Wolter Roof Fans

- WRH Series

Air in Motion.

Wolter Fans.

Table of Content

Fan type code

W R H **355** **- 2** **HT**

- HT: Application:
  - SD: Standard
  - HT: Smoke extract fan
    F400, F300 (EN 12101-3)
  - EX: Explosion proof
- 2: Number of poles
- 355: Diameter of impeller
- WRH: Wolter Roof fan Horizontal type

Design Features

The roof fan is of the centrifugal type, using the plug fan impeller with high-strength aircraft-grade aluminum alloy casing. Compact structure, beautiful shape, the air flow smooth; fan can be installed in a variety of roofs, which can be accessed round or square flange or flashing installation. These fans are ideal for factory roof discharge.

This roof fan is also designed and tested to operate at standard temperatures as well as at elevated temperatures of 300°C for 60 minutes (*F300*) and 120 minutes and 400°C for at least 120 minutes (*F400*), according to BS EN 12101-3:2015.

Construction of Product

WRH Series fans mainly consist of the housing, impeller, motor, safety net, eliminator and gravity shutter.

Housing

Roof fan housing uses high-strength aluminum alloy to reduce weight. The Inlet and the base plate are made of stretch forming, for compact structure, beautiful shape, smooth airflow, and completely avoiding the problem of water creep.

Impeller

Backward aluminum alloy impeller with vaneless diffusion technology, effectively to improve the efficiency of the fan. Impeller hub uses the way of locking sleeve, to make the impeller fitted with the motor gapless, so it can end capping minimize the assembly error caused by impeller hub fitting with motor shaft, to avoid the destruction of the balance, improve the grade of balance.

For *F400* application, impeller comes with casted steel type.

Motor

WRH series is equipped with standard motor of insulation class F, ingress protection IP54, continuous operation temperature ranges from -20°C to 40°C

Safety Net and Eliminator

WRH Series fans use high-grade stainless steel wire

Gravity Shutter

High-grade aluminum alloy louvers mounted on the flashing, the size can be determined according to the size of the flashing. It can effectively prevent air reflux.

Performance curves

The performance curves have been established using the outlet test method in the test chamber according to AMCA 210 Figure 15 installation type C (ducted inlet, free outlet).

The curves indicate as a function of the volume flow:

- the static pressure increase Δp_{st}. for constant speed(heave black lines)
- constant lines of shaft power P_W (red Lines)
- constant lines of sound power level L_{wiA} (blue lines)

All values relate to an air density:

ρ = 1,2 kg/m³ at 20°C

The dynamic pressure p_{d2} stated in the diagrams refer to the flange cross section of the outlet connection pieces.

Sound levels

In order to make possible an assessment of sound projection adequate to the human ear the A-assessed description of sound levels has been chosen.

The ascertaining of the sound power level follows the reverberant room method according to AMCA 300 Figure 3.

The sound power levels shown on each performance curve, LwoA, refer to the overall sound power “A-Weighted” levels. The computed sound power levels were converted into A-Weighted levels using adjustments to the octave band spectrum as follows:

Hz	63	125	250	500	1000	2000	4000	8000
Adjustment dB(A)	-26.2	-16.1	-8.6	-3.2	0	+1.2	+1.0	-1.1

The overall sound pressure levels, LpA, can be calculated from the overall sound power levels as follows:

1) Free Field Conditions: LpA = LwA - (20 $\log_{10}$ d) -11

2) Room Conditions: LpA = LwA - (20 $\log_{10}$ d) -7

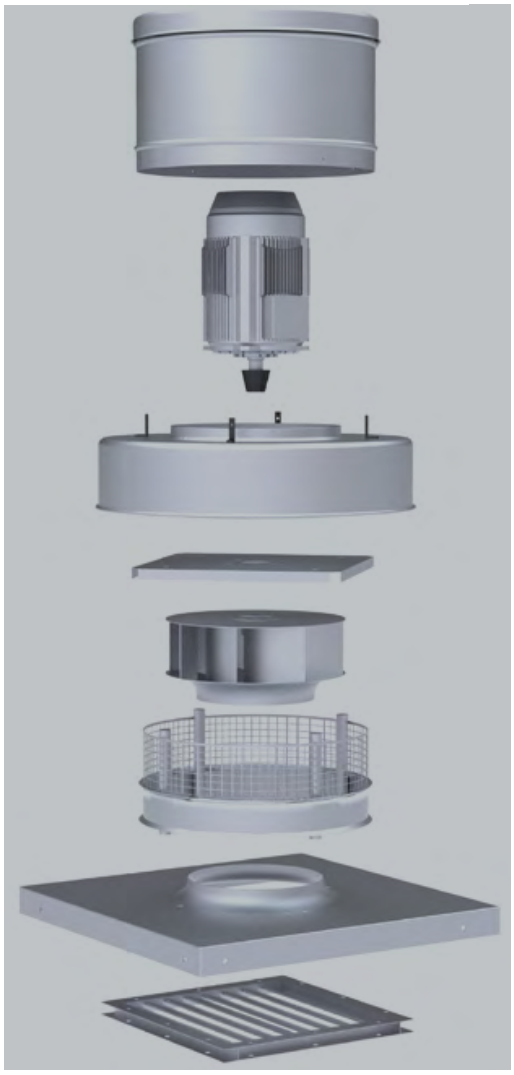
Where: d = distance from fan in meters.

Installation and Maintenance

- The installed base should be above the roof, surface should be smooth to prevent leakage, and with good anchor bolts embedded.
- Between the fan base and the base layer, 5mm rubber plate should be installed to reduce vibration; anchor bolts should be fitted with spring washers to prevent loosening when used.
- Detailed inspection of all components before the fan begins to run. The rotating impeller should not be chafed.
- During the initial stage of commissioning, first check that the impeller rotation direction is correct (looking down the impeller should rotate counterclockwise).
- During the commissioning or normal usage the fan voltage, current, vibration, noise should be within the normal range.
- During operation, the fan should be immediately shut down and the problems identified if the following issues occur:
  1) A strong vibration
  2) An abnormal noise or the sound of a sudden increase
  3) Motor fume-offs
  4) Motor bearing temperature rise too high.
- When the throttle is the electric damper, it should open the throttle first when fan runs; turn off the fan and then shut down the fan.
- Began operation 72 hours and should be checked every six months, to make sure that the fan connectors, fasteners are tight, then adjust the belt tension, append lubrication (grease).
- In case of snowing, freezing date, the fan must often be switched on to prevent heavy snow blocking the fan's outlet.
- It should be re-checked after long term shutdown.

Instructions

- When placing the order, it is necessary to state the type of fan, speed, air volume, air pressure, discharge direction, rotation direction, type of electric motor and its specifications.
- Prior to installation, the fan should be carefully inspected. Special care should be taken in checking the shalf, impeller and bearings. If there is an indication of any damage, the damaged parts should be repaired or repaired before the fan is installed or commissioned.
- The inside of the scroll and casing need to be checked to make sure that there are no foreign objects inside the housing, such as tools or loose parts.
- The rotational directions of the motor and impeller should be checked to ensure that they are in compliance with the specification and purchase orders.
- A flexible connector should be used between the fan out let flange and its mating ductwork. The flex connector should not be over-stretched.
- Following the installation, the impeller should be turned by hand or with the use of a wrench to make sure that it turns freely without colliding with other parts of the fan. Once all this is done, the fan can be commissioned normally.
- The rated motor power as calculated herein might not be sufficient to drive the fan with an unrestricted discharge flow. Operating the fan with an unrestricted discharge outlet will result in flow rate that exceeds the specified fan capabilities. Such operation will quickly burn the motor and damage the fan. Great care must be taken in operating the fan to make sure that the maximum rated flows, as provided on the performance charts in this catalog, are not exceeded.
- The fan is limited for use in areas where air substances are non-corrosive, non-toxics and non-erosive and where dust particles are less than 150mg/m3 with a temperature between -20°C and 40°C. Special care should be taken during transportation, load and unload.



