УКРВЕНТ

BOMB SHELTER VENTILATION

CONTENT

FVU-20

The FVU-20 complex filter and ventilation unit is designed to provide clean air to shelters for 6-48 hours in which no more than 20 people are at the same time. This unit includes an electric manual fan (230/380 Volts), which is a very important factor, because, as practice shows, our enemy is very insidious and often strikes power plants, which is why we have developed a fan that can work both from a connection to the mains and from a mechanical pull of the handle, which is within the power of every adult. An explosion-proof protective section is mounted at the beginning of the air duct, which automatically closes under the pressure of the blast wave, in order to further avoid destruction of the ventilation system. A replaceable G4 dust filter is mounted in the air duct for air purity. And the last, perhaps the most relevant component

– anti-radiation filter-absorber, designed to operate in filter ventilation mode in the event of a radiation or chemical threat (additional catalysts are added at the Customer's request).

Possibilities of installing FVU-20:
- private homes;
- enterprises;
- suburban cooperatives and complexes;
- small kindergartens and schools.

Main types of premises for installation of the FVU-20 unit:
- basement;
- semi-basement (basement floor);
- underground/semi-underground parking;
- shelter made of reinforced concrete products;
- cellar (basement);

The installation can be done independently and takes no more than 6 hours, provided that the assembly instructions are followed.

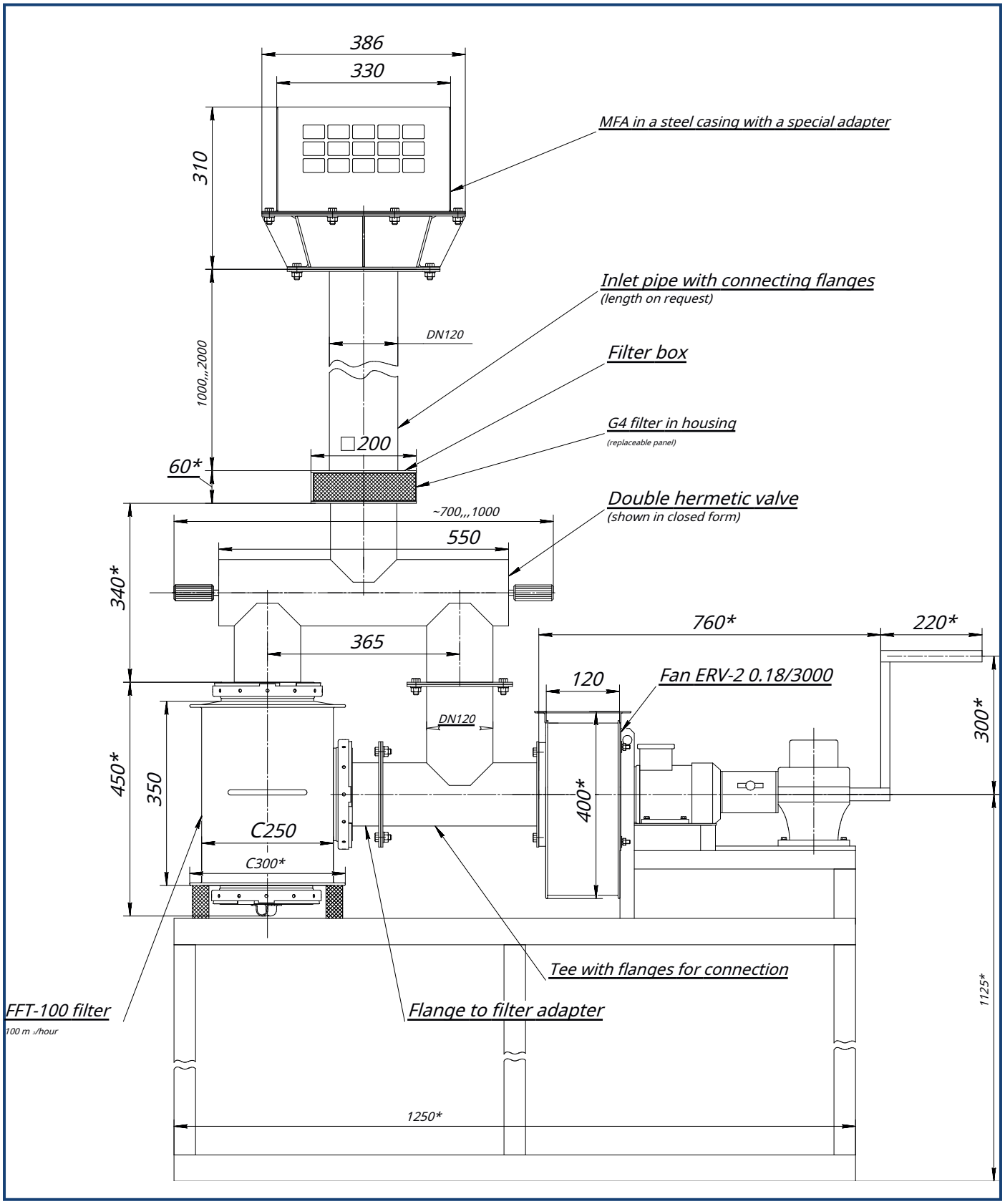

Figure 1 – Integrated filter and ventilation unit FVU-20

ERV

APPOINTMENT

Electric hand fans are designed to supply air to the premises of various structures in the clean ventilation or filter generation mode and can operate both from the electrical network (U=380V) and from a manual drive. Electric hand fans are used in exhaust and supply ventilation systems mainly for civil defense facilities, they can be used for ventilation of wells and other engineering structures in the absence of power supply.

COMPONENTS OF AN ELECTRIC HAND FAN

- radial fan;
- reducer;
- clutch;
- handle.

OPERATING CONDITIONS

- Fans are operated in conditions of moderate (U) climate of the third location category according to GOST 15150.
- Ambient temperature from - 40 to + 40°C.
- Temperature of the medium moved by fans up to +80°C.
- Distance between two electric hand fans (between axes handles) – not less than 1.8m.

The electric hand fan is used to move air and other gas mixtures with a dust and solids content of no more than 100 mg/m^3 and does not contain sticky substances and fibrous materials.

ADDITIONAL EQUIPMENT

Electric manual fans can be equipped with flow-meter valves (shut-off valves) of the KVVB series, which are designed to determine the air flow rate during operation of electric manual fans and to close the opening of the fan's discharge pipe when it stops or its performance decreases. In the event that there is a backdraft in the system, the KVVB series valve performs the function of a check valve.

Assembly table with rubber vibration isolators for convenient operation of the manually operated fan.

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

Marking of the electric hand fan of the ERV series

Example:
Electric hand fan series ERV-2; housing position left 0; complete with mounting table and rubber vibration isolators; curve according to aerodynamic characteristics graph No. 4.

ERV-2 - Left.0 - MSG - 4

Fan type:**ERV-2**;**ERV-3**;**ERV-4**;
Case position:**Left.0°/Right 0°**;
Equipment:**MSG -**complete with assembly table and rubber vibration isolators; **0**-without additional equipment;
Curve number:**1**;**2**;**3**;**4**;**5**;**6**;

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ERV-2

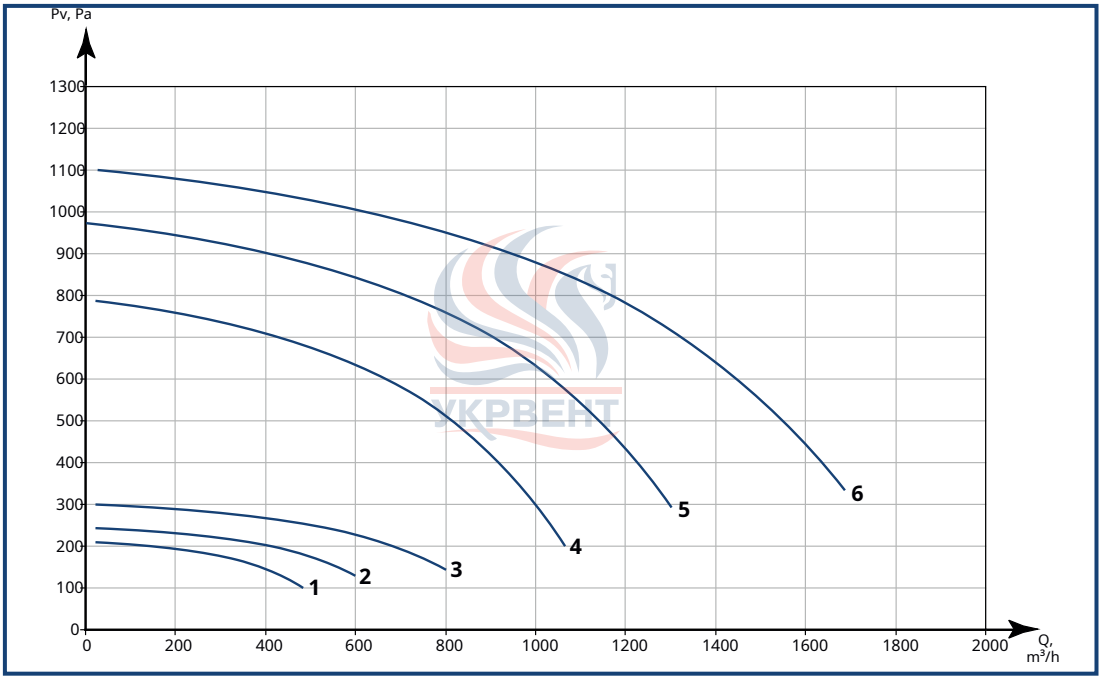

Figure 2 – Aerodynamic characteristics of the ERV-2 series fan

Table 1 – Technical characteristics of the ERV-2 series fan

curve №	Power,kW	Frequency of rotation of the impeller, rpm.	The number of required revolutions of the handle, rpm.	Force on handle, N/kg	Rated current, A	Weight of fan, max kg	Weight of fan complete with mounting table, max kg
1	*0.12*	*1325*	*30-33*	*90/9*	*0.5*	*52*	*64*
2	*0.12*	*1325*	*30-33*		*0.5*	*52*	*64*
3	*0.12*	*1325*	*30-33*		*0.5*	*52*	*64*
4	*0.18*	*2700*	*67-72*		*0.73*	*54*	*66*
5	*0.25*	*2720*	*68-72*		*0.84*	*55*	*67*
6	*0.37*	*2730*	*68-72*		*1.0*	*56*	*68*

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ERV-2

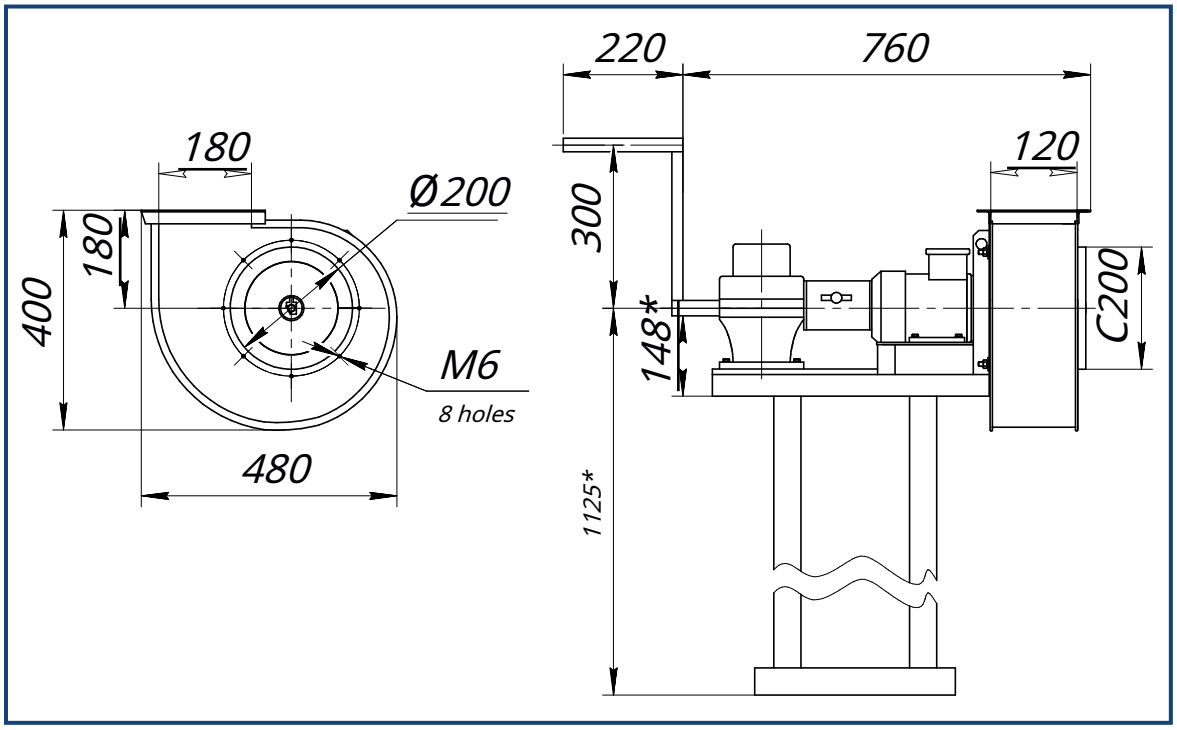

Figure 3 - Overall and connection dimensions of the ERV-2 series fan

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ERV-3

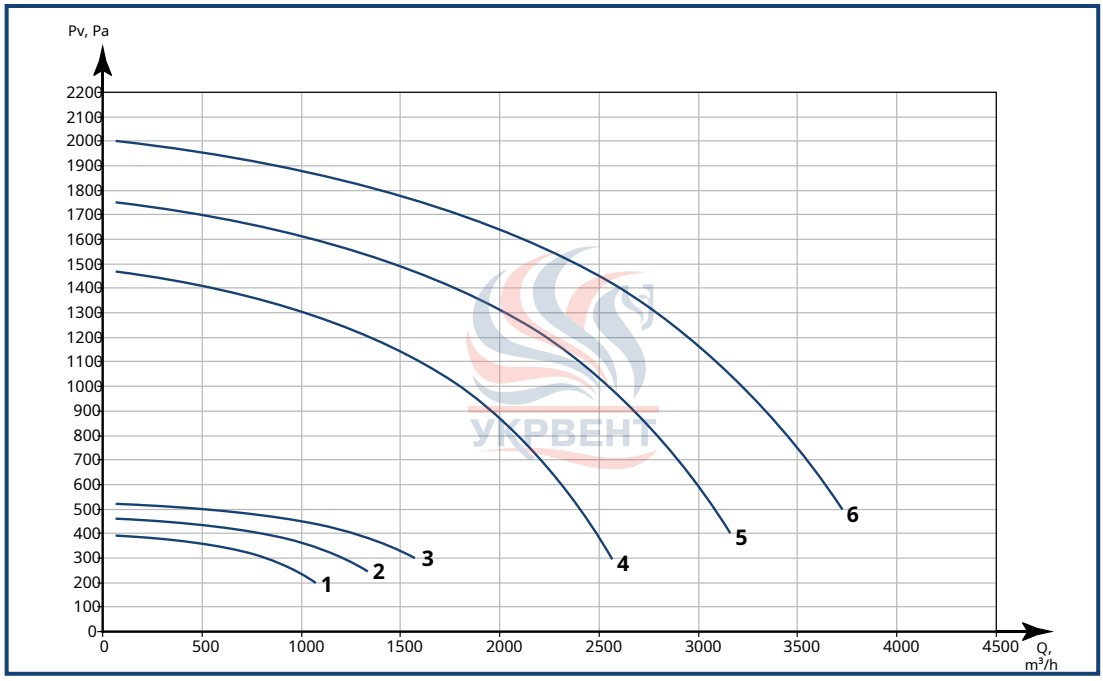

Figure 4 – Aerodynamic characteristics of the ERV-3 series fan

Table 2 – Technical characteristics of the ERV-3 series fan

curve №	Power,kW	Frequency of rotation of the impeller, rpm.	The number of required revolutions of the handle, rpm.	Force on handle, N/kg	Rated current, A	Weight of fan, max kg	Weight of fan complete with mounting table, max kg
1	*0.12*	*1325*	*30-33*	*105/10.5*	*0.5*	*57*	*69*
2	*0.18*	*1325*	*30-33*		*0.7*	*58*	*70*
3	*0.25*	*1325*	*30-33*		*0.82*	*59*	*71*
4	*0.75*	*2840*	*68-72*		*1.17*	*61*	*73*
5	*1.1*	*2840*	*68-72*		*2.6*	*63*	*75*
6	*1.5*	*2850*	*68-72*		*3.46*	*69*	*81*

