



HORUS AIR MOVING 和旭風機

RB 系列—雙吸後傾式離心風機

Series RB, Double Inlet Centrifugal Ventilators
with Backward Wheels





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Horus Air Moving Co. , Ltd. Certifies that the RB Centrifugal Ventilators shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

All of the Centrifugal Ventilators described herein are licensed to bear the AMCA Seal, and their certified ratings are shown on pages 10 through 23.

和旭機械股份有限公司對下圖所示的 RB 系列離心風機進行 AMCA 認證，並取得了標籤。樣式中的所有數據都基於 AMCA 的性能測試，性能測試符合 AMCA 211 和 AMCA 311 文件，完全按照 AMCA 認證程序的要求進行。

這裡描述的所有離心風機都已經取得了 AMCA 認證，它們的認證數據見第十到二十三頁。

概述 Outline

本公司之風機採用後傾式離心葉輪，具有通用性強、效率高、噪音低、耗能少等特點。是各類中央空調機組及其它暖氣空調、淨化、通風等最佳選擇。

The ventilators are centrifugal fans with backward curved impellers. Some of the features and characteristics of these ventilators are: backward impeller blading, a wide range of applications, high efficiency, low noise, and low power consumption. These ventilators are ideal for use in central air conditioning systems, heating and ventilating air conditioning systems, and in purifiers. They are also suitable for use in a number of other ventilator applications.

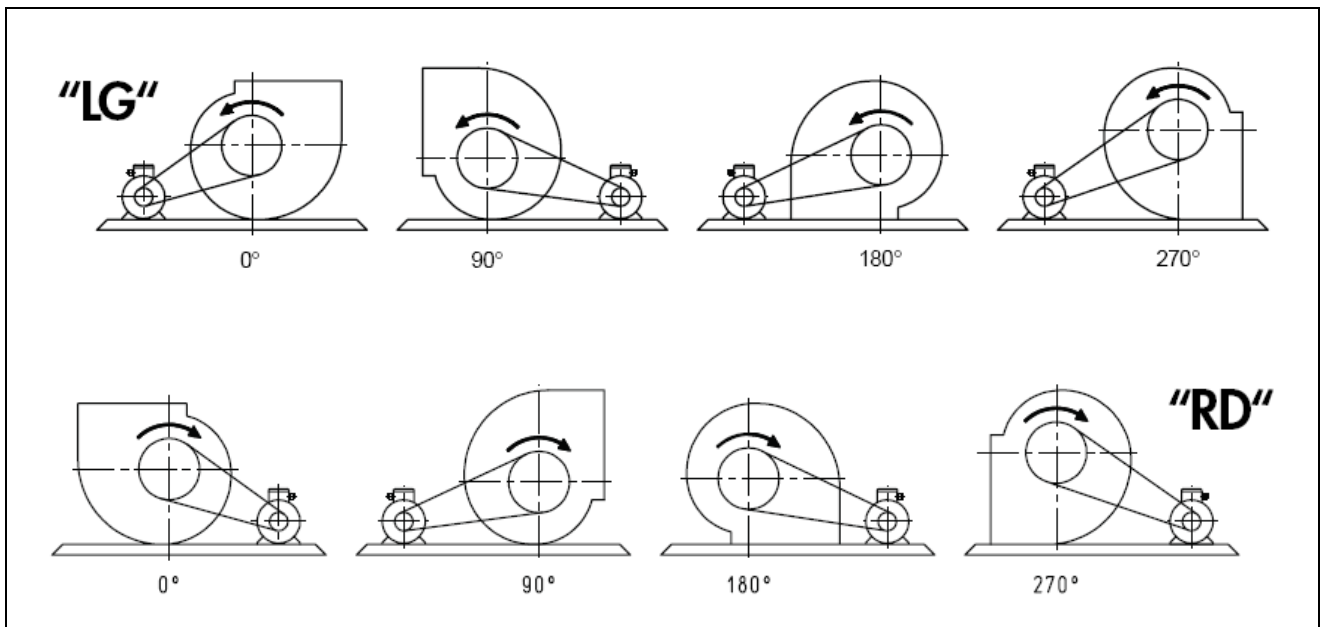


圖 1 (Fig1)

產品型式 Type of Product

1. 旋向

此風機旋向可分為左旋（LG）和右旋（RD）二種方式，以馬達一端正視，葉輪順時針旋轉的稱為右旋風機、逆時針旋轉的稱為左旋風機。皮帶輪可左右調向，因此不受左右方向的限制。

2. 出風口方向

風機可如圖 1 所示製成 0° 、 90° 、 180° 、 270° 四種出風方向。

1. Direction of Rotation

The ventilators can be applied with two directions of rotation, left hand (LG) and right hand (RD). If the impeller rotates in a counterclockwise direction when viewed from the drive motor side, it is designated as a left hand ventilator. If it rotates clockwise when viewed from the drive pulley can be mounted on either side of the ventilator, so there is no significant limitation on the ventilator directionality.

2. Direction of Air Outlet

As shown in Figure 1, the ventilators can be arranged to provide four different air outlet directions, 0, 90, 180, and 270 degrees.

產品結構 Construction of Product

此風機主要由機殼、葉輪、框架、軸承、軸、出風口法蘭（常規配置不帶法蘭）構成。

1. 機殼

機殼基本採用鋼板烤漆製造，具有符合空氣動力的外形，蝸殼板採用焊接或“匹茲堡溝”咬合的方式與側板連接成一體。其它如不銹鋼材質或鍍鋅鋼板亦可採用。

2. 葉輪

葉輪採用優質鋼板烤漆製成，葉片設計符合空氣動力的特定形狀，使得效率最高、噪音最低。葉片用焊接固定在中盤板及葉輪蓋板上，葉輪蓋板採用油壓伸抽一體成型，在最大功率連續運轉時，葉輪具有足夠的剛度。葉輪按 ISO1940-1 的動平衡精度 G6.3 等全檢合格。其它如不銹鋼材質或鍍鋅鋼板亦可採用。

3. 框架

框架由角鋼和扁鋼焊接製成，表面噴漆，以保證框架具有足夠的剛度和強度。

4. 軸承

此風機採用優質連座軸承，該軸承預先加潤滑油並有自動放正功能。

The major components of the ventilators include the scroll, impeller, frame, bearings, shaft, and outlet flange.

1. Scroll

The scroll is basic made of painted steel sheet, and it is designed to provide an aerodynamically efficient flow path. The inlet is formed in one piece. The scroll plate is connected to the side plate by using welding or a “Pittsburgh lock” type of system. In addition, the stainless or galvanized steel material is also provided.

2. Impeller

The impeller is made of high grade painted steel sheet, and it is configured to provide a highly efficient and low noise aerodynamic flow path. The blade is fixed to the central disk plate and shroud by welding. The shroud is made of hydraulic draw . The impeller strength is sufficient for it to operate continuously at maximum power. The impellers are balanced before assembly in accordance with ISO1940-1, G6.3 requirement. In addition, the stainless or galvanized steel material is also provided.

3. Frame

The frames use sections of steel to assure sufficient frame rigidity and they are finished with painting.

4. Bearings

For the ventilators, self-aligning pillow block ball bearings are used, and these bearings are supplied with lubrication fittings.

5. 軸

風機軸採用 S45C 棒剛粗加工、熱處理及研磨加工製成，嚴格控制軸徑尺寸公差及配合公差，每根軸均經過塗覆防鏽處理。

6. 出風口法蘭（選配）

法蘭採用鍍鋅鋼板製成，法蘭及法蘭與殼體的連接採用鉚釘或自攻螺絲，外觀精美，並具有足夠的剛度與強度。

5. Shaft

The shafts are made of C45 carbon steel bars. The shafts are rough machined and then stress relieved before final machining. The shaft diameters are machined to very accurate tolerance levels and they are fully checked to assure precision fits. They are coated after assembly in order to provide corrosion resistance.

6. Outlet Flange (Option)

The outlet flange is made of galvanized steel angle iron bars. The connections of the flange components to each other and to the scroll are made using rivet or self tapping screw. This maintains a good flange appearance while also providing sufficient strength and rigidity.

風機定律 The Fan Laws

1st law :

$$\left[\frac{Q_c}{Q} \right] = \left[\frac{D_c}{D} \right]^3 \left[\frac{N_c}{N} \right] \left[\frac{K_p}{K_{pc}} \right]$$

2nd law :

$$\left[\frac{P_{tc}}{P} \right] = \left[\frac{D_c}{D} \right]^2 \left[\frac{N_c}{N} \right]^2 \left[\frac{K_p}{K_{pc}} \right] \left[\frac{\rho_c}{\rho} \right]$$

3rd law :

$$\left[\frac{P_{vc}}{P} \right] = \left[\frac{D_c}{D} \right]^2 \left[\frac{N_c}{N} \right]^2 \left[\frac{\rho_c}{\rho} \right]$$

4th law :

$$\left[\frac{H_c}{H} \right] = \left[\frac{D_c}{D} \right]^5 \left[\frac{N_c}{N} \right]^3 \left[\frac{K_p}{K_{pc}} \right] \left[\frac{\rho_c}{\rho} \right]$$

5th law :

$$P_{sc} = P_{tc} - P_{vc}$$

Where P_{tc} and P_{vc} are established per the 2nd and 3rd FAN LAW.