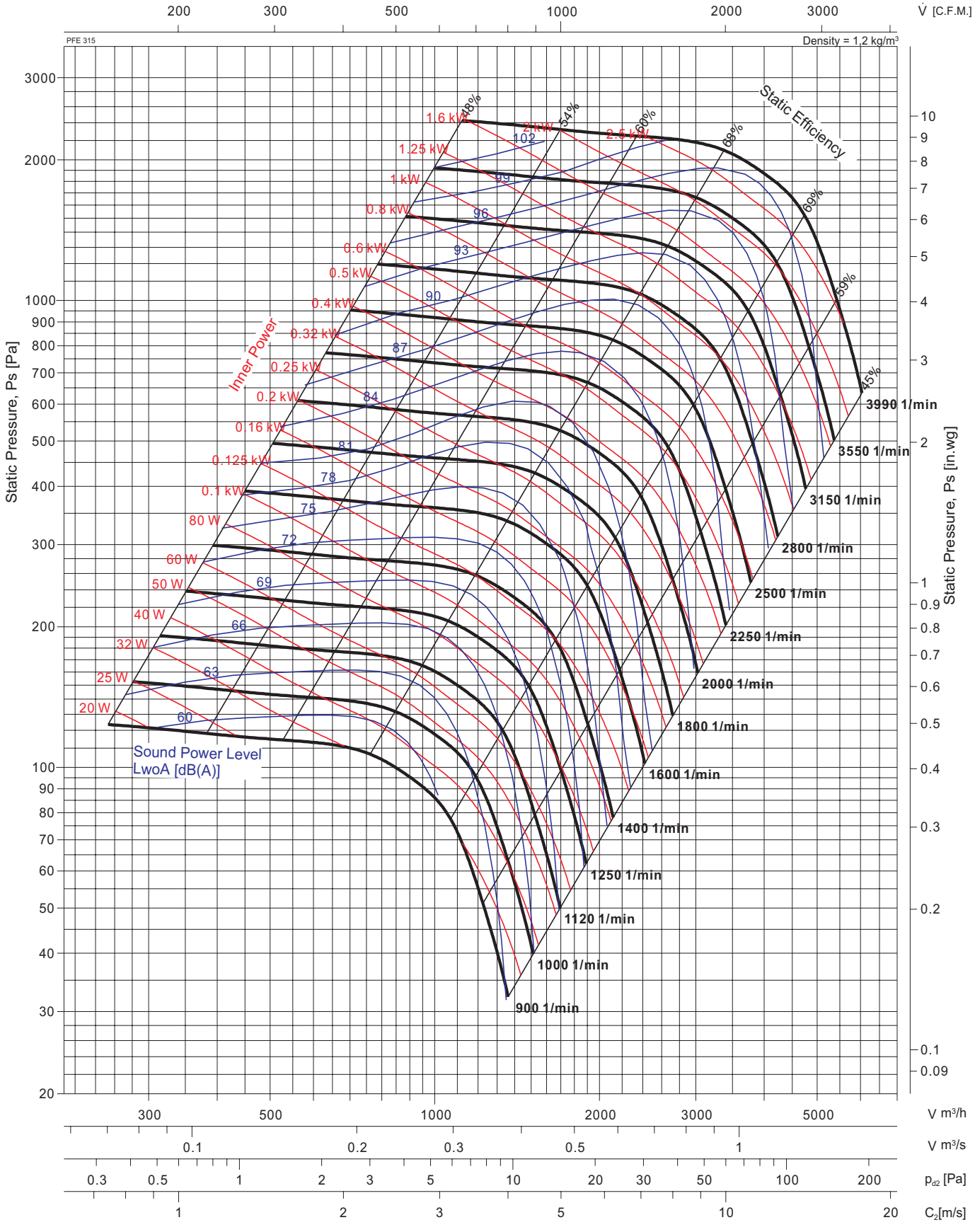
Centrifugal Roof Fan

Performance Curve

WRH 315

Impeller diameter	**D =**	327	mm
Moment of inertia	**J =**	0.076	kgm²

Fan Weight (w/o motor)	**G =**	16	kg
Speed Limit	**n_{max} =**	3990	1/min



Fan tested in an accredited laboratory by AMCA according to AMCA 210, Figure15. Performance is for installation type C: ducted inlet, free outlet. Power rating (kW) does not include transmission losses. Performance ratings do not include the effects of housing and accessories.

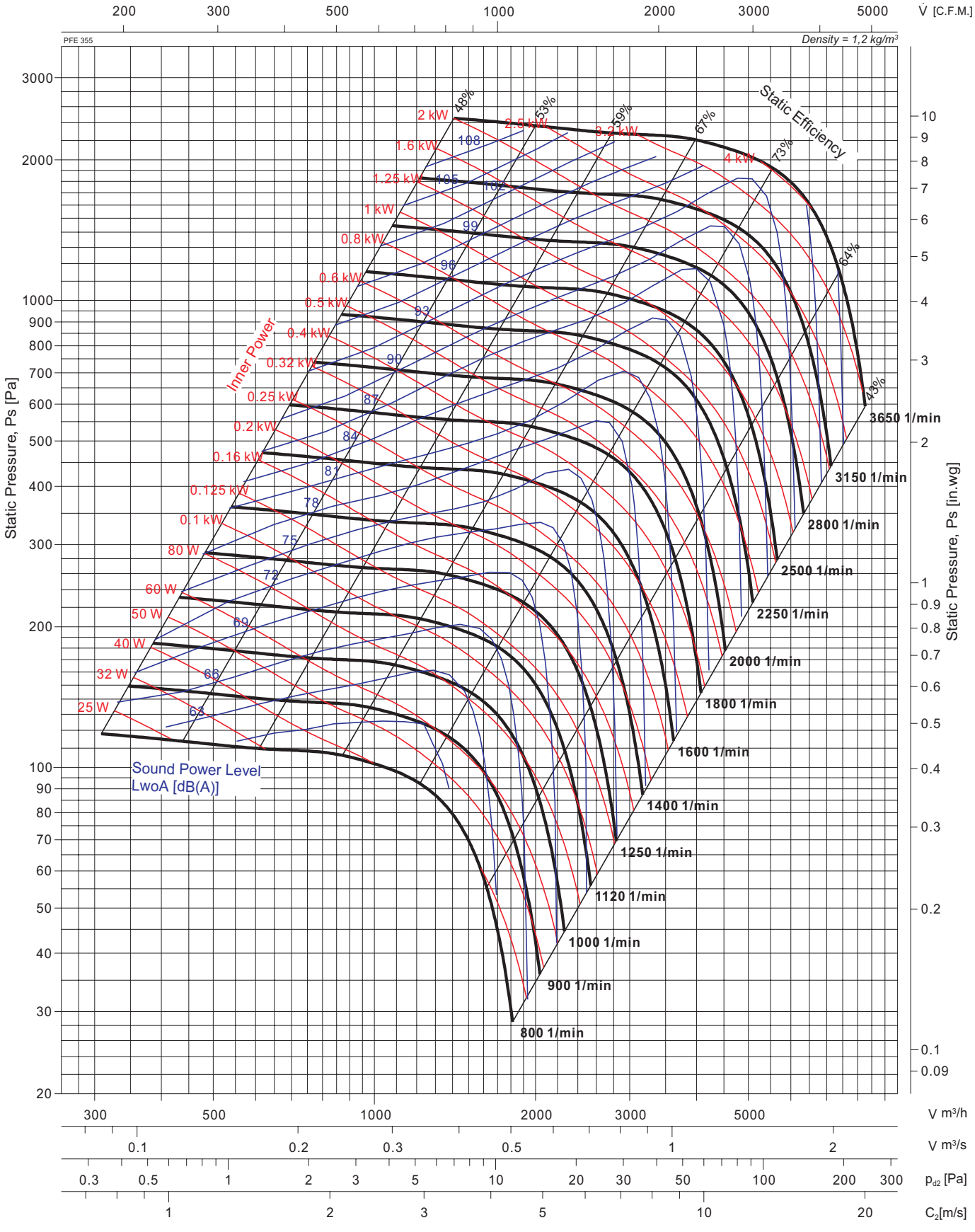
The A-weighted sound ratings shown have been calculated per AMCA International Standard 301. Values shown are for outlet $L_{WC}A$ sound power levels for installation type C: ducted inlet, free outlet.