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

ERV-3

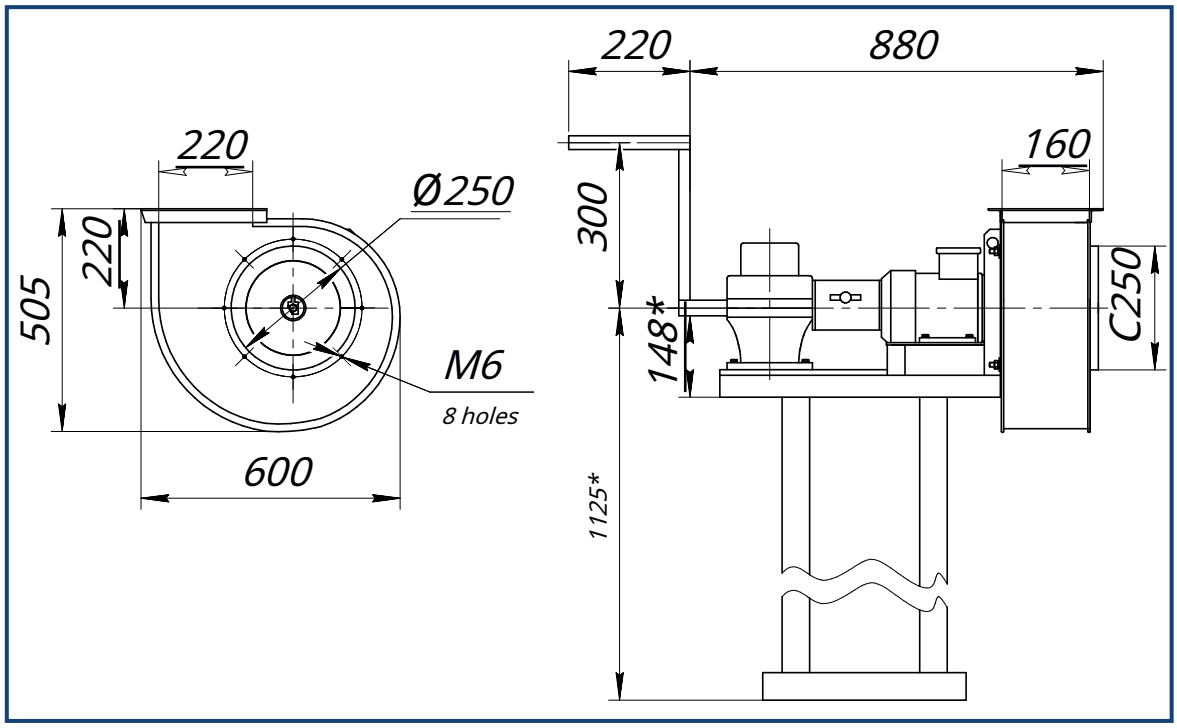

Figure 5 - Overall and connection dimensions of the ERV-3 series fan

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ERV-4

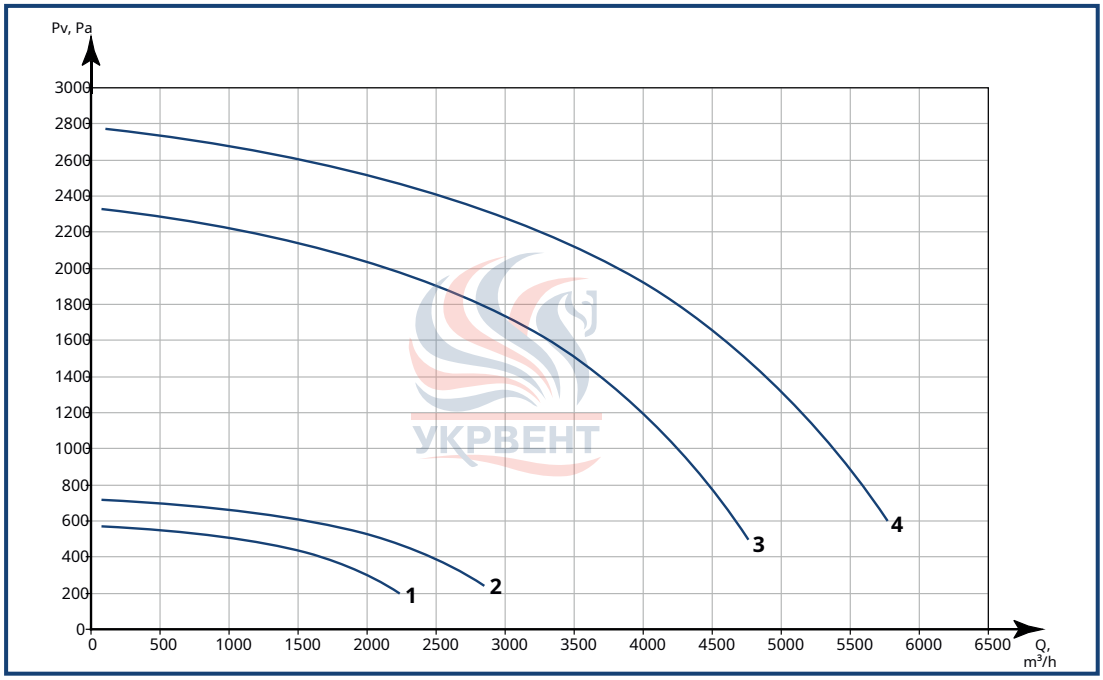

Figure 6 – Aerodynamic characteristics of the ERV-4 series fan

Table 3 – Technical characteristics of the ERV-4 series fan

curve №	Power,kW	Frequency of rotation of the impeller, rpm.	The number of required revolutions of the handle, rpm.				
1	*0.25*	*1325*	*30-33*	*110/11*	*0.82*	*61*	*73*
2	*0.37*	*1325*	*30-33*		*1.12*	*62*	*74*
3	*2.2*	*2855*	*68-72*		*4.85*	*74*	*86*
4	*3*	*2860*	*68-72*		*6.5*	*83*	*95*

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ERV-4

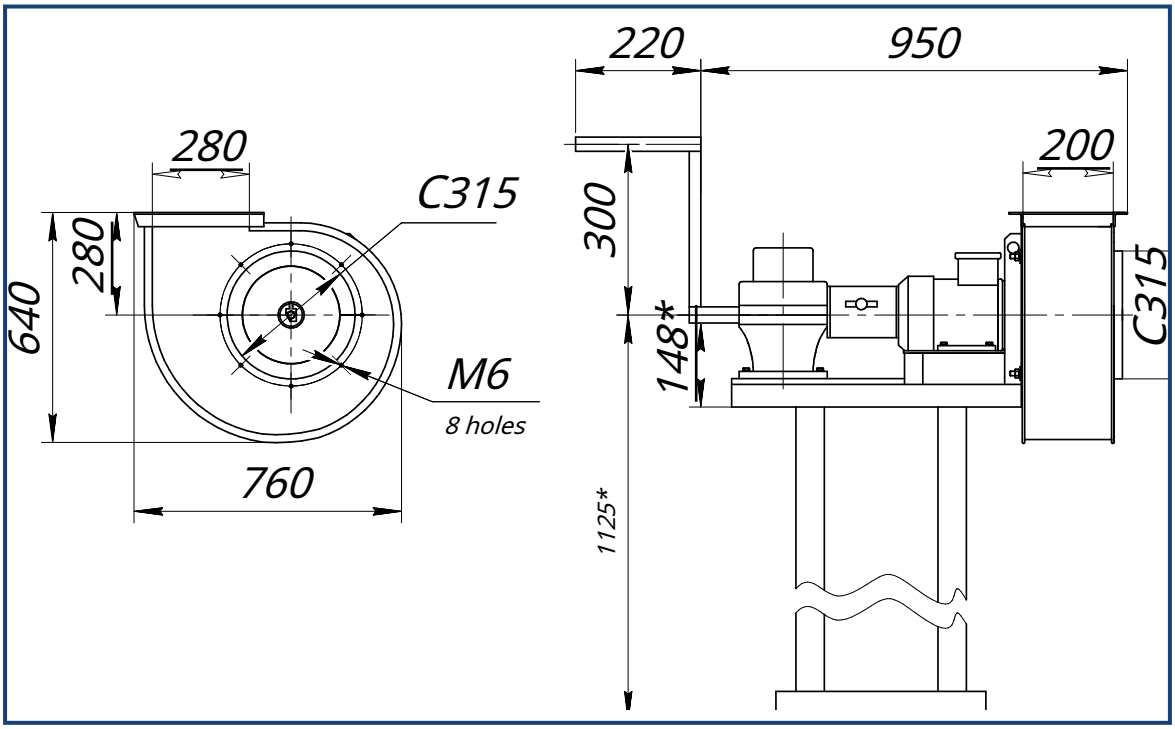

Figure 7 - Overall and connection dimensions of the ERV-4 series fan

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

KVVB

The KVVB series flowmeter-shutoff valves are designed to determine the air flow rate during the operation of radial electric manual fans of the EVR-2, ERV-3, ERV-4 series. The valve consists of a prismatic body of welded construction and a damper, which is installed on a horizontal axis. This damper rotates under air pressure from the fan. There is an arrow on the axis that indicates the air flow rate on a scale. After the fan operation is completed, the damper returns to a horizontal position and cuts off the fan from the ventilation network.

The installation mark on the valve shows how the valve should be installed in relation to the fan exhaust port. The valve is installed in a vertical position.

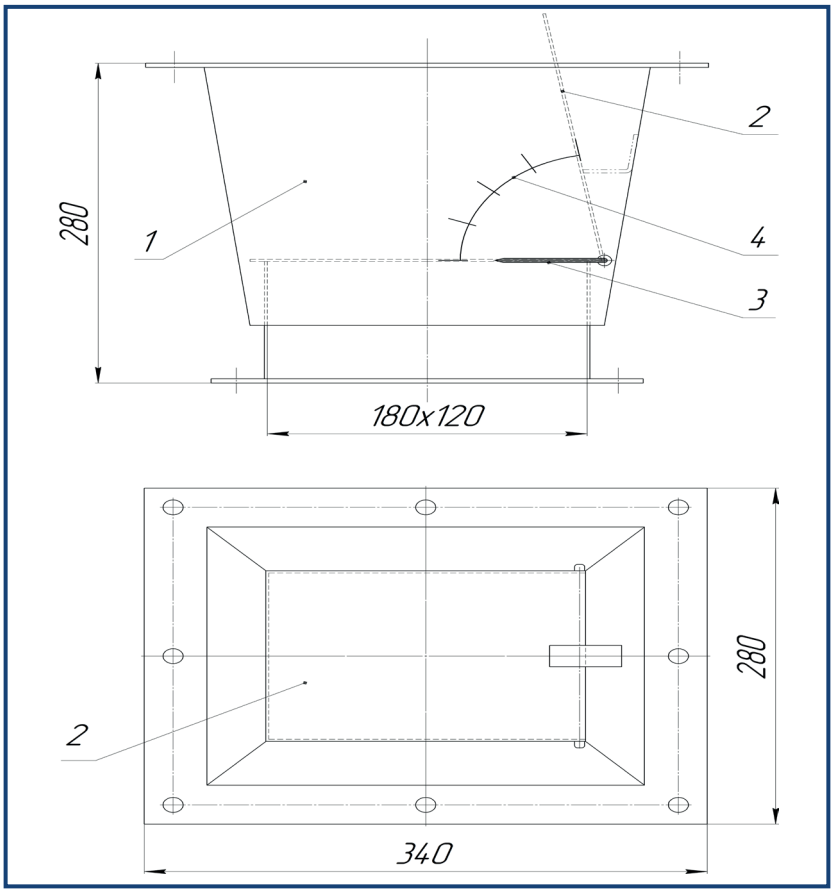

Figure 8 – KVVB-2 for electric manual fan ERV-2

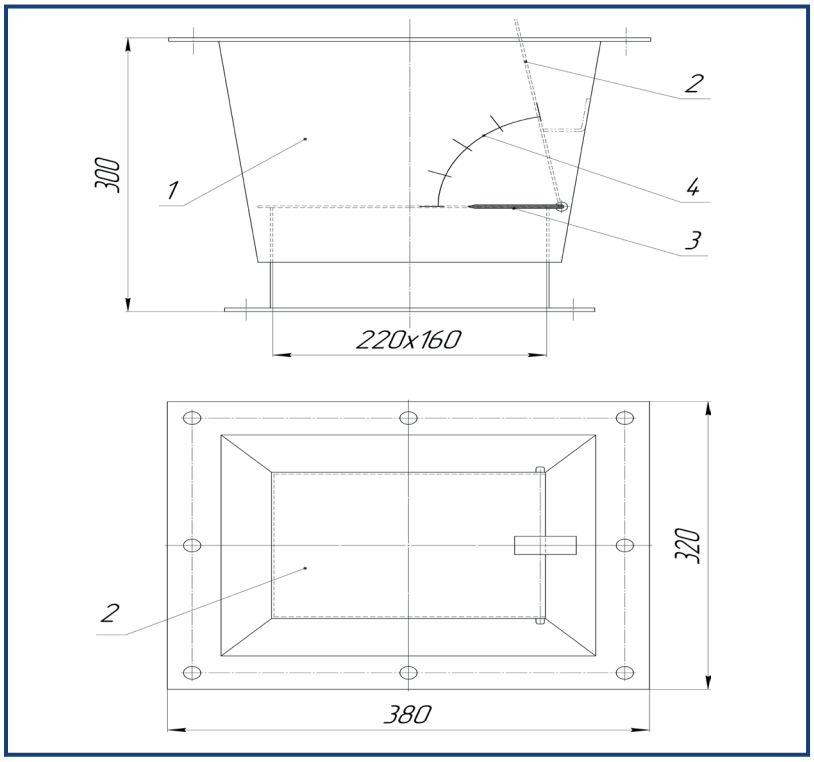

Figure 9 – KVVB-3 for electric manual fan ERV-3

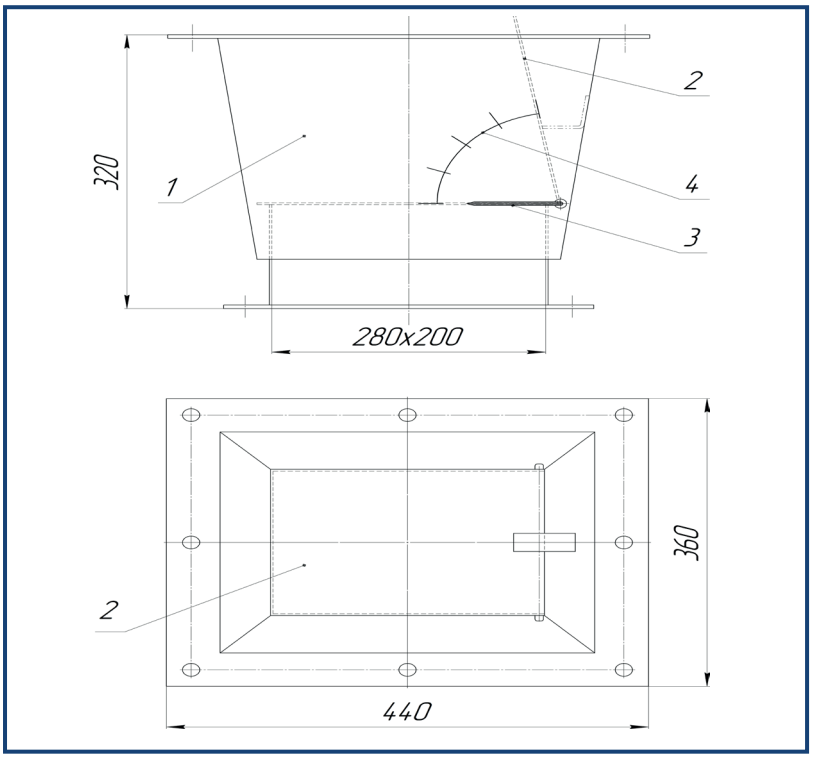

Figure 10 – KVVB-4 for electric manual fan ERV-4

Purpose and technical characteristics of anti-explosion devices

Small-sized protective sections MZS 282x321, medium-sized protective sections SZS 500x500 and unified protective sections UZS 595x649, UZS 700x745, UZS 815x2200 are designed to protect against the effects of a shock wave of long duration with a pressure from 0.3 to 10 kgf/cm$_2$The sections automatically, under the action of a shock wave, cover ventilation shafts or air ducts and provide protection against wave penetration into the storage facility.

Sections are installed on air ducts and in ventilation openings of buildings and structures in any operating position.

For installation on air ducts, protective sections MZS 282x321, SZS 500x500 and UZS 595x649 are placed in boxes KMZ, KSZ and KUZ, respectively. The small-sized protective section MZS 282x321 can be installed on the air intake head in a steel casing with a special adapter.

Unified protective sections UZS 700x745 and UZS 815x2200 can be used as an emergency exit from the premises.

The service area of protective sections is at least 1m.

Table 4 – Main parameters and dimensions of small-sized and unified

Parameter name	MZS 282x321	SZS 500x500	UZS 595x649	UZS 700x745	UZS 815x2200
Overall dimensions, mm: length	*282*	*500*	*595*	*700*	*815*
width	*83*	*139*	*183*	*245*	*420*
height	*321*	*500*	*649*	*745*	*2200*
Nominal air flow rate, m$_3$/hour	*1500*	*4500*	*8000*	*8000*	*25000*
Blade operation time, sec	*0.4*	*0.4*	*0.7*	*0.7*	*0.7*
Area of live cross-section, m$_2$	*0.045*	*0.135*	*0.235*	*0.235*	*0.705*
Shock wave pressure, kgf/cm$_2$	*From 0.3 to 10*				
Shock wave pressure, per section, kgf/cm$_2$	*0.01*	*0.01*	*0.2*	*0.2*	*0.2*

Table 5 – Main parameters and dimensions of boxes and casings for explosion-proof protective sections

Parameter name	KMZ box	KSZ box	Box KUZ	Casing with special adapter SKS
Section	*MZS 282x321*	*SZS 500x500*	*UZS 595x649*	*MZS 282x321*
Overall dimensions, mm: length	*450*	*750*	*836*	*385*
width	*150*	*240*	*260*	*345*
height	*470*	*750*	*841*	*310*
Shock wave pressure, kgf/cm$_2$	*From 0.3 to 10*			
Maximum diameter, mm	*355*	*710*	*710*	*250*
Weight, kg, no more	*20*	*42*	*85*	*13*

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

MZS 282x321

The small-sized protective section of the MZS 282x321 (see Figure 11) is a rectangular frame 1 made of profiled rolled steel with stiffening ribs welded into it, which form cells. The cells are closed with elastic blades (louvers) 2.

Under the influence of the excess pressure of the shock wave, the louvers 2 fit tightly against the grille, thereby preventing the penetration of the shock wave into the ventilation system. After the excess pressure decreases, they return to their original position under the influence of springs.

The angle of inclination of the louver plates to the plane of the grille can be adjusted within the range from 0 to 45 degrees and set by raising and lowering the movable frame 3 using adjusting screws 4.

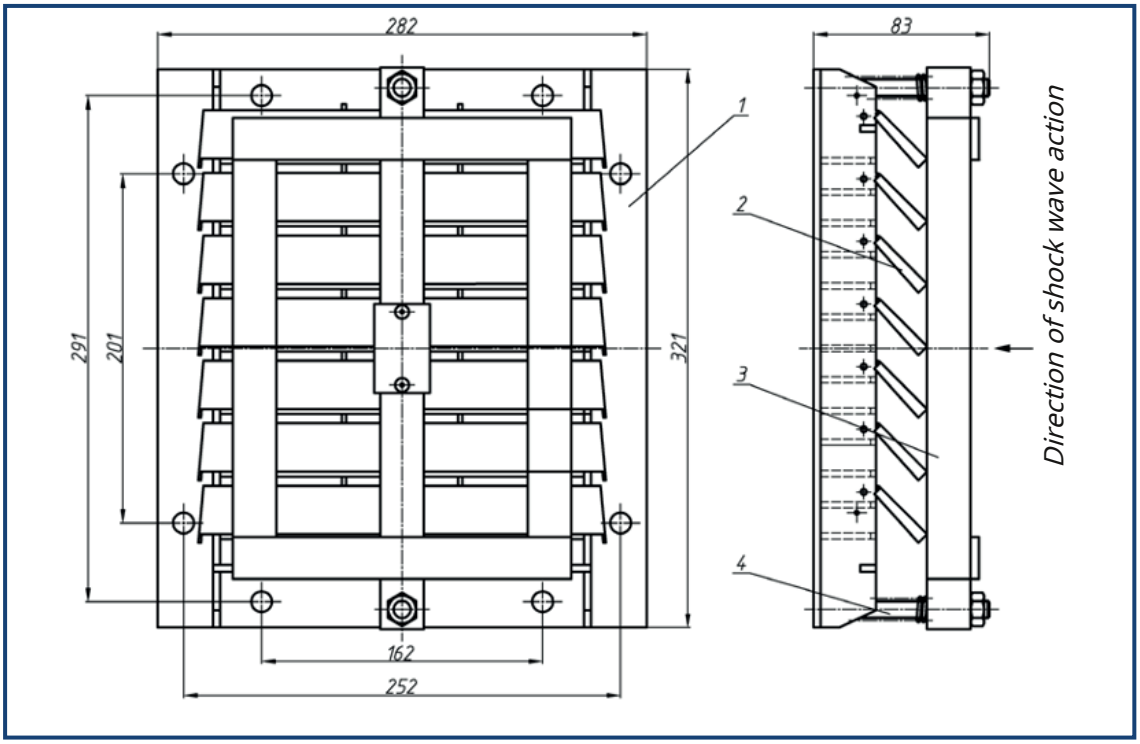

Figure 11 – Small-sized protective section MZS 282x321 1 – Frame; 2 – Louvers; 3 - Movable frame; 4 – Adjusting screw

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

SZS 500x500

The medium-sized protective section SZS 500x500 (see Figure 12) is a rectangular frame 1 made of profiled rolled steel with stiffening ribs welded into it, which form cells. The cells are closed with elastic blades (louvers) 2.