6th law :

$$\eta_{sc} = \eta_{tc} \left[\frac{P_{sc}}{P_{tc}} \right]$$

Where P_{sc} is established using the 5th FAN LAW and P_{tc} is established using the 2th FAN LAW. In the above, subscript c denotes the new operating condition, and:

D = Impeller diameter

D_c = Impeller diameter, converted

N = Impeller rotational speed

N_c = Impeller rotational speed, converted

K_p = Compressibility coefficient

K_{pc} = Compressibility coefficient, converted

Q = Volume airflow rate

Q_c = Volume airflow rate, converted

P_t = Pressure, total

P_{tc} = Pressure, total, converted

P_v = Pressure, velocity

P_{vc} = Pressure, velocity, converted

H = Power

H_c = Power, converted

P_s = Pressure, static

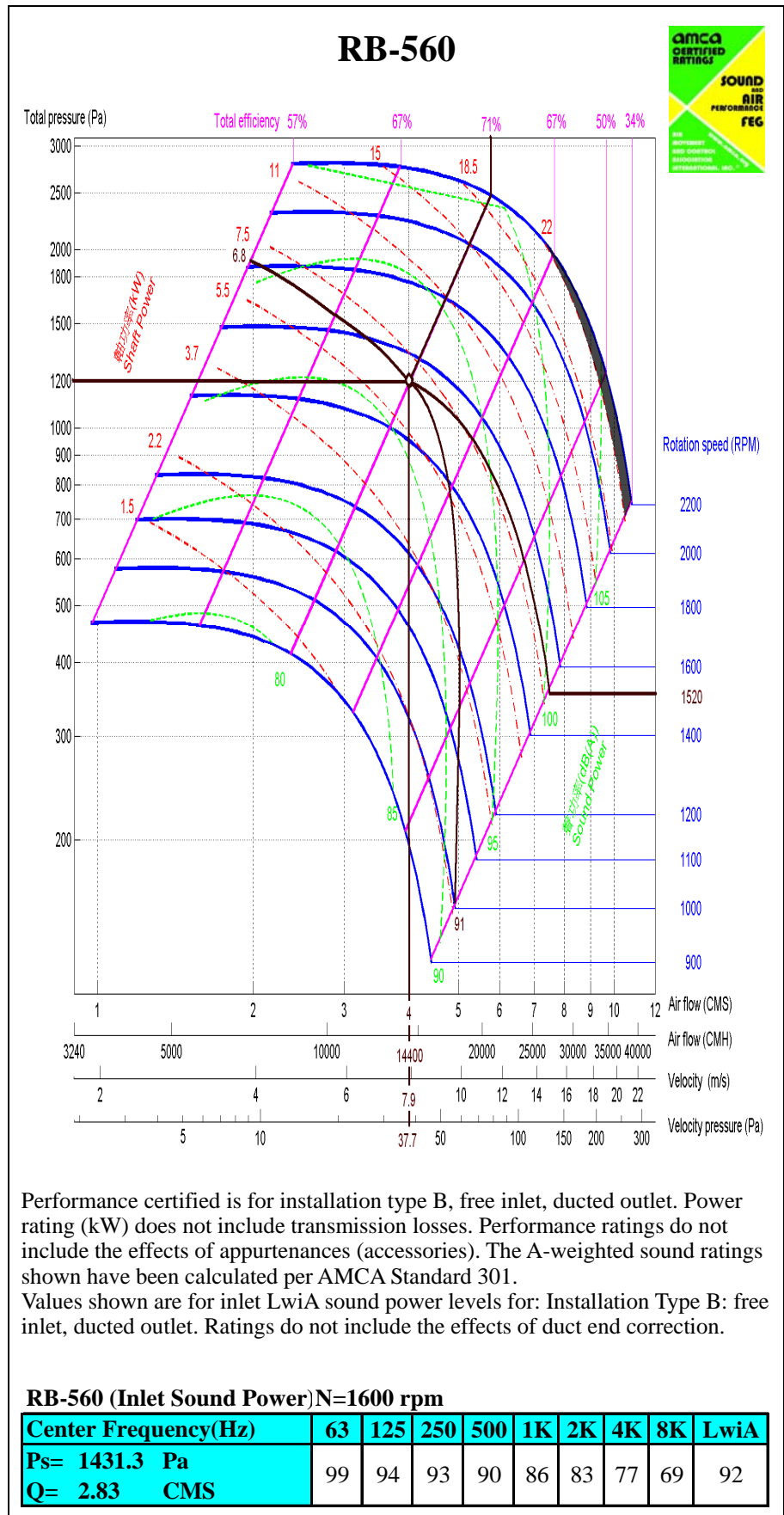
P_{sc} = Pressure, static, converted

η_{sc} = Efficiency, static, converted

η_{tc} = Efficiency, total, converted

範例 Example Of Curve Reading

風量
 Air Volume $Q=14400\text{m}^3/\text{h}$
 風速
 Outlet Velocity $V=7.9\text{m/s}$
 全壓
 Total Pressure $P_t=1200\text{ Pa}$
 動壓
 Velocity Pressure $P_v=37.7\text{ Pa}$
 靜壓
 Static Pressure $P_s = P_t - P_v$
 $=1162.3\text{ Pa}$
 轉速
 Fan Speed $N=1520\text{ rpm}$
 軸功率
 Shaft Power $W=6.8\text{ kW}$
 聲功率
 Sound Power $L_{wi} A=91\text{dB(A)}$
 總效率
 Total Efficiency $\eta=71\%$



自由音場 Non-Directional Sound in a Free-Field

聲功率和聲壓之間的最簡單的關係為一個非方向性聲源的自由音場，其關係如下列方程式所示：

The simplest relation between sound power level and sound pressure level is found for a free-field, non-directional sound source, as given by the following equation :

$$L_p = L_{wi} - 20 \log_{10}(r) - k + T$$

L_p = sound pressure level (dB) re $20 \mu\text{Pa}$

L_{wi} = sound power level (dB) re 10^{-12} watts

r = distance from the source in meters or feet

k = 11.0 dB for metric units and 0.5 dB for English units

T = correction factor for atmospheric pressure and temperature (dB) (since most industrial noise problems are concerned with air at or near standard conditions, T is usually negligible and, therefore, equals 0)

Example :

計算在自由音場中 110 dB 的聲功率距離聲源 10 英尺時的聲壓：

Consider a point source having a L_{wi} of 110 dB for a free-field . The sound pressure level at a distance of 10 feet from the source would be calculated as follows (since the source is found for a free-field, the equation for hemispherical radiation from a point source is used) :

$$L_p = L_{wi} - 20 \log_{10}(r) - k$$

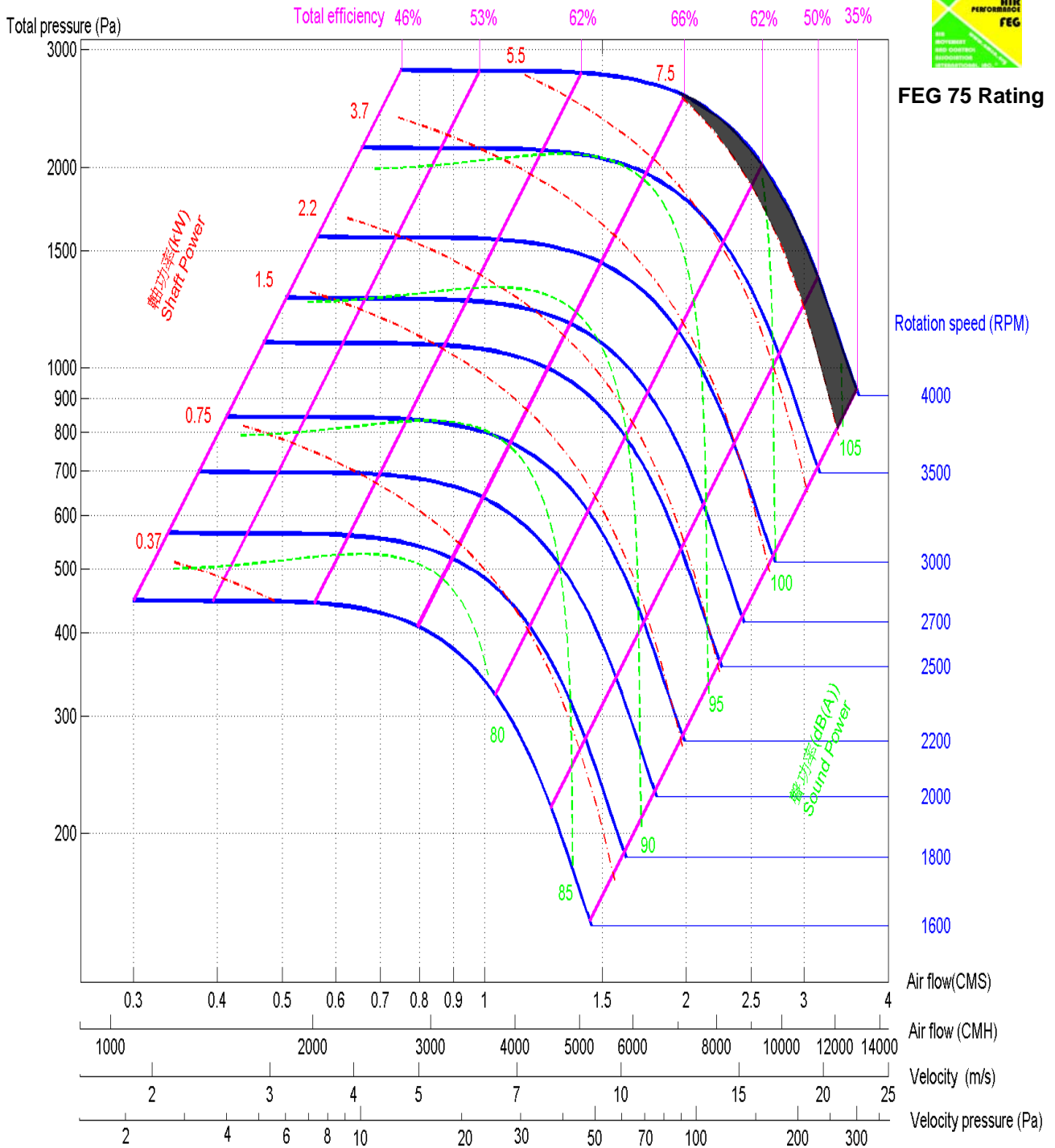
therefore :