Centrifugal Roof Fan

Performance Curve WRH 355

Impeller diameter	**D =**	369	mm
Moment of inertia	**J =**	0.136	kgm²

Fan Weight (w/o motor)	**G =**	18	kg
Speed Limit	$\mathbf{n_{max}}$ **=**	3650	1/min



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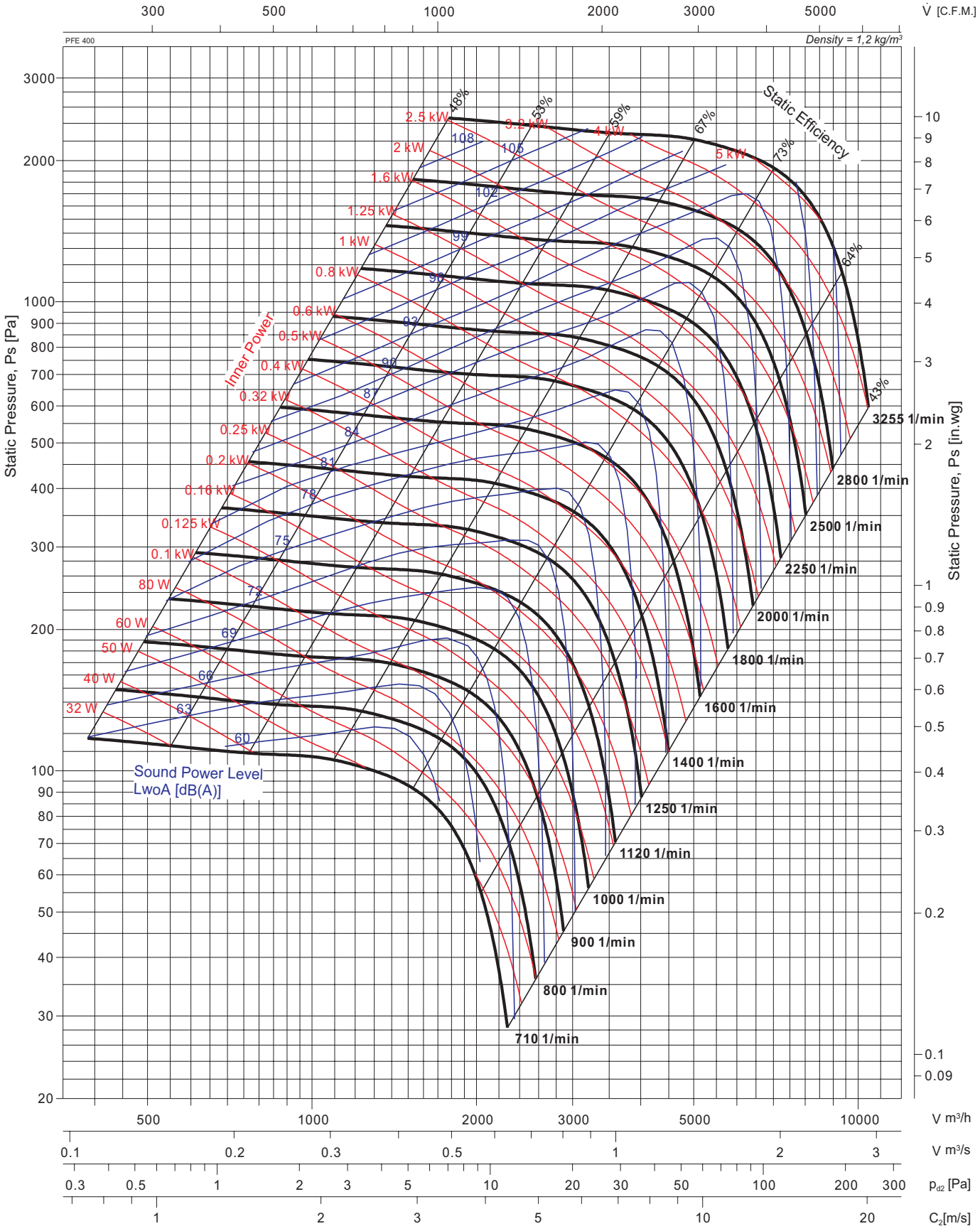
Centrifugal Roof Fan

Performance Curve

WRH 400

Impeller diameter	**D =**	417	mm
Moment of inertia	**J =**	0.208	kgm²

Fan Weight (w/o motor)	**G =**	25	kg
Speed Limit	n_{max} =	3255	1/min



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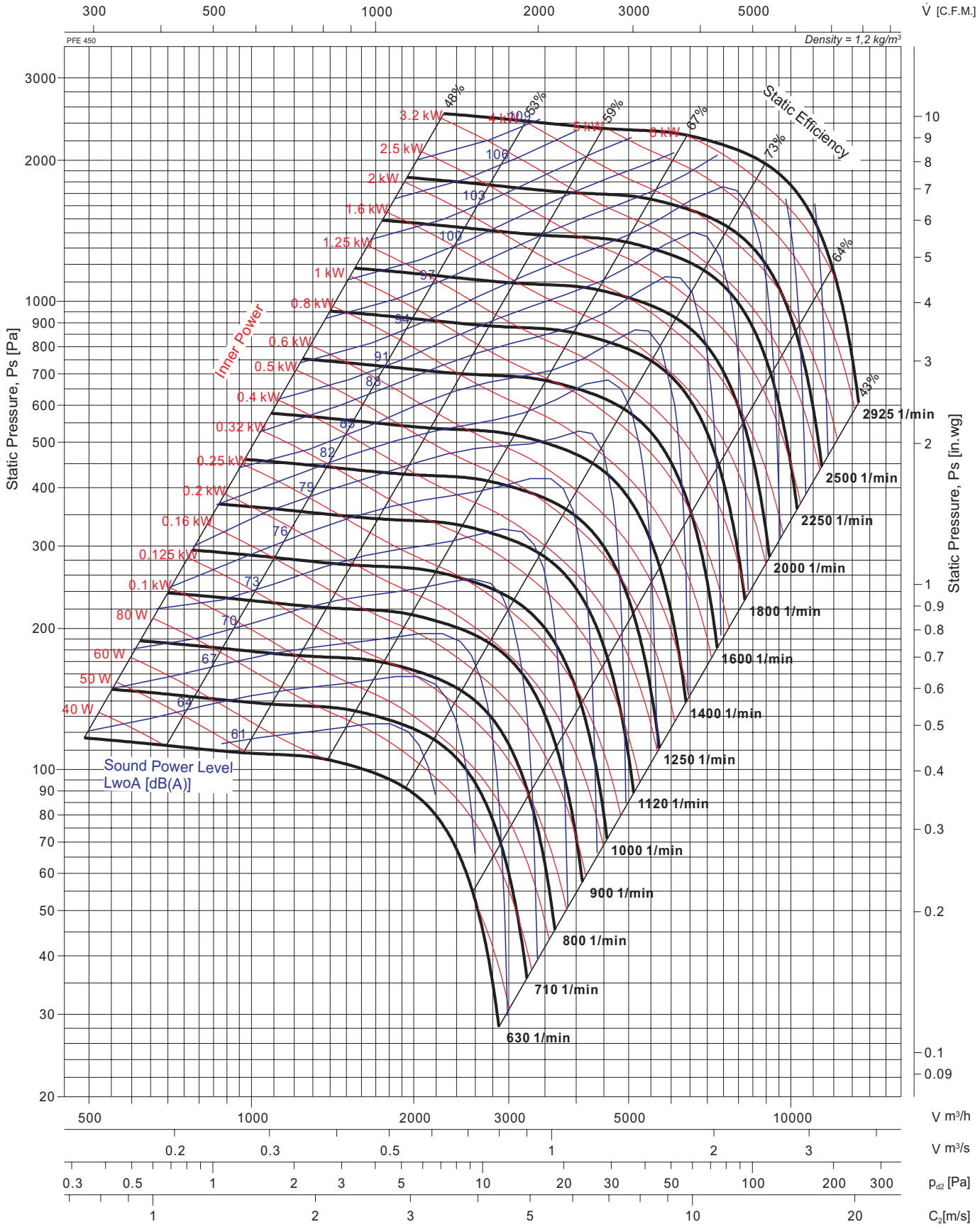
Centrifugal Roof Fan

