Elektror

HRD

高压离心式鼓风机

High pressure blowers

目录
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Elektror 高压离心式鼓风机具有以下特点：

- 合理的性能分布
- 配备有三相或单相电机
- 高性能紧凑设计
- 超长的使用寿命和低运行成本
- 超高的工作效率
- 较低的噪音
- 坚固的铸造部件
- 多种调速方式
- 多种附件可供选择

Elektror high pressure blowers offer:

- Logical performance graduation
- Ready-to-install design with three-phase or single-phase AC motors
- High performance in a compact design
- Long service life with low operation cost
- High efficiency
- Favourable noise characteristics
- Robust casings
- Variable speed control versions
- Useful accessories

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依莱克罗高压离心式鼓风机在广泛的应用领域拥有出色表现

- 物料输送
- 吸收气体或蒸汽
- 装置内部冷却散热
- 持续稳定的通风系统
- 真空站
- 天然气，燃油和煤炭燃烧时供气设备
- 干燥装置供气
- 气浮台面供气

Our high pressure blowers are suitable for a wide range of applications:

- Conveying medium air volumes at high system resistances
- Extraction of gases and vapours
- Cooling of apparatus and machine components
- Ventilation of systems with higher resistances
- Generation of vacuum
- Air supply for gas, oil and coal-fired systems
- Air supply of drying installations
- Air supply of air cushion tables

1. 技术信息/Technical information

1.1 设计

依莱克罗高压离心式鼓风机的设计源于中压离心式鼓风机。

是由非常坚固可靠的皮带传动装置或者通过变频器驱动提高风机的转速，从而获得更大的气体体积流量和更高的气体压力。

本公司自行开发的高性能鼠笼式异步电机为如此高性能的鼓风机提供可靠保障。

外观非常漂亮的铸铝外壳和优良的动平衡性能的铝合金或钢材料叶轮保证了高压鼓风机正常运转和达到设计要求，同时降低了噪音。

所有驱动电机依照标准EN60034-1(VDE 0539-第1部分要求采用防护等级IP54，标准配置的频率为50Hz，电压为230/400V，按照IEC38要求400V 三角形接法。同时也提供频率为60Hz，电压为277/480V，按照IEC要求400V三角形接法。电机电压允许有10%的上下波动。

调速风机

此型号的鼓风机可以根据应用工艺需要或者配套工程需要任意调节风量和风压，并且可以按照工艺要求保持所需要的压力流量。

优点：

- 通过调整压力流量优化工作状态，可以降低能耗节省费用。
- 也可以使鼓风机工作状态更加平稳，从而延长使用寿命。
- 较低的噪音和较低的温升。

1.1 Design

The constructive design of Elektror high pressure blowers has been derived from the design of the medium pressure blowers.

The substantially higher pressure and volume ratings result from the appropriately higher rotation speeds, which are achieved by a rugged and reliable V-belt drive or by direct drive in combination with a frequency converter.

Amply rated squirrel-cage motors of the company´s own make are especially adapted to the blower requirements and guarantee optimum performance conditions.

The attractively designed cast aluminium housings complying with the flow requirements as well as balanced impellers made from sheet aluminium and steel ensure vibration-free operation at low noise levels.

All drive motors are manufactured in conformity with IP 54 and comply with EN 60034-1 (VDE 0539-Part 1). The standard version of the motor is designed for 50 Hz mains frequency and voltages of 230/400 V Δ/Y at 400 V Δ in conformity with IEC 38. Motors are supplied at 60 Hz mains frequency for voltages of 277/480 Δ/Y and 400 V Δ in conformity with IEC 38. Motors, which are designed for the standard voltage, are suitable for a voltage tolerance of ± 10% in continuous operation.

Speed-control blowers

This type of device is used wherever different volume flows or pressures are required for process air or process engineering reasons, or where these parameters have to be kept constant.

Advantages:

- Energy and cost savings through optimised applications
- The devices are operated more gently, resulting in longer service life
- No unnecessary noise and heat generation

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全部高压鼓风机型号都有对应的变频驱动型号（变频调速）。为此，变频驱动电机都安装了PTC温度传感器用于提高绕组绝缘保护。

理论上直连电机是最理想的。最大允许频率按照风机型号和速比要求从95Hz到135Hz。

皮带传动型高压风机电机频率不能大于电机额定频率，如50Hz电机则不能大于50Hz，60Hz电机不能大于60Hz。后面技术参数内容会详细介绍。

变频器可以安装在电控箱里，此系列风机被称为FU系列。另外，功率小于7.5kW的高压风机还可以配备直接安装在电机上的变频器，此系列风机为FUK系列，以上全部变频器都是以EMV限制条件等级B为标准（限定为工业应用）。

All high-pressure blowers can be configured for frequency converter operation (speed control). To this end, the motors are equipped with PTC sensors and improved winding insulation.

Ideally the directly-driven versions are best. The maximum permitted frequencies are between 95 Hz and 135 Hz according to type and correspond with the maximum transmission ratios.

The speed range in the case of belt-operated transmission units must not exceed 50 Hz for 50 Hz versions and 60 Hz for 60 Hz versions. The technical data are identical to the standard version.

For offset frequency converter operation (device series FU), the converter is designed for control cabinet installation. Alternatively, the compact frequency converter (up to 7.5 kW) can be installed directly at the motor (FUK series). Both frequency converter variants are available for EMV limit value class B as standard (limit values for industrial application).

1.2 性能介绍

鼓风机是一种输送空气或者其他气体的流量发生设备。离心式鼓风机输送气体的方式是：通过叶轮的转动，气体从轴向吸入，沿着放射状叶片加速，最后沿叶轮切线方向排出，从而产生气流。鼓风机产生的压力要克服安装在排气口的附件（比如连接接头，管道，过滤器和其他附件）产生的阻力。当气体流量增加，则产生的压力会下降，鼓风机的性能参数设计，尺寸，性能曲线等技术数据在后面会有详细的阐述。

鼓风机输送气体的压力（系统阻力）的改变与气体流量的改变是平方的关系。

- 如果流量增加一倍，压力将提升到原来的4倍。
  其结果导致性能曲线为抛物线式的特性曲线。
- 鼓风机工作点取决于两条曲线的交叉点。
- 一般来说，系统压力不需要复杂的计算，
  可以通过实验或者经验。随着系统压力的上升，流量和消耗的功率会随之下降。

风机最大流量通常在风机静压曲线和流量曲线的交叉点上。（如图1所示）

1.2 Performance

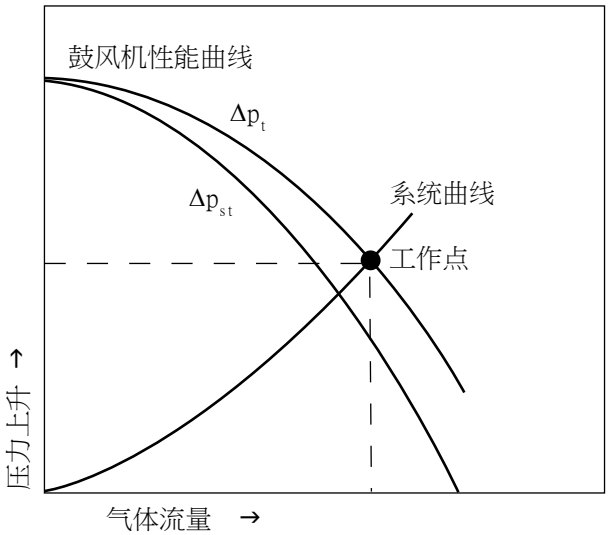
Blowers are flow-generating appliances for the convey-ance of air and other gases. In radial blowers the conveyed medium is drawn axially, accelerated radially through the rotation of the impeller and expelled tangentially. The resistance to the discharged air (by ducts, pipes, filters, parts of the installed system) must be overcome by the excess pressure generated by the blower. With increasing flow volume the ability of the blower to generate pressure is decreased. The performance behaviour depends on the blower design and size and is presented as characteristic curves of pressure difference and volumetric flow rate (blower characteristics).

The resistances of air conveying systems (system resistances) change (in most cases) quadratically with the change of volumetric flow, i.e.:

- If the volumetric flow rate shall be doubled, four times the installation resistance must be overcome. The resultant characteristics are termed resistance parabolas or system characteristics.
- The operating point of the blower is determined by the intersection point of the two curves.
- Insofar as the installation resistance cannot be computed without difficulty, recourse to experiments or experience is suggested. At a growing system resistance the flow volume of the blowers and the power consumption decrease.

The maximum volumetric flow of a blower occurs at the intersection of the static pressure difference curve Δp_t and the volume flow coordinate (cf. Fig. 1).

图1：鼓风机的工作点



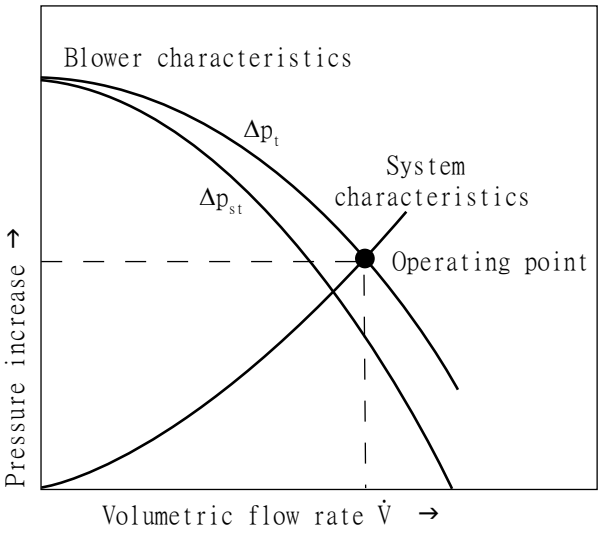
1.3 噪音指标

鼓风机工作中产生噪音是风机叶轮与外壳之间的气旋造成的，噪音的大小取决于如下几点：

a) 鼓风机的设计
（轴流风机，离心风机，叶轮的安装原理）
b) 与鼓风机大小相关的风量和风压
c) 鼓风机的工作点，在鼓风机的性能曲线上面的一个点
d) 依莱克罗高压鼓风机的叶轮旋转速度可以通过调速装置调节。

鼓风机的噪音并不是一成不变的，而是随着压力流量变化而变化的。由于鼓风机的外壳和叶轮都是依照流体力学的原理设计的，所以噪音主要来源于气体的流动和压力差，以及鼓风机的尺寸大小。所以选择合适的风机型号，在特定的流量和压力下噪音可以降到最低。现在通常用dB(A)“分贝”来表示噪音值，字母A在这里指的是测试者对于音频强度的主管感知而对声压水平的评价值的标准。高频噪音往往比低频噪音更令人厌恶。如果相同强度的噪音由来自不同方向的噪音源同时发出并且融合在一起则噪音值会叠加，比如两台相同型号的鼓风机同时启动，则噪音值会增加3分贝。同时启动3台鼓风机则噪音增加5分贝，同时启动4台鼓风机则噪音增加6分贝，同时启动5台鼓风机噪音增加7分贝。通常情况下增加或减少10分贝的噪音，人听起来就好像声音增加了一倍或减少了一倍。距离也是噪音大小的影响因素，距离延长一倍则噪音值降低到原来的一半。

Figure 1: Operating point of the blower



1.3 Noise generation

The noise generated by a blower ensues from flow processes and vortices inside the impeller and the housing and is determinded by:

a) the blower design (axial blower, radial blower, construction principle of the impeller).
b) the blower size in relation to the specified pressure differences and volumetric flow rates.
c) the operating point of the blower, i.e. in which section of the characteristic curve the blower operates.,
d) the rotational speed which can be reduced by the variable speed control for the Elektror high pressure blowers.

The noise emissions are not constant over the whole performance range. Blower housing and impeller are designed in conformity with flow-technical requirements and thus the noise generation depends mainly on the requirements for flow volume and pressure difference as well as on the correct selection of the blower. As a measure for noise and sound pressure level the unit dB (A) is used. The letter »A« in the unit refers to the standardised frequency evaluation of the sound pressure level that takes the strong frequency dependence of the subjective perception of the noise level into consideration: High frequencies are perceived as more unpleasant than low frequencies. If several noise sources emitting the same noise level are evaluated together, the noise pressure level increased, e.g. by 3 dB (A) in the case of two blowers, by 5 dB (A) for three blowers, by 6 dB (A) for four blowers and by 7 dB (A) for five blowers. And finally, a change of 10 dB (A) corresponds to double or half the noise perception. With increasing distance to the noise source the emitted noise becomes weaker, doubling the distance can reduce the noise level up to 5 dB (A).

1.4 性能曲线

性能曲线图中显示的鼓风机压力流量曲线包括全压差ΔPt和静压差ΔPst曲线，其中某些部分的压力要比性能参数表中的最大值还要高一些。所有技术参数都是根据标准EN ISO5801的要求，在标准空气密度1.2kg/cm2的条件下，在鼓风机的排气口安装流量调节阀的情况下实测出来的。鼓风机的噪音LA是在距离鼓风机1米远的地方，在鼓风机排气口安装了排气管道的情况下实测得出的。
所有偏差范围都是按照标准DIN24166精度等级3的要求。

1.4 Performance curves

The characteristics shown of the total pressure Δp_t and of the static pressure Δp_{st} as a function of the volumetric flow rate V were determined in measurements and some are higher than the ratings shown in the technical tables. All measurements took place in tubular test as sembly in compliance with EN ISO 5801 with a throttle at the pressure side and apply for an air density of 1.2 kg/m³. The noise pressure levels L_A were measured in the tubular test assembly with the blowers connected at the pressure side and at a spacing of 1 m from the intake port. Limit deviation according to DIN 24166 Accuracy class 3.

1.5 性能曲线

工作点压力差的判断和应用

当根据计算或者凭经验得出所需要的工作点压力差的时候，要考虑工作点压力差是全压差ΔPt还是静压差ΔPst。如果鼓风机排气口连接管道与鼓风机排气口的横截面积相同或者排气口比较畅通的时候，鼓风机的部分压差则转化为动压差ΔPd而损失掉。全压差减去动压差剩余的部分为我们所需要的静压差。如果连接管道的截面积是逐渐增加的（喇叭口形状），则气体流速会继续下降而动压也全部转化为静压差，则压力在相同流量下可能会超过系统阻力，那么选型时可以考虑选择一台小一点的鼓风机（如图2 中所示）。喇叭口的影响取决于气流的扩散角度，相比排气口进气口安装喇叭口的影响要小到可以忽略不计。

1.5 Performance curves

Usable pressure difference

Once the necessary pressure difference has been de-ter-mined by computation or experiments, the amount must be checked of the total pressure increase of the blower which may be used as static pressure difference. If the duct connected at the pressure side features the same cross-section as the blower discharge port or if the blower discharges unimpeded, the dynamic pressure com-ponent p_{d2} must be considered loss. The remaining com-ponent of the total pressure increase is available as usable static pressure difference Δp_{st}. If the duct cross-section is increased gradually (diffusor), the flow is decreased and the dynamic pressure is converted to static pressure. The pressure may be included to overcome the system resistances or, with the same volumetric flow rate, a smaller blower may be used (cf. characteristic blower 2, Fig.2). The effect of the diffusor depends on the angle of flow spread. Pressure recovery at the intake port by means of the diffusor effect are small an may be neglected.

图2 ：压力恢复

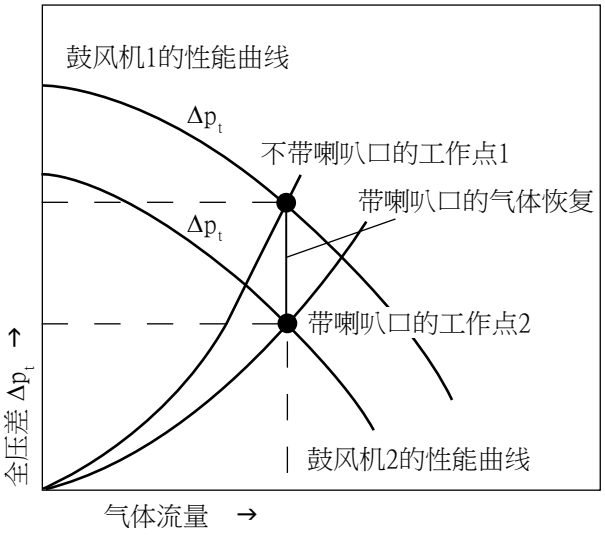
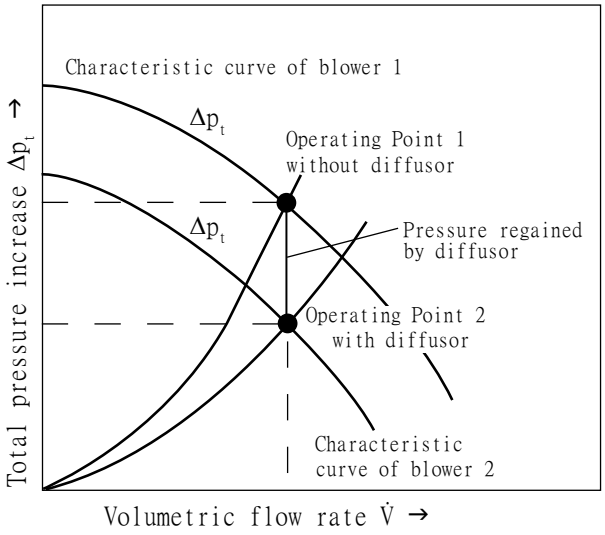


Figure 2: Pressure recovery



气体密度的影响

鼓风机选型的时候的主要参数包括全压差，动压差，静压差以及鼓风机的功率大小（如图3）。气体密度随温度变化的计算公式如下：

$$\rho_2 = \rho_1 \frac{273 + \vartheta_1}{273 + \vartheta_2}$$

ϑ = 介质气体温度℃
ρ = 气体密度

Influence of the density

Total pressure increase, dynamic pressure, static pres sure and power requirement of the blower change proportio-nally to the pressure of the conveyed medium and must be taken into consideration on selecting the blower (Fig. 3). Density changes through temperature influences may be calculated as follows:

$$\rho_2 = \rho_1 \frac{273 + \vartheta_1}{273 + \vartheta_2}$$

ϑ = temperature of conveyed medium [° C]
ρ = air density [kg/m³]

图3：介质气体密度的影响

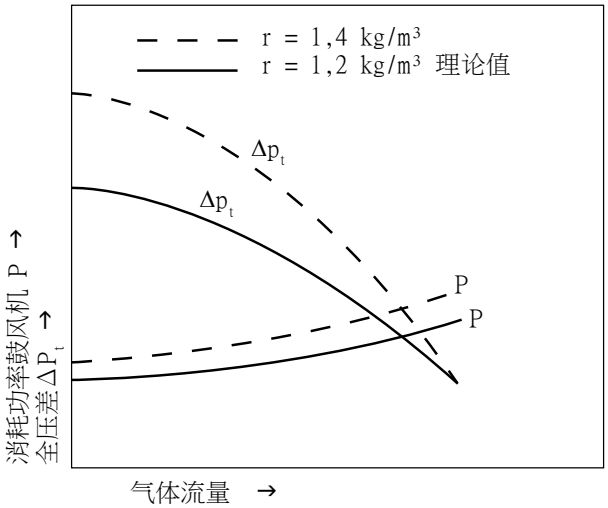
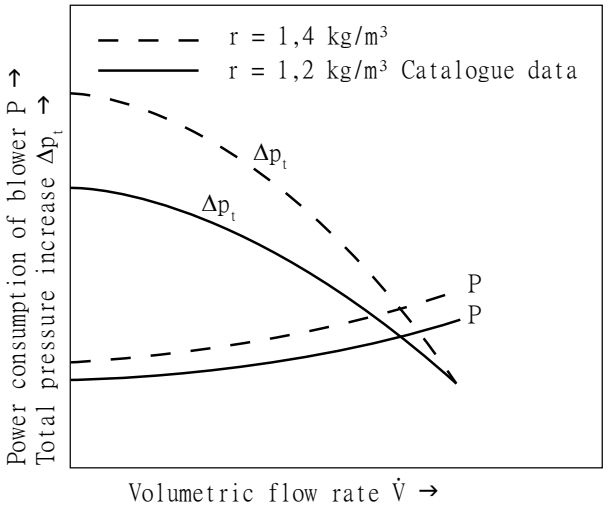


Figure 3: Influence of conveyed medium density



1.6 设计

V-皮带驱动鼓风机

本品适用于所需要的压力流量不变的情况下，或工作条件变化很小的情况下使用。

调速式鼓风机

本品适合任何需要调节流量压力的应用条件

FU 型号

全部标准型号的鼓风机适用变频器驱动，电机配备PTC热传感器和自动切断装置用来防止电机过载。 50Hz电机只适用于0到50Hz频率范围可调，60Hz电机只适用于0到60Hz频率范围可调。

1.6 Designs

V-belt driven blowers

The use is recommended in all cases where unchangeable operating conditions prevail or the pressure relationships change only slightly and thus uniform volumetric flow rates are desired.

Speed controlled blowers

They are to be used wherever for process-inherent reasons the change of volumetric flow is needed.

Model range FU

All standard blowers are also as frequency converter suitable version available. These motors are equiped with PTC thermistor sensors for trip decvice and with a reinforced barrier. The speed range can be adjusted via the frequency - for 50 Hz versions the speed range is 0-50 Hz and for 60 Hz versions it is 0-60 Hz. The speed range must not exceed 50 Hz for the 50 Hz version or 60 Hz for the 60 Hz version.

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技术信息
TECHNICAL INFORMATION

特种风机
根据用户的特殊要求，在标准系列鼓风机的基础上配备特殊的附件，使之能够满足特殊应用的特殊工艺要求。

Special blowers
In special cases of application standard designs may be matched to the given requirements by special accessories, whereby customer-specific problem solutions are possible.

输送介质及环境温度
电机允许的环境温度范围是-20℃至+60℃，其热防护等级均为F级，符合EN60034-1(VDE 0530 第1部分)要求。

如果使用更好的隔热材料，电机允许的最高温度可以超过60℃。但此种情况需要向生产商确认。

Temperature of conveyed media and environment
The admissible ambient temperature (cooling air temperature) of the drive motors is -20° C to +60° C. The motors invariably comply with thermal class F in accordance with EN 60034-1 (VDE 0530 Part 1).
The admissible ambient temperature may be increased over 60° C by using suitable insulating materials. In such cases the manufacturer must always be consulted.

-20℃ 到 +60 ℃,
50或60Hz标准电机，电压范围为+/-10%

-20° C to +60° C
standard devices with a nominal voltage (max ±10% voltage tolerance) and a nominal frequency of 50 Hz or 60 Hz.

-20℃ 到 +60℃,
宽频宽电压电机（50/60Hz），FU/FUK变频电机，防爆电机以及UL电机。

-20° C to +40° C
special motors with multivoltage range (50 Hz and/or 60 Hz) of the FU/FUK-series, with EX motor, UL approval.

允许的介质气体温度范围是 -20℃ 到 +80℃

The permitted flow media temperature for the standard-version is -20° C to +80° C.

输送介质气体温度
如果在电机和鼓风机之间加装隔热但愿，允许的最高介质气体温度可以达到180℃。如果输送的介质气体温度超过180℃则需要与供应商联系确认解决方案。

Temperature of conveyed media
Temperatures of the conveyed medium up to 180° C may be achieved by fitting a temperature barrier between blower and motor. Temperature barriers over 180° C conveying medium temperatures can be supplied on request.

绝缘等级
所有电机的绝缘等级都可以根据要求达到IP55，并且可以做防水防隔热处理。鼓风机的轴套部位可以加装PTFE密封垫片达到密封的效果，或者加装带弹性的密封圈或密封环来提高气密性。

Insulation
All motors can be supplied for the more stringent protection category IP 55 as well as well as with tropical and moisture protection insulation. If the ventilators shall be extensively insulated, a PTFE radial shaft gasket can be fitted at the shaft bushing. Further insulation possibilities are given by means of flat gaskets and permanently elastic sealers.

防腐蚀
铝合金外壳和叶轮作为鼓风机的主要材料本身就具有一定的防腐蚀能力。如果需要满足特殊用途，我们可以在叶轮和外壳表面喷漆或喷塑处理，或者采用1.4301不锈钢材质的叶轮或电机轴等。

Protection against corrosion
By choosing cast aluminium as manufacturing material the standard blowers are substantially resistant to corrosion. For special applications the blowers may be appropriately varnished or be coated with plastic. Aversion of the impellers made from material 1.4301 can be supplied.

Ⓔx 防爆风机
多种型号的鼓风机可以满足防爆标准EN EX 94/9（ATEX）标准要求。依莱克罗防爆风机可以应用于Zone1，2和Zone22（根据EN 1127-1）。温度等级可以是T3或更高（T2，T1）。也可以在某些应用中提供T4等级的防

Ⓔx Explosion-proof variants
Numerous fans of the series listed in this catalogue are also available in explosion-proof variants according to EU EX directive 94/9/EU (ATEX). Elektror ATEX blowers are suitable for use in potentially explosive zones 1, 2 and 22 (according

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爆风机。

如需要了解更多依莱克罗ATEX风机的信息请在依莱克罗公司网站上下载ATEX风机的样本和说明书。

to EN 1127-1) and as standard can be supplied in temperature class T3 or higher (T2 or T1). Applications in temperature class T4 are possible in certain cases upon request.
For further information and product details of our ATEX fans, please refer to our ATEX catalogues or our website at www.elektror.com.

风机转速

标准型号的鼓风机采用2-Pole电机，当电机转速改变时，鼓风机的全压差，气体流量和消耗功率都会相应的改变。

$$\dot{V}_2 = \dot{V}_1 \frac{n_2}{n_1}$$

$$\Delta p_{t2} = \Delta p_{t1}\left(\frac{n_2}{n_1}\right)^2$$

$$n_2 = n_1 \frac{\dot{V}_2}{\dot{V}_1}$$

$$P_2 = P_1\left(\frac{n_2}{n_1}\right)^3$$

$\dot{V}$ – 体积流量
Δp_t – 全压差
n – 转/分钟
P – 消耗功率
f – 频率

Blower speeds

The standard blowers are equipped with 2-pole motors. When the blower speed changes, the total pressure, volumetric flow rate and power consumption change as follows:

$$\dot{V}_2 = \dot{V}_1 \frac{n_2}{n_1}$$

$$\Delta p_{t2} = \Delta p_{t1}\left(\frac{n_2}{n_1}\right)^2$$

$$n_2 = n_1 \frac{\dot{V}_2}{\dot{V}_1}$$

$$P_2 = P_1\left(\frac{n_2}{n_1}\right)^3$$

$\dot{V}$ – Volumetric flow rate
Δp_t – Total pressure increase
n – RPM
P – Power consumption
f – Frequency

电压和频率

遵照IEC 38的要求，频率为50Hz的标准三相电机 电压是230/400Δ/Y和400Δ。同样频率为60Hz的电机也遵照IEC38的要求。

标准电机电压允许有+/-10%的波动。

我们可以提供特殊电压特殊频率的电机，3相电机最高电压为690V。电机频率的改变会导致鼓风机风量，全压差以及消耗功率的改变。具体变化见下面公式

$$n_2 = n_1 \frac{f_2}{f_1}$$

$$\Delta p_{t2} = \Delta p_{t1}\left(\frac{f_2}{f_1}\right)^2$$

$$\dot{V}_2 = \dot{V}_1 \frac{f_2}{f_1}$$

$$P_2 = P_1\left(\frac{f_2}{f_1}\right)^3$$

$\dot{V}$ – 气体流量
Δp_t – 全压差
n – 转/每分钟
P – 消耗功率
f – 频率

高压离心式鼓风机系列中60Hz皮带传动的鼓风机皮带轮的转速比经过调整，最终风机转速与50Hz皮带传动的型号相同。

Voltages and frequencies

In the standard versions the motors are designed for 50 Hz mains frequency and voltages of 230/400 V Δ/Y and 400 V Δ at three-phase current in conformity with IEC 38. Motors for 60 Hz mains frequency are likewise designed in compliance with IEC 38.

Motors that are designed for standard power, are appropriate for a voltage tolerance ± 10% in continuous operation.

Special voltages and frequencies are available on request. On three-phase supply the maximum admissible voltage is 690 V. On changing the mains frequency the rotation speed of the impeller is changed an thus the total pressure increase, the volumetric flow rate and the power requirement of a blower as follows:

$$n_2 = n_1 \frac{f_2}{f_1}$$

$$\Delta p_{t2} = \Delta p_{t1}\left(\frac{f_2}{f_1}\right)^2$$

$$\dot{V}_2 = \dot{V}_1 \frac{f_2}{f_1}$$

$$P_2 = P_1\left(\frac{f_2}{f_1}\right)^3$$

$\dot{V}$ – Volumetric flow rate
Δp_t – Total pressure increase
n – RPM
P – Power consumption
f – Frequency

In high pressure blowers with 60 Hz motors the transmission ratio of the V-belt drive has been so chosen that the blower characteristic curve corresponds to those for 50 Hz.

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1.7 节能高效离心式鼓风机

依莱克罗高压离心式鼓风机配备高效节能电机IE2/IE3/NEMA电机（根据不同国家实施的能效标准），符合IEC 60034-30 标准规定。

高压离心式鼓风机配备IE2/IE3/NEMA电机

- 更高的工作效率
- 降低使用成本
- 延长使用寿命
- 减少热量的产生
- 保护环境

除了使用高效电机之外，用户还可以通过其他方式进一步降低风机能耗。可能的方式有：

- 安装和使用条件的改善
- 选择正确的鼓风机型号
- 选择合适的附件
- 使用变频器调节高压离心式鼓风机（使用变频器驱动非变频驱动风机）

我们的客户服务部门可以为广大用户提供进一步降低能耗节约使用成本的方案和建议。详情请联系我们的客户服务部门或发邮件至support@elektror.com.

本产品样本中的能效标志

本产品样本中列举的电机能效等级如下：

标识	频率	能效等级	使用地点
IE2	50 Hz	IE2标准适用于 < 7,5 kW	欧洲
IE3	50 Hz	IE3标准适用于 ≥ 7,5 kW	欧洲
IE2	60 Hz	IE2标准适用于 < 7,5 kW	韩国，台湾
IE3	60 Hz	IE3标准适用于 ≥ 7,5 kW	韩国，台湾
NEMA	60 Hz	NEMA 标准是用户	美国 加拿大和墨西哥

* 其他国家的能效等级划分，请参考我公司客户服务部门提供的考能效等级国别手册

1.7 Energy efficient high pressure blowers

Elektror high pressure blowers come fitted as standard with energy efficient IE2/IE3/NEMA motors (acc. to destination country) conformant to the IEC 60034-30 standard.

High pressure blowers with IE2/IE3/NEMA motors

- have a higher degree of efficiency
- reduce operating costs
- have a longer service life
- generate less waste heat
- protect the environment

Besides the energy efficient motors used, other factors may serve to reduce energy and costs. These are to be checked out if necessary. Potential savings may be found, for example, by

- determining the framework conditions of the application or installation
- the correct choice and adaptation, if applicable, of the Elektror high pressure blowers
- choosing the appropriate accessories
- optimised control/regulation of high pressure blowers with a frequency converter (FU/FUK-series for decentralised or on-motor operation)

Our Product Management will be pleased to help you locate further potential savings in the planning and realisation of your installation or machine. Please get in touch with support@elektror.com.

Designation in the present catalogue

The designation of the motor efficiency classes is as follows:

Designation	Frequency	Efficiency class	Place of use (examples)*
IE2	50 Hz	Device with IE2-conformant motor < 7.5 kW	Europe
IE3	50 Hz	Device with IE3-conformant motor ≥ 7.5 kW	Europe
IE2	60 Hz	Device with IE2-conformant motor < 7.5 kW	Korea, Taiwan
IE3	60 Hz	Device with IE3-conformant motor ≥ 7.5 kW	Korea, Taiwan
NEMA	60 Hz	Device with NEMA-conformant motor	USA, Canada, Mexico

* For further country-specific requirements, please refer to our information brochure on motor changeover or direct your enquiry to our Product Management.

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1.8 关于ErP 实施条例的内容 327/2011

与节能相关的机械产品ErP 实施条例（327/2011 EU自2011年3月30日）在所有鼓风机领域严格规范了消耗能量的范围，规定了电动机驱动的鼓风机产品最低能耗等级范围，该范围涵盖了电机功率125瓦至500千瓦全部风机产品。

背弯式叶轮或圆形排气口外壳作为鼓风机的标准形式，用于决定依莱克罗高压鼓风机的能效。对应的检验种类为“方法B”，依莱克罗全部型号的高压鼓风机都有相对应的能效等级。

计算鼓风机能效的方法通常基于假定鼓风机速度不变的情况下。对于变频调速风机，则要求将鼓风机与变频器整合为一体（即FU形式和FUK形式）。

标识	描述
FU	变频器安装在控制箱内通过电缆线与鼓风机电机相连。
FUK	变频器安装在鼓风机电机上。

鼓风机的工作效率百分数值%精确到小数点后第一位，能效等级，比转速，电机输入功率，风机流量，压力和风机转速以及最佳工作点效率值等数据均可在此产品样本第52， 53页查到。

生产厂，生产厂的分厂，型号和生产年份等等均可通过鼓风机铭牌上的产品序列号查到。

另外，操作说明书中还列举了关于如何降低能耗，延长使用寿命以及安装调试维护保养等信息供用户参考。

对于即将报废活淘汰的鼓风机建议送到专门的回收部门做回收处理。

1.8 Information for ErP implementing regulation 327/2011

The Energy-related Product implementing regulation (327/2011 of the EU dated March 30, 2011) defines concrete requirements regarding the implementation of the Energy-related Product Directive in the area of fans. It specifies minimum efficiency grades for fans driven by motors with an electric input power between 125 W and 500 kW.

For determining the energy efficiency of the Elektror high pressure blowers, a radial fan with vanes curved backwards or rounded at the ends with housing are used as the blower type. The measuring category corresponds with method „B“. The efficiency category always corresponds with the total degree of efficiency for all Elektror high pressure blowers.

The calculation of the blower efficiency is always based on the assumption that no speed regulation is used. A speed regulator must be integrated for Elektror blowers with frequency converter for remote operation (marked with the supplement FU). A speed regulator is already integrated for Elektror blowers with remote frequency converter (marked with the supplement FUK).

Product designation	Description
FU	A speed regulator **must** be installed with this blower
FUK	A speed regulator **is** installed in this blower

The total efficiency (%) rounded to the decimal point, the degree of efficiency, the specific ratio as well as the nominal motor power input, volume flow, pressure and revolutions per minute at the optimum energy efficiency can be obtained in pages 52 to 53.

Manufacturer, branch office of the manufacturer, type designation, year of manufacturer as well as the serial number of the Elektror high pressure blower can be obtained on the type plate on the device.

Information for reducing the effect to the environment and for ensuring an optimum service life with regard to installation, operation and maintenance of the Elektror high pressure blower can be obtained from the respective operating instructions.

The disposal following final decommissioning must be carried out professionally.

