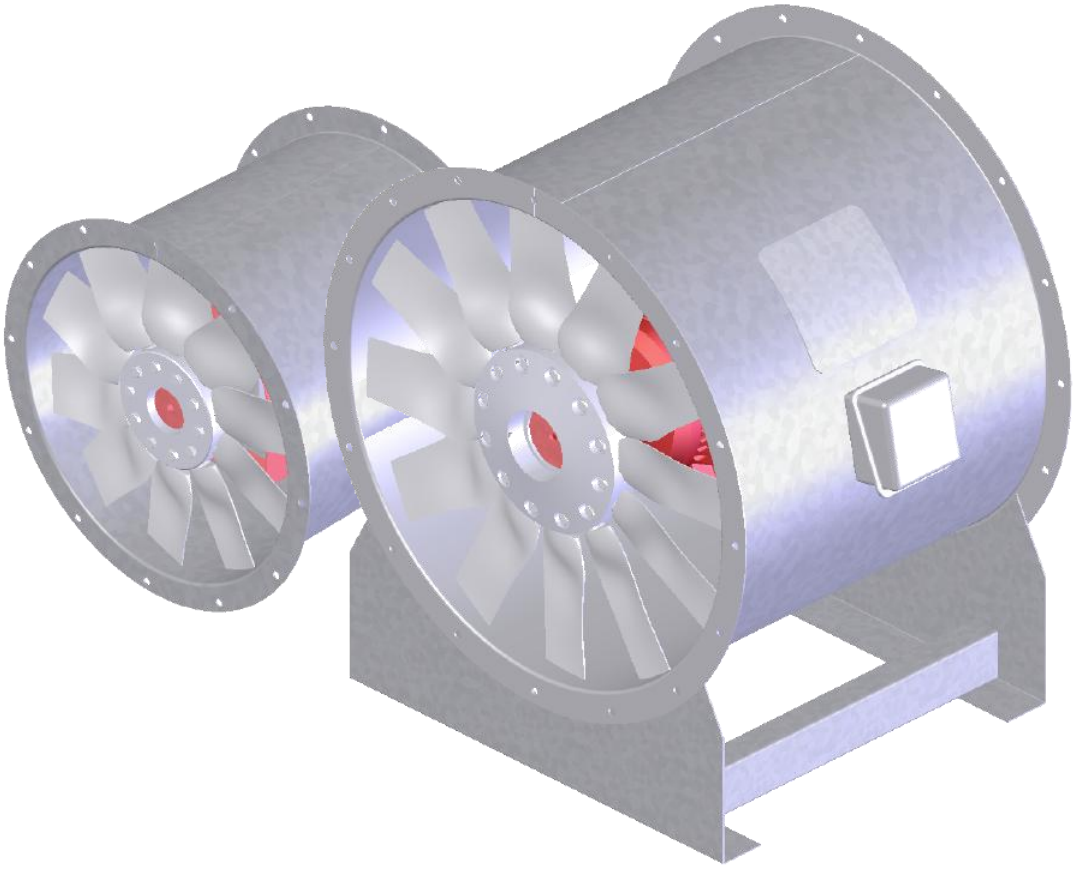
軸流直結式排煙風機

Low Pressure Axial Smoke-exhaust Fan Driven Directly

with Cast Aluminum Airfoil Propellers

FLOWTECH Co., Ltd. certifies that the series LASD shown herein (page 19-30) are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

陽鼎實業股份有限公司特此證明，此處所示 LASD 系列目錄中，第 19~30 頁獲得了加蓋 AMCA 印章的授權。所示額定值系根據 AMCA 出版物 211 和 AMCA 出版物 311 所進行測試和程序確定，並符合 AMCA 認證額定值計畫的要求。



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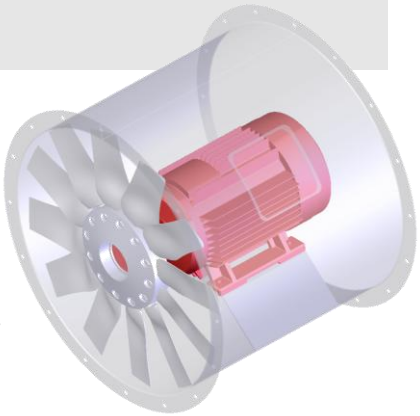
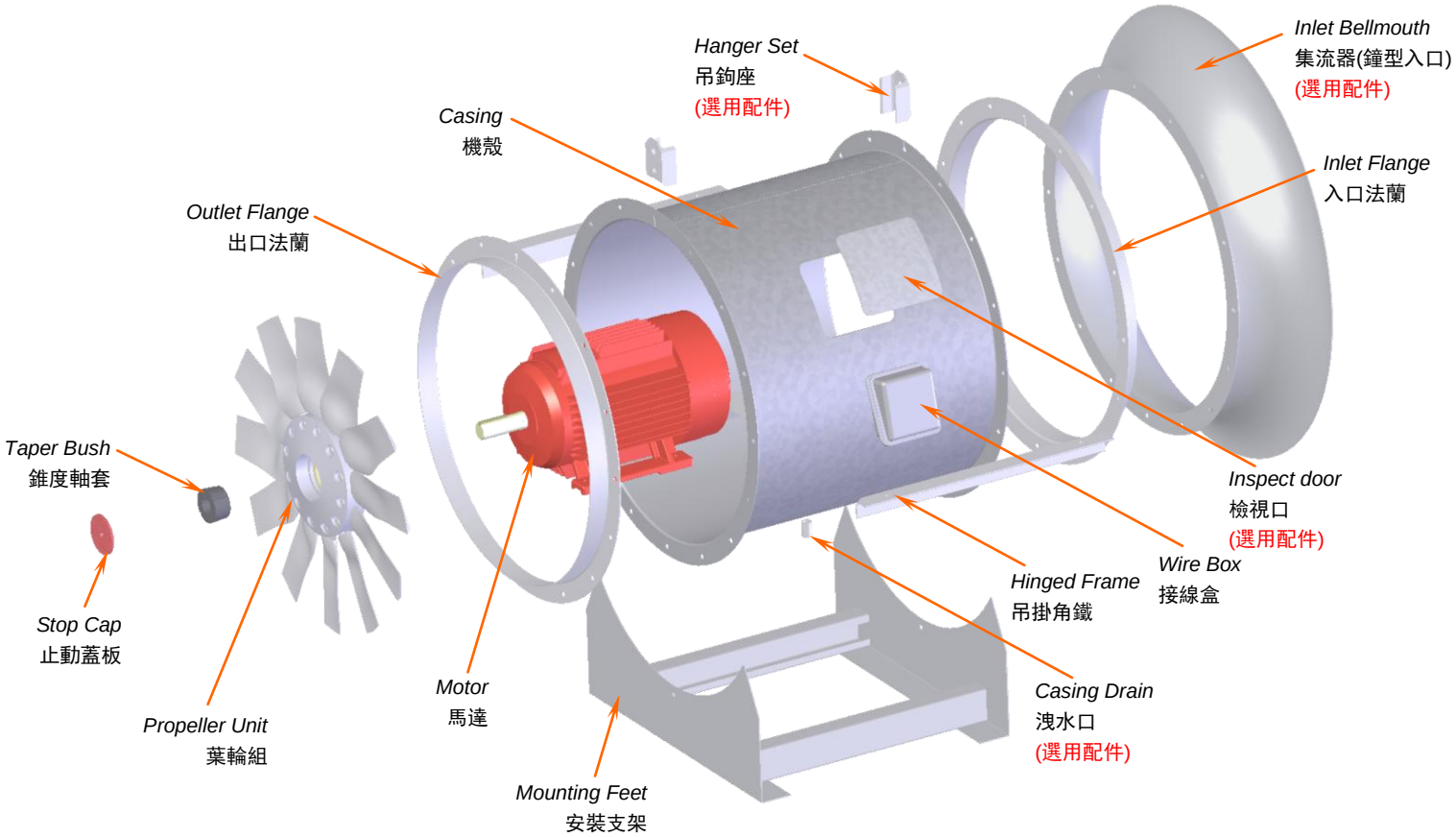
Fan code 風機型號命名方法

FOR EXAMPLE LASD-560-5/10-3.7-2

LASD - 560 - 5 / 10° - 3.7 - 2



- Number of poles of motor
  馬達極數
- Power of motor, Unit：kW
  馬達功率， 單位：kW
- Number of Blades / Blade Pitch Angle[°]
  葉輪葉片數 / 葉片角度
- Normal Fan Diameter, Unit： mm
  風機公稱直徑，單位：mm
- Low pressure Axial Smoke-exhaust fan driven Directly
  低壓直結式軸流排煙風機



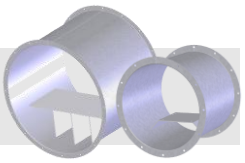
Fan layout drawing

風機設計爆炸圖

Types and Duties 規格和功率範圍

Flowtech-Axial flow Smoke-Exhaust fans are specially manufactured for all applications and mounting positions in case sizes 560 up to 1250 mm diameter. The performance range is from 500 up to 2,000 m³/min on air volume, at total pressure up to 1,800 Pa. Higher pressures are possible on multi-stage versions, contra-rotating. Air performance according to AMCA 210 standard, shown is for test installation type B, free inlet, ducted outlet.

陽鼎軸流排煙風機，依其適用範圍及安裝操作環境，以直徑 ø560mm 至 ø1250mm 不同規格來做製造。最大全壓可達到 1,800Pa 的情況下，風機流量可從 500 至 2,000 m^3/min。若需要更大的壓力，可以串聯多級風機，利用反向葉片原理方向來達成。空氣性能依 AMCA 210 標準，安裝方式 Type B，入口加裝配件鐘型入口測試及出口加裝出口風管，其性能都是於 1.2 kg/m^3 空氣密度的標準條件下定義的。



Casing 機殼

Version: L (light version)

Casings are spun of sheet galvanized steel with integral inlet flanges on both ends, mounting hole drilled in accordance to DIN 24154, R 2. The strengthen structure is order to pad-mounted motors, foot-motors or flange-motors. It is suitable for duct or plenum type installation. This version is for all applications including smoke-extract and normal conditions in the HVAC-market.

結構形式 1: L (輕型結構)

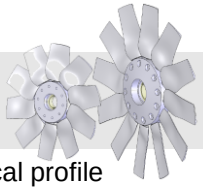
機殼用鍍鋅鋼板製成通過精密旋壓成形，在機殼兩端旋壓製成法蘭，按 DIN 24154 標準的系列 2 的規定鑽孔，此強化結構以便安裝 Pad-mounting, foot mounting 及 flange mounting 之馬達。配合於管道或平面形式的安裝。這種結構形式可適應排煙與通風空調行業的全方位需求。

Version 2: H (heavy version)

Fan case and motor mounting made of hot-rolled steel, after welding that all steel parts are hot dip galvanized manufacturing. This version is for higher demands, for heavy industry or for high performances. Flanges on both ends, drilled in accordance to DIN 24154, R2 are integrated. On this type external terminal boxes are fitted as standard. If motors are with lubrication, tubes and grease-nipples are fitted outside fan case.

結構形式 2 : H (重型結構)

機殼和馬達底座以碳鋼製成，經焊接後進行熱浸鍍鋅處理。這種製造方式適合較高要求，使用於重工業領域或高功率情況。機殼兩端的法蘭，並按 DIN 24154 標準系列 2 鑽孔。對於此一筒形機殼，在機殼上可安裝適合之接線盒。若馬達需要潤滑保養，則將潤滑口移到機殼之外。



Propeller 葉輪

The ***Flowtech***-propellers, hubs and blades are made of cast aluminum alloy, the aero-dynamical profile guarantees high efficiency and low noise. The blades are with adjustable pitch angle to optimum the duty point. The solidity varies for a wider range of performance. All rotating aluminum components are X-ray examined to ensure quality and reliability. All propellers are statically and dynamically balanced to ISO 1940 and AMCA 204 balance quality grade level-G2.5.

陽鼎風機葉輪，中心轂和葉片是由鑄鋁合金製的。葉片組外型的空氣力特性可以保證高效率和低噪音。中心轂結構允許在靜止時對葉片的角度進行調整，以達到最佳操作狀況。風機有不同的葉片數，因此可擴大了風機的適用

範圍。所有旋轉的鋁合金部件在安裝前都經過 X-射線探傷檢驗，以保證品質及操作安全性。且全葉片組為確保振動之良好其動平衡和靜平衡校正皆達到 ISO1940 / AMCA 204 (G2.5)級別。

Motors 馬達

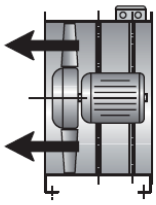
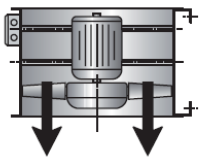
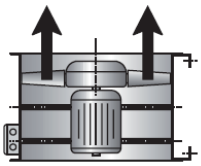
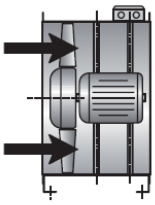
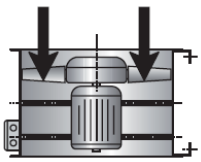
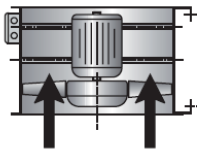
Flowtech uses as standard closed squirrel cage motors with pad-mounting and airstream rated to IEC 34, if required also in accordance to EPACT. The standard motors have Class H and enclosure IP 54. Continuous operating ranges from -40 °C to +40 °C, other operating conditions on demand. Multi speed versions with 2 or 3 speeds, TAB- or DUAL-wounded are also available. The motor bearings have L 10 (or L50) life design. All motors are can be manufactured to correspond to F200, F300 or F400 requirements for smoke-extract application.