Performance Curve WRH 450

Impeller diameter	**D =**	468	mm
Moment of inertia	**J =**	0.393	kgm²

Fan Weight (w/o motor)	**G =**	35	kg
Speed Limit	**n_{max} =**	2925	1/min



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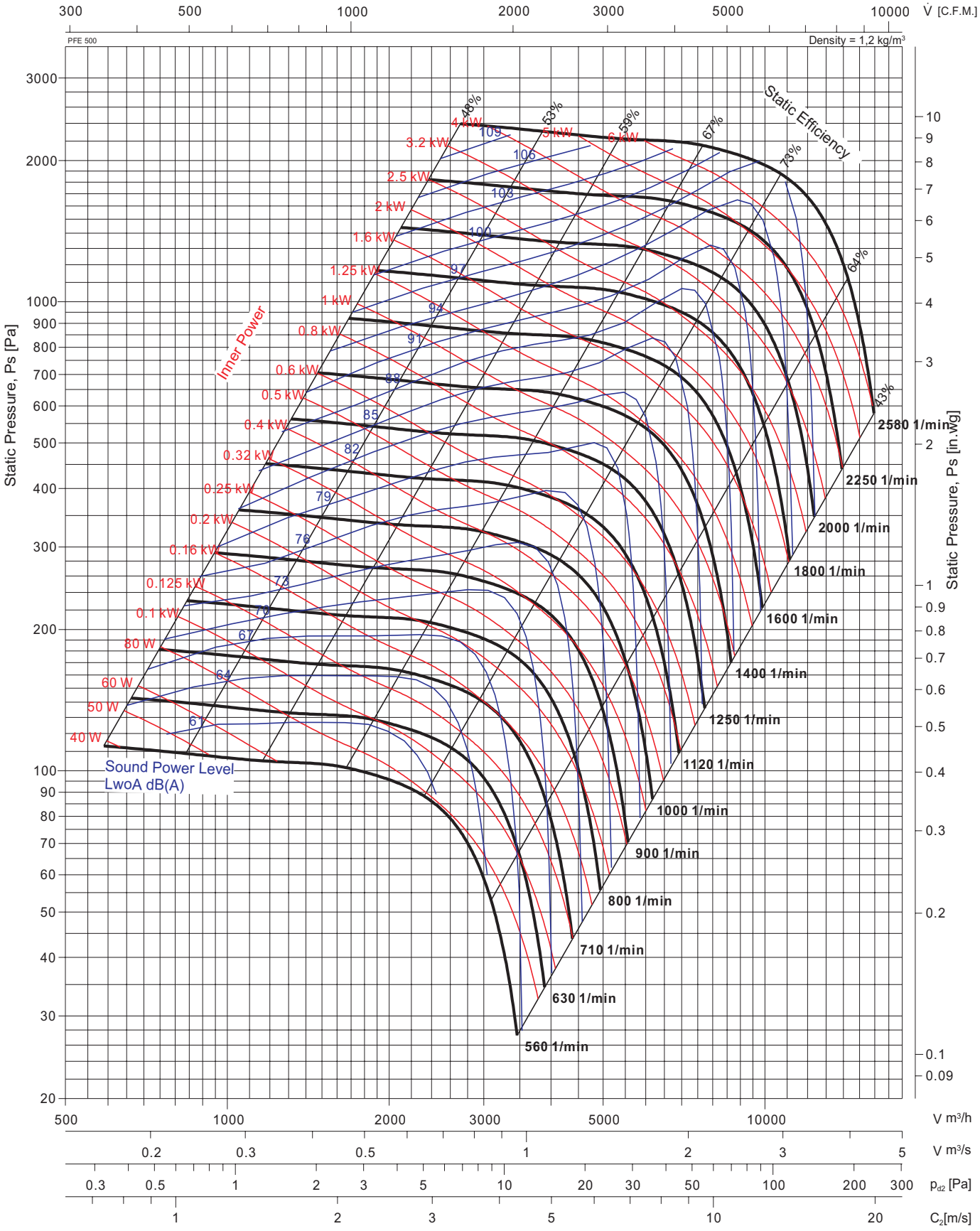
Centrifugal Roof Fan