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1.9 Hinweise für Betrieb und Wartung

依莱克罗高压离心式鼓风机的工作频率高达105Hz，使用的轴承为封闭式轴承，不需要添加或更换润滑油脂。在电机水平安放时轴承的工作寿命最少为22,000小时。

工作频率为105Hz的变频高压鼓风机，其轴承的使用寿命请参考鼓风机操作说明书。

轴承的使用寿命取决于工作时间和其他因素影响，比如温度。我们建议轴承即将达到使用寿命前进行更换。

对于V-皮带传动的高压鼓风机，皮带的使用寿命除了受皮带张力，负载以及其他因素影响，如温度。V-皮带的使用寿命通常为25,000小时。

每间隔一段时间就要对使用中的高压鼓风机进行检查和清洁，并将检查和清洁工作列入日常工作规程中。因为如果叶轮上沾了过多的灰尘或其他物质会使原有的动平衡受到破坏，影响电机和轴承的使用寿命。风机的工作性能曲线也会下降。另外全部型号的鼓风机进气口都安装有防护栅格。

通常高压鼓风机不能用于输送固体颗粒物质，全封闭的叶轮也不允许吸入固体物质。如果鼓风机是用来输送含有固体颗粒物的气体时，进气口一定要安装进气过滤器。不过要确保过滤器的透过率，非常细小的颗粒物质如灰尘在一定程度上是允许吸入的。具体细节请与厂家协商确认。

我们建议如果在产生凝结水的环境中使用或输送含有凝液的气体介质时需要在鼓风机的最底部开孔，或者安装排凝液阀。

通常的高压离心式鼓风机是不能用于输送易燃易爆气体的，如果需要使用鼓风机输送易燃易爆混合气体，必须按照标准DIN EN ISO 13857的要求保证进气口和排气口通畅，避免有突然的碰撞发生。

鼓风机必须按长在坚实的基础上防止碰撞或颠簸，并且注意避免气候的影响。

如果鼓风机电机功率大于3.5kW则需要使用Y/Δ启动，并且在安装和使用说明中应当加以注释。

1.9 Instructions for operation and maintenance

Up to an operating frequency of 105 Hz Elektror high pressure blowers are equipped with closed ball bearings that do not have to be lubricated and, with horizontal drive shafts, have a minimum service life of 22,000 hours.

The minimum service life and lubrication schedules for ball bearings from an operating frequency of 105 Hz can be obtained from the respective operating instructions.

The service life of the ball bearings depends on the operating hours and other influences, such as temperature, etc. We recommend that the grooved ball bearings are replaced before exceeding the service life.

The service life of the V-belt depends on the operating hours, the belt tensioning and the loading as well as other influences, such as temperature, etc. The nominal service life of the V-belt is at least 25,000 hours.

Checks and possible cleaning work must be carried out at the respective intervals also observing the safety-relevant guidelines. Dirty or worn vanes lead to imbalance that may lead to failure of the bearing. The operating safety as well as the specified performance characteristics are thus no longer ensured. All blowers are serially equipped with protective grille on the intake side.

Conveying solid matters is not permitted and the closed vanes are not suitable for transporting material. If the media to be conveyed includes solid matters or other impurities, these must be separated by a filter installed on the intake side before entering the blower. The permeability of the filter must be ensured. Light solid matters, such as dust, can be conveyed to a certain extent. A detailed clarification must be carried out with the factory.

We recommend a condensed water borehole at the lowest point in the housing in the event of formation of condensation.

The conveying of potentially explosive mixtures is not permitted. Blowers that freely extract or blow-out, protection against accidental contact must be provided on the intake side or blow-out side according to DIN EN ISO 13857 as long as this has not already been fitted ex-factory.

The devices must be installed protected against the weather and must not be exposed to oscillation or shock loading as well as vibration.

Y/Δ must be switched for devices more than 3.5 kW. The installation and operating instructions enclosed must be observed in all cases.

1.10 订货数据

- 鼓风机型号
- 气体流量
- 要求的全压差或静压差
- 电压，频率，三相或单相电
- 环境和输送介质气体温度
- 变频器使用方式
- 输送介质气体密度
- 介质气体组分
- 鼓风机排气口方向
- 附件或其他特殊要求

1.10 Ordering data

- Blower type
- Volumetric flow rate
- Required total or static pressure difference
- Voltage, frequency, three or single phase AC
- Ambient and conveyed medium temperature
- Mains or frequency converter operation
- Conveyed medium density
- Type of conveyed medium
- Housing position
- Accessories / special requirements

1.11 注释

尺寸大小，技术参数和描述都是近似值，可能会有错误或遗漏，我们会及时更正

1.11 Remarks

Dimensions, technical data and descriptions are approximate only. Subject to modifications and errors.

1.12 单位换算表 / Conversion table

计量单位 / units of measurement

	由计量单位 by units of measurement	换算因子 with conversion factor	到计量单位 in units of measurement	由计量单位 by units of measurement	换算因子 with conversion factor	到计量单位 in units of measurement
压力 / Pressure	bar	1000	mbar	mbar	0,001	bar
压力 / Pressure	mbar	100	Pa	Pa	0,01	mbar
压力 / Pressure	mmWS	0,098	mbar	mbar	10,2	mm H_2O
压力 / Pressure	mWS	98,07	mbar	mbar	0,0102	m H_2O

欧洲计量单位与美式计量单位 / European units of measurement in the USA

	有国际标准单位 by SI unit of measurement	换算因子 with conversion factor	到英-美制计量单位 in anglo-amer. unit of measur.	有英-美制计量单位 by anglo-amer. unit of measur.	换算因子 with conversion factor	到国际标准单位 In SI units of measurement
压力 / Pressure	bar	0,014	psi = Ib/in²	psi = Ib/in²	68,95	mbar
压力 / Pressure	mbar	14,5	psi = Ib/in²	psi = Ib/in²	0,068	bar
压力 / Pressure	mbar	0,402	inches water	inches water	2,49	mbar
气体流量 Volumetric flow rate	m³/min	264,2	gal/min	gal/min	0,003	m³/min
气体流量 Volumetric flow rate	m³/min	35,31	cfm	cfm	0,028	m³/min
气体流量 Volumetric flow rate	kW	1,36	hp	hp	0,735	kW
长度 / Length	mm	0,039	inch	inch	25,4	mm
长度 / Length	m	39,37	inch	inch	0,025	m
长度 / Length	mm	0,003	ft	ft	305	mm
长度 / Length	m	3,28	ft	ft	0,305	m
重量 / Weight	kg	2,05	Ib	Ib	0,454	kg

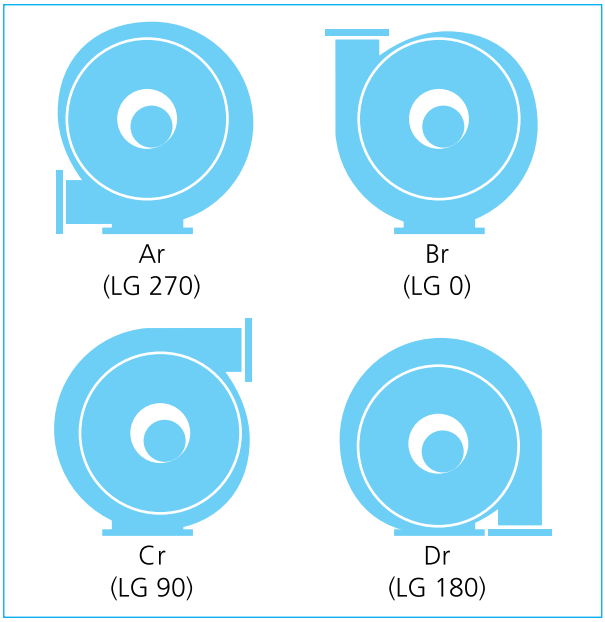
举例说明 / Example for conversion						
压力 / Pressure	180 mbar	0,014	2,61 PSI	2,61 PSI	68,95	180 mbar
气体流量 Volumetric flow rate	6 m³/min	35,31	211,8 ft³/min	211,8 ft³/min	0,283	6 m³/min

2. 鼓风机排气口方向，接线盒方向，进线位置

鼓风机方向

判断鼓风机排气口方向需要从鼓风机进气口一侧观察。
方向 Ar - Dr = 风机叶轮顺时针方向旋转
方向 El - Hl = 风机叶轮逆时针方向旋转

括号里的方向标志方式是按照EURVENT 1/1的标准表示，但他们的方式是要从电机侧观察。全部型号的高压离心式鼓风机的排气口方向都可以做成A，B， C和E等等，以及根据客户要求的其他方向。如果用户没有特别要求，Ar 方向则作为标准排气口方向。



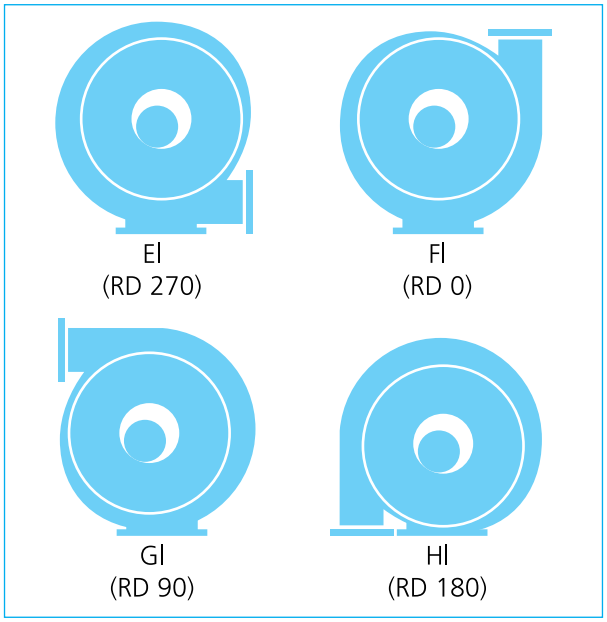
标准产品中，接线盒位置在270度位置（电机顶部），进线位置在A（右侧）。第15页有指示接线盒位置和进线位置的简图。

2. Housing positions, terminal box positions, cable entry

Housing Positions

The housing position is determined when facing the intake side.
Positions Ar - Dr = Clockwise rotation
Positions EI - HI = Counter-clockwise rotation

The designations in brackets are in accordance with EUROVENT 1/1, but they are determined when facing t he drive side. Housings positions A, B, C, and E are deliverable for all high pressure blowers. Other positions on demand. If not indicated otherwise, standard housing position Ar will be supplied.



In the standard version, the equipment is supplied with the terminal box position 270° (top) and the cable inlet A (right). For explanations of the terminal box position and the cable inlet options, see page 15.

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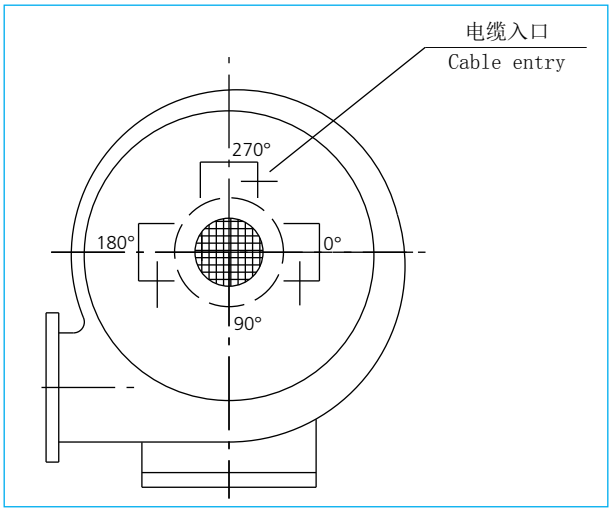
接线盒位置 / Terminal box positions



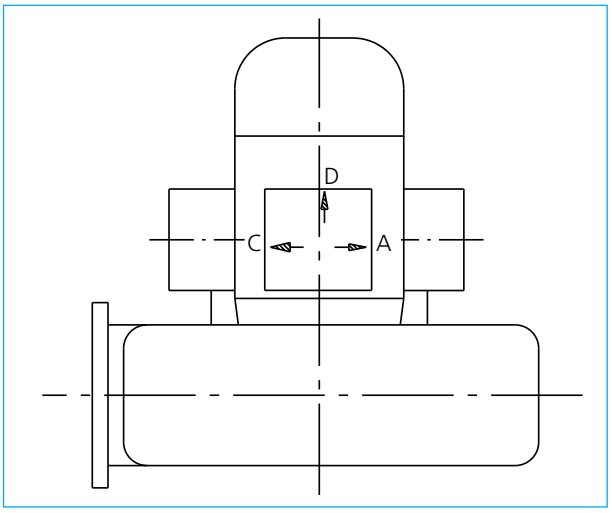
判断接线盒位置
（从鼓风机进气口方向观察）

270° = 接线盒在电机顶部 （标准配置）
180° = 接线盒在电机左侧
0° = 接线盒在电机右侧
90° = 接线盒在电机地步 （根据客户要求）

Definition of the terminal box position
(seen from suction side)

270° = terminal box at top (standard version)
180° = terminal box left
0° = terminal box right
90° = terminal box at bottom (only on request)

电缆入口 / Cable entry



判断进线位置

A = 右侧（标准配置）
C = 左侧
D = 后部

Definition of cable inlet

A= right (standard version)
C= left
D = rear

3. 型号代码，预选型，性能曲线 / Type code, preselection, characteristic curves

型号代码 / Type code

鼓风机	H	R	D	1	T	FU	/	FUK
Blower	H	R	D	1	T	FU	/	FUK

FUK 变频器安装在鼓风机电机上
with installed frequency converter

FU 变频器
Frequency converter

T 法兰式连接
Carrier flange

1 鼓风机型号代码
Construction size of the high pressure blowers

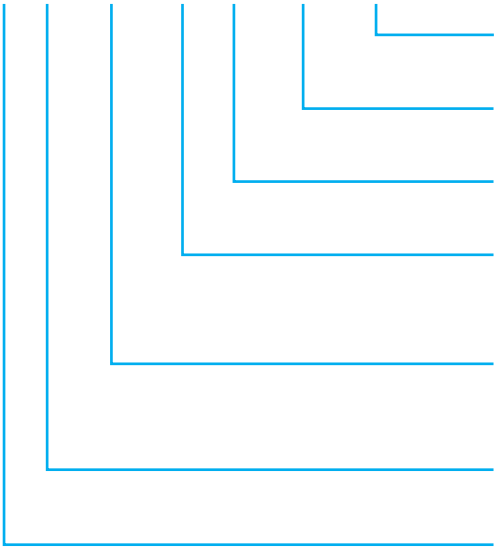
D 配三相电机
E 配单相电机
D With three phase a.c. motor
E With single phase a.c. motor

R 离心式鼓风机
Blower design radial

H 高压鼓风机
High pressure blower

技术信息
TECHNICAL INFORMATION

鼓风机	H	R	D	2	FU	130 / 7,5	BOOSTED
Blower	H	R	D	2	FU	130 / 7,5	BOOSTED



电机功率
Motor rating

最高工作频率
Frequency

变频器
Frequency converter

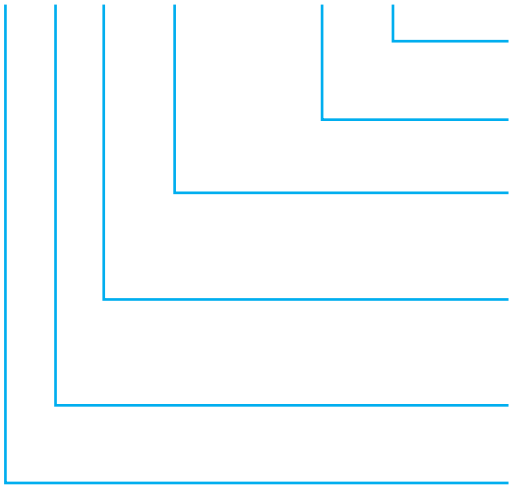
鼓风机型号代码
Construction size of the high pressure blowers

D 配三相电机
E 配单相电机
D With three phase a.c. motor
E With single phase a.c. motor

离心式鼓风机
Blower design radial

高压鼓风机
High pressure blower

鼓风机	H	R	D	2	/	4	T
Blower	H	R	D	2	/	4	T



法兰式连接
Carrier flange

传动速比代码
Transmission code

鼓风机型号代码
Construction size of the high pressure blowers

D 配三相电机
E 配单相电机
D With three phase a.c. motor
E With single phase a.c. motor

离心式鼓风机
Blower design radial

高压鼓风机
High pressure blower

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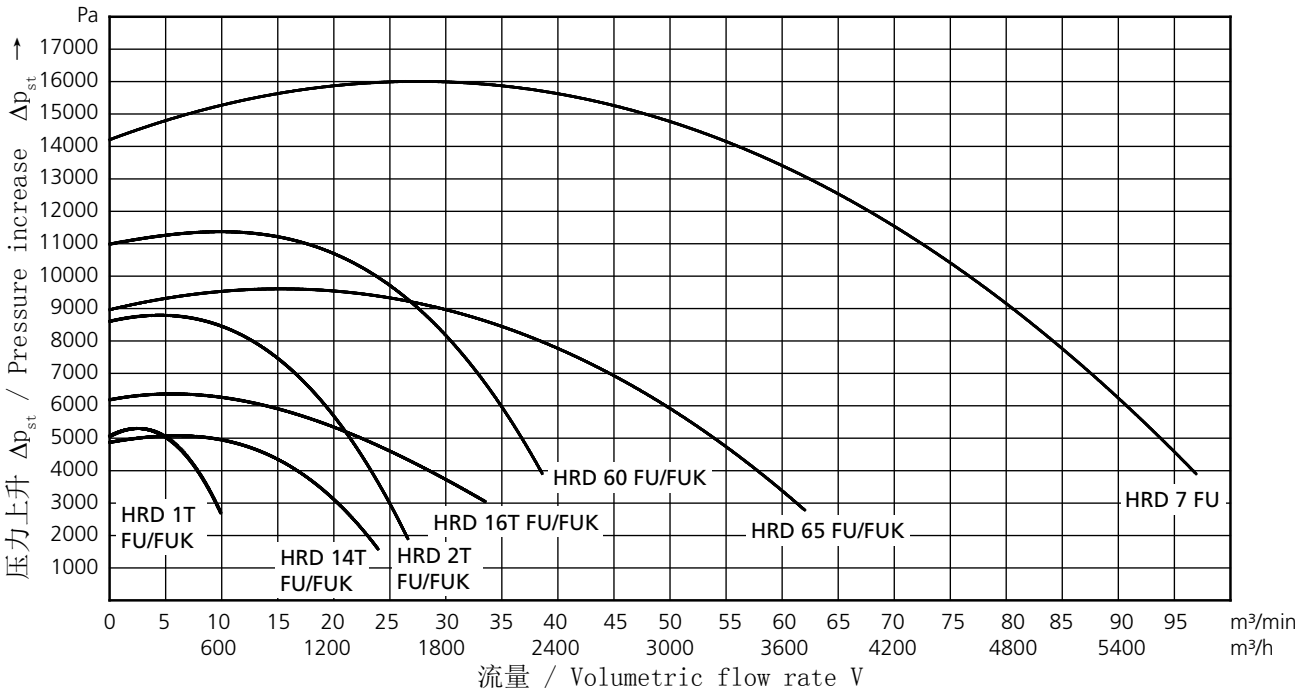
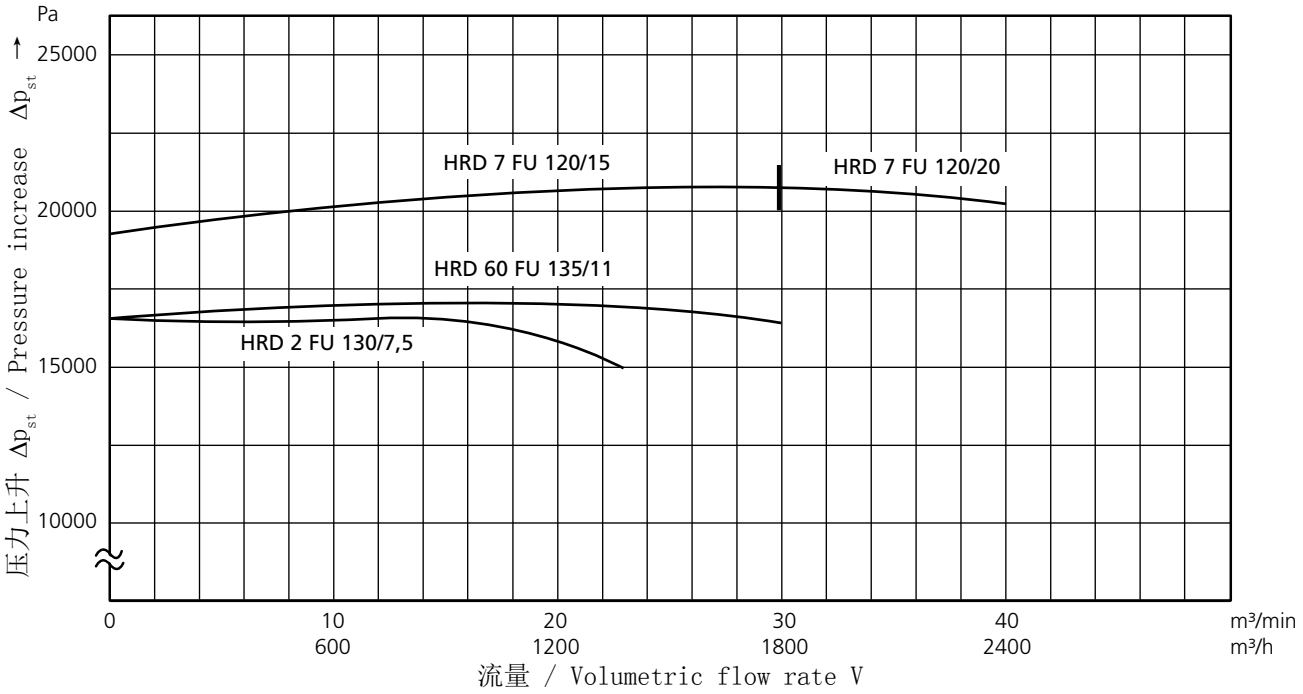
预选型 / Preselection
工作曲线 / Characteristic curves

高压鼓风机FU/FUK 系列 第19页
High pressure blowers FU/FUK Page 19



高压鼓风机超高压系列 第26页
High pressure blowers BOOSTED range Page 26



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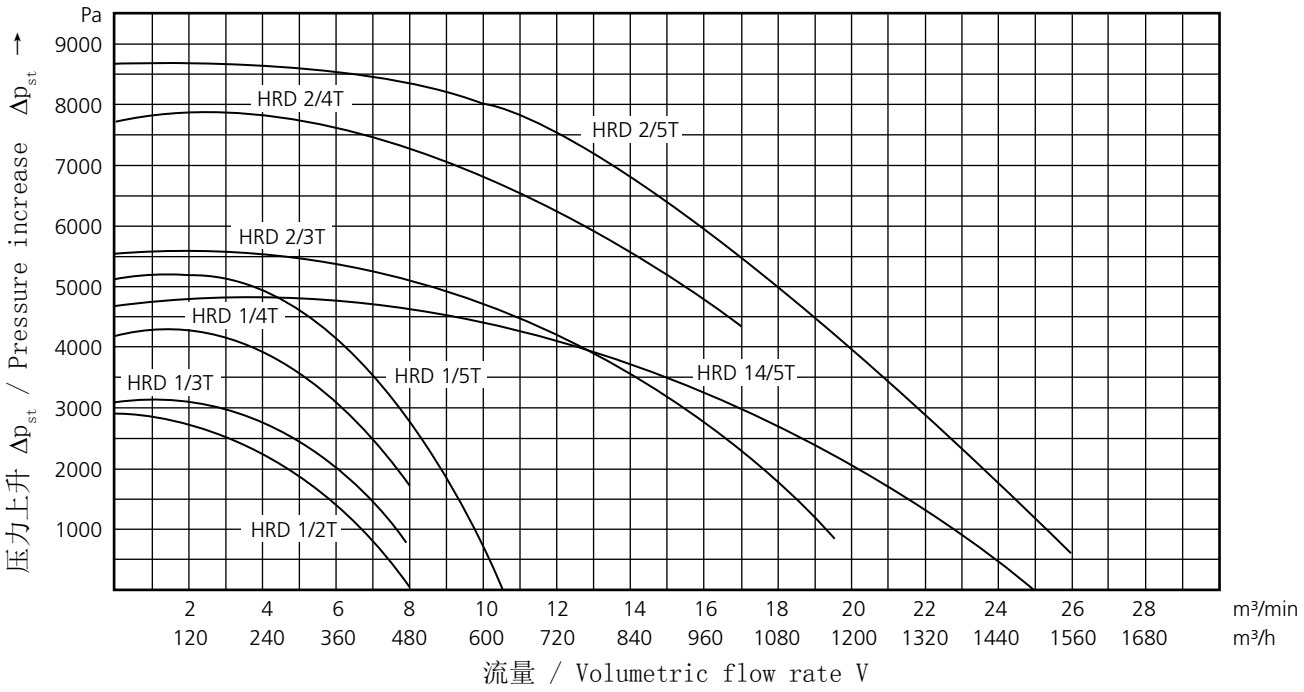
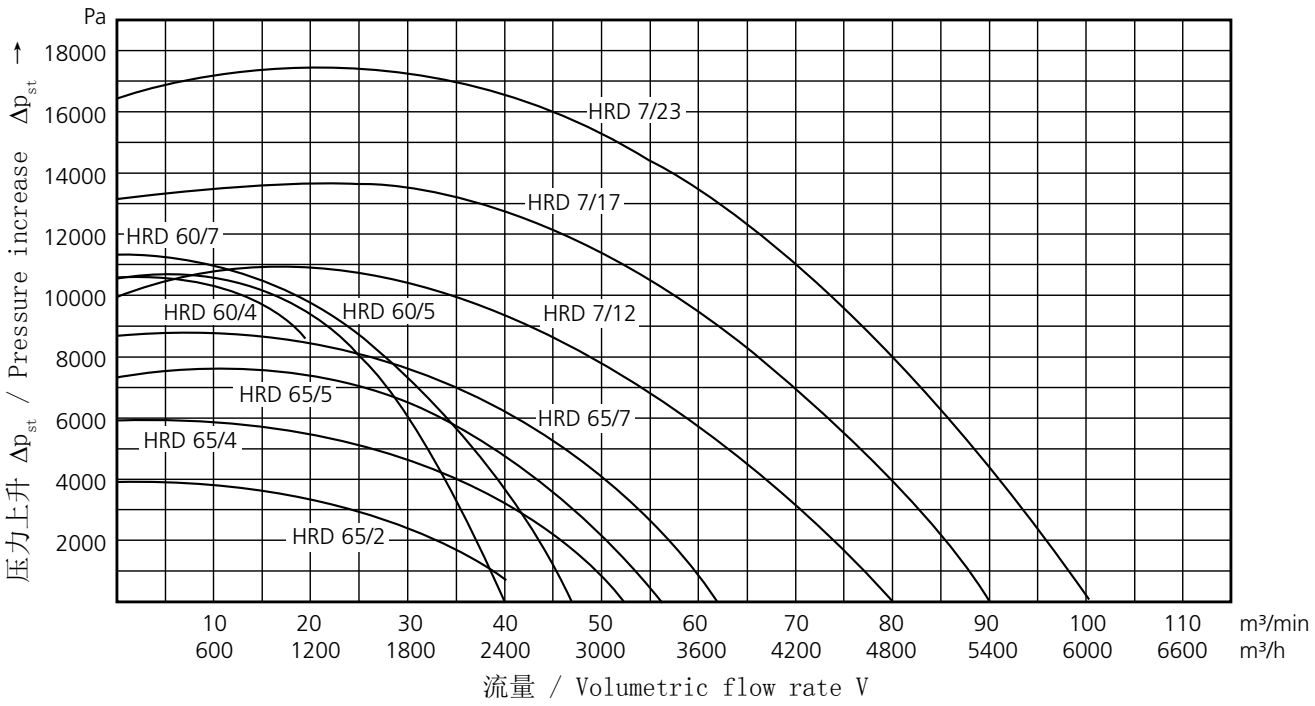
技术信息
TECHNICAL INFORMATION

预选型 / Preselection
工作曲线 / Characteristic curves

高压鼓风机法兰式皮带防护罩 第30页
High pressure blowers with flange housing Page 30



高压鼓风机带底座 第41页
High pressure blowers with base plate Page 41



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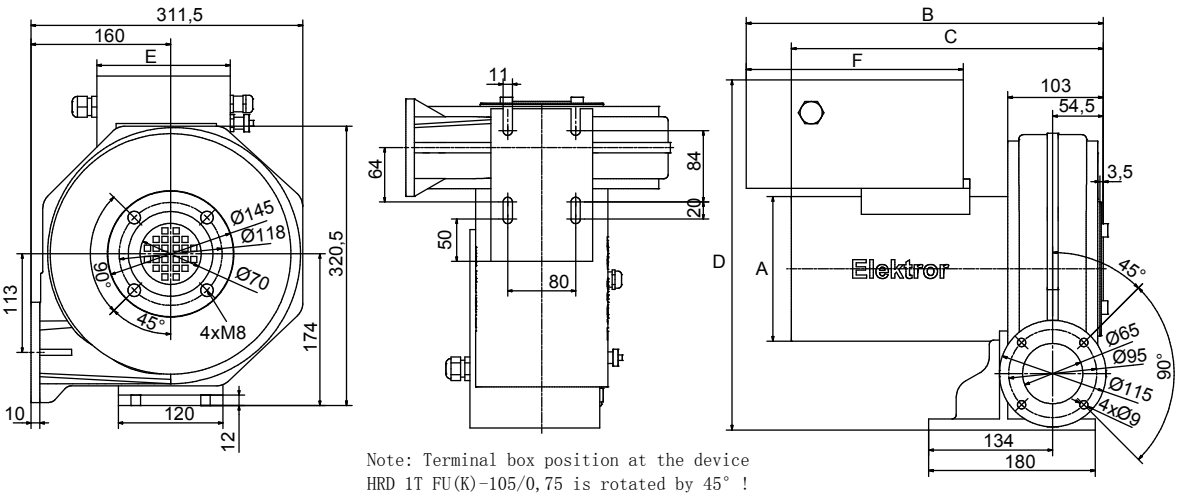
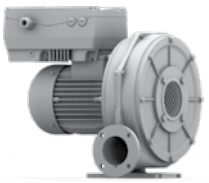


Note: Terminal box position at the device HRD 1T FU(K)-105/0,75 is rotated by 45° !

Typ	A	B	C	D	E	F
HRD 1T FU-105/0,75	Ø138	-	330	-	-	-
HRD 1T FUK-105/0,75	Ø138	398	330	368	153	234
HRD 1T FU-105/1,10	Ø156	-	337	-	-	-
HRD 1T FUK-105/1,10	Ø156	385	337	378	153	234

适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

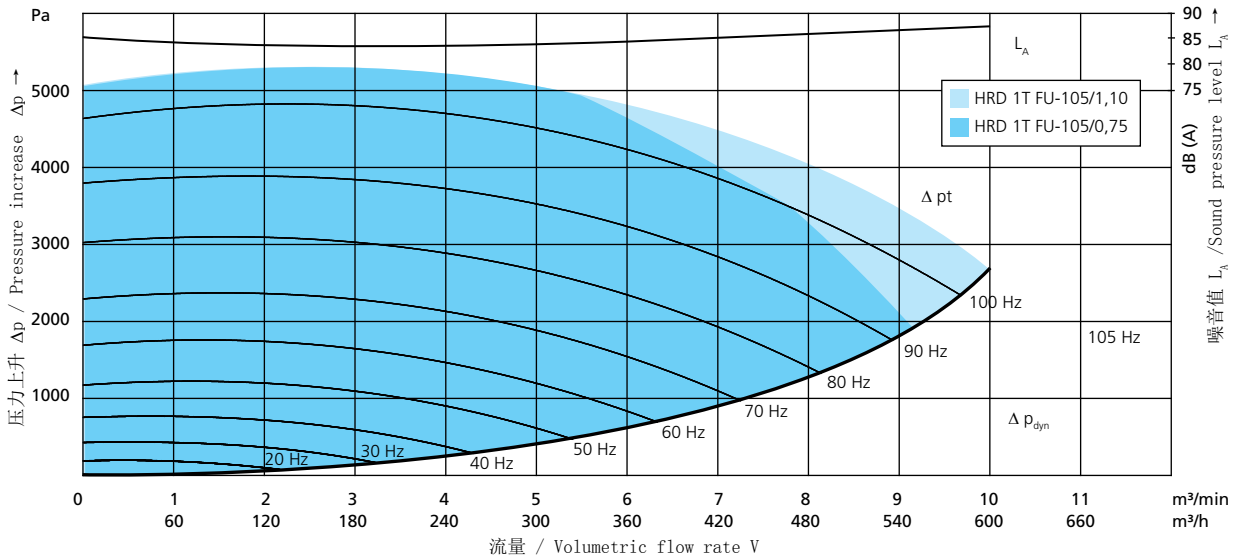
尺寸单位为 mm
Dimensions in mm - subject to modifications.



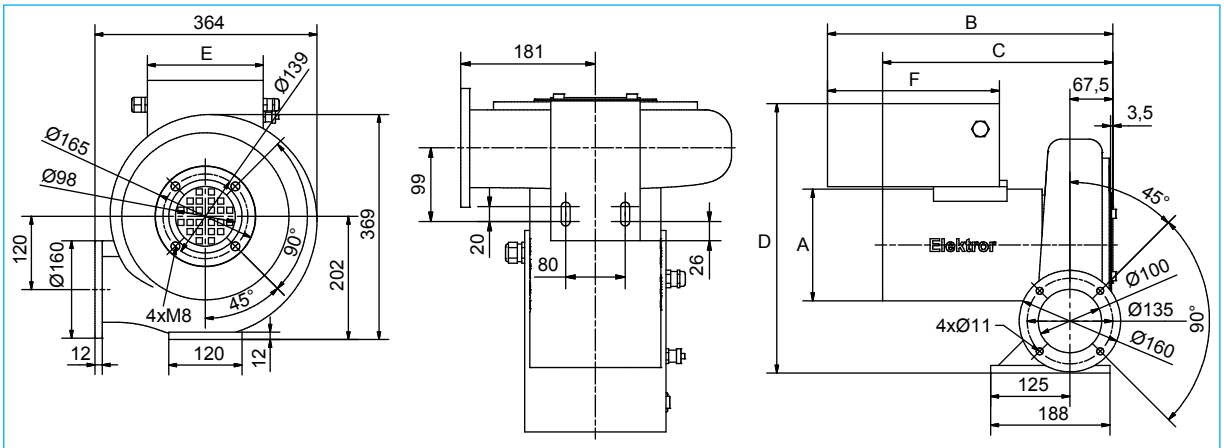
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 1T FU*-105/0,75	5,5	4900	230/400	105	3,05/1,75	6090	0,75	13
HRD 1T FUK#-105/0,75	5,5	4900	400	105	1,75	6090	0,75	16
HRD 1T FU*-105/1,10	10,0	4900	230/400	105	4,00/2,3	6050	1,10	14
HRD 1T FUK#-105/1,10	10,0	4900	400	105	2,3	6050	1,10	19

* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.
# = 变频器安装在鼓风机电机上 | A variable speed drive is integrated within the blower.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



Typ	A	B	C	D	E	F
HRD 14T FU-105/1,1	Ø156	-	325	-	-	-
HRD 14T FUK-105/1,1	Ø156	374	325	406	153	234
HRD 14T FU-105/1,5	Ø156	-	325	-	-	-
HRD 14T FUK-105/1,5	Ø156	374	325	406	153	234
HRD 14T FU-105/2,2	Ø176	-	363	-	-	-
HRD 14T FUK-105/2,2	Ø176	450	363	425	190	271

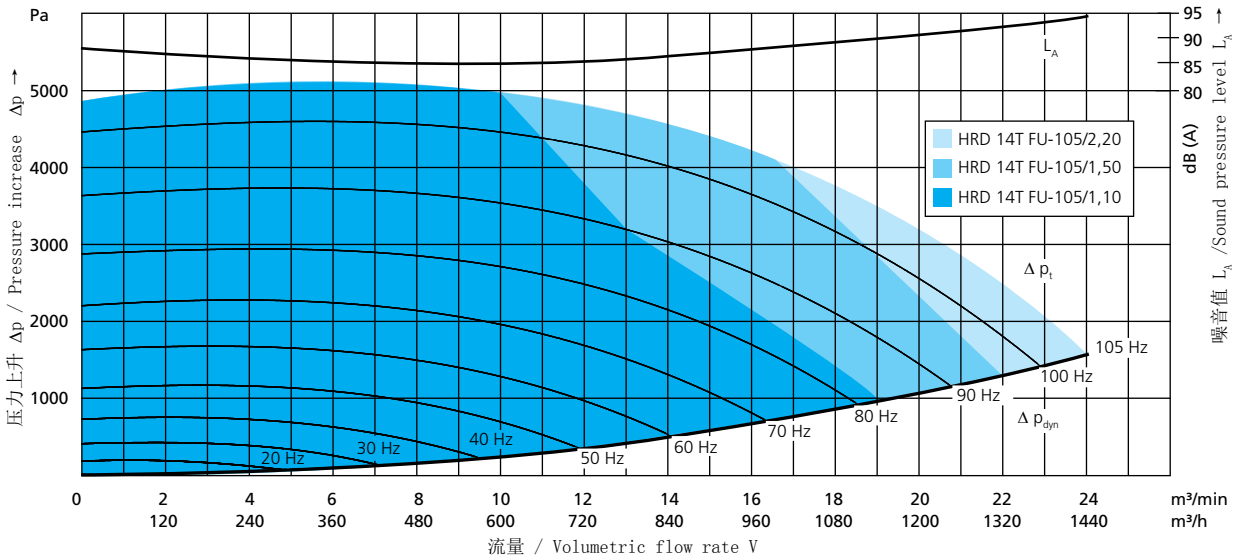
适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

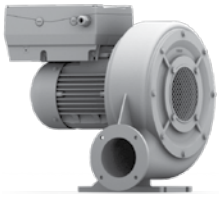
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 14T FU*-105/1,10	10,0	4900	230/400	105	4,15/2,40	6070	1,10	17
HRD 14T FUK#-105/1,10	10,0	4900	400	105	2,40	6070	1,10	21
HRD 14T FU*-105/1,50	16,5	4900	230/400	105	5,70/3,30	6075	1,50	19
HRD 14T FUK#-105/1,50	16,5	4900	400	105	3,30	6075	1,50	23
HRD 14T FU*-105/2,20	24,0	4900	230/400	105	6,90/4,00	6140	2,20	22
HRD 14T FUK#-105/2,20	24,0	4900	400	105	4,00	6140	2,20	26

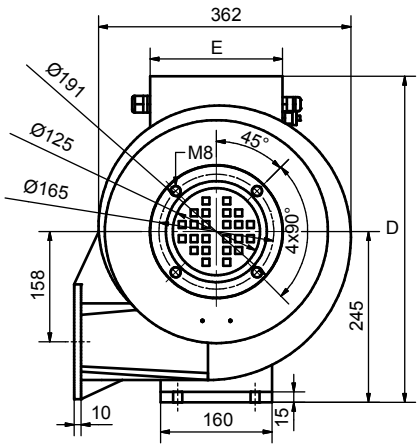
* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.
# = 变频器安装在鼓风机电机上 | A variable speed drive is integrated within the blower.

