In-Line Fans — 1 - 27

Axial-flow Fans Wall Versions — 29 - 42

Axial-flow Fans Cased Versions — 43 - 69

Roof Fans — 71 - 86

Fans “ATEX” — 87 - 94

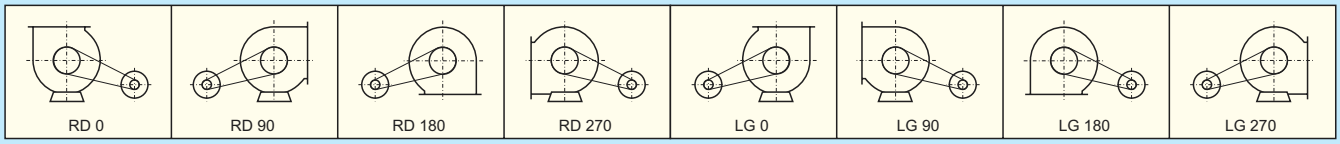
Centrifugal Fans VISP/VASP — 95 - 104

Centrifugal Fans — 105 - 190

Side Channel Blowers — 191 - 212

Chip Extractors — 213 - 215

All fans in this catalogue can be specified with orientations as shown below. However some fans can only be delivered as shown in the pictures in the catalogue. The symbols show the fan from the drive side or the motor side.



Performance curves are valid with a tolerance of ±10% for the pressure and ±10% for the airflow, air density 1,223kg/m³, at an ambient temperature of 20°C and at 1013mbar atmospheric pressure. We reserve the right to make changes of constructions and performance curves without prior notice. We do not take any responsibility for misprints.

Units

The technical data shown in the catalogue is based on the SI-system. For practical reasons there is however a few discrepancies. The most common units in the SI-system and conversion factors between different systems are presented in table 1.

Table 1

	SI	mkps	fps
Length	m	m	1 ft = 0.3048 m
Time	s	s	s
Mass	kg	1 kps^2/m = 9.81 kg	1 lb = 0.453592 kg
Force	N	1 kp = 9.81 N	1 ldf = 4.44822 N
Energy factor	1 Nm = 1J	1 kpm = 9.81 J	1 ftlb = 1.35582 J
Pressure	1 n/m^2 = 1 Pa 1 bar = 10^5 Pa	1 kp/m^2 = 9.81 Pa 1 at = 10^4 pk/m^2 1 at = 0.981 bar	1 atm = 1.01325 bar
Density	kg/m^3	1 kps^2/m^4 = 9.81 kg/m^3	1 lb/ft^3 = 16.0185 kg/m^3
Power	1 W = 1 J/s	1 kpm/s = 9.81 W 1 hk = 0.7355 kW	1 ftlb/s = 1.35334 W

At rough estimates can following relations be used:

1 kp = 10 N
1 hk = 0,75 kW

1 at = 1 bar

0,1 m^3/s = 100 l/s
1 mm vp = 0.1 mbar

Fans

The performance curves shown in the catalogue are valid, if not anything else is mentioned, for normal air with density γ=1.2kg/m^3, pressure p=1013Pa, temperature t=20°C and a specific rated speed n=rotation speed/min.
If conditions are changed can recalculations be done with formulas shown in table 2.

Table 2

	Density Temperature	Rated speed n	Fan size
Flow [m^3/s]		$Q_2=Q_1\left(\frac{n_2}{n_1}\right)$	$Q_2=Q_1\left(\frac{D_2}{D_1}\right)^3$
Pressure Δp [Pa]	$\Delta p_2=\Delta p_1\left(\frac{\gamma_2}{\gamma_1}\right)=\Delta p_1\left(\frac{T_1}{T_2}\right)$	$\Delta p_2=\Delta p_1\left(\frac{n_2}{n_1}\right)^2$	$\Delta p_2=\Delta p_1\left(\frac{D_2}{D_1}\right)^2$
Required power [kW]	$P_2=P_1\left(\frac{\gamma_2}{\gamma_1}\right)=P_1\left(\frac{T_1}{T_2}\right)$	$P_2=P_1\left(\frac{n_2}{n_1}\right)^3$	$P_2=P_1\left(\frac{D_2}{D_1}\right)^5$

There:

γ = density [kg/m^3]
Δp = total pressure [Pa]
P = required power [kW]
n = fan rotation speed [rated speed/min]
T = absolute temperature = 273 + t°C
Q = flow [m^3/s]
D = fan wheel diameter [m]

Electrical motors

Fans shown in the catalogue are, if not anything else is mentioned, provided with electrical motors designed according to Swedish and international standards. A summary of the most common directives concerning enclosures, insulation classes an designs for explosive environments will follow below.

