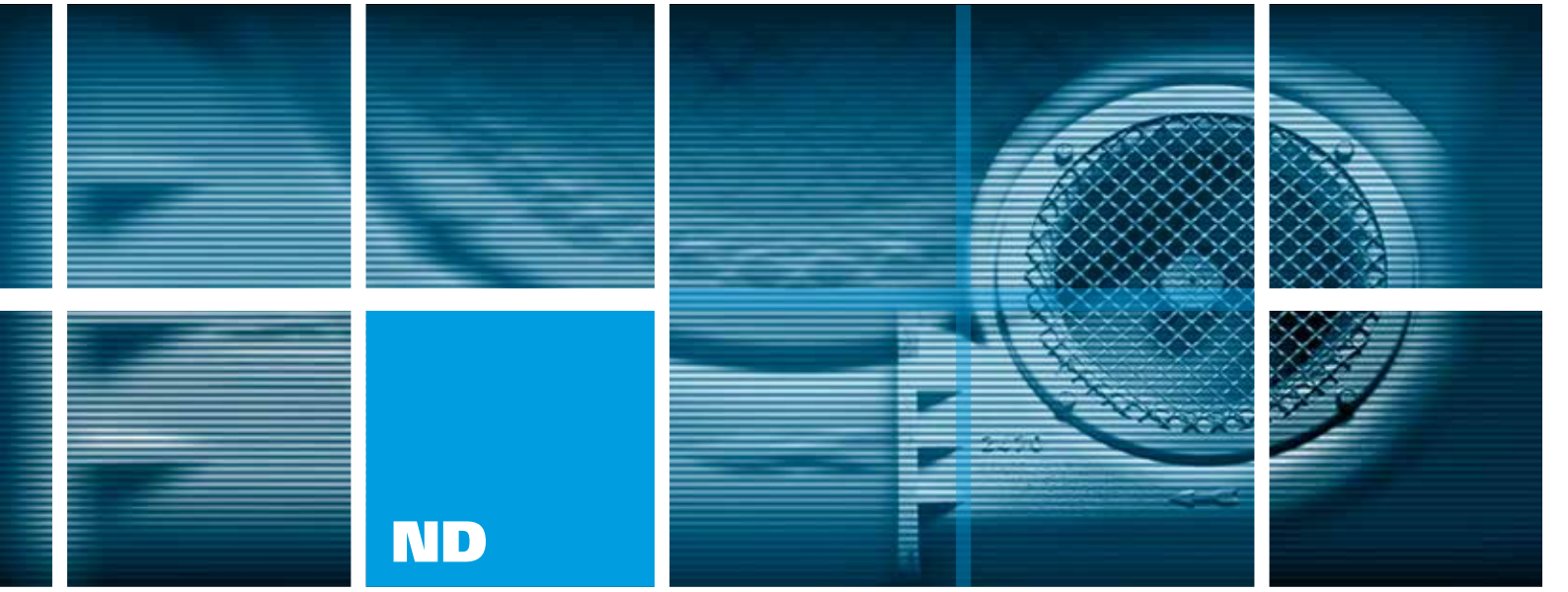
Elektror
airsystems gmbh



# ND

低压离心式鼓风机

*Low pressure blowers*

Go BLUE & save energy!

# 目录
# *TABLE OF CONTENTS*

**Elektror 低压离心式鼓风机为您提供：**

- 合理的性能分布
- 配备有三相或单相电机
- 高性能紧凑型设计
- 超长使用寿命、低运行成本
- 高效能
- 低噪音
- 坚固的铸造部件
- 多种调速方式
- 多种配件可供选择

***Elektror low 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***





03.18/01

依莱克罗低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
- 气体或蒸汽吸收
- 装置内部冷却散热
- 保持空间的空气流通
- 改善壁炉内的气流量
- 天然气，燃油和煤炭燃烧时供气设备
- 干燥各种结构元件
- 维持电器的外部通风

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

- ***Supply of medium air volumes in systems with higher resistance***
- ***Extraction of gases and vapours***
- ***Cooling of apparatus and machine components***
- ***Ventilation of rooms***
- ***Improvement of chimney draft***
- ***Air supply for gas, oil and coal-fired systems***
- ***Drying of diverse products***
- ***External ventilation of electrical machinery***

## 1. 技术信息/*Technical information*

### 1. 设计

依莱克罗低压鼓风机是一款拥有旋转曲线设计的叶片和镀锌钢叶轮的高性能离心式鼓风机。由依莱克罗公司自行开发生产的高性能异步鼠笼式电机为鼓风机提供可靠的技术保障。设计感极强的铸铝外壳和优良的动平衡性能叶轮保证了低压鼓风机的正常运转。依莱克罗专业为客户提供低维护、低噪音、低成本、使用寿命长的低压离心式风机

所有驱动电机依照标准 EN60034-1 (DVE 0530 第一章）要求用防护等级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。在标准电压下使用的电机，电压允许有±10%的上下波动。

D 03到D 052机型采用宽频电机，在50Hz的情况下，电压范围208-265/360-460V，在60Hz的情况下，电压范围208-290/360-500V电机电压允许有±5%的上下波动。

### *1.1 Design*

*Elektror low pressure blowers are radial blowers with closed impellers made of zinc coated steel plates. They are driven by generously dimensioned squirrel-cage motors which have been especially adapted to the operation of blowers. The well-shaped housings are made of cast aluminium and meet the required flow properties; the dynamically balanced impellers ensure shock free, low-noise operation and high efficiency. The robust design of Elektror's low-maintenance low pressure blowers is the basis for long service life and low opera-ting cost.*

*All drive motors conform to EN 60034-1 (VDE 0530 Part 1) and meet enclosure type IP 54. The standard versions operate on a 50 Hz supply and voltages of 230/400 V Δ/Y or 400 VΔ three-phase current and 230 V single-phase alternating current according to IEC 38. Motors for a supply frequency of 60 Hz according to IEC 38 are likewise available. Motors, which operate with the standard voltage, are suitable for a voltage tolerance of ±10% in permanent operation.*

*The three-phase versions of the types D 03 M to D 052 M feature wide-range motors. At 50 Hz supply frequency they can operate with voltages of 208-265/360-460 V ±5% and at 60 Hz supply frequency with voltages of 208-290/360-500 V ±5%.*



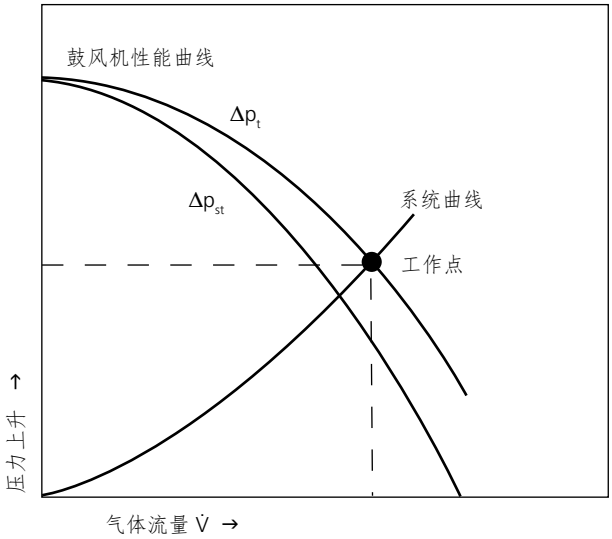
03.18/01

## 1.2 性能

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，系统阻力将提升到原来的四倍。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ΔPt和流量曲线的交叉点上。（如图1所示）

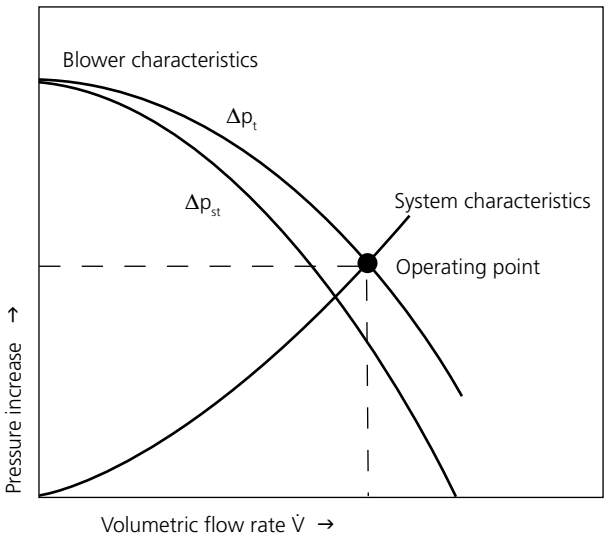
**图 1:** 鼓风机的工作点




## 1.2 *Performance*

*Blowers are flow-generating machines used to supply air and/or other gases. Radial blowers draw in the medium axially and accelerate it radially by means of the rotating impeller. The resistance to the air flow (by ducts, pipes, filters, system sections etc.) must be overcome by the excess pressure generated by the blower. With increasing flow volume (volumetric flow rate) the ability of the blower to generate pressure decreases. The performance depends on the design of the blower and its size and is described by the "differential pressure versus volumetric flow rate" characteristic (blower characteristic). The resistance of air conducting systems (system resistance) changes (in most cases) quadratically with the change in the volumetric flow rate, that is, if the volumetric flow rate is to be doubled, four times the system resistance must be overcome. The resulting characteristic curve is referred to as the resistance parabola or system characteristics. The operating point of the blower is defined by the intersection of the two characteristic curves. Where the system resistance cannot be calculated without substantial effort, experiments may help or values may be based on experience. With increasing system resistance the flow volume supplied by the blowers and the power consumption decrease. The maximum volumetric flow rate of a blower is determined by the intersection of the total pressure characteristic $\Delta p_t$ with the volumetric flow rate coordinate (see fig. 1).*

***Figure 1:*** *Operating point of the blower*






03.18/01

## 1.3 噪音

鼓风机工作中的噪音由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，叶轮的构造）
**b)** 与鼓风机尺寸相关的风量和风压。
**c)** 鼓风机的工作点。例如：鼓风机在特性曲线的哪个范围内运行。
**d)** 依莱克罗低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，因此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。衡量噪音的测量单位一般采用dB(A)，字母A在这里指的是测试者对于音频强度的主观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。如果对多种不同的声源同时发出的相同等级的噪声进行评估，那么噪声声压级会增加。例如，两台相同型号的鼓风机同时启动，则噪音值会增加3 dB (A)。同时启动3台鼓风机则噪音增加5 dB (A)，同时启动4台鼓风机则噪音增加6 dB (A)，同时启动5台鼓风机噪音增加7 dB (A)。通常情况下增加或减少10 dB (A)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降低到原来的一半。

## *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 low 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 Δ Pt 和静压差 Δ Pst曲线，其中某些部分的压力要比性能参数表中的最大值高一些。所有技术参数都是根据标准EN ISO5801，在标准空气密度1.2kg/m³ 的条件下，在鼓风机的排气口安装节流阀的情况下实测出来的。鼓风机的噪音LA是在距离鼓风机1m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。

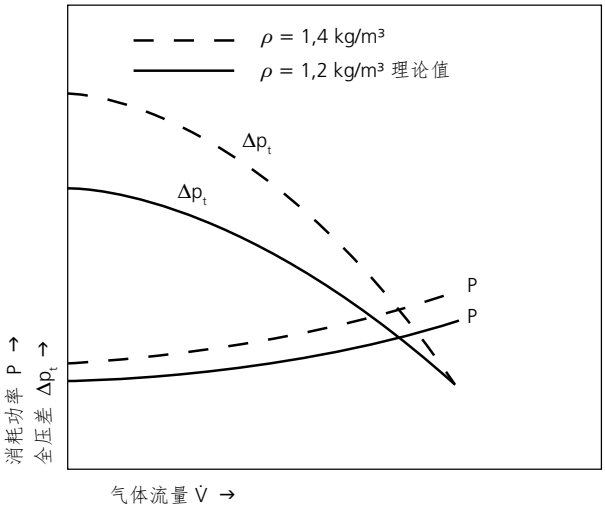
## 1.4 *Performance curves*

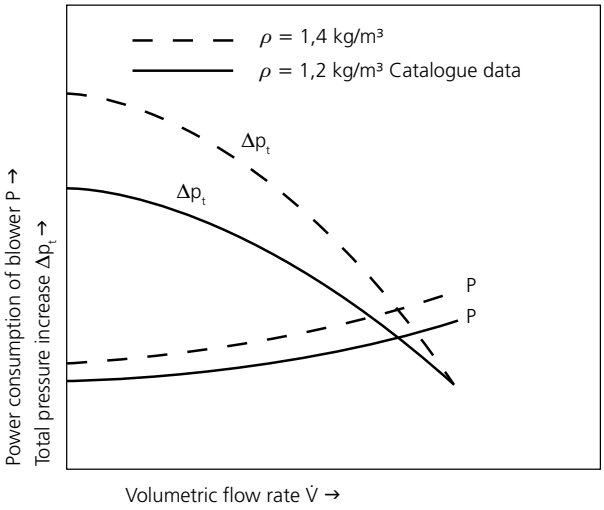
*The characteristics shown of the total pressure $\Delta p_t$ and of the static pressure $\Delta p_{st}$ as a function of the volumetric flow rate V were determined in measurements and some are higher than the ratings shown in the technical tables. All measurements took place in tubular test as sembly 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.*

**图 2:** Einfluss der Fördermediendichte

***Figure 2:*** *Influence of conveyed medium density*






03.18/01

## 1.5 风机选型

**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2）。气体密度随温度变化的计算公式如下：

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

$\vartheta$ = 介质气体温度 [°C]

$\rho$ = 气体密度 [kg/m³]

## 1.6 设计

**标准型鼓风机**

本品适用于所需要的压力流量不变的情况或工作条件变化很小的情况。

**双头型鼓风机**

双头型鼓风机是由两台被连接起来的鼓风机合并而成的一台装置，共用一台的电机。这种鼓风机的优点是在紧凑的设计结构下可以产生高流量。因为它的双口独特结构，气体通过时，两个出口可以单独或者共同使用。

## *1.5 Blower selection*

***Influence of the density***

*Total pressure increase, dynamic pressure, static pres sure and power requirement of the blower change proportionally to the pressure of the conveyed medium and must be taken into consideration on selecting the blower (Fig. 2). Density changes through temperature influences may be calculated as follows:*

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

$\vartheta$ = *temperature of conveyed medium [°C]*

$\rho$ = *air density [kg/m³]*

## *1.6 Designs*

***Standard designs***

*They can be employed wherever the operating conditions do not change or where the pressure ratios fluctuate minimally, and constant volumetric flow rates are thus desired.*

***Twin blowers***

*In a twin blower two blowers are connected to form a single unit that is driven by one common motor to whose shaft they are attached on either side. The advantage of these blowers is the high flow volume packaged in a fairly compact design. Since the twin blower has two outlet openings, the flow generated may be used together in one or in two separate applications.*

# 技术信息
# *TECHNICAL INFORMATION*

**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，防止电机过载。这类鼓风机的数据参数与标准机型相同。50Hz电机只适用于5到50Hz频率范围可调，60Hz电机只适用于5到60Hz频率范围可调。请勿超过相应的频率范围使用。

**特种风机**
对于特殊应用情况，在标准系列鼓风机的基础上按照要求件，使之能够满足特殊应用的特殊工艺要求。

**输送介质及环境温度**
电机运转允许的环境温度范围是-20℃至+60℃，其热防护等级为F级，均符合EN60034-1(VED 0531)要求。如果电机采用了适当的隔热材料，电机运转允许环境温度最高可以超过60℃。但这种情况需要跟生产商协商。输送的介质的温度标准范围是-20℃到+80℃。如果在风机和电机之间安装一个标准的单元阻隔，输送介质的温度最大可以达到180℃。

**密封**
所有风机都可以根据要求达到IP55的防护等级，确保风机在炽热或者是潮湿的环境下正常运转。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。

**防腐蚀**
为了确保标准风机具有防腐蚀性，在原材料的选择上，依莱克罗采用铸铝和镀锌钢板。如果用作特殊应用，可以根据需求采用喷漆喷塑处理，除此之外，叶轮也可以采用不锈钢材料No.1.4301制成。

***Variable speed blowers***
*These are used where changing volumetric flows are required to satisfy process requirements.*

***Full range for control by frequency converter (FU)***
*For operation in frequency converter mode nearly all drive motors can be optionally equipped with PTC thermistors and with a reinforced insulation of the coils. The technical data are identical with those of the standard blowers. The adjustable speed range in the 50 Hz version is 5 to 50 Hz and in the 60 Hz version 5 to 60 Hz. However, the speed setting must not exceed 50 Hz in the 50 Hz version and 60 Hz in the 60 Hz version.*

***Special blowers***
*For special applications, standard units may be adapted to the requirements on hand; custom designs are possible.*

***Medium temperatures and ambient temperatures***
*The admissible ambient temperature (cooling air temperature) for the drive motors ranges between -20° C and +60° C. As standard, the motors conform to thermal class F acc. to EN 60034-1 (VDE 0530 Part 1). The admissible ambient temperature can be increased to above 60° C by suitable insulation. However, this should be discussed in detail with the manufacturer. The admissible temperature of the medium for the standard version is –20° C to +80° C. If a thermal barrier is installed between blower and motor of the standard version, the medium temperature may rise to max. 180° C.*

***Sealing***
*The improved enclosure type IP 55 as well as insulation for use in tropical or wet environments are available for all motors. If the blower is to be sealed to the extent possible, a PTFE radial shaft seal can be installed in the shaft opening. Further sealing of the blowers can be achieved by means of flat gaskets or permanently elastic sealing agents.*

***Corrosion protection***
*The materials chosen - cast aluminium and zinc coated steel plates - make our standard blowers largely corrosion resistant already. For special applications the blowers can be lacquered or plastic coated as needed. The impellers can be made of material no. 1.4301.*



03.18/01

### 防爆风机

本系列中多种型号的鼓风机可以满足防爆标准EN EX 94/9/EU(ATEX)的要求。依莱克罗防爆风机可以应用于Zone1， 2和Zone22（根据EN 1127-1）。温度等级可以达到T3或更高（T2， T1）的标准，也可以根据客户需要在某些条件下提供T4等级的防爆风机。

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获取更多ATEX风机的样本和说明书。

网址： www.elektror.com
www.elektror-china.com

### 风机转速

标准型号的鼓风机采用二极电机，当改变电机转速时，鼓风机的全压差值增加，气体体积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
$\Delta p_t$ - 全压差
n - 转/分钟
P - 消耗功率
f - 频率

### 电压和频率

遵照IEC 38要求，频率为50Hz的标准三相电机 电压是230/400 Δ/Y。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。D 03M到D 052M配备宽频三相电机，在50Hz工作状态下，电压为208-265/360-460 V；在60Hz工作状态下，208-290/360-500 V，电压允许有+/−5%的波动。除此之外，根据客户要求，我们可以提供特殊电压、特殊频率的电机，标准三相电机最高电压为690V，单相电机电压为255V。当电机的频率发生变化是，导致叶轮的转速改变，从而全压差以及消耗功率的改变。具体变化见下面公式：

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

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

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

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

$\dot{V}$ - 体积流量
$\Delta p_t$ - 全压差
n - 转数
P - 消耗功率
f - 频率

频率为60Hz鼓风机性能曲线和消耗功率的变化将在每个机型具体信息数据上有所标示。

### *Explosion-proof variants*

*Numerous blowers of the series listed in this catalogue are also available in explosion-proof variants according to EU EX directive 2014/34/EU (ATEX). Elektror ATEX blowers are suitable for use in potentially explosive zones 1, 2 and 22 (according 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 blowers, please refer to our ATEX catalogues or our website at www.elektror.com.*

### *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*
$\Delta p_t$ - *Total pressure increase*
n - *RPM*
P - *Power consumption*
f - *Frequency*

### *Voltages and frequencies*

*The standard versions operate on a 50 Hz supply and voltages of 230/400 V Δ/Y or 400 V Δ three-phase current and 230 V single-phase alternating current according to IEC 38. Motors for a supply frequency of 60 Hz according to IEC 38 are likewise available. The three-phase versions of the types D 03 M to D 052 M feature wide-range motors. At 50 Hz supply frequency they can operate with voltages of 208-265/360-460 V ±5% and at 60 Hz supply frequency with voltages of 208-290/360-500 V ±5%. Special voltages and frequencies are available on request. The maximum admissible voltage for three-phase supply is 690 V, for single-phase alternating current drives it is 255 V. When the supply frequency changes, the impeller speed increases; this in turn increases the total pressure, the volumetric flow rate and the power consumption of the 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*
$\Delta p_t$ - *Total pressure difference*
n - *RPM*
P - *Power consumption*
f - *Frequency*

*In blowers with 60 Hz drives the characteristic curve and the power consumption change as set forth in the technical data sheets for the respective units.*

## 1.7 节能高效离心式鼓风机

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

**低压离心式鼓风机配备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和合理调试
- 选择合适的配件
- 使用变频器调节低压离心式鼓风机（FU/FUK 系列）

我们的产品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。详情请联系我们的产品服务部门或发邮件至 support@elektror.com

**本产品样本中的能效标志**

| 标识 | 频率 | 能效等级 | 使用地点* |
|---|---|---|---|
| IE3 | 50 Hz | IE3标准适用于 ≥ 0,75 kW | 欧洲 |
| IE3 | 60 Hz | IE3 标准适用于 ≥ 0,75 kW | 墨西哥、美国、加拿大 (NEMA 标准) |

* 其他国家的能效等级划分，请参考能效等级国别手册或者直接与产品服务部门取得联系。

## 1.7 *Energy efficient low pressure blowers*

*Elektror low pressure blowers come fitted as standard with energy efficient IE3 motors / Nema Premium motors (acc. to destination country) conformant to the IEC 60034-30 standard.*

***Low pressure blowers with IE3 motors / NEMA Premium 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 side channel blowers*
- *choosing the appropriate accessories*
- *optimised control/regulation of side channel 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***

| *Designation* | *Frequency* | *Efficiency class* | *Place of use (examples)** |
|---|---|---|---|
| IE3 | *50 Hz* | *Device with IE3-conformant motor ≥ 0.75 kW* | *Europe* |
| IE3 | *60 Hz* | *Device with IE3-conformant motor ≥ 0.75 kW* | *Mexico, USA, Canada (Nema Premium)* |

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



03.18/01

## 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125w至500kW全部风机产品。

前倾式叶轮以及圆形排气口外壳作为鼓风机的标准形式，决定依莱克罗低压鼓风机的能效。对应的检验种类为“方法B”，依莱克罗全部型号的低压鼓风机都有相对应的能效等级。

对于计算鼓风机能效的计算方法，通常假定在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）计算。

| 产品标识 | 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** | 变频器已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38，39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。

对于即将报废或者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 blowers. It specifies minimum efficiency grades for blowers driven by motors with an electric input power between 125 W and 500 kW.*