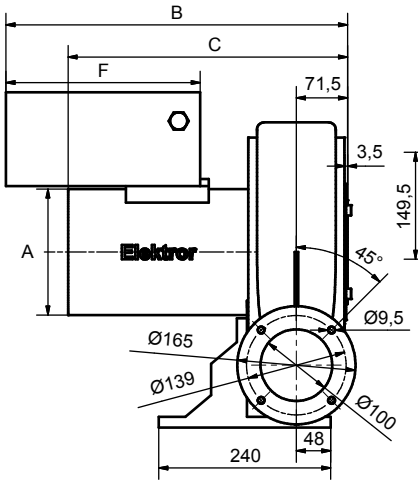
性能曲线 / Characteristic curves

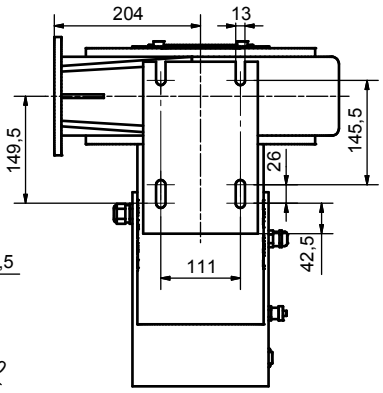


根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.









Typ	A	B	C	D	E	F
HRD 16T FU-105/1,5	Ø156	-	372	-	-	-
HRD 16T FUK-105/1,5	Ø156	421	372	449	153	234
HRD 16T FU-105/2,2	Ø156	-	372	-	-	-
HRD 16T FUK-105/2,2	Ø156	465	372	463	190	271
HRD 16T FU-105/3,0	Ø176	-	390	-	-	-
HRD 16T FUK-105/3,0	Ø176	477	390	468	190	271

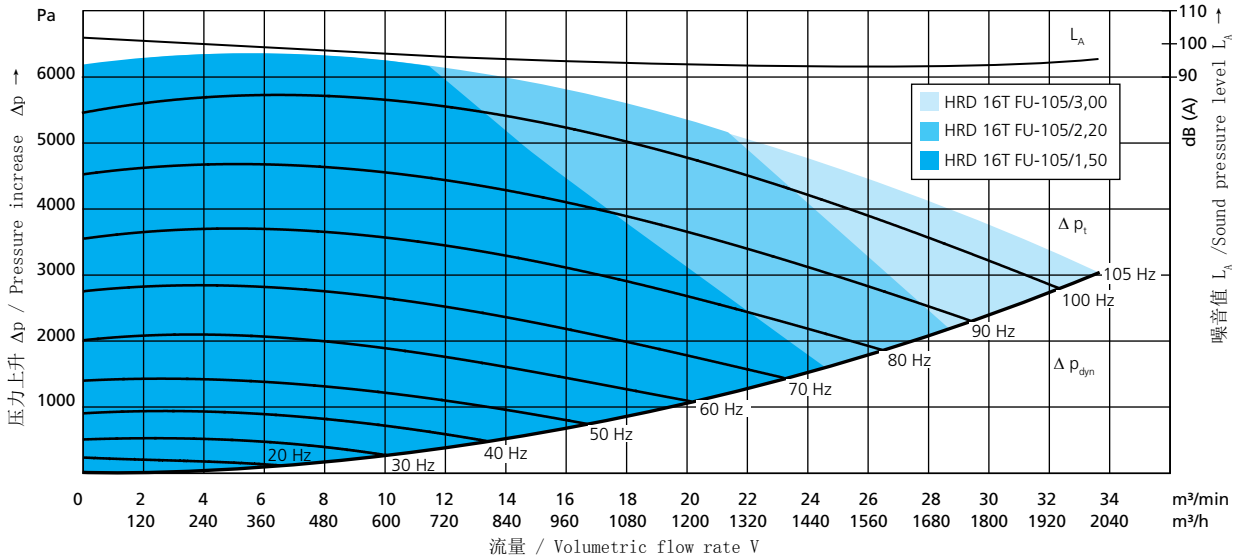
适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 16T FU*-105/1,50	11,5	6100	230/400	105	5,70/3,30	5920	1,50	21
HRD 16T FUK#-105/1,50	11,5	6100	400	105	3,30	5920	1,50	25
HRD 16T FU*-105/2,20	20,0	6100	230/400	105	7,80/4,50	5870	2,20	23
HRD 16T FUK#-105/2,20	20,0	6100	400	105	4,50	5870	2,20	27
HRD 16T FU*-105/3,00	33,5	6100	230/400	105	10,7/6,20	5980	3,00	25
HRD 16T FUK#-105/3,00	33,5	6100	400	105	6,20	5980	3,00	35

* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.
# = 变频器安装在鼓风机电机上 | A variable speed drive is integrated within the blower.
HRD 16T FU(K)-105/1,5 wird im Jahr 2014 noch auf ErP 2015 angepasst! | HRD 16T FU(K)-105/1,5 will be adapted in 2014 to ErP 2015!

性能曲线 / Characteristic curves



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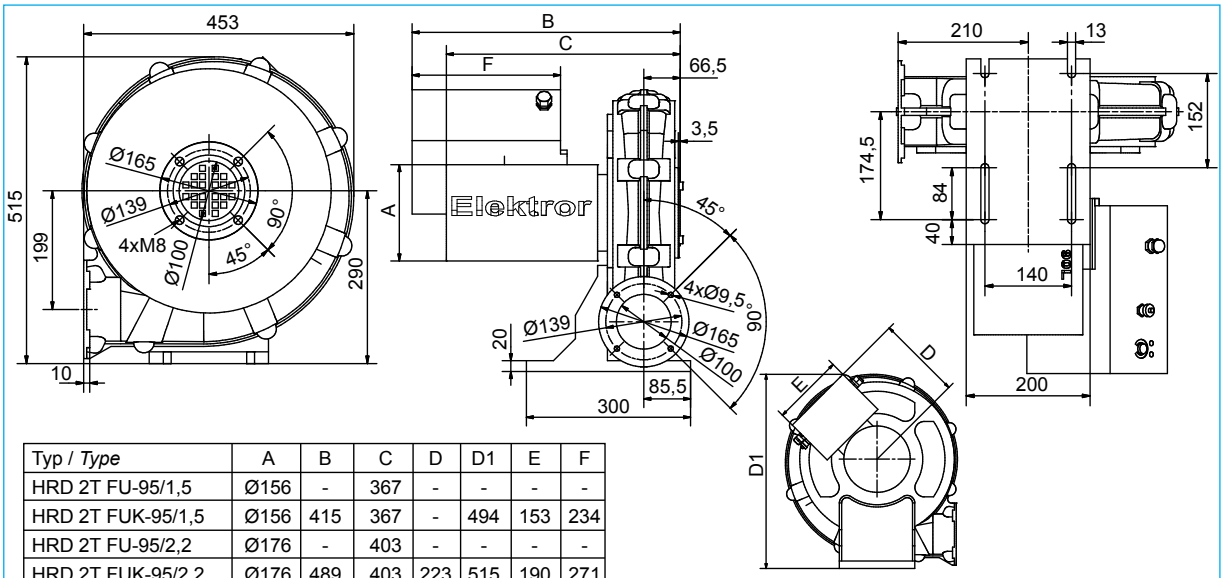
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



Typ / *Type*	A	B	C	D	D1	E	F
HRD 2T FU-95/1,5	Ø156	-	367	-	-	-	-
HRD 2T FUK-95/1,5	Ø156	415	367	-	494	153	234
HRD 2T FU-95/2,2	Ø176	-	403	-	-	-	-
HRD 2T FUK-95/2,2	Ø176	489	403	223	515	190	271
HRD 2T FU-95/3,0	Ø176	-	427	-	-	-	-
HRD 2T FUK-95/3,0	Ø176	490	427	223	515	190	271

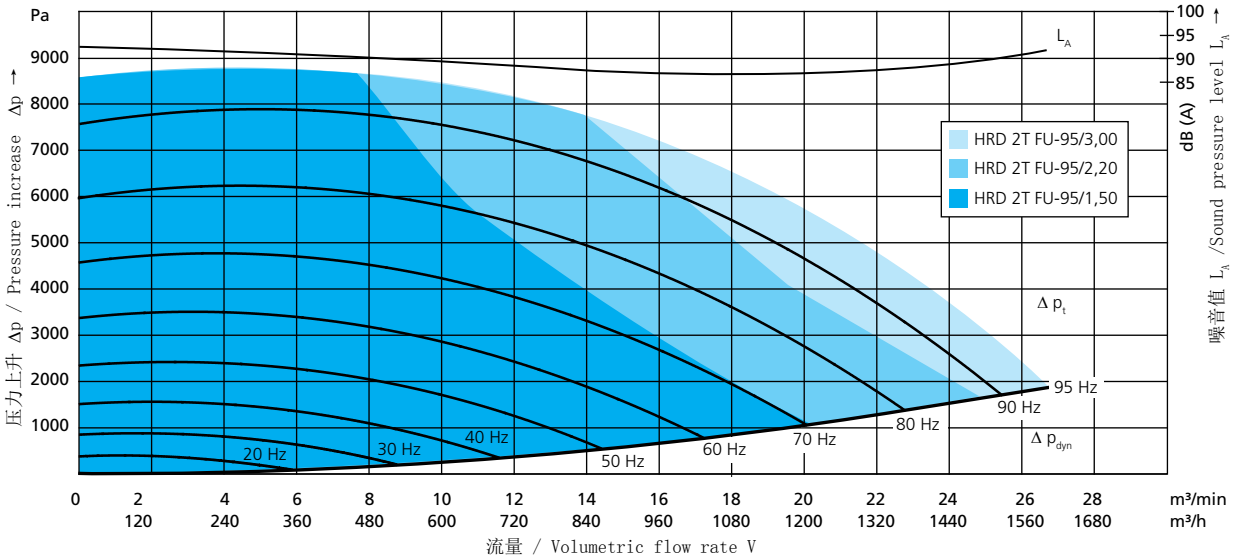
适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

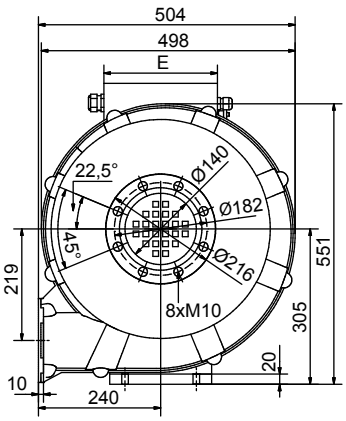
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 2T FU*-95/1,50	7,7	8500	230/400	95	5,35/3,10	5520	1,50	26
HRD 2T FUK#-95/1,50	7,7	8500	400	95	3,1	5520	1,50	30
HRD 2T FU*-95/2,20	13,5	8500	230/400	95	7,80/4,50	5520	2,20	29
HRD 2T FUK#-95/2,20	13,5	8500	400	95	4,5	5520	2,20	33
HRD 2T FU*-95/3,00	27,0	8500	230/400	95	10,9/6,3	5600	3,00	31
HRD 2T FUK#-95/3,00	27,0	8500	400	95	6,3	5600	3,00	41

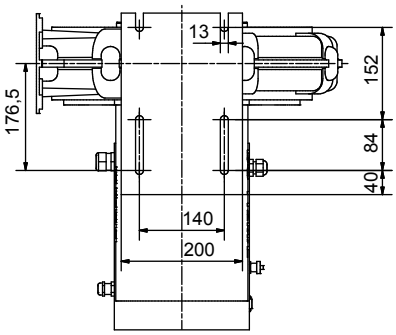
* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.
# = 变频器安装在鼓风机电机上 | A variable speed drive is integrated within the blower.

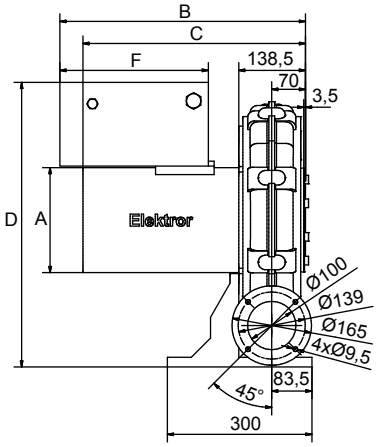
性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.







Typ	A	B	C	D	E	F
HRD 60 FU-105/4,0	Ø194	-	445,5	-	-	-
HRD 60 FUK-105/4,0	Ø194	480,5	445,5	536	190	271
HRD 60 FU-105/5,5	Ø218	-	462	-	-	-
HRD 60 FUK-105/5,5	Ø218	509,7	462	591	223	308
HRD 60 FU-105/7,5	Ø218	-	462	-	-	-
HRD 60 FUK-105/7,5	Ø218	509,7	462	591	223	308

适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 60 FU*-105/4,00	21,0	10500	400 Δ	105	9,5	6190	4,00	36
HRD 60 FUK#-105/4,00	21,0	10500	400 Δ	105	9,5	6190	4,00	46
HRD 60 FU*-105/5,50	32,0	10500	400 Δ	105	12,0	6140	5,50	46
HRD 60 FUK#-105/5,50	32,0	10500	400 Δ	105	12,0	6140	5,50	56
HRD 60 FU*-105/7,50	40,0	10500	400 Δ	105	14,5	6235	7,50	50
HRD 60 FUK#-105/7,50	40,0	10500	400 Δ	105	14,5	6235	7,50	60

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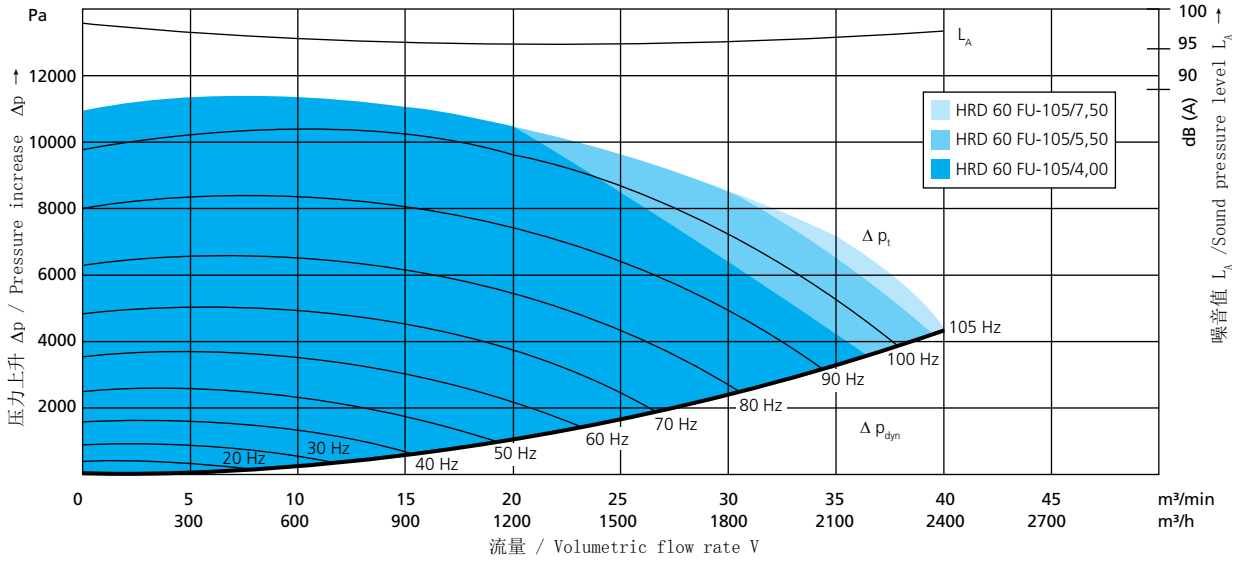
性能曲线 / Characteristic curves



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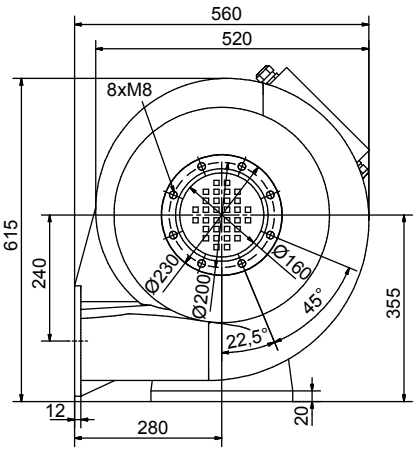
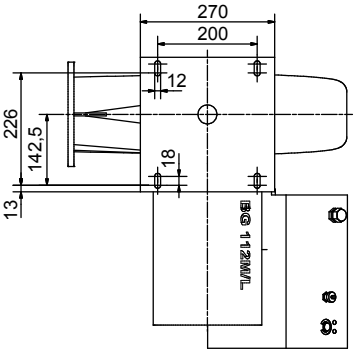
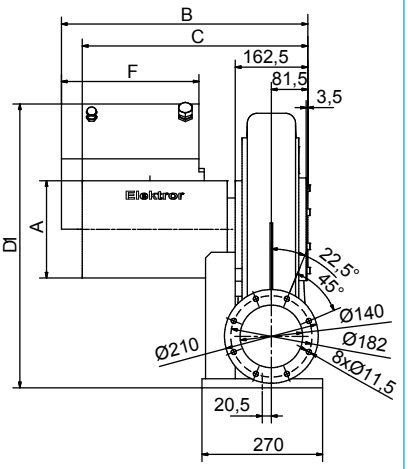
Technical and constructional subject to change. Data according to ErP directive see page 52-53.







Typ	A	B	C	D	D1	E	F
HRD 65 FU-100/5,5	Ø218	-	505	-	-	-	-
HRD 65 FUK-100/5,5	Ø218	551,7	505	286	636	223	308
HRD 65 FU-100/7,5	Ø218	-	505	-	-	-	-
HRD 65 FUK-100/7,5	Ø218	551,7	505	286	636	223	308

适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 65 FU*-100/5,50	27,0	9000	400 Δ	100	12,5	5930	5,50	51
HRD 65 FUK#-100/5,50	27,0	9000	400 Δ	100	12,5	5930	5,50	61
HRD 65 FU*-100/7,50	62,0	9000	400 Δ	100	17,5	5920	7,50	55
HRD 65 FUK#-100/7,50	62,0	9000	400 Δ	100	17,5	5920	7,50	65

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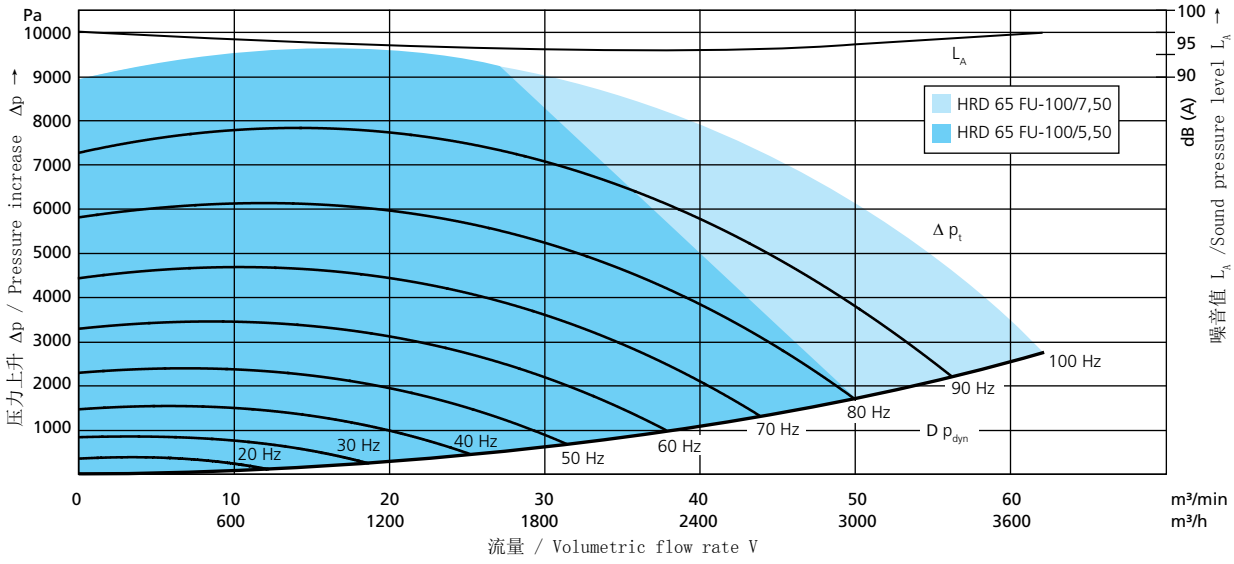
性能曲线 / Characteristic curves



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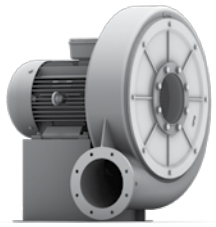
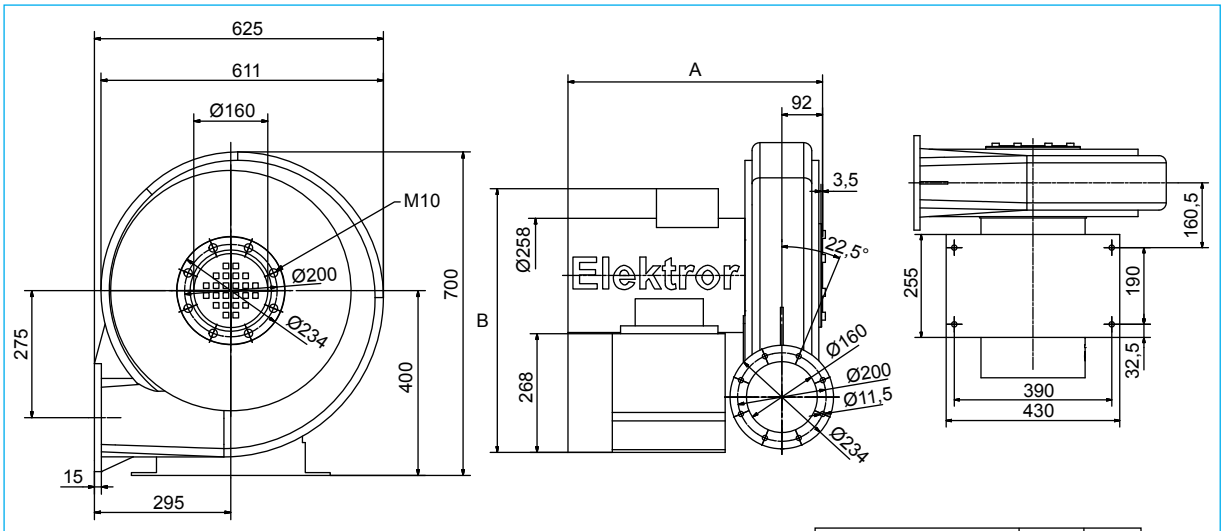
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

CN 09.14





Typ	A	B
HRD 7 FU-105/11,00	537	596
HRD 7 FU-105/15,00	575	596
HRD 7 FU-105/20,00	575	596

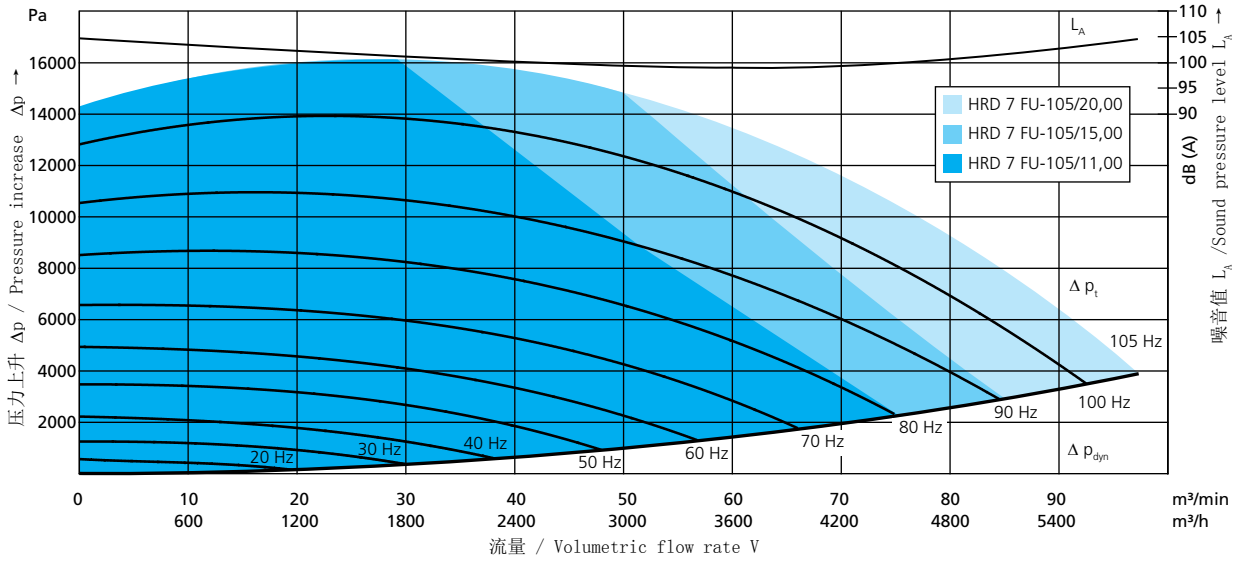
适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 7 FU*-105/11,0	32,0	16000	400 Δ	105	25,0	6200	11,0	92
HRD 7 FU*-105/15,0	50,0	16000	400 Δ	105	32,0	6250	15,0	110
HRD 7 FU*-105/20,0	97,0	16000	400 Δ	105	38,0	6220	20,0	110

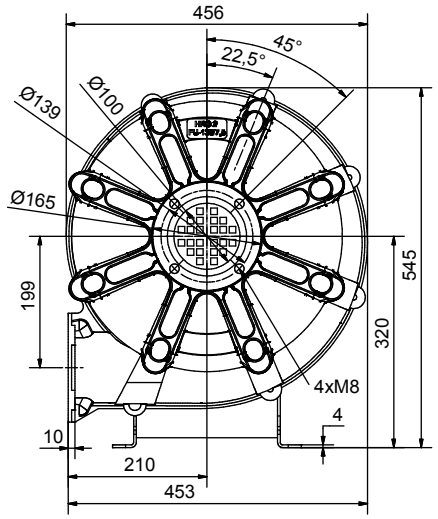
* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.

性能曲线 / Characteristic curves



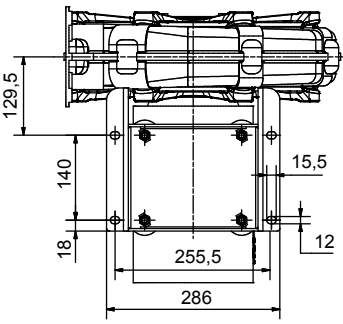
根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

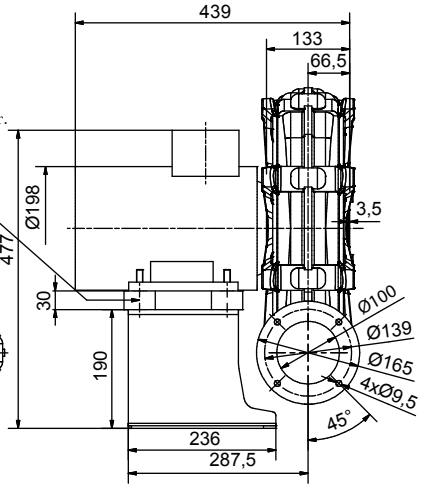
HRD 2 FU 130/7,5



注意：
不要使橡胶减震垫受到剪切力
电机必须水平安装

Attention:
Do not strain the rubber buffers to shear.
Operate only with horizontal motor shaft.





BOOSTED!

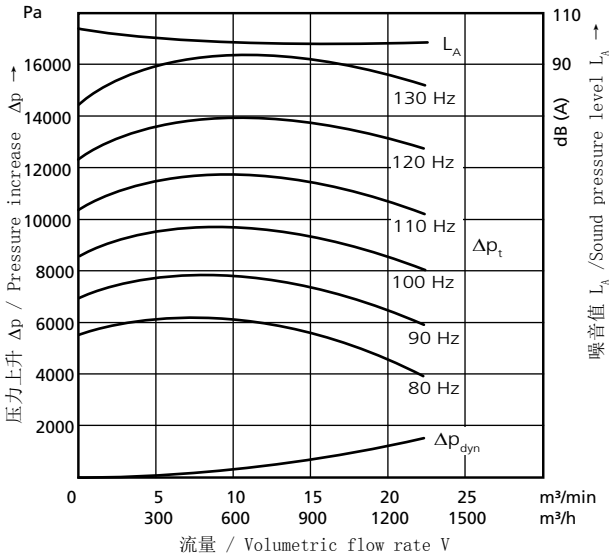
适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

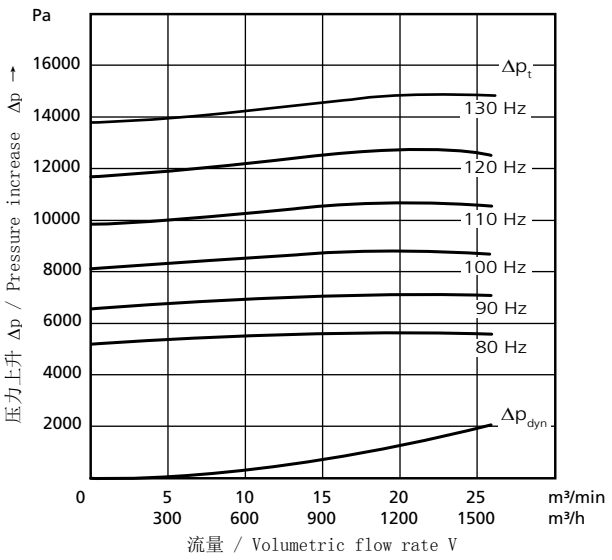
尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 2 FU* 130/7,5 Überdruck / Pressure	23,0	14600	400 Δ	130	16,5	7670	7,5	57
HRD 2 FU* 130/7,5 Unterdruck / Vacuum	26,0	13700	400 Δ	130	16,5	7670	7,5	57

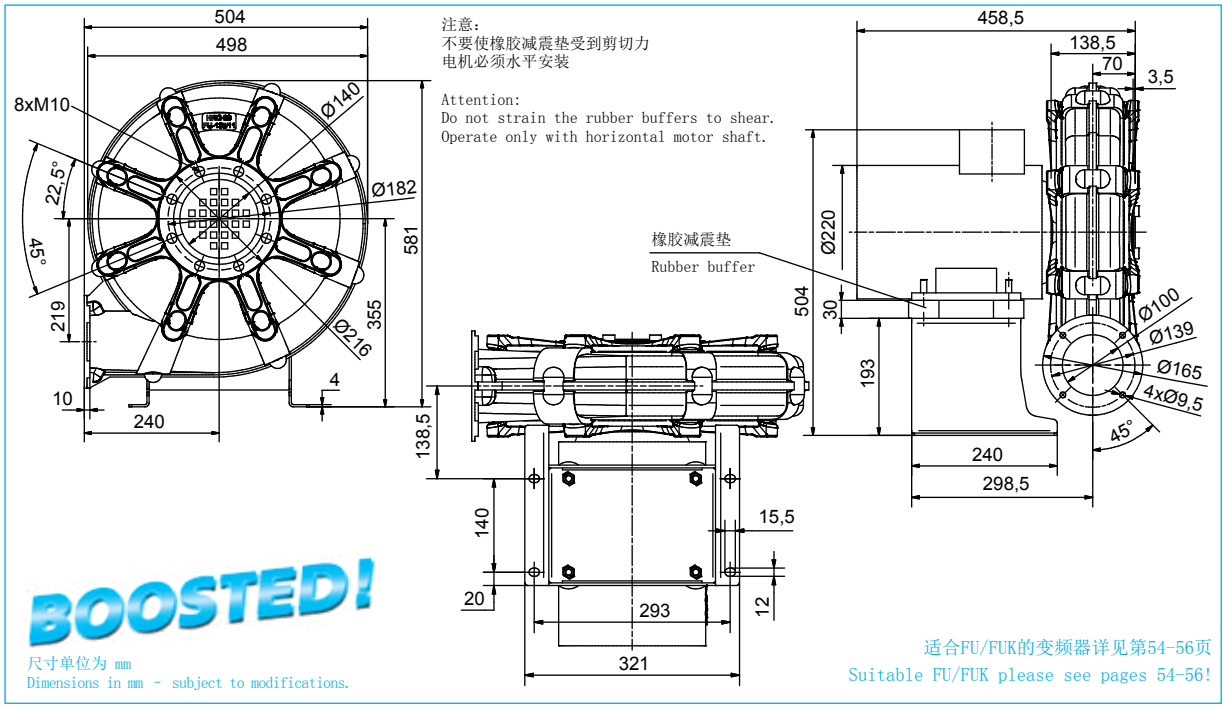
* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.