Performance Curve

WRH 500

Impeller diameter	**D =**	520	mm
Moment of inertia	**J =**	0.567	kgm²

Fan Weight (w/o motor)	**G =**	39	kg
Speed Limit	**n_{max} =**	2580	1/min



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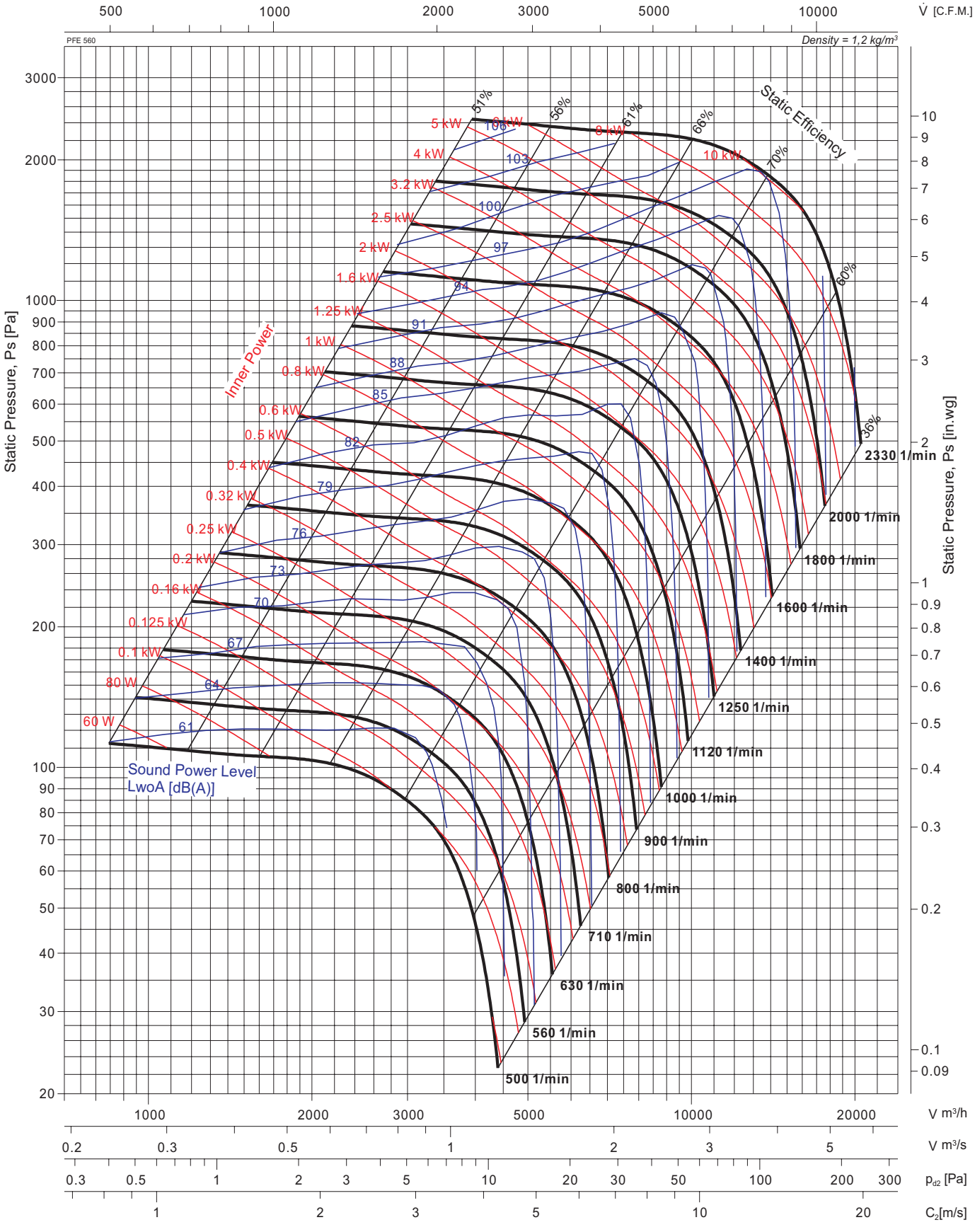
Centrifugal Roof Fan

Performance Curve WRH 560

Impeller diameter	**D =**	572	mm
Moment of inertia	**J =**	0.992	kgm²

Fan Weight (w/o motor)	**G =**	52	kg
Speed Limit	**n_{max} =**	2330	1/min



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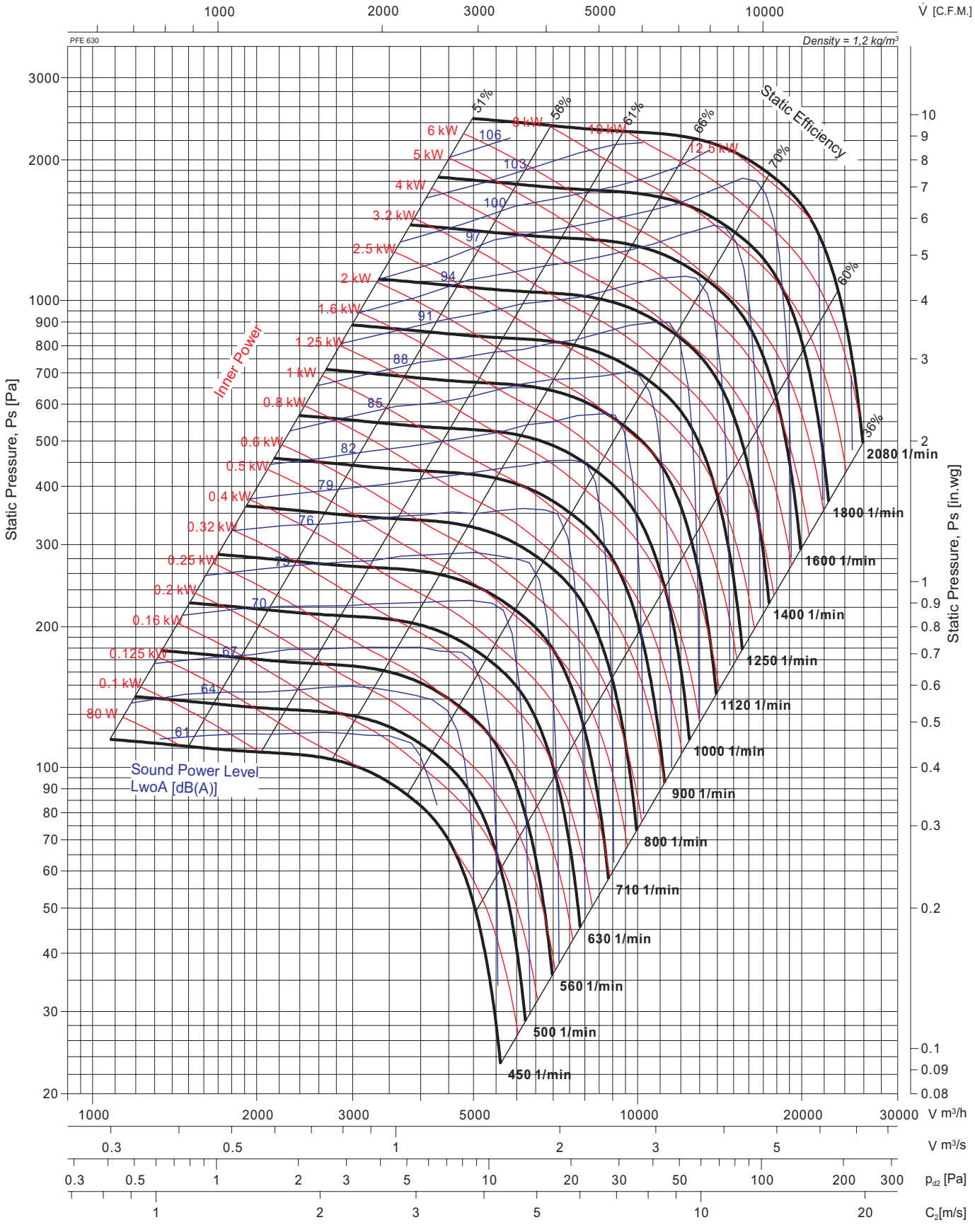
Centrifugal Roof Fan