*For determining the energy efficiency of the Elektror low pressure blowers, a radial blowers with vanes curved forwards with housing are always 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 low 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 ventilator* |
| ***FUK*** | *A speed regulator **is** installed in this ventilator* |

*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 38 to 39.*

*Manufacturer, branch office of the manufacturer, type designation, year of manufacturer as well as the serial number of the Elektror low 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 medium pressure blower can be obtained from the respective operating instructions.*

*The disposal following final decommissioning must be carried out professionally.*



03.18/01

## 1.9 操作及维护说明

依莱克罗低压离心式鼓风机配备封闭式轴承，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。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。

每间一段时间就要对使用中的低压鼓风机进行检查和清洁。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。

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，安装排凝液阀。

通常的低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，设备需要进行保护，用以避免天气气候或是碰撞和颠簸。

风机必须安装在水平的位置上。避免电机过载过热现象的发生，每台风机使用时应该配备监控系统或开关。如果鼓风机电机功率大于3.5kW则需要使用Y/Δ启动，相关阐述详见安装和使用说明。

## 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

## *1.9 Instructions for operation and maintenance*

*Elektror low pressure blowers are equipped with closed grooved ball bearings that do not have to be lubricated and, with horizontal drive shafts, have a minimum service life of 22,000 hours. 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. 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 of solid matters is not permitted. 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.*

*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.*

*The blower must only be installed on a level and horizontal position. Each motor must be protected against impermissible heating as a result of overload using a monitoring system or a motor protection switch. Overflow protection equipment with current-dependent delayed tripping must monitor the rated current in all wires. 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 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<br>*by units of measurement* | 换算因子<br>*with conversion factor* | 到计量单位<br>*in units of measurement* | 由计量单位<br>*by units of measurement* | 换算因子<br>*with conversion factor* | 到计量单位<br>*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<br>*by SI unit of measurement* | 换算因子<br>*with conversion factor* | 到英-美制计量单位<br>*in anglo-amer. unit of measur.* | 有英-美制计量单位<br>*by anglo-amer. unit of measur.* | 换算因子<br>*with conversion factor* | 到国际标准单位<br>*in SI units of measurement* |
|---|---|---|---|---|---|---|
| 压力/*Pressure* | bar | 0,014 | psi = lb/in² | psi = lb/in² | 68,95 | mbar |
| 压力/*Pressure* | mbar | 14,5 | psi = lb/in² | psi = lb/in² | 0,068 | bar |
| 压力/*Pressure* | mbar | 0,402 | inches water | inches water | 2,49 | mbar |
| 气体流量<br>*Volumetric flow rate* | m³/min | 264,2 | gal/min | gal/min | 0,003 | m³/min |
| 气体流量<br>*Volumetric flow rate* | m³/min | 35,31 | cfm | cfm | 0,028 | m³/min |
| 电机功率<br>*Electric power* | 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 | lb | lb | 0,454 | kg |

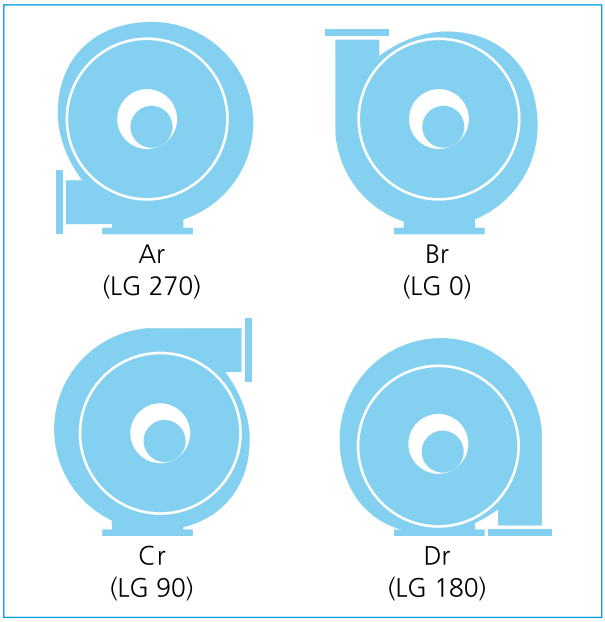
| 举例说明/***Example for conversion*** | | | | | | |
|---|---|---|---|---|---|---|
| 压力/*Pressure* | 180 mbar | 0,014 | 2,61 PSI | 2,61 PSI | 68,95 | 180 mbar |
| 气体流量<br>*Volumetric flow rate* | 6 m³/min | 35,31 | 211,8 ft³/min | 211,8 ft³/min | 0,283 | 6 m³/min |

## 2. 鼓风机排气口方向，接线盒方向，进线位置

**鼓风机方向**

定义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，他们的定义方式是从电机侧观察。全部型号的低压离心式鼓风机的排气口方向都可以做成A,B,C和E,F,G等等，同样适用于不带底座的风机。根据客户要求也可以提供其他方向。如果用户没有特别特别声明鼓风机方向，Ar 方向则作为标准鼓风机方向。



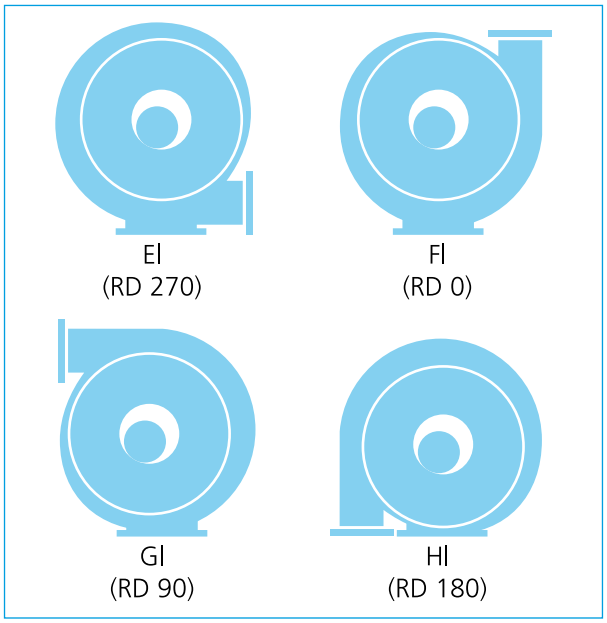

标准产品中，接线盒位置在270度位置（电机顶部），进线位置在A（右侧）。第15页有指示接线盒位置和进线位置的简图。

## 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 El-Hl = Counter-clockwise rotation*

*The designations in brackets are according to EUROVENT 1/1 but they are determined when facing the drive side. Housing positions A, B, C and E, F, G as well as the version without foot base are available for all types of low pressure blowers. Other positions are deliverable on demand. The intended position should also be stated for the version without foot base. Orders without indicated housing position will be supplied in our standard version Ar.*

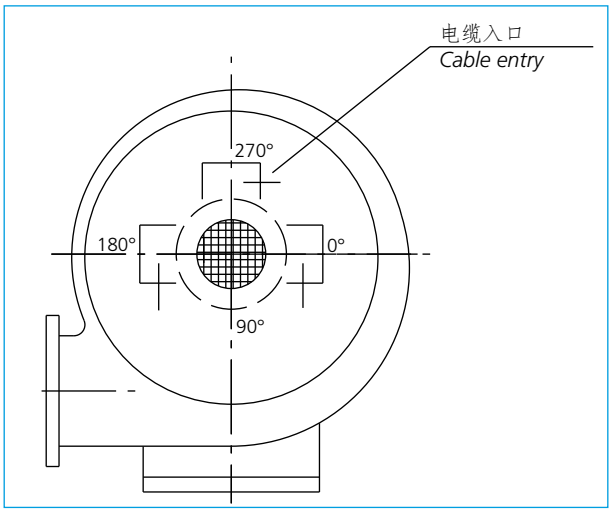



*In the standard version, the equipment is supplied with the terminal box position 270° (top) and the cable inlet A (right). For explanations of the terminal box position and the cable inlet options, see page 15.*



03.18/01

## 接线盒位置/*Terminal box positions*



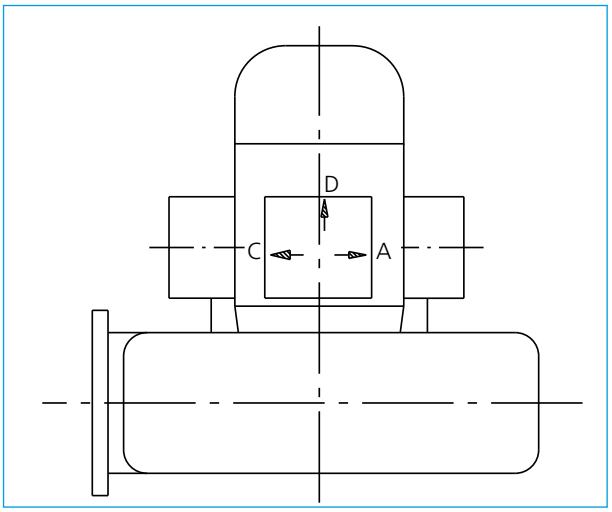

**定义接线盒位置**
**（从鼓风机进气口方向观察）**

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° = 接线盒在电机底部 （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*




**定义电源线进线位置**

A = 右侧（标准配置）
C = 左侧
D = 后部

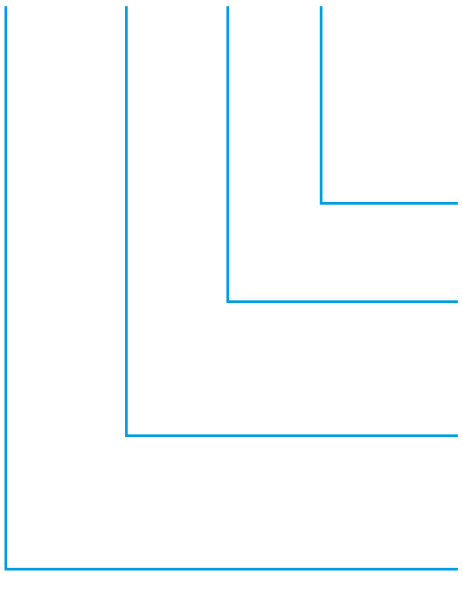
***Definition of cable inlet***

*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 | 2 | D/E | 0 | 60 |
|---|---|---|---|---|
| *Blower* | ***2*** | ***D/E*** | ***0*** | ***60*** |



结构编号
*Construction size*

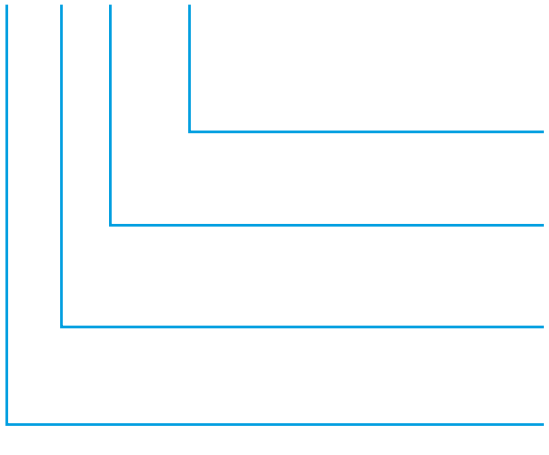
低压鼓风机
*Low pressure blower*

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

双头型鼓风机
*Twin blowers*

### 产品序列代码/*Structure of the serial number*

| 16 | 06 | A | 1234567 |
|---|---|---|---|
| ***16*** | ***06*** | ***A*** | ***1234567*** |



产品序列号（7位）
*Serialnumber, 7-digit*

厂区*
*Place of location**

生产月份（2位）
*Month of manufacture, 2-digit*

生产年份（2位）
*Year of manufacture, 2-digit*

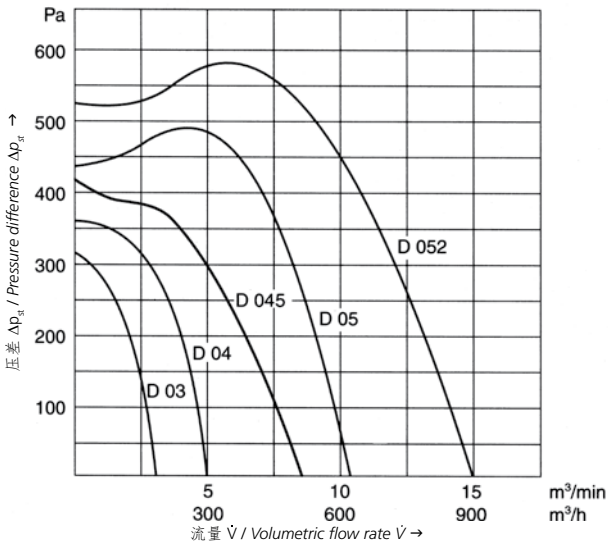
* A = Waghäusel, B = Chorzów, D = 1SD/2SD



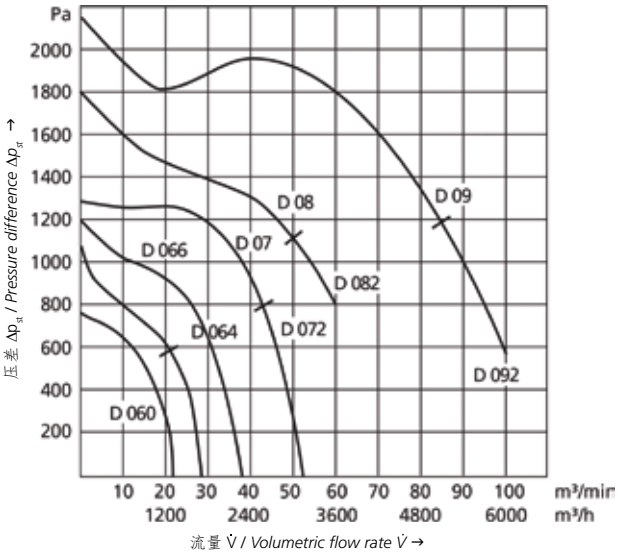
03.18/01

预选/***Preselection***
工作曲线/***Characteristic curves***

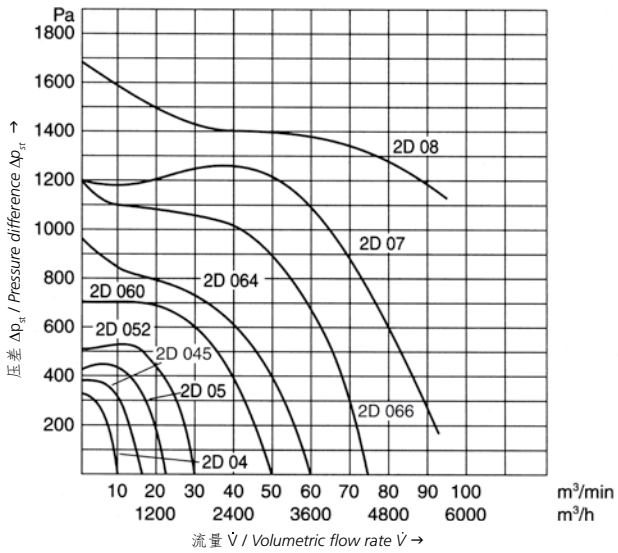
标准型号 第**18**页
***Standard blowers*** ***Page 18***



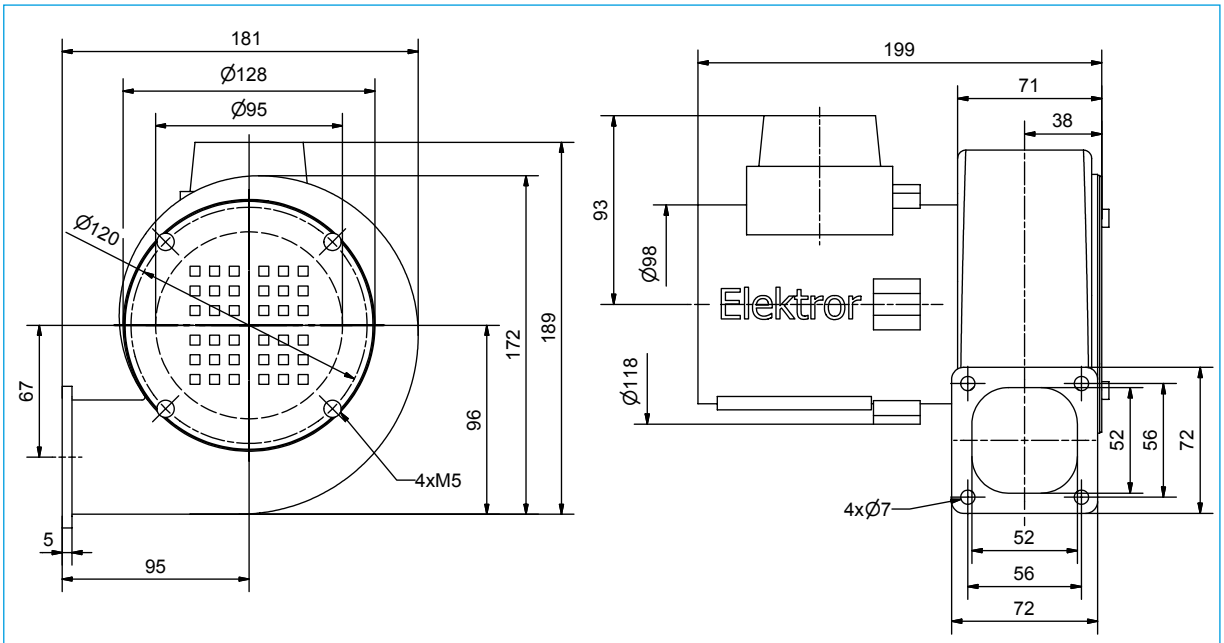

标准型号 第**23**页
***Standard blowers*** ***Page 23***




双头型鼓风机 第**29**页
***Twin blowers*** ***Page 29***



# D 03 M
# E 03

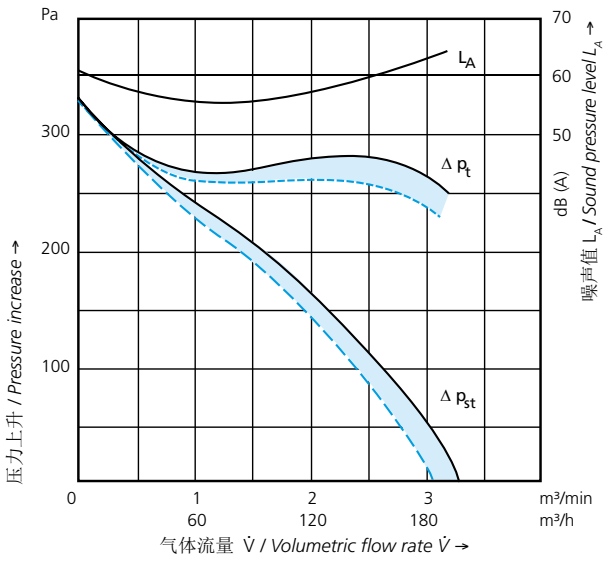



尺寸单位为mm
*Dimensions in mm - subject to modifications.*

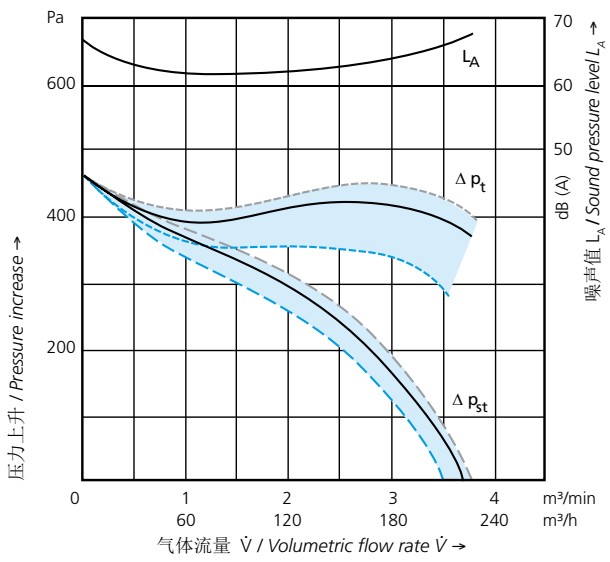
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 电容<br>*Capacitor* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min⁻¹ | kW | µF/V | kg |
| **D 03 M** | 3,2 | 330 | 208-265/<br>360-460 | 50 | 0,36-0,68/<br>0,21-0,36 | 2820 | 0,03 | - | 4,3 |
| **D 03 M** | 3,8 | 480 | 208-290/<br>360-500 | 60 | 0,33-0,55/<br>0,19-0,28 | 3400 | 0,05 | - | 4,3 |
| **E 03** | 3,2 | 330 | 230 | 50 | 0,55 | 2880 | 0,03 | 3/450 | 4,5 |
| **E 03** | 3,8 | 480 | 230 | 60 | 0,50 | 3350 | 0,05 | 3/450 | 4,5 |