性能曲线 / Characteristic curves





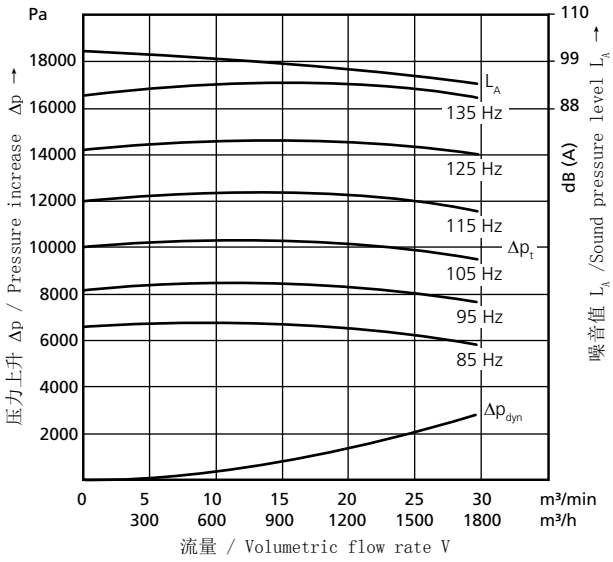
根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



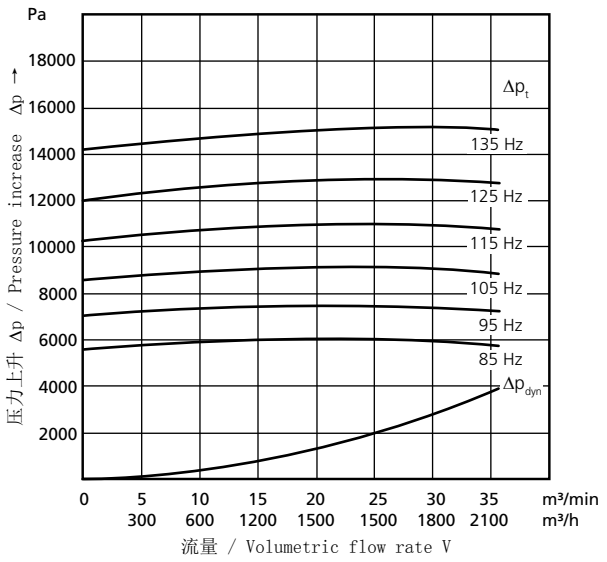
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 60 FU* 135/11,0 Überdruck / Pressure	30,0	16600	400 Δ	135	21,0	7965	11,0	64
HRD 60 FU* 135/11,0 Unterdruck / Vacuum	36,0	14100	400 Δ	135	21,0	7965	11,0	64

* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.

压力 / Pressure



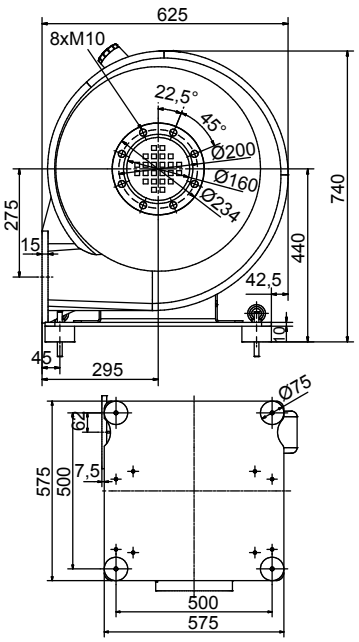
真空 / Vacuum



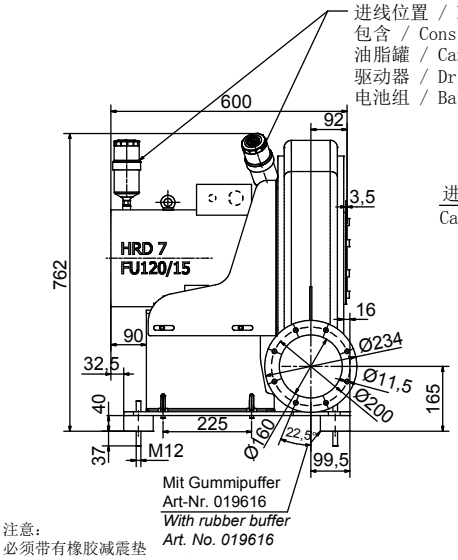
CN 09.14

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

HRD 7 FU 120/15, 0

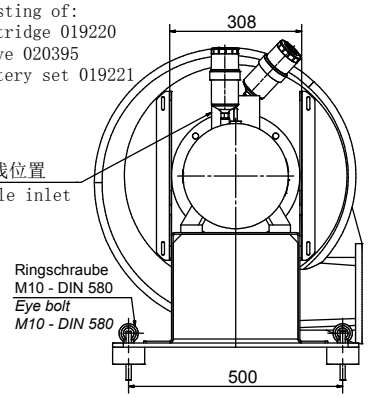


尺寸单位为 mm
Dimensions in mm - subject to modifications.



注意：
必须带有橡胶减震垫
避免橡胶减震垫承受剪切力
电机必须水平安装

Attention:
Operate only with enclosed rubber buffer.
Do not strain the rubber buffers to shear.
Operate only with horizontal motor shaft.



驱动部分由工厂安装好
加油装置随货一起发送

The drive has been set by the factory!
The retro fit kits are enclosed the delivery!

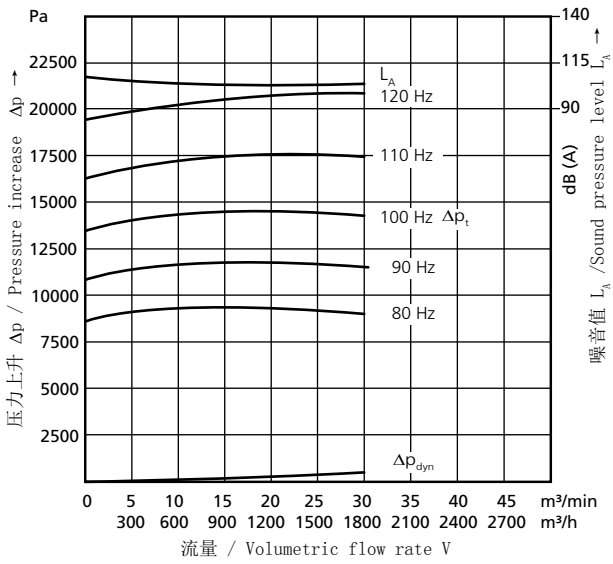
BOOSTED!

适合FU/FUK的变频器详见第54-56页
Suitable FU/FUK please see pages 54-56!

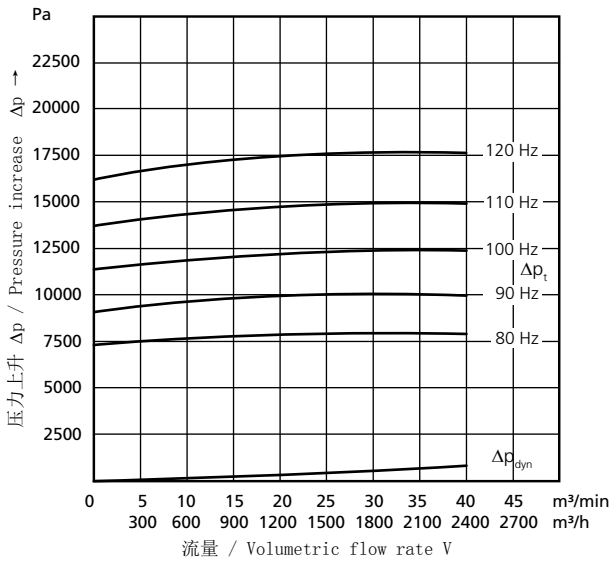
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 7 FU* 120/15, 0 Überdruck / Pressure	30, 0	20000	400 Δ	120	32, 0	7085	15, 0	138
HRD 7 FU* 120/15, 0 Unterdruck / Vacuum	40, 0	16500	400 Δ	120	32, 0	7085	15, 0	138

* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.

压力 / Pressure

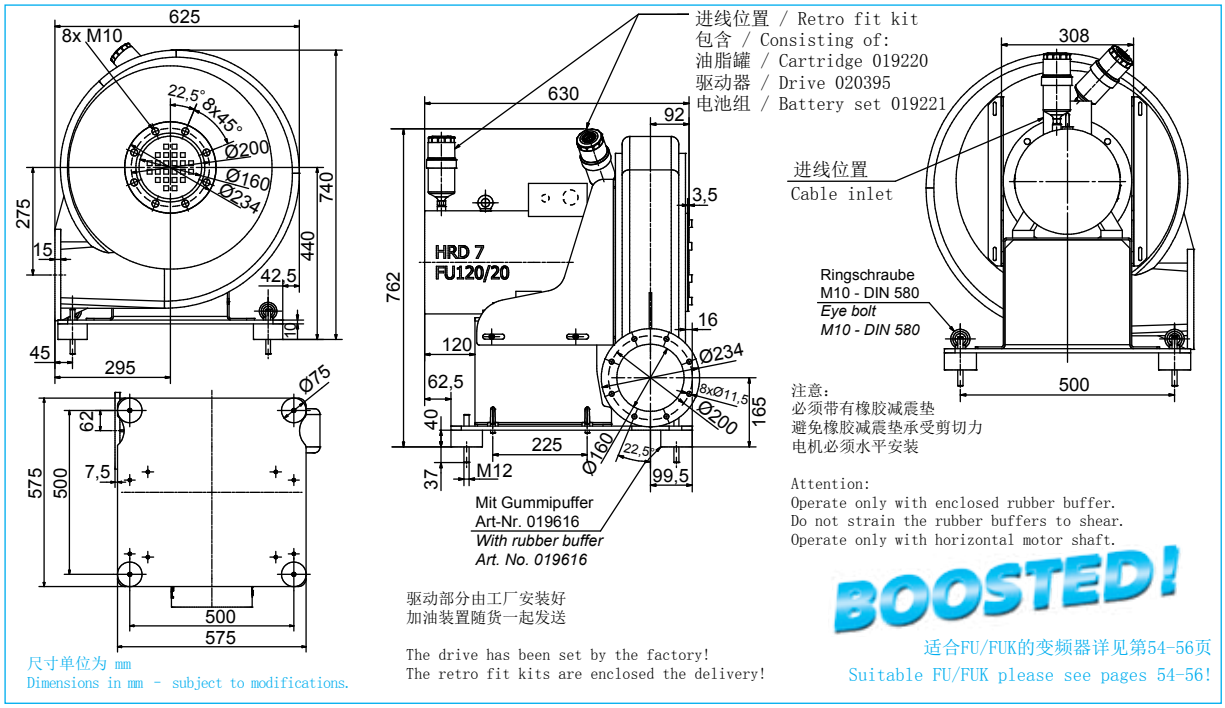


真空 / Vacuum



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

CN 09.14



尺寸单位为 mm
Dimensions in mm - subject to modifications.

驱动部分由工厂安装好
加油装置随货一起发送

The drive has been set by the factory!
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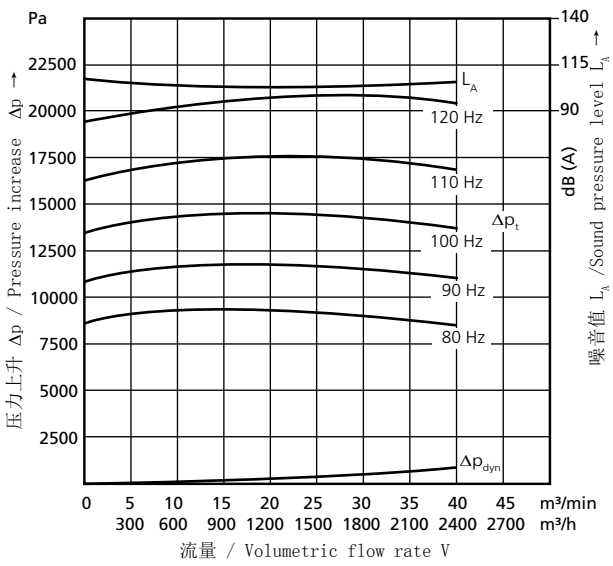
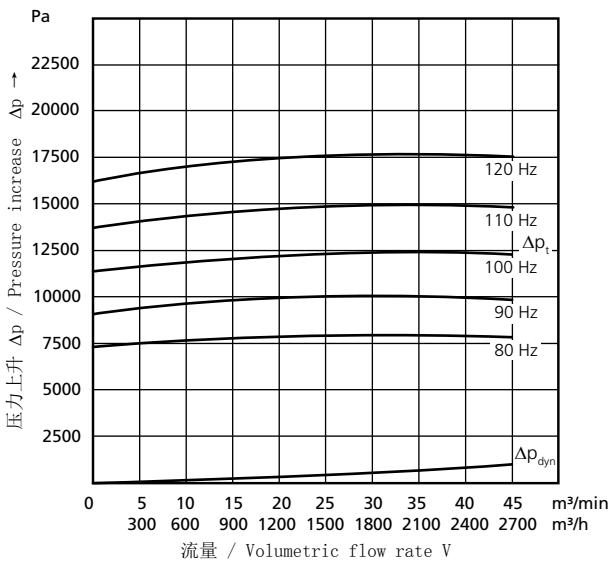
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	kg
HRD 7 FU* 120/20, 0 Überdruck / Pressure	40, 0	20000	400 Δ	120	40, 0	7085	20, 0	144
HRD 7 FU* 120/20, 0 Unterdruck / Vacuum	45, 0	16500	400 Δ	120	40, 0	7085	20, 0	144

* = 必须连接变频器才可以使用 | A variable speed drive must be installed with this blower.

压力 / Pressure

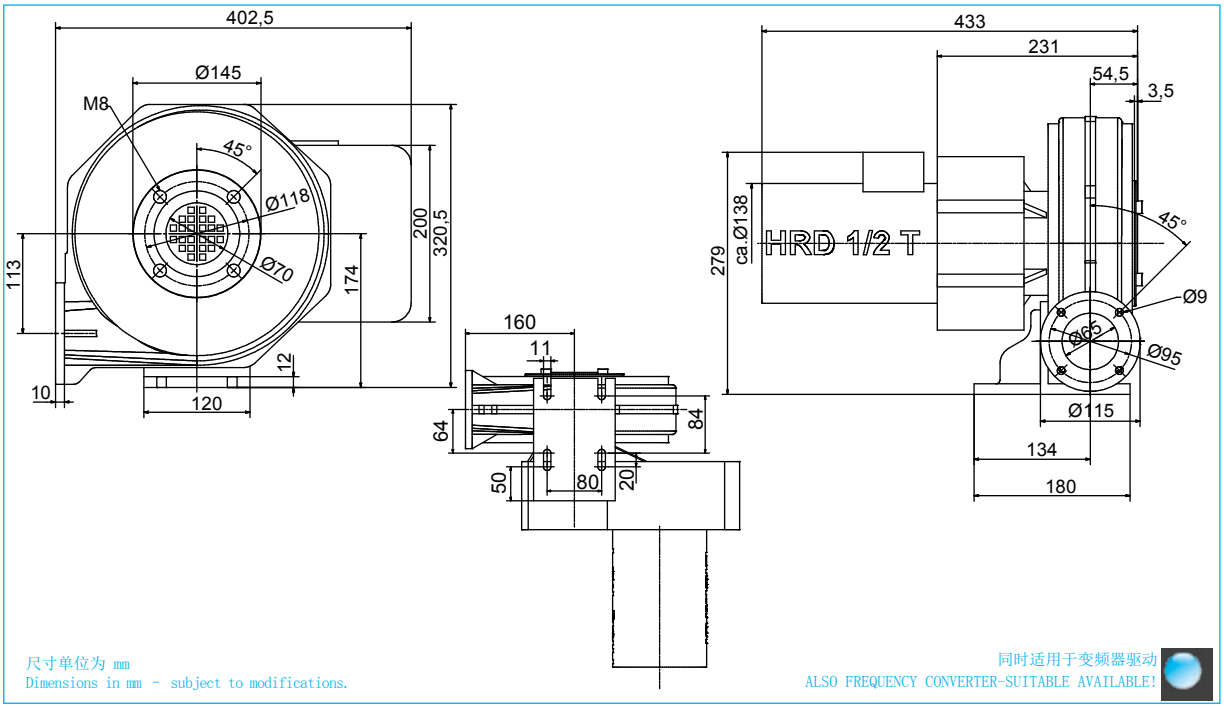


真空 / Vacuum



CN 09.14

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



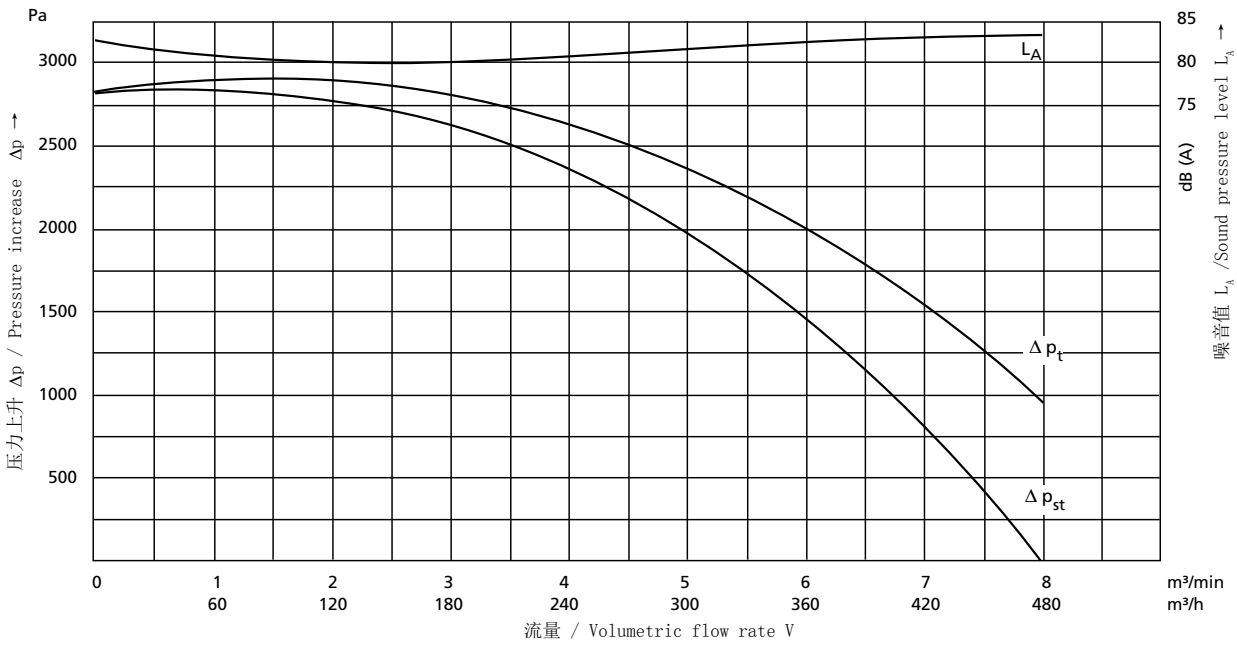
尺寸单位为 mm
Dimensions in mm - subject to modifications.

同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

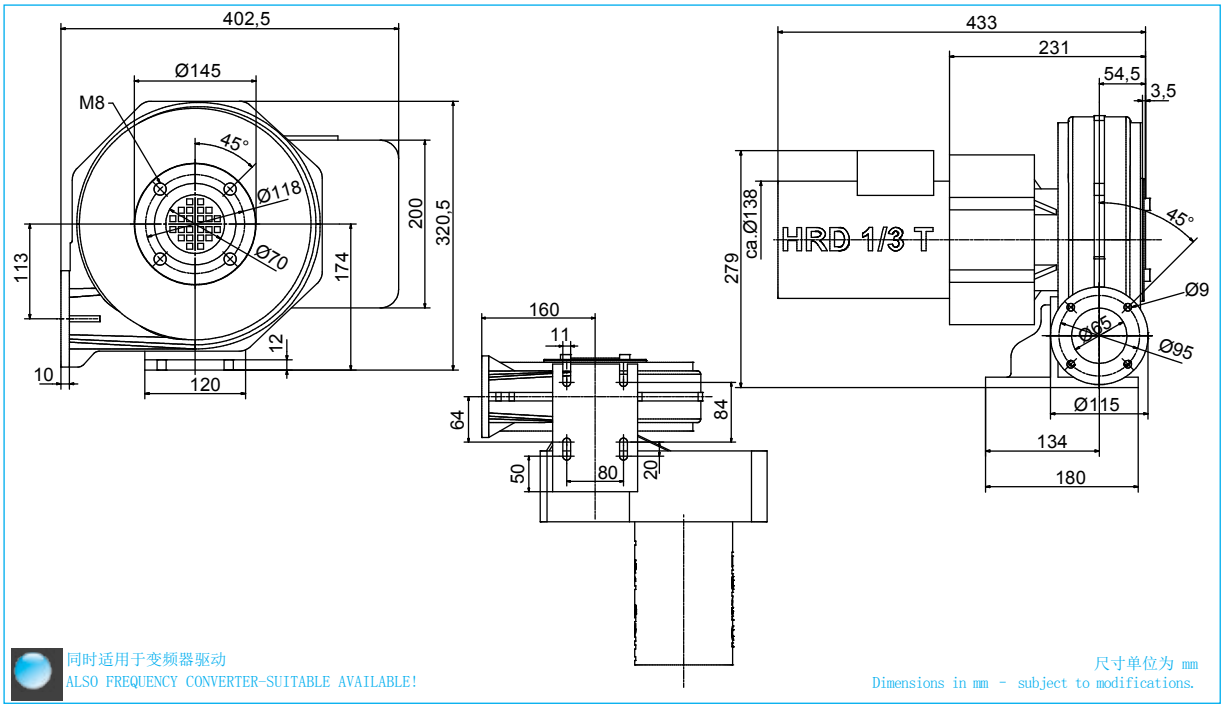
型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	风机转速 [1] Blower speed [1]	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	min^{-1}	kg
HRD 1/2 T	8,0	2800	230/400	50	2,50/1,45	2840	0,55	4550	18
HRD 1/2 T	8,0	3000	277/480	60	2,50/1,45	3410	0,66	4550	18

[1] 转速偏差+/-5%属于正常 / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



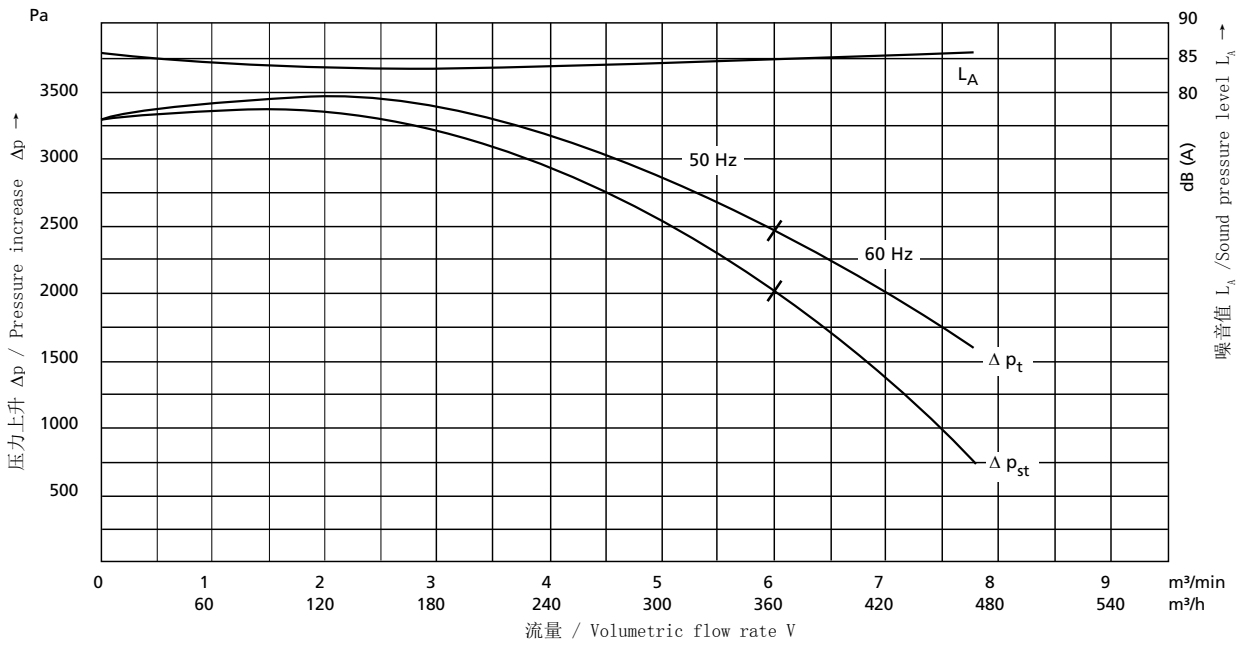
同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	频率 Frequency	电流 Current consump-tion	风机转速（转/每分钟） Number of revolutions	电机功率 Motor rating	风机转速 [1] Blower speed [1]	重量（大约） Weight (approx.)
	m^3/min	Pa	V	Hz	A	min^{-1}	kW	min^{-1}	kg
HRD 1/3 T	6,0	3300	230/400	50	2,50/1,45	2840	0,55	5500	19
HRD 1/3 T	8,5	3200	277/480	60	2,50/1,45	3410	0,66	5500	19

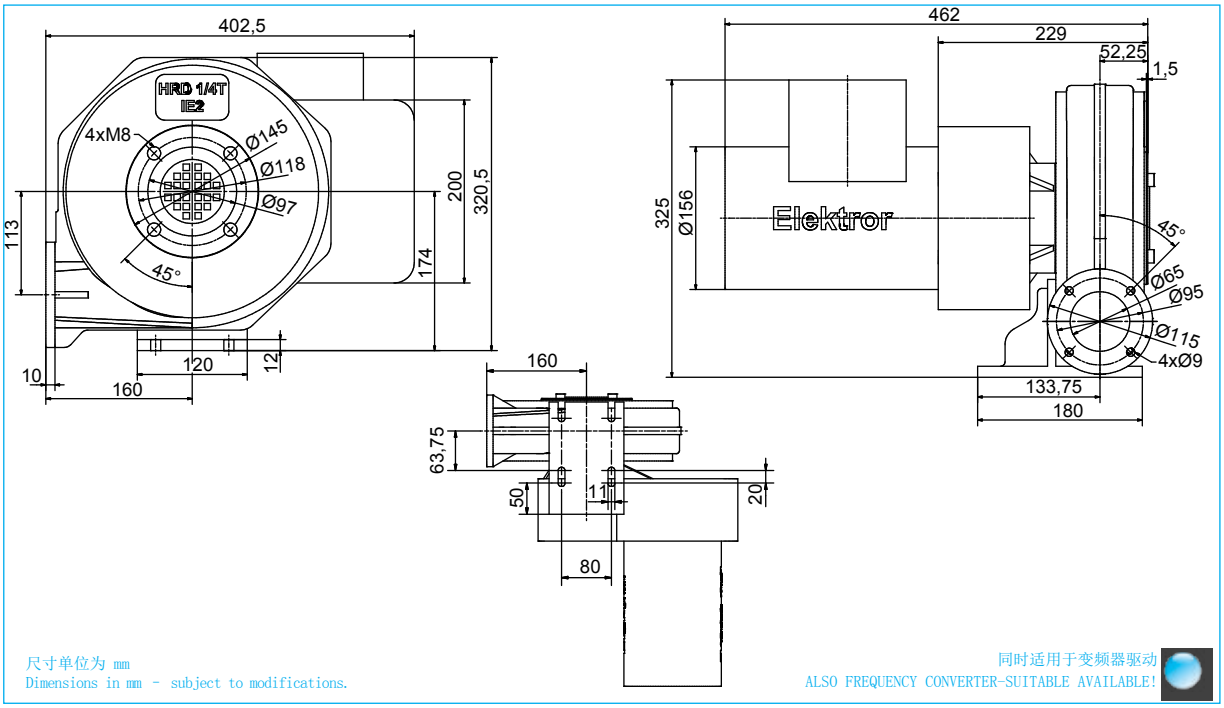
[1] 转速偏差+/-5%属于正常 / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



运行时勿使鼓风机排气口完全开放 / Blower not to be operated with free discharge.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



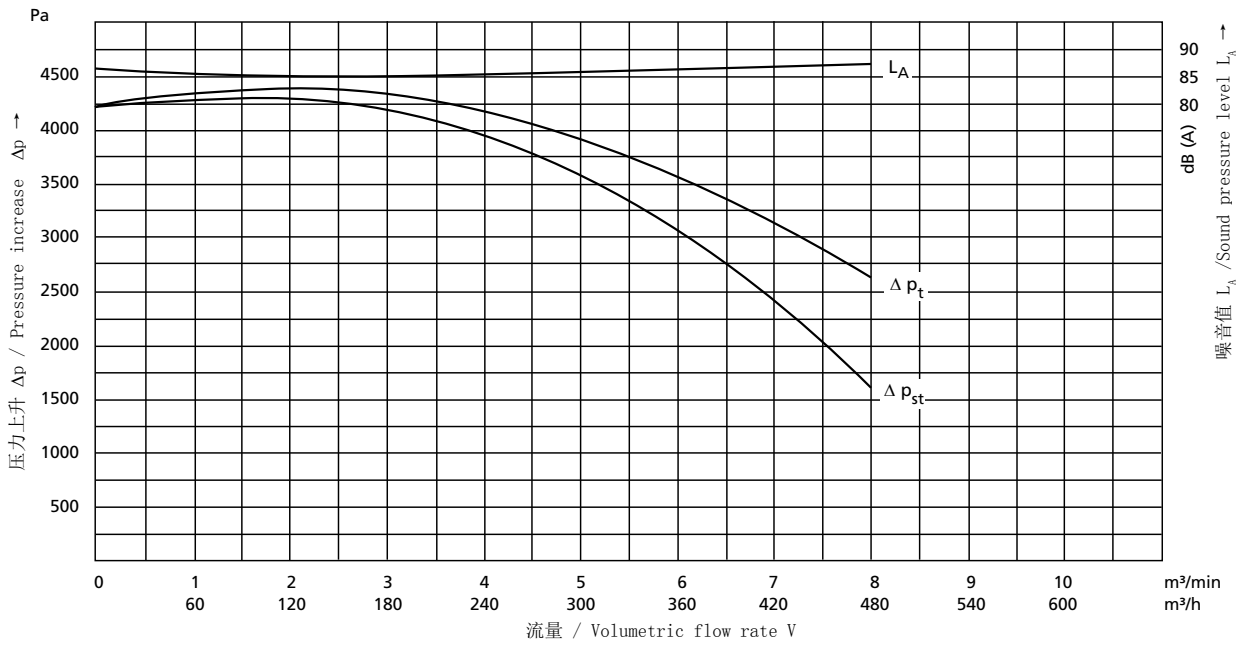
尺寸单位为 mm
Dimensions in mm - subject to modifications.

