

皮带传动离心风机

Radial Fans, belt driven



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担保的宗旨

客户负责风机选型、风机的安装和操作。根据有效条款 VII 段和购买条件，提供产品担保，不包括其他要求。

担保不适用于下列情况：

购买者或第三方的不恰当使用，装配或安装错误，正常磨损，违规操作，不正确的维护保养，不适宜的通风介质，错误安装，不适宜的底座，化学及电气的影响超出厂商责任范围。

如果在厂商交货时，产品存在质量问题，客户有权要求更换风机或其他部件。厂商也可以在合理的时间内修好产品，一有问题顾客应尽早通知厂商。

在保修期的维修与更换，可访问我们的网站或直接联系我们的子公司。

机械安全的信息

洛森伯格风机是符合EC评议会指令（机械，低电压，电磁兼容性和在ATEX指令下的潜在危险区），这种产品标有CE标签和一个制造商的合格声明。

风机的潜在危险评估和必要的技术安全措施是按照VDMA标准，图表编号24167：风机，安全性要求和相关的欧洲标准。

为满足欧共体的方针要求，在安装过程中使用的操作手册包含了其他的安全方面的考虑。

Warranty Guidelines

The customer is responsible for the project design, selection and operation of the fans. The supplier gives warranty for faulty products, excluding further claims, in accordance with paragraph VII of the valid terms and conditions of business.

Warranty will not given in the following instances:

Unfitted or inappropriate usage, incorrect mounting or faulty installation by the purchaser or a third party, normal wear and tear, incorrect or negligent handling, improper maintenance, unsuitable operating material, faulty installation, unsuitable ground and chemical, electrochemical or electrical influence - as long as they are not the responsibility of the supplier.

If the goods delivered from the manufacturer are faulty, the customer has the right to receive a replacement or replacement of the faulty parts up to the maximum value of the purchase price. The manufacturer also has the right to get the product repaired within a reasonable time period. The manufacturer must be informed immediately in the case of damage.

The obligation to replace additional faults is herewith excluded. Our general terms of business are the basis for all further agreements for example: time periods to repair or replace. The general terms of business are available on our website www.rosenberg.eu or direct from one of our sales representatives.

Information on Machine Safety

Rosenberg fans are in conformity with EC council directives (machinery, low voltage, electromagnetic compatibility and in potential hazardous areas with the ATEX directive). The products are marked with a CE label and delivered with a manufacturers declaration respectively a declaration of conformity.

The assessment of the potential dangers of the fan and the necessary technical safety measures are in accordance with VDMA standard, sheet number 24167: fans; Safety requirements and relevant harmonized European standards.

The operation manual contains additional safety precautions to be considered during installation to fulfil the requirements of the guidelines of the European Community.

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误差、标准、认证

我们的目标是为客户生产高质量的产品并提供优质的服务。
因此，在您——我们尊敬的客户和我们之间保持一个持续的信息沟通 and 良好合作对于我们共同实现提升产品品质和服务质量非常重要。

用负责任的工作团队操作使用现代化的测试装置和数控设备以生产高质量的产品和环境保护措施是我们的理念。

我们在设计和生产空气传动设备时使用的大量的知识是按照 DIN EN ISO 9001 和 RLT 制造协会的要求并取得认证的。

Tolerances, standards, QMS

Our goal is to produce high quality products and provide excellent customer support.
Thus a continuous flow of information and good cooperation between you, our dear customers, and us is important to jointly achieve a continuous development of our products and maintain quality.

Modern test chambers and equipment, as well as computer controlled production handled by responsible working teams are part of our philosophy, as is the control of high quality and environmental protection measures.

Our extensive knowledge in the design and production of air movement products is shown by our certification according to DIN EN ISO 9001 and by our membership to the RLT association of manufacturer.



洛森博格风机达到 DIN24166 的要求

Rosenberg fans meet the requirements of DIN 24166

DIN 24166	公差 1 / tolerance 1	
风量 / volume flow	± 2,5%	
压力 / pressure increase	± 2,5%	
功率 / power	+ 3%	
效率 / efficiency	- 2%	
A 声功率级 / A- weighted sound power level	+ 3dB	
	从尺寸 450 / from size 450	



洛森通风设备（上海）有限公司特此证明，此处所示 HRZ 系列离心风机获得了加盖 AMCA 印章的授权。所示额定值系根据 AMCA 出版物 211 和 AMCA 出版物 311 进行测试和程序确定，并符合 AMCA 认证额定值计划的要求。

Rosenberg Ventilations & Energy Systems (Shanghai) Co., Ltd certifies that the HRZ Series Centrifugal Fan shown herein are licensed to bear the AMCA Seal.

The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.



HRZ
带高效后倾叶轮双进风皮带传动
离心风机

HRZ
Belt driven radial fan double inlet with
backward curved high efficiency impeller.

参考型号

reference code

		H	R	Z	450	R	0	0	0
H	后倾叶轮 backward curved impeller	_____	_____	_____	_____	_____	_____	_____	_____
T	前倾叶轮 forward curved impeller	_____	_____	_____	_____	_____	_____	_____	_____
R	皮带传动 belt driven	_____	_____	_____	_____	_____	_____	_____	_____
Z	双进风 double inlet	_____	_____	_____	_____	_____	_____	_____	_____
E	单进风 single inlet	_____	_____	_____	_____	_____	_____	_____	_____
450	叶轮直径 impeller diameter	_____	_____	_____	_____	_____	_____	_____	_____
R, L	右/左手旋转 right / left hand rotation	_____	_____	_____	_____	_____	_____	_____	_____
000	进一步说明 further classification 例如 / e. g. 带闭式圆管 / with closed circular pipe 设备类别2 / equipment categorie 2	_____	_____	_____	_____	_____	_____	_____	_____

总则

洛森博格离心风机是由一个持续的、系统的开发工艺生产的，适用于现代通风和空气处理机组的要求，其特别之处在于：

- 高效，运行经济
- 运行安静，低操作噪音
- 壳体模块化设计，不同系列之间可以互换
- 设计紧凑，根据DIN 323 R20进行设计，尺寸符合叶轮外径

壳体

整个蜗壳由镀锌板制成。侧板带有固定孔以便于和框架连接。框架和进风导风圈用螺栓螺母与侧板连接。

叶轮

一般来说，我们的带有内置轴的叶轮是根据DIN / ISO1940中的Q2.5或6.3质量要求进行动平衡和静平衡。质量标准是根据叶轮的尺寸判断。

HRZ 系列的叶轮由普通钢板制成，表面喷塑。

旋转方向

标准旋转方向是站在驱动侧，叶轮为顺时针转动。错误的旋转方向会导致电机过载。所以在使用前检查风机的旋转方向是必不可少的。

进风导风圈

进风口符合空气动力学设计并且保证空气在进入叶轮时的完美组织。

所有HRZ 系列其导风圈为镀锌板制成。

Generally

Rosenberg radial fans are produced in a continuous, systematic development process especially for the demands of modern ventilating and air handling units.

The specific characteristics are:

- High efficiency for economical operating mode
- quiet running, low operating noise
- interchangeable from one series to another because of the uniform casings
- compact design with graduation of the components according to DIN 323 R20. The size corresponds to the outside diameter of the impeller

Casing

The hole spiral casing is made of galvanized sheet metal. The side plates with holes for fixing the stand are lock-seamed with the sheet casing. The stands and the inlet cones are attached to the casing by screw nuts which are mounted on the side plates.

Impeller

Generally our impellers with built-in shafts are statically and dynamically balanced on precision machines according to quality standard Q2,5 or 6,3 of DIN/ISO1940. The quality standard depends on the size of the impeller.

The impeller of fan series HRZ from black steel with powder coated

Direction of rotation

The standard direction of rotation of the impellers is clockwise by looking on the actuation. Wrong direction of rotation can overload the motor, therefore it is essential to check the direction of rotation before use.

Inlet cones

The bolt-on inlets are aerodynamically shaped and guarantee a perfect inlet stream onto the impeller.

Inlets for the whole range of type HRZ are made in series of galvanized sheet metal.

