

AXIS-JET CENTRO-JET

Smoke extraction ventilation
for parking premises

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DESIGN



- Smoke control is a complex process involving smoke extraction and fresh air supply by the supply and extract ventilation system of buildings in order to ensure safe evacuation of people in case of a fire in any of the spaces.
- Ventilation systems for underroof parking are designed to ensure the most important functions. Such systems are designed to protect people escaping fire through the evacuation routes against hazardous fire factors by extracting harmful combustion products and preventing their spreading in the air.
- According to conclusive evidence the majority of mortalities in a fire are caused by poisoning from carbon monoxide and other combustion products. Carbon monoxide is one of the most toxic smoke components. It is carbon monoxide poisoning that accounts for 80 % of the fire accident causes. Fires in closed spaces where oxygen supply is limited are especially prone to intensive carbon monoxide generation.
- Smoke is able to cause loss of consciousness and cardiac standstill before a person may leave a house on fire. Jet ventilation system is the most suitable and safe ventilation solution for modern underground parkings. Arrangement of such ventilation requires no ductwork layout, thus the involved mounting expenses are reduced by 45 %. The energy losses caused by aerodynamic resistance in the air ducts are also reduced. The jet ventilation system design requires no complicated annual cleaning of the ductworks, thus reducing the maintenance costs by 35-40 %.
- Axial fans are used for general ventilation purposes of underground and semiopened parkings, covered shelters, ventilation of tunnels, air recirculation in atriums and air supply to panoramic glass constructions. Such ventilation system does not require installation of ductworks and the air stream flows directly from air supply vent to air exhaust vent.

Impurity content in the air [mg/m³] and health effect

Influence	CO	SO ₂	NO _x
No marked effect in case of exposure for several hours	115	6	15
Symptoms of light poisoning or mucous membrane irritation in 2-3 hours	115...575	130	20
Poisoning in 30 minutes	2300...3500	210...400	100
Life hazard even if short-term exposure	5700	1600	150

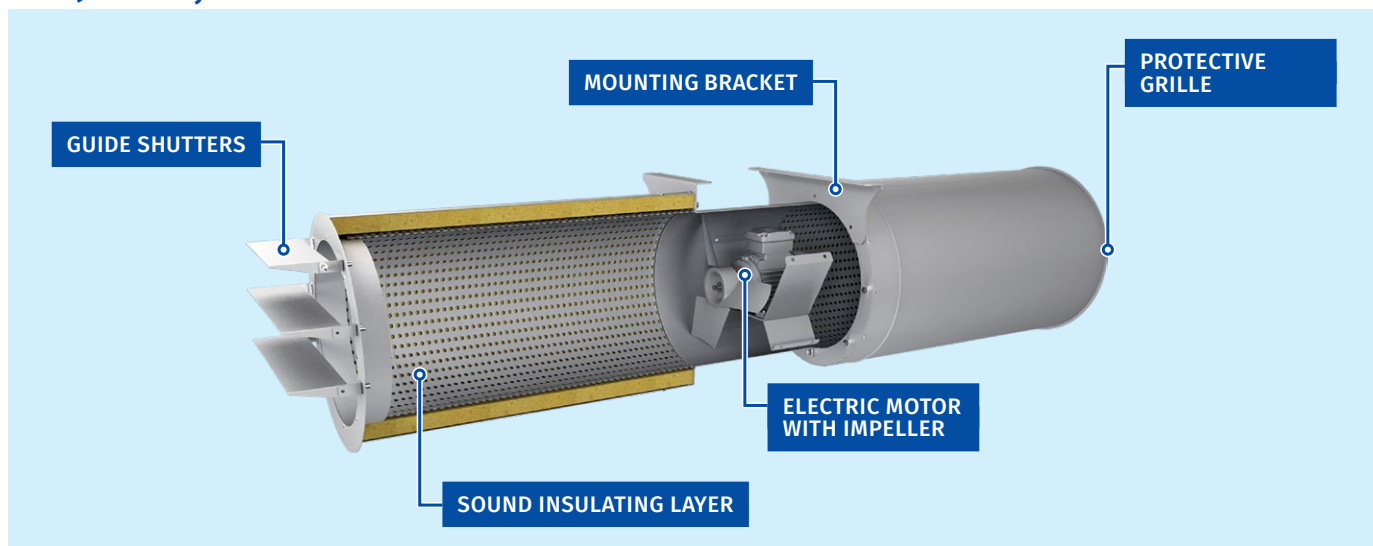
Composition of automotive exhaust gases

Content, volume in %	Petrol type	Diesel type
N ₂	74-77	76-78
O ₂	0.3-0.8	2.0-18.0
H ₂ O (vapours)	3.0-5.5	0.5-4.0
CO ₂	0.0-16.0	1.0-10.0
CO*	0.1-5.0	0.01-0.5
Nitrogen oxide*	0.0-0.8	0.0002-0.5000
Hydrocarbons*	0.2-3.0	0.09-0.500
Aldehydes*	0.0-0.2	0.001-0.009
Soot** [g/m ³]	0.0-0.04	0.01-1.10
Benzpyrene3.4** [g/m ³]	10-20 x 10 ⁻⁶	10 x 10 ⁻⁶

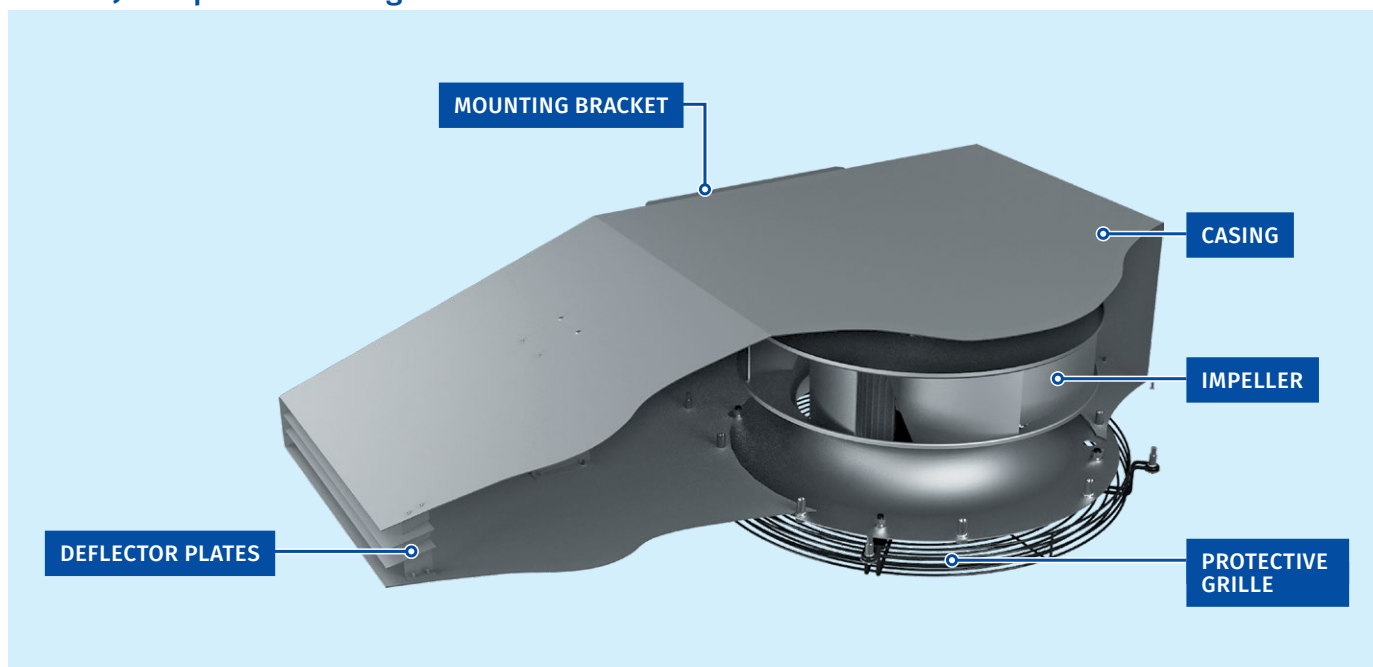
* Toxic components

** Carcinogens

Axis-Jet axial jet fan construction



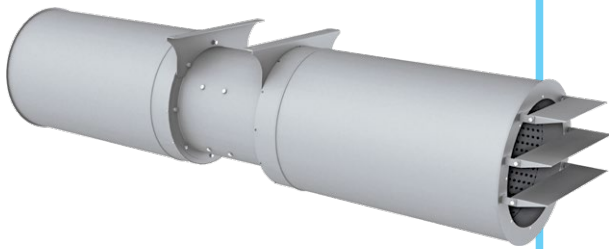
Centro-Jet impulse centrifugal fan construction