Performance Curve

WRH 630

Impeller diameter	**D =**	642	mm
Moment of inertia	**J =**	1.602	kgm²

Fan Weight (w/o motor)	**G =**	62	kg
Speed Limit	**n_{max} =**	2080	1/min



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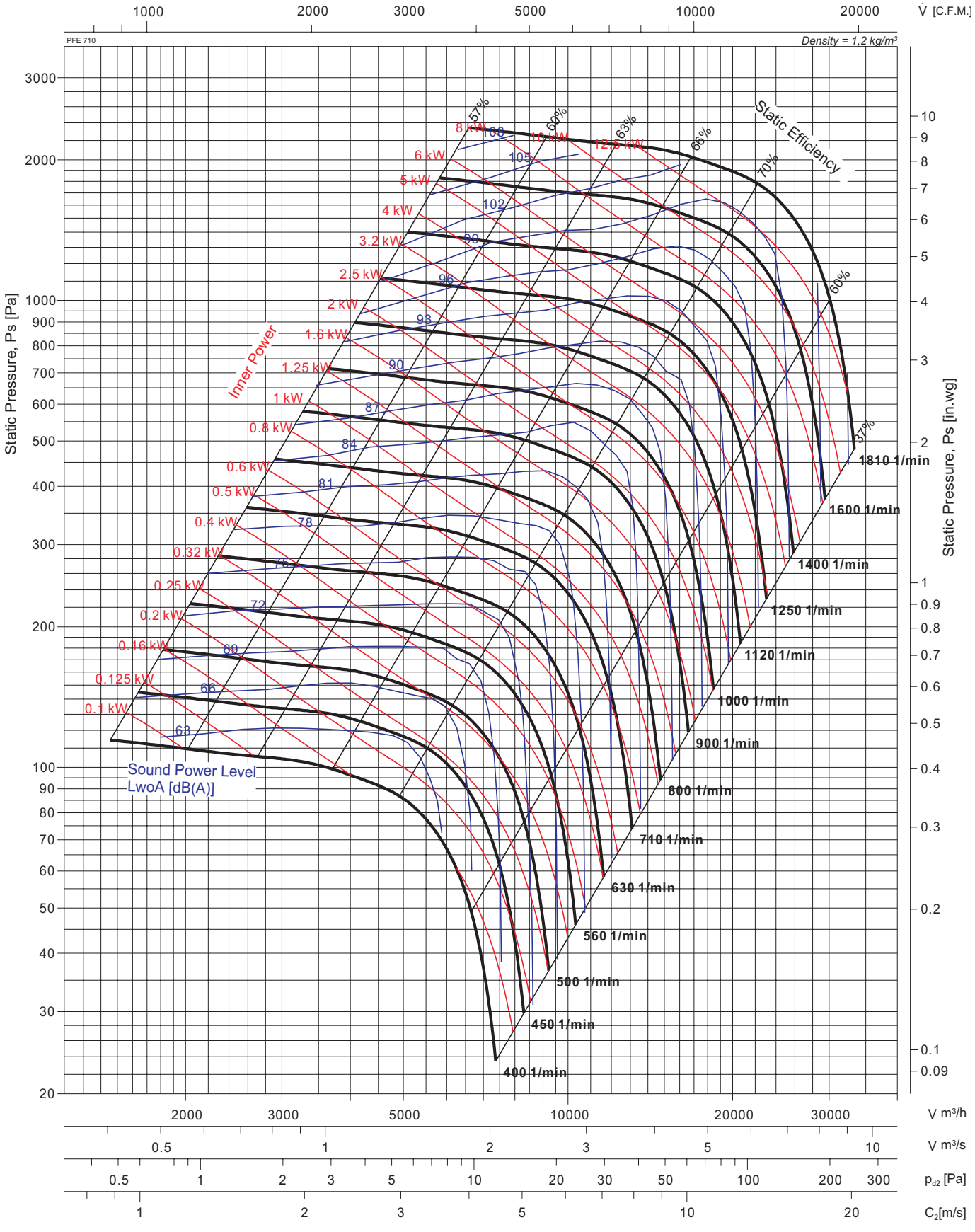
Centrifugal Roof Fan

Performance Curve WRH 710

Impeller diameter	**D =**	722	mm
Moment of inertia	**J =**	2.723	kgm²

Fan Weight (w/o motor)	**G =**	75	kg
Speed Limit	**n_{max} =**	1810	1/min



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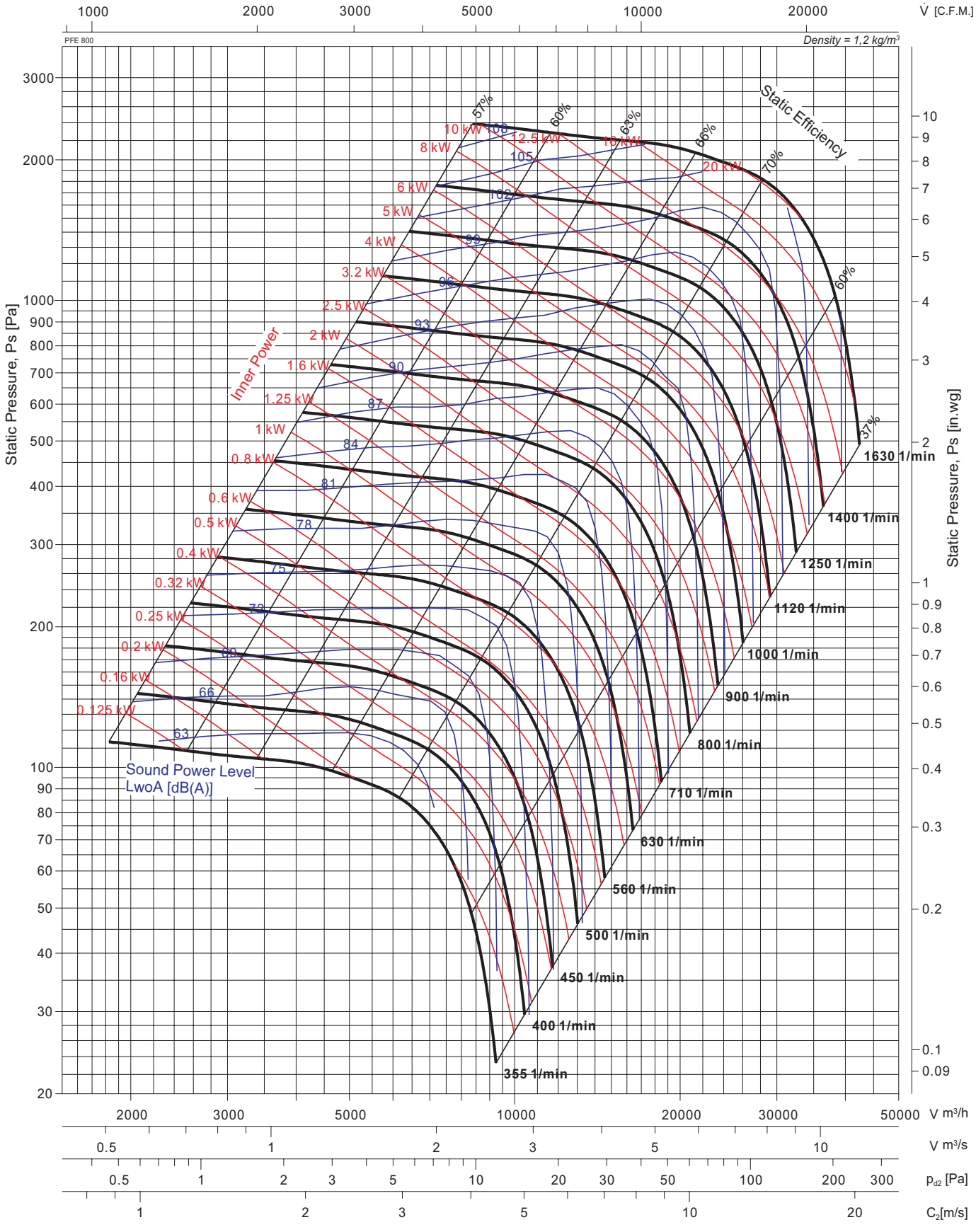
Centrifugal Roof Fan

