



KLIMATECH

Trust the traditions





Automatic switch

Choosing automatically between cooling and heating to reach the selected set temperature.



Ventilation

The air-conditioning system can be used only for ventilation, without cooling and heating.



Fan speed

It allows a two-speed working mode of the fan.



Soundproofing

The Klimatech air-conditioning systems are soundproofed and conform to the noise standards.



Air filter

It catches the dust from the air and provides constantly fresh air.



Energy efficiency

The Klimatech air-conditioning systems are energy efficient and economical.

Europe - Bulgaria - Dimitrovgrad



KLIMATECH



„Klimatech“ AD Dimitrovgrad is the first factory for air-conditioning appliances in Bulgaria.

It was established in 1969. It is situated on the area of 40 000 m², 14 000 m² of which are built up with production and warehouse facilities.

The company constantly works to increase the range and the quality of the offered products.

The main directions in which „Klimatech“ AD is specialized are:

- ✓ Air-conditioning and ventilation
- ✓ Heat exchange apparatuses
- ✓ Air dedusting

The company offers to its clients a complete service which includes:

- ✓ Design
- ✓ Manufacture
- ✓ Delivery
- ✓ Installation
- ✓ Installation supervision
- ✓ Warranty and post warranty service

The products of „Klimatech“ are well accepted not only in Bulgaria but abroad as well - Russia, Kazakhstan, Moldova, Ukraine, Sudan, France, and Austria.

The company has taken part in the construction of complex projects of „Glavbolgarstroy“ AD: residential complexes, catering establishments, shops, gymnasiums, hospitals, stadiums, NEK (National Electricity Company), in the field of chemistry and metallurgy.

„Klimatech“ AD has taken part with its products in technical exhibitions and fairs. The company was awarded with:

- ✓ A Gold Medal in the „Balkans without Borders“ Exhibition in 1999 in Vidin.
- ✓ A Certificate of Honour of the „Bulgarian Days in Macedonia“ in 2000 in Skopje.
- ✓ A Gold Medal of the 57-th International Technical Fair - Plovdiv, 2001.



Since 2002 „Klimatech“ AD has installed and serviced System for quality control certified according to ISO 9001: 2000.

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Comfort for you

Air-conditioning and ventilation

Air Heating Units CKK type

The Air Heating Units CKK type are designed to process the air in the central air - conditioning and ventilation installations for domestic and industrial needs.

They are composed of separate modules which provide the opportunity for different combinations, and the requirements of the project are taken into account.

The company offers 11 standards according to the measurements installations, which include the following types of modules:

- General
- Filter Class EU3-EU7
- Ventilation
- Heating
- Cooling
- Moisture
- Silencer

The Air Heating Units which „Klimatech“ AD manufactures have TÜV Certificate in conformity with the European machine norms into operation:

MD 98/37/EEC and LVD 73/23/EEC

For electromagnetic compatibility:

EMC 89/336/EEC

And the harmonized European Standards:

EN 1886:05.1998

- Strength class - 2A
- Hermetically class -A
- Thermal transmittance - T3
- Sound pressure level $\leq 50\text{dB/A/}$

EN 60 439-1:01.1994

EN 60 204-1:12.1997

EN 50081-1:01.1992

The structure of the Air Heating Units CKK type was awarded with a Gold Medal of the 57-th International Technical Fair in Plovdiv in 2001.



Air Heating Units CKK type



The Air Heating Units are used for air-conditioning and ventilation of public building: cinemas, theatres, hotels, clubs, restaurants, production sheds, and warehouses.

Parameters of the Air Heating Units

Fan flow: $500 \div 80\,000 \text{ m}^3/\text{h}$

Free pressure: $300 \div 1100 \text{ Pa}$

Heat capacity:

- when the heat carrier is hot water: $4 \div 1777 \text{ kW}$
- when the heat carrier is steam: $10 \div 1490 \text{ kW}$
- electrical energy: $1 \div 50 \text{ kW}$

Refrigerator capacity:

- when the cold carrier is cold water: $5 \div 960 \text{ kW}$
- when the cold carrier is Freon R22: $5 \div 560 \text{ kW}$

Silencing:

- up to 18 dB/A/

Filtering:

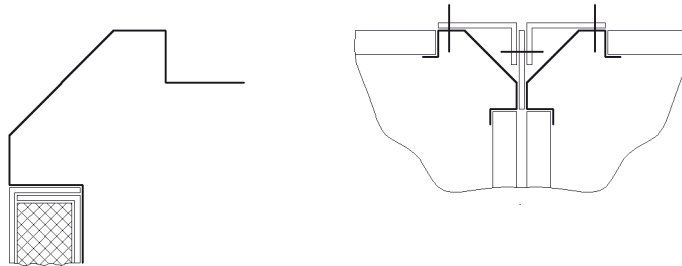
- rough filter class EU3
- fine filter class EU7
- „Hepa“ filter class EU13



„Klimatech“ AD manufactures installations type CKK in hygiene modification: for hospitals, operation rooms, electronics, and pharmacy.

Air Heating Units CKK type

- The modules construction allows when the order of the modules is set to be realized as a block construction, two-storey and so on dimension realization.
- The housing of the separate modules and blocks are realized as it follows:
 - the bearing structure of steel profiles with moulded angles



- The plates of the units and the blocks are produced in two variants:
 - a 2 mm thick panel with plates of steel sheets zinc coated or powder painted and insulation of mineral wadding;
 - a 20÷40 mm thick panel with plates of steel sheets where the inside is perforated and has an insulation of mineral wedding (for special purpose).
- The modules are joined together with an eccentric connection or with a bolt connection.
- The thickness between the frame and the sides, as well as between the separate modules is provided by rubber gaskets with different section and silicon gasket.
- CKK is designed for each specific occasion including according to the investor's request, according to the requirements of the ISO 9001:2000 standard.
- The Air Heating Units with standard manufacturing can be installed only in facilities with normal fire risks.
- The units are to be installed on leveled metal frames, which are cemented in the concrete grounds. A rubber gasket is put between the frames and the units.
- The connection between the separate modules must ensure the air impermeability of the construction.
- The exploitation of the units must be one by qualified specialists.

The Air Heating Units are equipped with fans of the European Union which guarantee reliability during the exploitation and low noise characteristics.