JET AXIAL FANS

AXIS-JET SERIES

Unidirectional single- and double-speed fans
Reversible single- and double-speed fans



Axial jet fans with fire resistance 300 °C/2 hrs, 400 °C/2 hrs for ventilation of covered parkings.
Functionality. Power. Efficiency.

Application

The **Axis-Jet** axial fans are designed for general purpose ventilation of underground and semiopened car parks, ventilation of tunnels, smoke extraction in case of fire as a part of smoke extract system. The fans generate a high-speed and high-pressure directed air jet.

Modifications

- Unidirectional single-speed
- Unidirectional double-speed
- Reversible single-speed
- Reversible double-speed

Design

The casing of the **Axis-Jet** fan has a tubular shape and is made of polymer coated steel. The fan has a sound insulation of mineral wool. The casing includes inner brackets for motor fixation. These brackets act as directing vanes and distribute air flow uniformly, thus increasing aerodynamic performances of the fan.

The fans with the fire resistance rating 200 °C/2 hrs can be manufactured on special request.

Motor

The three-phase asynchronous motor with a short-circuit rotor is installed in the fan casing. The motor ingress protection rating is IP55. The motor design ensures operation of the fan in the smoke extraction systems on unidirectional and reverse modes. The motors are rated for 400 V power mains voltage and 50 Hz frequency.

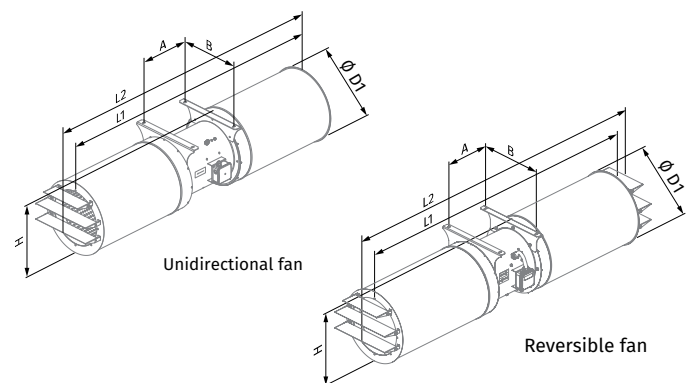
Impeller

Dynamically balanced impeller made of cast aluminium alloy. The reversible fans are equipped with a 100 % reversible two-directional impeller.

Mounting

The **Axis-Jet** fans are designed for horizontal ceiling mounting and fixation by means of the supplied fixing brackets attached to the fan casing.

Overall dimensions



Model	Dimensions [mm]						Weight [kg]
	Ø D1	A	B	H	L1	L2	
Unidirectional							
Axis-Jet-CI-315-U	414	302	355	425	1654	1763	40
Axis-Jet-CI-355-U	467	302	420	482	1954	2079	50
Axis-Jet-CI-400-U	515	351	460	525	2004	2129	65
Axis-Jet-CI-450-U	565	351	500	575	2004	2129	85
Axis-Jet-CI-500-U	603	371	580	620	2004	2145	110
Axis-Jet-CI-560-U	663	446	620	678	2093	2247	155
Axis-Jet-CI-630-U	733	550	710	748	2193	2357	245
Reversible							
Axis-Jet-CI-315-R	414	302	355	425	1654	1872	40
Axis-Jet-CI-355-R	467	302	420	482	1954	2202	50
Axis-Jet-CI-400-R	515	351	460	525	2004	2253	65
Axis-Jet-CI-450-R	565	351	500	575	2004	2253	85
Axis-Jet-CI-500-R	603	371	580	620	2004	2290	110
Axis-Jet-CI-560-R	663	446	620	678	2093	2400	155
Axis-Jet-CI-630-R	733	550	710	748	2193	2520	245

Designation key

Model	Casing type	Casing insulation	Diameter [mm]	Motor	Number of poles	Air flow	Fire resistance limit/hrs
AXIS-JET: jet axial fan	- C: round	_: without sound-insulation I: sound-insulated casing	- 315; 355; 400; 450; 500; 560; 630	_: standard motor M, S: model with a high-power motor	- 2 (for single-speed motors) 2/4 (for double-speed motors)	- U: unidirectional R: reversible	- _: max. +55 °C 300/2: 300 °C/2 hrs 400/2: 400 °C/2 hrs