陽鼎風機安裝符合 EN60034-1(IEC 34-1)標準的交流馬達，也可以應客戶要求按 EPACT 製造，作標準的四點固定。馬達全密閉、帶短路轉子。保護等級為 IP54，絕緣等級為 H 級。按用戶需求還可以選擇用於常溫環境操作馬達，或通過變級開關，實現兩級或三級調速的帶特殊繞組的馬達。馬達軸承的壽命按 L10 或 L50 設計。所有馬達亦可依排煙應用場合之需求符合 F200(耐溫達 200℃/120min)、F300(耐溫達 300℃/60min)或 F400(耐溫達 400℃/120min)之耐溫等級。

Forms of running 安裝位置和氣流方向

Flowtech-Axial flow fans are available for all forms of running. The chart information shows all standard forms of running, please indicate when ordering. Standard form of running“S“. Form of running is especially relevant when weather proof motors are required.

陽鼎軸流風機可以適用於各種氣流方向。下圖中所示的安裝運行方式和氣流方向都是標準設計的。在訂貨時應加以說明。基本的氣流方向為"S"形式。當需要安裝特殊的馬達時，一定要說明氣流的方向。

S	SU	SO	D	DU	DO
					

Arrows indicating correct rotating and direction of airflow are mounted on the outside of the fan case.
表示正確旋轉及氣流方向的箭頭以貼在風機機殼外面。

Ancillaries 附件

Flowtech offers a wide range of ancillaries, e.g.:陽鼎公司提供多種附件，如:

＊Propeller or motor side guard葉輪側或馬達側的護網

＊Mounting feet for both horizontal or vertical operation 用於水平或垂直安裝的支架

＊Matching flanges 配套的法蘭配件

＊Complete flex. connectors 柔性法蘭連接件

＊Bellmouth inlets 集流器(鐘型進風噴口)
＊Air operated dampers 空氣驅動的氣流調節器
＊Anti-vibration mounts 防振阻尼器
＊Silencers with or without pod 帶內芯或不帶內芯的管狀消音器
＊Anti-spark-track for flame proof 用於防火的火花保護帶
＊Inverters 變頻器

Specify the fan 風機說明

Having chosen the fan most suitable for your individual application: please specify as follows:
在選擇了最適合您的實際用途的風機後，請特別留意以下說明:
(1)Manufacturer ***Flowtech***, light or heavy version.製造商:陽鼎，輕型結構或重型結構。
(2)Exact details on motor data like power supply and cycles and specifications on temperature, flame proof, multi-speeds, extra enclosure and overheat protection.對馬達參數的其它特殊要求:如電壓、頻率、溫度、防爆要求、轉速、特殊防護措施和過熱保護等。
(3)The impeller manufactured in cast aluminum alloy with high efficiency blade profile and adjustable pitch angle.用鑄鋁合金製造的葉片外型，葉片安裝前經過X-射線探傷檢驗。性能符合空氣動力學要求，葉片可在靜止時調節。
(4)The case in light version made of galvanized sheet steel or heavy version with hot dip galvanized finish.用鍍鋅鋼板製成的輕型機殼，或者用鋼板製成的熱浸鍍鋅的重型機殼。
(5)All necessary ancillaries are to be specified.所有必要的附件應當列出。

Ordering the fan 訂貨說明

After selection of the fan best for your needs please order as follows:
在選擇最適合您的風機後，訂購陽鼎風機時還需說明:
(1) Fan type, casing version and running form風機機殼形式、氣流方向和安裝位置。
(2) Fan code and type: see below正確的風機名稱和型號:按隨後提供的風機型號命名方法。
(3)Quantity required訂購數量。
(4)Duty required at standard air and temperature, air volume in m^3/s at static pressure in Pa.按單位m^3/s(或m^3/min)的流量，在空氣密度為1.2 kg/m^3下的風機靜壓;按單位Pa(或mmAq)。
(5)Motor power rating in kW 需求的馬達功率。
(6)Electrical supply需求馬達電壓、頻率和馬達輸入相數。
(7)Ancillaries required必需的附件。

Useful information 其它有用的指示和信息

Fan selection 風機選用

Please select fans within the curve. Do not select above curve end, fan will work in stall and will be damaged. For a non-overloading selection you can select motor on the peak-kW from each pitch angle which marks and covers the maximum on absorbed power.

在配置風機時，在性能曲線中要注意，運行點應低於相應的性能曲線。當超過這一區域時，就存在失速的危險，風機發生共振。其結果是，作用在葉輪上的機械負荷會增大到足以損壞葉輪。為了能最大可能的保證運行安全，可以按照葉片傾角對應的吸收功率性能曲線的最大值來選擇馬達，這樣可排除馬達過載的可能。

Fan installation 風機安裝

Installation recommendations are as follows:

• Fans with free inlet and outlet should be installed with 1,5 x fan diameter distance on extract and supply side to next equipment. Fans should have a

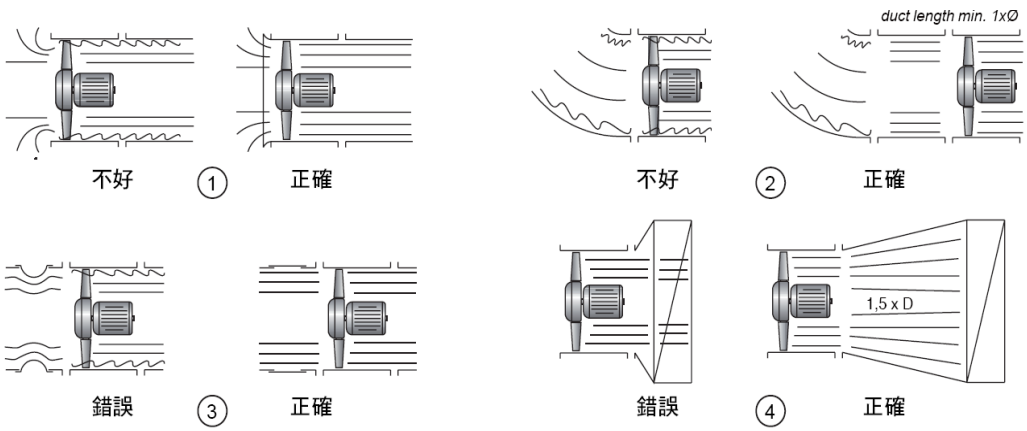
bellmouth on the air entry to get a smooth airstream. High performance fans will work at higher efficiencies and save energy if diffusers are mounted on the outlet.

• When installing fans into systems and to other equipments (bends by 90 degree., filters, silencers etc) correct bond radius and distance are to be considered to avoid losses. Flexible connectors are to be installed smooth. By not following advices you will lose performance. (see pictures below)

風機安裝時，應注意以下幾點:

＊自由地吸風和排風的風機的吸入氣流和排出氣流應當這樣配置，風機的進氣側和出氣側與其它結構件至少有1.5x 風機直徑的自由空間。氣流吸入側應當用集流器，保證氣流均勻流向葉輪。對於大功率的風機，建議在風機出風口使用出口擴張管，這樣可以使風機工作在效率較高的狀況，產生節省能源效果。

＊對於安裝在系統或風道中的風機，需要注意的是，在風機出口和進口處的連接件(如直角彎管，過濾器，消音器等)應當有足夠大的直徑和風機之間足夠的距離，以避免損失。柔性連接件的安裝要光滑。如果不注意安裝的要求，就可能會降低風機的性能。(參考下圖)



Example fan selection 風機選型舉例

Required duty point by customer 客戶要求的狀況

＊Volume flow 流量：6 m^3/s　＊static pressure 靜壓：500 Pa

＊Fan speed 風機轉速：1760 [RPM] (4 Pole 4 極)

–for total pressure, please add velocity pressure to static pressure

–在確定靜壓升高時，通過動壓損失曲線，確定P_d(動壓)的值。

85 Pa dyn. pressure + 500 Pa static pressure = 585 Pa total pressure)

85Pa(動壓)+500 Pa(靜壓) =585Pa(全壓)

How to use: 用法:

After having chosen right fan performance curve please draw volume flow and pressure.

在選定正確的風機性能曲線後，畫出流量和壓力差圖。

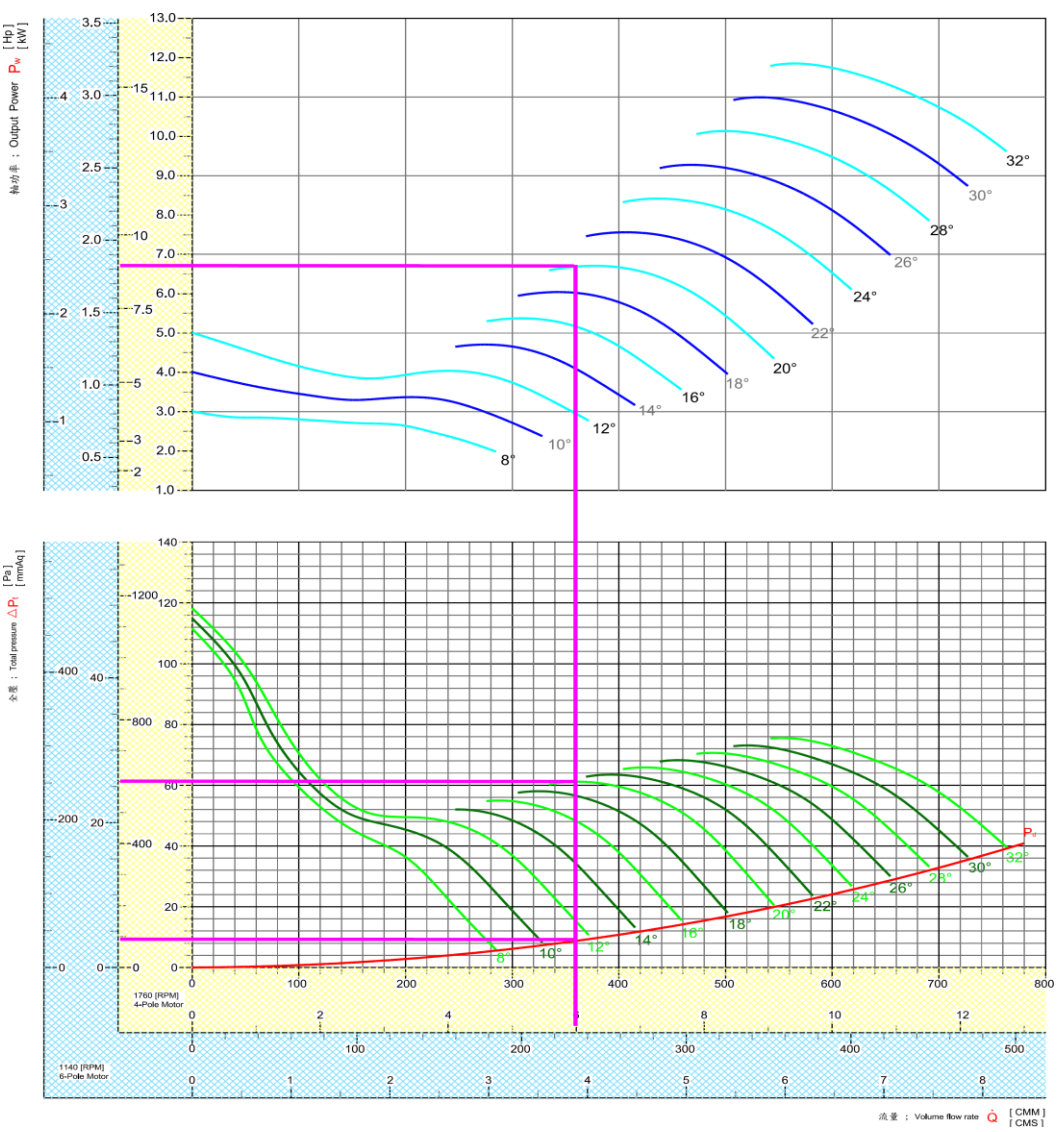
In the cross you will find the following fan data:在曲線焦點處，可找到下風機數據:

＊motor speed or number of poles 1760 [RPM] - 4-pole馬達轉速或極數:1760 [RPM]-4極

＊pitch angle : 20 degrees 葉片傾角:20 度

Performance curve

風機性能曲線



Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n [min^{-1}]	葉片角度 Pitch Angle[˚]												
	8	10	12	14	16	18	20	22	24	26	28	30	32
1760	3.02	4.01	5	4.64	5.3	5.96	6.62	7.47	8.32	9.2	10.05	10.93	11.78
motor	3.7	5.5				7.5			11				15
1140	0.82	1.09	1.36	1.26	1.44	1.62	1.8	2.03	2.26	2.50	2.73	2.97	3.2
motor	1.5					2.2			3.7				

Choose motor power 確定馬達功率

After peak-absorbed power see table chart: 6.62 kW 按查表確定最大吸收功率6.62kW

Motor power: 7.5kW 馬達功率:7.5kW

Peak power is the max power over the whole pitch angle in the worst case.最大吸收功率是對應葉片傾角的整條性能曲線上，預計最壞情況下的最大值。