## 50 Hz



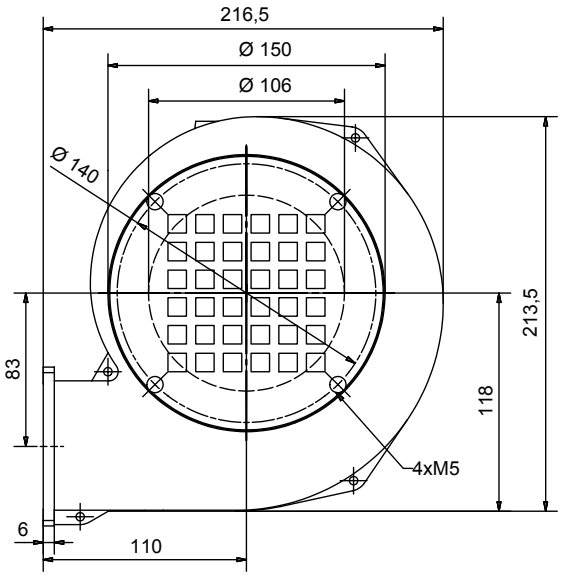

## 60 Hz

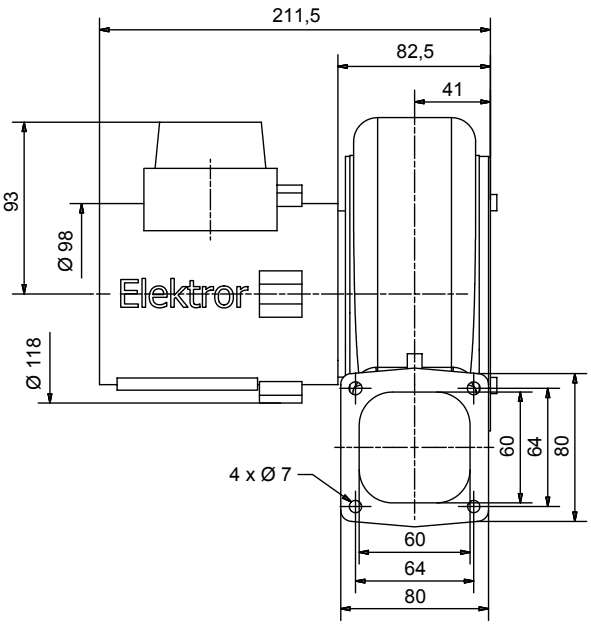



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01



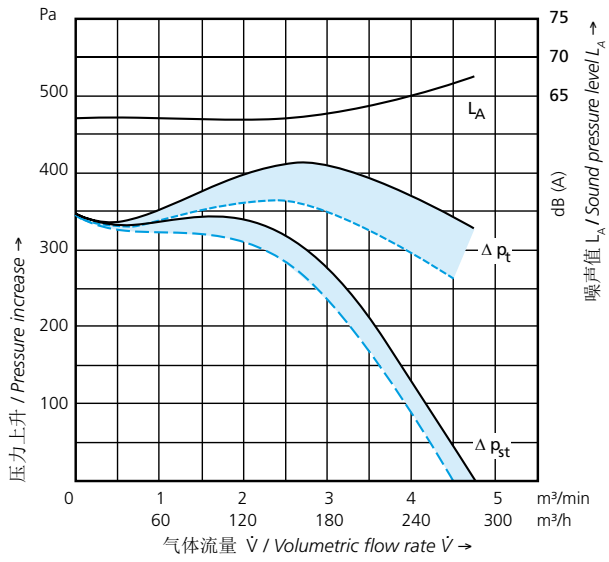




适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

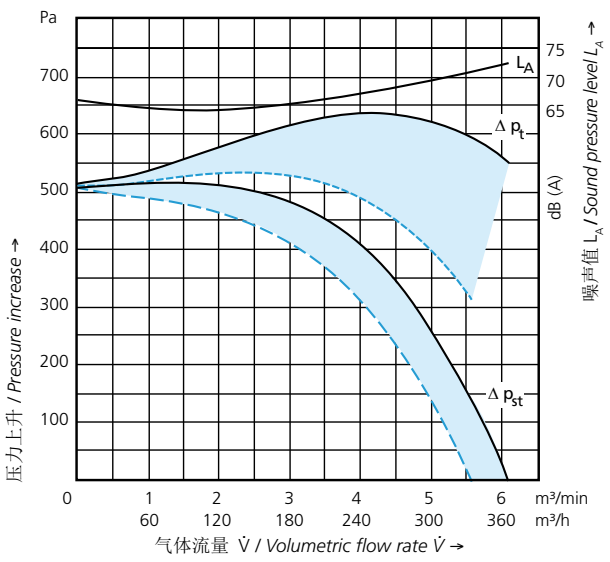
尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 电容<br>*Capacitor* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min⁻¹ | kW | µF/V | kg |
| **D 04 M** | 5,0 | 350 | 208-265/<br>360-460 | 50 | 0,45-0,72/<br>0,26-0,42 | 2850 | 0,07 | - | 4,5 |
| **D 04 M** | 6,0 | 500 | 208-290/<br>360-500 | 60 | 0,47-0,52/<br>0,27-0,30 | 3400 | 0,12 | - | 4,5 |
| **E 04** | 5,0 | 350 | 230 | 50 | 0,80 | 2850 | 0,07 | 3/450 | 4,7 |
| **E 04** | 6,0 | 500 | 230 | 60 | 0,75 | 3400 | 0,12 | 3/450 | 4,7 |

## 50 Hz




## 60 Hz

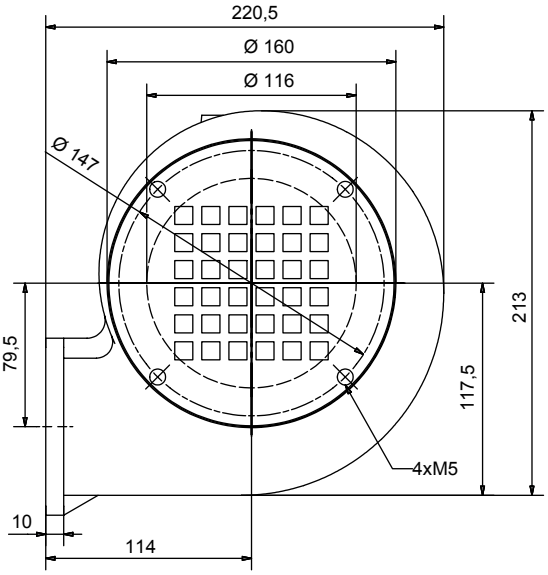


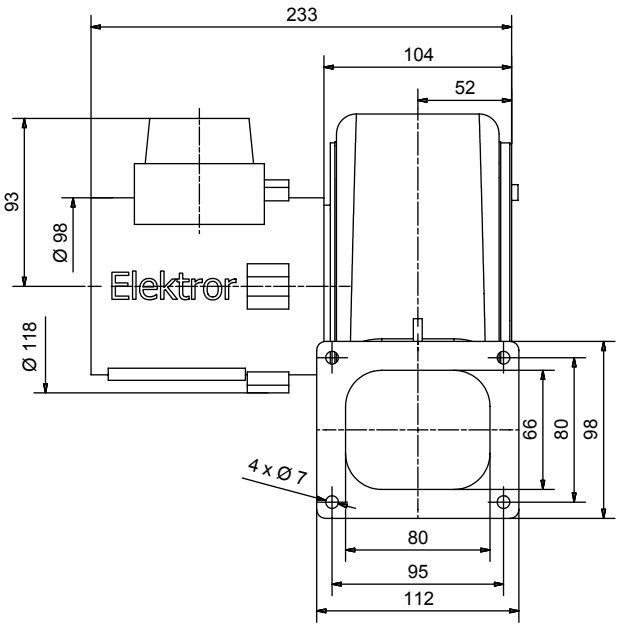





根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# D 045 M
# E 045



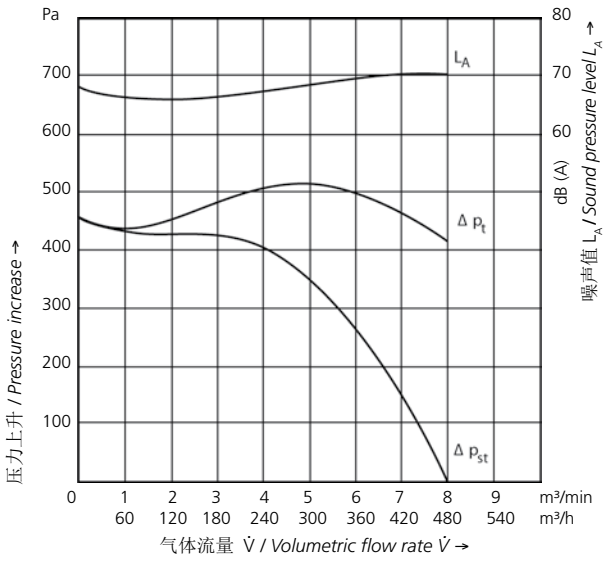




尺寸单位为mm
*Dimensions in mm - subject to modifications.*

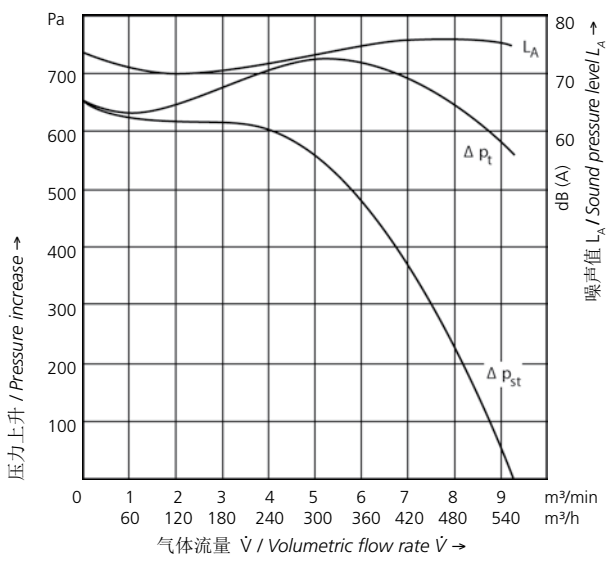
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consump-tion* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 电容<br>*Capaci-tor* | 重量<br>*Weight (ap-prox.)* |
|---|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min⁻¹ | kW | µF/V | kg |
| **D 045 M** | 8,0 | 460 | 208-265/<br>360-460 | 50 | 0,48-0,50/<br>0,28-0,29 | 2660 | 0,10 | - | 5,2 |
| **D 045 M** | 9,3 | 650 | 208-290/<br>360-500 | 60 | 0,62-0,61/<br>0,36-0,35 | 3070 | 0,17 | - | 5,2 |
| **E 045** | 8,4 | 460 | 230 | 50 | 0,82 | 2770 | 0,13 | 3/450 | 5,4 |
| **E 045** | 9,2 | 650 | 230 | 60 | 1,17 | 2980 | 0,15 | 3/450 | 5,4 |

## 50 Hz




## 60 Hz

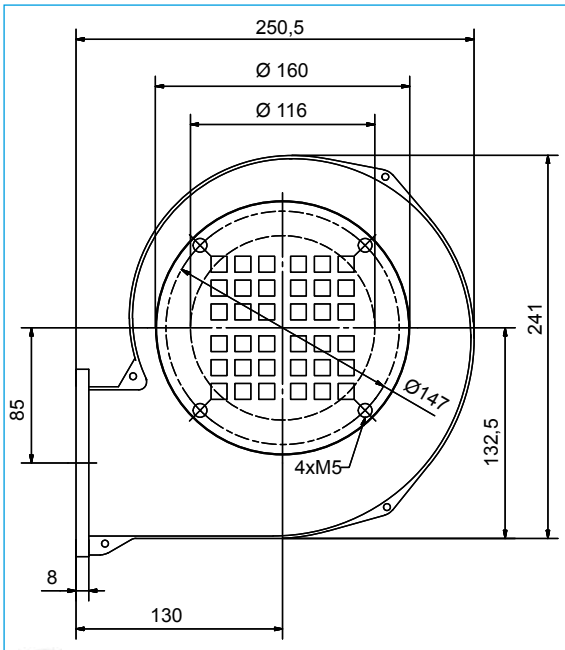


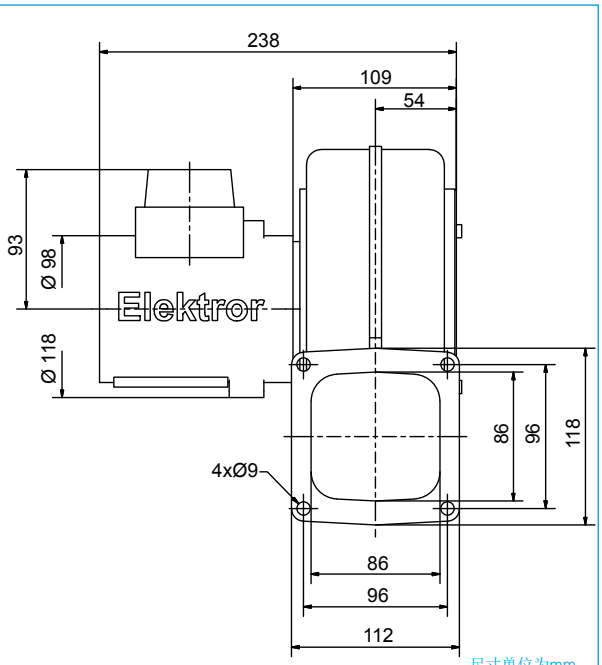

根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01

# D 05 M
# E 05



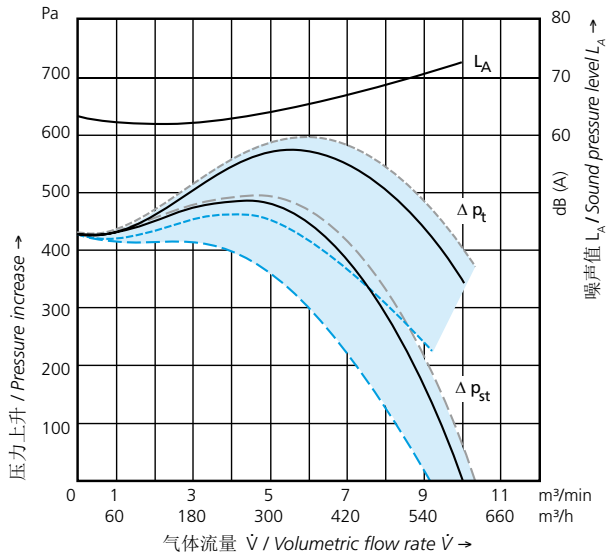




适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

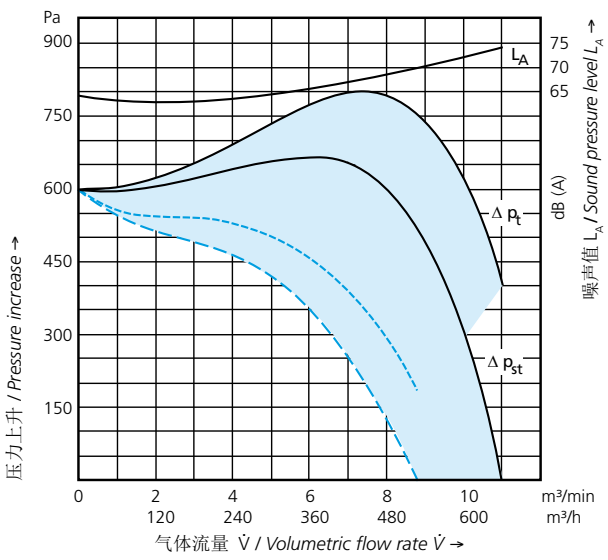
尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 电容<br>*Capacitor* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min⁻¹ | kW | µF/V | kg |
| **D 05 M** | 10,0 | 430 | 208-265/<br>360-460 | 50 | 0,59-0,59/<br>0,34-0,34 | 2550 | 0,13 | - | 5,0 |
| **D 05 M** | 11,0 | 620 | 208-290/<br>360-500 | 60 | 0,74-0,74/<br>0,43-0,43 | 3000 | 0,22 | - | 5,0 |
| **E 05** | 10,0 | 430 | 230 | 50 | 1,1 | 2550 | 0,14 | 3/450 | 5,2 |
| **E 05** | 9,5 | 620 | 230 | 60 | 0,9 | 3300 | 0,14 | 3/450 | 5,2 |

## 50 Hz




## 60 Hz



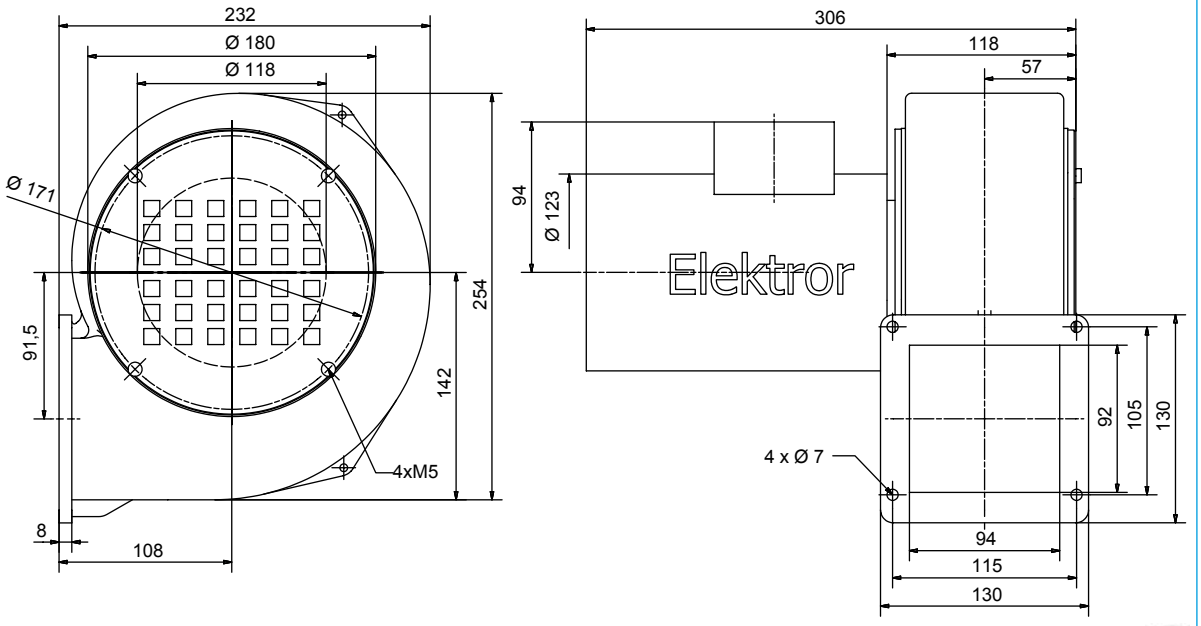




03.18/01


根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# D 052 M
# E 052

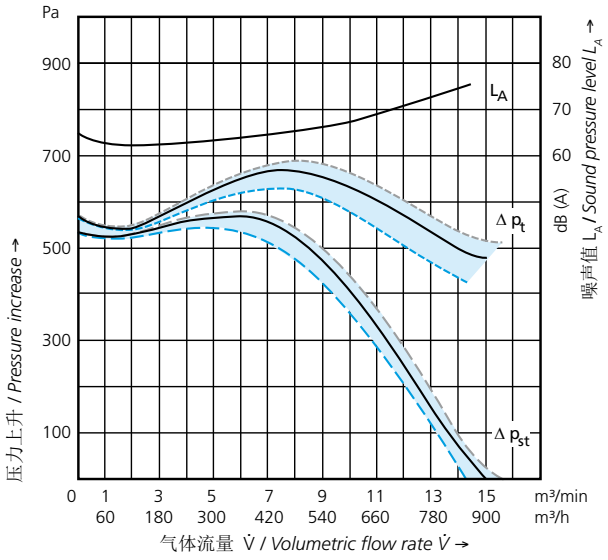



尺寸单位为mm
*Dimensions in mm - subject to modifications.*

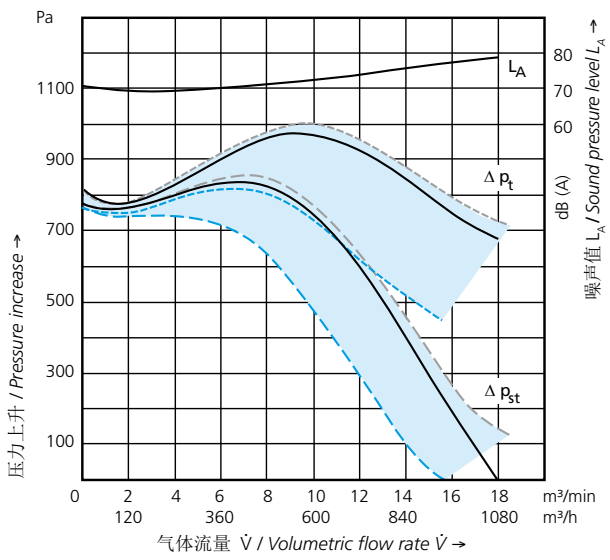
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 电容<br>*Capacitor* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min⁻¹ | kW | µF/V | kg |
| **D 052 M** | 15,0 | 530 | 208-265/<br>360-460 | 50 | 1,25-2,15/<br>0,72-1,24 | 2840 | 0,37 | - | 6,7 |
| **D 052 M** | 18,0 | 760 | 208-290/<br>360-500 | 60 | 1,73-1,91/<br>1,00-1,10 | 3350 | 0,44 | - | 6,7 |
| **E 052** | 13,5 | 530 | 230 | 50 | 1,8 | 2805 | 0,25 | 12/450 | 6,9 |
| **E 052** | 12,5 | 760 | 230 | 60 | 2,2 | 3365 | 0,3 | 12/450 | 6,9 |

## 50 Hz




## 60 Hz

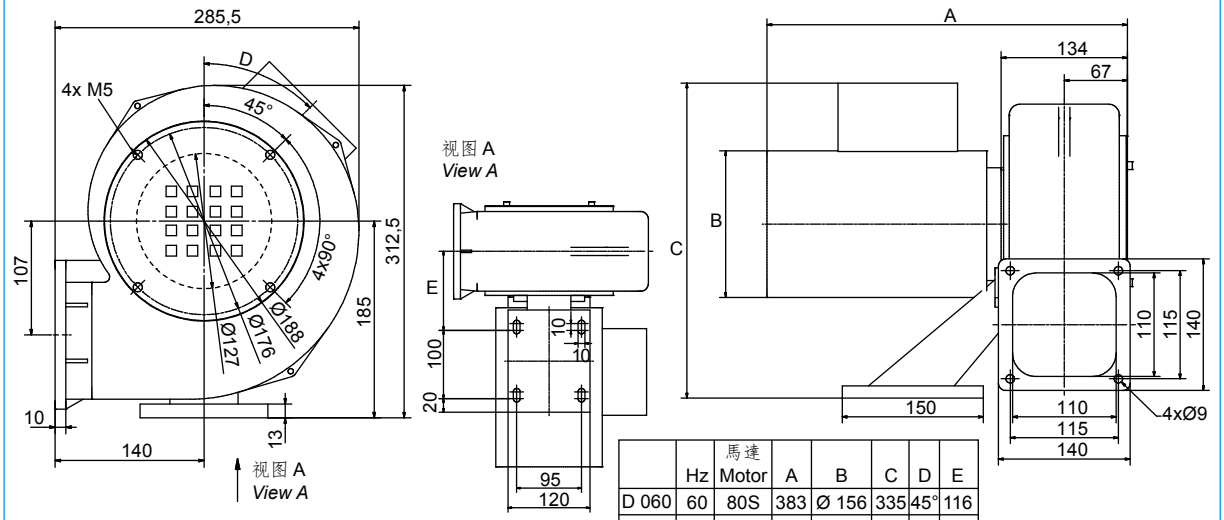



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01

注意！ 60Hz装置接线盒位置旋转45°
*Note! Terminal box position at 60 Hz device rotated by 45°!*




| | Hz | 馬達 Motor | A | B | C | D | E |
|---|---|---|---|---|---|---|---|
| D 060 | 60 | 80S | 383 | Ø 156 | 335 | 45° | 116 |
| D 060 | 50 | 71L | 346 | Ø 138 | 317 | 0° | 110 |