Under the influence of the excess pressure of the shock wave, the louvers 2 fit tightly against the grille, thereby preventing the penetration of the shock wave into the ventilation system. After the excess pressure decreases, they return to their original position under the influence of springs.

The angle of inclination of the louver plates to the plane of the grille can be adjusted within the range from 0 to 45 degrees and set by raising and lowering the movable frame 3 using adjusting screws 4.

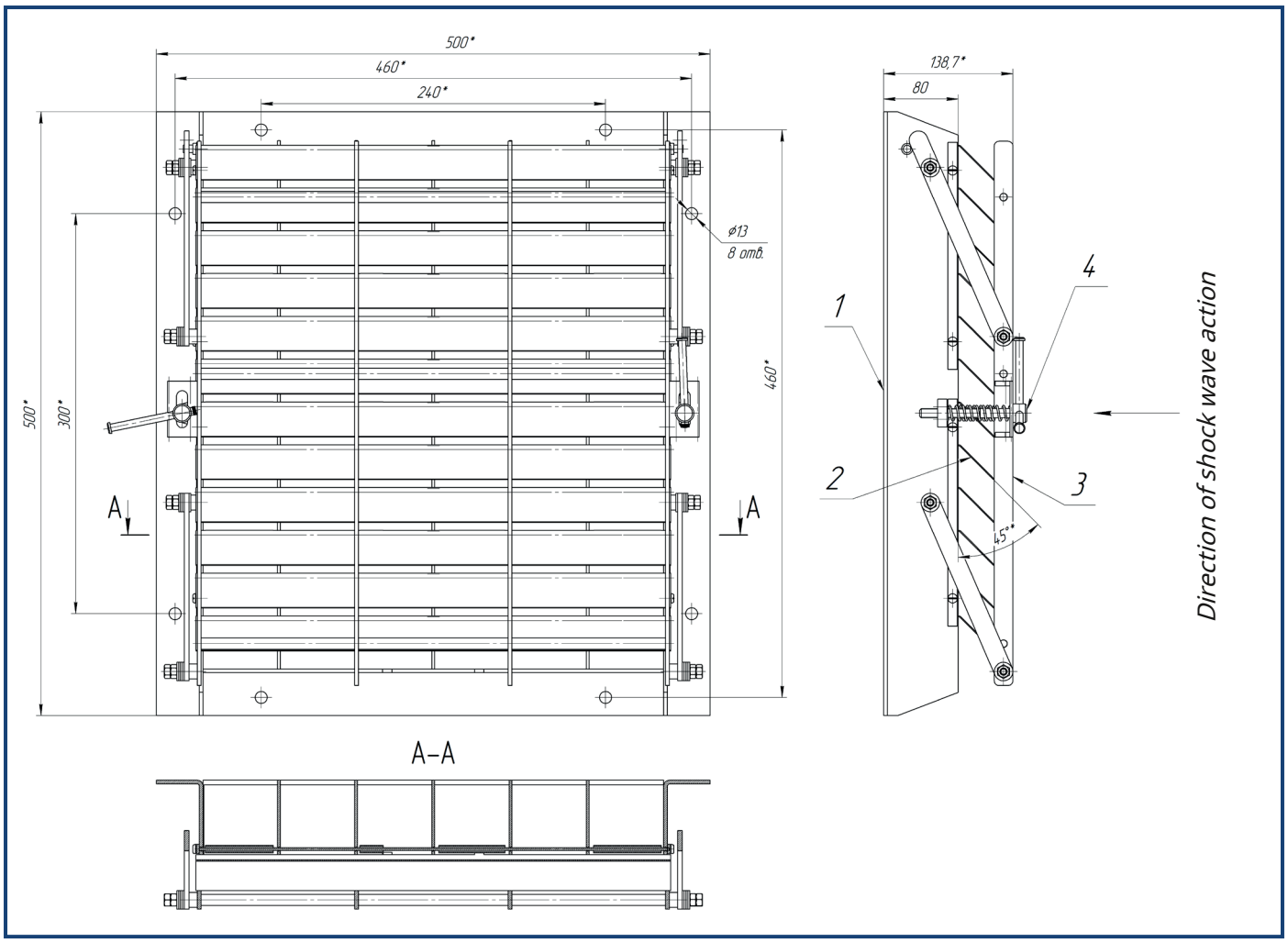

Figure 12 – Medium-sized protective section SZS 500x500 1 – Frame; 2 – Louvers; 3 - Movable frame; 4 – Adjusting screw

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UZS 595x649

The unified protective section UZS 595x649 (see Figure 13) is a rectangular frame 1 made of profiled rolled steel with stiffening ribs welded into it, which form cells. The cells are closed with elastic blades (louvers) 2.

Under the influence of the excess pressure of the shock wave, the louvers 2 fit tightly against the grille, thereby preventing the penetration of the shock wave into the ventilation system. After the excess pressure decreases, they return to their original position under the influence of springs.

The angle of inclination of the louver plates to the plane of the grille can be adjusted within the range from 0 to 45 degrees and set by raising and lowering the movable frame 3 using adjusting screws 4.

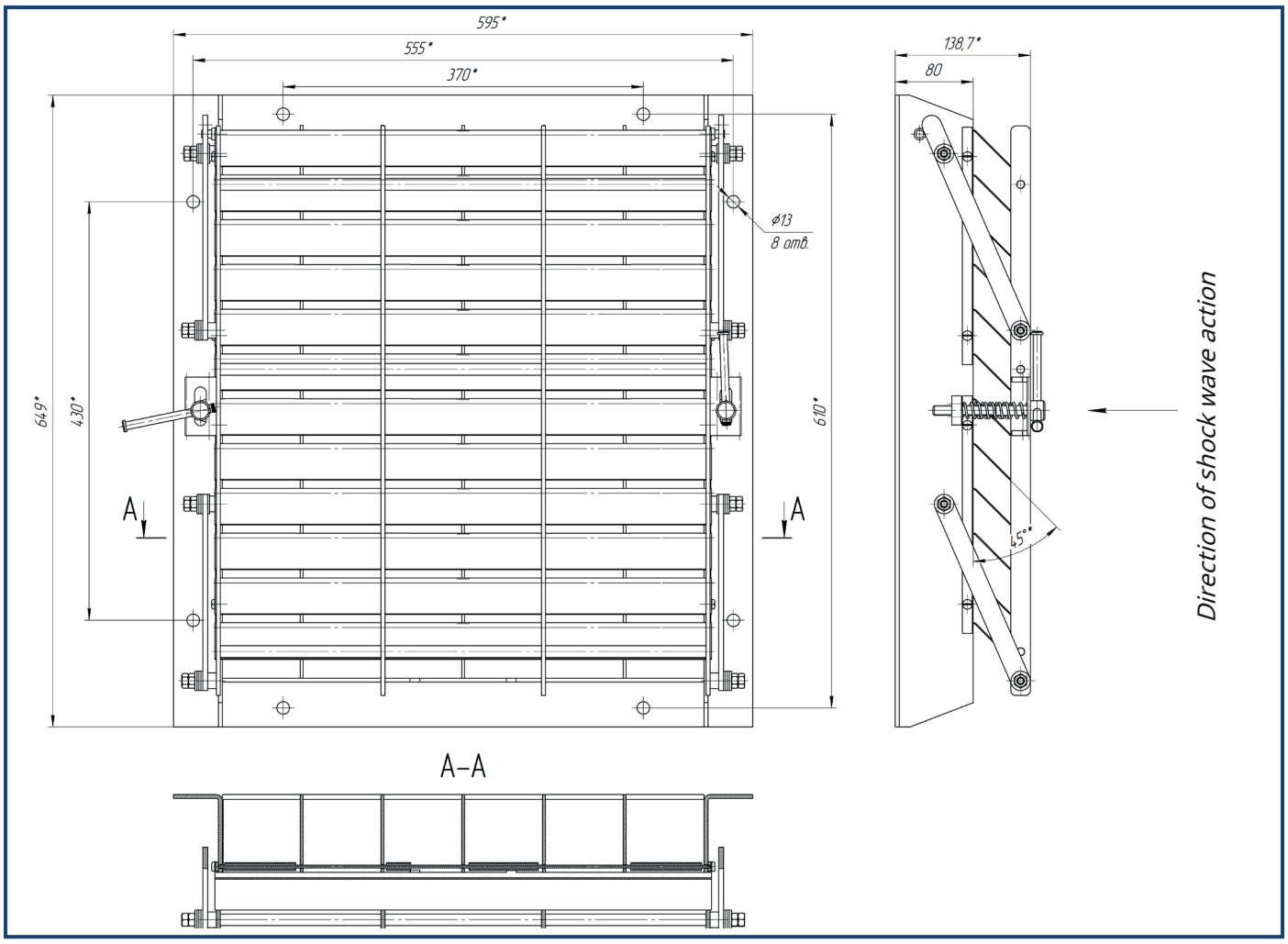


Figure 13 – Unified protective section UZS 595x649 1 – Frame; 2 – Louvers; 3 - Movable frame; 4 – Adjusting screw

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

UZS 700x745

The unified protective section UZS 700x745 (see Figure 14) consists of a unified protective section UZS 595x649 and a support frame 2 (welded from profiled rolled steel), which are interconnected by a hinge mechanism 3 and a locking mechanism 4. The hinge and locking mechanisms allow for adjustment of the tightness of the UZS-1 fit to the support frame 2, between which there is a rubber gasket.

For installation of UZS 700x745, the section frame has four holes for anchor bolts with a diameter of 16 mm.

The explosion-proof protective section UZS 700x745 is installed in air intake and exhaust ducts when it is necessary to ensure passage through them.

The protective section of the UZS 700x745 opens when viewed from the bomb shelter to the right. If it is necessary to ensure opening to the left, the explosion-proof protective section should be rotated 180 degrees: remove the section and install it with the blades facing down.

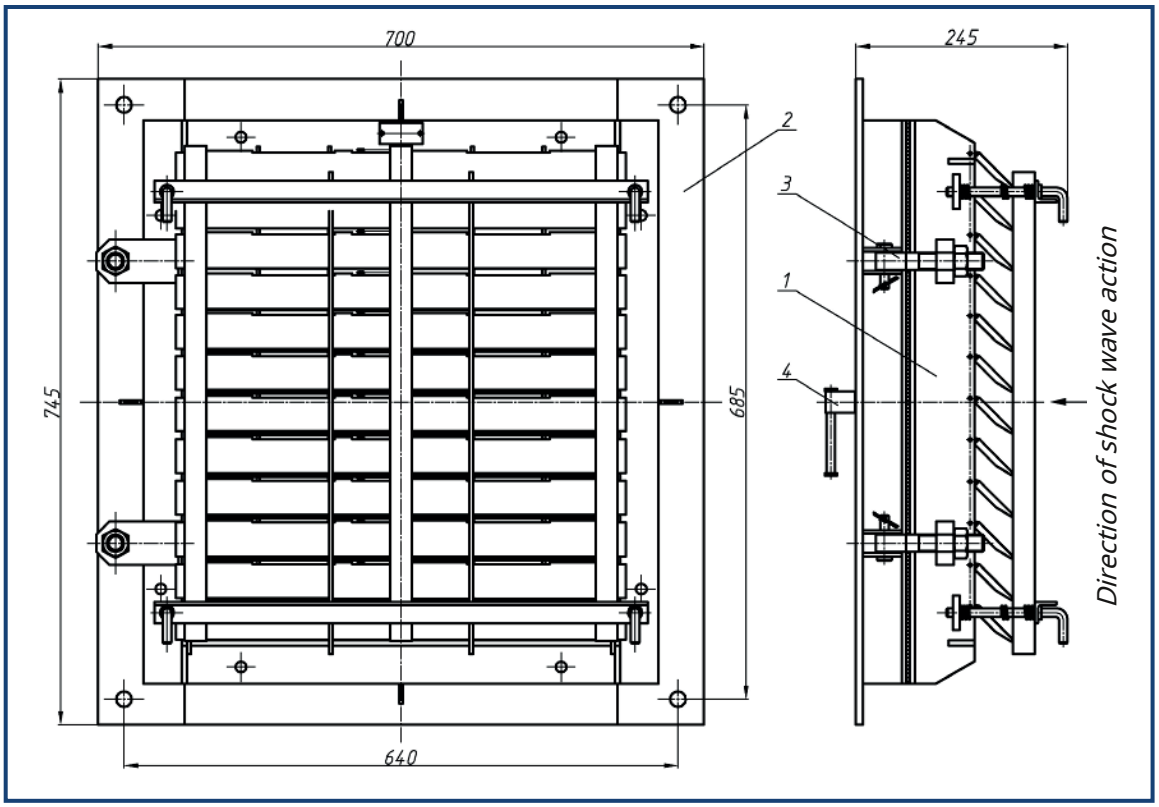


Figure 14 – Unified protective section of the UZS 700x745
1 – Section UZS-1; 2 – Support frame; 3 – Hinge mechanism; 4 – Locking mechanism

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

UZS 815x2200

The unified protective section UZS 815x2200 (see Figure 15) consists of a support frame 1, a door frame 2 (welded from profiled rolled steel) and three sections UZS 595x649 fixed to the door frame. The support and door frames are interconnected by hinged and locking mechanisms (4 and 5, respectively). The hinged and locking mechanisms allow for adjustment of the tightness of the door frame to the support frame, between which there is a rubber gasket.

To ensure the tightness of the connection between the base and the support frame, rubber gaskets are installed.

For mounting the UZS 815x2200, the support frame has eight holes for anchor bolts with a diameter of 16 mm.

The explosion-proof protective section UZS 815x2200 is installed in air intake and exhaust ducts when it is necessary to ensure passage through them.

The door frame UZS 815x2200 opens when viewed from the bomb shelter to the right. If it is necessary to ensure opening to the left, the explosion-proof protective sections should be rotated 180 degrees: remove the sections and install them with the blades facing down.

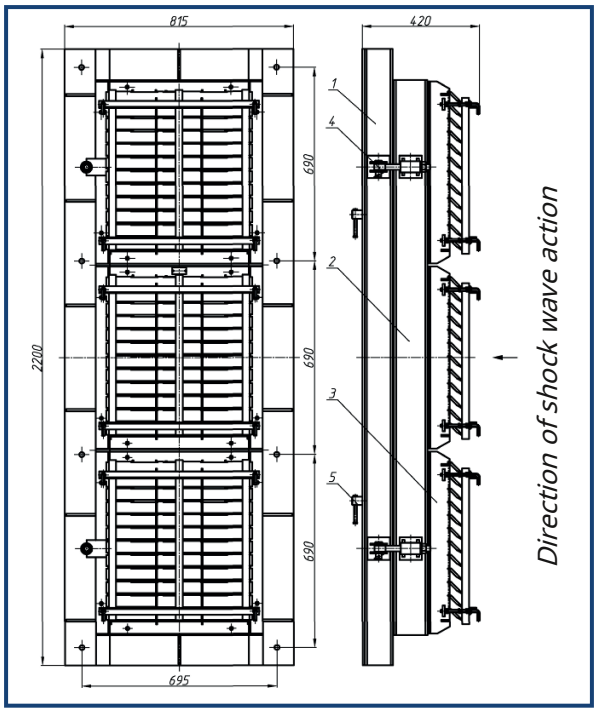


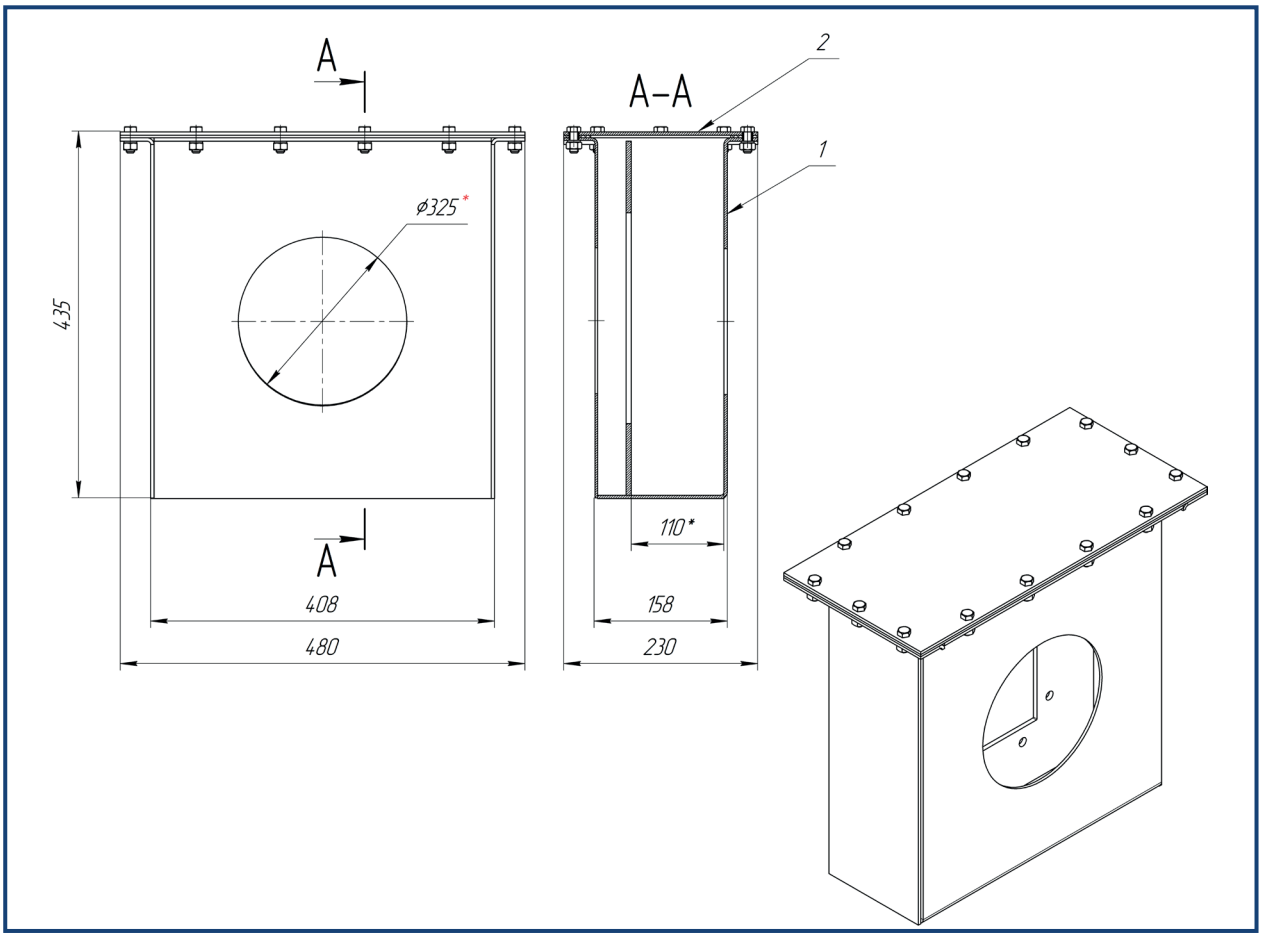
Figure 15 – Unified protective section of the UZS 815x2200
1 – Support frame; 2 – Door frame; 3 – Section UZS-1; 4 – Hinge mechanism; 5 – Locking mechanism

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

KMZ

The KMZ box for the small-sized protective section MZS 282x321 (see Figure 16) consists of a body 1 and a removable cover 2. The KMZ box is welded to the air ducts with a continuous hermetic seam on both sides (air duct diameter 325 mm). The small-sized protective section MZS 282x321 is mounted on the guides in the KMZ box. The cover reliably and hermetically closes the KMZ box for MZS 282x321.