轴

在安装皮带轮时，轴两端的直径设计按照DIN 748 (表1)附带按照DIN 6885 (表1)设计的键槽。轴上涂抹蜡状物以防腐

轴承的应用

低噪音高精度滚珠轴承，理论设计工作寿命 L_{H10} 至少20,000小时。其标识的最大功率和皮带轮最大直径必须遵守。

倾斜和静态失调可以通过径向轴承宽松度C3（根据DIN 620-4）和球面轴承表面来补偿。轴承通过一个支撑在轴旋转方向并且带有平头螺栓保护的偏心应力环

来固定。为了避免由于摩擦产生的腐蚀，在内滚道和应变环上会镀一层很薄的锌铁合金。带有内置轴承的风机在输送洁净空气时的温度范围可以在 -20°C (-4°F) 至 $+80^{\circ}\text{C}$ (176°F)。严格遵守皮带装置的通用组装和服务手册可以确保他们的长期质量。

HRZ 450-630

安装在3个支撑架的外壳的带沟滚珠轴承是完全密封并免于维护的。外包装的橡胶环可以减少振动和碰撞的损害。

轴承支撑

从尺寸450到630装备牢固的4支撑架，其支柱为镀锌铁制成。

Shaft

To fix the V-belt pulleys, the diameters of both shaft ends are standardized to DIN 748 (sheet 1), with keyways to DIN 6885 (sheet 1). A wax-type coating protects the shaft against corrosion.

Bearing application

The low noise precision ball bearings are designed for a theoretical service life L_{H10} of at least 20.000 working hours. The indicated maximum power and diameters of the V-belt pulleys have to be observed. Tipping and static misalignments can be compensated by the radial bearing slackness C3 (according to DIN 620-4) and a spherical bearing surface. The bearings are fixed with eccentric straining rings which are braced in direction of rotation of the shaft and guarded with a grub screw. To avoid frictional corrosion the inner raceway and the straining ring is plated with a thin alloyed ZnFe coating. With the built-in bearings the fans are suitable for moving clean air at temperatures ranging from -20°C (-4°F) to $+80^{\circ}\text{C}$ (176°F). Strict observance of the general assembly and service instructions for belt drives ensures their long-term quality.

HRZ 450-630

The grooved ball bearings in the 3-branched strut housings are completely sealed and maintenance-free. A wraparound rubber ring reduces vibrations and bumps.

Bearing support

From size 450 to size 630 with stable 4-branched strut housings made of galvanized sheet steel.

电机和电气连接

标准IEC三相电机，型式IMB3，防护等级IP55，400V/50Hz，绝缘等级F。电机装有一个PTC热保护器并适合用变频器运行。

在电机初次运行前以及在其维护时，必须遵守制造厂商的关于电机现场防护的详细的操作使用手册。

电机接线盒易于进入。电机的接线必须按照符合当地法规的接线图。如果使用变频器运行，请参考操作手册。

电机的选择

为了补偿皮带传动系统和进风导风圈的损失，您必须考虑以下系数 f_p 来增加轴输出功率：

$$P_m = P_w \times f_p$$

型号 450
型号 500 - 630

Motor and electrical connection

Standard IEC three phase motors in size IMB3, protection class IP55, 400V/50Hz, insulation class F. The motors are equipped with a PTC thermo protector and suitable for operation with frequency converter.

Before initial operation and during maintenance, the manufacturer's detailed instructions regarding motor protection installations which are required on site, have to be followed.

The motor wiring box is easily accessible. The motor has to be connected according to the wiring diagram under consideration of the local guidelines and directives. In case of operation with frequency transformer, please refer to operation manual.

Motor selection

To compensate the losses of the belt drive and inlet, you must multiple the effective shaft output by the factor f_p below:

P_m 电机功率 / motor power [kW]
 P_w 轴功率 / shaft power [kW]

$f_p = 1.15$
 $f_p = 1.12$

风机型号为HRZ最大质量惯性力矩为 6kg/m^2 ，任何型号的启动时间为少于5秒。对于标准电机的最长启动时间为10秒。

所以为了电机的安全启动，必须考虑其运行环境。

当电机直接启动时，启动电流会达到运行电流的6倍以上。机械应力会达到3倍以上。为了避免任何故障，风机选型必须遵守以下最大电机消耗功率：

！所用的数据是适用于机械平衡时的数据！
必须尊重电力供应公司的准则和指令（通常大于3kW的电机必须考虑平滑启动。）

The mass moment of inertia of the fan type HRZ is max. 6kg/m^2 . The start up time is therefore for any types less than 5 sec. The maximum allowed start up time for standard motors is about 10 sec.

Therefore a safe start up of the motor is observed if the operating conditions are considered.

When the motor is started directly the resulted starting current can be 6 times higher as in normal operation. The mechanical stresses can be up to 3 times higher. To avoid any failure the following max motor power consumptions have to be observed:

！The indicated data refer to the mechanical stability!
The guidelines and directives of the electric supply company have to be respected (usually motors bigger than 3kW have to be started by smooth start).

	450	500	560	630
最大电机功率	5,5	5,5	5,5	7,5
max. motor power	kW	kW	kW	kW

特别是大电机，这里建议使用星三角启动方式。交替式离合器，滑动轮毂或者其他的方式是可以用于平滑启动。

速度控制

可以通过一个适合的速度控制系统来达到现场所需最适合的工作点。

可以通过用变频器更改频率来更改速度。

必须遵守电机的最大频率。

在频率高于电机的 f_{max} 时会导致热超载并且温度传感器会在发热一段时间后作用。

对于所有的风机，其变频器上的截止频率均调节为50Hz。

在紧急情况或变频器故障的情况下，所有风机均可以在400V, 50Hz的主电源下运行。

当使用变频器来运行电机时，电压增幅得不得超过500V/ μ s。根据不同型号的变频器以及变频器与电机之间的电缆距离，需额外增加某些设备，例如滤波器。

It is advisable to use star-delta starting especially for big motors. Alternatively clutches, sliding hubs or other methods can be used for smooth starting.

Speed control

The required optimum duty point of the unit on site can only be achieved with a suitable speed control system.

The speed is changed by changing the frequency with a frequency converter.

The max. frequency of the motor must be observed

At higher frequencies than f_{max} the motor will thermally overload and the temperature sensor will react after a certain period of heating up.

The cut-off frequency adjustable on the frequency converter is 50Hz for all fans.

In case of emergency service or failure of the frequency converter, all fans can be operated at 400V, 50Hz main supply.

When the motors are operated by frequency converter the max. speed of voltage increase of 500V/ μ s should not be exceeded. Depending on the type of frequency converter, and the length of the cable between motor and frequency converter, additional components must be provided, such as a sinus filter.

皮带传动

三角皮带

通过专业人员的正确选型，三角皮带是一种经济的、有较长使用寿命和低维护成本的皮带。不管是什么样的条件，适合的皮带和皮带轮结构可以通过软件选出。

对于无故障运行，拉力的说明书中的皮带的绷紧值和间隔是必须的。

平皮带

在较高线速度的时候，平皮带装置的效率要高于三角皮带。

由于平皮带的磨损小，所以特别适合有严格卫生要求的地方。对保养的要求较高（拉力说明，校准）。

尺寸按照要求选取。

意外接触的防护

风机是按照箱体安装来建造的，并且标准配置的风机是没有手指防护装置的。

在初次运行前，必须安装和连接所有的保护装置。防护措施必须按照DIN EN 292（“器械分开保护”，“安全措施技术”），以及DIN EN 294（“意外接触的防护”）执行。

Belt drive

V-belt

V-belts are economic, long life and low-maintenance when professionally dimensioned. Regardless of the application conditions the suitable belt and pulley configuration can be identified by a software program.

The tighten values and intervals as indicated in the tension specification are required for a trouble free operation.

Flat belt

Flat belt drives exhibit a higher efficiency than V-belts at a higher peripheral speed.

They are especially suitable for strict hygienic applications as a result of the minimum abrasion. The maintenance requirements (tension specification, alignment) are higher.

Dimensioning on request.

Protection against accidental contact

The fans are constructed for installation in units and therefore as a standard are not equipped with a finger protection.

Before initial operation all required protection components must be installed and connected. The protective measures must be executed according to DIN EN 292 (“separative protection appliances”, “technical protective measures”), resp. DIN EN 294 (“protection against accidental contact”).

爆炸防护

在03年7月1日后所有安装在危险区域的风机必须遵守94/9/EC (防爆指令100)的推荐。按照发生爆炸事件的概率，潜在的爆炸性大气被分为0, 1, 2区域

区域 zone	爆炸事故 / explosion hazard	根据VDMA 24169的要求，避免着火源的方法 ignition sources to be avoided according to VDMA 24169
0	不变或长期的 constant or longterm	预期很少有故障 with breakdown anticipated rarely
1	偶尔有 occasional	预期经常有故障 with breakdown anticipated frequently
2	很少或短时间 rare or short term	正常运行 with normal operation

为了确定这些区域，爆炸性其他将被输送出去并且装置区域中的风机将被分开考虑

坚决遵守94/9/EC里关于设备种类2（用于区域1）或设备种类3（用于区域2）中风机的分类所主张的标准由制造商决定。在一个有潜在爆炸性大气的装置的操作工必须符合1999/92/EC（防爆指令137）的要求。

根据Ex – RL的推荐，通风系统中的风机必须由专家进行测试。以下着火源可以考虑使用标准风机：

- 热表面，例如固定的叶轮或从轴承处得来的摩擦热。
- 摩擦、研磨或者火花冲击，例如旋转的叶轮和风机的其他部件接触。当风机材料是根据VDMA 24169部分1来组合时，着火的威胁会降低。

HRZ 的叶轮由钢板制成，表面喷塑。

- 火花来自于静电载荷不导电部分，例如：塑料部件以及有厚涂层和油漆部分。

Explosion protection

All fans which are installed in an explosion hazardous area after 01.07.03 must comply with the recommendations of 94/9/EC (Atex 100). The potentially explosive atmospheres are divided into zones 0, 1 or 2 according to the probability of occurrence.