Air Heating Units CKK type

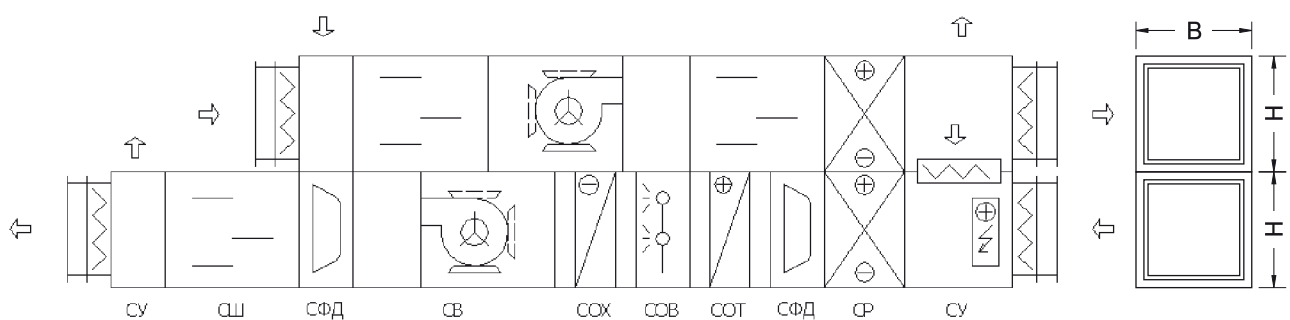
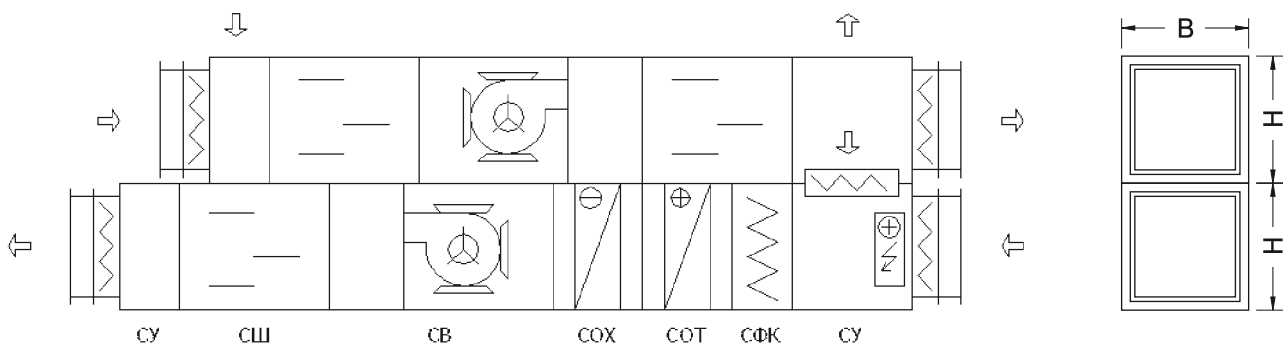
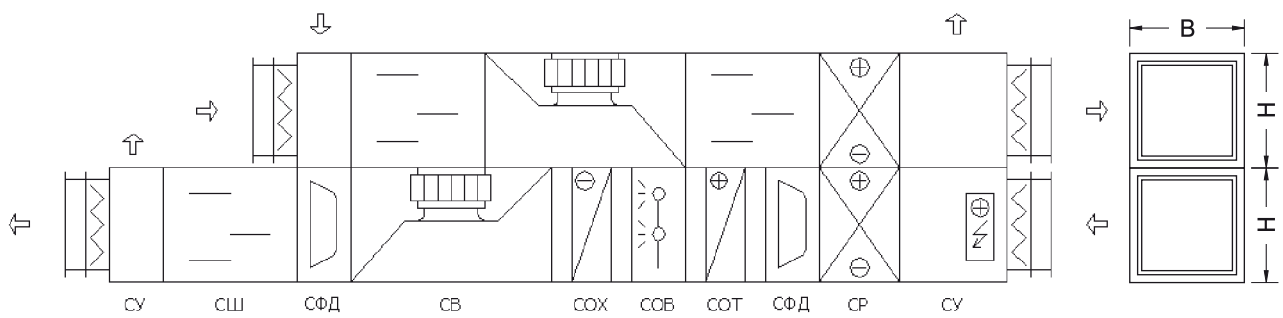
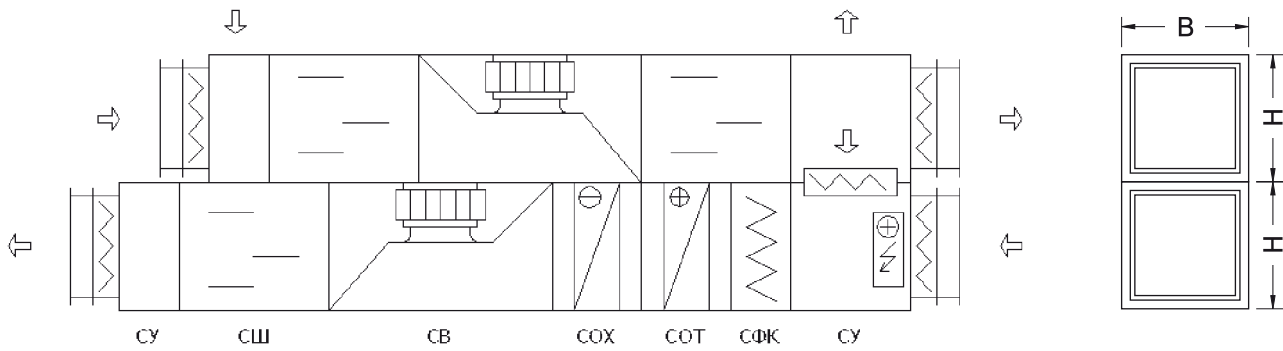


The Choice of type size according to flow and pressure

Type size CKK BxH mm	F m ²	Flow, m ³ /h																			
		0,5	1	1,5	2	3	4	5	6	7	8	9	10	15	20	30	40	50	60	70	
560 x 560 pressure 600 ÷ 300 Pa	0.22																				
660 x 660 pressure 600 ÷ 300 Pa	0.325																				
760 x 760 pressure 800 ÷ 300 Pa	0.449																				
860 x 860 pressure 800 ÷ 300 Pa	0.523																				
960 x 960 pressure 1000 ÷ 300 Pa	0.757																				
1060 x 1060 pressure 1000 ÷ 300 Pa	0.941																				
1260 x 1260 pressure 1000 ÷ 300 Pa	1.369																				
1360 x 1360 pressure 1000 ÷ 300 Pa	1.623																				
1560 x 1560 pressure 1500 ÷ 300 Pa	2.161																				
2060 x 2060 pressure 1500 ÷ 300 Pa	3.881																				
2580 x 2580 pressure 1500 ÷ 300 Pa	6.2																				

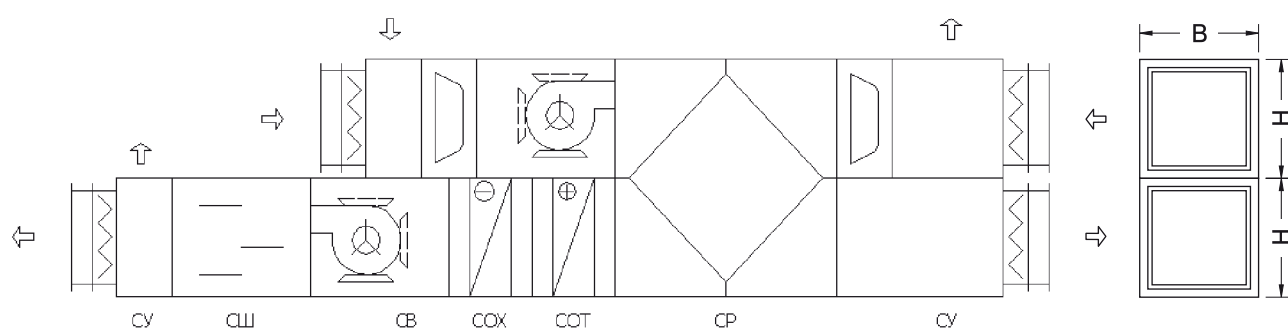
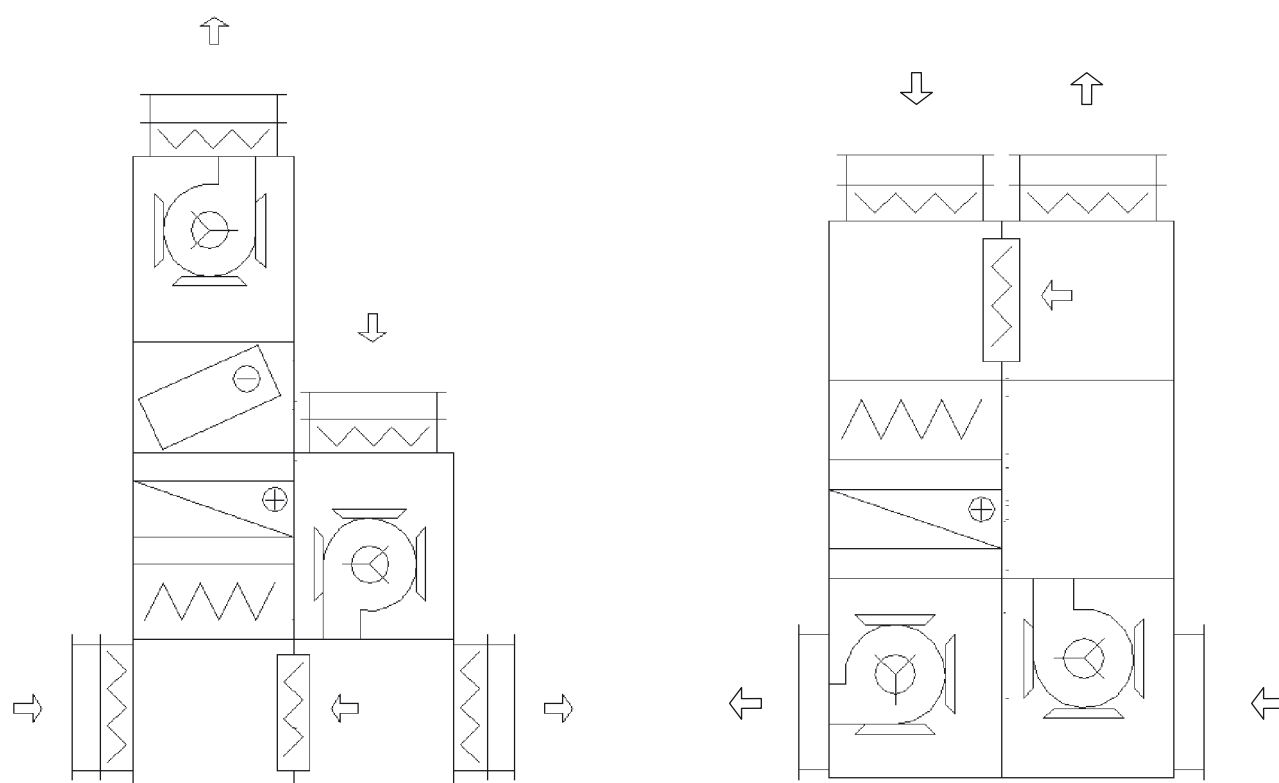
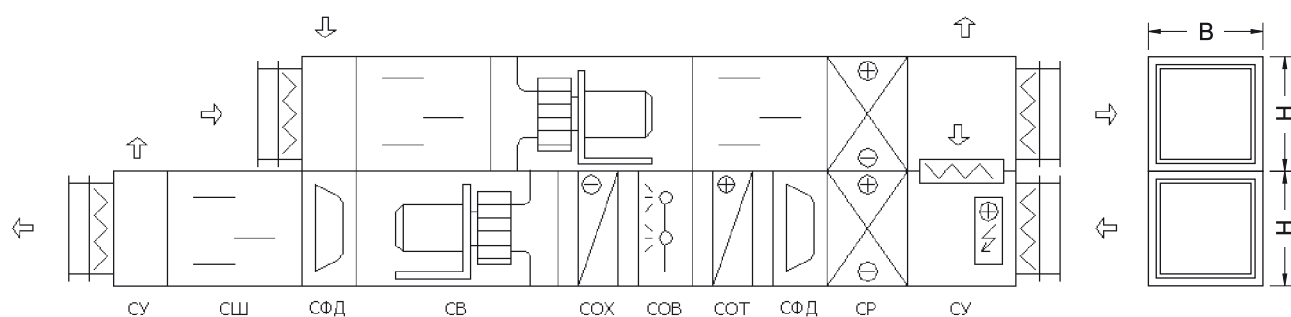
Air Heating Units CKK type