TECHNICAL DATA

Ø, mm	Air flow direction	Number of speeds	Model	Power [kW]	Max. air flow [m³/h]	Fan pull [N]	Air speed [m/s]	RPM	Operating temperature [°C]	Sound pressure Lp(A), dB in 3 m
315	Unidirectional	1	AXIS-JET-CI-315-2-U	0.55	4520	26	17.2	2880	-25...+55 °C	63
			AXIS-JET-CI-315-2-U-300/2		4520	26	17.2		300 °C/2 h	63
			AXIS-JET-CI-315-2-U-400/2		3250	14	12.4		400 °C/2 h	63
		AXIS-JET-CI-315M-2-U	0.75	4990	32	19	2880	-25...+55 °C	64	
		AXIS-JET-CI-315M-2-U-300/2		4990	32	19		300 °C/2 h	64	
		AXIS-JET-CI-315M-2-U-400/2		3590	16	13.6		400 °C/2 h	65	
	2	AXIS-JET-CI-315-2/4-U	0.55 / 0.11	4520 / 2260	26 / 13	17.2 / 8.6	2880 / 1440	-25...+55 °C	63/48	
		AXIS-JET-CI-315-2/4-U-300/2		4520 / 2260	26 / 13	17.2 / 8.6		300 °C/2 h	63/48	
		AXIS-JET-CI-315-2/4-U-400/2		3250 / 1630	14 / 7	12.4 / 6.18		400 °C/2 h	63/48	
		AXIS-JET-CI-315M-2/4-U		4990 / 2490	32 / 16	19 / 9.5		-25...+55 °C	64/49	
		AXIS-JET-CI-315M-2/4-U-300/2		4990 / 2490	32 / 16	19 / 9.5		300 °C/2 h	64/49	
	AXIS-JET-CI-315M-2/4-U-400/2	3590 / 1790	16 / 8	13.6 / 6.8	400 °C/2 h	65/50				
	Reversible	1	AXIS-JET-CI-315-2-R	0.55	4190	22	15.9	2880	-25...+55 °C	67
			AXIS-JET-CI-315-2-R-300/2		4190	22	15.9		300 °C/2 h	67
			AXIS-JET-CI-315-2-R-400/2		3010	12	11.4		400 °C/2 h	68
2		AXIS-JET-CI-315-2/4-R	0.55 / 0.11	4180 / 2100	22 / 11	15.9 / 7.9	2880 / 1440	-25...+55 °C	67/52	
		AXIS-JET-CI-315-2/4-R-300/2		4180 / 2100	22 / 11	15.9 / 7.9		300 °C/2 h	67/52	
		AXIS-JET-CI-315-2/4-R-400/2		3010 / 1510	12 / 6	11.4 / 5.7		400 °C/2 h	68/53	
355	Unidirectional	1	AXIS-JET-CI-355-2-U	0.75	5830	34	17.3	2880	-25...+55 °C	65
			AXIS-JET-CI-355-2-U-300/2		5830	34	17.3		300 °C/2 h	65
			AXIS-JET-CI-355-2-U-400/2		4880	24	14.5		400 °C/2 h	65
		AXIS-JET-CI-355M-2-U	1.1	6740	45	20.0	2880	-25...+55 °C	64	
		AXIS-JET-CI-355M-2-U-300/2		6740	45	20.0		300 °C/2 h	64	
		AXIS-JET-CI-355M-2-U-400/2		5360	29	15.9		400 °C/2 h	67	
	2	AXIS-JET-CI-355-2/4-U	0.8 / 0.2	5830 / 3000	34 / 17	17.3 / 8.9	2880 / 1440	-25...+55 °C	65/50	
		AXIS-JET-CI-355-2/4-U-300/2		5830 / 3000	34 / 17	17.3 / 8.9		300 °C/2 h	65/50	
		AXIS-JET-CI-355-2/4-U-400/2		4880 / 2440	24 / 12	14.5 / 7.3		400 °C/2 h	65/50	
		AXIS-JET-CI-355M-2/4-U		6740 / 3370	45 / 23	20.0 / 10.0		-25...+55 °C	64/49	
		AXIS-JET-CI-355M-2/4-U-300/2		6740 / 3370	45 / 23	20.0 / 10.0		300 °C/2 h	64/49	
	AXIS-JET-CI-355M-2/4-U-400/2	5360 / 2680	29 / 14	15.9 / 8	400 °C/2 h	67/52				
	Reversible	1	AXIS-JET-CI-355-2-R	1.1	5810	34	17.3	2880	-25...+55 °C	68
			AXIS-JET-CI-355-2-R-300/2		5810	34	17.3		300 °C/2 h	68
			AXIS-JET-CI-355-2-R-400/2		5160	27	15.3		400 °C/2 h	70
2		AXIS-JET-CI-355-2/4-R	1.1 / 0.25	5810 / 2900	34 / 17	17.3 / 8.6	2810 / 1390	-25...+55 °C	68/53	
		AXIS-JET-CI-355-2/4-R-300/2		5810 / 2900	34 / 17	17.3 / 8.6		300 °C/2 h	68/53	
		AXIS-JET-CI-355-2/4-R-400/2		5160 / 2580	27 / 13	15.3 / 7.7		400 °C/2 h	70/55	

* Smoke extraction mode: once for two hours

AXIS-JET, CENTRO-JET

Ø, mm	Air flow direction	Number of speeds	Model	Power [kW]	Max. air flow [m³/h]	Fan pull [N]	Air speed [m/s]	RPM	Operating temperature [°C]	Sound pressure Lp(A), dB in 3 m	
400	Unidirectional	1	AXIS-JET-CI-400-2-U	1.1	8500	57	20.0	2880	-25...+55 °C	69	
			AXIS-JET-CI-400-2-U-300/2		8500	57	20.0		300 °C/2 h	69	
			AXIS-JET-CI-400-2-U-400/2		6970	38	16.4		400 °C/2 h	70	
			AXIS-JET-CI-400M-2-U	2.2	9870	77	23.2	2880	-25...+55 °C	67	
			AXIS-JET-CI-400M-2-U-300/2		9870	77	23.2		300 °C/2 h	67	
			AXIS-JET-CI-400M-2-U-400/2		8500	57	20		400 °C/2 h	69	
		2	AXIS-JET-CI-400-2/4-U	1.1 / 0.25	8500 / 4250	57 / 28	20.0 / 10.0	2880 / 1440	-25...+55 °C	69/54	
			AXIS-JET-CI-400-2/4-U-300/2		8500 / 4250	57 / 28	20.0 / 10.0		300 °C/2 h	69/54	
			AXIS-JET-CI-400-2/4-U-400/2		6970 / 3490	38 / 19	16.4 / 8.2		400 °C/2 h	70/55	
			AXIS-JET-CI-400M-2/4-U	2.2 / 0.5	9870 / 4930	77 / 38	23.2 / 11.6	2880 / 1440	-25...+55 °C	67/52	
			AXIS-JET-CI-400M-2/4-U-300/2		9870 / 4930	77 / 38	23.2 / 11.6		300 °C/2 h	67/52	
			AXIS-JET-CI-400M-2/4-U-400/2		8500 / 4250	57 / 28	20 / 10		400 °C/2 h	69/54	
		Reversible	1	AXIS-JET-CI-400-2-R	1.5	8290	54	19.5	2880	-25...+55 °C	70
				AXIS-JET-CI-400-2-R-300/2		8290	54	19.5		300 °C/2 h	70
				AXIS-JET-CI-400-2-R-400/2		7140	40	16.8		400 °C/2 h	71
2	AXIS-JET-CI-400-2/4-R		1.5 / 0.37	8290 / 4140	54 / 27	19.5 / 9.7	2880 / 1440	-25...+55 °C	70/55		
	AXIS-JET-CI-400-2/4-R-300/2			8290 / 4140	54 / 27	19.5 / 9.7		300 °C/2 h	70/55		
	AXIS-JET-CI-400-2/4-R-400/2			7140 / 3570	40 / 20	16.8 / 8.4		400 °C/2 h	71/56		

