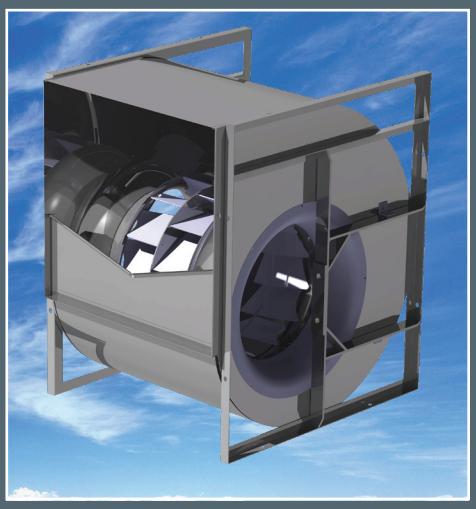
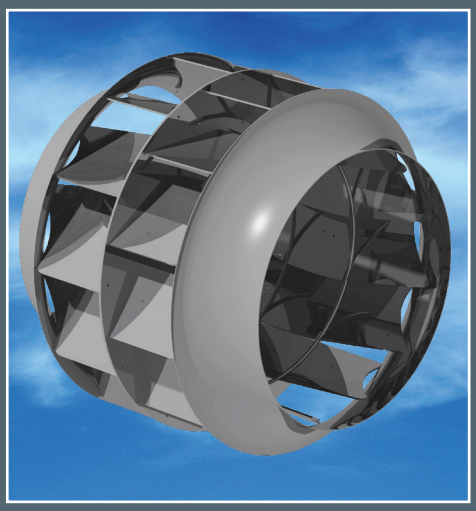
DBC

Backward Centrifugal Fan

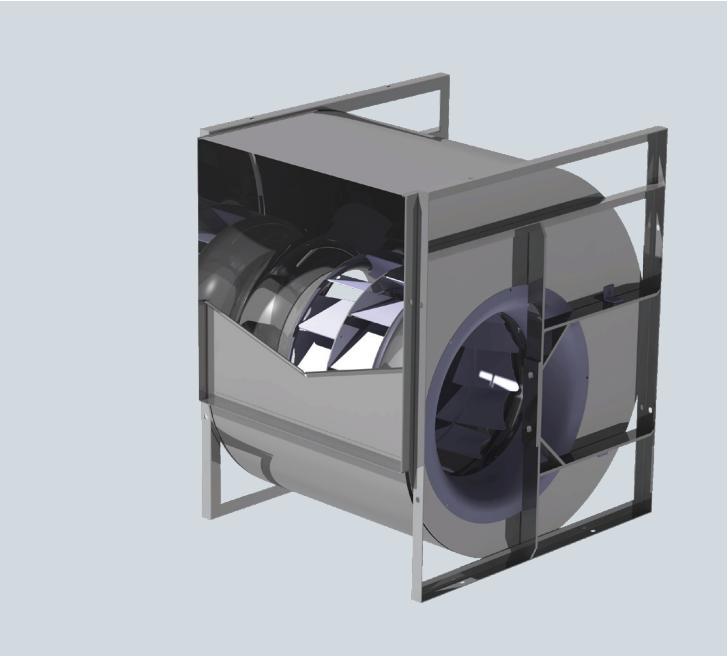




Technical introduction

DYNAIR®

DBC
Backward Centrifugal Fan



FEATURES

The Backward Curve Impeller generates higher efficiency and less noise than Forward Curve impeller. Efficiency is only slightly less than airfoil blade but its suits for industrial applications where airfoil blade is not acceptable because of corrosive or erosive environment.

APPLICATIONS

These models are widely used in for the replacements like low pressure HVAC application such as atomizing oil burners, automotive heaters, air-conditioners, space heaters, processing machinery, house hold all appliances, window ventilators draft inducers, electronics, transformers and many others.

In general these fans are suitable for supply or extract applications in commercial, process and industrial HVAC systems.

DOUBLE INLET CENTRIFUGAL FAN
BACKWARD IMPELLER

FLOW RANGES	
Flow Volume (CMH)	Total Pressure (Pa)
400 to 120,000	2200

Maico Ventilation Pvt.Ltd certifies that the Dynair model DBC series: version S, M and H for the model 200 to 1000 shown herein is licensed to bear the AMCA Seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

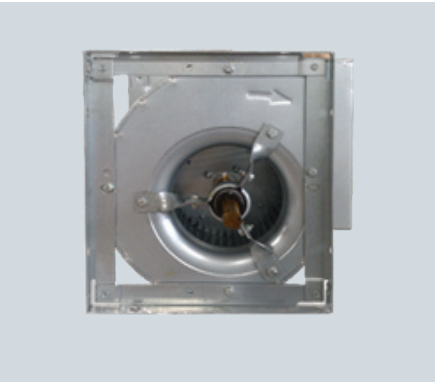
TYPE / OPERATING LIMIT

Each fan type has its maximum operating speed and power due to its mechanical design. The operating limit of DBC series fan type is design to meet the requirement of class I, II and III limit as defined in AMCA standard 99.

The DBC series is available in type S, M, H and this series are in accordance with AMCA standard 99.

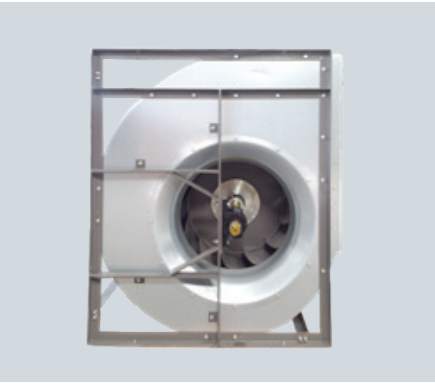
Size 200 to 250		
Type S	I	Size 710 to 1000
Type M	II	II
Type H	III	III

CONSTRUCTIONAL FEATURES



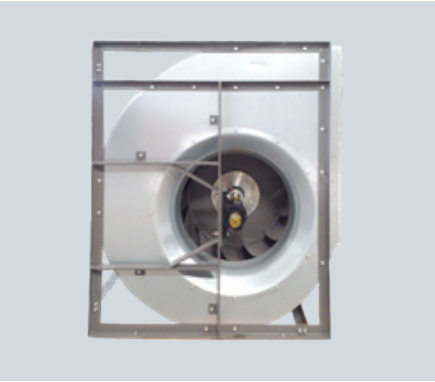
TYPE - S

Type S model constructed with mounting feet and it can be mounted in three different orientations. It is mainly for OEM application.
Fan Size: 200 to 250
Volume: 400 to 5000 m³/h
Total Pressure: up to 1400 Pa



TYPE - M

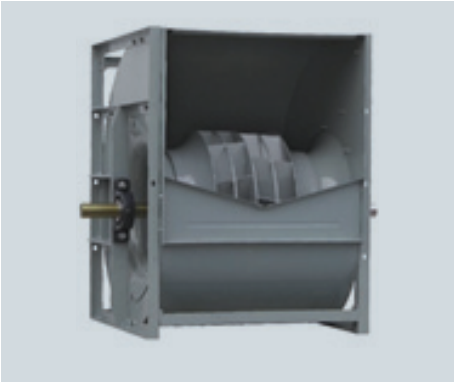
Type M model constructed with strength and rigid frames fitted on both sides of the fan. Mounting can be in four different orientations.
Fan Size: 200 to 710
Volume: 750 to 45000 m³/h
Total Pressure: up to 1600 Pa



TYPE - H

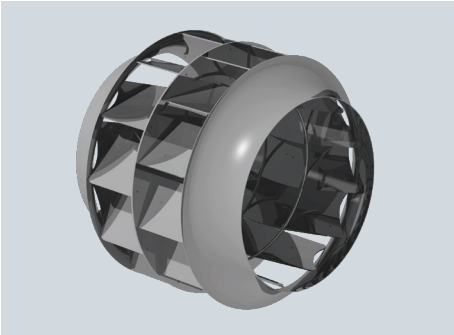
H model is similar to type M but assembled with bearings to support higher dynamic load necessary for the increased performance.
Fan Size: 280 to 1000
Volume: 2000 to 120000 m³/h
Total Pressure: up to 2200 Pa

CONSTRUCTIONAL FEATURES



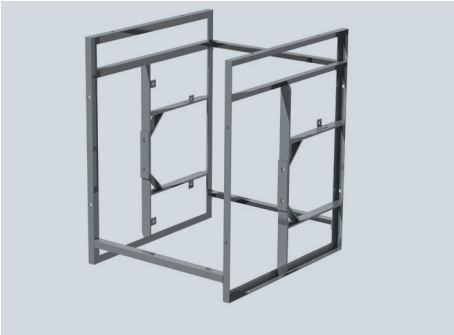
HOUSING

Housings are Factory prefabricated, Formed and reinforced galvanized steel panels to make curved scroll housings with shaped cutoff, spun- metal inlet bell. The housings is fixed with side plates in Pittsburg lock form system.



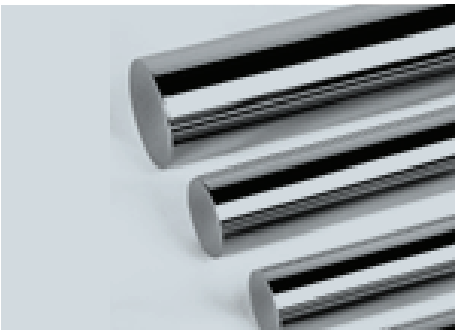
IMPELLER

The Impeller is made of cold rolled sheet steel backward curved blades with high efficiency and blades with polyester powder coating finish. backward inclined wheels shall be single thickness plate type, designed for maximum efficiency and quiet operation, and shall be solid welded to the rim and back plate. All wheels shall be statically and dynamically balanced.