Performance Curve

WRH 800

Impeller diameter	**D =**	810	mm
Moment of inertia	**J =**	5.034	kgm²

Fan Weight (w/o motor)	**G =**	96	kg
Speed Limit	**n_{max} =**	1630	1/min



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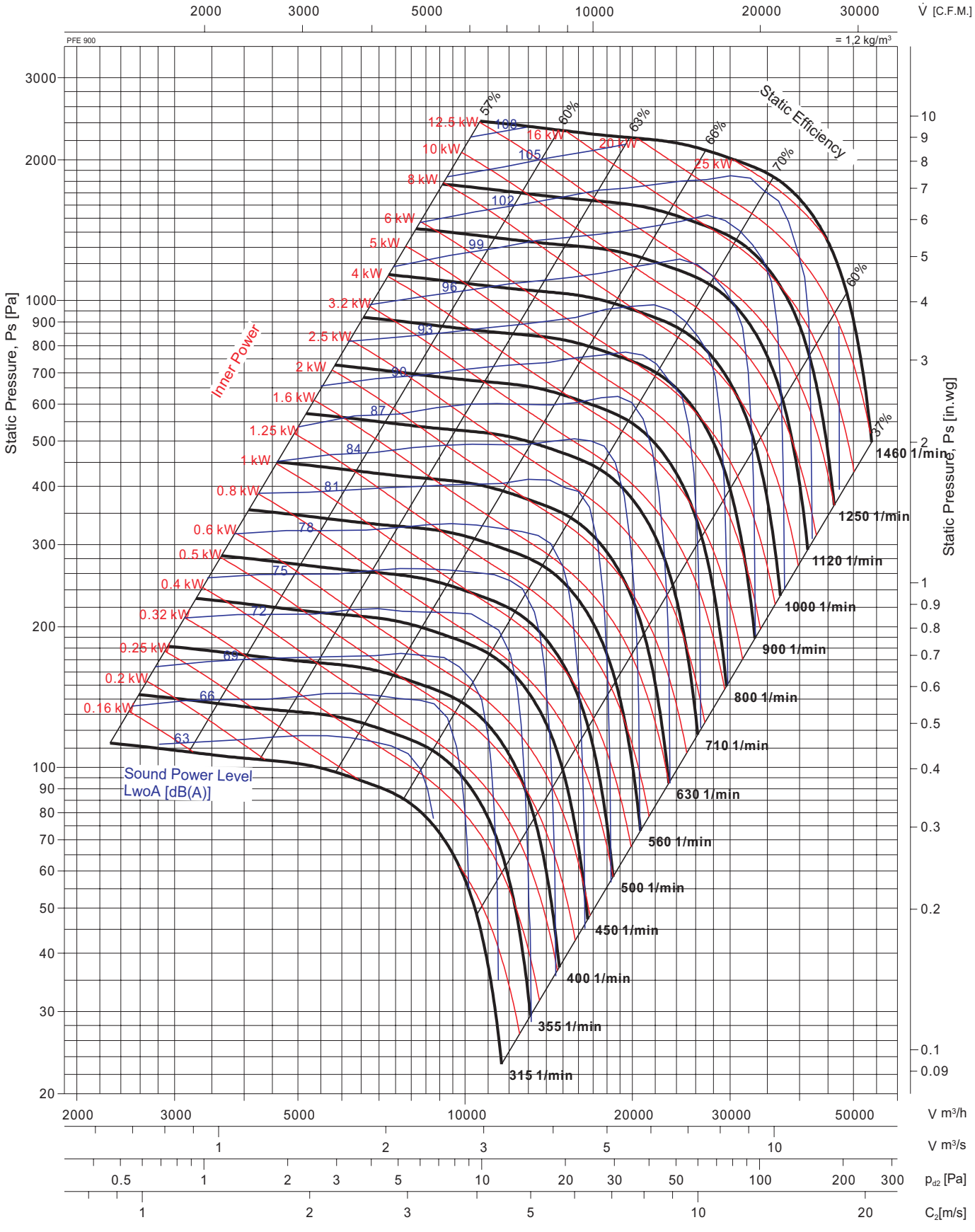
Centrifugal Roof Fan

Performance Curve WRH 900

Impeller diameter	**D =**	910	mm
Moment of inertia	**J =**	9.214	kgm²

Fan Weight (w/o motor)	**G =**	120	kg
Speed Limit	**n_{max} =**	1460	1/min



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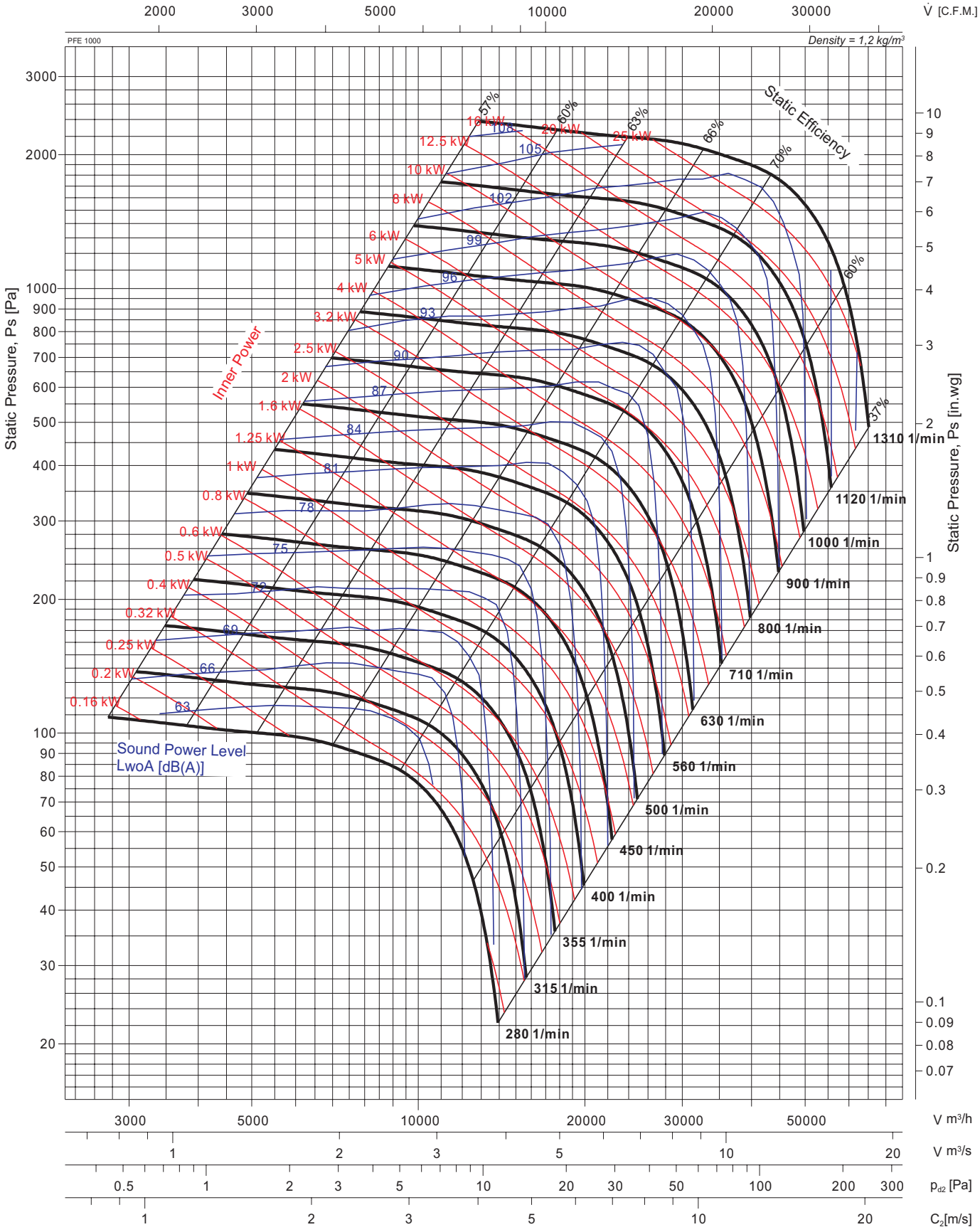
Centrifugal Roof Fan