To determine the zones, the explosive atmosphere to be conveyed and the installation area of the fans are to be regarded separately.

The responsibility of adhering to the standards laid down in 94/9/EC for fans classified in equipment category 2 (for usage in zone 1) or equipment category 3 (for usage in zone 2) is left to the manufacturers. The operator of a installation with potentially explosive atmosphere has to meet the requirements of 1999/92/EC (Atex 137)

According to Ex-RL recommendations a ventilation system with fans must be tested by specialists. The following ignition sources are to be considered with standard fans:

- hot surfaces e.g. frictional heat as a result of a fixed impeller or from the bearing.
- friction, grinding or impact sparks e.g. as a result of contact of the rotating impeller with other parts of the fan. Danger of ignition is reduced when materials are combined in accordance with VDMA 24169 part 1.

HRZ is fitted with impellers out of powder coated steel.

- Sparks from electrostatically loaded parts, which are not conductible, e.g. plastic parts and thick coated or painted parts.

风机系列HRZ是用于区域2设备等级3的并且按照94/9/EC温度等级为T1-T3的。

如果风机是在有潜在爆炸威胁或传输爆炸性气体时，下列几点必须注意：

- 防爆型最高允许转速为其标准最大转速的83%
- 最大轴功率为15kW
- 风机只可用水平轴
- 皮带传动必须按照轴承理论寿命 $L_{h10} = 20,000$ h计算。这个计算（张力）必须用于固定和运行。

皮带轮的直径也必须注意：

- 必须使用认证的皮带
- 必须使用用于区域2的并有相关证书的电机
- 在气流方向上的过滤器如果有潜在的产生火花的颗粒，那么必须使用TRE/TRZ风机
- 风机必须有可以防止颗粒进入或从导风圈吸入的保护装置。

Fans of series HRZ are assigned to equipment group 3 for usage in zone 2 with temperature class T1-T3 according to 94/9/EC.

The following steps have to be noticed if fans are operated in potential explosive atmosphere or transporting such an atmosphere:

- The maximum allowed ex-speed is 83% of that of the standard speed
- The maximum power is 15kW
- The fans must be used only with horizontal shaft
- The belt drive has to be calculated to a theoretical bearing lifetime of $L_{h10} = 20.000$ h. This calculation (tension instruction) has to be used on mounting and operating

The V-pulley diameters have to be observed:

- Use only certified conductive belts
- Use only motors licensed at least for zone 2
- If potentially sparking particles can be in the airflow filters must be used especially by TRE/TRZ
- The fans have to be protected against particles which can falling in or can be absorbed from the inlet

空气特性曲线

空气特性曲线是根据AMCA 210, Figure 12, B类安装测试的。

Air performance curves

The test standard is AMCA 210, Figure 12, installation type B.

密度的影响

所有测试数据是建立在空气密度为 1.2 kg/m^3 。对于任何其他条件，您必须根据如下公式来修正压力和轴功率：

Influence of density

The measured data base on air with a density of $\rho=1.2 \text{ kg/m}^3$. For any other conditions you have to correct the pressure increase and power consumption as follows:

$$p_2 = p_1 \times \frac{\rho_2}{1,2} \quad P_2 = P_1 \times \frac{\rho_2}{1,2}$$

p_1 / P_1 = 压力 / 轴功率（查图表所得）
pressure increase / power consumption out of diagram

p_2 / P_2 = 压力 / 轴功率（新密度下的）
pressure / power consumption with new density

ρ_2 = 更改后的密度 / changed density

噪音数据

风机的声音测试是根据AMCA 300，混响室法。

特性图表显示的是声功率级(入口L_{WA})。

自由进风处的A声功率级L_{WA7}可以用如下方法计算得到:

HRZ

对于使用何种噪音防护，八阶声功率级是非常重要的，可以通过减去系数L_{Wrel}得到。

系数L_{Wrel}是由V_{opt}决定的

Calculation for free inlet sound power level L_{WA7} and octave bands sound power levels are not licensed by AMCA International

Noise level data

The test standard is AMCA 300, reverberant room method.

The characteristic diagram shown are for inlet L_{WA} sound power level.

The free inlet sound power level L_{WA7} can be obtained according to following calculation:

$$L_{WA7} = L_{WA6} - 3 \text{ dB}$$

For the determination of sound protective arrangements the sound power levels of the octave bands are important. By subtracting the factor L_{Wrel}:

$$L_{Wokt} = L_{WA} - L_{Wrel}$$

The factor L_{Wrel} is determined on V_{opt}.

型号/ type	尺寸 / size		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
HRZ	450 - 630	进风口 inlet side	-4	-5	-3	-7	-9	-9	-12	-17
HRZ	450 - 630	出风口 outlet side	-4	-3	-2	-4	-4	-8	-14	-20

在图表中所示的声功率特性曲线是通过所测得的在特定速度下的值并通过如下公式计算出其他速度下的值所得到的结果：

The characteristic sound power curve as indicated in the diagrams are measured at a characteristic speed and are calculated to other speeds as follows:

$$L_{WAn2} = L_{WAn1} + k * \log n_2/n_1$$

无论如何这个系数是通过不同尺寸的风机测试得来的。

Where by the factor is determined in test measurements on various fan sizes.

由于环境影响会导致声压级的值有很大的偏差，作为一个参考值，您可以用1m距离处的声功率值减去7dB做为它的声压值。

The expected sound pressure level can only be approximately determined as the ambient influences can lead to strong deviations. As a reference value you can subtract 7 dB from the sound power level for a distance of 1m to reach the sound pressure level.

Calculation to sound power levels at other speeds are not licensed by AMCA International

风量测试装置

后倾叶轮风机的风量测试装置由一个装在吸风侧的闭式循环管组成，四个测量装置合并在进风导风圈上以测量风压

由于这个测量装置可以通过进风导风圈处的静压和吸风处的静压之间压差来控制风量。

需要注意的是在所测吸风处是没有动压的。测量时所钻的孔必须保持在同一平面上。

在风机运行时，直接控制和测定风机的流量是可行的。

风量通过如下公式计算得到：

Air volume testing device

The air volume testing device for fans with backward curved impellers consists of a closed circular pipe on suction side with four measuring devices incorporated in the inlet cone to measure the pressure.

Due to this measuring device it is possible to control the air volume depending on the difference in pressure between the static pressure at the inlet cone and the static pressure on the suction side.

Please note that no dynamic pressure in the suction space is measured. The drillings for measurement have to be aligned accordingly.

As a result a direct control and determination of the volume flow of the fans is possible during operation

The air volume is calculated according to the following formula:

$$\dot{V} = k \cdot \sqrt{\frac{2}{\rho} \cdot \Delta p}$$

\dot{V} 风量 / air volume m^3/h

k 校准系数 / calibration factor

ρ 气体密度 / density of gas kg/m^3

Δp 压差 / differential pressure Pa

测试每款不同风机时所用不同的校准系数如下：

k_{10} = 风量偏差小于10%

Testing of each type of fan has shown that the calibration factor k for each type of fan is:

k_{10} = deviation of the airflow smaller than 10%

	450	500	560	630
HRZ	345	430	550	690

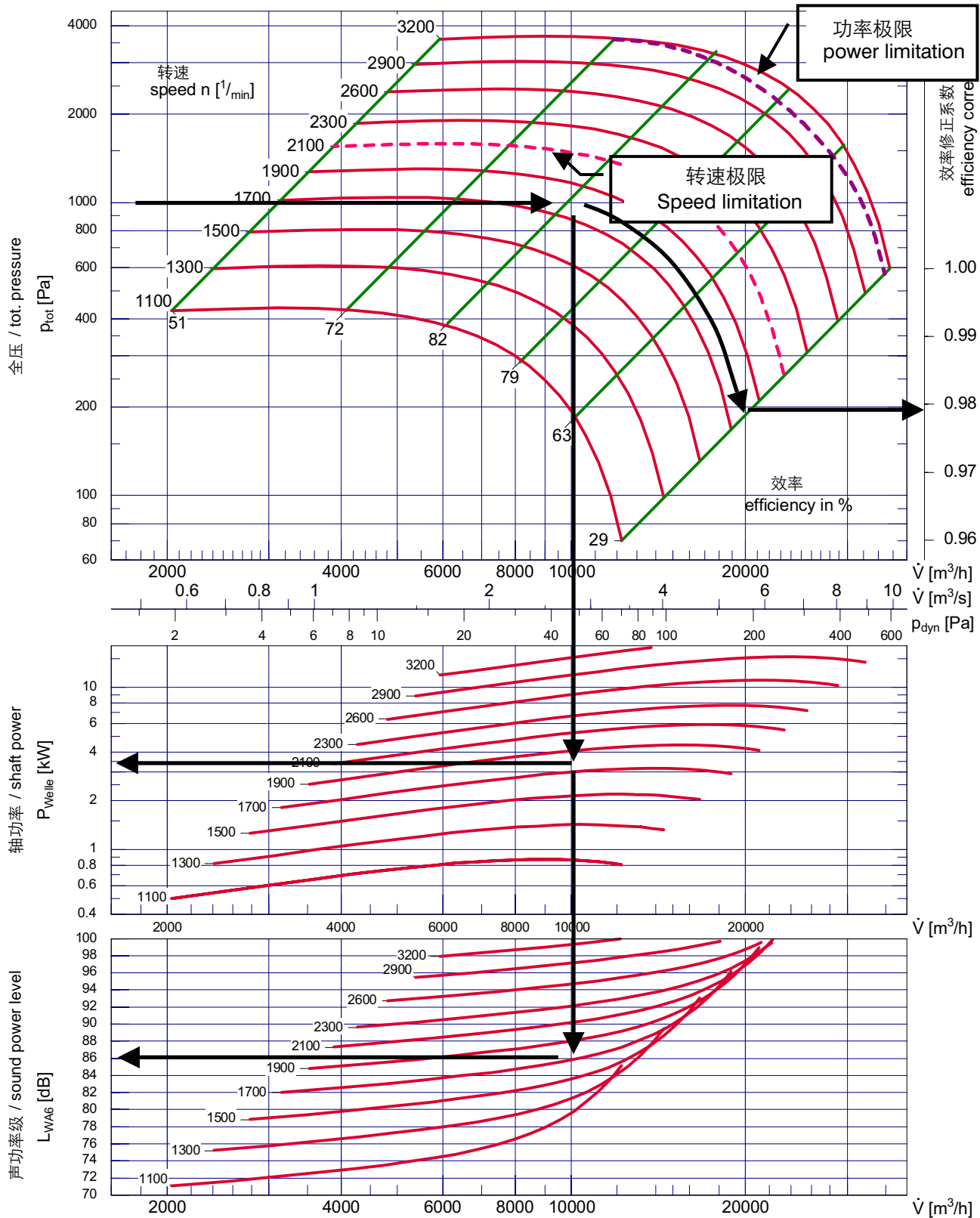
Fan Performance calculate with this calibration factor K are not licensed by AMCA International

使用的符号 Used Symbol

V	流量 / volume flow	m ³ /h
Δp_t	全压 / total pressure	Pa
Δp_{st}	静压 / static pressure	Pa
Δp_d	动压 / dynamic pressure	Pa
n	转速 / speed	1/min
P_w	轴功率 / shaft output	kW
P_m	电机功率 / motor power	kW
η_t	效率 / efficiency	%/100
ρ	密度 / density	kg/m ³
D₂	叶轮直径 / diameter of the impeller	mm
A	截面积 / cross-sectional area	m ²
J	质量惯性矩 / mass moment of inertia	kgm ²
t_a	启动时间 / starting time	s
L_{pA}	A声压级 / A-weighted sound pressure level	dB
L_{WA}	A声功率级 / A-weighted sound power level	dB
L_{Wokt}	八音阶声功率级 / octave sound power level	dB
L_{Wrel}	相对声功率 / relative sound power	dB
F	频率 / frequency	Hz

所需运行工况
10.000 m³/h, 1000 Pa
选择: HRZ450

Requested operating point
10.000 m³/h, 1000 Pa
Selected: HRZ 450

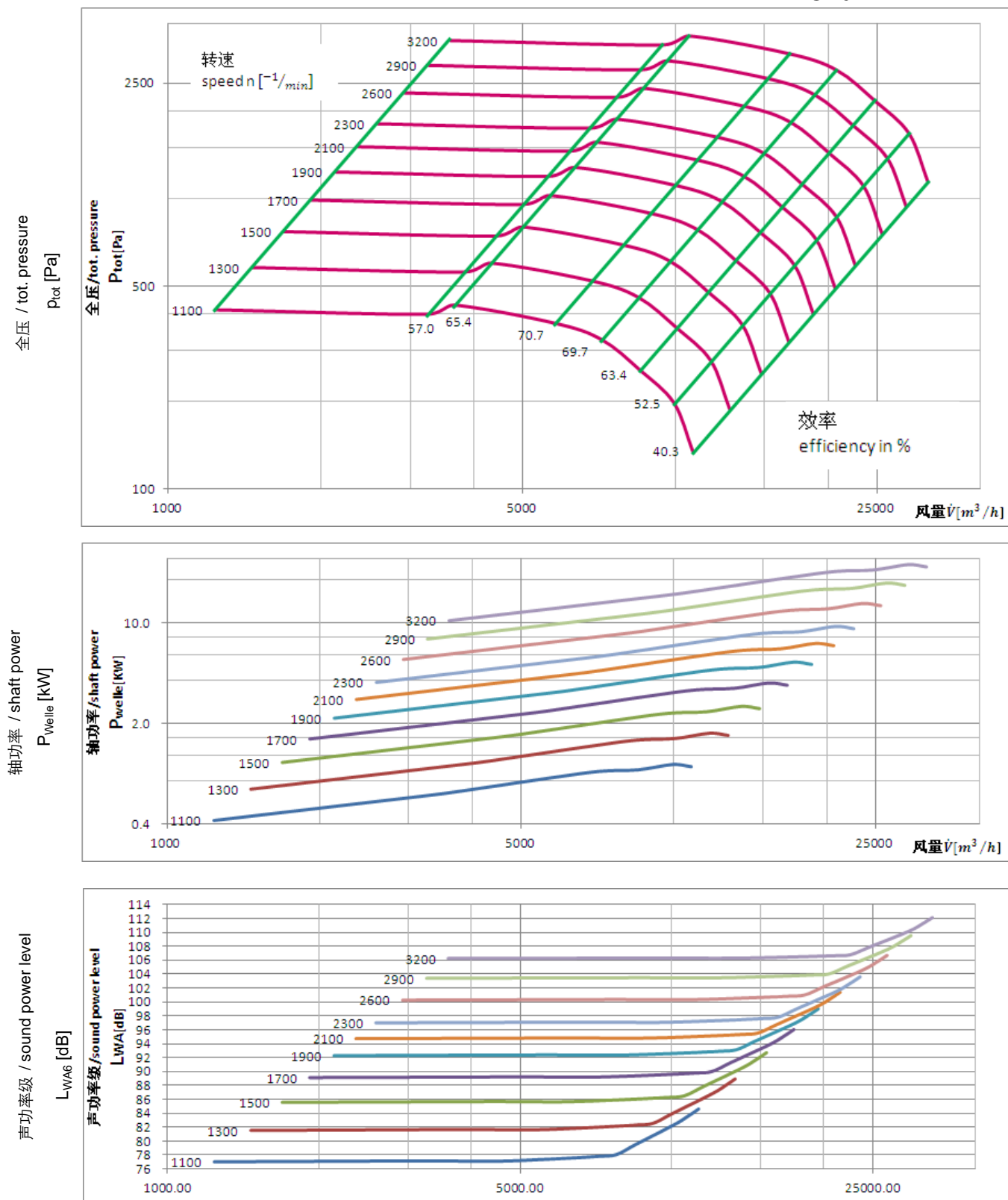


效率 $82\% \times 0.98 = 80.4\%$,
动压 47 Pa, 轴功率 3.6 kW,
声功率级 L_{WA6} 87 db(A)

Efficiency $82\% \times 0.98 = 80.4\%$,
dyn. pressure 47 Pa, shaft power 3.6kW,
sound power level L_{WA6} 87 db(A)

Performance certified for installation type B - free inlet, ducted outlet. Power rating (kW) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).
The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.
Values shown are for inlet L_{wiA} sound power levels for installation type B - free inlet, ducted outlet.