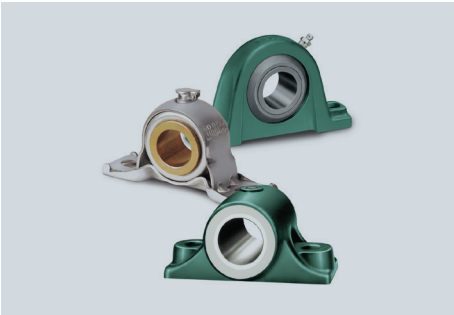
FRAME

The frame is manufactured with galvanized angular bars for type "M" and "H", they are manufactured with sections of steel and finished with polyester powder coating.



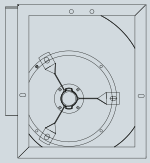
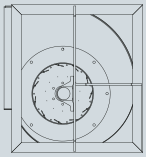
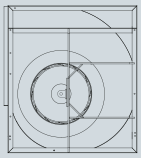
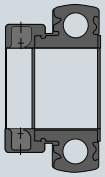
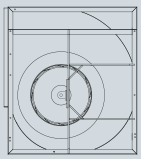
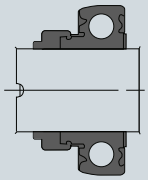
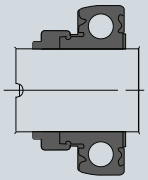
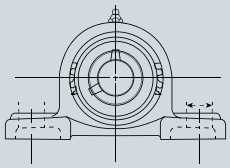
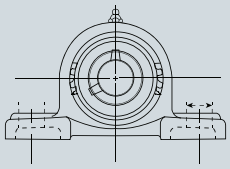
SHAFT

Shafts are manufactured from C45 carbon steel using an automatic process for positioning and cutting of the keyways. All dimensional tolerances of the shaft are fully checked to ensure a precision fit and then coated with an anti-corrosion varnish after assembly.

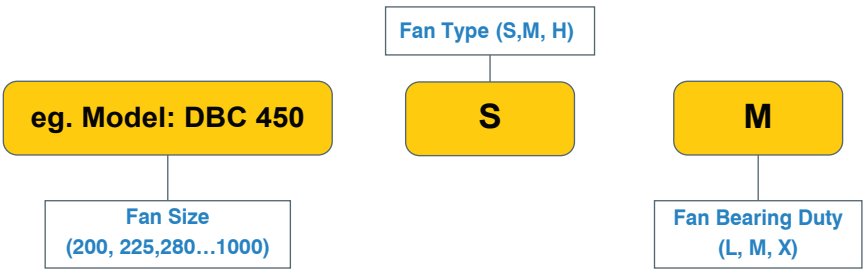


BEARINGS

Bearings used are either deep groove ball bearing type with an eccentric locking collar or an adapter sleeve, or spherical roller bearings type sealed at both sides for different duty application as classified below:

	MOUNTED IN A RUBBER HOUSING WITH SPIDER SUPPORT		MOUNTED ON PILLOW BLOCK BEARING WITH SIDE FRAME
FAN TYPE	S	M	H
			
BEARING DUTY	SL Light Duty	HL Light Duty	
			
	SM Medium Duty	HM Medium Duty	HM Medium Duty
			
			HX Extra Heavy Duty
			

Bearing References



ROLLER BEARING

The bearings are pre lubricated and sealed, self-aligning with adapter mount and two piece and this bearing are life time lubricated and maintenance-free. Roller Bearing Rating Life: AFBMA 9, L - 50 of 200,000 hours. Bearings are selected for basic rating fatigue life (L-10) per AFBMA standards in excess of 80,000 hours at maximum operating speed for each pressure class.

PILLOW BLOCK BALL BEARINGS

The bearings are heavy duty grease lubricated and permanently sealed, self-aligning, pillow block type ball bearing for life and maintenance-free. Roller Bearing Rating Life: AFBMA 11, L - 50 of 200,000 hours. Bearings are selected for minimum L50 life in excess of 200,000 hours at maximum catalogued operating speed for each pressure class. If re-lubrication is necessary, it is recommended to use lithium base grease suitable for all temperatures within the operational limits.

BALANCING QUALITY

All wheels are statically and dynamically balanced to ISO1940 and AMCA 204 – G2.5 standards. All fans after assembly are trim-balanced to ISO1940 and AMCA 204 – G2.5 standard.

FAN ROTATION AND DISCHARGE

The rotation and discharge of the fan is in accordance with AMCA standard 99. The direction of rotation is determined from the drive side of the fan (refer Fig below)

CW - clockwise rotation
CCW - counter clockwise rotation

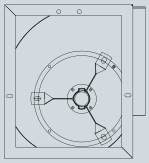
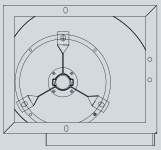
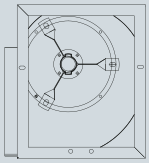
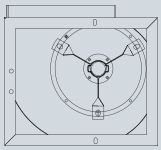
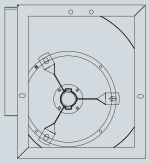
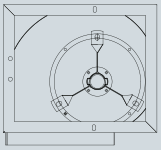
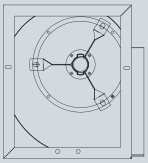
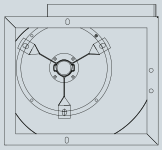
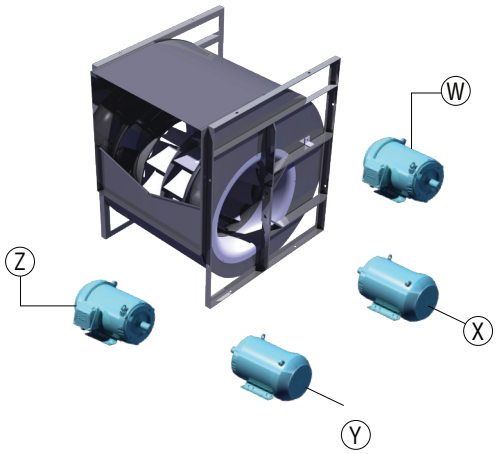
	90°	180°	270°	360°
CW				
CCW				

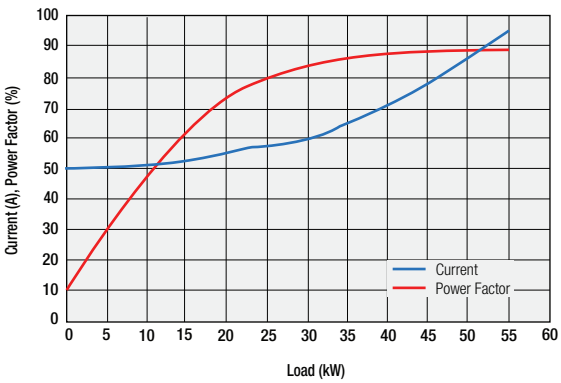
FIG. 4 - MOTOR POSITION



MOTOR POSITION

The position of the motor for belt drive centrifugal fan is in accordance with AMCA standard 99.

Location of motor is determined by facing the drive side of fan and designating the positions by letters W, X, Y, or Z. [Refer to Fig.4]



MOTOR SELECTION

The power curve shown on each performance curve represents the absorbed power at the shaft of the fan measured in kW.

To determine the power of the motor to be installed, a correction factor should be applied to compensate for transmission losses.

For conversion to horsepower (HP), use multiplying factor 1.34.

DYNAMIC PRESSURE

Outlet air velocity on each curve and the dynamic pressure are calculated on the full air discharge area, during duct outlet conditions.
Velocity pressure is higher when free outlet conditions, To determine this new value, multiply the velocity pressure of the ducted outlet obtained from the fan curve by the following correction factor “K” is given below.

K = 1.67

Fan performances calculate with this correction factors are not licensed by AMCA

PERFORMANCE

Fan performance can be predicted over a wide range of sizes and speeds using basic scaling relations. Ratings are referred to the standard air density with the total pressure as a function of the air volume, using logarithmic scales.

The performance data shown on each diagram has been tested and measured in accordance to AMCA Standard 210/300– Fig 12 – installation type B (free inlet and ducted outlet conditions). It is essential that, the same installation type and test standards are used at all times, when comparing fan performances.

NOISE

For lowest noise output, fans should always be operated near their peak efficiency point. The noise level shown on each diagram refer to the sound power "A-weighted" and the data on the inlet side has been measured measured in accordance with AMCA Standard 300 Figure 2, Installation type B. The noise levels of the fans are determined as follows:

Sound power level - ("A" scale): Lw (A) as catalogue
Octave band spectrum: Lw = Lw(A) + Lw rel. dB (Refer to Maico Gulf for more Details)
Sound pressure level:

A) FREE FIELD

Lp(A) = Lw(A) - (20log10d) -11

B) ROOM CONDITIONS

Lp(A) = Lw(A) - (20log10d) -8
where d = distance of fan (m)

