INDUSTRIAL AND COMMERCIAL VENTILATION

VENTS

Fresh air in your house!

2010

FANS FOR ROUND DUCTS

FANS FOR RECTANGULAR DUCTS

CHIMNEY CENTRIFUGAL FAN

Chimney centrifugal fan
VENTS KAM

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SOUND-PROOF FANS

Series
VENTS VS

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Series
VENTS KSA

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Series
VENTS KSB

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CENTRIFUGAL FANS

Squirl-type centrifugal fans
VENTS VCU

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Squirl-type centrifugal fans
VENTS VCUN

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AXIAL FANS

Axial fan
VENTS OV

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Axial fan
VENTS OVK

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Axial fan
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Axial fan
VENTS OV1

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Axial fan
VENTS OVK1

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Axial fan
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ROOF FANS

INTAKE UNITS AND EXHAUST UNITS

AIR HANDLING UNITS WITH HEAT RECOVERY

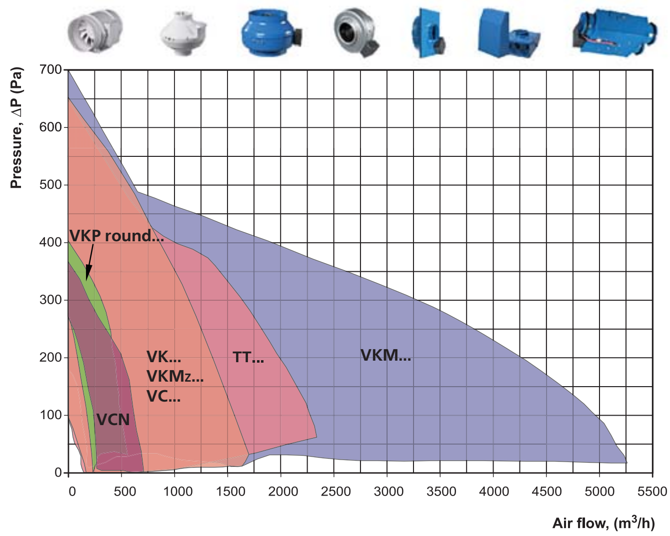
ENERGY SAVING DUCT UNITS X-VENT

ACCESSORIES

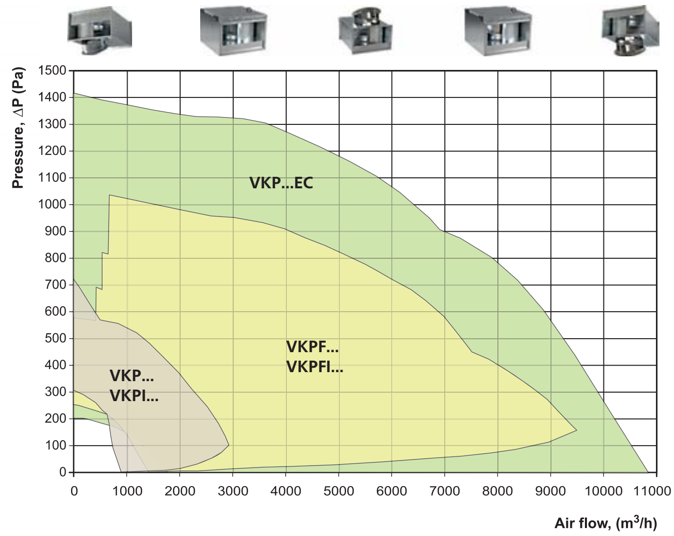
ELECTRIC ACCESSORIES

FAN QUICK SELECTION

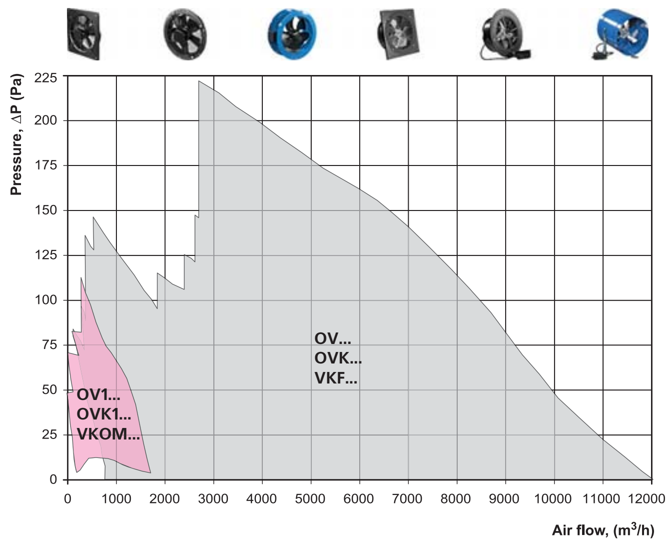
In-line fans (round ducts)
TT..., VK..., VKM..., VKMz..., VC..., VCN...



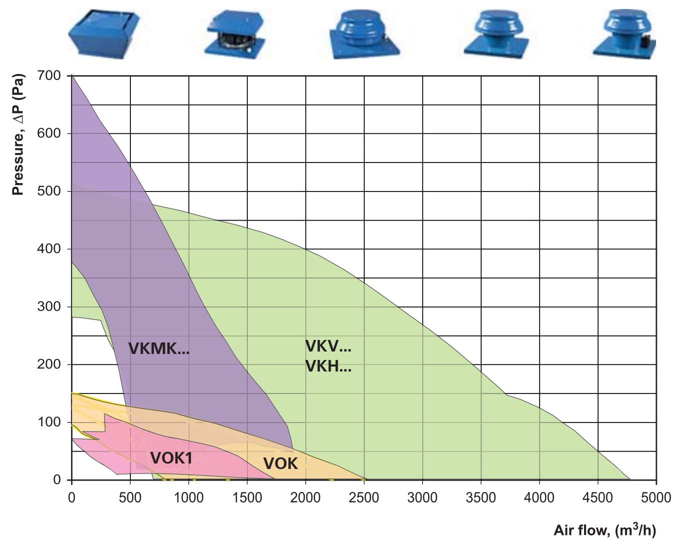
In-line fans (rectangular ducts)
VKPF..., VKPFI..., VKP..., VKPI..., VKP...EC



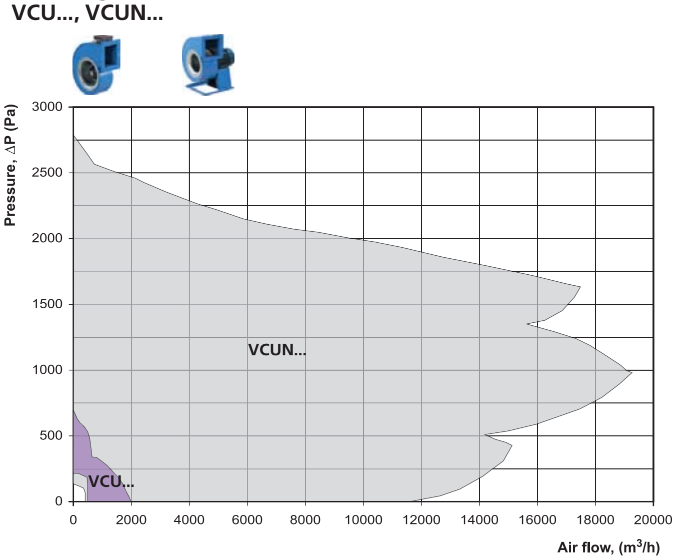
Axial fans
OV..., OVK..., VKF..., OV1..., OVK1..., VKOM...,



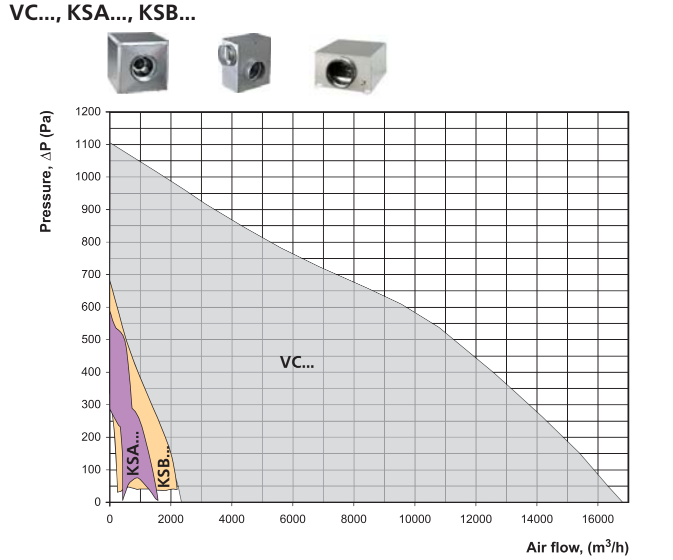
Roof fans
VKV..., VKH..., VKMK..., VOK..., VOK1...



Centrifugal fans
VCU..., VCUN...

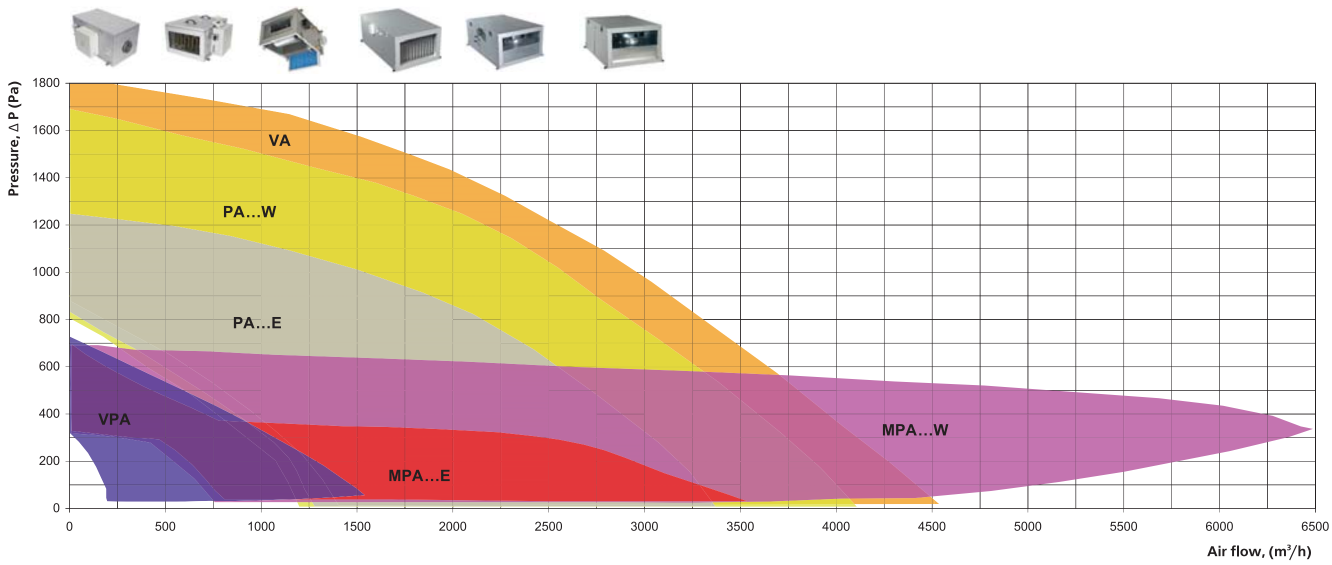


Sound insulated fans
VC..., KSA..., KSB...

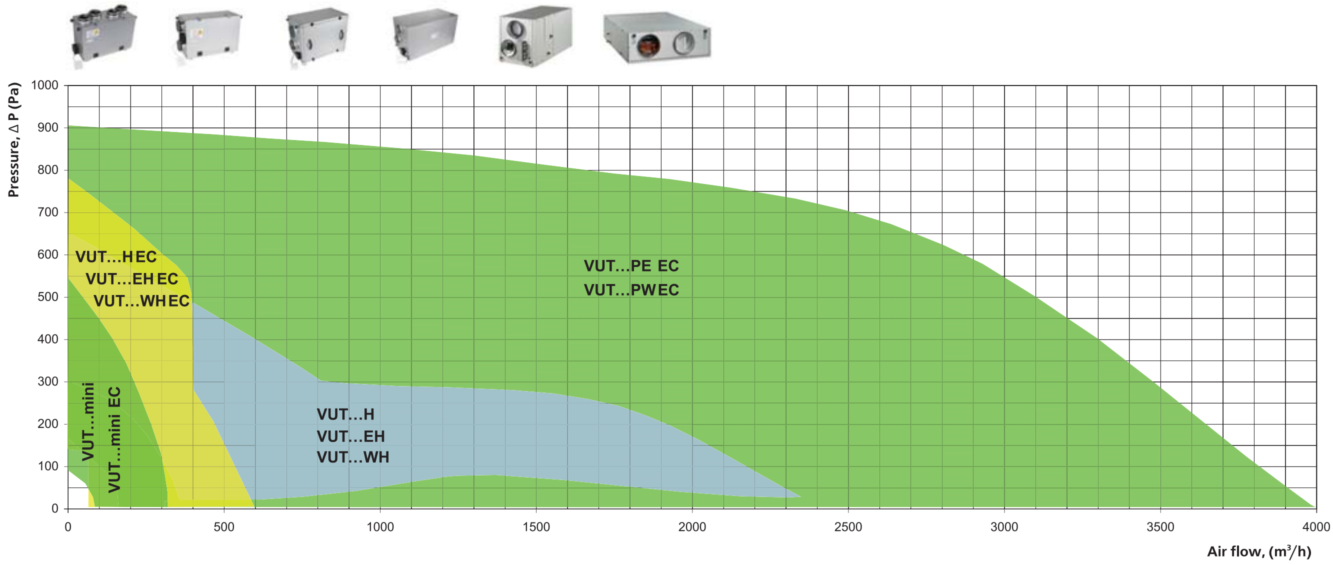


AIR HANDLING UNITS QUICK SELECTION

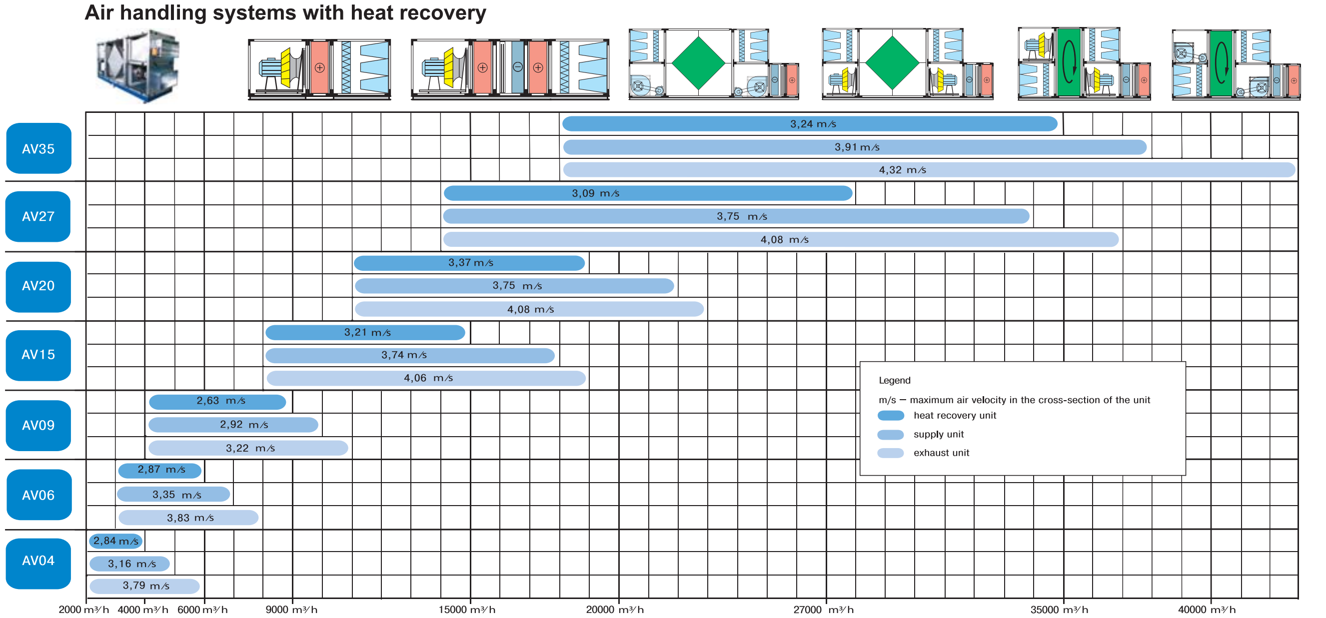
Air handling units of VPA…, MPA…, PA…, VA...series



Air handling units with heat recovery of VUT series



Air handling systems with heat recovery



WELCOME TO THE VENTS WORLD!

VENTS company was founded in the 90s of the XX century. Dynamic development of the enterprise and never-ending study of consumer demand enabled rapid international leadership in ventilation industry.

VENTS company is one of few companies that independently manufactures wide range of products for development of ventilation systems of any complexity. Representative offices located in the majority of countries of the world, do their best to make VENTS products easy to buy.

VENTS is a powerful research and development enterprise with approximately 2000 specialists ensuring with their work the full production cycle from the idea to the end product. Production base of the company is located at more than 60 000 m2. It includes 12 workshops equipped under the international standards; each of them may be compared to the plant.

Modern equipment, active implementation of advanced technologies and high level of manufacture automation are the characteristic features of «VENTS» company.

The company is dynamically developing; the fundamental researches and effective designs in ventilation industry are in the focus of company's business strategy.

Design department, test laboratories and production shops enable to market the products of high quality.

Special attention is paid to the quality of the output equipment: observation of process requirements is controlled at all production stages; the specifications of incoming stock are extensively controlled. Quality control system which meets international standard requirements ISO 9001:2000 was implemented.

Environmental care is one of the most important components of the company development. The whole technological process at the enterprise consists in eliminating the negative environmental effect. Specially for solution of global energy saving problem we develop special ventilation equipment of residential and industrial use which provides comfort conditions and considerably reduces energy costs.

Metal workshop

Injection molding workshop

Extrusion workshop

Domestic fans assembling workshop

Plastic grilles assembling workshop

Commercial ventilation assembling workshop

Industrial ventilation assembling workshop

Air handling units assembling workshop

Spiro ducts workshop

Flexible ducts workshop

VENTS goods gained consumers' acceptance in more than 80 countries of the world including the countries of Europe, America, Asia and Australia that confirms the company reliability and excellent quality of the products. Since 2008 our company is the member of the USA Ventilation and Conditioning Association HARDI. Worldwide recognition witnessed that VENTS is the leader of the world ventilation market.

With VENTS you have the maximal choice of high quality products by single manufacturer.

VENTILATION IN OUR LIFE

What Is Ventilation?

Ventilation is a complex of actions and facilities used for air exchange in order to provide the specified air condition in the premises and in working places.
Ventilation systems maintain admissible meteorological parameters in the premises of different purpose. Ventilation system should create the atmosphere inside meeting the specified hygienic standards and technological requirements.

What Is Ventilation Necessary For?

We are constantly surrounded with air and breathe in and out 20 000 litres of air every day. How much is inspired air applicable for the safe life? There is a range of aspects to determine air quality.

- **Oxygen and Carbon Dioxide Concentration In the Air.**
Oxygen decrease and carbon dioxide increase cause stuffiness in the premises.
- **Content of Harmful Substances and Dust In the Air.** High content of dust, tobacco smoke and other substances in the air badly impact human organism and can cause various lung and skin diseases.
- **Smell.** Bad smell causes discomfort or irritates the nervous system.
- **Air Humidity.** Increased or decreased moisture cause sense of discomfort and may cause disease exacerbation of the sick with airways or skin diseases. Air humidity is important also for the atmosphere in the premises. For instance, doors, window frames, furniture may dry up of decreased humidity in winter; but in the premises with increased humidity (e.g. in swimming-pools, bathrooms) it may expand.
- **Air Temperature.** A person feels good in the premises with the temperature 21-23°C. Variation of temperature causes the change of «comfort" well-being to a greater or lesser degree that influences on the person's physical and mental activity and on health.
- **Air Motion.** Increased air speed in the premises causes the feeling of draft, and decreased speed causes air blanketing. Being inside we feel the impact of any of these factors.

Solution:

Properly arranged ventilation system may help in this situation. Ventilation system will provide filtered air supply in summer and - filtered and warmed outdoor air in winter, including used and polluted air removal from the premises.
Any ventilation scheme must foresee simultaneous fresh air supply and spent air exhaust providing air balance indoors. In case of air deficiency or poor outdorr air supply the oxygen content decreases, humidity and dustiness increase. If there is no air vent inside the building or it is not effective, polluted air, smells, humidity and harmful substances are not removed.
One more important factor for properly arranged ventilation system is that air supply and air vent can not operate separately. Take into account that with the only air vent (e.g. only exhaust fan is mounted in the bathroom unit), air flows from all possible gaps in windows, doors and walling. Such air supply leads to dust ingress, smells in the premises and drafts. Natural sources of the organized air supply for making compensation to the exhausted air may serve vent grids mounted in doors of the bathroom unit, wall or window vents, opened ventlights, windows. Otherwise it may be the system of artificial ventilation when air flows to the premises in a centralized way.

Determination of the Essential Air Exchange. Engineering recommendations

Determination of Air Exchange According to the Number of People In the Premises:
Amount of ventilation air is determined for each premise separately taking into account harmful impurities (substances) or it is specified on the basis of researches. If the nature and number of harmful impurities (substances) cannot be counted, air exchange is determined with the formula:

$$L = V\ prem * Ach \qquad (m^3/h),$$

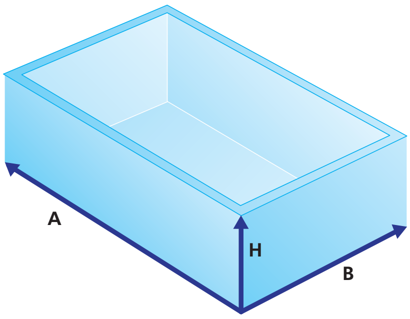
where **V prem.** – airspace, m^3;
Ach – minimal air exchange per hour, see air exchange table.

How to determine the Volume of Premises?

Calculate the total volume of the premises in cubic meters. Use the simple formula:

Length x Width x Height=Volume of the premises m³

$$A \times B \times H = V\ (m^3)$$



For example: premises with length 7 m, width 4 m and height 2.8 m. To determine the air volume required for ventilation of this premises, calculate the volume of the room: 7x4x2.8=78.4 m³. After that determine the required efficiency of the fan using the following tables of recommended ventilation rate.

Determining replacement of air according to the number of people in the premises:

$$L=L1*NL\ \ (m^3/hour)$$

where **L1** – norm of air per one person, m³/hour*person;
NL – number of people in the premises

20-25 m³/hour per one person at minimal physical activity
45 m³/hour per one person at light physical activity
60 m³/hour per one person at heavy physical activity

Determining of air exchange at exudation of moisture:

$$L=\frac{D}{(d_v-d_n)*\rho}\ (m^3/hour)$$

where **D** – quantity of moisture, g/hour;
d_v – moisture content in the outcoming air, gram of water/kg of air;
d_n – moisture content in the incoming air, gram of water/kg of air;
ρ – air density, kg/m³ (at 200 C=1.205 kg/m³);

Determining of air exchange for removal of heat surplus:

$$L=\frac{Q}{\rho * C_p*(t_v-t_n)}\ (m^3/hour)$$

where **Q** – heat emission in the premises, kW;
t_v – temperature of the outcoming air, °C
t_n – temperature of the incoming air, °C
ρ – air density kg/m³ (at 200 C=1.205 kg/m³);
C_p – heat capacity of air, kJ/(kg.K)(at 20°C; Cp=1.005 kJ/(kg.K))

Air changes table

	Premises	Rate
Residential premises	Living room of apartments or hostels	3 m³/hour per 1 m² of living accommodations
	Kitchen of an apartment or hostel	6-8
	Bathroom	7-9
	Shower cabin	7-9
	Toilet	8-10
	Home laundry	7
	Cloakroom	1,5
	Storerooms	1
	Garage	4-8
	Cellar	4-6
Industrial premises and premises of large volume	Theatres, cinemas, conference rooms	20-40 m³ per person
	Office premises	5-7
	Banks	2-4
	Restaurant	8-10
	Bar, café, pub, billiard room	9-11
	Kitchen of a café, restaurant, etc.	10-15
	Supermarket	1,5-3
	Chemist's (sales area)	3
	Garages and auto repair shops	6-8
	Lavatories (public)	10-12 (or 100 m³ per one toilet bowl)
	Dance Halls and disco clubs	8-10
	Smoking rooms	10
	Server rooms	5-10
	Gymnasiums	No less than 80 m³ per 1 training person and no less than 20 m³ per 1 spectator
	Barber's and hairdresser's	
	Up to 5 working places	2
	More than 5 working places	3
	Warehouses	1-2
	Laundry	10-13
	Swimming-pool	10-20
	Industrial painting shops	25-40
	Machine shop	3-5
	School classroom	3-8

Determining replacement of air according to maximum permissible concentration of substances:

$$L=\frac{G_{CO_2}}{y_{mpc}-y_p}\ (m^3/hour)$$

where G_{CO_2} – quantity of released CO_2, l/hour,
y_{mpc} – maximum permissible concentration of CO_2, l/m3,
y_p – gas content in incoming air, l/hour

Norms of permissible concentrations of CO_2 in the air, l/m³

In places of people permanent residence (living rooms)		1,0
In hospitals and children establishments		0,7
In places of people periodical stay (offices)		1,25
In places of people short stay (offices)		2,0
In the open air:	Villages	0,33
	Towns	0,4
	Cities	0,5

What Is Pressure Loss?

Airflow resistance in ventilation system is mainly determined by air speed in this system. Resistance grows with speed enhancing. This phenomenon is called pressure loss. Static pressure, produced by a fan, causes air motion in the ventilation system, which has a certain resistance. The higher is the resistance of such a system, the less is the air consumption, moved by the fan. Calculation of friction losses for air in air ducts, as well as resistance of the networking equipment (a filter, muffler, heater, valve, etc.) can be done with help of tables and diagrams, mentioned in the catalogue. One can calculate general pressure drop, having summed the resistance indices of all the elements of a ventilation system.

Recommended air speed in air ducts:

Type	Air speed, m/s
In main air ducts	6,0 - 8,0
In side branches	4,0 - 5,0
In air distribution ducts	1,5 - 2,0
Supply grills at the ceiling	1,0 – 3,0
Exhaust grills	1,5 – 3,0

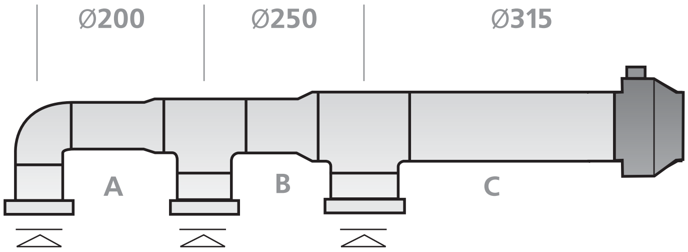
Determining air speed in air ducts:

$$V = \frac{L}{3600*F} \quad \text{(m/s)}$$

where **L** is air consumption, m³/hour;
F – is area of section, m²

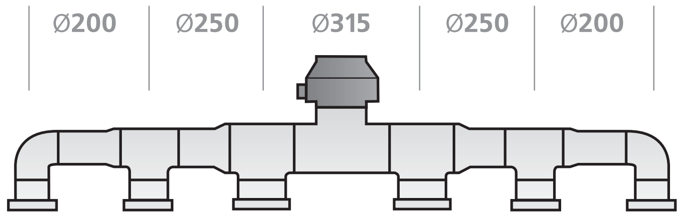
Recommendation 1.

Loss of pressure in the duct system can be reduced due to enlargement of duct section, which provides comparatively equal speed of air in the whole system. At the figure below it is shown how to provide comparatively equal speed of air in the duct system with the minimal loss of pressure.



Recommendation 2.

In systems with big length of ducts and large number of dampers it is reasonable to locate the fan in the middle of the ventilation system. Such a solution has several advantages. On the one hand, pressure losses are reduced, on the other hand, you can use ducts with smaller section.



Example of calculation of ventilation system:

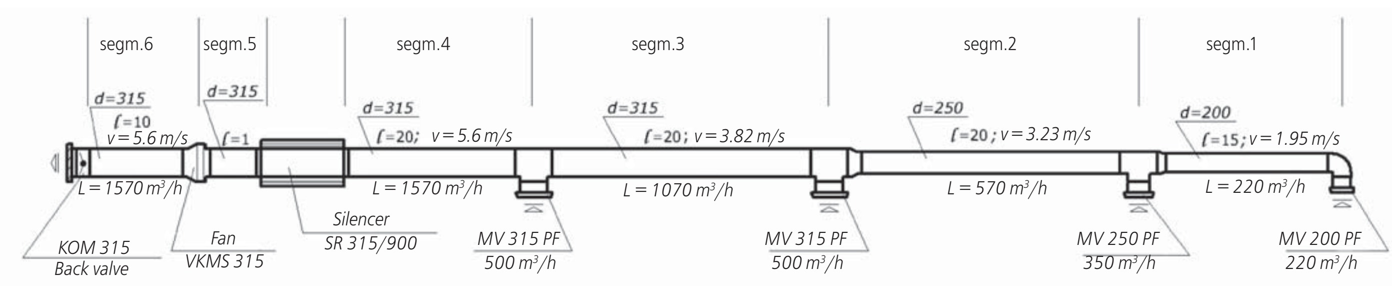
Start the calculation with designing a draft of the system, showing the location of air ducts, dampers, fans and also the length of air duct segments between T-joint, then calculate the air consumption at every segment of the network.

Let's determine pressure losses for segments 1-6, using the graph of pressure losses in round air ducts, let's determine the necessary diameters of air ducts and pressure losses in them under condition that it is necessary to provide the permissible air speed.

Segment 1: air consumption through this segment will make 220 m³/hour. The diameter of the air duct is 200 mm, speed is 1.95 m/sec., pressure loss is 0.2 Pa/mx15 m=3 Pa (see the diagram of pressure losses for 1 m of extended air duct.

Segment 2: let's repeat the same calculations and remember that air consumption through this segment will make 220+350=570 m³/hour. The diameter of the air duct is 250 mm, speed is 3.23 m/sec., pressure loss is 0.9 Pa/mx20 m=18 Pa.

Segment 3: air consumption through this segment will make 1070 m³/hour. The diameter of the air duct is 315 mm, speed is 3.82 m/sec., pressure loss is 1.1 Pa/mx20 m=22 Pa



Segment 4: air discharge through this area will amount 1570 m^3/h. Take up air duct diameter 315 mm, speed 5.6 m/s. Pressure loss 2.3 Pa x 20=46 Pa.

Segment 5: air discharge through this area will amount 1570 m^3/h, pressure loss 2.3 Pa/m x 1=2.3 Pa.

Segment 6: air discharge through this area will amount 1570 m^3/h. Take up air duct diameter 315 mm, speed 5.6 m/s. Pressure loss 2.3 Pa x 10=23 Pa. Total pressure loss in air ducts will amount 114.3 Pa.

When the last area is calculated determine pressure losses in network elements: in the noise damper CP 315/900 (16 Pa) and in the check valve KOM 315 (22 Pa). Further determine pressure loss in pipe bends to the grids (resistance of 4 pipe bends will amount 8 Pa).

Take up ceiling diffusers PF to the unit which resistance will make up 26 Pa according to the diagram.

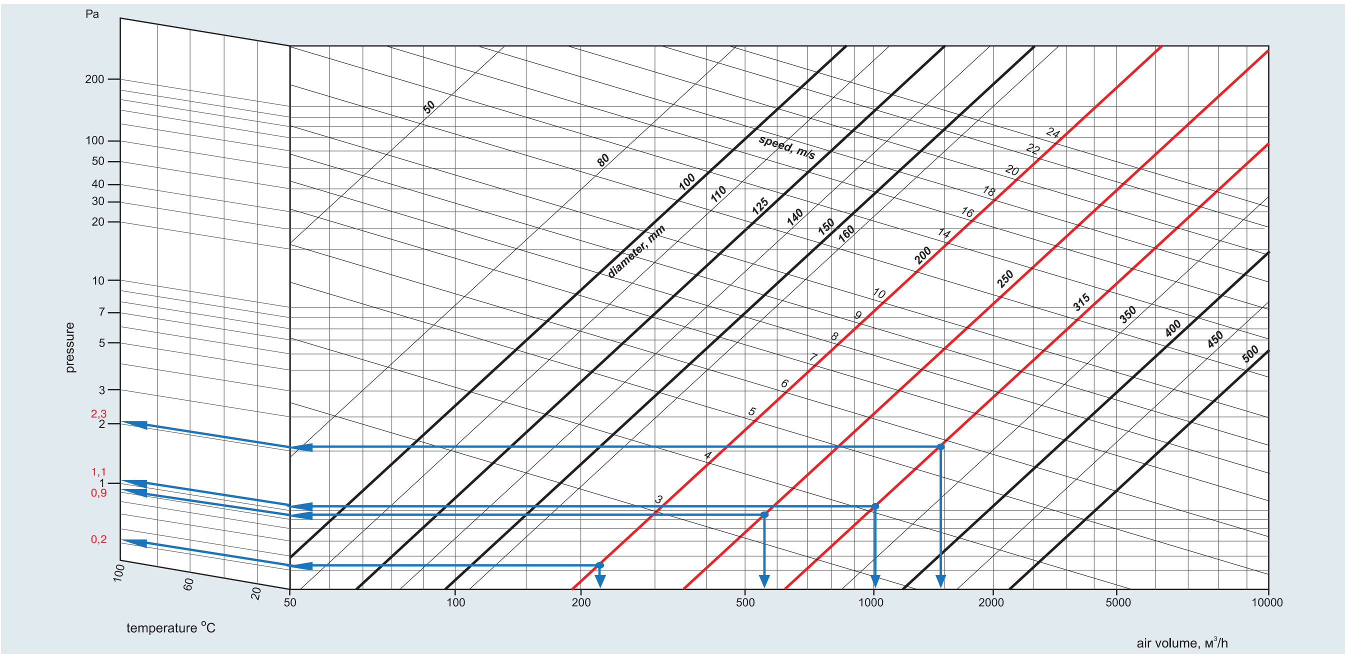
Now sum all the values of pressure loss for straight areas of air ducts, network elements, pipe bends and grids. Target value is 186.3 Pa.

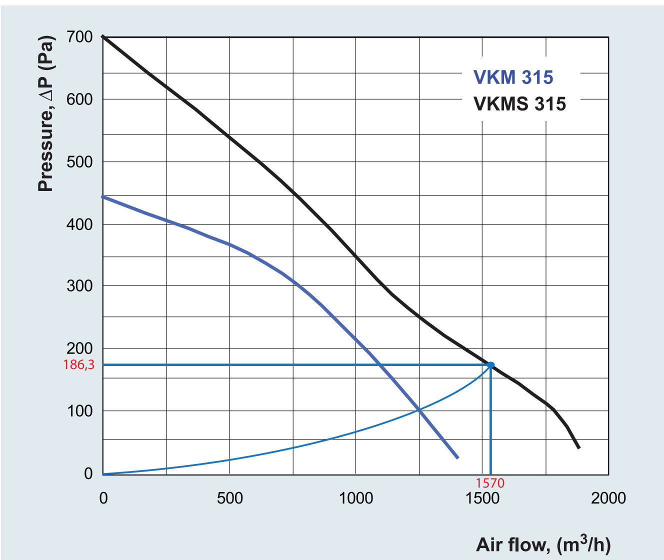
We calculated the system and determined that we need the fan which excludes 1570 m^3/h of the air with network resistance 186.3 Pa. Taking into account the requested for the system operation characteristics VENTS VKMS 315 will suit us.

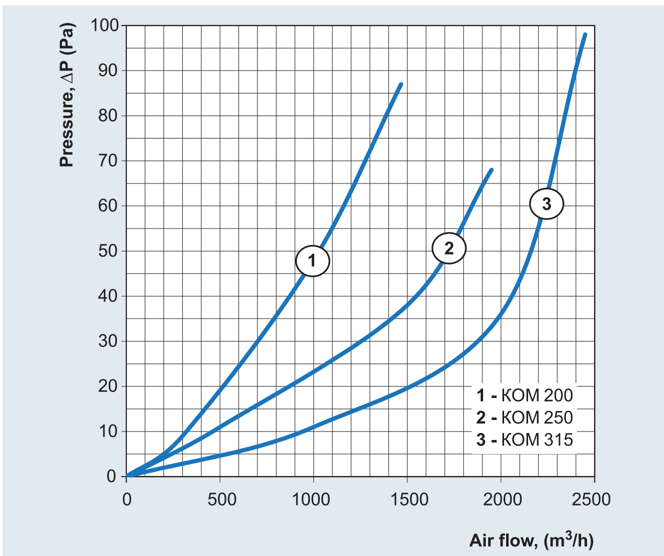
Diagram of pressure loss for 1 m of extended air ducts

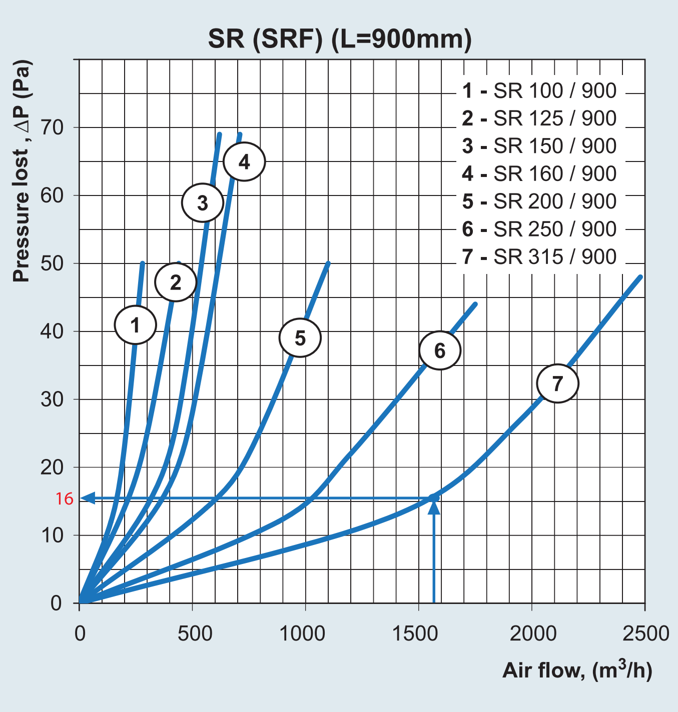
Diagram enables to determine the value of pressure loss in the pipe bend using the value of bending angle, diameter and air discharge.

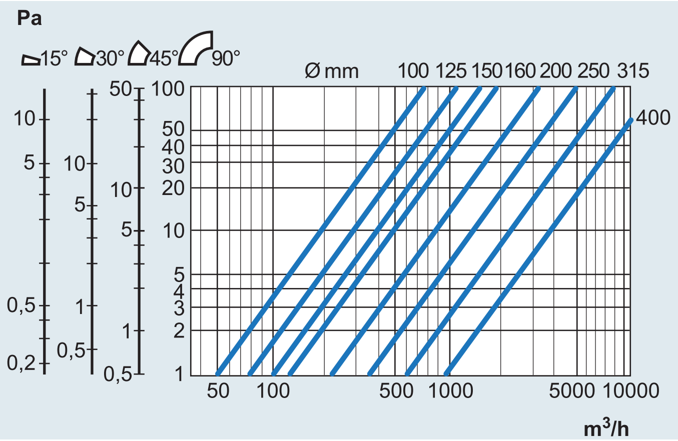
Example: Determine pressure loss for pipe bend of 90°C with diameter 250 mm with air discharge of 500 m^3/h. For this purpose find crossing of the vertical line that corresponds to our air discharge with slash which characterizes the diameter 250 mm, and on the vertical line in the left for pipe bend in 90°C and find the value of pressure loss which makes up 2 Pa.

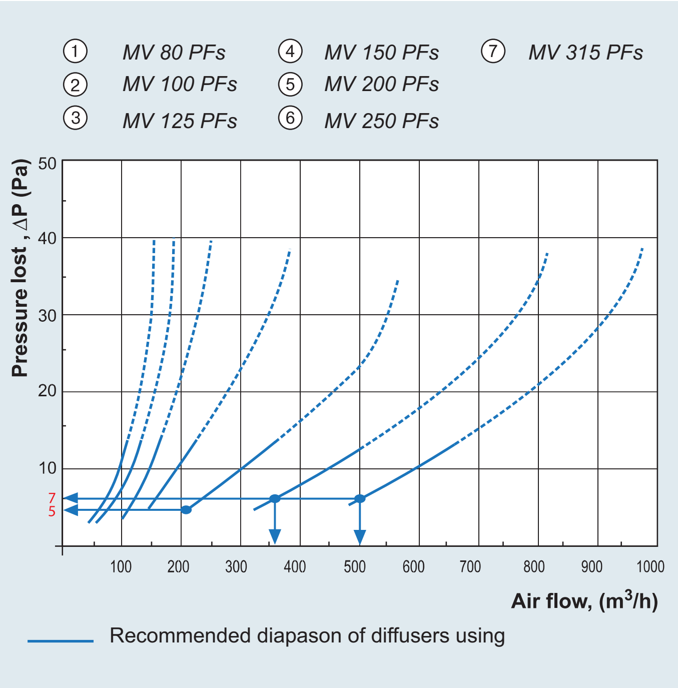








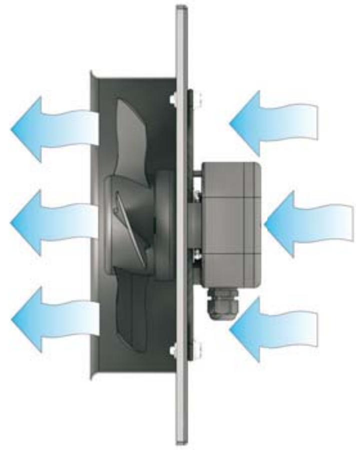




Fan types:

Fans are mechanical units which serve for air-handling in air ducts, for direct feed or air exhaust from the premises. Air handling occurs of pressure drop between the inlet and outlet of fan.

Axial-flow fans:
Axial - fan represents a wheel from the impellers fixed to the bushes at some angle to the plane of rotation. This ring is mounted in the cylindrical shell.



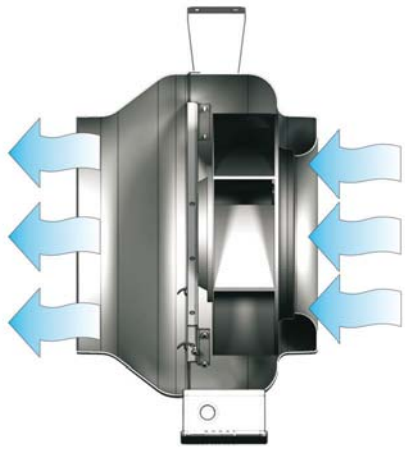
While rotating the impellers entrap and move it in the axial direction. Herewith air almost is not transferred in the radial direction. More often the impellers of the axial fan are set directly on the motor axis.

Application:
- for air supply and exhaust

through free entries or the application of not more than 3 metres of the horizontal area with small aerodynamic resistance of the network.

Centrifugal and axial fans:
Centrifugal and axial fans may transfer air in the direction of motor axis. Fans found wide application in the ventilation systems with large air ducts.

Round duct fans have the typical sizes from 100 up to 450 mm, with efficiency from 250 up to 5200 m³/h. Fans are equipped with induction motors with outer rotor which have an impeller with backward curved blades. Roller bearing is used in order to increase operating life in motors. Fan cases are made of plastic, steel with polymer coating or galvanized steel that provides strong corrosion proofing and in addition to that has aesthetic impression.



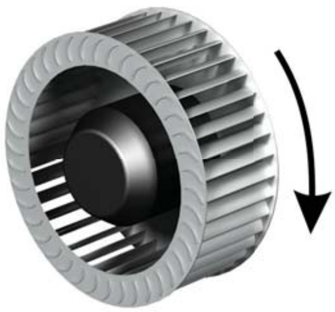
Application:
- for air supply and exhaust in ventilation systems with large air ducts extension and high aerodynamic resistance of the network.

Centrifugal fans:

Centrifugal fan consists of two basic parts: turbine and scroll. Impeller of centrifugal fan is a hollow cylinder with mounted vanes inside, circumferentially fixed with disk plates. In the centre of binding disk plates there is a hub for inserting the impeller on the shaft. While impeller's rotating the air, penetrating between the vanes, transfers radially from the centre and herewith compresses. Under centrifugal force the air is pressed out into scroll case and thereafter transfers to the discharge port.

Centrifugal fans are produced with backward or forward curved blades impellers. Application of radial fans with backward curved vanes enables to save energy approximately to 20%. The other prime advantage of fans with backward curved blades consists in their easy overload capability in air discharge. Centrifugal fans with forward curved blades provide the same input-output and head characteristics as fans with backward curved blades but with the less impeller diameter and less rotating frequency. Thus they may reach the required result owing to their compactness and quietness.

Back curved blades



Forward curved blades

Application:

- air supply and exhaust in the ventilation system with long-range air ducts and large aerodynamic resistance of the network.

Fan speed control

Rotation speed of VENTS fans may be performed with thyristor or transformer speed control units.

Thyristor fan control.

Smooth speed control units are meant for manual speed control of fan motors and accordingly air discharge, performed by the fan. The work of speed control units is based on smooth variation of output voltage by means of thyristor. The control of several motors is admitted upon condition that public consumption current does not exceed the maximum permissible value. These control units differ in high efficiency and control accuracy. Noise, performed by the fan, may increase while using speeds in lower range value. Thus this control unit is not recommended to use in-line with exclusive standards to the noise content. In motor operation with low-voltage power supply the bearings service life reduces. The recommended control interval is 60-100 % from the nominal voltage.

Transformer fan control.

The work of transformer speed control units is based on usage of 5-phase autotransformer for the control of motor supply voltage (network frequency is invariable). It is meant for speed control of motor rotating controlled with the voltage. Several fans may be controlled with one transformer under condition that public consumption current does not exceed the nominal current of the control unit. While speed control by means of transformers motor noise does not increase in the lower speed range. Nevertheless the service life of motor bearings may reduce of operation at low supply voltage for a long period (speed 1 or 2).

Fan motors

Motors with external rotor

Motor design with external rotor is similar to induction motor design but has one small difference: motor rotor is outside the stator winding and the wound stator is in the centre of the motor. Such an original motor performance provides fan unit compactness. Motor shaft rotates on ball bearings fixed inside the stator; the impeller is fixed on the rotor case. Due to this design motor air-cooling is provided that enables to apply fans in the wide temperature range. All motors and fans are statically and dynamically balanced at the producing plant.

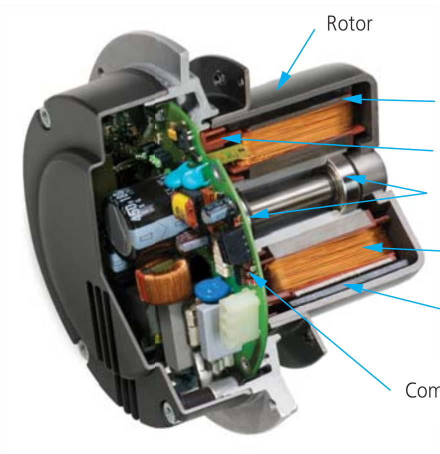
Units with EC motors

The motor (EC motor), brought into operation with electric switching device (controller), represents direct-current motor but, unlike an ordinary motor, the direct-current EC motor has no rubbing and trimming parts such as commutator and brush. These nonservice parts are replaced with electronic board of EC controller. New motors have high efficiency and optimal control in the whole range of rotary speeds. By means of electric controller of EC motor the additional functions may be realized, e.g. fan control due to the temperature or pressure sensor and many others.

Fans with EC motor are characterized with the following advantages:

- economical performance at any rotation speed of a fan impeller(up to zero)
- reduced heat release;
- overall sizes of fans can be reduced due to the construction with an external rotor and advantages of an EC motor;
- maximum speed of fan rotation does not depend on electrical frequency in the network (operation is possible in the net with electrical frequency of 50 Hz, as well as in the net with frequency of 60 Hz);
- high coefficient of efficiency while performance at low rotations;
- EC controller of fans has slot for connecting a cable, which enables data exchange between a personal computer and a fan for control and setting operating characteristics;
- centralized control of group of fans, united in one system.

Applying EC motors in fans enables to unite them in one computer-driven control net. The specially designed software allows managing the operation of fan networks with high precision. All the system parameters are displayed on the computer, and, if necessary, you can set a mode of operation for each fan in the network individually.
Operation characteristics of a fan, working in united control system, can be centrally corrected to meet the parameters of ventilation system. The present technology allows to adjust the ventilation system in accordance with certain customer's demands.



Sound features of fans

Sound features of equipment are given in the form of tables, containing:

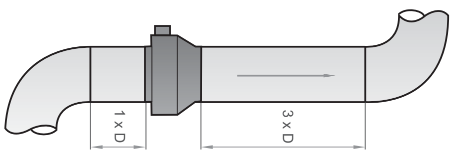
- Sound-power level of noise LWA in dBA with layout for frequency bands. Sound-power levels for entrance, for exit and for fan environment are shown in the tables.
- General sound pressure dBA in 3 m distance.

Frequency band is divided into 8 groups of waves. Average frequency is determined in each group: 63 Hz, 125 Hz, 250 Hz, 500 Hz, 250 Hz, 500 Hz, 1000 Hz, 2 kHz, 4 kHz, 8 kHz. Any noise is laid out in frequency groups and you can find distribution of sound energy at different frequencies.
Noise from fan is propagated through the air duct (air channel), it attenuates partially in its elements and gets into the ventilated premises through air distribution grills and air intake grids.
The basis for designing of ventilation systems is acoustic design – an obligatory appendix to ventilation project of any object. The main tasks of such a design are: to determine octave spectrum of ventilation noise in design points and its required reduction, by comparing this spectrum with the permissible one according to hygienic regulations. After choosing building and acoustic measures for providing the required noise reduction, do checking calculation of expected levels of sound pressure in the same design points taking into account the efficiency of these measures.

dBA	Characteristics	Sources of sound
0	Nothing is heard	
5	Almost nothing is heard	
10		low rustling of the leaves
15	It is hardly heard	rustling of the leaves
20		
25	Low	human whispering (1m)
30		whispering, ticking of a wall clock
		Norm for living premises at night, from 11 p.m till 7 a.m.
35	It is quite heard	A muffled talk
40		A common talk
		Norm for living premises, from 7 a.m. till 11 p.m.
45		A common conversation
50	It is heard distinctly	A conversation, a typewriter
55		Norm for class A office premises (according to European norms)
60	Noisy	Norm for offices
65		A loud talk (1 m)
70		Loud conversations (1 m)
75		Shouting, laughing (1 m)
80	Very noisy	Shouting, a motorcycle with a muffler
85		Loud shouting, a motorcycle with a muffler
90		Loud shouts, a freight car (in 7 meters)
95		A subway car (7 m)
100	Extremely noisy	An orchestra, a subway car (abruptly), peals of thunder
		Maximum permissible sound pressure for headphones of a personal stereo (according to European norms)
105		inside the airplane (before 1980s)
110		a helicopter
115		a sandblaster (1 m)
120	Almost unbearable	a pneumatic hammer (1 m)
130	Pain threshold	An airplane at start

General recommendations for mounting

For reduction of losses, connected with airflow turbulence, there must be a direct segment of the air duct at the entrance and at the exit of the fan. Minimum recommended lengths of these direct sections make: 1 air duct diameter at the entrance and 3 air duct diameters at the exit. Do not mount filters or similar devices at these segments. For square channels the appropriate air duct diameter is calculated by the following formula:



$$D = \sqrt{\frac{4 * H * B}{\pi}}$$

D = air duct diameter
H = air duct height
B = air duct width

What is IP?

Choosing the equipment and place of its mounting it is essential to provide the conformity of IP of the unit to the conditions in which the equipment will be operated. Any electrical appliance must meet two protection requirements at the same time:

- to provide electrical safety of the consumer and maintenance staff,
- to protect electronic components placed in the unit from the environmental effect.

IP standard represents safety of dust and moisture of the product and its electrical safety.

Ingress protection, marked with IP, and two numbers, indicating degree of protection of the equipment, e.g. IP20 or IP65. The first number means degree of protection from conducting parts and foreign objects penetration into the product. Protection characteristics, indicated by the first number, are stated in the table 1. The second number indicates case degree of protection from water ingress and is transcribed in the table 2.

Table 1

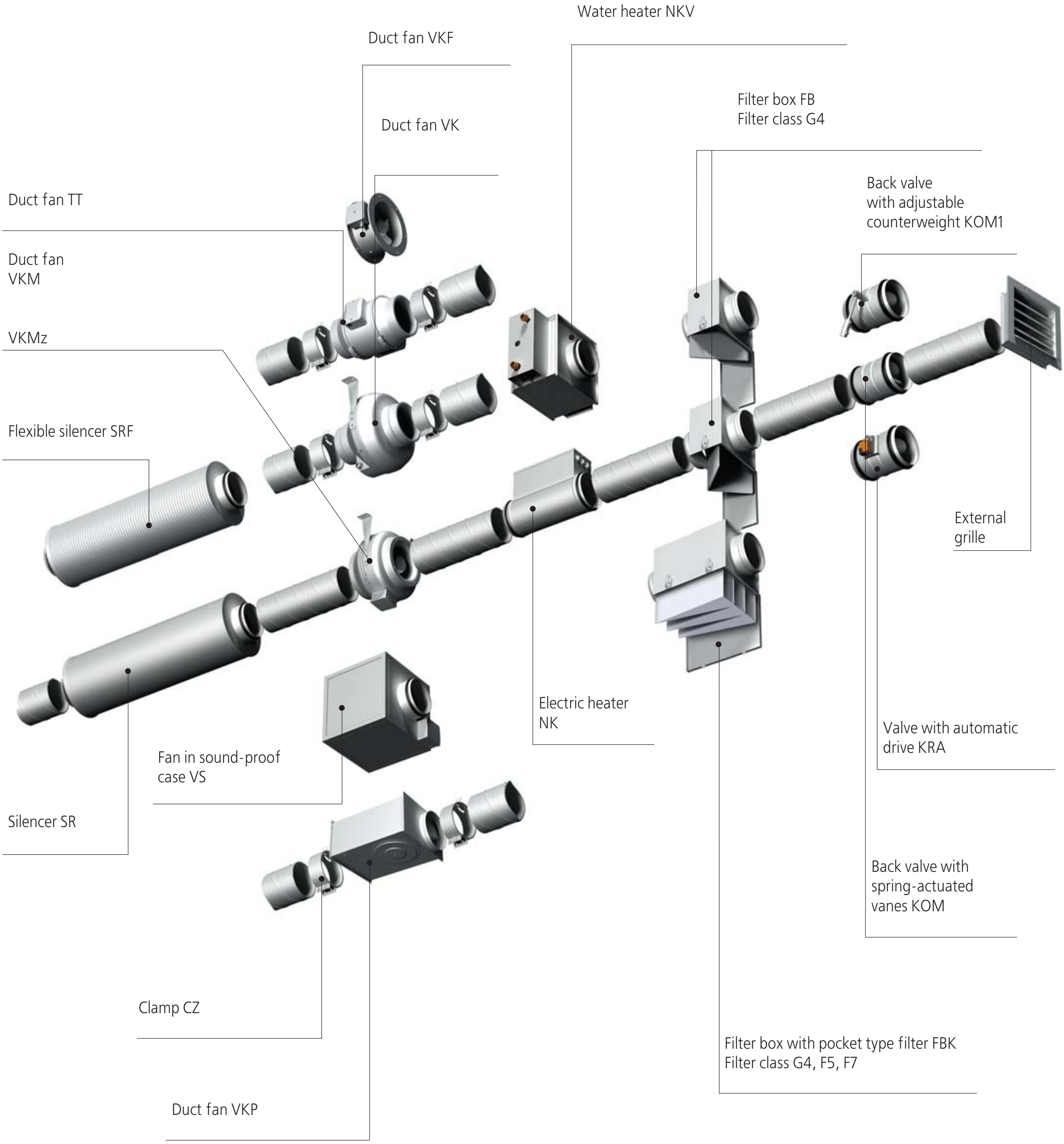
The first number	Protection characteristics	Description
x	Protection is not determined	Open construction, without dust protection and shock-proof.
1	Protection from large objects	Protection from large objects penetration with the diameter more than 50 mm. Partial protection from accidental contact of conducting parts by the person (protection from palms touch).
2	Protection from the objects of middle size	Construction protection from the objects penetration inside with the diameter more than 12 mm. Protection from fingers touch to the conducting parts.
3	Protection from little objects	Construction does not permit the objects, more than 2,5 mm of diameter, to penetrate inside. Personnel protection from accidental contact with conducting parts by the instrument or finger.
4	Sand protection	The objects with the diameter more than 1 mm can not penetrate to the case. Construction protects from the contact with conducting parts by the instrument or finger.
5	Dust protection	Little of dust can penetrate to the case that will not prevent the normal equipment operation. Full protection from the contact with conducting parts of the equipment.
6	Full dust protection	No dust can penetrate inside the construction.

Table 2

The second number	Protection characteristics	Description
x	Protection is not determined	Open design, without protection from splash of water.
1	Protection from drops, falling vertically	Water drops, falling vertically, cannot cause hazard effects for the equipment.
2	Protection from drops, falling at an angle	Water drops, falling on the equipment at the angle of 15°, do not cause hazard effects.
3	Protection from splash of water	Product is protected from splash of water penetrating to the construction at the angle up to 60°.
4	Protection from splash of water from any directions	Construction is protected from splash of water that can be pointed on the product from any direction.
5	Protection from water sheets	Pointed water sheets do not cause harm for the case equipment.
6	Protection from overwater	Overwater of the equipment does not cause equipment damage.
7	Protection from water-immersion	Case may be completely immersed that will not cause equipment damage, placed in the case.
8	Protection from water-immersion under pressure	Construction stands water-immersion at the proper depth without hazard effects (protection from water under pressure, and the pressure value is specially indicated).

Certification

CE	Product with the marking CE means that production is produced in compliance with quality and safety standards, provided by the Directions of EU for the current item of production (is marked by the manufacturer).		Conformance mark of standard specifications of Ukraine is confirmed by the certificate of compliance UkrTEST.
GS	Conformance mark of European standards of quality and electric safety issued by the society of technical supervision TUV (Germany).	PCT	Standards conformance mark, adopted in the territory of the Russian Federation, is liable to the obligatory certification in the system ДСТ Р. It is confirmed with certificates, issued by the certification center RusTEST (Moscow).
B	Conformance mark of European standards of quality and electric safety, adopted in Poland, issued by the certification center PCBC (Poland).		Insulation class: double insulation.
ESČ	Conformance mark of Slovak standards of quality and electric safety issued by the certification center EVPU (Slovakia).	IP 34	Index of protection


Water heater NKV
Duct fan VKF
Filter box FB
Filter class G4
Duct fan VK
Back valve
with adjustable
counterweight KOM1
Duct fan TT
Duct fan
VKM
VKMz
Flexible silencer SRF
External
grille
Electric heater
NK
Valve with automatic
drive KRA
Fan in sound-proof
case VS
Silencer SR
Back valve with
spring-actuated
vanes KOM
Clamp CZ
Filter box with pocket type filter FBK
Filter class G4, F5, F7
Duct fan VKP

SELECTION TABLE

	d=100 mm	d=125 mm	d=150 mm	d=160 mm	d=200 mm	d=250 mm	d=315 mm
Fans	TT 100	TT 125	TT 150	TT 160	TT 200	TT 250	TT 315
		TT 125 S					
	VK 100 Q	VK 125 Q			VK 200	VK 250 Q	VK 315
	VK 100	VK 125	VK 150	VK 160	VKS 200	VK 250	VKS 315
	VKM 100 Q	VKM 125 Q			VKM 200	VKM 250 Q	VKM 315
	VKM 100	VKM 125	VKM 150	VKM 160	VKMS 200	VKM 250	VKMS 315
	VKMz 100 Q	VKMz 125 Q			VKMz 200 Q	VKMz 250 Q	VKMz 315 Q
	VKMz 100	VKMz 125	VKMz 150	VKMz 160	VKMz 200	VKMz 250	VKMz 315
	VC 100 Q	VC 125 Q			VC 200	VC 250 Q	VC 315
	VC 100	VC 125	VC 150	VC 160	VCS 200	VC 250	VCS 315
	VCN 100	VCN 125	VCN 150	VCN 160	VCN 200		
	VKP 100 mini						
	VKP 100	VKP 125	VKP 150	VKP 160	KSB 200	KSB 250	KSB 315
	KSB 100	KSB 125	KSB 150	KSB 160	KSB 200 C		
					VKF 2E 200	VKF 2E 250	VKF 2E 300
						VKF 4E 250	VKF 4E 300
Filters	FB 100	FB 125	FB 150	FB 160	FB 200	FB 250	FB 315
	FBV 100	FBV 125	FBV 150	FBV 160	FBV 200	FBV 250	FBV 315
	FBK 100-4	FBK 125-4	FBK 150-4	FBK 160-4	FBK 200-4	FBK 250-4	FBK 315-4
	FBK 100-5	FBK 125-5	FBK 150-5	FBK 160-5	FBK 200-5	FBK 250-5	FBK 315-5
	FBK 100-7	FBK 125-7	FBK 150-7	FBK 160-7	FBK 200-7	FBK 250-7	FBK 315-7
Heaters							
electrical	NK 100 0,6-1	NK 125 0,6-1	NK 150 1,2-1	NK 160 1,2-1	NK 200 1,2-1	NK 250 1,2-1	NK 315 1,2-1
	NK 100 0,8-1	NK 125 0,8-1	NK 150 2,4-1	NK 160 2,4-1	NK 200 2,4-1	NK 250 2,4-1	NK 315 2,4-1
	NK 100 1,2-1	NK 125 1,2-1	NK 150 3,4-1	NK 160 3,4-1	NK 200-3,4-1	NK 250-3,0-1	NK 315 3,6-3
	NK 100 1,6-1	NK 125 1,6-1	NK 150 3,6-3	NK 160 3,6-3	NK 200 3,6-3	NK 250 3,6-3	NK 315 6,0-3
	NK 100-1,8-1	NK 125 2,4-1	NK 150 5,1-3	NK 160 5,1-3	NK 200 5,1-3	NK 250 6,0-3	NK 315 9,0-3
			NK 150 6,0-3	NK 160 6,0-3	NK 200 6,0-3	NK 250 9,0-3	
water	NKV 100-2	NKV 125-2	NKV 150-2	NKV 160-2	NKV 200-2	NKV 250-2	NKV 315-2
	NKV 100-4	NKV 125-4	NKV 150-4	NKV 160-4	NKV 200-4	NKV 250-4	NKV 315-4
Silencers	SR 100	SR 125	SR 150	SR 160	SR 200	SR 250	SR 315
	SRF 100	SRF 125	SRF 150	SRF 160	SRF 200	SRF 250	SRF 315
Valves, Dampers	KOM 100	KOM 125	KOM 150	KOM 160	KOM 200	KOM 250	KOM 315
	KOM1 100	KOM1 125	KOM1 150	KOM1 160	KOM1 200	KOM1 250	KOM1 315
	KR 100	KR 125	KR 150	KR 160	KR 200	KR 250	KR 315
	KRA 100	KRA 125	KRA 150	KRA 160	KRA 200	KRA 250	KRA 315
Clamps	CZK 100	CZK 125	CZK 150	CZK 160	CZK 200	CZK 250	CZK 315
	CZ 100	CZ 125	CZ 150	CZ 160	CZ 200	CZ 250	CZ 315
	C 100	C 125	C 150	C 160	C 200	C 250	C 315
	CB 100	CB 125	CB 150	CB 160	CB 200	CB 250	CB 315
Speed controllers							
thyristor	series RS	series RS	series RS	series RS	series RS	series RS	series RS
transformer	series RSA	series RSA	series RSA	series RSA	series RSA	series RSA	series RSA

FANS FOR ROUND DUCTS

Series VENTS TT

Duct fans of a mixed type in plastic case with air flow capacity to 2350 m^3/h. Assigned for exhaust and intake ventilation.

Series VENTS VK

Duct centrifugal fans in plastic case with air flow capacity to 1700 m^3/h. Assigned for exhaust and intake ventilation.

Series VENTS VKM and VKMz

Duct centrifugal fans in steel case (air flow capacity to 5260 m^3/h) or in galvanized case (air flow capacity to 1540 m^3/h). Assigned for exhaust and intake ventilation.

Series VENTS VC

Duct centrifugal fans with air flow capacity to 1880 m3/h. Assigned for exhaust and intake ventilation.

Series VENTS VCN

Duct centrifugal fans in steel case with air flow capacity to 710 m^3/h, for outdoor wall mounting. Assigned for exhaust ventilation systems.

Series VENTS VKP and VKP mini

Compact centrifugal fans in steel case with air flow capacity to 553 m^3/h or 176 m^3/h with constant airflow support function for alternating pressure in the system. Assigned for exhaust and intake ventilation.



Series
VENTS TT

Duct fans of a mixed type in plastic case with air flow capacity to **2350 m^3/h**.

■ Application
Fans VENTS TT are full-featured fans combining high features of axial and centrifugal fans. They are used in exhaust and intake ventilation that require high pressure, powerful airflow and low noise level. These fans are compatible with the air ducts of 100, 125, 150, 160, 200, 250, 315 mm. Fans of TT series are perfect for installation in the exhaust systems of premises with high humidity (bathroom units, kitchens) as well as for ventilation of flats, cottages, shops, cafes, cinemas etc.
The wide model range and great choice of options allows you to choose the fan meeting your demands.

■ Design
The fans cases are made of high-quality and high-strength materials: ABC plastic (Ø100-200) and low-combustible polypropylene (Ø250-315). Motor with impeller and terminal block are attached to the case with special clamps with latches, designed to be demounted without any special skills or instruments. Due to such design the maintenance of the fan is extremely simple. All the models are equipped with adjustable timer with turn-off delay range from 2 to 30 minutes (TT...T). For easy connection and operation a power cord with a plug may be provided (TT...R).

■ Motor
Single-phase motor on ball bearings has two speeds. For some dimension types the version of motor with more powerful features is available (TT...S).
The temperature switches are provided for overload protection. Class of motor protection - IP X4.

■ Speed control
The motor control is performed with outer speed selector.
For smooth or step speed control use thymistor or autotransformer controller connected to the terminal of motor's maximum speed.

■ Mounting
Fans can be mounted at the beginning, in the middle or at the end of air ducts system. The mounting at any angle to the fan axis is permitted. It is possible to mount several fans parallel (to increase the efficiency) or consequently (to increase the working pressure) in one system. Fan case is equipped with a flat mounting plate with which the fan is wall-mounted. Mounting with special stand PTT 100...315 (to be ordered separately). Connection and mounting is to be performed pursuant to the manual and electrical circuit on the terminal block. For convenient mounting and connection the mounting box may be installed in any position.

■ Fans TT with electronic temperature and speed module
An ideal solution for ventilation of premises where air temperature control is necessary (for instance, greenhouses). Fans of series TT...U with electronic module TSC (Temperature and speed controller) allows to change the impeller's rotation speed automatically depending on the temperature in the air duct.
At the front panel there are controllers of:
- presetting of the impeller's rotation speed;
- threshold of electronic thermostat action.

There is a version of the fan with temperature sensor built in the duct or outer temperature sensor (cable length – 4 m, sensor is protected from mechanical damage). The LED of thermostat operation is placed at the front panel of the fan.

Legend:

Fan series	Flange diameter	Additional options
VENTS TT	100; 125; 150; 160; 200; 250; 315	**S –** high-powered motor; **T –** timer; **U –** with electronic "temperature" module and temperature sensor built in the fan's duct; **Un –** with electronic "temperature" module and outer temperature sensor; **U1 –** with electronic "timer" module and temperature sensor built in the fan's duct; **U1n –** Un - with electronic "timer" module and outer temperature sensor; **RV –** switch and power cord with a plug C14.

Accessories











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Operation pattern of TT with electronic temperature and speed module

Set the necessary air temperature with thermostat controller knob (threshold of thermostat action). Set the necessary rotation speed (air consumption) with controller knob. As the air temperature rises, and set threshold of thermostat action is exceeded, motor automatically switches to the maximum rotation speed (maximum consumption). As the air temperature drops below the set threshold of thermostat action, the motor automatically switches to the preset rotation speed. The switching delay function eliminates the possibility of frequent motor switching (if set temperature in the duct is equal to threshold temperature).

There are two patterns of delay, which may be used in various cases:

1. Temperature sensor delay (TT...U): when the temperature rises by at least 2°C of the set threshold of thermostat action, the motor switches to the increased rotation speed. The motor switches to the preset (low) speed as the temperature drops below the set threshold of thermostat action.

This pattern may be used to keep air temperature to within 2°C. In this case fan switches will be rare.

2. Sensor delay (TT...U1): as the air temperature rises above the set threshold of thermostat action, motor switches to the increased rotation speed and the delay timer activates for 5 minutes. The motor switches to the preset (low) speed as the temperature drops below the set threshold of thermostat action and the delay timer switches off. This pattern may be used to keep air temperature at the precise level. In this case fan will switch more frequently than in the pattern of temperature sensor delay, but with intervals not more than 5 minutes.

Example for temperature sensor delay:

Initial conditions:
- rotation speed is set = 60% of maximum speed
- threshold of action is set =25°C
- air temperature in the duct =20°C

fan operates with the impeller rotation speed =60%

- temperature in the duct rises
fan operates with the speed of impeller's rotation =60%

- temperature in the duct reaches 27°C
fan switches to the impeller rotation speed =100%

-temperature in the duct goes down
fan operates with the impeller rotation speed =100%

-temperature in the duct reaches 25°C
fan switches to the preset rotation speed =60%

Example for timer delay:

Initial conditions:
- rotation speed is set = 60% of maximum speed
- threshold of action is set =25°C
- air temperature in the duct =20°C

fan operates with the impeller rotation speed =60%

- temperature in the duct rises, reaches 25°C and keeps rising

fan switches to the impeller rotation speed =100%, delay timer activates for 5 minutes

- temperature goes down
fan operates with the impeller rotation =100%

- temperature in the duct reaches 25°C and keeps going down

- after the timer stops, the fan switches to the preset rotation speed (=60%). After the switch to the preset rotation speed (=60%) the delay timer activates again for 5 minutes.

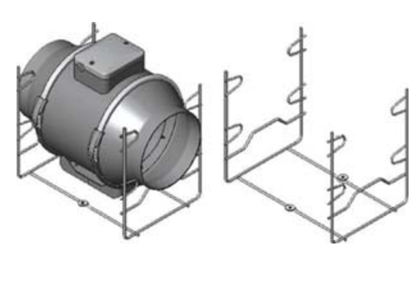
- temperature in the duct rises, reaches 25°C and keeps rising

- after the timer stops, the fan switches to the impeller rotation speed =100% (the delay timer activates for 5 minutes).

Thus, in timer delay pattern the delay timer will activate every time fan changes its speed.

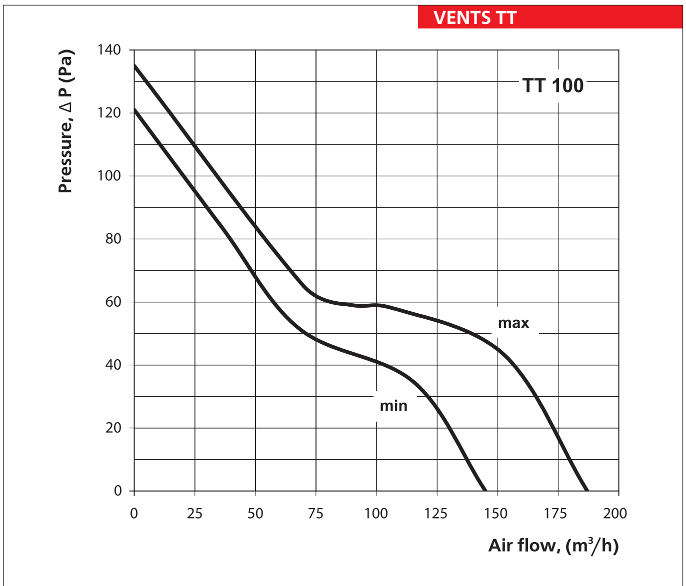
Vents TT...U is equipped with electronic module

Vents TT

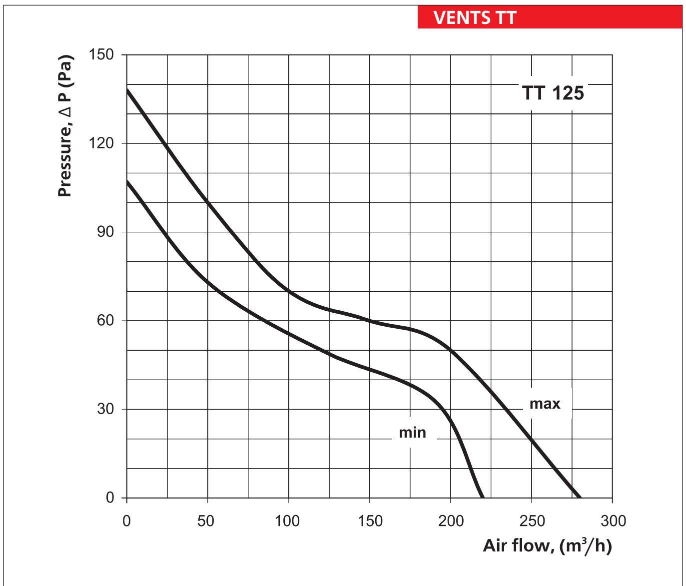


Holder

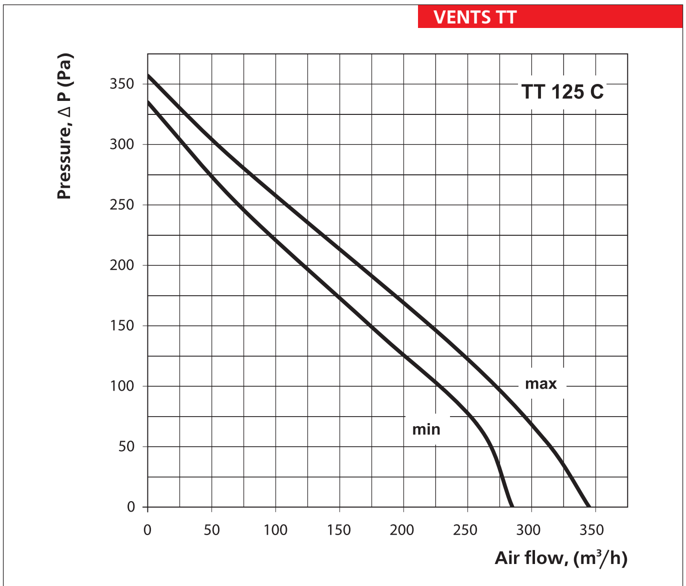
	TT 100		TT 125		TT 125 C		TT 150	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~230		1~230		1~230		1~230	
Power consumption, W	21	33	23	37	28	54	30	60
Current, A	0,12	0,2	0,19	0,26	0,1	0,16	0,17	0,27
Maximum air consumption, m^3/h	145	187	22	280	285	345	467	552
RPM	2450	2500	1960	2500	1875	2500	1670	2450
Noise level at 3 m, dBA	28	35	29	36	31	42	33	44
Maximal temperature of transferred air, °C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	



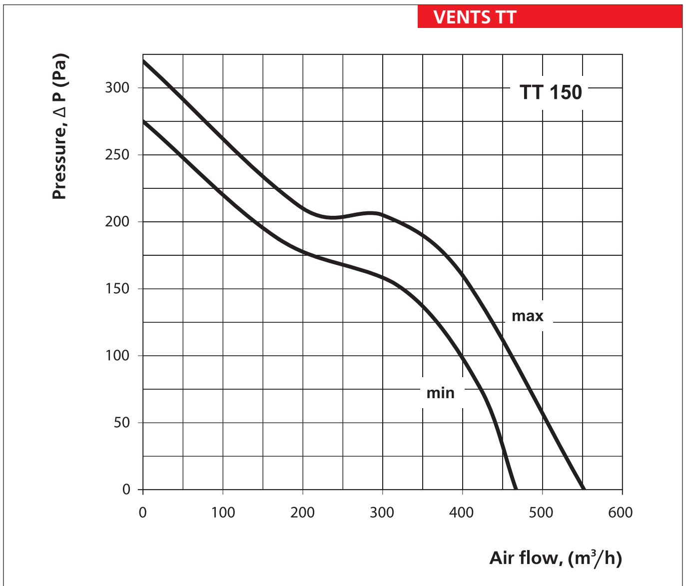
Sound-power level		Octave-frequency band, (Hz)							
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	29	26	46	51	55	52	46	34
L_{WA} to outlet	dBA	60	30	30	48	52	56	47	47	32
L_{WA} to environment	dBA	46	25	24	29	38	43	32	32	21



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	57	28	27	45	52	54	55	43	35
L_{WA} to outlet	dBA	59	28	32	47	50	54	53	47	36
L_{WA} to environment	dBA	43	23	27	31	36	44	37	31	22



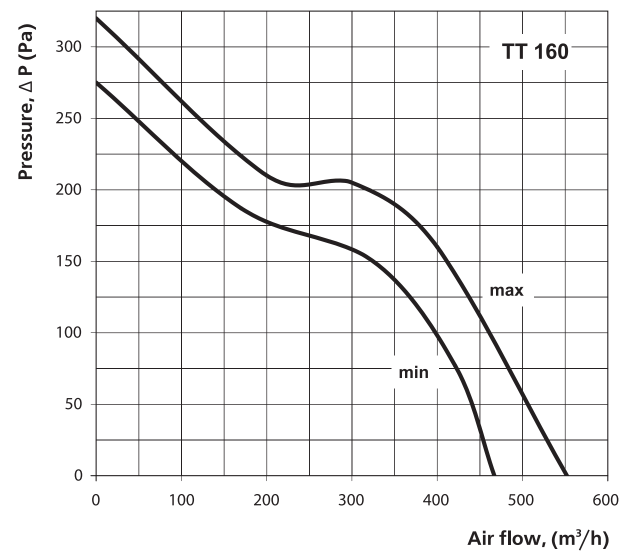
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	63	32	35	51	53	59	62	48	40
L_{WA} to outlet	dBA	64	37	33	53	54	60	58	50	39
L_{WA} to environment	dBA	52	28	30	37	43	48	39	34	29



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	72	40	42	59	62	60	72	57	47
L_{WA} to outlet	dBA	71	44	46	60	64	65	67	57	47
L_{WA} to environment	dBA	55	37	39	43	48	54	51	41	25

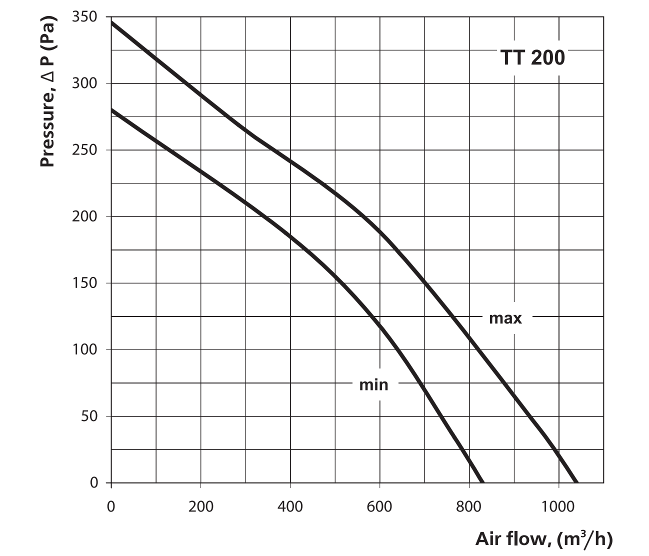
	TT 160		TT 200		TT 250		TT 315	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~ 230		1~ 230		1~ 230		1~ 230	
Power consumption, W	30	60	90	125	125	177	225	330
Current, A	0,17	0,27	0,4	0,55	0,54	0,79	0,98	1,43
Maximum air consumption, m^3/h	467	552	830	1040	1110	1400	1760	2350
RPM	1670	2450	2045	2510	1955	2440	1980	2660
Noise level at 3 m, dBA	33	44	45	52	47	55	49	58
Maximal temperature of transferred air, ^{o}C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	

VENTS TT



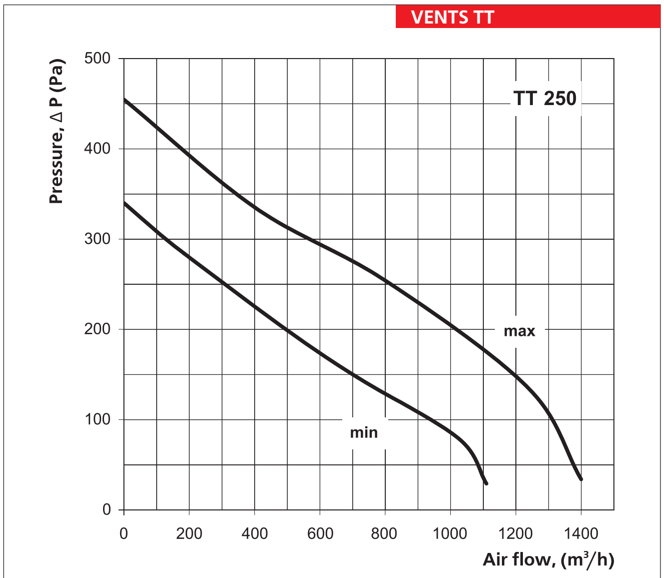
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	59	39	37	43	49	55	52	45	27
L_{wA} to outlet	dBA	70	42	43	60	62	63	69	61	48
L_{wA} to environment	dBA	73	41	43	56	62	62	69	60	46

VENTS TT



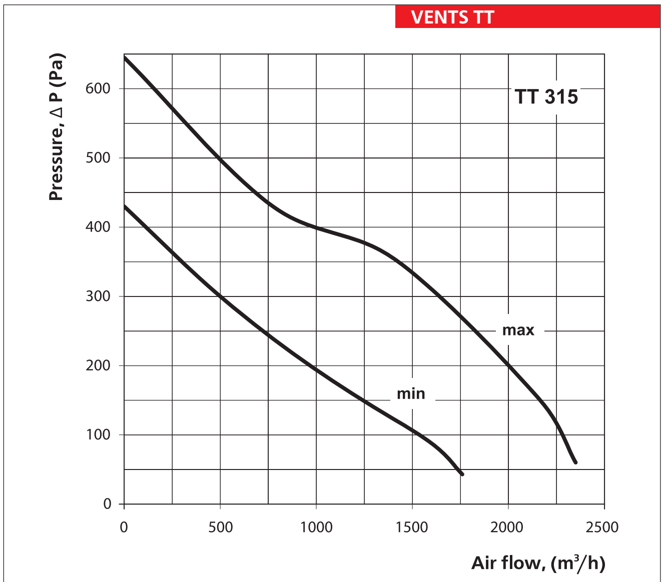
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	51	51	60	69	69	76	66	57
L_{wA} to outlet	dBA	76	53	58	60	67	69	72	67	56
L_{wA} to environment	dBA	62	47	47	43	55	60	55	51	38

VENTS TT



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	79	51	62	65	71	74	75	63	55
L_{wA} to outlet	dBA	78	53	52	64	72	75	74	64	54
L_{wA} to environment	dBA	68	47	48	48	60	62	54	49	34

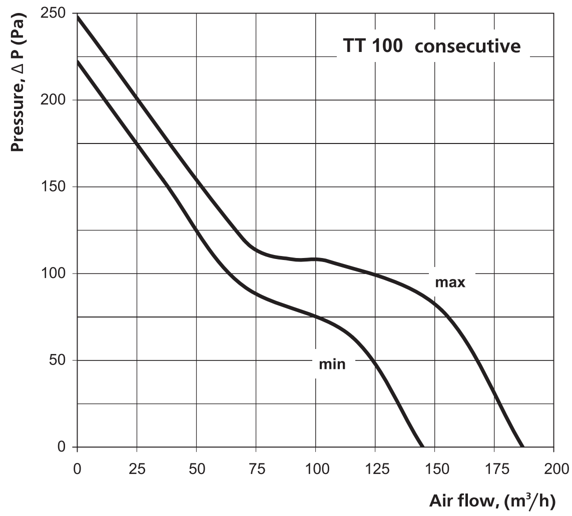
VENTS TT



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	82	55	53	66	75	82	80	67	58
L_{wA} to outlet	dBA	84	57	58	69	78	80	78	67	57
L_{wA} to environment	dBA	72	51	51	53	62	72	61	55	39

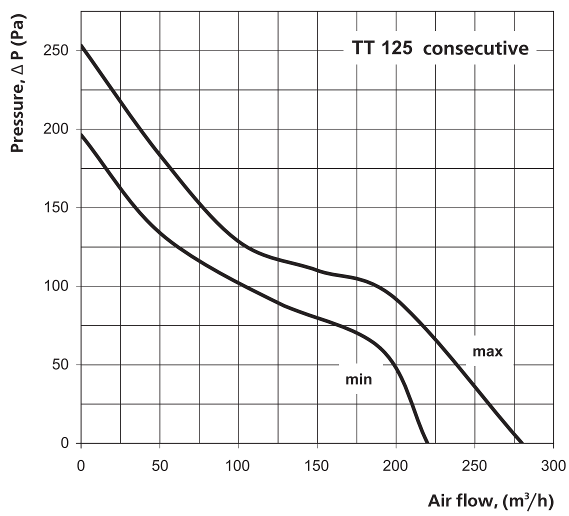
	TT 100 consecutive		TT 125 consecutive		TT 125 C consecutive		TT 150 consecutive	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~ 230		1~ 230		1~ 230		1~ 230	
Power consumption, W	42	66	46	74	56	108	60	120
Current, A	0,24	0,40	0,38	0,52	0,20	0,32	0,34	0,54
Maximum air consumption, m^3/h	145	187	220	280	285	345	467	552
RPM	2450	2500	1960	2500	1875	2500	1670	2450
Noise level at 3 m, dBA	32	40	34	41	36	46	39	49
Maximal temperature of transferred air, °C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	

VENTS TT



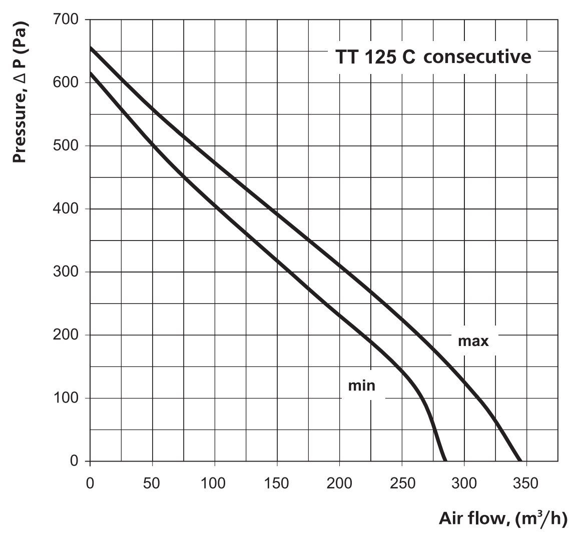
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	63	31	31	48	53	57	55	50	37
L_{wA} to outlet	dBA	65	32	32	53	56	60	49	50	36
L_{wA} to environment	dBA	51	29	29	31	40	45	35	37	25

VENTS TT



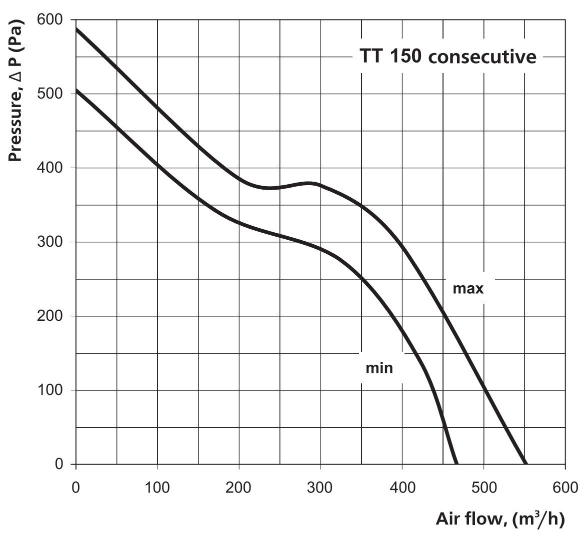
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	30	30	47	55	56	59	46	39
L_{wA} to outlet	dBA	63	30	34	49	52	58	55	50	41
L_{wA} to environment	dBA	47	27	30	34	41	47	39	35	24

VENTS TT



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	68	35	38	54	58	64	64	50	44
L_{wA} to outlet	dBA	67	42	37	58	57	63	62	52	42
L_{wA} to environment	dBA	56	33	34	41	48	50	42	36	33

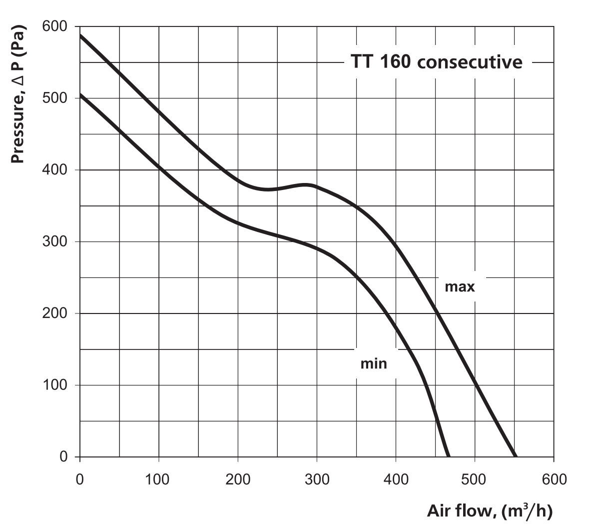
VENTS TT



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	44	45	63	65	65	74	60	51
L_{wA} to outlet	dBA	75	46	50	62	67	70	71	62	51
L_{wA} to environment	dBA	59	40	44	47	52	59	53	45	29

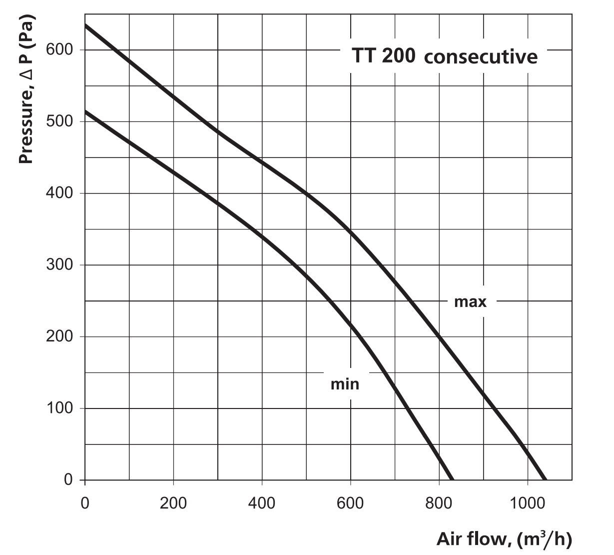
	TT 160 consecutive		TT 200 consecutive		TT 250 consecutive		TT 315 consecutive	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~ 230		1~ 230		1~ 230		1~ 230	
Power consumption, W	60	120	180	250	250	354	450	660
Current, A	0,34	0,54	0,80	1,10	1,08	1,58	1,96	2,86
Maximum air consumption, m^3/h	467	552	830	1040	1110	1400	1760	2350
RPM	1670	2450	2045	2510	1955	2440	1980	2660
Noise level at 3 m, dBA	39	49	51	57	54	61	55	65
Maximal temperature of transferred air, °C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	

VENTS TT



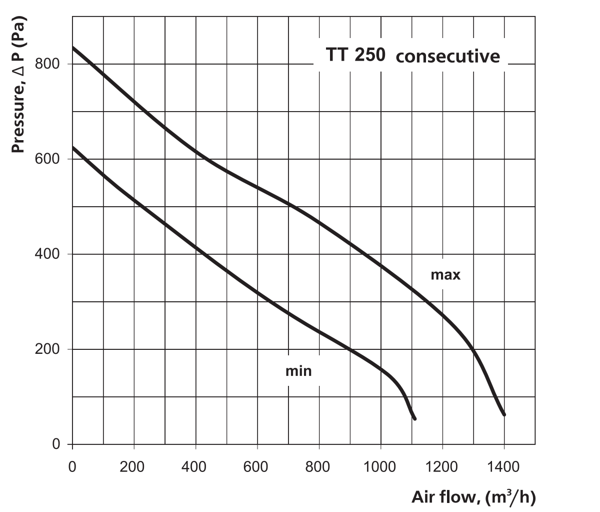
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	62	41	42	48	53	57	54	47	31
L_{wA} to outlet	dBA	73	44	48	64	65	66	71	65	52
L_{wA} to environment	dBA	75	44	48	59	66	65	72	62	50

VENTS TT



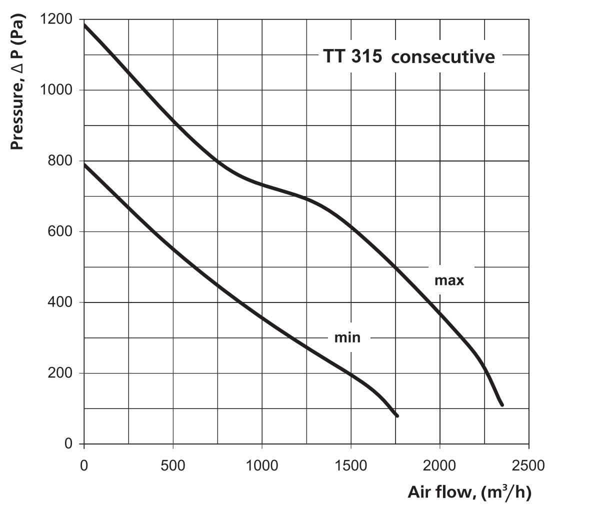
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	78	56	53	63	73	74	79	69	61
L_{wA} to outlet	dBA	78	58	61	65	69	71	75	71	59
L_{wA} to environment	dBA	65	51	51	47	58	63	57	56	43

VENTS TT



Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	83	53	64	67	73	79	80	66	58
L_{wA} to outlet	dBA	80	58	54	66	74	78	76	66	59
L_{wA} to environment	dBA	72	51	51	52	64	65	59	54	37

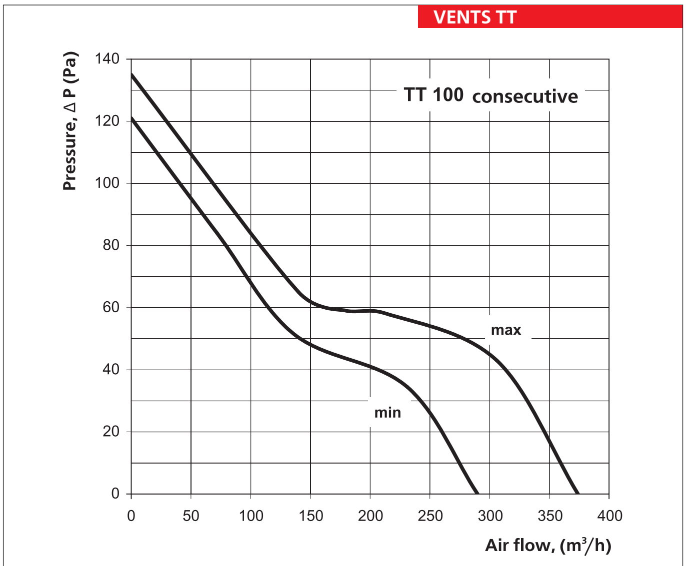
VENTS TT



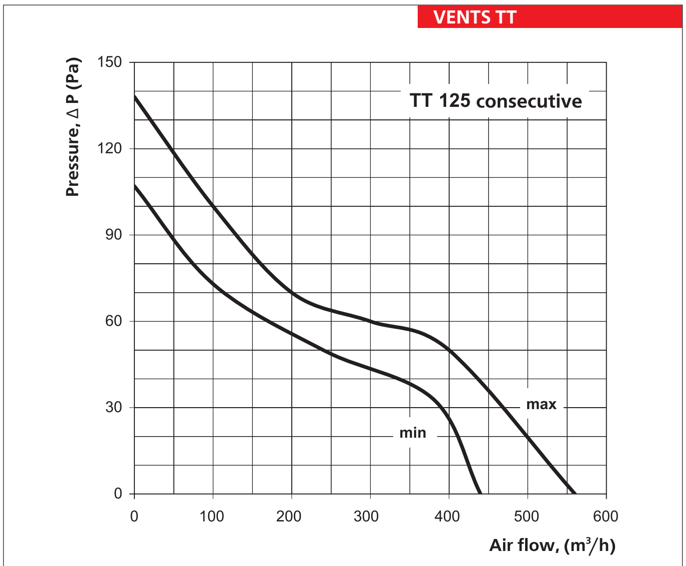
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	85	58	58	69	79	86	84	72	60
L_{wA} to outlet	dBA	87	59	63	74	80	84	83	71	60
L_{wA} to environment	dBA	76	56	54	58	65	74	64	60	42

FAN SERIES VENTS TT

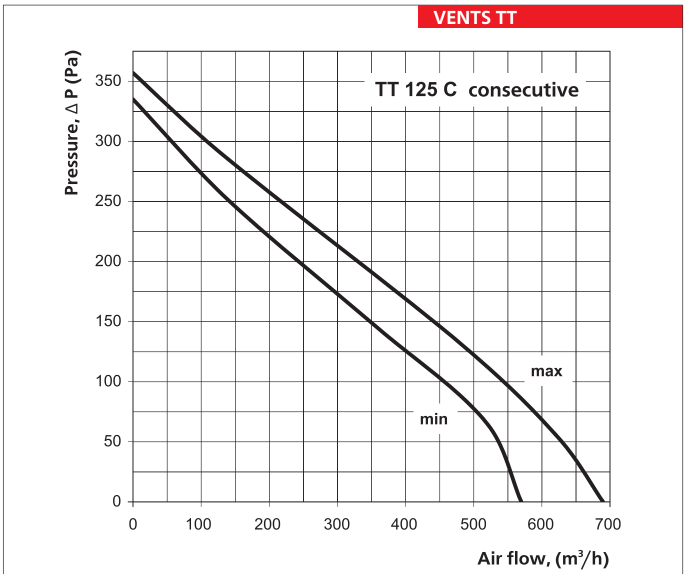
	TT 100 consecutive		TT 125 consecutive		TT 125 C consecutive		TT 150 consecutive	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~ 230		1~ 230		1~ 230		1~ 230	
Power consumption, W	42	66	46	74	56	108	60	120
Current, A	0,24	0,40	0,38	0,52	0,20	0,32	0,34	0,54
Maximum air consumption, m^3/h	290	374	440	560	570	690	934	1104
RPM	2450	2500	1960	2500	1875	2500	1670	2450
Noise level at 3 m, dBA	32	40	34	41	36	46	39	49
Maximal temperature of transferred air, °C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	



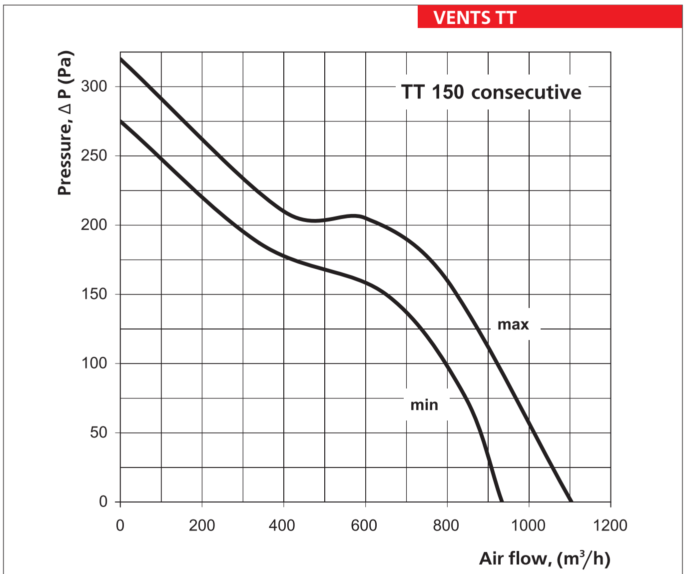
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	34	28	48	55	57	55	49	36
L_{wA} to outlet	dBA	63	35	33	51	56	60	52	52	36
L_{wA} to environment	dBA	49	28	27	33	41	47	34	35	25



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	59	32	29	48	57	58	57	46	39
L_{wA} to outlet	dBA	61	32	35	52	55	56	57	50	40
L_{wA} to environment	dBA	46	26	29	33	38	46	40	34	26



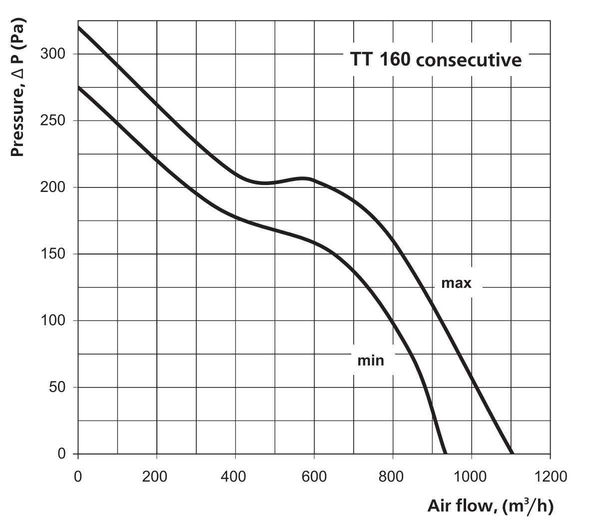
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	65	37	40	54	58	63	64	50	45
L_{wA} to outlet	dBA	68	42	38	57	58	62	60	55	44
L_{wA} to environment	dBA	54	33	34	42	48	53	44	38	31



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	76	44	47	64	66	65	77	59	51
L_{wA} to outlet	dBA	74	49	48	62	69	69	71	61	51
L_{wA} to environment	dBA	60	39	41	47	50	57	55	46	28

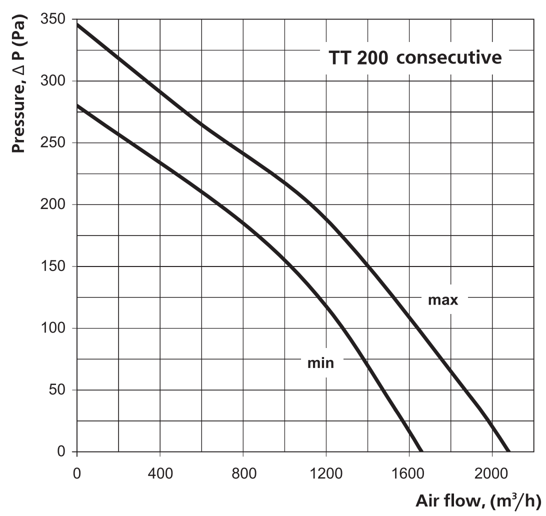
	TT 100 consecutive		TT 125 consecutive		TT 125 C consecutive		TT 150 consecutive	
Speed	min	max	min	max	min	max	min	max
Voltage, V/50Hz	1~ 230		1~ 230		1~ 230		1~ 230	
Power consumption, W	60	120	180	250	250	354	450	660
Current, A	0,34	0,54	0,80	1,10	1,08	1,58	1,96	2,86
Maximum air consumption, m^3/h	934	1104	1660	2080	2220	2800	3520	4700
RPM	1670	2450	2045	2510	1955	2440	1980	2660
Noise level at 3 m, dBA	39	49	51	57	54	61	55	65
Maximal temperature of transferred air, °C	60		60		60		60	
Index of protection	IP X4		IP X4		IP X4		IP X4	

VENTS TT



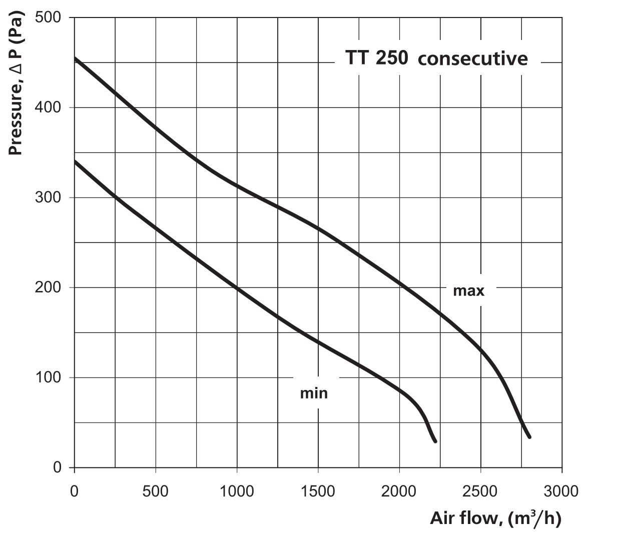
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	63	42	40	48	51	58	56	47	30
L_{WA} to outlet	dBA	74	44	47	62	67	68	72	65	51
L_{WA} to environment	dBA	75	46	45	59	64	65	73	65	48

VENTS TT



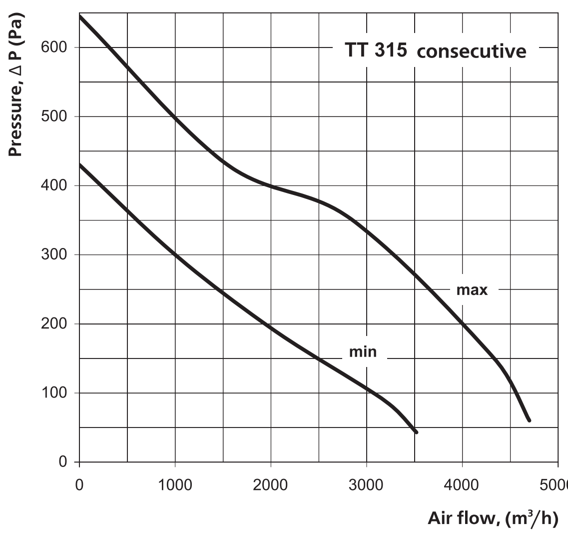
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	77	53	56	64	72	73	81	71	60
L_{WA} to outlet	dBA	80	55	63	64	72	74	76	69	61
L_{WA} to environment	dBA	67	49	51	45	60	63	59	55	41

VENTS TT



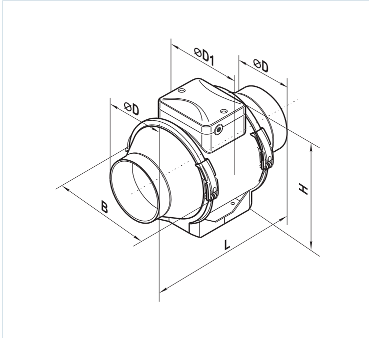
Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	84	53	66	69	76	77	79	68	60
L_{WA} to outlet	dBA	82	58	57	68	76	79	77	69	57
L_{WA} to environment	dBA	70	50	50	52	65	66	56	51	37

VENTS TT

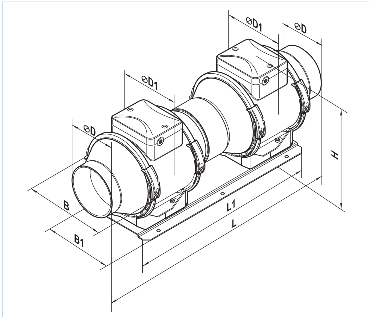


Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	87	60	55	69	79	86	85	71	60
L_{WA} to outlet	dBA	89	62	60	71	83	85	82	69	59
L_{WA} to environment	dBA	74	54	54	56	65	76	66	58	43

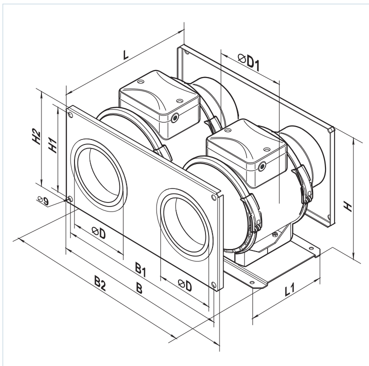
Type	Dimensions, mm					Weight, kg
	ØD	ØD1	B	H	L	
TT 100	96	140	167	190	246	1,4
TT 125	123	140	167	190	246	1,4
TT 125 C	123	195	223	250	295	3,0
TT 150	146	195	223	250	295	3,0
TT 160	158	195	233	250	295	3,0
TT 200	199	209	239	261	295,5	6,4
TT 250	247	257	287	323	383	8,3
TT 315	310	323	362	408	445	11,4



Type	Dimensions, mm							Weight, kg
	ØD	ØD1	B	B1	H	L	L1	
TT 100 consecutive	96	140	167	140	196	492	372	3,3
TT 125 consecutive	123	140	167	140	196	492	372	3,3
TT 125 C consecutive	123	195	223	140	256	590	440	6,3
TT 150 consecutive	148	195	223	140	256	590	440	6,3
TT 160 consecutive	158	195	233	140	256	590	440	6,3
TT 200 consecutive	197	209	239	190	270	595	440	13,5
TT 250 consecutive	247	257	287	190	331	766	580	17,6
TT 315 consecutive	310	323	362	240	420	890	700	24,2



Type	Dimensions, mm										Weight, kg
	ØD	ØD1	B	B1	B2	H	H1	H2	L	L1	
TT 100 consecutive	100	140	320	300	380	185	160	178	246	140	4
TT 125 consecutive	125	140	320	300	380	185	160	178	261	140	4
TT 125 C consecutive	125	195	395	375	430	228	200	220	295	180	7,5
TT 150 consecutive	150	195	395	375	430	228	200	220	310	180	7,5
TT 160 consecutive	160	195	395	375	430	228	200	220	310	180	7,6
TT 200 consecutive	200	209	450	420	492	225	220	240	306	190	15,2
TT 250 consecutive	250	257	580	520	625	287	270	290	398	240	22,5
TT 315 consecutive	315	323	690	670	740	366	335	355	465	340	28,4



Variants of application of fans TT

▶ In a bathroom

▶ In office

▶ Parallel installation fans in a warehouse to increase capacity

Series

VENTS VK

Duct centrifugal fans in plastic case with air flow capacity to **1700 m³/h**

Application

Fans are applied in exhaust and intake ventilationof trade, office and other premises. These fans are compatible with the air ducts of 100, 125, 150, 200, 250, 315 mm. For premises with high requirements to the level of noise, we offer units in low-noise design (VK...B). Owing to high quality plastic not influenced by corrosion, these models are ideal for installation in exhaust ventilation system of premises with high humidity: bathroom, kitchen etc.

Design

The fans cases are made of high-quality and high-strength ABC plastic. Mounting block is hermetical. Fan is equipped with power cord with a plug (VK..P).

Motor

Single-phase motor with outer rotor and plastic impeller with backward curved blades. Motors are supplied with thermal protection with automatic restart. For some dimension types the version of motor with more powerful features is available (VKS). Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control

Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Mounting

Mounting at any angle to the fan axis is permitted. Mounting to wall or ceiling is performed with fastening brackets (supplied with the unit) or with extra fastening PVK stand (to be purchased). Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.

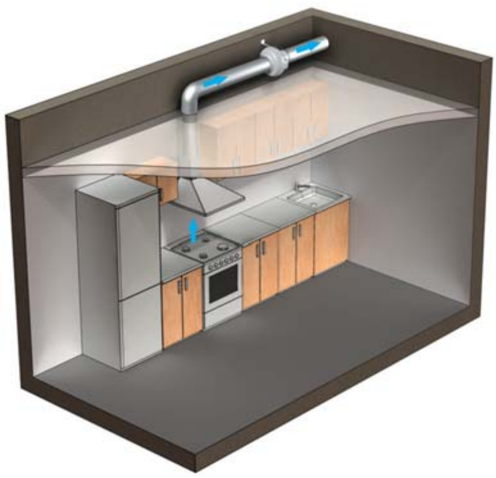
VK fan with electronic temperature and speed module

These fans are ideal for ventilation of premises requiring air temperature control (for example, greenhouses).

Fans of VK...U series with electronic module TSC (Temperature and speed controller) enable automatic change of impeller rotation speed (air consumption) depending on the temperature of air in the duct. There are several controllers on the front panel:

- preliminary setting of impeller rotation speed;
- threshold of electronic thermostat action.

There is one more design of fan with temperature sensor built in the duct or outer temperature sensor



A variant of application of fan in a kitchen

Legend:

Fan series	Option*
VENTS VK	**S** – high-powered motor

Flange diameter
100; 125; 150; 160; 200; 250; 315

Additional options
Q – low-noise design; **U** – with electronic "temperature" module and temperature sensor built in the fan duct; **Un** – with electronic "temperature" module and outer temperature sensor; **U1** – with electronic "timer" module and temperature sensor built in the fan duct; **U1n** – with electronic "timer" module and outer temperature sensor; **R** – supply cable with a C14 plug.

Accessories









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(length of cable – 4m, sensor is protected from mechanical damage).
LED of thermostat action is placed on the front panel of the fan.

Operation pattern of VK with electronic temperature and speed

Set desirable air temperature with controller knob (threshold of thermostat action). Set the required rotation speed (air consumption) with the knob of impeller speed controller. If the temperature rises exceeding the set threshold of thermostat action, automation sets the fan motor to maximal rotation speed (maximal consumption). If the temperature goes down below the set threshold of thermostat action, automation sets the fan motor to rotation speed set prior.

To exclude the possibility of highly repetitive motor switches (if set duct temperature is equal to threshold), switch delay was introduced. There are two patters of delay that may be used in various cases:

1. Temperature sensor delay (VK...U): if temperature rises for 2°C from the set threshold of thermostat action, motor starts operating on higher speed. If the temperature goes down below the set threshold of thermostat action, motor returns to prior set (lower) speed.
This pattern may be used to keep air temperature to within 2°C. In this case fan switches will be rare.

2. Timer delay (VK...U1): if temperature rises exceeding the set threshold of thermostat action, motor sets to higher speed and delay timer switches on for 5min. If the temperature goes down below the set threshold of thermostat action, motor returns to prior set (lower) speed, but only after the end of delay time set in timer.
This pattern may be used to keep air temperature at the precise level. In this case fan will switch more frequently than in the pattern of temperature sensor delay, but with intervals not more than 5 minutes.

Example for temperature sensor delay:

Initial conditions:
- rotation speed is set as 60% of maximal
- threshold of action is set as 25°C
- air temperature in the duct =20°C

Fan operates with impeller rotation speed =60%

▼

- air temperature in the duct rises
Fan operates with impeller rotation speed =60%

▼

- air temperature in the duct reaches 27°C
Fan switches to impeller rotation speed =100%

▼

- air temperature in the duct goes down
Fan operates with impeller rotation speed =100%

▼

- air temperature in the duct returns to 25°C
Fan switches to impeller rotation speed set prior =60%

Example for timer delay:

Initial conditions:
- rotation speed is set as 60% of maximal
- threshold of action is set as 25°C
- air temperature in the duct =20°C

Fan operates with impeller rotation speed =60%

▼

- air temperature in the duct rises, reaches 25°C and keeps rising

▼

Fan switches to impeller rotation speed =100%, at the same time delay timer activates for 5 minutes

▼

- air temperature in the duct goes down
Fan operates with impeller rotation speed = 100%

▼

- air temperature in the duct reaches 25°C and keeps going down

▼

Fan waits for timer stop and after that switches to prior set rotation speed (=60%). After switching to the set speed (=60%), delay timer will activate again for 5 minutes

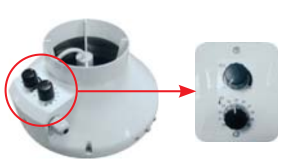
▼

- air temperature in the duct rises, reaches 25°C and keeps rising

▼

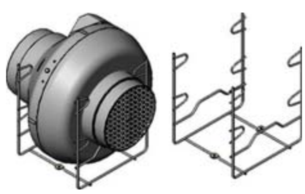
- air temperature in the duct rises, reaches 25°C and keeps rising
Fan waits for timer stop and after that switches to impeller rotation speed =100% (at the same time delay timer activates for 5 minutes)

In other words, in timer delay pattern the delay timer will activate every time fan changes its speed.



Vents VK...U is equipped with electronic module

Bracket for easy mounting (supplied with the fan)

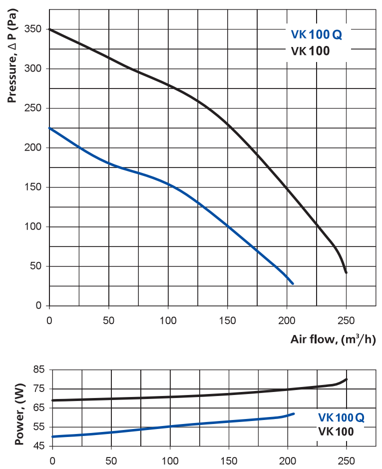


Holder

VK

	VK 100 Q	VK 100	VK 125 Q	VK 125	VK 150	VK 200	VKS 200
Voltage, V/50Hz	230	230	230	230	230	230	230
Power consumption, W	62	80	61	79	80	107	173
Current, A	0,38	0,34	0,38	0,34	0,35	0,47	0,76
Maximum air consumption, m^3/h	205	250	260	355	460	780	930
RPM	2650	2820	2610	2800	2725	2660	2125
Noise level at 3 m, dBA	36	46	36	46	46	48	51
Maximal temperature of transferred air, °C	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4

VENTS VK

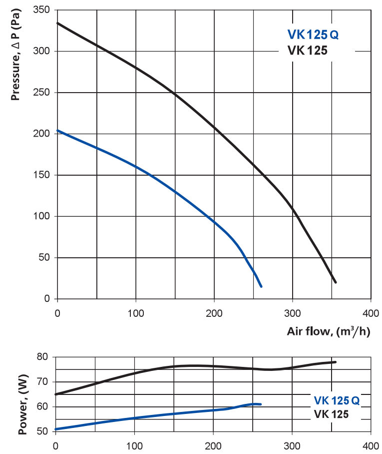


VK 100 Q

Sound-power level		Octave-frequency band, (Hz)							
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	51	59	58	57	50	46	42	28
L_{wA} to outlet	dBA	67	54	63	61	59	50	47	42	33
L_{wA} to environment	dBA	55	21	15	24	37	42	41	31	19

VK 100	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	71	51	65	70	66	60	57	53	38
L_{wA} to outlet	dBA	75	51	68	70	68	66	57	57	42
L_{wA} to environment	dBA	62	44	63	57	40	25	4	17	23

VENTS VK

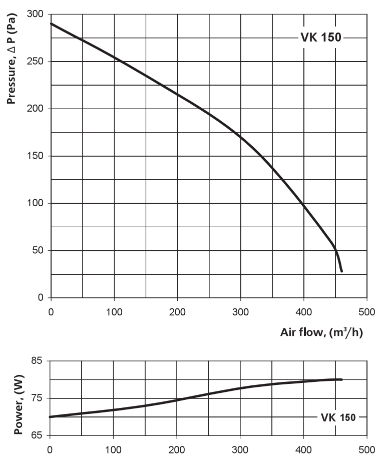


VK 125 Q

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	58	34	51	53	53	49	47	37	30
L_{wA} to outlet	dBA	61	37	53	57	62	51	48	39	31
L_{wA} to environment	dBA	66	48	63	61	41	32	13	30	26

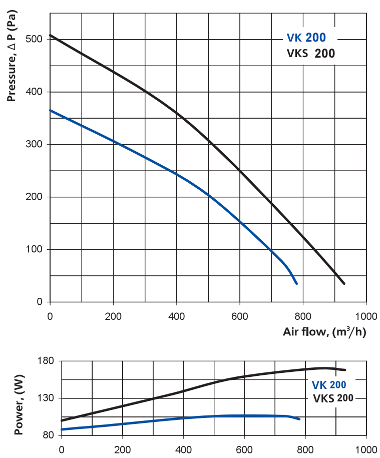
VK 125	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	55	65	66	70	63	61	52	40
L_{wA} to outlet	dBA	77	58	65	71	75	69	61	53	44
L_{wA} to environment	dBA	63	51	60	58	44	35	19	30	25

VENTS VK



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	70	43	63	62	65	63	60	50	38
L_{wA} to outlet	dBA	76	44	69	63	71	65	64	54	41
L_{wA} to environment	dBA	62	40	62	53	35	17	15	29	23

VENTS VK



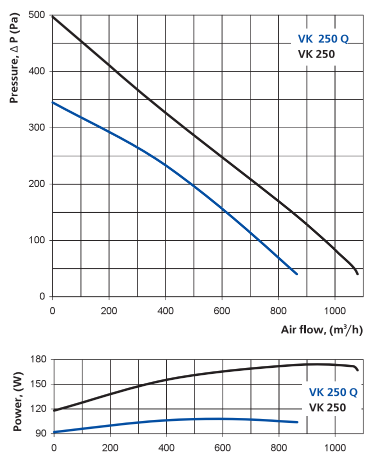
VK 200

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	76	47	65	65	70	63	61	61	49
L_{wA} to outlet	dBA	81	53	66	71	73	65	68	63	51
L_{wA} to environment	dBA	64	45	62	59	48	34	26	45	39

VKS 200	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	51	69	72	71	67	60	60	51
L_{wA} to outlet	dBA	81	56	74	71	76	69	62	57	55
L_{wA} to environment	dBA	65	49	63	60	47	35	28	47	39

	VK 250 Q	VK250	VK 315	VKS 315
Voltage, V/50Hz	230	230	230	230
Power consumption, W	108	173	200	310
Current, A	0,47	0,76	0,88	1,36
Maximum air consumption, m^3/h	865	1080	1340	1700
RPM	2560	2090	2655	2590
Noise level at 3 m, dBA	51	50	50	53
Maximal temperature of transferred air, °C	-25 +50	-25 +50	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4

VENTS VK

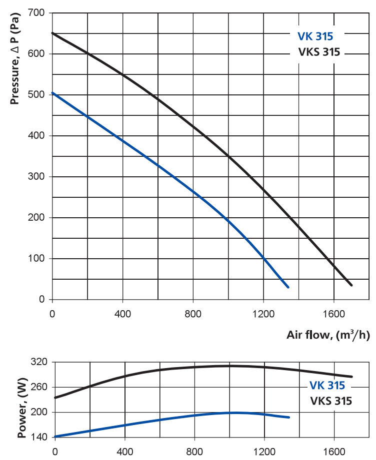


VK 250 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	68	46	59	62	65	60	59	64	53
L_{wA} to outlet	dBA	72	47	62	62	65	65	60	64	57
L_{wA} to environment	dBA	60	41	57	53	44	35	37	54	45

VK 250	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	59	64	69	68	66	62	53	46
L_{wA} to outlet	dBA	73	62	68	71	72	70	62	55	50
L_{wA} to environment	dBA	67	58	62	61	50	41	37	45	38

VENTS VK

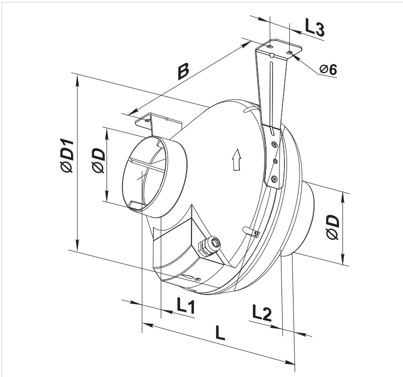


VK 315

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	72	35	50	61	66	64	64	60	55
L_{wA} to outlet	dBA	71	40	57	68	71	65	63	57	57
L_{wA} to environment	dBA	58	38	51	56	53	44	51	50	49

VKS 315	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	57	68	71	71	69	66	61	59
L_{wA} to outlet	dBA	79	58	68	76	74	67	68	66	59
L_{wA} to environment	dBA	70	54	63	64	56	44	53	57	50

Type	Dimensions, mm							Weight, kg
	ØD	ØD1	B	L	L1	L2	L3	
VK 100 Q / VK 100	100	250	270	230	30	27	30	2,15
VK 125 Q / VK 125	125	250	270	220	30	27	30	2,2
VK 150	150 /160	300	310	286	30	30	30	2,6
VK 200	200	340	354	276	30	30	40	4,0
VKS 200	200	340	354	276	30	30	40	4,3
VK 250 Q / VK 250	250	340	354	265	30	30	40	4,5
VK 315	315	400	414	276	40	55	40	5,1
VKS 315	315	400	414	276	40	55	40	5,2



Series
VENTS VKM

Duct centrifugal fans in steel case with air flow capacity to **5260 m³/h**

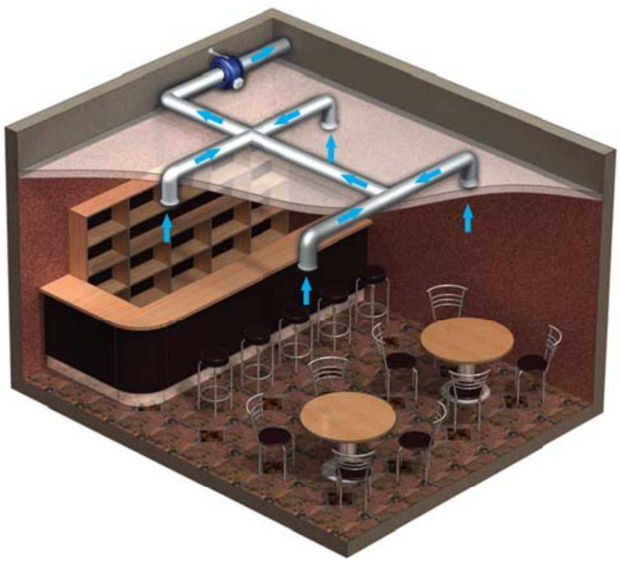
Application
Exhaust and intake ventilation of various premises ventilation. Steel case ensures safe operation if the unit is mounted outdoors. For premises with high requirements to the level of noise, we offer units in low-noise design (VKM...B).

Design
Fan case is made of steel with polymer coating. For easier connection and operation fan may be equipped with power cord with a plug (VKM...R).

Motor
Single-phase motor with outer rotor and plastic impeller with backward curved blades. Motors are supplied with thermal protection with automatic restart. For some dimension types the version of motor with more powerful features is available (VKMS). Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Mounting
Mounting at any angle to the fan axis is permitted. Mounting to wall or ceiling is performed with fastening brackets (supplied with the unit). Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.



A variant of application of fan in cafe

Legend:

Fan series		Flange diameter	Additional options
VENTS VKM	**S** – high-powered motor	100; 125; 150; 160; 200; 250; 315; 355; 400; 455	**Q** – low-noise design; **R** – supply cable with a C14 plug.