FEG 75



最高转速 / max. speed
消防型最高转速 / max. speed ex

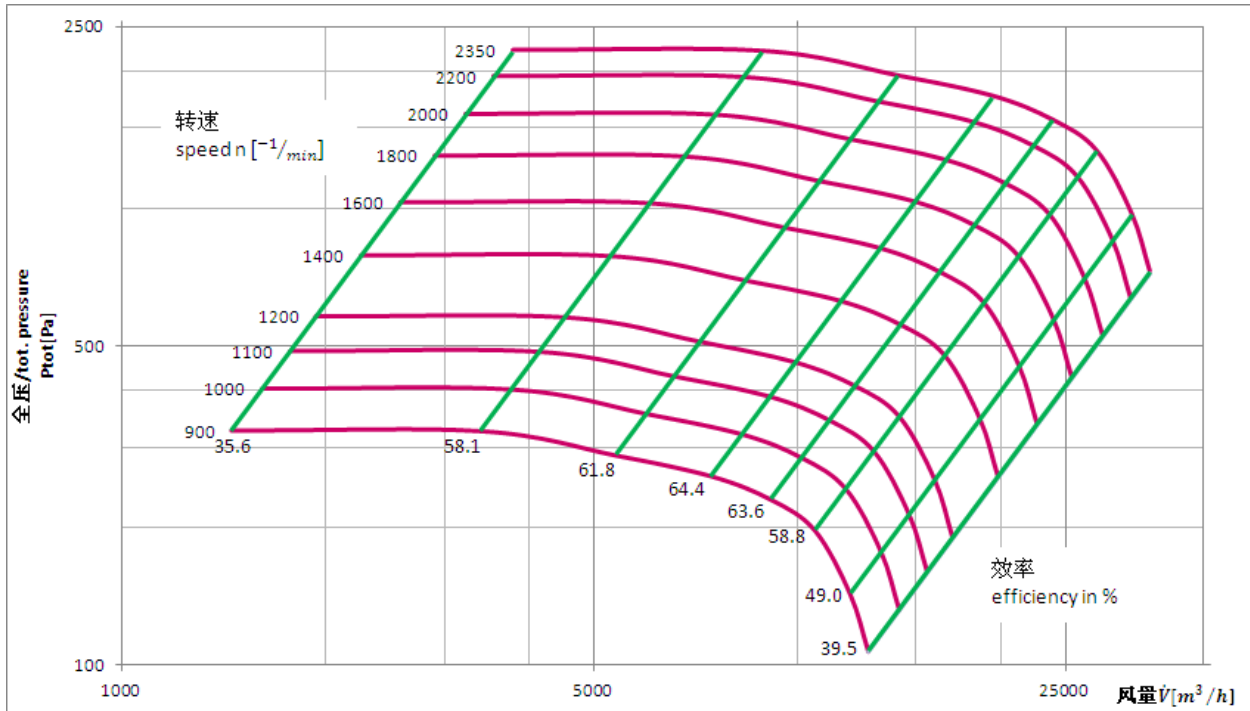
3200 min^{-1}
2450 min^{-1}

Performance certified is for installation type B - free inlet, ducted outlet. Power rating (kW) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).
The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.
Values shown are for inlet L_{wA} sound power levels for installation type B - free inlet, ducted outlet.

FEG 67

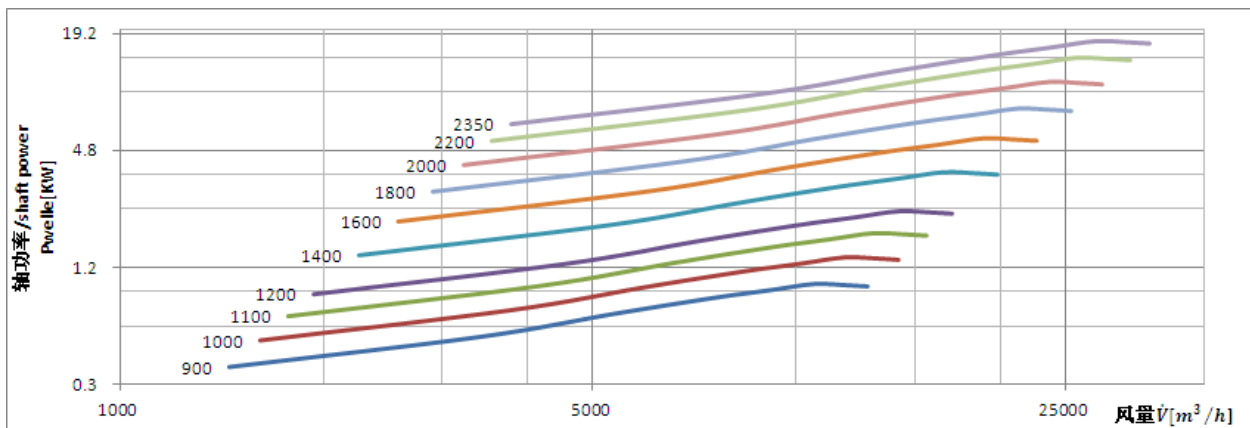
全压 / tot. pressure

P_{tot} [Pa]



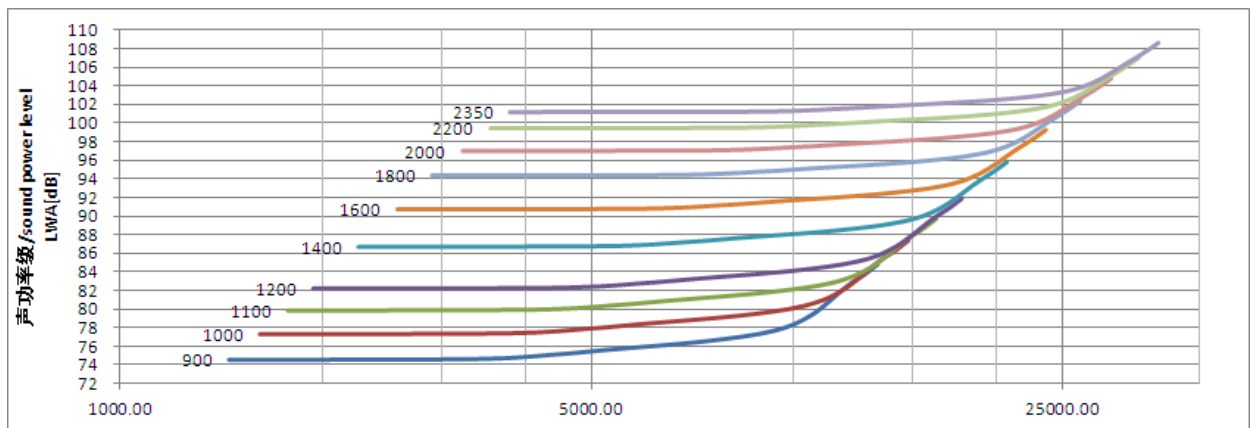
轴功率 / shaft power

P_{Welle} [kW]



声功率级 / sound power level

L_{WA6} [dB]