DYNAIR®

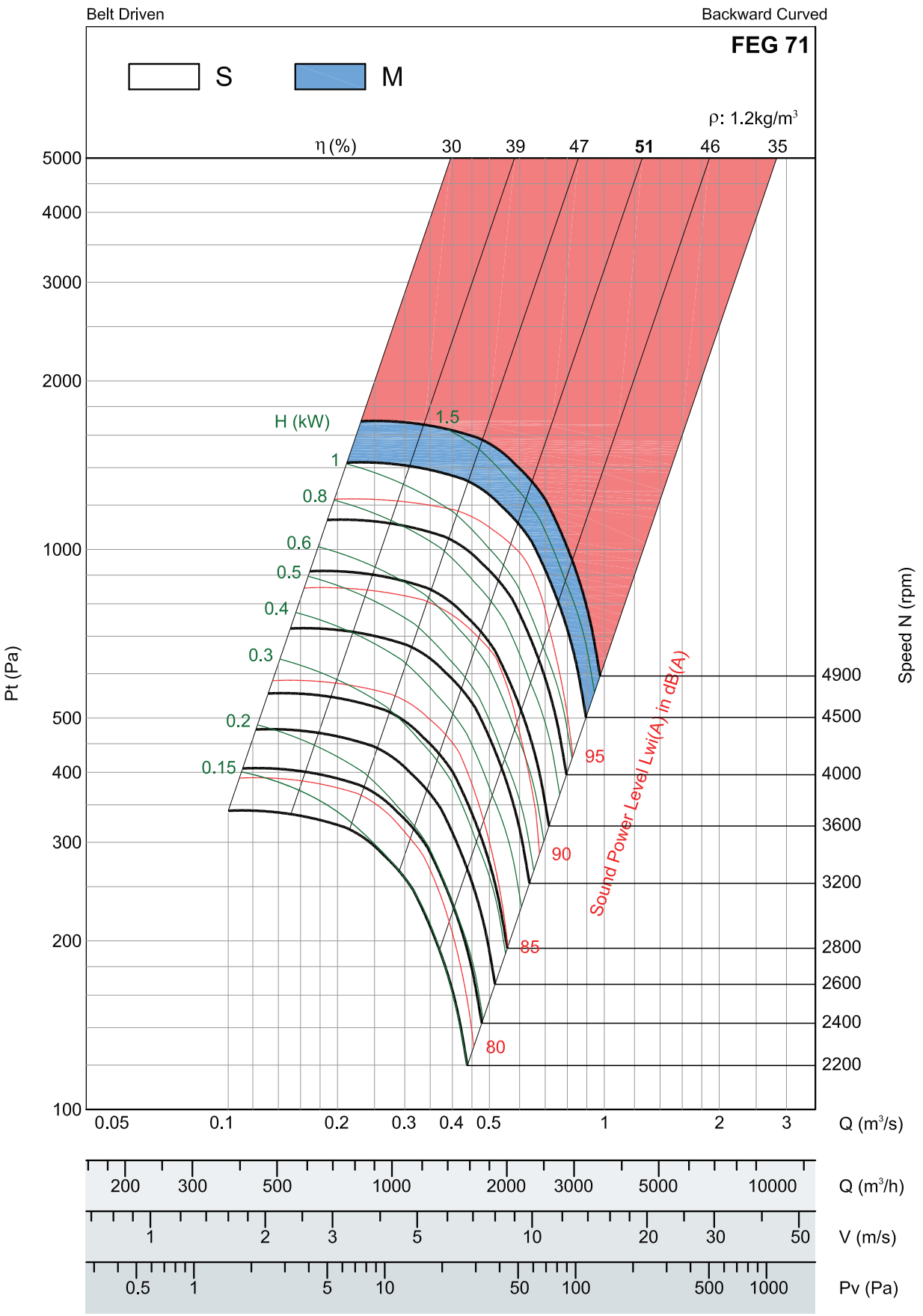
FAN DETAILS	
Fan type	(A) DFC (B) DBC
Impeller type	(A) Forward Curved (B) Backward Curved
	(C) Others : _____ (Please State)
Model & size e.g.DFC 560 M	Model : _____ (If known)
Drive type - belt, direct	(A) Belt (B) Direct (C) Coupling
Coupling(if differ from standard)	(D) Others:_____ (Please State)
Arrangement (1&3 for bare shaft fan: 4, 8 & 12 for complete with drive system)	(A) Bare fan (B) Complete with drive system
Rotation & Discharge e.g. CCW 270	(A) CW (B) CCW (A) 90 (B) 180 (C) 270 (D)360
Motor position (refer to diagram) e.g.W	(A) W (B) X (C) Y (D) Z
Air Flow Rate	Q : _____ (A) L /S (B) m³ /h (C) m³ /min (D) m³ /s (E) cfm
Pressure (static & total)	SP : _____ TP : _____ (A) Pa (B) mm H2O (C) in WG
Fan RAM (if specified)	
Noise level	(A) dB (B) dBA Lw : _____ Lp : _____ at Distance :_____m (A) free field (A) room condition (C) corner / wall
Ambient temperature	Temp. :_____oc
Air density, if differ from standard	(A) Density :_____kg/m³ (B) Altitude:_____ m

MOTOR DETAILS	
Power	(A) kW :_____
	(B) HP :_____
No. of Poles / RAM	(A) 2P (B) 4P (C) 6P (D) 6P (E) 8P
	(A) Others : _____ (pls state RPM)
Voltage	(A) 220V (B) 415V
	(C) 380V (D) 440V
	(E) 400V (F) Others:_____
Phase	(A) 1 ph
	(B) 3 ph
Frequency	(A) 50 Hz (B) 60 Hz
Frame size	(A) IEC : _____
	(B) NEMA : _____
	(C) Others : _____
Make, if specified	Others Brand:_____
	Mfr. :_____
	Country : _____

FITTINGS DETAIL	
ACCESSORIES	(A) Inspection door (B) Drain plug (C) Flexible duct (D) Inlet vane control
	Vibration Isolators: (A) Rubber (B) Spring (C) Floor-mount (D) Ceiling-hang
	Silencers: (A) Without pod (B) Inlet (C) Outlet (D) Both inlet & outlet
	Counter-flanges: (A) Flat (B) L- type (C) U- type (D) Inlet (E) Outlet

SPECIAL FEATURES	
OTHER REQUIREMENTS	Painting Powder coating Hot- dipped galvanizing
	(A) Spark-resitant (B) Corrosion-resistant (C) Heat- resistant, temp._____ ˚C (D) Smoke Spill, Max. temp._____ ˚C for _____Hr