Accessories









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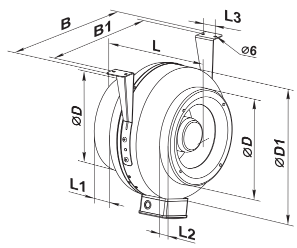
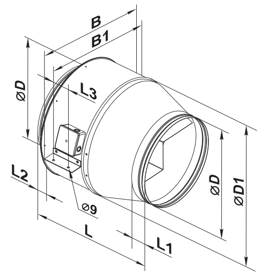
Type	Dimensions, mm								Weigh, kg
	ØD	ØD1	B	B1	L	L1	L2	L3	
VKM 100 Q	98	254	298	258	205	20	25	30	4,2
VKM 100	98	254	298	258	205	20	25	30	4,4
VKM 125 Q	123	254	298	258	205	20	25	30	4,1
VKM 125	123	254	298	358	205	20	25	30	4,3
VKM 150	149	304	349	309	220	25	25	30	5,4
VKM 160	159	304	357	317	220	25	25	30	5,6
VKM 200	198	344	390	350	240	25	29	40	6,6
VKMS 200	198	344	390	350	250	25	29	40	6,7
VKM 250 Q	248	344	390	350	249	25	31	40	7,1
VKM 250	248	344	390	350	249	25	31	40	7,3
VKM 315	314	404	454	414	260	25	40	40	8,1
VKMS 315	314	404	454	414	288	25	40	40	8,2
VKM 355 Q	353	460	522	522	506	60	60	70	12,8
VKM 400	398	570	663	634	570	60	60	70	20,0
VKM 450	448	608	700	670	644	60	60	80	30,0

VKM 100 -VKM 315



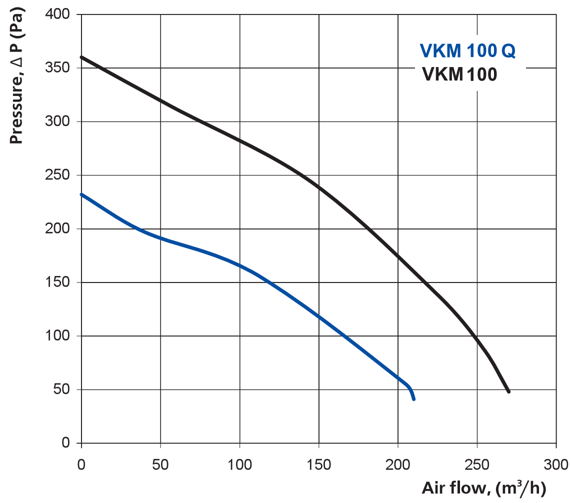
VKM 355- VKM 450

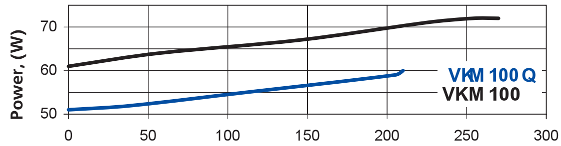


	VKM 100 Q	VKM 100	VKM 125 Q	VKM 125	VKM 150	VKM 160	VKM 200	VKMS 200
Voltage, V/50Hz	230	230	230	230	230	230	230	230
Power consumption, W	60	73	60	75	98	98	154	193
Current, A	0,37	0,32	0,37	0,33	0,43	0,43	0,67	0,84
Maximum air consumption, m^3/h	210	270	255	355	555	555	950	1100
RPM	2620	2830	2535	2800	2705	2660	2375	2780
Noise level at 3 m, dBA	36	47	36	47	47	47	48	51
Maximal temperature of transferred air, °C	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4
Speed controller	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1

	VKM 250 Q	VKM 250	VKM 315	VKMS 315	VKM 355Q	VKM 400	VKM 450
Voltage, V/50Hz	230	230	230	230	230	230	230
Power consumption, W	158	194	171	296	233	460	665
Current, A	0,69	0,85	0,77	1,34	1,06	2,23	2,89
Maximum air consumption, m^3/h	1190	1310	1400	1880	2210	3050	5260
RPM	2315	2790	2600	2720	1375	1370	1265
Noise level at 3 m, dBA	52	52	52	54	58	61	65
Maximal temperature of transferred air, °C	-25 +50	-25 +50	-25 +50	-25 +45	-25 +45	-40 +80	-40 +70
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4
Speed controller	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-400 RS-1,5	RS-1-300 RS-1-400 RS-1,5	RS-2,5	-

VENTS VKM



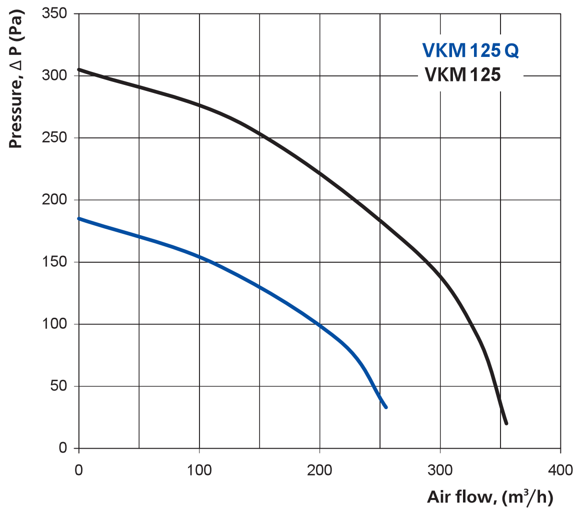


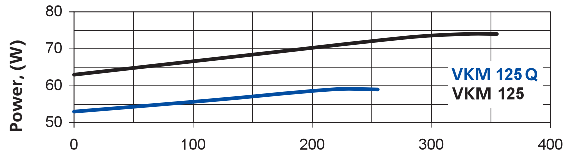
VKM 100 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	64	48	57	57	59	51	47	40	28
L_{wA} to outlet	dBA	64	52	62	56	57	50	46	39	32
L_{wA} to environment	dBA	57	23	13	23	38	42	42	31	15

VKM 100	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	47	63	67	68	60	55	54	38
L_{wA} to outlet	dBA	77	54	66	73	66	66	60	55	46
L_{wA} to environment	dBA	63	45	60	55	41	25	7	18	22

VENTS VKM



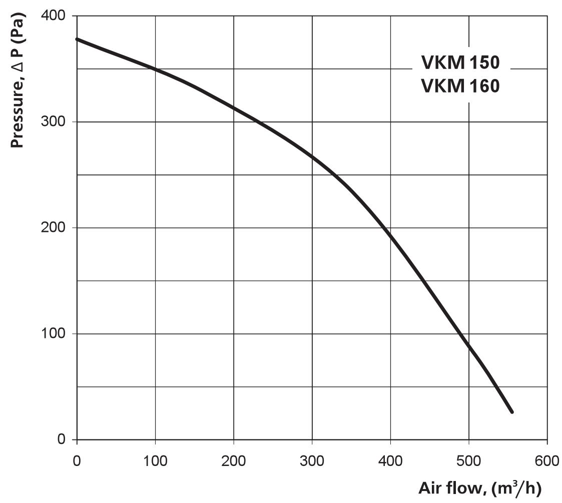


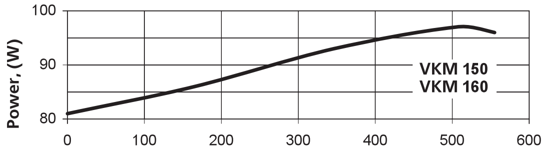
VKM 125 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	60	34	51	53	56	46	43	34	29
L_{wA} to outlet	dBA	62	33	52	59	58	51	49	41	32
L_{wA} to environment	dBA	65	44	61	59	43	30	17	30	28

VKM 125	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	54	67	68	67	64	61	51	41
L_{wA} to outlet	dBA	76	57	69	68	72	71	65	57	45
L_{wA} to environment	dBA	62	51	61	60	46	36	22	31	27

VENTS VKM



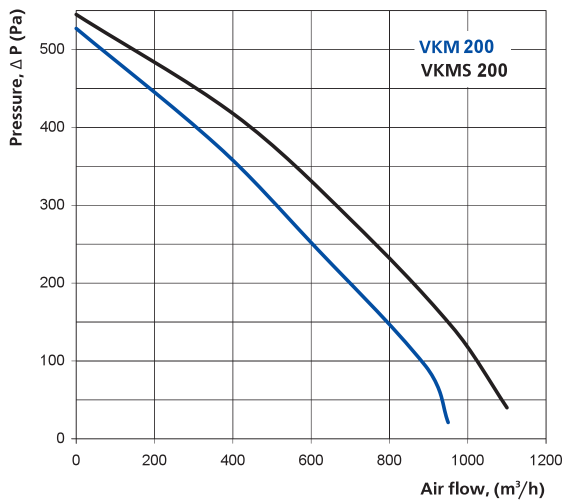


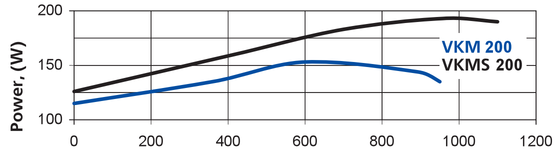
VKM 150

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	72	45	65	62	67	59	59	49	38
L_{wA} to outlet	dBA	74	42	69	63	71	63	59	50	37
L_{wA} to environment	dBA	62	41	59	55	39	19	17	28	22

VKM 160	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	68	41	65	64	63	61	57	47	35
L_{wA} to outlet	dBA	70	47	67	68	66	64	60	51	41
L_{wA} to environment	dBA	60	40	61	55	39	18	16	28	22

VENTS VKM



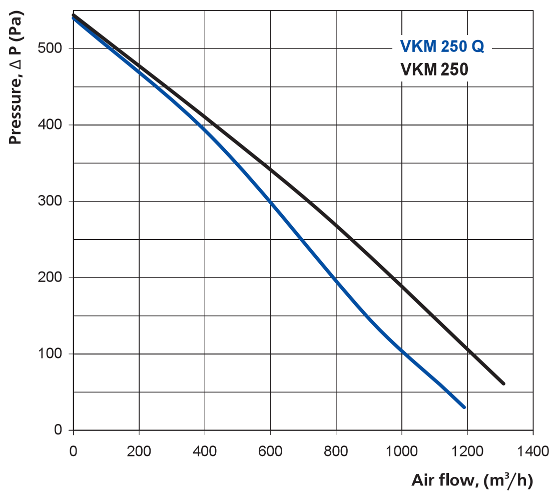


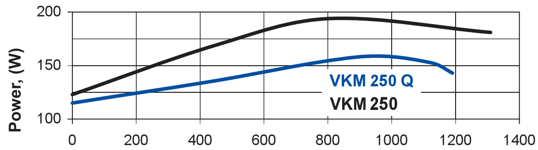
VKM 200

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	75	47	68	65	72	65	61	59	49
L_{wA} to outlet	dBA	75	51	72	68	75	67	65	59	50
L_{wA} to environment	dBA	65	46	61	59	47	31	28	46	42

VKMS 200	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	48	66	72	73	66	63	58	49
L_{wA} to outlet	dBA	78	51	70	74	71	64	64	60	53
L_{wA} to environment	dBA	66	49	64	60	45	35	28	46	41

VENTS VKM



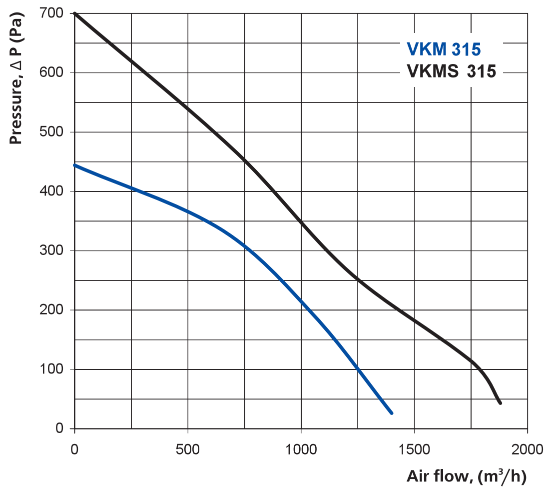


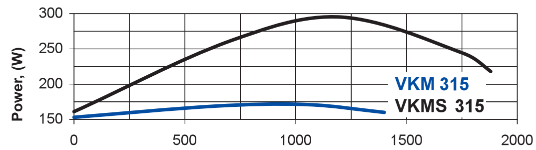
VKM 250 Q

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	68	46	57	60	65	62	58	60	54
L_{WA} to outlet	dBA	75	44	59	64	65	67	65	68	59
L_{WA} to environment	dBA	60	44	57	52	47	36	39	51	45

VKM 250	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	75	60	68	65	67	66	60	53	48
L_{WA} to outlet	dBA	77	62	71	74	70	71	69	59	50
L_{WA} to environment	dBA	65	57	62	60	50	43	37	45	38

VENTS VKM



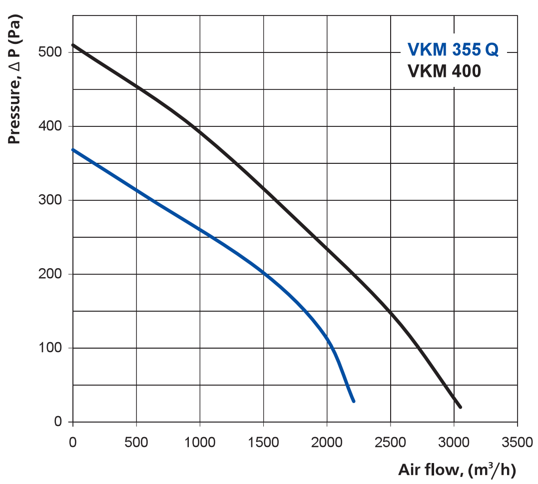


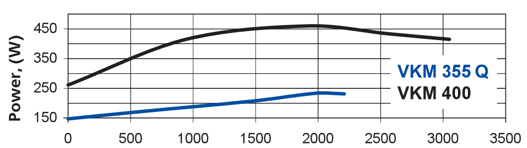
VKM 315

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	71	35	51	61	69	66	62	59	56
L_{WA} to outlet	dBA	75	42	58	62	71	69	67	59	57
L_{WA} to environment	dBA	60	34	49	56	50	44	49	53	50

VKMS 315	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	77	54	67	72	70	67	67	64	56
L_{WA} to outlet	dBA	81	54	71	72	71	69	72	64	60
L_{WA} to environment	dBA	68	56	66	62	57	47	54	55	51

VENTS VKM



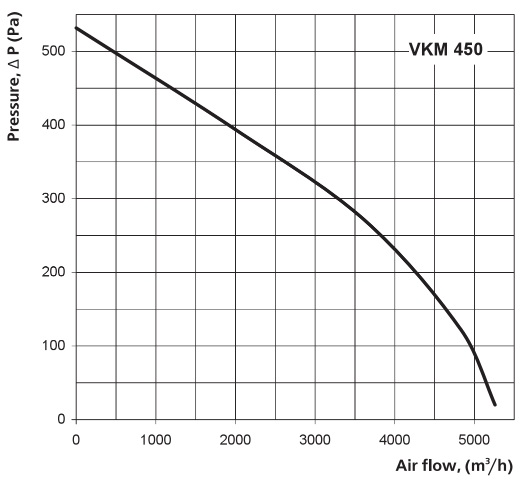


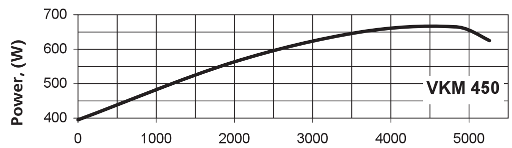
VKM 355 Q

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	66	54	49	56	63	61	58	56	46
L_{WA} to outlet	dBA	63	53	53	62	61	58	52	51	43
L_{WA} to environment	dBA	53	50	48	49	49	45	39	36	24

VKM 400	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	68	53	48	56	59	58	60	55	48
L_{WA} to outlet	dBA	65	52	55	62	62	58	56	51	41
L_{WA} to environment	dBA	56	47	47	49	47	43	42	37	25

VENTS VKM





VKM 450

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	64	51	50	55	60	60	60	53	44
L_{WA} to outlet	dBA	64	52	51	61	61	60	56	51	41
L_{WA} to environment	dBA	54	46	48	51	47	44	42	37	24

Series
VENTS VKMz

Duct centrifugal fans in galvanized case with air flow capacity to **1540 m³/h**

Application
Exhaust and intake ventilation of various premises ventilation. Fans may be mounted outdoors. For premises with high requirements to the level of noise, we offer units in low-noise design (VKMz...B).

Design
Fan case is made of galvanized steel. For easier connection and operation fan may be equipped with power cord with a plug (VKMz...R).

Motor
Single-phase motor with outer rotor and plastic impeller with backward curved blades. Motors are supplied with thermal protection with automatic restart. For some dimension types the version of motor with more powerful features is available (VKMz...S). Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (see chapter "Electronic Control Devices").

Mounting
Mounting at any angle to the fan axis is permitted. Mounting to wall or ceiling is performed with fastening brackets (supplied with the unit). Fan is powered via outer terminal block. Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.

Legend:

Fan series	Flange diameter	Additional options
VENTS VKMz	100; 125; 150; 160; 200; 250; 315	**Q** – low-noise design; **R** – supply cable with a C14 plug.

Accessories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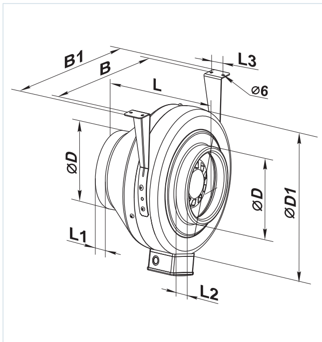
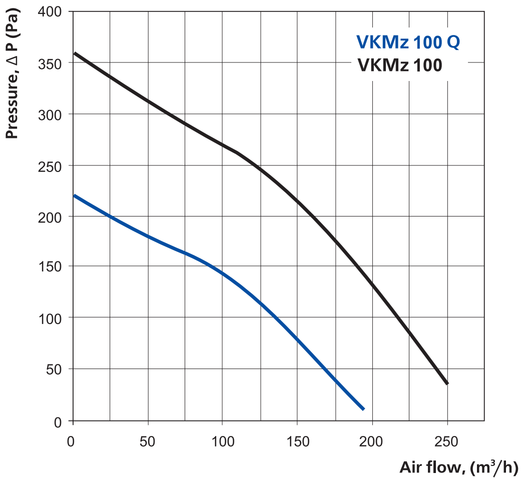
	VKMz 100 Q	VKMz 100	VKMz 125 Q	VKMz 125	VKMz 150	VKMz 160
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	60	72	60	78	75	78
Current, A	0,37	0,32	0,37	0,34	0,33	0,34
Maximum air consumption, m^3/h	195	250	230	330	455	455
RPM	2670	2820	2605	2820	2770	2760
Noise level at 3 m, dBA	35	46	35	46	46	46
Maximal temperature of transferred air, ^oC	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4

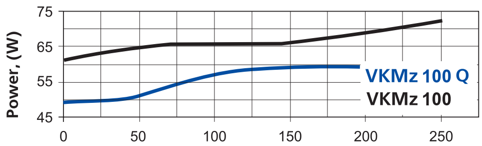
	VKMz 200 Q	VKMz 200	VKMz 250 Q	VKMz 250	VKMz 315 Q	VKMz 315
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	139	157	134	152	151	185
Current, A	0,61	0,69	0,59	0,66	0,66	0,81
Maximum air consumption, m^3/h	840	1000	980	1070	1330	1540
RPM	2790	2740	2785	2765	2680	2730
Noise level at 3 m, dBA	48	50	51	52	52	53
Maximal temperature of transferred air, ^oC	-25 +50	-25 +45	-25 +50	-25 +50	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4

Type	Dimensions, mm								Weigh, kg
	ØD	ØD1	B	B1	L	L1	L2	L3	
VKMz 100 Q	98	237	253	293	202	23	22	30	3,1
VKMz 100	98	237	253	293	202	23	22	30	3,2
VKMz 125 Q	123	237	253	293	202	23	22	30	3,1
VKMz 125	123	237	253	293	202	23	22	30	3,15
VKMz 150	148	278	294	334	200	25	23	30	3,8
VKMz 160	158	278	294	334	200	25	23	30	3,3
VKMz 200 Q	198	332	340	380	245	25	29	40	4,2
VKMz 200	198	332	340	380	245	25	29	40	4,4
VKMz 250 Q	249	332	340	380	213	25	29	40	4,1
VKMz 250	249	332	340	380	213	25	29	40	4,3
VKMz 315 Q	313	402	410	450	308	33	55	40	5,5
VKMz 315	313	402	410	450	308	33	55	40	5,7



VENTS VKMz



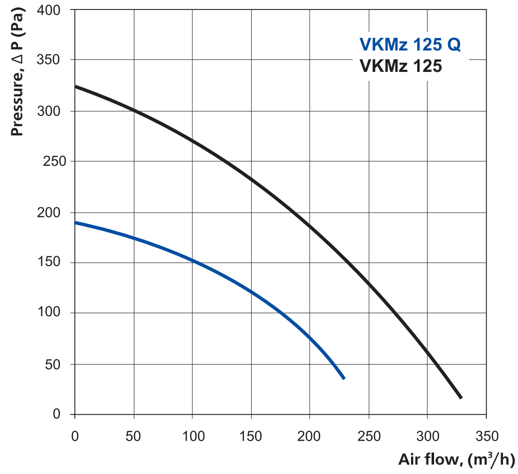


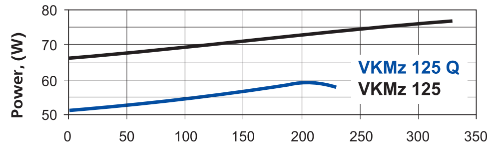
VKMz 100 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	63	51	57	56	57	51	46	40	29
L_{wA} to outlet	dBA	65	54	62	58	61	57	50	45	33
L_{wA} to environment	dBA	55	19	14	21	34	42	41	29	17

VKMz 100	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	47	67	68	67	60	54	53	42
L_{wA} to outlet	dBA	73	56	67	72	66	63	58	57	42
L_{wA} to environment	dBA	64	43	60	57	41	24	6	17	24

VENTS VKMz



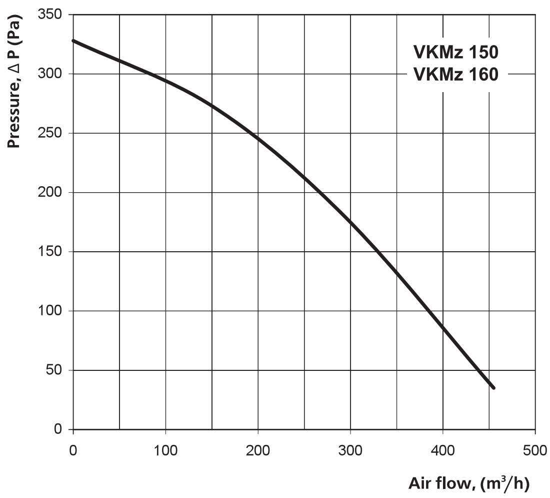


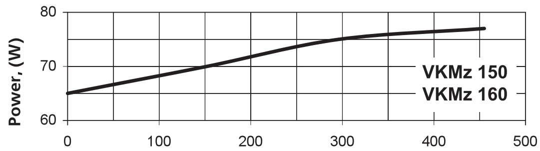
VKMz 125 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	59	31	52	54	53	49	46	35	30
L_{wA} to outlet	dBA	61	35	53	56	60	51	49	35	34
L_{wA} to environment	dBA	64	46	60	59	43	33	15	30	28

VKMz 125	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	56	63	68	69	64	61	52	41
L_{wA} to outlet	dBA	75	58	71	74	72	65	65	56	47
L_{wA} to environment	dBA	64	52	64	59	48	36	23	30	27

VENTS VKMz



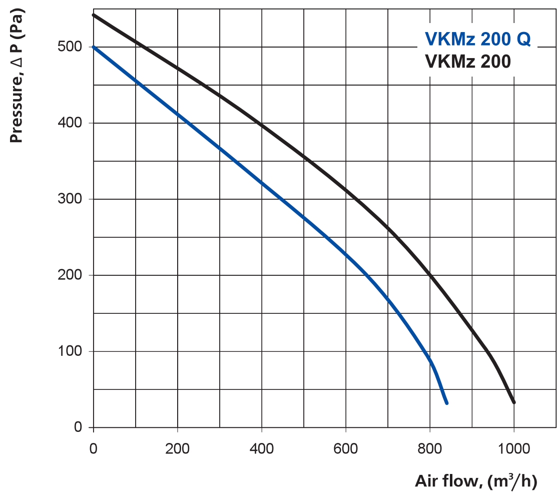


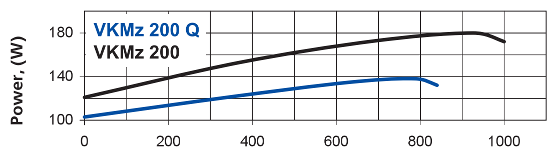
VKMz 150

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	72	42	65	64	64	61	60	48	38
L_{wA} to outlet	dBA	73	47	68	66	69	64	59	47	41
L_{wA} to environment	dBA	63	41	59	54	37	18	17	29	22

VKMz 160	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	69	42	67	66	63	61	58	48	35
L_{wA} to outlet	dBA	72	46	69	65	68	64	63	50	40
L_{wA} to environment	dBA	60	41	60	53	36	20	18	30	24

VENTS VKMz



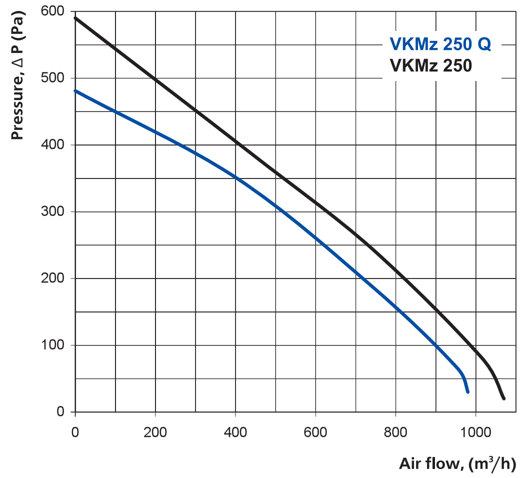


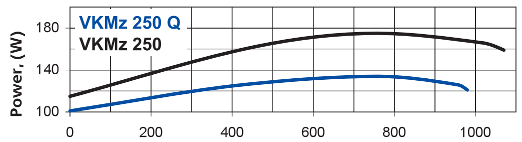
VKMz 200 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	76	47	68	65	70	67	59	58	50
L_{wA} to outlet	dBA	76	49	71	69	72	63	63	60	53
L_{wA} to environment	dBA	64	46	61	57	48	32	27	48	42

VKMz 200	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	51	66	68	71	67	64	58	52
L_{wA} to outlet	dBA	79	51	73	69	74	67	65	60	50
L_{wA} to environment	dBA	68	47	64	64	46	32	30	44	42

VENTS VKMz



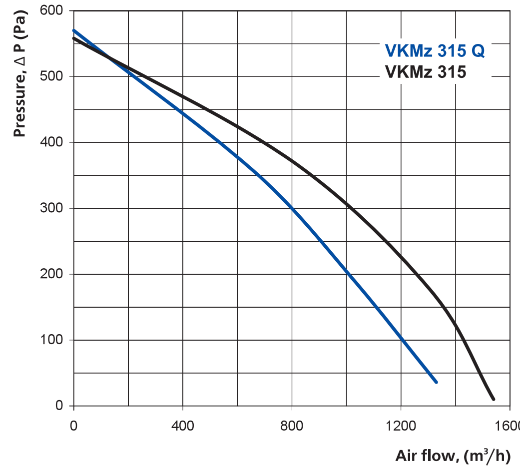


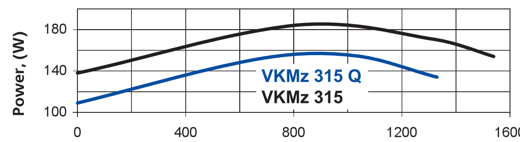
VKMz 250 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	46	59	61	65	62	58	60	54
L_{wA} to outlet	dBA	74	49	59	63	66	67	62	64	56
L_{wA} to environment	dBA	60	42	54	54	44	37	37	52	45

VKMz 250	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	60	66	67	67	67	63	56	45
L_{wA} to outlet	dBA	76	60	73	71	69	65	66	59	46
L_{wA} to environment	dBA	65	58	62	60	47	43	40	47	36

VENTS VKMz

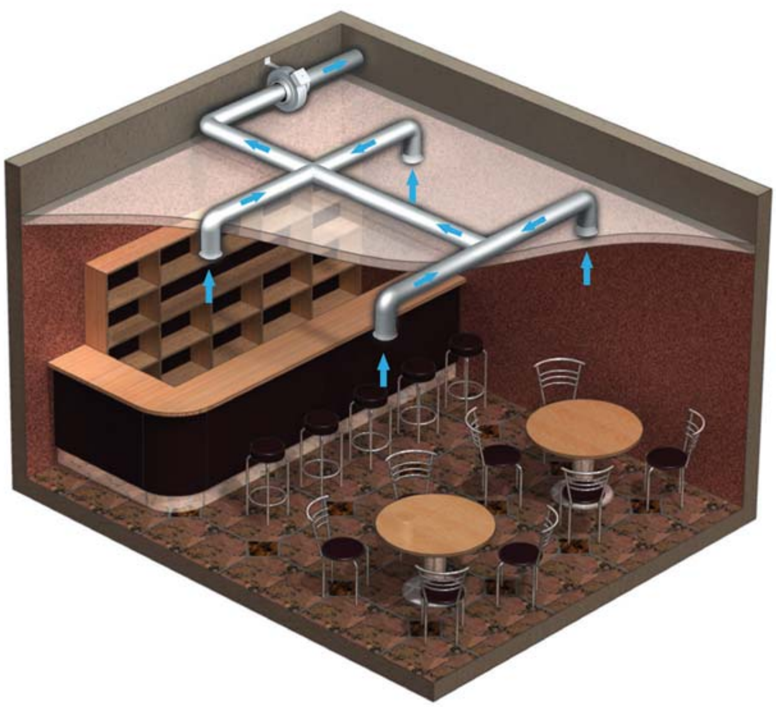




VKMz 315 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	70	35	53	61	65	67	61	58	56
L_{wA} to outlet	dBA	74	41	54	64	73	70	65	62	60
L_{wA} to environment	dBA	59	35	49	53	50	46	51	50	50

VKMz 315	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	53	66	71	69	68	66	63	60
L_{wA} to outlet	dBA	78	58	71	74	72	71	71	63	63
L_{wA} to environment	dBA	70	55	66	61	57	48	54	56	51



A variant of application of fan in cafe

Series
VENTS VC

Duct centrifugal fans with air flow capacity to **1880 m^3/h**

Application
Exhaust and intake ventilation of various premises ventilation. Fans may be mounted outdoors. For premises with high requirements to the level of noise, we offer units in low-noise design (VC...B).

Design
Fan case is made of steel with polymer coating. Fans may be designed both for through-the-wall and wall mounting.

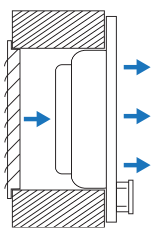
Motor
Single-phase motor with outer rotor and plastic impeller with backward curved blades. Motors are supplied with thermal protection with automatic restart. For some dimension types the version of motor with more powerful features is available (VC...S). Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (see chapter "Electronic Control Devices").

Mounting
Fan is designed for wall (VC...PN and VC...VN models) or through-the-wall mounting (VC...PK and VC...VK) depending on design variant (see below). Fan is mounted to the wall with the mounting plate. Fan is powered via outer terminal block. Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.

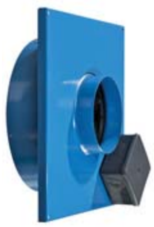
VC-PK

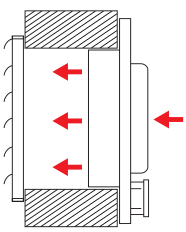
Fresh air fan to be mounted through the wall.



VC-VK

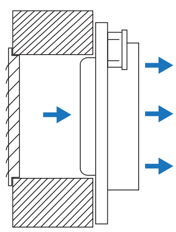
Exhaust fan to be mounted through the wall.





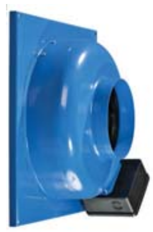
VC-PN

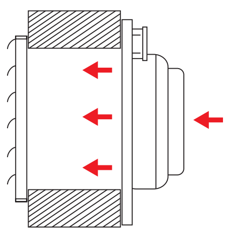
Fresh air fan to be mounted on the wall.



VC-VN

Fresh air fan to be mounted on the wall.





Legend:

Fan series		Flange diameter	Design variants	Mounting options	Additional options
VENTS VC	**S** – high-powered motor	100; 125; 150; 160; 200; 250; 315	**V** – exhaust **P** – ntake	**N** – in-build **K** – through-the-wall (in the duct)	**Q** – low-noise design

Accessories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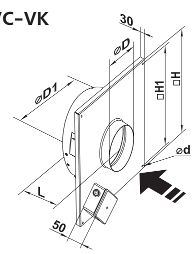
	VC 100 Q	VC 100	VC 125 Q	VC 125	VC 150	VC 160
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	60	73	60	75	98	98
Current, A	0,37	0,32	0,37	0,33	0,43	0,43
Maximum air consumption, m3/h	210	270	255	355	555	555
RPM	2620	2830	2535	2800	2705	2660
Noise level at 3 m, dBA	36	47	36	47	47	47
Maximal temperature of transferred air, °C	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55	-25 +55
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4
Speed controller	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1

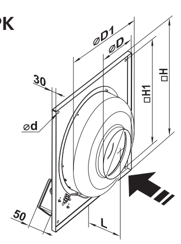
	VC 200	VCS 200	VC 250 Q	VC 250	VC 315	VCS 315
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	154	193	158	194	171	296
Current, A	0,67	0,84	0,69	0,85	0,77	1,34
Maximum air consumption, m3/h	950	1100	1190	1310	1400	1880
RPM	2375	2780	2315	2790	2600	2720
Noise level at 3 m, dBA	48	51	52	52	52	54
Maximal temperature of transferred air, °C	-25 +50	-25 +45	-25 +50	-25 +50	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4
Speed controller	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-300 RS-1-400 RS-1	RS-1-400 RS-1,5

Type	Dimensions, mm						Weigh, kg
	ØD	ØD1	Ød	H	H1	L	
VC100 Q	98	249	6,1	310	295	115	3,1
VC100	98	249	6,1	310	295	115	3,2
VC125 Q	123	249	6,1	310	295	115	3,1
VC125	123	249	6,1	310	295	115	3,2
VC150	149	300	6,1	400	385	115	4,8
VC160	159	300	6,1	400	385	115	4,9
VC200	198	339	6,1	400	385	138	6,1
VCS 200	198	339	6,1	400	385	138	6,1
VC250 Q	248	339	6,1	400	385	138	7,1
VC250	248	339	6,1	400	385	138	7,2
VC315	315	399	6,1	460	445	146	7,8
VCS 315	315	399	6,1	460	445	180	7,8

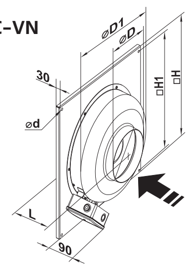
VC-VK



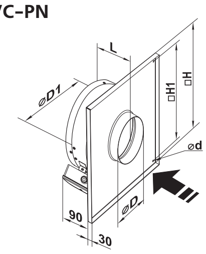
VC-PK



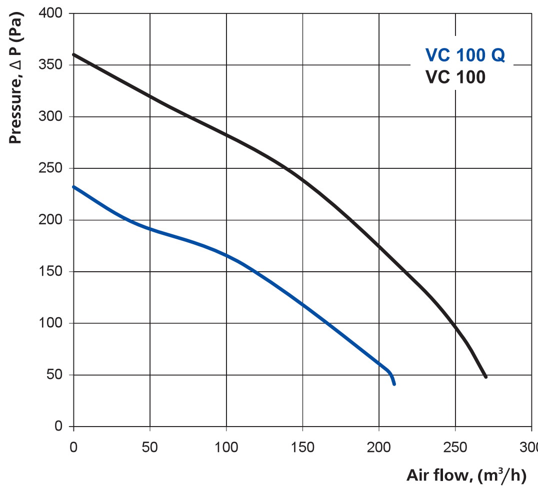
VC-VN

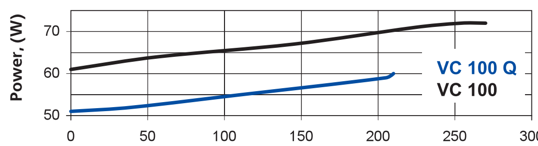


VC-PN



VENTS VC





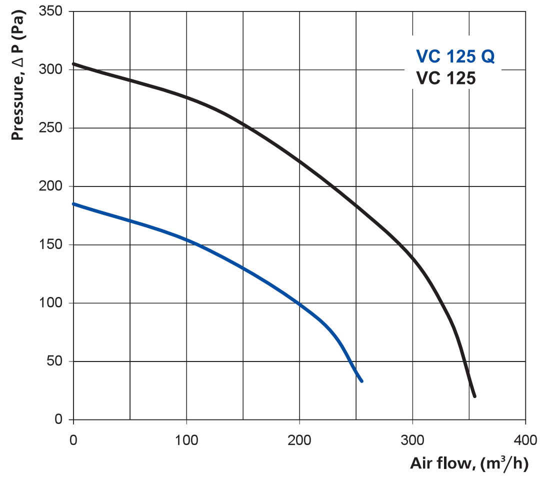
VC100 Q

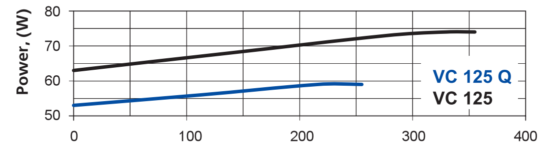
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	62	52	60	56	60	48	48	41	28
L_{wA} to outlet	dBA	67	49	57	58	60	54	52	45	30
L_{wA} to environment	dBA	55	19	16	23	36	39	42	30	19

VC100

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	49	66	70	67	62	53	52	40
L_{wA} to outlet	dBA	77	48	69	73	68	61	57	53	47
L_{wA} to environment	dBA	63	43	63	57	40	27	6	20	25

VENTS VC





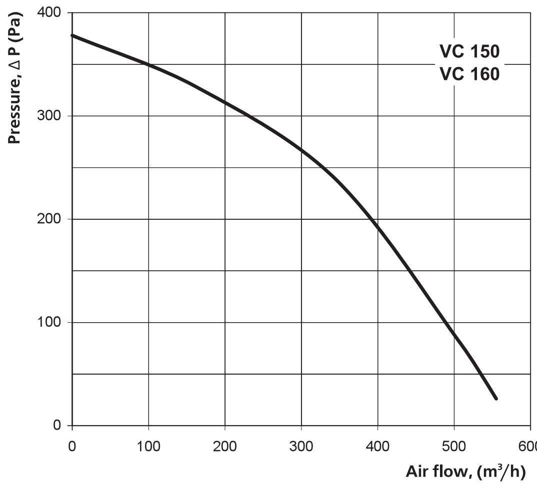
VC125 Q

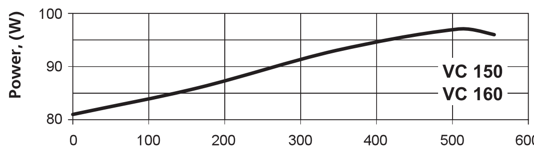
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	61	32	53	55	55	49	45	36	30
L_{wA} to outlet	dBA	58	37	54	57	54	52	50	36	34
L_{wA} to environment	dBA	64	44	64	59	41	32	15	32	26

VC125

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	57	65	67	70	66	61	53	42
L_{wA} to outlet	dBA	76	63	69	66	68	70	65	52	42
L_{wA} to environment	dBA	65	54	60	59	46	36	21	29	25

VENTS VC





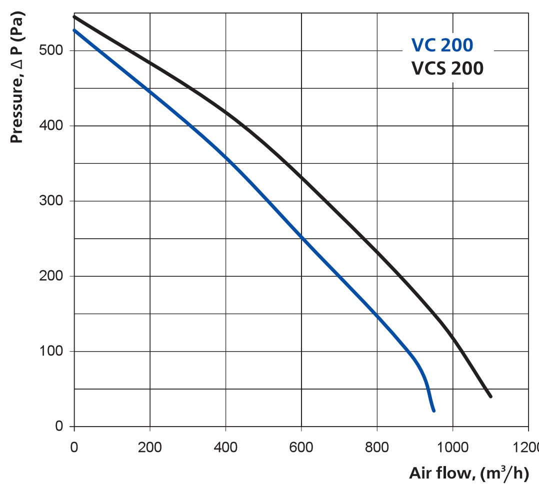
VC150

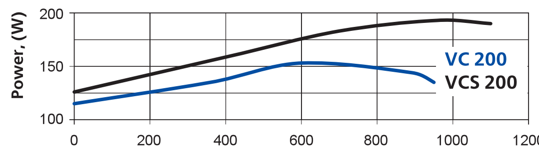
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	70	45	66	64	67	61	59	50	38
L_{wA} to outlet	dBA	71	48	69	67	65	67	62	53	42
L_{wA} to environment	dBA	62	39	62	54	39	19	17	28	20

VC160

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	44	64	64	63	61	59	48	35
L_{wA} to outlet	dBA	72	43	66	68	66	65	63	50	42
L_{wA} to environment	dBA	64	42	59	55	36	18	15	30	22

VENTS VC





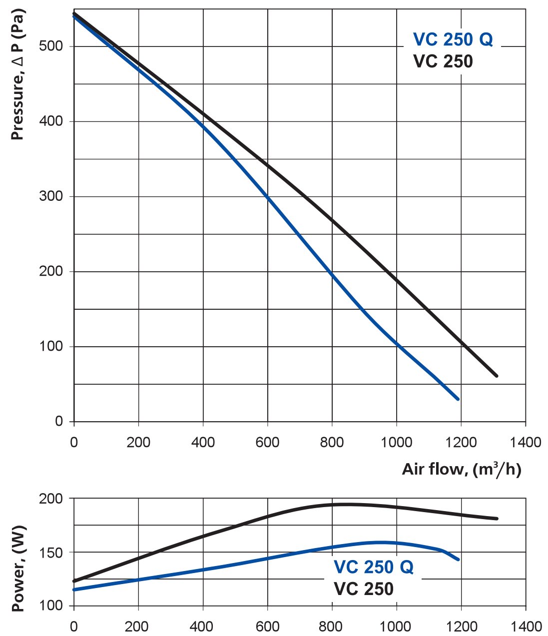
VC200

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	77	47	68	67	72	67	59	59	50
L_{wA} to outlet	dBA	76	53	69	71	73	69	67	62	52
L_{wA} to environment	dBA	64	46	61	57	50	33	26	44	39

VCS 200

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	47	70	72	71	64	63	58	51
L_{wA} to outlet	dBA	80	52	70	75	72	64	64	62	54
L_{wA} to environment	dBA	64	49	66	61	47	33	29	45	42

VENTS VC



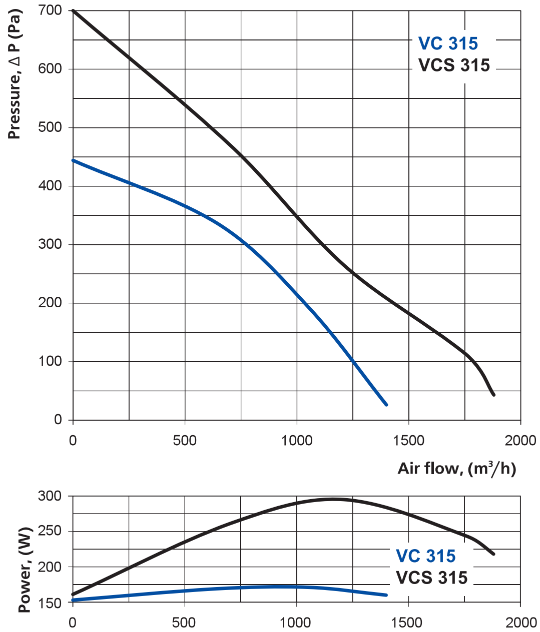
VC250 Q

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	45	58	61	64	63	59	60	55
L_{wA} to outlet	dBA	74	47	64	62	63	66	60	67	59
L_{wA} to environment	dBA	61	43	57	55	45	37	37	51	44

VC250

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	57	64	67	70	67	62	54	44
L_{wA} to outlet	dBA	73	62	67	67	68	71	61	54	48
L_{wA} to environment	dBA	67	56	63	59	50	42	39	45	38

VENTS VC



VC315

Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	35	51	62	69	64	61	60	54
L_{wA} to outlet	dBA	73	38	55	62	70	68	65	58	60
L_{wA} to environment	dBA	58	36	49	52	51	43	50	53	47

VCS 315

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	53	68	71	70	68	64	62	59
L_{wA} to outlet	dBA	78	55	71	73	73	73	65	62	59
L_{wA} to environment	dBA	68	54	65	63	53	46	54	58	53

Series

VENTS VCN

Duct centrifugal fans with air flow capacity to **1880 m³/h**

Application

Exhaust and intake ventilation of various premises ventilation. Fans may be mounted outdoors. For premises with high requirements to the level of noise, we offer units in low-noise design (VC...B).

Design

Fan case is made of steel with polymer coating. Fans may be designed both for through-the-wall and wall mounting.

Motor

Single-phase motor with external rotor and plastic impeller with backward curved blades. Motors are supplied with thermal protection with automatic restart. Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control

Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (see chapter "Electronic Control Devices").

Mounting

Fan is designed for outdoor wall mounting and connection to round duct of appropriate diameter. Fan is powered via outer terminal block. Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit provided in registration certificate of the unit.

An motor is protected from the direct hit of moisture and strange objects

A variant of application of fan in a bathroom

Legend:

Fan series	Flange diameter
VENTS VCN	100; 125; 150; 160; 200

Accessories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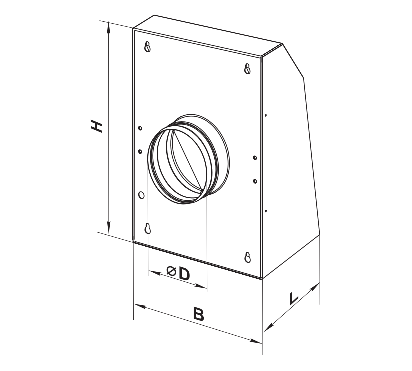
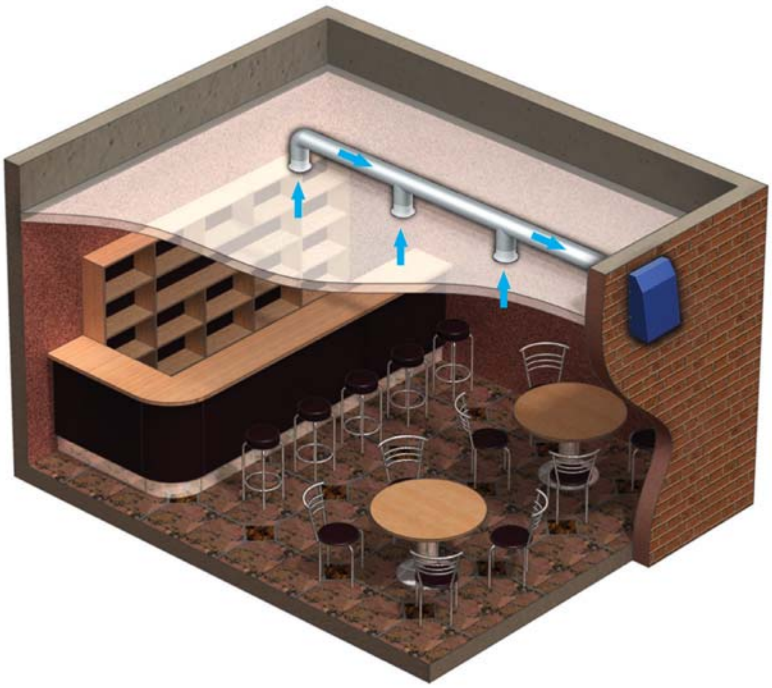
	VCN 100	VCN 125	VCN 150	VCN 160	VCN 200
Voltage, V/50Hz	230	230	230	230	230
Power consumption, W	58	60	100	102	104
Current, A	0,26	0,27	0,43	0,44	0,45
Maximum air consumption, m3/h	280	390	600	650	710
RPM	2500	2500	2600	2600	2600
Noise level at 3 m, dBA	54	54	58	60	62
Maximal temperature of transferred air, °C	55	55	55	55	55
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4

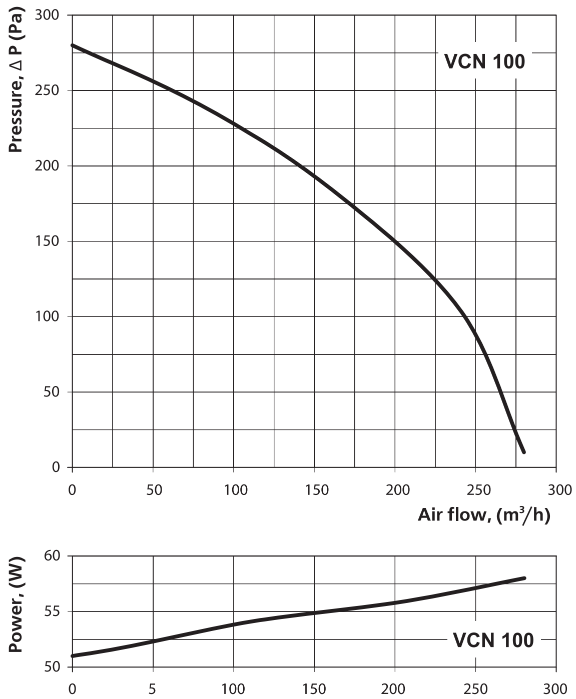
Type	Dimensions, mm				Weigh, kg
	⌀D	B	H	L	
VCN 100	99	260	355	138	4,1
VCN 125	124	260	355	138	4,1
VCN 150	149	300	400	138,2	4,5
VCN 160	159	300	400	138,2	4,5
VCN 200	199	300	400	138,2	4,5





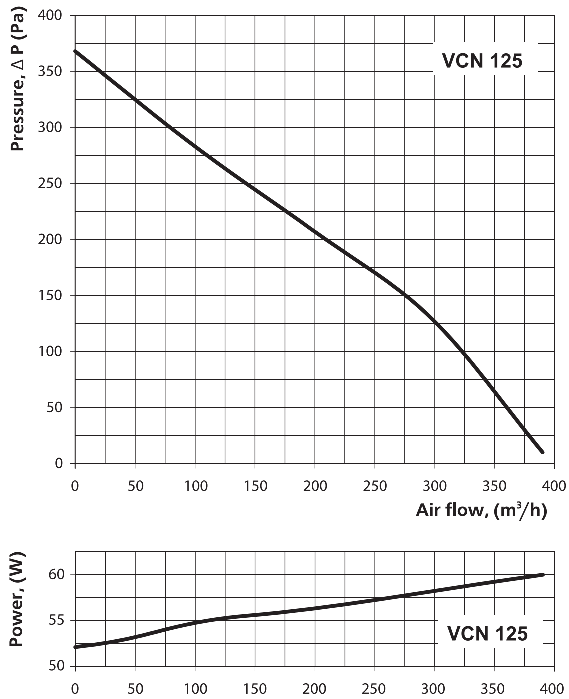
A variant of application of fan in cafe

VENTS VCN



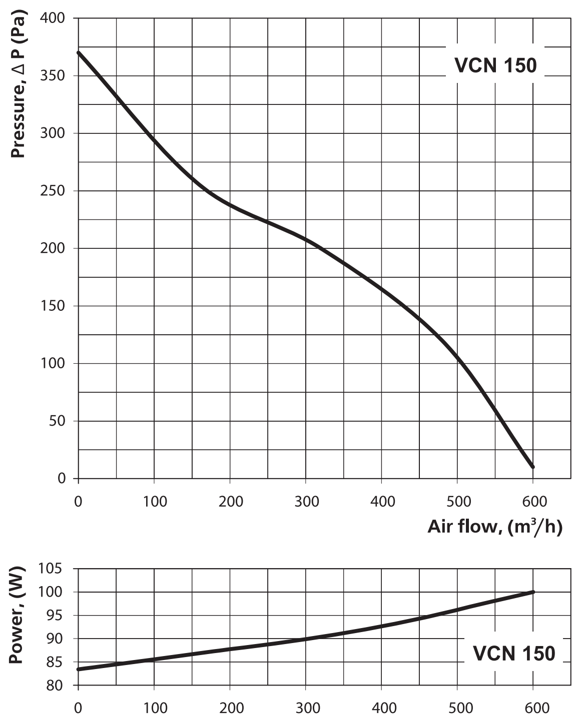
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	60	46	52	58	58	58	51	40	28
L_{wA} to environment	dBA	58	39	40	49	55	60	56	43	35

VENTS VCN



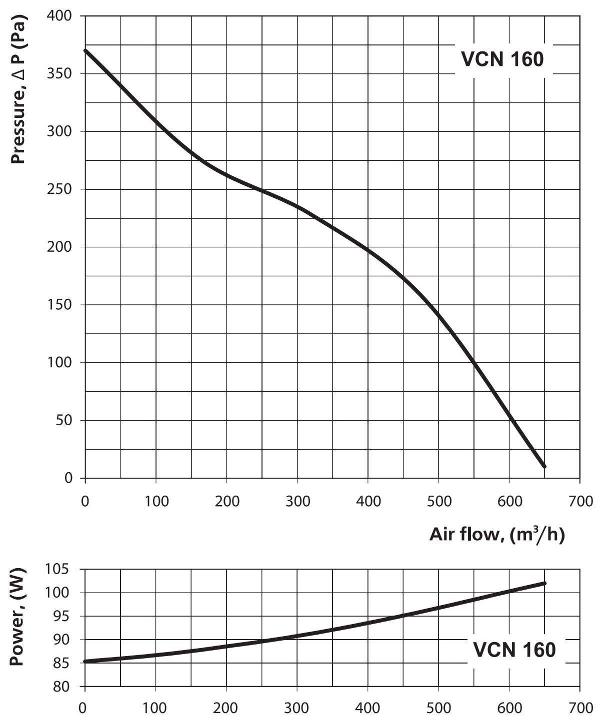
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	58	48	54	59	56	57	52	42	29
L_{wA} to environment	dBA	59	41	41	52	55	58	54	46	35

VENTS VCN



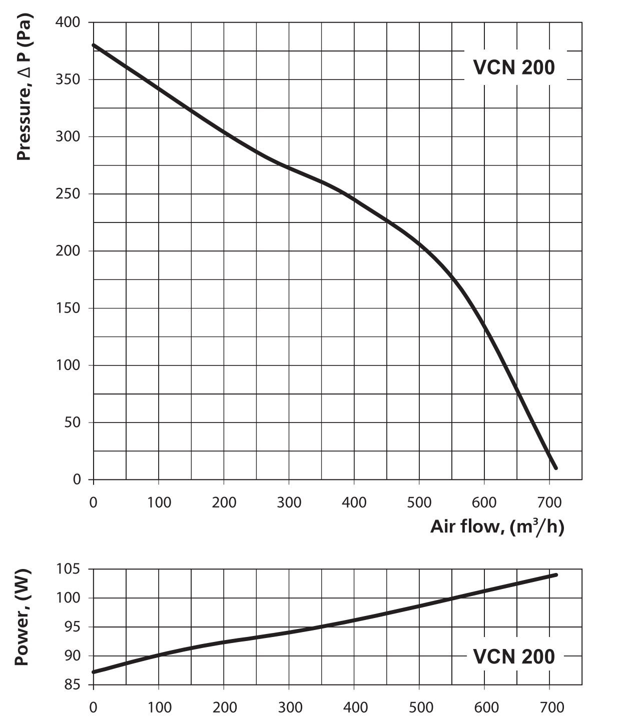
Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	57	45	53	54	57	56	46	38	19
L_{wA} to environment	dBA	56	48	38	48	52	54	49	39	32

VENTS VCN



Sound-power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	55	44	54	55	58	54	46	36	18
L_{wA} to environment	dBA	54	46	39	49	51	53	49	42	31

VENTS VCN



Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	59	48	55	50	58	58	48	41	23
L_{wA} to environment	dBA	55	47	39	51	55	53	52	38	33

Series
VENTS VKP

Centrifugal fans in steel case with air flow capacity to **553 м³/ч** for round

Application
Intake and exhaust systems are purposed for ventilation of various small premises where there is little space for mounting. These fans are aimed for connection to round ducts with 100 and 160 mm of diameter.

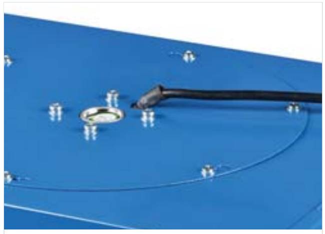
Design
Fan case is made of steel with polymer coating. Swing-roof and free access to engine make mounting easier and enable fan and air ducts maintenance without dismounting .

Motor
Single-phase motor with outer rotor and plastic impeller with backward curved blades.
Motors are supplied with thermal protection with automatic restart. Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Fan rotation speed changes automatically depending on ventilation system resistance. This ensures constant airflow. If tree-position switch is additionally installed, three speeds of motor may be controlled manually.
Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (see chapter "Electronic Control Devices").

Mounting
Mounting at any angle to the fan axis is permitted. Mounting to wall is performed with holding bracket supplied with the unit. Fan is powered via outer terminal block. Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.

External terminal block for electrical connection



Access to the motor without dismounting of fan

	VKP 100	VKP 125	VKP 150	VKP 160
Voltage, V/50Hz	230	230	230	230
Power consumption, W	58	58	85	85
Current, A	0,26	0,26	0,38	0,38
Maximum air consumption, m3/h	240	340	553	553
RPM	2500	2500	2600	2600
Noise level at 3 m, dBA	47	48	50	50
Maximal temperature of transferred air, °C	-25 +50	-25 +50	-25 +40	-25 +40
Index of protection	IP X4	IP X4	IP X4	IP X4

Legend:

Fan series	Flange diameter
VENTS VKP	100; 125; 150; 160; 200

Accessories











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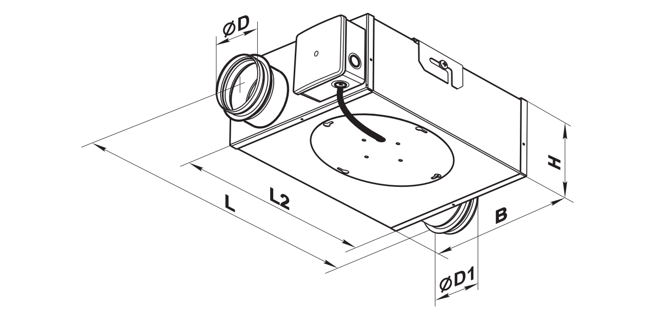
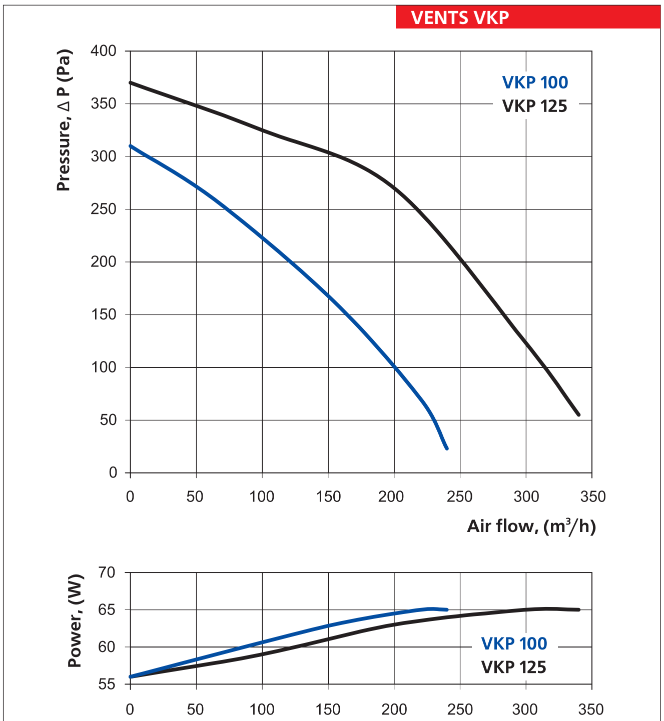
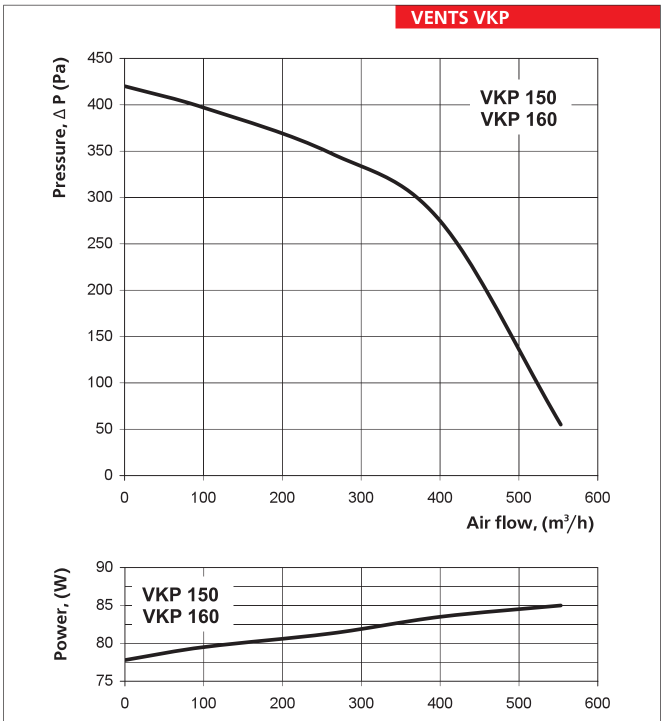
Type	Dimensions, mm								Weigh, kg
	ØD	ØD1	B	H	H1	L	L1	L2	
VKP 100	99	99	260	110	-	352	-	253	3,2
VKP 125	124	124	255	145	-	420	-	322	4,5
VKP 150	149	149	305	175	-	480	-	382	5,4
VKP 160	159	159	305	175	-	480	-	382	5,5



A variant of application of fan in office





VKP 100

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	58	53	55	53	51	51	54	53	48
L_{wA} to outlet	dBA	66	51	51	54	56	64	61	56	52
L_{wA} to environment	dBA	51	38	37	42	43	46	41	40	32

VKP 125

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	63	53	51	56	56	53	54	51	49
L_{wA} to outlet	dBA	65	49	49	59	57	62	61	56	53
L_{wA} to environment	dBA	48	38	40	42	41	43	42	37	33

VKP 150

Sound-power level		Octave-frequency band, (Hz)								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	51	51	58	56	54	54	52	51
L_{wA} to outlet	dBA	66	45	46	60	56	61	61	55	54
L_{wA} to environment	dBA	49	36	38	44	44	42	41	38	35

VKP 160

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	64	52	51	59	57	54	55	54	50
L_{wA} to outlet	dBA	69	47	46	58	59	65	61	57	55
L_{wA} to environment	dBA	52	40	37	42	43	44	43	36	33

Series
VENTS VKP mini

Compact centrifugal fans in steel case with air flow capacity to **176 m³/h** with constant airflow support function for alternating pressure in the system.

Application
Intake and exhaust systems are purposed for ventilation of various small premises where there is little space for mounting. These fans are aimed for connection to round ducts with 80 and 100 mm of diameter. There are several variants of case design with 1 to 6 pipes that enable used air exhaust from several premises simultaneously. This makes ventilation system assembly much easier.

Design
Fan case is made of steel with polymer coating. Case height is only 94 mm for VKP...80 model and 112 mm for VKP...100 model that enable mounting in limited space.
Swing-roof and free access to engine make mounting easier and enable fan and air ducts maintenance without dismounting .

Motor
Single-phase three-speed motor with outer rotor and galvanized steel impeller. Impeller has backward curved blades and provides high pressure in the duct. Elaborated turbine construction (motor and impeller) allows to support constant airflow in the premise, at the same time controlling impeller rotation speed, depending on the air duct pressure.
Motors are supplied with thermal protection with automatic restart. Motors are equipped with ball bearings for longer service life (40 000 hours). For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Fan rotation speed changes automatically depending on ventilation system resistance. This ensures constant airflow. If tree-position switch is additionally installed, three speeds of motor may be controlled manually.
Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (see chapter "Electronic Control Devices").

Mounting
Mounting at any angle to the fan axis is permitted. Mounting to wall is performed with holding bracket supplied with the unit. Fan is powered via outer terminal block. Electric connection and mounting are to be carried out in compliance with the manual and electrical circuit on terminal block.

Access to the motor without dismounting of fan

External terminal block for electrical connection

Legend:

Series	Flange diameter	Number of flanges
VENTS VKP mini	80; 100	1 / 2 / 4 / 6

Accessories



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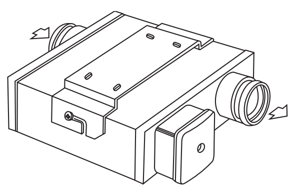
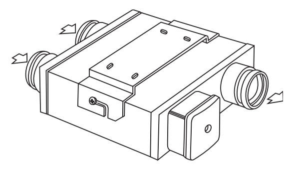
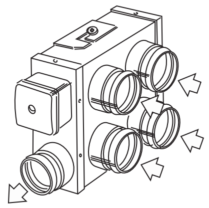
Modifications of fan VKP mini



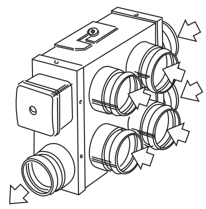
1 inlet – 1 outlet



2 inlets – 1 outlet

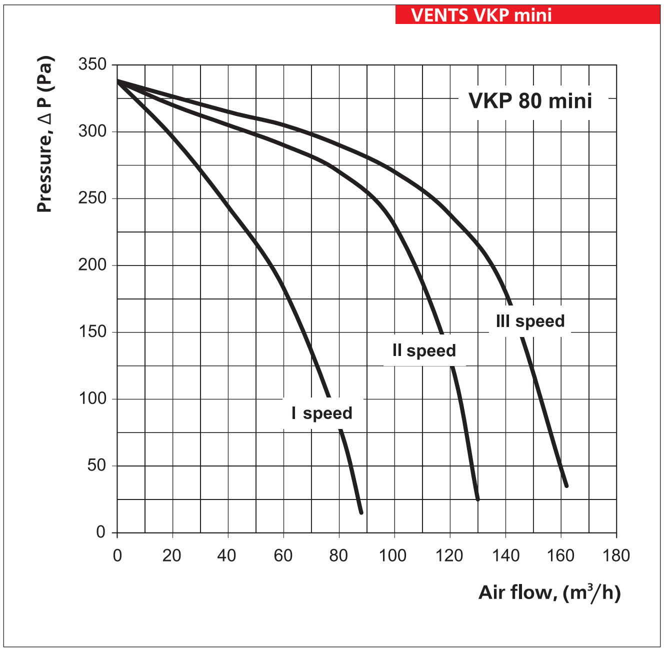


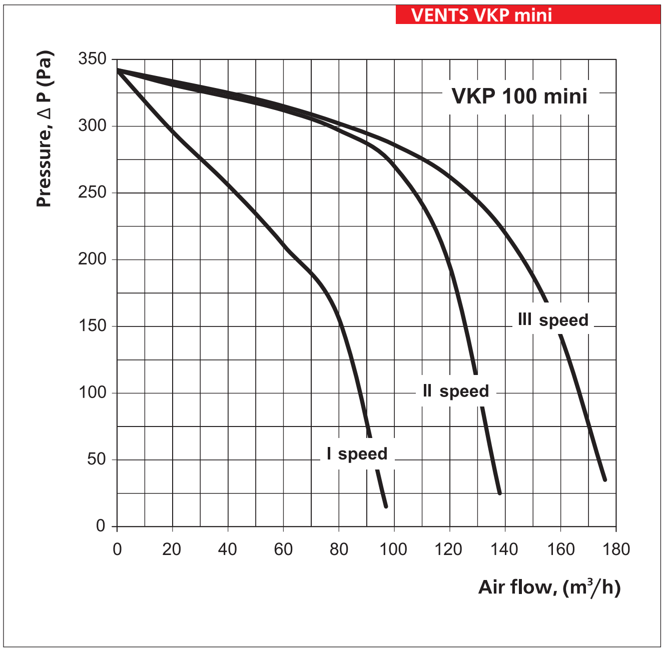
4 inlets – 1 outlet



6 inlets – 1 outlet

	VKP 80 mini			VKP 100 mini		
Speed	1	2	3	1	2	3
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	20	26	45	20	26	45
Current, A	0,32	0,34	0,4	0,32	0,34	0,4
Maximum air consumption, m3/h	88	130	162	97	138	176
RPM	1400	1800	2600	1400	1800	2600
Noise level at 3 m, dBA	32	35	43	33	36	44
Maximal temperature of transferred air, ^{o}C	50	50	50	50	50	50
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4	IP X4





Type	Dimensions, mm								Weigh, kg	Fig.
	∅D	∅D1	B	H	H1	L	L1	L2		
VKP 80 mini	79	79	260	90	-	352	-	253	3,2	3
VKP 100 mini	99	99	260	110	-	352	-	253	3,2	3
VKP 80 P mini	79	-	260	90	126	-	302	253	3,1	1
VKP 100 P mini	99	-	260	110	146	-	302	253	3,1	1
VKP 80/80*2 mini	79	79	260	90	-	352	-	253	3,1	5
VKP 100/100*2 mini	99	99	260	110	-	352	-	253	3,1	5
VKP 80/80*4 mini	79	79	260	90	150	-	302	253	3,4	2
VKP 100/100*4 mini	99	99	260	110	170	-	302	253	3,4	2
VKP 100/80*2 mini	99	79	260	110	-	352	-	253	3,1	5
VKP 100/80*4 mini	99	79	260	110	170	-	302	253	3,1	2
VKP 80/80*5 mini	79	79	260	90	150	352	-	253	3,5	4
VKP 80/80*6 mini	79	79	260	90	150	352	-	253	3,6	6
VKP 100/80*6 mini	99	79	260	110	150	352	-	253	3,6	6
VKP 100/80*5 mini	99	79	260	110	170	352	-	253	3,7	4
VKP 100/100*5 mini	99	99	260	110	170	352	-	253	3,5	4
VKP 100/100*6 mini	99	99	260	110	170	352	-	253	3,5	6

Fig. 1

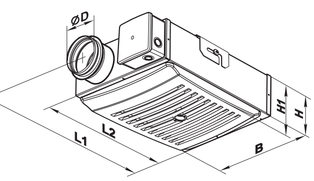


Fig. 2

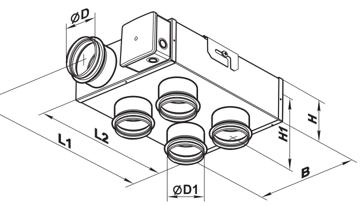


Fig. 3

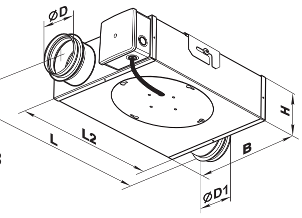


Fig. 4

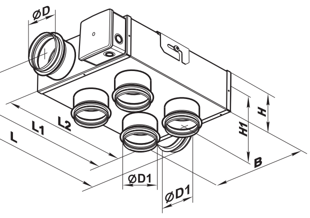


Fig. 5

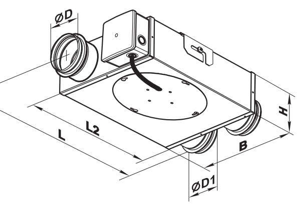
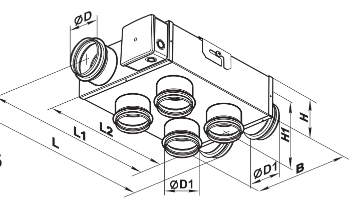


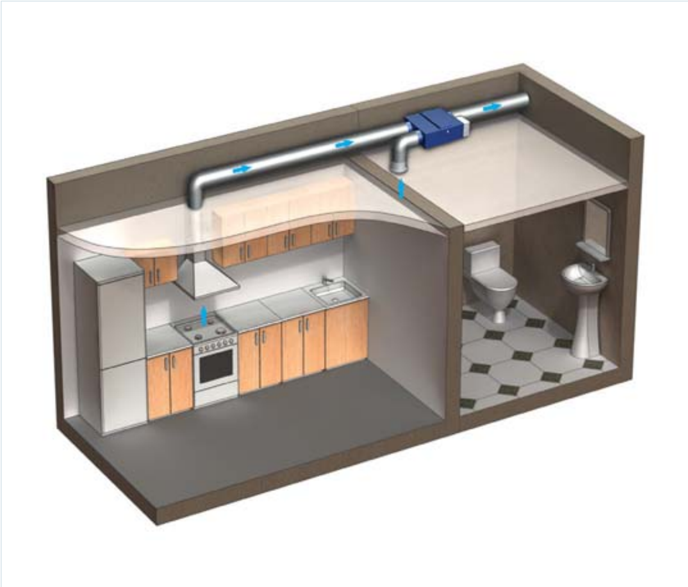
Fig. 6



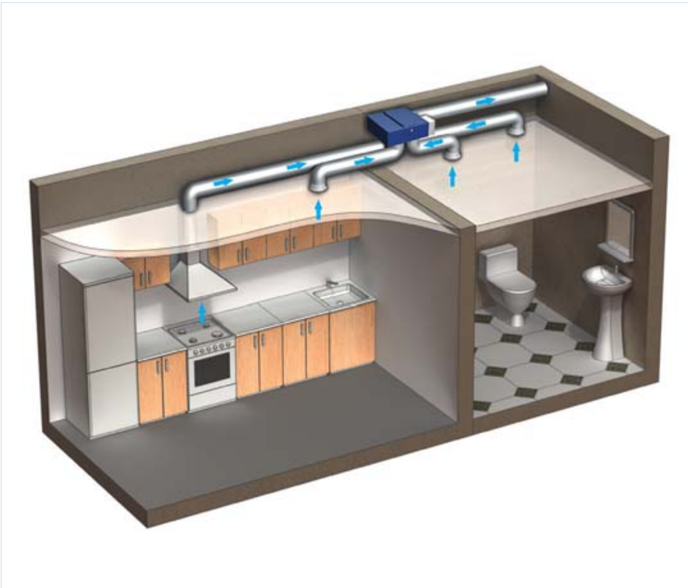
Variants of application of fans VKP mini

▶1 inlet – 1 outlet

▶2 inlet – 1 outlet



▶ 4 inlet – 1 outlet



CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

<table>
<tr><th></th><th colspan="2">Control switch</th><th colspan="3">Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>TT 100</td><td rowspan="8">P2-2-300</td><td rowspan="8">P2-5,0 N(V)</td><td rowspan="8">RTS-1-400</td><td rowspan="8">RTSD-1-400</td><td rowspan="8">RT-10</td><td rowspan="8">T-1,5 N(V)</td><td rowspan="8">TH-1,5 N(V)</td><td rowspan="8">TF-1,5 N(V)</td><td rowspan="8">TR-1,5 N(V)</td></tr>
<tr><td>TT 125</td></tr>
<tr><td>TT 125S</td></tr>
<tr><td>TT 150</td></tr>
<tr><td>TT 160</td></tr>
<tr><td>TT 200</td></tr>
<tr><td>TT 250</td></tr>
<tr><td>TT 315</td></tr>
</table>

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VK 100 Q</td><td rowspan="11">RS-1-300</td><td rowspan="11">RS-1-400</td><td rowspan="6">RS-0,5-PS</td><td rowspan="10">RS-1 N(V)</td><td rowspan="11">RS-1,5-T</td><td rowspan="11">RSA5E-2-P</td><td rowspan="11">RSA5E-1,5-T</td><td rowspan="11">RSA5E-1,5-TA</td><td rowspan="11">RSA5E-2-M</td><td rowspan="11">RT-10</td><td rowspan="11">T-1,5 N(V)</td><td rowspan="11">TH-1,5 N(V)</td><td rowspan="11">TF-1,5 N(V)</td><td rowspan="11">TR-1,5 N(V)</td></tr>
<tr><td>VK 100</td></tr>
<tr><td>VK 125 Q</td></tr>
<tr><td>VK 125</td></tr>
<tr><td>VK 150</td></tr>
<tr><td>VK 200</td></tr>
<tr><td>VKS 200</td><td>RS-1,5-PS</td></tr>
<tr><td>VK 250 Б</td><td>RS-0,5-PS</td></tr>
<tr><td>VK 250</td><td rowspan="3">RS-1,5-PS</td></tr>
<tr><td>VK 315</td></tr>
<tr><td>VKS 315</td><td>RS-1,5 N(V)</td></tr>
</table>

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VKM 100 Q</td><td rowspan="13">RS-1-300</td><td rowspan="13">RS-1-400</td><td rowspan="6">RS-0,5-PS</td><td rowspan="11">RS-1 N(V)</td><td rowspan="13">RS-1,5-T</td><td rowspan="13">RSA5E-2-P</td><td rowspan="13">RSA5E-1,5-T</td><td rowspan="13">RSA5E-1,5-TA</td><td rowspan="13">RSA5E-2-M</td><td rowspan="13">RT-10</td><td rowspan="13">T-1,5 N(V)</td><td rowspan="13">TH-1,5 N(V)</td><td rowspan="13">TF-1,5 N(V)</td><td rowspan="13">TR-1,5 N(V)</td></tr>
<tr><td>VKM 100</td></tr>
<tr><td>VKM 125 Q</td></tr>
<tr><td>VKM 125</td></tr>
<tr><td>VKM 150</td></tr>
<tr><td>VKM 160</td></tr>
<tr><td>VKM 200</td><td rowspan="7">RS-1,5-PS</td></tr>
<tr><td>VKMS 200</td></tr>
<tr><td>VKM 250 Q</td></tr>
<tr><td>VKM 250</td></tr>
<tr><td>VKM 315</td></tr>
<tr><td>VKMS 315</td><td rowspan="2">RS-1,5 N(V)</td></tr>
<tr><td>VKM 355 Q</td></tr>
<tr><td>VKM 400</td><td></td><td></td><td>RS-2,5-PS</td><td>RS-2,5 N(V)</td><td rowspan="2">RS-3,0-T</td><td></td><td rowspan="2">RSA5E-3,5-T</td><td rowspan="2">RSA5E-3,5-TA</td><td rowspan="2">RSA5E-3-M</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VKM 450</td><td></td><td></td><td>RS-4,0-PS</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

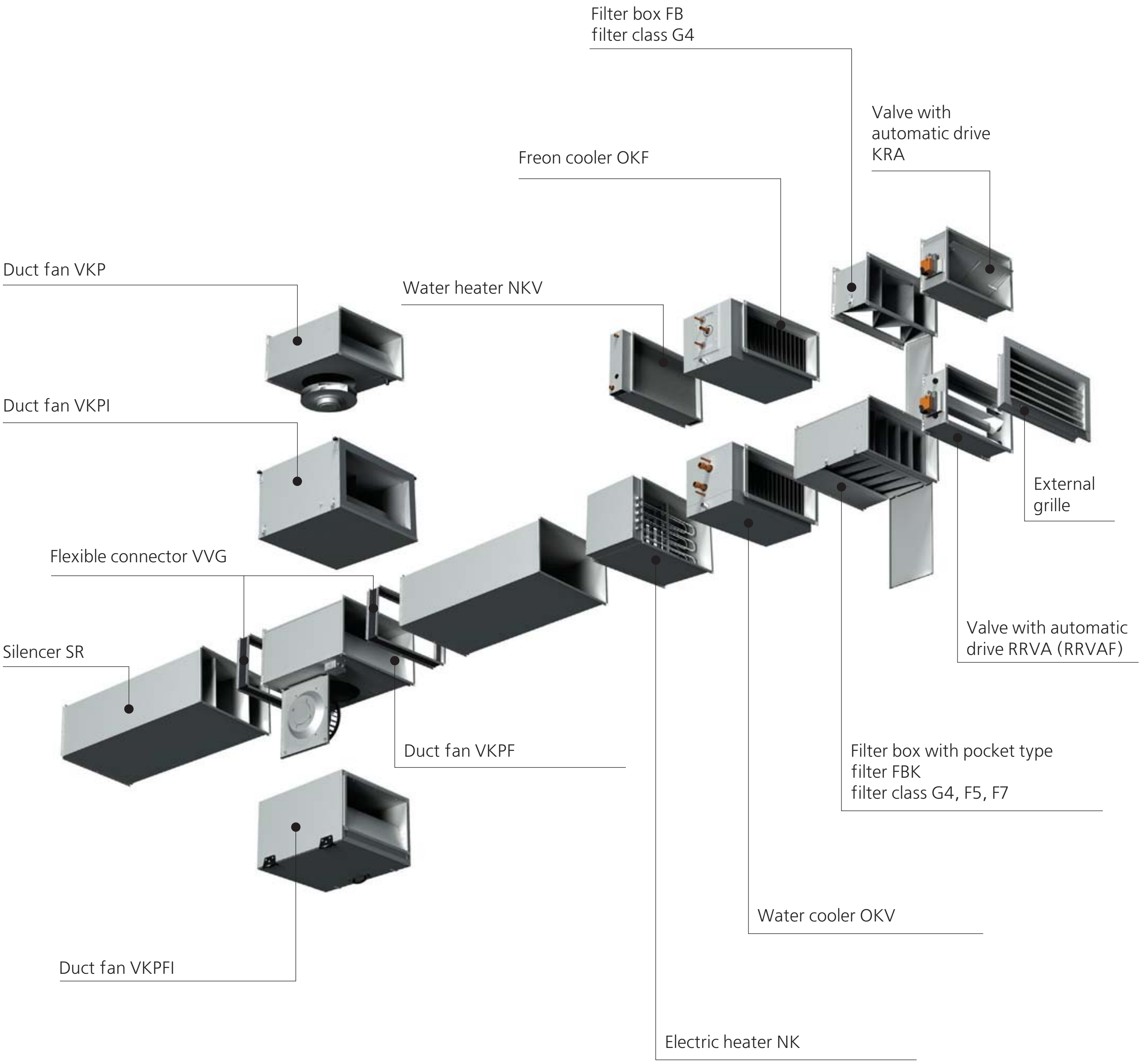
	Thyristor speed controllers					Transformer speed single phase controllers				Temperature controllers	Sensors			
VKMz 100 Q	RS-1-300	RS-1-400	RS-0,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VKMz 100														
VKMz 125 Q														
VKMz 125														
VKMz 150														
VKMz 160														
VKMz 200 Q			RS-1,5-PS											
VKMz 200														
VKMz 250 Q														
VKMz 250														
VKMz 315 Q														
VKMz 315														

	Thyristor speed controllers					Transformer speed single phase controllers				Temperature controllers	Sensors			
VC 100 Q	RS-1-300	RS-1-400	RS-0,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VC 100														
VC 125 Q														
VC 125														
VC 150														
VC 160														
VC 200			RS-1,5-PS											
VCS 200														
VC 250 Q														
VC 250														
VC 315														
VCS 315														

	Thyristor speed controllers					Transformer speed single phase controllers				Temperature controllers	Sensors			
VCN 100	RS-1-300	RS-1-400	RS-0,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VCN 125														
VCN 150														
VCN 160														
VCN 200														

	Control switch		Temperature controllers			Sensors			
VENTS VKP 80 mini smart	P3-1-300	P3-5,0 N(V)	RTS-1-400	RTSD-1-400	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VENTS VKP 100 mini smart									

	Thyristor speed controllers					Transformer speed single phase controllers				Temperature controllers	Sensors			
VENTS VKP 100	RS-1-300	RS-1-400	RS-0,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VENTS VKP 125														
VENTS VKP 150														
VENTS VKP 160														


Filter box FB
filter class G4
Valve with
automatic drive
KRA
Freon cooler OKF
Duct fan VKP
Water heater NKV
Duct fan VKPI
External
grille
Flexible connector VVG
Valve with automatic
drive RRVA (RRVAF)
Silencer SR
Duct fan VKPF
Filter box with pocket type
filter FBK
filter class G4, F5, F7
Water cooler OKV
Duct fan VKPFI
Electric heater NK

SELECTION TABLE

	400x200	500x250	500x300	600x300	600x350	700x400	800x500	900x500	1000x500
Fans	VKPF 4E 400x200	VKPF 4E 500x250	VKPF 4E 500x300	VKPF 4E 600x300	VKPF 4E 600x350	VKPF 4D 700x400	VKPF 6D 800x500	VKPF 6D 900x500	VKPF 6D 1000x500
	VKPF 4D 400x200	VKPF 4D 500x250	VKPF 4D 500x300	VKPF 4D 600x300	VKPF 4D 600x350		VKPF 4D 800x500		
	VKPFI 4E 400x200	VKPFI 4E 500x250	VKPFI 4E 500x300	VKPFI 4E 600x300	VKPFI 4E 600x350	VKPFI 4D 700x400	VKPFI 6D 800x500	VKPFI 6D 900x500	VKPFI 6D 1000x500
	VKPFI 4D 400x200	VKPFI 4D 500x250	VKPFI 4D 500x300	VKPFI 4D 600x300	VKPFI 4D 600x350		VKPFI 4D 800x500		
				VKP 600x300 EC	VKP 600x350 EC	VKP 700x400 EC	VKP 800x500 EC		VKP 1000x500 EC
	VKP 2E 400x200	VKP 2E 500x250	VKP 4E 500x300	VKP 4E 600x300	VKP 4E 600x350				
			VKP 4D 500x300	VKP 4D 600x300	VKP 4D 600x350				
	VKPI 2E 400x200	VKPI 2E 500x250	VKPI 4E 500x300	VKPI 4E 600x300	VKPI 4E 600x350				
			VKPI 4D 500x300	VKPI 4D 600x300	VKPI 4D 600x350				
Filters	FB 400x200	FB 500x250	FB 500x300	FB 600x300	FB 600x350	FB 700x400	FB 800x500	FB 900x500	FB 1000x500
	FBK 400x200-4	FBK 500x250-4	FBK 500x300-4	FBK 600x300-4	FBK 600x350-4	FBK 700x400-4	FBK 800x500-4	FBK 900x500-4	FBK 1000x500-4
	FBK 400x200-5	FBK 500x250-5	FBK 500x300-5	FBK 600x300-5	FBK 600x350-5	FBK 700x400-5	FBK 800x500-5	FBK 900x500-5	FBK 1000x500-5
	FBK 400x200-7	FBK 500x250-7	FBK 500x300-7	FBK 600x300-7	FBK 600x350-7	FBK 700x400-7	FBK 800x500-7	FBK 900x500-7	FBK 1000x500-7
Heaters									
electrical	NK 400x200-4,5-3	NK 500x250-6,0-3	NK 500x300-6,0-3	NK 600x300-9,0-3	NK 600x350-9,0-3	NK 700x400-18-3	NK 800x500-27-3	NK 900x500-45-3	NK 1000x500-45-3
	NK 400x200-6,0-3	NK 500x250-7,5-3	NK 500x300-7,5-3	NK 600x300-12,0-3	NK 600x350-12,0-3	NK 700x400-27-3	NK 800x500-36-3	NK 900x500-54-3	NK 1000x500-54-3
	NK 400x200-7,5-3	NK 500x250-9,0-3	NK 500x300-9,0-3	NK 600x300-15,0-3	NK 600x350-15,0-3	NK 700x400-36-3	NK 800x500-54-3		
	NK 400x200-9,0-3	NK 500x250-10,5-3	NK 500x300-10,5-3	NK 600x300-18,0-3	NK 600x350-18,0-3				
	NK 400x200-10,5-3	NK 500x250-12,0-3	NK 500x300-12,0-3	NK 600x300-21,0-3	NK 600x350-21,0-3				
	NK 400x200-12,0-3	NK 500x250-15,0-3	NK 500x300-15,0-3	NK 600x300-24,0-3	NK 600x350-24,0-3				
	NK 400x200-15,0-3	NK 500x250-18,0-3	NK 500x300-18,0-3						
		NK 500x250-21,0-3	NK 500x300-21,0-3						
water	NKV 400x200-2	NKV 500x250-2	NKV 500x300-2	NKV 600x300-2	NKV 600x350-2	NKV 700x400-2	NKV 800x500-2	NKV 900x500-2	NKV 1000x500-2
	NKV 400x200-4	NKV 500x250-4	NKV 500x300-4	NKV 600x300-4	NKV 600x350-4	NKV 700x400-3	NKV 800x500-3	NKV 900x500-3	NKV 1000x500-3
Coolers									
water	OKV 400X200-3	OKV 500X250-3	OKV 500X300-3	OKV 600X300-3	OKV 600X350-3	OKV 700x400-3	OKV 800x500-3	OKV 900x500-3	OKV 1000x500-3
freon	OKF 400X200-3	OKF 500X250-3	OKF 500X300-3	OKF 600X300-3	OKF 600X350-3	OKF 700x400-3	OKF 800x500-3	OKF 900x500-3	OKF 1000x500-3
Silencers	SR 400x200	SR 500x250	SR 500x300	SR 600x300	SR 600x350	SR 700x400	SR 800x500	SR 900x500	SR 1000x500
Valves, dampers	KR 400x200	KR 500x250	KR 500x300	KR 600x300	KR 600x350				
	KRA 400x200	KRA 500x250	KRA 500x300	KRA 600x300	KRA 600x350				
	KOM 1 400x200	KOM 1 500x250	KOM1 500x300	KOM1 600x300	KOM1 600x350				
	RRV 400x200	RRV 500x250	RRV 500x300	RRV 600x300	RRV 600x350	RRV 700x400	RRV 800x500	RRV 900x500	RRV 1000x500
	RRVA 400x200	RRVA 500x250	RRVA 500x300	RRVA 600x300	RRVA 600x350	RRVA 700x400	RRVA 800x500	RRVA 900x500	RRVA 1000x500
	RRVAF 400x200	RRVAF 500x250	RRVAF 500x300	RRVAF 600x300	RRVAF 600x350	RRVAF 700x400	RRVAF 800x500	RRVAF 900x500	RRVAF 1000x500
	KG 400x200	KG 500x250	KG 500x300	KG 600x300	KG 600x350	KG 700x400	KG 800x500	KG 900x500	KG 1000x500
Flexible connectors	VVG 400x200	VVG 500x250	VVG 500x300	VVG 600x300	VVG 600x350	VVG 700x400	VVG 800x500	VVG 900x500	VVG 1000x500
Plate heat exchangers	PR 400x200	PR 500x250	PR 500x300	PR 600x300	PR 600x350	PR 700x400	PR 800x500	PR 900x500	PR 1000x500
Mixing chambers	SKRA 400x200	SKRA 500x250	SKRA 500x300	SKRA 600x300	SKRA 600x350	SKRA 700x400	SKRA 800x500		
Speed controller									
thyristor	Series RS	Series RS	Series RS	Series RS	Series RS	Series RS	Series RS	Series RS	Series RS
transformer	Series RSA	Series RSA	Series RSA	Series RSA	Series RSA	Series RSA	Series RSA	Series RSA	Series RSA
frequency	Series VFED	Series VFED	Series VFED	Series VFED	Series VFED	Series VFED	Series VFED	Series VFED	Series VFED

FANS FOR RECTANGULAR DUCTS

Series VENTS VKP and VKPI

Centrifugal fans with forward-curved blades and air flow capacity up to 2970 m^3/h. Applied in Intake and exhaust ventilation systems. VKPI models are sound- and heat-insulated. Compatible with rectangular air ducts of the following sizes: 400x200, 500x250, 500x300, 600x300, 600x350 mm.

Series VENTS VKPF and VKPFI

Centrifugal fans fans with forward-curved blades and air flow capacity up to 9540 m^3/h. Applied in Intake and exhaust ventilation systems. VKPFI models are sound- and heat-insulated. Compatible with rectangular air ducts of the following sizes: 400x200, 500x250, 500x300, 600x300, 600x350, 700x400, 800x500, 900x500, 1000x500 mm.

Series
VENTS VKPF

Centrifugal fans with air flow capacity up to **9540 m³/h** for rectangular ducts

Series
VENTS VKPFI

Centrifugal sound- and heat insulated fans with air flow capacity up to **9540 m³/h** for rectangular ducts

Application
Intake and exhaust ventilation of different premises with restricted mounting space. Compatible with rectangular air ducts of the following sizes: 400x200, 500x250, 500x300, 600x300, 600x350, 700x400, 800x500, 900x500, 1000x500 mm.

Design
Fan's case is made of galvanized steel. VKPFI models are heat- and sound-insulated with a layer of mineral wool of 50 mm.

Motor
2- and 4-pole asynchronous motors with external rotor are used. The impeller has forward-curved blades and is made of galvanized steel. The main advantage of such motors are high efficiency and pressure drop. For thermal overheating protection thermal contacts with terminals are built in the motor winding for connection of the outer protection devices. The use of ball bearings provides the long service life. To get the most precise features, low noise level and safe operation, each turbine is dynamically balanced while assembling. Protection class of motor is IP 44.

Speed control
The control can be either smooth or step and is performed with thymistor or autotransformer controller. You can connect several fans at a time to one controller provided that total power and operating current do not exceed the controller's ratings.

Mounting
The fans are mounted in the rectangular ducts openings and require no special fixing if connected to them directly. In case they are connected with the flexible connectors, it is necessary to fix them to the structural unit with supports, suspension brackets or holding brackets. Fans can be mounted in any position considering the airflow direction (indicated with an arrow on the case). It is necessary to provide the access for maintenance of the fan. The power is supplied to the fan through the outer terminals. There is a special cover for inspection and maintenance.

Legend:

Series of a fan	
VENTS VKPF	**I** – model in sound- and heat- insulated case

Motor	
Number of poles	Phase
4 6	**E** – single-phase **D** – three-phase

Flange diameter (WxH)
400x200, 500x250, 500x300, 600x300, 600x350, 700x400, 800x500, 900x500, 1000x500

Accessories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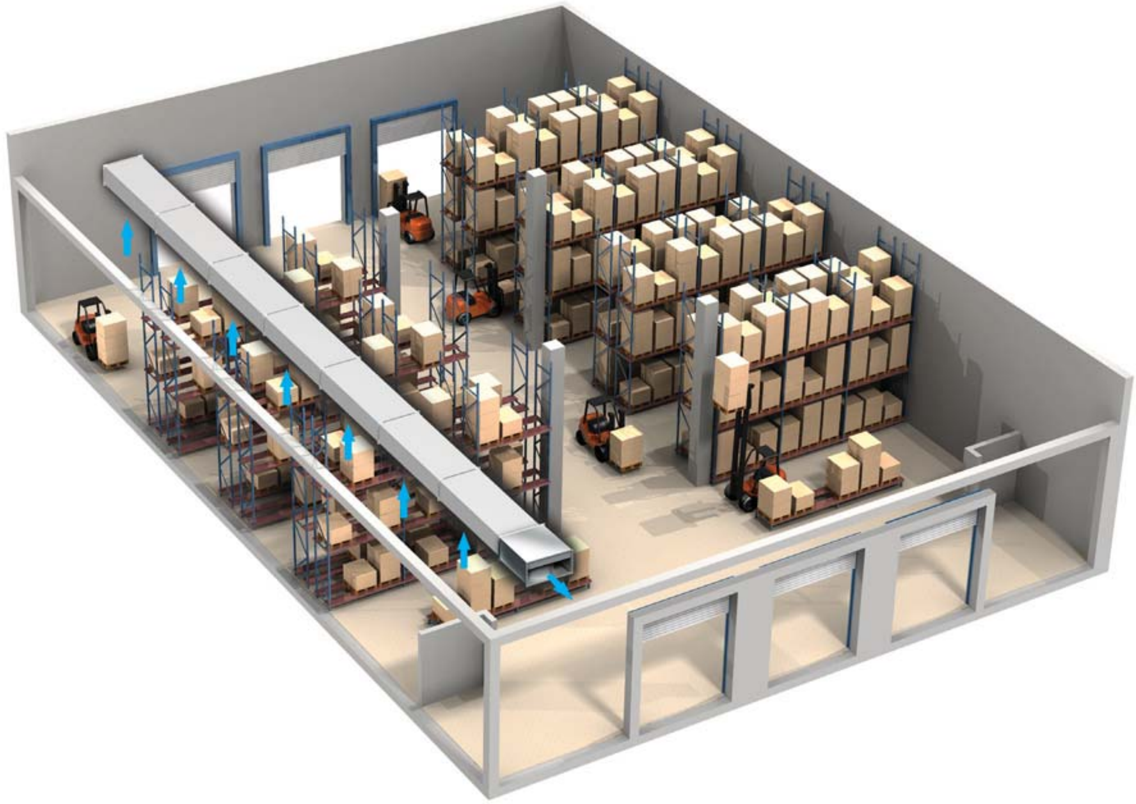
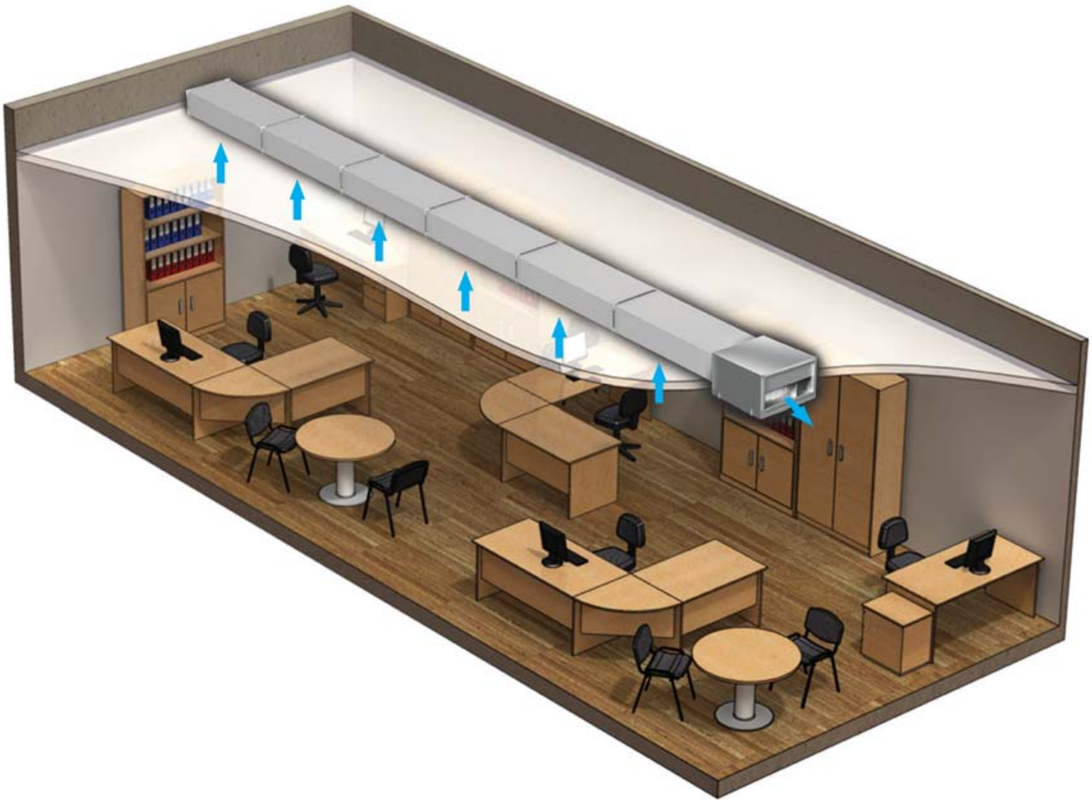


Application of VKPF in warehouse



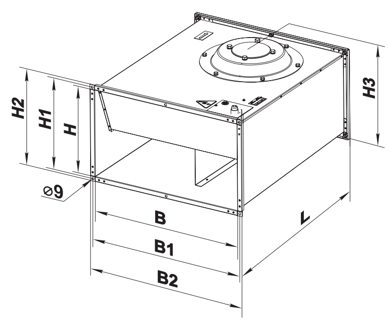
Application of VKPF in office

	VKPF / VKPFI 4E 400x200	VKPF / VKPFI 4D 400x200	VKPF / VKPFI 4E 500x250	VKPF / VKPFI 4D 500x250
Voltage, V~50Hz	230	400	230	400
Power consumption, W	295	282	535	570
Current, A	1,32	0,60	2,49	0,94
Maximum air consumption, m³/h	1440	1470	1750	1850
RPM	1350	1300	1250	1270
Noise level at 3 m, dBA	50	52	53	54
Maximal temperature of transferred air, ⁰C	-25 +40	-25 +45	-20 +40	-20 +40
Index of protection	IP X4	IP X4	IP X4	IP X4

	VKPF / VKPFI 4E 500x300	VKPF / VKPFI 4D 500x300	VKPF / VKPFI 4E 600x300	VKPF / VKPFI 4D 600x300
Voltage, V~50Hz	230	400	230	400
Power consumption, W	710	855	1240	1560
Current, A	3,10	1,70	6,45	2,73
Maximum air consumption, m³/h	2350	2350	2950	3740
RPM	1230	1300	1210	1310
Noise level at 3 m, dBA	57	56	59	57
Maximal temperature of transferred air, ⁰C	-25 +70	-20 +50	-25 +50	-25 +65
Index of protection	IP X4	IP X4	IP X4	IP X4

Type	Dimensions, mm								Weight, kg
	B	B1	B2	H	H1	H2	H3	L	
VKPF 4E 400x200	400	420	440	200	220	240	255	500	17,5
VKPF 4D 400x200	400	420	440	200	220	240	255	500	17,5
VKPF 4E 500x250	500	520	540	250	270	290	335	640	24,0
VKPF 4D 500x250	500	520	540	250	270	290	335	640	24,0
VKPF 4E 500x300	500	520	540	300	320	340	365	680	33,0
VKPF 4D 500x300	500	520	540	300	320	340	365	680	33,0
VKPF 4E 600x300	600	620	640	300	320	340	375	680	35,0
VKPF 4D 600x300	600	620	640	300	320	340	375	680	35,0
VKPF 4E 600x350	600	620	640	350	370	390	425	735	49,5
VKPF 4D 600x350	600	620	640	350	370	390	425	735	49,5
VKPF 4D 700x400	700	720	740	400	420	440	480	780	60,0
VKPF 6D 800x500	800	820	840	500	520	540	580	820	70,0
VKPF 4D 800x500	800	820	840	500	520	540	580	820	74,0
VKPF 6D 900x500	900	920	940	500	520	540	580	954	90,0
VKPF 6D 1000x500	1000	1020	1040	500	520	540	580	954	95,0

VKPF

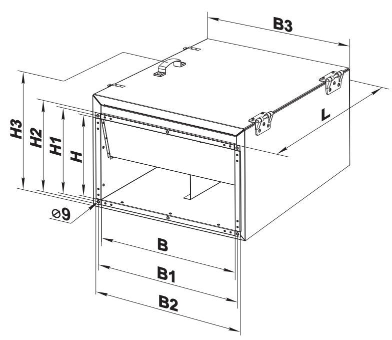


	VKPF / VKPFI 4E 600x350	VKPF / VKPFI 4D 600x350	VKPF / VKPFI 4D 700x400	VKPF / VKPFI 6D 800x500
Voltage, V~50Hz	230	400	400	400
Power consumption, W	2840	2460	3630	2790
Current, A	13,90	3,93	6,00	5,18
Maximum air consumption, m^3/h	4260	5020	6450	7610
RPM	1260	1300	1320	830
Noise level at 3 m, dBA	59	60	65	59
Maximal temperature of transferred air, ^0C	-20 +40	-20 +40	-25 +40	-20 +50
Index of protection	IP X4	IP X4	IP X4	IP X4

	VKPF / VKPFI 4D 800x500	VKPF / VKPFI 6D 900x500	VKPF / VKPFI 6D 1000x500
Voltage, V~50Hz	400	400	400
Power consumption, W	5850	3870	3870
Current, A	9,35	7,0	7,0
Maximum air consumption, m^3/h	8120	9540	9540
RPM	1140	930	930
Noise level at 3 m, dBA	67	61	61
Maximal temperature of transferred air, ^0C	-25 +40	-20 +55	-20 +55
Index of protection	IP X4	IP X4	IP X4

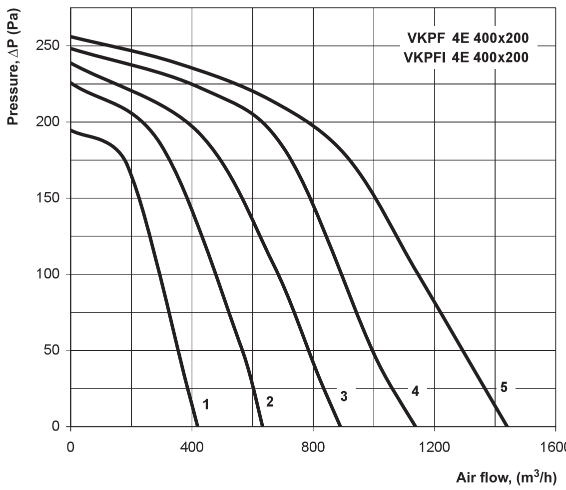
Type	Dimensions, mm									Weight, kg
	B2	B1	B	B3	H2	H1	H	H3	L	
VKPFI 4E 400x200	440	420	400	470	240	220	200	360	500	29,0
VKPFI 4D 400x200	440	420	400	470	240	220	200	360	500	29,0
VKPFI 4E 500x250	540	520	500	570	290	270	250	410	640	40,5
VKPFI 4D 500x250	540	520	500	570	290	270	250	410	640	40,5
VKPFI 4E 500x300	540	520	500	570	340	320	300	460	680	52,5
VKPFI 4D 500x300	540	520	500	570	340	320	300	460	680	52,5
VKPFI 4E 600x300	640	620	600	670	340	320	300	480	680	56,0
VKPFI 4D 600x300	640	620	600	670	340	320	300	480	680	56,0
VKPFI 4E 600x350	640	620	600	670	390	370	350	530	735	72,0
VKPFI 4D 600x350	640	620	600	670	390	370	350	530	735	72,0
VKPFI 4D 700x400	740	720	700	800	440	420	400	620	880	103,0
VKPFI 6D 800x500	840	820	800	900	540	520	500	720	935	120,0
VKPFI 4D 800x500	840	820	800	900	540	520	500	720	935	127,0
VKPFI 6D 900x500	940	920	900	1000	540	520	500	720	1000	142,0
VKPFI 6D 1000x500	1040	1020	1000	1100	540	520	500	720	1000	150,0

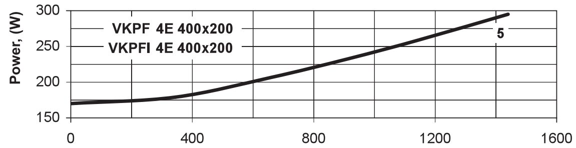
VKPFI



VENTS
VKPF / VKPFI
FAN SERIES

VENTS VKPF / VKPFI





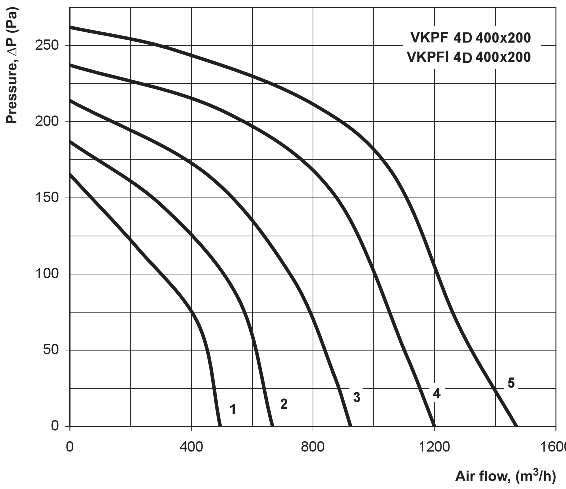
VKPF 4E 400x200

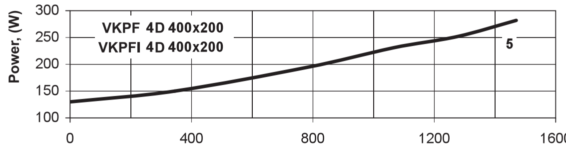
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	69	58	68	63	59	56	53	53	45
L_{wA} to outlet	dBA	70	53	63	67	62	65	63	58	55
L_{wA} to environment	dBA	59	34	46	57	52	49	43	40	36

VKPFI 4E 400x200

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	66	50	60	58	54	50	49	46	39
L_{wA} to outlet	dBA	67	48	60	62	58	60	57	54	49
L_{wA} to environment	dBA	43	24	35	45	41	36	34	29	22

VENTS VKPF / VKPFI





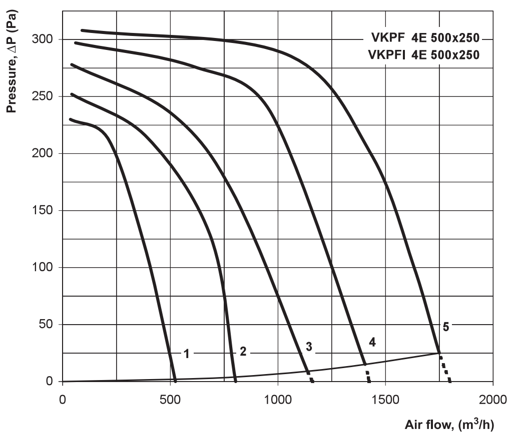
VKPF 4D 400x200

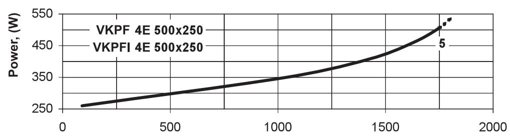
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	72	56	69	65	57	58	57	53	48
L_{wA} to outlet	dBA	74	54	65	66	61	63	60	61	55
L_{wA} to environment	dBA	61	34	44	56	52	50	44	40	33

VKPFI 4D 400x200

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	65	53	62	60	54	52	50	46	41
L_{wA} to outlet	dBA	66	48	59	62	58	58	58	53	47
L_{wA} to environment	dBA	47	24	36	45	38	36	30	29	22

VENTS VKPF / VKPFI





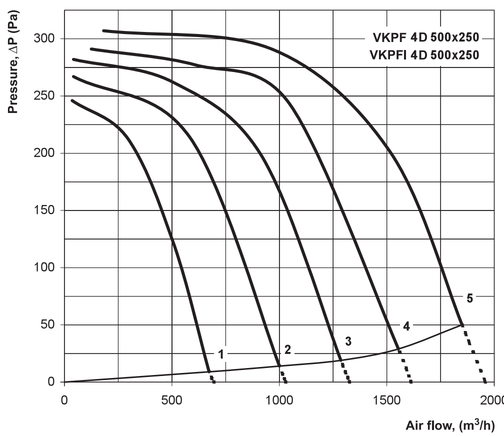
VKPF 4E 500x250

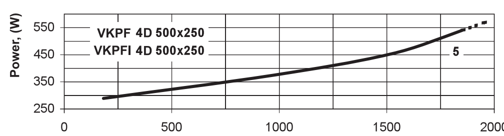
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	72	58	67	62	57	62	64	62	60
L_{wA} to outlet	dBA	77	57	63	62	66	72	69	68	63
L_{wA} to environment	dBA	62	41	49	54	53	56	52	51	53

VKPFI 4E 500x250

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	68	57	62	58	54	57	58	59	53
L_{wA} to outlet	dBA	72	50	60	61	60	66	66	61	62
L_{wA} to environment	dBA	51	29	36	39	43	44	38	37	43

VENTS VKPF / VKPFI





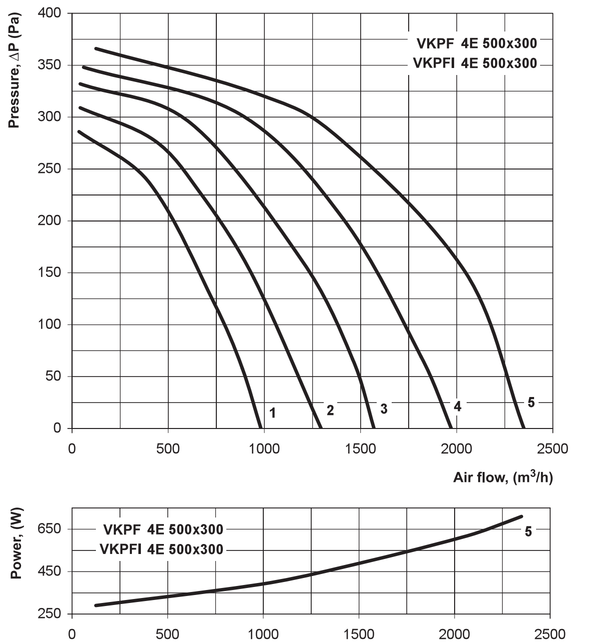
VKPF 4D 500x250

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
		Octave-frequency band, (Hz)								
L_{wA} to inlet	dBA	74	60	67	64	61	64	62	60	58
L_{wA} to outlet	dBA	76	57	65	65	67	69	69	68	63
L_{wA} to environment	dBA	61	41	48	53	53	56	52	50	53

VKPFI 4D 500x250

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	67	55	61	57	52	61	58	57	54
L_{wA} to outlet	dBA	71	49	58	60	62	67	66	61	60
L_{wA} to environment	dBA	50	27	38	41	44	45	42	40	43

VENTS VKPF / VKPFI

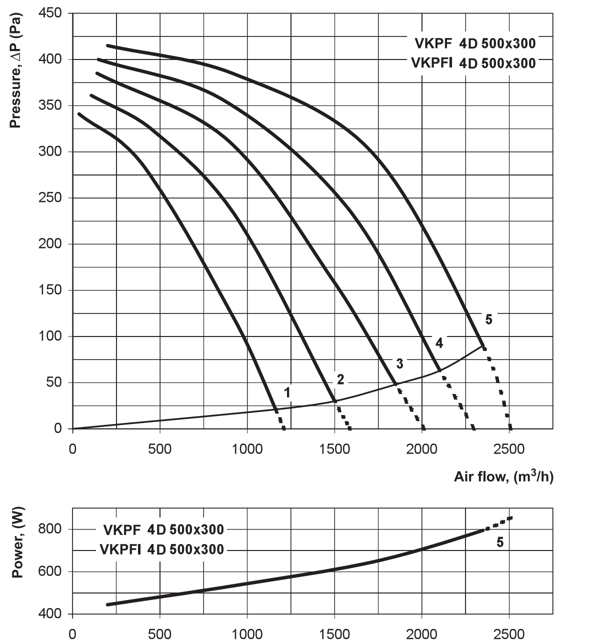


VKPF 4E 500x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	64	69	65	63	66	67	65	60
L_{wA} to outlet	dBA	79	62	69	66	72	73	72	71	64
L_{wA} to environment	dBA	64	46	53	59	54	58	56	49	50

VKPFI 4E 500x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	69	59	65	59	58	64	63	60	56
L_{wA} to outlet	dBA	74	57	62	63	65	69	68	65	61
L_{wA} to environment	dBA	53	34	43	48	43	46	42	37	38

VENTS VKPF / VKPFI

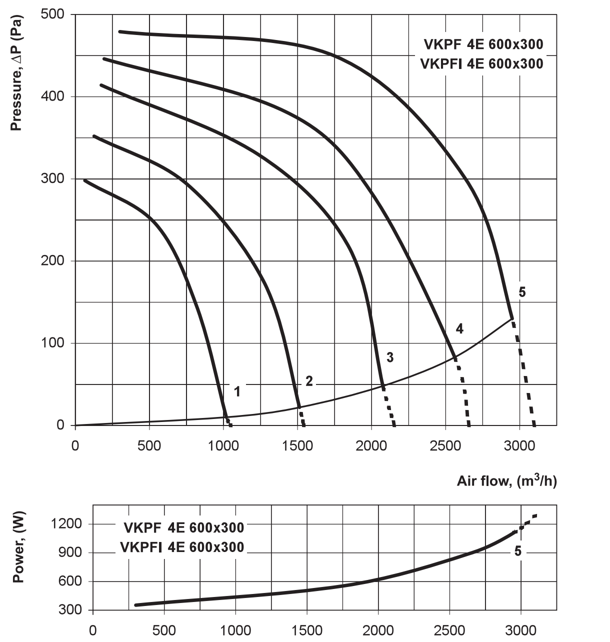


VKPF 4D 500x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	67	69	62	63	68	68	68	63
L_{wA} to outlet	dBA	79	61	68	69	71	75	74	73	68
L_{wA} to environment	dBA	65	46	55	58	56	60	54	48	47

VKPFI 4D 500x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	71	62	64	59	60	62	63	63	56
L_{wA} to outlet	dBA	72	58	62	63	65	71	66	67	63
L_{wA} to environment	dBA	52	33	42	48	45	46	42	36	36

VENTS VKPF / VKPFI

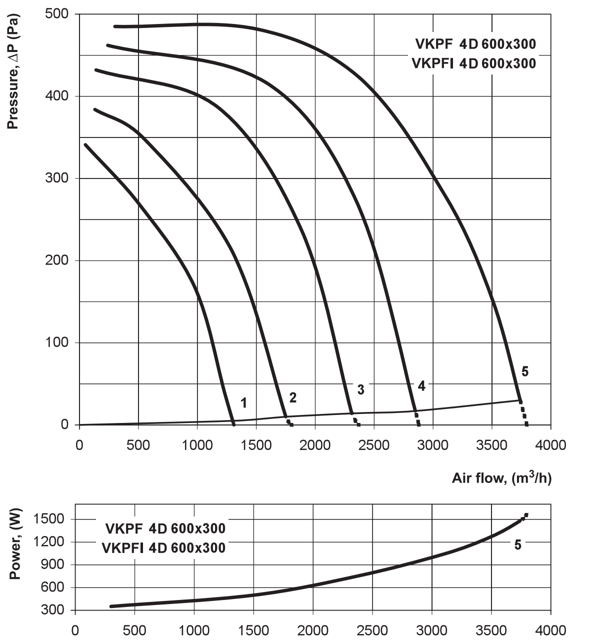


VKPF 4E 600x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	83	66	77	69	66	71	70	71	67
L_{wA} to outlet	dBA	85	62	77	71	74	79	76	73	67
L_{wA} to environment	dBA	69	42	65	66	61	61	56	53	47

VKPFI 4E 600x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	78	61	72	63	62	68	68	65	66
L_{wA} to outlet	dBA	80	55	74	65	72	74	70	68	66
L_{wA} to environment	dBA	58	30	53	54	49	48	43	39	37

VENTS VKPF / VKPFI

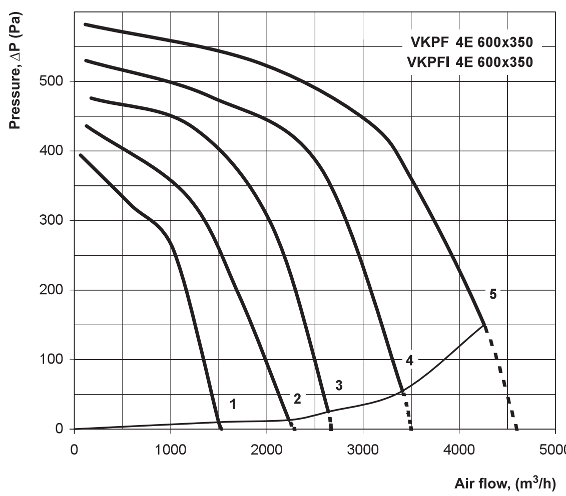


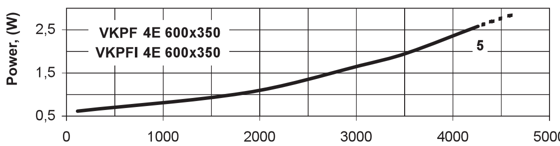
VKPF 4D 600x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	82	66	77	67	67	70	72	68	69
L_{wA} to outlet	dBA	82	62	77	71	76	79	75	76	67
L_{wA} to environment	dBA	71	43	63	62	64	62	55	49	51

VKPFI 4D 600x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	75	65	72	62	62	67	66	62	64
L_{wA} to outlet	dBA	79	57	72	66	70	72	70	67	65
L_{wA} to environment	dBA	56	30	52	52	49	51	42	37	35

VENTS VKPF / VKPFI





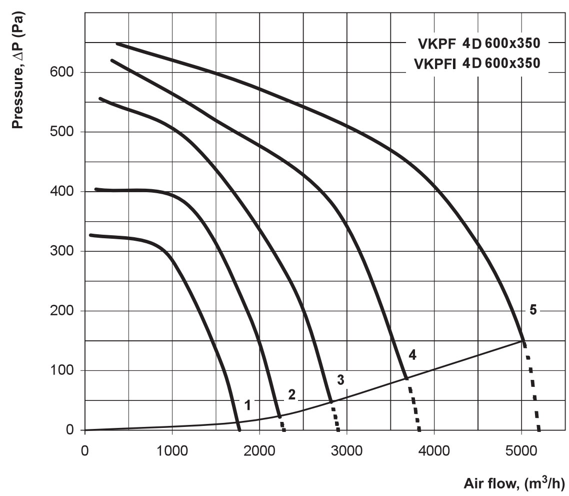
VKPF 4E 600x350

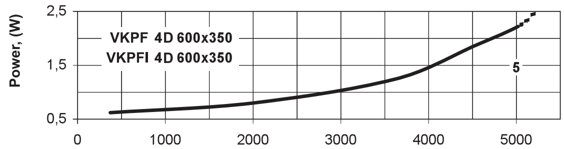
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{WA} to inlet	dBA	78	71	74	65	66	75	72	70	64
L_{WA} to outlet	dBA	86	69	73	74	74	78	76	77	68
L_{WA} to environment	dBA	67	54	60	63	58	62	55	51	48

VKPFI 4E 600x350

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	75	69	69	62	63	70	65	64	62
L_{WA} to outlet	dBA	78	62	68	67	71	76	73	69	66
L_{WA} to environment	dBA	54	40	51	51	48	48	43	40	35

VENTS VKPF / VKPFI





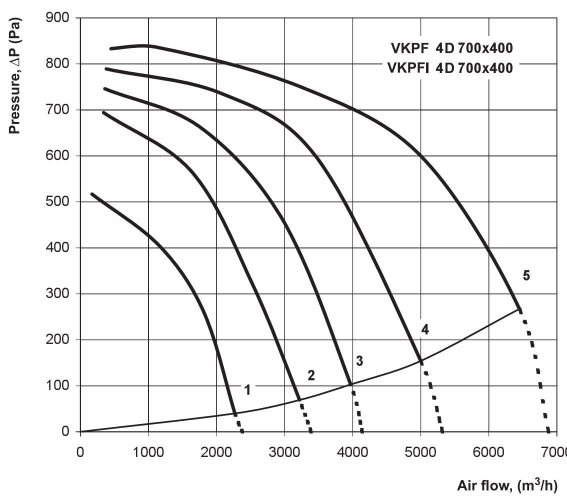
VKPF 4D 600x350

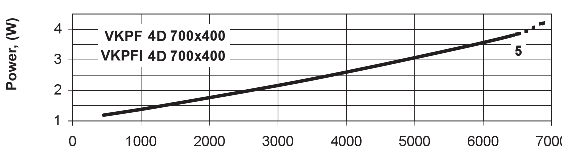
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{WA} to inlet	dBA	80	72	75	69	67	73	71	69	67
L_{WA} to outlet	dBA	84	66	74	70	76	79	76	74	68
L_{WA} to environment	dBA	68	52	62	65	61	58	56	52	48

VKPFI 4D 600x350

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	73	66	72	64	63	69	67	63	59
L_{WA} to outlet	dBA	80	64	67	67	69	76	71	69	65
L_{WA} to environment	dBA	56	40	48	49	49	48	43	41	38

VENTS VKPF / VKPFI





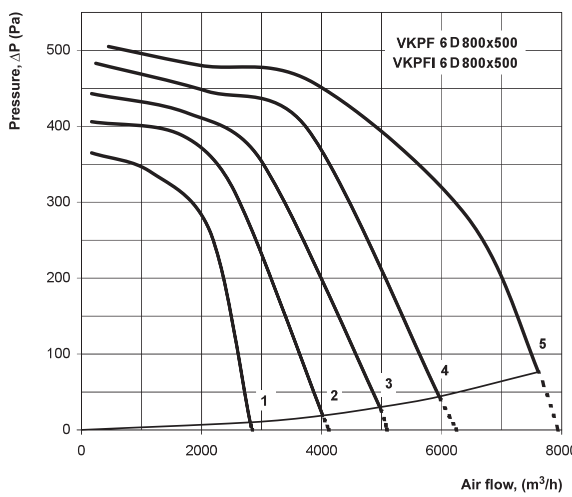
VKPF 4D 700x400

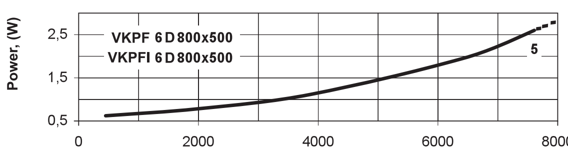
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{WA} to inlet	dBA	82	80	77	70	71	75	73	71	68
L_{WA} to outlet	dBA	86	74	77	75	78	83	81	77	71
L_{WA} to environment	dBA	71	55	64	69	67	70	63	62	59

VKPFI 4D 700x400

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	77	75	70	64	62	73	71	66	64
L_{WA} to outlet	dBA	79	68	70	70	72	76	72	74	67
L_{WA} to environment	dBA	61	41	54	57	53	56	52	53	47

VENTS VKPF / VKPFI





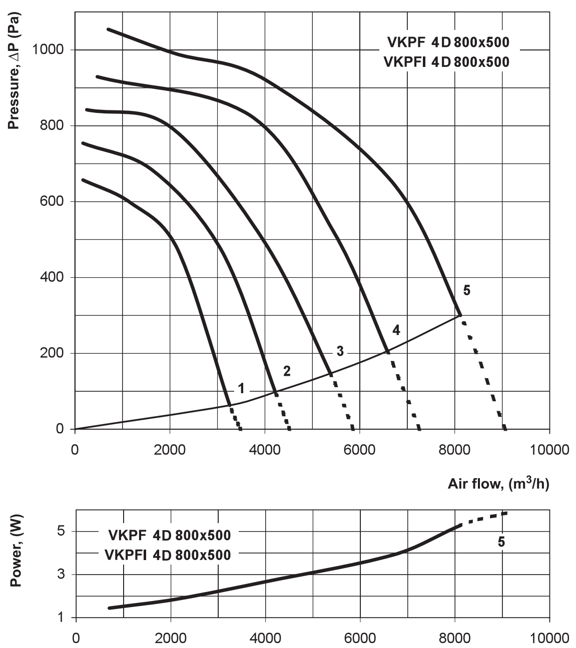
VKPF 6D 800x500

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{WA} to inlet	dBA	77	64	66	66	70	71	70	66	62
L_{WA} to outlet	dBA	82	64	66	69	76	74	73	73	64
L_{WA} to environment	dBA	64	51	59	58	61	60	55	50	49

VKPFI 6D 800x500

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	70	61	60	60	64	67	66	63	58
L_{WA} to outlet	dBA	79	58	63	64	72	73	70	69	62
L_{WA} to environment	dBA	54	37	45	45	50	48	41	37	39

VENTS VKPF / VKPFI



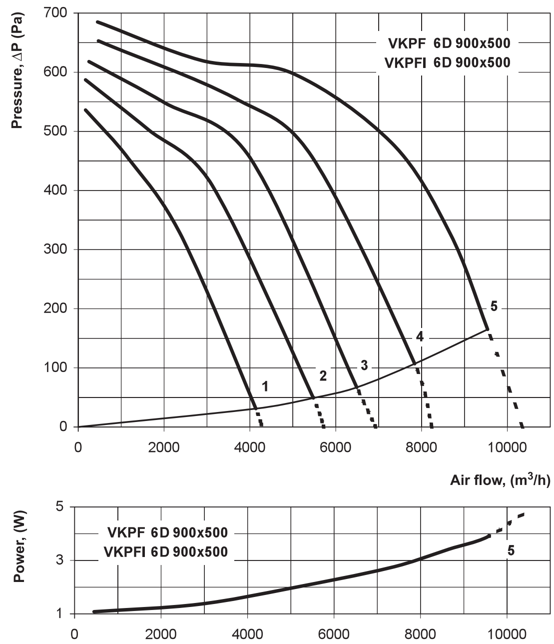
VKPF 4D 800x500

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	82	71	74	75	70	75	75	70	67
L_{wA} to outlet	dBA	90	72	77	76	82	86	85	80	78
L_{wA} to environment	dBA	73	61	68	67	65	70	66	61	60

Octave-frequency band, (Hz)

VKPFI 4D 800x500	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	79	68	68	70	65	71	71	66	62
L_{wA} to outlet	dBA	84	65	72	73	77	81	80	75	71
L_{wA} to environment	dBA	64	49	56	55	53	59	50	48	48

VENTS VKPF / VKPFI



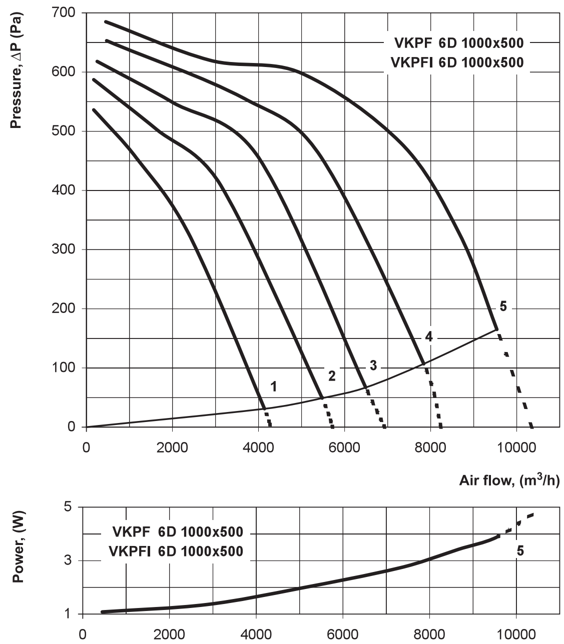
VKPF 6D 900x500

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	78	70	68	63	72	69	71	68	64
L_{wA} to outlet	dBA	83	71	70	70	80	78	79	74	68
L_{wA} to environment	dBA	65	56	64	60	63	58	56	52	51

Octave-frequency band, (Hz)

VKPFI 6D 900x500	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	65	64	57	66	68	68	62	57
L_{wA} to outlet	dBA	80	62	66	66	71	74	72	69	65
L_{wA} to environment	dBA	55	45	51	46	52	48	47	41	43

VENTS VKPF / VKPFI



VKPF 6D 1000x500

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	80	73	68	64	74	71	72	69	66
L_{wA} to outlet	dBA	86	70	71	71	78	78	78	75	71
L_{wA} to environment	dBA	69	59	61	59	65	61	58	53	53

Octave-frequency band, (Hz)

VKPFI 6D 1000x500	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	76	68	62	58	66	66	67	64	60
L_{wA} to outlet	dBA	80	64	64	67	74	75	73	67	67
L_{wA} to environment	dBA	59	46	51	50	53	48	46	42	40

VENTS VKPF / VKPFI FAN SERIES

Series
VENTS VKP EC

Centrifugal fans with air flow capacity up to **10850 m³/h** for rectangular ducts

Application
Intake and exhaust ventilation and air conditioning systems of various applications for premises requiring cost-effective solution and controlled ventilation. Application of EC motors in VKP fan allow to reduce the power consumption by 1, 5-3 times as well as to provide high efficiency and low noise level. This is of special importance if the fans are applied in public facilities (banks, supermarkets, restaurants, hotels etc.), close to domestic buildings and in domestic sphere (for instance, ventilation of private pools). The fans are compatible with rectangular ducts of nominal cross-section of 600x300, 600x350, 700x400, 800x500, 1000x500 mm.

Design
The fan's case is made of galvanized steel. All the inner elements are interconnected with rivets. The fan is equipped with standard flanges of 20 mm wide.

Motor
Highly efficient electric-commuter EC-series motors with external rotor and impeller with backward-curved blades are being used. As of today, such motor is the most advanced solution for energy saving. EC-motors feature is high level of efficiency and optimal control over the whole range of fan speeds. Premium efficiency (reaching 90%) is an unquestionable advantage of electric-commuter motor.

Functions and control
Control of the fan control is effected by external control signal 0-10 V (air flow capacity depends on temperature level, pressure and smoke conditions). Fan with EC-motor changes its speed and supply (or exhaust) exact air volume needed for ventilation when one of the control factor value has been changed.
Maximal speed of the fan does not depend on the current frequency. Fan can operate at 50 or 60 Hz.
Fans can be integrated to the computer system of control. Respective software allows to control the operation of all fan units with high accuracy and set particular settings and display a current mode of each fan.

Mounting
The fans are mounted in the rectangular ducts openings and require no special fixing if connected directly thereto. It is necessary to fix the fan to the structural unit with supports, suspension brackets or holding brackets in case they are connected with the flexible connectors. Fans can be mounted in any position considering the airflow direction (indicated with an arrow on the case). It is necessary to provide the access for maintenance of the fan. The power is supplied to the fan through the outer terminals. There is a special cover for inspection and maintenance.

Legend:

Series of a fan	Flange diameter (WxH)	Motor
VENTS VKP	600x300, 600x350, 700x400, 800x500, 1000x500	**EC** – electric-commutted syncronous motor

Accessories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p. 216


p. 220


p. 226


p. 236


p. 274


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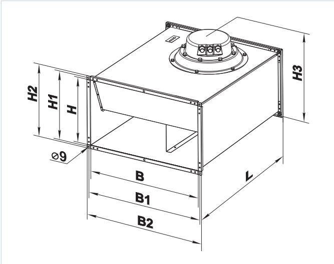
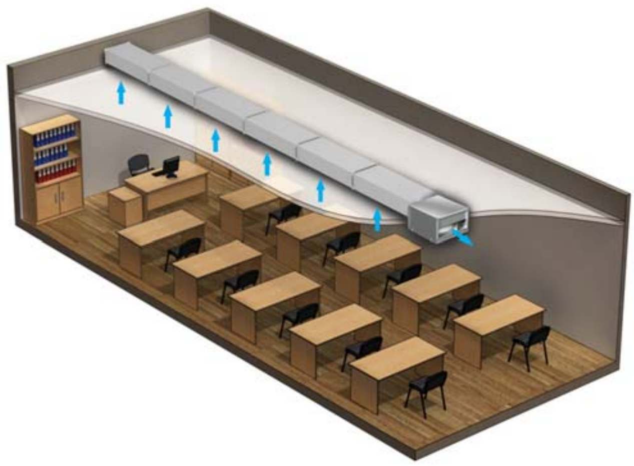
	VKP 600x300 EC	VKP 600x350 EC	VKP 700x400 EC	VKP 800x500 EC	VKP 1000x500 EC
Voltage, V~50Hz	1~ 200-277	3~ 380-480	3~ 380-480	3~ 380-480	3~ 380-480
Power consumption, W	0,48	0,99	1,70	2,95	2,98
Current, A	3,10	1,70	2,60	4,60	4,60
Maximum air consumption, m^3/h	3350	4550	6300	8900	10850
RPM	2300	2580	2600	2500	2040
Noise level at 3 m, dBA	58	60	63	65	69
Maximal temperature of transferred air, ^0C	-25 +60	-25 +50	-25 +40	-25 +40	-25 +40
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4

Type	Dimensions, mm								Weight, kg
	B	B1	B2	H	H1	H2	H3	L	
VKP 600x300 EC	600	620	640	300	320	340	430	680	35,0
VKP 600x350 EC	600	620	640	350	370	390	480	735	49,5
VKP 700x400 EC	700	720	740	400	420	440	540	780	60,0
VKP 800x500 EC	800	820	840	500	520	540	640	880	70,0
VKP 1000x500 EC	1000	1020	1040	500	520	540	640	954	95,0

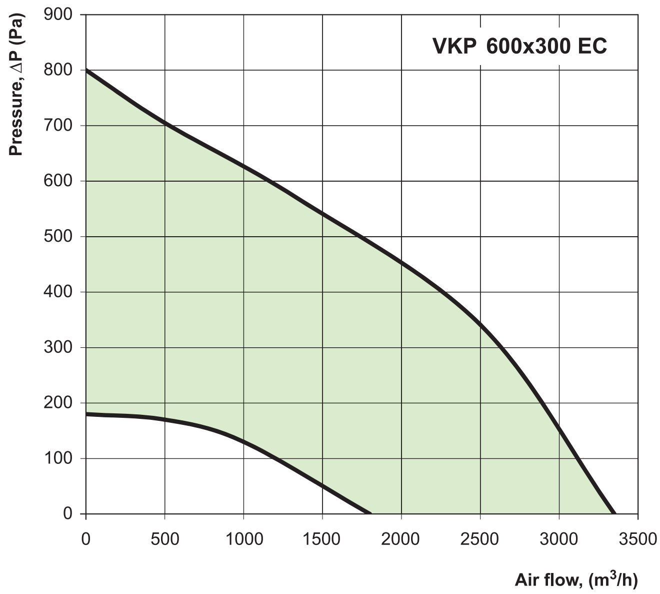




Application of VKP EC fan in a school class

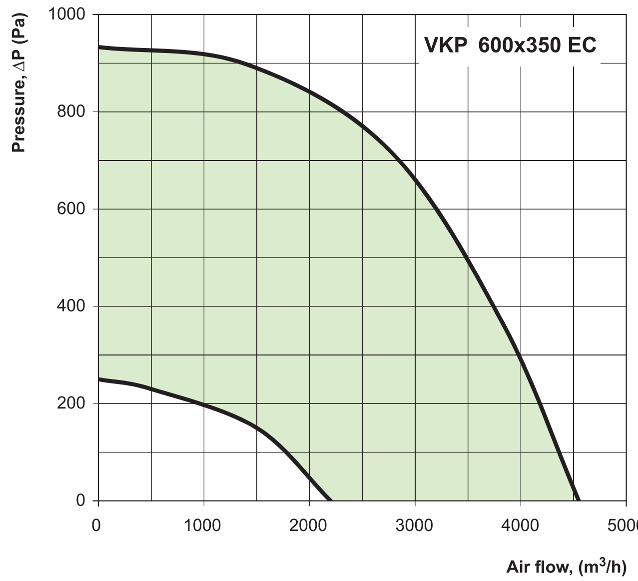
Application of VKP EC fan in a parking place

VENTS VKP EC



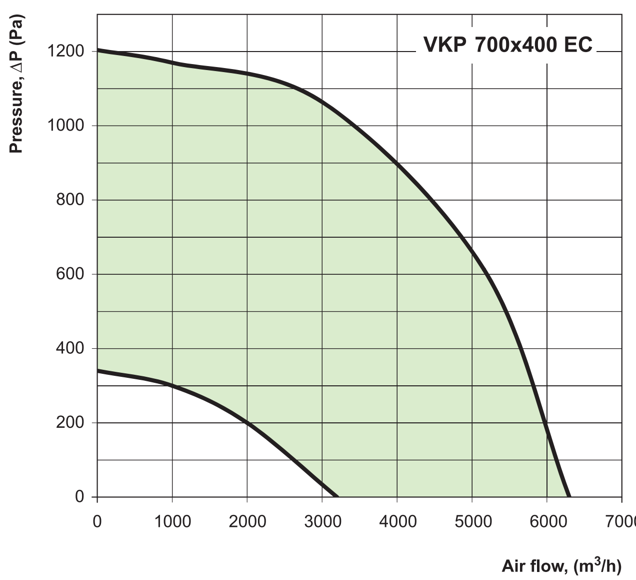
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	79	68	78	68	65	71	74	70	69
L_{wA} to outlet	dBA	84	62	77	73	77	78	78	74	70
L_{wA} to environment	dBA	69	42	64	64	64	60	57	51	49

VENTS VKP EC



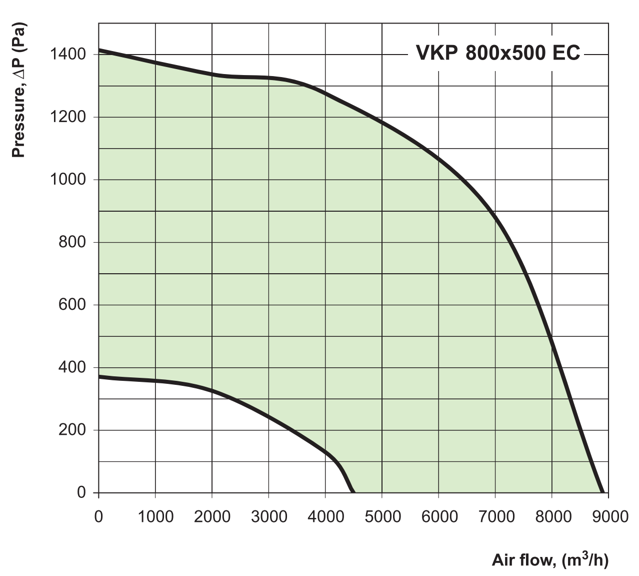
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	80	71	77	67	69	72	72	70	65
L_{wA} to outlet	dBA	84	67	75	71	74	77	77	77	70
L_{wA} to environment	dBA	68	52	63	65	61	60	56	50	46

VENTS VKP EC



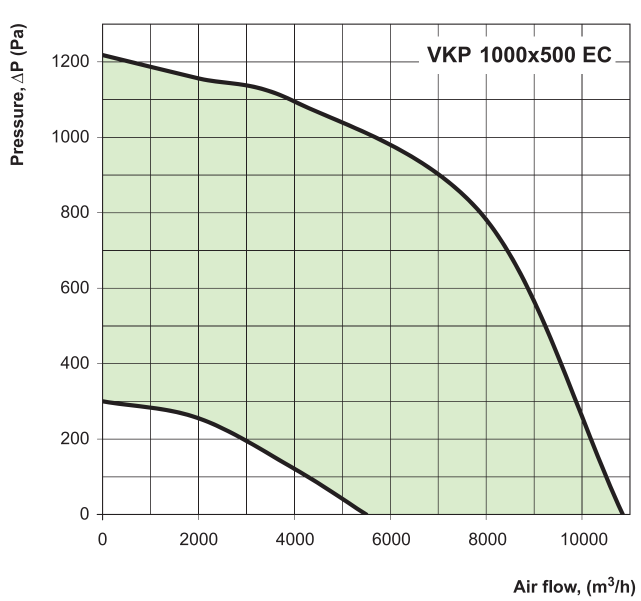
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	84	79	76	72	68	76	75	69	68
L_{wA} to outlet	dBA	85	73	73	76	80	81	80	77	72
L_{wA} to environment	dBA	73	57	64	66	65	68	63	64	60

VENTS VKP EC



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	84	70	73	75	73	76	75	71	66
L_{wA} to outlet	dBA	91	73	77	76	81	87	86	79	76
L_{wA} to environment	dBA	72	62	68	66	68	69	65	58	57

VENTS VKP EC



Sound pressure level		Octave-frequency band, (Hz)								
	Гц	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	81	73	70	65	72	74	70	67	63
L_{wA} to outlet	dBA	86	70	70	72	78	79	78	73	70
L_{wA} to environment	dBA	69	57	63	63	65	62	56	53	54

Series
VENTS VKP

Centrifugal fans with air flow capacity up to **2970 m³/h** for rectangular ducts

Series
VENTS VKPI

Centrifugal fans with heat- and sound insulation with air flow capacity up to **2970 m³/h** for rectangular ducts

Application
Intake and exhaust ventilation of different premises with restricted mounting space. Compatible with rectangular air ducts of the following sizes: 400x200, 500x250, 500x300, 600x300, 600x350 mm.