KMZ boxes for MZS 282x321 are placed on vertical and horizontal air ducts with the cover to the side. When installing the KMZ box on the air duct, attention should be paid to ensuring access to the box, the possibility of free opening of the cover, as well as removing from the box or installing in it a small-sized protective section MZS 282x321.



1 – Housing; 2 - Removable cover; 3 – MFA section 282x321.

Figure 16 – KMZ box for a small-sized MFA protective section 282x321

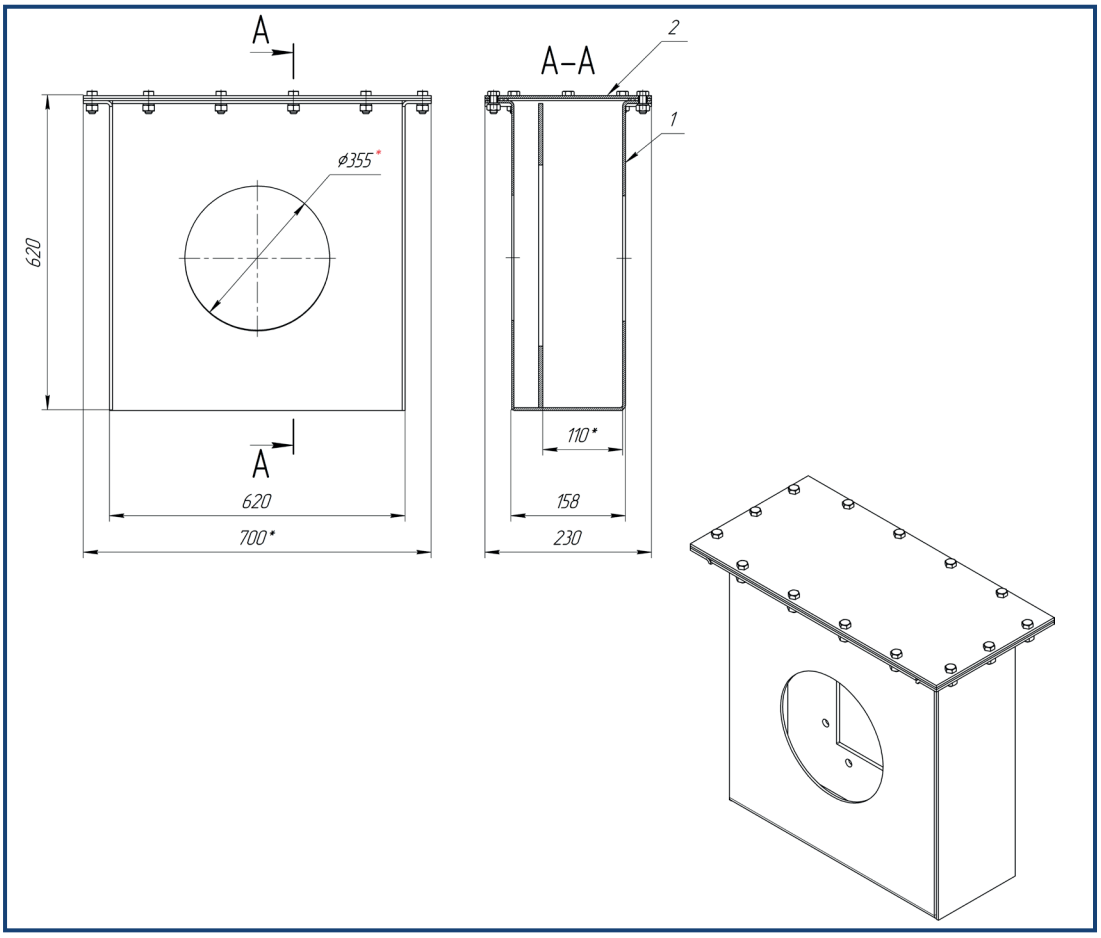
Table 6 – Standard dimensions of the KMZ mounting box diameters

Name	KMZ-355	KMZ-350	KMZ-325	KMZ-300	KMZ-280	KMZ-250	KMZ-225	KMZ-200	KMZ-180	KMZ-160	KMZ-150	KMZ-125	KMZ-100
Diameter, mm	*355*	*350*	*325*	*300*	*280*	*250*	*225*	*200*	*180*	*160*	*150*	*125*	*100*

KSZ

The KSZ box for the medium-sized protective section SZS 500x500 (see Figure 17) consists of a body 1 and a removable cover 2. The KSZ box is welded to the air ducts with a continuous hermetic seam on both sides (air duct diameter 500 mm). The medium-sized protective section SZS 500x500 is mounted on guides in the KSZ box. The cover reliably and hermetically closes the KSZ box for SZS 500x500.

KSZ boxes for SZS 500x500 are placed on vertical and horizontal air ducts with the cover to the side. When installing the KSZ box on the air duct, attention should be paid to ensuring access to the box, the possibility of free opening of the cover, as well as the removal from the box or installation of the medium-sized SZS 500x500 protective section in it.



1 – Housing; 2 - Removable cover; 3 – SZS section 500x500.

Figure 17 – KSZ box for medium-sized SZS protective section 500x500

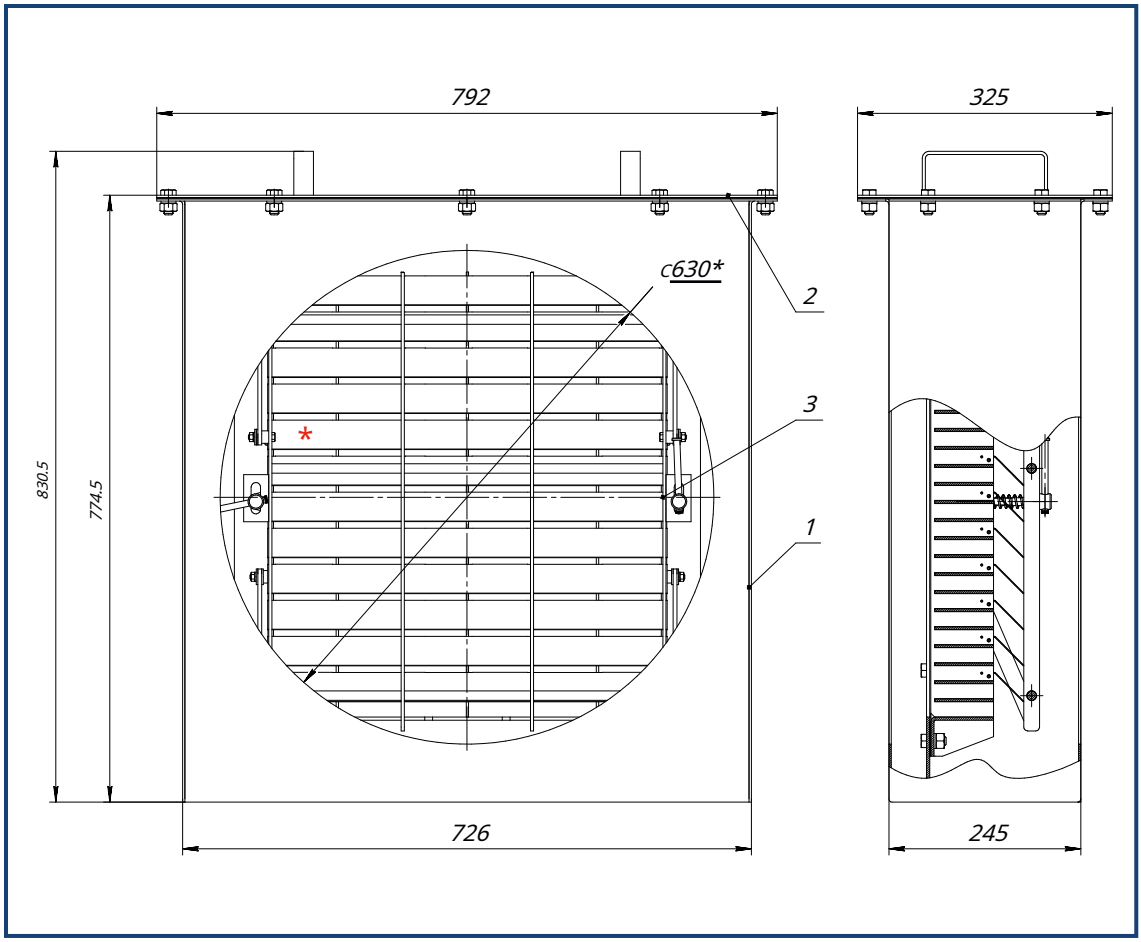
Table 6 – Standard dimensions of the diameters of the KSZ mounting box

Name	KSZ-560	KSZ-500	KSZ-450	KSZ-400	KSZ-355	KSZ-325	KSZ-300
Diameter, mm	*560*	*500*	*450*	*400*	*355*	*325*	*300*

BODY

The KUZ box for the unified protective section UZS 595x649 (see Figure 18) consists of a body 1 and a removable cover 2. The KUZ box is welded to the air ducts with a continuous hermetic seam on both sides (air duct diameter 630 mm). The unified protective section UZS 595x649 is mounted vertically in the KUZ box. The cover reliably and hermetically closes the KUZ box for UZS 595x649.

KUZ boxes for UZS 595x649 are placed on vertical and horizontal air ducts with the cover to the side. When installing the KUZ box on the air duct, attention should be paid to ensuring access to the box, the possibility of free opening of the cover, as well as removing from the box or installing in it the unified protective section UZS 595x649.



1 – Housing; 2 - Removable cover; 3 – Section UZS 595x649

Figure 18 – KUZ box for unified protective section UZS 595x649

Table 7 – Standard dimensions of the diameters of the KUZ mounting box

Name	KUZ-710	KUZ-630	KUZ-560	KUZ-500	KUZ-450	KUZ-400	KUZ-355	KUZ-325	KUZ-300
Diameter, mm	*710*	*630*	*560*	*500*	*450*	*400*	*355*	*325*	*300*

SKS

The steel casing with the special adapter SKS (see Figure 19) is designed to accommodate the small-sized protective section MZS 282x321, when the latter is installed on the air intake head. The special adapter 3 is connected to the air duct with a diameter of 200 to 355 mm using the appropriate flange. The casing 1 with the small-sized protective section MZS 282x321 is attached to the special adapter with a bolted connection. The casing protects the section from mechanical damage and atmospheric precipitation.

When installing a small-sized protective section MZS 282x321 in a steel casing with a special adapter SKS, it is necessary to ensure access to the product for inspection and repair.

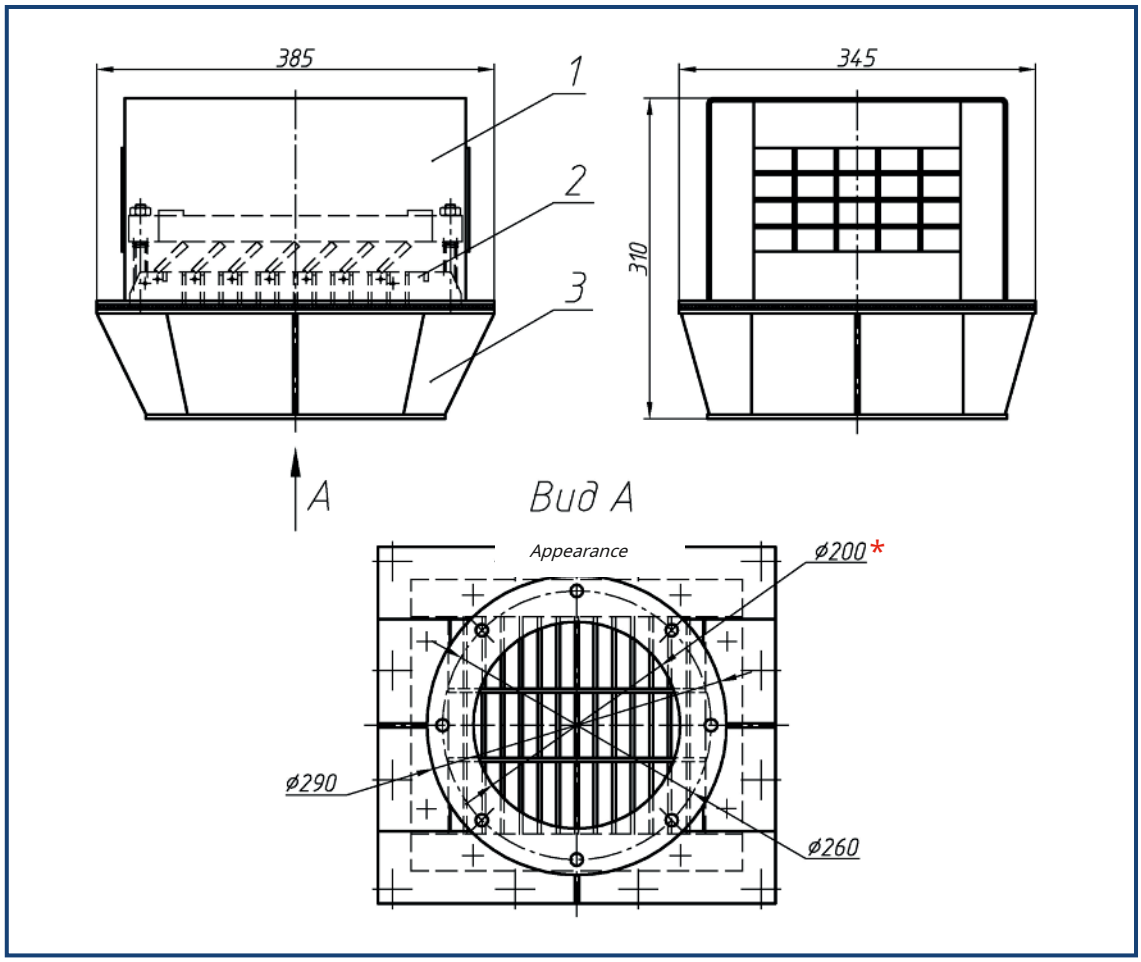


Figure 19 – Steel casing with special adapter 1 - Steel casing; 2 – MFA section 282x321; 3 - Special adapter.

* size can be changed at the request of the Customer

Expansion chambers of the DBK are designed to reduce the pressure of the shock wave that has passed through the explosion-proof protective section to a safe value and are used when connecting air ducts from the side.

Table 8 – Technical characteristics of expansion chambers of DBK

Parameter name		BRK-0.5	BRK-1A	BRK-1B
Overall dimensions, mm:	*width*	*570*	*1110*	*1100*
	height	*2830*	*2100*	*2650*
Nominal chamber volume, m3		*0.5*	*2*	*2*
Design load of the expansion chamber structure, kg/cm3		*0.2*	*0.2*	*0.72*
Weight, kg, no more		*190*	*220*	*237*

DBK expansion chambers are installed on ventilation systems in the direction of the blast wave behind the explosion protection sections. The expansion chamber of the DBK is welded to the plates embedded in the floor, around the circumference of the bottom.