$$L_p = 110 \text{ dB} - 20 \log_{10}(20) - 0.5 = 89.5 \text{ dB}$$

RB-315



FEG 75 Rating



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

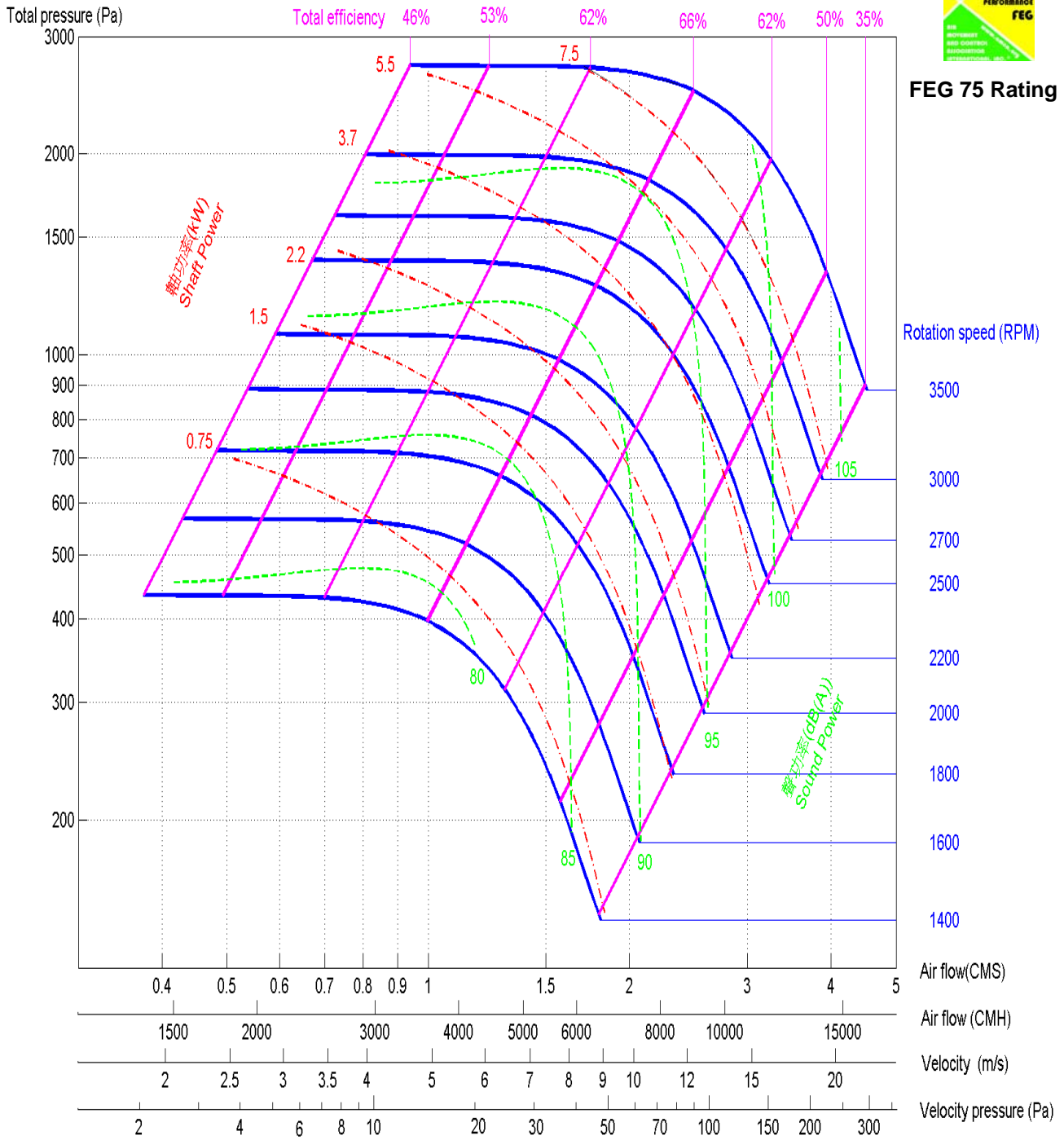
RB-315 (Inlet Sound Power) N=2700 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 1244.6 Pa	90	92	93	87	83	78	74	67	90
Q= 0.85 CMS									

RB-355



FEG 75 Rating



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

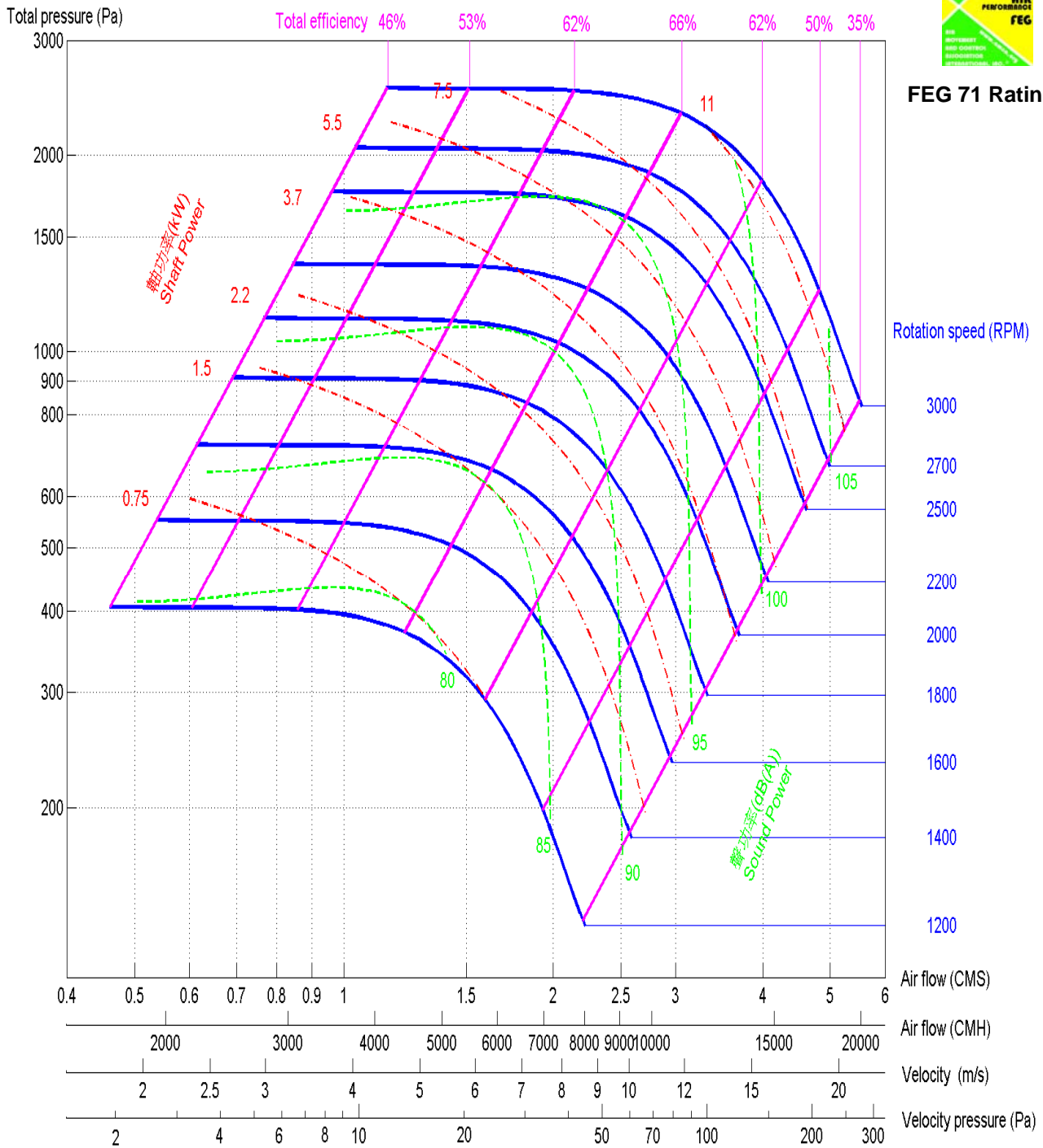
RB-355 (Inlet Sound Power) N=2700 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 1580.8 Pa	95	96	97	91	87	82	78	71	94
Q= 1.21 CMS									