Design
Fan's case is made of galvanized steel. VKPI models are heat- and sound-insulated with a layer of mineral cotton of 50 mm.

Motor
2- and 4-pole asynchronous motors with external rotor are used. The impeller has back-curved blades and is made of galvanized steel. For thermal overheating protection thermal contacts with terminals are built in the motor coil winding for connection of the outer protection devices. The use of ball bearings provides the long service life. To get the most precise features, low noise level and safe operation, each turbine is dynamically balanced while assembling. Protection class of motor is IP 44.

Speed control
The control can be either smooth or step and is performed with thymistor or autotransformer controller. You can connect several fans at a time to one controller provided that total power and operating current do not exceed the controller's ratings.

Mounting
The fans mounted in the rectangular ducts openings and require no special fixing if connected directly thereto. In case they are connected with the flexible connectors, it is necessary to fix them to the structural unit with supports, suspension brackets or holding brackets. Fans can be mounted in any position considering the airflow direction (indicated with an arrow on the case). It is necessary to provide the access for maintenance of the fan. The power is supplied to the fan through the outer terminals. There is a protective cap for inspection and maintenance.

Legend:

Series of a fan		Model of a motor		Flange diameter (WxH)
		Number of poles	Phase	
VENTS VKP	**I** – model in the sound- and heat-insulated case	4 6	**E** – single-phase **D** – three-phase	400x200, 500x250, 500x300, 600x300, 600x350

Accessories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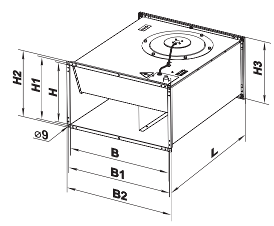
	VKP/ VKPI 2E 400x200	VKP/ VKPI 2E 500x250	VKP/ VKPI 4E 500x300	VKP/ VKPI 4D 500x300
Voltage, V~50Hz	230	230	230	400
Power consumption, W	138	305	140	136
Current, A	0,60	1,32	0,57	0,34
Maximum air consumption, m³/h	930	1720	1700	1380
RPM	2600	2550	1390	1360
Noise level at 3 m, dBA	59	61	53	53
Maximal temperature of transferred air, ⁰C	-25 +45	-25 +45	-25 +45	-25 +65
Index of protection	IPX4	IPX4	IPX4	IPX4

	VKP/ VKPI 4E 600x300	VKP/ VKPI 4D 600x300	VKP/ VKPI 4E 600x350	VKP/ VKPI 4D 600x350	
Voltage, V~50Hz	230	400	230	400△	400Y
Power consumption, W	220	230	470	510	380
Current, A	0,90	0,52	2,37	1,41	0,70
Maximum air consumption, m³/h	2470	2530	2950	2970	2660
RPM	1400	1360	1370	1415	1235
Noise level at 3 m, dBA	55	53	67	64	63
Maximal temperature of transferred air, ⁰C	-25 +45	-25 +70	-40 +80	-40 +60	-40 +80
Index of protection	IPX4	IPX4	IPX4	IPX4	

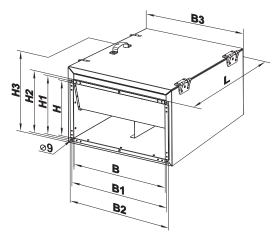
Type	Dimensions, mm								Weight, kg
	B	B1	B2	H	H1	H2	H3	L	
VKP 2E 400x200	400	420	440	200	220	240	240	500	13,6
VKP 2E 500x250	500	520	540	250	270	290	290	640	17,7
VKP 4E 500x300	500	520	540	300	320	340	340	680	25,5
VKP 4D 500x300	500	520	540	300	320	340	340	680	25,5
VKP 4E 600x300	600	620	640	300	320	340	342	680	31,5
VKP 4D 600x300	600	620	640	300	320	340	342	680	32,5
VKP 4E 600x350	600	620	640	350	370	390	390	735	41,5
VKP 4D 600x350	600	620	640	350	370	390	390	735	41,5

VKP

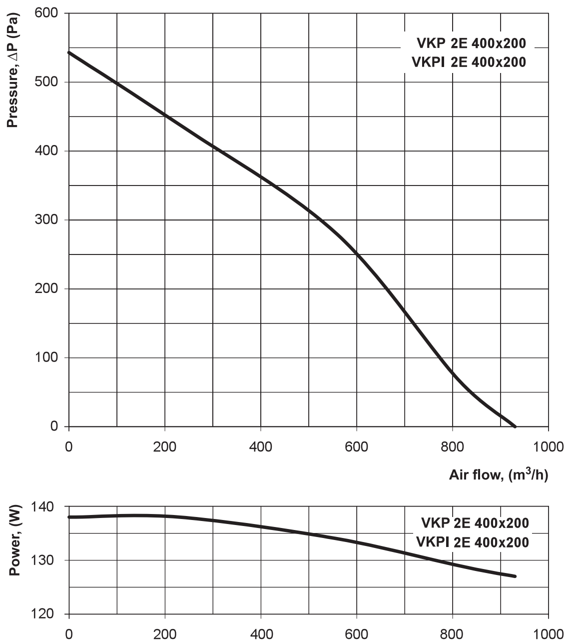


Type	Dimensions, mm									Weight, kg
	B	B1	B2	B3	H	H1	H2	H3	L	
VKPI 2E 400x200	400	420	440	500	200	220	240	360	500	24,4
VKPI 2E 500x250	500	520	540	600	250	270	290	410	640	34,0
VKPI 4E 500x300	500	520	540	600	300	320	340	460	680	45,0
VKPI 4D 500x300	500	520	540	600	300	320	340	460	680	45,0
VKPI 4E 600x300	600	620	640	700	300	320	340	460	680	52,5
VKPI 4D 600x300	600	620	640	700	300	320	340	460	680	53,0
VKPI 4E 600x350	600	620	640	700	350	370	390	530	735	64,0
VKPI 4D 600x350	600	620	640	700	350	370	390	530	735	64,0

VKPI



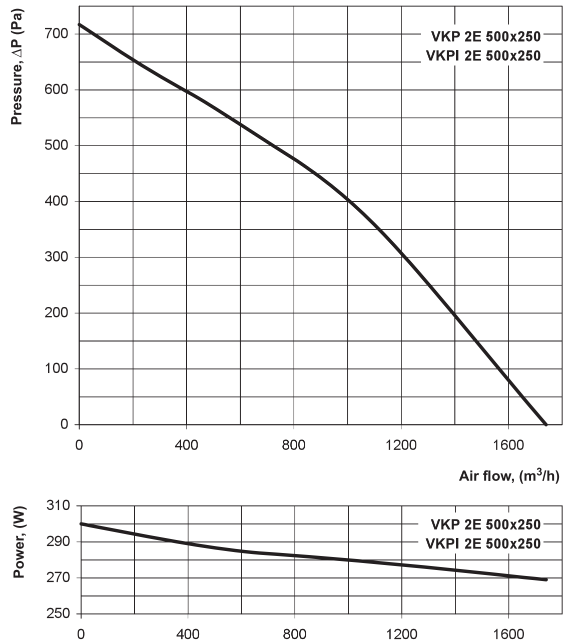
VENTS VKP / VKPI



VKP 2E 400x200

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	71	54	63	68	64	64	58	54	45
L_{wA} to outlet	dBA	75	53	62	66	68	69	66	60	48
L_{wA} to environment	dBA	58	36	48	56	54	50	46	41	32
VKPI 2E 400x200	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	65	45	57	60	60	57	53	49	43
L_{wA} to outlet	dBA	70	47	59	61	66	64	60	55	43
L_{wA} to environment	dBA	48	26	37	45	43	35	32	29	22

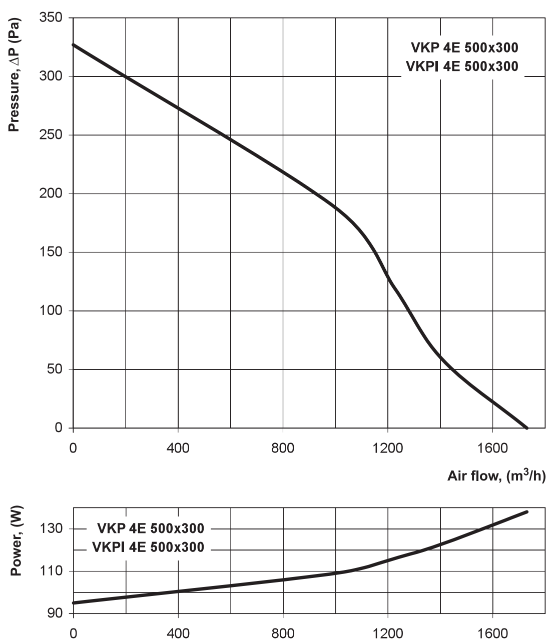
VENTS VKP / VKPI



VKP 2E 500x250

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	60	68	60	56	56	49	46	46
L_{wA} to outlet	dBA	70	54	65	64	63	60	56	49	44
L_{wA} to environment	dBA	53	41	48	47	44	40	38	33	35
VKPI 2E 500x250	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	52	60	56	51	50	43	42	40
L_{wA} to outlet	dBA	63	48	59	60	55	57	53	45	39
L_{wA} to environment	dBA	41	27	35	37	31	29	27	25	27

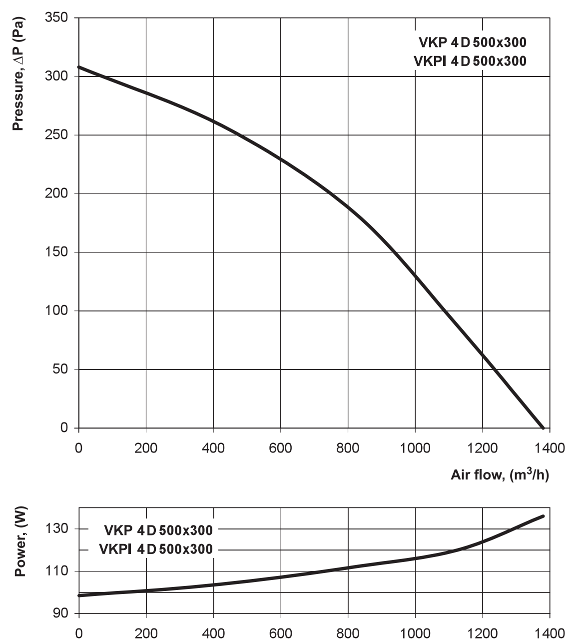
VENTS VKP / VKPI



VKP 4E 500x300

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	58	63	64	55	57	58	51	46
L_{wA} to outlet	dBA	73	57	60	72	65	65	64	57	48
L_{wA} to environment	dBA	56	44	52	51	51	49	48	43	33
VKPI 4E 500x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	64	51	59	60	48	55	51	49	40
L_{wA} to outlet	dBA	70	50	55	64	59	62	59	50	43
L_{wA} to environment	dBA	44	31	37	40	39	38	35	32	20

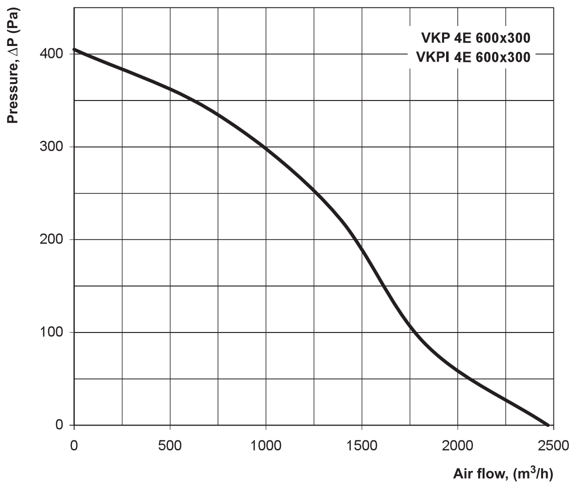
VENTS VKP / VKPI

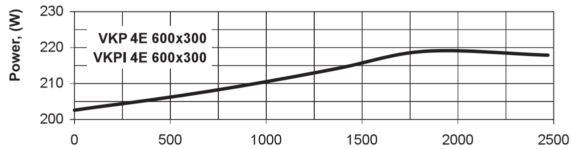


VKP 4D 500x300

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	69	58	62	65	55	58	58	55	45
L_{wA} to outlet	dBA	71	56	62	69	64	66	63	59	50
L_{wA} to environment	dBA	55	42	51	51	52	52	48	43	32
VKPI 4D 500x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	62	51	59	63	49	55	54	49	39
L_{wA} to outlet	dBA	66	51	57	67	59	63	60	50	42
L_{wA} to environment	dBA	44	31	38	38	38	36	38	31	22

VENTS VKP / VKPI

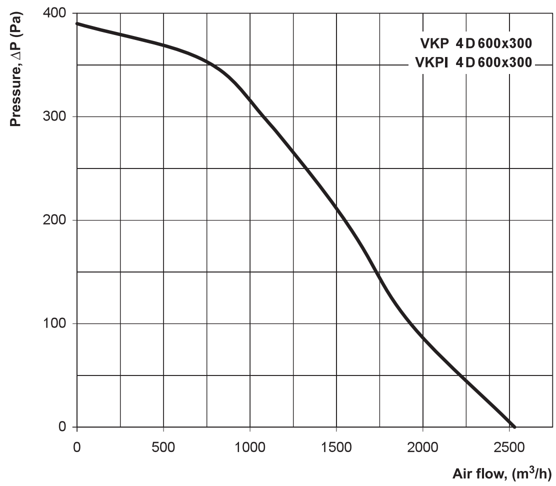


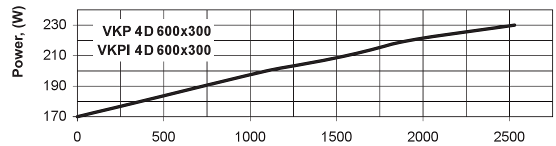


VKP 4E 600x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	72	63	67	69	56	61	61	54	48
L_{WA} to outlet	dBA	78	57	65	73	68	69	69	61	54
L_{WA} to environment	dBA	61	43	55	54	55	53	49	48	35
VKPI 4E 600x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	68	58	62	64	55	55	53	51	42
L_{WA} to outlet	dBA	71	54	60	67	62	64	61	54	49
L_{WA} to environment	dBA	48	34	42	43	41	40	37	36	23

VENTS VKP / VKPI

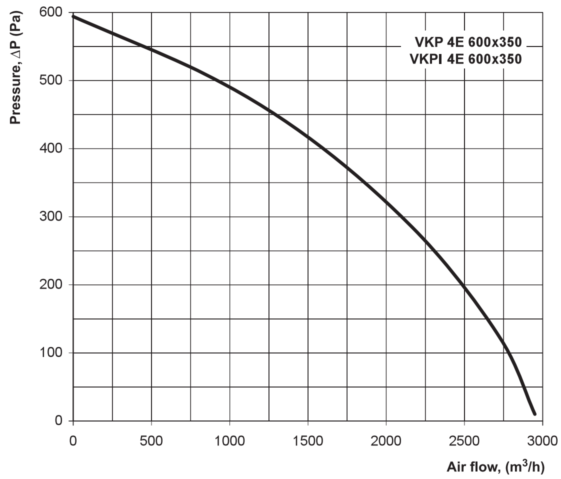


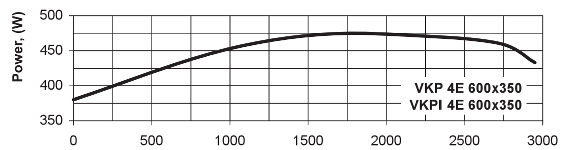


VKP 4D 600x300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	72	61	69	67	60	62	58	56	50
L_{WA} to outlet	dBA	76	59	66	73	68	69	66	58	51
L_{WA} to environment	dBA	59	45	53	56	54	54	53	47	38
VKPI 4D 600x300	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	69	55	60	66	53	55	56	52	43
L_{WA} to outlet	dBA	71	56	61	70	62	65	60	55	45
L_{WA} to environment	dBA	46	31	43	41	40	41	40	35	23

VENTS VKP / VKPI

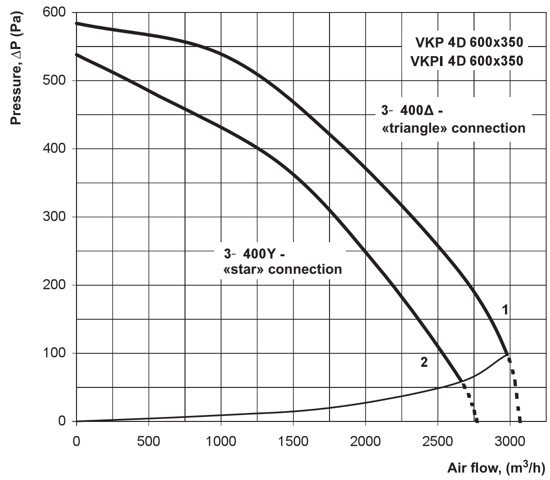


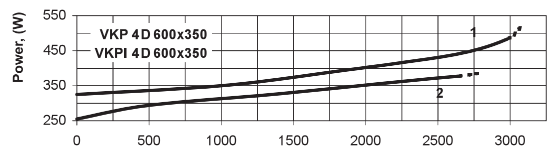


VKP 4E 600x350

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	78	58	78	75	60	64	65	67	55
L_{WA} to outlet	dBA	79	58	69	75	67	70	69	69	56
L_{WA} to environment	dBA	64	37	61	55	51	54	49	43	35
VKPI 4E 600x350	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	75	53	72	71	54	58	63	60	52
L_{WA} to outlet	dBA	74	52	62	69	62	67	65	64	54
L_{WA} to environment	dBA	51	25	51	44	40	42	38	34	23

VENTS VKP / VKPI





VKP 4D 600x350

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	72	57	59	72	66	64	65	58	47
L_{WA} to outlet	dBA	81	60	67	76	74	74	69	59	50
L_{WA} to environment	dBA	65	40	53	61	57	55	54	47	38
VKPI 4D 600x350	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	70	54	56	65	62	60	58	49	40
L_{WA} to outlet	dBA	74	57	63	73	70	68	65	57	47
L_{WA} to environment	dBA	52	27	41	50	43	45	41	35	26

CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th colspan="2">Three-phase transformer speed controllers</th><th>Frequency speed controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VKP 2E 400x200 / VKPI 2E 400x200</td><td rowspan="3">RS-1-300</td><td rowspan="3">RS-1-400</td><td rowspan="3">RS-1,5-PS</td><td>RS-1 N(V)</td><td rowspan="3">RS-1,5-T</td><td rowspan="3">RSA5E-2-P</td><td rowspan="3">RSA5E-1,5-T</td><td rowspan="3">RSA5E-1,5-TA</td><td rowspan="3">RSA5E-2-M</td><td></td><td></td><td></td><td rowspan="3">RT-10</td><td rowspan="3">T-1,5 N(V)</td><td rowspan="3">TH-1,5 N(V)</td><td rowspan="3">TF-1,5 N(V)</td><td rowspan="3">TR-1,5 N(V)</td></tr>
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<tr><td>VKP 4E 500x300 / VKPI 4E 500x300</td><td>RS-1 N(V)</td><td></td><td></td><td></td></tr>
<tr><td>VKP 4D 500x300 / VKPI 4D 500x300</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-1,5-T</td><td>RSA5D-5,0-M</td><td>VFED-200-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VKP 4E 600x300 / VKPI 4E 600x300</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-1,5-PS</td><td>RS-1 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td><td></td><td></td><td></td><td>RT-10</td><td>T-1,5 N(V)</td><td>TH-1,5 N(V)</td><td>TF-1,5 N(V)</td><td>TR-1,5 N(V)</td></tr>
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<tr><td>VKP 4E 600x350 / VKPI 4E 600x350</td><td></td><td></td><td>RS-2,5-PS</td><td>RS-2,5 N(V)</td><td>RS-3,0-T</td><td></td><td>RSA5E-3,5-T</td><td>RSA5E-3,5-TA</td><td>RSA5E-3-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">VKP 4D 600x350 / VKPI 4D 600x350</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-1,5-T</td><td>RSA5D-5,0-M</td><td>VFED-400-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
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</table>

	Thyristor speed controllers					Transformer speed single phase controllers				Three-phase transformer speed controllers		Frequency speed controllers	Temperature controllers	Sensors			
VKPF 4E 400x200 / VKPFI 4E 400x200	RS-1-300	RS-1-400	RS-1,5-PS	RS-1,5 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M				RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VKPF 4D 400x200 / VKPFI 4D 400x200										RSA5D-1,5-T	RSA5D-5,0-M	VFED-200-TA					
VKPF 4E 500x250 / VKPFI 4E 500x250			RS-2,5-PS	RS-2,5 N(V)	RS-3,0-T		RSA5E-3,5-T	RSA5E-3,5-TA	RSA5E-3-M								
VKPF 4D 500x250 / VKPFI 4D 500x250										RSA5D-1,5-T	RSA5D-5,0-M	VFED-200-TA					
VKPF 4E 500x300 / VKPFI 4E 500x300			RS-4,0-PS		RS-5,0-T		RSA5E-3,5-T	RSA5E-3,5-TA	RSA5E-4-M								
VKPF 4D 500x300 / VKPFI 4D 500x300										RSA5D-3,5-T	RSA5D-5,0-M	VFED-400-TA					
VKPF 4E 600x300 / VKPFI 4E 600x300					RS-10,0-T		RSA5E-8,0-T	RSA5E-8,0-TA	RSA5E-12-M								
VKPF 4D 600x300 / VKPFI 4D 600x300										RSA5D-3,5-T	RSA5D-5,0-M	VFED-750-TA					
VKPF 4E 600x350 / VKPFI 4E 600x350																	
VKPF 4D 600x350 / VKPFI 4D 600x350											RSA5D-5,0-M	VFED-1100-TA					
VKPF 4D 700x400 / VKPFI 4D 700x400											RSA5D-8,0-M	VFED-1500-TA					
VKPF 6D 800x500 / VKPFI 6D 800x500												VFED-1100-TA					
VKPF 4D 800x500 / VKPFI 4D 800x500											RSA5D-10,0-M						
VKPF 6D 900x500 / VKPFI 6D 900x500											RSA5D-8,0-M	VFED-1500-TA					
VKPF 6D 1000x500 / VKPFI 6D 1000x500																	

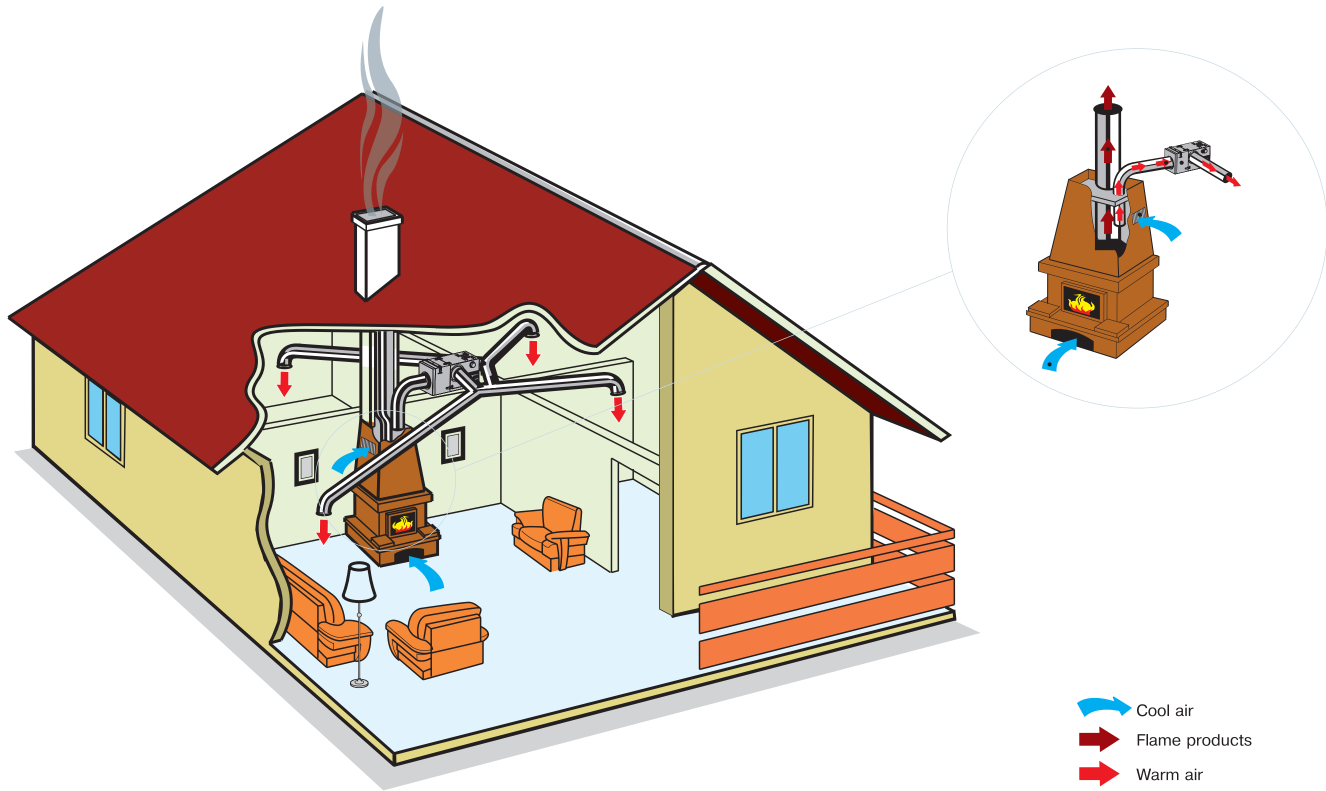
	EC-motors controller
VKP 600x300 EC	R-1/010
VKP 600x350 EC	
VKP 700x400 EC	
VKP 800x500 EC	
VKP 1000x500 EC	

CHIMNEY CENTRIFUGAL FAN

IT'S NOT ONLY FIREPLACE THAT MAKES YOU FEEL WARM!

A fireplace in the country house brings comfort and romance; it is a unique energy of country life. The warmth of fireplace recovers serenity of mind, calms and harmonizes our thoughts in a philosophical manner. And, of course, it makes us feel warm.

Chimney fans designed for hot air distribution allow creating fully-featured air heating system based on a fireplace. Such system is optimal for heating seasonal houses that serve as a secondary residence during winter time and provide fast and efficient hot air distribution from chimney to other premises.



Series VENTS KAM

Chimney fan is designed for house heating system management using heat of chimney or fireplace. It can be also used as a base for backup heating source. Air flow capacity of the fan is 540 m^3/h. Fans are compatible with 125, 140, 150 and 160 mm diameter air ducts.



Chimney centrifugal fan
VENTS KAM

Air flow capacity is up to 540 m³/h

p. 84

Series
VENTS KAM

This centrifugal fireplace fan is designed for house heating system management. It can be also used as a base for backup heating source.

Application
Fireplace fans, designed for warm air distribution systems, allow creating fully-featured air heating system based on a fireplace. Such system is optimal for heating seasonal houses that serve as a secondary residence during winter time.
Implementation of air charging system helps to distribute the initial heat from fireplace to other premises in a quick and rational manner. The system is applied at shifted air temperatures ranging from 0 to +150°C.

Construction design
Fan case is made of zinc-galvanized steel with usage of heat and sound-insulated material made from non-flammable mineral wool. The case is equipped with perforations that allow internal air circulation and motor cooling. The fan is equipped with temperature control device that allows setting temperature level at which the fan shall be switched on/off automatically. Fan startup is allowed within the range of 0 °C to +90°C depending on the air temperature generated inside the fireplace heat-exchanger.

Motor
The fans are supplied with single-phase motors for operation in 230/50Hz power supply network. Insulation Class F. Motors have built-in thermal protection with automatic restart. The motor is placed off-airflow and is equipped with impeller with forward-curved blades. Ball bearings are used to achieve long term operation.
- Fan of KAM Series is equipped with an asynchronous motor with supplementary impeller for motor purging and cooling.

Speed adjustment
Smooth and step-by-step fan adjustment are both available; it is performed by means of thyristor or auto-connected transformer. Fan speed is regulated within the range of 0 to 100%.

Installation
Fireplace fans are designed for connection with round air ducts. The fan can be fixed in any position; however airflow direction (indicated on the fan case) must be taken into consideration. It is also necessary to provide free access for fan maintenance service. Warm-air feed ducts are laid between the fan and each of the heated rooms. Hidden air ducts system with forced warm air distribution to premises allows saving useful space in your house and does not break its stylistic harmony.

Options
FFK – is a dismountable metal filter for purification of transferred air (Class G3). Filter is fixed to the fan case by lock-latches which allow easy removal of the filter for cleaning.

KFK – is a dismountable metal mixture chamber with built-in thermostatic control valve for purification of transferred air (Class G3). Mixture chamber is fixed to the fan case by lock-latches which allow easy removal of the chamber for cleaning. Fan configuration, that includes KFK mixture chamber, provides cool air supply into the mixture chamber when the temperature of transferred air rises above 90°C. Such configuration also allows removal of hot air while the fan motor is not running.

GFK is a roll over valve. It prevents reverse-direction airflow in the system. Fan configuration, that includes KFK mixture chamber and roll over valve GFK, protects the fan motor from overheating in accordance with BY-PASS system (for example, when motor is not running due to power supply cut-off). Fans with such configuration enable roll over valve closure and hot air discharge through ventilation ducts to the other premises even if the fan motor is not running.

Legend:

Fan series	Flange diameter	Modifications
VENTS KAM	125; 140; 150; 160	_ -is stocked with temperature controller by default; T1 - without temperature controller

Accessories

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Options

FFK

KFK

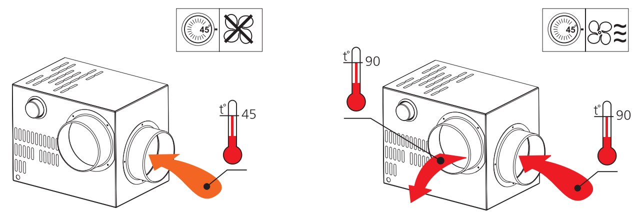
GFK

1

Operation principle of the KAM fan

KAM

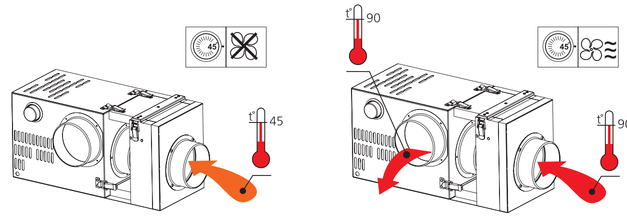
When the temperature in the fireplace hood reach the value set the fan turns on automatically and distribute the hot air from the fire hood place to other room and turns off when the temperature falls down under a value set.



2

Operation principle of the KAM fan with filter FFK

KAM + FFK =



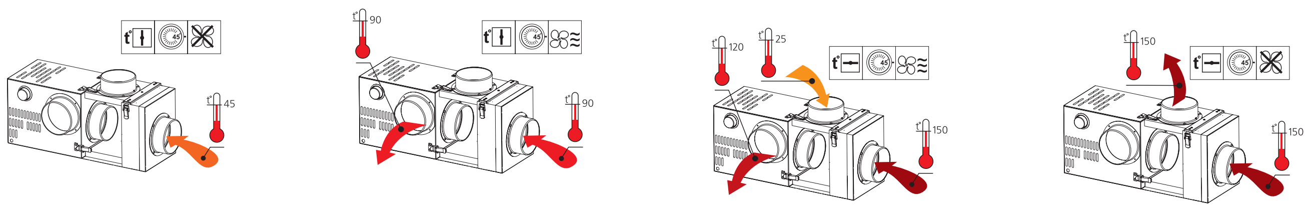
When the temperature in the fireplace hood reach the value set the fan turns on automatically and distribute the hot air purified by filter from the fire hood place to other room and turns off when the temperaure falls down under a value set.

3

Operation principle of the KAM fan with valve KFK

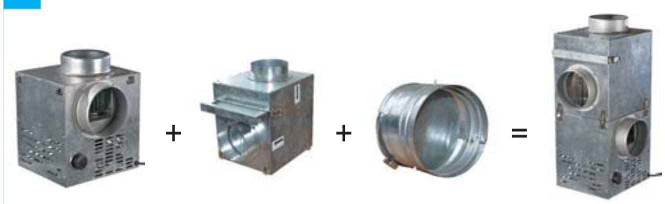
KAM + KFK =

When the temperature in the fireplace hood reach the value set the fan turns on automatically and distribute the hot air from the fire hood place to other room and turns off when the temperature falls down under a value set. Fan with valve KFK provides additional supply of hot air to the valve box when the temperature of distributed air is more then 90°C and withdrawal of the hot air if the motor does not work.



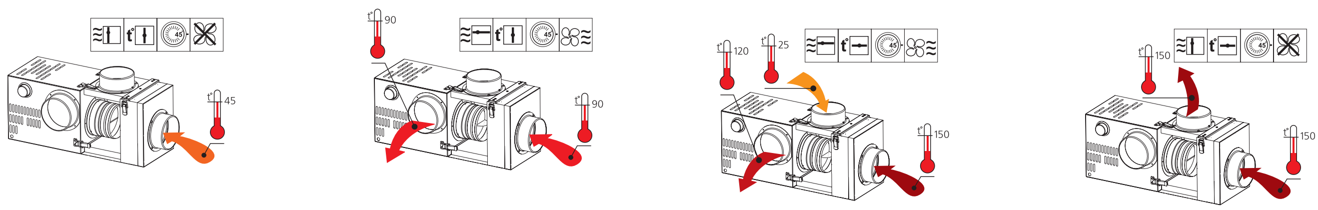
4

Operation principle of the KAM fan with valve KFK and BY-PASS system GFK

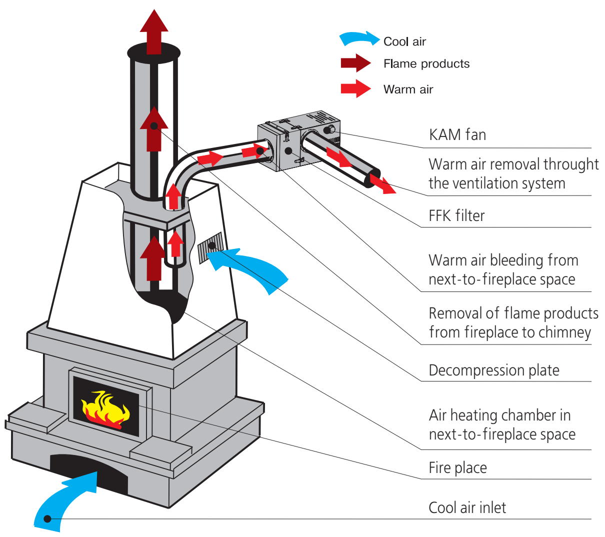


KAM + KFK + GFK = BY-PASS system

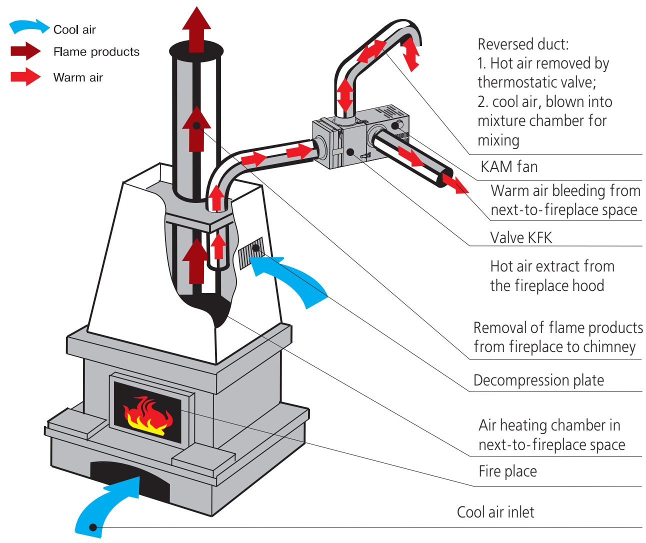
When the temperature in the fireplace hood reach the value set fan turns on automatically and distribute hot air from the fire hood place to other room and turns off when the temperature falls down under a value set. **BY-PASS** system protects fan from overheating (f.e. fan's motor does not work due to lack of electricity). It is close damper and rejects hot air through the gap to other room. BY-PASS stabilizes the temperature by damper opening and cold air supplying if the air incoming to the fan is too hot.



Example of installation and operation of KAM fans, KAM supplied with filter FFK in fireplace system

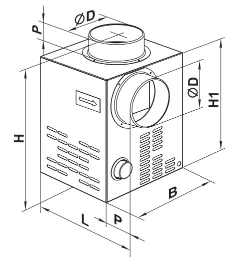


Example of installation and operation of KAM fans supplied with KFK valve, KAM fan supplied with KFK and GFK valves ("BY-PASS") in the fireplace system



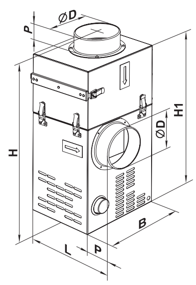
Type	Dimensions, mm						Weight, kg
	ØD	B	H	H1	L	P	
KAM 125	124	245	350	300	260	50	4,5
KAM 140	139	285	350	300	300	50	5,7
KAM 150	149	285	350	300	300	50	5,7
KAM 160	159	285	350	300	300	50	5,7

KAM



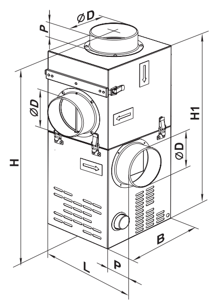
Type	Dimensions, mm						Weight, kg
	ØD	B	H	H1	L	P	
KAM 125 + FFK 125	124	245	530	480	260	50	6,7
KAM 140 + FFK 140	139	285	540	490	300	50	8,7
KAM 150 + FFK 150	149	285	540	490	300	50	8,7
KAM 160 + FFK 160	159	285	540	490	300	50	8,7

KAM +FFK

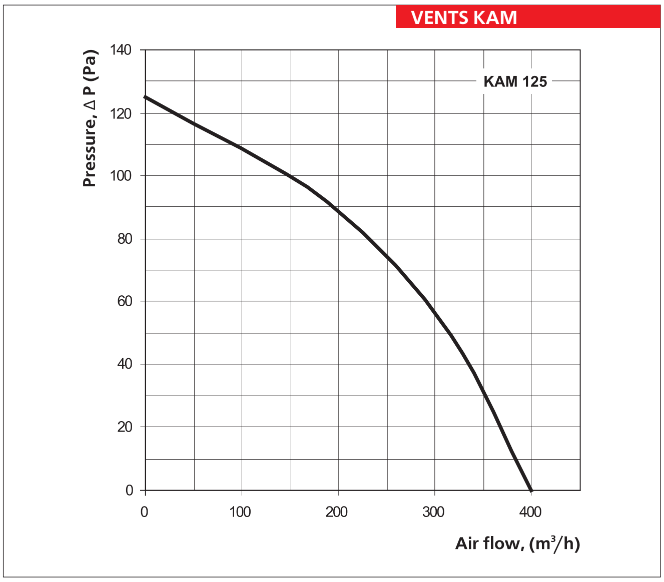


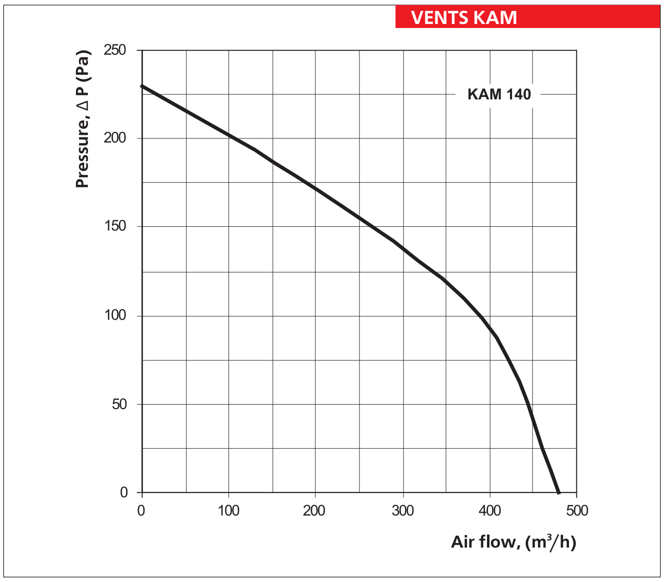
Type	Dimensions, mm						Weight, kg
	ØD	B	H	H1	L	P	
KAM 125 + KFK 125	124	245	610	560	260	50	8,3
KAM 140 + KFK 140	139	285	650	600	300	50	9,7
KAM 150 + KFK 150	149	285	650	600	300	50	9,7
KAM 160 + KFK 160	159	285	650	600	300	50	9,7

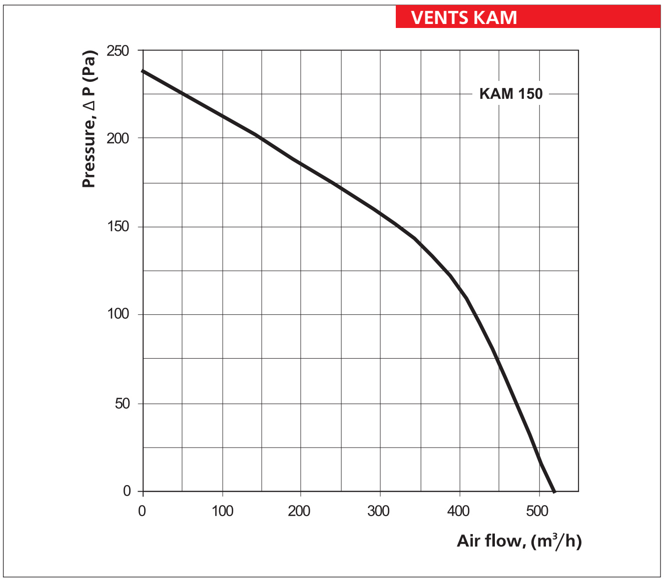
KAM + KFK

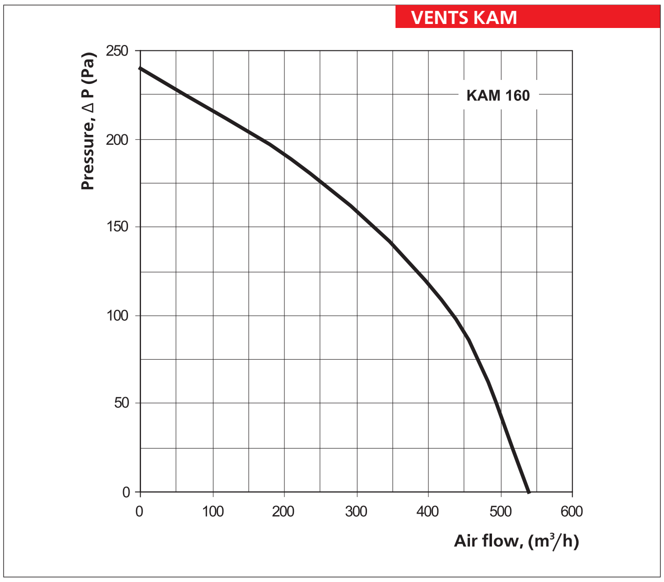


	KAM 125	KAM 140	KAM 150	KAM 160
Voltage, V/50Hz	230	230	230	230
Power consumption, W	108	110	115	116
Current, A	0,81	0,82	0,84	0,86
Maximum air consumption, m^3/h	400	480	520	540
RPM	1300	1290	1280	1270
Noise level at 3 m, dBA	42	42	42	42
Maximal temperature of transferred air, °C	+20 + 150	+20 + 150	+20 + 150	+20 + 150
Index of protection	IP X2	IP X2	IP X2	IP X2









CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

	Thyristor speed controllers					Transformer speed single phase controllers				Temperature controllers	Sensors			
KAM 125 KAM 140 KAM 150 KAM 160	RS-1-300	RS-1-400	RS-1,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M	RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)

SOUND-PROOF FANS

VENTS VS

Sound- and heat isolated centrifugal fans with back-curved blades and air flow capacity up to 16870 m^3/h. Applied in intake and exhaust ventilation systems for premises with high noise level requirements. Compatible with 355, 400, 450, 500, 560, 630 and 710 mm air ducts diameters.

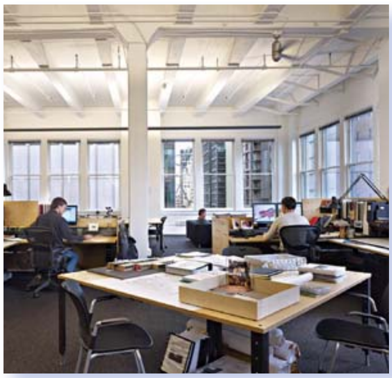
VENTS KSA

Compact sound- and heat isolated centrifugal fans with forward-curved blades and air flow capacity up to 1500 m^3/h. Applied in intake and exhaust ventilation systems for premises with high noise level requirements. Compatible with 100, 125, 150, 160, 200 and 250 mm air ducts diameters.

VENTS KSB

Compact sound- and heat isolated centrifugal fans with forward-curved blades and air flow capacity up to 2150 m^3/h. Applied in intake and exhaust ventilation systems for premises with high noise level requirements. Compatible with 100, 125, 150, 160, 200, 250 and 315 mm air ducts diameters.

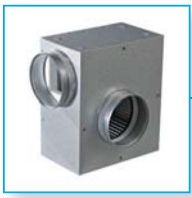




Series
VENTS VS

Efficiency - up to 16870 m³/h

p. 90



Series
VENTS KSA

Efficiency - up to 1500 m³/h

p. 96

Series
VENTS KSB

Efficiency - up to 2150 m³/h

p. 100

Series

VENTS VS

Centrifugal duct fans in the heat- and sound-proof case with efficiency up to **16 870 m³/h**

Application

Intake and exhaust systems for ventilation of various premises with high requirements to the level of noise. Fans have a unique design which enables to change position of the side panels and a panel with the outlet pipe for air supply in all directions both linearly and at the angle of 90°. It enables to collect various configurations of ventilation systems on the basis of VS fans depending on the project. Due to the galvanized case and heat insulation the fans can be used for external mounting also. These fans can be used as a separate element of the composing air handling unit.

Design

Fan case is made of aluminum body fixed with angles, and removable heat- and sound-proof double layer panels of galvanized steel. Noncombustible mineral wool with the thickness of 25 mm is applied in case of panels insulation. Connection pipes of circular section are equipped with rubber gasket.

Motor

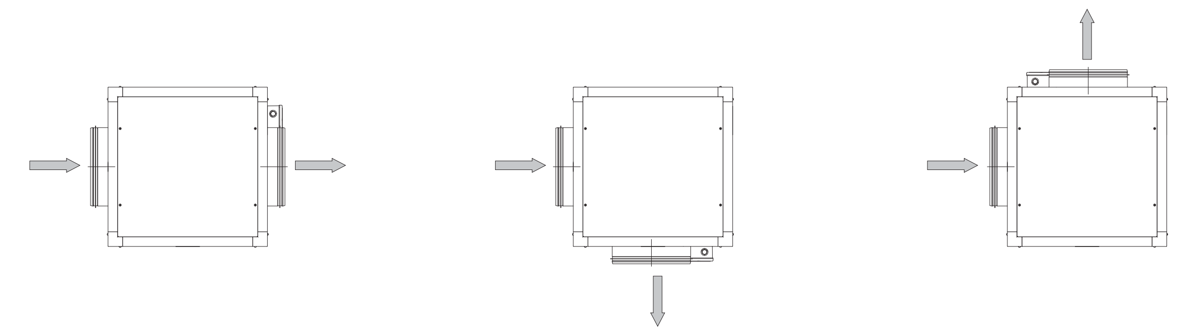
Two, four- and six-pole induction motors with external rotor and impeller with backward curved blades are used. Motors have built-in heat protection for connection to the external protection unit (thermoswitch with automation restart is applied in the model VS 355-4E). Due to the application of the motor with ball bearings, with selective lubricating oil the low-noise fan operating regime, which requires no servicing, is guaranteed.

Speed control

Speed control can be both smooth and step and is performed with thyristor and autotransformer controller. Change of number of rotations is achieved by means of applied voltage decrease. Transferable air volume changes according to the change of motor rotations. Several fans can be connected to one control device provided that the overall power and operating current will not exceed the nominal parameters of the controller.

Mounting

Duct fans are meant for mounting with round ducts. Fans are mounted in the blowout of air ducts. In the event of connection via flexible connectors the fan is necessary to fix to the building construction with the mounts, suspension mounts or holding brackets. Fan can be mounted in any position taking into account the air flow direction (it is indicated with the pointer on the fan case). It is essential to foresee access place for fan servicing.



Legend:

Fan series	Diameter of connection pipe	Motor	
		Polarity	Phase
VENTS VS	355; 400; 450; 500; 560; 630; 710	2, 4, 6	E – single-phase D – three-phase

Accessories









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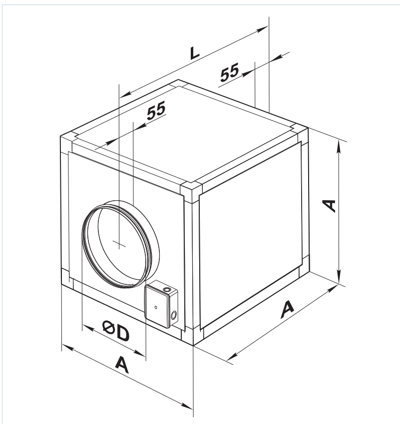
	VS 355-4E	VS 355-4D	VS 400-4E	VS 400-4D	
Voltage, V/50/60Hz	1~ 230	3~ 400	1~ 230	3~ 400 △	3~ 400 Y
Power consumption, W	245	230	480	515	385
Current, A	1.12	0.52	2.40	1.41	0.70
Maximal air flow capacity (m^3/h) at air flow directed: - cross	2890	2660	3750	3950	3340
- straight	2650	2380	3535	3740	3110
RPM	1420	1400	1370	1415	1235
Noise level at 3 m, dBA	54	53	51	51	47
Maximal temperature of transferred air, °C	-25 +50	-25 +70	-40 +80	-40 +60	-40 +80
Index of protection	IP X4	IP X4	IP X4	IP X4	

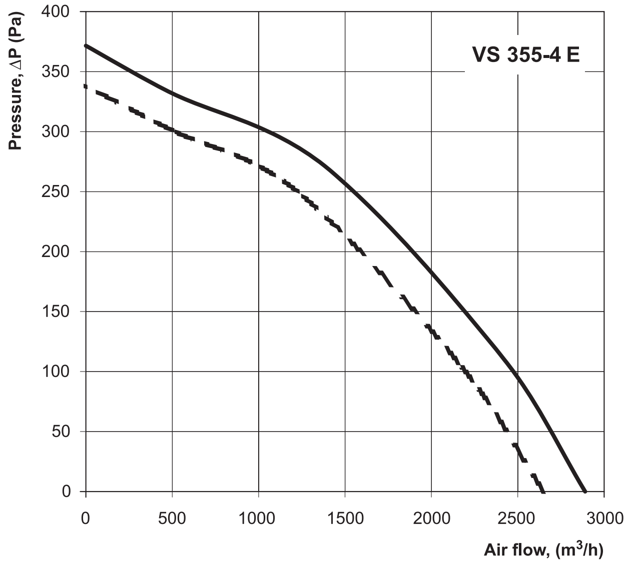
	VS-450-4E	VS-450-4D	VS-500-4E	VS-500-4D	VS 560-4D
Voltage, V/50/60Hz	1~ 230	3~ 400	1~ 230	3~ 400	3~ 400
Power consumption, W	680	740	1300	1430	2380
Current, A	3.00	1.50	5.70	3.00	5.00
Maximal air flow capacity (m^3/h) at air flow directed: - cross	5630	5700	7330	7940	11340
- straight	4930	5080	6680	7200	10490
RPM	1250	1350	1320	1375	1365
Noise level at 3 m, dBA	53	54	55	58	56
Maximal temperature of transferred air, °C	-40 +70	-40 +80	-20 +50	-40 +80	-40 +60
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4

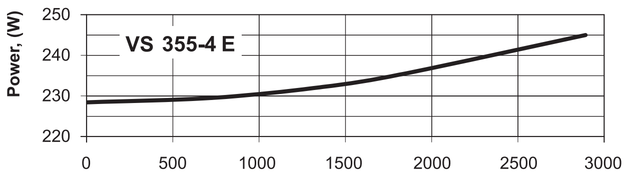
	VS 560-6D	VS 630-4D	VS 630C-4D	VS 630-6D	VS 710-6D
Voltage, V/50/60Hz	3~ 400	3~ 400	3~ 400	3~ 400	3~ 400
Power consumption, W	780	3310	4250	1310	2000
Current, A	1.70	6.20	7.55	2.80	3.90
Maximal air flow capacity (m^3/h) at air flow directed: - cross	7970	15170	16870	12030	15830
- straight	7330	13740	14930	10440	14880
RPM	885	1170	1300	880	890
Noise level at 3 m, dBA	49	67	69	55	59
Maximal temperature of transferred air, °C	-40 +55	-40 +35	-40 +60	-40 +60	-20 +40
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4

Type	Dimensions, mm			Weight, kg
	A	L	ØD	
VS 355-4E	500	610	355	25
VS 355-4D	500	610	355	25
VS 400-4E	670	780	400	39
VS 400-4D	670	780	400	39
VS 450-4E	670	780	450	43
VS 450-4D	670	780	450	43
VS 500-4E	670	780	500	52
VS 500-4D	670	780	500	56
VS 560-4D	800	910	560	99
VS 560-6D	800	910	560	86
VS 630-4D	800	910	630	102
VS 630C-4D	800	910	630	100
VS 630-6D	800	910	630	98
VS 710-6D	1000	1110	710	136



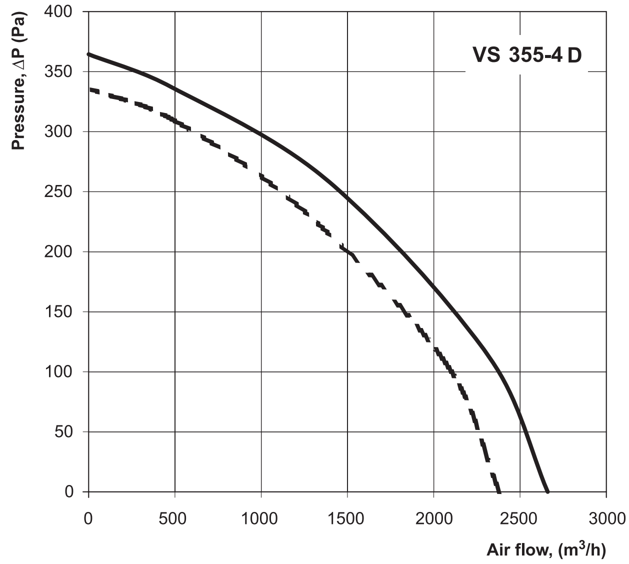
VENTS VS

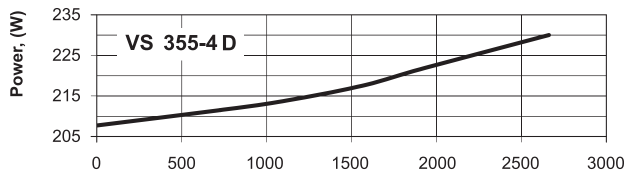




Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	70	55	58	61	63	62	60	52	47
L_{wA} to outlet	dBA	68	57	59	62	65	63	62	55	47
L_{wA} to environment	dBA	62	51	51	54	58	55	55	48	40

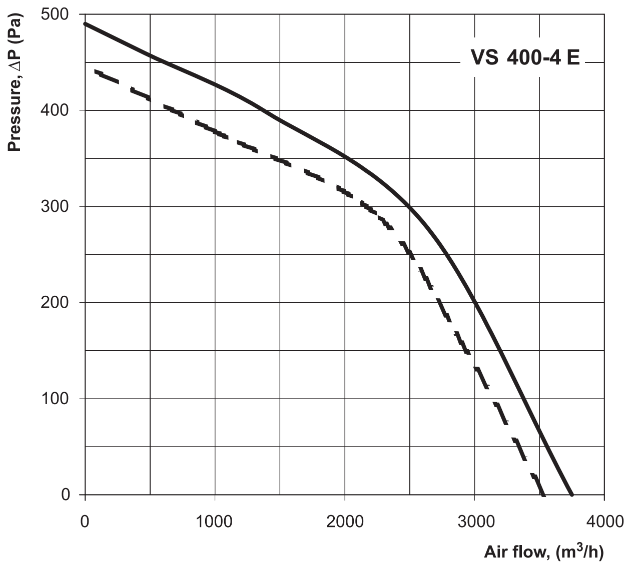
VENTS VS

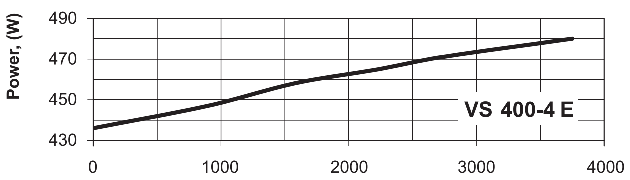




Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	68	54	57	61	63	62	59	52	46
L_{wA} to outlet	dBA	70	55	61	61	65	66	59	54	47
L_{wA} to environment	dBA	64	49	50	55	59	56	52	49	39

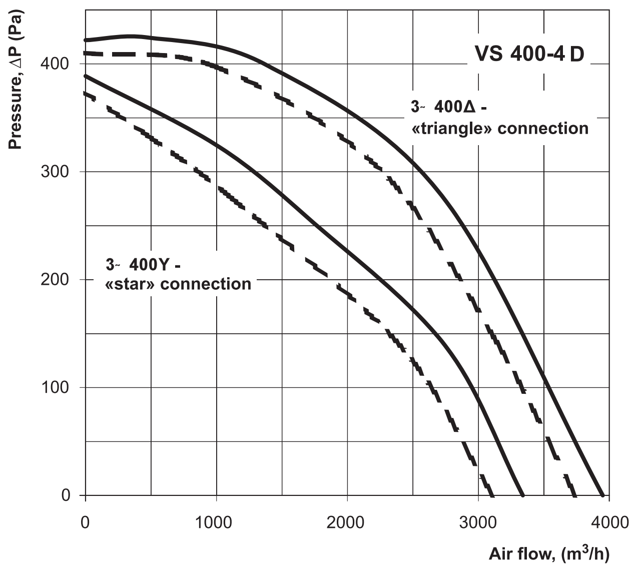
VENTS VS

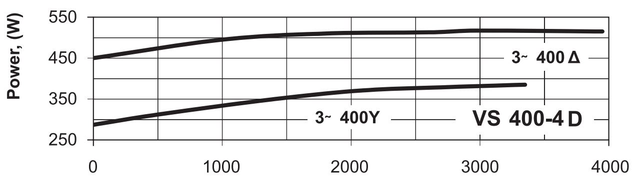




Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	60	62	66	66	64	65	58	51
L_{wA} to outlet	dBA	74	61	63	68	71	68	67	58	53
L_{wA} to environment	dBA	56	43	47	47	52	49	48	42	33

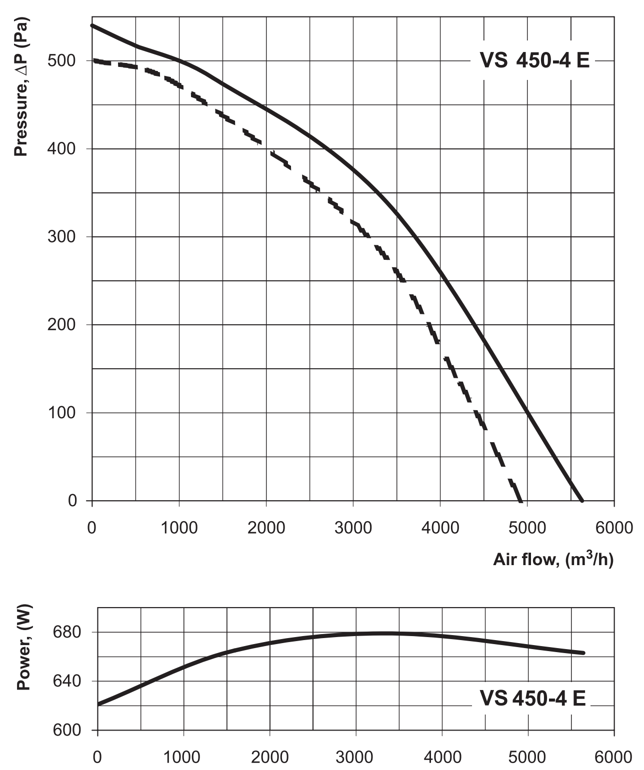
VENTS VS





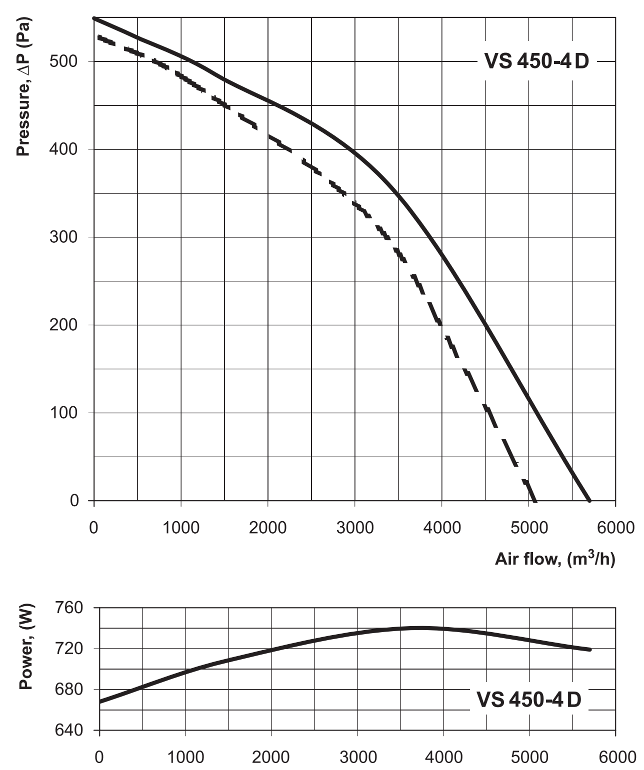
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	73	57	63	64	67	68	62	59	52
L_{wA} to outlet	dBA	74	60	63	65	69	66	67	61	51
L_{wA} to environment	dBA	54	43	44	49	50	51	47	42	36

VENTS VS



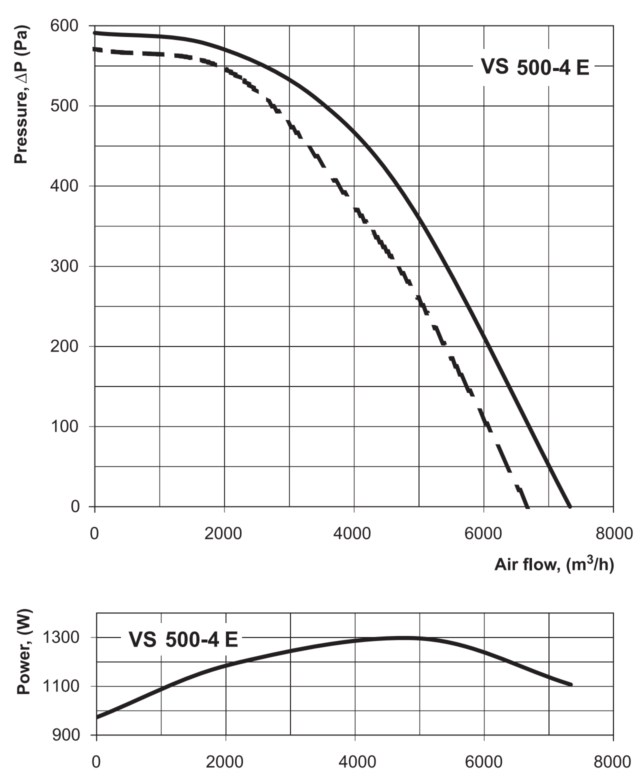
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	76	62	64	67	68	69	66	63	53
L_{wA} to outlet	dBA	76	63	66	70	71	69	66	63	57
L_{wA} to environment	dBA	57	44	48	52	56	53	50	47	38

VENTS VS



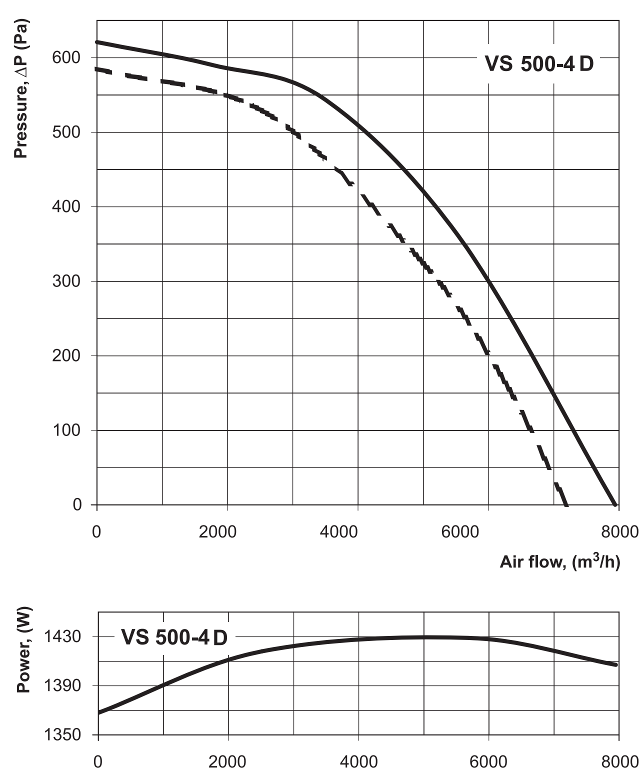
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	76	61	65	67	68	68	66	50	55
L_{wA} to outlet	dBA	75	63	67	69	70	72	68	63	54
L_{wA} to environment	dBA	61	46	47	52	52	51	51	44	36

VENTS VS



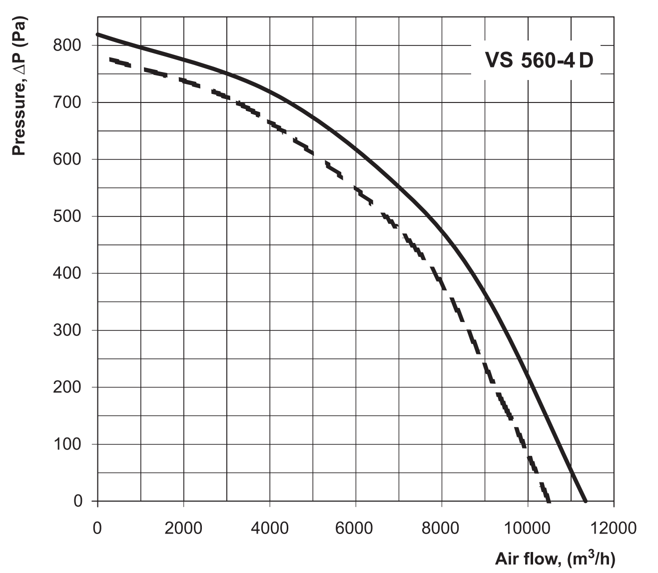
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	81	65	70	73	74	75	69	65	57
L_{wA} to outlet	dBA	81	68	72	74	76	75	71	69	61
L_{wA} to environment	dBA	65	52	53	56	57	56	55	51	40

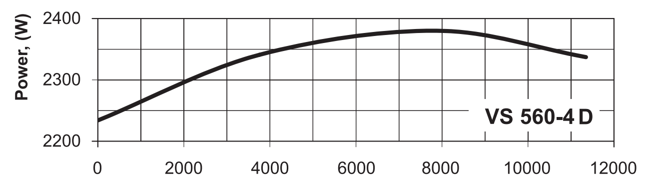
VENTS VS



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	66	67	71	71	74	71	65	55
L_{wA} to outlet	dBA	79	69	67	73	76	74	73	68	59
L_{wA} to environment	dBA	61	52	54	54	56	55	54	51	44

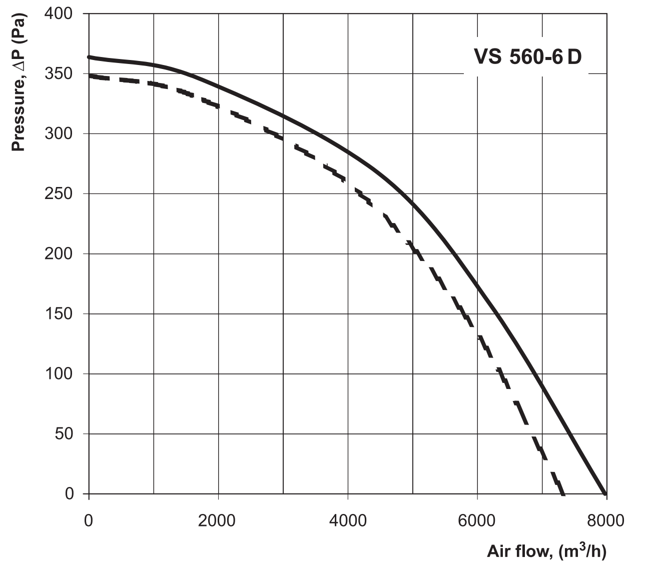
VENTS VS

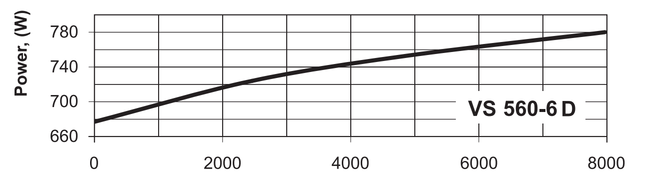




Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	80	66	67	73	75	73	69	67	58
L_{wA} to outlet	dBA	80	67	71	73	77	74	73	65	61
L_{wA} to environment	dBA	63	53	55	59	57	60	53	49	41

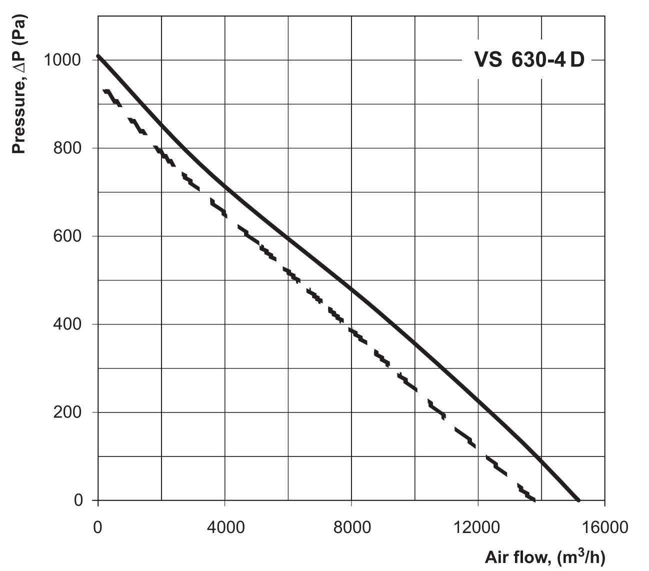
VENTS VS

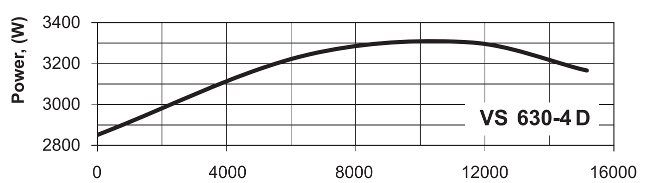




Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	72	59	57	64	67	67	62	56	49
L_{wA} to outlet	dBA	70	58	61	66	68	65	65	60	51
L_{wA} to environment	dBA	56	44	43	48	52	50	46	41	33

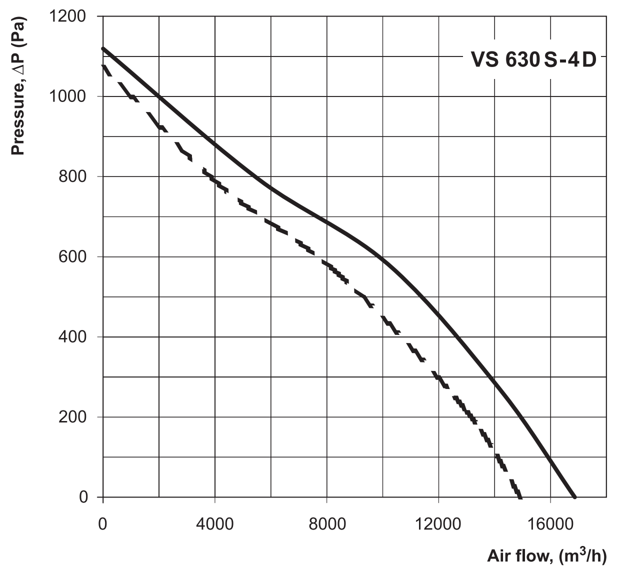
VENTS VS

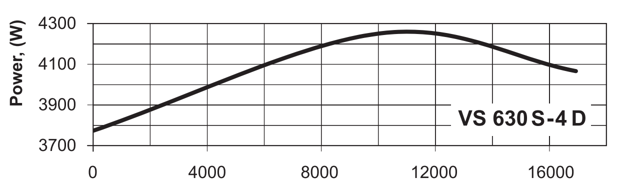




Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	85	76	78	80	80	83	78	75	68
L_{wA} to outlet	dBA	88	76	76	84	86	82	78	77	67
L_{wA} to environment	dBA	76	64	65	67	73	68	69	62	53

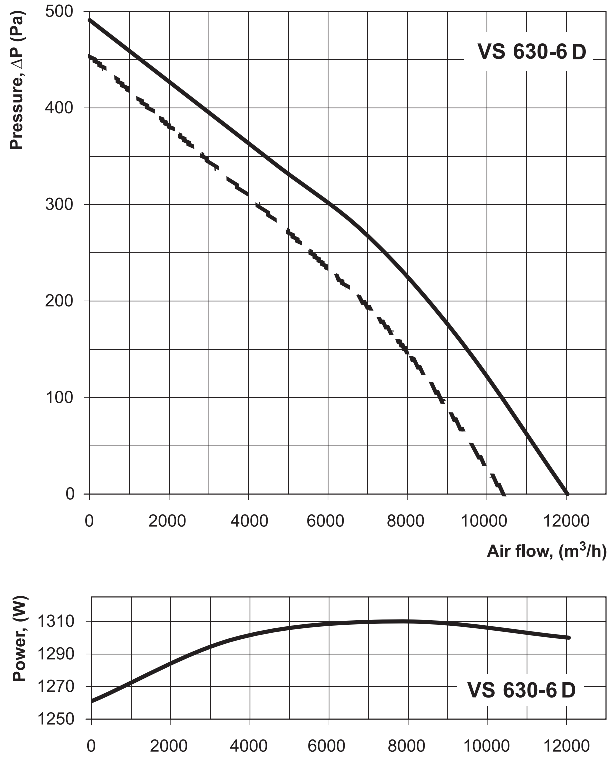
VENTS VS





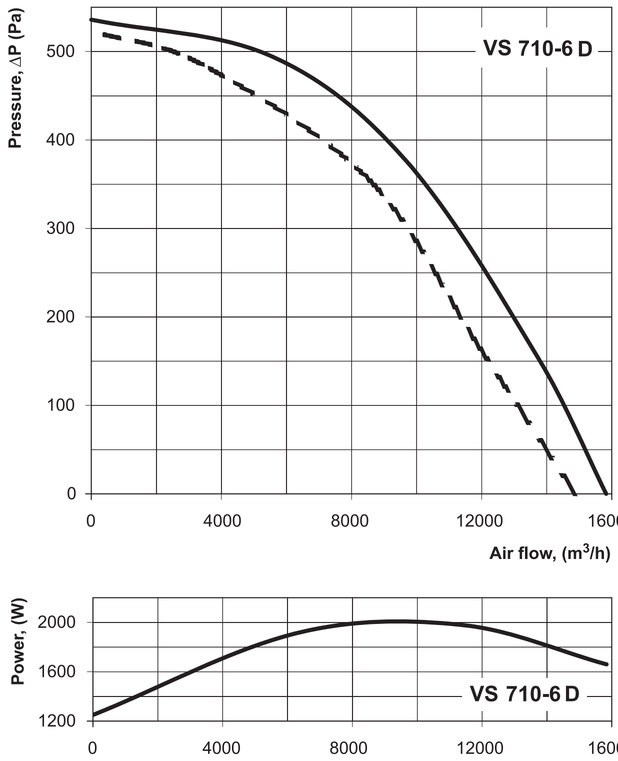
Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to inlet	dBA	85	76	77	81	83	82	77	72	68
L_{wA} to outlet	dBA	89	77	78	81	85	84	80	73	68
L_{wA} to environment	dBA	78	65	65	70	71	70	69	62	54

VENTS VS



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	61	63	70	70	69	64	60	50
L_{wA} to outlet	dBA	76	65	64	71	73	69	68	60	54
L_{wA} to environment	dBA	61	50	51	53	56	56	52	47	40

VENTS VS



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	79	64	66	71	74	72	71	67	58
L_{wA} to outlet	dBA	80	67	70	76	74	76	72	67	57
L_{wA} to environment	dBA	68	53	58	61	64	62	56	53	47

Series
VENTS KSA

Centrifugal fans in heat- and sound-proof case with efficiency up to **1500 m³/h**

Application
KSA fan design enables to apply them in inlet and outlet ventilation systems in the premises with high requirements to the level of noise and restricted space for mounting. For example, it is possible to place it directly over the counter ceiling in the premises. It is meant for mounting with air ducts with diameter of 100, 125, 150, 160, 200 and 250 mm.

Design
Fan case is made of aluzink. Heat- and sound-insolated layer is made of foam polystyrene.

Motor
Two and four-polar induction motors with external rotor and impeller with backward curved blades of galvanized steel can be applied. Application of motor ball bearings provides long service life. Each turbine is subjected to dynamic balancing while assembly in order to achieve exact characteristics, low level of noise and safe fan operation. Fan motor has protection class IP 44.

Speed control
Speed control can be both smooth and step and is performed with thyristor and autotransformer controller. Change of number of rotations is achieved by means of applied voltage decrease. Transferable air volume changes according to the change of motor rotations. Several fans can be connected to one control device provided that the overall power and operating current will not exceed the nominal parameters of the controller.

Mounting
Connection pipes have circular section. In the basic set fan is delivered with the power cord without connector. It can be delivered with the power cord with connector C14 (KSA...P). Electric connection and mounting should be performed in compliance with user's manual and electric scheme stated in the service list.

Legend:

Fan series
VENTS KSA

Diameter of connection pipe, mm
100; 125; 150; 160; 200; 250; 315

Motor	
Polarity	Phase
2, 4	E – single-phase

Options
P – equipped with power cord with a plug; **U** – “temperature” electronic module and built-in temperature sensor to the air duct; **Un** – “temperature” electronic module and remote temperature sensor; **U1** – “timer” with electronic module and built-in temperature sensor to the fan duct; **U1n** – “timer” with electronic module and built-in temperature sensor.

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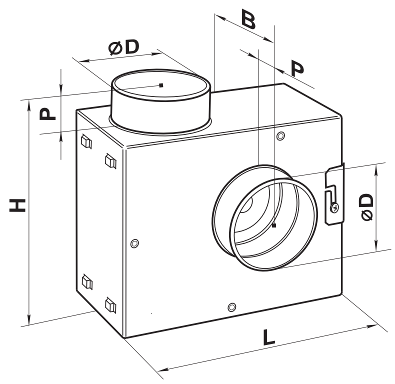
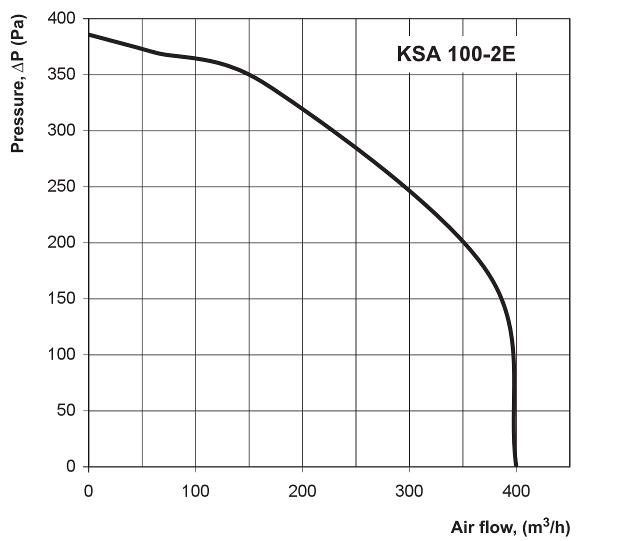
	KSA 100-2E	KSA 125-2E	KSA 150-2E
Voltage, V/50Hz	230	230	230
Power consumption, W	115	120	260
Current, A	0,51	0,52	1,16
Maximum air consumption, m^3/h	400	530	730
RPM	2650	2650	2600
Noise level at 3 m, dBA	36,1	38,3	39,4
Maximal temperature of transferred air, °C	-25 +40	-25 +40	-25 +40
Index of protection	IPX4	IPX4	IPX4

	KSA 160-2E	KSA 200-4E	KSA 250-4E
Voltage, V/50Hz	230	230	230
Power consumption, W	260	110	395
Current, A	1,16	0,45	1,98
Maximum air consumption, m^3/h	730	850	1500
RPM	2600	1300	1330
Noise level at 3 m, dBA	37,9	29,1	35,5
Maximal temperature of transferred air, °C	-25 +40	-25 +40	-25 +40
Index of protection	IPX4	IPX4	IPX4

Type	Dimensions, mm					Weight, kg
	⌀D	B	H	L	P	
KSA 100-2E	99	184	308	310	48	4,22
KSA 125-2E	123	204	308	310	48	4,57
KSA 150-2E	148	231	343	358	48	6,28
KSA 160-2E	158	231	343	358	48	6,28
KSA 200-4E	198	282	408	445	48	8,25
KSA 250-4E	248	330	500	525	48	10,50

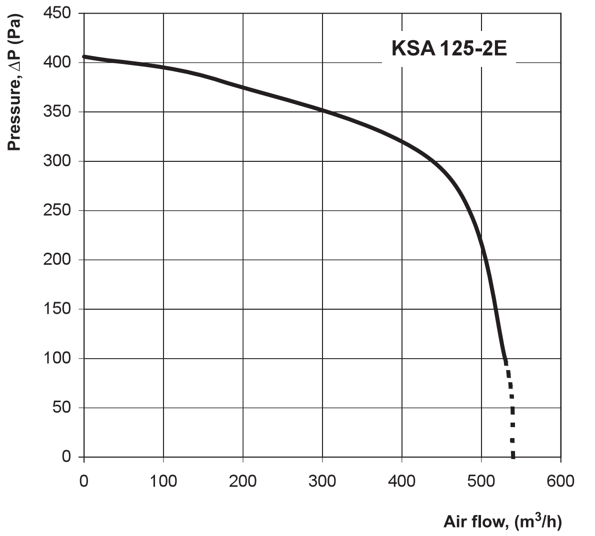


VENTS KSA



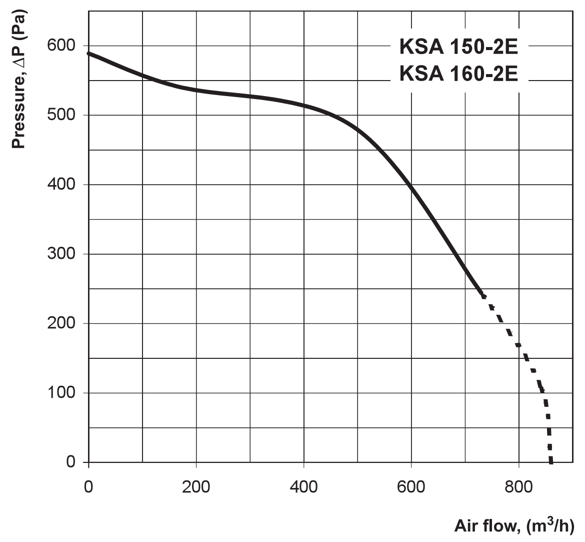
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	47	44	41	42	37	35	35	30	29
L_{wA} to outlet	dBA	50	45	41	41	37	35	31	30	28
L_{wA} to environment	dBA	43	39	36	37	31	30	28	25	22

VENTS KSA



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	48	45	44	46	37	39	33	30	25
L_{wA} to outlet	dBA	50	45	43	47	39	39	33	29	27
L_{wA} to environment	dBA	45	40	39	41	34	33	27	23	22

VENTS KSA

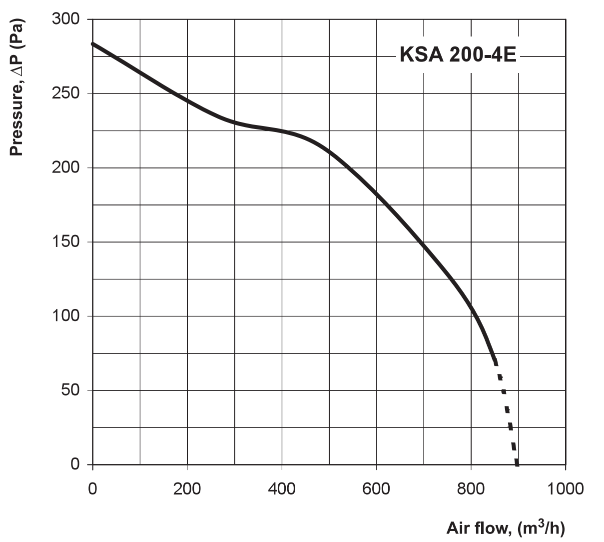


KCA 150–2E

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	55	42	52	50	40	35	28	25	21
L_{wA} to outlet	dBA	55	43	51	48	40	34	29	23	23
L_{wA} to environment	dBA	50	39	48	44	35	30	25	20	17

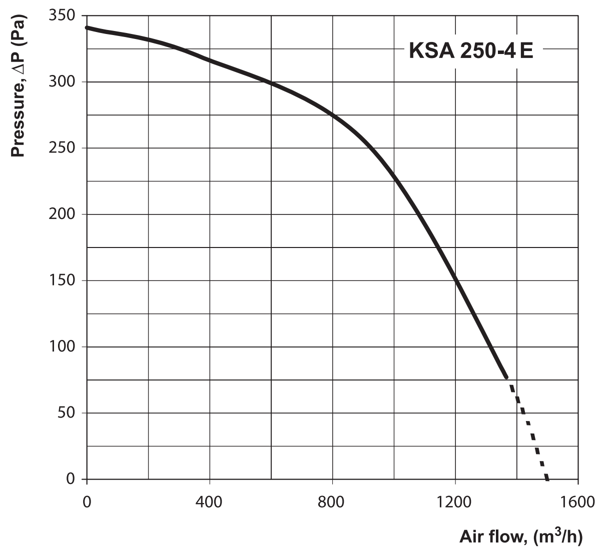
KCA 160–2E	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	56	44	51	48	38	33	29	24	22
L_{wA} to outlet	dBA	54	42	51	50	37	31	30	25	25
L_{wA} to environment	dBA	49	37	47	43	34	28	25	20	18

VENTS KSA

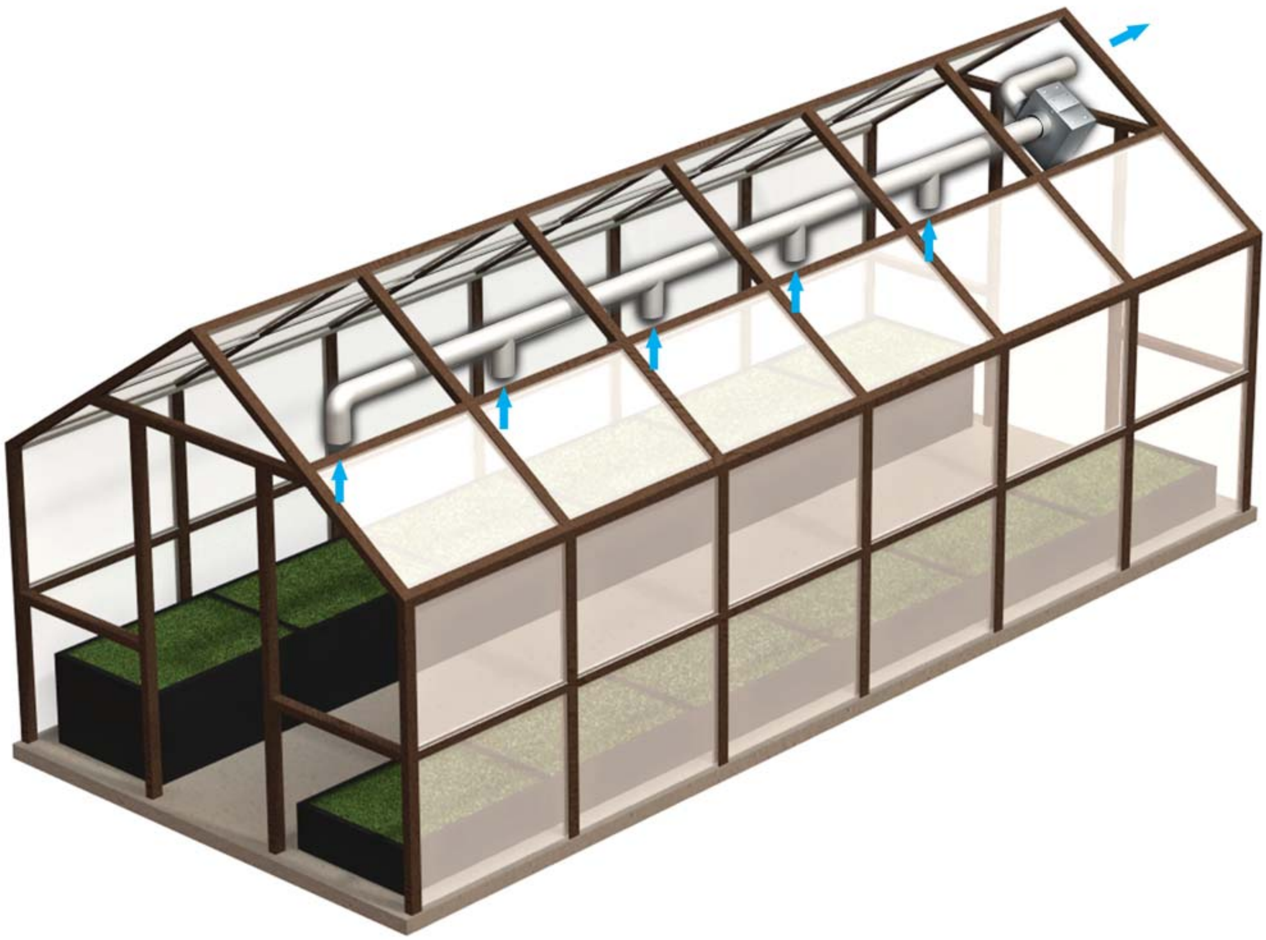


Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	43	39	38	38	31	29	20	17	14
L_{wA} to outlet	dBA	43	36	38	34	34	27	23	18	18
L_{wA} to environment	dBA	38	33	35	31	27	22	16	13	11

VENTS KSA



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	44	41	43	40	32	24	27	24	21
L_{wA} to outlet	dBA	46	41	45	38	32	26	29	22	18
L_{wA} to environment	dBA	41	35	38	33	27	21	24	18	15



Application of the KSA fan in greenhouse

Series

VENTS KSB

Sound- and heat isolated centrifugal fans with air flow capacity up to **2150 m³/h.**

Application

KSB fans design gives opportunity to use them in intake and exhaust ventilation systems in the premises with high requirements to the level of noise and restricted space for mounting. For example, it is possible to place it directly over the counter ceiling in the premises. It is intended for mounting with air ducts with diameter of 100, 125, 150, 160, 200, 250 and 315 mm.

Design

Fan case is made of galvanized steel sheet with heat- and sound-proof material. Connection pipes of circular section are equipped with rubber seals.

Motor

Two-polar induction motors with external rotor and impeller with backward curved blades is used. Motors have built-in heat protection with automation restart. Due to the application of the motor with ball bearings, with selective lubricating oil the low-noise fan operating regime, which requires no servicing, is guaranteed. The motor is mounted on the rubber vibratory inserts in order to reduce vibronoise.

Motor version with more powerful features (KSB...S) is available for some standard sizes.

Speed control

Speed control can be both smooth and step and is performed with thyristor and autotransformer controller. Change of rotations number is achieved by means of applied voltage decrease. Transferable air volume changes according to the change of motor rotations. Several fans can be connected to one control device provided that the overall power and operating current will not exceed the nominal parameters of the controller.

Mounting

Duct fans are meant for mounting with round ducts. Fans are mounted in the blowout of air ducts. In the event of connection via flexible connectors the fan is necessary to fix to the building construction with the mounts, suspension mounts or holding brackets. Fan can be mounted in any position taking into account the air flow direction (it is indicated with the pointer on the fan case). Be sure to have free access for fan servicing.

KSB fan with electronic module of temperature and speed

It is an ideal solution for ventilation systems of premises where air temperature control (e.g. for greenhouses) is essential.

KSB fans...U with electronic module TSC (Temperature and speed controller) enable automatic change of the impeller rotation speed (air consumption) depending on air temperature in the duct.

The following controllers are placed on the front panel:

- preset of impeller rotation speed;
- operating level of electronic thermostat.

There is a fan version with built-in temperature sensor or remote temperature sensor in the fan duct (4m of cable length, sensor is protected from mechanical damage). LED indicator of thermostat operating is placed on the front panel.

Legend:

Fan series
VENTS KSB

Diameter of connection pipe, mm
100; 125; 150; 160; 200; 250; 315

Options
P – equipped with power cable with plug; **S** – equipped with higher-power motor; **M** – Motor on rubber isolation pads; **U** – " temperature" electronic module with built-in temperature sensor in the air duct; **Un** – "temperature" electronic module with remote temperature sensor; **U1** – "timer" electronic module with built-in temperature sensor in the air duct; **U1n** – "timer" electronic module with remote temperature sensor.

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KSB Operation pattern with electronic module of temperature and speed

Set the desired air temperature (thermostat operating threshold) with thermostat control knob. Set the required rotation speed (air consumption) with control knob of impeller rotation speed. In case of air temperature increase with further exceeding of threshold of thermostat action, the automation activates the motor for the maximal rotation speed (maximal consumption). In case of air temperature goes down below the set threshold of thermostat action, the automation sets the motor to the previously set rotation speed.

In order to eliminate the possibility of the frequent motor switching (with the preset temperature in the duct, equal to the threshold level) there is switching delay. There are two delay patterns applicable in different cases:

1. Temperature sensor delay (KSB...U):
If temperature rises for 2°C from the set threshold of thermostat action, motor starts operating on higher speed. If the temperature goes down below the set threshold of thermostat action, motor returns to prior set (lower) speed.
This pattern may be used to keep air temperature to within 2°C. In this case fan switches will be rare.

2. Timer delay (KSB...U1): if temperature rises exceeding the set threshold of thermostat action, motor sets to higher speed and delay timer switches on for 5min. If the temperature goes down below the set threshold of thermostat action, motor returns to prior set (lower) speed, but only after the end of delay time set in timer.
This pattern may be used to keep air temperature at the precise level. In this case fan will switch more frequently than in the pattern of temperature sensor delay, but with intervals not more than 5 minutes.

Example for temperature sensor delay:
Initial conditions:
-rotation speed is set as 60% of maximal
-threshold of action is set as 25%
-air temperature in the duct =20°C

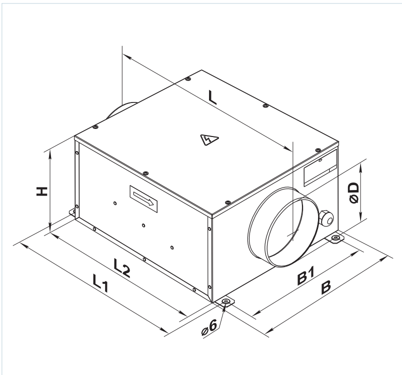
Fan operates with impeller rotation speed=60%
▼
-air temperature in the duct increases
Fan operates with impeller rotation speed=60%
▼
-air temperature in the duct reaches 27°C
Fan is switches to the impeller rotation speed=100%
▼
-air temperature in the duct decreases
Fan operates with impeller rotation speed=100%
▼
-air temperature in the duct reaches 25°C
Fan switches to impeller rotation speed set prior (=60%)

Example for timer delay:
Initial conditions:
- rotation speed is set as 60% of maximal
- threshold of action is set as 25°C
- air temperature in the duct =20°C

Fan operates with impeller rotation speed =60%
▼
- air temperature in the duct rises, reaches 25°C and keeps rising
▼
Fan switches to impeller rotation speed =60%, at the same time delay timer activates for 5 minutes
▼
- air temperature in the duct goes down
Fan operates with impeller rotation speed = 100%
▼
- air temperature in the duct reaches 25°C and keeps going down
▼
Fan waits for timer stop and after that switches to prior set rotation speed (=60%). After switching to the set speed (=60%), delay timer will activate again for 5 minutes.
▼
- air temperature in the duct rises, reaches 25°C and keeps rising
▼
Fan waits for timer stop and after that switches to impeller rotation speed =100% (at the same time delay timer activates for 5 minutes)

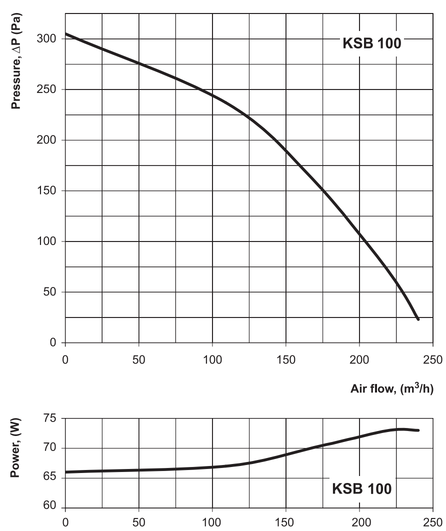
In other words, in timer delay pattern the delay timer will activate every time fan changes its speed.

Type	Dimensions, mm							Weight, kg
	ØD	B	B1	H	L	L1	L2	
KSB 100	99	322	280	192	447	380	350	5,4
KSB 125	124	322	280	192	447	380	350	5,4
KSB 150	149	352	310	212	477	410	380	6,4
KSB 160	159	352	310	212	477	410	380	6,4
KSB 200	199	432	368	287	588	506	480	10,0
KSB 200 C	199	432	368	287	588	506	480	12,0
KSB 250	249	432	368	287	588	506	480	12,5
KSB 315	314	502	438	397	648	566	540	15,5



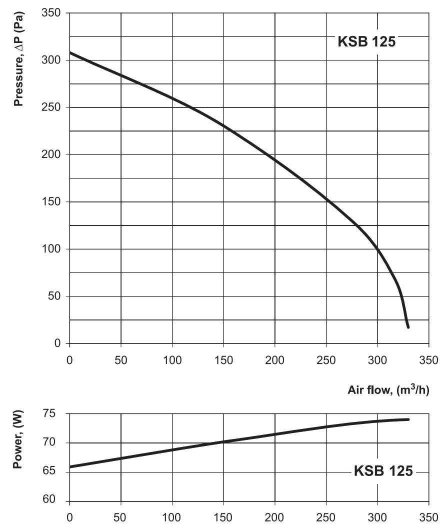
	KSB 100	KSB 125	KSB 150	KSB160
Voltage, V/50Hz	230	230	230	230
Power consumption, W	73	73	72	75
Current, A	0.32	0.32	0.32	0.33
Maximum air consumption, m^3/h	240	330	420	420
RPM	2560	2590	2600	2690
Noise level at 3 m, dBA	33	35	36	36
Maximal temperature of transferred air, ^oC	-25 +55	-25 +55	-25 +55	-25 +55
Index of protection	IP X4	IP X4	IP X4	IP X4

VENTS KSB



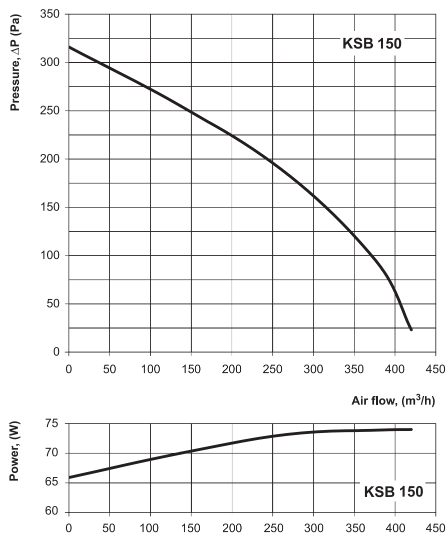
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	53	57	54	52	51	54	51	47
L_{WA} to outlet	dBA	68	49	50	53	56	66	63	56	54
L_{WA} to environment	dBA	40	27	29	32	31	34	29	29	20

VENTS KSB



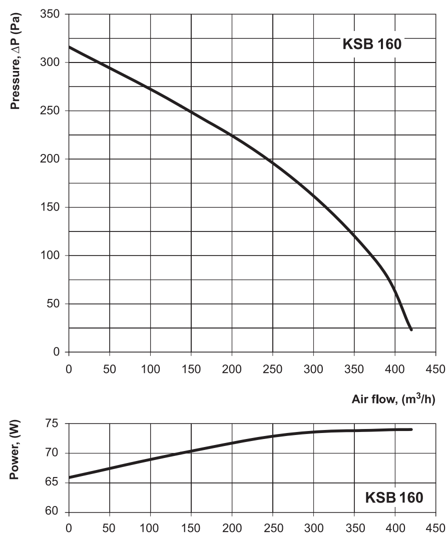
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	64	51	51	54	56	54	55	53	51
L_{WA} to outlet	dBA	65	50	49	59	55	61	61	58	51
L_{WA} to environment	dBA	38	29	32	33	33	33	31	28	25

VENTS KSB



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	62	49	50	58	56	54	55	52	50
L_{WA} to outlet	dBA	66	43	44	59	55	62	60	55	53
L_{WA} to environment	dBA	41	26	30	35	34	34	30	26	25

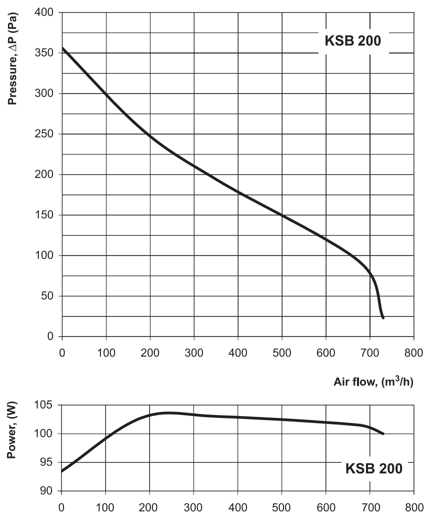
VENTS KSB



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	62	50	51	60	56	52	55	54	51
L_{WA} to outlet	dBA	68	48	47	57	60	67	63	59	56
L_{WA} to environment	dBA	41	28	26	32	33	36	34	25	23

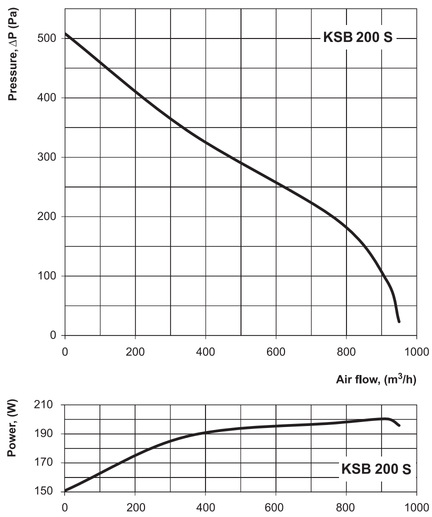
	KSB 200	KSB 200 C	KSB 250	KSB 315
Voltage, V/50Hz	230	230	230	230
Power consumption, W	103	195	198	322
Current, A	0.45	0.85	0.87	1.40
Maximum air consumption, m^3/h	730	950	1300	2150
RPM	2550	2570	2420	2670
Noise level at 3 m, dBA	38	41	41	43
Maximal temperature of transferred air, ^oC	-25 +50	-25 +45	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4

VENTS KSB



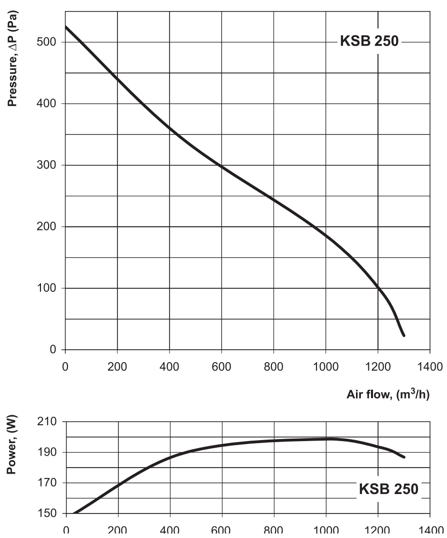
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	52	37	38	45	45	39	39	36	26
L_{wA} to outlet	dBA	67	49	46	55	64	59	60	53	41
L_{wA} to environment	dBA	43	33	35	33	38	25	31	25	25

VENTS KSB



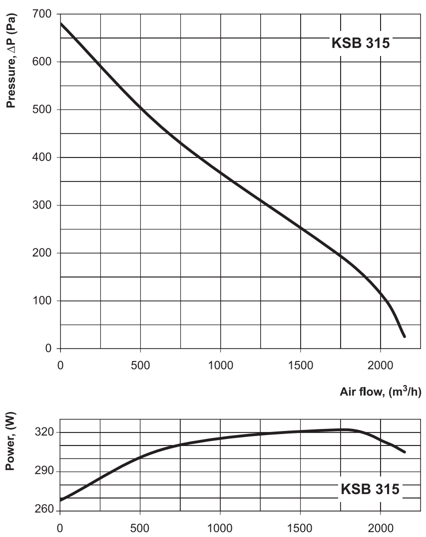
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	53	41	43	53	51	47	44	44	36
L_{wA} to outlet	dBA	70	48	49	57	68	65	63	58	51
L_{wA} to environment	dBA	45	29	32	37	40	27	29	26	27

VENTS KSB



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	59	44	45	54	51	47	45	45	38
L_{wA} to outlet	dBA	74	51	51	62	70	67	64	61	55
L_{wA} to environment	dBA	46	33	36	41	42	30	26	23	27

VENTS KSB



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	59	45	47	56	47	48	50	44	40
L_{wA} to outlet	dBA	75	52	51	59	68	68	65	62	54
L_{wA} to environment	dBA	48	41	41	44	43	36	28	32	29

CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th colspan="2">Three-phase transformer speed controllers</th><th>Frequency speed controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VS-355-4E</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-1,5-PS</td><td>RS-1,5 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td><td></td><td></td><td></td><td>RT-10</td><td>T-1,5 N(V)</td><td>TH-1,5 N(V)</td><td>TF-1,5 N(V)</td><td>TR-1,5 N(V)</td></tr>
<tr><td>VS-355-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-1,5-T</td><td>RSA5D-5,0-M</td><td>VFED-200-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-400-4E</td><td></td><td></td><td>RS-2,5-PS</td><td>RS-2,5 N(V)</td><td>RS-3,0-T</td><td></td><td>RSA5E-3,5-T</td><td>RSA5E-3,5-TA</td><td>RSA5E-3-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">VS-400-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-1,5-T</td><td rowspan="2">RSA5D-5,0-M</td><td>VFED-400-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td>VS-450-4E</td><td></td><td></td><td>RS-4,0-PS</td><td></td><td>RS-5,0-T</td><td></td><td>RSA5E-3,5-T</td><td>RSA5E-3,5-TA</td><td>RSA5E-4-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-450-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-3,5-T</td><td>RSA5D-5,0-M</td><td>VFED-400-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-500-4E</td><td></td><td></td><td></td><td></td><td>RS-10,0-T</td><td></td><td>RSA5E-8,0-T</td><td>RSA5E-8,0-TA</td><td>RSA5E-12-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-500-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-3,5-T</td><td>RSA5D-5,0-M</td><td>VFED-750-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-560-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-8,0-M</td><td>VFED-1100-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-560-6D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>RSA5D-3,5-T</td><td>RSA5D-5,0-M</td><td>VFED-400-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-630-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="2">RSA5D-8,0-M</td><td>VFED-1500-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>VS-630C-4D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td>VS-710-6D</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>VFED-1100-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td>KSA 100-2E</td><td rowspan="5">RS-1-300</td><td rowspan="5">RS-1-400</td><td rowspan="4">RS-1,5-PS</td><td rowspan="2">RS-1 N(V)</td><td rowspan="5">RS-1,5-T</td><td rowspan="6">RSA5E-2-P</td><td rowspan="5">RSA5E-1,5-T</td><td rowspan="5">RSA5E-1,5-TA</td><td rowspan="6">RSA5E-2-M</td><td rowspan="6">RT-10</td><td rowspan="5">T-1,5 N(V)</td><td rowspan="5">TH-1,5 N(V)</td><td rowspan="5">TF-1,5 N(V)</td><td rowspan="5">TR-1,5 N(V)</td></tr>
<tr><td>KSA 125-2E</td></tr>
<tr><td>KSA 150-2E</td><td rowspan="2">RS-1,5 N(V)</td></tr>
<tr><td>KSA 160-2E</td></tr>
<tr><td>KSA 200-4E</td><td>RS-0,5-PS</td><td>RS-1 N(V)</td></tr>
<tr><td>KSA 250-4E</td><td></td><td></td><td>RS-2,5-PS</td><td>RS-2 N(V)</td><td>RS-3,0-T</td><td>RSA5E-3,5-T</td><td>RSA5E-3,5-TA</td><td></td><td></td><td></td><td></td></tr>
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<tr><td>KSB 125</td></tr>
<tr><td>KSB 150</td></tr>
<tr><td>KSB 160</td></tr>
<tr><td>KSB 200</td></tr>
<tr><td>KSB 200 C</td><td rowspan="3">RS-1,5-PS</td></tr>
<tr><td>KSB 250</td></tr>
<tr><td>KSB 315</td><td>RS-1,5 N(V)</td></tr>
</table>

CENTRIFUGAL FANS

Series VENTS VCU

- Squirl-type centrifugal fans with an external rotor motor and one intake side with efficiency up to 2000 m³/h. The fan is designed for the intake and exhaust ventilation systems.

Series VENTS VCUN

- Squirl-type centrifugal fans one intake side and an impeller mounted on a stock of three-phase asynchronous motor with the efficiency up to 19 000 m³/h. The fan is designed for the intake and exhaust ventilation systems.

Squirl-type centrifugal fans
VENTS VCU

Efficiency up to 2 000 m³/h

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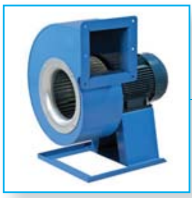

Squirl-type centrifugal fans
VENTS VCUN

Efficiency up to 19 000 m³/h

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Series
VENTS VCU

Squirl-type centrifugal fans with an external rotor motor and one intake side with efficiency up to **2000 m³/h.** The fan is designed for the intake and exhaust ventilation systems.

Application
Designed for intake and exhaust ventilation of various purpose premises. Fans may be used as components for both ventilation and air conditioning units and are suitable for outside installations.

Design
The fan case is made of steel with polymer coating.

Motor
Two- and four-pole one-phase asynchronous motors with an external rotor having an impeller with forward-curved blades made of galvanized steel. The motors are equipped with built-in thermal protection with an automatic restart. The application of ball bearings provides a long service life. For long-term durability, low noise level and a fan safe operation, each turbine is dynamically balanced during assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Installation
The fans may be installed in air-ventilation chambers, air conditioning units or separately and may be connected to air ducts by means of both exhaust and suction pipes and just one exhaust pipe. The exhaust and suction pipes have a rectangular and circular section accordingly. The incoming power supply takes place by means of external terminals.

Legend:

Series	Motor		Diameter of turbine, mm	Width of turbine, mm
	Poles	Phases		
VENTS VCU	2 4	**E** – single phase	140; 160; 180; 200; 225; 250	60; 62; 80; 90; 92; 102; 140

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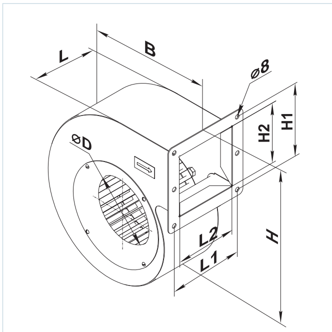
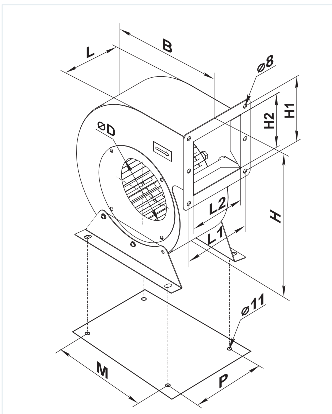
	VCU 2E 140x60	VCU 2E 160x62	VCU 2E 160x90	VCU 4E 180x92
Voltage, V/50Hz	230	230	230	230
Power consumption, W	148	240	320	160
Current, A	0,64	1,05	1,48	0,7
Maximum air consumption, m^3/h	515	600	730	800
RPM	2820	2100	2745	1465
Noise level at 3 m, dBA	68	68	70	62
Maximal temperature of transferred air, °C	-25 +45	-25 +50	-25 +45	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4

	VCU 4E 200x80	VCU 4E 200x102	VCU 4E 225x102	VCU 4E 250x140
Voltage, V/50Hz	230	230	230	230
Power consumption, W	125	280	395	570
Current, A	0,55	1,25	1,98	2,48
Maximum air consumption, m^3/h	730	1350	1480	2000
RPM	1430	1475	1330	1310
Noise level at 3 m, dBA	63	65	69	60
Maximal temperature of transferred air, °C	-25 +45	-25 +40	-40 +70	-40 +70
Index of protection	IP X4	IP X4	IP X4	IP X4

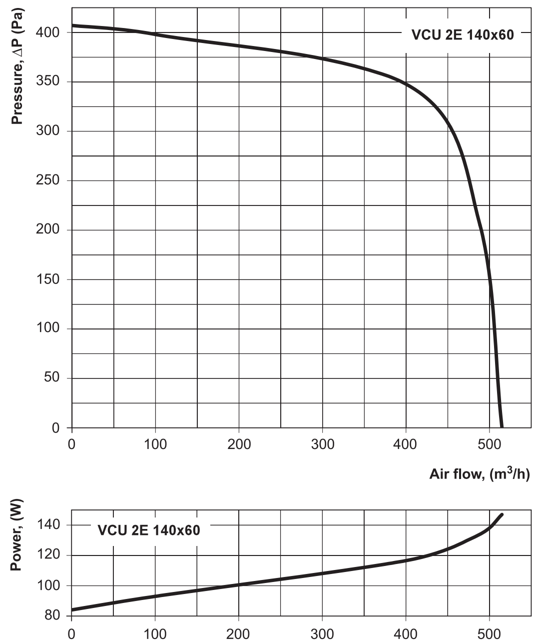
Type	Dimensions, mm								Weight, kg
	ØD	B	H	H1	H2	L	L1	L2	
VCU 2E 140x60	140	243	287	125	93	85	107	75	3,2
VCU 2E 160x62	160	277	324	136	106	89	112	82	4,2
VCU 2E 160x90	160	277	324	136	106	136	158	127	5,1
VCU 4E 180x92	180	311	360	150	120	145	166	137	6,5
VCU 4E 200x80	200	335	398	165	134	121	140	113	6,8
VCU 4E 200x102	200	335	398	165	134	157	175	148	7,3



Type	Dimensions, mm										Weight, kg
	ØD	B	H	H1	H2	L	L1	L2	P	M	
VCU 4E 225x102	225	365	441	210	171	145	170	137	178	250	11,2
VCU 4E 250x140	250	410	485	230	191	205	230	197	238	270	15,5

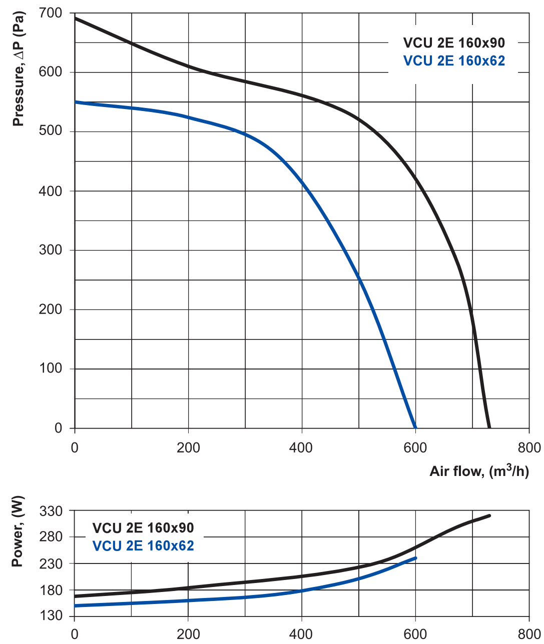


VENTS VCU



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	60	44	51	50	37	33	31	27	17
L_{wA} to outlet	dBA	58	45	53	44	43	38	31	26	19
L_{wA} to environment	dBA	50	41	48	44	35	31	24	20	15

VENTS VCU



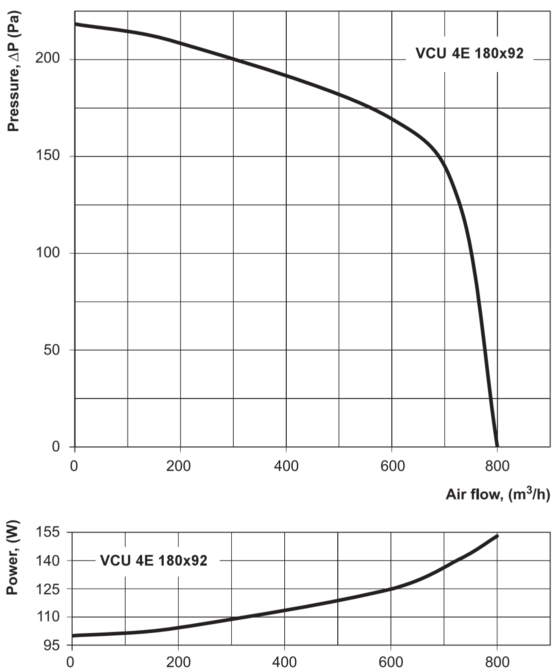
VCU 2E 160x90

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	58	41	55	53	40	33	33	25	21
L_{wA} to outlet	dBA	57	45	56	46	43	36	30	26	21
L_{wA} to environment	dBA	51	39	48	45	36	32	25	20	17

VCU 2E 160x62

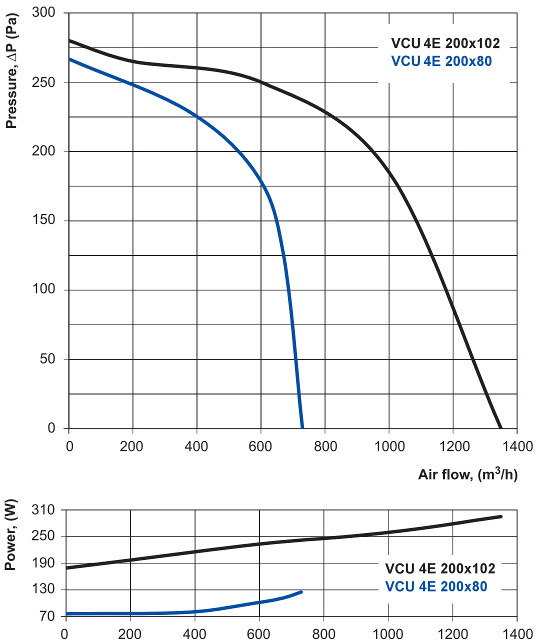
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	57	42	54	54	38	34	31	28	21
L_{wA} to outlet	dBA	57	46	57	45	42	38	31	26	20
L_{wA} to environment	dBA	49	37	48	42	33	29	25	19	16

VENTS VCU



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	56	43	54	52	38	34	30	29	17
L_{wA} to outlet	dBA	56	46	55	45	42	35	30	27	21
L_{wA} to environment	dBA	52	39	47	46	35	28	24	18	17

VENTS VCU



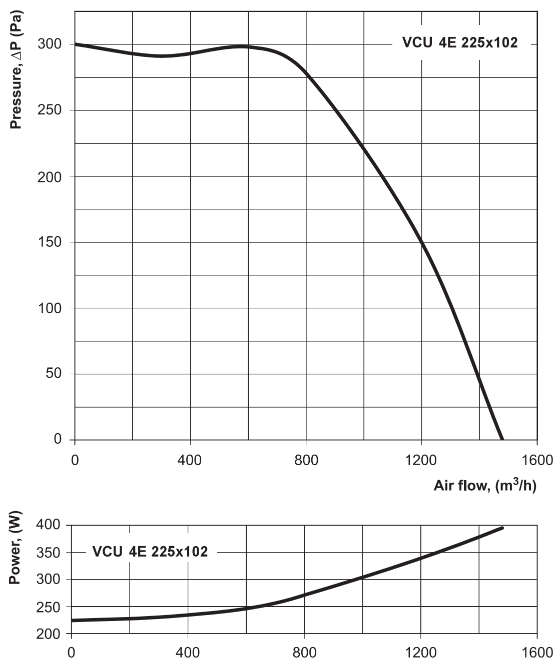
VCU 4E 200x102

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	41	37	38	37	30	26	19	17	14
L_{wA} to outlet	dBA	42	40	41	36	36	25	16	17	18
L_{wA} to environment	dBA	37	32	35	29	26	20	16	11	11

VCU 4E 200x80

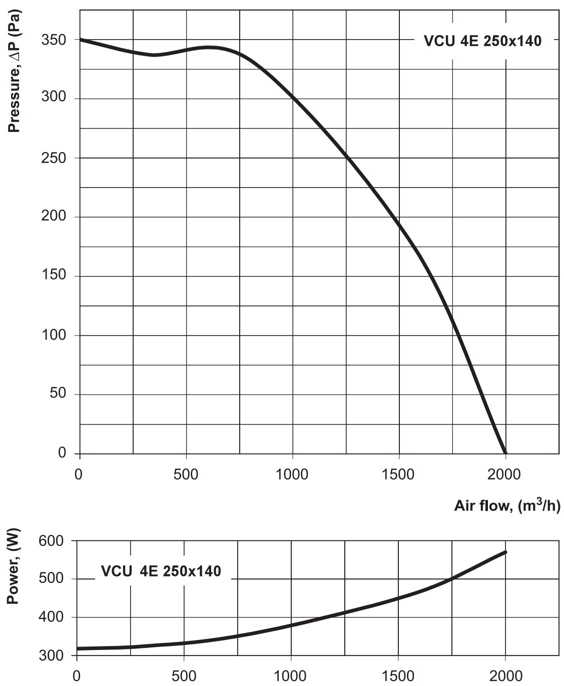
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	41	38	39	34	31	29	20	18	13
L_{wA} to outlet	dBA	44	40	40	36	34	25	20	16	17
L_{wA} to environment	dBA	37	33	37	30	25	21	16	13	13

VENTS VCU



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	39	37	38	38	31	28	21	17	15
L_{wA} to outlet	dBA	44	37	41	38	34	27	16	17	19
L_{wA} to environment	dBA	37	31	33	31	25	20	17	13	11

VENTS VCU



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	44	44	42	36	31	22	29	21	19
L_{wA} to outlet	dBA	46	37	42	38	29	28	29	23	21
L_{wA} to environment	dBA	40	34	37	31	27	21	24	17	14

Series
VENTS VCUN

Squirl-type centrifugal fans one intake side and an impeller mounted on a stock of three-phase asynchronous motor with the efficiency up to **19 000 m³/h.** The fan is designed for the intake and exhaust ventilation systems.

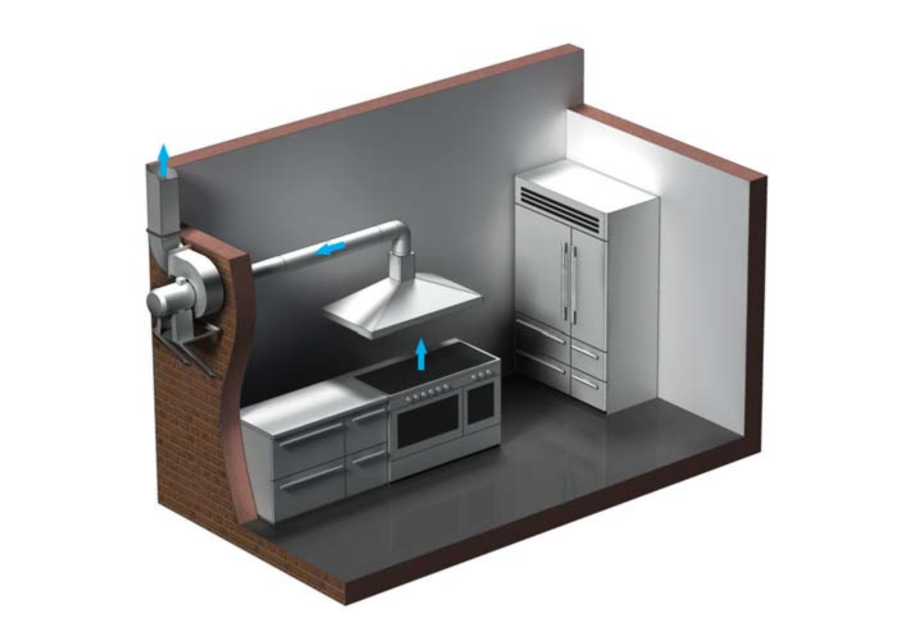
Application
Designed for intake and exhaust ventilation of various purpose premises. Fans may be used as components for both ventilation and air conditioning units. They are suitable for outside installation.

Design
The fan case is made of steel with polymer coating. The fan may be supplied both with the clockwise or counterclockwise rotation. There are a few positions of fan case for connection of air ducts at any angle with pitch distance of 45 °.

Motor
Two-, four-, six-, or eight-pole three-phase asynchronous motors with forward-curved blades impeller made of galvanized steel mounted on the stack of the motor. The application of ball bearings provides a long service life. For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Installation
The fans may be installed both in air-ventilation chambers, air conditioning units or separately and may be connected to air ducts by means of both exhaust and suction pipes and just one exhaust pipe. The exhaust and suction pipes have a rectangular and circular cross section accordingly. The incoming power supply takes place by means of external terminals.