* Smoke extraction mode: once for two hours

TECHNICAL DATA

Ø, mm	Air flow direction	Number of speeds	Model	Power [kW]	Max. air flow [m³/h]	Fan pull [N]	Air speed [m/s]	RPM	Operating temperature [°C]	Sound pressure Lp(A), dB in 3 m	
450	Unidirectional	1	AXIS-JET-CI-450-2-U	1.5	10400	67	19.3	2880	-25...+55 °C	67	
			AXIS-JET-CI-450-2-U-300/2		10400	67	19.3		300 °C/2 h	67	
			AXIS-JET-CI-450-2-U-450/2		9520	56	17.6		400 °C/2 h	67	
			AXIS-JET-CI-450M-2-U		12800	98	23.3		2850	-25...+55 °C	70
			AXIS-JET-CI-450M-2-U-300/2		12800	98	23.3			300 °C/2 h	70
			AXIS-JET-CI-450M-2-U-400/2		11600	83	21.5			400 °C/2 h	70
		2	AXIS-JET-CI-450S-2-U	3	14100	123	26.2	2890	-25...+55 °C	69	
			AXIS-JET-CI-450S-2-U-300/2		14100	123	26.2		300 °C/2 h	69	
			AXIS-JET-CI-450S-2-U-400/2		12300	93	22.7		400 °C/2 h	72	
			AXIS-JET-CI-450-2/4-U		10400 / 5220	67 / 34	19.3 / 9.7		2880 / 1440	-25...+55 °C	67/52
			AXIS-JET-CI-450-2/4-U-300/2		10400 / 5220	67 / 34	19.3 / 9.7			300 °C/2 h	67/52
			AXIS-JET-CI-450-2/4-U-400/2		9520 / 4760	56 / 28	17.6 / 8.8			400 °C/2 h	67/52
	Reversible	1	AXIS-JET-CI-450M-2/4-U	2.2 / 0.5	12800 / 6290	98 / 49	23.3 / 11.7	2880 / 1440	-25...+55 °C	70/55	
			AXIS-JET-CI-450M-2/4-U-300/2		12800 / 6290	98 / 49	23.3 / 11.7		300 °C/2 h	70/55	
			AXIS-JET-CI-450M-2/4-U-400/2		11600 / 6070	83 / 42	21.5 / 11.3		400 °C/2 h	70/55	
			AXIS-JET-CI-450S-2/4-U		14100 / 7070	124 / 62	26.2 / 13.1		2880 / 1440	-25...+55 °C	69/54
			AXIS-JET-CI-450S-2/4-U-300/2		14100 / 7070	124 / 62	26.2 / 13.1			300 °C/2 h	69/54
			AXIS-JET-CI-450S-2/4-U-400/2		12400 / 6200	93 / 47	22.9 / 11.5			400 °C/2 h	72/57
	Unidirectional	1	AXIS-JET-CI-450-2-R	1.5	9280	53	17.2	2880	-25...+55 °C	73	
			AXIS-JET-CI-450-2-R-300/2		9280	53	17.2		300 °C/2 h	73	
			AXIS-JET-CI-450-2-R-450/2		8560	45	15.8		400 °C/2 h	71	
			AXIS-JET-CI-450M-2-R		10400	67	19.2		2850	-25...+55 °C	72
			AXIS-JET-CI-450M-2-R-300/2		10400	67	19.2			300 °C/2 h	72
			AXIS-JET-CI-450M-2-R-400/2		10300	66	19.1			400 °C/2 h	73
2		AXIS-JET-CI-450S-2-R	3	12800	102	23.7	2890	-25...+55 °C	74		
		AXIS-JET-CI-450S-2-R-300/2		12800	102	23.7		300 °C/2 h	74		
		AXIS-JET-CI-450S-2-R-400/2		11200	78	20.8		400 °C/2 h	74		
		AXIS-JET-CI-450-2/4-R		9280 / 4640	53 / 27	17.2 / 8.6		2880 / 1440	-25...+55 °C	73/58	
		AXIS-JET-CI-450-2/4-R-300/2		9280 / 4640	53 / 27	17.2 / 8.6			300 °C/2 h	73/58	
		AXIS-JET-CI-450-2/4-R-400/2		8560 / 4280	45 / 23	15.8 / 7.9			400 °C/2 h	71/56	
Reversible	1	AXIS-JET-CI-450M-2/4-R	2.2 / 0.5	10400 / 5190	67 / 33	19.2 / 9.6	2880 / 1440	-25...+55 °C	72/57		
		AXIS-JET-CI-450M-2/4-R-300/2		10400 / 5190	67 / 33	19.2 / 9.6		300 °C/2 h	72/57		
		AXIS-JET-CI-450M-2/4-R-400/2		10300 / 5160	66 / 33	19.1 / 9.6		400 °C/2 h	73/58		
		AXIS-JET-CI-450S-2/4-R		12800 / 6400	102 / 51	23.7 / 11.9		2880 / 1440	-25...+55 °C	74/59	
		AXIS-JET-CI-450S-2/4-R-300/2		12800 / 6400	102 / 51	23.7 / 11.9			300 °C/2 h	74/59	
		AXIS-JET-CI-450S-2/4-R-400/2		11200 / 5610	78 / 39	20.8 / 10.4			400 °C/2 h	74/59	
Unidirectional	2	AXIS-JET-CI-500-2/4-U	3.1 / 0.8	16200 / 8120	132 / 66	24.3 / 12.2	2880 / 1440	-25...+55 °C	72/57		
		AXIS-JET-CI-500-2/4-U-300/2		16200 / 8120	132 / 66	24.3 / 12.2		300 °C/2 h	72/57		
		AXIS-JET-CI-500-2/4-U-400/2		14900 / 7430	111 / 55	22.2 / 11.1		400 °C/2 h	70/55		
		AXIS-JET-CI-500M-2/4-U		18500 / 9240	171 / 86	27.7 / 13.8		2880 / 1440	-25...+55 °C	72/57	
		AXIS-JET-CI-500M-2/4-U-300/2		18500 / 9240	171 / 86	27.7 / 13.8			300 °C/2 h	72/57	
		AXIS-JET-CI-500M-2/4-U-400/2		17200 / 8600	149 / 74	25.8 / 12.9			400 °C/2 h	74/59	
	Reversible	2	AXIS-JET-CI-500-2/4-R	3.1 / 0.8	14500 / 7250	105 / 52	21.7 / 10.8	2880 / 1440	-25...+55 °C	77/62	
			AXIS-JET-CI-500-2/4-R-300/2		14500 / 7250	105 / 52	21.7 / 10.8		300 °C/2 h	77/62	
			AXIS-JET-CI-500-2/4-R-400/2		13600 / 6790	93 / 46	20.3 / 10.2		400 °C/2 h	75/60	
			AXIS-JET-CI-500M-2/4-R		16600 / 8310	139 / 69	24.8 / 12.4		2880 / 1440	-25...+55 °C	76/61
			AXIS-JET-CI-500M-2/4-R-300/2		16600 / 8310	139 / 69	24.8 / 12.4			300 °C/2 h	76/61
			AXIS-JET-CI-500M-2/4-R-400/2		15900 / 7940	127 / 63	23.8 / 11.9			400 °C/2 h	77/62

* Smoke extraction mode: once for two hours

Ø, mm	Air flow direction	Number of speeds	Model	Power [kW]	Max. air flow [m³/h]	Fan pull [N]	Air speed [m/s]	RPM	Operating temperature [°C]	Sound pressure Lp(A), dB in 3 m
560	Unidirectional	2	AXIS-JET-CI-560-2/4-U	4.4 / 1.1	20200 / 10100	167 / 84	24.7 / 12.4	2880 / 1440	-25...+55 °C	74/59
			AXIS-JET-CI-560-2/4-U-300/2		20200 / 10100	167 / 84	24.7 / 12.4		300 °C/2 h	74/59
			AXIS-JET-CI-560-2/4-U-400/2		18000 / 9010	133 / 66	22 / 11		400 °C/2 h	74/59
			AXIS-JET-CI-560M-2/4-U		25100 / 12500	258 / 129	30.7 / 15.3		-25...+55 °C	76/61
			AXIS-JET-CI-560M-2/4-U-300/2		25100 / 12500	258 / 129	30.7 / 15.3		300 °C/2 h	76/61
	AXIS-JET-CI-560M-2/4-U-400/2	24300 / 12200	242 / 121	29.8 / 14.9	400 °C/2 h	77/62				
	Reversible	2	AXIS-JET-CI-560-2/4-R	4.4 / 1.1	16800 / 8410	116 / 58	20.5 / 10.3	2880 / 1440	-25...+55 °C	77/62
			AXIS-JET-CI-560-2/4-R-300/2		16800 / 8410	116 / 58	20.5 / 10.3		300 °C/2 h	77/62
			AXIS-JET-CI-560-2/4-R-400/2		17200 / 8900	121 / 60	21 / 10.9		400 °C/2 h	77/62
			AXIS-JET-CI-560M-2/4-R		21100 / 10500	182 / 91	25.8 / 12.9		-25...+55 °C	79/64
AXIS-JET-CI-560M-2/4-R-300/2			21100 / 10500		182 / 91	25.8 / 12.9	300 °C/2 h		79/64	
AXIS-JET-CI-560M-2/4-R-400/2	18800 / 9380	145 / 72	23 / 11.5	400 °C/2 h	77/62					
630	Unidirectional	2	AXIS-JET-CI-630-2/4-U	12 / 3	31500 / 15700	320 / 160	30.4 / 15.2	2880 / 1440	-25...+55 °C	79/64
			AXIS-JET-CI-630-2/4-U-300/2		31500 / 15700	320 / 160	30.4 / 15.2		300 °C/2 h	79/64
			AXIS-JET-CI-630-2/4-U-400/2		31500 / 15750	320 / 160	30.4 / 15.2		400 °C/2 h	77/62
			AXIS-JET-CI-630M-2/4-U		35200 / 176500	400 / 200	34 / 17		-25...+55 °C	81/66
			AXIS-JET-CI-630M-2/4-U-300/2		35200 / 176500	400 / 200	34 / 17		300 °C/2 h	81/66
	AXIS-JET-CI-630M-2/4-U-400/2	33100 / 16550	354 / 177	31.9 / 16	400 °C/2 h	78/63				
	Reversible	2	AXIS-JET-CI-630-2/4-R	12 / 3	26700 / 13400	232 / 116	25.8 / 12.9	2880 / 1440	-25...+55 °C	85/70
			AXIS-JET-CI-630-2/4-R-300/2		26700 / 13400	232 / 116	25.8 / 12.9		300 °C/2 h	85/70
			AXIS-JET-CI-630-2/4-R-400/2		28800 / 14400	268 / 134	27.9 / 13.9		400 °C/2 h	82/67
			AXIS-JET-CI-630M-2/4-R		29100 / 14600	274 / 137	28.2 / 14.1		-25...+55 °C	86/71
AXIS-JET-CI-630M-2/4-R-300/2			29100 / 14600		274 / 137	28.2 / 14.1	300 °C/2 h		86/71	
AXIS-JET-CI-630M-2/4-R-400/2	32100 / 16000	334 / 167	31 / 15.5	400 °C/2 h	82/67					

