Axial Flow Fans

with adjustable blades

rosenberg

AXIAL FANS WITH ADJUSTABLE BLADES

Technical Description

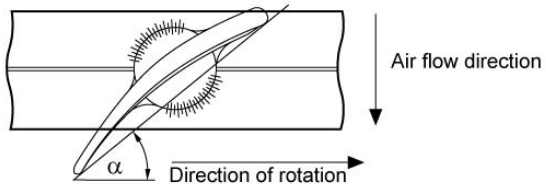
Axial fans with adjustable blades cover a wide capacity range due to their large variation possibilities with hub relation, number of blades and blade angle. With the Rosenberg and series pressure increases up to 830 Pa and volumes up to 85000 m3/h can be realized. The allowed temperatures of the ventilated mediums are from -30°C up to +40°C as a standard (Follow description of motor manufacturer. Special motors for higher temperatures on request). The casings with flange master-gauge for holes according to DIN 24154 line 2 ensure a simple connection to the duct system. The standard air flow direction is pressured over the motor. To reverse air flow direction blade position must be rotated 180° and the direction of motor rotation must be changed. The fans are suitable for vertical and horizontal installation. For sizes 315-630 the maximum fan speed is 2880 r.p.m., from size 560-1250 1440 r.p.m. During operation with invertor a maximum peripheral speed of 75 m/s must not be exceeded.

Casings

The casings are made of mild steel as a standard and are equipped with a mounting bracket for terminal box, service switch or similar. On request the casings can be supplied plastic-coated or made of special steel. The flanges are welded on and have a master-gauge for holes according to DIN 24154, line 2. The casings can be equipped with a service access. On request a terminal box, fixed on the casing or loose can be supplied. (In this case without mounting bracket for terminal box). Also available are inlet cones with or without protection guards, feet sleeves with two steel flanges as well as matching flanges, matching to the casing. The motor suspension is vertically adjustable and therefore allows the installation of motors of different sizes (according to power requirement).

Impellers

The axial impellers are balanced on balancing standard G 6,3 according to DIN ISO 1940. The hubs of aluminium drilled casting are in two parts and have removal drillings for easy dismounting of the impeller. For sizes 315 to 800 hubs with outside diameter 150 mm are used. These hubs can be equipped with 5 resp. 10 blades. From size 500 to 1000 the hubs have an external diameter of 250 mm and can be quipped with 7 to 14 blades. From size 1000 to 1250 the hubs have an external diameter of 500mm and can be equipped with 9 & 18 blades. The profiled blades are made of aluminium diecast or FRP, in standstill the blade angles are adjustable. The adjusting dial is on the blade foot. If the blade angle is adjusted after delivery the power requirement must be checked for overload of the motor. The balance of the impeller must be checked after blade adjustment. The blade angle α is measured on the wing tip.



Motors

3-phase IEC standard motors of type B3 with protection class IP 54, insulation class F in 2-, 4-, 6- or 8 pole execution is used. Pole-changeable, voltage-controllable, invertor motors and single phase a.c. motors or motors for medias to be ventilated with higher temperatures are available on request. EExe-executions please see explosion protection.

Explosion protection

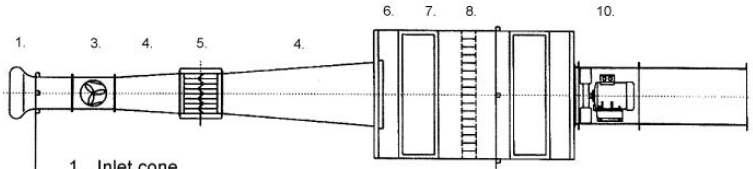
The fans can be supplied in explosion proof design according to VDMA 24169 part 1. The ex-execution is equipped with explosion-proof IEC standard motors of type of protection increased safety “e” with temperature class T1 to T3 (T4 special execution) and in insulation class F. With respect to possible breakdowns possible contact surfaces between rotating and stationary parts, are made of materials with reduced danger of inflammation by sparks from shocks or friction. For this Fibre Reinforced Polypropylene (FRP) blades are used. Due to the larger annular gap between impeller and casing (gap is prescribed by law) with explosion proof fans a power loss (5% in Volume flow and 15% in pressure) must be taken into consideration during selection. The fans are suitable for use in zone 1 and 2 as well as for ventilation of explosive atmosphere of zone 1 and 2 combustible gases and vapours of temperature classes T1 to T3. The fans are for continuous duty and must not be operated with an invertor.

Zone	Danger of Explosion ...	avoid ignition sources, which ...
0	always or long-term	may arise from breakdowns which are expected to happen occasionally
1	sometimes	may arise from breakdowns which are expected to happen quite often
2	seldom or short-term	may arise with normal operation

Special design with service access

The service access makes it possible to gain access for cleaning and maintenance on the installed fan. During installation take care that service access can be opened.

Subject to technical modification.



1. Inlet cone
2. Inlet cone with pressure measurement point
3. Auxiliary fan
4. Transistion piece
5. Reducing damper
6. Sreens
7. Measuring chamber
8. Straightener
9. Pressure manometer p and pressure measurement point
10. Tested fan

Measuring method for performance curves and noise

Performance curves were made in accordance to DIN 24163 part 1 in mounting position B, using the inlet method in the test chamber as shown below. The performance curves in this catalogue show the static pressure increase and the dynamic pressure in Pascal (Pa) over the air volume flow in m³/h. The perfemance curves are valid for air with a density of 1,2 kg/m³ with a temperature of 20ºC.
Inlet test chamber as per DIN 24163:

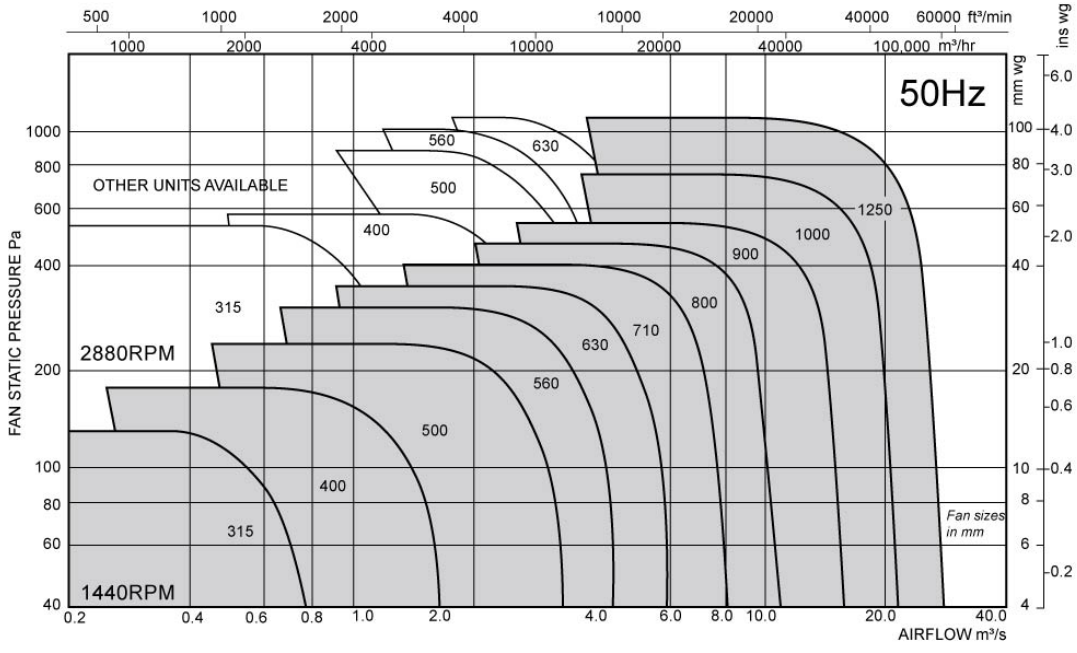
Noise level measurements

Noise specifications are in accordance to DIN 45635 Part 1 resp. VDI 3731. For each blade angle the A-weighted outlet duct sound power level L_{WA^4} is mentioned in dB(A). The results please find in the tables under the performance curves. In order to obtain the outlet noise values L_{WA^4} for the outlet sound power L_{WA^4} the same measurements can be used. The measuring method for the A-sound power level at the outlet side L_{WA^4} according to DIN 45635, Part 38, Graticule e, in a reflection-poor sound measurement chamber with reflecting plane is

The approximate sound pressure level at the outlet side in 1m distrance in a return loss room can be obtained by deducting 11 dB from the sound power level at the outlet side. The sound pressure difference from distance 1 m to distance a is obtained as follows: Lp = 10 * log (1/a). Please note that reflections and room characteristics as well as natural frequencies influence the size of the sound pressure level differently. Assuming that $L_{WA^4} \approx L_{WA^4}$, resp. $L_{WA^4} \approx L_{WA^4}$ the acoustic values of the outlet side can be used for the inlet side of the fans as well (L_{WA^3} = sound power level of inlet side).

STANDARD SELECTION CHARTS

TYPICAL PERFORMANCE WITH 2 AND 4 POLE MOTORS - 2880 AND 1440 RPM



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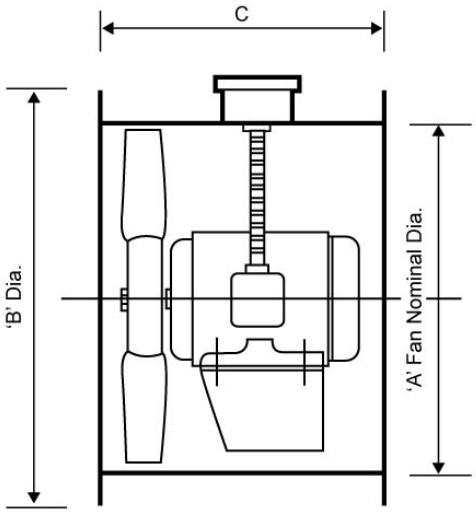
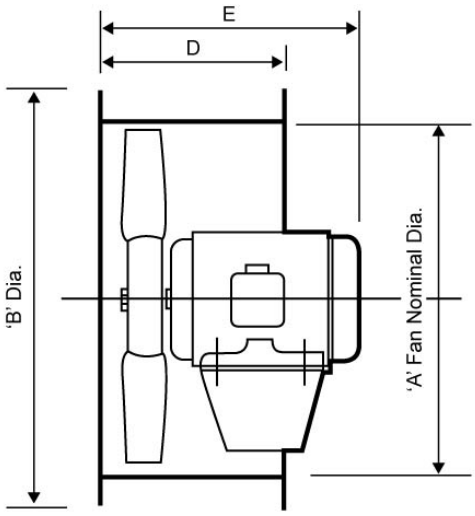
DIMENSIONAL DATA

LONG CASING



SHORT CASING



All Dimension In mm

MODEL	A	B	C	D	E (Max)	Max. Motor Frame Size	L.C. (kg)	S.C. (kg)
315	315	375	300	180	300	71	23	15
400	400	475	400	220	380	90L	41	27
500	500	585	450	250	440	112L	61	46
560	560	645	570	300	555	132M	103	72
630	630	715	710	400	650	160M	148	120
710	710	795	840	550	840	200L	300	256
800	800	885	710	400	650	160M	155	135
900	900	1000	710	400	710	160L	199	178
1000	1000	1100	840	550	840	200L	340	278
1250	1250	1350	840	550	840	200L	360	307