同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 1/4 T	IE2	50	8,0	4200	230/400	2,95/1,70	2850	0,75	5500	21
	IE2	60	8,0	4200	230/400	3,55/2,05	3430	0,90	5500	21
	NEMA*	60	8,0	4200	277/480	2,95/1,71	3430	0,90	5500	21

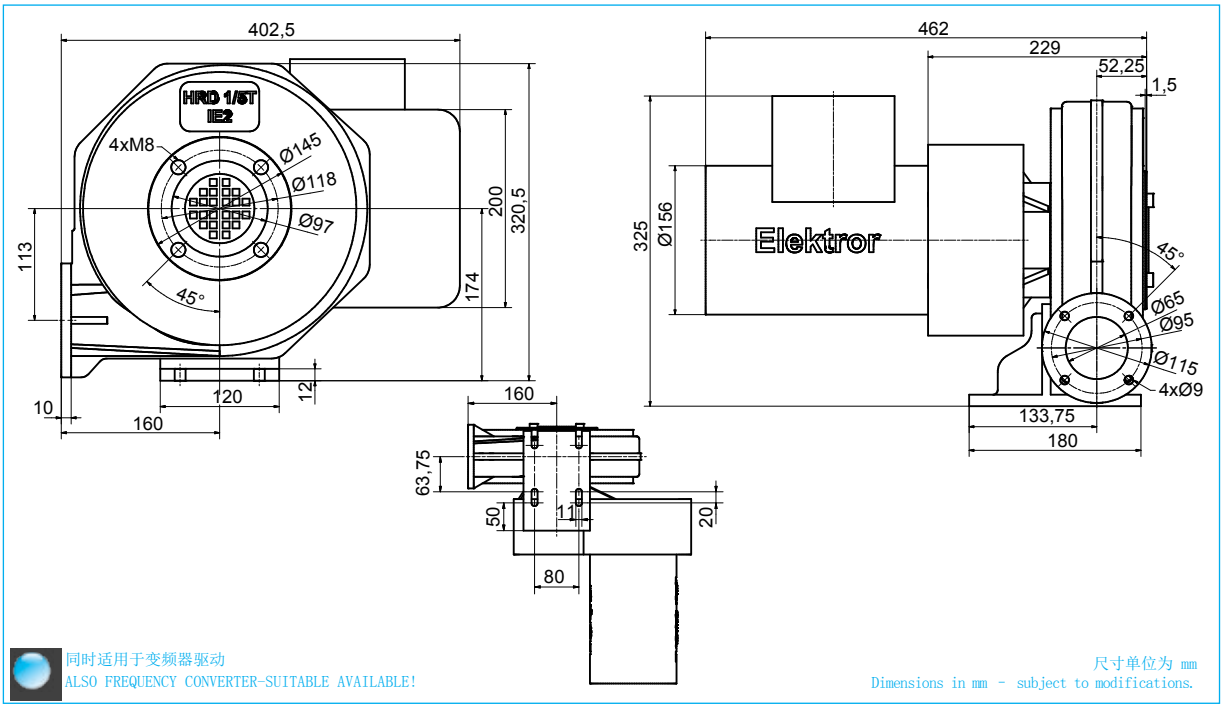
* NEMA Energy Efficient 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

CN 09.14



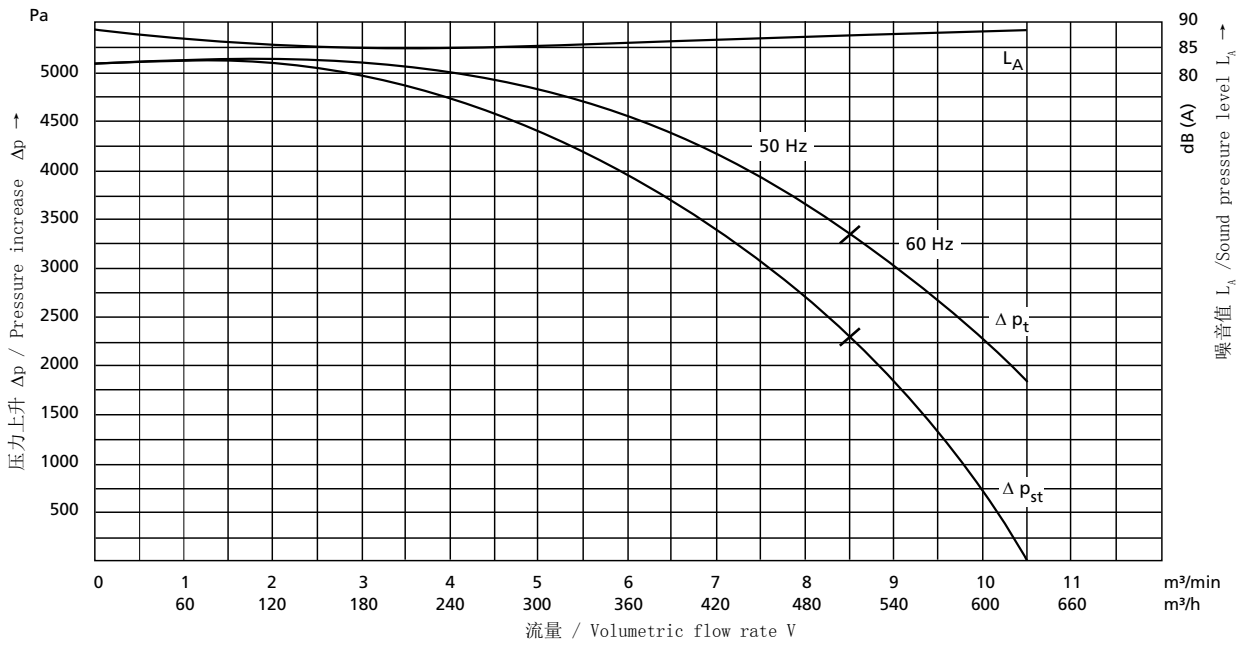
同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 [1] Blower speed [1]	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 1/5 T	IE2	50	8,5	5100	230/400	4,00/2,30	2830	1,10	6000	24
	IE2	60	10,5	5000	230/400	4,45/2,60	3400	1,32	6000	24
	NEMA*	60	10,5	5000	277/480	3,70/2,15	3400	1,32	6000	24

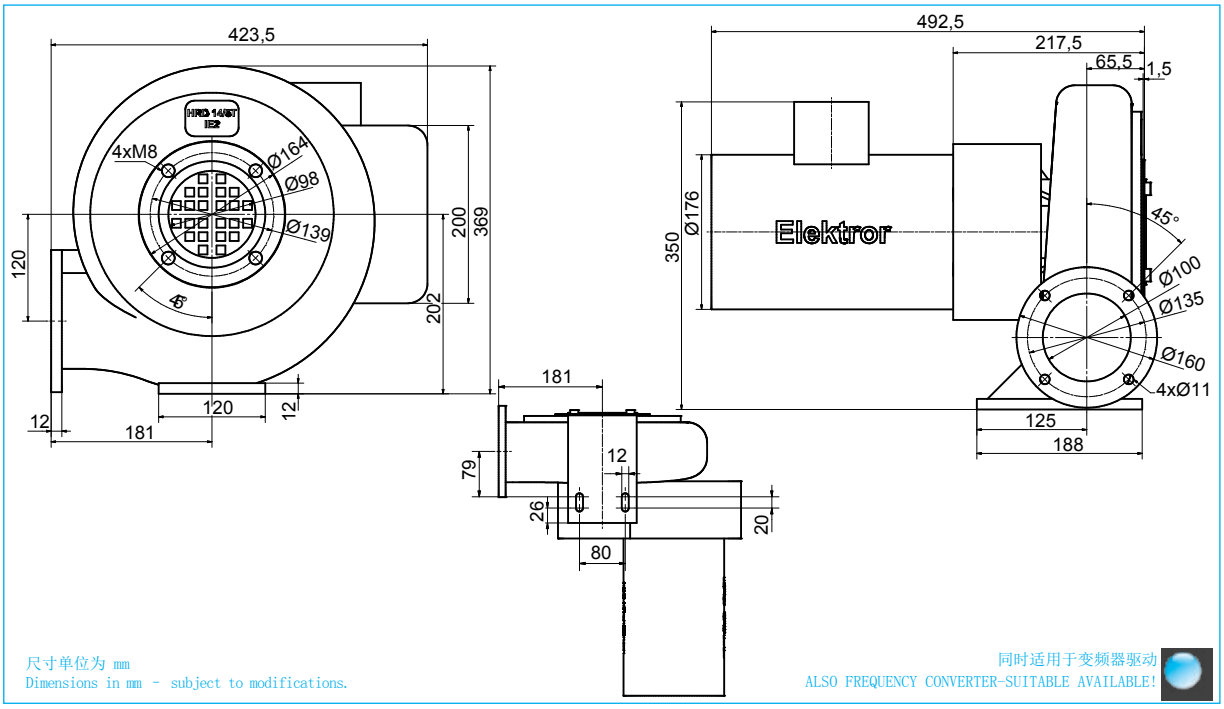
* NEMA Energy Efficient [1] 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

HRD 14/5 T



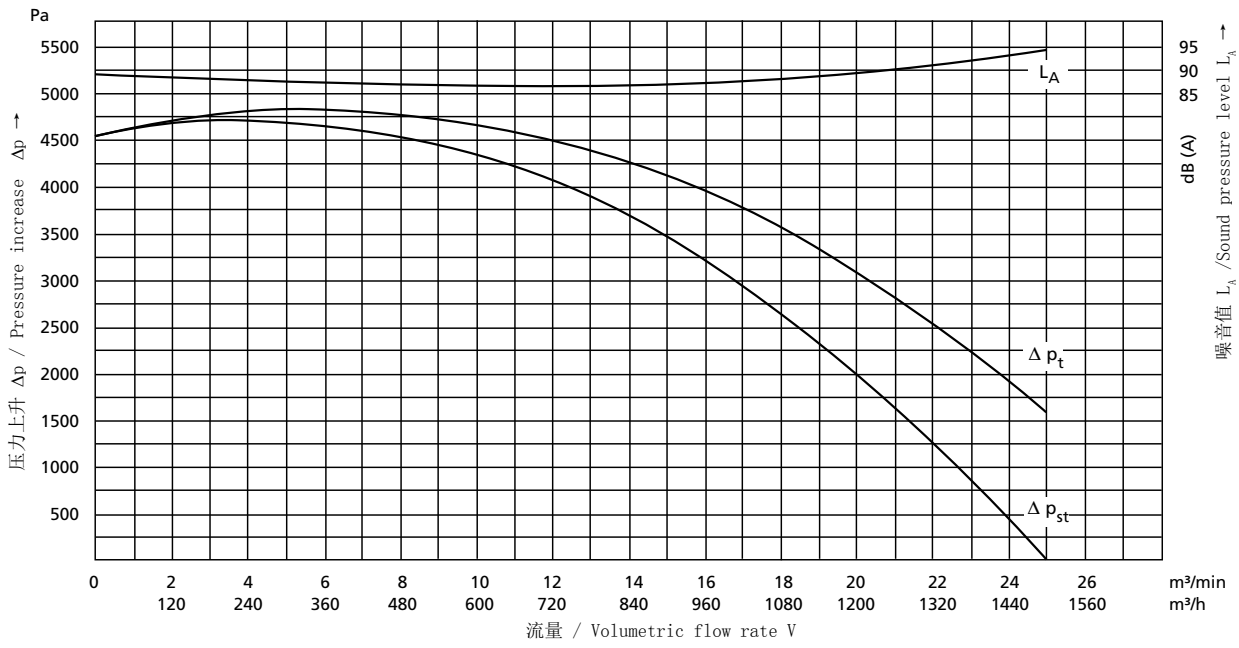
尺寸单位为 mm
Dimensions in mm - subject to modifications.

同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 14/5 T	IE2	50	25, 0	4500	230/400	7, 50/4, 35	2870	2, 20	6000	29
	IE2	60	25, 0	4500	230/400	9, 20/5, 30	3480	2, 64	6000	29
	NEMA*	60	25, 0	4500	277/480	7, 70/4, 45	3480	2, 64	6000	29

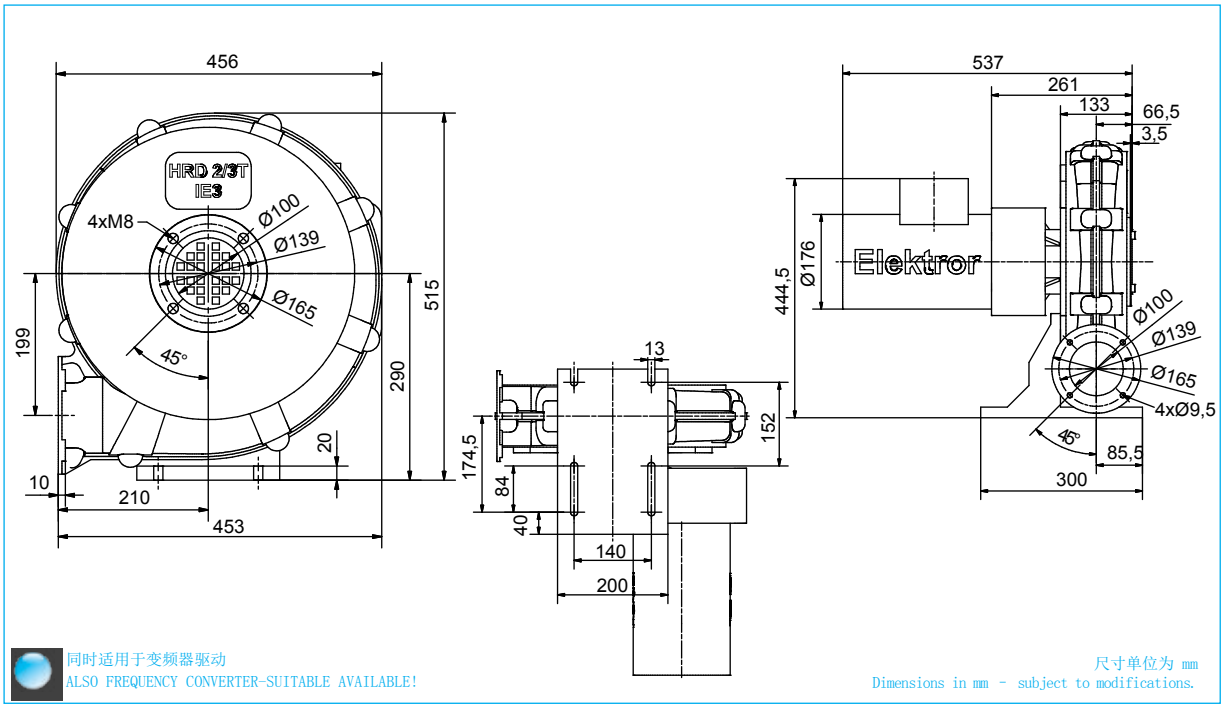
* NEMA Energy Efficient 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

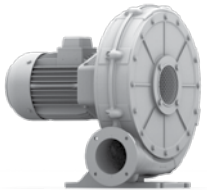
性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

CN 09.14

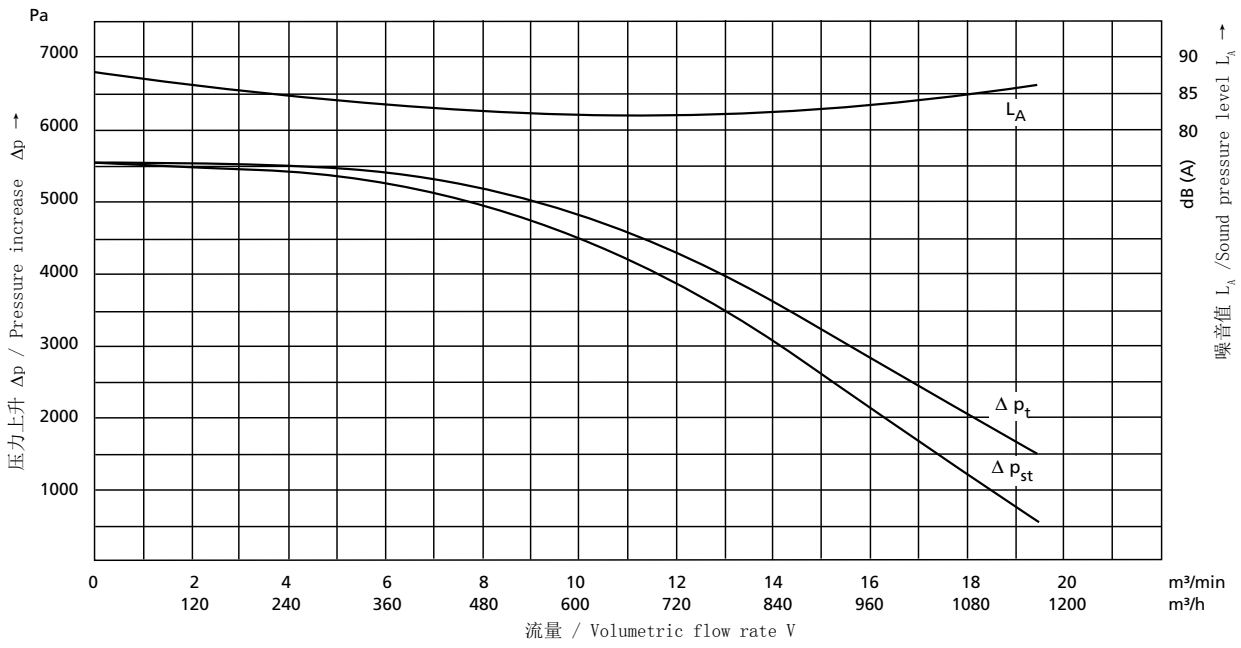




型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 2/3 T	IE2	50	19,5	5600	230/400	5,55/3,20	2870	1,50	4500	32
	IE2	60	21,5	5900	230/400	6,50/3,80	3465	1,80	4500	32
	NEMA*	60	21,5	5900	277/480	5,50/3,15	3465	1,80	4500	32

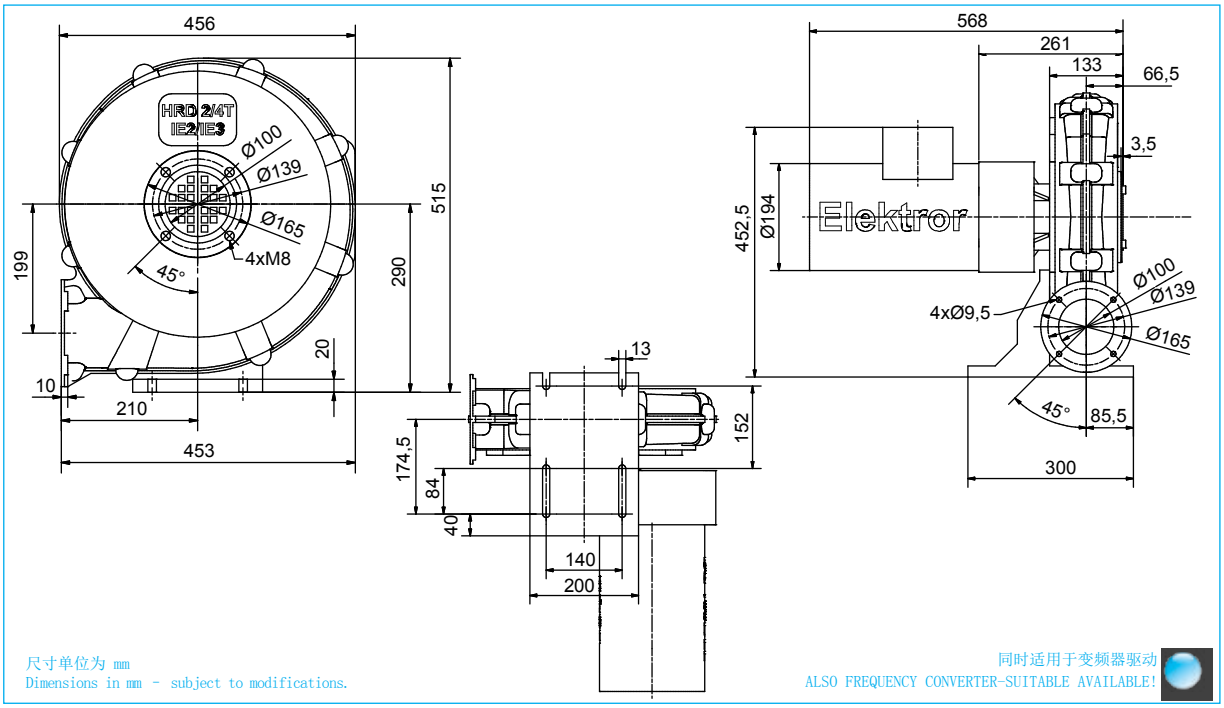
* NEMA Energy Efficient 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



运行时勿使鼓风机排气口完全开放 / Blower not to be operated with free discharge.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.



尺寸单位为 mm
Dimensions in mm - subject to modifications.

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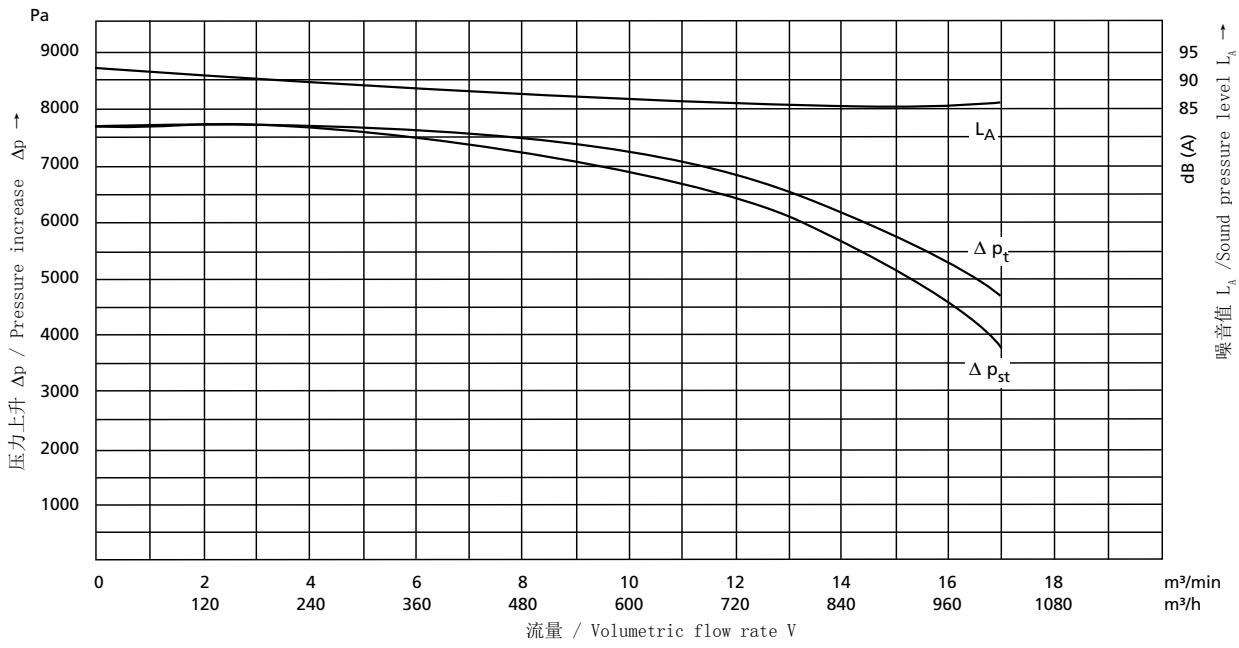
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 2/4 T	IE2	50	17,0	7700	230/400	10,4/6,00	2890	3,00	5200	39
	IE2	60	17,0	7700	230/400	12,5/7,20	3500	3,60	5200	39
	NEMA*	60	17,0	7700	277/480	10,4/6,00	3500	3,60	5200	39

* NEMA Energy Efficient 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



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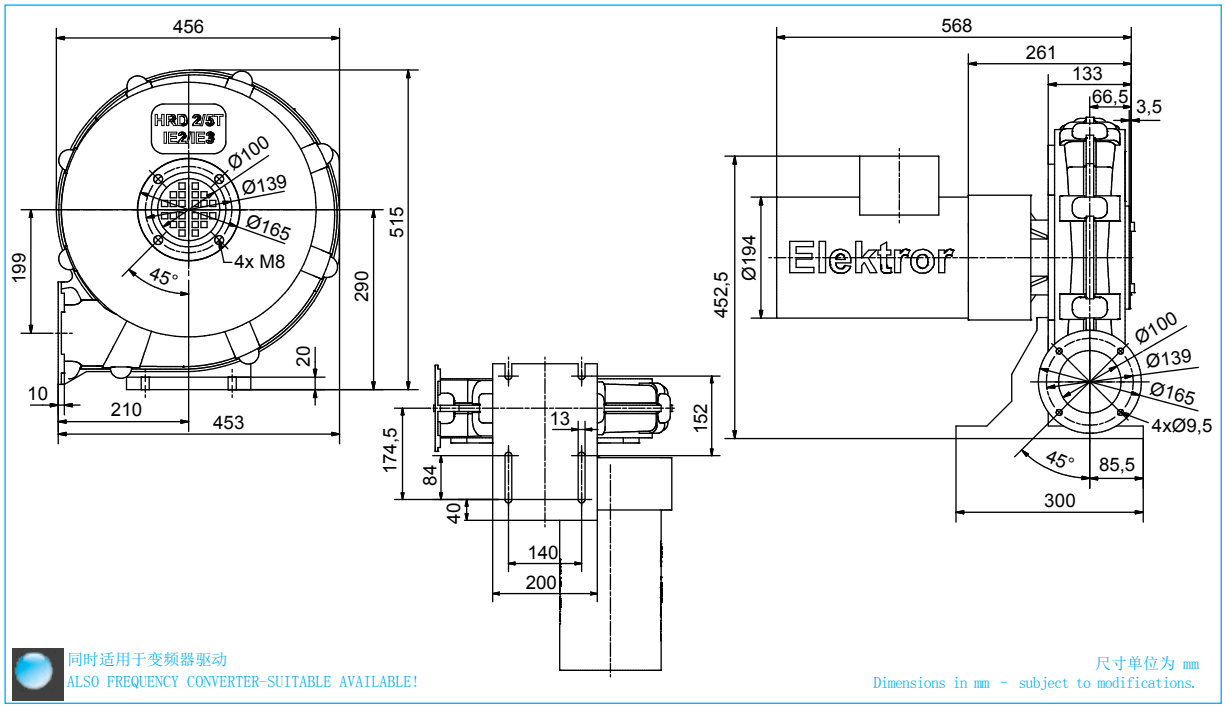

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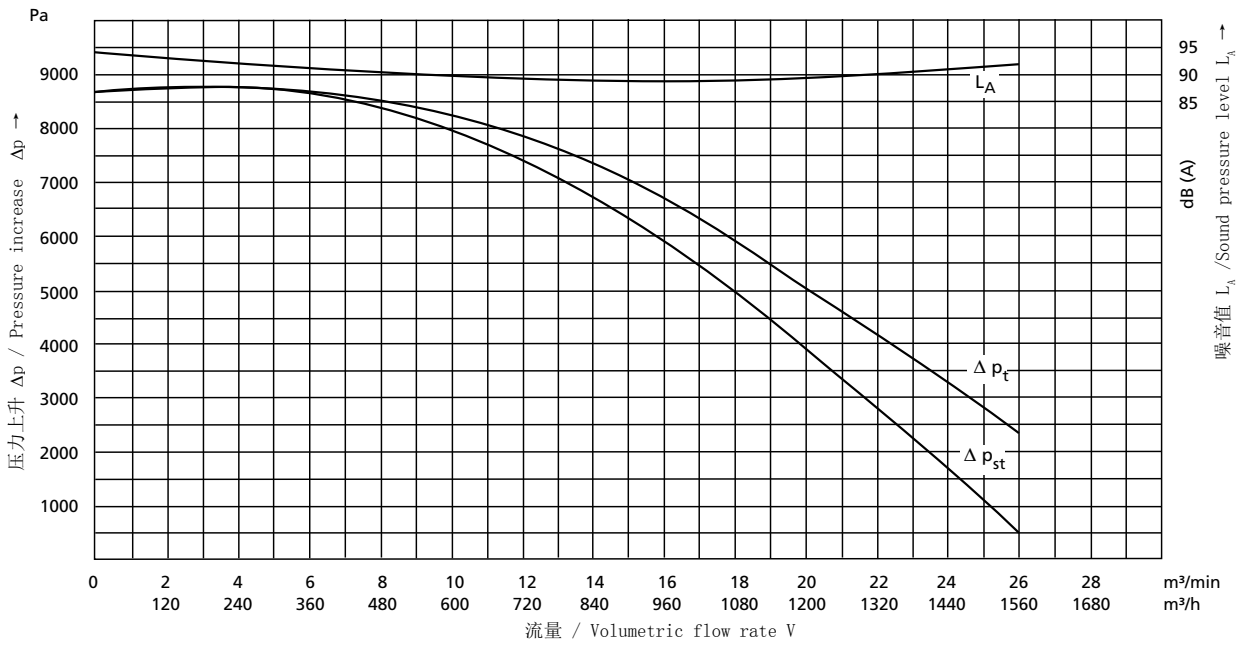
		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 2/5 T	IE2	50	26,0	8600	230/400	10,4/6,00	2890	3,00	5600	43
	IE2	60	27,0	8600	230/400	12,5/7,20	3500	3,60	5600	43
	NEMA*	60	27,0	8600	277/480	10,4/6,00	3500	3,60	5600	43

* NEMA Energy Efficient 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



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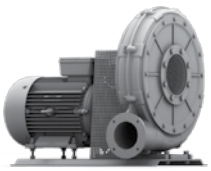

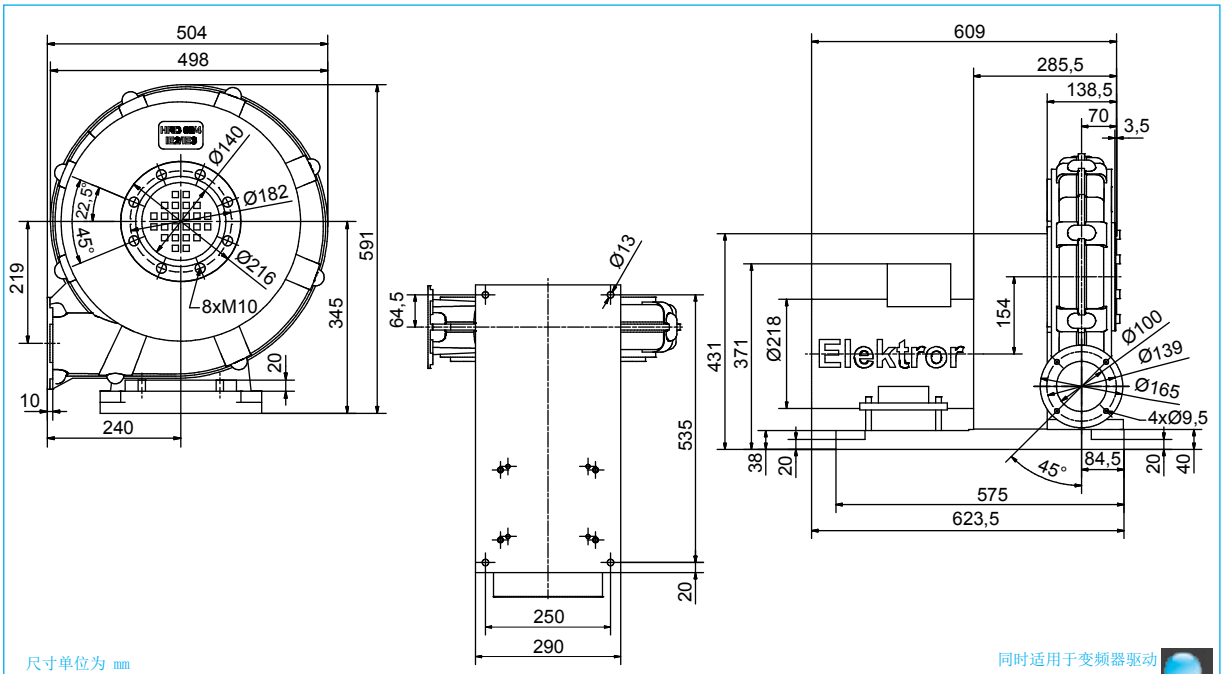

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		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 60/4	IE2	50	20,0	10150	400 Δ	7,90	2935	4,00	6100	65
	IE2	60	20,0	9600	400 Δ	9,20	3525	4,80	6100	65
	NEMA*	60	20,0	9600	480 Δ	7,60	3525	4,80	6100	65

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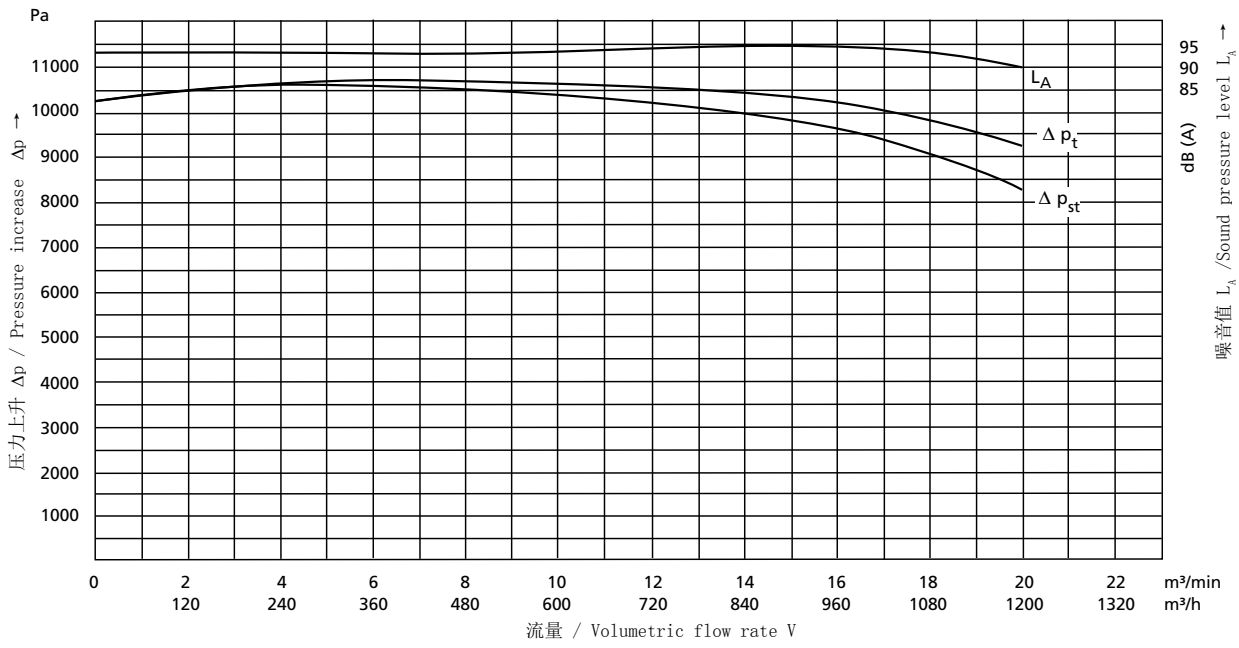
性能曲线 / Characteristic curves



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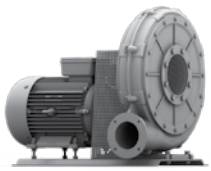

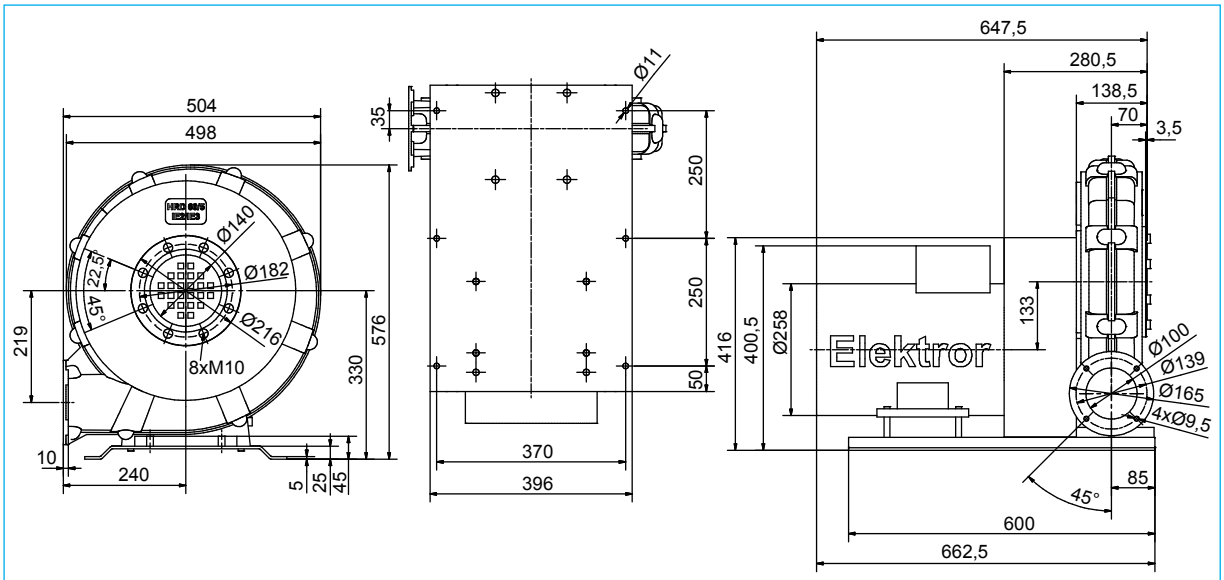

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		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 60/5	IE2	50	22,0	11400	400 Δ	10,5	2940	5,50	6350	85
	IE2	60	22,0	11000	400 Δ	12,4	3540	6,60	6350	85
	NEMA*	60	22,0	11000	480 Δ	10,3	3540	6,60	6350	85

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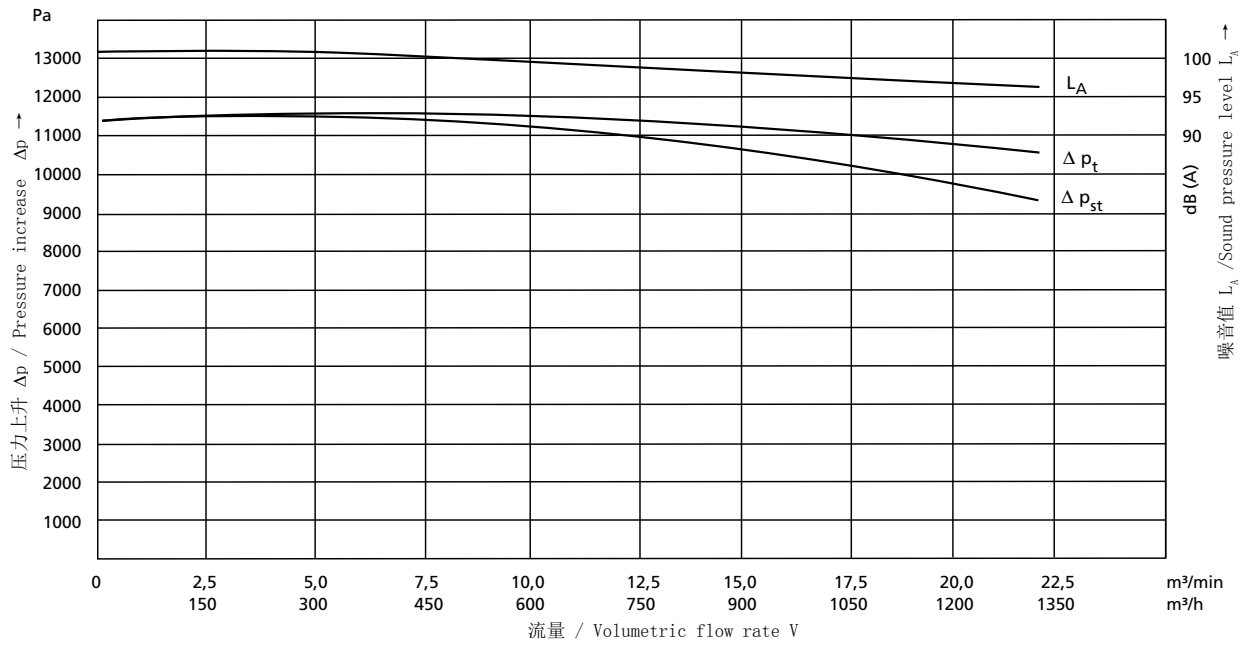
性能曲线 / Characteristic curves



