无蜗壳离心风机
radial fans with free-running impeller ; without housing

外转子马达电机
with external rotor motor
外转子EC电机
with external rotor EC-motor
标准IEC电机
with IEC-standard motor

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THE AIR MOVEMENT GROUP

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担保的宗旨

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

担保不适用于下列情况：

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

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

在保修期的维修与更换，可访问我们的网站或直接联系我们的子公司。

机械安全的信息

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

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

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

版本：11/2009

Warranty Guidelines

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

Warranty will not given in the following instances:

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

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

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

Information on Machine Safety

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

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

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

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目录 Contents

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参考代码/ Reference code

		K	N								A	06	
D	K	H	R	355	-4	S	W.110	.4	EC	-	001		

D = 三相电机 / Three phase
E = 单相电机 / Single phase A.C.
G = EC- 直流电机 / EC- Motor Drive

KH= 外转子电机驱动无蜗壳风机
Free running impeller with external rotor motor
KN= IEC标准电机驱动无蜗壳风机
Free running impeller with IEC motor

R = 简便叶轮 / Motorized impeller
M = 风机组件 / Fan module
B = 带安装支架的风机组件
Fan module with mounting stand

叶轮直径(mm)

电机极数 / **Number of poles**
2 = 2; 4 = 4; 6 = 6; 8 = 8; F = 2-2; G = 4-4; H = 6-6;
M = 8-8; B = 10; C=12; N = 10-10; P = 12-12;
O = 4-6; X = 4-8

S = 电缆引出 / Flying lead
K = 接线盒/ Terminal box

W = 高效后倾叶轮
High efficiency impeller

叶轮宽度(mm)

电机型号 / **Motor type**
4 = 080 (EC-080)
5 = 106 (EC-108)
6 = 137 (EC-150)
7 = 165

电机安装形式 / **Motor design**
A = B3
B = B5

矽钢片长度/ **silicon steel sheet length**

A = 0	H = 7	06 = 063	16 = 160
B = 1	I = 8	07 = 071	18 = 180
C = 2	K = 9	08 = 080	20 = 200
D = 3	L = 10	09 = 090	22 = 225
E = 4	M = 11	10 = 100	25 = 250
F = 5	N = 12	11 = 112	
G = 6		13 = 132	

电机尺寸 / **Motor size**

产品编码 / **Consecutive no.**

特点和结构

DKN_..W系列的无蜗壳离心风机设计安装在，如空调箱、卫生环境、无尘过滤室这样的装置里，以及RLT器。这些装置使用无蜗壳后倾式叶轮，在宽广的特性曲线上具有最优的效率，并且，性能好，噪声低。这种风机适合处理空气不具腐蚀性气体或烟尘。可以使用带电子整流器的外转子电机或标准三相IEC电机。

根据电机的型号和风机结构可应用在下列电机：

- _KHR: 机动化叶轮带或不带导流口（外转子电机）
- _KHM: 风机组件（外转子电机）
- DKNB: 风机组件（IEC-电机，型号: IM B3）
- DKNM: 风机组件（IEC-电机，型号: IM B5）

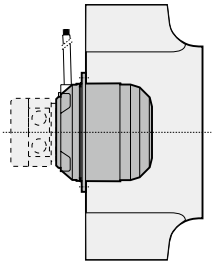
Features and Construction

The **Rosenberg Centrifugal Fans with free-running impeller** of the range DKN_ .. W were designed for installation in appliances such as air-handling-units, hygienic- and clean room filter units as well as for RLT units. During the development of this unit with backward-curved impeller without scroll casing, special attention was paid to optimize the efficiency over a wide characteristic curve having at the same time high performance and an optimum sound power level. The fans are suitable to handle air and other non aggresive gases or fumes. The motors are available as electronically commutated (EC) external rotor motors or standard three phase IEC-motors.

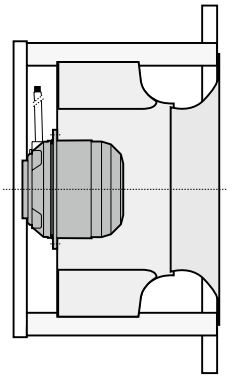
Depending on the type of motor and the fan construction, the following fans are available:

- _KHR: Motorized impeller with or without inlet cone. (External rotor motor)
- _KHM: Fan module (External rotor motor)
- DKNB: Fan module with mounting stand (IEC-Motor; Type. IM B3)
- DKNM: Fan module (IEC-Motor; IM B5)

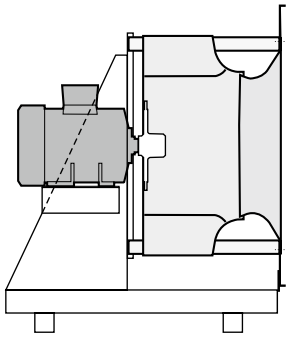
_KHR



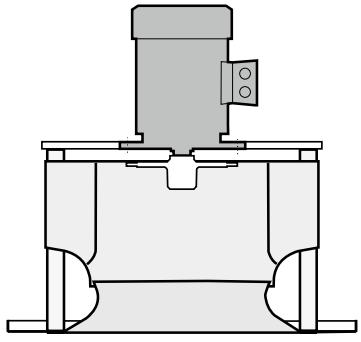
_KHM



DKNB



DKNM



叶轮
叶轮带有8片铝(AlMg3)制叶片，并且静平衡和动平衡符合G2,5/6,3 DIN ISO 1940如需叶轮可以喷涂防腐涂层。

叶轮 **Impeller**

The impellers with 8 backward curved blades are made of aluminium sheet (AlMg3) and are statically and dynamically balanced with hub according to quality level G2,5/6,3 DIN ISO 1940. The impellers can also be supplied with epoxy coating if requested.

旋转方向
从进风口观察叶轮旋转方向为顺时针转向，错误的转向会使电机超载，因此，有必要在初次使用是检查转向。

Direction of rotation
Direction of rotation of the impellers viewed from the inlet side is clockwise. Wrong direction of rotation can overload the motor , therefore it is essential to check the direction of rotation before initial operation.

导风圈
导风圈由镀锌钢板制成，并结合叶轮提供最优化的气流。最佳叶轮与导风口配合深度见尺寸图。

导风圈 **Inlet cones**

The inlet cones are made of galvanized sheet steel. They are fluidic optimized and offer a good airflow of the impeller. The optimal immersion depth of the impeller is shown on the according dimensional drawings.

流量监控/控制
在进风导流口安装测试管，风量易于测量。

Volume flow monitor / control
An easy volume flow determination and monitoring in an installed condition is possible with a ring testing wire on the inlet cone. See page 13 for description.

电机
可从风机型号说明书中获得更多有关驱动电机，电机防护等级，转速控制等信息。

Motors
Further information on the Drive Motor, Motor safety, Speed control can be found in the individual special description of each ventilator type.

防止触电
风机安装于箱体中，因此无需防护网。按照DIN EN 292采取保护措施(“可分离的保护装置”，“技术上的保护措施”)。遵守DIN EN 292(“防止触电”)

Protection against accidental contact
The fans are constructed for installation in units and therefore as a standard are not equipped with a finger protection. Before initial operation all required protection components must be installed and connected. The protective measures must be executed according to DIN EN 292 (“separative protection appliances”, “technical protective measures”), resp. DIN EN 294 (“protection against accidental contact”).

防爆
按要求提供防爆电机

Explosion protection
Explosion-proof fans are available on request.

制造厂商声明

洛森集团的无蜗壳风机专门用于装配其在他机器或机器部件里，他们符合CE-标志和EU制造商的声明和EU机器规格98/37EG。附件II B。

生产的组合设备被证实符合EU设备规格才能运行。

按照EN294仅引用适合的连接保险装置，如果是交货范围的部分，设备制造商有责任完全遵照EN294。

操作手册包含附加的安全预防对考虑在安装期间在机器上依照EC委员会指示。

无蜗壳离心风机的优势

- 完整的风机组件易于安装
- 不用皮带转送，易于维护
- 容易清洁保养
- 水平或垂直安装（DKNB; DKNM）
- 外转子电机和高性能后倾式叶轮
- 使风机节省空间
- 不同的驱动具有各自的优点
- 不同的速度控制器
- 测量装置很容易测定气流
- 组件在技术上可避免震动
- 可根据客户要求进行更改
- 最佳的叶轮效率具有高经济性

Information on manufacturers declaration

Rosenberg Free Running Impellers are dedicated to be assembled with other machinery or parts of machinery. They are marked with the CE-sign and supplied with a EU-manufacturer's declaration according to the EU Machinery Guideline 98/37EG, Annex II B.

Putting into operation is prohibited until it is confirmed that the assembled machine has been manufactured according to the EU Machinery Guideline.

The compliance with EN 294 only refers to the fitted contact safety device, provided that it is part of the extent of delivery. The system manufacturer is responsible for the complete compliance with EN 294.

The operation manual contains additional safety precautions to be considered during installation in compliance with the EC Council Directive on Machinery 98/37/EC.

Advantages of radial fans with free-running impeller

- Easy to install due to installation of the complete fan modul
- Easy maintenance as the fans are not belt driven

- Hygienic, easy to clean
- Can be installed either with horizontal or vertical shaft (DKNB; DKNM)
- Compact, space saving ventilaton units as a result of external rotor motor and the high performance backward curved impeller. (_KH_)
- Different drive concepts available with individual advantages.
- Different speed controllers possible
- Easy determination of the airflow due to measuring device
- Technical decoupling of vibration ot the module possible without problem
- Customers specific variations possible without problem.
- High economic efficiency as a result of the optimized efficiency of the impeller

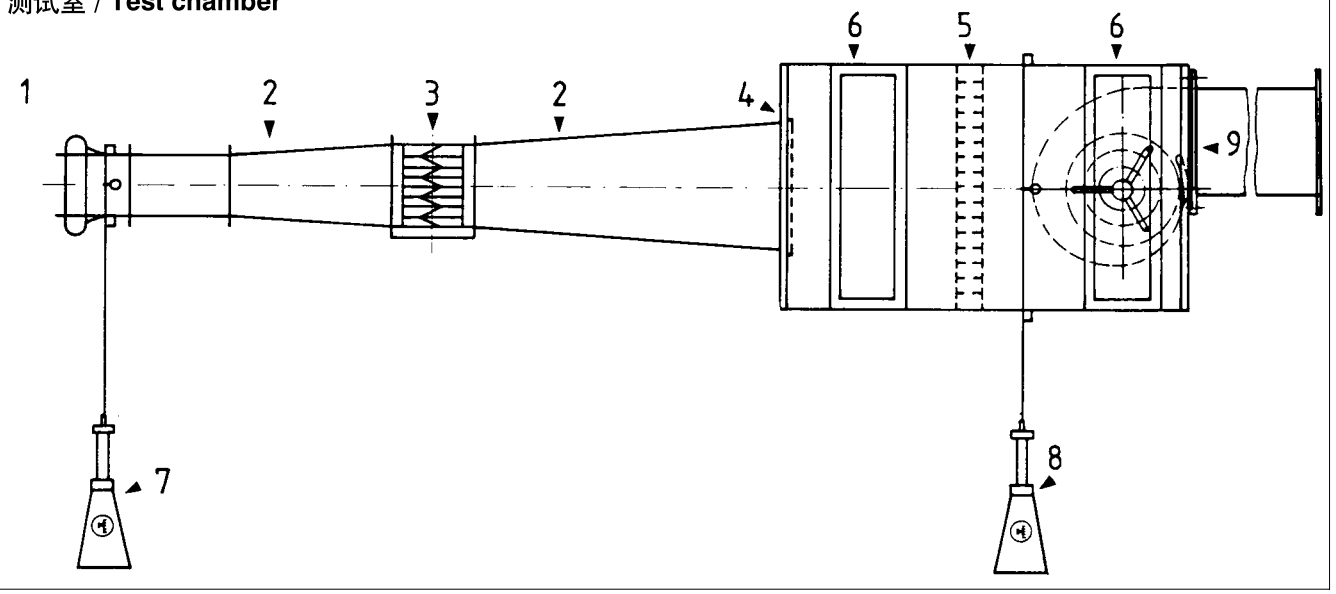
特性曲线

特性曲线按照DIN 24163，在测试室使用进风测试法获得在空气密度1.2kg/m³。温度20℃时有效。特性曲线在安装位置A（自由进出风）获得，并显示进风口压力，随风量变化的关系。

Air performance curves

The air performance curves have been established using the inlet test method in the test chamber as shown below according to DIN 24163. They are valid for air with a density of 1,2 kg/m^3 with a temperature of 20 °C.
The performance curves were made in mounting position A (free inlet, free outlet) and show the pressure increase, available on inlet side, p_{fa} as a function of the volume flow.

测试室 / **Test chamber**



1 导风圈

2 连接部分

3 风量控制阀

4 屏栅

5 整流器

6 带百叶窗的测试室

7 进风口压力计（Pd）

8 压力计（Pfa）

9 被测样品

1 Inlet cone

2 Connecting parts

3 Throttling device with straightener

4 Screens

5 Straightener

6 Measuring chamber with shutters

7 Inlet cone pressure manometer (p_d)

8 Pressure manometer pfa

9 Test sample

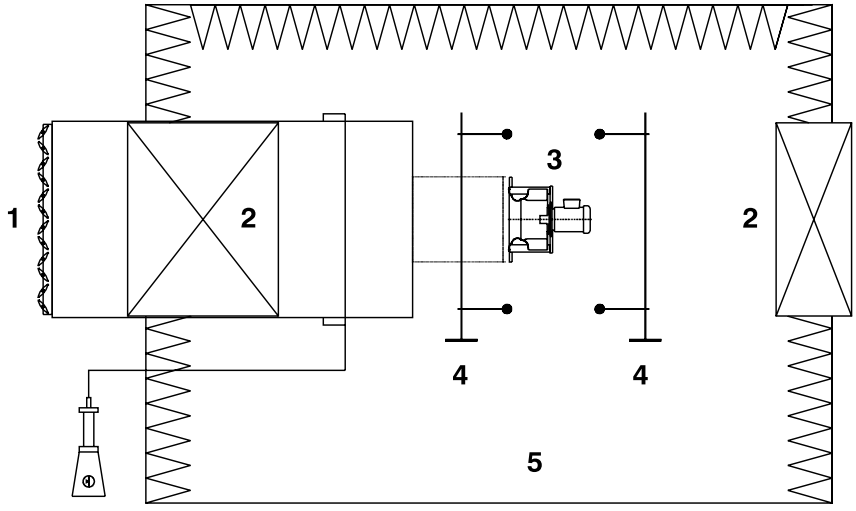
噪声级

特性曲线按照 DIN 45635D 的第38部分，使用表面包络测试法。在一个立体环境测试区域，收集多个测试点。

Noise levels

The tests and their performance curves were made according to DIN 45635, part 38, in accordance with the envelopesurface method, after data collection at several test points via a square test area.

1 百叶窗
2 消音器
3 被测样品
4 测试位置
5 带反射地板的噪音测试室



1 shutter door
2 sound attenuator
3 test sample
4 measurement arrangement
5 sound chamber with refelecting ground

特性曲线显示出风口的“A”声功率级$L_{W(A)8}$。

The characteristic diagram shows the “A” decibel **free-outlet sound power level $L_{W(A)8}$**.

自由进风口声功率$L_{W(A)6}$很重要，列如，空调箱组件出口处的声功率级。当空调箱和风机组装好后，这个值按以下确定：

The **Free-blowing-sound power level $L_{W(A)6}$** is significant, for a typical application with air handling unit modules where the sound power level scattered at the outlet opening is indicated.
This value can be determined when air handling units and ventilators are sensibly arranged:

$$L_{W(A)6} = L_{W(A)8} - 3\ dB$$

自由进风口声功率$L_{W(A)5}$，按以下计算获得：

The free inlet sound power level **$L_{W(A)5}$** can be calculated according to following formula:

$$L_{W(A)5} = L_{W(A)8} - 6\ dB$$

由于环境产生偏差，只能大致确定出风口的声压级。按以下公式计算1米远处的声压级：

The expected sound pressure level on the outlet side can only be approximately determined as the ambient influences can lead to strong deviations. The following formula can be used to calculate the standard value of the sound power level at a distance of 1m:

$$L_{P(A)\ 1m} \approx L_{W(A)} - 7dB$$

为了准确地确定所需的噪声保护，倍频带声功率很重要。

For the exact determination of the sound protection requirement, the sound power level of the octave bands is important.

$$L_{Woct} = L_{W(A)} + L_{Wrel}$$

外转子电机型号 Type with external rotor motor:

进风口 inlet side	相对声功率级 L_{Wrel} [dB] 在中频带时 f_m [Hz] Relative sound power level L_{Wrel} [dB]at octave medium frequenzies f_m [Hz]								
尺寸/ size	63	125	250	500	1000	2000	4000	8000	Hz
250 / 280	-1	-4	-1	-2	-5	-10	-11	-14	dB
315 / 355	-4	-4	-1	-2	-6	-8	-12	-15	dB
400 / 450	-4	-3	0	-3	-6	-7	-12	-15	dB
500 / 560	-3	-4	0	-3	-6	-7	-12	-15	dB
630	-2	-2	0	-3	-6	-7	-12	-15	dB
710	-2	-1	-1	-3	-5	-8	-12	-17	dB
出风口 / outlet side									
250 / 280	-4	-6	-2	-3	-5	-7	-13	-14	dB
315 / 355	-3	-4	-2	-3	-4	-8	-15	-18	dB
400 / 450	-2	0	0	-3	-5	-7	-14	-20	dB
500 / 560	-2	0	1	-3	-5	-9	-16	-22	dB
630	-4	0	0	-1	-5	-9	-15	-19	dB
710	-2	0	-2	-2	-4	-10	-16	-20	dB

IEC 标准电机型号 Type with IEC standard motor:

进风口 inlet side	相对声功率级 L_{Wrel} [dB] 在中频带时 f_m [Hz] Relative sound power level L_{Wrel} [dB]at octave medium frequenzies f_m [Hz]								
尺寸/ size	63	125	250	500	1000	2000	4000	8000	Hz
250 / 280	-11	-8	-1	-4	-6	-7	-9	-16	dB
315 / 355	-11	-7	0	-3	-5	-9	-10	-16	dB
400 / 450	-11	-4	0	-3	-5	-8	-12	-18	dB
500 / 560	-10	-3	0	-4	-5	-8	-12	-19	dB
630	-10	-2	1	-5	-5	-7	-12	-19	dB
710 / 800	-3	1	-4	-5	-2	-11	-17	-24	dB
出风口 / outlet side									
250 / 280	-8	-11	-4	-4	-4	-7	-11	-18	dB
315 / 355	-8	-11	-3	-2	-6	-7	-11	-18	dB
400 / 450	-9	-8	-2	-2	-5	-8	-13	-19	dB
500 / 560	-10	-7	-1	-3	-4	-8	-13	-20	dB
630	-10	-3	0	-4	-5	-7	-12	-20	dB
710 / 800	-2	0	-4	-5	-2	-11	-17	-25	dB

相对声功率平均超过特性曲线从0.75到1.2当工作点超出最适宜的范围时，从表格中的 V opt，且在速度25到50 m/s 时有效。数值推测，低频带时将产生更大的误差。个别情况下，在环境音调频率范围内倍频程声功率级要高于表格中的数值。噪声值受安装条件、反射、空间声学特性以及其他因素的影响。

The relative sound power level was averaged over a performance curve from 0,75 to 1,2 V_{opt} and is valid for speeds of 25 - 50 m/s. When the operating points are outside of the optimum application range, higher deviations from the table values can be expected at lower frequencies.
In individual cases, higher octave sound power levels than indicated in the table can be achieved in the frequency range of the revolution tones .
A general observation is that the noise values may be affected by the installation conditions, reflections, the acoustic of the room and other influential factors.

安装在箱体内

我们推荐保持以下安装比例：

$$\frac{\text{外壳内侧尺寸 A}}{\text{叶轮的直径 D}} \geqslant 1{,}6$$

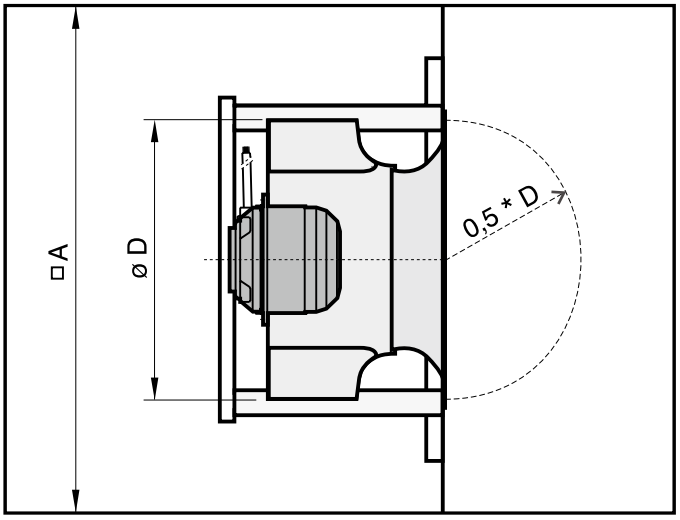
将自由转动叶轮的离心风机安装到外壳里时，下面图表显示推荐的和安装在小面积下时的压力损失。

Installation in casings or air handling units

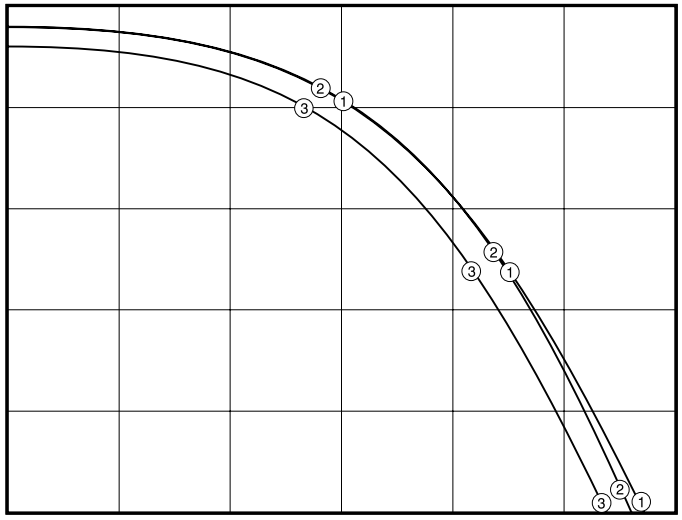
We recommend to keep the installation ratio as follows:

$$\frac{\text{internal dimension of casing A}}{\text{external dimension of impeller D}} \geqslant 1{,}6$$

when installing a centrifugal ventilator with free-running impeller into a casing. The following diagram shows installation pressure losses when installed as recommended and when installed in a small area



△**p** [Pa]



① 风机无外壳时的特性曲线
100%普通空气特性

② 特性曲线为A/D=1,6:
100%普通空气特性

③ 特性曲线为A/D=1,2:
92%普通空气特性

需保证进风口和出风口之间的隔离部分大于0.5*D，无需考虑压力测的损失。

① Catalogue performance curve without casing :
100 % nominal air performance

② Performance curve with A/D = 1,6 :
100 % nominal air performance

③ Performance curve with A/D = 1,2 :
92 % nominal air performance

On the inlet and outlet side a minimum distance of 0.5 * D to adjoining parts has to be kept. So losses on the pressure side must not be taken into consideration.

风量测试装置

风量测试装置由带有3个或4个测量设备的环形导管组成。

测试装置依靠导流口和进风口处静压差来测量。

注意，进风口区域测量到的并不是动压，因此测量是正确的。

因此，可在风机运转时确定风量。

风量按以下公式计算：

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

$$k = \alpha \cdot \varepsilon \cdot A$$

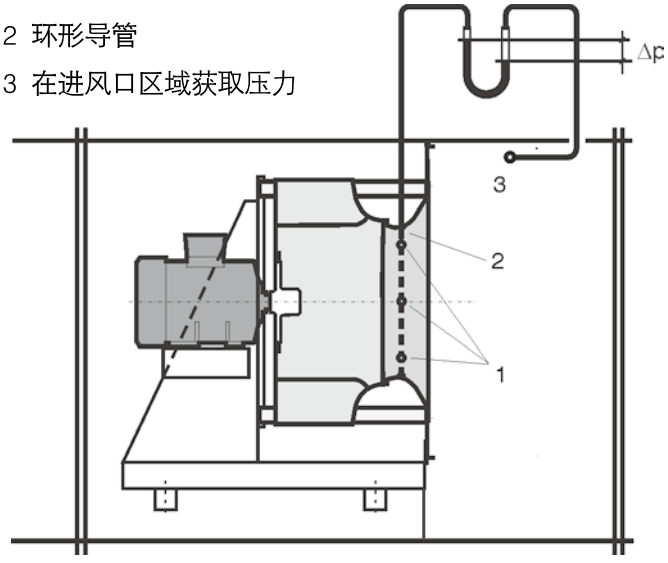
风机每个型号的测试需要各自的校准系统

K_{10}=流量偏差小于10%

1 在进风导流口获得压力

2 环形导管

3 在进风口区域获取压力



Air volume testing device

The air volume testing device consists of a circular lead on the inlet side with 3 or 4 pressure measuring devices incorporated in the inlet cone.

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

Please note that dynamic pressure in the inlet area is not measured. The drillings for measurement are to be made accordingly.

Due to this a direct control and determination of the air volume of the fans is possible during operation.

The air volume is calculated according to following formula:

V	空气流量/ air volume	m^3/h
k	校准系数/ calibration factor	m^2 s/h
ρ	空气密度/ density of gas	kg/m^3
△	压力变化/ differential pressure	Pa
α	流量系数 / flow factor	
ε	膨胀系数 / expansion factor	
A	Ring cross section surface at the narrowest point	

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

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

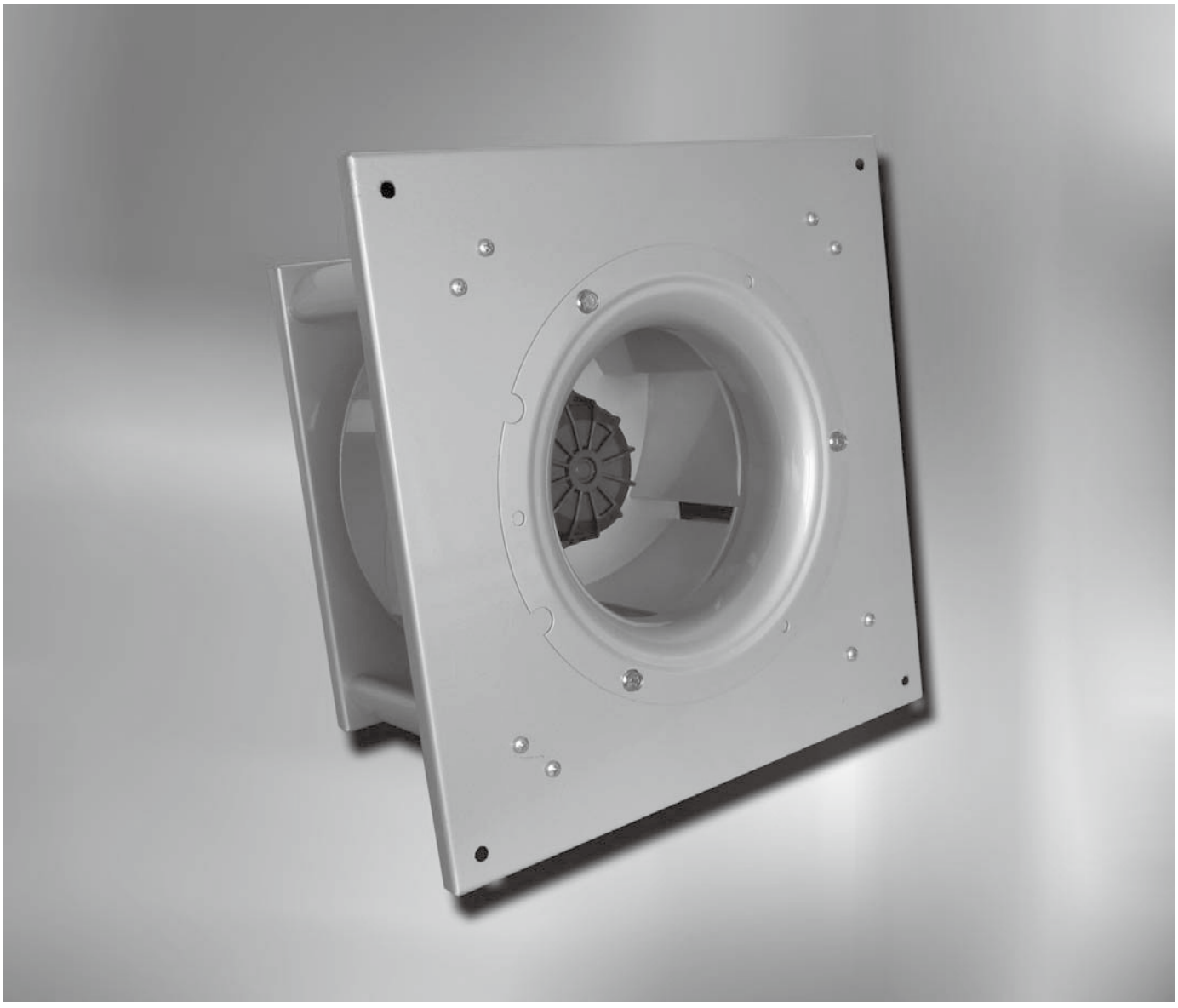
1 Pressure take-out at inlet cone

2 Circular lead

3 Pressure take-out inlet area

校准系数 k_{10} / Calibration factor k_{10}

尺寸 / size	250	280	315	355	400	450	500	560	630	710	800
k_{10} E/DKH_	37	55	70	83	110	134	160	204	278	358	-
k_{10} GKH_	-	55	70	87	113	145	180	220	-	-	-
k_{10} DKN_	46	55	70	90	113	145	180	220	287	370	475



优点:

- 结构紧凑，节省空间
- 高效后倾叶轮
- 可安装于任何位置
- 电机直联易于维护
- 适宜变压和变频调速

Advantages:

- compact, space saving construction
- high power impeller
- highly economical because of high efficiency impeller
- installable in all positions
- easy to maintain due to no attrition
- wide range of voltage- and frequency controllable units

易转动的叶轮加载放射状叶片

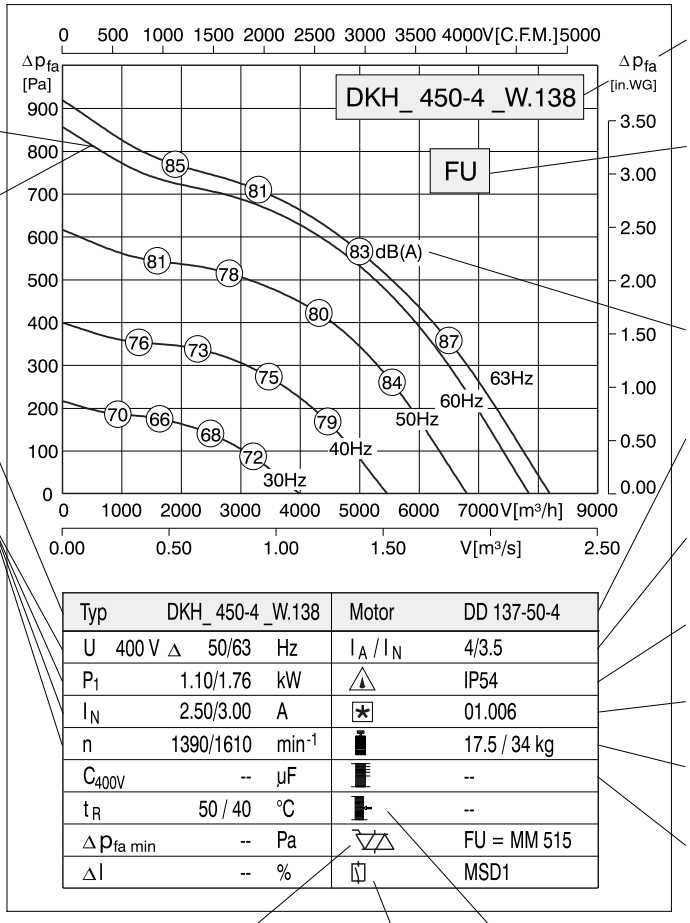
性能曲线

性能曲线适用于空气的标准状态（一个大气压，20℃，相对湿度50%，此时空气密度 ρ =1.2kg/m³ ）

Radial fans with free-running impeller

Performance Curves

The performance curve indicates the static pressure increase p_{fa} as a function of the volume flow. The performance curves refer to an air density of 1,2 kg/m^3.



额定电压和部分电压的特性曲线

Fan performance curves at rated voltage and component voltage resp. with max. frequency and partial frequency

风机型号
Fan type

风机额定数据
Fan rated data

频率可调范围最大不可超过63 Hz(本款型号) with frequency control the nominal data for max. frequency and for 50 Hz frequency are stated

风机型号
Type description

调频
Frequency controlled

A声功率级
Noise level L_{WA8}

产品编码
Motor type

启动电流与额定电流比值 / Ratio of starting current to rated current

防护等级
Motor protection class

接线图编码
Wiring diagram

风机重量 / weight
DKHR / DKHM

5级调速器
5-step controller

无极调速器，电子控制
Stepless adjustable, electronic controller (with frequency converter use the f.c. type is stated)

无极调速器，变压器控制
Continously adjustable controller, transformer type

电机保护器 / Motor protection unit

建议：关于控制器部分，请参见样册–洛森集团介绍
Advice : For controllers see basic catalogue

技术规定 / Technical Formula

	表示 / Designation	Einheit / Unit
U	额定电压 / Rated voltage	V
P_1	电机功率 / Motor power consumption	kW
I_N	额定电流 / Rated current	A
n	风机速度 / Fan speed	min^{-1}
C_{400V}	电容器 / Capacitor	F
t_R	最大可允许的媒介温度 / Max. permissible medium temperature	°C
$\triangle pfa_{min}$	自由出风的静压升 / Min. required counter pressure	Pa
$\triangle I$	部分电压下的电流增量 / Current increase in partial voltage	%
I_A / I_N	启动电流与额定电流的比率 / Ratio of starting current to rated current	-

特点和结构

洛森集团E/DKHR和E/DKHM无蜗壳离心风机结构紧凑，设计完美。他们是可变压外转子电机和新式设计叶轮的完美结合。这种风机适合多种外壳，使风机结构形式多样化，也就能满足客户对风机结构要求的多样化。

可提供的风机组件如下：

E/DKHR：风机化叶轮，可带导风圈

E/DKHM：组件安装

电机

洛森外转子电机防护等级为 IP54，绝缘等级F，使用SKF带特殊润滑脂的密封深沟球轴承保持流畅低噪声运行。

电机保护

洛森集团的外转子电机都装配热保护器，包埋在线圈绕组里来保护电机。热保护器是依靠温度的金属断流器，用以控制线圈温度。热保护器被正确安装后，启动时可使电机停止运转；用以防止过载、相位失调、电机失速和过高环境温度。

电子连接

在产品标牌上的标称电压最大可允许电压耐受量±10%；标准引线，不带电机的标准电线长度（从电机法兰处）80和106是68cm；加上电机尺寸的长度137和165是88cm。客户需求定制化：特殊电线长度、特殊的带可装配接线盒的风机也是可达成的。

Features and Construction

Rosenberg centrifugal fans of the ranges E/DKHR and E/DKHM with free running impeller are very compact units. With regard to the air movement, the fans have been optimally designed. They combine a voltage controlled external rotor motor and a newly designed impeller.

This combination together with flexible production of impellers and efficient sheet metal handling makes it possible to manufacture fan modules for various applications. Constructive demands of the customer can be met.

The fan modules can be provided (as shown on page 6) as:

E/DKHR:	motorized impeller (mounted and balanced) with or without inlet cone (loose)
E/DKHM:	module for installation

Motors

Rosenberg external rotor motors have protection class IP54.
The winding insulation corresponds to insulation class F. By use of deep groove ball bearings, closed on both sides, with special grease lubrication a maintenance free and low noise operation is possible.

Motor protection

All motors are equipped with thermal contacts, wired in series. Thermal contacts are temperature dependent control elements, controlling the winding temperature of the motor. If they are installed correctly they protect the motor windings from overload, failure of a mains phase, standstill of the motor and from too high temperatures of the medium to be ventilated. In connection with the mounted thermal contacts we recommend the usage of our motor protection control units. We also offer 5-step speed controllers, RTE and RTD Types are equipped with thermal contact motor protection. An additional motor protection switch is not required.

Electrical Connection

The nominal voltage indicated on the type plate is valid with a max. allowed voltage tolerance of 10%. Flying leads as standard. The connection ends are 10 cm dismantled and equipped with end splices. Standard cable length with motor size **80** and **106** is 68 cm and with motor sizes **137** and **165** 88 cm from motor flange. Special cable lengths and fans with mounted terminal box are available on request.

电压类型

性能曲线图表上显示的性能资料是为标准版本50 Hz 1230V, 3400V制作的。客户要求的其他电压或其他频率的电机，在洛森也可以达成。页码A24、A25可以看到我们60 Hz标准款。

速度控制

我们用一种合适的系统来进行速度调节，实现客户对工况点的要求。
有两种速度控制方法能够被应用在洛森系列风扇上。

– 电压控制

（性能曲线上同时显示标称电压和局部电压）。

通过降低终端电压来实现速度控制。所以通过负载控制来实现滑移增量的减小，并且空气流动也相应的减少。用户可在我们的产品铭牌上可以看到相匹配的电压控制器。对于三厢电，我们所有的电压可控离心风扇也能通过变频器下调频率实现速度控制。

– 频率控制

（性能曲线上同时显示最大频率和局部频率）。
通过降低频率来实现速度控制。我们所有的风机可以在变频器上可调节的截止频率是50Hz， 60HZ型号的风机请参见本样册页面A24和A25。
每条性能曲线上显示了最高频率.使用比额定频率更高的频率，电机会出现热过载。万一变频器出现故障，所有可控频率的型号（风机）也能直接在400V/50Hz的条件下工作。

频率控制器上的电机运转，最大电压增速不可超过500V/s。根据变频器的类型以及电机和变频器间的电线长度，也可能需要附加组件。

Voltage types

The performance data as indicated on the performance curve charts are for the standard versions at 50 Hz 1 230 V and 3400 V. Motors for other voltages or frequencies are available on request for additional charge. Please see pages A24 and A25 for 60 Hz standard models.

Speed control

The installation-specific optimal adjustment for the required operation point can only be realized with a suitable system for speed adjustment. Two common systems can be used for the speed control of this fan series.

- Voltage control

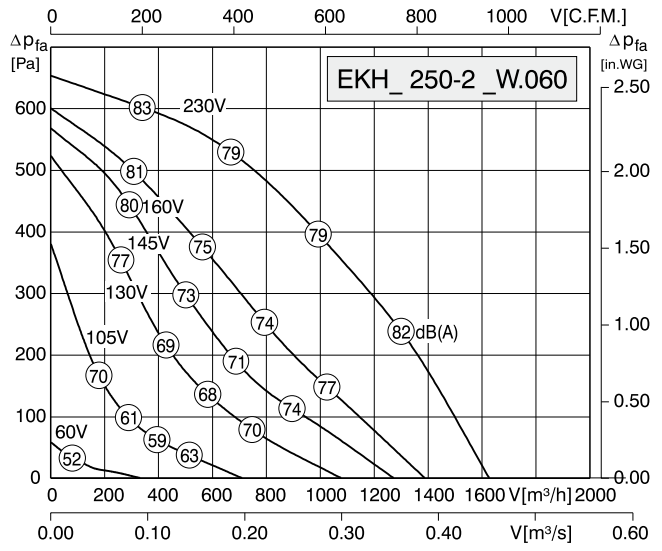
(The performance curves show both nominal voltage and partial voltage).

