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FANS FOR EXHAUST VENTILATION SYSTEMS

ROOF FANS

■ 400/600° C • 120 min

UKROS-DU/DUV
•N •CR1 •VCR1



P. 9

KROV-DU/DUV
•N •CR1 •V •VCR1



P. 26

RADIAL FANS

■ 400/600° C • 120 min

VRAN-DU/DUV
•N •CR1 •V •VCR1



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WALL-MOUNTED RADIAL FANS

■ 400/600° C • 120 min

VNR-DU/DUV
•N •CR1



P. 63

AXIAL SMOKE EXTRACTION FANS

■ 400/600° C

■ 400° C

■ 400/600° C

OZA-DUV
•N



P. 71

OZA-LR, OZA-LW
•N •CR1



P. 85

AF-DU
•N



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JET FANS

AXIAL JET FANS

■ 300° C • 120 min

JF-DU
•N



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RADIAL JET FANS

■ 300° C • 120 min

RJF-DU
•N



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FANS FOR AIR SUPPLY/SMOKE VENTILATION SYSTEMS

AXIAL FANS

OZA 201
•N



P. 103

OZA 501
•N



P. 111

ROOF-MOUNTED AIR SUPPLY FANS

VKOP 0
•N



P. 125

VKOP 1
•N



P. 132

VKOP 2
•N



P. 140

ADDITIONAL EQUIPMENT

TSK
heat and sound insulated casing



P. 143

COM
flexible connector



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COM 560
linear compensator



P. 151

FON/FOV
counter flanges



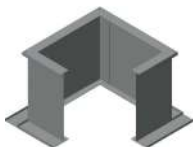
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KIV
vibration isolators



P. 155

STAM
roof curbs



P. 156

DF
deflector



P. 176

ZNT
weather protection hood



P. 178

OZA-VKO
inlet header



P. 180

OZA-MOP/MOB
mounting support



P. 181

OZA-PEP
flat adapter



P. 182

OZA-PET
toroidal adapter



P. 183

OZA-PEK
roof adapter



P. 184

OZA-PUV
straight duct section



P. 185

R50
decorative grille



P. 186

OZA-SEM/SEB
protective mesh



P. 188

OZA-FOT
counter flange



P. 189

POD
pan



P. 190

FC
frequency converter



P. 192

VLT
frequency converter



P. 193

MCD
soft starter



P. 200

SHTORM-V
control systems for pressurization
or smoke extraction fans



P. 201

SHTORM-VL
control systems for OZA-LR, OZA-LW
insulated axial smoke extraction fans



P. 204

During the construction of modern and reconstruction of old buildings and structures, much attention is paid to measures to ensure effective fire safety. One of the main tasks is to create a reliable smoke protection system aimed at removing and reducing the concentration of smoke that occurs during a fire. These measures are aimed at creating safe ways to evacuate people from burning premises, reducing material losses from fire by dissipating heat, and creating safe working conditions for units of the State Fire Service to rescue people, detect and eliminate fires.

The requirements governing the design, operation and repair of smoke protection systems for buildings and structures are contained in a system of regulatory and methodological documents. The nomenclature of premises and buildings to be equipped with smoke protection systems and the composition of this system are given in industry regulatory documents. The requirements for the performance of smoke protection systems and its individual elements are set out in DBN B.1.2-7-2008.

Depending on the building's spatial layout and number of floors, the smoke control system may include a smoke extraction system for rooms and/or corridors during a fire, a system for removing smoke and gases after a fire, systems to ensure smoke-free stairwells, an air pressurization system for elevator shafts, stairwell-elevator lobbies, stairwells, and elevator lobbies.

The main equipment of this system includes smoke extraction fans, fans providing additional air pressurization, fire and smoke dampers. In accordance with DBN B.1.2-7-2008, the fans for exhaust smoke ventilation systems listed in the Catalog work reliably for at least two hours when moving gas-air mixtures with temperatures up to 400° C and 600° C.

FAN DESIGN BY INTENDED PURPOSE

DESIGN VERSION	FLOW PASSAGE	INTENDED USE	OPERATION	EXPLOSION HAZARD MIXTURE GROUP ACCORDING TO GOST 12.1.011-78
general purpose industrial	carbon steel	N	The permissible content of dust and other solid impurities in the transported medium is not more than 0.1 g/m ³ . The presence of sticky, fibrous and abrasive materials is not allowed. The aggressiveness of the transported gas-air mixtures toward ordinary-grade steel and 12X18H10T stainless steel must not cause corrosion at a rate exceeding 0.1 mm per year.	—
corrosion-resistant	stainless steel	CR1		—
explosion-proof	carbon steel	V	For moving explosive gas-vapor-air mixtures of Category 2. The permissible content of dust and solid impurities in the transported medium is not more than 0.1 g/m ³ . The presence of sticky, fibrous, abrasive and explosive substances is not allowed. The aggressiveness of the transported gas-air mixtures toward ordinary-grade steel and 12X18H10T stainless steel must not cause corrosion at a rate exceeding 0.1 mm per year. Not suitable for conveying gas-vapor-air mixtures from process units where explosive substances are heated above their autoignition temperature or are under excess pressure	T1, T2, T3
explosion-proof, corrosion-resistant	stainless steel	VCR1		T1, T2, T3

FAN NOMENCLATURE

TYPE	Operating mode	STANDARD SIZE														Design - scheme	Design version			
		031	035	040	045	050	056	063	071	080	090	100	112	125	140		N ¹	V ³	CR1 ²	VCR1 ⁴
VRAN	DUV			■	■	■	■	■	■	■	■	■	■	■	■	1	■	■	■	■
								■		■		■		■		5	■		■	
	DUV-F			■	■	■	■	■	■	■	■	■	■	■	■	1	■		■	
	DU			■	■	■	■	■	■	■	■	■	■	■	■	1	■			
VNR	DUV		■	■	■	■	■	■	■	■	■	■				1	■		■	
	DU		■	■	■	■	■	■	■	■	■	■				1	■			
OZA-DUV	DUV				■	■	■	■	■	■	■	■	■			1	■			
KROV	DUV		■	■	■	■	■	■	■	■	■	■	■	■		1	■	■	■	■
	DUV-F					■	■	■	■	■	■	■	■	■		1	■		■	
	DU		■	■	■	■	■	■	■	■	■	■	■	■		1	■			
UKROS	DUV		■	■	■	■	■	■	■	■	■	■	■	■		1	■		■	■
	DUV-F					■	■	■	■	■	■	■	■	■		1	■		■	
	DU		■	■	■	■	■	■	■	■	■	■	■	■		1	■			
AF	DU			■		■		■	■	■	■	■	■	■		1	■			
JF	DU	■	■	■	■	■										1	■			
	DUV	■	■	■	■	■										1	■			
RJF	DU					■			■		■					1	■			
	DUV					■			■		■					1	■			
OZA 201	PD									■	■	■	■	■		1	■			
OZA 501	PD			■	■	■	■	■	■	■	■	■	■	■		1	■			
VKOP 0	PD			■	■	■	■	■	■	■	■	■	■	■		1	■			
VKOP 1	PD			■	■	■	■	■	■	■	■	■	■	■		1	■			
VKOP 2	PD							■	■							7	■			

¹ – general purpose industrial design

² – corrosion-resistant design

³ – explosion-proof design

⁴ – explosion-proof, corrosion-resistant design

SYMBOLS

- ρ**, kg/m³ – density of the transported medium;
- Q**, m³/h – airflow rate through the fan;
- nk**, min⁻¹ – fan impeller rotational speed;
- N_{nom}**, kW – motor rated power;
- P_v**, Pa – total fan pressure;
- P_{dv}**, Pa – velocity pressure;
- P_{sv}**, Pa – static fan pressure;
- ΔP**, Pa – air flow resistance;
- α**, deg – impeller blade angle;
- L_w**, dBA – corrected sound power level on the discharge side;
- L_p**, dBA – corrected sound pressure level on the discharge side;
- L_{wi}**, dB – sound power level in octave frequency bands with geometric mean frequencies;
- ΔL_{wi}**, dB – corrections to the corrected sound power level in octave frequency bands;
- f_i**, Hz – sound frequency in octave bands.

REQUIREMENTS FOR THE INSTALLATION OF FANS IN THE NETWORK

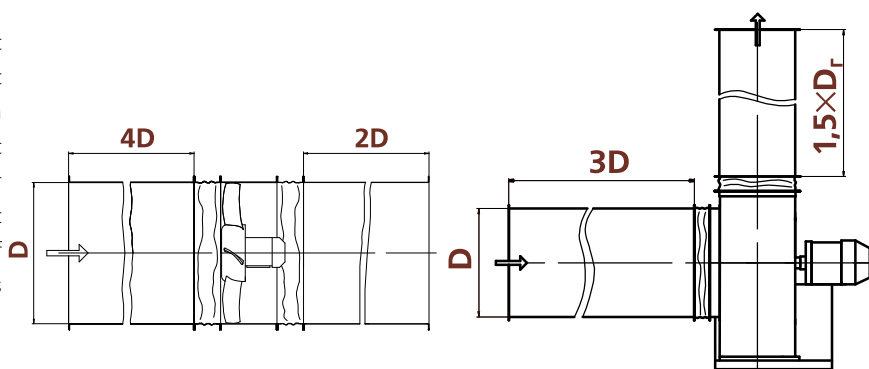
The aerodynamic characteristics given in the catalog are obtained on an aerodynamic testing bench of type A with a free inlet and outlet section of the fan. These characteristics can be used when designing a ventilation network if the fan is properly installed in this network. If the condition of uniform flow entry into the fan is met and there is no blockage of its outlet section. If these requirements for the installation of the fan are violated, then it is necessary to use its degraded performance characteristics, which can be obtained using the recommendations presented in the specialized literature. The reduction of the pressure generated by the fan can reach 10-30% or more.

Specific recommendations are given below for the most common options for installing fans in ventilation systems.

AIR DUCTS

RECOMMENDED

When installing a fan in a ventilation network, it is recommended to ensure that there are straight sections of air ducts of sufficient length with a cross-sectional area equal to the area of the inlet and outlet sections of the fan before and after the fan inlet. Reducing the length of the straight sections adjacent to the fan results in a decrease of the pressure generated by the fan. Flexible inserts in front and behind the fan reduce vibration and noise.

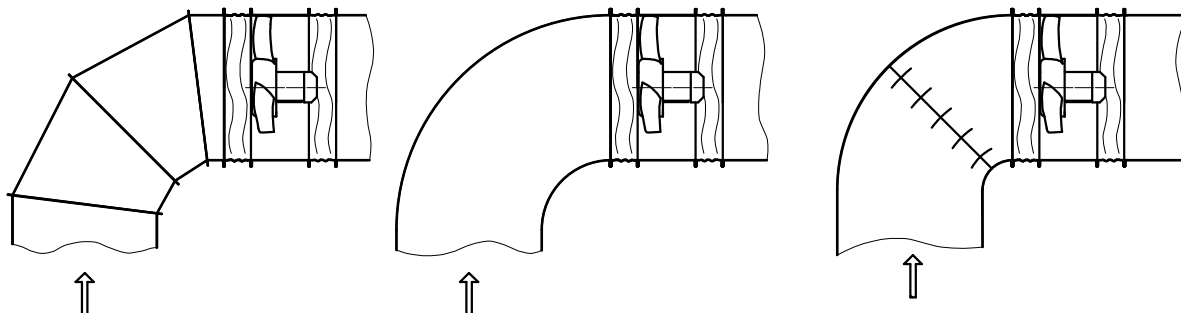


NOTE

D_f – is the hydraulic diameter of the rectangular outlet section

DUCT ANGLES

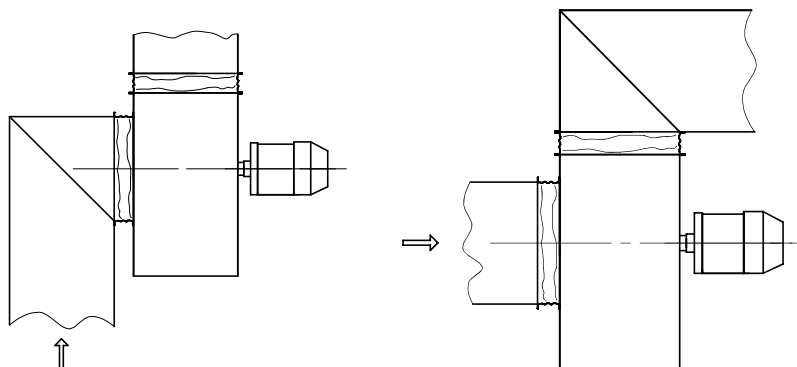
RECOMMENDED



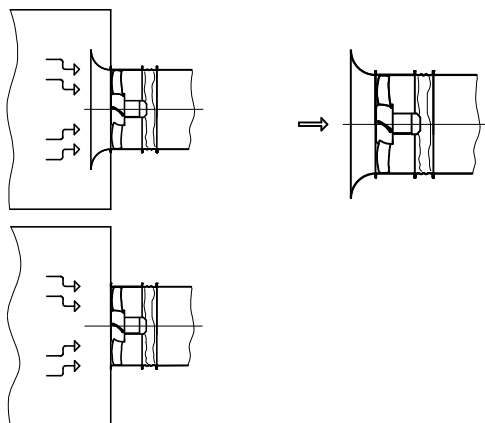
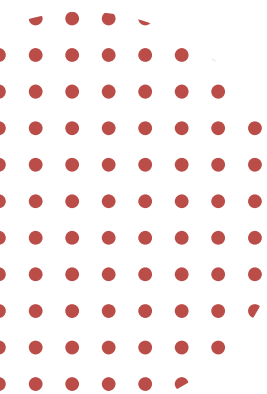
If it is necessary to install duct angles of the network directly near the fan, it is recommended to use a folded elbow or a duct angle with a large radius of curvature, or a duct angle with a system of blades located in it.

NOT RECOMMENDED

It is not recommended to use a simple duct elbow directly in front of and behind the fan. The installation of such duct angle leads to a significant decrease in fan performance and an increase in noise generated.



DISCHARGE OPERATION



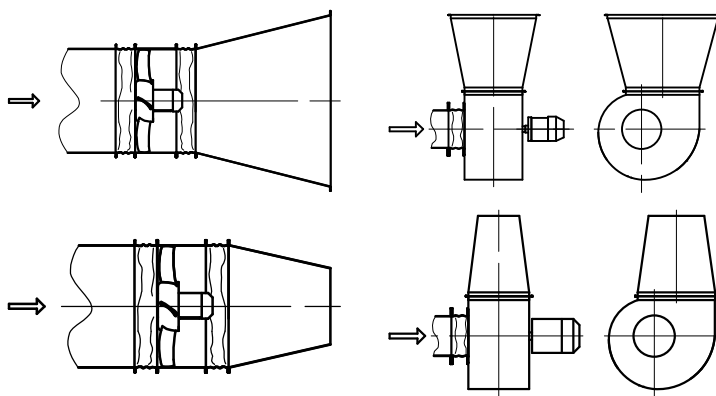
RECOMMENDED

When the network is located on the discharge side and the inlet is free, it is recommended to install the inlet header in front of the fan, especially in front of the axial fan.

NOT RECOMMENDED

It's not recommended to leave a flange at the free inlet of the fan

SUCTION OPERATION



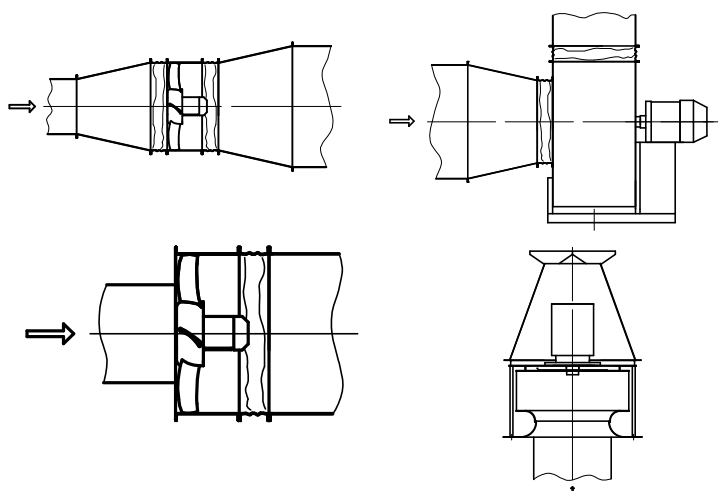
RECOMMENDED

When the network is located on the suction side and the outlet section is free, it is recommended to install a diffuser at the fan outlet to reduce the speed and dynamic pressure of the fans.

NOT RECOMMENDED

It is not recommended to place a confuser at the fan outlet, which increases the axial component of the flow velocity and swirl, as well as unused dynamic pressure.

ADAPTERS



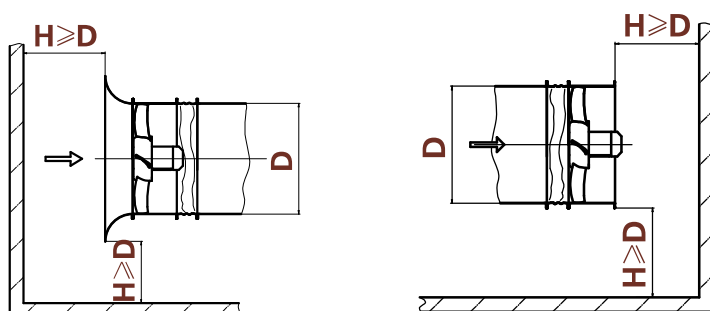
RECOMMENDED

If the cross-sectional area of the air duct in front of the fan is larger or smaller than the inlet cross-sectional area of the fan, it is recommended to install adapters in the form of a diffuser or confuser between the air duct and the fan.

NOT RECOMMENDED

It is not recommended to place an air duct with a smaller cross-section than the fan inlet directly in front of the inlet. This disrupts the normal operation of the fan: efficiency and pressure are reduced.

LOCATION IN THE ROOM



RECOMMENDED

It is recommended that for normal operation of the fan in a confined space, the specified minimum permissible distances from the inlet and outlet sections to nearby walls of the room, obstacles and large-sized equipment be observed.

RADIAL ROOF FANS

UKROS-DU/DUV

➤ for removing gases generated during a fire, with an upblast discharge;

➤ energy efficient

INTENDED USE:

- ventilation and air heating systems;
- sanitary and technological installations;
- smoke ventilation systems.



• 400° C • 600° C
• 180 MIN

•035 •040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

UKROS-DU/DUV smoke extraction fans use a new, improved impeller with backward-curved blades, a toroidal inlet pipe with a large inlet diameter.

The fundamental difference of UKROS-DU/DUV is the upblast discharge system with foldable protective pockets.

The impeller (with increased efficiency) is mounted directly on the motor shaft.

The fans are equipped with high-quality 3-phase asynchronous single-speed motors. It is possible to use frequency control of the rotation speed.

UKROS-DU/DUV fans have a well-thought-out casing design with a 4- and 6-sided motor enclosure with a movable and very durable built-in gravity-type backdraft damper that forms an upblast discharge. Provides maximum protection against both snow and rain (exceeds the protection level of KROV and KROS fans).

The mounting dimensions on the base plate are unified with the KROV roof fan. Fans on the roof can be easily installed using the STAM roof curb.

Additional fan options are available - see the "Additional equipment" section of the catalog.

➤ general purpose industrial (N);

➤ corrosion-resistant (CR1) - only for DUV mode;

➤ explosion-proof, corrosion-resistant (VCR1) - only for DUV mode

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st placement category.

Operating conditions:

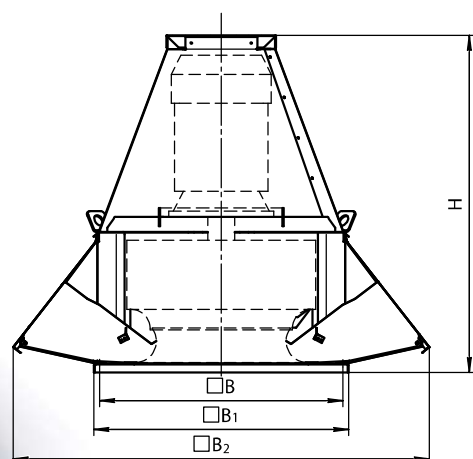
➤ ambient temperature:

- from -45 °C to +40 °C for temperate climate,
- from -60 °C to +40 °C for temperate and cold climates,
- from -10 °C to +50 °C for tropical climate;

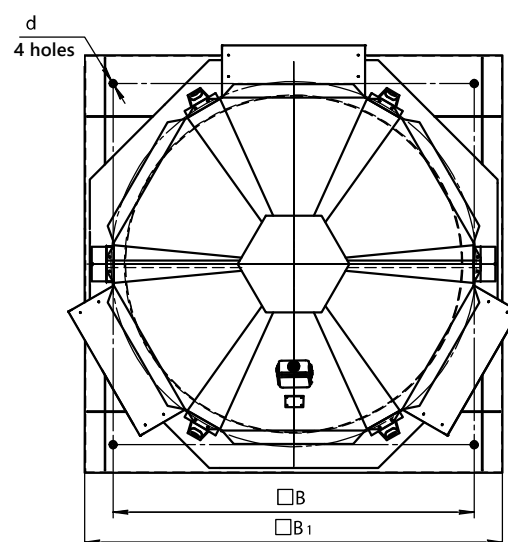
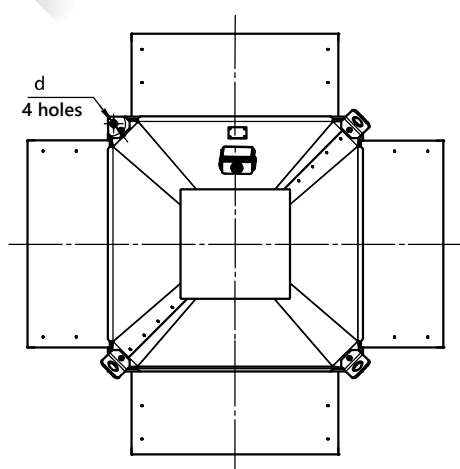
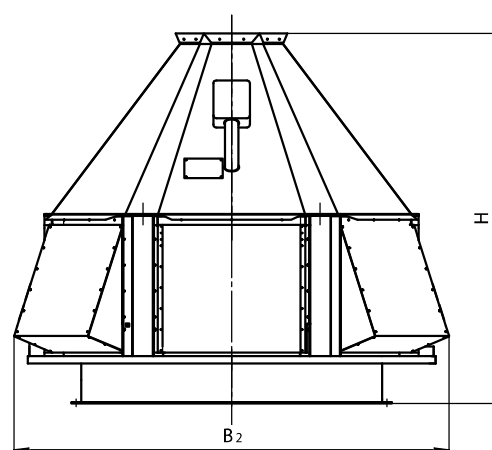
➤ the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;

➤ conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

035... 112



125



STANDARD SIZE	Dimensions, mm					Weight, max, kg	STANDARD SIZE* STAM
	B	B ₁	B ₂	H _{max}	d		
035	480	570	840	720	10	100	35
040	530	625	950	800	10	120	40
045	580	680	1030	850	10	160	45
050	630	710	1180	980	10	135	51
056	690	820	1300	1150	10	173	56
063	755	850	1400	1000	10	230	63
071	840	950	1550	1072	10	307	71
080	1005	1080	1720	1265	12	484	88
090	1050	1130	1840	1425	12	609	90
100	1220	1280	2100	1420	12	718	109
112	1350	1430	2300	1405	12	808	112
125	1505	1740	2500	1830	16	1430	136

* The standard STAM size indicates the flow section of the duct shaft in centimeters

EXAMPLE:

UKROS91 roof-mounted radial smoke extraction fan; standard size 035; operating mode DU400; corrosion-resistant; motor rated power N_{nom} = 0.25 kW; number of poles 4 (synchronous speed 1500 min⁻¹); climatic version Y1:

UKROS91-035-DUF400-CR1-00025/4-Y1

- roof-mounted radial fan (•UKROS60 •UKROS61 •UKROS90 •UKROS91)
- standard fan size (•035 •040 •045 •056 •063 •071 •080 •090 •100 •112 •125)
- operating mode
 - temperature of the transported medium is 400° C
 - DU operating mode: •DUF400 DUV operating mode: •DUVF400
 - temperature of the transported medium is 600° C
 - DU operating mode: •DUF600 DUV operating mode: •DUVF600
- design version (•N •CR1 •VCR1 (only for fans without FC))
- motor parameters* (•n/P •n/PF - for motor configuration with FC)
 - n** – Motor Power Index
 - P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm),
 - F – with using a FC (the FC is not included)

When ordering a fan designed to operate with a VFD, the required impeller speed should be indicated in brackets after the marking
- climatic version (• Y1 • YHL1 • T1)
- the energy efficiency class of the electric motor: •IE2 (indicated for DUV fans if it differs from the standard)

NOTE

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement. It is recommended to start motors from 15 kW using the MCD soft starter.

** Motor Power Index - see Table 1.

For compliance with the roof curb, see Table 2.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

Special requirements for the fan are specified additionally and agreed with the manufacturer.

TABLE 1

UKROS-DU/DUV

Motor rated power (N _{nom}), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n)	00018...00075	00110...00750	01100...09000

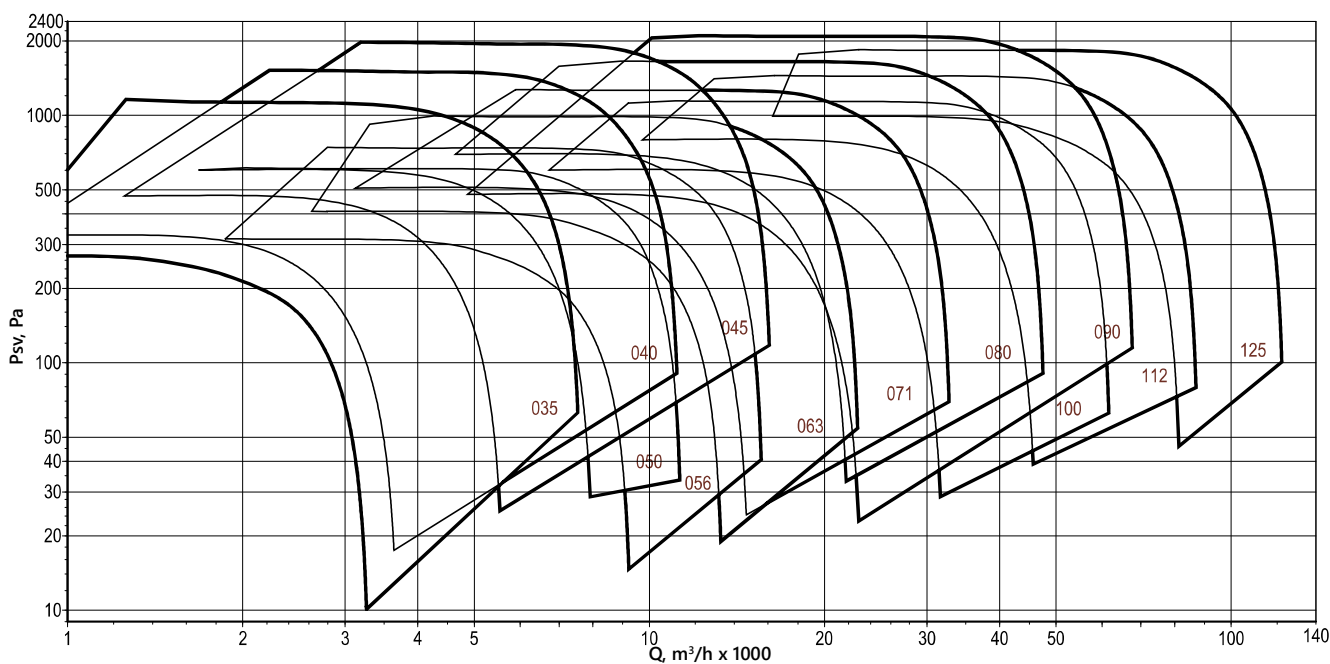
TABLE 2

UKROS-DU/DUV

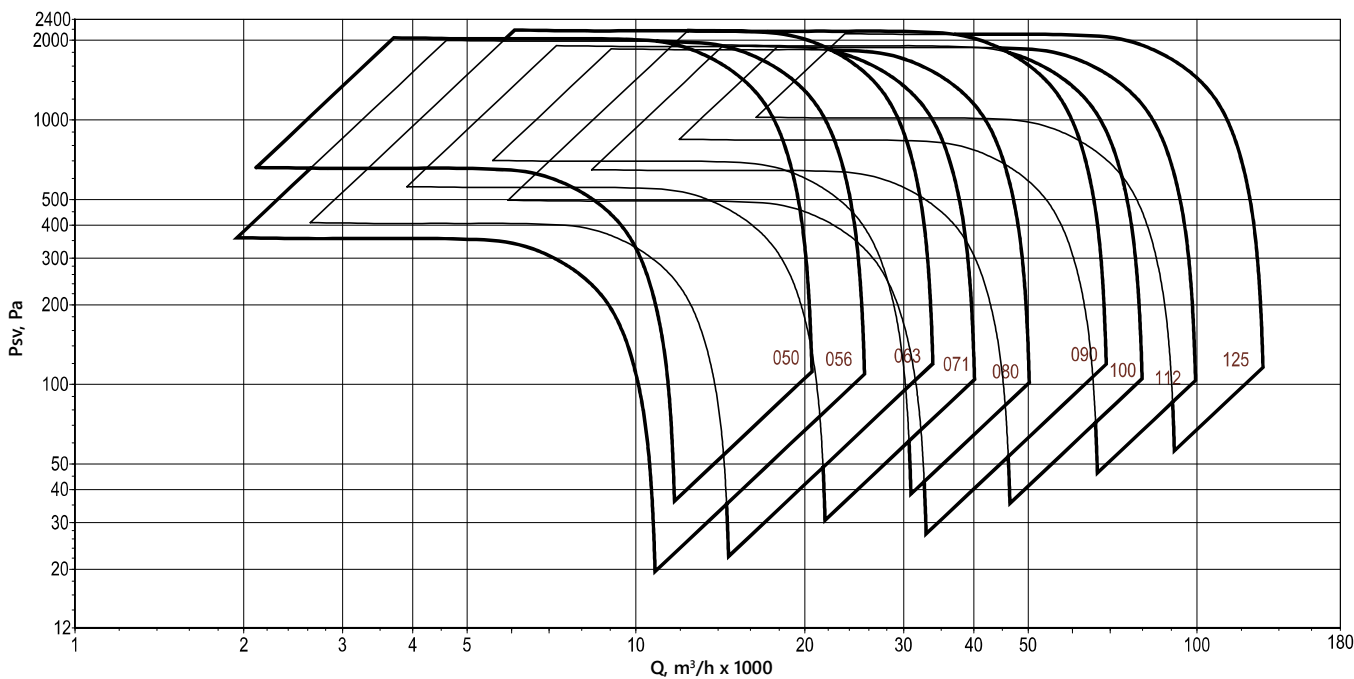
Product	035	040	045	050	056	063	071	080	090	100	112	125
STAM	35	40	45	51	56	63	71	88	90	109	112	136

AREAS OF AERODYNAMIC PARAMETERS

UKROS-DU/DUV DIRECT CONNECTION TO MAINS 380 V/50 HZ



UKROS-DUV-F FAN WITH VFD



NOTE

The dynamic pressure of the fan is not used, so static pressure curves are given.

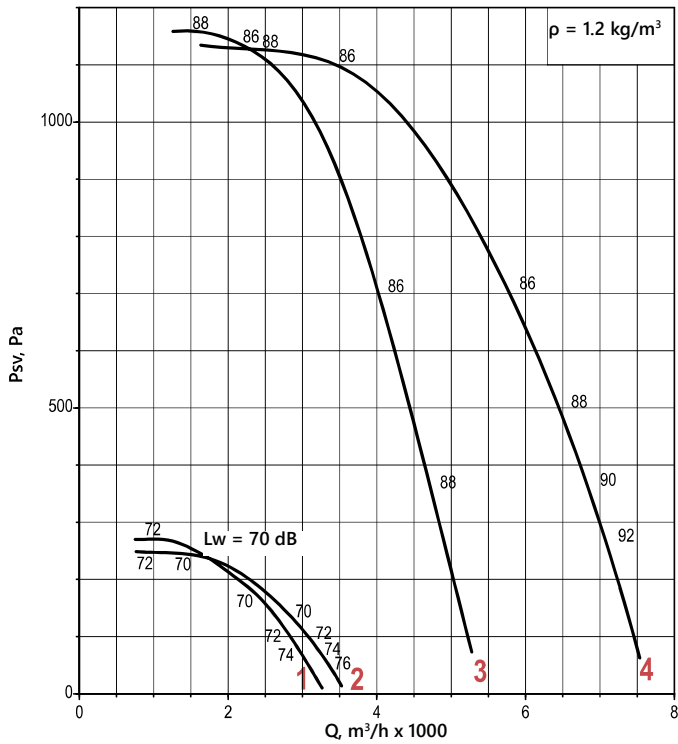
TECHNICAL SPECIFICATIONS

035

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------	-------------

DU AND DUV MODE

1	UKROS61-DU/DUV	4	0,18**	0,73	35
2	UKROS91-DU/DUV		0,25	0,83	36
3	UKROS60-DU/DUV	2	1,5	3,2	44
4	UKROS91-DU/DUV		2,2	4,6	46



NOTE

*When the motor type is changed, the weight may change.
** The motor is not available in the "V" and "VCR1" design versions.
The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment				
				
roof curb STAM	pan POD	frequency converter	soft starter	automatic control system SHTORM-D

040

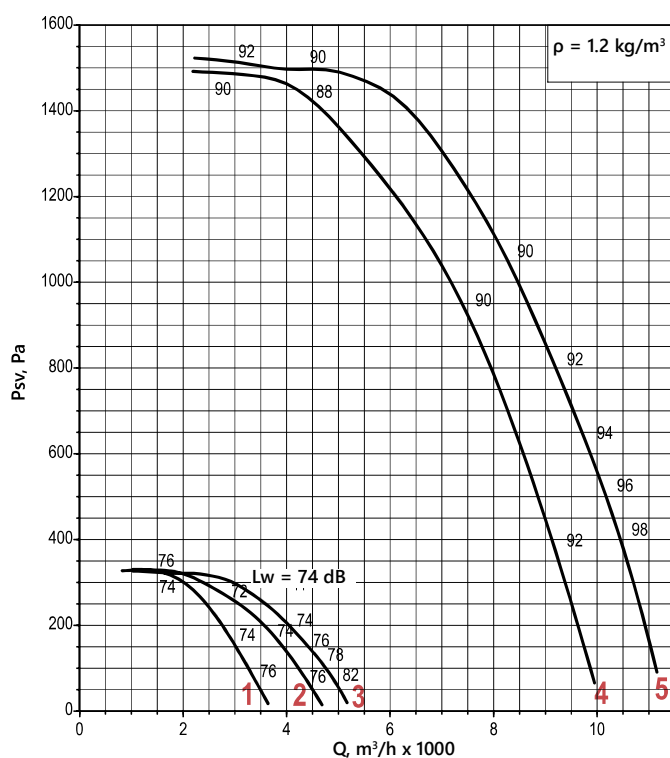
Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------	-------------

DU AND DUV MODE

1	UKROS60-DU/DUV	0,25	4	0,83	40
2	UKROS61-DU/DUV	0,37		1,18	41
3	UKROS91-DU/DUV	0,55		1,5	43

DU-ONLY MODE

4	UKROS61-DU	3	2	6,5	52
5	UKROS91-DU	4		8,4	57



NOTE

*When the motor type is changed, the weight may change.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

045

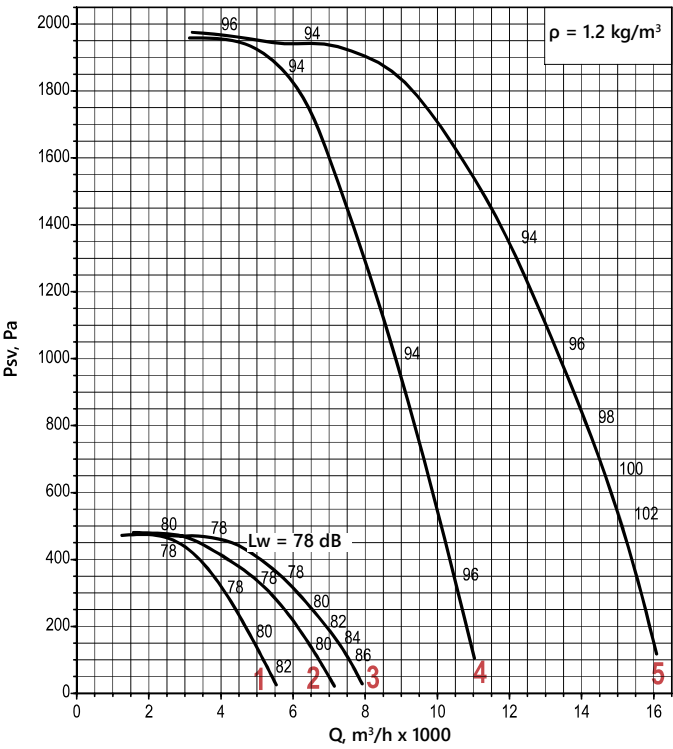
Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------	-------------

DU AND DUV MODE

1	UKROS60-DU/DUV	0,55	4	1,5	61
2	UKROS61-DU/DUV	0,75		2,2	63
3	UKROS91-DU/DUV	1,1		2,6	67

DU-ONLY MODE

4	UKROS60-DU	5,5	2	11	84
5	UKROS91-DU	7,5		14,7	104



NOTE

*When the motor type is changed, the weight may change.
** The motor is not available in the "V" and "VCR1" design versions.
The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment				
				
roof curb STAM	pan POD	frequency converter	soft starter	automatic control system SHTORM-D

050

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
--------------	----------	----------	-----------------	---------------------	-------------

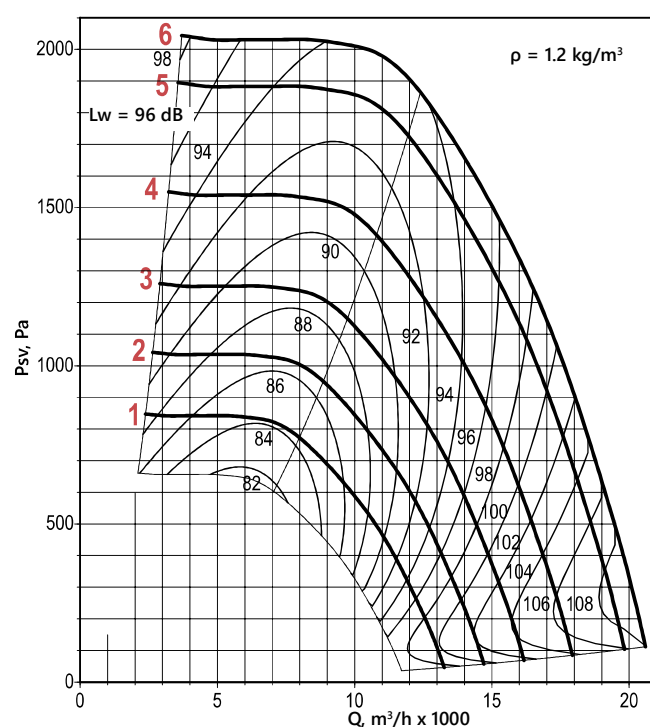
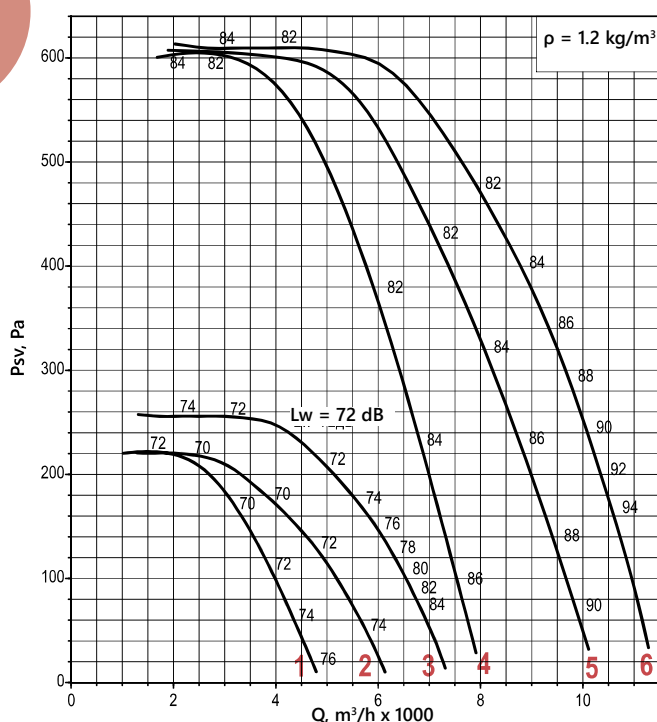
DU AND DUV MODE

1	UKROS60-DU/DUV	0,25	6	1,04	68
2	UKROS61-DU/DUV	0,37		1,31	71
3	UKROS91-DU/DUV	0,55		1,74	72
4	UKROS60-DU/DUV	1,1	4	2,6	76
5	UKROS61-DU/DUV	1,5		3,6	78
6	UKROS91-DU/DUV	2,2		5,1	81

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
--------------	----------	-----------------------	----------	-----------------	-------------

DUV MODE WITH FREQUENCY CONVERTER

1	UKROS91-DUV-F	1669	2,2	4	81
2		1851	3		83
3		2035	4		92
4		2257	5,5		113
5		2496	7,5		137
6		2592	11		149



NOTE

*When the motor type is changed, the weight may change.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

056

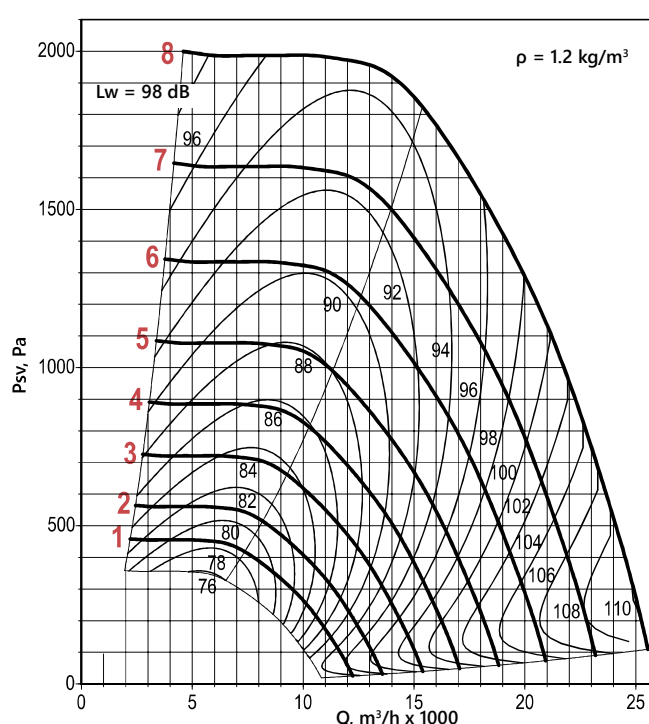
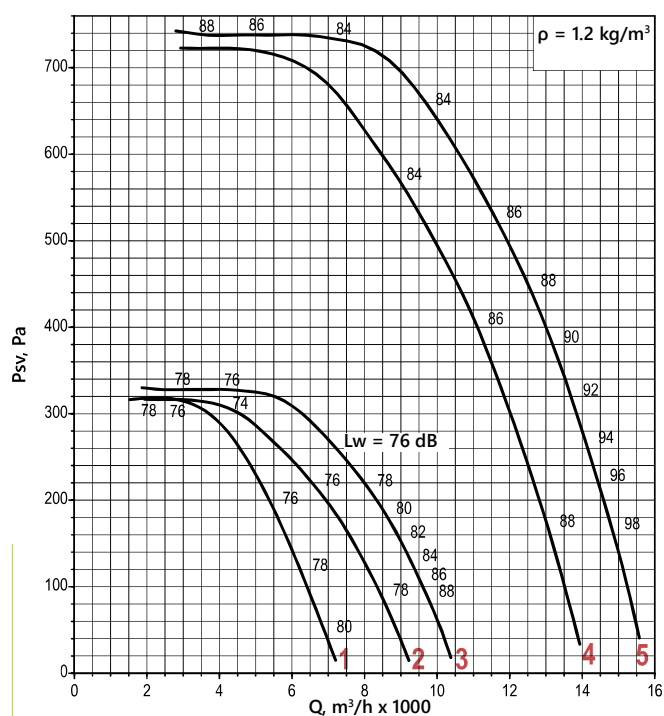
Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg	Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
--------------	----------	----------	-----------------	---------------------	-------------	--------------	----------	-----------------------	----------	-----------------	-------------

DU AND DUV MODE

1	UKROS60-DU/DUV	0,55	6	1,74	90
2	UKROS61-DU/DUV	0,75		2,3	94
3	UKROS91-DU/DUV	1,1		3,2	96
4	UKROS61-DU/DUV	2,2	4	5,1	99
5	UKROS91-DU/DUV	3		7,3	101

DUV MODE WITH FREQUENCY CONVERTER

1	UKROS91-DUV-F	1096	1,1	6	96
2		1216	1,5		99
3		1379	2,2		107
4		1528	3	4	101
5		1686	4		110
6		1876	5,5		131
7		2077	7,5		155
8		2289	11		167



NOTE

*When the motor type is changed, the weight may change.

** The motor is not available in the "V" and "VCR1" design versions.

The acoustic parameters of the fan (L_p sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

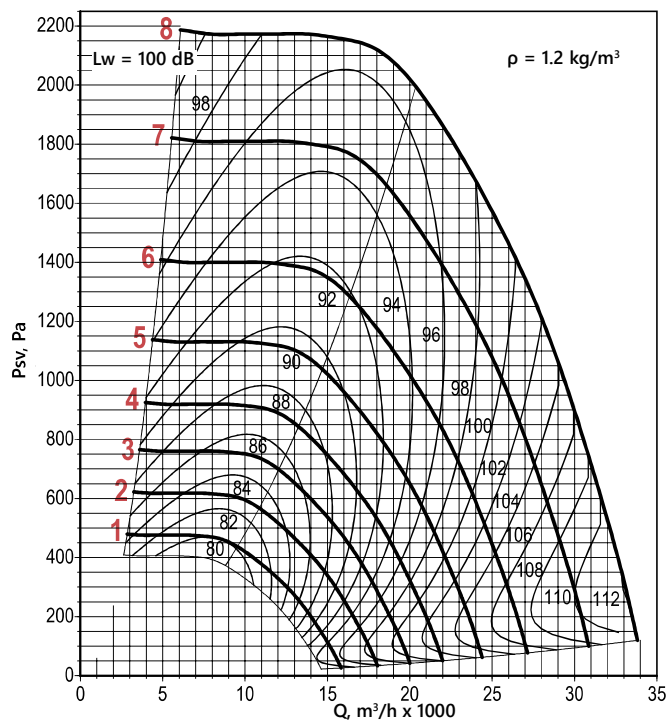
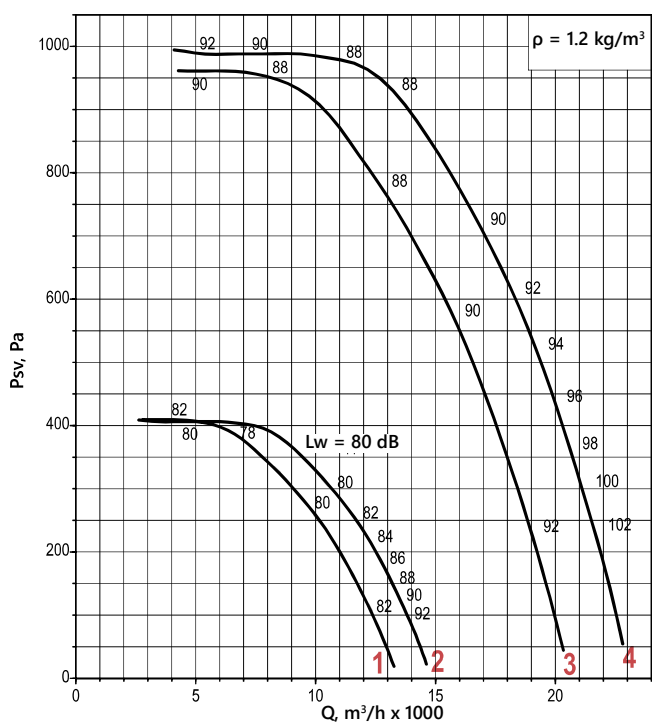
063

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
1	UKROS61-DU/DUV	1,1	6	3,2	106
2	UKROS91-DU/DUV	1,5		4,1	109
3	UKROS61-DU/DUV	4	4	8,6	120
4	UKROS91-DU/DUV	5,5		11,7	141

DU AND DUV MODE

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
1	UKROS91-DUV-F	996	1,5	6	109
2		1135	2,2		117
3		1259	3		121
4		1384	4	4	132
5		1535	5,5		141
6		1708	7,5		165
7		1942	11		177
8		2128	15		210

DUV MODE WITH FREQUENCY CONVERTER



NOTE

*When the motor type is changed, the weight may change.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



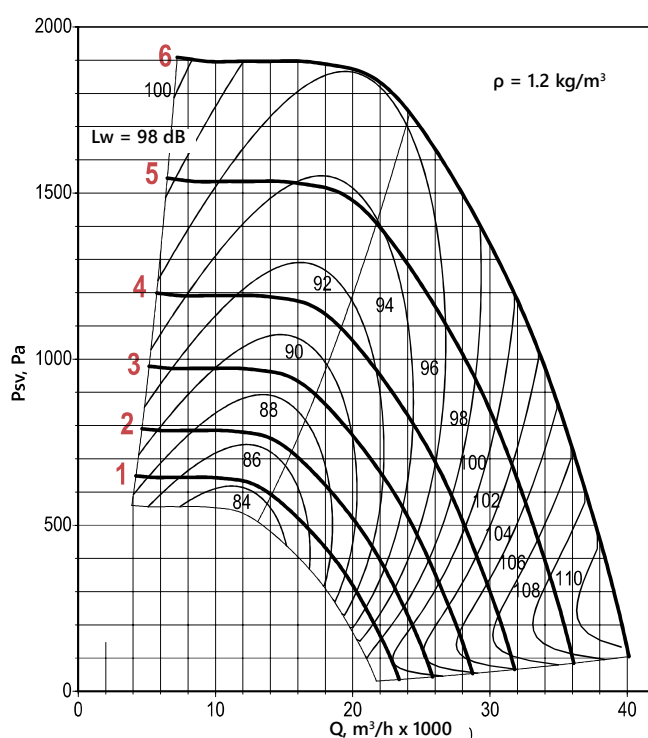
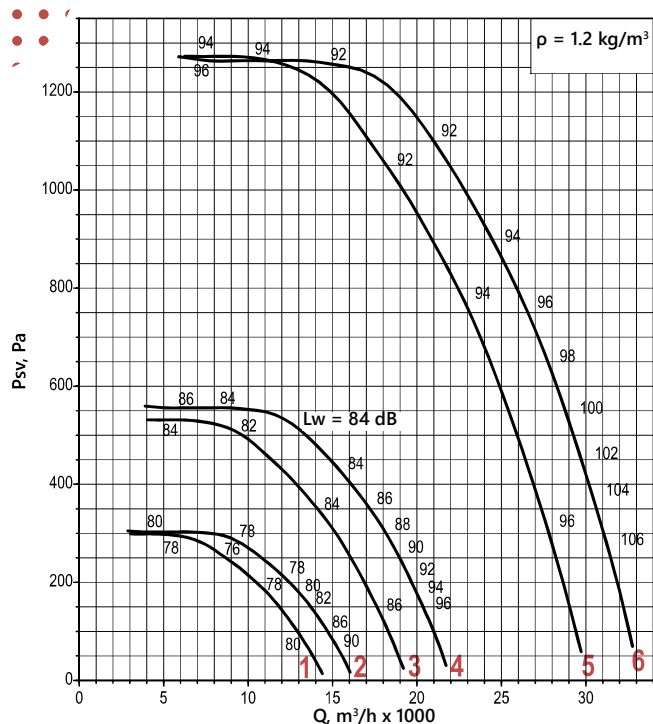
soft starter



automatic control system
SHTORM-D

071

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg	Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
DU AND DUV MODE						DUV MODE WITH FREQUENCY CONVERTER					
1	UKROS60-DU/DUV	0,75	8	2,1	140	1	UKROS91-DUV-F	1028	3	6	153
2	UKROS91-DU/DUV	1,1		3	143	2		1135	4		164
3	UKROS61-DU/DUV	2,2		5,8	149	3		1263	5,5		178
4	UKROS91-DU/DUV	3	6	7	153	4		1398	7,5	4	189
5	UKROS61-DU/DUV	7,5		15,6	197	5		1587	11		209
6	UKROS91-DU/DUV	11		23	209	6		1764	15		242



NOTE

*When the motor type is changed, the weight may change.

** The motor is not available in the "V" and "VCR1" design versions.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

080

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
--------------	----------	----------	-----------------	---------------------	-------------

DU AND DUV MODE

1	UKROS60-DU/DUV	1,5	8	4,6	192
2	UKROS91-DU/DUV	2,2		6,3	201
3	UKROS61-DU/DUV	4	6	9	210
4	UKROS91-DU/DUV	5,5		12	224

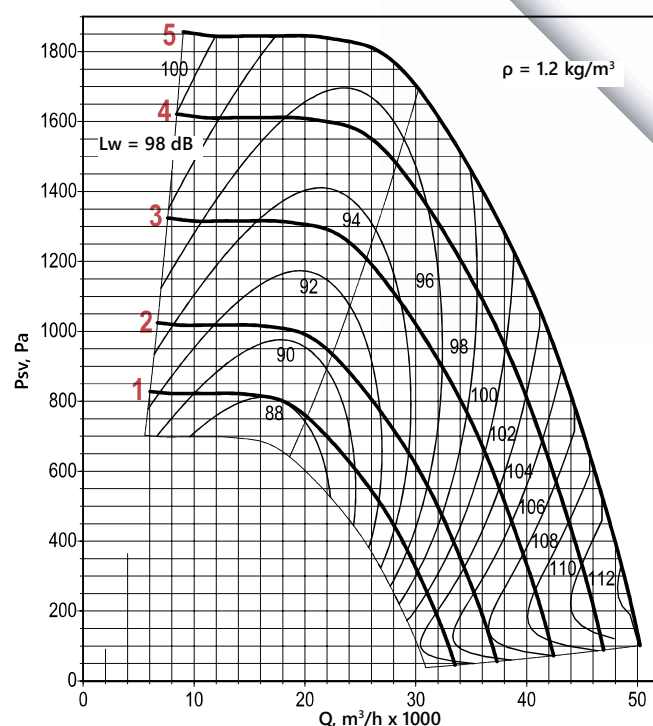
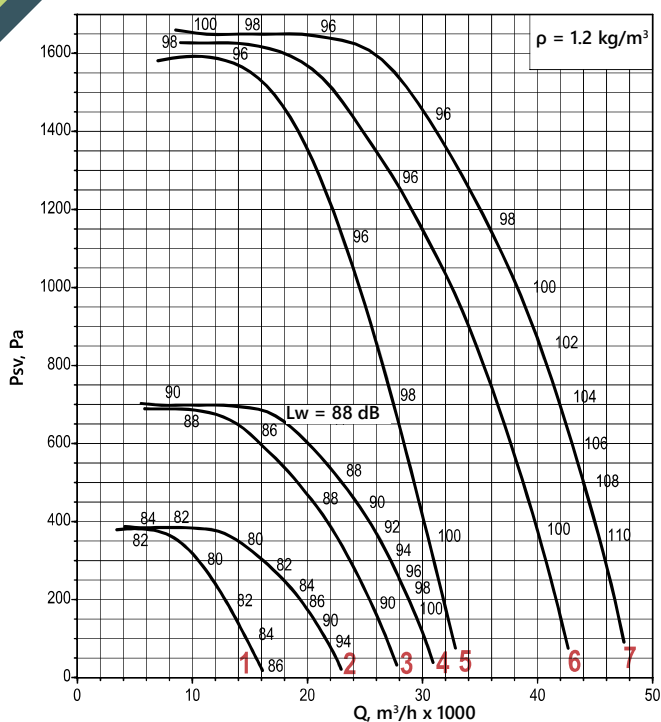
DU-ONLY MODE

5	UKROS60-DU	11	4	23	255
6	UKROS61-DU	15		31	288
7	UKROS91-DU	18,5		36	306

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
--------------	----------	-----------------------	----------	-----------------	-------------

DUV MODE WITH FREQUENCY CONVERTER

1	UKROS91-DUV-F	1031	5,5	6	224
2		1147	7,5		235
3		1304	11		261
4		1443	15	4	263
5		1544	18,5		306



NOTE

*When the motor type is changed, the weight may change.
The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

SMOKE EXTRACTION FANS

additional equipment



roof curb
STAM



pan
POD



frequency
converter



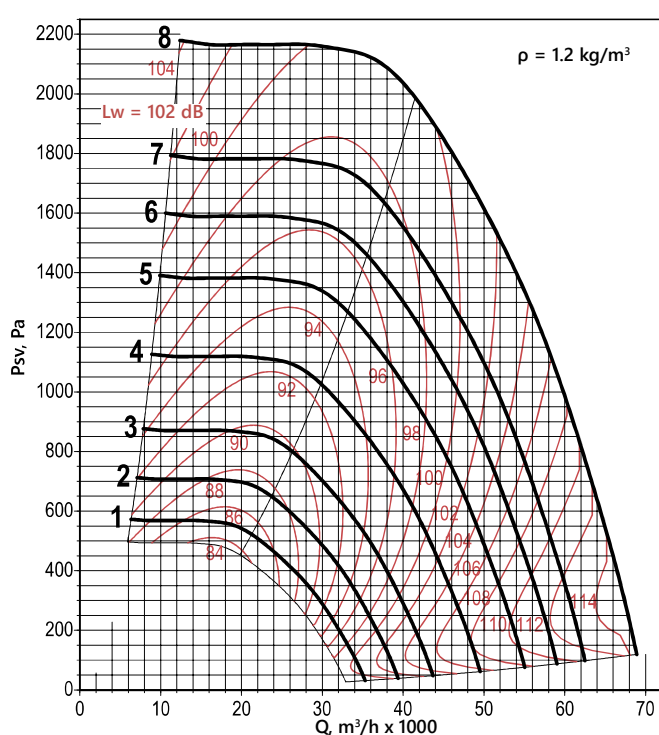
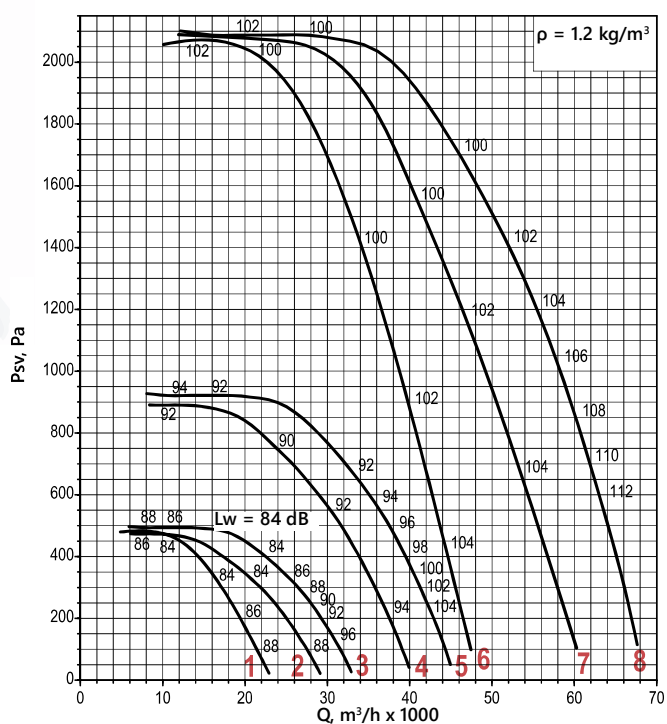
soft starter



automatic control system
SHTORM-D

090

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg	Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
DU AND DUV MODE						DUV MODE WITH FREQUENCY CONVERTER					
1	UKROS60-DU/DUV	2,2	8	6,3	237	1	UKROS91-DUV-F	762	4	8	256
2	UKROS61-DU/DUV	3		8	243	2		850	5,5		266
3	UKROS91-DU/DUV	4		10,5	256	3		943	7,5		297
4	UKROS61-DU/DUV	7,5	6	17,5	271	4		1069	11	6	297
5	UKROS91-DU/DUV	11		24	297	5		1188	15		329
DU-ONLY MODE						6		1274	18,5		336
6	UKROS60-DU	22	4	44	361	7		1349	22		374
7	UKROS61-DU	30		56	394	8		1487	30	4	409
8	UKROS91-DU	37		70	434						



NOTE

*When the motor type is changed, the weight may change.

** The motor is not available in the "V" and "VCR1" design versions.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



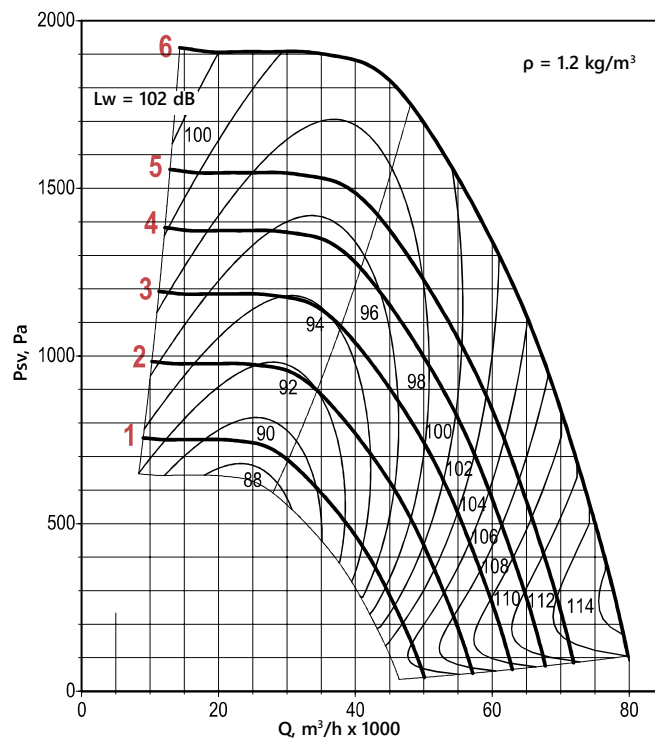
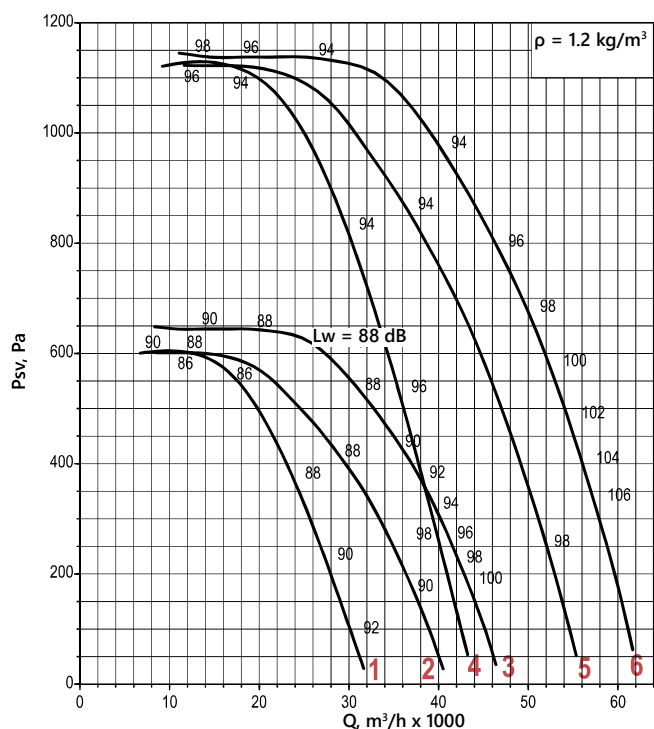
soft starter



automatic control system
SHTORM-D

100

Curve number	Fan type	N _{nom} , kW	Number of poles	Current at 380 V, A	Weight,* kg	Curve number	Fan type	n _k , min ⁻¹	N _{nom} , kW	Number of poles	Weight,* kg
DU AND DUV MODE						DUV MODE WITH FREQUENCY CONVERTER					
1	UKROS60-DU/DUV	4	8	10,5	330	1	UKROS91-DUV-F	788	7,5	8	371
2	UKROS61-DU/DUV	5,5		13,6	340	2		899	11		398
3	UKROS91-DU/DUV	7,5		18	371	3		990	15	6	403
4	UKROS60-DU/DUV	11	6	24	373	4		1066	18,5		410
5	UKROS61-DU/DUV	15		32	403	5		1131	22		448
6	UKROS91-DU/DUV	18,5		37	410	6		1256	30		483



NOTE

*When the motor type is changed, the weight may change.

The acoustic parameters of the fan (L_p sound pressure levels) are given in the Appendix.

SMOKE EXTRACTION FANS

additional equipment



roof curb
STAM



pan
POD



frequency
converter



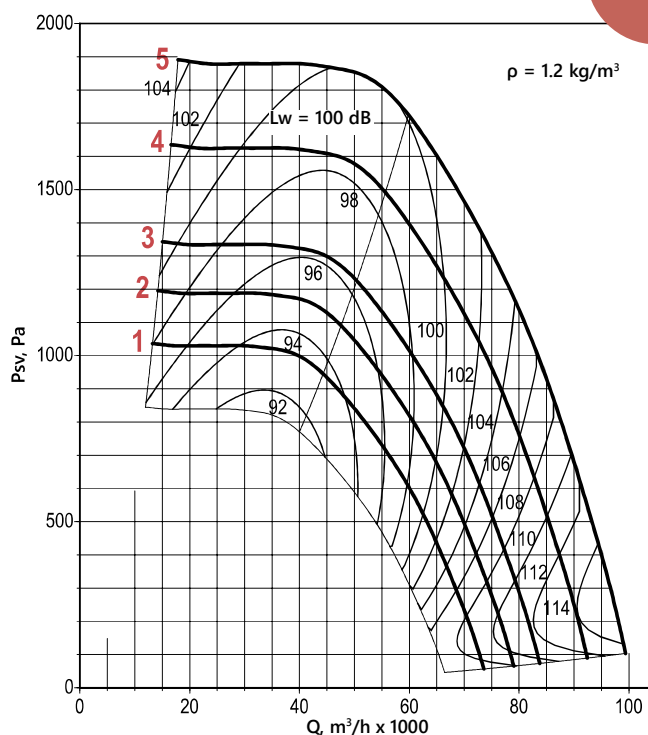
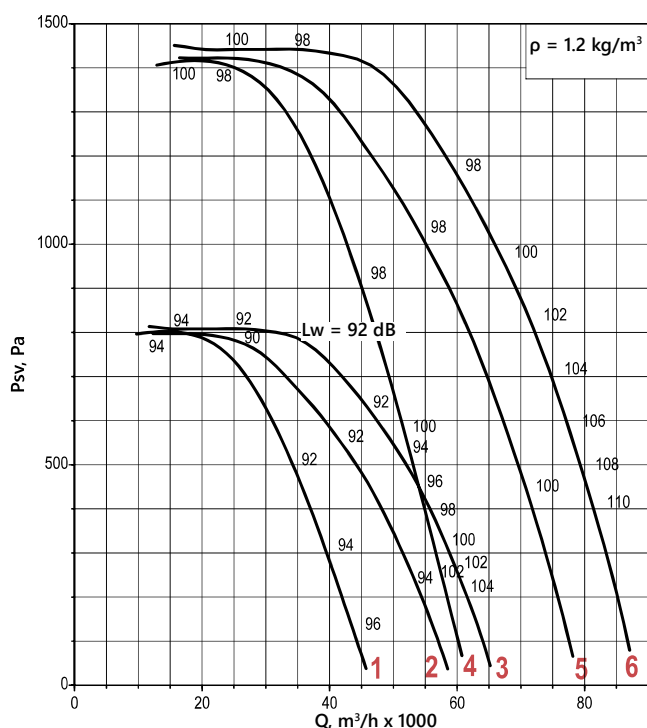
soft starter



automatic control system
SHTORM-D

112

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg	Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
РЕЖИМ DU TA DUV						DUV MODE WITH FREQUENCY CONVERTER					
1	UKROS60-DU/DUV	7,5	8	18	399	1	UKROS91-DUV-F	824	15	8	486
2	UKROS61-DU/DUV	11		26	456	2		885	18,5		516
3	UKROS91-DU/DUV	15		35	486	3		938	22		541
DU-ONLY MODE						4		1035	30	6	511
4	UKROS60-DU	18,5	6	37	438	5		1113	37		614
5	UKROS61-DU	22		44	476						
6	UKROS91-DU	30		60	511						



NOTE

*When the motor type is changed, the weight may change.

** The motor is not available in the "V" and "VCR1" design versions.

The acoustic parameters of the fan (L_p sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

125

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
--------------	----------	----------	-----------------	---------------------	-------------

DU AND DUV MODE

1	UKROS60-DU/DUV	15	8	35	665
2	UKROS61-DU/DUV	18,5		40	695
3	UKROS91-DU/DUV	22		48	720

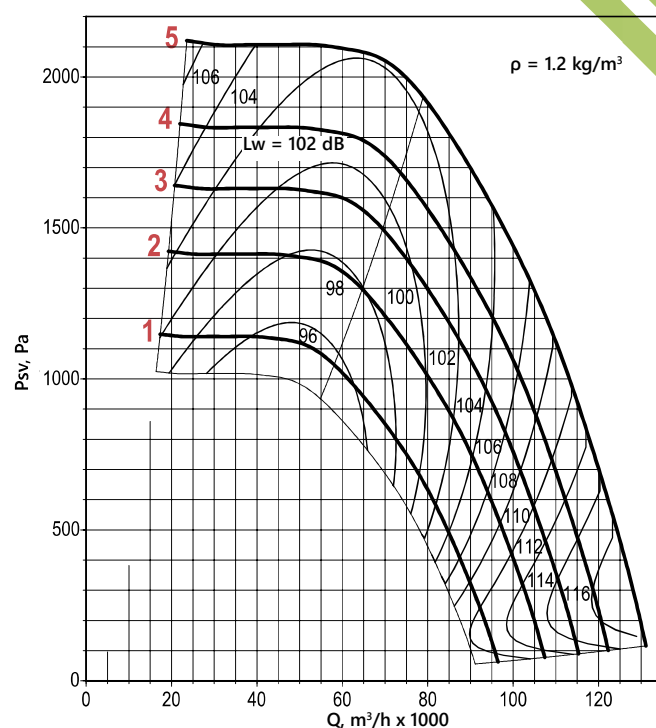
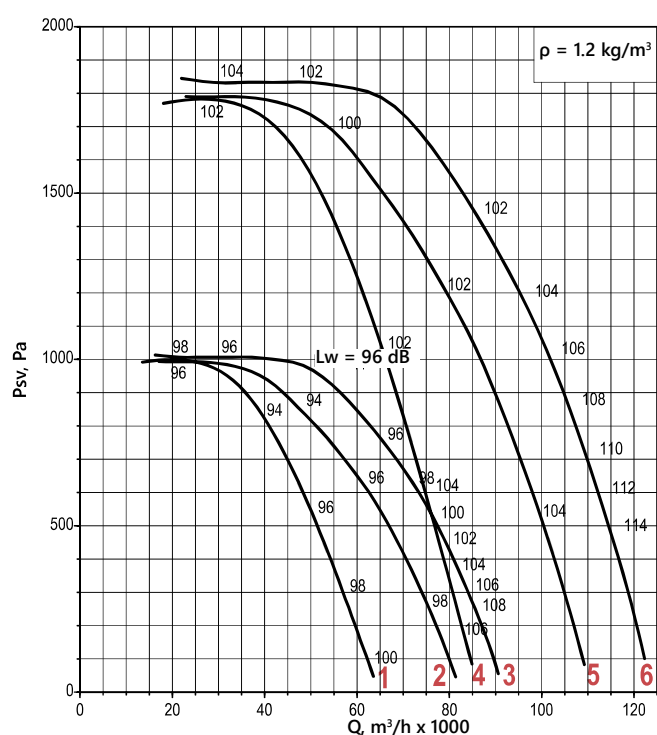
DU-ONLY MODE

4	UKROS60-DU	37	6	71	793
5	UKROS61-DU	45		85	925
6	UKROS91-DU	55		103	965

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
--------------	----------	-----------------------	----------	-----------------	-------------

DUV MODE WITH FREQUENCY CONVERTER

1	UKROS91-DUV-F	777	22	8	720
2		865	30		801
3		929	37		920
4		985	45	6	965
5		1056	55		1055



NOTE

*When the motor type is changed, the weight may change.

The acoustic parameters of the fan (Lp sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

**UKROS-DU/DUV roof-mounted radial smoke extraction fan
with an upblast discharge**

UKROS _____

quantity, pcs _____

Contact person: _____

Organization: _____

tel.: _____ e-mail: _____

Region (city): _____ date: _____

Mark the required one with a "V" sign or specify a value

operating mode (range of modes)	efficiency Q, m ³ /h	
	static pressure P _{sv} at t = 20 °C, Pa	
fan standard size		
operating mode	DU - smoke extraction	
	DUV - smoke extraction and ventilation	
fan design	N - general purpose industrial	
	CR1 - corrosion-resistant	
	VCR1 - explosion-proof, corrosion-resistant	
temperature of the transported medium	400° C	
	600° C	
climatic version	Y1	
	YHL	
	T1	
impeller	rotation speed, min ⁻¹ (specify when using the frequency converter)	
motor	motor rated power, kW	
	number of poles	
	with a frequency converter	

Additional equipment

STAM roof curb	
POD pan	
frequency converter	
soft starter	
SHTORM-D cabinet	

Special requirements:

Customer _____
(signature) (full name)

KROV-DU/DUV

RADIAL ROOF FANS



• 400° C • 600° C
• 180 MIN

- for removing gases generated during a fire with upward airflow discharge;
- energy efficient

INTENDED USE:

- ventilation and air heating systems;
- sanitary and technological installations;
- smoke ventilation systems.

•035 •040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

- general purpose industrial (N);
- explosion-proof (V) - only for DUV modes;
- corrosion-resistant (CR1) - only for DUV mode;
- explosion-proof, corrosion-resistant (VCR1) - only for DUV mode

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st placement category.

Operating conditions:

- ambient temperature
 - from -45° C to +40° C for temperate climate,
 - from -60° C to +40° C for temperate and cold climates,
 - from -10° C to +50° C for tropical climate;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose"

The KROV-DU/DUV fans feature a tall housing with free upward air discharge and low weight; the design provides structural protection of the premises from atmospheric precipitation.

The fan features a small base plate and an impeller with increased efficiency of up to 75%.

The fans create high flow, high static pressure and low noise.

It is possible to operate the fans both in the smoke extraction mode (DU) and in the combined smoke extraction and ventilation mode (DUV). More modifications have been developed for DUV mode. The KROV-DUV model features an operating time limit of 120 minutes.

The impeller is mounted directly on the motor shaft.

The fans are equipped with high-quality 3-phase asynchronous single-speed motors.

It is possible to use a VFD with programming of different speeds for the DUV mode.

The mounting dimensions on the base plate are unified with the KROS roof fan.

Fans on the roof can be easily installed using the STAM roof curb.

Additional fan options are available - see the "Additional equipment" section of the catalog.

An example of mounting a fan on a roof is given in the "STAM" section.

EXAMPLE:

KROV roof-mounted radial smoke extraction fan; standard size 056; operating mode DUVF400; corrosion-resistant; motor with rpm control, rated power $N_{nom} = 1.5$ kW and number of poles 6; climatic version Y1:

KROV91-056-DUVF400-CR1-00150/6F-Y1

- roof-mounted radial fan
(•KROV60 •KROV61 •KROV90 •KROV91)
- standard fan size
(•035 •040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125)
- operating mode
temperature of the transported medium is 400 °C
DU operating mode: •DUF400 DUV operating mode: •DUVF400
temperature of the transported medium is 600 °C
DU operating mode: •DUF600 DUV operating mode: •DUVF600
- design version (•N •CR1 •V (only for fans without FC)
•VCR1 (only for fans without VFD)
- motor parameters* (•n/P •n/PF - for motor configuration with FC)
n** – Motor Power Index
P - number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm),
12 (500 rpm)
F – with using a FC (the FC is not included)
When ordering a fan designed to operate with a VFD, the required impeller speed should be indicated in brackets after the marking
- climatic version (•Y1 •YHL1 •T1)
- the energy efficiency class of the electric motor: •IE2 (indicated for DUV fans if it differs from the standard)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement. It is recommended to start motors from 15 kW using the MCD soft starter.

** Motor Power Index - see Table 1.

For compliance with the roof curb, see Table 2.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

Special requirements for the fan are specified additionally.

TABLE 1

KROV-DU/DUV

Motor rated power (N_{nom}), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n)	00018...00075	00110...00750	01100...09000

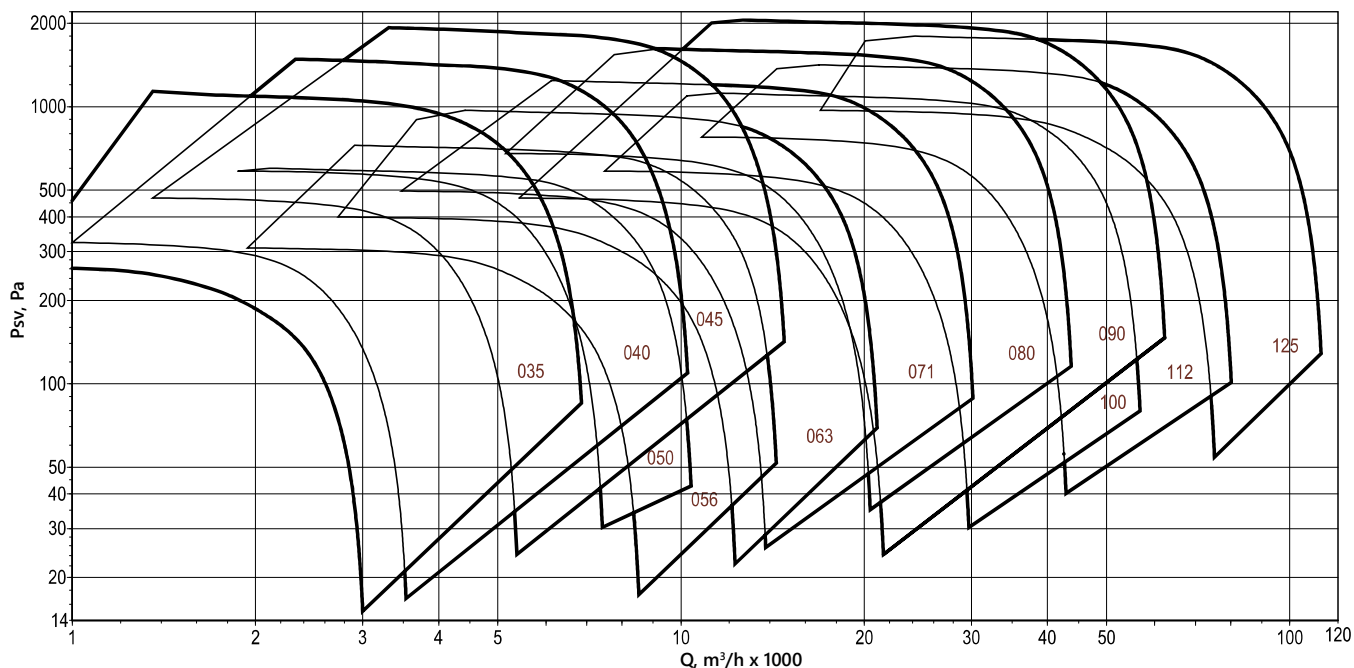
TABLE 2

KROV-DU/DUV

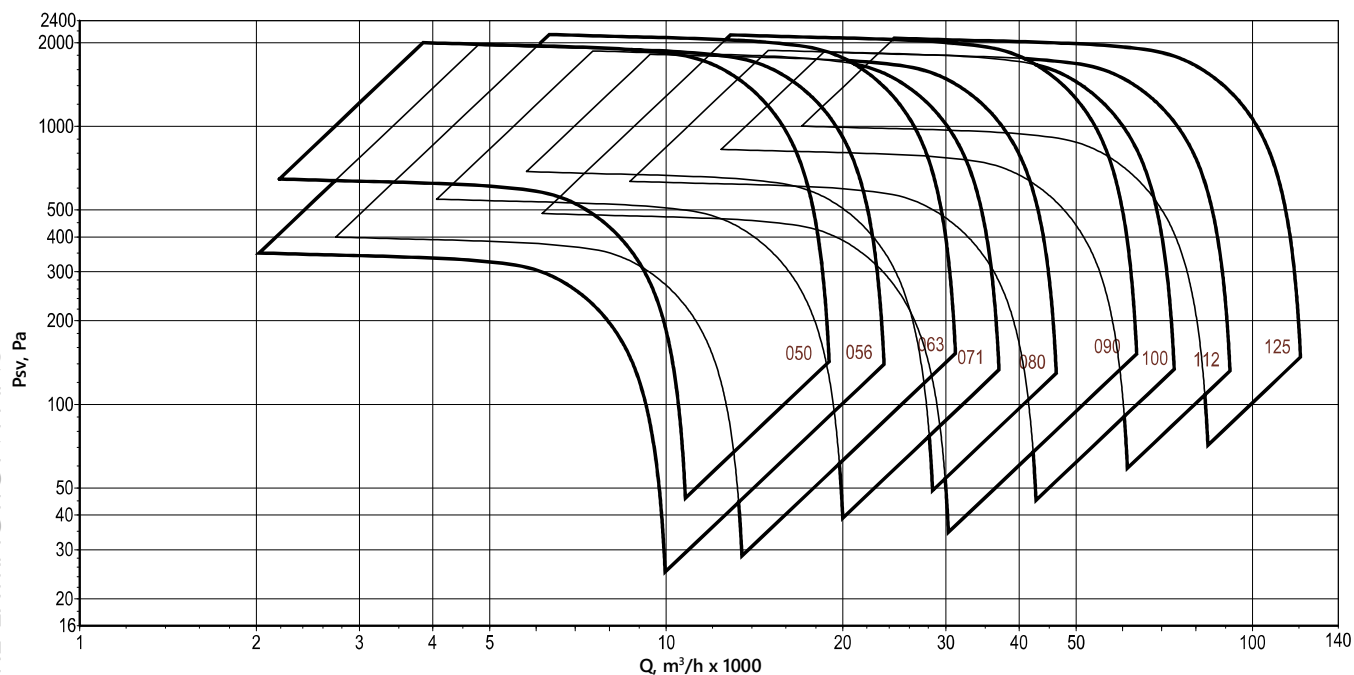
Product	035	040	045	050	056	063	071	080	090	100	112	125
STAM	35	40	45	51	56	63	71	88	90	109	112	136

AREAS OF AERODYNAMIC PARAMETERS

KROV-DU/DUV, DIRECT CONNECTION TO MAINS 380 V/50 HZ



KROV-DUV-F FAN WITH VFD



NOTE

The dynamic pressure of the fan is not used, so static pressure curves are given.

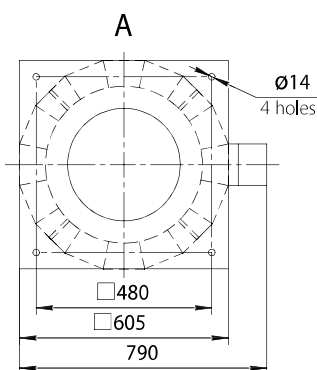
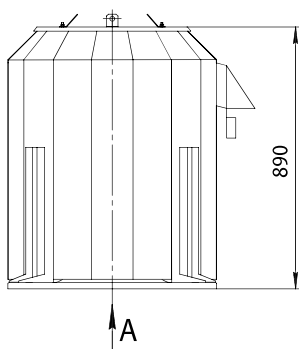
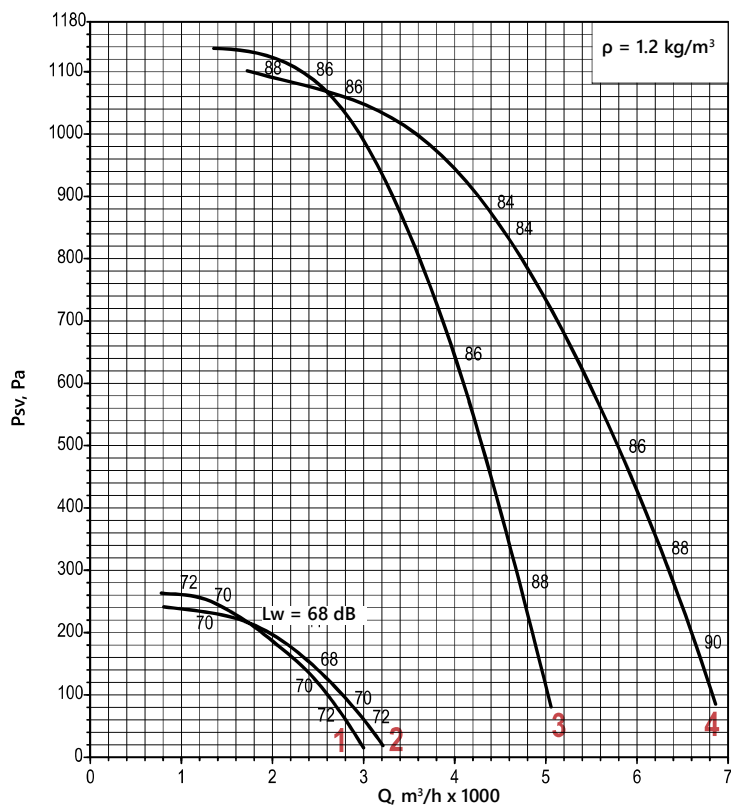
TECHNICAL SPECIFICATIONS

035

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	KROV61-DU/DUV	0,18**	4	0,73	64
2	KROV91-DU/DUV	0,25		0,83	65
3	KROV60-DU/DUV	1,5	2	3,2	73
4	KROV91-DU/DUV	2,2		4,6	75



NOTE

*When the motor type is changed, the weight may change.