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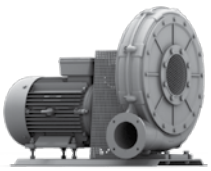

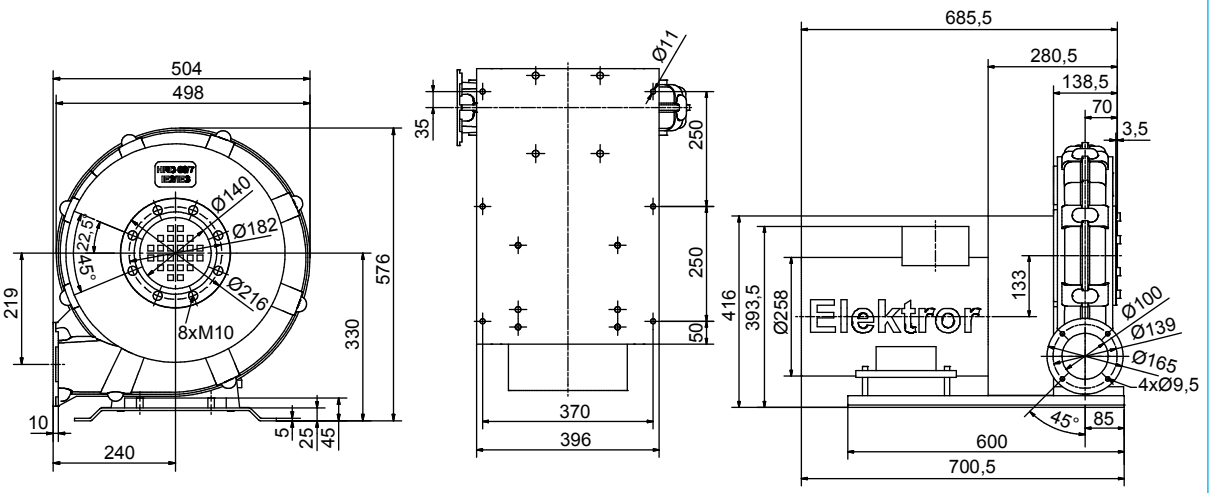

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		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 60/7	IE3	50	47,0	11400	400 Δ	13,4	2935	7,50	6350	93
	IE3	60	46,0	11000	400 Δ	16,1	3530	9,00	6350	93
	NEMA*	60	46,0	11000	480 Δ	13,4	3530	9,00	6350	93

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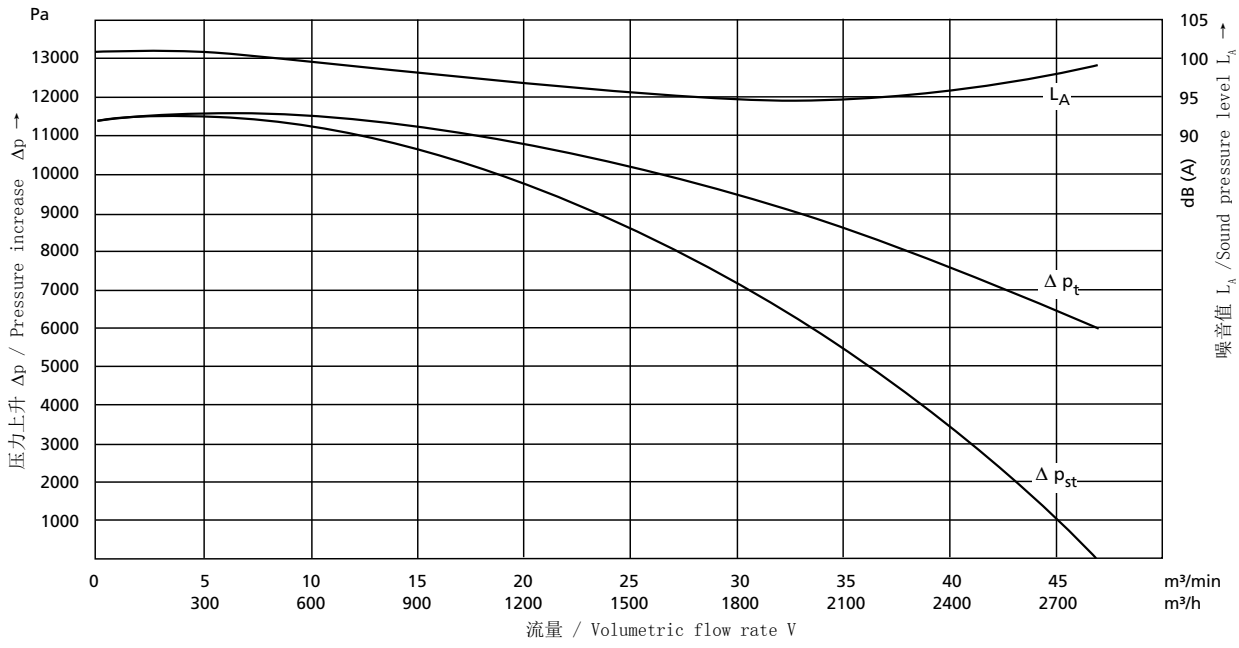
性能曲线 / Characteristic curves



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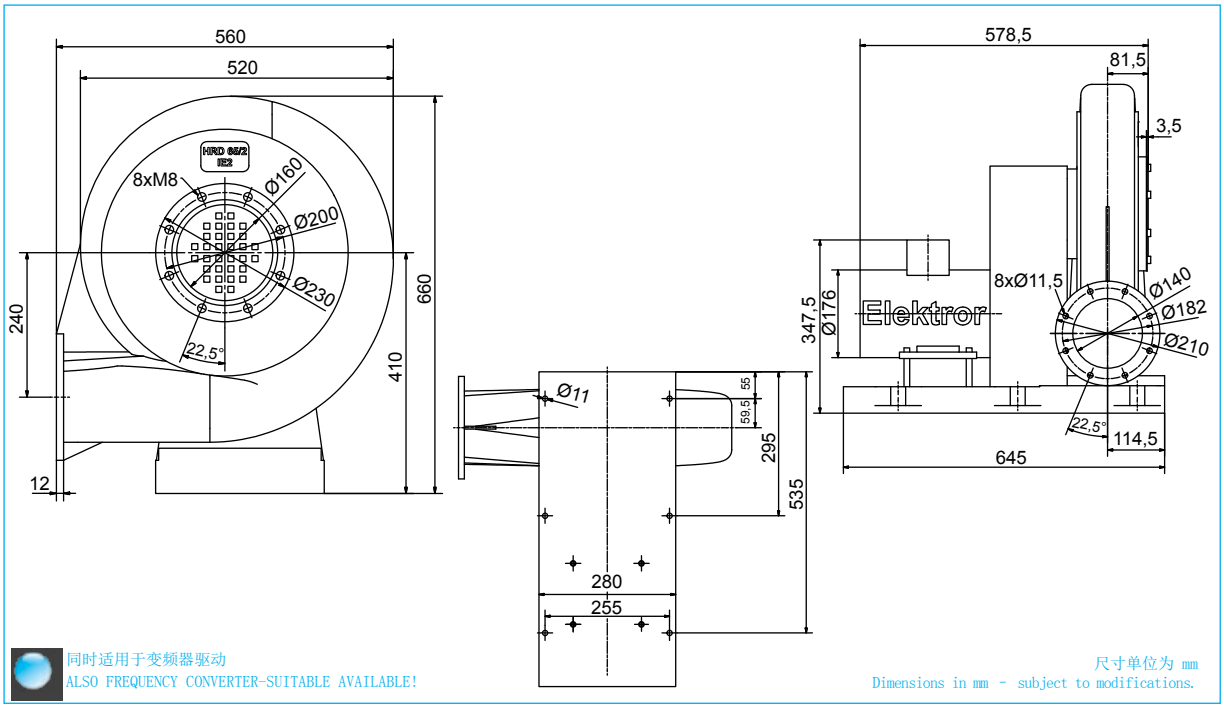

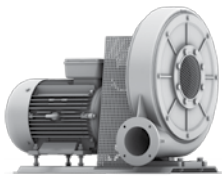

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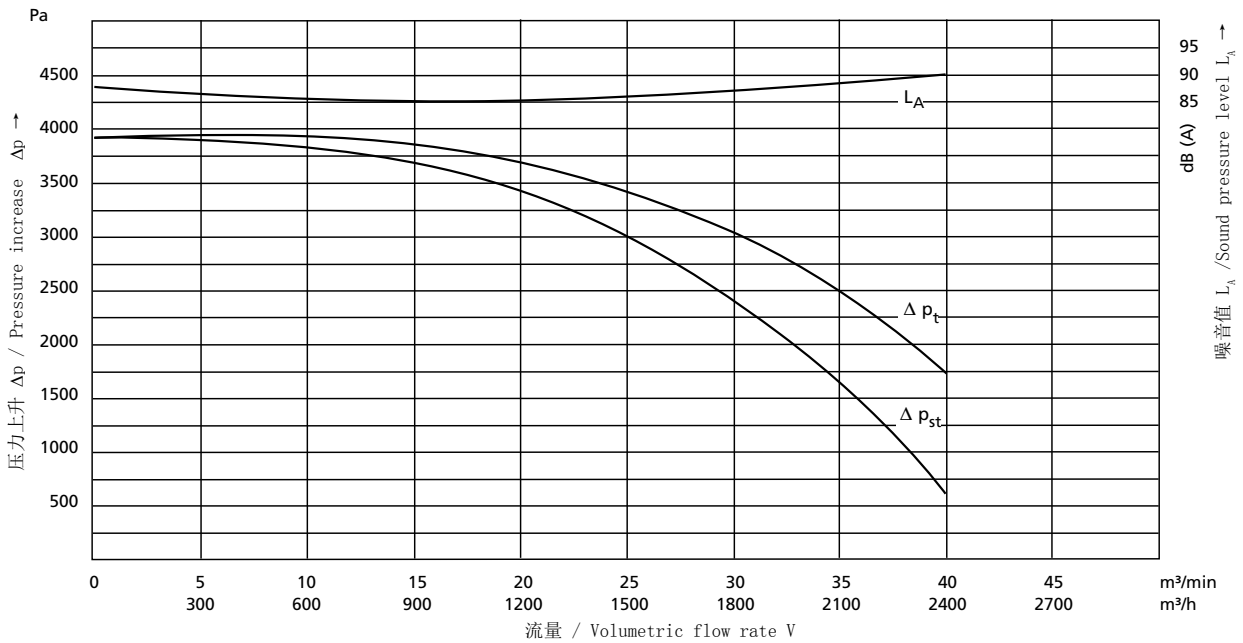
		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 65/2	IE2	50	40,0	3900	230/400	7,50/4,35	2870	2,20	3900	63
	IE2	60	44,0	4000	230/400	9,20/5,30	3480	2,64	3900	63
	NEMA*	60	44,0	4000	277/480	7,70/4,45	3480	2,64	3900	63

* NEMA Premium [1] 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



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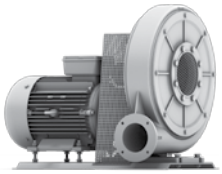

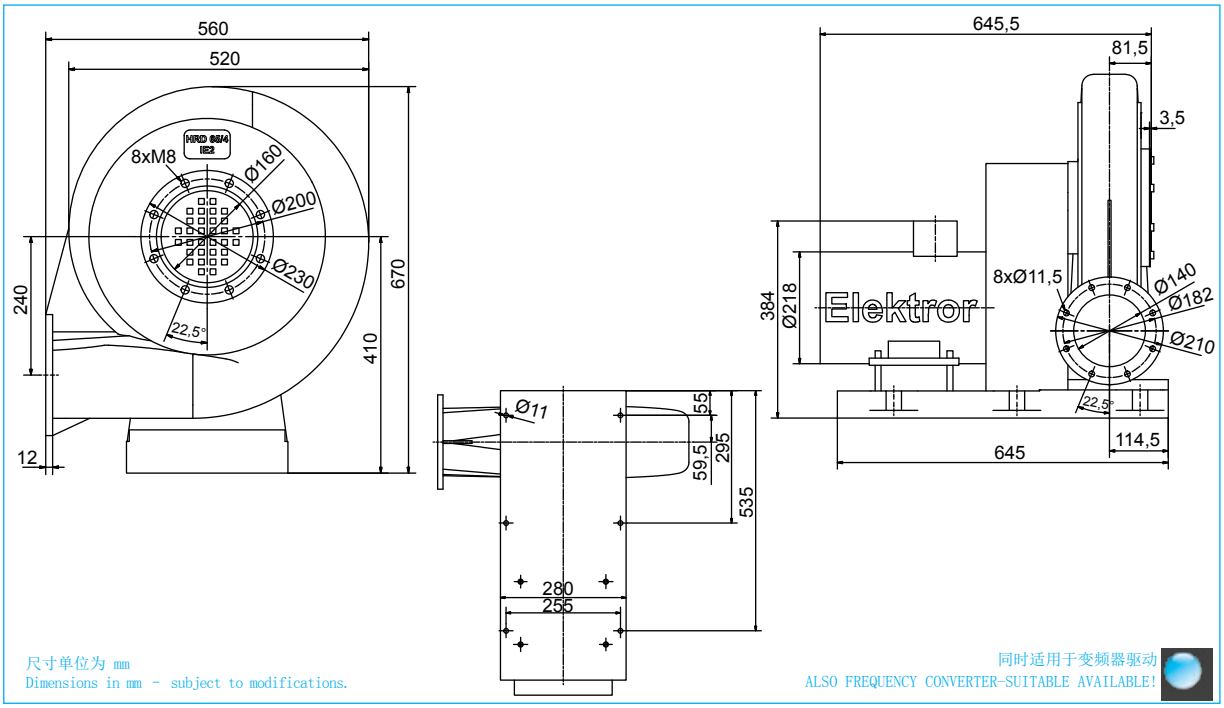

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型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 65/4	IE2	50	52,0	5900	400 Δ	7,90	2935	4,00	4850	72
	IE2	60	52,0	5900	400 Δ	9,20	3525	4,80	4850	72
	NEMA*	60	52,0	5900	480 Δ	7,60	3525	4,80	4850	72

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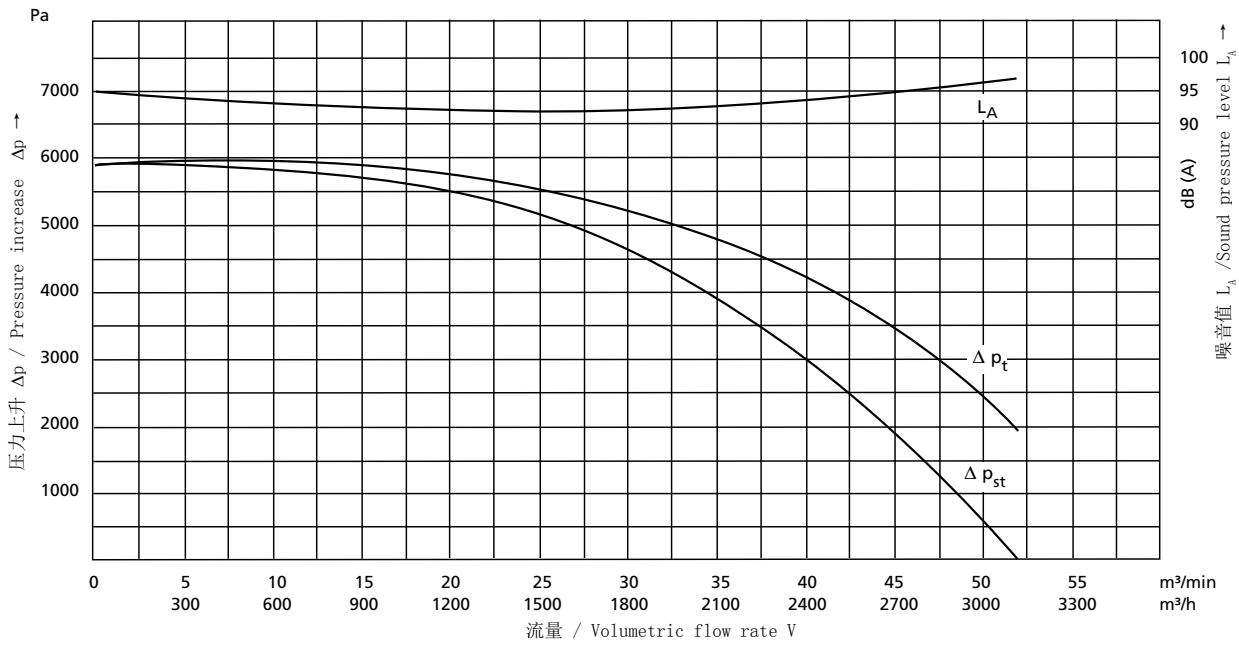

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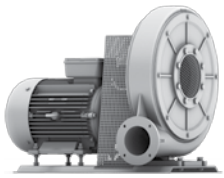

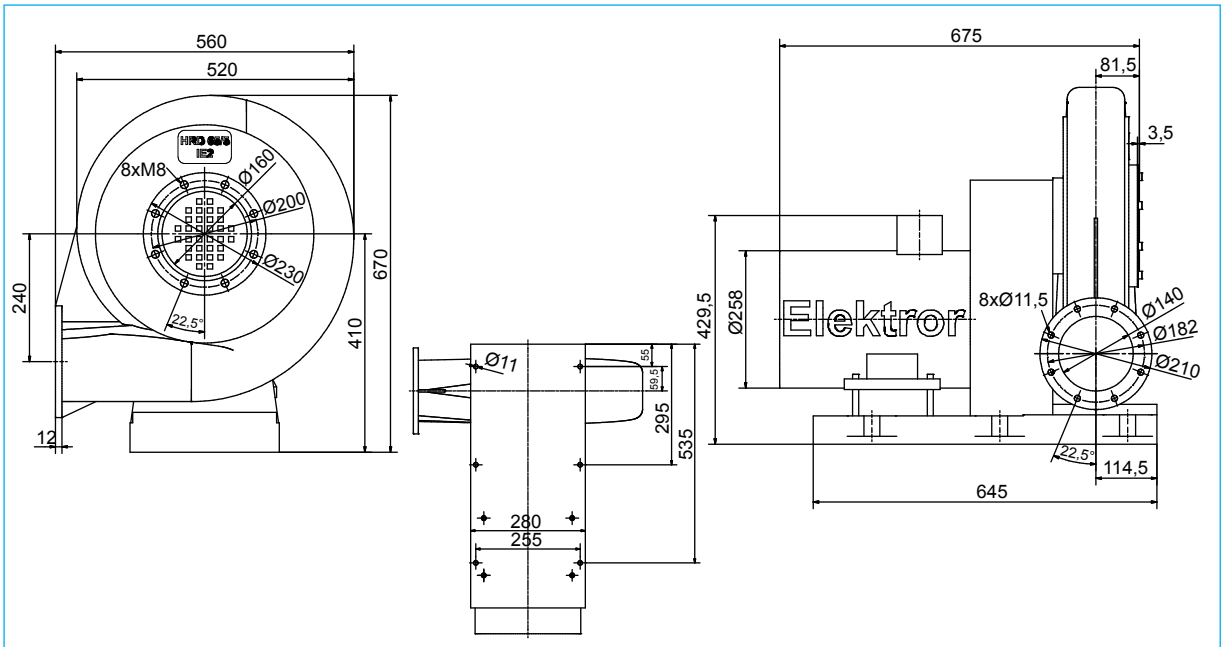

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		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 65/5	IE2	50	56,0	7500	400 Δ	10,5	2940	5,50	5300	80
	IE2	60	56,0	7700	400 Δ	12,4	3540	6,60	5300	80
	NEMA*	60	56,0	7700	480 Δ	10,3	3540	6,60	5300	80

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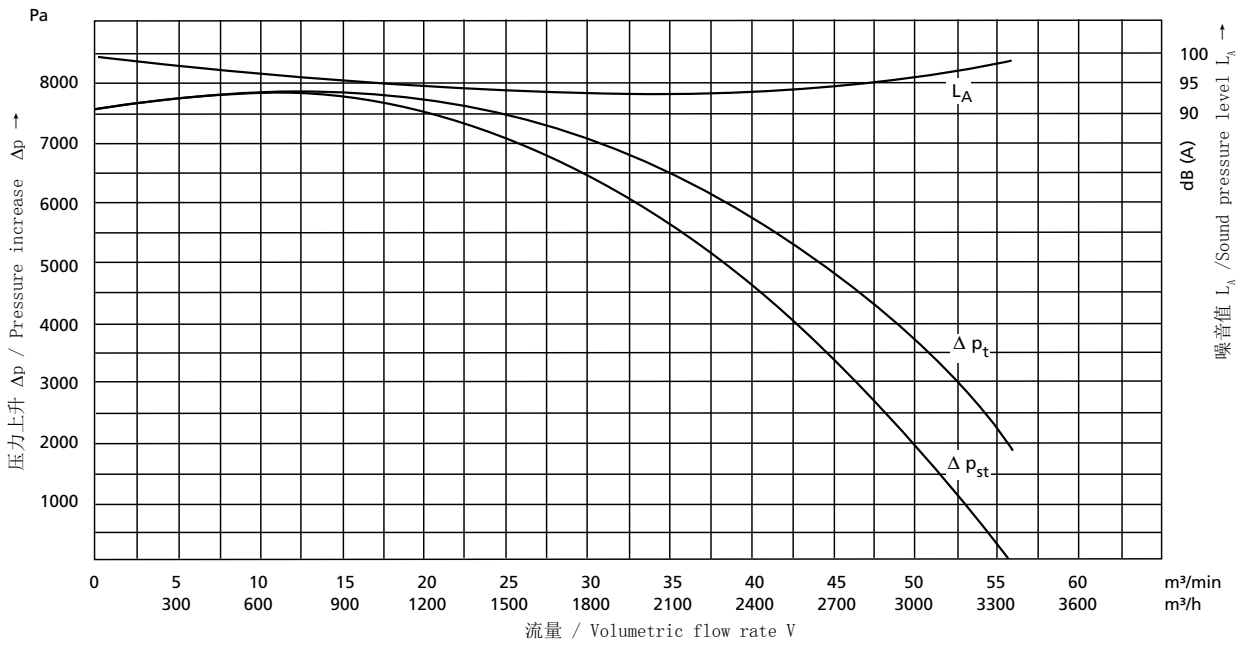
性能曲线 / Characteristic curves



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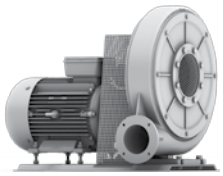

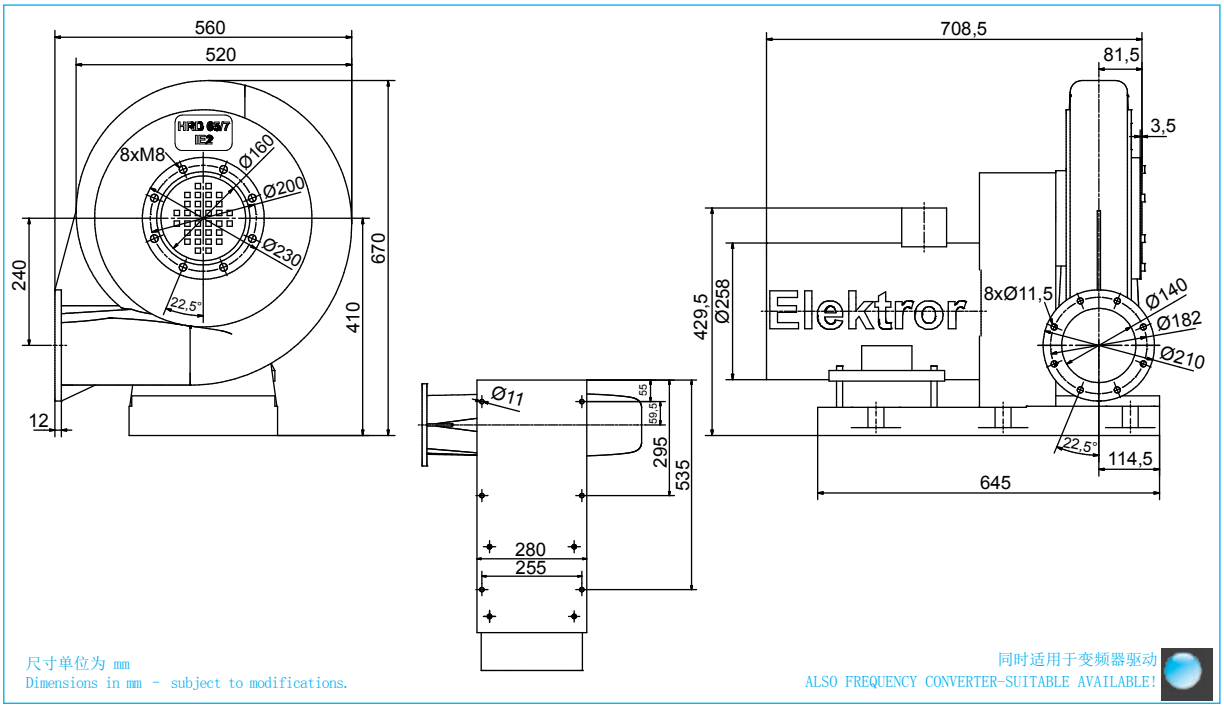

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型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m³/min	Pa	V	A	min⁻¹	kW	min⁻¹	kg
HRD 65/7	IE3	50	62,0	8700	400 Δ	13,4	2935	7,50	5800	93
	IE3	60	62,0	8700	400 Δ	16,1	3530	9,00	5800	93
	NEMA*	60	62,0	8700	480 Δ	13,4	3530	9,00	5800	93

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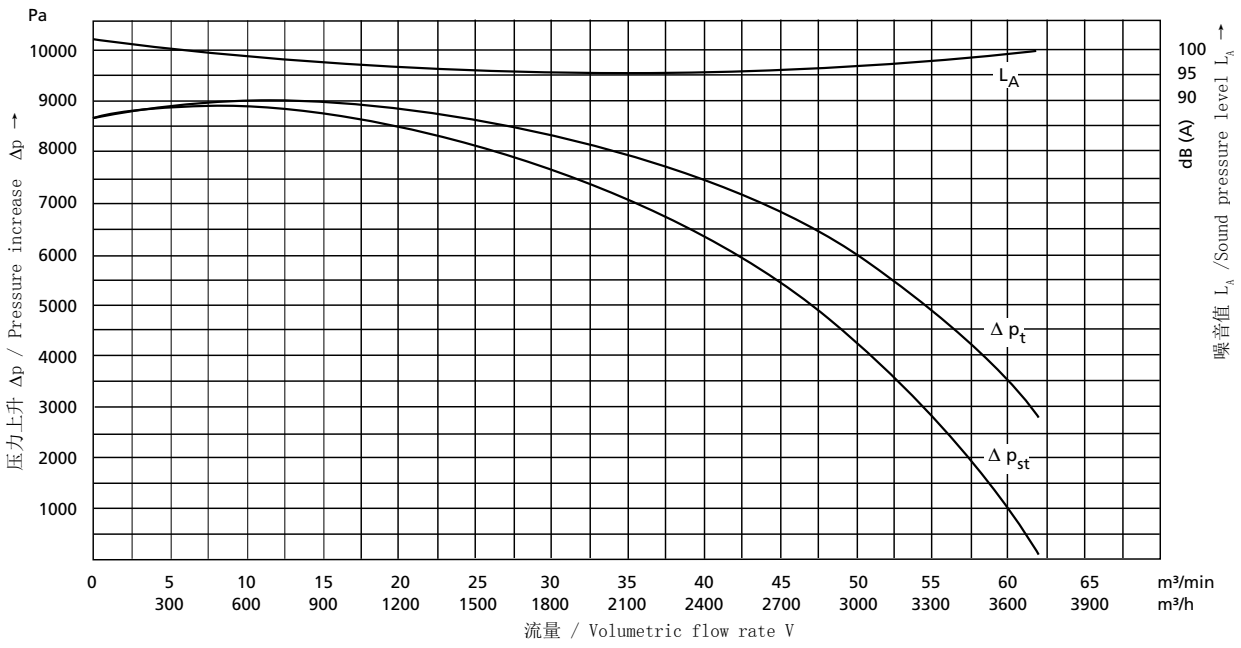
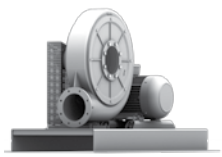
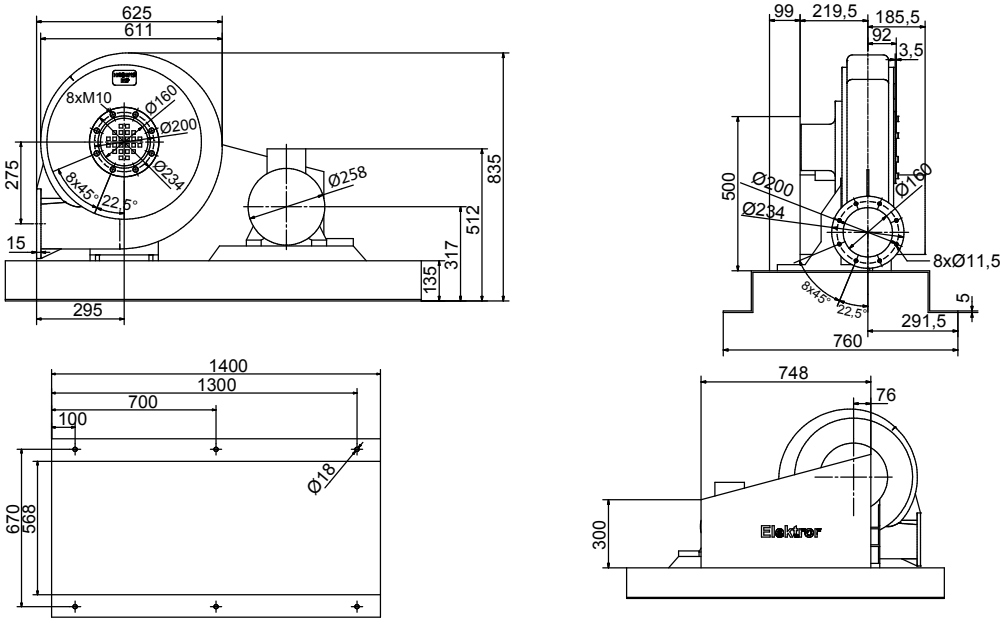


根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.





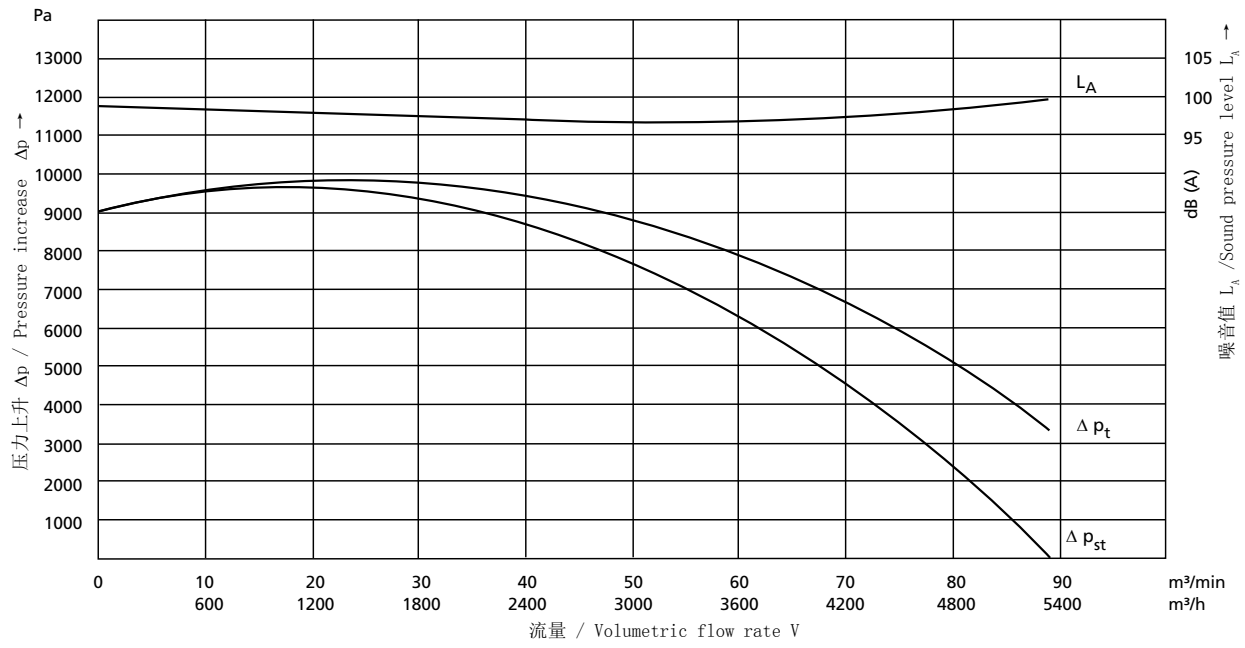
同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

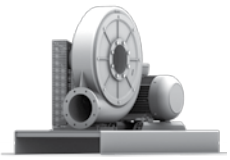
型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 7/12	IE3	50	88,0	9000	400 Δ	19,9	2920	11,0	4950	190

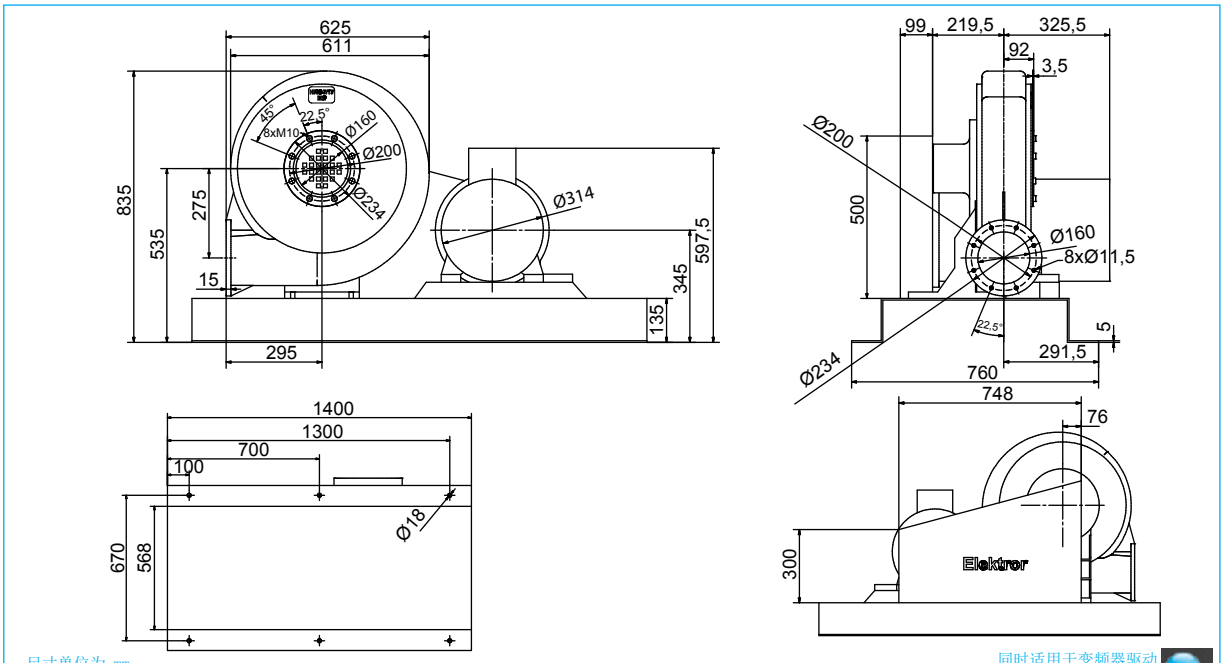
* NEMA Premium 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.