How to get the required noise level, see page 28.噪音級的計算，詳見第28頁。

***Acoustic and noise control* 噪音信息**

General 概述

Noise produced by axial flow fans is basically in a high frequency level. The sound power depends on careful selection of the fan regarding duty, efficiency, characteristics and above all quality of installation. There is a strong correlation between sound power and aerodynamic loss of the fan. Generally speaking, sound power of fans is a function of air volume and total pressure. This will be confirmed by the following rough calculation formula:

軸流風機產生的噪音主要是高頻噪音。影響噪音聲級的因素視風機的狀況、風機的效率、風機特性的是否合理選擇及整體安裝品質等決定的。為了獲得最接近且合適的人類耳朵聽覺效果，噪音位準根據 AMCA 300 量測。聲功率等級的確定根據"AMCA 300 全響室量測方法"測得。在聲功率和動壓損失之間有著嚴格的相互關係。一般來講，聲功率是流量和全壓的函數。可以通過下面的近似公式來粗略計算聲功率級:

$$L_{WG}\,[dB] = L_{WS} + 10\log(\dot{V}\ \mathrm{m^3/s}) + 20\log(\triangle p_{tot}\,[Pa]) \pm 5$$

式中:

L_{WG} =總的聲功率級

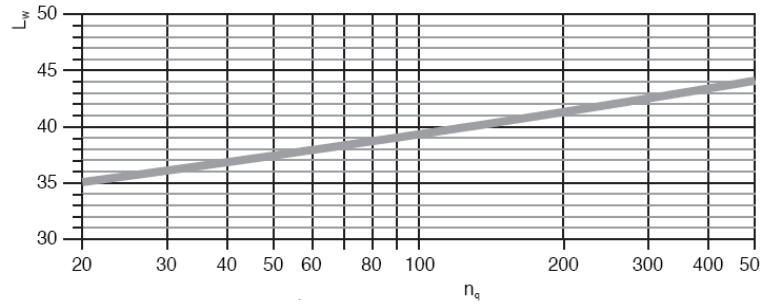
L_{WS} =按圖 1.與轉速相關的聲功率級

where by:

L_{WG} =total sound power

L_{WS} =specific sound power by the speed (see fig.1)

Fig 1.圖 1



$$n_q = n[\mathrm{min^{-1}}] \cdot \frac{\sqrt{\dot{V}[\mathrm{m^3/s}]}}{\left(\frac{\Delta p_t[Pa]}{\rho_m[\mathrm{kg/m^3}] \cdot 9{,}81}\right)^{3/4}}$$

Sound power levels 聲功率級

This is the amount of power which a source gives off as sound. Sound power levels are expressed in decibels with a reference level of 1 picoWatt. The sound power level of a source remains the same regardless the environment and the distance to the listener.

聲功率是聲源產生的噪音功率。聲功率的單位是以皮瓦(Pico watt)為基準的分貝(dB)。聲源的聲功率只決定於聲源本身，與聲源周圍環境和測試據的距離無關。

Sound pressure levels 聲壓級

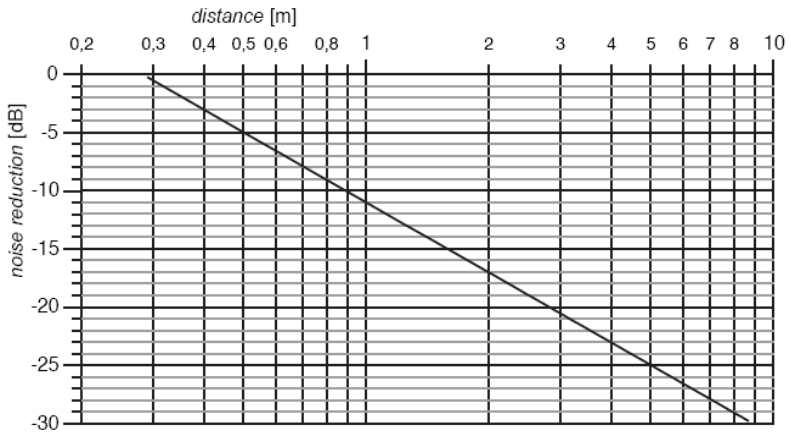
These are pressure fluctuations radiated by a source expressed in decibels with a reference level of 20 µPa. The sound pressure level varies according to the distance of source to the listener and its environment.
聲壓是以聲源傳出的壓力振動。聲壓的單位是以20微怕(μ P)基準的分貝(dB)。聲壓與測試點據聲源的距離以聲源周圍環境有關。

$$Nr = 10\log(4\pi \times r^2)$$

Sound distance
聲源距離;r [m]

Noise reduction
噪音衰減;Nr [dB]

Fig 2.
圖 2



Frequencies 頻率

Sound is split into different frequencies. Frequencies of human hearing ranges from about 20 cycles per second (Hz) to 20000 cycles per second (Hz). For practical purposes FLOWTECH publishes noise data in eight octave bands with the centre frequencies of 63, 125, 250, 500, 1000, 2000, 4000 and 8000 Hz.
噪音一般是由不同頻率的聲音組合成的。人耳能夠感覺到的聲音頻率範圍為 20Hz 至 20,000 Hz。在工程實際中，陽鼎一般只給出以下各頻率為中心的頻率倍頻及噪聲值:63、125、250、500、1000、2000、4000 和 8000Hz
每個風機都是有自己特有的噪音頻率分佈

„A“ weighted sound pressure levels (dB A) A 計權聲壓級 dB(A)

The ear is more sensitive to sound in some frequencies than in others. The „A“-weighting is an attempt to reflect this natural attention of sound. The „A“-weighting is a set of figures which are applied to the sound pressure levels. The levels in each of the octave band are added logarithmically to give a single figure. „A“-weighting will be over octave band as follows:
人耳對不同頻率範圍的聲音的敏感程度不同。通過 A 計權來模仿人耳對聲音的自然感覺。按照 A 計權，各個頻帶的聲壓級都要分別扣除一定的分貝值。對各頻帶的 A 計權聲壓級按對數求和，可得到 A 計權的總 X 聲壓級。

Chart (3)
表(3)

頻率[Hz]	63	125	250	500	1000	2000	4000	8000
A-計權[dB]	-26	-16	-9	-3	0	+1	+1	-1

Example 舉例

Customer requires the dB(A) level at 3 m distance from a 800 diameter. fan, 1760 1/min, 12 blades, 20 degree. pitch angle, duty 6 m³/s at 500 Pa (static).

The sound data for the operating points inside these boundaries may be determined using interpolation.

Example to Ps comparison with 63Hz; $\frac{500-346}{517-346}=\frac{L_{W_{63Hz}}-92}{94-92}\Rightarrow L_{W_{63Hz}}=92+\frac{2\times154}{171}=93.8\cong94[dB]$

The same method to calculate and fill in each octave band decibel data as following:

Model No.	RPM	Ps	Sound Power re 10^{-12} Watts Octave Band [Hz]								L_{WiA}
			63	125	250	500	1000	2000	4000	8000	
LASD-800-12/20°-7.5-4	1760	346	92	97	97	98	94	91	87	83	100
LASD-800-12/20°-7.5-4	1760	517	94	99	99	102	101	97	92	85	105
LASD-800-12/20°-7.5-4	1760	500	94	99	99	102	100	96	92	85	104.2

一位用戶選擇一台風機，直徑800mm，轉速1760 1/min，葉片共12葉且傾角20°，在靜壓為500Pa 下的狀況為 6m³/s，想知道風機 3mm 位置處的 A 計權聲壓級 dB(A)。

噪音數值資料在操作點要求查找聲功率一覽表，因數據落在其中需使用內插法決定聲功率值。

舉例靜壓為 500Pa 對照表格 63Hz; $\frac{500-346}{517-346}=\frac{L_{W_{63Hz}}-92}{94-92}\Rightarrow L_{W_{63Hz}}=92+\frac{2\times154}{171}=93.8\cong94[dB]$

同理計算填入如上表完成之計算列結果。

Frequency 頻率[Hz]	63	125	250	500	1000	2000	4000	8000
sound power level 聲功率級	94	99	99	102	100	96	92	85
Reduction for 3 m distance (fig. 2) 按圖2扣除3m距離的聲壓級衰減	-20	-20	-20	-20	-20	-20	-20	-20
Apply „A“ as chart 3 按表3按A計權	-26	-16	-9	-3	0	1	1	-1

Add noise levels as given in chart 4 below
以表4進行對數求和

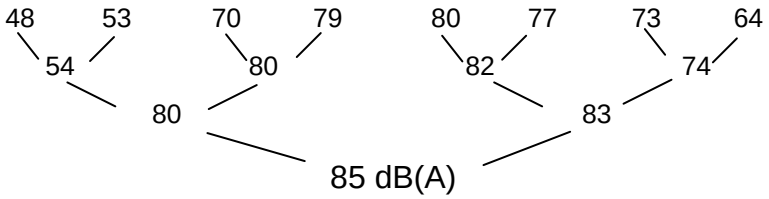


Chart (4)
表(4)

Addition of sound level 聲級求和

Difference between two sound levels 兩個聲級值差值 [dB]	Add to the higher level 相加後得較高的聲級值 [dB]
0-1	3
2-3	2
4-9	1
≧10	0

$L_{\Sigma}=10\cdot\log(10^{0.1L1}+10^{0.1L2}+\ldots\ldots\ldots\ldots10^{0.1Ln})$

whereby: 式中：

L1= sound level of a source 1 聲源1的聲級

L_{Σ}= resulted level 總聲級

Noise of several sources, equivalent in characteristic and level

多個種類相同，強弱一樣的聲源產生的聲級

$$L_{\Sigma} = L_1 + 10 \cdot \mathrm{Log}(Z)$$

whereby: 式中:

Z= number of sources 聲源個數

L1= sound level of a single source 單個聲源的聲級

L_{Σ}= resulted level 總聲級

Please note: **請注意:**

Here are some usefully information and fan laws:陽鼎公司提供多種多樣的，不同消音效果的消音器。

Fan Laws 風機定律 **(for geometrically similar fans only)**

• Volume flow ≈ rotational speed **Speed change - constant size**

在一定風機尺寸和一定的密度下，轉速變化時:

* Pressure (all) ≈ (rotational speed)2

流量與轉速成正比:

$$\frac{\dot{Q}_2}{\dot{Q}_1} = \frac{N_2}{N_1}$$

*Pressure (all) ≈ (rotational speed)2

壓力變化與轉速的平方成正比:

$$\frac{\Delta P_a}{\Delta P_b} = \left(\frac{N_1}{N_2}\right)^2 = \left(\frac{\dot{Q}_1}{\dot{Q}_2}\right)^2$$

* Power absorbed ≈ (rotational speed)3

吸收功率與轉速的三次方成正比:

$$\frac{P_1}{P_2} = \left(\frac{N_1}{N_2}\right)^3 = \left(\frac{\dot{Q}_1}{\dot{Q}_2}\right)^3$$

在轉速不變的條件下，葉輪尺寸變化時 (對幾何形狀相似的風機)

* Volume flow ≈ (impeller Diameter)3

流量與葉輪直徑的三次方成正比:

$$\frac{\dot{Q}_2}{\dot{Q}_1} = \left(\frac{D_2}{D_1}\right)^3$$

* Pressure ≈ (impeller Diameter)2

壓力差與葉輪直徑的平方成正比:

$$\frac{\Delta P_1}{\Delta P_2} = \left(\frac{D_1}{D_2}\right)^2$$

* Power absorbed ≈ (impeller Diameter)5

吸收功率與葉輪直徑的五次方成正比:

$$\frac{P_1}{P_2} = \left(\frac{D_1}{D_2}\right)^5$$

Density change - constant speed- constant size

轉速,尺寸一定,而密度變化時 ：

* Volume flow no change流量不受影響:

$$\dot{V} = \text{constant}$$

* Pressure ≈ Density壓力差與密度成正比:

$$\frac{\Delta P_1}{\Delta P_2} = \frac{\rho_1}{\rho_2} = \frac{T_2}{T_1}$$

whereby:式中:

T= Kelvin Temperature[K]絕對溫度 [K]

* Power absorbed ≈ Density

風機軸功率計算公式 ：

$$P_L[kW] = \frac{\dot{V}[m^3/s] x \Delta Pt[Pa]}{\eta[\%] x 10}$$

Pressure壓力 ：

* Dynamic Pressure [Pa]動壓

$$Pd = \frac{\rho}{2} \cdot V^2$$

whereby:式中:

ρ= air density in [kg/m³]空氣密度 [kg/m^3]

V = air velocity in [m/s]風機中的空氣風速 [m/s]

* Total pressure全壓

$$P_t = P_s + P_d$$

* **Absorbed power - calculation in duty point**

吸收功率與密度成正比:

$$\frac{P_1}{P_2} = \frac{\rho_1}{\rho_2} = \frac{T_2}{T_1}$$

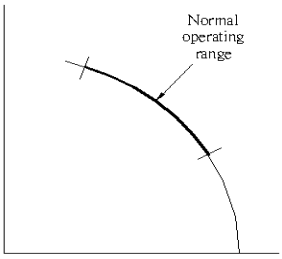
Statement of Fan Performance 說明

Air and Sound performance of LASD series are based on test conducts in according with AMCA Standard 210. and performance changes with two factors as following：

LASD 系列的風機性能，經過 AMCA 210 標準測試後所得到的性能曲線，會由於以下兩個主要因素而改變:

a) The air duct near to the fan were blocked or suddenly change the outline of ductwork. In general, the air flow smoothly through the fan in a perfect design condition, and performance will appear like the result that expect.