RB-400



FEG 71 Rating



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

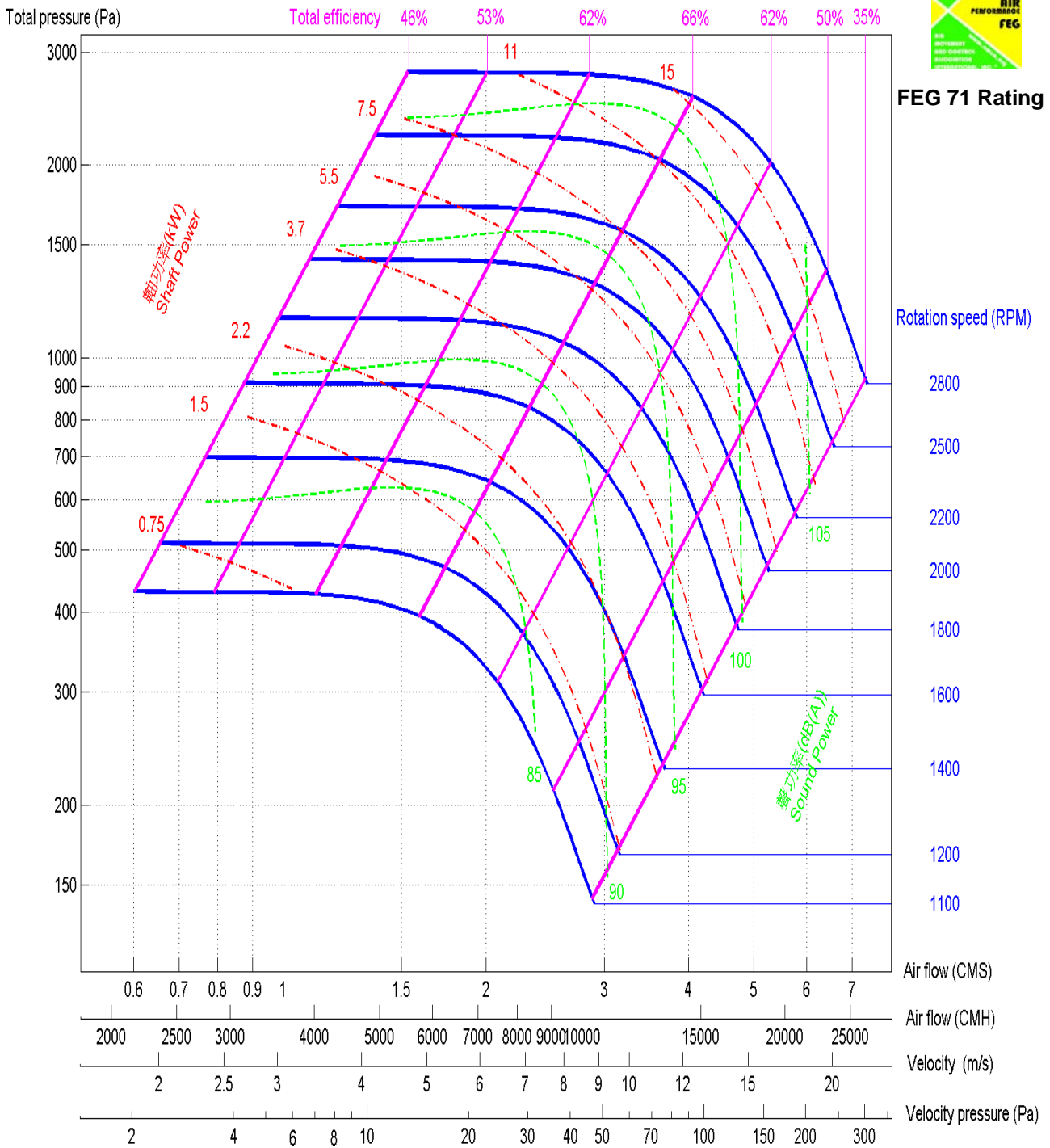
RB-400 (Inlet Sound Power) N=2700 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 2006.9 Pa	99	101	101	95	90	85	81	74	97
Q= 1.73 CMS									

RB-450



FEG 71 Rating



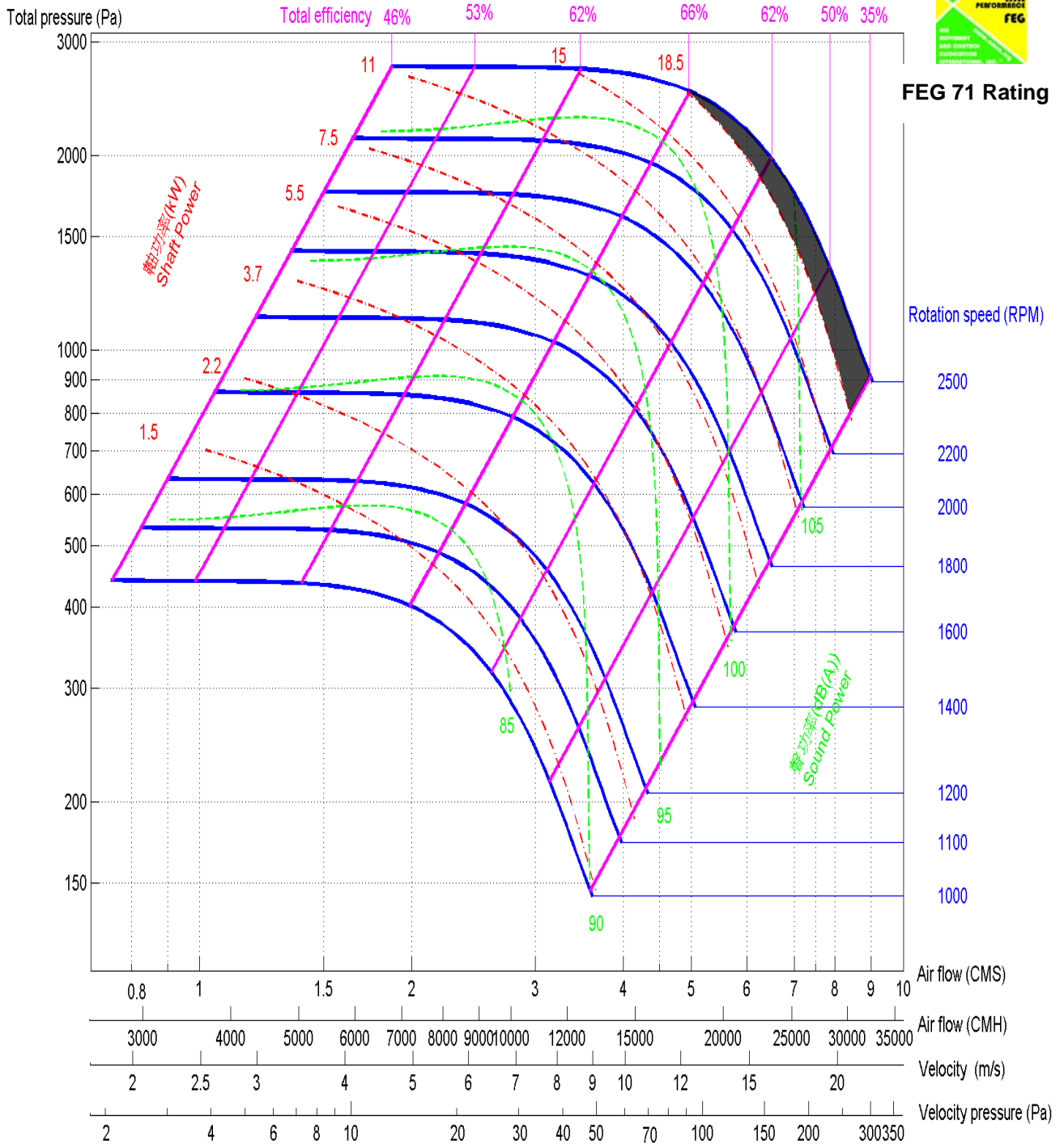
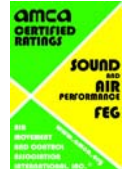
Performance certified is for installation type B, free inlet, ducted outlet. Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