Legend:

Series	Diameter of turbine, mm	Width of turbine, mm	Motor		Case	Rotation angle
			Power, kW	Poles		
VENTS VCUN	140; 160; 180; 200; 225; 250; 280; 315; 355; 400; 450; 500	74; 93; 103; 127; 143; 183; 203; 229	0,25; 0,37; 0,55; 0,75; 1,1; 1,5; 2,2; 3; 4; 5,5; 7,5; 1	2; 4; 6; 8	R – right side; L – left side	0; 45; 90; 135; 180; 225; 270; 315

Accessories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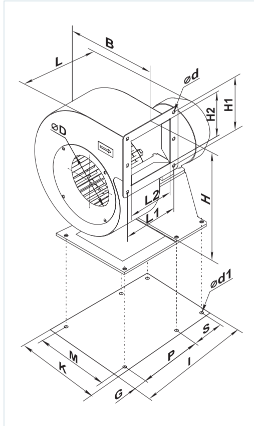
	VCUN 140x74-0,25-4	VCUN 140x74-0.37-2	VCUN 160x74-0,55-4	VCUN 160x74-0,75-2	VCUN 180x74-0,55-4	VCUN 180x74-1,1-2	VCUN 200x93-0,55-4	VCUN 200x93-1,1-2
Voltage, V/50Hz	400	400	400	400	400	400	400	400
Power consumption, kW	0,25	0,37	0,55	0,75	0,55	1,1	0,55	1,1
Current, A	0,8	0,9	1,6	1,8	1,6	2,6	1,6	2,6
Maximum air consumption, m^3/h	450	710	750	1540	1030	1950	1615	1900
RPM	1350	2730	1360	2820	1360	2800	1360	2800
Noise level at 3 m, dBA	60	65	62	68	64	70	67	73
Maximal temperature of transferred air, ^oC	60	60	60	60	60	60	60	60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

	VCUN 225x103-1,1-4	VCUN 225x103-2,2-2	VCUN 240x114-2,2-4	VCUN 240x114-3,0-2	VCUN 250x127-1,5-6	VCUN 250x127-2,2-4	VCUN 250x127-5,5-2	VCUN 280x127-1,5-6
Voltage, V/50Hz	400	400	400	400	400	400	400	400
Power consumption, kW	1,1	2,2	2,2	3,0	1,5	2,2	5,5	1,5
Current, A	2,8	4,7	5,1	6,1	4,2	5,1	10,7	4,2
Maximum air consumption, m^3/h	2125	3350	2930	4350	2415	3720	4820	3450
RPM	1420	2865	1420	2870	940	1420	2850	940
Noise level at 3 m, dBA	72	75	74	78	68	78	81	69
Maximal temperature of transferred air, ^oC	60	60	60	60	60	60	60	60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

	VCUN 280x127-2,2-4	VCUN 280x127-5,5-2	VCUN 315x143-2.2-6	VCUN 315x143-4.0-4	VCUN 355x143-2,2-6	VCUN 355x143-4,0-4	VCUN 400x183-1,5-8	VCUN 400x183-2,2-6
Voltage, V/50Hz	400	400	400	400	400	400	400	400
Power consumption, kW	2,2	5,5	2,2	4,0	2,2	4,0	1,5	2,2
Current, A	5,1	10,7	5,6	8,7	5,6	8,7	4,2	5,8
Maximum air consumption, m^3/h	4395	6330	4375	6530	5090	8150	6545	8100
RPM	1420	2850	940	1410	940	1410	700	940
Noise level at 3 m, dBA	75	81	70	79	71	79	62	73
Maximal temperature of transferred air, ^oC	60	60	60	60	60	60	60	60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

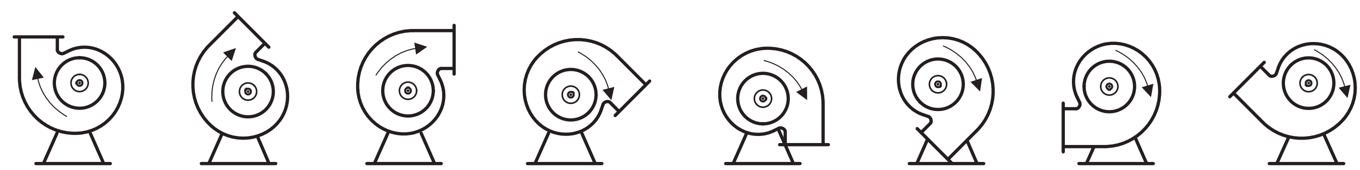
	VCUN 400x183-5,5-4	VCUN 450x203-3,0-8	VCUN 450x203-4,0-6	VCUN 450x203-11,0-4	VCUN 500x229-5,5-8	VCUN 500x229-7,5-6	VCUN 500x229-11,0-4
Voltage, V/50Hz	400	400	400	400	400	400	400
Power consumption, kW	5,5	3,0	4,0	11,0	5,5	7,5	11,0
Current, A	11,0	7,8	9,1	24,0	14,8	17,0	24,0
Maximum air consumption, m^3/h	10175	10230	11150	19000	11550	14960	17250
RPM	1430	700	950	1450	700	955	1450
Noise level at 3 m, dBA	80	70	76	84	72	78	85
Maximal temperature of transferred air, ^oC	60	60	60	60	60	60	60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

Type	Dimensions, mm																Weight, kg
	ØD	Ød	Ød1	B	H	H1	H2	L	L1	L2	P	M	I	G	K	S	
VCUN 140x74-0,25-4	140	8	10	242	323	125	92	309	125	95	124	220	234	18	253	80	9,3
VCUN 140x74-0,37-2	140	8	10	242	323	125	92	309	125	95	124	220	234	18	253	80	9,3
VCUN 160x74-0,55-4	160	8	10	277	373	134	106	356	134	104	141	220	260	17	252	90	12,7
VCUN 160x74-0,75-2	160	8	10	277	373	134	106	356	134	104	141	220	260	17	252	90	13,0
VCUN 180x74-0,55-4	180	10	10	311	414	143	120	365	143	114	146	270	270	22	314	90	13,5
VCUN 180x74-1,1-2	180	10	10	311	414	143	120	365	143	114	146	270	270	22	314	90	14,5
VCUN 200x93-0,55-4	200	10	10	345	436	160	134	380	160	129	158	270	284	24	315	90	15,2
VCUN 200x93-1,1-2	200	10	10	345	436	160	134	380	160	129	158	270	284	24	315	90	16,2
VCUN 225x103-1,1-4	225	10	12	388	507	178	151	432	172	141	174	275	316	27	330	100	21,2
VCUN 225x103-2,2-2	225	10	12	388	507	178	151	432	172	141	174	275	316	27	330	100	24,2
VCUN 240x114-2,2-4	240	10	12	414	568	186	161	461	186	156	195	275	362	27	330	125	30,5
VCUN 240x114-3,0-2	240	10	12	414	568	186	161	461	186	156	195	275	362	27	330	125	31,4
VCUN 250x127-1,5-6	250	10	12	431	594	202	168	473	202	166	206	300	373	27	355	125	33,0
VCUN 250x127-2,2-4	250	10	12	431	594	202	168	473	202	166	206	300	373	27	355	125	32,2
VCUN 250x127-5,5-2	250	10	12	431	614	202	168	517	202	166	213	300	397	27	355	140	40,0
VCUN 280x127-1,5-6	280	10	12	483	626	225	189	503	231	196	243	300	410	27	355	125	35,1
VCUN 280x127-2,2-4	280	10	12	483	626	225	189	503	231	196	243	300	410	27	355	125	34,2
VCUN 280x127-5,5-2	280	10	12	483	646	225	189	545	231	196	243	300	427	27	355	140	42,4
VCUN 315x143-2,2-6	315	10	15	543	731	250	213	568	255	216	268	350	452	27	405	140	46,8
VCUN 315x143-4,0-4	315	10	15	543	731	250	213	568	255	216	268	350	452	27	405	140	49,8
VCUN 355x143-2,2-6	355	10	15	611	817	275	241	566	255	214	253	350	442	32	405	140	49,0
VCUN 355x143-4,0-4	355	10	15	611	817	275	241	566	255	214	253	350	442	32	405	140	51,0
VCUN 400x183-1,5-8	400	10	15	689	870	310	272	619	310	268	313	400	497	27	455	140	57,1
VCUN 400x183-2,2-6	400	10	15	689	870	310	272	619	310	268	313	400	497	27	455	140	54,1
VCUN 400x183-5,5-4	400	10	15	689	882	310	272	662	330	289	341	400	525	27	455	140	69,5
VCUN 450x203-3,0-8	450	10	15	774	985	345	306	690	352	315	351	450	550	42	530	140	77,8
VCUN 450x203-4,0-6	450	10	15	774	985	345	306	690	352	315	351	450	550	42	530	140	76,5
VCUN 450x203-11,0-4	450	10	15	774	1005	345	306	722	352	315	371	450	608	42	530	178	105,0
VCUN 500x229-5,5-8	500	11	15	860	1115	390	341	761	401	353	408	500	645	42	580	178	85,0
VCUN 500x229-7,5-6	500	11	15	860	1115	390	341	761	401	353	408	500	645	42	580	178	86,0
VCUN 500x229-11,0-4	500	11	15	860	1115	390	341	761	401	353	408	500	645	42	580	178	107,0



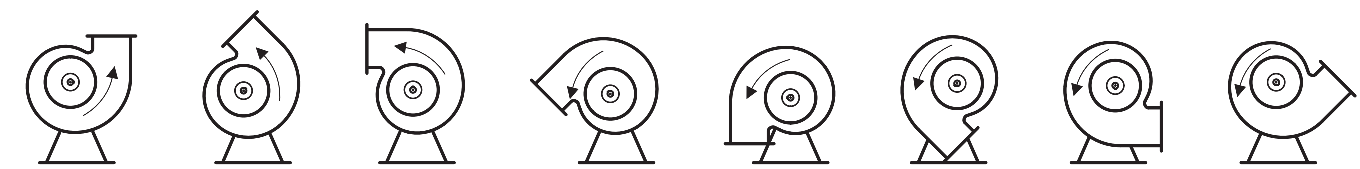
Positions of fan case (view from the suction side)

Right rotation of the turbine



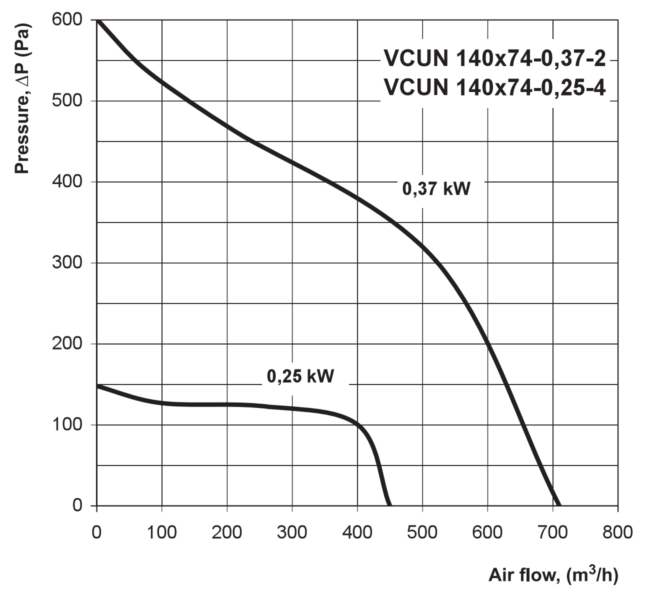
R 0^0 R 45^0 R 90^0 R 135^0 R 180^0 R 225^0 R 270^0 R 315^0

Left rotation of the turbine



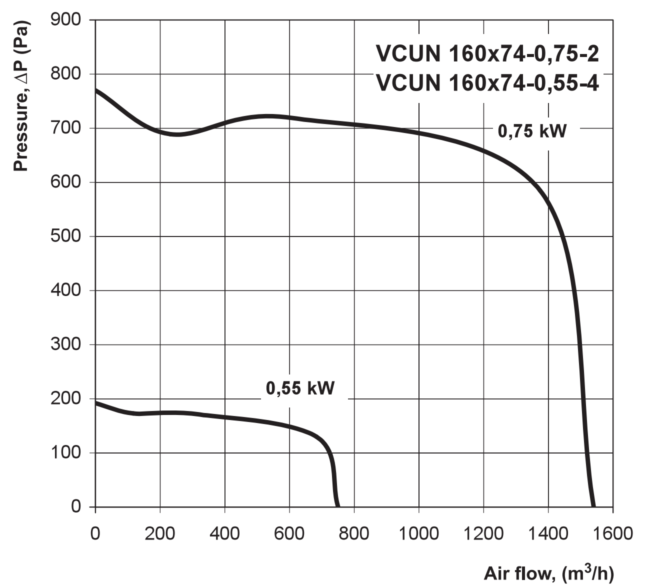
L 0^0 L 45^0 L 90^0 L 135^0 L 180^0 L 225^0 L 270^0 L 315^0

VENTS VCUN



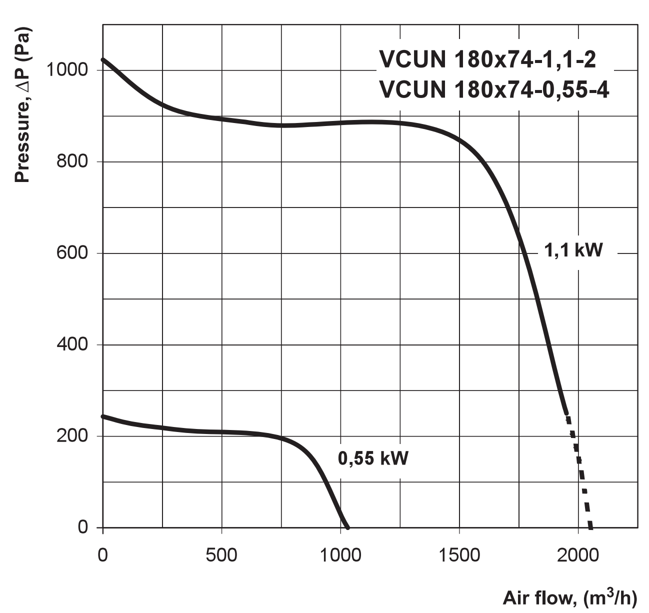
VCUN 140x74-0.37-2										
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	68	47	59	69	72	74	75	72	71
VCUN 140x74-0,25-4	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	61	43	58	64	61	68	68	65	63

VENTS VCUN



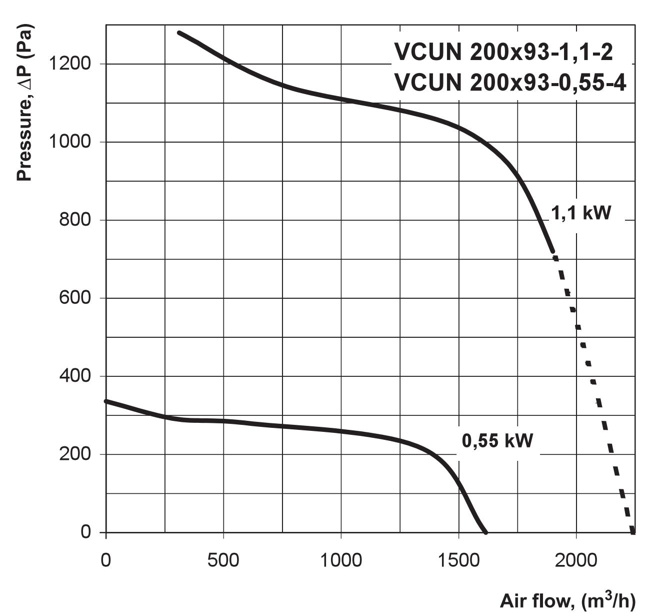
VCUN 160x74-0,75-2										
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	67	48	60	69	74	74	78	73	72
VCUN 160x74-0,55-4	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	63	46	59	64	65	69	71	68	65

VENTS VCUN



VCUN 180x74-1,1-2										
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	70	53	62	72	78	77	81	78	77
VCUN 180x74-0,55-4	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	62	50	63	68	67	73	75	69	67

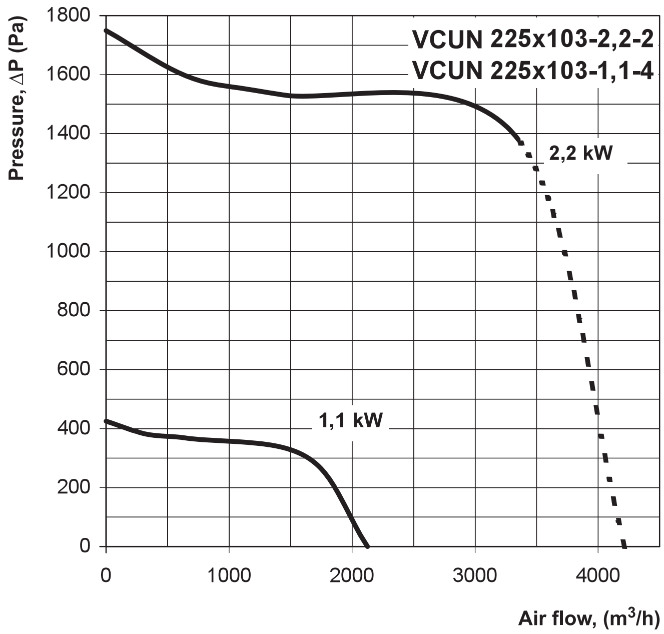
VENTS VCUN



VCUN 200x93-1,1-2										
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	75	54	65	78	81	81	85	78	78
VCUN 200x93-0,55-4	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	65	51	64	71	72	75	77	72	70

FAN SERIES VENTS VCUN

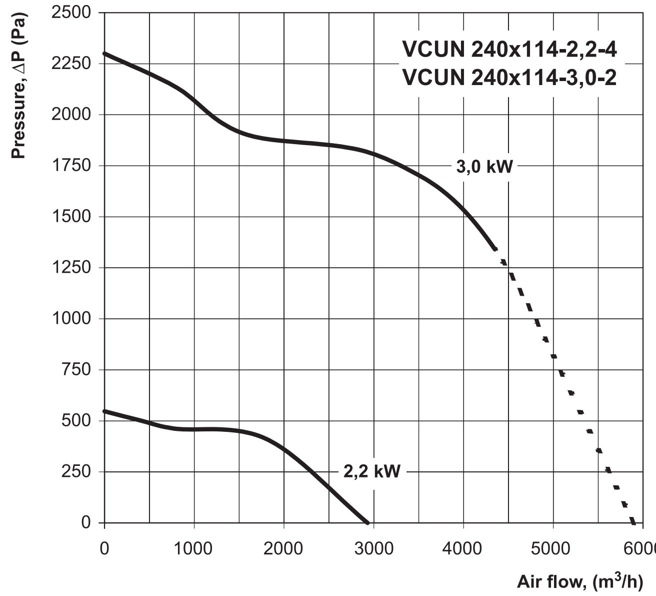
VENTS VCUN



VCUN 225x103-2,2-2

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	75	58	67	78	83	83	88	81	79
VCUN 225x103-1,1-4	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	72	55	65	75	76	81	81	77	75

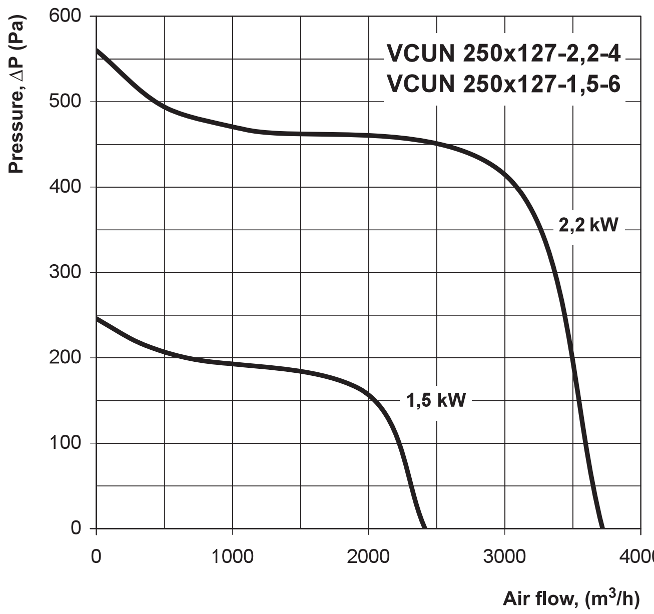
VENTS VCUN



VCUN 240x114-2,2-4

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	71	57	69	75	75	81	82	79	76
VCUN 240x114-3,0-2	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	58	69	74	78	73	79	78	78

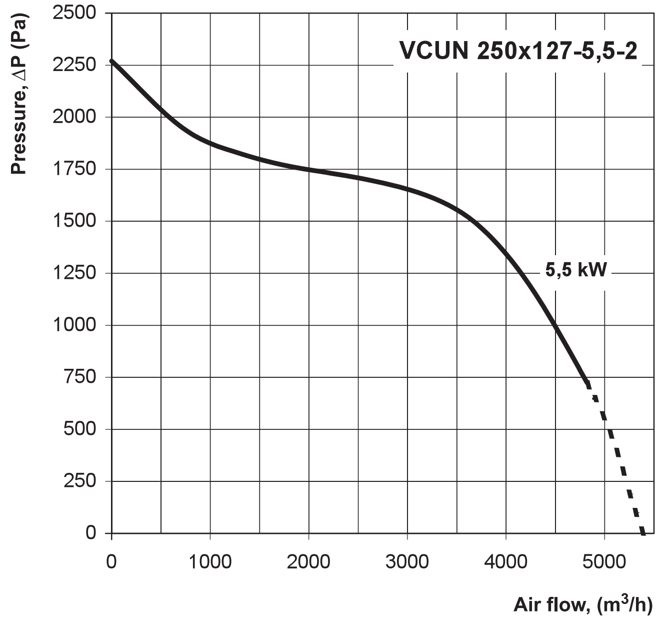
VENTS VCUN



VCUN 250x127-2,2-4

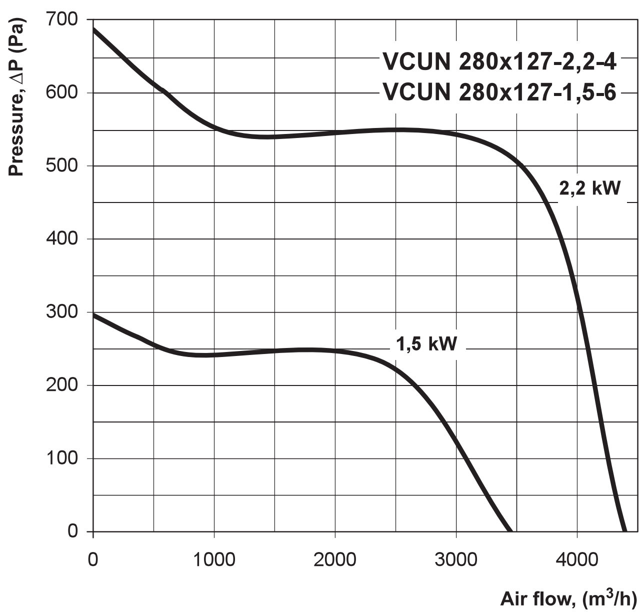
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	70	56	71	77	74	81	82	80	73
VCUN 250x127-1,5-6	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	65	50	62	68	68	73	71	72	65

VENTS VCUN



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	78	57	71	79	84	85	89	83	81

VENTS VCUN



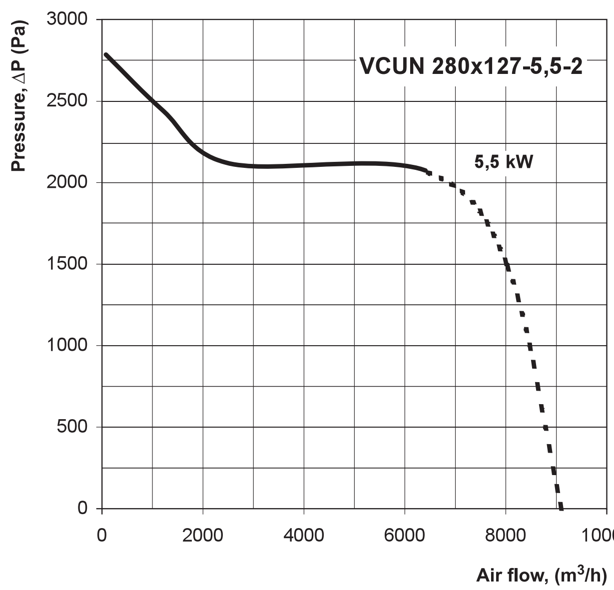
VCUN 280x127-2,2-4

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	73	61	74	76	81	82	83	81	77

VCUN 280x127-1,5-6

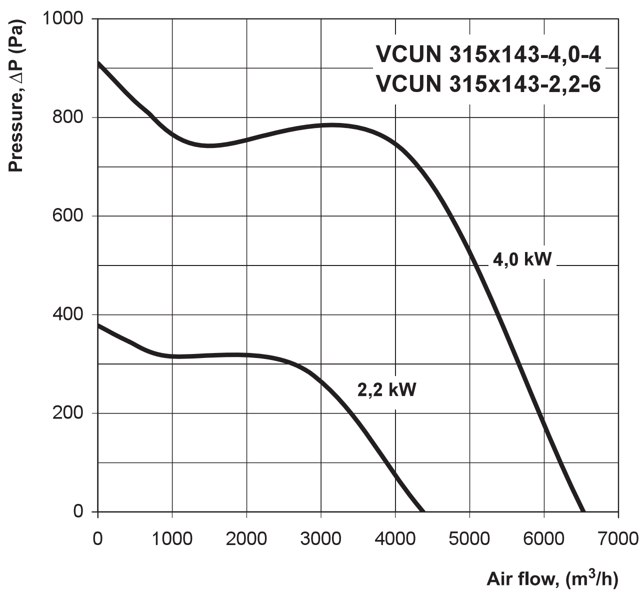
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	67	50	63	69	67	73	71	69	66

VENTS VCUN



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	80	63	72	81	88	86	91	87	86

VENTS VCUN



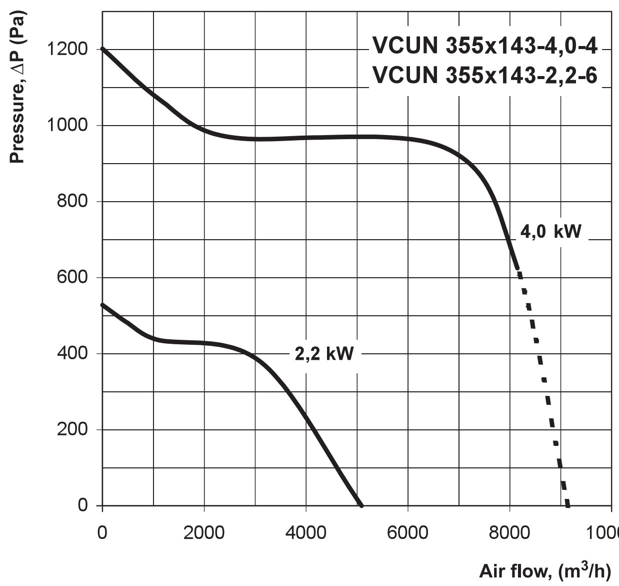
VCUN 315x143-4.0-4

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	78	62	73	81	84	88	86	86	83

VCUN 315x143-2.2-6

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	71	56	67	70	80	78	79	72	68

VENTS VCUN



VCUN 355x143-4,0-4

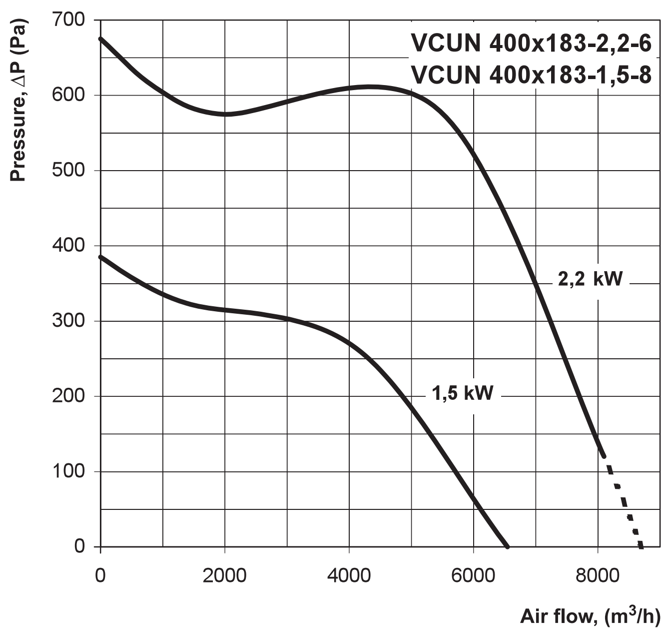
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	62	75	80	84	87	90	82	82

VCUN 355x143-2,2-6

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	71	54	68	73	82	82	82	75	72

FAN SERIES VENTS VCUN

VENTS VCUN



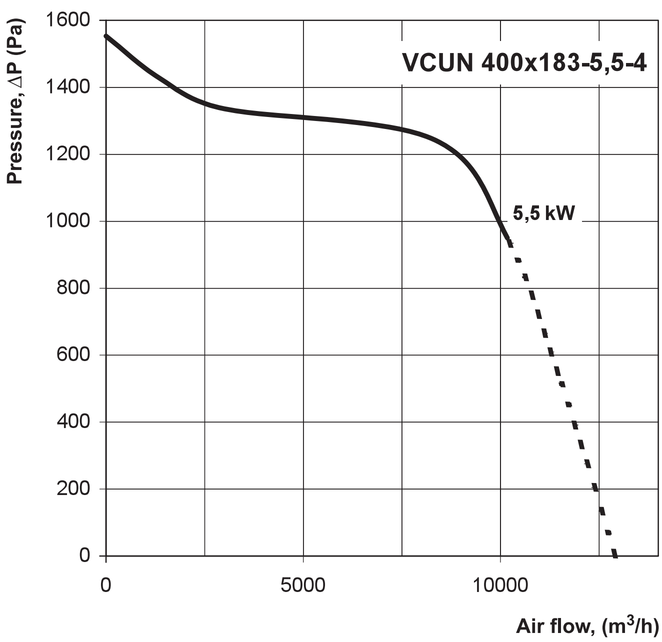
VCUN 400x183-2,2-6

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	75	57	72	75	81	80	81	78	76

VCUN 400x183-1,5-8

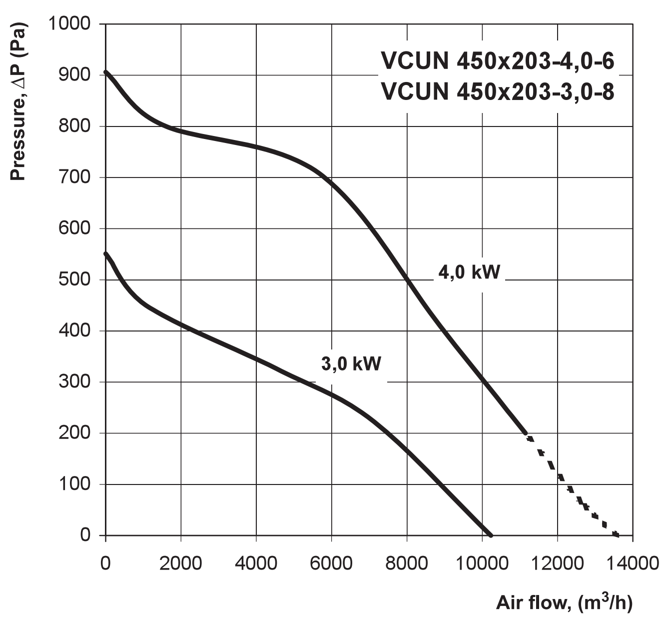
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	68	53	65	69	74	76	77	73	67

VENTS VCUN



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	76	64	75	81	82	89	88	84	83

VENTS VCUN



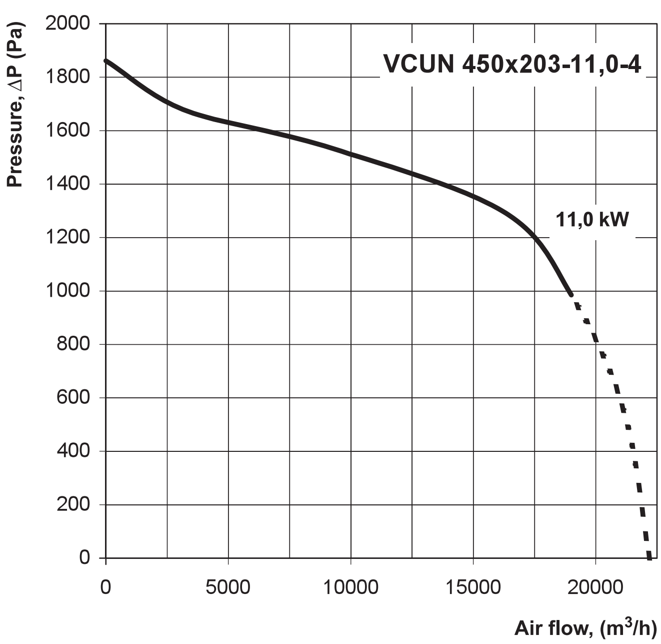
VCUN 450x203-4,0-6

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	76	59	74	75	83	83	85	81	77

VCUN 450x203-3,0-8

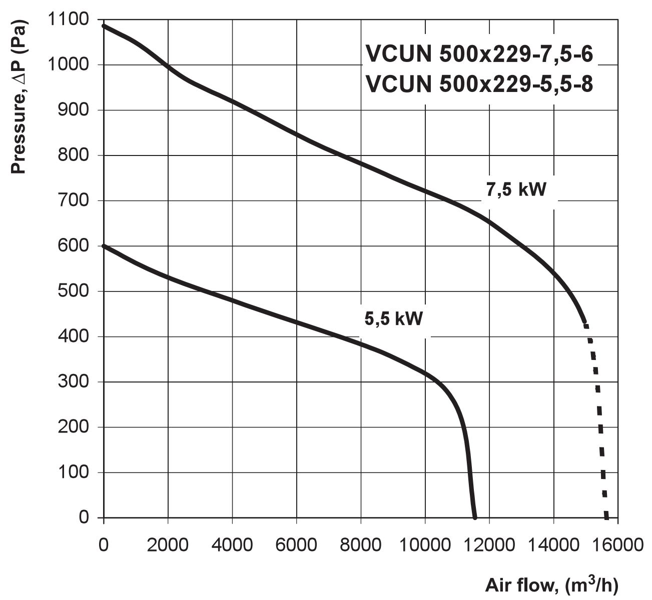
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	67	56	63	65	75	75	71	71	69

VENTS VCUN



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	85	70	84	89	88	94	94	94	91

VENTS VCUN



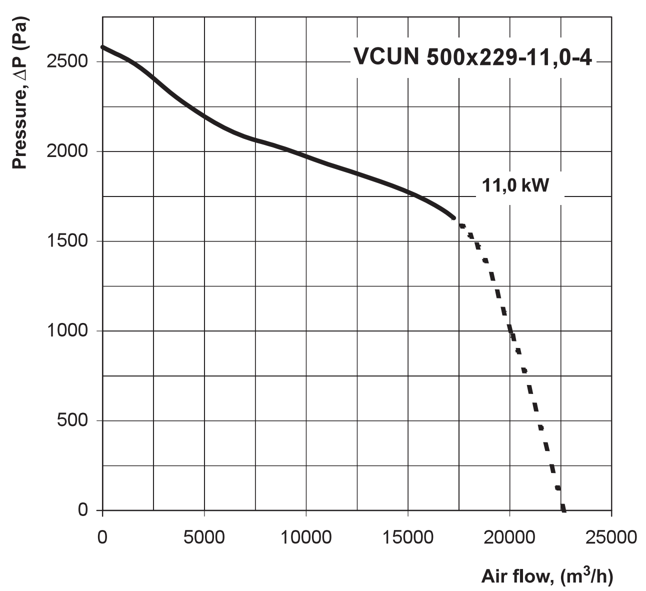
VCUN 500x229-7,5-6

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	83	68	79	85	85	93	92	86	85

VCUN 500x229-5,5-8

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	61	74	78	81	86	85	81	80

VENTS VCUN



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	85	73	83	90	91	94	97	94	90

CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VCU 2E 140x60</td><td rowspan="6">RS-1-300</td><td rowspan="6">RS-1-400</td><td rowspan="5">RS-1,5-PS</td><td>RS-1 N(V)</td><td rowspan="6">RS-1,5-T</td><td rowspan="7">RSA5E-2-P</td><td rowspan="6">RSA5E-1,5-T</td><td rowspan="6">RSA5E-1,5-TA</td><td rowspan="7">RSA5E-2-M</td><td rowspan="7">RT-10</td><td rowspan="6">T-1,5 N(V)</td><td rowspan="6">TH-1,5 N(V)</td><td rowspan="6">TF-1,5 N(V)</td><td rowspan="6">TR-1,5 N(V)</td></tr>
<tr><td>VCU 2E 160x62</td><td rowspan="2">RS-1,5 N(V)</td></tr>
<tr><td>VCU 2E 160x90</td></tr>
<tr><td>VCU 4E 180x92</td><td rowspan="2">RS-1 N(V)</td></tr>
<tr><td>VCU 4E 200x80</td></tr>
<tr><td>VCU 4E 200x102</td><td>RS-1,5-PS</td><td>RS-1,5 N(V)</td></tr>
<tr><td>VCU 4E 225x102</td><td></td><td></td><td rowspan="2">RS-2,5-PS</td><td>RS-2 N(V)</td><td rowspan="2">RS-3,0-T</td><td rowspan="2">RSA5E-3,5-T</td><td rowspan="2">RSA5E-3,5-TA</td><td></td><td></td><td></td><td></td></tr>
<tr><td>VCU 4E 250x140</td><td></td><td></td><td>RS-2,5 N(V)</td><td></td><td>RSA5E-3-M</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

<table>
<tr><th></th><th colspan="2">Three-phase transformer speed controllers</th><th>Frequency speed controllers</th></tr>
<tr><td>VCUN 140x74-0,25-4</td><td rowspan="2">RSA5D-1,5-T</td><td rowspan="11">RSA5D-5,0-M</td><td rowspan="2">VFED-200-TA</td></tr>
<tr><td>VCUN 140x74-0.37-2</td></tr>
<tr><td>VCUN 160x74-0,55-4</td><td rowspan="7">RSA5D-3,5-T</td><td rowspan="3">VFED-400-TA</td></tr>
<tr><td>VCUN 160x74-0,75-2</td></tr>
<tr><td>VCUN 180x74-0,55-4</td></tr>
<tr><td>VCUN 180x74-1,1-2</td><td>VFED-750-TA</td></tr>
<tr><td>VCUN 200x93-0,55-4</td><td>VFED-400-TA</td></tr>
<tr><td>VCUN 200x93-1,1-2</td><td rowspan="2">VFED-750-TA</td></tr>
<tr><td>VCUN 225x103-1,1-4</td></tr>
<tr><td>VCUN 225x103-2,2-2</td><td></td><td rowspan="3">VFED-1100-TA</td></tr>
<tr><td>VCUN 250x127-1,5-6</td><td></td></tr>
<tr><td>VCUN 250x127-2,2-4</td><td></td><td>RSA5D-8,0-M</td></tr>
<tr><td>VCUN 250x127-5,5-2</td><td></td><td>RSA5D-12,0-M</td><td></td></tr>
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<tr><td>VCUN 280x127-5,5-2</td><td></td><td>RSA5D-12,0-M</td><td></td></tr>
<tr><td>VCUN 315x143-2.2-6</td><td></td><td>RSA5D-8,0-M</td><td>VFED-1500-TA</td></tr>
<tr><td>VCUN 315x143-4.0-4</td><td></td><td>RSA5D-10,0-M</td><td></td></tr>
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<tr><td>VCUN 355x143-4,0-4</td><td></td><td>RSA5D-10,0-M</td><td></td></tr>
<tr><td>VCUN 400x183-1,5-8</td><td></td><td>RSA5D-5,0-M</td><td>VFED-1100-TA</td></tr>
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<tr><td>VCUN 450x203-4,0-6</td><td></td><td>RSA5D-10,0-M</td><td></td></tr>
<tr><td>VCUN 450x203-11,0-4</td><td></td><td></td><td></td></tr>
<tr><td>VCUN 500x229-5,5-8</td><td></td><td></td><td></td></tr>
<tr><td>VCUN 500x229-7,5-6</td><td></td><td></td><td></td></tr>
<tr><td>VCUN 500x229-11,0-4</td><td></td><td></td><td></td></tr>
</table>

AXIAL FANS

Series VENTS OV

- Axial fans of low pressure in steel case with the efficiency up to 11900 m³/h for a wall-mounted assembly.

Series VENTS OVK

- Axial fans of low pressure in steel case with the efficiency up to 11900 m³/h for a wall-mounted assembly.

Series VENTS VKF

- Axial fans of low pressure in steel case with the efficiency up to 11900 m³/h for a vent duct assembly.

Series VENTS OV1

- Axial fans of low pressure in steel case with the efficiency up to 1700 m³/h for a wall-mounted assembly.

Series VENTS OVK1

- Axial fans of low pressure in steel case with the efficiency up to 1700 m³/h for a wall-mounted assembly

Series VENTS VKOM

- Axial fans of low pressure in steel case with the efficiency up to 1700 m³/h for a vent duct assembly.

Series
VENTS OV

Axial fans of low pressure in steel case with the efficiency up to **11900 m³/h** for a wall-mounted assembly

Series
VENTS OVK

Axial fans of low pressure in steel case with the efficiency up to **11900 m³/h** for a wall-mounted assembly.

Series
VENTS VKF

Axial fans of low pressure in steel case with the efficiency up to **11900 m³/h** for a vent duct assembly

Application
Combined supply and extract ventilation systems of premises for different destinations, where a high air flow capacity are required at relatively low resistance of the system. OV and OVK fans series can be used for the direct ejection of the exhaust air or static suction head ventilation in fire-prevention ventilation systems. It is possible to install OV and OVK fans series on external walls.

Design
The fan case and the impeller are made of steel body with polymeric covering. Terminal box of fans OV and OVK series has a cord for remote connecting. The fan VKF has an outward terminal block, mounted on the fan housing.

Motor
Two- and four-pole of one- or three-phase asynchronous motors equipped with built-in thermal protection on automatic restart are used. Application in the motors of ball bearings provides a long service life (40 000 hours). Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (refer to the section "Electronic Control Devices").

Mounting
A fan is mounted on the wall with rectangular (OV series) or circular (OVK series) of joining plate. The VKF fan is set in a duct through connecting flanges. Fan is powered through a remote terminal box. Power connection and installation should be accomplished according to the manual and circuit scheme on a terminal block.

Legend:

Series and variant of design	Motor		Flange diameter
	Poles	Phases	
VENTS OV – with a rectangular assembling plate **VENTS OVK** – with a circular assembling plate **VENTS VKF** – for air duct assembly	2 4	E – one-phase Д – three-phase	200; 250; 300; 350; 400; 450; 500; 550; 630

Accessories


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	OV / OVK / VKF 2E 200	OV / OVK / VKF 2E 250	OV / OVK / VKF 4E 250	OV / OVK / VKF 2E 300	OV / OVK / VKF 4E 300	OV / OVK / VKF 4E 350
Voltage, V/50Hz	230	230	230	230	230	230
Power consumption, W	55	80	50	145	75	140
Current, A	0,26	0,4	0,22	0,66	0,35	0,65
Maximum air consumption, m^3/h	860	1050	800	2230	1340	2500
RPM	2300	2400	1380	2300	1350	1380
Noise level at 3 m, dBA	50	60	55	60	58	62
Maximal temperature of transferred air, ^oC	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

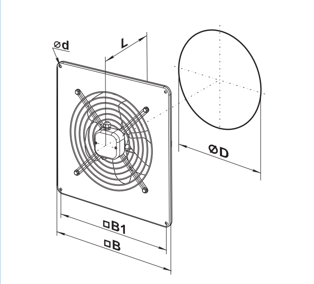
	OV / OVK / VKF 4E 400	OV / OVK / VKF 4E 450	OV / OVK / VKF 4E 500	OV / OVK / VKF 4E 550	OV / OVK / VKF 4E 630
Voltage, V/50Hz	230	230	230	230	230
Power consumption, W	180	250	420	550	750
Current, A	0,82	1,2	1,95	2,55	3,5
Maximum air consumption, m^3/h	3580	4680	7060	8800	11900
RPM	1380	1350	1300	1300	1360
Noise level at 3 m, dBA	63	64	69	70	75
Maximal temperature of transferred air, ^oC	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54

	OV / OVK / VKF 2D 250	OV / OVK / VKF 4D 250	OV / OVK / VKF 2D 300	OV / OVK / VKF 4D 300	OV / OVK / VKF 4D 350	OV / OVK / VKF 4D 400	OV / OVK / VKF 4D 450
Voltage, V/50Hz	400	400	400	400	400	400	400
Power consumption, W	80	60	145	75	140	180	250
Current, A	0,22	0,17	0,25	0,22	0,38	0,47	0,6
Maximum air consumption, m^3/h	1060	850	2310	1310	2520	3740	5280
RPM	2600	1400	2350	1380	1380	1380	1360
Noise level at 3 m, dBA	60	55	60	58	62	64	65
Maximal temperature of transferred air, ^oC	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

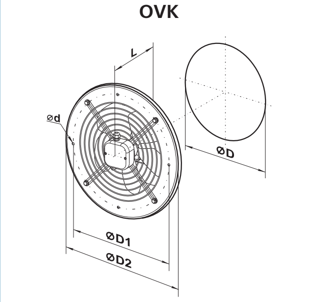

Application of OV fan in boiler-room


Installation of VKF fan to ventilation duct with help of flanges

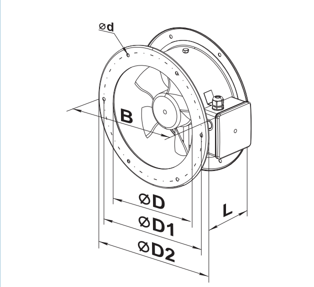
Type	Dimensions, mm					Weight, kg
	ØD	Ød	B	B1	L	
OV 2E 200	210	7	312	260	145	3,0
OV 2E 250	260	7	370	320	155	4,0
OV 4E 250	260	7	370	320	155	3,5
OV 2E 300	326	9	430	380	195	6,1
OV 4E 300	326	9	430	380	195	5,0
OV 4E 350	388	9	485	435	200	7,8
OV 4E 400	417	9	540	490	240	8,8
OV 4E 450	465	11	576	535	250	10,5
OV 4E 500	520	11	655	615	260	14,0
OV 4E 550	570	11	725	675	280	16,5
OV 4E 630	650	11	800	710	295	20,0
OV 2D 250	260	7	370	320	155	4,0
OV 4D 250	260	7	370	320	155	3,5
OV 2D 300	326	9	430	380	155	5,4
OV 4D 300	326	9	430	380	155	5,4
OV 4D 350	388	9	485	435	200	7,8
OV 4D 400	417	9	540	490	240	8,8
OV 4D 450	465	11	576	535	250	10,5

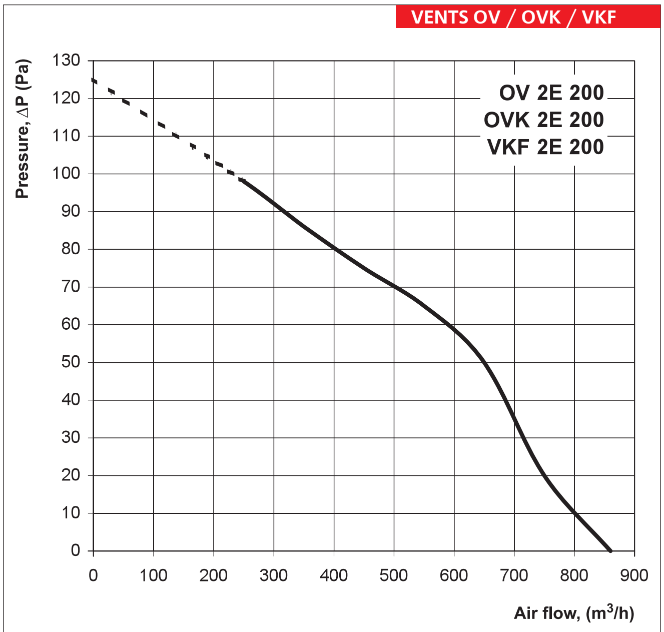


Type	Dimensions, mm					Weight, kg
	ØD	ØD1	ØD2	Ød	L	
OVK 2E 200	210	250	280	7	145	2,8
OVK 2E 250	260	295	320	7	155	3,8
OVK 4E 250	260	295	320	7	155	3,4
OVK 2E 300	326	380	397	9	195	5,9
OVK 4E 300	326	380	397	9	195	5,0
OVK 4E 350	388	442	460	9	200	7,5
OVK 4E 400	417	504	528	9	240	8,5
OVK 4E 450	465	578	607	11	250	10,0
OVK 4E 500	520	590	655	11	260	14,0
OVK 4E 550	570	645	710	11	280	16,5
OVK 4E 630	650	760	800	11	295	20,0
OVK 2D 250	260	295	320	7	155	3,8
OVK 4D 250	260	295	320	7	155	3,4
OVK 2D 300	326	380	397	9	155	5,1
OVK 4D 300	326	380	397	9	155	5,1
OVK 4D 350	388	442	460	9	200	7,5
OVK 4D 400	417	504	528	9	240	8,5
OVK 4D 450	465	578	607	11	250	10,0

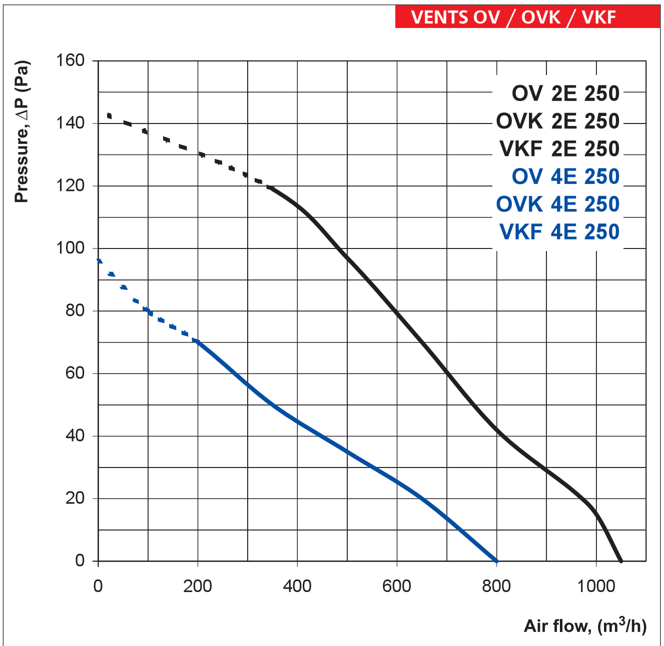


Type	Dimensions, mm						Weight, kg
	ØD	ØD1	ØD2	Ød	B	L	
VKF 2E 200	205	250	280	7	290	120	3,1
VKF 2E 250	260	295	320	7	340	150	4,0
VKF 4E 250	260	295	320	7	340	150	4,1
VKF 2E 300	310	380	397	9	420	160	6,5
VKF 4E 300	310	380	397	9	420	160	6,5
VKF 4E 350	362	442	460	9	480	160	8,1
VKF 4E 400	412	504	528	9	550	170	9,1
VKF 4E 450	462	578	607	11	630	200	10,6
VKF 4E 500	515	600	650	11	635	220	12,8
VKF 4E 550	565	650	700	13	685	230	15,5
VKF 4E 630	645	740	790	13	780	230	18,5
VKF 2D 250	260	295	320	7	340	150	4,0
VKF 4D 250	260	295	320	7	340	150	4,1
VKF 2D 300	310	380	397	9	420	160	6,0
VKF 4D 300	310	380	397	9	420	160	6,0
VKF 4D 350	362	442	460	9	480	160	8,1
VKF 4D 400	412	504	528	9	550	170	9,1
VKF 4D 450	462	578	607	11	630	200	10,6





Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to environment	dBA	65	56	58	58	57	59	55	51	45

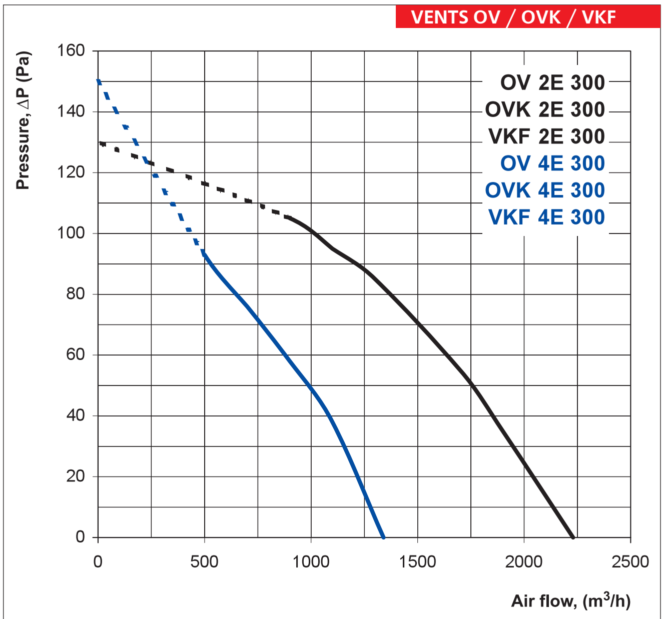


OV / OVK / VKF 2E 250

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to environment	dBA	76	68	66	68	70	68	68	63	58

OV / OVK / VKF 4E 250

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	60	52	50	52	53	52	52	44	43

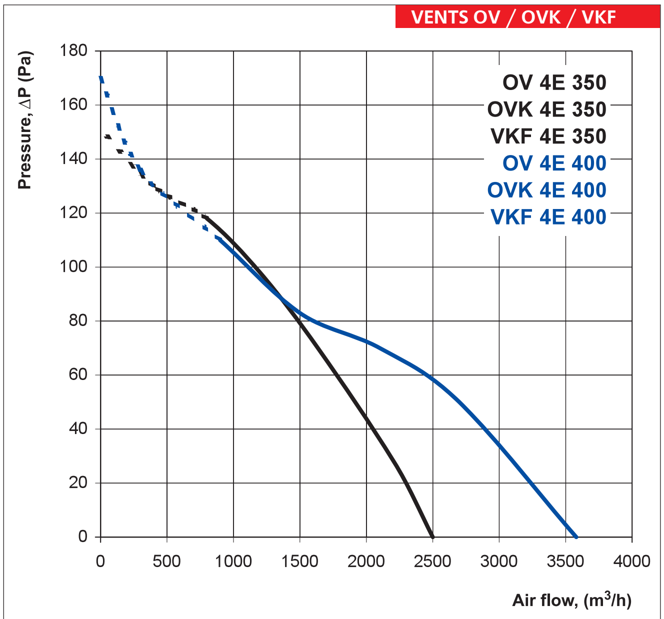


OV / OVK / VKF 2E 300

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to environment	dBA	78	72	72	70	72	70	69	63	63

OV / OVK / VKF 4E 300

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	67	58	57	59	57	58	53	52	49



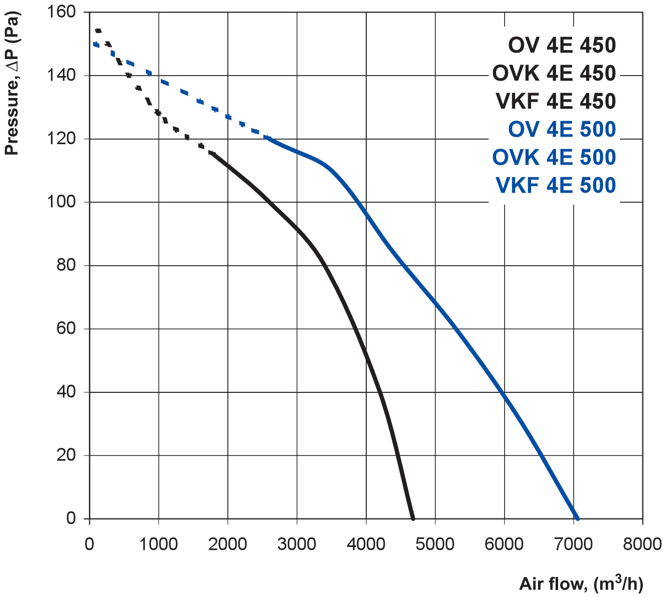
OV / OVK / VKF 4E 350

Sound pressure level	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band, (Hz)							
L_{wA} to environment	dBA	70	61	62	64	63	63	58	56	52

OV / OVK / VKF 4E 400

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	75	66	68	66	69	67	65	61	56

VENTS OV / OVK / VKF



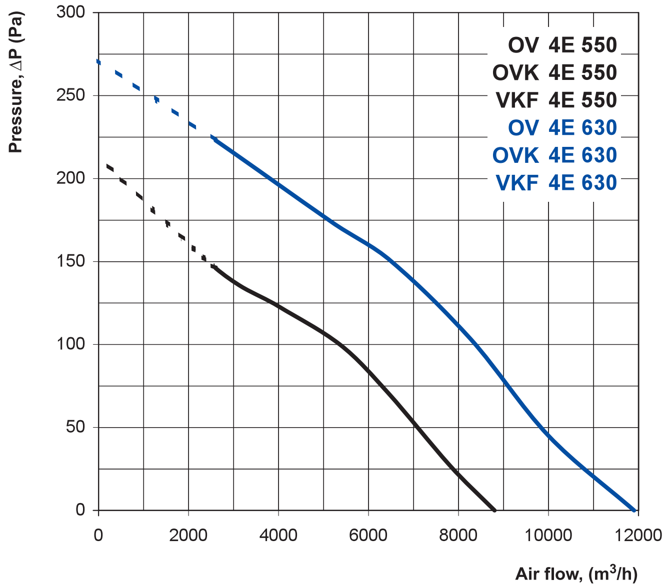
OV / OVK / VKF 4E 450

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	69	70	73	73	71	67	67	61

OV / OVK / VKF 4E 500

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	80	71	73	72	74	73	70	67	63

VENTS OV / OVK / VKF



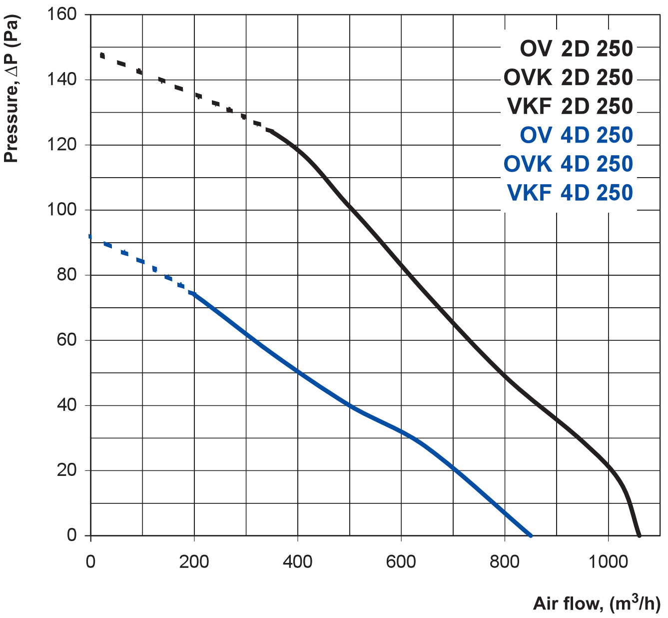
OV / OVK / VKF 4E 550

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	83	73	75	73	75	74	72	66	63

OV / OVK / VKF 4E 630

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	71	73	72	73	71	70	63	59

VENTS OV / OVK / VKF



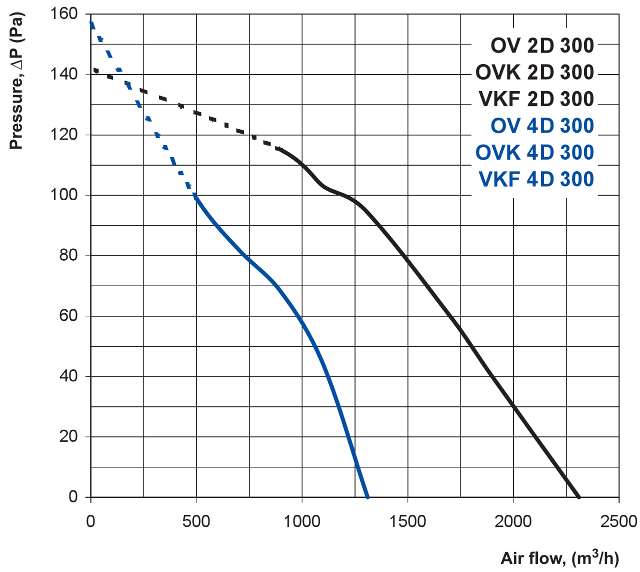
OV / OVK / VKF 2Д 250

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	77	67	68	70	69	68	66	60	57

OV / OVK / VKF 4Д 250

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	60	49	50	53	54	53	52	45	42

VENTS OV / OVK / VKF



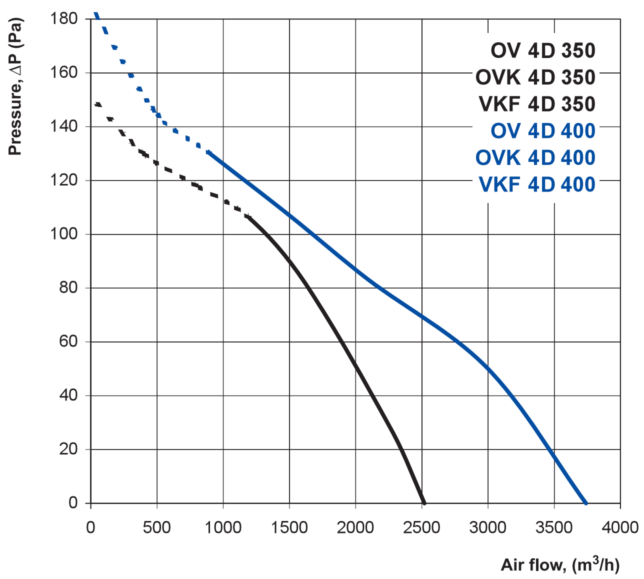
OV / OVK / VKF 2Д 300

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	80	72	71	71	74	70	69	65	63

OV / OVK / VKF 4Д 300

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	63	58	55	58	56	58	57	52	48

VENTS OV / OVK / VKF



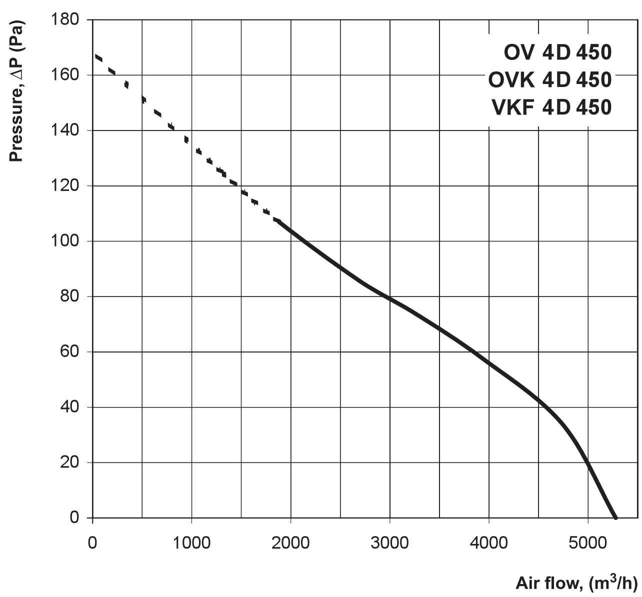
OV / OVK / VKF 4Д 350

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	72	62	61	64	64	61	61	56	54

OV / OVK / VKF 4Д 400

	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	75	65	66	69	66	67	64	60	55

VENTS OV / OVK / VKF



OV / OVK / VKF 4Д 450

Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	76	65	68	69	69	70	64	60	57

Series
VENTS OV1

Series
VENTS OVK1

Series
VENTS VKOM

Axial fans of low pressure in steel case with the efficiency up to **1700 m³/h** for a wall-mounted assembly.

Axial fans of low pressure in steel case with the efficiency up to **1700 m³/h** for a wall-mounted assembly

Axial fans of low pressure in steel case with the efficiency up to **1700 m³/h** for air duct assembly.

Application
Combined supply and extract ventilation systems of premises for different destinations, where a high air flow capacity are required at relatively low resistance of the system. OV1 and OVK1 fans series can be used for the direct ejection of the exhaust air or static suction head ventilation in fire-prevention ventilation systems. It is possible to install OV1 and OVK1 fans series on external walls.

Design
The OV1, OVK1, VKOM fans cases are made of steel body with polymer coating. The fan case VKOMz is made of galvanized steel. The impeller is made of aluminum. A terminal block has a cord for remote connecting.

Motor
One-phase asynchronous motor with outward rotor are used equipped with built-in thermal protection on automatic restart. Application in the motors of single-shield bearings provides a long service life (40 000 hours). Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller (refer to the section "Electronic Control Devices").

Installation
A fan is mounted on the wall through rectangular (OV1 series) or circular (OVK1 series) joining plate. The fan VKOM (VKOMz) is mount in a air duct with clamps or directly in the wall. VKOMk fan supplied with fastening brackets. Fan is powered through a remote terminal block. Power supply and installation should be accomplished according to the manual and circuit scheme on a terminal block.

Legend:

Series and variant of design	Case (VKOM series)	Diameter of flange
VENTS OV1 – with a rectangular assembling plate **VENTS OVK1** – with a circular assembling plate **VENTS VKOM** – for air duct assembly	**Z** – galvanized steel	150; 200; 250; 315

Accessories

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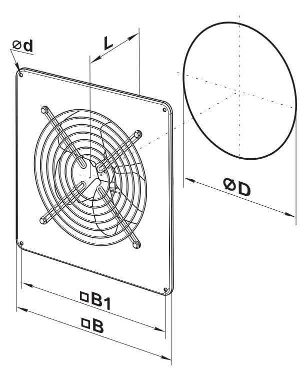
	OV1 / OVK1 / VKOM 150	OV1 / OVK1 / VKOM 200	OV1 / OVK1 / VKOM 250	OV1 / OVK1 / VKOM 315
Voltage, V/50Hz	230	230	230	230
Power consumption, W	36	43	68	110
Current, A	0,26	0,28	0,48	0,75
Maximum air consumption, m^3/h	200	405	1070	1700
RPM	1300	1300	1300	1300
Noise level at 3 m, dBA	33	32	48	54
Maximal temperature of transferred air, °C	40	40	40	40
Index of protection	IP 24 (VKOM IP X4)	IP 24 (VKOM IP X4)	IP 24 (VKOM IP X4)	IP 24 (VKOM IP X4)

Fastening bracket for wall installation of VKOM (VKOMZ)

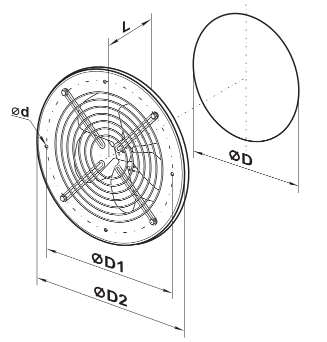
Type	Dimensions, mm					Weight, kg
	ØD	Ød	B	B1	L	
OV1 150	162	7	250	210	120	2,5
OV1 200	208	7	312	260	120	3,0
OV1 250	262	7	370	320	140	3,5
OV1 315	312	9	430	380	170	6,1

OV 1



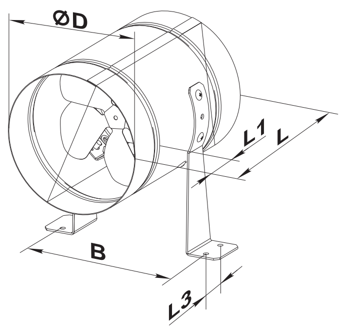
Type	Dimensions, mm					Weight, kg
	∅D	∅D1	∅D2	∅d	L	
OVK1 150	162	190	220	7	120	2,5
OVK1 200	208	270	300	7	120	2,5
OVK1 250	262	330	360	7	140	3,0
OVK1 315	312	390	420	9	170	5,1

OVK 1

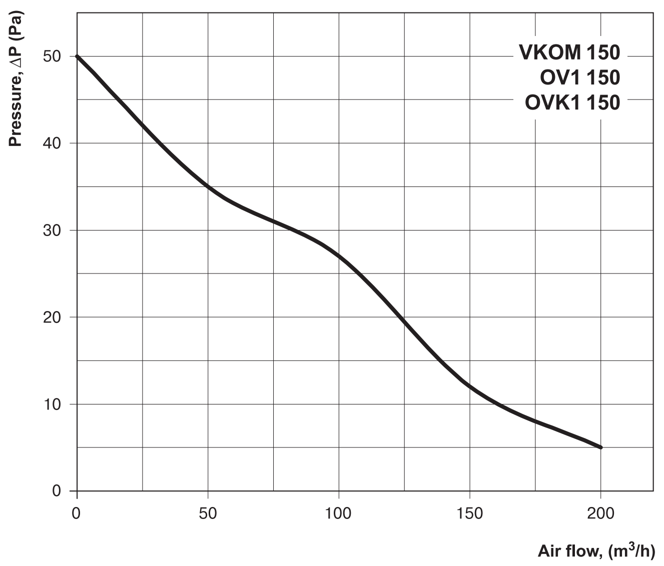


Type	Dimensions, mm					Weight, kg
	∅D	B	L	L1	L3	
VKOM 150	162	183	220	40	30	1,8
VKOM 200	208	228	220	40	30	2,4
VKOM 250	262	283	270	55	30	3,7
VKOM 315	315	337	278	55	40	4,9

VKOM

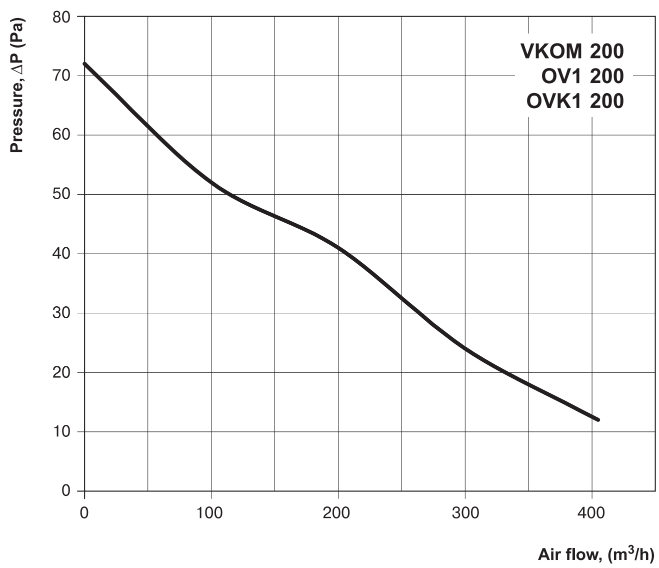


VENTS VKOM / OV1 / OVK1



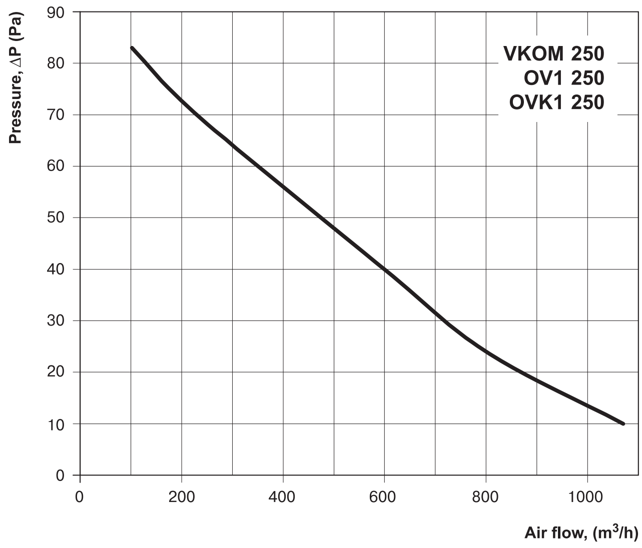
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	46	47	56	45	35	30	31	31	20

VENTS VKOM / OV1 / OVK1



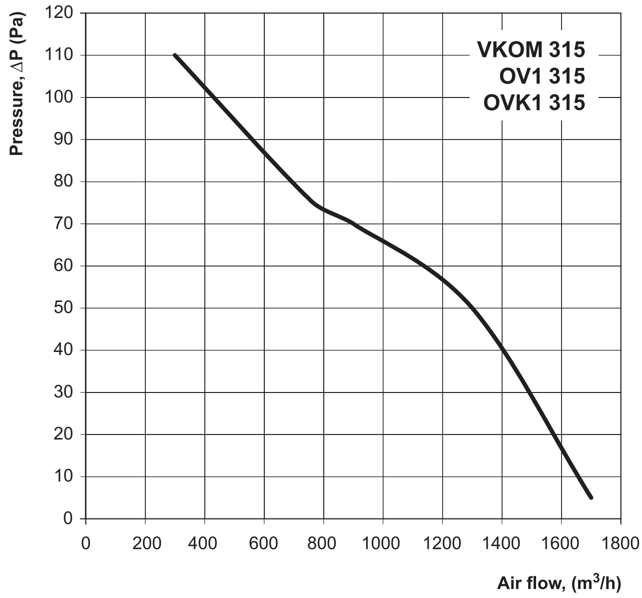
Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	53	55	63	56	44	42	36	30	15

VENTS VKOM / OV1 / OVK1



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	59	61	70	60	43	46	41	34	19

VENTS VKOM / OV1 / OVK1



Sound pressure level		Octave-frequency band, (Hz)								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to environment	dBA	62	65	67	58	45	51	48	41	30

CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th colspan="2">Three-phase transformer speed controllers</th><th>Frequency speed control-lers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>OV 2E 200 / OVK 2E 200 / VKF 2E 200</td><td rowspan="8">RS-1-300</td><td rowspan="8">RS-1-400</td><td rowspan="3">RS-0,5-PS</td><td rowspan="7">RS-1 N(V)</td><td rowspan="8">RS-1,5-T</td><td rowspan="9">RSA5E-2-P</td><td rowspan="8">RSA5E-1,5-T</td><td rowspan="8">RSA5E-1,5-TA</td><td rowspan="9">RSA5E-2-M</td><td></td><td></td><td></td><td rowspan="9">RT-10</td><td rowspan="8">T-1,5 N(V)</td><td rowspan="8">TH-1,5 N(V)</td><td rowspan="8">TF-1,5 N(V)</td><td rowspan="8">TR-1,5 N(V)</td></tr>
<tr><td>OV 2E 250 / OVK 2E 250 / VKF 2E 250</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 250 / OVK 4E 250 / VKF 4E 250</td><td></td><td></td><td></td></tr>
<tr><td>OV 2E 300 / OVK 2E 300 / VKF 2E 300</td><td>RS-1,5-PS</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 300 / OVK 4E 300 / VKF 4E 300</td><td>RS-0,5-PS</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 350 / OVK 4E 350 / VKF 4E 350</td><td rowspan="3">RS-1,5-PS</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 400 / OVK 4E 400 / VKF 4E 400</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 450 / OVK 4E 450 / VKF 4E 450</td><td>RS-1,5 N(V)</td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 500 / OVK 4E 500 / VKF 4E 500</td><td></td><td></td><td>RS-2,5-PS</td><td>RS-2 N(V)</td><td rowspan="2">RS-3,0-T</td><td rowspan="2">RSA5E-3,5-T</td><td rowspan="2">RSA5E-3,5-TA</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 550 / OVK 4E 550 / VKF 4E 550</td><td></td><td></td><td>RS-4,0-PS</td><td></td><td></td><td>RSA5E-3-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>OV 4E 630 / OVK 4E 630 / VKF 4E 630</td><td></td><td></td><td>RS-4,0-PS</td><td></td><td>RS-5,0-T</td><td></td><td>RSA5E-5,0-T</td><td>RSA5E-5,0-TA</td><td>RSA5E-4-M</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>OV 2D 250 / OVK 2D 250 / VKF 2D 250</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td rowspan="7">RSA5D-1,5-T</td><td rowspan="7">RSA5D-5,0-M</td><td rowspan="7">VFED-200-TA</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>OV 4D 250 / OVK 4D 250 / VKF 4D 250</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td>OV 4D 400 / OVK 4D 400 / VKF 4D 400</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>OV 4D 450 / OVK 4D 450 / VKF 4D 450</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>OV1 150 / OVK1 150 / VKOM 150</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-0,5-PS</td><td>RS-1 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td><td rowspan="3">RT-10</td><td rowspan="4">T-1,5 N(V)</td><td rowspan="4">TH-1,5 N(V)</td><td rowspan="4">TF-1,5 N(V)</td><td rowspan="4">TR-1,5 N(V)</td></tr>
<tr><td>OV1 200 / OVK1 200 / VKOM 200</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-0,5-PS</td><td>RS-1 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td></tr>
<tr><td>OV1 250 / OVK1 250 / VKOM 250</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-0,5-PS</td><td>RS-1 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td></tr>
<tr><td>OV1 315 / OVK1 315 / VKOM 315</td><td>RS-1-300</td><td>RS-1-400</td><td>RS-1,5-PS</td><td>RS-1 N(V)</td><td>RS-1,5-T</td><td>RSA5E-2-P</td><td>RSA5E-1,5-T</td><td>RSA5E-1,5-TA</td><td>RSA5E-2-M</td><td></td></tr>
</table>

ROOF FANS

Series VENTS VKV

Centrifugal roof fans in steel case with vertical air extract and air flow capacity up to 4700 m³/h. Assigned for exhaust ventilation systems.

Series VENTS VKH

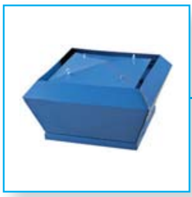
Centrifugal roof fans in steel case with horizontal air extract and air flow capacity up to 4700 m³/h. Assigned for exhaust ventilation systems.

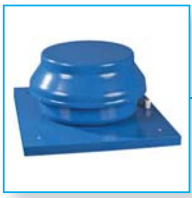
Series VENTS VKMK

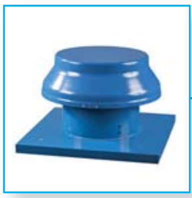
Centrifugal roof fans with air flow capacity up to 1880 m³/h in steel case with horizontal air extract.

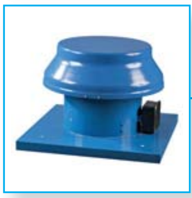
Series VENTS VOK and VENTS VOK1

Axial roof fans in steel case with horizontal air extract and air flow capacity up to 1700 m³/h (VENTS VOK1) and up to 2500 m³/h (VENTS VOK).



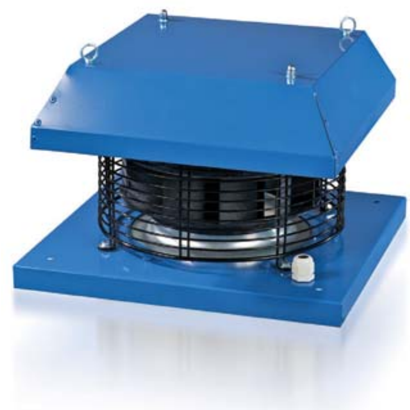






Series
VENTS VKV

Series
VENTS VKH



Centrifugal roof fans with air flow capacity **up to 4700 m³/h** in steel case with vertical air extract. Assigned for exhaust systems of ventilation.

Centrifugal roof fans with air flow capacity **up to 4700 m³/h** in steel case with horizontal air extract. Assigned for exhaust ventilation systems.

Application

Exhaust ventilation systems of different premises for mounting on the roofs of buildings. Compatible with air ducts with diameter from 200 to 500 mm.

Design

The case of the fan is made of steel with polymer coating.

Motor

Two-, four- or six-pole asynchronous motors of one-phase or three-phase type with external rotor and centrifugal impeller with backward-curved blades. The motor is equipped with built-in thermal protection with automatic restart. Application of ball bearings provides the long service life of the motor. For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control

Smooth or step control is carried out with thyristor or autotransformer. Several fans at a time can be connected to one controller, provided that total power and operating current do not exceed the nominal parameters of the controller.

Mounting

The fan can be mounted at any angle to the fan axis. It is wall-mounted with holding brackets that are delivered in a set. The power is supplied to the fan through the external terminal block. The electrical connection and installation should be carried out according to the manual and electric circuit indicated on the terminal block.

The fan is mounted on the roof directly above the ventilation duct or shaft. The fan is fixed to the flat surface with a connection plate. It is necessary to provide a support at installation of the VKH fans directly on the flat roof in order to prevent the water and snow from getting into the vent of shaft.

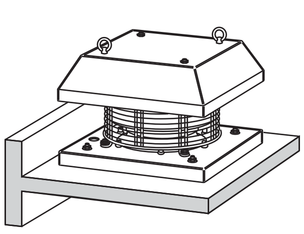
The power is supplied to the fan through the terminal block. The electrical connection and installation should be carried out according to the manual and electric circuit indicated on the terminal block.

Legend:

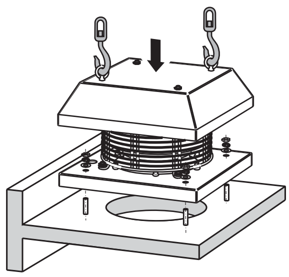
Series and model	Number of poles	Phases	Type of turbine
VENTS VKV – with vertical air extract **VENTS VKG** – with horizontal air extract	**2**; **4**; **6**	**E** – one-phase model **D** – three-phase model	220; 225; 250; 280; 310; 355; 400; 450; 500

Accessories

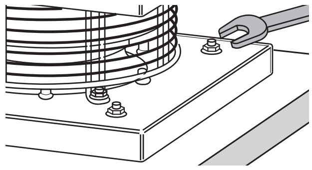
p. 206 p. 206 p. 266 p. 270 p. 288 p. 288 p. 289 p. 294 p. 293



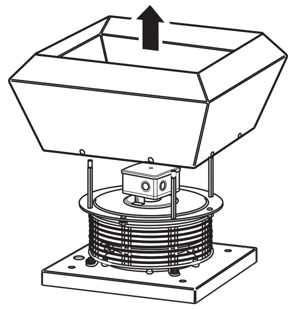
Mounting of fans on the flat roof surface



Fastening brackets (VKH series)



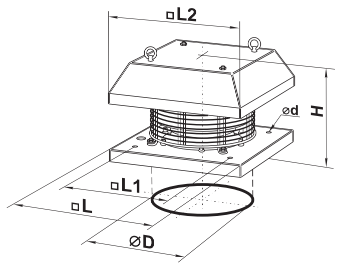
Easy mounting with connection plate



Position of the terminal block (VKV series)

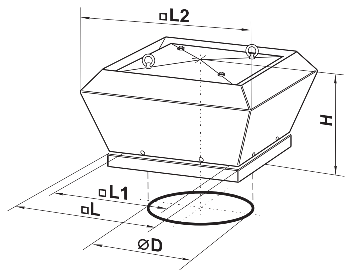
Type	Dimensions, mm						Weight, kg
	ØD	Ød	H	L	L1	L2	
VKH 2E 220	245	10	228	338	245	338	6,9
VKH 2E 225	210	10	228	338	245	338	7,1
VKH 2E 250	286	10	265	400	330	365	10,1
VKH 2E 280	286	10	265	400	330	365	10,2
VKH 4E 310	286	10	300	438	330	400	10,2
VKH 4D 310	286	10	300	438	330	400	10,2
VKH 4E 355	438	12	348	598	450	550	15,6
VKH 4D 355	438	12	325	598	450	550	15,6
VKH 4E 400	438	12	348	598	450	550	21,0
VKH 4E 450	438	12	400	668	450	640	22,7
VKH 4D 400	438	12	348	598	450	550	22,0
VKH 4D 450	438	12	400	668	450	640	22,7
VKH 6E 500	438	12	465	668	450	640	26,6

VKG



Type	Dimensions, mm					Weight, kg
	ØD	H	L2	L1	L	
VKV 2E 220	245	275	460	245	338	8,9
VKV 2E 225	210	275	460	245	338	9,6
VKV 2E 250	286	275	520	330	400	12,0
VKV 2E 280	286	275	520	330	400	12,7
VKV 4E 310	286	330	560	330	438	17,8
VKV 4D 310	286	330	560	330	438	17,8
VKV 4E 355	438	420	783	450	598	22,0
VKV 4D 355	438	420	783	450	598	22,0
VKV 4E 400	438	420	783	450	598	27,5
VKV 4E 450	438	454	872	450	668	30,0
VKV 4D 400	438	420	783	450	598	27,5
VKV 4D 450	438	454	872	450	668	30,0
VKV 6E 500	438	454	872	450	668	33,8

VKV

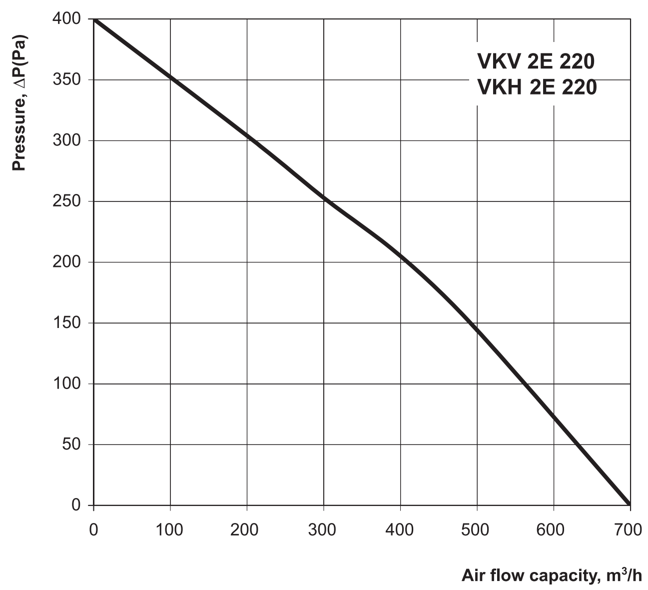


	VKV / VKH 2E 220	VKV / VKH 2E 225	VKV / VKH 2E 250	VKV / VKH 2E 280
Voltage, V / 50 Hz	230	230	230	230
Power, W	85	135	155	225
Current, A	0,38	0,6	0,7	1,0
Air flow capacity, m^3/h	700	900	1300	1780
r.p.m, min^{-1}	2700	2650	2600	2700
Noise level at 3 m, dB(A)	49	49	65	66
Maximal temperature of transferred air, ^oC	55	55	50	50
Index of protection	IP X4	IP X4	IP X4	IP X4

	VKV / VKH 4E 310	VKV / VKH 4D 310	VKV / VKH 4E 355	VKV / VKH 4D 355
Voltage, V / 50 Hz	230	400	230	400
Power, W	120	110	245	170
Current, A	0,54	0,32	1,12	0,52
Air flow capacity, m^3/h	1820	1950	2800	2350
r.p.m, min^{-1}	1370	1400	1420	1400
Noise level at 3 m, dB(A)	45	53	46	53
Maximal temperature of transferred air, ^oC	85	65	50	70
Index of protection	IP X4	IP X4	IP X4	IP X4

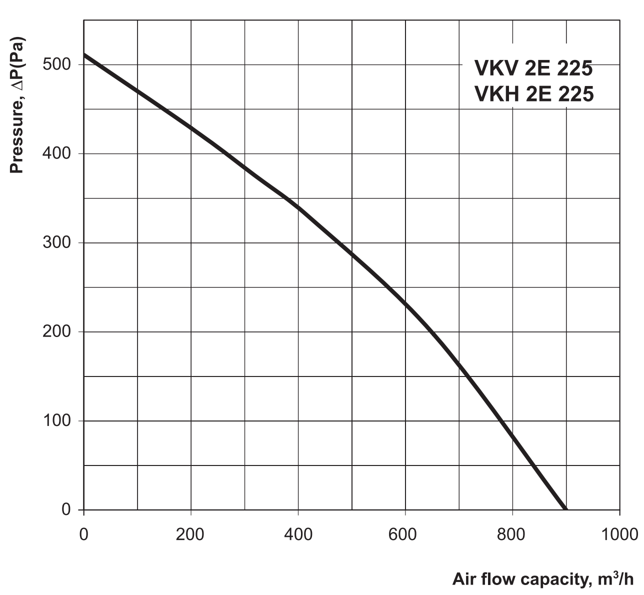
	VKV / VKH 4E 400	VKV / VKH 4E 450	VKV / VKH 4D 400	VKV / VKH 4D 450	VKV / VKH 6E 500
Voltage, V / 50 Hz	230	230	400	400	230
Power, W	410	450	445	455	320
Current, A	2,1	2,2	1,4	1,4	0,55
Air flow capacity, m^3/h	3400	3850	3800	4300	4700
r.p.m, min^{-1}	1400	1350	1430	1430	880
Noise level at 3 m, dB(A)	52	53	52	53	47
Maximal temperature of transferred air, ^oC	80	50	60	50	50
Index of protection	IP X4	IP X4	IP X4	IP X4	IP X4

VENTS VKV / VKH



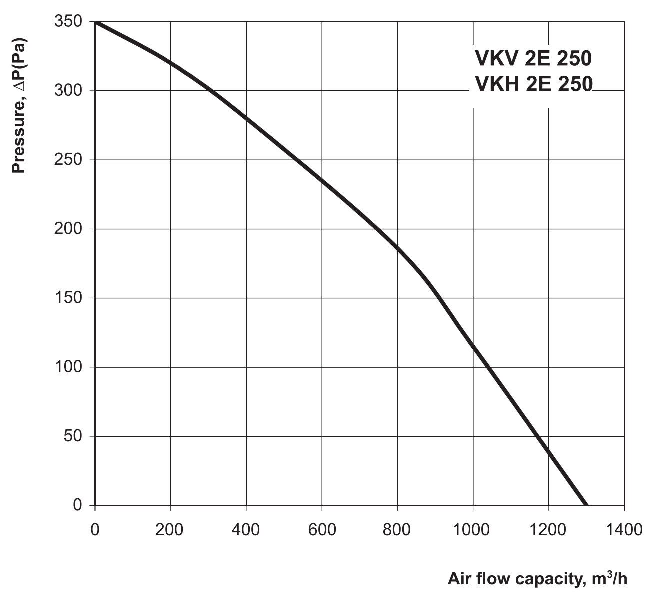
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	69	42	60	65	68	65	61	59	50
L_{wA} to environment	dBA	73	42	60	65	67	67	65	57	50

VENTS VKV / VKH



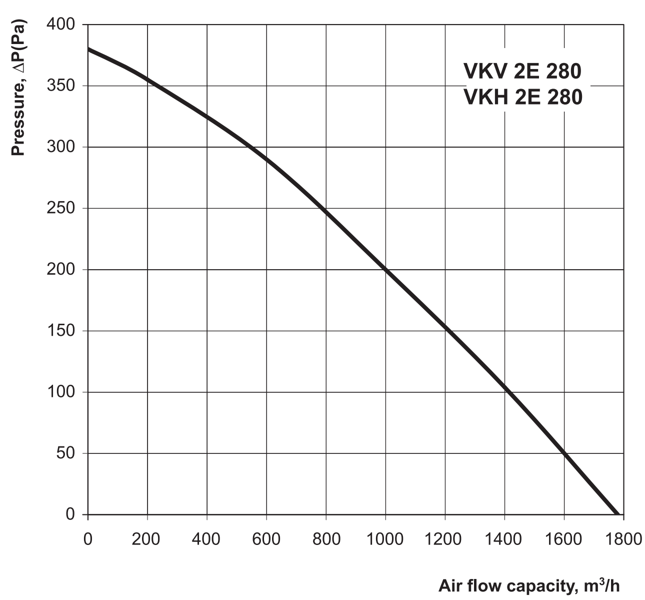
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	41	59	66	68	66	61	57	49
L_{wA} to environment	dBA	72	42	60	67	69	66	63	58	51

VENTS VKV / VKH



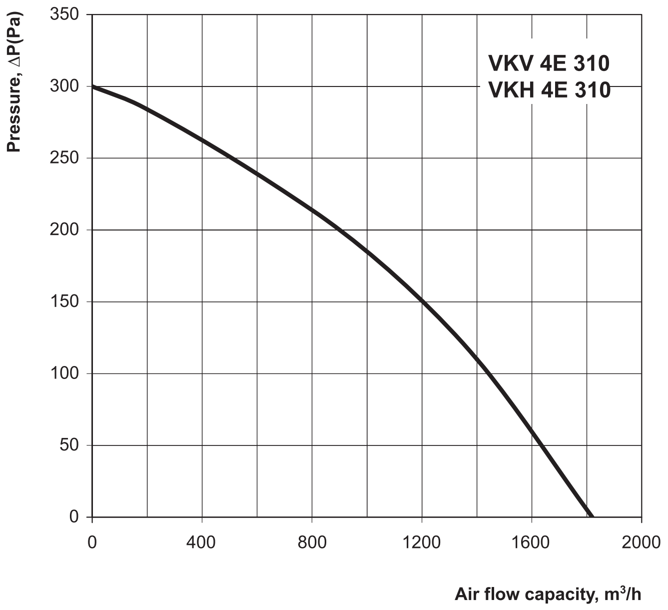
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	69	40	62	65	66	66	64	57	49
L_{wA} to environment	dBA	71	44	59	65	68	66	62	60	53

VENTS VKV / VKH



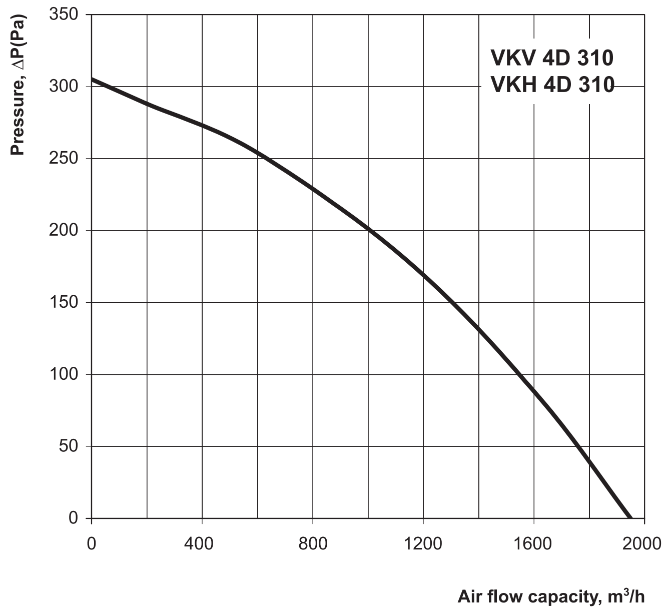
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	42	58	62	64	65	63	56	49
L_{wA} to environment	dBA	72	45	61	63	66	66	61	60	53

VENTS VKV / VKH



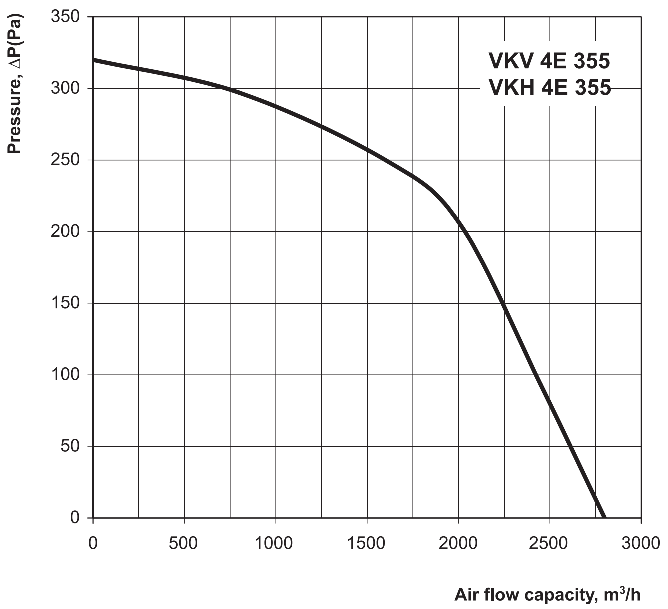
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	57	44	45	50	53	52	51	43	36
L_{wA} to environment	dBA	60	47	50	53	56	57	51	45	39

VENTS VKV / VKH



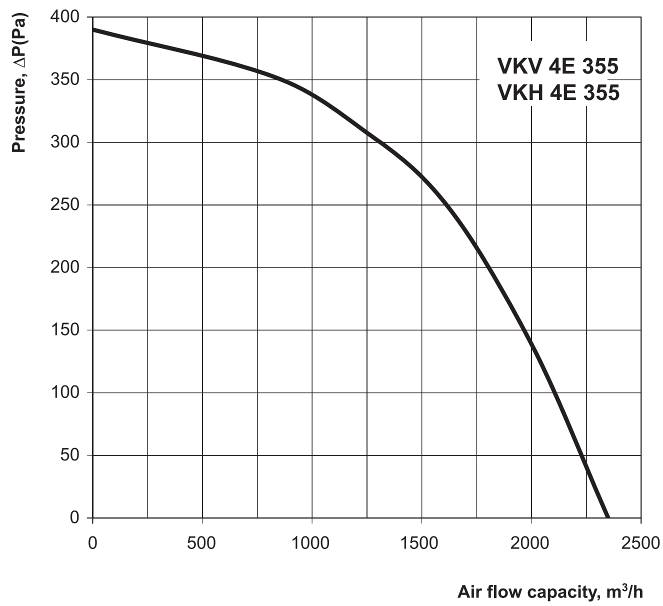
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	58	45	46	51	55	53	49	45	37
L_{wA} to environment	dBA	60	48	51	52	54	56	49	44	38

VENTS VKV / VKH



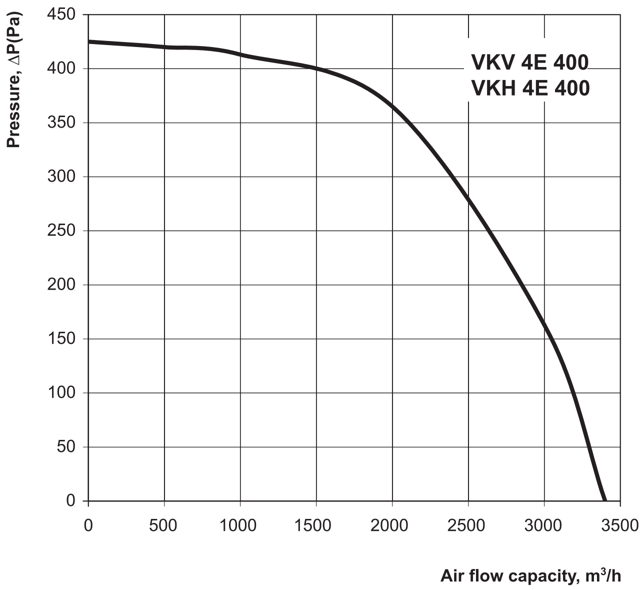
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	69	53	58	61	62	63	59	54	45
L_{wA} to environment	dBA	72	57	60	63	65	64	61	55	49

VENTS VKV / VKH



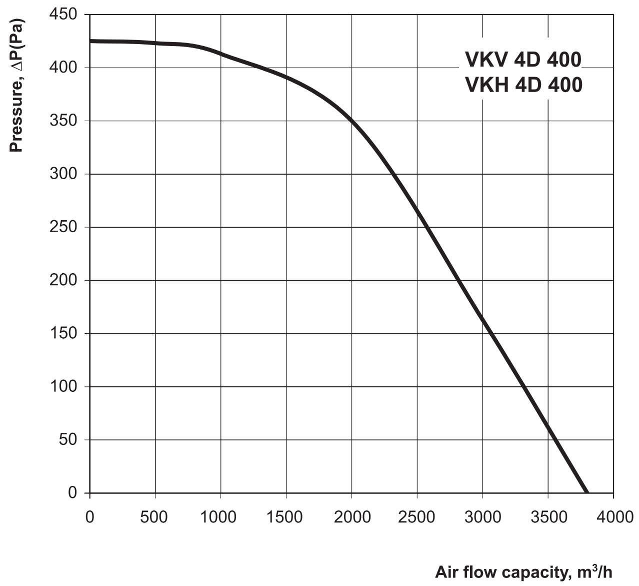
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	67	56	57	63	65	64	59	54	47
L_{wA} к окружению	dBA	72	56	60	62	66	62	63	55	49

VENTS VKV / VKH



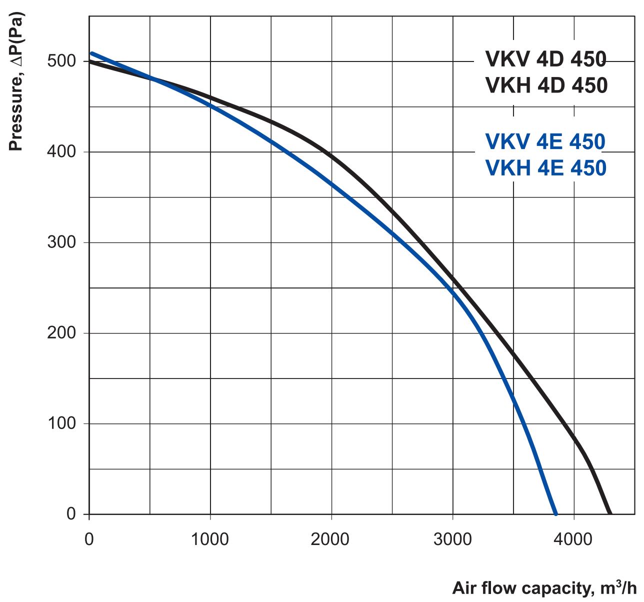
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	58	62	67	69	68	63	58	52
L_{wA} to environment	dBA	76	61	63	68	70	68	65	60	53

VENTS VKV / VKH



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	72	59	63	65	67	68	63	58	51
L_{wA} to environment	dBA	74	59	62	65	69	69	66	59	53

VENTS VKV / VKH



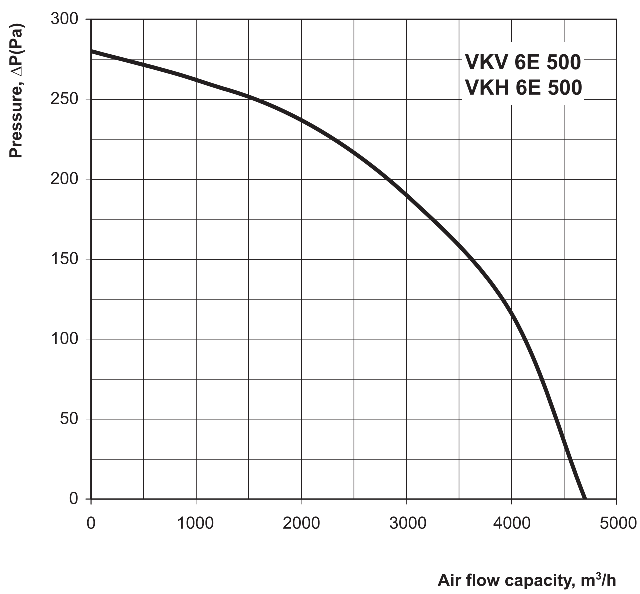
VKV 4E 450/VKH 4E 450

Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	63	51	54	58	59	61	56	50	41
L_{wA} to environment	dBA	68	51	53	60	61	61	58	52	43

VKV 4D 450/VKH 4D 450

Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	64	49	55	59	60	60	56	48	42
L_{wA} to environment	dBA	66	51	56	58	61	61	56	52	46

VENTS VKV / VKH



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	67	54	55	59	61	64	59	55	46
L_{wA} to environment	dBA	70	56	56	62	64	63	60	56	45

Series
VENTS VKMK

Centrifugal roof fans with air flow capacity **up to 1880 m³/h** in steel case with horizontal air extract.

Application
Exhaust ventilation system of different premises for mounting on the roofs of buildings. Fans are compatible with the air duct with diameter from 150 to 315 mm.

Design
The case of a fan is made of steel with polymer coating. A thin steel connection plate is provided at the bottom of VKMKp model. Terminal block of the fan is mounted on its case.

Motor
One-phase motors with external rotor and centrifugal impeller with backward-curved blades. The motors are equipped with built-in thermal protection with automatic restart. Application of ball bearings provides the long service life of the motor. For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

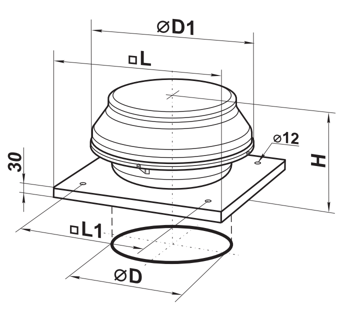
Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Mounting
The fan is mounted on the roof directly above the vent or shaft. The fan is fixed to the flat surface with a connection plate. The power is supplied to the fan through the terminal block. The electrical connection and installation should be carried out according to the manual and electric circuit indicated on the terminal block.

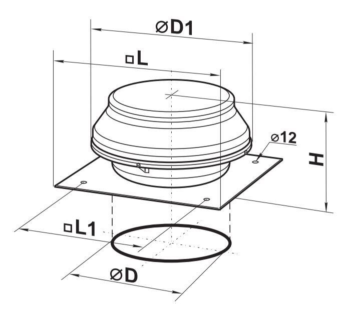
	VKMK 150	VKMK 200	VKMK 250	VKMK 315
Voltage, V / 50 Hz	230	230	230	230
Power, W	98	154	194	296
Current, A	0,43	0,67	0,85	1,34
Air flow capacity, m^3/h	555	950	1310	1880
r.p.m., min^{-1}	2705	2375	2790	2720
Noise level at 3 m, dB(A)	47	48	52	54
Maximal temperature of transferred air, °C	-25 +55	-25 +50	-25 +50	-25 +45
Index of protection	IP X4	IP X4	IP X4	IP X4

Type	Dimensions, mm					Weight, kg
	ØD	ØD1	H	L	L1	
VKMK 150	149	400	230	440	330	7,2
VKMK 200	198	400	250	440	330	8,1
VKMK 250	248	400	249	590	450	10,1
VKMK 315	315	500	269	590	450	10,1
VKMKp 150	149	400	230	440	330	8,2
VKMKp 200	198	400	250	440	330	9,3
VKMKp 250	248	400	249	590	450	12,3
VKMKp 315	315	500	269	590	450	12,2

VKMK



VKMKp



Legend:

Series		Flange diameter, mm
VENTS VKMK	**p** – with a flat connection plate	150; 200; 250; 315

Accessories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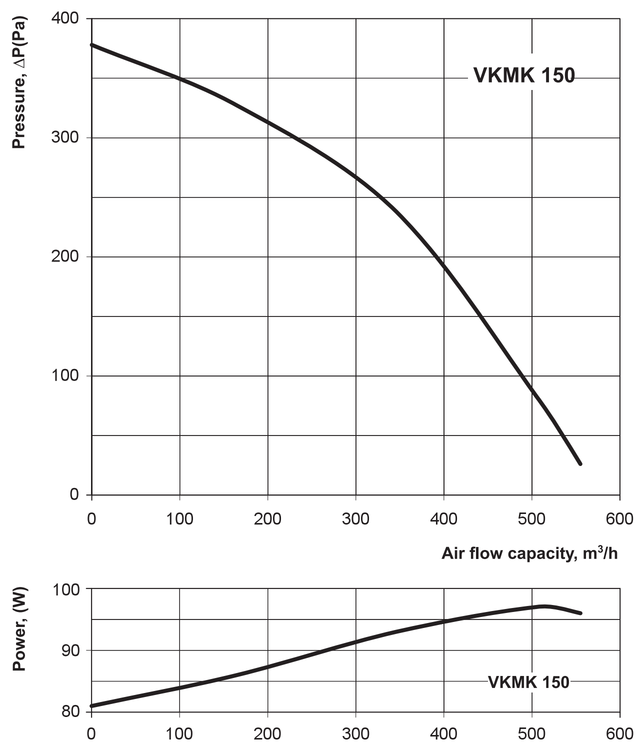
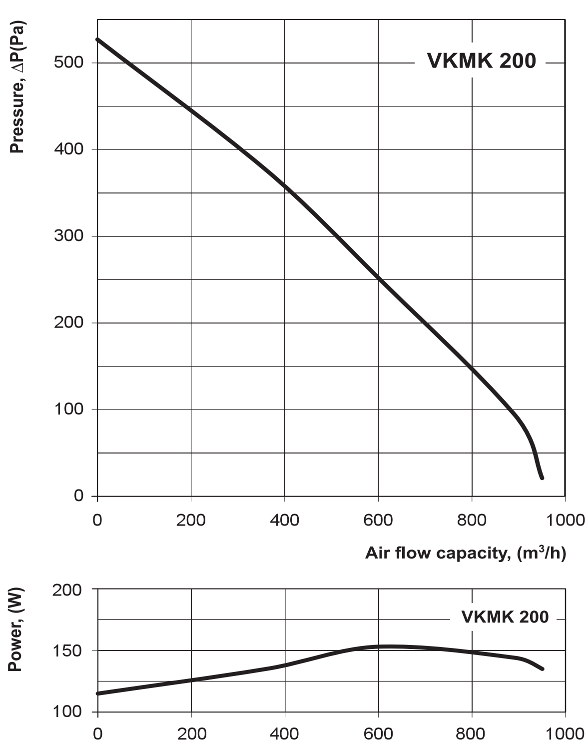
VENTS VKMK



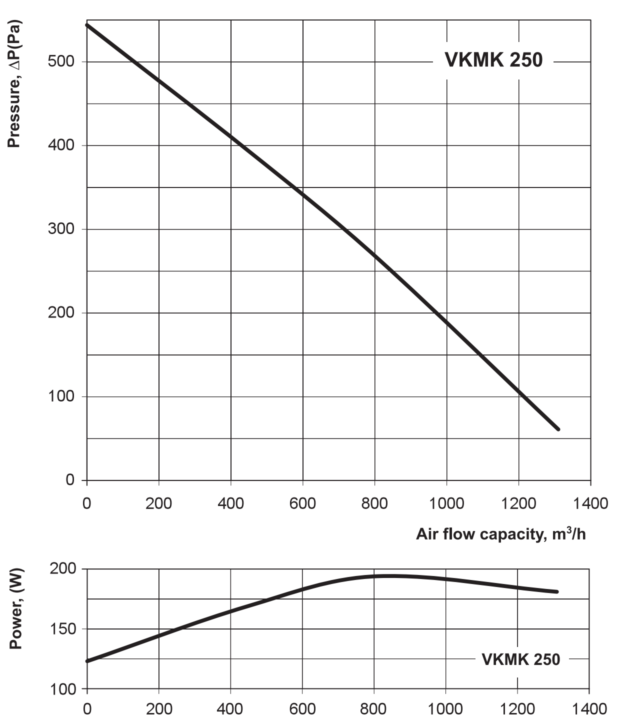
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	71	45	65	64	63	61	60	48	39
L_{wA} to environment	dBA	64	39	59	55	37	20	17	26	20

VENTS VKMK



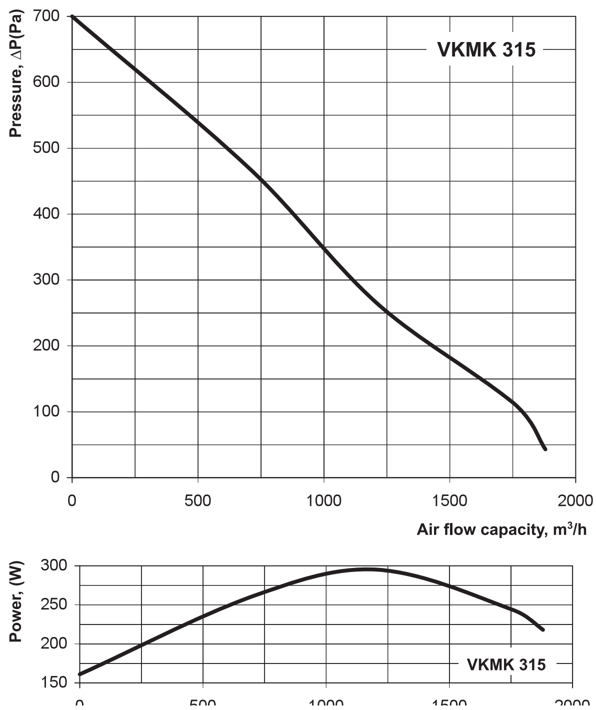
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	49	69	67	72	65	61	58	50
L_{wA} to environment	dBA	64	45	63	61	48	31	25	47	41

VENTS VKMK



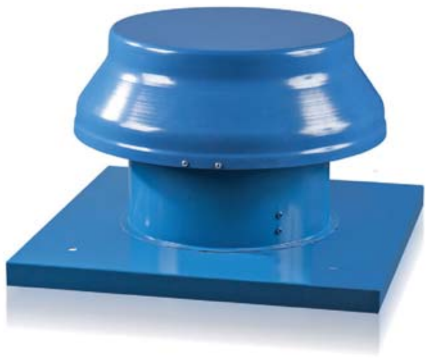
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	74	58	65	66	69	66	62	53	47
L_{wA} to environment	dBA	65	57	64	60	49	39	39	44	40

VENTS VKMK



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	55	67	68	72	68	66	62	60
L_{wA} to environment	dBA	68	52	64	63	55	47	52	57	50

Series
VENTS VOK



Axial roof fans with air flow capacity **up to 2500 m³/h** in steel case with horizontal air extract.

Application
Exhaust ventilation system of different premises for mounting on the roofs of buildings. Fans are compatible with the air duct with diameter from 200 to 350 mm.

Design
The case and impeller of the fan is made of steel with polymer coating.

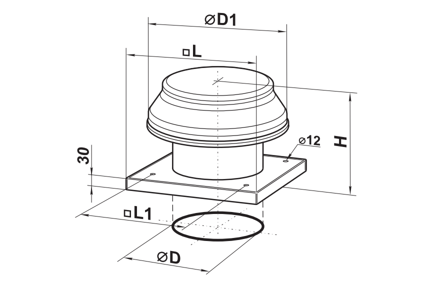
Motor
Depending on the model two- or four-pole asynchronous motors of one- or three-phase type with external rotor equipped with built-in thermal protection with automatic restart. The motors are equipped with built-in thermal protection with automatic restart. Application of ball bearings provides the long service life of the motor. For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Mounting
The fan is mounted on the roof directly above the vent or shaft. The fan is fixed to the flat surface with a connection plate. It is necessary to provide a support at installation of the VOK fans directly on the flat roof in order to prevent the water and snow from getting into the vent of shaft. The power is supplied to the fan through the terminal block. The electrical connection and installation should be carried out according to the manual and electric circuit indicated on the terminal block.

	VOK 2E 200	VOK 2E 250	VOK 4E 250	VOK 2E 300	VOK 4E 300	VOK 4E 350
Voltage, V / 50 Hz	230	230	230	230	230	230
Power, W	55	80	50	145	75	140
Current, A	0,26	0,4	0,22	0,66	0,35	0,65
Air flow capacity, m^3/h	860	1050	800	2230	1340	2500
r.p.m, min^{-1}	2300	2400	1380	2300	1350	1380
Noise level at 3 m, dB(A)	50	60	55	60	58	62
Maximal temperature of transferred air, °C	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60	-30 +60
Index of protection	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54

Type	Dimensions, mm					Weight, kg
	ØD	ØD1	H	L	L1	
VOK 2E 200	207	341	220	410	245	4,3
VOK 2E 250	262	401	250	460	330	6,5
VOK 4E 250	262	401	250	460	330	6,5
VOK 2E 300	312	401	260	560	450	8,7
VOK 4E 300	312	401	260	560	450	8,7
VOK 4E 350	362	500	260	630	535	10,9



Legend:

Series	Motor		Diameter of impeller
	Poles	Phases	
VENTS VOK	2 4	**E** – one-phase	200; 250; 300; 350

Accessories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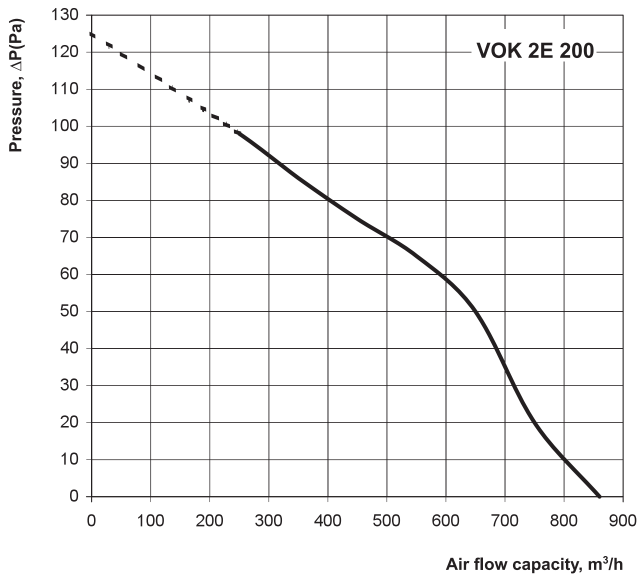
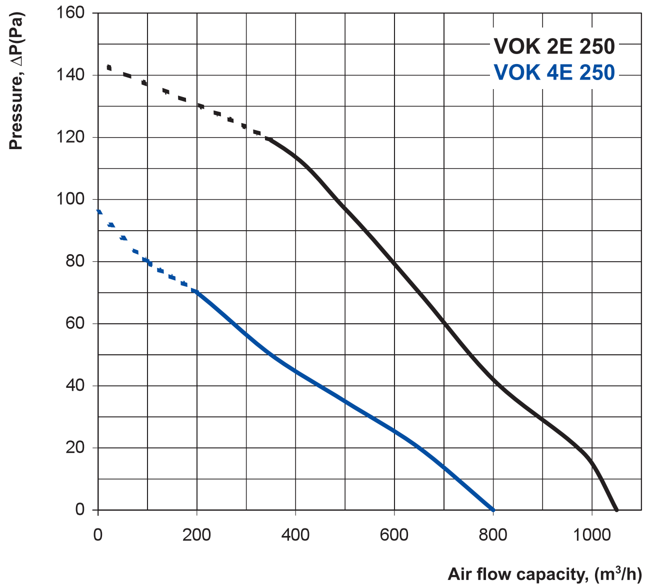
VENTS VOK



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	66	58	58	57	58	57	53	52	46
L_{WA} to environment	dBA	65	57	57	58	60	55	57	53	47

VENTS VOK



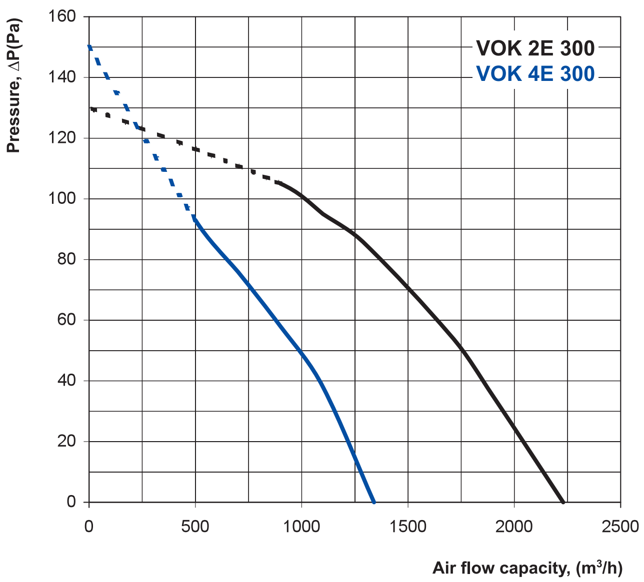
VOK 2E 250

Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	76	69	66	69	71	68	68	61	56
L_{WA} to environment	dBA	78	65	70	69	71	69	64	62	60

VOK 4E 250

	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	50	51	53	55	53	51	45	43
L_{WA} to environment	dBA	60	51	52	54	55	54	51	45	42

VENTS VOK



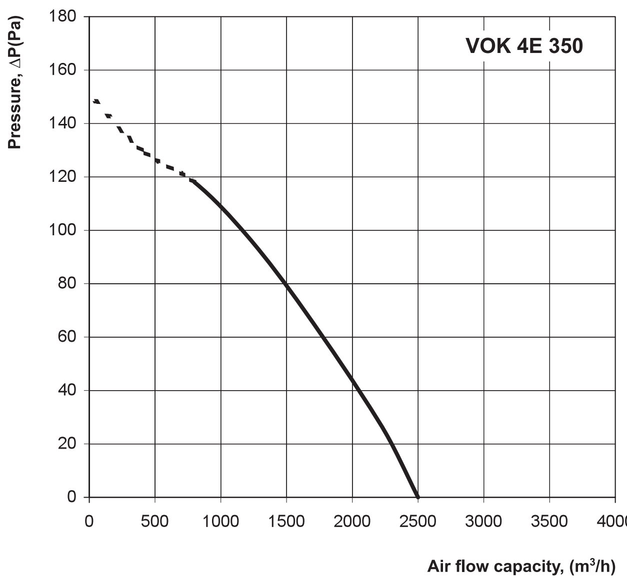
VOK 2E 300

Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	79	68	71	73	72	71	69	64	59
L_{WA} to environment	dBA	78	68	72	72	74	72	70	64	61

VOK 4E 300

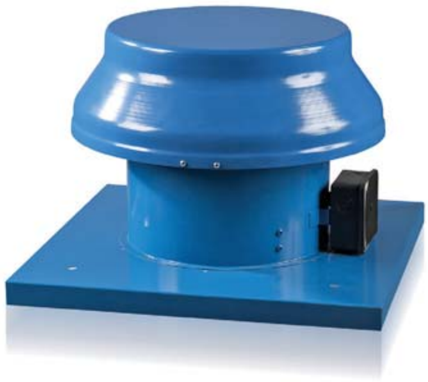
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	66	55	57	58	58	57	53	51	48
L_{WA} to environment	dBA	65	56	56	57	57	57	55	51	49

VENTS VOK



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	70	61	62	61	65	61	58	56	53
L_{WA} to environment	dBA	68	61	63	63	62	60	60	56	52

Series
VENTS VOK1



Axial roof fans with air flow capacity **up to 1700 m³/h** in steel case with horizontal air extract.

Application
Exhaust system of ventilation of different premises for mounting on the roofs of buildings. Fans are compatible with the air duct with diameter from 200 to 315 mm.

Design
The case and impeller of the fan is made of steel with polymer coating, the impeller is made of aluminum.

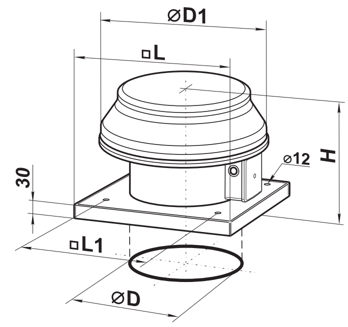
Motor
One-phase asynchronous motors with external rotor equipped with built-in thermal protection with automatic restart.
Application of ball bearings provides the long service life of the motor. For precise features, safe operation and low noise, each turbine is dynamically balanced while assembly. Class of motor protection is IP 44.

Speed control
Smooth or step speed control is performed with thyristor or autotransformer controller. Several fans may be connected to one controller in case total power and operating current will not exceed rated values of controller.

Mounting
The fan is mounted on the roof directly above the vent or shaft. The fan is fixed to the flat surface with a connection plate. It is necessary to provide a support at installation of the VOK1 fans directly on the flat roof in order to prevent the water and snow from getting into the vent of shaft. The power is supplied to the fan through the terminal block. The electrical connection and installation should be carried out according to the manual and electric circuit indicated on the terminal block.

	VOK1 200	VOK1 250	VOK1 315
Voltage, V / 50 Hz	230	230	230
Power, W	43	68	110
Current, A	0,28	0,48	0,75
Air flow capacity, m^3/h	405	1070	1700
r.p.m, min^{-1}	1300	1300	1300
Noise level at 3 m, dB(A)	32	48	54
Maximal temperature of transferred air, °C	50	50	50
Index of protection	IP X4	IP X4	IP X4

Type	Dimensions, mm					Weight, kg
	ØD	ØD1	H	L	L1	
VOK1 200	207	341	220	410	245	4,9
VOK1 250	262	401	250	460	330	6,8
VOK1 315	312	500	260	560	450	9,2



Legend:

Series	Diameter of impeller
VENTS VOK1	200; 250; 315

Accessories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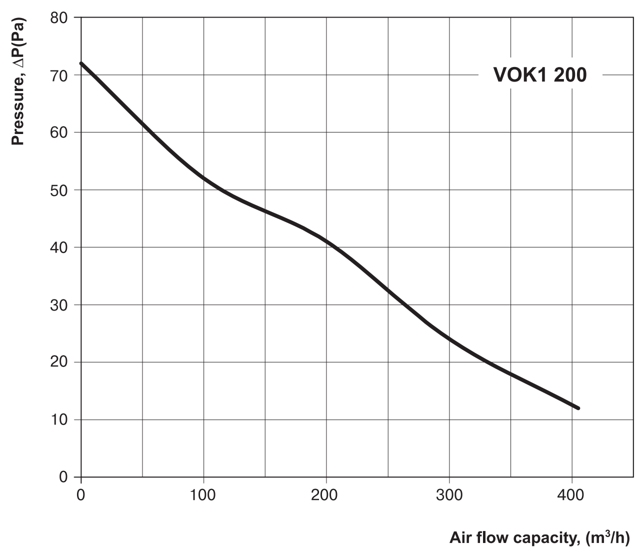
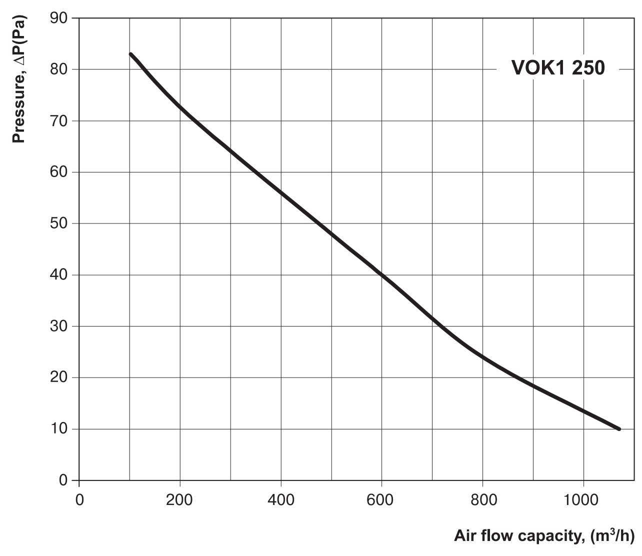
VENTS VOK1



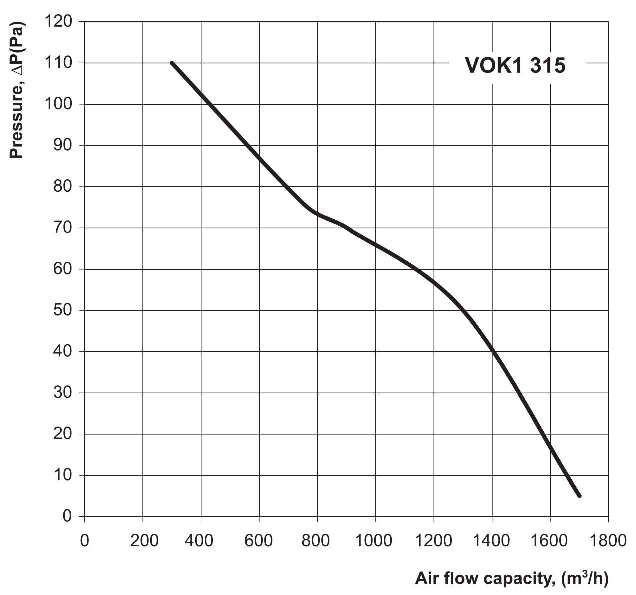
Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	56	55	61	55	41	40	36	30	15
L_{wA} to environment	dBA	56	54	63	56	41	38	35	28	15

VENTS VOK1



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	61	64	67	62	42	47	44	34	20
L_{wA} to environment	dBA	60	65	69	60	44	45	42	35	21

VENTS VOK1



Sound pressure level		Octave-frequency band, Hz								
	Hz	Gen.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	61	67	69	62	47	50	46	41	30
L_{wA} to environment	dBA	64	66	67	62	47	51	49	41	28

CORRESPONDS TABLE OF ELECTRICAL ACCESSORIES

	Thyristor speed controllers					Transformer speed single phase controllers				Transformer speed three phase controllers		Frequency speed con-trollers	Temperature controllers	Sensors			
VKV 2E 220 / VKH 2E 220	RS-1-300	RS-1-400	RS-0,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T										
VKV 2E 225 / VKH 2E 225	RS-1-300	RS-1-400	RS-1,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T										
VKV 2E 250 / VKH 2E 250	RS-1-300	RS-1-400	RS-1,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M				RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VKV 2E 280 / VKH 2E 280	RS-1-300	RS-1-400	RS-1,5-PS	RS-1,5 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T										
VKV 4E 310 / VKH 4E 310	RS-1-300	RS-1-400	RS-1,5-PS	RS-1 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T										
VKV 4D 310 / VKH 4D 310										RSA5D-1,5-T	RSA5D-5,0-M	VFED-200-TA					
VKV 4E 355 / VKH 4E 355	RS-1-300	RS-1-400	RS-1,5-PS	RS-1,5 N(V)	RS-1,5-T	RSA5E-2-P	RSA5E-1,5-T	RSA5E-1,5-TA	RSA5E-2-M				RT-10	T-1,5 N(V)	TH-1,5 N(V)	TF-1,5 N(V)	TR-1,5 N(V)
VKV 4D 355 / VKH 4D 355										RSA5D-1,5-T	RSA5D-5,0-M	VFED-200-TA					
VKV 4E 400 / VKH 4E 400			RS-2,5-PS	RS-2,5 N(V)	RS-3,0-T		RSA5E-3,5-T	RSA5E-3,5-TA	RSA5E-3-M								
VKV 4D 400 / VKH 4D 400										RSA5D-1,5-T	RSA5D-5,0-M	VFED-400-TA					
VKV 4E 450 / VKH 4E 450			RS-2,5-PS	RS-2,5 N(V)	RS-3,0-T		RSA5E-3,5-T	RSA5E-3,5-TA	RSA5E-3-M								
VKV 4D 450 / VKH 4D 450										RSA5D-1,5-T	RSA5D-5,0-M	VFED-400-TA					
VKV 6E 500 / VKH 6E 500		RS-1-400	RS-2,5-PS	RS-2 N(V)	RS-3,0-T	RSA5E-2-P	RSA5E-3,5-T	RSA5E-3,5-TA	RSA5E-2-M				RT-10				

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VKMK 150 / VKMKp 150</td><td rowspan="4">RS-1-300</td><td rowspan="4">RS-1-400</td><td>RS-0,5-PS</td><td rowspan="3">RS-1 N(V)</td><td rowspan="4">RS-1,5-T</td><td rowspan="4">RSA5E-2-P</td><td rowspan="4">RSA5E-1,5-T</td><td rowspan="4">RSA5E-1,5-TA</td><td rowspan="4">RSA5E-2-M</td><td rowspan="4">RT-10</td><td rowspan="4">T-1,5 N(V)</td><td rowspan="4">TH-1,5 N(V)</td><td rowspan="4">TF-1,5 N(V)</td><td rowspan="4">TR-1,5 N(V)</td></tr>
<tr><td>VKMK 200 / VKMKp 200</td><td rowspan="3">RS-1,5-PS</td></tr>
<tr><td>VKMK 250 / VKMKp 250</td></tr>
<tr><td>VKMK 315 / VKMKp 315</td><td>RS-1,5 N(V)</td></tr>
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<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VOK 2E 200</td><td rowspan="6">RS-1-300</td><td rowspan="6">RS-1-400</td><td rowspan="3">RS-0,5-PS</td><td rowspan="6">RS-1 N(V)</td><td rowspan="6">RS-1,5-T</td><td rowspan="6">RSA5E-2-P</td><td rowspan="6">RSA5E-1,5-T</td><td rowspan="6">RSA5E-1,5-TA</td><td rowspan="6">RSA5E-2-M</td><td rowspan="6">RT-10</td><td rowspan="6">T-1,5 N(V)</td><td rowspan="6">TH-1,5 N(V)</td><td rowspan="6">TF-1,5 N(V)</td><td rowspan="6">TR-1,5 N(V)</td></tr>
<tr><td>VOK 2E 250</td></tr>
<tr><td>VOK 4E 250</td></tr>
<tr><td>VOK 2E 300</td><td>RS-1,5-PS</td></tr>
<tr><td>VOK 4E 300</td><td>RS-0,5-PS</td></tr>
<tr><td>VOK 4E 350</td><td>RS-1,5-PS</td></tr>
</table>

<table>
<tr><th></th><th colspan="5">Thyristor speed controllers</th><th colspan="4">Transformer speed single phase controllers</th><th>Temperature controllers</th><th colspan="4">Sensors</th></tr>
<tr><td>VOK1 200</td><td rowspan="3">RS-1-300</td><td rowspan="3">RS-1-400</td><td rowspan="2">RS-0,5-PS</td><td rowspan="3">RS-1 N(V)</td><td rowspan="3">RS-1,5-T</td><td rowspan="3">RSA5E-2-P</td><td rowspan="3">RSA5E-1,5-T</td><td rowspan="3">RSA5E-1,5-TA</td><td rowspan="3">RSA5E-2-M</td><td rowspan="3">RT-10</td><td rowspan="3">T-1,5 N(V)</td><td rowspan="3">TH-1,5 N(V)</td><td rowspan="3">TF-1,5 N(V)</td><td rowspan="3">TR-1,5 N(V)</td></tr>
<tr><td>VOK1 250</td></tr>
<tr><td>VOK1 315</td><td>RS-1,5-PS</td></tr>
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INTAKE UNITS
EXHAUST UNITS

VENTS VPA Series

Sound-insulated and heat-insulated fan units with an air flow capacity up to 1520 m^3/h provide premises with fresh filtered air. Electric heaters are fixed to provide unit's operation in low temperature of outer air. They are compatible with round air ducts of nominal diameter – 100, 125, 150, 200, 250, 315 mm.

VENTS MPA...E Series

Sound-insulated and heat-insulated fan units with an air flow capacity up to 3500 m^3/h provide premises with fresh filtered air. Water heaters are fixed to provide unit's operation in low temperature of outer air. They are compatible with rectangular air ducts of nominal cross-section – 400x200, 500x250, 500x300, 600x300, 600x350 mm.

VENTS MPA...W Seres

Sound-insulated and heat-insulated fan units with an air flow capacity up to 7590 m^3/h provide premises with fresh filtered air. Electric heaters are fixed to provide unit 's operation in low temperature of outer air. They are compatible with rectangular air ducts of nominal cross-section – 400x200, 500x250, 500x300, 600x300, 600x350 и 800x500 mm.

VENTS PA... E Series

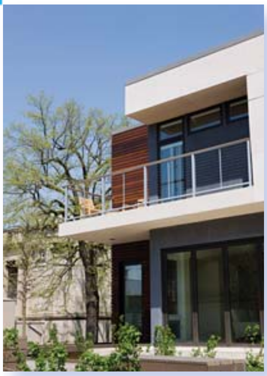
Compact suspended, sound-insulated fan units with air flow capacity up to 3350 m^3/h provide premises with fresh filtered air. Electric heaters are fixed to provide unit 's operation in low temperature of outer air. They are compatible with rectangular air ducts of nominal cross-section – 400x200, 500x300, 600x350 mm.

VENTS PA...W Series

Compact suspended sound-insulated fan units with an air flow capacity up to 4100 m^3/h provide premises with fresh filtered air. Water heaters are fixed to provide unit 's operation in low temperature of outer air. They are compatible with round air ducts of nominal cross-section – 400x200, 500x300, 600x350, 700x400 mm.

VENTS VA Series

Compact suspended sound-insulated fan units with an air flow capacity up to 4100 m^3/h provide extraction of exhaust air from premises. They are compatible with rectangular air ducts of nominal cross-section – 400x200, 500x300, 600x350, 600x350, 700x400 mm.



VENTS VPA
Series

Intake units with air flow capacity up to **1520 m³/h** in a compact sound-insulated and heat-insulated case with electric heater

Description
This is a fan unit that provides filtration, heating and supply of fresh air into the premises. Unit's capacities range from 200 to 1500 m^3/h. All models are compatible with round air ducts of nominal diameter 100, 125, 150, 200, 250, 315 mm.

Case
The case is made of aluzink with internal heat and sound insulation of 25 mm thickness made of mineral wool.

Filter
High degree of air purification is achieved due to the in-build filter of G4 Class.

Heater
Electric fan heater warms incoming air during winter and cold weather.

Fan
Centrifugal fan with backward-curved blades and in-build thermostatic protection with automatic restart is utilized here. A version with more powerful parameters (VPA-1) is available for some standard sizes. Fan motor and impeller are dynamically balanced in two-dimensional subspace. Ball bearings of electric motor rolling do not require to be maintained, the life circle amounts no less than 40000 hours.

Control and automation
Two options of inlet unit performance are possible:
1. Without control, when a customer individually defines and select necessary automation system.

2. With in-build controlling system and automation that allows regulating fan air flow capacity, setting temperature of incoming air, controlling filter's contamination level. Beside this, automation system provides positive defense from overheat of fan's heater elements. It is possible to operate unit at a distance by means of wired (in standard set there is a wire with the length of 10 m) remote control unit.

Control and protection functions
- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of control panel (electric air heater control by means of bidirectional optothyristor);
- fan speed regulation with the use of control panel (3 speed modes);
- trying-out necessary algorithms at start up and shutdown of the unit ;
- operation of the unit according to daily or weekly timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- filter clogging control (differential Pressure sensor);

Mounting
Air supply unit can be mounted on the floor, attached to a ceiling by a seat angle with inserted vibration-damping element or attached to a wall with brackets. Mounting can be done either in service space (balcony, storage room, underground floor, roof space etc.) or in the main space by placing the unit above suspended ceiling or in the pocket. The unit can be mounted in any position except for vertical position in case of downward current of air (tubular heating elements should not be placed under the fan). Free access to the unit should be provided in case of service maintenance or filter cleaning.