** The motor is not available in the "V" and "VCR1" design versions.

The acoustic parameters of the fan (L_p sound pressure levels) are given in the Appendix.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

040

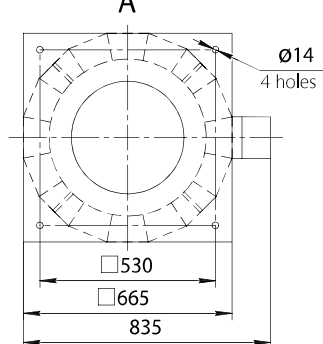
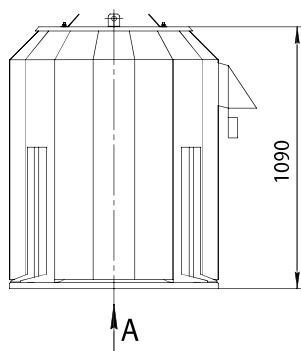
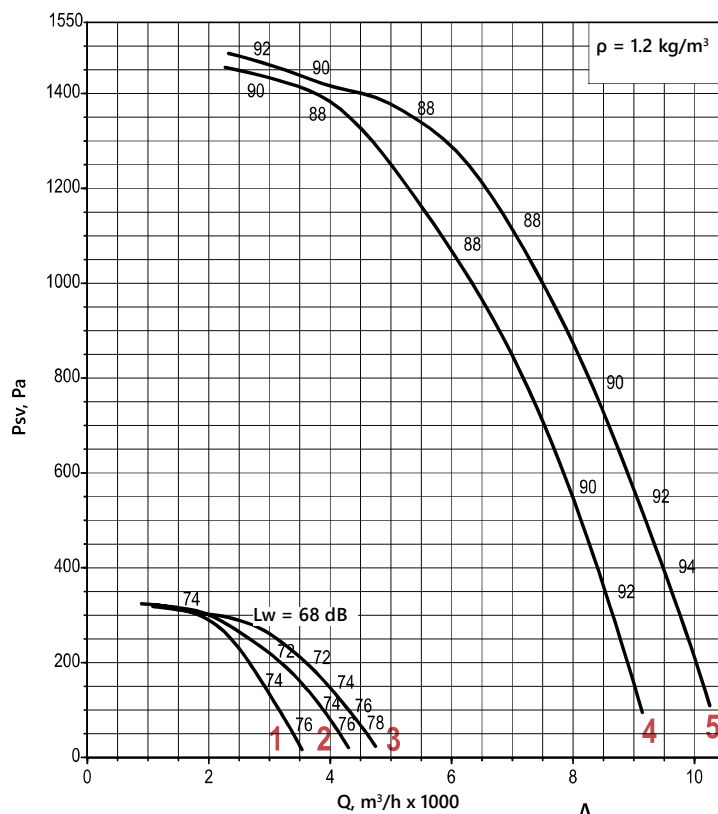
Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
--------------	----------	----------	-----------------	---------------------	-------------

DU AND DUV MODE

1	KROV60-DU/DUV	0,25	4	0,83	80
2	KROV61-DU/DUV	0,37		1,18	81
3	KROV91-DU/DUV	0,55		1,5	83

DU-ONLY MODE

4	KROV61-DU	3	2	6,5	92
5	KROV91-DU	4		8,4	97



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

045

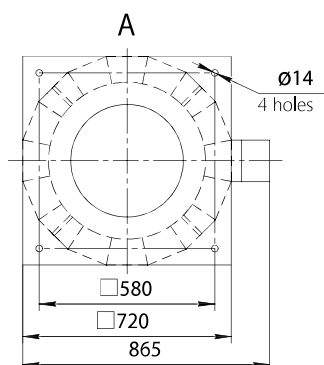
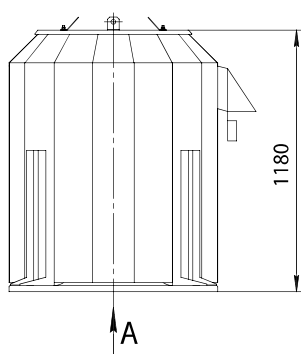
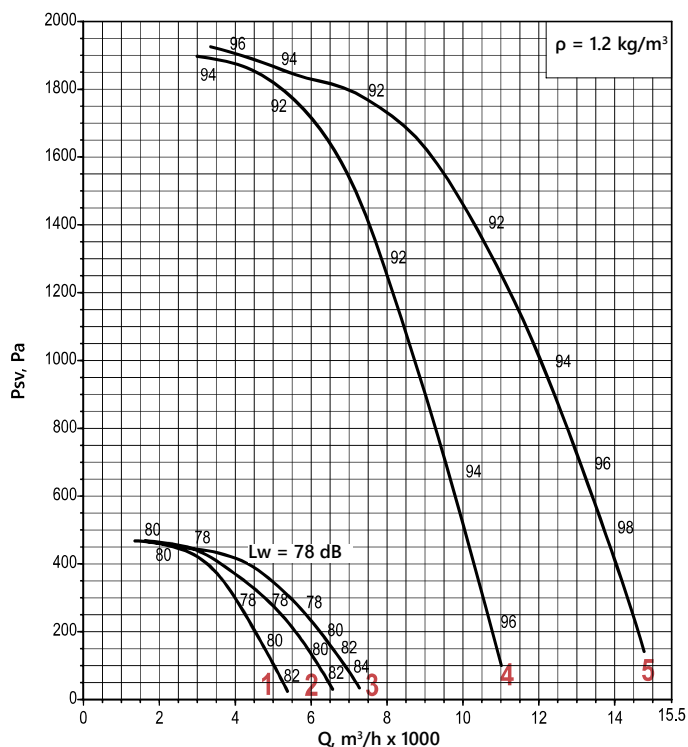
Curve number	Fan type	N _{nom} , kW	Number of poles	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	KROV60-DU/DUV	0,55	4	1,5	94
2	KROV61-DU/DUV	0,75		2,2	95
3	KROV91-DU/DUV	1,1		2,6	98

DU-ONLY MODE

4	KROV60-DU	5,5	2	11	117
5	KROV91-DU	7,5		14,7	137



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску L_p) наведені в додатку.

additional equipment

roof curb STAM	pan POD	frequency converter	soft starter	automatic control system SHTORM-D

050

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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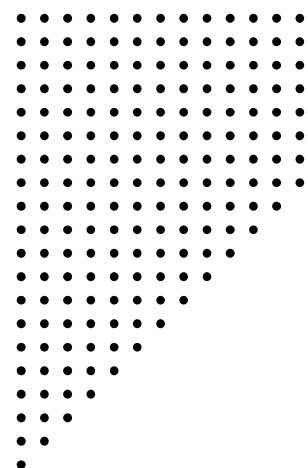
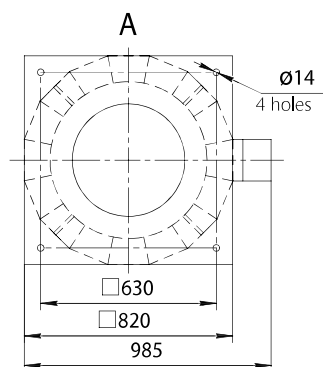
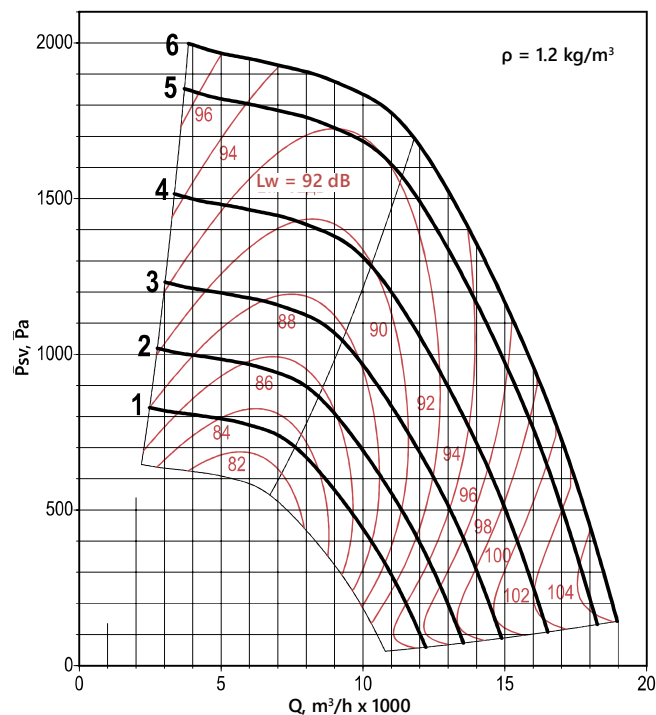
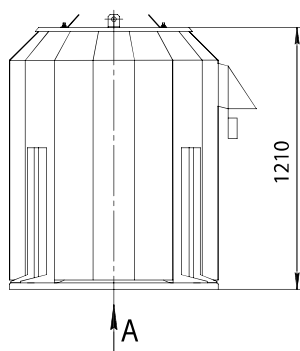
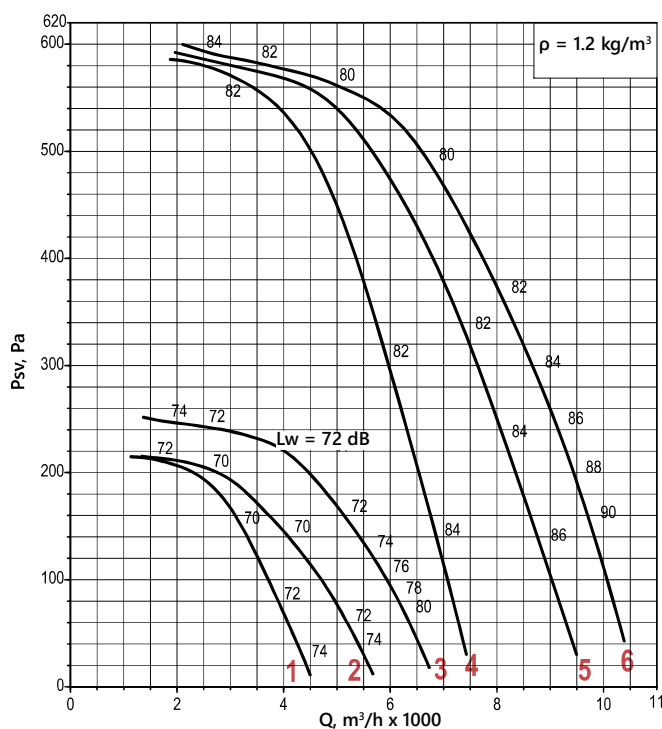
DU AND DUV MODE

1	KROV60-DU/DUV	0,25	6	1,04	102
2	KROV61-DU/DUV	0,37		1,31	105
3	KROV91-DU/DUV	0,55		1,74	106
4	KROV60-DU/DUV	1,1	4	2,6	110
5	KROV61-DU/DUV	1,5		3,6	112
6	KROV91-DU/DUV	2,2		5,1	115

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	1669	2,2	4	115
2		1851	3		117
3		2035	4		126
4		2257	5,5		147
5		2496	7,5		171
6		2592	11		183



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску L_p) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

056

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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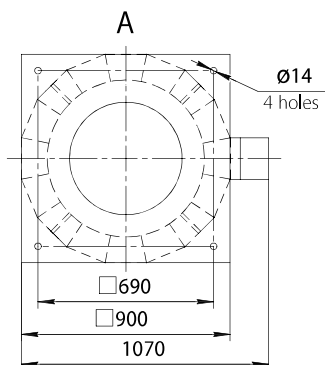
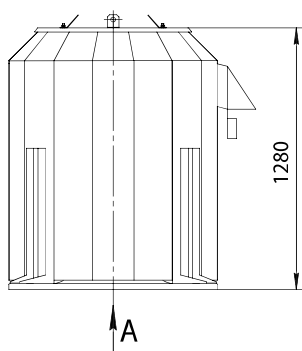
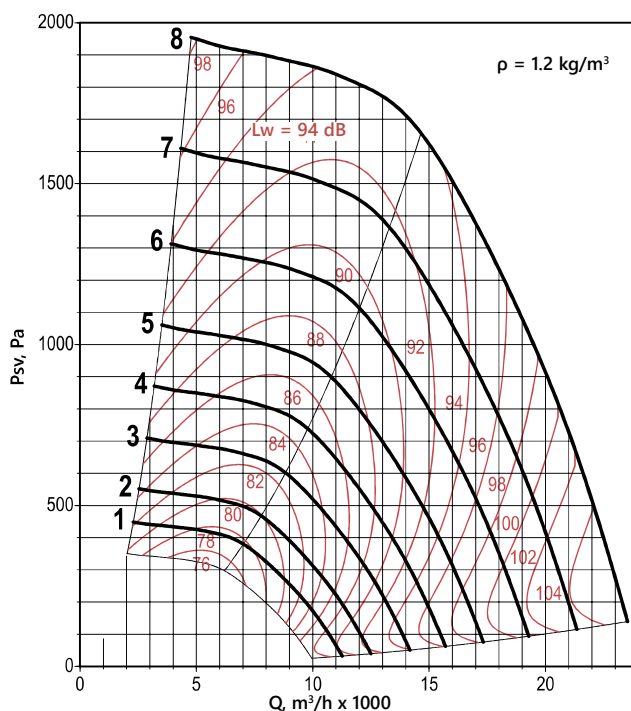
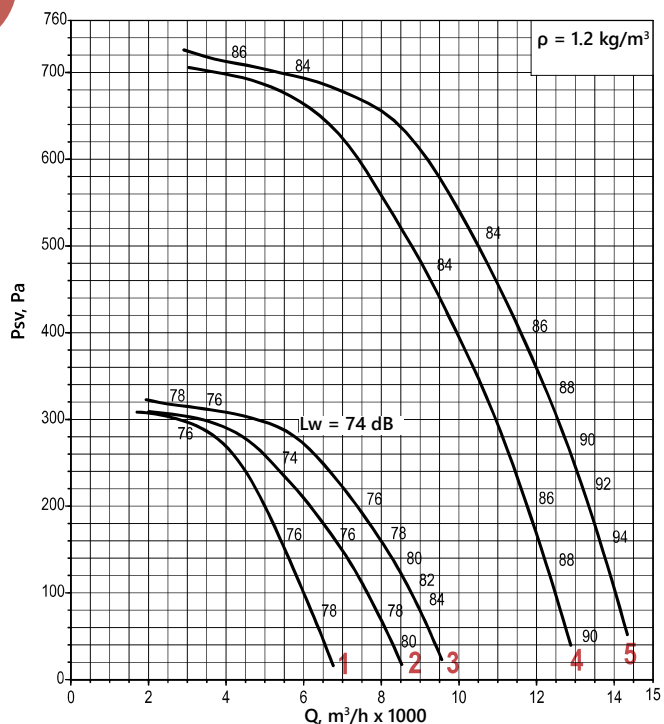
DU AND DUV MODE

1	KROV60-DU/DUV	0,55	6	1,74	157
2	KROV61-DU/DUV	0,75		2,3	161
3	KROV91-DU/DUV	1,1		3,2	163
4	KROV61-DU/DUV	2,2	4	5,1	166
5	KROV91-DU/DUV	3		7,3	168

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
--------------	----------	-----------------------	----------	-----------------	-------------

DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	1096	1,1	6	163
2		1216	1,5		166
3		1379	2,2		174
4		1528	3	4	168
5		1686	4		177
6		1876	5,5		198
7		2077	7,5		222
8		2289	11		234



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

063

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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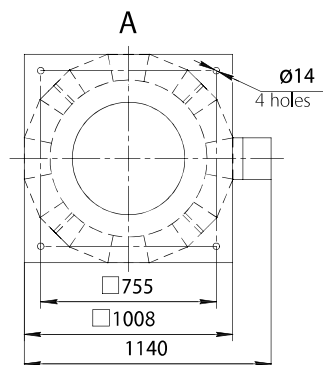
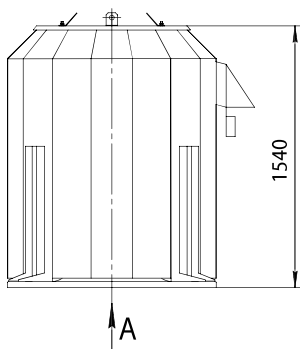
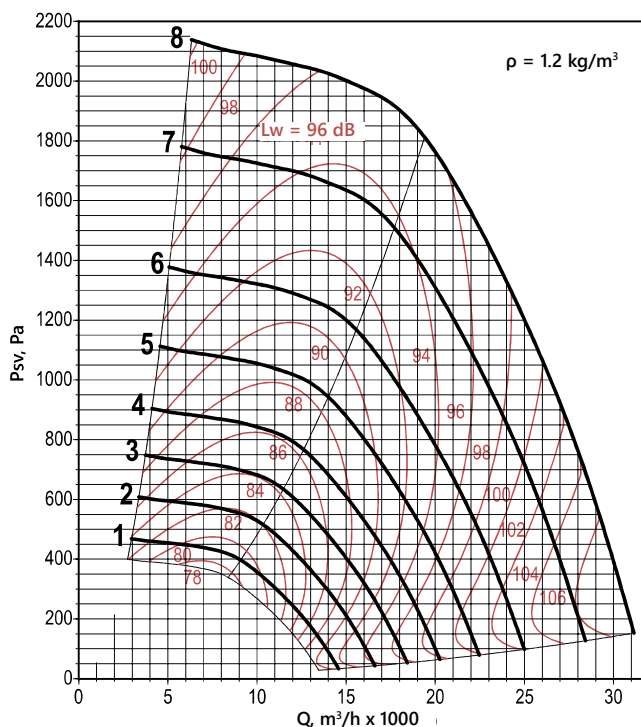
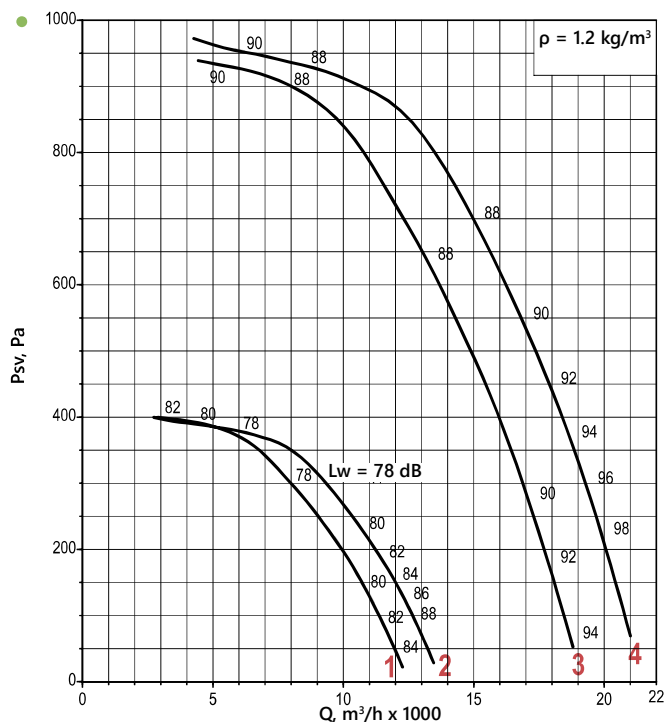
DU AND DUV MODE

1	KROV61-DU/DUV	1,1	6	3,2	191
2	KROV91-DU/DUV	1,5		4,1	194
3	KROV61-DU/DUV	4		8,6	205
4	KROV91-DU/DUV	5,5	4	11,7	226

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	996	1,5	6	194
2		1135	2,2		202
3		1259	3		206
4		1384	4		217
5		1535	5,5	4	226
6		1708	7,5		250
7		1942	11		262
8		2128	15		295



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

071

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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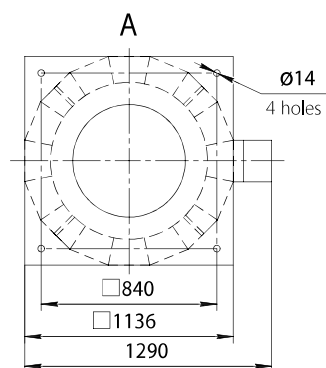
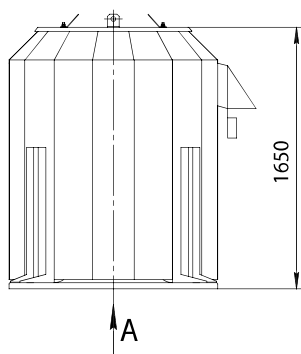
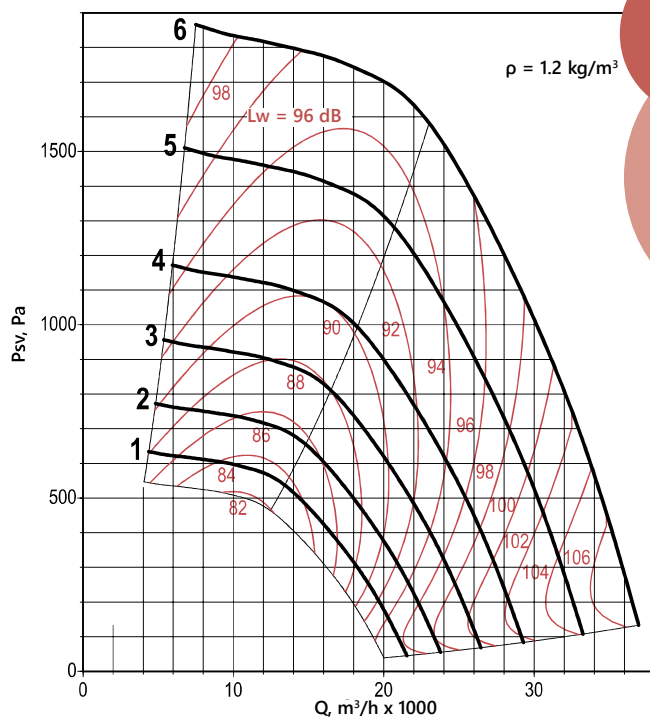
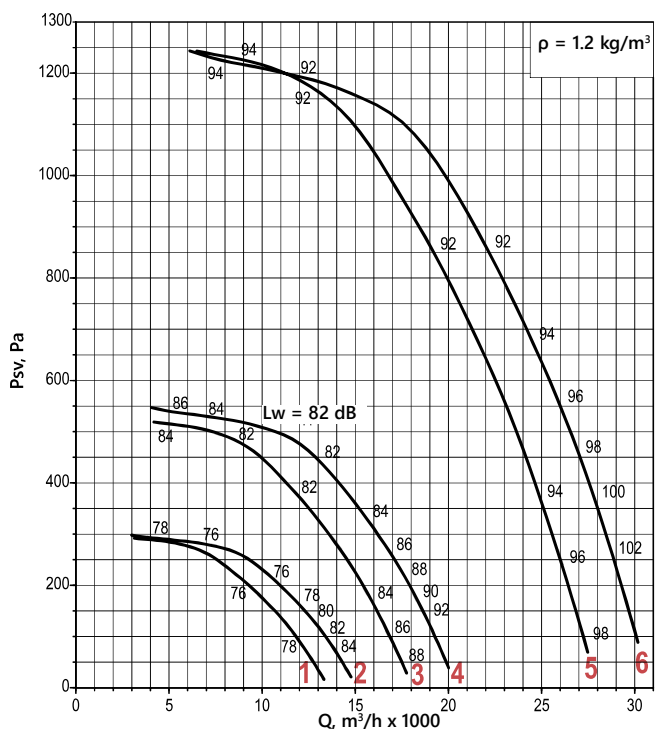
DU AND DUV MODE

1	KROV60-DU/DUV	0,75	8	2,1	223
2	KROV91-DU/DUV	1,1		3	226
3	KROV61-DU/DUV	2.2		5,8	232
4	KROV91-DU/DUV	3	6	7	236
5	KROV61-DU/DUV	7.5		15,6	280
6	KROV91-DU/DUV	11	4	23	292

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	1028	3	6	236
2		1135	4		247
3		1263	5,5		261
4		1398	7,5	4	272
5		1587	11		292
6		1764	15		325



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску L_p) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

080

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	KROV60-DU/DUV	1,5	8	4,6	324
2	KROV91-DU/DUV	2,2		6,3	333
3	KROV61-DU/DUV	4	6	9	342
4	KROV91-DU/DUV	5,5		12	356

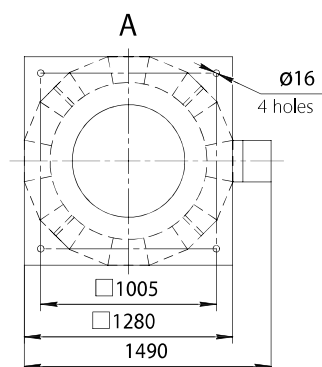
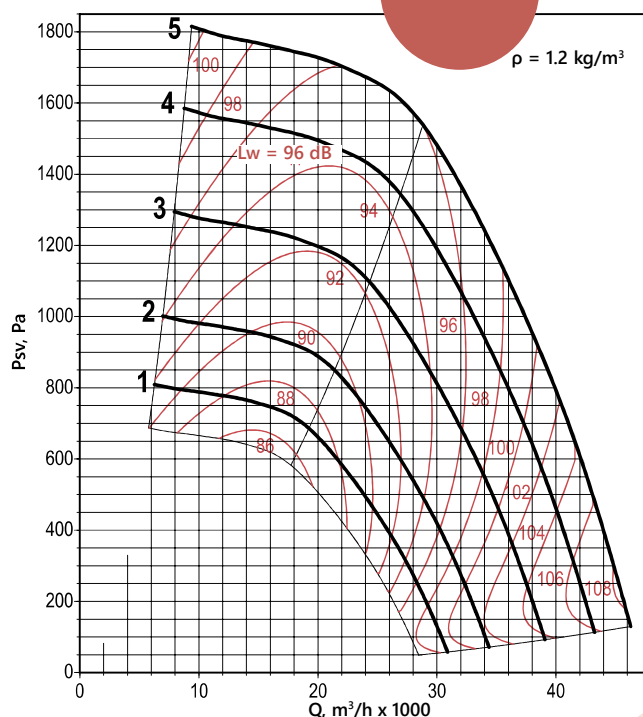
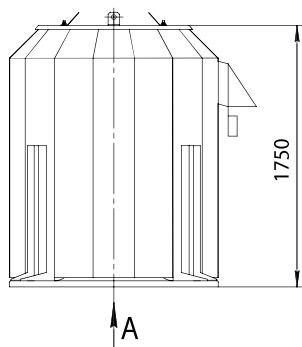
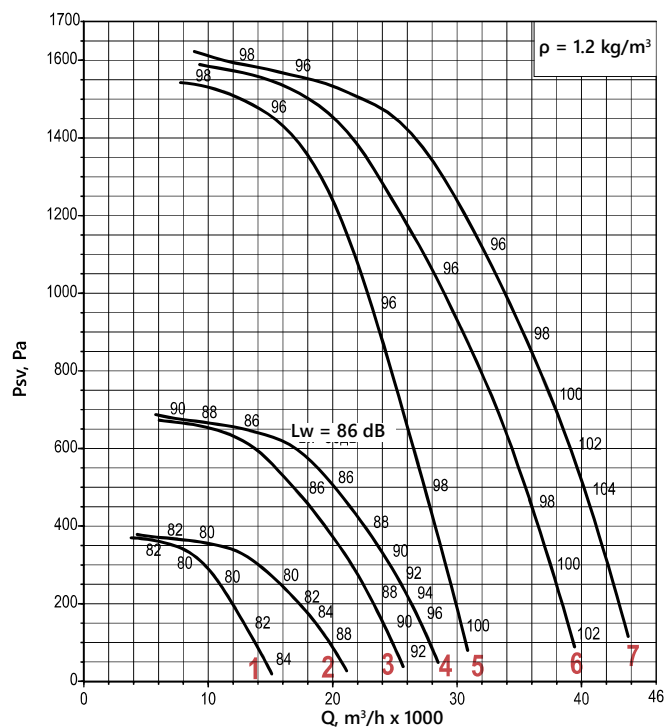
DU-ONLY MODE

5	KROV60-DU	11	4	23	387
6	KROV61-DU	15		31	420
7	KROV91-DU	18,5		36	438

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	1031	5,5	6	356
2		1147	7,5		367
3		1304	11		393
4		1443	15	4	395
5		1544	18,5		438



ПРИМІТКА:

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Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

090

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	KROV60-DU/DUV	2,2	8	6,3	390
2	KROV61-DU/DUV	3		8	396
3	KROV91-DU/DUV	4		10,5	409
4	KROV61-DU/DUV	7,5	6	17,5	424
5	KROV91-DU/DUV	11		24	450

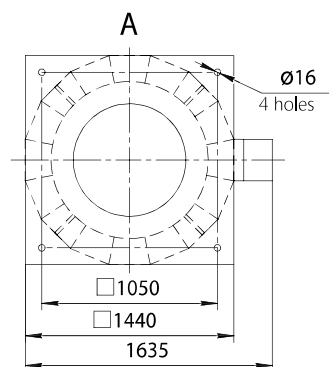
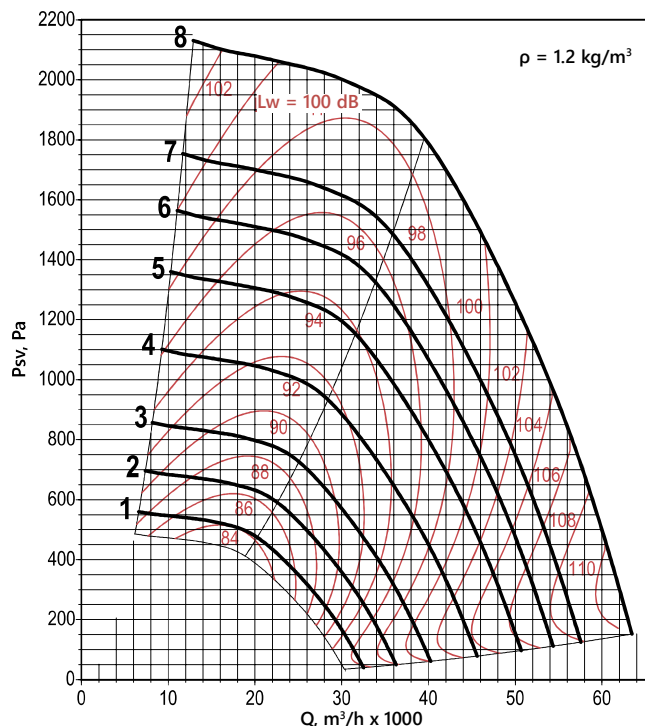
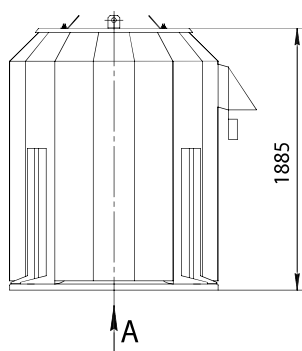
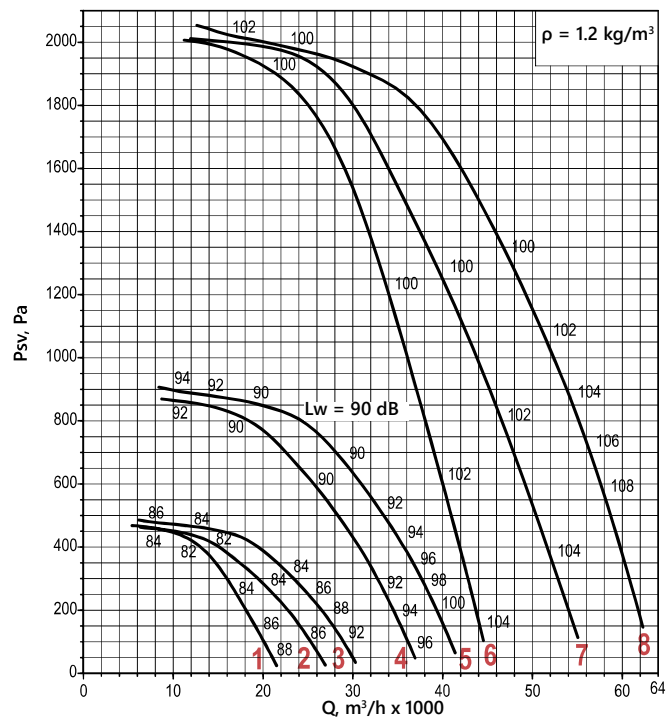
DU-ONLY MODE

6	KROV60-DU	22	4	44	514
7	KROV61-DU	30		56	547
8	KROV91-DU	37		70	587

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	762	4	8	409
2		850	5,5		419
3		943	7,5		450
4		1069	11	6	450
5		1188	15		482
6		1274	18,5		489
7		1349	22	4	527
8		1487	30		562



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

100

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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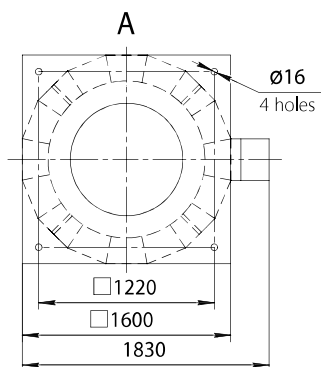
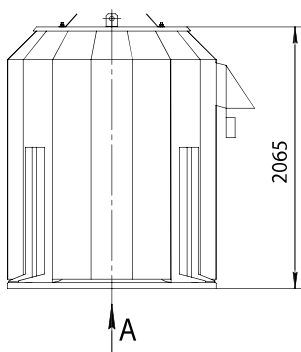
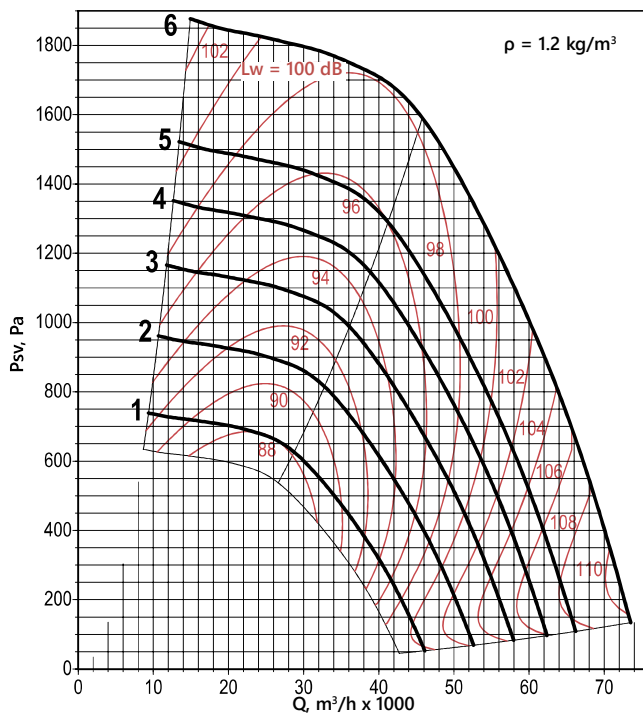
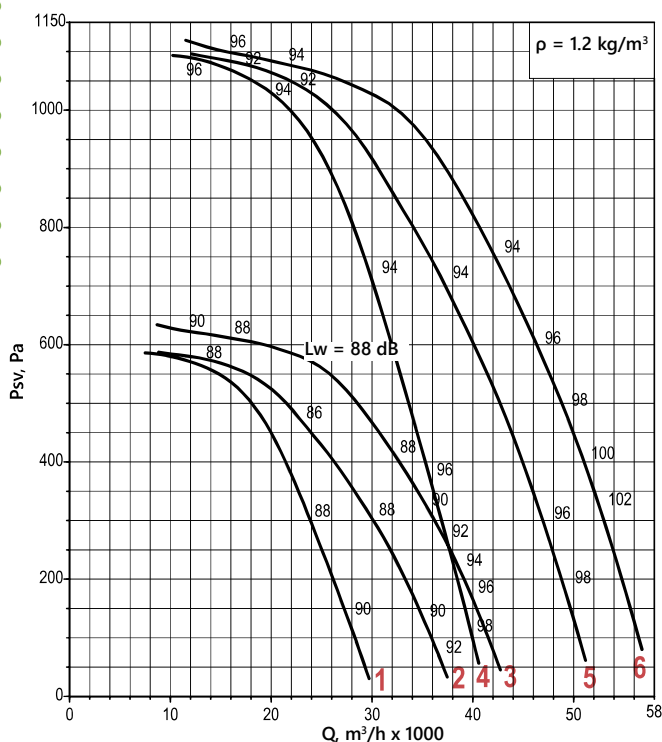
DU AND DUV MODE

1	KROV60-DU/DUV	4	8	10,5	589
2	KROV61-DU/DUV	5,5		13,6	599
3	KROV91-DU/DUV	7,5		18	630
4	KROV60-DU/DUV	11	6	24	632
5	KROV61-DU/DUV	15		32	662
6	KROV91-DU/DUV	18,5		37	669

Curve number	Fan type	nk, min ⁻¹	Nnom, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	788	7,5	8	630
2		899	11		657
3		990	15		662
4		1066	18,5	6	669
5		1131	22		707
6		1256	30		742



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

112

Curve number	Fan type	Nnom, kW	Number of poles	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

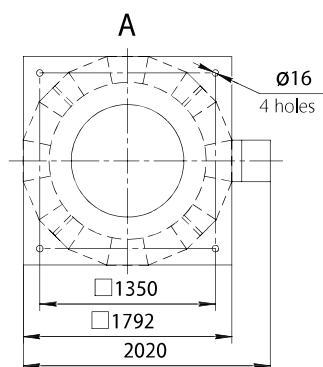
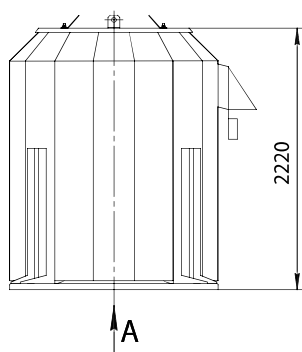
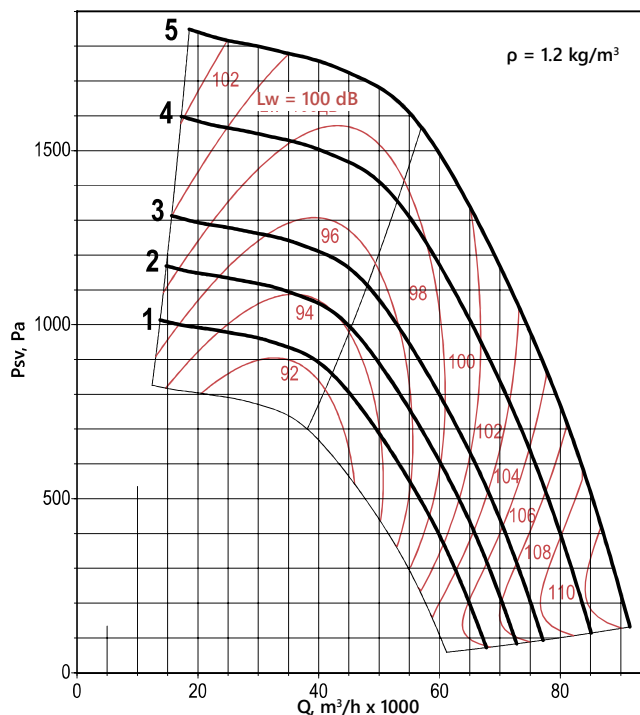
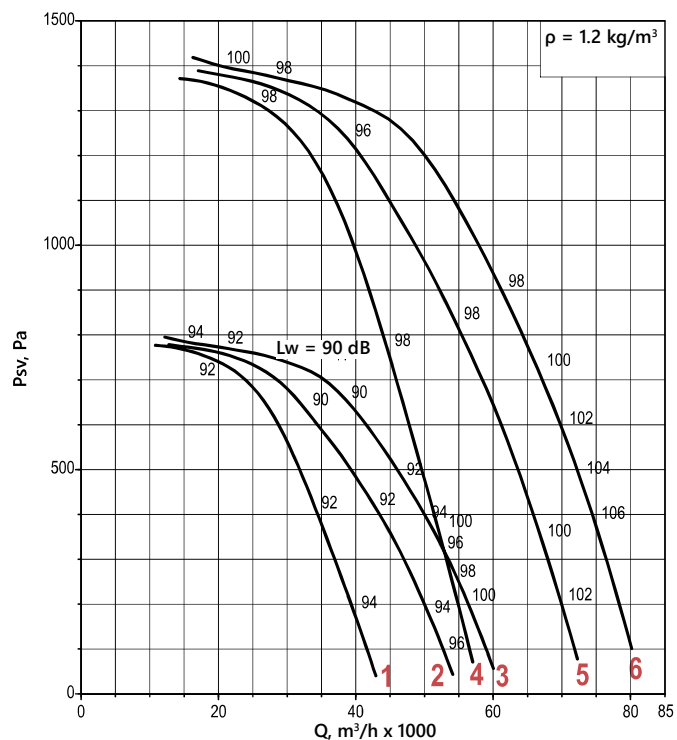
1	KROV60-DU/DUV	7,5	8	18	749
2	KROV61-DU/DUV	11		26	806
3	KROV91-DU/DUV	15		35	836

DU-ONLY MODE

4	KROV60-DU	18,5	6	37	788
5	KROV61-DU	22		44	826
6	KROV91-DU	30		60	861

DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	824	15	8	836
2		885	18,5		866
3		938	22		888
4		1035	30	6	861
5		1113	37		964



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску L_p) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

125

Номер кривої	Тип вентилятора	Nном, кВт	Число полюсів	Струм при 380 В, А	Маса,* кг
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DU AND DUV MODE

1	KROV60-DU/DUV	15	8	35	963
2	KROV61-DU/DUV	18,5		40	993
3	KROV91-DU/DUV	22		48	1018

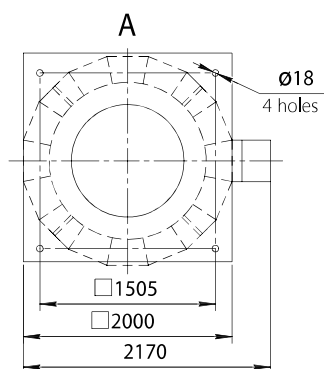
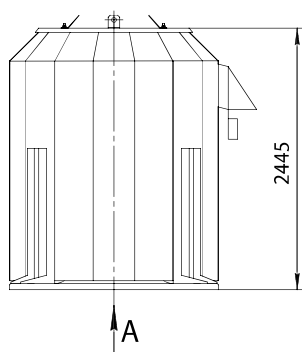
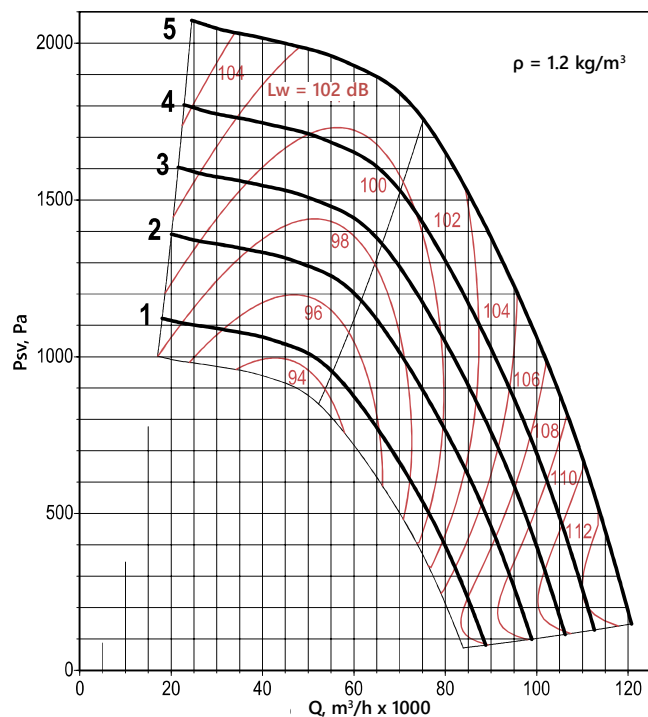
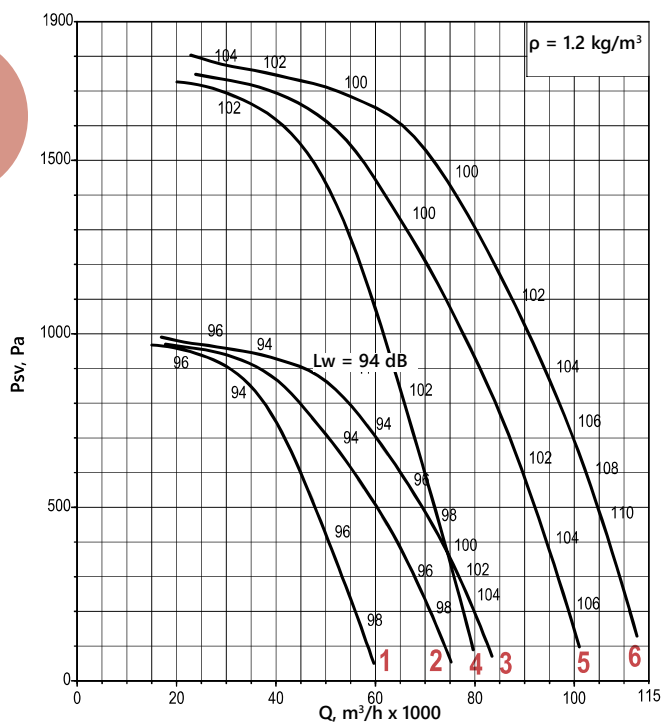
DU-ONLY MODE

4	KROV60-DU	37	6	71	1091
5	KROV61-DU	45		85	1223
6	KROV91-DU	55		103	1263

Curve number	Fan type	nk, min ⁻¹	Nном, kW	Number of poles	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	KROV91-DUV-F	777	22	8	1018
2		865	30		1099
3		929	37		1218
4		985	45	6	1263
5		1056	55		1353



ПРИМІТКА:

*При зміні типу двигуна маса може змінюватися.

Акустичні параметри вентилятора (рівні звукового тиску Lp) наведені в додатку.

additional equipment



roof curb
STAM



pan
POD



frequency
converter



soft starter



automatic control system
SHTORM-D

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

KROV-DU/DUV roof-mounted radial fan with upward airflow discharge

KROV _____

quantity, pcs: _____

Contact person: _____

Organization: _____

tel.: _____

e-mail: _____

Region (city): _____

date: _____

Mark the required one with a "V" sign or specify a value

operating mode (range of modes)	efficiency Q, m ³ /h	
	static pressure P _{sv} at t = 20 °C, Pa	
fan standard size		
operating mode	DU - smoke extraction	
	DUV - smoke extraction and ventilation	
fan design	N - general purpose industrial	
	CR1 - corrosion-resistant	
	V- explosion-proof	
	VCR1 - explosion-proof, corrosion-resistant	
temperature of the transported medium	400° C	
	600° C	
climatic version	Y1	
	YHL	
	T1	
impeller	rotation speed, min ⁻¹ (specify when using the frequency converter)	
motor	motor rated power, kW	
	number of poles	
	with a frequency converter	

Additional equipment

STAM roof curb	
POD pan	
frequency converter	
soft starter	
SHTORM-D cabinet	

Special requirements:

Customer _____
(signature)

_____ (full name)

VRAN-DU/DUV

RADIAL FANS



• 400° C • 600° C
• 120 MIN

- for removing gases generated during a fire;
- energy efficient

INTENDED USE:

- ventilation and air heating systems;
- sanitary and technological installations;
- smoke ventilation systems.

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125 •140

ACCORDING TO THE 1ST DESIGN SCHEME

•063 •080 •100 •125

ACCORDING TO THE 5TH DESIGN SCHEME

- general purpose industrial (N);
- gcorrosion-resistant (CR1) - only for DUV mode;
- gexplosion-proof (V) - only according to 1 design scheme for DUV mode;
- gexplosion-proof, corrosion-resistant (VCR1) - only according to 1 design scheme for DUV mode

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st and 2nd placement category.

Operating conditions:

- ambient temperature:
 - from -45 °C to +40 °C for temperate climate,
 - from -60 °C to +40 °C for temperate and cold climates,
 - from -10 °C to +50 °C for tropical climate;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

VRAN fans feature a left- or right-hand rotating impeller with specially shaped backward-curved blades to ensure high efficiency and low noise.

The spiral body is rotatable.

It is possible to operate the fans both in the smoke extraction mode (DU) and in the combined smoke extraction and ventilation mode (DUV). In the latter case, the fans are equipped with motors designed for continuous long-term operation.

The fans are equipped with standard 3-phase asynchronous single-speed motors. For VRAN 9 fans designed according to the 1st design scheme, it is possible to equip them with motors that allow frequency regulation of the rotation speed.

For the casing orientations R0 and L0 for the 1st placement category (outdoor), ZNT weather protection hood is provided (to be ordered separately as an option).

Additional fan options are available - see the "Additional equipment" section of the catalog.

EXAMPLE:

Radial fan VRAN9; standard size 063; operating mode – DUVF400; general industrial design; motor rated power $N_{nom}=5.5$ kW, number of poles 4, frequency control of speed is provided; climatic version Y2; design scheme 1; casing orientation R90; without TSK; energy efficiency class of the electric motor IE2:

VRAN9-063-DUVF400-N-00550/4F-Y2-1-R90-O-IE2

- radial fan (•VRAN6 •VRAN9)
- standard fan size (•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125 •140)
- operating mode
temperature of the transported medium is 400 °C
DU operating mode: •DUF400 DUV operating mode: •DUVF400
temperature of the transported medium is 600 °C
DU operating mode: •DUF600 DUV operating mode: •DUVF600
- design version (•N •CR1 •V (only for fans without FC) •VCR1 (only for fans without IF))
- motor parameters* (•n/P •n/PF - for motor configuration with FC)
n** – Motor Power Index
P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm), 12 (500 rpm)
F – with using a FC (the FC is not included)
When ordering a fan designed to operate with FC, the required impeller speed should be indicated in brackets after the marking
- climatic version (•Y1*** •Y2 •YHL1*** •YHL2 •T1*** •T2)
- design scheme (•1 •5)
- casing orientation (•R0 •R45 •R90 •R270 •R315 •L0 •L45 •L90 •L270 •L315)
- heat and sound insulated casing (•TSK •0)
- energy efficiency class of the electric motor: •IE2 (specified for DUV fans if it is different from the standard one)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start. Design types of other voltages and connection methods are available upon special agreement. It is recommended to start motors from 15 kW using the MCD soft starter.

** Motor Power Index - see Table 1.

***For the climatic versions Y1, YHL1, T1, additional motor protection and fan outlet protection are provided (ZNT is ordered as a separate item). Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

Special requirements for the fan are specified additionally and agreed with the manufacturer.

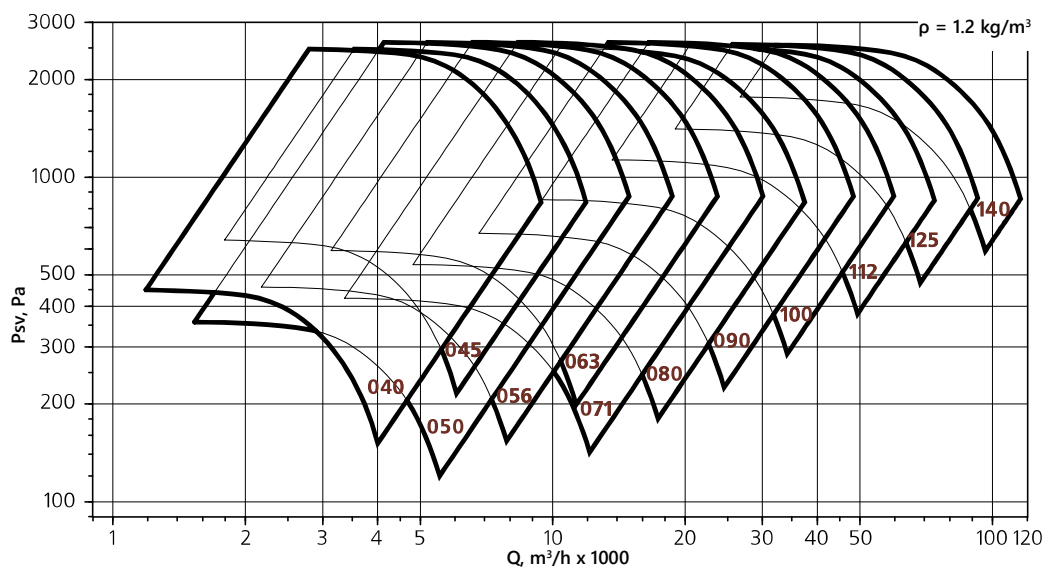
TABLE 1

VRAN-DU/DUV

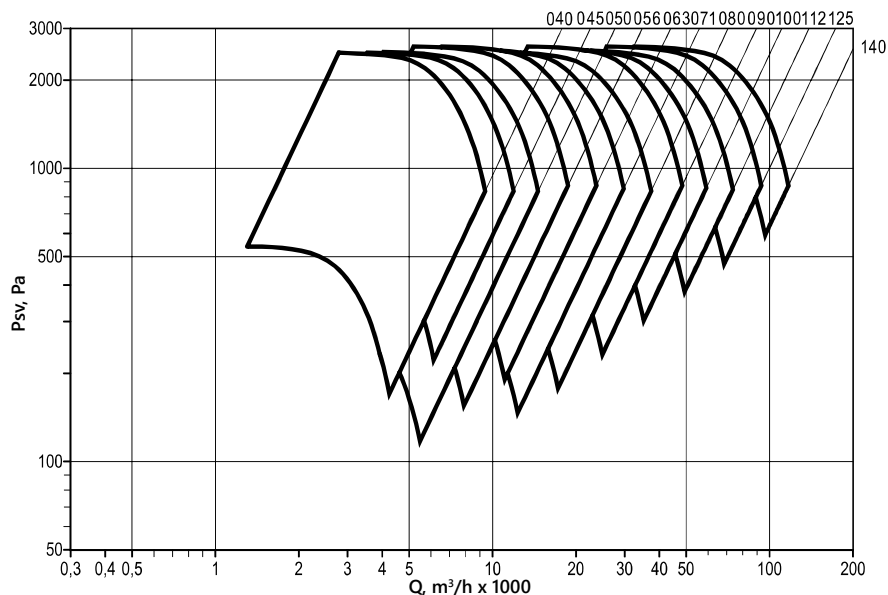
Motor rated power (N_{nom}), kW	0,25...0,75	1,1...7,5	11...90
Motor Power Index (n)	00025...00075	00110...00750	01100...09000

AREAS OF AERODYNAMIC PARAMETERS

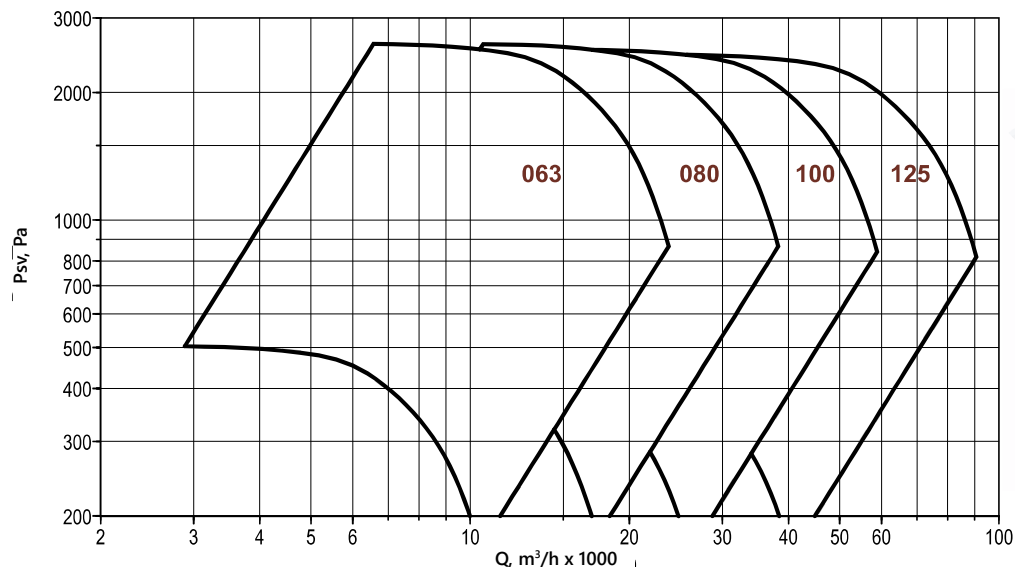
VRAN-DU/DUV DESIGN VERSION 1



VRAN-DUV DESIGN VERSION 1 WITH VFD

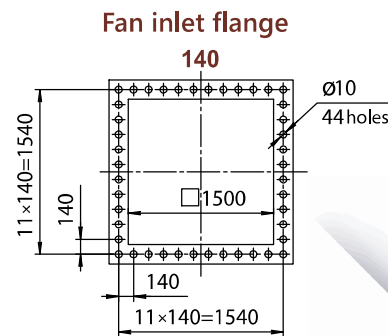
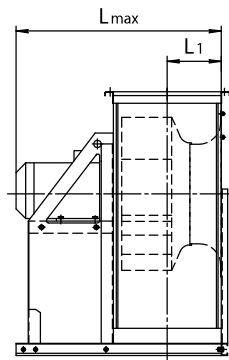
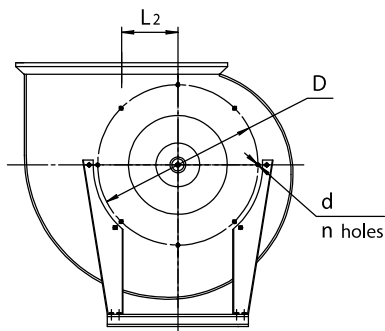


VRAN-DUV DESIGN VERSION 5



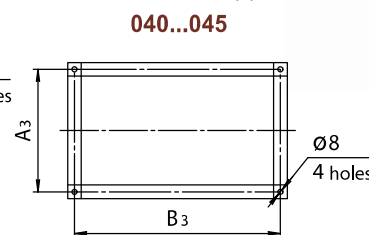
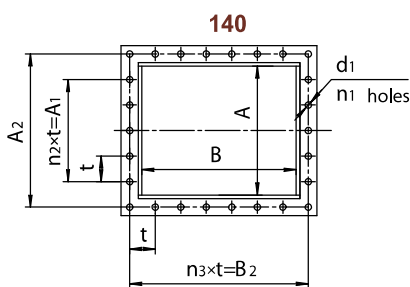
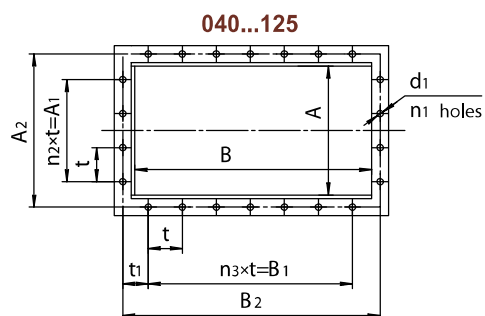
NOTE: The dynamic pressure of the fan is not used, so static pressure curves are given.

DESIGN VERSION 1

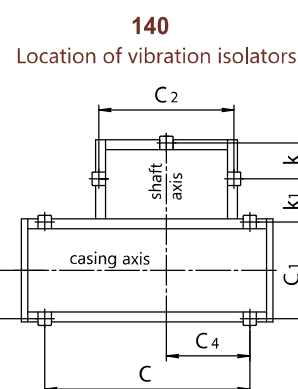
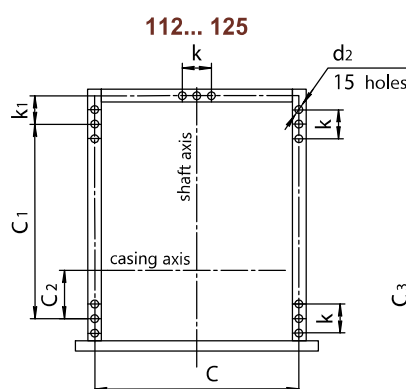
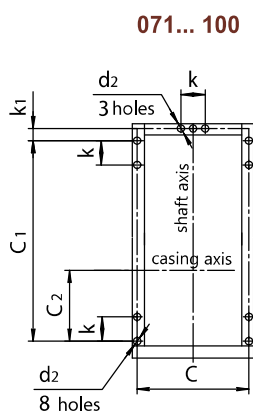
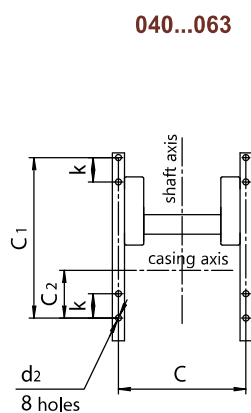


Fan outlet flange

Fan design version:
all except for · CR1 · VCR1 (3)
Climatic version: Y 1(2)



Location of fan mounting holes

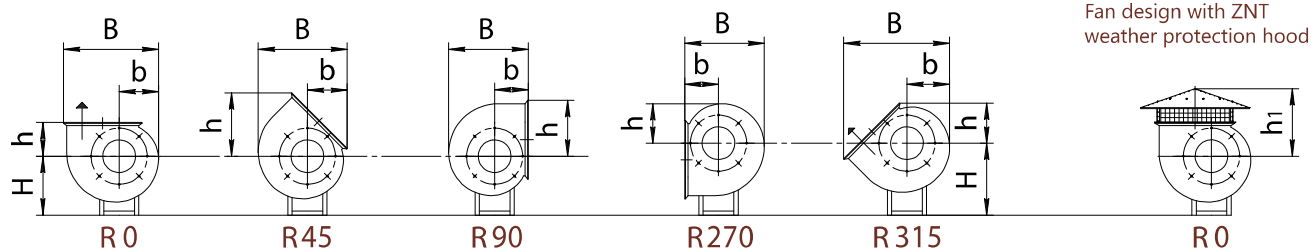


Fan standard size	Connection dimensions, mm														Overall dimensions, mm					
	A	A ₁	A ₂	A ₃	B	B ₁	B ₂	B ₃	D	d	d ₁	t	t ₁	n	n ₁	n ₂	n ₃	L _{max}	L ₁	L ₂
040	281	200	310	307	512	400	538	535	430	M8	9	100	55	8	16	2	4	760	143	145
045	318	240	350	340	574	480	604	596	480	M8	9	120	55	8	16	2	4	770	160	164
050	353	300	380	—	643	600	668	—	530	M8	9	100	40	8	22	3	6	800	175	182
056	394	300	426	—	719	600	749	—	600	M8	9	100	63	8	22	3	6	865	198	202
063	441	400	470	—	801	700	830	—	660	M8	9	100	35	8	26	4	7	989	222	231
071	497	270	540	—	900	675	941	—	740	M8	9	135	135	8	18	2	5	1070	250	260
080	563	300	600	—	1009	750	1047	—	835	M8	9	150	150	8	18	2	5	1133	282	297
090	630	600	670	—	1132	1050	1170	—	940	M8	9	150	35	16	26	4	7	1283	318	335
100	703	450	750	—	1269	1050	1317	—	1050	M8	12	150	150	16	24	3	7	1501	353	366
112	784	750	830	—	1424	1350	1463	—	1170	M10	12	150	40	16	32	5	9	1560	395	409
125	877	750	925	—	1593	1500	1638	—	1285	M10	12	150	87,5	16	34	5	10	1770	440	455
140	980	672	1040	—	1460	—	1512	—	—	—	12	168	—	—	30	4	9	2150	594	980

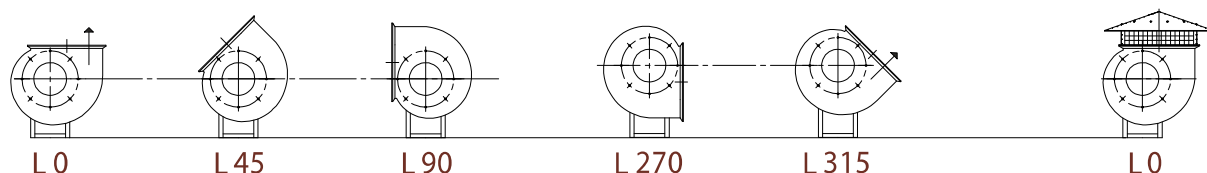
Fan standard size	Installation dimensions, mm								Flexible connector	
	C	C ₁	C ₂	C ₃	C ₄	d ₂	k	k ₁	on the discharge side	on the suction side
040	520	610	127	—	—	11	80	—	COM-040B	COM-040A
045	525	660	140	—	—	12	100	—	COM-045B	COM-045A
050	525	695	160	—	—	12	100	—	COM-050B	COM-050A
056	550	740	183	—	—	14	100	—	COM-056B	COM-056A
063	550	830	200	—	—	14	100	—	COM-063B	COM-063A
071	710	750	200	—	—	14	120	—	COM-071B	COM-071A
080	655	845	222	—	—	14	120	—	COM-080B	COM-080A
090	870	950	258	—	—	14	130	100	COM-090B	COM-090A
100	960	960	218	—	—	20	130	245	COM-100B	COM-100A
112	1070	1090	245	—	—	20	180	175	COM-112B	COM-112A
125	1230	1200	235	—	—	20	180	105	COM-125B	COM-125A
140	2250	1060	1485	530	915	—	395	473	COM-140B	COM-140A

CASING ORIENTATION

Right-hand rotation

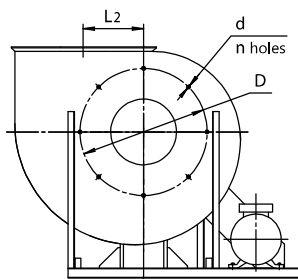


Left-hand rotation

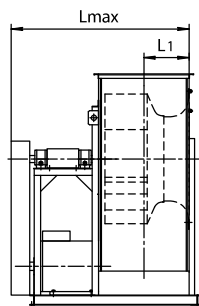


Fan standard size	Dimensions, mm																				
	R0, L0					R45, L45				R90, L90				R270, L270				R315, L315			
	B	b	H	h	h ₁	B	b	H	h	B	b	H	h	B	b	H	h	B	b	H	h
040	738	301	390	290	593	686	310	390	514	641	290	390	437	641	290	470	301	840	326	470	310
045	821	338	435	325	715	761	339	435	570	719	325	435	483	719	325	535	338	936	366	535	339
050	913	375	535	338	699	832	363	535	619	776	338	535	538	776	338	580	375	1026	406	580	363
056	1020	420	570	375	705	924	399	570	688	865	375	570	600	865	375	665	420	1143	455	665	399
063	1140	474	640	426	713	1034	442	640	768	973	420	640	667	973	420	746	474	1282	513	746	442
071	1282	534	745	480	933	1167	499	745	869	1103	480	745	748	1103	480	845	534	1447	578	845	500
080	1440	602	795	536	1044	1304	553	795	972	1238	536	795	839	1238	536	895	602	1623	651	895	553
090	1615	677	890	590	1100	1467	621	890	1078	1379	590	890	938	1379	590	1010	677	1811	733	1010	621
100	1797	751	970	656	1156	1627	689	970	1204	1533	656	970	1046	1533	656	1100	751	2017	814	1100	689
112	2004	841	1100	735	1396	1822	764	1100	1342	1716	735	1100	1163	1716	735	1250	841	2254	911	1250	764
125	2235	947	1230	810	1525	2050	869	1230	1487	1905	810	1230	1302	1905	810	1430	947	2512	1025	1430	869
140	2760	1170	1365	965	1790	—	—	—	—	2350	965	1365	1590	2350	965	1635	1170	—	—	—	—

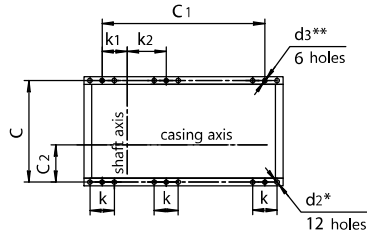
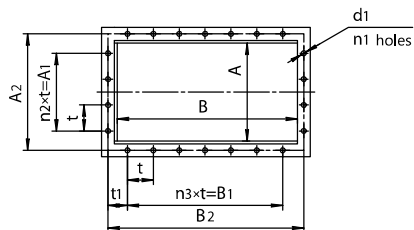
DESIGN VERSION 5



Outlet flange



Location of fan mounting holes



Note:

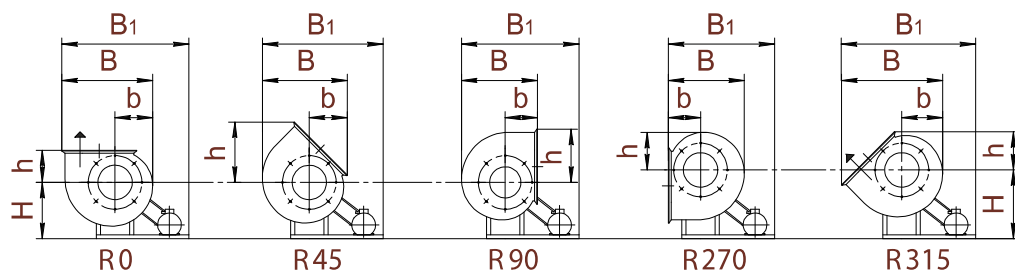
* Size for vibration isolator

** Size for the foundation bolt

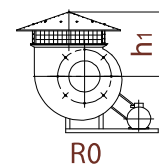
Fan standard size	Overall dimensions, mm			Installation dimensions, mm							
	Lmax	L ₁	L ₂	C	C ₁	C ₂	d ₂	d ₃	k	k ₁	k ₂
063	1150	222	231	980	1110	245	12	18	120	140	320
080	1350	282	297	1156	1190	310	12	18	130	301	294
100	1650	353	366	1455	1900	446	12	18	150	381	904
125	1900	440	455	1645	2025	550	15	24	180	525	875

Fan standard size	Connection dimensions, mm											n	n ₁	n ₂	n ₃
	A	A ₁	A ₂	B	B ₁	B ₂	D	d	d1	t	t ₁				
063	441	400	470	801	700	830	660	M8	9	100	35	8	26	4	7
080	563	300	600	1009	750	1047	835	M8	9	150	150	8	18	2	5
100	703	450	750	1269	1050	1317	1050	M8	12	150	150	16	24	3	7
125	877	750	925	1593	1500	1638	1285	M10	12	150	87,5	16	34	5	10

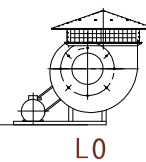
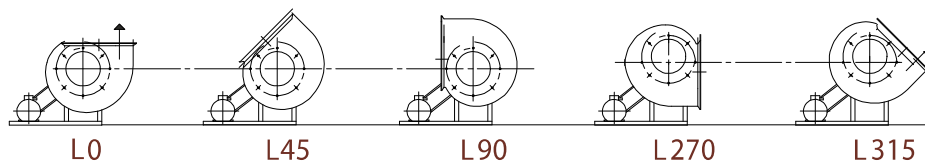
Right-hand rotation



Fan design with ZNT weather protection hood



Left-hand rotation



Fan standard size	Dimensions, mm																													
	R0, L0						R45, L45						R90, L90						R270, Л270						R315, L315					
	B	B ₁	b	H	h	h ₁	B	B ₁	b	H	h	B	B ₁	b	H	h	B	B ₁	b	H	h	B	B ₁	b	H	h				
063	1140	1736	474	671	426	713	1034	1662	442	671	768	973	1623	420	671	667	973	1490	420	751	474	1282	1839	513	751	442				
080	1440	1833	602	843	536	1044	1304	1746	553	843	972	1238	1697	536	843	839	1238	1531	536	933	602	1623	1967	651	933	553				
100	1797	2676	751	1050	656	1156	1627	2568	689	1050	1204	1533	2507	656	1050	1046	1533	2286	656	1150	751	2017	2833	814	1150	689				
125	2235	2918	947	1230	810	1525	2050	2811	869	1230	1487	1905	2725	810	1230	1302	1905	2440	810	1430	947	2512	3117	1025	1430	869				

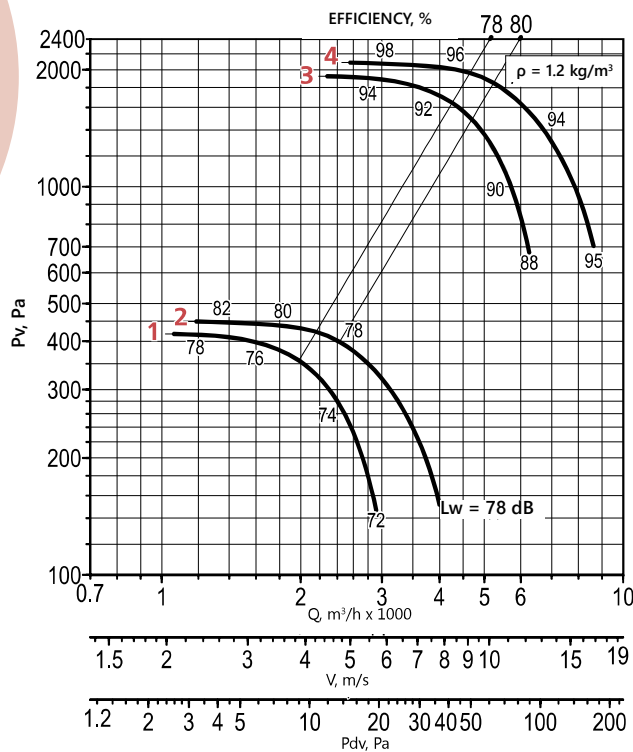
040

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	VRAN6-DU/DUV	4	0,37	1,18	50
2	VRAN9-DU/DUV		0,55	1,5	53
3	VRAN6-DU/DUV		3	6,5	61
4	VRAN9-DU/DUV	2	4	8,4	66



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

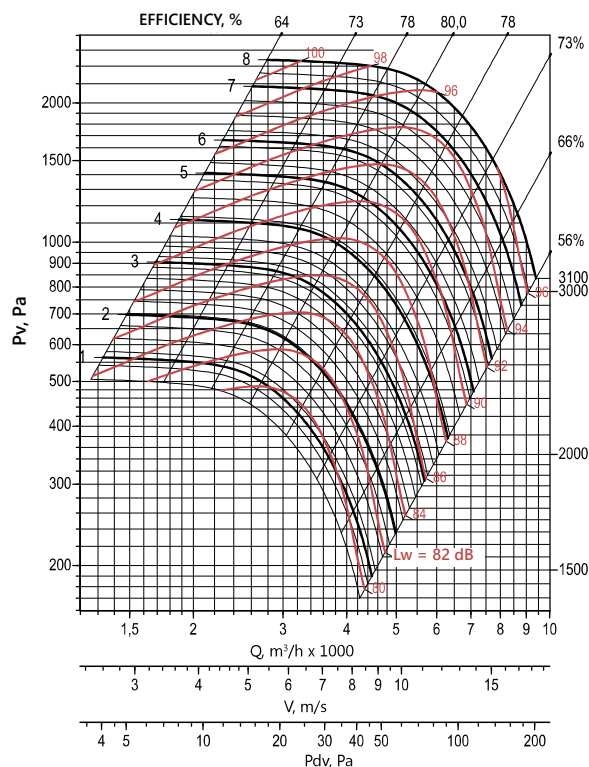
fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2	-8	+3	+5	-4	-6	-8	-12	-25
	3, 4	-11	-8	+3	+5	-4	-6	-10	-20

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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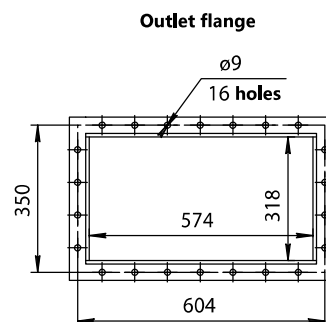
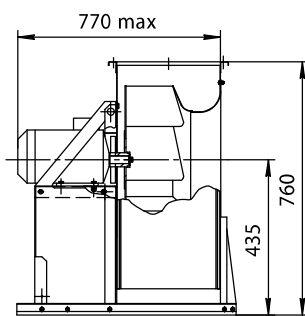
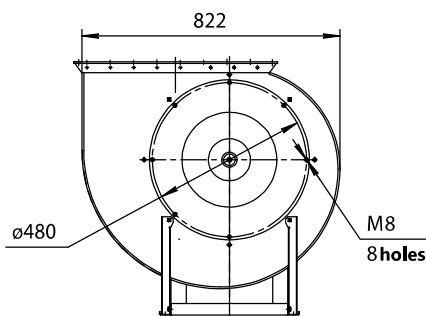
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	4	0,55	50
2			0,75	52
3			1,1	56
4			1,5	58
5			2,2	59
6			3	59
7		2	4	63
8			5,5	72



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<2500	-8	+3	+5	-4	-6	-8	-12	-25
	≥2500	-11	-8	+3	+5	-4	-6	-10	-20



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

045

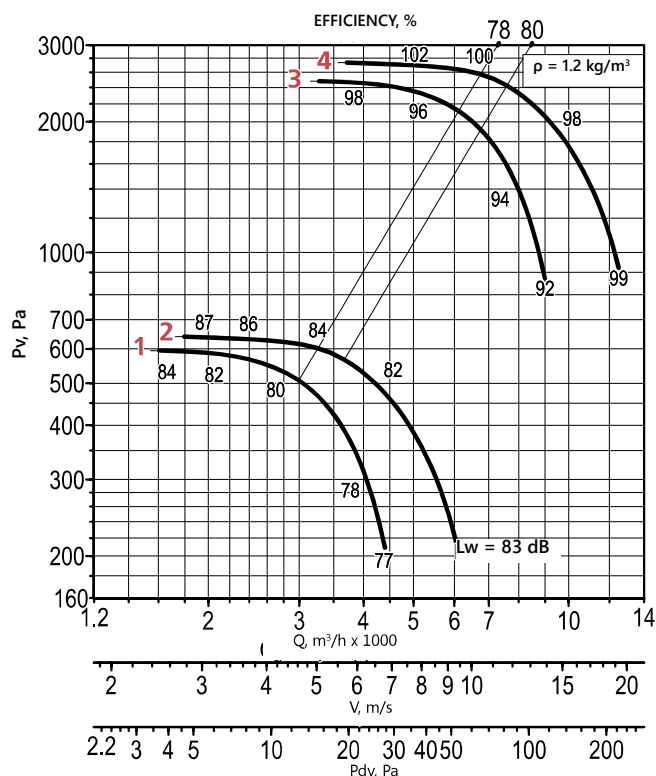
DESIGN VERSION 1

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

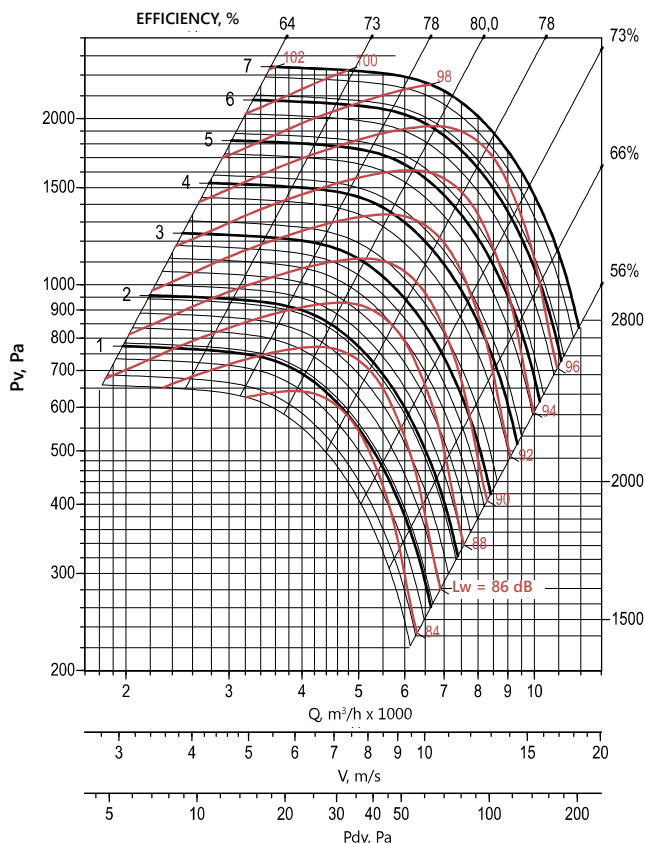
1	VRAN6-DU/DUV	4	0,75	2,2	62
2	VRAN9-DU/DUV		1,1	2,6	67
3	VRAN6-DU/DUV	2	5,5	11	80
4	VRAN9-DU/DUV		7,5	14,7	102



Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
--------------	----------	-----------------	----------	-------------

DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	4	1,1	79
2			1,5	81
3			2,2	82
4			3	86
5			4	102
6			5,5	110
7			7,5	117

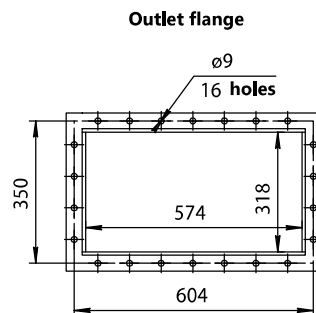
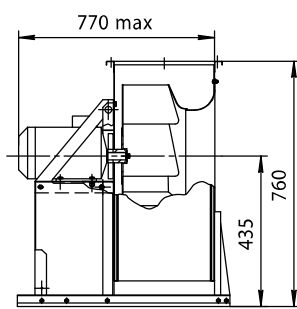
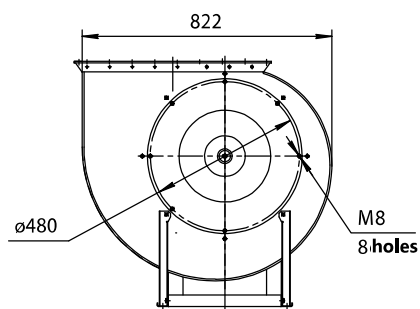


Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2	-7	+2	+5	-4	-5	-7	-12	-20
	3, 4	-10	-9	-2	+4	-4	-5	-7	-18

Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<2500	-7	+2	+5	-4	-5	-7	-17	-20
	≥2500	-10	-9	-2	+4	-4	-5	-7	-18



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

050

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

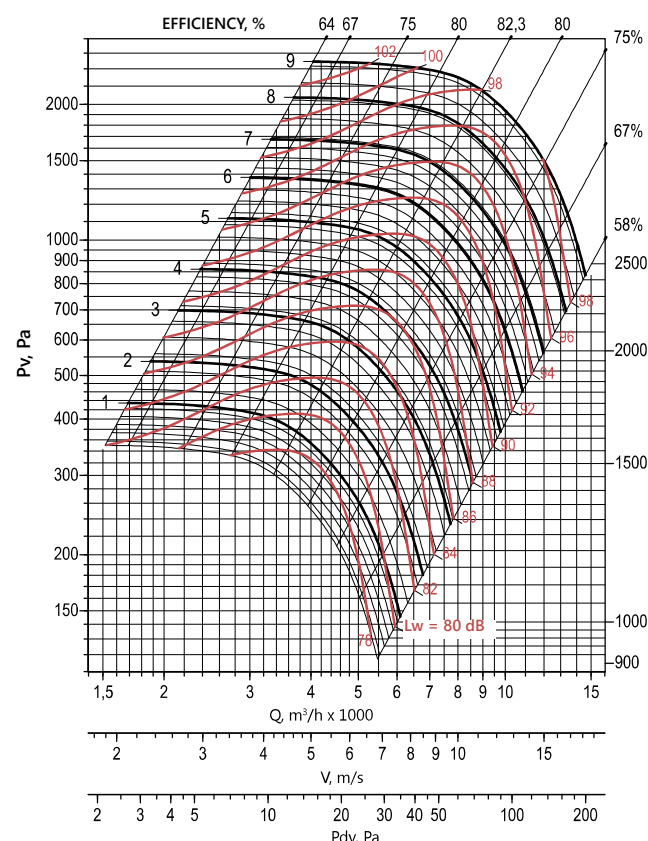
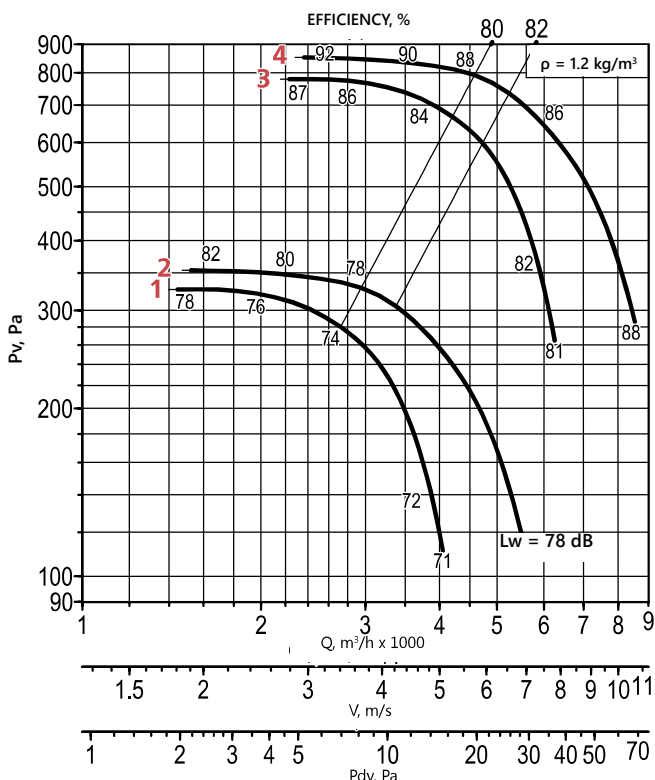
1	VRAN6-DU/DUV	8	0,25	1,27	76
2	VRAN9-DU/DUV	6	0,55	1,74	78
3	VRAN6-DU/DUV	4	1,1	2,6	81
4	VRAN9-DU/DUV	4	1,5	3,6	84

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	6	0,55	97
2			0,75	101
3			1,1	103
4			1,5	103
5	VRAN9-DUV-F	4	2,2	104
6			3	108
7			4	124
8			5,5	132
9			7,5	139

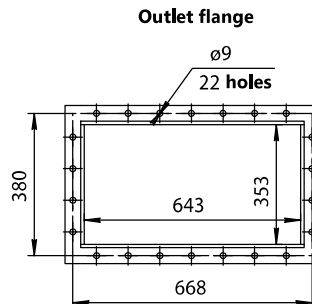
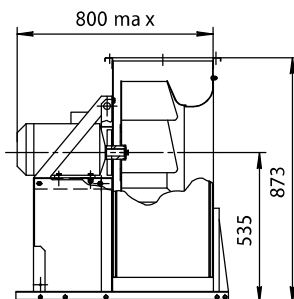
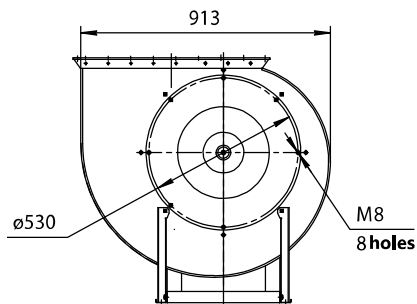


Sound power level in octave frequency bands $L_{wi} = L_w + \Delta L_{wi}$

f _i , Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4	-8	-5	+3	-4	-6	-8	-16	-25

Sound power level in octave frequency bands $L_{wi} = L_w + \Delta L_{wi}$

f _i , Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<2250	-8	-5	+3	-4	-6	-8	-16	-25



additional equipment

heat and sound insulated casing

TSK

flexible connector

COM

weather protection hood

ZNT

automatic control system

SHTORM-D

counter flange • **FOV** • **FON**

soft starter

frequency converter

vibration isolators

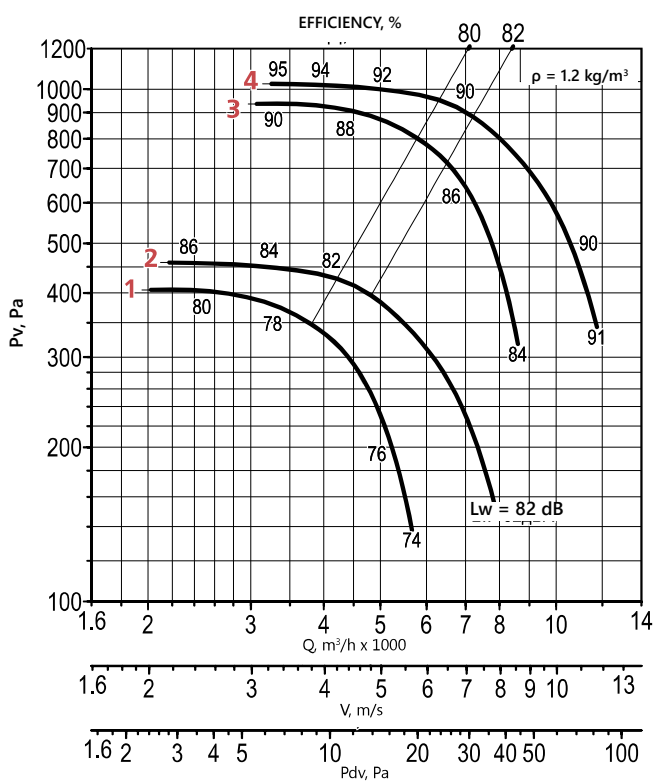
056

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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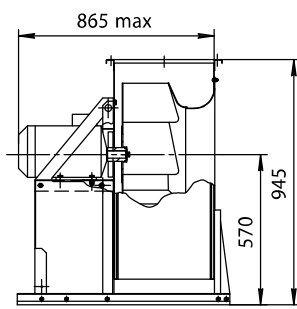
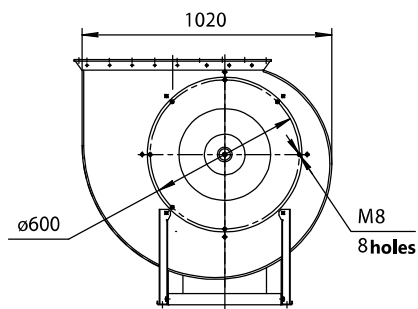
DU AND DUV MODE

1	VRAN6-DU/DUV	6	0,55	1,74	98
2	VRAN9-DU/DUV	6	0,75	2,3	104
3	VRAN6-DU/DUV	4	2,2	5,1	105
4	VRAN9-DU/DUV	4	3	7,3	111



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4	-5	+3	-4	-5	-7	-10	-15	-21

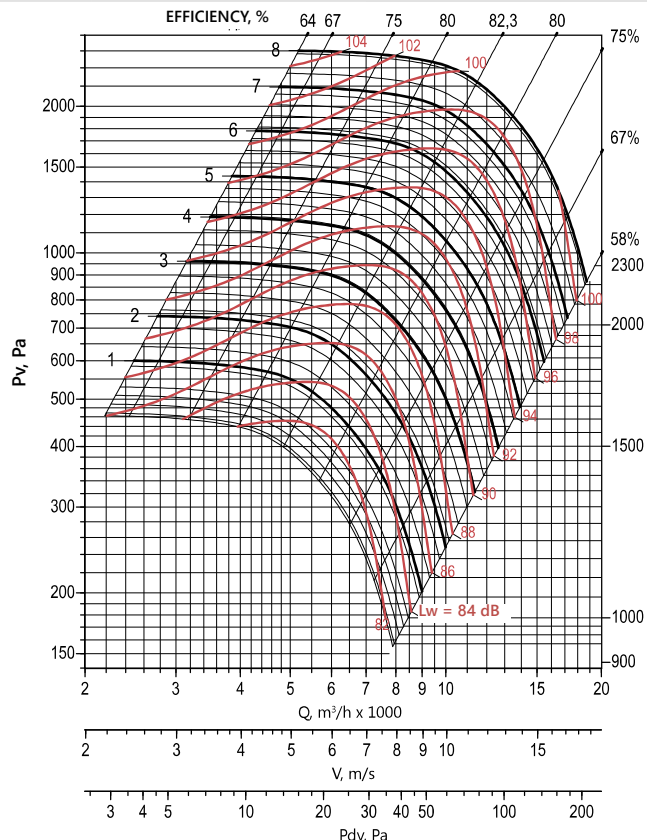


DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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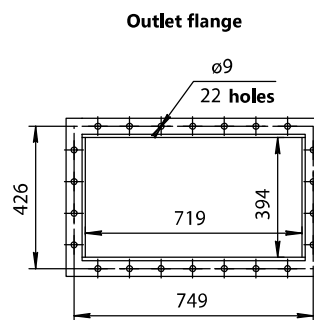
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	6	1,1	128
2			1,5	130
3			2,2	137
4			3	133
5		4	4	149
6			5,5	157
7			7,5	164
8			11	172