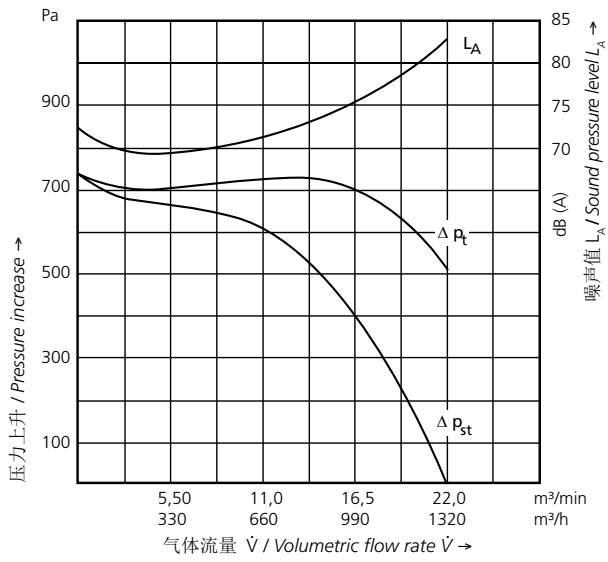
适用于变频器驱动！
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

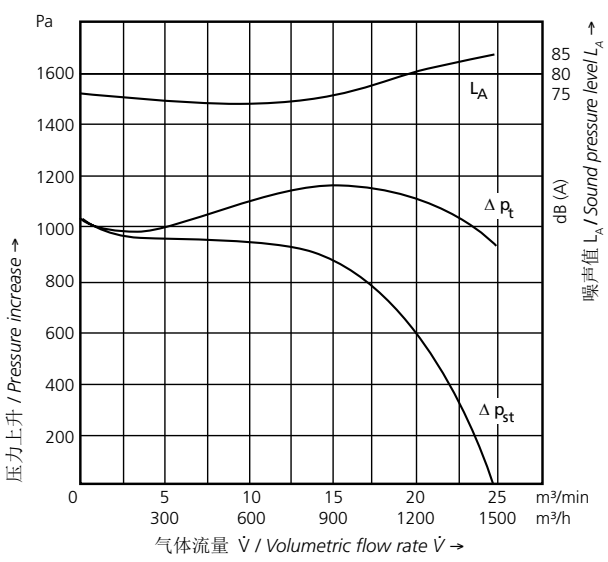
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 电容 *Capacitor* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | µF/V | kg |
| | - | 50 | 22,0 | 730 | 230/400 | 2,50/1,45 | 2840 | 0,55 | - | 10 |
| **D 060** | IE3 | 60 | 24,5 | 1040 | 230/400 | 3,55/2,05 | 3430 | 0,90 | - | 12 |
| | **NEMA*** | 60 | 24,5 | 1040 | 277/480 | 2,95/1,71 | 3430 | 0,90 | - | 12 |
| **E 060** | - | 50 | 22,0 | 730 | 230 | 3,6 | 2820 | 0,55 | 16/450 | 11 |
| **E 060** | - | 60 | 22,5 | 1040 | 230 | 5,0 | 3360 | 0,75 | 16/450 | 11 |

* NEMA 效率等级 / *NEMA Premium*

## 50 Hz



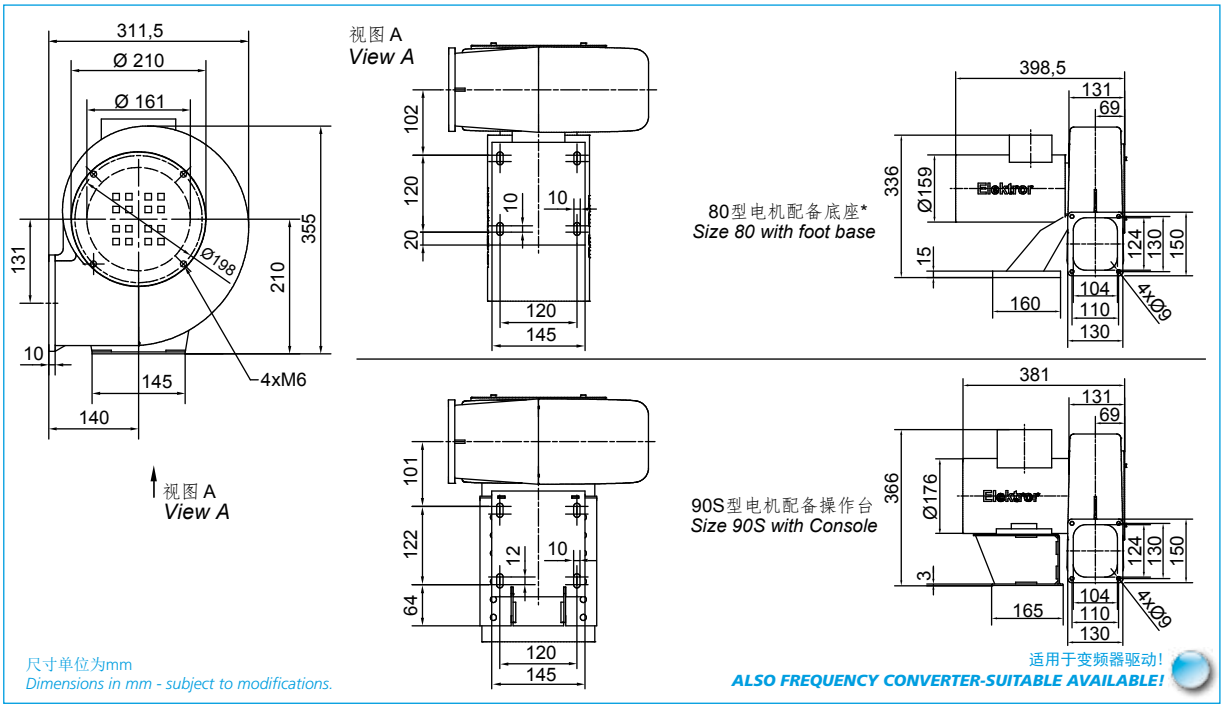

## 60 Hz






根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# D 064
# E 064



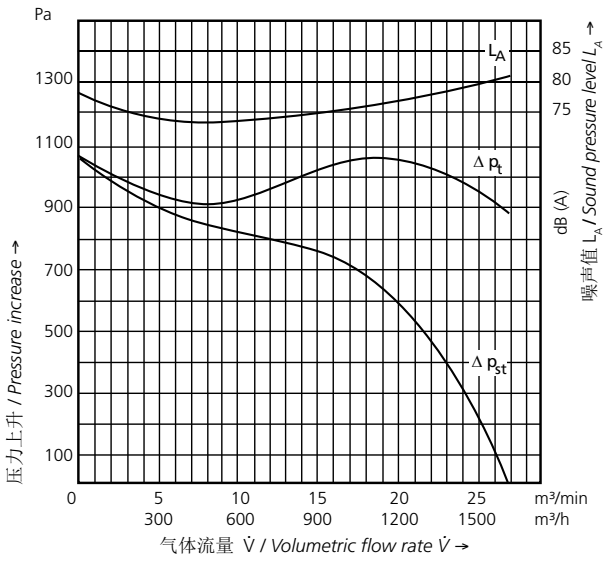

尺寸单位为mm
*Dimensions in mm - subject to modifications.*

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

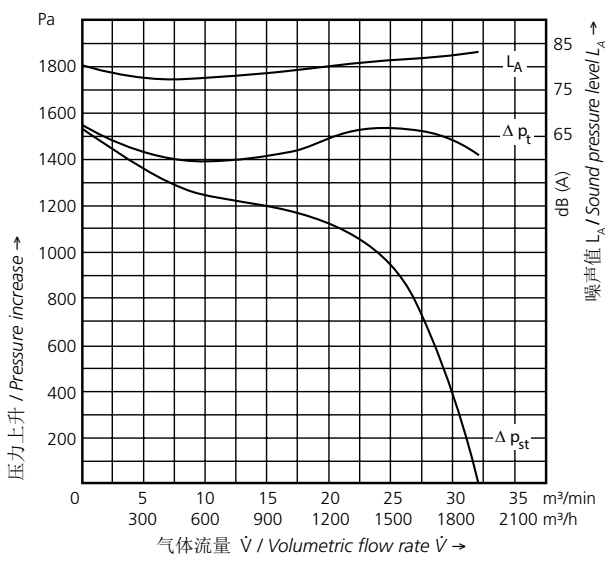
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 电容 *Capacitor* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | µF/V | kg |
| **D 064** | IE3* | 50 | 27,0 | 1050 | 230/400 | 4,20/2,40 | 2910 | 1,10 | - | 15 |
| | IE3 | 50 | 27,0 | 1050 | 230/400 | 4,00/2,30 | 2905 | 1,10 | - | 17 |
| | IE3 | 60 | 32,0 | 1550 | 230/400 | 4,55/2,65 | 3490 | 1,32 | - | 17 |
| | **NEMA**** | 60 | 32,0 | 1550 | 277/480 | 3,80/2,20 | 3490 | 1,32 | - | 17 |
| **E 064** | - | 50 | 28,0 | 1000 | 230 | 6,7 | 2800 | 1,10 | 30/450 | 17 |
| **E 064** | - | 60 | 26,0 | 1500 | 230 | 6,7 | 3360 | 1,10 | 30/450 | 17 |

* 230/400,50Hz,IP55,PTC 风机配备80型号电机,其他均为90S型号风机 /
*Size 80-Motor for 230/400 V, 50 Hz, IP55, PTC. Size 90S-Motor for all other executions.*
** NEMA 效率等级 / *NEMA Premium*

## 50 Hz



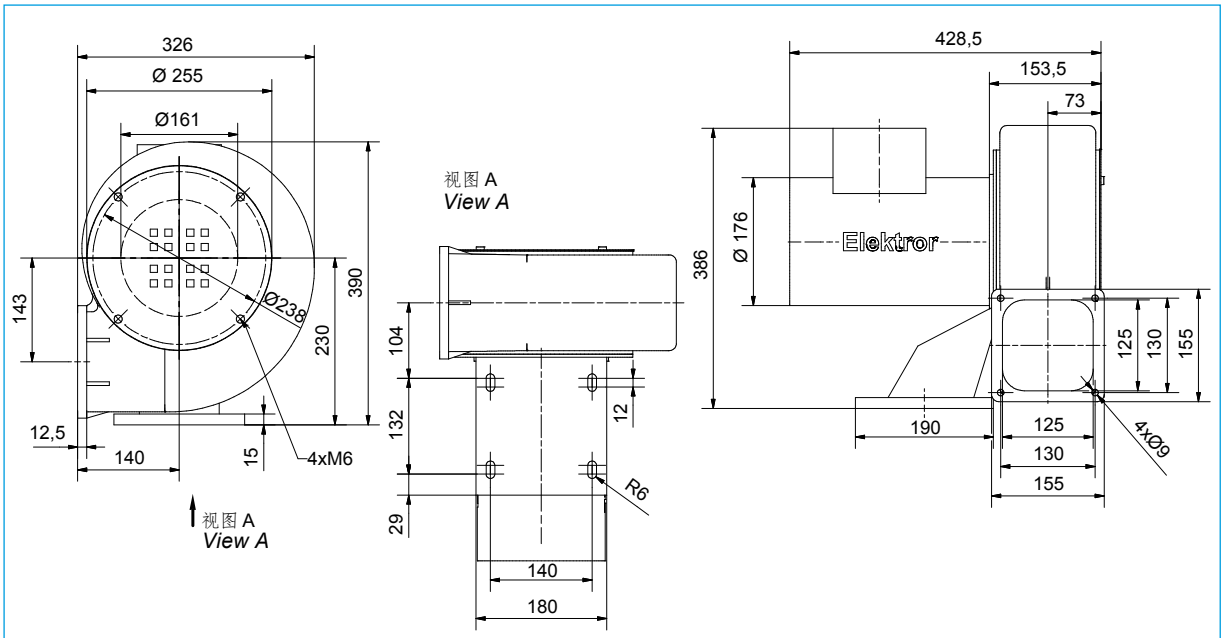

## 60 Hz




根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*




03.18/01



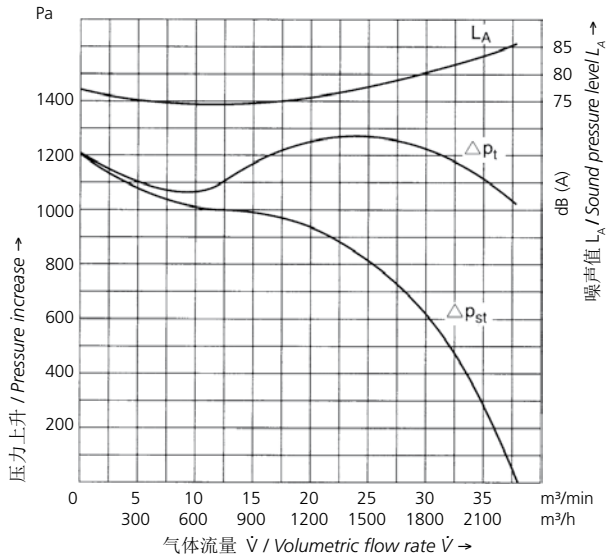

适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

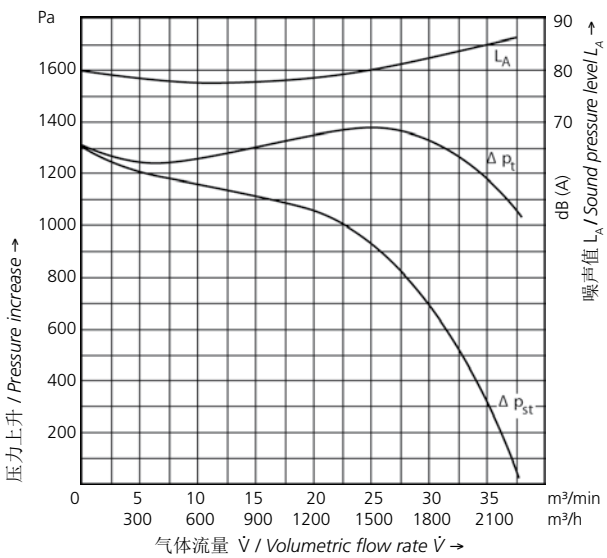
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 电容 *Capacitor* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | µF/V | kg |
| **D 066** | IE3 | 50 | 38,0 | 1200 | 230/400 | 5,4/3,1 | 2905 | 1,5 | - | 21,5 |
| | IE3 | 60 | 38,0 | 1300 | 230/400 | 6,4/3,7 | 3505 | 1,8 | - | 21,5 |
| | **NEMA*** | 60 | 38,0 | 1300 | 277/480 | 5,4/3,1 | 3505 | 1,8 | - | 21,5 |
| **E 066** | - | 50 | 36,0 | 1200 | 230 | 9,5 | 2880 | 1,5 | 30/450 | 18 |

***** NEMA 效率等级 / *NEMA Premium*

## 50 Hz



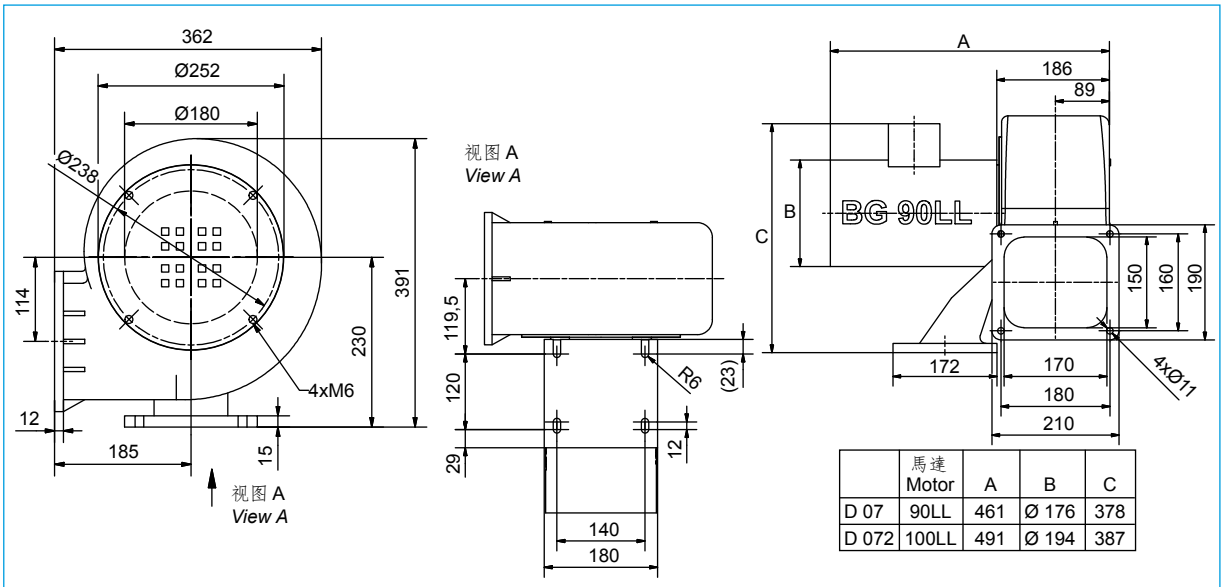

## 60 Hz






根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# D 07
# D 072




| | 馬達 Motor | A | B | C |
|---|---|---|---|---|
| D 07 | 90LL | 461 | Ø 176 | 378 |
| D 072 | 100LL | 491 | Ø 194 | 387 |

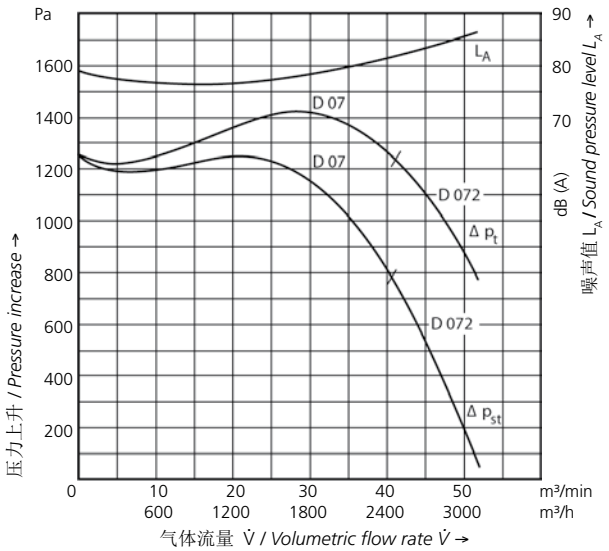
尺寸单位为mm
*Dimensions in mm - subject to modifications.*

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

| 型号 *Type* | 型号 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| **D 07** | IE3 | 50 | 41,0 | 1200 | 230/400 | 7,6/4,4 | 2870 | 2,20 | 25 |
| | IE3 | 60 | 41,0 | 1600 | 230/400 | 9,1/5,3 | 3480 | 2,64 | 25 |
| | **NEMA*** | 60 | 41,0 | 1600 | 277/480 | 7,6/4,4 | 3480 | 2,64 | 25 |
| **D 072** | IE3 | 50 | 52,0 | 1200 | 230/400 | 10,2/5,9 | 2900 | 3,00 | 27 |
| | IE3 | 60 | 52,0 | 1600 | 230/400 | 12,4/7,1 | 3500 | 3,60 | 27 |
| | **NEMA*** | 60 | 52,0 | 1600 | 277/480 | 10,3/6,00 | 3500 | 3,60 | 27 |

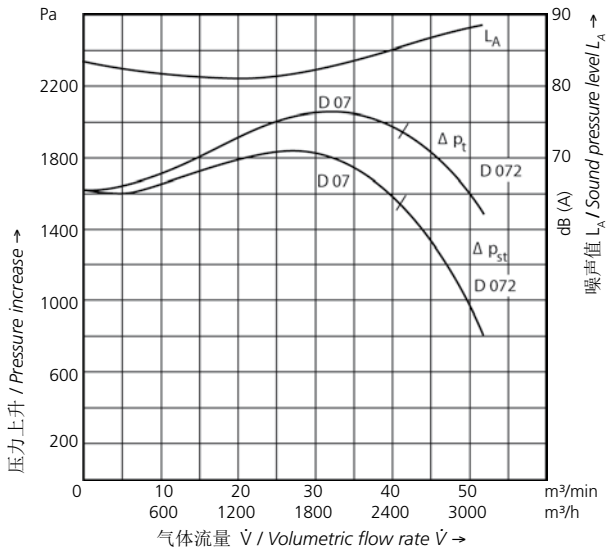
***** NEMA 效率等级 / *NEMA Premium*

## 50 Hz




注意不能空载启动. *Blower not to be operated with free discharge.*

## 60 Hz

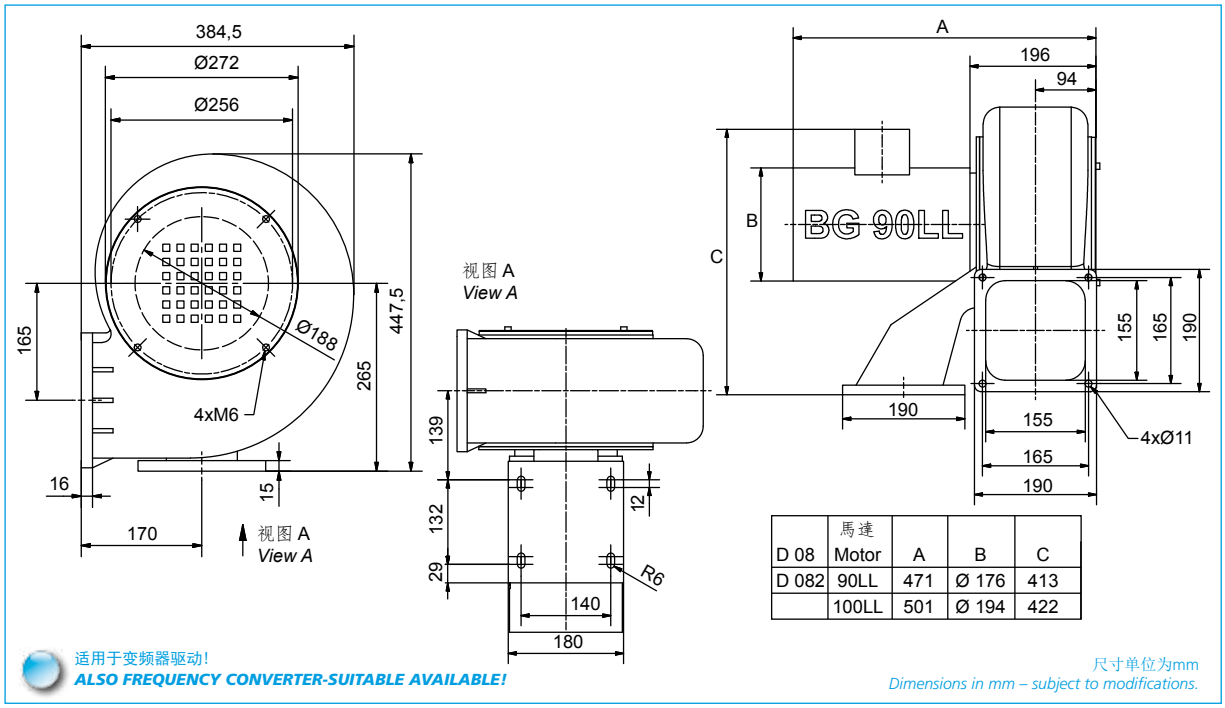



注意不能空载启动. *Blower not to be operated with free discharge.*

根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01




| | 馬達 | A | B | C |
|---|---|---|---|---|
| D 08 | Motor | | | |
| D 082 | 90LL | 471 | Ø 176 | 413 |
| | 100LL | 501 | Ø 194 | 422 |