Legend:

Series		Flange diameter, [mm]	Electric heater power [kW]	Phase
VENTS VPA	– **1 –** increased capacity motor	100; 125; 150; 200; 250; 315	1,8; 2,4; 3,4; 3,6; 5,1; 6; 9	**1 –** one-phase; **3 –** three-phase

Accessories



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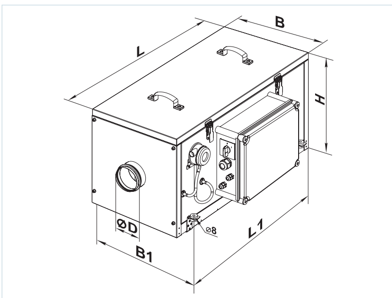
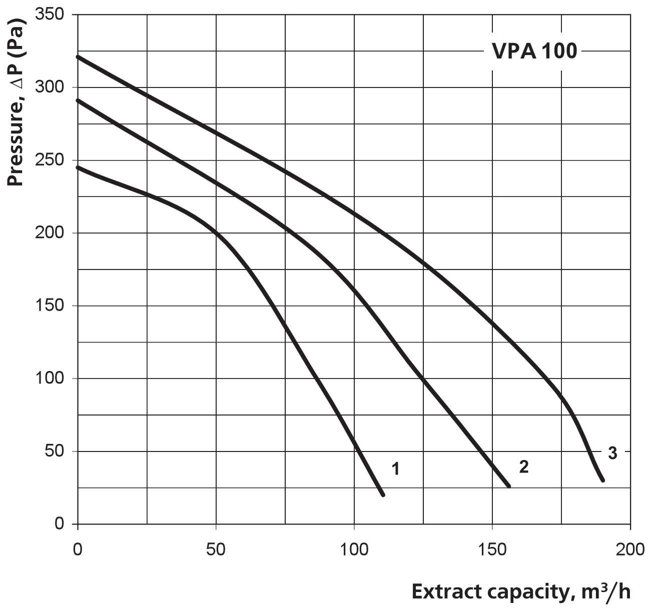
	VPA 100-1,8-1	VPA 125-2,4-1	VPA 150-2,4-1	VPA 150-3,4-1	VPA 150-5,1-3	VPA 150-6,0-3	VPA 200-3,4-1	VPA 200-5,1-3	VPA 200-6,0-3
Voltage [V~50Hz]	1~ 230	1~ 230	1~ 230		3~ 400		1~ 230	3~ 400	
Maximum fan power [W]	73	75	98				193		
Fan current [A]	0,32	0,33	0,43				0,84		
Electric heater capacity [kW]	1,8	2,4	2,4	3,4	5,1	6,0	3,4	5,1	6,0
Electric heater current [A]	7,8	10,4	10,4	14,8	7,4	8,7	14,8	7,4	8,7
Number of tubular heating elements in electric heater	3	3	2	2	3	3	2	3	3
Total power of the unit [kW]	1,873	2,475	2,498	3,498	5,198	6,098	3,593	5,293	6,193
Total current of the unit [A]	8,12	10,73	10,83	15,23	7,83	9,13	15,64	8,24	9,54
Air capacity, [m³/h]	190	285	425				810		
RPM	2830	2800	2705				2780		
Noise level at 3m [dB[A]]	27	28	29				30		
Maximum temperature of shifted air [°C]	-25 +55	-25 +55	from -25 up to +55				from -25 up to +45		
Case material	Aluzink	Aluzink	Aluzink				Aluzink		
Insulation	25 mm, Mineral wool	25 mm, Mineral wool	25 mm, Mineral wool				25 mm, Mineral wool		
Filter	G4	G4	G4				G4		
Size of connected air duct [mm]	100	125	150				200		
Weight [kg]	50	50	50				52		

	VPA 250-3,6-3	VPA 250-6,0-3	VPA 250-9,0-3	VPA 315-6,0-3	VPA 315-9,0-3	VPA-1 315-6,0-3	VPA-1 315-9,0-3
Voltage [V~50Hz]	3~ 400			3~ 400			
Maximum fan power [W]	194			171		296	
Fan current [A]	0,85			0,77		1,34	
Electric heater capacity [kW]	3,6	6,0	9,0	6,0	9,0	6,0	9,0
Electric heater current [A]	5,3	8,7	13,0	8,7	13,0	8,7	13,0
Number of tubular heating elements in electric heater	3	3	3	3	3	3	3
Total power of the unit [kW]	3,794	6,194	9,194	6,171	9,171	6,296	9,296
Total current of the unit [A]	6,15	9,55	13,85	9,47	13,77	10,04	14,34
Air capacity, [m³/h]	990			1190		1520	
RPM	2790			2600		2720	
Noise level at 3m [dB[A]]	30			30		30	
Maximum temperature of shifted air [°C]	from -25 up to +50			from -25 up to +50		from -25 up to +45	
Case material	Aluzink			Aluzink			
Insulation	25 mm, Mineral wool			25 mm, Mineral wool			
Filter	G4			G4			
Size of connected air duct [mm]	250			315			
Weight [kg]	52			62			

Type	Dimension [mm]					
	ØD	B	B1	H	L	L1
VPA 100	99	382	421,5	408	800	647
VPA 125	124	382	421,5	408	800	647
VPA 150	149	455	496,5	438	800	647
VPA 200	199	487	526,5	513	835	684
VPA 250	249	487	526,5	513	835	684
VPA 315	314	527	566,5	548	900	750

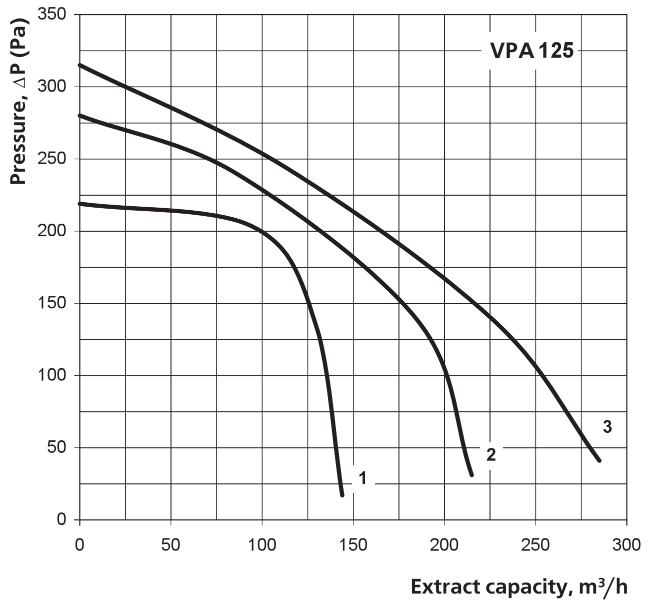


VENTS VPA



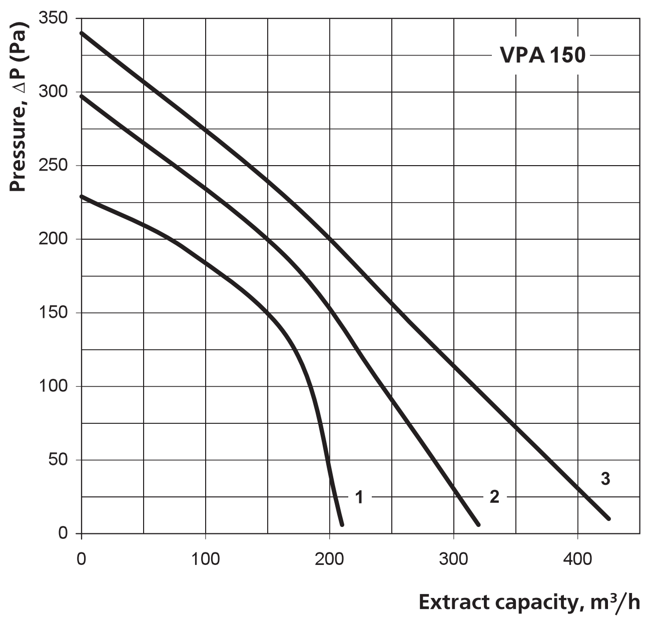
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	50	30	47	47	35	40	37	28	16
L_{wA} (output)	dB[A]	58	39	50	56	49	45	42	33	23
L_{wA} (environment)	dB[A]	31	5	21	28	24	19	13	4	0

VENTS VPA



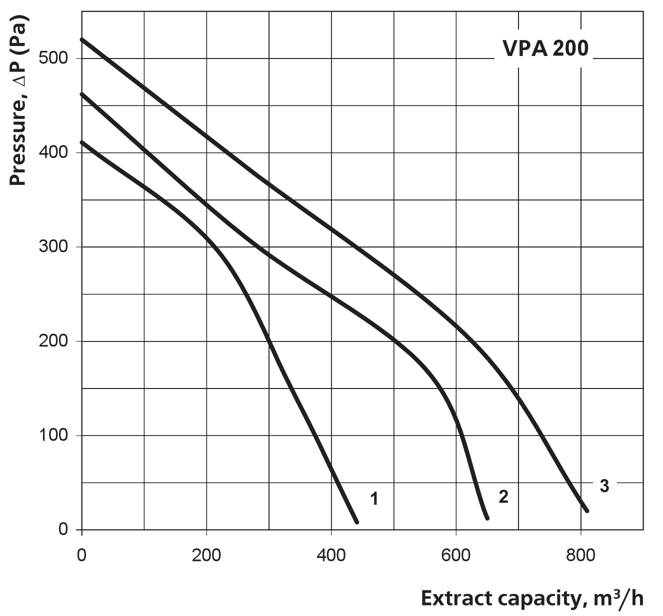
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	52	31	48	48	36	41	40	32	18
L_{wA} (output)	dB[A]	62	40	53	56	52	47	47	37	23
L_{wA} (environment)	dB[A]	33	9	24	33	26	17	16	3	4

VENTS VPA



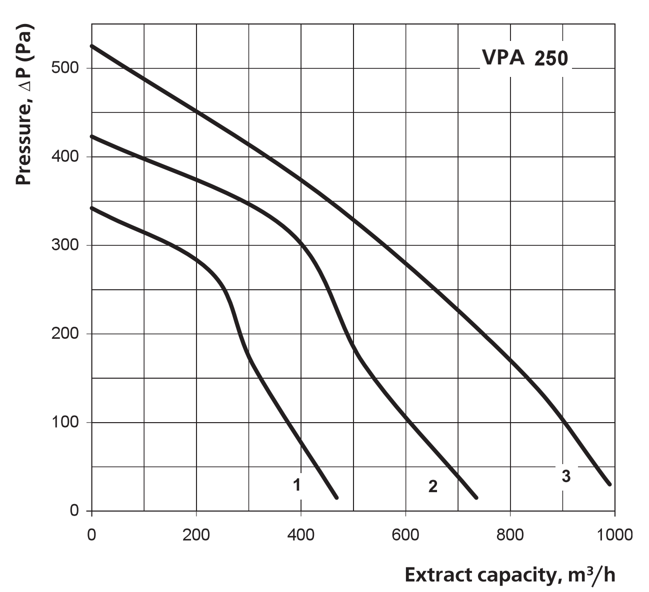
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	65	37	53	63	50	53	53	45	30
L_{wA} (output)	dB[A]	63	22	43	53	52	57	57	46	36
L_{wA} (environment)	dB[A]	41	14	34	39	19	27	19	7	0

VENTS VPA



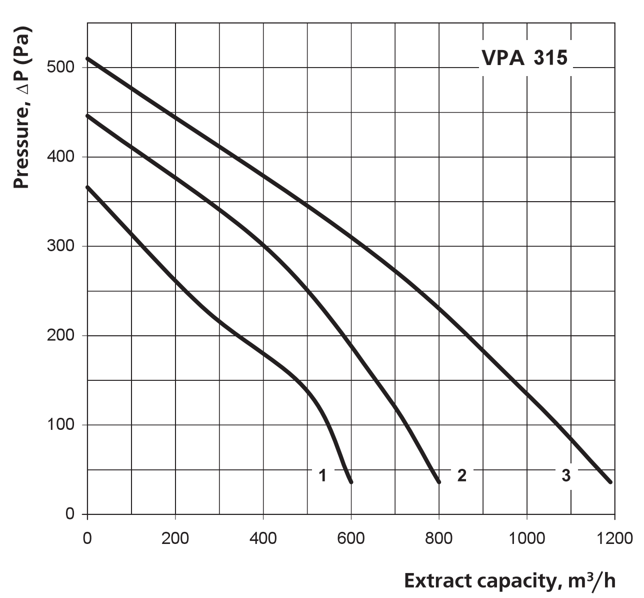
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	65	41	58	59	56	60	62	56	41
L_{wA} (output)	dB[A]	71	46	57	63	64	66	66	58	45
L_{wA} (environment)	dB[A]	46	15	31	43	40	34	30	22	8

VENTS VPA



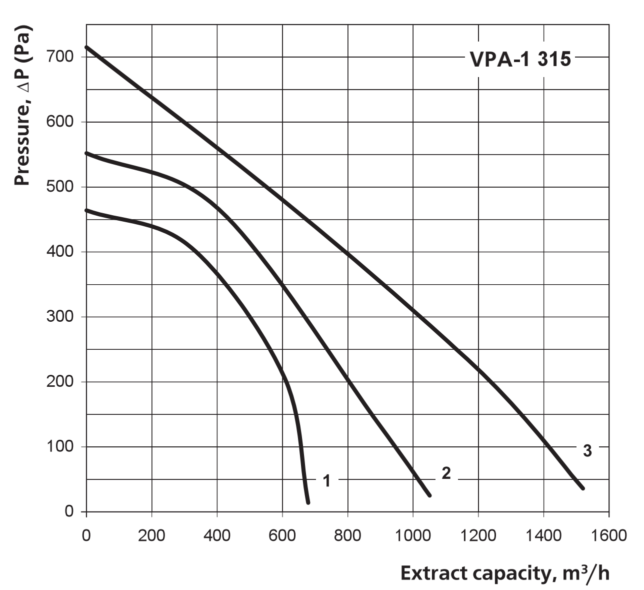
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	65	41	54	61	58	63	62	55	43
L_{wA} (output)	dB[A]	72	42	55	63	63	68	70	60	45
L_{wA} (environment)	dB[A]	45	15	30	44	39	37	28	23	6

VENTS VPA



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	55	69	74	68	71	65	64	62
L_{wA} (output)	dB[A]	82	55	74	74	77	76	74	70	59
L_{wA} (environment)	dB[A]	55	32	44	50	49	46	36	31	24

VENTS VPA



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	75	61	72	72	68	69	66	67	59
L_{wA} (output)	dB[A]	79	43	65	71	72	77	74	69	60
L_{wA} (environment)	dB[A]	58	37	47	51	54	46	38	36	34

VENTS MPA E
Series

Intake units with an air flow capacity up to **3500 m³/h** in a compact sound-insulated and heat-insulated case with electric heater.

VENTS MPA W
Series

Intake units with an air flow capacity up to **6500 m³/h** in a compact sound-insulated and heat-insulated case with water heater.

Description
Inlet unit MPA is a turn key unit that provides filtration, heating and supply of fresh air into the premises. The unit is compatible with rectangular air ducts of nominal cross-section – 400x200, 500x250, 500x300, 600x300, 600x350 and 800x500 mm.

Case
The case is made of aluzink with internal heat and sound insulation of 25 mm thickness made of mineral wool.

Filter
High degree of air purification is achieved due to the in-build filter of G4 Class.

Heater
Electric heater (MPA E models) and hot water (glycolic) heater (MPA W models) both are used for heating of incoming air during winter and cold weather. Tubular heating elements of electric fan heater are supplied with additional ribbing which increases the heat exchange surface area and also increases heat transfer to incoming air.

Fan
Centrifugal double-suction fan with forward-curved blades and in-build thermostatic protection with automatic restart. Fan motor and impeller are dynamically balanced in two-dimensional subspace. Ball bearings of electric motor do not require to be maintained, the life circle amounts no less than 40000 hours.

Control and automation
Two performance options are possible:

1. Without control, when a customer individually defines and select necessary automation system.
2. With in-build controlling system and automation that allows regulating fan capacity (3 speeds), setting temperature of incoming air, controlling filter's condition (contamination level). Beside this, automation system provides positive defense from overheat of fan's heater elements. Unit can be operated by remote control. Standard set provides 10 meters of wire for the remote control.

Legend:

Series	Rated air consumption [m³/h]	Heater type	Phase
VENTS MPA	800, 1200, 1800, 2500, 3200, 3500, 5000	**E** – electric; **W** – water;	**1** – one-phase; **3** – three-phase

Accessories

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Control and protection functions

- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of control panel (electric air heater control by means of bidirectional optothyristor);
- fan speed regulation with the use of control panel (3 speed modes);
- trying-out necessary algorithms at start up and shutdown of the unit;
- operation of the timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- filter clogging control (differential pressure sensor);

Control and protection functions of MPA W model

- start up and shut down of unit's electric motor;
- fan speed selection (3 speed modes);
- maintenance of predetermined value of incoming air temperature using a three-way valve actuator which controls the supply of heat-carrying agent to the liquid heating device;
- protection of liquid heating device from freezing (according to temperature-sensing device placed behind the heater and according to temperature probe of reverse heat-carrying agent);
- Control and control on operation of external circulating pump installed in the delivery line of heat-carrying agent to the liquid heating device (mixing unit pump);
- control on compressor-condenser block (CCB) of air-cooling device considering room temperature;
- Control and control on operation of inlet fan;
- Control on filter clogging;
- Control on electric actuator of external air-valve;
- System stop on a signal sent from fire-alarm panel.

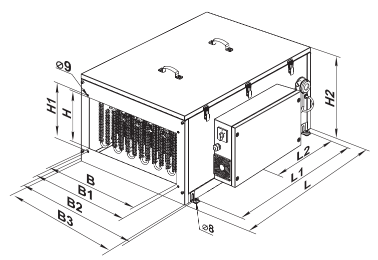
If mixing unit is available, in this case the control panel allows maintaining of predetermined air temperature in the room by regulating consumption of a heat-transfer agent through the air heater. The use of mixing unit with a pump allows executing above-mentioned regulation if mains Pressure differentia is less than 40 kPa. The mixing unit with a pump helps to prevent freezing of heat exchanger and provides additional time for performing operational procedures in case of emergency.

Mounting

Inlet unit can be mounted on the floor, attached to a ceiling by a seat angle with inserted vibration-damping element or attached to a wall with brackets. Mounting can be done either in service space (balcony, storage room, underground floor, roof space etc.) or in the main space by placing the unit above suspended ceiling, in the pocket or directly on the ceiling. The unit can be mounted in any position except for vertical position in case of downward current of air (tubular heating elements should not be placed under the fan). Free access to the unit should be provided in case of service maintenance or filter cleaning.

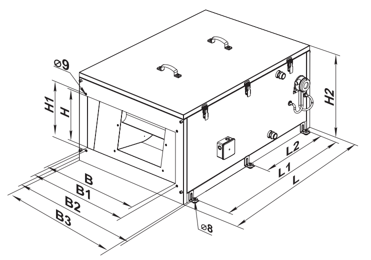
Type	Dimension [mm]									
	B	B1	B2	B3	H	H1	H2	L	L1	L2
MPA 800 E1	400	420	549	500	200	220	352	650	530	-
MPA 1200 E3	400	420	549	500	200	220	352	650	530	-
MPA 1800 E3	500	520	649	600	250	270	480	800	680	-
MPA 2500 E3	500	520	649	600	300	320	480	800	680	-
MPA 3200 E3	600	620	759	710	300	320	530	1000	880	440
MPA 3500 E3	600	620	759	710	350	370	530	1000	880	440

MPA E



Type	Dimension [mm]									
	B	B1	B2	B3	H	H1	H2	L	L1	L2
MPA 800 W	400	420	549	500	200	220	352	650	530	-
MPA 1200 W	400	420	549	500	200	220	352	650	530	-
MPA 1800 W	500	520	649	600	250	270	480	800	680	-
MPA 2500 W	500	520	649	600	300	320	480	800	680	-
MPA 3200 W	600	620	759	710	500	320	530	1000	880	440
MPA 3500 W	600	620	759	710	300	370	530	1000	880	440
MPA 5000 W	800	820	971	925	350	520	670	1299	720	360

MPA W



	MPA 800 E1	MPA 800 W	MPA 1200 E3	MPA 1200 W
Voltage [V~50Hz]	1~ 230		3~ 400	
Maximum fan power [W]	245		410	
Fan current [A]	1,08		1,8	
Electric heater capacity [kW]	3,3	-	9,9	-
Electric heater current [A]	14,3	-	24,8	-
Number of tubular heating elements in electric heater	1	4	3	4
Total power of the unit [kW]	3,55	0,245	9,94	0,410
Total current of the unit [A]	15,38	1,08	26,6	1,8
Air capacity [m³/h]	800	750	1200	1200
RPM	1650		1850	
Noise level at 3m [dB[A]]	35		38	
Maximum temperature of shifted air [°C]	from -25 up to +45		from -25 up to +45	
Case material	Aluzink		Aluzink	
Insulation	25 mm, Mineral wool		25 mm, Mineral wool	
Filter	G4		G4	
Size of connected air duct [mm]	400x200		400x200	
Weight [kg]	36,2	41,3	38,9	42,8

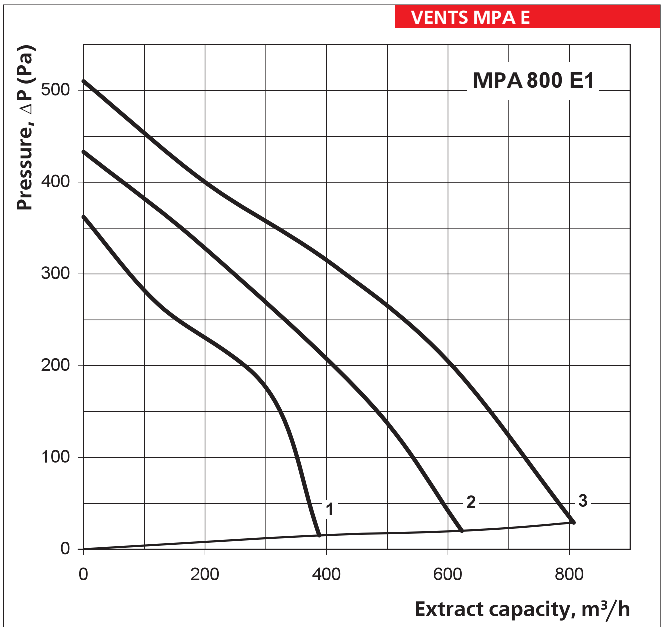
* Without control block case (with block case for MPA… E+130mm)

	MPA 1800 E3	MPA 1800 W	MPA 2500 E3	MPA 2500 W
Voltage [V~50Hz]	3~ 400		3~ 400	
Maximum fan power [W]	490		650	
Fan current [A]	2,15		2,84	
Electric heater capacity [kW]	18,0	-	18,0	-
Electric heater current [A]	45,0	-	45.0	-
Number of tubular heating elements in electric heater	3	4	3	4
Total power of the unit [kW]	18,49	0,490	18,65	0,650
Total current of the unit [A]	47,15	2,15	47,84	2,84
Air capacity [m³/h]	2000	1870	2500	2150
RPM	1100		1000	
Noise level at 3m [dB[A]]	40		45	
Maximum temperature of shifted air [°C]	from -25 up to +45		from -25 up to +45	
Case material	Aluzink		Aluzink	
Insulation	25 mm, Mineral wool		25 mm, Mineral wool	
Filter	G4		G4	
Size of connected air duct [mm]	500x250		500x300	
Weight [kg]	61,5	62,5	62	63

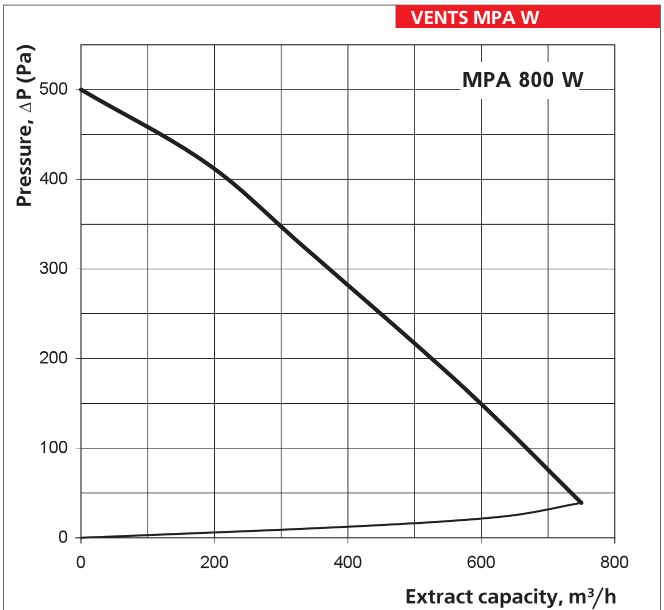
* Without control block case (with block case for MPA… E+130mm)

	MPA 3200 E3	MPA 3200 W	MPA 3500 E3	MPA 3500 W	MPA 5000 W
Voltage [V~50Hz]	3~ 400Y		3~ 400Y		3~ 400
Maximum fan power [W]	1270		1270		1800
Fan current [A]	2,3		2,3		4,5
Electric heater capacity [kW]	25,2	-	25,2	-	-
Electric heater current [A]	63,0	-	63,0	-	-
Number of tubular heating elements in electric heater	6	4	6	4	4
Total power of the unit [kW]	26,47	1,270	26,47	1,270	1,80
Total current of the unit [A]	65,3	2,3	65,3	2,3	4,5
Air capacity [m³/h]	3200	3000	3500	3250	6500
RPM	1200		1200		1400
Noise level at 3m [dB[A]]	53		53		55
Maximum temperature of shifted air [°C]	from -40 up to +45		from -40 up to +45		from -25 up to +45
Case material	Aluzink		Aluzink		Aluzink
Insulation	25 mm, Mineral wool		25 mm, Mineral wool		25 mm, Mineral wool
Filter	G4		G4		G4
Size of connected air duct [mm]	600x300		600x350		800x500
Weight [kg]	69,4	73,2	69,3	73,1	136

* Without control block case (with block case for MPA... E+130mm)

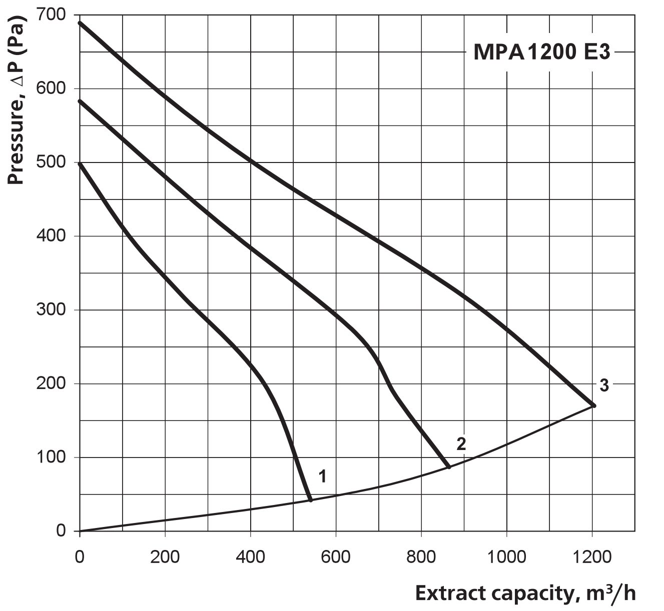


Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	63	66	63	63	61	56	53	50	41
L_{wA} (output)	dB[A]	64	67	65	64	56	61	56	51	46
L_{wA} (environment)	dB[A]	39	42	56	43	36	34	28	24	22



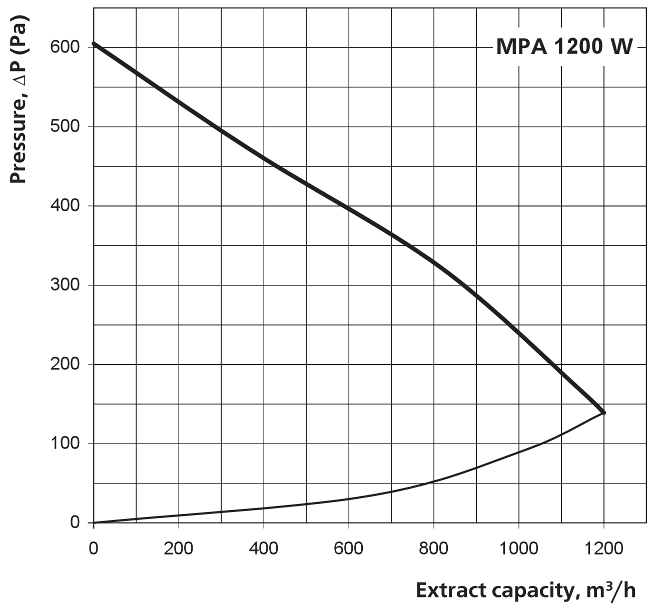
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	62	64	62	60	62	54	56	50	44
L_{wA} (output)	dB[A]	61	67	65	63	59	59	55	52	45
L_{wA} (environment)	dB[A]	38	45	55	42	36	34	26	24	21

VENTS MPA E



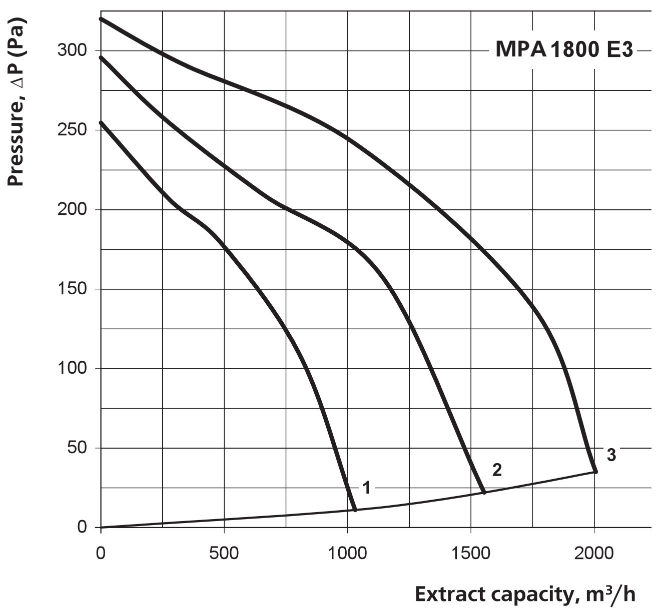
Sound power level	Hz	Total	Octave-frequency band [Hz]							
			63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	67	66	66	68	66	60	63	60	55
L_{WA} (output)	dB[A]	72	71	70	68	68	65	60	60	57
L_{WA} (environment)	dB[A]	45	55	54	48	52	40	37	34	35

VENTS MPA W



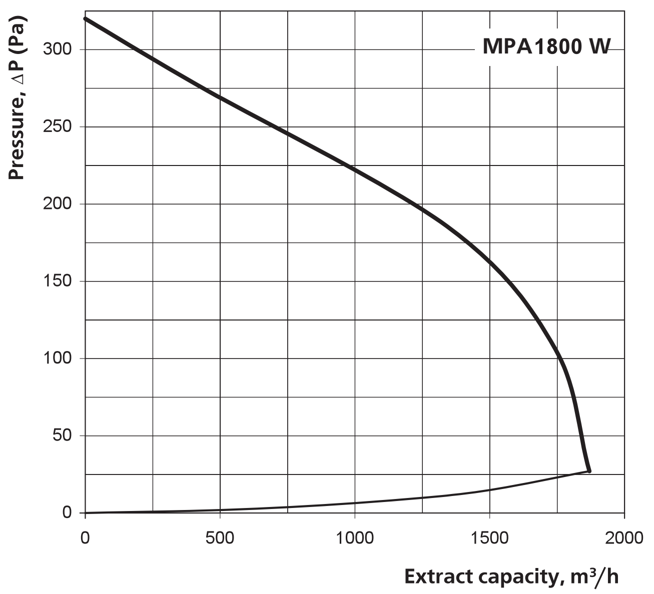
Sound power level	Hz	Total	Octave-frequency band [Hz]							
			63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	71	70	68	66	68	62	61	61	56
L_{WA} (output)	dB[A]	71	68	69	67	64	67	62	61	57
L_{WA} (environment)	dB[A]	48	56	54	48	53	40	39	35	33

VENTS MPA E



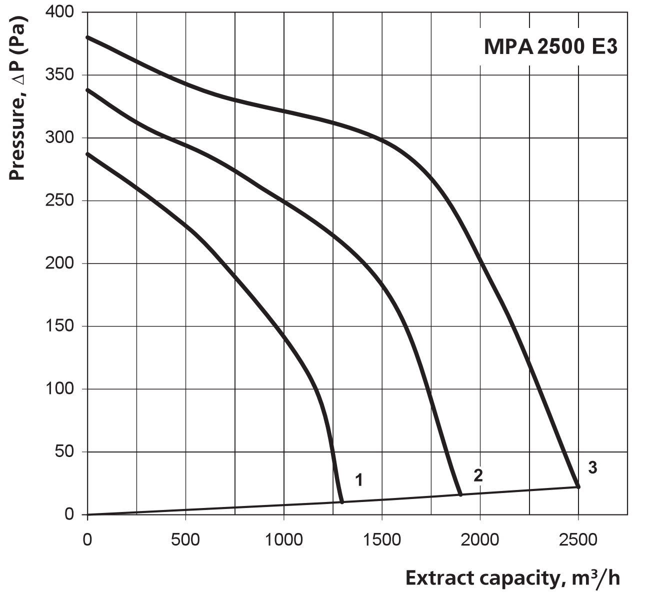
Sound power level	Hz	Total	Octave-frequency band [Hz]							
			63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	74	79	76	74	67	67	64	64	54
L_{WA} (output)	dB[A]	75	82	78	74	68	73	66	70	67
L_{WA} (environment)	dB[A]	52	64	62	54	48	44	40	36	34

VENTS MPA W



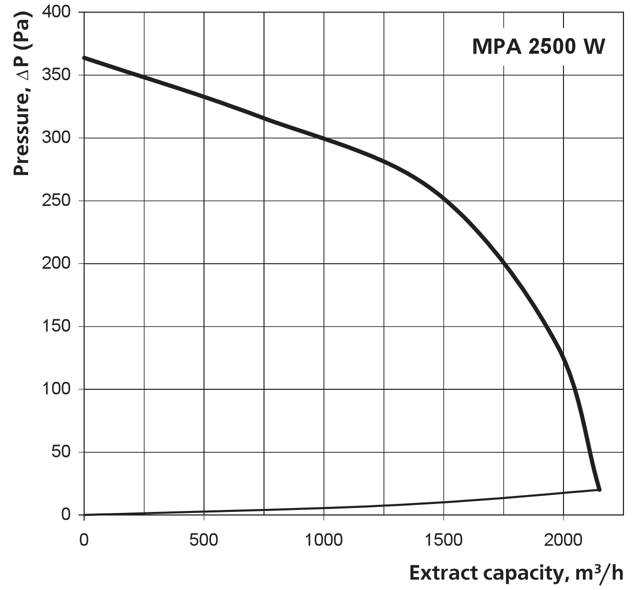
Sound power level	Hz	Total	Octave-frequency band [Hz]							
			63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	73	78	77	77	67	68	62	63	57
L_{WA} (output)	dB[A]	75	79	78	74	68	73	66	69	66
L_{WA} (environment)	dB[A]	51	63	61	54	47	44	40	37	33

VENTS MPA E



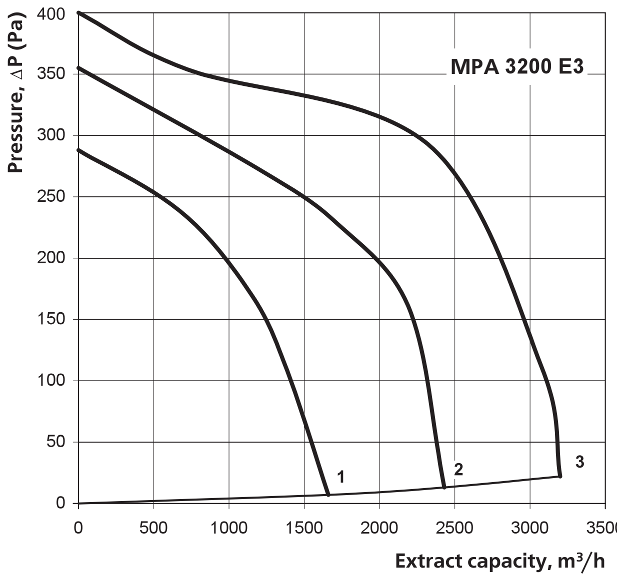
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	82	80	80	70	70	66	66	58
L_{wA} (output)	dB[A]	82	82	84	79	75	79	74	71	68
L_{wA} (environment)	dB[A]	55	67	68	61	54	48	45	40	37

VENTS MPA W



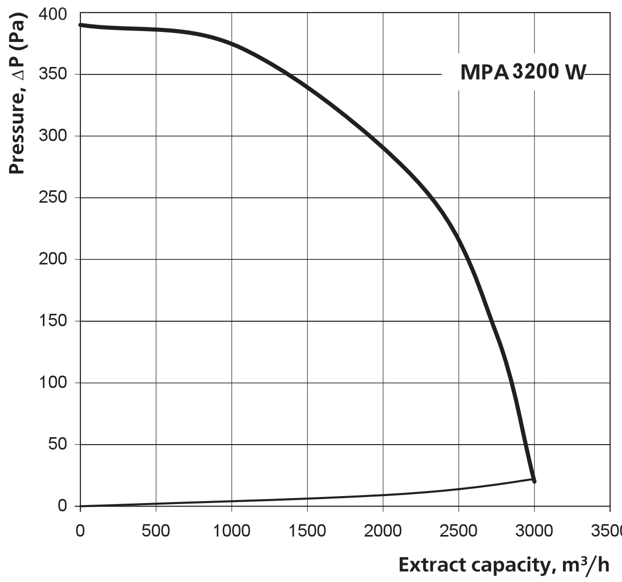
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	77	81	83	78	71	72	67	66	59
L_{wA} (output)	dB[A]	80	86	81	79	75	77	71	75	68
L_{wA} (environment)	dB[A]	54	68	65	59	51	50	45	41	40

VENTS MPA E



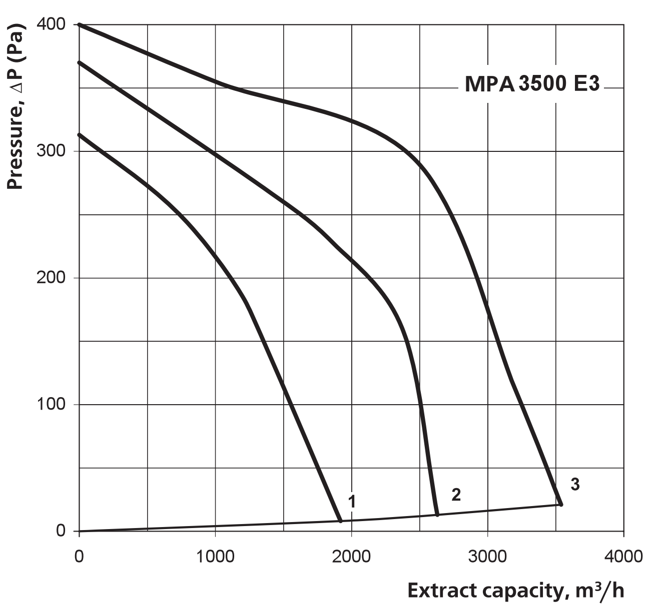
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	82	85	84	83	76	77	73	73	68
L_{wA} (output)	dB[A]	86	83	83	83	82	80	72	73	70
L_{wA} (environment)	dB[A]	63	68	64	67	55	55	52	45	45

VENTS MPA W



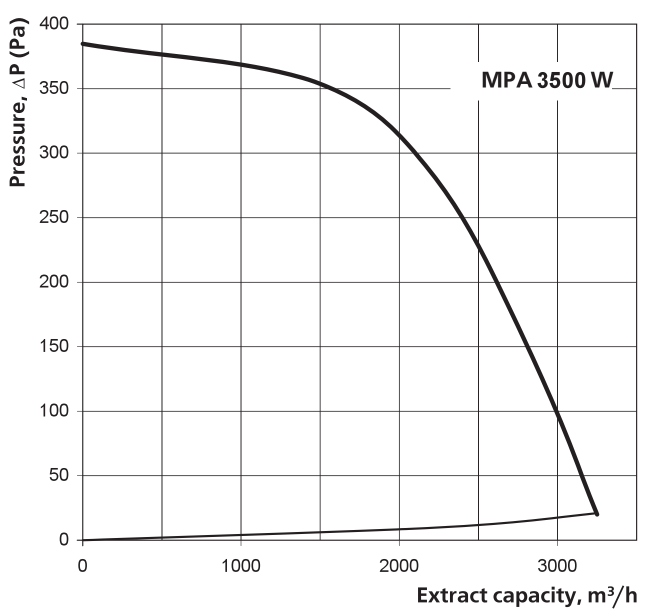
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	83	86	86	81	76	75	75	72	68
L_{wA} (output)	dB[A]	86	86	83	85	81	77	74	75	72
L_{wA} (environment)	dB[A]	63	66	68	71	58	51	50	45	44

VENTS MPA E



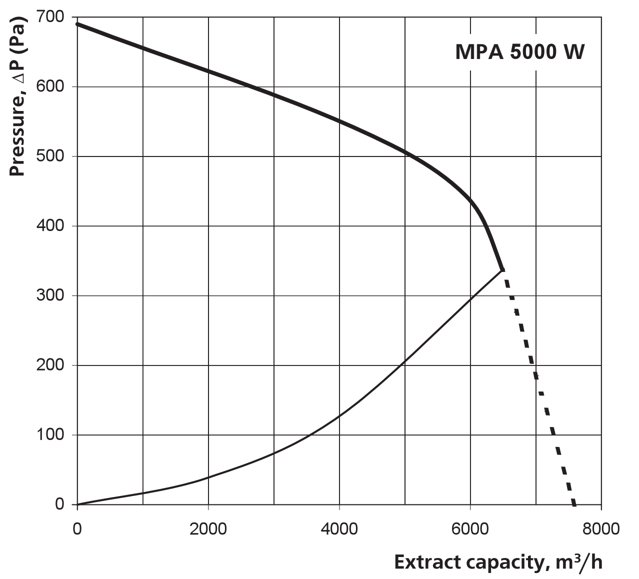
Sound power level			Octave-frequency band [Hz]							
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	82	85	88	85	77	77	75	72	70
L_{wA} (output)	dB[A]	87	86	83	85	84	79	72	75	71
L_{wA} (environment)	dB[A]	62	68	67	71	56	51	50	47	43

VENTS MPA W



Sound power level			Octave-frequency band [Hz]							
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	84	84	86	85	77	76	73	71	69
L_{wA} (output)	dB[A]	84	83	84	83	82	80	72	75	73
L_{wA} (environment)	dB[A]	60	67	66	71	54	55	50	45	45

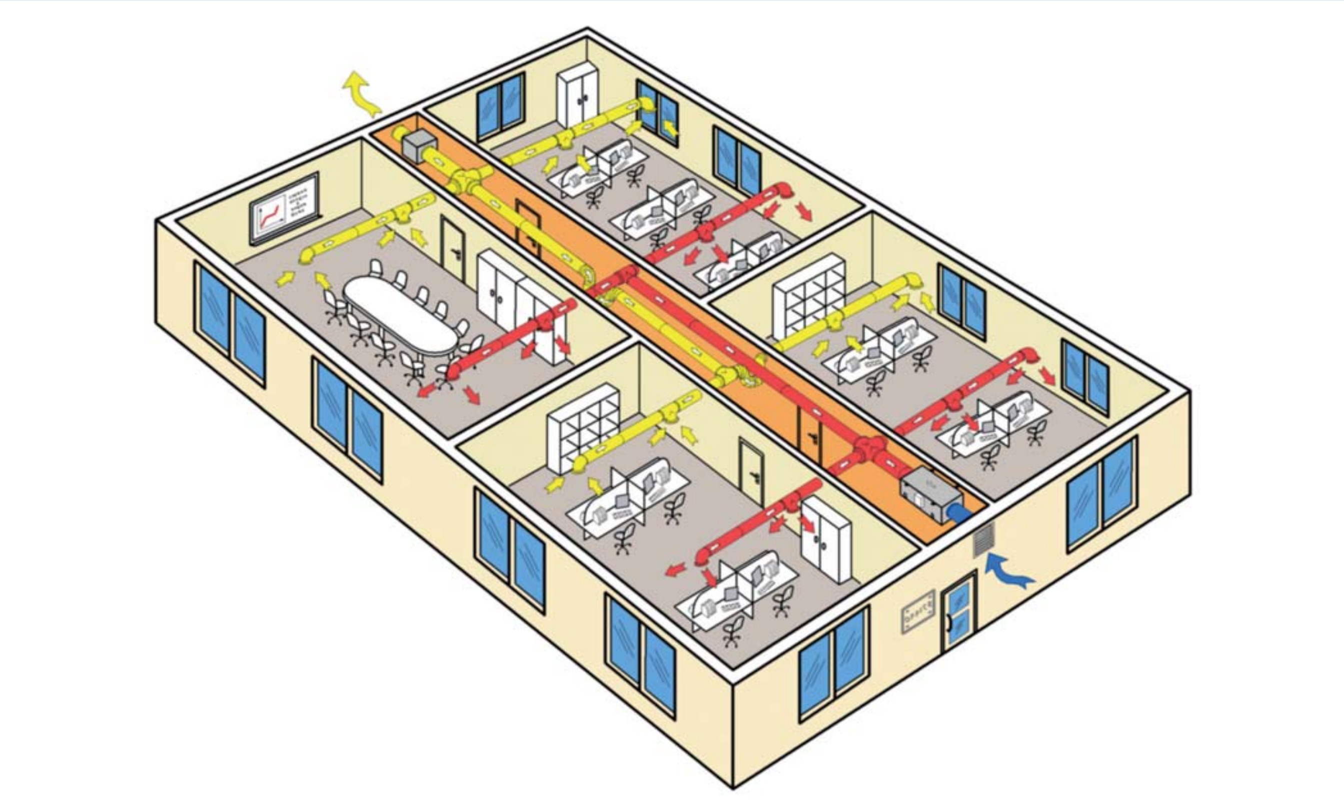
VENTS MPA W



Sound power level			Octave-frequency band [Hz]							
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	89	86	85	77	74	66	61	54
L_{wA} (output)	dB[A]	85	90	92	88	79	76	71	65	56
L_{wA} (environment)	dB[A]	68	82	79	75	68	62	55	52	43

EXAMPLE OF VENTILATION IN OFFICE

The ventilation in the modern office can be organized in the following way. Air handing unit MPA, exhaust fan (which complies with MPA unit characteristics), inlet and exhaust main air ducts are mounted behind the suspended ceiling. In office_rooms the branching are laid and the air distribution units are mounted. Fresh air is taken from outside through the external grille, filtered in the air handing unit, heated to the necessary temperature, and comes to the office rooms through the branchy ducting system. The polluted air is thrown outside through the external grille with the help of the exhaust fan. Thus, there will be constant presence of the fresh air in apartment and absence of draught, dust and noise while windows are open.



VENTS PA...E
Series

Suspended intake units with an air flow capacity up to **3350 m³/h** in sound and heat-insulated case with electric heater

VENTS PA...W
Series

Suspended intake units with an air flow capacity up to **4100 m³/h** in sound and heat-insulated case with water heater

Description

Intake units PA is a turn key unit that provides filtration, heating and supply of fresh air into the premises. VA-series exhaust unit (equipped with fans similar to PA-series) can be connected to PA unit In order to ensure well-balanced ventilation provided that VA-series unit will be operating interactively with PA unit .

Case

The case is made of aluzink covered with sound insulation made of 50 mm mineral wool.

Filter

A filter with purification class of G4 is built into the unit in order to perform filtration of incoming air.

Heater

PA units are supplied with electric (PA...E) and water (PA....W) heaters. Either double-, three- or four-row water heaters are being installed depending on an air flow capacity required.

Fan

These units are supplied with frameless high-pressure centrifugal fans directly driven by electric motor with external rotor. The impeller blades are curved backwards. The fan provides optimal performance: air consumption, noise level and efficiency. The fan can be easily removed from the case for cleaning or inspection.

Mounting

Intake unit can be mounted on the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). All electric interfaces are performed via terminal block placed in connection box. PA-series intake units are equipped with brackets in order to make mounting process easier. The unit can be mounted in any position except for vertical position in case of downward current of air (tubular heating elements should not be placed under the fan). Free access to the unit should be provided in case of service maintenance or filter cleaning.

Control and automation

Two unit' performance options are possible:

1. Without control, when a customer individually defines and select necessary automation system.
2. With in-build controlling system and automation that allows regulating fan capacity (3 speeds), setting temperature of incoming air, controlling filter's condition (contamination level). Beside this, automation system provides positive defense from overheat of fan's heater elements. Unit can be operated by remote control.

Legend:

Series	Unit size	Heater type	Number of rows in water heater
VENTS PA	01; 02; 03; 04	**E** – electric; **W** – water	**2** – two-row; **3** – three-row; **4** – four-row

Accessories

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Remote control panel provides the following:

- fan unit switching on and off;
- set point of required air-consumption rate;
- set point of desired temperature of incoming air;
- visual display of room temperature;
- •visual display of malfunction (emergency situation).

Control and protection functions of PA...E model

- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of control panel (electric air heater control by means of bidirectional optothyristor);
- fan speed regulation with the use of control panel;
- trying-out necessary algorithms at start up and shutdown of the unit ;
- operation of the timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- filter clogging control (differential pressure sensor);

Control and protection functions of PA...W model

Regulating stations, meant for systems with cooling device, are additionally equipped with room temperature sensor/set-point device. Complete equipment of regulating station includes an electric actuator of a LF230 air-valve. Components of heater manifold (pump, valve, three-way actuator) are not included in the equipment list.

Functionality

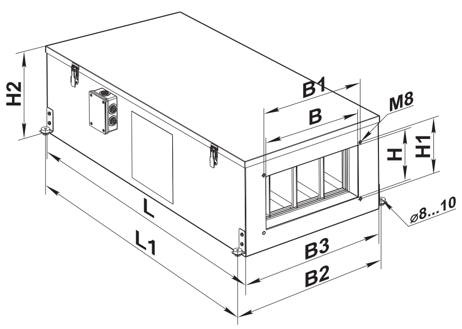
1. Automatic control on inlet air-valve (RRVA)
2. Control and visual display of filter clogging
3. Smooth fan speed regulation 3~380V (50Hz).
4. Maintenance of predetermined temperature of incoming air and maintenance of predetermined temperature in the premises.
5. Control and control on operation liquid air heater.
6. Control on compressor-condenser block (CCB) for systems supplied with air-cooling device
7. Exhaust fan startup signal.
8. Individual adjustability of all parameters of ventilation system
9. System stop on a signal sent from fire-alarm panel.

Supplementary equipment:

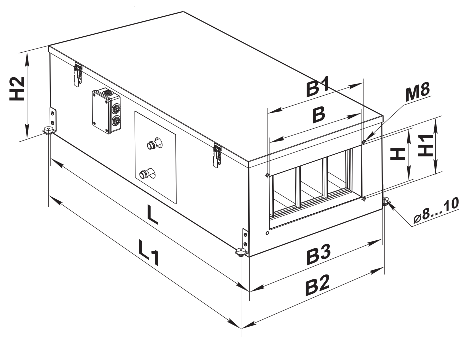
The unit can be supplied with an air-valve, flexible connectors (or clamps) and mixing unit for models featuring hot water heater. Delivery set may also include a section of pipe cooling unit that is installed in the air duct after the PA-series unit .

Type	Dimension [mm]								
	B	B1	B2	B3	H	H1	H2	L	L1
PA 01 E	400	420	624	582	200	220	374	1145	1106
PA 02 E	500	520	689	646	300	320	447	1250	1212
PA 03 E	600	620	888	744	350	370	500	1252	1212
PA 01 W	400	420	624	582	200	220	374	1145	1106
PA 02 W	500	520	689	646	300	320	447	1250	1212
PA 03 W	600	620	787	744	350	370	500	1252	1212
PA 04 W	700	720	888	844	400	420	546	1302	1262

PA...E



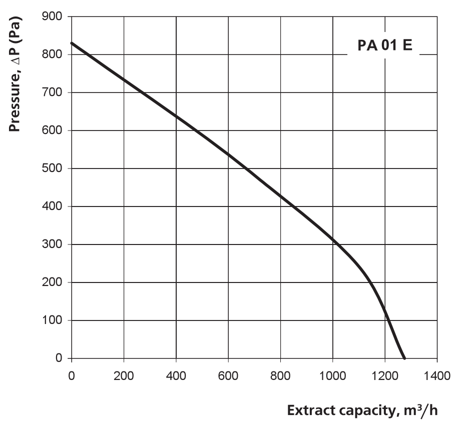
PA...W



	PA 01 E	PA 01 W2	PA 01 W4	PA 02 E	PA 02 W2	PA 02 W4
Voltage [V~50Hz]	3~ 400			3~ 400		
Maximum fan power [W]	320			620		
Fan current [A]	0,55			1,05		
Electric heater capacity [kW]	12,0	-		18,0	-	
Electric heater current [A]	17,4	-		26,0	-	
Number of tubular heating elements in electric heater	3x4,0	2	4	3x6,0	2	4
Total power of the unit [kW]	12,32	0,32		18,62	0,62	
Total current of the unit [A]	17,95	0,55		27,05	1,05	
Air capacity [m³/h]	1275	1200		2500	2350	
RPM	2700			2690		
Noise level at 3m [dB[A]]	51			54		
Maximum temperature of shifted air [˚C]	from -25 up to +55			from -25 up to +45		
Case material	Aluzink			Aluzink		
Insulation	50 mm, Mineral wool			50 mm, Mineral wool		
Filter	G4 (F7)*	Pocket G4 (F7)*		G4 (F7)*	Pocket G4 (F7)*	
Size of connected air duct [mm]	400x200			500x300		
Weight [kg]	56	55	57	61	61	63

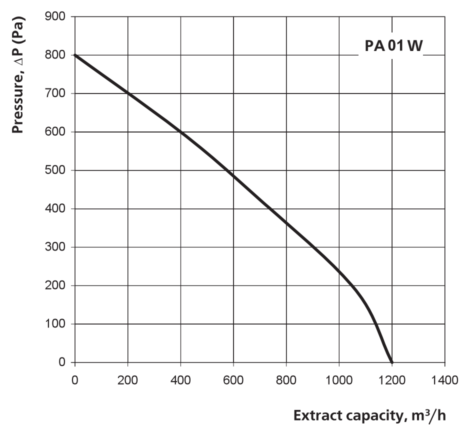
*option

VENTS PA E



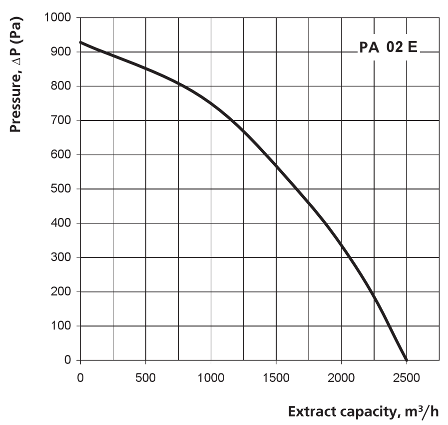
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	62	45	62	60	55	45	45	47	35
L_{wA} (output)	dB[A]	73	48	60	66	71	62	64	62	56
L_{wA} (environment)	dB[A]	47	22	40	47	44	30	32	29	19

VENTS PA W



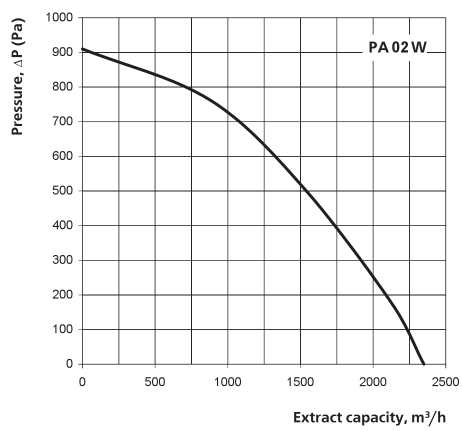
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	62	47	62	58	54	43	45	44	37
L_{wA} (output)	dB[A]	73	49	61	70	70	62	63	61	57
L_{wA} (environment)	dB[A]	47	24	39	44	46	33	35	27	19

VENTS PA E



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	70	52	67	67	60	55	51	53	49
L_{wA} (output)	dB[A]	84	56	70	81	77	76	74	74	70
L_{wA} (environment)	dB[A]	55	35	57	62	52	48	54	52	53

VENTS PA W

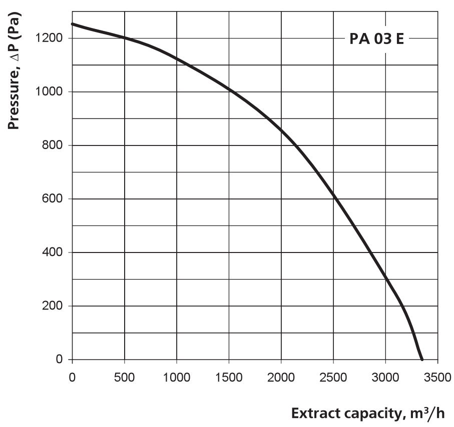


Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	69	52	69	65	60	58	49	55	49
L_{wA} (output)	dB[A]	85	57	71	82	77	75	74	73	69
L_{wA} (environment)	dB[A]	55	37	58	61	53	51	52	55	52

	PA 03 E	PA 03 W2	PA 03 W4	PA 04 W2	PA 04 W3
Voltage [V~50Hz]	3~ 400			3~ 400	
Maximum fan power [W]	1330			2300	
Fan current [A]	2,4			4,3	
Electric heater capacity [kW]	21,0	-		-	
Electric heater current [A]	30,0	-		-	
Number of tubular heating elements in electric heater	3x7,0	2	4	2	3
Total power of the unit [kW]	22,33	1,33		2,30	
Total current of the unit [A]	32,4	2,4		4,3	
Air capacity [m³/h]	3350	3260		4100	
RPM	2730			2840	
Noise level at 3m [dB[A]]	57			58	
Maximum temperature of shifted air [°C]	from -25 up to +45			from -25 up to +70	
Case material	Aluzink			Aluzink	
Insulation	50 mm, Mineral wool			50 mm, Mineral wool	
Filter	G4 (F7)*	Pocket G4 (F7)*		Pocket G4 (F7)*	
Size of connected air duct [mm]	600x350			700x400	
Weight [kg]	91	91	94	107	110

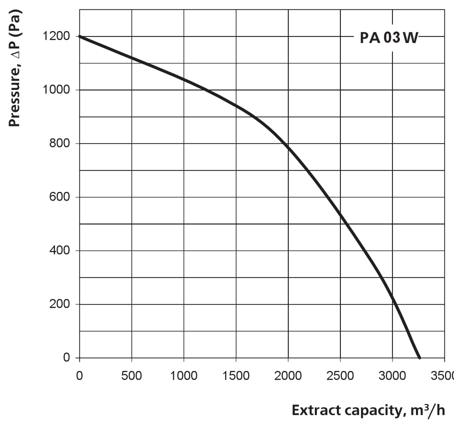
*option

VENTS PA E



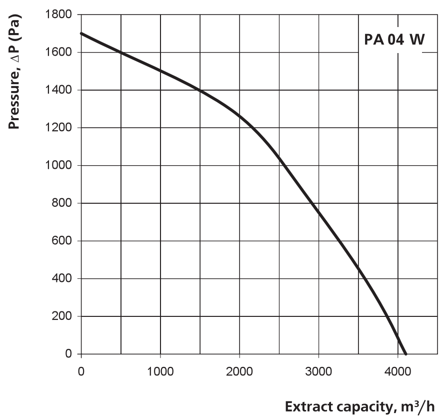
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	72	58	71	67	59	49	51	56	54
L_{wA} (output)	dB[A]	77	58	71	73	71	70	68	65	55
L_{wA} (environment)	dB[A]	58	41	59	62	51	47	53	51	46

VENTS PA W



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	71	57	71	66	57	51	50	56	56
L_{wA} (output)	dB[A]	78	57	70	73	73	70	67	64	53
L_{wA} (environment)	dB[A]	59	39	58	62	51	44	52	49	46

VENTS PA W



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	57	73	68	68	66	66	64	52
L_{wA} (output)	dB[A]	85	60	84	82	77	77	72	71	61
L_{wA} (environment)	dB[A]	62	47	72	71	59	52	50	55	53

VENTS VA
Series

Compact suspended units with an air flow capacity up to **4450 m³/h** in sound-insulated case

Description
VA-series inlet unit is a turn key unit that ensures extraction of exhaust air from the premises. Unit capacity is up to 4450 m^3/h. It is recommended to use VA-series unit in combination with PA-series units, their coordinated operation has been checked

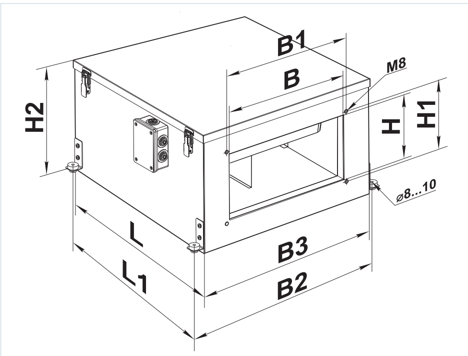
Case
The case is made of aluzink, sound insulation is provided by 50 mm mineral wool.

Fan
These units are supplied with frameless high-pressure centrifugal fans directly driven by electric motor with external rotor. The impeller blades are curved backwards. The fan provides optimal performance: air consumption, noise level and efficiency. The fan can be easily removed from the case for cleaning or inspection.

Mounting
PA-series intake units are equipped with brackets in order to make mounting process easier. Inlet unit can be mounted on the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). All electric interfaces are performed via terminal block placed in connection box. Unit 's performance control is done from the control panel with built-in frequency converter and speed device R1/010.

Supplementary equipment:
The unit can be supplied with an air-valve, flexible connectors or clamps.

Type	Dimension [mm]								
	B	B1	B2	B3	H	H1	H2	L	L1
VA 01	400	420	624	585	200	220	375	660	621
VA 02	500	520	689	646	300	320	450	665	627
VA 03	600	620	787	745	350	370	500	696	657
VA 04	700	720	888	844	400	420	546	805	766



Legend:

Series	Unit size
VENTS VA	01; 02; 03; 04

Accessories









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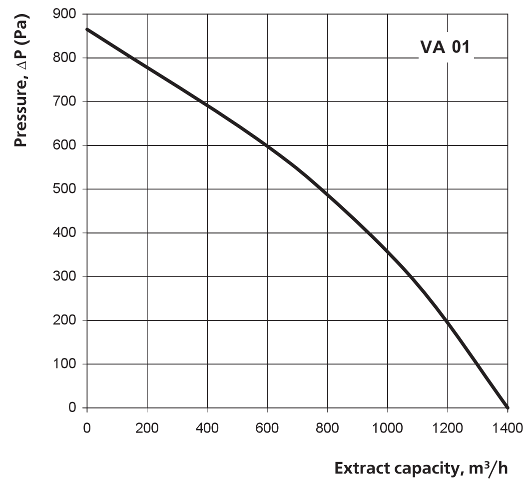
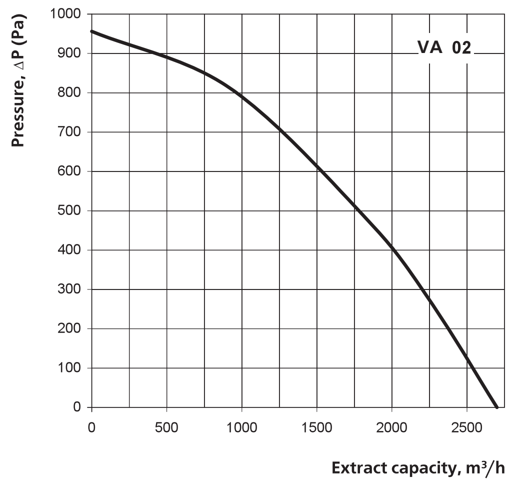
	VA 01	VA 02	VA 03	VA 04
Voltage [V~50Hz]	3~ 400	3~ 400	3~ 400	3~ 400
Maximum fan power [W]	320	620	1330	2300
Fan current [A]	0,55	1,05	2,4	4,3
Air capacity [m³/h]	1400	2700	3450	4450
RPM	2700	2690	2730	2840
Noise level at 3m [dB[A]]	51	54	57	58
Maximum temperature of shifted air [°C]	from -25 up to +55	from -25 up to +45	from -25 up to +45	from -25 up to +70
Case material	Aluzink	Aluzink	Aluzink	Aluzink
Insulation	50 mm, Mineral wool	50 mm, Mineral wool	50 mm, Mineral wool	50 mm, Mineral wool
Size of connected air duct [mm]	400x200	500x300	600x350	700x400
Weight [kg]	35	38	59	71

VENTS VA



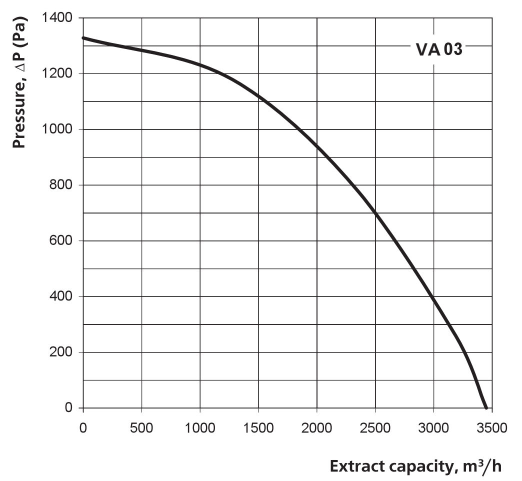
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	69	53	66	63	57	53	50	56	52
L_{WA} (output)	dB[A]	75	56	69	67	71	63	64	65	57
L_{WA} (environment)	dB[A]	58	32	47	48	51	44	46	49	40

VENTS VA



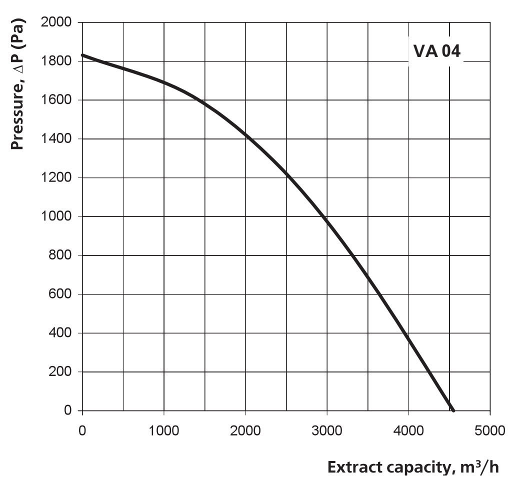
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	75	56	68	72	57	55	58	61	57
L_{WA} (output)	dB[A]	81	57	71	80	74	70	69	69	62
L_{WA} (environment)	dB[A]	62	37	51	62	52	39	36	39	34

VENTS VA



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	74	57	73	67	55	53	50	55	54
L_{WA} (output)	dB[A]	78	57	72	73	74	69	68	64	55
L_{WA} (environment)	dB[A]	63	41	58	61	55	45	53	48	48

VENTS VA



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	77	56	73	69	69	69	62	63	55
L_{WA} (output)	dB[A]	87	60	84	80	78	76	70	72	62
L_{WA} (environment)	dB[A]	71	45	70	68	58	51	48	53	52

AIR HANDLING UNITS WITH HEAT RECOVERY

VENTS VUT mini

Compact sound- and heat-insulated air handling units with an air flow capacity up to 345 m^3/h and heat exchanger efficiency up to 85%. They provide supply of fresh filtered air and extract impure air from the premises. They are compatible with round air ducts with nominal diameter of 100 mm and 125 mm.

VENTS VUT H

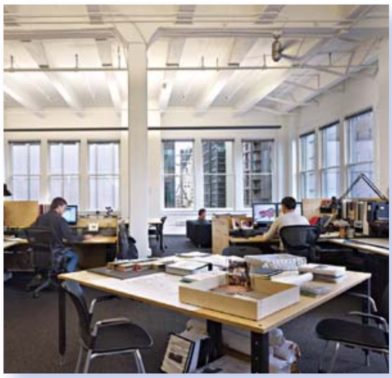
Sound- and heat-insulated air handling units with an air flow capacity up to 2200 m^3/h and heat exchanger efficiency up to 88%. They provide supply of fresh filtered air and extract impure air from the premises. They are compatible with round air ducts with nominal diameters of 125, 150, 160, 200, 250, 315 mm.

VENTS VUT EH and VUT WH

Sound- and heat-insulated air handling units with an air flow capacity up to 2200 m^3/h and heat exchanger efficiency up to 88%. They provide supply of fresh filtered air and extract impure air from the premises. Water and electric heaters are fixed to provide normal unit 's operation in low temperature of outer air. They are compatible with round air ducts with nominal diameters of 125, 150, 160, 200, 250, 315 mm.

VENTS VUT PE and VENTS VUT PW

Compact suspended sound- and heat-insulated air handling units with an air flow capacity up to 4000 m^3/h and heat exchanger efficiency re up to 90%. They provide supply of fresh filtered air and extract impure air from the premises. They are compatible with round air ducts with nominal diameters of 150, 160, 200, 250, 315 and 400 mm.



THE DEVICE STRUCTURE BY THE EXAMPLE OF VUT 600 EH EC

Automation and control:

- air handling units VENTS are equipped with the built in automation system with the remote control.

The remote control with the interface is equipped with multifunctional buttons, disrepair and breakdown indicator. The stated above units are also equipped with a multifunctional remote control with a graphic LCD indicator.

Functionality:

- Inflowing air temperature maintenance
- Indoor air temperature maintenance
- Ventilation intensity control
- Heat recovery by means of a plate heat exchanger
- A plate heat exchanger protection from freezing
- Electric heater protection from overheating
- The program of heaters correct shut off in case of emergency
- Inflowing air filter pollution indication
- The devices operation mode set-up
- A week timer with the ventilation intensity change
- Daily timer availability
- Seasonal mode of operation set-up
- Filter replacement timer availability
- Automatic indication of the plugged in devices
- Disrepair indication via text and light signals
- Disrepair indication via light signals
- Interface language selection

Filter

- High level of inflowing air cleaning takes place due to the use of built in filters with the G4-F7 cleaning level. They are cartridge filters with a metal framework. The filters' sizes correspond to the European standards. Filters high quality and long life are provided by the possibility of filters dirtyness control by means of the built in automation and their design which makes it easy to clean and replace them.

Heater:

- The unit is equipped with the electric heater used for the exploitation of air handling unit at low temperature of outdoor air.
- The electric heater is made of thermal-resistant and stainless steel, additionally ribbed for increased heat exchange and is equipped with two security thermostats (protection from overheating).

Heat exchanger (recuperator)

- A plate recuperator is used with a great surface area and high coefficient of efficiency and is made of polystyrene. The operation process is based on the fact that the warmth of the outflowing air is taken to the gills which in their turn leave it to the inflowing air. That is why there is no need to heat up the inflowing air. The exhaust and fresh airflows do not intersect what makes it possible to avoid carrying over the pollutants, odours and microorganisms. The level of recuperators effectiveness is up to 95% what allows to reduce the fresh air heating up exploitation expenses. The bypass availability allows to switch the device operation over to the regime «without recovery» when necessary.

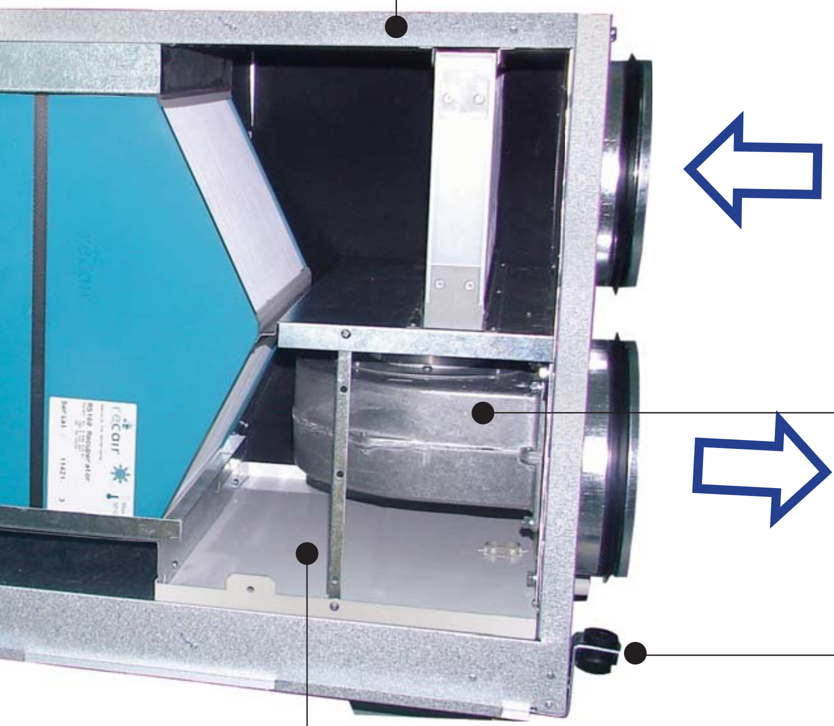
Heat recovery

Control system

Effective isolation

Frame

- Air handling units walls are made of two-layer galvanized sheet with the gap filled with mineral cotton. The outer side is made of alumo-galvanized steel with the varnished covering what prolongs the exploitation term. The inner galvanized side guarantees the hygienic purity of the device surface and prevents the dust gathering on the device panel. Side panels are easily removable what makes it easy to have access to all the parts of the device.



EC fan:

ebmpapst The ultimate EC-Technology

- Air injection and drawing out is possible due to two EC centrifugal fans with the single-suction blower and forward-curved blades.
- EC motor is a commutatorless synchronous motor with an electronic control. EC fans consume up to 50% less energy than the ordinary ones with the same productivity. Their exploitation expenses decrease up to 30%.
- The stated above type of a fan provides the minimal level of noise with the high productivity.

Vibration Isolator:

- The device is mounted on the rubber vibration isolators what makes it possible to completely exclude the vibration.

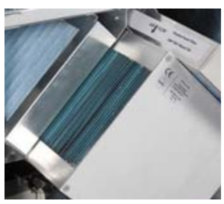
Condensation Drainage Tank:

- The device is equipped with the condensate gathering tank made of painted steel. There are delivery pipes for the condensate drain at the bottom of the device connected to the canalization

Installation simplicity

Economical EC motors

Maintainability



VENTS VUT V mini
Series

Air handling units with an air flow capacity up to **300 m³/h** in compact sound- and heat-insulated case with vertical direction of the pipes.

VENTS VUT H mini
Series

Air handling units with an air flow capacity up to **300 m³/h** in compact sound- and heat-insulated case with horizontal direction of the pipes.

Description
Air handling units VUT mini are turn key units providing supply of fresh filtered air and extract impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger. All models are compatible with round air ducts with nominal diameter of 100, 125 mm.

Modification group
VUT H mini – Models with horizontal direction of the pipes are supplied with asynchronous motors.
VUT V mini – Models with vertical direction of the pipes are supplied with asynchronous motors.

Case
The case is made of aluzink with internal heat and sound insulation with 20 mm thickness made of mineral wool.

Filter
Two filters with purification class of G4 are built into the unit in order to perform filtration of incoming and exhaust air.

Fan
This unit is supplied with intake and exhaust centrifugal fans with backward-curved blades and in-build thermostatic protection with automatic restart is utilized here. Fan motor and impeller are dynamically balanced in two-dimensional subspace.

Heat exchanger
Plate heat exchanger is made from aluminum plates. «Summer» filler is provided for unit operation without heat exchanger. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block. Air handling unit is supplied with a built-in system that protects heat exchanger from freezing. In the course of heat exchanger operation during cold season the heat taken from the warm exhaust air is transferred to cold incoming air. Condensate may drop out in heat exchanger while exhaust air is cooling down, and condensation freezing may take place in exhaust ducts if the average temperature of incoming air is below -5oc. Electric freeze protection is used to prevent heat exchanger from freezing. The main point of this protection is that the inlet fan is switched off according to thermal sensor measures. The warm exhaust air heats up the heat exchanger which is followed by the start up of inlet fan, and the whole unit is running in a customary regime.

Control
Start up of the unit and its performance Control is carried out via thyristor device controlling the motor's r.p.m. speed (PS-1-300) that allows smooth regulation of fan speed within a range of 0-100%.

Mouning
Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Legend:

Series	Air flow [m³/h]	Pipes direction	Type
VENTS VUT	200; 300	**V** – vertical **H** – horyzontal	**mini**

Accessories

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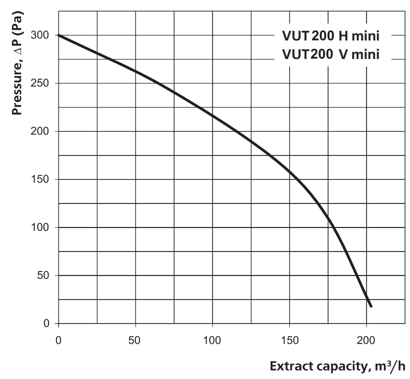
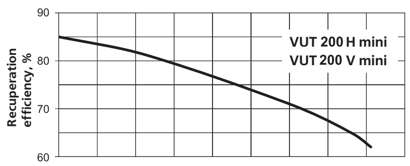
	VUT 200 H mini	VUT 200 V mini	VUT 300 H mini	VUT 300 V mini
Voltage [V~50Hz]	1~ 230		1~ 230	
Maximum fan power [W]	2pc. x 58		2pc. x 58	
Fan current [A]	2pc. x 0,26		2pc. x 0,26	
Total power of the unit [kW]	116		116	
Total current of the unit [A]	0,52		0,52	
Air capacity [m³/h]	200		300	
RPM	2500		2500	
Noise level at 3m [dB[A]]	24-45		28-47	
Maximum temperature of shifted air [°C]	from -25 up to +50		from -25 up to +50	
Case material	Aluzink		Aluzink	
Insulation	20 mm Mineral wool		20 mm Mineral wool	
Filter: extract	G4		G4	
intake	G4		G4	
Diameter of connectable air duct [mm]	⌀100		⌀125	
Weight [kg]	30		30	
Heat exchanger efficiency	up to 85%		up to 85%	
Cross flow heat exchanger type	cross flow		cross flow	
Heat exchanger material	aluminium		aluminium	

VENTS VUT mini





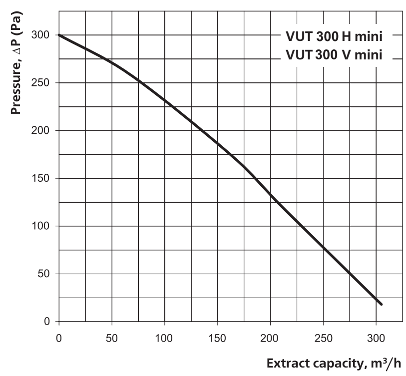
VUT 200 H mini

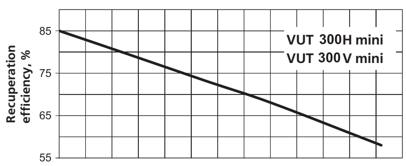
Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	51	29	47	47	34	40	38	30	20
L_{wA} (output)	dB[A]	59	35	52	54	51	44	44	31	21
L_{wA} (environment)	dB[A]	30	5	19	29	25	17	14	4	4

VUT 200 V mini

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	49	26	46	46	35	37	34	31	18
L_{wA} (output)	dB[A]	58	37	50	54	50	46	46	31	22
L_{wA} (environment)	dB[A]	29	5	21	27	27	18	14	0	4

VENTS VUT mini





VUT 300 H mini

Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	53	29	48	46	37	41	40	34	18
L_{wA} (output)	dB[A]	60	41	52	57	54	46	46	37	26
L_{wA} (environment)	dB[A]	33	5	23	32	27	19	17	2	0

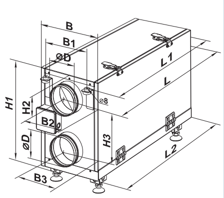
VUT 300 V mini

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	49	31	48	47	35	43	38	30	20
L_{wA} (output)	dB[A]	62	37	55	56	54	47	46	37	26
L_{wA} (environment)	dB[A]	34	7	22	31	27	19	18	5	4

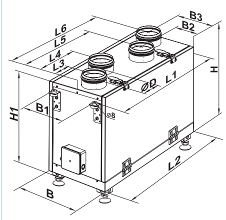
Type	Dimension [mm]											
	ØD	B	B1	B2	B3	H	H1	H2	H3	L	L1	L2
VUT 200 H mini	99	278	200	121	192	481	431	84	191	699	640	600
VUT 300 H mini	124	278	200	139	139	481	431	89	296	699	640	600

Type	Dimension [mm]												
	ØD	B	B1	B2	B3	H	H1	L1	L2	L3	L4	L5	L6
VUT 200 V mini	99	278	200	109	169	481	431	640	600	73,5	204	396	526,5
VUT 300 V mini	124	278	200	100	178	481	431	640	600	74	210	390	526

VUT...H mini



VUT ...V mini



AIR HANDLING UNIT WITH HEAT RECOVERY

VENTS VUT mini

VENTS VUT V mini EC
Series

Air handling units in compact sound- and heat-insulated case with vertical direction of the pipes with air flow capacity up to **345 m³/h** and heat exchanger efficiency up to 85%

VENTS VUT H mini EC
Series

Air handling units in compact sound- and heat-insulated case with horizontal direction of the pipes with an air flow capacity up to **345 m³/h** and heat exchanger efficiency up to 85%

Description
Air handling unit VUT mini is a turn key unit that provides filtration and supply of fresh air and extracts impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate exchanger. This unit is used in ventilation and air conditioning systems in premises serving different purposes which require cost-effective solution and controlled ventilation system. The use of electric-commuter (EC) motors allowed to decrease consumption of electricity 1,5-3 times and at the same time provided high efficiency and low level of noise. All models are compatible with round air ducts with a nominal diameter of 100, 125 mm.

Modification group
VUT H mini EC– Models with fans supplied with EC motors and horizontal direction of the pipes.
VUT V mini EC – Models with fans supplied with EC motors and vertical direction of the pipes.

Case
The case is made of aluzink with internal heat and sound insulation with 20 mm thickness made of mineral wool.

Filter
Two filters with purification class of G4 are built into the unit in order to perform filtration of incoming and exhaust air.

Motor
Highly efficient electric-commuter EC-series motors with external rotor and impeller with backward-curved blades are being used. As of today, such motor is the most advanced solution for energy saving. EC-motors feature high level of efficiency and optimal control over the whole range of fan speeds. Premium efficiency (reaching 90%) is an unquestionable advantage of electric-commuter motor.

Recuperator
Plate heat exchanger is made from aluminum plates. «Summer» filler is provided for unit operation without heat exchanger. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block. Air handling unit is supplied with a built-in system that protects heat exchanger from freezing. The main point of this protection is that the inlet fan is switched off according to thermal sensor measures. The warm exhaust air heats up the heat exchanger which is followed by the start up of inlet fan, and the whole unit is running in a customary regime.

Control
This motor is put into effect by means of external activation signal 0-10 V (for example, with the help of R1/010 controller for EC-motors). Capacity regulation is carried out depending on the temperature level, pressure, smoke content and other system parameters. If any of the control factors changes, the EC-motor shall adjust fan speed and shall supply just enough air required for the ventilation system.

Mounting
Air handling unit is mounted with brackets to the floor, wall or ceiling. Mounting can be done either in service space (balcony, storage room, underground floor, roof space etc.) or in the main space by placing the unit above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Legend:

Series	Air flow [m³/h]	Flange direction	Type	Motor type
VENTS VUT	200; 300	**V** – vertical **H** – horyzontal	**mini**	**EC** – synchronous motor with electronic motor

Accessories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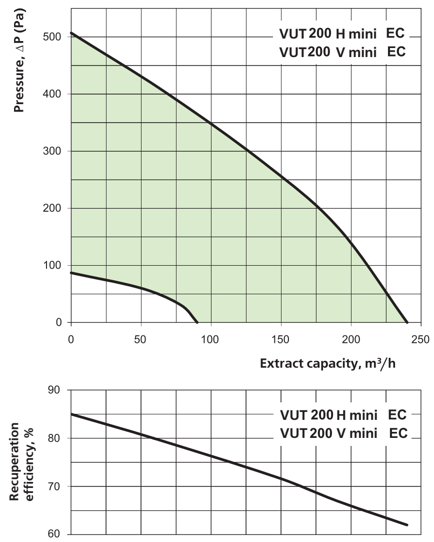
	VUT 200 H mini EC	VUT 200 V mini EC	VUT 300 H mini EC	VUT 300 V mini EC
Voltage [V~50Hz]	1~ 230		1~ 230	
Maximum fan power [W]	2pc. x 105		2pc. x 105	
Fan current [A]	2pc. x 0,9		2pc. x 0,9	
Total power of the unit [kW]	210		210	
Total current of the unit [A]	1,80		1,80	
Air capacity [m³/h]	240		345	
RPM	3550		3570	
Noise level at 3m [dB[A]]	24-45		28-47	
Maximum temperature of shifted air [°C]	from -25 up to +60		from -25 up to +60	
Case material	Aluzink		Aluzink	
Insulation	20 mm Mineral wool		20 mm Mineral wool	
Filter: extract	G4		G4	
intake	G4		G4	
Diameter of connectable air duct [mm]	⌀100		⌀125	
Weight [kg]	30		30	
Heat exchanger efficiency	up to 85%		up to 85%	
Cross flow heat exchanger type	cross flow		cross flow	
Heat exchanger material	aluminium		aluminium	

VENTS VUTmini EC



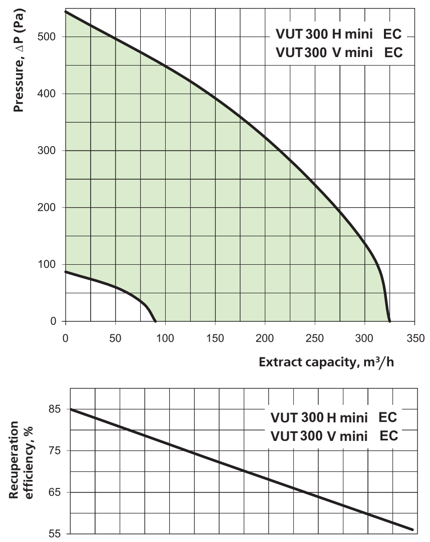
VUT 200 H mini EC

Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	49	30	46	44	35	41	35	32	19
L_{wA} (output)	dB[A]	57	38	51	53	50	45	43	32	24
L_{wA} (environment)	dB[A]	33	3	21	29	25	19	16	4	0

VUT 200 V mini EC

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	49	26	46	44	37	39	38	30	17
L_{wA} (output)	dB[A]	60	35	53	52	51	44	43	31	24
L_{wA} (environment)	dB[A]	29	5	22	30	25	17	12	4	0

VENTS VUTmini EC



VUT 300 H mini EC

Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	52	31	48	47	35	41	37	34	20
L_{wA} (output)	dB[A]	59	39	54	58	53	47	45	37	26
L_{wA} (environment)	dB[A]	34	9	24	31	29	17	16	2	0

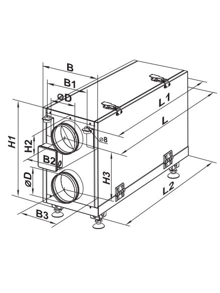
VUT 300 V mini EC

	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	53	30	50	48	37	41	39	32	20
L_{wA} (output)	dB[A]	60	39	54	55	54	45	45	33	25
L_{wA} (environment)	dB[A]	34	5	25	30	29	21	14	6	2

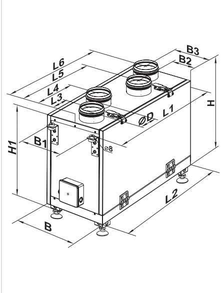
Type	Dimension [mm]										
	ØD	B	B1	B2	B3	H	H1	H2	H3	L	L1	L2
VUT 200 H mini EC	99	278	200	121	192	481	431	84	191	699	640	600
VUT 300 H mini EC	124	278	200	139	139	481	431	89	296	699	640	600

Type	Dimension [mm]											
	ØD	B	B1	B2	B3	H	H1	L1	L2	L3	L4	L5	L6
VUT 200 V mini EC	99	278	200	109	169	481	431	640	600	73,5	204	396	526,5
VUT 300 V mini EC	124	278	200	100	178	481	431	640	600	74	210	390	526

VUT...H mini EC



VUT ...V mini EC



VENTS VUT H
Series

Air handling unit in sound- and heat-insulated case with air flow capacity up to **2200 m³/h** and heat exchanger efficiency up to 88%.

Description
Air handling unit VUT H is a turn key unit providing supply of fresh filtered air and extract impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger. All models are compatible with round air ducts with nominal diameter of 125, 150, 160, 200, 250, 315 mm.

Case
The case is made of aluminum and sandwich panels with internal heat- and sound-insulation of 20 mm mineral wool.

Filters
Two filters with purification class of G4 (incoming) and F7 (exhaust) are built into the unit in order to perform filtration of incoming and exhaust air.

Fan
The unit is supplied with intake and exhaust double-suction centrifugal fans with forward-curved blades and built-in thermostatic protection with automatic restart function. Electric motors and impellers are dynamically balanced in two-dimensional subspace. Ball bearing motors do not require maintenance operation and their service life period lasts at least 40 000 hours.

Heat exchanger
Plate heat exchanger is made from aluminum plates. «Summer» filler is provided for unit operation without heat exchanger. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block. Air handling unit is supplied with a built-in system that protects heat exchanger from freezing during cold weather. The main point of this protection is that the inlet fan is switched off according to thermal sensor measures. The warm exhaust air heats up the heat exchanger which is followed by the start up of inlet fan, and the whole unit is running in a customary regime.

Control
Fan speed control is carried out via 4-position switch that allows choosing low, medium or high rotation speed or simply switching off the unit.

Mounting
Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Legend:

Series	Air flow [m³/h]	Flange direction
VENTS VUT	350; 500; 530; 600; 1000; 2000	**H** – horyzontal

Accessories







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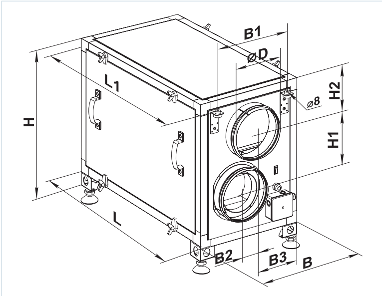
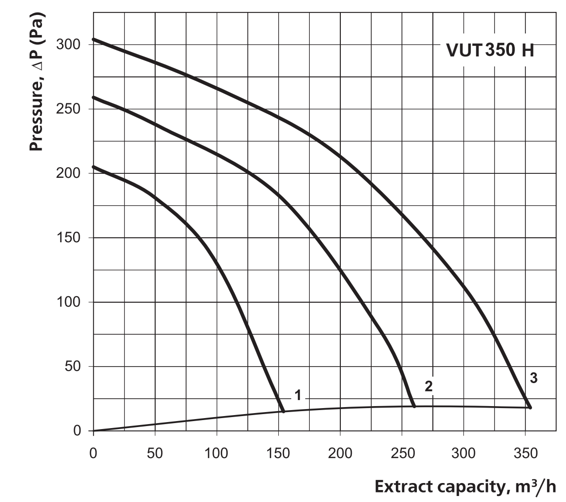
	VUT 350 H	VUT 500 H	VUT 530 H
Voltage [V~50Hz]	1~ 230	1~ 230	1~ 230
Maximum fan power [W]	2pc. x 130	2pc. x 150	2pc. x 150
Fan current [A]	2pc. x 0,60	2pc. x 0,66	2pc. x 0,66
Total power of the unit [kW]	260	300	300
Total current of the unit [A]	1,2	1,32	1,32
Air capacity [m³/h]	350	500	530
RPM	1150	1100	1100
Noise level at 3m [dB[A]]	24-45	28-47	28-47
Maximum temperature of shifted air [˚C]	from -25 up to +55	from -25 up to +50	from -25 up to +50
Case material	Aluzink	Aluzink	Aluzink
Insulation	25 mm Mineral wool	25 mm Mineral wool	25 mm Mineral wool
Filter: extract	G4	G4	G4
intake	F7 (EU7)	F7 (EU7)	F7 (EU7)
Diameter of connectable air duct [mm]	⌀125	⌀150	⌀160
Weight [kg]	45	49	49
Heat exchanger efficiency	up to 78%	up to 88%	up to 88%
Cross flow heat exchanger type	cross flow	cross flow	cross flow
Heat exchanger material	aluminium	aluminium	aluminium
*option			

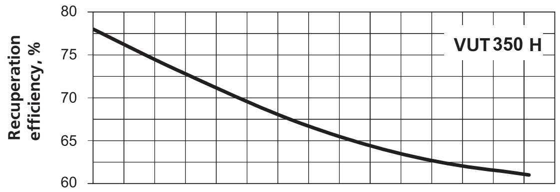
	VUT 600 H	VUT 1000 H	VUT 2000 H
Voltage [V~50Hz]	1~ 230	3~ 400	3~ 400
Maximum fan power [W]	2pc. x 195	2pc. x 410	2pc. x 650
Fan current [A]	2pc. x 0,86	2pc. x 1,8	2pc. x 2,84
Total power of the unit [kW]	390	820	1300
Total current of the unit [A]	1,72	3,6	5,68
Air capacity [m³/h]	600	1200	2200
RPM	1350	1850	1150
Noise level at 3m [dB[A]]	32-48	60	65
Maximum temperature of shifted air [˚C]	from -25 up to +55	from -25 up to +40	from -25 up to +40
Case material	Aluzink	Aluzink	Aluzink
Insulation	25 mm Mineral wool	50 mm Mineral wool	50 mm Mineral wool
Filter: extract	G4	G4	G4
intake	F7 (EU7)	G4 (F7)*	G4 (F7)*
Diameter of connectable air duct [mm]	⌀200	⌀250	⌀315
Weight [kg]	54	85	96
Heat exchanger efficiency	up to 85%	up to 88%	up to 87%
Cross flow heat exchanger type	cross flow	cross flow	cross flow
Heat exchanger material	aluminium	aluminium	aluminium
*option			

Type	Dimension [mm]									
	ØD	B	B1	B2	B3	H	H1	H2	L	L1
VUT 350 H	124	416	300	54	207	603	230	148	722	768
VUT 500 H	149	416	300	54	207	603	230	148	722	768
VUT 530 H	159	416	300	54	207	603	230	148	722	768
VUT 600 H	199	416	300	54	207	603	230	148	722	768
VUT 1000 H	248	548	496	60	213	794	290	200	802	850
VUT 2000 H	313	846	796	235	588	968	360	246	1000	1050



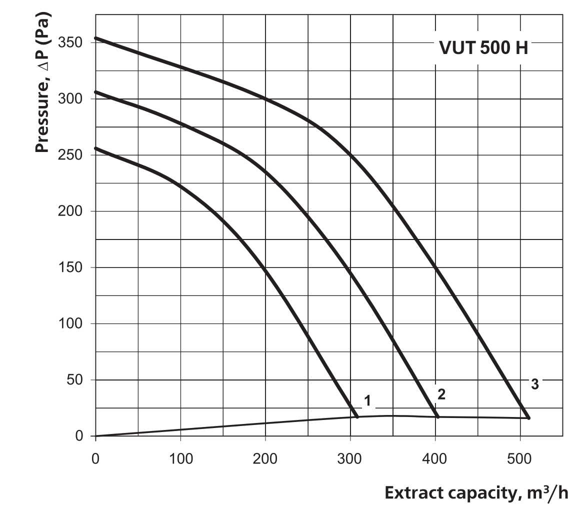
VENTS VUT H

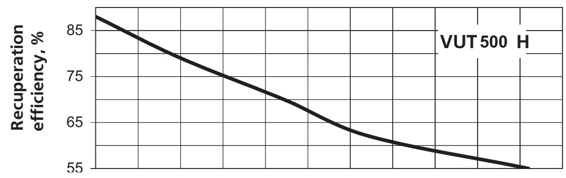




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	52	30	48	47	37	43	40	32	20
L_{WA} (output)	dB[A]	61	39	56	58	53	48	47	37	23
L_{WA} (environment)	dB[A]	31	22	23	30	27	21	16	20	22

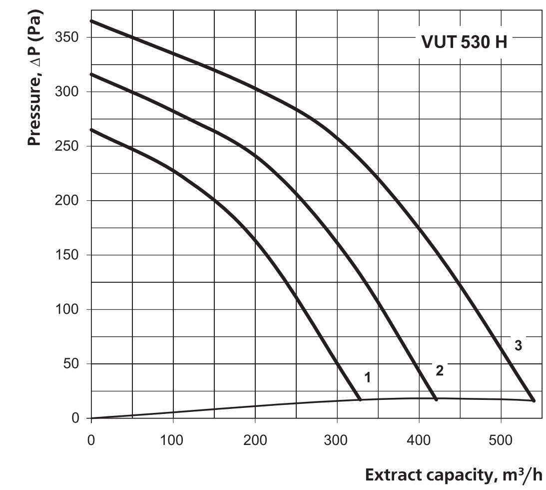
VENTS VUT H

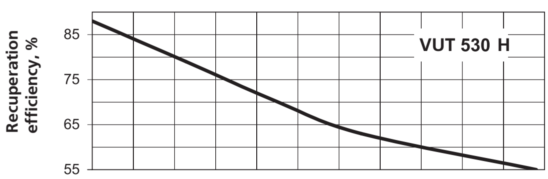




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	54	33	49	51	40	45	43	34	22
L_{WA} (output)	dB[A]	65	41	58	59	55	48	48	39	27
L_{WA} (environment)	dB[A]	37	25	26	33	29	20	19	22	23

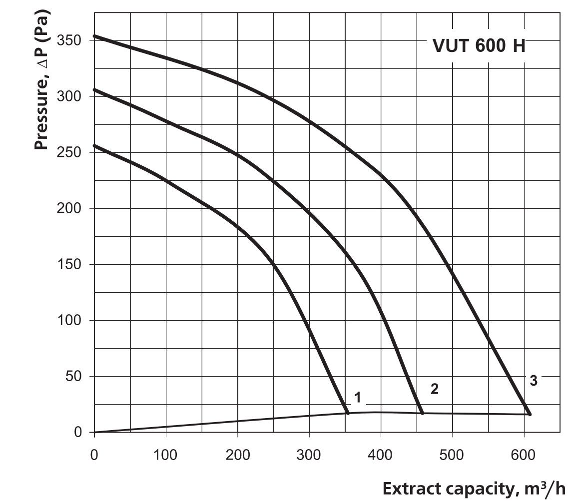
VENTS VUT H

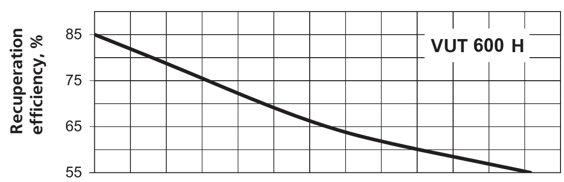




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	55	33	51	50	39	46	41	34	21
L_{WA} (output)	dB[A]	62	43	58	60	57	49	48	38	26
L_{WA} (environment)	dB[A]	36	25	26	33	30	20	18	23	25

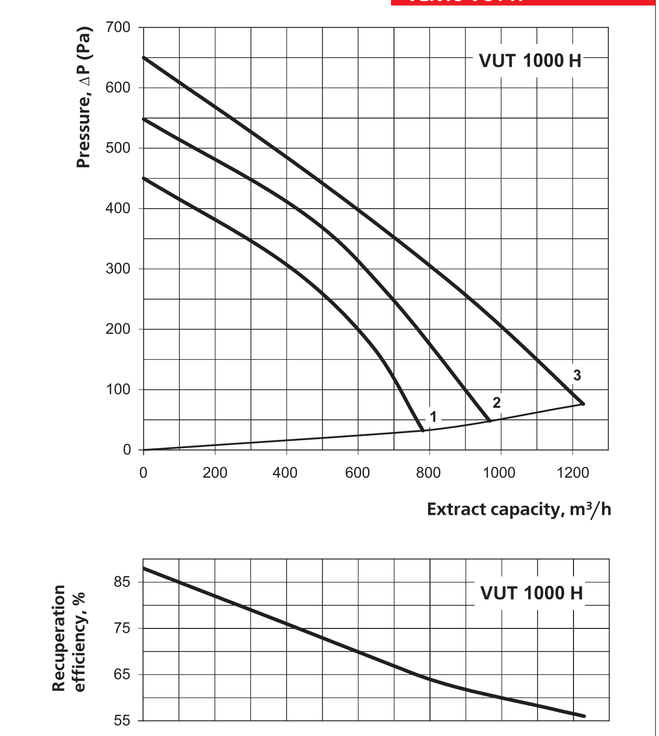
VENTS VUT H





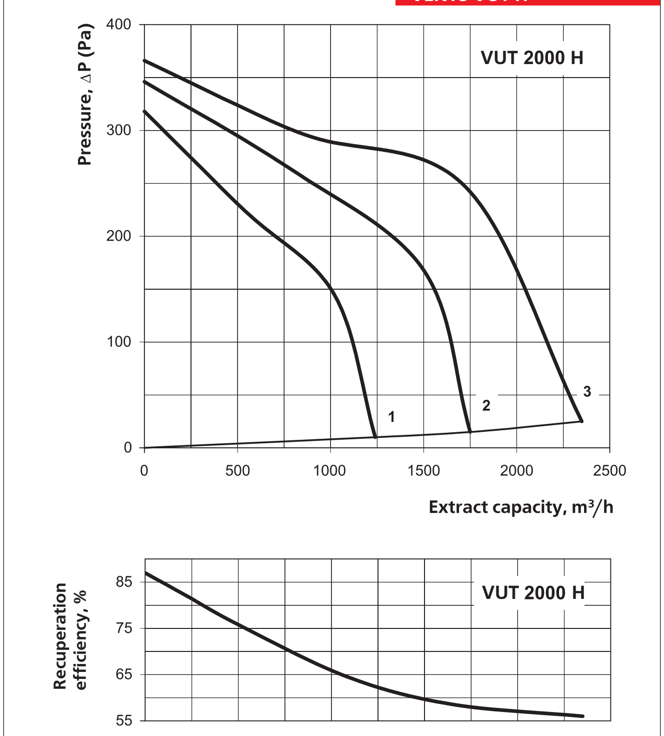
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	57	36	53	53	41	48	46	38	25
L_{WA} (output)	dB[A]	66	44	61	63	59	50	50	39	29
L_{WA} (environment)	dB[A]	40	26	29	37	35	25	23	26	27

VENTS VUT H



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	67	70	66	66	67	63	62	60	56
L_{wA} (output)	dB[A]	70	70	70	68	68	66	62	59	57
L_{wA} (environment)	dB[A]	46	57	54	49	54	39	39	34	32

VENTS VUT H



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	82	83	79	71	70	69	68	60
L_{wA} (output)	dB[A]	81	82	82	77	72	79	73	74	67
L_{wA} (environment)	dB[A]	55	65	66	60	52	49	46	40	38

VENTS VUT H EC
Series

Air handling unit in sound- and heat-insulated case with air flow capacity up to **600 m³/h** and heat exchanger efficiency up to 95%.

Description
Air handling unit VUT H is a turn key unit that provides filtration and supply of fresh air and extracts impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger. This unit is used in ventilation and air conditioning systems in premises serving different purposes which require cost-effective solution and controlled ventilation system. The use of electric-commuter (EC) motors allowed to decrease consumption of electricity 1,5-3 times and at the same time provided high efficiency and low level of noise. All models are compatible with round air ducts with a nominal diameter of 160 and 200 mm.

Case
The case is made from aluminum and sandwich panels with internal heat- and sound-insulation of 20 mm mineral wool.

Filters
Two filters with purification class of G4 (incoming) and F7 (exhaust) are built into the unit in order to perform filtration of incoming and exhaust air.

Motor
Highly efficient electric-commuter EC-series motors with external rotor and double suction impeller with backward-curved blades are being used. As of today, such motor is the most advanced solution for energy saving. EC-motors feature high level of efficiency and optimal control over the whole range of fan speeds. Premium efficiency (reaching 90%) is an unquestionable advantage of electric-commuter motor.

Fan
The unit is supplied with intake and exhaust double-suction centrifugal fans with forward-curved blades and built-in thermostatic protection with automatic restart function. Electric motors and impellers are dynamically balanced in two-dimensional subspace. Ball bearing motors do not require maintenance operation and their service life period lasts at least 40 000 hours.

Heat exchanger
Plate heat exchanger is made from aluminum plates. «Summer» filler is provided for unit operation without heat exchanger. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block. Air handling unit is supplied with a built-in system that protects heat exchanger from freezing during cold weather. The main point of this protection is that the inlet fan is switched off according to thermal sensor measures. The warm exhaust air heats up the heat exchanger which is followed by the start up of inlet fan, and the whole unit is running in a customary regime.

Control
Fan speed control is carried out via 4-position switch that allows choosing low, medium or high rotation speed or simply switching off the unit.

Mounting
Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Legend:

Series	Air flow [m³/h]	Flange direction	Motor type
VENTS VUT	300; 400; 600	**H** – horyzontal	**EC** – synchronous motor with electronic control

Accessories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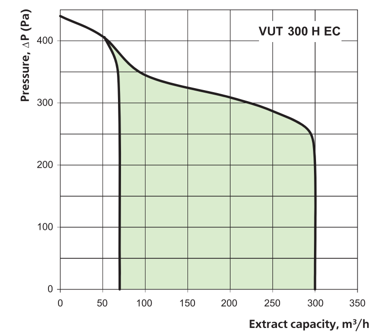
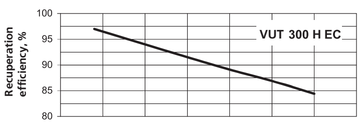
	VUT 300-1 H EC	VUT 300-2 H EC	VUT 400 H EC	VUT 600 H EC
Voltage [V~50Hz]	1~ 230		1~ 230	1~ 230
Maximum fan power [W]	2pc. x 70		2pc. x 175	2pc. x 175
Fan current [A]	2pc. x 0,60		2pc. x 1,3	2pc. x 1,3
Total power of the unit [kW]	140		350	350
Total current of the unit [A]	1,2		2,6	2,6
Air capacity [m³/h]	300		400	600
RPM	1380		1340	2150
Noise level at 3m [dB[A]]	24-45		28-47	28-47
Maximum temperature of shifted air [°C]	from -25 up to +60		from -25 up to +60	from -25 up to +60
Case material	Aluzink		Aluzink	Aluzink
Insulation	25 mm Mineral wool		25 mm Mineral wool	25 mm Mineral wool
Filter: extract	G4		G4	G4
intake	F7 (EU7)		F7 (EU7)	F7 (EU7)
Diameter of connectable air duct [mm]	⌀150	⌀160	⌀200	⌀200
Weight [kg]	36		37	37
Heat exchanger efficiency	up to 95%		up to 95%	up to 95%
Cross flow heat exchanger type	Cross flow		Cross flow	Cross flow
Heat exchanger material	Polysterene		Polysterene	Polysterene

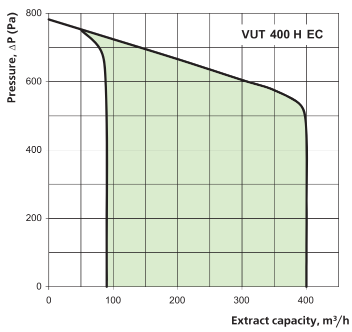
VENTS VUT H EC

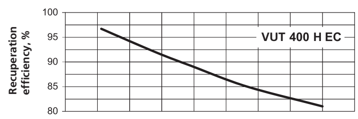




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	51	29	49	47	37	41	39	34	22
L_{WA} (output)	dB[A]	59	39	53	54	54	46	45	35	24
L_{WA} (environment)	dB[A]	32	22	23	30	25	18	16	19	20

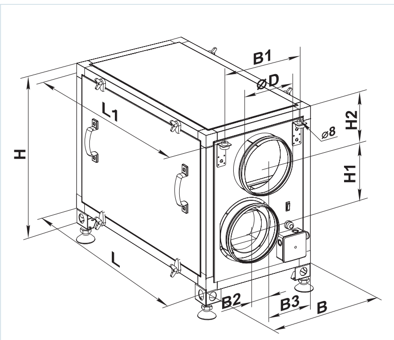
VENTS VUT H EC



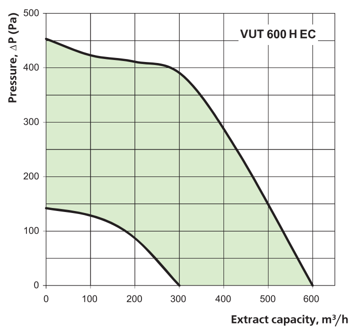


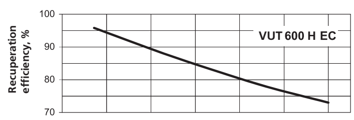
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	54	32	53	52	40	44	41	37	22
L_{WA} (output)	dB[A]	65	42	59	57	56	51	47	38	29
L_{WA} (environment)	dB[A]	34	25	24	36	30	23	20	24	25

Type	Dimension [mm]									
	ØD	B	B1	B2	B3	H	H1	H2	L	L1
VUT 300-1 H EC	149	420	390	100	159	562	215	147	829	876
VUT 300-2 H EC	159	420	390	100	159	562	215	147	829	876
VUT 400 H EC	199	420	390	100	159	562	215	147	829	876
VUT 600 H EC	199	420	390	100	159	562	215	147	829	876



VENTS VUT H EC





Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	57	36	55	51	41	47	42	38	28
L_{WA} (output)	dB[A]	67	47	62	62	59	53	52	42	29
L_{WA} (environment)	dB[A]	41	26	29	36	32	24	22	26	26

VENTS VUT EH
Series

Air handling units with air flow capacity up to **2200 m³/h** placed in a sound- and heat-insulation case with electric heater. Heat exchanger efficiency up to 85%.

VENTS VUT WH
Series

Air handling units with air flow capacity up to **2100 m³/h** placed in a sound- and heat-insulation case with water heater. Heat exchanger efficiency up to 78%.

Description
Air handling units VUT EH with electric and VUT WH with water heater are turn key units that provide filtration and supply of fresh air and extracts impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger. All models are compatible with round air ducts with a nominal diameter of 125, 150, 160, 200, 250, 315 mm.

Modification group
VUT EH – models supplied with electric heater, fans with asynchronous motors, cross flow heat exchangers.
VUT WH – models supplied with water (glycolic) heater, fans with asynchronous motors, flow heat exchangers.

Case
The case is made from aluzink with internal heat- and sound-insulation of 25 mm mineral wool.

Filters
Two filters with purification class of G4 (incoming) and F7 (exhaust) are built into the unit in order to perform filtration of incoming and exhaust air.

Fan
The unit is supplied with intake and exhaust double-suction centrifugal fans with forward-curved blades and built-in thermostatic protection with automatic restart function. Electric motors and impellers are dynamically balanced in two-dimensional subspace. Ball bearing motors do not require maintenance operation and their service life period lasts at least 40 000 hours.

Heat exchanger
Plate heat exchanger is made from aluminum plates. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block.

Heater
Air handling units are supplied either with electric (for VUT EH models) or water (for VUT WH models) heaters that allow to run the unit at low outdoor temperatures. The air heater switches on automatically and warms up the air in the room in case the predetermined temperature of incoming air was not reached by means of heat recuperation.

Control and automation
The unit is supplied with a built-in automation system and multi-function control panel with a

Legend:

Series	Air flow [m³/h]	Heater type	Pipes direction
VENTS VUT	350; 500; 530; 600; 1000; 2000;	**E** – electric; **W** – water	**H** – horyzontal

Accessories





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display plotter. Work package includes a cable 10 m in length needed to establish connection with control panel. Electronic freeze protection, equipped with bypass and air heater is used to prevent heat exchanger freezing. The main idea of this protection is that the bypass damper opens up according to certain thermal sensor figure and all of the incoming air flows past heat exchanger via bypass duct. During defreezing procedure the warm exhaust air warms up the heat exchanger. After that the bypass damper is closed, the electric air heater shuts down, incoming air continues flowing through heat exchanger and warming up in the process while the whole unit is operating in a customary mode.

Control and protection functions of VUT EH model:

- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of remote control;
- regulate fan speed and correspondingly change unit productivity with the use of remote control;
- possibility to connect air flap's electric drives and control them;
- trying-out necessary algorithms at start up and shutdown of the unit;
- operation of the weekly timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- automation system is protected against short-circuit failure by circuit breaker;
- filter clogging control;

Control and protection functions of VUT WH model

- start up and shut down of unit;
- maintenance of predetermined value of incoming air temperature using a three-way valve actuator which controls the supply of heat-carrying agent to the liquid heating device ;
- protection of liquid heating unit from freezing (according to temperature-sensing device placed behind the heater and according to temperature probe of reverse heat-carrying agent);
- Control of the electric drive of the heat exchanger's bypass valve;
- Control and control on operation of external circulating pump installed in the delivery line of heat-carrying agent to the liquid heating device;
- protection of heat exchanger from freezing;
- Control and control on operation of inlet fan;
- Control on filter clogging (keeping track of service hours);
- Control on electric actuator of external air-valve.

Air handling unit is supplied with remote control panel which provides the following:

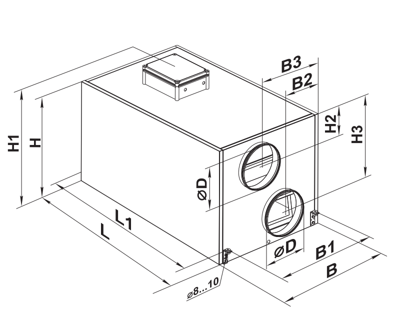
- fan unit switching on and off;
- set point of required air-consumption rate;
- set point of desired temperature of incoming air;
- visual display of room temperature.

Mounting

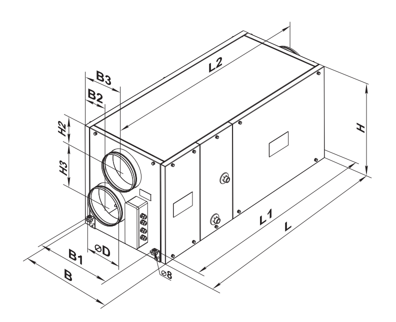
Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Type	Dimension [mm]										
	ØD	B	B1	B2	B3	H	H1	H2	H3	L	L1
VUT 350 EH	124	497	403	348	248	554	-	111	230	954	996
VUT 500 EH	149	497	403	348	248	554	-	111	230	954	996
VUT 530 EH	159	497	403	348	248	554	-	111	230	954	996
VUT 600 EH	199	497	403	348	248	554	-	111	230	954	996
VUT 1000 EH	249	613	460	306	386	698	832	154	280	1071	1117
VUT 1000 WH	249	613	460	306	386	698	832	154	280	1071	1117
VUT 2000 EH	314	842	581	520	320	814	947	201	595	1345	1388
VUT 2000 WH	314	842	581	520	320	814	947	201	595	1345	1388

VUT EH



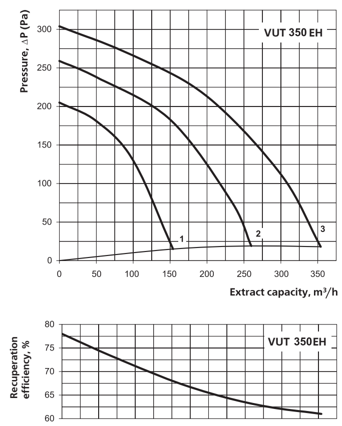
VUT WH



	VUT 350 EH	VUT 500 EH	VUT 530 EH	VUT 600 EH
Voltage [V~50Hz]	1~230	1~230	1~230	1~230
Maximum fan power [W]	2pc. x 130	2pc. x 150	2pc. x 150	2pc. x 195
Fan current [A]	2pc. x 0,60	2pc. x 0,66	2pc. x 0,66	2pc. x 0,86
Electric heater capacity [kW]	3	3	4	4
Electric heater current [A]	13	13	17,4	17,4
Total power of the unit [kW]	3,26	3,3	4,3	4,39
Total current of the unit [A]	14,2	14,32	18,72	19,1
Air capacity [m³/h]	350	500	530	600
RPM	1150	1100	1100	1350
Noise level at 3m [dB[A]]	24-45	28-47	28-47	32-48
Maximum temperature of shifted air [°C]	from -25 up to +55	from -25 up to +50	from -25 up to +50	from -25 up to +55
Case material	Aluzink	Aluzink	Aluzink	Aluzink
Insulation	25 mm Mineral wool	25 mm Mineral wool	25 mm Mineral wool	25 mm Mineral wool
Filter: extract	G4	G4	G4	G4
intake	F7 (EU7)	F7 (EU7)	F7 (EU7)	F7 (EU7)
Diameter of connectable air duct [mm]	⌀125	⌀150	⌀160	⌀200
Weight [kg]	45	49	49	54
Heat exchanger efficiency	up to 78%	up to 88%	up to 88%	up to 85%
Cross flow heat exchanger type	cross flow	cross flow	cross flow	cross flow
Heat exchanger material	aluminium	aluminium	aluminium	aluminium

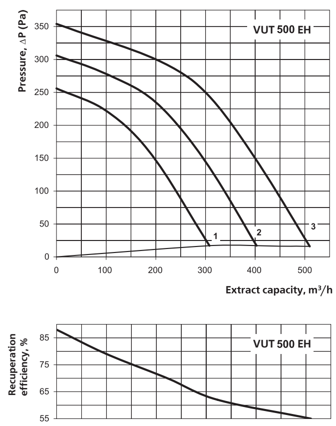
*option

VENTS VUT EH



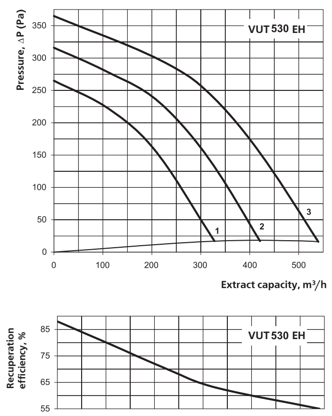
Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{WA} (input)	dB[A]	50	30	50	47	38	41	38	31	19
L_{WA} (output)	dB[A]	58	38	53	56	53	47	45	37	25
L_{WA} (environment)	dB[A]	33	23	22	32	26	19	17	22	18

VENTS VUT EH



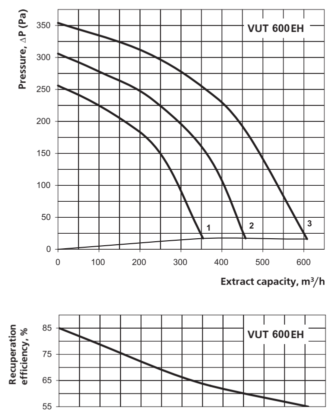
Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{WA} (input)	dB[A]	54	34	52	49	40	46	42	33	22
L_{WA} (output)	dB[A]	64	41	57	57	56	51	50	40	26
L_{WA} (environment)	dB[A]	36	25	26	36	30	22	21	24	21

VENTS VUT EH



Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{WA} (input)	dB[A]	56	34	50	48	42	46	41	35	21
L_{WA} (output)	dB[A]	63	42	59	58	57	49	46	38	26
L_{WA} (environment)	dB[A]	34	25	25	34	31	21	17	25	22

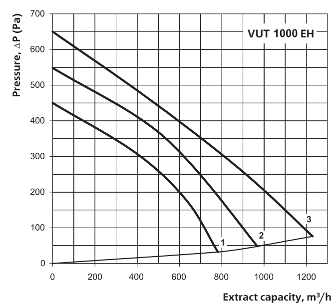
VENTS VUT EH

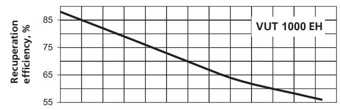


Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{WA} (input)	dB[A]	55	36	52	52	43	46	42	37	27
L_{WA} (output)	dB[A]	67	45	60	62	59	52	53	43	32
L_{WA} (environment)	dB[A]	39	28	29	38	34	25	20	25	26

	VUT 1000 EH	VUT 1000 WH	VUT 2000 EH	VUT 2000 WH
Voltage [V~50Hz]	3~400	1~230	3~400	
Maximum fan power [W]	2pc. x 410		2pc. x 650	
Fan current [A]	2pc. x 1,8		2pc. x 2,84	
Electric heater capacity [kW]	9,0	-	18,0	-
Electric heater current [A]	13,0	-	26,0	-
Total power of the unit [kW]	9,80	0,82	19,30	1,30
Total current of the unit [A]	16,6	3,6	31,7	5,68
Air capacity [m³/h]	1200	1100	2200	2100
RPM	1850		1150	
Noise level at 3m [dB[A]]	60		65	
Maximum temperature of shifted air [°C]	from -25 up to +40		from -25 up to +40	
Case material	Aluzink		Aluzink	
Insulation	50 mm Mineral wool		50 mm Mineral wool	
Filter: extract	G4		G4	
intake	G4 (F7)*		G4 (F7)*	
Diameter of connectable air duct [mm]	⌀250		⌀315	
Weight [kg]	85	88	96	99
Heat exchanger efficiency	up to 78%		up to 77%	
Cross flow heat exchanger type	cross flow		cross flow	
Heat exchanger material	aluminium		aluminium	
*option	**no control unit			

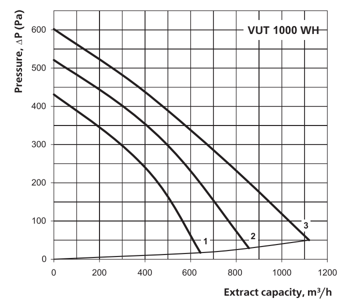
VENTS VUT EH

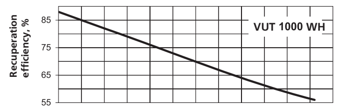




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	69	68	66	68	68	60	63	61	54
L_{WA} (output)	dB[A]	70	70	73	70	65	65	62	59	58
L_{WA} (environment)	dB[A]	49	54	55	49	51	41	37	36	33

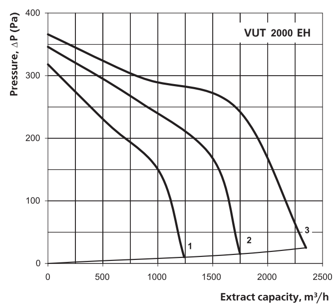
VENTS VUT WH

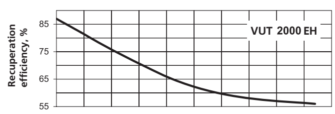




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	68	68	70	69	66	61	62	61	56
L_{WA} (output)	dB[A]	70	68	69	69	68	64	61	59	58
L_{WA} (environment)	dB[A]	47	55	56	48	55	38	40	36	34

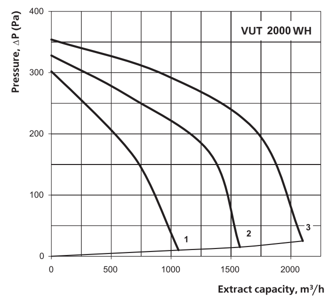
VENTS VUT EH

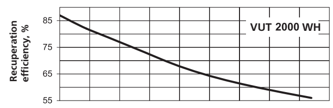




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	75	80	82	80	72	71	66	66	59
L_{WA} (output)	dB[A]	81	85	82	79	73	76	74	74	68
L_{WA} (environment)	dB[A]	54	65	68	58	55	50	46	42	39

VENTS VUT WH





Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	76	82	81	77	69	72	68	65	60
L_{WA} (output)	dB[A]	79	86	80	79	74	75	70	74	68
L_{WA} (environment)	dB[A]	58	66	64	58	51	48	45	41	38

VENTS VUT EH EC
Series

VENTS VUT WH EC
Series

Air handling units with air flow capacity up to **600 m³/h** placed in a sound- and heat-insulation case with electric heater. Heat exchanger efficiency up to 95%.

Air handling units with air flow capacity up to **550 m³/h** placed in a sound- and heat-insulation case with water heater. Heat exchanger efficiency up to 95%.

Description

Air handling unit VUT EH EC with electric heater and VUT WH EC with water heater are turn key units that provide filtration and supply of fresh air and extracts impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger. This unit is used in ventilation and air conditioning systems in premises serving different purposes which require cost-effective solution and controlled ventilation system. The use of electric-commuter (EC) motors allowed to decrease consumption of electricity 1,5-3 times and at the same time provided high efficiency and low level of noise. All models are compatible with round air ducts with a nominal diameter of 150, 160 and 200 mm.

Modification group

VUT EH EC – Models supplied with electric heaters, fans with EC-motors, delivery set includes a countercurrent duct heat exchanger.

VUT WH EC – Models supplied with water (glycolic) heaters, fans with EC-motors, delivery set includes a Countercurrent, hexagonal duct heat exchanger.

Case

The case is made from aluzink steel with internal heat- and sound-insulation of 25 mm mineral wool.

Filter

Two filters with purification class of G4 (incoming) and F7 (exhaust) are built into the unit in order to perform filtration of incoming and exhaust air.

Motors

Highly efficient electric-commuter EC-series motors with external rotor and double suction impeller with backward-curved blades are being used. As of today, such motor is the most advanced solution for energy saving. EC-motors feature high level of efficiency and optimal control over the whole range of fan speeds. Premium efficiency (reaching 90%) is an unquestionable advantage of electric-commuter motor.

Heat exchanger

Heat exchangers with high level of efficiency (around 95%) are used in the units. VUT EH EC and VUT WH EC models are supplied with cross flow heat exchanger made of polystyrene. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block.

Air handling units are supplied either with electric (for VUT EH EC models) or hot water (for VUT WH EC models) heaters that allow to run the unit at low outdoor temperatures. The air heater switches on automatically and warms up the air in case if the predetermined temperature of incoming air was not reached by means of heat recuperation.

Legend:

Series	Air flow [m³/h]	Heater type	Pipes direction	Motor type
VENTS VUT	300; 400; 600	**E** – electric; **W** – water	**H** – horyzontal	**EC** – synchronous motor with electronic control

Accessories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Control and automation

The unit is supplied with a built-in automation system and multi-function control panel with a display plotter. Work package includes a cable 10 m in length needed to establish connection with control panel. Electronic freeze protection, equipped with bypass and air heater is used to prevent heat exchanger freezing. The main idea of this protection is that the bypass damper opens up according to certain thermal sensor figure and all of the incoming air flows past heat exchanger via bypass duct. During defreezing procedure the warm exhaust air warms up the heat exchanger. After that the bypass damper is closed, the electric air heater shuts down, incoming air continues flowing through heat exchanger and warming up in the process while the whole unit is operating in a customary mode.

Control and protection functions of VUT EH EC model:

- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of remote control;
- regulate fan speed and correspondingly change unit productivity with the use of remote control;
- possibility to connect air flap's electric drives and control them;
- trying-out necessary algorithms at start up and shutdown of the unit;
- operation of the weekly timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- automation system is protected against short-circuit failure by circuit breaker;
- filter clogging control;

Control and protection functions of VUT WH EC model

- start up and shut down of unit;
- maintenance of predetermined value of incoming air temperature using a three-way valve actuator which controls the supply of heat-carrying agent to the liquid heating device;
- protection of liquid heating device from freezing (according to temperature-sensing device placed behind the heater and according to temperature probe of reverse heat-carrying agent);
- Control of the electric drive of the heat exchanger's bypass valve;
- Control and control on operation of external circulating pump installed in the delivery line of heat-carrying agent to the liquid heating device;
- protection of heat exchanger from freezing;
- Control and control on operation of inlet fan;
- Control on filter clogging (keeping track of service hours);
- Control on electric actuator of external air-valve.

Air handling unit is supplied with remote control panel which provides the following:

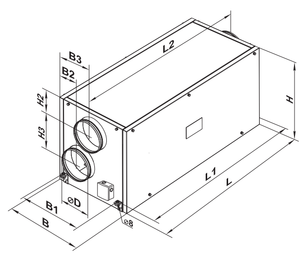
- fan unit switching on and off;
- set point of required air-consumption rate;
- set point of desired temperature of incoming air;
- visual display of room temperature.

Mounting

Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

Type	Dimension [mm]										
	ØD	B	B1	B2	B3	H	H2	H3	L	L1	L2
VUT 300-1 EH EC	149	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-2 EH EC	159	500	403	161	249	555	127	231	1092	1137	1198
VUT 400 EH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 600 EH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-1 WH EC	149	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-2 WH EC	159	500	403	161	249	555	127	231	1092	1137	1198
VUT 400 WH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 600 WH EC	199	500	403	161	249	555	127	231	1092	1137	1198

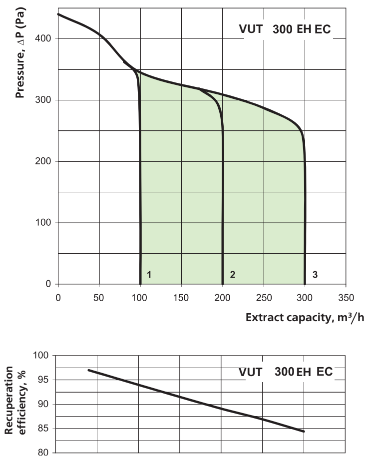
VENTS VUT EH EC
VENTS VUT WH EC



	VUT 300-1 EH EC	VUT 300-2 EH EC	VUT 300-1WH EC	VUT 300-2 WH EC
Voltage [V~50Hz]	1~ 230			
Maximum fan power [W]	2pc. x 70			
Fan current [A]	2pc. x 0,60			
Electric heater capacity [kW]	3,0		-	
Electric heater current [A]	13,0		-	
Number of tubular heating elements in electric heater	1		2	
Total power of the unit [kW]	3,14		0,14	
Total current of the unit [A]	14,2		1,2	
Air capacity [m³/h]	300			
RPM	1380			
Noise level at 3m [dB[A]]	24-45		24-45	
Maximum temperature of shifted air [°C]	from -25 up to +60			
Case material	Aluzink			
Insulation	25 mm Mineral wool			
Filter: extract	G4			
intake	F7 (EU7)			
Diameter of connectable air duct [mm]	⌀150	⌀160	⌀150	⌀160
Weight [kg]	38		40	
Heat exchanger efficiency	up to 90%			
Cross flow heat exchanger type	Cross flow			
Heat exchanger material	Polysterene			

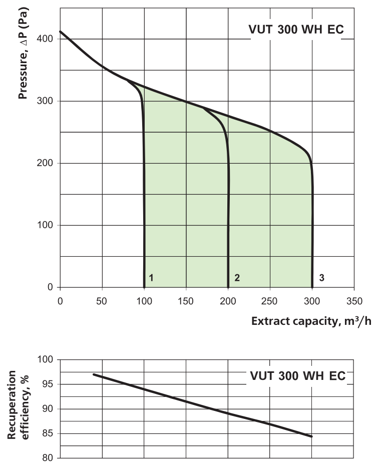
	VUT 400 EH EC	VUT 400 WH EC	VUT 600 EH EC	VUT 600 WH EC
Voltage [V~50Hz]	1~ 230		1~ 230	
Maximum fan power [W]	2pc. x 175		2pc. x 175	
Fan current [A]	2pc. x 1,3		2pc. x 1,3	
Electric heater capacity [kW]	4,0	-	4,0	-
Electric heater current [A]	17,4	-	17,4	-
Number of tubular heating elements in electric heater	1	2	1	2
Total power of the unit [kW]	4,35	0,35	4,35	0,35
Total current of the unit [A]	20,0	2,6	20,0	2,6
Air capacity [m³/h]	400		600	550
RPM	1340		2150	
Noise level at 3m [dB[A]]	28-47	28-47	28-47	28-47
Maximum temperature of shifted air [°C]	from -25 up to +60		from -25 up to +60	
Case material	Aluzink		Aluzink	
Insulation	25 mm Mineral wool		25 mm Mineral wool	
Filter: extract	G4		G4	
intake	F7 (EU7)		F7 (EU7)	
Diameter of connectable air duct [mm]	⌀200		⌀200	
Weight [kg]	38	40	38	40
Heat exchanger efficiency	up to 90%		up to 90%	
Cross flow heat exchanger type	Cross flow		Cross flow	
Heat exchanger material	Polystyrene		Polystyrene	

VENTS VUT EH EC



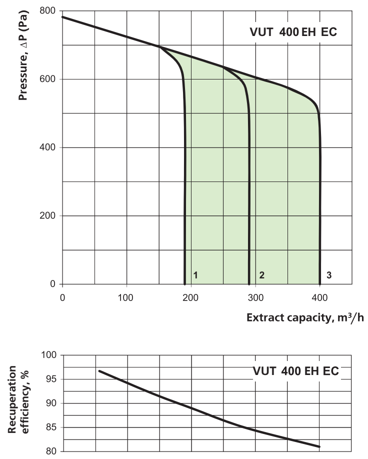
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	51	30	48	46	37	42	36	32	21
L_{WA} (output)	dB[A]	60	41	54	57	55	44	46	35	24
L_{WA} (environment)	dB[A]	33	23	23	32	27	19	15	19	18

VENTS VUT WH EC



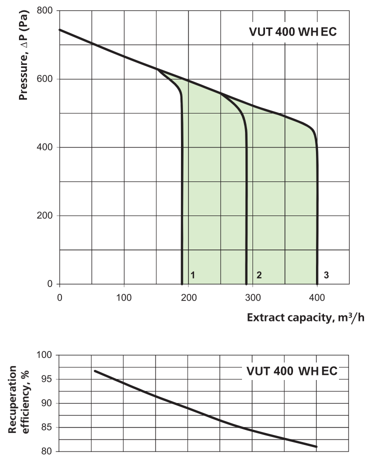
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	49	30	46	49	39	42	38	31	20
L_{WA} (output)	dB[A]	60	39	55	58	52	45	45	35	26
L_{WA} (environment)	dB[A]	34	20	23	30	27	18	18	20	21

VENTS VUT EH EC



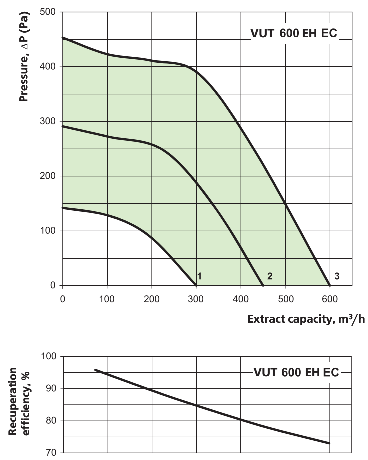
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	54	32	50	51	40	43	40	37	25
L_{WA} (output)	dB[A]	65	44	57	58	54	51	48	38	27
L_{WA} (environment)	dB[A]	37	27	28	32	29	22	19	21	23

VENTS VUT WH EC



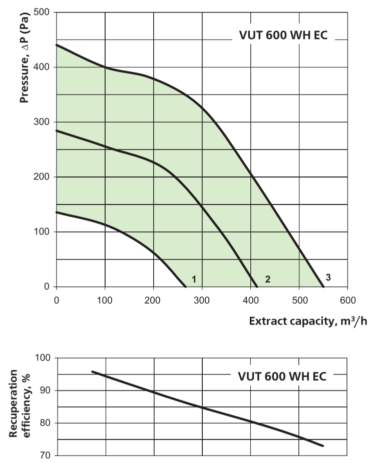
Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	56	33	51	50	40	44	41	37	22
L_{WA} (output)	dB[A]	62	42	57	58	58	48	49	36	26
L_{WA} (environment)	dB[A]	36	25	27	34	29	20	19	25	23

VENTS VUT EH EC



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	59	36	55	54	43	46	43	38	26
L_{WA} (output)	dB[A]	68	45	60	64	61	52	52	40	29
L_{WA} (environment)	dB[A]	38	29	31	38	31	26	24	27	26

VENTS VUT WH EC



Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{WA} (input)	dB[A]	59	38	56	52	41	47	44	40	24
L_{WA} (output)	dB[A]	66	45	59	62	57	52	50	39	30
L_{WA} (environment)	dB[A]	41	26	31	35	32	25	24	24	28

VENTS VUT PE EC
Series

VENTS VUT PW EC
Series

Compact suspended air handling unit with air flow capacity up to **4000 m³/h** in sound- and heat-insulated case with electric heater. Heat exchanger efficiency is up to 90%.