* Smoke extraction mode: once for two hours

IMPULSE CENTRIFUGAL FANS

CENTRO-JET SERIES



Impulse centrifugal fans with fire resistance limit 300 °C/2 h and 400 °C/2 h for ventilation of underground parkings. Compactness. Power. Efficiency.

Application

The **Centro-Jet** impulse centrifugal fans are designed for general purpose ventilation of underground and semiopened car parks, smoke extraction in case of fire as a part of smoke extract system. The fans generate a high-speed and high-pressure directed air jet.

Modifications

- Single-speed
- Double-speed

Design

- The casing of the **Centro-Jet** fan is made of polymer coated steel.
- Due to low height of the casing the fan is recommended for use in low-ceilinged room.
- The protective grille on the intake side prevents ingress of foreign objects into the fan.
- The deflector plates on the exhaust side of the fan ensure correct air flow distribution.

The fans with the fire resistance rating 200 °C/2 hrs can be manufactured on special request.

Motor

Single- or double-speed 4-, 6- or 8-pole asynchronous motors. The motor ingress protection rating is IP55. The motors are rated for 400 V power mains voltage and 50 Hz frequency.

Impeller

The impeller with backward curved steel blades.

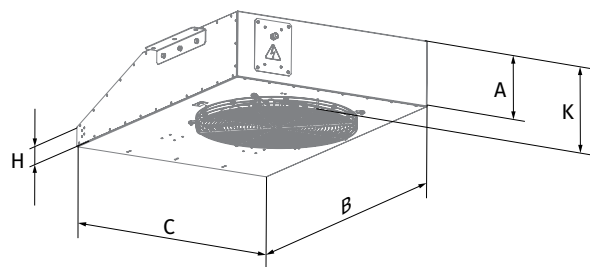
Mounting

The **Centro-Jet** fans are designed for ceiling mounting and fixation by means of the supplied fixing brackets.

Power is supplied through the internal terminal box.

The fan wiring and mounting must be made according to the instructions and the wiring diagram shown in the terminal box.

Overall dimensions



Model	Dimensions [mm]					Weight [kg]
	A	B	C	H	K	
Centro-Jet-50N	290	1355	935	90	350	96
Centro-Jet-85N	330	1605	1105	110	390	136
Centro-Jet-100N	330	1605	1105	110	390	138

Designation key

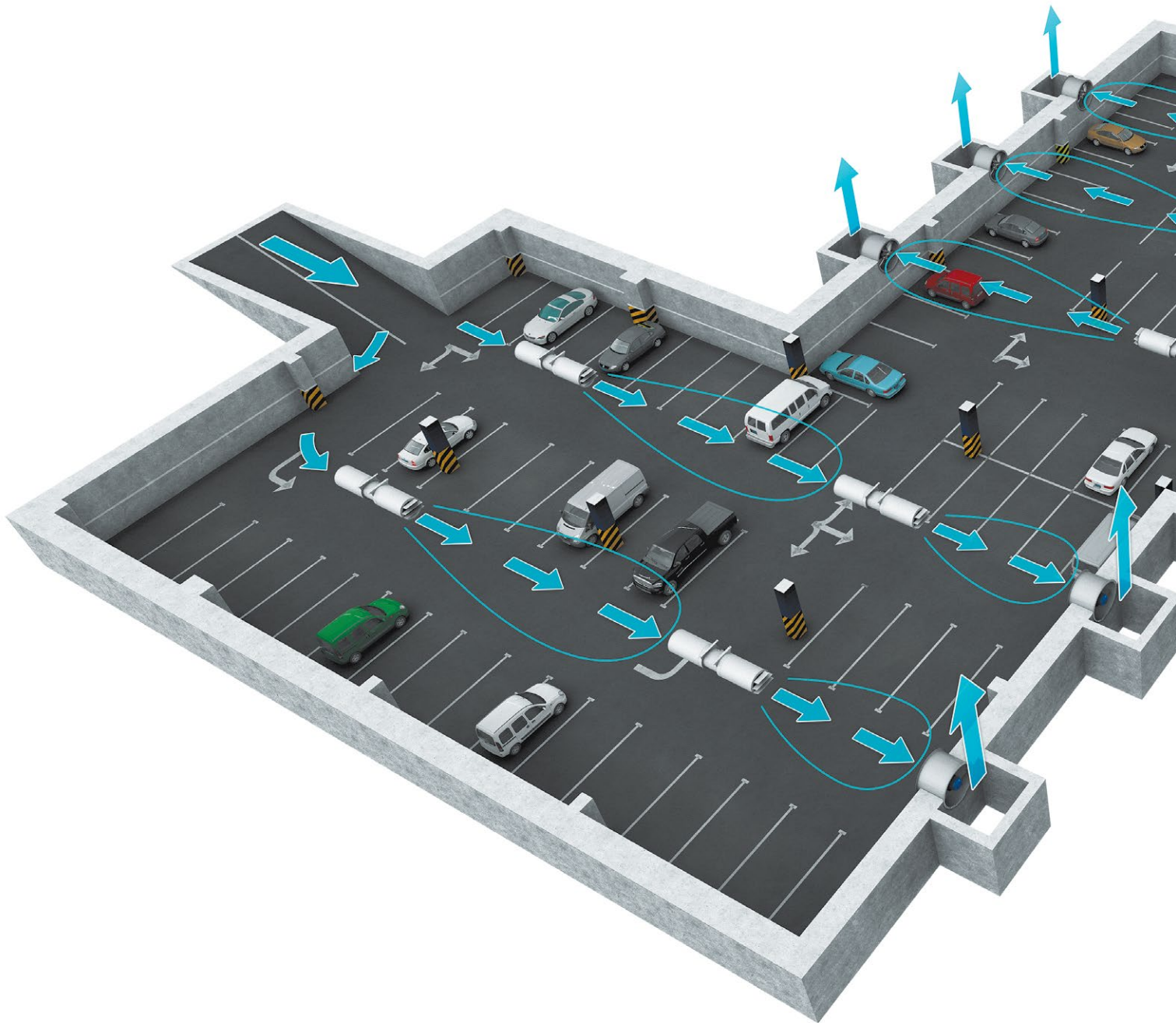
Model	Fan pull [N]	Number of poles	Fire resistance limit/hrs
CENTRO-JET: impulse centrifugal fan	- 50N - 85N - 100N	- 4 (for single-speed models) - 4/6 (for double-speed models) - 4/8 (for double-speed models)	- _: max. +55 °C - 300/2: 300 °C/2 hrs. - 400/2: 400 °C/2 hrs.

