>Max.:</b> +40 to +120
High temperature classes	F200, F300 or F400 <sup>1</sup>		F200 and F300	F200, F300 or F400 <sup>1</sup>
Approvals	CE and EN ISO 12101-3			
Corrosion category- acc. to EN 12944-2	C3			
Reversible airflow	No	Yes	No	No
<b>Performance<sup>3</sup></b>				
Thrust [N]	14 / 53	13 / 50	26 / 100	12 / 50
Sound pressure level [dB(A)] <sup>2</sup>	54 / 72	56 / 75	55 / 74	61 / 75

1. Fans in class F400 are only available for 50 Hz.

2. The level is at 3 m from the inlet of the jet fan under free field conditions at an angle of 45°.

3. Data is for operation at low / high speeds.

### Accessories - features

Powder coated casing

# TUNNEL JET FANS AUC/ARC/AUR/ARR

The tunnel fans are for ventilation and fire control in tunnel facilities. The units use the impulse principle to move air through the tunnels, which then function as oversized ducts. Some system designs include axial flow fans for supply or exhaust. Ventilation with tunnel fans have low construction cost and good space utilisation.

The Novenco series of tunnel fans are available as unidirectional or reversible units with silencers.

Two-speed motors are standard in all jet fans.



Specifications	AUC	ARC	AUR	ARR
Rotor diameters [mm]	Ø630- Ø710- Ø800		Ø630- Ø710- Ø800- Ø900- Ø1000- Ø1120- Ø1250- Ø1400- Ø1600	
Lengths [mm]	3220		3150- 3400- 3650- 2950- 3250- 3350- 1560- 1710- 1910	
Heights [mm] <sup>3</sup>	670- 750- 840		850- 930- 1020- 1118- 1218- 1339-1560- 1710- 1910	
Materials	<b>Fan casing:</b> Welded hot-dip galv. or stainless steel; <b>Impeller blades:</b> Aluminium alloy; <b>Hub:</b> Galv. steel with optional epoxy coating			
Weights without motors [kg] <sup>3</sup>	350- 430- 480		220- 280- 360- 460- 510- 560- 630 <sup>4</sup> - 780 <sup>4</sup> - 840	
Drive	Direct-coupled			
Executions	Standard			
Rated power [kW] <sup>5</sup>	2.2 / 26		7.5 / 90	
Operating temperatures [°C]	<b>Standard:</b> -20 to +40; <b>Max.:</b> +40 to +120			
High temperature classes	F200, F300 or F400 <sup>1</sup>			
Approvals	CE and EN ISO 12101-3			
Corrosion category- acc. to EN 12944-2	C3 (Galvanised), C5-I (Stainless Steel)			
Reversible airflow	No	Yes	No	No
<b>Performance <sup>6</sup></b>				
Thrust [N] <sup>5</sup>	109 / 850	105 / 742	290 / 3002	272 / <2870
Sound pressure level [dB(A)] <sup>2,5</sup>	80 / 102		87 / 106	

1. Fans in class F400 are only available for 50 Hz.
2. The level is at 3 m from the jet fan under free field conditions at an angle of 45°.
3. Values are according to rotor diameters.
4. Max. values with Ø578 hubs, which are 20 kg heavier than with Ø403 hubs.
5. Values are min. / max. among all rotor diameters.
6. Data is for operation at low / high speeds.

## Accessories - features

Powder coated casing

# CENTRIFUGAL FANS CNA/CNB

Centrifugal fans type CNA and CNB are single-inlet, light, compact and low-pressure fans. They are designed for universal installation in many kinds of systems, among them marine systems.

The CNB impeller is fully welded to allow for higher RPMs and max. total pressure compared to the spot welded impeller of the CNA.

Characteristic for the fans are the backward-curved blades, low energy consumption and low sound emission.

The fans are available in standard and Ex versions.



Specifications	CNA	CNB
Impeller diameters [mm]	Ø250, Ø315, Ø400, Ø500, Ø630, Ø710, Ø800, Ø900, Ø1000	Ø400, Ø500, Ø630, Ø710, Ø800, Ø900, Ø1000
Casing thicknesses [mm] <sup>1</sup>	1.5, 2, 2.5 or 3	
Materials	<b>Impeller:</b> Galvanised sheet steel (CNA/CNB), hot-dip galvanised sheet steel (CNB) <b>Housing:</b> Galvanised sheet steel, epoxy coating (optional)	
Drive	Direct-coupled or belt	
Executions	Standard or Ex	
Approvals	CE	
Corrosion category- acc. to EN 12944-2	C2	
Reversible airflow	No	
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.2- 14 (720- 50400)	0.8- 18 (2880- 64800)
Max. total pressures [Pa]	1000	1500
Efficiency [%]	72	

1. The casing thickness depends on fan and motor size.

Accessories - installation	- regulation	- protection	- service
Anti-vibration mountings	2-speed motor	Guard nets for inlet and outlet	Drain plug
Common base frame for fan and motor	Frequency inverter	Inlet funnel of brass	Inspection and access doors
Flexible connections			
Counter flanges			

# CENTRIFUGAL FANS CND/CNF

The centrifugal fans type CND and CNF are compact medium-pressure fans designed for universal installation and continuous operation in maritime and aggressive environments.