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<2200	-5	+3	-4	-5	-7	-10	-15	-21



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange FOV FON	soft starter	frequency converter	vibration isolators

063

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

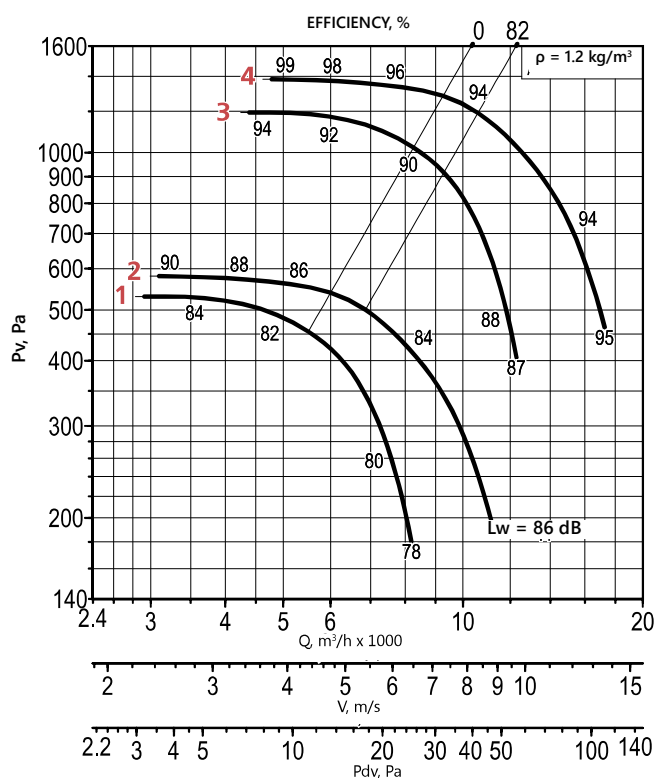
1	VRAN6-DU/DUV	6	1,1	3,2	117
2	VRAN9-DU/DUV		1,5	4,1	122
3	VRAN6-DU/DUV	4	4	8,6	138
4	VRAN9-DU/DUV		5,5	11,7	149

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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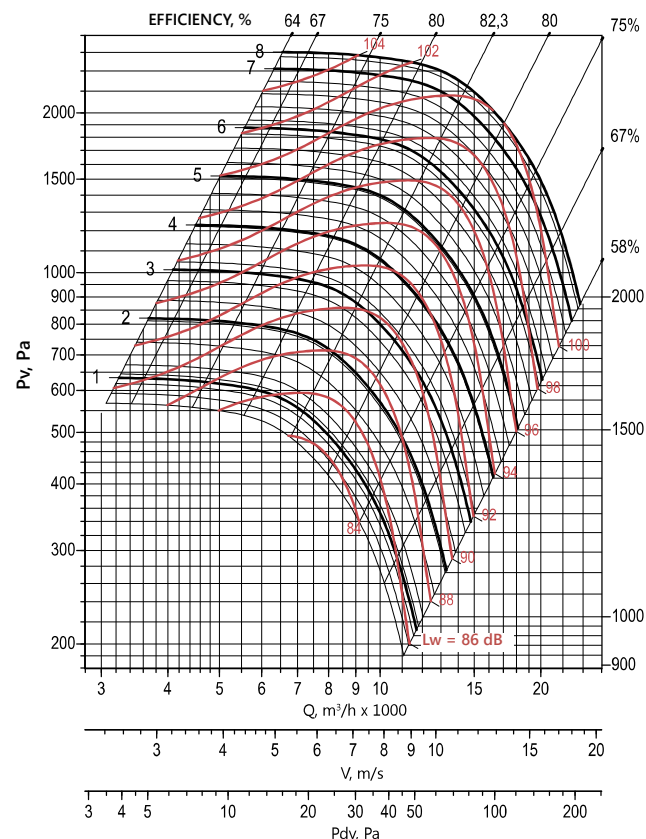
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	6	1,5	160
2			2,2	176
3			3	183
4			4	203
5		4	5,5	187
6			7,5	194
7			11	202
8			15	235



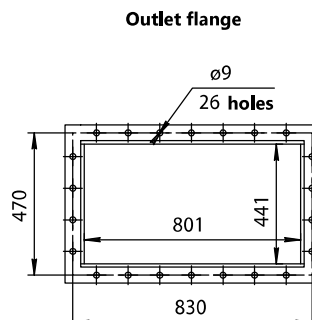
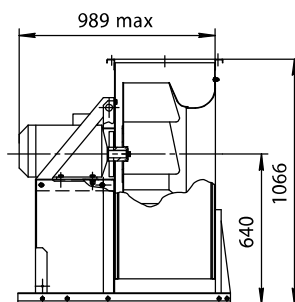
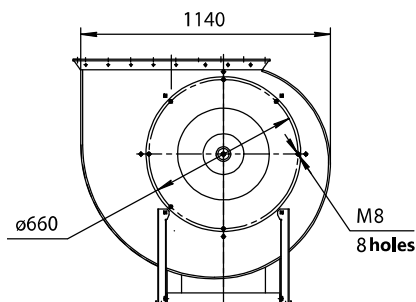
Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2	-6	+3	-4	-6	-8	-10	-13	-22
	3, 4	-8	-5	+3	-4	-6	-8	-16	-25



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1500	-6	+3	-4	-6	-8	-10	-13	-22
	≥1500	-8	-5	+3	-4	-6	-8	-16	-25



additional equipment

heat and sound insulated casing
TSK

flexible connector
COM

weather protection hood
ZNT

automatic control system
SHTORM-D

counter flange • **FOV • FON**

soft starter

frequency converter

vibration isolators

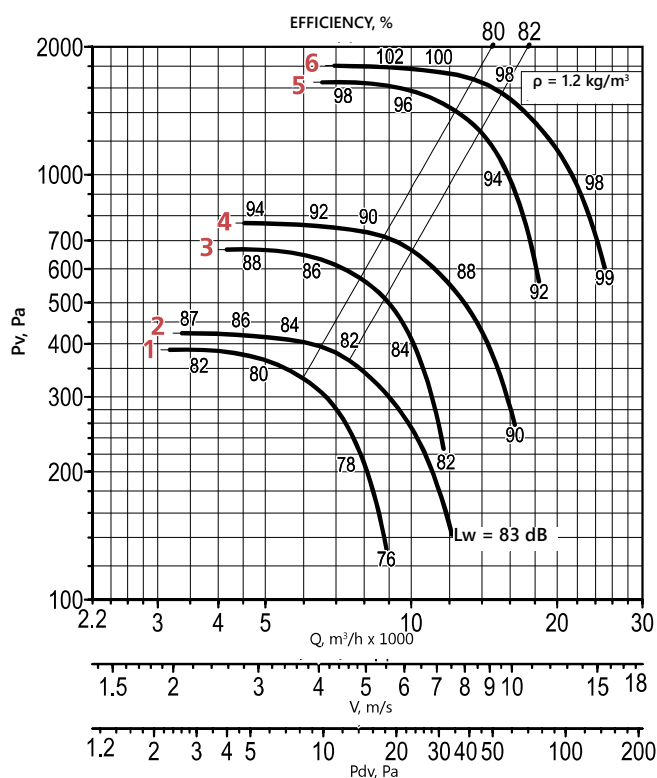
071

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	VRAN6-DU/DUV	8	1,1	3	140
2	VRAN9-DU/DUV		1,1	3	144
3	VRAN6-DU/DUV	6	2,2	5,8	146
4	VRAN9-DU/DUV		3	7	157
5	VRAN6-DU/DUV	4	7,5	15,6	164
6	VRAN9-DU/DUV		11	23	176



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

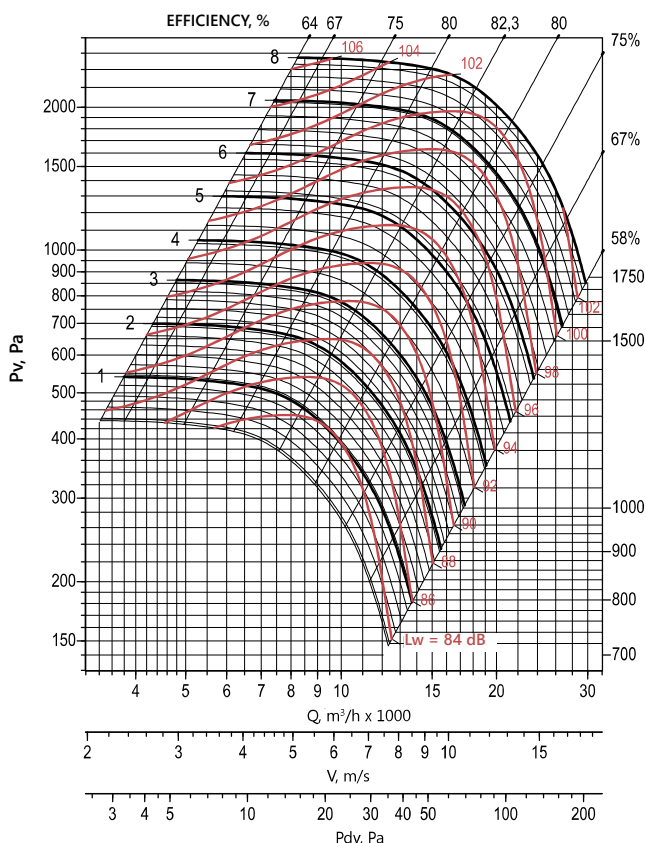
f_i , Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4	-8	+2	-2	-4	-6	-8	-14	-23
	5, 6	-11	-5	+3	-2	-5	-7	-9	-20

DESIGN VERSION WITH FC

Curve number	Fan typea	Number of poles	Nnom, kW	Weight,* kg
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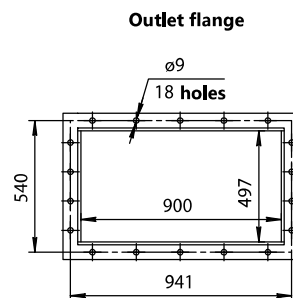
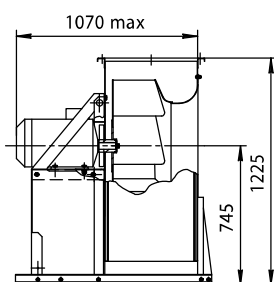
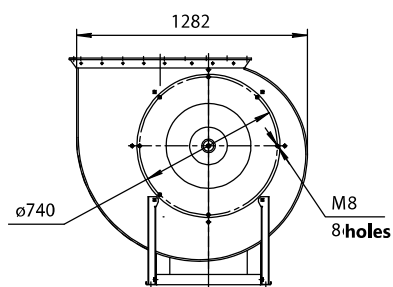
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	1,5	253
2			2,2	258
3		6	3	260
4			4	269
5			5,5	275
6			7,5	288
7		4	11	279
8			15	344



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

f_i , Hz	n_k , min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1000	-8	+2	-2	-4	-6	-8	-14	-23
	≥1000	-11	-5	+3	-2	-5	-7	-9	-20



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

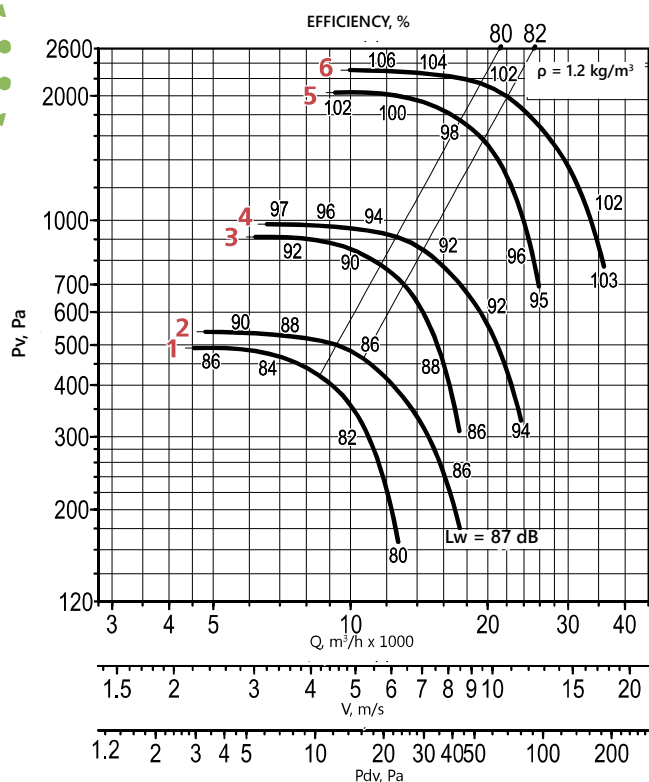
080

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	VRAN6-DU/DUV	8	1,5	4,6	196
2	VRAN9-DU/DUV		2,2	6,3	212
3	VRAN6-DU/DUV		4	9	212
4	VRAN9-DU/DUV	6	5,5	12	222
5	VRAN6-DU/DUV		15	31	287
6	VRAN9-DU/DUV	4	18,5	36	308



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

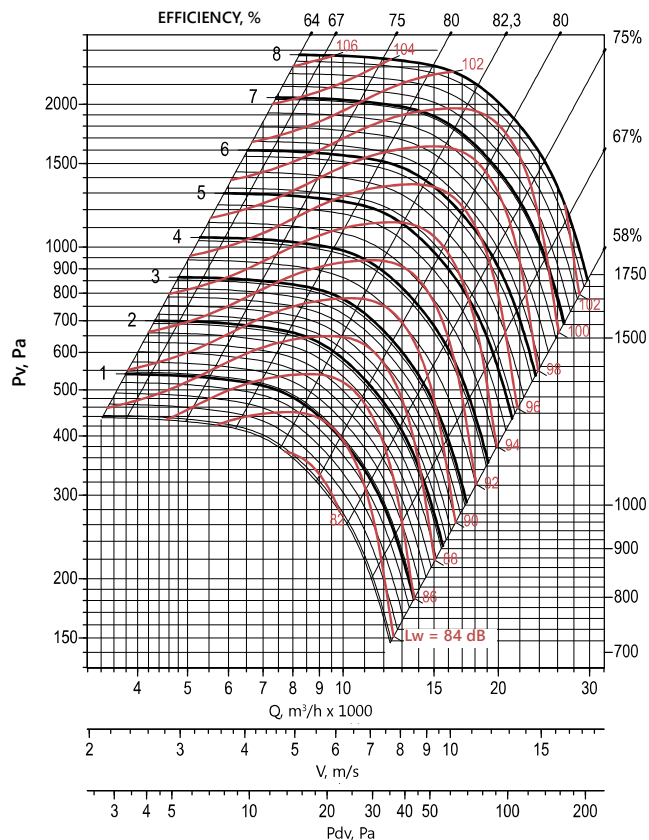
fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4	-8	+2	-2	-4	-6	-8	-14	-23
	5, 6	-11	-5	+3	-2	-5	-7	-9	-20

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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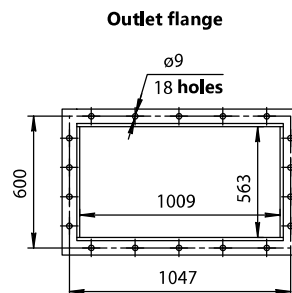
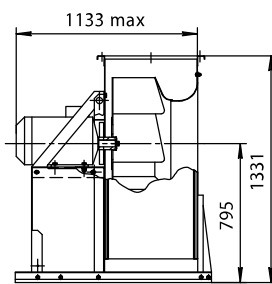
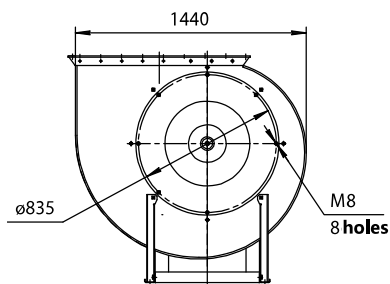
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	2,2	302
2			3	308
3			4	310
4		6	5,5	312
5			7,5	317
6			11	381
7			15	406
8		4	18,5	410



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1000	-8	+2	-2	-4	-6	-8	-14	-23
	≥1000	-11	-5	+3	-2	-5	-7	-9	-20



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

090

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

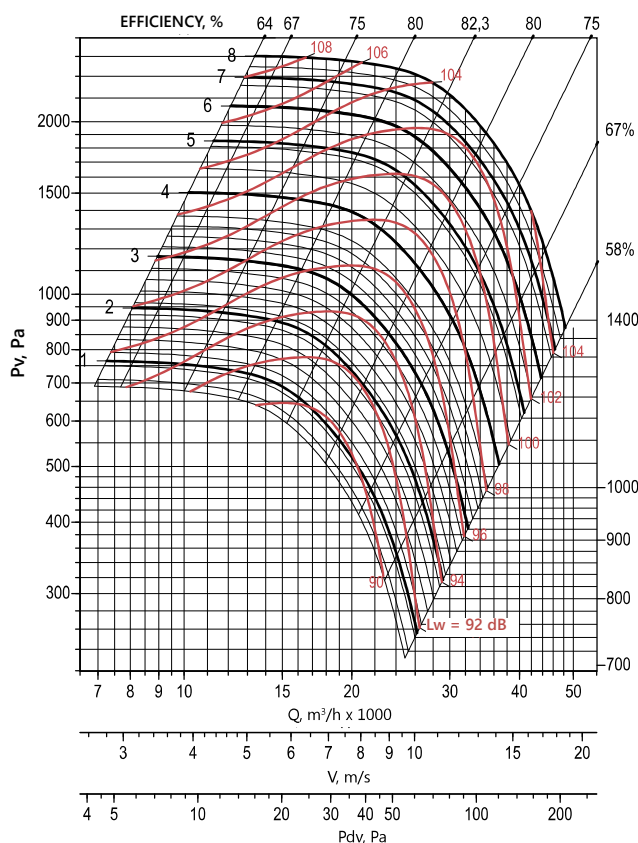
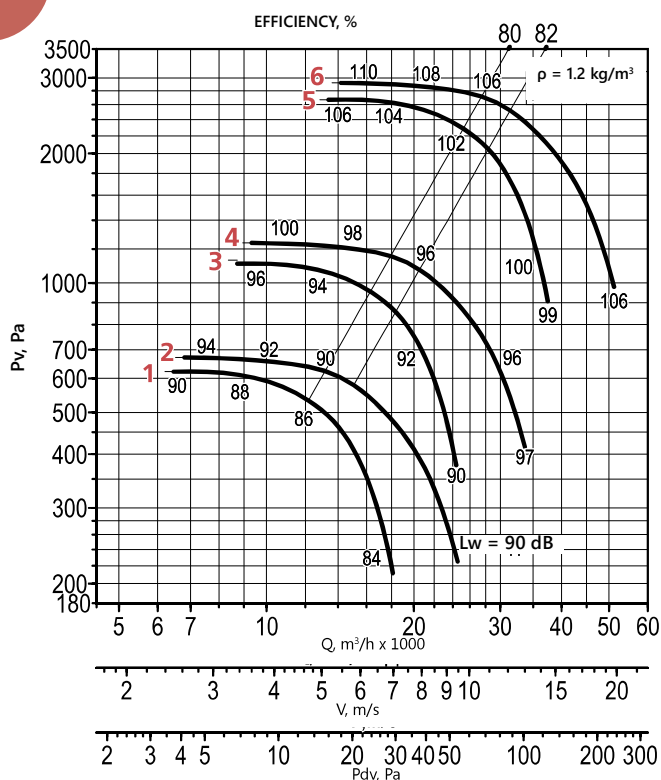
1	VRAN6-DU/DUV	8	3	8	262
2	VRAN9-DU/DUV		4	10,5	285
3	VRAN6-DU/DUV		7,5	17,5	270
4	VRAN9-DU/DUV	6	11	24	340
5	VRAN6-DU/DUV	4	22	56	399
6	VRAN9-DU/DUV		30	56	405

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	4	414
2			5,5	430
3			7,5	438
4		6	11	469
5			15	500
6			18,5	504
7			22	557
8		4	30	550

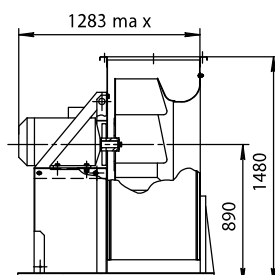
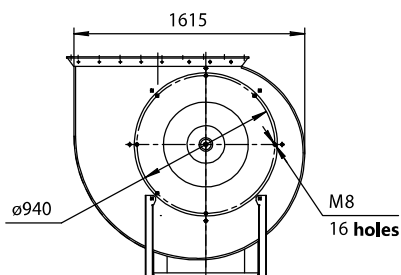


Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

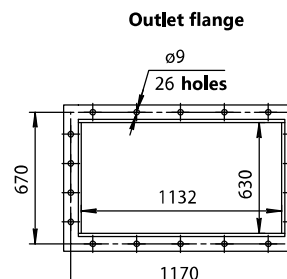
fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4 5, 6	-8	+3	-2	-4	-5	-7	-12	-20

Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1400	-8	+3	-2	-4	-5	-7	-12	-20



additional equipment



heat and sound insulated casing

TSK

flexible connector

COM

weather protection hood

ZNT

automatic control system

SHTORM-D

counter flange •FOV•FON

soft starter

frequency converter

vibration isolators

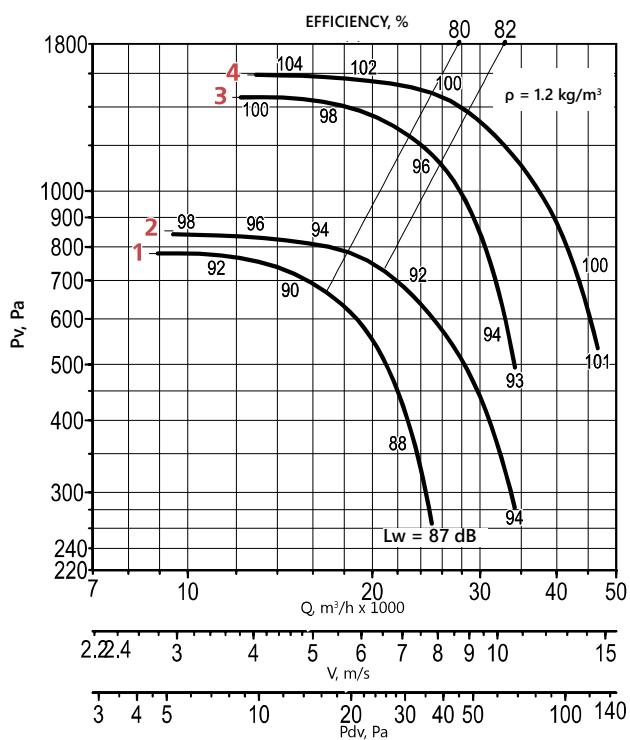
100

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

1	VRAN6-DU/DUV	8	5,5	13,6	418
2	VRAN9-DU/DUV	8	7,5	18	465
3	VRAN6-DU/DUV	6	11	24	457
4	VRAN9-DU/DUV	6	15	32	496



Sound power level in octave frequency bands $L_{wi} = L_w + \Delta L_{wi}$

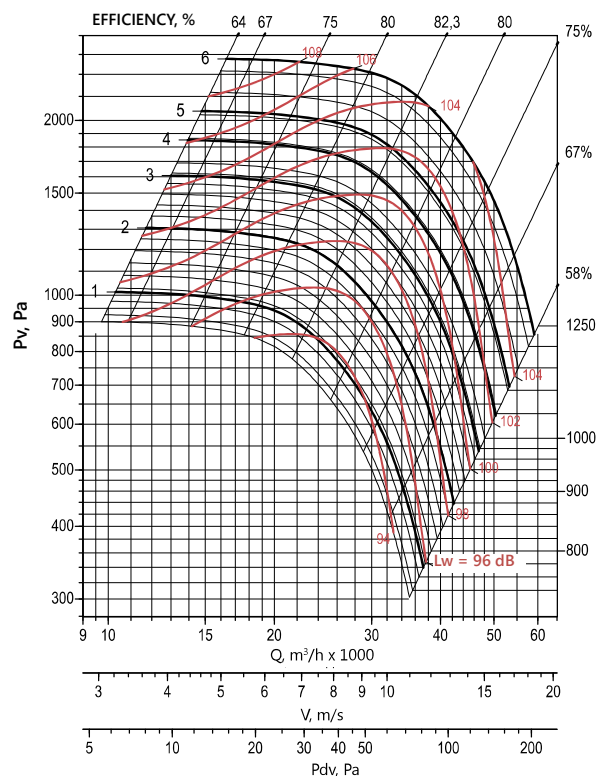
fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1,2	-8	+2	-3	-4	-6	-9	-15	-21
	3,4	-10	-7	+4	-2	-3	-7	-8	-19

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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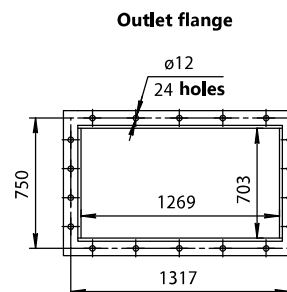
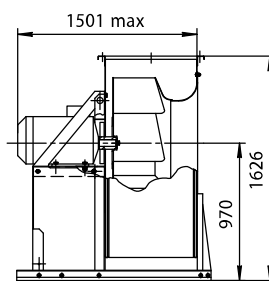
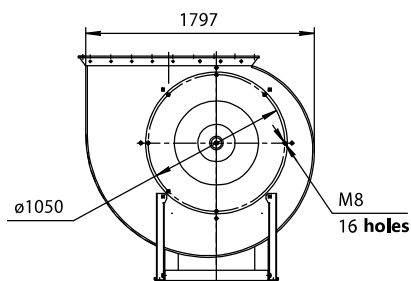
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	7,5	538
2		8	11	563
3		8	15	569
4		6	18,5	573
5		6	22	608
6		6	30	638



Sound power level in octave frequency bands $L_{wi} = L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<750	-8	+2	-3	-4	-6	-9	-15	-21
	≥750	-10	-7	+4	-2	-3	-7	-8	-19



additional equipment

heat and sound insulated casing

TSK

flexible connector

COM

weather protection hood

ZNT

automatic control system

SHTORM-D

counter flange • **FOV • FON**

soft starter

frequency converter

vibration isolators

112

DESIGN VERSION 1

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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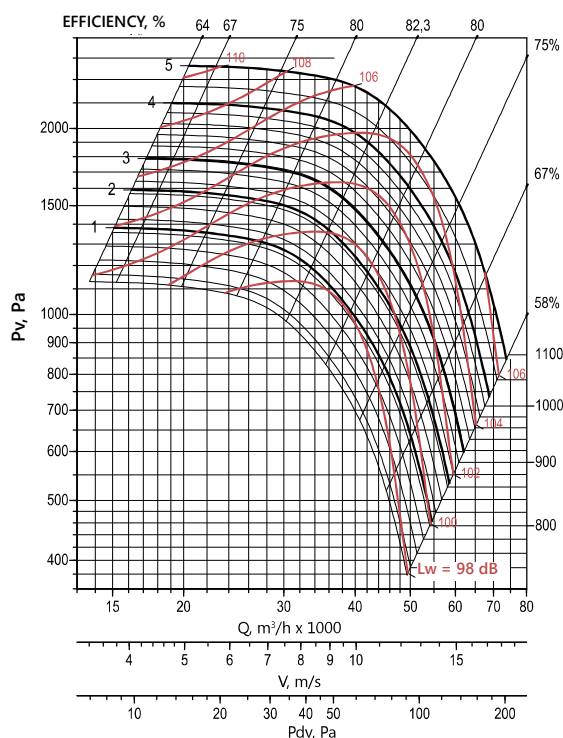
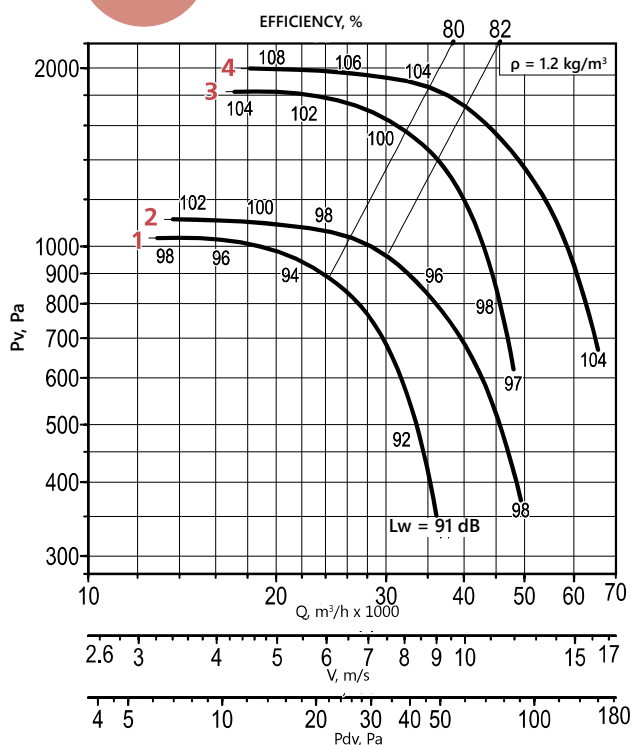
DU AND DUV MODE

1	VRAN6-DU/DUV	8	11	26	496
2	VRAN9-DU/DUV		15	35	527
3	VRAN6-DU/DUV	6	22	44	541
4	VRAN9-DU/DUV		30	60	580

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	15	672
2			18,5	710
3			22	720
4		6	30	725
5			37	798

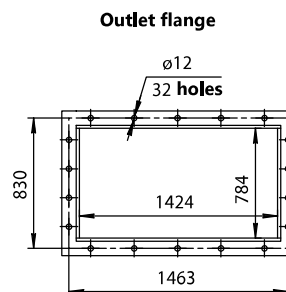
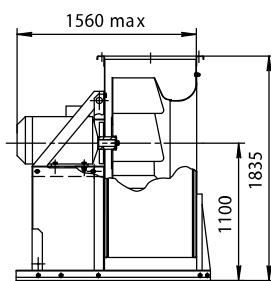
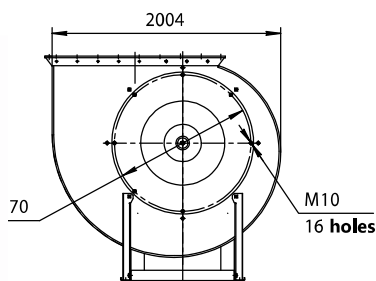


Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1, 2, 3, 4	-8	+2	-3	-5	-6	-8	-13	-20

Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1100	-8	+2	-3	-5	-6	-8	-13	-20



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange •FOV•FON	soft starter	frequency converter	vibration isolators

125

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
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DU AND DUV MODE

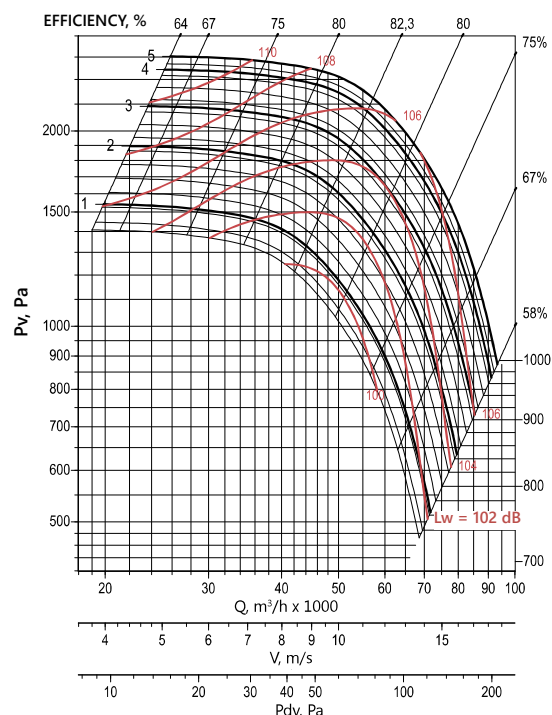
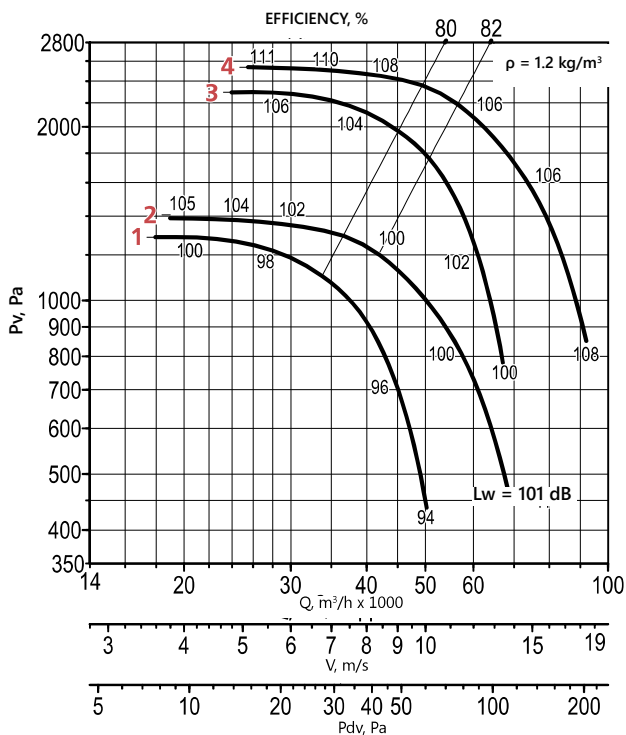
1	VRAN6-DU/DUV	8	15	35	631
2	VRAN9-DU/DUV		22	48	694
3	VRAN6-DU/DUV	6	37	71	819
4	VRAN9-DU/DUV		55	103	989

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
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DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	22	859
2			30	994
3			37	1099
4			45	1140
5		6	55	1140

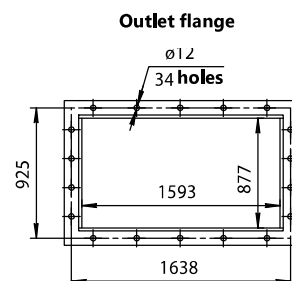
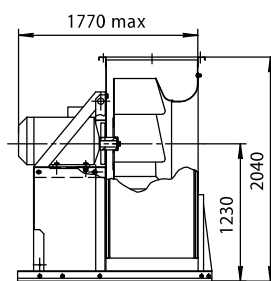
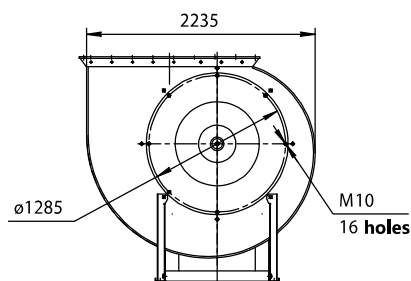


Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1,2,3,4	-8	+2	-3	-5	-6	-8	-13	-20

Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1000	-8	+2	-3	-5	-6	-8	-13	-20



additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

140

DESIGN VERSION 1

Curve number	Fan type	Number of poles	Nnom, kW	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------	-------------

DU AND DUV MODE

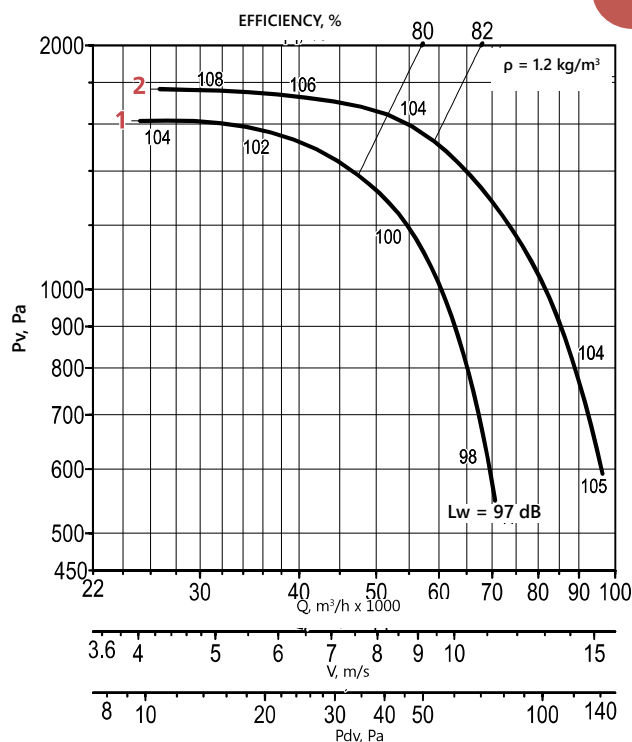
1	VRAN6-DU/DUV	8	30	64	1500
2	VRAN9-DU/DUV		37	76	1605

DESIGN VERSION WITH FC

Curve number	Fan type	Number of poles	Nnom, kW	Weight,* kg
--------------	----------	-----------------	----------	-------------

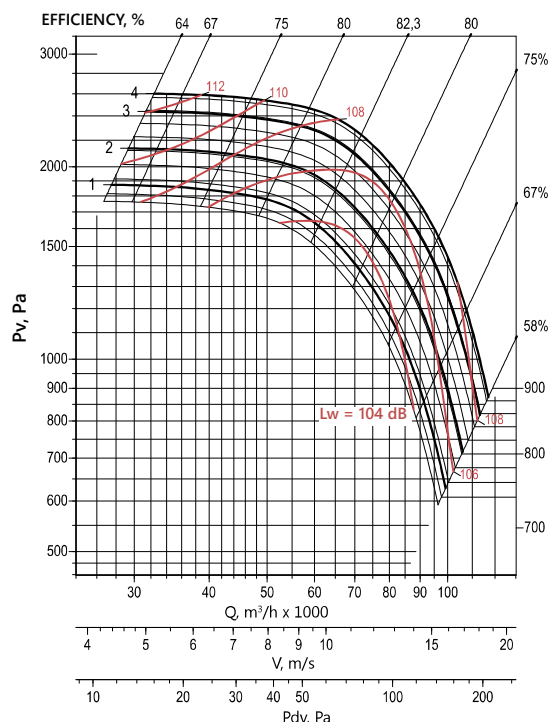
DUV MODE WITH FREQUENCY CONVERTER

1	VRAN9-DUV-F	8	37	1605
2			45	1660
3			55	1830
4			75	1960



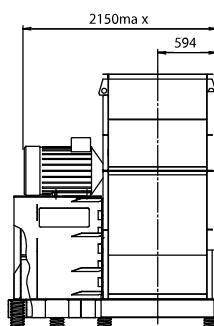
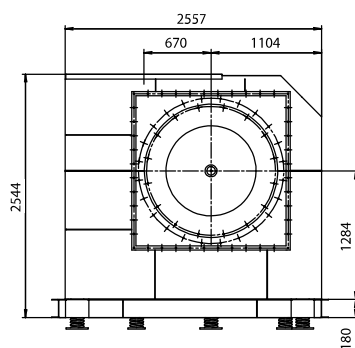
Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	Curve number	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	1.2	-8	+3	-2	-5	-7	-10	-13	-22

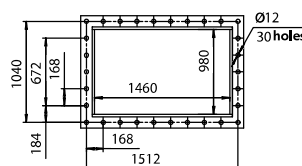


Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

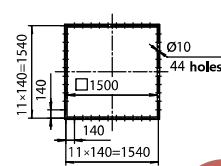
fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<900	-8	+3	-2	-5	-7	-10	-13	-22



Outlet flange



Inlet flange



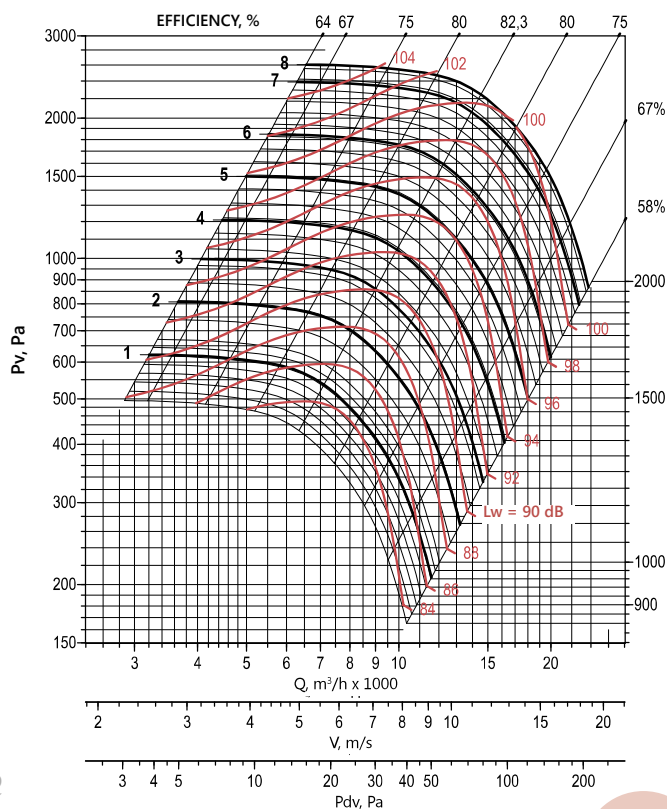
additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange •FOV•FON	soft starter	frequency converter	vibration isolators

063

DESIGN VERSION 5

Curve number	Fan type	Number of poles	Nnom, kW	nk max, min ⁻¹	Current at 380 V, A	Weight,* kg
DUV MODE						
1	VRAN9-DUV	4	1,5	965	3,6	181
2			2,2	1095	5,1	182
3			3	1220	7,3	186
4			4	1345	8,6	202
5			5,5	1495	11,7	210
6			7,5	1660	15,6	217
7			11	1885	23	225
8			15	1970	31	258



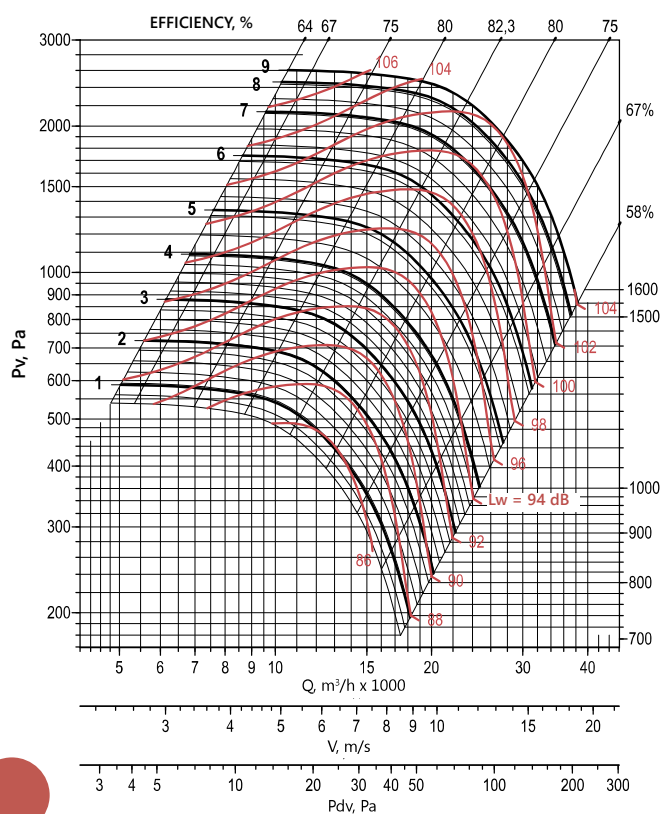
Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1450	-6	+3	-4	-6	-8	-10	-13	-22
	≥1450	-8	-5	+3	-4	-6	-8	-16	-25

080

DESIGN VERSION 5

Curve number	Fan type	Number of poles	Nnom, kW	nk max, min ⁻¹	Current at 380 V, A	Weight,* kg
DUV MODE						
1	VRAN9-DUV	6	2,2	735	5,8	324
2			3	820	7	331
3			4	900	9	340
4		4	5,5	1005	11,7	335
5			7,5	1115	15,6	342
6			11	1265	23	350
7			15	1405	31	415
8			18,5	1510	36	432
9			22	1550	44	450



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

fi, Hz	nk, min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1200	-8	+2	-2	-4	-6	-8	-14	-23
	≥1200	-11	-5	+3	-2	-5	-7	-9	-20

additional equipment

heat and sound insulated casing

TSK

flexible connector

COM

weather protection hood

ZNT

automatic control system

SHTORM-D

counter flange • **FOV** • **FON**

soft starter

frequency converter

vibration isolators

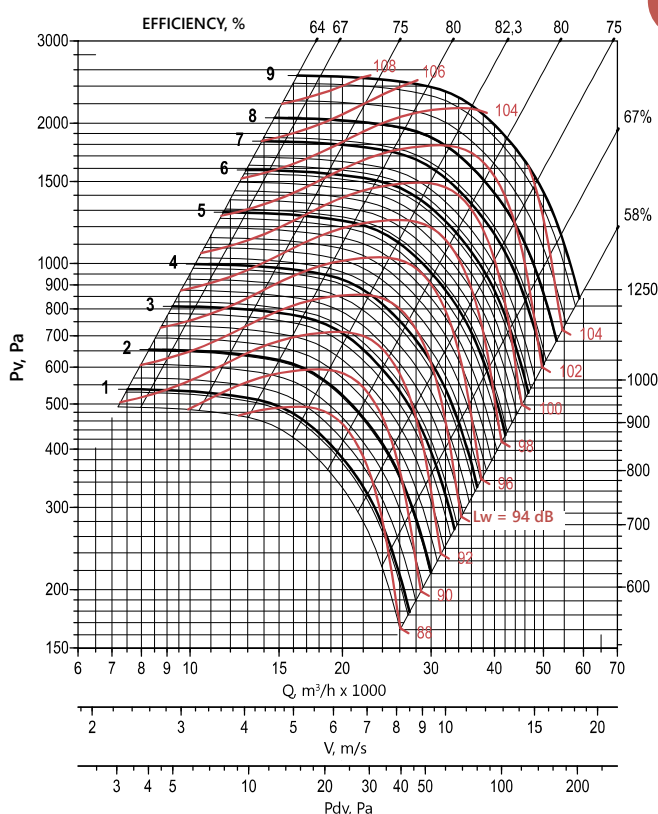
100

DESIGN VERSION 5

Curve number	Fan type	Number of poles	Nnom, kW	nk max, min ⁻¹	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------------	---------------------	-------------

DUV MODE

1	VRAN9- DUV	8	3	565	8	543
2			4	620	10,5	560
3			5,5	690	13,6	576
4		6	7,5	770	17,5	551
5			11	875	24	615
6			15	970	32	646
7		4	18,5	1040	36	630
8			22	1100	44	650
9			30	1225	56	680



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

f_i , Hz	nk , min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<1000	-8	+2	-2	-3	-7	-9	-13	-21
	≥ 1000	-10	-7	+4	-2	-3	-7	-8	-19

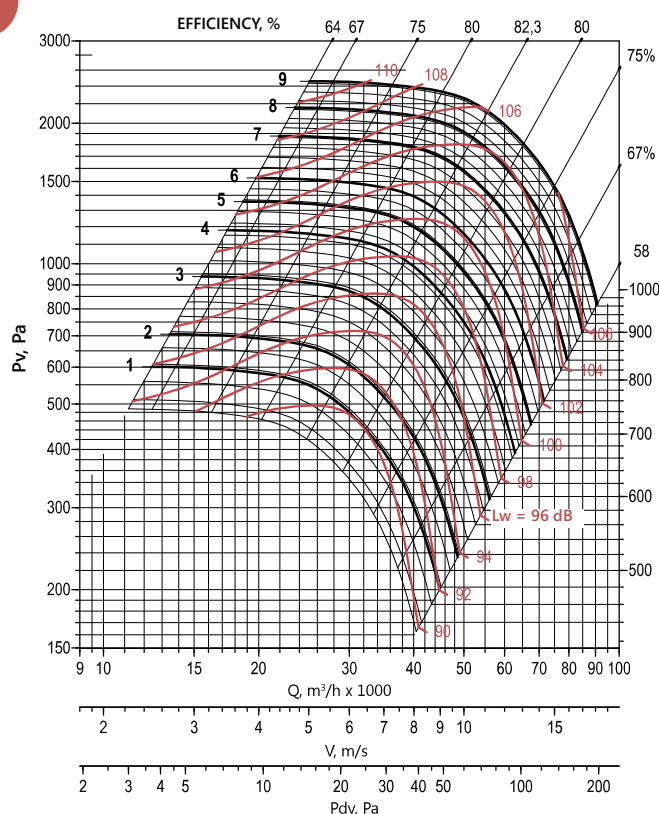
125

DESIGN VERSION 5

Curve number	Fan type	Number of poles	Nnom, kW	nk max, min ⁻¹	Current at 380 V, A	Weight,* kg
--------------	----------	-----------------	----------	---------------------------	---------------------	-------------

DUV MODE

1	VRAN9- DUV	8	5,5	502	13,6	676
2			7,5	559	18	715
3			11	635	26	740
4			15	695	35	762
5			18,5	746	40	800
6		6	22	787	48	815
7			30	888	60	815
8			37	952	71	950
9			45	993	85	1082



Sound power level in octave frequency bands $L_{wi}=L_w + \Delta L_{wi}$

f_i , Hz	nk , min ⁻¹	63	125	250	500	1000	2000	4000	8000
ΔL_{wi} , dB	<750	+3	-2	-5	-7	-10	-13	-19	-25
	≥ 750	-8	+3	-2	-5	-7	-10	-13	-22

additional equipment

heat and sound insulated casing TSK	flexible connector COM	weather protection hood ZNT	automatic control system SHTORM-D
counter flange • FOV • FON	soft starter	frequency converter	vibration isolators

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

Radial smoke extraction fan VRAN-DU/DUV

VRAN

quantity, pcs: _____

Contact person: _____

Organization: _____

tel.: _____

e-mail: _____

Region (city): _____

date: _____

Mark the required one with a "V" sign or specify a value

operating mode (range of modes)	efficiency Q, m3/h	
	static pressure Psv at t = 20 °C, Pa	
fan number		
operating mode	DU - smoke extraction	
	DUV - smoke extraction and ventilation	
fan design	N - general purpose industrial	
	V - explosion-proof	
	CR1 - corrosion-resistant	
	VCR1 - explosion-proof, corrosion-resistant	
temperature of the transported medium	400° C	
	600° C	
climatic version	Y1	
	Y2	
	YHL1	
	YHL2	
	T1	
design scheme	1	
	5	
impeller	rotation speed, min-1 (for design scheme 1 with frequency control and 5)	
motor	motor rated power, kW	
	number of poles	
	with frequency control	
casing orientation	airflow outlet angle, deg.	right rotation (R)
		left rotation (L)

Additional equipment

TSK heat and sound insulated casing	
vibration isolators	
flexible connector COM	series
	installation on the suction side
	installation on the discharge side
counter flange	FOV - on the suction side
	FON - on the discharge side
frequency converter	
soft starter	
cabinet SHTORM-D	
weather protection hood ZNT	

Special requirements:

Customer _____
(signature)

_____ (full name)

WALL-MOUNTED FANS

VNR-DU/DUV



• 400° C • 600° C
• 120 MIN

► energy efficient.

INTENDED USE:

- ventilation and air heating systems;
- sanitary and technological installations;
- smoke ventilation systems.

•035 •040 •045 •050 •056 •063 •071 •080 •090 •100

Wall-mounted radial fans with a vertical axis of rotation remove the flow from a smoke-filled room to the outside. The fans have an impeller with backward-curved blades, a toroidal inlet pipe with a large inlet diameter, and a spiral housing. The fans can be used in six different configurations, both indoors and outdoors. When installed indoors, the smoke-air mixture enters the fan directly from the smoke-filled room (configurations 1 and 4) or from the duct (configuration 2, 5). In the latter case, an inlet box is installed at the fan inlet.

Enhanced motor air cooling is provided by outside air entering a special protective motor enclosure. Motor cooling and motor thermal overload protection protect the motor from exposure to the conveyed high-temperature gas. When the fan is installed outside the building (configurations 3 and 6), the smoke-air mixture can also be supplied either from a duct or directly from the smoke-filled room. The motor does not have a protective enclosure. Motor thermal overload protection is provided. A corrosion-resistant design (CR1) is provided for the operation of the fan in an aggressive environment.

It is possible to operate the fan both in the smoke extraction mode (DU) and in the combined smoke extraction and ventilation mode (DUV). In the latter case, the fans are equipped with motors designed for continuous long-term operation.

- general purpose industrial (N);
- corrosion-resistant (CR1) - only for DUV mode

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st placement category.

Operating conditions:

- ambient temperature
 - from -45 °C to +40 °C for temperate climate,
 - from -60 °C to +40 °C for temperate and cold climates,
 - from -10 °C to +50 °C for tropical climate;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- the conditions for the medium to be transported can be found in the section "Fan designs for their intended purpose".

EXAMPLE:

VNR wall-mounted radial fan; standard size 090; operating mode DUF400; corrosion resistant; motor rated power $N_{nom} = 7.5$ kW and number of poles 6; climatic version Y1; configuration 6; inlet box position 90:

VNR6-090-DUF400-CR1-00750/6-Y1-6-90

- wall-mounted fan (•VNR6 •VNR9)
- standard fan size (•035 •040 •045 •050 •056 •063 •071 •080 •090 •100)
- operating mode
 - temperature of the transported medium is 400 °C
 - DU operating mode: •DUF400 DUV operating mode: •DUVF400
 - temperature of the transported medium is 600 °C
 - DU operating mode: •DUF600 DUV operating mode: •DUVF600
- design version (•N •CR1)
- motor parameters* (•n/P)
 - n** – Motor Power Index
 - P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm)
- climatic version (•Y1 •T1)
- configuration (•1 •2 •3 •4 •5 •6)
- position of the inlet box (•0 •45 •90 •135 •180)
- the energy efficiency class of the electric motor: •IE2 (indicated for DUV fans if it differs from the standard)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start. Design types of other voltages and connection methods are available upon special agreement. Starting the motors from 15 kW must be performed using the MCD soft starter.

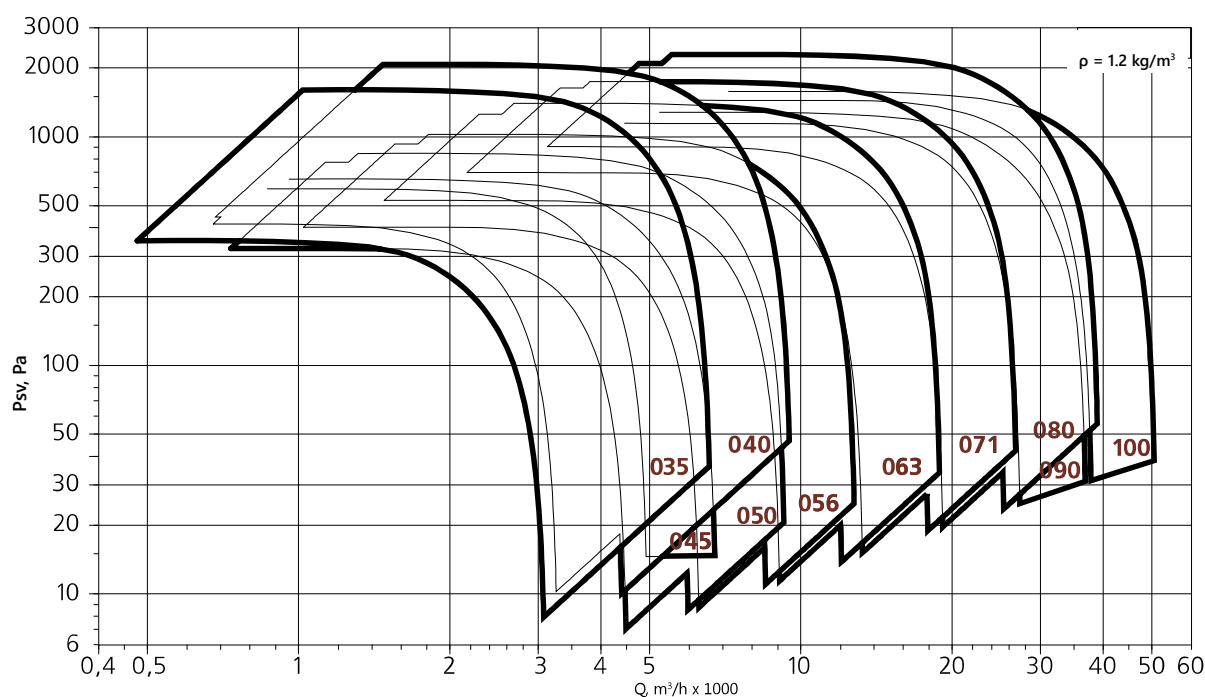
** Motor Power Index - see Table 1.

Special requirements for the fan are specified additionally.

TABLE 1

VNR-DU/DUV

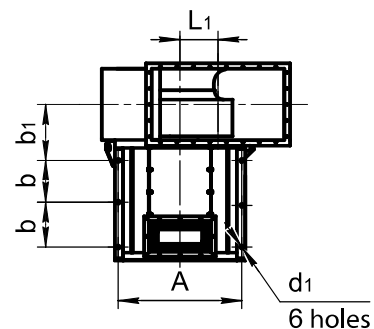
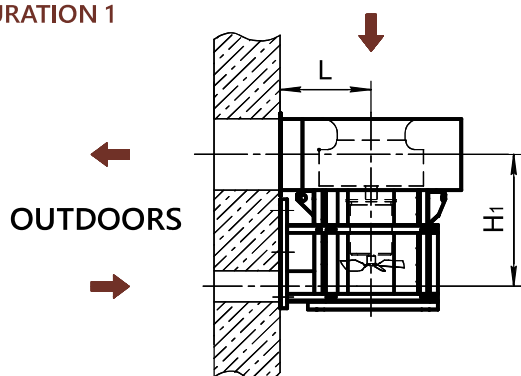
Motor rated power (N_{nom}), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n))	00018...00075	00110...00750	01100...09000



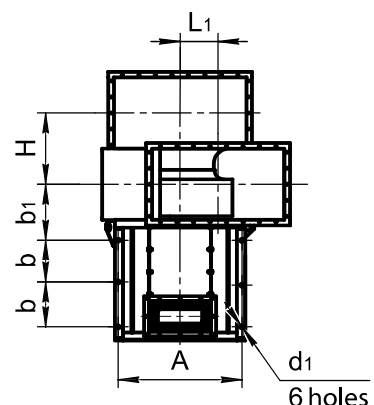
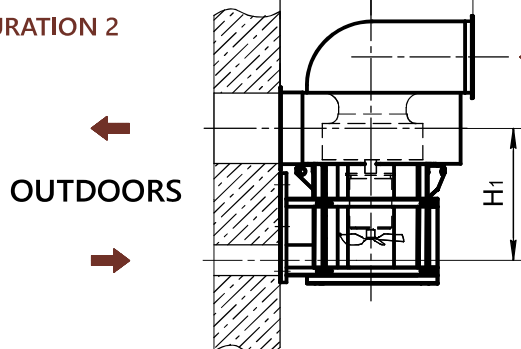
FAN INSTALLATION INDOORS

CONFIGURATION 1

WALL MOUNTING
035...063

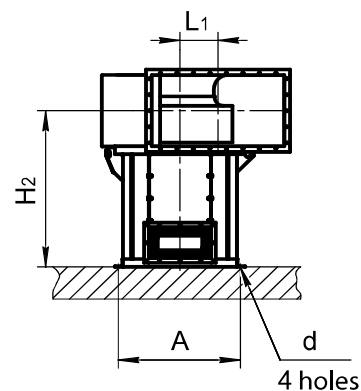
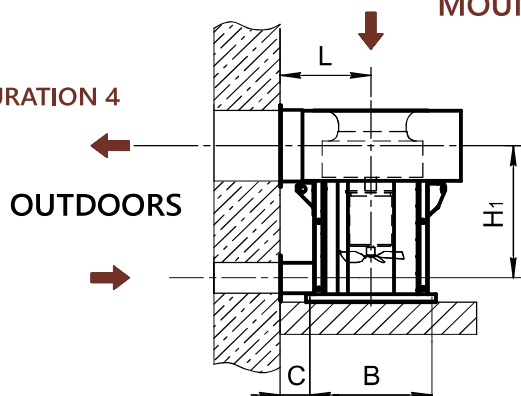


CONFIGURATION 2

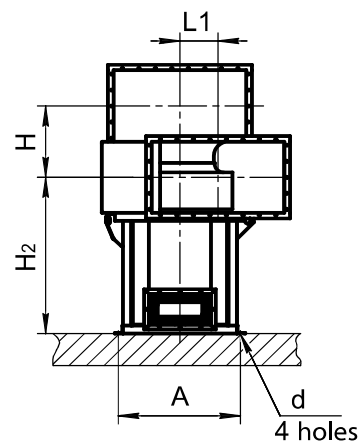
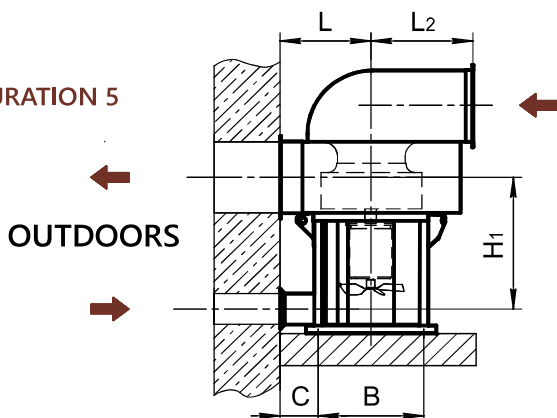


MOUNTING TO A HORIZONTAL SUPPORT
035...100

CONFIGURATION 4

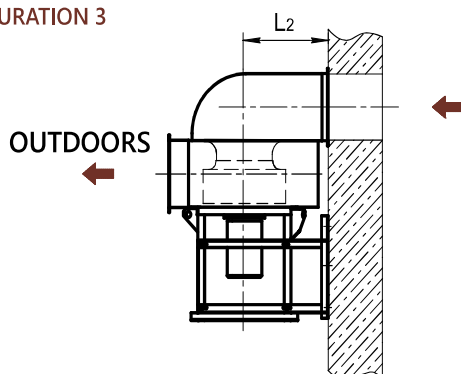


CONFIGURATION 5

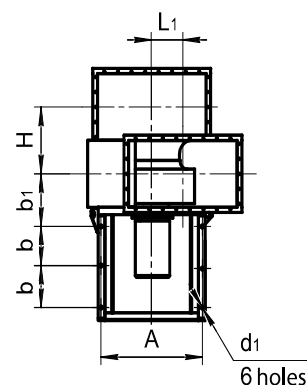


FAN INSTALLATION OUTDOORS

CONFIGURATION 3

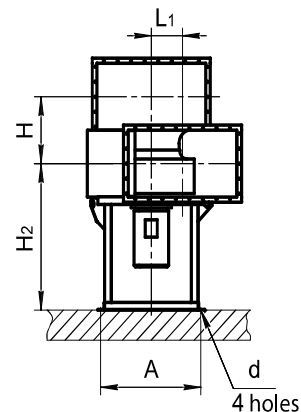
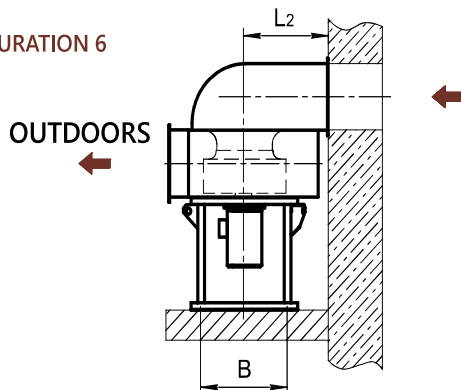


WALL MOUNTING
035...063



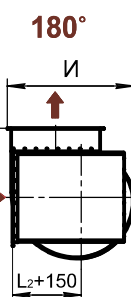
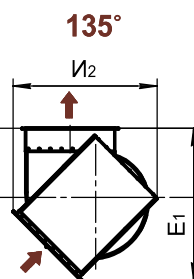
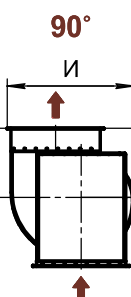
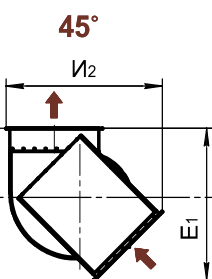
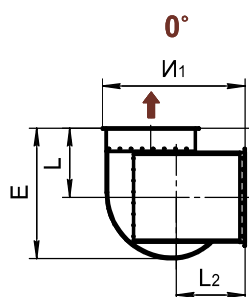
MOUNTING TO A HORIZONTAL SUPPORT
035...100

CONFIGURATION 6

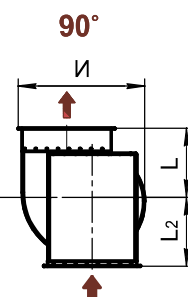


POSITION OF THE INLET BOX

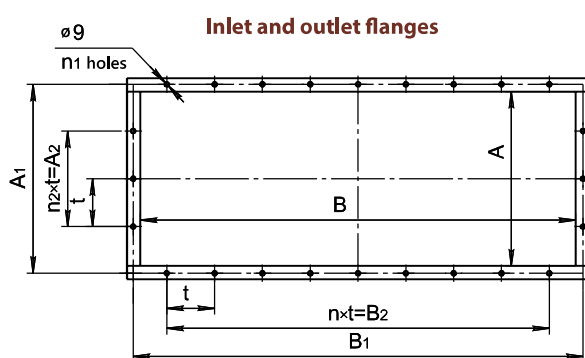
CONFIGURATION •2 •5



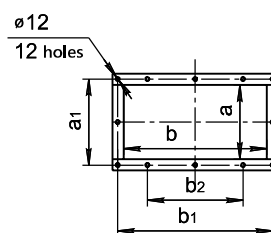
CONFIGURATION •3 •6



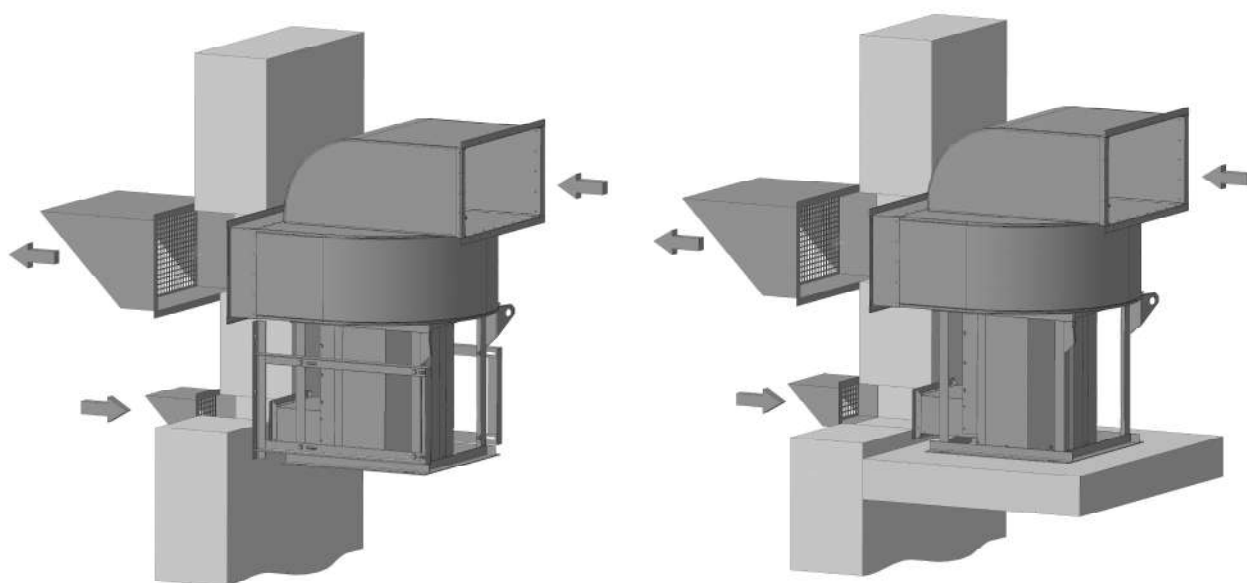
TFan standard size	Dimensions, mm																	
	A	B	b	b ₁	C	d	d ₁	H	H ₁	H ₂	L	L ₁	L ₂	E	E ₁	I	I ₁	I ₂
035	580	400	160	206	160	18	18	250	489	614	360	129	360	720	790	750	750	810
040	580	400	160	220	190	18	18	285	506	631	390	145	390	780	870	810	825	915
045	660	400	160	240	205	18	18	320	522	655	420	164	420	815	940	820	890	1000
050	660	400	160	259	250	18	18	355	553	684	450	182	450	890	1015	955	990	1110
056	780	440	220	308	284	15x40	20	397	646	875	504	202	504	995	1140	1075	1100	1235
063	750	600	280	350	260	15x60	20	445	823	975	620	231	620	1175	1370	1140	1290	1420
071	840	690	—	—	405	15x60	—	502	856	1058	750	260	750	1375	1625	1290	1500	1625
080	950	800	—	—	480	20	—	565	1050	1232	880	297	880	1580	1890	1440	1720	1845
090	970	970	—	—	365	20	—	635	947	1124	800	335	800	1595	1800	1655	1780	1935
100	970	970	—	—	440	20	—	705	975	1152	926	366	926	1800	2070	1825	2000	2240



The channel for cooling the motor
(configuration •1 •2 •4 •5)



Fan standard size	Dimensions, mm														
	A	A ₁	A ₂	a	a ₁	B	B ₁	B ₂	b	b ₁	b ₂	t	n	n ₁	n ₂
035	252	272	200	150	182	455	475	400	250	282	125	100	4	16	2
040	280	310	200	150	182	510	538	400	250	282	125	120	4	16	2
045	315	350	240	150	182	569	604	480	250	282	125	100	4	16	2
050	350	380	300	150	182	638	668	600	250	282	125	100	6	22	3
056	392	426	300	150	182	720	749	600	250	282	125	100	6	22	3
063	440	470	400	192	225	800	830	700	372	405	250	100	7	26	4
071	497	540	270	194	225	898	941	675	372	405	250	135	5	18	2
080	560	600	300	220	250	1007	1047	750	400	430	250	150	5	18	2
090	630	670	600	220	250	1130	1170	1050	400	430	250	150	7	26	4
100	700	750	450	220	250	1267	1317	1050	400	430	250	150	7	24	3

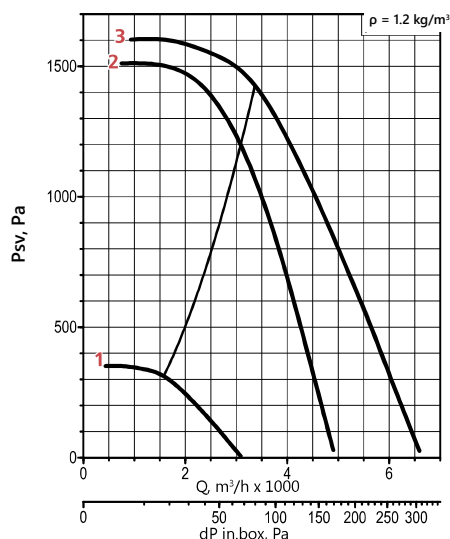


Weather protection hoods for the upblast discharge and for the motor cooling channel flange are ordered separately from the fan under the marking: • KIT-VNR-X
X is the standard size of the fan

035

Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR9-DU	0,25	4	33
2	VNR6-DU	1,5	2	42
3	VNR9-DU	2,2	2	44

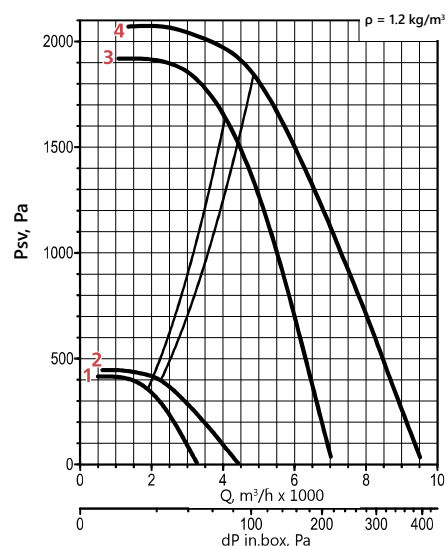
COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR9-DUV	0,25	4	33
2	VNR6-DUV	2,2	2	44
3	VNR9-DUV	2,2	2	44



040

Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR6-DU	0,25	4	50
2	VNR9-DU	0,37	4	51
3	VNR6-DU	3	2	62
4	VNR9-DU	4	2	66

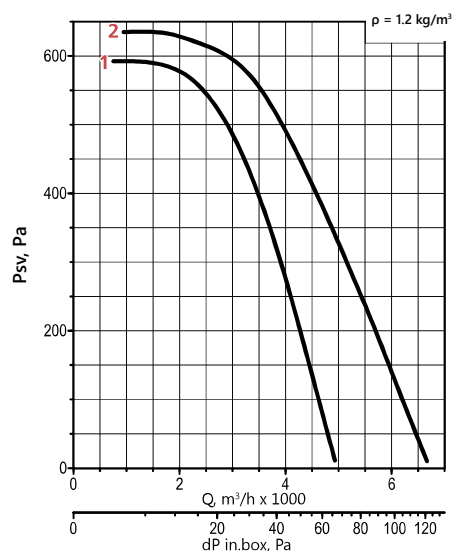
COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR6-DUV	0,37	4	51
2	VNR9-DUV	0,55	4	53
3	VNR6-DUV	3	2	62
4	VNR9-DUV	4	2	66



045

Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR6-DU	0,55	4	61
2	VNR9-DU	0,75	4	63

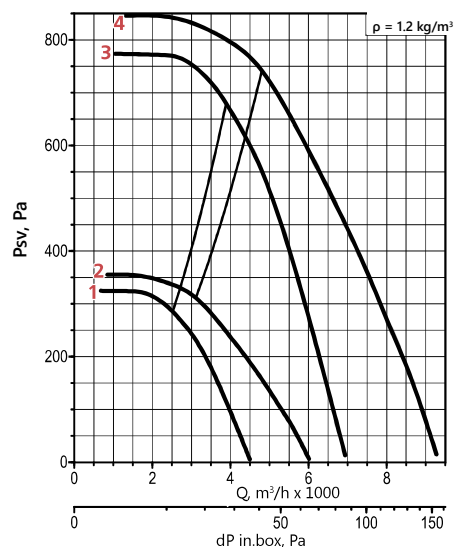
COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR6-DUV	0,75	4	63
2	VNR9-DUV	1,1	4	67



050

Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR6-DU	0,37	6	76
2	VNR9-DU	0,37	6	76
3	VNR6-DU	1,1	4	82
4	VNR9-DU	1,5	4	84

COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR6-DUV	0,37	6	76
2	VNR9-DUV	0,55	6	78
3	VNR6-DUV	1,1	4	82
4	VNR9-DUV	1,5	4	84



056

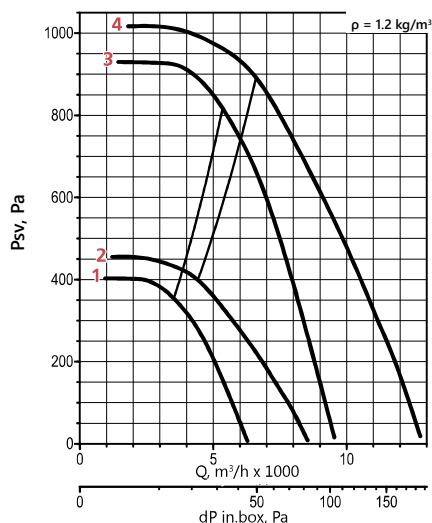
Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
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SMOKE EXTRACTION MODE ONLY (DU)

1	VNR6-DU	0,55	6	100
2	VNR9-DU	0,75	6	104
3	VNR6-DU	2,2	4	107
4	VNR9-DU	2,2	4	107

COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)

1	VNR6-DUV	0,55	6	100
2	VNR9-DUV	0,75	6	104
3	VNR6-DUV	2,2	4	107
4	VNR9-DUV	3	4	111



063

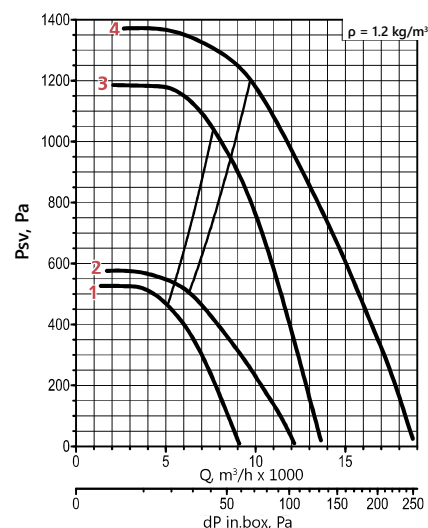
Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
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SMOKE EXTRACTION MODE ONLY (DU)

1	VNR6-DU	1,1	6	120
2	VNR9-DU	1,1	6	120
3	VNR6-DU	3	4	125
4	VNR9-DU	4	4	141

COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)

1	VNR6-DUV	1,1	6	120
2	VNR9-DUV	1,5	6	122
3	VNR6-DUV	4	4	141
4	VNR9-DUV	5,5	4	149



071

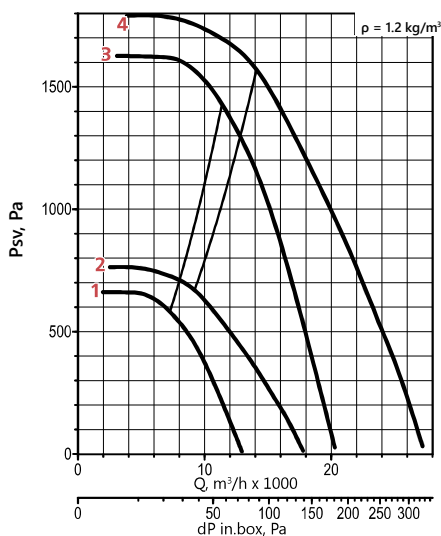
Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
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SMOKE EXTRACTION MODE ONLY (DU)

1	VNR6-DU	1,5	6	134
2	VNR9-DU	2,2	6	150
3	VNR6-DU	5,5	4	161
4	VNR9-DU	7,5	4	168

COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)

1	VNR6-DUV	2,2	6	150
2	VNR9-DUV	3	6	157
3	VNR6-DUV	7,5	4	168
4	VNR9-DUV	11	4	176



080

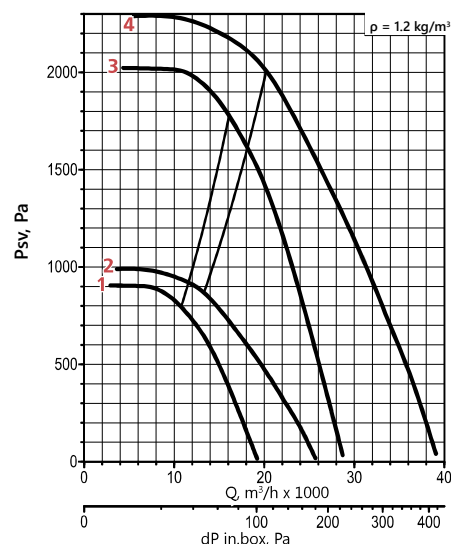
Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
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SMOKE EXTRACTION MODE ONLY (DU)

1	VNR6-DU	3	6	207
2	VNR9-DU	4	6	216
3	VNR6-DU	11	4	226
4	VNR9-DU	15	4	291

COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)

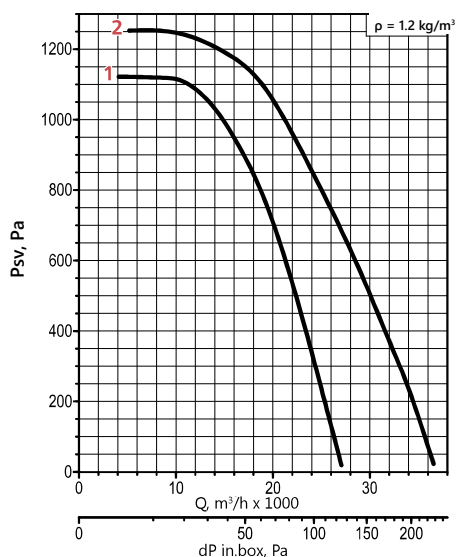
1	VNR6-DUV	4	6	216
2	VNR9-DUV	5,5	6	222
3	VNR6-DUV	15	4	291
4	VNR9-DUV	18,5	4	308



NOTE: *When the motor type is changed, the weight may change.

090

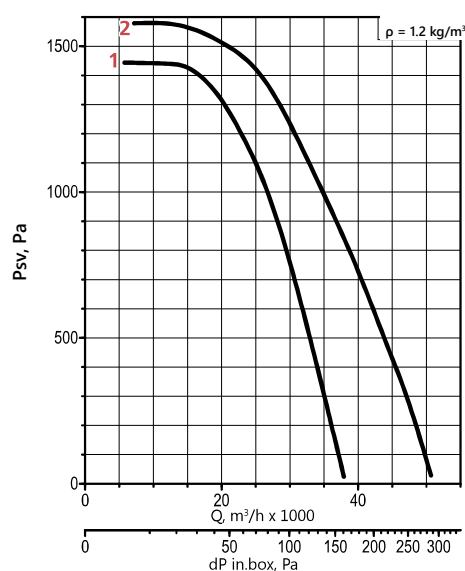
Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR6-DU	5,5	6	271
2	VNR9-DU	7,5	6	276
COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR6-DUV	7,5	6	276
2	VNR9-DUV	11	6	340



NOTE: *When the motor type is changed, the weight may change.

100

Curve number	Fan type	Nnom, kW	Number of poles	Weight,* kg
SMOKE EXTRACTION MODE ONLY (DU)				
1	VNR6-DU	11	6	465
2	VNR9-DU	15	6	496
COMBINED SMOKE EXTRACTION AND VENTILATION MODE (DUV)				
1	VNR6-DUV	11	6	465
2	VNR9-DUV	15	6	496



QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

Wall mounted radial fan VNR-DU/DUV

VNR _____

quantity, pcs: _____

Contact person: _____

Organization: _____

tel.: _____ e-mail: _____

Region (city): _____ date: _____

Mark the required one with a "V" sign or specify a value

operating mode (range of modes)	efficiency η , %	
	static pressure P_{sv} at $t = 20^\circ\text{C}$, Pa	
fan standard size		
operating mode	DU - smoke extraction	
	DUV - smoke extraction and ventilation	
fan design	N - general purpose industrial	
	CR1 - corrosion-resistant	
temperature of the transported medium	400° C	
	600° C	
motor	Y1	
	T1	
двигун	motor rated power, kW	
	number of poles	

Special requirements: _____

Customer _____
(signature)

_____ (full name)

AXIAL SMOKE EXTRACTION FANS

OZA-DUV

➤ designed to remove gases generated during a fire and simultaneously remove heat from a serviced room or building in order to carry out fire fighting operations. In addition to emergency operation, fans can be used for long-term continuous operation (at temperatures below 40 °C) in a combined smoke extraction and ventilation mode;

➤ allows for the creation of safe evacuation routes for people from burning premises;

➤ does not obscure other systems (sprinklers, power lines, etc.) and surveillance camera viewing zones;

➤ no air ducts or additional rooms required for fan installation.

INTENDED USE:

- ventilation and air heating systems;
- sanitary and technological installations;
- DU systems - flue gas removal in case of fire.



- 400° C
- 120 MINUTES

•045 •050 •056 •063 •071 •080 •090 •100 •112 •125

OZA-DUV axial fans consist of a new design impeller, a cylindrical housing and an asynchronous electric motor located in the housing.

Impeller with adjustable blade angle (factory setting only). The blades are three-dimensional in design. The flow cross-section is maximized, resulting in a significant reduction in outlet velocity. When there is no inlet duct, fans with an OZA-VKO inlet header or an OZA-PET toroidal adapter must be used.

The motor is designed to operate at temperatures up to 400 °C for 120 minutes (depending on the fan modification).

OZA-DUV fans provide an air handling capacity ranging from 3000 to 90000 m³/h and a total pressure of up to 900 Pa.

The flow direction is always from the impeller to the motor, regardless of orientation. All elements of the fan have a decorative protective coating.

➤ general purpose industrial (N)

OPERATING CONDITIONS

(except for operation in smoke extraction mode)

The fans are designed for conveying air and other non-aggressive gas mixtures that do not cause accelerated corrosion of the materials and coatings of the fan's flow section and do not contain explosive substances, abrasive dust, sticky, or fibrous materials. The content of dust and other solid impurities in the transported medium is not higher than 100 mg/m³.

Operating conditions:

- ambient temperature
 - from -45 °C to +40 °C for temperate climate,
- the root-mean-square value of vibration velocity of external vibration sources at fan installation locations should not exceed 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

EXAMPLE:

OZA axial fan; standard size 050, modification M; blade angle 50, DUV operating mode, temperature of the moving medium 400 ° C, general industrial design; motor rated power N_{nom} = 4.0 kW, number of poles 2, climatic version Y2.

OZA-050/M-50-DUV400-N-00400/2-Y2

- axial smoke extraction fan (•OZA)
- standard fan size (•045 •050 •063 •071 •080 •090 •100 •112)
- modification of the impeller (•A •B •C •D •E •I •L •M •P •R •S •T)
- impeller blade angle α , deg (•40... •70)
- operating mode
The temperature of the transported medium is 400 °C: • DUV400
- design version (•N)
- motor parameters* (•n/P)
n** – Motor Power Index
P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm)
- climatic version (•Y2)

NOTE:

*All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement.

** Motor Power Index - see Table 1.

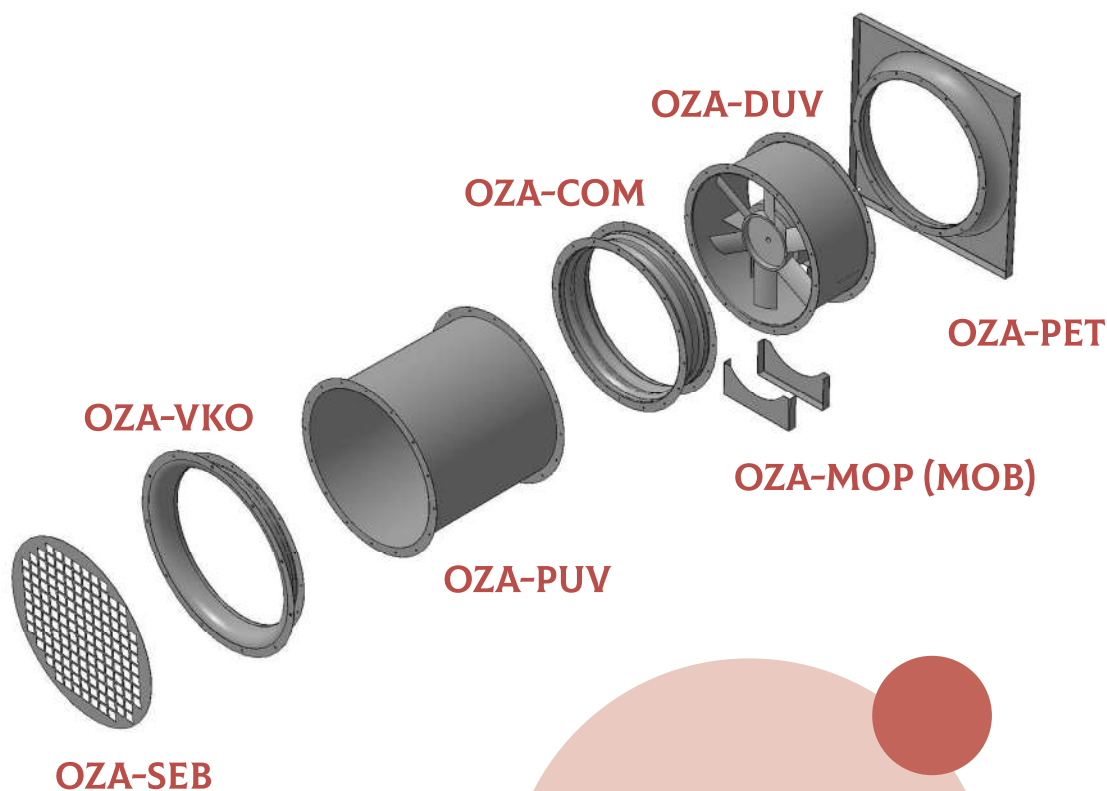
Special requirements for the fan are specified additionally and agreed with the manufacturer.