Performance Curve

WRH 1000

Impeller diameter	**D =**	1010	mm
Moment of inertia	**J =**	14.37	kgm²

Fan Weight (w/o motor)	**G =**	146	kg
Speed Limit	**n_{max} =**	1310	1/min



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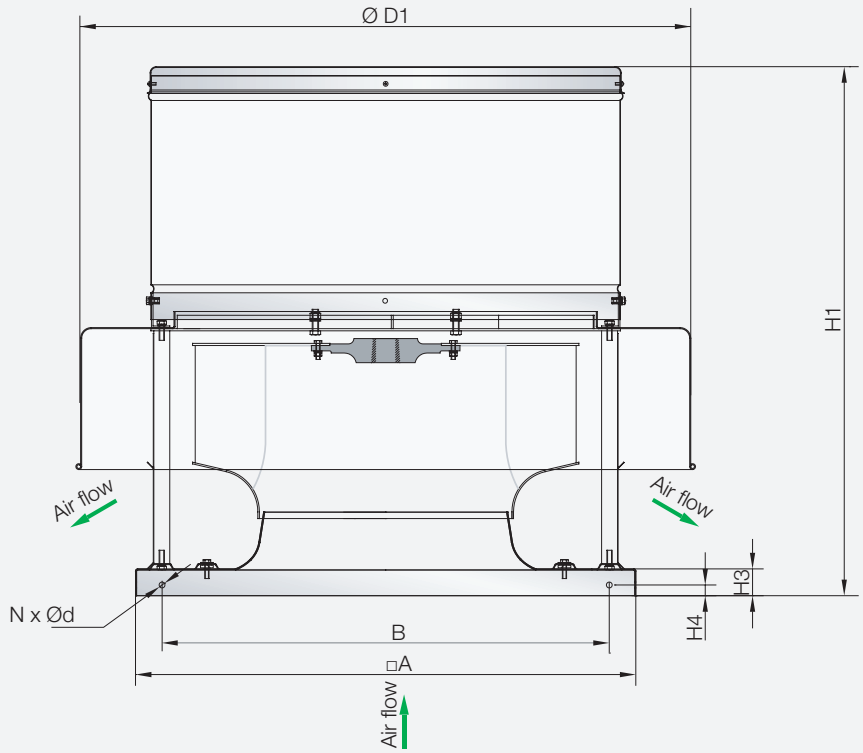
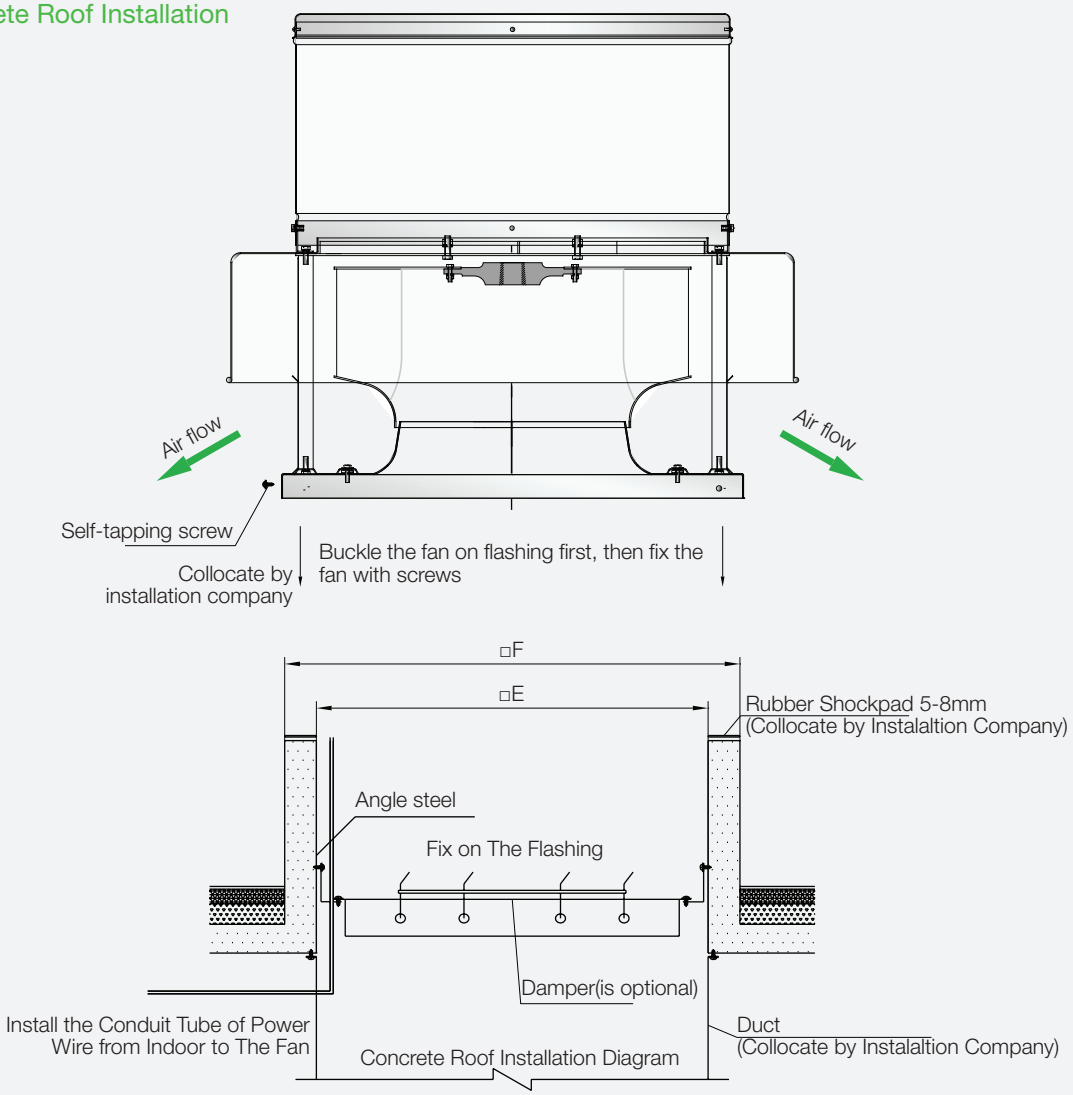
WRH Series



Model size	A [mm]	B [mm]	D1 [mm]	H1 [mm]	H3 [mm]	H4 [mm]	N x d [mm]
315	600	400	700	670	60	25	8 x 11
355	600	400	700	697	60	25	8 x 11
400	701	500	830	774	60	25	8 x 11
450	701	500	830	810	60	25	8 x 11
500	756	600	904	890	60	25	8 x 11
560	858	720	904	942	60	25	8 x 11
630	896	720	1080	1046	60	25	8 x 11
710	939	780	1080	1100	60	25	8 x 11
800	1210	1000	1400	1238	60	25	12 x 11
900	1210	1000	1400	1292	60	25	12 x 11
1000	1290	1130	1580	1336	60	25	12 x 11

We reserve the right to alter measurements without notice in case of technical improvements.

WRH Concrete Roof Installation



Model size	E [mm]	F [mm]
315	430	590
355	430	590
400	531	691
450	531	691
500	586	746
560	688	848
630	726	886
710	769	929
800	1040	1200
900	1040	1200
1000	1120	1280

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