BRK-0.5

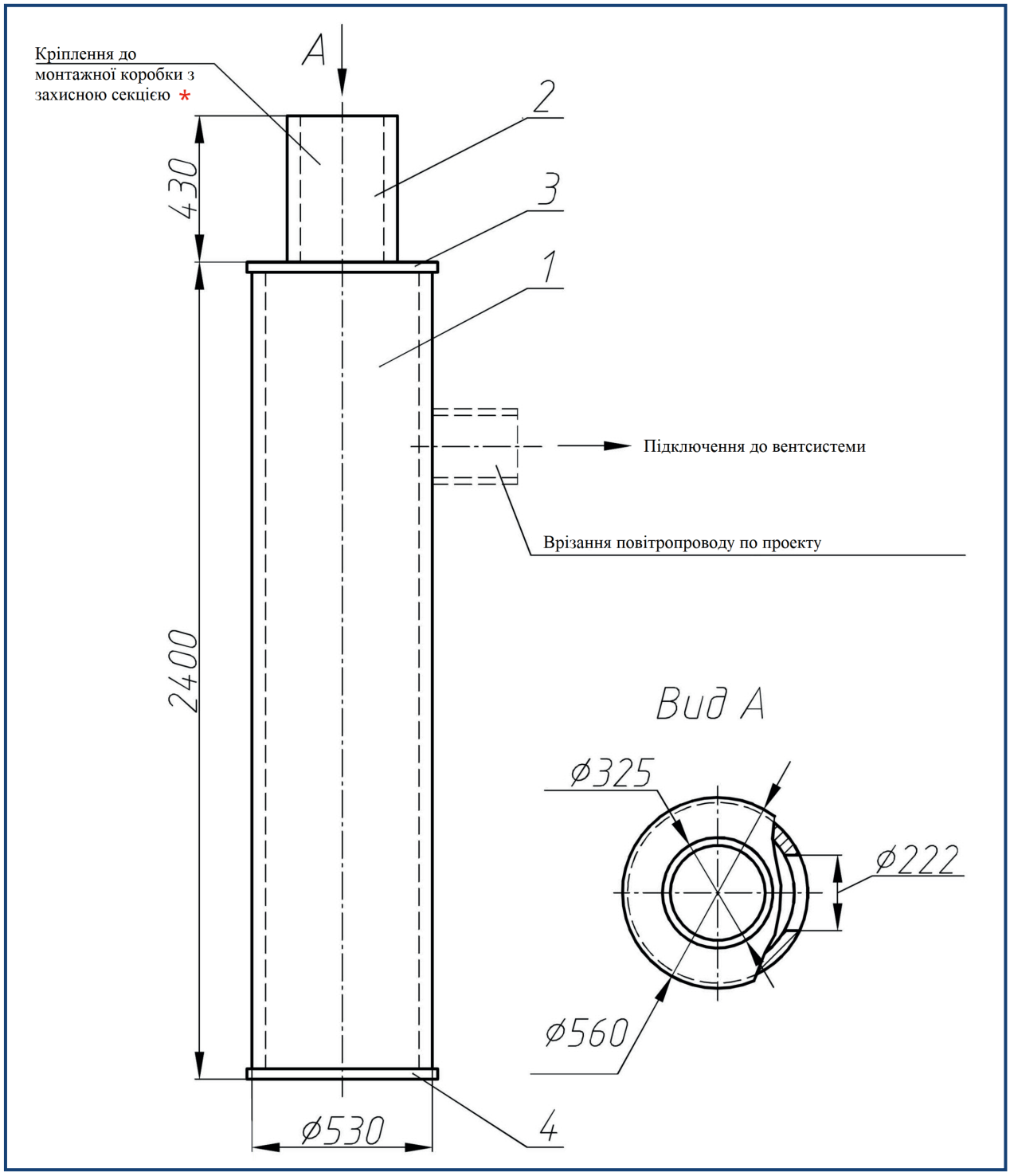


Figure 20 – Overall and connecting dimensions of the expansion joint BRK-0.5

* recommended use of explosion-proof protective section MZS 282x321 complete with mounting box KMZ-325

BRK-1A

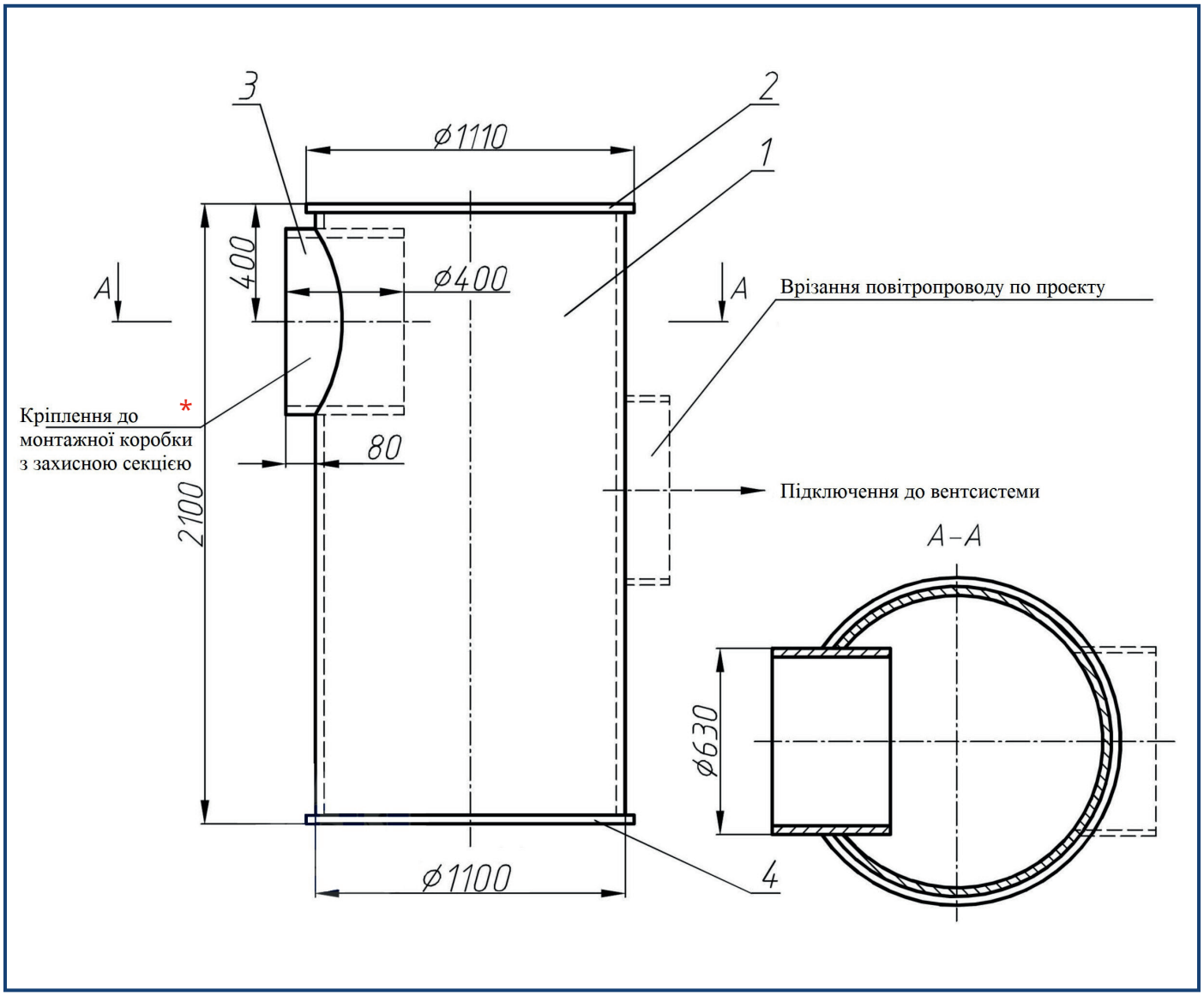


Figure 21 – Overall and connecting dimensions of the expansion BRK-1A

* recommended use of the explosion-proof protective section UZS 595x649 complete with the mounting box KUZ-630

BRK-1B

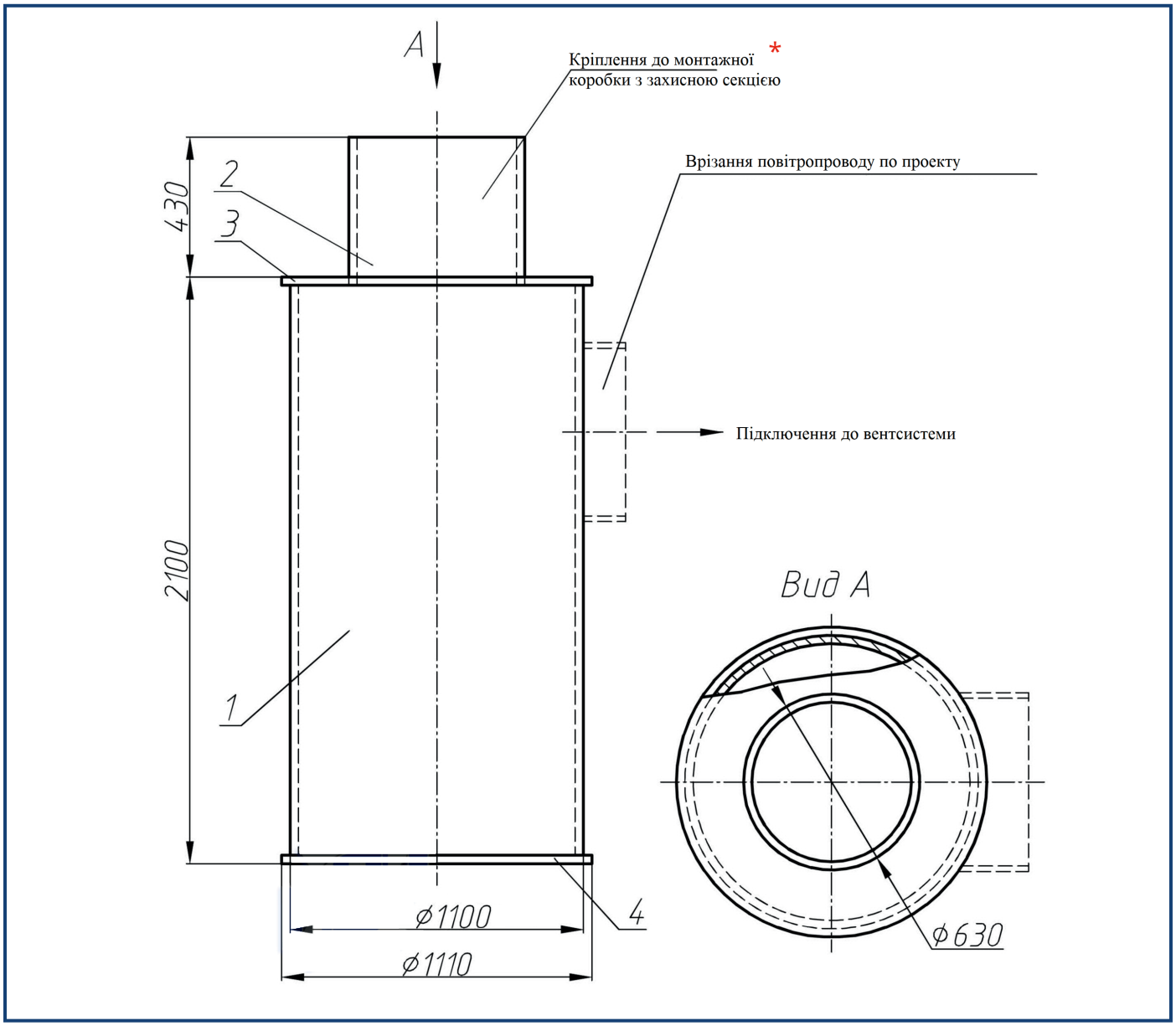


Figure 22 – Overall and connecting dimensions of the expansion BRK-1B

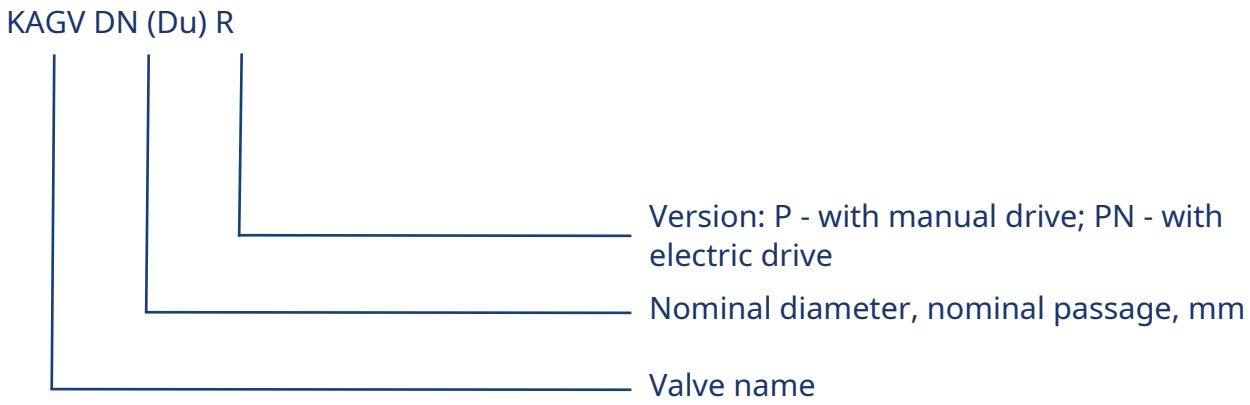
* recommended use of the explosion-proof protective section UZS 595x649 complete with the mounting box KUZ-630

HERMETIC VENTILATION VALVES

KAGV

KAGV hermetic ventilation valves with manual drive are designed for installation on air ducts of ventilation systems as shut-off devices.

Valves are used to reliably disconnect rooms from the outside environment or one room from another and have the following symbol structure:



The main components of manually operated KAGV valves are (see Figure 23):

• Body 1. When the valve gate is open, air passes through it. Environment: Steel body (welded construction);

• Plate (shutter) 2. A locking device that provides a tight seal overlapping of the valve passage cross-section;

• Lever 3. Presses the disc against the sealing surface of the seat of the housing 1;

• Axis 4. Connects plate 2 to lever 3;

• Spring 5. Stabilizes the plate in the flow, participates in the opening and closing the valve;

• Shaft 6. Transmits movement from the drive through lever 3 to plate 2;

• Manual drive 7. Transmits rotation to shaft 6 through a gearbox.

The main technical characteristics of KAGV valves with manual drive are given in Table 8.

Valve operating conditions are in Table 9.

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

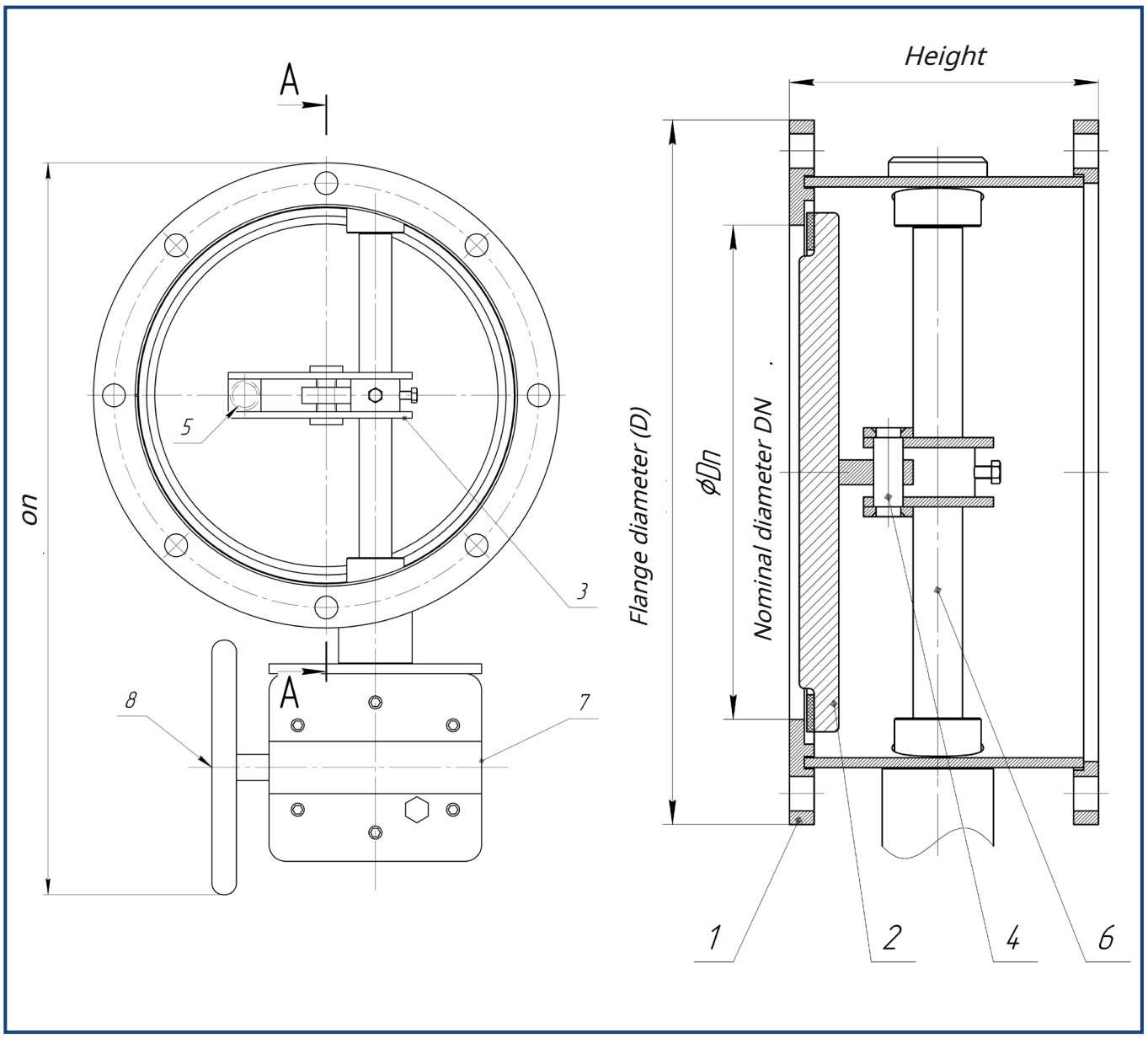


Figure 23 – General view of hermetic ventilation valves
KAGV with manual drive
1 – Housing, 2 – Plate (shutter), 3 – Lever, 4 – Axle, 5 – Spring, 6 – Shaft,
7 – Manual drive, 8 – Pointer

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

Table 9 – Technical characteristics of KAGV valves with manual drive

Name valve	Nominal diameter, DN, mm	Nominal pressure, PN, MPa(kgf/cm2)	Type management	Overall dimensions dimensions, WxHxD, mm	Weight, kg, no more
KAGV 100-R	100	0.1 (1.0)	Manual reason from reducer	415x125x205	22
KAGV 150-R	150			470x125x235	28
KAGV 200-R	200			515x125x285	35
KAGV 225-R	225			540x140x320	42
KAGV 250-R	250			570x160x340	54
KAGV 280-R	280			600x180x380	68
KAGV 300-R	300			620x200x430	75
KAGV 315-R	315			640x230x440	128
KAGV 355-R	355			680x270x490	144
KAGV 400-R	400			750x290x530	175
KAGV 450-R	450			800x290x580	182
KAGV 500-R	500			850x290x530	194
KAGV 560-R	560			920x290x590	212
KAGV 600-R	600			970x290x730	220
KAGV 630-R	630			1000x290x770	248

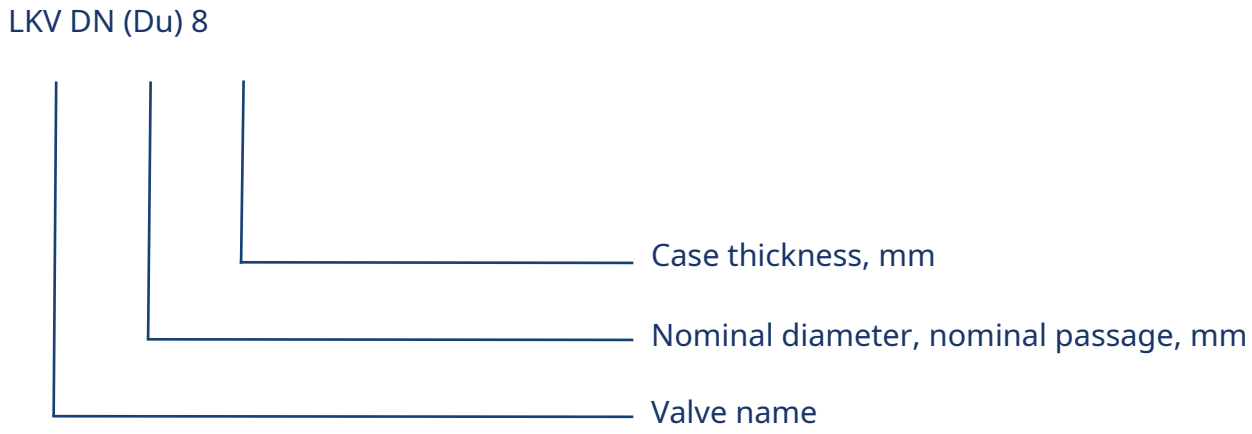
Table 10 – Operating conditions of manually operated KAGV valves

Name valve	Working environment	Temperature working environment, t, °C	Direction submissions environment	Assembly position	Joining air duct
KAGV 100-R - KAGV 630-R	Air ventilation systems.	From -30 to +50	"On a plate" (from the side shaft)	Any. Mostly – installation valve with horizontal position shaft.	Flanged with appropriate flanges.