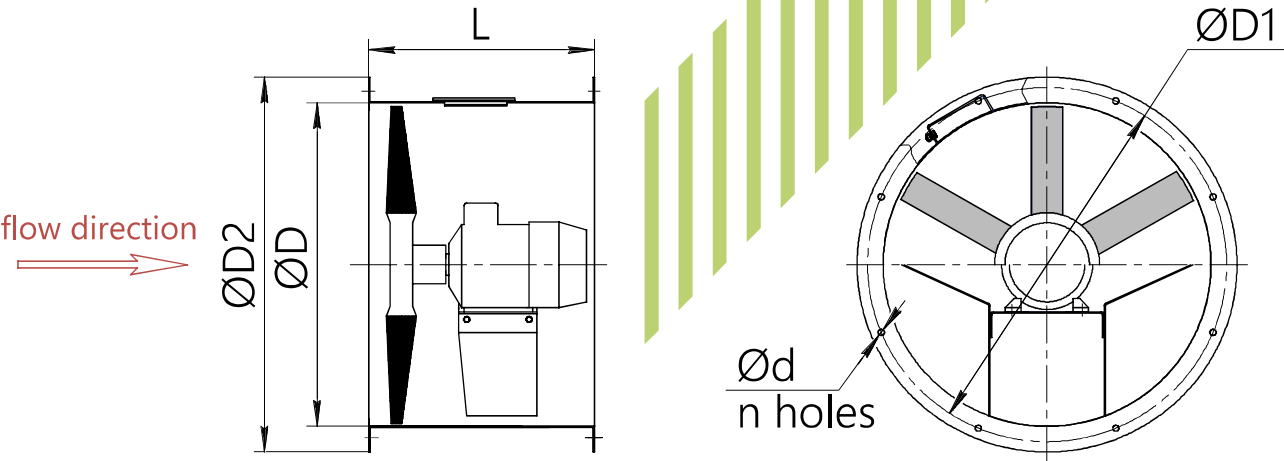
Additional equipment is ordered in separate items as an option (see the section "Additional equipment")

TABLE 1

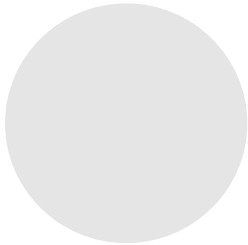
OZA-DUV

Motor rated power (N _{nom}), kW	1,1...7,5	11...90
motor power index (n)	00110...00750	01100...09000





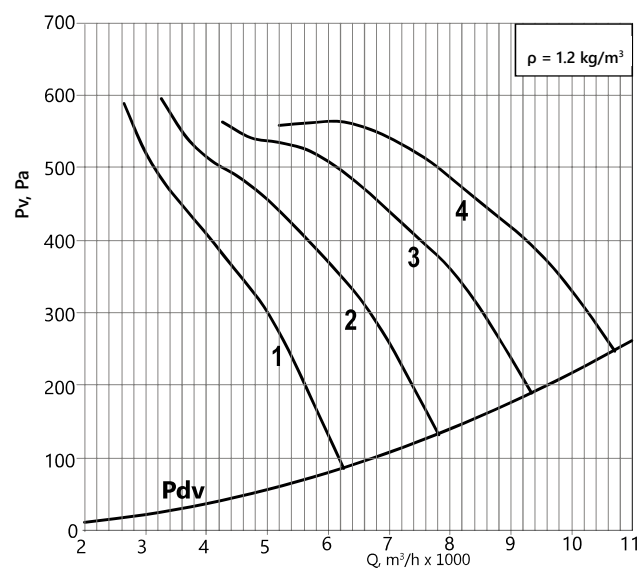
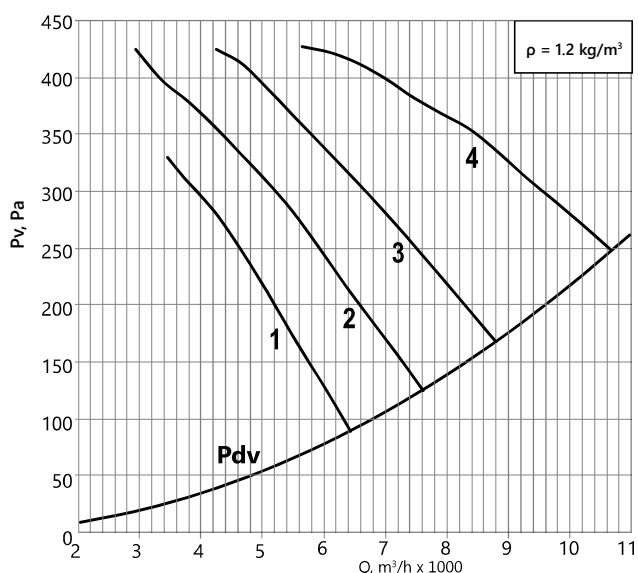
Fan standard size	Dimensions, mm								n, pcs	
	D	D ₁	D ₂	d	L					
					motor size					
					A71-A80	A90-A100	A112-A132	A160-A180		A200
045	450	480	510	12	440	510	625	815	950	8
050	500	530	560	12						12
056	560	620	660	12						12
063	630	690	730	12						12
071	710	770	810	12						16
080	800	860	900	14						16
090	900	960	1000	14						16
100	1000	1070	1100	14						16
112	1120	1195	1235	14						20



045

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	2,6	1,1	N	40	32,6	A71
2		2,6	1,1		45	32,6	A71
3		3,2	1,5		50	38,5	A80
4		4,6	2,2		60	42,5	A80

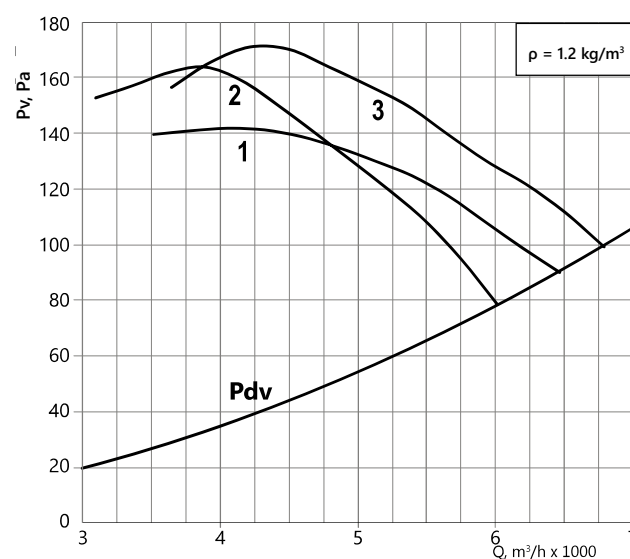
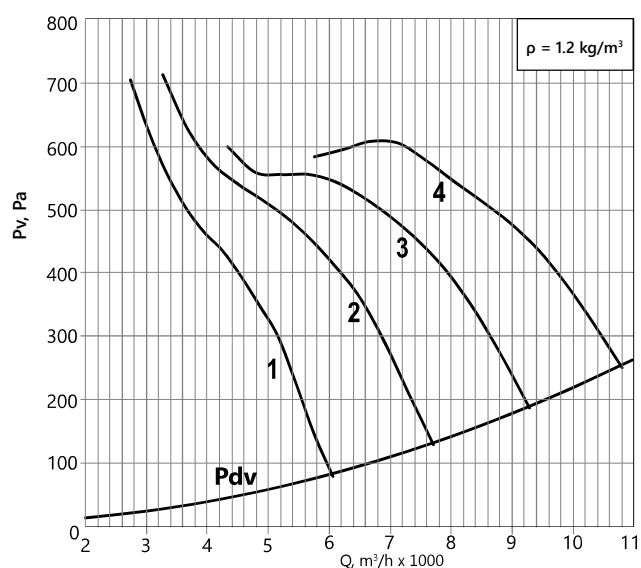
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	3,2	1,5	M	40	39,5	A80
2		4,6	2,2		45	43,5	A90
3		4,6	2,2		50	43,5	A90
4		6,5	3		55	50,4	A90



045

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	4,6	2,2	P	40	44,5	A80
2		4,6	2,2		45	44,5	A80
3		6,5	3		50	51,4	A90
4		6,5	3		55	51,4	A90

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	M	65	31,7	A71
2		1,5	0,55	P	60	32,2	A71
3		2,2	0,75	P	65	33,6	A71



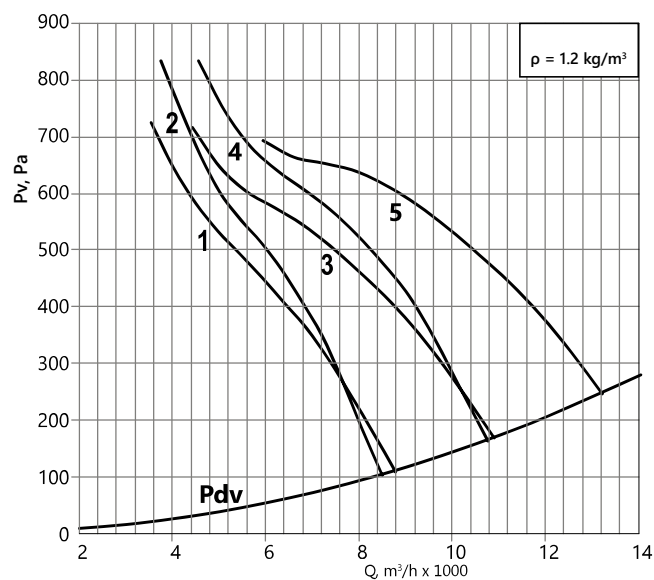
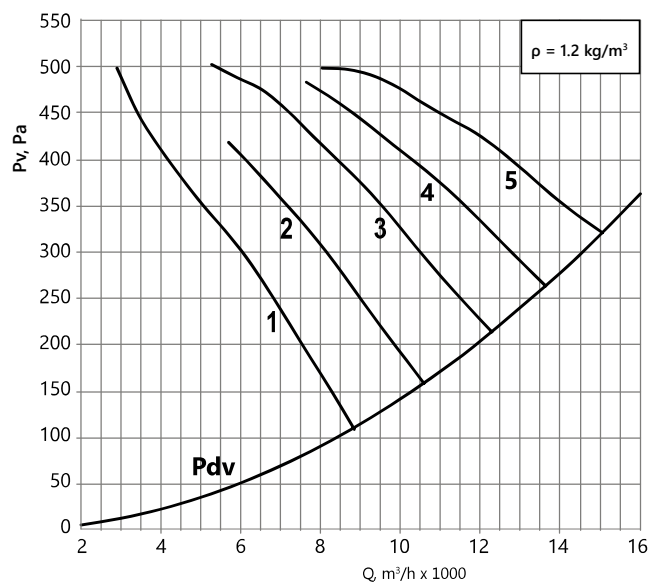
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

050

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	2,6	1,1	N	40	33,6	A71
2		3,2	1,5		45	39,5	A80
3		4,6	2,2		50	43,5	A80
4		6,5	3		55	52,4	A90
5		8,4	4		60	60	A100

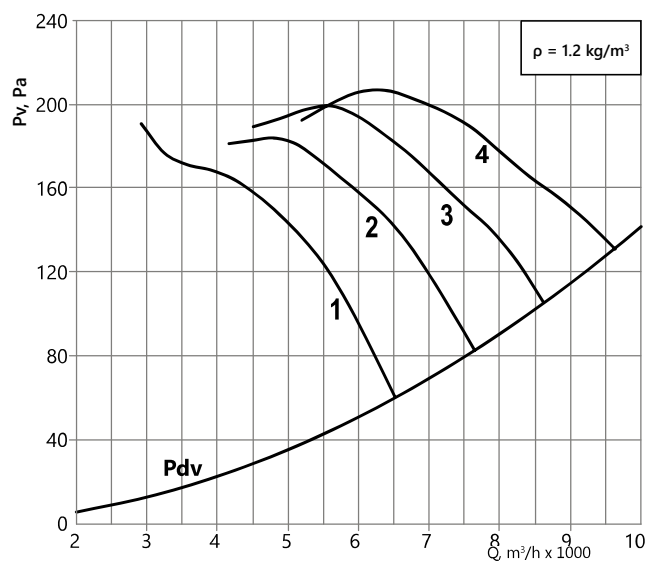
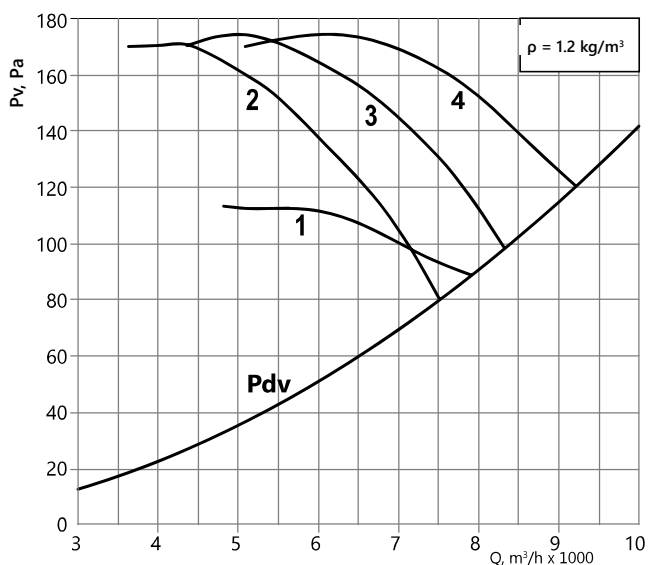
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	4,6	2,2	M	40	44,5	A80
2		6,5	3	P	40	52,4	A90
3		6,5	3	M	45	53,4	A90
4		6,5	3	P	45	52,4	A90
5		8,4	4	M	50	61	A100



050

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	N	65	31,2	A71
2		1,5	0,55		55	32,2	A71
3		2,2	0,75	M	60	33,6	A71
4		2,8	1,1		65	40	A80

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	P	50	33,2	A71
2		2,2	0,75		55	34,6	A71
3		2,8	1,1		60	41	A80
4		2,8	1,1		65	41	A80



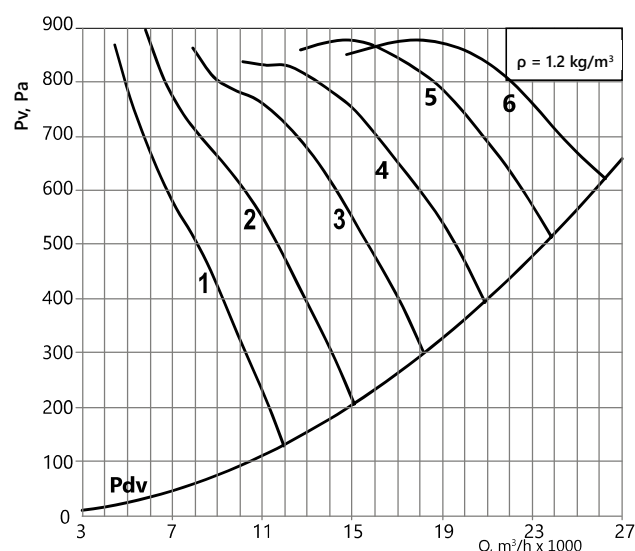
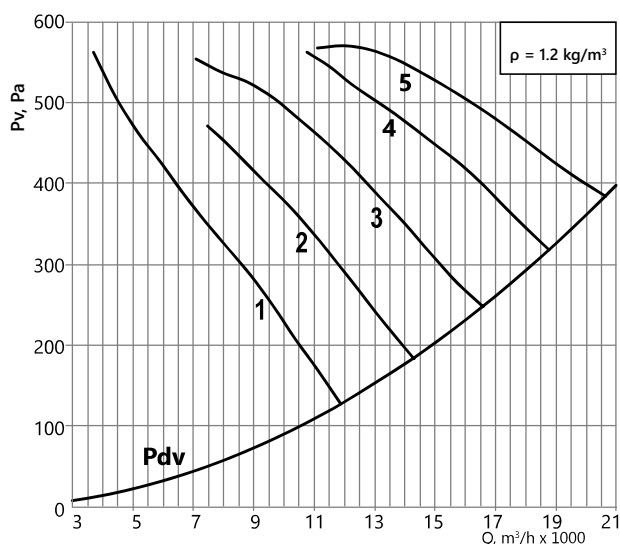
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

056

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	3,2	1,5	N	40	49,5	A80
2		4,6	2,2		45	53,5	A80
3		6,5	3		50	61,4	A90
4		8,4	4		55	69	A100
5		11	5,5		60	74	A100

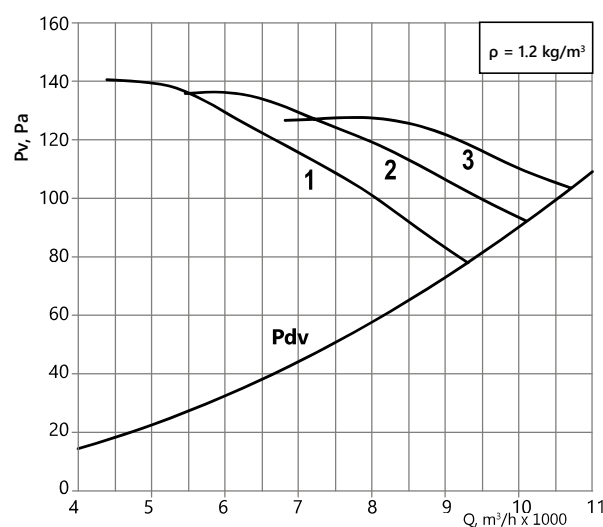
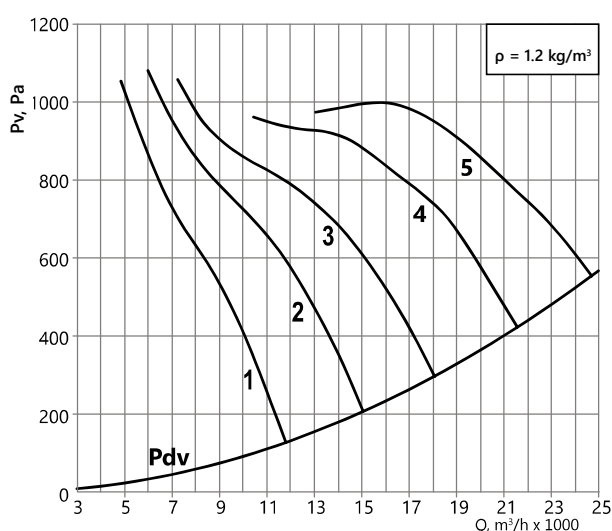
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	6,5	3	M	40	62,4	A90
2		8,4	4		45	70	A100
3		11	5,5		50	81	A100
4		14,7	7,5		55	92	A112
5		22	11		60	126	A132
6		22	11		65	126	A132



056

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	8,4	4	P	40	71	A100
2		11	5,5		45	82	A100
3		14,7	7,5		50	93	A112
4		22	11		55	127	A132
5		22	11		60	127	A132

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	N	55	42,2	A71
2		2,2	0,75		60	43,6	A71
3		2,2	0,75		65	43,6	A71



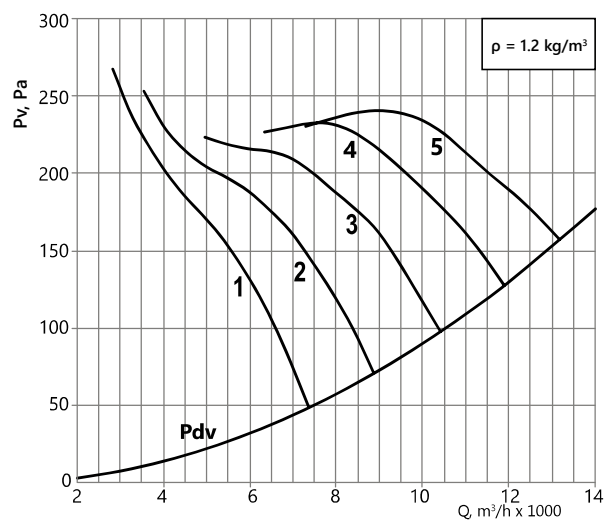
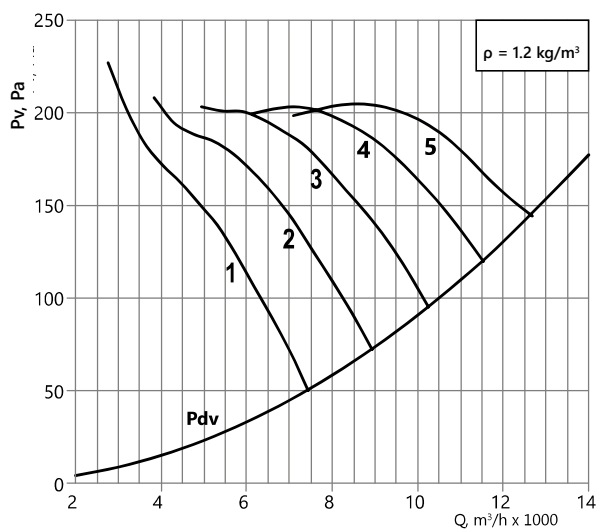
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

056

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	M	45	42,7	A71
2		2,2	0,75		50	44,1	A71
3		2,8	1,1		55	50,5	A80
4		2,6	1,1		60	50,5	A80
5		3,6	1,5		65	54	A80

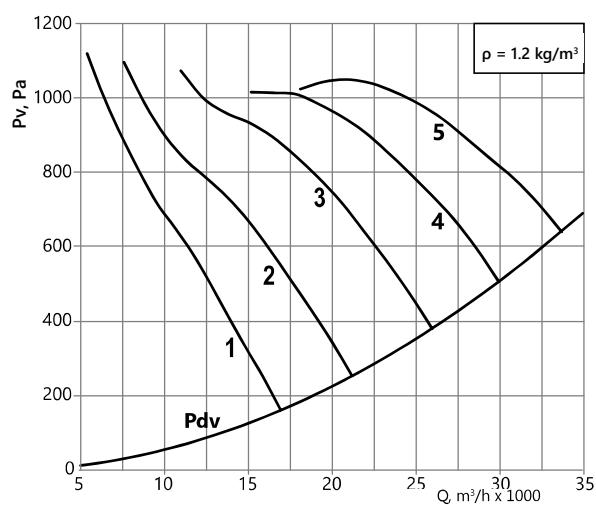
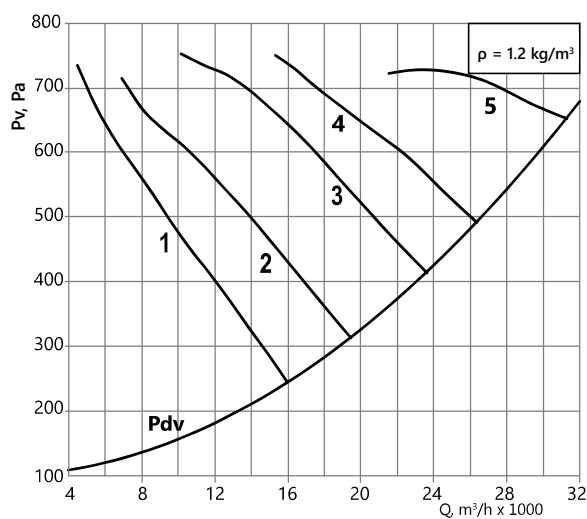
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	2,2	0,75	P	45	44,6	A71
2		2,2	0,75		50	44,6	A71
3		2,8	1,1		55	51	A80
4		3,6	1,5		60	54,5	A80
5		3,6	1,5		65	54,5	A80



063

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	4,6	2,2	N	40	51,5	A80
2		6,5	3		45	57,4	A90
3		11	5,5		50	70	A100
4		14,7	7,5		55	94	A112
5		22	11		65	128	A132

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	11	5,5	M	40	84	A100
2		14,7	7,5		45	95	A112
3		22	11		50	129	A132
4		22	11		55	129	A132
5		30	15		60	184	A160



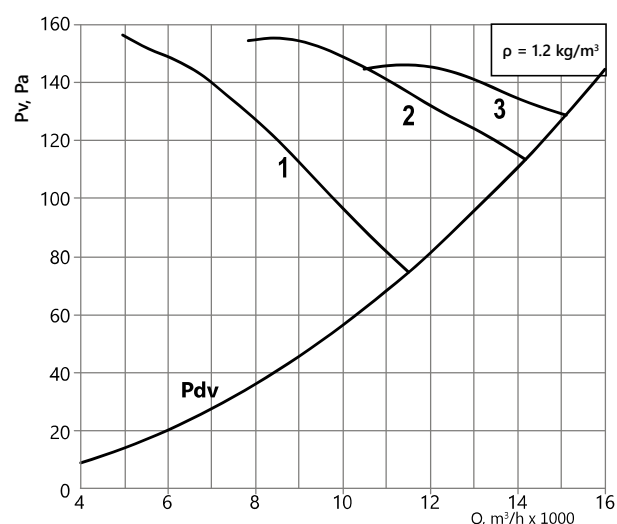
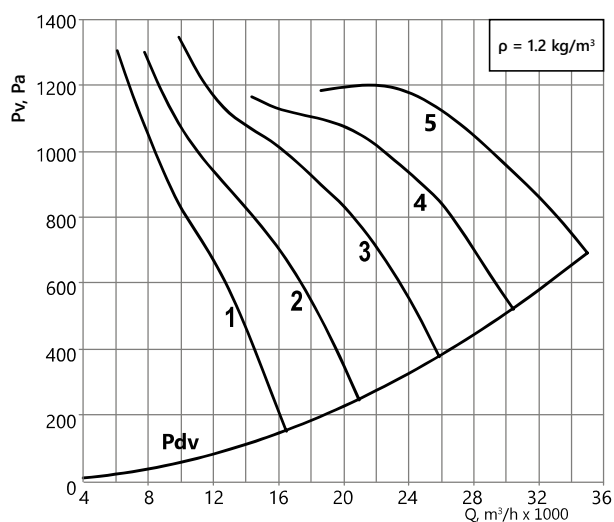
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

063

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impeller	α , deg	Weight, kg	Motor size
1	2	11	5,5	P	40	85	A100
2		14,7	7,5		45	96	A112
3		22	11		50	130	A132
4		30	15		55	185	A160
5		35	18,5		60	205	A160

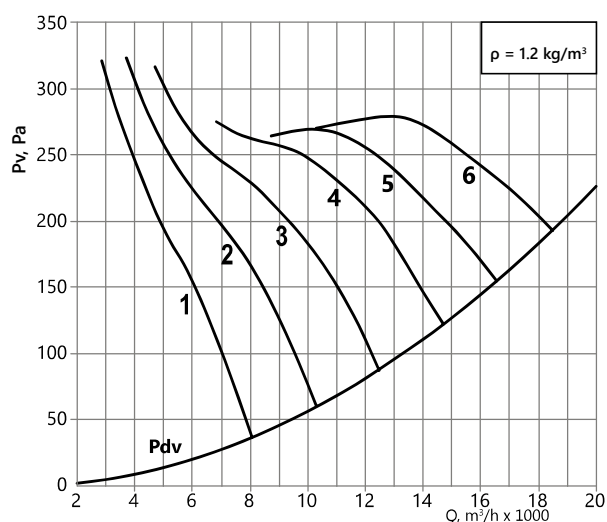
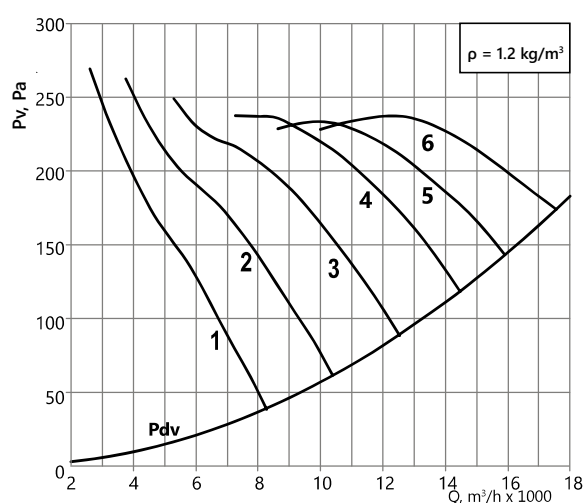
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impeller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	N	50	38,2	A71
2		2,8	1,1		60	46	A80
3		3,6	1,5		65	49,5	A80



063

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impeller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	M	40	39,2	A71
2		2,2	0,75		45	40,6	A71
3		2,8	1,1		50	47	A80
4		3,6	1,5		55	50,5	A80
5		5,1	2,2		60	58,5	A90
6		5,1	2,2		65	58,5	A90

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impeller	α , deg	Weight, kg	Motor size
1	4	2,2	0,75	P	40	41,6	A71
2		2,8	1,1		45	48	A80
3		3,6	1,5		50	51,5	A80
4		3,6	1,5		55	51,5	A80
5		5,1	2,2		60	59,5	A90
6		7,3	3		65	68,5	A100



additional equipment

weather protection hood
OZA-ZNT

inlet header
OZA-VKO

flexible connector
OZA-COM 400

flat adapter
OZA-PEP

toroidal adapter
OZA-PET

mounting support
OZA-MOP

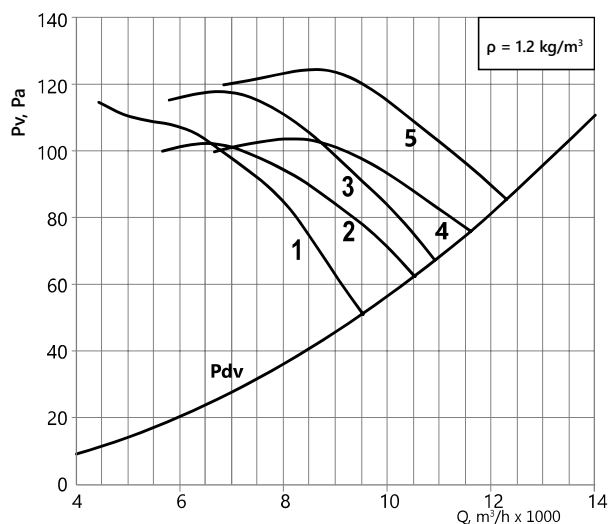
protective mesh
OZA-SEM (SEB)

counter flange
OZA-FOT

straight duct section
OZA-PUV

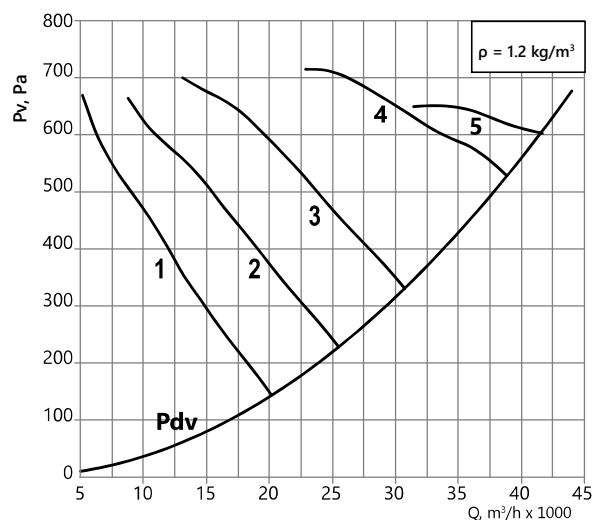
063

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	1,74	0,55	P	55	41,8	A71
2		1,74	0,55	M	60	40,8	A71
3		1,74	0,55	M	65	40,8	A71
4		1,74	0,55	P	60	41,8	A71
5		2,3	0,75	P	65	48,7	A80



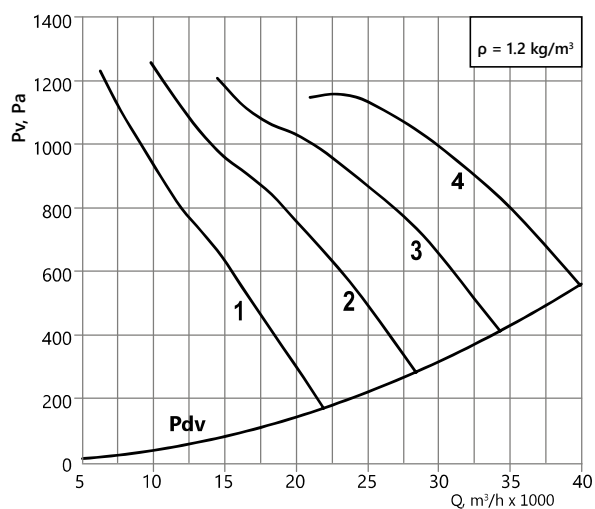
071

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	6,5	3	N	40	72,4	A90
2		8,4	4		45	80	A100
3		14,7	7,5		50	100	A112
4		22	11		60	134	A132
5		30	15		65	188	A160

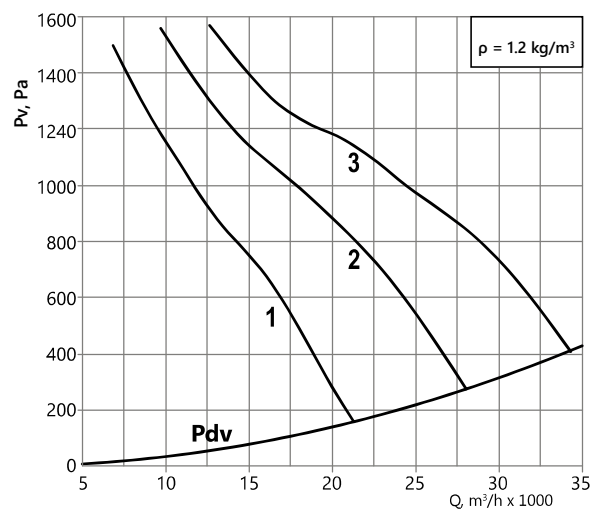


071

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	11	5,5	M	40	86	A100
2		22	11		45	135	A132
3		22	11		50	135	A132
4		35	18,5		55	209	A160



Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	2	14,7	7,5	P	40	102	A112
2		22	11		45	136	A132
3		30	15		50	190	A160



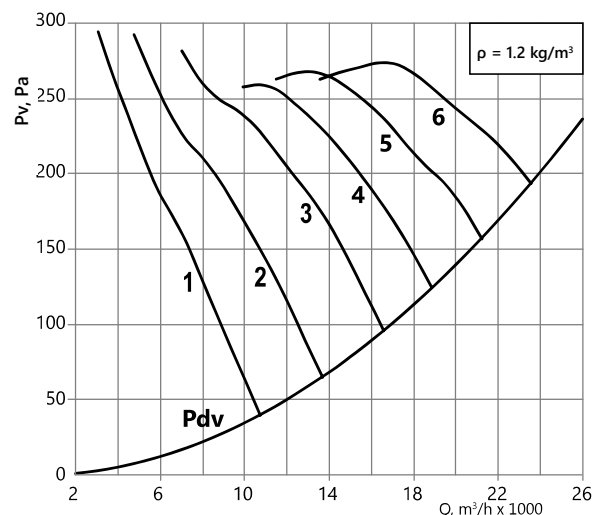
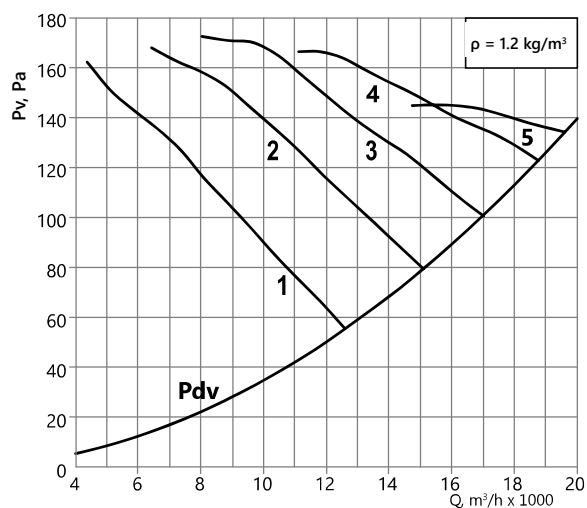
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

071

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	1,5	0,55	N	45	51,2	A71
2		2,2	0,75		50	52,6	A71
3		2,8	1,1		55	59	A80
4		3,6	1,5		60	62,5	A80
5		5,1	2,2		65	72	A90

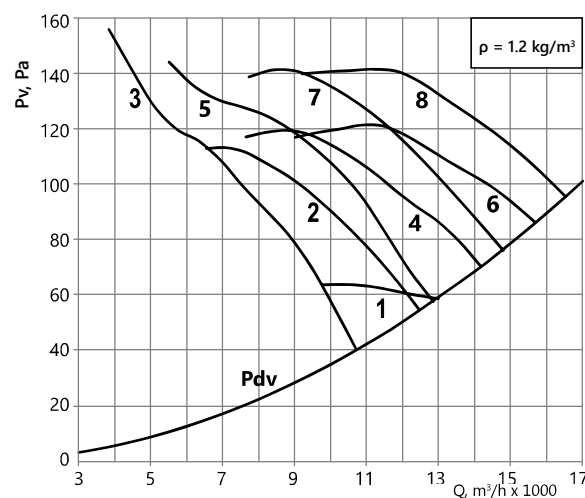
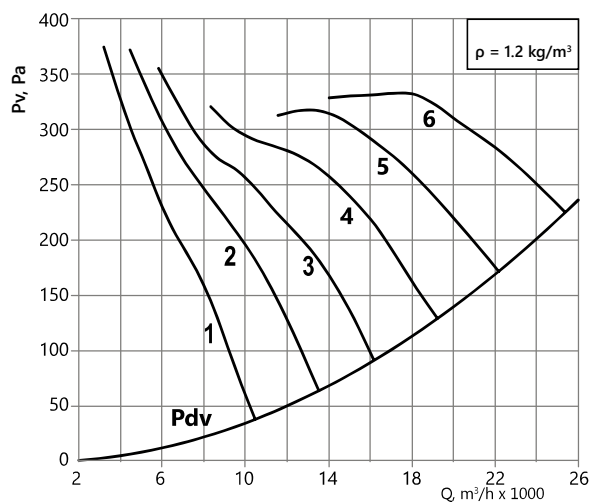
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	2,2	0,75	M	40	53,6	A71
2		2,8	1,1		45	60	A80
3		3,6	1,5		50	63,5	A80
4		5,1	2,2		55	73	A90
5		5,1	2,2		60	73	A90
6		7,3	3		65	82	A100



071

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	2,8	1,1	P	40	61	A80
2		3,6	1,5		45	64,5	A80
3		5,1	2,2		50	74	A90
4		5,1	2,2		55	74	A90
5		7,3	3		60	83	A100
6		8,6	4		65	86	A100

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	1,74	0,55	N	65	52,8	A71
2		1,74	0,55	M	55	54,3	A71
3		1,74	0,55	P	50	55,3	A71
4		2,3	0,75	M	60	61,2	A80
5		2,3	0,75	P	55	62,2	A80
6		3,2	1,1	M	65	64,5	A80
7		3,2	1,1	P	60	65,5	A80
8		3,2	1,1	P	65	65,5	A80



additional equipment

weather protection hood
OZA-ZNT

inlet header
OZA-VKO

flexible connector
OZA-COM 400

flat adapter
OZA-PEP

toroidal adapter
OZA-PET

mounting support
OZA-MOP

protective mesh
OZA-SEM (SEB)

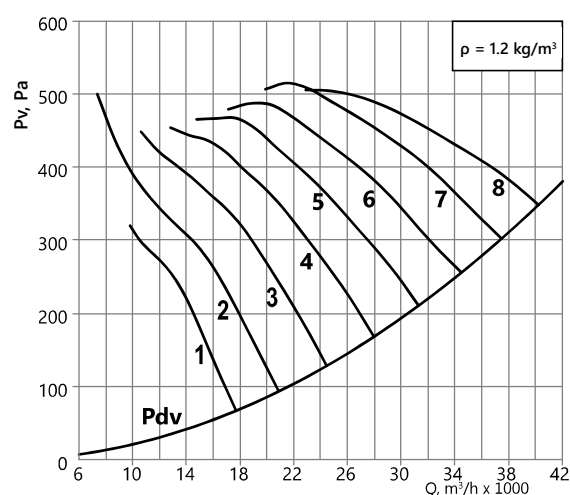
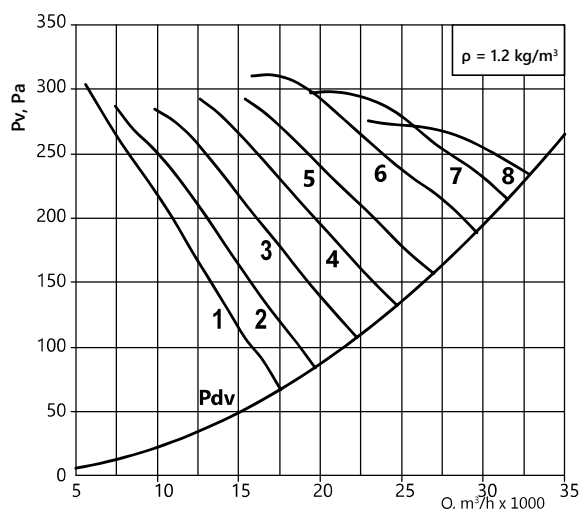
counter flange
OZA-FOT

straight duct section
OZA-PUV

080

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	3,6	1,5	A	40	71,5	A80
2		5,1	2,2		44	83	A90
3		5,1	2,2		48	83	A90
4		7,3	3		52	92	A100
5		8,6	4		56	95	A100
6		8,6	4		60	95	A100
7		11,7	5,5		64	119	A112
8		11,7	5,5		68	119	A112

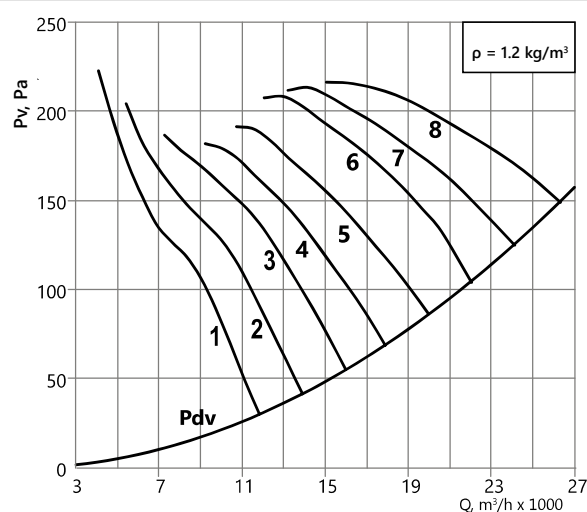
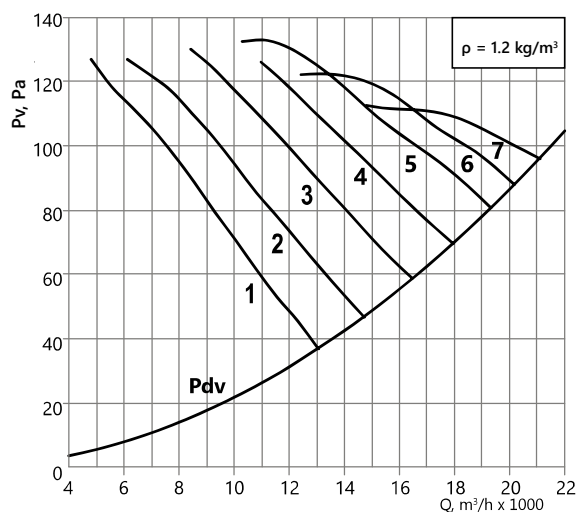
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	5,1	2,2	B	40	86	A90
2		7,3	3		44	95	A100
3		8,6	4		48	98	A100
4		11,7	5,5		52	122	A112
5		15,6	7,5		56	143	A132
6		15,6	7,5		60	143	A132
7		23	11		64	155	A132
8		23	11		68	155	A132



080

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	1,74	0,55	A	44	61,8	A71
2		1,74	0,55		48	61,8	A71
3		2,3	0,75		52	68,7	A80
4		3,2	1,1		56	72	A80
5		3,2	1,1		60	72	A80
6		4,1	1,5		64	83	A90
7		4,1	1,5		68	83	A90

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	2,3	0,75	B	40	71,7	A80
2		3,2	1,1		44	75	A80
3		3,2	1,1		48	75	A80
4		4,1	1,5		52	86	A90
5		4,1	1,5		56	86	A90
6		5,8	2,2		60	99	A100
7		5,8	2,2		64	99	A100
8		7	3		68	113	A112



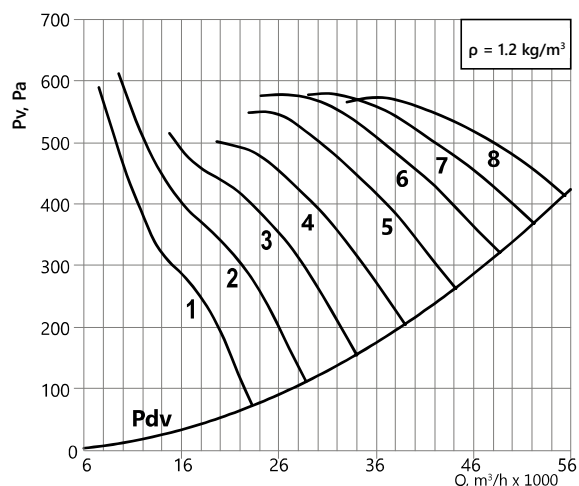
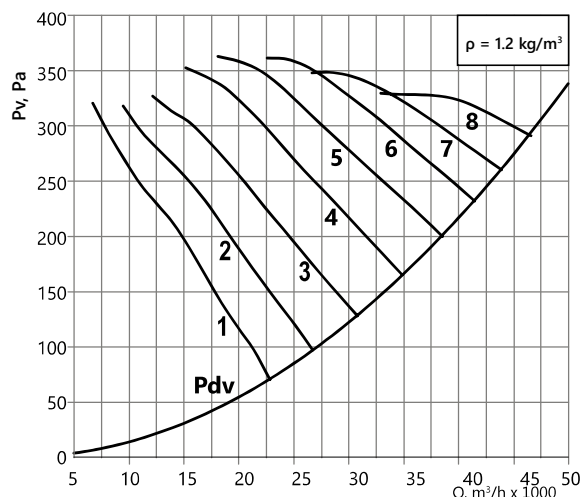
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

090

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	5,1	2,2	A	40	86	A90
2		5,1	2,2		44	86	A90
3		7,3	3		48	95	A100
4		8,6	4		52	98	A100
5		11,7	5,5		56	125	A112
6		15,6	7,5		60	146	A132
7		15,6	7,5		64	146	A132
8		23	11		68	158	A132

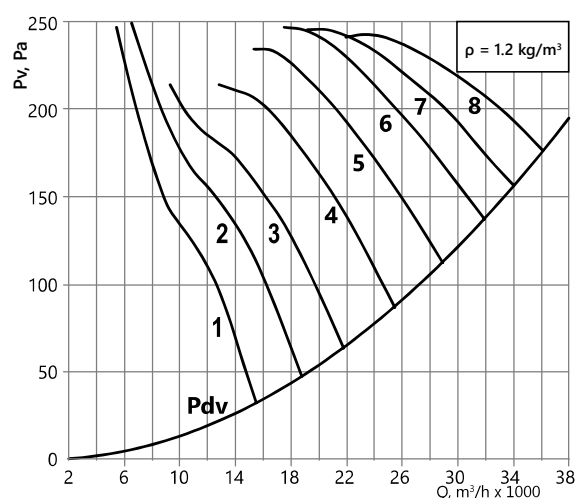
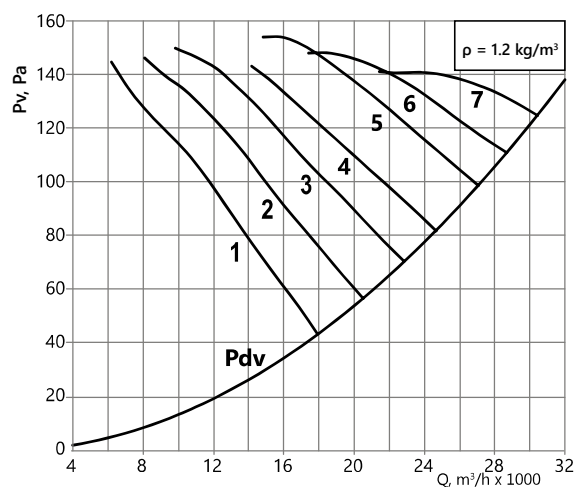
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	7,3	3	B	40	99	A100
2		8,6	4		44	102	A100
3		11,7	5,5		48	129	A112
4		15,6	7,5		52	150	A132
5		23	11		56	162	A132
6		23	11		60	162	A132
7		31	15		64	236	A160
8		31	15		68	236	A160



090

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	2,3	0,75	A	44	72,7	A80
2		3,2	1,1		48	76	A80
3		3,2	1,1		52	76	A80
4		4,1	1,5		56	86	A90
5		5,8	2,2		60	99	A100
6		5,8	2,2		64	99	A100
7		7	3		68	116	A112

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	3,2	1,1	B	40	80	A80
2		3,2	1,1		44	80	A80
3		4,1	1,5		48	90	A90
4		5,8	2,2		52	103	A100
5		7	3		56	120	A112
6		7	3		60	120	A112
7		9	4		64	124	A112
8		9	4		68	124	A112



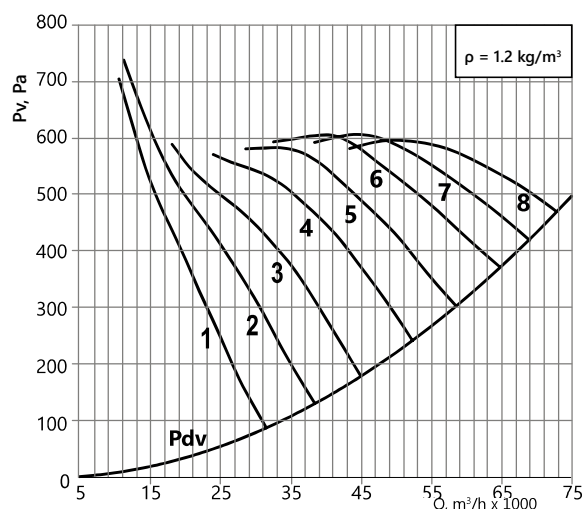
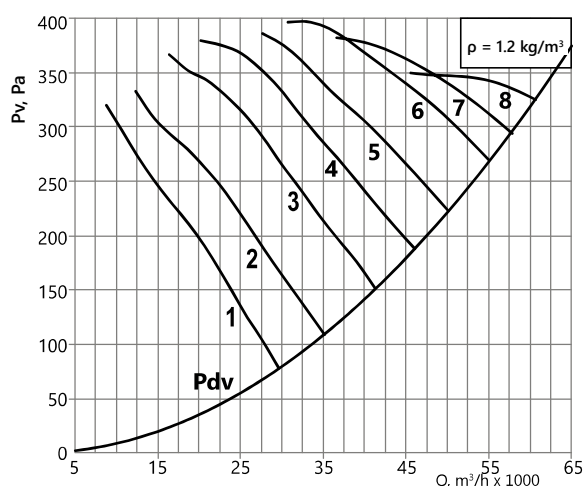
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

100

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	5,1	2,2	A	40	102	A90
2		7,3	3		44	111	A100
3		11,7	5,5		48	137	A112
4		11,7	5,5		52	137	A112
5		15,6	7,5		56	158	A132
6		23	11		60	170	A132
7		23	11		64	170	A132
8		31	15		68	238	A160

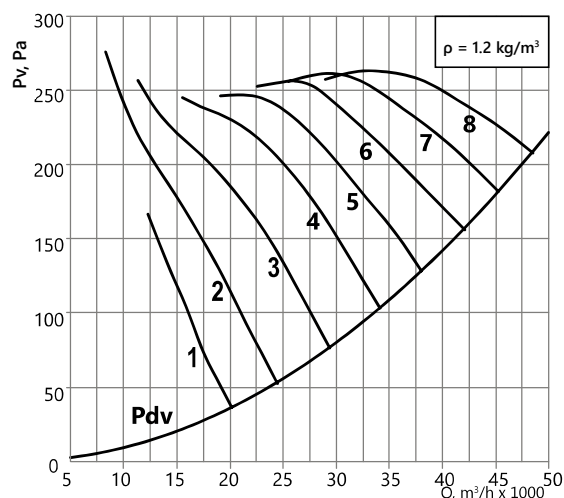
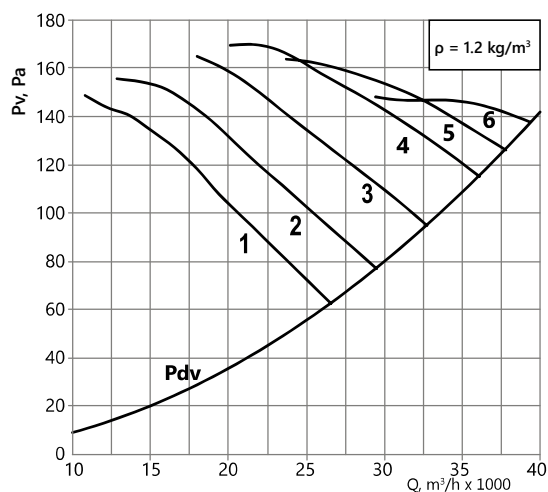
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	11,7	5,5	B	40	142	A112
2		15,6	7,5		44	163	A132
3		15,6	7,5		48	163	A132
4		23	11		52	175	A132
5		31	15		56	243	A160
6		31	15		60	243	A160
7		36	18,5		64	247	A160
8		44	22		68	282	A180



100

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	4,1	1,5	A	48	102	A90
2		4,1	1,5		52	102	A90
3		5,8	2,2		56	115	A100
4		7	3		60	128	A112
5		7	3		64	128	A112
6		9	4		68	132	A112

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	4,1	1,5	B	40	107	A90
2		4,1	1,5		44	107	A90
3		5,8	2,2		48	120	A100
4		7	3		52	133	A112
5		9	4		56	137	A112
6		9	4		60	137	A112
7		12	5,5		64	162	A132
8		18	7,5		68	174	A132



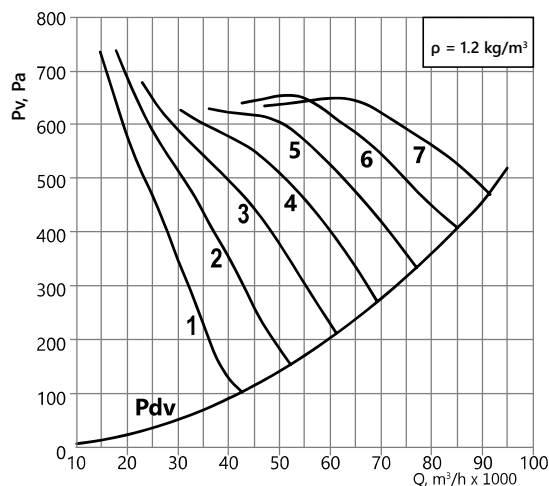
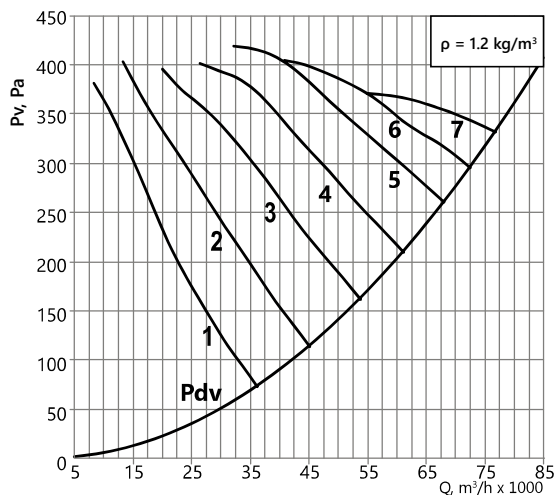
additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

112

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	7,3	3	A	40	129	A100
2		8,6	4		44	132	A100
3		11,7	5,5		48	150	A112
4		15,6	7,5		52	171	A132
5		23	11		56	183	A132
6		31	15		60	278	A160
7		31	15		64	278	A160

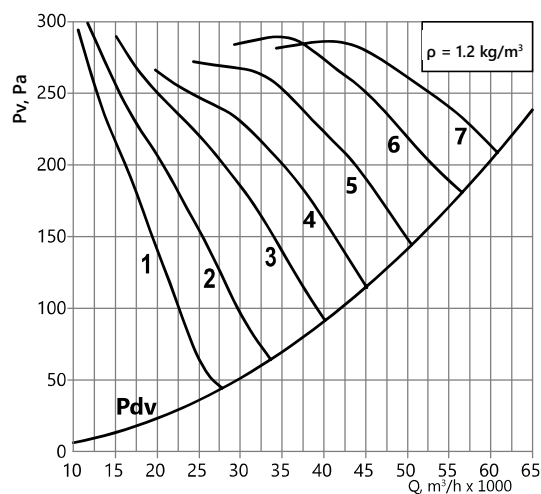
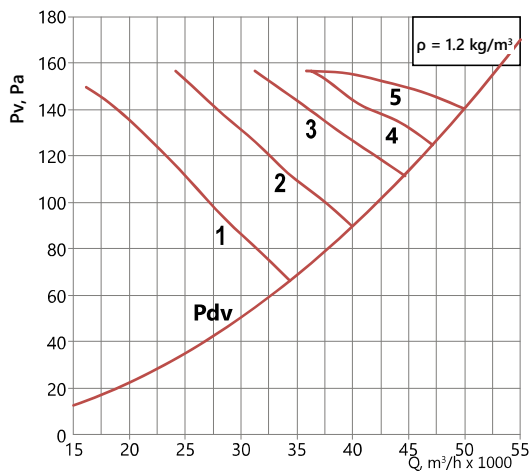
Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	4	15,6	7,5	B	5-40	176	A132
2		23	11		5-44	188	A132
3		23	11		5-48	188	A132
4		31	15		5-52	278	A160
5		36	18,5		5-56	282	A160
6		44	22		5-60	317	A180
7		56	30		5-64	330	A180



112

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	4,1	1,5	A	48	117	A90
2		5,8	2,2		52	134	A100
3		7	3		56	142	A112
4		9	4		60	146	A112
5		9	4		64	146	A112

Curve number	Number of poles	Current at 380 V, A	Nnom, kW	Impe-ller	α , deg	Weight, kg	Motor size
1	6	5,8	2,2	B	40	140	A100
2		5,8	2,2		44	140	A100
3		7	3		48	148	A112
4		9	4		52	152	A112
5		12	5,5		56	177	A132
6		18	7,5		60	189	A132
7		18	7,5		64	189	A132



additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM 400	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

INSULATED AXIAL SMOKE EXTRACTION FANS

OZA-LR, OZA-LW

- new systems for removing exhaust air and smoke from buildings during a fire;
- cost-effective solution to prevent heat loss in buildings;
- the systems are designed specifically to remove gases and combustion products generated during a fire and simultaneously remove heat outside the serviced premises or for the purpose of fire-fighting operations, rescuing people and equipment;
- two designs according to the mounting method:
 - LR - for roof mounting
 - LW - for wall mounting



- 400° C
- 120 MIN

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112

The OZA-LR, OZA-LW fans are a new development of a system for removing exhaust air and smoke from buildings in case of fire.

Structurally, axial fans with a smoke vent consist of a specially insulated and waterproof housing, an impeller and a special-type motor. The main advantage of the system over standard roof fans is significantly lower heat loss due to the fully insulated housing and airtight smoke vent. In addition, the waterproof housing design prevents water from entering the system. The smoke vent is opened by special electric actuators that remain operational under simultaneous snow and wind loads. The electric drive supply voltage is 24V.

For ease of use, two design versions have been developed based on the installation method:

- for roof mounting (LR). This version has an integrated support structure, eliminating the need for additional installation of special roof curbs..
- for wall mounting (LW). The use of this design allows the use of one unit instead of two: a separate fan and damper.

The "freezing protection of the cover" option guarantees free opening of the fan cover at any time of the year, regardless of the humidity of the outside air and temperature fluctuations.

The following fan versions have been developed based on their intended use:

- DU systems - flue gas removal in case of fire. The fans can handle gases at a temperature of 400°C for 120 minutes.
- DUV systems. In addition to operating in emergency mode, the fans can be used for long-term operation in combined smoke extraction and ventilation mode.
- PV design version - for exhaust ventilation systems.
- PD design version - for smoke control pressurization ventilation.

- general purpose industrial (N)
- corrosion-resistant (CR1)

OPERATING CONDITIONS

(except for operation in smoke extraction mode)

The fans are designed for conveying air and other non-aggressive gas mixtures that do not cause accelerated corrosion of the materials and coatings of the fan's flow section and do not contain explosive substances, abrasive dust, sticky, or fibrous materials. The content of dust and other solid impurities in the transported medium is not higher than 100 mg/m³.

Operating conditions:

- ambient temperature
 - from -45 °C to +40 °C for temperate climate, Y1
- the root-mean-square value of vibration velocity of external vibration sources at fan installation locations should not exceed 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

EXAMPLE:

OZA-LR insulated axial smoke extraction fan for installation on the roof; standard size 080, modification L; blade angle 50, operating mode: exhaust ventilation, motor rated power $N_{nom} = 3.0$ kW, number of poles 4, general industrial design; additional coating RAL 3015, freezing protection of the cover, energy efficiency class of the electric motor IE3.

OZA-LR-080/L-50-PV-00300/4-N/7024-Z-IE3

- smoke extraction fan (• LR - roof-mounted; • LW - wall-mounted)
- standard fan size (•040* •045 •050 •056 •063 •071 •080 •090 •100 •112)
- modification of the impeller (•A •B •C •D •E •I •L •M •P •R •S •T)
- impeller blade angle α , deg (•40... •70)
- application
 - DU400 - smoke extraction;
 - DUV400 - smoke extraction and ventilation;
 - PV - exhaust ventilation;
 - PD - for pressurization
- motor parameters** (•n/P)
 - n*** – Motor Power Index
 - P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm)
- design version (•N •CR1)
- additional coating - specify the color according to the RAL catalog (to be specified if necessary)
- additional equipment (to be specified if necessary)
 - Z - freezing protection of the cover
- the energy efficiency class of the electric motor (IE1 standard; specify if different from the standard)

NOTE:

* only for the pressurization fan;

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement;

*** Motor Power Index - see Table 1.

Special requirements for the fan are specified additionally and agreed with the manufacturer.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment")

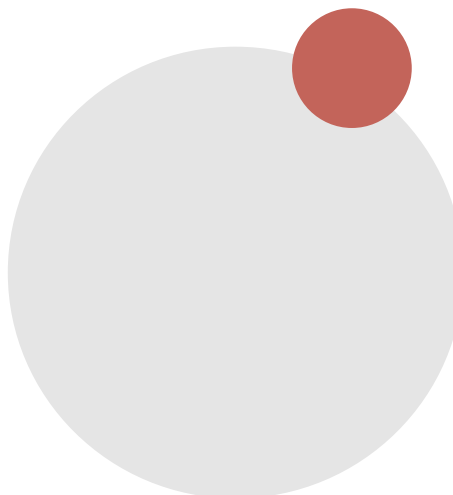
TABLE 1

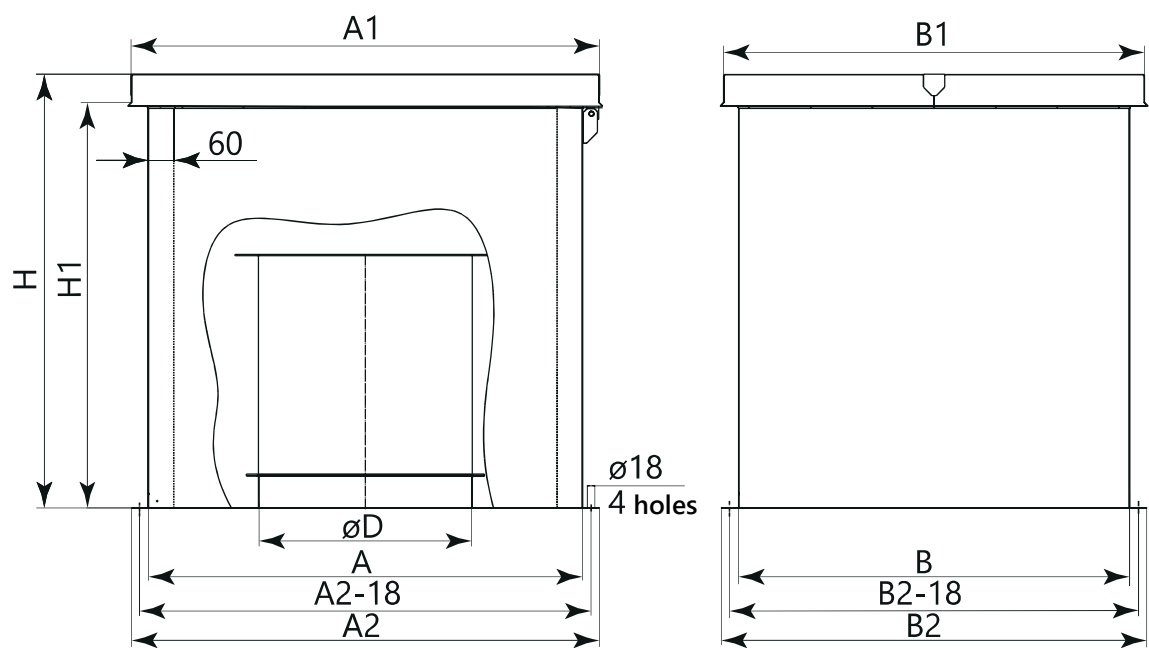
OZA-LR, OZA-LW

Motor rated power (N_{nom}), kW	1,1...7,5	11...90
motor power index (n)	00110...00750	01100...09000

To select a fan, it is necessary to select a fan for the appropriate purpose (pressurization, smoke extraction, exhaust general industrial*) and enter the appropriate impeller modification indexes, blade angle, motor parameters in the OZA-LR or OZA-LW fan marking.

* from the catalog OZA 300, OZA 301 AXIAL FANS.





Fan standard size	Dimensions, mm									Weight, kg max
	D	H	H1	A	A1	A2	B	B1	B2	
040	400	1000	940	1022	1100	1100	920	990	1000	157
045	450									165
050	500									174
056	560									240
063	630			1222	1295	1300	1122	1195	1200	336
071	710									340
080	800									286
090	900	1290	1230	1420	1492	1500	1320	1392	1400	386
100	1000									432
112	1120			1700	1750	1780	1700	1775	1780	530

AF-DU

AXIAL SMOKE EXTRACTION FANS



• 400° C • 600° C
• 120 MINUTES

➤ designed to remove gases generated during a fire and simultaneously remove heat outside the serviced room or building in order to carry out fire fighting, rescue people and equipment.

•040 •050 •063 •071 •080 •090 •100 •112 •125

AF-DU fans consist of a casing, an impeller, an electric motor, and a protective enclosure.

High-pressure and high-flow fans have a significant proportion of dynamic pressure in the total pressure generated. To reduce pressure losses in the network sections adjacent to the outlet section of the fan, and especially in the absence of a network at the outlet, it is recommended to install an outlet channel with a guide apparatus behind the fan (configuration 02 and 04). At the same time, the dynamic pressure of the fan is reduced by almost 2.5 times.

The impeller features a large relative hub diameter, representing 70% of the impeller diameter, which is due to the large motor dimensions and the presence of a protective enclosure. A distinctive feature of AF-DU fans is the ability to set the impeller blades at different angles, allowing a fan with a single impeller diameter to cover a wide range of operating modes. The fans have four configurations differing in the mounting of the shell and the presence of a guide apparatus (GA): GA and rack are absent (configuration 01); GA is present, rack is absent (configuration 02); GA is absent, rack is present (configuration 03); GA and rack are present (configuration 04). All fan components have a protective and decorative paint coating.

If there is no duct network at the inlet, an inlet header must be installed in front of the fan (see the "Additional Equipment" section of the catalog).

➤ general purpose industrial (N)

OPERATING CONDITIONS

The fans must be installed outside the serviced area and beyond zones of permanent human occupancy. When installing the fan, there must be straight sections of the duct in front of and behind it with a diameter equal to the diameter D of the impeller and a length of at least 4D in front of the fan and 2D behind the fan. Fans can be operated in temperate (Y) and tropical (T) climates of the 2nd placement category according to GOST 15150.

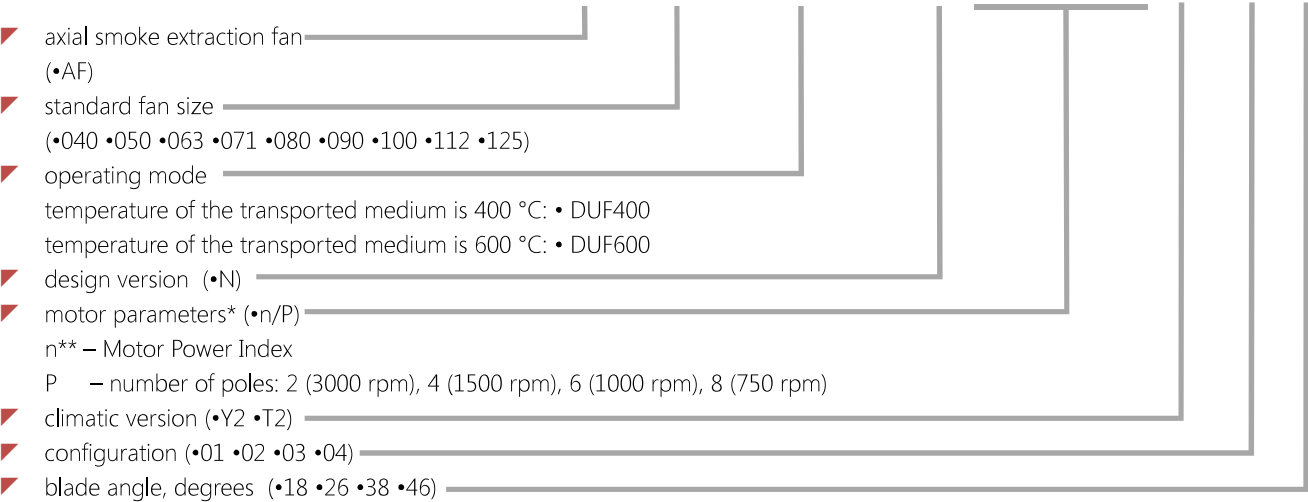
Operating conditions:

- ambient temperature
 - from -45 °C to +40 °C for temperate climate,
 - from -10 °C to +50 °C for tropical climate;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

EXAMPLE:

AF smoke extraction fan; standard size 040, DUF600 operating mode; general industrial design; motor rated power Nnom – 0,18 kW; number of poles 4; climatic version Y2; configuration 02 (with guide apparatus, without rack); blade angle 26°:

AF-040-DUF600-N-00018/4-Y2-02-26



NOTE:

* Всі двигуни за замовчуванням постачаються з напругою живлення 380 В, 50 Гц, прямий пуск, виконання на іншу напругу і способи підключення за спеціальним погодженням. Пуск двигуна від 15 кВт повинен виконуватися із застосуванням софт стартера MCD.

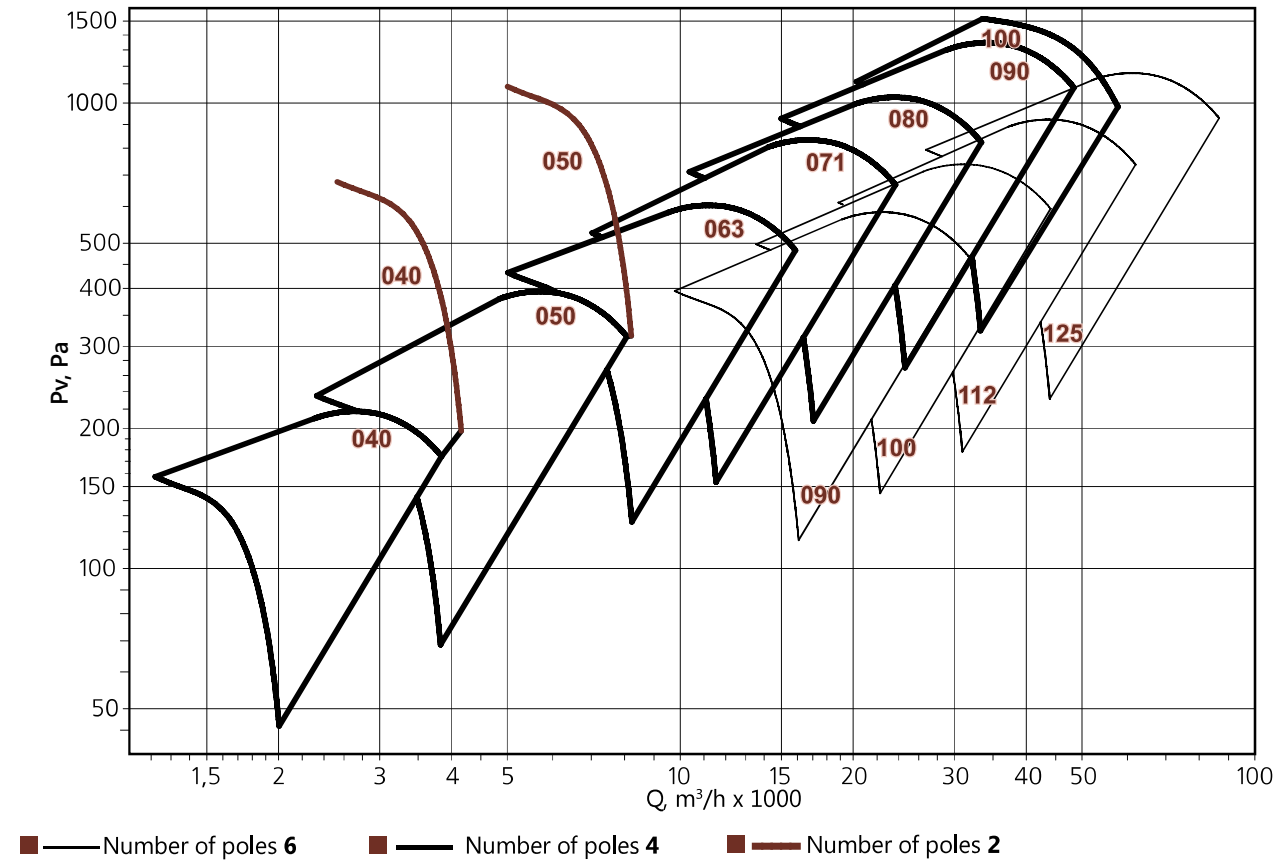
** Індекс потужності - див. таблицю 1.

Спеціальні вимоги до вентилятора вказуються додатково і узгоджуються з виробником.

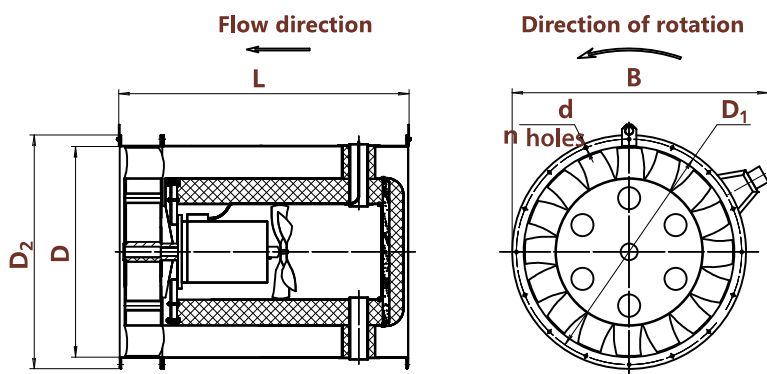
TABLE 1

AF-DU

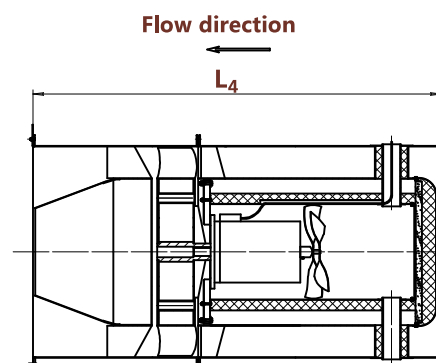
Motor rated power (Nnom), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n)	00018...00075	00110...00750	01100...09000



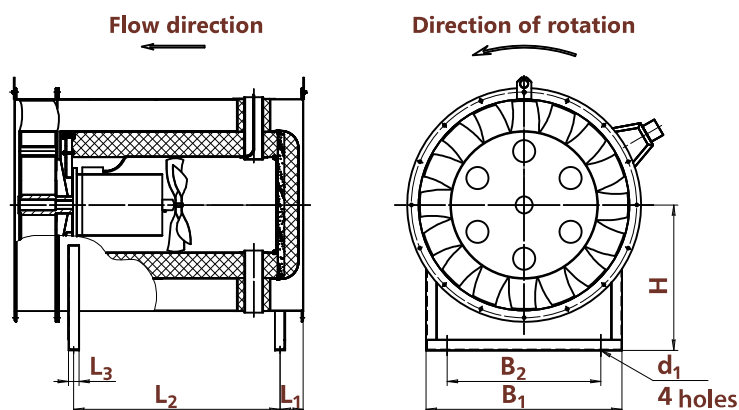
CONFIGURATION 01



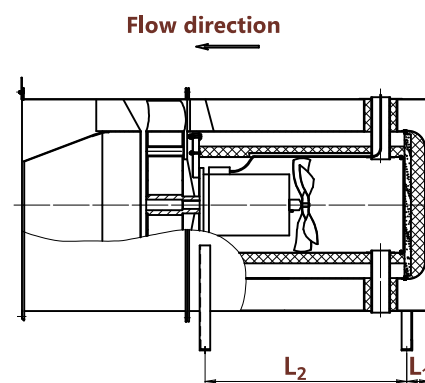
CONFIGURATION 02



CONFIGURATION 03



CONFIGURATION 04



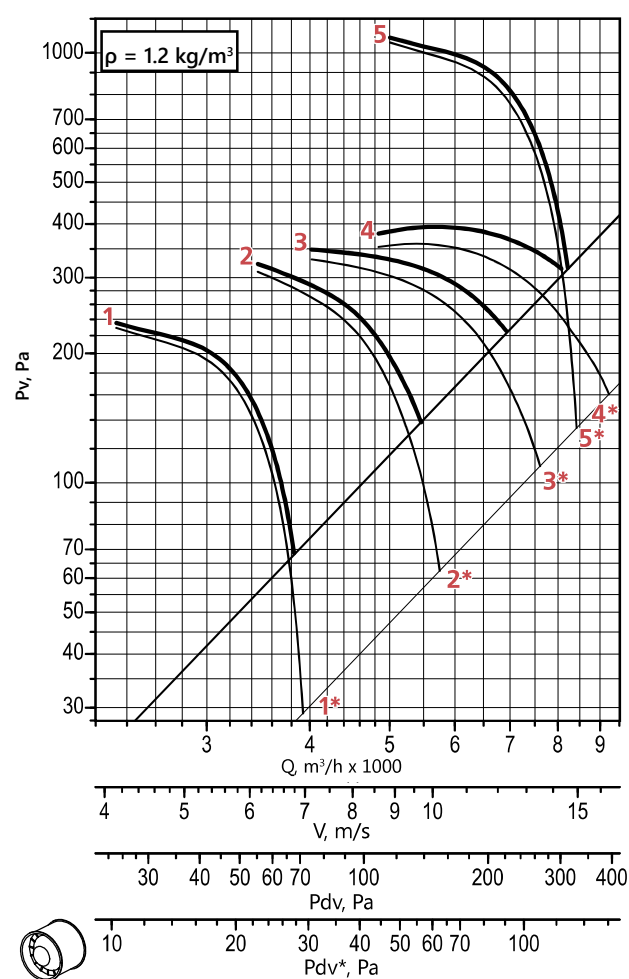
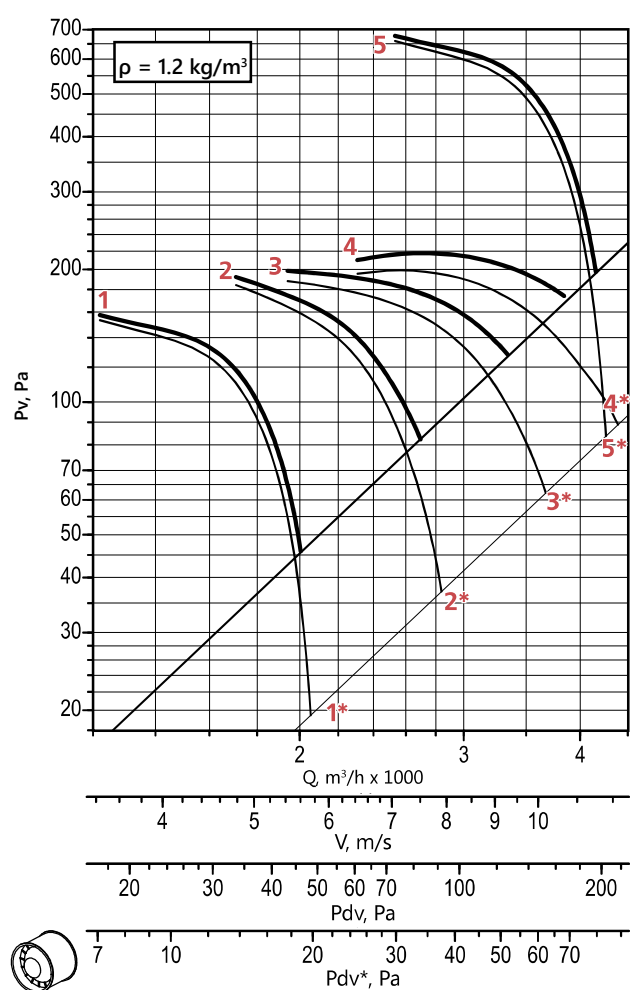
Fan standard size	Dimensions, mm														n
	D	D ₁	D ₂	L	L ₁	L ₂	L ₃	L ₄	H	B	B ₁	B ₂	d	d ₁	
040	400	450	497	620	45	420	32	895	290	625	350	300	12	12	8
050	500	560	584	800	55	570	50	1220	360	725	440	360	12	12	12
063	630	690	737	910	55	655	50	1475	450	854	600	440	12	12	12
071	710	770	795	1020	55	745	50	1605	500	976	690	545	12	12	16
080	800	860	900	1120	60	820	50	1875	560	1020	760	610	12	12	16
090	900	960	1005	1370	55	1040	50	2270	650	1150	850	650	14	14	16
100	1000	1070	1110	1370	55	1040	50	2270	690	1215	930	730	14	14	16
112	1120	1195	1235	1465	95	1040	63	2540	790	1370	930	730	14	18	20
125	1250	1320	1350	1500	130	1240	63	2470	790	1495	990	790	14	18	20

040

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	4	0,73	0,18	64	80	66	82
2	26	4	0,73	0,18	64	80	66	82
3	38	4	0,83	0,25	64	81	66	83
4	46	4	1,18	0,37	65	82	67	84
5	18	2	2,4	1,1	69	86	71	88

050

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	4	1,18	0,37	103	128	109	134
2	26	4	1,5	0,55	105	130	111	136
3	38	4	2,2	0,75	106	131	113	138
4	46	4	2,6	1,1	109	133	115	140
5	18	2	6,5	3	116	140	122	147



* - characteristics of the fan with an outlet channel (configuration 02, 04)

P_{dv} , Pa — the scale of the dynamic pressure of the fan when the outlet channel is installed with a guide apparatus

NOTE:

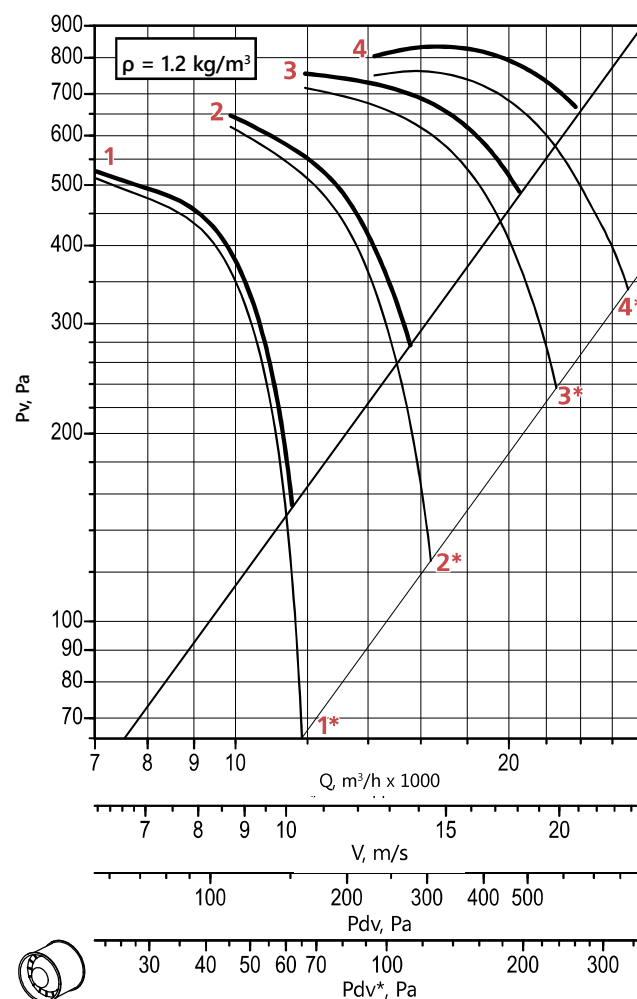
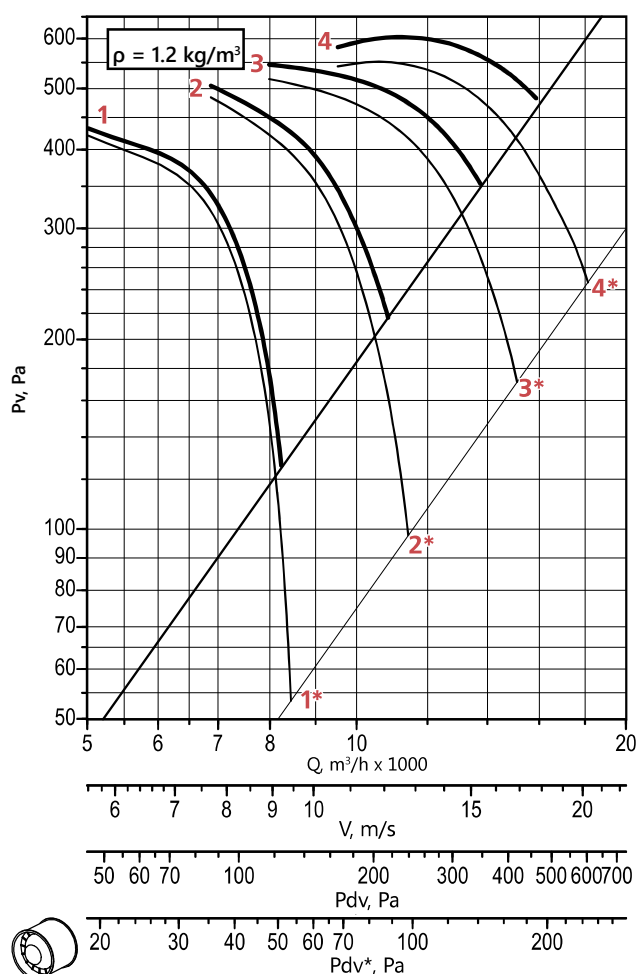
The dynamic pressure is calculated based on the average velocity in the annular area of the outlet cross-section.