Compact suspended air handling unit with air flow capacity up to **3800 m³/h** in sound- and heat-insulated case with water heater. Heat exchanger efficiency is up to 90%.

Description
Air handling unit VUT PE EC with electric heater and VUT PW EC with water heater are turn key fan units that provide filtration and supply of fresh air and extracts impure air from the premises. Meanwhile, the heat from exhaust air is transferred to incoming air via plate heat exchanger.

This unit is used in ventilation and air conditioning systems in premises serving different purposes which require cost-effective solution and controlled ventilation system. The use of electric-commuter (EC) motors allowed to decrease consumption of electricity 1,5-3 times and at the same time provided high efficiency and low level of noise. All models are compatible with round air ducts with a nominal diameter of 160 (150), 200, 250, 315 and 400 mm.

Modification group
VUT PE EC – models with electric heater.

VUT PW EC – models with liquid (water, glycolic) heater.

Case
The case is made from Zinc-aluminum alloy with internal heat- and sound-insulation of 20 mm mineral wool (in units VUT PE 350, 600, 100) and 50 mm (in units VUT PE 2000, 3000)

Filters
Two filters with purification class of G4 (incoming) and F7 (exhaust) are built into the unit in order to perform filtration of incoming and exhaust air.

Motors
Highly efficient electric-commuter EC-series motors with external rotor and impeller with backward-curved blades are being used. As of today, such motor is the most advanced solution for energy saving. EC-motors feature high level of efficiency and optimal control over the whole range of fan speeds. Premium efficiency (reaching 90%) is an unquestionable advantage of electric-commuter motor.

Heat exchanger
Unit models VUT PE/PW 350, 600, 1000 are supplied with counterflow heat exchanger made from polystyrene, models VUT PE/PW 2000, 3000 are supplied with cross flow plate heat exchanger made of aluminum. A drip-plate, meant for collection and removal of condensed water, is placed under the heat exchanger block.

Heater
Air handling unit are supplied either with electric (for VUT EH models) or hot water (for VUT WH models) heaters that allow to run the unit at low outdoor temperatures. The air heater switches on automatically and warms up the air in case if the predetermined temperature of incoming air was not reached by means of heat exchanger.

Legend:

Series	Air flow [m³/h]	Model	Heater type	Motor type
VENTS VUT	350; 600; 1000; 2000; 3000	**P** – suspended	**E** – electric; **W** – water	**EC** – synchronous motor with electronic control

Accessories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Automation

The unit is supplied with a built-in automation system and multi-function control panel with a display plotter. Work package includes a cable 10 m in length needed to establish connection with control panel. Electronic freeze protection, equipped with bypass and air heater is used to prevent heat exchanger freezing. The main idea of this protection is that the bypass damper opens up according to certain thermal sensor figure and all of the incoming air flows past heat exchanger via bypass duct. During defreezing procedure the warm exhaust air warms up the heat exchanger . After that the bypass damper is closed, the electric air heater shuts down, incoming air continues flowing through heat exchanger and warming up in the process while the whole unit is operating in a customary mode.

Control and protection functions of VUT PE EC model:

- remote switching of the unit ;
- setting of required temperature of incoming air and maintenance of selected temperature regime with the use of remote control;
- regulate fan speed and correspondingly change unit productivity with the use of remote control;
- possibility to connect air flap's electric drives and control them;
- trying-out necessary algorithms at start up and shutdown of the unit ;
- operation of the weekly timer;
- active protection against overheating of tubular heating elements of electric air heater;
- avoiding electric air heater operation if the fan is switched off;
- electric air heater protection from overheating (two thermostatic regulators);
- automation system is protected against short-circuit failure by circuit breaker;
- filter clogging control;

General description of control system of VUT PW (EC) model

Unit is equipped with built-in automated system control and Control block.

Control block performs the following functions:

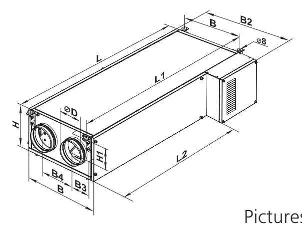
- start up and shut down of unit ;
- maintenance of predetermined value of incoming air temperature using a three-way valve actuator which controls the supply of heat-carrying agent to the liquid heating unit ;
- protection of liquid heating device from freezing (according to temperature-sensing device placed behind the heater and according to temperature probe of reverse heat-carrying agent);
- Control of the electric drive of the heat exchanger's bypass valve;
- Control and control on operation of external circulating pump installed in the delivery line of heat-carrying agent to the liquid heating device;
- protection of heat exchanger from freezing;
- Control and control on operation of inlet fan;
- Control on filter clogging (keeping track of service hours);
- Control on electric actuator of external air-valve.
- Inlet exhaust units is supplied with remote control panel which provides the following:
- fan unit switching on and off;
- set point of required air-consumption rate;
- set point of desired temperature of incoming air;
- visual display of room temperature;
- visual display of malfunction (emergency situation).

Mounting

Air handling unit is mounted with brackets to the floor, wall or ceiling. Unit can be mounted in service space as well as in the main space (above suspended ceiling, in the pocket or directly on the ceiling). Unit mounting can be done only in such position which guarantees collection and removal of condensate water. Access to maintenance service and filter cleaning is provided from the swing panel's side.

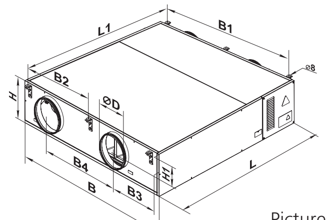
Type	Dimension [mm]											Pictures №
	ØD	B	B1	B2	B3	B4	H	H1	L	L1	L2	
VUT 350 PE EC	149	485	415	596	132,5	220	285	130	1238	1286	948	1
VUT 600 PE EC	199	827	711	-	294	345	283	120	1238	1286	-	2
VUT 1000 PE EC	249	1350	1215	607,5	430	655	317	143	1346	1395	-	2
VUT 2000 PE EC	314	1050	915	457,5	247	575	750	375	1360	1408	-	2
VUT 3000 PE EC	399	1265	1130	565	297	632,5	830	415	1595	1643	-	2
VUT 600 PW EC	199	827	711	-	294	345	283	120	1238	1286	-	2
VUT 1000 PW EC	249	1350	1215	607,5	430	655	317	143	1346	1395	-	2
VUT 2000 PW EC	314	1050	915	457,5	247	575	750	375	1360	1408	-	2
VUT 3000 PW EC	399	1265	1130	565	297	632,5	830	415	1595	1643	-	2

VENTS VUT 350 PE EC



Pictures 1

VENTS VUT PE EC
VENTS VUT PW EC

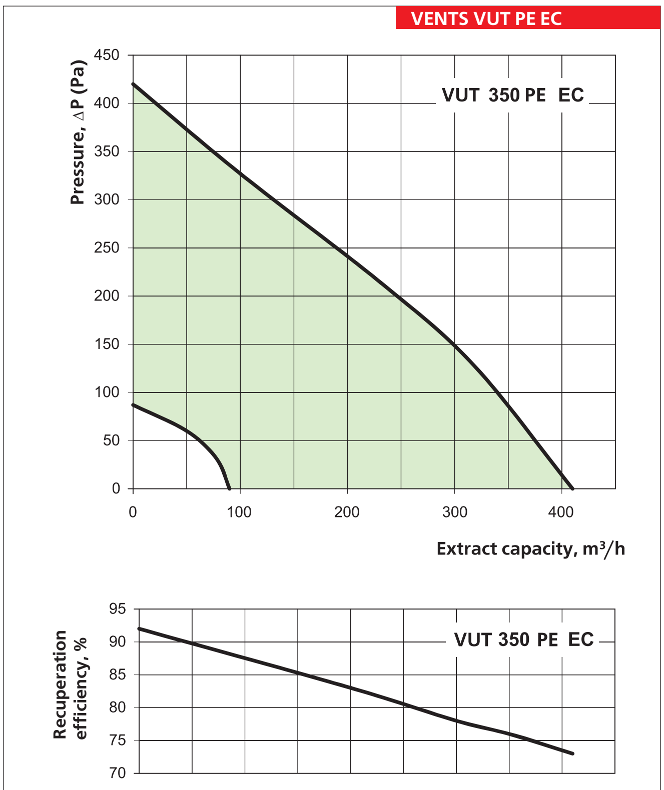


Pictures 2

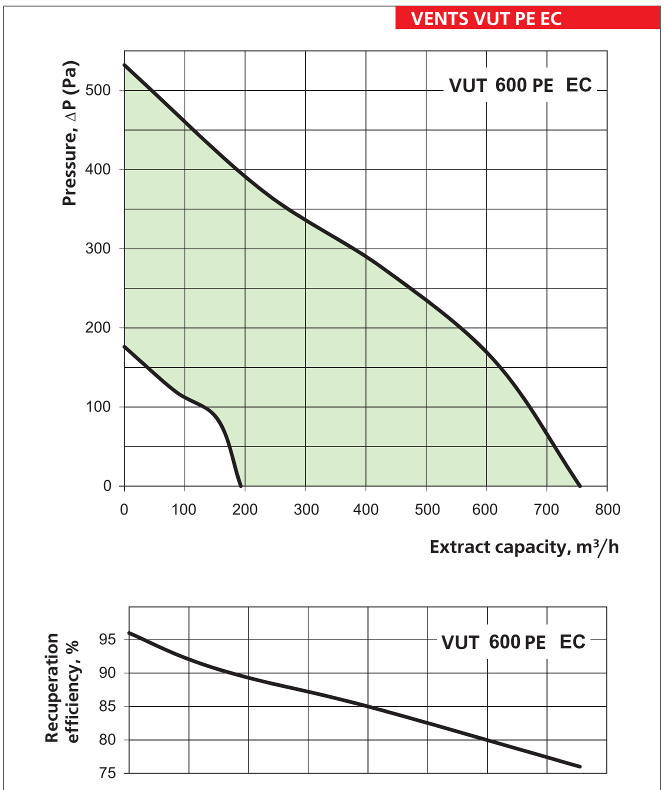
	VUT 350 PE EC	VUT 600 PE EC	VUT 600 PW EC
Voltage [V~50Hz]	1~ 230	1~ 230	
Maximum fan power [W]	2pc. x 51	2pc. x 100	
Fan current [A] (EC fan supply voltage)	2pc. x 1,2 (48B)	2pc. x 2,4 (48B)	
Electric heater capacity [kW]	1,5	2,0	-
Electric heater current [A]	6,5	8,7	-
Total power of the unit [kW]	1,502	2,20	0,20
Total current of the unit [A]	7,05	9,76	1,06
Air capacity [m³/h]	400	700	600
RPM	2950	3150	
Noise level at 3m [dB[A]]	48	53	
Maximum temperature of shifted air [°C]	from -25 up to +40	from -25 up to +60	
Case material	Aluzink	Aluzink	
Insulation	20 mm	20 mm Mineral wool	
Filter: extract	G4	G4	
intake	F7 (EU7)	F7 (EU7)	
Diameter of connectable air duct [mm]	⌀160 (150)	⌀200	
Weight [kg]	65	75	77
Heat exchanger efficiency	up to 90%	up to 90%	
Cross flow heat exchanger type	Cross flow	Cross flow	
Heat exchanger material	Polysterene	Polysterene	

	VUT 1000 PE EC	VUT 1000 PW EC	VUT 2000 PE EC	VUT 2000 PW EC
Voltage [V~50Hz]	1~ 230		3~ 400	1~ 230
Maximum fan power [W]	2pc. x 135		2pc. x 420	
Fan current [A] (EC fan supply voltage)	2pc. x 2,8 (48B)		2pc. x 2,5 (230B)	
Electric heater capacity [kW]	3,3	-	12,0	-
Electric heater current [A]	14,3	-	17,4	-
Total power of the unit [kW]	3,57	0,27	12,84	0,84
Total current of the unit [A]	15,5s3	1,23	22,4	5
Air capacity [m³/h]	1100	1000	2000	1950
RPM	2645		2920	
Noise level at 3m [dB[A]]	52		58	
Maximum temperature of shifted air [°C]	from -25 up to +60		from -25 up to +40	
Case material	Aluzink		Aluzink	
Insulation	20 mm Mineral wool		50 mm Mineral wool	
Filter: extract	G4		G4	
intake	F7 (EU7)		F7 (EU7)	
Diameter of connectable air duct [mm]	⌀250		⌀315	
Weight [kg]	95	98	190	194
Heat exchanger efficiency	up to 90%		up to 75%	
Cross flow heat exchanger type	Cross flow		Cross flow	
Heat exchanger material	Polysterene		aluminium	

	VUT 3000 PE EC	VUT 3000 PW EC
Voltage [V~50Hz]	3~ 400	
Maximum fan power [W]	2pc. x 990	
Fan current [A] (EC fan supply voltage)	2pc. x 1,7 (400B)	
Electric heater capacity [kW]	18,0	-
Electric heater current [A]	26,0	-
Total power of the unit [kW]	19,98	1,98
Total current of the unit [A]	29,4	3,4
Air capacity [m³/h]	4000	3800
RPM	2580	
Noise level at 3m [dB[A]]	59	
Maximum temperature of shifted air [°C]	from -25 up to +50	
Case material	Aluzink	
Insulation	50 mm Mineral wool	
Filter: extract	G4	
intake	F7 (EU7)	
Diameter of connectable air duct [mm]	⌀400	
Weight [kg]	290	295
Heat exchanger efficiency	up to 75%	
Cross flow heat exchanger type	Cross flow	
Heat exchanger material	aluminium	

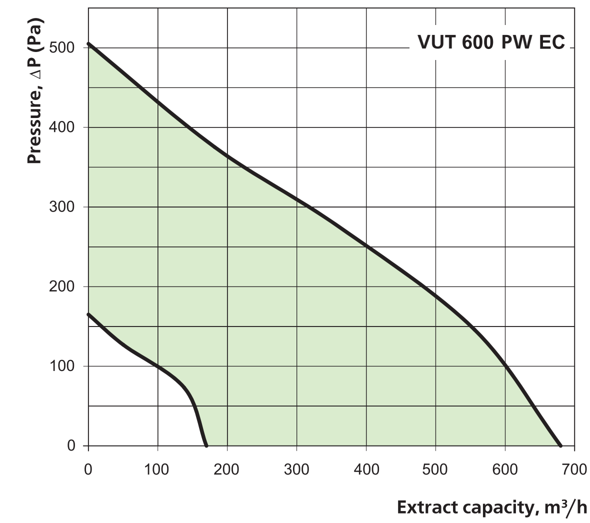


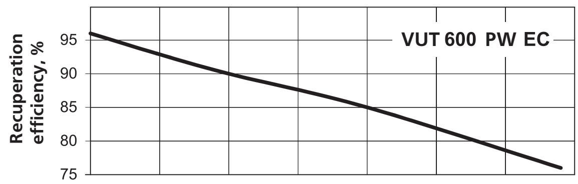
Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	52	32	47	49	37	40	36	32	20
L_{wA} (output)	dB[A]	62	39	56	58	55	48	44	36	25
L_{wA} (environment)	dB[A]	33	20	21	31	29	21	17	20	22



Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	55	35	56	53	43	47	45	37	28
L_{wA} (output)	dB[A]	65	47	60	61	61	52	51	40	30
L_{wA} (environment)	dB[A]	39	30	30	39	33	23	24	26	28

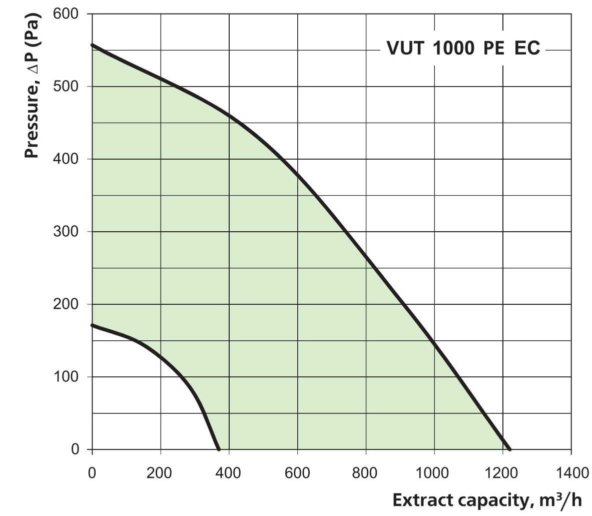
VENTS VUT PW EC

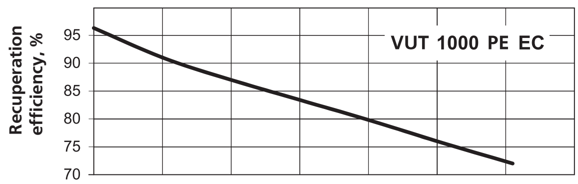




Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	59	34	56	54	43	46	44	36	24
L_{wA} (output)	dB[A]	68	43	59	62	59	52	52	40	29
L_{wA} (environment)	dB[A]	38	29	27	39	33	23	23	24	24

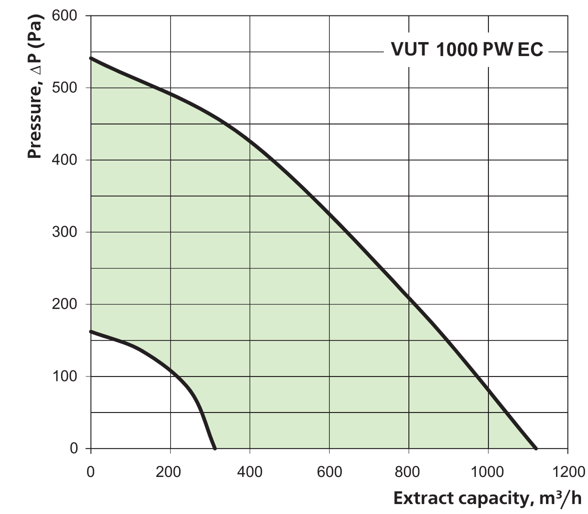
VENTS VUT PE EC

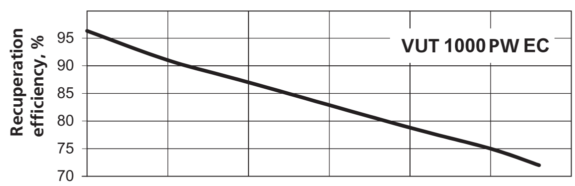




Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	68	67	68	70	68	60	60	61	55
L_{wA} (output)	dB[A]	70	71	69	68	66	65	63	61	58
L_{wA} (environment)	dB[A]	45	57	56	47	52	42	38	34	35

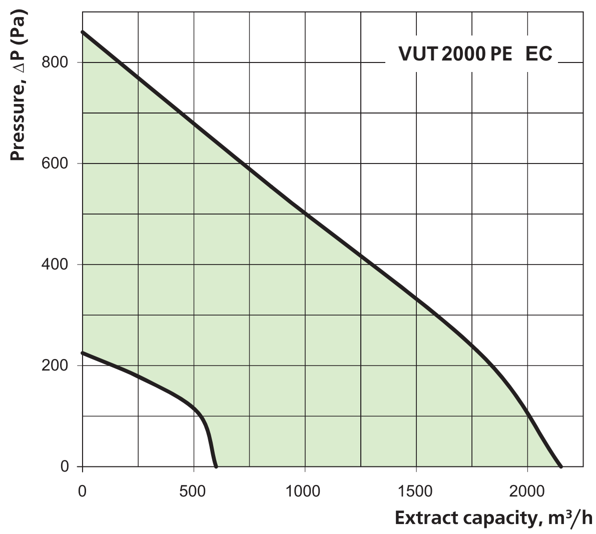
VENTS VUT PW EC

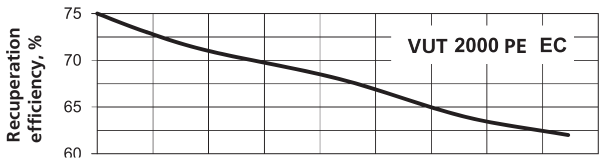




Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	67	68	67	67	66	59	61	61	56
L_{wA} (output)	dB[A]	69	70	71	68	66	66	64	59	58
L_{wA} (environment)	dB[A]	47	58	52	47	53	40	41	35	35

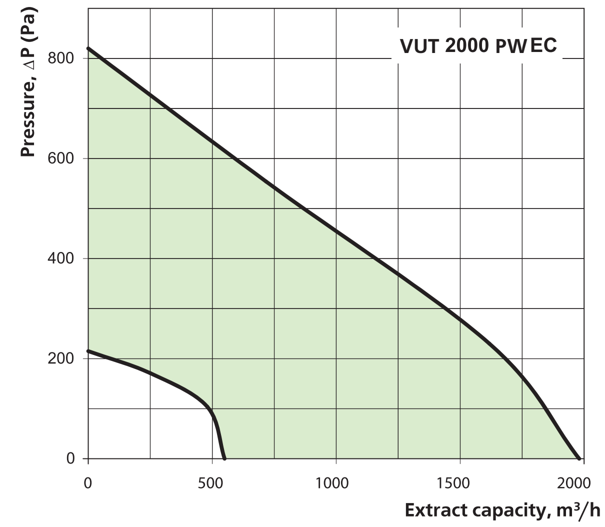
VENTS VUT PE EC

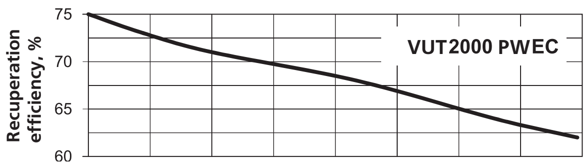




Sound power level	Hz	Total	63	125	250	500	1000	2000	4000	8000
			Octave-frequency band [Hz]							
L_{wA} (input)	dB[A]	77	83	83	78	72	73	66	67	58
L_{wA} (output)	dB[A]	83	86	84	80	72	75	70	72	69
L_{wA} (environment)	dB[A]	56	65	66	59	53	46	42	39	39

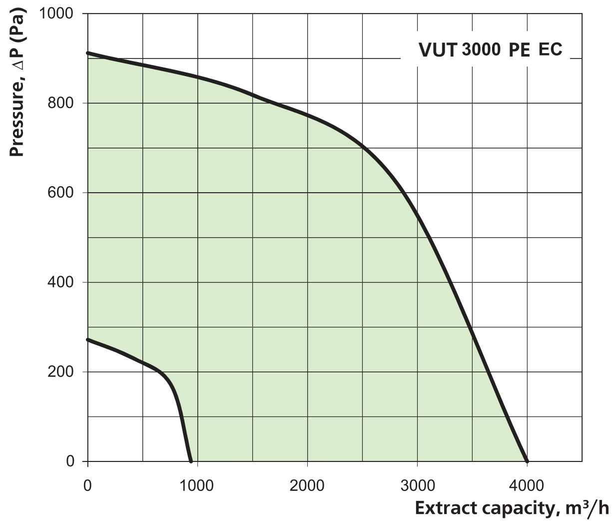
VENTS VUT PW EC

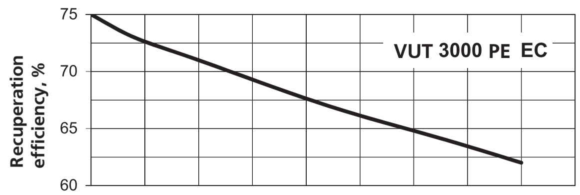




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	79	80	80	79	71	72	69	64	58
L_{wA} (output)	dB[A]	81	84	83	79	71	77	71	73	69
L_{wA} (environment)	dB[A]	56	66	66	59	55	48	44	38	38

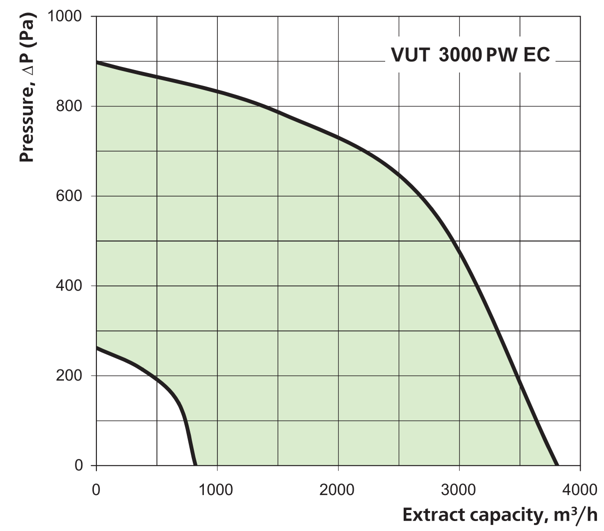
VENTS VUT PE EC

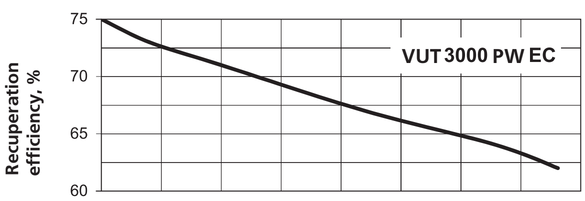




Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	80	85	83	82	75	75	72	70	64
L_{wA} (output)	dB[A]	86	87	86	83	77	80	75	75	74
L_{wA} (environment)	dB[A]	61	70	69	63	58	51	48	42	41

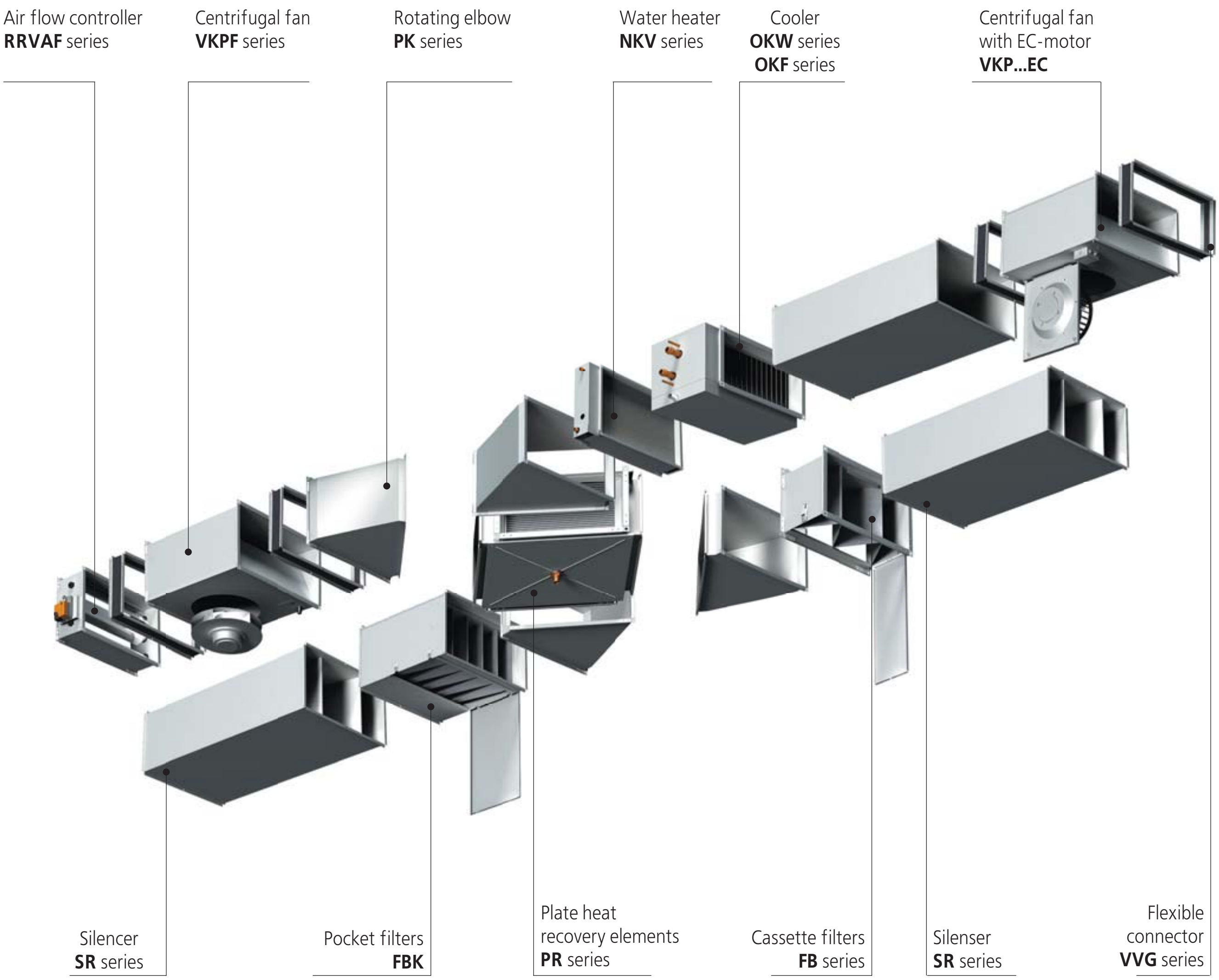
VENTS VUT PW EC





Sound power level		Octave-frequency band [Hz]								
	Hz	Total	63	125	250	500	1000	2000	4000	8000
L_{wA} (input)	dB[A]	82	87	83	84	75	72	72	69	63
L_{wA} (output)	dB[A]	84	86	85	82	74	80	77	76	73
L_{wA} (environment)	dB[A]	60	69	68	62	56	51	47	41	41

ENERGY SAVING DUCT UNITS X-VENT



WWW.VENTILATION-SYSTEM.COM

Energy saving duct units X-vent – the best solution for ventilation and air conditioning! !

- Do you have limited space in the room?
  - None ventilation chambers?
    - All the ventilation system you want to hide under the false ceiling?
      - You need cost effective and energy saving solution?

THEN DUCT X-VENT UNITS IS YOUR CHOICE!

ON THE BASIS OF DUCT X-VENT UNITS YOU CAN IMPLEMENT THE COMPLEX AND SIMPLE SYSTEM OF VENTILATION AND AIR CONDITIONING. X-VENT UNITS ALLOW YOU TO ASSEMBLE ANY MODIFICATION YOU MAY NEED: INTAKE OR EXHAUST VENTILATION OR HEAT RECOVERY AIR HANDLING SYSTEM.

ADVANTAGES OF DUCT X-VENT UNITS:

- «ALL INCLUSIVE» SOLUTION;
- FULL PRODUCTS RANGE;
- COMPACT AND ECONOMICAL;
- EASY INSTALLATION;
- ENERGY SAVING TECHNOLOGIES;
- COMPLETE INTEGRATED SYSTEM OF AUTOMATION;
- LOW OPERATING COSTS;
- EASY MAINTENANCE AND REPLACEMENT OF FAN FILTERS;
- LONG LIFETIME (40 000 HOURS OF CONTINUOUS FAN OPERATION);
- HIGH QUALITY FOR THE BEST PRICE.

Duct systems main elements:

Air flow controller
RRVAF series

Centrifugal duct fan
VKPF series

Rotating elbow
PK series

Water heater
NKV series

Cooler
OKW series
OKF series

Centrifugal duct fan
with EC motor
VKP...EC series

Filters
FB series
FBK series

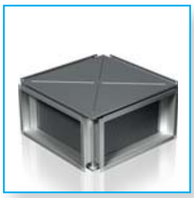


Plate recuperator
PR series

Silencer
SR series

Flexible connector
VVG

ACCESSORIES

Series
PR

Application
Plate heat recovery elements **PR** with cross-shaped air passage is designed for exhaust air heat recovery in ventilation and air conditioning systems. Recuperators are connected directly to air ducts of rectangular cross-section, with parallel, perpendicular or diagonal arrangement of the pipes at an angle of 45°. Different connection options are provided by using the elbow fittings, which should be ordered in quantity that corresponds to the specified configuration. The air, passing through, should not contain solid, fibrous, aggressive and explosive impurities.

Design
The recuperator case is made of galvanized steel. Heat-exchange surface is a stack of special thin aluminum plates which provide high heat transfer efficiency. The bottom access panel of recuperator provides for collection of a quantity of condensate water (which may form on exhaust surfaces of heat exchange). Standard equipment list for plate recuperators PR includes a fitting for removal of condensate water which is installed on the bottom panel.

Specifications
Efficiency, i.e. performance coefficient, and resistance level in the air duct system are the basic specifications of plate recuperators. Thermal-performance coefficient is determined from the following formula:

$$\eta=(t_i-t_o)/(t_e-t_i)$$

where:

t_i – incoming air temperature (after recuperation);

t_o – outdoor air temperature (incoming air prior to recuperation);

t_e – exhaust air temperature (exhaust air prior to recuperation).

Accessories

– Bend **PK**

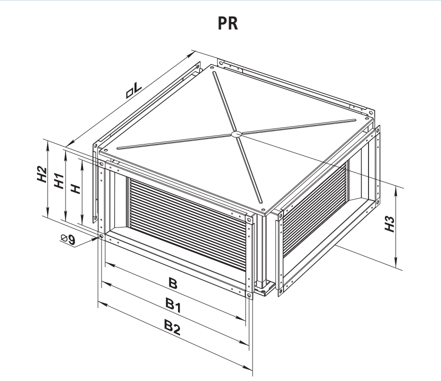
Designed for convenient installation of recovery element in different versions of air duct.

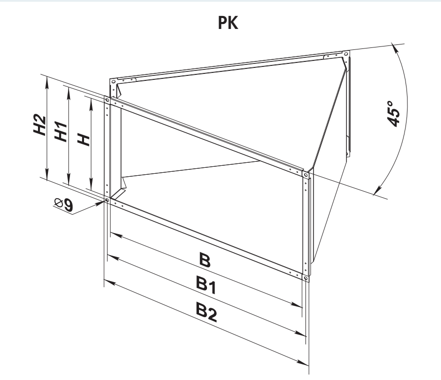
Designator of bend: **PK W x H**

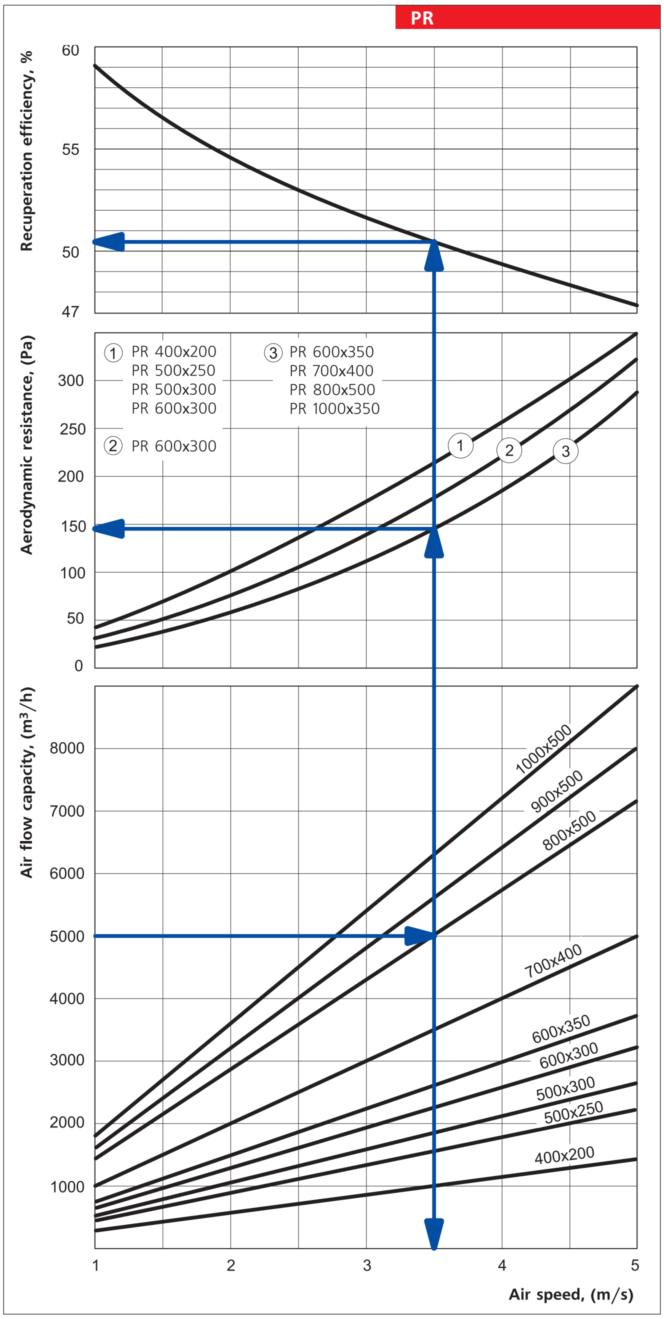
Bend PK series

Legend:

Series	Flange size (WxH), mm
PR - plate heat recovery elements **PK** - band	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500







Type	Dimensions, mm						Weight, kg
	B	B1	B2	H	H1	H2	
PK 400x200	400	420	440	200	220	240	2,2
PK 500x250	500	520	540	250	270	290	3,3
PK 500x300	500	520	540	300	320	340	3,5
PK 600x300	600	620	640	300	320	340	4,5
PK 600x350	600	620	640	350	370	390	4,7
PK 700x400	700	720	740	400	420	440	5,9
PK 800x500	800	820	840	500	520	540	7,5
PK 900x500	900	920	940	500	520	540	8,7
PK 1000x500	1000	1020	1040	500	520	540	10,3

Type	Dimensions, mm								Weight, kg
	B	B1	B2	H	H1	H2	H3	L	
PR 400x200	400	420	440	200	220	240	275	530	17,1
PR 500x250	500	520	540	250	270	290	325	630	22,6
PR 500x300	500	520	540	300	320	340	375	630	24,2
PR 600x300	600	620	640	300	320	340	375	730	31,0
PR 600x350	600	620	640	350	370	390	425	730	33,4
PR 700x400	700	720	740	400	420	440	475	830	47,8
PR 800x500	800	820	840	500	520	540	575	930	61,1
PR 900x500	900	920	940	500	520	540	575	1130	78,8
PR 1000x500	1000	1020	1040	500	520	540	575	1130	78,3

Series
SR

Series
SRF

■ **Application**

A silencer is used for the noise absorption generated by the ventilation units and spreading via the air ducts of the ventilation system. The devices are applied for placing in circular ducts. It considerably reduces the level of noise in an air duct (see fig. "Noise Level Reduction"). A silencer is used with a fan with sound insulation case when it is necessary to reduce the level of noise not only of the air duct but also of the device itself.

■ **Design**

- **SR** series silencer case is made of galvanized steel and filled in with noncombustible sound proofing material with a protective coating preventing the fibers blowing. The silencer is equipped with connecting flanges with rubber gaskets for leakproof connection to air ducts.
- **SRF** series silencer case is composed of outer and inner flexible ducts made of aluminum foil filled in with noncombustible sound proofing material. The inner duct has perforated layer with the protective covering preventing the fibers blowing. The silencer may be bended with a minimum radius up to two diameters.

■ **Mounting**

Silencer can be connected to the circular air ducts with clamps. For the most effective way of noise level reducing fix silencers in one by one manner. To avoid a flexible silencer deflection it is necessary to fix also the central part.

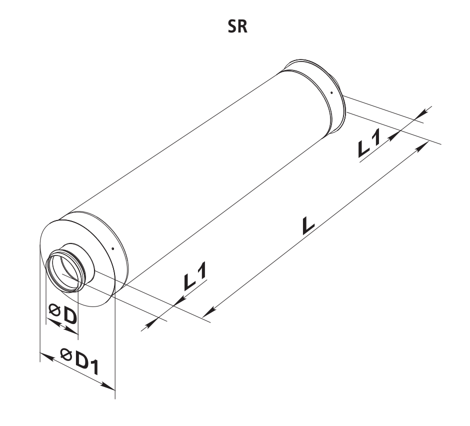
Legend:

Series	Duct diameter, mm	/	Length, mm
SR SRF	100; 125; 150; 160; 200; 250; 315		600; 900; 1200; 2000

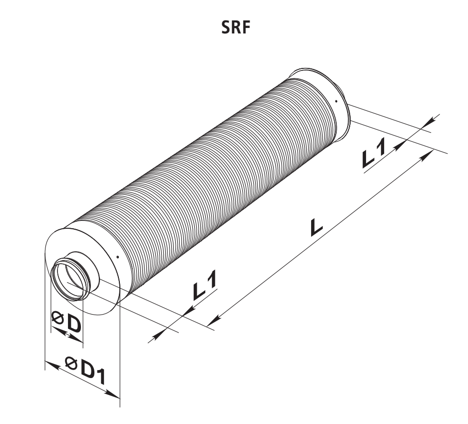
	Noise reduction, dBA (octave-frequency band, Hz)							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SR 100/600	4	8	10	20	34	30	13	14
SR 100/900	5	10	15	23	44	30	16	15
SR 100/1200	6	11	19	28	50	34	20	18
SR 125/600	3	5	6	15	28	17	10	9
SR 125/900	4	9	12	22	43	22	16	12
SR 125/1200	4	9	16	27	48	27	21	17
SR 150/600	2	4	8	16	32	11	7	7
SR 150/900	3	5	9	18	36	25	13	14
SR 150/1200	4	8	14	25	43	30	18	19
SR 160/600	2	4	8	17	33	11	7	7
SR 160/900	2	5	10	19	37	25	13	15
SR 160/1200	4	10	14	24	42	30	19	20
SR 200/600	2	4	6	10	27	13	7	7
SR 200/900	3	7	11	20	39	23	8	7
SR 200/1200	4	10	14	23	40	26	13	12
SR 250/600	4	5	6	11	22	12	7	6
SR 250/900	4	5	7	16	32	20	12	10
SR 250/1200	4	6	8	17	34	22	14	12
SR 315/600	2	4	5	10	17	9	6	5
SR 315/900	3	5	8	17	30	14	10	8
SR 315/1200	4	7	11	22	36	18	14	10

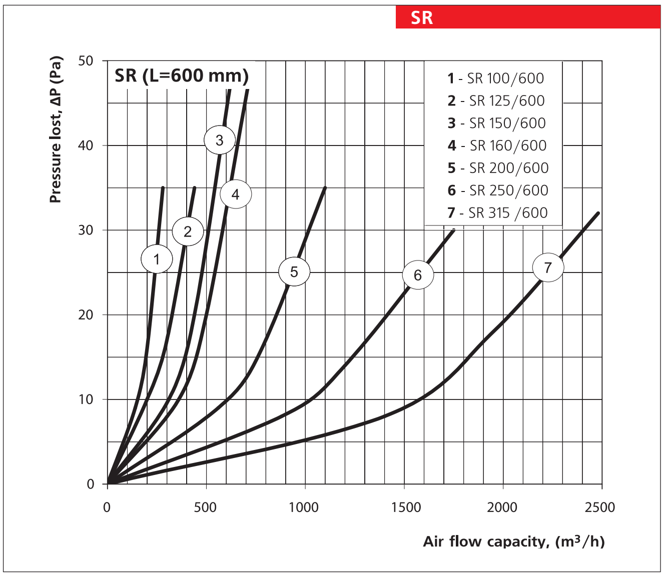
	Noise reduction, dBA (octave-frequency band, Hz)							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SRF 100/600	6	8	13	22	28	34	17	20
SRF 100/900	8	10	15	25	33	40	21	23
SRF 100/2000	10	15	24	48	53	51	39	36
SRF 125/600	4	7	14	20	31	31	13	12
SRF 125/900	5	9	16	23	36	37	17	16
SRF 125/2000	7	15	23	47	55	50	28	25
SRF 150/600	3	7	12	32	40	40	19	20
SRF 150/900	4	8	14	40	48	49	26	25
SRF 150/2000	5	10	21	42	50	48	26	25
SRF 160/600	3	7	12	20	25	24	10	12
SRF 160/900	3	8	13	21	28	28	13	16
SRF 160/2000	5	11	20	40	48	48	25	25
SRF 200/600	2	5	12	20	26	21	10	10
SRF 200/900	3	6	12	22	28	24	12	13
SRF 200/2000	4	11	22	42	51	34	19	23
SRF 250/600	2	3	8	16	22	13	10	10
SRF 250/900	2	4	9	18	25	16	11	12
SRF 250/2000	3	6	16	30	39	27	17	22
SRF 315/600	2	4	9	18	21	12	7	9
SRF 315/900	2	5	11	21	24	14	8	10
SRF 315/2000	4	7	17	34	39	24	14	18

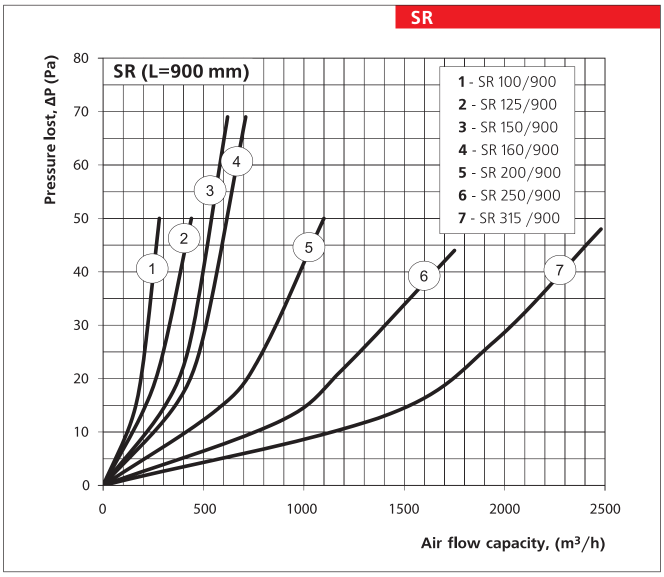
Type	Dimensions, mm				Weight, kg
	ØD	ØD1	L	L1	
SR 100/600	99	200	600	50	2,2
SR 100/900	99	200	900	50	3,2
SR 100/1200	99	200	1200	50	4,3
SR 125/600	124	225	600	50	2,7
SR 125/900	124	225	900	50	4,1
SR 125/1200	124	225	1200	50	5,4
SR 150/600	149	250	600	50	2,8
SR 150/900	149	250	900	50	4,2
SR 150/1200	149	250	1200	50	5,6
SR 160/600	159	260	600	50	3,1
SR 160/900	159	260	900	50	4,6
SR 160/1200	159	260	1200	50	6,2
SR 200/600	199	300	600	50	3,5
SR 200/900	199	300	900	50	5,3
SR 200/1200	199	300	1200	50	7,1
SR 250/600	249	350	600	50	4,2
SR 250/900	249	350	900	50	6,2
SR 250/1200	249	350	1200	50	8,3
SR 315/600	314	415	600	50	4,7
SR 315/900	314	415	900	50	7,1
SR 315/1200	314	415	1200	50	9,4

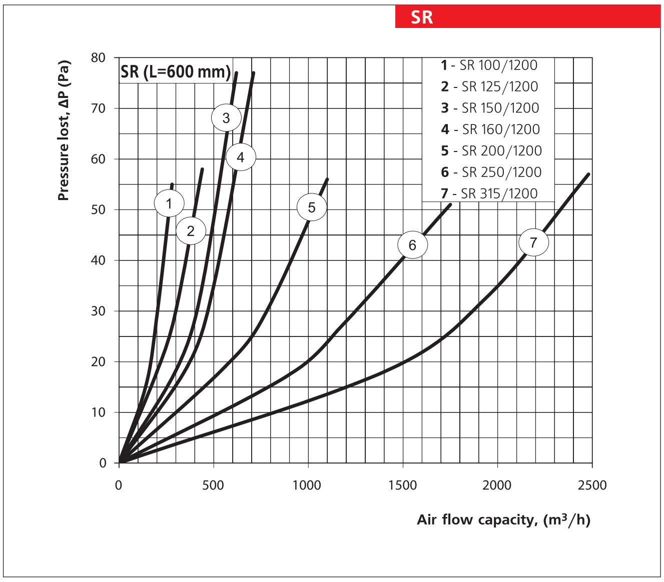


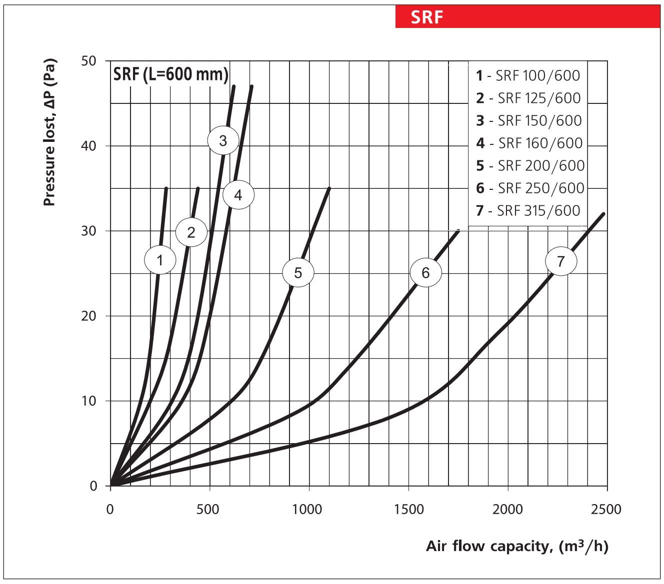
Type	Dimensions, mm				Weight, kg
	ØD	ØD1	L	L1	
SRF 100/600	99	200	600	50	1,5
SRF 100/900	99	200	900	50	2,2
SRF 100/2000	99	200	2000	50	4,8
SRF 125/600	124	225	600	50	1,8
SRF 125/900	124	225	900	50	2,7
SRF 125/2000	124	225	2000	50	6,0
SRF 150/600	149	250	600	50	1,9
SRF 150/900	149	250	900	50	2,8
SRF 150/2000	149	250	2000	50	6,2
SRF 160/600	159	260	600	50	2,1
SRF 160/900	159	260	900	50	3,1
SRF 160/2000	159	260	2000	50	6,8
SRF 200/600	199	300	600	50	2,4
SRF 200/900	199	300	900	50	3,5
SRF 200/2000	199	300	2000	50	7,8
SRF 250/600	249	350	600	50	2,8
SRF 250/900	249	350	900	50	4,2
SRF 250/2000	249	350	2000	50	9,2
SRF 315/600	314	415	600	50	3,2
SRF 315/900	314	415	900	50	4,7
SRF 315/2000	314	415	2000	50	10,4

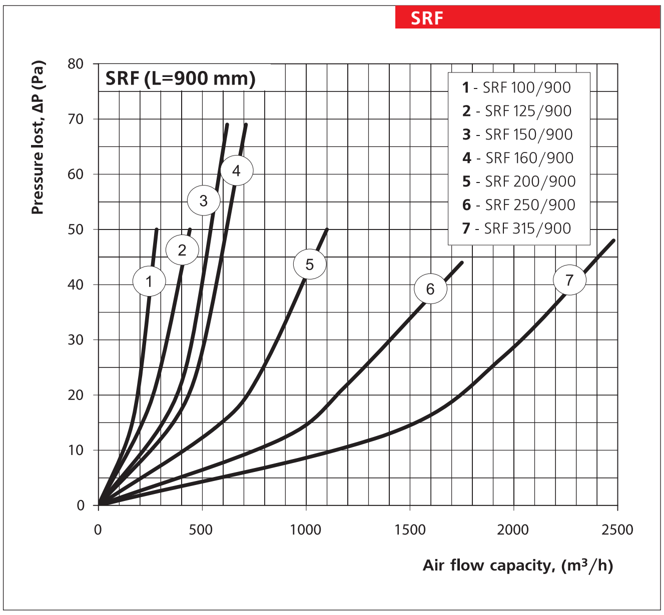


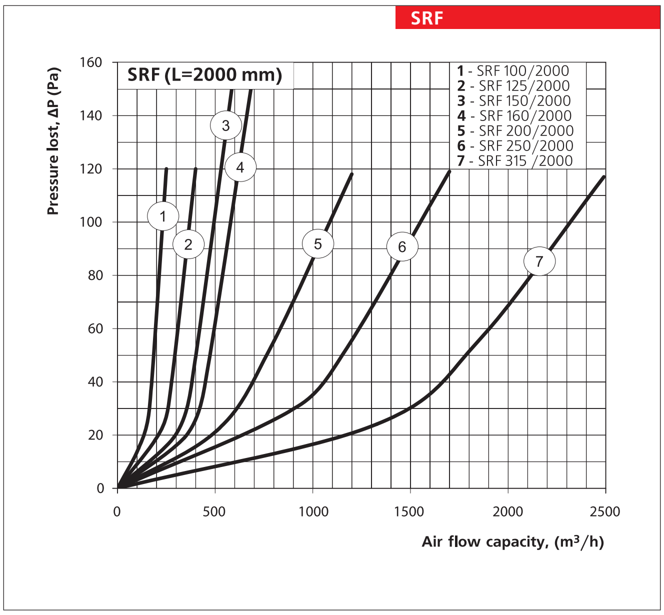

SR
SR (L=600 mm)
1 - SR 100/600
2 - SR 125/600
3 - SR 150/600
4 - SR 160/600
5 - SR 200/600
6 - SR 250/600
7 - SR 315 /600
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)


SR
SR (L=900 mm)
1 - SR 100/900
2 - SR 125/900
3 - SR 150/900
4 - SR 160/900
5 - SR 200/900
6 - SR 250/900
7 - SR 315 /900
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)


SR
SR (L=600 mm)
1 - SR 100/1200
2 - SR 125/1200
3 - SR 150/1200
4 - SR 160/1200
5 - SR 200/1200
6 - SR 250/1200
7 - SR 315/1200
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)


SRF
SRF (L=600 mm)
1 - SRF 100/600
2 - SRF 125/600
3 - SRF 150/600
4 - SRF 160/600
5 - SRF 200/600
6 - SRF 250/600
7 - SRF 315/600
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)


SRF
SRF (L=900 mm)
1 - SRF 100/900
2 - SRF 125/900
3 - SRF 150/900
4 - SRF 160/900
5 - SRF 200/900
6 - SRF 250/900
7 - SRF 315/900
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)


SRF
SRF (L=2000 mm)
1 - SRF 100/2000
2 - SRF 125/2000
3 - SRF 150/2000
4 - SRF 160/2000
5 - SRF 200/2000
6 - SRF 250/2000
7 - SRF 315 /2000
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)

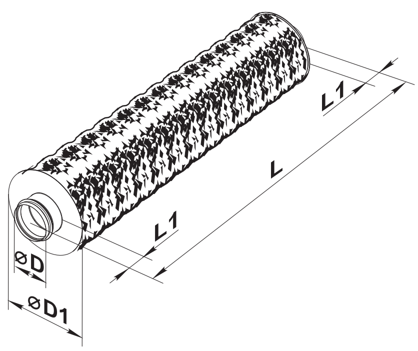
Series
SRP

Series
SRN

Application
A silencer is used for the noise absorption generated by the ventilation units and spreading via the air ducts of the ventilation system. The devices are applied for placing in circular ducts. It considerably reduces the level of noise in an air duct (see fig. "Noise Level Reduction"). A silencer is used with a fan with sound insulation case when it is necessary to reduce the level of noise not only of the air duct but also of the device itself.

Design
- **SRP** series silencer case is composed of outer and inner flexible ducts made of aluminum laminated foil on steel wiring. Inner duct is made of perforated aluminum laminated foil and insulated with mineral wool (thickness of 25 mm). The silencer is equipped with connecting flanges with rubber gaskets for leakproof connection to air ducts.
- **SRN** series silencer case is composed of outer and inner flexible ducts made of metallized polyester foil on steel wiring. Inner duct is insulated with mineral wool (thickness of 25 mm). The silencer is equipped with connecting flanges with rubber gaskets for leakproof connection to air ducts.

Mounting
silencer can be connected to the circular air ducts with clamps. For the most effective way of noise level reducing fix silencers in one by one manner. To avoid a flexible silencer deflection it is necessary to fix also the central part.



Legend:

Series	Duct diameter, mm	/	Length, mm
SRP SRN	100; 125; 150; 160; 200; 250; 315		500; 600; 750; 900; 1200; 1500;2000

Type	Dimensions, mm				Weight, kg
	ØD	ØD1	L	L1	
SRP 100/500	99	162	600	50	0,56
SRP 100/600	99	162	700	50	0,62
SRP 100/750	99	162	850	50	0,72
SRP 100/900	99	162	1000	50	0,82
SRP 100/1200	99	162	1300	50	1,02
SRP 100/1500	99	162	1600	50	1,22
SRP 100/2000	99	162	2100	50	1,55
SRP 125/500	124	187	600	50	0,66
SRP 125/600	124	187	700	50	0,74
SRP 125/750	124	187	850	50	0,86
SRP 125/900	124	187	1000	50	0,97
SRP 125/1200	124	187	1300	50	1,21
SRP 125/1500	124	187	1600	50	1,44
SRP 125/2000	124	187	2100	50	1,83
SRP 150/500	149	212	600	50	0,91
SRP 150/600	149	212	700	50	1,00
SRP 150/750	149	212	850	50	1,14
SRP 150/900	149	212	1000	50	1,27
SRP 150/1200	149	212	1300	50	1,54
SRP 150/1500	149	212	1600	50	1,81
SRP 150/2000	149	212	2100	50	2,27
SRP 160/500	159	212	600	50	0,94
SRP 160/600	159	212	700	50	1,03
SRP 160/750	159	212	850	50	1,16
SRP 160/900	159	212	1000	50	1,30
SRP 160/1200	159	212	1300	50	1,57
SRP 160/1500	159	212	1600	50	1,84
SRP 160/2000	159	212	2100	50	2,29
SRP 200/500	199	264	600	50	1,25
SRP 200/600	199	264	700	50	1,36
SRP 200/750	199	264	850	50	1,53
SRP 200/900	199	264	1000	50	1,71
SRP 200/1200	199	264	1300	50	2,05
SRP 200/1500	199	264	1600	50	2,40
SRP 200/2000	199	264	2100	50	2,98
SRP 250/500	249	314	600	50	1,53
SRP 250/600	249	314	700	50	1,67
SRP 250/750	249	314	850	50	1,88
SRP 250/900	249	314	1000	50	2,09
SRP 250/1200	249	314	1300	50	2,51
SRP 250/1500	249	314	1600	50	2,93
SRP 250/2000	249	314	2100	50	3,63
SRP 315/500	314	365	600	50	1,87
SRP 315/600	314	365	700	50	2,04
SRP 315/750	314	365	850	50	2,30
SRP 315/900	314	365	1000	50	2,55
SRP 315/1200	314	365	1300	50	3,06
SRP 315/1500	314	365	1600	50	3,56
SRP 315/2000	314	365	2100	50	4,41

Type	Dimensions, mm				Weight, kg
	ØD	ØD1	L	L1	
SRN 100/500	99	162	600	50	0,56
SRN 100/600	99	162	700	50	0,62
SRN 100/750	99	162	850	50	0,72
SRN 100/900	99	162	1000	50	0,82
SRN 100/1200	99	162	1300	50	1,02
SRN 100/1500	99	162	1600	50	1,22
SRN 100/2000	99	162	2100	50	1,55
SRN 125/500	124	187	600	50	0,66
SRN 125/600	124	187	700	50	0,74
SRN 125/750	124	187	850	50	0,86
SRN 125/900	124	187	1000	50	0,97
SRN 125/1200	124	187	1300	50	1,21
SRN 125/1500	124	187	1600	50	1,44
SRN 125/2000	124	187	2100	50	1,83
SRN 150/500	149	212	600	50	0,91
SRN 150/600	149	212	700	50	1,00
SRN 150/750	149	212	850	50	1,14
SRN 150/900	149	212	1000	50	1,27
SRN 150/1200	149	212	1300	50	1,54
SRN 150/1500	149	212	1600	50	1,81
SRN 150/2000	149	212	2100	50	2,27
SRN 160/500	159	212	600	50	0,94
SRN 160/600	159	212	700	50	1,03
SRN 160/750	159	212	850	50	1,16
SRN 160/900	159	212	1000	50	1,30
SRN 160/1200	159	212	1300	50	1,57
SRN 160/1500	159	212	1600	50	1,84
SRN 160/2000	159	212	2100	50	2,29
SRN 200/500	199	264	600	50	1,25
SRN 200/600	199	264	700	50	1,36
SRN 200/750	199	264	850	50	1,53
SRN 200/900	199	264	1000	50	1,71
SRN 200/1200	199	264	1300	50	2,05
SRN 200/1500	199	264	1600	50	2,40
SRN 200/2000	199	264	2100	50	2,98
SRN 250/500	249	314	600	50	1,53
SRN 250/600	249	314	700	50	1,67
SRN 250/750	249	314	850	50	1,88
SRN 250/900	249	314	1000	50	2,09
SRN 250/1200	249	314	1300	50	2,51
SRN 250/1500	249	314	1600	50	2,93
SRN 250/2000	249	314	2100	50	3,63
SRN 315/500	314	365	600	50	1,87
SRN 315/600	314	365	700	50	2,04
SRN 315/750	314	365	850	50	2,30
SRN 315/900	314	365	1000	50	2,55
SRN 315/1200	314	365	1300	50	3,06
SRN 315/1500	314	365	1600	50	3,56
SRN 315/2000	314	365	2100	50	4,41

Series
SR

Application
plate silencer is used for the noise absorption generated by the ventilation units and spreading via the air ducts of the ventilation system. The devices are applied for placing in rectangular ducts. It considerably reduces the level of noise in an air duct (see fig. "Noise Level Reduction"). A silencer is used with a fan with sound insulation case when it is necessary to reduce the level of noise not only of the air duct but also of the device itself.

Design
- SR series silencer case and cover of the plates are made of galvanized steel. Plates are filled with noncombustible sound proofing material with a protective coating preventing the fibers blowing.

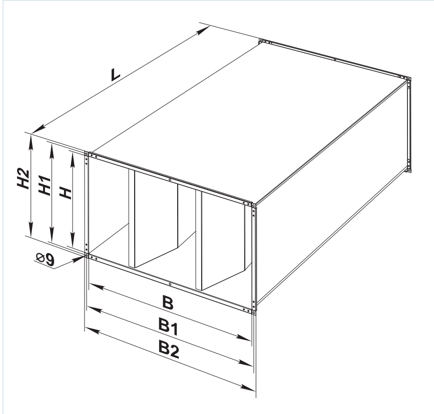
Mounting
Silencer are connected to the air ducts with flanges. It is necessary to follow the air flow direction accordingly to arrow placed on the silencer case and provide at least 1 m straight-line for the maximal noise reduction. To reach the best result it is recommended to install silencer in one by one manner.

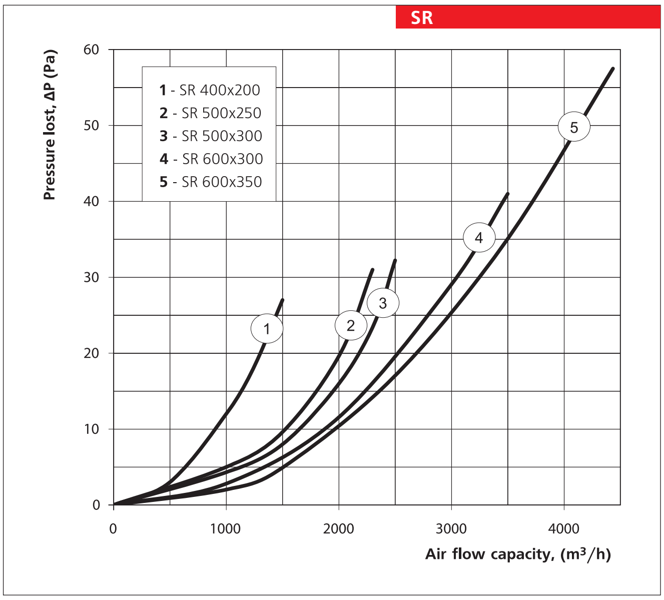
	Noise reduction, dBA (octave-frequency band, Hz)							
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SR 400x200	3	7	10	23	27	30	25	22
SR 500x250	3	6	11	22	26	25	27	22
SR 500x300	3	6	10	23	24	25	23	18
SR 600x300	3	6	10	21	24	30	24	17
SR 600x350	3	5	11	22	25	29	24	21
SR 700x400	4	7	10	15	22	19	21	18
SR 800x500	5	6	11	17	21	20	22	20
SR 900x500	3	6	10	16	20	20	21	15
SR 1000x500	4	6	11	16	21	21	23	17

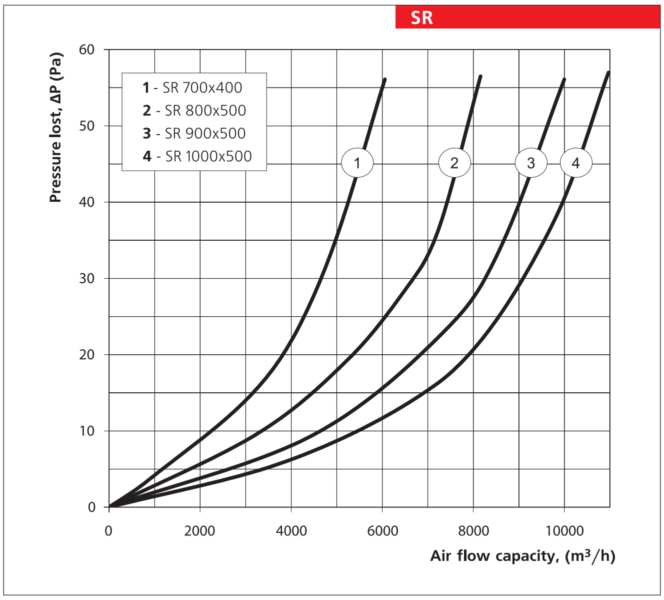
Legend:

Series	Flange dimension (WxH), mm
SR	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500

Type	Dimensions, mm							Weight, kg
	B	B1	B2	H	H1	H2	L	
SR 400x200	400	420	440	200	220	240	950	18,5
SR 500x250	500	520	540	250	270	290	950	20,5
SR 500x300	500	520	540	300	320	340	950	24,5
SR 600x300	600	620	640	300	320	340	950	26,5
SR 600x350	600	620	640	350	370	390	950	28,7
SR 700x400	700	720	740	400	420	440	1010	36,7
SR 800x500	800	820	840	500	520	540	1010	50,0
SR 900x500	900	920	940	500	520	540	1010	51,7
SR 1000x500	1000	1020	1040	500	520	540	1010	57,3







Series
FB

Series
FBV

Application
Cassette air filters are designed for intake and exhaust air cleaning in HVAC systems. Filters are assigned for air ducts, heat exchangers, fans, automatic devices and other ventilation units protection from dust minimizing the possibility of the walls and ceilings located near the air diffusers being polluted. Rough filter may be used as a first purification stage before undergoing more effective filters.

Design
Filter case is made of galvanized steel. Filter box is equipped with connecting flanges with rubber gasket for leak proof connection to air ducts. Filter cover is equipped with locks for a quick access to a removable filtering element. The filtering element is made of synthetic fibers and is fixed to a framing made of steel.

FB – filter with a plane filtering element (G4 filtration class)

FBV – filter with V-shaped element with an increased filtration area (G4 filtration class).

Mounting
Filter is connected to circular air ducts with clamps. The direction of the airflow should correspond to the arrows on the filter. During the installation it is necessary to leave the space for the maintenance access.

Replaceable filter element CF

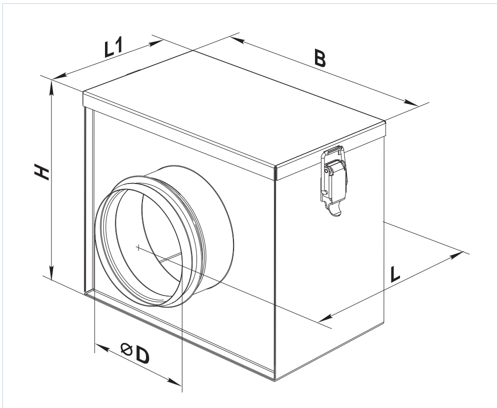
Replaceable filter element CFB

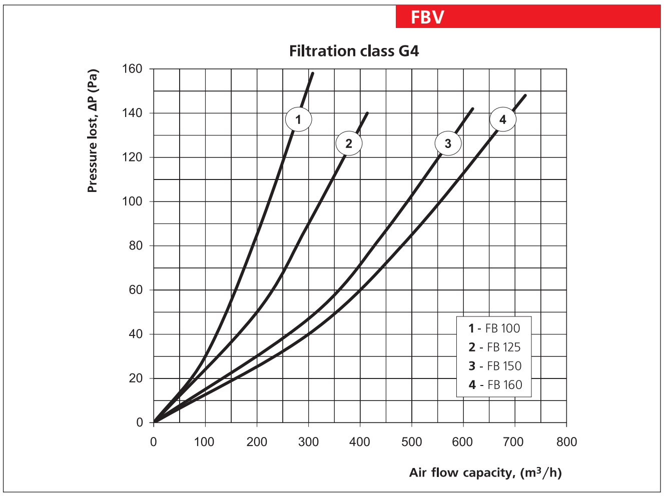
Legend:

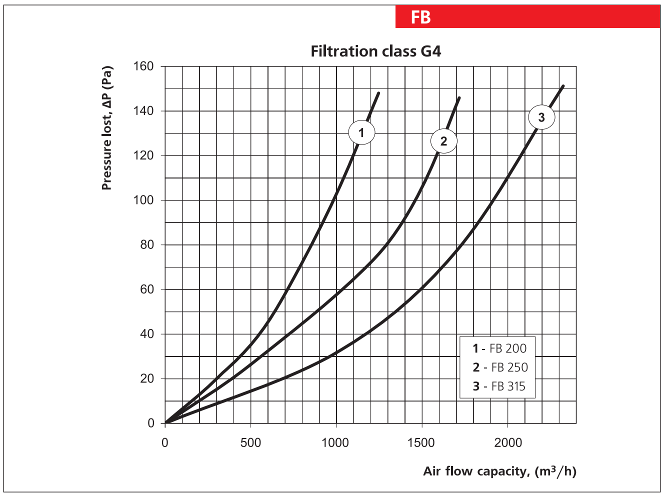
Series	Flange diameter , mm
FB FBV CF CFB	100; 125; 150; 160; 200; 250; 315

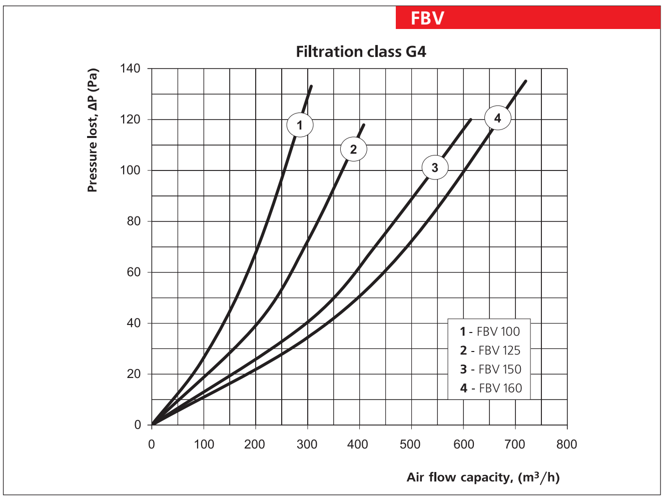
Type	Dimensions, mm					Weight, kg
	ØD	B	H	L	L1	
FB 100	99	210	175	215	123	1,4
FB 125	124	220	209	235	143	1,7
FB 150	149	270	237	250	158	2,5
FB 160	159	270	237	250	158	2,3
FB 200	199	320	279	275	183	3,1
FB 250	249	370	327	325	233	4,5
FB 315	314	430	392	425	333	6,7

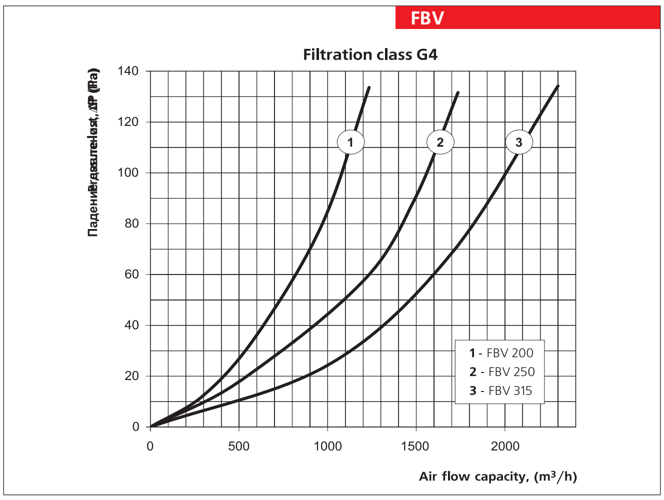
Type	Dimensions, mm					Weight, kg
	ØD	B	H	L	L1	
FBV 100	99	233	175	215	123	1,4
FBV 125	124	243	209	235	143	1,7
FBV 150	149	293	237	250	158	2,2
FBV 160	159	293	237	250	158	2,2
FBV 200	199	343	279	275	183	3,1
FBV 250	249	393	327	325	233	4,2
FBV 315	314	453	392	425	333	6,3











Series
FB

■ **Application**
Cassette air filters are designed for intake and exhaust air cleaning in HVAC systems. Filters are assigned for air ducts, heat exchangers, fans, automatic devices and other ventilation units protection from dust minimizing the possibility of the walls and ceilings located near the air diffusers being polluted. Rough filter may be used as a first purification stage before undergoing more effective filters.

■ **Design**
Filter case is made of galvanized steel. Filtering element is made of synthetic fibers (G4 filtration class) and has several waves for the filtration area increasing. It is protected from becoming deformed by the airflow by means of metal net. Filter cover is equipped with locks for a quick access to a removable filtering element. The filters are of small size what is of a great help with a limited space available.

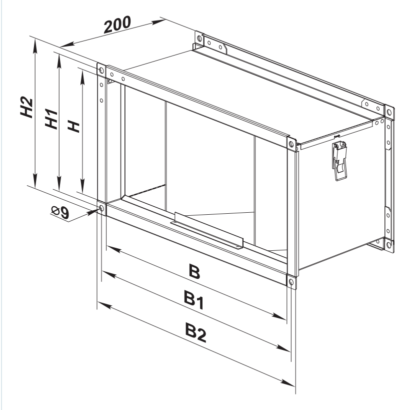
■ **Mounting**
Filters are installed in front of the heater and fan, directed to the airflow. The installation is held by means of flange connection. The airflow direction should correspond to the filter arrow. During the installation it is necessary to leave the space for the maintenance access.

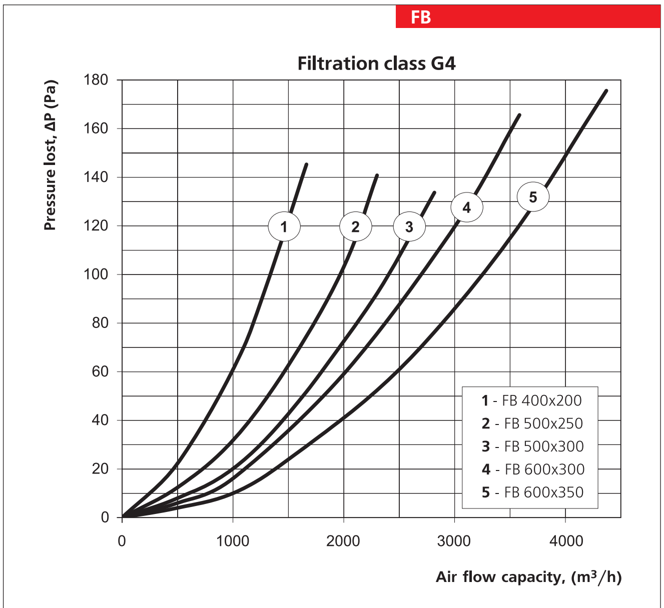
Replaceable filter element CF

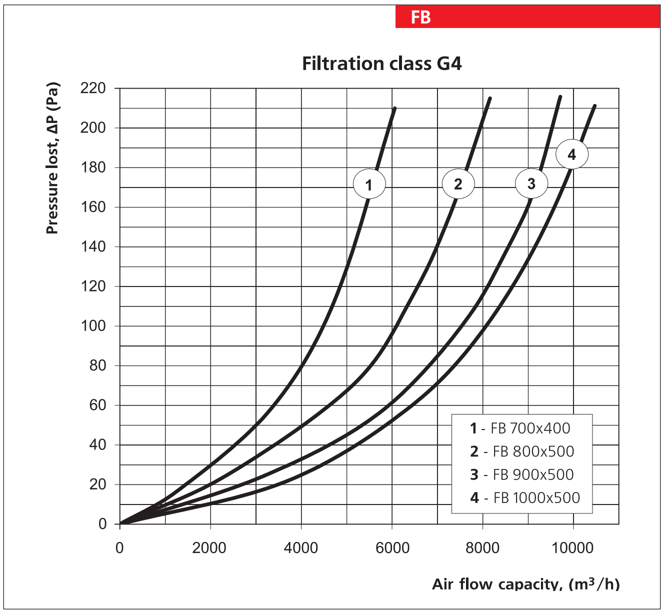
Legend:

Series	Flange dimension (WxH), mm
FB CF	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500

Type	Dimensions, mm						Weight, kg
	B	B1	B2	H	H1	H2	
FB 400x200	400	420	440	200	220	240	2,4
FB 500x250	500	520	540	250	270	290	4,1
FB 500x300	500	520	540	300	320	340	4,4
FB 600x300	600	620	640	300	320	340	5,2
FB 600x350	600	620	640	350	370	390	5,8
FB 700x400	700	720	740	400	420	440	6,7
FB 800x500	800	820	840	500	520	540	7,9
FB 1000x500	1000	1020	1040	500	520	540	8,9







Series
FBK

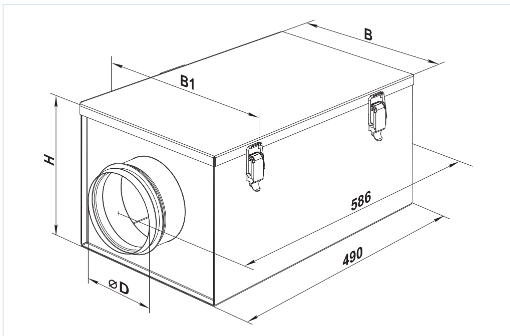
Application
Pocket air filters are designed for fresh air cleaning, sometimes - for extract air cleaning in the HVAC systems. Filters are assigned for air ducts, heat exchangers, fans, automatic devices and other ventilation units protection from dust minimizing the possibility of the walls and ceilings located near the air diffusers being polluted. . Rough filter may be used as a first purification stage before undergoing more effective filters.

Design
Filter case is made of galvanized steel. Filter box is equipped with connecting flanges with rubber gasket for leak proof connection to air ducts. Filter cover is equipped with locks for a quick access to a removable filtering element. The filtering element (G4, F4, F7 filtration class) is made of synthetic fibers and is fixed to a frame made of steel.

Mounting
Filter is connected to circular air ducts with clamps in a horizontal or vertical position. The direction of the airflow should correspond to the arrows on the filter. Airflow should be down-directed to avoid the filter pockets creasing at vertical installation. During the installation it is necessary to leave the space for the maintenance access.

Replaceable filter element CFK

Type	Dimensions, mm				Weight, kg
	ØD	B	B1	H	
FBK 100	99	210	230	170	2,41
FBK 125	124	220	240	206	2,69
FBK 150	149	270	290	236	3,20
FBK 160	159	270	290	236	3,26
FBK 200	199	320	340	276	3,76
FBK 250	249	370	390	386	4,39
FBK 315	314	430	450	390	5,17

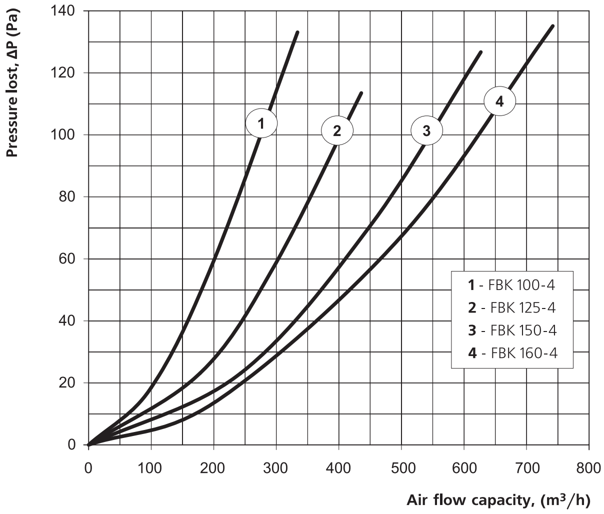


Legend:

Series	Flange diameter, mm
FBK CFK	100; 125; 150; 160; 200; 250; 315

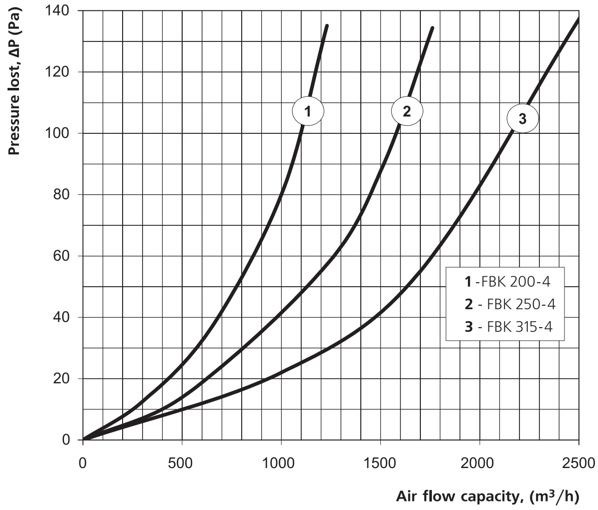
FBK

Filtration class G4



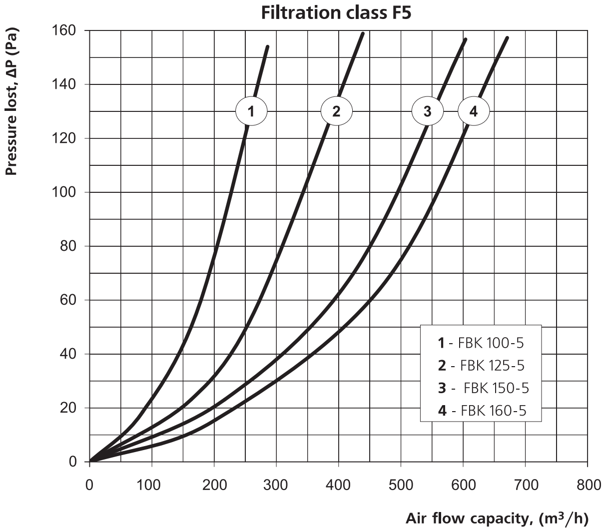
FBK

Filtration class G4



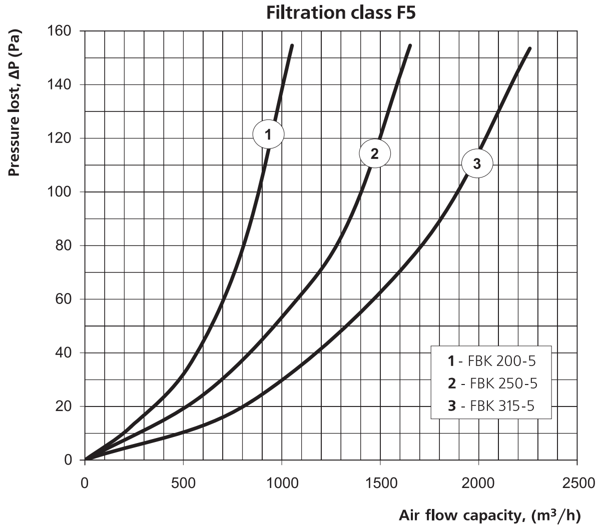
FBK

Filtration class F5



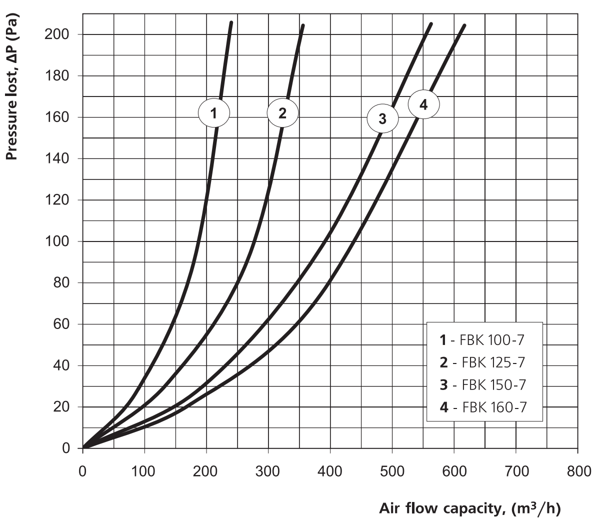
FBK

Filtration class F5



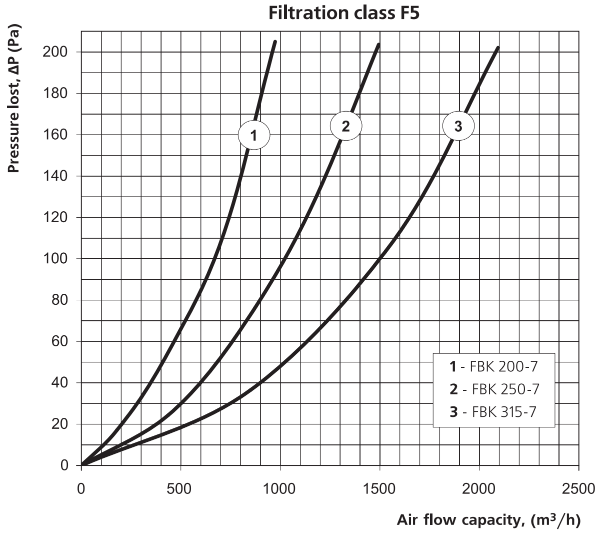
FBK

Filtration class F7



FBK

Filtration class F5



FBK

POCKET FILTERS SERIES

Series
FBK

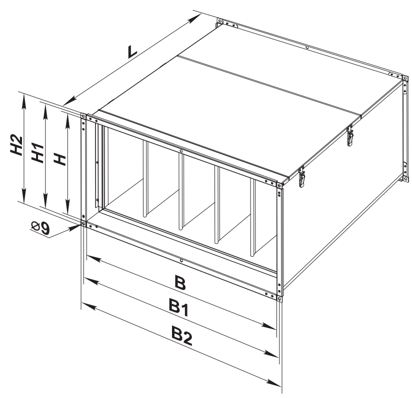
Application
Pocket air filters are designed for fresh air cleaning, sometimes - for extract air cleaning in the HVAC systems. Filters are assigned for air ducts, heat exchangers, fans, automatic devices and other ventilation units protection from dust minimizing the possibility of the walls and ceilings located near the air diffusers being polluted. Rough filter may be used as a first purification stage before undergoing more effective filters.

Design
Filter case is made of galvanized steel. Filter box is equipped with connecting flanges with rubber gasket for leak proof connection to air ducts. Filter cover is equipped with locks for a quick access to a removable filtering element. The filtering element (G4, F4, F7 filtration class) is made of synthetic fibers and is fixed to a frame made of steel.

Mounting
Filter is connected to circular air ducts with flange connection in a horizontal or vertical position. The direction of the airflow should correspond to the arrows on the filter. Airflow should be down-directed to avoid the filter pockets creasing at vertical installation. During the installation it is necessary to leave the space for the maintenance access.

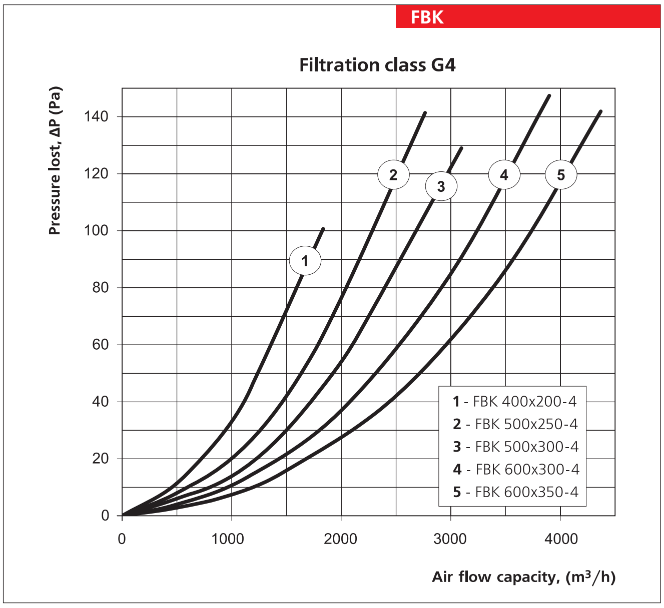
Replaceable filter element CFK

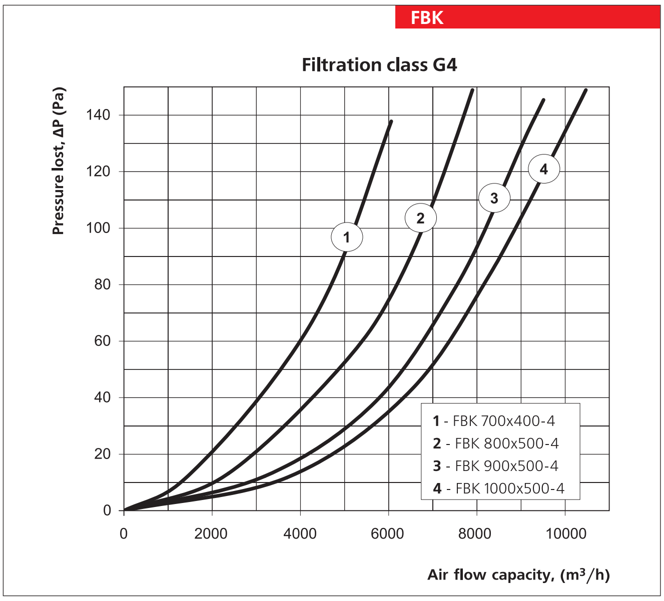
Type	Dimensions, mm							Weight, кг
	B	B1	B2	H	H1	H2	L	
FBK 400x200	400	420	440	200	220	240	500	6,2
FBK 500x250	500	520	540	250	270	290	600	7,8
FBK 500x300	500	520	540	300	320	340	600	8,3
FBK 600x300	600	620	640	300	320	340	600	8,9
FBK 600x350	600	620	640	350	370	390	600	9,5
FBK 700x400	700	720	740	400	420	440	720	16,2
FBK 800x500	800	820	840	500	520	540	800	20,4
FBK 900x500	900	920	940	500	520	540	800	21,7
FBK 1000x500	1000	1020	1040	500	570	540	800	23,5

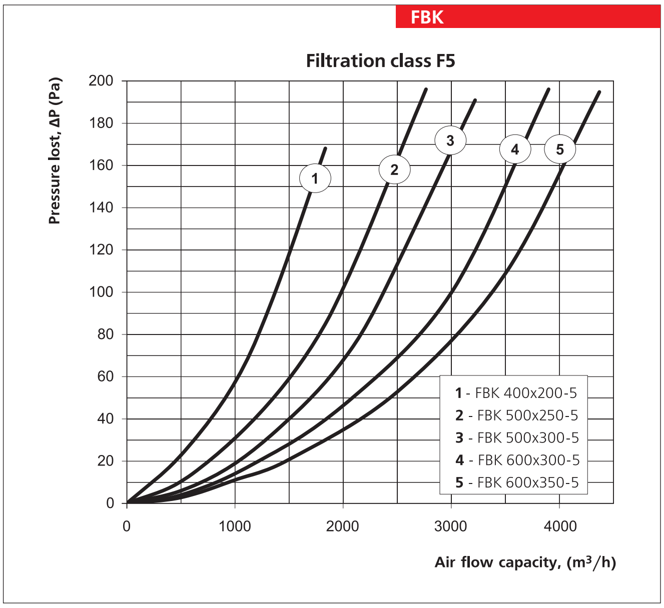


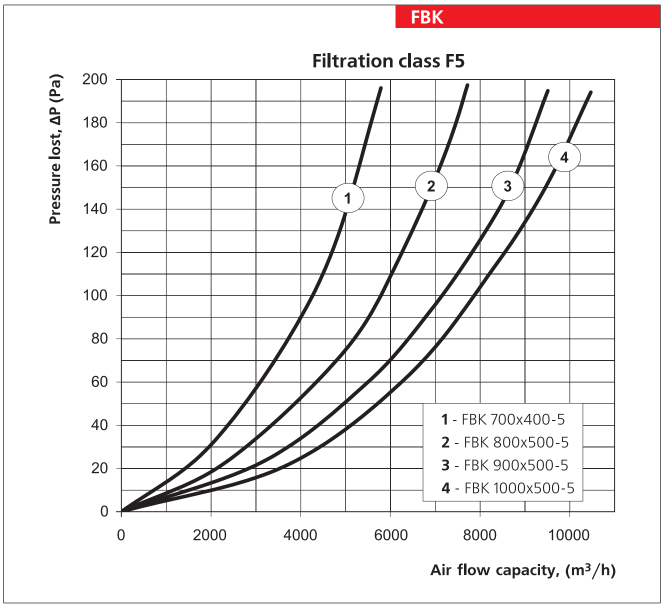
Legend:

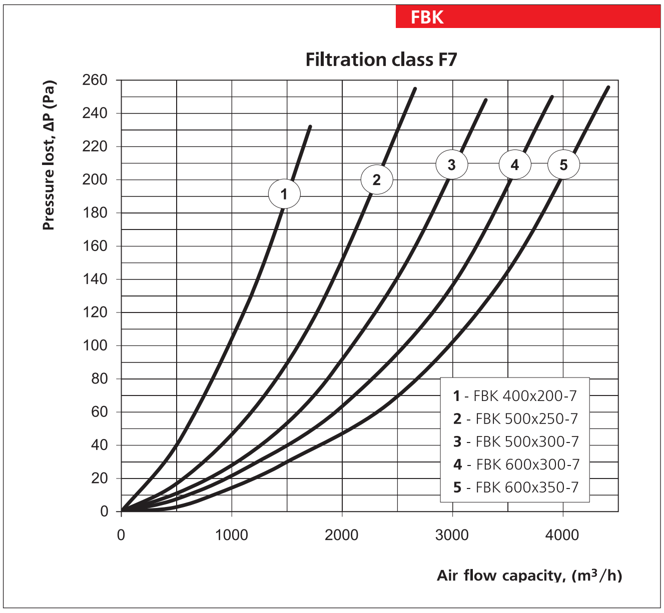
Series	Flange dimension (WxH), mm
FBK CFK	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500

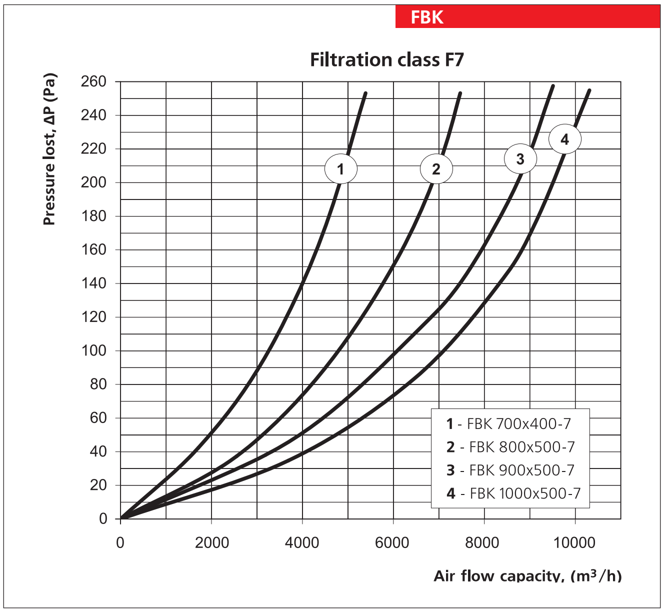

FBK
Filtration class G4
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140
0 1000 2000 3000 4000
Air flow capacity, (m³/h)
1 - FBK 400x200-4
2 - FBK 500x250-4
3 - FBK 500x300-4
4 - FBK 600x300-4
5 - FBK 600x350-4


FBK
Filtration class G4
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140
0 2000 4000 6000 8000 10000
Air flow capacity, (m³/h)
1 - FBK 700x400-4
2 - FBK 800x500-4
3 - FBK 900x500-4
4 - FBK 1000x500-4


FBK
Filtration class F5
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140 160 180 200
0 1000 2000 3000 4000
Air flow capacity, (m³/h)
1 - FBK 400x200-5
2 - FBK 500x250-5
3 - FBK 500x300-5
4 - FBK 600x300-5
5 - FBK 600x350-5


FBK
Filtration class F5
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140 160 180 200
0 2000 4000 6000 8000 10000
Air flow capacity, (m³/h)
1 - FBK 700x400-5
2 - FBK 800x500-5
3 - FBK 900x500-5
4 - FBK 1000x500-5


FBK
Filtration class F7
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140 160 180 200 220 240 260
0 1000 2000 3000 4000
Air flow capacity, (m³/h)
1 - FBK 400x200-7
2 - FBK 500x250-7
3 - FBK 500x300-7
4 - FBK 600x300-7
5 - FBK 600x350-7


FBK
Filtration class F7
Pressure lost, ΔP (Pa)
0 20 40 60 80 100 120 140 160 180 200 220 240 260
0 2000 4000 6000 8000 10000
Air flow capacity, (m³/h)
1 - FBK 700x400-7
2 - FBK 800x500-7
3 - FBK 900x500-7
4 - FBK 1000x500-7

Series
NK

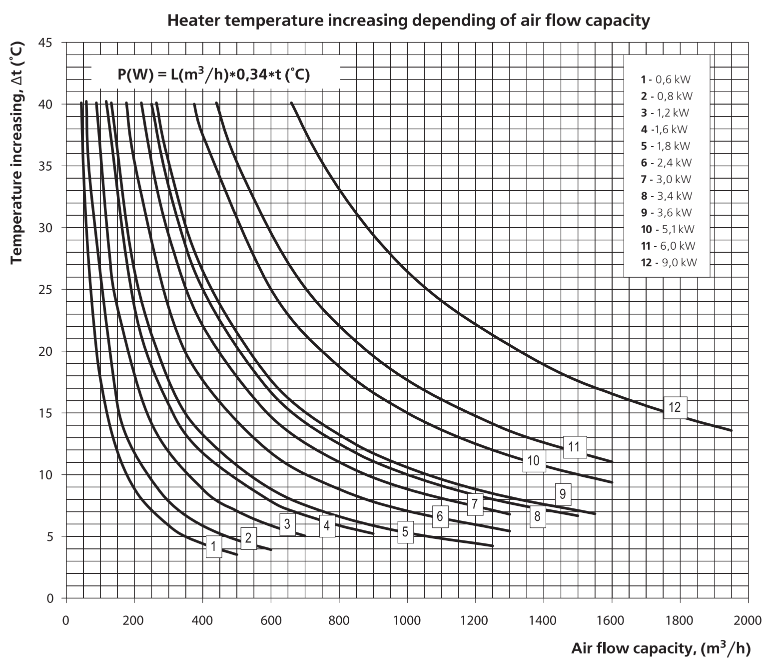
Application
Electric heaters are designed for heating the incoming air in ventilation systems with round cross-section. Heaters are used to warm the air in heating facilities, ventilation and air conditioning systems in various premises.

Design
The case and terminal box are made of galvanized sheet steel and the heating elements are made of stainless steel. To ensure pressure tight joint with the air ducts heaters are supplied with rubber seals. NK-series heaters are supplied with two thermostatic switches that provide overheating control:
- primary protection with automatic restart (response temperature +50°C). After cooling down the thermostatic switch automatically closes the heater's control circuit.
- emergency protection with manual restart (response temperature +90°C). In case of actuation of emergency protection power supply can be fed to the heating device only after the failure condition has been reset manually.

Several power capacity versions are available for each unit size. Greater output capacity can be achieved if heaters are attached consequently one after one.

Mounting
- Design of the heater allows fixing it by clamps on round air ducts. Air flow direction should correspond with the direction of the arrow placed on air heater. Heaters can be installed in any position except for position with downward-facing electrical control unit (the danger of condensate water flowing in and causing electrical circuit closure).
- It is recommended to install the heater in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the heater protecting the heating elements from contamination.
- The recommended distance between the heating device and all other elements is not less than two connecting diameters.
- The heaters are designed for the minimum air flow speed equal to 1,5 m/s and for the maximum operative temperature of the exhaust air equal to 40°C. If applying fan speed control, make sure that minimum air flow capacity rate is provided through the heating device.
- It is forbidden to feed power supply to the heating device while the fan is shut down.
- For correct and safe operation of heaters we recommend you to use automation system that provides complex control and protection:
  - ✓ automatic control of power adjustment and air heating temperature;
  - ✓ tracking filter condition by means of differential pressure sensor;
  - ✓ blocking power supply to heater in case of inlet fan shutdown or air flow speed reduction, and also in the event of in-built overheat control thermostatic switches actuation;
  - ✓ disabling ventilation system equipped with air blowing of heater's tubular heating elements (THE).

NK

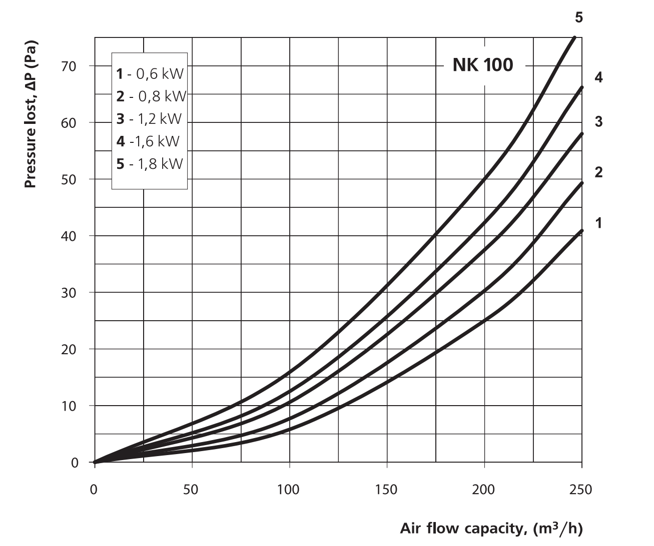


Legend:

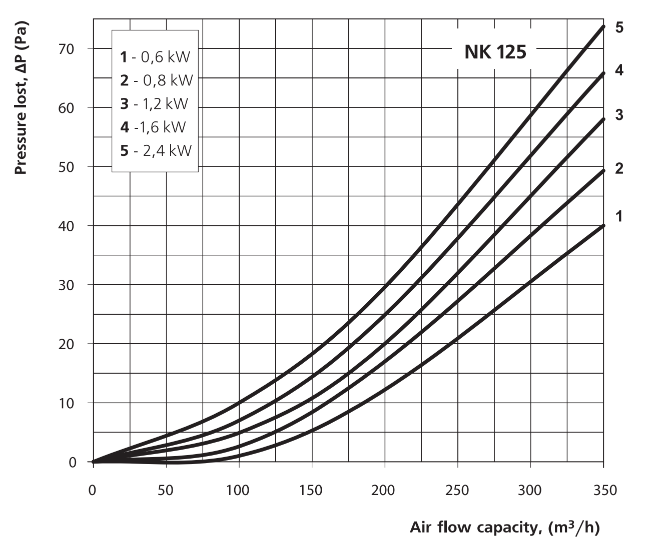
Series	Flange diameter, mm	-	Heater's capacity, kW	-	Phase
NK	100; 125; 150; 160; 200; 250; 315		0,6; 0,8; 1,2; 1,6; 1,8; 2,4; 3,4; 3,6; 5,1; 6,0; 9,0		1 – single-phase; 3 – three-phase

	Min. air pass, m^3/h	Consumption current, A	Voltage, V	Power, kW	Number of heating elements x kW	Phase
NK-100-0,6-1	60	2,6	230	0,6	1x0,6	1
NK-100-0,8-1	80	3,5	230	0,8	1x0,8	1
NK-100-1,2-1	90	5,2	230	1,2	2x0,6	1
NK-100-1,6-1	120	7,0	230	1,6	2x0,8	1
NK-100-1,8-1	130	7,8	230	1,8	3x0,6	1
NK-125-0,6-1	60	2,6	230	0,6	1x0,6	1
NK-125-0,8-1	80	3,5	230	0,8	1x0,8	1
NK-125-1,2-1	90	5,2	230	1,2	2x0,6	1
NK-125-1,6-1	120	7,0	230	1,6	2x0,8	1
NK-125-2,4-1	150	7,8	230	2,4	3x0,8	1
NK-150-1,2-1	120	5,2	230	1,2	1x1,2	1
NK-150-2,4-1	150	10,4	230	2,4	2x1,2	1
NK-150-3,4-1	220	14,7	230	3,4	2x1,7	1
NK-150-3,6-3	265	5,2	400	3,6	3x1,2	3
NK-150-5,1-3	320	7,4	400	5,1	3x1,7	3
NK-150-6,0-3	360	8,7	400	6,0	3x2,0	3
NK-160-1,2-1	150	5,2	230	1,2	1x1,2	1
NK-160-2,4-1	180	10,4	230	2,4	2x1,2	1
NK-160-3,4-1	250	14,8	230	3,4	2x1,7	1
NK-160-3,6-3	265	5,2	400	3,6	3x1,2	3
NK-160-5,1-3	375	7,4	400	5,1	3x1,7	3
NK-160-6,0-3	440	8,7	400	6,0	3x2,0	3
NK-200-1,2-1	150	5,2	230	1,2	1x1,2	1
NK-200-2,4-1	180	10,4	230	2,4	2x1,2	1
NK-200-3,4-1	250	14,8	230	3,4	2x1,7	1
NK-200-3,6-3	265	5,2	400	3,6	3x1,2	3
NK-200-5,1-3	375	7,4	400	5,1	3x1,7	3
NK-200-6,0-3	440	8,7	400	6,0	3x2,0	3
NK-250-1,2-1	180	5,2	230	1,2	1x1,2	1
NK-250-2,4-1	265	10,4	230	2,4	2x1,2	1
NK-250-3,0-1	375	13,0	230	3,0	1x3,0	1
NK-250-3,6-3	375	5,2	400	3,6	3x1,2	3
NK-250-6,0-3	440	8,7	400	6,0	3x2,0	3
NK-250-9,0-3	660	13,0	400	9,0	3x3,0	3
NK-315-1,2-1	180	5,2	230	1,2	1x1,2	1
NK-315-2,4-1	265	10,4	230	2,4	2x1,2	1
NK-315-3,6-3	375	5,2	400	3,6	3x1,2	3
NK-315-6,0-3	440	8,7	400	6,0	3x2,0	3
NK-315-9,0-3	660	13,0	400	9,0	3x3,0	3

NK



NK



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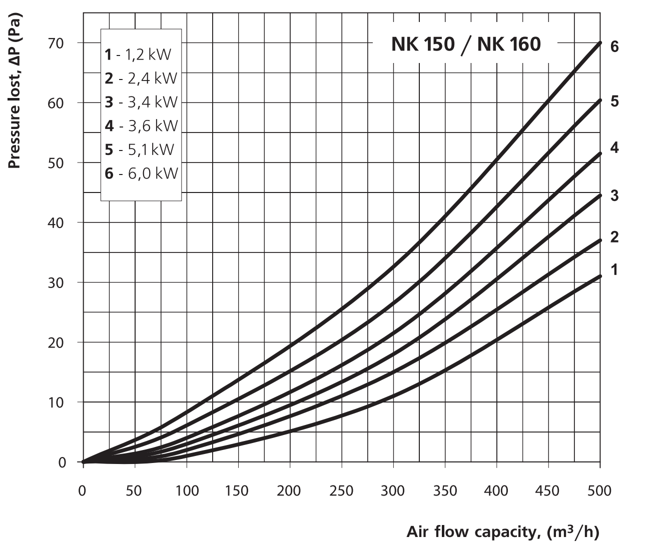

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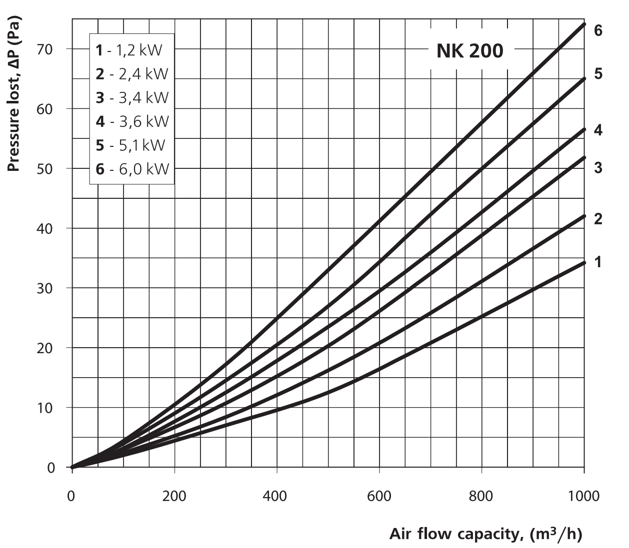

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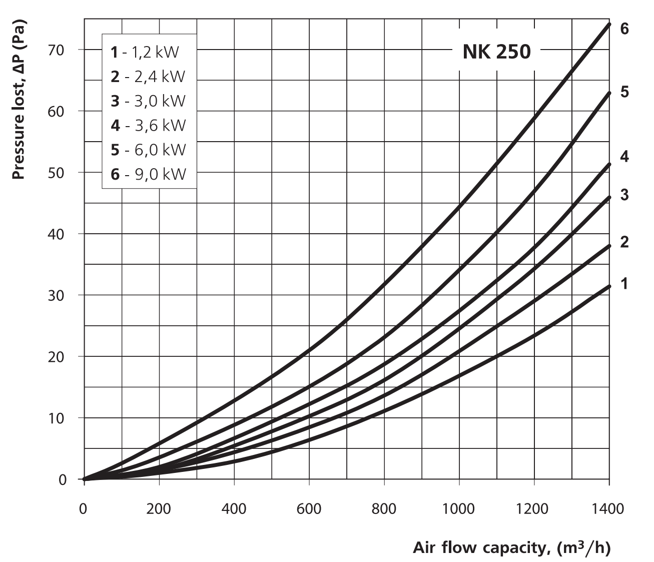
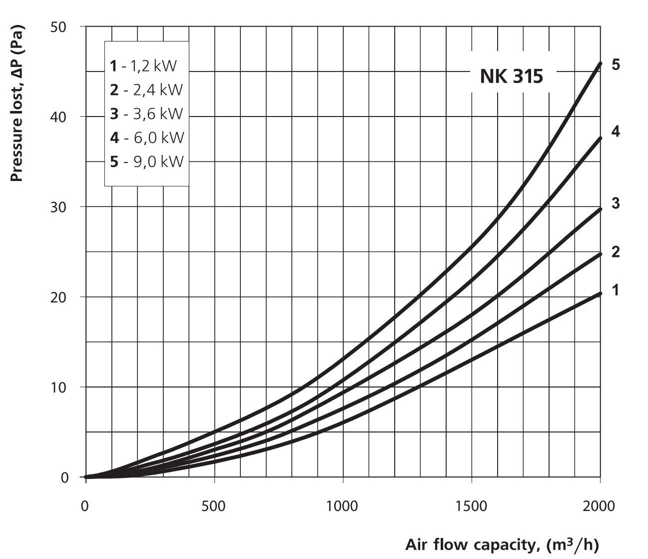
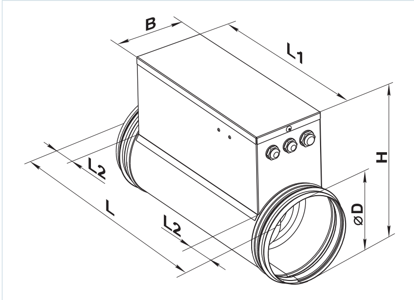


NK



Type	Dimensions, mm						Weight, kg
	ØD	B	H	L	L1	L2	
NK-100-0,6-1	99	94	207	306	226	40	2,6
NK-100-0,8-1	99	94	207	306	226	40	2,6
NK-100-1,2-1	99	94	207	306	226	40	2,9
NK-100-1,6-1	99	94	207	306	226	40	2,9
NK-100-1,8-1	99	94	207	376	296	40	3,1
NK-125-0,6-1	124	103	230	306	226	40	2,4
NK-125-0,8-1	124	103	230	306	226	40	2,4
NK-125-1,2-1	124	103	230	306	226	40	2,7
NK-125-1,6-1	124	103	230	306	226	40	2,7
NK-125-2,4-1	124	103	230	376	296	40	3,0
NK-150-1,2-1	149	120	255	306	226	40	2,5
NK-150-2,4-1	149	120	255	306	226	40	3,1
NK-150-3,4-1	149	120	255	306	226	40	3,1
NK-150-3,6-3	149	120	255	376	296	40	4,1
NK-150-5,1-3	149	120	255	376	296	40	4,1
NK-150-6,0-3	149	120	255	376	296	40	4,1
NK-160-1,2-1	159	120	267	306	226	40	2,1
NK-160-2,4-1	159	120	267	306	226	40	2,9
NK-160-3,4-1	159	120	267	306	226	40	3,2
NK-160-3,6-3	159	120	267	376	296	40	3,9
NK-160-5,1-3	159	120	267	376	296	40	3,9
NK-160-6,0-3	159	120	267	376	296	40	3,9
NK-200-1,2-1	199	150	302	294	214	40	2,4
NK-200-2,4-1	199	150	302	294	214	40	3,2
NK-200-3,4-1	199	150	302	294	214	40	3,3
NK-200-3,6-3	199	150	302	376	296	40	4,1
NK-200-5,1-3	199	150	302	376	296	40	4,1
NK-200-6,0-3	199	150	302	376	296	40	4,1
NK-250-1,2-1	249	150	356	306	226	40	2,4
NK-250-2,4-1	249	150	356	306	226	40	2,6
NK-250-3,0-1	249	150	356	306	226	40	2,4
NK-250-3,6-3	249	150	356	376	296	40	2,9
NK-250-6,0-3	249	150	356	376	296	40	2,9
NK-250-9,0-3	249	150	356	376	296	40	2,9
NK-315-1,2-1	313	150	425	294	214	40	2,6
NK-315-2,4-1	313	150	425	294	214	40	2,8
NK-315-3,6-3	313	150	425	376	296	40	3,1
NK-315-6,0-3	313	150	425	376	296	40	3,1
NK-315-9,0-3	313	150	425	376	296	40	3,1



Series
NK

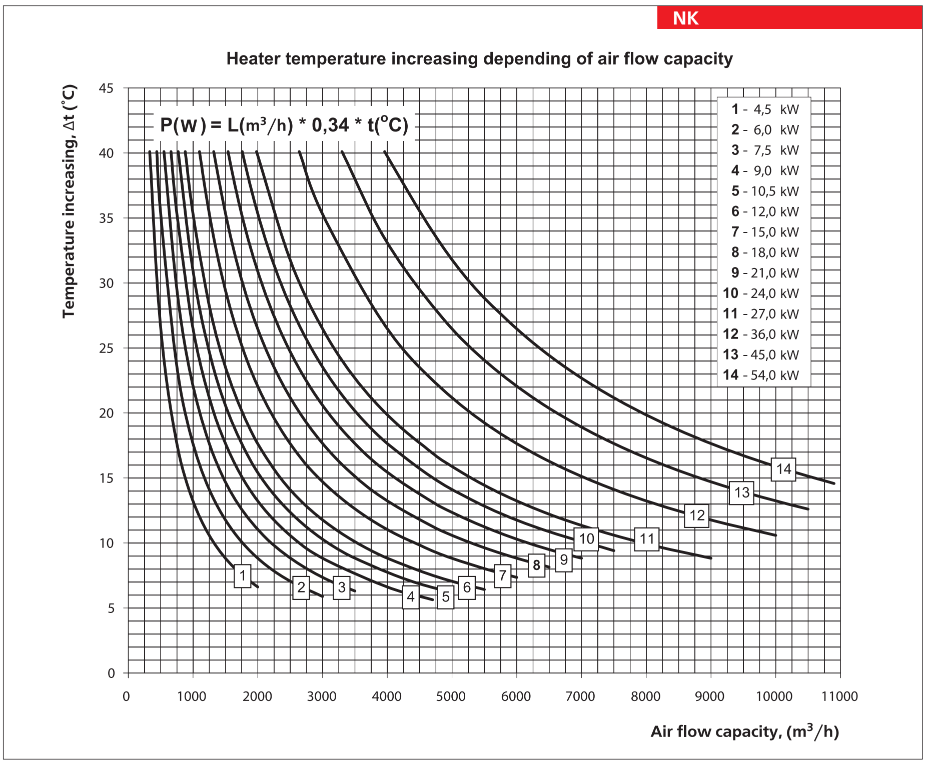
Application
Electric heaters are designed for heating the incoming air in ventilation systems with rectangular cross-section. Heaters are used to warm the air in heating facilities, ventilation and air conditioning systems in various premises.

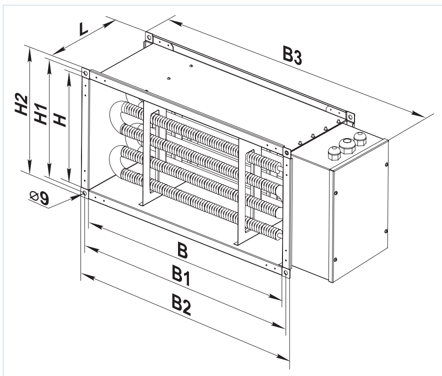
Design
The case and terminal box are made of galvanized sheet steel and the heating elements are made of stainless steel. Heaters are supplied with additional finning to enlarge heat exchange area. NK-series heaters are supplied with two thermostatic switches that provide overheating control:

- primary protection with automatic restart (response temperature +50°C). After cooling down the thermostatic switch automatically closes the heater's control circuit.
- emergency protection with manual restart (response temperature +90°C). In case of actuation of emergency protection power supply can be fed to the heating device only after the failure condition has been reset manually.

Several power capacity versions are available for each unit size. Greater output capacity can be achieved if heaters are attached consequently one after one.

Mounting
- Design of the heater allows fixing it by clamps on round air ducts. Water heaters may be installed in any position allowing its deairing. Air flow direction should correspond with the direction of the arrow placed on air heater.
- It is recommended to install the heater in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the heater protecting the heating elements from contamination.
- Heater may be installed in front or behind the fan. If the heater is placed in front of the fan it's recommended to anticipate air duct between them in the distance not less than two connecting diameters in order to stabilize air flow, as well as not to exceed maximum allowed temperature inside the fan.
- Air heater needs to be connected on the counterflow principle, otherwise its capacity will be reduced by 5-15%. All estimated nomographic charts, included in the catalogue, are true for such type of connection;
- If water is used as heat carrying agent the heating devices can be installed only inside the premises. In case of outdoor mounting an antifreezing mixture should be used as heat carrying agent (for example, ethylene glycol solution);
- For correct and safe operation of heaters we recommend you to use automation system that provides complex control and freezing protection:
  - ✓ automatic control of power adjustment and air heating temperature;
  - ✓ ventilation system startup with heater's pre-heating process;
  - ✓ application of air dampers supplied with servo-controlled actuator with a pull-back spring;
  - ✓ tracking filter condition by means of differential pressure sensor;
  - ✓ shutting down fan in case of heater frost threat.

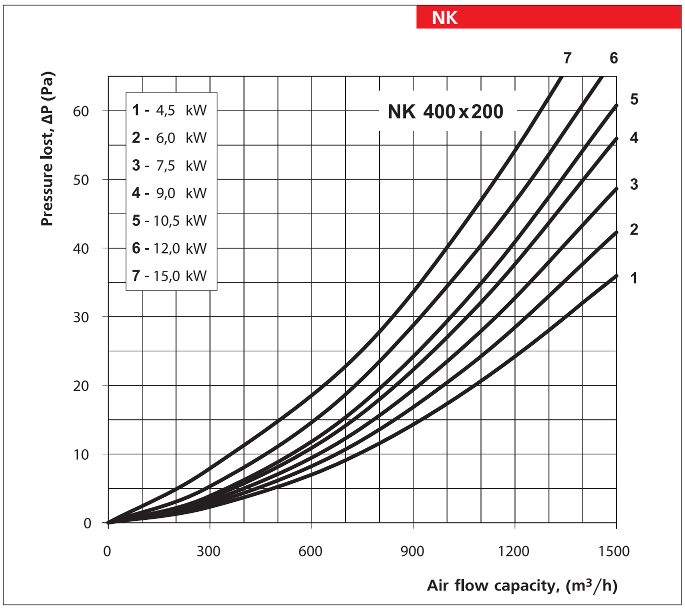


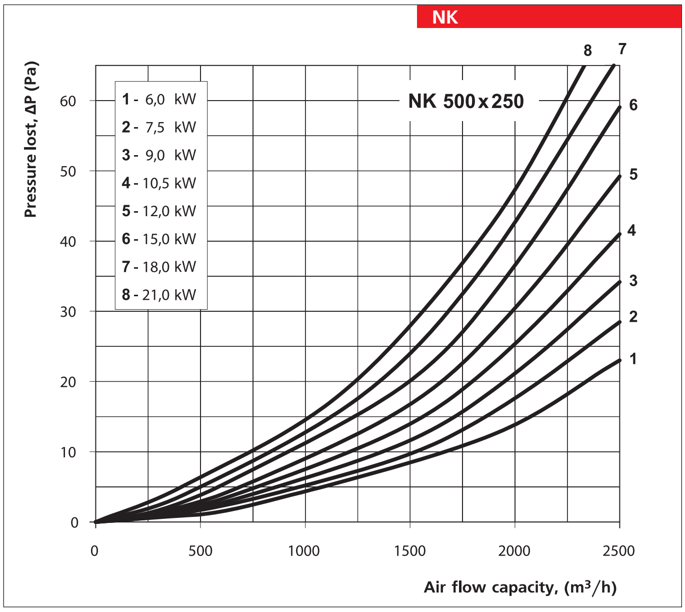


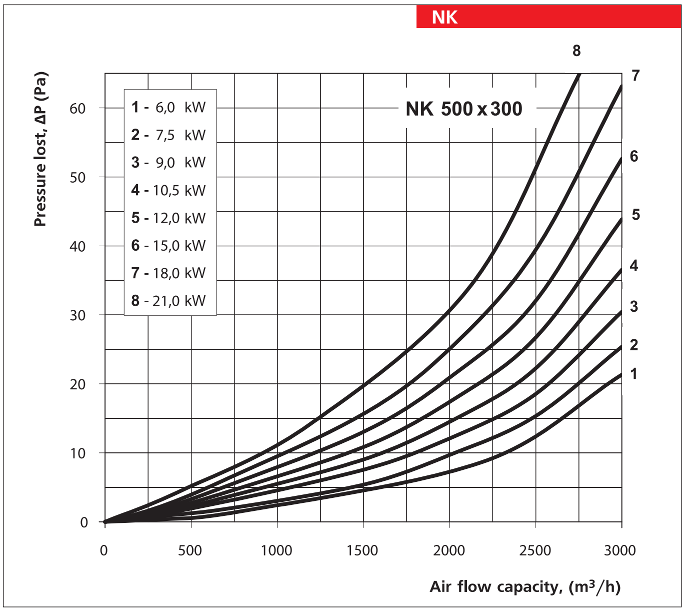
Legend:

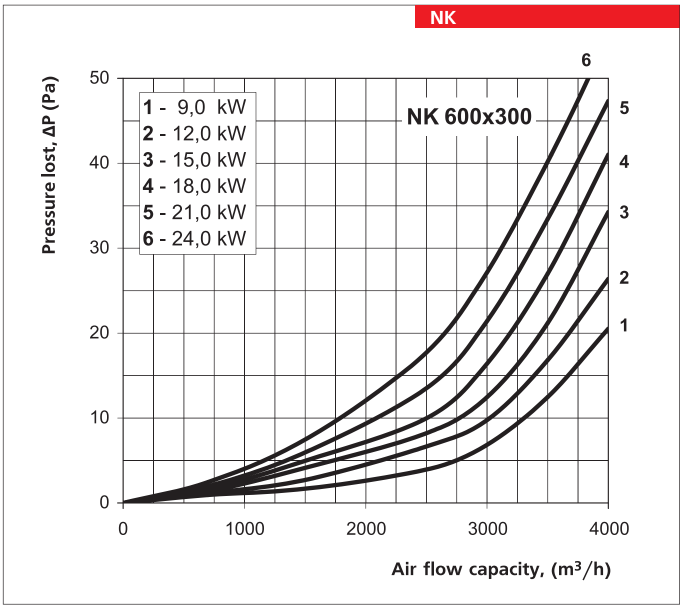
Series	Flange diameter (WxH), mm	-	Heater's capacity, kW	-	Phase
NK	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500.		4,5; 6; 7,5; 9; 10,5; 12; 18; 21; 24; 27; 36; 45; 54		3 - phase

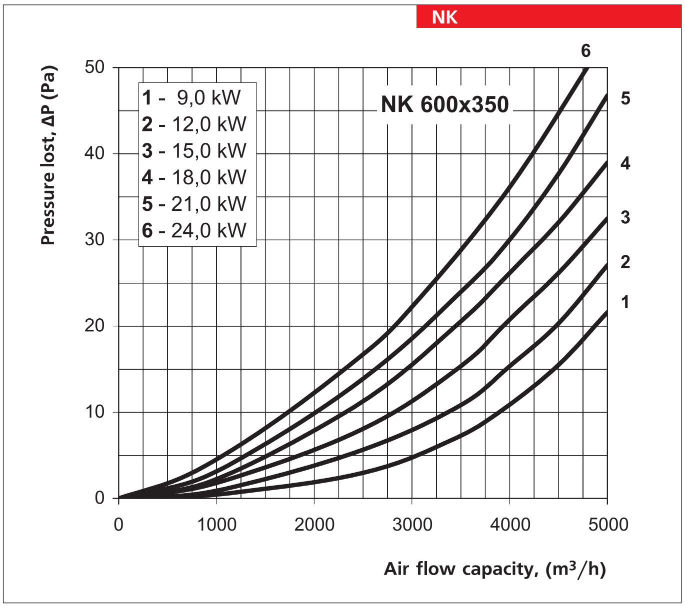
	Min. air pass, m³/h	Consumption current, A	Voltage, V	Power, kW	Quantity of heating elements x kW
NK 400x200-4,5-3	330	6,5	400	4,5	3x1,5
NK 400x200-6,0-3	440	8,7	400	6,0	3x2,0
NK 400x200-7,5-3	550	10,9	400	7,5	3x2,5
NK 400x200-9,0-3	660	13,0	400	9,0	3x3,0
NK 400x200-10,5-3	770	15,2	400	10,5	3x3,5
NK 400x200-12,0-3	880	17,4	400	12,0	3x4,0
NK 400x200-15,0-3	1100	21,7	400	15,0	3x5,0
NK 500x250-6,0-3	440	8,7	400	6,0	3x2,0
NK 500x250-7,5-3	550	10,9	400	7,5	3x2,5
NK 500x250-9,0-3	660	13,0	400	9,0	3x3,0
NK 500x250-10,5-3	770	15,2	400	10,5	3x3,5
NK 500x250-12,0-3	880	17,4	400	12,0	3x4,0
NK 500x250-15,0-3	1100	21,7	400	15,0	3x5,0
NK 500x250-18,0-3	1320	26,0	400	18,0	3x6,0
NK 500x250-21,0-3	1540	30,0	400	21,0	3x7,0
NK 500x300-6,0-3	440	8,7	400	6,0	3x2,0
NK 500x300-7,5-3	550	10,9	400	7,5	3x2,5
NK 500x300-9,0-3	660	13,0	400	9,0	3x3,0
NK 500x300-10,5-3	770	15,2	400	10,5	3x3,5
NK 500x300-12,0-3	880	17,4	400	12,0	3x4,0
NK 500x300-15,0-3	1100	21,7	400	15,0	3x5,0
NK 500x300-18,0-3	1320	26,0	400	18,0	3x6,0
NK 500x300-21,0-3	1540	30,0	400	21,0	3x7,0
NK 600x300-9,0-3	660	13,0	400	9,0	3x3,0
NK 600x300-12,0-3	880	17,4	400	12,0	3x4,0
NK 600x300-15,0-3	1100	21,7	400	15,0	3x5,0
NK 600x300-18,0-3	1320	26,0	400	18,0	3x6,0
NK 600x300-21,0-3	1540	30,0	400	21,0	3x7,0
NK 600x300-24,0-3	1760	34,7	400	24,0	3x8,0
NK 600x350-9,0-3	660	13,0	400	9,0	3x3,0
NK 600x350-12,0-3	880	17,4	400	12,0	3x4,0
NK 600x350-15,0-3	1100	21,7	400	15,0	3x5,0
NK 600x350-18,0-3	1320	26,0	400	18,0	3x6,0
NK 600x350-21,0-3	1540	30,0	400	21,0	3x7,0
NK 600x350-24,0-3	1760	34,7	400	24,0	3x8,0
NK 700x400-18-3	1320	26,0	400	18,0	6x3,0
NK 700x400-27-3	1980	39,0	400	27,0	9x3,0
NK 700x400-36-3	2640	52,0	400	36,0	12x3,0
NK 800x500-27-3	1980	39,0	400	27,0	9x3,0
NK 800x500-36-3	2640	52,0	400	36,0	12x3,0
NK 800x500-54-3	3960	78,0	400	54,0	18x3,0
NK 900x500-45-3	3300	65,0	400	45,0	15x3,0
NK 900x500-54-3	3960	78,0	400	54,0	18x3,0
NK 1000x500-45-3	3300	65,0	400	45,0	15x3,0
NK 1000x500-54-3	3960	78,0	400	54,0	18x3,0

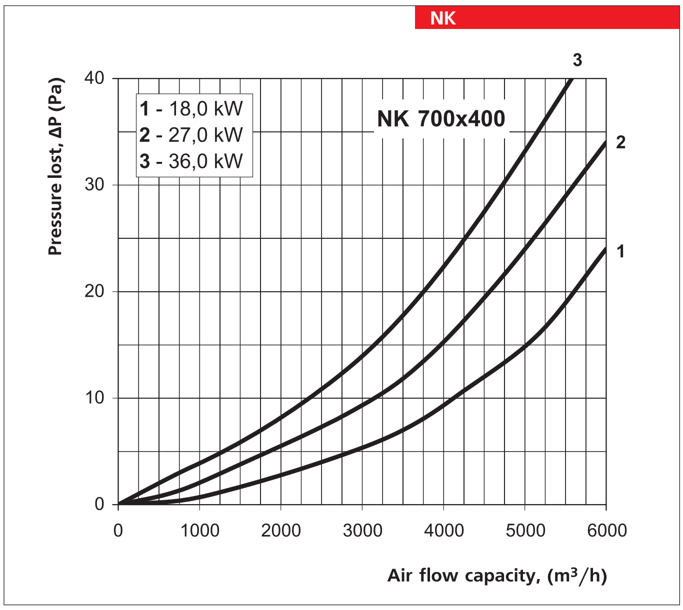

NK
NK 400x200
1 - 4,5 kW
2 - 6,0 kW
3 - 7,5 kW
4 - 9,0 kW
5 - 10,5 kW
6 - 12,0 kW
7 - 15,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
300
600
900
1200
1500
10
20
30
40
50
60

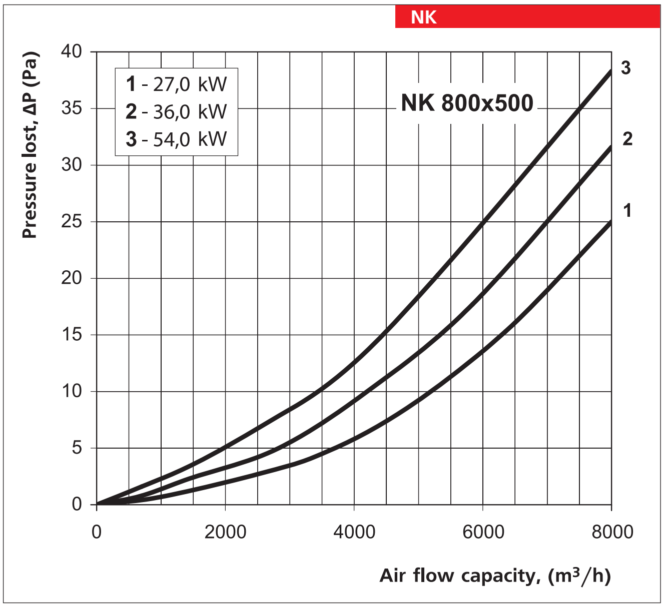

NK
NK 500x250
1 - 6,0 kW
2 - 7,5 kW
3 - 9,0 kW
4 - 10,5 kW
5 - 12,0 kW
6 - 15,0 kW
7 - 18,0 kW
8 - 21,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
500
1000
1500
2000
2500
10
20
30
40
50
60

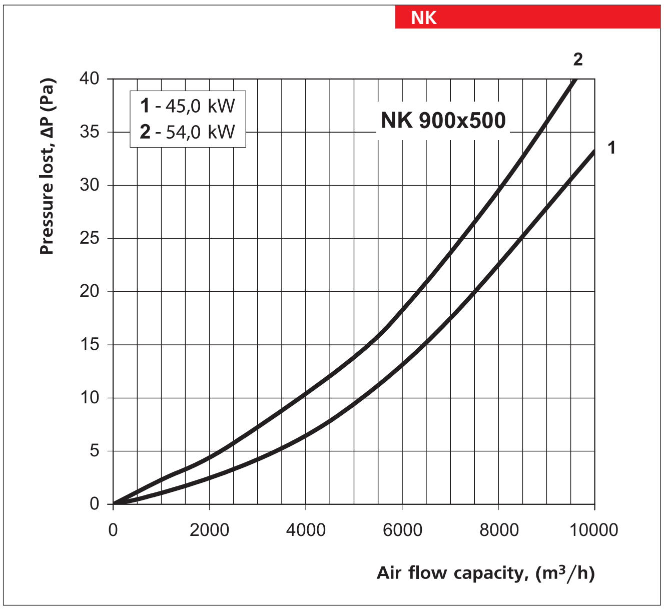

NK
NK 500x300
1 - 6,0 kW
2 - 7,5 kW
3 - 9,0 kW
4 - 10,5 kW
5 - 12,0 kW
6 - 15,0 kW
7 - 18,0 kW
8 - 21,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
500
1000
1500
2000
2500
3000
10
20
30
40
50
60

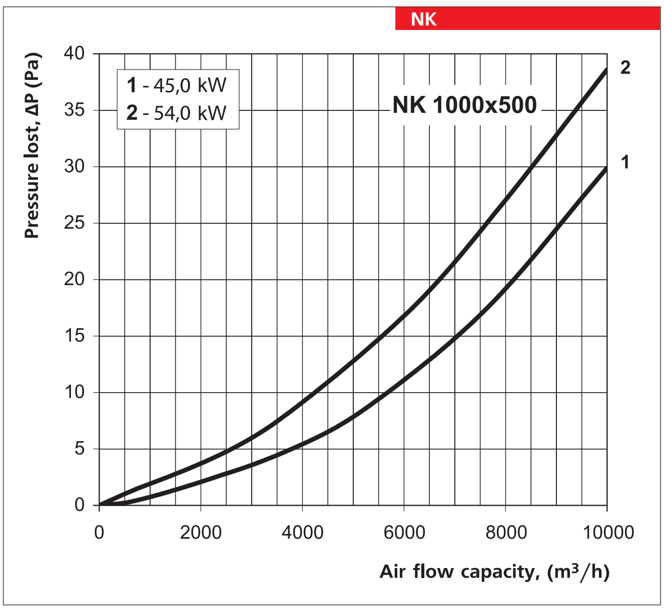

NK
NK 600x300
1 - 9,0 kW
2 - 12,0 kW
3 - 15,0 kW
4 - 18,0 kW
5 - 21,0 kW
6 - 24,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
1000
2000
3000
4000
10
20
30
40
50


NK
NK 600x350
1 - 9,0 kW
2 - 12,0 kW
3 - 15,0 kW
4 - 18,0 kW
5 - 21,0 kW
6 - 24,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
1000
2000
3000
4000
5000
10
20
30
40
50

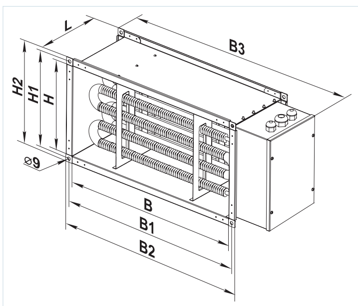

NK
NK 700x400
1 - 18,0 kW
2 - 27,0 kW
3 - 36,0 kW
Pressure lost, ΔP (Pa)
Air flow capacity, (m³/h)
0
1000
2000
3000
4000
5000
6000
10
20
30
40







Type	Dimension, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
NK 400x200-4,5-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-6,0-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-7,5-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-9,0-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-10,5-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-12,0-3	400	420	440	540	200	220	240	200	6,5
NK 400x200-15,0-3	400	420	440	540	200	220	240	200	6,5
NK 500x250-6,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-7,5-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-9,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-10,5-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-12,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-15,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-18,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x250-21,0-3	500	520	540	640	250	270	290	200	7,65
NK 500x300-6,0-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-7,5-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-9,0-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-10,5-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-12,0-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-15,0-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-18,0-3	500	520	540	640	300	320	340	200	8,2
NK 500x300-21,0-3	500	520	540	640	300	320	340	200	8,2
NK 600x300-9,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x300-12,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x300-15,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x300-18,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x300-21,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x300-24,0-3	600	620	640	740	300	320	340	200	9,4
NK 600x350-9,0-3	600	620	640	740	350	370	390	200	9,75
NK 600x350-12,0-3	600	620	640	740	350	370	390	200	9,75
NK 600x350-15,0-3	600	620	640	740	350	370	390	200	9,75
NK 600x350-18,0-3	600	620	640	740	350	370	390	200	9,75
NK 600x350-21,0-3	600	620	640	740	350	370	390	200	9,75
NK 600x350-24,0-3	600	620	640	740	350	370	390	200	9,75
NK 700x400-18-3	700	720	740	840	400	420	440	390	14
NK 700x400-27-3	700	720	740	840	400	420	440	510	18.5
NK 700x400-36-3	700	720	740	840	400	420	440	750	25
NK 800x500-27-3	800	820	840	940	500	520	540	390	19
NK 800x500-36-3	800	820	840	940	500	520	540	510	23,5
NK 800x500-54-3	800	820	840	940	500	520	540	750	30
NK 900x500-45-3	900	920	940	1040	500	520	540	750	31
NK 900x500-54-3	900	920	940	1040	500	520	540	750	33,5
NK 1000x500-45-3	1000	1020	1040	1140	500	520	540	750	33
NK 1000x500-54-3	1000	1020	1040	1140	500	520	540	750	36



Series
NKV

■ **Application**

Water heaters are designed for heating the incoming air in ventilation systems with round cross-section. These heaters can also be used as warmers in inlet and inlet-exhaust units.