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

LKV

LKV hatch inserts are designed for installation on air ducts of ventilation systems, as well as on diesel exhaust gas pipelines close to



Main components and working principle

The LKV hatch insert consists of the following main parts and assemblies (see Figure 24):

- T-body 1 with two flanges 4 and 5 at the ends and a side hatch, which provides the ability to visually or by touch check the condition and, if necessary, clean the pressure point of the valve plate of the sealed ventilation KAGV from clogging;

- cover 2, which hermetically closes the opening of the side hatch with the help of bolts through rubber seal;

- mating flange 6, supplied separately from the LKV insert hatch, for connection to the air duct.

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

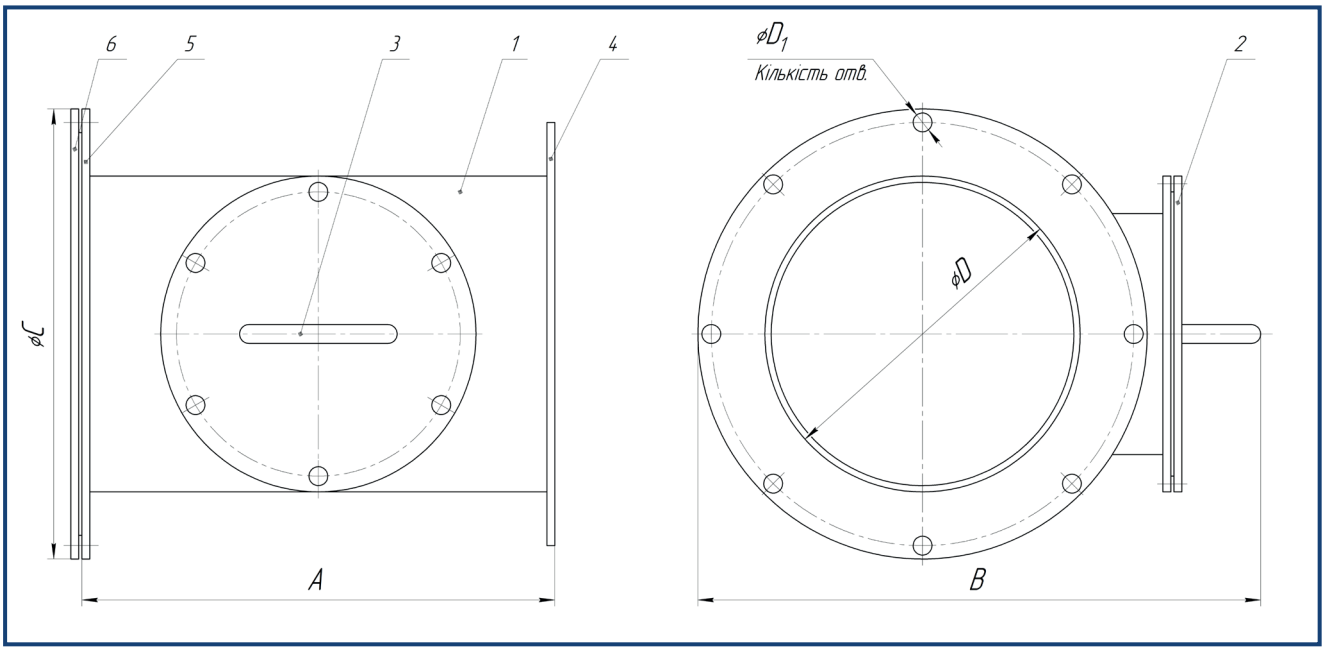


Figure 24 – The LKV hatch insert consists of the following main components parts and assemblies: 1-body-tee, 2-cover, 3-handle, 4-flange, 5-flange, 6- matching flange

Table 11 – Technical characteristics of LKV hatch inserts

Name	D,mm	A, mm	B, mm	C, mm	D1, mm	Number of holes, pcs.	Weight, max kg
LKV-200	200	300	370	290	14	8	20
LKV-300	300	360	500	430	13	12	38
LKV-400	400	460	620	530	14	20	68
LKV-600	600	540	810	730	14	24	108
LKV-800	800	670	1100	990	18	24	218
LKV-1000	1000	670	1320	1240	22	32	268

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

ZDKB

A throttle valve or throttle damper for bomb shelters is an element of a ventilation system used to regulate the speed and flow of air flow. The device allows you to equalize air resistance and regulate volumes.

There are round and rectangular cross-section valves. ZDKB butterfly valves for bomb shelters are made of thick sheet metal to protect against the blast wave. The gland in the ZDKB design is used to seal the gaps.

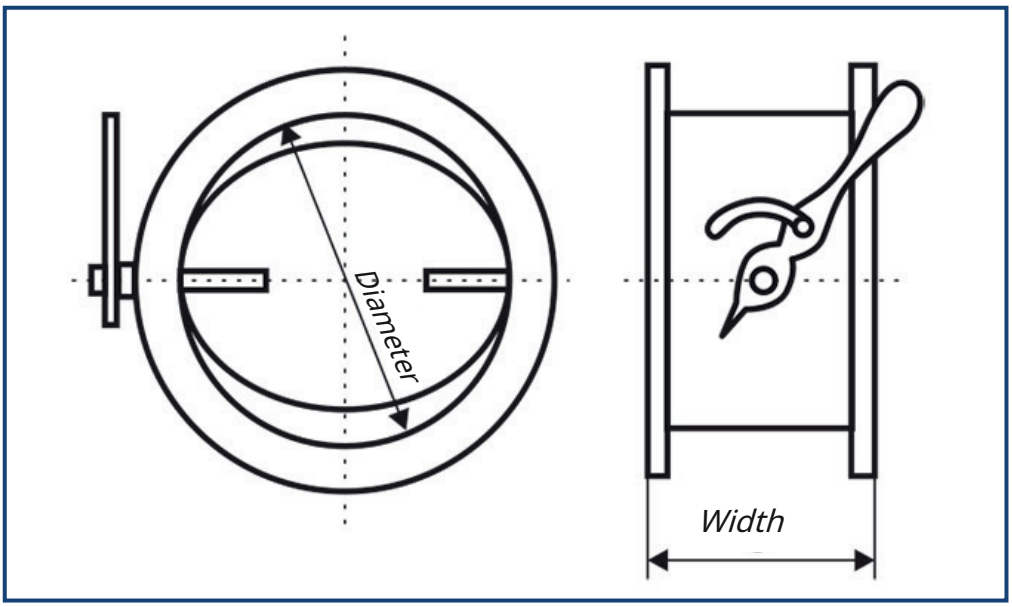


Figure 25 – Round throttle valve with ZDKB gland

Table 12 – Overall and connecting dimensions of the throttle valve round with gland ZDKB

Name	*Diameter, mm*	*Width, mm*
ZDBK-150	*150*	*170*
ZDBK-200	*200*	*200*
ZDBK-250	*250*	
ZDBK-300	*300*	
ZDBK-350	*350*	*200*
ZDBK-400	*400*	
ZDBK-450	*450*	

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

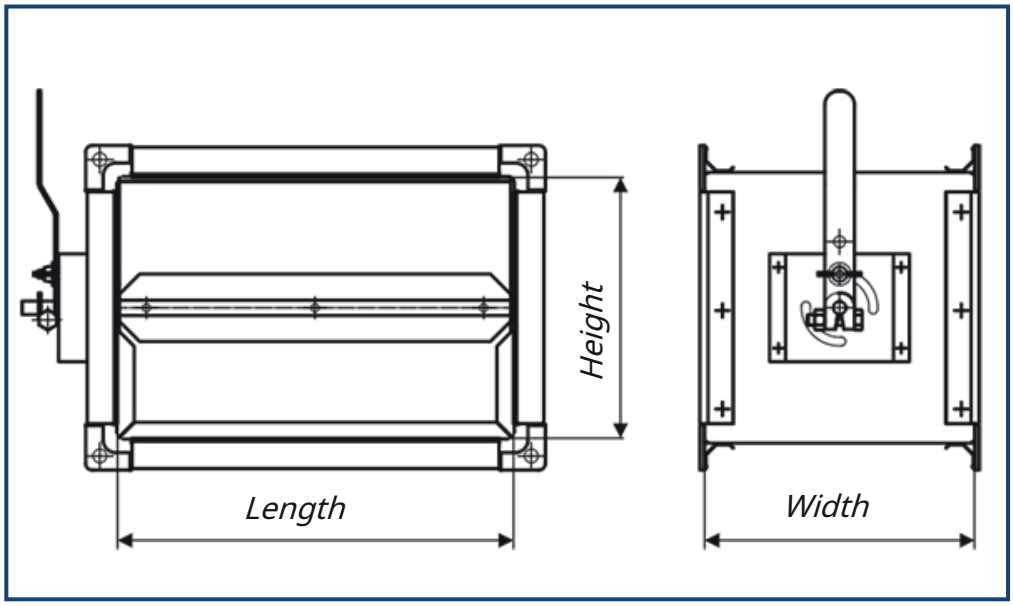


Figure 26 – Rectangular throttle valve with ZDKB gland

Table 13 – Overall and connecting dimensions of the throttle valve rectangular with gland ZDKB

Name	Length, mm	Height, mm	Width, mm
ZDKB-150x150	150	150	200
ZDKB-200x200	200	200	
ZDKB-250x250	250	250	
ZDKB-300x300	300	300	
ZDKB-350x350	350	350	
ZDKB-400x400	400	400	
ZDKB-450x450	450	450	

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

KNTM(A)

KNTM excess pressure valves are designed for installation on air ducts of ventilation systems:

• for automatic maintenance of constant overpressure of the set value values in adjacent rooms;

• to ensure air flow from one room to another in one direction only;

Pressure relief valves are available in conventional KNTM and anti-corrosion KNTMA versions. The conventional KNTM pressure relief valve is designed to operate in a clean air environment (air from ventilation systems); the anti-corrosion KNTMA version is designed to operate in an environment containing aggressive vapors (diesel exhaust gases).

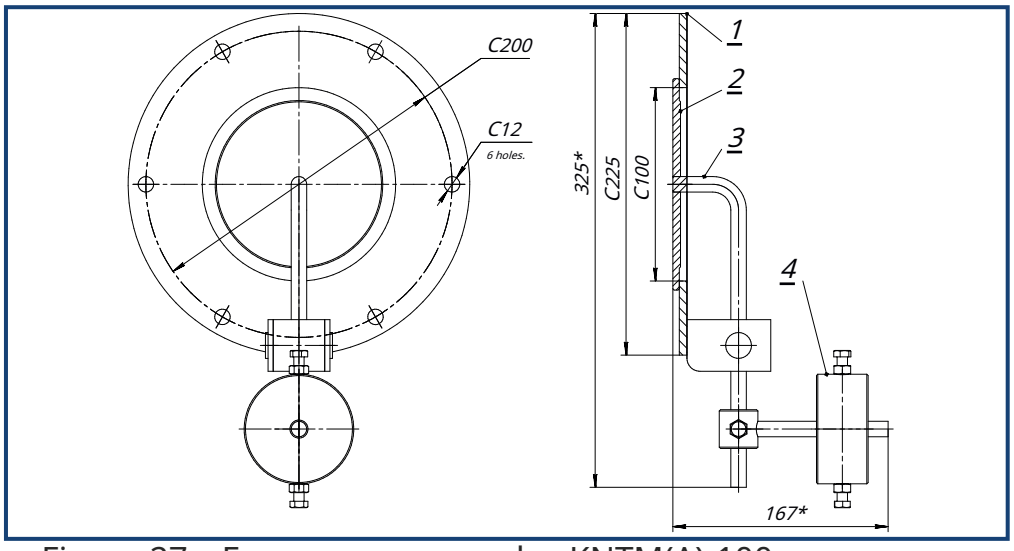


Figure 27 – Excess pressure valve KNTM(A)-100

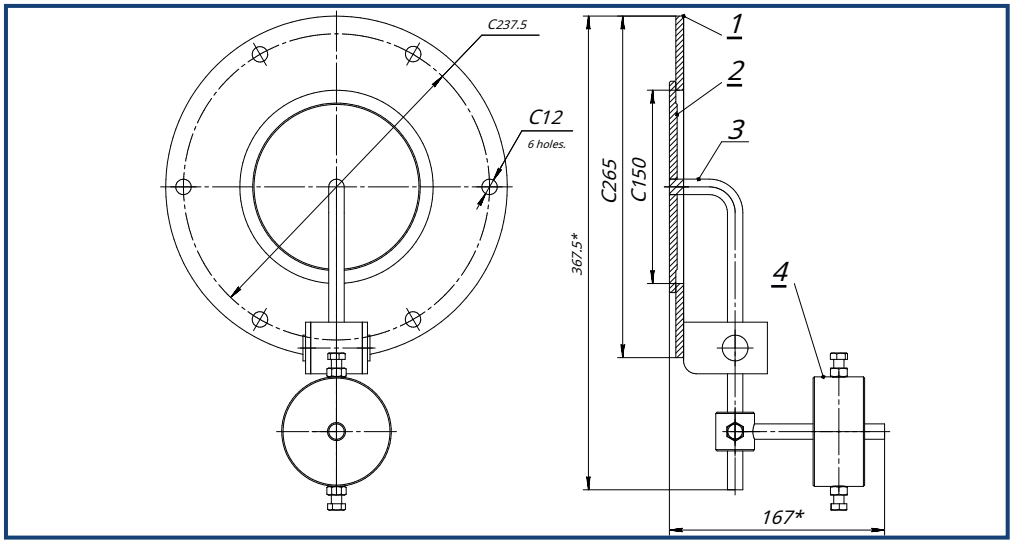


Figure 28 – Excess pressure valve KNTM(A)-150

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

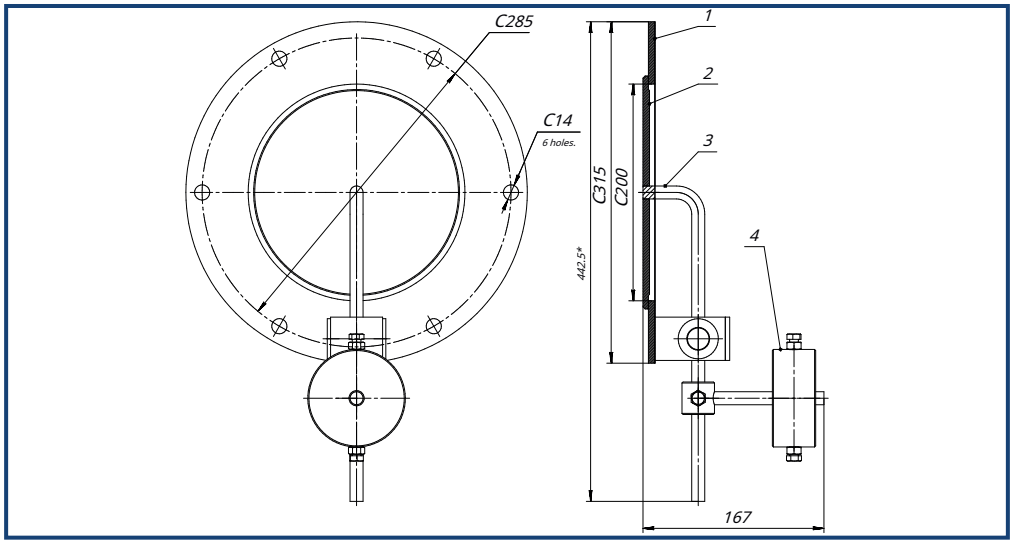


Figure 29 – Excess pressure valve KNTM(A)-200

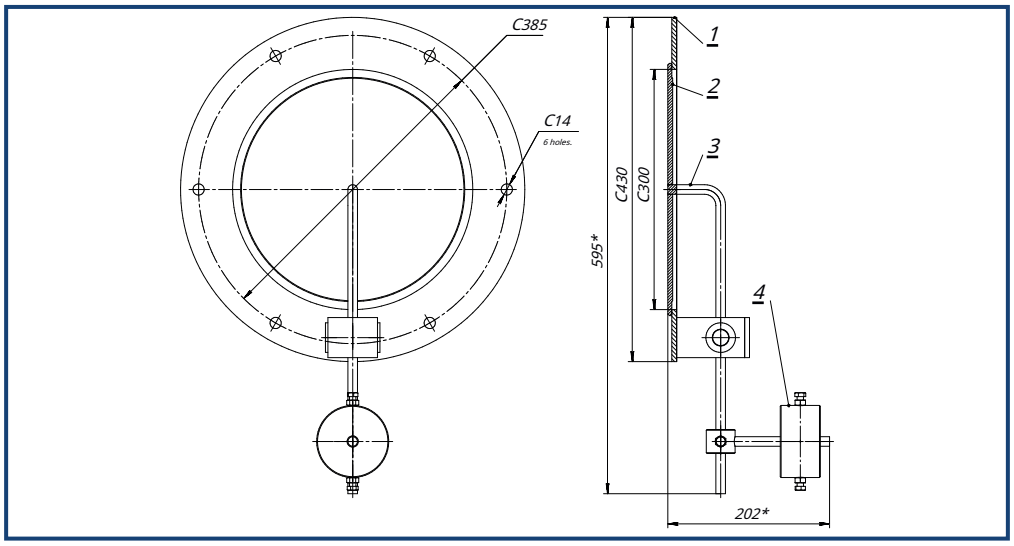


Figure 30 – Excess pressure valve KNTM(A)-300

Designations in the figures:

1 – Housing
2 – Taril
3 – Lever
4 – Adjustable counterweight system

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

Under the influence of the force created by the excess pressure on the surface of the plate 2, the excess pressure valve is activated (opened). Then, when equalization occurs or the specified pressure difference values are reached, the excess pressure valve, under the influence of the gravity of the counterweights 4 installed in the lever 3, closes.