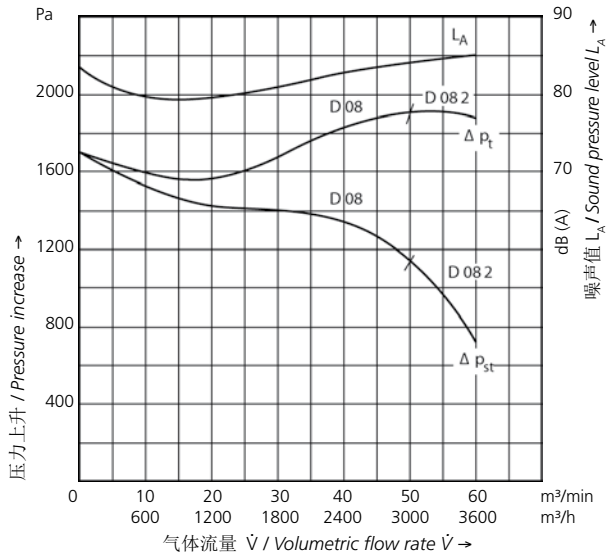
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| **D 08** | IE3 | 50 | 50,0 | 1700 | 230/400 | 7,6/4,4 | 2870 | 2,20 | 30 |
| | IE3 | 60 | 42,0 | 2300 | 230/400 | 9,1/5,3 | 3480 | 2,64 | 30 |
| | **NEMA*** | 60 | 42,0 | 2300 | 277/480 | 7,6/4,4 | 3480 | 2,64 | 30 |
| **D 082** | IE3 | 50 | 60,0 | 1700 | 230/400 | 10,2/5,9 | 2920 | 3,00 | 33 |
| | IE3 | 60 | 53,0 | 2300 | 230/400 | 12,4/7,1 | 3500 | 3,60 | 33 |
| | **NEMA*** | 60 | 53,0 | 2300 | 277/480 | 10,3/6,0 | 3500 | 3,60 | 33 |

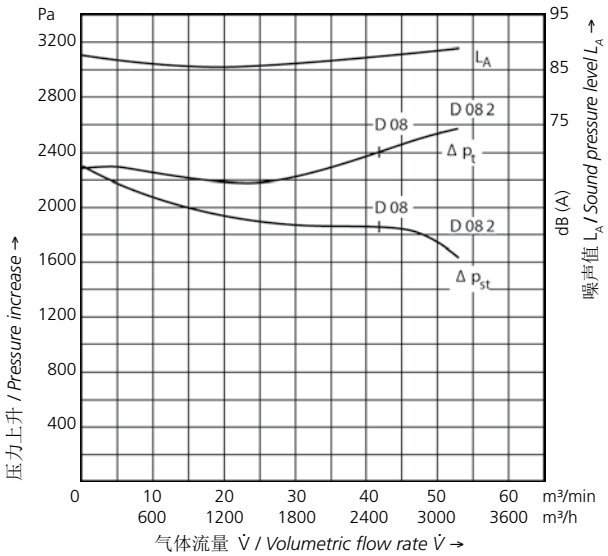
* NEMA 效率等级 / *NEMA Premium*

## 50 Hz




注意不能空载启动. *Blower not to be operated with free discharge.*

## 60 Hz

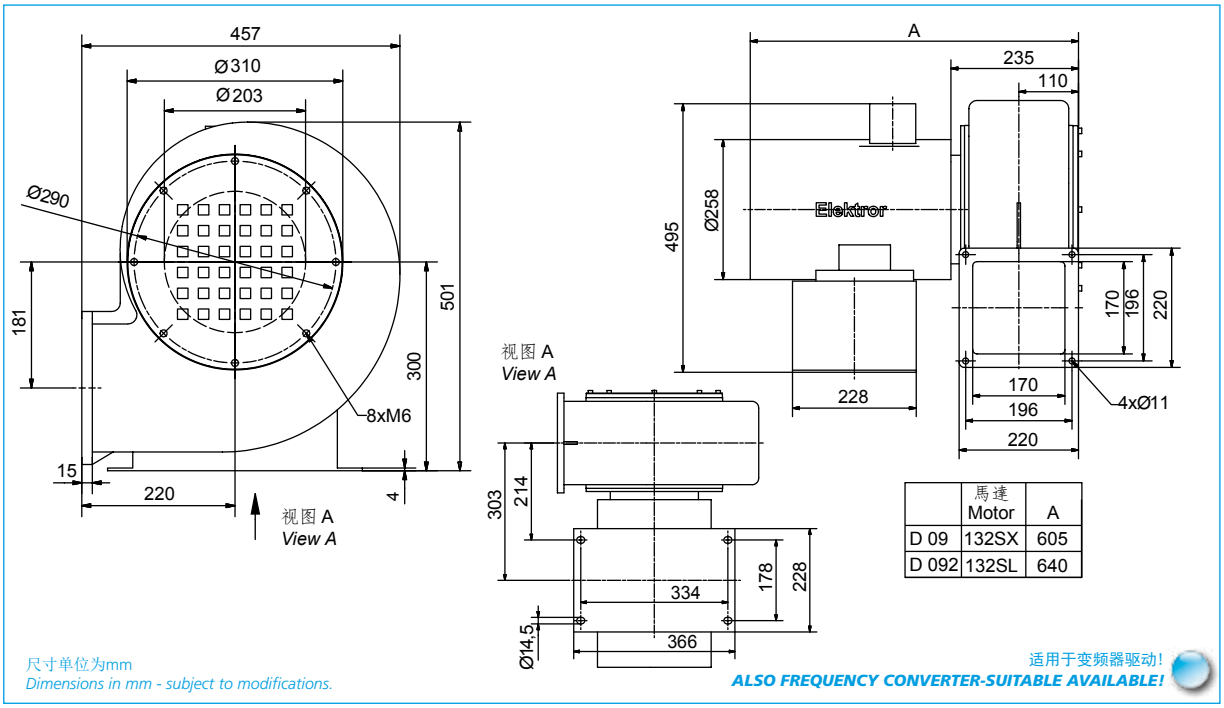



注意不能空载启动. *Blower not to be operated with free discharge.*



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# D 09
# D 092




| | 馬達 Motor | A |
|---|---|---|
| D 09 | 132SX | 605 |
| D 092 | 132SL | 640 |

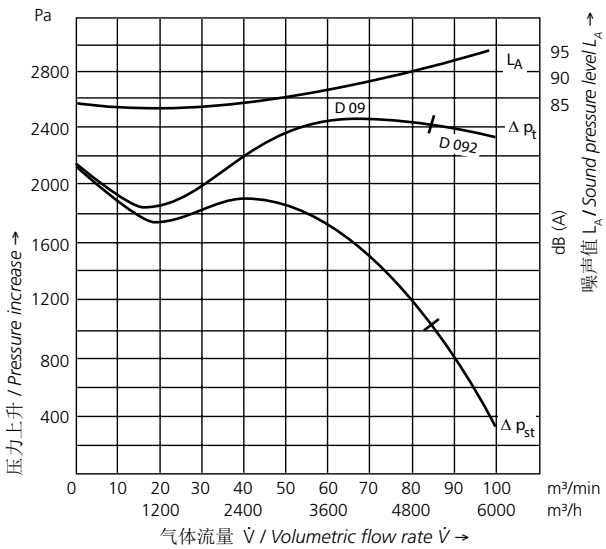
尺寸单位为mm
*Dimensions in mm - subject to modifications.*

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

| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consumption* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| **D 09** | IE3 | 50 | 84,0 | 2200 | 400 Δ | 10,2 | 2940 | 5,5 | 66 |
| | IE3 | 60 | 88,0 | 3200 | 400 Δ | 12,4 | 3540 | 6,6 | 66 |
| | **NEMA*** | 60 | 88,0 | 3200 | 480 Δ | 10,3 | 3540 | 6,6 | 66 |
| **D 092** | IE3 | 50 | 100,0 | 2200 | 400 Δ | 13,4 | 2935 | 7,5 | 71 |
| | IE3 | 60 | 96,0 | 3200 | 400 Δ | 16,1 | 3530 | 9,0 | 71 |
| | **NEMA*** | 60 | 96,0 | 3200 | 480 Δ | 13,4 | 3530 | 9,0 | 71 |

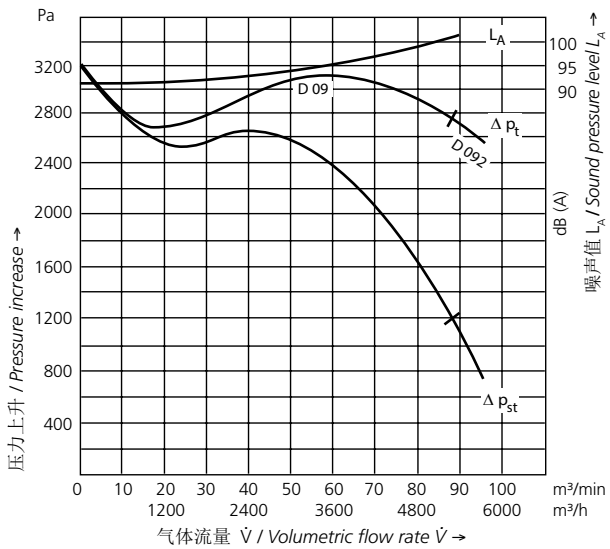
***** NEMA 效率等级 / *NEMA Premium*

## 50 Hz




注意不能空载启动. *D 09 not to be operated with free discharge.*

## 60 Hz

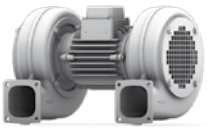


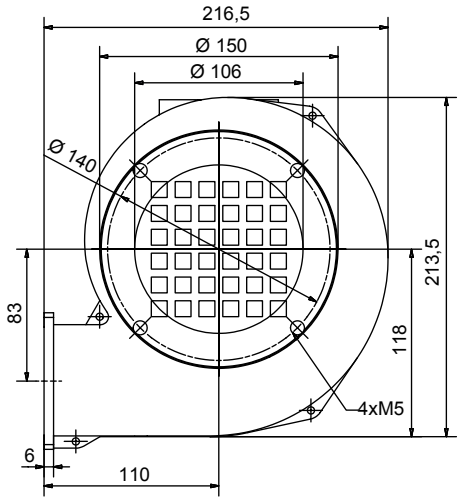

注意不能空载启动. *D 09 not to be operated with free discharge.*

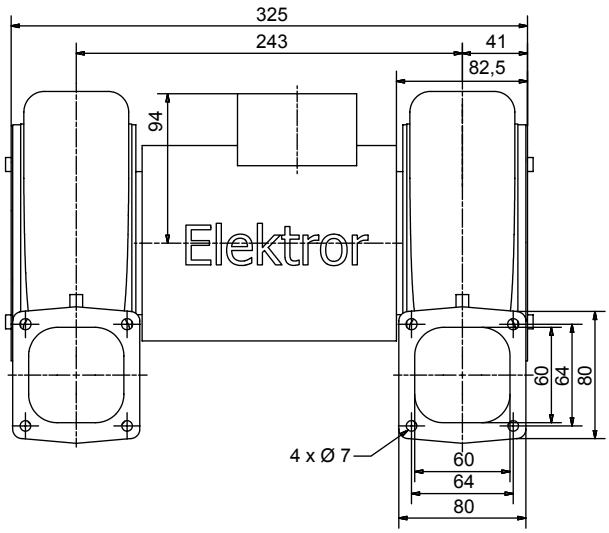
根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01





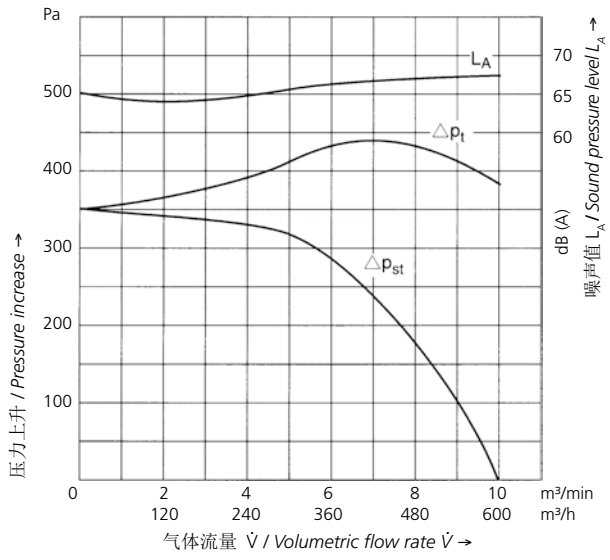




适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

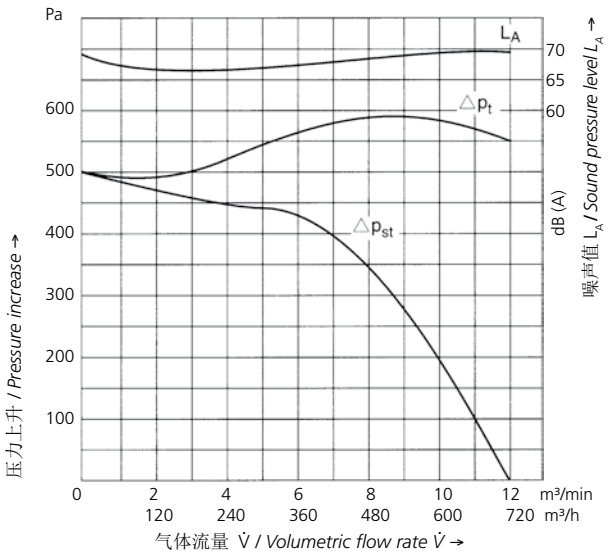
尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min-1 | kW | kg |
| **2D 04** | 10,0 | 350 | 230/400 | 50 | 1,04/0,60 | 2900 | 0,14 | 6,7 |
| **2D 04** | 12,0 | 500 | 277/480 | 60 | 1,13/0,65 | 3450 | 0,24 | 6,7 |

## 50 Hz



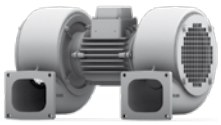

## 60 Hz

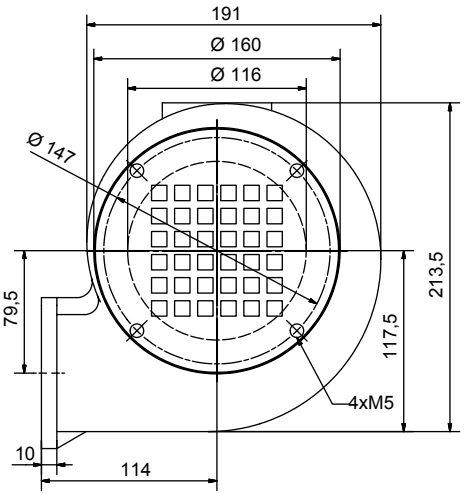


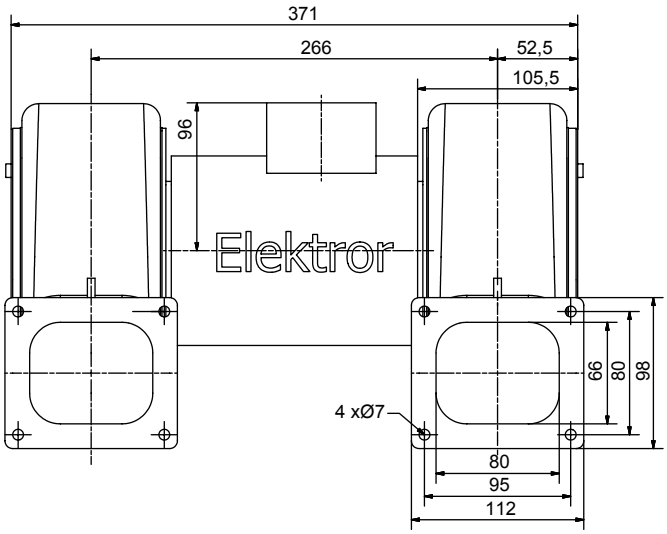



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# 2D 045





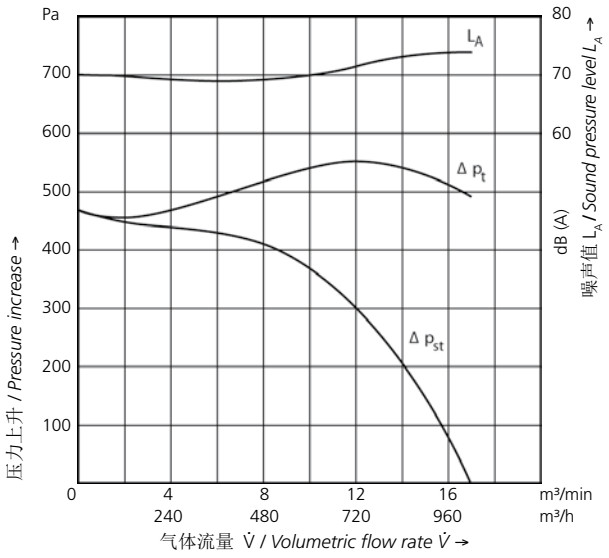




尺寸单位为mm
*Dimensions in mm - subject to modifications.*

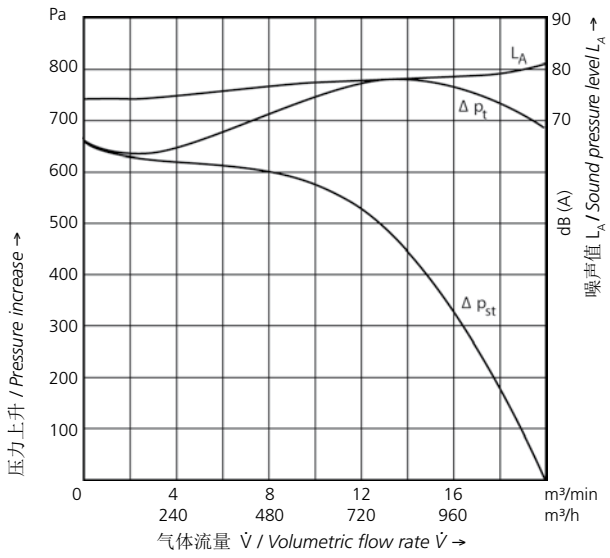
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consump-tion* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min-1 | kW | kg |
| **2D 045** | 17,0 | 460 | 230/400 | 50 | 1,63/0,94 | 2855 | 0,24 | 8,7 |
| **2D 045** | 20,0 | 650 | 277/480 | 60 | 1,73/1,00 | 3320 | 0,40 | 8,7 |

## 50 Hz



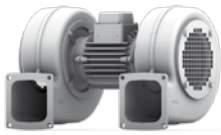

## 60 Hz

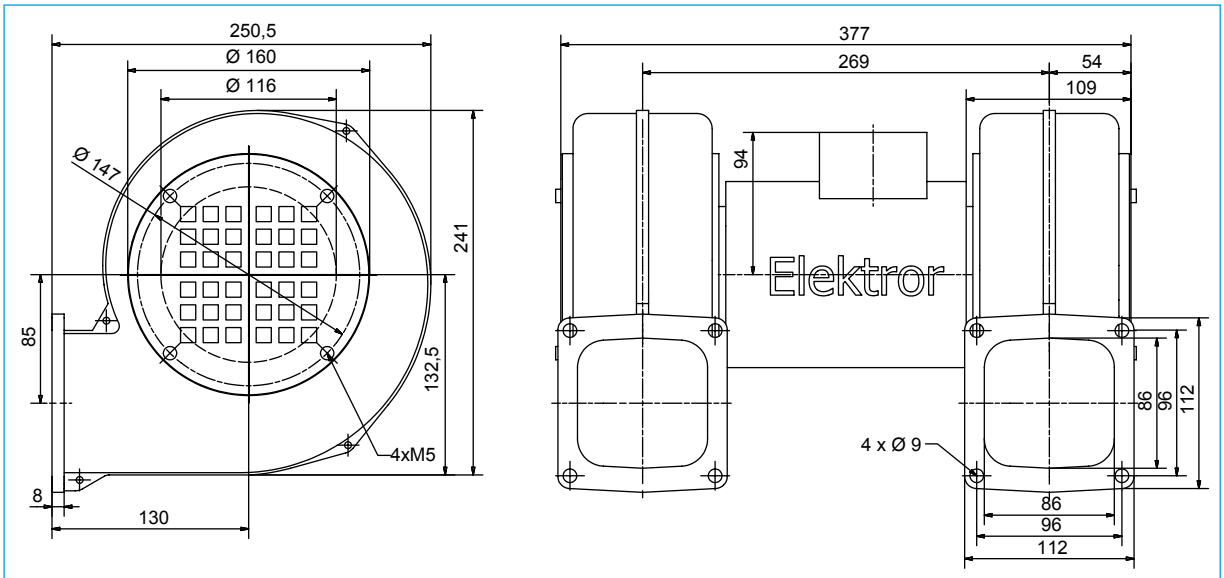



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01



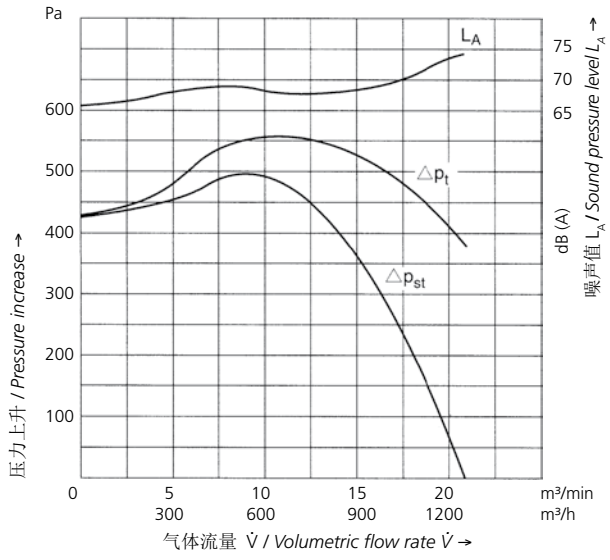



适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

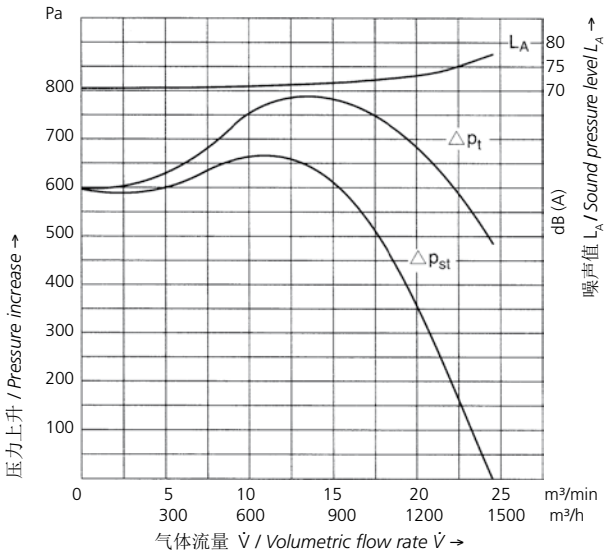
尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consumption* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min-1 | kW | kg |
| **2D 05** | 21,0 | 430 | 230/400 | 50 | 1,91/1,10 | 2770 | 0,35 | 8,4 |
| **2D 05** | 24,0 | 620 | 277/480 | 60 | 2,15/1,25 | 3200 | 0,55 | 8,4 |