The speed control is provided by reduction of the terminal voltage. So by load-controlled increase of the slippage the speed is reduced and the air volume flow is reduced in proportion to the speed. The matching voltage controllers can be found on the fan name plate. All voltage controllable centrifugal fans for three-phase current construction can also be speed controlled by frequency converter from rated frequency downwards.

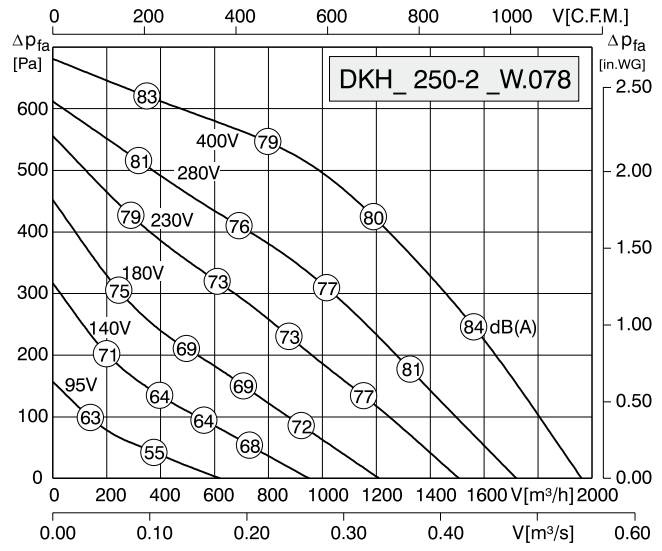
- Frequency control

(The performance curves show both maximum frequency fmax and partial frequency).
The speed control is provided by reduction of the frequency. The cut-off frequency adjustable on the frequency converter is 50Hz for all fans. The maximum frequency adjustable on the frequency converter is 50 Hz respectively 60 Hz for 60 Hz models pages A 24 and A 25. Each performance curve shows the max. possible frequency. With higher frequencies than the rated frequency the motor will thermally overload. In case of emergency service or failure of the frequency converter all frequency controllable types can be used also direct with 400V on the 50 Hz mains supply.

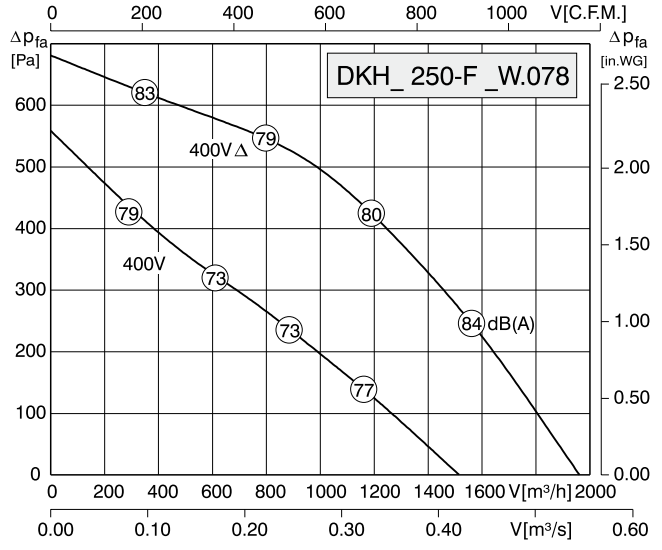
With operation of the motors on a frequency controller the max. speed of voltage increase of 500 V/ s must not be exceeded. According to the frequency converter type and the length of the cable between motor and frequency converter additional components may be required.



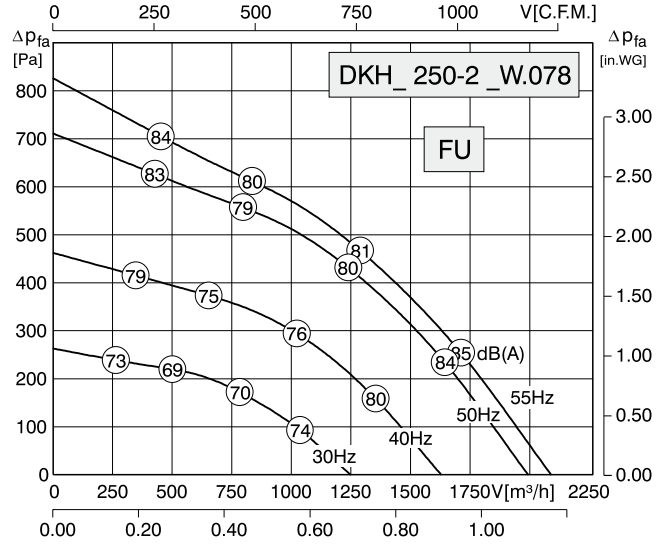
Typ	EKH_ 250-2 _W.060		Motor	ED 080-55-2
U 230 V	50	Hz	I_A / I_N	2.2
P_1	0.36	kW		IP54
I_N	1.55	A		01.024
n	2680	min^{-1}		4,5 / 10,5 kg
C_{400V}	8	µF		RE/RTE 3.2
t_R	40	°C		RSE 2.5
$\Delta p_{fa\ min}$	--	Pa		ED 2,5
ΔI	26	%		MSE1



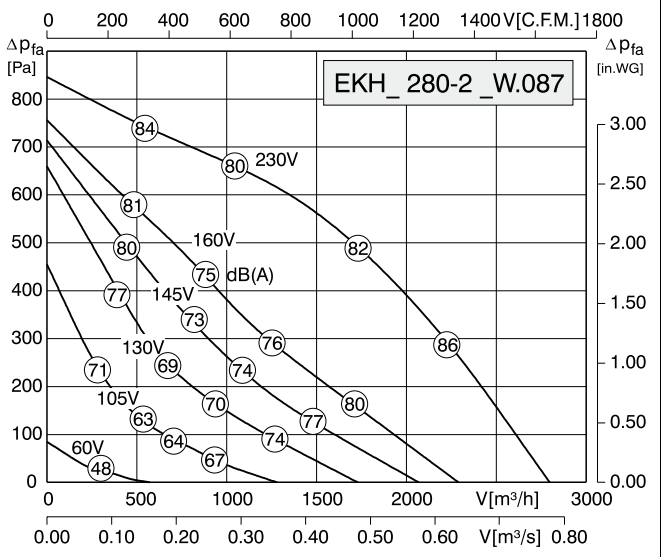
Typ	DKH_ 250-2 _W.078		Motor	DD 080-55-2
U 400 V Δ	50	Hz	I_A / I_N	3
P_1	0.43	kW		IP54
I_N	0.72	A		01.006
n	2600	min^{-1}		4,5 / 11 kg
C_{400V}	--	µF		RTD 1.2
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	11	%		MSD1



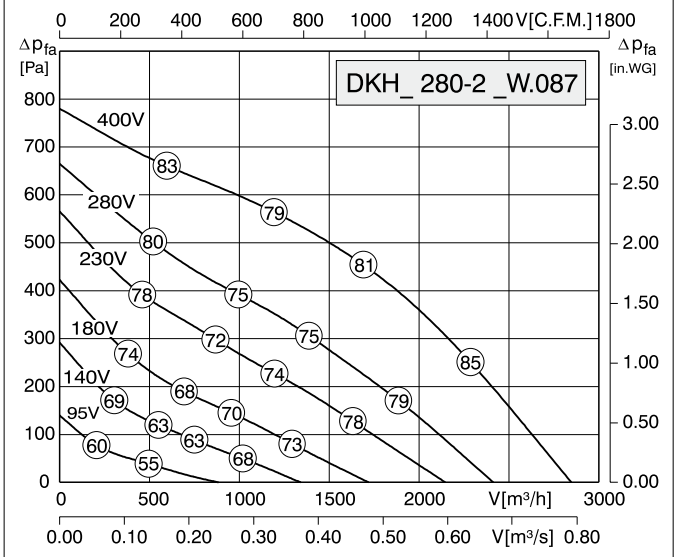
Typ	DKH_ 250-F _W.078		Motor	DD 080-55-2
U 400 V Δ /	50	Hz	I_A / I_N	3
P_1	0.43/0.29	kW		IP54
I_N	0.72/0.44	A		01.045
n	2600/1920	min^{-1}		4,5 / 11 kg
C_{400V}	--	µF		--
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



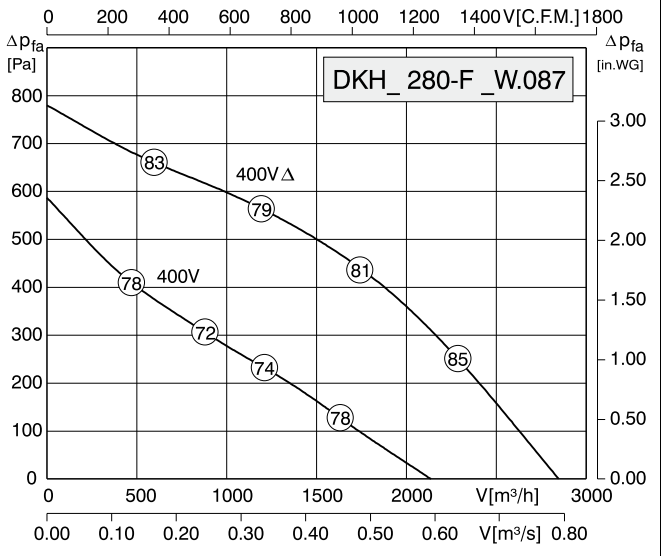
Typ	DKH_ 250-2 _W.078		Motor	DD 080-55-2
U 400 V Δ	50/55	Hz	I_A / I_N	3/2.3
P_1	0.43/0.50	kW		IP54
I_N	0.72/0.80	A		01.006
n	2600/2690	min^{-1}		4,5 / 11 kg
C_{400V}	--	µF		--
t_R	60/45	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM507
ΔI	--	%		MSD1



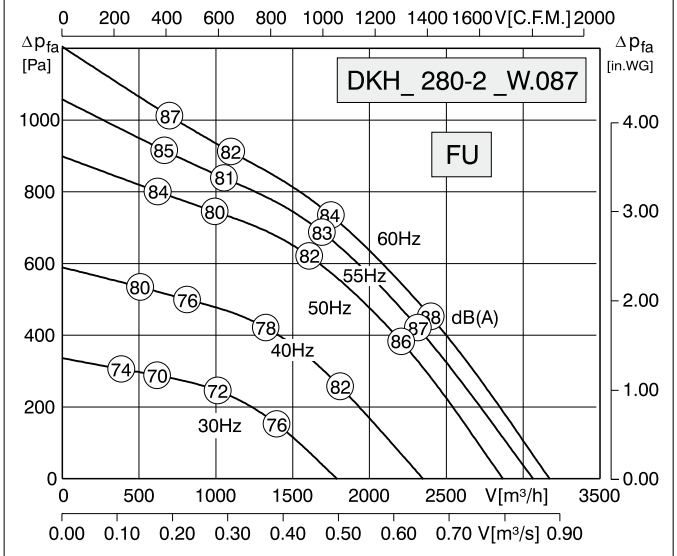
Typ	EKH _ 280-2 W.087		Motor	ED 106-50-2
U 230 V	50	Hz	I_A / I_N	2.2
P_1	0.77	kW		IP54
I_N	3.40	A		01.024
n	2520	min^{-1}		7,5 / 18 kg
C_{400V}	14	µF		RE/RTE 5
t_R	40	°C		RSE 5.5
$\Delta p_{fa\ min}$	--	Pa		ED 5,0
ΔI	13	%		MSE1



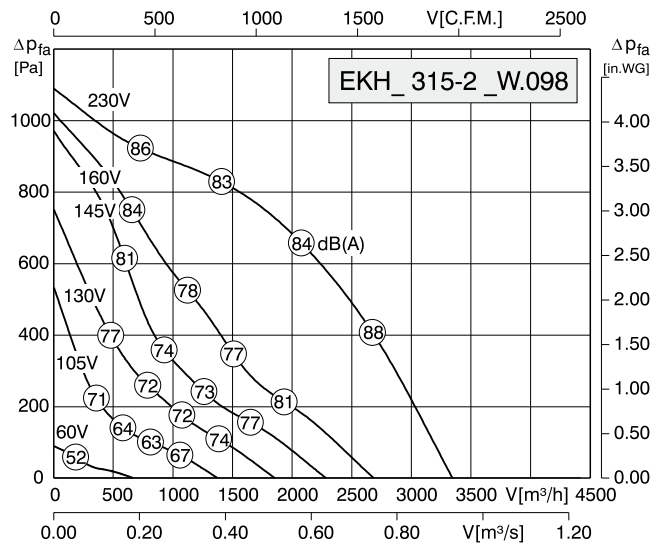
Typ	DKH_ 280-2 _W.087		Motor	DD 106-35-2
U 400 V Δ	50	Hz	I_A / I_N	2.7
P_1	0.66	kW		IP54
I_N	1.10	A		01.006
n	2400	min^{-1}		6.5 / 17 kg
C_{400V}	--	µF		RTD 1.2
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	--	%		MSD1



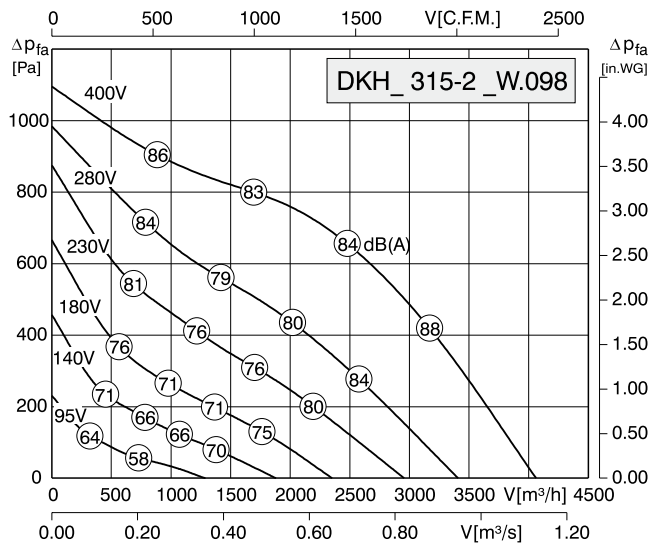
Typ	DKH_ 280-F _W.087		Motor	DD 106-35-2
U 400 V Δ/	50	Hz	I_A / I_N	2.7
P_1	0.66/0.40	kW		IP54
I_N	1.10/0.60	A		01.045
n	2400/1720	min^{-1}		6.5 / 17 kg
C_{400V}	--	µF		--
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



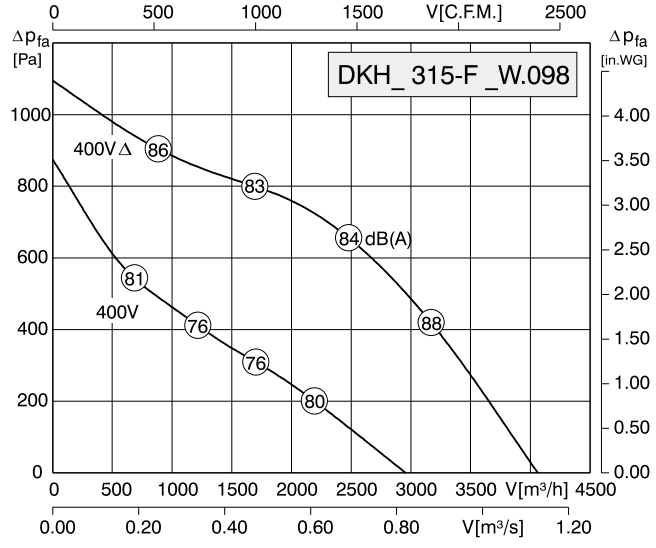
Typ	DKH_ 280-2 _W.87		Motor	DD 106-50-2
U 400 V Δ	50/60	Hz	I_A / I_N	2.6/2.6
P_1	0.90/1.05	kW		IP54
I_N	1.30/1.60	A		01.006
n	2600/2810	min^{-1}		7.5 / 18 kg
C_{400V}	--	µF		--
t_R	60/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM507
ΔI	--	%		MSD1



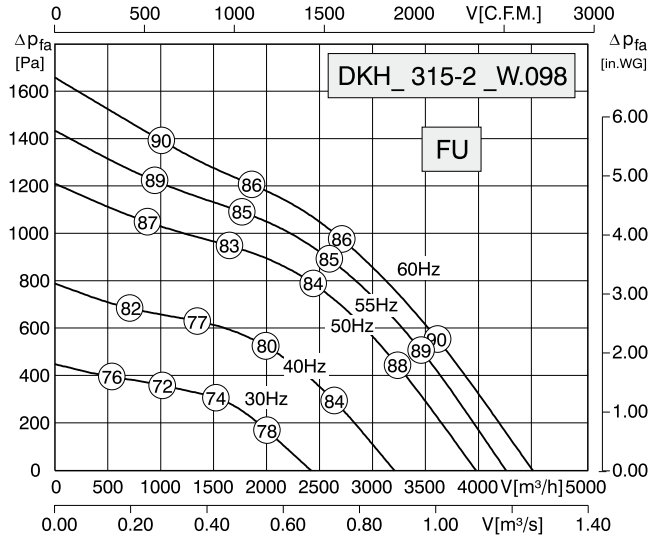
Typ	EKH_ 315-2 _W.098		Motor	ED 137-50-2
U 230 V	50	Hz	I_A / I_N	1.5
P_1	1.50	kW		IP54
I_N	6.70	A		01.024
n	2610	min^{-1}		15 / 26 kg
C_{400V}	25	µF		RE/RTE 7.5
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	11	%		MSE1



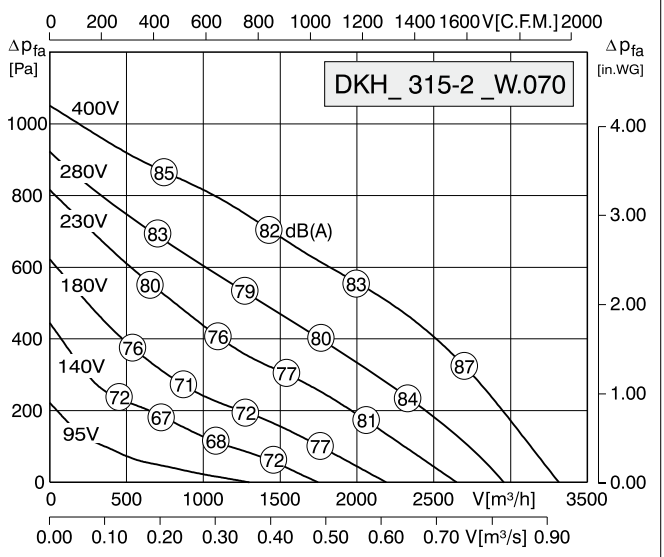
Typ	DKH_ 315-2 _W.098		Motor	DD 137-35-2
U 400 V Δ	50	Hz	I_A / I_N	2.6
P_1	1.30	kW		IP54
I_N	2.20	A		01.006
n	2550	min^{-1}		12 / 23 kg
C_{400V}	--	µF		RTD 2,5
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	3	%		MSD1



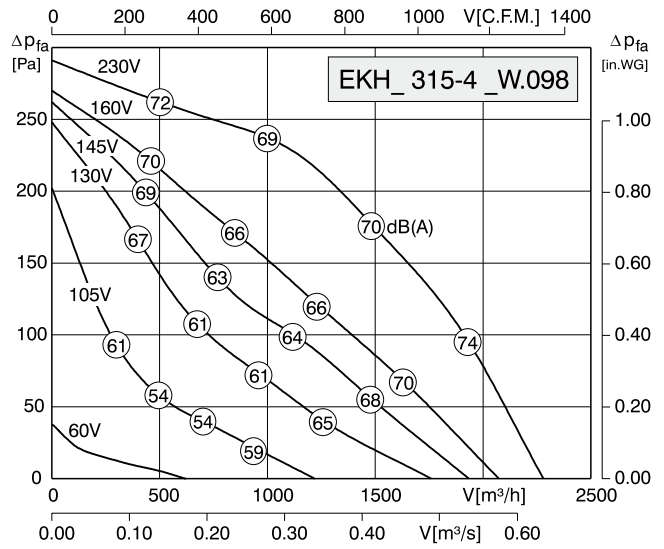
Typ	DKH_ 315-F _W.098		Motor	DD 137-35-2
U 400 V Δ/	50	Hz	I_A / I_N	2.6
P_1	1.30/0.80	kW		IP54
I_N	2.20/1.30	A		01.045
n	2550/1750	min^{-1}		12 / 23 kg
C_{400V}	--	µF		--
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



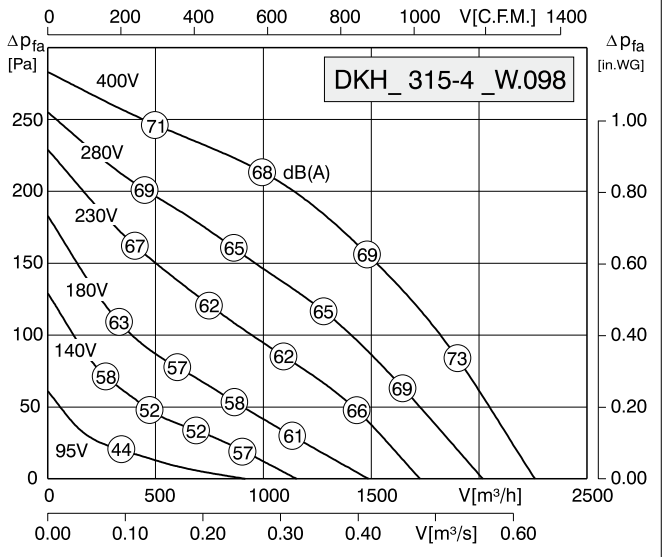
Typ	DKH_ 315-2 _W.098		Motor	DD 137-50-2
U 400 V Δ	50/60	Hz	I_A / I_N	4.2/3.2
P_1	1.4/2.1	kW		IP54
I_N	2.5/3.4	A		01.006
n	2750/3060	min^{-1}		15 / 26 kg
C_{400V}	--	µF		RTD 2.5
t_R	70/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 515
ΔI	--	%		MSD1



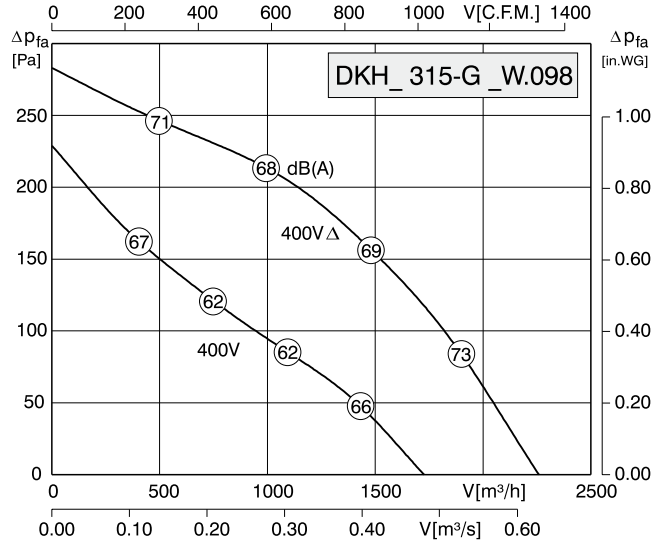
Typ	DKH_315-2 _W.070		Motor	DD 106-50-2
U 400 V Δ	50	Hz	I_A / I_N	2.9
P_1	0.85	kW		IP54
I_N	1.45	A		01.006
n	2480-	min^{-1}		8 / 15.5 kg
C_{400V}	--	µF		RTD 2.5
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	5	%		MSD1



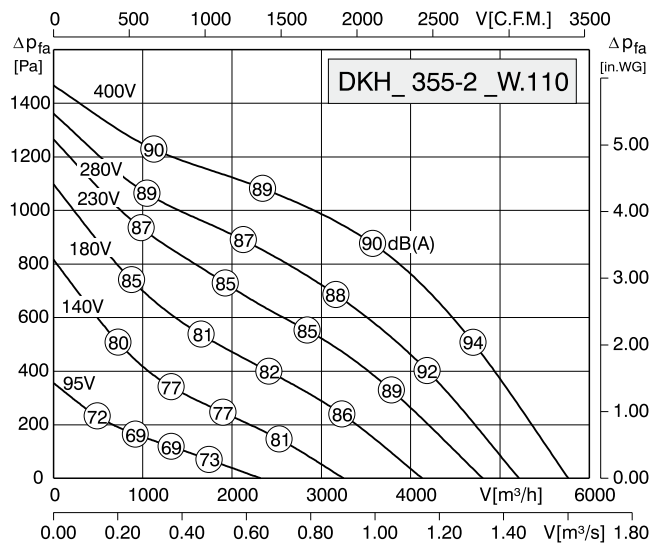
Typ	EKH_315-4 _W.098		Motor	ED 080-42-4
U 230 V	50	Hz	I_A / I_N	1.6
P_1	0.22	kW		IP54
I_N	1.00	A		01.024
n	1350	min^{-1}		4.5 / 12 kg
C_{400V}	5	µF		RE/RTE 1.5
t_R	60	°C		RSE 1.4
$\Delta p_{fa\ min}$	--	Pa		--
Δl	18	%		MSE1



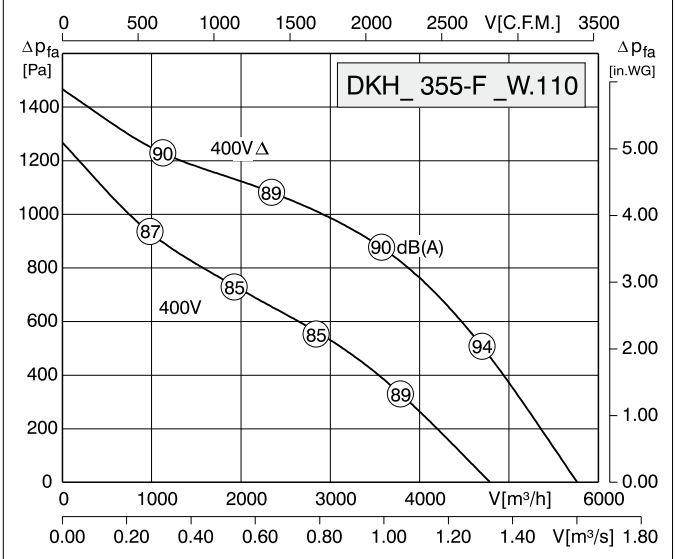
Typ	DKH_315-4 _W.098		Motor	DD 080-30-4
U 400 V Δ	50	Hz	I_A / I_N	2.4
P_1	0.20	kW		IP54
I_N	0.38	A		01.006
n	1300	min^{-1}		4 / 11.5 kg
C_{400V}	--	µF		RTD 1.2
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



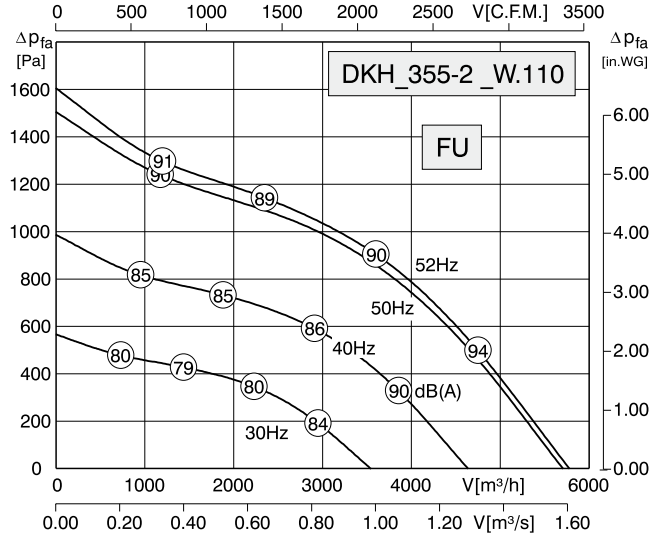
Typ	DKH_315-G _W.098		Motor	DD 080-30-4
U 400 V Δ/	50	Hz	I_A / I_N	2.4
P_1	0.20/0.12	kW		IP54
I_N	0.38/0.20	A		01.045
n	1300/960	min^{-1}		4 / 11.5 kg
C_{400V}	--	µF		--
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



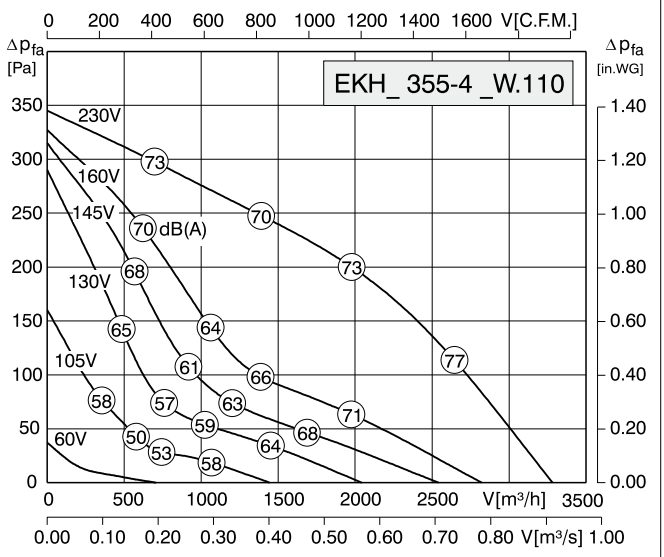
Typ	DKH_ 355-2 _W.110		Motor	DD 137-75-2
U 400 V Δ	50	Hz	I_A / I_N	3
P_1	2.35	kW		IP54
I_N	4.0	A		01.006
n	2650	min^{-1}		20 / 31 kg
C_{400V}	--	µF		RTD 5
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	6	%		MSD1



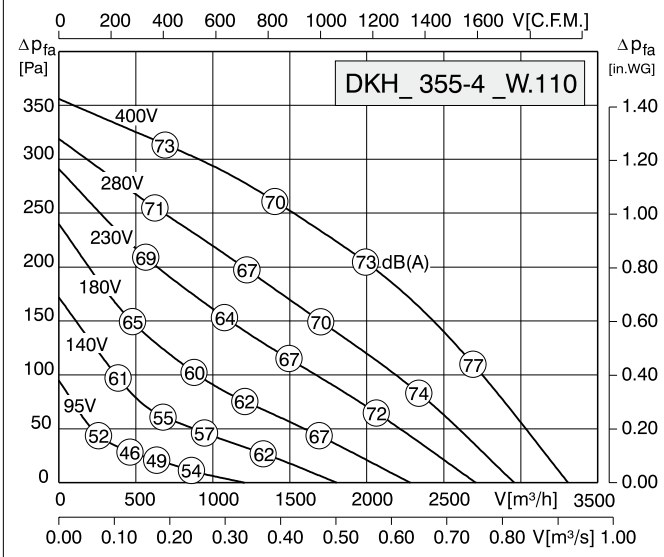
Typ	DKH_ 355-F _W.110		Motor	DD 137-75-2
U 400 V Δ/	50	Hz	I_A / I_N	3
P_1	2.35/1.50	kW		IP54
I_N	4.0/2.5	A		01.045
n	2650/2050	min^{-1}		20 / 31 kg
C_{400V}	--	µF		--
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



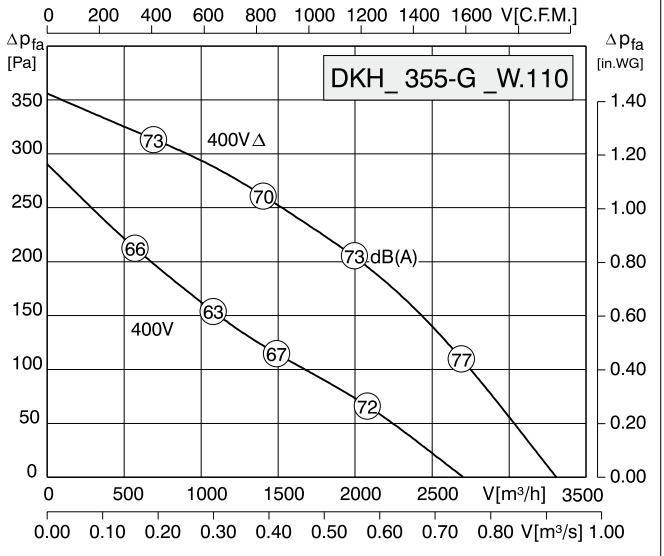
Typ	DKH_ 355-2 _W.110		Motor	DD 137-75-2
U 400 V Δ	50/52	Hz	I_A / I_N	3
P_1	2.35/2.55	kW		IP54
I_N	4.00/4.25	A		01.006
n	2650/2710	min^{-1}		20 / 31 kg
C_{400V}	--	µF		--
t_R	45/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 522
Δl	--	%		MSD1



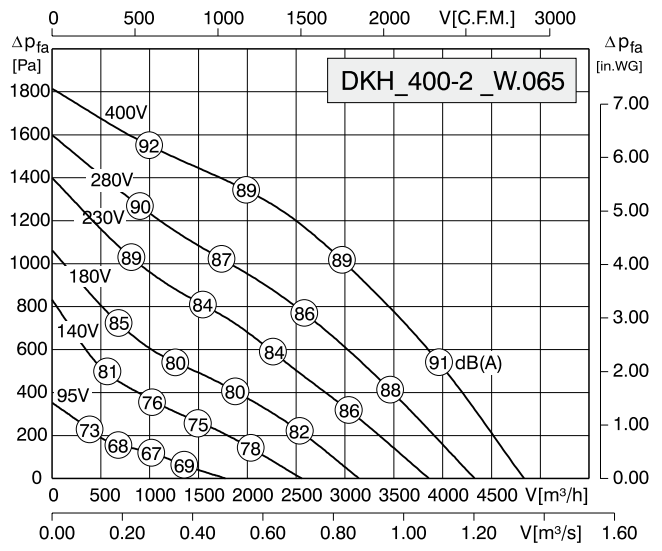
Typ	EKH_ 355-4 _W.110		Motor	ED 080-55-4
U	230 V	50 Hz	I_A / I_N	2
P_1	0.32	kW		IP54
I_N	1.40	A		01.024
n	1300	min^{-1}		5.5 / 16.5 kg
C_{400V}	6	µF		RE/RTE 3.2
t_R	50	°C		RSE 2.5
$\Delta p_{fa\ min}$	--	Pa		ED 2,5
ΔI	18	%		MSE1



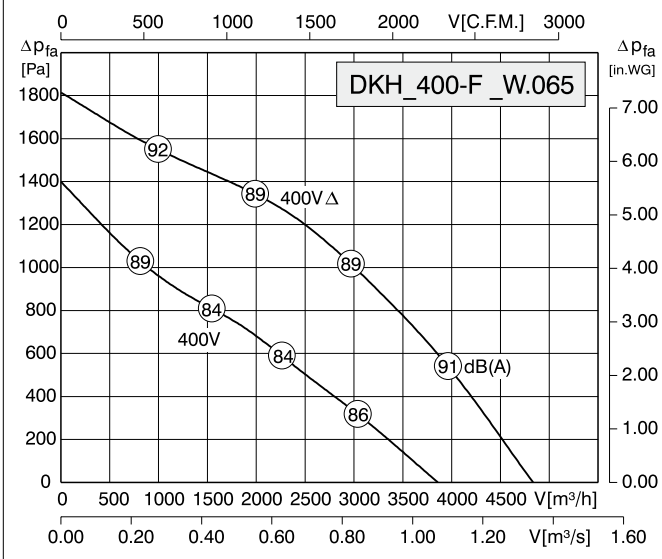
Typ	DKH_ 355-4 _W.110		Motor	DD 080-42-4
U	400 V Δ	50 Hz	I_A / I_N	2.9
P_1	0.29	kW		IP54
I_N	0.60	A		01.006
n	1310	min^{-1}		5 / 16 kg
C_{400V}	--	µF		RTD 1.2
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	--	%		MSD1



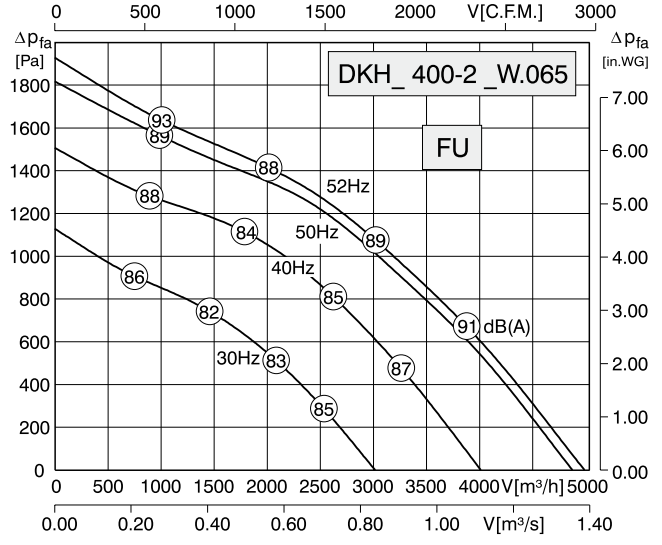
Typ	DKH_ 355-G _W.110		Motor	DD 080-42-4
U	400 V Δ/	50 Hz	I_A / I_N	2.9
P_1	0.29/0.19	kW		IP54
I_N	0.60/0.30	A		01.045
n	1310/990	min^{-1}		5 / 16 kg
C_{400V}	--	µF		--
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



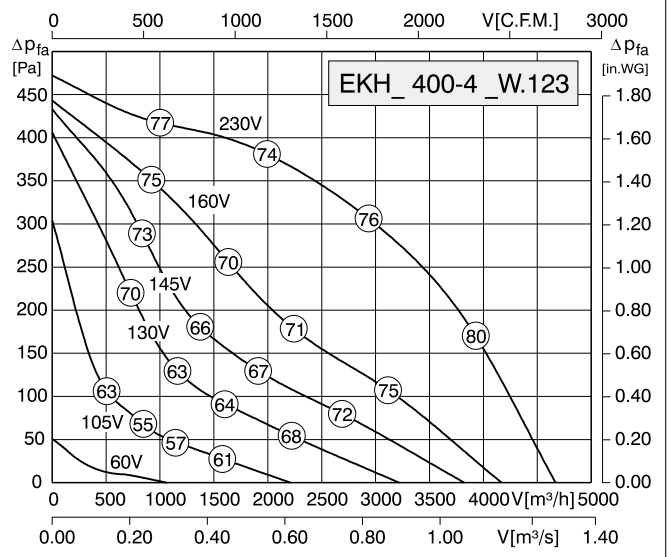
Typ	DKH_ 400-2 _W.065		Motor	DD 137-75-2
U	400 V Δ 50	Hz	I_A / I_N	3
P_1	2.35	kW		IP54
I_N	4.0	A		01.006
n	2650	min^{-1}		20 / 31 kg
C_{400V}	--	µF		RTD 5
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	6	%		MSD1