063

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	4	2,6	1,1	128	178	147	187
2	26	4	5,1	2,2	145	185	154	193
3	38	4	5,1	2,2	144	184	153	192
4	46	4	7,3	3	149	189	158	197

071

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	4	5,1	2,2	184	233	194	243
2	26	4	7,3	3	189	238	199	248
3	38	4	11,7	5,5	204	253	215	264
4	46	4	15,6	7,5	219	268	230	279



* - characteristics of the fan with an outlet channel (configuration 02, 04)

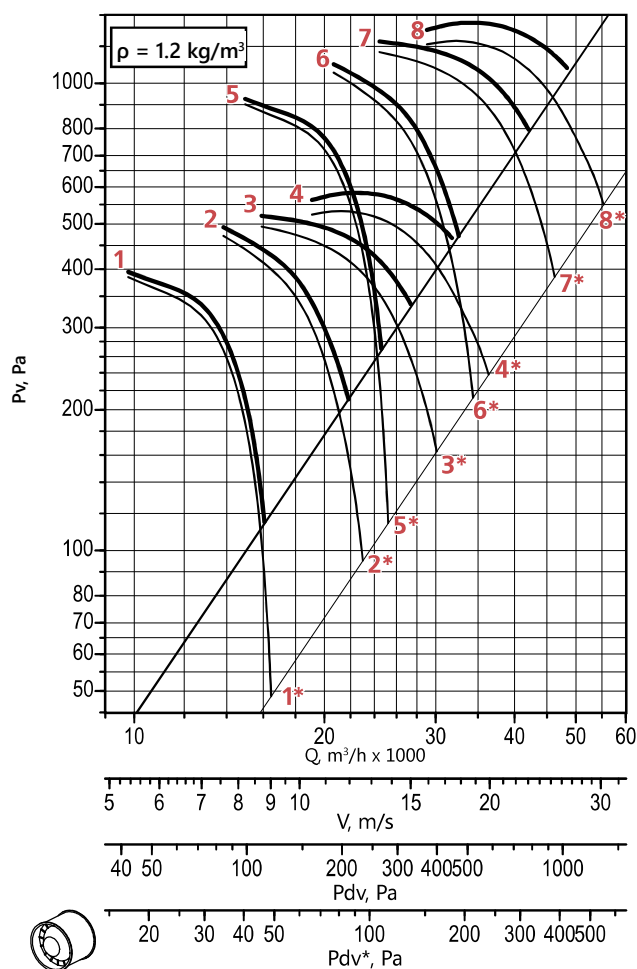
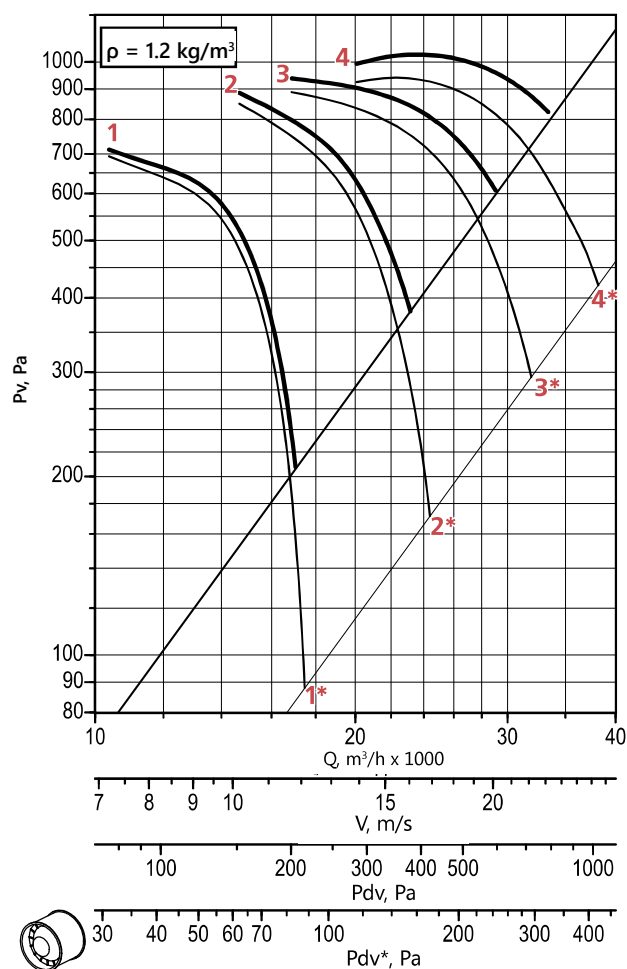
Pdv*, Pa — the scale of the dynamic pressure of the fan when the outlet channel is installed with a guide apparatus

080

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	4	8,6	4	232	295	244	307
2	26	4	11,7	5,5	241	305	253	316
3	38	4	23	11	269	333	281	344
4	46	4	23	11	269	333	281	344

090

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	6	5,8	2,2	302	378	314	391
2	26	6	7	3	309	384	321	399
3	38	6	12	5,5	328	403	340	416
4	46	6	17,5	7,5	340	415	352	428
5	18	4	15,6	7,5	330	404	341	417
6	26	4	23	11	342	417	354	430
7	38	4	31	15	373	448	384	461
8	46	4	44	22	405	481	417	494



* - characteristics of the fan with an outlet channel (configuration 02, 04)

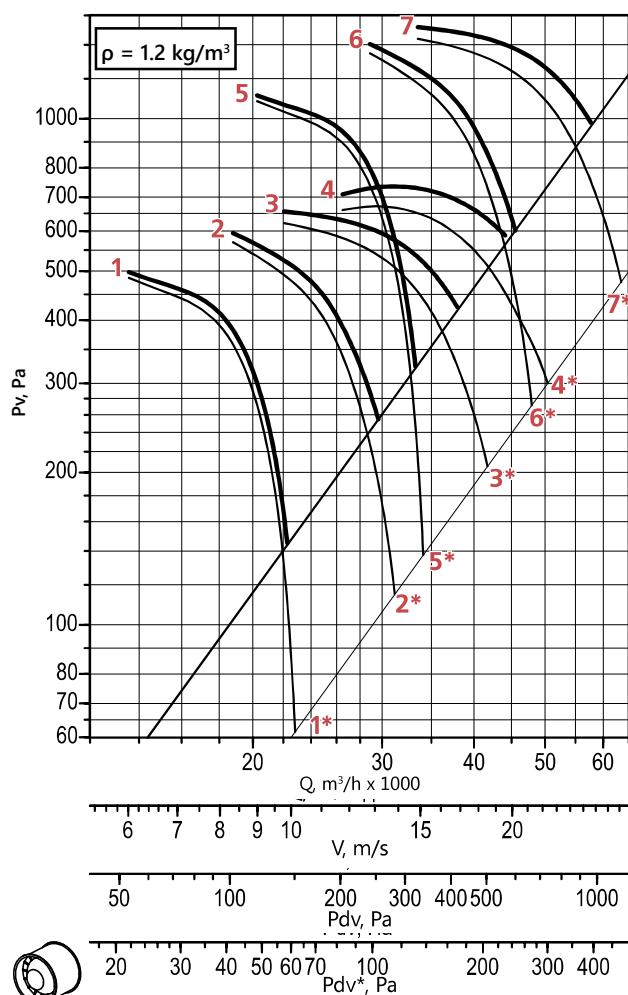
Pdv*, Pa — the scale of the dynamic pressure of the fan when the outlet channel is installed with a guide apparatus

NOTE:

The dynamic pressure is calculated based on the average velocity in the annular area of the outlet cross-section.

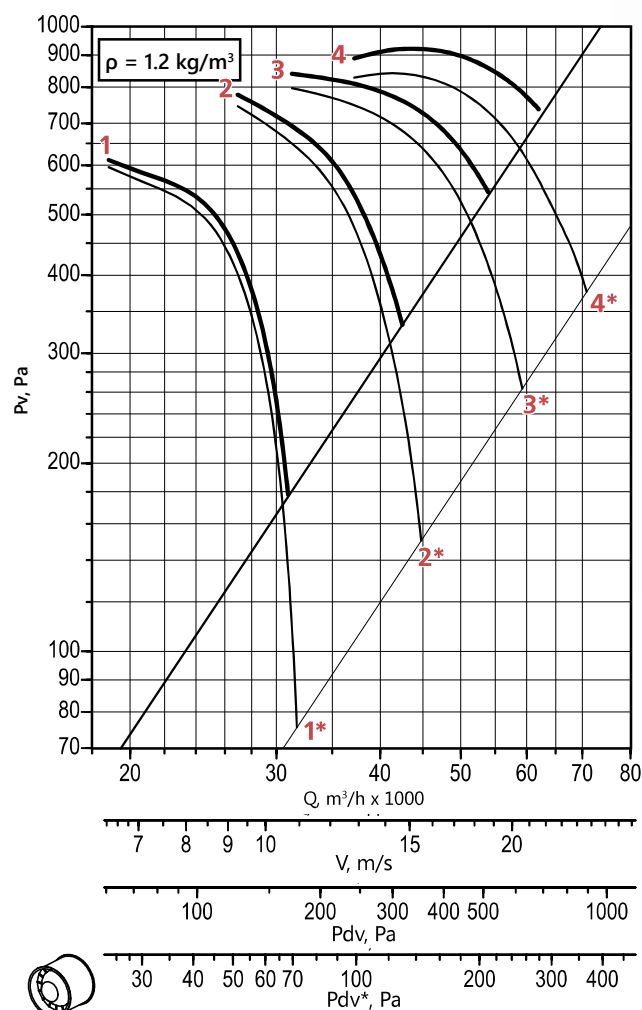
100

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	6	9	4	355	448	369	461
2	26	6	12	5,5	369	461	382	475
3	38	6	17,5	7,5	381	474	394	487
4	46	6	24	11	415	507	428	521
5	18	4	23	11	383	475	396	489
6	26	4	36	18,5	420	513	434	526
7	38	4	56	30	467	560	481	574



112

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	6	12	5,5	512	624	529	642
2	26	6	24	11	558	670	575	688
3	38	6	32	15	573	686	591	703
4	46	6	37	18,5	598	711	616	728



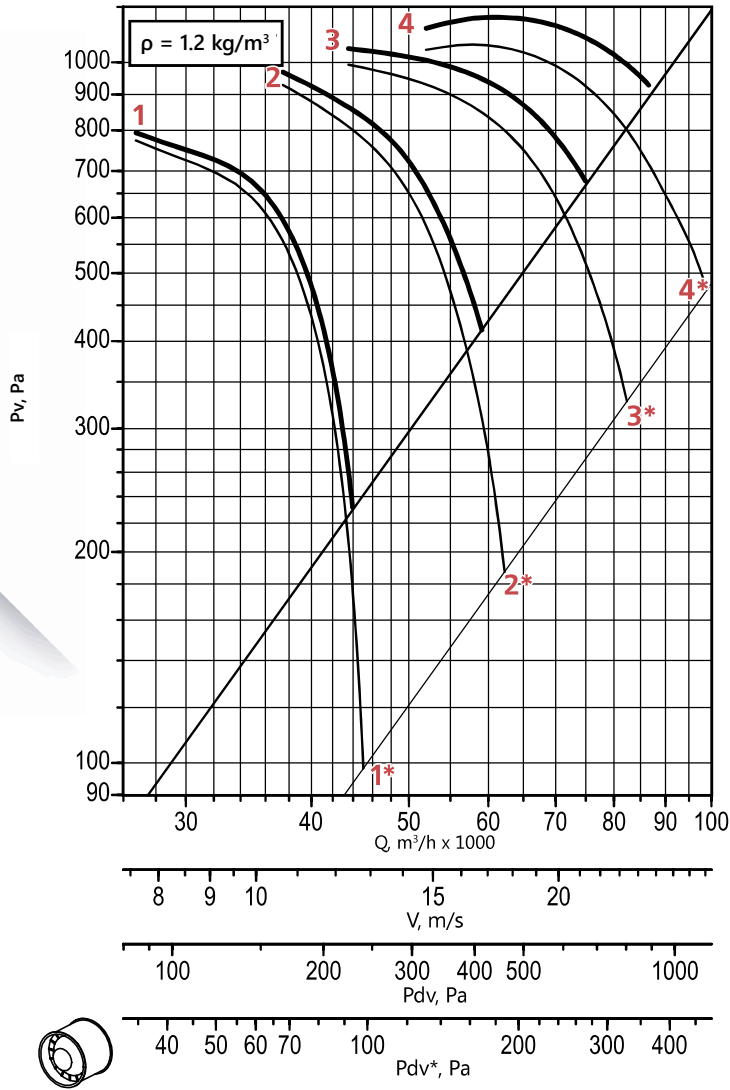
* - characteristics of the fan with an outlet channel (configuration 02, 04)

Pdv*, Pa — the scale of the dynamic pressure of the fan when the outlet channel is installed with a guide apparatus

NOTE:
The dynamic pressure is calculated based on the average velocity in the annular area of the outlet cross-section.

125

Curve number	Blade angle, degree	Number of poles	Current at 380 V, A	Nnom, kW	Fan weight, kg			
					configuration			
					01	02	03	04
1	18	6	24	11	657	797	674	820
2	26	6	32	15	673	813	689	829
3	38	6	44	22	754	894	771	910
4	46	6	71	37	920	1059	936	1075



* - characteristics of the fan with an outlet channel (configuration 02, 04)
 P_{dv}^* , Pa — the scale of the dynamic pressure of the fan when the outlet channel is installed with a guide apparatus

NOTE:
The dynamic pressure is calculated based on the average velocity in the annular area of the outlet cross-section.

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

AF-DU axial smoke extraction fan

AF-DU

quantity, pcs: _____

contact person: _____

organization: _____

tel: _____ e-mail: _____

Region (city): _____ date: _____

Mark the required one with a "V" sign or specify a value

operating mode	efficiency Q, m ³ /h		
	pressure at t = 20 °C, Pa	full pressure Pv static pressure Psv	
standard size			
scope of application	DU - smoke extraction		
design version	N - general industrial		
temperature of the transported medium	400° C		
	600° C		
climatic version	Y2		
	T2		
motor	motor rated power, kW		
	number of poles		
configuration	01 (without a guide apparatus, without a support)		
	02 (with a guide apparatus, without a support)		
	03 (without a guide apparatus, without a support)		
	04 (with a guide apparatus, with a support)		
impeller	blade angle, deg	18	
		26	
		38	
		46	

Additional equipment

Special requirements:

Customer _____
(signature)

_____ (full name)

AXIAL JET FANS | JF-DU/DUV

- smoke extraction during and after a fire;
- allows for the creation of safe evacuation routes for people from burning premises;
- does not obscure other systems (sprinklers, power lines, etc.) and surveillance camera viewing areas;
- consumes less energy compared to conventional systems, as it does not operate continuously and there is no pressure loss in the ducts;
- no air ducts or additional rooms required for fan installation;
- quick installation and the ability to change the configuration of the ventilation system;
- low cost of equipment, low operating costs.

➤ INTENDED USE:

- smoke ventilation systems.



- 300° C
- 120 MIN

•315 •355 •400 •450 •500

- general purpose industrial (N)

OPERATING CONDITIONS

Operating conditions:

- ambient temperature:
 - from -45 °C to +40 °C for temperate climate.
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

Jet fans are designed for forced ventilation and removal of combustion products, in case of fire, from enclosed and underground parking lots, as well as garage premises. Toxic substances (nitrogen oxides, carbon monoxide, and soot) are released and evenly distributed throughout the entire parking area; therefore, their removal must be carried out along the entire length.

Jet fans are installed at certain intervals from each other under the ceiling of the parking area. The air moves from one side of the parking area to the other without air ducts; in other words, the entire cross-section of the parking area acts as an air duct.

Unlike conventional bulky smoke extraction systems, jet fans take up little space and simply push the air horizontally to create an airflow.

They can be used to control, direct, and remove smoke from parking garages, tunnels, and other large open spaces. Axial jet fans provide efficient airflow without the need for ductwork.

JF-DU fans operate effectively in smoke extraction mode during fires, as they are made from heat-resistant materials.

JF-DU-355-DUVF300-N-00150/2

- axial jet fan (•JF-DU)
- standard fan size (•315 •355 •400 •450 •500)
- operating mode
The temperature of the transported medium is 300° C: • DUF300 • DUVF300
- design version (•N)
- motor parameters* (•n/P)
n** – Motor Power Index
P – number of poles: •2 (3000 rpm), •4 (1500 rpm)

NOTE:

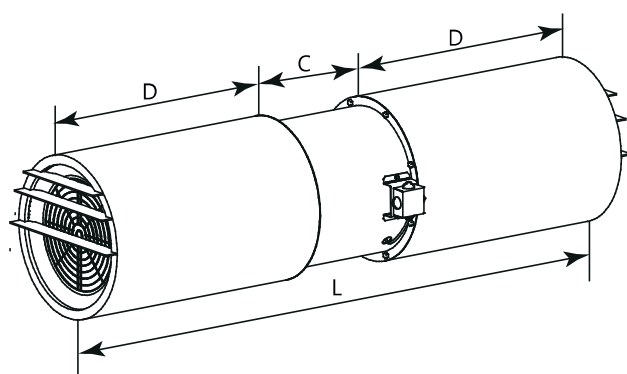
* All supplied motors in the basic version are designed for 380 V/50 Hz, direct start. Version with other voltages and connection options by special agreement.

** motor power index - see table 1.

TABLE 1

JF-DU		
Motor rated power (N _{nom}), kW	0,18...0,75	1,1...7,5
Motor Power Index (n)	00018...00075	00110...00750

Fan standard size	Flow rate, m³/h	Air velocity, m/s	Pushing force, N	Revolutions, rpm.	Installed power, kW	Sound pressure level, dB(A)-1m
JF-DU 315	2 600/5 200	10,0/20,0	9/36	1 500/3 000	0,20/0,80	71/85
JF-DU 355	3 650/7 300	10,9/21,9	14/56	1 500/3 000	0,37/1,50	74/87
JF-DU 400	5 200/10 400	12,2/24,4	22/88	1 500/3 000	0,50/2,20	76/90
JF-DU 450	7 250/14 500	13,3/26,6	32/128	1 500/3 000	0,80/3,10	79/93
JF-DU 500	9 550/19 100	14,1/28,2	45/180	1 500/3 000	1,10/4,40	81/95



Fan standard size	A, mm	B, mm	C, mm	D, mm	L, mm
JF-DU 315	315	415	400	800	2 000
JF-DU 355	355	455	400	800	2 000
JF-DU 400	400	500	400	800	2 000
JF-DU 450	450	550	400	800	2 000
JF-DU 500	500	600	400	800	2 000

RADIAL JET FANS

RJF-DU/DUV

- smoke extraction during and after a fire;
- allows for the creation of safe evacuation routes for people from burning premises;
- does not obscure other systems (sprinklers, power lines, etc.) and surveillance camera viewing areas;
- consumes less energy compared to conventional systems, as it does not operate continuously and there is no pressure loss in the ducts;
- no air ducts or additional rooms required for fan installation;
- quick installation and the ability to change the configuration of the ventilation system;
- low cost of equipment, low operating costs.

➤ INTENDED USE:

- smoke ventilation systems.



- 300° C
- 120 MIN

●50 ●70 ●90

- general purpose industrial (N)

OPERATING CONDITIONS:

OPERATING CONDITIONS:

- ambient temperature:
 - from -45 °C to +40 °C for temperate climate.
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s;
- conditions for the transported medium can be found in the section "Fan designs for their intended purpose".

Jet fans are designed for forced ventilation and removal of combustion products, in case of fire, from enclosed and underground parking lots, as well as garage premises. Toxic substances (nitrogen oxides, carbon monoxide, and soot) are released and evenly distributed throughout the entire parking area; therefore, their removal must be carried out along the entire length.

Jet fans are installed at certain intervals from each other under the ceiling of the parking area. The air moves from one side of the parking area to the other without air ducts; in other words, the entire cross-section of the parking area acts as an air duct.

Unlike an axial jet fan, a radial jet fan draws air from the lower space rather than from behind itself. Because of this, RJF-DU/DUV fans can only be installed in a horizontal position.

These fans are characterized by their low profile, so it is advisable to use them in rooms with "low ceilings". The RJF-DU series fans perform the function of organizing air movement in indoor or underground parking lots, without requiring the use of an air duct system.

RJF-DU-50-DUVF300-N-00120/4

- ✓ axial jet fan (•RJF-DU)
- ✓ standard fan size (•50 •70 •90)
- ✓ operating mode
The temperature of the transported medium is 300° C: • DUF300 • DUVF300
- ✓ design version (•N)
- ✓ motor parameters* (•n/P)
n** – Motor Power Index
P – number of poles: •4 (1500 rpm), •8 (750 rpm)

NOTE:

* All supplied motors in the basic version are designed for 380 V/50 Hz, direct start. Version with other voltages and connection options by special agreement.

** motor power index - see table 1.

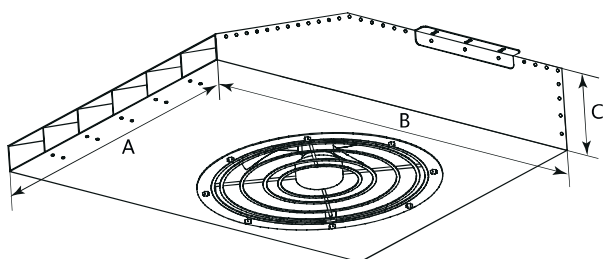
TABLE 1

RJF-DU

Motor rated power (N _{nom}), kW	0,18...0,75	1,1...7,5
Motor Power Index (n)	00018...00075	00110...00750



Fan standard size	Flow rate, m³/h	Pushing force, N	Revolutions, rpm	Installed power, kW	Sound pressure level, dB(A)-1m
RJF-DU 50	2 850/5 760	13/50	750/1 500	0,30/1,20	38/54
RJF-DU 70	3 500/7 009	19/70	750/1 500	0,55/2,20	43/58
RJF-DU 90	3 800/7 641	25/90	750/1 500	0,55/2,20	46/62



Fan standard size	A, mm	B, mm	C, mm
RJF-DU 50	800	1 232	272
RJF-DU 70	1 000	1 600	305
RJF-DU 90	1 000	1 600	305

RECOMMENDATIONS FOR SELECTING EQUIPMENT FOR PD-SYSTEMS

Axial fans are better suited for use in PD-systems, as they are more compact and, most importantly, cheaper than radial fans. In fact, the range of well-known older models of axial fans is significantly smaller than that of radial ones, and the cheapest axial fans show considerable deviations of actual parameters from the declared ones.

The main function of PD-system fans is to create excess pressure.

In addition to creating overpressure, there is another very important function - compensation for the operation of DU systems, since it is wrong to remove the gas-air mixture from an airtight room. The air supply to the lower zone creates a protected space for people and reduces the heat load from fire products on building structures. Designing any smoke extraction (DU) system involves calculating and selecting a compensating air supply system. Thus, for smoke extraction from corridors, the compensation is provided by pressurization of adjacent stairwells. The exhaust DU/EDU system cannot operate without compensating air supply. Modern plastic double-glazed windows do not "burst" when heated, as previously thought about standard windows.

There is an opinion that it is necessary to specify the total fan pressure in the project. There have been long-standing debates about whether it is more correct to use TOTAL or STATIC PRESSURE. As is known, it is in PD-systems that a significant increase in flow rates is used to save space for shaft placement. A significant increase in the flow velocity in the fan cross-section leads to an increase in the dynamic pressure and a decrease in the actual static pressure of the fan, for example, at 20 m/s the dynamic pressure of the flow is 230 Pa. Only the static pressure of the fan can be used to compensate for friction losses in the ducts and determine the overpressure created in the room. The residual energy of the flow (dynamic pressure at the outlet) is dissipated as heat without increasing the pressure in the room.

Fans with equal flow and total pressure are equivalent when replaced in the project. This is the most serious mistake, as shown by comparing two axial fans with an equal total pressure of 200 Pa and a flow rate of 30000 m³/h and sizes 080 and 100. The dynamic pressure will be 67 Pa and 165 Pa, respectively. As a result, 100 has a static pressure higher by 100 Pa. It is in axial fans that the proportion of "wasted" energy used to create dynamic pressure reaches 100%. When designing PD systems, it is especially important to take into account Static pressure, which is why the parameters of axial fans for PD-systems are shown in the catalog.

Axial fans are convenient because they are unpretentious; they can be oriented in space as desired and simply mounted into a wall, covered against precipitation with a backdraft damper. All characteristics of axial fans are specified for certain conditions, in particular, for the OZA-VKO inlet header installed at the fan inlet. Without the OZA-VKO and when additional elements are used directly in the fan cross-section, the "flow-pressure" parameters drop sharply (sometimes several times).

Installation of axial fans for air pressurization in light roofs poses a leakage risk and requires the development of special supporting structures. Indeed, the installation of standard axial fans in light roofs creates the aforementioned problems; however, there is a proven STAM series, originally designed for mounting exhaust roof fans. VKOP 0 roof-mounted air supply fans can be installed on the roof using STAM.

The VKOP 0 and VKOP 1 roof-mounted air supply fans are distinguished by the improved design of the protective hood.

The cost of a conventional axial fan is significantly lower than the specially designed VKOP series pressurization units. Cost reduction and design optimization are distinctive features of the VKOP 0 and VKOP 1 series. The design of the VKOP 1 (low-profile) is particularly interesting, as it can be installed into the roof without the use of STAM. Weather protection hood and the inlet header are designed to preserve the fan's performance parameters.

A reserve in airflow rate in PD-systems is always useful and necessary. Most often, the fan power reserve, in addition to completely blocking the doors on evacuation routes, leads to an increase in the weight, dimensions and cost of the equipment, which cannot be mitigated by installing pressure limiting systems.

The fan should not generate static pressure above 150 Pa, and then there will be no problems. The selection of a fan with a "horizontal" characteristic is generally possible; for this purpose, the OZA-201 series is offered. However, when operating "against a wall" in a completely enclosed room, it is impossible to avoid exceeding the limitation. Most often, the air supply occurs through a shaft with its own additional losses. Due to cost savings, the size of the shaft requires a significant increase in the static pressure of the fan (up to 1000 Pa with the doors closed), which is significantly higher than the 150 Pa limit.

There is no need to adjust the pressure in PD-systems, excess air will find its way out anyway. Unfortunately, all construction technology is directed against any openings in doors, walls and windows. The pressure of modern fans operating "against a wall" reaches 1000 Pa or more (with a minimum of 400 Pa), making it physically impossible to open doors. According to EU standards, the force on doors must be less than 100 N (10 kg), while according to SP7, the actual allowable force is 300 N (30 kg) at 150 Pa for a door with an area of 2.0 m². The throughput capacity of an opening of 1/10 m² with a pressure drop of 150 Pa is only 5700 m³/h, but there are no openings in fire doors.

It is never too late to install a pressure limiting system in the PD-system. Indeed, it is physically possible to additionally install pressure sensors and connect electronic fan control at the constructed facility, but changing the fire automation project requires costs for coordination with the author. When implementing pressure control measures at the design stage, there are no additional costs later.

Electronic pressure limiting systems are always better than mechanical ones. For low-power pressurization fans, electronics can indeed be comparable in price to pressure-relief dampers, but for powerful 15–30 kW PD-systems, the cost of electronics significantly exceeds the price of pressure-relief dampers. Properly selected OZA and VKOP 0/1 PD-fans feature low power consumption and very high performance, which allows the use of VFDs to control airflow considering external wind pressure and door opening. The company supplies Danfoss VFDs with a built-in control program for PD-fans based on a pressure-limiting sensor installed on evacuation routes.

The pressure-relief dampers are new and sparsely used equipment. In fact, the KID (PRD – Pressure Relief Damper) or pressure limiting valve is a very popular valve all over the world. The design is based on a multi-blade gravity damper with an additional mechanism for opening at a specified pressure differential. The KID compensates for excess pressure inside buildings by venting the "excess" supply air back outside.

Installing the KID unit in an exterior wall is a ready-made solution to all problems with door blockage. For a significant part of the country, the freezing of the blades of the non-insulated KID unit is the reason why it is necessary to additionally use GMK-type dampers in the exterior wall, which open when the PD-system is activated. The KID unit can be used without additional insulation in rooms with a dry regime and in warm regions, as well as, if necessary, with activation to open only during the warm season.

It is considered that supplying air to the upper part of the building's paths is a simple and reliable scheme. Unfortunately, this is not the case — the EN 12101-6 standard defines the "STACK EFFECT" — the effect of pressure increase in the lower/upper parts of the building during warm/cold seasons. This effect creates problems with the overhead supply in winter, completely blocking the doors on the escape routes of the upper floors. Besides the simplicity of overhead supplying of pressurization air, there are no other advantages, while the risk of door blocking is maximal – especially after the installation of plastic windows and doors with seals on every floor. The schemes used in EN12101-6 limit the distance between the inlet openings in height (no more than 10 meters apart). And the PD airflow is created either along the entire height of the stairwell from top to bottom, or strictly from the bottom with air exhaust at the lower part of the stairwell. The difference between the described PD airflow scheme and those typically used in standard residential buildings is fundamental. The effect is ignored because acceptance and periodic tests are conducted only once a year, usually during the warm season.



AXIAL FANS

OZA 201

- smoke extraction during and after a fire;
- allows for the creation of safe evacuation routes for people from burning premises;
- does not obscure other systems (sprinklers, power lines, etc.) and surveillance camera viewing areas;
- consumes less energy compared to conventional systems, as it does not operate continuously and there is no pressure loss in the ducts;
- no air ducts or additional rooms required for fan installation;
- quick installation and the ability to change the configuration of the ventilation system;
- low cost of equipment, low operating costs.

➤ INTENDED USE

- PD - smoke control pressurization ventilation systems.



•080 •090 •100 •112 •125

- general purpose industrial (N)

OPERATING CONDITIONS

The fans must be installed outside the serviced area and beyond zones of permanent human occupancy. They are designed for use in temperate (Y) climate conditions of the 2nd placement category according to GOST 15150-69.

Operating conditions:

- ambient temperature:
 - from -40 °C to +40 °C.
- under normal conditions, the conveyed medium must not contain abrasive or sticky substances, fibrous materials, vapors, or dust; its aggressiveness toward carbon steels, aluminum alloys, and GRP material must not exceed that of air; and it must not contain dust or other solid particles in concentrations exceeding 100 mg/m³;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s.

The axial low-pressure fans of the OZA 201 series consist of an impeller of a new design similar to the OZA 300, an all-welded casing and an asynchronous motor housed in the casing.

An impeller with an adjustable blade angle. The blades are made three-dimensional, by injection molding. The flow cross-section is maximized, resulting in a significant reduction in outlet velocity. Thanks to the new impeller design, the fans are designed with the highest static efficiency at pressures of 100 Pa - 300 Pa.

The short fan casing does not fully cover the motor and has a reduced weight. The flanges are fully edge-raised, providing increased rigidity and precise geometry.

When there is no inlet duct, fans with an OZA-VKO inlet header or an OZA-PET toroidal adapter must be used.

The flow direction is always from the impeller to the motor, regardless of orientation. All fan casing components have a galvanized coating.

Additional fan options are available - see the "Additional equipment" section of the catalog.

EXAMPLE:

OZA 201 axial fan; standard size 080; general industrial design; motor rated power $N_{nom} = 0.75$ kW, number of poles 6; climatic version Y2:

OZA 201-080-N-00075/6-Y2

- axial fan (•OZA 201)
- standard fan size (•080 •090 •100 •112 •125)
- design version (•N)
- motor parameters* (•n/P)
 n** – Motor Power Index
 P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm)
- climatic version (•Y2)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement.

** Motor Power Index - see Table 1.

Special requirements for the fan are specified additionally and agreed with the manufacturer.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

TABLE 1

OZA 201

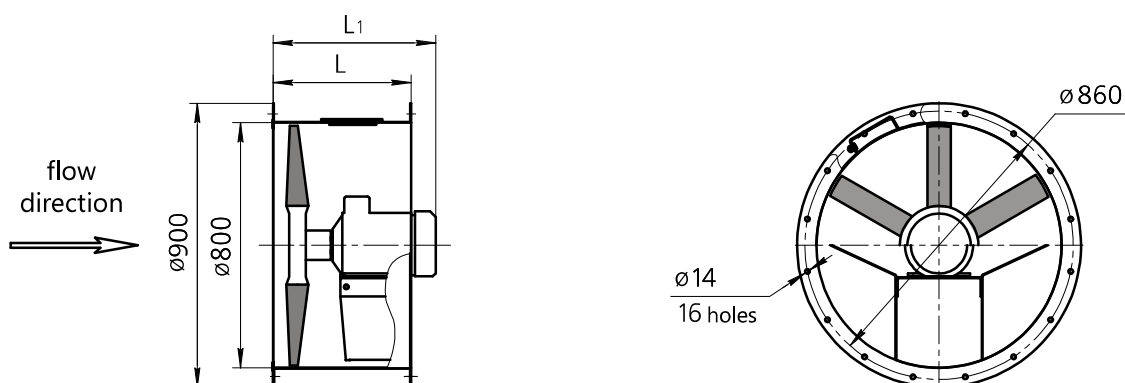
Motor rated power (N_{nom}), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n)	00018...00075	00110...00750	01100-09000

080

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	8	3	1,1	73
2		4,6	1,5	78
3	6	2,3	0,75	54
4		3,2	1,1	56
5		4,1	1,5	63
6		5,8	2,2	74
7	4	7	3	111
8		9	4	120
9		2,6	1,1	54
10		3,6	1,5	56
11		5,1	2,2	62
12		7,3	3	65
13		8,6	4	74
14		11,7	5,5	102

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h												
		5000	7500	10000	12500	15000	17500	20000	22500	25000	27500	30000	35000	40000
1,1	8	150	120	110	100	90	62	19						
1,5			130	97	105	110	81	47	0,6					
0,75	6		175	150	120	60	0,6							
1,1			200	185	170	135	75	2						
1,5				165	175	167	135	85	19					
2,2				180	160	175	145	100	55					
3				200	165	155	165	163	137	110	65	2		
4					195	185	197	200	168	130	83	22		
1,1	4	300	230	177	100	8								
1,5				264	224	170	94	4						
2,2				310	273	250	206	150	75	0				
3					315	296	280	242	195	138	64	0		
4							310	300	275	243	188	130	0	
5,5								306	302	285	258	220	110	0



Motor size	L, mm	L ₁ , mm
• 80	370	440
• 90 • 100	420	510
• 112	515	625

NOTE: * When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

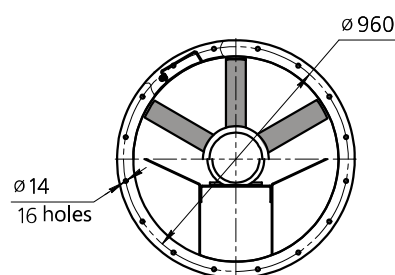
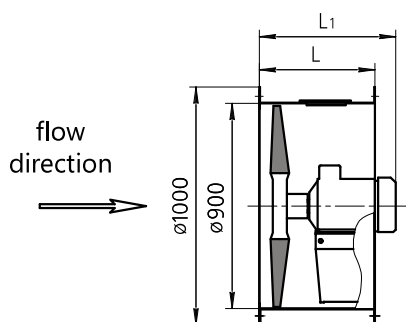
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter й OZA-PEP	toroidal adapter OZA-PET
grille R50	mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

090

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	8	3	1.1	90
2		4,6	1.5	95
3		6,3	2.2	118
4	6	3,2	1,1	75
5		4	1,5	80
6		5,8	2,2	91
7		7	3	130
8		9	4	139
9		12	5,5	150
10	4	2,6	1,1	69
11		3,6	1,5	71
12		5,1	2,2	78
13		7,3	3	81
14		8,6	4	90
15		11,7	5,5	121

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h											
		10000	12500	15000	17500	20000	22500	25000	27500	30000	35000	40000	
1,1	8	155	130	120	105	80	46						
1,5			140	123	120	107	84	46					
2,2					125	120	110	85	50				
1,1	6	203	165	145	100	42							
1,5			203	172	160	133	88	29					
2,2				215	190	185	165	125	85	35			
3						196	195	187	160	125	30		
4						240	217	222	205	176	78	0	
5,5								225	215	200	130		
1,1	4	210	172	130	77	22							
1,5			247	222	190	150	107	56	0				
2,2				250	240	215	180	142	100	52	0		
3						262	245	218	182	145	52	0	
4						285	267	250	222	190	115	18	
5,5							295	273	250	180	90		



Motor size	L, mm	L ₁ , mm
• 80	370	440
• 90 • 100	420	510
• 112 • 132	515	625

NOTE: * When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.

additional equipment

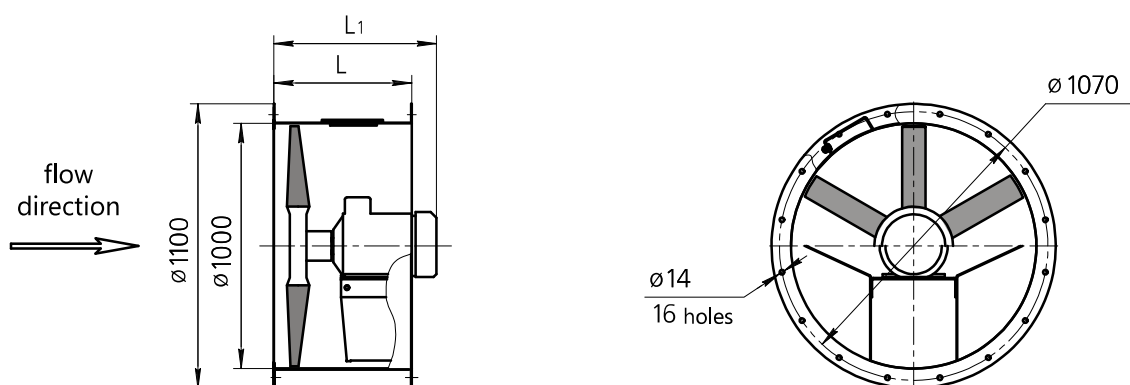
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter й OZA-PEP	toroidal adapter OZA-PET
grille R50	mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

100

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	8	6,3	2,2	119
2		8	3	126
3		10,5	4	144
4	6	4,1	1,5	80
5		5,8	2,2	91
6		7	3	132
7		9	4	141
8		12	5,5	152
9		17,5	7,5	165
10	4	3,6	1,5	76
11		5,1	2,2	84
12		7,3	3	87
13		8,6	4	96
14		11,7	5,5	123

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h										
		17500	20000	22500	25000	27500	30000	35000	40000	45000	50000	55000
2,2	8	120	114	113	105	90	67	1,4				
3				127	130	132	120	72	15			
4					154	155	145	102	40			
1,5	6	150	115	70	14							
2,2		200	185	167	135	98	50					
3			224	212	204	188	164	100	10			
4					216	212	209	170	120	35		
5,5						195	190	192	160	100	32	
7,5								250	234	178	106	23
1,5	4	130	100	65	30							
2,2		192	172	148	123	93	63	0				
3			211	197	179	160	137	77	12			
4				221	209	195	180	140	75	6		
5,5					229	220	210	182	140	70	1,3	



Motor size	L, mm	L ₁ , mm
• 80	370	440
• 90 • 100	420	510
• 112 • 132	515	625

NOTE: * When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

additional equipment

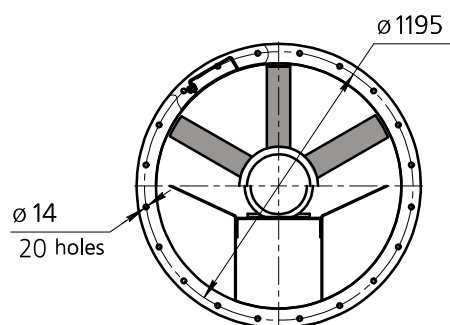
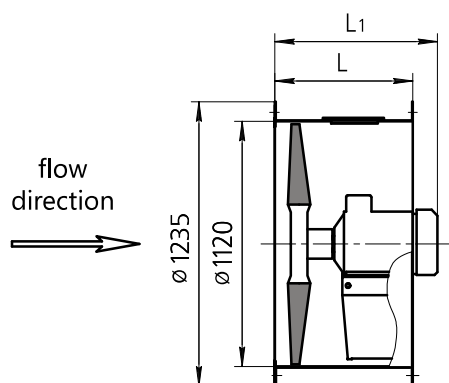
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter й OZA-PEP	toroidal adapter OZA-PET
grille R50	mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

112

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	8	8	3	128
2		10,5	4	145
3		13,6	5,5	161
4		18	7,5	216
5	6	5,8	2,2	96
6		7	3	133
7		9	4	142
8		12	5,5	154
9		17,5	7,5	167
10		24	11	216
11	4	5,1	2,2	85
12		7,3	3	87
13		8,6	4	96
14		11,7	5,5	125

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h											
		22500	25000	27500	30000	35000	40000	45000	50000	55000	60000	65000	70000
3	8	148	133	117	105	100	65	12					
4			146	132	114	113	100	69	22				
5,5					167	147	127	96	61	0			
7,5						200	184	160	123	71	0		
2,2	6	136	111	86	55	0							
3			183	165	142	97	40						
4				190	182	155	123	83	23				
5,5					247	225	187	134	67	0			
7,5							200	205	172	120	18	0	
11													
2,2	4	135	110	85	55	0							
3			213	193	173	125	74	22					
4					222	184	135	88	35				
5,5						253	221	187	145	93	39		



Motor size	L, mm	L ₁ , mm
• 90 • 100	420	510
• 112 • 132	515	625
• 160	630	815

NOTE: * When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.

additional equipment

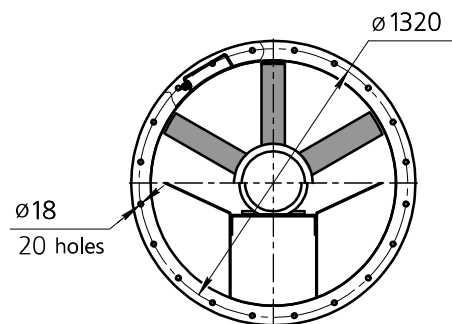
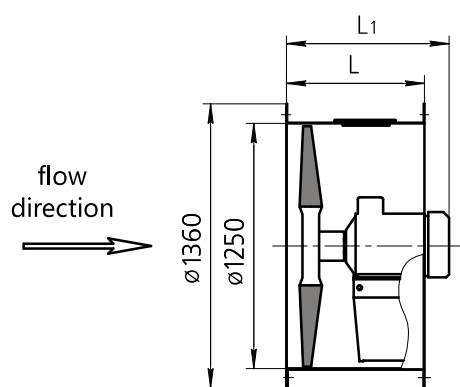
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter ñ OZA-PEP	toroidal adapter OZA-PET
grille R50	mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

125

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	8	8	3	133
2		10,5	4	150
3		13,6	5,5	166
4		18	7,5	221
5	6	26	11	247
6		9	4	147
7		12	5,5	159
8		17,5	7,5	172
9	4	24	11	222
10		32	15	242
11		37	18,5	257
12		11,7	5,5	130
13	4	15,6	7,5	155
14		23	11	167

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h													
		27500	30000	35000	40000	45000	50000	55000	60000	65000	70000	75000	80000	90000	100000
3	8	149	142	104	50	0									
4		200	180	138	131	100	48								
5,5					140	140	113	72	23						
7,5							133	130	110	69	23				
11							212	192	170	130	86				
4	6	219	200	150	86	6									
5,5			292	260	217	148	68	0							
7,5					290	260	230	180	114	37					
11						386	358	320	266	196	105	0			
15									370	335	288	233	166	0	
18,5	4								390	378	356	328	296	194	44
5,5		325	310	280	260	220	178	145	90						
7,5		450	415	332	240	138	32								
11						450	376	290	192	80	0				



Motor size	L, mm	L ₁ , mm
• 112 • 132	515	625
• 160 • 180	630	815

NOTE: * When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

additional equipment

weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter и OZA-PEP	toroidal adapter OZA-PET
grille R50	mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

OZA 201 axial fan

OZA 201 _____

Quantity, pcs: _____

Contact person: _____

Organization: _____

tel.: _____ e-mail: _____

Region (city): _____ date: _____

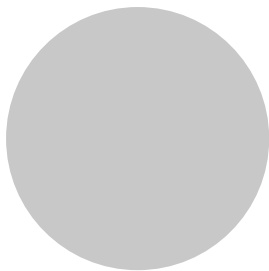
Mark the required one with a "V" sign or specify a value

operating mode	efficiency Q, m ³ /h	
	pressure at t = 20 °C, Pa	efficiency Q, m ³ /h Pv static pressure Psv
fan number		
design version	N - general purpose industrial	
climatic version	Y	
motor	motor rated power, kW	
	number of poles	
Additional equipment		
flexible connector OZA-COM	series	COM 400 COM 600
	flange material	stainless steel
		galvanized steel
		St3 steel
damper	TUL-1(-2)(-3)	
	GMK, GMK-P	
	REG, REG-L	
flat adapter OZA-PEP		
toroidal adapter OZA-PET		
straight duct section OZA-PUV		
grille R50		
protective mesh	OZA-SEM	
	OZA-SEB	
counter flange OZA-FOT		
inlet header OZA-VKO		
mounting support	OZA-MOP	
	OZA-MOB	
weather protection hood OZA-ZNT		

Special requirements:

Customer _____
(signature)

_____ (full name)



AXIAL FANS

OZA 501

- smoke extraction during and after a fire;
- allows for the creation of safe evacuation routes for people from burning premises;
- does not obscure other systems (sprinklers, power lines, etc.) and surveillance camera viewing areas;
- consumes less energy compared to conventional systems, as it does not operate continuously and there is no pressure loss in the ducts;
- no air ducts or additional rooms required for fan installation;
- quick installation and the ability to change the configuration of the ventilation system;
- low cost of equipment, low operating costs.

➤ **INTENDED USE:**

- PD - smoke control pressurization ventilation systems.



•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

- general purpose industrial (N)

OPERATING CONDITIONS

The fans must be installed outside the serviced area and beyond zones of permanent human occupancy. They are designed for use in temperate (Y) climate conditions of the 2nd placement category according to GOST 15150-69.

OPERATING CONDITIONS:

- ambient temperature:
 - from -40 °C to +40 °C.
- under normal conditions, the conveyed medium must not contain abrasive or sticky substances, fibrous materials, vapors, or dust; its aggressiveness toward carbon steels, aluminum alloys, and GRP material must not exceed that of air; and it must not contain dust or other solid particles in concentrations exceeding 100 mg/m³;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s.

The axial high-pressure fans of the OZA 501 series consist of an impeller of a new design, an all-welded cylindrical casing and an asynchronous motor housed in the casing.

An impeller with an adjustable blade angle. The blades are made three-dimensional, by injection molding. The flow cross-section is maximized, resulting in a significant reduction in outlet velocity. Thanks to the new impeller design, the fans are designed with the highest static efficiency at pressures of 400 Pa - 900 Pa.

The housing is made as a cylindrical shell using specialized equipment, ensuring high precision of the internal circular cross-section. Flanges of standardized dimensions are located on both sides of the fan casing.

When there is no inlet duct, fans with an OZA-VKO inlet header or an OZA-PET toroidal adapter must be used.

The flow direction is always from the impeller to the motor, regardless of orientation. All fan casing components have a galvanized coating.

Additional fan options are available - see the "Additional equipment" section of the catalog.

EXAMPLE:

OZA 501 axial fan; standard size 056; general industrial design; motor rated power $N_{nom} = 1.5$ KW, number of poles 2; climatic version Y2:

OZA 501-056-N-00150/2-Y2

- axial fan (•OZA 501)
- standard fan size (•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125)
- design version (•N)
- motor parameters* (•n/P)
n** – Motor Power Index
P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm), 8 (750 rpm)
- climatic version (•Y2)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement.

** Motor Power Index - see Table 1.

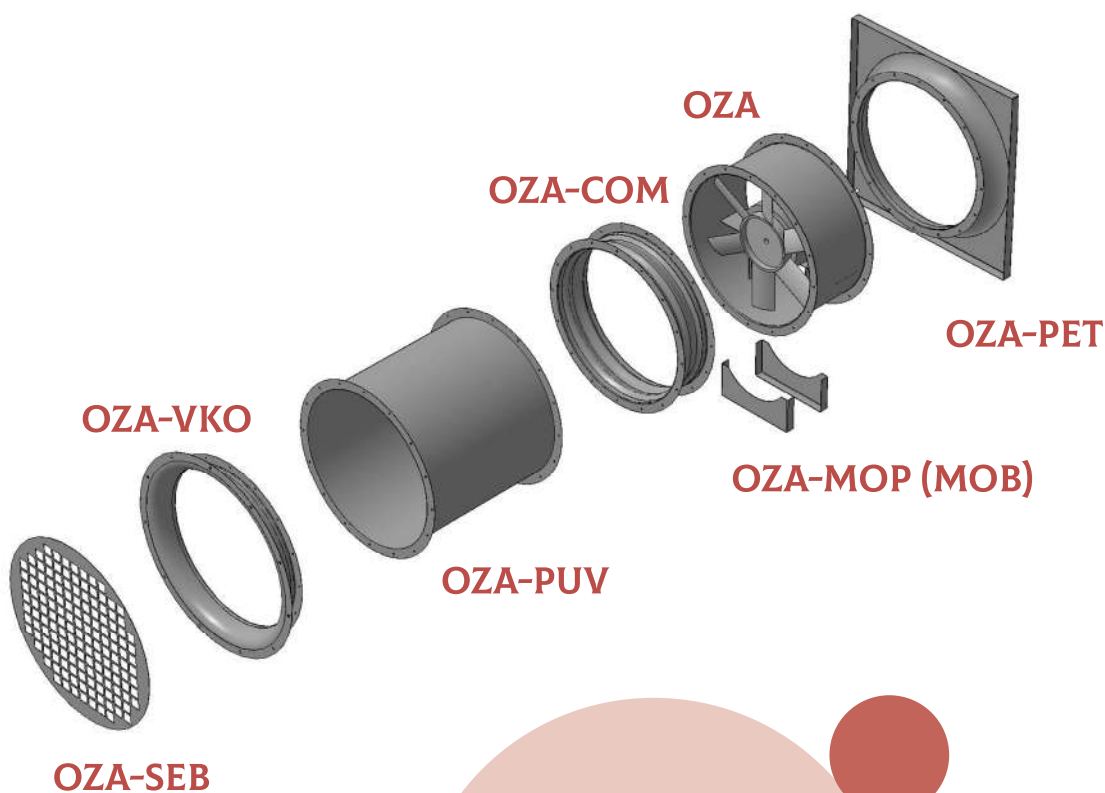
Special requirements for the fan are specified additionally and agreed with the manufacturer.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

TABLE 1

OZA 501

Motor rated power (N_{nom}), kW	1,1...7,5	11...90
Motor Power Index (n)	00110...00750	01100...09000

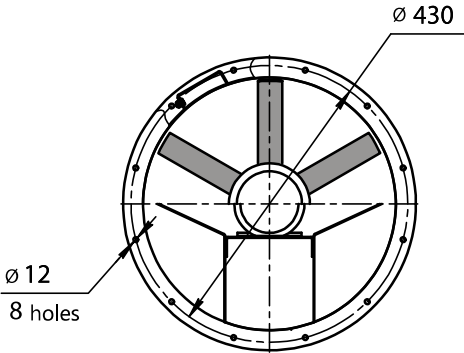
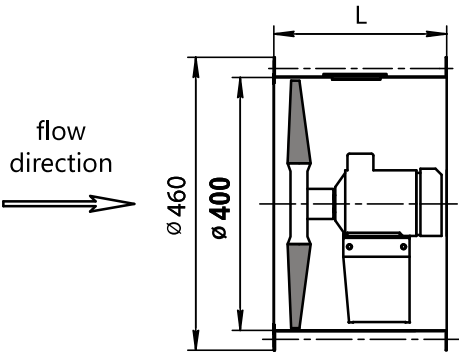


O40

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	2,4	1,1	24
2		3,2	1,5	26
3		4,6	2,2	28
4		6,5	3	32

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h									
		3000	3500	4000	4500	5000	6000	7000	8000	9000	10000
1,1	2	466	455	395	319	227	0				
1,5			497	517	459	387	223	0			
2,2						457	438	338	193	0	
3							433	365	281	146	0



Motor size	L, mm
•71 •80	440
•90	510

NOTE:
* When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

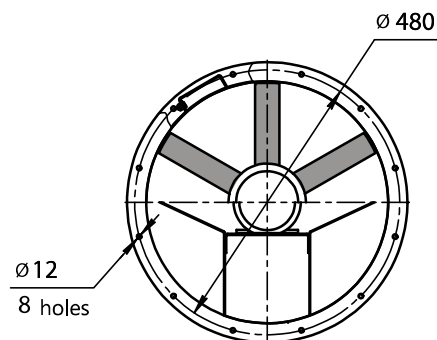
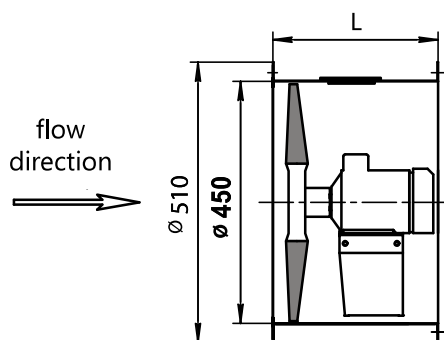
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

045

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	2,4	1,1	27
2		3,2	1,5	29
3		4,6	2,2	32
4		6,5	3	35
5		8,4	4	41
6		11	5,5	50

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h										
		4000	4500	5000	6000	7000	8000	9000	10000	12000	14000	16000
1,1	2	424	400	368	286	185	66					
1,5			480	460	397	322	233	122	2			
2,2					445	400	346	271	170	0		
3					625	642	568	477	357	48		
4							568	570	515	370	130	
5,5									560	485	325	65



Motor size	L, mm
•71 •80	440
•90 •100	510

NOTE:

* When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.

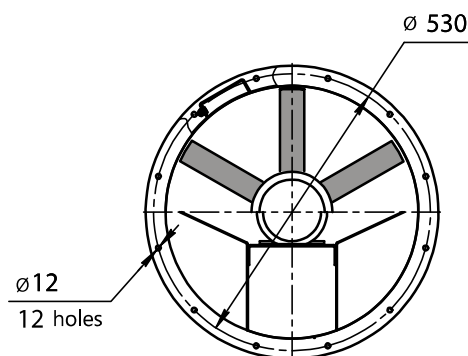
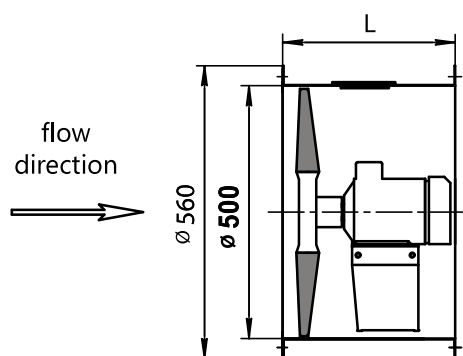
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

050

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	2,4	1,1	28
2		3,2	1,5	31
3		4,6	2,2	33
4		6,5	3	38
5		8,4	4	43
6		11	5,5	52
7		14,7	7,5	77

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h									
		5000	6000	7000	8000	9000	10000	12000	14000	16000	18000
1,1	2	410	355	280	192	93	0				
1,5			485	432	363	285	200	0			
2,2			522	495	442	380	312	137	0		
3					493	466	425	303	146	0	
4					710	721	657	470	225	0	
5,5						725	740	660	500	262	0
7,5							812	840	683	457	148



Motor size	L, mm
•71 •80	440
•90 •100	510
•112	625

NOTE:

* When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

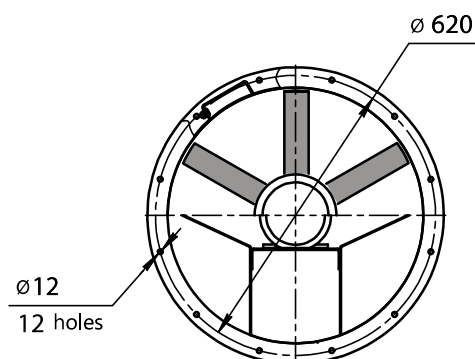
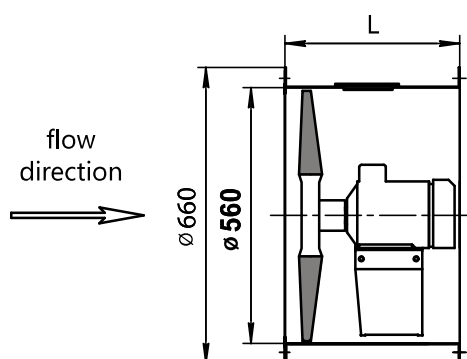
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP	protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV	

056

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	3,2	1,5	35
2		4,6	2,2	37
3		6,5	3	41
4		8,4	4	47
5		11	5,5	56
6		14,7	7,5	65

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h											
		6000	7000	8000	9000	10000	12000	14000	16000	18000	20000	22000	24000
1,5	2	500	460	410	350	273	116	0					
2,2		605	575	550	510	457	330	183	28				
3			640	607	585	555	460	345	217	56			
4					600	585	540	450	342	205	52		
5,5							555	537	463	362	232	90	
7,5								500	457	395	310	196	67



Motor size	L, mm
•71 •80	440
•90 •100	510
•112	625

NOTE:

* When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.

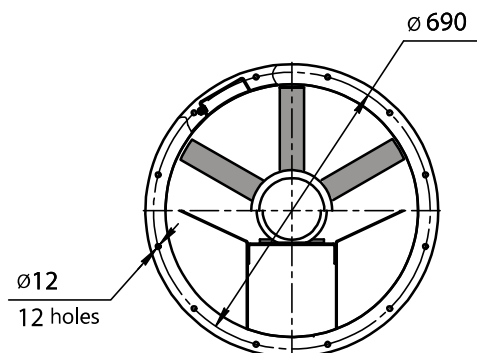
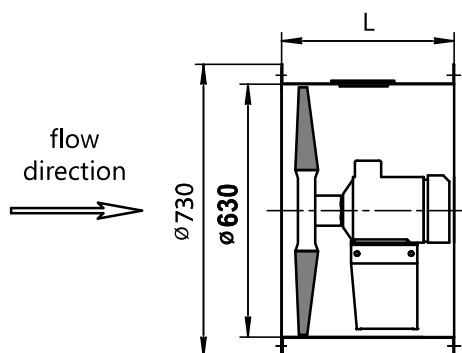
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

063

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	4,6	2,2	38
2		6,5	3	43
3		8,4	4	48
4		11	5,5	57
5		14,7	7,5	66
6		21	11	106
7		30	15	189
8		36	18,5	198

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h													
		9000	10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	35000	40000
2,2	2	450	405	325	217	90									
3		590	560	503	435	328	224	100	0						
4		670	650	606	550	475	395	295	180	50					
5,5			760	715	690	640	565	470	375	270	147	18			
7,5			1080	1010	945	885	786	660	517	340	140	0			
11				1200	1120	1090	1070	1010	935	826	680	530	362	0	
15						1100	1070	1080	1090	1050	976	870	745	375	0
18,5							1300	1380	1340	1280	1210	1080	952	546	10



Motor size	L, mm
•80	440
•90 •100	510
•112 •132	625
•160	815

NOTE:

* When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

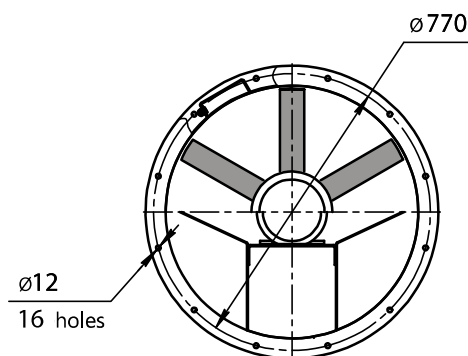
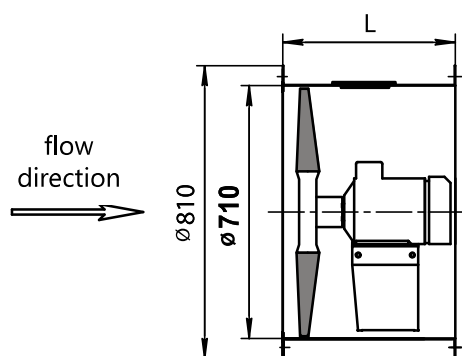
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

071

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	2	6,5	3	46
2		8,4	4	52
3		11	5,5	60
4		14,7	7,5	67
5		21	11	108
6		30	15	146
7		36	18,5	155
8		42	22	187
9		56	30	210

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h														
		10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	35000	40000	45000	50000
3	2	607	550	476	400	320	223	114	0							
4		670	625	578	525	465	387	305	221	114	0					
5,5		800	745	700	657	600	530	447	354	255	153	38				
7,5			880	815	775	753	705	643	575	500	415	323	62			
11				1250	1170	1110	1050	990	915	825	717	593	240	0		
15						1290	1240	1200	1170	1130	1070	993	755	423	26	
18,5							1240	1200	1190	1170	1140	1080	880	610	263	0
22							1640	1580	1520	1470	1420	1340	1110	755	275	0
30								1590	1530	1520	1510	1490	1380	1160	863	482



Motor size	L, mm
•80	440
•90 •100	510
•112 •132	625
•160 •180	815

NOTE:

* When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.

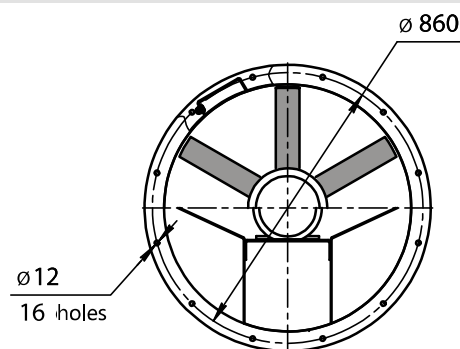
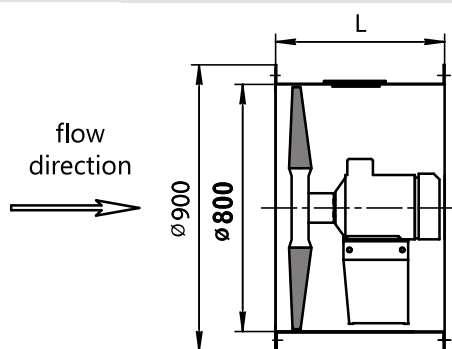
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

080

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	4	5,1	2,2	67
2		7,3	3	69
3		8,6	4	79
4		11,7	5,5	95
5		15,6	7,5	133
6		23	11	143
7		31	15	195
8	2	14,7	7,5	108
9		21	11	135
10		30	15	191
11		36	18,5	200
12		42	22	222
13		56	30	245

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h																	
		10000	12000	14000	16000	18000	20000	22000	24000	26000	28000	30000	35000	40000	45000	50000	55000	60000	70000
7,5	2				940	852	748	640	513	367	204	65							
11					1250	1170	1090	1020	963	892	806	705	400	32					
15						1490	1430	1370	1310	1240	1200	1170	1010	792	521	164			
18,5								1470	1400	1340	1300	1270	1170	1000	785	507	167		
22										1430	1370	1340	1290	1160	980	760	492	160	
30												1400	1330	1310	1220	1090	897	660	110
2,2	4	345	310	290	272	245	206	160	100	32									
3			353	315	300	295	277	248	210	165	111	50							
4			444	410	385	380	355	325	282	225	155	72							
5,5					430	412	408	405	385	345	300	249	83						
7,5							383	382	393	386	365	335	230	74					
11										442	450	447	353	220	42				
15										530	515	478	356	182	0				



Motor size	L, mm
•90 •100	510
•112 •132	625
•160 •180	815

NOTE:

* When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

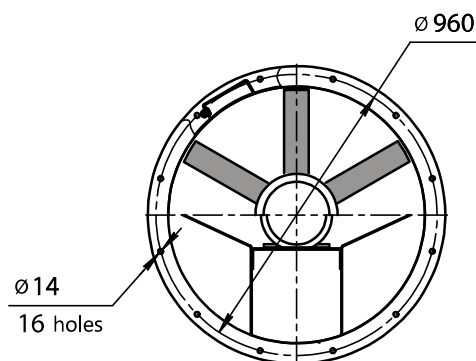
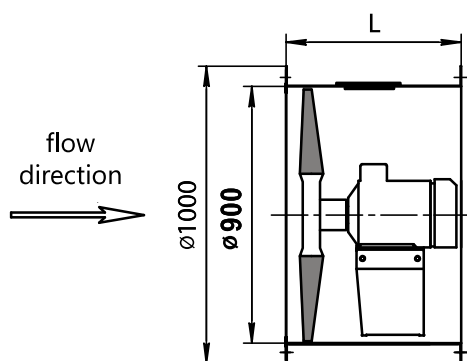
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

090

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	4	8,6	4	84
2		11,7	5,5	115
3		15,6	7,5	125
4		23	11	135
5		31	15	202
6		36	18,5	220

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h										
		22000	24000	26000	28000	30000	35000	40000	45000	50000	55000	60000
4	4	344	324	300	267	230	113	0				
5,5		392	378	374	364	348	276	166	33			
7,5		536	503	473	441	442	393	268	130	0		
11				500	470	440	445	378	280	150	0	
15						482	410	435	385	300	180	40
18,5							550	520	485	400	285	150

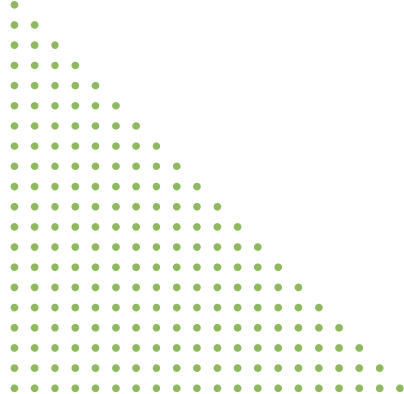


Motor size	L, mm
•100	510
•112 •132	625
•160	815

NOTE:

* When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.



additional equipment

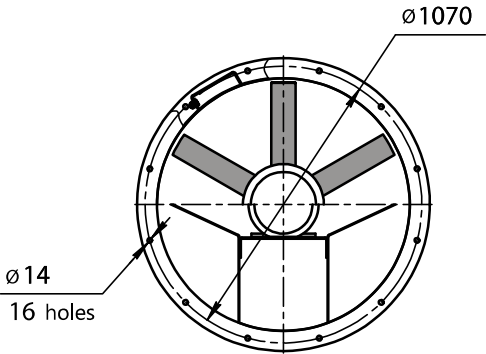
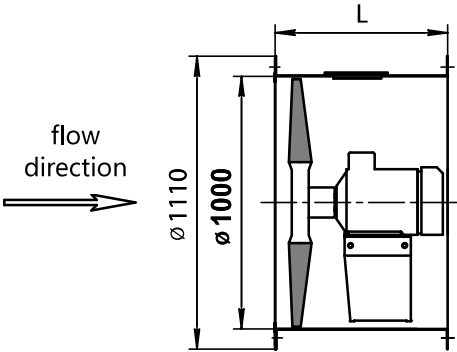
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

100

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	4	8,6	4	109
2		11,7	5,5	118
3		15,6	7,5	128
4		23	11	137
5		31	15	221
6		36	18,5	236
7		44	22	255
8		56	30	288

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h												
		22000	24000	26000	28000	30000	35000	40000	45000	50000	55000	60000	70000	80000
4	4	360	335	305	270	228	117	0						
5,5		448	430	415	405	387	320	230	120	0				
7,5			460	440	425	420	378	308	217	110	0			
11					525	500	470	440	370	278	157	20		
15							520	495	485	443	375	293	46	
18,5									455	460	445	395	226	3
22									595	595	537	452	213	0
30										550	585	550	378	150



Motor size	L, mm
•100	510
•112 •132	625
•160 •180	815

NOTE:
* When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.



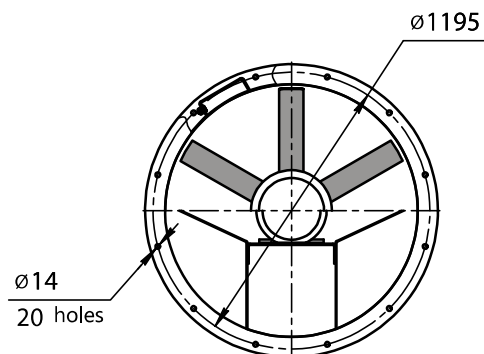
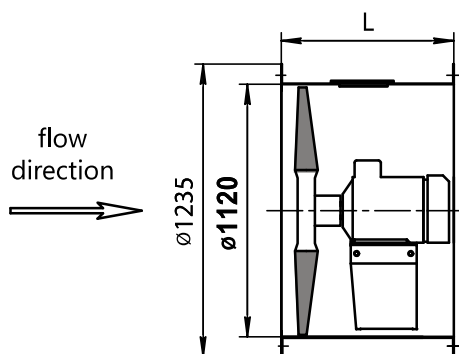
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

112

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	4	11,7	5,5	128
2		15,6	7,5	131
3		23	11	142
4		31	15	223
5		36	18,5	241
6		44	22	259
7		56	30	293
8		70	37	358

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h												
		26000	28000	30000	35000	40000	45000	50000	55000	60000	70000	80000	90000	100000
5,5	4	400	386	370	322	260	188	113	33					
7,5			440	430	395	345	288	222	140	50				
11			660	640	583	515	435	315	188	45				
15				765	706	665	620	565	492	400	162			
18,5					740	695	660	630	580	510	310	53		
22					782	720	690	665	640	595	436	213	0	
30							754	723	700	670	593	460	250	0
37								730	710	690	635	560	442	297

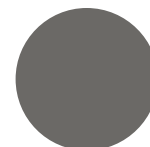


Motor size	L, mm
•112 •132	625
•160 •180	815
•200	950

NOTE:

* When the motor type is changed, the weight may change.

The company reserves the right to change the size and configuration without prior notice.



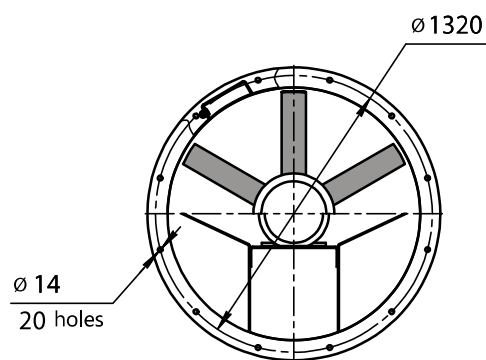
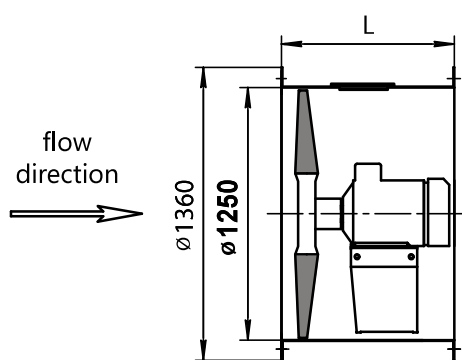
additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

125

Item number	Number of poles	Current at 380 V, A	Motor rated power (Nnom), kW	Weight*, kg
1	4	23	11	187
2		31	15	234
3		36	18,5	252
4		44	22	270
5		56	30	304
6		70	37	373
7		86	45	403
8	6	9	4	154
9		12	5,5	177
10		17,5	7,5	192
11		24	11	239
12		32	15	259
13		37	18,5	274

STATIC PRESSURE, PA

Nnom, kW	Number of poles	flow rate, m³/h															
		24000	26000	28000	30000	35000	40000	45000	50000	55000	60000	70000	80000	90000	100000	110000	120000
11	4	680	656	630	605	560	510	450	375	295	195						
15					700	643	600	553	500	440	370	183	0				
18,5						715	660	620	575	530	475	345	150				
22							720	670	630	595	555	455	320	140			
30								935	900	855	785	615	575	465	277	28	
37									1010	970	931	855	762	607	382	100	0
45											895	760	620	600	515	357	157
4	6	245	230	216	200	150	85	6									
5,5				270	257	230	195	150	94	18							
7,5					310	285	262	240	205	167	120	2					
11					470	438	410	386	360	320	265	100	0				
15							450	430	414	395	370	288	166	0			
18,5									412	400	390	356	295	195	44	0	



Motor size	L, mm
•112 •132	625
•160 •180	815
•200	950

NOTE: * When the motor type is changed, the weight may change.
The company reserves the right to change the size and configuration without prior notice.

additional equipment				
weather protection hood OZA-ZNT	inlet header OZA-VKO	flexible connector OZA-COM	flat adapter OZA-PEP	toroidal adapter OZA-PET
mounting support OZA-MOP		protective mesh OZA-SEM (SEB)	counter flange OZA-FOT	straight duct section OZA-PUV

QUESTIONNAIRE

PLEASE FILL IN ALL THE NECESSARY DATA AND SEND IT TO THE NEAREST COMPANY OFFICE

OZA 501 axial fan

OZA 501

Quantity, pcs: _____

Contact person: _____

Organization: _____

tel.: _____ e-mail: _____

Region (city): _____ date: _____

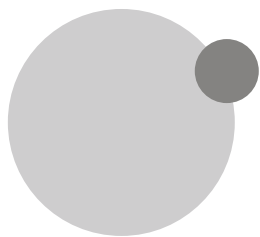
Mark the required one with a "V" sign or specify a value

operating mode	efficiency Q, m ³ /h	
	pressure at t = 20 °C, Pa	efficiency Q, m ³ /h Pv static pressure Psv
fan number		
design version	N - general purpose industrial	
climatic version	Y2	
motor	motor rated power, kW	
	number of poles	
Additional equipment		
flexible connector OZA-COM	series	400 600
	flange material	
inlet header OZA-VKO		
damper	TUL-1(-2)(-3)	
	GMK, GMK-P	
	REG, REG-L	
flat adapter OZA-PEP		
toroidal adapter OZA-PET		
straight duct section OZA-PUV		
grille R50		
protective mesh	OZA-SEM	
	OZA-SEB	
counter flange OZA-FOT		
mounting support	OZA-MOP	
	OZA-MOB	
weather protection hood OZA-ZNT		

Special requirements:

Customer _____
(signature)

_____ (full name)



provide direct supply of outdoor air from the space above the roof to the stairwell and elevator areas, creating overpressure in the stairwell, elevator and other areas, preventing smoke from entering these rooms. At the same time, the ventilation system is simplified, and usable space on the technical floor is freed up.

INTENDED USE:

- PD - smoke control pressurization ventilation systems.

ROOF-MOUNTED AIR SUPPLY FANS

VKOP 0



•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

general purpose industrial (N)

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st placement category.

Operating conditions:

- ambient temperature
 - from -40 °C to +40 °C for temperate climate,
 - from -60 °C to +40 °C for temperate and cold climates,
 - from -10 °C to +50 °C for tropical climate;
- under normal conditions, the conveyed medium must not contain abrasive or sticky substances, fibrous materials, vapors, or dust; its aggressiveness toward carbon steels, aluminum alloys, and GRP material must not exceed that of air; and it must not contain dust or other solid particles in concentrations exceeding 100 mg/m³;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s.

VKOP 0 is the simplest and most economical option for mounting on a prepared base or on an air duct. VKOP 0 is based on specially designed high-efficiency axial fans.

The installation of VKOP 0 assumes a prepared building base, when installing into the roof without preparation, it is necessary to use a STAM connected to VKOP 0 via an OZA-PEK adapter.

VKOP 0 features improved precipitation protection, lower weight, higher performance, versatility, and competitive price.

To protect against accidental leaks in case of heavy precipitation or condensation of moisture from the room on cold VKOP 0 elements, additional solutions must be used - POD series pans.

EXAMPLE:

VKOP 0 rooftop unit, standard size 063; general industrial design; motor rated power $N_{nom} = 11$ kW, number of poles 2; climatic version Y1:

VKOP 0-063-N-01100/2-Y1

- roof-mounted air supply fan (• VKOP 0)
- standard fan size (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- design version (• N)
- motor parameters* (• n/P)
n ** - Motor Power Index
P - number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm)
- climatic version*** (• Y1 • YHL1 • T1)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement. Starting the motors from 15 kW must be performed using the MCD soft starter.

** Motor Power Index - see Table 1.

*** Ambient temperature: for Y1 - from -40 °C to +40 °C; YHL1 - from -60 °C to +40 °C; T1 - from -10 °C to +50 °C. Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

Special requirements for the fan are specified additionally.

TABLE 1
VKOP 0

Motor rated power (N_{nom}), kW	1,1...7,5	11...90
Motor Power Index (n)	00110...00750	01100...09000

TABLE 2 COMPLETE SET OF VKOP 0 FANS WITH ELECTRIC MOTORS

		Standard size										
Number of poles	N_{nom} , kW	040	045	050	056	063	071	080	090	100	112	125
6 (1000 min ⁻¹)	•4											■
	•5,5											■
	•7,5											■
	•11											■
	•15											■
	•18,5											■
4 (1500 min ⁻¹)	•2,2							■				
	•3							■				
	•4							■	■	■		
	•5,5							■	■	■	■	
	•7,5							■	■	■	■	
	•11							■	■	■	■	■
	•15							■	■	■	■	■
	•18,5								■	■	■	■
	•22									■	■	■
	•30									■	■	■
	•37										■	■
2 (3000 min ⁻¹)	•45											■
	•1,1	■	■	■								
	•1,5	■	■	■	■							
	•2,2	■	■	■	■	■						
	•3	■	■	■	■	■	■					
	•4		■	■	■	■	■					
	•5,5		■	■	■	■	■					
	•7,5			■	■	■	■	■				
	•11					■	■	■				
	•15					■	■	■				
	•18,5					■	■	■				
	•22						■	■				
	•30						■	■				

TABLE 3

THE VALUE OF DYNAMIC PRESSURE (R_{dyn} , PA) FOR ROUND DUCTS

Flow rate, m ³ /h	Diameter of the round duct, dm										
	4	4,5	5	5,6	6,3	7,1	8	9	10	11,2	12,5
7000	143,4	89,5	58,8	37,3	23,3	14,4					
7500	164,7	102,8	67,4	42,9	26,8	16,6	10,3				
8000	187,3	117,0	76,7	48,8	30,4	18,9	11,7				
8500	211,5	132,0	86,6	55,1	34,4	21,3	13,2				
9000	237,1	148,0	97,1	61,7	38,5	23,9	14,8				
10000		182,7	119,9	76,2	47,6	29,5	18,3	11,4			
11000		221,1	145,1	92,2	57,6	35,7	22,1	13,8	9,1		
12500		285,5	187,3	119,1	74,3	46,1	28,6	17,8	11,7		
13000		308,8	202,6	128,8	80,4	49,8	30,9	19,3	12,7		
14000			235,0	149,3	93,2	57,8	35,9	22,4	14,7		
15000			269,8	171,4	107,0	66,4	41,2	25,7	16,9	10,7	
17500				233,4	145,7	90,3	56,0	35,0	22,9	14,6	
20000				304,8	190,3	118,0	73,2	45,7	30,0	19,0	12,3
22500				385,8	240,8	149,3	92,6	57,8	37,9	24,1	15,5
25000				476,2	297,3	184,3	114,3	71,4	46,8	29,8	19,2
27500					359,8	223,0	138,4	86,4	56,7	36,0	23,2
30000					428,1	265,4	164,7	102,8	67,4	42,9	27,6
32500					502,5	311,5	193,2	120,6	79,2	50,3	32,4
35000					582,7	361,2	224,1	139,9	91,8	58,3	37,6
37500						414,7	257,3	160,6	105,4	67,0	43,2
40000						471,8	292,7	182,7	119,9	76,2	49,1
42500						532,7	330,5	206,3	135,4	86,0	55,4
45000							370,5	231,3	151,7	96,4	62,2
47500							412,8	257,7	169,1	107,5	69,3
50000								285,5	187,3	119,1	76,7
55000								345,5	226,7	144,1	92,9
60000								411,2	269,8	171,4	110,5
65000								482,6	316,6	201,2	129,7

According to tradition, only the total pressure is specified for any fans, consisting of $P_{total} = P_{stat} + P_{dyn}$, where P_{stat} is precisely the value required for PD-system calculations, while P_{dyn} is practically a useless part of the pressure. To determine the useful part of the P_{stat} , it is necessary to recalculate, which is inconvenient and often ignored, thereby creating errors when choosing equipment. The table provides detailed data for quickly determining the P_{dyn} of any axial fan at a known flow rate, regardless of the manufacturer. Overcoming the channel resistance and creating excessive pressure inside the protected area determines the choice of the fan according to the P_{stat} . With $P_{total} = P_{dyn}$, the useful part of the fan head $P_{stat} = 0$, and creating overpressure becomes completely impossible. It is advisable to select units with a minimum dynamic pressure P_{dyn} of less than 200 Pa, with a reasonable air velocity of up to 15–16 m/s in the cross-section.

For the most convenient and quick selection of VKOP 0 units, all data on the pressure generated is given in the form of tables: Standard size - Static pressure - Flow rate - Motor power.