最高转速 / max. speed

2350 $1/min$

消防型最高转速 / max. speed ex

1750 $1/min$

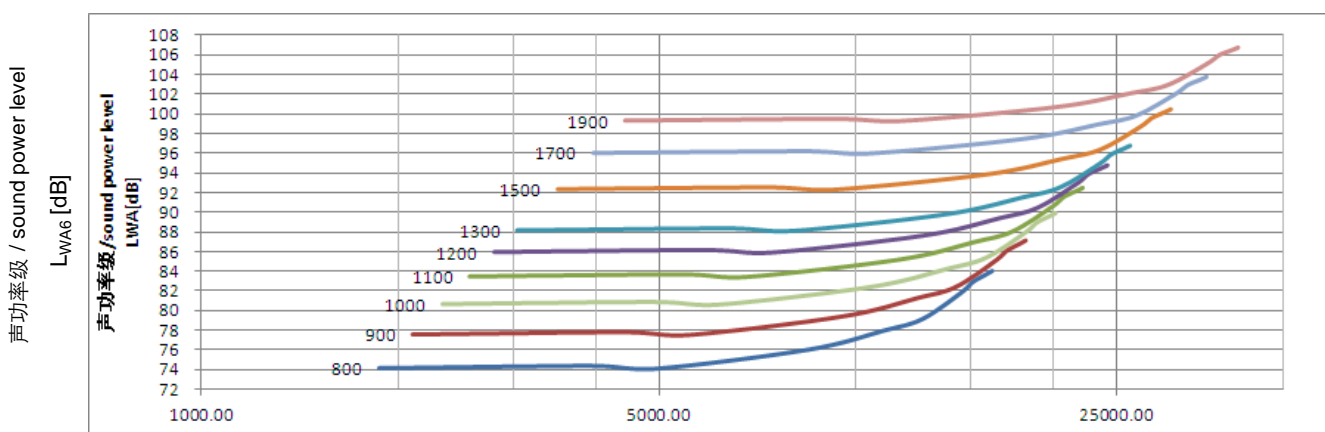
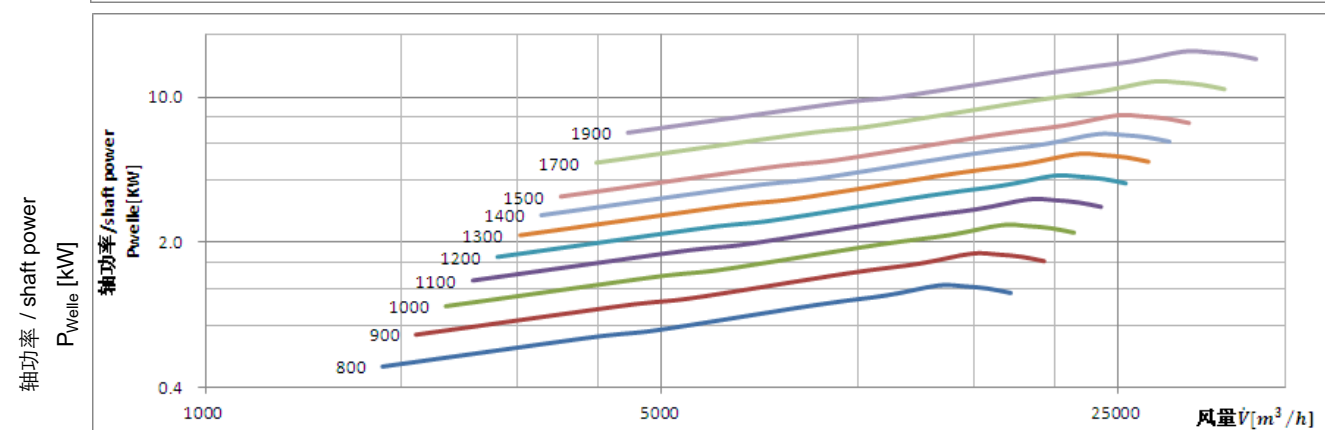
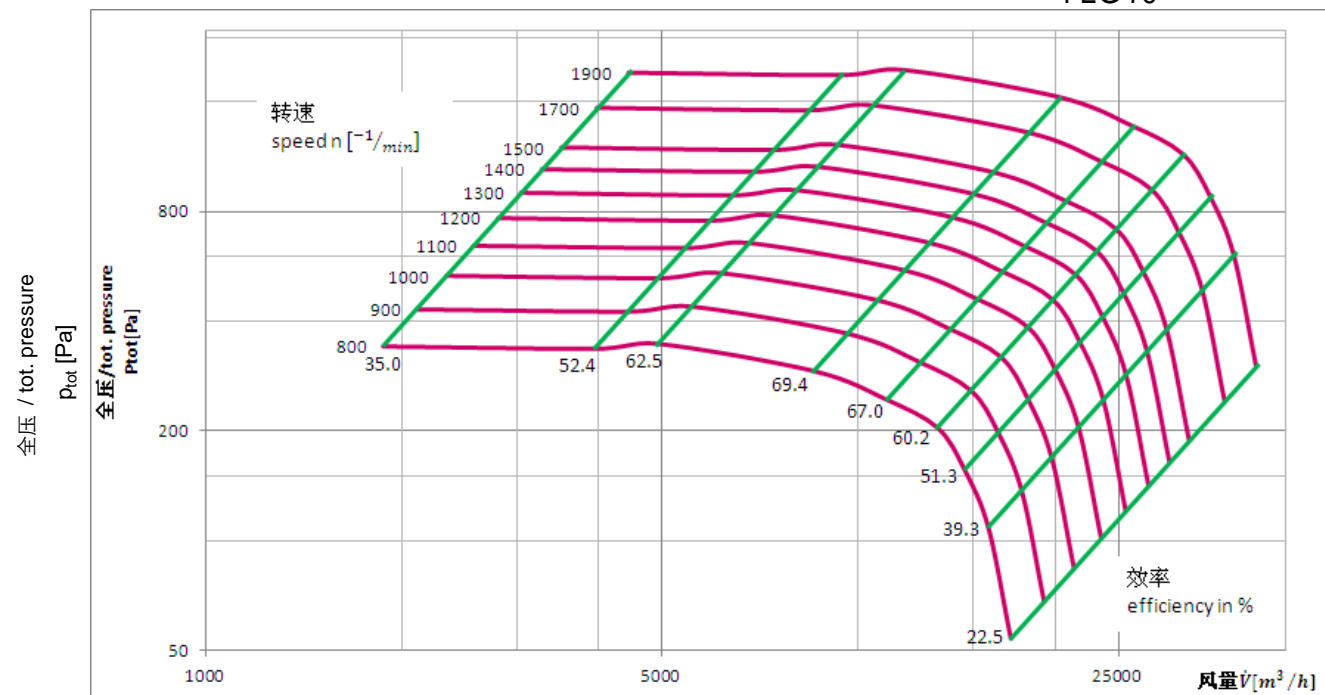
Performance certified for installation type B - free inlet, ducted outlet. Power rating (kW) does not include transmission losses.

Performance ratings do not include the effects of appurtenances (accessories).

The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.

Values shown are for inlet L_{wiA} sound power levels for installation type B - free inlet, ducted outlet.

FEG 75



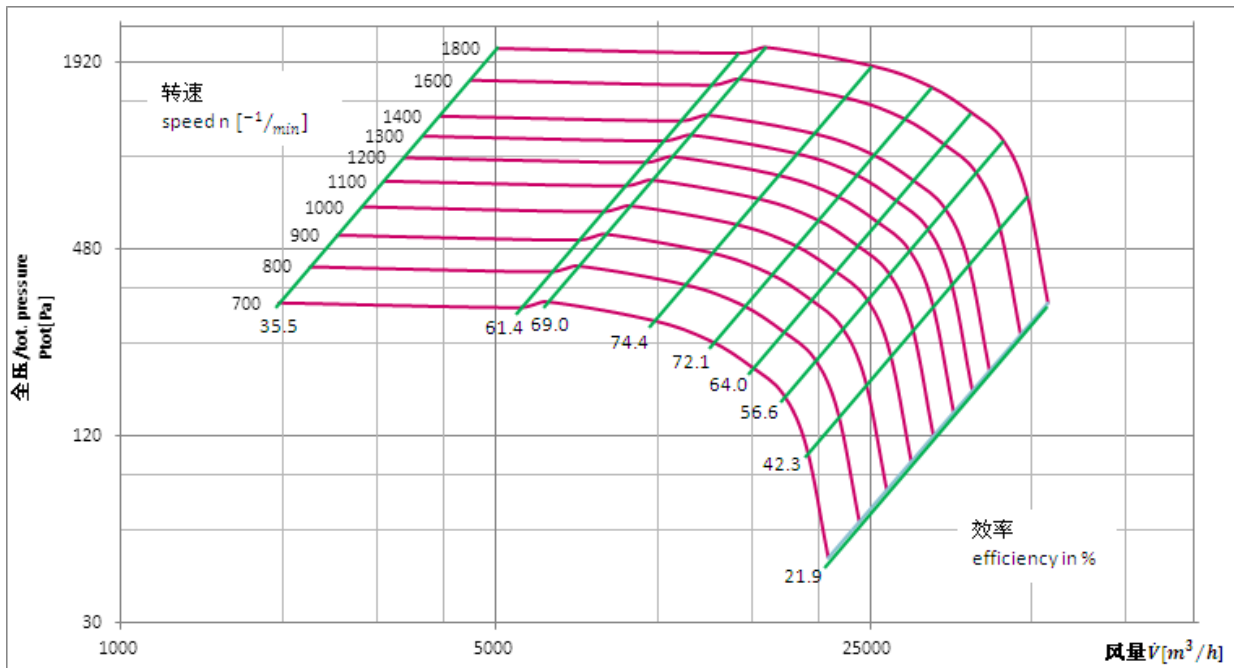
最高转速 / max. speed
消防型最高转速 / max. speed ex

1900 $1/min$
1450 $1/min$

Performance certified for installation type B - free inlet, ducted outlet. Power rating (kW) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).
The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.
Values shown are for inlet L_{WA} sound power levels for installation type B - free inlet, ducted outlet.