## 50 Hz




## 60 Hz

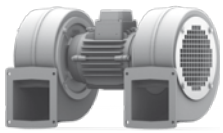


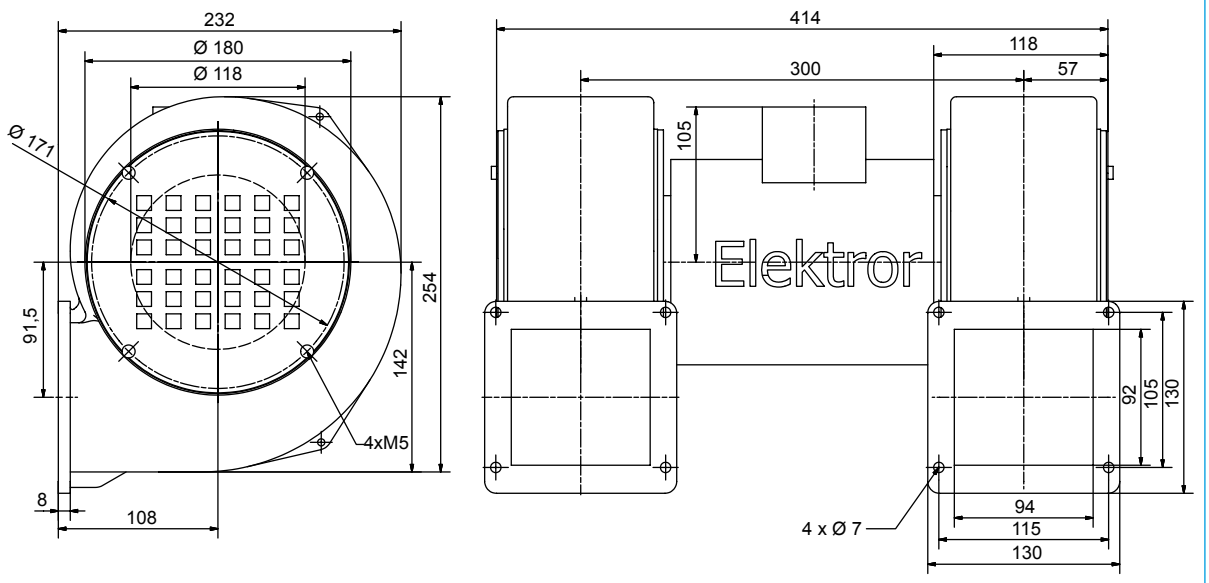





根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# 2D 052



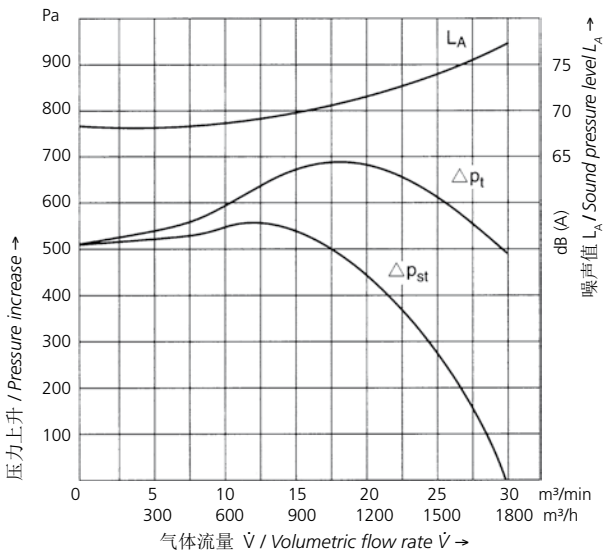



尺寸单位为mm
*Dimensions in mm - subject to modifications.*

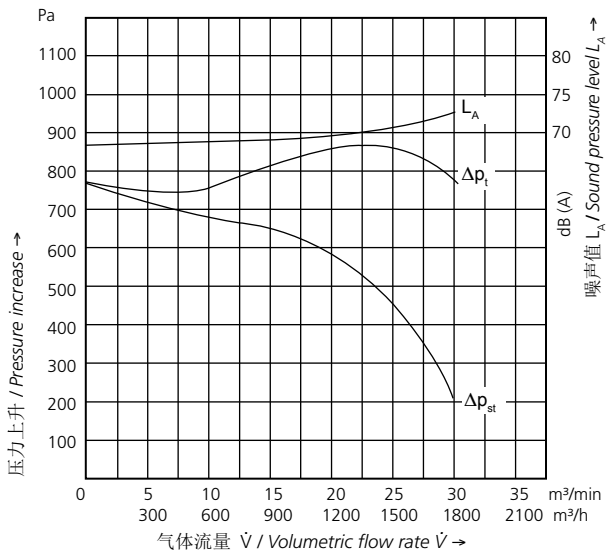
适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

| 型号<br>*Type* | 气体流量<br>*Volumetric flow rate* | 全压差<br>*Total pressure difference* | 电压<br>*Voltage* | 频率<br>*Frequency* | 电流<br>*Current consump-tion* | 转速<br>*Number of revolutions* | 电机功率<br>*Motor rating* | 重量<br>*Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|
| | m³/min | Pa | V | Hz | A | min-1 | kW | kg |
| **2D 052** | 30,0 | 530 | 230/400 | 50 | 2,60/1,50 | 2850 | 0,56 | 11 |
| **2D 052** | 30,0 | 760 | 277/480 | 60 | 2,60/1,50 | 3420 | 0,70 | 11 |

## 50 Hz




## 60 Hz

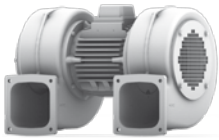


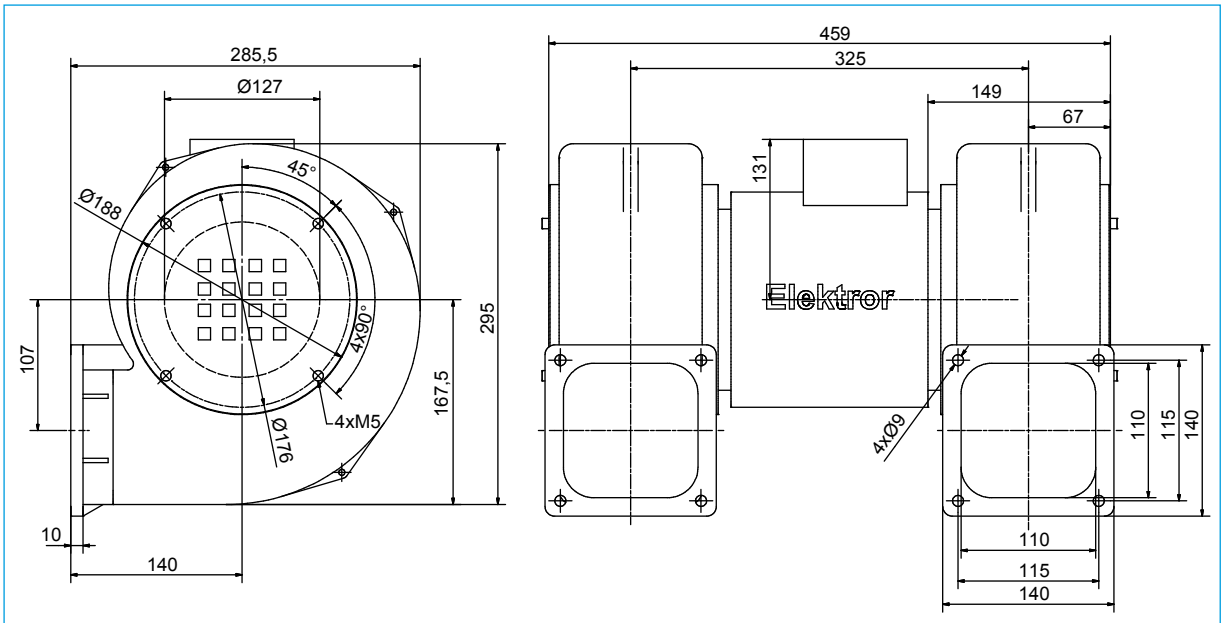

注意不能空载启动. *Blower not to be operated with free discharge.*

根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01





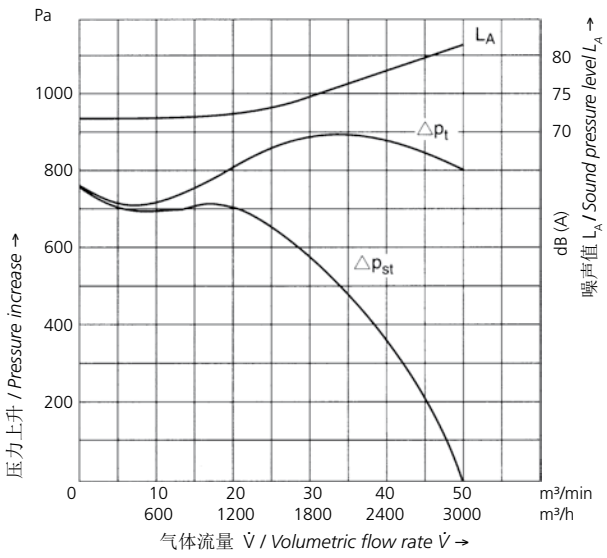

适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

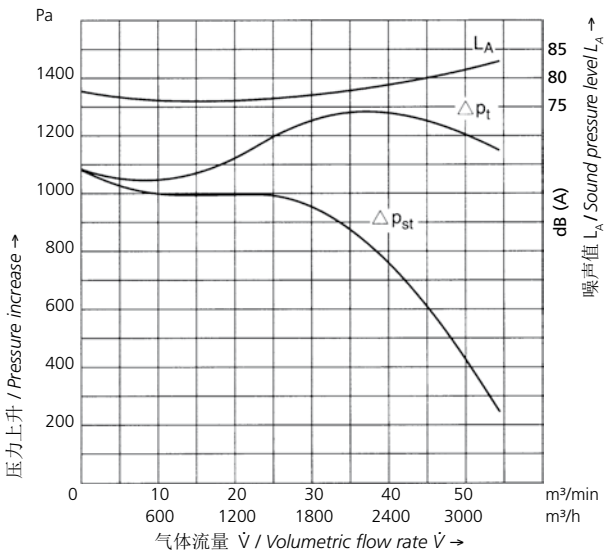
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consump-tion* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| | IE3 | 50 | 50,0 | 730 | 230/400 | 5,40/3,10 | 2905 | 1,5 | 21,5 |
| **2D 060** | IE3 | 60 | 54,0 | 1040 | 230/400 | 6,40/3,70 | 3505 | 1,8 | 21,5 |
| | **NEMA*** | 60 | 54,0 | 1040 | 277/480 | 5,40/3,10 | 3505 | 1,8 | 21,5 |

***** NEMA 效率等级 **/** *NEMA Premium*

## 50 Hz




## 60 Hz

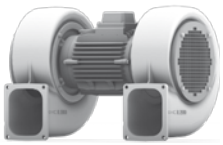


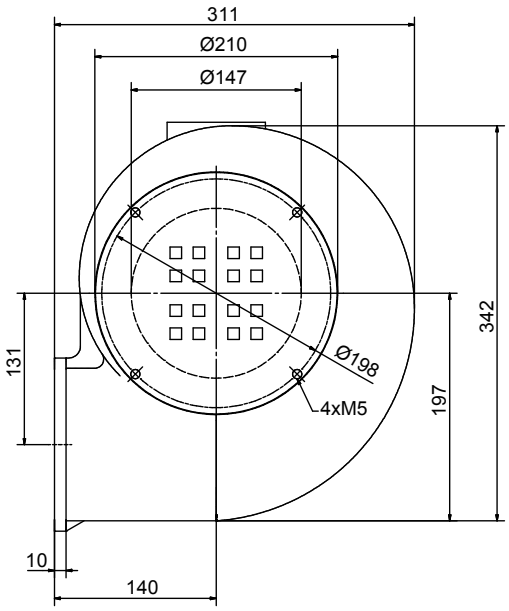

注意不能空载启动. *Blower not to be operated with free discharge.*

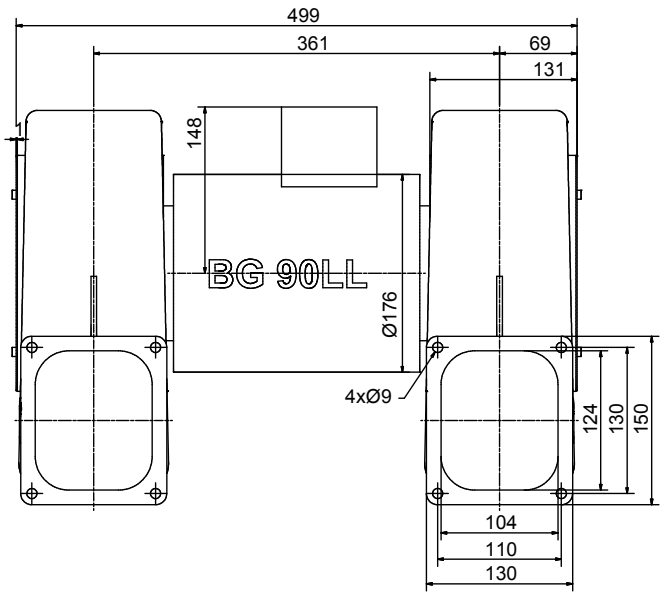


根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# 2D 064





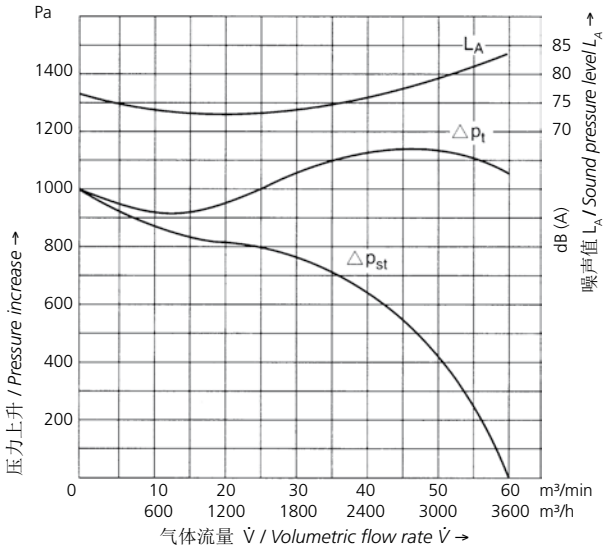

尺寸单位为mm
*Dimensions in mm - subject to modifications.*

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

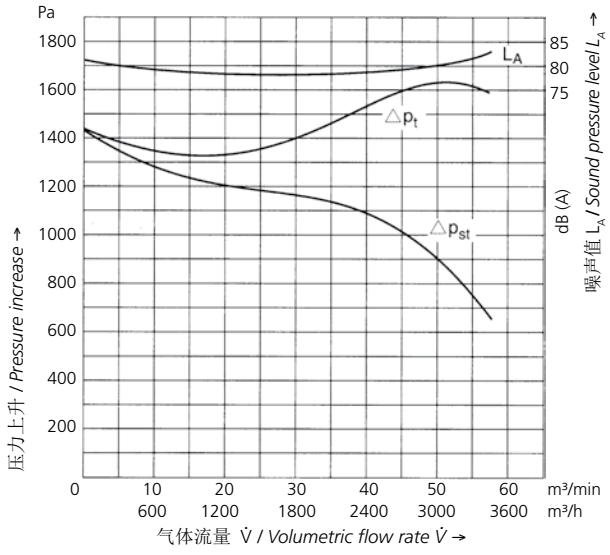
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consump-tion* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| | IE3 | 50 | 60,0 | 1000 | 230/400 | 7,60/4,40 | 2870 | 2,20 | 25 |
| **2D 064** | IE3 | 60 | 57,0 | 1440 | 230/400 | 9,10/5,30 | 3480 | 2,64 | 25 |
| | **NEMA*** | 60 | 57,0 | 1440 | 277/480 | 7,60/4,40 | 3480 | 2,64 | 25 |

***** NEMA 效率等级 **/** *NEMA Premium*

## 50 Hz




## 60 Hz

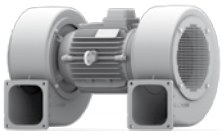


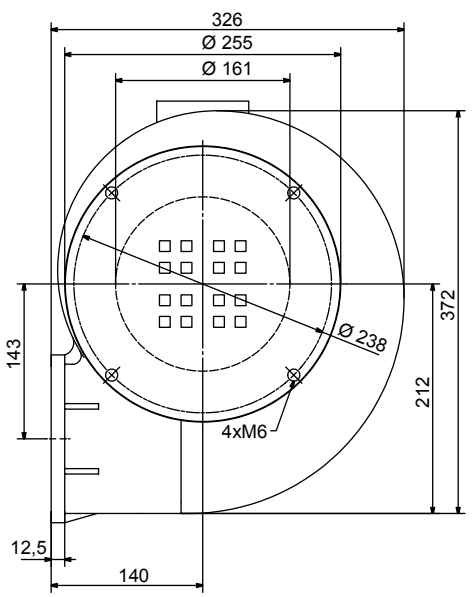

注意不能空载启动. *Blower not to be operated with free discharge.*

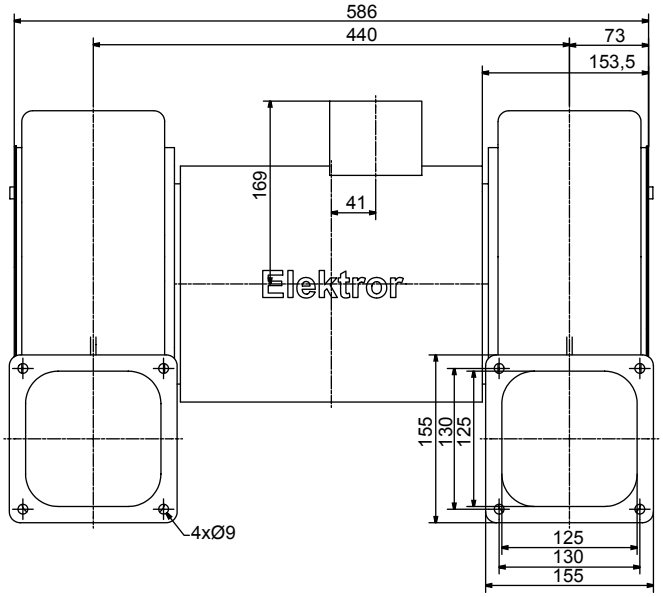
根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01





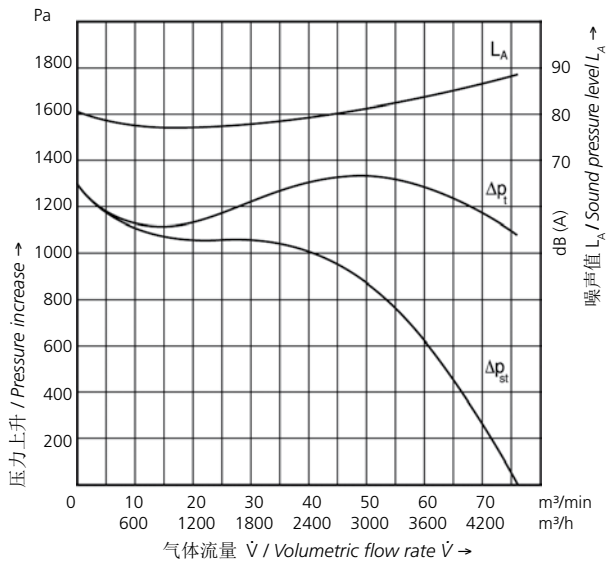

适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

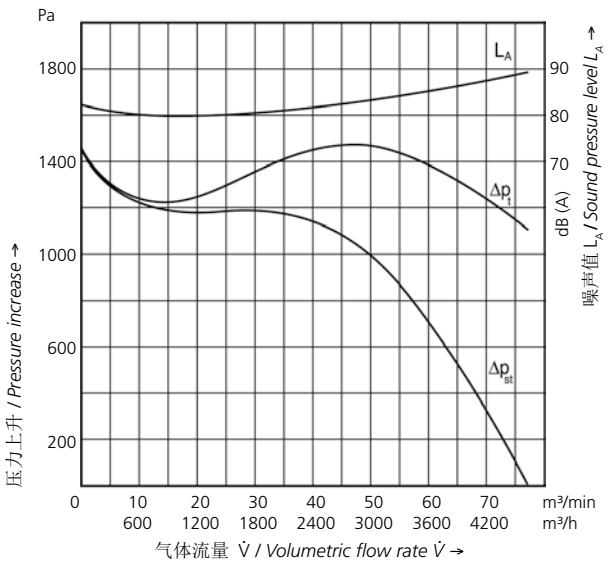
| 型号 *Type* | 能源類 *Efficiency class* | 频率 *Frequency* | 气体流量 *Volumetric flow rate* | 全压差 *Total pressure difference* | 电压 *Voltage* | 电流 *Current consump-tion* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| | IE3 | 50 | 76,0 | 1200 | 400 Δ | 7,80 | 2935 | 4,0 | 39 |
| **2D 066** | IE3 | 60 | 76,0 | 1300 | 400 Δ | 9,10 | 3525 | 4,8 | 39 |
| | **NEMA*** | 60 | 76,0 | 1300 | 480 Δ | 7,60 | 3525 | 4,8 | 39 |