TABLE 4 FOR QUICK SELECTION OF VKOP O INSTALLATIONS

Static pressure	Flow rate (m³/h) / Nnom (kW)						
	040	045	050	056	063	071	080
	2 poles						
100 Pa	5500/ 1,1 6500/ 1,5 8500/ 2,2 9260/ 3	7710/ 1,1 9180/ 1,5 10700/ 2,2 11700/ 3 14200/ 4 15800/ 5,5	8940/ 1,1 11000/ 1,5 12400/ 2,2 14500/ 3 14800/ 4 17200/ 5,5 18300/ 7,5	12200/ 1,5 15100/ 2,2 17500/ 3 19500/ 4 21900/ 5,5 23600/ 7,5	15900/ 2,2 19900/ 3 23200/ 4 26700/ 5,5 26300/ 7,5 32700/ 11 37800/ 15 38900/ 18,5	22300/ 3 26200/ 4 28900/ 5,5 34400/ 7,5 36600/ 11 44100/ 15 47000/ 18,5 46600/ 22 53800/ 30	29500/ 7,5 39100/ 11 51000/ 15 55900/ 18,5 60700/ 22 70200/ 30
150 Pa	5300/ 1,1 6340/ 1,5 8250/ 2,2 8960/ 3	7300/ 1,1 8770/ 1,5 10200/ 2,2 11400/ 3 13900/ 4 15400/ 5,5	8460/ 1,1 10500/ 1,5 11900/ 2,2 14000/ 3 14500/ 4 16900/ 5,5 18000/ 7,5	11600/ 1,5 14500/ 2,2 16900/ 3 18800/ 4 21200/ 5,5 22900/ 7,5	15100/ 2,2 19200/ 3 22400/ 4 26000/ 5,5 25900/ 7,5 32200/ 11 37300/ 15 38400/ 18,5	21400/ 3 25300/ 4 28100/ 5,5 33500/ 7,5 36000/ 11 43400/ 15 46400/ 18,5 46200/ 22 53300/ 30	28700/ 7,5 38400/ 11 50300/ 15 55300/ 18,5 60000/ 22 69400/ 30
200 Pa	5100/ 1,1 6100/ 1,5 7950/ 2,2 8660/ 3	6870/ 1,1 8340/ 1,5 9740/ 2,2 11100/ 3 13500/ 4 14900/ 5,5	7930/ 1,1 9980/ 1,5 11400/ 2,2 13400/ 3 14200/ 4 16500/ 5,5 17700/ 7,5	11000/ 1,5 13800/ 2,2 16200/ 3 18100/ 4 20400/ 5,5 22100/ 7,5	14300/ 2,2 18400/ 3 21600/ 4 25200/ 5,5 25400/ 7,5 31700/ 11 36800/ 15 38000/ 18,5	20500/ 3 24400/ 4 27100/ 5,5 32600/ 7,5 35500/ 11 42700/ 15 45800/ 18,5 45700/ 22 52900/ 30	28100/ 7,5 37700/ 11 49600/ 15 54600/ 18,5 59400/ 22 68700/ 30
250 Pa	4900/ 1,1 5860/ 1,5 7660/ 2,2 8280/ 3	6390/ 1,1 7820/ 1,5 9250/ 2,2 10800/ 3 13100/ 4 14500/ 5,5	7360/ 1,1 9400/ 1,5 10800/ 2,2 12800/ 3 13800/ 4 16100/ 5,5 17400/ 7,5	10400/ 1,5 13200/ 2,2 15500/ 3 17400/ 4 19700/ 5,5 21300/ 7,5	13500/ 2,2 17500/ 3 20800/ 4 24300/ 5,5 24900/ 7,5 31200/ 11 36400/ 15 37600/ 18,5	19500/ 3 23200/ 4 26100/ 5,5 31500/ 7,5 34900/ 11 42100/ 15 45100/ 18,5 45200/ 22 52400/ 30	27400/ 7,5 37000/ 11 48900/ 15 53900/ 18,5 58700/ 22 67800/ 30
300 Pa	4620/ 1,1 5600/ 1,5 7280/ 2,2 7840/ 3	5840/ 1,1 7260/ 1,5 8630/ 2,2 10500/ 3 12600/ 4 13900/ 5,5	6750/ 1,1 8800/ 1,5 10200/ 2,2 12000/ 3 13500/ 4 15700/ 5,5 17100/ 7,5	9680/ 1,5 12500/ 2,2 14700/ 3 16600/ 4 19000/ 5,5 20400/ 7,5	12600/ 2,2 16500/ 3 19900/ 4 23400/ 5,5 24400/ 7,5 30600/ 11 35900/ 15 37200/ 18,5	18500/ 3 22100/ 4 25100/ 5,5 30600/ 7,5 34200/ 11 41400/ 15 44500/ 18,5 44800/ 22 51900/ 30	26900/ 7,5 36300/ 11 48200/ 15 53200/ 18,5 58000/ 22 67000/ 30
350 Pa	4300/ 1,1 5260/ 1,5 6870/ 2,2 7180/ 3	5220/ 1,1 6640/ 1,5 7950/ 2,2 10100/ 3 12200/ 4 13400/ 5,5	6070/ 1,1 8170/ 1,5 9480/ 2,2 11300/ 3 13100/ 4 15300/ 5,5 16800/ 7,5	8970/ 1,5 11800/ 2,2 13900/ 3 15800/ 4 18200/ 5,5 19400/ 7,5	11400/ 2,2 15700/ 3 18900/ 4 22400/ 5,5 23900/ 7,5 30100/ 11 35200/ 15 36800/ 18,5	17300/ 3 20900/ 4 24100/ 5,5 29500/ 7,5 33600/ 11 40800/ 15 43800/ 18,5 44300/ 22 51400/ 30	26200/ 7,5 35700/ 11 47500/ 15 52400/ 18,5 57400/ 22 66200/ 30
400 Pa	3960/ 1,1 4900/ 1,5 6430/ 2,2 6580/ 3	4510/ 1,1 5980/ 1,5 7040/ 2,2 9730/ 3 11800/ 4 12700/ 5,5	5260/ 1,1 7480/ 1,5 8680/ 2,2 10500/ 3 12600/ 4 14900/ 5,5 16400/ 7,5	8210/ 1,5 11000/ 2,2 13100/ 3 15000/ 4 17300/ 5,5 18100/ 7,5	10100/ 2,2 14700/ 3 17800/ 4 21500/ 5,5 23400/ 7,5 29600/ 11 34700/ 15 36400/ 18,5	16100/ 3 19700/ 4 22900/ 5,5 28400/ 7,5 32900/ 11 40200/ 15 43100/ 18,5 43900/ 22 51000/ 30	25500/ 7,5 35000/ 11 46800/ 15 51700/ 18,5 56500/ 22 65200/ 30
500 Pa	2730/ 1,1 4150/ 1,5 4120/ 2,2 4300/ 3	2800/ 1,1 4090/ 1,5 4500/ 2,2 8770/ 3 10300/ 4 10900/ 5,5	3250/ 1,1 5470/ 1,5 6890/ 2,2 7660/ 3 11700/ 4 14000/ 5,5 15700/ 7,5	5900/ 1,5 9190/ 2,2 11200/ 3 13000/ 4 15300/ 5,5 14400/ 7,5	7720/ 2,2 12100/ 3 15300/ 4 19400/ 5,5 22200/ 7,5 28400/ 11 33500/ 15 35400/ 18,5	13400/ 3 16900/ 4 20700/ 5,5 25900/ 7,5 31400/ 11 39000/ 15 41800/ 18,5 42800/ 22 49800/ 30	24200/ 7,5 33500/ 11 45300/ 15 50100/ 18,5 54800/ 22 63200/ 30

PART I (PRESSURE UP TO 500 PA)

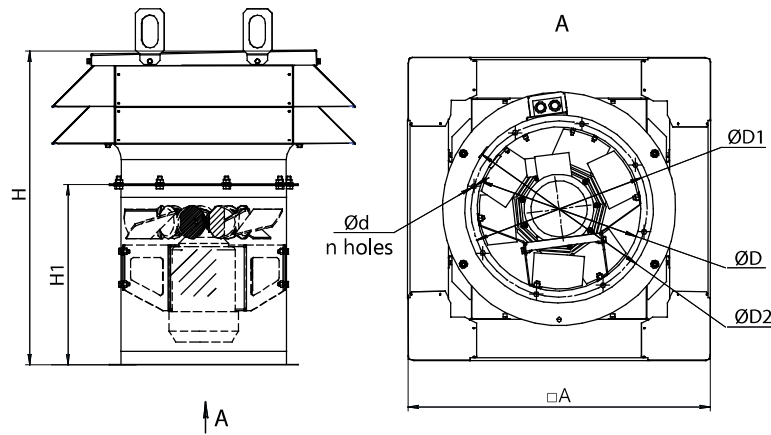
Flow rate (m³/h) / Nnom (kW)						Static pressure
080	090	100	112	125		
4 poles					6 poles	
24000/ 2,2 28700/ 3 28800/ 4 34300/ 5,5 39600/ 7,5 43700/ 11 41800/ 15	35500/ 4 42400/ 5,5 46000/ 7,5 51600/ 11 58000/ 15 61600/ 18,5	35600/ 4 45800/ 5,5 50700/ 7,5 57100/ 11 67900/ 15 76000/ 18,5 73700/ 22 76200/ 30	50800/ 5,5 57400/ 7,5 58000/ 11 72100/ 15 78200/ 18,5 84400/ 22 95600/ 30 109000/ 37	64100/ 11 73600/ 15 82200/ 18,5 91800/ 22 107000/ 30 110000/ 37 123000/ 45	38900/ 4 49500/ 5,5 61900/ 7,5 70200/ 11 84100/ 15 96600/ 18,5	100 Pa
22900/ 2,2 27100/ 3 27600/ 4 33200/ 5,5 38000/ 7,5 42400/ 11 40800/ 15	33600/ 4 40600/ 5,5 44400/ 7,5 50000/ 11 56300/ 15 60000/ 18,5	33500/ 4 43700/ 5,5 48500/ 7,5 55200/ 11 66000/ 15 73800/ 18,5 72100/ 22 74800/ 30	47600/ 5,5 54500/ 7,5 56300/ 11 70400/ 15 76400/ 18,5 82600/ 22 93600/ 30 108000/ 37	62000/ 11 71500/ 15 80100/ 18,5 89500/ 22 105000/ 30 108000/ 37 121000/ 45	34900/ 4 45100/ 5,5 56900/ 7,5 67600/ 11 81100/ 15 93100/ 18,5	150 Pa
21200/ 2,2 25400/ 3 26300/ 4 31700/ 5,5 36400/ 7,5 40700/ 11 39500/ 15	31400/ 4 38600/ 5,5 42700/ 7,5 48200/ 11 54400/ 15 58200/ 18,5	31300/ 4 41500/ 5,5 46200/ 7,5 53300/ 11 64100/ 15 71400/ 18,5 70500/ 22 73400/ 30	44300/ 5,5 51400/ 7,5 54500/ 11 68400/ 15 74500/ 18,5 80500/ 22 91800/ 30 106000/ 37	59600/ 11 69300/ 15 77800/ 18,5 86900/ 22 103000/ 30 106000/ 37 118000/ 45	30000/ 4 39200/ 5,5 50700/ 7,5 64800/ 11 77700/ 15 89600/ 18,5	200 Pa
19200/ 2,2 23400/ 3 25100/ 4 30200/ 5,5 34500/ 7,5 39100/ 11 38200/ 15	28900/ 4 36400/ 5,5 40900/ 7,5 46300/ 11 52500/ 15 56400/ 18,5	29000/ 4 38800/ 5,5 43600/ 7,5 51300/ 11 62200/ 15 68800/ 18,5 68600/ 22 71900/ 30	40800/ 5,5 47900/ 7,5 52700/ 11 66400/ 15 72300/ 18,5 78500/ 22 90100/ 30 103000/ 37	57100/ 11 66900/ 15 75400/ 18,5 84200/ 22 101000/ 30 105000/ 37 116000/ 45	23000/ 4 31300/ 5,5 42500/ 7,5 61200/ 11 73500/ 15 84800/ 18,5	250 Pa
16300/ 2,2 20900/ 3 23700/ 4 28800/ 5,5 32600/ 7,5 37300/ 11 36700/ 15	25700/ 4 33700/ 5,5 38800/ 7,5 44100/ 11 50100/ 15 54400/ 18,5	26200/ 4 36200/ 5,5 40700/ 7,5 49100/ 11 59700/ 15 66100/ 18,5 66800/ 22 70300/ 30	36900/ 5,5 44000/ 7,5 50800/ 11 64300/ 15 70400/ 18,5 76400/ 22 88100/ 30 100000/ 37	54500/ 11 64200/ 15 72900/ 18,5 81300/ 22 98800/ 30 103000/ 37 113000/ 45	16200/ 4 23100/ 5,5 32100/ 7,5 57000/ 11 68700/ 15 79200/ 18,5	300 Pa
11700/ 2,2 13900/ 3 21800/ 4 26900/ 5,5 30700/ 7,5 35200/ 11 35200/ 15	20900/ 4 29800/ 5,5 36800/ 7,5 41700/ 11 47300/ 15 52300/ 18,5	22900/ 4 33000/ 5,5 37500/ 7,5 46200/ 11 56700/ 15 63200/ 18,5 64800/ 22 68800/ 30	32200/ 5,5 39400/ 7,5 48700/ 11 62000/ 15 68000/ 18,5 74200/ 22 86200/ 30 96500/ 37	51600/ 11 61100/ 15 69500/ 18,5 77900/ 22 96400/ 30 101000/ 37 111000/ 45	10500/ 4 16400/ 5,5 24100/ 7,5 51100/ 11 63100/ 15 71200/ 18,5	350 Pa
9600/ 2,2 11600/ 3 19100/ 4 24500/ 5,5 28300/ 7,5 32500/ 11 33500/ 15	16500/ 4 20900/ 5,5 34700/ 7,5 38900/ 11 44100/ 15 50000/ 18,5	18100/ 4 28900/ 5,5 33100/ 7,5 42900/ 11 53400/ 15 59500/ 18,5 62500/ 22 67200/ 30	26300/ 5,5 34000/ 7,5 46500/ 11 59800/ 15 65700/ 18,5 71800/ 22 83700/ 30 92800/ 37	48500/ 11 57700/ 15 65900/ 18,5 74300/ 22 93800/ 30 99500/ 37 108000/ 45	3000/ 4 9200/ 5,5 17400/ 7,5 42100/ 11 53500/ 15 53600/ 18,5	400 Pa
6570/ 2,2 8690/ 3 10800/ 4 11700/ 5,5 13100/ 7,5 16000/ 11 28900/ 15	12300/ 4 16100/ 5,5 24100/ 7,5 25900/ 11 28800/ 15 43500/ 18,5	12500/ 4 18800/ 5,5 21700/ 7,5 30300/ 11 37500/ 15 38000/ 18,5 57300/ 22 63600/ 30	17700/ 5,5 20700/ 7,5 41000/ 11 54500/ 15 60400/ 18,5 66400/ 22 77400/ 30 85300/ 37	40800/ 11 50100/ 15 57700/ 18,5 65500/ 22 88000/ 30 95400/ 37 101000/ 45	3600/ 7,5 25700/ 11 31100/ 15 34400/ 18,5	500 Pa

TABLE 4

Static pressure	Flow rate (m³/h) / Nnom (kW)						
	040	045	050	056	063	071	080
	2 poles						
600 Pa	2270/ 1,1 2730/ 1,5 3550/ 2,2 3800/ 3	1980/ 1,1 2930/ 1,5 3560/ 2,2 7620/ 3 6300/ 4 7710/ 5,5	2230/ 1,1 3640/ 1,5 4530/ 2,2 5420/ 3 10700/ 4 12900/ 5,5 14900/ 7,5	3850/ 1,5 6110/ 2,2 8230/ 3 8800/ 4 9800/ 5,5 10600/ 7,5	5040/ 2,2 8600/ 3 12200/ 4 17100/ 5,5 20900/ 7,5 27000/ 11 32100/ 15 34400/ 18,5	10200/ 3 13100/ 4 18100/ 5,5 23300/ 7,5 29900/ 11 37500/ 15 40100/ 18,5 41800/ 22 48600/ 30	22600/ 7,5 32000/ 11 43600/ 15 48400/ 18,5 53100/ 22 61300/ 30
700 Pa	1920/ 1,1 2340/ 1,5 3000/ 2,2 3300/ 3	1440/ 1,1 2270/ 1,5 2860/ 2,2 4700/ 3 5450/ 4 6980/ 5,5	1500/ 1,1 2740/ 1,5 3480/ 2,2 4610/ 3 9340/ 4 11300/ 5,5 13800/ 7,5	2730/ 1,5 4310/ 2,2 6020/ 3 6870/ 4 8200/ 5,5 9240/ 7,5	2570/ 2,2 5420/ 3 8000/ 4 13200/ 5,5 19400/ 7,5 25800/ 11 30700/ 15 33300/ 18,5	7200/ 3 8970/ 4 14000/ 5,5 20200/ 7,5 28300/ 11 35900/ 15 38400/ 18,5 40800/ 22 47400/ 30	20900/ 7,5 30200/ 11 41800/ 15 46600/ 18,5 51100/ 22 59200/ 30
800 Pa	1600/ 1,1 2000/ 1,5 2500/ 2,2 2800/ 3	893/ 1,1 1740/ 1,5 2220/ 2,2 4080/ 3 4830/ 4 5510/ 5,5	2080/ 1,5 2810/ 2,2 3760/ 3 5950/ 4 7140/ 5,5 9100/ 7,5	1760/ 1,5 3400/ 2,2 4800/ 3 5870/ 4 7270/ 5,5 8100/ 7,5	2900/ 3 5200/ 4 9400/ 5,5 17700/ 7,5 24300/ 11 29100/ 15 32000/ 18,5	5000/ 3 5680/ 4 10000/ 5,5 14800/ 7,5 26600/ 11 34200/ 15 36500/ 18,5 39500/ 22 46000/ 30	19000/ 7,5 28100/ 11 39800/ 15 44600/ 18,5 49200/ 22 57100/ 30
900 Pa	1270/ 1,1 1650/ 1,5 2080/ 2,2 2350/ 3	1230/ 1,5 1590/ 2,2 3620/ 3 4260/ 4 4870/ 5,5	1400/ 1,5 2150/ 2,2 2900/ 3 5230/ 4 6260/ 5,5 7030/ 7,5	2580/ 2,2 4020/ 3 4880/ 4 6330/ 5,5 6940/ 7,5	2700/ 4 7700/ 5,5 15600/ 7,5 22700/ 11 27400/ 15 30800/ 18,5	3200/ 3 2710/ 4 7500/ 5,5 11600/ 7,5 24300/ 11 32300/ 15 34600/ 18,5 38100/ 22 44400/ 30	16900/ 7,5 25700/ 11 37600/ 15 42400/ 18,5 46900/ 22 54900/ 30

PRESSURE FROM 600 PA

	Flow rate (m³/h) / Nnom (kW)					Static pressure
	080	090	100	112	125	
	4 poles				6 poles	
4220/2,2 6000/ 3 7690/ 4 8450/ 5,5 9380/ 7,5 12100/ 11 14900/ 15	8600/ 4 12700/ 5,5 16800/ 7,5 16900/ 11 19100/ 15 30500/ 18,5	7800/ 4 13600/ 5,5 16300/ 7,5 23000/ 11 28100/ 15 31600/ 18,5 38500/ 22 58300/ 30	11200/ 5,5 12100/ 7,5 33600/ 11 47000/ 15 53400/ 18,5 59600/ 22 69200/ 30 74700/ 37	30500/ 11 39600/ 15 47100/ 18,5 54400/ 22 70900/ 30 90400/ 37 92100/ 45	11800/ 11 16300/ 15 18300/ 18,5	600 Pa
4450/ 5,5 5320/ 7,5 8350/ 11 11900/ 15	4900/ 4 8790/ 5,5 10400/ 7,5 9800/ 11 11500/ 15 20300/ 18,5	3100/ 4 8120/ 5,5 10800/ 7,5 16400/ 11 20900/ 15 25400/ 18,5 30300/ 22 44400/ 30	4700/ 5,5 3140/ 7,5 25300/ 11 35700/ 15 39400/ 18,5 43200/ 22 55100/ 30 58000/ 37	22600/ 11 30100/ 15 36100/ 18,5 41600/ 22 65000/ 30 84200/ 37 73400/ 45		700 Pa
4650/ 11 8620/ 15	4700/ 5,5 4600/ 7,5 3300/ 11 4600/ 15 13400/ 18,5	2560/ 5,5 5000/ 7,5 8600/ 11 12700/ 15 17200/ 18,5 24100/ 22 32800/ 30	19100/ 11 27400/ 15 30600/ 18,5 33700/ 22 41000/ 30 42100/ 37	14500/ 11 22000/ 15 27600/ 18,5 32500/ 22 59000/ 30 76300/ 37 67500/ 45		800 Pa
5190/ 15	7900/ 18,5	3970/ 15 6300/ 18,5 17500/ 22 26800/ 30	13600/ 11 21300/ 15 24200/ 18,5 27400/ 22 33700/ 30 35000/ 37	4520/ 11 12800/ 15 18400/ 18,5 23300/ 22 49900/ 30 64500/ 37 59400/ 45		900 Pa



Standard size	Dimensions, mm							n	Number of poles	Nnom, kW	Weight, kg	STAM*	OZA-PEK*	
	A	H	H ₁	D	D ₁	D ₂	d							
040	740	769	440	400	430	460	12	8	2	•1,1 •1,5 •2,2	•44 •46 •48	STAMXXX-56	040	
		839	510								•3			•52
045	805	760	440	450	480	510	12	8		•1,1 •1,5 •2,2	•47 •50 •53	STAMXXX-63	045	
		830	510								•3 •4 •5,5			•55 •60 •69
050	920	868	440	500	530	560	12	12		•1,1 •1,5 •2,2	•50 •54 •56	STAMXXX-71	050	
		938	510								•3 •4 •5,5			•59 •64 •73
		1053	625								•7,5			•98
056	920	882	440	560	620	660	12	12		•1,5 •2,2	•66 •68	STAMXXX-71	056	
		952	510								•3 •4 •5,5			•73 •79 •87
		1067	625								•7,5			•97
063	1030	898	440	630	690	730	12	12		•2,2	•74	STAMXXX-88	063	
		968	510								•3 •4 •5,5			•79 •84 •93
		1083	625								•7,5 •11			•101 •170
		1273	815								•15 •18,5			•225 •234
071	1105	983	510	710	770	810	12	16		•3 •4 •5,5	•91 •97 •105	STAMXXX-90	071	
		1098	625								•7,5 •11			•113 •148
		1288	815								•15 •18,5 •22 •30			•190 •199 •221 •244
080	1201	1122	625	800	860	900	14	16		2	•7,5 •11	•126 •153	STAMXXX-109	080
		1312	815									•15 •18,5 •22 •30		
		1007	510								•2,2 •3 •4	•116 •119 •128		
		1122	625							•5,5 •7,5 •11	•136 •150 •160			
		1312	815							•15	•219			
090	1405	1035	510	900	960	1000	14	16	4	•4	•157	STAMXXX-112	090	
		1150	625								•5,5 •7,5 •11			•175 •189 •200
		1340	815								•15 •18,5			•277 •294
100	1560	1060	510	1000	1070	1100	14	16		•4	•150	STAMXXX-136	100	
		1175	625								•5,5 •7,5 •11			•196 •210 •220
		1365	815								•15 •18,5 •22 •30			•301 •328 •347 •371
112	1680	1165	625	1120	1195	1235	14	20	•5,5 •7,5 •11	•220 •230 •240	STAMXXX-136	112		
		1355	815							•15 •18,5 •22 •30			•321 •339 •357 •391	
		1490	950							•37			•457	
125	1680	1165	625	1250	1320	1360	14	20	4	•11	•245	STAMXXX-136	125	
		1355	815								•15 •18,5 •22 •30			•305 •323 •341 •376
		1490	950								•37 •45			•475 •505
		1165	625							6	•4 •5,5 •7,5			•212 •235 •250
		1355	815								•11 •15 •18,5			•307 •329 •364

NOTE:

* The installation of VKOP 0 assumes a prepared building base, when installing into the roof without preparation, it is necessary to use a STAM connected to VKOP 0 via an OZA-PEK adapter. To protect against accidental leaks in case of heavy precipitation or condensation of moisture from the room on cold VKOP 0 elements, additional solutions must be used - POD series pans.

STAMXXX is 56, where XXX is the modification; 56 is the standard size.

** OZA-PEK is a special roof adapter for installing VKOP 0 on STAM (see section "Additional equipment" of the catalog).

VKOP 1

ROOF-MOUNTED AIR SUPPLY FANS



provide direct supply of outdoor air from the space above the roof to the stairwell and elevator areas, creating overpressure in the stairwell, elevator and other areas, preventing smoke from entering these rooms. At the same time, the ventilation system is simplified, and usable space on the technical floor is freed up.

INTENDED USE:

- PD - smoke control pressurization ventilation systems.

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

VKOP 1, a new development with an improved appearance, consists, in addition to the fan itself, of its own mounting plate. VKOP 1 also includes a special external cladding for direct installation of waterproofing when installed directly into the roof without an additional STAM base.

To protect against accidental leaks in case of heavy precipitation or condensation of moisture from the room on cold VKOP 1 elements, additional solutions must be used - POD series pans.

- general purpose industrial (N)

OPERATING CONDITIONS

According to GOST 15150, fans can be operated in temperate (Y), temperate and cold (YHL) and tropical (T) climates of the 1st placement category.

Operating conditions:

- ambient temperature
 - from -40 °C to +40 °C for temperate climate,
 - from -60 °C to +40 °C for temperate and cold climates,
 - from -10 °C to +50 °C for tropical climate;
- under normal conditions, the conveyed medium must not contain abrasive or sticky substances, fibrous materials, vapors, or dust; its aggressiveness toward carbon steels, aluminum alloys, and GRP material must not exceed that of air; and it must not contain dust or other solid particles in concentrations exceeding 100 mg/m³;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s.

EXAMPLE:

VKOP 1 rooftop unit, standard size 063; general industrial design; motor rated power Nnom = 11 kW, number of poles 2; climatic version Y1:

VKOP 1-063-N-01100/2-Y1

- roof-mounted air supply fan (•VKOP 1)
- standard fan size (• 040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125)
- design version (•N)
- motor parameters* (•n/P)
n** – Motor Power Index
P – number of poles: 2 (3000 rpm), 4 (1500 rpm), 6 (1000 rpm)
- climatic version*** (•Y1 •YHL1 •T1)

NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement. Starting the motors from 15 kW must be performed using the MCD soft starter.

** Motor Power Index - see Table 1.

*** Ambient temperature: for Y1 - from -40° C to +40° C; YHL1 - from -60° C to +40° C; T1 - from -10° C to +50° C.

Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

TABLE 1

VKOP 1

Motor rated power (Nnom), kW	1,1...7,5	11...90
Motor Power Index (n)	00110...00750	01100...09000

TABLE 2 COMPLETE SET OF VKOP 1 FANS WITH ELECTRIC MOTORS

Standard size												
Number of poles	Nnom, kW	040	045	050	056	063	071	080	090	100	112	125
6 (1 000 min ⁻¹)	•4											■
	•5,5											■
	•7,5											■
	•11											■
	•15											■
	•18,5											■
4 (1 500 min ⁻¹)	•2,2							■				
	•3							■				
	•4							■	■	■		
	•5,5							■	■	■	■	
	•7,5							■	■	■	■	
	•11							■	■	■	■	■
	•15							■	■	■	■	■
	•18,5								■	■	■	■
	•22									■	■	■
	•30									■	■	■
	•37										■	■
	•45											■
2 (3 000 min ⁻¹)	•1,1	■	■	■								
	•1,5	■	■	■	■							
	•2,2	■	■	■	■	■						
	•3	■	■	■	■	■	■					
	•4		■	■	■	■	■					
	•5,5		■	■	■	■	■					
	•7,5			■	■	■	■	■				
	•11					■	■	■				
	•15					■	■	■				
	•18,5					■	■	■				
	•22						■	■				
	•30						■	■				

TABLE 3
THE VALUE OF DYNAMIC PRESSURE (RDYN, PA) FOR ROUND DUCTS

Flow rate, m ³ /h	Diameter of the round duct, dm										
	4	4,5	5	5,6	6,3	7,1	8	9	10	11,2	12,5
7 000	143,4	89,5	58,8	37,3	23,3	14,4					
7 500	164,7	102,8	67,4	42,9	26,8	16,6	10,3				
8 000	187,3	117,0	76,7	48,8	30,4	18,9	11,7				
8 500	211,5	132,0	86,6	55,1	34,4	21,3	13,2				
9 000	237,1	148,0	97,1	61,7	38,5	23,9	14,8				
10 000		182,7	119,9	76,2	47,6	29,5	18,3	11,4			
11 000		221,1	145,1	92,2	57,6	35,7	22,1	13,8	9,1		
12 500		285,5	187,3	119,1	74,3	46,1	28,6	17,8	11,7		
13 000		308,8	202,6	128,8	80,4	49,8	30,9	19,3	12,7		
14 000			235,0	149,3	93,2	57,8	35,9	22,4	14,7		
15 000			269,8	171,4	107,0	66,4	41,2	25,7	16,9	10,7	
17 500				233,4	145,7	90,3	56,0	35,0	22,9	14,6	
20 000				304,8	190,3	118,0	73,2	45,7	30,0	19,0	12,3
22 500				385,8	240,8	149,3	92,6	57,8	37,9	24,1	15,5
25 000				476,2	297,3	184,3	114,3	71,4	46,8	29,8	19,2
27 500					359,8	223,0	138,4	86,4	56,7	36,0	23,2
30 000					428,1	265,4	164,7	102,8	67,4	42,9	27,6
32 500					502,5	311,5	193,2	120,6	79,2	50,3	32,4
35 000					582,7	361,2	224,1	139,9	91,8	58,3	37,6
37 500						414,7	257,3	160,6	105,4	67,0	43,2
40 000						471,8	292,7	182,7	119,9	76,2	49,1
42 500						532,7	330,5	206,3	135,4	86,0	55,4
45 000							370,5	231,3	151,7	96,4	62,2
47 500							412,8	257,7	169,1	107,5	69,3
50 000								285,5	187,3	119,1	76,7
55 000								345,5	226,7	144,1	92,9
60 000								411,2	269,8	171,4	110,5
65 000								482,6	316,6	201,2	129,7

According to tradition, only the total pressure is specified for any fans, consisting of $P_{total}=P_{stat}+P_{dyn}$, where P_{stat} is precisely the value required for PD-system calculations, while P_{dyn} is practically a useless part of the pressure. To determine the useful part of the P_{stat} , it is necessary to recalculate, which is inconvenient and often ignored, thereby creating errors when choosing equipment. The table provides detailed data for quickly determining the P_{dyn} of any axial fan at a known flow rate, regardless of the manufacturer. Overcoming the channel resistance and creating excessive pressure inside the protected area determines the choice of the fan according to the P_{stat} . With $P_{total}=P_{dyn}$, the useful part of the fan head $P_{stat}=0$, and creating overpressure becomes completely impossible. It is advisable to select units with a minimum dynamic pressure P_{dyn} of less than 200 Pa, with a reasonable air velocity of up to 15–16 m/s in the cross-section.

For the most convenient and quick selection of VKOP 1 units, all data on the pressure generated is given in the form of tables: Standard size - Static pressure - Flow rate - Motor power.

TABLE 4 FOR QUICK SELECTION OF VKOP 1 INSTALLATIONS

Static pressure	Flow rate (m³/h) / Nnom (kW)						
	040	045	050	056	063	071	080
	2 poles						
100 Pa	5500/ 1,1 6500/ 1,5 8500/ 2,2 9260/ 3	7710/ 1,1 9180/ 1,5 10700/ 2,2 11700/ 3 14200/ 4 15800/ 5,5	8940/ 1,1 11000/ 1,5 12400/ 2,2 14500/ 3 14800/ 4 17200/ 5,5 18300/ 7,5	12200/ 1,5 15100/ 2,2 17500/ 3 19500/ 4 21900/ 5,5 23600/ 7,5	15900/ 2,2 19900/ 3 23200/ 4 26700/ 5,5 26300/ 7,5 32700/ 11 37800/ 15 38900/ 18,5	22300/ 3 26200/ 4 28900/ 5,5 34400/ 7,5 36600/ 11 44100/ 15 47000/ 18,5 46600/ 22 53800/ 30	29500/ 7,5 39100/ 11 51000/ 15 55900/ 18,5 60700/ 22 70200/ 30
150 Pa	5300/ 1,1 6340/ 1,5 8250/ 2,2 8960/ 3	7300/ 1,1 8770/ 1,5 10200/ 2,2 11400/ 3 13900/ 4 15400/ 5,5	8460/ 1,1 10500/ 1,5 11900/ 2,2 14000/ 3 14500/ 4 16900/ 5,5 18000/ 7,5	11600/ 1,5 14500/ 2,2 16900/ 3 18800/ 4 21200/ 5,5 22900/ 7,5	15100/ 2,2 19200/ 3 22400/ 4 26000/ 5,5 25900/ 7,5 32200/ 11 37300/ 15 38400/ 18,5	21400/ 3 25300/ 4 28100/ 5,5 33500/ 7,5 36000/ 11 43400/ 15 46400/ 18,5 46200/ 22 53300/ 30	28700/ 7,5 38400/ 11 50300/ 15 55300/ 18,5 60000/ 22 69400/ 30
200 Pa	5100/ 1,1 6100/ 1,5 7950/ 2,2 8660/ 3	6870/ 1,1 8340/ 1,5 9740/ 2,2 11100/ 3 13500/ 4 14900/ 5,5	7930/ 1,1 9980/ 1,5 11400/ 2,2 13400/ 3 14200/ 4 16500/ 5,5 17700/ 7,5	11000/ 1,5 13800/ 2,2 16200/ 3 18100/ 4 20400/ 5,5 22100/ 7,5	14300/ 2,2 18400/ 3 21600/ 4 25200/ 5,5 25400/ 7,5 31700/ 11 36800/ 15 38000/ 18,5	20500/ 3 24400/ 4 27100/ 5,5 32600/ 7,5 35500/ 11 42700/ 15 45800/ 18,5 45700/ 22 52900/ 30	28100/ 7,5 37700/ 11 49600/ 15 54600/ 18,5 59400/ 22 68700/ 30
250 Pa	4900/ 1,1 5860/ 1,5 7660/ 2,2 8280/ 3	6390/ 1,1 7820/ 1,5 9250/ 2,2 10800/ 3 13100/ 4 14500/ 5,5	7360/ 1,1 9400/ 1,5 10800/ 2,2 12800/ 3 13800/ 4 16100/ 5,5 17400/ 7,5	10400/ 1,5 13200/ 2,2 15500/ 3 17400/ 4 19700/ 5,5 21300/ 7,5	13500/ 2,2 17500/ 3 20800/ 4 24300/ 5,5 24900/ 7,5 31200/ 11 36400/ 15 37600/ 18,5	19500/ 3 23200/ 4 26100/ 5,5 31500/ 7,5 34900/ 11 42100/ 15 45100/ 18,5 45200/ 22 52400/ 30	27400/ 7,5 37000/ 11 48900/ 15 53900/ 18,5 58700/ 22 67800/ 30
300 Pa	4620/ 1,1 5600/ 1,5 7280/ 2,2 7840/ 3	5840/ 1,1 7260/ 1,5 8630/ 2,2 10500/ 3 12600/ 4 13900/ 5,5	6750/ 1,1 8800/ 1,5 10200/ 2,2 12000/ 3 13500/ 4 15700/ 5,5 17100/ 7,5	9680/ 1,5 12500/ 2,2 14700/ 3 16600/ 4 19000/ 5,5 20400/ 7,5	12600/ 2,2 16500/ 3 19900/ 4 23400/ 5,5 24400/ 7,5 30600/ 11 35900/ 15 37200/ 18,5	18500/ 3 22100/ 4 25100/ 5,5 30600/ 7,5 34200/ 11 41400/ 15 44500/ 18,5 44800/ 22 51900/ 30	26900/ 7,5 36300/ 11 48200/ 15 53200/ 18,5 58000/ 22 67000/ 30
350 Pa	4300/ 1,1 5260/ 1,5 6870/ 2,2 7180/ 3	5220/ 1,1 6640/ 1,5 7950/ 2,2 10100/ 3 12200/ 4 13400/ 5,5	6070/ 1,1 8170/ 1,5 9480/ 2,2 11300/ 3 13100/ 4 15300/ 5,5 16800/ 7,5	8970/ 1,5 11800/ 2,2 13900/ 3 15800/ 4 18200/ 5,5 19400/ 7,5	11400/ 2,2 15700/ 3 18900/ 4 22400/ 5,5 23900/ 7,5 30100/ 11 35200/ 15 36800/ 18,5	17300/ 3 20900/ 4 24100/ 5,5 29500/ 7,5 33600/ 11 40800/ 15 43800/ 18,5 44300/ 22 51400/ 30	26200/ 7,5 35700/ 11 47500/ 15 52400/ 18,5 57400/ 22 66200/ 30
400 Pa	3960/ 1,1 4900/ 1,5 6430/ 2,2 6580/ 3	4510/ 1,1 5980/ 1,5 7040/ 2,2 9730/ 3 11800/ 4 12700/ 5,5	5260/ 1,1 7480/ 1,5 8680/ 2,2 10500/ 3 12600/ 4 14900/ 5,5 16400/ 7,5	8210/ 1,5 11000/ 2,2 13100/ 3 15000/ 4 17300/ 5,5 18100/ 7,5	10100/ 2,2 14700/ 3 17800/ 4 21500/ 5,5 23400/ 7,5 29600/ 11 34700/ 15 36400/ 18,5	16100/ 3 19700/ 4 22900/ 5,5 28400/ 7,5 32900/ 11 40200/ 15 43100/ 18,5 43900/ 22 51000/ 30	25500/ 7,5 35000/ 11 46800/ 15 51700/ 18,5 56500/ 22 65200/ 30
500 Pa	2730/ 1,1 4150/ 1,5 4120/ 2,2 4300/ 3	2800/ 1,1 4090/ 1,5 4500/ 2,2 8770/ 3 10300/ 4 10900/ 5,5	3250/ 1,1 5470/ 1,5 6890/ 2,2 7660/ 3 11700/ 4 14000/ 5,5 15700/ 7,5	5900/ 1,5 9190/ 2,2 11200/ 3 13000/ 4 15300/ 5,5 14400/ 7,5	7720/ 2,2 12100/ 3 15300/ 4 19400/ 5,5 22200/ 7,5 28400/ 11 33500/ 15 35400/ 18,5	13400/ 3 16900/ 4 20700/ 5,5 25900/ 7,5 31400/ 11 39000/ 15 41800/ 18,5 42800/ 22 49800/ 30	24200/ 7,5 33500/ 11 45300/ 15 50100/ 18,5 54800/ 22 63200/ 30

PART I (PRESSURE UP TO 500 PA)

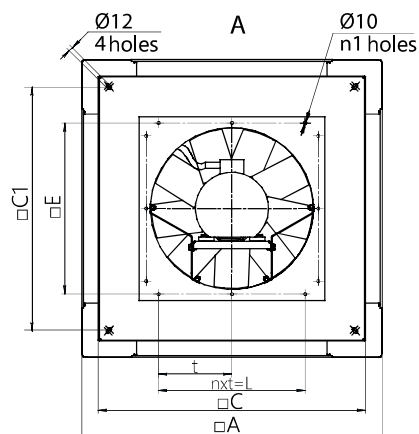
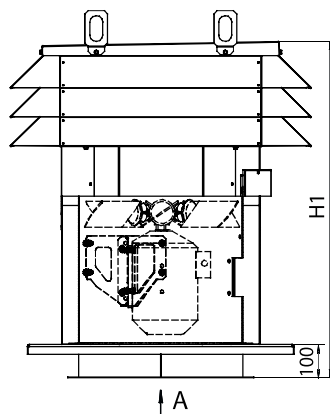
Flow rate (m³/h) / Nnom (kW)						Static pressure
080	090	100	112	125		
4 poles					6 poles	
24000/ 2,2 28700/ 3 28800/ 4 34300/ 5,5 39600/ 7,5 43700/ 11 41800/ 15	35500/ 4 42400/ 5,5 46000/ 7,5 51600/ 11 58000/ 15 61600/ 18,5	35600/ 4 45800/ 5,5 50700/ 7,5 57100/ 11 67900/ 15 76000/ 18,5 73700/ 22 76200/ 30	50800/ 5,5 57400/ 7,5 58000/ 11 72100/ 15 78200/ 18,5 84400/ 22 95600/ 30 109000/ 37	64100/ 11 73600/ 15 82200/ 18,5 91800/ 22 107000/ 30 110000/ 37 123000/ 45	38900/ 4 49500/ 5,5 61900/ 7,5 70200/ 11 84100/ 15 96600/ 18,5	100 Pa
22900/ 2,2 27100/ 3 27600/ 4 33200/ 5,5 38000/ 7,5 42400/ 11 40800/ 15	33600/ 4 40600/ 5,5 44400/ 7,5 50000/ 11 56300/ 15 60000/ 18,5	33500/ 4 43700/ 5,5 48500/ 7,5 55200/ 11 66000/ 15 73800/ 18,5 72100/ 22 74800/ 30	47600/ 5,5 54500/ 7,5 56300/ 11 70400/ 15 76400/ 18,5 82600/ 22 93600/ 30 108000/ 37	62000/ 11 71500/ 15 80100/ 18,5 89500/ 22 105000/ 30 108000/ 37 121000/ 45	34900/ 4 45100/ 5,5 56900/ 7,5 67600/ 11 81100/ 15 93100/ 18,5	
21200/ 2,2 25400/ 3 26300/ 4 31700/ 5,5 36400/ 7,5 40700/ 11 39500/ 15	31400/ 4 38600/ 5,5 42700/ 7,5 48200/ 11 54400/ 15 58200/ 18,5	31300/ 4 41500/ 5,5 46200/ 7,5 53300/ 11 64100/ 15 71400/ 18,5 70500/ 22 73400/ 30	44300/ 5,5 51400/ 7,5 54500/ 11 68400/ 15 74500/ 18,5 80500/ 22 91800/ 30 106000/ 37	59600/ 11 69300/ 15 77800/ 18,5 86900/ 22 103000/ 30 106000/ 37 118000/ 45	30000/ 4 39200/ 5,5 50700/ 7,5 64800/ 11 77700/ 15 89600/ 18,5	200 Pa
19200/ 2,2 23400/ 3 25100/ 4 30200/ 5,5 34500/ 7,5 39100/ 11 38200/ 15	28900/ 4 36400/ 5,5 40900/ 7,5 46300/ 11 52500/ 15 56400/ 18,5	29000/ 4 38800/ 5,5 43600/ 7,5 51300/ 11 62200/ 15 68800/ 18,5 68600/ 22 71900/ 30	40800/ 5,5 47900/ 7,5 52700/ 11 66400/ 15 72300/ 18,5 78500/ 22 90100/ 30 103000/ 37	57100/ 11 66900/ 15 75400/ 18,5 84200/ 22 101000/ 30 105000/ 37 116000/ 45	23000/ 4 31300/ 5,5 42500/ 7,5 61200/ 11 73500/ 15 84800/ 18,5	
16300/ 2,2 20900/ 3 23700/ 4 28800/ 5,5 32600/ 7,5 37300/ 11 36700/ 15	25700/ 4 33700/ 5,5 38800/ 7,5 44100/ 11 50100/ 15 54400/ 18,5	26200/ 4 36200/ 5,5 40700/ 7,5 49100/ 11 59700/ 15 66100/ 18,5 66800/ 22 70300/ 30	36900/ 5,5 44000/ 7,5 50800/ 11 64300/ 15 70400/ 18,5 76400/ 22 88100/ 30 100000/ 37	54500/ 11 64200/ 15 72900/ 18,5 81300/ 22 98800/ 30 103000/ 37 113000/ 45	16200/ 4 23100/ 5,5 32100/ 7,5 57000/ 11 68700/ 15 79200/ 18,5	300 Pa
11700/ 2,2 13900/ 3 21800/ 4 26900/ 5,5 30700/ 7,5 35200/ 11 35200/ 15	20900/ 4 29800/ 5,5 36800/ 7,5 41700/ 11 47300/ 15 52300/ 18,5	22900/ 4 33000/ 5,5 37500/ 7,5 46200/ 11 56700/ 15 63200/ 18,5 64800/ 22 68800/ 30	32200/ 5,5 39400/ 7,5 48700/ 11 62000/ 15 68000/ 18,5 74200/ 22 86200/ 30 96500/ 37	51600/ 11 61100/ 15 69500/ 18,5 77900/ 22 96400/ 30 101000/ 37 111000/ 45	10500/ 4 16400/ 5,5 24100/ 7,5 51100/ 11 63100/ 15 71200/ 18,5	
9600/ 2,2 11600/ 3 19100/ 4 24500/ 5,5 28300/ 7,5 32500/ 11 33500/ 15	16500/ 4 20900/ 5,5 34700/ 7,5 38900/ 11 44100/ 15 50000/ 18,5	18100/ 4 28900/ 5,5 33100/ 7,5 42900/ 11 53400/ 15 59500/ 18,5 62500/ 22 67200/ 30	26300/ 5,5 34000/ 7,5 46500/ 11 59800/ 15 65700/ 18,5 71800/ 22 83700/ 30 92800/ 37	48500/ 11 57700/ 15 65900/ 18,5 74300/ 22 93800/ 30 99500/ 37 108000/ 45	3000/ 4 9200/ 5,5 17400/ 7,5 42100/ 11 53500/ 15 53600/ 18,5	400 Pa
6570/ 2,2 8690/ 3 10800/ 4 11700/ 5,5 13100/ 7,5 16000/ 11 28900/ 15	12300/ 4 16100/ 5,5 24100/ 7,5 25900/ 11 28800/ 15 43500/ 18,5	12500/ 4 18800/ 5,5 21700/ 7,5 30300/ 11 37500/ 15 38000/ 18,5 57300/ 22 63600/ 30	17700/ 5,5 20700/ 7,5 41000/ 11 54500/ 15 60400/ 18,5 66400/ 22 77400/ 30 85300/ 37	40800/ 11 50100/ 15 57700/ 18,5 65500/ 22 88000/ 30 95400/ 37 101000/ 45	3600/ 7,5 25700/ 11 31100/ 15 34400/ 18,5	

TABLE 4

Static pressure	Flow rate (m³/h) / Nnom (kW)						
	040	045	050	056	063	071	080
	2 poles						
600 Pa	2270/ 1,1 2730/ 1,5 3550/ 2,2 3800/ 3	1980/ 1,1 2930/ 1,5 3560/ 2,2 7620/ 3 6300/ 4 7710/ 5,5	2230/ 1,1 3640/ 1,5 4530/ 2,2 5420/ 3 10700/ 4 12900/ 5,5 14900/ 7,5	3850/ 1,5 6110/ 2,2 8230/ 3 8800/ 4 9800/ 5,5 10600/ 7,5	5040/ 2,2 8600/ 3 12200/ 4 17100/ 5,5 20900/ 7,5 27000/ 11 32100/ 15 34400/ 18,5	10200/ 3 13100/ 4 18100/ 5,5 23300/ 7,5 29900/ 11 37500/ 15 40100/ 18,5 41800/ 22 48600/ 30	22600/ 7,5 32000/ 11 43600/ 15 48400/ 18,5 53100/ 22 61300/ 30
700 Pa	1920/ 1,1 2340/ 1,5 3000/ 2,2 3300/ 3	1440/ 1,1 2270/ 1,5 2860/ 2,2 4700/ 3 5450/ 4 6980/ 5,5	1500/ 1,1 2740/ 1,5 3480/ 2,2 4610/ 3 9340/ 4 11300/ 5,5 13800/ 7,5	2730/ 1,5 4310/ 2,2 6020/ 3 6870/ 4 8200/ 5,5 9240/ 7,5	2570/ 2,2 5420/ 3 8000/ 4 13200/ 5,5 19400/ 7,5 25800/ 11 30700/ 15 33300/ 18,5	7200/ 3 8970/ 4 14000/ 5,5 20200/ 7,5 28300/ 11 35900/ 15 38400/ 18,5 40800/ 22 47400/ 30	20900/ 7,5 30200/ 11 41800/ 15 46600/ 18,5 51100/ 22 59200/ 30
800 Pa	1600/ 1,1 2000/ 1,5 2500/ 2,2 2800/ 3	893/ 1,1 1740/ 1,5 2220/ 2,2 4080/ 3 4830/ 4 5510/ 5,5	2080/ 1,5 2810/ 2,2 3760/ 3 5950/ 4 7140/ 5,5 9100/ 7,5	1760/ 1,5 3400/ 2,2 4800/ 3 5870/ 4 7270/ 5,5 8100/ 7,5	2900/ 3 5200/ 4 9400/ 5,5 17700/ 7,5 24300/ 11 29100/ 15 32000/ 18,5	5000/ 3 5680/ 4 10000/ 5,5 14800/ 7,5 26600/ 11 34200/ 15 36500/ 18,5 39500/ 22 46000/ 30	19000/ 7,5 28100/ 11 39800/ 15 44600/ 18,5 49200/ 22 57100/ 30
900 Pa	1270/ 1,1 1650/ 1,5 2080/ 2,2 2350/ 3	1230/ 1,5 1590/ 2,2 3620/ 3 4260/ 4 4870/ 5,5	1400/ 1,5 2150/ 2,2 2900/ 3 5230/ 4 6260/ 5,5 7030/ 7,5	2580/ 2,2 4020/ 3 4880/ 4 6330/ 5,5 6940/ 7,5	2700/ 4 7700/ 5,5 15600/ 7,5 22700/ 11 27400/ 15 30800/ 18,5	3200/ 3 2710/ 4 7500/ 5,5 11600/ 7,5 24300/ 11 32300/ 15 34600/ 18,5 38100/ 22 44400/ 30	16900/ 7,5 25700/ 11 37600/ 15 42400/ 18,5 46900/ 22 54900/ 30

PRESSURE FROM 600 PA

Flow rate (m³/h) / Nnom (kW)						Static pressure
080	090	100	112	125		
4 poles					6 poles	
4220/2,2 6000/ 3 7690/ 4 8450/ 5,5 9380/ 7,5 12100/ 11 14900/ 15	8600/ 4 12700/ 5,5 16800/ 7,5 16900/ 11 19100/ 15 30500/ 18,5	7800/ 4 13600/ 5,5 16300/ 7,5 23000/ 11 28100/ 15 31600/ 18,5 38500/ 22 58300/ 30	11200/ 5,5 12100/ 7,5 33600/ 11 47000/ 15 53400/ 18,5 59600/ 22 69200/ 30 74700/ 37	30500/ 11 39600/ 15 47100/ 18,5 54400/ 22 70900/ 30 90400/ 37 92100/ 45	11800/ 11 16300/ 15 18300/ 18,5	600 Pa
4450/ 5,5 5320/ 7,5 8350/ 11 11900/ 15	4900/ 4 8790/ 5,5 10400/ 7,5 9800/ 11 11500/ 15 20300/ 18,5	3100/ 4 8120/ 5,5 10800/ 7,5 16400/ 11 20900/ 15 25400/ 18,5 30300/ 22 44400/ 30	4700/ 5,5 3140/ 7,5 25300/ 11 35700/ 15 39400/ 18,5 43200/ 22 55100/ 30 58000/ 37	22600/ 11 30100/ 15 36100/ 18,5 41600/ 22 65000/ 30 84200/ 37 73400/ 45		700 Pa
4650/ 11 8620/ 15	4700/ 5,5 4600/ 7,5 3300/ 11 4600/ 15 13400/ 18,5	2560/ 5,5 5000/ 7,5 8600/ 11 12700/ 15 17200/ 18,5 24100/ 22 32800/ 30	19100/ 11 27400/ 15 30600/ 18,5 33700/ 22 41000/ 30 42100/ 37	14500/ 11 22000/ 15 27600/ 18,5 32500/ 22 59000/ 30 76300/ 37 67500/ 45		800 Pa
5190/ 15	7900/ 18,5	3970/ 15 6300/ 18,5 17500/ 22 26800/ 30	13600/ 11 21300/ 15 24200/ 18,5 27400/ 22 33700/ 30 35000/ 37	4520/ 11 12800/ 15 18400/ 18,5 23300/ 22 49900/ 30 64500/ 37 59400/ 45		900 Pa



Standard size	Dimensions, mm							n	n ₁	Number of poles	Nnom, kW	Weight, kg	POD*			
	A	C1	H1	E	C	L	t									
040	740	590	869	430	665	360	180		12	2	•1,1 •1,5 •2,2	•74 •76 •78	POD-50			
		590	939								•3	•82				
045	805	640	860	480	720	390	195	2	12		•1,1 •1,5 •2,2	•78 •81 •84		POD-50		
		640	930								•3 •4 •5,5	•87 •92 •101				
050	920	750	968	530	820	450	225	2	12		•1,1 •1,5 •2,2	•83 •87 •89	POD-84			
		750	1038								•3 •4 •5,5	•95 •100 •106				
		750	1153								•7,5	•131				
056	920	830	981	590	900	450	225	2	12		•1,5 •2,2	•103 •105		POD-84		
		830	1051								•3 •4 •5,5	•110 •113 •121				
		830	1166								•7,5	•146				
063	1030	940	998	660	1070	585	195	3	16		•2,2	•120			POD-84	
		940	1068								•3 •4 •5,5	•125 •130 •140				
		940	1183								•7,5 •11	•150 •217				
		940	1373								•15 •18,5	•271 •280				
071	1105	1036	1083	740	1136	585	195	3	16		•3 •4 •5,5	•147 •153 •161	POD-93			
		1036	1198								•7,5 •11	•180 •230				
		1036	1388								•15 •18,5 •22 •30	•272 •281 •303 •326				
080	1201	1180	1222	910	1280	780	260	3	16	2	•7,5 •11	•226 •253		POD-93		
		1180	1412								•15 •18,5 •22 •30	•315 •324 •346 •369				
		1180	1107							•2,2 •3 •4	•207 •209 •218	4			•5,5 •7,5 •11	•236 •271 •285
		1180	1222							•15	•337					
		1180	1412							•4	•250					
090	1405	1340	1136	930	1440	780	260	3	16	•5,5 •7,5 •11	•306 •318 •269	POD-137				
		1340	1441							•15 •18,5	•375 •393					
		1500	1160							•4	•270					
100	1560	1500	1275	1120	1600	900	150	6	28	•5,5 •7,5 •11	•319 •354 •368		POD-137			
		1500	1465							•15 •18,5 •22 •30	•424 •445 •464 •499					
		1692	1265							•5,5 •7,5 •11	•347 •357 •367					
112	1680	1692	1450	1150	1792	960	160	6	28	•15 •18,5 •22 •30	•455 •473 •491 •525			POD-137		
		1692	1590							•37	•595					
		1860	1265							•11	•450					
125	1680	1860	1455	1400	2000	1260	210	6	28	4	•15 •18,5 •22 •30	•510 •527 •545 •580	POD-137			
		1860	1590								•37 •45	•603 •635				
		1860	1265								6	•4 •5,5 •7,5		•412 •435 •450		
		1860	1455							•11 •15 •18,5		•515 •534 •569				

NOTE:

*To protect against accidental leaks in case of heavy precipitation or condensation of moisture from the room on cold VKOP 1 elements, additional solutions must be used - POD series pans.

**Waterproofing
(in-situ)**

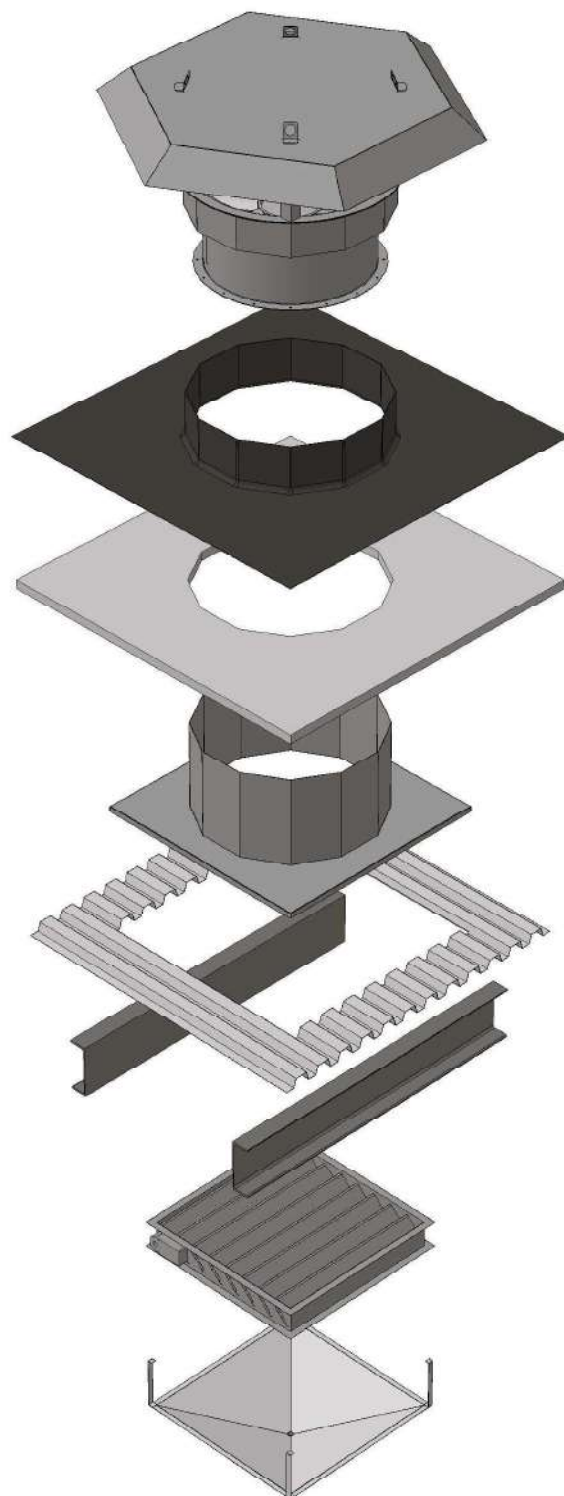
**Insulation
(in-situ)**

**Profiled
flooring**

Rafters

Damper

POD pan



**VKOP 1
(removable part)**

**VKOP 1
(non-removable part)**

VKOP 2

ROOF-MOUNTED AIR SUPPLY FANS



provide direct supply of outdoor air from the space above the roof to the stairwell and elevator areas, creating overpressure in the stairwell, elevator and other areas, preventing smoke from entering these rooms. At the same time, the ventilation system is simplified, and usable space on the technical floor is freed up.

INTENDED USE:

- PD - smoke control pressurization ventilation systems

•063 •071

VKOP 2 roof units are manufactured with built-in double-inlet radial fans with a belt drive. The fan is placed inside a block assembled from panels. The air from the spiral housing flows down into the duct or directly into the room. The two side panels of the block are made with louvered grilles located opposite the inlet openings of the fan and protecting it from atmospheric phenomena.

When installing VKOP 2 on the roof, it is necessary to use STAM..

- general purpose industrial (N)

OPERATING CONDITIONS

The fans can be operated in a temperate (Y) climate of the 1st placement category according to GOST 15150.

Operating conditions:

- ambient temperature:
 - from -40 °C to +40 °C for temperate climate,
- under normal conditions, the conveyed medium must not contain abrasive or sticky substances, fibrous materials, vapors, or dust; its aggressiveness toward carbon steels, aluminum alloys, and GRP material must not exceed that of air; and it must not contain dust or other solid particles in concentrations exceeding 100 mg/m³;
- the average value of the vibration velocity of external vibration sources at the fan installation locations is not more than 2 mm/s.

EXAMPLE:

VKOP 2 rooftop unit, standard size 063; general industrial design; motor rated power Nnom = 11 kW, number of poles 4; climatic version Y1:

VKOP 2-063-N-01100/4-Y1

- roof-mounted air supply fan (• VKOP 2)
- standard fan size (• 063 • 071)
- design version (• N)
- motor parameters * (• n/P)
n ** - Motor Power Index
P - number of poles: 4 (1500 rpm)
- climatic version (• Y1)

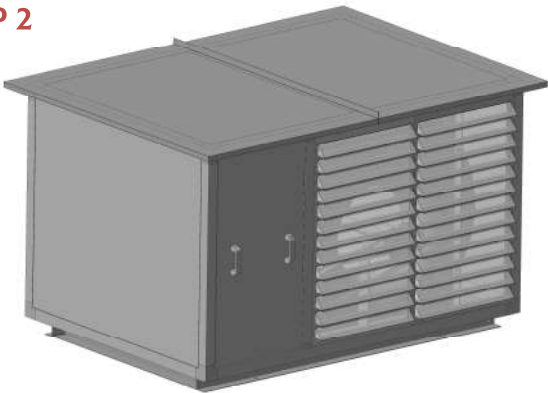
NOTE:

* All supplied motors are designed for 380 V/50 Hz by default, direct start, versions for other voltages and connection methods are available upon special agreement. Starting the motors from 15 kW must be performed using the MCD soft starter.
** Motor Power Index - see Table 1.
Additional equipment is ordered in separate items as an option (see the section "Additional equipment").

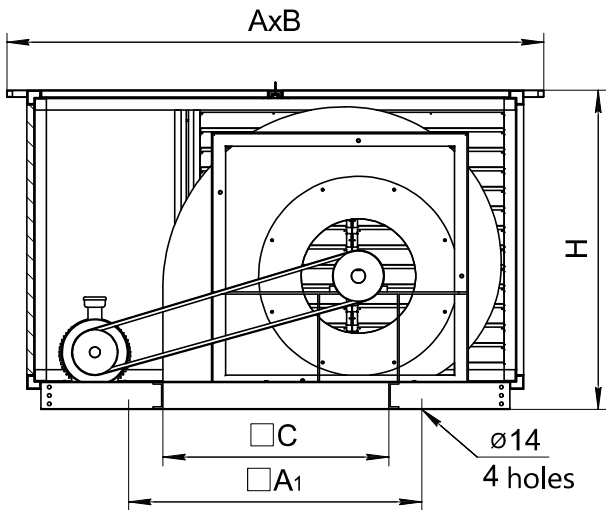
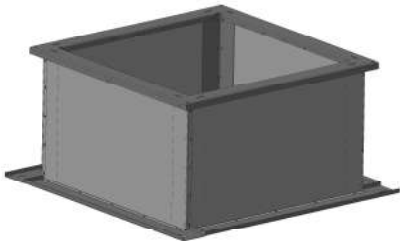
TABLE 1
VKOP 2

Motor rated power (Nnom), kW	1,1...7,5	11...90
Motor Power Index (n)	00110...00750	01100...09000

VKOP 2



STAM



Standard size	Dimensions, mm					STAM*
	A	A ₁	B	C	H	
063	1850	1050	1450	800	1150	STAM 200(203)-90
071	2000	1220	1650	900	1250	STAM 200(203)-109

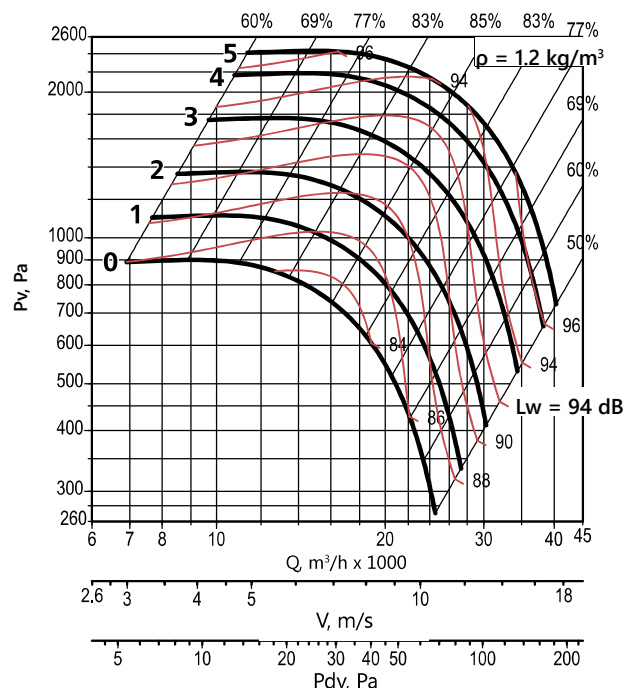
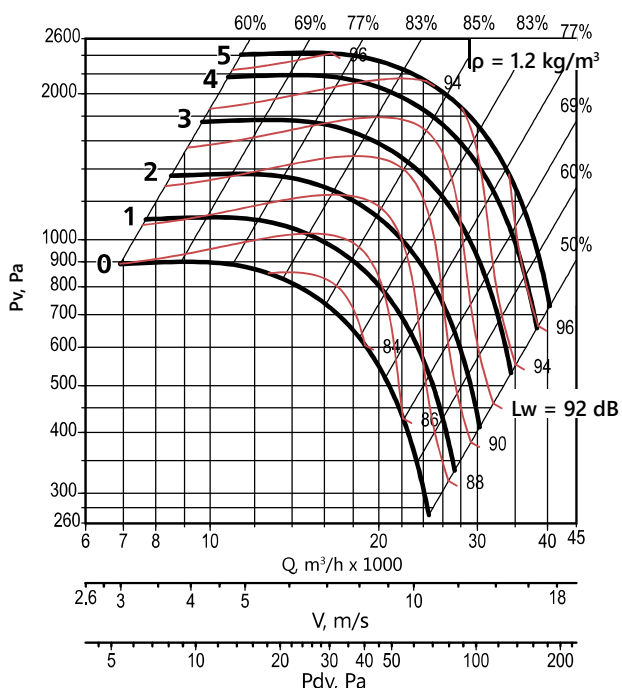
* when installing on the roof, it is necessary to use STAM.

063

071

Curve number	nk, min ⁻¹	Nnom, kW	Number of poles	Current at 380 V, A	Weight*, kg
1	1285	5,5	4	11,7	436
2	1425	7,5	4	15,6	460
3	1620	11	4	23	472
4	1802	15	4	31	505
5	1900	18,5	4	36	523

Curve number	nk, min ⁻¹	Nnom, kW	Number of poles	Current at 380 V, A	Weight*, kg
1	1168	7,5	4	15,6	540
2	1327	11	4	23	552
3	1476	15	4	31	585
4	1583	18,5	4	36	603
5	1677	22	4	44	622



NOTE:

*When the motor type is changed, the weight may change

additional equipment

roof curb
STAM

pan
POD

soft starter

automatic control system
SHTORM-D

ADDITIONAL EQUIPMENT

HEAT AND SOUND INSULATED CASING

TSK

Radial smoke extraction fans are usually placed in ventilation chambers inside the building. At the same time, during a fire, there is a high probability that the ventilation chamber will overheat until the fan motor fails. To ensure reliable operation of the fans, it becomes necessary to develop a special air cooling system for the ventilation chamber with outdoor air supply to cool the equipment. This leads to a significant complication and cost increase of the smoke extraction system project. To solve this problem, a new design of VRAN-DU fans is proposed in a heat and sound insulated casing with maximum thermal protection that minimizes heat generation when the fan is running. Below is a table of heat fluxes q from the fan in a heat and sound insulated casing and without it for calculations and determining the need to develop an air cooling system for the ventilation chamber.

The recently adopted design practices for combined systems allow for dual-mode operation of the exhaust ventilation system, serving both as general exchange and smoke extraction ventilation. This combination makes it possible to significantly reduce costs for air ducts, equipment, and the space required for their installation. The proposed design of the VRAN-DU fans in a sound insulated casing reduces the total sound pressure level by 25...30 dB at a distance of 5 m, which is especially important for fans used in DU systems combined with general exchange ventilation.



The heat and sound insulated casing is designed as a frame-panel structure, consisting of an inner mesh and outer galvanized panels, with thermal and sound-absorbing material placed between them. VRAN-DU fans in a heat and sound insulated casing are manufactured according to design versions 1 and 5 only for housing positions of 0, 90 and 270 degrees.

●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125 ●140

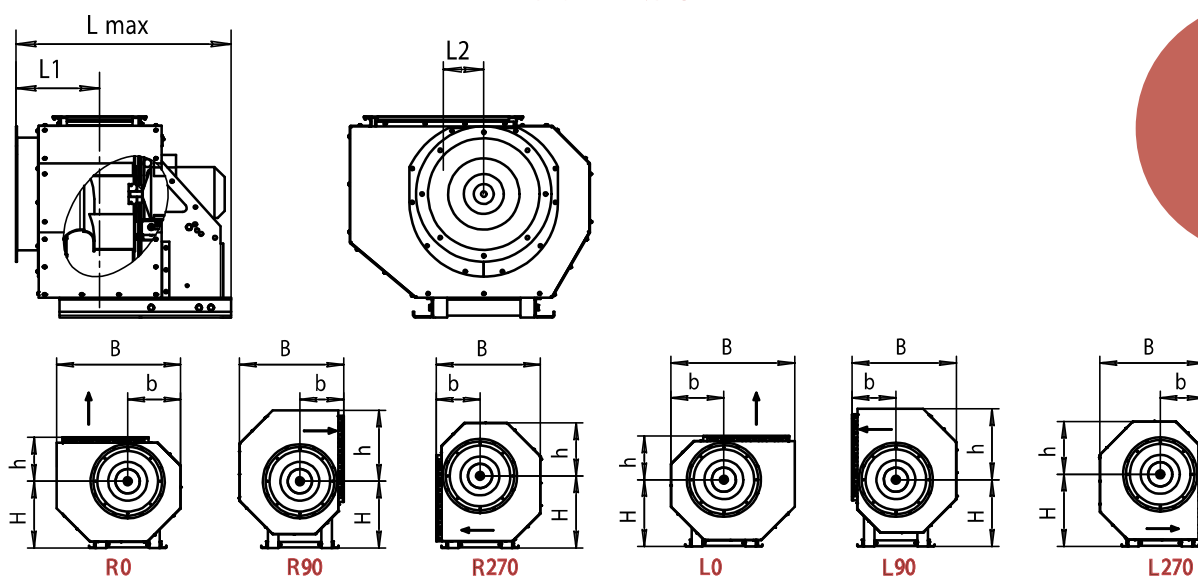
ACCORDING TO THE 1ST DESIGN SCHEME

●063 ●080 ●100 ●125

ACCORDING TO THE 5TH DESIGN SCHEME

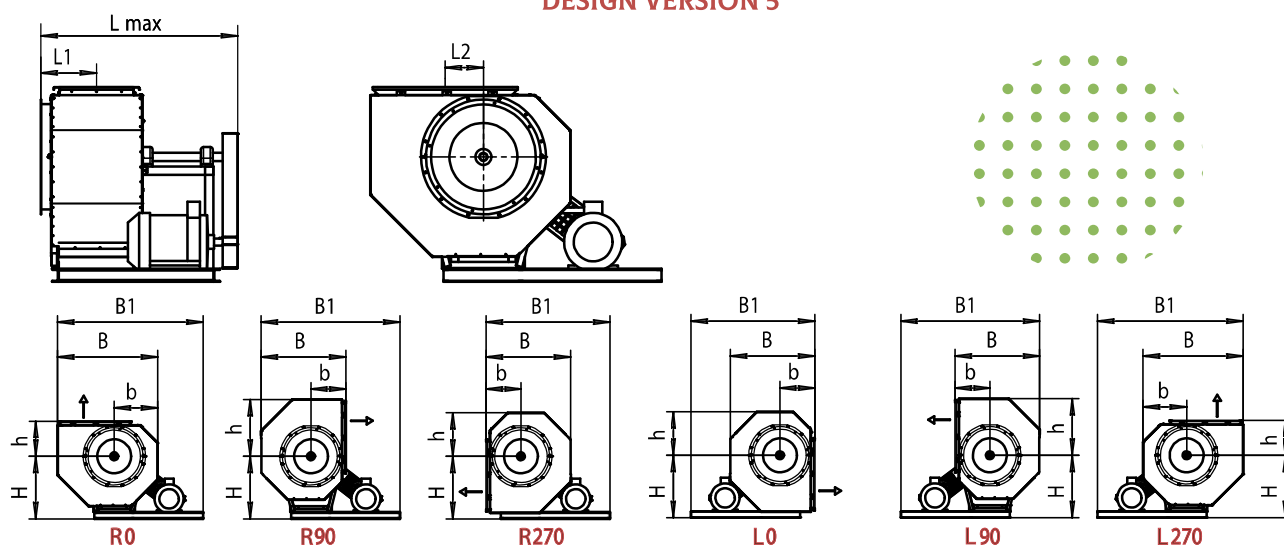
Fan standard size	Heat flow q from the fan for 1 hour of operation in W			
	without TSK casing		with TSK casing	
	400° C	600° C	400° C	600° C
040	5152	8540	490	924
045	6440	10675	602	1135
050	6992	11590	658	1241
056	8462	14030	798	1505
063	9936	16470	938	1769
071	12512	20740	1190	2244
080	14720	24400	1400	2640
090	19136	31720	1820	3430
100	21344	35380	2030	3828
112	26496	43920	2520	4752
125	38272	63440	3640	6864
140	45632	75640	4340	8185

DESIGN VERSION 1



Fan standard size	Overall dimensions, mm																Weight, kg	
	L1	L2	Lmax		R0, L0				R90, L90				R270, L270				VRAN-DU	
			VRAN	VRAN	B	b	H	h	B	b	H	h	B	b	H	h	min	max
040	255	145	760	860	795	345	395	290	685	290	395	450	685	290	475	345	62	93
045	270	164	880	880	875	380	440	325	765	325	440	495	765	325	540	380	70	109
050	285	182	910	1080	980	425	535	338	825	338	535	555	825	338	580	425	96,5	164
056	308	202	975	—	1090	475	570	375	915	375	570	615	915	375	665	475	120	198
063	332	231	1085	1190	1200	520	670	420	1020	420	670	680	1020	420	751	520	145	263
071	360	260	1140	—	1355	585	745	480	1150	480	745	770	1150	480	845	585	229	344
080	392	297	1245	1700	1500	650	800	536	1285	536	800	850	1285	536	935	650	295	412
090	428	335	1360	—	1680	730	890	590	1430	590	890	950	1430	590	1025	730	333	513
100	463	366	1450	—	1870	800	970	656	1580	656	970	1070	1580	656	1100	800	537	717
112	505	409	1650	—	2060	890	1100	735	1765	735	1100	1170	1765	735	1250	890	710	915
125	550	455	1860	—	2295	990	1230	810	1975	810	1230	1305	1975	810	1430	990	870	1180
140	704	980	2260	—	2660	1155	1464	965	2295	965	1320	1505	2295	965	1655	1155	1455	1895

DESIGN VERSION 5



Fan standard size	Overall dimensions, mm																	Weight, kg		
	L1	L2	L _{max}	R0, L0					R90, L90					R270, L270					VRAN-DU	
				B	B1	b	H	h	B	B1	b	H	h	B	B1	b	H	h	min	max
063	332	231	1270	1200	1780	520	751	420	1020	1670	420	751	680	1020	1490	420	751	520	255	391
080	392	297	1400	1500	1880	650	843	536	1285	1745	536	843	850	1285	1535	536	933	650	444	590
100	463	366	1720	1870	2720	800	1050	656	1580	2550	656	1050	1070	1580	2290	656	1150	800	703	876
125	550	455	1860	2295	2980	990	1230	810	1975	2770	810	1230	1305	1975	2450	810	1430	990	988	1388

A METHOD FOR DETERMINING THE NEED FOR AIR COOLING OF A VENTILATION CHAMBER WITH SMOKE EXTRACTION FANS

All air ducts of smoke extraction systems must have a special fire-resistant coating, which is actually thermal insulation. The cross-section of the ducts is quite small compared to the size of the smoke extraction fans. The main heat emissions in the ventilation chamber come from the fan casing surface. The following methodology is proposed for assessing the need for special cooling of the ventilation chamber in the event of a fire.

STEP 1. Determines the operating parameters of the fan and the total heat flow from the fan for 1 hour, as well as the total heat load for the entire time of emergency operation of the fan for 1 or 2 hours of operation.

STEP 2. The heat flow perceived by the enclosing structure of the walls of the ventilation chamber is determined, depending on the area and material of the walls. The values of the heat fluxes generated by the fan and perceived by the enclosing structures are compared. If the heat emission flow exceeds the absorption flow, proceed to Step 4.

STEP 3. The total thermal loads generated by the fan during operation and the heat absorption capacity of the walls over the same period of time are compared. If the walls do not have sufficient heat absorption capacity, proceed to Step 4.

STEP 4. The required cooling air consumption is calculated to remove the estimated excess heat flow

CALCULATION EXAMPLES

EXAMPLE 1: A STANDARD CHAMBER MADE OF PLASTERED BRICK AND CONCRETE

Given

Smoke extraction fan Number 10 in a heat and sound insulated casing is installed in a room with the following data:

- room dimensions, m	4x4x3 (h)
- walls – plastered brick walls with a thickness (δ)	150 mm
- floor and ceiling - concrete slab with a thickness (δ)	50 mm
- ventilation	no
- indoor air temperature (t in.)	50° C
- indoor wall temperature (t in.w.)	40° C
- outside wall temperature (t out.w.)	30° C
Fan operating time	2 hours
Temperature of the transported medium (t tr.m.)	400° C

COMPUTING CHAIN

STEP 1 According to Table 1, we determine the q from the fan for 1 hour at t mov.m. = 400°C; q = 2 030 W.
Thermal load during the entire emergency operation of the fan (2 hours):

$$Q_{\text{fan in 2 hours}} = q \times 2 = 4060 \text{ W}$$

STEP 2 Determine the heat flow perceived by 1 m² of the enclosing structure:

$$q = \alpha \times (t_{\text{in.}} - t_{\text{in.w.}}), \text{ W/m}^2$$

where: α is the heat transfer coefficient; α = 8.7 W/m²K (reference)

$$q = 8.7 \times (50 - 40) = 87 \text{ W/m}^2$$

We determine the heat flow perceived by the entire area of the enclosing structure:

$$Q_{\text{perc.end.str.}} = q \times F_{\text{surf.end.str.}} = 87 \times 80 = 6960 \text{ W}$$

$$F_{\text{surf.end.str.}} = 80 \text{ m}^2$$

We compare the values of Q fan for 2 hours and Q perc.end.str.

$$4060 \text{ W} < 6960 \text{ W}$$

CALCULATION RESULTS

Additional ventilation of the room is not required. We check the walls' ability to absorb excess heat.

STEP 3

We determine the heat absorption of the enclosing structure in 1 hour:

$$Q_{\text{abs.end.str. for 1 hour}} = c \times (t_{\text{in.w.}} - t_{\text{out.w.}}) \times M, \text{ kcal}$$

where: c is the heat capacity of the material, kcal/kg °C, c brick, concr. = 0.25 kcal/kg °C (reference)

M is the mass of the enclosing structures, kg

$$M_{\text{brick, concr.}} = F_{\text{surf.end.str.}} \times \rho_{\text{brick}} \times p_{\text{brick}}$$

where: F surf.end.str. = 80 m²

$$\rho_{\text{brick}} = 1800 \text{ kg/m}^3 \text{ (reference)}$$

$$M_{\text{brick, concr.}} = 80 \times 0.15 \times 1800 = 21600 \text{ kg}$$

$$Q_{\text{abs.end.str. for 1 hour}} = 0.25 \times (40 - 30) \times 21600 = 54000 \text{ kcal} = 46440 \text{ W}$$

We determine the heat absorption of the enclosing structure in 2 hours of fan operation:

$$Q_{\text{abs.end.str. for 2 hours}} = 46440 \times 2 = 92880 \text{ W}$$

Compare the values of Q fan for 2 hours and Q abs.end.str. for 2 hours: 4060 W < 92880 W

CALCULATION RESULTS

Additional ventilation of the room is not required.

EXAMPLE 2. A CHAMBER MADE OF FIRE-RESISTANT SANDWICH PANELS

Given

Smoke extraction fan Number 10 in a heat and sound insulated casing is installed in a room with the following data:	
— room dimensions, m	4x4x3(h)
— sandwich panel walls: galvanized steel on both sides with thickness (δ)	1,5 mm
— fire-resistant basalt thickness (δ)	50 mm
— floor and ceiling - concrete slab with a thickness (δ)	50 mm
— ventilation	no
— indoor air temperature (t in.)	50 °C
— indoor wall temperature (t in.w.)	40 °C
— outside wall temperature (t out.w.)	30 °C
Temperature of the transported medium (t tr.m.)	400 °C
Fan operating time	2 hours

COMPUTING CHAIN

STEP 1 According to Table 1, we determine the q from the fan for 1 hour at $t_{\text{mov.m.}} = 400$ °C; $q = 2030$ W

Thermal load during the entire emergency operation of the fan (2 hours):

$$Q_{\text{fan for 2 hours}} = q \times 2 = 2030 \times 2 = 4\,060 \text{ W}$$

STEP 2 Determine the heat flow perceived by 1 m^2 of the enclosing structure:

$$q = \alpha \times (t_{\text{in.}} - t_{\text{in.w.}}), \text{ W/m}^2$$

where: α is the heat transfer coefficient, $\text{W/m}^2\text{K}$

$$\alpha_{\text{concr.}} = 8.7 \text{ W/m}^2\text{K (reference)}$$

$$\alpha_{\text{sandw.pan.}} = 20 \text{ W/m}^2\text{K (reference)}$$

$$q_{\text{sandw.pan.}} = 20 \times (50 - 40) = 200 \text{ W/m}^2$$

$$q_{\text{concr.}} = 8.7 \times (50 - 40) = 87 \text{ W/m}^2$$

We determine the heat flow perceived by the entire area of the enclosing structure:

$$Q_{\text{perc.endl.str.}} = q \times F_{\text{surf.endl.str.}}$$

$$F_{\text{sandw.pan.}} = 48 \text{ m}^2; F_{\text{concr.}} = 32 \text{ m}^2$$

$$Q_{\text{perc.endl.str.}} = (200 \times 48) + (87 \times 32) = 12384 \text{ W}$$

We compare the values of $Q_{\text{fan for 2 hours}}$ and $Q_{\text{perc.endl.str.}}$: $4060 \text{ W} < 12\,384 \text{ W}$

CALCULATION RESULTS

Additional ventilation of the room is not required. We check the walls' ability to absorb excess heat

STEP 3

We determine the heat absorption of the enclosing structure in 1 hour:

$$Q_{\text{abs.endl.str. for 1 hour}} = c \times (t_{\text{in.w.}} - t_{\text{out.w.}}) \times M, \text{ kcal}$$

where: c is the heat capacity of the material, $\text{kcal/kg } ^\circ\text{C}$,

$$c_{\text{galv.steel}} = 0.5 \text{ kcal/kg } ^\circ\text{C}; \rho_{\text{galv.steel}} = 790 \text{ kg/m}^3 \text{ (reference)}$$

$$c_{\text{basalt}} = 0 \text{ kcal/kg } ^\circ\text{C}; \rho_{\text{basalt}} = 200 \text{ kg/m}^3 \text{ (reference)}$$

$$F_{\text{sandw.pan.}} = 80 \text{ m}^2$$

M is the mass of the enclosing structure, kg

$$M_{\text{galv.steel}} = 380 \text{ kg (including lightweight metal structures installed indoors)}$$

$$M_{\text{basalt}} = 800 \text{ kg}$$

$$Q_{\text{abs.endl.str. for 1 hour}} = 0.5 \times (40 - 30) \times 380 + 0 \times (40 - 30) \times 800 = 1900 \text{ kcal} = 1634 \text{ W}$$

We determine the heat absorption of the enclosing structure in 2 hours of fan operation:

$$Q_{\text{abs.endl.str. for 2 hours}} = 1634 \times 2 = 3268 \text{ W}$$

Compare the values of $Q_{\text{fan for 2 hours}}$ and $Q_{\text{abs.endl.str. for 2 hours}}$: $4060 \text{ W} < 3268 \text{ W}$

CALCULATION RESULTS

Ventilation of the room is required, since the excess heat flow is 396 W :

$$[(4060 - 3268)/2 \text{ hours} = 396 \text{ W}]$$

STEP 4

We calculate the required cooling air consumption to remove the estimated excess heat flow:

$$L = Q \times 3.6 / c_{\text{air}} \times \rho_{\text{air}} \times (t_{\text{in.}} - t_{\text{in.w.}})$$

where: c_{air} is the heat capacity of air - $1,005 \text{ kJ/kg } ^\circ\text{C}$

$$\rho_{\text{air}} - \text{air density} - 1.24 \text{ kg/m}^3$$

$$L = 396 \times 3.6 / 1.005 \times 1.24 \times 10 = 114.4 \text{ m}^3/\text{hour}$$

EXAMPLE 2. A STANDARD CHAMBER WITH A FAN WITHOUT A HEAT AND SOUND INSULATED CASING, REQUIRING SIGNIFICANT AIR COOLING

Given

- Smoke extraction fan Number 10 without heat and sound insulated casing is installed in a room with the following data
- room dimensions, m 4x4x3(h)
- walls – plastered brick walls with a thickness (δ) 150 mm
- підлога і стеля - бетонна плита товщиною(δ) 150 mm
- ventilation no
- indoor air temperature (t in.) 50 °C
- indoor wall temperature (t in.w.) 40 °C
- outside wall temperature (t out.w.) 30 °C
- Fan operating time 2 hours
- Temperature of the transported medium (t tr.m.) 400 °C

COMPUTING CHAIN

STEP 1

According to Table 1, we determine the q from the fan for 1 hour at t mov.m. = 400 °C; q = 21 344 W

Thermal load during the entire emergency operation of the fan (2 hours):

Q fan for 2 hours = 21344 x 2 = 42688 W

STEP 2

From the previously given Example 1, we take the heat flow perceived by the entire area of the enclosing structure.

Q perc.encl.str. = q x F surf.encl.str. = 87 x 80 = 6960 W

We compare the values of Q fan for 2 hours and Q perc.encl.str.: 42688 W > 6960 W

CALCULATION RESULTS

Ventilation of the room is required, since the excess heat flow is 17864 W:

[(42688 - 6960)/2 hours = 17864 W]

STEP 4

We calculate the required cooling air consumption to remove the estimated excess heat flow:

$L = Q \times 3.6 / c_{\text{air}} \times \rho_{\text{air}} \times (t_{\text{in.}} - t_{\text{in.w.}})$

where: c air is the heat capacity of air - 1,005 kJ/kg °C

ρ_{air} - air density - 1.24 kg/m³

$L = 17864 \times 3.6 / 1005 \times 1.24 \times (50 - 40) = 5161 \text{ m}^3/\text{hour}$

CONCLUSION

The use of a heat and sound insulated casing makes it possible to significantly reduce the thermal load in the ventilation chamber, and in some cases practically abandon the special cooling of the chamber.

COM 400/600 || FLEXIBLE CONNECTOR



• 400° C • 600° C
• 120 MIN

➤ The COM heat-resistant flexible connector is designed for conveying gas-air mixtures at temperatures up to 400 °C and up to 600 °C for at least 120 minutes.

➤ INTENDED USE:

- COM 400/600-VRAN (AF) - designed to connect smoke extraction fans to air ducts or dampers. It is used in DU and DUV systems for mounting VRAN-DUV and AF-DU fans as part of dual-use systems.
- COM 420/620-VRAN - designed for installation of explosion-proof fans.

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125 •140

The COM flexible connector consists of a special multilayer sleeve and metal flanges fixed in the sleeve through the shells with rivets. The flanges can be made of stainless steel or galvanized steel, as well as St3 steel.

COM - VRAN (OZA/AF) connectors can have rectangular (square) and round cross-sections.

OPERATING CONDITIONS

COM connectors are designed for use in temperate (Y) climate conditions of the 2nd placement category according to GOST 15150.

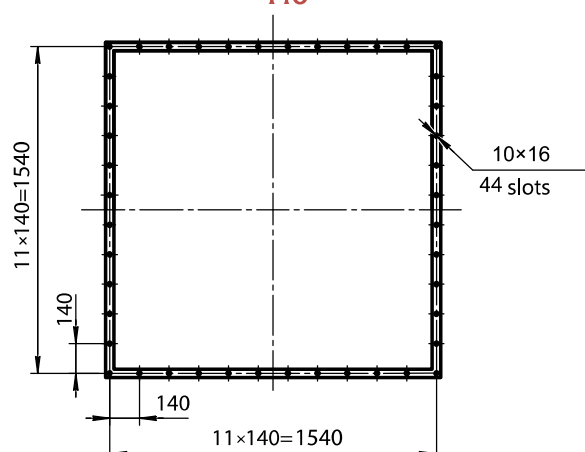
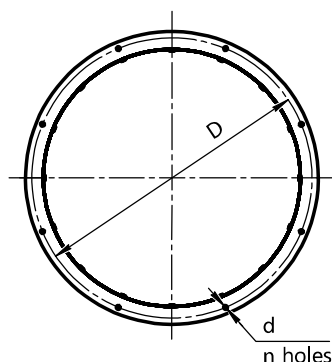
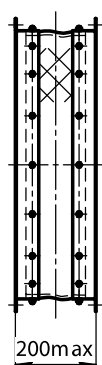
Operating conditions:

- ambient temperature:
 - from -40 °C to +45 °C,
- COM connectors of antistatic design (on request) can be used in systems in which explosive mixtures of all categories and groups according to GOST 12.1.0.78 classification are transported. The flexible connectors can be installed in ventilation systems of explosive production facilities with a pressure differential of up to 2000 Pa or more.

COM 400 (600) FLEXIBLE CONNECTOR - VRAN/OZA (AF) ON THE SUCTION SIDE

040...125

140

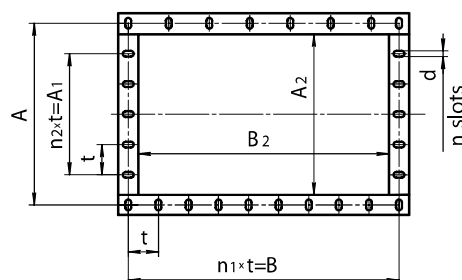
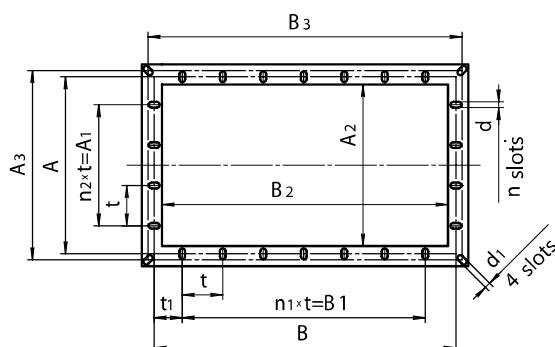
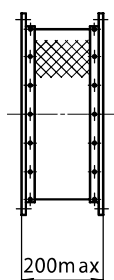


Fan standard size	Dimensions, mm		n VRAN/OZA (AF)	Weight, kg	
	VRAN/ OZA/ AF			400° C	600° C
	D	d			
040	430/430/450	9/12/12	8/8	3,9	4,7
045	480/480/-	9/12/-	8/8	4,4	5,3
050	530/530/560	9/12/12	8/12	6,7	7,6
056	600/620/-	9/12/-	8/12	7,2	8,3
063	660/690/690	9/12/12	16/12	8,1	9,3
071	740/770/770	9/12/12	16/16	9,8	11,0
080	835/860/860	9/12/12	16/16	11,1	12,4
090	940/960/960	9/14/14	16/16	13,0	14,7
100	1050/1070/1070	12/14/14	24/16	14,4	16,3
112	1170/1195/1195	12/14/14	24/20	16,3	18,4
125	1285/1320/1320	12/14/14	24/20	18,1	20,4
140				30,2	33,1

COM 400 (600) FLEXIBLE CONNECTOR - VRAN ON THE DISCHARGE SIDE

040...125

140



Fan standard size VRAN	Dimensions, mm												n	n ₁	n ₂	Weight, kg	
	A	A ₁	A ₂	A ₃	B	B ₁	B ₂	B ₃	d	d ₁	t	t ₁				400° C	600° C
040	310	200	280	319	538	400	507	549	9×16	7×30	100	55	16	4	2	8,9	10,1
045	350	240	319	352	604	480	573	605	9×16	7×25	120	55	16	4	2	9,3	10,5
050	380	300	350		668	600	638		9×16		100	40	22	6	3	10,1	11,2
056	426	300	395		749	600	718		9×16		100	63	22	6	3	11,5	12,7
063	470	400	440		830	700	798		9×16		100	35	26	7	4	13,0	14,2
071	540	270	508		941	675	909		9×16		135	135	18	5	2	14,9	16,4
080	600	300	568		1047	750	1012		9×16		150	150	18	5	2	16,8	20,4
090	670	600	637		1170	1050	1137		9×16		150	35	26	7	4	19,4	20,8
100	750	450	716		1317	1050	1280		12×18		150	150	24	7	3	20,1	21,9
112	830	750	791		1463	1350	1429		12×18		150	40	32	9	5	21,6	23,1
125	925	750	890		1638	1500	1604		12×18		150	87,5	34	10	5	22,2	24,3
140	1040	672	1000		1512		1472		12×18		168		30	9	4	27,8	30,5

EXAMPLE:

COM 400 flexible connector for connection to the VRAN fan of size 063 on the suction side; flange material St3 steel:

COM 400-VRAN-063A-C

- flexible connector (•COM)
- series
- attachable equipment
(•VRAN •OZA •AF)
- standard size of the connected equipment
OZA: •040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125
VRAN: •040Y •045Y •050Y •056Y •063Y •071Y •080Y •090Y •100Y •112Y •125Y •140Y
Y: A – installation of COM on the suction side
B – installation of COM on the discharge side
- flange material (•C - St3 steel; •NS - stainless steel; •ZS - galvanized steel)

*COM series - see Table 1..

TABLE 1

Series	Operating conditions		
	Transported medium	Operating pressure, Pa	Temperature, °C
400	• non-aggressive	2000	from -45 to +200 (+400/2 hours)
420	• non-aggressive • antistatic (explosion-proof)	2000	from -45 to +200 (+400/2 hours)
600	• non-aggressive	2000	from -45 to +300 (+600/2 hours)
620	• non-aggressive • antistatic (explosion-proof)	2000	from -45 to +300 (+600/2 hours)

LINEAR COMPENSATOR | COM 560

► compensator for linear thermal expansion of smoke extraction duct networks, which is designed to compensate for linear extensions of the ducts of smoke extraction systems under the influence of the temperature of the medium being transported up to 600 °C, while maintaining the tightness of the duct

► INTENDED USE:

- COM 560 - designed for installation in places of thermal deformation of the steel smoke extraction duct;
- in systems with static pressure up to 1500 Pa.



- 600° C
- 120 MIN

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125 •140

The COM 560 linear compensator has a steel box-shaped structure consisting of two metal housings connected telescopically, the gap between the mating surfaces of these housings is filled with an expansion material.

It can only be made of rectangular cross-section. The duct sections are connected to the linear compensator by means of a flange connection. The design of the COM 560 makes it possible to compensate for the linear elongation of the ducts up to 3 cm. Minimum and maximum dimensions: B, mm = 200...2400; H, mm = 200...1250.

It is made of galvanized steel (ZS), stainless steel (NS).

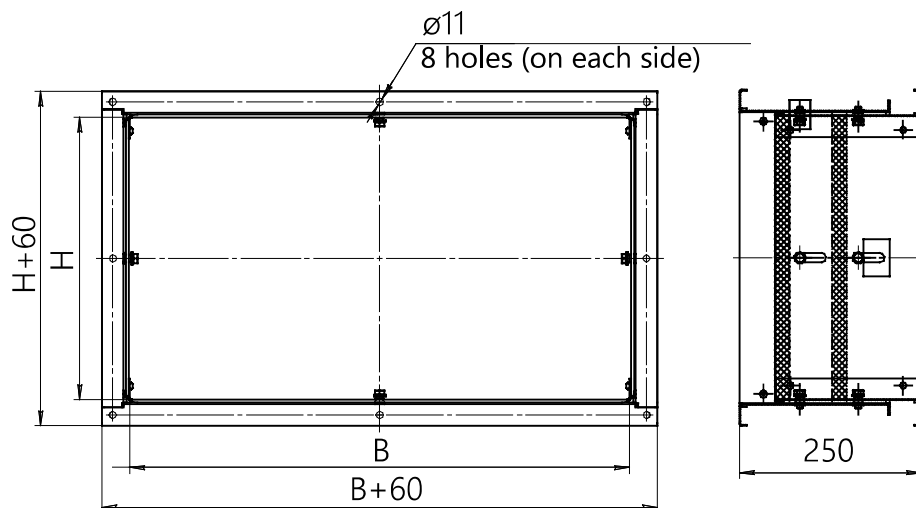
The flow cross-section and pressure losses are calculated in the same way as for duct sections of the same size.

OPERATING CONDITIONS

The COM 560 linear compensator is designed for use in temperate (Y) climate conditions of the 2nd placement category according to GOST 15150

OPERATING CONDITIONS:

- ambient temperature
 - from -40 °C to +45 °C.