在靠近風機的風道系統有不正常的阻礙或突然的變化。一般而言，若依循合理的常規設計，空氣流場會均勻的進入及被送出風機，接近一個理想狀況，性能會如預期的結果出現。



b) Change of the component within the fan , such as the change of the model of the fan, or even there is sizable most tip clearance.

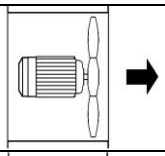
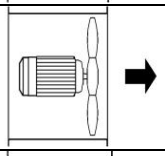
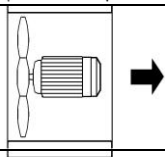
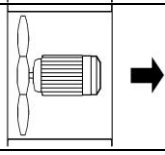
風機內部元件的改變，如風機型式的改變，或甚至是有相當大的尖端間隙。

The influence of the following general effect that the choice of the fan must also be considered, in order to reach the working order on the proper choice blade pitch angle.

風機的選擇還必須考慮以下一般效應的影響，在適當的選擇葉片角度以達到正常運轉狀態。

Fan Type 風機型式

LASD 系列主要風管安裝方式有 A 型式風機及相對應的 B 型式。其性能上的差異主要由於風機出口及入口，在實際使用安裝有風管或喇叭進風口。

Type 型式	Installation mode 安裝方式	Performance Change 性能變化	Noise Change 噪音變化
A	 B&D	Refer to Performance Curve 參照性能曲線表上數據	Refer to Noise Tables 參照噪音表上數據
A	 A&C	qv 1.02 PsF 1.04 Compare to mode D Performance Curve 比較 D 式的性能曲線	Refer to Noise Tables 參照噪音表上數據
B	 B&D	Refer to Performance Curve 如性能曲線顯示	＋2 ~ 3 dB
B	 A&C	Refer to Performance Curve 如性能曲線顯示	＋2 ~ 3 dB

Fan performance with Type A and Installation mode B are licensed by AMCA International only.

Propeller Material 葉輪材質

Propeller Hubs and blades are made with cast aluminum and airfoil blades ensure efficient performance. Fan have several blades mode and blade pitch angle can be adjusted statically to ensure best operating condition.
中心轂(Hub)及葉片以鋁合金壓鑄而成，具良好的空氣動力性能。風機有不同葉片數並允許在靜止時進行葉片角度調整，以達到最佳操作狀態。

Tip clearance 尖端間隙

Fan performance curve and noise data are based on tip clearance /Impeller diameter in 0.25％。If the tip clearance get bigger then performance curve must be adjusted as following.

風機性能曲線及噪音值都是以尖端間隙/葉輪直徑在 0.25%為標準。若尖端間隙加大，則運轉點必須以下方式，在性能曲線上做些調整。

Tip clearance/Impeller dia.尖端間隙/葉輪直徑：0.5%　qv*1.01,　PsF * 1.02
Tip clearance/Impeller dia 尖端間隙/葉輪直徑：0.75%　qv*1.04,　PsF * 1.08
Tip clearance/Impeller dia 尖端間隙/葉輪直徑：1.0%　qv*1.06,　PsF * 1.12

Fan performance calculates with this correction factors for tip clearance are not licensed by AMCA International.

Pressure Drop of Compound Fan 複合風機壓損

For special conditions，for example：using two fan, one fan operating and other standby. pressure drop of compound fan are in relation to blade pitch angle.

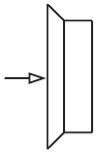
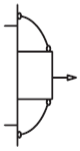
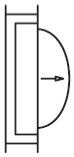
為了某些情況需要，如一台運轉使用，一台停機備用，必須共同使用兩台風機。這種狀況，複合風機(非加壓型風機)的壓損和葉片角度是有關係的。

Blade Pitch Angle葉片角度	K factor係數
8° ~20°	6.0
20° ~30°	3.0
30° ~20°	2.0

Pressure Drop 壓損 = K * Pdf

Fan performance calculates with this correction factors are not licensed by AMCA International.

***Pressure Drop of standard* Accessories 標準附件的壓損**

		K factor 係數
bellmouth inlets喇叭進風口		0.20- A-mode A-型式 0.38- B-mode B-型式
guard安裝護網		0.75
Motor guard馬達圓錐保護蓋		0.4
Damper單向風門		0.3~0.4

Fan performance calculates with this correction factors "K" are not licensed by AMCA International.

Other Devices 其他裝置

Another installation mode does not mention here also can be apply to LASD series fan. General guideline are as following.在型錄上未詳細提到的風機其他安裝方式，也能應用於 LASD 系列風機。一般通則如下:

Fan Installation mode風機安裝方式	Pressure effect 壓力影響效應	Noise effect 噪音影響效應
Single fan with guide vane單一風機內裝有靜葉	1.25	+1 dB
Twin fans with guide vane雙台風機組內裝有導流裝置	2.00	+3 dB
Reversible Twin fans可正逆轉的雙台風機組	2.4	+8到 10 dB
Separable flow fan分流的風機	0.7	+2 dB

Fan performance calculates with this correction factors are not licensed by AMCA International.

When select the operation pint must consider the pressure drop effect as described and adjust the performance curve.

風機的操作點的選擇，必須考慮以上所提的壓力增加/損失因素，並在性能曲線上做調整。

Note：About others installation type of LASD series fan, Consult Flowtech for detail information.

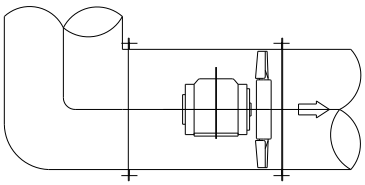
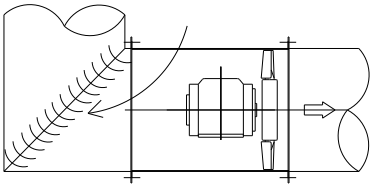
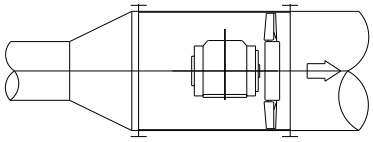
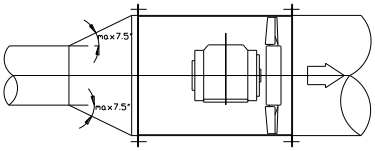
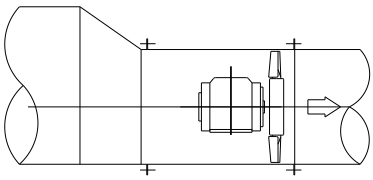
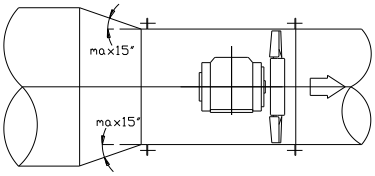
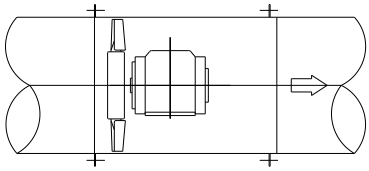
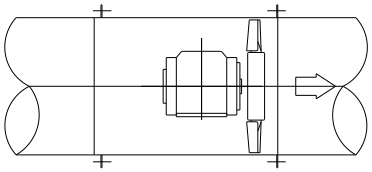
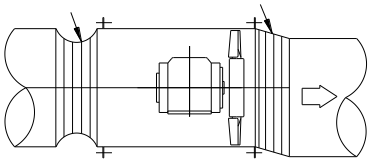
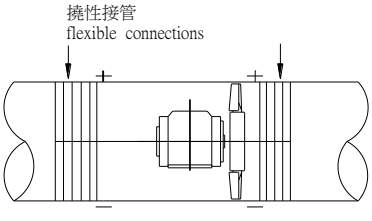
※注意：有關 LASD 系列風機各項安裝，請由陽鼎公司專業技術人員為您提出建議參考。

軸流風機風管安裝導引守則

Installation Guidelines for Ductwork of Axial Fan

請遵守下列安裝導引,以增加通風系統的風量

Please follow Installation Guidelines with Ductwork to maximize the air delivery to your ventilation system.

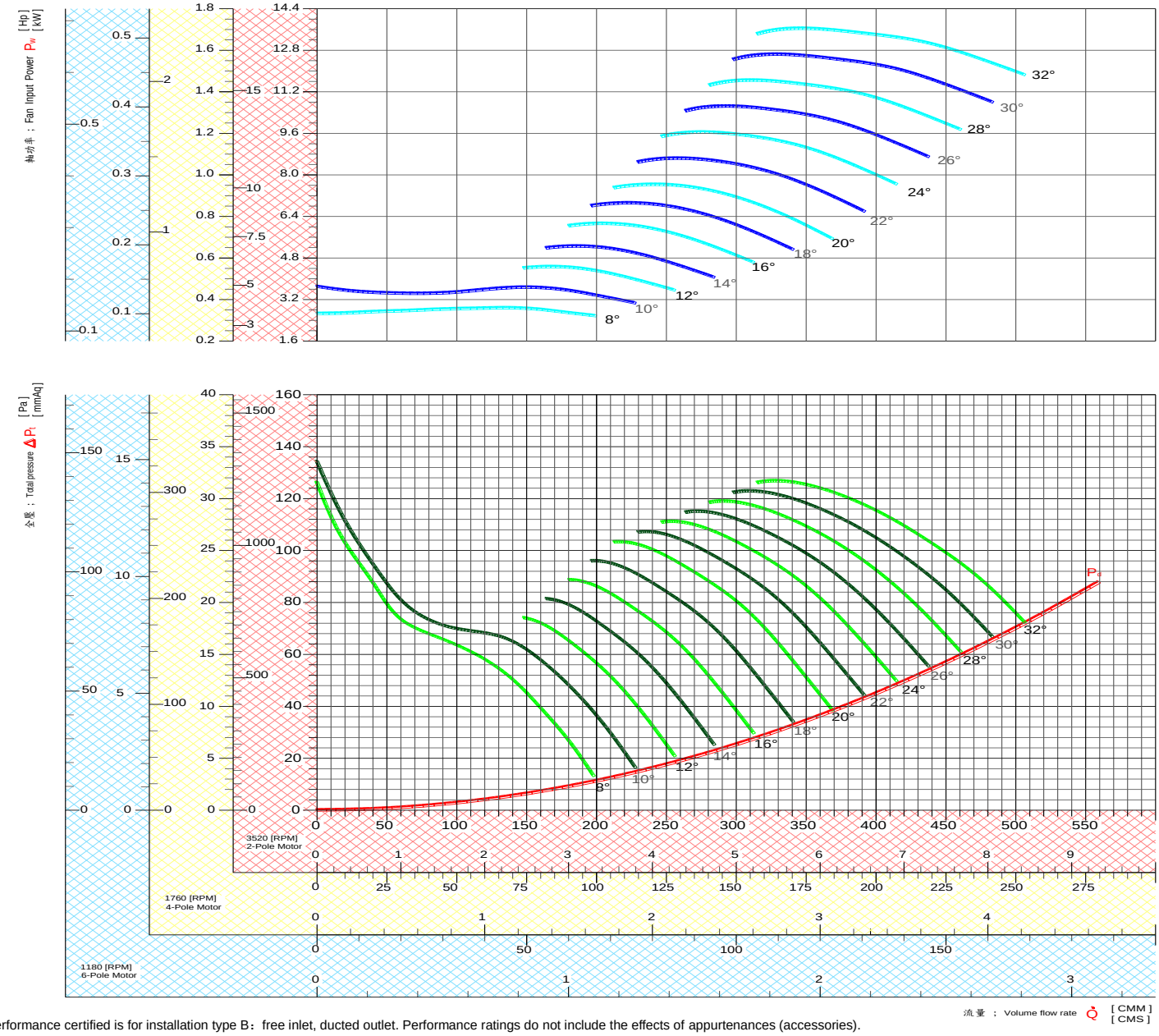
✗	●
 上游彎肱管形成入口氣流不平衡 Upstream radius elbow creates Imbalance at inlet	 內部裝有導流板的方形入口肘管產業較低程度的紊流至風機入口 Square inlet elbow with extended trailing edge Vanes delivers less airflow to fan turbulent inlet.
 入口接突擴管易造成紊流 Abrupt inlet transition Causes turbulence	 入口接漸擴管(1:7)可避免紊流發生 Gradual(1:7)expansion of Inlet duct avoids impeller turbulence
 不對稱接管造成風機負載不平衡且產生額外的紊流和噪音 Asymmetrical transition creates imbalanced with Minimizes turbulence and noise	 對稱接管可平衡風機負載並減小紊流噪音 Symmetrical transition balances load on fan, minimizes turbulence and noise.
 馬達在葉輪下游增加紊流和影響 Motor upstream of impeller increase turbulence and noise	 馬達在葉輪上游減小紊流和影響 Motor downstream from impeller.
 鬆弛或偏置的連接管形成空氣紊流 Slack or offset flexible connection causes turbulent air flow.	 拉緊的撓性連接管可避免紊流的產生並提供合適的避震效果 Taut in-line flexible connections provide optional vibration isolation without creating turbulence.

