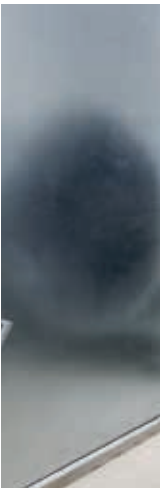


Green Ventilation Jet Fan Systems for Car Parks

Higher safety, more efficiency





Green Ventilation

The standard for efficient car park ventilation

High safety standard requirements and energy efficiency – Systemair’s Green Ventilation Jet Fan System fulfills these demands without compromise: The system achieves 80% energy saving in Green Ventilation mode* and you can trust the safety promise of a global system partner.

Three times good

- Low operating cost
- Competitive initial investment
- Complying with European and international standards



All Systemair products and systems, marked with the Green Ventilation label, meet highest requirements for energy and economic efficiency.

Components

The Green Ventilation Jet Fan System basically replaces the duct system of a car park. Depending on the ventilation concept of the individual car park and the defined safety standards, supply fans in addition to the exhaust fans may be installed.

Systemair offers axial supply fans (AXC series) as well as high temperature exhaust fans, axial or centrifugal models, for in duct or roof installation (AXC (B), AXC (F) or DVV series), certified in accordance with EN 12101-3.

Systemair is able to offer you all further components, e.g. silencers, dampers and other ventilation elements for a modern ventilation system.

Application examples and planning

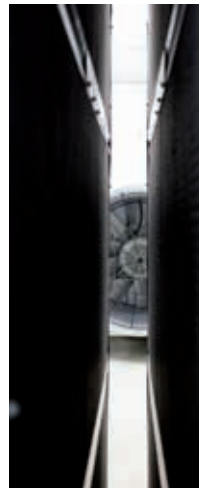
The better the planning, the more efficient the system. In addition to the car park dimensions, a proper planning includes data such as occupancy, utilization pattern and peak loads. The dimensioning of the ventilation system generally is based on the air exchange rate (depending on the atmospheric pollution) or on a defined air volume, which is multiplied with the amount of parking spaces.

With the use of a Green Ventilation System you can avoid "dead" zones in the car park. Systemair jet fans are used for everyday demand ventilation as well as smoke extraction in case of fire.

*Comparison of CO mode with rated power of car park exhaust fans



Exhaust fans



Silencer

Advantages and benefits of Systemair Green Ventilation Jet Fan Systems

For investors

- Reduction of investment cost because bulky and complex duct systems can be omitted. A great advantage especially for renovation projects.
- Modern aesthetics – The flexible positioning of the jet fans allow for a modern and aesthetic design.
- Attractive and well arranged – The whole design is more attractive and there are no line-of-sight obstructions coming from the ductwork.

For consultants

- High flexibility – Whether it is a new building or renovation of parking decks, the jet fan positioning is highly flexible.
- Time saving design work – No complex duct system is needed.
- Evidence of functionality – Use the Systemair CFD analysis and the possibility to carry out smoke tests, you will always be on the safe side.

For installers

- Easy installation work – Jet fans are fast and easy to be installed to the car park ceiling.
- Trouble-free installation – The fans can be installed as last subsection, means less interfaces with other crafts.
- Flexible fan positioning.

For operators

- Energy saving – The Green Ventilation Jet Fan System saves up to 80% energy. This leads to considerably reduced operating costs. The center-piece is an intelligent control unit for an energy-efficient, demand controlled ventilation. Pressure drops of a duct system do not exist, allowing to downsize the fan energy.
- Tailored to suit your needs – CO (carbon monoxide) sensors activate only those fans which are really needed. Pre-defined areas can be ventilated without running the whole system. This, again, helps to lower the running costs.
- Good air quality – In comparison to conventional ducted systems, the concentration of pollutants in the air is lower when using a jet fan system. The air all over the activated car park area is constantly in motion, increasing the clean air ratio in all areas.
- Jet fan systems for heat and smoke extraction avoid cost-intensive secondary damages. Ceilings are exposed to lower temperature, smoke will be quickly removed from the building.
- Optimum safety in case of fire – Fast smoke and heat extraction prevent the heat and smoke from spreading into other car park areas. Precise smoke control is facilitating the work of firefighters.
- Easy to maintain.





Customized solutions

System description

Driveway, ramp or other fresh air openings can supply natural fresh air. The supply air is designed to guarantee an almost laminar air flow. If no natural supply air can be provided, a supply air fan is needed.