***** NEMA 效率等级 **/** *NEMA Premium*

## 50 Hz




## 60 Hz

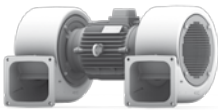


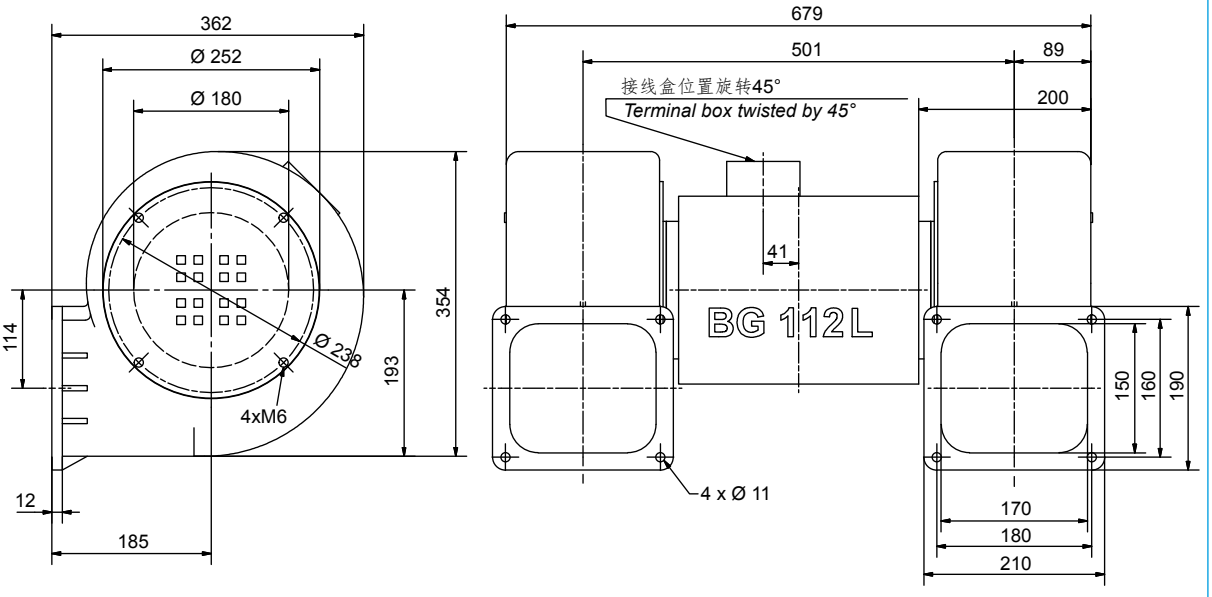



03.18/01

根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# 2D 07





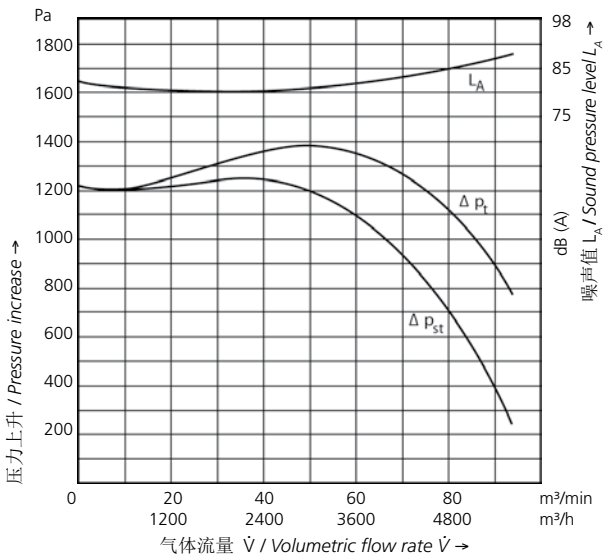

尺寸单位为mm
*Dimensions in mm - subject to modifications.*

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

| 型号 *Type* | 能源類 *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* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| | IE3 | 50 | 94,0 | 1200 | 400 Δ | 7,80 | 2935 | 4,0 | 50 |
| **2D 07** | IE3 | 60 | 77,0 | 1600 | 400 Δ | 9,10 | 3525 | 4,8 | 50 |
| | **NEMA*** | 60 | 77,0 | 1600 | 480 Δ | 7,60 | 3525 | 4,8 | 50 |

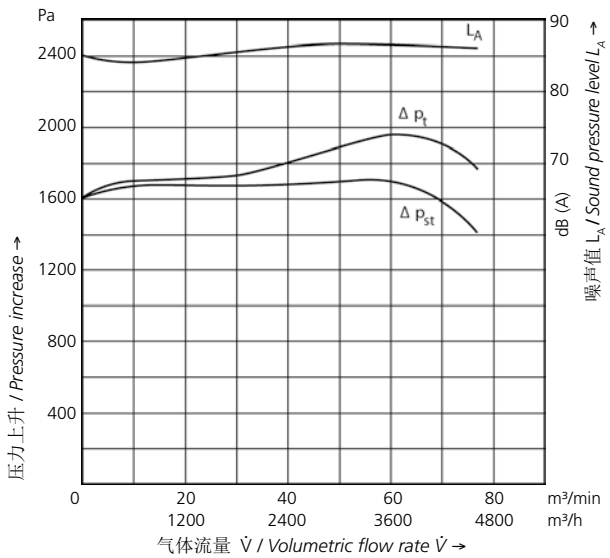
***** NEMA 效率等级 **/** *NEMA Premium*

## 50 Hz




注意不能空载启动. *Blower not to be operated with free discharge.*

## 60 Hz

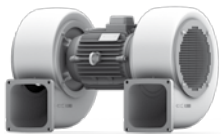


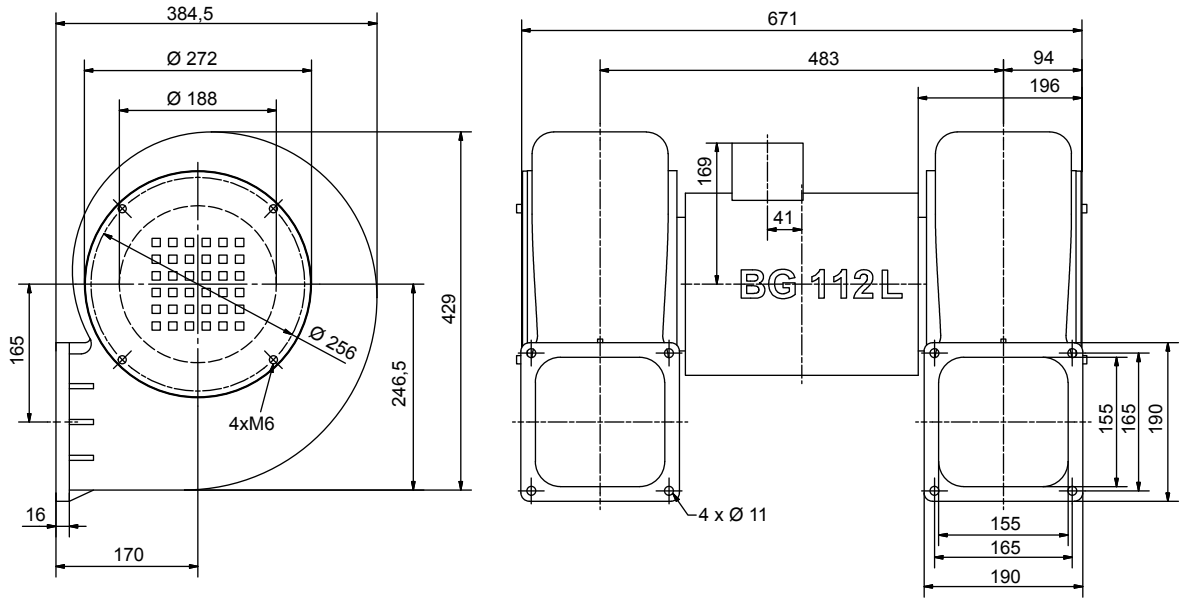

注意不能空载启动. *Blower not to be operated with free discharge.*

根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*



03.18/01





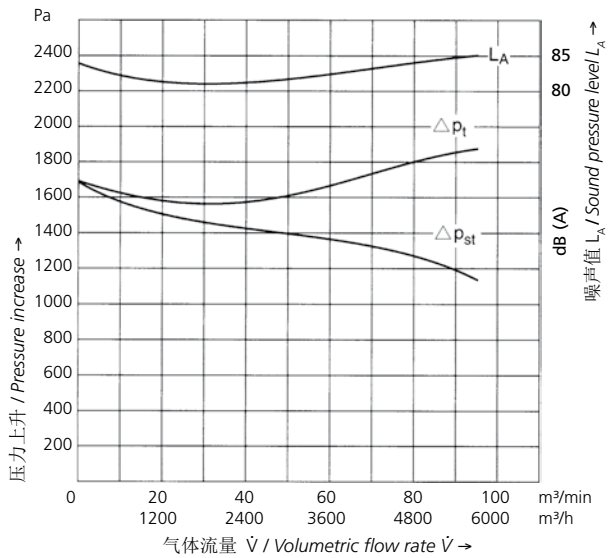

适用于变频器驱动!
***ALSO FREQUENCY CONVERTER-SUITABLE AVAILABLE!***

尺寸单位为mm
*Dimensions in mm – subject to modifications.*

| 型号 *Type* | 能源類 *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* | 转速 *Number of revolutions* | 电机功率 *Motor rating* | 重量 *Weight (approx.)* |
|---|---|---|---|---|---|---|---|---|---|
| | | Hz | m³/min | Pa | V | A | min⁻¹ | kW | kg |
| | IE3 | 50 | 95,0 | 1900 | 400 Δ | 7,80 | 2935 | 4,0 | 52 |
| **2D 08** | IE3 | 60 | 72,0 | 2500 | 400 Δ | 9,10 | 3525 | 4,8 | 52 |
| | **NEMA*** | 60 | 72,0 | 2500 | 480 Δ | 7,60 | 3525 | 4,8 | 52 |

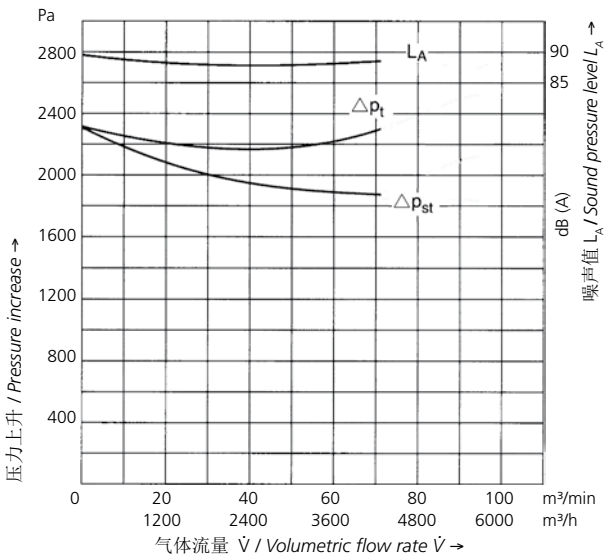
***** NEMA 效率等级 **/** *NEMA Premium*

## 50 Hz




注意不能空载启动. *Blower not to be operated with free discharge.*

## 60 Hz




注意不能空载启动. *Blower not to be operated with free discharge..*



根据第38-39页ErP的要求技术参数及结构有所调整
*Data according to ErP directive see page 38-39. Technical and constructional subject to change.*

# ERP 综述
# *OVERVIEW OF THE ERP*

| 型号<br>*Type* | 频率<br>*Frequency* | 鼓风机总效率<br>*Total blower efficiency* | 效率等级<br>*Degree of efficiency* | 2015 起执行的能效等级<br>*Required degree of efficiency 2015* | 修正系数<br>*Specific behaviour* | 最佳能效点 *At optimum energy efficiency*<br>标称电机输入功率<br>*Nominal motor input power* | 气体流量 V<br>*Volumetric flow rate V* | 全压差 $\Delta p_t$<br>*Total pressure $\Delta p_t$ (rounded up)* | 转速<br>*Number of revolutions (rounded up)* |
|---|---|---|---|---|---|---|---|---|---|
| | Hz | % | N | N | | kW | m³/min | Pa | min⁻¹ |
| **D 03** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **D 03** | 60 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **E 03** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **E 03** | 60 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **D 04** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **D 04** | 60 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **E 04** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **E 04** | 60 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **D 045** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **D 045** | 60 | 45,0 | 56,9 | 49,0 | 1,01 | 0,13 | 4,9 | 730 | 2890 |
| **E 045** | 50 | 39,1 | 50,8 | 49,0 | 1,01 | 0,14 | 6,2 | 530 | 2770 |
| **E 045** | 60 | 40,4 | 51,4 | 49,0 | 1,01 | 0,18 | 6,2 | 720 | 2990 |
| **D 05** | 50 | 42,2 | 53,8 | 49,0 | 1,01 | 0,15 | 6,5 | 570 | 2550 |
| **D 05** | 60 | 44,8 | 55,6 | 49,0 | 1,01 | 0,19 | 6,5 | 800 | 3000 |
| **E 05** | 50 | 不适用于 **ErP** \| ***ErP not applicable*** | | | | | | | |
| **E 05** | 60 | 39,6 | 50,1 | 49,0 | 1,01 | 0,22 | 6,5 | 800 | 3300 |
| **D 052** | 50 | 41,1 | 52,2 | 49,0 | 1,01 | 0,19 | 7,5 | 630 | 2890 |
| **D 052** | 60 | 47,5 | 56,9 | 49,0 | 1,01 | 0,32 | 9,6 | 960 | 3450 |
| **E 052** | 50 | 39,8 | 49,7 | 49,0 | 1,01 | 0,27 | 9,8 | 663 | 2867 |
| **E 052** | 60 | 40,8 | 49,3 | 49,0 | 1,01 | 0,45 | 11,2 | 990 | 3370 |
| **D 060** | 50 | 49,7 | 58,4 | 49,0 | 1,01 | 0,42 | 13,8 | 890 | 2930 |
| **D 060** | 60 | 43,5 | 51,2 | 49,0 | 1,01 | 0,60 | 13,5 | 1150 | 3480 |
| **E 060** | 50 | 44,6 | 52,3 | 49,0 | 1,01 | 0,60 | 16,1 | 880 | 2900 |
| **E 060** | 60 | 43,2 | 50,1 | 49,0 | 1,01 | 0,80 | 18,3 | 1140 | 3360 |
| **D 064** | 50 | 49,9 | 57,2 | 49,0 | 1,01 | 0,71 | 20,0 | 1060 | 2880 |
| **D 064** | 60 | 50,7 | 56,7 | 49,0 | 1,02 | 1,13 | 22,4 | 1530 | 3440 |
| **E 064** | 50 | 51,3 | 57,5 | 49,0 | 1,01 | 1,03 | 26,3 | 1208 | 2890 |
| **E 064** | 60 | 50,3 | 54,8 | 49,0 | 1,02 | 1,96 | 35,0 | 1690 | 3360 |
| **D 066** | 50 | 55,0 | 61,5 | 49,0 | 1,01 | 0,94 | 22,5 | 1340 | 2910 |
| **D 066** | 60 | 43,8 | 49,2 | 49,0 | 1,01 | 1,38 | 24,4 | 1440 | 3520 |
| **E 066** | 50 | 48,5 | 54,2 | 49,0 | 1,01 | 1,24 | 25,3 | 1430 | 2920 |
| **D 07** | 50 | 52,1 | 58,2 | 49,0 | 1,01 | 1,08 | 22,4 | 1470 | 2940 |
| **D 07** | 60 | 47,7 | 52,1 | 49,0 | 1,02 | 2,02 | 27,0 | 2090 | 3500 |
| **D 072** | 50 | 48,8 | 54,1 | 49,0 | 1,01 | 1,44 | 27,7 | 1430 | 2890 |
| **D 072** | 60 | 49,5 | 53,5 | 49,0 | 1,02 | 2,34 | 31,7 | 2060 | 3500 |
| **D 08** | 50 | 57,9 | 62,1 | 49,0 | 1,02 | 2,19 | 41,5 | 1790 | 2920 |
| **D 08** | 60 | 52,9 | 55,9 | 49,0 | 1,02 | 3,36 | 42,2 | 2470 | 3470 |
| **D 082** | 50 | 59,4 | 63,4 | 49,0 | 1,02 | 2,34 | 42,8 | 1830 | 2930 |
| **D 082** | 60 | 57,1 | 59,4 | 49,0 | 1,03 | 4,40 | 55,5 | 2560 | 3500 |
| **D 09** | 50 | 57,3 | 59,8 | 49,0 | 1,02 | 3,98 | 59,3 | 2429 | 2975 |
| **D 09** | 60 | 53,2 | 54,9 | 49,0 | 1,02 | 5,50 | 58,9 | 3092 | 3567 |



03.18/01

| 型号<br>*Type* | *频率 Frequency* | 鼓风机总效率<br>*Total blower efficiency* | 效率等级<br>*Degree of effi-ciency* | 2015 起执行的能效等级<br>*Required degree of efficiency 2015* | 修正系数<br>*Specific behaviour* | 最佳能效点 *At optimum energy efficiency*<br>标称电机输入功率<br>*Nominal motor input power* | 气体流量 V<br>*Volumetric flow rate V* | 全压差 $\Delta p_t$<br>*Total pressure $\Delta p_t$ (rounded up)* | 转速<br>*Number of revolutions (rounded up)* |
|---|---|---|---|---|---|---|---|---|---|
| | Hz | % | N | N | | kW | m³/min | Pa | $min^{-1}$ |
| **D 092** | 50 | 57,3 | 59,8 | 49,0 | 1,02 | 3,98 | 59,3 | 2429 | 2975 |
| **D 092** | 60 | 53,2 | 54,9 | 49,0 | 1,03 | 5,50 | 58,9 | 3092 | 3567 |
| **2D 04** | 50 | 41,5 | 53,4 | 49,0 | 1,00 | 0,13 | 7,6 | 440 | 2880 |
| **2D 04** | 60 | 43,8 | 54,8 | 49,0 | 1,01 | 0,18 | 7,6 | 610 | 3450 |
| **2D 045** | 50 | 43,8 | 54,2 | 49,0 | 1,01 | 0,27 | 13,4 | 540 | 2890 |
| **2D 045** | 60 | 47,9 | 57,4 | 49,0 | 1,01 | 0,31 | 11,2 | 800 | 3500 |
| **2D 05** | 50 | 46,6 | 57,2 | 49,0 | 1,01 | 0,21 | 10,9 | 540 | 2880 |
| **2D 05** | 60 | 47,0 | 56,1 | 49,0 | 1,01 | 0,36 | 13,6 | 740 | 3400 |
| **2D 052** | 50 | 46,0 | 54,0 | 49,0 | 1,01 | 0,56 | 22,4 | 690 | 2850 |
| **2D 052** | 60 | 50,7 | 57,5 | 49,0 | 1,01 | 0,84 | 25,2 | 1010 | 3420 |
| **2D 060** | 50 | 50,8 | 57,7 | 49,0 | 1,01 | 0,80 | 27,2 | 870 | 2960 |
| **2D 060** | 60 | 54,4 | 60,5 | 49,0 | 1,01 | 1,08 | 27,3 | 1250 | 3550 |
| **2D 064** | 50 | 49,1 | 54,4 | 49,0 | 1,01 | 1,44 | 42,5 | 970 | 2940 |
| **2D 064** | 60 | 53,0 | 57,3 | 49,0 | 1,01 | 2,11 | 44,4 | 1470 | 3530 |
| **2D 066** | 50 | 56,3 | 60,6 | 49,0 | 1,01 | 2,12 | 50,8 | 1,37 | 2970 |
| **2D 066** | 60 | 53,1 | 57,5 | 49,0 | 1,01 | 2,03 | 42,6 | 1,48 | 3570 |
| **2D 07** | 50 | 48,9 | 53,0 | 49,0 | 1,01 | 2,22 | 45,2 | 1406 | 2978 |
| **2D 07** | 60 | 50,2 | 53,0 | 49,0 | 1,02 | 3,65 | 54,0 | 1986 | 3567 |
| **2D 08** | 50 | 57,9 | 60,1 | 49,0 | 1,02 | 4,45 | 85,5 | 1760 | 2950 |
| **2D 08** | 60 | 53,4 | 55,1 | 49,0 | 1,02 | 5,41 | 71,1 | 2380 | 3530 |




03.18/01

# 不同负载情况下的电机能效 **50 HZ**
# *MOTOR EFFICIENCY FACTORS IN TURNDOWN OF 50 HZ DEVICES*

| 型号<br>*Type* | 电机型号<br>*Motor size* | 能效<br>*Energy efficiency* | 电极<br>*Number of poles* | 功率<br>*Power* | 频率<br>*Frequency* | 电压<br>*Voltage* | 转速<br>*Number of revolutions* | 100%<br>*100%* | 75%<br>*75%* | 50%<br>*50%* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | kW | Hz | V | $min^{-1}$ | Eta | Eta | Eta |
| **D064** | BG 80 | IE3 | 2 | 1,1 | 50 | 230/400 | 2910 | 84,1 | 83,9 | 81,7 |
| **D064** | NRD90S/2 | IE3 | 2 | 1,1 | 50 | 230/400 | 2905 | 82,7 | 84,8 | 83,0 |
| **D066, 2D060** | NRD90L/2 | IE3 | 2 | 1,5 | 50 | 230/400 | 2905 | 84,2 | 87,4 | 86,5 |
| **D07, D08, 2D064** | NRD90LL/2 | IE3 | 2 | 2,2 | 50 | 230/400 | 2870 | 85,9 | 86,6 | 85,9 |
| **D072, D082** | NRD100LL/2 | IE3 | 2 | 3 | 50 | 230/400 | 2900 | 87,1 | 87,0 | 86,0 |
| **2D066, 2D07, 2D08** | NRD112L/2 | IE3 | 2 | 4 | 50 | 400 | 2935 | 88,1 | 88,8 | 88,2 |
| **D09** | NRD132SX/2 | IE3 | 2 | 5,5 | 50 | 400 | 2940 | 89,2 | 90,6 | 90,0 |
| **D092** | NRD132SL/2 | IE3 | 2 | 7,5 | 50 | 400 | 2935 | 90,1 | 91,0 | 90,3 |



03.18/01

# 不同负载情况下的电机能效 60 HZ
# *MOTOR EFFICIENCY FACTORS IN TURNDOWN OF 60 HZ DEVICES*

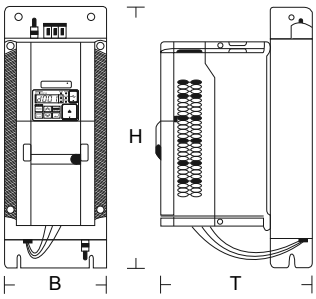
| 型号<br>*Type* | 电机型号<br>*Motor size* | 能效<br>*Energy efficiency* | 电极<br>*Number of poles* | 功率<br>*Power* | 频率<br>*Frequency* | 电压<br>*Voltage* | 转速<br>*Number of revolutions* | 100%<br>*100%* | 75%<br>*75%* | 50%<br>*50%* |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | kW | Hz | V | $min^{-1}$ | Eta | Eta | Eta |
| **D060** | NRD80S/2 | IE3 | 2 | 0,9 | 60 | 277/480 | 3430 | 77,0 | 81,9 | 80,6 |
| **D064** | NRD90S/2 | IE3 | 2 | 1,32 | 60 | 277/480 | 3490 | 84,0 | 82,4 | 79,2 |
| **D066, 2D060** | NRD90L/2 | IE3 | 2 | 1,8 | 60 | 277/480 | 3505 | 85,5 | 85,2 | 82,5 |
| **D07, D08, 2D064** | NRD90LL/2 | IE3 | 2 | 2,64 | 60 | 277/480 | 3480 | 86,5 | 87,0 | 86,0 |
| **D072, D082** | NRD100LL/2 | IE3 | 2 | 3,6 | 60 | 277/480 | 3500 | 88,5 | 87,9 | 86,4 |
| **2D066, 2D07, 2D082** | NRD112L/2 | IE3 | 2 | 4,8 | 60 | 480 | 3525 | 89,5 | 89,6 | 88,4 |
| **D09** | NRD132SX/2 | IE3 | 2 | 6,6 | 60 | 480 | 3540 | 90,2 | 90,5 | 88,9 |
| **D092** | NRD132SL/2 | IE3 | 2 | 9 | 60 | 480 | 3530 | 90,2 | 91,3 | 90,3 |