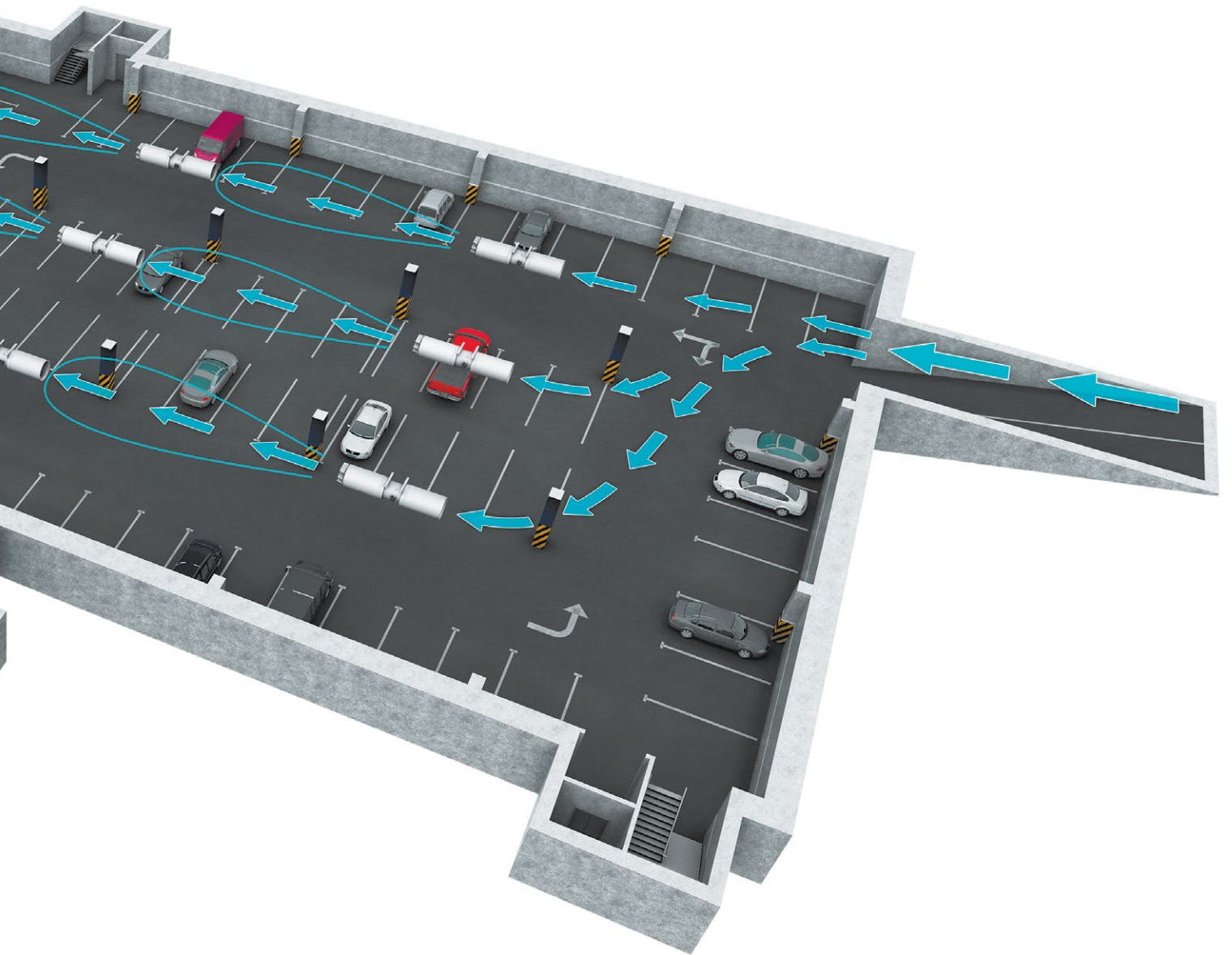
TECHNICAL DATA

Model	Number of speeds	Max. air flow [m ³ /h]	Power [kW]	Fan pull [N]	Air speed [m/s]	RPM	Operating temperature*	Sound pressure Lp(A), dB in 3 m
Centro-Jet-50N-4	1	6200	1.5	50	20.5	1500	-25...+55 °C	72
Centro-Jet-50N-4-300/2							300 °C/2 h	
Centro-Jet-50N-4-400/2							400 °C/2 h	
Centro-Jet-50N-4/6	2	6200/4100	1.5/0.37	50/20	20.5/13.5	1500/1000	-25...+55 °C	72/59
Centro-Jet-50N-4/6-300/2							300 °C/2 h	
Centro-Jet-50N-4/6-400/2							400 °C/2 h	
Centro-Jet-50N-4/8							-25...+55 °C	
Centro-Jet-50N-4/8-300/2							300 °C/2 h	
Centro-Jet-50N-4/8-400/2	400 °C/2 h							
Centro-Jet-85N-4	1	9750	2.2	85	22.3	1500	-25...+55 °C	76
Centro-Jet-85N-4-300/2							300 °C/2 h	
Centro-Jet-85N-4-400/2							400 °C/2 h	
Centro-Jet-85N-4/6	2	9750/5950	2.2/0.7	85/28	22.3/13.6	1500/1000	-25...+55 °C	76/63
Centro-Jet-85N-4/6-300/2							300 °C/2 h	
Centro-Jet-85N-4/6-400/2							400 °C/2 h	
Centro-Jet-85N-4/8							-25...+55 °C	
Centro-Jet-85N-4/8-300/2							300 °C/2 h	
Centro-Jet-85N-4/8-400/2	400 °C/2 h							
Centro-Jet-100N-4	1	10200	3	100	23.3	1500	-25...+55 °C	78
Centro-Jet-100N-4-300/2							300 °C/2 h	
Centro-Jet-100N-4-400/2							400 °C/2 h	
Centro-Jet-100N-4/8	2	10200/5150	2.8/0.7	100/26	23.3/11.8	1500/750	-25...+55 °C	78/63
Centro-Jet-100N-4/8-300/2							300 °C/2 h	
Centro-Jet-100N-4/8-400/2							400 °C/2 h	

