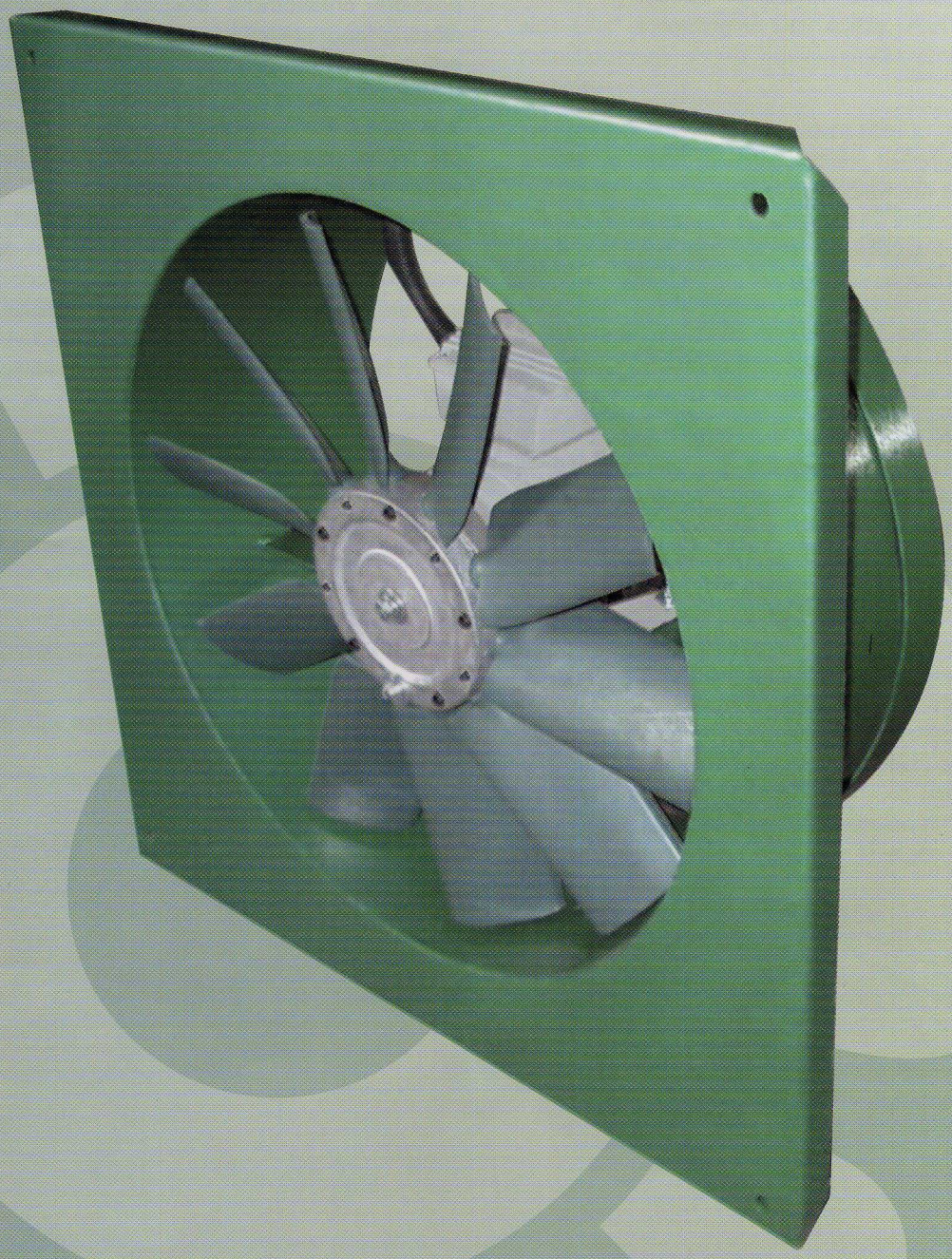
Square Plate Axial Fans

with adjustable blades



SQUARE PLATE AXIAL FANS WITH ADJUSTABLE BLADES

Technical Description

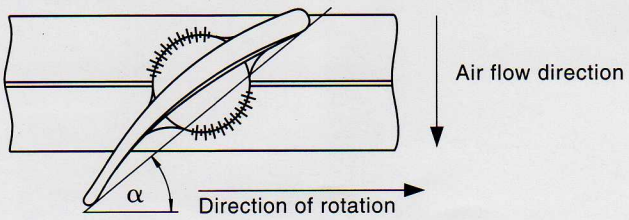
Square Plate Axial fans with adjustable blades cover a wide capacity range due to their large variation possibilities with hub relation, number of blades and blade angle. With the Rosenberg SP series pressure increases up to 830 Pa and volumes up to 85000 m3/h can be realized. The allowed temperatures 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 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. For sizes 315-710 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. On request the casings can be supplied plastic-coated or made of special steel. The square plate 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.