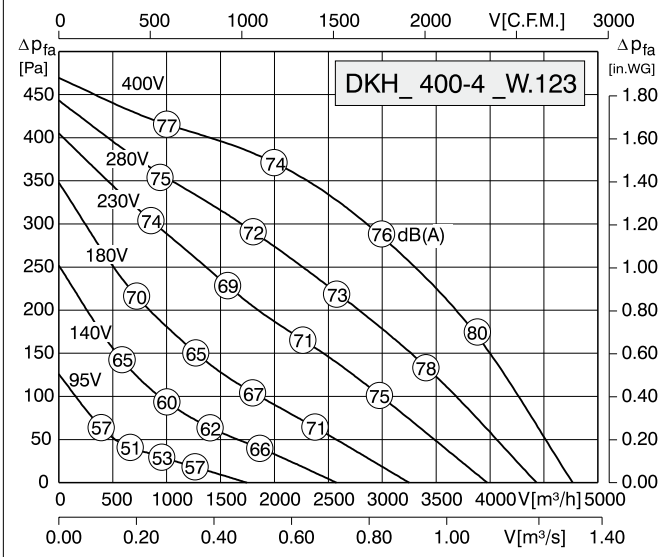
Typ	DKH_ 400-F _W.065		Motor	DD 137-75-2
U	400 V Δ/ 50	Hz	I_A / I_N	3
P_1	2.35/1.5	kW		IP54
I_N	4.0/2.5	A		01.045
n	2650/2040	min^{-1}		20 / 31 kg
C_{400V}	--	µF		--
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



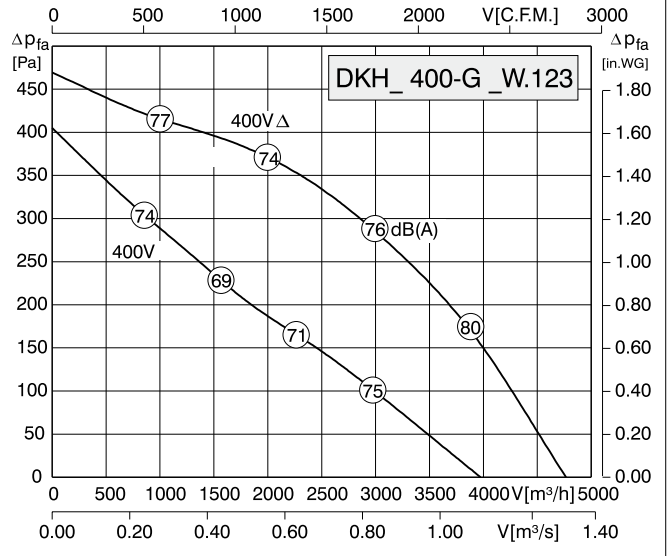
Typ	DKH_ 400-2 _W.065		Motor	DD 137-75-2
U	400 V Δ 50/52	Hz	I_A / I_N	3/3
P_1	2.35/2.55	kW		IP54
I_N	4.0/4.25	A		01.006
n	2650/2700	min^{-1}		20 / 31 kg
C_{400V}	--	µF		--
t_R	45/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 522
Δl	--	%		MSD1



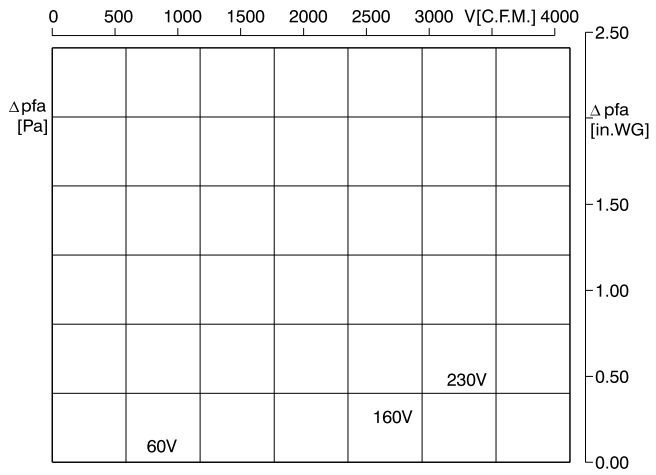
Typ	EKH_ 400-4 _W.123		Motor	ED 106-50-4
U	230 V	50 Hz	I_A / I_N	2.3
P_1	0.60	kW		IP54
I_N	2.80	A		01.024
n	1350	min^{-1}		12 / 20 kg
C_{400V}	12	µF		RE/RTE 3.2
t_R	40	°C		RSE 3.7
$\Delta p_{fa\ min}$	--	Pa		ED 5,0
ΔI	12	%		MSE1



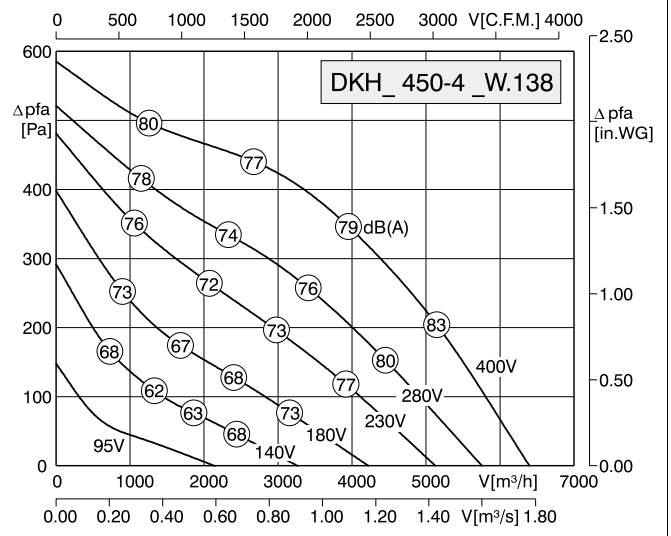
Typ	DKH_ 400-4 _W.123		Motor	DD 106-50-4
U	400 V Δ	50 Hz	I_A / I_N	3.1
P_1	0.54	kW		IP54
I_N	1.15	A		01.006
n	1340	min^{-1}		12 / 20 kg
C_{400V}	--	µF		RTD 2.5
t_R	60	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	--	%		MSD1



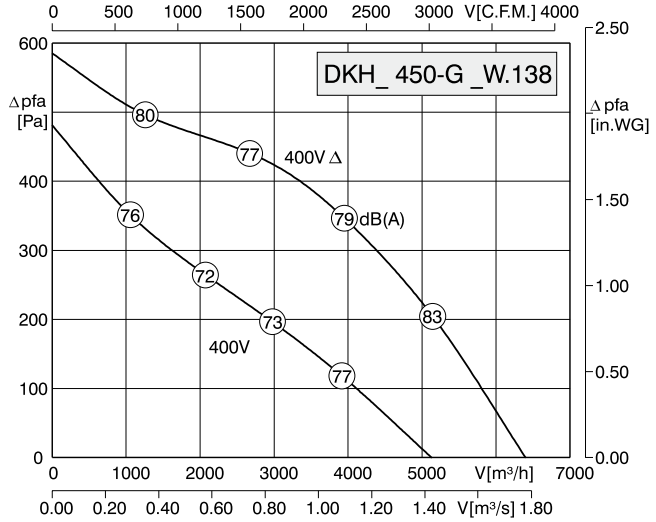
Typ	DKH_ 400-G _W.123		Motor	DD 106-50-4
U	400 V Δ /	50 Hz	I_A / I_N	3.1
P_1	0.54/0.35	kW		IP54
I_N	1.15/0.65	A		01.045
n	1340/1050	min^{-1}		12 / 20 kg
C_{400V}	--	µF		--
t_R	60	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



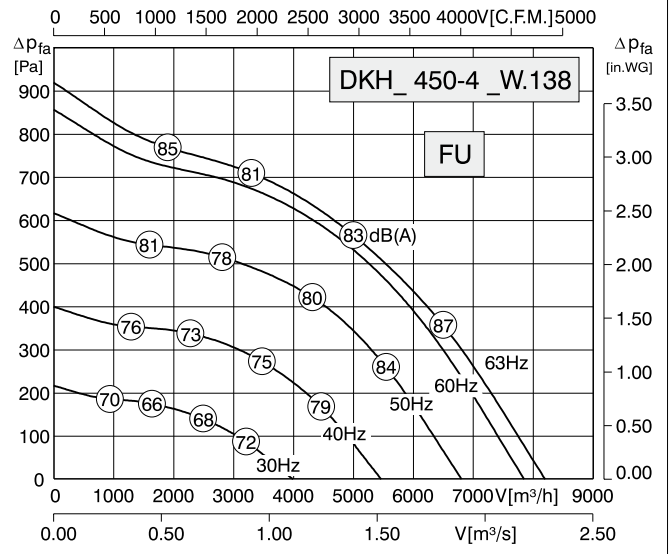
U 230 V		Hz	1.9
P_1	0.82	kW	IP54
I_N		A	01.024
n		min^{-1}	12 / 30 kg
C_{400V}		µF	RE/RTE 5
t_R		°C	RSE 5.5
		Pa	ED 5,0
		%	MSE1



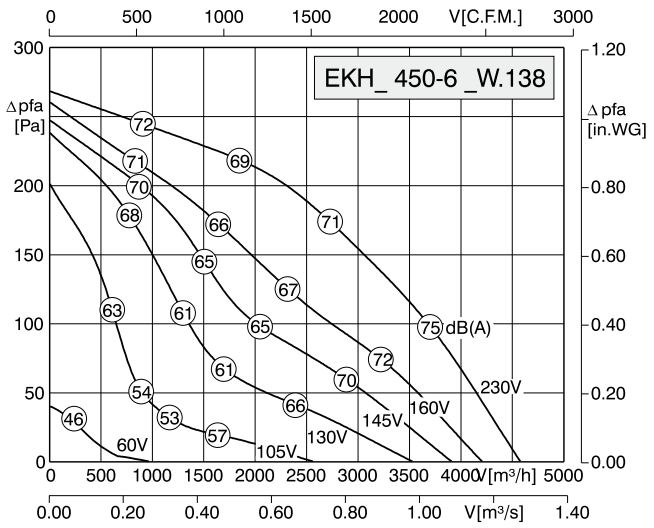
Typ	DKH_ 450-4 _W.138		Motor	DD 106-70-4
U 400 V △	50	Hz	I_A / I_N	3.3
P_1	0.91	kW		IP54
I_N	1.65	A		01.006
n	1300	min^{-1}		12 / 30 kg
C_{400V}	--	µF		RTD 2.5
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	8	%		MSD1



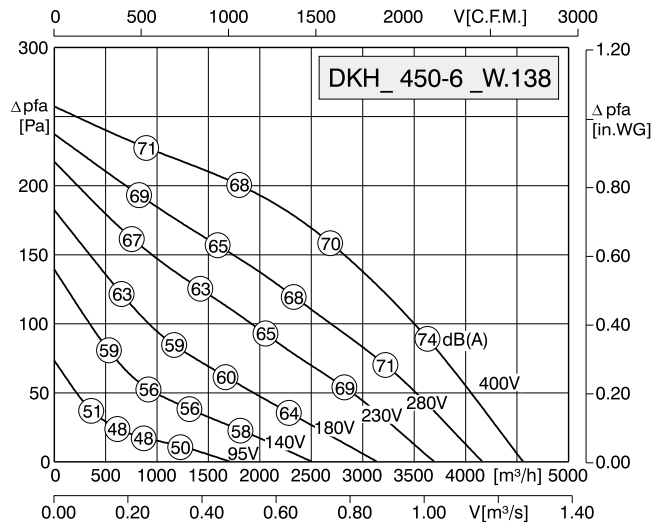
Typ	DKH_ 450-G _W.138		Motor	DD 106-70-4
U 400 V △/	50	Hz	I_A / I_N	3.3
P_1	0.91/0.58	kW		IP54
I_N	1.65/1.0	A		01.045
n	1300/980	min^{-1}		12 / 30 kg
C_{400V}	--	µF		--
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD 2



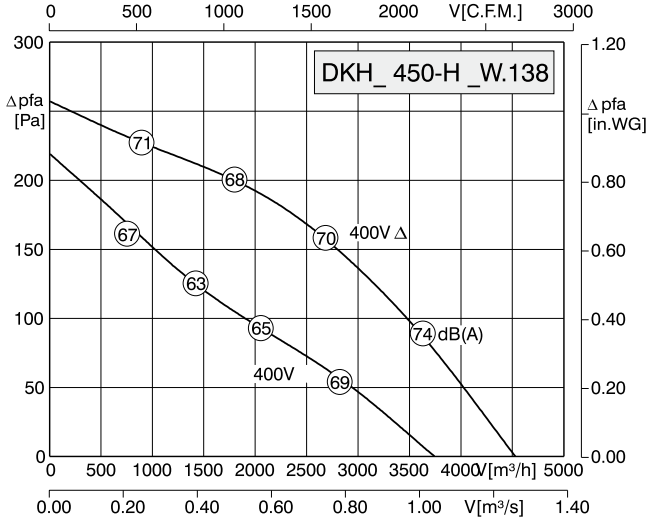
Typ	DKH_ 450-4 _W.138		Motor	DD 137-50-4
U 400 V △	50/63	Hz	I_A / I_N	4/3.5
P_1	1.10/1.76	kW		IP54
I_N	2.50/3.00	A		01.006
n	1390/1610	min^{-1}		17.5 / 34 kg
C_{400V}	--	µF		--
t_R	50 / 40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 515
ΔI	--	%		MSD1



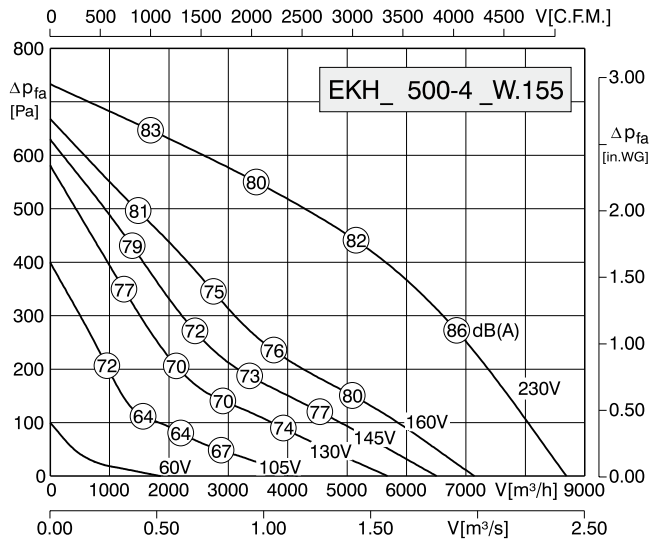
Typ	EKH_ 450-6 _W.138		Motor	ED 106-50-6
U	230 V	50 Hz	I_A / I_N	2.4
P_1		0.37 kW		IP54
I_N		1.9 A		01.024
n		910 min^{-1}		9.5 / 28 kg
C_{400V}		6 µF		RE/RTE 3.2
t_R		40 °C		RSE 2.5
$\Delta p_{fa\ min}$		-- Pa		--
ΔI		23 %		MSE1



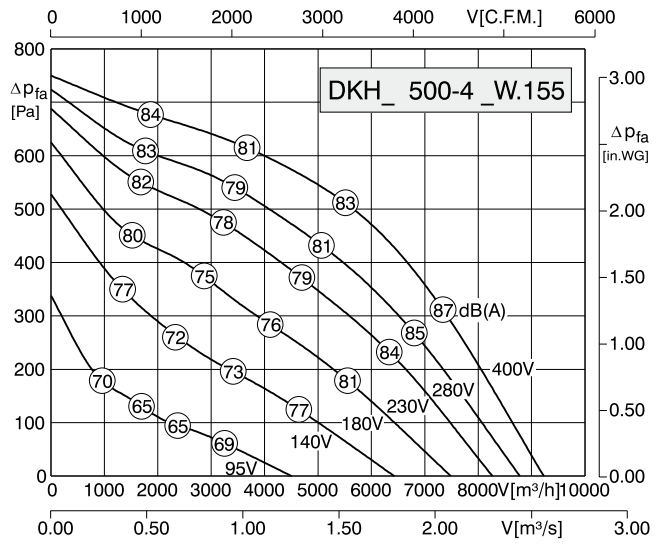
Typ	DKH_ 450-6 _W.138		Motor	DD 106-35-6
U	400 V Δ	50 Hz	I_A / I_N	2.6
P_1		0.31 kW		IP54
I_N		0.64 A		01.006
n		880 min^{-1}		8.5 / 27 kg
C_{400V}		-- µF		RTD 1.2
t_R		70 °C		--
$\Delta p_{fa\ min}$		-- Pa		RED 8P
ΔI		-- %		MSD1



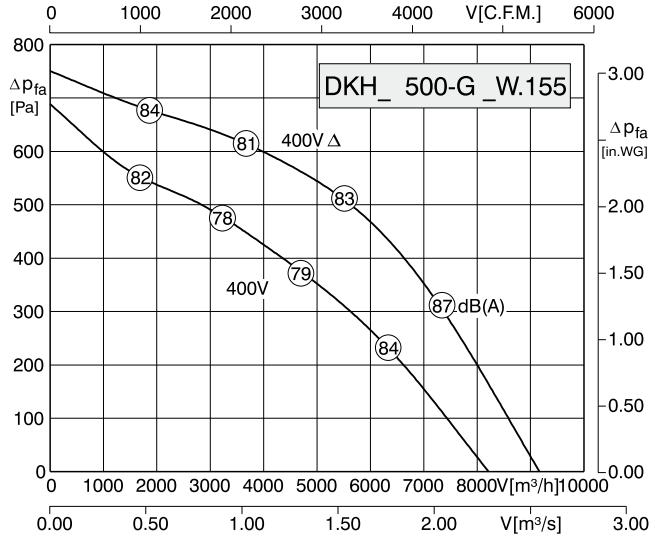
Typ	DKH_ 450-H _W.138		Motor	DD 106-35-6
U	400 V Δ /	50 Hz	I_A / I_N	2.6
P_1		0.31/0.2 kW		IP54
I_N		0.64/0.34 A		01.045
n		880/675 min^{-1}		8.5 / 27 kg
C_{400V}		-- µF		--
t_R		70 °C		--
$\Delta p_{fa\ min}$		-- Pa		--
ΔI		-- %		MSD2



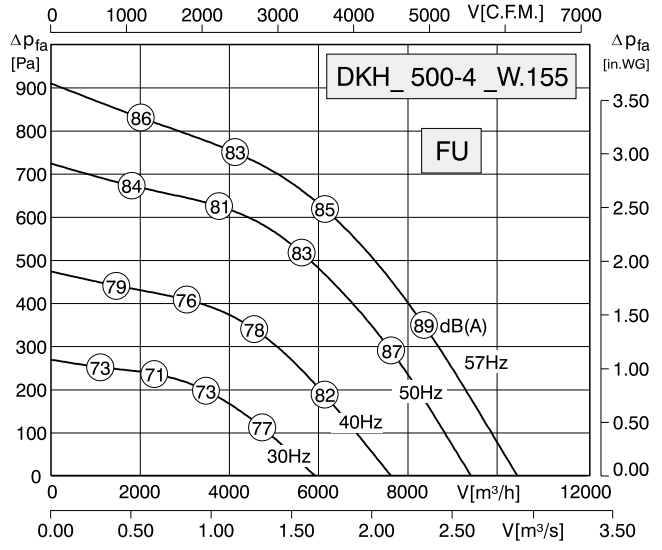
Typ	EKH_ 500-4 _W.155		Motor	ED 137-75-4
U 230 V	50	Hz	I_A / I_N	2.2
P_1	1.7	kW		IP54
I_N	7.5	A		01.024
n	1290	min^{-1}		21.5 / 39 kg
C_{400V}	30	µF		RE/RTE 10
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	7	%		MSE1 3,6kW



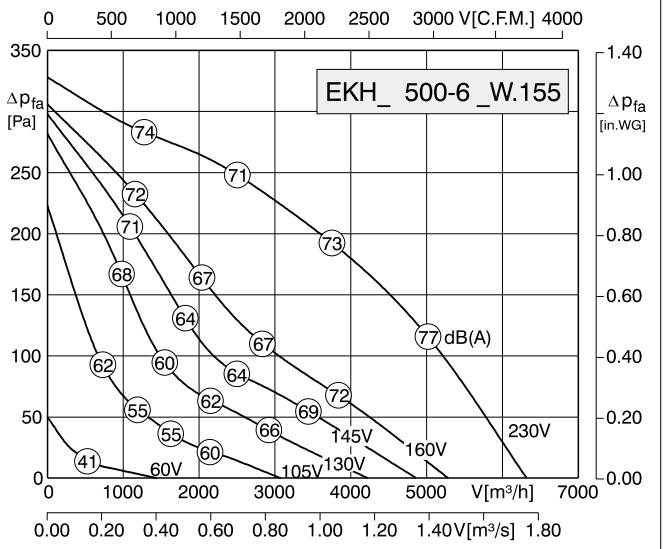
Typ	DKH_ 500-4 _W.155		Motor	DD 137-75-4
U 400 V Δ	50	Hz	I_A / I_N	4.0
P_1	1.8	kW		IP54
I_N	3.5	A		01.006
n	1380	min^{-1}		21.5 / 39 kg
C_{400V}	--	µF		RTD 5
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	11	%		MSD1



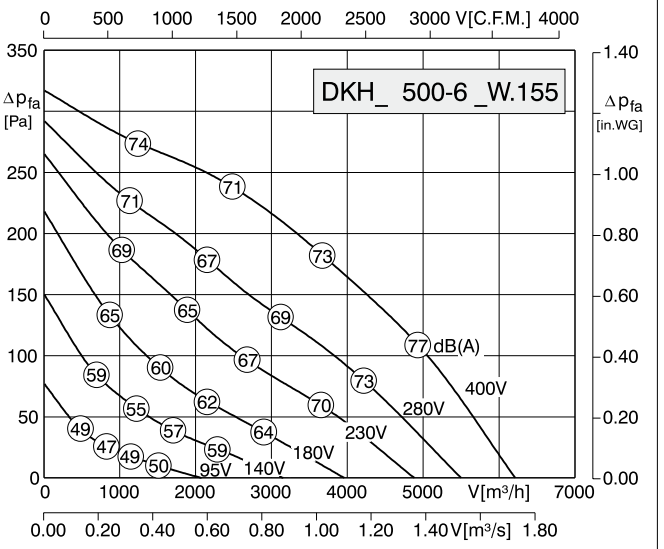
Typ	DKH_ 500-G _W.155		Motor	DD 137-75-4
U 400 V Δ /	50	Hz	I_A / I_N	4.0
P_1	1.8/1.3	kW		IP54
I_N	3.5/2.1	A		01.045
n	1380/1190	min^{-1}		21.5 / 39 kg
C_{400V}	--	µF		--
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



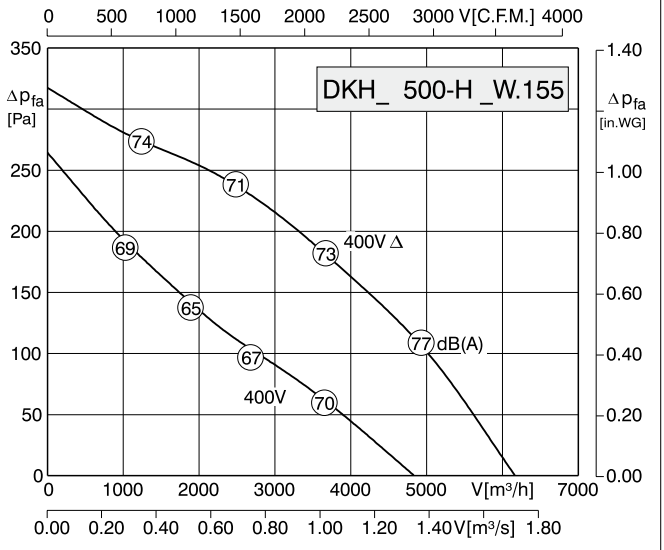
Typ	DKH_ 500-4 _W.155		Motor	DD 137-75-4
U 400 V Δ	50/57	Hz	I_A / I_N	4
P_1	1.8/2.4	kW		IP54
I_N	3.5/4.0	A		01.006
n	1380/1500	min^{-1}		21.5 / 39 kg
C_{400V}	--	µF		--
t_R	55/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 515
Δl	--	%		MSD1



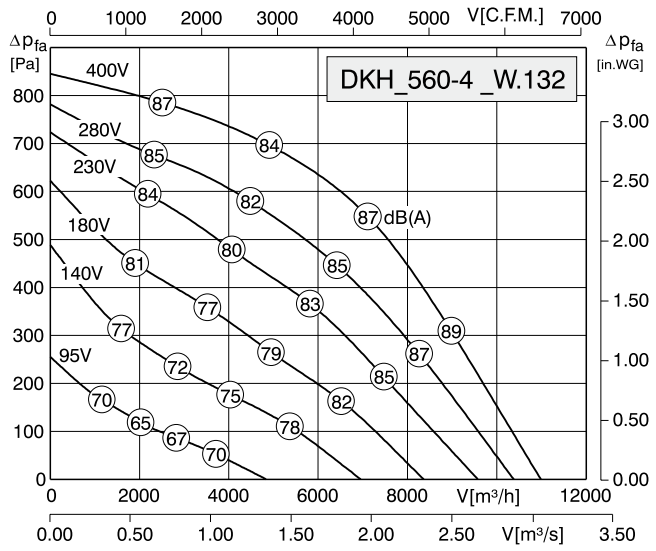
Typ	EKH_ 500-6 _W.155		Motor	ED 106-70-6
U 230 V	50	Hz	I_A / I_N	2.3
P_1	0.57	kW		IP54
I_N	2.6	A		01.024
n	890	min^{-1}		13 / 30 kg
C_{400V}	12	µF		RE/RTE 3.2
t_R	45	°C		RSE 3.7
$\Delta p_{fa\ min}$	--	Pa		ED 5,0
ΔI	7	%		MSE1



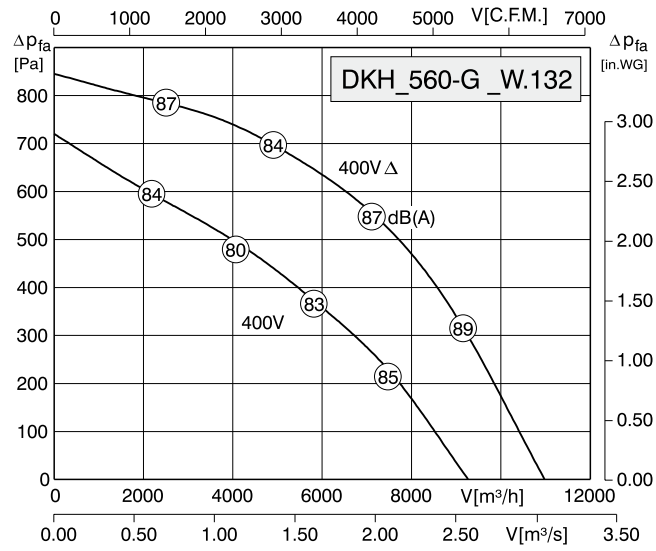
Typ	DKH_ 500-6 _W.155		Motor	DD 106-50-6
U 400 V Δ	50	Hz	I_A / I_N	2.9
P_1	0.52	kW		IP54
I_N	0.95	A		01.006
n	860	min^{-1}		11 / 28 kg
C_{400V}	--	µF		RTD 1.2
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	--	%		MSD1



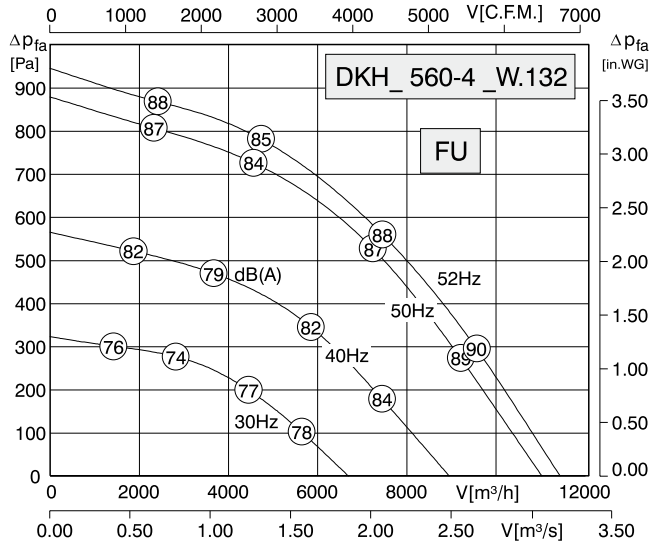
Typ	DKH_ 500-H _W.155		Motor	DD 106-50-6
U 400 V Δ /	50	Hz	I_A / I_N	2.9
P_1	0.52/0.33	kW		IP54
I_N	0.95/0.55	A		01.045
n	860/640	min^{-1}		11 / 28 kg
C_{400V}	--	µF		--
t_R	55	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



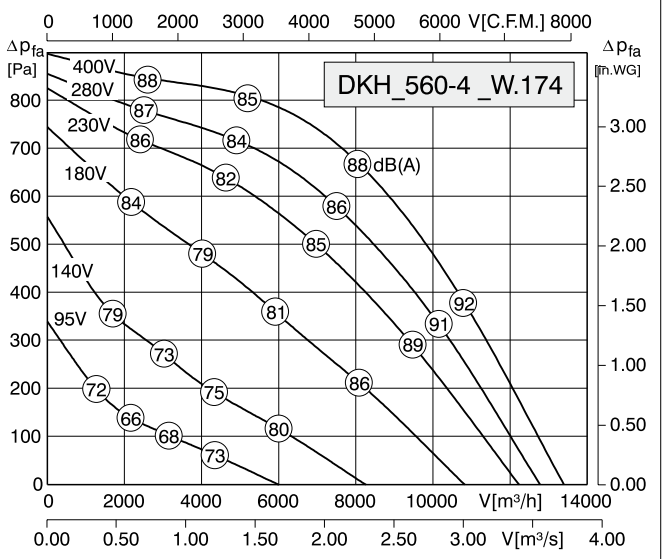
Typ	DKH_ 560-4 _W.132		Motor	DD 137-100-4
U 400 V Δ	50	Hz	I_A / I_N	4.5
P_1	2.3	kW		IP54
I_N	4.4	A		01.006
n	1350	min^{-1}		27 / 52 kg
C_{400V}	--	µF		RTD 5,0
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	2	%		MSD1



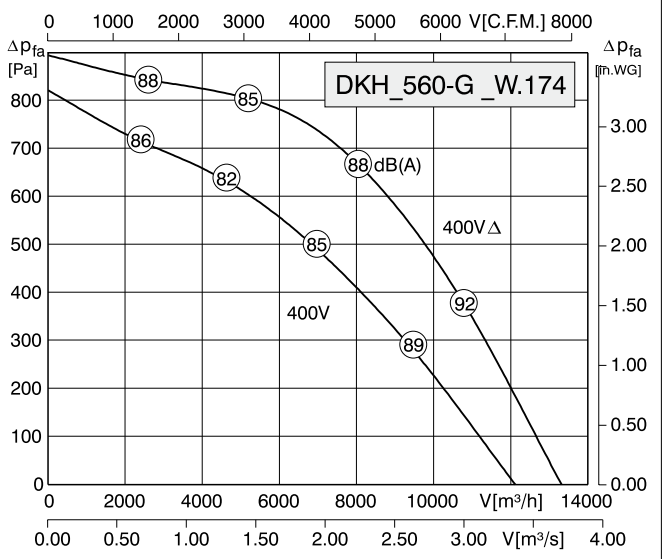
Typ	DKH_ 560-G _W.132		Motor	DD 137-100-4
U 400 V Δ /	50	Hz	I_A / I_N	4.5
P_1	2.3/1.6	kW		IP54
I_N	4.4/2.65	A		01.045
n	1350/1140	min^{-1}		27 / 52 kg
C_{400V}	--	µF		--
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2



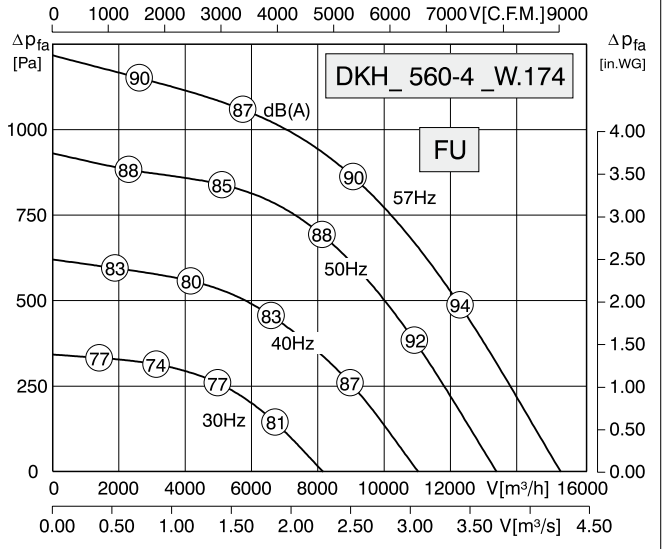
Typ	DKH_ 560-4 _W.132		Motor	DD 137-100-4
U 400 V Δ	50/52	Hz	I_A / I_N	4/3.8
P_1	2.3/2.5	kW		IP54
I_N	4.6/4.8	A		01.006
n	1350/1420	min^{-1}		27 / 52 kg
C_{400V}	--	µF		--
t_R	50/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 522
ΔI	--	%		MSD1



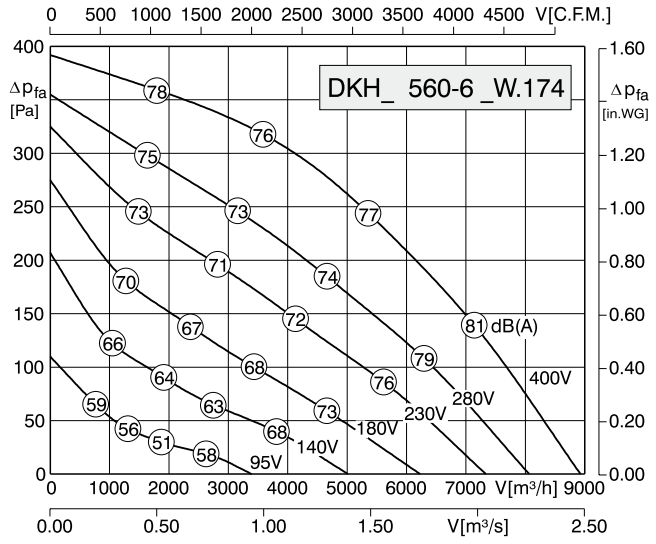
Typ	DKH_ 560-4 _W.174		Motor	DD 165-95-4
U	400 V Δ	50 Hz	I_A / I_N	5
P_1	3.1	kW		IP54
I_N	5.5	A		01.006
n	1410	min^{-1}		37.5 / 62 kg
C_{400V}	--	µF		RTD 10
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
ΔI	30	%		MSD1 (7,5 kW)



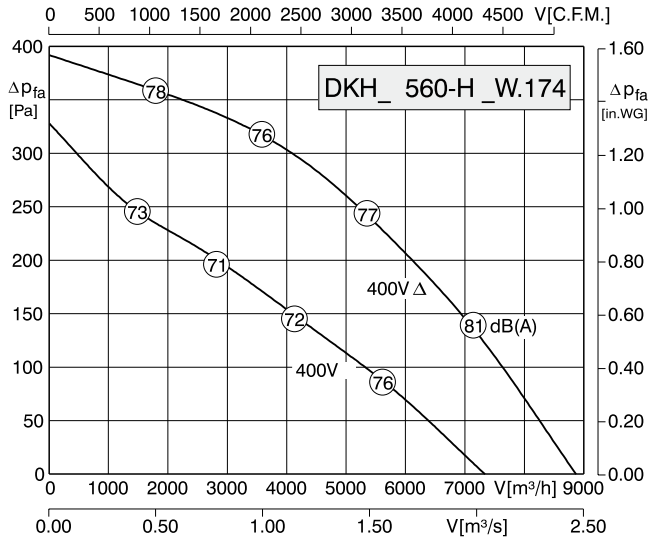
Typ	DKH_ 560-G _W.174		Motor	DD 165-95-4
U	400 V Δ/ 50	Hz	I_A / I_N	5
P_1	3.1/2.4	kW		IP54
I_N	5.5/4.0	A		01.045
n	1410/1225	min^{-1}		37.5 / 62 kg
C_{400V}	--	µF		--
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2 (7,5 kW)



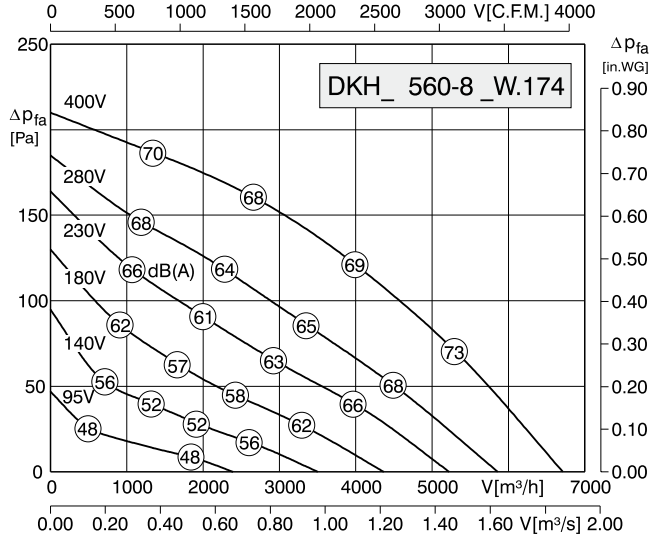
Typ	DKH_ 560-4 _W.174		Motor	DD 165-95-4
U	400 V Δ 50/57	Hz	I_A / I_N	5/4.5
P_1	3.1/4.3	kW		IP54
I_N	5.5/7.2	A		01.006
n	1410/1560	min^{-1}		37.5 / 62 kg
C_{400V}	--	µF		--
t_R	70/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 540
ΔI	--	%		MSD1 (7,5 kW)



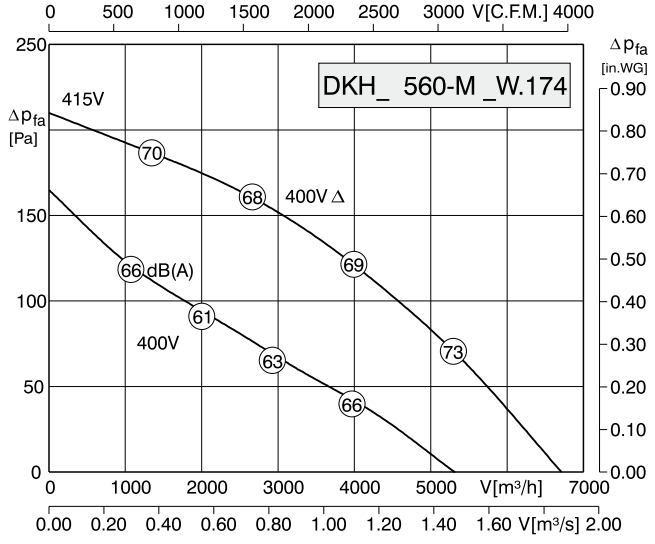
Typ	DKH_ 560-6 _W.174		Motor	DD 137-50-6
U	400 V Δ 50	Hz	I_A / I_N	2.9
P_1	0.87	kW		IP54
I_N	1.9	A		01.006
n	870	min^{-1}		19 / 44 kg
C_{400V}	--	µF		RTD 2.5
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