LASD-560-5 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 3520 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量；$\dot{Q}$ [cmm])/60 / 0.246[m^2]

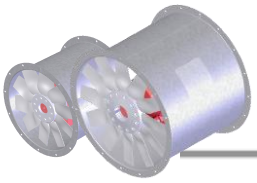
Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2



Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n	葉片角度 Pitch Angle[°]												
[min^{-1}]	8	10	12	14	16	18	20	22	24	26	28	30	32
3520	2.96	3.76	4.56	5.28	6.0	6.88	7.68	8.64	9.6	10.64	11.6	12.56	13.52
motor	3.7		5.5		7.5		—						
1760	0.37	0.47	0.57	0.66	0.75	0.86	0.96	1.08	1.2	1.33	1.45	1.57	1.69
motor	0.75					1.5						2.2	
1180	0.1	0.14	0.17	0.2	0.23	0.26	0.29	0.33	0.36	0.4	0.44	0.47	0.51
motor	0.75												



Low Pressure Axial Smoke-exhaust Fan Driven Directly with Cast Aluminum Airfoil Propellers

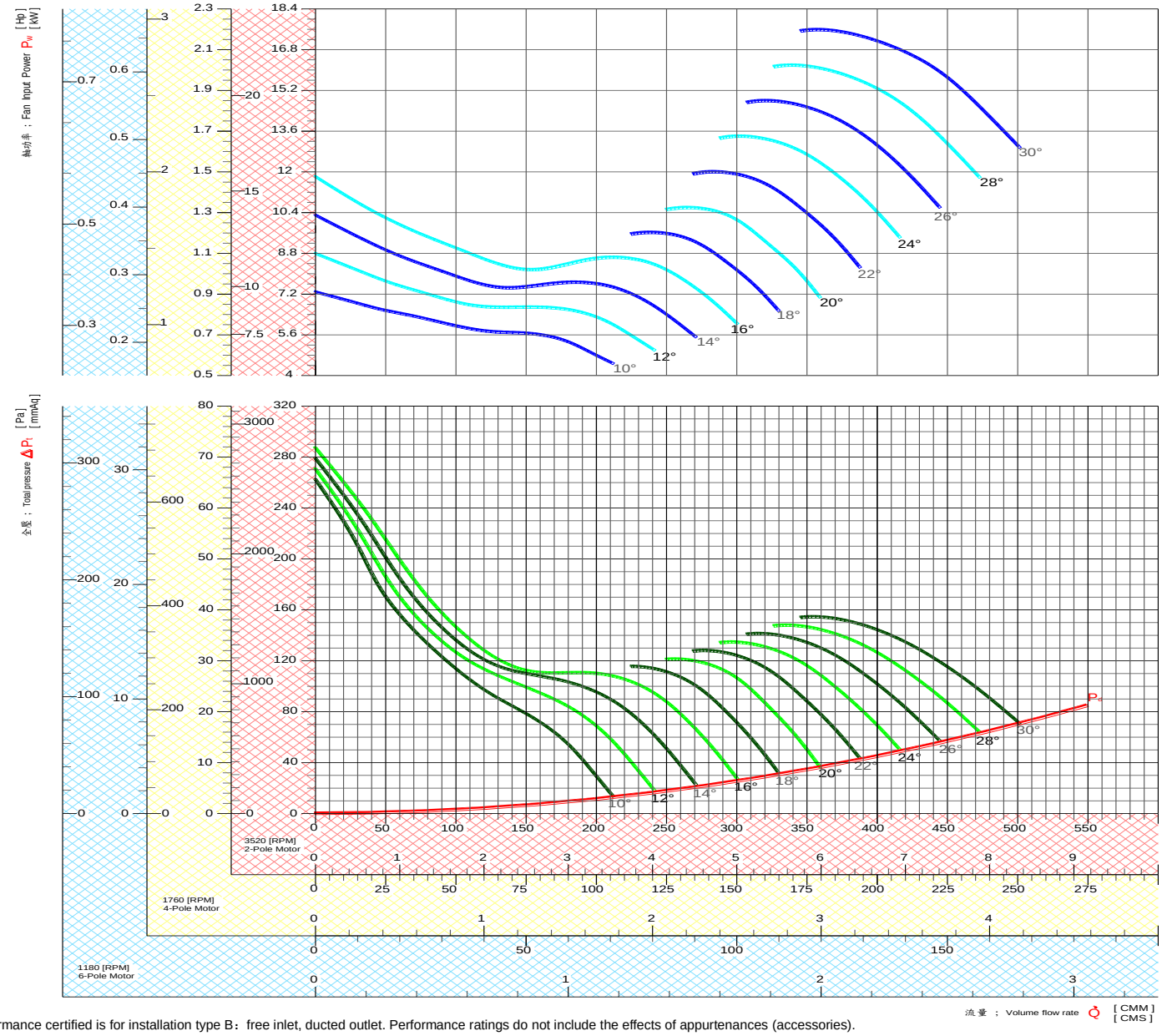
FLOWTECH 陽鼎實業股份有限公司

LASD-560-10 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 3520 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量；$\dot{Q}$ [cmm])/60 / 0.246[m^2]

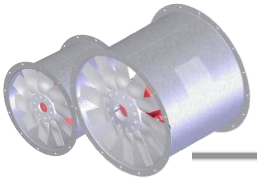
Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2



Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n	葉片角度 Pitch Angle[°]										
[min^{-1}]	10	12	14	16	18	20	22	24	26	28	30
3520	7.28	8.8	10.32	11.84	9.52	10.48	11.92	13.28	14.72	16.08	17.52
motor	7.5	—									
1760	0.91	1.1	1.29	1.48	1.19	1.31	1.49	1.66	1.84	2.01	2.19
motor	1.5							2.2			
1180	0.27	0.3	0.39	0.45	0.36	0.39	0.45	0.5	0.55	0.61	0.66



Low Pressure Axial Smoke-exhaust Fan Driven Directly with Cast Aluminum Airfoil Propellers

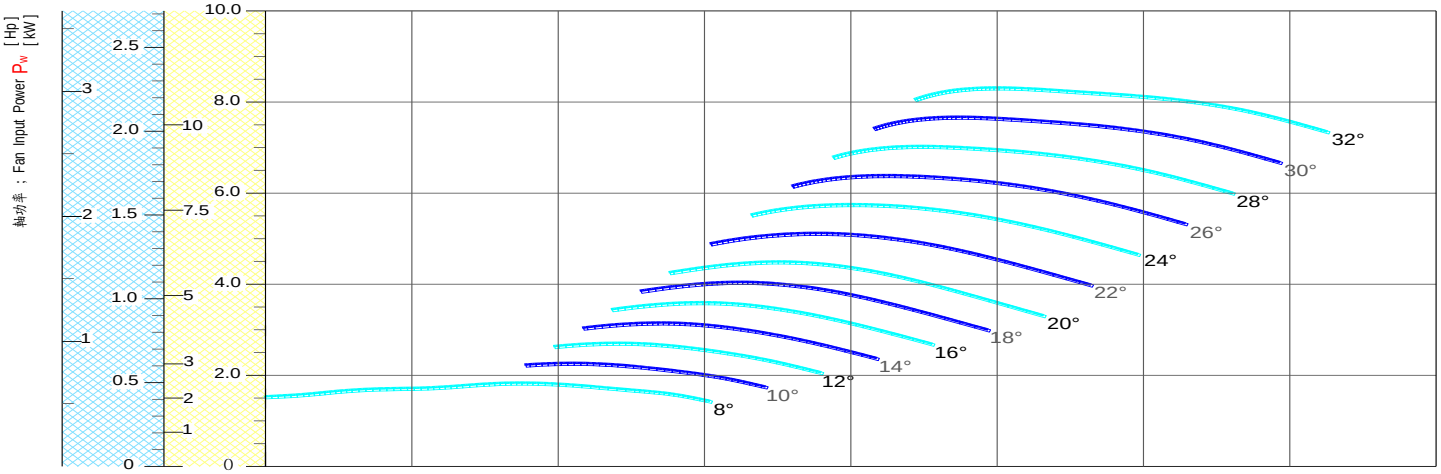
FLOWTECH 陽霖事業股份有限公司

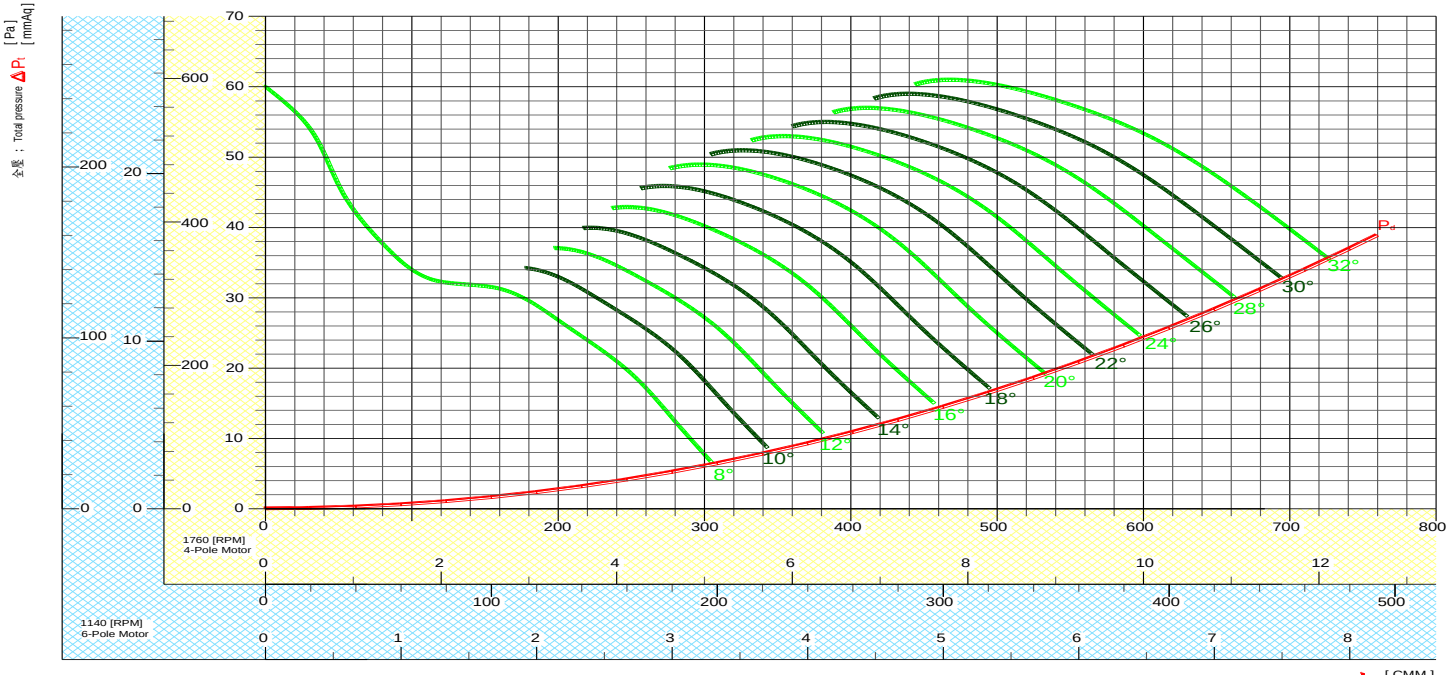
LASD-800-6 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 1760 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量；$\dot{Q}$ [cmm])/60 / 0.503[m^2]

Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2

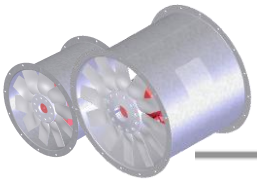




Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n	葉片角度 Pitch Angle[°]												
[min^{-1}]	8	10	12	14	16	18	20	22	24	26	28	30	32
1760	1.8	2.24	2.69	3.13	3.57	4.01	4.49	5.08	5.7	6.33	6.96	7.58	8.21
motor	2.2	3.7				5.5			7.5			11	
1140	0.49	0.61	0.73	0.85	0.97	1.09	1.22	1.38	1.55	1.72	1.89	2.06	2.23
motor	0.75			1.5					2.2				