03.18/01

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

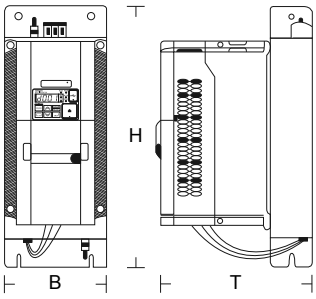
***Omron MX2***
*230 V class*




| 额定功率<br>*Rated Power* | 对应型号<br>*for device* | 尺寸 (B x H x T)<br>*Dimensions (B x H x T)* | 重量<br>*Weight* | 成套变频器编号*<br>*FU-package* Article No.* |
|---|---|---|---|---|
| kW | | mm | kg | |
| 0,37 | D 03, D 04, D 045, D 05, D 052 | 71 x 169 x 168 | 1,7 | 016660 |
| 0,75 | D 060 | 111 x 169 x 221 | 2,2 | 016662 |
| 1,5 | D 064, D 066 | 111 x 169 x 221 | 2,6 | 016664 |
| 2,2 | D 07, D 08 | 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***
*400 V class*




| 额定功率<br>*Rated Power* | 对应型号<br>*for device* | 尺寸 (B x H x T)<br>*Dimensions (B x H x T)* | 重量<br>*Weight* | 成套变频器编号*<br>*FU-package* Article No.* |
|---|---|---|---|---|
| kW | | mm | kg | |
| 0,75 | D 03, D 04, D 045, D 05, D 052, D 060 | 114 x 169 x 190 | 2,6 | 016667 |
| 1,5 | D 064, D 066 | 114 x 169 x 217 | 2,8 | 016669 |
| 2,2 | D 07, D 08 | 114 x 169 x 217 | 2,9 | 016671 |
| 3,0 | D 072, D 082 | 114 x 169 x 217 | 2,9 | 016672 |
| 5,5 | D 09 | 150 x 306 x 207 | 5,5 | 016675 |
| 7,5 | D 092 | 150 x 306 x 207 | 5,5 | 016677 |

*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**
**欧姆龙变频器配件**

***Omron MX2***
***Accessories***

| 配置<br>*Denomination* | 编号<br>*Article No.* |
|---|---|
| 欧姆龙MX2 变频器LCD控制面板<br>*Add-on LCD control panel* | 016681 |
| 3米LCD控制面板数据线<br>*Extension cable 3 m for add-on LCD control panel* | 016682 |
| 3米USB数据线<br>*USB cable for parameterization 3 m length* | 016683 |
| 欧姆龙MX2变频器驱动软件<br>*Software for parameterization Omron MX2* | 016684 |

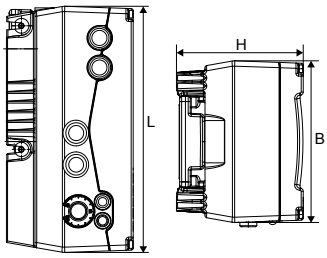


尺寸单位为mm.
*Dimensions in mm - subject to modifications.*

03.18/01

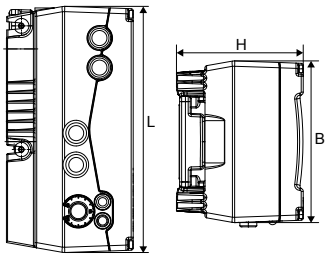
**科世达变频器 直接安装电机上使用（FUK）**
性能配置除另外说明，一律符合50Hz 标准（60Hz 根据需要配置）
***Kostal on the motor integrated frequency converter (FUK)***
*Performance allocation, unless otherwise indicated, suitable for 50 Hz device (60 Hz devices upon request)*

***Kostal INVEOR***
*230 V class*




| 额定功率 *Rated Power* | 对应型号 *for device* | 尺寸 (L x B x H) *Dimensions (L x B x H)* | 重量 *Weight* | 驱动变频器编号 *FU drive unit Article No.* |
|---|---|---|---|---|
| kW | | mm | kg | |
| 0,37 | D 03, D 04, D 045, D 05, D 052 | 233 x 153 x 120 | 3,9 | 020754 |
| 0,75 | D 060 | 233 x 153 x 120 | 3,9 | 020755 |
| 1,1 | D 064 | 233 x 153 x 120 | 3,9 | 020756 |

***Kostal INVEOR***
*400 V class*




| 额定功率 *Rated Power* | 对应型号 *for device* | 尺寸 (L x B x H) *Dimensions (L x B x H)* | 重量 *Weight* | 驱动变频器编号 *FU drive unit Article No.* |
|---|---|---|---|---|
| kW | | mm | kg | |
| 0,75 | D 03, D 04, D 045, D 05, D 052, D 060 | 233 x 153 x 120 | 3,9 | 020743 |
| 1,5 | D 064, D 066 | 233 x 153 x 120 | 3,9 | 020744 |
| 2,2 | D 07, D 08 | 270 x 189 x 140 | 5,0 | 020745 |
| 3,0 | D 072, D 082 | 270 x 189 x 140 | 5,0 | 020746 |
| 5,5 | D 09 | 307 x 223 x 181 | 8,7 | 020748 |
| 7,5 | D 092 | 307 x 223 x 181 | 8,7 | 020749 |

**Kostal INVEOR 配件**

***Kostal INVEOR Accessories***

| 配置 *Denomination* | 编号 *Article No.* |
|---|---|
| 控制面板 MMI INVEOR<br>*Control panel MMI INVEOR* | 020758 |
| 链接电脑的数据线<br>*Interface cable for PC* | 020759 |

可以根据需求提供安装在墙面的面板
*Adapter plate wall mounting on request*





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

# 配件
# *ACCESSORIES*

## 进气口过滤器

依莱克罗鼓风机进气口过滤器的设计和尺寸都对应符合每款风机的最大流量，因此有很少压力损失。

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。过滤器所有的金属部件都是采用镀锌材料，具有防腐蚀能力。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*

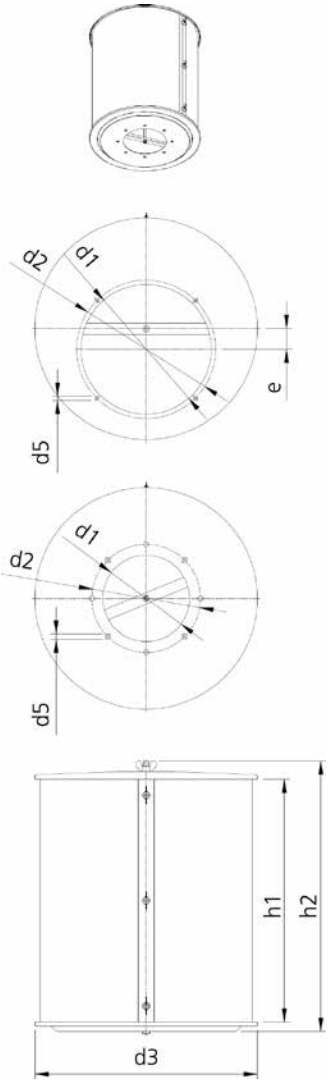
*Layout and dimensions of Elektror fine filters are adapted to the maximum volume flow of the respective blowers and have a very small pressure loss therefore.*

*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 | $h_1$ | $h_2$ | 编号 *Article No.* |
|---|---|---|---|---|---|---|---|---|
| **D 03, E 03** | 95 | 120 | 148 | 4 x 6 | - | 111 | 153 | 009098 |
| **D 04, E 04 2D 04** | 120 | 140 | 210 | 4 x 6 | - | 111 | 153 | 009116 |
| **D 045, E 045 2D 045** | 130 | 147 | 210 | 4 x 6 | 20 | 151 | 200 | 009596 |
| **D 05, E 05 2D 05** | 120 | 147 | 210 | 4 x 6 | - | 216 | 265 | 009117 |
| **D 05, E 05 2D 05** 按需求供应/*shorted execution* | 120 | 147 | 210 | 4 x 6 | - | 151 | 193 | 009306 |
| **D 052, E 052 2D 052** | 130 | 171 | 210 | 4 x 6 | 10 | 216 | 258 | 009118 |
| **D 060, E 060 2D 060** | 130 | 176 | 260 | 4 x 5,5 | - | 241 | 293 | 009119 |
| **D 064, E 064 2D 064** | 150 | 198 | 260 | 4 x 6 | - | 347 | 399 | 009120 |
| **D 066, E 066 2D 066** | 222 | 238 | 315 | 4 x 7 | 24 | 449 | 501 | 009122 |
| **D 07, D 072 2D 07** | 222 | 238 | 315 | 4 x 7 | 24 | 441 | 501 | 009122 |
| **D 08, D 082 2D 08** | 240 | 256 | 410 | 4 x 7 | 38 | 449 | 501 | 009123 |
| **D 08, D 082 2D 08** 按需求供应/*shorted execution* | 240 | 256 | 410 | 4 x 7 | 38 | 215 | 267 | 009096 |
| **D 09, D 092** | 270 | 290 | 410 | 8 x 7 | - | 657 | 709 | 009307 |

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



03.18/01

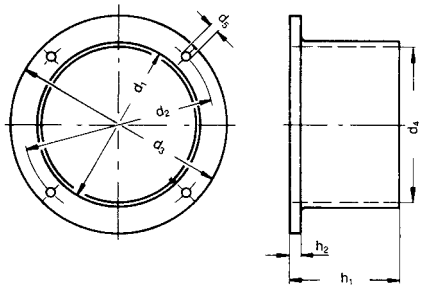
过滤器滤芯

***Spare filter tissue***
*for fine filter*

| 型号 *Type* | 尺寸 *Dimensions* | 编号 *Article No.* |
|---|---|---|
| **D 03, E 03** | 15 x 123 x 425 | 008636 |
| **D 04, E 04**<br>**2D 04** | 15 x 123 x 630 | 008598 |
| **D 045, E 045**<br>**2D 045** | 15 x 163 x 630 | 008599 |
| **D 05, E 05**<br>**2D 05** | 15 x 228 x 630 | 008600 |
| **D 05, E 05**<br>**2D 05**<br>按需求供应/*shorted execution* | 15 x 163 x 630 | 008599 |
| **D 052, E 052**<br>**2D 052** | 15 x 228 x 630 | 008600 |
| **D 060, E 060**<br>**2D 060** | 15 x 254 x 780 | 008604 |
| **D 064, E 064**<br>**2D 064** | 15 x 360 x 780 | 008605 |
| **D 066, E 066**<br>**2D 066** | 15 x 462 x 960 | 008607 |
| **D 07, D 072**<br>**2D 07** | 15 x 462 960 | 008607 |
| **D 08, D 082**<br>**2D 08** | 15 x 462 x 1235 | 008612 |
| **D 08, D 082**<br>**2D 08**<br>按需求供应/*shorted execution* | 15 x 228 x 1235 | 008609 |
| **D 09, D 092** | 15 x 674 x 1235 | 008613 |

进气口接头

***Intake connector***




| 型号 *Type* | $d_1$ | $d_2$ | $d_3$ | $d_4$ | $d_5$ | $h_1$ | $h_2$ | 编号 *Article No.* |
|---|---|---|---|---|---|---|---|---|
| **D 03, E 03** | 100 | 120 | 131 | 90,5 | 4 x 5,8 | 100 | 6 | 000713 |
| **D 04, E 04**<br>**2D 04** | 120 | 140 | 151 | 110,5 | 4 x 5,8 | 100 | 6 | 000714 |
| **D 045, E 045**<br>**2D 045**<br>**D 05, E 05**<br>**2D 05** | 130 | 147 | 160 | 119,5 | 4 x 5,8 | 100 | 6 | 000715 |
| **D 052, E 052**<br>**2D 052** | 151 | 171 | 180 | 140 | 4 x 5,8 | 100 | 6 | 000254 |
| **D 060, E 060**<br>**2D 060** | 150 | 176 | 188 | 140 | 4 x 5,8 | 120 | 6 | 000716 |
| **D 064, E 064**<br>**2D 064** | 160 | 198 | 210 | 149,5 | 4 x 5,8 | 140 | 6 | 000717 |
| **D 066, E 066**<br>**2D 066, D 07**<br>**D 072, 2D 07** | 190 | 238 | 252 | 176 | 4 x 7 | 160 | 10 | 000718 |
| **D 08, D 082**<br>**2D 08** | 220 | 256 | 272 | 208 | 4 x 7 | 160 | 10 | 000719 |
| **D 09, D 092** | 250 | 290 | 310 | 234 | 8 x 7 | 180 | 10 | 000488 |



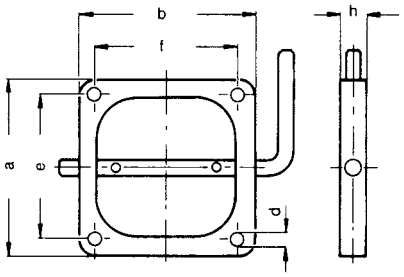
03.18/01

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

# 配件
# *ACCESSORIES*

## 调节阀
（适用于鼓风机排气口）

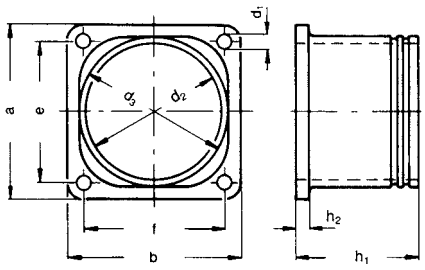
## ***Throttle valve***
*for fitting on the blower discharge side*




| 型号 *Type* | a | b | d | e | f | h | 编号 *Article No.* |
|---|---|---|---|---|---|---|---|
| **D 03, E 03** | 72 | 72 | 7 | 56 | 56 | 23 | 000035 |
| **D 04, E 04 2D 04** | 80 | 80 | 7 | 64 | 64 | 23 | 000095 |
| **D 045, E 045 2D 045** | 112 | 98 | 7 | 95 | 80 | 20 | 016769 |
| **D 05, E05 2D 05** | 112 | 112 | 9 | 96 | 96 | 23 | 000036 |
| **D 052, E 052 2D 052** | 130 | 130 | 7 | 105 | 115 | 23 | 000264 |
| **D 060, E 060 2D 060** | 140 | 140 | 9 | 115 | 115 | 23 | 001350 |
| **D 064, E 064 2D 064** | 150 | 130 | 9 | 130 | 110 | 23 | 000093 |
| **D 066, E 066 2D 066** | 155 | 155 | 9 | 130 | 130 | 23 | 001129 |
| **D 07, D 072 2D 07** | 190 | 210 | 11 | 160 | 180 | 23 | 000094 |
| **D 08, D 082 2D 08** | 190 | 190 | 11 | 165 | 165 | 23 | 000106 |
| **D 09, D 092** | 220 | 220 | 11 | 196 | 196 | 23 | 000490 |

## 排气口接头
（用于连接管道）

## ***Discharge connector***
*for tube connection*



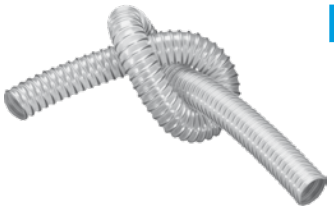

| 型号 *Type* | a | b | $d_1$ | $d_2$ | $d_3$ | e | f | $h_1$ | $h_2$ | 编号 *Article No.* |
|---|---|---|---|---|---|---|---|---|---|---|
| **D 03, E 03** | 72 | 72 | 7 | 52 | 60 | 56 | 56 | 70 | 5 | 000044 |
| **D 04, E 04 2D 04** | 80 | 80 | 7 | 60 | 70 | 64 | 64 | 70 | 6 | 000045 |
| **D 045, E 045 2D 045** | 98 | 112 | 7 | 76 | 80 | 80 | 95 | 85 | 2 | 009594 |
| **D 05, E05 2D 05** | 112 | 112 | 9 | 86 | 96 | 96 | 96 | 100 | 8 | 000046 |
| **D 052, E 052 2D 052** | 130 | 130 | 7 | 92 | 99 | 105 | 115 | 100 | 8 | 000273 |
| **D 060, E 060 2D 060** | 140 | 140 | 9 | 110 | 120 | 115 | 115 | 100 | 10 | 001351 |
| **D 064, E 064 2D 064** | 150 | 130 | 9 | 104 | 114 | 130 | 110 | 100 | 12 | 000123 |
| **D 066, E 066 2D 066** | 155 | 155 | 9 | 125 | 135 | 130 | 130 | 100 | 12 | 001144 |
| **D 07, D 072 2D 07** | 190 | 210 | 11 | 150 | 160 | 160 | 180 | 120 | 12 | 000048 |
| **D 08, D 082 2D 08** | 190 | 190 | 11 | 155 | 165 | 165 | 165 | 100 | 12 | 000124 |
| **D 09, D 092** | 220 | 220 | 11 | 170 | 180 | 196 | 196 | 140 | 15 | 000489 |



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

03.18/01

| 风刀 | *Air Knife* |
|---|---|
| ■ 用于干燥、冷却、清洁、除尘的鼓风机理想配件<br>■ 提供持续平稳的气流和风幕，精准的到达预期值<br>■ 1mm到10mm可调节的出风缝隙<br>■ 材料：不锈钢 | ■ *Ideally suitable as a blower connection accessory for drying, cooling, cleaning, blowing out and de-dusting*<br>■ *Provides a consistent air flow or air curtain and directs it precisely and perfectly at the desired spot*<br>■ *Slot width adjustable between 1 mm and 10 mm*<br>■ *Material: stainless steel* |



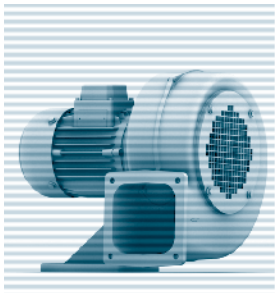
| 软管 | *Spiral hose* |
|---|---|
| ■ 耐磨损性好，减少空气损耗。柔韧性好，具有极高的伸缩性能<br>■ 具有良好的耐腐蚀性，可以运输原油、燃料、弱碱弱酸溶液，抵御紫外线和其他大气因素。<br>■ 同样适用于例如粉尘、粉末、纤维、切屑以及颗粒物类似的粗糙固体颗粒 | ■ *Highly abrasion-proof, smooth interior, optimised flow properties, flexible, high tensile strength and tear resistant*<br>■ *High resistance to oils, fuels, diluted alkaline solutions and acids, UV radiation and atmospheric agents*<br>■ *Also suitable for abrasive solids like dusts, powder, fibres, shavings and granules* |

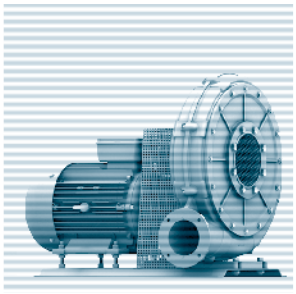
| 软管喉箍 | *Spiral hose clamps* |
|---|---|
| ■ 软管配件<br>■ 不锈钢钢箍带 | ■ *For attachment of exterior corrugated spiral hoses*<br>■ *Stainless steel band and housing* |

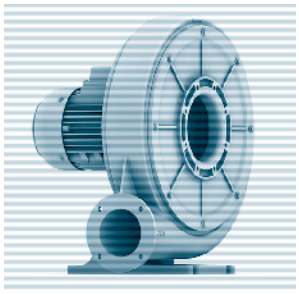
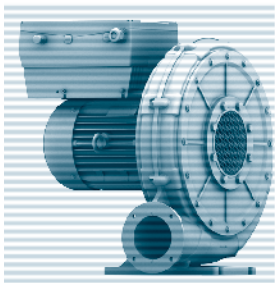
过去更多的连接配件的信息，请您与我们的产品部门联系（support@elektror.com).

*For detailed information about the system components of our connection system, please contact our Product Management (support@elektror.com).*

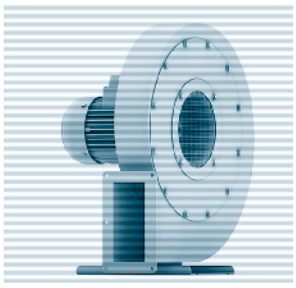
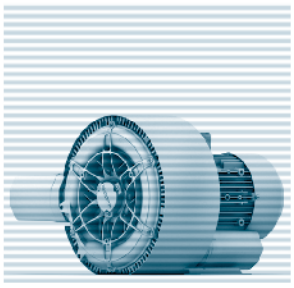
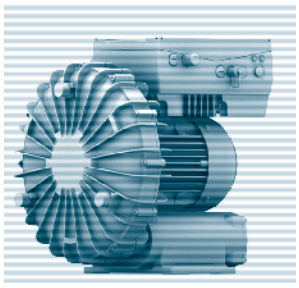
Elektror
airsystems gmbh





## 产品范围
## *PRODUCT RANGE*

低压离心式风机
*Low pressure blowers*
**ND**

中压离心式风机
*Medium pressure blowers*
**RD**

ATEX-
低压离心式风机
*ATEX Low pressure blowers*
**ND-ATEX**

ATEX-
中压离心式风机
*ATEX Medium pressure blowers*
**RD-ATEX**

侧流式风机
*Side channel blowers*
**SD**

高压离心式风机
*High pressure blowers*
**HRD**

输送式风机
*Conveying blowers*
**FD**
**RDF**

ATEX-
高压离心式风机
*ATEX High pressure blowers*
**HRD-ATEX**


Headquarters Ostfildern
Elektror airsystems gmbh
Hellmuth-Hirth-Straße 2
D-73760 Ostfildern
Tel. +49 711 31973-0
Fax +49 711 31973-5000
info@elektror.de
www.elektror.de

依莱克罗鼓风机（北京）有限公司 Elektror airsystems (Beijing) Co.,Ltd.
北京市海淀区西直门北大街32号院2号楼1703室
地址 Add: Room 1703, Floor 17 Building 2, 32 XiZhiMen North Street, HaiDian District, Beijing P.R.China 100082
电话 Tel. 8610-8260 5581, 8610-82605385
传真 Fax 8610-6223 3825
elektror_beijing@163.com
www.elektror.cn www.elektror-china.com


03.18/01