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.



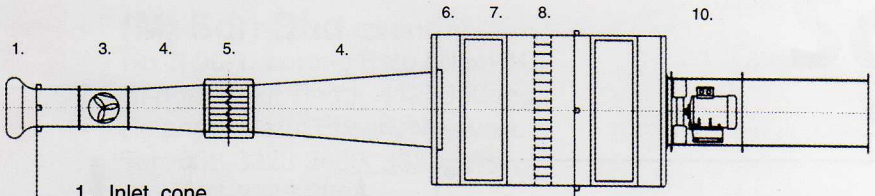
Motors

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 source, 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



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 m^3/h. The performance curves are valid for air with a density of 1,2 kg/m^3 with a temperature of 20°C.
Inlet test chamber as per DIN 24163:

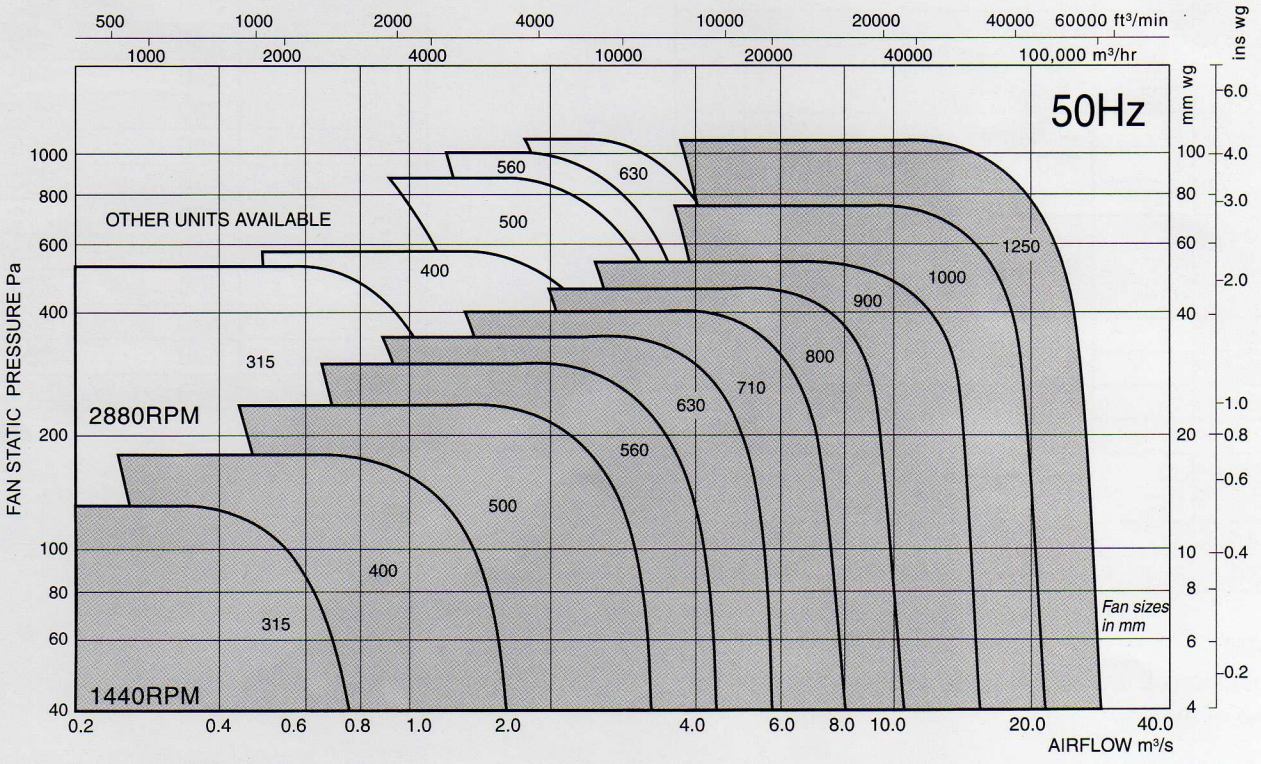
Noise level measurements

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}^3 the same measurements can be used. The measuring method for the A-sound power level at the outlet side L_{WA}^6 according to DIN 45635, Part 38, graticule e, in a reflection-poor sound measurement chamber with reflecting plane is