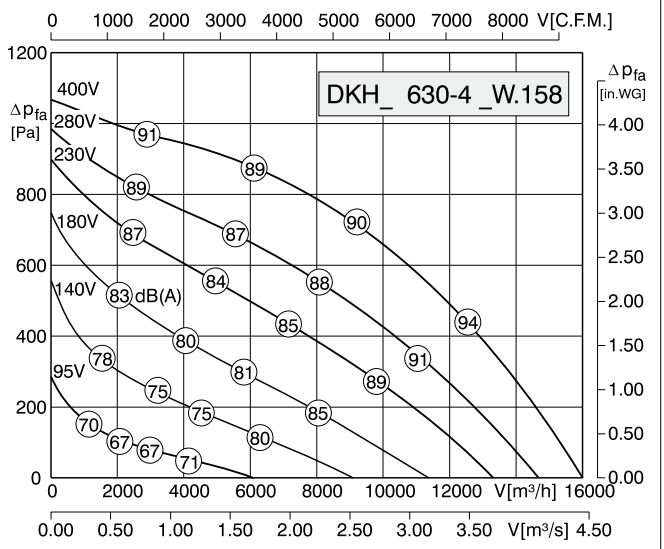
Typ	DKH._ 560-H W.174		Motor	DD 137-50-6
U	400 V Δ / 50	Hz	I_A / I_N	2.9
P_1	0.87/0.53	kW		IP54
I_N	1.9/0.95	A		01.045
n	870/680	min^{-1}		19 / 44 kg
C_{400V}	--	µF		--
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



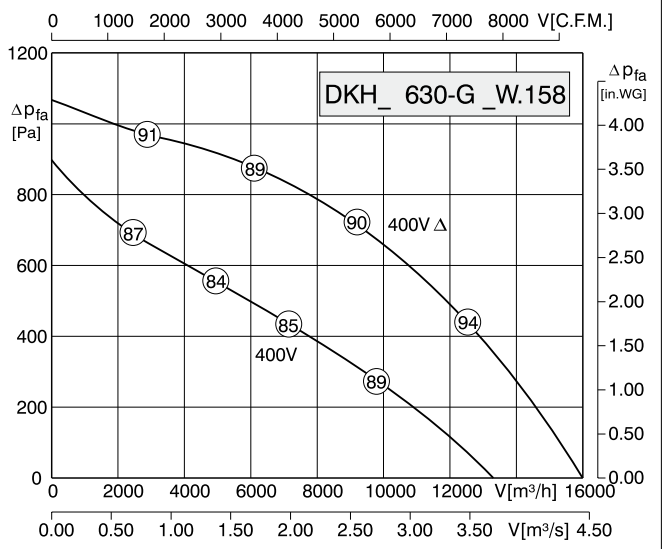
Typ	DKH_ 560-8 _W.174		Motor	DD 137-35-8
U	400 V Δ 50	Hz	I_A / I_N	2.0
P_1	0.4	kW		IP54
I_N	1.0	A		01.006
n	620	min^{-1}		16 / 41.5 kg
C_{400V}	--	µF		RTD 1.2
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



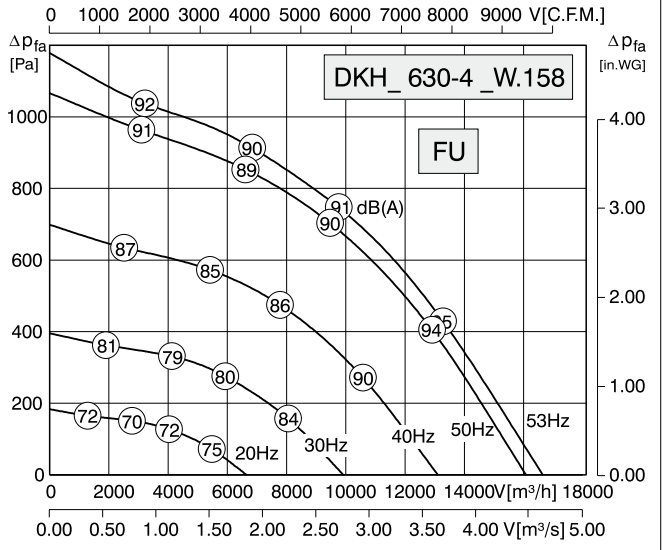
Typ	DKH_ 560-M _W.174		Motor	DD 137-35-8
U	400 V Δ / 50	Hz	I_A / I_N	2
P_1	0.4/0.21	kW		IP54
I_N	1.0/0.42	A		01.045
n	620/460	min^{-1}		16 / 41.5 kg
C_{400V}	--	µF		--
t_R	50	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



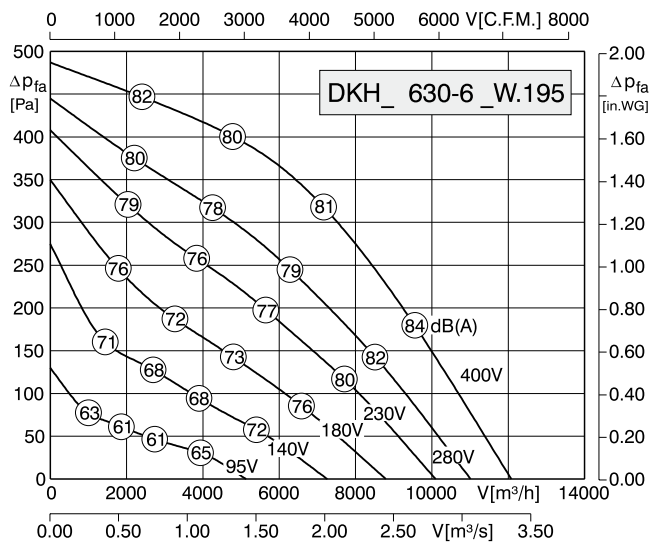
Typ	DKH_ 630-4 _W.158		Motor	DD 165-120-4
U	400 V Δ 50	Hz	I_A / I_N	5.8
P_1	4.0	kW		IP54
I_N	6.9	A		01.006
n	1340	min^{-1}		43 / 70 kg
C_{400V}	--	µF		RTD 10
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		nicht el. spg. steuerbar
ΔI	21	%		MSD1 (7,5 kW)



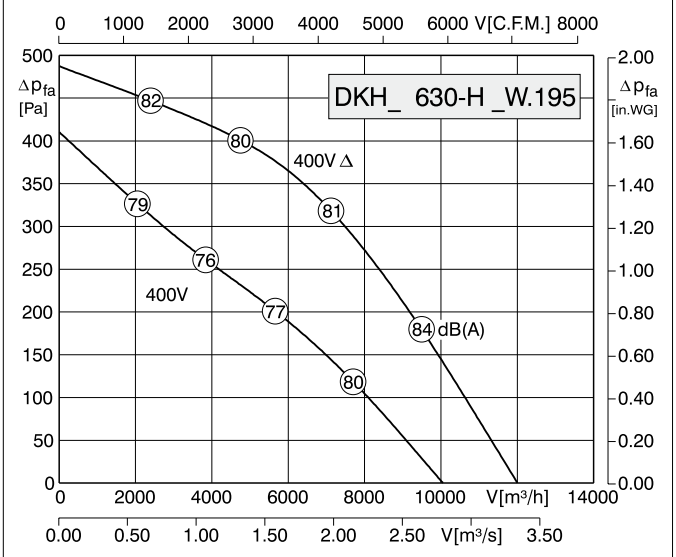
Typ	DKH_ 630-G _W.158		Motor	DD 165-120-4
U	400 V Δ / 50	Hz	I_A / I_N	5.8
P_1	4.0/2.6	kW		IP54
I_N	6.9/4.4	A		01.045
n	1340/1070	min^{-1}		43 / 70 kg
C_{400V}	--	µF		--
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
ΔI	--	%		MSD2 (7,5 kW)



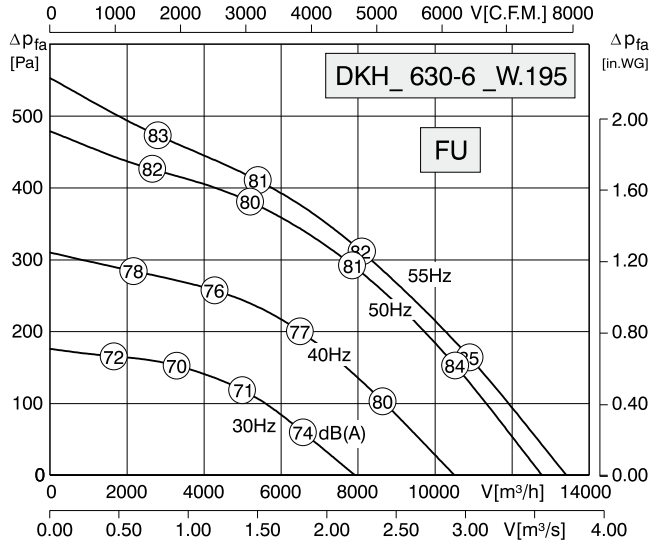
Typ	DKH_ 630-4 _W.158		Motor	DD 165-120-4
U	400 V Δ 50/53	Hz	I_A / I_N	5.8
P_1	4.0/4.5	kW		IP54
I_N	6.9/7.6	A		01.006
n	1340/1380	min^{-1}		43 / 70 kg
C_{400V}	--	µF		--
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 540
ΔI	--	%		MSD1 (7,5 kW)



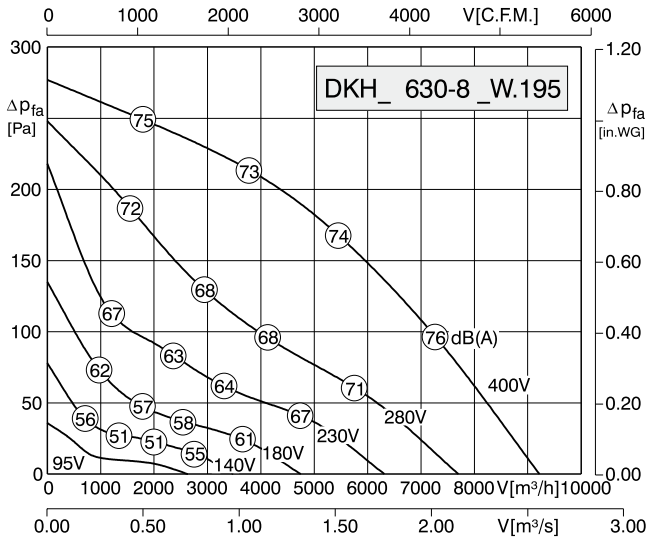
Typ	DKH_ 630-6 _W.195		Motor	DD 137-100-6
U	400 V Δ 50	Hz	I_A / I_N	3.2
P_1	1.4	kW		IP54
I_N	3.0	A		01.006
n	880	min^{-1}		28 / 57 kg
C_{400V}	--	µF		RTD 3,8
t_R	65	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



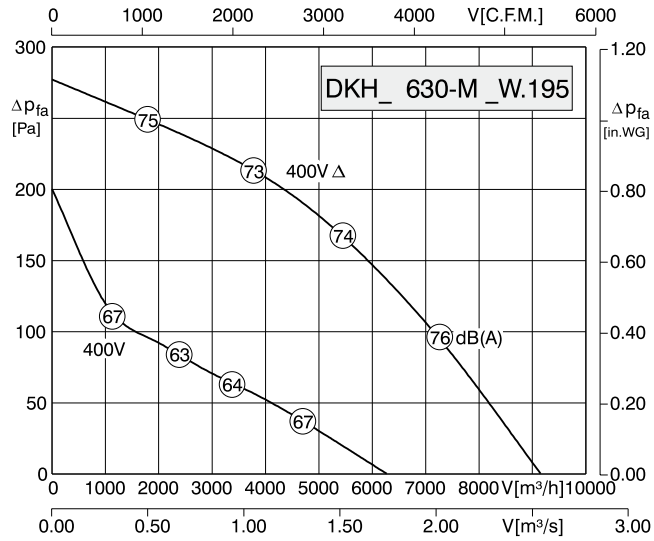
Typ	DKH_ 630-H _W.195		Motor	DD 137-100-6
U	400 V Δ / 50	Hz	I_A / I_N	3.2
P_1	1.4/0.9	kW		IP54
I_N	3.0/1.6	A		01.045
n	880/710	min^{-1}		28 / 57 kg
C_{400V}	--	µF		--
t_R	65	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



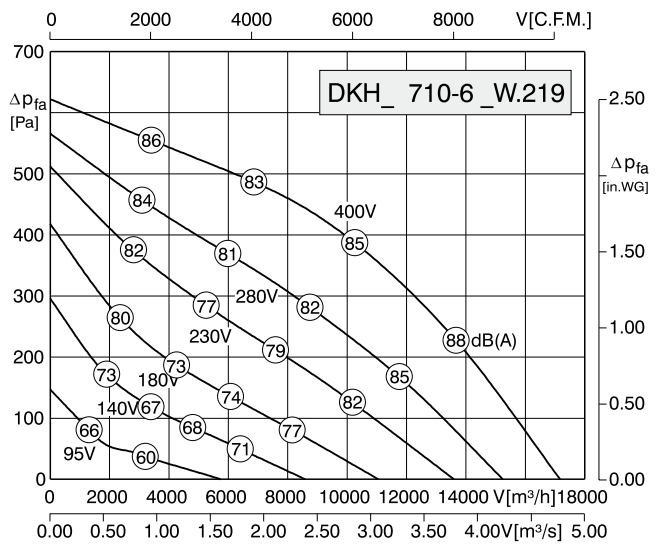
Typ	DKH_ 630-6 _W.195		Motor	DD 137-100-6
U	400 V Δ 50/55	Hz	I_A / I_N	3.2/2.5
P_1	1.40/1.75	kW		IP54
I_N	3.0/3.6	A		01.006
n	860/890	min^{-1}		28 / 57 kg
C_{400V}	--	µF		--
t_R	65/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 515
Δl	--	%		MSD1



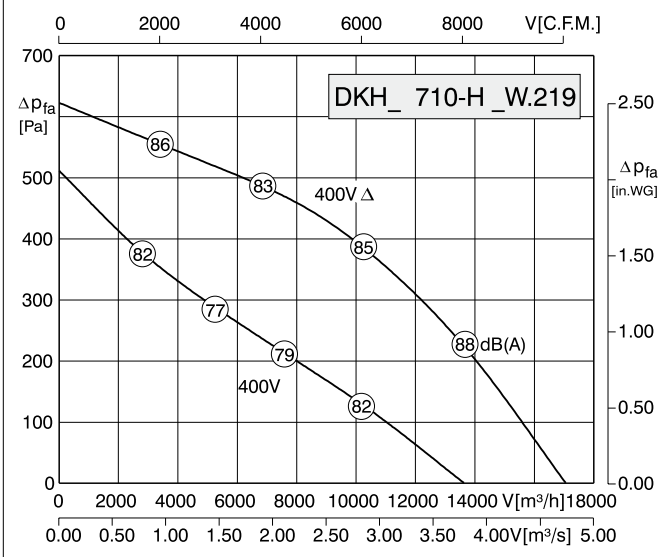
Typ	DKH_ 630-8 _W.195		Motor	DD 137-50-8
U	400 V Δ 50	Hz	I_A / I_N	2.2
P_1	0.7	kW		IP54
I_N	1.4	A		01.006
n	650	min^{-1}		21 / 50 kg
C_{400V}	--	µF		RTD 2.5
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



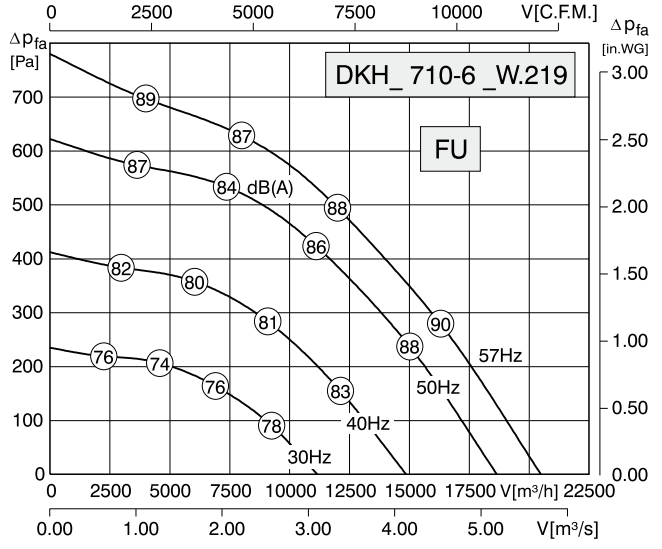
Typ	DKH_ 630-M _W.195		Motor	DD 137-50-8
U	400 V Δ / 50	Hz	I_A / I_N	2.2
P_1	0.7/0.38	kW		IP54
I_N	1.4/0.72	A		01.045
n	650/405	min^{-1}		21 / 50 kg
C_{400V}	--	µF		--
t_R	40	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



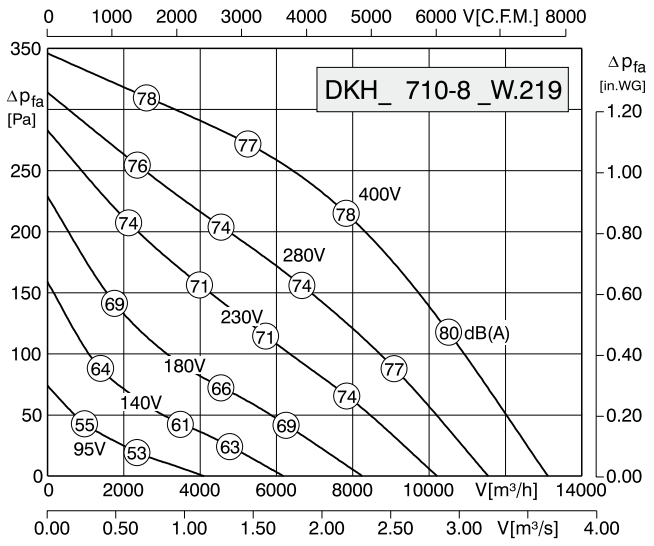
Typ	DKH_ 710-6 _W.219		Motor	DD 165-95-6
U	400 V Δ 50	Hz	I_A / I_N	3.6
P_1	2.5	kW		IP54
I_N	4.8	A		01.006
n	890	min^{-1}		40 / 88 kg
C_{400V}	--	µF		RTD 7
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	10	%		MSD1



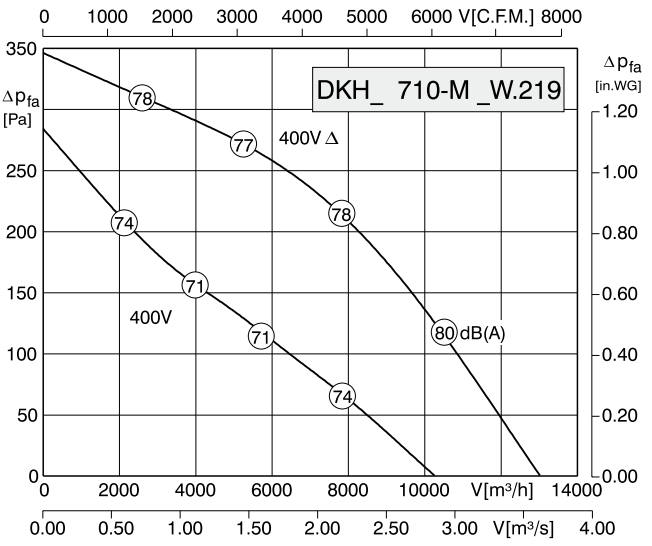
Typ	DKH_ 710-H _W.219		Motor	DD 165-95-6
U	400 V Δ / 50	Hz	I_A / I_N	3.6
P_1	2.5/1.5	kW		IP54
I_N	4.8/2.9	A		01.045
n	890/670	min^{-1}		40 / 88 kg
C_{400V}	--	µF		--
t_R	45	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2



Typ	DKH_ 710-6 _W.219		Motor	DD 165-120-6
U	400 V Δ 50/57	Hz	I_A / I_N	3.6/3.1
P_1	2.6/3.55	kW		IP54
I_N	5.2/6.6	A		01.006
n	920/990	min^{-1}		43 / 91 kg
C_{400V}	--	µF		--
t_R	70/40	°C		--
$\Delta p_{fa\ min}$	--	Pa		FU = MM 540
Δl	--	%		MSD1

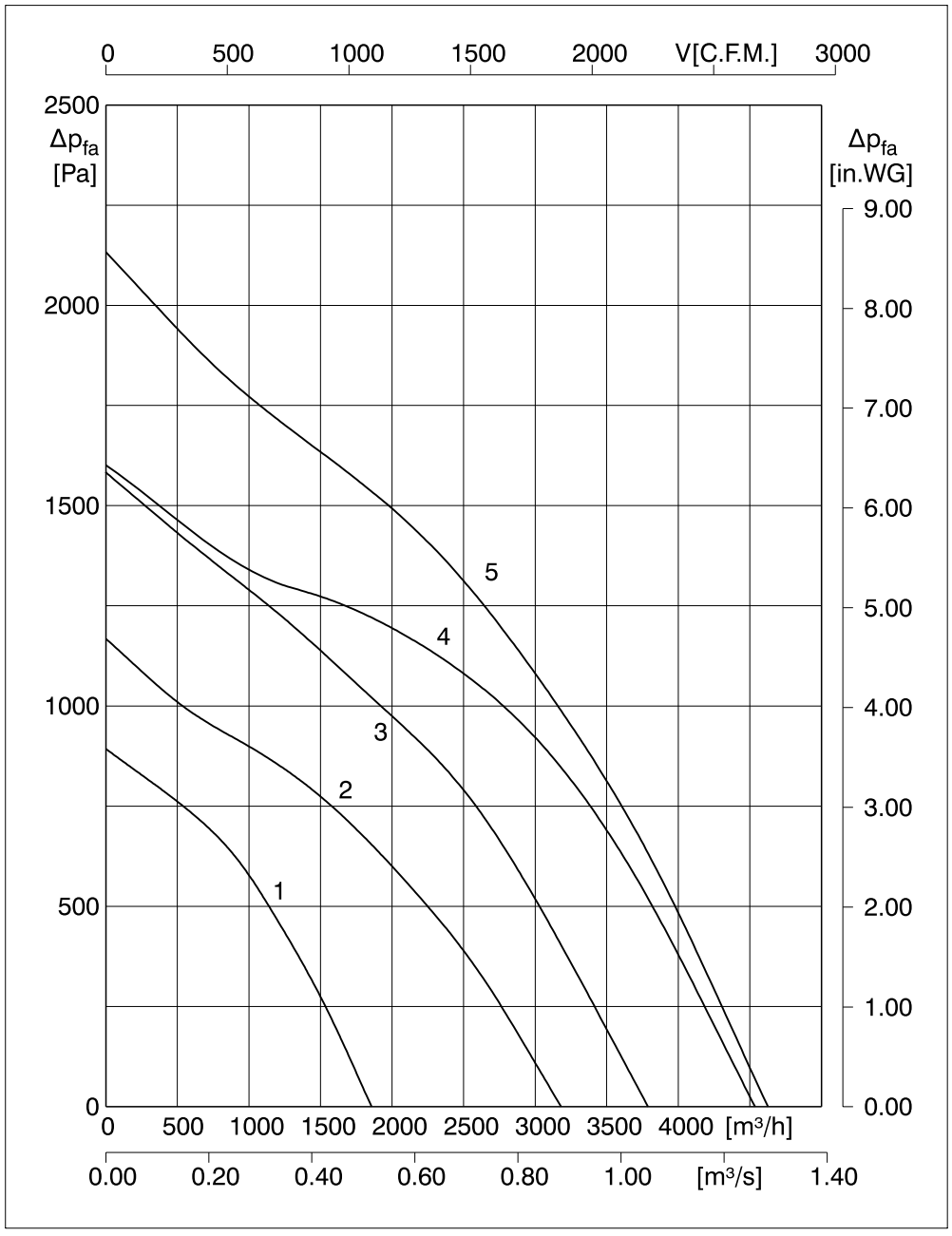


Typ	DKH_ 710-8 _W.219		Motor	DD 165-70-8
U	400 V Δ 50	Hz	I_A / I_N	3.0
P_1	1.15	kW		IP54
I_N	2.6	A		01.006
n	660	min^{-1}		34 / 82 kg
C_{400V}	--	µF		RTD 3
t_R	70	°C		--
$\Delta p_{fa\ min}$	--	Pa		RED 8P
Δl	--	%		MSD1



Typ	DKH_ 710-M _W.219		Motor	DD 165-70-8
U	400 V Δ / 50	Hz	I_A / I_N	3.0
P_1	1.15/0.7	kW		IP54
I_N	2.6/1.4	A		01.045
n	660/495	min^{-1}		34 / 82 kg
C_{400V}	--	µF		--
t_R	70	°C		--
$\Delta p_{fa\ min}$	--	Pa		--
Δl	--	%		MSD2

快速选型 Quick Selection



1 DKH_ 250-2_W.060

2 DKH_ 280-2_W.087

3 DKH_ 315-2_W.070

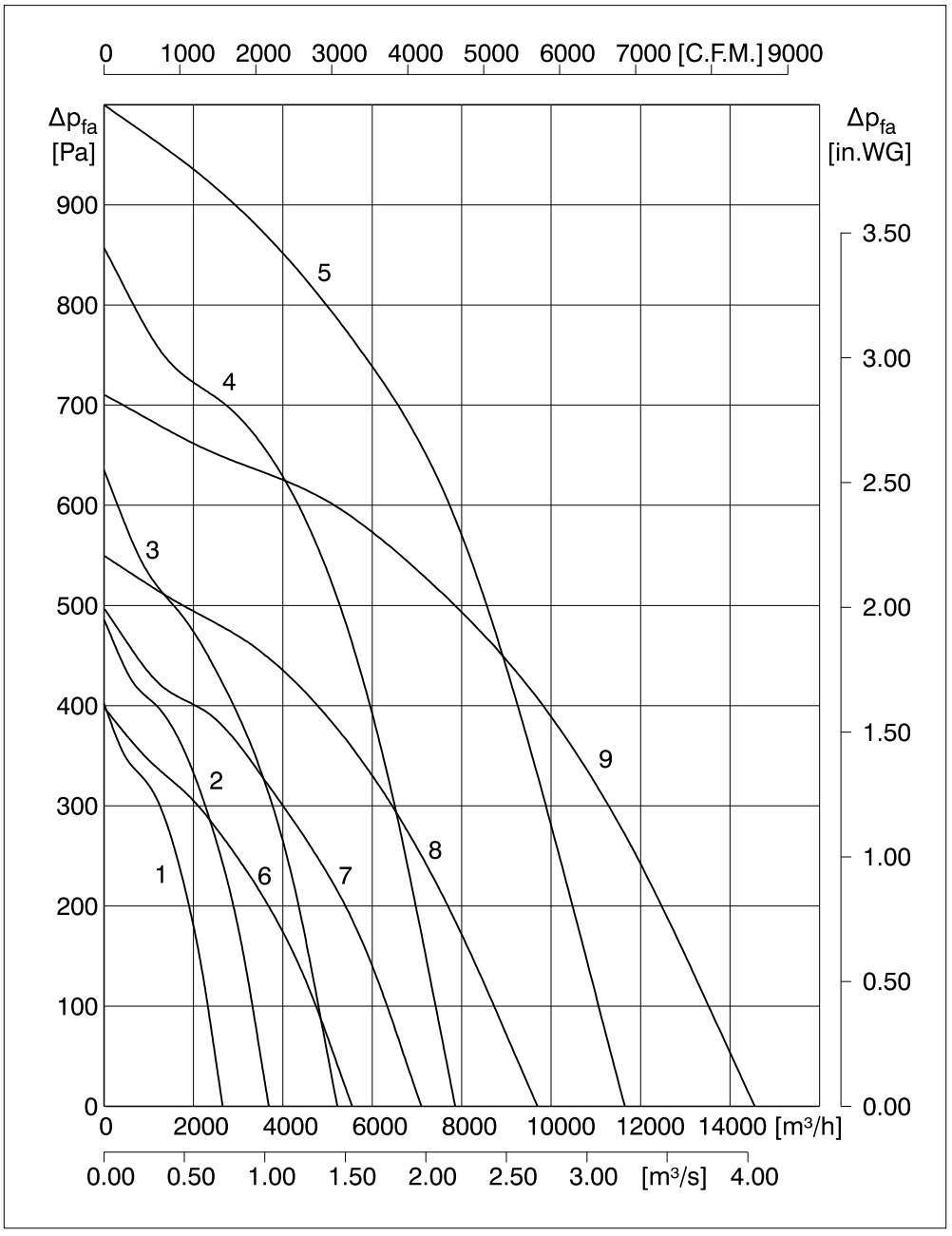
4 DKH_ 315-2_W.098

5 DKH_ 355-2_W.078

.KHR /.KHM

Typ	Motor	U [V]	f [Hz]	P_1 [kW]	I_N [kW]	n [min^{-1}]	t_R [°C]	Δ I [%]	I_A/I_N [-]	⚠	✱			
DKH_250-2_W.060	DD 080-055-2	440 Δ	60	0.5	0.75	3050	55	-	3	44	01.006	4.5 / 10.5 kg	RTD1,2	MSD1
DKH_280-2_W.087	DD 106-050-2	440 Δ	60	1.08	1.6	2830	40	-	2.6	54	01.006	7.5 / 18 kg	RTD2,5	MSD1
DKH_315-2_W.070	DD 106-070-2	440 Δ	60	1.47	2.2	3065	40	5	3.1	54	01.006	9 / - kg	RTD2,5	MSD1
DKH_315-2_W.098	DD 137-050-2	440 Δ	60	2.2	3.3	3140	40	12	3.2	54	01.006	15 / 26 kg	RTD3,8	MSD1
DKH_355-2_W.078	DD 137-075-2	440 Δ	60	2.7	4.1	3220	50	12	3.3	54	01.006	19 / - kg	RTD5,0	a.A.

快速选型 Quick Selection

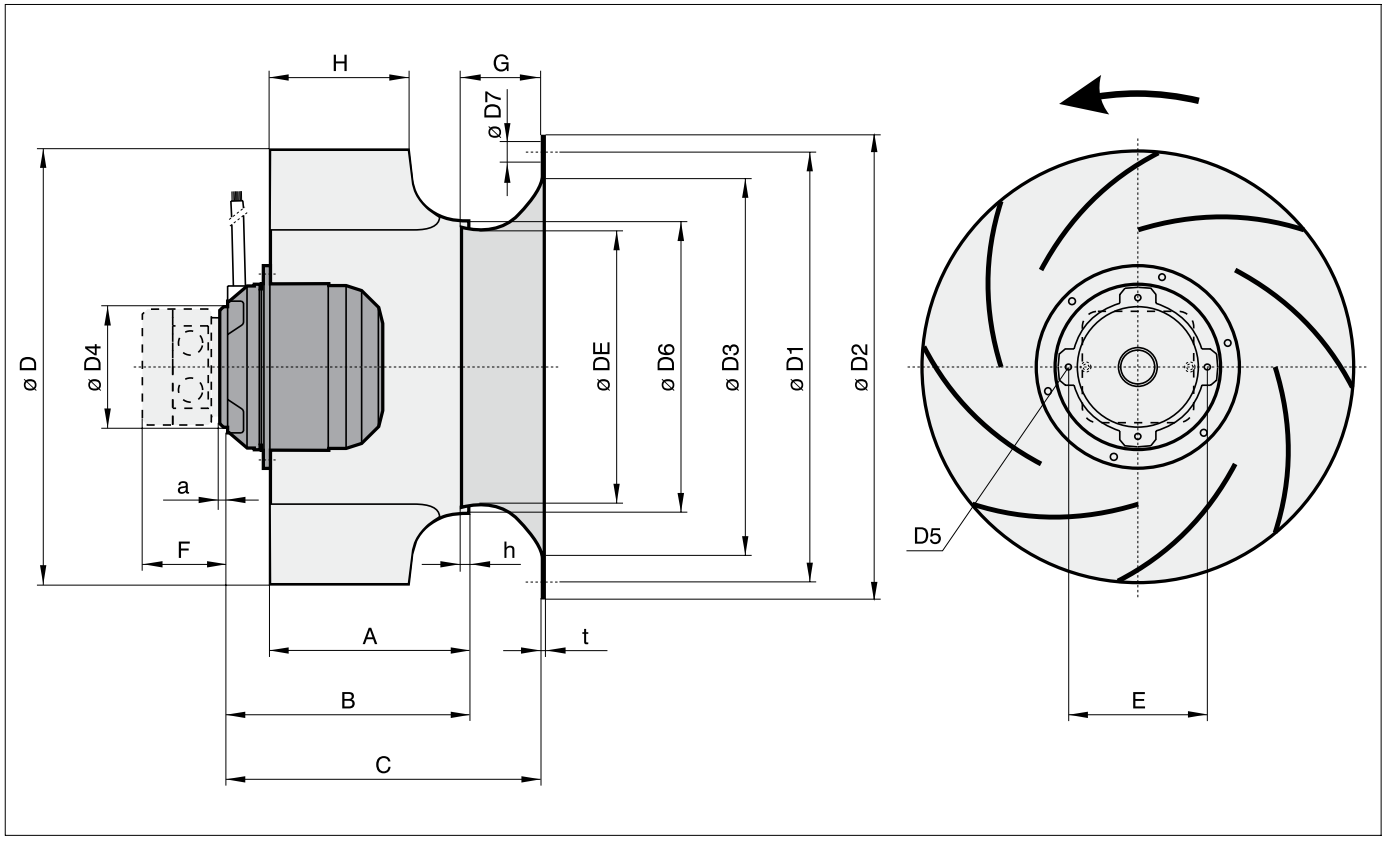


1 DKH_ 315-4_W.098
2 DKH_ 355-4_W.110
3 DKH_ 400-4_W.123
4 DKH_ 450-4_W.138
5 DKH_ 500-4_W.155
6 DKH_ 450-6_W.138
7 DKH_ 500-6_W.155
8 DKH_ 560-6_W.174
9 DKH_ 630-6_W.195

.KHR /.KHM

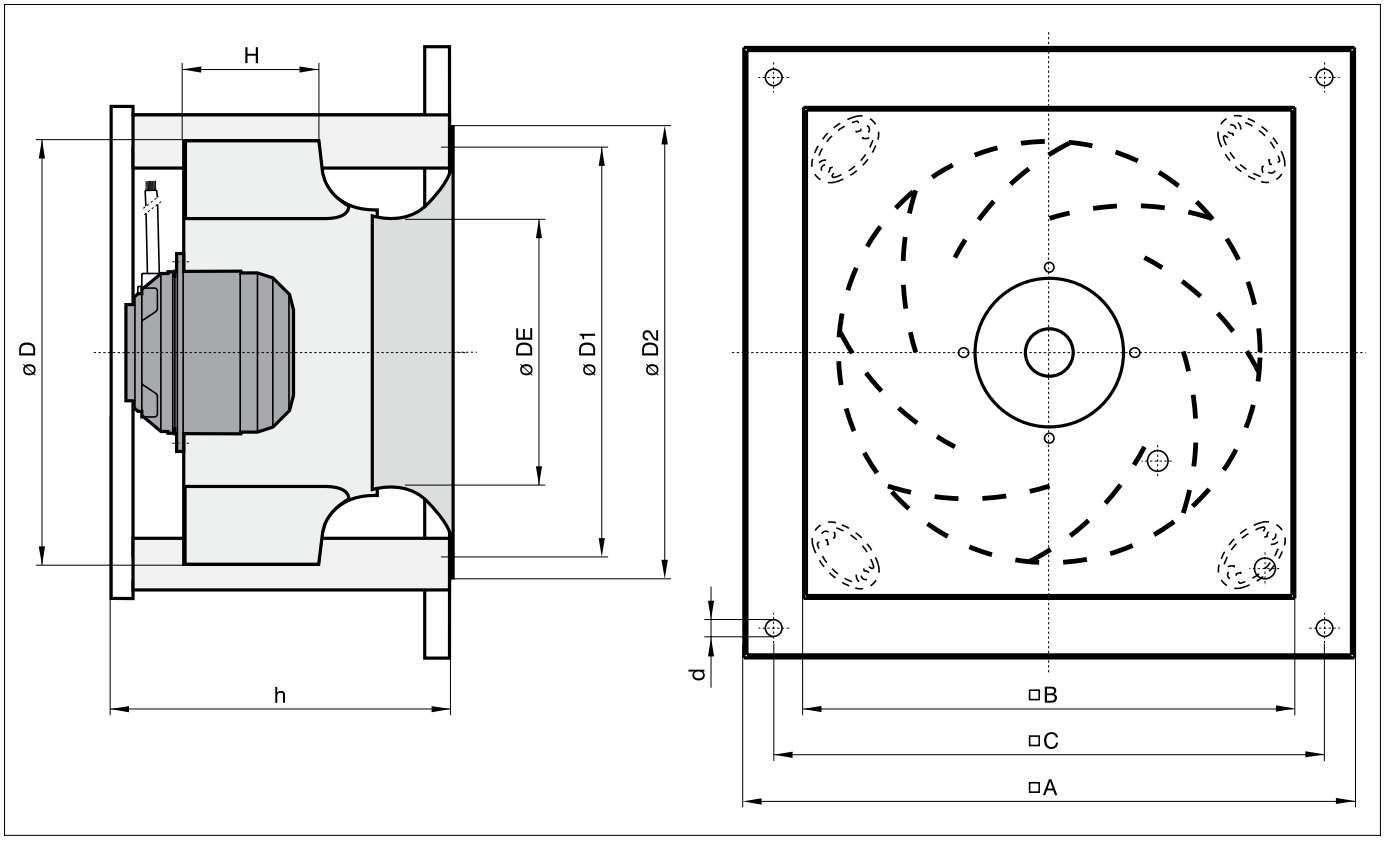
Typ	Motor	U [V]	f [Hz]	P_1 [kW]	I_N [kW]	n [min^{-1}]	t_R [°C]	Δ I [%]	I_A/I_N [-]	△	*			
DKH_315-4_W.098	DD 080-042-4	440 Δ	60	0.39	0.50	1610	70	-	2.5	44	01.006	4.5 / 10.5 kg	RTD1,2	MSD1
DKH_355-4_W.110	DD 080-055-4	440 Δ	60	0.49	0.80	1560	50	4	2.9	44	01.006	7.5 / 18 kg	RTD1,2	MSD1
DKH_400-4_W.123	DD 106-070-4	440 Δ	60	0.79	1.5	1475	65	-	2.6	54	01.006	9.0 / 20 kg	RTD2,5	MSD1
DKH_450-4_W.138	DD 137-050-4	440 Δ	60	1.6	2.7	1600	60	8	3.5	54	01.006	15 / 26 kg	RTD3,8	MSD1
DKH_500-4_W.155	DD 137-100-4	440 Δ	60	2.8	4.5	1610	50	13	4.4	54	01.006	24 / 41.5 kg	RTD5,0	a.A.
DKH_450-6_W.138	DD 106-050-6	440 Δ	60	0.67	0.9	1060	60	8	3.2	54	01.006	9.5 / 28 kg	RTD1,2	MSD1
DKH_500-6_W.155	DD 137-050-6	440 Δ	60	0.87	1.7	1030	70	-	3.6	54	01.006	19 / 36 kg	RTD2,5	MSD1
DKH_560-6_W.174	DD 137-100-6	440 Δ	60	1.4	3.0	1070	70	-	3.2	54	01.006	26 / 51 kg	RTD3,0	MSD1
DKH_630-6_W.195	DD 165-095-6	440 Δ	60	2.6	4.5	1090	50	13	3.0	54	01.006	40 / 67 kg	RTD5,0	MSD1

.KHR .. W



Ventilator / fan	A	B	C	H	D	a	D4	D5	E	F	D6	h	DE	D3	D2	D1	D7	G	t
.KHR 710 -6 / -8	328	367	490	**219**	718	7	160	M12/8*45°	190	70	476	12.5	438	630	710	674/8*45°	14	135	2
.KHR 630 -6 / -8	292	327	430	**195**	640	6	140	M10/4*90°	162	70	424	11	390	560	638	608/8*45°	14	114	1.5
.KHR 630 -4	255	296	399	**158**	640	7	160	M12/8*45°	190	70	424	11	390	560	638	608/8*45°	14	114	1.5
.KHR 560 -6 / -8	262	296	391	**174**	570	6	140	M10/4*90°	162	70	377	10	348	500	564	541/8*45°	11	105	1.5
.KHR 560 -4	262	302	397	**174**	570	7	160	M12/8*45°	190	70	377	10	348	500	564	541/8*45°	11	105	1.5
.KHR 560 -4	219	253	350	**132**	570	6	140	M10/4*90°	162	70	377	10	348	500	564	541/8*45°	11	105	1.5
.KHR 500 -6	234	270	359	**155**	510	6.5	100	M6 / 4*90°	115	70	337	9	310	450	515	490/8*45°	11	98	1.5
.KHR 500 -4	234	270	359	**155**	510	6	140	M10/4*90°	162	70	337	9	310	450	515	490/8*45°	11	98	1.5
.KHR 450 -4 *	209	244	318	**138**	454	6	140	M10/4*90°	162	70	300	8	277	400	464	438/8*45°	11	82	1.5
.KHR 450 -4 / -6	209	244	318	**138**	454	6.5	100	M6/ 4*90°	115	70	300	8	277	400	464	438/8*45°	11	82	1.5
.KHR 400 -4 / -6	184	212	281	**123**	404	6.5	100	M6 / 4*90°	115	70	267	7	248	355	422	395/8*45°	11	76	1.5
.KHR 400 -2	126	173	242	**65**	404	6	140	M10/4*90°	162	70	267	7	248	355	422	395/8*45°	11	76	1.5
.KHR 355 -4	164	189	250	**110**	359	2.5	75	M6 / 4*90°	90	70	238	6	219	315	382	356/6*60°	11	67	1.5
.KHR 355 -2	164	211	272	**110**	359	6	140	M10/4*90°	162	70	238	6	219	315	382	356/6*60°	11	67	1.5
.KHR 315 -4	146	171	225	**98**	319	2.5	75	M6 / 4*90°	90	70	212	5.5	195	282	348	320/6*60°	11	59	1.5
.KHR 315 -2	146	194	247	**98**	319	6	140	M10/4*90°	162	70	212	5.5	195	282	348	320/6*60°	11	59	1.5
DKHR 315 -2	118	154	207	**70**	319	6.5	100	M6 / 4*90°	115	70	212	5.5	195	282	348	320/6*60°	11	59	1.5
.KHR 280 -2	133	169	216	**87**	284	6.5	100	M6 / 4*90°	115	70	188	5	174	250	307	286/6*60°	7	52	1.5
DKHR 250 -2	118	143	185	**78**	252	2.5	75	M6 / 4*90°	90	70	168	4.5	155	225	280	259/6*60°	7	46	1.5
.KHR 250 -2	100	125	167	**60**	252	2.5	75	M6 / 4*90°	90	70	168	4.5	155	225	280	259/6*60°	7	46	1.5

.KHM .. W



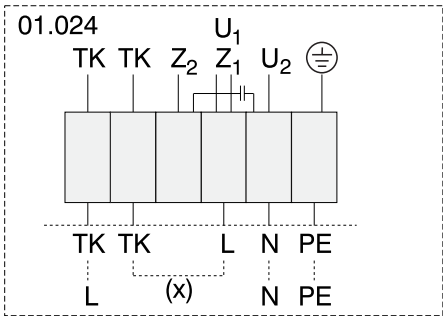
Ventilator / fan	A	B	C	d	H	h	D	DE	D1	D2
.KHM 710 -6 / -8	900	720	850	18	219	510	718	438	674	710
.KHM 630 -6 / -8	800	625	750	14	195	451	640	390	608	638
.KHM 630 -4	800	625	750	14	158	414	640	390	608	638
.KHM 560 -4 / -6 / -8	800	585	750	14	174	410	570	348	541	564
.KHM 560 -4	800	585	750	14	132	368	570	348	541	564
.KHM 500 -4 / -6	630	535	580	14	155	374	510	310	487	515
.KHM 450 -4 / -6	630	470	580	14	138	333	454	277	438	464
.KHM 400 -4 / -6	500	420	450	11	123	296	404	248	395	422
.KHM 400 -2	500	420	450	11	65	257	404	248	395	422
.KHM 355 -4	500	395	450	11	110	265	359	219	356	382
.KHM 355 -2	500	395	450	11	110	292	359	219	356	382
.KHM 315 -4	500	360	450	11	98	240	319	195	320	348
.KHM 315 -2	500	360	450	11	98	267	319	195	320	348
.KHM 280 -2	500	320	450	11	87	232	284	174	286	307
DKHM 250 -2	500	290	450	11	78	200	252	155	259	280
.KHM 250 -2	500	290	450	11	60	182	252	155	259	280

Andere Abmessungen auf Anfrage / Other dimensions on request.