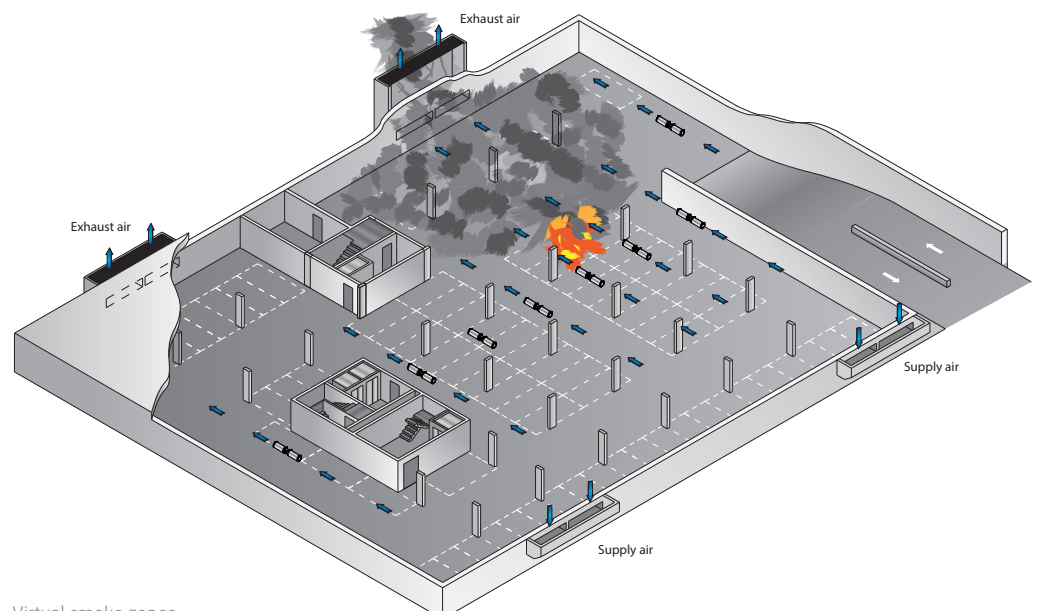
The Green Ventilation Jet Fan System supports the natural air flow between supply and exhaust air and helps accelerate the airflow in areas where it is too low to guarantee a sufficient air change all over the car park. According to safety regulations, virtual smoke sectors are created by aerodynamic loads in case of fire. This allows the design of wide and spacious car parks which normally need to be separated by gates or other installation elements. This always includes the aspect of efficiency and energy efficiency without losing sight of investment costs.

A project-related switching matrix ensures that legal requirements are observed and individual safety objectives are followed. These are e.g. maximum CO and smoke gas concentration, required sight distances for personal rescue and preparation of fire-fighting operations by fire services.

In case of an exhaust air fan failure, it is important that the control detects and indicates this failure automatically and finally switches over to the second fan.

Different versions of axial, radial and roof fans are available, for standard temperature up to temperature class F600 (600 °C/120 min.).

An optimised operation is provided by the project designed Green Ventilation control system. It analyses measurements of CO exhaust sensors and/or fire/smoke detectors and controls single, virtual smoke and CO zones according to the requirements. Jet fans in not affected smoke and CO zones are controlled according to the stored control matrix. The system will be designed in accordance with the requirements given in the specifications. Complete documentation can be found within the control cabinet.





Installed premium jet fan


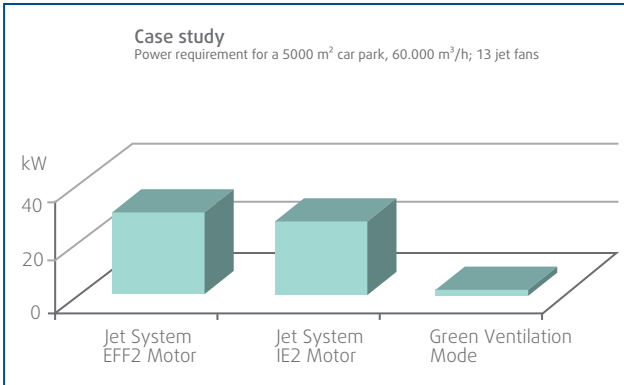
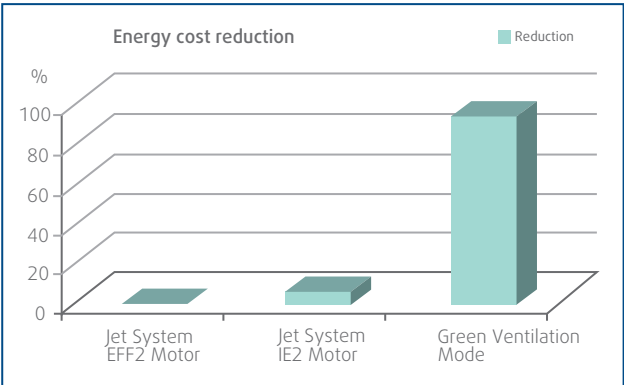


Warning sign

The space required by different ventilation systems has a direct impact on the investment cost of a project. Jet fans do only punctually reduce the available ceiling height and need often unlike many other installation systems like electric wiring and water pipes less than 0.5% ceiling surface. The extra ceiling space can be used for technical appliances and/or allows to reduce the ceiling height during the planning stage already. Another advantage is a higher safety of an active system which, depending on the fire location, reacts in accordance with the defined fire scenario matrix and offers best possible protection to human beings and buildings .