* Smoke extraction mode: once for two hours

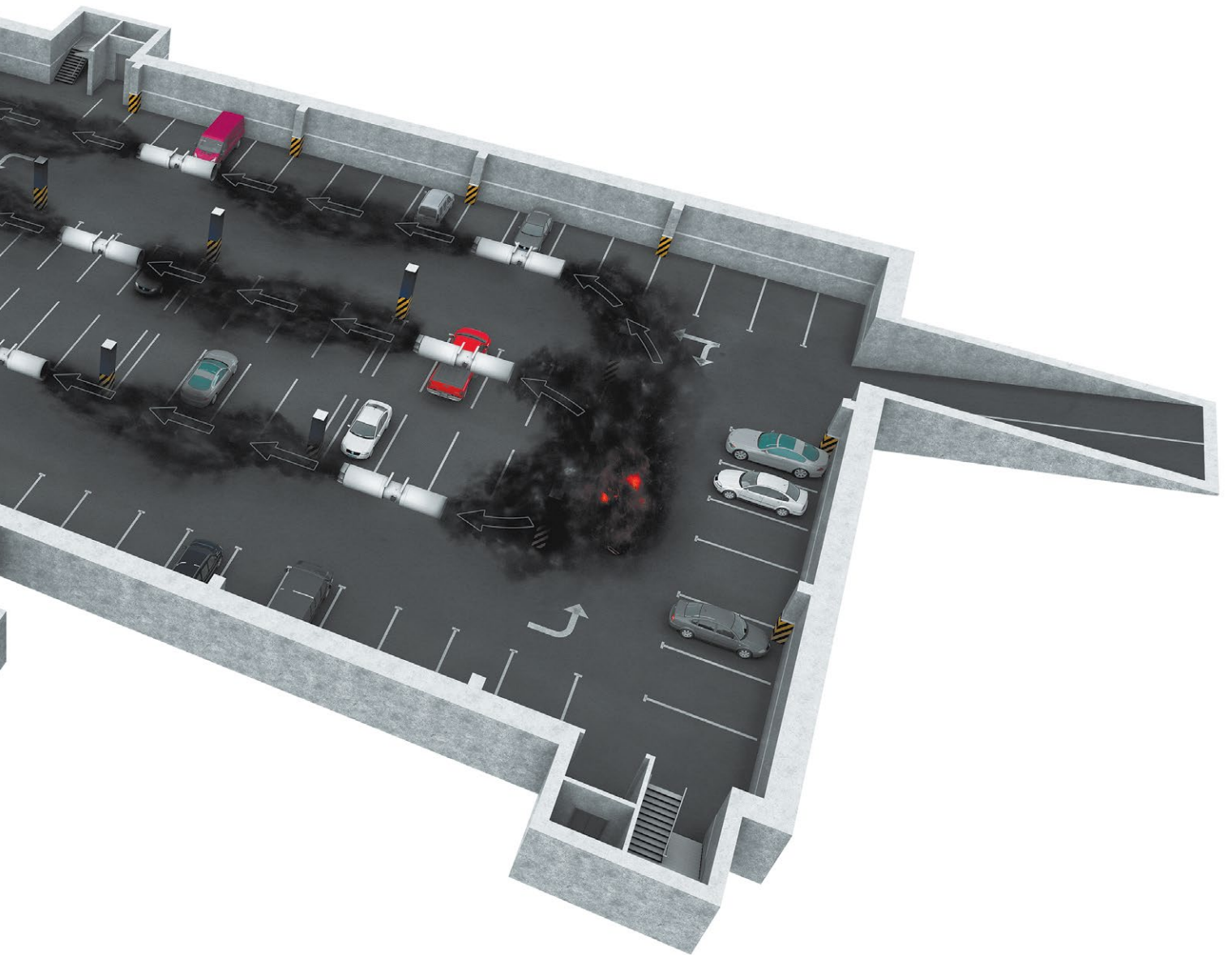
UNDERGROUND PARKING VENTILATION EXAMPLE





UNDERGROUND PARKING SMOKE EXTRACTION EXAMPLE



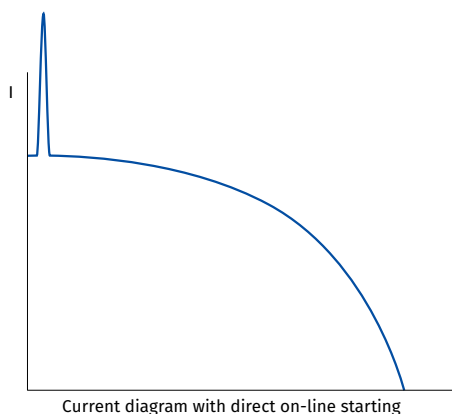


OPERATION OF FANS WITH FREQUENCY CONVERTERS

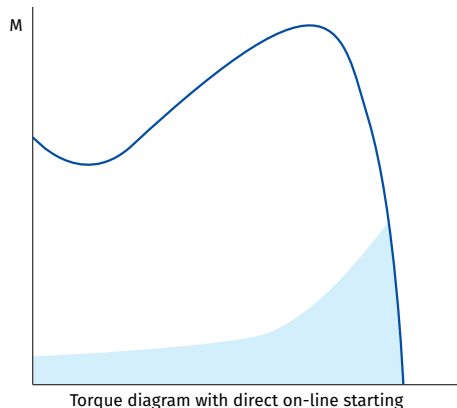
Ventilation systems produce a heavy load on the electrical systems of a building. Therefore, reducing the power consumption is among the top priorities for construction project designers.

Direct on-line starting (DOL)

As a rule, smoke extraction systems utilize large high-performance fans. During starting the high inertia of the shaft causes a substantial increase in the start-up time – i.e. the time from the application of power to reaching the rated speed. As a result the motor is subjected to high starting current for a prolonged period of time.



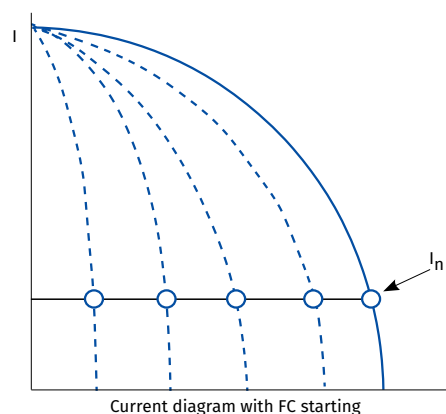
Standard switchgear (automatic circuit breakers, contactors and motor starters) is not designed to withstand prolonged overloads causing the fan to shut down automatically during starting. Using switchgear with a higher maximum current rating renders the electric motor protection system less sensitive. As a result the switchgear will not be able to detect motor overload in time due to a higher current sensing threshold. Such challenges can only be addressed by utilizing a soft starter or a frequency converter to start the fan without causing a prolonged overload.



Frequency converter

A frequency converter (FC) consists of two main component blocks. One converts alternating current (50 or 60 Hz) into direct current. The other converts direct current into alternating current of variable frequency ranging from 0 to 250 Hz.

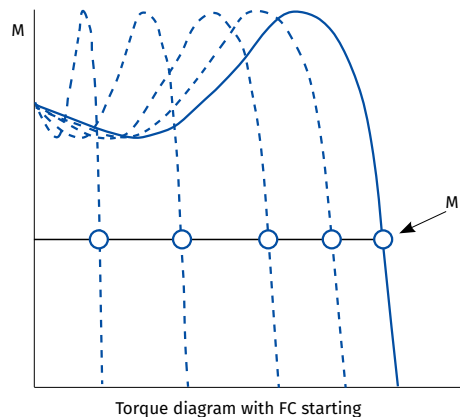
By controlling the frequency output the FC offers a broad range of motor speed regulation.



During the starting the FC raises the frequency from 0 Hz to the electrical mains frequency (50 or 60 Hz).

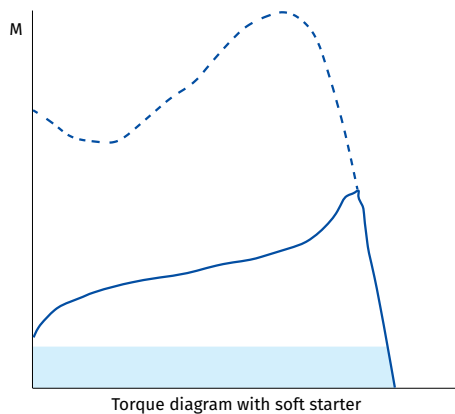
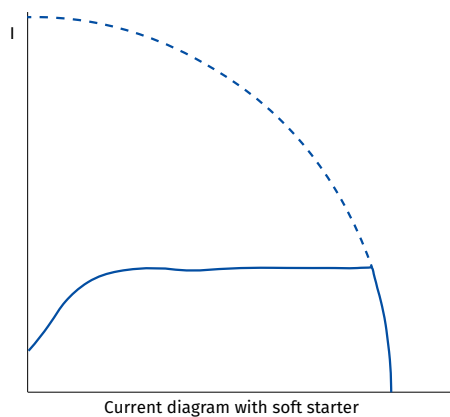
As the frequency is increased gradually, the motor can be assumed to operate at its nominal speed for a given frequency value.