■ **Design**

The case and terminal box are made of galvanized sheet, pipe collectors are made of copper tubes and heat exchange surface is made of aluminum plates. To ensure pressure tight joint with the air ducts heaters are supplied with rubber seals. Double and four-row versions of heaters are available. These heaters are designed for operation under the maximum working pressure of 1,6MPa (16 bar) and under the maximum operating water temperature of +100°C. The outlet collector of the heater is supplied with a branch pipe that allows installing a submersible sensor for measuring temperature or freeze protection for air heater. The heater is supplied with an air valve for system deairing.

■ **Mounting**

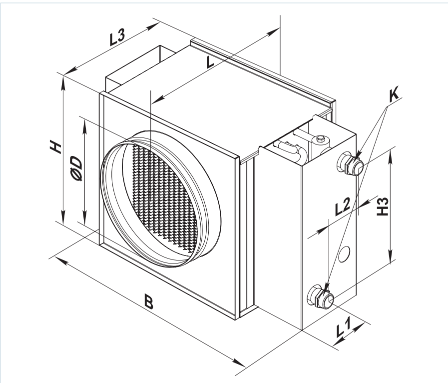
- Design of the heater allows fixing it by clamps on round air ducts. Water heaters may be installed in any position allowing its deairing. Air flow direction should correspond with the direction of the arrow placed on air heater.
- It is recommended to install the heater in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the heater protecting the heating elements from contamination.
- Heater may be installed in front or behind the fan. If the heater is placed in front of the fan it's recommended to anticipate air duct between them in the distance not less than two connecting diameters in order to stabilize air flow, as well as not to exceed maximum allowed temperature inside the fan.
- Air heater needs to be connected on the counterflow principle, otherwise its capacity will be reduced by 5-15%. All estimated nomographic charts, included in the catalogue, are true for such type of connection;
- If water is used as heat carrying agent the heating devices can be installed only inside the premises. In case of outdoor mounting an antifreezing mixture should be used as heat carrying agent (for example, ethylene glycol solution);
- For correct and safe operation of heaters we recommend you to use automation system that provides complex control and freezing protection:

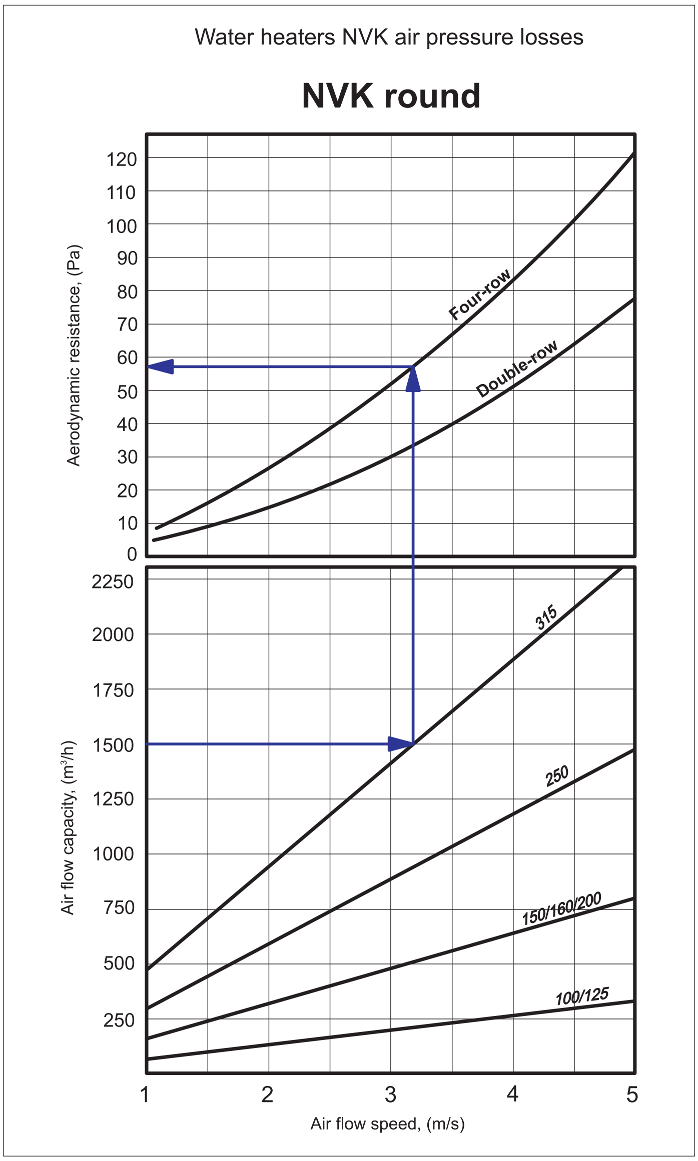
✓ automatic control of power adjustment and air heating temperature;
✓ application of air dampers supplied with servo-controlled actuator with a pull-back spring;
✓ tracking filter condition by means of differential pressure sensor;
✓ tracking filter condition by means of differential pressure sensor;
✓ shutting down fan in case of heater frost threat.

Legend:

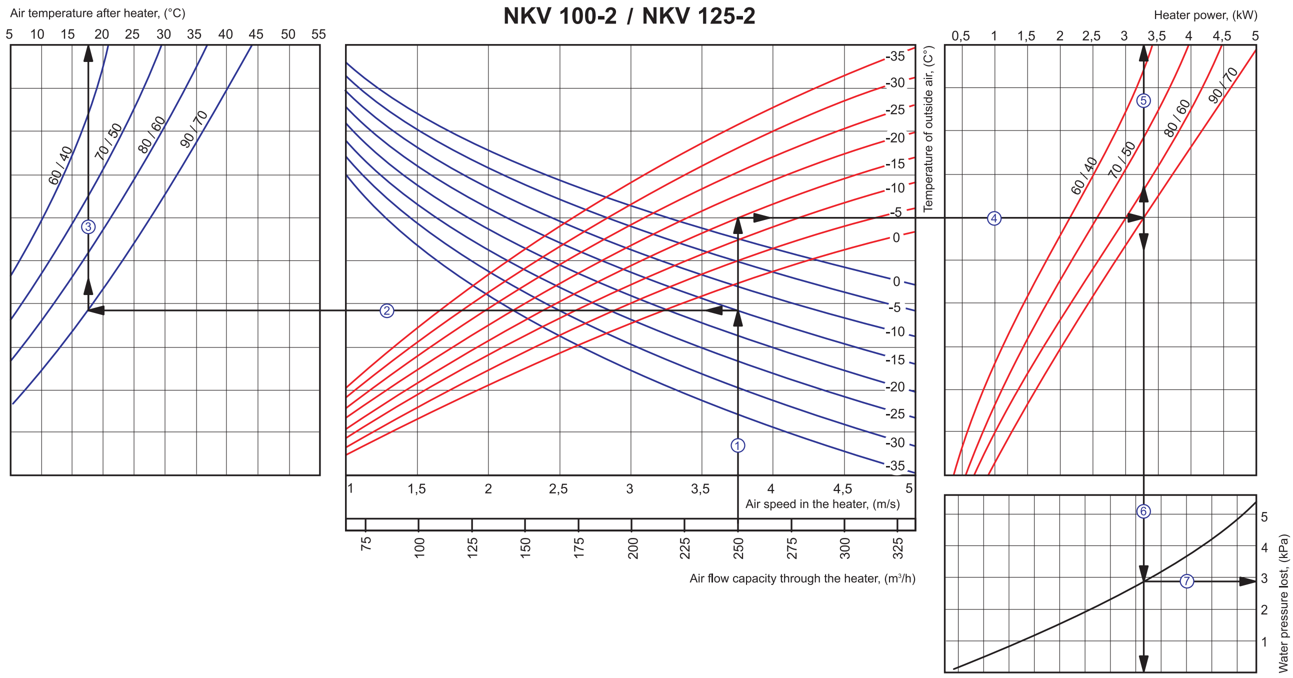
Series	Flange diameter, mm	-	Number of pipes' rows
NKV	100; 125; 150; 160; 200; 250; 315		2; 4

Type	Dimensions, mm									Number of pipes' rows	Weight, kg
	ØD	B	H	H3	L	L1	L2	L3	K		
NKV 100-2	99	350	230	150	300	32	43	220	G 3/4"	2	3,9
NKV 100-4	99	350	230	150	300	28	65	220	G 3/4"	4	5,2
NKV 125-2	124	350	230	150	300	32	43	220	G 3/4"	2	4,0
NKV 125-4	124	350	230	150	300	28	65	220	G 3/4"	4	5,3
NKV 150-2	149	400	280	200	300	32	43	220	G 3/4"	2	7,5
NKV 150-4	149	400	280	200	300	28	65	220	G 3/4"	4	8,2
NKV 160-2	159	400	280	200	300	32	43	220	G 3/4"	2	7,5
NKV 160-4	159	400	280	200	300	28	65	220	G 3/4"	4	8,2
NKV 200-2	198	400	280	200	300	32	43	220	G 3/4"	2	7,5
NKV 200-4	198	400	280	200	300	28	65	220	G 3/4"	4	8,2
NKV 250-2	248	470	350	270	350	32	43	270	G 1"	2	10,3
NKV 250-4	248	470	350	270	350	28	65	270	G 1"	4	10,8
NKV 315-2	313	550	430	350	450	57	43	370	G 1"	2	12,6
NKV 315-4	313	550	430	350	450	53	65	370	G 1"	4	13,4





NKV

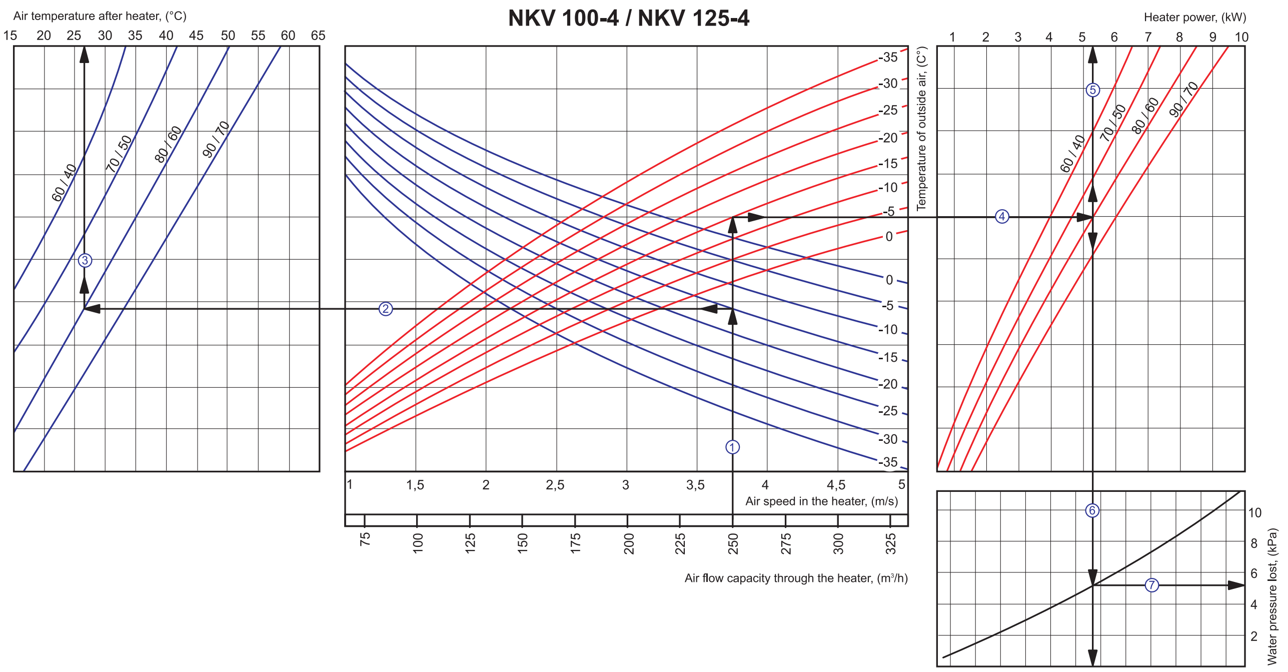


Example of water heater parameters determination:

On condition that air flow capacity is 250 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (17,50°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (3,25kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,042 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (2,9 kPa).

NKV



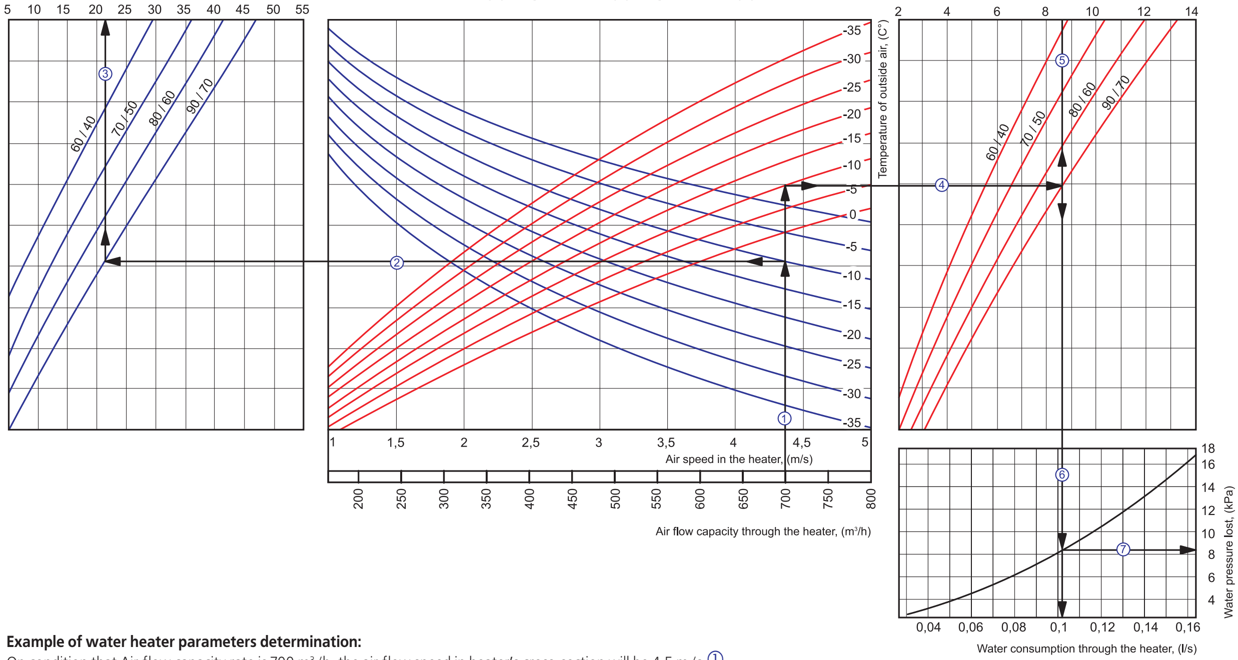
Example of water heater parameters determination:

On condition that Air flow capacity rate is 250 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 60/80) and then erect a perpendicular to the axis of air temperature after the heater (27°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (5,2kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,067 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (5,2 kPa).

NKV

NKV 150-2 / NKV 160-2 / NKV 200-2



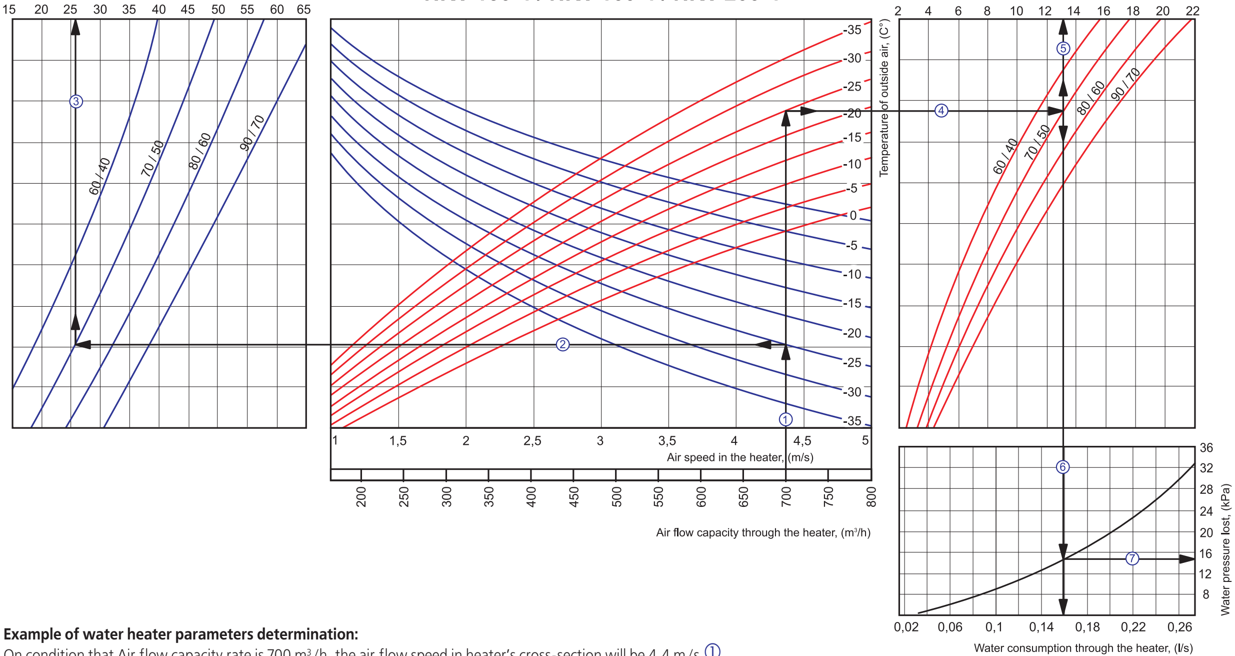
Example of water heater parameters determination:

On condition that Air flow capacity rate is 700 m³/h, the air flow speed in heater's cross-section will be 4,5 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -10°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (21°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -10°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (8,6 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,11 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (8,2 kPa).

NKV

NKV 150-4 / NKV 160-4 / NKV 200-4

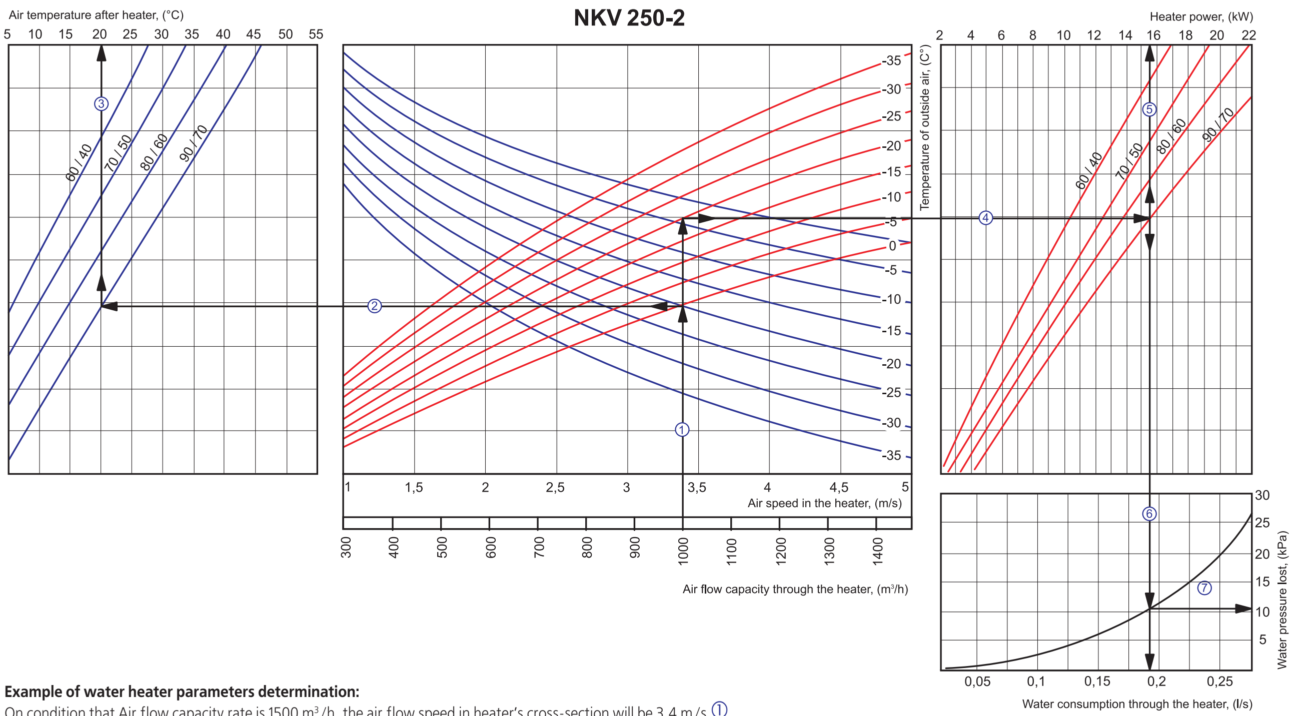


Example of water heater parameters determination:

On condition that Air flow capacity rate is 700 m³/h, the air flow speed in heater's cross-section will be 4,4 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (26°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -25°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (13,0kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,16 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (15 kPa).

NKV

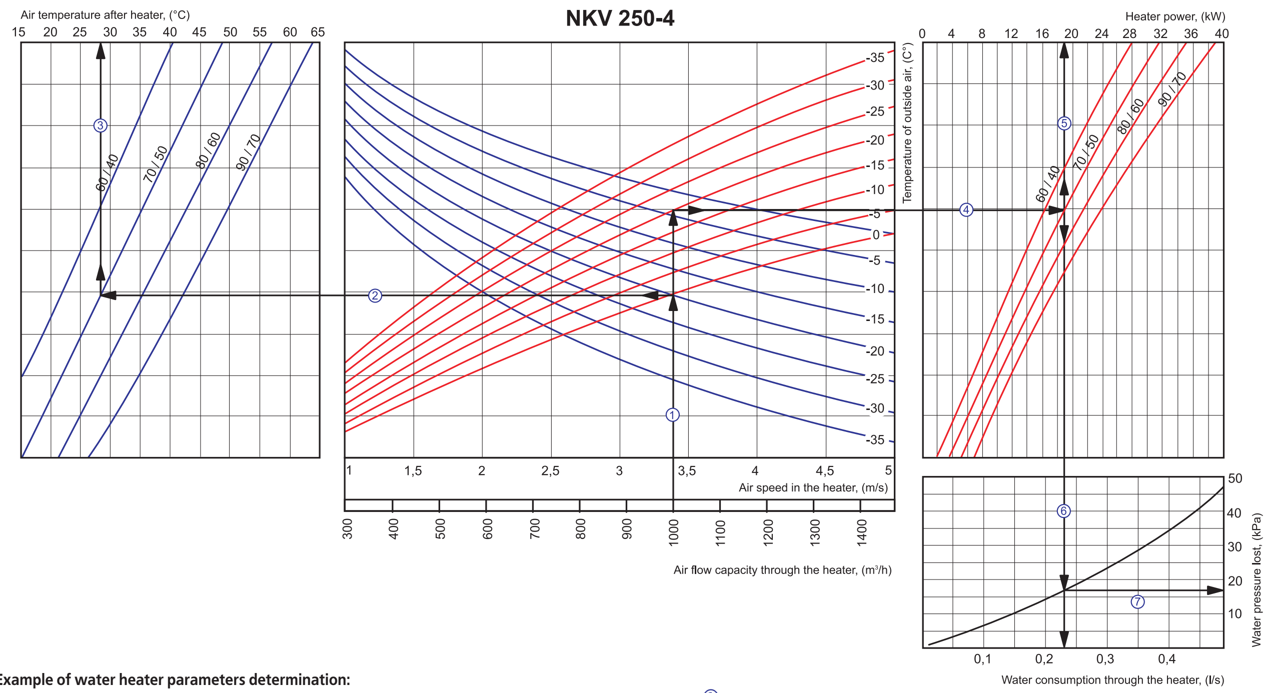


Example of water heater parameters determination:

On condition that Air flow capacity rate is 1500 m³/h, the air flow speed in heater's cross-section will be 3,4 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (20°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (15,5 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,19 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (11,0 kPa).

NKV



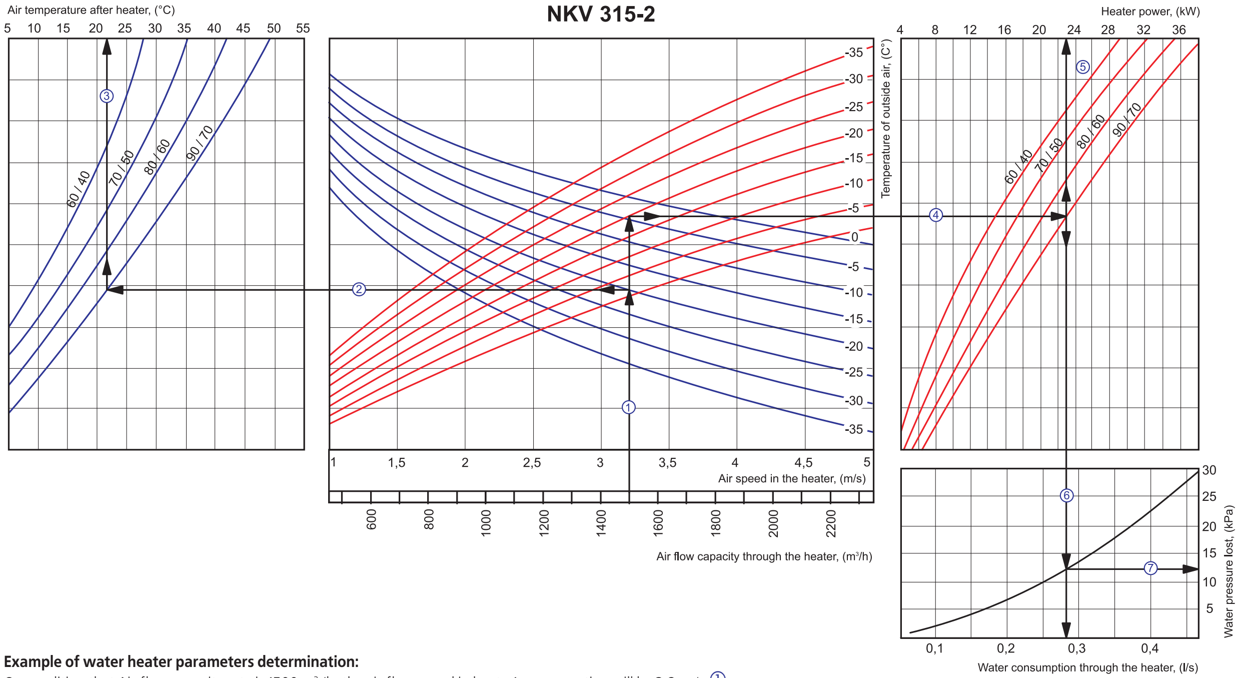
Example of water heater parameters determination:

On condition that Air flow capacity rate is 1000 m³/h, the air flow speed in heater's cross-section will be 3,4 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (28°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (19,0kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,23 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (17,0 kPa).

NKV

NKV 315-2



Example of water heater parameters determination:

On condition that Air flow capacity rate is 1500 m³/h, the air flow speed in heater's cross-section will be 3,2 m/s ①.

■ In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (21°C) ③.

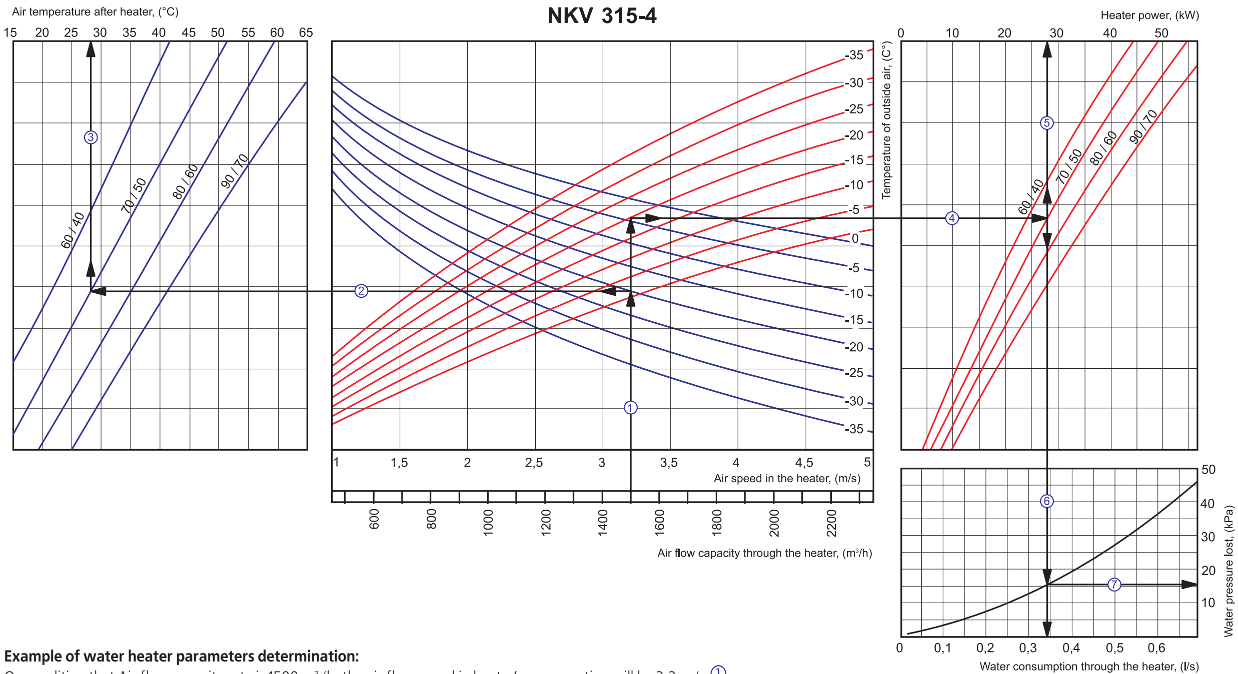
■ In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (23,0 kW) ⑤.

■ In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,28 l/s).

■ In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (12,5 kPa).

NKV

NKV 315-4



Example of water heater parameters determination:

On condition that Air flow capacity rate is 1500 m³/h, the air flow speed in heater's cross-section will be 3,2 m/s ①.

■ In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (28°C) ③.

■ In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (28,0kW) ⑤.

■ In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,34 l/s).

■ In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (16,0 kPa).

Series
NKV

Application
Water heaters are designed for heating the incoming air in ventilation systems with round cross-section. These heaters can also be used as warmers in inlet and inlet-exhaust units.

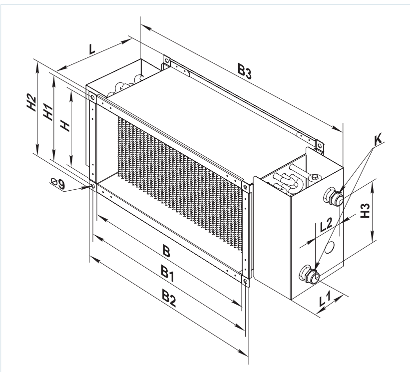
Design
The case and terminal box are made of galvanized sheet, pipe collectors are made of copper tubes and heat exchange surface is made of aluminum plates. To ensure pressure tight joint with the air ducts heaters are supplied with rubber seals. Double and four-row versions of heaters are available. These heaters are designed for operation under the maximum working pressure of 1,6MPa (16 bar) and under the maximum operating water temperature of +100°C. The outlet collector of the heater is supplied with a branch pipe that allows installing a submersible sensor for measuring temperature or freeze protection for air heater. The heater is supplied with an air valve for system deairing.

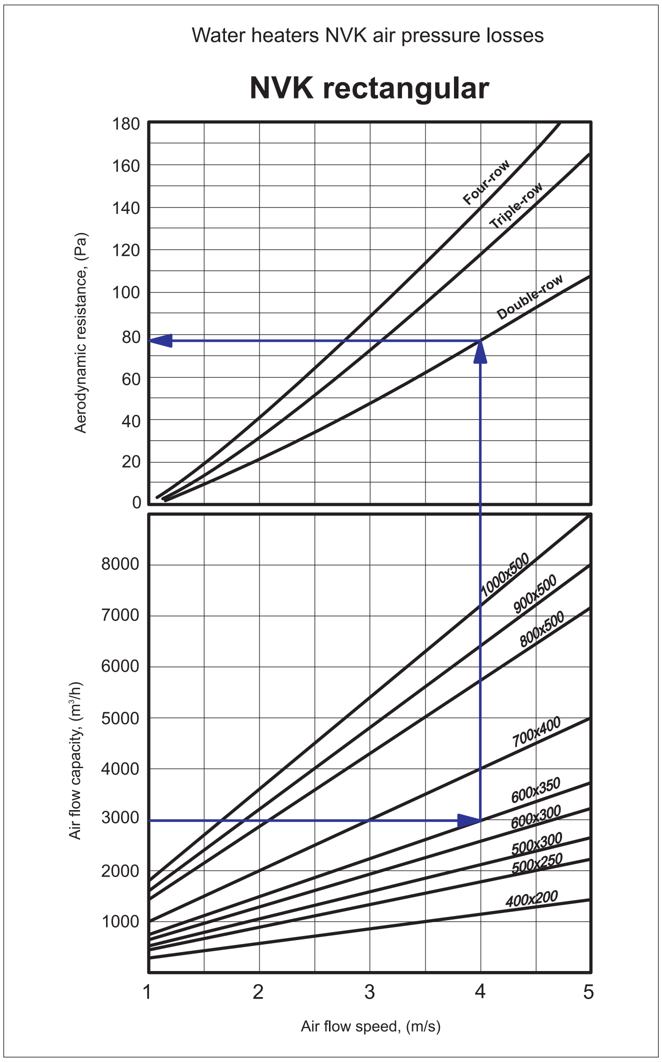
Mounting
- Heater installation is done by ring coupling. Water heaters may be installed in any position allowing its deairing. Air flow direction should correspond with the direction of the arrow placed on air heater.
- It is recommended to install the heater in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the heater protecting the heating elements from contamination.
- Heater may be installed in front or behind the fan. If the heater is placed in front of the fan it's recommended to anticipate air duct between them in the distance not less than two connecting diameters in order to stabilize air flow, as well as not to exceed maximum allowed temperature inside the fan.
- Air heater needs to be connected on the counterflow principle, otherwise its capacity will be reduced by 5-15%. All estimated nomographic charts, included in the catalogue, are true for such type of connection;
- If water is used as heat carrying agent the heating devices can be installed only inside the premises. In case of outdoor mounting an antifreezing mixture should be used as heat carrying agent (for example, ethylene glycol solution);
- For correct and safe operation of heaters we recommend you to use automation system that provides complex control and freezing protection:
  - ✓ automatic control of power adjustment and air heating temperature;
  - ✓ application of air dampers supplied with servo-controlled actuator with a pull-back spring;
  - ✓ tracking filter condition by means of differential pressure sensor;
  - ✓ tracking filter condition by means of differential pressure sensor;
  - ✓ shutting down fan in case of heater frost threat.

Legend:

Series	Flange diameter, mm	-	Number of pipes' rows
NKV	400x200; 500x250; 500x300; 600x300; 600x350; 700x400; 800x500; 900x500; 1000x500		2; 3; 4

Type	Dimensions, mm												Number of pipes' rows	Weight, kg
	B	B1	B2	B3	H	H1	H2	H3	L	L1	L2	K		
NKV 400x200-2	400	420	440	565	200	220	240	150	200	43	43	G 3/4”	2	7,6
NKV 400x200-4	400	420	440	565	200	220	240	150	200	38	65	G 3/4”	4	8,1
NKV 500x250-2	500	520	540	665	250	270	290	200	200	43	43	G 3/4”	2	15,8
NKV 500x250-4	500	520	540	665	250	270	290	200	200	38	65	G 3/4”	4	16,3
NKV 500x300-2	500	520	540	665	300	320	340	250	200	43	43	G 1”	2	11,5
NKV 500x300-4	500	520	540	665	300	320	340	250	200	38	65	G 1”	4	12,0
NKV 600x300-2	600	620	640	765	300	320	340	250	200	43	43	G 1”	2	21,8
NKV 600x300-4	600	620	640	765	300	320	340	250	200	38	65	G 1”	4	22,3
NKV 600x350-2	600	620	640	765	350	370	390	300	200	43	43	G 1”	2	22,4
NKV 600x350-4	600	620	640	765	350	370	390	300	200	38	65	G 1”	4	22,9
NKV 700x400-2	700	720	740	865	400	420	440	350	200	36	47	G 1”	2	27,8
NKV 700x400-3	700	720	740	865	400	420	440	350	200	42	58	G 1”	3	28,4
NKV 800x500-2	800	820	840	965	500	520	540	450	200	36	47	G 1”	2	36,5
NKV 800x500-3	800	820	840	965	500	520	540	450	200	42	58	G 1”	3	37,2
NKV 900x500-2	900	920	940	1065	500	520	540	450	200	36	47	G 1”	2	40,4
NKV 900x500-3	900	920	940	1065	500	520	540	450	200	42	58	G 1”	3	41,2
NKV1000x500-2	1000	1020	1040	1165	500	520	540	450	200	36	47	G 1”	2	44,3
NKV 1000x500-3	1000	1020	1040	1165	500	520	540	450	200	42	58	G 1”	3	45,2

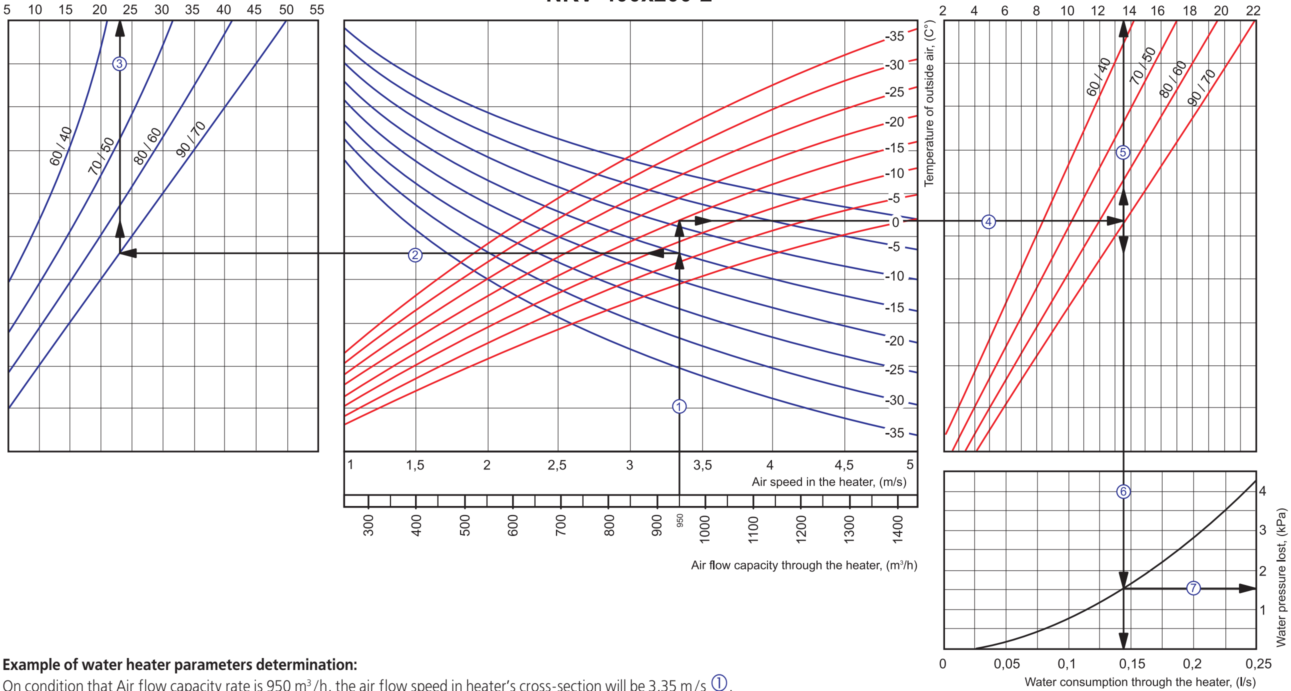




NKV
HEATER SERIES

NKV

NKV 400x200-2



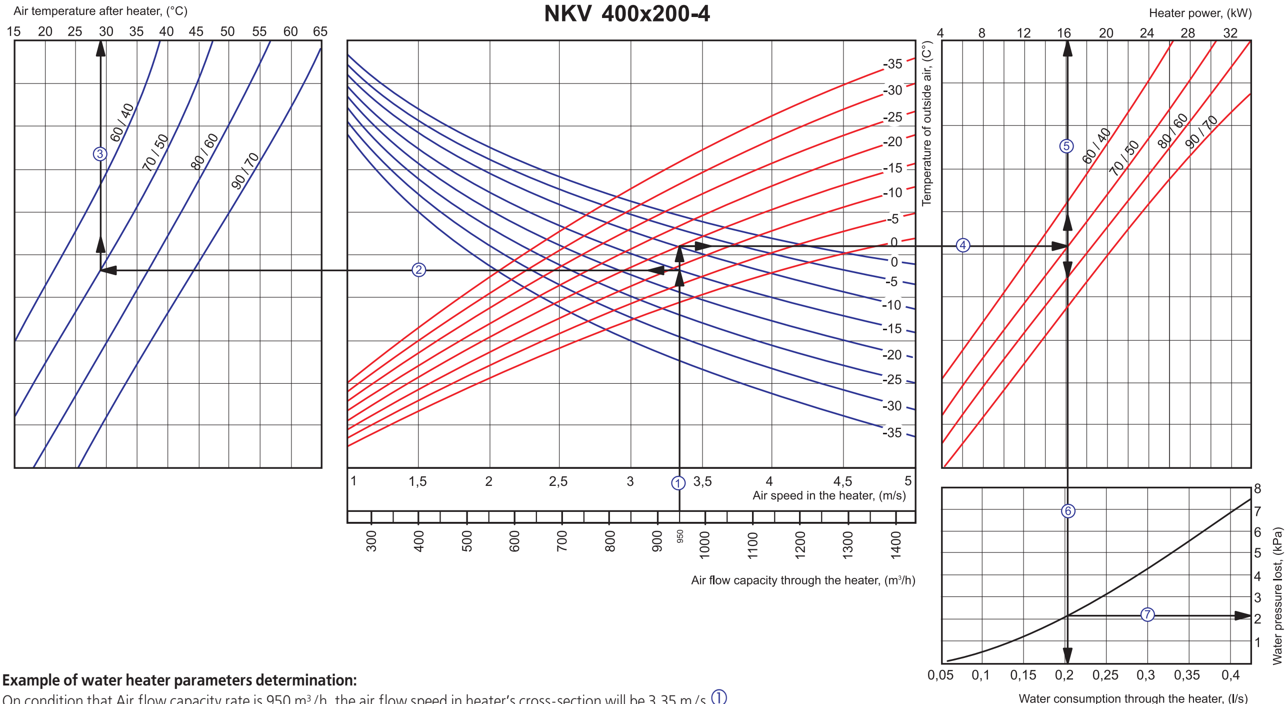
Example of water heater parameters determination:

On condition that Air flow capacity rate is 950 m³/h, the air flow speed in heater's cross-section will be 3,35 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (23°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (13,5 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,14 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (1,5 kPa).

NKV

NKV 400x200-4



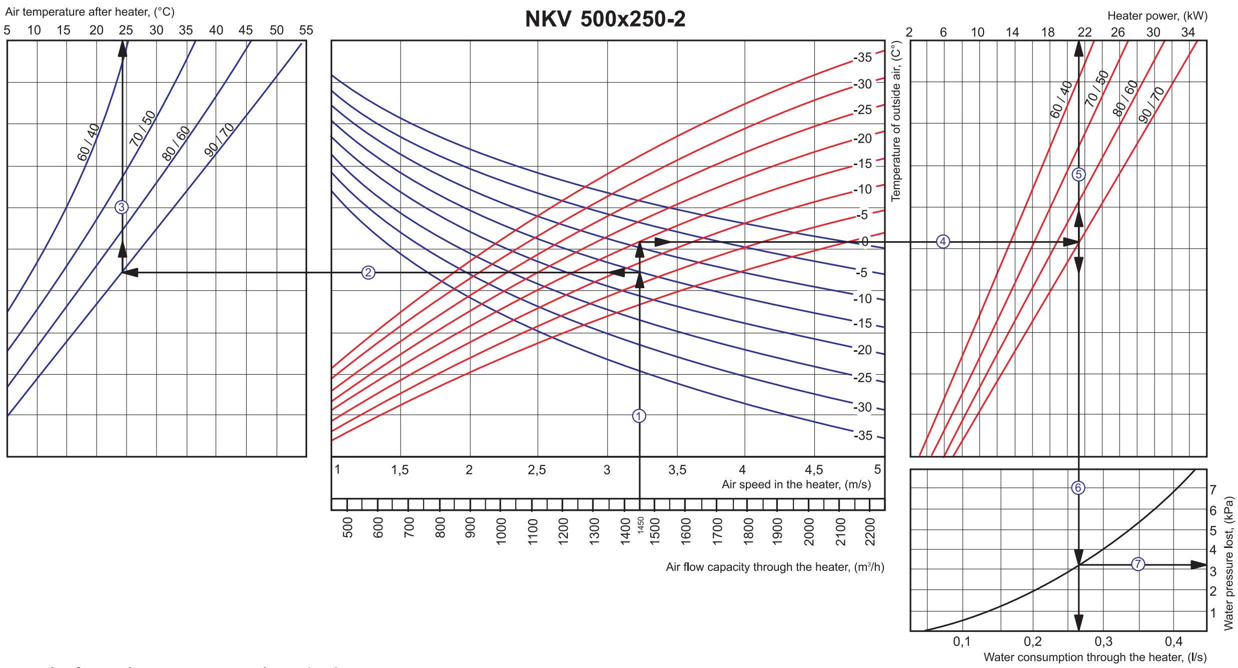
Example of water heater parameters determination:

On condition that Air flow capacity rate is 950 m³/h, the air flow speed in heater's cross-section will be 3,35 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (23°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (13,5 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,14 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (1,5 kPa).

NKV

NKV 500x250-2



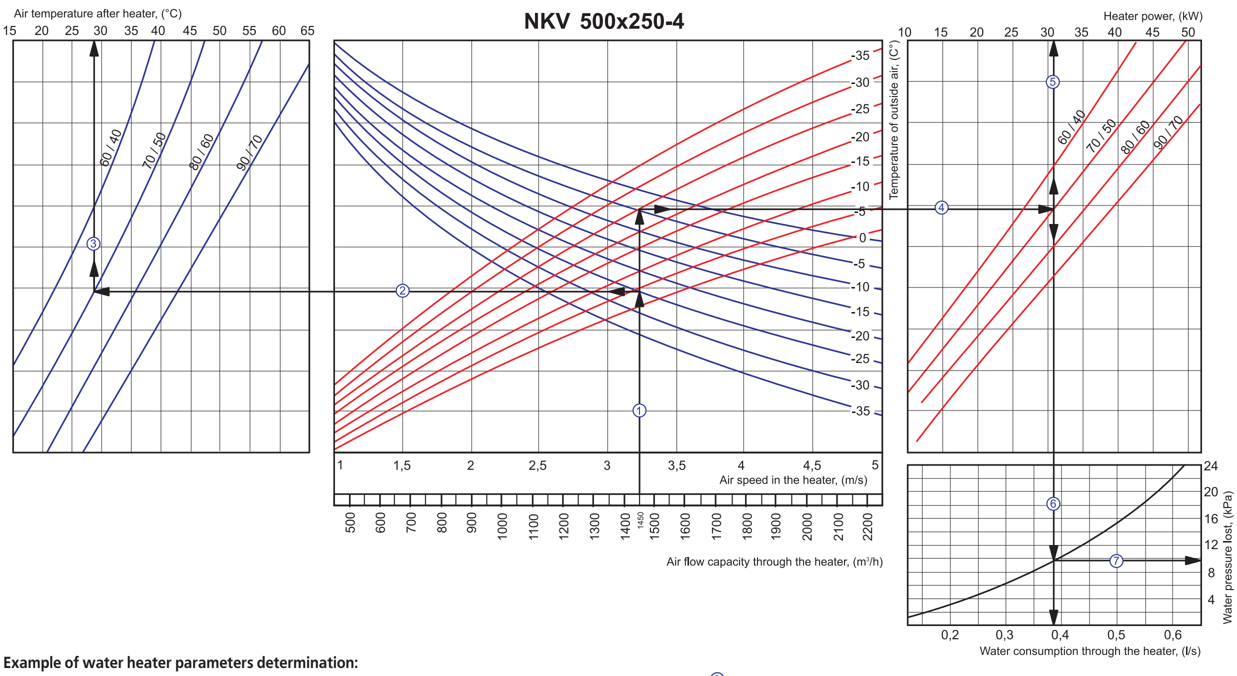
Example of water heater parameters determination:

On condition that Air flow capacity rate is 1450 m³/h, the air flow speed in heater's cross-section will be 3,2 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (24°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (21,5 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,27 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (3,2 kPa).

NKV

NKV 500x250-4

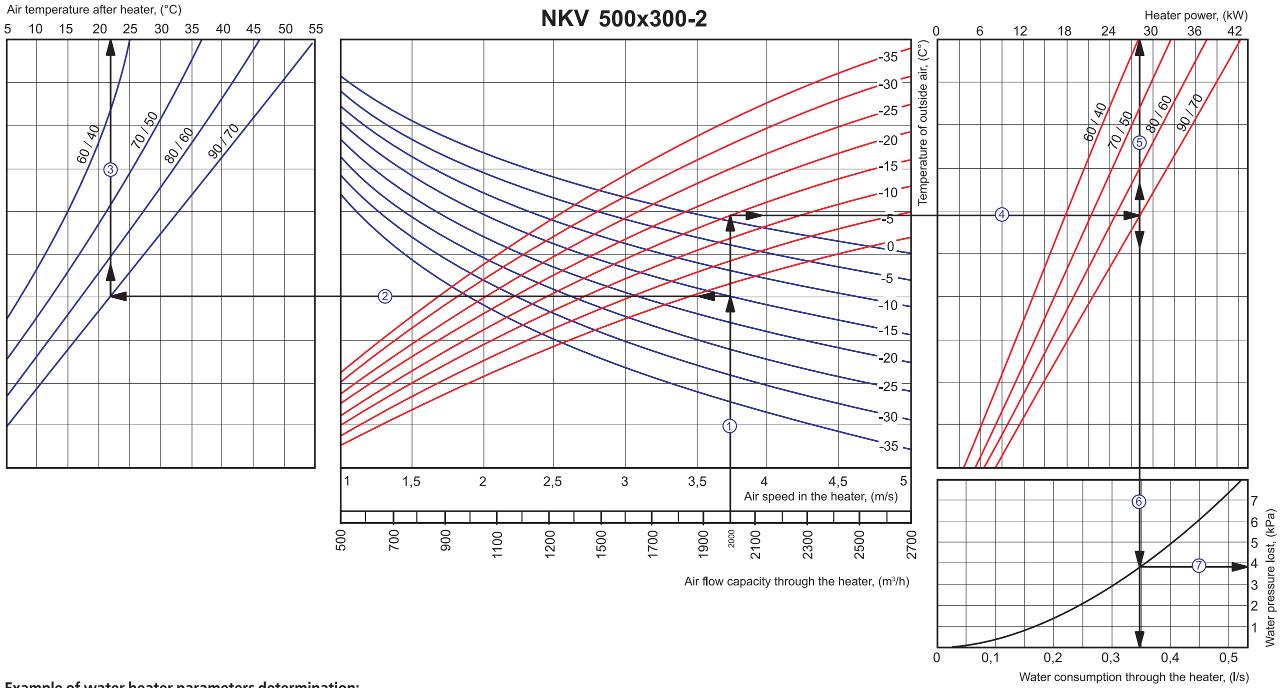


Example of water heater parameters determination:

On condition that Air flow capacity rate is 1450 m³/h, the air flow speed in heater's cross-section will be 3,2 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -25°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (28°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -25°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (31,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,38 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (9,8 kPa).

NKV

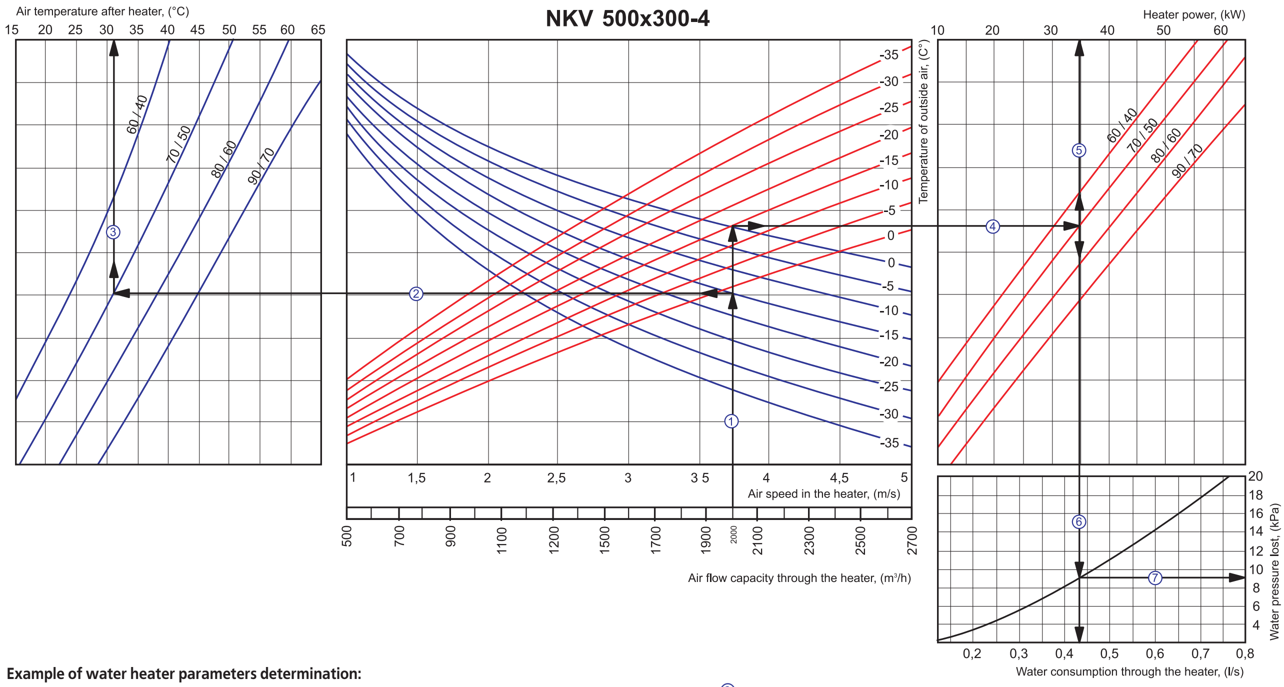


Example of water heater parameters determination:

On condition that Air flow capacity rate is 2000 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (22°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (28,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,35 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (3,8 kPa).

NKV

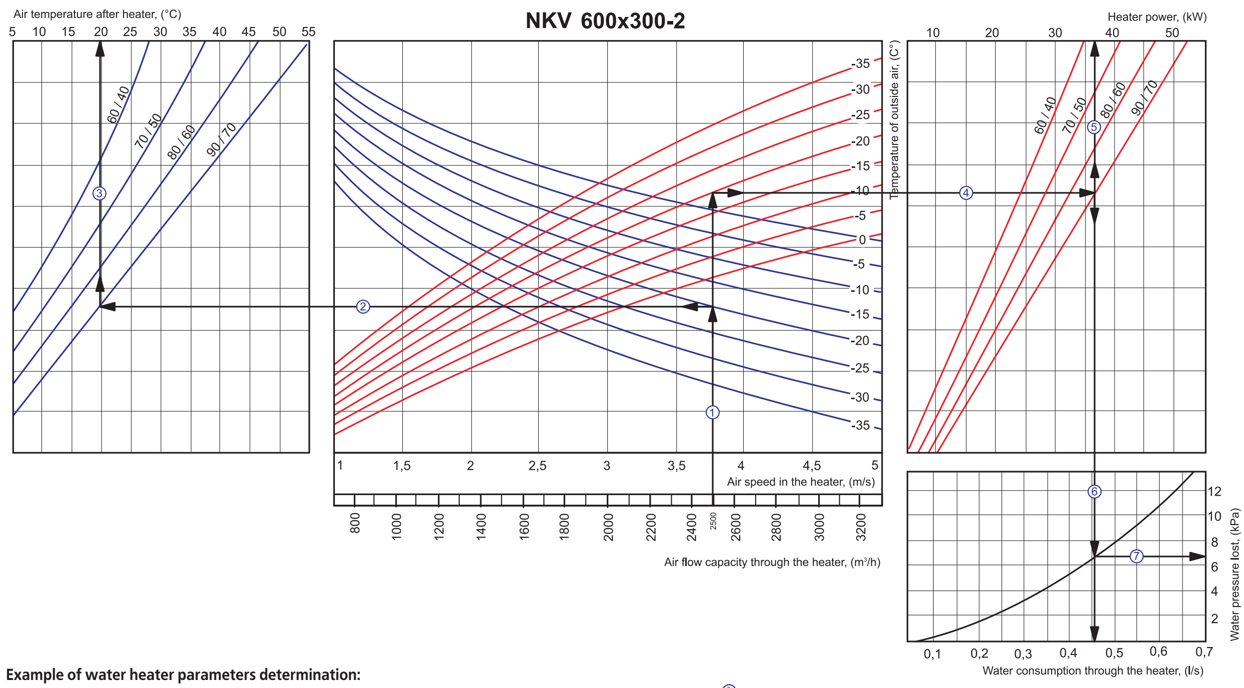


Example of water heater parameters determination:

On condition that Air flow capacity rate is 1450 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -15°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (31°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -15°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (35,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,43 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (9,0 kPa).

NKV

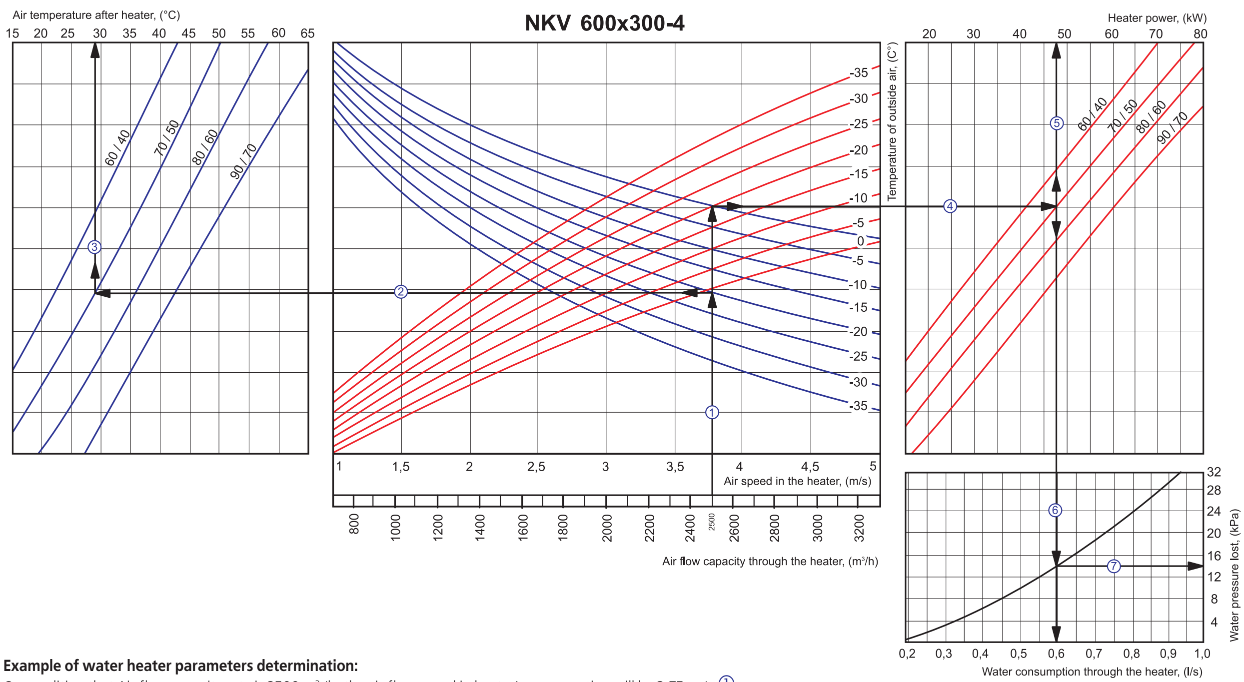


Example of water heater parameters determination:

On condition that Air flow capacity rate is 2500 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (20°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (37,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,46 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (6,7 kPa).

NKV

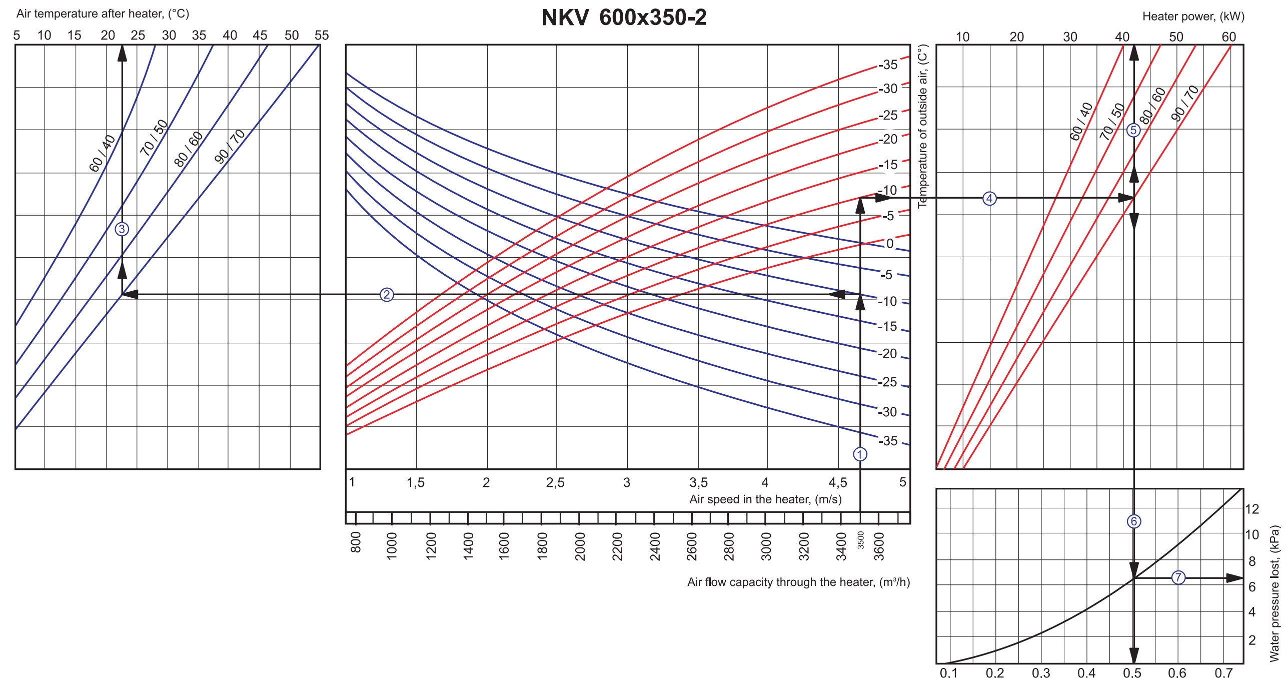


Example of water heater parameters determination:

On condition that Air flow capacity rate is 2500 m³/h, the air flow speed in heater's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (29°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the heater capacity axis (48,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,6 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (14,0 kPa).

NKV

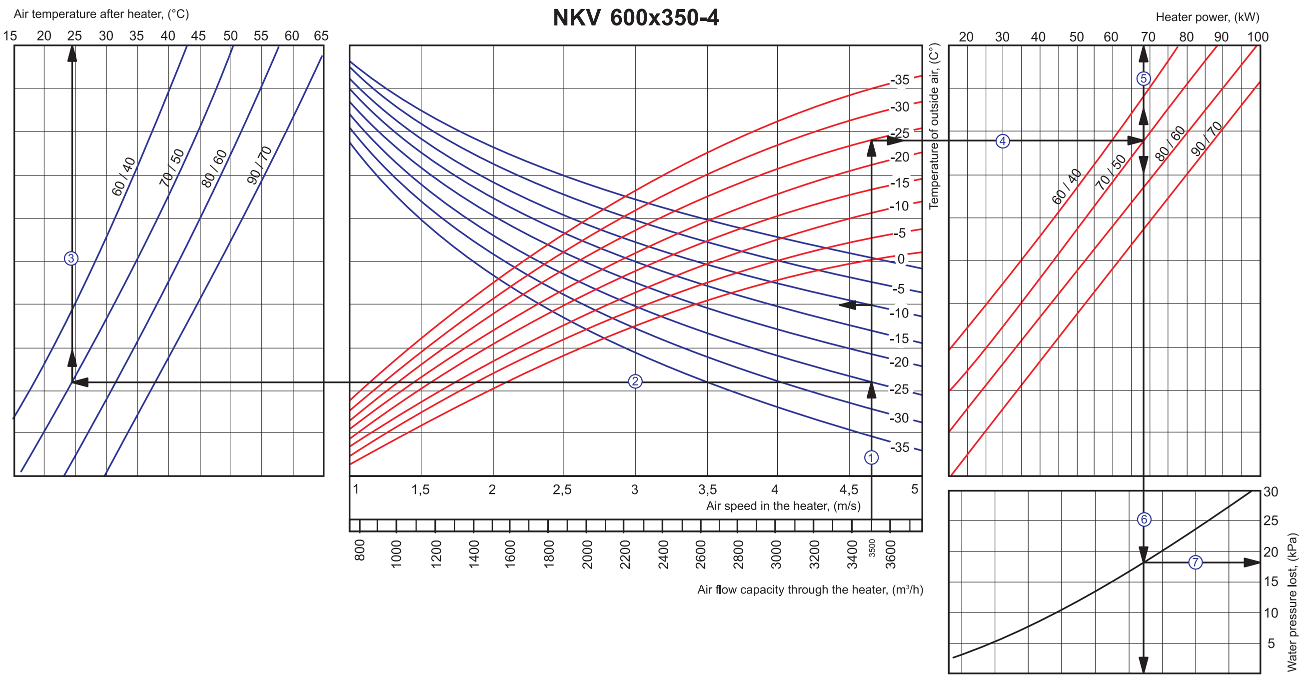


Example of water heater parameters determination:

On condition that Air flow capacity rate is 3500 m³/h, the air flow speed in heater's cross-section will be 4,65 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -10°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (22,5°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -10°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (42,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,5 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (6,5 kPa).

NKV



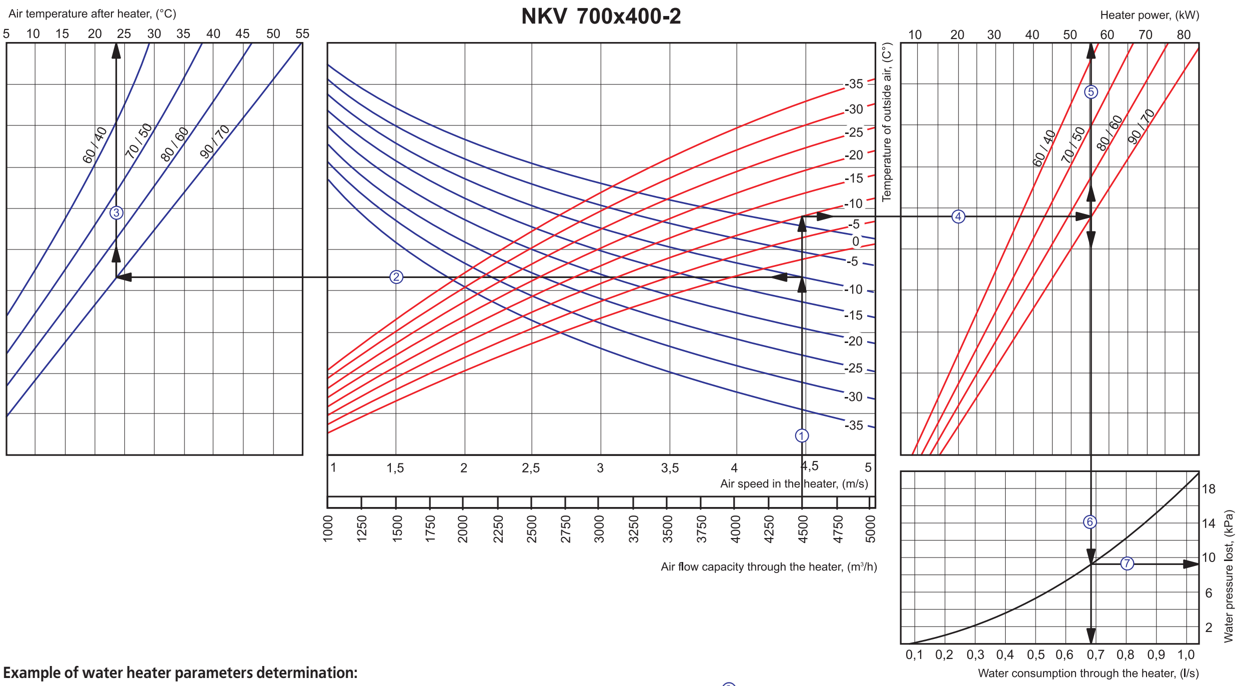
Example of water heater parameters determination:

On condition that Air flow capacity rate is 3500 m³/h, the air flow speed in heater's cross-section will be 4,65 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -25°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 70/50) and then erect a perpendicular to the axis of air temperature after the heater (24°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -25°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 70/90) and then erect a perpendicular to the heater capacity axis (68,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,84 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (18,0 kPa).

NKV

NKV 700x400-2



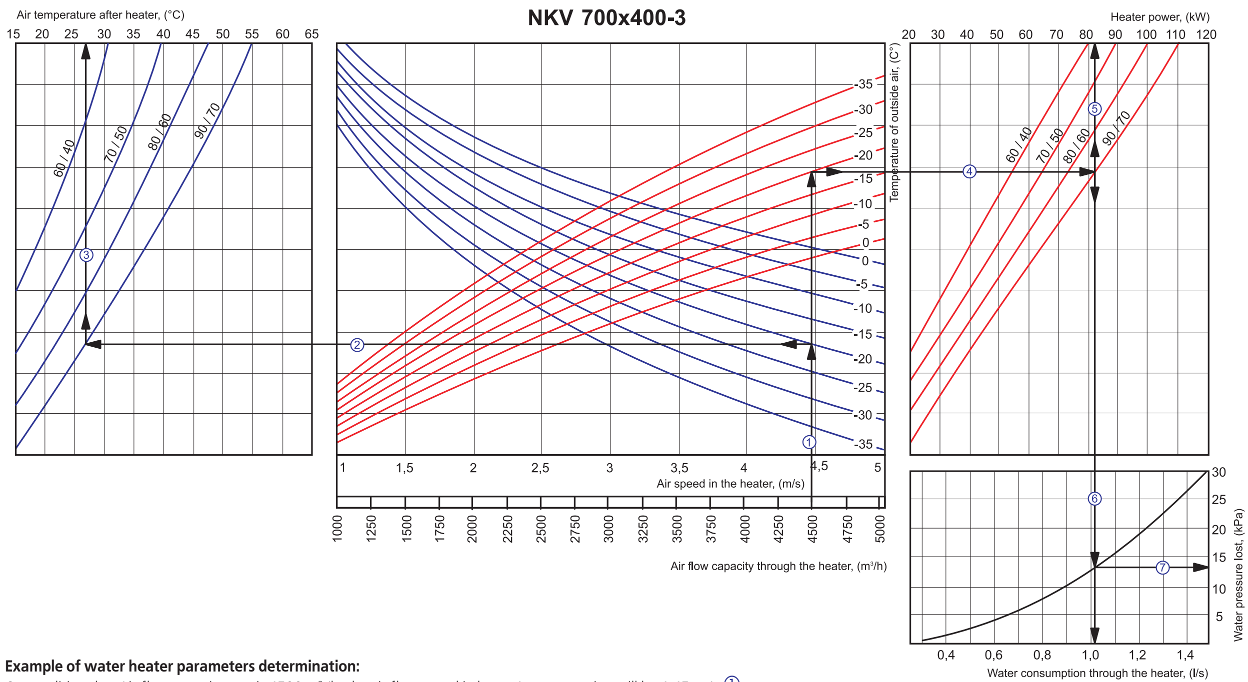
Example of water heater parameters determination:

On condition that Air flow capacity rate is 3500 m³/h, the air flow speed in heater's cross-section will be 4,45 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -10°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (24°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -10°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (55,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,68 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (9,2 kPa).

NKV

NKV 700x400-3

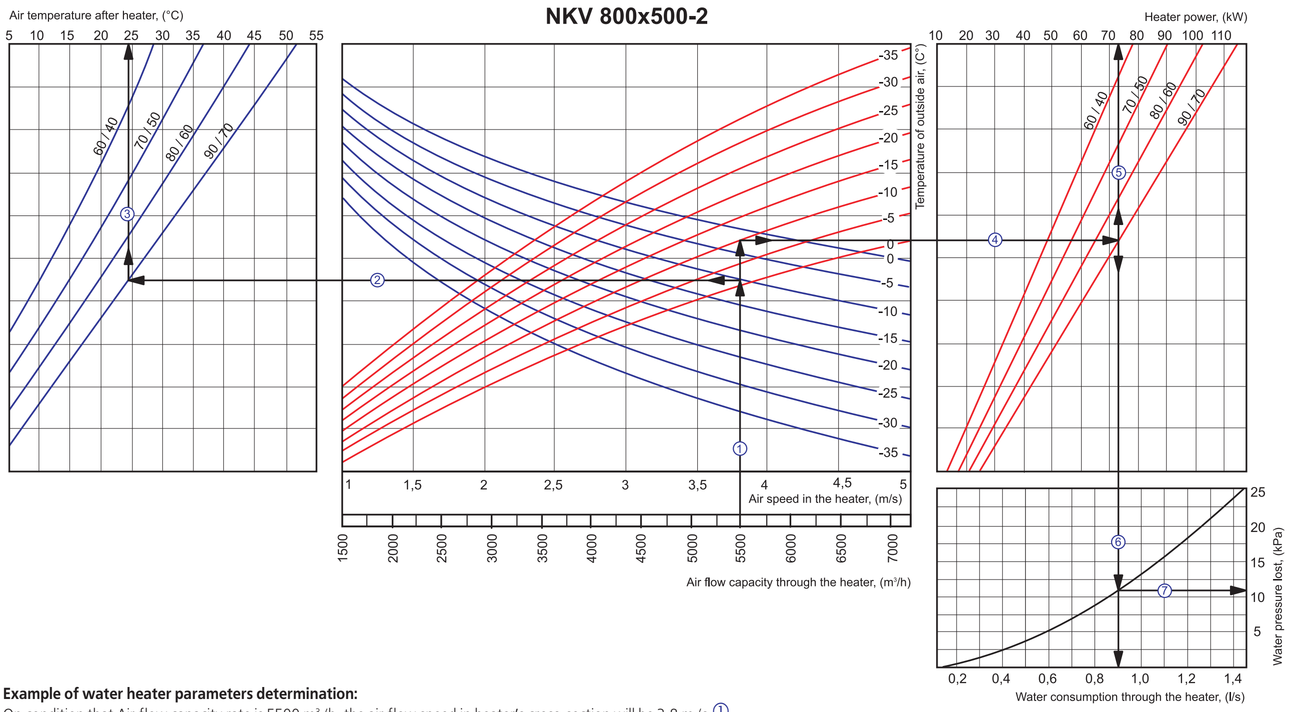


Example of water heater parameters determination:

On condition that Air flow capacity rate is 4500 m³/h, the air flow speed in heater's cross-section will be 4,45 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (27°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (82,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,02 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (13,0 kPa).

NKV

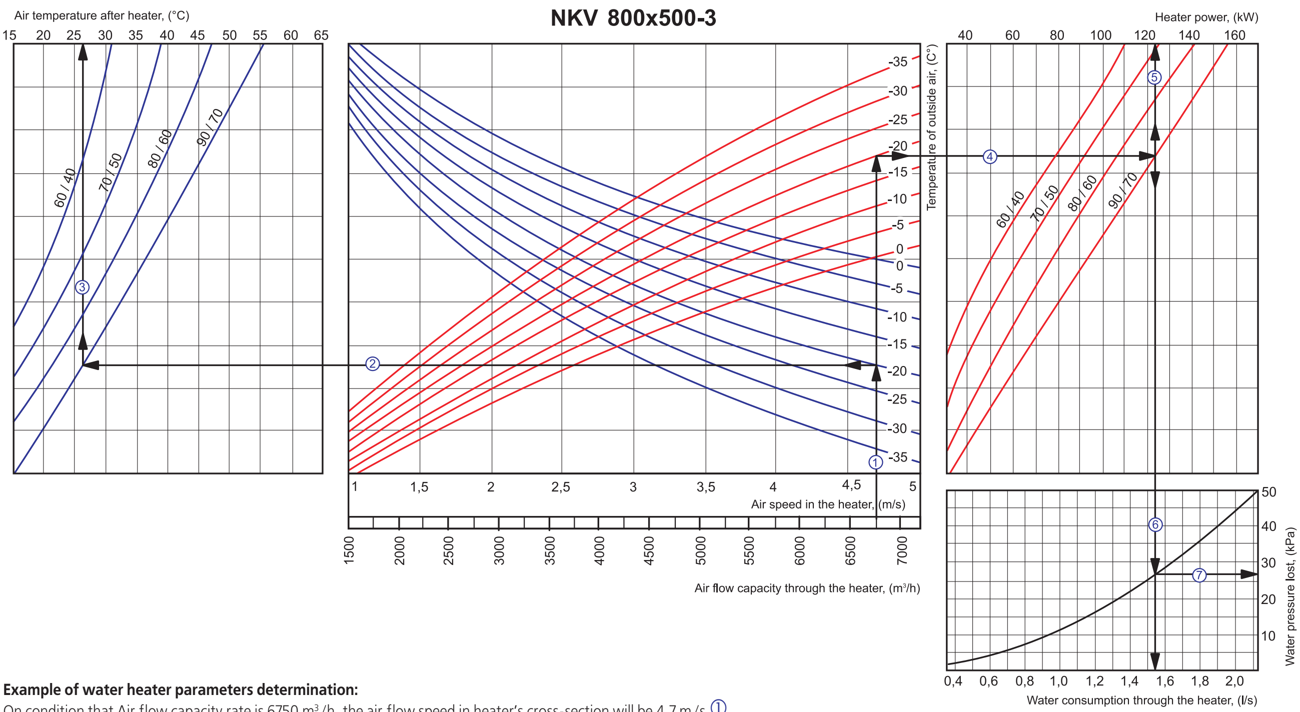


Example of water heater parameters determination:

On condition that Air flow capacity rate is 5500 m³/h, the air flow speed in heater's cross-section will be 3,8 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -10°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (24,5°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -10°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (73,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (0,9 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (11,0 kPa).

NKV



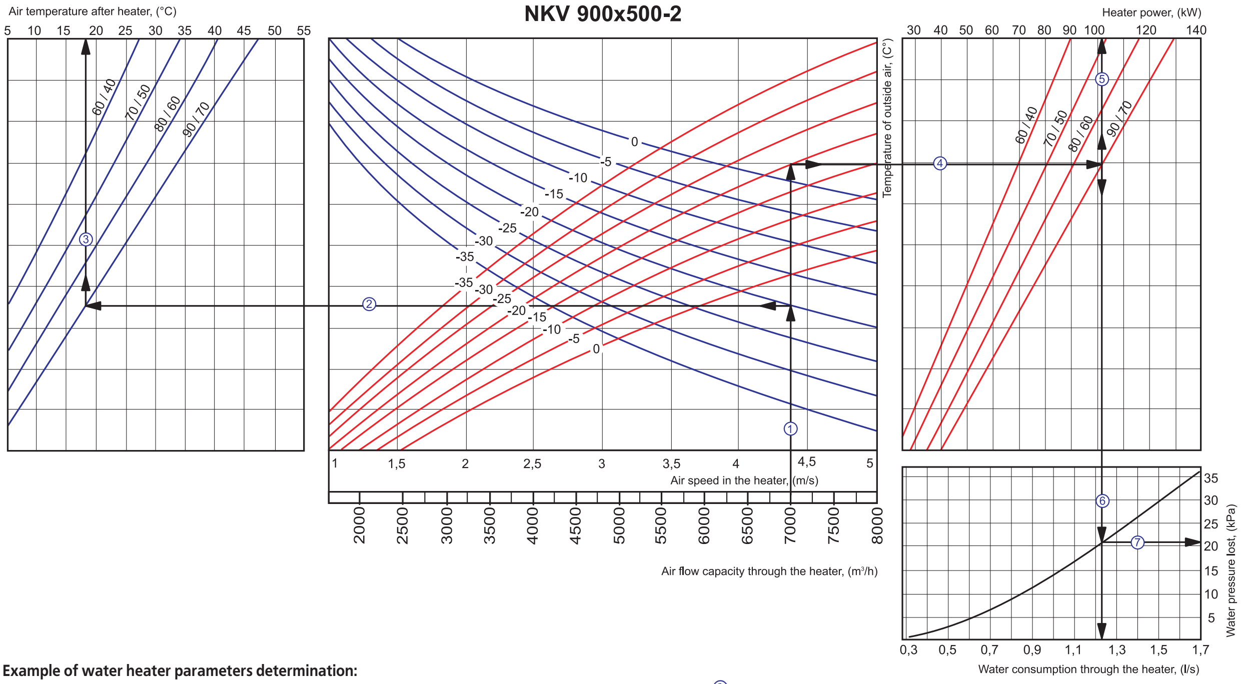
Example of water heater parameters determination:

On condition that Air flow capacity rate is 6750 m³/h, the air flow speed in heater's cross-section will be 4,7 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (26°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (123,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,54 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (27,0 kPa).

NKV

NKV 900x500-2



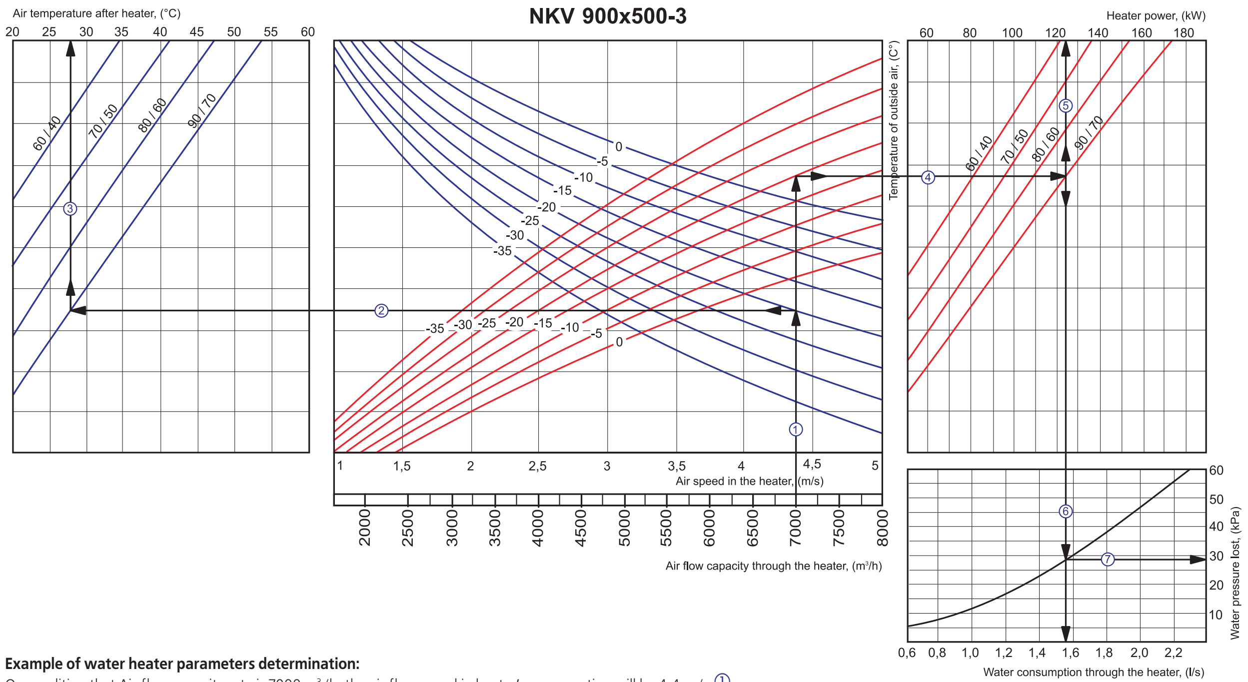
Example of water heater parameters determination:

On condition that Air flow capacity rate is 7000 m³/h, the air flow speed in heater's cross-section will be 4,4 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (18°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (102,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,23l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (21,0 kPa).

NKV

NKV 900x500-3



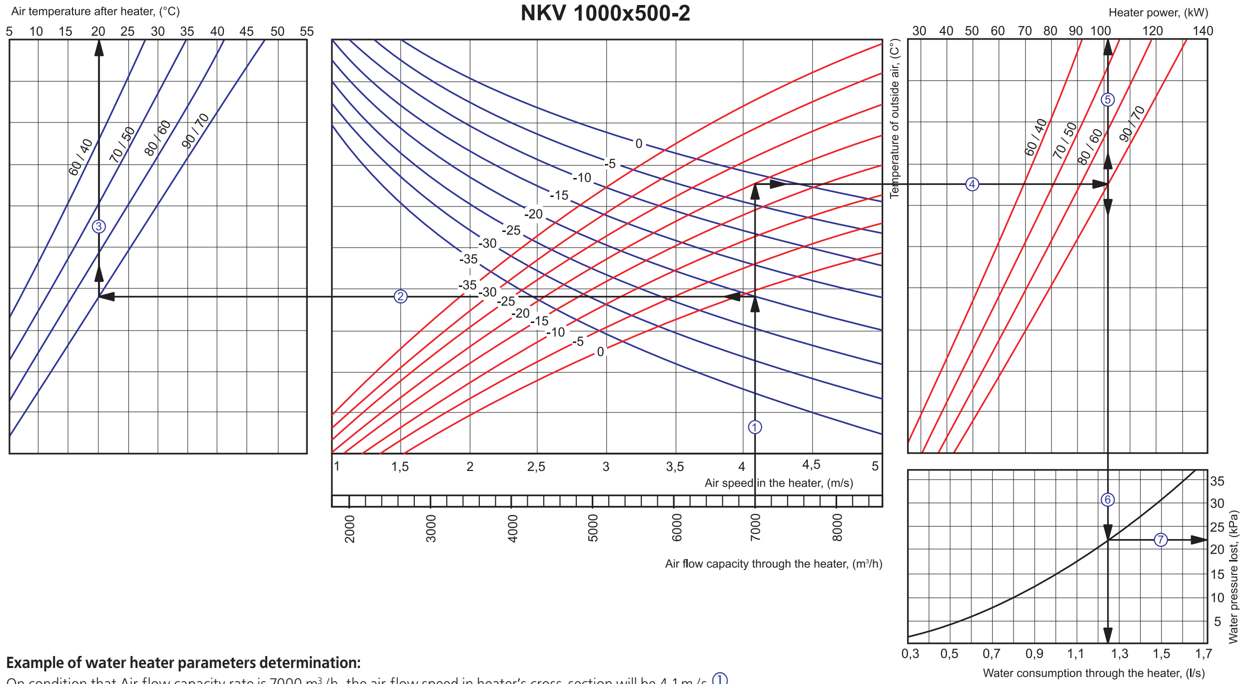
Example of water heater parameters determination:

On condition that Air flow capacity rate is 7000 m³/h, the air flow speed in heater's cross-section will be 4,4 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (28°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (124,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,55 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (28,0 kPa).

NKV

NKV 1000x500-2



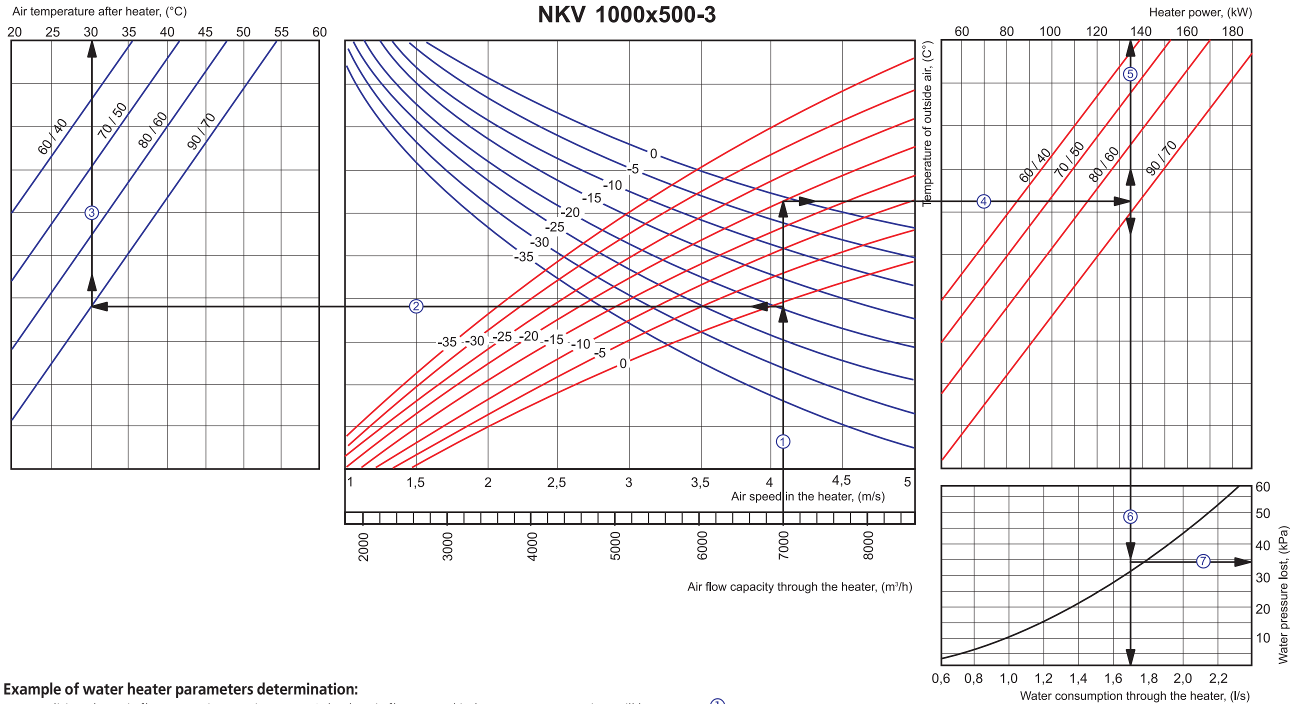
Example of water heater parameters determination:

On condition that Air flow capacity rate is 7000 m³/h, the air flow speed in heater's cross-section will be 4,1 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (20°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (101,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,25 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (22,0 kPa).

NKV

NKV 1000x500-3



Example of water heater parameters determination:

On condition that Air flow capacity rate is 7000 m³/h, the air flow speed in heater's cross-section will be 4,1 m/s ①.

- In order to determine the highest possible temperature of heated air you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the descending blue line, for example -20°C) to draw the line to the left ② until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the axis of air temperature after the heater (30°C) ③.
- In order to determine heater capacity you need from the point of intersection of two lines which stand for Air flow capacity rate ① and estimated winter temperature (the ascending red line, for example -20°C), extend a line to the right ④ until it intersects the line of water temperature difference (for example, 90/70) and then erect a perpendicular to the heater capacity axis (135,0 kW) ⑤.
- In order to determine the required consumption rate of water flowing through the heater you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the heating device (1,7 l/s).
- In order to determine the water pressure drop in the heater you need to find the intersection point between the line ⑥ and the pressure drop graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (34,0 kPa).

Series
USVK

Application
USVK-series water-mixing units provide temperature control and circulation of water (water mixtures) used as a heat carrying agent in the heat exchangers of ventilation systems.

Design and operation description
Design of USVK-series is shown in figure 1.

Either right-hand or left-hand version of USVK device can be delivered depending on the customer's request. Unit manifold consists of metallic elements with thermal resistance reaching +1500C. Circulation pump 1 provides continuous water flow with necessary level of pressure, while the temperature of water, supplied to the heat exchanger, is adjusted in a water heating circuit by means of mixing the water flowing in from the mains with the used water flowing in from the heat exchanger. The amount of used water ducted through a shunt pipe 4, is controlled by a T-valve 3 supplied with electric actuator 2 while its control voltage is determined by set-point temperature of incoming air distributed from the heat exchanger.

USVK installation and maintenance service
Connection should be done by specialists authorized to perform such works. It's prohibited to use USVK device beyond the temperature range, specified in operating manual, as well as operation in premises with aggressive or explosive environment. Make sure that there is no visual damage before connecting USVK device to the power supply network. The following conditions must be observed during the process of installation of water-mixing unit:

- make sure that the shaft axis of the motor is placed horizontally;
- eliminate the possibility of mechanical load transfer from the pipes, that are being connected, to the USVK device;
- eliminate the possibility of accidental contact between the moving parts of USVK device and the power supply wires.

USVK device connection to the water main
Water admission (discharge) to the USVK device is done by direct attachment to the fixed water main or by metal and rubber flexible hoses by means of threaded connection with the inlet and outlet pipes.

Device connection to the water main should be done in a way to eliminate any load transfer that may cause mechanical damage and breaks of air tightness of USVK device. Installation of pipes should be done to arrange their fast detachment during repair operations.

Electrical connection
All electric connections should be carried out by persons with required level of qualification and authorization. Protective grounding should be installed for circulation pump before performing connection works.

Contacts between power supply cable and the pipeline or a pump must be avoided. Connection of pump electric motor and electric actuator should be carried out in accordance with the following electrical diagrams.

USVK device operating conditions
Allowable conditions for operation of mixing units are determined by assembly of elements, forming such units, and are described by the following figures:

-environmental air temperature,°C 5-40

-maximum water temperature at the input,°C........150

-maximum pressure in the channel of MU-device, bar..10

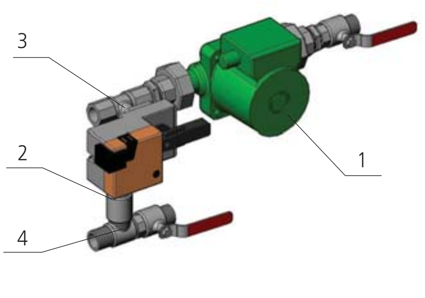


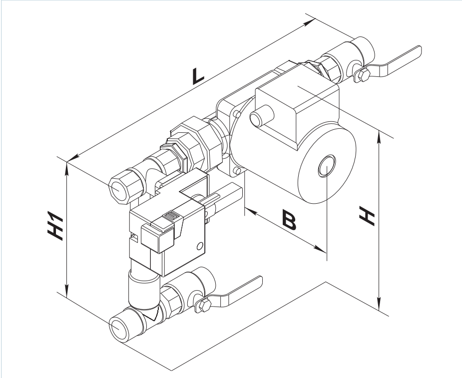
Fig. 1

Legend:

Series	Connection diameter, mm	-	Transmission coefficient, Kvs
USVK	3/4"; 1"; 1 1/4"; 1 1/2"; 2"		4; 6; 10; 16; 25

Type MU	USVK-3/4-4	USVK-1-6	USVK-1 1/4-10	USVK-1 1/2-16	USVK-2-25
Water consumption, m^3/h	up to 4	up to 6	up to 10	up to 16	up to 25
Hydrostatic head pressure, m. w.c.	up to 6	up to 6	up to 6	up to 11	up to 11
Kvs*	4	6,3	10	16	25
Pressure, bar	10	10	10	10	10
Connecting diameter, mm	3/4”	1”	1 1/4”	1 1/2”	2”
Weight, kg	4,1	6,8	7,4	22	30,7

Type	Dimensions, mm				Weight, kg
	B	H	H1	L	
USVK-3/4-4	150	290	180	460	4,1
USVK-1-6	175	320	210	490	6,8
USVK-1 1/4-10	175	355	240	500	7,4
USVK-1 1/4-16	266	420	255	610	23,0
USVK-2-25	312	474	290	660	31,0

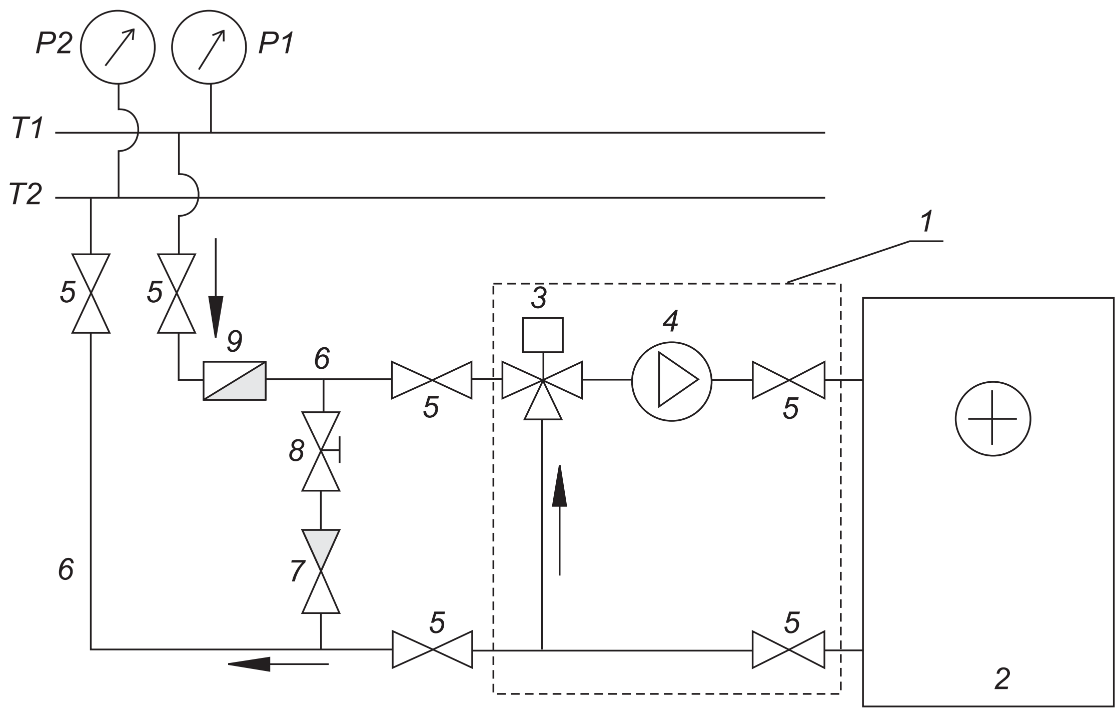


* transmission coefficient $K_{vs} = \frac{V_{100}}{\sqrt{\frac{\Delta pv_{100}}{100}}}$, where

Δpv_{100} – pressure loss with valve in fully unseated position;

V_{100} – rated water consumption under Δpv_{100}.

Recommended connection scheme to the water supply main



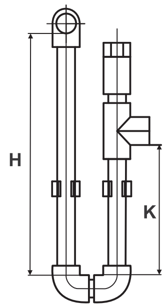
T1 and **T2** – supply and return pipes of heating supply network;
P1 и **P2** – liquid pressure-measuring devices in the heating supply network;
1 – USVK (mixing unit);
2 – Water air heater;
3 – T-valve supplied with an actuator;
4 – Circulation pump;
5 – Shut-off valve;
6 – Supply and return pipe from the main heating supply to air heater;
7 – Back valve;
8 – Balancing valve;
9 – Primary filter.

Series
OKW

Application
Air coolers are designed for cooling the incoming air in ventilation systems with rectangular cross-section. These air coolers can also be used as coolers in inlet and inlet-exhaust units.

Design
The case is made of galvanized sheet steel, pipe collectors are made of copper tubes and heat exchange surface is made of aluminum plates. Triple-row versions of coolers are available. They are designed for operation under the maximum working pressure of 1,5MPa (15 bar). The coolers are supplied with a drip-plate for collection and removal of condensed water.

Mounting
- Design of the cooler allows fixing it by flanged coupling. Water coolers may be installed only horizontally, allowing its deairing and removal of condensed water.
- It is recommended to install the cooler in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the cooler protecting it from contamination.
- Cooler may be installed in front or behind the fan. If the cooler is placed behind the fan it's recommended to anticipate air duct between them in the distance not less than 1-1,5 m in order to stabilize air flow.
- Cooler needs to be connected on the counterflow principle in order to reach maximum cooling effect. All estimated nomographic charts, included in the catalogue, are true for such type of connection.
- If water is used as cooling medium the coolers can be installed only inside the premises where temperature doesn't go bellow 0C. In case of outdoor mounting an antifreezing mixture should be used (for example, ethylene glycol solution).
- It is recommended to install a droplet separator (ordered separately) at the coolers air outlet if air flow speed exceeds 2,5 m/s. This will prevent the drops of condensed water from penetrating into air duct system.
- Removal of condensed water from the cooler should be carried out by means of siphon. The height of siphon directly depends on the fan total pressure. The height of siphon can be calculated in accordance with the following figure and table.



H (mm)	K (mm)	P (Pa)
100	55	600
200	105	1100
260	140	1400

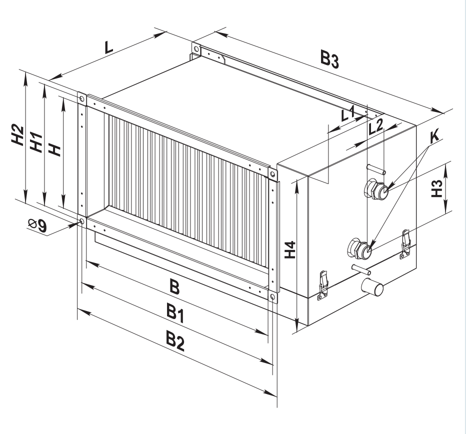
H – siphon height
K – branch height
P – fan total pressure

- For correct and safe operation of coolers we recommend you to use automation system that provides complex control and automated regulation of cooling effect and chilling temperature.

Legend:

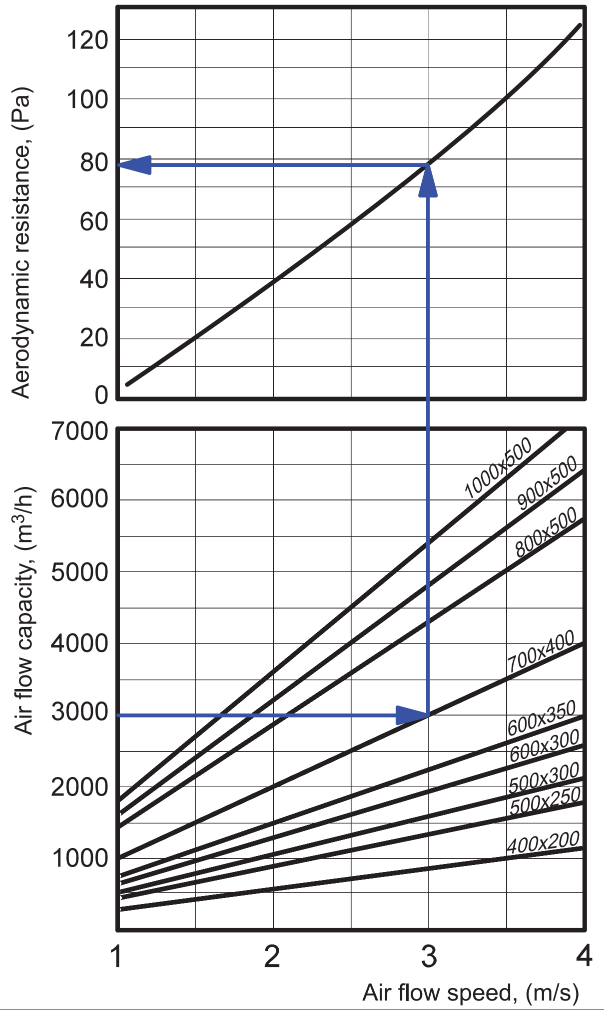
Series	Flange diameter, mm	-	Number of pipes' rows
OKW	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 900x500; 1000x500		3

Type	Dimensions, mm												
	B	B1	B2	B3	H	H1	H2	H3	H4	L	L1	L2	K
OKW 400x200-3-2,0	400	420	438	528	200	220	238	70	273	395	176	43	G 3/4”
OKW 500x250-3-2,0	500	520	538	628	250	270	288	120	323	395	176	43	G 3/4”
OKW 500x300-3-2,0	500	520	538	628	300	320	338	175	373	395	176	43	G 3/4”
OKW 600x300-3-2,0	600	620	638	728	300	320	338	170	373	395	176	43	G 3/4”
OKW 600x350-3-2,0	600	620	638	728	350	370	388	220	423	395	176	43	G 3/4”
OKW 700x400-3-2,0	700	720	738	828	400	420	438	250	473	395	170	55	G 1”
OKW 800x500-3-2,0	800	820	838	928	500	520	538	340	573	395	170	55	G 1”
OKW 900x500-3-2,0	900	920	938	1028	500	520	538	350	573	395	170	55	G 1”
OKW 1000x500-3-2,0	1000	1020	1038	1128	500	520	538	350	573	395	170	55	G 1”



Water coolers OKW air pressure losses

OKW rectangular

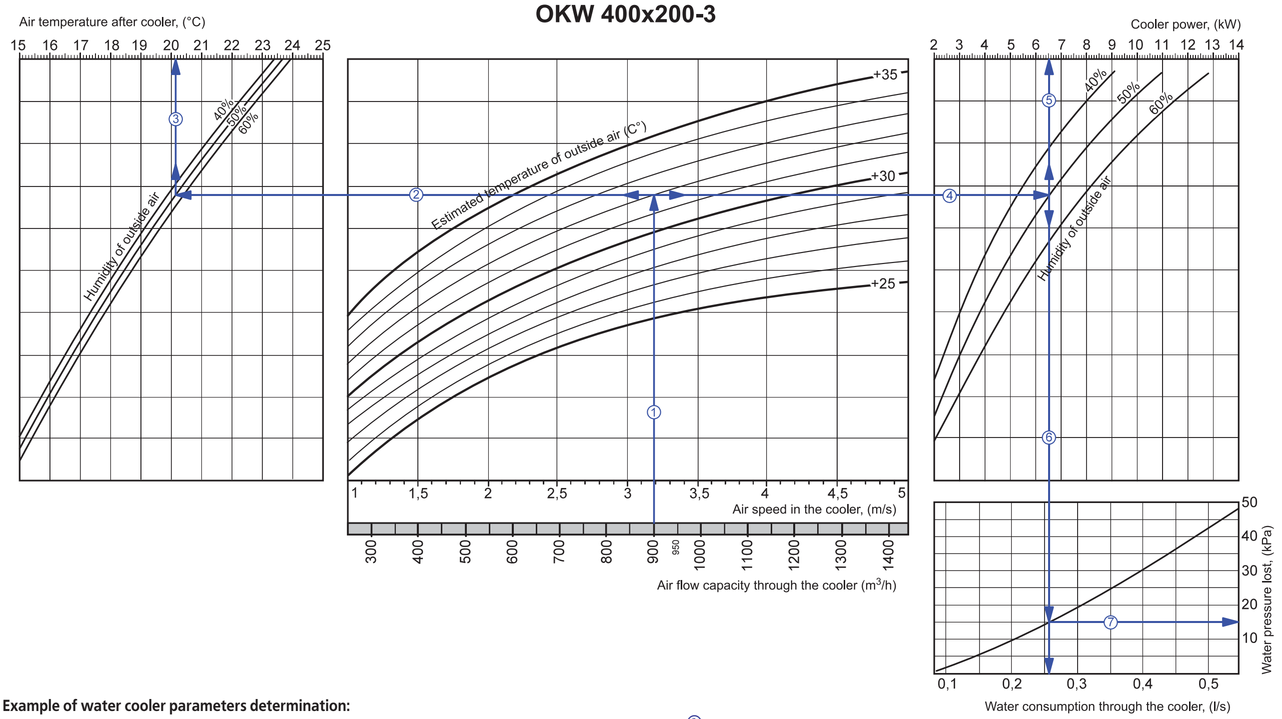


OKW

WATER COOLERS SERIES

OKW

OKW 400x200-3



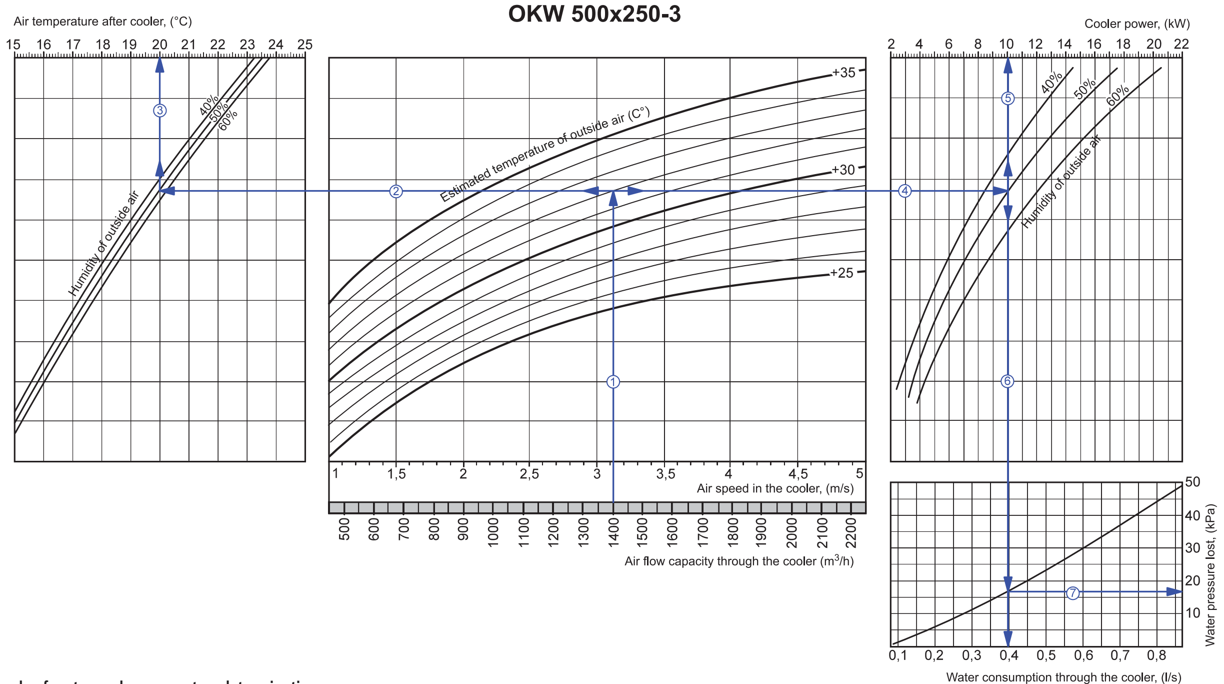
Example of water cooler parameters determination:

On condition that air flow capacity rate is 900 m³/h the air flow speed in cooler's cross-section will be 3,2 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (6,5 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (0,26 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (15 кPa).

OKW

OKW 500x250-3



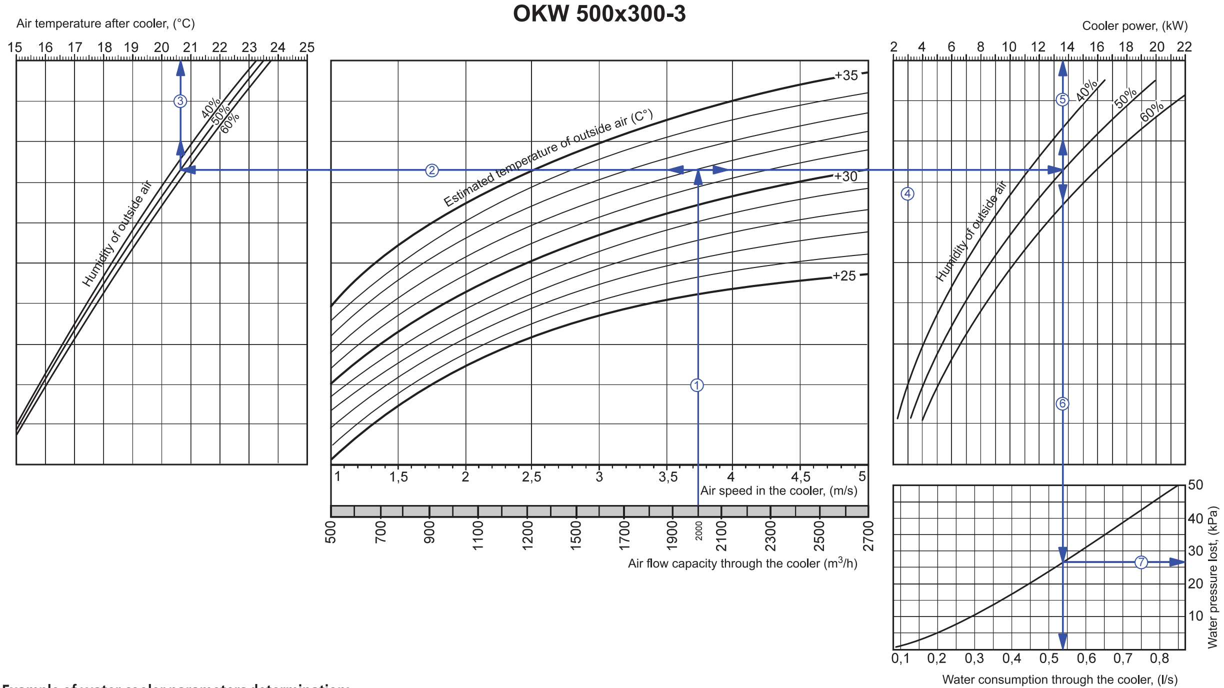
Example of water cooler parameters determination:

On condition that air flow capacity rate is 1400 m³/h the air flow speed in cooler's cross-section will be 3,1 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (10 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (0,4 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (17 кPa).

OKW

OKW 500x300-3



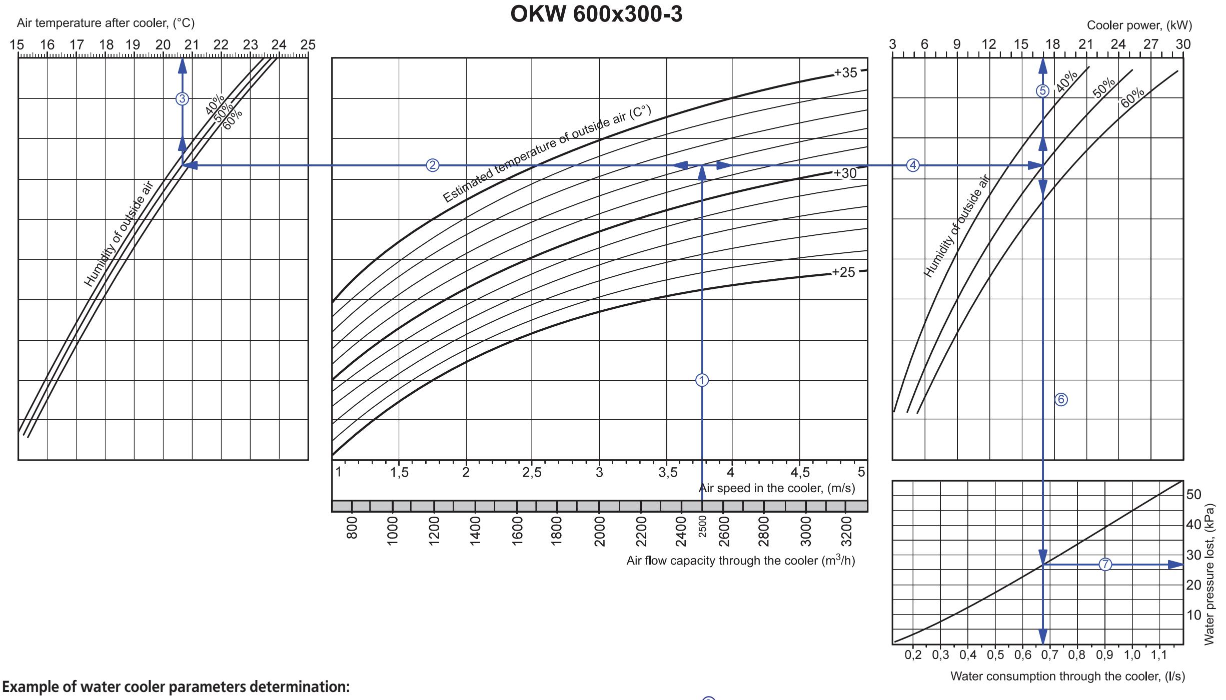
Example of water cooler parameters determination:

On condition that air flow capacity rate is 2000 m³/h the air flow speed in cooler's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,6°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (13,6 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (0,54 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (27 кPa).

OKW

OKW 600x300-3



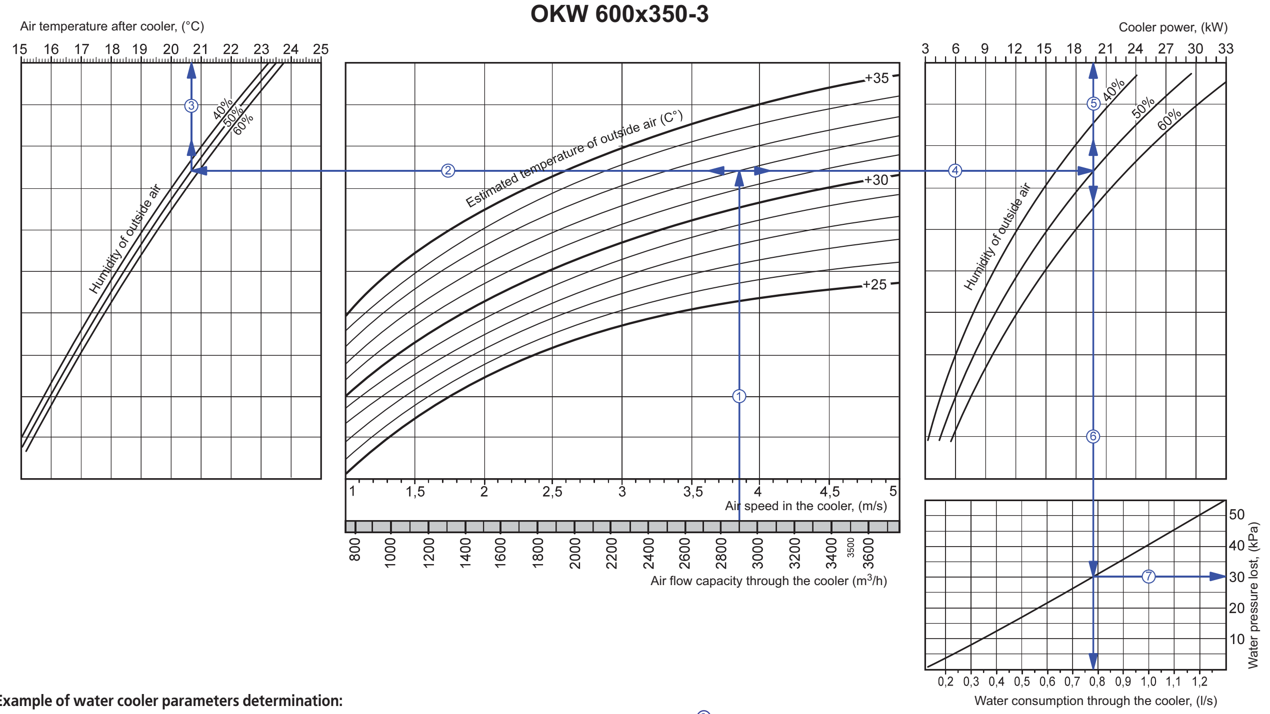
Example of water cooler parameters determination:

On condition that air flow capacity rate is 2500 m³/h the air flow speed in cooler's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,7°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (17 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (0,68 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (27 кPa).

OKW

OKW 600x350-3



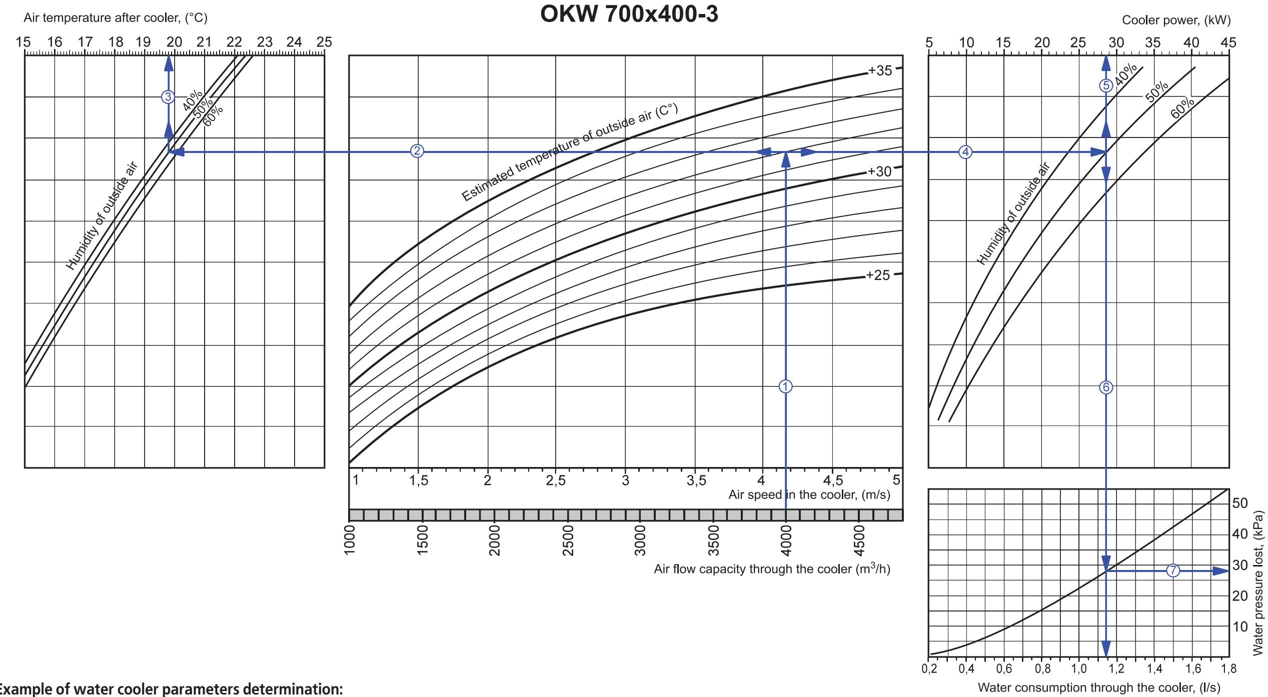
Example of water cooler parameters determination:

On condition that air flow capacity rate is 2850 m³/h the air flow speed in cooler's cross-section will be 3,85 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,7°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (19,8 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (0,78 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (30 кPa).

OKW

OKW 700x400-3



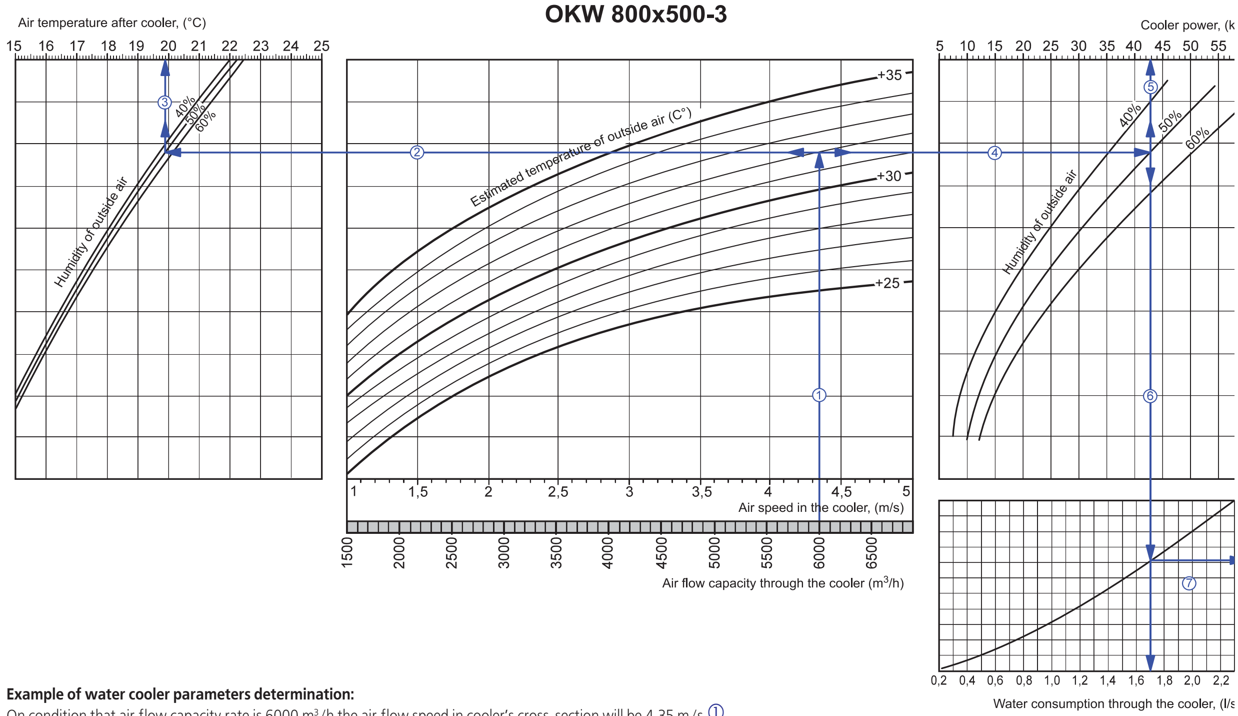
Example of water cooler parameters determination:

On condition that air flow capacity rate is 4000 m³/h the air flow speed in cooler's cross-section will be 4,15 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (19,8°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (28,5 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (1,14 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (28 кPa).