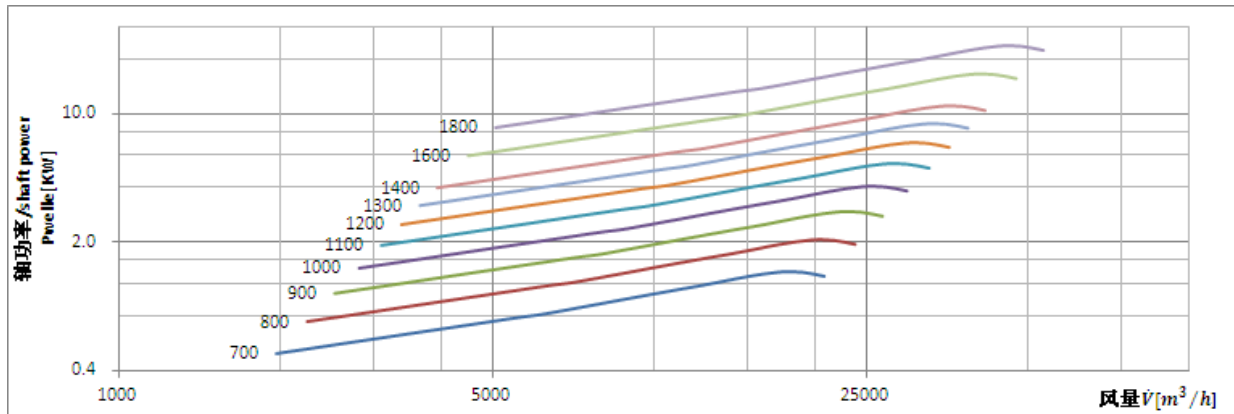
全压 / tot. pressure

P_{tot} [Pa]



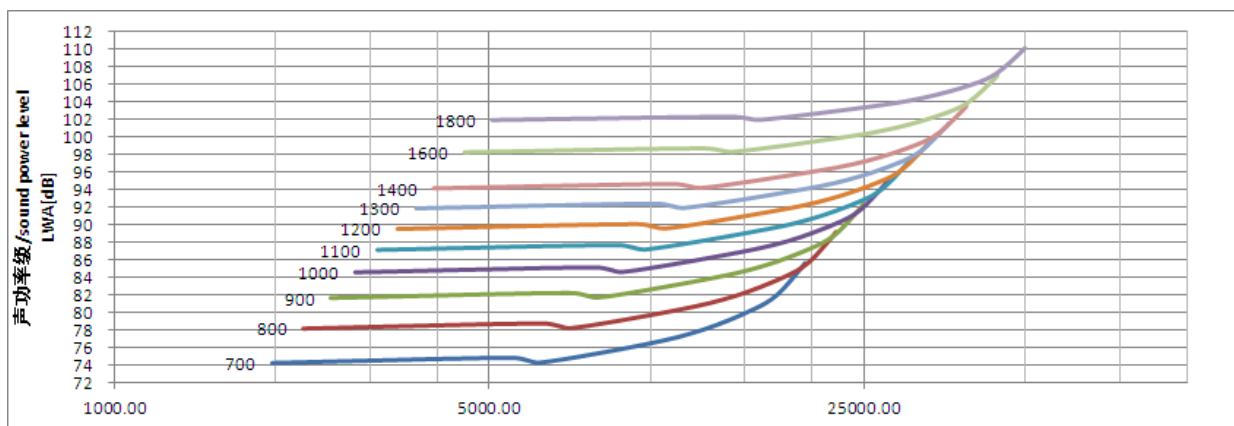
轴功率 / shaft power

P_{welle} [kW]



声功率级 / sound power level

L_{WA6} [dB]



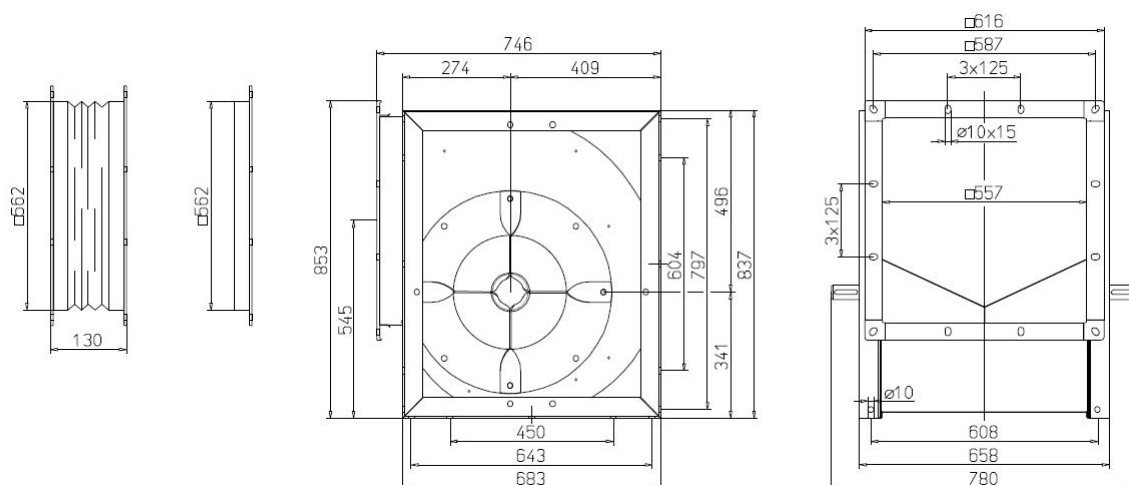
最高转速 / max. speed

1800 $1/min$

消防型最高转速 / max. speed ex

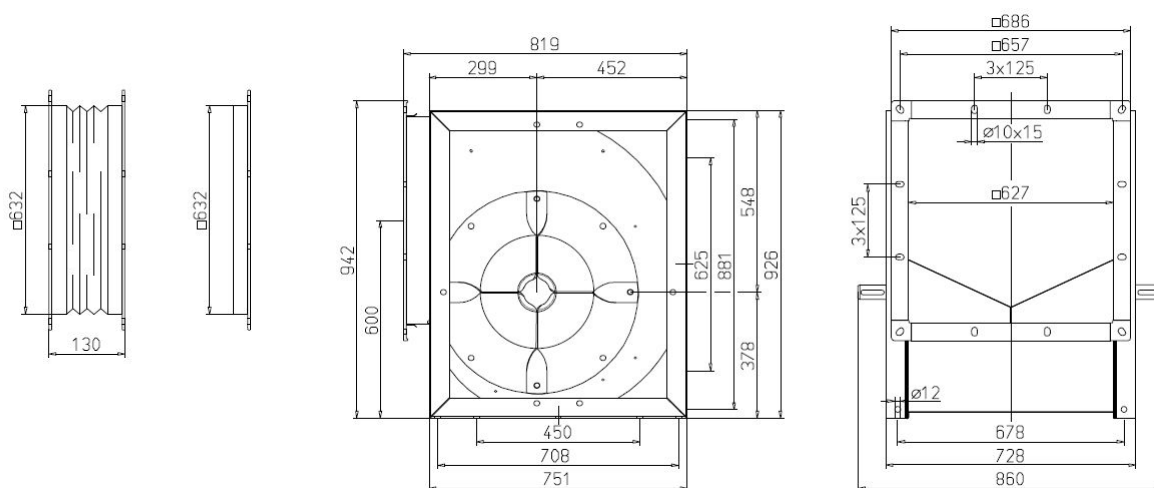
1350 $1/min$

Performance certified is for installation type B - free inlet, ducted outlet. Power rating (kW) does not include transmission losses.
Performance ratings do not include the effects of appurtenances (accessories).
The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.
Values shown are for inlet L_{WA} sound power levels for installation type B - free inlet, ducted outlet.