- Enclosure according to IEC 34-5
- Code sign IP followed by two digits, f. ex. IP54

The first digit = protection against penetration of particles of objects
Second digit = protection against water

The first digit (protection against solid objects)

The first symbol digit	Degree of protection Short description	Definition
0	No protection	No particular protection
1	Protection against solid objects larger then 50mm	Part of the body, like a hand (but no protection against deliberate penetrating). Solid objects exceeding 50mm in diameter.
2	Protection against solid objects larger than 12mm	Fingers or similar, not exceeding a length of 80mm. Solid objects exceeding a diameter of 12mm.
3	Protection against solid objects larger than 2,5mm	Tools, wires, etc with a diameter or thickness larger than 2,5mm. Solid objects exceeding a diameter of 2,5mm
4	Protection against solid objects larger than 1,0mm	Wires or strips with a thickness larger than 1,0mm. Solid objects exceeding a diameter of 1,0mm
5	Protection against dust	Penetrating of dust is not totally prevented, but dust can not penetrate in such quantity that the materials normal operation will be jeopardised.
6	Dust-proof	No penetrating of dust

Second digit (protection against penetration of water)

The second symbol digit	Degree of protection Short description	Definition
0	No protection	No particular protection
1	Protection against dripping water	Dripping water (drops vertically falling) may not have harmful effect.
2	Protection against dripping water of max. 15° down tilting.	Vertically dripping water may not have harmful effect as the sealing bends at the most 15° from its normal position.
3	Protection from sprinkling water	Sprinkling water with an angle of max. 60° fromthe vertical line may not have harmful effect.
4	Protection against over-sprinkling with water	Water that sprinkles towards the sealing from an arbitrary direction may not have harmful effect.
5	Protection against jets of water	Water that flushes through a nozzle from an arbitrary direction towards the sealing may not have harmful effect.
6	Protection against heavy sea	Water from heavy sea or water flushing in heavy jets of water may not force into the sealing in harmful quantities.
7	Protection against influence of short immersion into water	Penetration of water in harmful quantity may not be possible so the sealing will be immersed into the water at shown pressure and under given time.
8	Protection against influence of long-time immersion in water	The material are designed for long-time immersion in water under conditions specified from manufacturer.

Insulation class

Motors are manufactured with various quality of the insulating materials. The insulating material are classified in different ranges which are specified with a letter, f. Ex. B or F. The insulation class shows the upper temperature limit that the insulation material can manage.
The environmental temperature, temperature increase and a fixed temperature reserve are factors that settles how much a motor can be charged. The motor power for a motor is normally given.

Insulation classes	105 A	120 E	130 B	155 F	180 H
Ambient temperature °C	40	40	40	40	40
Allowed temperature increase °C	60	75	80	100	125
Temperature reserve °C	5	5	10	15	15
Final temperature °C	105	120	130	155	180

Voltage

Three-phase motors for one speed can normally be connected for two voltages. The lowest voltage is to be used when the motor is connected in Δ and the highest voltage when the motor is connected in Y. The voltage at Y = $\sqrt{3}$ x voltage at Δ.

Motors for 60Hz

Motors winded for 50Hz can also be used for 60Hz. The rating can be recounted according to the table below.

Standard voltage at 50Hz	% of data for 50 Hz						
	Voltage at 60Hz	Motor power	Maximum current	Starting current	Rated torque	Starting torque	Rated speed
220-240 V	220-240 V 255-278 V	100 115	100 100	80 95	83 93	67 92	120 120
380-420 V	380-420 V 440-480 V	100 115	100 100	80 95	83 93	67 92	120 120
500 V	500 V 575 V	100 115	100 100	80 95	83 93	67 92	120 120

Ignition classes for gases

Ignition class	Ignition point for gases °C	Maximum motor surface temperature °C
T1	>450	450
T2	>300 ≤450	300
T3	>200 ≤300	200
T4	>135 ≤200	135
T5	>100 ≤135	100
T6	>85 ≤100	85