RB-450 (Inlet Sound Power) N=2700 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 2540.0 Pa	104	105	105	99	94	89	85	78	101
Q= 2.47 CMS									

RB-500



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

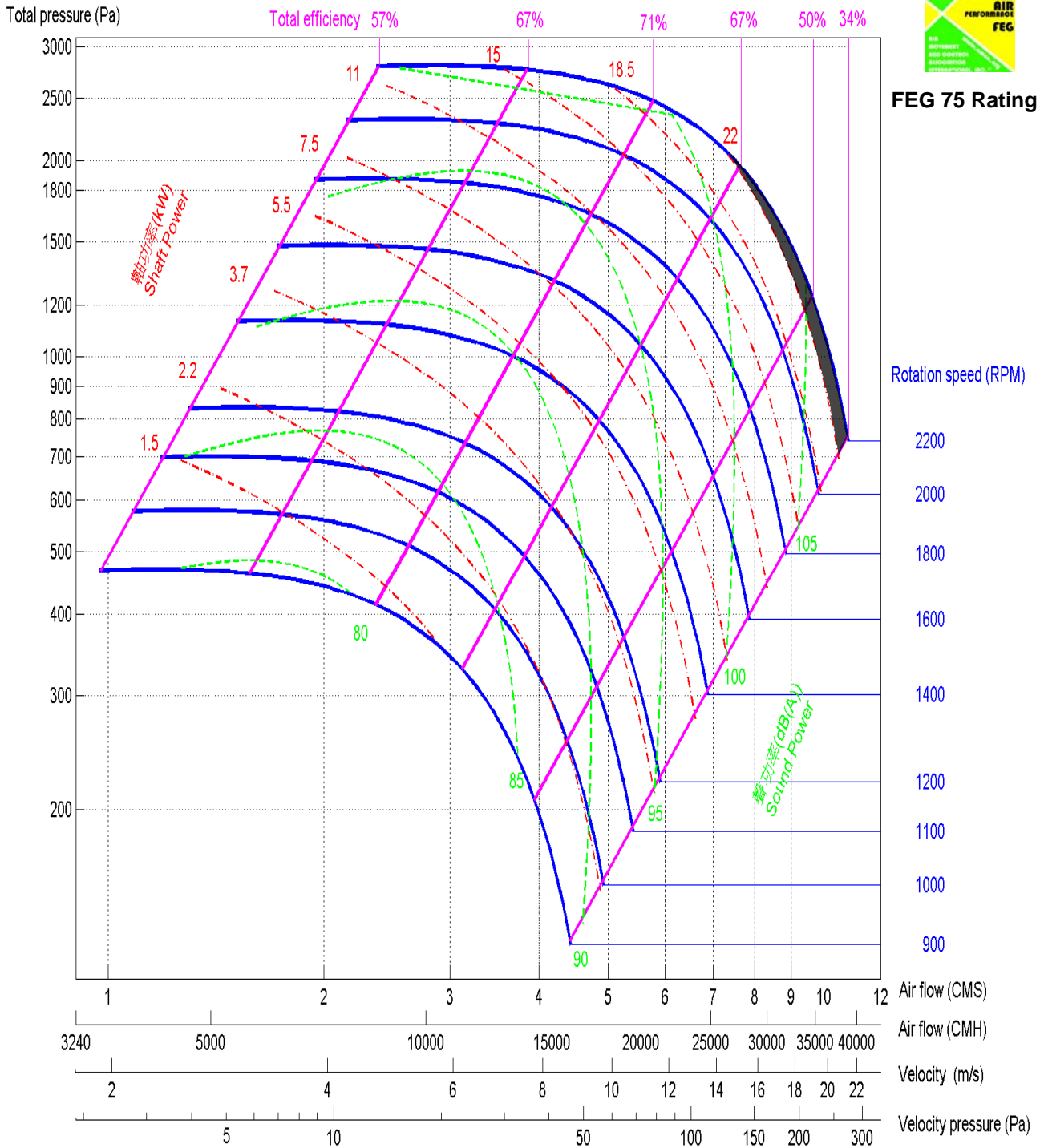
RB-500 (Inlet Sound Power) N=2200 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 2081.9 Pa	102	104	105	96	91	87	82	75	100
Q= 2.76 CMS									

RB-560



FEG 75 Rating



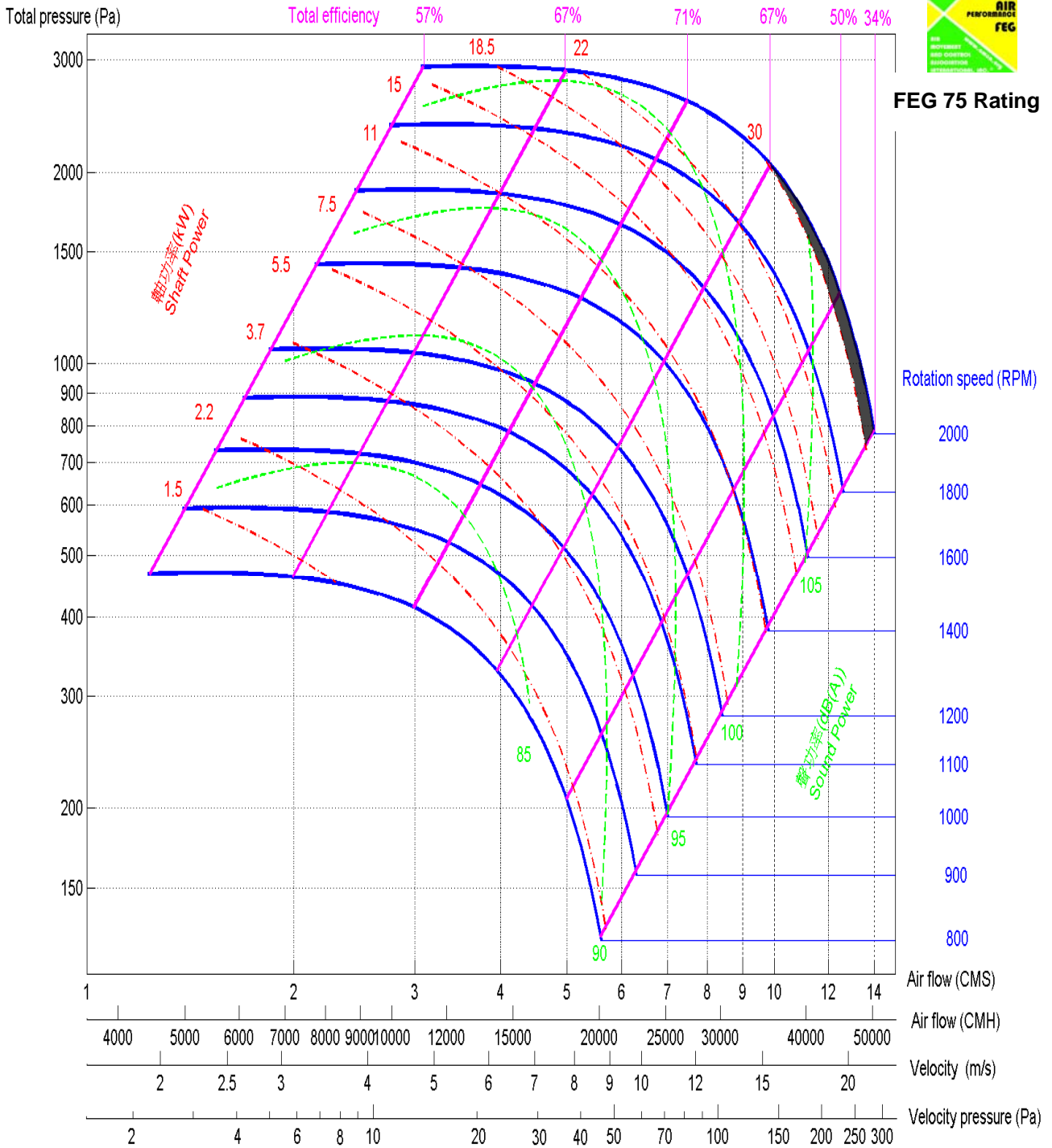
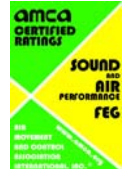
Performance certified is for installation type B, free inlet, ducted outlet. Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

RB-560 (Inlet Sound Power) N=1600 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 1431.3 Pa	99	94	93	90	86	83	77	69	92
Q= 2.83 CMS									