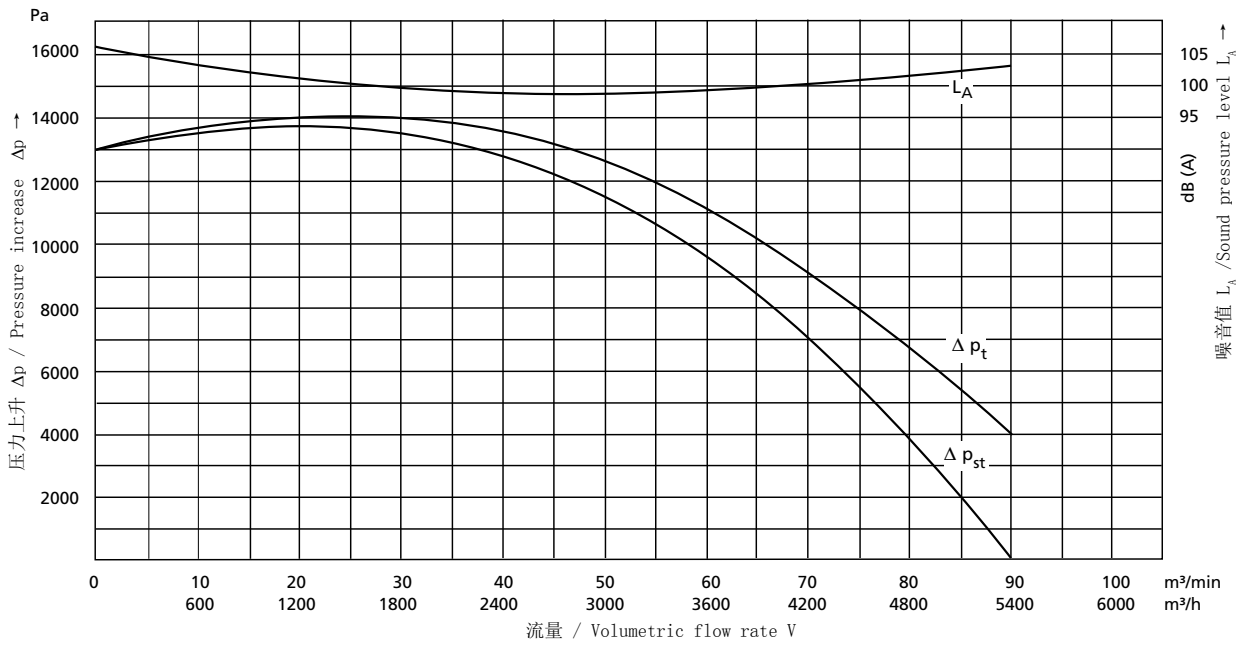
尺寸单位为 mm
Dimensions in mm - subject to modifications.

同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 7/17	IE3	50	90, 0	13000	400 Δ	33, 0	2950	18, 5	5600	230
	IE3	60	90, 0	13000	400 Δ	39, 1	3545	22, 5	5600	230
	NEMA*	60	90, 0	13000	480 Δ	33, 5	3545	22, 5	5600	230

* NEMA Premium 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves



根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

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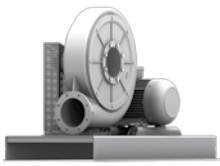
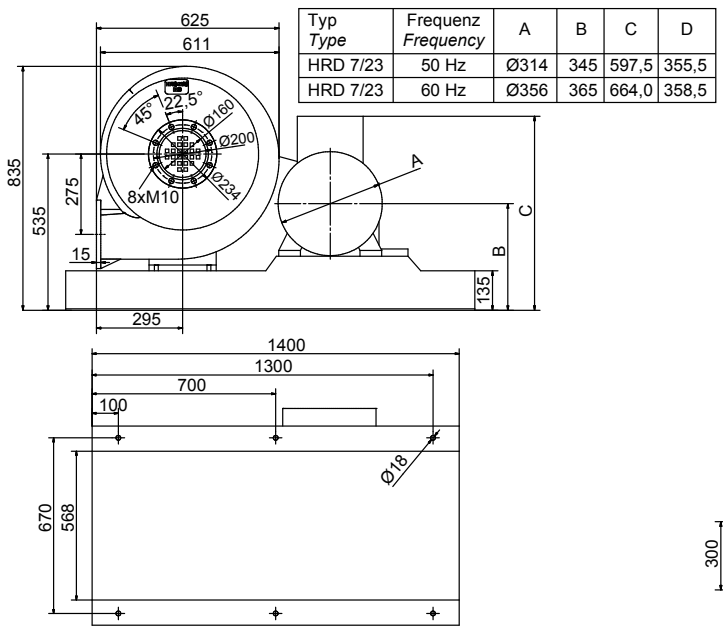
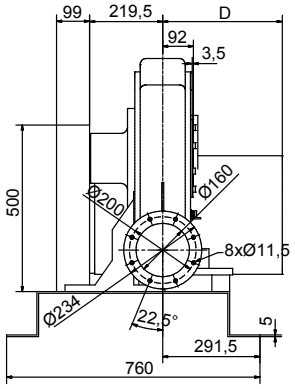
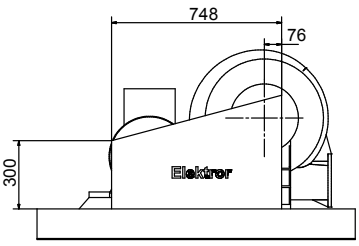




Typ *Type*	Frequenz *Frequency*	A	B	C	D
HRD 7/23	50 Hz	Ø314	345	597,5	355,5
HRD 7/23	60 Hz	Ø356	365	664,0	358,5





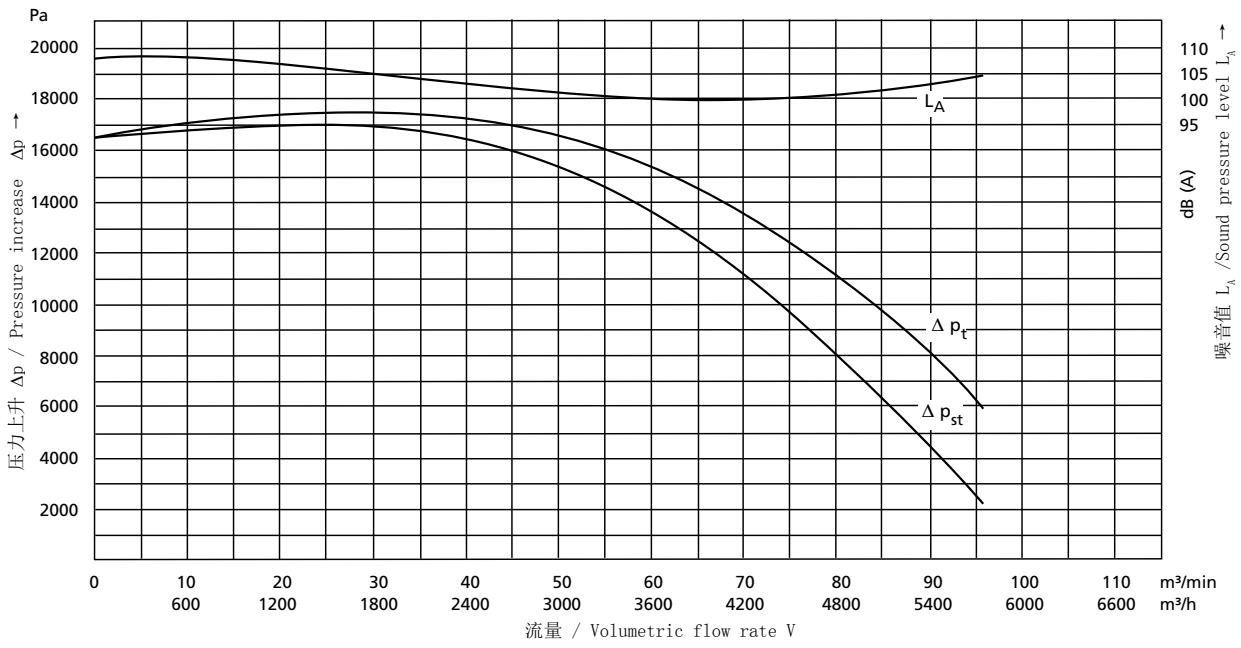
同时适用于变频器驱动
ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	能效等级 Efficiency class	频率 Frequency	气体流量 Volumetric flow rate	全压差 Total pressure difference	电压 Voltage	电流 Current consump-tion	风机转速（转/每分钟） Number of revolu-tions	电机功率 Motor rating	风机转速 1) Blower speed 1)	重量（大约） Weight (approx.)
		Hz	m^3/min	Pa	V	A	min^{-1}	kW	min^{-1}	kg
HRD 7/23	IE3	50	96, 0	16400	400 Δ	39, 8	2950	22, 0	6350	255
	IE3	60	100, 0	16400	400 Δ	45, 4	3550	26, 5	6350	325
	NEMA*	60	100, 0	16400	480 Δ	38, 5	3550	26, 5	6350	325

* NEMA Premium 1) 转速偏差+/-5%属于正常. / Deviations in the revolutions of ± 5% are possible.

性能曲线 / Characteristic curves

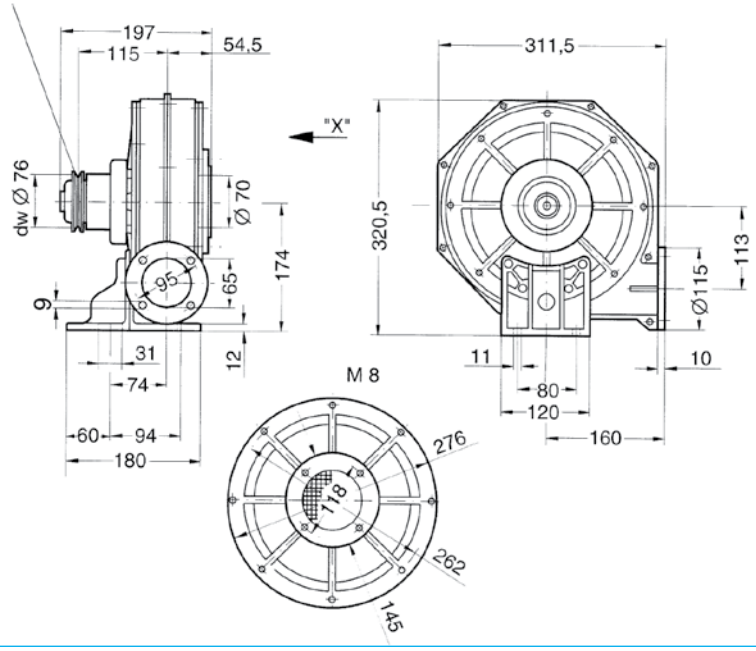


运行时勿使鼓风机排气口完全开放 / Blower not to be operated with free discharge.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

V-皮带传动参考 XPZ DIN 7753
V-belt profile XPZ DIN 7753

HRD 1T

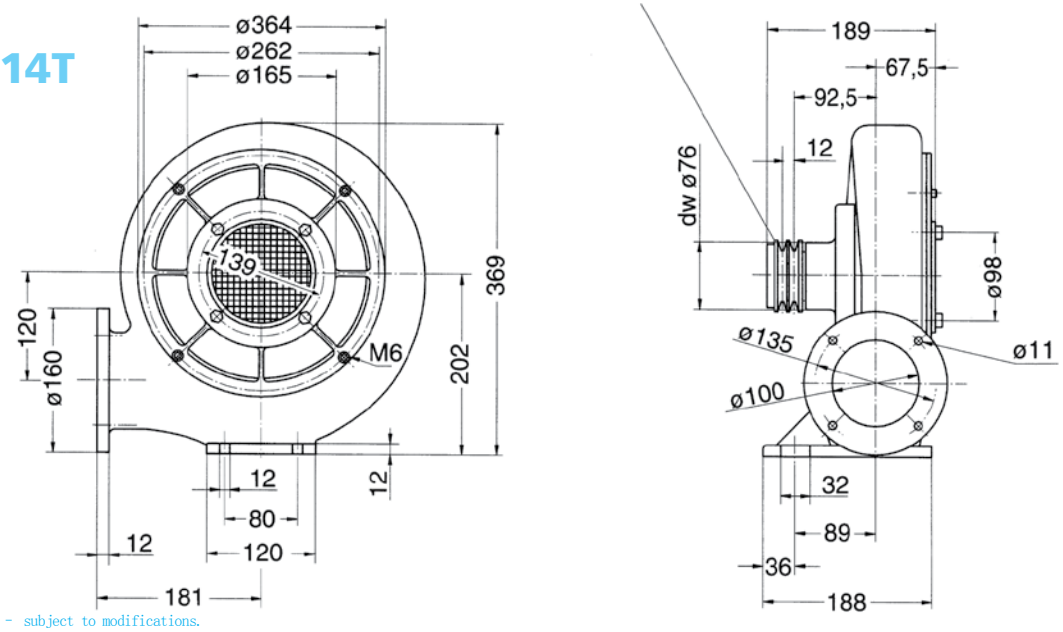


尺寸单位为 mm
Dimensions in mm - subject to modificatior

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	最高转速 Maximum number of revolutions	最高转速下所需电机功率 Power consumption at maximum RPM rating	重量（大约） Weight (approx.)
	m^3/min	Pa	min^{-1}	kW	kg
HRD 1T	10,5	4700	6000	1,10	7,5
HRD 14T	25,0	4500	6000	2,20	7,5

V-皮带传动参考 XPZ DIN 7753
V-belt profile XPZ DIN 7753

HRD 14T



尺寸单位为 mm
Dimensions in mm - subject to modifications.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

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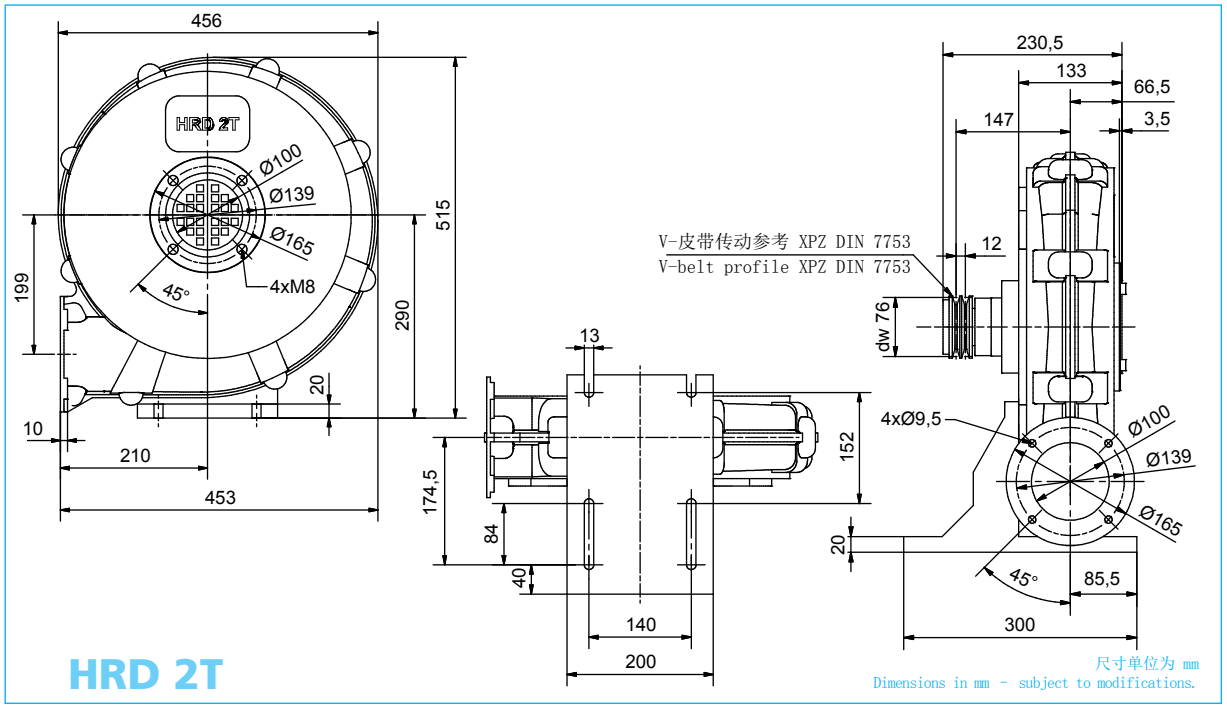
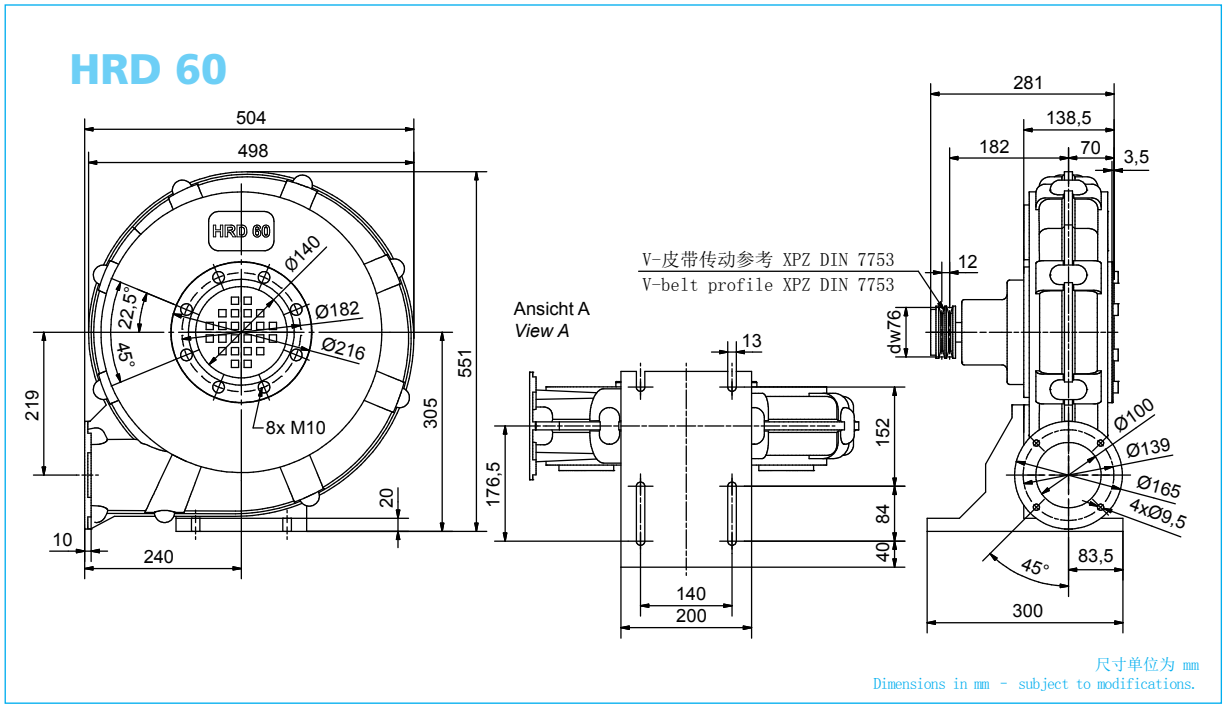


HRD 2T

尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	最高转速 Maximum number of revolutions	最高转速下所需电机功率 Power consumption at maximum RPM rating	重量（大约） Weight (approx.)
	m^3/min	Pa	min^{-1}	kW	kg
HRD 2T	27, 0	8600	5600	3, 0	18, 5
HRD 60	38, 0	10150	6100	5, 5	25, 0

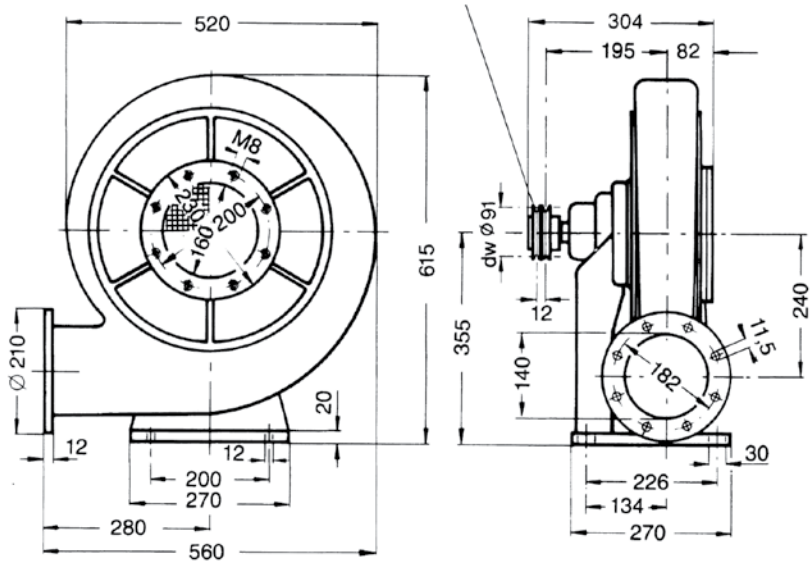


尺寸单位为 mm
Dimensions in mm - subject to modifications.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

HRD 65

V-皮带传动参考 XPZ DIN 7753
V-belt profile XPZ DIN 7753

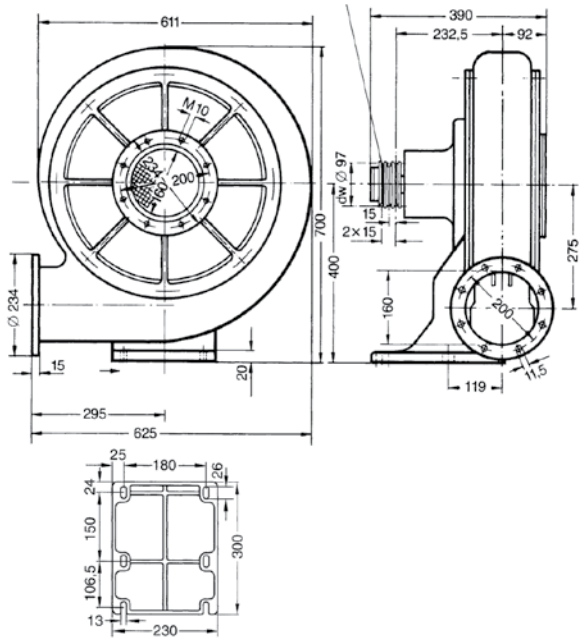


尺寸单位为 mm
Dimensions in mm - subject to modifications.

型号 Type	气体流量 Volumetric flow rate	全压差 Total pressure difference	最高转速 Maximum number of revolutions	最高转速下所需电机功率 Power consumption at maximum RPM rating	重量（大约） Weight (approx.)
	m^3/min	Pa	min^{-1}	kW	kg
HRD 65	62,0	8700	5800	7,50	32
HRD 7	90,0	13000	5600	18,5	65

HRD 7

V-皮带传动参考 XPA DIN 7753
V-belt profile XPA DIN 7753



尺寸单位为 mm
Dimensions in mm - subject to modifications.

根据第52-53页ErP的要求，鼓风机的技术参数和结构有所调整。
Technical and constructional subject to change. Data according to ErP directive see page 52-53.

笔记簿
FOR YOUR NOTES

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ERP简介
OVERVIEW OF THE ERP

型号 Type	频率 Frequency	鼓风机总效率 Total blower efficiency	效率等级 Degree of efficiency	2015起执行的能效等级 Required degree of efficiency 2015	修正系数 Specific behaviour	最佳能效点 At optimum energy efficiency			
						标称电机输入功率 Nominal motor input power	气体流量 Volumetric flow rate V	全压差 Δp_t Total pressure Δp_t (rounded up)	转速 Number of revolutions (rounded up)
	Hz	%	N	N		kW	m^3/min	Pa	min^{-1}
HRD 1T FU*-105/0,75	105	48,8	54,8	49,0	1,05	1,12	7,0	4660	6070
HRD 1T FUK#-105/0,75	105	48,8	54,8	49,0	1,05	1,12	7,0	4660	6070
HRD 1T FU*-105/1,1	105	49,7	56,0	49,0	1,05	1,00	5,9	5070	6140
HRD 1T FUK#-105/1,1	105	49,7	56,0	49,0	1,05	1,00	5,9	5070	6140
HRD 14T FU*-105/1,1	105	57,8	66,8	64,0	1,05	1,38	10,3	4650	6070
HRD 14T FUK#-105/1,1	105	57,8	66,8	64,0	1,05	1,38	10,3	4650	6070
HRD 14T FU*-105/1,5	105	60,9	68,9	64,0	1,04	1,73	14,5	4360	6120
HRD 14T FUK#-105/1,5	105	60,9	68,9	64,0	1,04	1,73	14,5	4360	6120
HRD 14T FU*-105/2,2	105	60,8	68,8	64,0	1,04	1,75	14,5	4390	6190
HRD 14T FUK#-105/2,2	105	60,8	68,8	64,0	1,04	1,75	14,5	4390	6190
HRD 16T FU*-105/1,5*	105	54,4	61,8	64,0	1,06	1,96	11,3	5660	5920
HRD 16T FUK#-105/1,5*	105	54,4	61,8	64,0	1,06	1,96	11,3	5660	5920
HRD 16T FU*-105/2,2	105	61,7	67,9	64,0	1,05	1,90	17,9	5260	5990
HRD 16T FUK#-105/2,2	105	61,7	67,9	64,0	1,05	1,90	17,9	5260	5990
HRD 16T FU*-105/3,0	105	61,0	66,9	64,0	1,05	2,74	18,3	5475	6130
HRD 16T FUK#-105/3,0	105	61,0	66,9	64,0	1,05	2,74	18,3	5475	6130
HRD 2T FU*-95/1,5	95	58,6	66,2	64,0	1,08	1,91	7,7	8384	5510
HRD 2T FUK#-95/1,5	95	58,6	66,2	64,0	1,08	1,91	7,7	8384	5510
HRD 2T FU*-95/2,2	95	62,5	68,4	64,0	1,08	2,75	13,5	7650	5520
HRD 2T FUK#-95/2,2	95	62,5	68,4	64,0	1,08	2,75	13,5	7650	5520
HRD 2T FU*-95/3,0	95	61,0	66,4	64,0	1,07	3,07	15,1	7435	5600
HRD 2T FUK#-95/3,0	95	61,0	66,4	64,0	1,07	3,07	15,1	7435	5600
HRD 60 FU*-105/4,0	105	65,4	68,2	64,0	1,10	5,41	20,9	10160	6190
HRD 60 FUK#-105/4,0	105	65,4	68,2	64,0	1,10	5,41	20,9	10160	6190
HRD 60 FU*-105/5,5	105	70,2	72,5	64,0	1,09	5,09	27,6	9238	6240
HRD 60 FUK#-105/5,5	105	70,2	72,5	64,0	1,09	5,09	27,6	9238	6240
HRD 60 FU*-105/7,5	105	67,9	70,2	64,0	1,09	6,00	25,5	9600	6260
HRD 60 FUK#-105/7,5	105	67,9	70,2	64,0	1,09	6,00	25,5	9600	6260
HRD 65 FU*-100/5,5	100	62,1	64,0	64,0	1,09	6,65	27,0	9204	5930
HRD 65 FUK#-100/5,5	100	62,1	64,0	64,0	1,09	6,65	27,0	9204	5930
HRD 65 FU*-100/7,5	100	67,7	69,2	64,0	1,09	7,16	32,1	9050	5950
HRD 65 FUK#-100/7,5	100	67,7	69,2	64,0	1,09	7,16	31,4	9050	5950
HRD 7 FU*-105/11**	105	56,8	56,4	64,0	1,15	15,67	35,0	15260	6200
HRD 7 FU*-105/15**	105	64,8	64,1	64,0	1,14	19,30	52,9	14180	6250
HRD 7 FU*-105/20**	105	75,7	75,2	64,0	1,13	17,20	57,9	13490	6248
HRD 2 FU*-130/7,5**	130	59,2	59,4	64,0	1,15	9,61	22,4	15210	7720
HRD 60 FU*-135/11**	135	64,9	64,7	64,0	1,12	12,60	29,7	16450	7970
HRD 7 FU*-120/15**	120	54,8	54,1	64,0	1,20	19,10	31,5	20020	7070
HRD 7 FU*-120/20**	120	60,3	59,4	64,0	1,19	23,00	41,2	20250	7060

* = 适用于2014的标准将适用于2015年起实行的ErP标准！ | Will be adapted in 2014 to ErP 2015!

** = 新的能效等级不适用于此系列鼓风机。 修正系数大于 1,11

** = The requirements for energy efficiency do not apply to this type of blower. Specific behaviour > 1.11

* = 必须安装变频器才能够使用 | A variable speed drive must be installed with this blower.

= 变频器安长在鼓风机电机上 | A variable speed drive is integrated within the blower.

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型号 Type	频率 Frequency	鼓风机总效率 Total blower efficiency	效率等级 Degree of efficiency	2015起执行的能效等级 Required degree of efficiency 2015	修正系数 Specific behaviour	最佳能效点 At optimum energy efficiency			
						标称电机输入功率 Nominal motor input power	气体流量 Volumetric flow rate V	全压差 Δp_t Total pressure Δp_t (rounded up)	转速 Number of revolutions (rounded up)
	Hz	%	N	N		kW	m^3/min	Pa	min^{-1}
HRD 1/2 T	50	45,0	52,8	49,0	1,02	0,54	5,4	2662	2900 / 4560
HRD 1/2 T	60	42,2	52,5	49,0	1,02	0,60	5,9	2570	3510 / 4570
HRD 1/3 T	50	45,5	52,4	49,0	1,03	0,64	5,5	3140	2880 / 5390
HRD 1/3 T	60	43,7	52,4	49,0	1,03	0,64	5,4	3081	3500 / 5490
HRD 1/4 T	50	44,5	51,6	49,0	1,04	0,85	5,6	4060	2870 / 5670
HRD 1/4 T	60	43,8	51,5	49,0	1,04	0,87	5,8	3930	3500 / 5500
HRD 1/5 T	50	46,7	51,1	49,0	1,04	1,03	6,1	4670	2880 /6020
HRD 1/5 T	60	46,8	50,8	49,0	1,04	1,12	6,6	4560	3500 / 6090
HRD 14/5 T	50	60,6	68,8	64,0	1,04	1,67	13,1	4650	2920 / 6000
HRD 14/5 T	60	57,3	65,0	64,0	1,05	1,86	16,2	3950	3540 / 6020
HRD 2/3 T	50	56,9	65,2	64,0	1,05	1,61	9,9	5581	2870 / 4580
HRD 2/3 T	60	50,8	55,1	49,0	1,05	1,92	11,4	5550	3470 / 4670
HRD 2/4 T	50	60,0	66,4	64,0	1,07	2,55	12,7	7200	2930 / 5530
HRD 2/4 T	60	59,9	65,4	64,0	1,06	2,97	15,9	6700	3570 / 5420
HRD 2/5 T	50	60,8	66,4	64,0	1,07	2,93	12,9	8270	2920 / 5640
HRD 2/5 T	60	60,1	65,3	64,0	1,07	3,18	15,6	7400	3520 / 5580
HRD 60/4	50	63,7	66,0	64,0	1,10	6,03	23,3	9650	2890 / 6180
HRD 60/4	60	63,5	66,1	64,0	1,09	5,60	23,6	8800	3530 / 5990
HRD 60/5	50	62,3	64,5	64,0	1,09	6,23	25,2	9030	2920 / 6100
HRD 60/5	60	73,7	75,1	64,0	1,10	7,31	31,9	10135	3540 / 6220
HRD 60/7	50	68,0	69,3	64,0	1,10	7,45	28,2	10540	2940 / 6470
HRD 60/7	60	66,2	67,3	64,0	1,09	7,86	31,9	9570	3540 / 6267
HRD 65/2	50	59,6	66,0	64,0	1,04	2,43	22,4	3880	2890 / 3980
HRD 65/2	60	61,3	67,4	64,0	1,04	2,41	21,1	4200	3500 / 4040
HRD 65/4	50	61,1	65,1	64,0	1,06	4,20	27,1	5680	2940 / 4780
HRD 65/4	60	64,8	68,4	64,0	1,06	4,52	28,9	6077	3547 / 4968
HRD 65/5	50	62,6	65,4	64,0	1,07	5,67	29,7	7160	2930 / 5320
HRD 65/5	60	63,5	65,7	64,0	1,07	6,18	32,0	7360	3540 / 5430
HRD 65/7	50	65,4	66,6	64,0	1,08	6,36	36,3	8090	2930 / 5830
HRD 65/7	60	65,0	65,6	64,0	1,07	7,16	43,7	7590	3510 / 5800
HRD 7/12	50	70,9	71,1	64,0	1,08	9,55	47,3	8587	2940 / 4910
HRD 7/17**	50	61,5	60,9	49,0	1,12	18,4	56,1	11900	2940 / 5600
HRD 7/17	60	60,6	60,0	49,0	1,11	18,2	56,1	11600	3520 / 5600
HRD 7/23**	50	69,2	68,4	64,0	1,16	22,6	57,1	16190	2960 / 6350
HRD 7/23**	60	65,5	64,7	64,0	1,16	22,9	56,1	15810	3570 / 6330
HRD 1 T	50	42,9	49,2	49,0	1,04	1,03	6,0	4420	2880 / 6020
HRD 14 T	50	56,6	64,8	64,0	1,04	1,67	12,8	4450	2920 / 6000
HRD 2 T	50	60,8	66,4	64,0	1,07	2,93	12,9	8270	2920 / 5640
HRD 60	50	62,3	64,5	64,0	1,09	6,23	25,2	9030	2920 / 6100
HRD 65	50	65,4	66,6	64,0	1,07	5,67	29,7	7160	2930 / 5320
HRD 7	不适用ErP | ErP not applicable								

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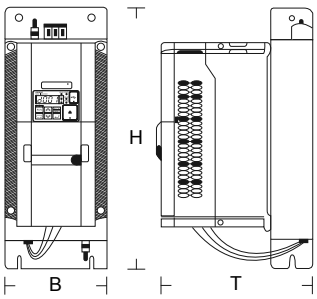
变频器技术说明
TECHNICAL INFORMATION FREQUENCY CONVERTER

欧姆龙变频器用于输入频率为50Hz
Omron frequency converter for the off-set operation of 50 Hz IE2 respectively FU-devices

Omron MX2
(EMV-类别 C2)
230 V 级

Omron MX2
(EMC-category C2)
230 V class

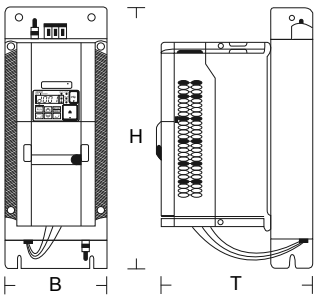


额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	成套变频器 编号* FU-package* Article No.
kW		mm	kg	
0,75	HRD 1T FU-105/0,75 HRD 1/2 T HRD 1/3 T HRD 1/4 T	111 x 169 x 221	2,2	016662
1,5	HRD 1T FU-105/1,1 HRD 14T FU-105/1,1 HRD 14T FU-105/1,5 HRD 16T FU-105/1,5 HRD 2T FU-95/1,5 HRD 1/5 T HRD 2/3 T	111 x 169 x 221	2,6	016664
2,2	HRD 14T FU-105/2,2 HRD 16T FU-105/2,2 HRD 2T FU-95/2,2 HRD 14/5 T HRD 65/2	111 x 169 x 221	2,6	016666

* 成套变频器由变频器和对应型号的滤波器组成
* FU-package consist of frequency converter and compatible EMC foot-print filter.