Variants to order CKK



Air Heating Units CKK type

Variants to order CKK



Air Heating Units CKK type

General Module CY (E) BxH.X

Symbol:

$X = 1 \div 7$ - design according to the availability and the situation of the movable louver grills (MLG).

Function:

- input and output of the absorption and heating air-conditioning systems;
 - mixer of air flows with different parameters in order to invert the air tract on 90°;
 - (E) to heat the air with installed electric heater panel with power $1 \div 50$ kW (according to a request it can be installed one with a bigger power);
 - to service the adjacent units;
 - to service the adjacent units and stilling the air flow after the fan.
- The speed of the air through the module is $1 \div 3,5$ m/s.
MLG can be equipped with servo motors for automatic motion.

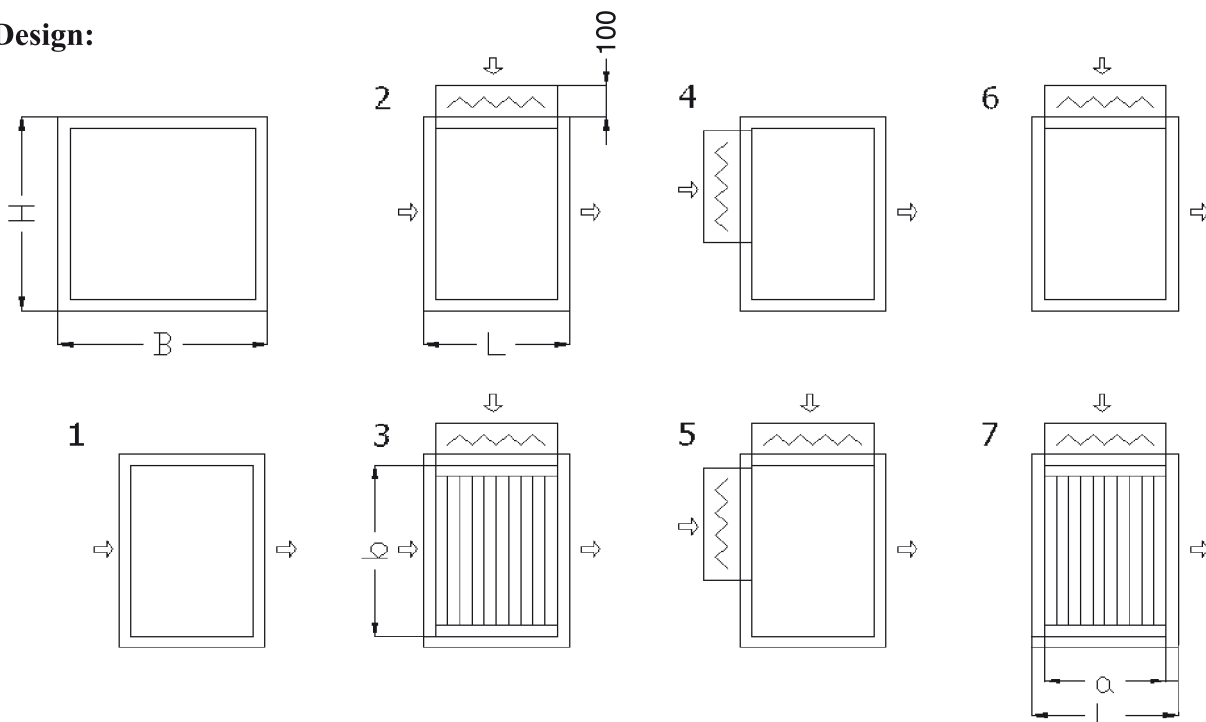
Technical characteristics:

dimensions, mm					Weight, kg
B	H	L	a	b	
560	560	525	310	385	53
660	660	525	310	385	64
760	760	525	310	510	74
860	860	525	310	510	84
960	969	690	510	675	116
1060	1060	855	610	865	155
1260	1260	1185	810	865	240
1360	1360	1185	810	1005	260
1560	1560	1185	1010	1335	306
2060	2060	1185	1010	1830	408
2580	2580	1515	1310	1830	627



Note: The dimensions specified are according to the company's standard nomenclature. They can be changed for each specific case according to the client's desire, the design or the aerodynamic requirements when structuring the units.

Design:



Air Heating Units CKK type

Filter Module CΦK BxH; CΦД BxH

Symbol:

CΦK - rough cleansing with filters class EU3, EU4

CΦД - fine cleansing, pockets with filters class EU5 ÷ EU7

Function:

- to process air with maximal dust concentration 5 mg/m^3
- for facilities with normal fire risk
- for air speed in the module from 1 to 3.5 m/s



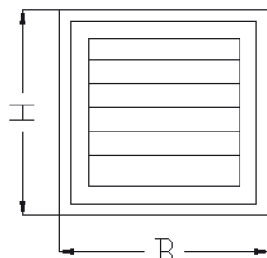
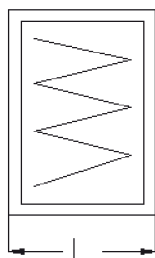
Technical characteristics of CΦK with cassettes:

Type size CΦK	Dimensions			Filter surface m^2	Filter cassettes				Weight kg
	B	H	L		b	a	l	num- ber	
CΦK 560x560	560	560	400	0,46	420	500	248	1	34
CΦK 660x660	660	660	400	0,72	520	600	248	1	52
CΦK 760x760	760	760	400	0,90	620	700	248	1	60
CΦK 860x860	860	860	400	1,3	720	800	248	1	69
CΦK 960x960	960	960	400	1,7	800	900	248	1	80
CΦK 1060x1060	1060	1060	400	2,2	920	1000	248	1	90
CΦK 1260x1260	1260	1260	400	3,1	1120	1210	248	1	109
CΦK 1360x1360	1360	1360	400	3,6	1220	655	248	2	116
CΦK 1560x1560	1560	1560	400	4,5	1405	750	248	2	141
CΦK 2060x2060	2060	2060	400	8,6	920	1008	248	4	216
CΦK 2580x2580	2580	2580	400	13,0	1405 920	1265 1265	248 -	2 2	305

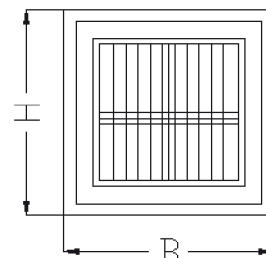
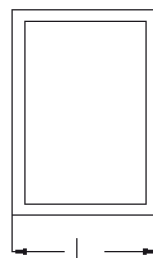
Technical characteristics of CΦД with pockets:

Type size CΦД	Dimensions			Filter surface m^2	Filter cassettes				Weight kg
	B	H	L		b	a	l	num- ber	
CΦK 560x560	560	560	704	1,8	420	420	600	1	61
CΦK 660x660	660	660	704	2,9	520	520	600	1	75
CΦK 760x760	760	760	704	5,5	620	620	600	1	88
CΦK 860x860	860	860	704	6,5	720	360	600	2	101
CΦK 960x960	960	960	704	7,5	820	410	600	2	113
CΦK 1060x1060	1060	1060	704	9,8	450	450	600	4	127
CΦK 1260x1260	1260	1260	704	11,3	520	520	600	4	156
CΦK 1360x1360	1360	1360	704	14,4	592	592	600	4	165
CΦK 1560x1560	1560	1560	704	22,1	450	470	600	9	195
CΦK 2060x2060	2060	2060	704	39,3	450	470	600	16	267
CΦK 2580x2580	2580	2580	704	61,5	450	490	600	25	340

CΦK



CΦД



Air Heating Units

CKK type

Ventilation Module CB BxH.X

Function:

To ensure the necessary aerodynamic parameters of the air-conditioning installations. It is developed in 6 designs.