BxH, mm	200x200	500x500	700x700	1 000x1 000	1 800x1 000	2 400x1 250
WEIGHT, KG MAX	6	13	18	25	38	50

EXAMPLE:

The COM 560 linear compensator; 600 mm wide and 400 mm high; made of galvanized steel:

COM 560-600×400-ZS

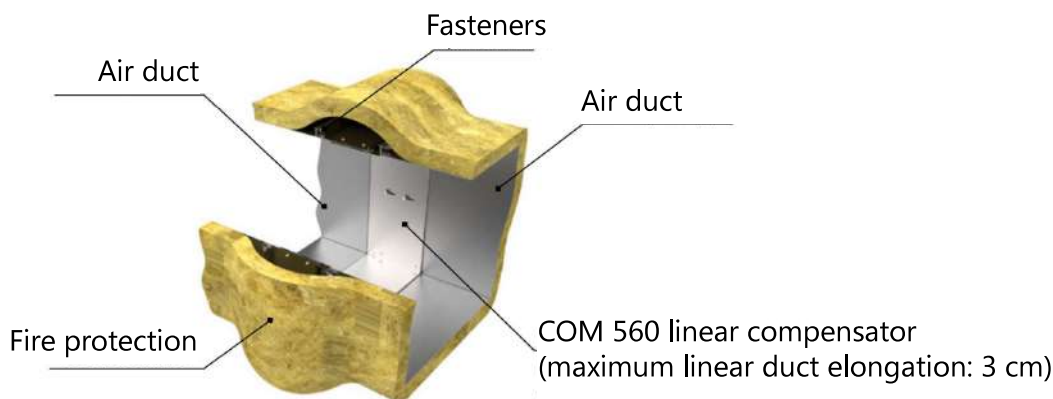
- linear compensator
- useful cross-section (B - width, mm; H - height, mm)
- flange material: (•NS - stainless steel; •ZS - galvanized steel)

INSTALLATION

The entire structure of the duct and linear compensator sections, including the flange connections, must have the correct (design) geometric dimensions and shape. Thus, all possible distortions, dents, etc. caused by possible violations during transportation and storage must be eliminated before starting the installation of all structures. The mounting holes of the bolted joints in the mating flanges must be aligned to ensure an unobstructed bolted connection. In the absence of alignment, it is allowed to use clamps and other types of connections, provided that the seating surfaces of the flanges are in full contact with each other. The presence of foreign materials, dirt, sticking, etc. on the seating surfaces of the duct flanges and linear compensators is not allowed.

The linear compensator is attached to the counter flanges of the duct only using a flange connection, which is sealed with heat-resistant sealants, heat-resistant or expandable material (tape, cord) that have appropriate certificates confirming their basic functional properties. The quality check of sealing and final sealing of flanged joints is carried out after tightening the flanges with bolts in such a way that no gaps remain, ensuring full contact of all mating surfaces of the connected flanges.

An external flame-retardant coating is applied to the outer surface of the duct and the housing of the linear compensator.



During the installation of a smoke extraction duct with the COM 560 linear compensator, it is necessary to prevent the parts of the linear compensator from being attached to the supporting structures of the building.

AN EXAMPLE OF CALCULATING THE NUMBER OF COMPENSATORS REQUIRED FOR USE IN A SMOKE EXTRACTION NETWORK

The total thermal expansion of the duct run for the smoke extraction system, calculated for a transported medium temperature of 600°C, is determined by the formula:

$$\Delta L = (\alpha \times t \times L) / 100, \text{ mm}$$

α is the coefficient of linear expansion of 1 m of pipe when heated at 100 °C.

$\alpha = 1.2 \text{ mm}$ - for St3 steel

$\alpha = 1.5 \text{ mm}$ - for 09G2S steel

t is the temperature of the transported medium, °C

L is the length of the pipeline, m

The total thermal expansion of a duct run with a length of, for example, 30 m can be estimated as:

$$\Delta L = (1,2...1,5) \times 600 \times 30 / 100 = 216...270 \text{ mm}$$

The resulting elongation will inevitably lead to the detachment of fire-resistant duct fastenings, destruction of certain sections, and inward crumpling with a loss of the "flow" cross-section, etc. Duct fastening to the building's load-bearing surfaces is rigid and does not allow damping of more than 10–20 mm. Thus, for a standard interstory height of 3.5–4.5 m (residential or office buildings), the maximum spacing for installing linear compensators should be at least one every two floors. The total elongation of a rigid duct section (without linear compensation) will amount, according to calculations, to 34–81 mm; any further elongation of this rigid section will result in a loss of duct airtightness.

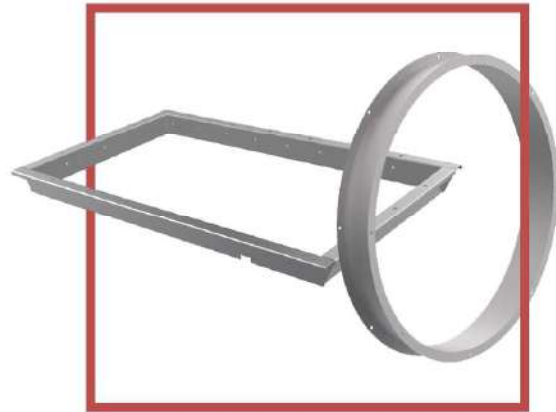
Thus, a simple and reliable design is required for installation in smoke extraction duct runs.

To solve this problem, CCK TM has developed the COM 560 linear thermal expansion compensator design.

COUNTER FLANGES

FON, FOV

The flanges are designed for connecting VRAN and VRAN-DU(V) radial fans to mating air ducts. They are made of galvanized or stainless steel.



●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125 ●140

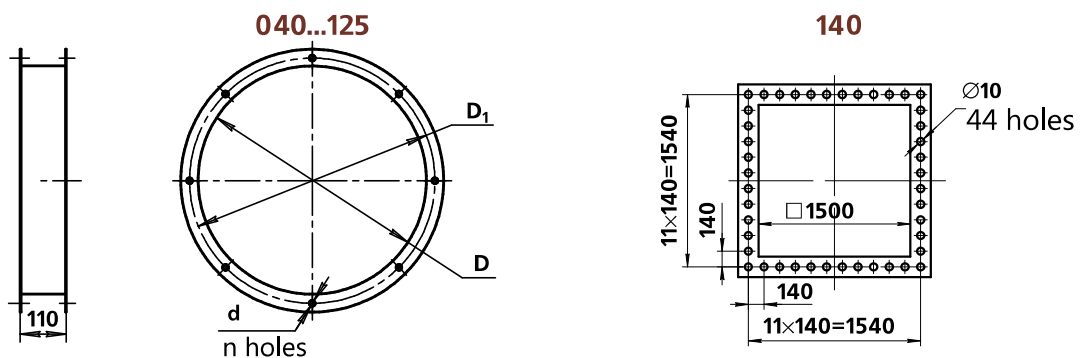
EXAMPLE:

Counter flange on the suction side; VRAN fan size 100; made of galvanized steel:

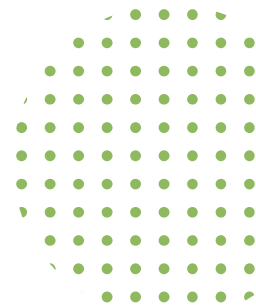
FOV-100-ZS

- ▀ counter flange (•FON •FOV)
- ▀ standard fan size
- ▀ material (•NS - stainless steel; •ZS - galvanized steel)

FLANGE ON THE SUCTION SIDE OF THE FOV



Fan standard size	040	045	050	056	063	071	080	090	100	112	125	140
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250	—
D ₁ , mm	430	480	530	600	660	740	835	940	1050	1170	1285	—
d, mm	9	9	9	9	9	9	9	9	9	12	12	—
n	8	8	8	8	8	8	8	16	16	16	16	—
Weight, kg	2,5	2,8	3,0	3,4	3,9	4,4	4,9	5,9	6,7	7,5	8,1	10,1



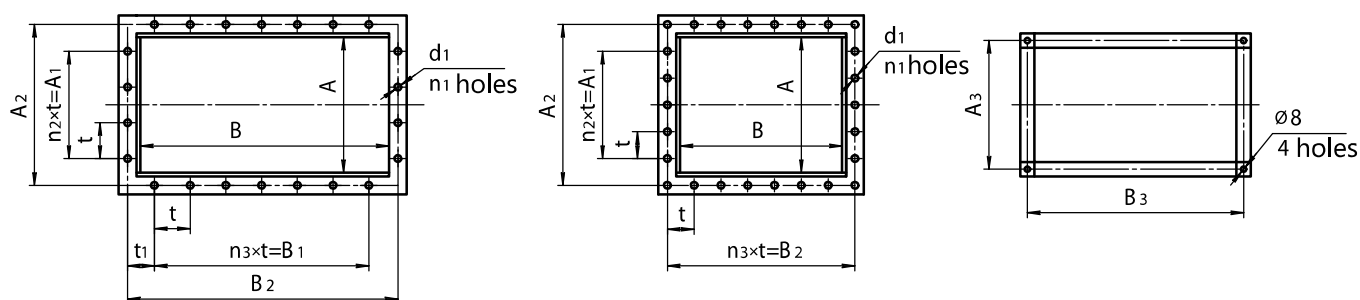
FON, FOV COUNTER FLANGE ON THE DISCHARGE SIDE

Fan design:
all except for •CR1 •VCR1
Climatic version: Y1 (2)

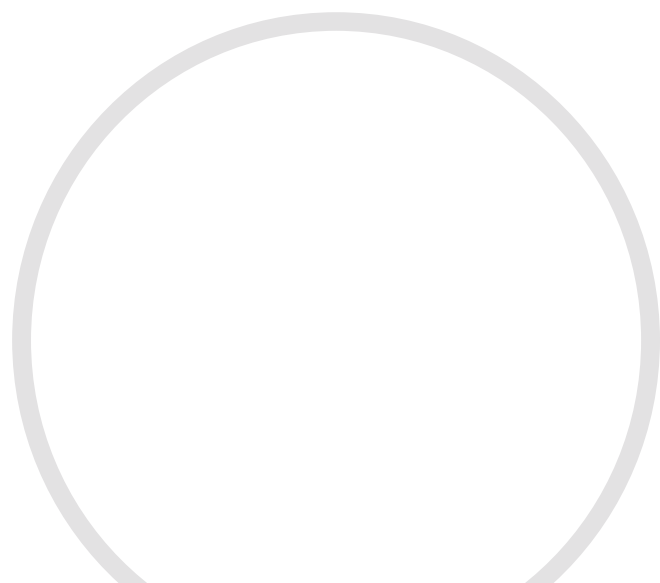
040...125

140

040...045



Fan standard size	040	045	05	056	063	071	080	090	100	112	125	140
A, mm	284	321	356	397	444	500	566	633	706	787	880	988
A ₁ , mm	200	240	300	300	400	270	300	600	450	750	750	672
A ₂ , mm	310	350	380	426	470	540	600	670	750	830	925	1040
A ₃ , mm	307	340	—	—	—	—	—	—	—	—	—	—
B, mm	513	575	644	720	802	901	1010	1133	1270	1425	1594	1124
B ₁ , mm	400	480	600	600	700	675	750	1050	1050	1350	1500	1176
B ₂ , mm	538	604	668	749	830	941	1047	1170	1317	1463	1638	1176
B ₃ , mm	535	596	—	—	—	—	—	—	—	—	—	—
d, mm	9	9	9	9	9	9	9	9	12	12	12	12
h, mm	50	60	45	44	47	58	58	49	62	73	75	75
t, mm	100	120	100	100	100	135	150	150	150	150	150	168
t ₁ , mm	55	55	40	63	35	135	150	35	150	40	87,5	—
n	16	16	22	22	26	18	18	26	24	32	34	26
n ₁	4	4	6	6	7	5	5	7	7	9	10	7
n ₂	2	2	3	3	4	2	2	4	3	5	5	4
Weight, kg	1,76	2,11	2,05	2,25	3,68	4,78	4,95	4,93	6,89	8,80	10,67	10,58



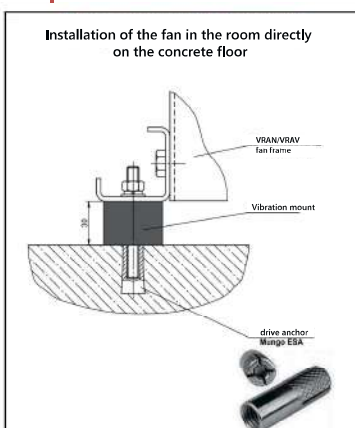
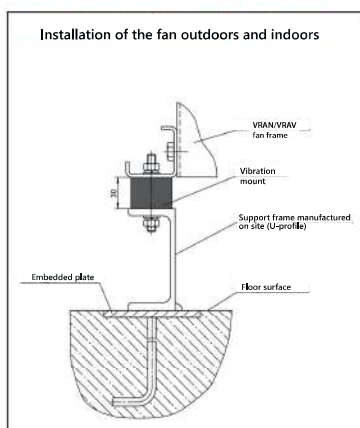
VIBRATION ISOLATOR KIT

KIV

- the series of vibration isolator kits is designed to simplify design and ordering with VRAN and VRAY fans;
- each of the kits includes the required number of vibration isolators and fasteners (nuts and washers) needed for mounting on a frame or concrete floor.

INTENDED USE:

The KIV kit is used for fans operating at ambient temperatures down to -40 °C. DU-type fans can be operated without vibration isolators. KIV kits can be used for DUV type fans.



TYPE OF KIT	MAXIMUM LOAD PER KIT, kg	NUMBER OF VIBRATION ISOLATORS	A SET OF FASTENERS	Weight, kg	MUNGO* DRIVE ANCHOR, STEEL
KIV-1	44	4	M6	0,2	ESA M6
KIV-2	60	4	M8	0,2	ESA M8
KIV-3	130	4	M8	0,3	ESA M8
KIV-4	270	4	M10	0,5	ESA M10
KIV-5	420	4	M12	1	ESA M12
KIV-6	630	6	M12	1,5	ESA M12
KIV-7	1000	10	M12	2	ESA M12

* Anchors are not included in the KIV. Examples of the most popular and affordable Mungo anchors are shown in the table.

EXAMPLE:

Kit of KIV vibration isolators for VRAN fan size 063:

KIV-7

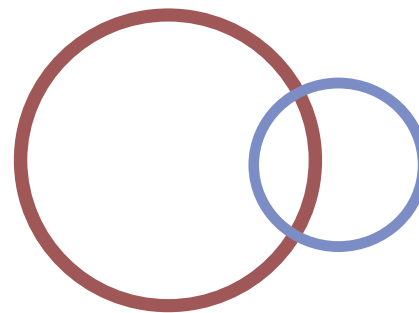
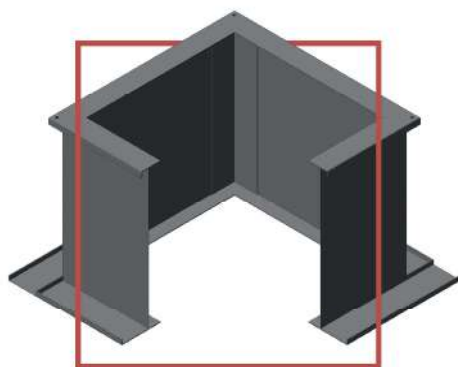
- vibration isolators kit (•KIV)
- kit number (•1 •2 •3 •4 •5 •6 •7)

KIV VIBRATION ISOLATORS KITS FOR INSTALLATION ON THE FANS

TYPE OF KIT	FAN STANDARD SIZE	
	VRAN	VRAY
KIV-1	■ 025 ■ 028 ■ 031	■ 020 ■ 025 ■ 028
KIV-2	■ 035	■ 031 ■ 035 (750/1000 хв ⁻¹)
KIV-3	■ 040 ■ 045 ■ 050 ■ 056	■ 035 (1500 хв ⁻¹) ■ 040 ■ 045
KIV-4	■ 063 ■ 071 ■ 080 (8 та 6 полюсів)	■ 050
KIV-5	■ 080 (4 полюса) ■ 090	■ 063
KIV-6	■ 100 ■ 112	■ 080 (8 полюсів)
KIV-7	■ 125	■ 080 (6 полюсів)

The fan configuration with KIV kits is proposed for the 1st design scheme of the VRAN and VRAY fans. For the 5th design scheme, the kit is selected by special order.

STAM || ROOF CURB



STAM models for a wide variety of purposes:

- STAM 100 is the simplest and most budget-friendly series of bases without thermal insulation of walls;
- STAM 200 series for general industrial fans with thermal insulation;
- STAM 310 is the lightest series for KROM fans;
- STAM 400 is a special series for mounting fans of DU-systems;
- STAM 500 is a special series designed for the installation of "twin" roof fans.
- STAM 610 series with built-in silencer for general ventilation fans;
- STAM 700 is a special series designed for fan installation in northern regions.

Additional components are available for STAM:

- OZA-PEK roof adapter for mounting VKOP 0 and OZA fans on STAM.
- OZA-ZNT weather protection hood, mounted on STAM + OZA, turns the structure into a mechanized exhaust or supply fan.
- STAM-ZNT weather protection hood, mounted on the STAM to create the air intake shaft through the STAM. It can also be used for the organization of exhaust mines.
- DF - deflector specially designed for installation on STAM. Allows safe discharge of air on the roof without the risk of leaks, including from internal DU systems.
- POD — condensation and rainwater collection pan, installed beneath the STAM unit.
- GMK-S •REG •TUL (and others) are models of air dampers that can be mounted underneath on special threaded mounting brackets (no nuts required). The choice of type for separately mounted dampers is not restricted; the use of special explosion-proof dampers is allowed. Some STAM units have built-in dampers, but without an option to select the model.

There are enough options for using the STAM system with various features and fan types to meet any requirements related to rooftop equipment installation:

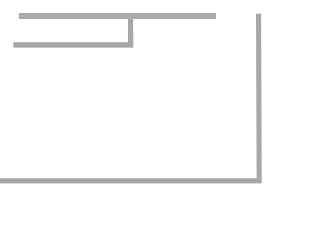
STAM+KPU/KPD+ZNT/DF = smoke vent;
 STAM+OZA-PEK+VKOP 0 = smoke ventilation system;
 STAM+OZA-PEK+OZA + OZA-ZNT = exhaust ventilation system;
 STAM+DF = natural ventilation system.

EXAMPLE:

STAM 100 roof curb (lightweight, without slope, without thermal insulation, without built-in dampers); standard size 35, general industrial design

STAM 100-35-N

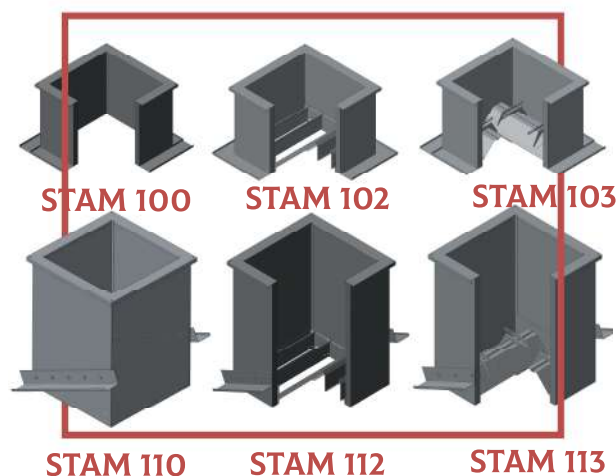
- roof curb (•STAM 100 •STAM 102 •STAM 103 •STAM 110 •STAM 112 •STAM 113
 •STAM 200 •STAM 202 •STAM 203 •STAM 210 •STAM 212 •STAM 213
 •STAM 400 •STAM 402 •STAM 403 •STAM 410 •STAM 412 •STAM 413
 •STAM 500 •STAM 502 •STAM 503)
- standard size (•35 •40 •45 •51 •56 •63 •71 •88 •90 •109 •112 •136
 •2x35 •2x40 •2x45 •2x51 •2x56 •2x63 •2x71 •2x88 •2x90 — for STAM 500)
- design version (•N; •CR1)



LIGHTWEIGHT ROOF CURBS

STAM 100

Lightweight roof curbs (without thermal insulation) of the STAM 100 series are designed for use in building construction projects on any type of roof. STAM 100, STAM 102, STAM 103 are designed for installation on a horizontal surface, STAM 110, STAM 112, STAM 113 - on an inclined surface together with KROS, KROV, UKROS, VKOP 0 and OZA roof-mounted exhaust and supply fans. When provided with adequate fire resistance and external thermal insulation, they are compatible with KROV-DU/DUV and UKROS-DU/DUV smoke extraction fans.



■ general purpose industrial (N)

●35 ●40 ●45 ●51 ●56 ●63 ●71 ●88 ●90 ●109 ●112 ●136*

* the standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The design of the lightweight roof curb of the STAM 100 series is a prefabricated structure consisting of a sturdy welded frame bearing the main load and a sealed galvanized exterior cladding. Thermal insulation is not included in the supply and can be applied on-site as part of an adjacent roofing pie. The connection to the ventilation duct is made via the mounting flange with bolts.

The following STAM models are available for installation on a roof without a slope:

- STAM 100 - without damper
- STAM 102 - with integrated exhaust damper
- STAM 103 - with integrated fresh air damper

The height of the roof curbs without a slope is 600 mm, designed for a snow cover thickness of no more than 500 mm (taking into account the thickness of the roofing pie).

- STAM 110 - without damper
- STAM 112 - with integrated exhaust damper
- STAM 113 - with integrated fresh air damper. They are supplied with side supports that are adjustable during installation. The angle of inclination is set during installation on the roof, the maximum slope is 1:2. The height of the roof curbs with a slope is 750-1150 mm, designed for a snow cover thickness of more than 500 mm (taking into account the variable angle of installation in the roof).

The connection dimensions of the STAM 100 series are standardized with UKROS-DU/DUV, KROV-DU/DUV.

OPTIONAL ACCESSORIES ARE OFFERED: • POD pan • R50 grille • ZNT weather protection hood • DF deflector • GMK/REG external dampers mounted from below.

EXAMPLE 1:

STAM 100 roof curb (lightweight, for installation on a roof without a slope, without a damper); for a shaft measuring 35x35 cm; general industrial design:

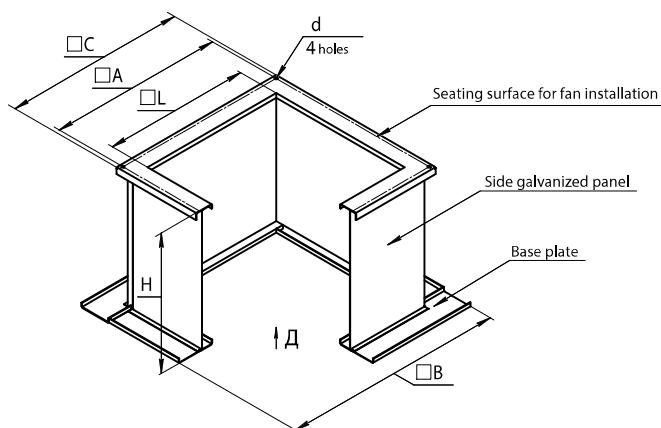
STAM 100-35-N

EXAMPLE 2:

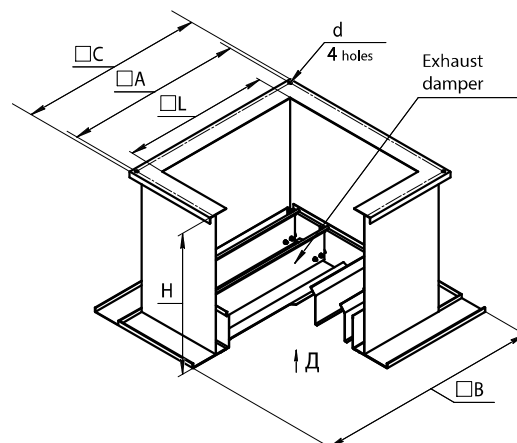
STAM 112 roof curb (lightweight, for installation on a roof with a slope, with a built-in exhaust damper); for a shaft measuring 109x109 cm; general industrial design:

STAM 112-109-N

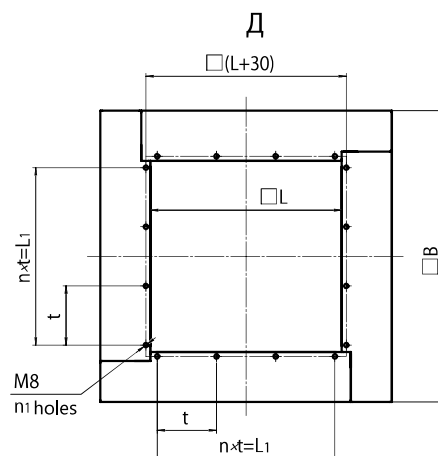
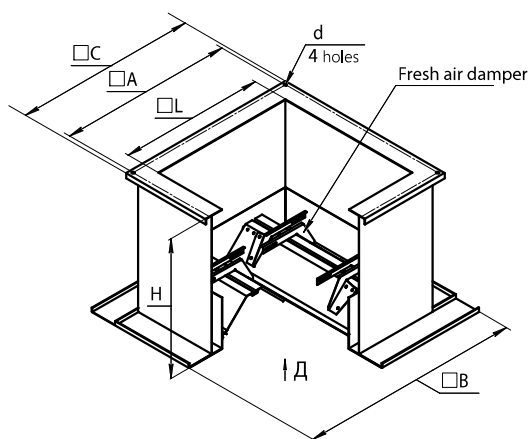
STAM 100



STAM 102

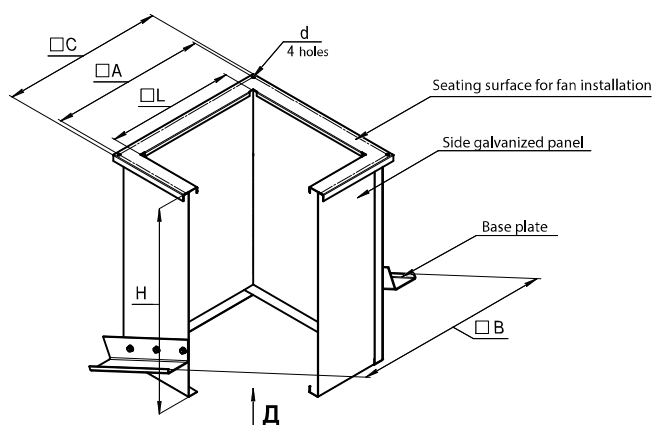


STAM 103

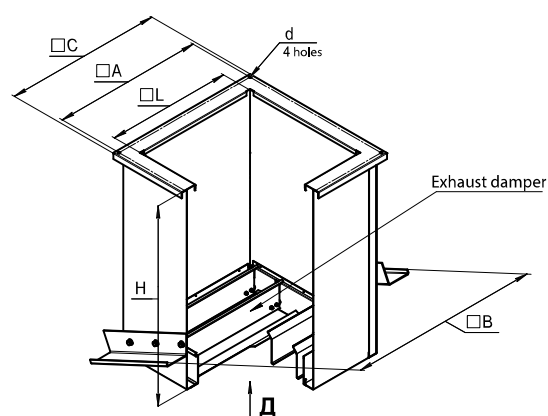


Standard size of STAM	Dimensions, mm										Weight, kg		
	A	B	C	L	L ₁	t	n	n ₁	H	d	100	102	103
35	480	685	520	355	275	137,5	2	12	600	12	22	25	29
40	530	730	565	400	360	180					24	28	33
45	580	780	615	450	390	195					27	42	38
51	630	830	665	500	450	225					29	35	41
56	690	890	725	560							33	40	47
63	755	960	790	630	585	195	3	16		43	51	58	
71	840	1040	875	710						46	56	63	
88	1005	1210	1050	880	780	260				14	53	65	73
90	1050	1230	1090	900							54	68	75
109	1220	1420	1260	1090	1050	150	7	32			61	77	85
112	1350	1450	1390	1120	960	160	6	28			69	87	96
136	1505	1700	1545	1370	1260	210					18	72	92

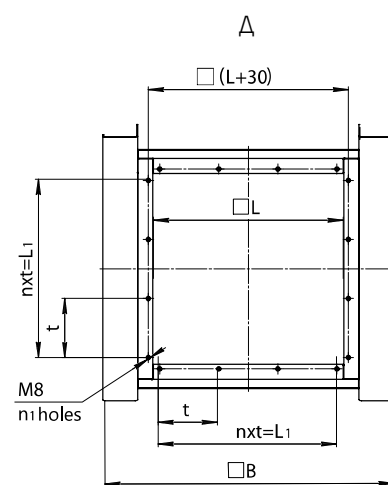
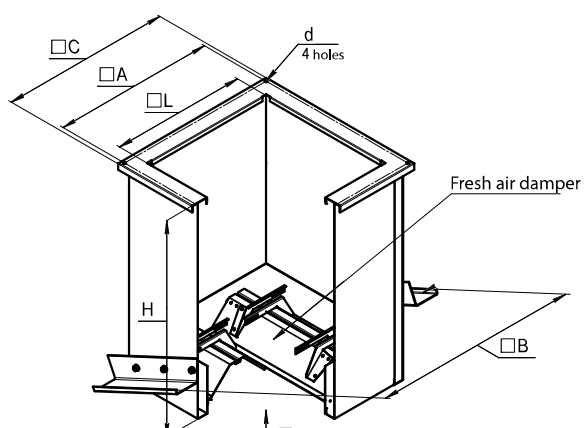
STAM 110



STAM 112



STAM 113

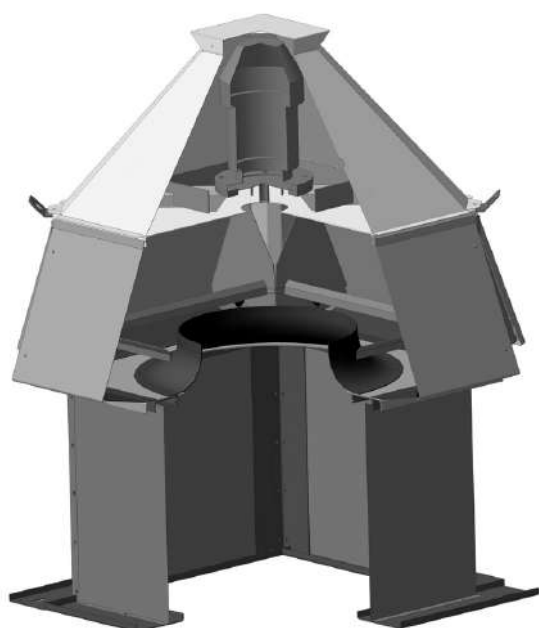


Standard size of STAM	Dimensions, mm										Weight, kg		
	A	B	C	L	L ₁	t	n	n ₁	H	d	110	112	113
35	480	685	520	355	275	137,5	2	12	750	12	24	27	31
40	530	730	565	400	360	180			780		26	30	35
45	580	780	615	450	390	195			800		29	34	40
51	630	830	665	500	450	225			800		32	38	44
56	690	890	725	560					840		36	43	50
63	755	960	790	630	585	195	3	16	860	14	46	54	61
71	840	1040	875	710					900		50	60	67
88	1005	1210	1050	880	780	260			950		58	70	78
90	1050	1230	1090	900					970		60	74	81
109	1220	1420	1260	1090	1050	150			7		32	1030	18
112	1350	1450	1390	1120	960	160	6	28	1050	75	93	102	
136	1505	1700	1545	1370	1260	210			1150	80	100	112	

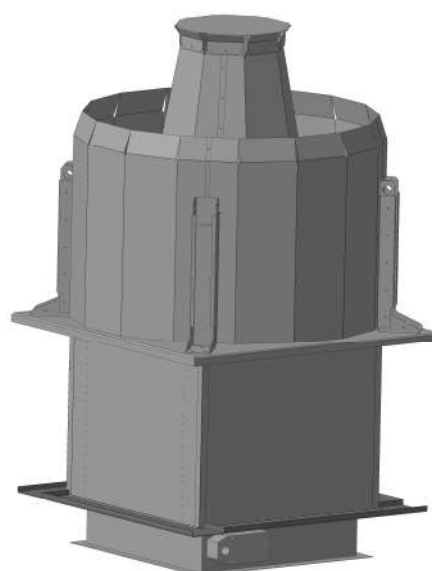
TABLE OF COMBINATIONS OF INDIVIDUAL PRODUCTS FOR USE WITH THE STAM 100 SERIES

Product	Standard size of the combined elements													
SERIES STAM 100	35	40	45	51	56	63	71	88	90	109	112	136		
UKROS (KROV)	035	040	045	050	056	063	071	080	090	100	112	•125 •140		
VKOP O					040	045	•050 •056	063	071	080	090	100	112	125
OZA-PEK					040	045	•050 •056	063	071	080	090	100	112	125
POD	50			84			93				137			

UKROS + STAM 100



KROV + STAM 100 + DAMPER

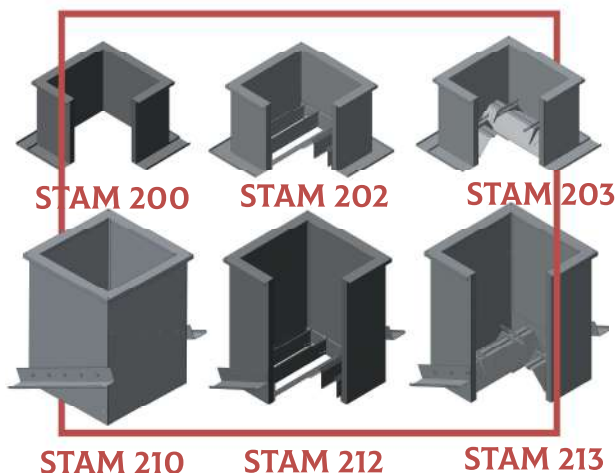


INSULATED ROOF CURBS

STAM 200

Insulated (thermally insulated) roof curbs of the STAM 200 series are designed for use in building construction projects on any type of roof. The STAM 200/202/203 is designed for horizontal installation, while the STAM 210/212/213 is designed for inclined installation, together with UKROS/KROV/VKOP 0/ OZA exhaust and supply fans.

- general purpose industrial (N)
- corrosion-resistant (CR1)



●35 ●40 ●45 ●51 ●56 ●63 ●71 ●88 ●90 ●109 ●112 ●136*

*the standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The design of the insulated roof curb of the STAM 200 series is a box-shaped structure consisting of a welded steel frame bearing the main support load, inside which is fixed a square-section duct made of galvanized (design version N) or stainless steel (design version CR1). The sides of the frame are completely covered with galvanized steel panels. There is a thermal insulation between the frame and the duct. From the outside, the frame has a support surface for installation and mounting on the supporting part of the roof.

The following models of roof curbs are offered for installation on a roof without a slope:

- STAM 200 - without damper;
- STAM 202 - with integrated exhaust damper;
- STAM 203 - with integrated fresh air damper.

The height of the STAM 200/202/203 is 600 mm, designed for a snow cover thickness of no more than 500 mm (taking into account the thickness of the roofing pie).

For installation on a roof with a slope:

- STAM 210 - without damper;
- STAM 212 - with integrated exhaust damper;
- STAM 213 - with integrated fresh air damper.

These roof curbs are supplied with side supports that are adjustable during installation. The angle of inclination is set during installation on the roof, the maximum slope is 1:2.

The height of the STAM 210/212/213 is 750-1150 mm, designed for a snow cover thickness of more than 500 mm (taking into account the variable angle of installation on the roof).

The connection dimensions of the STAM 200 series are standardized with UKROS-DU/DUV, KROV-DU/DUV.

OPTIONAL ACCESSORIES ARE OFFERED: • POD pan • R50 grille • ZNT weather protection hood • DF deflector • REG external damper.

EXAMPLE 1:

STAM 200 roof curb (insulated, for installation on a roof without a slope, without a damper), for a shaft measuring 35x35 cm; general industrial design:

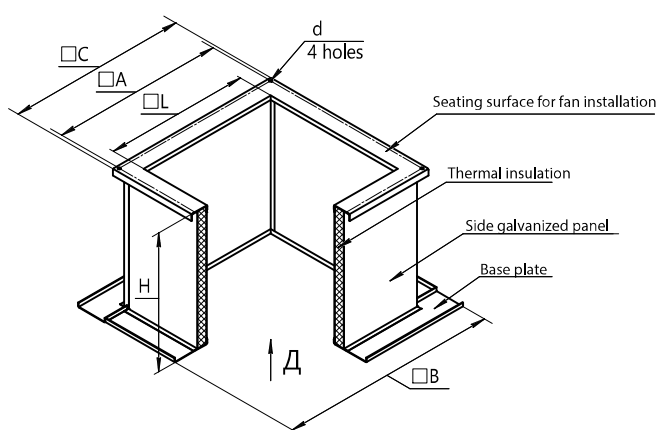
STAM 200-35-N

EXAMPLE 2:

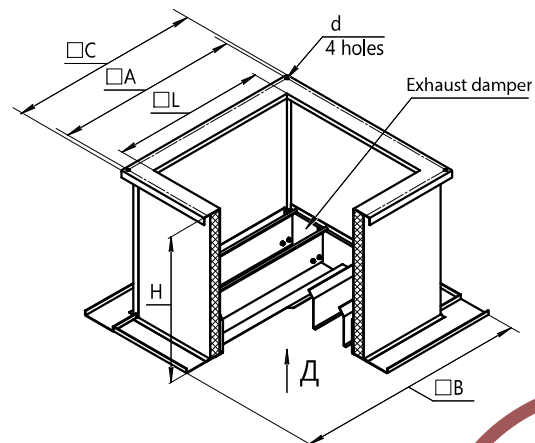
STAM 212 roof curb (insulated, for installation on a roof with a slope, with a built-in exhaust damper), for a shaft measuring 109x109 cm; general industrial design:

STAM 212-109-N

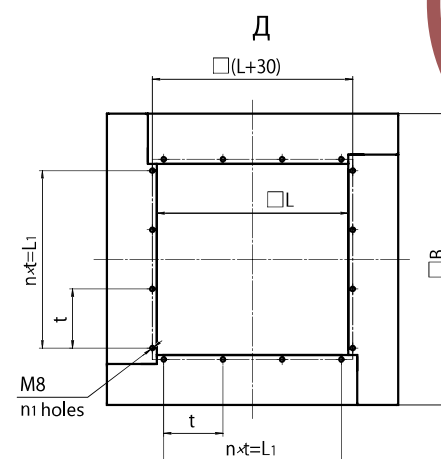
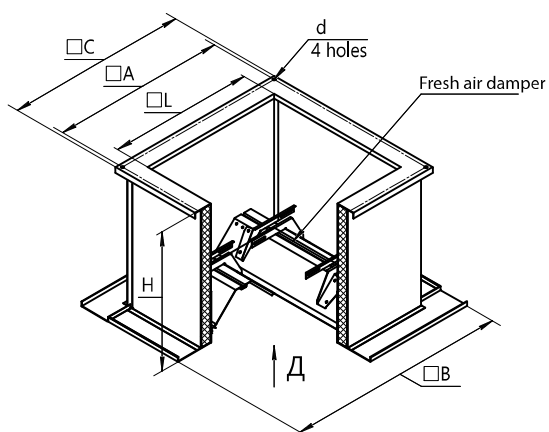
STAM 200



STAM 202

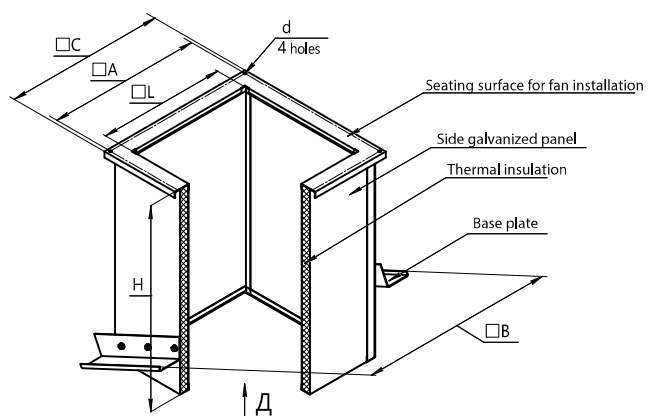


STAM 203

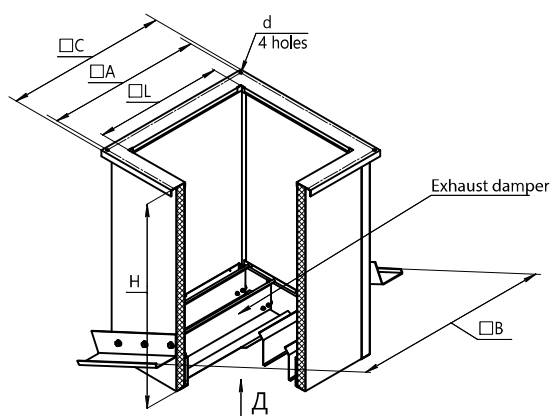


Standard size of STAM	Dimensions, mm										Weight, kg		
	A	B	C	L	L ₁	t	n	n ₁	H	d	200	202	203
35	480	685	520	355	275	137,5	2	12	600	12	27	30	34
40	530	730	565	400	360	180					29	33	38
45	580	780	615	450	390	195					31	36	42
51	630	830	665	500	450	225					35	41	47
56	690	890	725	560							38	45	52
63	755	960	790	630	585	195	3	16		51	59	66	
71	840	1040	875	710						55	65	72	
88	1005	1210	1050	880	780	260				14	65	77	85
90	1050	1230	1090	900							67	81	87
109	1220	1420	1260	1090	1050	150					7	32	76
112	1350	1450	1390	1120	960	160	6	28			83	101	110
136	1505	1700	1545	1370	1260	210				90	110	122	

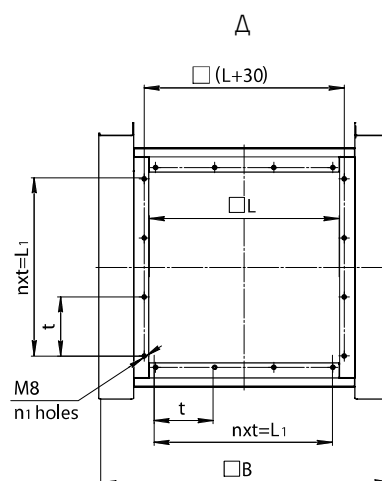
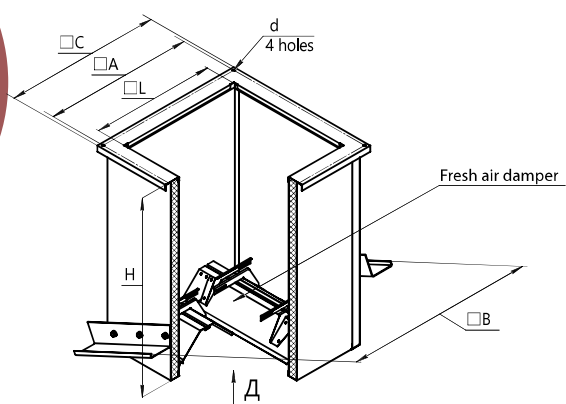
STAM 210



STAM 212



STAM 213

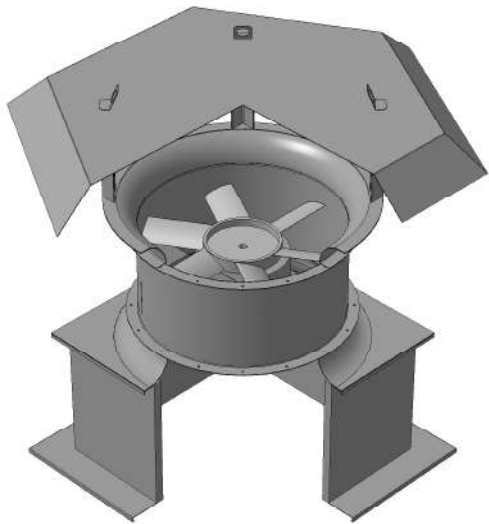


Standard size of STAM	Dimensions, mm										Weight, kg		
	A	B	C	L	L ₁	t	n	n ₁	H	d	210	212	213
35	480	685	520	355	275	137,5	2	12	750	12	34	37	41
40	530	730	565	400	360	180			780		36	40	45
45	580	780	615	450	390	195			800		39	44	50
51	630	830	665	500	450	225			800		42	48	54
56	690	890	725	560					840		46	53	60
63	755	960	790	630	585	195	3	16	860	14	62	70	77
71	840	1040	875	710					900		66	76	84
88	1005	1210	1050	880	780	260			950		78	90	98
90	1050	1230	1090	900					970		80	94	101
109	1220	1420	1260	1090	1050	150			7		32	1030	18
112	1350	1450	1390	1120	960	160	6	28	1050	92	110	119	
136	1505	1700	1545	1370	1260	210			1150	100	120	132	

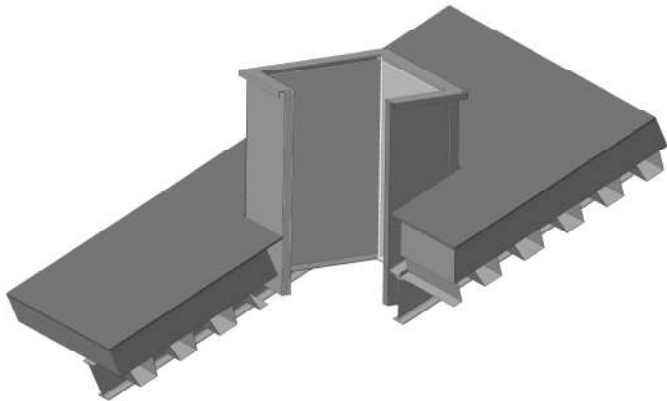
TABLE OF COMBINATIONS OF INDIVIDUAL PRODUCTS FOR USE WITH THE STAM 200 SERIES

PRODUCT	STANDARD SIZE OF THE COMBINED ELEMENTS														
STAM 200 SERIES	35	40	45	51	56	63	71	88	90	109	112	136			
UKROS (KROV)	035	040	045	050	056	063	071	080	090	100	112	•125 •140			
VKOP O					040	045	•050 •056	063	071	080	090	100	112	125	
OZA-PEK					040	045	•050 •056	063	071	080	090	100	112	125	
POD	50			84			93			137					

VKOP O + OZA-PEK + STAM 200



INSTALLATION OF STAM 210 ON
A SLOPING ROOF



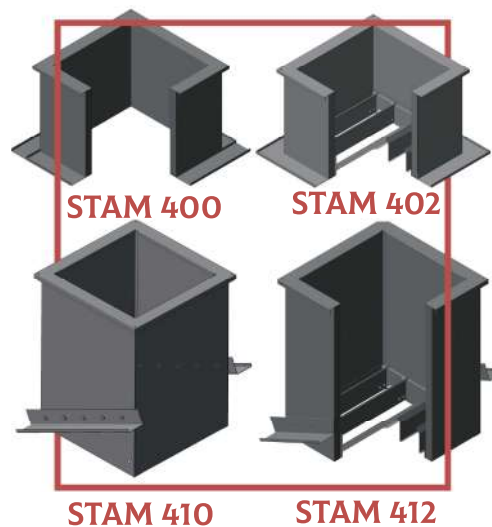
ROOF CURBS FOR SMOKE EXTRACTION FANS

STAM 400

STAM 400 series smoke extraction roof curbs (200 °C for continuous operation; 600 °C for 120-minute operation) are designed for installation and assembly of UKROS/OZA smoke extraction fans on various types of building roofs.

STAM 400, STAM 402 - on a horizontal surface, STAM 410, STAM 412 - on an inclined surface.

- general purpose industrial (N)
- corrosion-resistant (CR1)



- 200° C
- 600° C
- FULL-TIME

•35 •40 •45 •51 •56 •63 •71 •88 •90 •109 •112 •136*

*the standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The design of the thermally insulated STAM 400/STAM 410 is a box-shaped structure consisting of a welded steel frame bearing the main support load, inside which a square-section duct made of galvanized or stainless steel is fixed. The sides of the frame are completely covered with galvanized steel panels. There is a non-combustible heat-resistant thermal insulation between the frame and the duct. From the outside, the frame has a support surface for installation and mounting on the supporting part of the roof.

The following models of roof curbs are offered for installation on a roof without a slope:

- STAM 400 - without damper;
- STAM 402 - with integrated exhaust damper.

The height of the roof curbs without a slope is 600 mm, designed for a snow cover thickness of no more than 500 mm (taking into account the thickness of the roofing pie).

For installation on a roof with a slope:

- STAM 410 - without damper;
- STAM 412 - with integrated exhaust damper.

They are supplied with side supports that are adjustable during installation. The angle of inclination is set during installation on the roof, the maximum slope is 1:2. The height of the roof curbs with a slope is 750-1150 mm, designed for a snow cover thickness of more than 500 mm (taking into account the variable angle of installation in the roof).

The connection dimensions of the STAM 400 series are standardized with UKROS-DU/DUV, KROV-DU/DUV.

OPTIONAL ACCESSORIES ARE OFFERED: • POD pan • R50 grille • ZNT weather protection hood • DF deflector • KPD and GMK-DU dampers.

EXAMPLE 1:

STAM 400 roof curb (smoke extraction, for installation on a roof without a slope, without a damper); for a shaft measuring 35x35 cm; general industrial design:

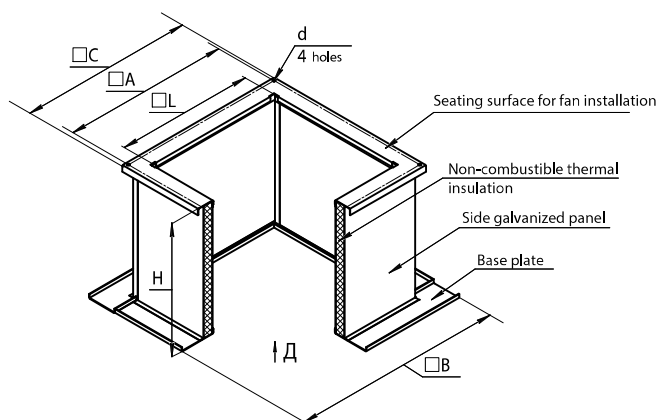
STAM 400-35-N

EXAMPLE 2:

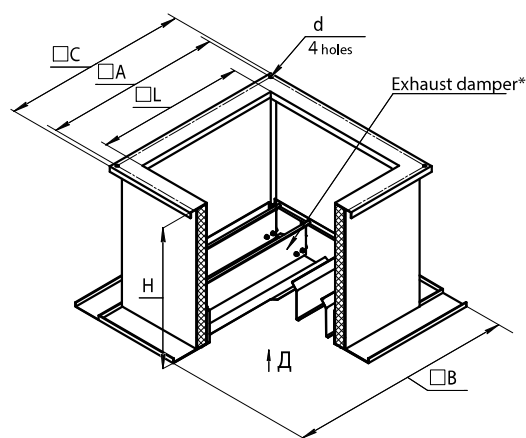
STAM 412 roof curb (smoke extraction, for installation on a roof with a slope, with an integrated exhaust damper); for a shaft measuring 112x112 cm; corrosion-resistant design:

STAM 412-112-CR1

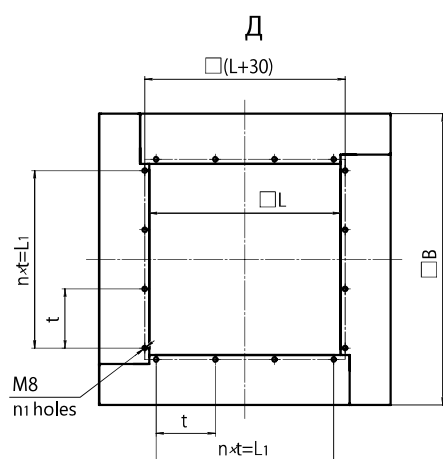
STAM 400



STAM 402

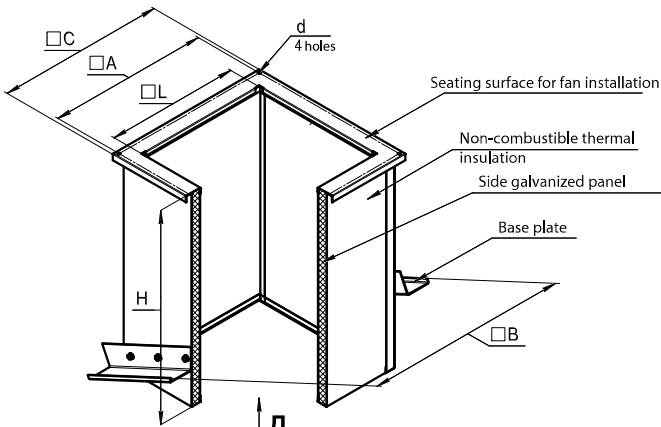


* damper type must be selected in accordance with the "Code of rules SP7.13130-2013 p.7.11 B), D)".

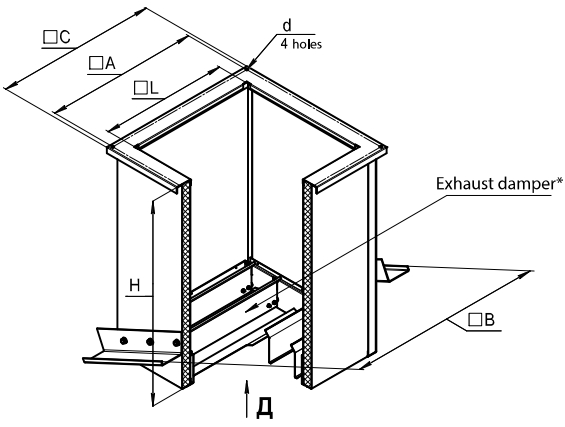


Standard size of STAM	Dimensions, mm										Weight, kg	
	A	B	C	L	L ₁	t	n	n ₁	H	d	400	402
35	480	685	520	355	275	137,5	2	12	600	12	29	31
40	530	730	565	400	360	180					31	35
45	580	780	615	450	390	195					34	39
51	630	830	665	500	450	225					37	43
56	690	890	725	560							40	47
63	755	960	790	630	585	195	3	16		58	66	
71	840	1040	875	710						63	73	
88	1005	1210	1050	880	780	260				14	76	88
90	1050	1230	1090	900							78	92
109	1220	1420	1260	1090	1050	150					7	32
112	1350	1450	1390	1120	960	160	6	28	18	95	113	
136	1505	1700	1545	1370	1260	210				106	126	

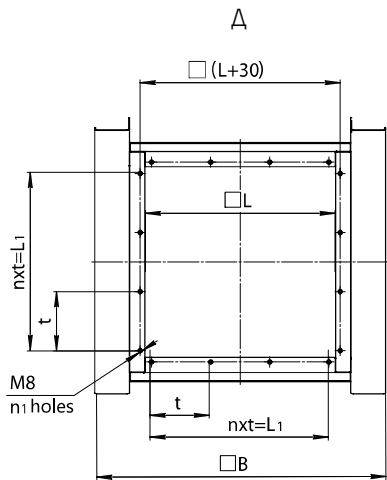
STAM 410



STAM 412



* damper type must be selected in accordance with the "Code of rules SP7.13130-2013 p.7.11 B), D)".

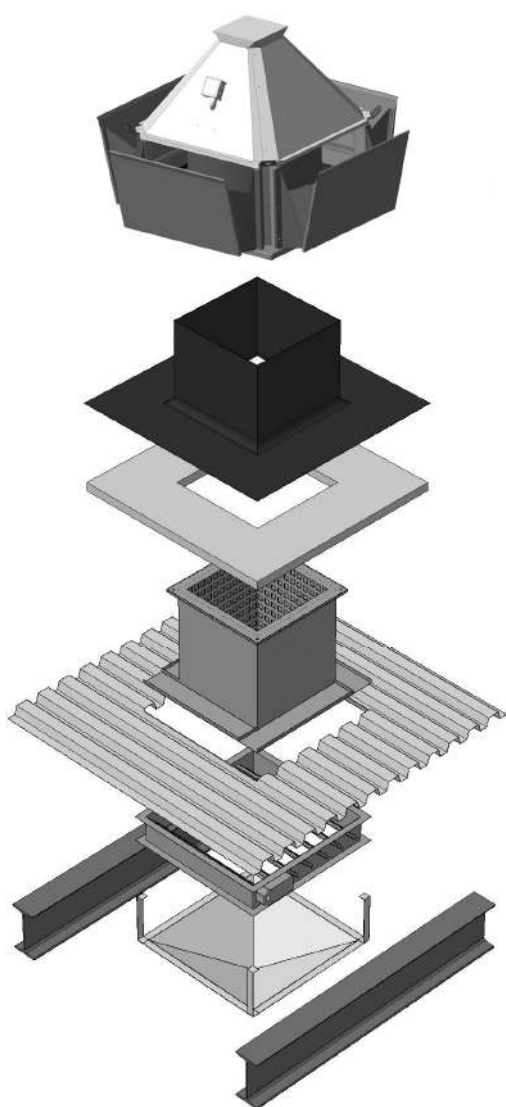


Standard size of STAM	Dimensions, mm										Weight, kg	
	A	B	C	L	L ₁	t	n	n ₁	H	d	410	412
35	480	685	520	355	275	137,5	2	12	750	12	41	44
40	530	730	565	400	360	180			780		43	47
45	580	780	615	450	390	195			800		46	51
51	630	830	665	500	450	225			800		49	55
56	690	890	725	560					840		53	60
63	755	960	790	630	585	195	3	16	860	14	65	72
71	840	1040	875	710					900		70	80
88	1005	1210	1050	880	780	260			950		85	97
90	1050	1230	1090	900					970		88	102
109	1220	1420	1260	1090	1050	150			7		32	1030
112	1350	1450	1390	1120	960	160	6	28	1050	18	100	118
136	1505	1700	1545	1370	1260	210			1150		116	136

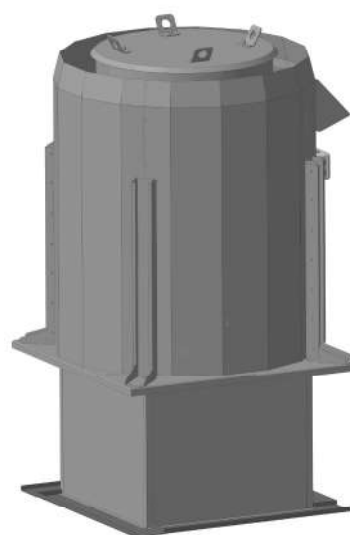
TABLE OF COMBINATIONS OF INDIVIDUAL PRODUCTS FOR USE WITH THE STAM 400 SERIES

PRODUCT	STANDARD SIZE OF THE COMBINED ELEMENTS														
STAM 400 SERIES	35	40	45	51	56	63	71		88	90	109	112	136		
UKROS-DU (KROV-DU)	035	040	045	050	056	063	071		080	090	100	112	•125 •140		
VKOP O					040	045	•050	•056	063	071	080	090	100	112	125
OZA-PEK					040	045	•050	•056	063	071	080	090	100	112	125
POD	50			84			93				137				

UKROS-DU/DUV + STAM 400 + DAMPER + POD



KROV-DU/DUV + STAM 400



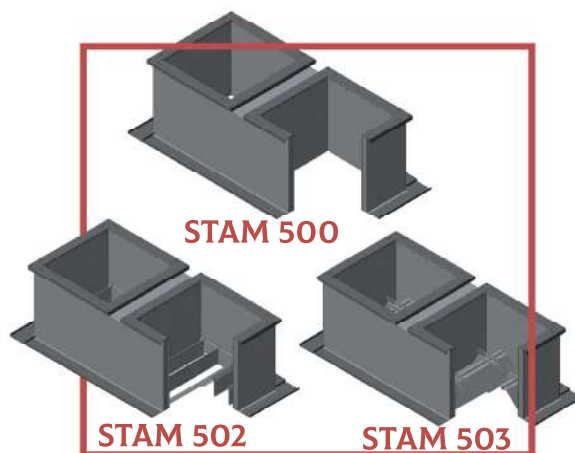
STAM 500

TWO-CHANNEL SMOKE EXTRACTION ROOF CURBS

The two-channel smoke extraction roof curbs of the STAM 500 series are designed for parallel installation of two KROV-DU/DUV smoke extraction fans on the horizontal roof of buildings.

The two-channel smoke extraction roof curbs of the STAM 500 series can also be used for roof mounting of two KROV fans on the horizontal roof of buildings. The use of two fans on the STAM 500 allows for reducing the overall system weight, lowering costs, and achieving a more flexible operating mode system.

It is permissible to combine fans of different types and power ratings, connect separate duct runs, and attach additional dampers beneath the STAM 500 beyond the standard STAM 502 and STAM 503 options.



• 400° C • 600° C

- general purpose industrial (N)
- corrosion-resistant (CR1)

•2X35 •2X40 •2X45 •2X51 •2X56 •2X63 •2X71•2X88 •2X90*

* the standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The design of the thermally insulated roof curbs of the STAM 500 series is a box-shaped structure consisting of a welded steel frame bearing the main support load, inside which two square-section ducts made of galvanized or stainless steel are fixed. The sides of the frame are completely covered with galvanized steel panels. There is a non-combustible thermal insulation between the frame and the duct. From the outside, the frame has a support surface for installation and mounting on the supporting part of the roof.

The following models are available:

- STAM 500 - without dampers;
- STAM 502 - with integrated exhaust dampers;
- STAM 503 - with integrated fresh air dampers.

The roof curbs of the STAM 500 series are intended only for use on a roof without a slope. The height of the roof curbs without a slope is 600 mm, designed for a snow cover thickness of no more than 500 mm (taking into account the thickness of the roofing pie).

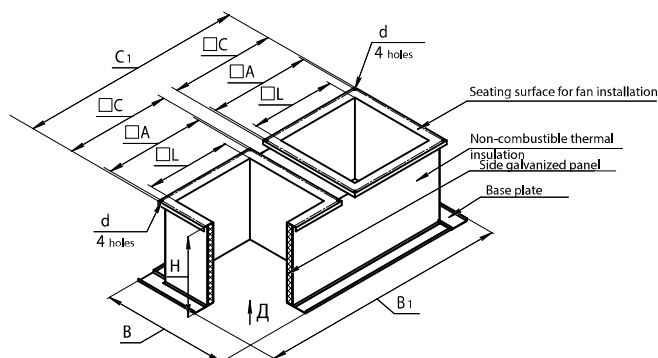
OPTIONAL ACCESSORIES ARE OFFERED: • POD pan • R50 grille • KPD and GMK-DU dampers for STAM 500.

EXAMPLE:

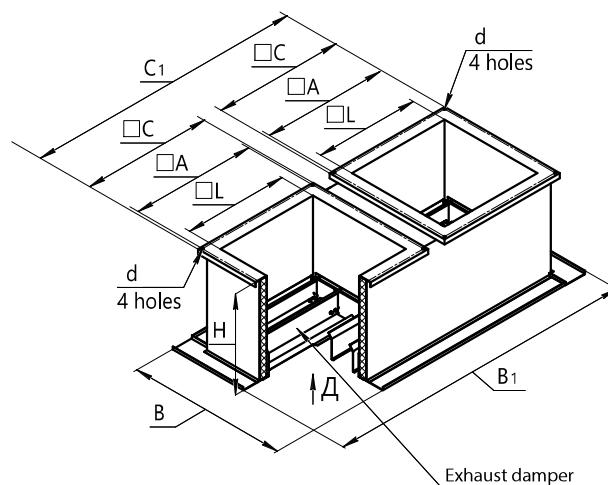
STAM 500 roof curb (two-channel, without damper, for installation on flat roofs); for shaft size 2 (35x35 cm); general industrial design:

STAM 500-2X35-N

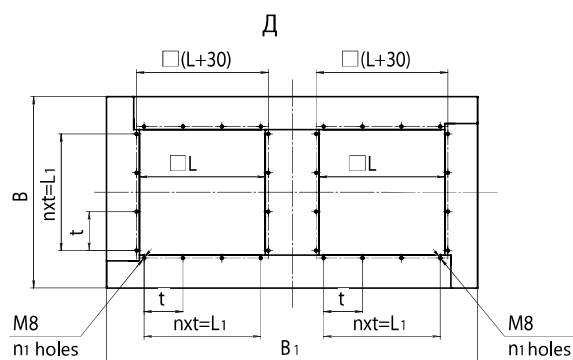
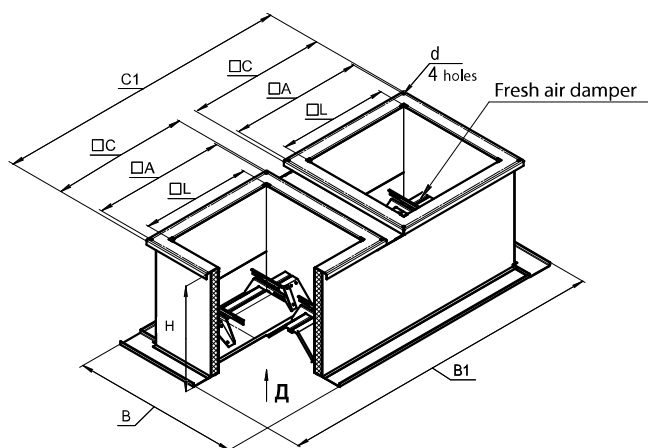
STAM 500



STAM 502



STAM 503

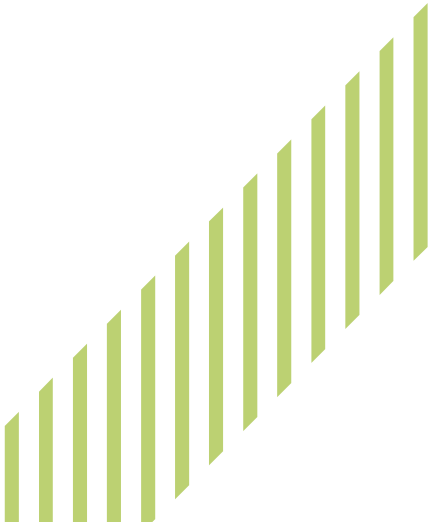
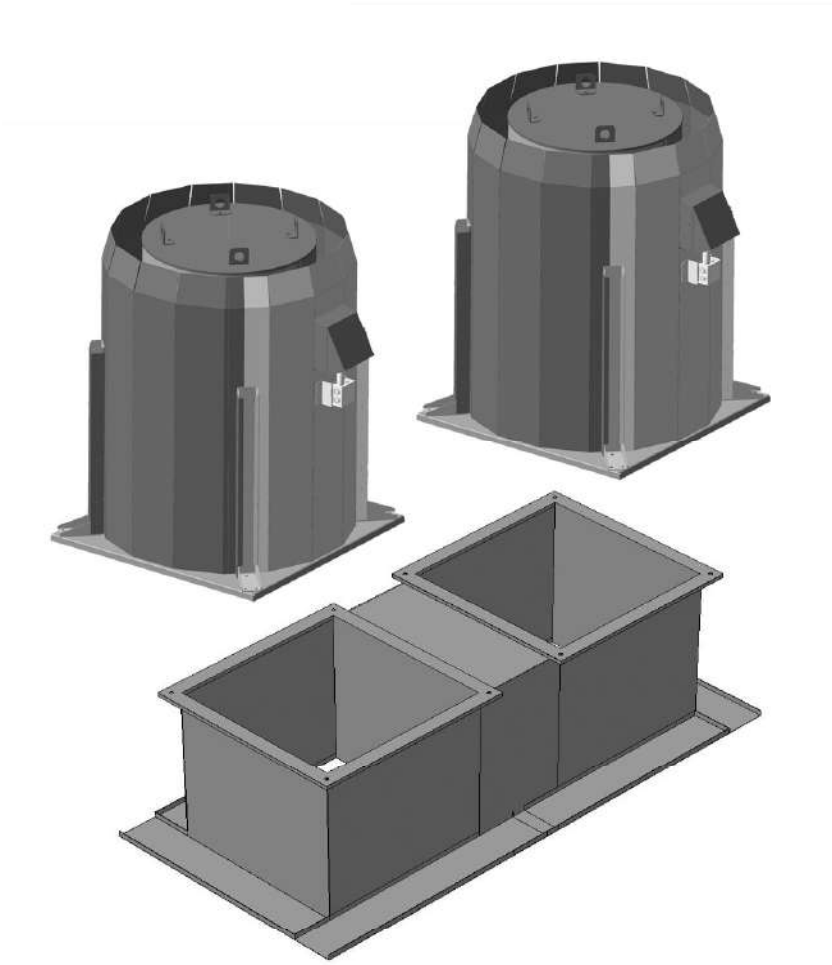


Standard size of STAM	Dimensions, mm												Weight, kg		
	A	B	B ₁	C	C ₁	L	L ₁	t	n	n ₁	H	d	500	502	503
2X35	480	685	1345	520	1175	355	275	137,5	2	12	600	12	60	66	74
2X40	530	730	1450	565	1280	400	360	180					70	78	98
2X45	580	780	1555	615	1385	450	390	195					85	95	107
2X51	630	830	1705	665	1535	500	450	225					100	112	124
2X56	690	890	1845	725	1675	560			120	134		148			
2X63	755	960	2020	790	1850	630	585	195	3	16		14	170	186	200
2X71	840	1040	2210	875	2040	710							185	205	219
2X88	1005	1210	2580	1050	2410	880	780	260					230	254	270
2X90	1050	1230	2770	1090	2600	900							250	278	292

TABLE OF COMBINATIONS OF INDIVIDUAL PRODUCTS FOR USE WITH THE STAM 500 SERIES

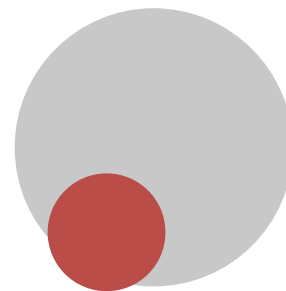
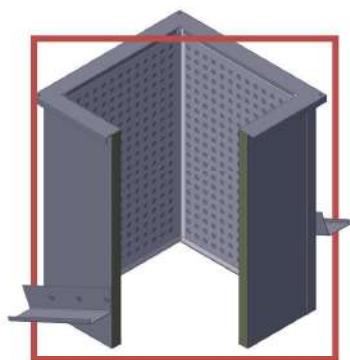
PRODUCT	STANDARD SIZE OF THE COMBINED PRODUCTS								
STAM 500 SERIES	2X35	2X40	2X45	2X51	2X56	2X63	2X71	2X88	2X90
POD - 2 PCS	50		84			93			
KROV-DU/DUV - 2 PCS	035	040	045	050	056	063	071	080	090

KROV + STAM 500



STAM 610

SOUND ATTENUATED ROOF CURB



The STAM 610 sound-attenuating roof curbs are designed for use in building construction projects on any type of roof, together with KROV-DU/DUV and UKROS-DU/DUV exhaust and supply rooftop fan installations. Numerical index - the standard size of the roof curb corresponds to the size of the flow section in centimeters.

- ▀ general purpose industrial (N)
- ▀ corrosion-resistant (CR1)

• 35 • 40 • 45 • 51 • 56 • 63 • 71 • 88 • 90*

*standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The design of the STAM 610 insulated soundproof roof curb is a box-shaped structure consisting of a welded frame that bears the main load, inside which a square-section perforated duct is fixed, made of galvanized or stainless steel. The sides of the frame are completely covered with galvanized steel panels. Between the frame and the duct is 50 mm thick thermal and sound insulation. For roof mounting, the STAM 610 is supplied with side supports that are adjustable during installation. The angle of inclination is set during installation on the roof, the maximum slope is 1:2. For a roof without a slope, specify a slope of 0. The connection dimensions of the STAM 610 fully correspond to the range of connection dimensions of UKROS and KROV roof fans. GMK-P, REG, and TUL type dampers can be connected underneath to the flanges of the STAM 610 support plate.

APPLICATION OF STAM IN COMBINATION WITH UKROS/KROV/VKOP O FANS

PRODUCT	STANDARD SIZE OF THE COMBINED PRODUCTS								
STAM 610	35	40	45	51	56	63	71	88	90
VKOP O					• 040	• 045	• 050	• 056	• 063
OZA-PEK					• 4	• 4,5	• 5	• 5,6	• 6,3
POD	50			84			93		
UKROS, KROV	035	040	045	050	056	063	071	080	090

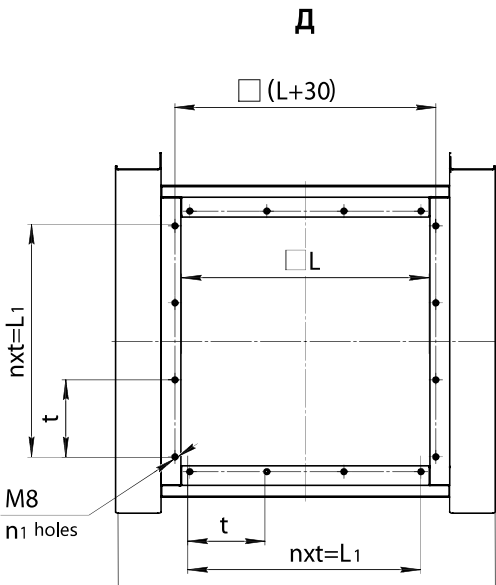
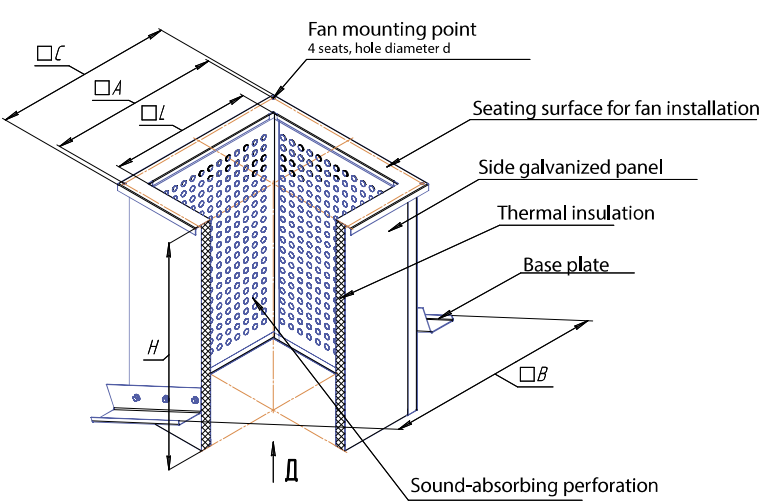
Combination options: ▀ VKOP O+OZA-PEK+STAM ▀ UKROS+STAM ▀ KROV+STAM

EXAMPLE:

STAM 610 roof curb (with sound attenuation) for a shaft size of 35 x 35 cm; general industrial design (galvanized steel):

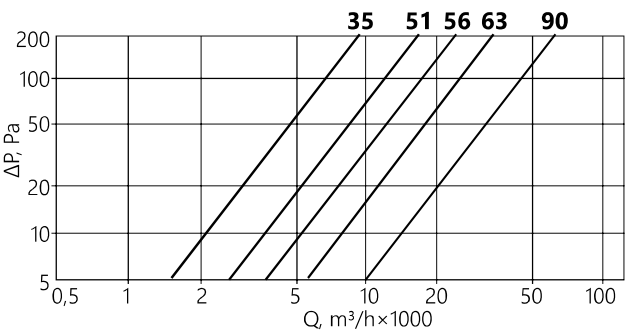
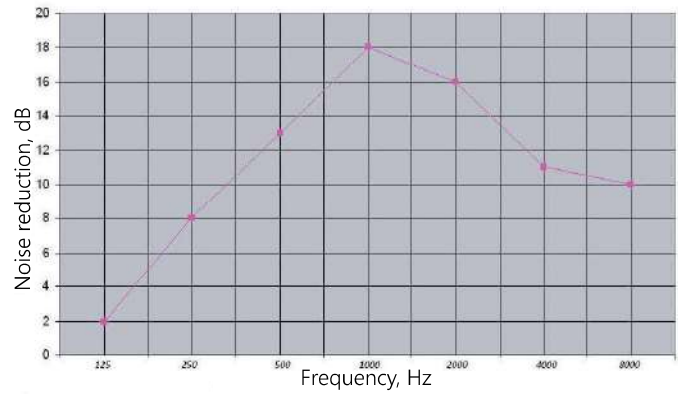
STAM 610-35-N

STAM 610 FOR INSTALLATION ON ROOFS WITH A SLOPE, FOR INSTALLATION ON FLAT ROOFS
(SLOPE 0 DEGREES)



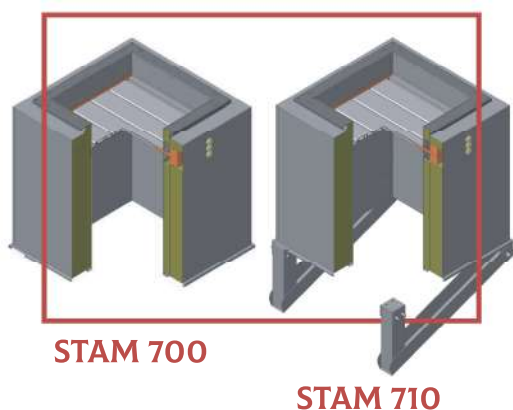
Standard size of STAM	Dimensions, mm										Weight, kg	
	A	B	C	L	L ₁	t	n	n ₁	H	d		
35	480	685	520	355	275	137,5	2	12	750	12	44	
40	530	730	565	400	360	180			780		46	
45	580	780	615	450	390	195			800		50	
51	630	830	665	500	450	225					840	55
56	690	890	725	560								60
63	755	960	790	630	585	195	3	16	860	14	75	
71	840	1040	875	710					900		80	
88	1005	1210	1050	880	780	260			950		95	
90	1050	1230	1090	900					970		105	

ACOUSTIC AND AERODYNAMIC PARAMETERS



STAM 700

THE ROOF CURBS FOR NORTHERN REGIONS, FOR FLAT ROOFS AND ROOFS WITH A SLOPE



To facilitate and simplify the installation of roof fans and prevent heat loss in temperate and cold climates, a special design of the insulated, noise-insulated roof curb STAM 700 (STAM 710) has been developed, which can be used on any type of roof.

The STAM 700 roof curbs are used on flat roofs, and STAM 710 on pitched roofs, together with KROV, UKROS exhaust and supply rooftop fan installations.

- general purpose industrial (N)
- corrosion-resistant (CR1)

• 35 • 40 • 45 • 51 • 56 • 63 • 71 • 88 • 90 • 109 • 112 • 136*

*standard size of the STAM (numeric index) corresponds to the size of the passage section in centimeters

The STAM 700 (STAM 710) roof curb is a box-shaped structure with an increased height of up to 1000 mm, consisting of a galvanized welded frame made of frost-resistant steel (down to -60°C) that bears the main load. Inside the frame, a square-section duct is fixed, made of galvanized or stainless steel. The STAM 700 (STAM 710) is equipped with a GMK damper installed at the top.

The sides of the frame are completely covered with galvanized steel panels. Between the frame and the duct is 150 mm thick thermal and sound insulation. The STAM 700 is designed for mounting on a roof without a slope. From the outside, the frame has a support surface for installation and mounting on the supporting part of the roof.

The STAM 710 is designed for mounting on a roof with a slope. They are supplied with side supports that are adjustable during installation. The angle of inclination is set during installation on the roof, the maximum slope is 1:2. The height of the STAM 700 (STAM 710) is 1000 mm, designed for a snow cover thickness of more than 500 mm (taking into account the modified angle of installation in the roof).

The connection dimensions of the STAM 700 (STAM 710) fully correspond to the range of connection dimensions for UKROS and KROV roof fans.

APPLICATION OF STAM IN COMBINATION WITH UKROS/KROV/VKOP 0/ VKOP 1 FANS

PRODUCT	STANDARD SIZE OF THE COMBINED PRODUCTS													
STAM	35	40	45	51	56	63	71	88	90	109	112	136		
VKOP 0					• 040	• 045	• 050	• 056	• 063	• 071	• 080	• 090	• 100	• 112
OZA-PEK					• 4	• 4,5	• 5	• 5,6	• 6,3	• 7,1	• 8	• 9	• 10	• 11,2
POD	50			84			93			137				
UKROS	035	040	045	050	056	063	071	080	090	100	112	• 125 • 140		

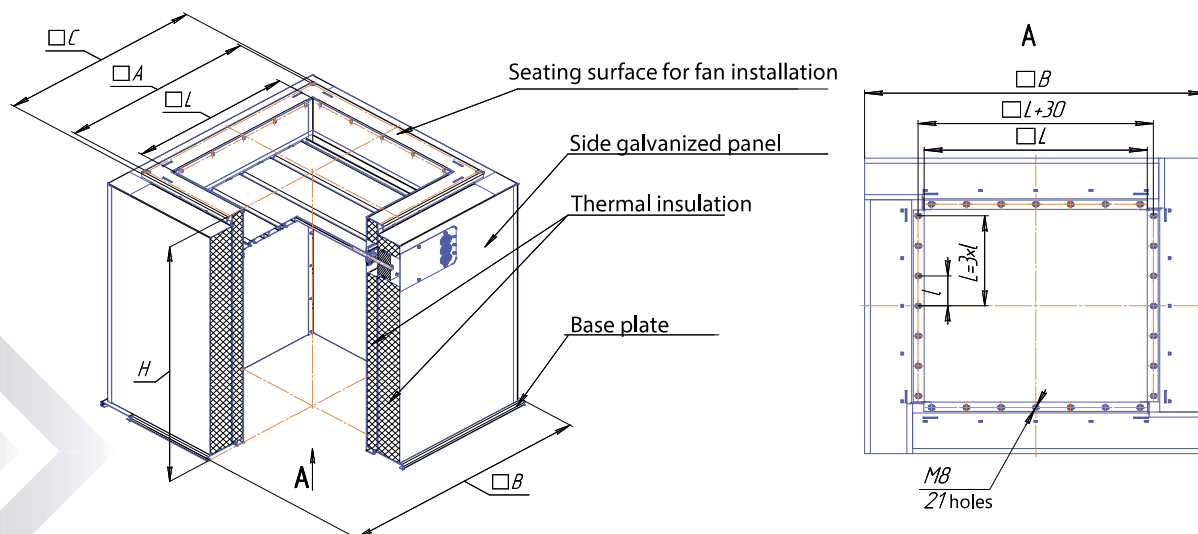
Combination options: ➤ VKOP 0+OZA-PEK+STAM ➤ UKROS+STAM ➤ KROV+STAM

EXAMPLE:

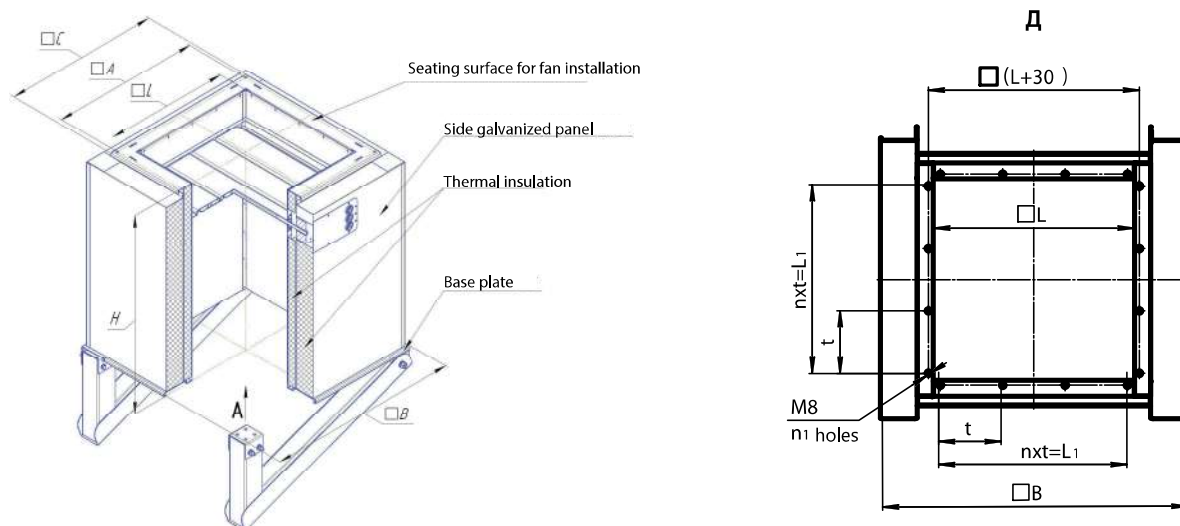
STAM 710 standard roof curb, for a shaft size of 35 x 35 cm; compatible with UKROS/KROV series fans with a 3.55 impeller, general industrial version (galvanized steel), for pitched roofs:

STAM 710-35-N

STAM 700 FOR INSTALLATION ON FLAT ROOF



STAM 710 FOR INSTALLATION ON PITCHED ROOFS, INSTALLATION ALLOWED WITH A SLOPE OF 0 DEGREES



Standard size of STAM	Dimensions, mm										Weight, kg			
	A	B	C	L	L ₁	t	n	n ₁	H	d	700	710		
35	480	685	520	355	275	137,5	2	12	1000	12	82	97		
40	530	730	565	400	360	180					90	105		
45	580	780	615	450	390	195					97	112		
51	630	830	665	500	450	225					105	120		
56	690	890	725	560							113	128		
63	755	960	790	630	585	195	3	16		1000	14	122	137	
71	840	1040	875	710								133	148	
88	1005	1210	1050	880	780	260						145	160	
90	1050	1230	1090	900								158	173	
109	1220	1420	1260	1090	450	150						6	28	1000
112	1350	1450	1390	1120	960	160	188	203						
136	1505	1700	1545	1370	1260	210	205	220						

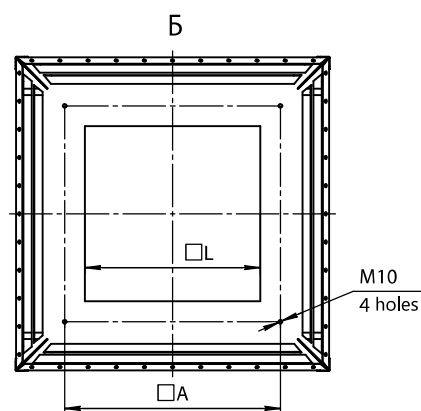
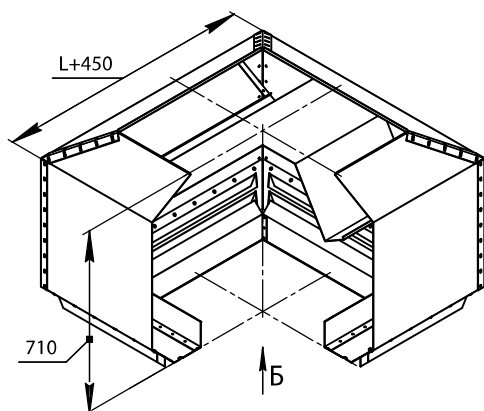
DF | **DEFLECTOR**



The deflector is designed to direct air discharge vertically to the roof when constructing exhaust shafts for natural and mechanical ventilation, including DU and DUV systems. It can be combined directly with STAM (except for the STAM 310 and STAM 500 series). It can be connected to OZA and OZA-DUV fans via OZA-PET adapters. The deflector can be used when fluxes of DU-systems are released into the roof, when any types of DU-fans are placed inside the building. Provides protection from rain and snow without the use of moving parts.

The design of the DF deflector of the exhaust shafts has an aerodynamic shape to enhance thrust from the external wind flow. The maximum protection against precipitation during gusty side winds, with a built-in external water drainage system, has been experimentally confirmed. The deflector is equipped with a built-in ejector to reduce the temperature of the exhaust flow. The deflector is bolted to the STAM roof curb of any series at four points. Precipitation is discharged to the outside of the STAM. The deflector can be made of galvanized or stainless steel.