Systemair remains your partner from the car park's planning to the commissioning and designs Green Ventilation car park exhaust systems according to your requirements.

Green Ventilation and smoke extraction function
 Many systems provide an opportunity either to save energy or to extract smoke out of your car park. But why should you choose the one or the other?
Systemair educated smoke extraction car park systems in energy saving.

Jet Fan AJR-TR



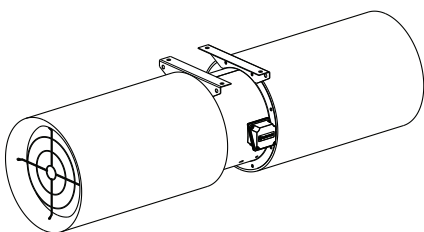
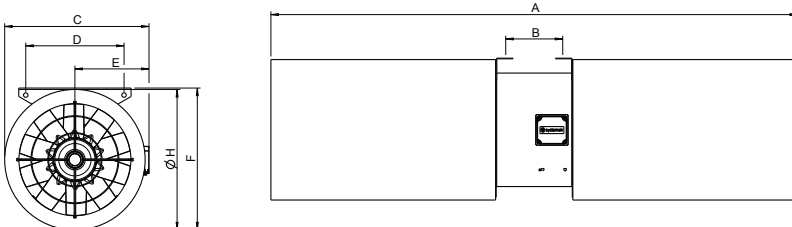
- Dual use: For daily ventilation and smoke extraction in case of fire F300 (300 °C/120 min.)
- Symmetrical blades; 100% reversible with low sound level
- Motors IP55, insulation class H (smoke extract); Motors IP55, insulation class F (CO-exhaust), according to EN 60034-5/IEC 85
- 50/60 Hz range available
- Tested inspection switch optional
- Casing manufactured from galvanized steel
- Certified to EN 12101-3
- CE-certification by BSI

Technical data

Jet Fan	55 °C			300 °C/120 Min			
	AJR 315-2/4-TR	AJR 355-2/4-TR	AJR 400-2/4-TR	AJR 315-2/4 (B)-TR	AJR 355-2/4 (B)-TR	AJR 400-2/4 (B)-TR	AJR 400-2/4 (B)-TR-L
Art. no.	36277	36278	36279	36221	36222	36400	36175
Voltage/Frequency	V/50 Hz	415	415	415	415	415	415
Phase	~	3	3	3	3	3	3
Speed	1/min	2825/1360	2840/1380	2840/1380	2880/1440	2880/1440	2880/1440
Rated power	kW	0.75/0.17	1.4/0.3	1.5/0.4	0.8/0.16	1.5/0.3	1.5/0.3
Rated current	A	1.83/0.65	3.33/0.82	3.0/1.07	1.9/0.4	3.0/0.7	3.0/0.7
Thrust	N	22/6	37/9	55/14	22/6	37/9	55/14
Air volume	m ³ /h	4400/2200	6400/3200	8700/4350	4400/2200	6400/3200	8700/4350
Weight	kg	60	66	68	60	66	68

Air volume related to air density 1.2 kg/m³

Dimensions

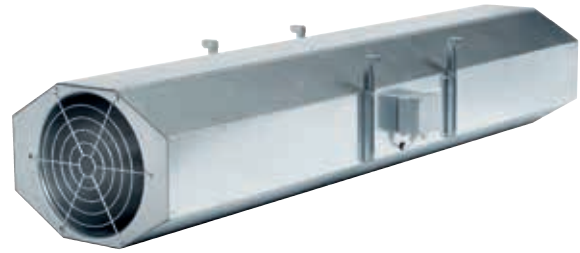


Size	ØH	A	B	C	D	E	F
315	420	1535	211	433	265	223	425
355	460	1695	211	473	305	243	465
400	500	1875	211	516	350	266	505

All dimensions in mm.

Jet Fan AJ8 – Premium Version

- Dual use: For daily ventilation and smoke extraction in case of fire F300 (300 °C/120 min.)
- Aerodynamical impellers for maximum thrust and with low sound level
- Motors IP55, insulation class H (smoke extract); Motors IP55, insulation class F (CO-exhaust), according to EN 60034-5/IEC 85
- Tested inspection switch optional
- Compact design, reduced height
- Casing manufactured from galvanized steel
- Certified to EN 12101-3
- CE-certification by BSI

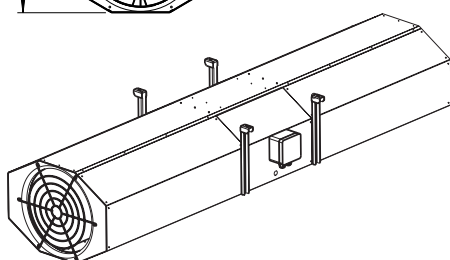
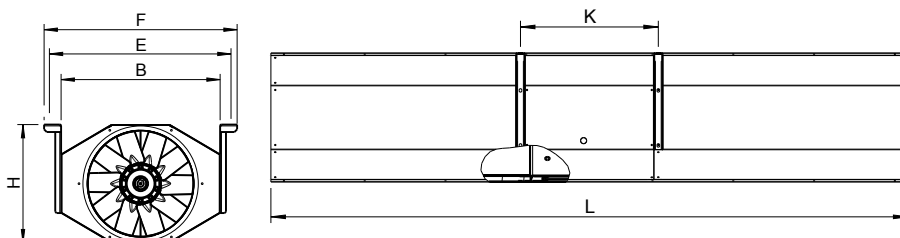