The CNF impeller is fully welded to allow for higher RPMs and max. total pressure compared to the spot welded impeller of the CND.

Characteristic for the fans are the backward-curved blades, the low sound levels and good operating economy.

ATEX or Ex versions are also available.



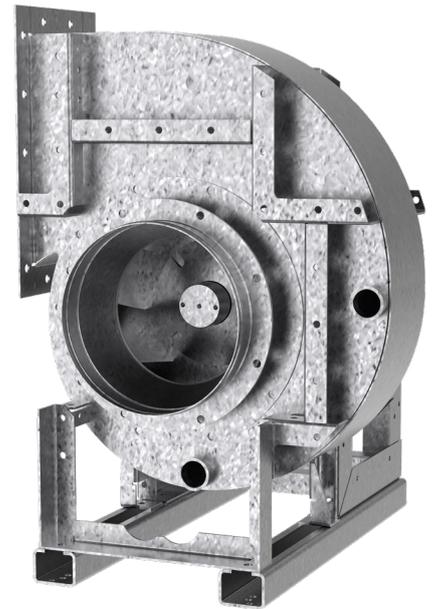
Specifications	CND	CNF
Impeller diameters [mm]	ø315, ø400, ø450, ø500, ø560, ø630, ø710	
Casing thicknesses [mm] <sup>1</sup>	2 or 3	
Materials	<b>Impeller:</b> Hot-dip galvanised steel (CND), hot-dip galvanised steel or stainless steel (CNF) <b>Housing:</b> Hot-dip galvanised steel or stainless steel (CNF)	
Drive	Direct-coupled or belt	
Executions	Standard, ATEX, EX or spark-proof	
Approvals	CE and EN ISO 12944-2	
Corrosion category- acc. to EN 12944-2	C5-I	
Reversible airflow	No	
Performance		
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.2- 10 (720- 36000)	0.2- 11 (720- 39600)
Max. total pressures [Pa]	2000	4000
Efficiency [%]	84	

1. The casing thickness depends on fan and motor size.

Accessories - installation	- regulation	- protection	- service
Anti-vibration mountings	2-speed motor	Guard nets for inlet and outlet	Drain plug
Common base frame for fan and motor	Frequency inverter	Inlet funnel of brass	Inspection hatch
Flexible connections			
Counter flanges			

# CENTRIFUGAL FANS CAL

The CAL are robustly built centrifugal fans of the high pressure type. They are primarily designed for process air and other installations in aggressive environments. They are also well suited for a wide range of industrial purposes with high physical load and long life requirements. The design is characterised by the drive-side-removable motor, which is built onto the baseframe. The blades are backward-curved. ATEX or Ex versions are also available.



Specifications	CAL
Impeller diameters [mm]	Ø400, Ø500, Ø630, Ø710, Ø800, Ø900, Ø1000, Ø1120, Ø1250
Materials	<b>Impeller:</b> Hot-dip galvanised steel or stainless steel <b>Housing:</b> Hot-dip galvanised steel or stainless steel
Drive	Direct-coupled
Executions	Standard, ATEX or Ex
Approvals	CE
Corrosion category- acc. to EN 12944-2	C3 (Galvanised), C5-I (Stainless Steel)
Reversible airflow	No
Performance	
Air quantities [m <sup>3</sup> /s (m <sup>3</sup> /h)]	0.3- 21 (1080- 75600)
Max. total pressures [Pa]	8500
Efficiency [%]	82

Accessories - installation	- regulation	- protection	- service
Anti-vibration mountings	2-speed motor	Wire guard	Drain
Counter flange	Frequency inverter		Inspection door
Flexible connections for inlet and outlet			
Guide vane arrangement			
Counter flanges			