OKW

OKW 800x500-3



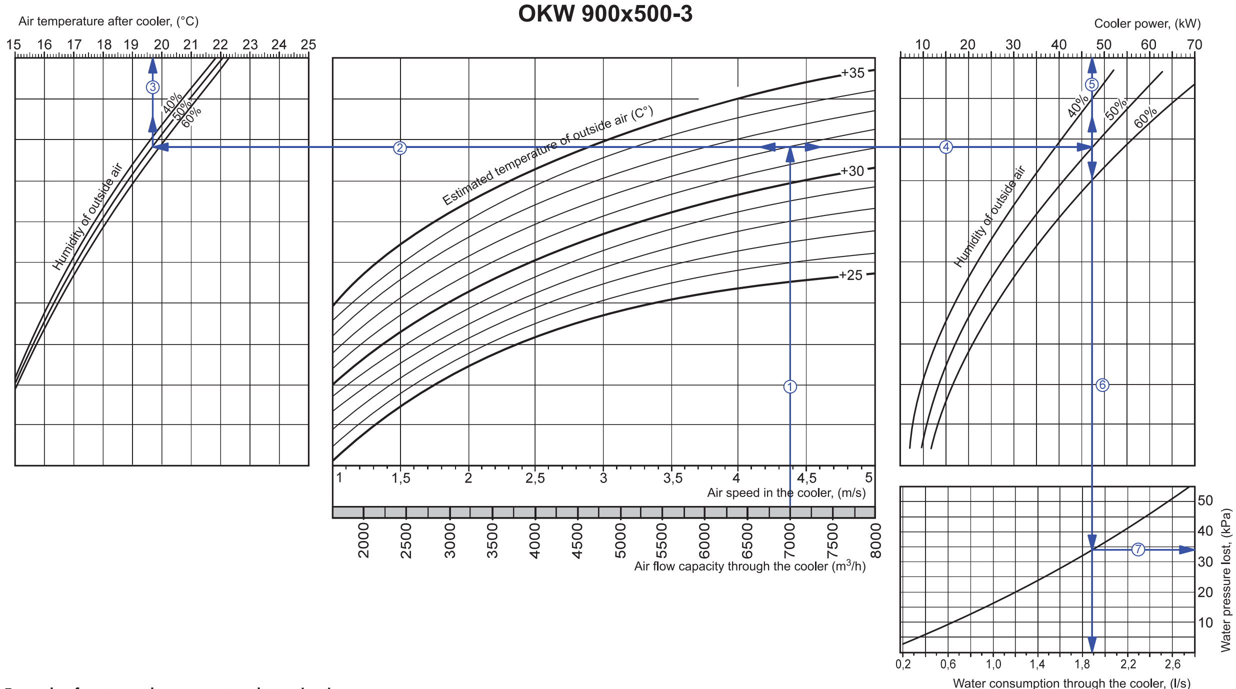
Example of water cooler parameters determination:

On condition that air flow capacity rate is 6000 m³/h the air flow speed in cooler's cross-section will be 4,35 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (19,9°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (43 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (1,7 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (36 кPa).

OKW

OKW 900x500-3



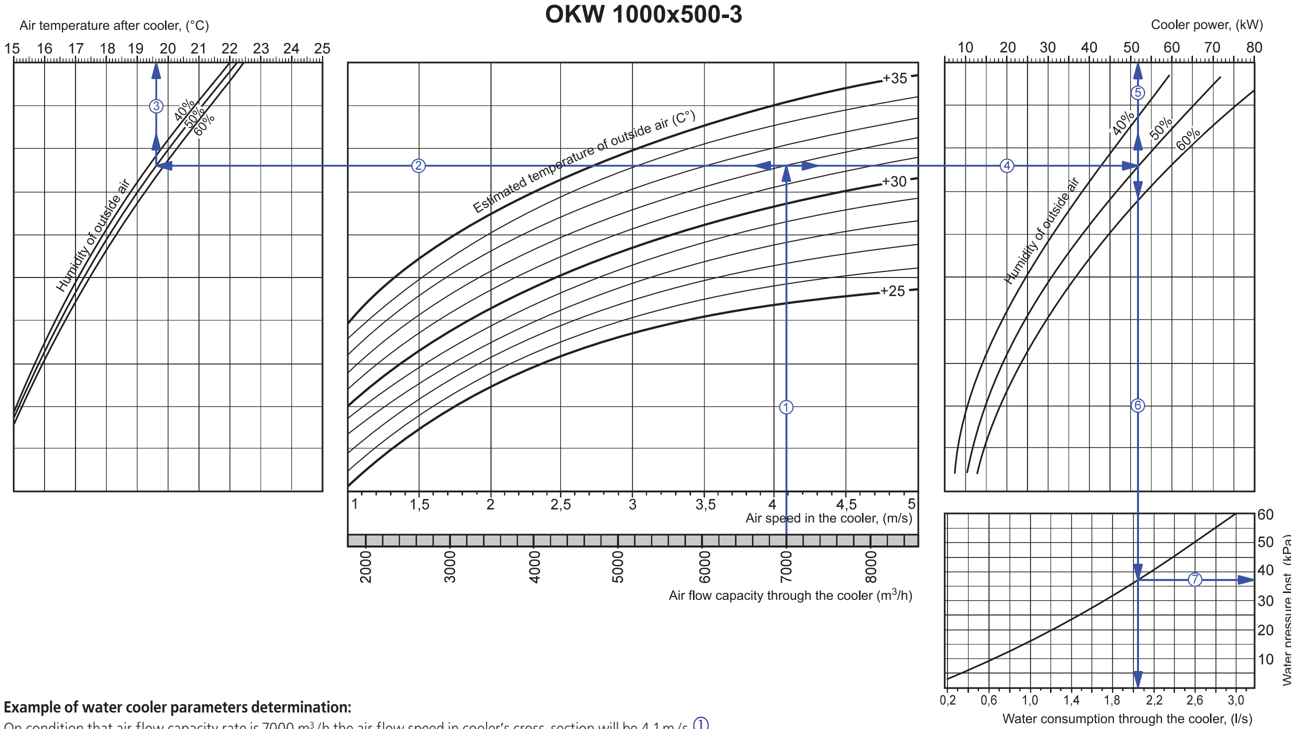
Example of water cooler parameters determination:

On condition that air flow capacity rate is 7000 m³/h the air flow speed in cooler's cross-section will be 4,4 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (19,7°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (47 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (1,9 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (34 кPa).

OKW

OKW 1000x500-3



Example of water cooler parameters determination:

On condition that air flow capacity rate is 7000 m³/h the air flow speed in cooler's cross-section will be 4,1 m/s ①.

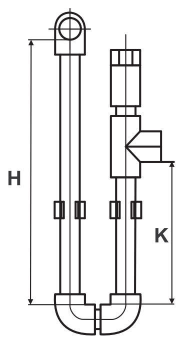
- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+32°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (19,6°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+32°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (52 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (2,05 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (37 кPa).

Series
OKF

Application
Air coolers with direct evaporative cooling are designed for cooling the incoming air in ventilation systems with rectangular cross-section. These air coolers can also be used as coolers in inlet and inlet-exhaust units.

Design
The case is made of galvanized sheet steel, pipe collectors are made of copper tubes and heat exchange surface is made of aluminum plates. Triple-row versions of coolers are available. They are designed for operation with cooling mediums R123, R134a, R152a, R404a, R407c, R410a, R507, R12, R22. The coolers are supplied with a drip-plate for collection and removal of condensed water.

Mounting
- Design of the cooler allows fixing it by flanged coupling. Coolers with direct evaporative cooling may be installed only horizontally, allowing removal of condensed water.
- It is recommended to install the cooler in position that ensures uniformly distributed air flow across the full width of cross-section.
- Air filter should be installed in front of the cooler protecting it from contamination.
- Cooler may be installed in front or behind the fan. If the cooler is placed behind the fan it's recommended to anticipate air duct between them in the distance not less than 1-1,5 m in order to stabilize air flow.
- Cooler needs to be connected on the counter flow principle in order to reach maximum cooling effect. All estimated nomographic charts, included in the catalogue, are true for such type of connection.
- It is recommended to install a droplet separator (ordered separately) at the coolers air outlet if air flow speed exceeds 2,5 m/s. This will prevent the drops of condensed water from penetrating into air duct system.
- Removal of condensed water from the cooler should be carried out by means of siphon. The height of siphon directly depends on the fan total pressure. The height of siphon can be calculated in accordance with the following figure and table.



H (mm)	K (mm)	P (Pa)
100	55	600
200	105	1100
260	140	1400

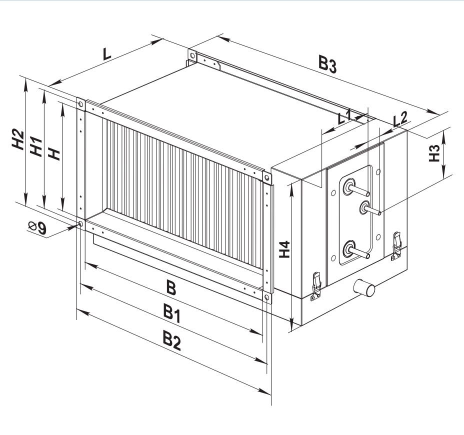
H – siphon height
K – branch height
P – fan total pressure

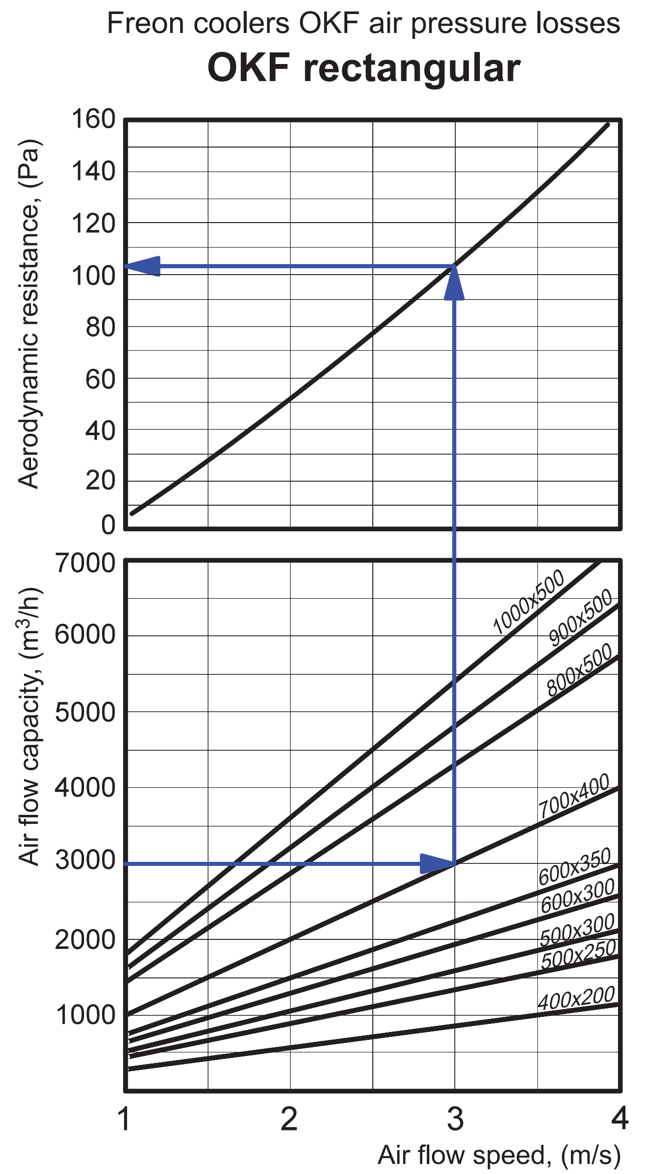
- For correct and safe operation of coolers we recommend you to use automation system that provides complex control and automated regulation of cooling effect and chilling temperature.

Legend:

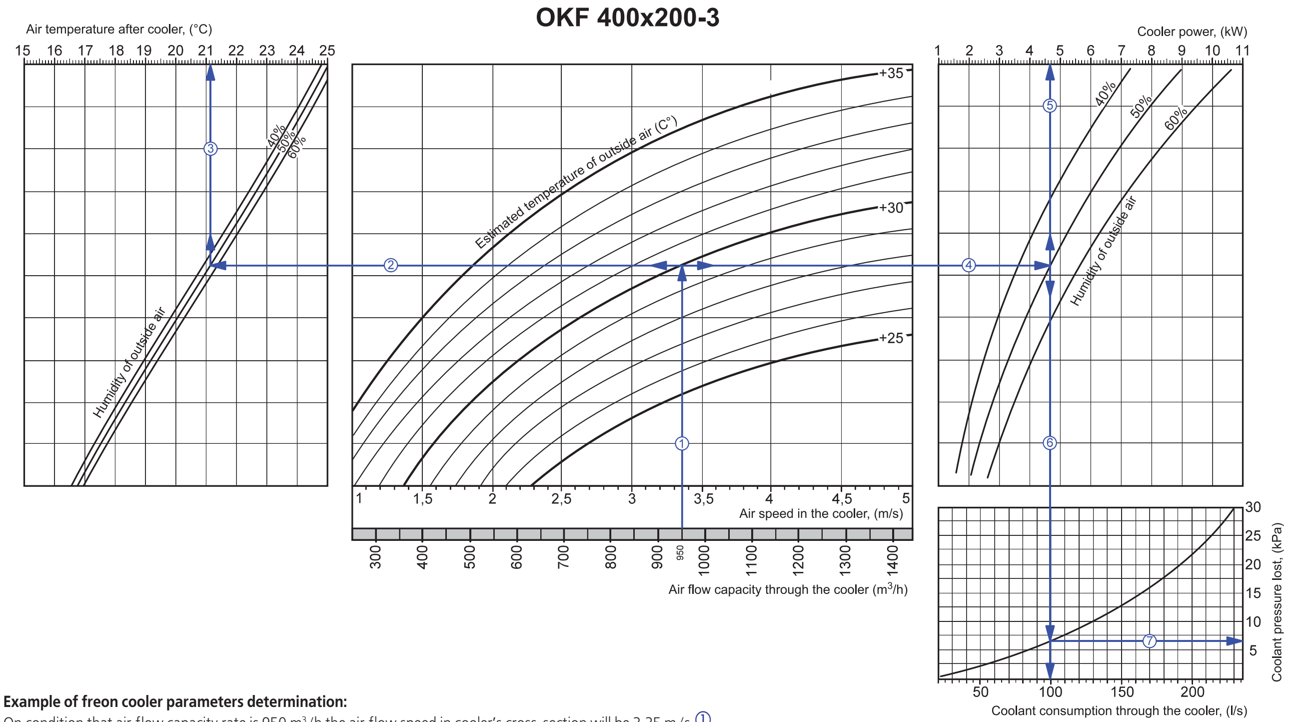
Series	Flange diameter, mm	-	Number of pipes' rows
OKF	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 900x500; 1000x500		3

Type	Dimensions, mm											
	B	B1	B2	B3	H	H1	H2	H3	H4	L	L1	L2
OKF 400x200-3-2,5	400	420	438	528	200	220	238	70	273	395	165	60
OKF 500x250-3-2,5	500	520	538	628	250	270	288	120	323	395	165	60
OKF 500x300-3-2,5	500	520	538	628	300	320	338	175	373	395	165	60
OKF 600x300-3-2,5	600	620	638	728	300	320	338	170	373	395	165	60
OKF 600x350-3-2,5	600	620	638	728	350	370	388	220	423	395	165	60
OKF 700x400-3-2,5	700	720	738	858	400	420	438	250	473	395	160	75
OKF 800x500-3-2,5	800	820	838	958	500	520	538	340	573	395	160	75
OKF 900x500-3-2,5	900	920	938	1058	500	520	538	350	573	395	160	75
OKF 1000x500-3-2,5	1000	1020	1038	1158	500	520	538	350	573	395	160	75





OKF 400x200–3

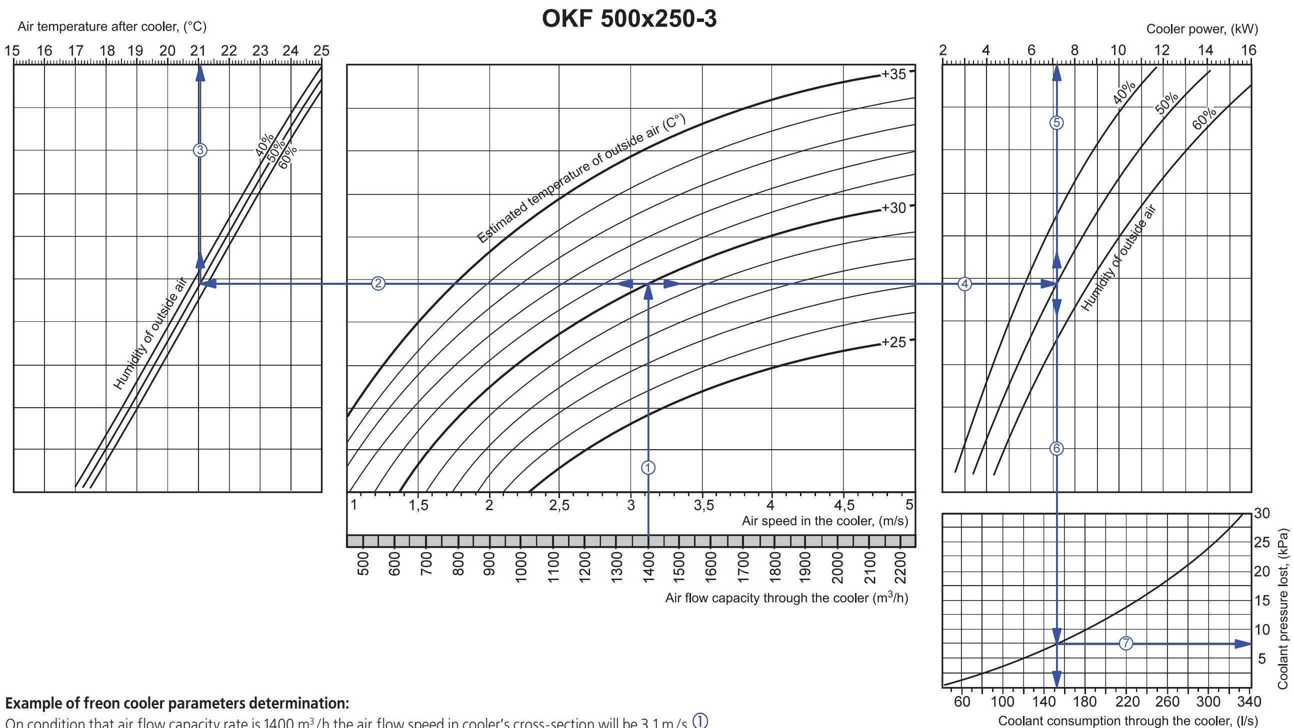


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 950 m^3/h the air flow speed in cooler's cross-section will be 3,35 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (21,1°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (4,7 kW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (100 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (6,5 кPa).

OKF 500x250–3



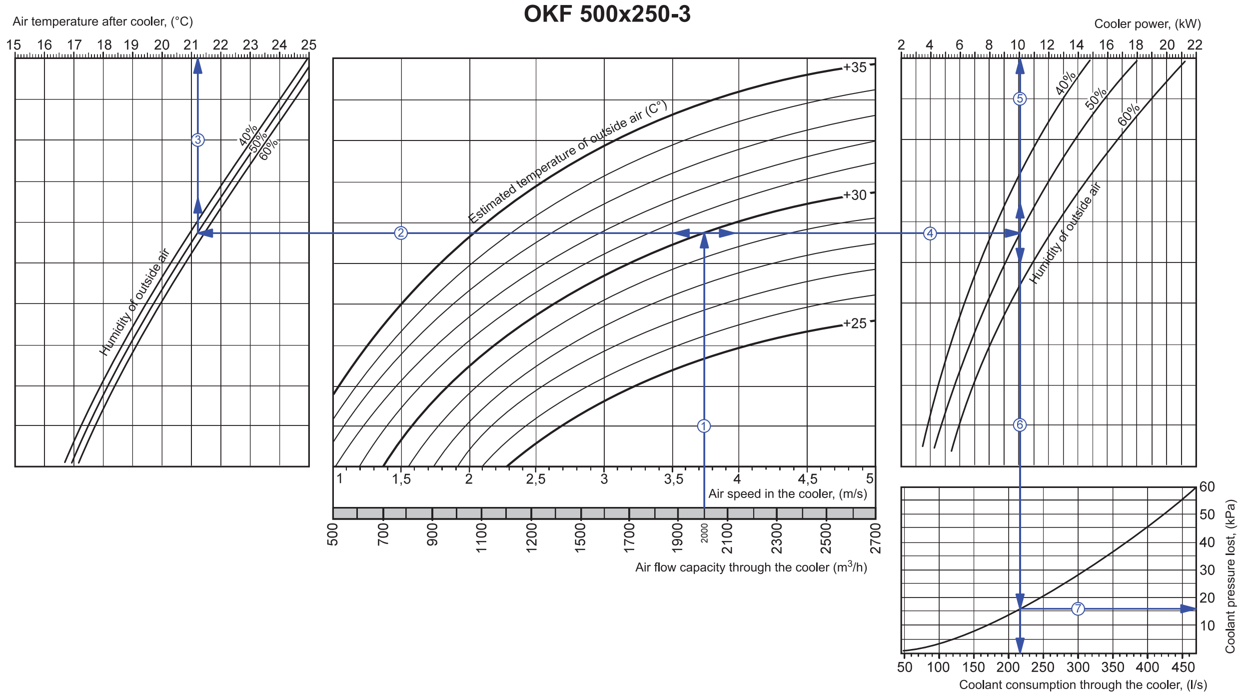
Example of freon cooler parameters determination:

On condition that air flow capacity rate is 1400 m^3/h the air flow speed in cooler's cross-section will be 3,1 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (21,1°C)③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (7,2 kW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (152 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (7,5 кPa).

OKF 500x300-3

OKF 500x250-3



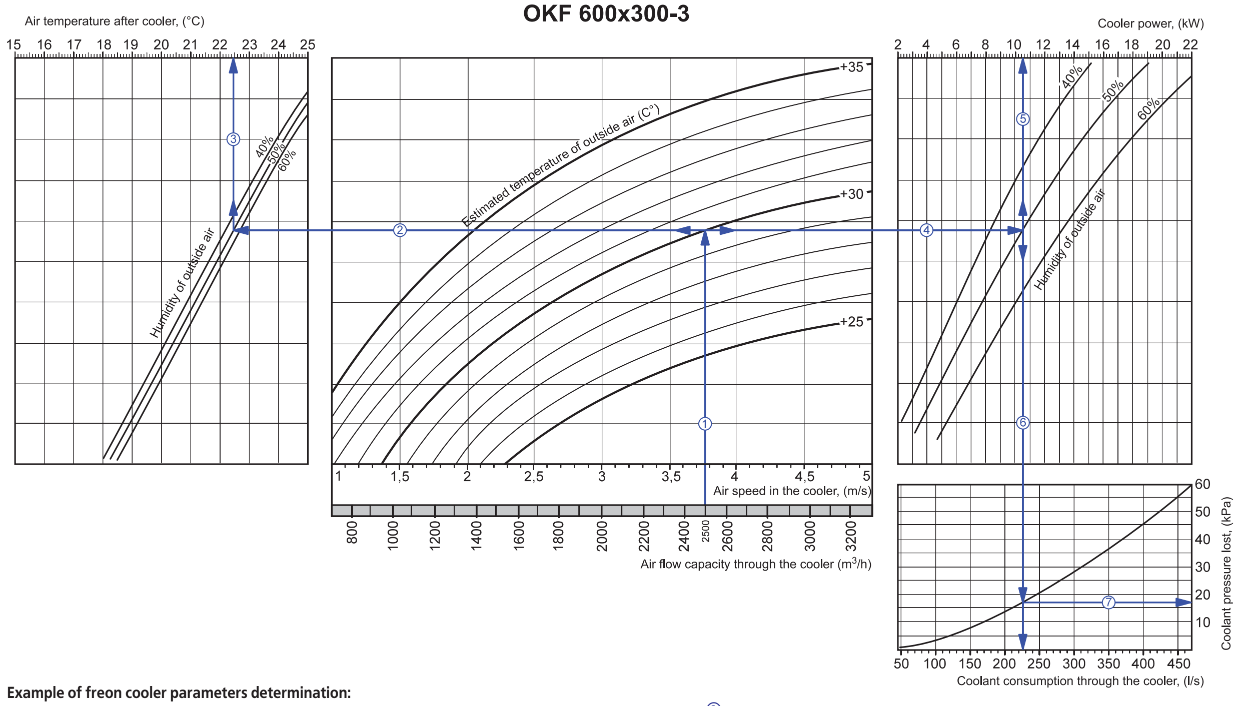
Example of freon cooler parameters determination:

On condition that air flow capacity rate is 2000 m^3/h the air flow speed in cooler's cross-section will be 3,25 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (21,2°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (10 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (215 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (16 кPa).

OKF 600x300-3

OKF 600x300-3

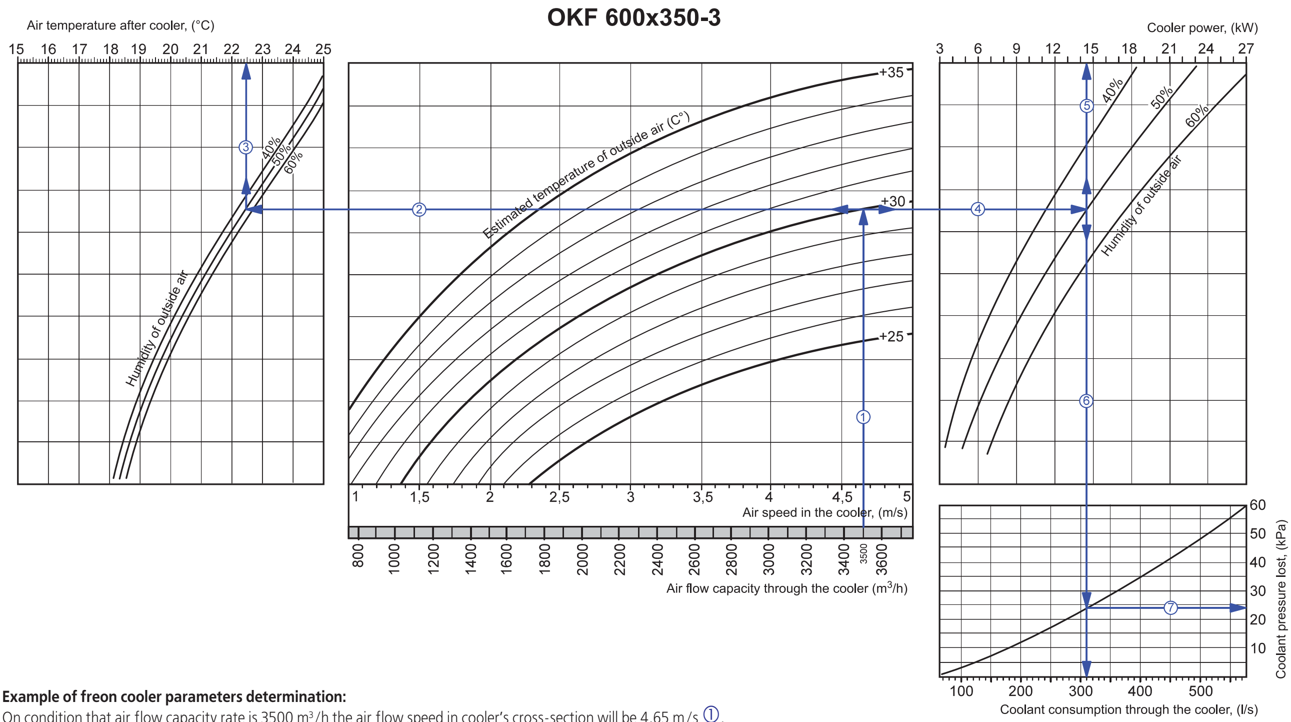


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 2500 m^3/h the air flow speed in cooler's cross-section will be 3,75 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (22,5°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (10,5 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (225 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (17 кPa).

OKF 600x350-3

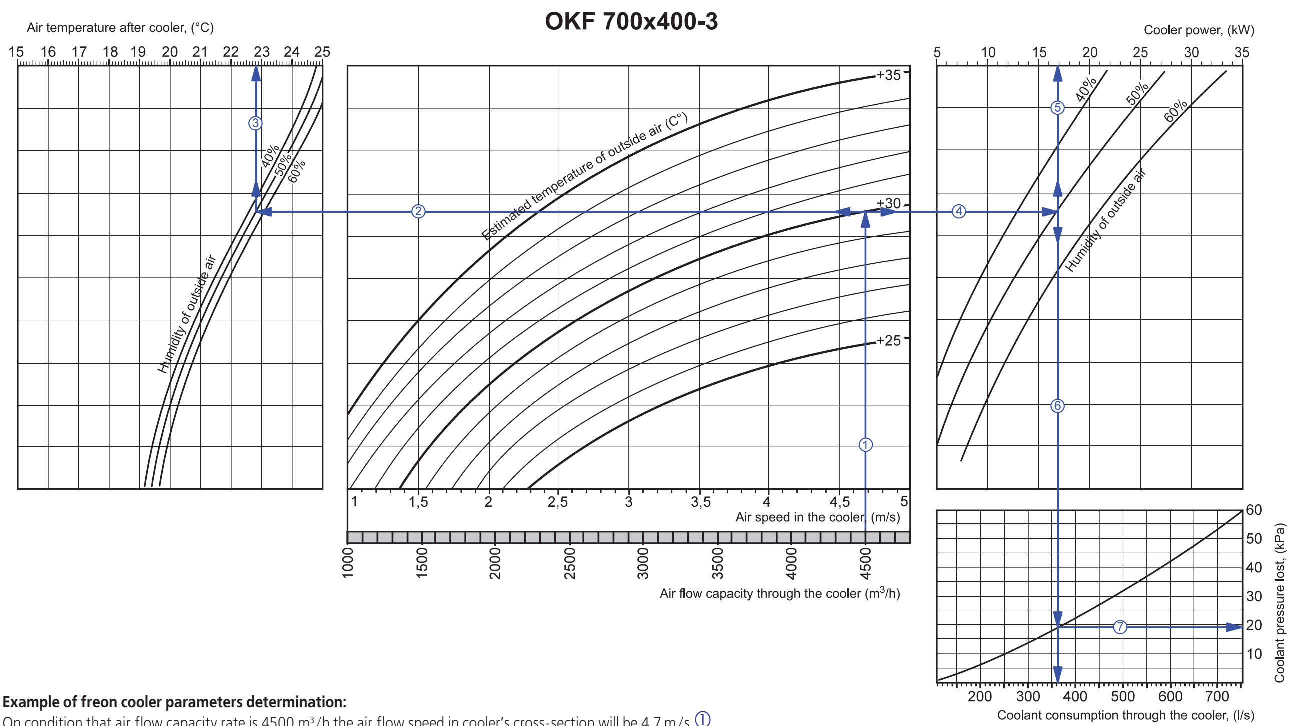


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 3500 m³/h the air flow speed in cooler's cross-section will be 4,65 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (22,5°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (14,5 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (310 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (24 кPa).

OKF 700x400-3

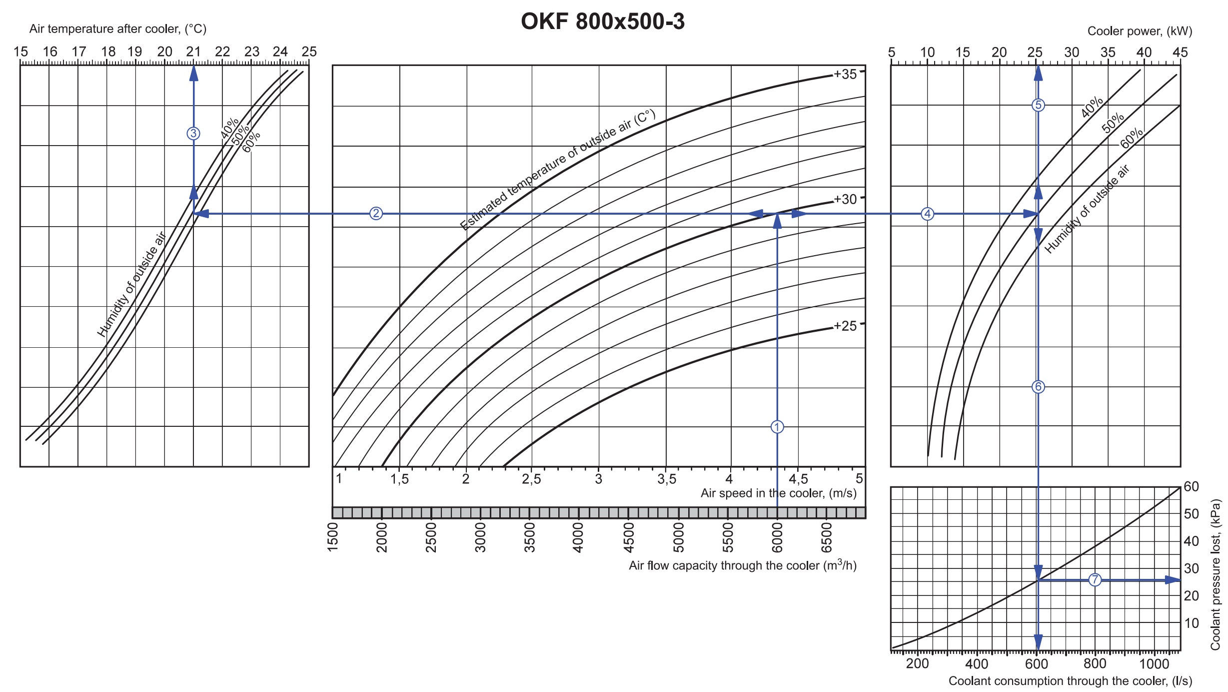


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 4500 m³/h the air flow speed in cooler's cross-section will be 4,7 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (22,8°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (17 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (360 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (19 кPa).

OKF 800x500-3

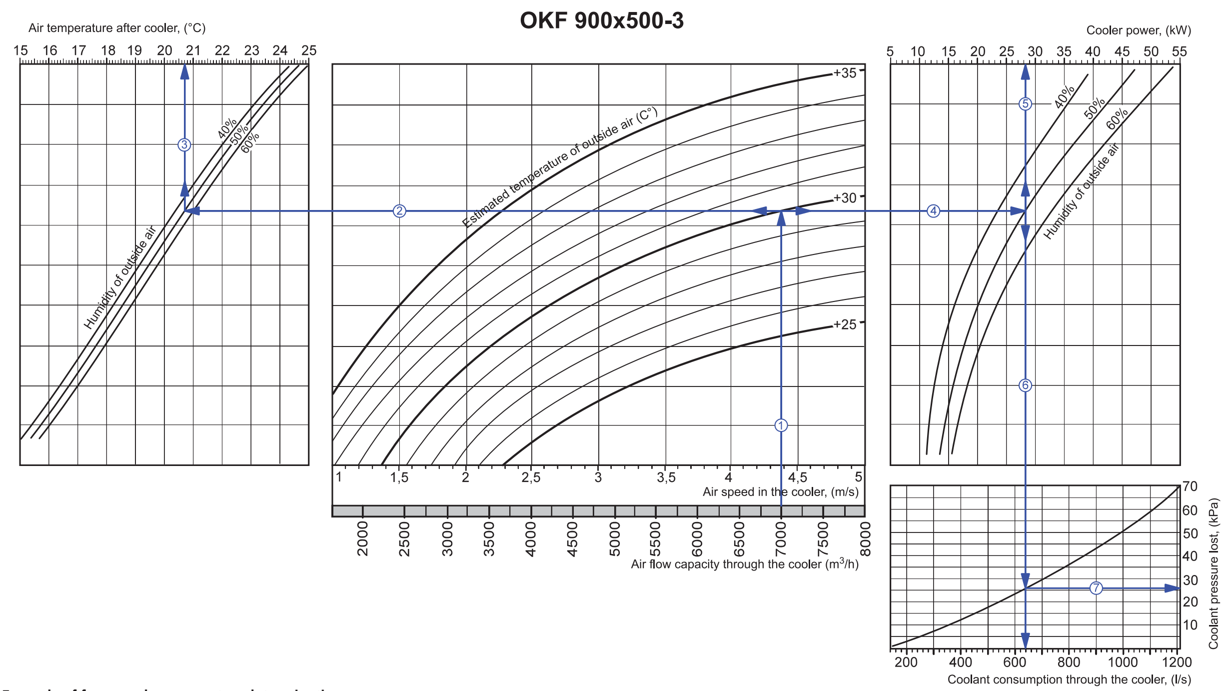


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 6000 m³/h the air flow speed in cooler's cross-section will be 4,35 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,7°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (25,5 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (605 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (26 кPa).

OKF 900x500-3

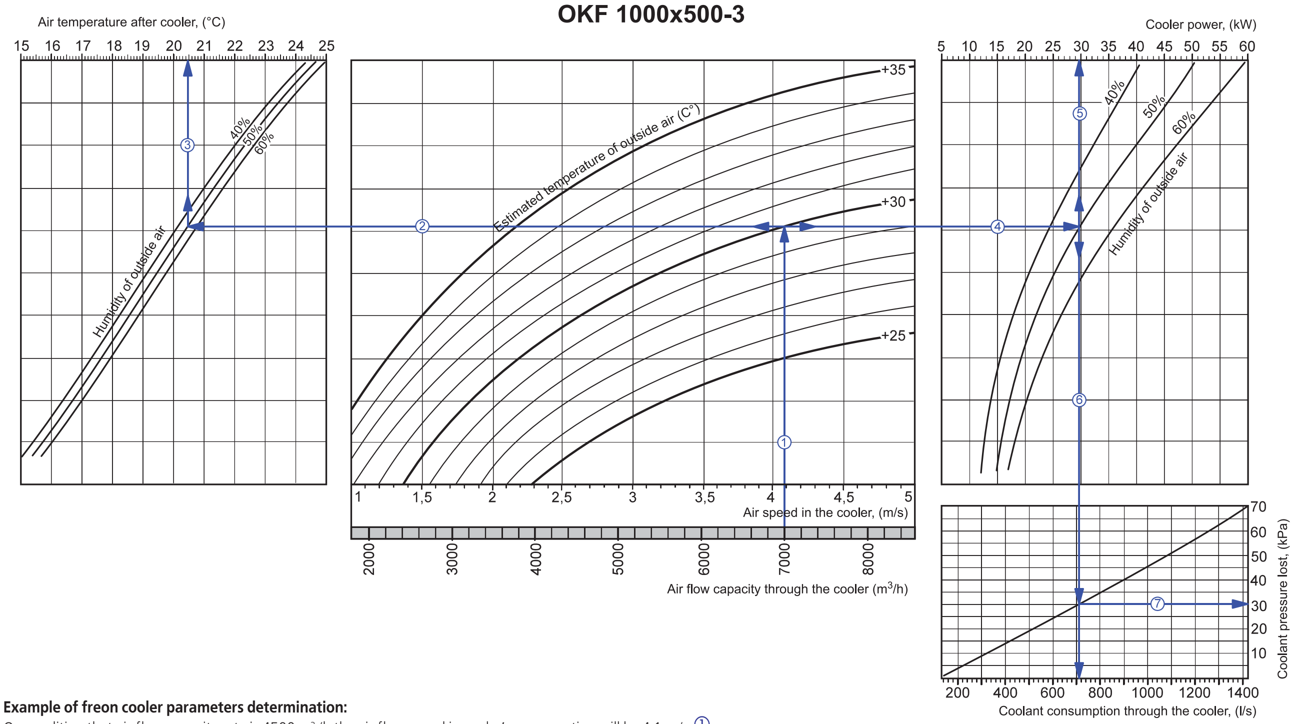


Example of freon cooler parameters determination:

On condition that air flow capacity rate is 7000 m³/h the air flow speed in cooler's cross-section will be 4,4 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,7°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (28 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (640 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (26 кPa).

OKF 1000x500-3



Example of freon cooler parameters determination:

On condition that air flow capacity rate is 4500 m³/h the air flow speed in cooler's cross-section will be 4,1 m/s ①.

- In order to determine the highest possible temperature of cooled air you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example,+30°C) to draw the line to the left ② until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the axis of air temperature after the cooler (20,5°C) ③.
- In order to determine cooler capacity you need from the point of intersection of two lines which stand for air flow capacity rate ① and estimated summer temperature (for example+30°C) extend a line to the right ④ until it intersects the line of outer air humidity (f.e. 50%) and then erect a perpendicular to the cooler capacity axis (30 кW) ⑤.
- In order to determine the required of water flowing consumption through the cooler you need to drop a perpendicular ⑥ on the axis of consumption of water flowing through the cooler (710 l/s).
- In order to determine the water pressure drop in the cooler you need to find the intersection point between the line ⑥ which stand for pressure lose graph and then construct a perpendicular ⑦ to the right until it reaches the axis of water pressure drop (30 кPa).

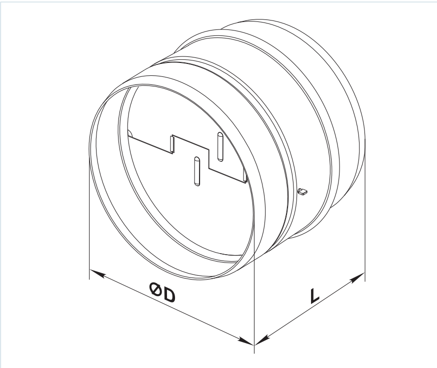
Series
KOM

■ **Application**
Back valve with spring-loaded blades allows shutting off the round air ducts automatically and also prevention the back air flow draught while the ventilation system is not operating. The valve blades are opened by the air flow pressure and then are closed by spring.

■ **Design**
The valve case is made of galvanized steel sheet and the blades are made of sheet aluminum. Each valve has two spring-loaded leafs.

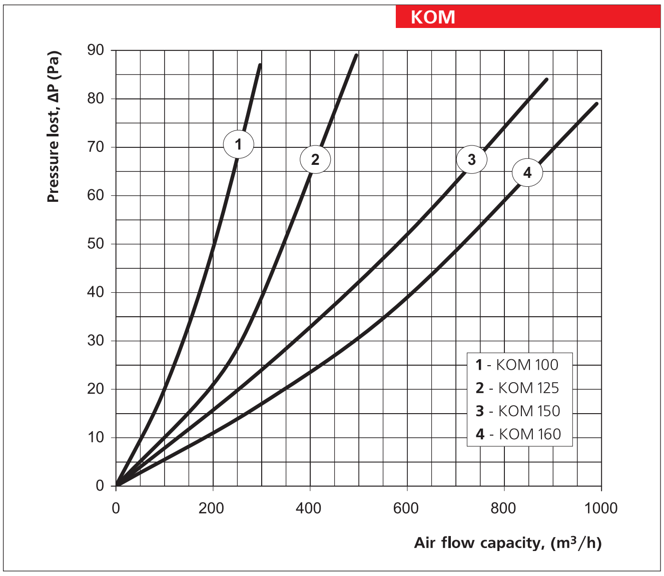
■ **Mounting**
Design of the valve allows fixing it on the round air ducts by means of clamps. Rotation axis of valve leafs must be vertical. Direction of air flow should be taken into consideration while installing the valve in ventilation system.

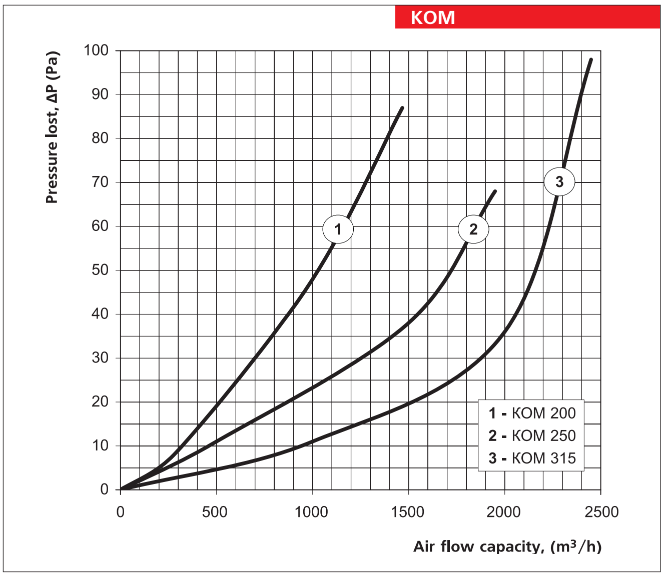
Type	Dimensions, mm		Weight, kg
	ØD	L	
KOM 100	99	80	0,18
KOM 125	124	100	0,27
KOM 150	149	115	0,38
KOM 160	159	120	0,42
KOM 200	199	145	0,63
KOM 250	249	165	0,90
KOM 315	314	190	1,31



Legend:

Series	Flange diameter , mm
KOM	100; 125; 150; 160; 200; 250; 315


KOM
Pressure lost, ΔP (Pa)
90
80
70
60
50
40
30
20
10
0
0
200
400
600
800
1000
Air flow capacity, (m³/h)
1 - KOM 100
2 - KOM 125
3 - KOM 150
4 - KOM 160


KOM
Pressure lost, ΔP (Pa)
100
90
80
70
60
50
40
30
20
10
0
0
500
1000
1500
2000
2500
Air flow capacity, (m³/h)
1 - KOM 200
2 - KOM 250
3 - KOM 315

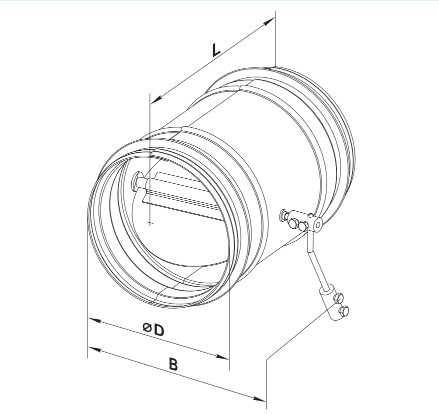
Series
KOM1

Application
Back valve is a gravity-type valve that is designed to shut down the air duct cross-section automatically when the fan is switched off.

Design
The case and rotating plate are both made of galvanized steel sheets. Dampersare supplied with rubber seals to achieve pressure tight joint with the air ducts. The valve plate is opened by the air flow pressure and resets automatically on loss of air supply. Valve handle is supplied with counter weight by means of which the valve response for valve open/close operation can be adjusted.

Mounting
Design of the valve allows fixing it on the round air ducts by means of clamps. The plate should autonomously close under the action of its own dead-weight. Rotation axis of valve leafs must be vertical. Direction of air flow should be taken into consideration while installing the valve in ventilation system.

Type	Dimensions, mm			Weight, kg
	ØD	B	L	
KOM1 100	99	139	150	0,65
KOM1 125	124	162	170	0,81
KOM1 150	149	194	180	0,97
KOM1 160	159	204	190	1,06
KOM1 200	199	238	220	1,57
KOM1 250	249	290	270	2,2
KOM1 315	314	356	340	3,24



Legend:

Series	Flange diameter , mm
KOM 1	1100; 125; 150; 160; 200; 250; 315

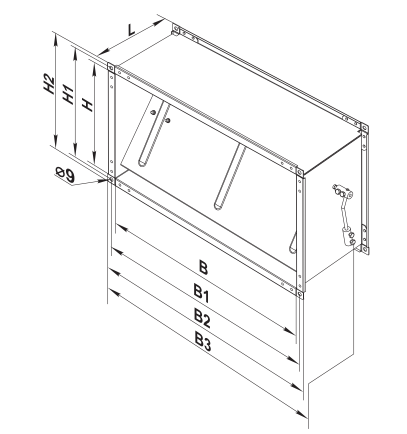
Series
KOM1

Application
Back valve is a gravity-type device that is designed to shut down the air duct cross-section automatically when the fan is switched off.

Design
The case and rotating plate are both made of galvanized steel sheets. The valve plate is opened by the air flow pressure and resets automatically on loss of air supply. Valve handle is supplied with counter weight by means of which the valve response for valve open/close operation can be adjusted.

Mounting
The valve is designed to be mounted in the rectangular air ducts of ventilation systems long side horizontally. The plate should autonomously close under the action of its own dead-weight. Rotation axis of valve leafs must be vertical. Direction of air flow should be taken into consideration while installing the valve in ventilation system.

Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
KOM1 400x200	400	420	440	461	200	220	240	202	2,9
KOM1 500x250	500	520	540	561	200	270	290	202	3,73
KOM1 500x300	500	520	540	561	300	320	340	202	4,1
KOM1 600x300	600	620	640	661	300	320	340	202	4,64
KOM1 600x350	600	620	640	661	350	370	390	202	5,03



BACK VALVES SERIES KOM1

Legend:

Series	Flange size (WxH), mm
KOM 1	400x200; 500x250; 500x300; 600x300; 600x350

Series
KR

Series
KRA

■ **Application**

Regulating dampers are designed to adjust the air flow capacity rate (KR) or to shut off the round air ducts automatically (KRA).

■ **Design**

The case and rotating plate are both made of galvanized steel sheets. Dampers are supplied with rubber seals to achieve pressure tight joint with the air ducts.

KR – manual control and shut-off valve, supplied with a lever with a metal handle and a stopper for fixing the valve in position by means of butterfly bolt.

KRA – regulating and shut-off damper valve, supplied with servo-controlled actuator, which opens/shuts off the ventilation duct automatically.

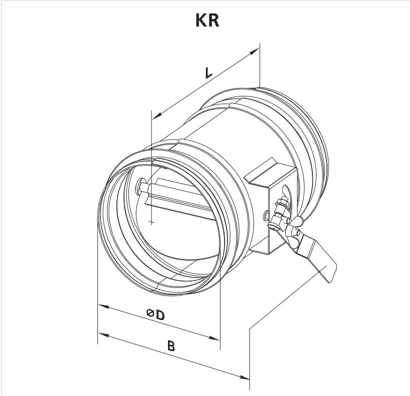
■ **Mounting**

Design of the valve allows fixing it on the round air ducts by means of clamps. Direction of air flow should be taken into consideration while installing the valve in ventilation system.

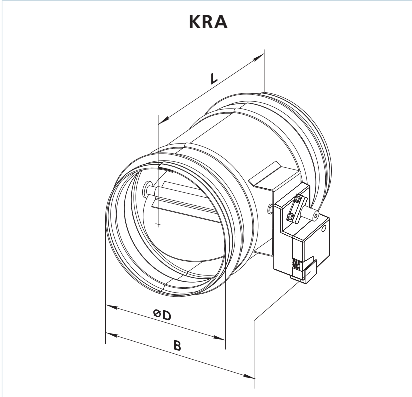
Legend:

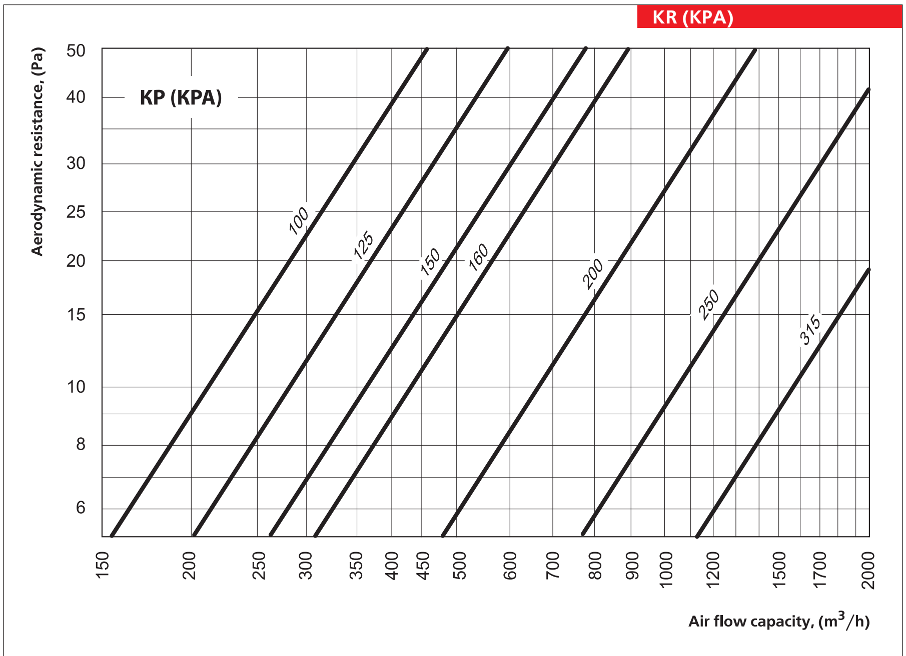
Series	Flange diameter , mm
KR KRA	100; 125; 150; 160; 200; 250; 315; 355

Type	Dimensions, mm			Weight, kg
	ØD	B	L	
KR 100	99	131	150	0,6
KR 125	124	159	170	0,8
KR 150	149	186	180	0,96
KR 160	159	196	190	1,04
KR 200	199	230	220	1,56
KR 250	249	282	270	2,18
KR 315	314	348	340	3,23



Type	Dimensions, mm			Weight, kg
	ØD	B	L	
KRA 100	99	185	150	1,2
KRA 125	124	211	170	1,4
KRA 150	149	237	180	1,6
KRA 160	159	243	190	1,7
KRA 200	199	287	220	2,2
KRA 250	249	339	270	2,8
KRA 315	314	405	340	3,9
KRA 355	348	450	400	5,0





KR KPA
DAMPERS SERIES

Series
KR

Series
KRA

Application

Regulating dampers are designed to adjust the Air flow capacity rate (KR) or to shut off the rectangular air ducts automatically (KRA).

Design

The case and rotating plate are both made of galvanized steel sheets.

KR – manual control and shut-off valve, supplied with a lever with a metal handle and a stopper for fixing the valve in position by means of butterfly bolt.

KRA – regulating and shut-off damper valve, supplied with servo-controlled actuator, which opens/shuts off the ventilation duct automatically.

Mounting

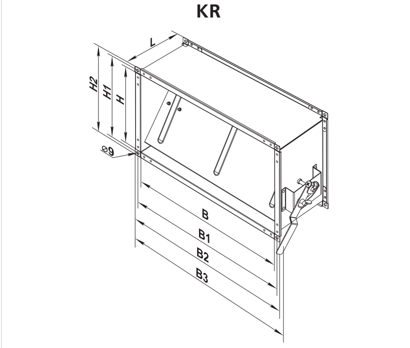
Installation of the damper valve is carried out by means of flanged coupling. Installation in ventilation system is performed by means of attaching the end flanges of dampers to the counter-flanges of air ducts and other units of ventilation system. Connection is done by galvanized screw-bolts and brackets. In the process of installation make sure that enough space is left for the checkup access to controlled actuators.

Legend:

Series	Flange size (WxH), mm
KR KRA	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 1000x500

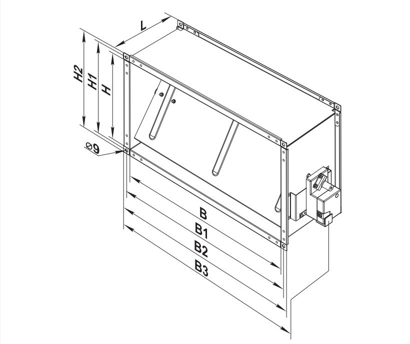
Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
KR 400x200	400	420	440	460	200	220	240	202	3,0
KR 500x250	500	520	540	560	250	270	290	202	3,8
KR 500x300	500	520	540	560	300	320	340	202	3,1
KR 600x300	600	620	640	660	300	320	340	202	4,2
KR 600x350	600	620	640	660	350	370	390	202	5,1

KR

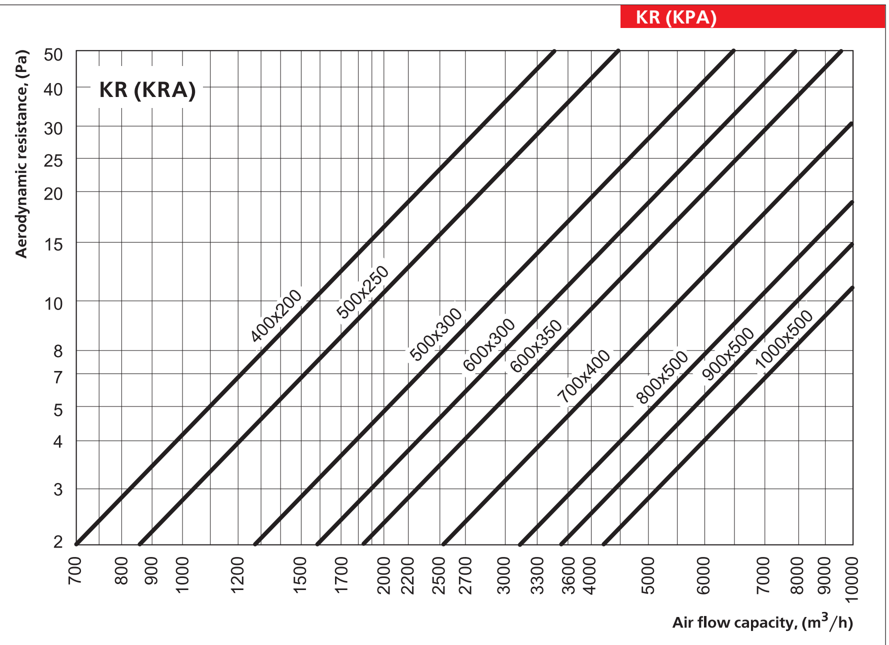


Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
KRA 400x200	400	420	440	503	200	220	240	202	3,6
KRA 500x250	500	520	540	603	250	270	290	202	4,4
KRA 500x300	500	520	540	603	300	320	340	202	4,8
KRA 600x300	600	620	640	703	300	320	340	202	5,4
KRA 600x350	600	620	640	703	350	370	390	202	5,8
KRA 700x400	700	720	740	803	400	420	440	202	4,8
KRA 800x500	800	820	840	903	500	520	540	202	5,4
KRA 1000x500	1000	1020	1040	1103	500	520	540	202	5,8

KRA



KR (KPA)



Series
RRV

Series
RRVA

Application

Air flow regulator is a multi-flapper valve with counter-rotating flappers and is designed for air flow rate control (RRV) or for shutting off the rectangular ventilation ducts automatically (RRVA, RRVAF).

Design

The case is made of galvanized steel sheets. The rotating plates, made from aluminum structural shape, are rotated by means of plastic gears.

RRV – manual control and shut-off valve, supplied with a lever with a metal handle and a stopper for fixing the valve in position by means of butterfly bolt.

RRVA – regulating and shut-off damper valve, supplied with servo-controlled actuator, which opens/shuts off the ventilation duct automatically.

RRVAF – is a regulating and shut-off damper valve, supplied with servo-controlled actuator with Back valve, which automatically opens and quickly shuts off the ventilation duct. Valve reseat takes place by means of spring return actuator, therefore, it is recommended for application as one of the freezing protection elements in water heating systems.

Mounting

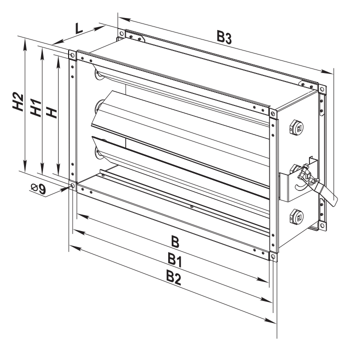
Mounting of the air flow regulator is carried out by means of flanged coupling. Installation in ventilation system is performed by means of attaching the end flanges of dampers to the counter-flanges of air ducts and other units of ventilation system. Connection is done by galvanized screw-bolts and brackets. In the process of installation make sure that enough space is left for the checkup access to controlled actuators.

Legend:

Series	Flange size (WxH), mm
RRV RRVA RRVAF	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 900x500; 1000x500

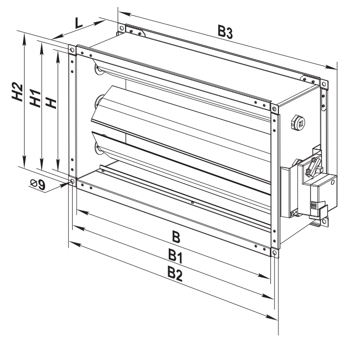
Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
RRV 400x200	400	420	440	475	200	220	240	170	3,5
RRV 500x250	500	520	540	575	250	270	290	170	4,2
RRV 500x300	500	520	540	575	300	320	340	170	4,9
RRV 600x300	600	620	640	675	300	320	340	170	5,4
RRV 600x350	600	620	640	675	350	370	390	170	5,7
RRV 700x400	700	720	740	775	400	420	440	170	7,7
RRV 800x500	800	820	840	875	500	520	540	170	8,8
RRV 900x500	900	920	940	975	500	520	540	170	9,6
RRV 1000x500	1000	1020	1040	1075	500	520	540	170	10,3

RRV



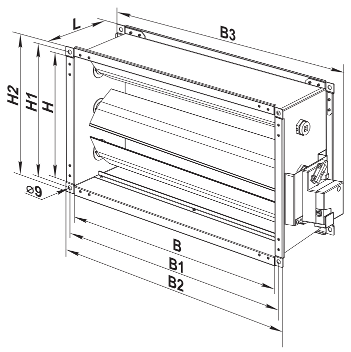
Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
RRVA 400x200	400	420	440	515	200	220	240	170	3,5
RRVA 500x250	500	520	540	615	250	270	290	170	4,2
RRVA 500x300	500	520	540	615	300	320	340	170	4,9
RRVA 600x300	600	620	640	715	300	320	340	170	5,4
RRVA 600x350	600	620	640	715	350	370	390	170	5,7
RRVA 700x400	700	720	740	815	400	420	440	170	8,0
RRVA 800x500	800	820	840	915	500	520	540	170	9,2
RRVA 900x500	900	920	940	1015	500	520	540	170	9,9
RRVA 1000x500	1000	1020	1040	1115	500	520	540	170	10,7

RRVA

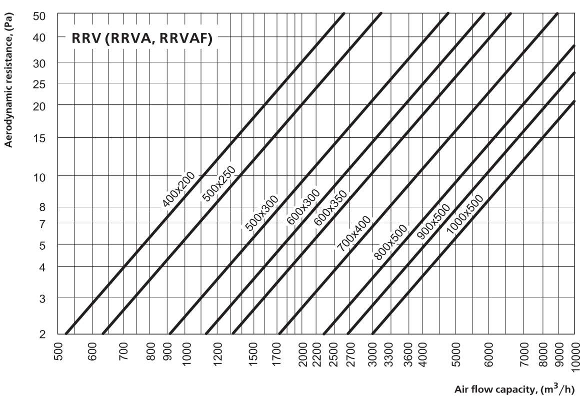


Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
RRVAF 400x200	400	420	440	530	200	220	240	170	4,5
RRVAF 500x250	500	520	540	630	250	270	290	170	5,2
RRVAF 500x300	500	520	540	630	300	320	340	170	5,9
RRVAF 600x300	600	620	640	730	300	320	340	170	6,4
RRVAF 600x350	600	620	640	730	350	370	390	170	6,7
RRVAF 700x400	700	720	740	830	400	420	440	170	9,1
RRVAF 800x500	800	820	840	930	500	520	540	170	10,2
RRVAF 900x500	900	920	940	1030	500	520	540	170	11
RRVAF 1000x500	1000	1020	1040	1030	500	520	540	170	11,7

RRVAF



RRV (RRVA, RRVAF)



Series
KG

Application
Gravity valve is a gravity-type device that is designed to shut down the air duct cross-section automatically when the fan is switched off.

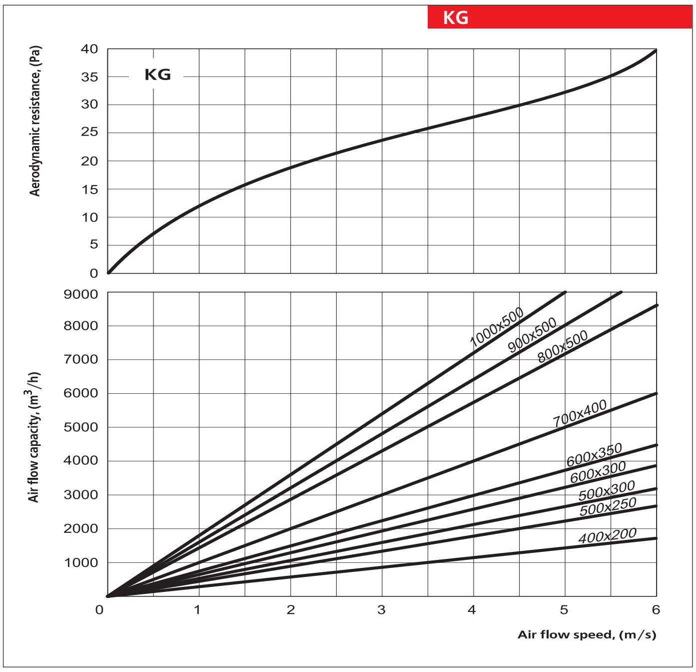
Design
The case and rotating plate are both made of galvanized sheets. The valve is supplied with light gravity-type plastic plates located on rotation axes, integrally mounted in the outer frame. The valve flappers are opened by the air flow pressure and reset automatically on loss of air supply.

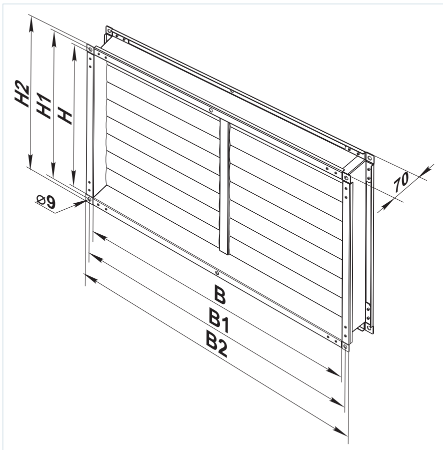
Mounting
The valve is designed to be mounted in the rectangular air ducts of ventilation systems long side horizontally. The plate should autonomously close under the action of its own dead-weight. Rotation axis of valve leafs must be vertical. Direction of air flow should be taken into consideration while installing the valve in ventilation system.

Legend:

Series	Flange size (WxH), mm
KG	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 900x500; 1000x500

Type	Dimensions, mm						Weight, kg
	B	B1	B2	H	H1	H2	
KG 400x200	400	420	440	200	220	240	1,29
KG 500x250	500	520	540	250	270	290	1,58
KG 500x300	500	520	540	300	320	340	1,83
KG 600x300	600	620	640	300	320	340	2,05
KG 600x350	600	620	640	350	370	390	2,21
KG 700x400	700	720	740	400	420	440	3,0
KG 800x500	800	820	840	500	520	540	3,6
KG 900x500	900	920	940	500	520	540	3,8
KG 1000x500	1000	1020	1040	500	520	540	4,0





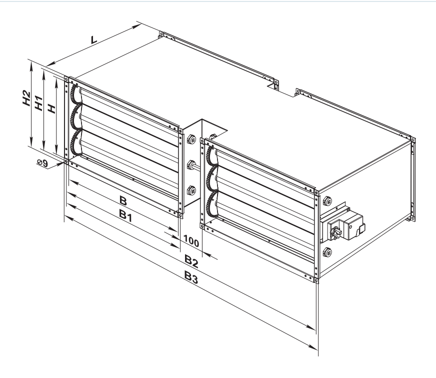
Series
SKRA

Application
Mixing chamber is designed for mixing (recirculation) portion of exhaust air with the outer air in the required proportions. Recirculation (returning portion of exhaust air) allows to make use of the heat contained in the warmed up exhaust air and return it back inside the premises.

Design
The case is made of sheets of galvanized steel. The rotating plates, made of aluminum structural shape, rotate by means of plastic gears. The two chamber inlets are supplied with air valves that allow controlling proportion between the flows of fresh and recirculation air (0-100%) by means of servo-controlled actuators. SKRA mixing chamber is equipped with two servo-controlled actuators and provides automatic adjustment of air flow. The power supply voltage for the actuators is 24V. Control voltage of 0-10V, distributed to the servo-controlled actuator, determines the rate of damper valve opening that on its turn determines proportion between the rates of consumption of incoming and recirculation air (from 0 to 100% of recirculation).

Mounting
Mounting of mixing chamber is carried out by means of flanged coupling. Installation in ventilation system is performed by means of attaching the end flanges of dampers to the counter-flanges of air ducts and other units of ventilation system. Connection is done by galvanizedscrew-bolts and brackets. Mixing chambers are designed for indoor and outdoor mounting in any operative position. In the process of installation make sure that enough space is left for the checkup access to servo-controlled actuators.

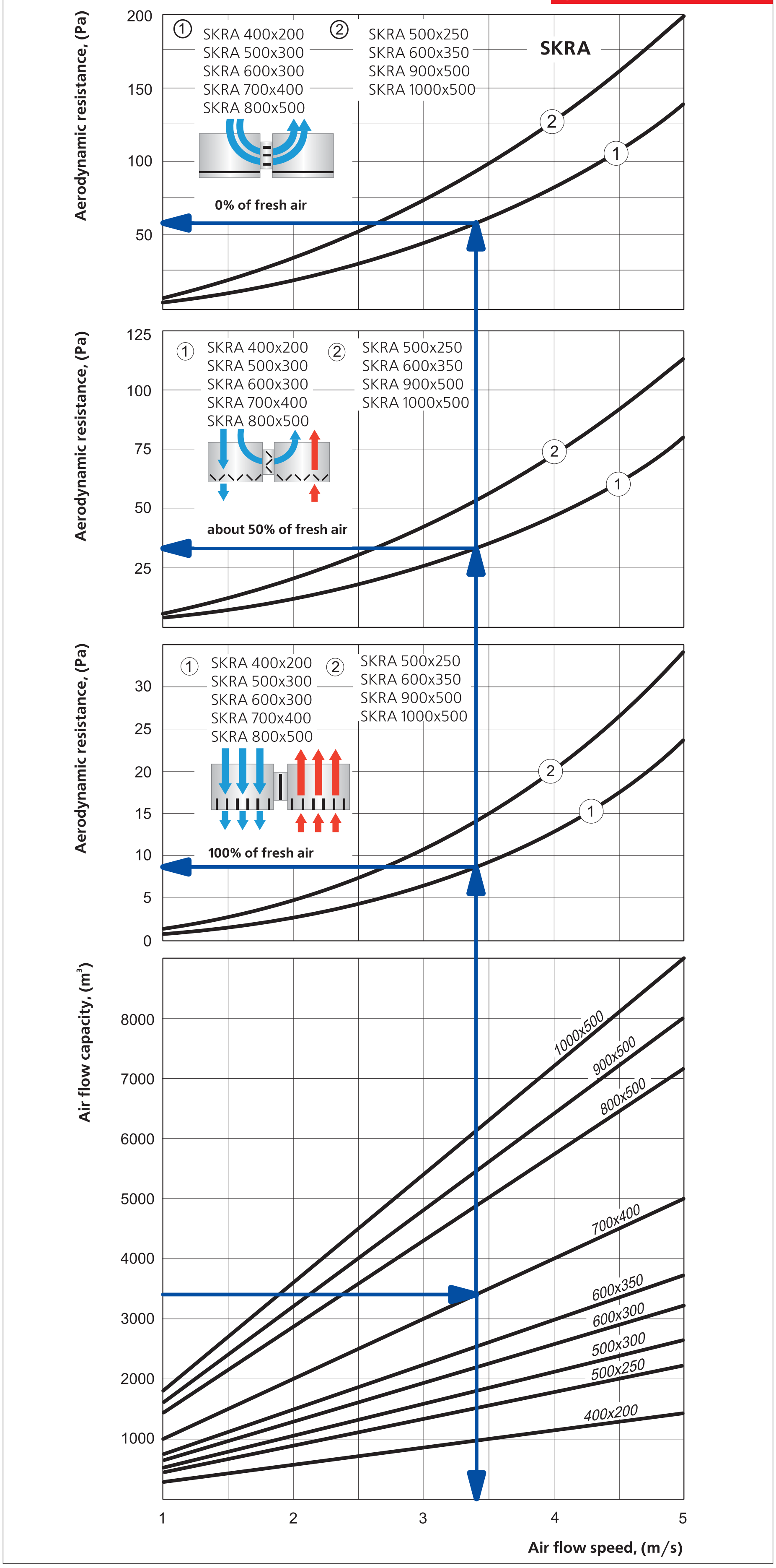
Type	Dimensions, mm								Weight, kg
	B	B1	B2	B3	H	H1	H2	L	
SKRA 400x200/24	400	420	940	960	200	220	240	390	20
SKRA 500x250/24	500	520	1140	1160	250	270	290	440	25
SKRA 500x300/24	500	520	1140	1160	300	320	340	490	33
SKRA 600x300/24	600	620	1340	1360	300	320	340	490	36
SKRA 600x350/24	600	620	1340	1360	350	370	390	540	40
SKRA 700x400/24	700	720	1540	1560	400	420	440	590	45
SKRA 800x500/24	800	820	1740	1760	500	520	540	690	55



Legend:

Series	Flange size (WxH), mm	/	Automatic actuator supply voltage, V
SKRA	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500		24

SKRA


SKRA
Aerodynamic resistance, (Pa)
1 SKRA 400x200
SKRA 500x300
SKRA 600x300
SKRA 700x400
SKRA 800x500
2 SKRA 500x250
SKRA 600x350
SKRA 900x500
SKRA 1000x500
0% of fresh air
about 50% of fresh air
100% of fresh air
Air flow capacity, (m³)
1000x500
900x500
800x500
700x400
600x350
600x300
500x300
500x250
400x200
Air flow speed, (m/s)

Series
VVG

Application
Flexible connectors prevent vibration transfer from the fans or ventilation devices to the air duct and also provide partial compensation of thermal distortion in the route of air duct work. They are applied in ventilation devices which are designed for air transfer within the temperature range of -40°C to +80°C.

Design
Flexible connectors are two flanges joined together by means of vibration-absorbing material, made from zinc-galvanized sheets and polyethylene straps, strengthened by nylon woven fabric. The connectors are not designed for mechanical loading; they should not be applied as supporting structures.

Mounting
Mounting of flexible connectors in ventilation system is performed by means of attaching the end flanges to the counter-flanges of ventilation system. Connection is done by galvanized screw-bolts and brackets.

Type	Dimensions, mm				Weight, KG	Fig. №
	∅D	∅D1	∅D2	L		
VVG 100	99	-	-	110	0,165	1
VVG 125	124	-	-	110	0,205	1
VVG 150	149	-	-	110	0,245	1
VVG 160	159	-	-	110	0,260	1
VVG 200	200	250	380	130	1,1	2
VVG 250	250	295	320	130	1,4	2
VVG 315	314	380	397	130	1,8	2
VVG 355	355	442	460	130	2,0	2
VVG 400	400	504	528	130	2,3	2
VVG 450	450	578	607	130	2,8	2

VVG (round)

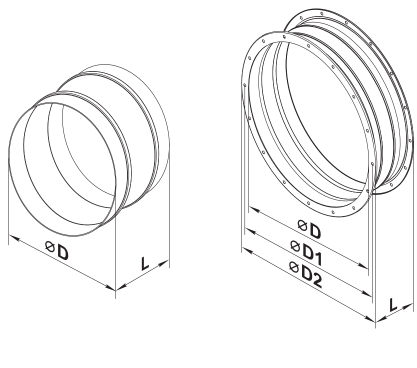


Fig. 1 Fig. 2

Legend:

Series	Flange diameter, mm
VVG	100; 125; 150; 160; 200; 250; 315; 355; 400; 450

Series
VVG

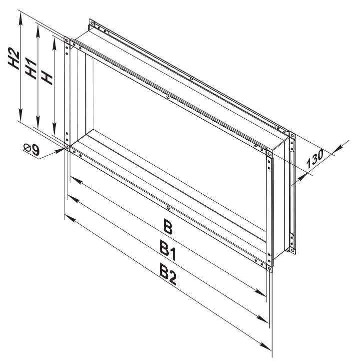
Application
Flexible connectors prevent vibration transfer from the fans or ventilation devices to the air duct and also provide partial compensation of thermal distortion in the route of air duct work. They are applied in ventilation devices which are designed for air transfer within the temperature range of -40°C to +80°C.

Design
Flexible connectors are two flanges joined together by means of vibration-absorbing material, made from zinc-galvanized sheets and polyethylene straps, strengthened by nylon woven fabric. The connectorsare not designed for mechanical loading; they should not be applied as supporting structures.

Mounting
Installation of flexible connectors in ventilation system is performed by means of attaching the end flanges of dampersto the counter-flanges of ventilation system. Connection is done by galvanized screw-bolts and brackets.

Type	Dimensions, mm						Weight, kg
	B	B1	B2	H	H1	H2	
VVG 400x200	400	420	440	200	220	240	1,1
VVG 500x250	500	520	540	250	270	290	1,4
VVG 500x300	500	520	540	300	320	340	1,6
VVG 600x300	600	620	640	300	320	340	1,82
VVG 600x350	600	620	640	350	370	390	1,95
VVG 700x400	700	720	740	400	420	440	2,4
VVG 800x500	800	820	840	500	520	540	2,8
VVG 900x500	900	920	940	500	520	540	3,0
VVG 1000x500	1000	1020	1040	500	520	540	3,2

VVG (rectangular)



Legend:

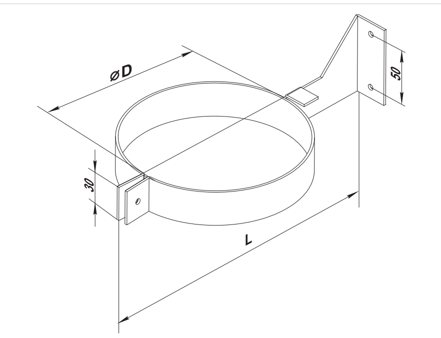
Series	Flange size (WxH), mm
VVG	400X200; 500X250; 500X300; 600X300; 600X350; 700x400; 800x500; 900x500; 1000x500

Series CZK

Application
Quick-disconnect clamp is designed for fast and reliable mounting of different round cross-section elements of ventilation system.

Design
Clamp is made from galvanized steel strip with bonded foam rubber for absorbing vibrations. The clamp is a wall- and ceiling-mountable.

Type	Dimensions, mm		Weight, kg
	ØD	L	
CZK 100	100	204	0,21
CZK 125	125	229	0,22
CZK 150	150	254	0,25
CZK 160	160	264	0,26
CZK 200	200	304	0,31
CZK 250	250	354	0,35
CZK 315	315	419	0,42

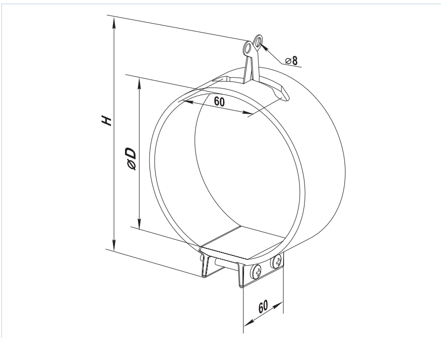


Series CZ

Application
Quick-disconnect manifold clamp is designed for fast and reliable mounting and connection of different round cross-section elements of ventilation system. Manifold clamps allow easy fan mounting and removal for maintenance service and cleaning.

Design
The clamp is made from galvanized steel strip, internally sealed with foam rubber for improving the reliability of hermetic sealing of connectors and also for reducing vibration. Quick-disconnect manifold clamps are tightened with two bolts.

Type	Dimensions, mm		Weight, kg
	ØD	H	
CZ 100	100	172	0,206
CZ 125	125	198	0,232
CZ 150	150	224	0,296
CZ 160	160	232	0,358
CZ 200	200	274	0,42
CZ 250	250	326	0,55
CZ 315	315	380	0,65



Legend:

Series	Diameter, mm
CZK CZ	100; 125; 150; 160; 200; 250; 315

Series **C**	Series **CB**	Series **CBR**

Application

Clamp is designed for fast and reliable mounting and connection of different round cross-section elements of ventilation system. Clamps allow easy fan mounting and removal for maintenance service and cleaning.

Design

- Clamp is made of stainless (C..) or galvanized steel (C... Zn) strip. Clamps are tightened with screw.
- **CB** series clamp is quick-release clamp made of stainless steel strip. Clamps are tightened with screw. .
- **CBR 3000** series clamp is a band clamps in a plastic case (30 m of 9mm*0.8 mm band and 50 pcs of locks SU 50). Using of clamp roll band of required length and lock you can easily get clamp of required size. Clamps are tightened with screw.

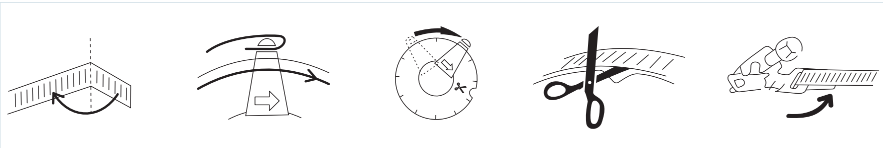
To make a clam you need only snips because plastic case has a special mark to help you.

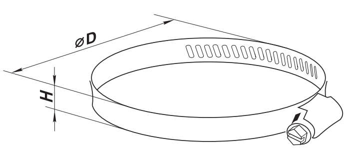
User's guide:

1. Bend a border of the clamp;
2. Fix the bent clamp border in clamp holder;
3. Turn a clamp holder to the required diameter indicated on the case;
4. Cut the clamp in the indicated place of case;
5. Fix a lock on the clamp.

Type	Dimensions, mm	
	ØD	H
C 100	90-110	9
C 125	110-130	9
C 150	140-160	9
C 160	150-170	9
C 200	190-210	9
C 250	240-260	9
C 315	300-330	9

Type	Dimensions, mm	
	ØD	H
CB 60-110	60-110	9
CB 60-135	60-135	9
CB 60-165	60-165	9





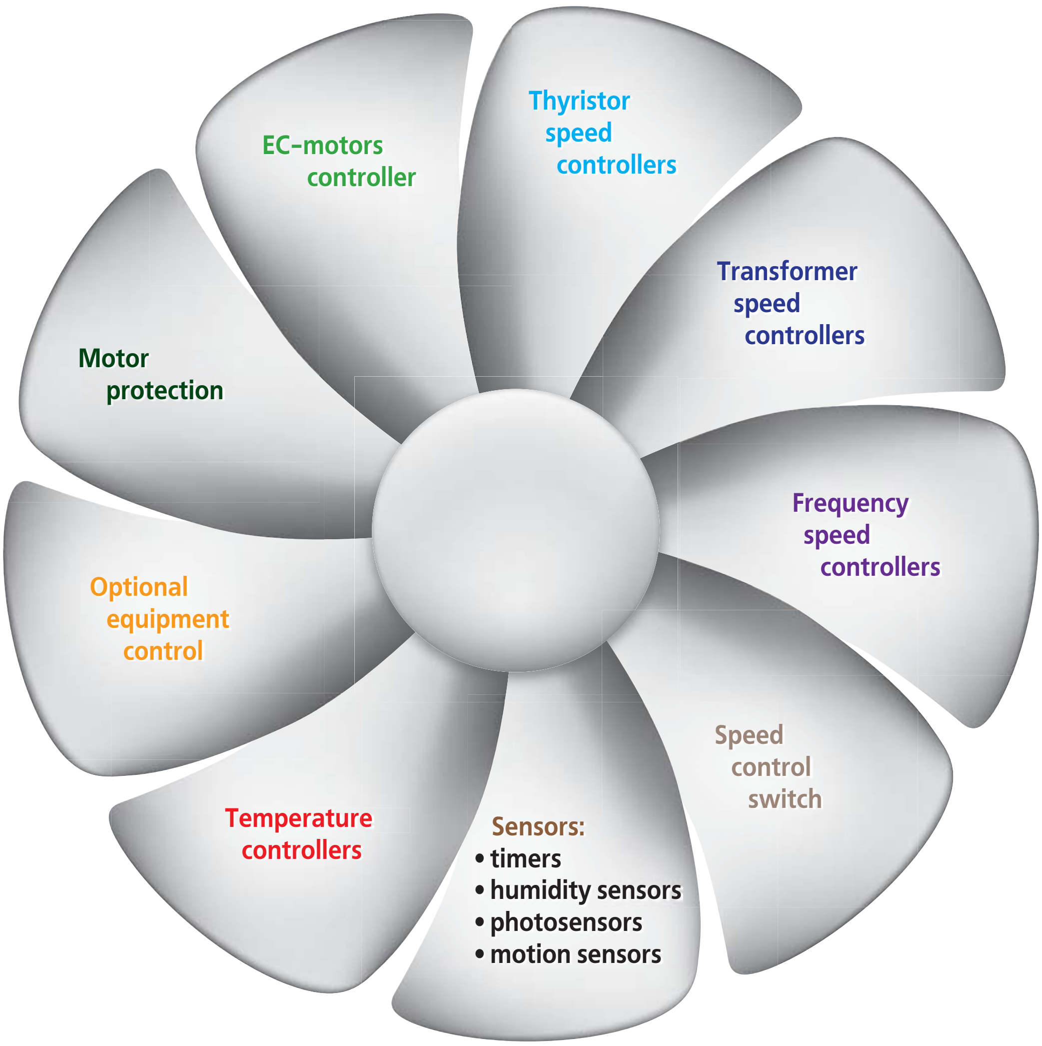
Lock unit SU 50 for CBR 3000

Clamps CB and CBR practical locking device

Legend:

Series	Diameter, mm
C CZ	100; 125; 150; 160; 200; 250; 315

ELECTRIC ACCESSORIES



	Model		Phase	Current	Protection	Case	Functions
Thyristor speed controllers							
1	RS-1-300 RS-1-400	 	1-phase	Up to 1,0 A Up to 1,8 A	IP40 IP40	Plastic, integrally mounted	Modulating fan speed control, built-in switch is provided
2	RS-1 N (V) RS-1,5 N (V) RS-2 N (V) RS-2,5 N (V)		1-phase	Up to 1,0 A Up to 1,5 A Up to 2,0 A Up to 2,5 A	IP44	Plastic, designed for wall mounting	Modulating fan speed control, built-in switch (max 5A) is provided.
3	RS-0,5-PS RS-1,5-PS RS-2,5-PS RS-4,0-PS		1-phase	Up to 0,5A Up to 1,5 A Up to 2,5 A Up to 4,0 A	IP44	Plastic, designed for wall and integral mounting	Modulating fan speed control, built-in switch is provided, minimum speed setup.
4	RS-1,5-T RS-3,0-T RS-5,0-T RS-10,0-T		1-phase	Up to 1,5 A Up to 3,0 A Up to 5,0 A Up to 10,0 A	IP54	Plastic, designed for wall mounting	Modulating fan speed control, built-in switch is provided, minimum speed setup.
5	RS-1,5-TA RS-3,0-TA RS-5,0-TA RS-10,0-TA		1-phase	Up to 1,5 A Up to 3,0 A Up to 5,0 A Up to 10,0 A	IP54	Plastic, designed for wall mounting	Modulating fan speed control. control input 0-10 V or 4-20 mA. Built-in switch is provided, minimum speed setup.
Transformer speed controllers							
1	RSA5E-2-P		1-phase	Up to 2,0 A	IP54	Plastic, designed for wall mounting	Stepped fan speed adjustment. Supplied with thermal motor protection, thermostat and air valve actuator are connected. Mechanical speed selection.
2	RSA5E-1,5-T RSA5E-3,5-T RSA5E-5,0-T RSA5E-8,0-T RSA5E-10,0-T		1-phase	Up to 1,5 A Up to 3,5 A Up to 5 A Up to 8 A Up to 10 A	IP54	Plastic, designed for wall mounting	Stepped fan speed adjustment. Supplied with thermal motor protection, thermostat and air valve actuator are connected. Mechanical speed selection.
3	RSA5E-2-M RSA5E-3-M RSA5E-4-M RSA5E-12-M		1-phase	Up to 2 A Up to 3 A Up to 4 A Up to 12 A	IP21 IP44	Metal, designed for wall mounting	Stepped fan speed adjustment. Supplied with thermal motor protection, thermostat and air valve actuator are connected. Mechanical speed selection.
4	RSA5D-1,5-T RSA5D-3,5-T		3-phase	Up to 1,5 A Up to 3,5 A	IP44	Plastic, designed for wall mounting	Stepped fan speed adjustment. Supplied with thermal motor protection, thermostat and air valve actuator are connected. Mechanical speed selection.
5	RSA5D-5-M RSA5D-8-M RSA5D-10-M RSA5D-12-M		3-phase	Up to 5 A Up to 8 A Up to 10 A Up to 12,0 A	IP44	Metal, designed for wall mounting	Stepped fan speed adjustment. Supplied with thermal motor protection, thermostat and air valve actuator are connected. Mechanical speed selection.

	Model		Phase	Current	Protection	Case	Functions
Frequency speed controllers							
1	VFED-200-TA VFED-400-TA VFED-750-TA VFED-1100-TA VFED-1500-TA		3-phase	200 W / 1A 400 W / 2A 750 W / 3,5 A 1,1 KW / 5,5A 1.5 кW / 7,5 A	IP54	Plastic, designed for wall mounting	Modulating speed control for 3-phase fan. 220 V power, with thermal motor protection. Control input 0-10 V or 4-20 mA. Serial port terminal RS232. Remote LCD Display (optional).
Temperature controllers							
1	RT-10		1-phase	Up to 10 A	IP40	Plastic, designed for wall and integral mounting	Control on temperature maintained in the buildings, control on ventilation, heating and air-conditioning systems. Temperature adjustment control area ranges from + 10 to +30°C.
2	RTS -1-400 RTSD -1-400		1-phase	Up to 2,0 A	IP40	Plastic, integrally mounted	Control on temperature conditions of ventilation, heating and air-conditioning systems. Supplied with digital LCD display with backlighting. Allows to change the heating/ cooling rate automatically
Switches for multi-speed fans							
1	P2-1-300		1-phase	Up to 5 A	IP40	Plastic, integrally mounted	Stepped switching between two fan speeds.
2	P3-1-300						Stepped switching between three fan speeds.
3	P2-5,0 N (V)		1-phase	Up to 5,0 A	IP40	Plastic, designed for wall mounting	Stepped switching between two fan speeds.
	P3-5,0 N (V)						Stepped switching between three fan speeds.
	P5-5,0 N (V)						Stepped switching between five fan speeds.
Ec-motor speed controllers							
1	R-1/010		1-phase	Up to 1,1 mA	IP40	Plastic, designed for wall mounting	Modulating control on different parameters (speed, temperature etc.). Output 0-10V. Supplied with a built-in break switch, max 3A.
Sensors							
1	T-1,5N		1-phase	Up to 1,5 A	IP54	Plastic, designed for wall mounting	Fan operation according to the level of illumination in the premises with turn off delay (timer).
	TN-1,5N						Fan operation according to the humidity level with turn off delay (timer).
	TF-1,5N						Fan operation according to the level of illumination in the premises with turn off delay (timer).
	TR-1,5N						Fan operation according to the motion sensor with turn off delay (timer).

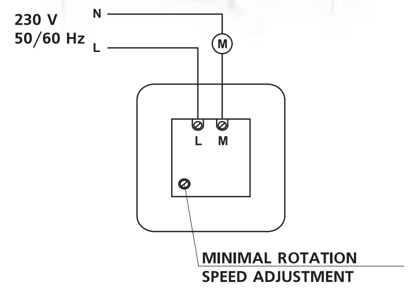
Speed controller
RS-1-300

Application
Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
The controller case is made of plastic. The controller is notable for high efficiency, control accuracy. Switching to maximum speed is carried out by turning the control knob. Adjustment is allowable from the maximum value to the minimum possible voltage value (while the fan is operating steadily). Minimum rotary speed value is set by variable resistor placed on the regulator control board.

Protection
The controller is supplied with a built-in replacement fuse used for protection from overload.

Installation
The controller is designed for mounting inside the premise on the wall, in the hidden mounting box. It can be mounted in the standard round wiring boxes.



Controller connection diagram

	RS-1-300
Voltage, V / 50 Hz	1~ 230
Current, A	1,5
Size AxBxC (mm)	95x85x60
Max environmental temperature, °C	40
Protection	IP 40
Weight, kg	0,11

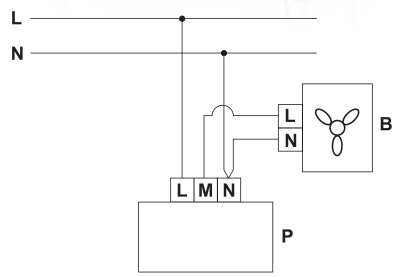
Speed controller
RS-1-400

Application
Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
The fan case is made of plastic. The controller is notable for high efficiency, control accuracy. Switching to maximum speed is carried out by turning the control knob. Adjustment is allowable from the maximum value to the minimum possible voltage value (while the fan begins to operate steadily). Minimum rotary speed value is set by variable resistor placed on the regulator control board.

Protection
Input circuit of speed controller is protected from overload with safety fuse. The controller is equipped with a filter of high-frequency interference.

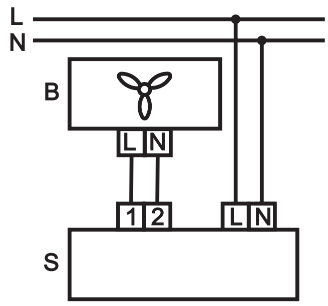
Installation
The controller is mounted inside the premises on the wall in the hidden mounting box. It can be mounted in the standard round wiring boxes.



Controller connection diagram

	RS-1-400
Voltage, V / 50 Hz	1~ 230
Current, A	1,8
Size AxBxC (mm)	78x78x63
Max environmental temperature, °C	35
Protection	IP 40
Weight, kg	0,11

Speed controller
RS-…N (V)



Controller connection diagram

Application

Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control

The case is made of plastic and is equipped with "On/Off" button and operation lamp. The controller is notable for high efficiency, control accuracy. Adjustment is allowable from the maximum value to the minimum possible voltage value (while the fan begins to operate steadily). Minimum rotary speed value is set by variable resistor placed on the regulator control board.

Protection

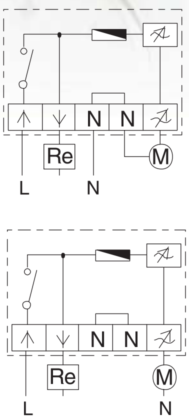
Input circuit of speed controller is protected from overload with safety fuse. The controller is equipped with a filter of high-frequency interference.

Installation

The controller is mounted inside the premises. Case construction design allows to mount the controller either on the wall (N modification) or inside the wall (V modification).

	RS-1 N (V)	RS-1,5N (V)	RS-2 N (V)	RS-2,5N (V)
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230
Current, A	1,0	1,5	2,0	2,5
Size AxBxC (mm)	162x80x70	162x80x70	162x80x70	162x80x70
Max environmental temperature, °C	40	40	40	40
Protection	IP 44	IP 44	IP 44	IP 44
Weight, kg	0,3	0,3	0,3	0,3

Speed controller
RS…PS



Controller connection diagram

Application

Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control

The case of control device is made of plastic. Control knob is supplied with a signal lamp indicating controllers' operative condition. Controller is notable for high efficiency, control accuracy. It is switched on by pressing of control knob. Adjustment is allowable from the maximum value to the minimum possible voltage value (while the fan begins to operate steadily). Minimum rotary speed value is set by variable resistor placed on the regulator control board. Control device is supplied with supplementary terminal (230 V) meant for connecting and controlling peripherals.

Protection

Input circuit of speed controller is protected from overload by safety fuse. Controller is equipped with a filter of high frequency interference.

Installation

The controller is mounted inside the premise on the wall. A versatile case construction design allows to mount the controller either on the wall or inside the wall. It can be mounted in the standard round wiring boxes.

	RS-0,5-PS	RS-1,5-PS	RS-2,5-PS	RS-4,0-PS
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230
Minimum current , A	0,1	0,15	0,25	0,4
Maximum current , A	0,5	1,5	2,5	4,0
Size AxBxC (mm)	82x82x65	82x82x65	82x82x65	82x82x65
Max environmental temperature, °C	35	35	35	35
Protection	IP 44	IP 44	IP 44	IP 44
Weight, kg	0,23	0,24	0,29	0,36

Speed controller
RS-...-T

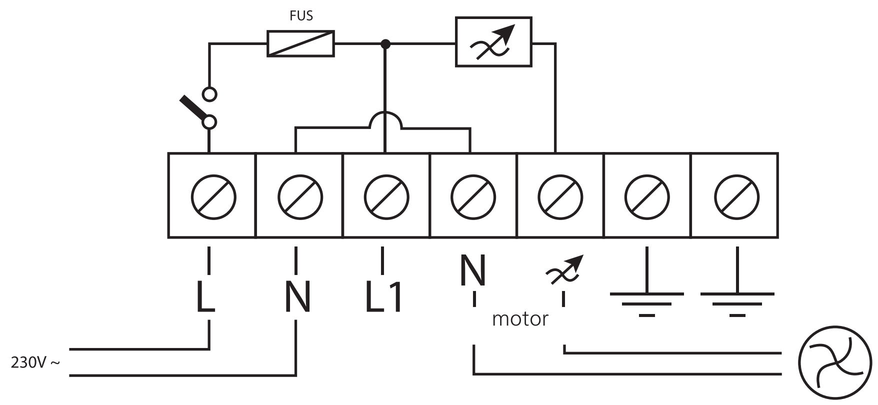
Application
Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
Case of control device is made from flameproof thermoplastic and is supplied with the "On/Off" button and operation lamp. Controller is notable for high efficiency, control accuracy. Power output variation from 25 to 100% is carried out proportionally to position of control knob. Minimum rotary speed value is set via variable resistor placed on the regulator control board. Control device is supplied with supplementary terminal (230 V) meant for connecting and controlling peripherals (for example, air valve actuators).

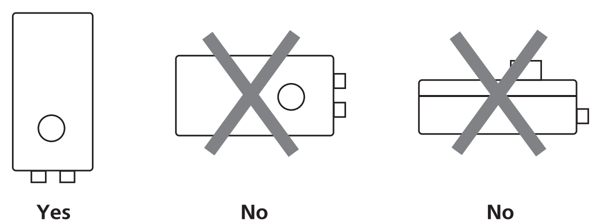
Protection
Input circuit of speed controller is protected from overload by safety fuse. The controller is equipped with a filter of high frequency interference.

Installation
Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

	RS-1,5-T	RS-3,0-T	RS-5,0-T	RS-10,0-T
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230
Minimum current , A	0,2	0,3	0,5	1,0
Maximum current , A	1,5	3,0	5,0	10,0
Size AxBxC (mm)	123x191x97	123x191x97	123x191x97	123x191x97
Max environmental temperature, ºC	+5...+40	+5...+40	+5...+40	+5...+40
Protection	IP 54	IP 54	IP 54	IP 54
Weight, kg	0,3	0,3	0,3	0,3



Controller connection diagram



Operative position for the device

Speed controller
RS-...-TA

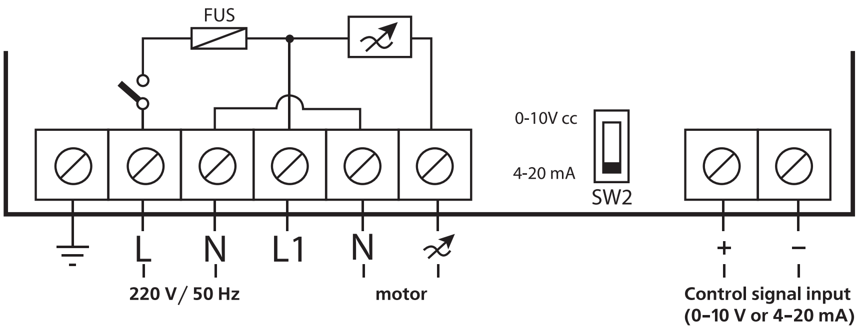
Application
Speed controller is applied in ventilation systems for switching on / off and the adjustment of speed of voltage-controlled, single-phase fan motors. Multiple fans control is tolerable provided that the total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
Case of control device is made from flameproof thermoplastic. Control device is supplied with the "On/Off" button. Power output variation from 25 to 100% is carried out proportionally to control signal 0..10 V or 4-20 mA within the range selected during the process of controller adjustment. Type of control signal 0..10 V or 4-20 mA is selected via SW2 switch placed on the case of controller.
Application of remote control unit, for example, R-1/010 controller (Page 302), is allowable.
Minimum rotary speed value is set via variable resistor placed on the regulator control board. Control device is supplied with supplementary terminal (230V) meant for connecting and controlling peripherals (for example, air valve actuators).

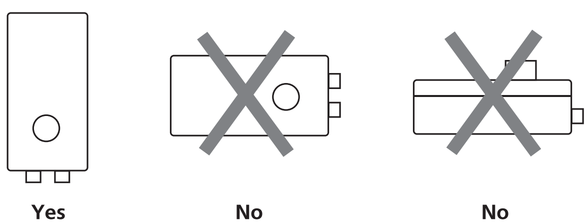
Protection
Input circuit of speed controller is protected from overload with safety fuse.

Installation
Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

	RS-1,5-TA	RS-3,0-TA	RS-5,0-TA	RS-10,0-TA
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230
Minimum current , A	0,2	0,3	0,5	1,0
Maximum current , A	1,5	3,0	5,0	10,0
Size AxBxC (mm)	180x127x95	180x127x95	180x127x95	180x127x95
Max environmental temperature, °C	+5...+40	+5...+40	+5...+40	+5...+40
Protection	IP 54	IP 54	IP 54	IP 54
Weight, kg	0,3	0,3	0,3	0,3



Controller connection diagram



Operative position for the device

Single-phase speed controller
RSA5E-2-P

Application

RCA5E-2-P-series control device is applied for engineering performance of single-phase fans via stepped motor-speed variation. Control device has five speed settings which are selected by turning the control knob, placed on the front side of the case, to one of the five detent positions. Multiple fans control is tolerable provided that total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control

Kcase of control device is made from flameproof thermoplastic. Control device has five speeds with output voltages of 110V – 130V – 160V – 190V –230V respectively. Control device is supplied with button "On/Off" and operation lamp, fan speed switch knob and a signal lamp indicating emergency application of control device. Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value.

Control device is supplied with the following additional features:

- Terminals meant for connecting to indoor thermostat or to freeze protection thermostat. Voltage supply to fan motor is discontinued once the circuit is disconnected.
- Terminals (230 V, max. 2A) meant for connecting and controlling peripherals (for example, air valve actuators).
- Connection of remote speed selection panel is allowable (see connection options).

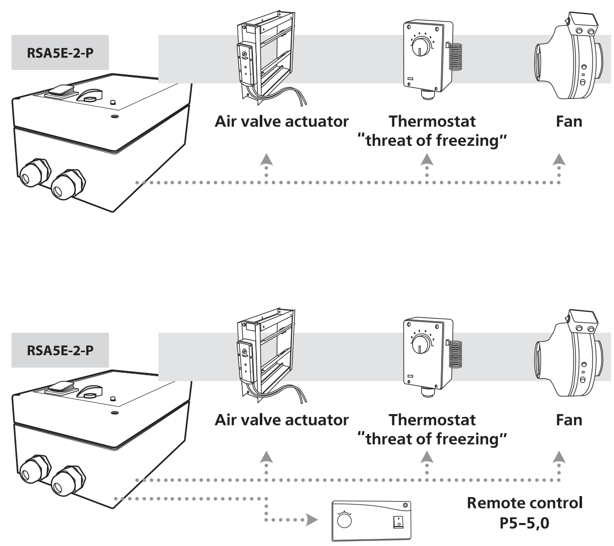
Protection

Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value.

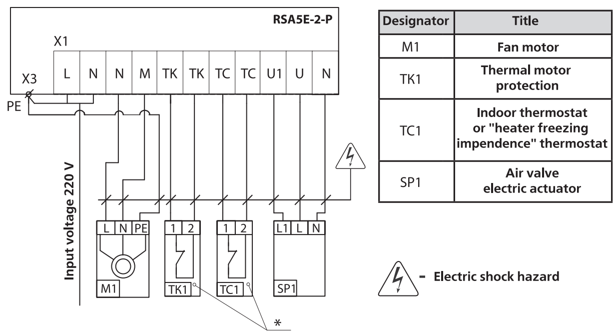
Installation

Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. Speed adjustment not only allows to select a convenient vent mode for premises with variable number of people, but also results in significant cut down on ventilation power consumption.

	RSA5E-2-P
Voltage, V / 50 Hz	1~ 230
Current, A	2,0
Size AxBxC (mm)	222x120x100
Max environmental temperature, °C	40
Protection	IP 54
Weight, kg	3,1



Controller connection options



* — Operation of control device is allowable without motor thermal protection (TK1), in this case a bypass should be installed between TK terminals. Operation of control device is allowable without a thermostat (TC1), in this case a bypass should be installed between TC terminals.

Electrical connection diagram

Single-phase speed controller
RSA5E-…-M

Application

RSA5E-...-M-series control devices are applied for engineering performance of single-phase fans via stepped motor-speed variation. Control devices have five speed settings which are selected by turning the control knob, placed on the front side of the case, to one of the five detent positions. Multiple fans control is tolerable provided that total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control

The case of control device is made from steel with polymeric covering. Control device has five speeds with output voltages of 110V-130V-160V-190V –230V respectively (for RCA5E-12-M-series – 80V-105V-130V-160V-230V respectively). Control device is supplied with button "On/Off" and operation lamp, fan speed switch knob and a signal lamp indicating emergency application of control device.

Control device is supplied with the following additional features:

- Terminals meant for connecting to indoor thermostat or to freeze protection thermostat. Voltage supply to fan motor is discontinued after the circuit is disconnected.
- Terminals (230 V, max. 2A/3A/4A) meant for connecting and controlling peripherals (for example, air valve actuators).
- Connection of remote speed selection panel is allowable (see connection options).

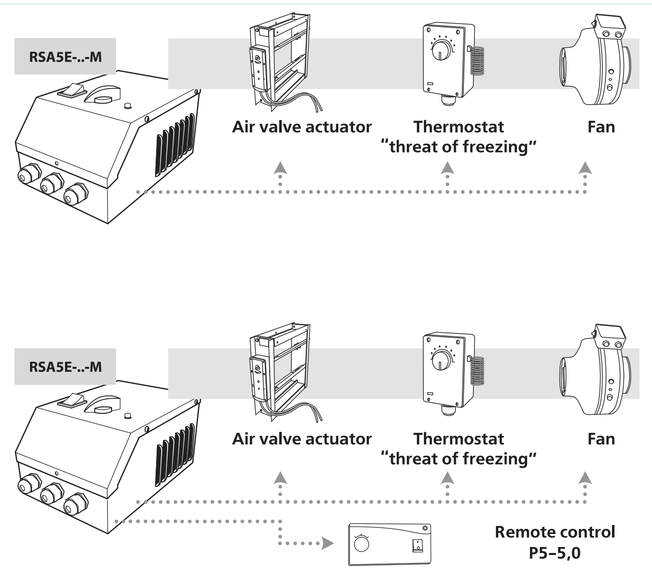
Protection

Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value.

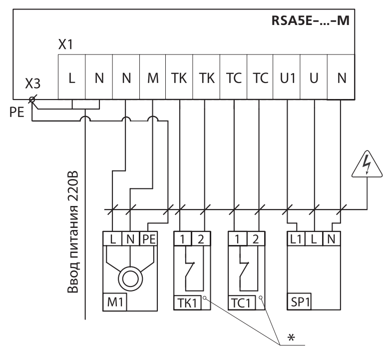
Installation

Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. Speed adjustment not only allows to select a convenient vent mode for premises with variable number of people, but also results in significant cut down on ventilation power consumption.

	RSA5E-2-M	RSA5E-3-M	RSA5E-4-M	RSA5E-12-M
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230
Current, A	2,0	3,0	4,0	12,0
Size AxBxC (mm)	226x144x120	241x164x138	241x184x132	325x250x245
Max environmental temperature, °C	40	40	40	40
Protection	IP 21	IP 21	IP 21	IP 44
Weight, kg	3,4	4,1	4,5	



Controller connection options



Designator	Title
M1	Fan motor
TK1	Thermal motor protection
TC1	Indoor thermostat or "heater freezing impendence" thermostat
SP1	Air valve electric actuator

– Electric shock hazard

* — Operation of control device is allowable without motor thermal protection (TK1), in this case a bypass should be installed between TK terminals. Operation of control device is allowable without a thermostat (TC1), in this case a bypass should be installed between TC terminals.

Electrical connection diagram

Single-phase speed controller
RSA5E-...-T

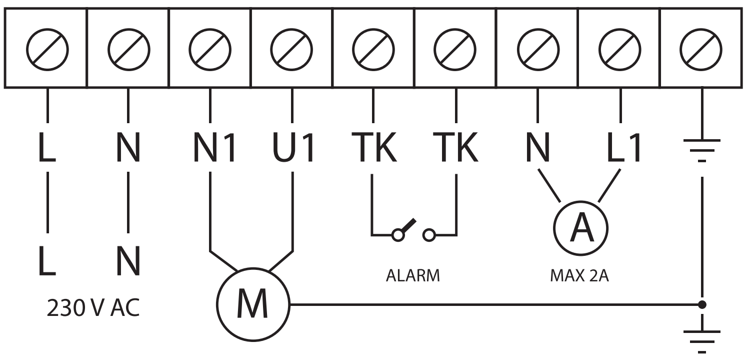
Application
RCA5E-..-T-series speed control units are applied for engineering performance of single-phase fans via stepped motor-speed variation. Control device has five speed settings which are selected by turning control knob, placed on the front side of the case, to one of the five detent positions. Multiple fans control is tolerable provided that total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
The case of control device is made from flameproof thermoplastic. Control device has five speeds with output voltages of 80V – 105V – 130V -160V – 230V respectively. Control device is supplied with a fan speed switch knob, an operation lamp and a signal lamp indicating emergency application of control device.

Protection
Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value.

Installation
Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

	RSA5E-1,5-T	RSA5E-3,5-T	RSA5E-5,0-T	RSA5E-8,0-T	RSA5E-10,0-T
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230	1~ 230
Current, A	1,5	3,5	5,0	8,0	10,0
Size AxBxC (mm)	205x110x85	255x170x140	255x170x140	305x200x180	305x200x180
Max environmental temperature, °C	+5...+35	+5...+35	+5...+35	+5...+35	+5...+35
Protection	IP 44	IP 44	IP 44	IP 44	IP 44
Weight, kg					



Controller connection diagram

Three-phase speed controller
RSA5D-...-T

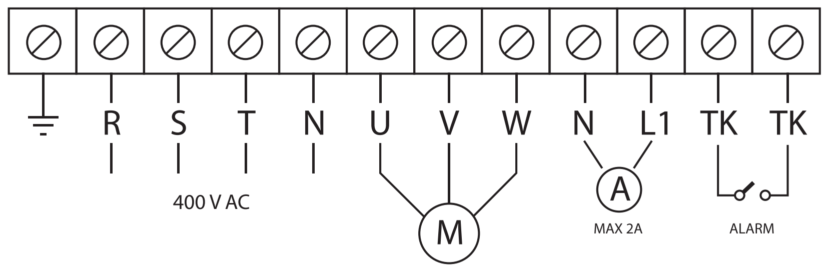
Application
RSA5D-..-T-series control device is applied for engineering performance of three-phase fans via stepped motor-speed variation. Control devices have five speed settings which are selected by turning control knob, placed on the front side of the case, to one of the five detent positions. Multiple fans control is tolerable provided that total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control
The case of control device is made from flameproof thermoplastic. Control device has five speeds with output voltages of 90V – 150V – 200V – 280V – 400V respectively. Control device is supplied with a fan speed switch knob, an operation lamp and a signal lamp indicating emergency application of control device. In addition, control device is supplied with terminals (230V, max. 2A) meant for connecting and controlling peripherals (for example, air valve actuators).

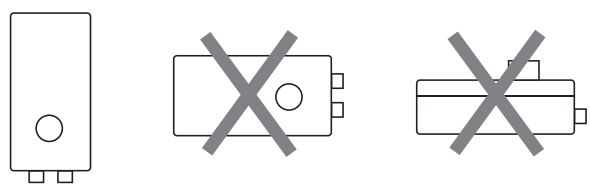
Protection
Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value.

Installation
Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

	RSA5D-1,5-T	RSA5D-3,5-T
Voltage, V / 50 Hz	3~ 400	3~ 400
Current, A	1,5	3,5
Size AxBxC (mm)	305x200x180	305x200x180
Max environmental temperature, °C	+5...+35	+5...+35
Protection	IP 44	IP 44
Weight, kg		



Controller connection diagram



Operative position for the device

Three-phase speed controller

RSA5D-...-M

Application

RSA5D-..-M-series control devices are applied for engineering performance of three-phase fans via stepped motor-speed variation. Control devices have five speed settings which are selected by turning control knob, placed on the front side of the case, to one of the five detent positions. Multiple fans control is tolerable provided that total consumption current does not exceed the maximum allowable intensity of control device current.

Construction design and control

The case of control device is made from steel with polymeric covering. Control device has five speeds with output voltages of 90V – 150V – 200V – 280V – 400V respectively. Control device is supplied with a fan speed switch knob, an operation lamp and a signal lamp indicating emergency application of control device. In addition, control device is supplied with terminals (230V, max. 2A) meant for connecting and controlling peripherals (for example, air valve actuators).

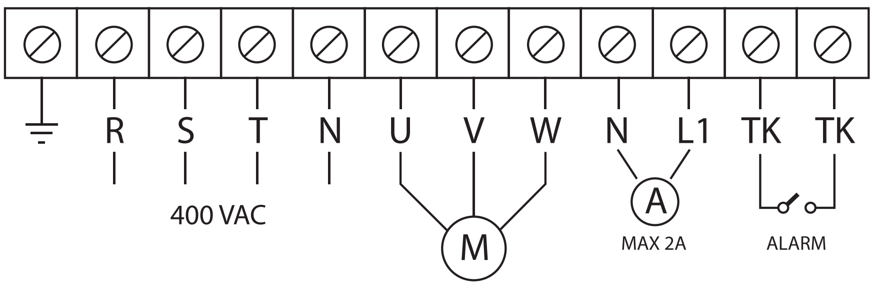
Protection

Control device is supplied with a built-in motor protection which cuts off energy supply in case if the thermal relay, built into fan electromotor, is actuated. Restarting takes place once the motor temperature returns to its working value. Регулятор имеет встроенное устройство защиты электродвигателя, кfromорое прекращает подачу электричества при срабатывании термоконтактов электродвигателя вентилятора. Повторное включение происходит после возвращения температуры двигателя к рабочим значениям.

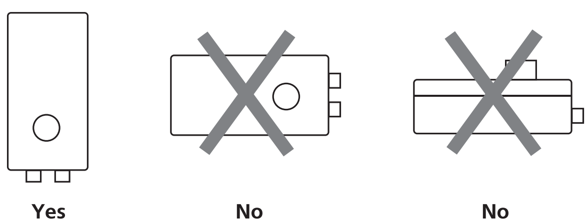
Installation

Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

	RSA5D-5,0-M	RSA5D-8,0-M	RSA5D-10,0-M	RSA5D-12,0-M
Voltage, V / 50 Hz	3~ 400	3~ 400	3~ 400	3~ 400
Current, A	5,0	8,0	10,0	12,0
Size AxBxC (mm)	325x250x245	325x250x245	425x300x250	425x300x250
Max environmental temperature, °C	+5...+35	+5...+35	+5...+35	+5...+35
Protection	IP 44	IP 44	IP 44	IP 44
Weight, kg				



Controller connection diagram



Operative position for the device

Speed controllers
VFED-...-TA

Frequency speed controllers are energy saving devices that provide maximum capacity utilization of the actuator at the minimum power consumption.

Application

VFED-...-TA-series control devices (or inverters) are designed for variable-frequency speed control for the fans supplied with three-phase AC asynchronous motors. Fan speed is adjusted by changing the power supply's frequency distributed for the motor. Control devices are applied for engineering performance of three-phase fans.

Construction design and control

The case of control device is made from flameproof thermoplastic. The item transforms the power supply voltage of 220V/50Hz into output impulse voltage with frequency ranging from 3Hz to 400 Hz. The motor's impeller, fed with sinusoidal current, rotates at a speed proportional to the frequency of power supply. Single-phase 220V/50Hz power supply is distributed to the input of frequency converter. While three-phase voltage with frequency rising up to 400 Hz is generated in the output to feed the asynchronous motor.

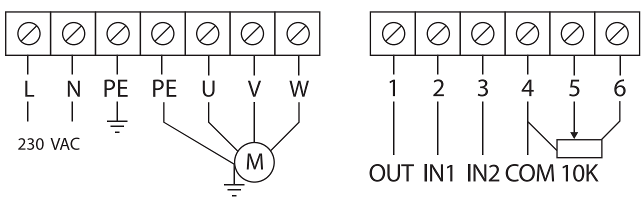
Control maintenance using an external source

Power output variation is carried out proportionally to external control signal 0..10V or 4-20mA within the range selected during the process of controller adjustment. Type of control signal 0..10V or 4-20mA is selected via SW2 switch placed on the case of controller. Connection of external source is carried out via serial port terminal RB 232.

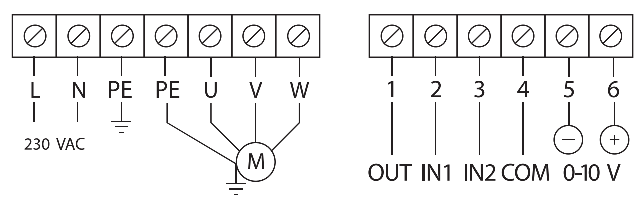
Installation

Control device installation is performed indoors. Installation should be carried out with due consideration of free recirculation of air required for cooling down the inner chains. The operative position of control device is vertical. Do not install control device above the heating bodies and in areas with poor convection of air.

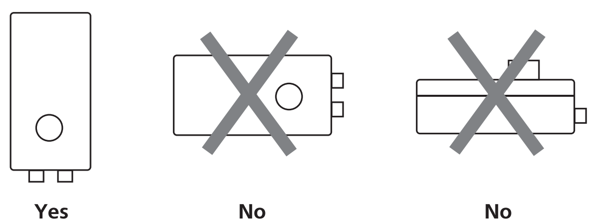
	VFED-200-TA	VFED-400-TA	VFED-750-TA	VFED-1100-TA	VFED-1500-TA
Voltage supplied to control device , V / 50 Hz	1~ 230	1~ 230	1~ 230	1~ 230	1~ 230
Voltage distributed from control device to electric motor, V	3~ 230	3~ 230	3~ 230	3~ 230	3~ 230
Output frequency distributed to electric motor, Hz	from 3 to 400	from 3 to 400	from 3 to 400	from 3 to 400	from 3 to 400
Maximum load current, A	1,0	2,0	3,5	5,5	7,5
Maximum power of electric motor, W	200	400	750	1100	1500
Size AxBxC (mm)					
Max environmental temperature, °C	+5...+40	+5...+40	+5...+40	+5...+40	+5...+40
Protection	IP 54	IP 54	IP 54	IP 54	IP 54
Weight, kg					



Controller connection diagram



Controller connection diagram



Operative position for the device

Temperature controller
RTS -1- 400
RTSD -1- 400

Application

This device is applied to control the temperature conditions of ventilation, heating and air conditioning systems. This device can be used to control the fans and fan coil valves, air heating units supplied with three-speed 230V fans. This device allows to adjust the heating/cooling rate automatically.

Construction design and control

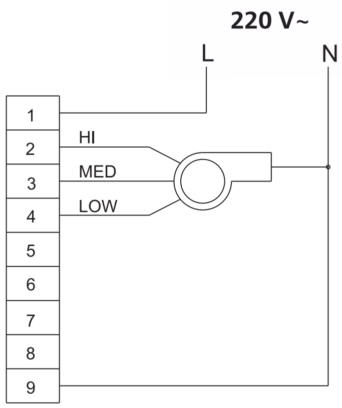
The case of remote controller made of plastic is supplied with a built-in temperature sensor. The digital LCD display with illumination and control buttons are placed on the face plate of remote controller. The display shows the current temperature and set point of temperature in the building, selected mode – cooling down, heating or automatic, set point of fan speed. Fan speed can be selected manually using the control buttons. This device also provides the possibility to choose one of the three speed settings (fast/medium/slow) automatically, depending on the air temperature inside the building.

- Provision of display illumination allows to use the remote controller under bad light conditions.
- Temperature maintenance within the accuracy of 1°C.
- Saving user settings in case of disconnection from the power supply network.
- RTSD-1-400 is supplied with remote control panel.

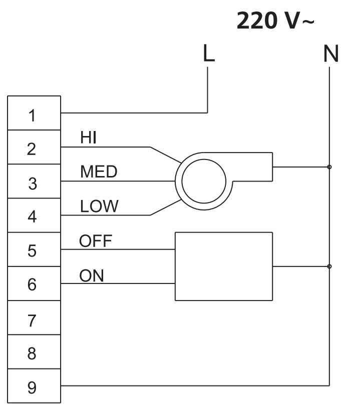
Installation

Remote controller is designed for wall mounting inside the buildings. The recommended height for installation is 1,5 meters above the floor. Installation is not recommended near the windows, doors, heating and cooling devices.

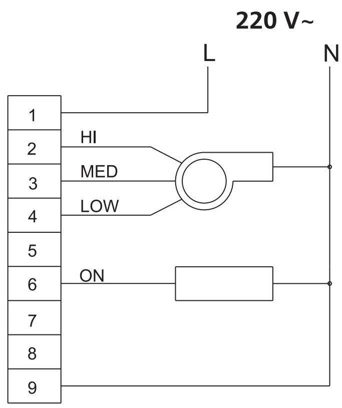
	RTS-1-400	RTSD-1-400
Voltage, V / 50 Hz	1~ 230	1~ 230
Current, A	2,0	2,0
Number of speed settings	3	3
Temperature adjustment range, °C	+10...+30	+10...+30
Size AxBxC (mm)	88x88x51	88x88x51
Max environmental temperature, °C	40	40
Protection	IP 40	IP 40
Remote controller availability	no	yes



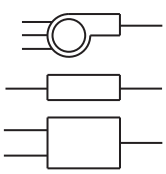
Heating and cooling ventilation



Heating and cooling ventilation SPDT valves three-wire systems



Heating and cooling ventilation SPST valves two-wire systems



three-speeds fan

two-wire SPST valve

three-wire SPDT valve

Controller connection options

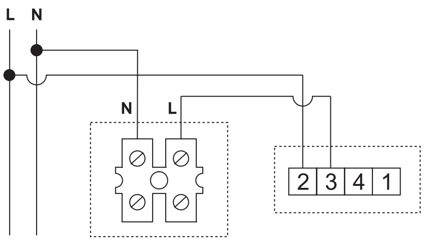
Temperature controller
RT -10

Application
This device is applied to control the temperature conditions maintained inside the building and is also used to control ventilation, heating and air conditioning systems.

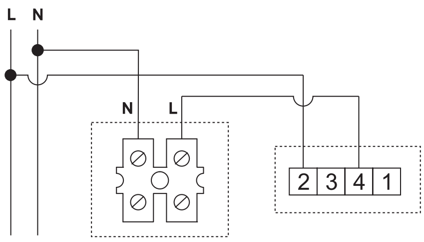
Construction design and control
The case is made from high-quality plastic. Thermostat can switch the contacts on/off in case if the measured temperature drops below or rises above the set point value (operation algorithm is selected during connection). Temperature adjustment is allowable within the range of +10 to +30°C.

Installation
Thermostat is designed for wall mounting inside the buildings. The recommended height for installation is 1,5 meters above the floor. Installation is not recommended near the windows, doors, heating devices.

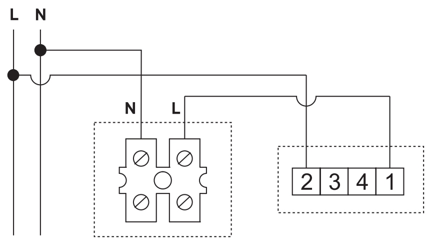
	RT-10
Voltage, V / 50/60 Hz	1~ 220-240
Size AxBxC (mm)	84x84x35
Max environmental temperature, °C	40
Index of protection	IP 40



Fan is operating until the temperature threshold, preset in the thermostat, is reached



Fan starts up once the temperature threshold, preset in the thermostat, is reached



Thermostat works as a normal key switch

Controller connection options

Switching unit
P2-5,0 N (V)
P3-5,0 N (V)
P5-5,0 N (V)

Application

The device is applied for switching on/off and selecting the speed of fans based on multi-speed motors.

Construction design and control

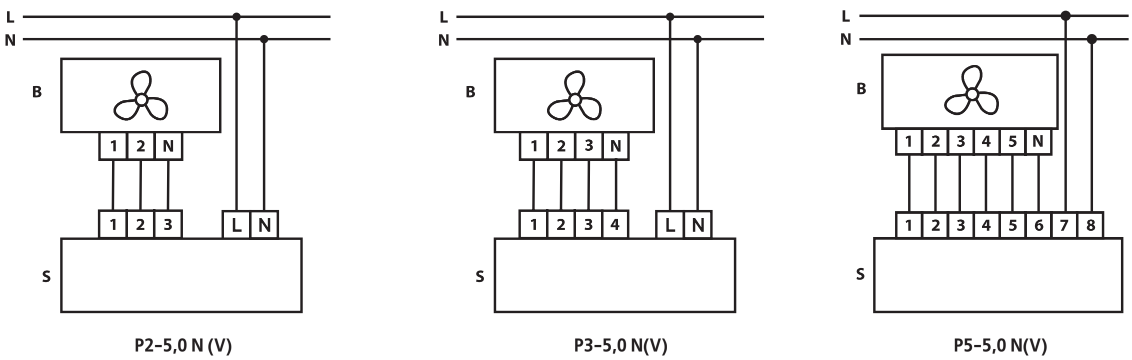
The case of switching unit is made of plastic and is supplied with ON/OFF button and operation lamp. Availability of direct selection of fan speeds and application as a remote speed controller for multistep transformer r.p.m. governors (for example, R5-5,0 models for five-step transformer r.p.m. governor)

Installation

Control device is installed inside the buildings. Case construction design allows to mount the control device on the wall (N modification) or inside the wall (V modification).

	R2-5,0	R3-5,0	R5-5,0
Voltage, V / 50 Hz	1~ 230	1~ 230	1~ 230
Current, A	5,0	5,0	5,0
Number of speed settings	2	3	5
Size AxBxC (mm)	88x88x51	88x88x51	88x88x51
Max environmental temperature , °C	40	40	40
Protection	IP 40	IP 40	IP 40
Weight, kg	0,25	0,25	0,25

B - fan;
S - switching unit



Controller connection options

Switching unit
P2-1-300
P3-1-300

Application

This device is applied for switching on/off and selecting the speed of fans based on multi-speed motors.

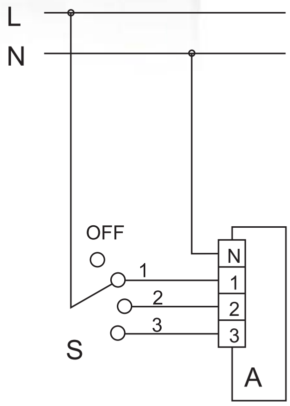
Construction design and control

The case of switching unit is made of plastic. Direct selection of fan speeds is available (connection diagram 1), as well as switching on and control on fan operation in combination with illumination inside the premise (connection diagrams 2 and 4).

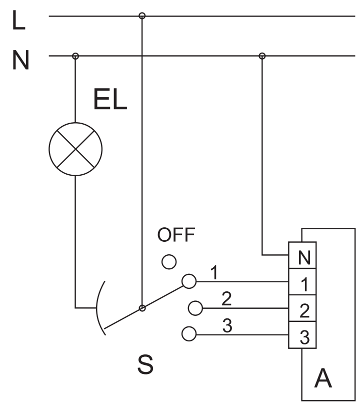
Installation

Speed control switch is mounted indoors on the walls in a hidden mounting box. It can be installed in standard round wiring boxes.

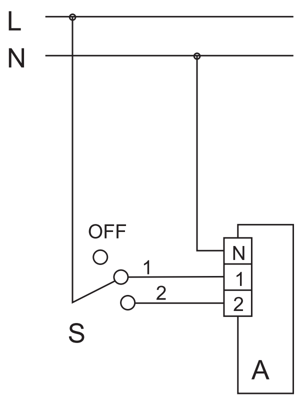
	P2-1-300	P3-1-300
Voltage, V / 50 Hz	1~ 230	1~ 230
Current, A	5,0	5,0
Number of speed settings	2	3
Size AxBxC (mm)	88x88x51	88x88x51
Max environmental temperature , °C	40	40
Protection	IP 40	IP 40
Weight, kg	0,13	0,13



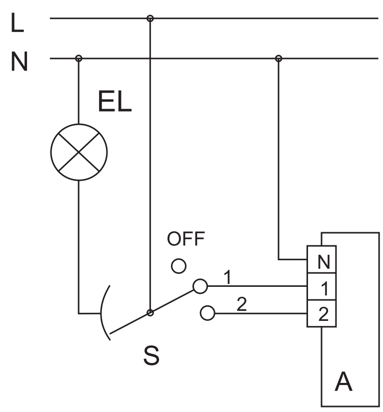
One of three speed settings may be selected manually or a fan may be switched off by means of external switch s (for example, P3-1-300)



One of three fan speed settings may be selected or a fan may be switched off manually by means of external switch S (for example, P3-1-300), while illumination in the premise will turn on/off simultaneously. The fan will not start up if illumination is turned off and vice versa.



The fan can be switched on or one of two speed settings can be selected manually by means of external switch s (for example, P2-1-300)



One of two fan speed settings may be selected or a fan may be switched off manually by means of external switch S (for example, P2-1-300), while illumination in the premise will turn on/off simultaneously. The fan will not start up if illumination is turned off and vice versa.

Controller connection options

Speed controller
R-1/010

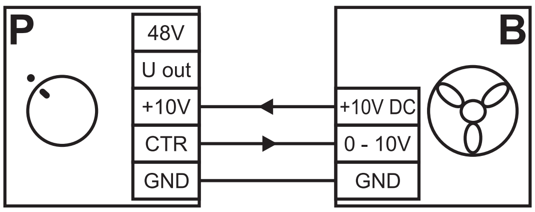
Application
This device is designed for modulating speed control of the fan supplied with EC-motor with control input of 0-10 V.

Construction design and control
The case of control unit is made of plastic. Switching on/off is carried out by turning the control knob. Adjustment is restricted by the minimum and the maximum possible values.

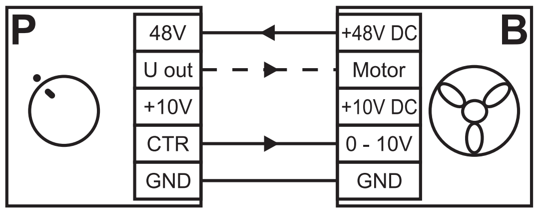
Installation
Control device is mounted indoors on the walls in a hidden mounting box. It can be installed in standard round wiring boxes.

	R-1/010
Voltage, V	10-48 V DC
Control signal, V	0-10
Max. current , mA	5
Size AxBxC (mm)	78x78x63
Мах температура окружающей среды, °С	35
Index of protection	IP 40
Масса, кг	0,12

Legend:
B - fan;
P - controller R-1/010



Connect the regulator to the fan with the EC-motor with output +10 V.



Connect the regulator to the fan with the EC-motor fed from mains voltage of 48V DC, which has no exit + 10V DC. If necessary, you can use dial-output 48 VDC (U out)

Controller connection options

Sensor
T-1,5 N
TH-1,5 N
TF-1,5 N
TP-1,5 N

T–1,5 N – fan turn off delay timer
This device allows the fan to continue operating for a certain period of time after "Off"-button was pressed, consequently allowing additional ventilation of the premise. The fan will turn off automatically after the preset period of time (ranging from 2 to 30 minutes). Turn off delay will suit the fans installed in bathrooms, toilets and kitchens.

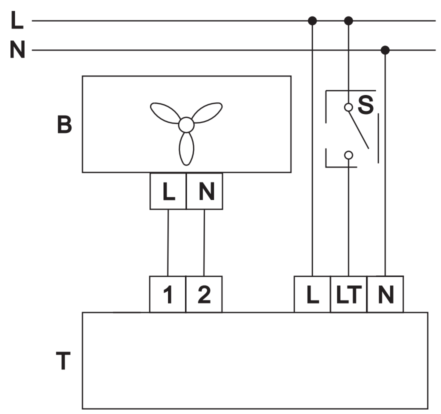
TH–1,5 N – humidity control sensor
A fan supplied with such type of sensor will start up automatically in case if the preset humidity level is exceeded. Each user can select the required humidity % in accordance with his/her personal preference. Humidity sensors will suit the fans installed in such premises where humidity level may rise (for example, in the bathroom, kitchen, laundry or swimming pool).

TF–1,5 N - timer + photosensor
A built-in photosensor is sensitive to a change in intensity of illumination inside the premise and starts up the fan automatically. After illumination is turned off the fan will shut down according to a built-in turn off delay timer which can be preset within the range of 2 to 30 minutes. Therefore, ventilation system, equipped with a photosensor, does not require human control because system operation is fully automated. Photosensors will suit the fans installed in places of periodic human presence.

TR–1,5 N – motion sensor
A built-in IR-based motion sensor is sensitive to human presence in the premise within the range of sensitivity and starts up the fan automatically. If the room is empty the fan will shut down according to a built-in turn off delay timer which can be preset within the range of 2 to 30 minutes Therefore, ventilation system, equipped with a motion sensor, does not require human control because system operation is fully automated. Motion sensors will suit the fans installed in places of periodic human presence.

Mounting
Sensors are installed inside the premise. Construction design of the case allows to install the sensor on the wall (N modification)

B - fan;
S - external switch;
T - timer.



Sensor connection diagram