Technical data

Jet Fan	55 °C			300 °C/120 Min			
	AJ8 315-2/4	AJ8 355-2/4	AJ8 400-2/4	AJ8 315-2/4 (B)	AJ8 355-2/4 (B)	AJ8 400-2/4 (B)	
Art. no.	32768	32769	32770	32771	32772	32773	
Voltage/Frequency	V/50 Hz	415	415	415	415	415	
Phase	~	3	3	3	3	3	
Speed	1/min	2825/1360	2840/1380	2840/1380	2880/1450	2905/1460	2880/1455
Rated power	kW	0.75/0.17	1.4/0.3	1.5/0.4	0.75/0.15	1.3/0.25	1.5/0.37
Rated current	A	1.83/0.65	3.33/0.82	3.0/1.07	1.6/0.4	3.1/0.68	3.9/0.95
Thrust	N	23/6	37/9	55/11	23/6	37/9	55/11
Air volume	m ³ /h	4399/2200	6300/3150	8698/4349	4400/2200	6300/3150	8700/4350
Weight	kg	84	90	99	84	90	99

Air volume related to air density 1.2 kg/m³

Dimensions



Size	H	B	C	E	F
315	365	550	355	610	650
355	395	550	355	610	650
400	445	600	380	660	700

All dimensions in mm.

Jet Fan AJ(F) – TR

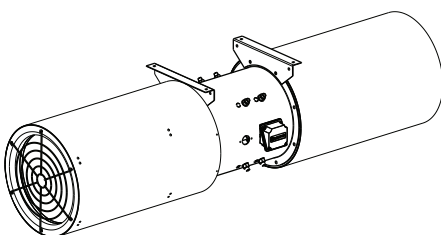
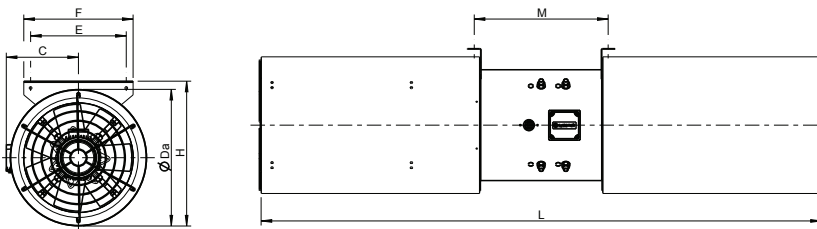


- Dual use: For daily ventilation and smoke extraction in case of fire F400 (400 °C/120 min.)
- Symmetrical blades; 100% reversible with low sound level
- Motors IP55, insulation class H (smoke extract) according to EN 60045-5/IEC 85
- Tested inspection switch optional
- Casing manufactured from galvanized steel
- Certified to EN 12101-3
- CE-certification by BSI

Technical data

Jet fan	400 °C/2 h		
	AJ 315-2/4 (F)-TR	AJ 355-2/4 (F)-TR	AJ 400-2/4 (F)-TR
Art. no.	33722	33724	33726
Voltage/Frequency	V/50 Hz 400	400	400
Phase	~ 3	3	3
Speed	1/min 2860/1420	2880/1440	2885/1435
Rated power	kW 0.75/0.15	1.8/0.37	1.8/0.37
Rated current	A 1.61/0.85	3.5/1.54	3.5/1.54
Thrust	N 21/6	41/10	55/14
Air volume	m ³ /h 4300/2150	6600/3300	8700/4350
Weight	kg 65	85	94

Dimensions



Size	Ø Da	H	E	C	F	L	M
315	420	445	265	223	315	1635	425
355	460	480	305	243	355	1795	425
400	500	530	350	266	400	2050	500

All dimensions in mm.

Jet Fan AJ(F) – TR-8

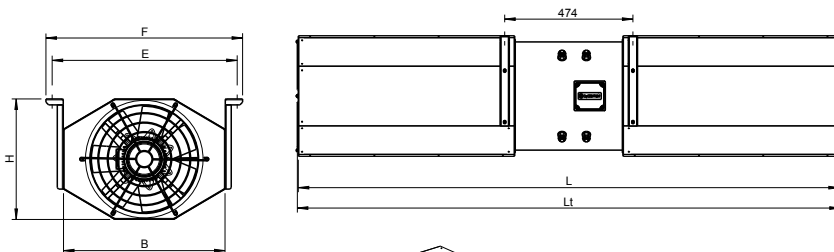
- Dual use: For daily ventilation and smoke extraction in case of fire F400 (400 °C/120 min.)
- Symmetrical blades; 100% reversible with low sound level
- Motors IP55, insulation class H (smoke extract) according to EN 60045-5/IEC 85
- Tested inspection switch optional
- Casing manufactured from galvanized steel
- Compact design, low height
- Certified to EN 12101-3
- CE-certification by BSI