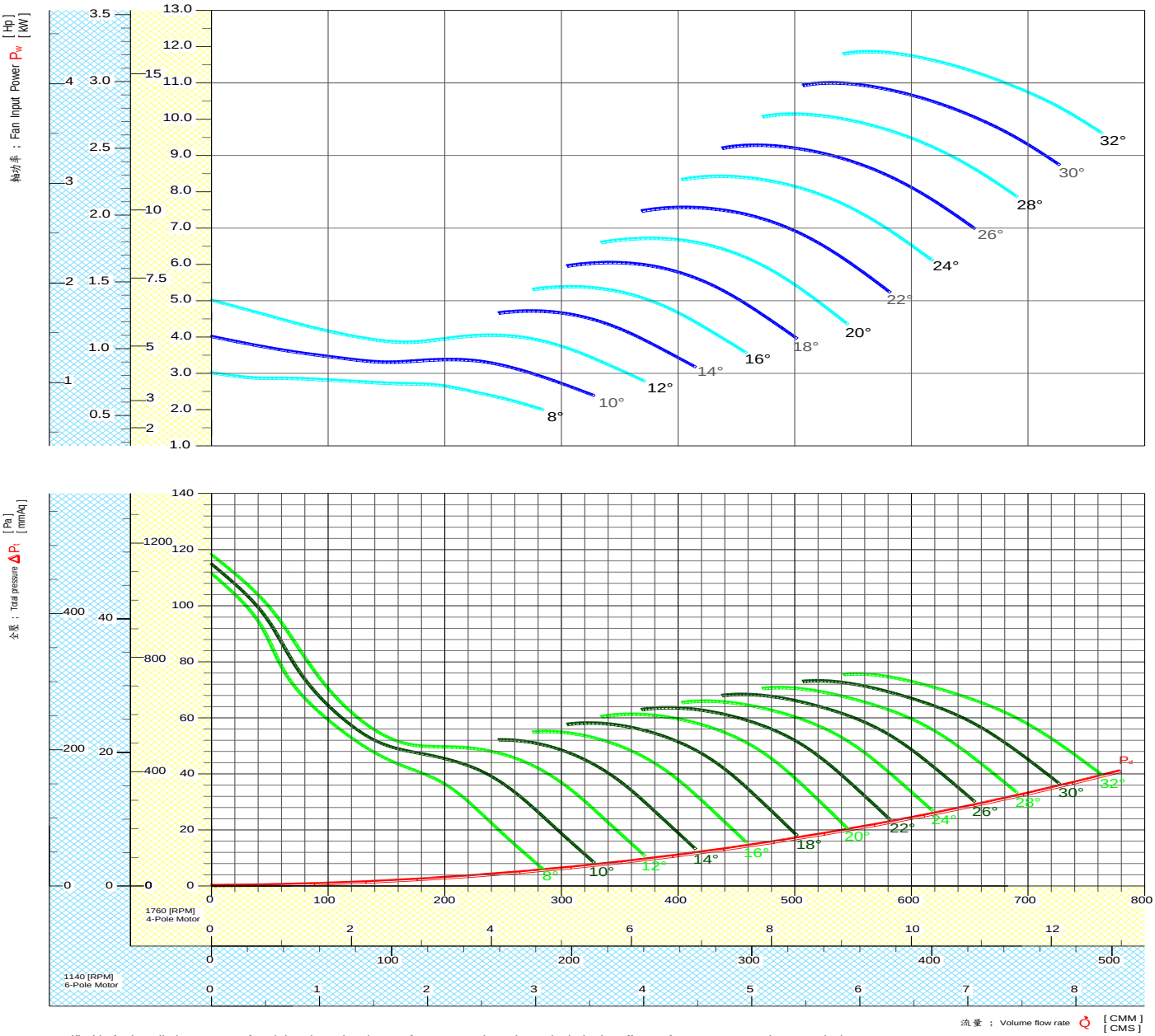


LASD-800-12 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 1760 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量；$\dot{Q}$ [cmm])/60 / 0.503[m^2]

Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2



Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

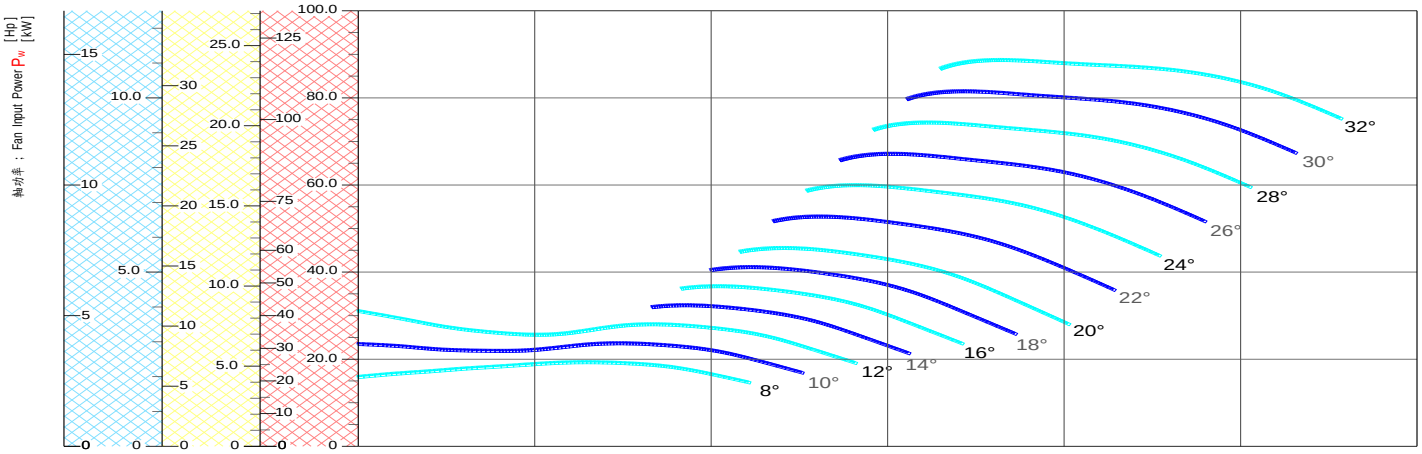
n [min^{-1}]	葉片角度 Pitch Angle[°]												
	8	10	12	14	16	18	20	22	24	26	28	30	32
1760	3.02	4.01	5	4.64	5.3	5.96	6.62	7.47	8.32	9.2	10.05	10.93	11.78
motor	3.7	5.5				7.5			11				15
1140	0.82	1.09	1.36	1.26	1.44	1.62	1.8	2.03	2.26	2.50	2.73	2.97	3.2
motor	1.5					2.2			3.7				

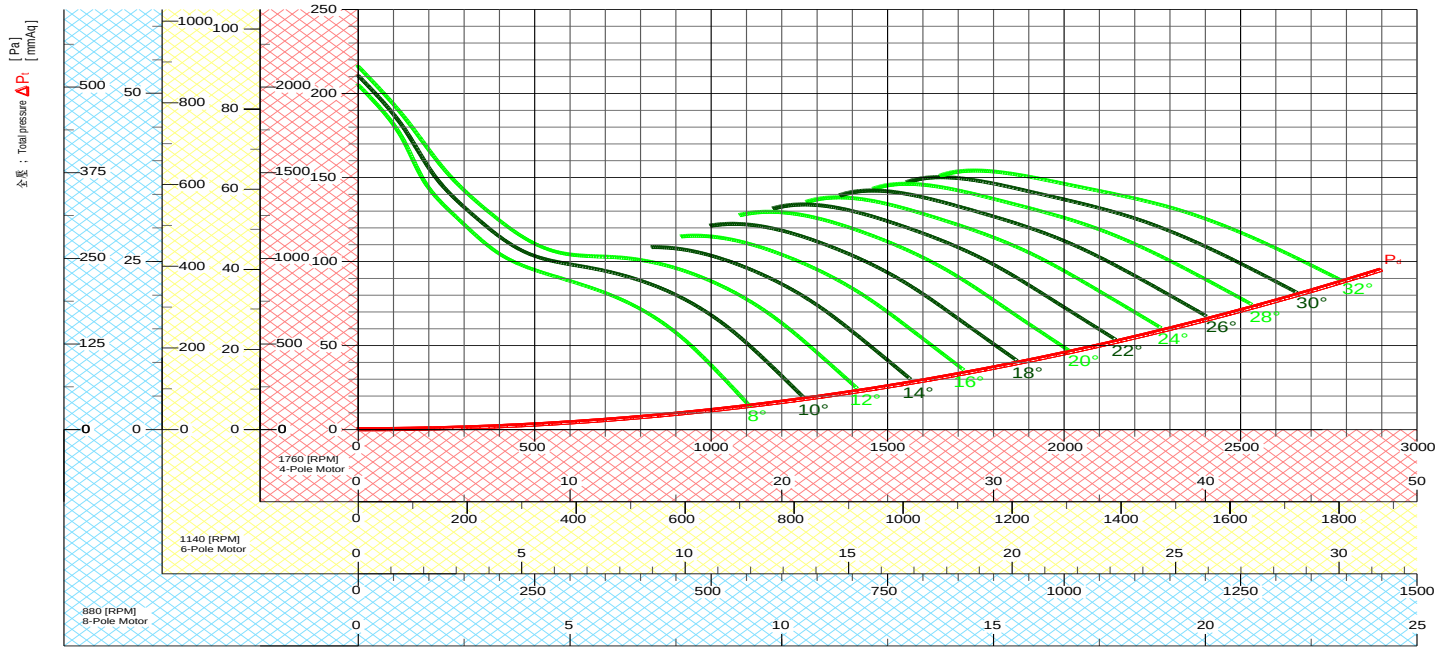
LASD-1250-7 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 1760 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量； $\dot{Q}$ [cmm])/60 / 1.227[m^2]

Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2

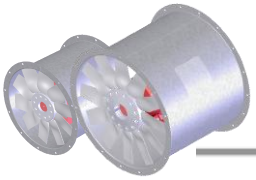




Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n [min^{-1}]	葉片角度 Pitch Angle[˚] 8	10	12	14	16	18	20	22	24	26	28	30	32
1760	19.14	23.40	31.02	31.87	36.10	40.33	44.56	51.56	58.59	65.87	73.20	80.56	87.88
motor	22	30	37			45		55	75			—	
1140	5.2	6.36	8.43	8.66	9.81	10.96	12.11	14.01	15.92	17.9	19.89	21.89	23.88
motor	5.5	7.5	11			15		18.5		22		30	
880	2.39	2.92	3.87	3.98	4.51	5.04	5.57	6.44	7.32	8.23	9.14	10.06	10.98
motor	3.7		5.5					7.5		11			

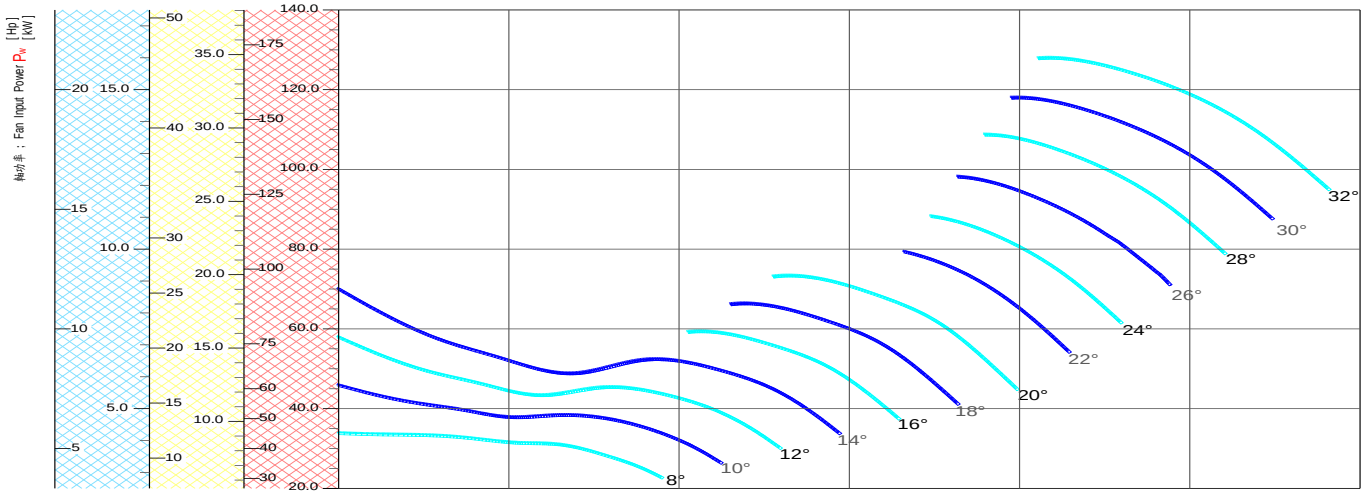


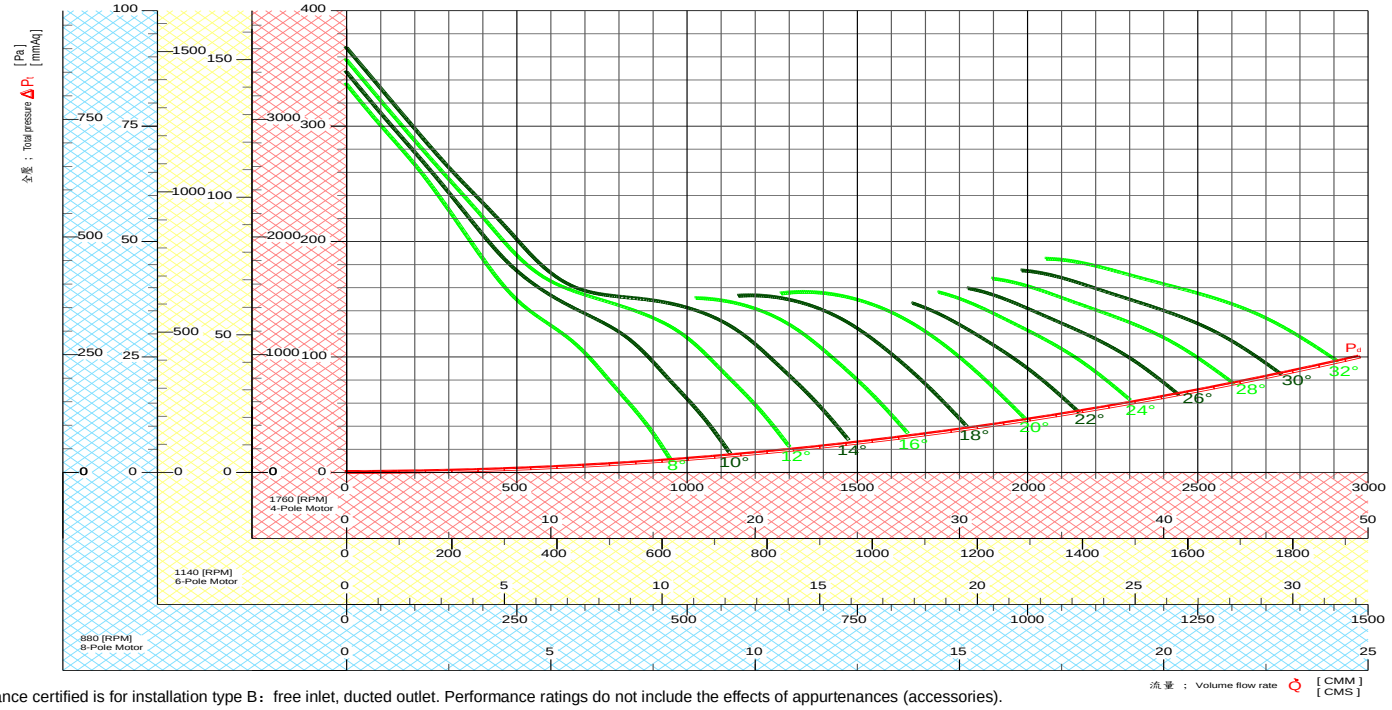
LASD1250-14 **60Hz** Performance curves 風機性能曲線