The excess pressure valve is installed in a vertical position. The valve can be allowed to deviate from the vertical by ±3 degrees.

The excess pressure valve is set to operate automatically by shifting the counterweights 4 along the length of the slot on the lever 3.

The plate 2 of the excess pressure valve must be securely pressed against the seat part of the housing 1 along the entire circumference, preventing gaps and air leakage.

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

Table 14 – Main characteristics of KNTM(A) pressure relief valves

Parameters	KNTM-100	KNTM-150	KNTM-200	KNTM-300	KNTM-100	KNTM-150	KNTM-200	KNTM-300
Nominal diameter, mm	100	150	200	300	100	150	200	300
Implementation	General industrial				Anti-corrosion			
Working environment	Air ventilation systems				Diesel exhaust gases			
Working temperature environment, °C	From -30 to +40				Up to +120			
Start automatic operation when pressure changes, Pa (mm water level)	From 49.03 to 196.133 (from 5 to 20)							
Fixed position counterweight for automatic operation when pressure changes, Pa (mm water level)	49.03±1 (5±1)		98.1±1.5 (10±1.5)		147.1±2 (15±2)		196,133±2 (20±2)	
Verticality of installation valve	±3°							
Joining air duct	Flanged							
Weight, kg, no more	4.15	7.6	8.7	9.9	4.15	7.6	8.7	9.9

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

BRGZ

Regulating plugs are designed to regulate the volume of air. They are installed on ventilation openings in the walls of rooms and are used as a regulating and locking device.

Index BRGZ-150, BRGZ-200 means: regulating plug with a hole diameter of 150 or 200 mm.

Given that the plug is sealed in the closed position, to install it in the wall, a sealed installation pipe with a flange that matches the flange of the plug must be installed. The flange of the installation pipe is welded with a sealed seam. The installation pipe is installed in the wall so that its flange is located 100 mm from the wall for ease of installation.

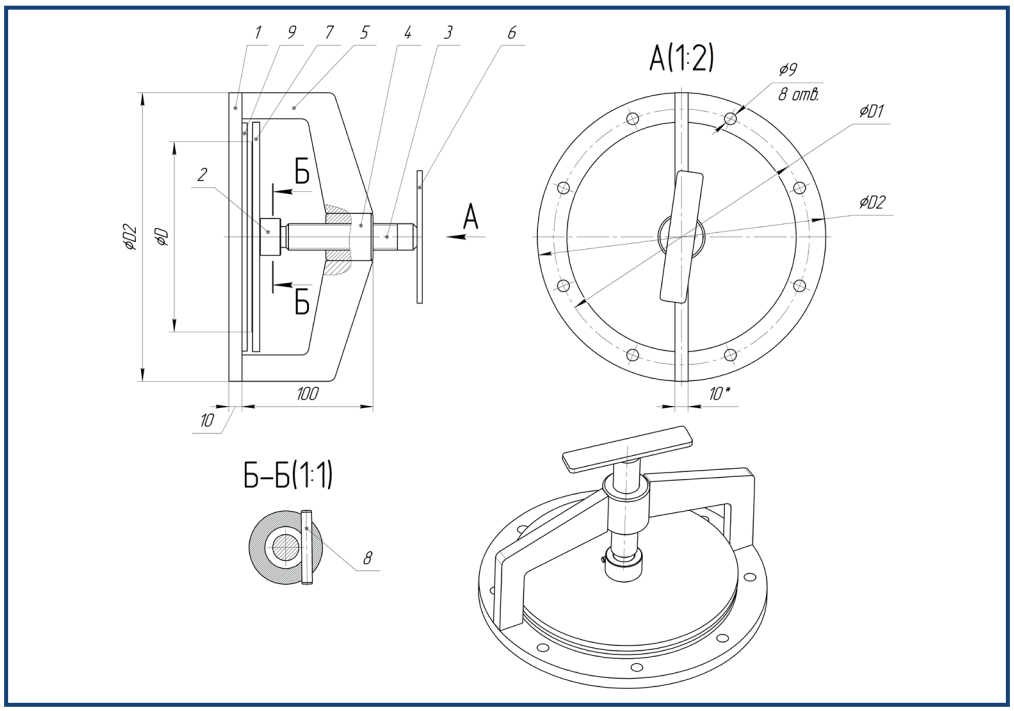


Figure 31 – BRGZ regulating plug
1 - flange; 2 - ring; 3 - screw; 4 - sleeve; 5 - rib; 6 - handle; 7 - clamp; 8 - cylindrical pin; 9 - gasket;

Table 15 – Overall and connecting dimensions of the BRGZ regulating plug

Name	*D*	*D1*	*D2*	*Weight, kg*
BRGZ-150	*150*	*195*	*220*	*4.5*
BRGZ-200	*200*	*245*	*270*	*5.3*

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

BPF-200

The BPF-200 filter-absorber is installed in the air ducts of ventilation systems of civil defense facilities, nuclear power plants and other types of storage facilities. Using couplings, pipes, tees and clamps, the filter-absorber is assembled into a column, which is connected to the air ducts.

The main purpose of the BPF-200 filter-absorber is to purify air in ventilation systems in II and III modes from radioactive dust, toxic substances, neutral and toxic fumes, as well as from biological agents at an air temperature of ±50°C, relative humidity up to 95%, provided that no droplet moisture enters the FPF-200.

When installing FPF-200 filter absorbers, the filter residence time with the plugs removed is a little more than 3-4 hours.

Table 16 – Technical characteristics of the BPF-200 filter-absorber

Parameter	*Unit of measurement*	*Value*
Nominal air flow rate	*m3/hour*	*200*
Filter resistance, no more	*Pa (kgf/m 2)*	*450 (45)*
Mass	*kg*	*31*

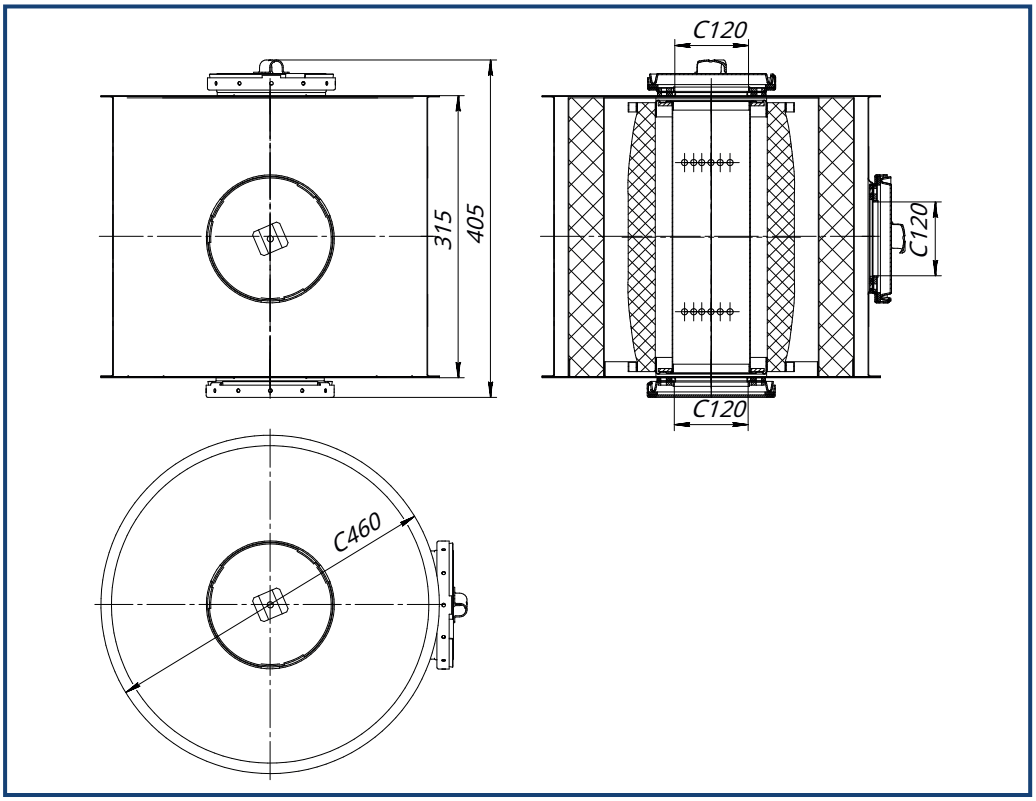


Figure 32 – Overall and connection dimensions of the filter-absorber

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

BFT-300

The FPF-300 filter-absorber is designed to purify the outside air entering the storage facility from toxic substances, radioactive dust, bacterial aerosols, toxic and neutral fumes. Installations equipped with FPF-300 filter-absorbers also provide protection against vapors of organic compounds of radioactive iodine.

The filter-absorber BPF-300L is designed to purify air from lewisite vapor at a concentration of no more than 2x10-3 vol.%.

The BPF-300 filter-absorber can be operated in all macroclimatic regions on land (except marine and tropical) with an ambient air temperature entering the facility of ±50°C, relative humidity up to 95%, with the exclusion of droplet moisture.

Table 17 – Main types of BPF-300(L) filter-absorber columns and their technical specifications

Name	*Nominal flow rate air, m³/hour*	*Joining ventilation systems*	*Filter resistance, Pa (mm. c.), no more*
BFT-300-300	*300*	*upper*	*450 (45)*
BFT-300-600	*600*		
BFT-300-900	*900*		
BPF-300-300N	*300*	*lower*	
BPF-300-600N	*600*		
BPF-300-900N	*900*		

Table 18 – Components of columns

Named components	*BFT-300-300*	*BFT-300-300N*	*BFT-300-600*	*BFT-300-600N*	*BFT-300-900*	*BFT-300-900N*
Filter-absorber FPF-300	*1*	*1*	*2*	*2*	*3*	*3*
PC corner pipe	*1*	*1*	*1*	*1*	*1*	*1*
STK glass	*1*	*-*	*1*	*-*	*1*	*-*
Or the lower glass STKN	*-*	*1*	*-*	*1*	*-*	*1*
TRK tee	*-*	*-*	*1*	*1*	*2*	*2*
HS clamp	*4*	*4*	*6*	*6*	*8*	*8*
MF coupling	*2*	*2*	*3*	*3*	*4*	*4*

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

Table 19 – Main technical characteristics of BFT-absorbing filters 300(L)

Parameter	*Unit of measurement*	*Value*
Nominal air flow rate	*m3/hour*	*300*
Filter resistance, no more	*Pa (kgf/m 2)*	*450 (45)*
Leakage rate (suck-up coefficient), no more	*%*	*0.1*
Mass	*kg*	*39.5*

The minimum distance from the floor to the bottom of the filter is at least 50mm. Filter-absorbers FPF-300 can be installed on a box-stand.

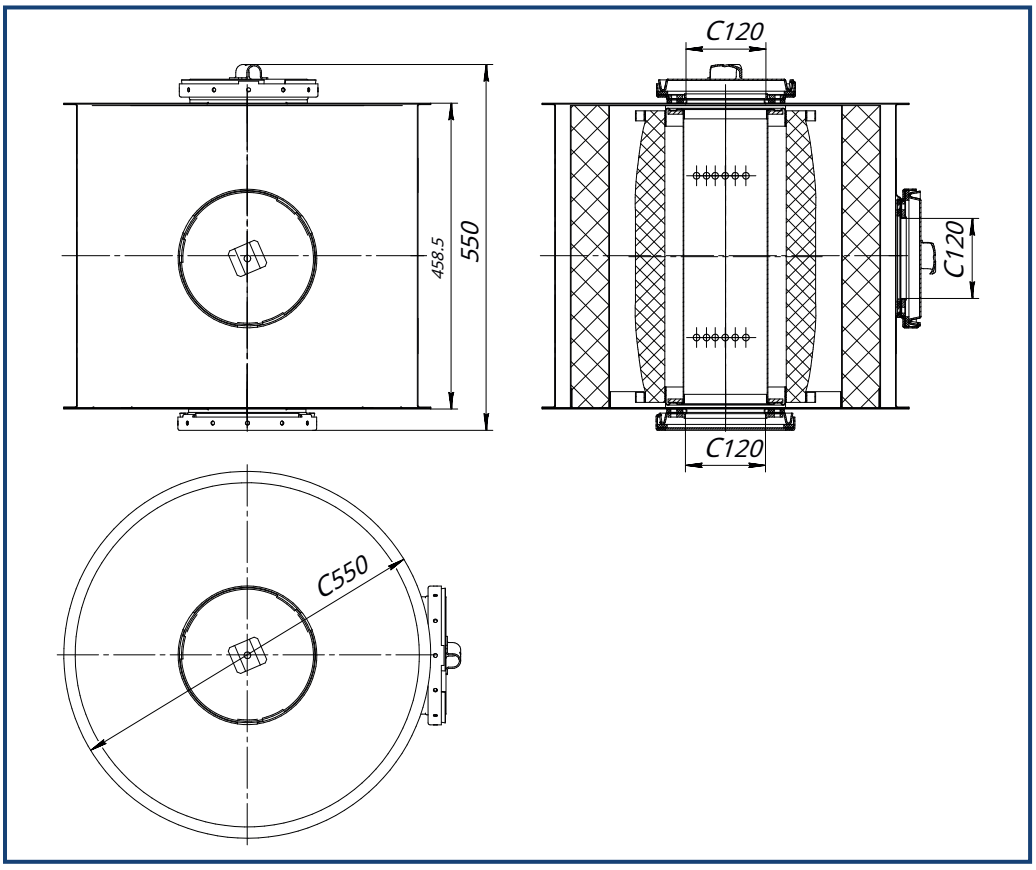


Figure 33 – Overall and connection dimensions of the filter-absorber FFT-300

* the catalog shows the main dimensions of the device, it is possible to manufacture non-standard dimensions

GK-F

The GK-F double hermetic valve is designed to switch the operation of the filter-ventilation unit from the ventilation mode to the filtration mode or to completely disconnect the unit from the ventilation system. The design of this valve has one inlet pipe with a diameter of 120 mm with a flange for connecting it to the air intake duct or dust filter and two outlet pipes with a diameter of 120 mm for connecting to the bypass line and filter-absorbers of the unit. The inlet holes are covered with angle hermetic valves. The clamping is carried out by screwing the handle onto the valve gland.