Technical data

Jet fan		400 °C/2 h		
		AJ 315-2/4 (F)-TR-8	AJ 355-2/4 (F)-TR-8	AJ 400-2/4 (F)-TR-8
Art. no.		33728	33730	33732
Voltage/Frequency	V/50 Hz	400	400	400
Phase	~	3	3	3
Speed	1/min	2860/1420	2880/1440	2885/1435
Rated power	kW	0.75/0.15	1.8/0.37	1.8/0.37
Rated current	A	1.61/0.85	3.5/1.54	3.5/1.54
Thrust	N	21/6	41/10	55/14
Air volume	m ³ /h	4300/2150	6600/3300	8700/4350
Weight	kg	85	98	117

Dimensions



Size	H	B	E	F	L	Lt
315	365	550	635	650	1660	1673
355	395	550	635	650	1820	1833
400	445	600	684	700	2000	2013

All dimensions in mm.

Centrifugal Jet Fan IV



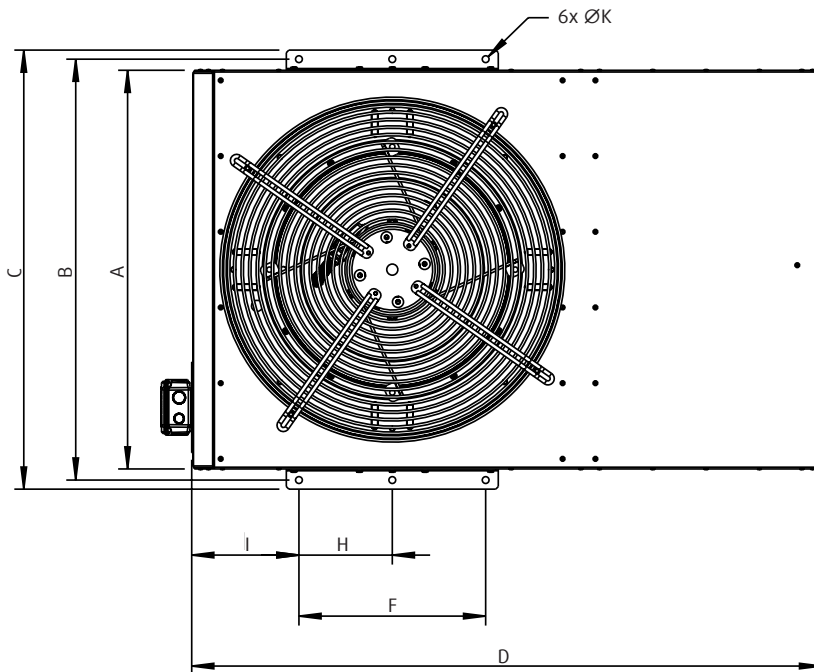
- Dual use: For daily ventilation and smoke extraction in case of fire F300 (300 °C/120 min.); F400 (400 °C/120 min.)
- Aerodynamical centrifugal impeller for maximum thrust and with low sound level
- Motors IP55, insulation class H (smoke extract)
- Tested inspection switch optional
- Compact design for low ceiling heights
- Casing manufactured from galvanized steel
- Integrated deflector
- Certified to EN 12101-3
- CE-certification by BSI

Technical data

Centrifugal Jet fan IV		300 °C/120 min					
		50-4 (B)	50-4/6 (B)	50-4/8 (B)	85-4 (B)	85-4/6 (B)	85-4/8 (B)
Art. no.		33477	33529	33530	33478	33534	33535
Voltage/Frequency	V/50 Hz	400	400	400	400	400	400
Phase	~	3	3	3	3	3	3
Speed	1/min	1435	1445/955	1430/715	1435	1450/965	1425/715
Rated power	kW	1.5	1.5/0.55	1.3/0.22	2.2	2.2/0.75	2.2/0.37
Rated current	A	3.4	3.7/1.9	3.2/1.15	4.7	4.9/2.6	6.7/2.2
Thrust	N	52	52/20	52/14	85	85/28	85/22
Air volume	m ³ /h	6196	6196/4190	6138/3100	9950	9950/5875	9950/5098
Weight	kg	120	120	120	170	175	170

Centrifugal Jet fan IV (F)		400 °C/120 min			
		50-4 (F)	50-4/6 (F)	50-4/8 (F)	85-4 (F)
Art. no.		34108	34109	34110	34111
Voltage/Frequency	V/50 Hz	400	400	400	400
Phase	~	3	3	3	3
Speed	1/min	1430	1430/955	1430/715	1435
Rated power	kW	1.5	1.5/0.55	1.3/0.22	2.2
Rated current	A	3.4	3.6/1.8	3.3/1.1	5
Thrust	N	52	52/20	52/14	85
Air volume	m ³ /h	6138	6138/4190	6138/3100	9950
Weight	kg	120	120	120	170

Dimensions



Size	A	B	C	D	E	F	H	I	6xØK
IV 50	790	834	870	1248	285	370	185	210	13,5
IV 85	1140	1184	1220	1900	340	420	210	430	13,5

All dimensions in mm.