Max Fan Speed 最大風機轉速；N = 1760 [RPM]

Outlet Velocity 出口風速；V[m/s] =(volume flow 流量； $\dot{Q}$ [cmm])/60 / 1.227[m^2]

Velocity Pressure 動壓；P_d[Pa]=0.6×(Outlet Velocity 出口風速；V[m/s])^2

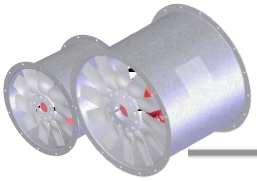




Performance certified is for installation type B：free inlet, ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

Peak absorbed Power 最大吸收功率 P_{Lmax}[kW]

n [min^{-1}]	葉片角度 Pitch Angle[˚]												
	8	10	12	14	16	18	20	22	24	26	28	30	32
1760	33.78	45.82	57.92	69.99	59.14	66.06	73.01	78.46	88.21	98.11	107.97	117.87	127.77
motor	37	55	75					—					
1140	9.18	12.45	15.74	19.02	16.07	17.95	19.84	21.32	23.97	26.66	29.34	32.03	34.72
motor	11	18.5		22	18.5		22		30			37	
880	4.22	5.72	7.23	8.74	7.39	8.25	9.12	9.80	11.02	12.25	13.49	14.72	15.96

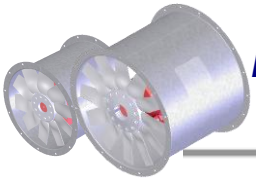


LASD-560-5 **60Hz**

Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-560-5/8°-0.75-4	1760	0	85	89	83	84	82	77	75	67	86
LASD-560-5/8°-0.75-4	1760	70	86	88	82	85	85	81	76	67	89
LASD-560-5/8°-0.75-4	1760	140	84	89	86	89	87	79	73	66	90
LASD-560-5/8°-0.75-4	1760	210	85	95	87	84	81	76	72	67	87
LASD-560-5/8°-0.75-6	1180	0	76	76	74	74	70	67	62	54	76
LASD-560-5/8°-0.75-6	1180	31	76	76	74	76	74	69	62	53	78
LASD-560-5/8°-0.75-6	1180	63	76	78	78	79	73	67	60	53	79
LASD-560-5/8°-0.75-6	1180	94	79	81	76	73	69	65	60	55	75
LASD-560-5/20°-1.5-4	1761	0	87	94	87	87	83	77	75	68	88
LASD-560-5/20°-1.5-4	1760	74	87	95	86	85	82	75	73	66	87
ASD-560-5/20°-1.5-4	1759	148	87	92	85	84	81	75	74	68	86
LASD-560-5/20°-1.5-4	1759	208	88	93	85	86	83	79	77	72	88
LASD-560-5/20°-0.75-6	1180	0	80	81	78	76	71	67	62	55	77
LASD-560-5/20°-0.75-6	1180	33	80	81	76	74	69	65	60	53	76
LASD-560-5/20°-0.75-6	1180	67	79	79	75	73	69	65	62	55	75
LASD-560-5/20°-0.75-6	1180	94	80	79	76	75	72	69	65	60	77
LASD-560-5/32°-2.2-4	1760	0	89	96	91	89	86	79	77	72	91
LASD-560-5/32°-2.2-4	1760	80	89	97	89	88	85	79	77	73	90
LASD-560-5/32°-2.2-4	1759	161	89	96	88	88	84	80	78	75	90
LASD-560-5/32°-2.2-4	1760	240	90	94	87	87	85	81	79	76	90
LASD-560-5/32°-0.75-6	1180	0	82	84	80	78	73	69	65	60	79
LASD-560-5/32°-0.75-6	1180	36	82	83	79	77	73	69	66	62	79
LASD-560-5/32°-0.75-6	1180	72	82	82	79	77	73	70	67	64	79
LASD-560-5/32°-0.75-6	1180	108	81	81	78	77	73	71	68	65	79

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.

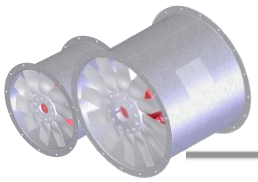


LASD-560-10 **60Hz**

Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-560-10/10°-1.5-4	1761	0	82	88	89	86	84	80	78	70	89
LASD-560-10/10°-1.5-4	1759	144	80	85	86	88	88	84	79	71	92
LASD-560-10/10°-1.5-4	1761	287	87	87	93	88	84	79	75	70	90
LASD-560-10/10°-1.5-4	1760	431	87	87	92	87	83	80	77	72	90
LASD-560-10/10°-0.75-6	1180	0	74	78	79	76	73	70	64	56	78
LASD-560-10/10°-0.75-6	1180	65	72	75	78	79	77	73	65	57	81
LASD-560-10/10°-0.75-6	1180	129	76	80	81	77	72	68	63	58	79
LASD-560-10/10°-0.75-6	1180	194	76	79	81	76	72	70	65	60	79
LASD-560-10/20°-1.5-4	1761	0	88	89	93	89	85	80	79	70	91
LASD-560-10/20°-1.5-4	1760	75	87	90	92	88	85	80	78	70	90
LASD-560-10/20°-1.5-4	1761	151	87	89	91	87	84	79	78	70	90
LASD-560-10/20°-1.5-4	1759	240	88	91	89	89	87	83	79	72	91
LASD-560-10/20°-0.75-6	1180	0	77	81	82	78	73	70	65	56	80
LASD-560-10/20°-0.75-6	1180	34	77	81	81	78	73	70	64	56	80
LASD-560-10/20°-0.75-6	1180	68	77	80	80	76	72	70	64	56	78
LASD-560-10/20°-0.75-6	1180	108	78	79	80	79	76	72	66	59	81
LASD-560-10/30°-2.2-4	1760	0	89	90	94	92	88	82	79	72	93
LASD-560-10/30°-2.2-4	1760	98	89	92	94	91	86	81	78	71	92
LASD-560-10/30°-2.2-4	1760	197	89	94	93	89	85	81	78	71	91
LASD-560-10/30°-2.2-4	1759	290	88	96	91	89	86	84	79	74	92
LASD-560-10/30°-0.75-6	1180	0	78	82	84	81	76	71	66	59	82
LASD-560-10/30°-0.75-6	1180	44	79	82	83	79	74	70	65	58	81
LASD-560-10/30°-0.75-6	1180	89	80	82	82	78	74	70	65	58	80
LASD-560-10/30°-0.75-6	1180	131	81	82	81	78	76	72	67	62	81

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.

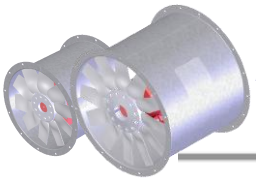


LASD-800-6 **60Hz**

Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-800-6/8°-2.2-4	1760	0	86	95	97	91	90	87	84	80	95
LASD-800-6/8°-2.2-4	1760	148	87	95	95	90	90	91	88	82	97
LASD-800-6/8°-2.2-4	1760	291	89	95	97	99	95	90	85	79	100
LASD-800-6/8°-2.2-4	1760	435	91	99	101	96	92	89	86	82	99
LASD-800-6/8°-0.75-6	1141	0	79	89	82	81	79	75	75	65	84
LASD-800-6/8°-0.75-6	1140	62	80	87	81	80	82	80	77	65	86
LASD-800-6/8°-0.75-6	1140	122	82	84	90	88	83	77	73	64	89
LASD-800-6/8°-0.75-6	1141	183	84	92	88	84	81	78	75	68	87
LASD-800-6/20°-5.5-4	1760	0	88	102	103	99	93	87	93	87	101
LASD-800-6/20°-5.5-4	1760	131	88	102	102	96	92	86	91	85	99
LASD-800-6/20°-5.5-4	1760	262	87	100	100	94	90	85	86	82	97
LASD-800-6/20°-5.5-4	1760	394	87	97	96	94	91	87	85	82	96
LASD-800-6/20°-1.5-6	1140	0	85	94	91	86	80	82	80	74	90
LASD-800-6/20°-1.5-6	1139	55	85	93	89	85	79	80	78	72	88
LASD-800-6/20°-1.5-6	1140	110	84	91	87	83	78	77	75	71	86
LASD-800-6/20°-1.5-6	1139	165	82	88	85	83	79	77	74	71	86
LASD-800-6/32°-11-4	1760	0	99	106	106	100	97	93	88	84	103
LASD-800-6/32°-11-4	1760	153	100	107	105	99	96	92	88	84	102
LASD-800-6/32°-11-4	1760	307	100	106	104	98	95	92	89	85	102
LASD-800-6/32°-11-4	1760	431	100	105	102	97	95	93	90	86	101
LASD-800-6/32°-2.2-6	1140	0	92	98	91	89	86	80	76	72	91
LASD-800-6/32°-2.2-6	1139	64	93	97	90	88	85	80	77	72	91
LASD-800-6/32°-2.2-6	1141	129	93	96	89	87	84	81	78	73	90
LASD-800-6/32°-2.2-6	1140	181	93	94	88	86	85	82	78	73	90

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.

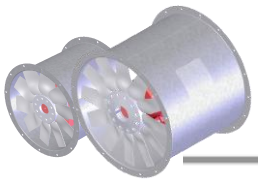


LASD-800-12 **60Hz**

Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-800-12/8°-3.7-4	1760	0	87	92	92	95	94	92	89	84	99
LASD-800-12/8°-3.7-4	1760	229	87	92	92	95	97	96	90	84	101
LASD-800-12/8°-3.7-4	1760	451	91	99	103	102	96	92	86	79	102
LASD-800-12/8°-3.7-4	1760	696	91	97	100	100	95	91	87	82	101
LASD-800-12/8°-1.5-6	1140	0	80	78	86	85	84	80	78	68	88
LASD-800-12/8°-1.5-6	1140	96	80	79	84	87	89	83	78	68	92
LASD-800-12/8°-1.5-6	1139	189	84	92	94	88	84	79	73	64	90
LASD-800-12/8°-1.5-6	1140	292	84	87	92	87	83	79	76	68	89
LASD-800-12/20°-7.5-4	1760	0	93	98	98	100	97	92	88	84	102
LASD-800-12/20°-7.5-4	1760	172	91	96	98	99	96	91	87	83	101
LASD-800-12/20°-7.5-4	1760	346	92	97	97	98	94	91	87	83	100
LASD-800-12/20°-7.5-4	1760	517	94	99	99	102	101	97	92	85	105
LASD-800-12/20°-2.2-6	1140	0	86	85	91	89	85	79	79	68	90
LASD-800-12/20°-2.2-6	1140	72	84	85	91	87	84	78	78	67	89
LASD-800-12/20°-2.2-6	1140	145	85	84	90	86	83	79	77	68	89
LASD-800-12/20°-2.2-6	1140	217	87	86	92	93	90	85	79	70	94
LASD-800-12/32°-15-4	1760	0	98	103	103	103	99	95	90	85	104
LASD-800-12/32°-15-4	1760	181	98	102	102	103	99	94	90	85	104
LASD-800-12/32°-15-4	1760	362	97	101	101	102	98	94	90	85	103
LASD-800-12/32°-15-4	1760	544	98	101	99	101	98	94	90	87	103
LASD-800-12/32°-3.7-6	1140	0	91	91	95	91	88	82	78	72	93
LASD-800-12/32°-3.7-6	1140	76	91	89	94	91	87	82	78	72	93
LASD-800-12/32°-3.7-6	1140	152	90	88	93	90	87	82	78	73	92
LASD-800-12/32°-3.7-6	1139	228	91	86	92	90	86	83	79	74	92

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.