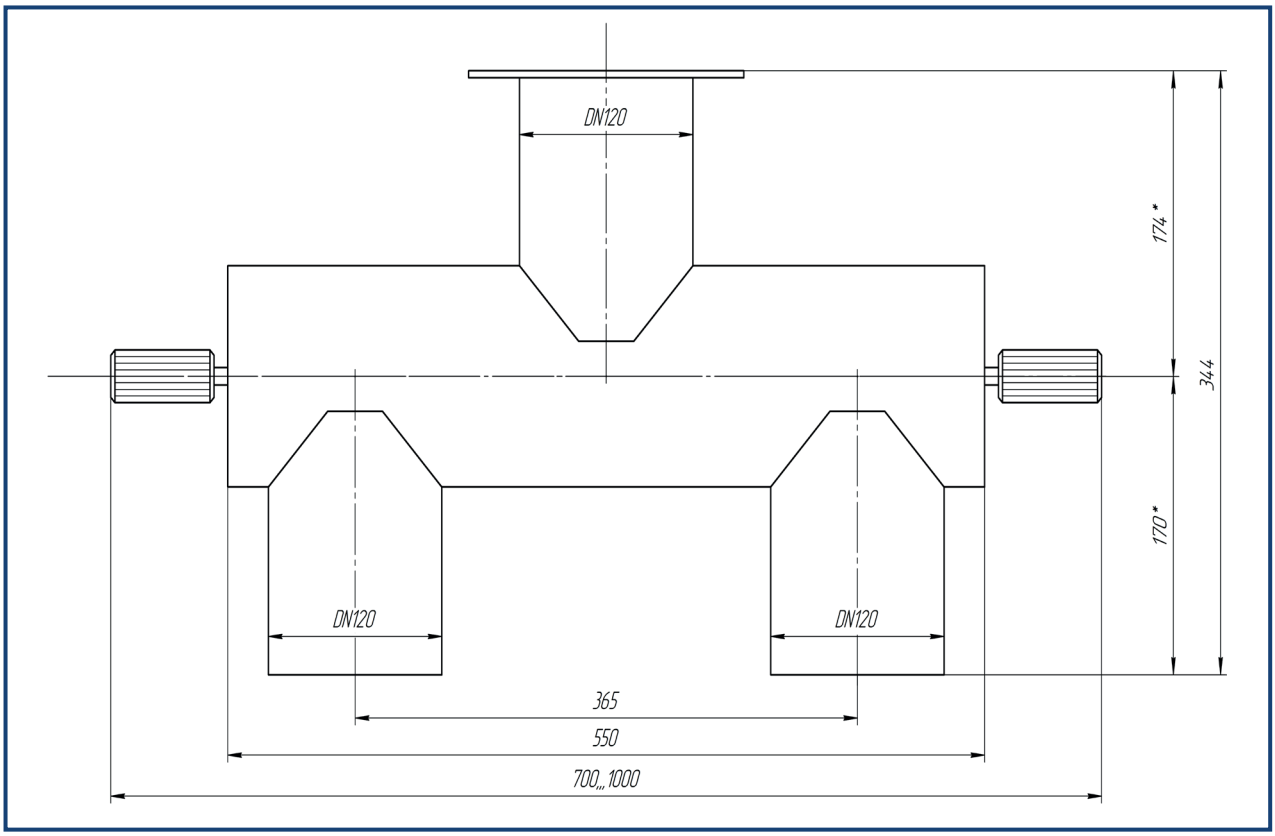


Figure 34 – Double hermetic valve GK-F

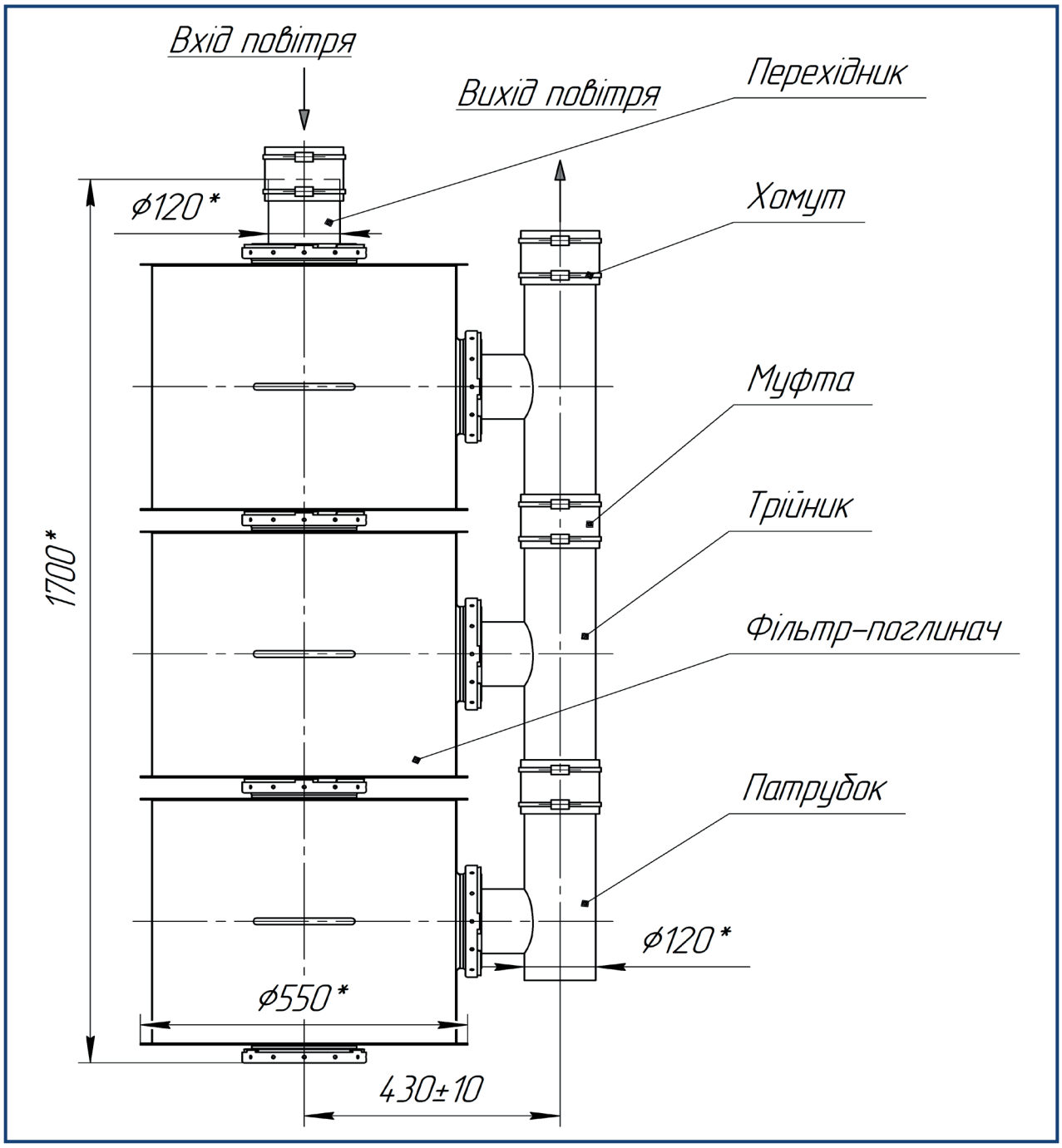


Figure 35 – Filter connection kit-absorbers

PFB-1000

Appointment

The purpose of the PFB-1000 pre-filter is to finely purify the air from all types of dust, including radioactive dust.

PFB-1000 is used in all ventilation modes, in any above-ground and underground premises, in the temperature range from -50°C to +50°C. Permissible relative air humidity is 95%.

Working principle

The principle of operation of the PFB-1000 pre-filter is that polluted air enters the pre-filter housing, passes through four filtering sections of the filter pack and then, after preliminary cleaning, enters other filter absorbers (BPF-200 or BPF-300) for further, finer cleaning.

The PFB-1000 pre-filter can be installed in both vertical and horizontal positions.

Before the PFB-1000 filter, it is necessary to install a coarse filter box BBFYA.

To connect the suction and discharge air ducts, flanged pipes are provided on the filter housing.

Table 20 – Main technical characteristics of PFB-1000 prefilters

Parameter	*Unit of measurement*	*Value*
Nominal air flow rate	*m3/hour*	*1000*
Initial resistance at constant air flow, no more	*Pa (mm H2O)*	*245 (25)*
Final resistance at constant air flow, no more	*Pa (mm of water column),*	*735 (75)*
Leakage coefficient (degree of leakage), no more	*%*	*1*
Air purification efficiency at an average particle diameter of 0.31 microns, not more	*%*	*86*
Mass	*kg*	*55*

The PP-1000 filter pack can be supplied separately for replacement.

PFB-1000

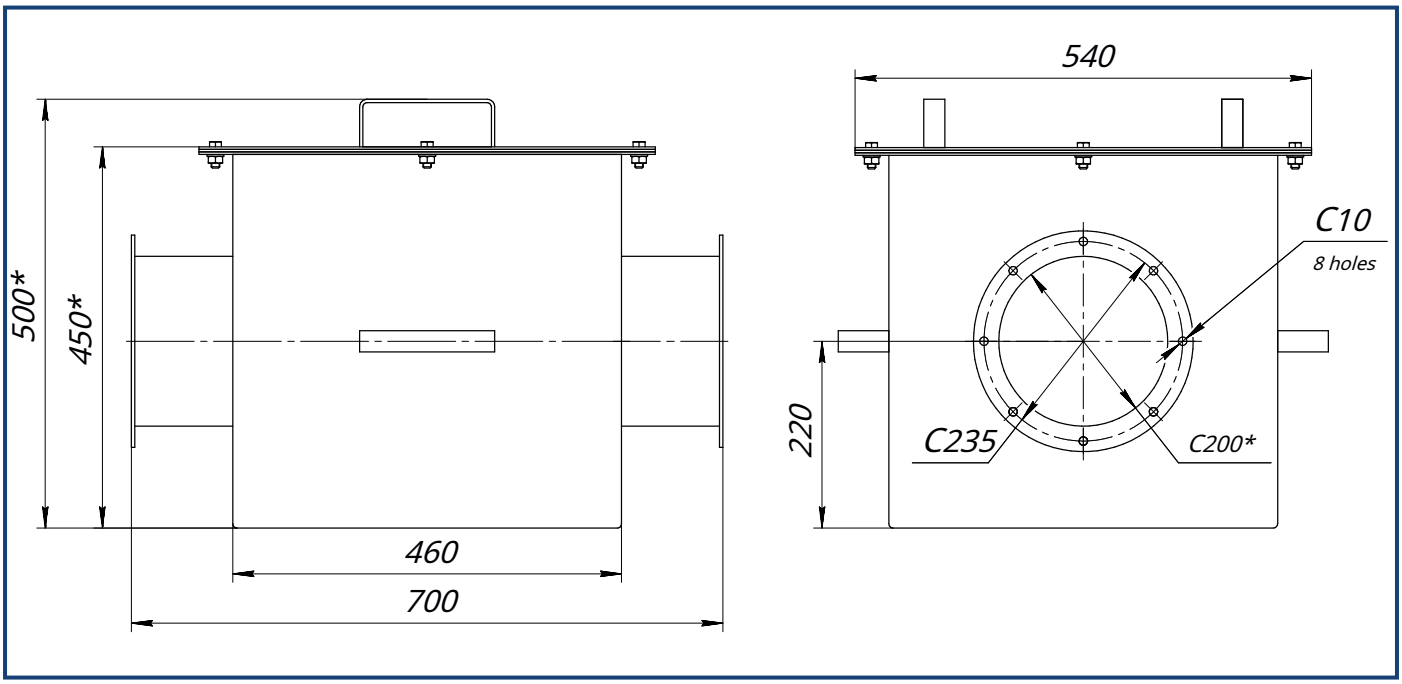


Figure 36 – Overall and connection dimensions of the packet filter PFB-1000

BBFYA

The BBFYA filter box is a coarse filter and is designed to clean the air from dust in supply ventilation systems of shelters/bomb shelters, as well as in various technological units and systems.

The efficiency of cleaning with BBFYA air filter boxes is up to 90%.

Table 21 – Main technical characteristics of the BBFJ filter box

Parameter	*Unit of measurement*	*Value*	
		BBFYA-1500	*BBFYA-3000*
Throughput	*m3/hour*	*1540*	*3080*
Initial resistance at constant air flow, no more	*Pa (mm H2O)*	*50 (5)*	*100(10)*
Final resistance at constant air flow, no more	*Pa (mm of water column),*	*150 (15)*	*300(30)*
Specific air load	*%*	*7000*	*7000*
Mass	*kg*	*48*	*50.5*

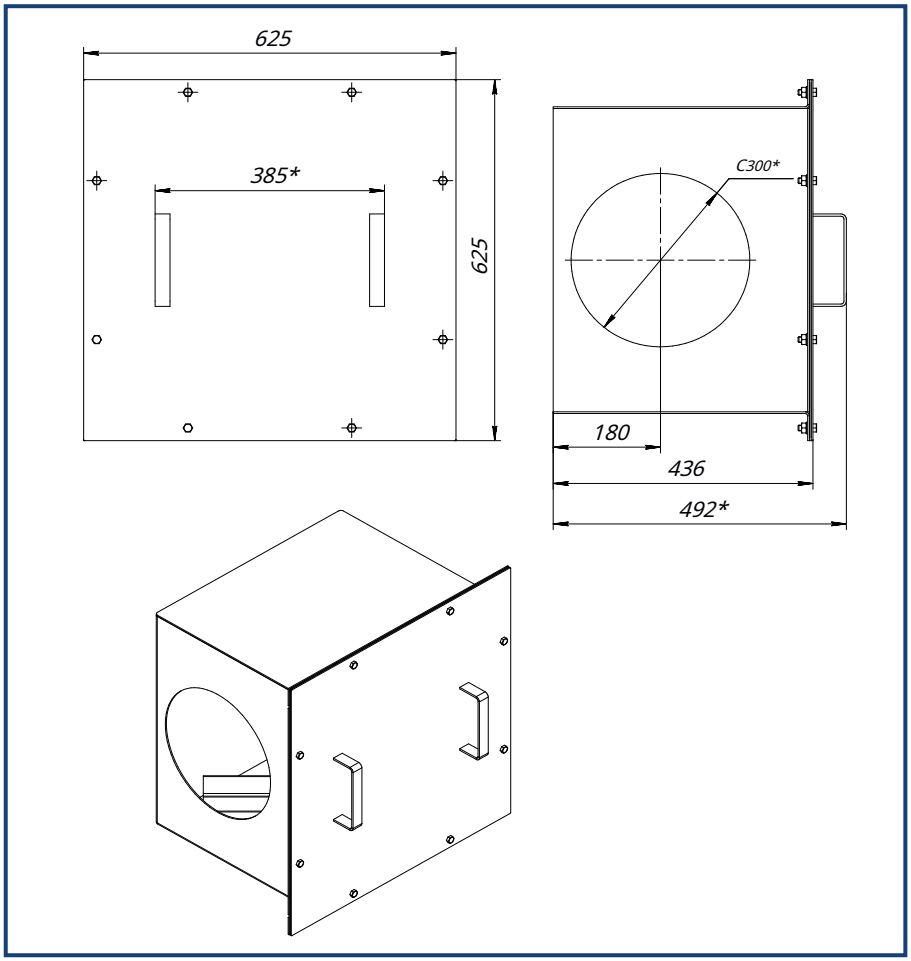


Figure 37 – Overall and connecting dimensions of the BBFJ filter box

BRP-150

Appointment

The main purpose of the BRP-150 regenerative cartridge is to purify the air from carbon dioxide in the III ventilation mode (regeneration mode) by absorbing it. The BRP-150 regenerative cartridge is used in the equipment of air purification and ventilation systems of storage facilities and other civil defense structures.

The BRP-150 regenerative cartridge is designed to operate both under pressure and under vacuum conditions. Air is supplied to the cartridge using ventilation equipment.

Main components and working principle

The BRP-150 regenerative cartridge has three holes with a diameter of 120 mm: one side for air inlet, two end holes for outlet. The air to be cleaned enters the cartridge through the side hole, passes through the absorber layer, where it is cleaned of carbon dioxide.

The BRP-150 regenerative cartridge is intended for single use; it is switched on when the carbon dioxide concentration in the air of the shelter reaches 2%. If the instrument readings indicate that the carbon dioxide concentration has reached 2.5-3%, the service life of the BRP-150 regenerative cartridge has expired and the cartridge must be replaced.

The BRP-150 regenerative cartridge is designed for operation in the temperature range from plus 18 to plus 35°C and relative humidity from 30 to 95%.

Table 22 – Main technical characteristics of the regenerative cartridge BRP-150

Parameter	*Unit of measurement*	*Value*
Productivity	*m^3/hour*	*150*
Air resistance in the cartridge, no more	*Pa (mm H2O)*	*354.8 (36)*
The area occupied by the equipment is no more than	*m^2*	*0.54*
Installation service area, not less than	*m^2*	*0.8*
Mass	*kg*	*119*

Additional information

The BRP-150 regenerative cartridge is intended for single use.

The minimum distance from the floor to the bottom of the BRP-150 regenerative cartridge is 50mm.

The purified air after the BRP-150 regenerative cartridge does not require cooling.

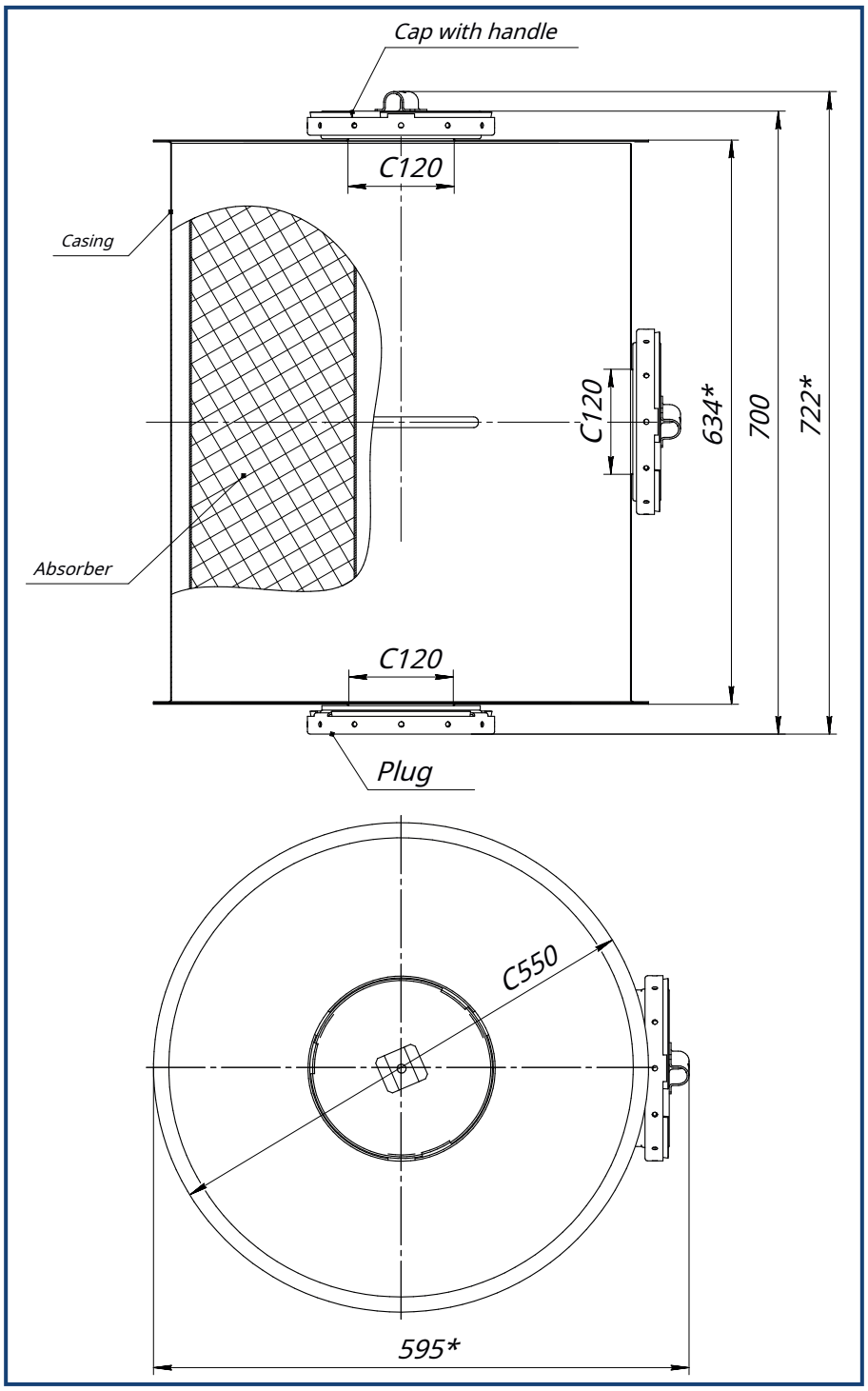


Figure 38 – Overall and connection dimensions of the regenerative cartridge BRP-150

Regenerative units are designed to purify the internal air of a shelter/bomb shelter from carbon dioxide and enrich it with oxygen in ventilation mode III (regeneration mode).

The main components of regenerative plants are:

- regenerative cartridges;
- dust collector;
- hermetic valve;
- air duct;
- installation frame;
- air flow indicator;

Working principle:

When the unit is operating, the air first passes through the cartridges, the air is purified from carbon dioxide and enriched with oxygen. The unit should be located in the room so that there is free access to it from all sides.

Air regeneration in the unit is accompanied by an increase in its temperature. The maximum temperature of the air leaving the cartridges is 40°C. The regenerative unit (or several units) is mounted on a concrete floor in a separate room. Heat release from the units to the rooms where they are installed is not taken into account, ventilation of these rooms in wartime is not provided, since maintenance of this equipment is carried out for a limited time.

Installation of the installation in a shelter/bomb shelter consists of assembling it without connecting the air ducts to the cartridges. The cartridges are stored in the installation in a sealed state. The seals from the cartridges are not allowed to be torn off until the installation is put into working condition.

Regenerative installations are selected individually for each facility, taking into account all the wishes of the Customer. Please send a request to the corporate email, or contact your manager!

The catalog is being updated.