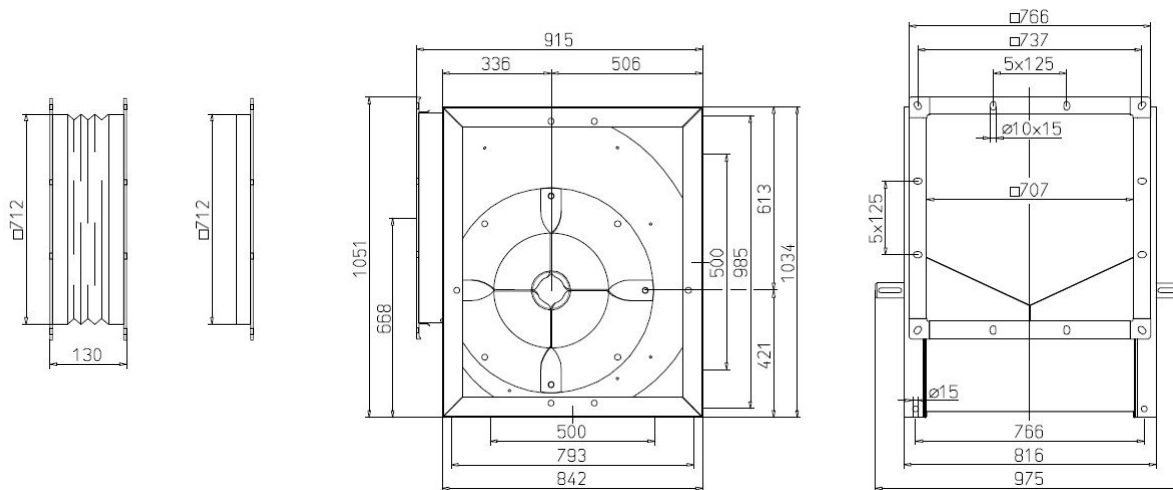
Total weight HRZ 450
 HRZ 450总重量

66 kg



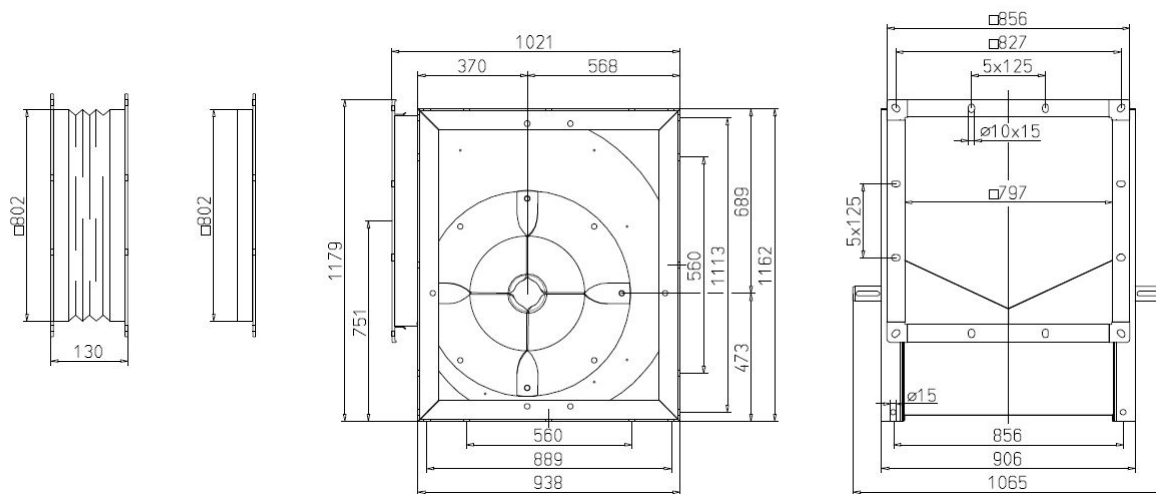
Total weight HRZ 500
HRZ 500总重量

84 kg



Total weight HRZ 560
HRZ 560总重量

106 kg



Total weight HRZ 630
 HRZ 630总重量

133 kg

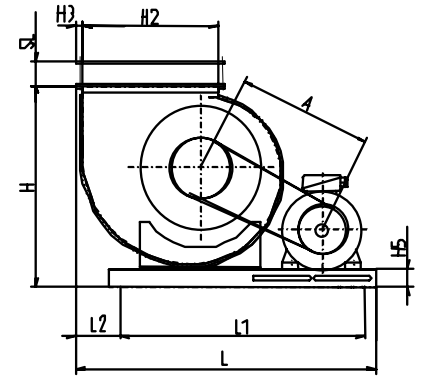
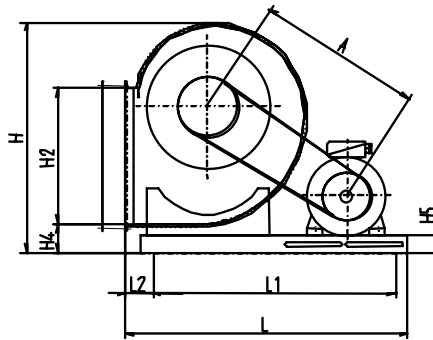
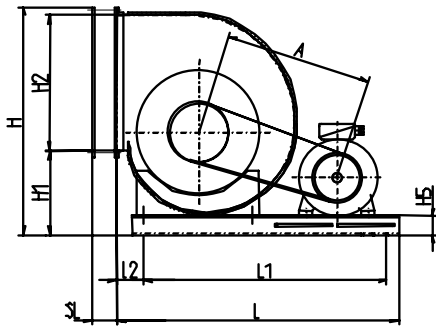
电机滑轨结构，电机尺寸从 450至630

Construction with motor slide size 450 – 630

gezeichnet LG 90 RD 90 spiegelbildlich

RD 270 (LG 270)

RD 0 (LG 0)

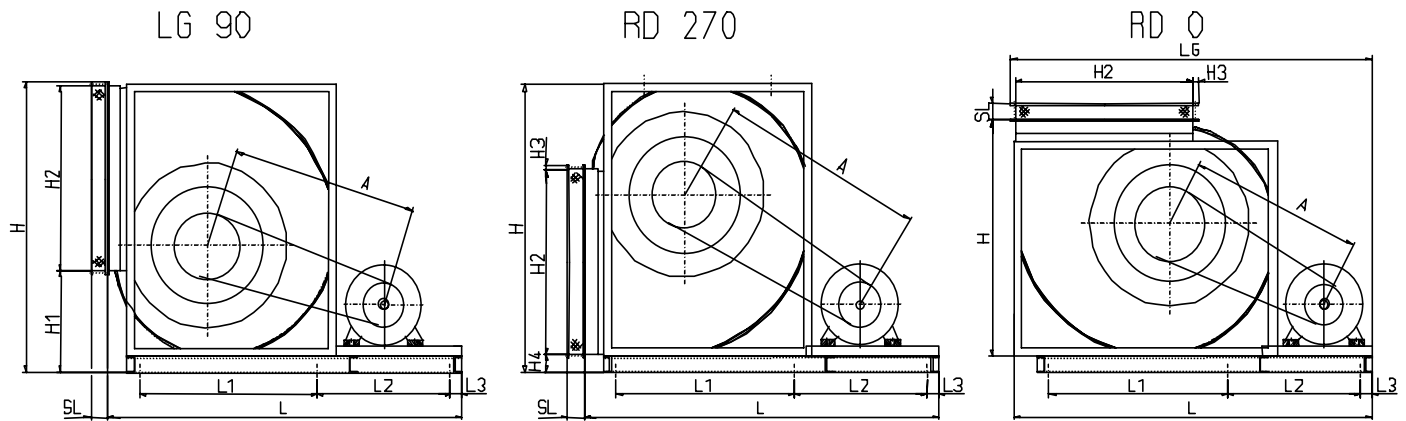


蜗壳方向 direction of scroll	H	H1	H2	H3	H4	H5	L	L1	L2	SL	A _{min} ①	电机尺寸 Motor size
450	LG 90	934	346	560	28	75	1162	1040	92	130	601	100 - 160
	RD 270	948		560	28	118	1162	1040	92	130	679	
	RD 0	827		560	28	75	1238	1040	168	130	562	
500	LG 90	1026	368	630	28	75	1192	1040	122	130	639	100 - 160
	RD 270	1030		630	28	115	1192	1040	122	130	705	
	RD 0	900		630	28	75	1291	1040	221	130	580	
560	LG 90	1130	392	710	28	75	1294	1140	124	130	724	112 - 180
	RD 270	1140		710	28	114	1294	1140	124	130	781	
	RD 0	994		710	28	75	1346	1140	176	130	638	
630	LG 90	1254	426	800	28	75	1533	1450	33	130	868	132 - 180
	RD 270	1237		800	28	86	1533	1450	33	130	963	
	RD 0	1096		800	28	75	1687	1450	205	130	820	

① A_{min} 最小中心距 / center distance minimum

带焊接底座结构, 尺寸630

Construction with welded base frame size 630



蜗壳方向 direction of scroll		H	H1	H2	H3	H4	H5	L	L1	L2	L3	LG	SL	A _{min} ①	电机尺寸 Motor size
630	LG 90	1259	431	800	28		80	1552	1350		75		130	820	112 – 225
	RD 270	1259		800	28	63	80	1552	1350		75		130	900	
	RD 0	1101		800	28		80	1701	1350		75	1718	130	760	

① A_{min} 最小中心距 / center distance minimum

Total dimension front view 所有尺寸前视图

Anschlussmaß für Ausführung mit:
Motorschlitten (450 – 630)
geschweißtem Grundrahmen (630)

Connection dimensions for fan types with:
motor slide (450 – 630)
welded base frame (630)

	450	500	560	630		
HRZ	608	678	766	856		

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Ozan Bağcılar Is Merkezi
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Abha Street - IInd Industrial City
SJ-Al-Khobar-31952
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Fax. 009/66 3 895 5025

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