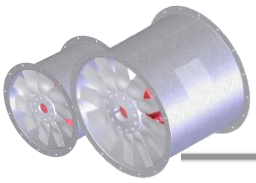


LASD-1250-7 **60Hz**

Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-1250-7/8°-3.7-8	880	0	95	99	94	93	90	86	79	70	95
LASD-1250-7/8°-3.7-8	880	117	92	96	93	92	91	88	80	70	95
LASD-1250-7/8°-3.7-8	880	234	95	101	98	93	89	84	78	71	95
LASD-1250-7/8°-3.7-8	880	350	96	100	95	91	88	85	81	75	94
LASD-1250-7/20°-5.5-8	880	0	101	105	99	96	91	87	80	71	98
LASD-1250-7/20°-5.5-8	880	91	100	103	98	95	90	85	79	70	97
LASD-1250-7/20°-5.5-8	880	179	98	102	97	93	89	85	80	73	95
LASD-1250-7/20°-5.5-8	880	267	97	103	103	100	94	90	83	77	101
LASD-1250-7/32°-11-8	880	0	104	108	102	99	94	89	83	76	101
LASD-1250-7/32°-11-8	880	91	102	106	101	98	93	88	83	78	100
LASD-1250-7/32°-11-8	880	181	102	105	99	96	92	89	85	80	99
LASD-1250-7/32°-11-8	880	272	100	103	97	95	92	90	87	82	98

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.



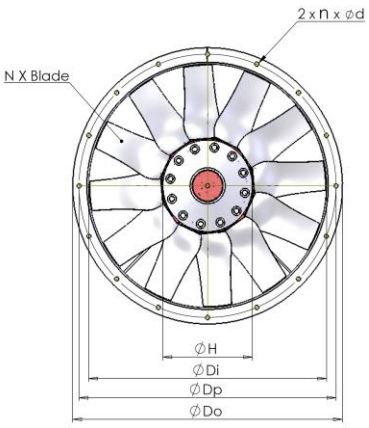
LASD-1250-14 **60Hz**

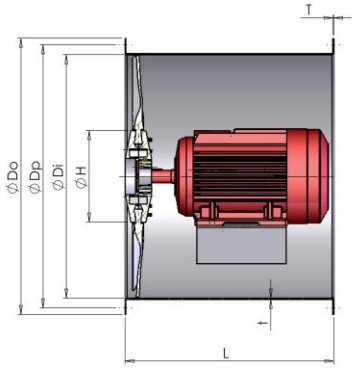
Sound Data 風機聲功率數值[dB]

Model No.	N [RPM]	Ps [Pa]	Sound Power re 10^{-12} Watts Octave Band [Hz]								$L_{WI}A$ [dBA]
			63	125	250	500	1000	2000	4000	8000	
LASD-1250-14/8°-5.5-8	880	0	86	94	97	94	93	89	81	73	97
LASD-1250-14/8°-5.5-8	880	212	87	94	97	96	94	88	80	73	98
LASD-1250-14/8°-5.5-8	880	427	88	95	97	96	94	88	80	73	98
LASD-1250-14/8°-5.5-8	880	639	89	96	100	96	92	87	80	73	98
LASD-1250-14/20°-11-8	880	0	94	101	104	97	94	90	83	75	100
LASD-1250-14/20°-11-8	880	105	92	100	104	97	94	89	81	75	100
LASD-1250-14/20°-11-8	880	210	91	99	102	96	93	87	81	75	99
LASD-1250-14/20°-11-8	880	315	91	99	101	97	94	89	82	77	99
LASD-1250-14/32°-18.5-8	880	0	98	105	107	101	98	92	84	76	104
LASD-1250-14/32°-18.5-8	880	98	97	104	106	99	97	90	83	76	102
LASD-1250-14/32°-18.5-8	880	198	95	103	104	98	96	89	83	78	101
LASD-1250-14/32°-18.5-8	880	315	94	101	103	98	94	90	85	81	100

The sound power level ratings shown are in decibels referred to 10^{-12} watts, calculated per AMCA International Standard 301. The A-weighted sound ratings shown have been calculated per AMCA International Standard 301.Values shown are for inlet L_{WI} and inlet $L_{WI}A$ sound power levels for Installation Type B：free inlet, ducted outlet.

Dimensions + Accessories 尺寸

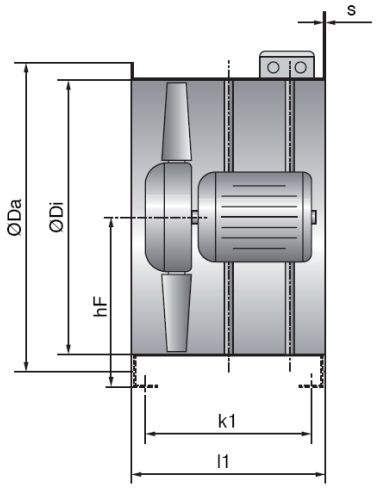


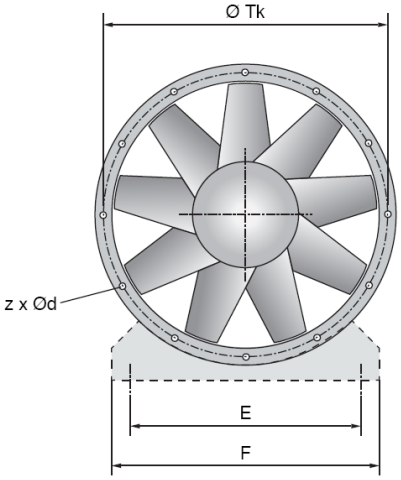


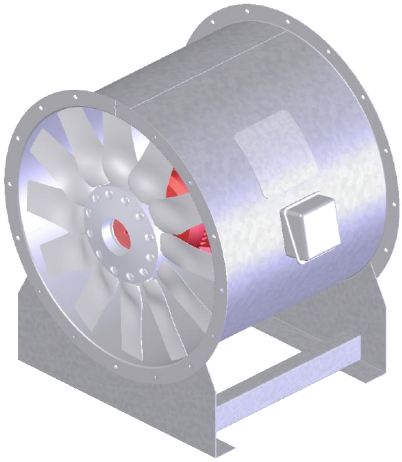
MODEL	Di[mm]	Do[mm]	Dp[mm]	H[mm]	2×n×⌀d	N[PCS]
LASD-560	565	660	629	200	2×12×14	5
						10
LASD-800	797	904	861	300	2×16×14	6
						12
LASD-1250	1250	1365	1320	550	2×24×14	7
						14

Dimensions + Accessories 尺寸 + 附件

Feet mounting 落地式





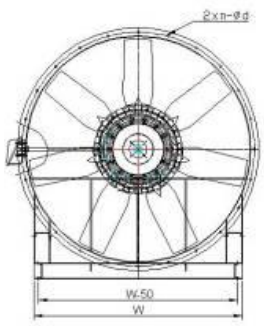


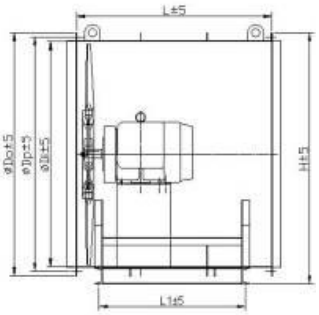
尺寸 Size	Di[mm]	Da[mm]	hF[mm]	Z*d[mm]	Tk[mm]	E[mm]	F[mm]	S[mm]	K1[mm]	l1[mm]
560	565	660	348	12*14	629	500	460	3	444	520
800	797	904	469	16*14	861	740	800	3	612	700
1250	1250	1365	685	24*14	1320	1150	1210	4	890	1000

Dimensions + Accessories 尺寸 + 附件

Feet mounting 落地式

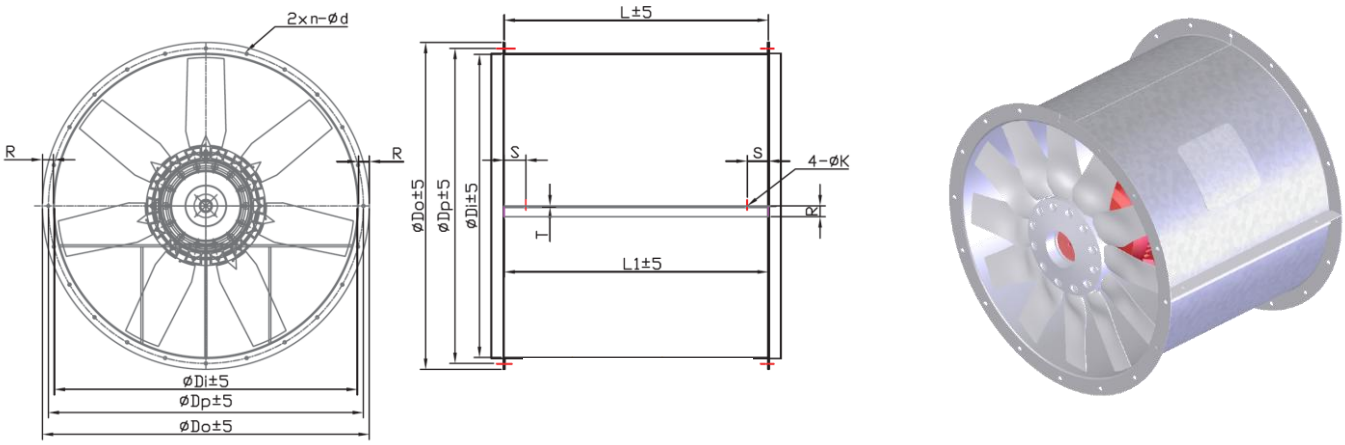
圖 1 落地式外型尺寸圖





尺寸 size	Di [mm]	Dp [mm]	Do [mm]	H [mm]	z*d [mm]	L [mm]	L1 [mm]	W [mm]
1250	1250	1320	1365	1392	24*14	1000	955	1250

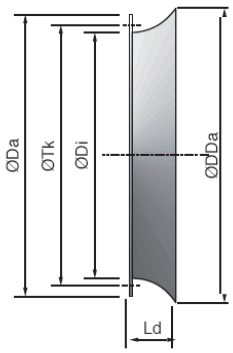
Ceiling Hanging 吊掛式　圖 2 吊掛式外型尺寸圖



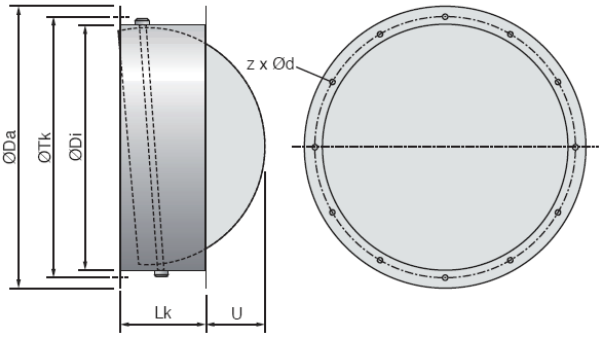
尺寸 size	Di [mm]	Dp [mm]	Do [mm]	n×d	L [mm]	L1 [mm]	t [mm]	T [mm]	R [mm]	K [mm]	S [mm]	安裝最大馬達 Max.Motor
560	565	629	660	12×14	520	514	3	5	50	14	100	132S
800	797	861	904	16×14	700	694	3	5	50	14	100	160L
1250	1250	1320	1365	24×14	1000	992	4	5	60	14	100	225SC

Dimensions + Accessories 尺寸 + 附件

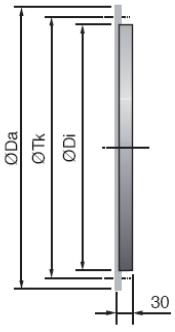
ED
集流器(通風噴口)



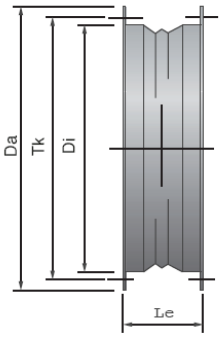
LRK
空氣驅動的氣流調節器



GL-AXV
配套的法蘭配件

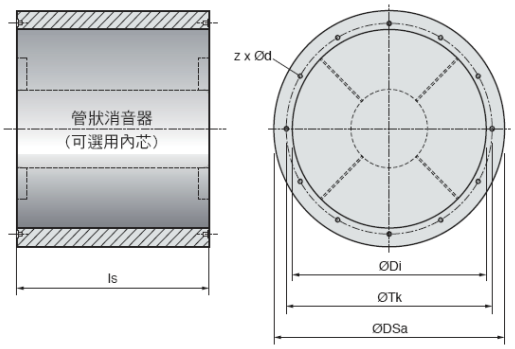


EV-AXV
柔性法蘭聯接器



規格尺寸 size	Da [mm]	Di [mm]	Tk [mm]	z×ψd [mm]	DDa [mm]	Ld [mm]	Lk [mm]	U [mm]
560	660	565	629	12*14	667	135	185	110
800	904	797	861	16*14	915	200	330	195
1250	1365	1250	1320	24*14	按需求 On demand			

SD
管狀消音器(可選用內芯)



規格 DSa ls 尺寸 [mm] [mm]			不同頻率下聲級衰減 ***attenuation at*** [Hz]							
		[kg]	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1k [dB]	2k [dB]	4k [dB]	8k [dB]
560	765	1120 50	1	3	10	10	6	3	1	1
		630 34	1	1	5	5	3	2	1	1
800	1005	800 62	1	3	7	5	2	1	1	1
		1600 98	1	4	11	7	4	2	1	1
1250			On demand 按需求							

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