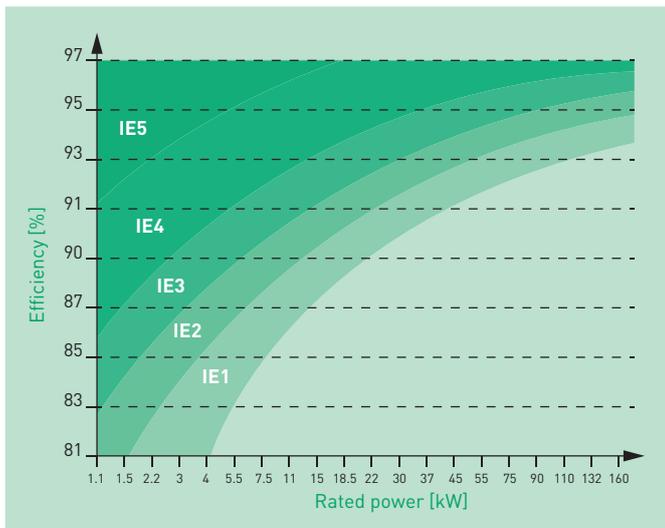
# MOTORS

Electric motors are key components in almost all products from NOVENCO Building & Industry. As a result, we offer motors in all efficiency grades.

With new EU legislation coming in to force January 2017, high efficiency IE3 (International Efficiency grade 3) motors are a direct requirement in products with rated motor powers between 0.75 and 375 kW, which include Novenco products. Motors with lower efficiency grades are only possible in combination with Variable Speed Drives (VSD), also referred to as frequency converters, or for special applications.

The IE3 standard raises the efficiency requirements, but exempts motors for explosive atmospheres and motors for special applications. However, many manufacturers already make explosion proof IE3 motors, which NOVENCO have adopted and recommend.

Configuration of NOVENCO products for operation in standard temperature conditions are oftentimes with IE3 or IE4 motors. Many NOVENCO products also support the new IE5 standard. The AirBox software automatically manages configuration and fitting of motors.



Current IE classes for 4 pole motors



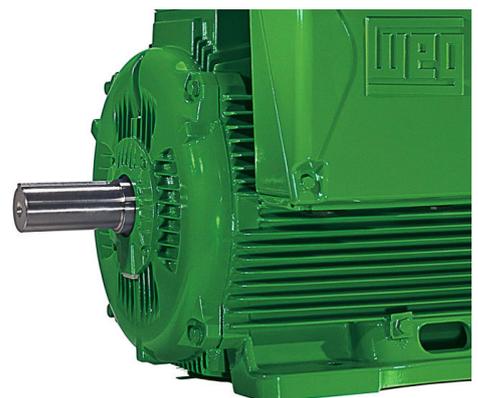
Motor with terminal box

## CHOICE OF MOTORS

The efficiency parameter is predominant in the selection of motors for axial and centrifugal fans. This is due the fact that most products for new installations and replacement are long-term investments, which must meet requirements for energy saving.

## AIRBOX SOFTWARE

The AirBox product configuration software is for calculation and selection of a wide range of Novenco products. The motor alternatives are central in the solution calculations. All parameters can be set by the user and include selection of efficiency grade, manufacturer, supply voltage, thermal protection, enclosure, motor modifications and more.



Shaft on motor

# ACCESSORIES

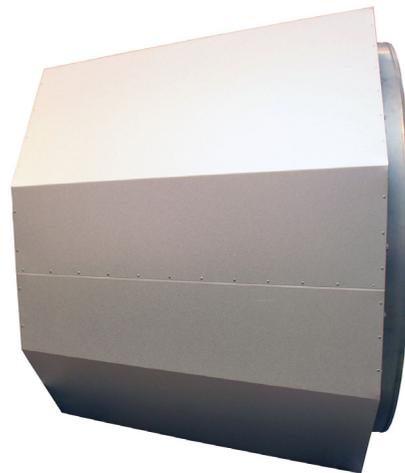
## DAMPERS SJD

The louvre dampers type SJD are for shutting off, regulation and mixing of airflows in ventilation systems and other air handling installations.



## DIFFUSERS YAD AND YAZ

The diffusers type YAD-YAZ are for removing noise, smoothing inlet air and delivering uniform airflows with NovAx and ZerAx fans in comfort and industrial installations. The YAD has a round exterior and connection profile, a conical shape and a core. The YAZ design has an octagonal exterior and a round connection profile, a conical shape and no core as standard. A version with core is also available.



## ROOF HOODS HAT AND HAN

The roof hoods type HAT-HAN are for preventing wind, rain and leaves from entering ventilation systems with subsequent noise-generation and clogging. Novenco roof hoods are durable in both design and materials. The HAN is for land and the HAT for marine applications.



## SILENCERS YAA AND YAH

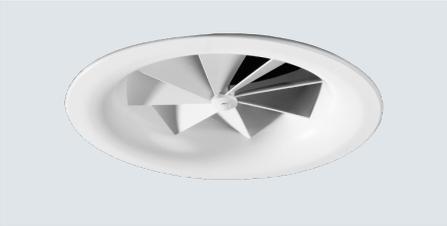
The silencers type YAA-YAH are for attenuating fan noise in comfort and industrial installations. Both types have round connection profiles and are available in versions with or without cores. Versions with cores are for removing high frequency sounds.