Symbol:

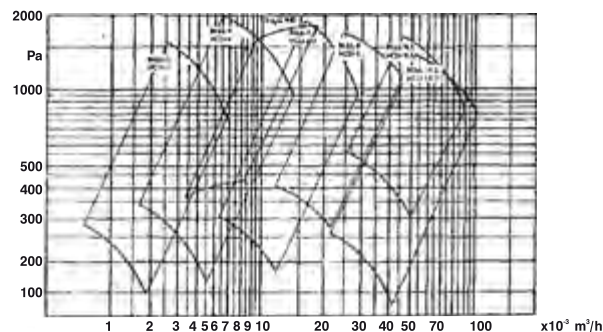
X = 1 ÷ 6 - designs according to the situation and the availability of MLG, and the position and the type of the fan.

Special features:

It is equipped with fans, which guarantee reliability during exploitation and low noise characteristics.

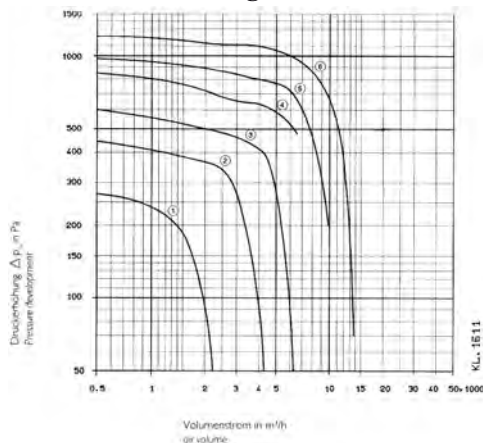
- double absorbing centrifugal fans type BЦД with belt gear and directly joined engines chosen according to BЦД - diagrams.

BЦД diagram

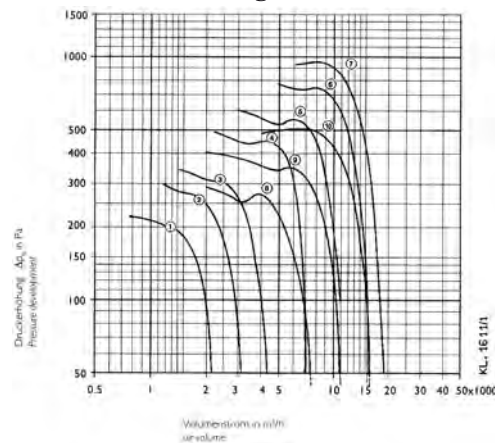


- double absorbing centrifugal fans with built in outrunner engine type RD ... S and RD... P, „Ziehl-Abegg“ Germany chosen according to S and P diagrams respectively.

S diagram

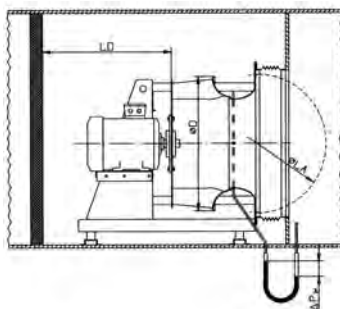


P diagram



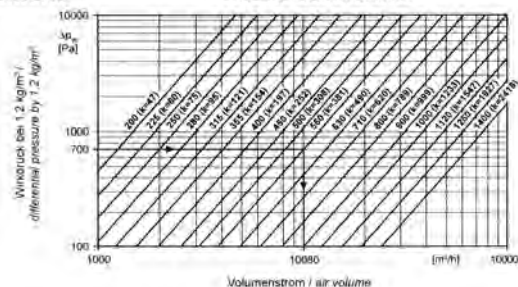
- centrifugal fans for building in with directly joined engines ER ... F of „Ziehl-Abegg“ Germany chosen according to ER diagram.

ER diagram



Düsenbeiwerte

Nozzle coefficients



- working wheels directly joined with outrunner electric motor.
- The ventilation modules are ordered when flow, pressure and fan type is specified.

Air Heating Units CKK type

Ventilation Module CB BxH.X

Note: When using the centrifugal fans of the BИД and RD type is advisable to provide an equalizing module with length L = 0.5D (D - fan diameter) after the supercharged side of the fan module for the equal distribution of the air flow.

Fan Choice ER--F...

1. It is determined, $\dot{V} = k \cdot \sqrt{\Delta p_w}$, where $k = \alpha \cdot \varepsilon \cdot A \cdot \sqrt{\frac{2}{\rho}}$

$\dot{V}$ - rate of air delivery, m³/h

α - flow quotient

ε - widening quotient

A - vertical section of the nozzle in its narrowest part

Δp_w - pressure, Pa

ρ - diameter, cm

R	47	61	75	95	121	154	197	243	306	409	489	575	784	992	1225	1530	1915	2402
D	20	22.5	25	28	31.5	35.5	40	45	50	56	63	71	80	90	100	112	125	140

Technical characteristics of CB:

Type	Design	Dimensions			Equipping fan	Diagram	Flow m ³ /h	MLG		Supercharging flange		Weight kg
		B	H	L				a	b	a1	b1	
CB 560x560	1;2	560	560	630	ER25F...	-	2000	310	405	-	-	88
	1;2			700	ER28F...	-	2000					97
CB 660x660	1;2	660	660	750	ER31F...	-	3500	310	505	-	-	118
	1;2;3;4;5;6	660	660	700	RD20P-4...	P-1	1600			251	251	92
	1;2;3;4;5;6	660	660	700	БИД 2,5	БИД	3000			183	237	115
CB 760x760	1;2	760	760	830	ER35F...	-	4500	510	605	-	-	149
	1;2;3;4;5;6	760	760	760	RD22P...	P-2	2100	310	605	283	283	114
	1;2;3;4;5;6	760	760	830	RD25P	P-3	2800	310	605	319	319	131
	1;2;3;4;5;6	760	760	800	RD25S	S-2	1600	310	605	168	292	119
CB 860x860	1;2;(3;4)	860	860	920	ER40F...	-	5000	510	705	-	-	188
	1;2;(3;4)	860	860	1050	ER45F...	-	8000	510	705	357	357	212
	1;2;3;4;5;6	860	860	900	RD28P...	P-4	5000	310	705	197	378	167
	1;2;3;4;5;6	860	860	800	RD25S...	S-2	2700	310	705	169	378	125
	1;2;3;4;5;6	860	860	900	RD28S...	S-3	3200	310	705			125
CB 960x960	1;2;(3;4)	960	960	1150	ER50F...	-	9000	610	805	-	-	151
	1;2;3;4;5;6	960	960	1000	RD31P...	P-5	7500	310	805	404	404	197
	1;2;3;4;5;6	960	960	950	RD31S...	S-4	6000					179
CB 1060x1060	1;2;(3;4)	1060	1060	1300	ER56F	-	11000	610	865	-	-	350
	1;2;3;4;5;6	1060	1060	1200	БИД 3	БИД	5500	610	865	255	442	268
	1;2;3;4;5;6	1060	1060	1370	БИД 4	БИД	10000	610	865	340	572	337
	1;2;3;4;5;6	1060	1060	1370	БИД 4Б	БИД	9000	610	865	410	410	335
	1;2;3;4;5;6	1060	1060	1100	RD35P...	P-6	12000	610	865	454	454	255
	1;2;3;4;5;6	1060	1060	1100	RD35S...	S-5	8000	610	865	262	408	240
	1;2;3;4;5;6	1060	1060	1150	RD40S...	S-6	11000	610	865	262	408	266
CB 1260x1260	1;2;(3;4)	1260	1260	1400	ER63F...	-	15000	1010	1065	-	-	412
	1;2;3;4;5;6	1260	1260	1200	RD40P...	P-7	14800	1010	1065	508	508	303
CB 1360x1360	1;2;(3;4)	1360	1360	1700	ER71F...	-	20000	1010	1165	-	-	545
	1;2;3;4;5;6	1360	1360	1300	RD45P	P-6	14000	1010	1165	570	570	353
CB 1560x1560	1;2;3;4;5;6	1560	1560	1950	БИД 4	БИД	10000	1010	1355	344	578	578
	1;2;3;4;5;6	1560	1560	1950	БИД 4Б	БИД	9000	1010	1355	410	410	575
	1;2;3;4;5;6	1560	1560	1950	БИД 6.3	БИД	20000	1010	1355	445	834	743
	1;2;3;4;5;6	1560	1560	1600	RD56B...		20000	1010	1355	716	716	476
	1;2;(3;4)	1560	1560	1900	ER80F...		25000	1010	1355	-	-	707
CB 2060x2060	1;2;3;4;5;6	2060	2060	2200	БИД 6.3	БИД	20000	1010	1865	445	834	973
	1;2;3;4;5;6	2060	2060	2200	БИД 8	БИД	30000	1010	1865	560	1050	1193
	1;2;(3;4)	2060	2060	2260	ER10F...	-	36000	1310	1865	-	-	1038
	1;2;(3;4)	2060	2060	2150	ER11F	-	40000	1310	1865	-	-	1077
CB 2580x2580	1;2;3;4;5;6	2580	2580	2200	БИД 8	БИД	30000	1310	1865	560	1050	1682
	1;2;3;4;5;6	2580	2580	2960	БИД 9,5	БИД	66000	1310	1865	767	1280	2357
	1;2;3;4;5;6	2580	2580	2960	БИД 11,2	БИД	80000	1310	1865	952	1630	1455
	1;2;(3;4)	2580	2580	2630	ER14F		75000	1310	1865			1620