Nr. 01.024 - 顺时针 / clockwise

单相交流电机工作电容和热保护器。热保护器串联在线圈绕组中，如果使用RE控制器。插入电桥和连接在图中用点线表示。

Single phase A.C. motor with operating capacitor and thermal contacts. Thermal contact wired in series with windings, if RE controllers are used. Insert bridge (x) and wire connections shown as dash-line on the drawings.

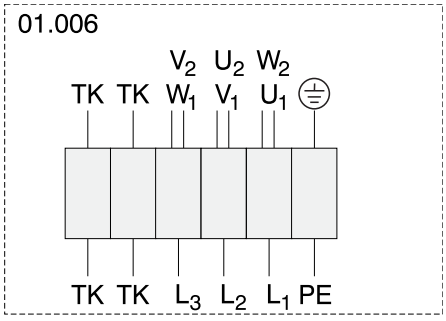


U_1 褐色/brown
U_2 蓝/blue
Z_1 黑/black
Z_2 桔黄/orange
TK 白/white
PE 黄绿/yellow-green

Nr. 01.006

带热保护器的三角连接三相电机。通过互换2相来改变转向。

Three phase motor in delta connection with thermal contacts. Changing of rotation direction by interchanging of 2 phases.



U_1 褐色/brown
V_1 蓝/blue
W_1 黑/black
U_2 红/red
V_2 灰色/grey
W_2 桔黄/orange
TK 白//white
PE 黄绿/yellow-green

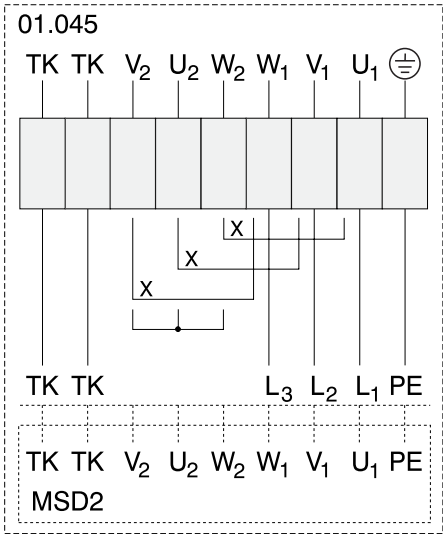
Nr. 01.045

带2速和热保护器的三相电机。通过△/ Y开关改变速度。互换2相来改变转向。

使用2步开关装置MSD 2 无需桥形连接。使用点线连接控制器。

Three phase motor with 2 speeds and thermal contact. Changing of rotation direction by interchanging of 2 phases.

When using the 2-steps switchgear MSD2 a bridge is not needed. Connection of the dashed-line to the controller has to be made and make connections as indicated by the dotted lines to the controller.



U_1 褐色/brown
V_1 蓝/blue
W_1 黑/black
U_2 红/red
V_2 灰色/grey
W_2 桔黄/orange
TK 白//white
PE 黄绿/yellow-green

X 桥形连接用于高速

Y 桥形连接用于低速

E/DKHR - 机 叶轮

用在管道风机中

E/DKHR - motorized impeller

used in duct fan

DKHM - 组件

安装于空调箱

DKHM - module

for installation in air-handling-unit

优势:

- 结构紧凑，节省空间
- 高效叶轮
- 高性价比：采用高效叶轮及EC驱动
- 可安装在任何位置
- 易维护保养：由于不存在摩擦
- 出色的速度控制
- 持续的高效率
- 独立的 50/60Hz电源频率

Advantages:

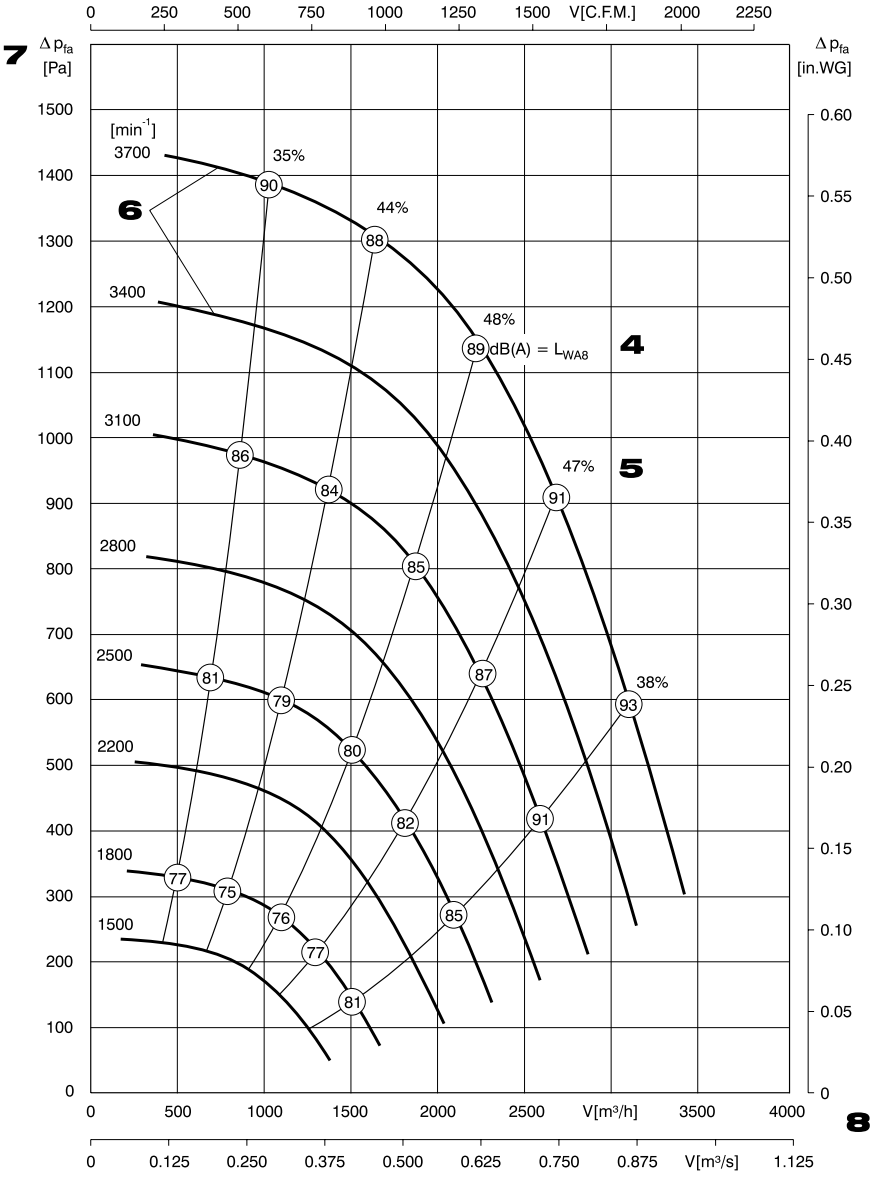
- compact, space saving construction
- high power impeller
- economic due to high efficiency impeller and EC-drive
- installable in all positions
- easy to maintain due to no attrition
- excellent speed controlability
- constant high efficiency
- independant of 50/60 Hz power supply frequency

直流外转子电机无蜗壳风机

特性曲线显示了静压随流量变化的关系，效率同样显示在曲线上，特性曲线是在空气密度为1.2kg/m³，使用直流电机，直流控制器来测得的。

Free blowing fan with ec- external rotor- motor

The performance curve indicates the static pressure increase Δp_{fa} as a function of the volume flow. The performance curves refer to an air density of 1,2 kg/m^3. The efficiency curves as shown on the performance curves indicate the system efficiency of the complete unit made up of EC-Controller, EC-Motor and impeller.



n [min^{-1}]	u [m/s]	η Korr
3700	55	1
3400	50,6	1
...	...	...

1 恒定转速的特性曲线 / performance curves of constant speed

2 线速度 / radial speed

3 效率系数 / correction of efficiency

4 声功率级 / sound power level

5 效率 / efficiency

6 在不同转速下的特性曲线 / performance curve at various speeds

7 静压 / static pressure

8 空气流量 / air volume

技术规定 / Technical Formula

	表示 / Description	单位 Unit
U	额定电压 / Rated voltage	V
P_{max}	最大允许功率 / Motor power consumption	kW
I_{max}	最大允许电流 / Rated current	A
n_{max}	最大允许转速 / Fan speed	min^{-1}
t_R	最大允许环境温度 / max. permissible medium temperature	°C
Δp_{fa}	静压 / static pressure increase	Pa
L_{WA}	A 声功率级 / A - sound power level	dB(A)

	表示 / Description	单位 Unit
L_{Wrel}	相关声功率级 / relative sound power level	dB
L_{WOkt}	倍频程声功率级 / Octave sound power level	dB(A)
L_{WA5}	进风口声功率级 / Free inlet sound power level	dB(A)
L_{WA6}	出风口声功率级 / Free outlet sound power level	dB(A)
L_{WA8}	外壳与出风口声功率级 / Casing and free-outlet sound power level	dB(A)

特点与结构

洛森集团无蜗壳离心风机GKHR/GKHW结构紧凑，设计优先，结合了直流外转子电机与新式设计叶轮的优点。这种风机适合多种外壳，使风机结构形式多样化，也就能满足客户对风机结构要求的多样化。

可提供的风机组件如下：

- GKHR: 机动化叶轮，可带导风圈
- GKHM: 组件安装

EC直流电机

EC电机犹如具有并联特性的DC电机，与传统的机械交换DC电机相反，它无磨损，例如不需要集流器与碳刷。在EC控制中已被免维护的电子电路替代。EC电机的特征是高效率与理想化开关控制。电机可反向旋转，利用电子电路可实现更多的附加功能。

设计和操作

由于外转子设计，EC电机设计紧凑和高功率密度特别使用于通风与空调。EC电机结合了异步电机免维护和直流电机效率可控的优点，尤其在低速时。

- 零差数和铜耗低，所以节约能源
- 发热量低，故可降低空调箱所需的冷却量。
- EC电机性能高，可减少电机结构尺寸，电机直联风机损耗小
- 最大转速不受电源频率影响
- 低速运转时，效率优势明显
- 外转子电机结构紧凑

Features and Construction

Rosenberg centrifugal fans of the ranges GKHR and GKHM with free running impeller are very compact units. With regard to the air movement, the fans have an optimum design. They combine an electronically commutated external rotor motor and a new designed impeller.

This combination together with flexible production of impellers and efficient sheet metal handling makes it possible to manufacture fan modules for various applications. Constructive demands of the customer can be met.

The fan modules can be provided (as shown on page 6) as:

- GKHR: motorized impeller (mounted and balanced) with or without inlet cone (loose)
- GKHM: module for installation

EC motor

Electronic commuted motors (EC motors) are DC motors with shunt characteristics. Contrary to the conventional DC motors with mechanical commutation, no wear and tear elements such as collectors and carbon brushes are required. They are substituted by maintenance-free electronic circuitry in the EC controller. EC motors are characterised by their high efficiency and optimal open-/closed-loop control. An electronic reversal of the motor's direction of rotation is possible. The utili- sation of electronic circuitry furthermore allows for the realisation of additional functions.

Design and operation

Due to the external rotor design, the EC motor with its compact design and high power density is particulary predestined for use in ventilation and air conditioning.The EC-Motor combines the maintenance free asynchronous machine with the efficiency control advantages of a direct current motor, especially at low speeds.

- Energy savings due to zero slippage and a large part of the copper losses.
- Less additional heat generation. Hereby the required cooling performance of the air handling unit can be reduced.
- The motor construction size can be reduced as a result of the EC-Motors high performance. Hereby minimising the losses as a result of motor blockage with direct driven fans.
- The maximum speed is independent of the power frequency.
- Major efficiency advantages during operation at low speeds.
- The construction of the external rotor motor remains compact.

转子

永磁铁转子取代短路电枢，外置整流器即EC控制器，用于电子整流。EC控制器给线圈提供电流，然后电机持续平静运转。

由于以上原因，EC电机不能直接接到电源上。

EC电机需要使用配套的整流器（EC-控制器）

定子

EC电机的定子为三芯设计，内部的星形连接绕组通过三个半桥内的六个晶体管供电。由此获得最佳的同心度和低噪声。三芯定子设计的优势超过一芯和二芯，较高的功率密度和启动转矩可实现特殊驱动功能。

其他的优点是更少的传感器使EC电机结构简化。整流无需在电机中安装霍尔效应传感器。并具备如下优势：

- 电机装配简单
- 减少了接线数，风机安装与运行更快更安全。

- 电机和EC控制器连接只需要一根电缆。

EMC方针说明

洛森EC电机驱动的无蜗壳离心风机和电子整流器结构符合EMC指示要求EMC，安装方法见操作手册，确保符合EMC89/336/EEC。EMC89/336/EEC只当接到电源时与产品有关。如果安装到一个系统里，其他电控组件没有按操作手册操作，那么厂商或整个系统的操作者有责任达到EMC89/336/EEC的要求。

Rotor

A rotor with permanent magnets replaces the short-circuit armature. An external electronic commutating unit, the so-called EC-Controller, provides for the electronic commutation. The EC-Controller provides the windings with electrical current so that, the motor rotates continuously and quietly.

This is the reason why the EC motor must not be operated directly from the mains.

The operation of an EC motor always requires the use of a matching commutating unit (EC-controller).

Stator

The stator of the EC motor is a three core design. The phase windings are energised by six transistors in three half-bridges. An optimal concentric running and noise behaviour is thus achieved. The three core stator design has an advantage over the one- or two-core version, since the power density is substantially higher and a higher start-up torque will allow for the realisation of specific drive functions.

A further advantage is the sensorless construction of the EC-Motor. The commutation takes place without the extra installation of Hall- Sensors- in the motor. This provides the following advantages:

- Simplifies the motor assembly
- Reduces the number of contact terminals, hereby allowing for a faster and safer installation and operation of the ventilator.
- Only one cable is required to connect the motor to the ec-controller.

Notes on EMC guidelines

The Rosenberg EC-motor driven, free blowing centrifugal fans and the electronic commutation units construction is in accordance with the EMC Directive EMC 89/336/EEC. The operating manual provides for measures to be taken during installation to ensure that the EMC Directive 89/336/EEC are met. The EMC Directive 89/336/EEC are relevant to this product only when it is connected to a mains supply. If it is installed into a system with for example, other electronically controlled components, or it is not operated in accordance with the operating manual, then the manufacturer or the operator of the complete system are responsible for meeting the requirements of the EMC Directive 89/336/EEC.

电路连接

风机交货后可迅速安装并可提供接线盒。电路连接必须按照正确的操作规则和当地的法规。每个电机都有接线图说明如何正确连接电机和 EC控制器。连接电机的电缆长度不能超过10米，原则上要遵循电子整流器使用手册的说明。

附件

所有附件包括电子整流器都要单独订购，样本后有技术资料和尺寸的详细说明。

速度控制

连接外置分压器可实现连续调速（附件），EC控制器有内置电位计，使风机启动操作简化。

特性曲线说明

样本中显示的特性曲线仅对装有整流器的风机有效。效率和功率消耗与整个系统包括由电机和整流器引起的损耗有关。

空气温度

GKH型号风机适用于空气，无腐蚀性气体及蒸汽，最大介质温度为40℃。

Electrical Connection

The fans are delivered ready to install and are supplied with an easily accessible terminal box. The electrical installation must be undertaken in accordance with valid regulations and local laws. An electrical connection diagram is provided with each motor and indicates how to correctly connect the motor to the ec-controller.The motor connection must only to be carried out with a sheathed cable which itself should not exceed 10 m in length. In principal, the instructions in the operating manual for the electronic commutating unit are to be followed.

Accessories

All accessories including the electronic commutating unit have to be ordered separately. The description, technical details and dimensions are included at the back of this catalogue.

Speed control

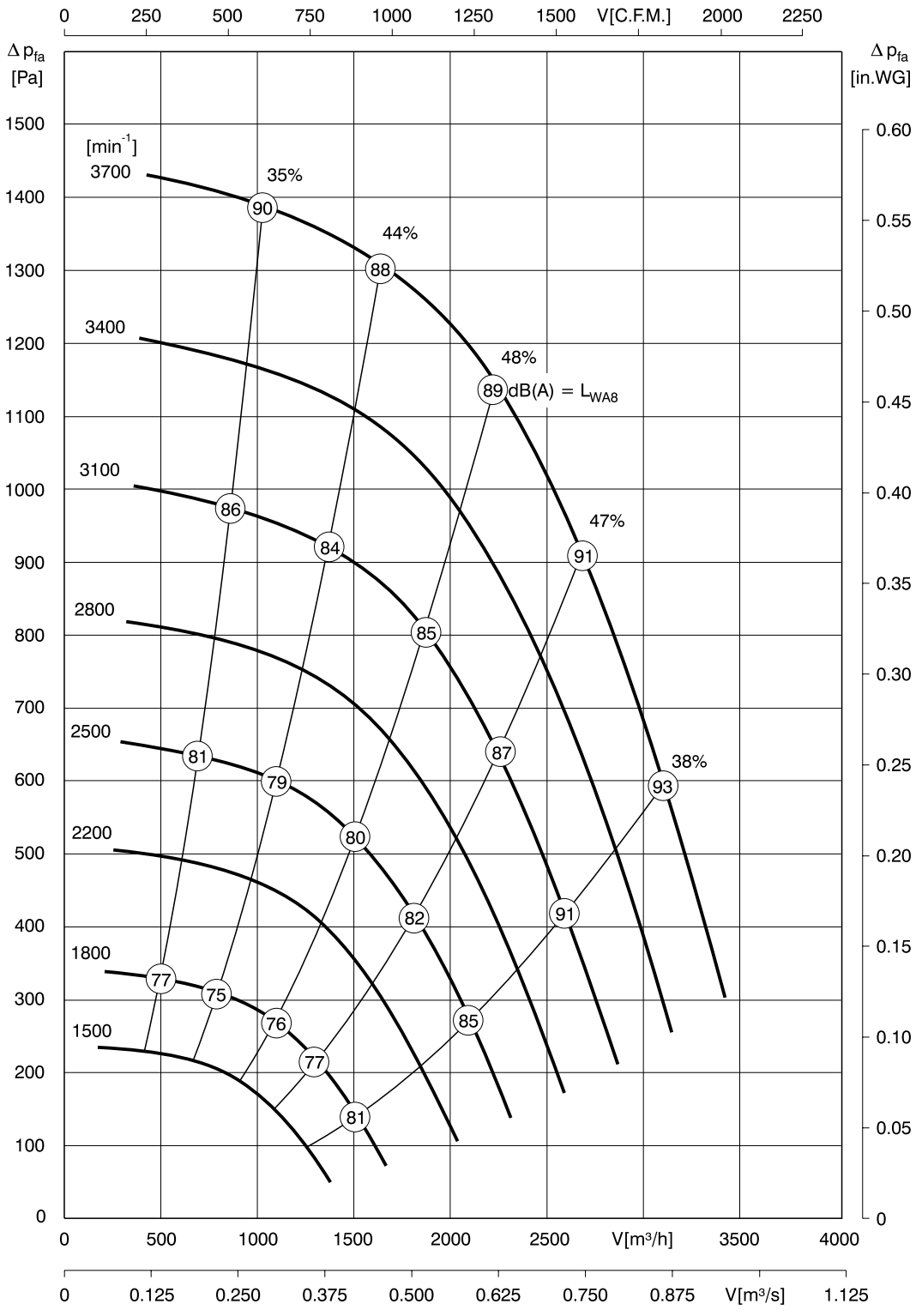
The speed control offers continuously variable control when connected to an external potentiometer (Accessory). The EC-controller has an internal potentiometer to simplify the initial operation of the fan (see operating manual).

Performance Curves - Note

The performance curves shown in this catalogue are only valid for the allocated commutation units. The efficiencies and power consumptions mentioned always relate to the complete system including all losses caused by the motor and the commutation unit.

Air Temperature

The fans of the GKH range are suitable for air and other non-aggressive gases or steams. The maximum temperature of the medium is 40°C.



n [min^{-1}]	u [m/s]	η Korr
3700	55	1
3400	50,6	1
3100	46,1	1
2800	41,6	1
2500	37,2	0,99
2200	32,7	0,98
1800	26,8	0,97
1500	22,3	0,96

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

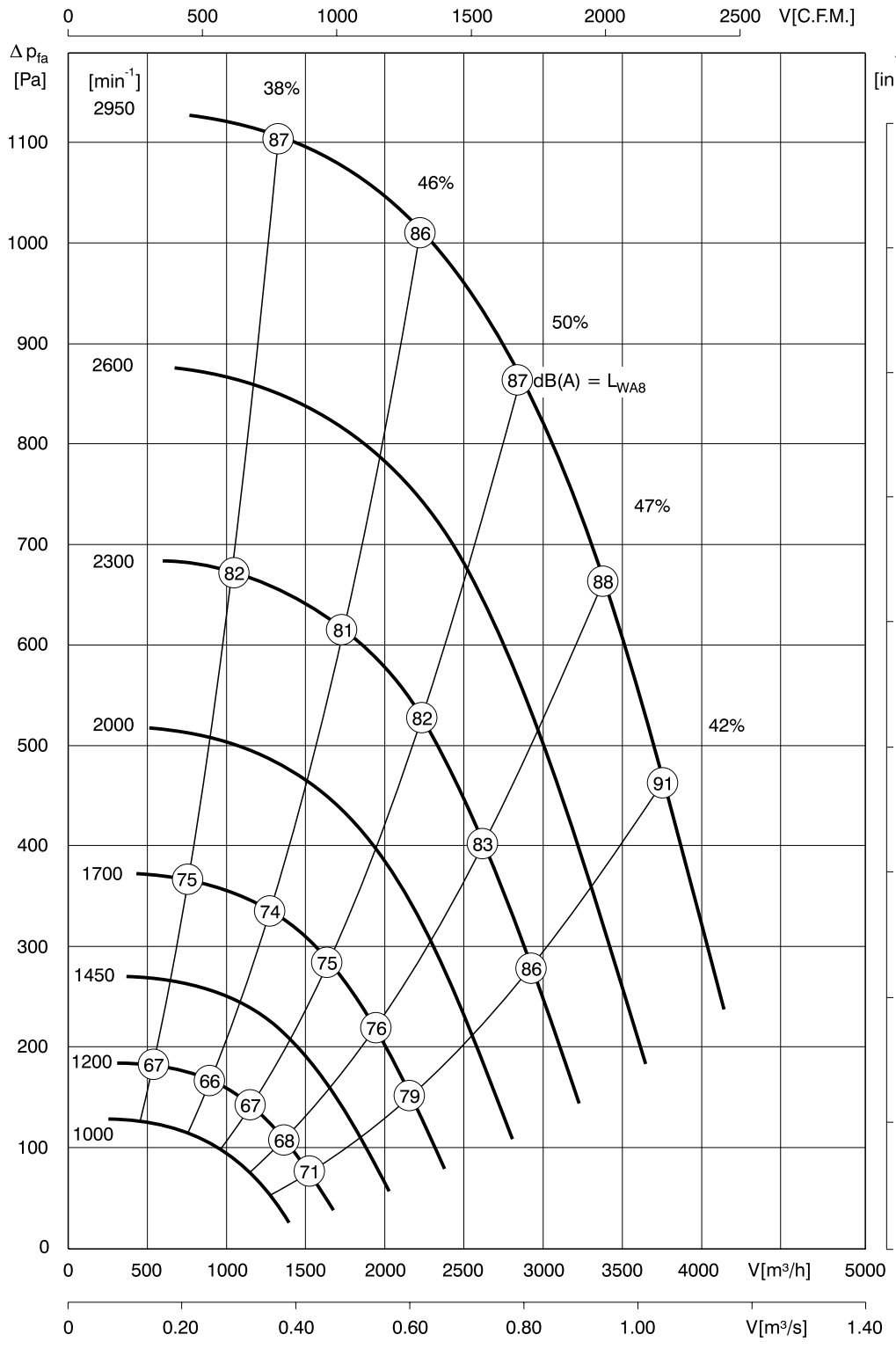
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-1	-4
125	-4	-6
250	-1	-2
500	-2	-3
1K	-5	-5
2K	-10	-7
4K	-11	-13
8K	-14	-14

Düsenbeiwert / Calibration factor
$k_{10} = 55$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nennspannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min^{-1}]
GKH_ 280-CKW.087.5FA	7	17,5	T03	3 ~ 400	1,7	2,8	3700

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min^{-1}]	u [m/s]	η Korr
2950	49,3	1
2600	43,4	1
2300	38,4	1
2000	33,4	1
1700	28,4	0,99
1450	24,2	0,98
1200	20,0	0,97
1000	16,7	0,96

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

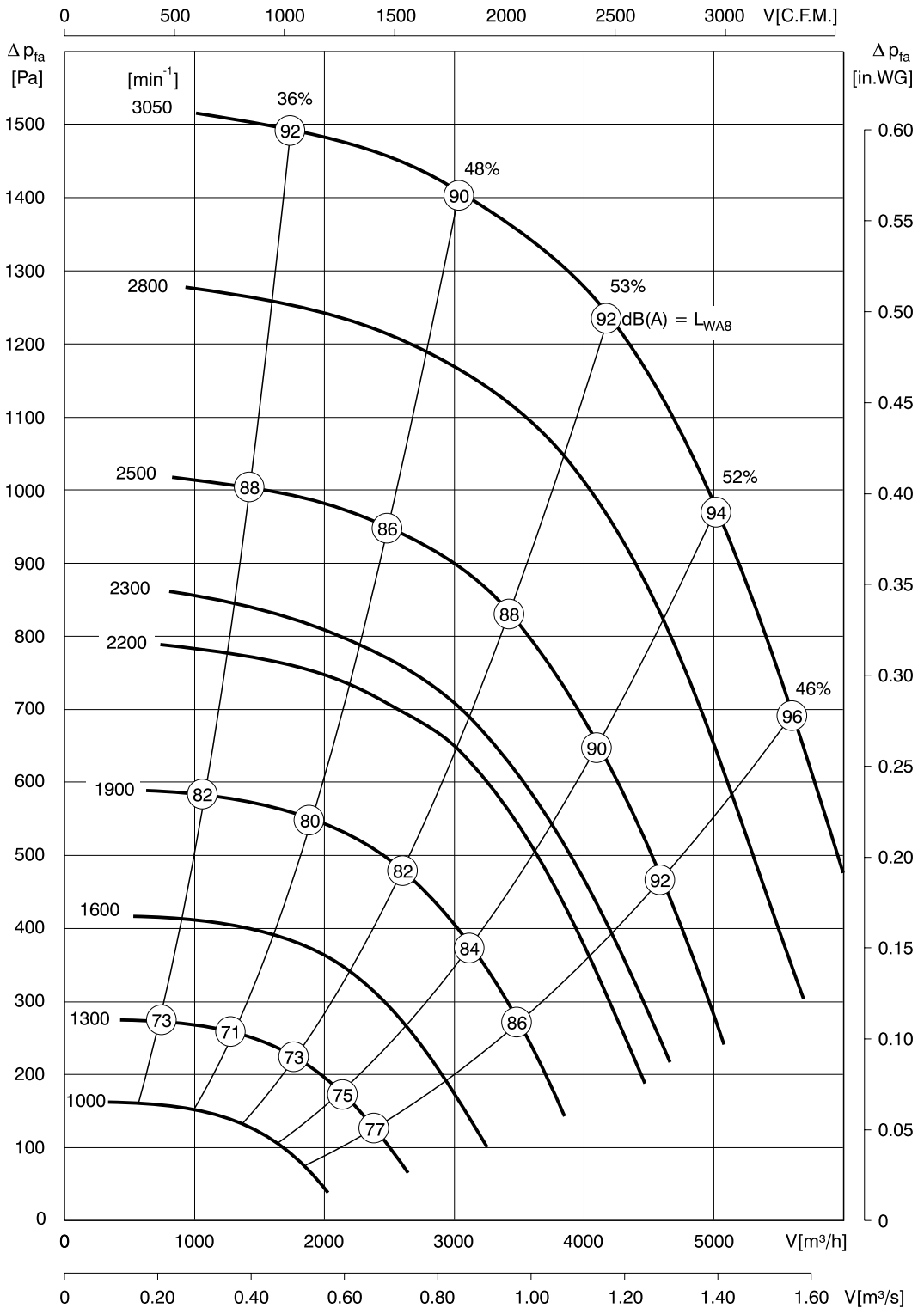
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-4	-3
125	-4	-4
250	-1	-2
500	-2	-3
1K	-6	-4
2K	-8	-8
4K	-12	-15
8K	-15	-18

Düsenbeiwert / Calibration factor
$k_{10} = 70$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min^{-1}]
GKH_ 315-CKW.098.5FA	7,3	18,5	T03	3 ~ 400	1,5	2,5	2950

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min-1]	u [m/s]	η Korr
3050	57,3	1
2800	52,6	1
2500	47	1
2200	41,4	1
1900	35,7	0,99
1600	30,1	0,98
1300	24,4	0,97
1000	18,8	0,96

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

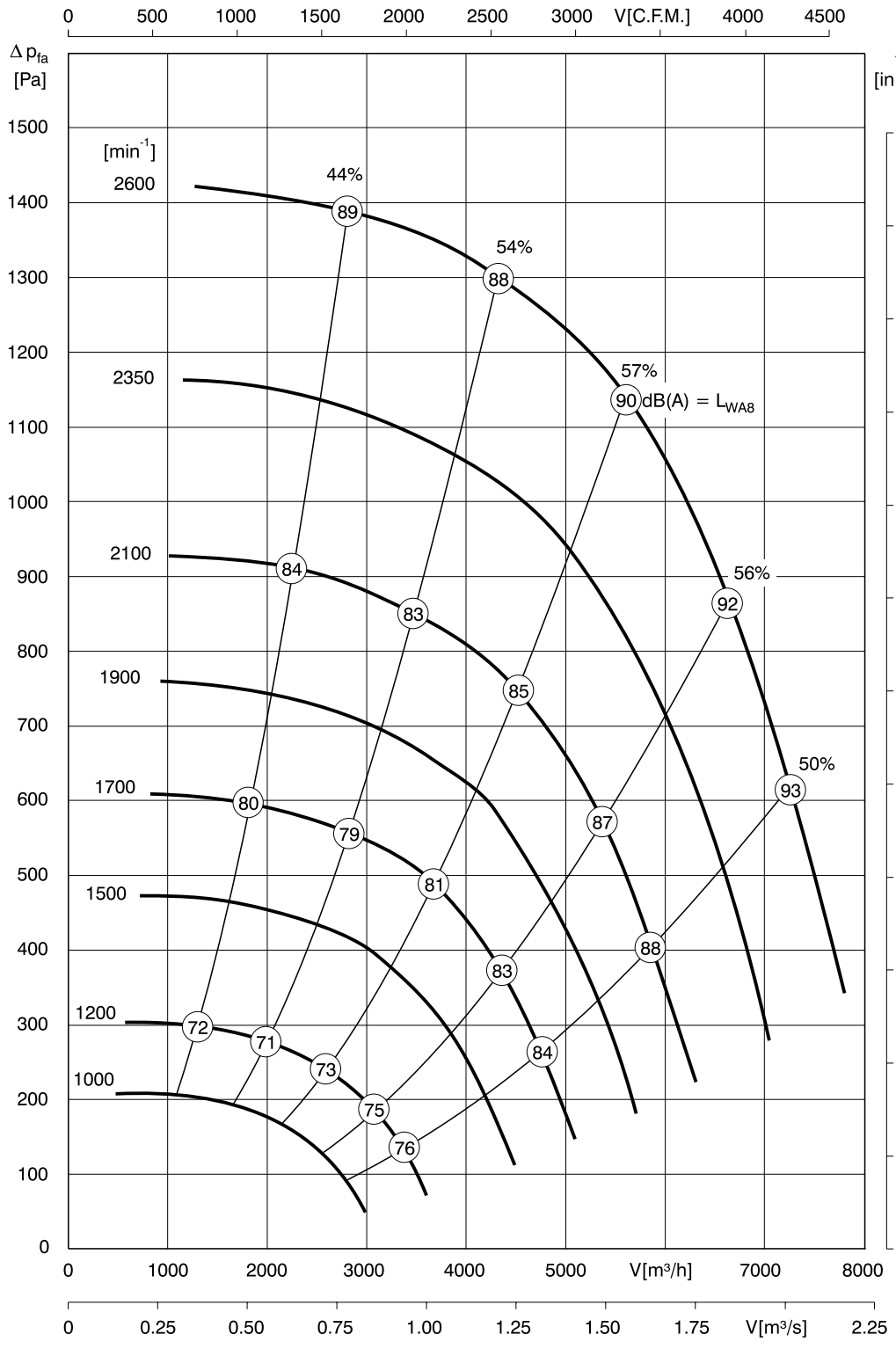
$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-4	-3
125	-4	-4
250	-1	-2
500	-2	-3
1K	-6	-4
2K	-8	-8
4K	-12	-15
8K	-15	-18

Düsenbeiwert / Calibration factor
$k_{10} = 87$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min-1]
GKH_ 355-CKW.110.6FA	14	25	T06	3 ~ 400	3	4,6	3050
GKH_ 355-CKW.110.5FA	10	21	T03	3 ~ 400	1,3	2,2	2300

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min^{-1}]	u [m/s]	η Korr
2600	55	1
2350	49,7	1
2100	44,4	1
1900	40,2	1
1700	36	0,99
1500	31,7	0,98
1200	25,4	0,97
1000	21,2	0,96

$L_{WA5} = L_{WA8}$ - 6 dB
$L_{WA6} = L_{WA8}$ - 3 dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