Accessories

DF – Guide vane



Guide vanes manufactured from galvanized steel to direct the air flow. Available as accessories for AJ8 and AJR.

	Guide vane	DF 315	DF 355	DF 400
AJ8	Art. no.	300886	300887	303989
AJR	Art. no.	309655	309656	309657

Warning sign



Warning sign with LED lights "international pictogram version". Standard color yellow. Different LED colors on request.

Warning sign	
Art. no.	35792

FET-AP and FEP-AP – Fire brigade switch



FET-AP



FEP-AP

FET-AP:

- Fireman's switch "smoke extraction" with standard Key switch
- IP 54, enclosure class
- H/B/T 160/80/80 mm

FEP-AP:

- Fireman's switch "smoke extraction" with holder for DIN-profile half cylinder
- DIN-profile half cylinder (FEP-ZY / Art. no 312119) not included.
- IP 44, enclosure class
- H/B/T 125/125/70 mm

Fire brigade switch	FET-AP	FEP-AP
Art. no.	35703	35704

Isolator



300 °C/120 min



55 °C

Isolator	6-pole	9-pole
Art. no.	35729	33981
Rated power	kW 7.5	7.5
Current	A 25	20
Temperature	°C 300/120 min	55

DKM-2K-RT – Push button switch



- DKM-2K-RT manual call point "smoke extraction" made of plastic, with push-button and covered release.

Pushbutton switch	DKM-2K-RT
Art. no.	35712

Safety-anchor for jet fan installation



Approved under ETA-02/0027.

Safety-Anchor	AJR-TR	AJ8	IV
	M8x40/15	M10x40/20	M12x60/20
Art. no.	313083	313084	313085

Set of 4 pcs needed for one jet fan.

Car park main supply or extract fans



AXC



AXC-G

AXC series available in standard sizes up to 1600 mm. Available with or without sound insulated casing in standard or high temperature version. Fans can be installed in series or parallel, optimized to the actual requirements.

AXC/AXC 55 °C continuous operation

AXC...(B) F300 – 300 °C/120 Min.

AXC...(F) F400 – 400 °C/120 Min.

- Fan size from 315 to 1600 mm
- Casing made of galvanized steel
- Aerofoil impeller with adjustable pitch angle for maximum efficiency
- Motors IP55 insulation class F or H, in accordance with EN 60034-5/IEC 85
- AXC...-G: Two fans in series for higher pressure
- Wide range of accessories
- Air flow up to 212.000 m³/h

AXC...Box



- The complete fan unit is mounted in a vibration insulated box, made of removable, double skin galvanised steel panels with 20 mm or 50 mm, non-combustible mineral wool insulation. Panels on duct connection sides are single skin without insulation.
- Standard execution made for horizontal installation, execution for vertical installation on request
- Box frame, including corners, completely made of aluminium. Fan access possible via maintenance door (selectable access side).
- Weather roof for outdoor installation available
- Sound attenuation values for surrounding, see table

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



Control cabinet with control modules

Our control at your service!

Systemair control systems

Every building has individual requirements for ventilation and smoke extraction concepts. Safety and efficiency are not in contradiction.

In case of a fire, the control disregards energy consumption. It is important to guarantee the safety of the people and the building, to enable the personal rescue and assist the fire brigade and other action forces in their work, which minimizes fire and smoke gas damages.

However, the systems generally run 24 hours a day and 365 days a year. Therefore each kilowatt of electrical energy used by the system counts for the operator or owner of the building.

Compared to conventional systems a Green Ventilation Jet Fan System considerably reduces the energy use.

For an optimal function, the control system has to be designed individually to meet all requirements of the project. Ideally, this must be done in line with all other crafts during basic conception and coordinated with the ventilation system of the building. Air quality requirements for desk spaces are different from those for underground car parks. Because of the duration of stay and other factors, harmful substances influence the human health. The factor time/duration of stay in the car park is responsible for different legal demands to average time values concerning CO/NO₂/LPG exposure (half-hourly average value, quarter-hourly average value, ...). Therefore, you can specify some areas of your building with different air quality that allows to provide exhaust air from the air conditioning unit to other areas as supply air.

Normally, the windows of energy optimised, modern buildings are not permanently in a tilted position. In fact, air quality in modern buildings is monitored and can be changed when preset maximum values are achieved. Systemair implements this concept also for underground car parks. On demand, the parameters can be changed and customised by the user. All legal requirements can be accomplished.

The Systemair control system

The Systemair control system provides active motor protection during normal ventilation mode with single and group error messages (only for standard temperature version).