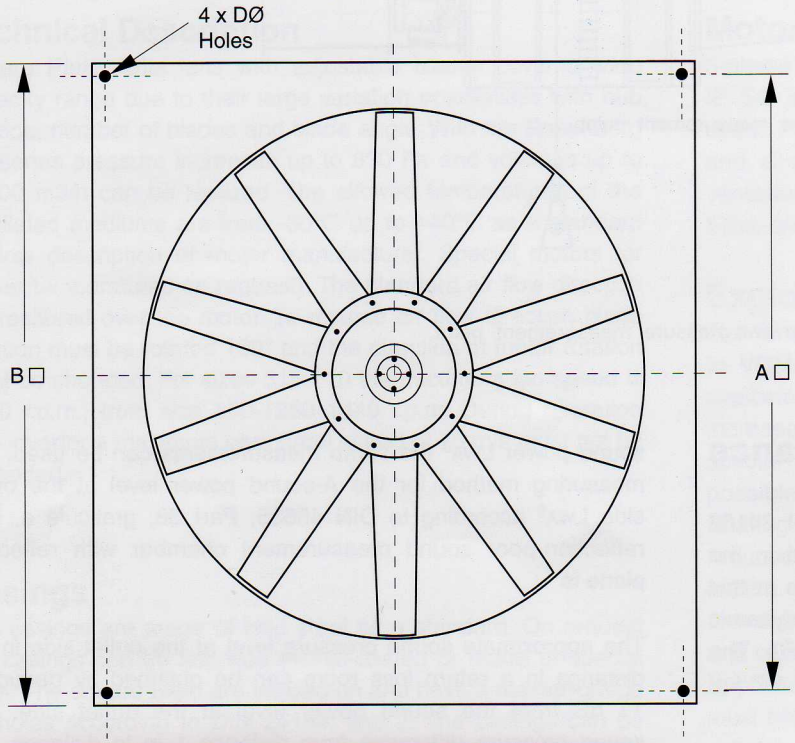
The approximate sound pressure level at the outlet side in 1m distance in a return loss room can be obtained by deducting 11 dB from the sound power level at the outlet side. The sound pressure difference from distance 1 m to distance a is obtained as follows: $\Delta Lp = 10 * \log (1/a)$. Please note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

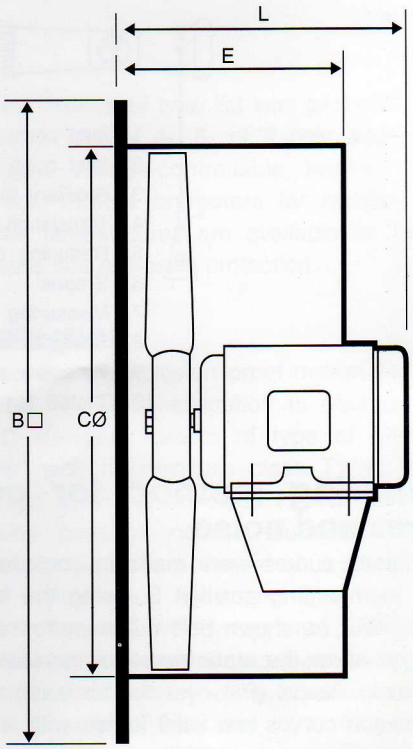
STANDARD SELECTION CHARTS

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



SP SERIES





Fan Size	Maximum Motor kW	Dimensions (mm) A□	B□	CØ	DØ	Weight (kg)
315-2	0.55	380	430	315	9	30
315-4	0.18					27
315-6	0.37					30
400-2	2.2	490	540	400	9	44
400-4	0.55					37
400-6	0.37					37
500-2	4	615	655	500	11	80
500-4	1.5					53
500-6	0.37					46
560-2	7.5	675	725	560	11	110
560-4	2.2					71
560-6	0.75					56
630-2	15	750	805	630	11	180
630-4	4					92
630-6	1.1					66
710-2	37	810	850	710	14.5	315
710-4	5.5					128
710-6	2.2					106
800-4	11	910	970	800	14.5	186
800-6	3					113
900-4	15	1010	1070	900	14.5	230
900-5	4					154
1000-4	30	1110	1170	1000	14.5	292
1000-6	11					232
1250-4	37	1360	1420	1250	14.5	365
1250-6	22					355

Motor frame size	Dimensions (mm) E	L
63	180	290
71	220	300
80	220	335
90S	220	360
90L	220	380
100L	250	440
112M	250	440
132S	300	500
132M	300	555
160M	400	650
160L	400	710
180M	500	745
180L	500	775
200L	550	840
225S	590	880
225M	590	910

Note:
Dimensions L are approximate as they vary with the make of motor.