Air Heating Units CKK type

Ventilation Module CB BxH.X

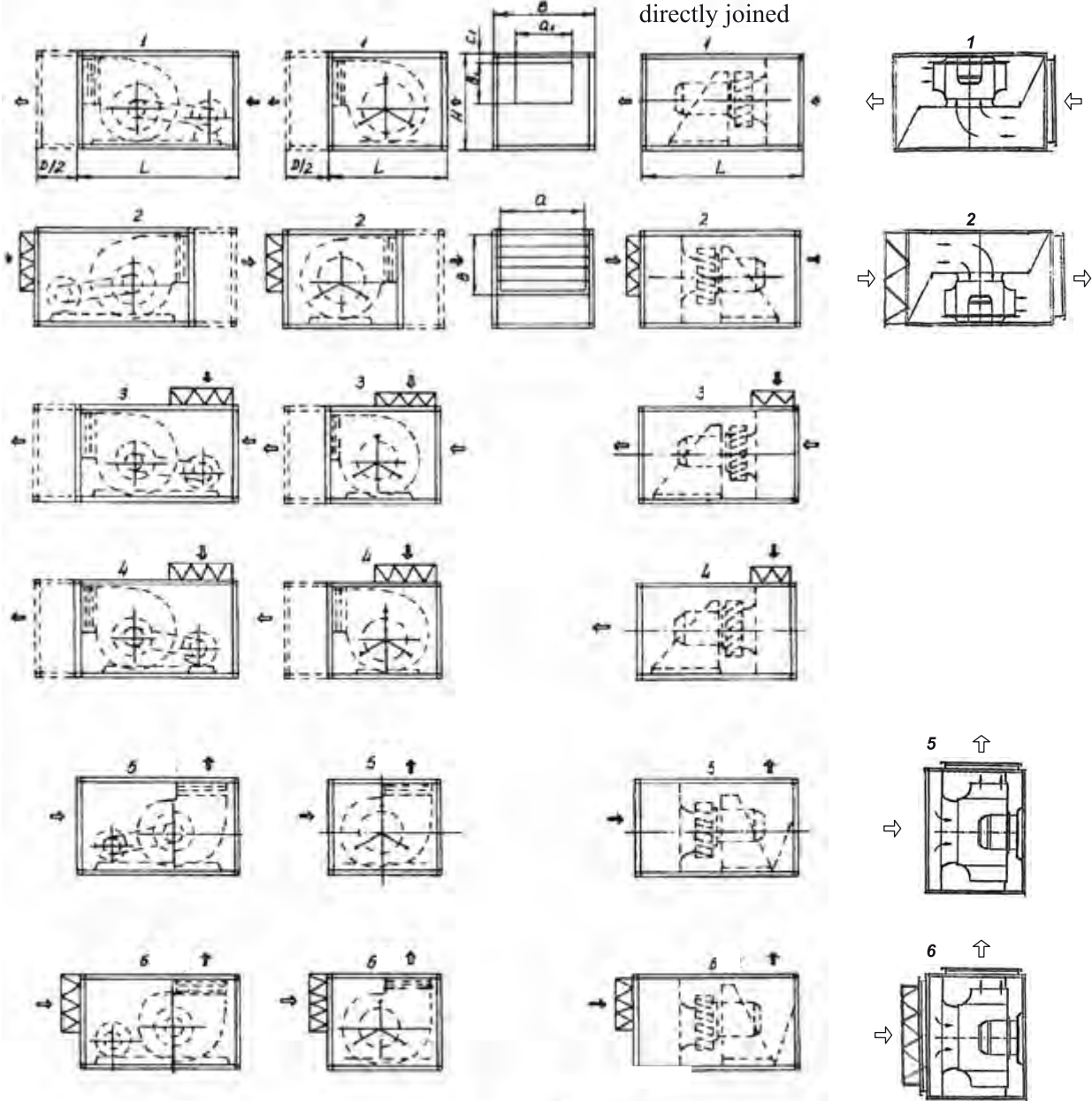
- with a double absorbing fan:

1. Belt gear

2. Directly joined

3. Without jacket:
directly joined

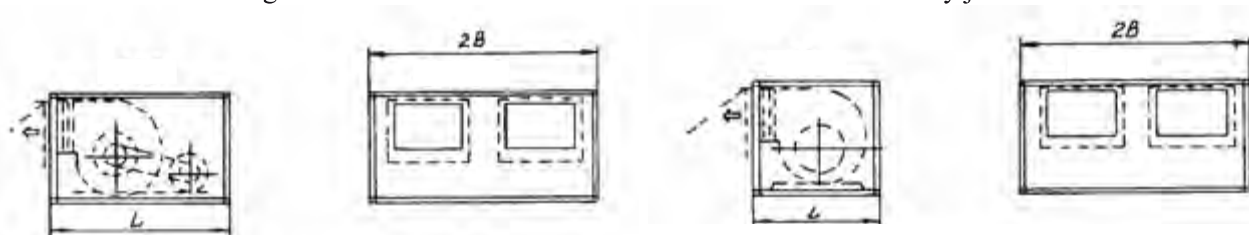
4. With working wheel:



5. With a double absorbing fan doubled

1. Belt gear

2. Directly joined



MLG can be equipped with servo motors for automatic motion.

Air Heating Units CKK type

Ventilation Module CB BxH.X



CKK equipped with a double absorbing centrifugal fan with a belt gear.

They are used for:

1. Flows from 500 to 80 000 m³/h
2. Fan pressure from 70 to 1500 Pa



CKK equipped with double absorbing centrifugal fans, directly joined with the outrunner electric motor with thermal protection.

They are used for:

1. Air Flows from 500 to 20 000 m³/h
2. Fan pressure from 100 to 800 Pa

Air Heating Units CKK type

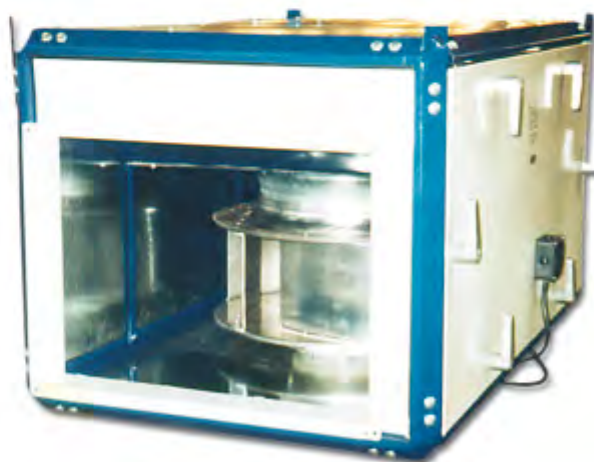
Ventilation Module CB BxH.X



CKK equipped with a centrifugal fan with a directly joined electric motor with posistor protection.

They are used for:

1. Air flows from 500 to 80 000 m³/h
2. Fan pressure from 150 to 1500 Pa



CKK equipped with a centrifugal fan with a directly joined outrunner electric motor with thermal protection.

They are used for:

1. Air Flows from 500 to 10 000 m³/h
2. Fan pressure from 100 to 1500 Pa

Air Heating Units CKK type

Heating module COT BxH.X

Function:

They are used to heat the air in the air-conditioning installations.