The control system includes fan control for ventilation and smoke extraction of underground car parks, equipped with supply and exhaust fans, jet fans and sensors.

Single- or double-speed fans and unidirectional or reversible fans can be controlled. Each jet fan can be separately switched on or off for maintenance and commissioning.

In normal ventilation mode, the control system works either in accordance with the CO alarm system, or the timer, or the BMS system data. The fan will run either in high or low speed in the selected flow direction.

In case of fire, the control system acts dependent on the fire alarm system. Virtual fire zones with different flow directions can be formed for smoke extraction. Fans being activated in the fire zone operate automatically in the selected speed and airflow direction. The built-in motor overload protection will be deactivated in the control cabinet. The fan permanently runs for a minimum period of 2 hours in the chosen temperature range, until mechanically demolished by the fire.

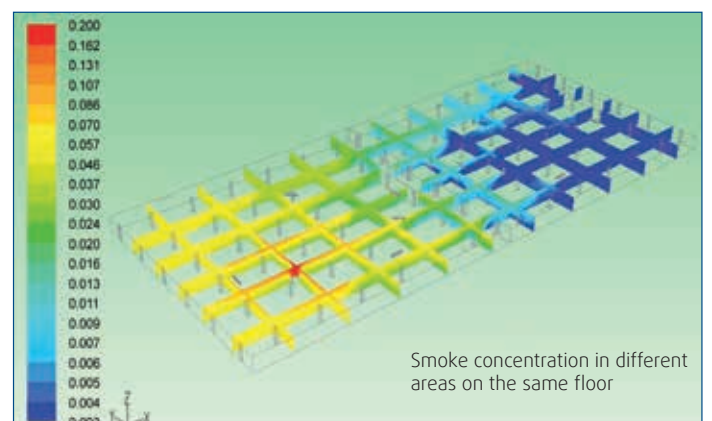
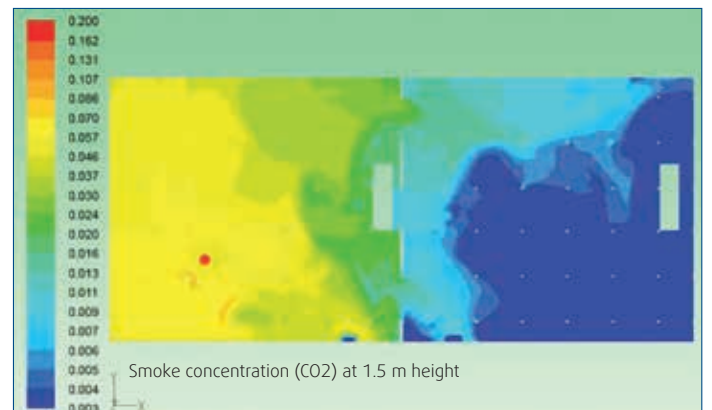
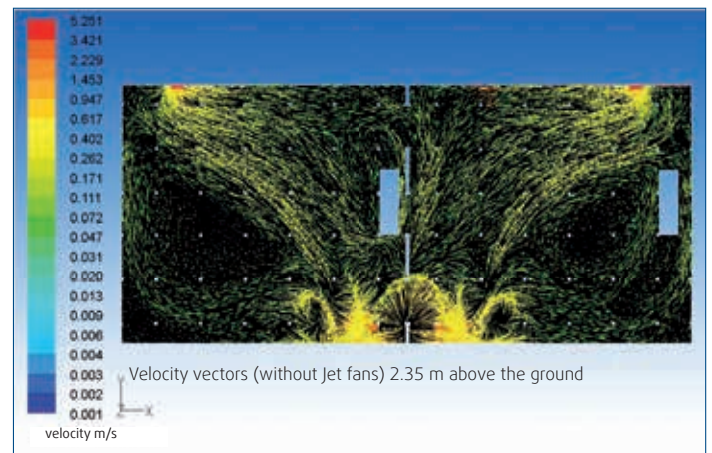
Safety requires individual planning

CFD simulation

CFD simulation is needed to confirm that there is enough air movement in all areas of the car park to secure the required number of air exchanges, to confirm the proposed number of jet fans and to determine the location where the jet fans have to be installed.

In order to be able to perform a CFD analysis, it is essential to have a 3D model of the building site, giving all openings, slab height, surface of the ceiling (flat or with drop beams, dimensioning of the drop beams, etc.) and all other details required to carry out a simulation.

A CFD analysis is used to simulate the airflows, to ensure that the distribution of the air is sufficient to effectively ventilate the car park under normal conditions as well as in emergency situations. Systemair offers this service meaning everything from one source and firsthand – truly tailored solutions.



Systemair as a system partner

Project handling

Electrical planning, commissioning, final approval test, handing over. Everyone knows the problems on the building site when ventilation crafts and electrical crafts meet with different requirements. Two crafts with different requirements for your team. Systemair helps you to handle the project successfully and on schedule. From the conception of the complete system with CFD analysis to the detailed technical planning of the ventilation system and the creation of cable lists, the delivery of components to the points of commissioning and supervised final approval test including warm smoke gas test. Thus, all planning phases and crafts are in our focus, we coordinate the interfaces and give you support according to your needs.