RB-630



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

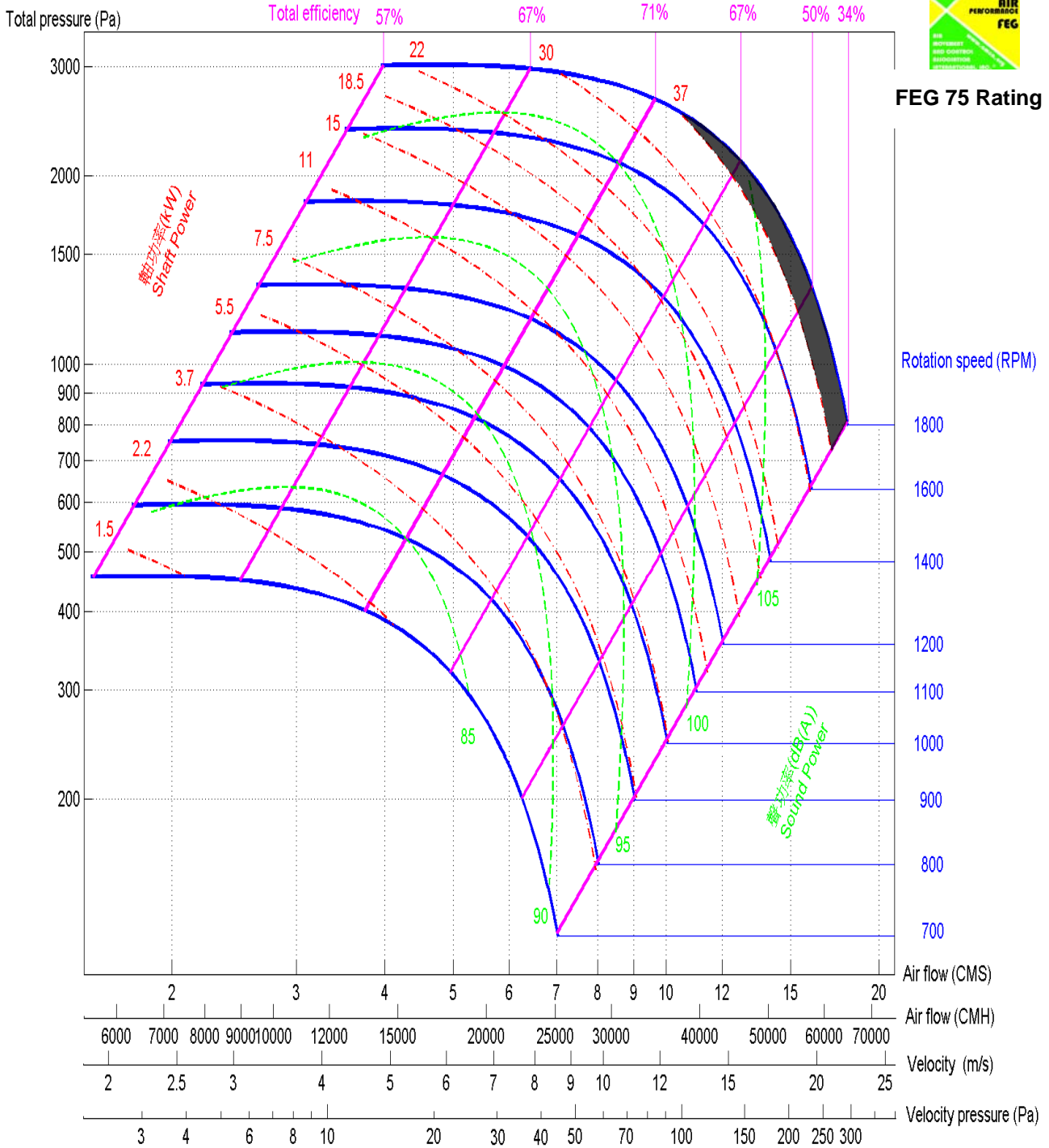
RB-630 (Inlet Sound Power) N=1600 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 1811.5 Pa	103	98	97	94	90	87	81	73	96
Q= 4.03 CMS									

RB-710



FEG 75 Rating



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

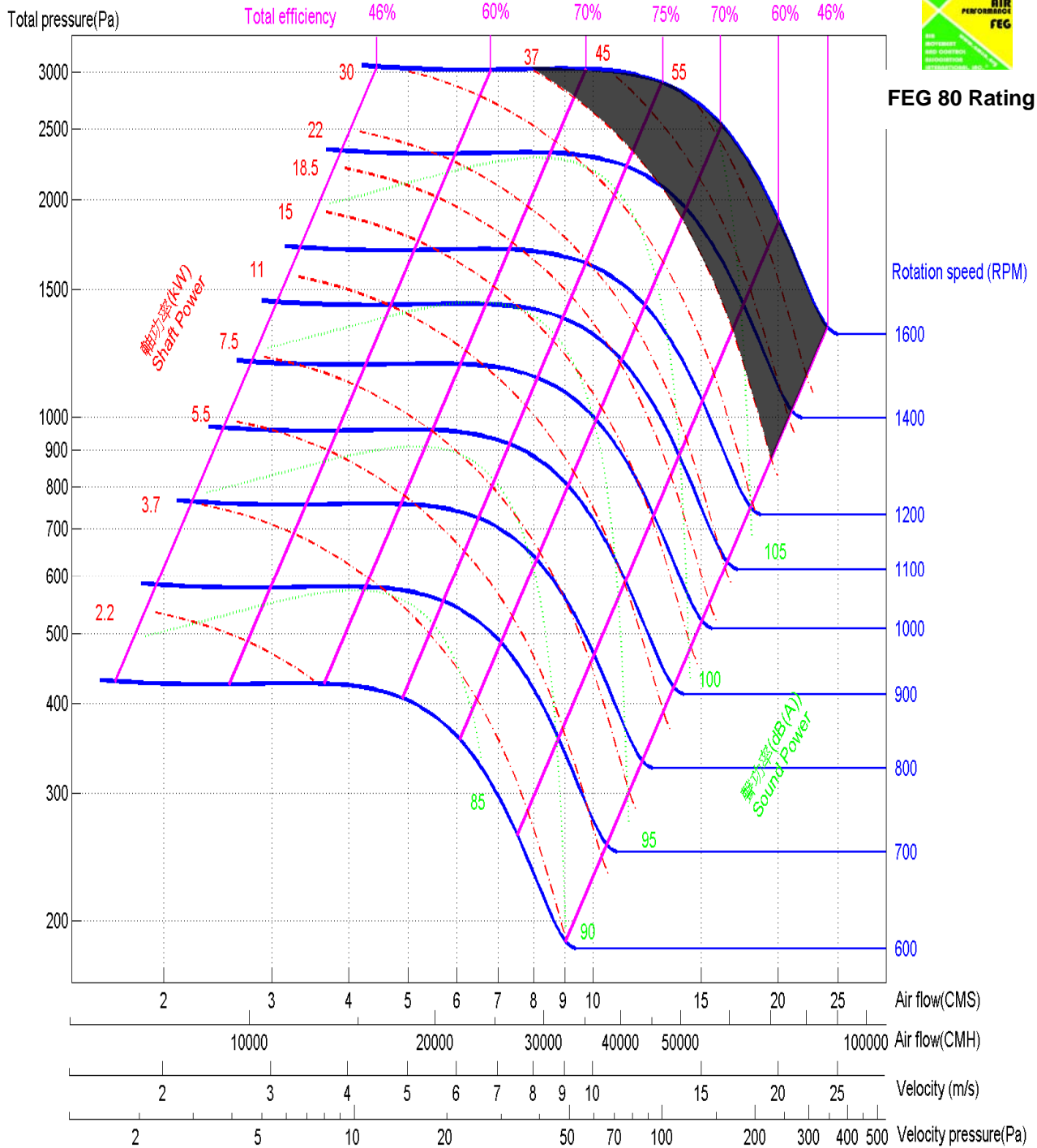
RB-710 (Inlet Sound Power) N=1600 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 2300.7 Pa	108	102	101	97	93	90	84	76	100
Q= 5.77 CMS									