X = 1; 2; 3 - the number of the rows according to the air motion

Types according to the heat carrier:

COT-EB: for water with input temperature $55 \div 140^{\circ}\text{C}$ and pressure 0,8 MPa

COT-EП: for steam with pressure $0,01 \div 0,8$ MPa

Structure:

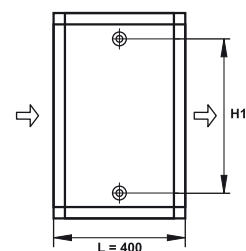
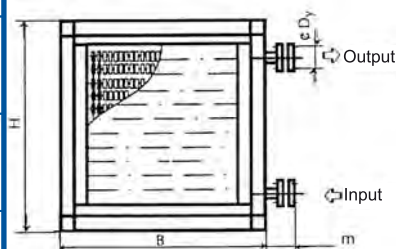
- a heat exchanger on the basis of gilled steel pipe with aluminum gills.



a COT heat exchanger

Parameters of the heating modules:

Type size COT BxH.X	Dimensions in mm								Hydro Resist. KPa	Heat exchanging surface - m ²		Weight kg
	water				steam					water	steam	
	Dy	B _{eff} xH _{eff}	H1	m	B _{eff} xH _{eff}	H1	m					
560x560 1 2 3	32	400x416	390	115	468x310	390	130	0.26	3.1	2.0	59	
								0.32	6.2	4.0	70	
								0.45	9.3	6.0	82	
660x660 1 2 3	32	500x520	490	115	572x410	490	130	0.07	5.0	3.4	74	
								0.20	10.0	6.8	91	
								1.45	15.0	10.2	109	
760x760 1 2 3	32	600x624	590	115	676x510	590	130	0.09	7.3	5.3	89	
								0.64	14.62	10.61	112	
								0.81	1.9	5.9	135	
860x860 1 2 3	32	650x728	680	115	780x570	680	130	0.47	10.1	7.6	104	
								0.94	20.2	15.2	134	
								2.10	30.3	22.8	164	
960x960 1 2 3	32	750x780	780	115	884x670	780	130	1.05	13.1	10.3	120	
								3.77	26.2	20.6	158	
								4.63	39.3	30.9	196	
1060x1060 1 2 3	32	850x884	880	115	988x770	880	130	1.86	15.9	13.4	136	
								2.42	31.8	26.8	181	
								5.58	47.7	40.2	226	
1260x1260 1 2 3	50	1050x1092	1040	135	1170x970	1040	130	3.52	25.4	20.8	177	
								7.03	50.8	41.6	245	
								13.45	76.2	62.4	313	
1360x1360 1 2 3	50	1100x1196	1140	135	1274x1070	1140	130	6.48	30.4	24.9	197	
								9.52	60.8	49.8	277	
								10.65	91.2	74.7	357	
1560x1560 1 2 3	50	1300x1404	1340	135	1482x1270	1340	130	4.00	38.6	33.5	235	
								6.40	77.2	67.0	336	
								21.87	115.8	100.5	436	
2060x2060 1 2 3	65	1740x1924	1830	140	1976x1770	1830	130	10.52	73.3	64.8	362	
								22.98	146.6	129.6	545	
								34.46	219.9	194.4	729	
2580x2580 1 2 3	80	2260x2444	2350	175	2496x2290	2350	130	5.96	116.4	106.8	506	
								13.13	232.8	213.6	791	
								90.45	349.2	320.4	1077	



Air Heating Units

CKK type

Heating module COT BxH.X

Heating capacity, kW

COT BxH.X Type	Flow	t° _{INLET AIR} = -20°						t° _{INLET AIR} = -10°						t° _{INLET AIR} = ±0°						
		t° _{OUTLET AIR} = +20°		= +30°		= +50°		= +20°		= +30°		= +50°		= +20°		= +30°		= +50°		
		water	steam	water	steam	water	steam	water	steam	water	steam	water	steam	water	steam	water	steam	water	steam	
560x560	1	2000	6	11	5	10	5	9	6	11	5	10	4	9	5	10	4	9	4	9
	2		12	22	10	20	10	18	12	22	10	20	8	18	10	20	8	18	8	18
	3		18	33	15	30	15	27	18	33	15	30	12	27	15	30	12	27	12	27
660x660	1	3000	10	18	9	17	7	15	9	17	8	16	7	15	8	16	7	15	6	14
	2		20	36	18	34	14	30	18	34	16	32	14	30	16	32	14	30	12	28
	3		30	54	27	51	21	45	27	51	24	48	21	45	24	48	21	45	18	42
760x760	1	5000	15	26	14	25	11	22	14	25	13	23	11	21	13	24	12	23	10	20
	2		30	52	28	50	22	44	28	50	26	46	22	42	26	48	24	46	20	40
	3		45	78	42	75	33	66	42	75	39	69	33	63	39	72	36	69	30	60
860x860	1	6500	20	36	19	34	16	30	20	35	18	33	15	29	18	33	17	32	14	28
	2		40	72	38	68	32	60	40	70	36	66	30	58	36	66	34	64	28	56
	3		60	108	57	102	48	90	60	105	54	99	45	87	72	99	51	96	42	84
960x960	1	8200	27	47	25	44	21	39	26	45	24	42	19	38	23	43	22	41	18	36
	2		54	94	50	88	42	78	52	90	48	84	38	76	46	86	44	82	36	72
	3		81	141	75	132	63	117	78	135	72	126	57	114	69	129	66	123	54	108
1060x1060	1	10000	31	56	30	54	25	48	31	54	29	51	23	46	28	52	27	50	22	44
	2		62	112	60	108	50	96	62	108	58	102	46	92	56	104	54	100	44	88
	3		93	168	90	162	75	144	93	162	87	153	69	138	84	157	81	150	66	132
1260x1260	1	15000	53	89	50	86	41	76	51	87	46	82	38	74	50	84	44	79	35	71
	2		106	178	100	172	82	152	102	174	92	164	76	148	100	168	88	158	70	142
	3		159	267	150	258	123	228	153	261	138	246	114	222	150	252	132	237	105	213
1360x1360	1	18000	64	107	60	103	49	91	61	104	55	99	46	88	59	100	53	95	42	85
	2		128	214	120	206	98	182	122	208	110	198	92	176	118	200	106	190	84	170
	3		192	321	180	309	147	273	183	312	165	297	138	264	177	300	159	285	126	260
1560x1560	1	22600	80	137	74	130	61	116	77	132	71	124	58	112	69	127	66	193	53	107
	2		160	274	148	260	122	232	154	264	142	248	116	224	138	254	132	386	106	214
	3		240	411	222	390	183	348	231	396	213	372	174	336	207	381	198	579	159	321
2060x2060	1	40000	151	260	140	248	117	220	146	251	135	236	110	213	131	241	126	229	101	203
	2		302	520	280	496	234	440	292	502	270	472	220	426	262	482	252	458	202	406
	3		453	780	420	744	351	660	438	753	405	708	330	639	393	723	378	687	303	609
2580x2580	1	63000	242	413	224	394	186	349	233	338	216	375	175	338	210	383	211	364	162	323
	2		484	826	448	788	372	698	466	676	432	750	350	676	420	766	422	728	324	646
	3		726	1239	726	1182	558	1047	699	1014	648	1125	525	1014	630	1149	633	1092	486	969

The technical parameters in the tables are set under the following conditions:

- heat carrier steam with excess of pressure 0.1 MPa and t° of saturation 120° C
- heat carrier water 90/70° C
- the hydraulic resistances are set according to the specified flows and heating capacity for t°_{INLET AIR} = -20°C and t°_{OUTLET AIR} = +30°C

Air Heating Units CKK type

Heating module COT BxH.X

Structure:

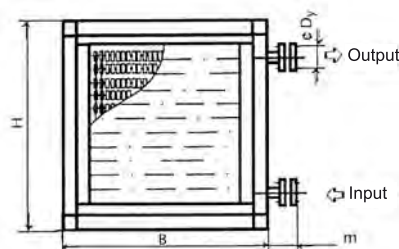
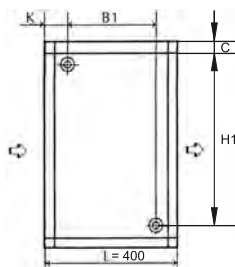
- a heat exchanger on the basis of copper pipe $\varnothing 16$ mm with aluminum lamella
- heat carrier- hot water 90/70° C

Parameters of the heating modules:

Type size COT BxH.	B eff. x H eff.	Rows	Dimensions in mm								Heat exchanging surface m ²	Weight kg
			B	H	m	Dy	B1	k	H1	c		
560x560	350x400											
		1	560	560	130	1"	152	95	330	115	3,6	54
		2	560	560	130	1"	152	95	330	115	7,2	58
		3	560	560	130	1"	141	117	330	115	10,8	60
660x660	450x500											
		1	660	660	130	1 1/4"	152	95	430	115	5,3	66
		2	660	660	130	1 1/4"	152	95	430	115	10,6	69
		3	660	660	130	1 1/4"	141	117	430	115	16,9	72
760x760	550x600											
		1	760	760	130	1 1/2"	152	95	530	115	8,27	80
		2	760	760	130	1 1/2"	152	95	530	115	16,54	84
		3	760	760	130	1 1/2"	141	117	530	115	24,8	88
860x860	650x700											
		1	860	860	130	1 1/2"	152	95	630	115	11,4	93
		2	860	860	130	1 1/2"	152	95	630	115	22,8	99
		3	860	860	130	1 1/2"	141	117	630	115	34,2	105
960x960	750x800											
		1	960	960	130	1 1/2"	152	95	730	115	15,03	109
		2	960	960	130	1 1/2"	152	95	730	115	30,06	117
		3	960	960	130	1 1/2"	141	117	730	115	45,1	125
1060x1060	850x900											
		1	1060	1060	130	1 1/2"	152	95	830	115	19,23	125
		2	1060	1060	130	1 1/2"	152	95	830	115	38,46	135
		3	1060	1060	130	1 1/2"	141	117	830	115	57,7	145
1260x1260	1030x1100											
		1	1260	1260	130	2"	152	95	1030	115	28,47	155
		2	1260	1260	130	2"	152	95	1030	115	56,94	170
		3	1260	1260	130	2"	141	117	1030	115	85,4	185
1360x1360	1130x1200											
		1	1360	1360	130	2"	152	95	1130	115	34,17	171
		2	1360	1360	130	2"	152	95	1130	115	68,34	189
		3	1360	1360	130	2"	141	117	1130	115	102,5	207
1560x1560	1330x1400											
		1	1560	1560	140	2"	152	95	1330	115	46,83	205
		2	1560	1560	140	2"	152	95	1330	115	93,66	230
		3	1560	1560	140	2"	141	117	1330	115	140,5	255
2060x2060	1820x1900											
		1	2060	2060	140	2 1/2"	152	95	1830	115	87	301
		2	2060	2060	140	2 1/2"	152	95	1830	115	174	350
		3	2060	2060	140	2 1/2"	141	117	1830	115	261	399
2580x2580	2320x2400											
		1	2580	2580	140	3"	152	95	2350	115	140	407
		2	2580	2580	140	3"	152	95	2350	115	280	488
		3	2580	2580	140	3"	141	117	2350	115	420	569



a heat exchanger for COT



Air Heating Units CKK type

Heating module COT BxH.X

Structure:

- a heat exchanger on the basis of copper pipe $\varnothing 16$ mm with aluminum lamella;
- water 90/70°C;
- heating capacity in kW.

COT BxH. B eff. x H eff.	Rows	Flow	t° _{INLET AIR} = -10°C		t° _{INLET AIR} = ±0°C		t° _{INLET AIR} = +10°C	
			t° _{OUTLET AIR}	kW	t° _{OUTLET AIR}	kW	t° _{OUTLET AIR}	kW
560x560		2000						
350x400	1							
	2		13,5	18,5	21,0	15,2	27,9	12,5
	3		21,0	24,5	28,0	20,4	38,4	19,8
660x660		3000						
450x500	1							
	2		17,8	31,3	24,3	26,5	30,7	22,0
	3		25,4	39,9	31,4	34,3	37,2	28,6
760x760		4000						
550x600	1							
	2		20,6	46,0	27,0	39,2	33,3	32,7
	3		34,2	66,0	39,4	57,2	44,37	48,1
860x860		5000						
650x700	1							
	2		26,2	68,0	32,4	58,7	38,4	49,6
	3		38,6	91,0	43,4	78,6	47,9	66,3
960x960		7000						
750x800	1							
	2		27,0	97,3	33,2	84,1	39,2	71,4
	3		41,0	134,5	45,9	116,3	50,5	99,1
1060x1060		9000						
850x900	1							
	2		28,2	129,2	34,4	112,0	40,4	95,6
	3		40,5	170,8	45,35	147,1	49,9	125,7
1260x1260		12500						
1030x1100	1							
	2		26,37	170,7	32,5	147,1	38,4	124,3
	3		40,7	238,0	45,8	205,6	50,0	174,6
1360x1360		15000						
1130x1200	1							
	2		29,5	222,6	35,6	193,4	41,5	165,1
	3		34,9	252,9	40,4	219,5	45,8	187,4
1560x1560		20000						
1330x1400	1							
	2		27,6	282,9	33,8	244,3	39,7	207,1
	3		42p0	390,7	46,7	338,0	51,5	287,5
2060x2060		40000						
1820x1900	1							
	2		27,7	565,8	33,8	489,6	39,85	416,6
	3		41,7	777,8	46,5	673,9	51,15	574,4
2580x2580		80000						
2320x2400	1							
	2		26,0	1083,2	32,5	941,0	38,8	804,3
	3		38,9	1467,5	44,0	1273,0	48,9	1086,8

Air Heating Units CKK type

Cooling module COX BxH.X

Structure:

- x = 3; 4; 5; 6 - the number of the rows according to the air motion
- a heat exchanger on the basis of non-ferrous metal - copper pipe $\varnothing 16 \times 0,8$ mm and aluminum lamellas with 0.2 mm thickness;
- cold carrier - cold water 5, 6, 7°C with pressure of 0,6 MPa or Freon
- drip stop, it is completed in case the speed is higher than 2,5 m/s

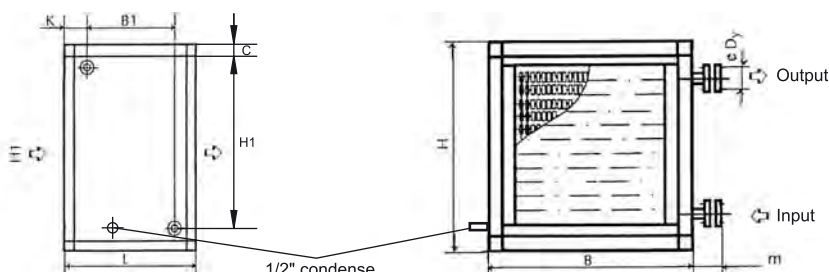


a heat exchanger for COT

Parameters of the cooling modules:

Type size COX BxH.X		Dimensions in mm								Heat exchanging Surface m²	Weight kg
		Dy	B	H	m	B1	k	H1	c		
560x560	.3	57	560	560	130	210	195	330	115	10.8	60
	.4	57				250	175	"	115	14.4	62
	.5	57				320	140	"	115	18.0	64
	.6	57				360	120	"	115	21.7	66
660x660	.3	57	660	660	130	210	195	430	115	16.9	72
	.4	57				250	175	"	115	22.5	75
	.5	57				320	140	"	115	28.3	78
	.6	57				360	120	"	115	33.9	81
760x760	.3	57	760	760	130	210	195	530	115	24.8	88
	.4	57				250	175	"	115	33.1	92
	.5	57				320	140	"	115	41.4	96
	.6	57				360	120	"	115	49.7	100
860x860	.3	57	860	860	130	210	195	630	115	34.2	105
	.4	57				250	175	"	115	45.6	111
	.5	76				320	140	"	125	57.0	116
	.6	76				360	120	"	125	68.4	122
960x960	.3	57	960	960	130	210	195	730	115	45.1	125
	.4	57				250	175	"	115	60.1	133
	.5	76				320	140	"	125	75.2	141
	.6	76				360	120	"	125	90.2	148
1060x1060	.3	57	1060	1060	130	210	195	830	115	57.7	145
	.4	57				250	175	"	115	76.9	155
	.5	76				320	140	810	125	96.2	165
	.6	76				360	120	810	125	115.4	175
1260x1260	.3	57	1260	1260	130	210	195	1030	115	85.4	185
	.4	57				260	170	1030	115	113.9	200
	.5	76				320	140	1010	125	142.4	215
	.6	76				360	120	1010	125	170.9	230
1360x1360	.3	57	1360	1360	130	210	195	1130	115	102.5	207
	.4	76				270	165	1110	125	136.6	225
	.5	76				320	140	1110	125	170.8	243
	.6	76				360	120	1110	125	204.9	261
1560x1560	.3	57	1560	1560	140	210	195	1330	110	140.5	255
	.4	76				280	160	1310	120	187.3	280
	.5	76				320	140	1310	120	234.2	305
	.6	76				360	120	1310	120	281.0	331
2060x2060	.3	76	2060	2060	140	210	180	1805	127.5	261.0	399
	.4	89				290	155	1795	132.5	348.0	448
	.5	89				320	135	1795	132.5	434.9	498
	.6	89				370	115	1795	132.5	521.9	547
2580x2580	.3	76	2580	2580	140	240	180	2395	92.5	420.0	569
	.4	108				290	155	2375	102.5	560.1	650
	.5	108				330	135	2375	102.5	700.1	731
	.6	108				370	115	2375	102.5	840.1	812