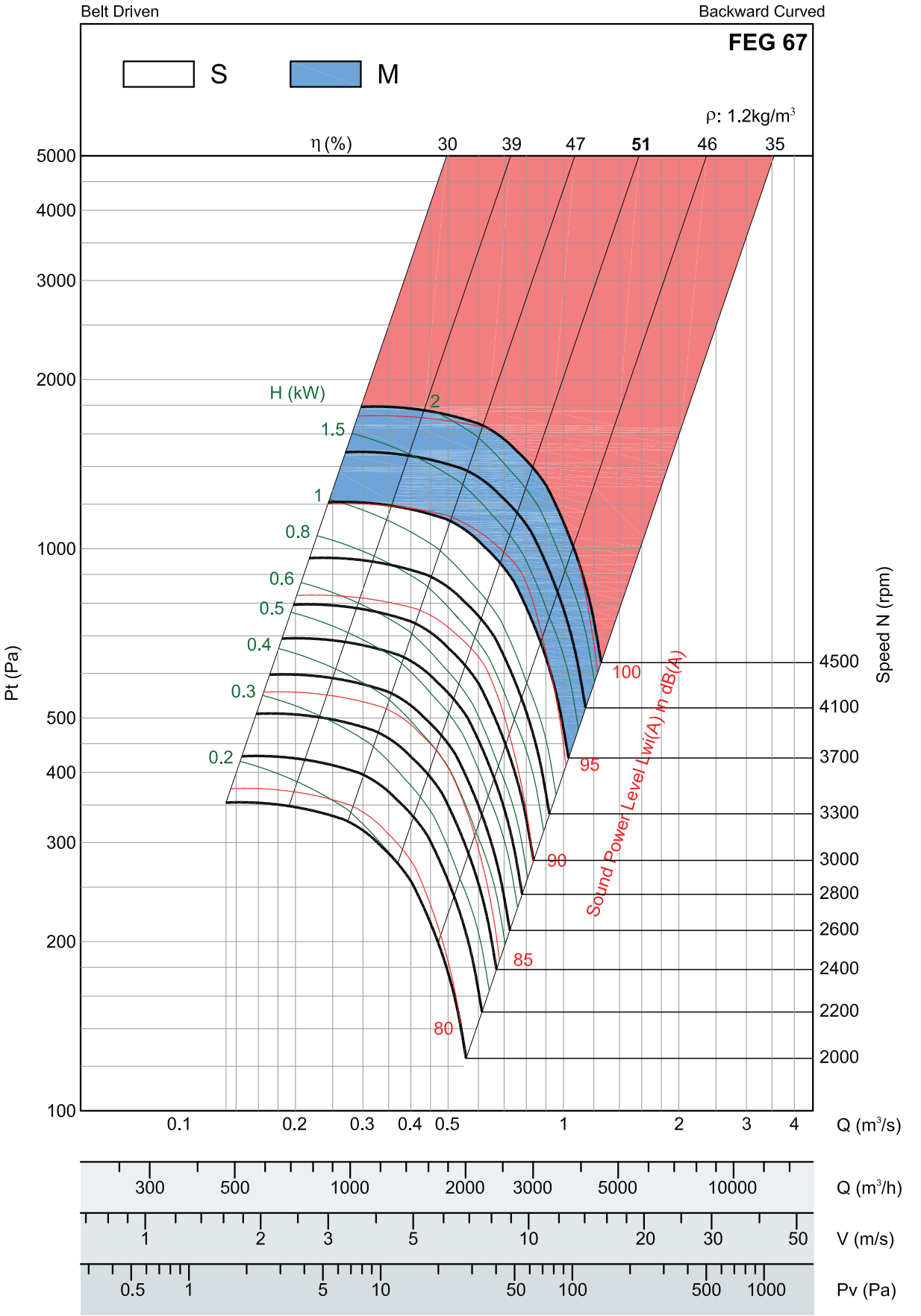
DBC - Performance Curve 200



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

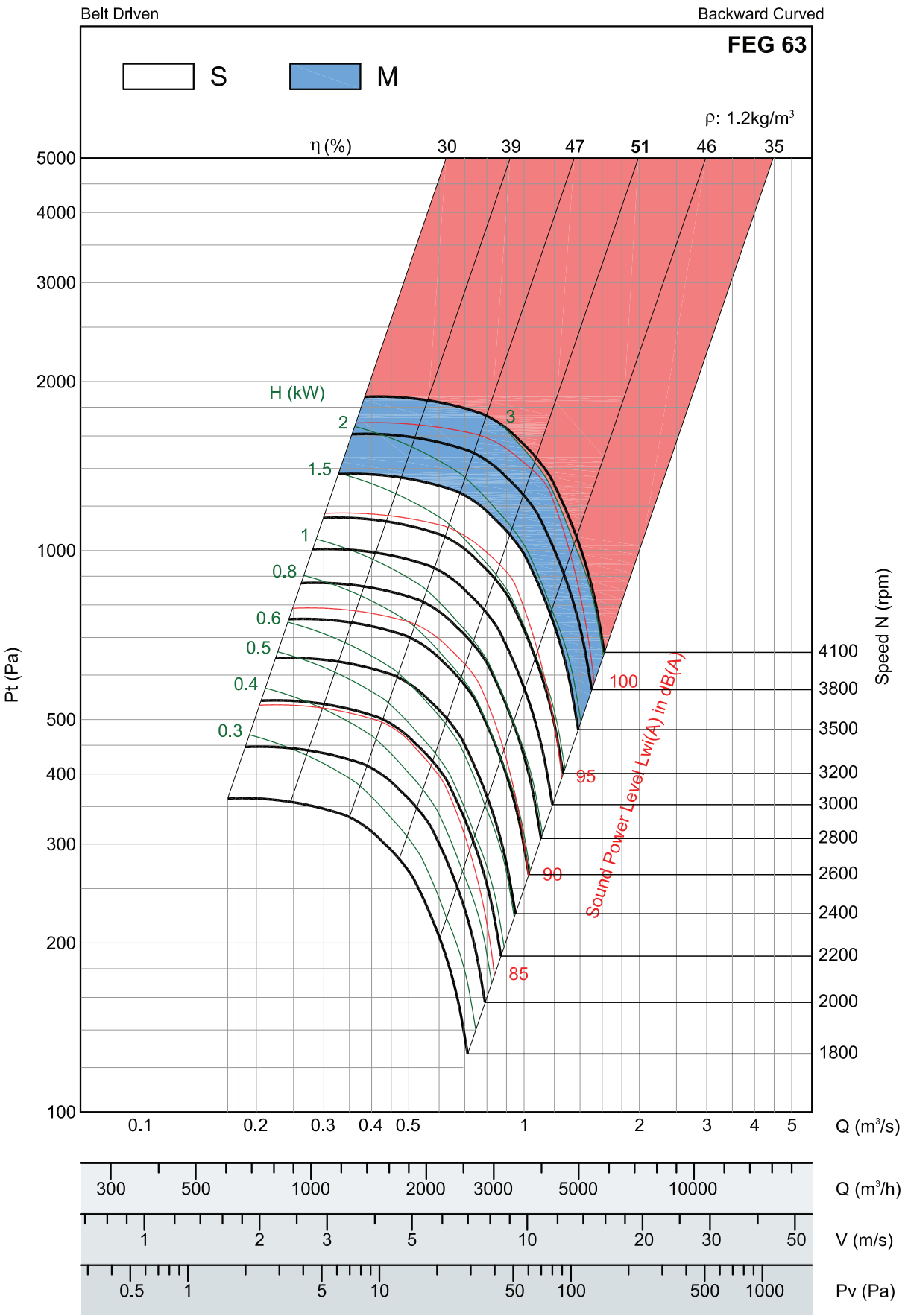
DBC - Performance Curve 225



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

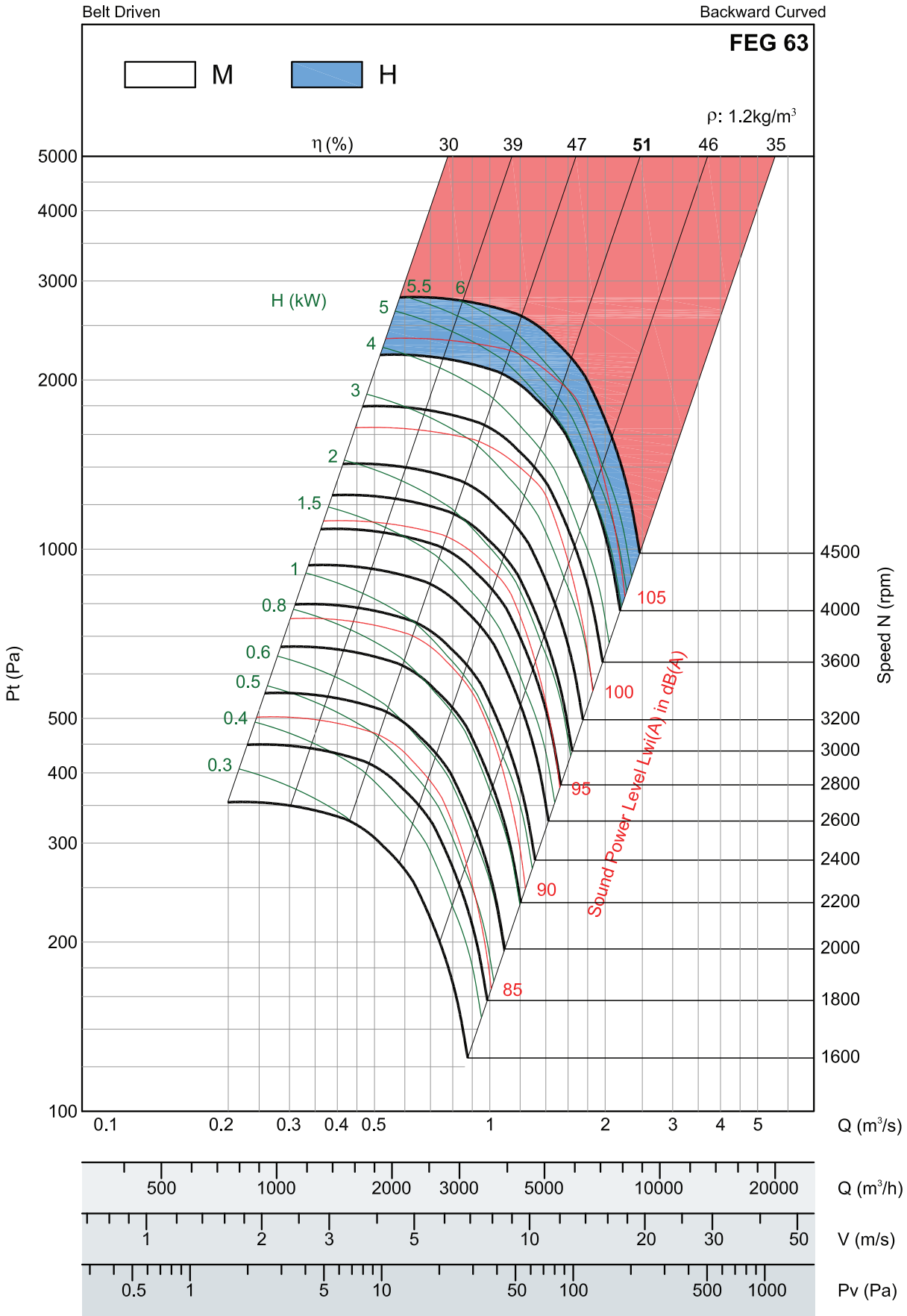
DBC - Performance Curve 250



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

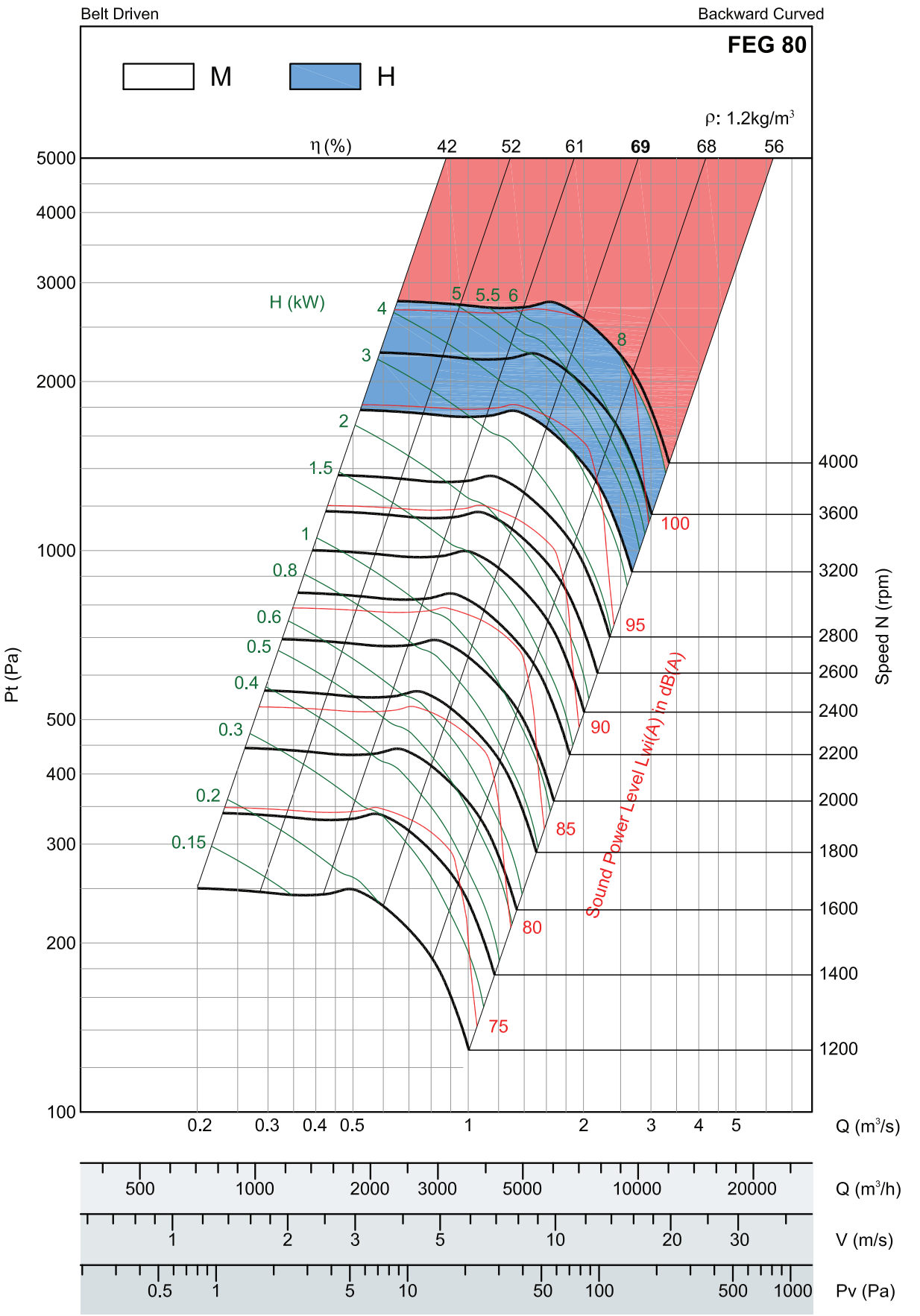
DBC - Performance Curve 280