RB-800



FEG 80 Rating



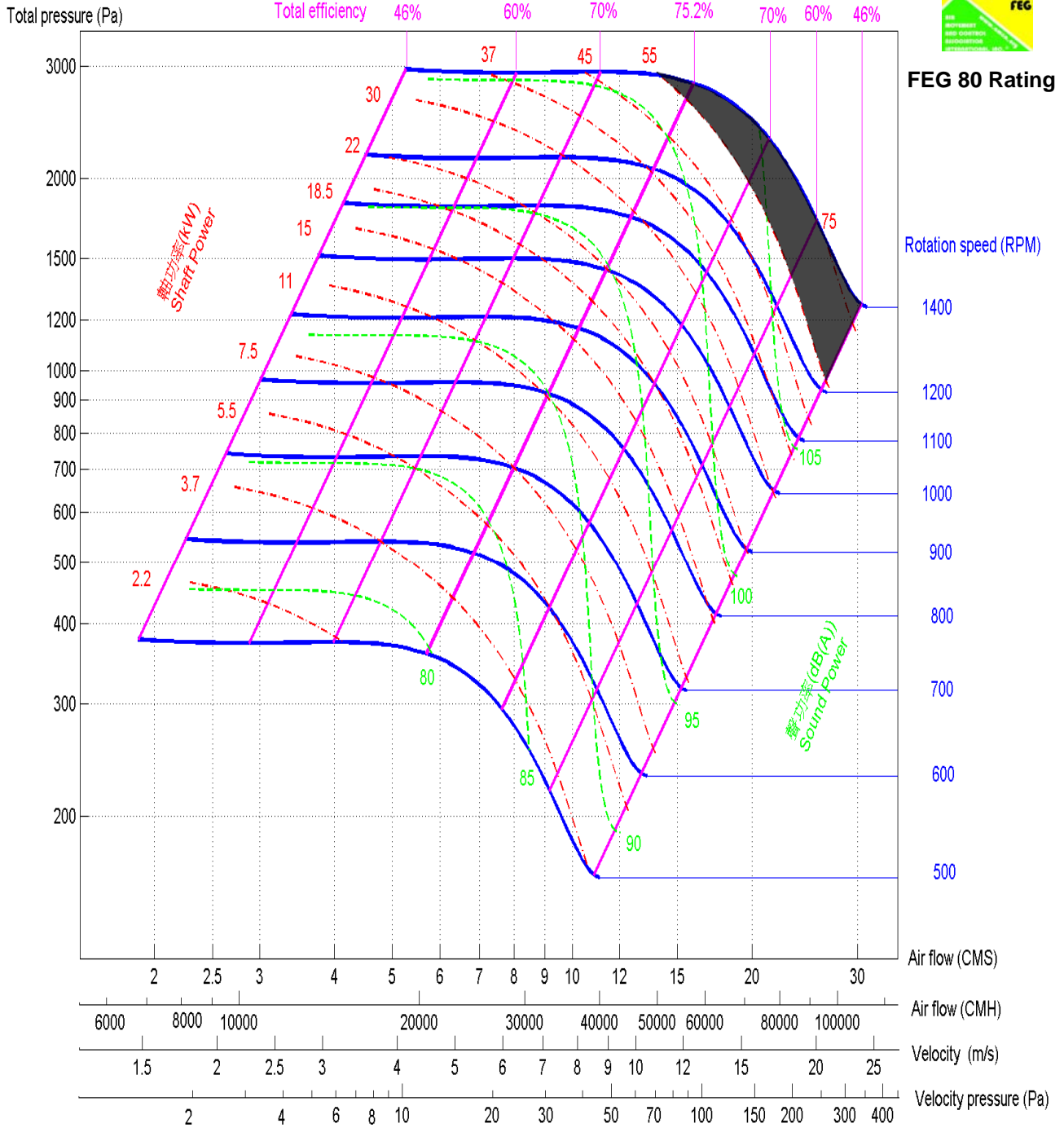
Performance certified is for installation type B, free inlet, ducted outlet. Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

RB-800 (Inlet Sound Power) N=800 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 749.2 Pa	93	94	84	82	78	73	66	60	85
Q= 4.25 CMS									

RB-900



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

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

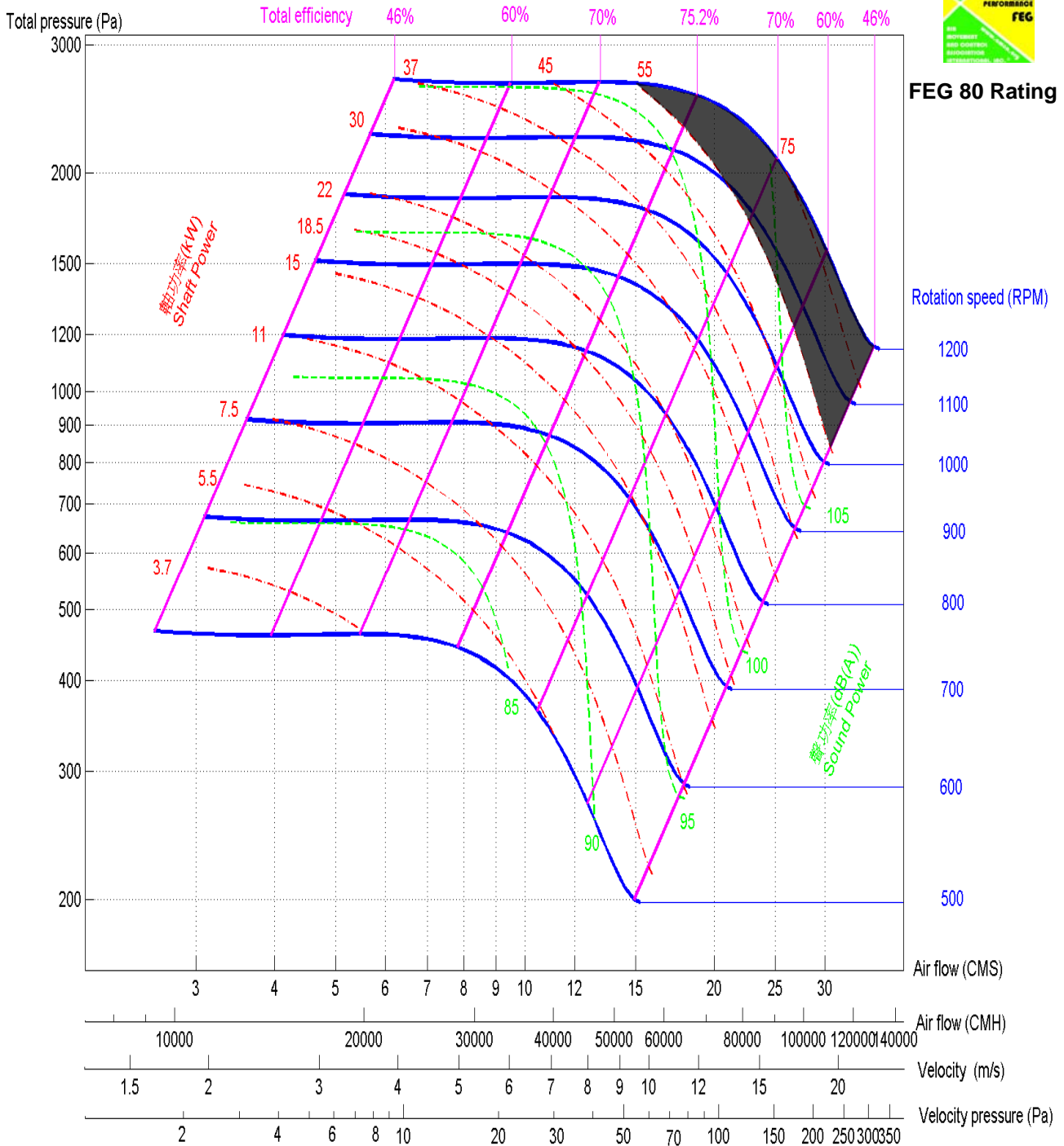
RB-900 (Inlet Sound Power) N=800 rpm

Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 948.3 Pa	97	98	88	86	82	77	70	64	88
Q= 6.05 CMS									

RB-1000



FEG 80 Rating



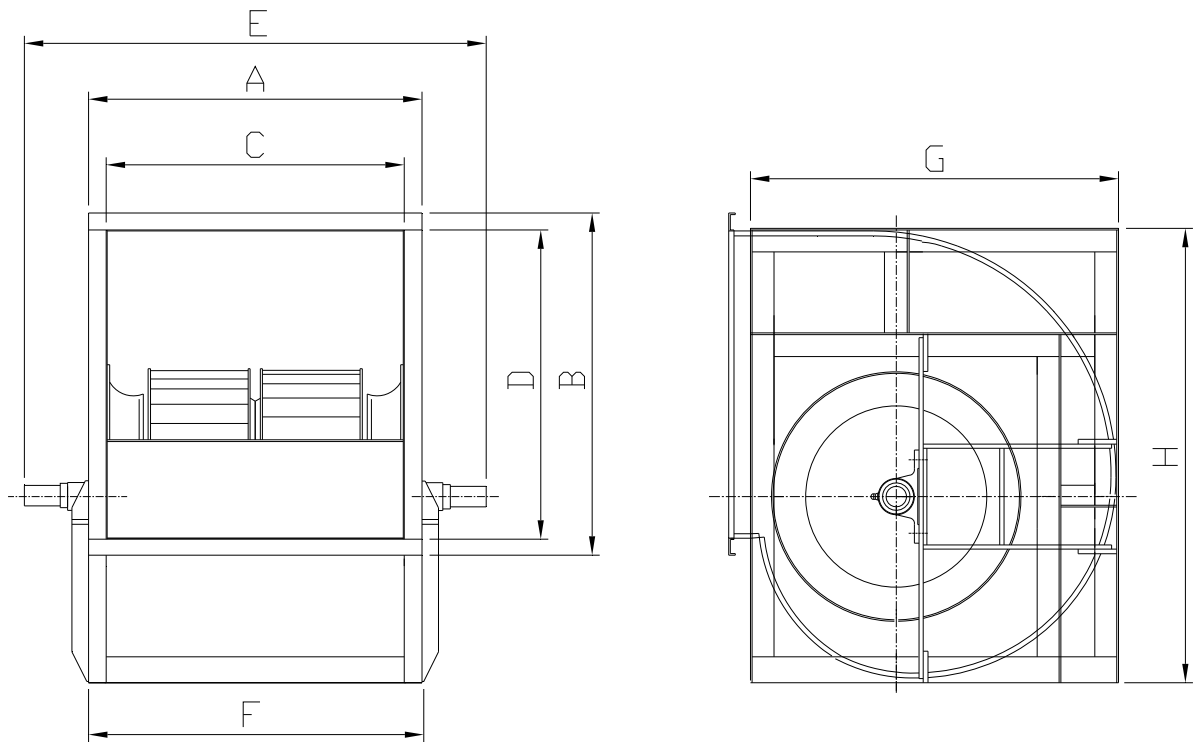
Performance certified is for installation type B, free inlet, ducted outlet. Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The A-weighted sound ratings shown have been calculated per AMCA Standard 301.