Furthermore, on the assumption that the motor runs at its nominal speed the nominal torque should be immediately available whereas the current will be approximately equal to the nominal value.



Soft starter

Unlike an FC, a soft starter does not change the frequency of speed. Instead it gradually increases the voltage supplied to the motor – from the initial level to the nominal level.



The very low voltage initially supplied to the motor during starting helps avoid sudden jolts. Both voltage and torque increase gradually.

Applications in ventilation systems

Using an FC or a soft starter allows to reduce the starting current thereby avoiding a loss of voltage in the electrical mains.

In addition to that the starting torque and mechanical strain on equipment are also reduced which translates into extended maintenance and repair intervals.

General exhaust ventilation (GV) systems and emergency smoke extraction (SE) systems of car parks, warehouses, utility and industrial spaces can be integrated into a single system at the design level. As the air flow rate a GV system is considerably lower than that in an SE system a high-capacity fan rated for smoke extraction duty runs in partial load mode.

Frequency converters can be programmed for several fixed-speed settings to enable operation in GV and SE modes.

The fan operating modes can be switched upon receiving an external signal from the control system.

Such integration of ventilation systems allows overall cost savings.

FC-51 and FC-101: when to use?

This catalogue features two series of frequency converters: FC-51 and FC-101.

The FC-51 series is only suitable for general ventilation systems.

If intended for a smoke extraction system, the fans should be fitted with the FC-101 series units as they feature an integrated fire mode. When activated the integrated protection equipment of the frequency converter is overridden enabling the unit to continue operation despite the possibility of sustaining irreparable damage due to overheating or overloading.

In case of a fire, the FC-101 series frequency converters are capable of maintaining a higher air pressure level at landings compared to other areas of the building in order to keep the landings smoke-free.

FREQUENCY CONVERTERS

MICRO DRIVE FC-51



This general-purpose variable frequency drive is designed for regulating the rotation speed of an AC electric motor with a maximum power output of 22 kW. This unit is only suitable for general ventilation systems.

Features

The drive construction prevents forced air flow passage through its internal electronic components. The internal circuit boards are well-protected.

Filter

The unit features an integrated HF filter which blocks RF interference from the motor and enables the use of a shielded cable up to 15 m long or unshielded cable up to 50 m long as per the applicable EU regulations.

Inputs and outputs

- 5 programmable digital inputs
- PNP/NPN logic
- 20-5000 Hz pulse input
- One 0-10 V or 0-20 mA analogue input
- One 0-20 mA analogue input
- Thermistor input (analogue or digital)
- 1 analogue output
- 1 relay, 240 V, 2 A
- RS 485
- MODBUS RTU

Installation

Back-to-back installation for space savings. Thanks to a compact design the drives can be mounted immediately next to one another without any performance penalties.

Control panels

Designation	Code
VLT control panel LCP 11 (without potentiometer)	132B0100
VLT Control Panel LCP 12 (with potentiometer)	132B0101

Designation	Code
Remote panel mounting kit	132B0102



Frequency converter type and order code

Three-phase, 380-480 V			
Power [kW]	Rated current [A]	Order code	Block type
0.37	1.2	132F0017	M1
0.75	2.2	132F0018	M1
1.5	3.7	132F0020	M2
2.2	5.3	132F0022	M2
3.0	7.2	132F0024	M3
4.0	9.0	132F0026	M3
5.5	12.0	132F0028	M3
7.5	15.5	132F0030	M3
11.0	23.0	132F0058	M4
15.0	31.0	132F0059	M4
18.0	37.0	132F0060	M5
22.0	43.0	132F0061	M5

Outside dimensions (including mounting ledge)

mm	M1	M2	M3	M4	M5
Height	150	176	239	292	335
Width	70	75	90	125	165
Depth	148	168	194	241	248

+ 6 mm with potentiometer

BASIC DRIVE FC-101



This general-purpose variable frequency drive is designed for regulating the rotation speed of an AC electric motor with a maximum power output of 90 kW. This drive is suitable for both general ventilation and smoke extraction ventilation systems.

Certified fire mode

The fire mode prevents the drive from a self-protecting shut-down. While in this mode the drive continues to perform speed regulation duty for mission-critical fans irrespective of control signals, warnings and alarms which may otherwise force it shut down.

Filter

A built-in throttle on the DC link ensures a low harmonic load on the power mains as per the EN 61000-3-12 standard requirements.

Inputs and outputs

- Four PNP or NPN programmable digital inputs, 0-24 V DC
- 2 analogue inputs (0-10 V or 0/4-20 mA)
- 2 analogue outputs (0/4-20 mA)
- 2 relay outputs
- MODBUS RTU (RS 485)
- BACnet MSTP
- FC Protocol
- N2 Metasys
- FLN Apogee

Installation

Thanks to an ultra-compact design the drive can be easily fitted into a larger unit or panel of an air ventilation system. The casings are rated IP20/Type 1/IP21 (optional) and IP54.

Frequency converter type and SKU code

Power [kW]	Current [A]	VLT® FC 101 HVAC Basic Drive 0.37-90 kW (3 x 380 – 480 V-, without a braking transistor)			
0.37	1.2	-	131L9861	-	-
0.75	2.2	-	131L9862	131N0177	131N0178
1.5	3.7	-	131L9863	131N0179	131N0180
2.2	5.3	-	131L9864	131N0181	131N0182
3	7.2	-	131L9865	131N0183	131N0184
4	9.1	-	131L9866	131N0185	131N0186
5.5	12	-	131L9867	131N0187	131N0188
7.5	15.5	-	131L9868	131N0189	131N0190
11	23	-	131L9869	131N0191	131N0192
15	31	-	131L9870	131N0193	131N0194
18	37	-	131L9871	131N0195	131N0196
22	42.5	-	131L9872	131N0197	131N0198
30	61	131L9873	131L9875	131N0201	131N0202
37	73	131L9881	131L9883	131N0205	131N0206
45	90	131L9889	131L9891	131N0209	131N0210
55	106	131L9897	131L9899	131N0213	131N0214
75	147	131L9905	131L9907	131N0217	131N0218
90	177	131L9913	131L9915	131N0221	131N0222
Casing		(E20) IP20/Chassis	(E20) IP20/Chasis	IP54	IP54
EMC filter		(H2) RFI class A2 (for industrial areas)	(H3/H4) RFI class A1/B (for residential areas)	(H2) RFI class A2 (for industrial areas)	(H3) RFI class A1/B (for residential areas)
Control panel		(X) without panel	(X) without panel	Integral	Integral

VLT® HVAC Basic frequency converters rated up to 22 kW are fitted with circuit boards with a special class 3C3 protective coating. For frequency converters rated higher than 22 kW this protective coating is optional while, the 3C2 coating is standard.

VLT® FC 101 HVAC Basic Drive frequency converter options

Order code	Description
132B0200	Operator's digital panel
132B0201	Kit for remote mounting of the operator panel to an IP55 cabinet, including 3 m cable
132B0202	Decoupling plate for H1 and H2 standard sizes
132B0204	Decoupling plate for H3 standard size
132B0205	Decoupling plate for H4 and H5 standard sizes
132B0207	Decoupling plate for H6 standard size
132B0242	Decoupling plate for H6 standard size (extra large)

Order code	Description
132B0208	Decoupling plate for H7 standard size
132B0243	Decoupling plate for H7 standard size (extra large)
132B0209	Decoupling plate for H8 standard size
132B0244	External EMC filter class A1/B1 for power output from 0.37 to 2.2 kW
132B0245	External EMC filter class A1/B1 for power output from 3 to 7.5 kW
132B0246	External EMC filter class A1/B1 for power output from 11 to 15 kW
132B0247	External EMC filter class A1/B1 for power output from 18.5 to 22 kW

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