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

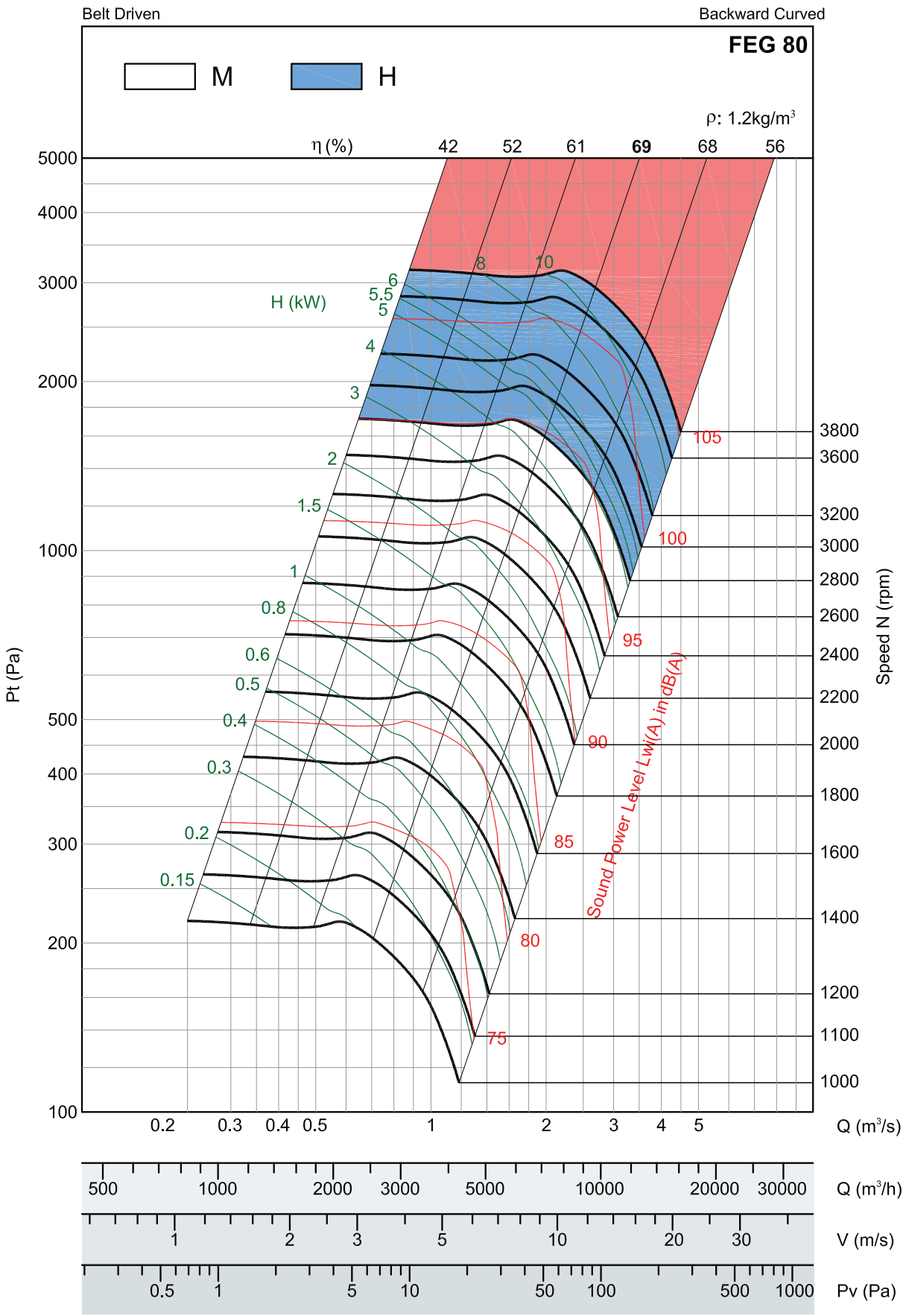
DBC - Performance Curve 315



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

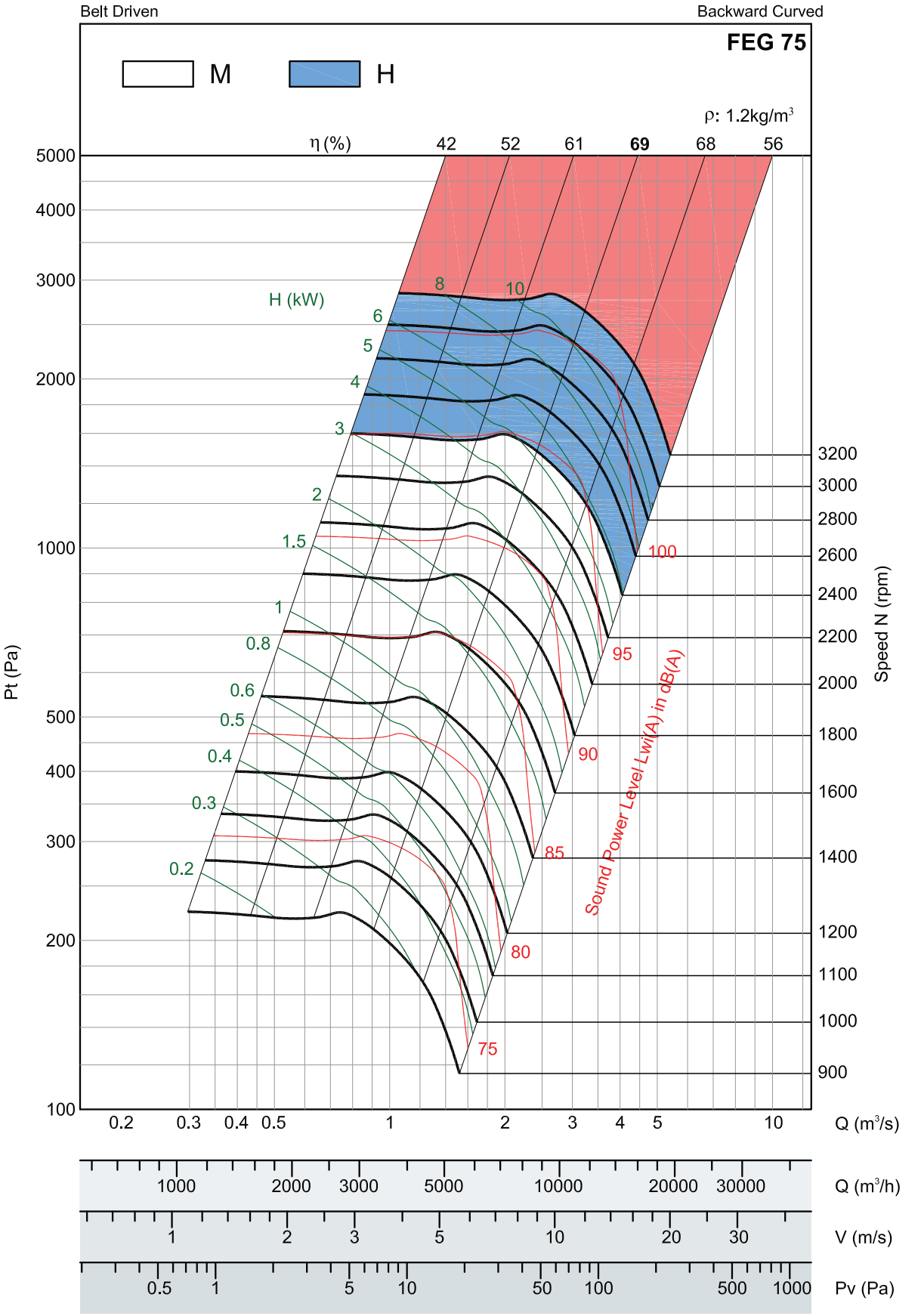
DBC - Performance Curve 355



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

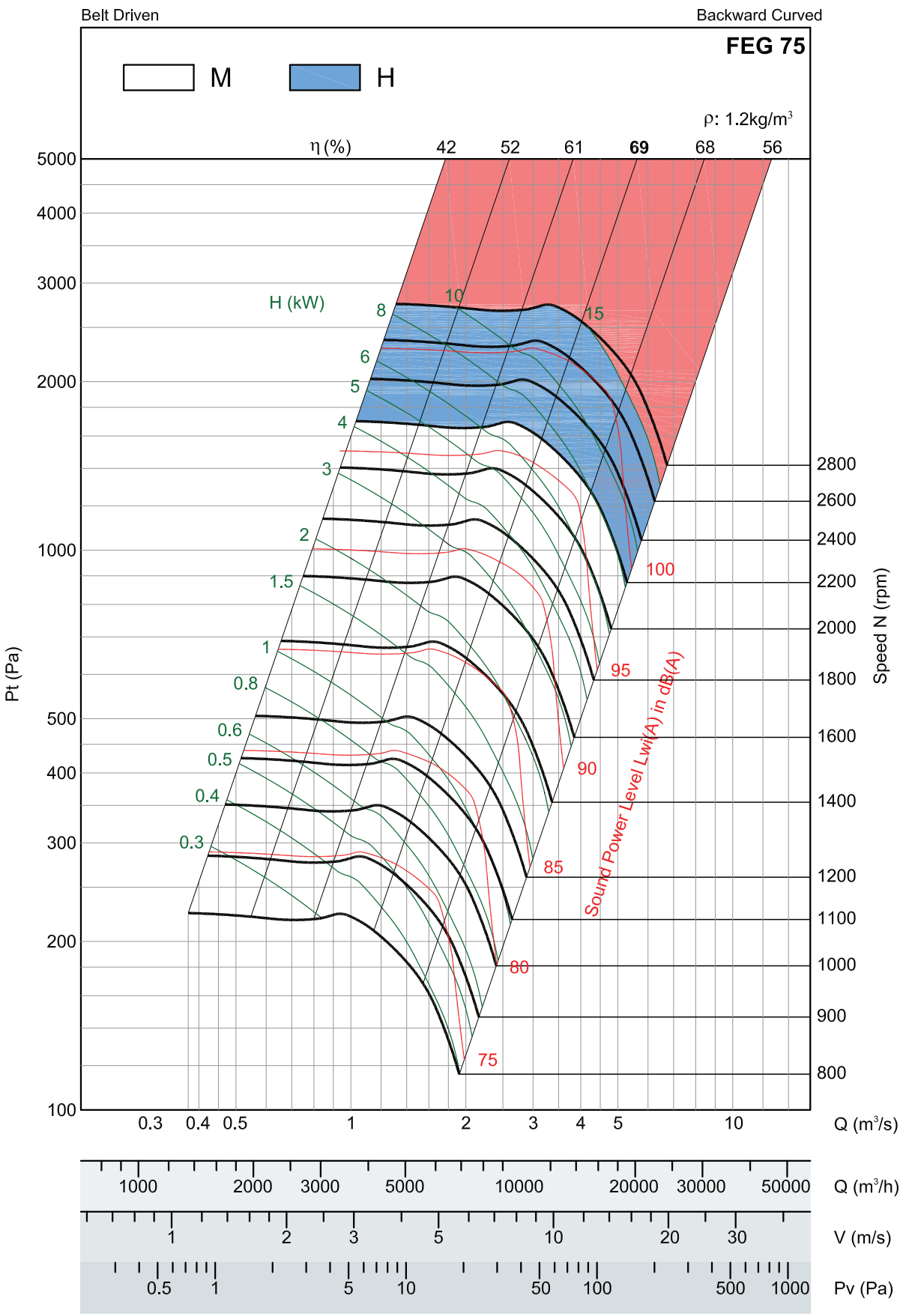
DBC - Performance Curve 400



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