•35 •40 •45 •51 •56 •63 •71 •88 •90 •109 •112 •136



STANDARD SIZE	35	40	45	51	56	63	71	88	90	109	112	136
A, mm	480	530	580	630	690	755	840	1005	1050	1220	1350	1505
L, mm	355	400	450	500	560	630	710	800	900	1090	1120	1370
Weight, kg	34	37	40	42	45	48	52	55	57	60	64	70

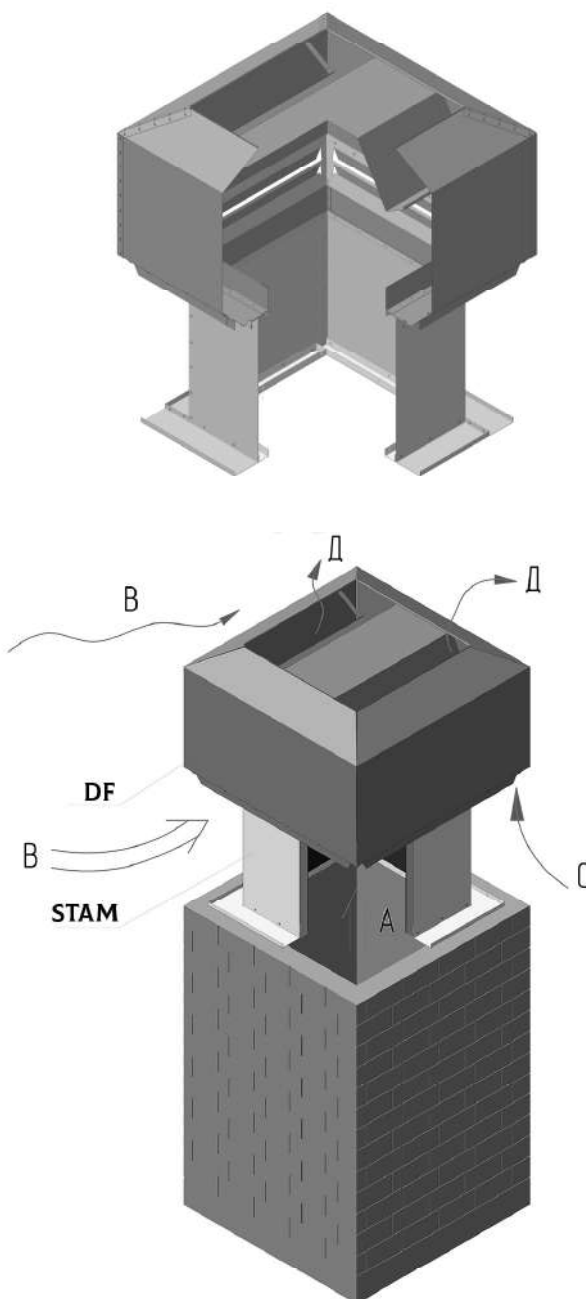
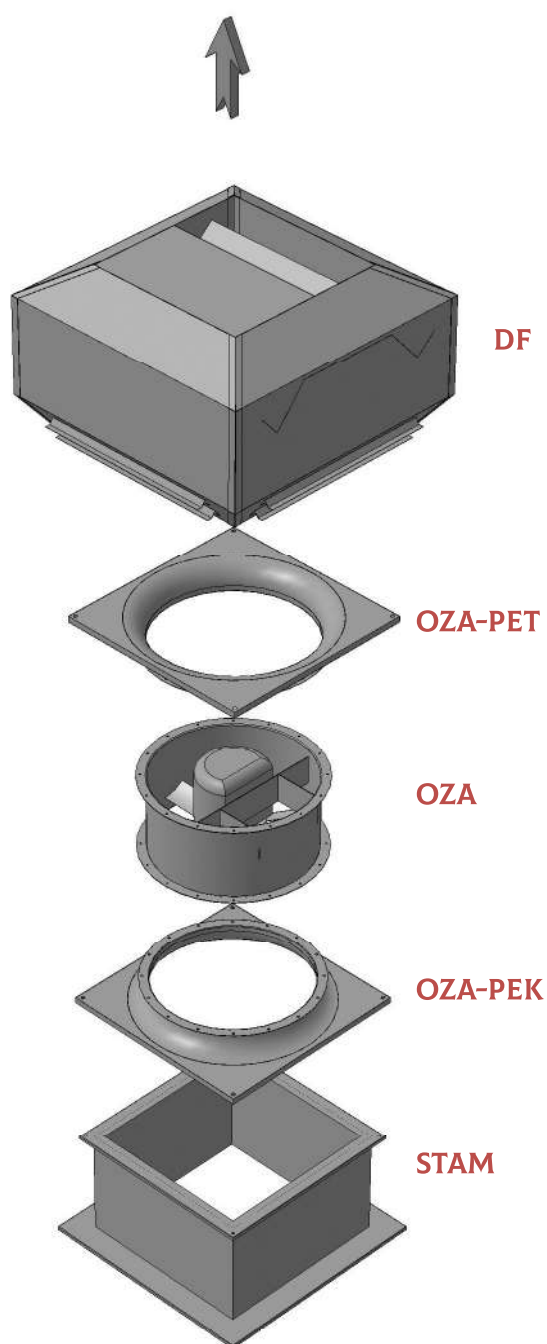
STAM												
STANDARD SIZE	35	40	45	51	56	63	71	88	90	109	112	136
•OZA •OZA-PET •OZA-PEK												
STANDARD SIZE					•040	•045	•050	•063	•071	•080	•090	•100
							•056					•112
												•125

EXAMPLE:

Deflector size 51 for installation on a galvanized steel STAM

DF-51-ZS

- deflector
 - standard size (•35 •40 •45 •51 •56 •63 •71 •88 •90 •109 •112 •136)
 - material (•NS - stainless steel; •ZS - galvanized steel)
- special requirements for DF are specified additionally and agreed with the manufacturer.



- A - from the shaft;
- V - wind;
- C - false air;
- D = A + B - total flow with increased air draft.

ZNT

WEATHER PROTECTION HOOD

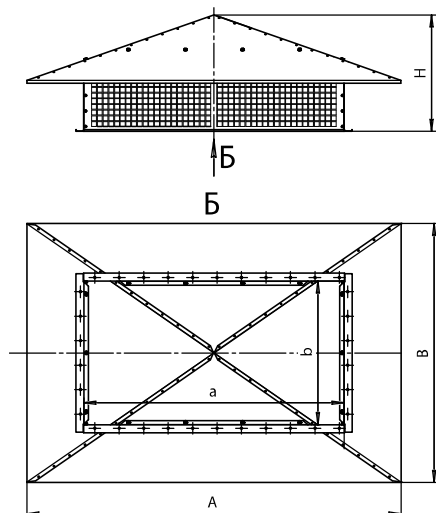


Weather protection hood is provided for outdoor operation of the VRAN, VRAN and OZA series fans, as well as for the STAM roof curb:

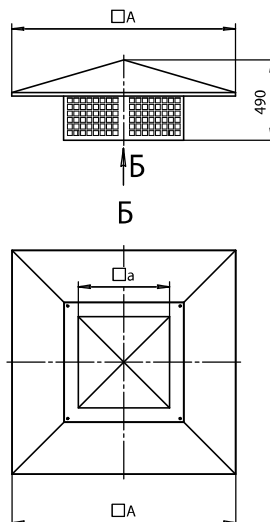
• VRAN-ZNT • OZA-ZNT • STAM-ZNT

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125

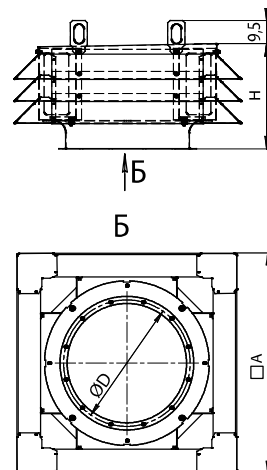
VRAN-ZNT



STAM-ZNT



OZA-ZNT



VRAN

STANDARD SIZE	040	045	050	056	063	071	080	090	100	112	125	140
A, mm	800	900	960	980	1094	1434	1534	1660	1757	2102	2294	2200
B, mm	551	600	670	658	734	1089	1089	1154	1193	1461	1588	1740
H, mm	303	390	361	330	338	453	508	510	500	661	715	825
a, mm	514	575	644	720	801	900	1010	1133	1270	1425	1594	1460
b, mm	286	321	356	397	441	497	566	633	706	787	880	988
Weight, kg	7	9,4	9,7	12,6	15,4	19,6	23,2	34,5	38,1	55,4	72,4	120

OZA

STANDARD SIZE	040	045	050	056	063	071	080	090	100	112	125	—
A, mm	740	805	920	920	1030	1105	1201	1405	1560	1680	1680	—
H, mm	329	320	428	442	458	473	497	525	550	540	540	—
D, mm	430	480	530	620	690	770	860	960	1070	1195	1320	—
Weight, kg	15	17,5	28,1	31,5	34,2	37,4	48,3	55	68	80	82,5	—

STAM

STANDARD SIZE	35	40	45	51	56	63	71	88	90	109	112	136
A, mm	1155	1200	1250	1300	1360	1425	1505	1685	1725	1895	2025	2180
a, mm	355	400	450	500	560	630	710	880	900	1090	1120	1370
Weight, kg	15	18	22	26	30	35	40	45	48	55	63	70

EXAMPLE:

OZA-ZNT weather protection hood for OZA axial fan; fan standard size 040; protection hood made of stainless steel:

OZA-ZNT-040-NS

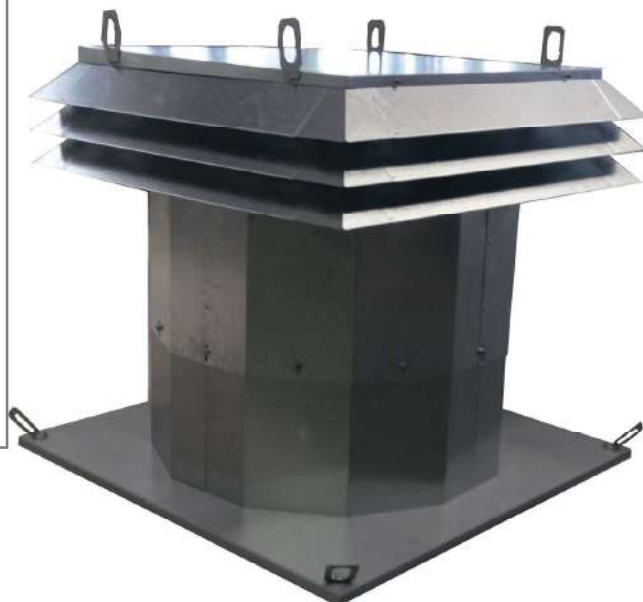
- ✓ weather protection hood (• VRAN-ZNT • VRAV-ZNT • OZA-ZNT • STAM-ZNT)
- ✓ standard size
 - fan standard size: • 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125 • 140
 - roof curb standard size: • 35 • 40 • 45 • 51 • 56 • 63 • 71 • 88 • 90 • 109 • 112 • 136
- ✓ material (•NS - stainless steel; •ZS - galvanized steel)

special requirements for ZNT are specified additionally and agreed with the manufacturer.

VRAN-ZNT



OZA-ZNT



OZA-VKO

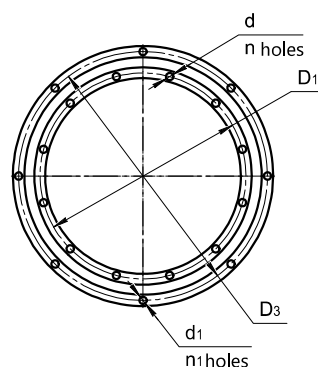
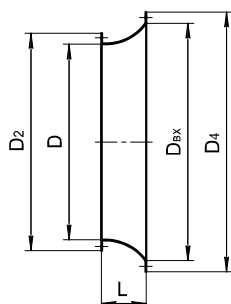
INLET HEADER



The OZA-VKO inlet header is used to properly form a uniform velocity field at the fan impeller blades of the OZA series when operating without an inlet duct. The OZA-VKO must also be installed on the suction duct when the fan is subsequently mounted, as flanged inlet airflow into an axial fan or duct significantly reduces the fan's airflow rate and generated pressure due to edge losses at the flange.

One side of the OZA-VKO is attached to the inlet flange of the axial fan casing of the OZA series; on the other side, for example, a large protective mesh (OZA-SEB) can be attached.

●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125



Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₂ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
D ₃ , mm	540	585	650	720	805	910	1045	1145	1265	1410	1410
D ₄ , mm	570	620	690	760	840	950	1090	1195	1315	1460	1460
D _{ax} , mm	485	546	606	680	764	861	970	1092	1213	1358	1358
L, mm	92	103	115	129	145	163	184	207	230	215	201
d, mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
d ₁ , mm	12	12	12	12	12	12	11	11	11	11	11
n ₁	6	6	8	8	8	12	12	12	12	12	12
Weight, kg	3,4	3,5	3,5	5,9	7,7	9,9	13,1	14,5	21	27	28,3

EXAMPLE:

OZA-VKO inlet header for connection to the OZA series fan, size 063; made of St3 steel:

OZA-VKO-063-NS

- inlet header
- fan standard size (●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125)
- material (●NS - stainless steel; ●ZS - galvanized steel)

* Special requirements for OZA-VKO are specified additionally and agreed with the manufacturer.

MOUNTING SUPPORT

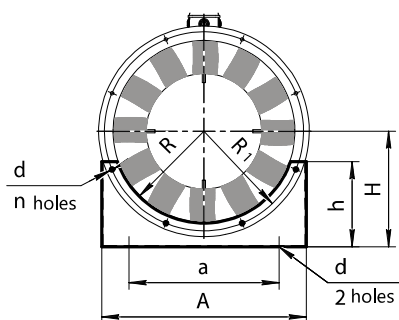
OZA-MOP, OZA-MOB

The OZA-MOP mounting support is used to install the OZA series fan in a horizontal position.

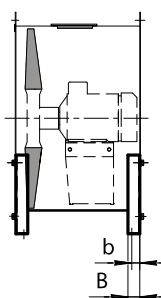
The OZA-MOB mounting support (large) is used to install the OZA series fan in a horizontal position with the OZA-VKO installed.



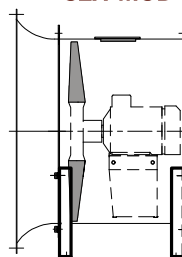
●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125



OZA-MOP



OZA-MOB



Standard size		OZA series fan										
		040	045	050	056	063	071	080	090	100	112	125
A, mm		430	480	440	500	550	690	760	860	960	1100	1220
a, mm		270	310	340	400	420	520	560	700	800	900	1000
B, mm		45			50	40		50			57	
b, mm		25			25	20		25			30	
h, mm	MOP	170	223	196	236	203	260	280	345	360	460	470
	MOB	262	310	288	326	291	375	435	496	511	621	571
H, mm	MOP	203	300	330	380	380	420	465	520	575	640	700
	MOB	295	387	422	470	468	535	620	670	726	800	800
d, mm		12					12		14		14	
n		4					6		6		8	
R, mm		205	230	255	285	323	363	408	458	508	568	633
R ₁ , mm		215	240	265	310	345	385	430	480	535	597,5	660
Weight, kg	MOP	1,2	1,4	1,3	1,8	2,2	3,2	3,6	4,4	5,3	7,4	8,1
	MOB	1,6	1,9	1,7	2,2	3	4,5	5,5	6,6	7,8	10,5	9,7

EXAMPLE:

OZA-MOP mounting support for the OZA series fan, standard size 063; stainless steel:

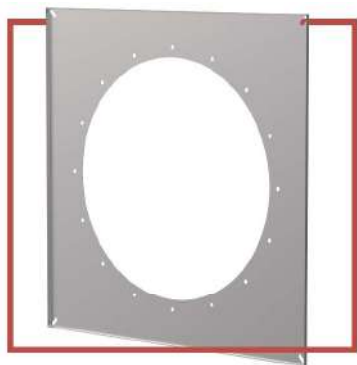
OZA-MOP-063-NS

- mounting support (●OZA-MOP ●OZA-MOB)
- standard size of the OZA fan (●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125)
- material (●NS - stainless steel; ●ZS - galvanized steel)

special requirements for OZA-MOP (B) are specified additionally and agreed with the manufacturer.

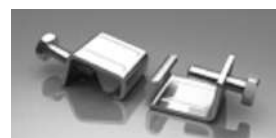
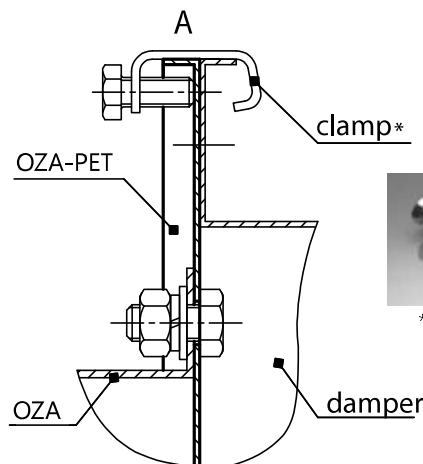
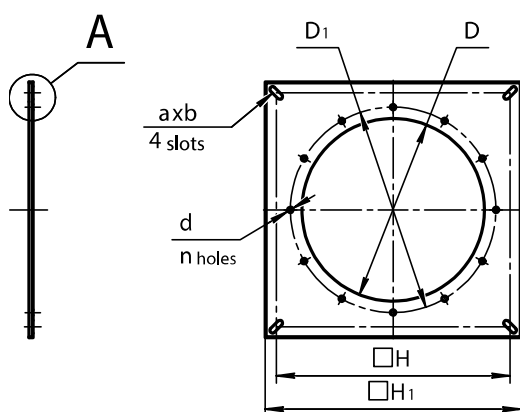
OZA-PEP

FLAT ADAPTER



The OZA-PEP flat adapter is used as a transition element for attaching a rectangular damper (TUL, REG, or GMK type) to the outlet section of an OZA series axial fan.

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125



*installation of clamps is allowed

Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
H, mm	650			795		945	1085		1395	1545	
H ₁ , mm	685			830		980	1130		1430	1580	
d, mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
axb, mm	10x30					12x60					
Weight, kg	2,7	2,5	2,2	3,5	4,5	6,7	9,1	7,6	14,8	17,7	14,9

EXAMPLE:

OZA-PEP flat adapter for connecting the damper to the fan of the OZA series, standard size 063, made of stainless steel:

OZA-PEP-063-NS

- flat adapter
 - standard size of the OZA fan (•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125)
 - material (•NS - stainless steel; •ZS - galvanized steel)
- special requirements for OZA-PEP are specified additionally and agreed with the manufacturer.

TOROIDAL ADAPTER

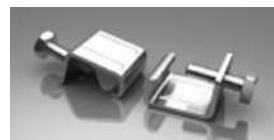
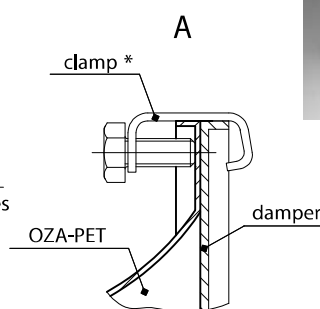
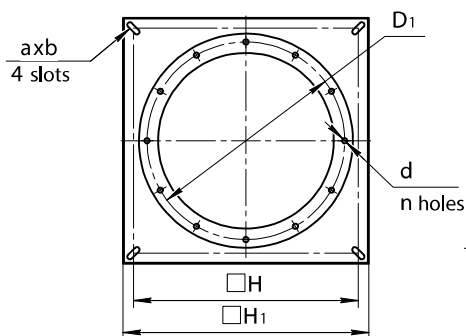
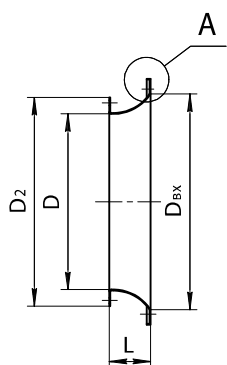
OZA-PET

The OZA-PET toroidal adapter is used to form a uniform velocity field when the flow enters the blades of the fan impeller. The OZA-PET must be installed when the fan is operating in the discharge mode, since with a flanged flow inlet into the axial fan, there is a significant reduction in flow rate and pressure generated.

One side of the OZA-PET adapter is attached to the inlet flange of the OZA series axial fan casing, and the other side is attached to a TUL, GMK or REG damper.



•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125



* installation of clamps is allowed

Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₂ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
D _{BX} , mm	485	546	606	680	764	861	970	1092	1213	1358	1358
L, mm	92	103	115	129	145	163	184	207	230	215	201
H, mm	650			795		945	1085		1395	1545	
H ₁ , mm	730			870		980	1240		1430	1580	
d, mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
a x b, mm	10x30					12x60					
Weight, kg	3,8	3,9	3,9	6,5	8,5	11,0	14,6	16,1	23,3	30,0	31,5

EXAMPLE:

OZA-PET toroidal adapter for connecting the damper to the fan of the OZA series, size 063, made of stainless steel

OZA-PET-063-NS

- toroidal adapter
- standard size of the OZA fan (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- material (•NS - stainless steel; •ZS - galvanized steel)

special requirements for OZA-PET are specified additionally and agreed with the manufacturer.

OZA-PEK

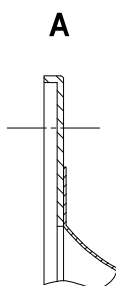
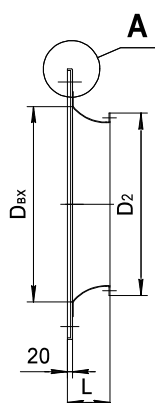
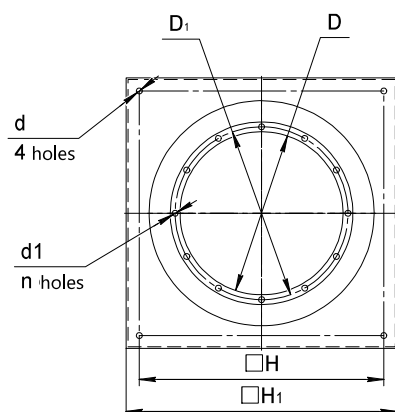
ROOF ADAPTER



The OZA-PEK roof adapter is used to form a uniform velocity field when the flow enters the blades of the fan impeller.

The OZA-PEK adapter is attached with one side to the inlet flange of the OZA or VKOP 0 fan casing and with the other side to the STAM roof curb.

●040 ●045 ●050 ●056 ●063 ●071 ●080 ●090 ●100 ●112 ●125



STANDARD SIZE OF THE COMBINED ELEMENTS

Type of equipment		
OZA	VKOP 0	STAM
040	040	56
045	045	63
050	050	71
056	056	88
063	063	90
071	071	109
080	080	112
090	090	136
100	100	
112	112	
125	125	

Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₂ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
D _{Bx} , mm	485	546	606	680	764	861	970	1092	1213	1358	1358
L, mm	110	121	133	147	163	181	202	225	248	233	219
H, mm	690	755	840	840	1005	1050	1220	1350	1505	1505	1505
H ₁ , mm	740	805	890	890	1065	1105	1275	1405	1560	1560	1560
d, mm	14	14	14	14	14	14	14	14	14	14	18
d ₁ , mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
Weight, kg	4	4,2	4,4	6,8	10,1	12,5	14,2	17,3	29,1	29,6	31,1

EXAMPLE:

OZA-PEK roof adapter for connecting the OZA type fan of size 063 to the STAM roof curb; made of stainless steel

OZA-PEK-063-NS

- flat adapter (• OZA-PEK)
- standard size of the OZA fan (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- material (• NS - stainless steel; • ZS - galvanized steel)

special requirements for OZA-PEK are specified additionally and agreed with the manufacturer.



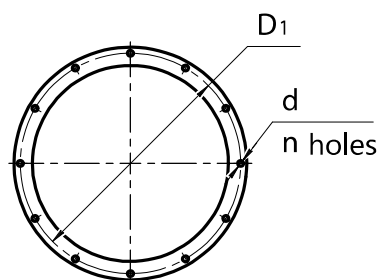
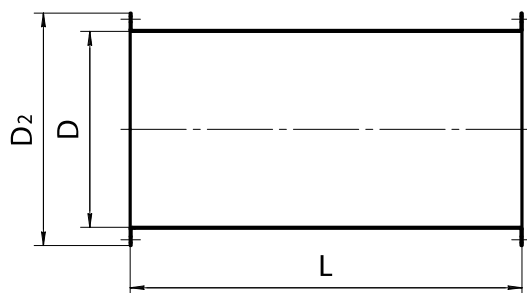
STRAIGHT DUCT SECTION

OZA-PUV

The OZA-PUV straight duct section is used when installing axial fans in ventilation systems. The installation of a straight section is especially necessary in front of the fan if there are shaped elements in the inlet sections of the air ducts, as well as behind the outlet section of an axial fan without a guide apparatus.



•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125



Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₂ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
L, mm	800	900	1000	1120	1150	1150	1150	1150	1140	1135	1140
d, mm	12	12	12	12	12	12	12	14	14	14	14
n, mm	8	8	12	12	12	16	16	16	16	20	20
Weight, kg	8,5	11,0	13,2	17,7	27,7	31,2	35,1	39,4	43,5	49,0	54,0

EXAMPLE:

The OZA-PUV straight duct section for the axial fan of the OZA series, standard size 050; made of stainless steel:

OZA-PUV-050-NS

- straight duct section
- standard size of the OZA fan (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- material (•NS - stainless steel; •ZS - galvanized steel)

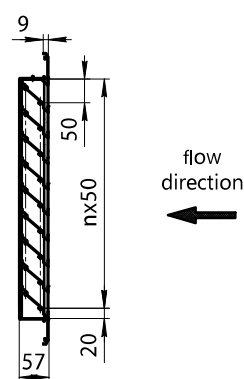
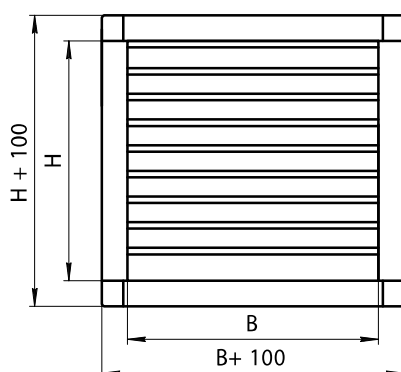
special requirements for OZA-PUV are specified additionally and agreed with the manufacturer

R50 | DECORATIVE GRILLE



Non-adjustable decorative aluminum grilles of the R50 type are intended for exterior decoration of ventilation shaft outlets, air ducts, and openings, providing an aesthetic finish for the exterior (facade) side of buildings.

These grilles can be equipped on the inner side with a perforated metal mesh to prevent foreign objects from entering the protected area. The upper shelf of the R50 grille housing has a so-called "drip mold" to protect against precipitation entering the inner cavity of the grille.



SIZE RANGE AND FLOW CROSS-SECTION, M²

B, mm H, mm	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000
520	—	0,218	0,250	0,281	0,312	0,343	0,374	0,406	0,437	0,468	0,499	0,530	0,562	0,593	0,624
620	—	0,260	0,298	0,335	0,372	0,409	0,446	0,484	0,521	0,558	0,595	0,632	0,670	0,707	0,744
720	—	0,302	0,346	0,389	0,432	0,475	0,518	0,562	0,605	0,648	0,691	0,734	0,778	0,821	0,864
820	—	0,344	0,394	0,443	0,492	0,541	0,590	0,640	0,689	0,738	0,787	0,836	0,886	0,935	0,984
920	—	0,386	0,442	0,497	0,552	0,607	0,662	0,718	0,773	0,828	0,883	0,938	0,994	1,049	1,104
1020	0,367	0,428	0,490	0,551	0,612	0,673	0,734	0,796	0,857	0,918	0,979	1,040	1,102	1,163	1,224
1120	0,403	0,470	0,538	0,605	0,672	0,739	0,806	0,874	0,941	1,008	1,075	1,142	1,210	1,277	1,344
1220	0,439	0,512	0,586	0,659	0,732	0,805	0,878	0,952	1,025	1,098	1,171	1,244	1,318	1,391	1,464
1320	0,475	0,554	0,634	0,713	0,792	0,871	0,950	1,030	1,109	1,188	1,267	1,346	1,426	1,505	1,584
1420	0,511	0,596	0,682	0,767	0,852	0,937	1,022	1,108	1,193	1,278	1,363	1,448	1,534	1,619	1,704
1520	0,547	0,638	0,730	0,821	0,912	1,003	1,094	1,186	1,277	1,368	1,459	1,550	1,642	1,733	1,824
1620	0,583	0,680	0,778	0,875	0,972	1,069	1,166	1,264	1,361	1,458	1,555	1,652	1,750	1,847	1,944
1720	0,619	0,722	0,826	0,929	1,032	1,135	1,238	1,342	1,445	1,548	1,651	1,754	1,858	1,961	2,064
1820	0,655	0,764	0,874	0,983	1,092	1,201	1,310	1,420	1,529	1,638	1,747	1,856	1,966	2,075	2,184
1920	0,691	0,806	0,922	1,037	1,152	1,267	1,382	1,498	1,613	1,728	1,843	1,958	2,074	2,189	2,304
2020	0,727	0,848	0,970	1,091	1,212	1,333	1,454	1,576	1,697	1,818	1,939	2,060	2,182	2,303	2,424
2120	0,763	0,890	1,018	1,145	1,272	1,399	1,526	1,654	1,781	1,908	2,035	2,162	2,290	2,417	2,544
2220	0,799	0,932	1,066	1,199	1,332	1,465	1,598	1,732	1,865	1,998	2,131	2,264	2,398	2,531	2,664
2320	0,835	0,974	1,114	1,253	1,392	1,531	1,670	1,810	1,949	2,088	2,227	2,366	2,506	2,645	2,784
2420	0,871	1,016	1,162	1,307	1,452	1,597	1,742	1,888	2,033	2,178	2,323	2,468	2,614	2,759	2,904
2520	0,907	1,058	1,210	1,361	1,512	1,663	1,814	1,966	2,117	2,268	2,419	2,570	2,722	2,873	3,024

Considering the use of standard unified components in the grilles, the size range of the grilles has the following limitations:

- ▀ by height (H) – increments of 50 + 20 mm added to the obtained value for the "drip mold";
- ▀ by width (B) – increments of 10 mm.

The cross-section of the grille must not obstruct the wall opening.

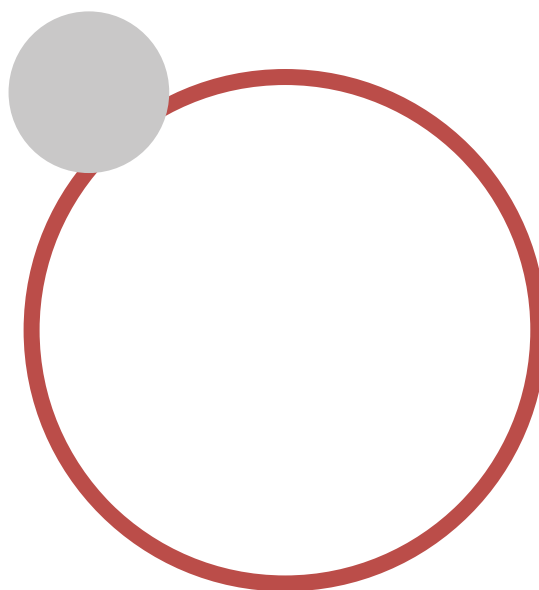
EXAMPLE:

Decorative grille R50 with useful cross-section height of 820 mm and width of 800 mm, equipped with a protective perforated metal mesh:

R50-820x800-SET

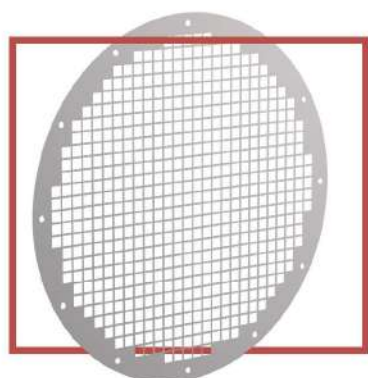
- ▀ decorative grille
- ▀ useful cross-section HxB (H, mm - height; B, mm - width)
- ▀ additional equipment (•SET - protective mesh; •0 - not included)

Special requirements for R50 are specified additionally and agreed with the manufacturer



OZA-SEM, OZA-SEB

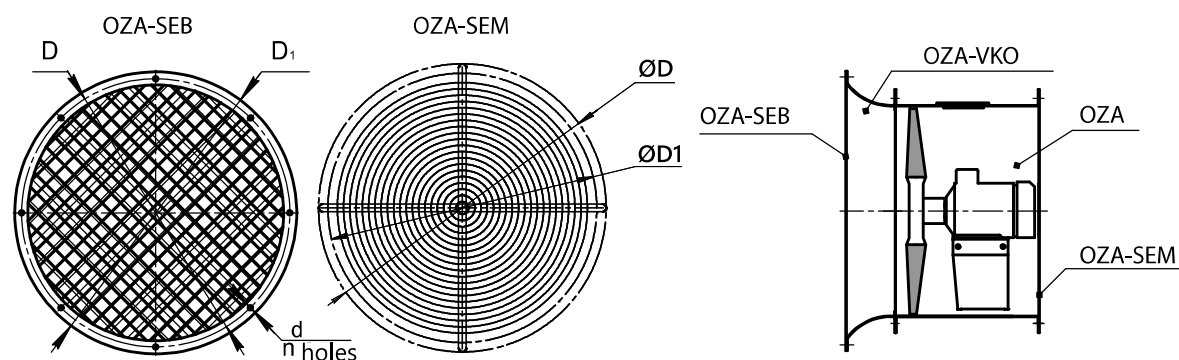
PROTECTIVE MESH



The OZA-SEM (SEB) protective mesh is used to prevent external mechanical impact and ingress of foreign objects larger than 50 mm into the axial fan of the OZA series. Protection level IP1X. The OZA-SEM mesh (small) is installed at the outlet, and the OZA-SEB mesh (large) is installed at the free flow inlet to the fan;

The protective mesh consists of a mounting flange and a welded or woven wire mesh.

•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125



Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
OZA-SEM											
D, mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₁ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
d, mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
Weight, kg	0,5	0,6	0,8	1,1	2,0	2,4	3,0	3,7	4,5	4,7	6,8
OZA-SEB											
D, mm	540	585	650	720	805	910	1045	1145	1265	1410	1410
D ₁ , mm	570	620	690	760	840	950	1090	1195	1315	1460	1460
d, mm	12	12	12	12	12	12	12	11	11	11	11
n	6	6	8	8	8	12	12	12	12	12	12
Weight, kg	0,8	1,0	1,2	1,4	2,6	3,3	4,4	5,3	6,4	7,9	7,9

EXAMPLE:

OZA-SEM protective mesh for axial fan of the OZA series, standard size 050; made of stainless steel

OZA-SEM-050-NS

- protective mesh (• OZA-SEB • OZA-SEM)
- standard size of the OZA fan (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- material (• NS - stainless steel; • ZS - galvanized steel)

Special requirements for OZA-SEM and OZA-SEB are specified additionally and agreed with the manufacturer.

COUNTER FLANGE

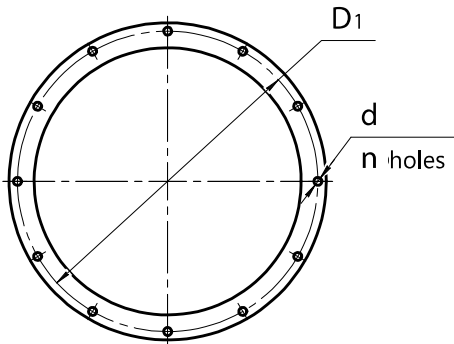
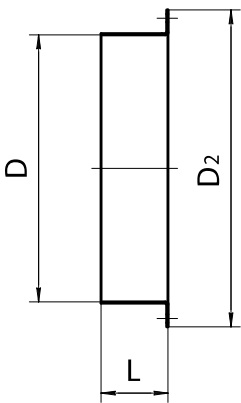
OZA-FOT



The OZA-FOT counter flange is used to connect the inlet or outlet of the fan to the air ducts by welding in place.



•040 •045 •050 •056 •063 •071 •080 •090 •100 •112 •125



Standard size	OZA series fan										
	040	045	050	056	063	071	080	090	100	112	125
D, mm	400	450	500	560	630	710	800	900	1000	1120	1250
D ₁ , mm	430	480	530	620	690	770	860	960	1070	1195	1320
D ₂ , mm	460	510	560	660	730	810	900	1000	1110	1235	1360
L, mm	100	110	110	110	125	125	125	125	125	140	140
d, mm	12	12	12	12	12	12	12	14	14	14	14
n	8	8	12	12	12	16	16	16	16	20	20
Weight, kg	1,3	1,6	1,8	2,1	2,9	3,7	4,2	4,7	5,1	6,5	7,1

EXAMPLE:

OZA-FOT counter flange for axial fan of OZA series Number 5; made of stainless steel

OZA-FOT-050-NS

- counter flange
- standard size of the OZA fan (• 040 • 045 • 050 • 056 • 063 • 071 • 080 • 090 • 100 • 112 • 125)
- material (•NS - stainless steel; •ZS - galvanized steel)

Special requirements for OZA-FOT are specified additionally and agreed with the manufacturer.

POD | LEAK PROTECTION PAN

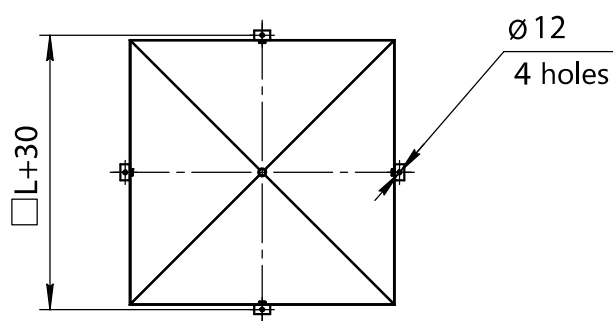
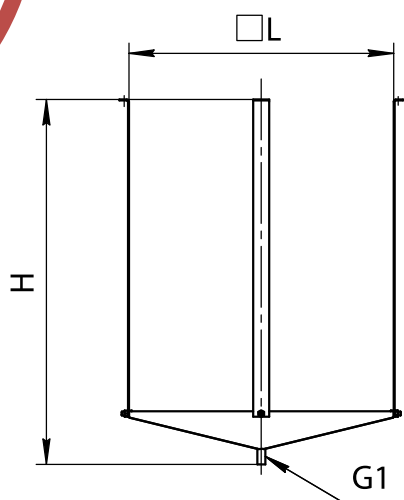


To collect and remove condensate formed at the boundary of moist air leaving the room and cold metal parts of the fan and/or STAM roof curb, it is mandatory to install a POD pan, especially at critical facilities (warehouses, control rooms, power substations). In rooms with a dry conditions of the fan operation, the use of POD is recommended to protect against extreme rainfall.

The POD pan is attached to the STAM roof curb from below using adjustable hangers. The pan is secured with four special bolts. In rooms with constantly high humidity, it is necessary to provide additional condensate drainage from the pan. For this purpose, a fitting is provided in the lower part of the pan bottom, to which a drain pipe can be connected.

In rooms with constant high humidity (food production, farms, swimming pools), it is recommended to use stainless steel design versions. The position of the vertical brackets included in the supply can vary by $\pm 30^\circ$ (to align with the holes of STAM or VKOP 1). The available POD sizes cover all STAM variants.

•50 •84 •93 •137



Standard size	50	84	93	137
H, mm	875	875	875	1125
L, mm	495	835	925	1370
Volume, l	16	28	33	65
Weight, kg	13	8	13	20
STAM	•35 •40 •45	•51 •56 •63	•71 •88 •90	•109 •112 •136
VKOP 1	•040 •045	•050 •056 •063	•071 •080 •090	•100 •112 •125

EXAMPLE:

POD pan for mounting to STAM size 84; material: galvanized steel:

POD-84-ZS

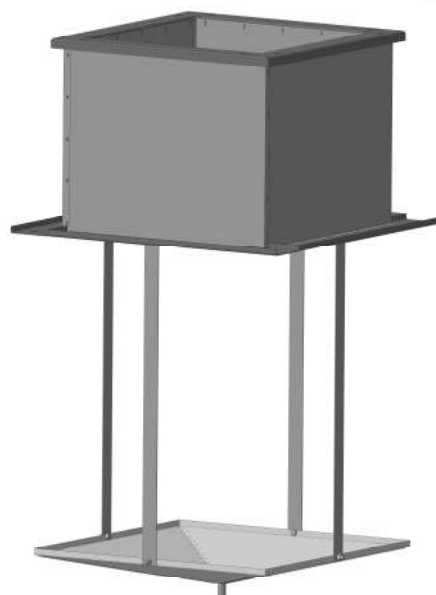
- ▀ pan (• POD)
- ▀ standard fan size (• 50 • 84 • 93 • 137)
- ▀ material (• NS - stainless steel; • ZS - galvanized steel)

Special requirements for the POD are specified additionally and agreed with the manufacturer.

VKOP 1



STAM



FC-101, FC-102 | FREQUENCY CONVERTERS



FC-102

FC-101

The VLT® HVAC Drive FC-101/ FC-102 series of frequency converters is universal for use in heating, ventilation and air conditioning systems with the possibility of integration into the upper level.

Energy savings

98% efficiency, "Automatic Optimization of Energy Consumption" function. The Automatic Optimization of Energy Consumption (AOE) function built into the standard frequency converter ensures optimal motor magnetization at all speeds and loads. Thanks to this feature, power consumption is reduced by 5-15% at partial load.

Energy consumption monitoring

The ability to monitor energy consumption using VLT® HVAC Drive frequency converters for preset counting periods in hours, days or weeks.

THE FREQUENCY CONVERTERS ARE CERTIFIED FOR USE IN SMOKE EXTRACTION SYSTEMS

Type	FC-101	FC-102
Operating voltage	3x380-480 V	3x380-480 V
Mains frequency	45-66 Hz	45-66 Hz
Ingress protection rating	•IP20 •IP21 •IP55	•IP20 •IP21 •IP55 •IP66
Maximum length of motor cable (shielded/unshielded)	25/50 m	150/300 m
Normal overload 110%	within 1 minute	within 1 minute

Model		Motor power, kW		Continuous output current, A		Weight, kg		Dimensions HxWxD, mm	
FC-101	FC-102	FC-101	FC-102	FC-101	FC-102	FC-101	FC-102	FC-101	FC-102
						IP20/IP21		IP20/IP21	
—	P1K1	—	1,1	—	3,0	—	4,8	—	
P1K5	P1K5	1,5	1,5	3,7	4,1	2,1		195x75x168	268x90x205
P2K2	P2K2	2,2	2,2	5,3	5,6		4,9		
P3K0	P3K0	3,0	3,0	7,2	7,2	3,4		227x90x190	
P4K0	P4K0	4,0	4,0	9,1	10,0				
P5K5	P5K5	5,5	5,5	12,0	13,0	4,5	6,6	255x100x206	268x130x205
P7K5	P7K5	7,5	7,5	15,5	16,0				
P11K	P11K	11,0	11,0	23,0	24,0	7,9	23	296x135x241	480x242x260
P15K	P15K	15,0	15,0	31,0	32,0				
P18K	P18K	18,5	18,5	37,0	37,5	9,5	23	334x150x255	650x242x260
P22K	P22K	22,0	22,0	42,5	44,0		27		
P30K	P30K	30,0	30,0	61,0	61,0	24,5	27	518x239x242	650x242x260
P37K	P37K	37,0	37,0	73,0	73,0		45		680x308x310

Note: For motors over 37 kW, frequency converters are available on request.

EXAMPLE:

FC-102 series frequency converter for 7.5 kW motor speed control:

FC-102-P7K5

FREQUENCY CONVERTERS

VLT MICRO DRIVE FC 051

The VLT® MICRO DRIVE FC 051 series of frequency converters are designed to regulate the motor speed.

- power supply output voltage (electric motor)
for single-phase series: 3x200-240 V ± 10%;
for three-phase series: 3x380 V ± 10%;
- vector and scalar motor control systems;
- 150% overload within 1 minute;
- built-in RS-485 FC-Protocol interface, Modbus RTU;
- increased durability and resistance to external influences;
- mains frequency 50/60 Hz;
- ingress protection rating IP 20.
- multi-purpose drive;
- built-in PID controller;
- vector control, control by volt-frequency characteristic U/F;
- automatic optimization of energy consumption (AEO);
- automatic adaptation to the motor;
- built-in programmable logic controller;
- electronic thermal relay;
- built-in RF interference filter;
- the ability to remove and install the control panel during operation, copy function;
- optimally suited for complex automation
- improves energy efficiency and system performance;
- the ability to configure about 100 parameters to optimize energy efficiency and operation.



Model	Motor power, kW	Output current, A		Dimensions HxWxD, mm	Weight, kg max
		continuous	intermittent		
single-phase input 200-240 V					
VLT MICRO DRIVE FC-51PK18S	0,18	1,2	1,8	150x70x148	1,1
VLT MICRO DRIVE FC-51PK37S	0,37	2,2	3,3	150x70x148	1,1
VLT MICRO DRIVE FC-51PK75S	0,75	4,2	6,3	150x70x148	1,1
VLT MICRO DRIVE FC-51P1K5S	1,5	6,8	10,2	176x75x168	1,6
VLT MICRO DRIVE FC-51P2K2S	2,2	9,6	14,4	239x90x194	3,0
three-phase input 380 V					
VLT MICRO DRIVE FC-051PK37T	0,37	0,37		150x70x148	1,1
VLT MICRO DRIVE FC-051PK75T	0,75	0,75		150x70x148	1,1
VLT MICRO DRIVE FC-051P1K5T	1,5	1,5		180x75x168	1,6
VLT MICRO DRIVE FC-051P2K2T	2,2	2,2		180x75x168	1,6
VLT MICRO DRIVE FC-051P3K0T	3,0	3,0		239x90x194	3,0
VLT MICRO DRIVE FC-051P4K0T	4,0	4,0		239x90x194	3,0
VLT MICRO DRIVE FC-051P5K5T	5,5	5,5		239x90x194	3,0
VLT MICRO DRIVE FC-051P7K5T	7,5	7,5		239x90x194	3,0
VLT MICRO DRIVE FC-051P11KT	11,0	11,0		292x125x241	6,0
VLT MICRO DRIVE FC-051P15KT	15,0	15,0		292x125x241	6,0
VLT MICRO DRIVE FC-051P18KT	18,5	18,5		335x165x248	9,5
VLT MICRO DRIVE FC-051P22KT	22,0	22,0		335x165x248	9,5

Note:

The overall dimensions of the VLT MICRO DRIVE FC-051 units are specified including the mounting flange (+6 mm with potentiometer).
ATTENTION! Danfoss mains filters and brake resistors must be ordered separately.

FAN OPERATION WITH A FREQUENCY CONVERTER (FC)

Over the past 10 years, the cost of FCs has decreased significantly relative to the price of fan equipment, as well as the cost of energy resources. The use of ventilation systems with a significant performance reserve relative to design parameters has become economically unprofitable, especially when constructing buildings with numerous systems. Reducing the total installed and consumed power of ventilation systems is one of the main tasks for optimizing the design. It is important to remember that ventilation systems are the largest consumer of electricity among a building's utility systems. The selection of fans for operation with FC is characterized by some features associated with the operating parameters of the motor-FC system. In this catalog, most of the fans are offered for operation in conjunction with FCs. The traditional characteristics of fans without FCs are highlighted separately.

DETERMINATION OF THE INSTALLED POWER OF THE MOTOR

The classical scheme of using fans assumes a constant rotation speed of the impeller with direct drive from the motor. In this case, the consumed power changes according to a known law with a change in flow rate and has a maximum for fans with backward-curved impeller blades in a mode close to the mode of maximum efficiency. The installed power of the motor supplied with such a fan is selected, firstly, higher than the maximum consumed power, and secondly, with some additional reserve for safe operation. After such a choice of the motor, it usually turns out that the installed power is 10-30% higher than the power actually consumed by the fan, which is taken for granted by the consumer. When using the FC, this rule can be changed and the fan can be used in different modes with different rotation speeds, which is allowed by the selected motor and the strength of the impeller.

REDUCING THE SIZE OF THE EQUIPMENT

Let's consider an example where it is necessary to obtain higher pressure or flow rate on an already selected fan. Normal operation at a constant impeller speed does not allow achieving the required values, although there is some reserve in terms of motor power. According to the classic rules, it is necessary to choose a fan of a larger size or with a more powerful motor due to the required increase in speed. By using the FC, it is possible to "squeeze" higher parameters out of the fan by increasing the rotation speed. In this case, the motor overload may not occur, since the power consumption of the fan in the required mode is lower than the installed power of the motor. The actual value of the "increased" speed is determined by a special program, but with mandatory monitoring of the impeller strength and possible motor overload. If there is no strict requirement to minimize power consumption, it is possible to switch to a smaller size fan.

EXPANSION OF DESIGN OPTIONS

This method of "uprating the rotation speed of the impeller with an increase in the power consumed by the fan up to the installed power of the motor" when selecting fans became the basis for presenting aerodynamic characteristics in a new way. Instead of the usual pressure curves at a constant impeller speed in flow-pressure coordinates, the catalog shows for the first time the lines of equal values of installed power. The choice of fans is no longer tied to discrete values of the synchronous motor speed (3000...1500 - 1000...750 rpm), but has a much larger range. By increasing the number of options, the accuracy of fan selection can be significantly increased. The main advantage of using the FC is to save energy consumed by the fan - choosing a fan with the highest possible efficiency at the required operating point. When using FC, 10-20 solutions can be found for one required flow-pressure mode instead of two or three without FC. To search for all the options, it is necessary to use a special program.

REDUCING POWER CONSUMPTION

The main problem - reducing the energy consumption of ventilation systems - can only be solved by the joint efforts of the designer, the equipment manufacturer and the installer. When designing systems today, the designer must calculate the aerodynamic parameters of the network more accurately and responsibly, and allow for minimum flow reserves not exceeding 2...5%. The manufacturer is obliged to ensure high-quality manufacturing of all equipment elements with high energy performance and to offer the best fan option for the specified parameters. An important step in this direction is the use of motors with FCs. Today, it is possible to select a fan with any requirements (in terms of noise, efficiency, size and weight) depending on the operating mode. Installers must properly assemble the system and correctly perform the commissioning work; the FC will also provide invaluable assistance in this regard.

THE ECONOMIC ASPECT OF ENERGY SAVING

The cost of energy has an operational and capital component. Connecting of 1 kW of power (capital costs) costs from \$500 to \$2000, which, together with the price of distribution equipment, exceeds the difference in the price of a more economical fan equipped with FC. An additional saving effect is provided by calculating energy consumption - operating costs.

Saving just 1 kW/h (average price \$0.1) for 12 hours a day and operation for 300 days a year gives \$360 annually, which pays off for the cost of the fan system itself in 3...5 years. Example: average savings when using VFD on fans with a capacity of 15.0...22.0 kW can be at least 2...3 kW. The cost of a fan with FC of 15.0 kW is about \$5000. There are options when the use of FC will allow the use of a smaller size motor (15.0 instead of 18.5 or 30.0 instead of 37.0).

MOTOR OVERLOAD PROTECTION

The motor is the most expensive part of the fan, difficult to repair and can fail even if there are simple protective devices to shut off the fan when the current consumption exceeds the limit. The use of fan motors with increased installed power is caused by the need to minimize the risk of overheating and short circuit of windings. Motor overheating depends not only on the power consumption, but also on the ambient air temperature, supply voltage, mechanical defects of the fan itself, bearings, etc. As can be seen from the list, there are many subjective factors that require an increase in the installed power, which leads to the need for different levels of reserve (from 5 to 20%) when choosing a motor. For smoke extraction fans that operate for a short time during commissioning and fire conditions, the fan motors are selected with some overload (no more than 10%). An important feature of the FC is the built-in diagnostics function of motor operation, with a gradual decrease in speed when the load is dangerously exceeded to maintain the system's operability. A simple example: at a site, due to poor transportation and installation, the fan impeller was touching a fixed element of the casing, which created an increased load on the motor. The FC independently reduced the rotation speed to reduce the load, after which the adjusters found out and eliminated the cause; thereby the fan was saved.

PROGRAM OF VFD OPERATION WHEN FANS ARE OPERATED IN THE DU MODE

A special feature of DU smoke extraction systems is the use of large and heavy-weight fans. During a fire, a lot of smoke is released and the flow rate of the smoke-air mixture to be removed is usually 20000...50000 m³/h. The presence of high temperature up to +600 °C makes it impossible to use lightweight impellers made of light-gauge metal. When starting heavy-weight fans, the motor start-up time increases significantly, creating continuous high inrush current. The standard protection elements (starting relays) are not designed to operate with long-term overloads and turn off the fan upon start-up. The use of overrated starting relays to start the DU fan makes it impossible to protect the motor, even in cases of real overload. A common mistake is to use overrated starting devices. As part of the FC, a program has been implemented that allows not only to make a "Soft start" without overloading the motor and the supply cables, but also to distinguish the operation of the fan under increasing load when the windings overheat in a real fire from obvious connection errors. The FC operation program in DU mode reliably controls the fan in real fire conditions.

MULTI-MODE USE OF DUV FANS

Smoke extraction systems in case of fire have very high airflow rates and are therefore extremely bulky. Installing two independent systems in a building - general exhaust ventilation and emergency ventilation - is expensive, as the sets of equipment and air ducts are duplicated. In addition, "golden" square meters of space are literally consumed. In many cases (parking lots, warehouses, technical and industrial premises), it is possible to combine general exchange ventilation and smoke extraction ventilation systems. Typically, the airflow rates in a general exchange ventilation system are lower than in a smoke extraction system, and the full fan capacity designed for smoke extraction mode is not utilized. When using an FC, it is possible to program two or more fixed speeds to operate in multiple modes. Switching is performed by an external command from the control system by simply closing certain contacts. Careful individual adjustment of each such system is necessary. Special dampers that shut off unused duct branches during a fire and open a direct outlet for flue gas, bypassing silencers required for daily operation, have also been developed and manufactured by CCK TM. It should be noted that there is no prohibition in design standards against constructing combined dual-mode systems (DUV), and the ventilation of parking areas in many large office complexes is implemented according to this principle.

To take full advantage of the FC's capabilities in the project, it is necessary, in addition to the catalog's graphical materials, to review the fan selection program. Training on the use of motors with FCs can be done either independently using the documentation or through specialized one-day courses, for example, at DANFOSS.

The FC includes a fully functional PC with a set of software, data input/output devices, and various options for connecting external instruments. Without proper knowledge and experience, using even the simplest FC models can result in damage to both the FC itself and the fan.

THE MAIN MODES OF USE OF VFD WITH FANS

Smooth start of the motor followed by continuous diagnostics of its operation.

Fan operation with maximum allowable power consumption while protecting the motor from overload.

The fan operates at several preset rotation speeds in the modes of general ventilation and smoke extraction.

Maintaining a constant flow rate and/or pressure and/or power in the system on an external command. It is especially important today in excessive air pressure systems, if necessary, to limit the pressure to 150-200 Pa to prevent blocking of emergency-exit doors.

AN EXAMPLE OF THE USE OF FREQUENCY CONVERTERS IN PD SYSTEMS

The use of frequency converters (FC) makes it possible to design more efficient solutions for the excessive air pressure system (PD system).

The FC will regulate the performance of the pressurization fan, while maintaining a constant pressure drop, both under normal conditions and in case of an emergency.

Using the controller and differential pressure sensors, the frequency converter will maintain the set pressure value, regardless of the condition of the stairwell doors (open/closed).

Thus, the frequency converter can quickly change the fan speed to compensate for pressure changes, preventing smoke from entering the stairwell without a significant increase in pressure. This ensures that there is no smoke throughout the entire evacuation route.

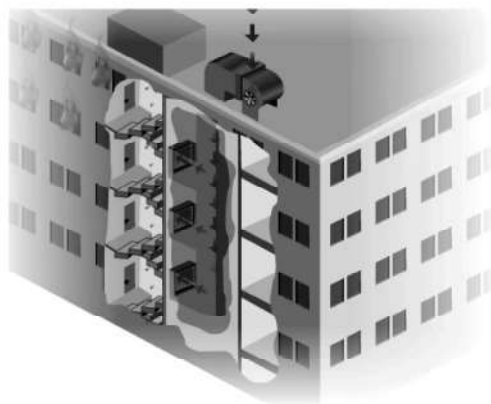
The pressure must be measured by a differential pressure sensor between the stairwell and the interior of the building.

The frequency converter can be connected to the building's BMS using the RS-485 interface (or other interfaces - see options), or via a "rigid link" to the fire extinguishing system (which is more preferable for emergency response services).

In this case, the functions of starting, blocking dampers, and control from the fire station panel can be provided by using the capabilities of the frequency converter.

The use of frequency converters in the excessive air pressure systems provides the following advantages:

- automatic maintenance of the required differential pressure, as a result of which the escape routes are kept free of smoke, the doors to the stairwell open without excessive effort;
- easy balancing of the system;
- reduction of acoustic noise;
- reduction of in-rush starting currents to the rated values of the electric motor, which allows for a reduction in capital costs for electrical power and switchgear for excessive air pressure systems;
- ability to monitor the excessive air pressure systems via RS-485, Ethernet interfaces.



SPECIFICATION OF THE MAIN EQUIPMENT

item number	Name	Manufacturer	Order code	Quantity
1	VLT® HVAC Drive FC102 Frequency Converter	Danfoss	depending on the power of the FC	1
2	Option VLT® Analog inputs/outputs of MCB 109	Danfoss	130B1143	1
3	Differential pressure sensor, 4-20 mA	-----	-----	3

RECOMMENDED EQUIPMENT

item number	Name	Manufacturer	Order code	Quantity
1	Option VLT® 24 VDC option MCB 107 backup power option	Danfoss	130B1108	1

PD SYSTEM CONTROL-FLOW CHART

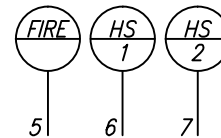
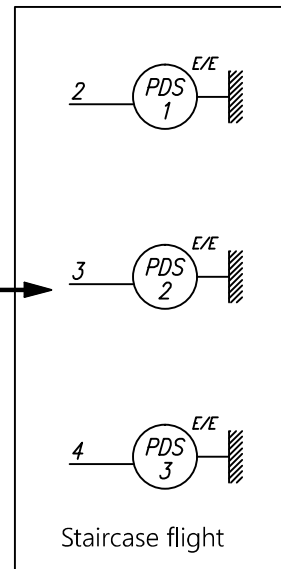
LEGEND

 ^{E/E} – differential pressure sensor

 – control switch (button)

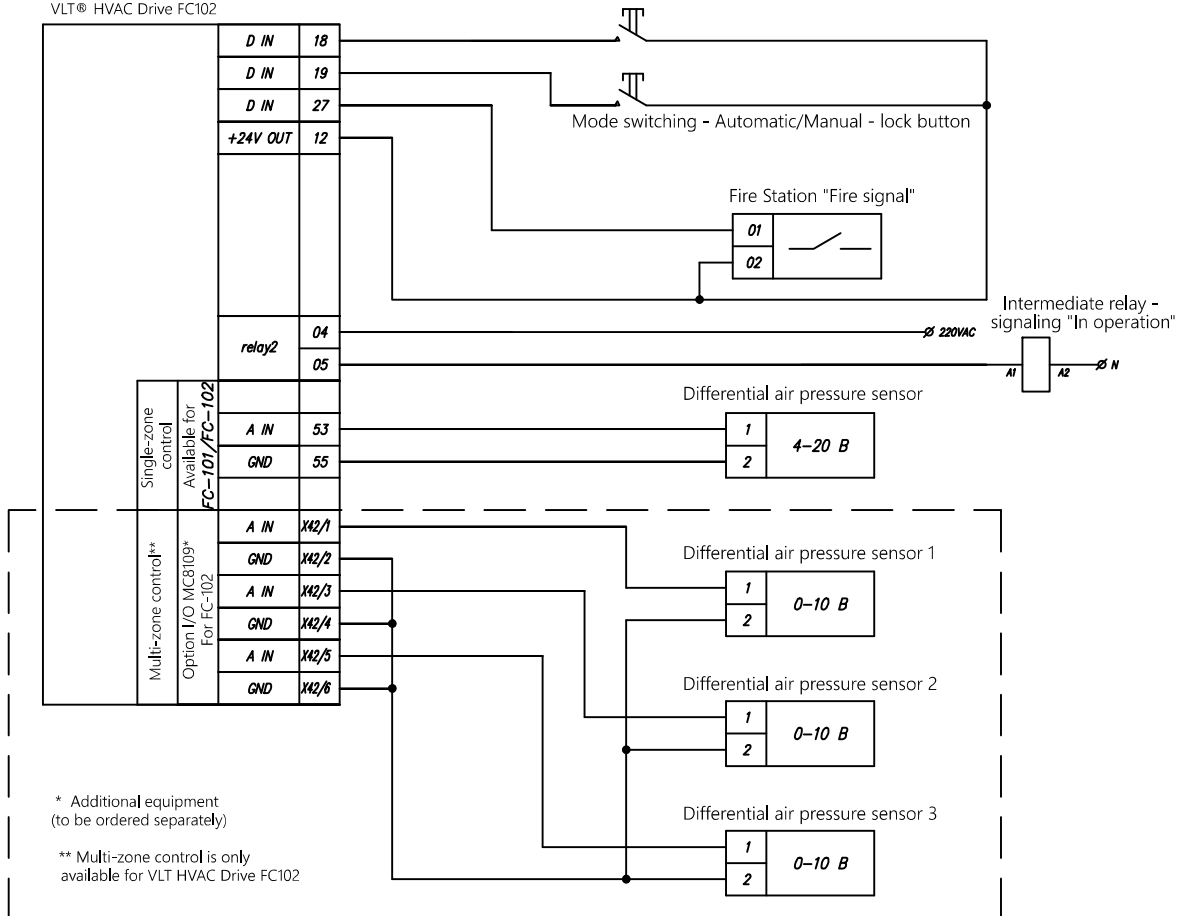
 – pressurization fan

	1	2	3	4	5	6	7
Device name	Fan	Differential pressure sensor	Differential pressure sensor	Differential pressure sensor	Fire alarm station	Control button	Control switch
Signal name	Rotation speed	Pressure drop in the stairwell 1	Pressure drop in the stairwell 2	Pressure drop in the stairwell 3	Fire	Start/stop system	Auto/Manual mode
Signal type							
	AI						
	AO						
	DI						
	DO						



Frequency converter
VLT® HVAC Drive FC102

Start/stop of the pressurization fan – lock button



STAIRWELL PRESSURIZATION

Parameter number	PARAMETER	IT IS REQUIRED TO INSTALL
14-22	Reset parameters to factory settings	[2] Initialization - initialization, after setting the value, turn off and then turn on the FC (reset to 0)
1-20	Rated power	xx kW - from the nameplate (motor nameplate)
1-22	Rated voltage	xx V - from the nameplate (motor nameplate)
1-23	Rated frequency	xx Hz - from the nameplate (motor nameplate)
1-24	Rated current	xx A - from the nameplate (motor nameplate)
1-25	Rated speed	xx RPM - from the nameplate (motor nameplate)
1-29*	Automatic motor adaptation	[2] Enable AMT - to start the adaptation, set [2], on the remote control "Hand on", at the end - "Ok" The value will reset [0]
4-12	Minimum rotation speed	[10] Hz - depending on the application (recommended for fans) [20] - recommended minimum speed for pumps
4-14	Maximum rotation speed	[50] Hz - it is recommended to set the rated speed
3-41	Acceleration time	[10] seconds
3-42	Deceleration time	[20] seconds
1-73**	Flying restart	[1] - Flying start in case of voltage dip or when switching on while the motor load is coasting
0-10	Active set	[9] Multiple sets
0-12	Set-to-set communication	[0] No connection
1-00	Configuration mode	[3] Closed loop
1-06	Motor connection type	[0] Normal (clockwise)
1-71	Start delay	[0] seconds
3-11	Fixed speed	[0] Hz
3-15	Task source 1	[0] Not used
3-16	Task source 2	[0] Not used
3-17	Task source 3	[0] Not used
4-10	Direction of motor rotation	[0] Clockwise
4-19	Maximum output frequency	[50] Hz
5-01	Terminal 27, mode	[0] Input
5-02	Terminal 29, mode	[0] Input
5-10	Digital input DI 18	[8] Start
5-11	Digital input DI 19	[23] Set selection Bit 0
5-12	Digital input DI 27	[0] Not used
5-13	Digital input DI 29	[0] Not used
5-30	Terminal 27, digital output	[0] Not used
5-31	Terminal 29, digital output	[0] Not used
5-40.0	Function relay	[5] Operation
5-40.1	Function relay	[0] Not used
5-41.0	Switch-on delay, relay	[0.01] seconds
5-41.1	Switch-on delay, relay	[0.01] seconds
5-42.0	Shutdown delay, relay	[0.01] seconds
5-42.1	Shutdown delay, relay	[0.01] seconds
26-00	Terminal x42/1, mode	[1] Voltage
26-01	Terminal x42/3, mode	[1] Voltage
26-02	Terminal x42/5, mode	[1] Voltage
26-14	Terminal x42/1, min task/feedback	[0]
26-15	Terminal x42/1, max task/feedback	[500]
26-16	Terminal x42/1, filter time constant (sensor interference suppression)	[0.05] seconds
26-24	Terminal x42/3, min task/feedback	[0]
26-25	Terminal x42/3, max task/feedback	[500]
26-26	Terminal x42/3, filter time constant (sensor interference suppression)	[0.05] seconds

26-34	Terminal x42/5, min task/feedback	[0]
26-35	Terminal x42/5, max task/feedback	[500]
26-36	Terminal x42/5, filter time constant (sensor interference suppression)	[0.05] seconds
20-00	Source OS 1	[9] Analog input x42/1
20-02	Unit of measurement of signal source OS 1	[72] Pa
20-03	Source OS 2	[10] Analog input x42/3
20-05	Unit of measurement of signal source OS 2	[72] Pa
20-06	Source OS 3	[11] Analog input x42/5
20-08	Unit of measurement of signal source OS 3	[72] Pa
20-12	Unit of measurement of task/signal OS	[72] Pa
20-13	Minimum task/OS	[0]
20-14	Maximum task/OS	[200]
20-20	Feedback function	[3] Minimum
20-21	Setpoint 1	[150]
20-81	Normal/inverse characteristic of the PID controller	[0] Normal
20-93	PID controller, proportional coefficient	[3]
20-94	PID controller, integral coefficient	[20]
20-95	PID controller, differential coefficient	[0]
20-96	PID controller, the limit of the differential coefficient	[5]
3-02	Minimum task	[0]
3-03	Maximum task	[200]

NOTE:

* If the frequency converter controls a group of fans, then the parameter "1-29" (Automatic adaptation) is unnecessary to set. Set the parameter "1-01" to 0 (U/f).

** If the frequency converter controls a group of fans, the parameter "1-73" (Flying restart) will not work. Set [0].

Check the correct operation and the direction of rotation of the shaft by manually pressing "Hand On" on the panel (then using the panel's potentiometer or arrows), and then pressing "Auto On".

An example of a setup table is provided for reference and can be changed during installation and operation.

MCD-201, MCD-202

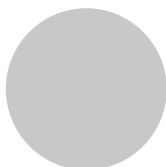
SOFT STARTER



Soft starters are electronic devices that regulate the voltage applied to the motor, while ensuring a smooth increase/decrease in motor speed during start-up and braking. VLT® MCD soft starters manufactured by Danfoss are used.

A soft starter, unlike a frequency converter, only allows for smooth acceleration or deceleration of the motor. In this case, the speed of rotation can only be controlled by a frequency converter, depending on the technological process. Soft starters are used mainly to reduce inrush currents from 7...9 to 3.5...4 of the motor rated current values, depending on the application.

The VLT® MCD soft starters used by Danfoss have a wide range of motor protection functions, as well as the ability to connect a Modbus RTU communication interface.



Operating voltage	3x200-440 V					
Mains frequency	45-66 Hz					
Control voltage at the soft starter terminals	24V (DC/AC) or 110-240 V and 380-440 V					
Basic models	007	015	018	022	030	037
Motor power, kW	7,5	15	18	22	30	37

Note:

For motors over 37 kW, soft starters are available on request.

EXAMPLE:

MCD-201 series soft starter for 18 kW motor start control:

MCD-202-018

frequency converter (•MCD-201 •MCD-202)

model

CONTROL SYSTEMS FOR PRESSURIZATION OR SMOKE EXTRACTION FANS

SHTORM-V

The SHTORM-V control system is designed to control the electric motor of a pressurization or smoke extraction fan. The control systems of the SHTORM-V series provide the ability to automatically regulate air flow and at the same time maintain excess pressure of 50 Pa in accordance with the DSTU EN 12101-06:2016 standard.

The control automation is powered by a three-phase AC mains supply with a frequency of 50Hz and a rated voltage of 400V. The mains feeder, fan power outputs, and external connections are routed into the cabinet through cable glands, which are standardly located on the top panel. The cabinet is equipped with a lockable door fitted with control and indication elements.

Structurally, the control system is a metal cabinet with IP54 protection rating.



OPERATING CONDITIONS:

- ▣ control systems can be operated in temperate and cold (YHL) climates of the 3rd and 4th placement categories according to GOST 15150;
- ▣ ambient temperature:
 - from -5 °C to +35 °C for the 4th placement category.
 - from -60 °C to +40 °C for the 3rd placement category (according to additional requirements).

SHTORM-V-AVR-VD(15)CH-2

- ▣ fan control system
- ▣ availability of AVR: AVR - yes; 0 - no
- ▣ fan type:
 - VD - smoke extraction fan; VPD - pressurization fan;
 - VPDp - pressurization fan with pressure maintenance (when this option is selected, the only available fan control type is CH)
- ▣ fan power, kW
- ▣ type of control:
 - P – direct start, CH* - frequency converter, S – soft starter, T - star-triangle start
- ▣ number of poles: 2-3000 rpm; 4-1500 rpm; 6-1000 rpm

* When selecting the CH type of fan control (frequency converter), the frequency converter is included in the control cabinet. The control system must be installed in the immediate vicinity of the fan. The cable length from the frequency converter to the fan is no more than 50 m (25 m for shielded cable). The technical characteristics of the frequency converters correspond to the type and brand of the fan motor.

The control systems of the SHTORM-V series provide the ability to automatically regulate air flow and at the same time maintain excess pressure of 50 Pa in accordance with the DSTU EN 12101-06:2016 standard. This function is implemented only for pressurization fans when ordering a control system marked VPDp (this operation algorithm is implemented using a frequency converter installed directly in the control cabinet and an analog pressure sensor (included in the delivery package).

Wire cross-section table based on calculations for distances not exceeding 50 m.

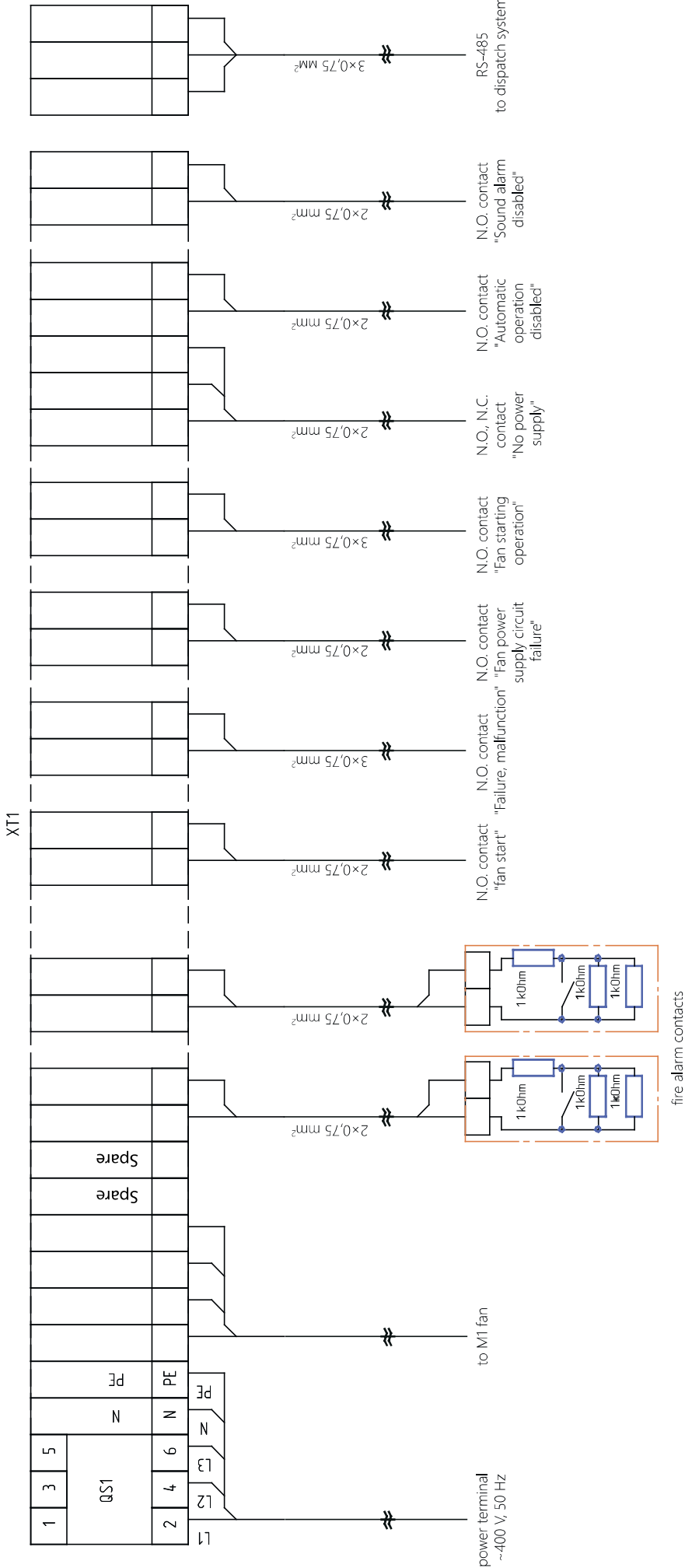
I _н , A	до 16	16...25	25...30	30...40	40...50	50...75	75...90	90...115	115...150
S, mm ²	1,5...4	2,5...4	4...6	6...10	10...16	16...25	25...35	35...70	50...70

THE SHTORM-V TYPE CONTROL SYSTEM FULFILLS THE REQUIREMENTS OF THE "FIRE PROTECTION SYSTEMS" OF DBN V.2.5-56:2014

- ✓ MANUAL-O-AUTO control mode selection (the switch is equipped with a key to protect against unauthorized access):
 - Manual - switching on and off from the front panel of the SHTORM-V fan;
 - O - the fan is turned off;
 - Automatic mode - the fan is turned on and off by a fire alarm or by a remote control.
- ✓ Indication of the system status on the SHTORM-V front panel:
 - "MAINS" – the yellow indicator is activated when the control system is powered;
 - "OPERATION" - the green indicator is activated when the fan is turned on (both in manual and automatic modes);
 - "FAILURE" - the red indicator is activated in case of fan failures;
 - "FIRE" – the red indicator is activated when a fire signal is received from the automatic fire alarm system.
- ✓ SHTORM-V provides an audible alarm (at least 60 dB at a distance of 1 meter from the cabinet) located on the front panel.
- ✓ Output of cabinet status signals to the fire alarm system in accordance with DSTU EN 12101-06:2016 and DBN requirements.
 Example:
 - "FAILURE" - Dry contact (closes in case of fan failure);
 - "OPERATION" - Dry contact (closes when the fan is running).
- ✓ The cabinet has a fire alarm input (N.O. dry contact).
- ✓ Protection against short circuits and overloads in electrical circuits (circuit breakers without a thermal cut-off).
- ✓ Control circuit integrity monitoring. The delivery package includes R=1 kOhm resistors (see the external connection diagram for SHTORM-V).
- ✓ The cabinet has the ability to test the functionality of the light signaling equipment located on its front panel.



EXTERNAL CONNECTION DIAGRAM
SHTORM-V-O-VPD(3)CH-4



The sections of copper cores of connecting wires and cables indicated in the diagram are specified taking into account local conditions (brands of drives and cables, their lengths, installation methods, operating conditions, etc.)
Resistors for monitoring the integrity of the R=1 kOhm circuit are included in the delivery package.



SHTORM-VL

CONTROL SYSTEMS FOR OZA-LR, OZA-LW INSULATED AXIAL SMOKE EXTRACTION FANS

OPERATING CONDITIONS:

- ▀ control systems can be operated in temperate and cold (YHL) climates of the 3rd and 4th placement categories according to GOST 15150.
- ▀ ambient temperature:
 - from -5 °C to +35 °C for the 4th placement category.
 - from -60 °C to +40 °C for the 3rd placement category.

The SHTORM-VL control system implements the function of fan control and ventilation of the room. The automatic closing system will provide protection in adverse weather conditions, as well as this function will help to avoid overheating of the room in the summer.

The SHTORM-VL system is designed to control the newly-designed product for smoke ventilation - OZA-LR, OZA-LW insulated axial smoke extraction fans.

It combines a fan and smoke vent control algorithm, which helps to quickly and efficiently remove harmful gases and smoke in the event of a fire. It can also be used for natural or forced ventilation of rooms. The control systems of the SHTORM-VL series provide the ability to automatically regulate air flow and at the same time maintain excess pressure of 50 Pa in accordance with the DSTU EN 12101-06:2016 standard.

The control automation is powered by a three-phase AC mains supply with a frequency of 50Hz and a rated voltage of 400V. The mains feeder, fan power outputs, and external connections are routed into the cabinet through cable glands, which are standardly located on the top panel. The cabinet is equipped with a lockable door fitted with control and indication elements.

Structurally, the control system is a metal cabinet with IP54 protection rating.

SHTORM-VL-AVR-VD(15)CH-2-20-E

- ▀ control system of OZA-LR, OZA-LW fan
- ▀ availability of AVR: AVR - yes; 0 - no
- ▀ fan type:
 - VD - smoke extraction fan; VPD - pressurization fan;
 - VPDp - pressurization fan with pressure maintenance (when this option is selected, the only available fan control type is CH)
- ▀ fan power, kW
- ▀ type of control:
 - P - direct start, CH* - frequency converter,
 - S - soft starter, T - star-triangle start
- ▀ number of poles: 2-3000 rpm; 4-1500 rpm; 6-1000 rpm
- ▀ control current of the smoke vent drive
- ▀ airing mode**: E - supported, 0 - not supported

* When selecting the CH type of fan control (frequency converter), the frequency converter is included in the control cabinet. The control system must be installed in the immediate vicinity of the fan. The cable length from the frequency converter to the fan is no more than 50 m (25 m for shielded cable). The technical characteristics of the frequency converters correspond to the type and brand of the fan motor.

** when ordering cabinets with airing mode (maintenance of airing mode), rain and wind sensors are included in the SHTORM-VL control system.

Wire cross-section table based on calculations for distances not exceeding 50 m

In, A	до 16	16...25	25...30	30...40	40...50	50...75	75...90	90...115	115...150
S, mm ²	1,5...4	2,5...4	4...6	6...10	10...16	16...25	25...35	35...70	50...70

Electric drive current table

Type of electric drive	Force, N	DC voltage, V	Maximum operating current, A
rod	1 600	24	2,5
rod	3 000	24	5
chain	200	24	0,7

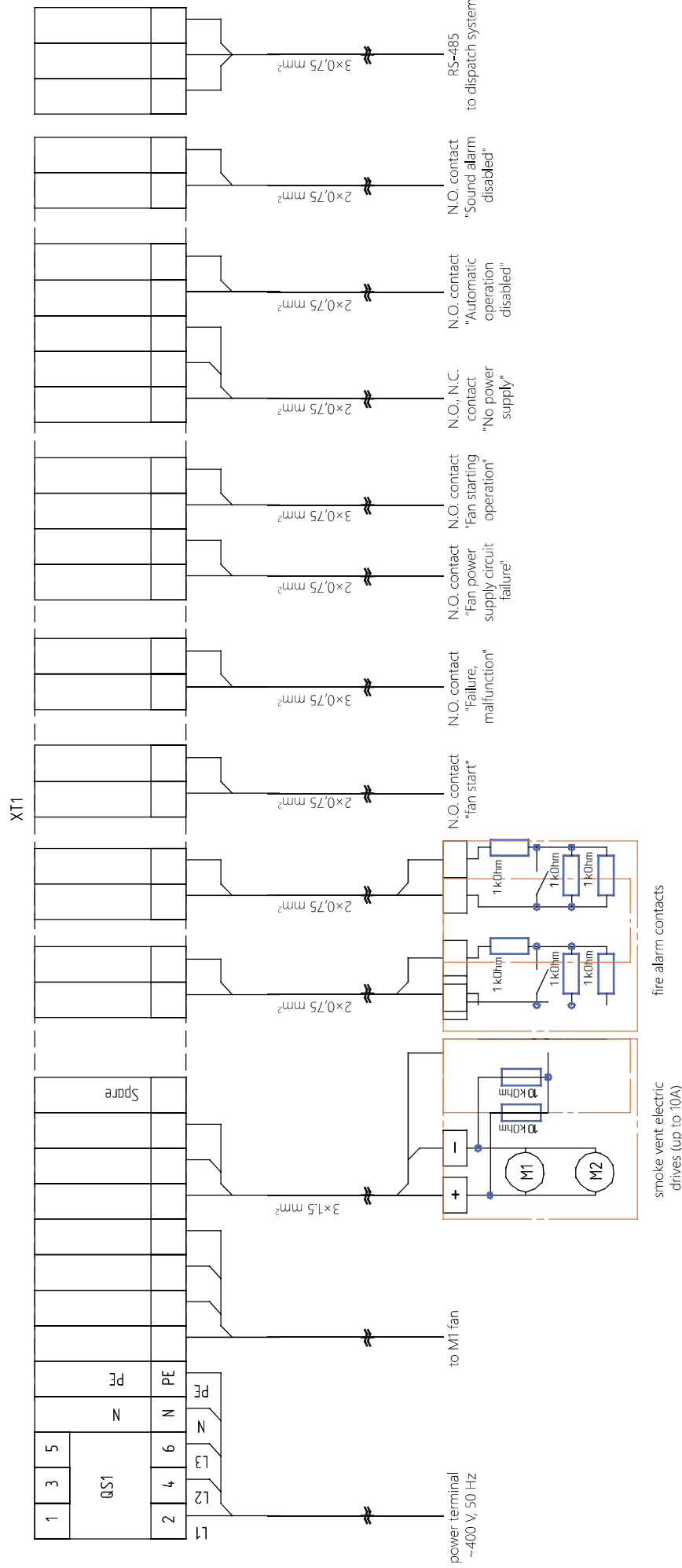
The control systems of the SHTORM-VL series provide the ability to automatically regulate air flow and at the same time maintain excess pressure of 50 Pa in accordance with the DSTU EN 12101-06:2016 standard. This function is implemented only for pressurization fans when ordering a control system marked VPDp (this operation algorithm is implemented using a frequency converter installed directly in the control cabinet and an analog pressure sensor (included in the delivery package).

THE SHTORM-VL TYPE CONTROL SYSTEM FULFILLS THE REQUIREMENTS OF THE "FIRE PROTECTION SYSTEMS" OF DBN V.2.5-56:2014

- MANUAL-O-AUTO control mode selection (the switch is equipped with a key to protect against unauthorized access):
 - Manual - switching on and off from the front panel of the SHTORM-VL fan;
 - O - the fan is turned off;
 - Automatic mode - the fan is turned on and off by a fire alarm or by a remote control.
- Indication of the system status on the SHTORM-VL front panel:
 - "MAINS" – the yellow indicator is activated when the control system is powered;
 - "OPERATION" - the green indicator is activated when the fan is turned on (both in manual and automatic modes);
 - "FAILURE" - the red indicator is activated in case of fan failures;
 - "FIRE" – the red indicator is activated when a fire signal is received from the automatic fire alarm system.
- The SHTORM-VL provides an audible alarm (at least 60 dB at a distance of 1 meter from the cabinet) located on the front panel..
- Output of cabinet status signals to the fire alarm system in accordance with DSTU EN 12101-06:2016 and DBN requirements.
Example:
 - "FAILURE" - Dry contact (closes in case of fan failure);
 - "OPERATION" - Dry contact (closes when the fan is running).
- The cabinet has a fire alarm input (N.O. dry contact).
- Protection against short circuits and overloads in electrical circuits (circuit breakers without a thermal cut-off).
- SHTORM-VL provides the possibility of automatic and manual control of actuators. The control method is selected by the controls installed on the lockable cabinet door with protection against unauthorized access.
- SHTORM-VL features a control option for controlled natural ventilation (via rain and wind sensors).
- 1 fire zone.
- The possibility of integrating multiple SHTORM-VL units into a bus system (for servicing several fire zones or increasing the total power of connected drives), with communication available via an RS-485 network using the ModBus RTU protocol.
- 2 drive control lines.
- The maximum permissible total current of drives connected to a single line is 10 A. Either rotary type drives or rod and chain type drives can be connected to one line. In this case, rod and chain type drives can be connected to the same line.
- As standard, all cabinets are equipped with FCP button (fire call point) and two sets of resistors for monitoring the integrity of the drive lines (resistor nominal value $R = 1 \text{ k}\Omega$).
- By default, all cabinets support connection of smoke vent cover anti-freeze protection. The maximum allowable operating current of the heaters is 5A.
- Dry contact "MALFUNCTION".
- The cabinet has the ability to test the functionality of the light signaling equipment located on its front panel.

EXTERNAL CONNECTION DIAGRAM

SHTORM-VL-0-VD(15)CH-2-K-20-0



The sections of copper cores of connecting wires and cables indicated in the diagram are specified taking into account local conditions (brands of drives and cables, their lengths, installation methods, operating conditions, etc.)

Resistors for monitoring the integrity of the $R=1$ kOhm circuit are included in the delivery package.

APPENDICES

ACOUSTIC PARAMETERS OF FANS

Lp sound pressure levels, dBA from UKROS/KROV fans in the maximum static efficiency mode at different distances from the fan outlet section

Standard size fan	Number of poles	Distance from the fan outlet section, m							
		1	3	5	10	15	20	25	30
035	4	62	53	48	42	39	36	34	33
	2	77	67	63	57	54	51	49	47
040	4	64	55	50	44	41	38	36	35
	2	79	69	65	59	56	53	51	50
045	4	69	60	55	49	46	43	41	40
	2	84	75	70	64	61	58	56	55
050	6	62	53	48	42	39	36	34	33
	4	72	63	58	52	49	46	44	43
056	6	66	57	52	46	43	40	38	37
	4	75	66	61	55	52	49	47	46
063	6	70	61	56	50	47	44	42	41
	4	79	70	65	59	56	53	51	50
071	8	68	59	54	48	45	42	40	39
	6	74	65	60	54	51	48	46	45
	4	83	74	69	63	60	57	55	54
080	8	71	62	57	51	48	45	43	42
	6	78	69	64	58	55	52	50	49
	4	87	78	73	67	64	61	59	58
090	8	75	66	61	55	52	49	47	46
	6	82	73	68	62	59	56	54	53
	4	91	82	77	71	68	65	63	62
100	8	78	69	64	58	55	52	50	49
	6	85	76	71	65	62	59	57	56
112	8	82	73	68	62	59	56	54	53
	6	88	79	74	68	65	62	60	59
125	8	86	77	72	66	63	60	58	57
	6	92	83	78	72	69	66	64	63

WHAT IS THE CONSUMED AND RATED POWER

All fans require an electric motor, which is conventionally specified in project documentation as: Installed power requirement – $N_y = XXX \text{ kW}$.

Since the total number of fans at the facility may exceed hundreds of units, the cost of supplying power to the building is very high, so it is essential to correctly determine the power to be specified in the design task for the electrical engineers.

N_y refers not to the "Installed" power but to the "Rated" (mechanical) power of the motor, i.e., the power it can continuously deliver to the fan shaft to drive the impeller.

Historically, the mechanical power of any drive was specified in horsepower (HP), and a number of values have remained "tied" to multiples of 1 HP $\approx 0.75 \text{ kW}$ (approx.)

Rated power $\frac{1}{2} \text{ HP} = 0.37 \text{ kW}$ $\frac{3}{4} \text{ HP} = 0.55 \text{ kW}$ $1 \text{ HP} = 0.75 \text{ kW}$ $1\frac{1}{2} \text{ HP} = 1.1 \text{ kW}$ $2 \text{ HP} = 1.5 \text{ kW}$...100 HP = 75 kW (many people can read this value in the registration certificate for a passenger car).

Thus, it is incorrect to specify 1000 HP (750 kW) in the transformer substation design, yet this often happens due to a misunderstanding.

The installed electrical power of the motor is determined taking into account the efficiency of the motor and always exceeds the nominal (rated) power by 50-50%. The efficiency range of electric motors varies from 50% to 95% and depends on the type of motor, size and energy efficiency class. A fan with a mechanical drive motor power of 1.1 kW ($1\frac{1}{2} \text{ HP}$) can have an installed power of the motor from 1200 W (with an EC motor of energy efficiency class IE3, efficiency - 90%) to 1700 W (with an AC motor of energy efficiency class below IE1, efficiency - 55%), while the motor manufacturer can be one company EBM-Papst (Germany). Obviously, a difference of 500 W at an energy price in Germany of 0.3 €/kW will result in excess consumption over 5000 hours (approximately 1 year) of $0.5 \times 5000 \times 0.3 = 750 \text{ €/year}$, which exceeds the price of the fan itself. For example, let's compare SYSTEMAIR roof fans:

lower-class AC motor	IE-1	TOV 560-4	2 854 W 8000 m ³ /h at 500 Pa
medium-class AC motor	IE-2	DVN 710	2 200 W 8500 m ³ /h at 500 Pa
top-class EC motor	IE-3	DVC 560-S	1 873 W 7500 m ³ /h at 500 Pa

As can be seen in the example (catalog of 2010) with a deviation of up to 6% in consumption - the range in power consumption was more than 30%, it is also clear that the model with economical consumption is the most modern for "green construction" and is proposed to replace older models with high energy consumption.

The fan can be most accurately described by the Motor Power Index (n) on the fan shaft, which must be provided by the selected motor. After selecting the appropriate motor with a given efficiency class based on the "n" value, the actual installed power can be obtained.

The actual electrical power consumption of the motor is also usually less than the installed power. This is due to the fact that "n" should not exceed N_y , in order to avoid overloading. The calculation program shows the estimated mechanical motor shaft output, which is converted into power consumption only if information on the motor efficiency is available.

At facilities with high energy efficiency requirements, all fans can be ordered with high-class motors. Standard and budget projects use fans equipped with standard lower-class electric motors (IE1 and below). Given the constant rise in electricity prices, the use of such "uneconomical" motors for constantly running fans is no longer profitable, but production continues until a complete ban is imposed by government decree.

To divide the new form of description of the fan motor by "n" value and the old form of description by the rated power of the motor, a correspondence table is given:

Motor rated power (N _{nom}), kW	0,18...0,75	1,1...7,5	11...90
Motor Power Index (n)	00018...00075	00110...00750	01100...09000