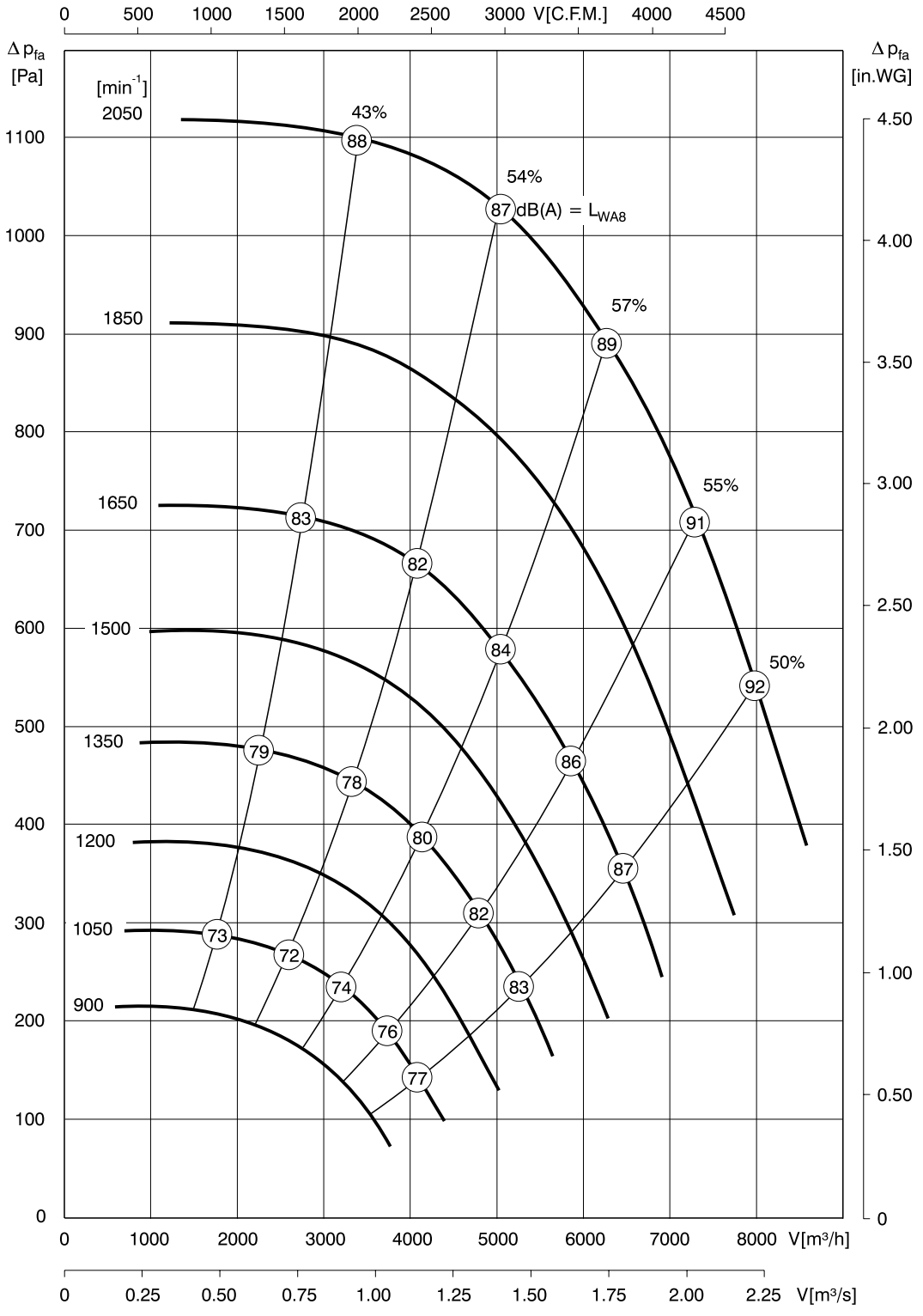
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-4	-2
125	-3	0
250	0	0
500	-3	-3
1K	-6	-5
2K	-7	-7
4K	-12	-14
8K	-15	-20

Düsenbeiwert / Calibration factor
$k_{10} = 113$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min^{-1}]
GKH_ 400-CKW.123.6FA	14,5	25,5	T06	3 ~ 400	3,4	5,3	2600
GKH_ 400-CKW.123.5FA	10,5	21,5	T03	3 ~ 400	1,0	1,8	1700

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min-1]	u [m/s]	η Korr
2050	48,7	1
1850	44	1
1650	39,2	1
1500	35,7	1
1350	32,1	0,99
1200	28,5	0,98
1050	25	0,97
900	21,4	0,96

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

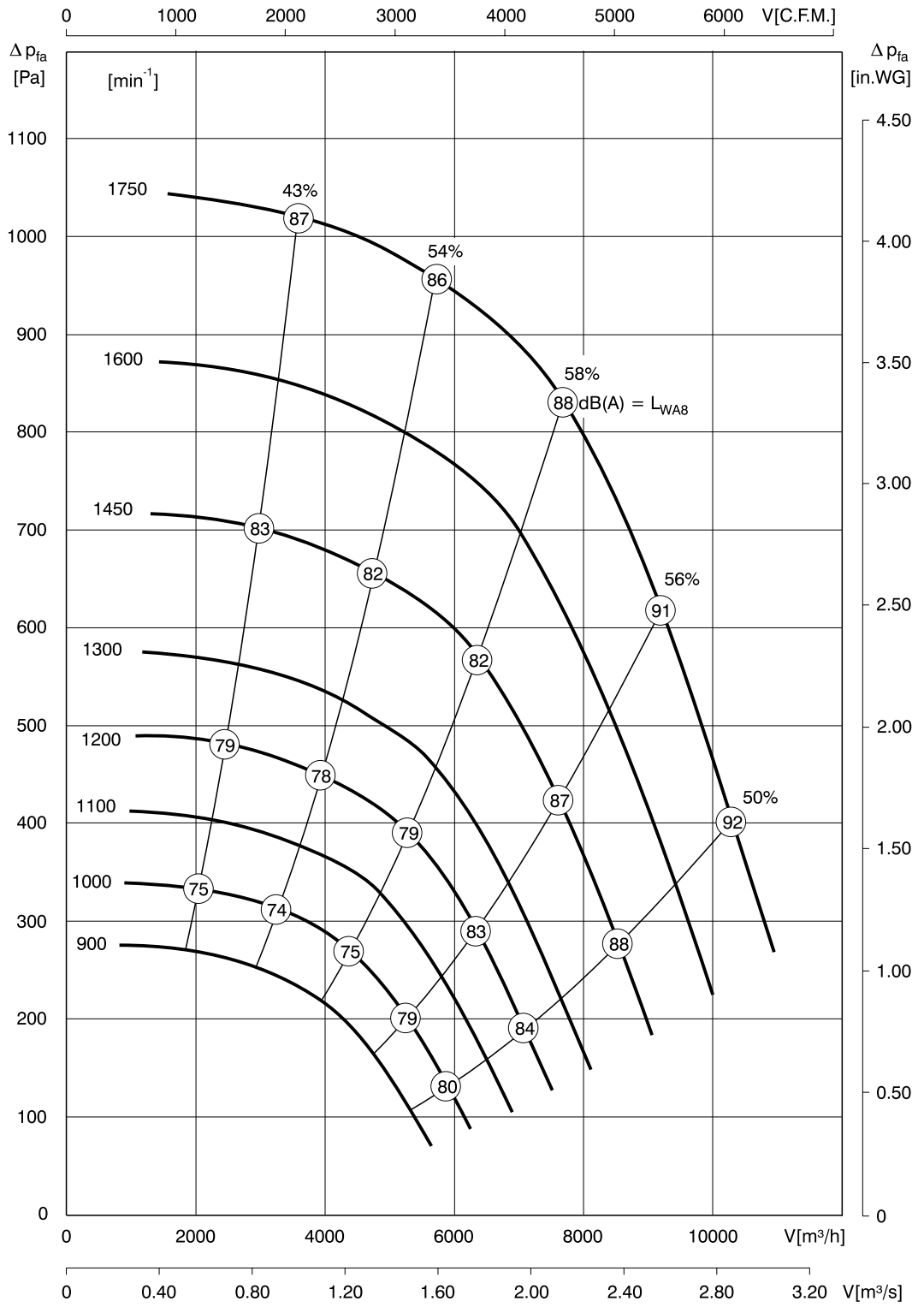
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-4	-2
125	-3	0
250	0	0
500	-3	-3
1K	-6	-5
2K	-7	-7
4K	-12	-14
8K	-15	-20

Düsenbeiwert / Calibration factor
$k_{10} = 145$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min-1]
GKH_ 450-CKW.138.6FA	15,5	31	T06	3 ~ 400	3,1	4,9	2050

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min^{-1}]	u [m/s]	η Korr
1750	46,7	1
1600	42,7	1
1450	38,7	1
1300	34,7	1
1200	32	1
1100	29,4	0,99
1000	26,7	0,98
900	24	0,97

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

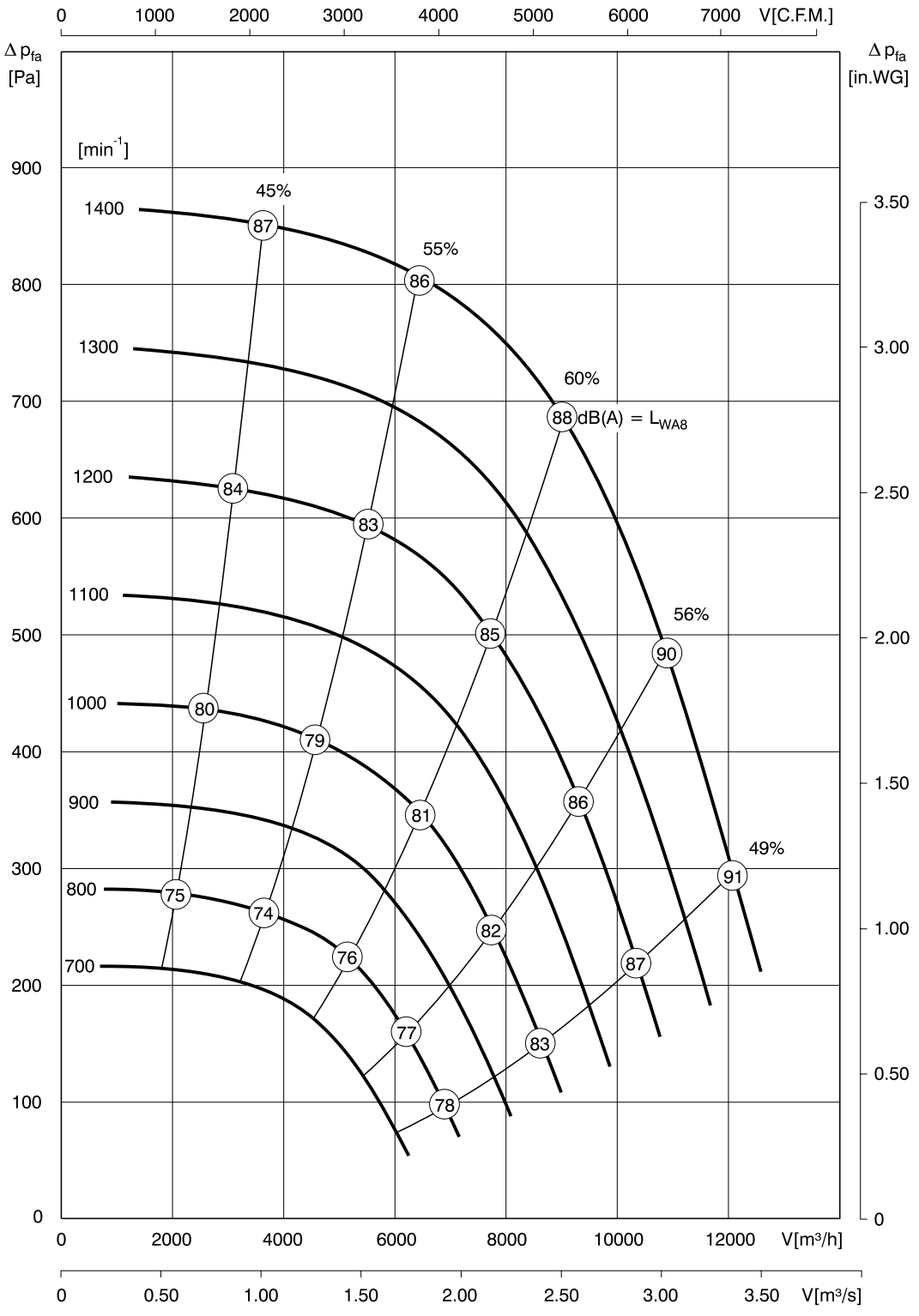
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-3	-2
125	-4	0
250	0	1
500	-3	-3
1K	-6	-5
2K	-7	-9
4K	-12	-16
8K	-15	-22

Düsenbeiwert / Calibration factor
$k_{10} = 180$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min^{-1}]
GKH_ 500-CKW.155.6HF	21	37	T06	3 ~ 400	3,5	5,4	1750

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



n [min-1]	u [m/s]	η Korr
1400	41,8	1
1300	38,8	1
1200	35,8	1
1100	32,8	1
1000	29,8	1
900	26,9	0,99
800	23,9	0,98
700	20,9	0,97

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

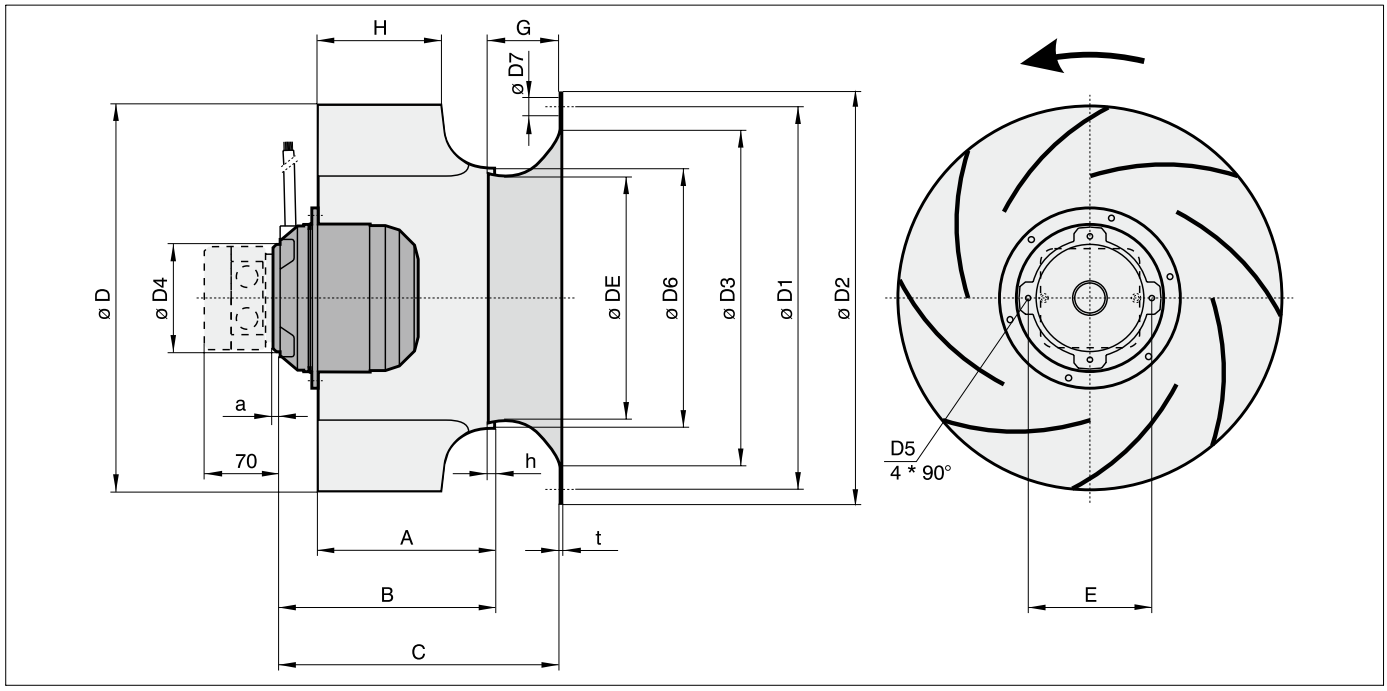
$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-3	-2
125	-4	0
250	0	1
500	-3	-3
1K	-6	-5
2K	-7	-9
4K	-12	-16
8K	-15	-22

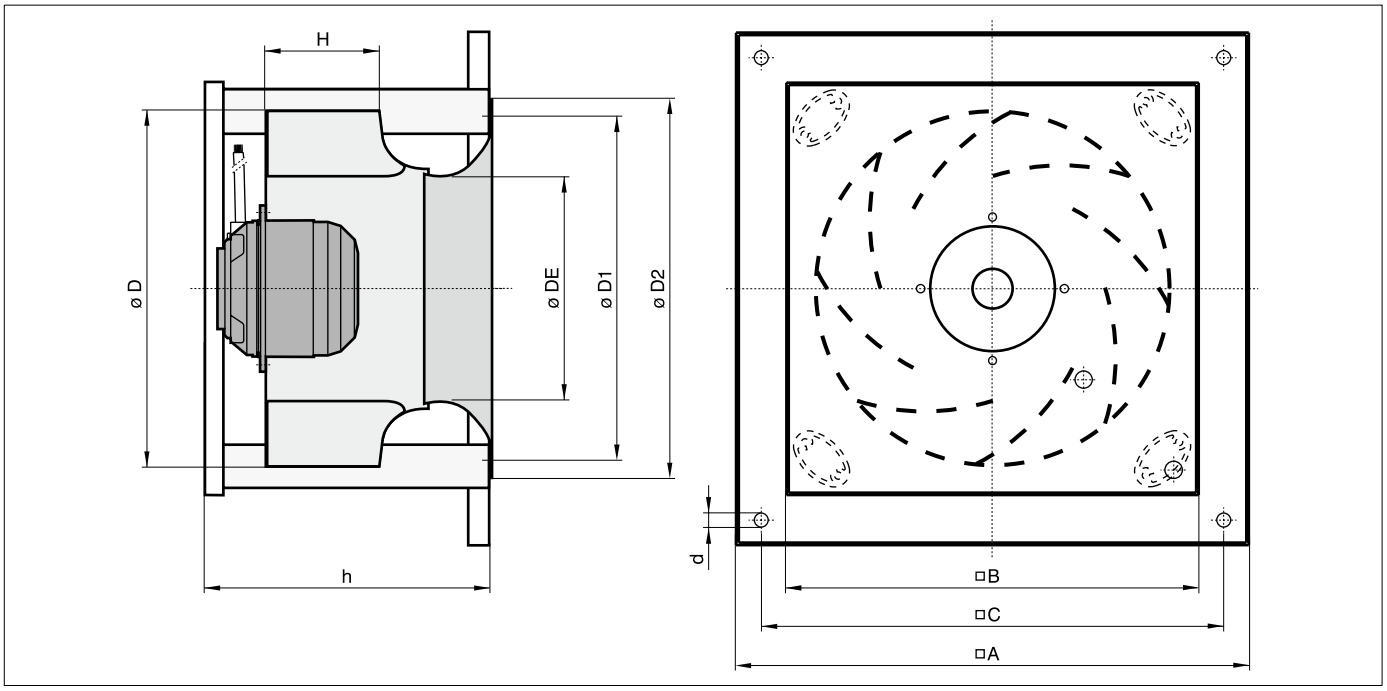
Düsenbeiwert / Calibration factor
$k_{10} = 220$

Ventilatortyp / Fan type	Gewicht / weight [kg] GKHR	GKHM	EC-Controller / EC-Controller	Nenn-spannung [V] / Rated voltage	P_{max} [kW]	I_{max} EC - Controller [A]	n_{max} [min-1]
GKH_ 560-CKW.174.6HF	22,5	48	T06	3 ~ 400	3,1	4,8	1400

P_{max} = maximale Leistung / maximum power
I_{max} = maximale Stromaufnahme EC- Controller / Max. input current EC- Controller
n_{max} = maximale Ventilatordrehzahl / Max. fan revolutions per minute



Ventilator / fan	A	B	C	H	D	a	D4	D5	E	D6	h	DE	D3	D2	D1	D7	G	t
GKHR 280-CSW.087	133	169	216	87	284	6,5	100	M6	115	188	5	174	250	307	286/6*60°	7	52	1,5
GKHR 315-CSW.098	146	182	236	98	319	6,5	100	M6	115	212	5,5	195	282	348	320/6*60°	11	59	1,5
GKHR 355-CSW.110	164	211	272	110	359	6	140	M10	162	238	6	219	315	382	356/6*60°	11	67	1,5
GKHR 400-CSW.123	184	231	300	123	404	6	140	M10	162	267	7	248	355	422	395/8*45°	11	76	1,5
GKHR 450-CSW.138	209	244	318	138	454	6	140	M10	162	300	8	277	400	464	438/8*45°	11	82	1,5
GKHR 500-CSW.155	234	270	359	155	510	6	140	M10	162	337	9	310	450	515	490/8*45°	11	98	1,5
GKHR 560-CSW.174	262	296	391	174	570	6	140	M10	162	377	10	348	500	564	541/8*45°	11	105	1,5



Ventilator / fan	A	B	C	d	H	h	D	DE	D1	D2
GKHM 280-CSW.087	500	320	450	11	87	232	284	174	286	307
GKHM 315-CSW.098	500	360	450	11	98	251	319	195	320	348
GKHM 355-CSW.110	500	395	450	11	110	287	359	219	356	382
GKHM 400-CSW.123	500	420	450	11	123	315	404	248	395	422
GKHM 450-CSW.138	630	470	580	14	138	333	454	277	438	464
GKHM 500-CSW.155	630	510	580	14	155	374	510	310	487	515
GKHM 560-CSW.174	800	585	750	14	174	406	570	348	541	564

Andere Abmessungen auf Anfrage / other dimensions on request

电子整流器

设计

电子整流器装在一个防护等级为IP20的金属盒里。请遵守操作手册上的清洁要求。允许的环境温度为40℃。电子整流器配有电磁干扰滤波器和电源节流器，符合EMC/336/EEC。请按照操作手册进行安装，以确保达到 EMC要求。

功能

速度可通过外部的0–10V输入信号或整体式电位计设置控制。通过外部信号可控制开关。最大速度可通过内置跳线设置。通过在连接器面板上架桥跳线来换向。故障和操作模式由部件顶部的两个LED显示。大范围控制保护功能用于电机流相位失调和过载电流。

Electronic Commutating Unit

Design

The electronic commutating unit is contained in a metal casing with IP 20 protection; loose, so appropriate for installation in a control box. Please observe the minimum clearance requirements as indicated in the operating manual. The permitted ambient temperature is +40° C. The electronic commutating units are fitted with radio interference filters and electrical supply power chokes in accordance with EMC Directive 89/336/EEC. The operating manual provides for special measures to be taken during installation to ensure that the EMC Directives are met.

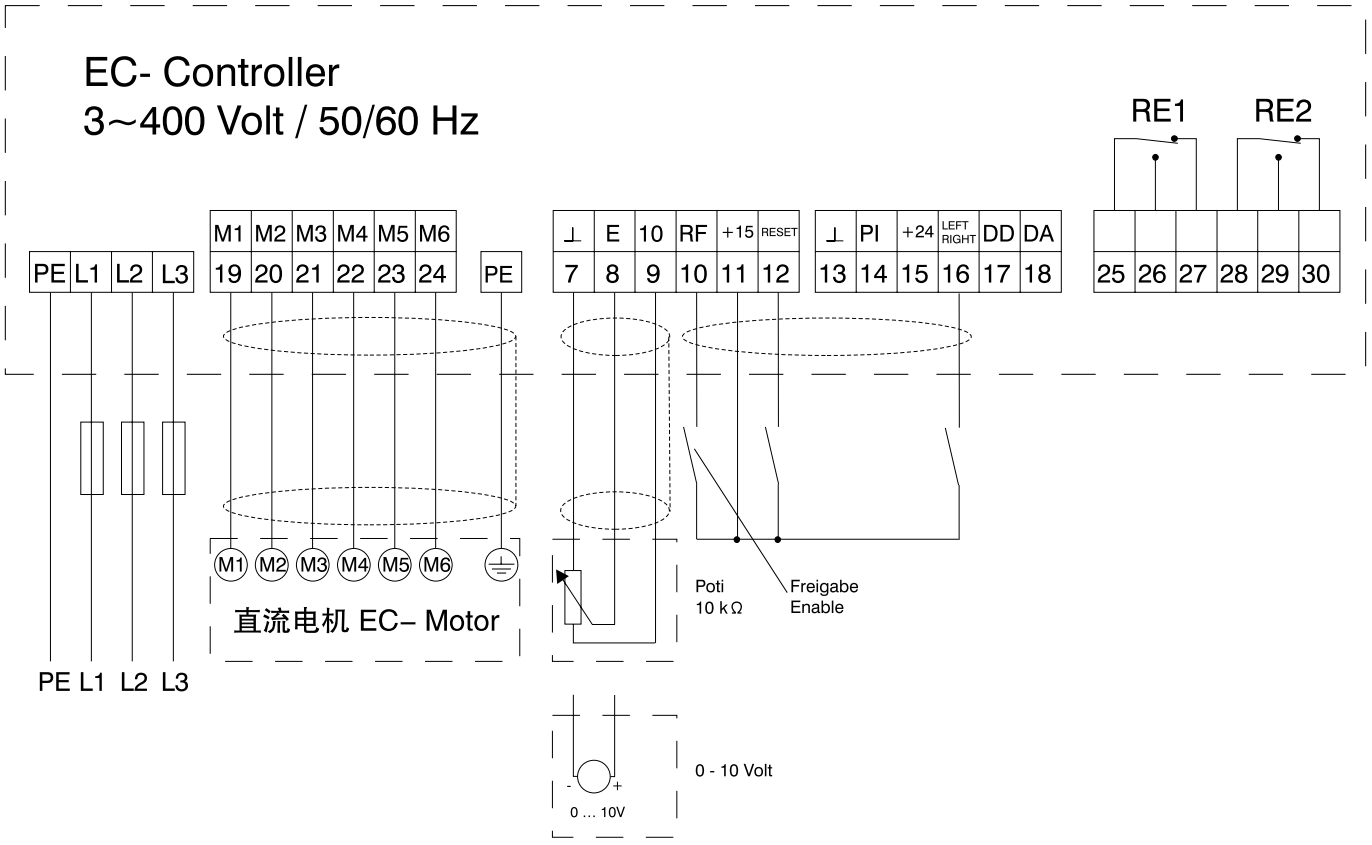
Functions

Speed control can be set with external 0-10 Volt input signal or with integrated potentiometer. The unit can be switched on or off with an external command signal. The maximum speed can be set with an internal jumper. The direction can be simply reversed by putting a bridge jumper on the connector panel. Failure and operating mode is displayed with two LED's incorporated into the top of the unit. A wide range of control and protection functions for motor current, phase failure, and over current.

说明	Specification		T03	T04	T06
输入电压 50/60H	Input voltage 50/60 Hz	V	3 * 400	3 * 400	3 * 400
最大额定电流–估定	Rated current max. approx.	A	3	4,5	6,7
最大输出电流–估定	Output power max. approx.	kW	1,8	2,4	3,6
速度设置–通过0 - 10 V	Speed setting via 0 - 10 V	V	✓	✓	ü
故障信号	Signal for fault		✓	ü	ü
操作信号	Signal for operation		✓	ü	ü
手动/自动转换	Manual / automatic switchover		✓	ü	ü
通过电位计手动速度控制	Manual speed setting by integral potentiometer		✓	ü	ü
设置 n_{min} / n_{max}	Setting n_{min} / n_{max}		✓	ü	ü
机架保护	Housing protection		IP 20	IP 20	IP 20
环境保护	Ambient temperature	°C	-10°C - +40 °C	-10°C - +40 °C	-10°C - +40 °C
尺寸 B x H x T	Dimensions	mm	145 x 300 x 165	145 x 300 x 165	145 x 300 x 165

接线图

Connection diagramm

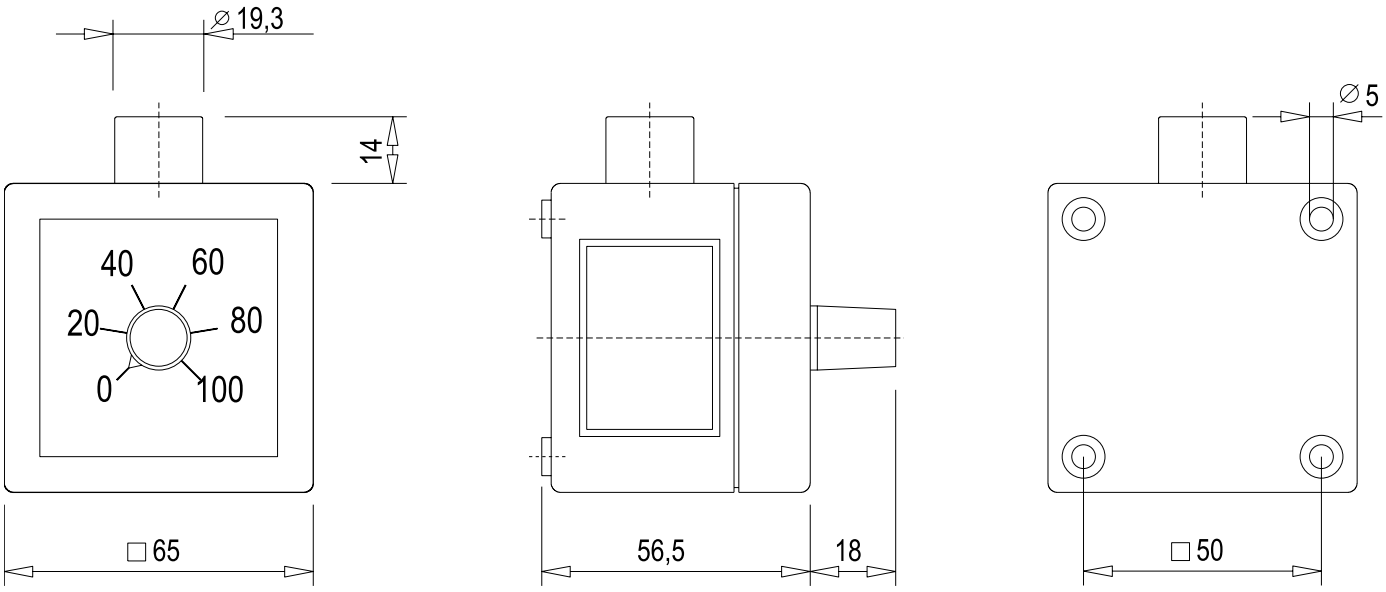


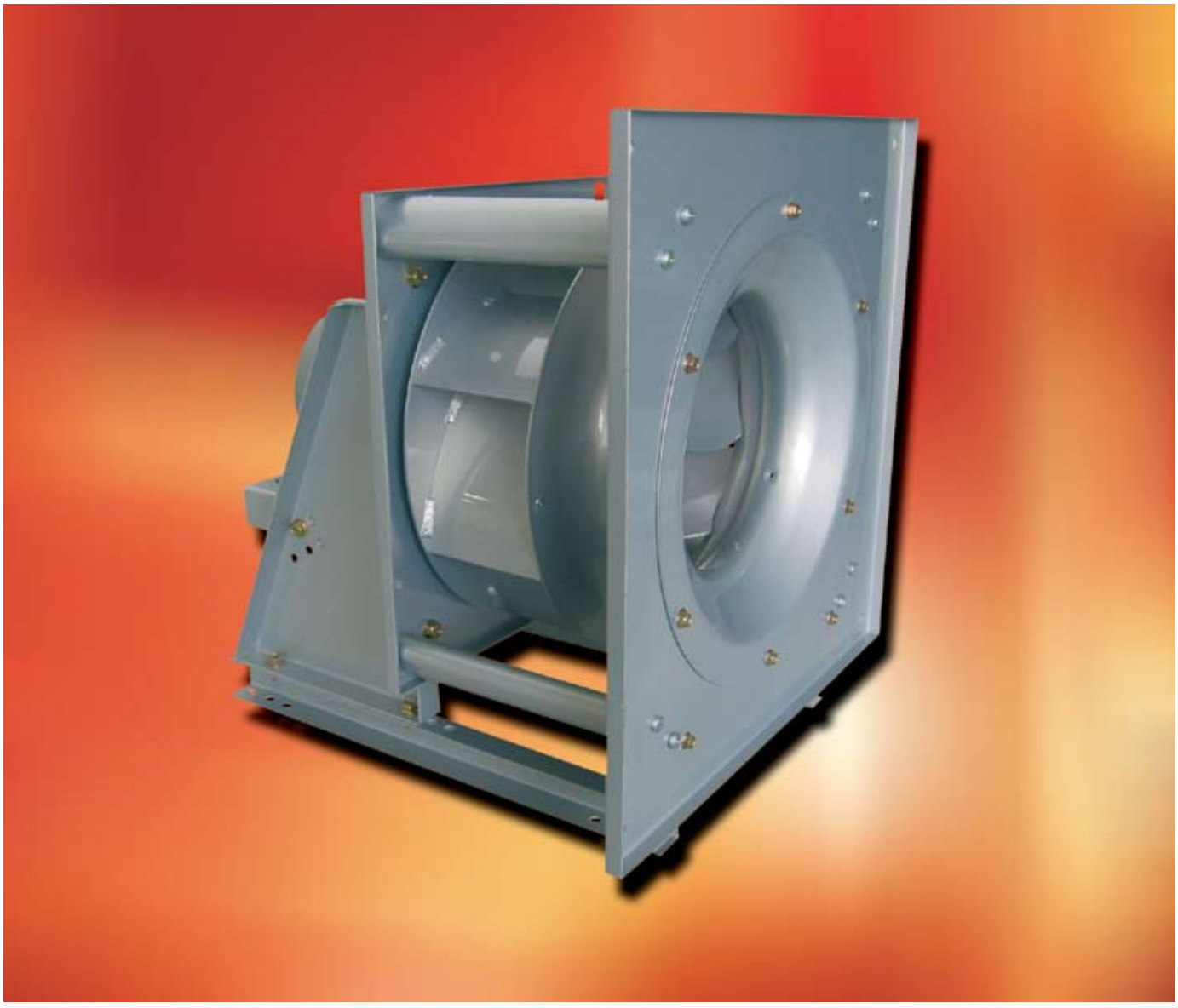
外置速度控制电位计

电位计（10千欧）为外置速度控制。数值范围0–100，直流控制器和电位计通过三芯铠装电缆连接。
LIYCY 3 x 0,5 mm2.

External speed control potentiometer

Potentiometer (10 kΩ) for external speed control. Scale 0 - 100 %. EC- Controller and Potentiometer are to be connected using a three core shielded control cable e.g. LIYCY 3 x 0,5 mm2.





优势:

- 结构紧凑，节省空间
- 高效叶轮
- 高性价比，由于采用高效叶轮及EC驱动
- 可安装在多种位置
- 易维护保养：无风机传送带磨损或自然磨损

Advantages:

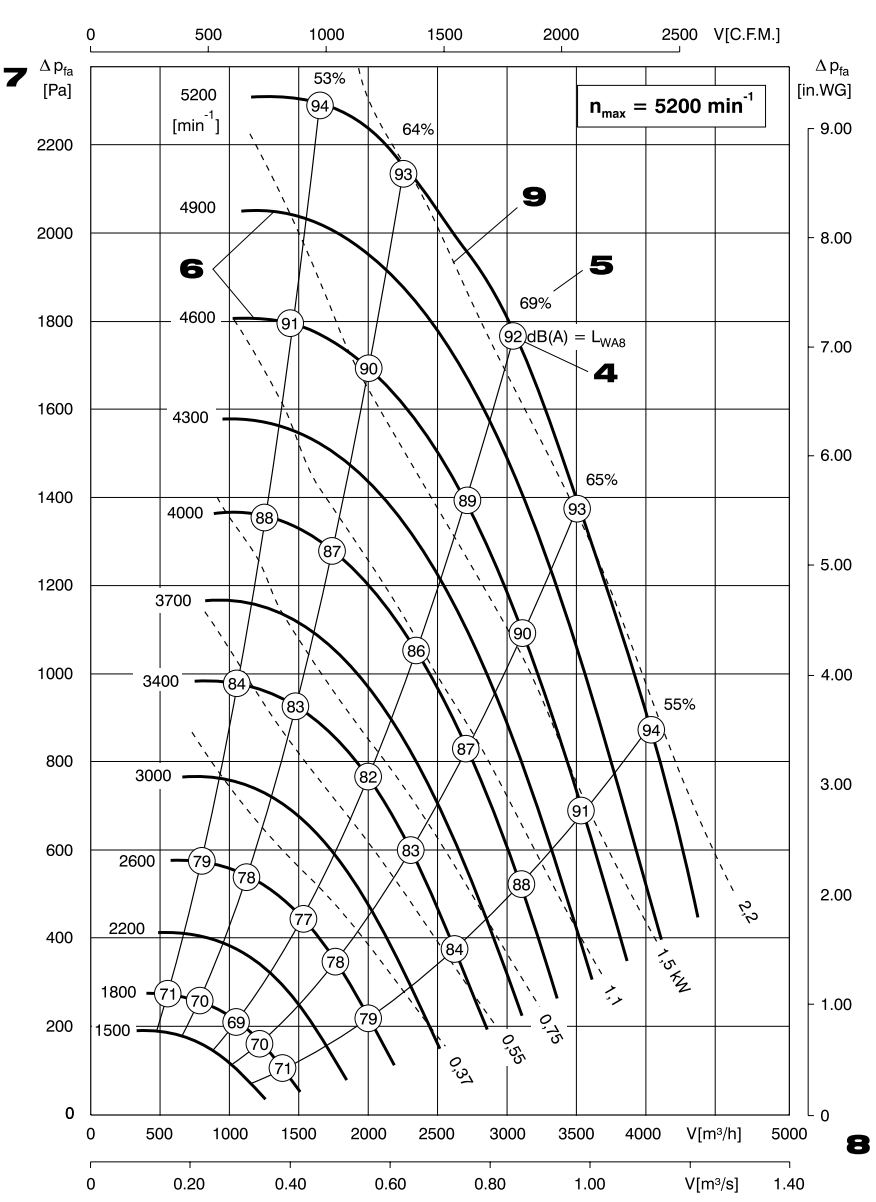
- compact, space saving construction
- high power impeller
- economical due to high efficiency impeller
- installable in various positions
- easy to maintain as a result of no fan belt abrasion or wear and tear.

IEC标准电机无蜗壳风机

特性曲线显示了静压随流量变化的关系，特性曲线参考的空气密度为1.2kg/m³。

Free blowing fan with standard IEC- motor

The performance curve indicates the static pressure increase Δp_{fa} as a function of the volume flow. The performance curves refer to an air density of 1,2 kg/m³.



n [min⁻¹]	u [m/s]	η Korr
5200	68,6	1
4900	64,7	1
...	...	...