Values shown are for inlet LwiA sound power levels for: Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

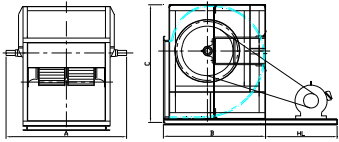
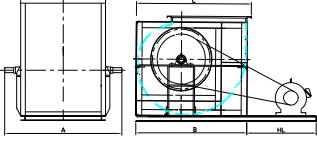
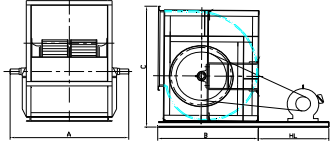
RB-1000 (Inlet Sound Power) N=800 rpm

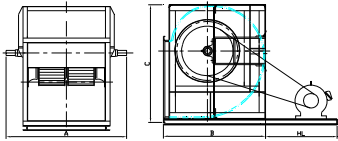
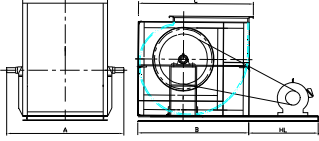
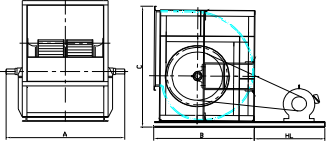
Center Frequency(Hz)	63	125	250	500	1K	2K	4K	8K	LwiA
Ps= 1170.7 Pa	101	102	91	89	85	80	73	67	92
Q= 8.30 CMS									

RB 系列之外型尺寸 Overall Dimension - RB Series



Model	A	B	C	D	E	F	G	H
315	466	466	406	406	625	466	482	578
355	535	535	455	455	685	535	550	655
400	589	589	509	509	750	589	613	736
450	651	651	571	571	850	651	681	827
500	720	720	640	640	920	720	750	918
560	817	817	717	717	1070	817	845	1030
630	903	903	803	803	1155	903	946	1157
710	1000	1000	900	900	1290	1000	1058	1303
800	1110	1110	1010	1010	1450	1110	1181	1468
900	1233	1233	1133	1133	1570	1233	1319	1648
1000	1370	1370	1270	1270	1700	1370	1451	1810

		0°				90°				180°			
													
Model	Motor Frame Size	HL	A	B	C	HL	A	B	C	HL	A	B	C
315	80	400	655	478	632	400	655	478	574	400	655	478	632
	90	400	655	478	632	400	655	478	574	400	655	478	632
	100	400	655	478	632	400	655	478	574	400	655	478	632
	112	400	655	478	632	400	655	478	574	400	655	478	632
	132	400	655	478	632	400	655	478	574	400	655	478	632
355	90	400	715	535	709	400	715	535	634	400	715	535	709
	100	400	715	535	709	400	715	535	634	400	715	535	709
	112	400	715	535	709	400	715	535	634	400	715	535	709
	132	400	715	535	709	400	715	535	634	400	715	535	709
	160	500	715	535	709	500	715	535	634	500	715	535	709
400	90	400	780	591	790	400	780	591	705	400	780	591	790
	100	400	780	591	790	400	780	591	705	400	780	591	790
	112	400	780	591	790	400	780	591	705	400	780	591	790
	132	400	780	591	790	400	780	591	705	400	780	591	790
	160	500	780	591	790	500	780	591	705	500	780	591	790
450	100	400	880	661	881	400	880	661	780	400	880	661	881
	112	400	880	661	881	400	880	661	780	400	880	661	881
	132	400	880	661	881	400	880	661	780	400	880	661	881
	160	500	880	661	881	500	880	661	780	500	880	661	881
	180	600	880	661	881	600	880	661	780	600	880	661	881
500	100	400	950	730	972	400	950	730	854	400	950	730	972
	112	400	950	730	972	400	950	730	854	400	950	730	972
	132	400	950	730	972	400	950	730	854	400	950	730	972
	160	500	950	730	972	500	950	730	854	500	950	730	972
	180	600	950	730	972	600	950	730	854	600	950	730	972
560	112	400	1100	799	1080	400	1100	799	943	400	1100	799	1080
	132	400	1100	799	1080	400	1100	799	943	400	1100	799	1080
	160	500	1100	799	1080	500	1100	799	943	500	1100	799	1080
	180	600	1100	799	1080	600	1100	799	943	600	1100	799	1080

		0°				90°				180°			
													
Model	Motor Frame Size	HL	A	B	C	HL	A	B	C	HL	A	B	C
630	132	400	1185	885	1207	400	1185	885	1049	400	1185	885	1207
	160	500	1185	885	1207	500	1185	885	1049	500	1185	885	1207
	180	600	1185	885	1207	600	1185	885	1049	600	1185	885	1207
	200	600	1185	885	1207	600	1185	885	1049	600	1185	885	1207
710	132	400	1320	986	1366	400	1320	986	1184	400	1320	986	1366
	160	500	1320	986	1366	500	1320	986	1184	500	1320	986	1366
	180	600	1320	986	1366	600	1320	986	1184	600	1320	986	1366
	200	600	1320	986	1366	600	1320	986	1184	600	1320	986	1366
	225	700	1320	986	1366	700	1320	986	1184	700	1320	986	1366
800	132	400	1480	1096	1531	400	1480	1096	1318	400	1480	1096	1531
	160	500	1480	1096	1531	500	1480	1096	1318	500	1480	1096	1531
	180	600	1480	1096	1531	600	1480	1096	1318	600	1480	1096	1531
	200	600	1480	1096	1531	600	1480	1096	1318	600	1480	1096	1531
	225	700	1480	1096	1531	700	1480	1096	1318	700	1480	1096	1531
	250	700	1480	1102	1531	700	1480	1102	1318	700	1480	1102	1531
900	160	500	1600	1219	1711	500	1600	1219	1471	500	1600	1219	1711
	180	600	1600	1219	1711	600	1600	1219	1471	600	1600	1219	1711
	200	600	1600	1219	1711	600	1600	1219	1471	600	1600	1219	1711
	225	700	1600	1219	1711	700	1600	1219	1471	700	1600	1219	1711
	250	700	1600	1225	1748	700	1600	1225	1508	700	1600	1225	1748
	280	700	1600	1225	1748	700	1600	1225	1508	700	1600	1225	1748
1000	160	500	1730	1356	1873	500	1730	1356	1604	500	1730	1356	1873
	180	600	1730	1356	1873	600	1730	1356	1604	600	1730	1356	1873
	200	600	1730	1356	1873	600	1730	1356	1604	600	1730	1356	1873
	225	700	1730	1356	1873	700	1730	1356	1604	700	1730	1356	1873
	250	700	1730	1362	1910	700	1730	1362	1641	700	1730	1362	1910
	280	700	1730	1362	1910	700	1730	1362	1641	700	1730	1362	1910

Note : The datas such as performance, dimension and etc. in this catalogue is subject to change without notice. Please contact with the manufacture for further information.

和旭各型風扇產品



RB型
後傾式離心通風機



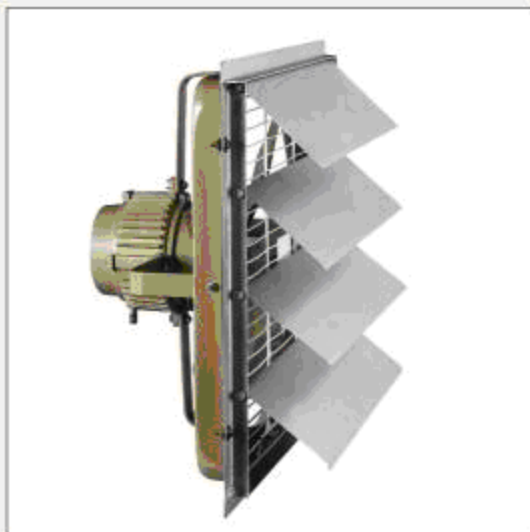
SB型
前傾式離心通風機



HSDB型
低噪音箱型離心通風機



HSJ型
離心式噴流送風機



HXD型
百葉型壁扇



HXE型
工業型壁扇



HRD型
離心式屋頂通風機
直結傳動式



HRA型
軸流式屋頂通風機



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