DBC - Performance Curve 450

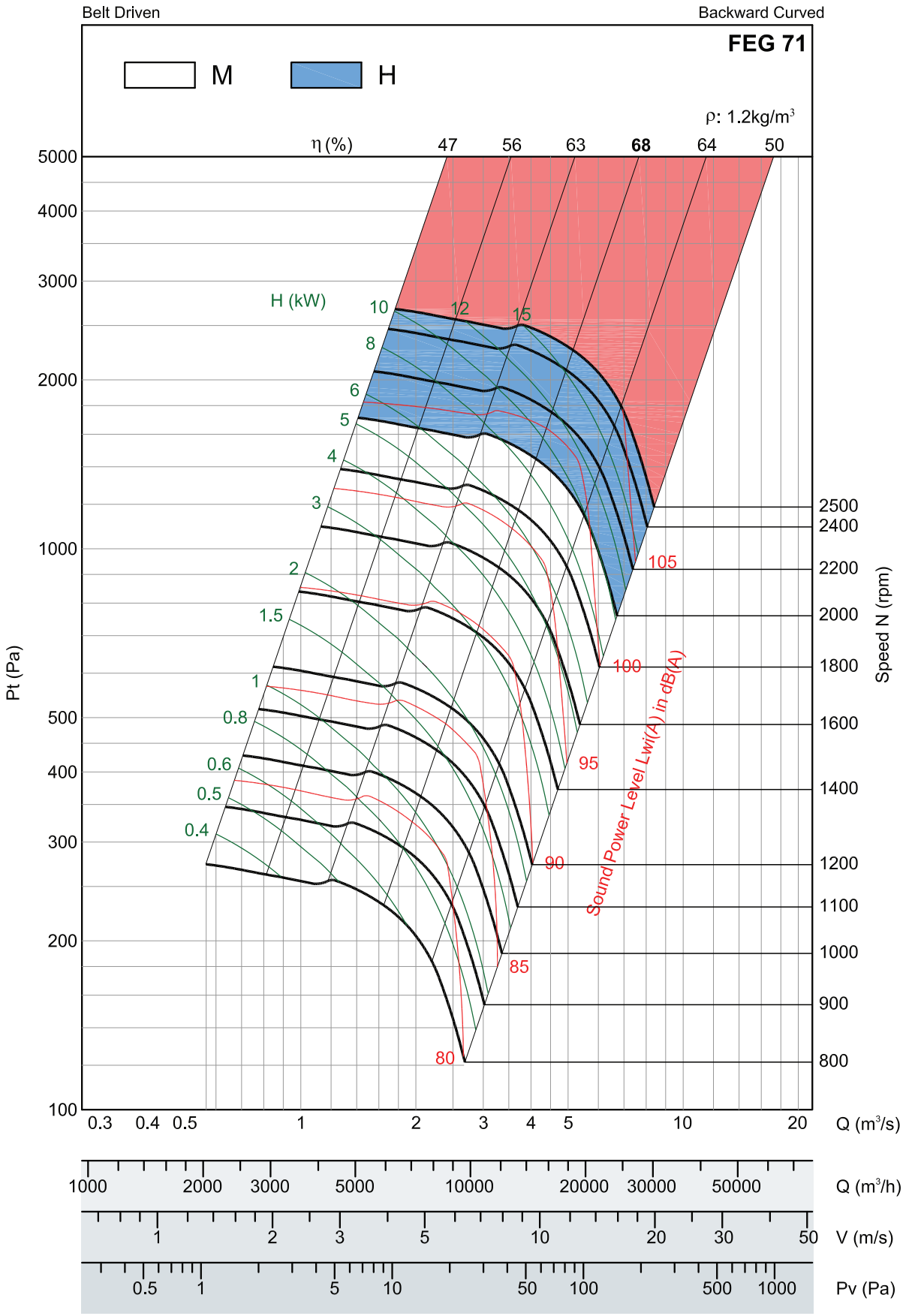


- Performance certified is for installation type B - Free inlet, Ducted outlet. Power rating kW does not include transmission losses. Performance ratings do not include the effects of appurtenances (accessories).
- The A-weighted sound ratings shown have been calculated per AMCA International Standard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

LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

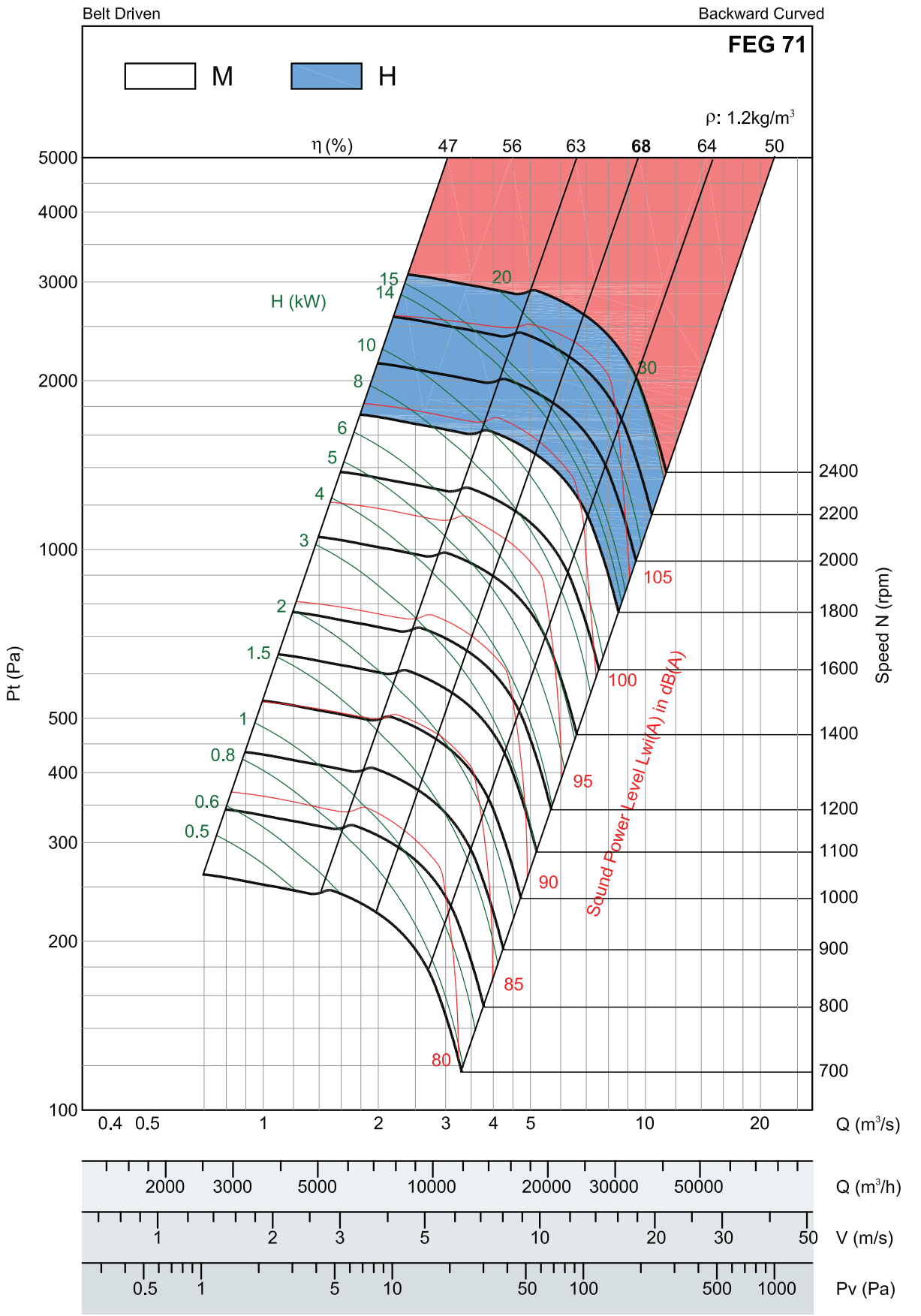
DBC - Performance Curve 500



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

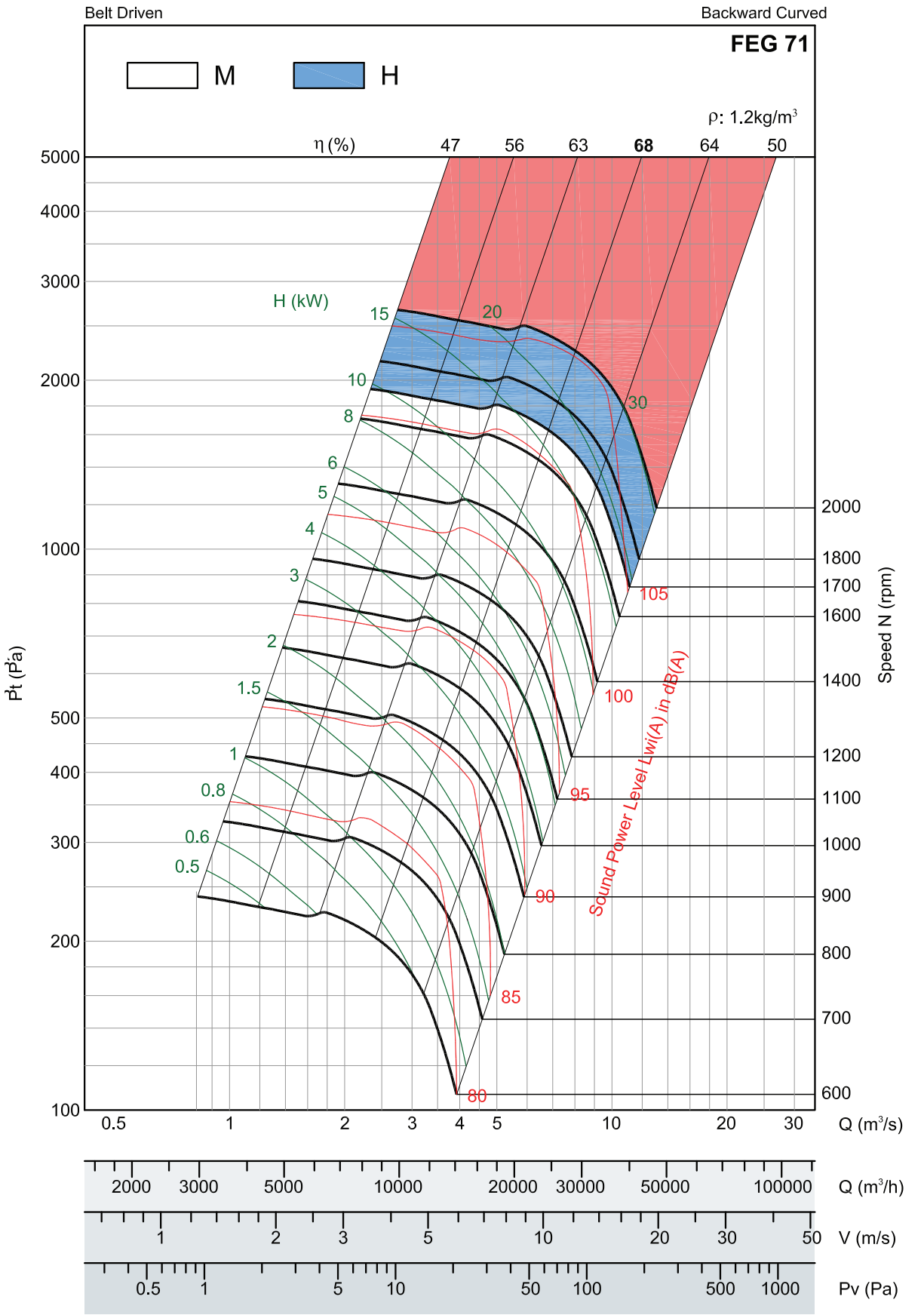
DBC - Performance Curve 560



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

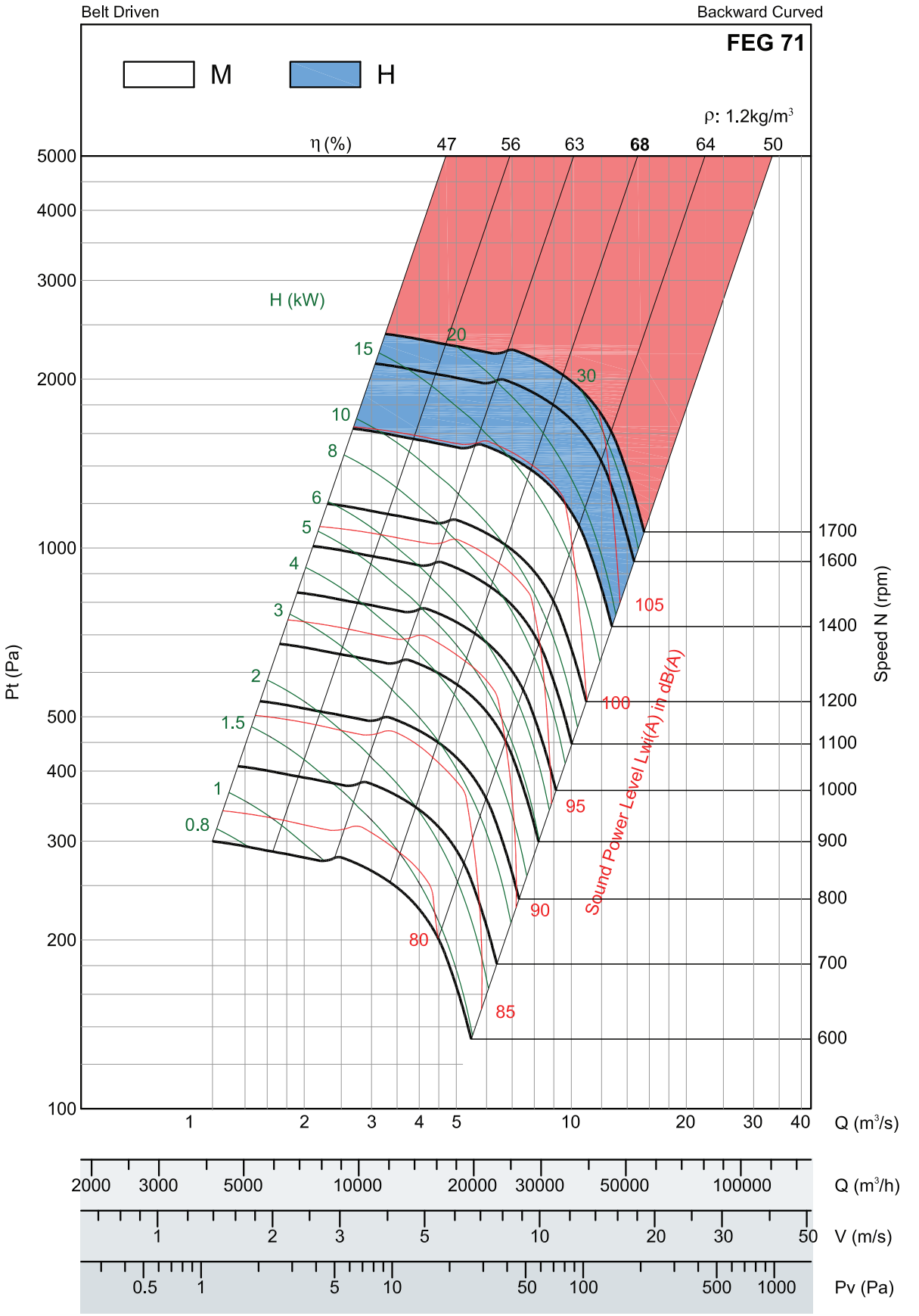
DBC - Performance Curve 630



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

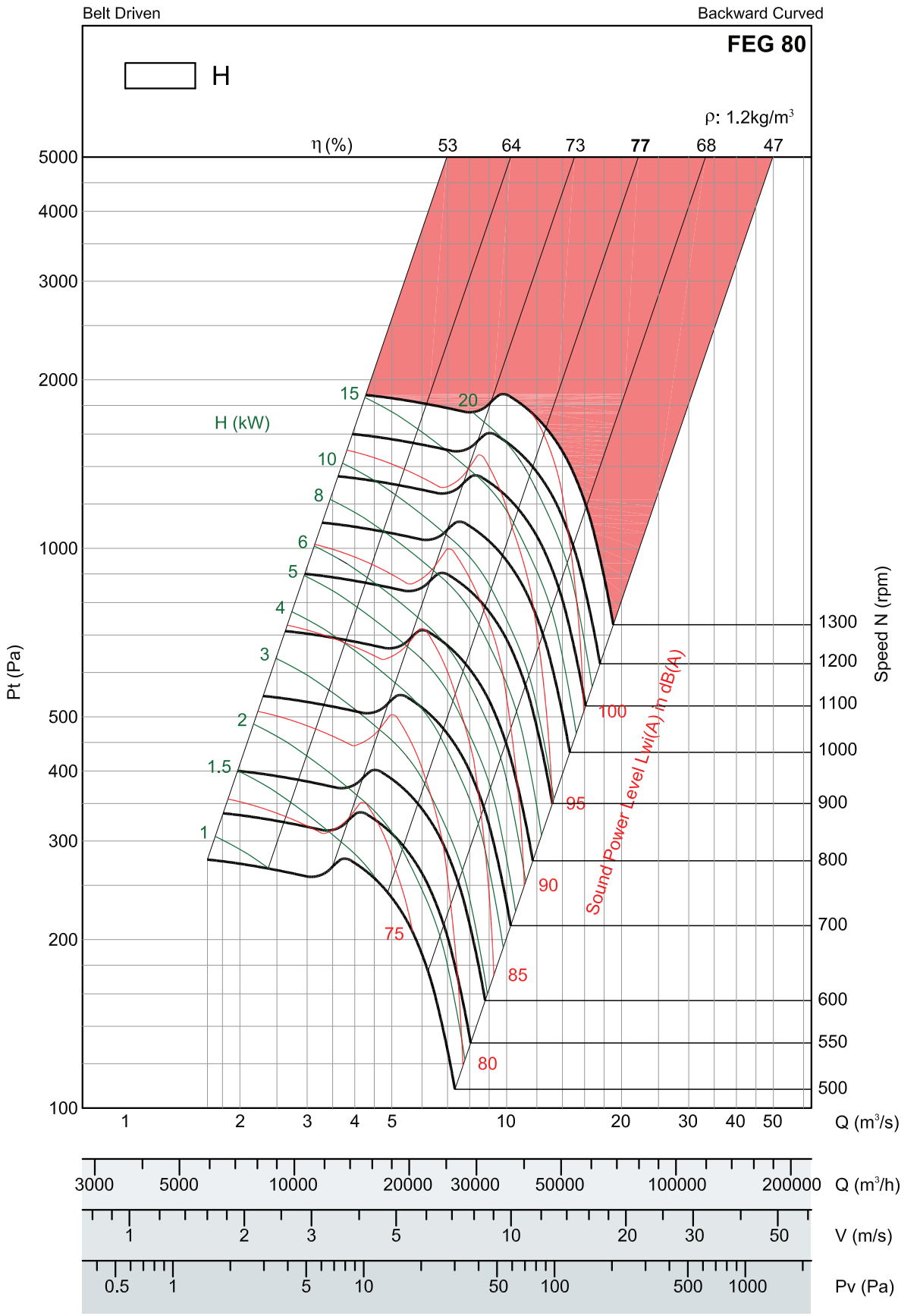
DBC - Performance Curve 710



- 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 International Standard 301. Values shown are for Inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