Installed supply cable for Jets and main fans

Commissioning

Systemair offers a smoke gas extraction test while commissioning your car park system. This simulates a case of emergency.



Smoke gas test preparation



Smoke gas test during commissioning

Systemair worldwide



Skinnskatteberg, Sweden:

Systemair AB, the Systemair group head office is in Skinnskatteberg, Sweden. The production is virtually fully automated with modern machinery featuring advanced computer support. Also located here is the company's most advanced test installation for measuring technical data.

Klockgården, Sweden:

Systemair's small air handling units are manufactured at Klockgården in Skinnskatteberg. 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.

Mühlheim 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.

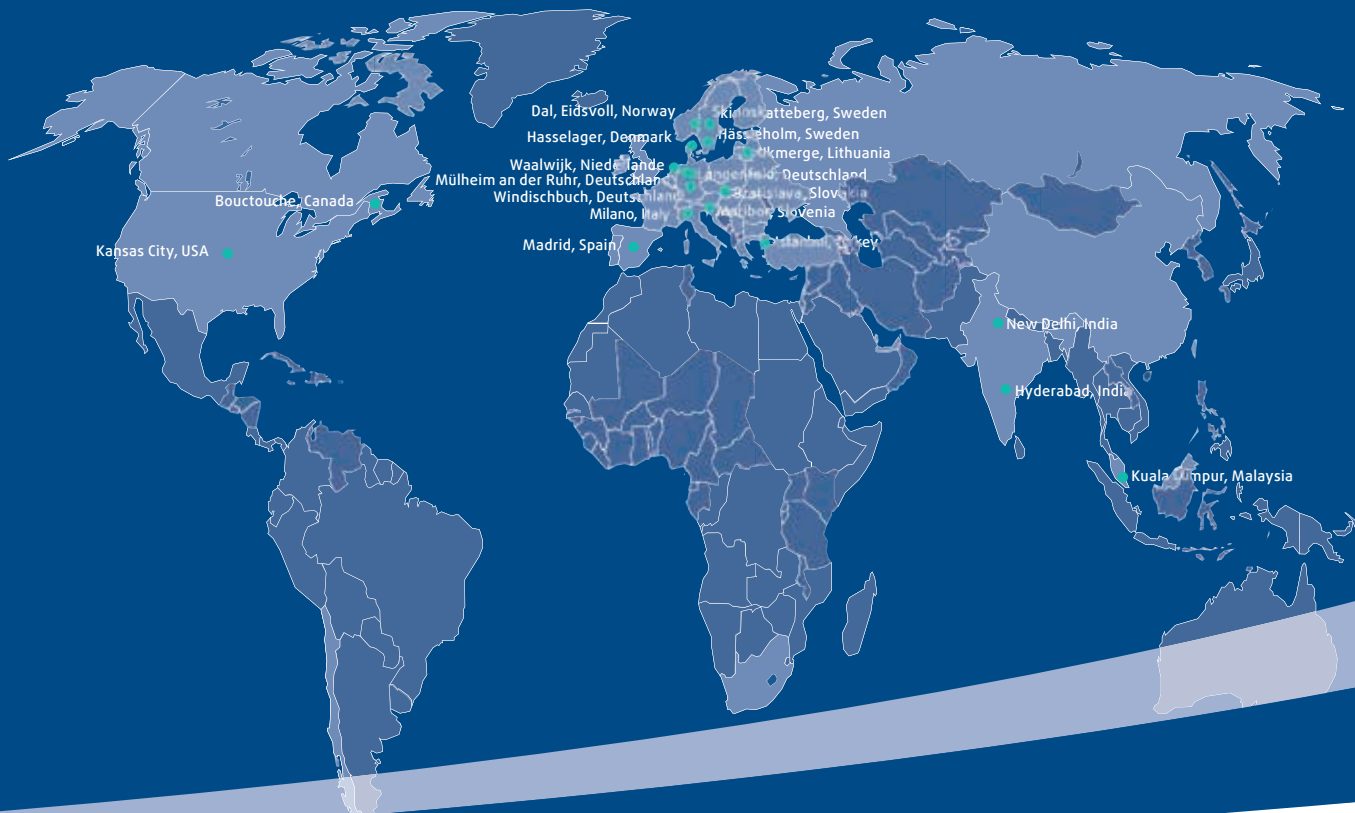


Quality:

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.



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.

Kuala Lumpur, Malaysia :

Production and marketing of products for Tunnel and garage ventilation.

Madrid, Spain:

Production of air handling units for the southern European market.

Hyderabad, India:

Production of air distribution products.

New Delhi, India:

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

Milan, Italy:

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

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.

Istanbul, Turkey:

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

Waalwijk, Netherlands:

Holland Heating is Netherlands leading manufacturer of air handling units.