1 恒定转速的特性曲线/ performance curves at constant speed

2 线速度 / radial speed

3 效率系数 / correction of efficiency

4 声功率级 / sound power level

5 效率 / efficiency

6 在不同转速下的特性曲线 / performance curve at various speeds

7 静压 / static pressure

8 空气流量 / air volume

9 Leistungsbedarf Laufrad / shaft power

Formelzeichen / Technical Formula

	表示 / Description	单位 Unit
U	额定电压 / Rated voltage	V
P_{max}	最大允许功率 / Motor power consumption	kW
I_{max}	最大允许电流 / Rated current	A
n_{max}	最大允许转速 / Fan speed	min^{-1}
t_R	最大允许环境温度 / max. permissible medium temperature	°C
Δp_{fa}	静压 / static pressure increase	Pa
L_{WA}	A 声功率级 / A - sound power level	dB(A)

	Benennung / Description	Einheit / Unit
L_{WRel}	相关声功率级 / relative sound power level	dB
L_{WOkt}	倍频程声功率级 / Octave sound power level	dB(A)
L_{WA5}	进风口声功率级 / Free inlet sound power level	dB(A)
L_{WA6}	出风口声功率级 / Free outlet sound power level	dB(A)
L_{WA8}	外壳与出风口声功率级 / Casing and free-outlet sound power level	dB(A)

特点和结构

洛森集团DKN_系列的无蜗壳离心风机设计用于AHUS的安装和操作，可提供如下：

- **DKNB**

  风机组件有电机支撑和基座，进风导流圈安装在支架上并调节到恰当的深度。整体单元安装减震或弹簧。电机安装形式IMB3、IMB5按要求使用，部分水平安装是标准形式，垂直安装需要使用附加的支撑杆。

- **DKNM**

  风机组件没有底座结构，进风导流口安装在支架上并调整到恰当的深度。安装形式IMB5。

电机

IEC标准三相电机安装形式一般IMB3，个别IMB5。防护等级 IP54，380V/50Hz，绝缘等级 F。电机可使用变频器。在启动操作之前或维修期间，必须遵循厂家提供的有关电机保护安装的详细用法说明。

电机保护

所有电机预装PTC热保护器，正确连接可保护电机因过载，单相击穿，电机锁定，过高的空气温度产生的损坏。洛森集团提供电机保护开关，型号**MSD1 K**允许电机的PTC中心连接，通常也要连接变频器。

电路连接

我们可提供接线盒连接，并提供接线图以便连接。如使用变频器，请查阅操作手册。

Features and Construction

Rosenberg centrifugal fans with free running impeller of the DKN_ ranges are designed for installation and operation in AHUs. They can be supplied as follows:

- **DKNB**

  Fan module with motor support and base frame. Inlet cone mounted and adjusted to correct depth. Complete unit installable with vibration dampers or springs. Motor in version IMB3. IMB5 available on request. Unit to be installed with horizontal shaft in standard version. Vertical installation with additional support bar.

- **DKNM**

  Fan module without base frame. Inlet cone mounted and adjusted to correct depth. Motor IMB5.

Motors

Standard IEC three phase motors in size IMB3 respectively IMB5, protection class IP55, 400V/50Hz, insulation class F. The motors are suitable for operation with frequency converter. Before initial operation and during maintenance, the detailed instructions of the motor supplier regarding motor protection installations which re- quired on site, have to be followed.

Motor protection

All motors are equipped with PTC (thermal contacts available on request) control the temperature of the motor. If wired correctly, they protect the motor from overload, breakdown of one phase, locking of the motor, and too high air temperatures. Rosenberg offers motor protection switches. Version **MSD1 K** allows a connection of the motor's PTC cores. The cores can usually also be wired to a frequency converter.

Electrical Connection

The wiring box of the motor is easily accessable. The motor has to be connected according to the wiring diagram (see on page C18 Connection diagram) and in accordance with valid regulations and local laws. In case of operation with frequency transformer, please check the operation manual.

速度控制

转速可通过变频器调节，风机技术参数中包含了允许的最高频率。

电机选择基于功率大小。超过电机最高承受频率将使电机过热，到一定温度时温度感应器做出反应。所有风机变频器的切断功率是50Hz。在紧急情况或变频器故障情况下，所有风机能再380，50Hz电源下运行。当电机通过变频器 500V/μs 压增最大速度时不会过载运行。根据变频器的型号和电机和其之间的电缆长度，必须提供附件，例如凹面过滤器。

Speed control

The installation specific optimal adjustment for the required operating point can only be realised with a suitable speed control system.

The speed is changed by changing the frequency with a frequency converter. The highest possible frequency for the determined motortype can be found in the technical data of the fans. The motor selection is based on the power reserves of the motor. At higher frequencies than f_{max} the motor will thermally overload and the temperature sensor will react after a certain period of heating up. The cut-off frequency adjustable on the frequency converter is 50Hz for all fans. In case of an emergency or failure of the frequency converter, all fans can be operated at 400V, 50Hz main supply. When the motors are operated by frequency converter the max. speed of voltage increase of 500V/μs should not be exceeded. Depending on the type of frequency converter, and the length of the cable between motor and frequency converter, additional components must be provided, such as a sinus filter.

一体化变频器

一般变频器与电机分离。但为了节省空间，我们提供电机和变频器一体化可至尺寸630。

优点是接线无须屏蔽导线和节省空间。

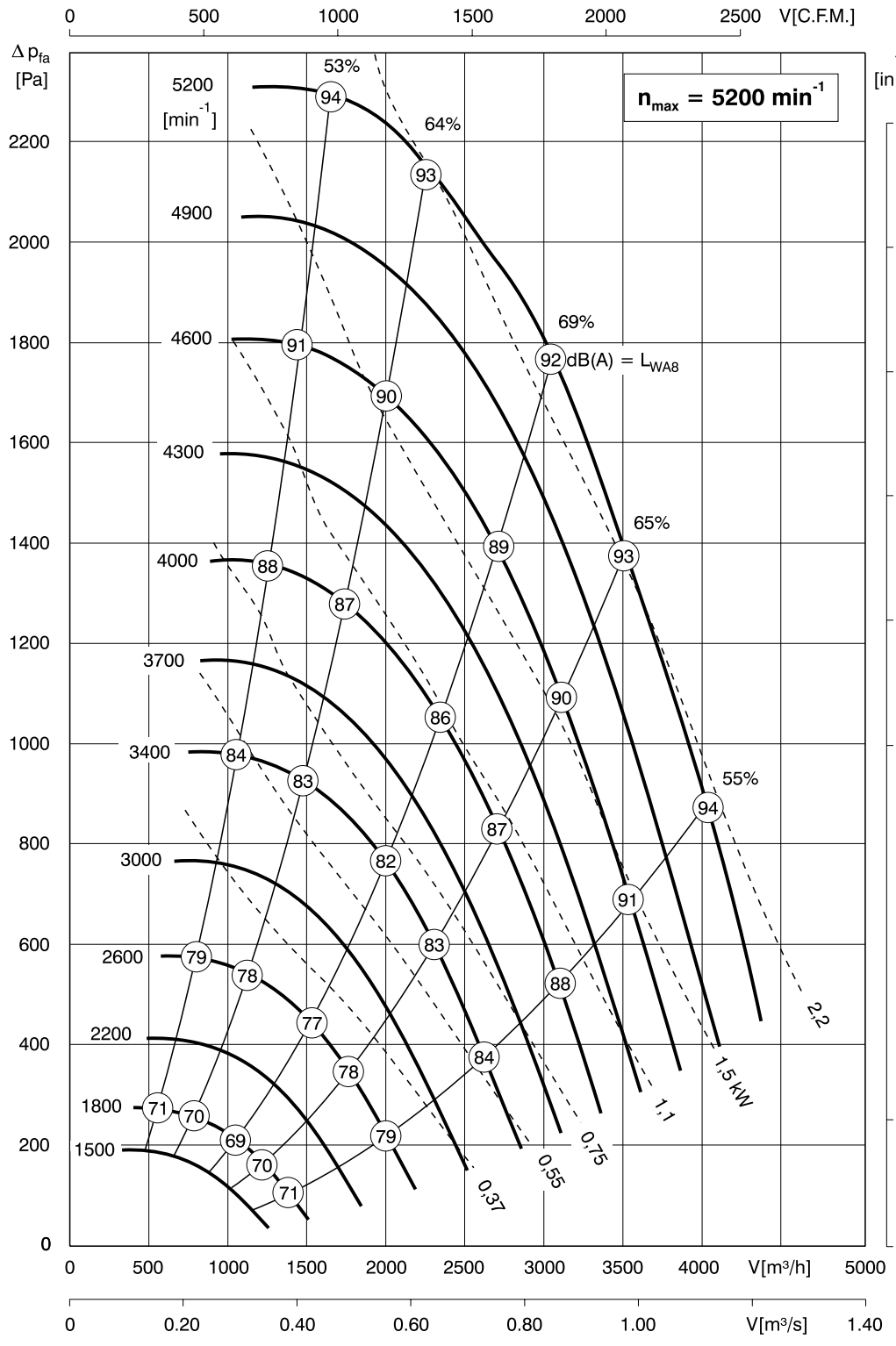
一体化电机类似IEC标准电机：尺寸从80-132为2，极个别为4极。

Motors with integrated frequency converter

Normally frequency converters are separated from the IEC-motor. As a space saving alternative we offer motors with integrated frequency converters up to fan size 630.

Advantages are also wiring requirements, no need for shielded leads, space requirements of the AHU's complete control unit are minimal.

The allocation of the motors with integrated frequency converter analogous to the standard IEC-motor. All motors with integrated frequency converter of the sizes 80 to 132 are available in 2- pole respectively 4-pole versions.



n [min^{-1}]	u [m/s]	η Korr
5200	68,6	1
4900	64,7	1
4600	60,7	1
4300	56,7	0,99
4000	52,8	0,99
3700	48,8	0,99
3400	44,9	0,99
3000	39,6	0,98
2600	34,3	0,98
2200	29	0,98
1800	23,8	0,97
1500	19,8	0,97

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

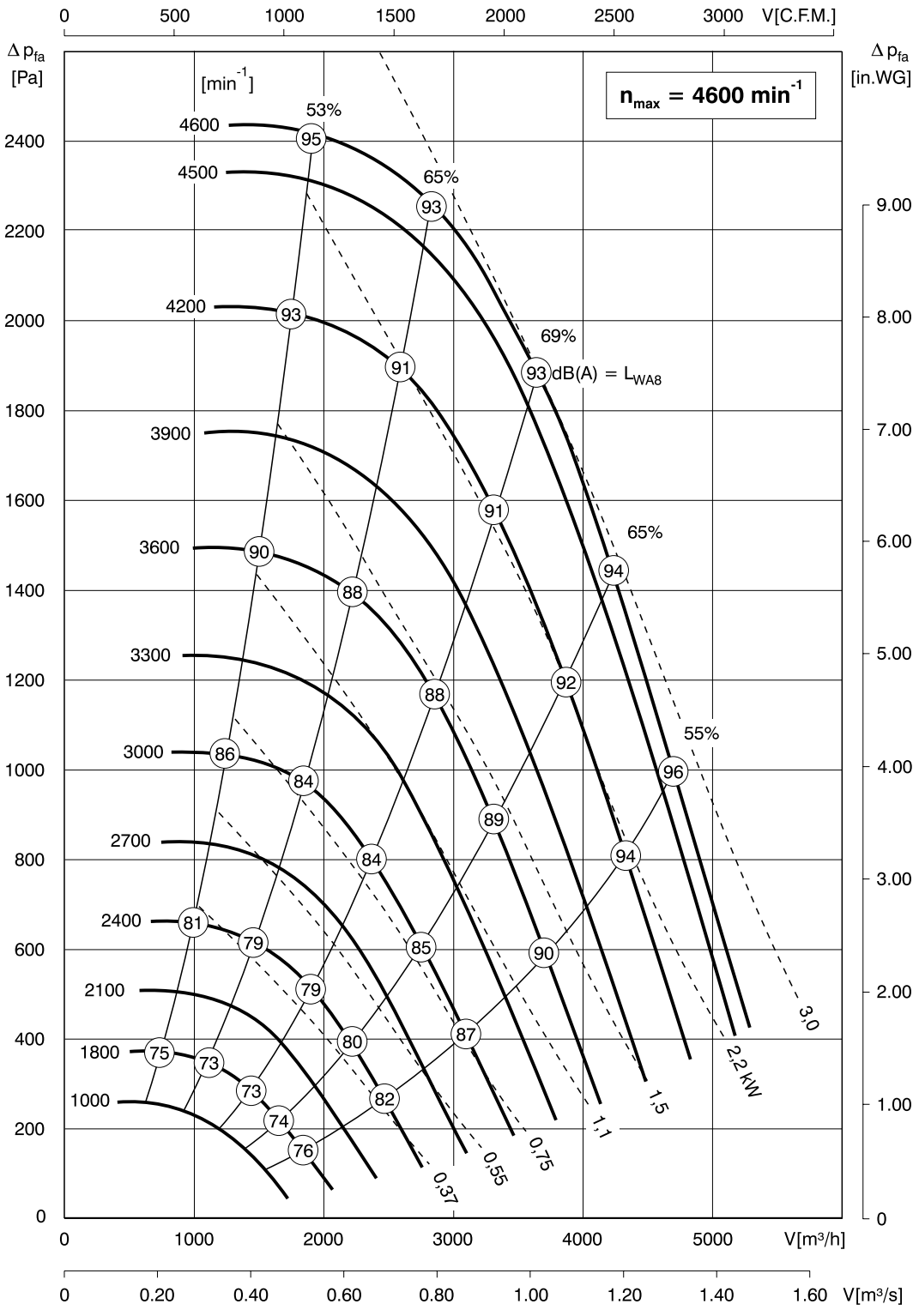
$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-11	-8
125	-8	-11
250	-1	-4
500	-4	-4
1K	-6	-4
2K	-7	-7
4K	-9	-11
8K	-16	-18

Düsenbeiwert / calibration factor $k_{10} = 46$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 250-2KW.078.A07-001	71-2	2800	0,55	1,36	55	3080	a.A.	a.A.
DKN_ 250-2KW.078.A08-001	80-2	2855	0,75	1,73	60	3425	20	a.A.
DKN_ 250-2KW.078.A08-002	80-2	2845	1,1	2,4	68	3780	21	a.A.
DKN_ 250-2KW.078.A09-001	90S-2	2860	1,5	3,25	75	4290	a.A.	a.A.
DKN_ 250-2KW.078.A09-001	90L-2	2880	2,2	4,6	85	4900	a.A.	a.A.
DKN_ 250-2KW.078.A10-001	100L-2	2895	3,0	6,1	89	5200	a.A.	a.A.

a.A. = auf Anfrage / on request



n [min-1]	u [m/s]	η Korr
4600	68,4	1
4500	66,9	1
4200	62,5	1
3900	58	0,99
3600	53,5	0,99
3300	49,1	0,99
3000	44,6	0,99
2700	40,1	0,98
2400	35,7	0,98
2100	31,2	0,98
1800	26,8	0,97
1500	22,3	0,97

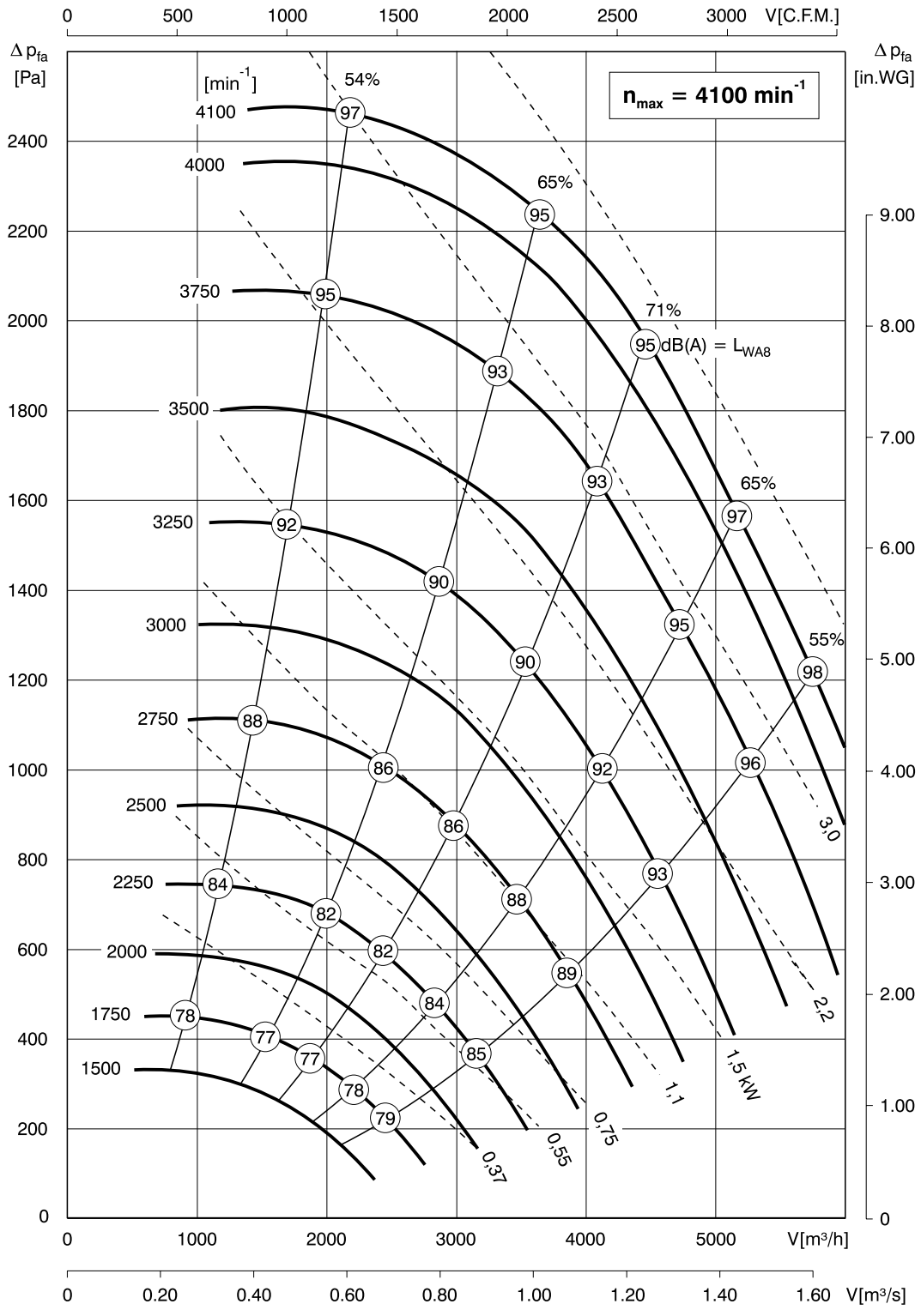
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-11	-8
125	-8	-11
250	-1	-4
500	-4	-4
1K	-6	-4
2K	-7	-7
4K	-9	-11
8K	-16	-18

Düsenbeiwert / calibration factor $k_{10} = 55$

Typenbezeichnung	Motortyp	n_N [min-1]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min-1]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 280-4KW.087.A08-001	80-4	1395	0,55	1,45	90	2510	20	18
DKN_ 280-2KW.087.A08-001	80-2	2855	0,75	1,73	50	2855	20	18,5
DKN_ 280-2KW.087.A08-002	80-2	2845	1,1	2,4	55	3130	22	20
DKN_ 280-2KW.087.A09-001	90S-2	2860	1,5	3,25	61	3490	24	23
DKN_ 280-2KW.087.A09-002	90L-2	2880	2,2	4,6	70	3980	27	26
DKN_ 280-2KW.087.A10-001	100L-2	2895	3,0	6,1	76	4400	34	32
DKN_ 280-2KW.087.A11-001	112M-2	2900	4,0	7,7	79	4600	41	39



n [min^{-1}]	u [m/s]	η Korr
4100	68,5	1
4000	66,8	1
3750	62,6	1
3500	58,5	0,99
3250	54,3	0,99
3000	50,1	0,99
2750	45,9	0,99
2500	41,8	0,98
2250	37,6	0,98
2000	33,4	0,98
1750	29,2	0,97
1500	25,1	0,97

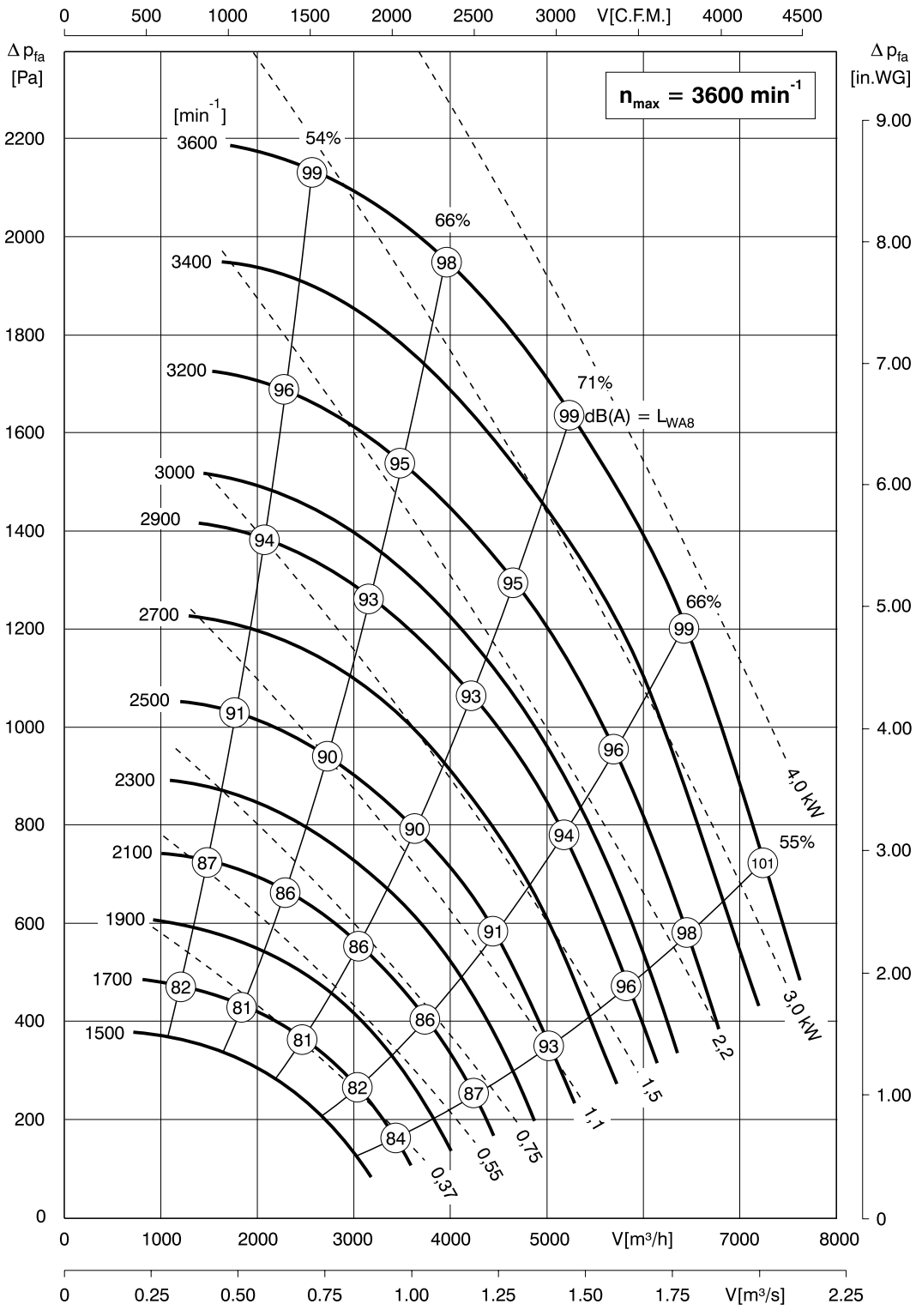
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-11	-8
125	-7	-11
250	0	-3
500	-3	-2
1K	-5	-6
2K	-9	-7
4K	-10	-11
8K	-16	-18

Düsenbeiwert / calibration factor $k_{10} = 70$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 315-4KW.098.A08-001	80-4	1395	0,55	1,45	74	2065	20	19
DKN_ 315-4KW.098.A08-002	80-4	1395	0,75	1,86	82	2290	21	20
DKN_ 315-4KW.098.A09-001	90S-4	1410	1,1	2,65	93	2620	25	24
DKN_ 315-2KW.098.A09-001	90S-2	2860	1,5	3,25	51	2920	25	25
DKN_ 315-2KW.098.A09-002	90L-2	2880	2,2	4,6	57	3280	28	28
DKN_ 315-2KW.098.A10-001	100L-2	2895	3,0	6,1	63	3650	34	34
DKN_ 315-2KW.098.A11-001	112M-2	2900	4,0	7,7	69	4000	41	41



n [min^{-1}]	u [m/s]	η Korr
3600	67,7	1
3400	63,9	1
3200	60,2	1
3000	56,4	0,99
2900	54,5	0,99
2700	50,8	0,99
2500	47	0,99
2300	43,2	0,98
2100	39,5	0,98
1900	35,7	0,98
1700	32	0,97
1500	28,2	0,97

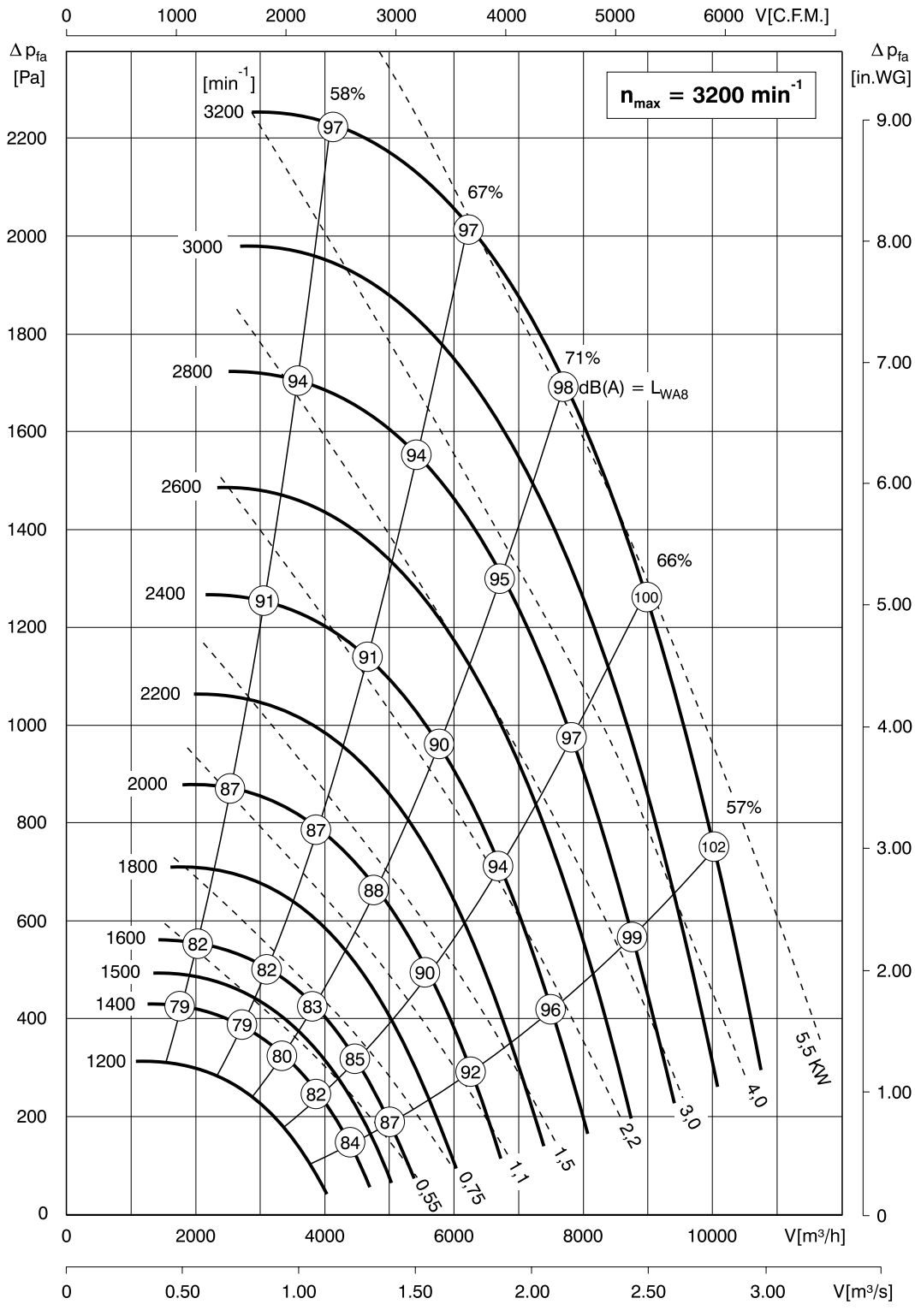
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-11	-8
125	-7	-11
250	0	-3
500	-3	-2
1K	-5	-6
2K	-9	-7
4K	-10	-11
8K	-16	-18

Düsenbeiwert / calibration factor $k_{10} = 90$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 355-4KW.110.A08-001	80-4	1395	0,55	1,45	66	1840	26	20
DKN_ 355-4KW.110.A08-002	80-4	1395	0,75	1,86	73	2035	26	21,5
DKN_ 355-4KW.110.A09-001	90S-4	1410	1,1	2,65	82	2310	30	24,5
DKN_ 355-4KW.110.A09-002	90L-4	1420	1,5	3,45	90	2550	33	27,5
DKN_ 355-2KW.110.A09-001	90L-2	2880	2,2	4,6	51	2940	33	28
DKN_ 355-2KW.110.A10-001	100L-2	2895	3,0	6,1	56	3240	39	34
DKN_ 355-2KW.110.A11-001	112M-2	2900	4,0	7,7	61	3540	46	41



n [min-1]	u [m/s]	η Korr
3200	67,7	1
3000	63,5	1
2800	59,2	1
2600	55	0,99
2400	50,8	0,99
2200	46,5	0,99
2000	42,3	0,99
1800	38,1	0,98
1600	33,8	0,98
1500	31,7	0,98
1400	29,6	0,97
1200	25,4	0,97

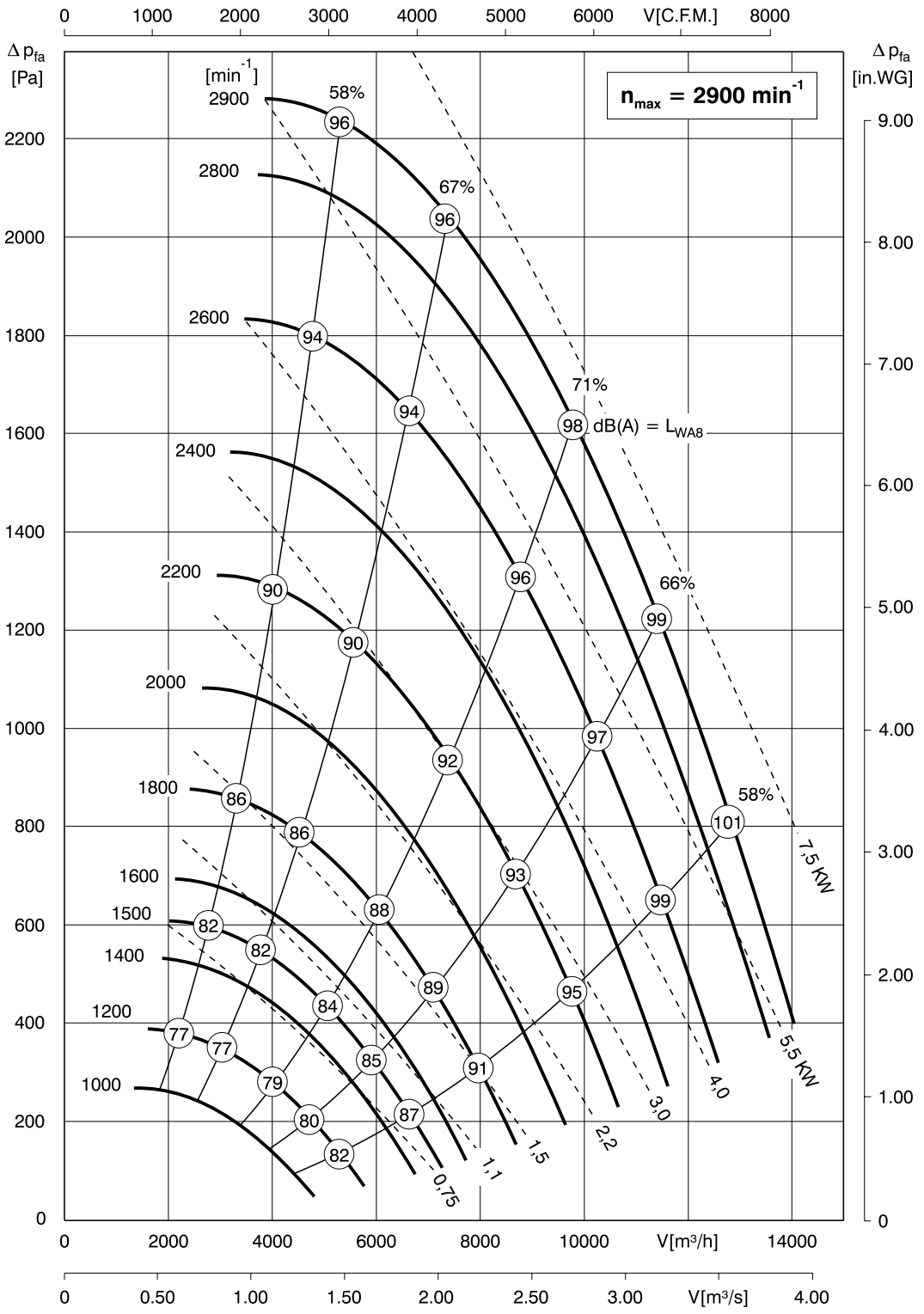
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-11	-9
125	-4	-8
250	0	-2
500	-3	-2
1K	-5	-5
2K	-8	-8
4K	-12	-13
8K	-18	-19

Düsenbeiwert / calibration factor $k_{10} = 113$

Typenbezeichnung	Motortyp	n_N [min-1]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min-1]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 400-4KW.123.A08-001	80-4	1395	0,75	1,86	56	1560	27	22,5
DKN_ 400-4KW.123.A09-001	90S-4	1410	1,1	2,65	64	1800	32	25,5
DKN_ 400-4KW.123.A09-002	90L-4	1420	1,5	3,45	70	1985	35	29
DKN_ 400-4KW.123.A10-001	100L-4	1420	2,2	4,90	79	2240	40	35
DKN_ 400-4KW.123.A10-002	100L-4	1420	3,0	6,40	88	2500	43	38
DKN_ 400-4KW.123.A11-001	112M-4	1440	4,0	8,30	95	2735	50	44
DKN_ 400-2KW.123.A13-001	132S-2	2915	5,5	11,1	52	3030	66	54
DKN_ 400-2KW.123.A13-002	132S-2	2915	7,5	14,7	55	3200	68	62



n [min-1]	u [m/s]	η Korr
2900	68,9	1
2800	66,6	1
2600	61,8	1
2400	57,1	0,99
2200	52,3	0,99
2000	47,5	0,99
1800	42,8	0,99
1600	38	0,98
1500	35,7	0,98
1400	33,3	0,98
1200	28,5	0,97
1000	23,8	0,97

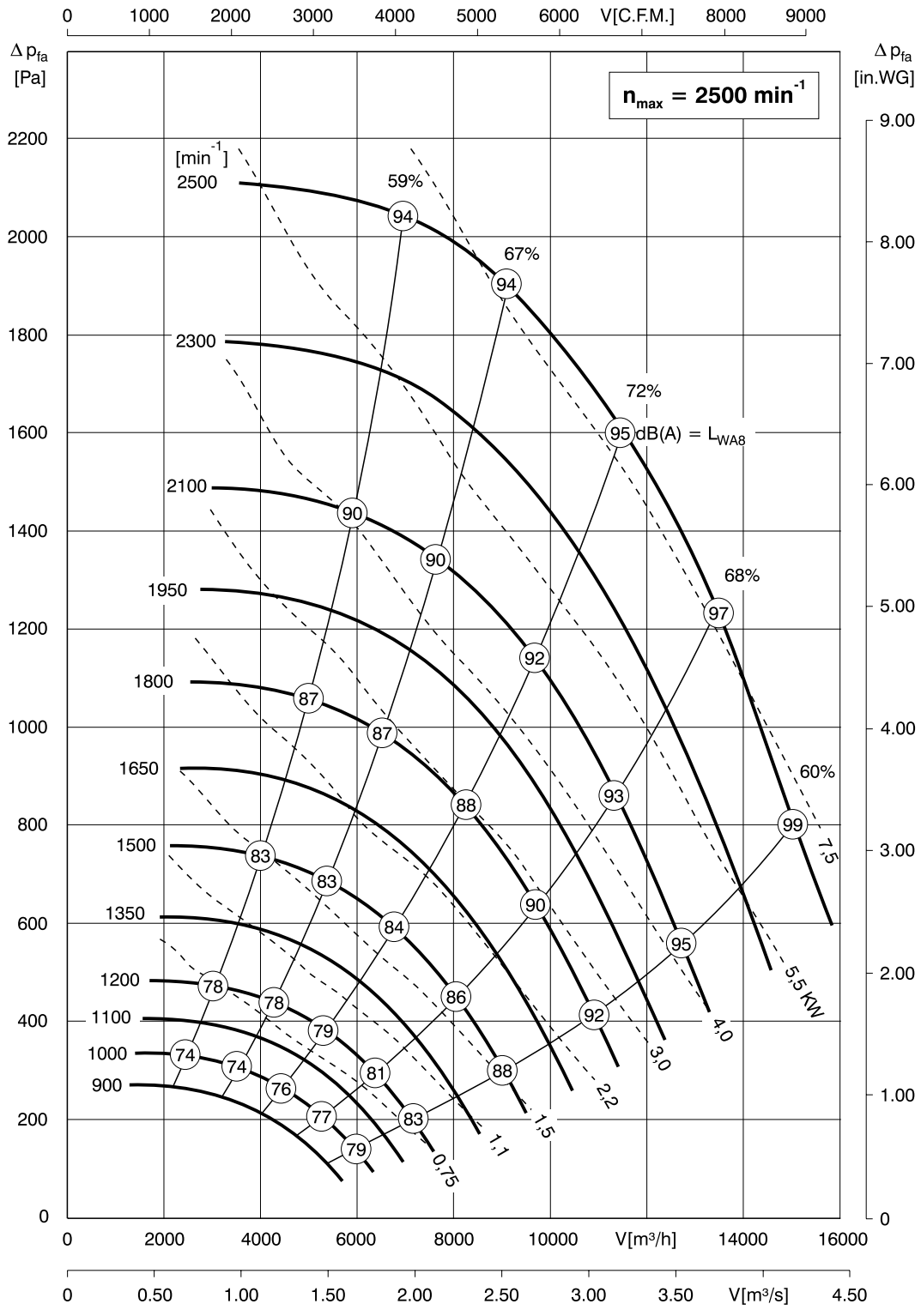
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-11	-9
125	-4	-8
250	0	-2
500	-3	-2
1K	-5	-5
2K	-8	-8
4K	-12	-13
8K	-19	-19