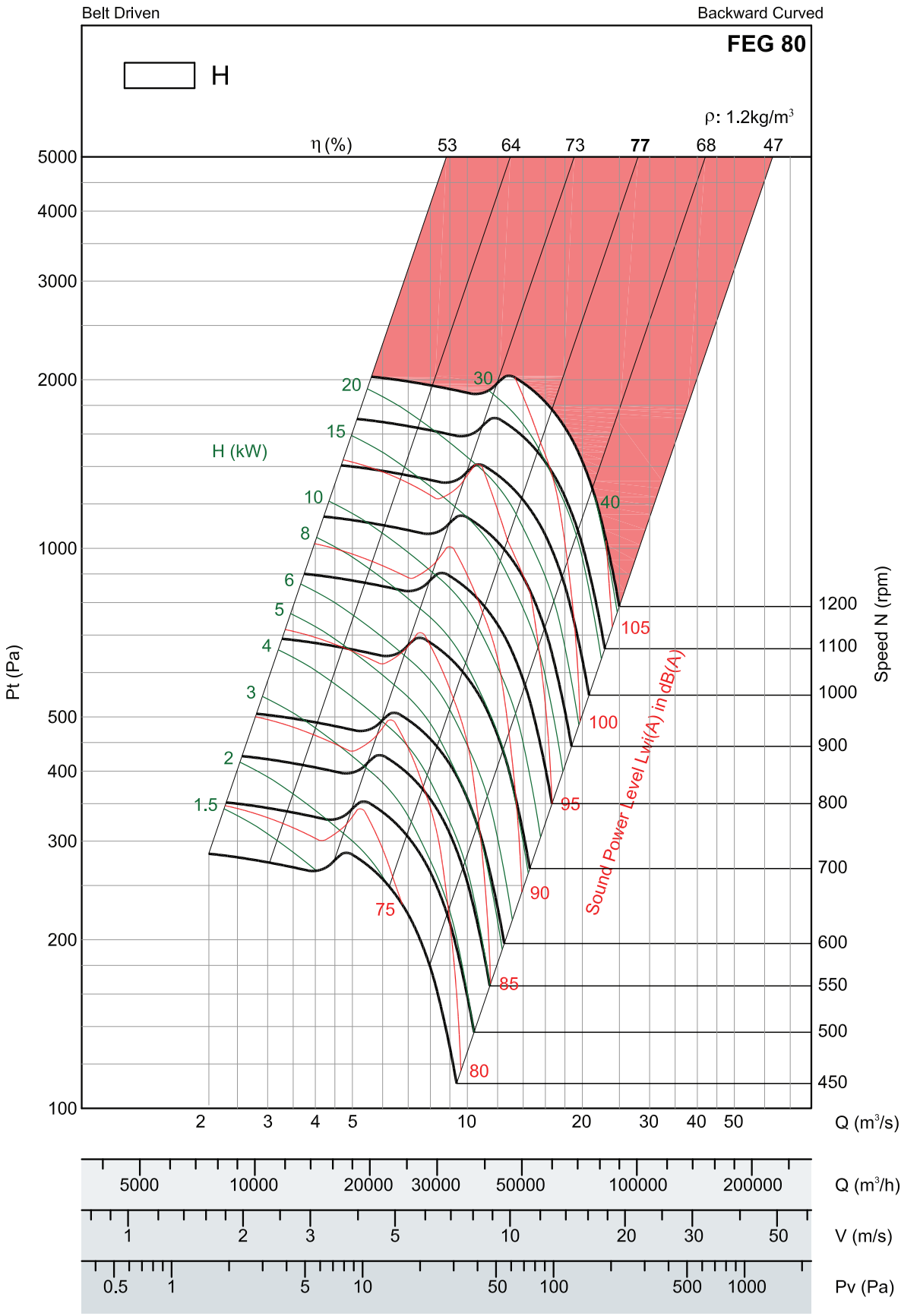
DBC - Performance Curve 800



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

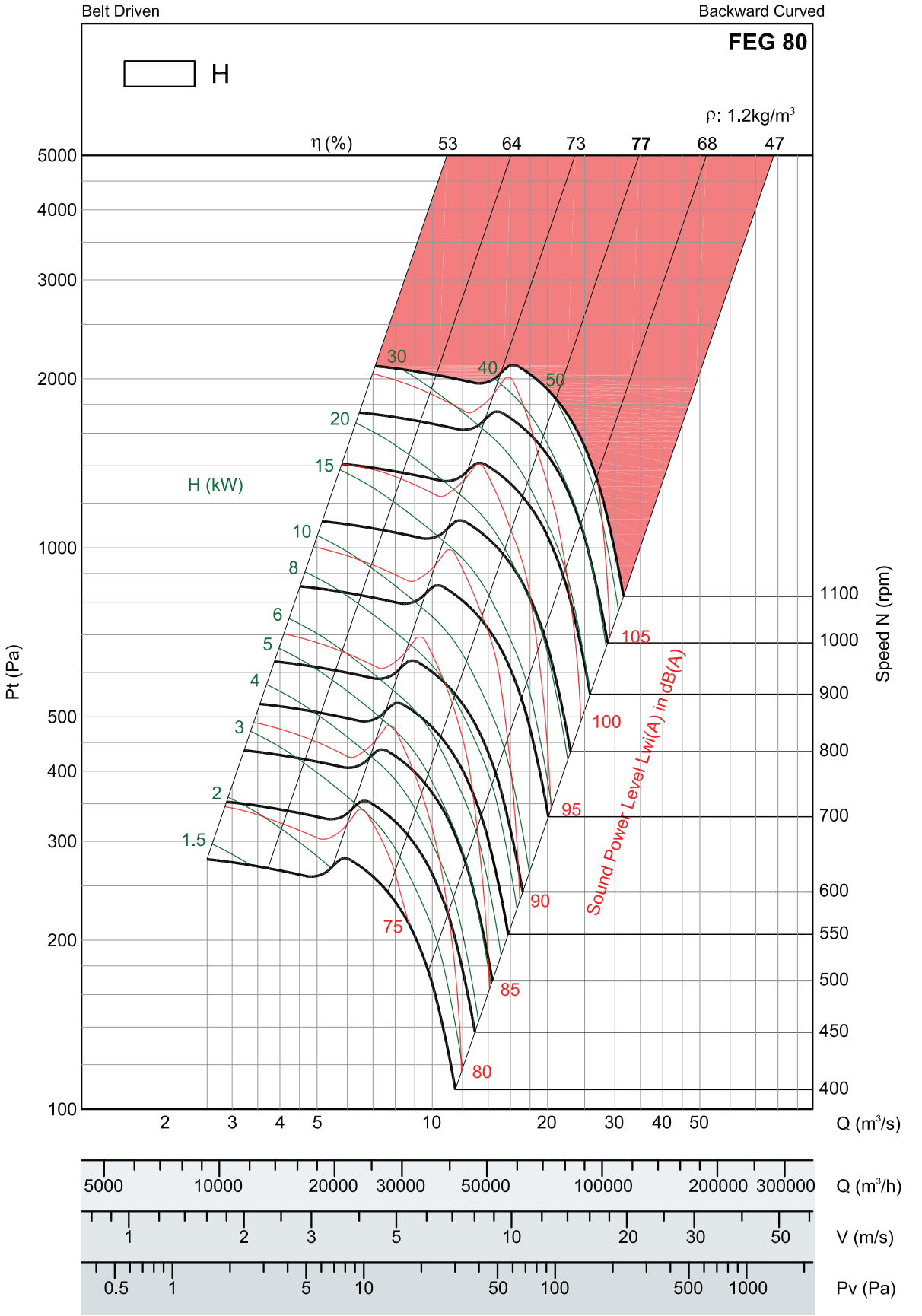
DBC - Performance Curve 900



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

DBC - Performance Curve 1000



- 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 International Standard 301. Values shown are for inlet LwiA sound power levels for installation Type B: free inlet, ducted outlet.

$Pv = (V/1.3)^2$

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