Omron MX2
(EMV-类别 C2)
400 V 级

Omron MX2
(EMC-category C2)
400 V class



额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	成套变频器 编号* FU-package* Article No.
kW		mm	kg	
0,75	HRD 1T FU-105/0,75 HRD 1/2 T HRD 1/3 T HRD 1/4 T	114 x 169 x 190	2,6	016667
1,5	HRD 1T FU-105/1,1 HRD 14T FU-105/1,1 HRD 14T FU-105/1,5 HRD 16T FU-105/1,5 HRD 2T FU-95/1,5 HRD 1/5 T HRD 2/3 T	114 x 169 x 217	2,8	016669
2,2	HRD 14T FU-105/2,2 HRD 16T FU-105/2,2 HRD 2T FU-95/2,2 HRD 14/5 T HRD 65/2	114 x 169 x 217	2,9	016671
3,0	HRD 16T FU-105/3,0 HRD 2/4 T HRD 2/5 T	114 x 169 x 217	2,9	016672
4,0	HRD 2T FU-95/3,0 HRD 60/4	144 x 174 x 221	3,2	016673

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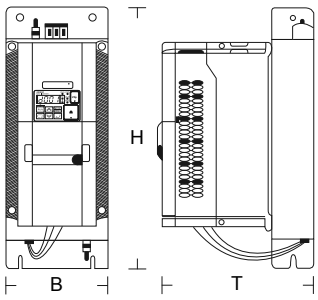
欧姆龙变频器用于输入频率为50Hz
Omron frequency converter for the off-set operation of 50 Hz IE2 respectively FU-devices

Omron MX2
(EMV-类别 C2)
400 V 级

Omron MX2
(EMC-category C2)
400 V class

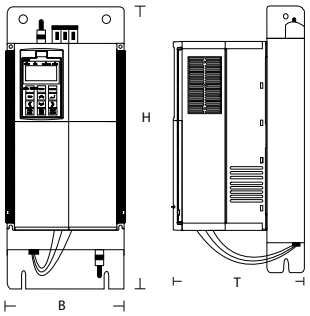


额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	成套变频器 编号* FU-package* Article No.
kW		mm	kg	
5,5	HRD 60 FU-105/4,0 HRD 60 FU-105/5,5 HRD 65 FU-100/5,5 HRD 60/5 HRD 65/4 HRD 65/5	150 x 306 x 207	5,5	016675
7,5	HRD 60 FU-105/7,5 HRD 65 FU-100/7,5 HRD 2 FU-130/7,5 HRD 60/7 HRD 65/7	150 x 306 x 207	5,5	016677
11,0	HRD 60 FU-135/11,0 HRD 60 FU-125/11,0 HRD 7/12 HRD 7 FU-105/11,0	182 x 357 x 237	7,5	016678

* 成套变频器由变频器和对应型号的滤波器组成
* FU-package consist of frequency converter and compatible EMC foot-print filter.

Omron RX
(EMV-类别 C2)
400 V 级

Omron RX
(EMC-category C2)
400 V class



额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	成套变频器 编号* FU-package* Article No.
kW		mm	kg	
18,5	HRD 7 FU-105/15,0 HRD 7 FU-120/15,0 HRD 7/17	451 x 252 x 250	18,5	019560
22,0	HRD 7/23 HRD 7 FU-105/20,0 HRD 7 FU-120/20,0	451 x 252 x 250	18,5	019562

* 成套变频器由变频器和对应型号的滤波器组成
* FU-package consist of frequency converter and compatible EMC foot-print filter.

Omron MX2
附件

Omron MX2
Accessories

配置 Denomination	编号 Article No.
欧姆龙MX2 变频器LCD控制面板 Add-on LCD control panel for Omron MX2	016681
3米长LCD控制面板数据线 Extension cable 3m for add-on LCD control panel for Omron MX2 and RX	016682
USB数据线 USB cable for parameterization 3m length for Omron MX2	016683
RJ45-USB 欧姆龙 RX变频器传输数据线 RJ45-UBS cable for parameterization, 3m length for Omron RX	019607
欧姆龙变频器驱动软件 Software for parameterization Omron MX2 and RX	016684

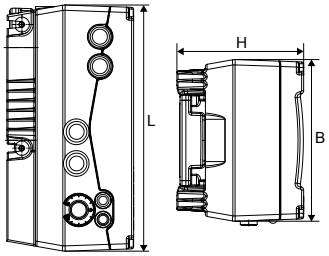
尺寸单位为 mm
Dimensions in mm - subject to modifications.

变频器技术说明
TECHNICAL INFORMATION FREQUENCY CONVERTER

变频器直接安装在电机上(FUK)
性能配置g，除非另外说明， 一律符合50 Hz IE2-标准 (60 Hz-则根据需要来定)
Kostal on the motor integrated frequency converter (FUK)
Performance allocation, unless otherwise indicated, suitable for 50 Hz IE2 device (60 Hz devices upon request)

Kostal INVEOR
(EMV-类别 C2)
230 V 级

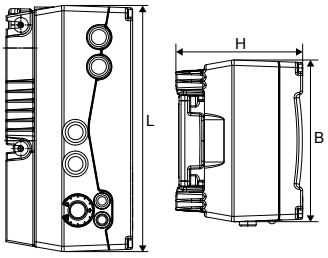
Kostal INVEOR
(EMC-category C2)
230 V class



额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	FU-变频器订货号-Nr. FU drive unit Article No.
kW		mm	kg	
0,75	HRD 1T FUK-105/0,75	233 x 153 x 120	3,9	020755
1,1	HRD 1T FUK-105/1,10, HRD 14T FUK-105/1,10	233 x 153 x 120	3,9	020756

Kostal INVEOR
(EMV-类别 C2)
4000 V 级

Kostal INVEOR
(EMC-category C2)
400 V class



额定功率 Rated Power	对应型号 for device	尺寸 (B x H x T) Dimensions (B x H x T)	重量 Weight	FU-变频器订货号-Nr. FU drive unit Article No.
kW		mm	kg	
0,75	HRD 1T FUK-105/0,75	233 x 153 x 120	3,9	020743
1,50	HRD 1T FUK-105/1,10, HRD 14T FUK-105/1,10, HRD 14T FUK-105/1,50, HRD 16T FUK-105/1,50, HRD 2T FUK-95/1,50	233 x 153 x 120	3,9	020744
2,20	HRD 14T FUK-105/2,20, HRD 16T FUK-105/2,20, HRD 2T FUK-95/2,20,	270 x 189 x 140	5,0	020745
3,00	HRD 16T FUK-105/3,00, HRD 2T FUK-95/3,00	270 x 189 x 140	5,0	020746
4,00	HRD 60 FUK-105/4,00	270 x 189 x 140	5,0	020747
5,50	HRD 60 FUK-105/5,50, HRD 65 FUK-105/5,50	307 x 223 x 181	8,7	020748
7,50	HRD 60 FUK-105/7,50, HRD 65 FUK-105/7,50	307 x 223 x 181	8,7	020749

Kostal INVEOR
附件

Kostal INVEOR
Accessories

配置 Denomination	编号 Article No.
控制面板 MMI INVEOR Control panel MMI INVEOR	020758
链接PC的数据线 Interface cable for PC	020759

可提供安装在墙面的适配器面板
Adapter plate wall mounting on request

尺寸单位为 mm
Dimensions in mm - subject to modifications.

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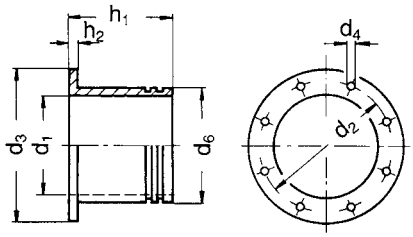
进气口接头（不带法兰）

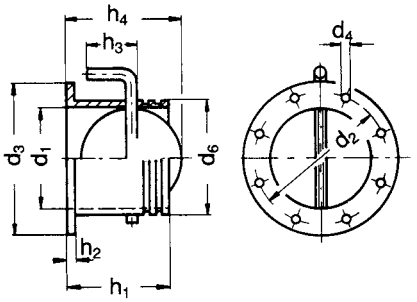
Intake connector without flange



型号 Type	d_1	d_2	d_3	d_4	d_6	h_1	h_2	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	70	118	145	4 x Ø 9,0	78	90	8	000736
HRD 14 T HRD 14/5 T	100	139	165	4 x Ø 9,5	110	100	8	000538
HRD 16 T/FU	125	165	191	4 x Ø 9,5	140	120	8	000540
HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	100	139	165	4 x Ø 9,5	110	100	8	000538
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	140	182	216	8 x Ø 11,5	150	140	8	000199
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	156	200	234	8 x Ø 11,5	170	160	8	000507
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	156	200	234	8 x Ø 11,5	170	160	8	000507

进气口接头不带法兰带调节阀

Intake connector without flange with throttle valve



型号 Type	d_1	d_2	d_3	d_4	d_6	h_1	h_2	h_3	h_4	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	70	118	145	4 x Ø 9,0	78	90	8	45	78	000739
HRD 14 T HRD 14/5 T	100	139	165	4 x Ø 9,5	110	100	8	60	108	000740
HRD 16 T/FU	125	165	191	4 x Ø 9,5	140	120	8	70	126,5	000543
HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	100	139	165	4 x Ø 9,5	110	100	8	60	108	000740
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	140	182	216	8 x Ø 11,5	150	140	8	75	142	000542
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	160	200	234	8 x Ø 11,5	170	160	8	85	163	000533
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	160	200	234	8 x Ø 11,5	170	160	8	85	163	000533

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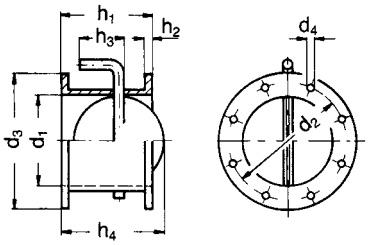
尺寸单位为 mm
Dimensions in mm - subject to modifications.

附件
ACCESSORIES

进气口接头带法兰带调节阀

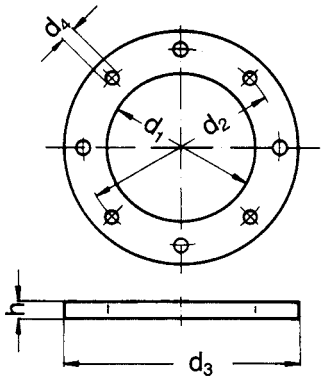
Intake connector with flange and throttle valve



型号 Type	d_1	d_2	d_3	d_4	h_1	h_2	h_3	h_4	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	74	118	145	4 x Ø 9,0	80	8	45	78	000742
HRD 14 T HRD 14/5 T	102	139	165	4 x Ø 9,5	100	8	60	108	000743
HRD 16 T/FU	125	165	191	4 x Ø 9,5	120	8	70	126,5	000545
HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	102	139	165	4 x Ø 9,5	100	8	60	108	000743
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	140	182	216	8 x Ø 11,5	140	8	75	142	000546
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	160	200	234	8 x Ø 11,5	140	8	85	163	000544
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	160	200	234	8 x Ø 11,5	140	8	85	163	000544

进气口焊接法兰

Welding flange for pipe connection on intake side



型号 Type	d_1	d_2	d_3	d_4	h	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	75	118	145	4 x Ø 9,5	6	000731
HRD 14 T HRD 14/5 T	105	139	165	4 x Ø 9,5	6	000552
HRD 16 T/FU	131	165	191	4 x Ø 9,5	6	000539
HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	105	139	165	4 x Ø 9,5	6	000552
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	146	182	216	8 x Ø 11,5	6	000309
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	164	200	230	8 x Ø 11,5	6	000505
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	164	200	234	8 x Ø 11,5	6	000551

尺寸单位为 mm
Dimensions in mm - subject to modifications.

CN 09.14

进气口过滤器

依莱克罗鼓风机进气过滤器的设计和尺寸要求允许相对应的最大的气体流量和最小的压力差。

过滤器表面允许最大的气体阻力是50Pa，　当气体流速为1.5m/s。过滤器滤材有合成纤维制成，过滤精度根据欧洲标准DIN EU 779达到G4等级（EU4）。如需要更高过滤精度的过滤材料请与风机生产厂家联系。

如果过滤器滤材表面比较脏，需要清洁，可以用压缩空气吹或中性肥皂洗底。
过滤器所有的金属部件都是采用镀锌材料，具有仿佛是能力。过滤器只适用于通过法兰安装在进气口位置

注意！
过滤器堵塞会导致鼓风机流量压力降低，定期清洗过滤器滤芯是十分必要的。破损的滤芯需要及时更换。

Fine filter, intake side

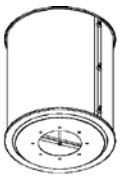
Layout and dimensions of Elektror fine filters are adapted to the maximum volume flow of the respective blowers and have a very small pressure loss therefore.

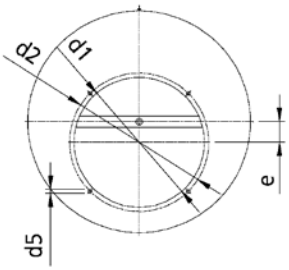
The surface of the filter was selected so that with a flow rate of 1.5 m/s an air resistance of 50 Pa can be achieved. The filter mat, which is installed, made from synthetic fibres has a high level of separation and corresponds with the filter class G4 (previously: EU 4) according to DIN EN 779. Higher filter classes require detailed clarification with the factory.

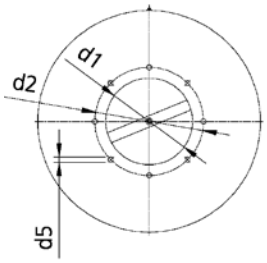
Dirty filters may be cleaned by blowing with compressed air or by washing with a weak soap solution. All steel parts are zinc-galvanized to provide high corrision protection. Fitting of the filter to the blower intake side is only possible by using the housing cover lid with flange.

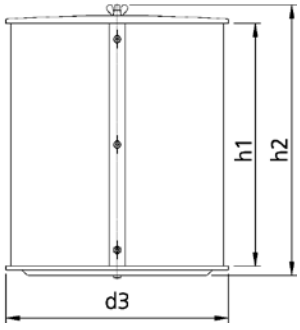
Caution!
Clogged and dirty filters significantly reduce the blower performance. Cleaning the filters in regular intervals is essential. The permeability of the filters has to be guaranteed.

型号 Type	d_1	d_2	d_3	d_5	e	h_1	h_2	过滤器 Filter 编号 Article No.	滤芯 Spare filter tissues 编号 Article No.	滤芯尺寸 Dimension spare filter tissue
HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	90	118	260	4x9,5	-	150	202	009109	008602	15x163x780
HRD 14/5 T	120	139	260	4x9,5	-	345	397	009111	008605	15x360x780
HRD 16 T/FU	150	165	410	4x9,5	-	215	273,5	009102	008609	15x228x1235
HRD 2/3 T HRD 2/5 T	120	139	410	4x9,5	-	215	267	009112	008609	15x228x1235
HRD 2/4 T	120	139	410	4x9,5	-	150	203	009101	008608	15x163x1235
HRD 60/4	160	182	410	8x11,5	-	150	202	009113	008608	15x163x1235
HRD 60/5 HRD 60/7	160	182	41	8x11,5	-	345	398	009104	008611	15x360x1235
HRD 65/2 HRD 65/4	160	200	410	8x10	-	345	397	009114	008611	15x360x1235
HRD 65/5 HRD 65/7	160	200	410	8x10	-	449	501	009105	008612	15x674x1235
HRD 7/12 HRD 7/17 HRD 7/23	176	200	510	8x11,5	-	657	709	009115	008615	15x674x1540









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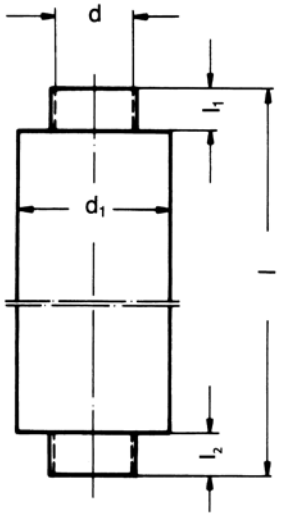
尺寸单位为 mm
Dimensions in mm - subject to modifications.

附件
ACCESSORIES

进气口消音器

Silencer
Intake side



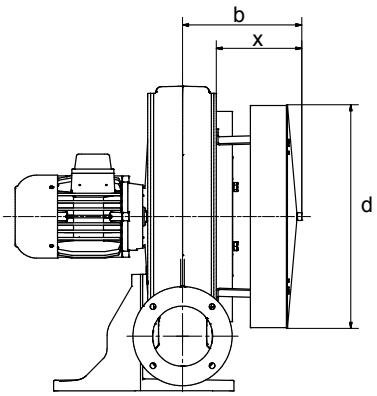
消音器需要与进气口不带法兰的接头一起购买。（见第59页附件）

Fitting of the silencers to the blowers is only possible by means of the intake connector without flange (see accessories page 59).

型号 Type	消音效果 Noise reduction [dB (A)]	l	l_1	l_2	d	d_1	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	– 6-8 4-8 6-8 9-10	600	50	150	80	120	000603
HRD 14 T HRD 14/5 T	– 8-12	1200	50	150	112	160	000751
HRD 16 T/FU	–	1200	100	100	140	250	001015
HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	– 5-10 10-14 9-15	1200	50	150	112	160	000751
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	– 10-15 10-15 10-15	1100	50	50	150	250	000427
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	– 9-12 7-13 10-14 9-14	1200	100	100	180	280	000421
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	– 9-15 7-13 8-15	1200	50	50	180	280	001232

盘式消音器

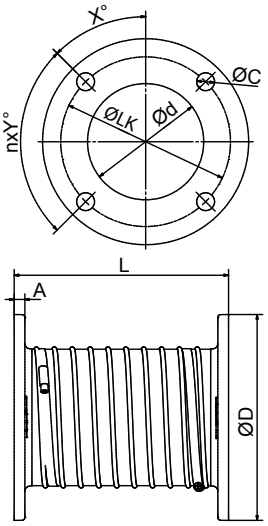
Disk silencer without housing cover lid



型号 Type	消音效果 Noise reduction [dB (A)]	b	x	d	编号 Article No.
HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	达到 8 / up to 8	194	145	250	017160
HRD 14/5 T	达到 8 / up to 8	200	137	250	017162
HRD 2/3 T HRD 2/4 T HRD 2/5 T	达到 9 / up to 9	206	142	370	017166
HRD 60/4 HRD 60/5 HRD 60/7	达到 10 / up to 10	212	150	370	017170
HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	达到 8 / up to 8	257	195	370	017174
HRD 7/12 HRD 7/17 HRD 7/23	达到 10 / up to 10	345	260	464	017176

补偿器，进气口端
（适用于输送介质气体温度低于80度）

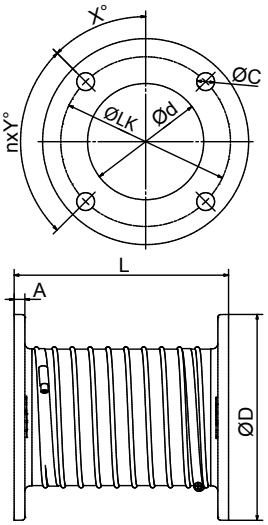
Compensator, intake side
(applicable for delivery medium temperatures up to 80° C)



型号 Type	n	Y	ØLK	Ød	C	A	L	X°	ØD	编号 Article No.
HRD 7	8	45°	200	156	11,5	8	260	22,5°	234	018307
HRD 7 BOOSTED	8	45°	200	156	11,5	8	260	22,5°	234	019290
HRD 65	8	45°	200	156	11,5	8	260	22,5°	234	018307
HRD 2, HRD 14	4	90°	139	100	9,5	8	200	45°	165	018494
HRD 16	4	90°	165	125	9,5	8	150	45°	191	019994
HRD 1	4	90°	118	70	9	8	200	45°	145	018492
HRD 60	8	45°	182	140	11,5	8	150	22,5°	216	018617

补偿器，排气口端
（适用于输送介质气体温度低于80度）

Compensator, discharge side
(applicable for delivery medium temperatures up to 80° C)



型号 Type	n	Y	ØLK	Ød	C	A	L	X°	ØD	编号 Article No.
HRD 7	8	45°	200	156	11,5	8	260	22,5°	234	018307
HRD 7 BOOSTED	8	45°	200	156	11,5	8	260	22,5°	234	019290
HRD 65	8	45°	182	140	11,5	8	150	22,5°	216	018617
HRD 2, HRD 16, HRD 60	4	90°	139	100	9,5	8	200	45°	165	018494
HRD 14	4	90°	135	100	11	6	200	45°	160	018643
HRD 1	4	90°	95	65	10	6	120	45°	115	019476

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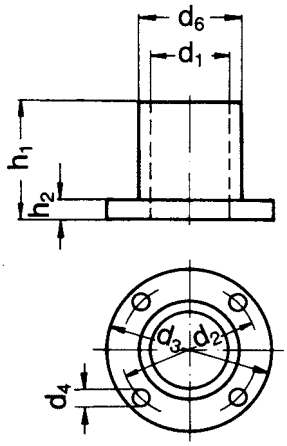
尺寸单位为 mm
Dimensions in mm - subject to modifications.

附件
ACCESSORIES

排气口管接头

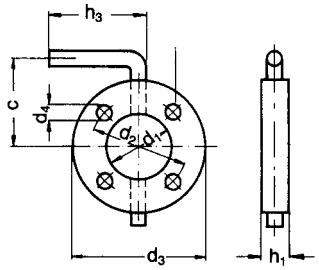
Discharge connector for tube connection



型号 Type	d_1	d_2	d_3	d_4	d_6	h_1	h_2	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	65	95	115	4 x Ø 10	75	45	6	000038
HRD 14 T HRD 14/5 T	100	135	160	4 x Ø 11	110	66	6	000039
HRD 16 T/FU HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	100	139	165	4 x Ø 9,5	110	100	8	000538
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	100	139	165	4 x Ø 9,5	110	100	8	000538
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	140	182	210	8 x Ø 11,5	150	100	12	000470
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	156	200	234	8 x Ø 11,5	170	160	8	000507

调节阀
（适用于鼓风机排气口端）

Throttle valve
(for fitting on the blowers discharge flange)



型号 Type	c	d_1	d_2	d_3	d_4	h_1	h_2	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	82,5	65	95	115	4 x Ø 9	23	100	000029
HRD 14 T HRD 14/5 T	100	100	135	160	4 x Ø 11	23	100	000031
HRD 16 T/FU HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	107,5	100	139	165	4 x Ø 9	23	100	000738
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	107,5	100	139	165	4 x Ø 9	23	100	000738
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	130	140	182	210	8 x Ø 11	23	100	000469
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	142	160	200	234	8 x Ø 11	23	100	000541

尺寸单位为 mm
Dimensions in mm - subject to modifications.

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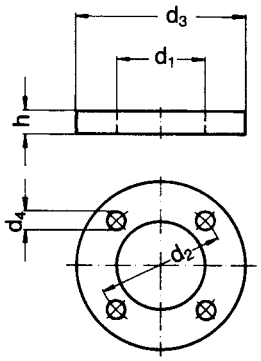
焊接法兰

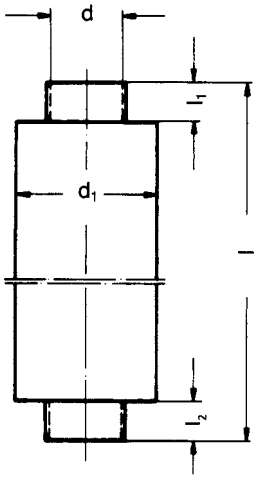
Welding flange for pipe connection on discharge side



型号 Type	d_1	d_2	d_3	d_4	h	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	65	95	115	4 x Ø 10	6	011904
HRD 14 T HRD 14/5 T	100	135	160	4 x Ø 11	6	011910
HRD 16 T/FU HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	105	139	165	4 x Ø 9,5	6	000552
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	105	139	165	4 x Ø 9,5	6	000552
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	146	182	210	4 x Ø 11,5	6	000506
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	164	200	234	4 x Ø 11,5	6	000551

消音器
排气口端

Silencer
Discharge side



消音器需要同排气口不带法兰的街头一同购买
（详见第62页附件）

Fitting of the silencers to the blowers is only possible by means of the discharge connector without flange (see accessories page 62).

型号 Type	消音效果 Noise reduction [dB (A)]	l	l_1	l_2	d	d_1	编号 Article No.
HRD 1 T HRD 1/2 T HRD 1/3 T HRD 1/4 T HRD 1/5 T	根据要求 on request	600	50	150	80	120	000603
HRD 14 T HRD 14/5 T	根据要求 on request	1200	500	150	112	160	000751
HRD 16 T/FU HRD 2 T HRD 2/3 T HRD 2/4 T HRD 2/5 T	根据要求 on request	1200	50	150	112	160	000751
HRD 60 HRD 60/4 HRD 60/5 HRD 60/7	根据要求 on request	1200	50	150	112	160	000751
HRD 65 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	根据要求 on request	1100	50	50	150	250	000427
HRD 7 HRD 7/12 HRD 7/17 HRD 7/23	根据要求 on request	1200	50	50	180	280	0001232

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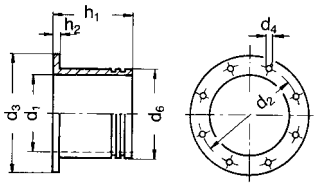
尺寸单位为 mm
Dimensions in mm - subject to modifications.

附件
ACCESSORIES

标准管接头，排气口端

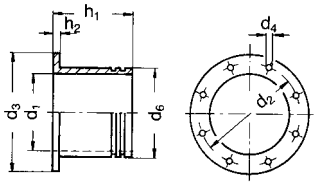
Standardized connector, discharge side



型号 Type	d_1	d_2	d_3	d_4	d_6	h_1	h_2	编号 Article No.
HRD 1/2-1/5T HRD 1T FU	65	95	115	4x10	75	45	6	017362
HRD 14/5T HRD 14T FU	100	135	165	4x11	109	75	8	017363
HRD 16T FU HRD 2/3-2/5T HRD 2T FU HRD 60/4-60/7 HRD 60 FU	100	139	165	4x9,5	109	75	8	017365

标准管接头，进气口端

Standardized connector, intake side



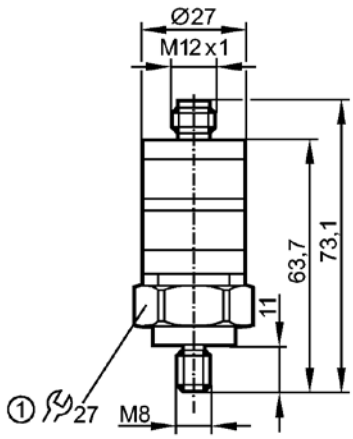
型号 Type	d_1	d_2	d_3	d_4	d_6	h_1	h_2	编号 Article No.
HRD 1/2-1/5T HRD 1T FU	70	118	145	4x9	75	90	8	017366
HRD 14/5T HRD 14T FU HRD 2/3-2/5T HRD 2T FU	100	139	165	4x9,5	109	75	8	017365

尺寸单位为 mm
Dimensions in mm - subject to modifications.

CN 09.14

震动传感器

Vibration guard



① 锁紧力矩 15 Nm
① Locking torque 15 Nm

技术数据 Technical data	
工作电压 Operating voltage	18 - 32 V 18 - 32 DC
开关输出 Switching output	1 开关输出连接， 开关点可调节， PNP弹性范围最高可达到500mA 1 switching output contact, switching point adjustable, PNP resilient up to 500 mA
模拟输出 Analog output	4 - 20 mA (4 mA = 0 mm/s; 20 mA = 25 mm/s)
负载电阻 Load impedance	500 Ohm
相应延迟 Response delay	1 -60秒可调 adjustable from 1 - 60 seconds
反向电保护 Reverse polarity protection	•
防护等级 Degree of protection / protection class	IP 67, III
环境温度 Ambient temperature	-25 - 80 ° C
外壳材质 Housing material	V4A 塑料 V4A, plastics
频率范围 Frequency range	10 - 1000 Hz
测量范围 Measuring range	0 - 25 mm/s
测量值 Measuring size	震动速率，震动效果值 Vibration velocity V-effective value (rms)
接线端子 Connection	M12-插头接口 M12 plug connection
配件编号 Article number	019351

震动传感器附件

Accessories for vibration guard

Typ Type	编号 Article No.
防护帽，透明塑料 Protection cap, plastic transparent	019352
接线盒 Cable box	020321

整套震动传感器，

Complete set vibration guard

描述 Description	编号 Article No.
适合于软式安装(鼓风机底座带橡胶减震器) for “soft” installation (rubber buffer)	020320
适用于硬式安装 (鼓风机底座直接用螺栓固定) for “fixed” installation (screwed)	020330

整套振动传感器 (019351)，防护帽 (019352)，和接线盒 (020321)
Complete set consisting of vibration guard (19351), protection cap (019352) and cable box (020321)

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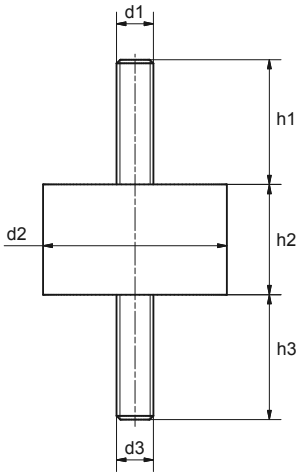
尺寸单位为 mm
Dimensions in mm - subject to modifications.

附件
ACCESSORIES

橡胶减震垫（标准型）
(A型减震器，牙形角 57°)

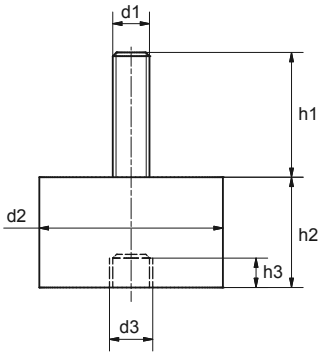
Rubber metal buffer
(Standard)
(Version A, Shore 57°)



型号 Type	d1	d2	d3	h1	h2	h3	个 / 每台 Pcs./Unit	编号 Article No.
HRD 1/2T HRD 1/3T HRD 1/4T HRD 1/5T	M10	50	M10	34	30	34	4	003459
HRD 14/5T	–	–	–	–	–	–	–	–
HRD 2/3T HRD 2/4T HRD 2/5T HRD 60/4	M10	50	M10	34	30	34	4	003459
HRD 60/5 HRD 60/7 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	M10	50	M10	34	30	34	6	003459
HRD 7/12 HRD 7/17 HRD 7/23	M16	100	M16	43	40	43	6	007521
HRD 1T FU/FUK	M10	50	M10	34	30	34	4	003459
HRD 14T FU/FUK	–	–	–	–	–	–	–	–
HRD 16T FU/FUK	M10	50	M10	34	30	34	4	003459
HRD 2T FU/FUK	M10	50	M10	34	30	34	4	003459
HRD 60 FU/FUK	M10	50	M10	34	30	34	4	003459
HRD 65 FU/FUK	M10	50	M10	34	30	34	4	003459
HRD 7 FU	M12	75	M12	37	40	37	4	007977

橡胶减震垫（可选型）
(B型减震器，牙形角 57°)

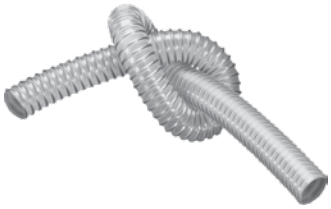
Rubber metal buffer
(Optional)
(Version B, Shore 57°)



型号 Type	d1	d2	d3	h1	h2	h3	个 / 每台 Pcs./Unit	编号 Article No.
HRD 1/2T HRD 1/3T HRD 1/4T HRD 1/5T	M10	50	M10	34	30	10	4	011436
HRD 14/5T	–	–	–	–	–	–	–	–
HRD 2/3T HRD 2/4T HRD 2/5T HRD 60/4	M10	50	M10	34	30	10	4	011436
HRD 60/5 HRD 60/7 HRD 65/2 HRD 65/4 HRD 65/5 HRD 65/7	M10	50	M10	34	30	10	6	011436
HRD 7/12 HRD 7/17 HRD 7/23	–	–	–	–	–	–	–	–
HRD 1T FU/FUK	M10	50	M10	34	30	10	4	011436
HRD 14T FU/FUK	–	–	–	–	–	–	–	–
HRD 16T FU/FUK	M10	50	M10	34	30	10	4	011436
HRD 2T FU/FUK	M10	50	M10	34	30	10	4	011436
HRD 60 FU/FUK	M10	50	M10	34	30	10	4	011436
HRD 65 FU/FUK	M10	50	M10	34	30	10	4	011436
HRD 7 FU	–	–	–	–	–	–	–	–

风刀
Air Knife

耐高温接头
HT fittings



软管
Spiral hose

软管喉箍
Spiral hose clamps

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电话：15564867265
联系人：李先生

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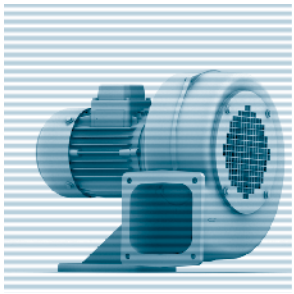
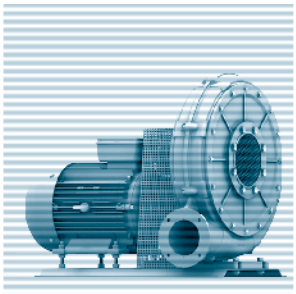
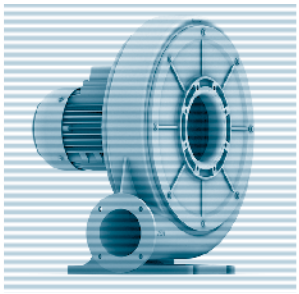
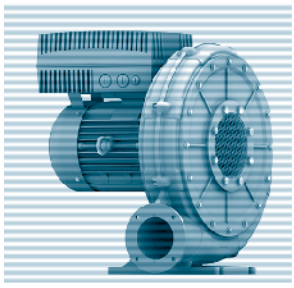
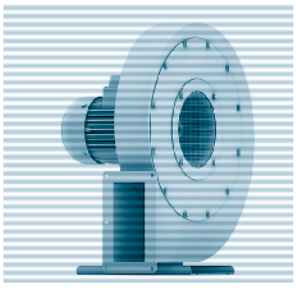
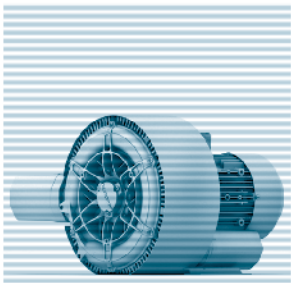
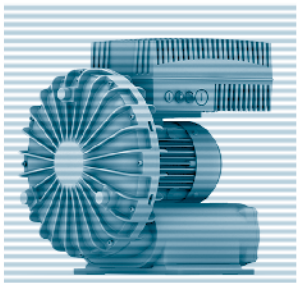
Elektror





产品概览
PRODUCT RANGE

径流低压风机
Low pressure blowers
ND

径流中等压力风机
Medium pressure blowers
RD

ATEX-径流低压风机
ATEX Low pressure blowers
ND-ATEX

ATEX-径流中等压力风机
ATEX Medium pressure blowers
RD-ATEX

侧面管道压缩机
Side channel blowers
SD

高压离心式鼓风机
High pressure blowers
HRD

输送式风机
Conveying blowers
RDF

ATEX-高压离心式鼓风机
ATEX High pressure blowers
HRD-ATEX

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