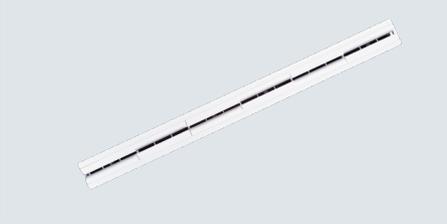
# SCHAKO PRODUCTS



**DIFFUSERS**



**GRILLS**



**DAMPERS**



**FLOW REGULATORS**



**SILENCERS AND BAFFLE PLATES**



**NOZZLES**



**CLEAN ROOM UNITS**

See more products at [www.schako.de](http://www.schako.de).

# QUALITY AND SERVICE



## **REST ASSURED**

All NOVENCO products are manufactured in accordance with our well-known and documented quality standards. NOVENCO Building & Industry A/S is ISO certified and all products are inspected and tested before they are shipped. Products are offered with options for technical guidance on installation, test of function and training of personnel.

## **WARRANTY**

NOVENCO provides according to law a standard 12 months warranty from products are sent from the factory. The warranty covers materials and manufacturing defects. Wear parts are not covered. Extended warranty can be agreed upon.

## IMPORTANT

This document is provided 'as is'. NOVENCO Building & Industry A/S reserves the right to changes without further notice due to continuous product development.

Some pictures in the brochure show products with accessories fitted.

The fans are designed for continuous operation. The following kinds of operation may cause fatigue break in the impeller and endanger people.

- Operation in stall area
- Operation with pulsating counter pressure – called pump mode
- Daily operation with exceedingly starting and stopping

If in doubt, NOVENCO should be contacted to assess the suitability of the fan.

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## PATENTS AND TRADEMARKS

Novenco<sup>®</sup>, 诺文科, 诺万科 and 诺昂 are registered trademarks of Novenco Marine & Offshore A/S.

ZerAx<sup>®</sup> is a registered trademark of NOVENCO Building & Industry A/S.

AirBox<sup>™</sup> and NovAx<sup>™</sup> are trademarks of NOVENCO Building & Industry A/S.

The ZerAx<sup>®</sup> manufacturing processes, technologies and designs are patented by Novenco A/S. **Pending patents** include Brazil no. BR-11-2012-008607-3, BR-11-2012-008543-3, BR-11-2012-008545-0, BR-11-

2014-002282-8 and BR-11-2014-002426-0; Canada no. 2.843.131 and 2.843.132; China no. 2012280037965.7; EU no. 10778838.2, 12740606.4 and 12740612.2; India no. 4140/CHENP/2012, 4077/CHENP/2012, 4073/CHENP/2012, 821/CHENP/2014 and 825/CHENP/2014; PCT no. EP2012/064908 and EP2012/064928; South Korea no. 10-2012-7012252, 10-2012-7012154, 10-2012-7012155, 10-2014-7005746 and 10-2014-7003829.

**Granted patents** include Canada no. 2.777.140, 2.777.141 and 2.777.144; China no. ZL2010800458842, ZL2010800460965, ZL2010800464275 and ZL2012800387210; EU no. 2488759 and 2488761; and US no. 8.967.983, 9.200.641, 9.273.696 B2, 9.683.577 and 9.926.943 B2.

**Granted designs** include Brazil no. BR-30-2012-003932-0; Canada no. 146333; China no. 1514732, 1517779, 1515003, 1555664 and 2312963; EU no. 001622945-0001 to 001622945-0009 and 001985391- 0001; India no. 246293; South Korea no. 30-0735804; and US no. D665895S, D683840S, D692119S, D704323S, D712023S, D743018S, D755363S, D756500S, D821560S and D823452S.

The NovAx Basic jet fans manufacturing processes, technologies and designs are patented by Novenco A/S or NOVENCO Building & Industry A/S. **Pending patents** include United Arab Emirates no. 723/2011 and EU no. 10701831.9. **Pending designs** include United Arab Emirates no. 223/2009.

**Granted patents** include Denmark no. PR 1774428. **Granted designs** include EU no. 001069884-0001 to 001069884-0028.

The CGF jet fans designs are patented by Novenco A/S. **Pending designs** include United Arab Emirates no. 70/2010.

**Granted designs** include EU no. 001610643-0001 to 001610643-0005.

Other trademarks appearing in this document are the property of their respective owners.

## QUALITY AND ENVIRONMENT

NOVENCO Building & Industry A/S is certified in accordance with ISO 9001 and 14001.



All NOVENCO Building & Industry's products are designed, developed and manufactured in Denmark.



Pure competence in air.

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