Düsenbeiwert / calibration factor $k_{10} = 145$

Typenbezeichnung	Motortyp	n_N [min-1]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min-1]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 450-4KW.138.A09-001	90S-4	1410	1,1	2,65	53	1490	41	31,5
DKN_ 450-4KW.138.A09-002	90L-4	1420	1,5	3,45	59	1670	42	35
DKN_ 450-4KW.138.A10-001	100L-4	1420	2,2	4,90	67	1900	48	41
DKN_ 450-4KW.138.A10-002	100L-4	1420	3,0	6,40	74	2100	51	44
DKN_ 450-4KW.138.A11-001	112M-4	1440	4,0	8,30	80	2300	57	50
DKN_ 450-4KW.138.A13-001	132S-4	1455	5,5	11,4	89	2590	70	62
DKN_ 450-2KW.138.A13-001	132S-2	2915	7,5	14,7	50	2915	77	69



n [min^{-1}]	u [m/s]	η Korr
2500	66,8	1
2300	61,4	1
2100	56,1	1
1950	52,1	0,99
1800	48,1	0,99
1650	44,1	0,99
1500	40,1	0,99
1350	36	0,98
1200	32	0,98
1100	29,4	0,98
1000	26,7	0,97
900	24	0,97

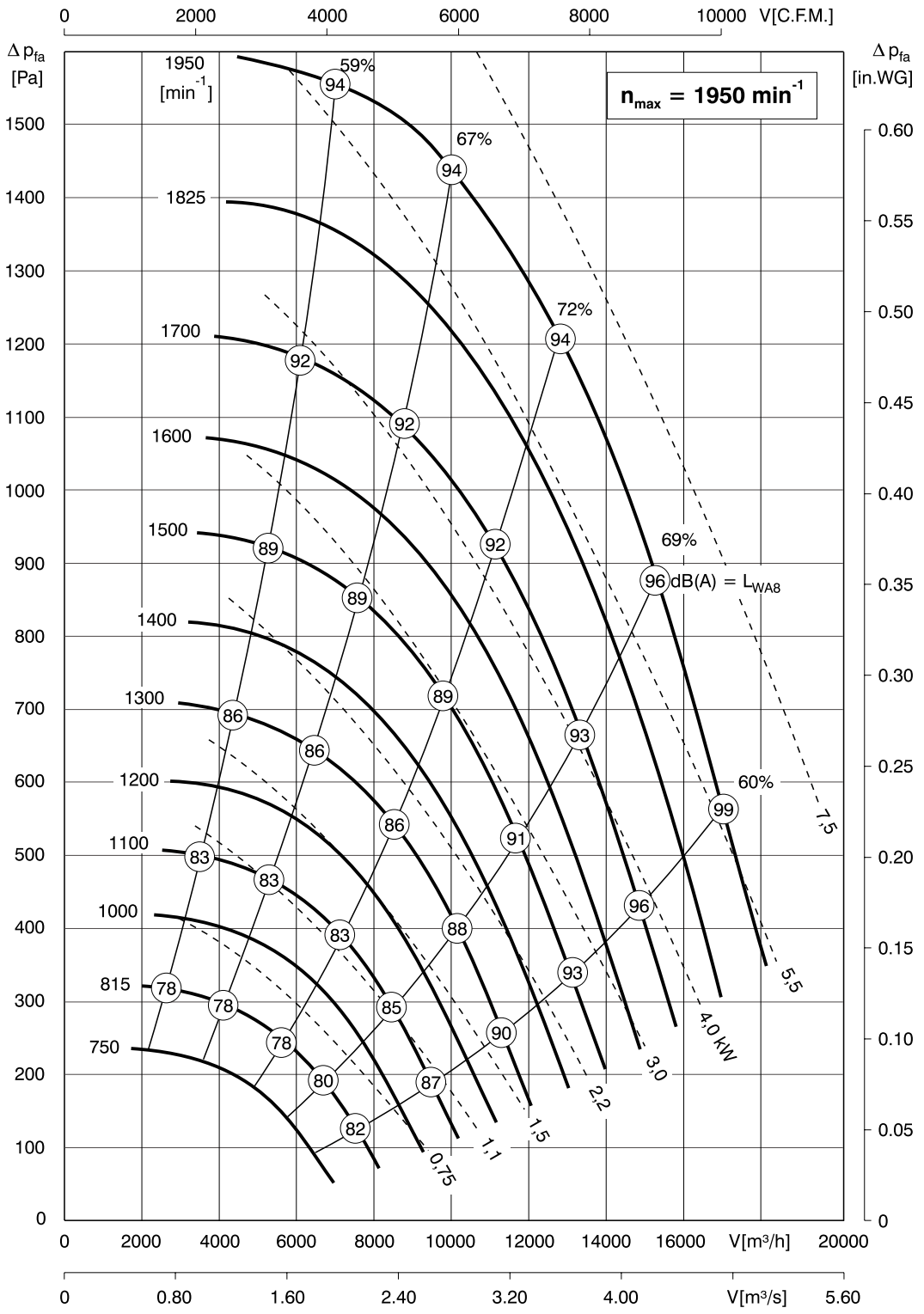
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-10	-10
125	-3	-7
250	0	-1
500	-4	-3
1K	-5	-4
2K	-8	-8
4K	-12	-13
8K	-19	-20

Düsenbeiwert / calibration factor $k_{10} = 180$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 500-6KW.155.A09-001	90L-6	915	1,1	2,9	68	1245	40	35
DKN_ 500-6KW.155.A10-001	100L-6	925	1,5	3,9	74	1370	45	43
DKN_ 500-4KW.155.A10-001	100L-4	1420	2,2	4,9	55	1560	45	51
DKN_ 500-4KW.155.A10-002	100L-4	1420	3,0	6,4	60	1700	48	54
DKN_ 500-4KW.155.A11-001	112M-4	1440	4,0	8,3	66	1900	55	60
DKN_ 500-4KW.155.A13-001	132S-4	1455	5,5	11,4	73	2120	72	72
DKN_ 500-4KW.155.A13-002	132M-4	1455	7,5	15,1	81	2350	75	78
DKN_ 500-4KW.155.A16-001	160M-4	1460	11	21,4	85	2480	104	97



n [min-1]	u [m/s]	η Korr
1950	58,2	1
1825	54,5	1
1700	50,7	1
1600	47,8	0,99
1500	44,8	0,99
1400	41,8	0,99
1300	38,8	0,99
1200	35,8	0,98
1100	32,8	0,98
1000	29,8	0,98
815	24,3	0,97
750	22,4	0,97

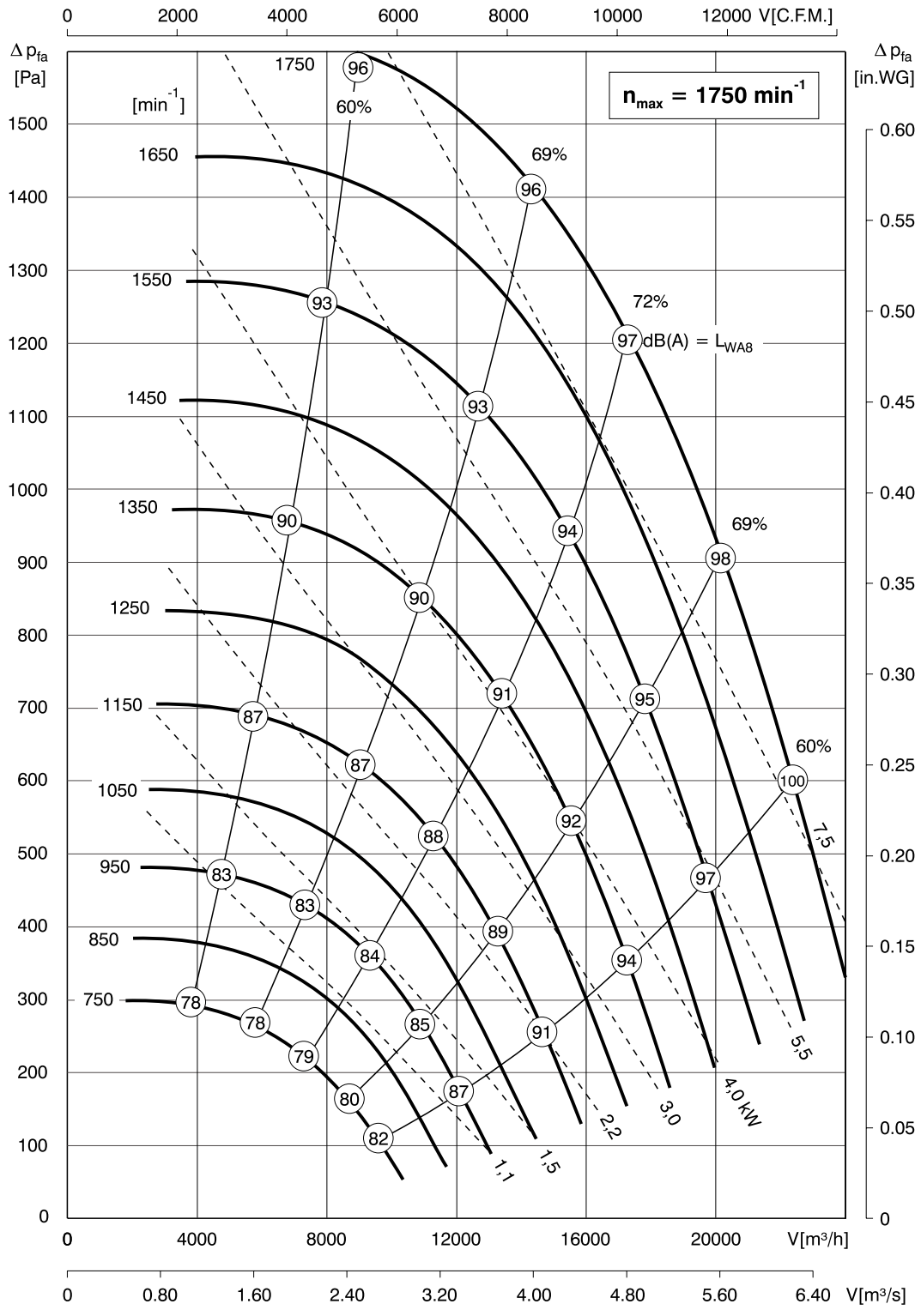
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-10	-10
125	-3	-7
250	0	-1
500	-4	-3
1K	-5	-4
2K	-8	-8
4K	-12	-13
8K	-19	-20

Düsenbeiwert / calibration factor $k_{10} = 220$

Typenbezeichnung	Motortyp	n_N [min-1]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min-1]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 560-6KW.174.A09-001	90L-6	915	1,1	2,9	56	1025	51	42
DKN_ 560-6KW.174.A10-001	100L-6	925	1,5	3,9	62	1150	58	50
DKN_ 560-4KW.174.A10-001	100L-4	1420	3,0	6,4	51	1450	61	50
DKN_ 560-4KW.174.A11-001	112M-4	1440	4,0	8,3	55	1580	68	56
DKN_ 560-4KW.174.A13-001	132S-4	1455	5,5	11,4	61	1775	81	68
DKN_ 560-4KW.174.A13-002	132M-4	1455	7,5	15,1	67	1950	89	74



n [min^{-1}]	u [m/s]	η Korr
1750	58,6	1
1650	55,3	1
1550	52	1
1450	48,6	0,99
1350	45,2	0,99
1250	41,9	0,99
1050	35,2	0,99
950	31,8	0,98
850	28,5	0,98
750	25	0,98

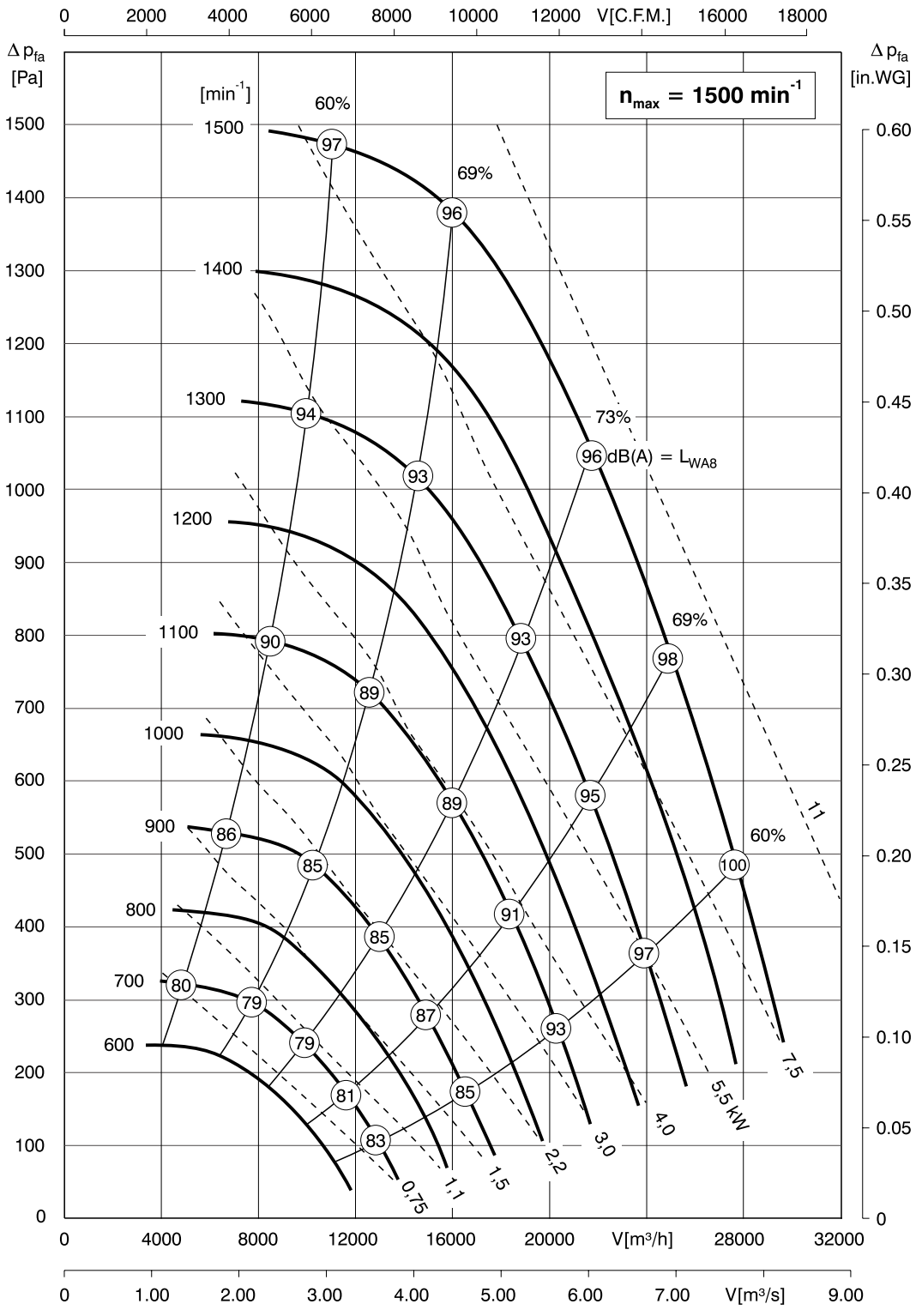
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-10	-10
125	-2	-3
250	1	0
500	-5	-4
1K	-5	-5
2K	-7	-7
4K	-12	-12
8K	-19	-20

Düsenbeiwert / calibration factor $k_{10} = 287$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 630-6KW.195.A10-001	100L-6	925	1,5	3,9	50	925	60	54
DKN_ 630-6KW.195.A11-001	112M-6	940	2,2	5,2	56	1050	65	56
DKN_ 630-6KW.195.A13-001	132S-6	950	3,0	7,2	62	1180	80	70
DKN_ 630-4KW.195.A13-001	132S-4	1455	5,5	11,4	50	1455	83	72
DKN_ 630-4KW.195.A13-002	132S-4	1455	7,5	15,1	55	1600	91	78
DKN_ 630-4KW.195.A16-001	160M-4	1460	11	21,4	60	1750	116	97



n [min-1]	u [m/s]	η Korr
1500	56,4	1
1400	52,6	1
1300	48,9	1
1200	45,1	0,99
1100	41,4	0,99
1000	37,6	0,99
900	33,8	0,99
800	30,1	0,98
700	26,3	0,98
600	22,6	0,98

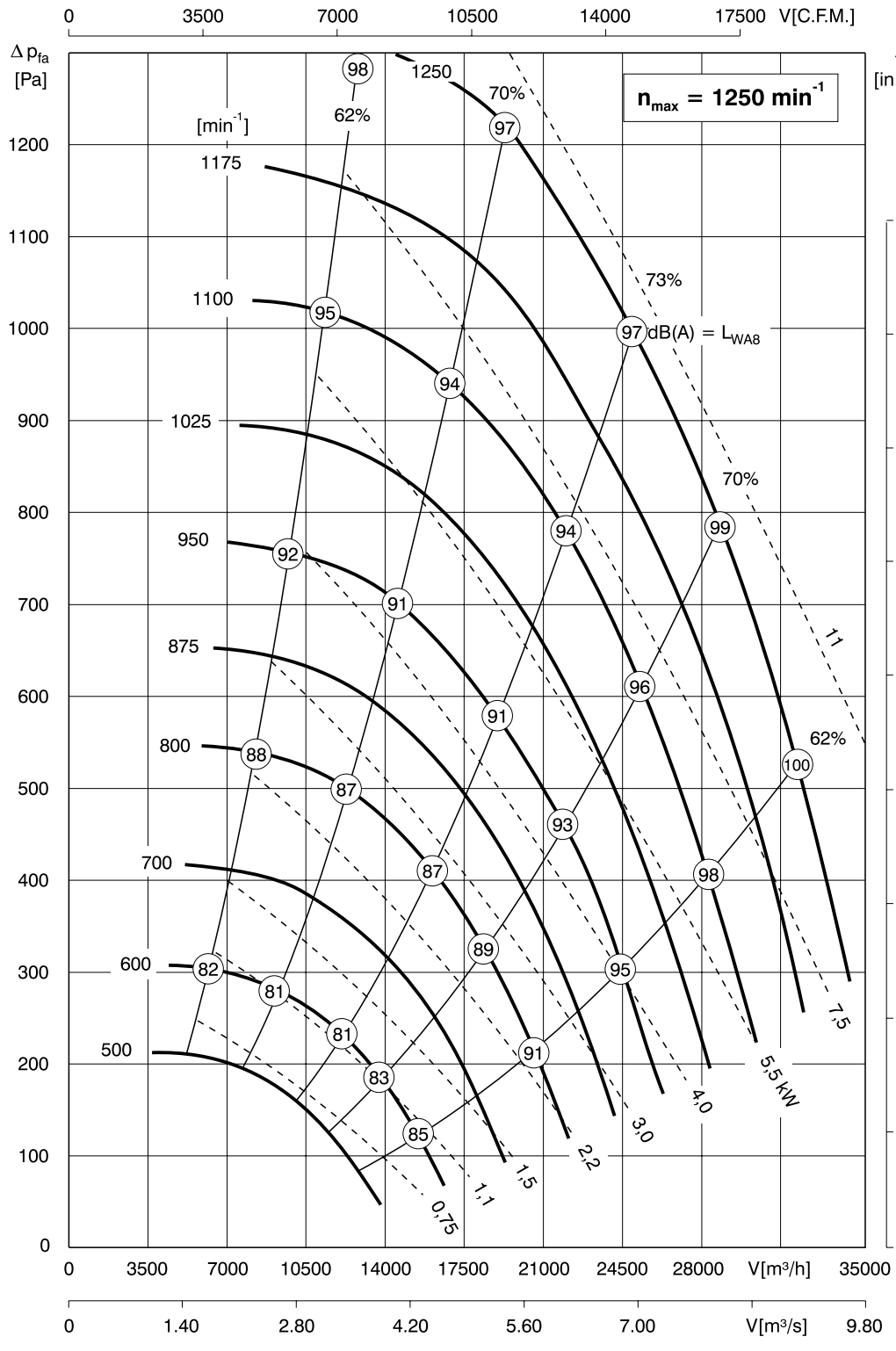
$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{Wrel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{Wrel}$

$L_{Woct\ outlet} = L_{WA8} - L_{Wrel}$
$L_{Woct\ inlet} = L_{WA5} - L_{Wrel}$

f [Hz]	L_{Wrel} Eintritt-Seite / inlet side [dB]	L_{Wrel} Austritt-Seite / outlet side [dB]
63	-3	-2
125	1	0
250	-4	-4
500	-5	-5
1K	-2	-2
2K	-11	-11
4K	-17	-17
8K	-24	-25

Düsenbeiwert / calibration factor $k_{10} = 370$

Typenbezeichnung	Motortyp	n_N [min-1]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min-1]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 710-8KW.219.A11-001	112M-8	705	1,5	3,9	54	760	138	-
DKN_ 710-8KW.219.A13-001	132S-8	700	2,2	5,7	62	870	155	-
DKN_ 710-6KW.219.A13-001	132S-6	950	3,0	7,2	51	970	155	-
DKN_ 710-6KW.219.A13-002	132M-6	950	4,0	9,4	56	1060	160	-
DKN_ 710-6KW.219.A13-003	132M-6	950	5,5	12,8	62	1180	168	-
DKN_ 710-6KW.219.A16-001	160M-6	960	7,5	17,0	68	1305	190	-
DKN_ 710-4KW.219.A16-001	160M-4	1460	11	21,4	51	1500	182	-



n [min^{-1}]	u [m/s]	η Korr
1250	52,9	1
1175	49,7	1
1100	46,5	1
1025	43,4	0,99
950	40,2	0,99
875	37	0,99
800	33,8	0,99
700	29,6	0,98
600	25,4	0,98
500	21,2	0,98

$L_{WA5} = L_{WA8} - 6$ dB
$L_{WA6} = L_{WA8} - 3$ dB
$L_{Wokt\ Austritt} = L_{WA8} - L_{WRel}$
$L_{Wokt\ Eintritt} = L_{WA5} - L_{WRel}$

$L_{Woct\ outlet} = L_{WA8} - L_{WRel}$
$L_{Woct\ inlet} = L_{WA5} - L_{WRel}$

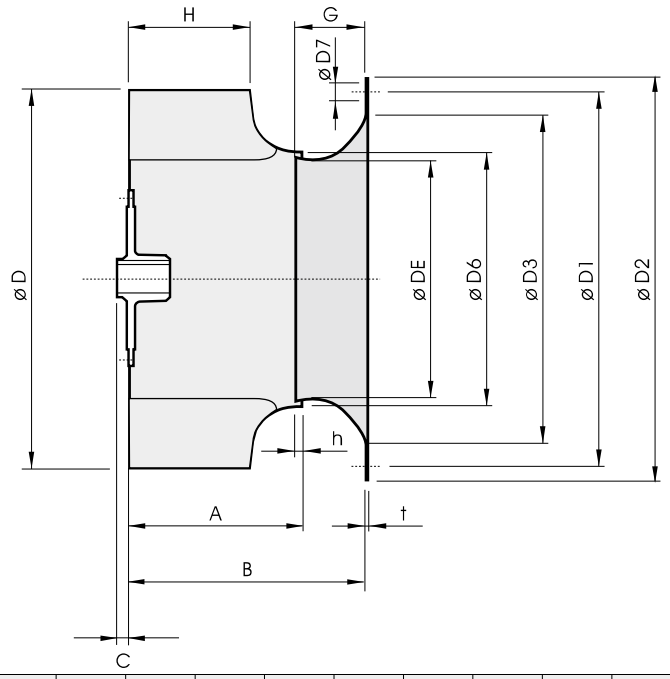
f [Hz]	L_{WRel} Eintritt-Seite / inlet side [dB]	L_{WRel} Austritt-Seite / outlet side [dB]
63	-3	-2
125	1	0
250	-4	-4
500	-5	-5
1K	-2	-2
2K	-11	-11
4K	-17	-17
8K	-24	-24

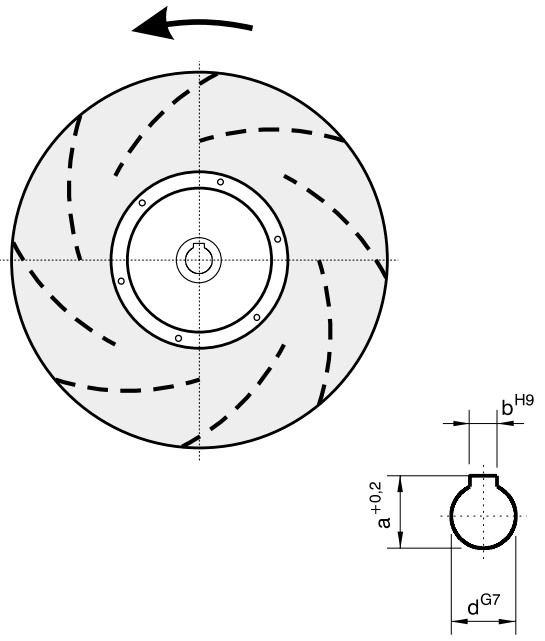
Düsenbeiwert / calibration factor $k_{10} = 475$

Typenbezeichnung	Motortyp	n_N [min^{-1}]	P_N [kW]	I_N [A]	f_{max} [Hz]	n_{max} [min^{-1}]	Gewicht / Weight [kg] DKNB	/ DKNM
DKN_ 800-8KW.246.A13-001	132M-8	700	3,0	7,6	53	740	163	-
DKN_ 800-6KW.246.A13-001	132M-6	950	5,5	12,8	51	970	168	-
DKN_ 800-6KW.246.A16-001	160M-6	960	7,5	17,0	56	1075	190	-
DKN_ 800-6KW.246.A16-002	160L-6	960	11	24,5	65	1250	216	-

LRHF : Laufrad mit Nabe

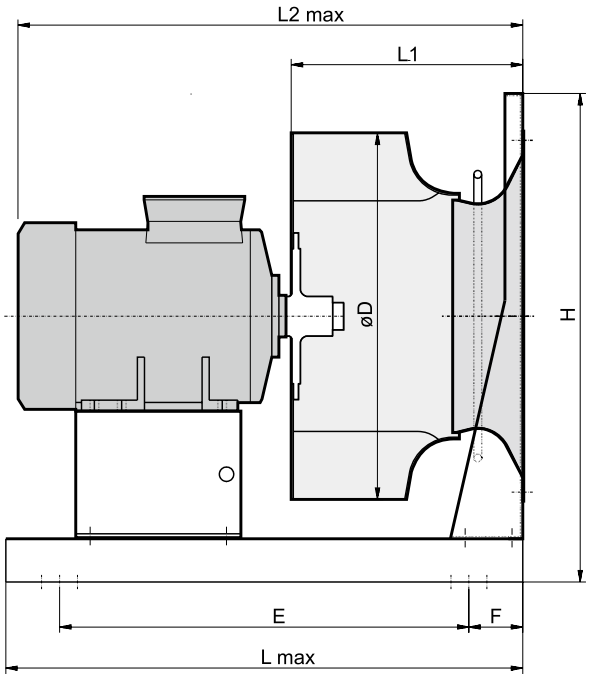
Impeller with hub

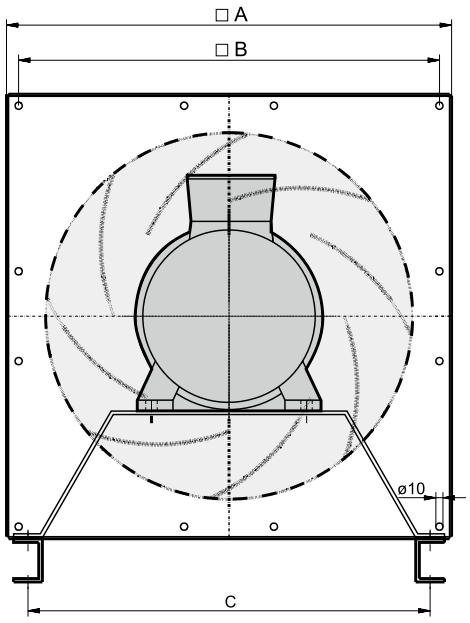




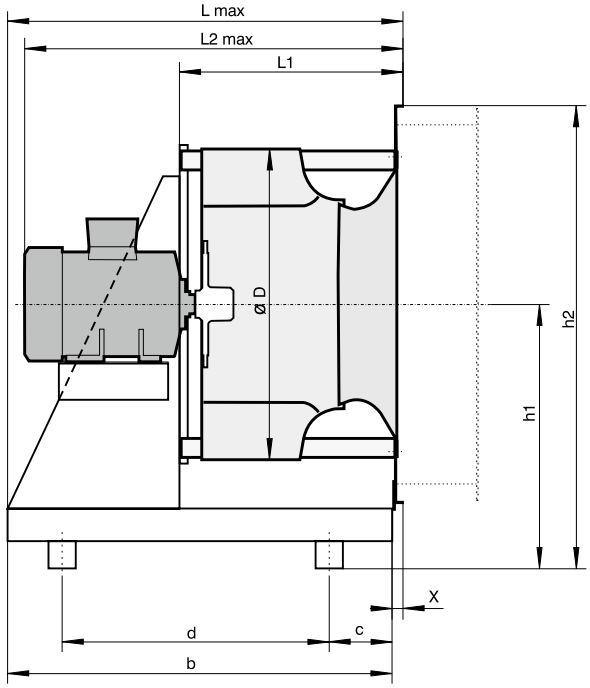
Artikel-Nr	A	B	C	**H**	øD	a	b	d	øD6	h	øDE	øD3	øD2	øD1	øD7	G	t
R63-25014	118	160	6	**78**	252	16,3	5	14	168	4,5	155	225	280	259 / 6x60°	7	46	1,5
R63-25019			6			21,8	6	19									
R63-25024			9,5			27,3	8	24									
R63-25028			9,5			31,3	8	28									
R63-28019	133	182	9,5	**87**	284	21,8	6	19	188	5	174	250	307	286 / 6x60°	7	52	1,5
R63-28024						27,3	8	24									
R63-28028						31,3	8	28									
R63-315-19	146	200	9,5	**98**	319	21,8	6	19	212	5,5	195	282	348	320 / 6x60°	11	52	1,5
R63-315-24						27,3	8	24									
R63-315-28						31,3	8	28									
R63-355-19	164	225	9,5	**110**	359	21,8	6	19	238	6	219	315	382	356 / 6x60°	11	67	1,5
R63-355-24						27,3	8	24									
R63-355-28						31,3	8	28									
R63-400-19	184	253	9,5	**123**	404	21,8	6	19	267	7	248	355	422	395 / 8x45°	11	76	1,5
R63-400-24			9,5			27,3	8	24									
R63-400-28			9,5			31,3	8	28									
R63-400-38			17			41,3	10	38									
R63-450-24	209	283	17	**138**	454	27,3	8	24	300	8	277	400	464	438 / 8x45°	11	82	1,5
R63-450-28						31,3	8	28									
R63-450-38						41,3	10	38									
R63-500-24	234	323	17	**155**	510	27,3	8	24	337	9	310	450	515	490 / 8x45°	11	98	1,5
R63-500-28						31,3	8	28									
R63-500-38						41,3	10	38									
R63-500-42						45,3	12	42									
R63-560-24	262	357	17	**174**	570	27,3	8	24	377	10	348	500	564	541 / 8x45°	11	105	1,5
R63-560-28						31,3	8	28									
R63-560-38						41,3	10	38									
R63-630-28	292	395	17	**195**	640	31,3	8	28	424	11	390	560	638	608 / 8 x45°	14	114	1,5
R63-630-38						41,3	10	38									
R63-630-42						45,3	12	42									
R63-710-28	326	449	16	**219**	718	31,3	8	28	476	12,5	438	630	710	674 / 8x45°	14	135	1,5
R63-710-38						41,3	10	38									
R63-710-42						45,3	12	42									
R63-800-38	366	506	15	**246**	808	41,3	10	38	534	14	491	710	785	751 / 8x45°	14	154	2,0
R63-800-42						45,3	12	42									

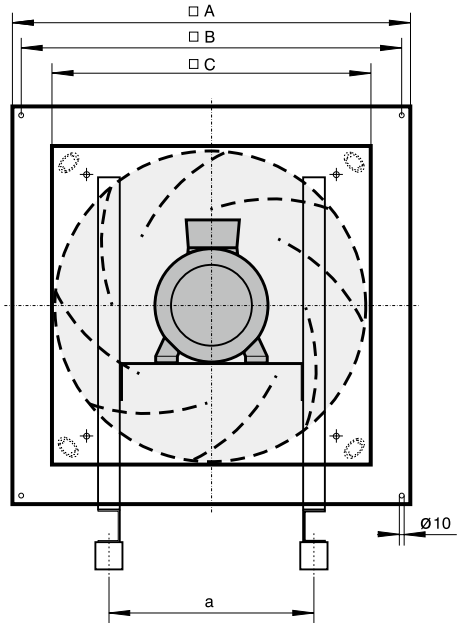
DKNB





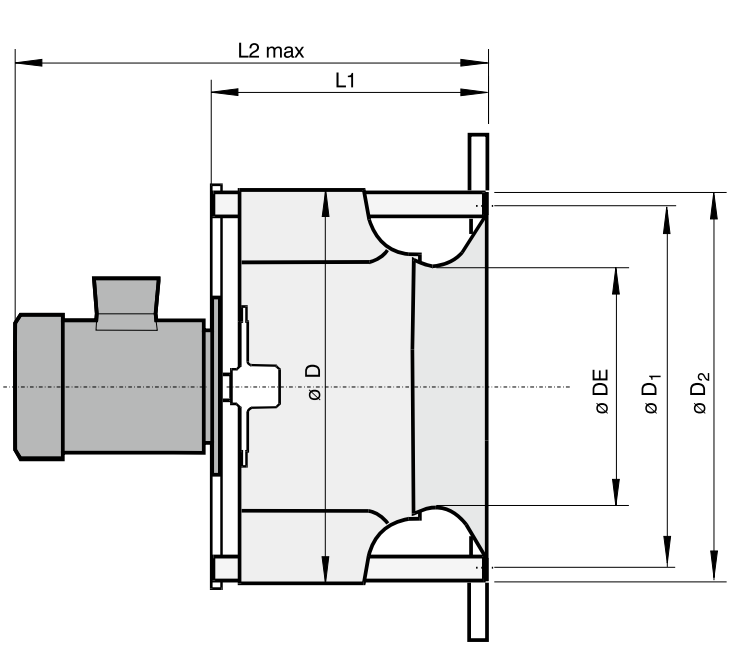
Typ	A	B	C	øD	E	F	Lmax	H	L1	L2max	Stutzen
DKNB 250	415	381	355	252	370	75	520	455	160	481	ELS280-0355N
DKNB 280	415	381	355	284	370	75	520	455	180	525	
DKNB 315	415	381	355	319	370	75	520	455	200	545	
DKNB 355	510	476	450	359	450	75	600	550	225	570	ELS355-0450N
DKNB 400	510	476	450	404	450	75	600	550	255	645	
DKNB 450	620	586	560	454	570	75	720	680	285	665	ELS450-0560N
DKNB 500	620	586	560	510	570	75	720	680	325	807	
DKNB 560	770	736	710	570	650	75	800	830	357	747	ELS560-0710N
DKNB 630	770	736	710	640	650	75	800	830	395	892	

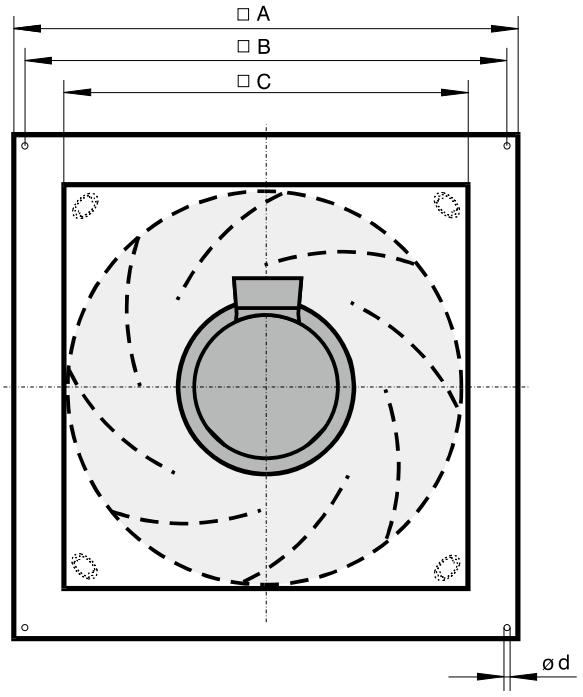




Typ	A	B	C	øD	Lmax	L2max	L1	a	b	c	d	h1	h2	x
DKNB 710	971	929	-	718	1050	1000	513	650	1030	135	800	615,5	1101	20
DKNB 800	971	929	-	808	1050	1060	570	650	1030	135	800	615,5	1101	20

DKNM



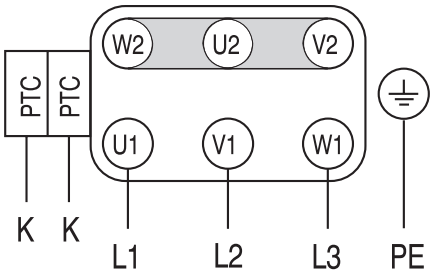


Typ	A	B	C	d	D	$L2_{max}$	L1	DE	D1	D2
DKNM 280	500	450	320	11	284	555	210	174	286	307
DKNM 315	500	450	360	11	319	575	230	195	320	348
DKNM 355	500	450	395	11	359	600	255	219	356	382
DKNM 400	500	450	420	11	404	710	287	248	395	422
DKNM 450	630	580	470	14	454	745	322	277	438	464
DKNM 500	630	580	535	14	510	840	356	310	487	515
DKNM 560	800	750	585	14	570	820	396	348	541	564
DKNM 630	800	750	625	14	640	920	436	390	608	638

Andere Abmessungen auf Anfrage.
Other dimensions on request.

接线图

带热保护器的三相交流电机



(Y) 星型连接 / Star connection

电机连接方式见电机铭牌，通过互换任意两相可以改变旋转方向。

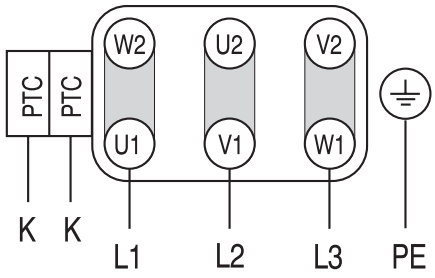
电机电压：220 V / 380V：

- 如果电源是380V，电机必须按照如图的星形连接接线。
- 如果电源是220V，电机必须按照如图的三角形连接接线。

备注：电源是220V，可用在外置变频器上。

Wiring diagrams

Three- phase A.C. motor with PTC resistor



(Δ) 三角连接 / Delta connection

Motor must be wired according to motor label. Reversible rotation by interchanging phases.

Motor voltages 230 V Δ / 400 V Y :

- Motor must be wired up in star connection (Y) according to the connection diagram, if power supply is 400 V / 3~.
- Motor must be wired up in delta connection (Δ) according to the connection diagram, if power supply is 230 V / 3~.
  Note: The above mentioned supplies are available on the “out” of a frequency converter if it is supplied with 230 V / 1~.

Motor voltages 400 V Δ / 690 V Y :

- Motor must be wired up in delta connection (Δ) according to the connection diagram, if power supply is 400 V / 3~.
  Note: The above mentioned motors can be started in delta-star.

您的销售代表 *your sales representative:*