For COX L=700
For COX-K
(with drip stop)
L=700



Air Heating Units CKK type

Cooling module COX BxH.X

Technical parameters

Type Size COX BxH.X	B effective	H effective	Number of horizontal rows of pipes	Number of lamellas	Inlet air section	Real air section	Number of air motion x number of pipes in motion			
							x = 3 rows	4 rows	5 rows	6 rows
560x560	350	400	7	116	0.140	0.11	4x6	4x8	4x10	4x12
660x660	450	500	8	145	0.225	0.14	4x6	4x8	4x10	4x12
760x760	550	600	10	177	0.330	0.21	5x6	5x8	5x10	5x12
860x860	650	700	12	209	0.450	0.32	6x6	6x8	6x10	6x12
960x960	750	800	15	241	0.600	0.43	8x6	8x8	8x10	8x12
1060x1060	850	900	17	274	0.760	0.57	13x4	17x4	13x6	17x6
1260x1260	1030	1100	20	332	1.130	0.73	15x4	20x4	15x6	20x6
1360x1360	1130	1200	22	365	1.350	0.87	16x4	22x4	16x6	22x6
1560x1560	1330	1400	28	429	1.860	2.26	22x4	29x4	22x6	29x6
2060x2060	1820	1900	38	587	3.450	2.86	30x4	40x4	30x6	40x6
2580x2580	2320	2400	48	748	5.560	4.62	39x4	52x4	39x6	52x6

COX BxH.X for cold water 7/12°C

$t^{\circ}_{\text{incoming air}} = 35^{\circ}\text{C}$; $t^{\circ}_{\text{outgoing air}} = 20^{\circ}\text{C}$; $\varphi = 34\%$

$t^{\circ}_{\text{water}_1} = 7^{\circ}\text{C}$

$t^{\circ}_{\text{water}_2} = 12^{\circ}\text{C}$

Cooling capacity and hydraulic resistances

Type Size BxH	Calculated flow of the air m ³ /h	COX BxH.3		COX BxH.4		COX BxH.5		COX BxH.6	
		Q, kW	Δp , kPa	Q, kW	Δp , kPa	Q, kW	Δp , kPa	Q, kW	Δp , kPa
560x560	2000	8.5	0.21	10.8	0.44	13.8	0.77	16.0	1.20
660x660	3000	13.5	0.58	17.7	1.17	22.4	2.08	26.9	3.25
760x760	4000	20.1	0.44	25.4	0.95	33.2	1.64	37.4	2.24
860x860	5000	26.2	1.46	34.0	2.86	44.8	4.37	51.0	8.40
960x960	7000	36.7	2.10	50.8	3.68	63.3	7.02	77.0	11.76
1060x1060	9000	47.2	1.70	64.4	1.56	84.7	5.76	103.0	4.26
1260x1260	12500	71.1	2.76	100.0	2.70	116.8	10.82	130.0	7.50
1360x1360	15000	90.9	4.22	124.5	3.02	141.2	14.56	155.0	10.01
1560x1560	20000	127.2	9.76	166.0	9.41	186.8	51.51	199.0	25.21
2060x2060	40000	242.4	14.35	346.8	10.50	430.0	43.20	490.0	33.13
2580x2580	80000	455.0	30.42	580.0	28.00	709.0	73.22	761.0	64.06

COX BxH.X for Freon R22, $t^{\circ}_{\text{EVAPORATION}} = 6^{\circ}\text{C}$

Temperature of the outside air $t^{\circ} = 35^{\circ}\text{C}$; $\varphi = 28\%$

Temperature of the inside air $t^{\circ} = 20^{\circ}\text{C}$

Cooling capacity, kW

Type Size BxH	Calculated flow of the air m ³ /h	COX BxH.3	COX BxH.4	COX BxH.5	COX BxH.6
		Q, kW	Q, kW	Q, kW	Q, kW
560x560	2000	7.7	9.6	11.3	13.0
660x660	3000	11.5	14.4	17.6	20.0
760x760	4000	16.9	20.8	24.3	27.4
860x860	5000	21.1	26.0	31.4	35.4
960x960	7000	29.6	36.4	42.5	48.0
1060x1060	9000	38.0	46.8	56.5	63.8
1260x1260	12500	55.3	67.8	80.9	91.5
1360x1360	15000	66.3	81.3	97.1	109.7
1560x1560	20000	92.4	112.9	133.3	146.3
2060x2060	40000	169.0	216.8	251.1	283.5
2580x2580	80000	306.6	385.0	451.5	518.0

Air Heating Units CKK type

Silencer module CIII BxH

Function:

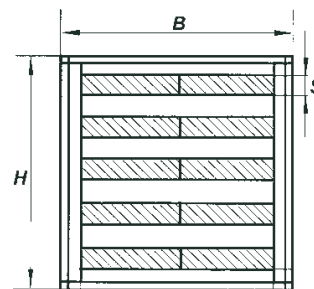
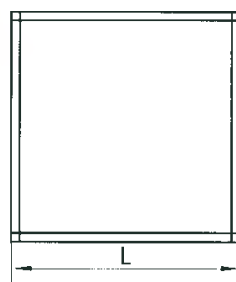
- reduction of the level of sound pressure up to a level, regulated by the sanitary hygiene norms for air-conditioned premises.

Structure:

- noise absorbing cassettes with thickness from 50 to 100 mm, and the interval between them is from 50 to 100mm;
- noise absorbing fabric - half - hard plates of mineral wading, closed between two layers of glass veil and perforated sheet iron or net;
- lateral removal of the noise absorbing cassettes;

Technical characteristics:

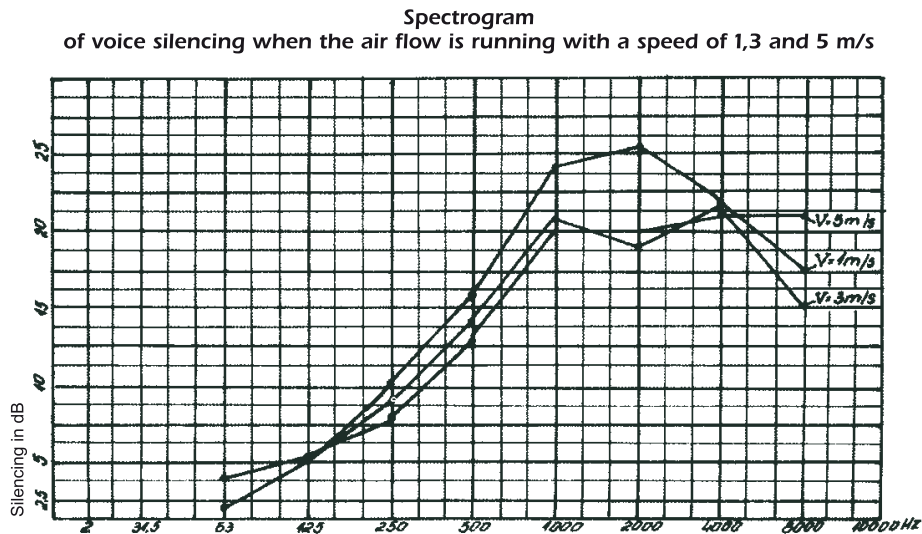
Type size	Surface of the integrated section	Cassettes			Dimensions in mm			Weight kg
		number	s	hxl	H	B	L	
CIII 560x560	0.17	4	50	400x970	560	560	1000	92
CIII 660x660	0.21	5	50	500x970	660	660	1000	120
CIII 760x760	0.31	6	50	600x970	760	760	1000	140
CIII 860x860	0.36	4	100	700x970	860	860	1000	172
CIII 960x960	0.49	4	100	800x970	960	960	1000	193
CIII 1060x1060	0.55	10	100	450x970	1060	1060	1000	229
CIII 1260x1260	0.84	12	100	500x970	1260	1260	1000	292
CIII 1360x1360	0.97	12	100	600x970	1360	1360	1000	315
CIII 1560x1560	1.62	14	100	450x970	1560	1560	1000	384
CIII 2060x2060	2.38	36	100	450x970	2060	2060	1000	592
CIII 2580x2580	3.55	60	100	450x970	2580	2580	1000	804



Type size	Speed m/s	Maximal flow of air m³/h	Level of the voice capacity dB/A/ in octave frequencies Hz							
			63	125	250	500	1000	2000	4000	8000
CIII 560x560	2.2	2000	2	6	8	11	18	15	12	8
CIII 660x660	2.7	3000	2	6	8	11	18	15	12	8
CIII 760x760	2.8	5000	2	6	8	11	18	15	12	8
CIII 860x860	3.5	8000	2	6	8	11	18	15	12	8
CIII 960x960	3.1	9000	2	6	8	11	18	15	12	8
CIII 1060x1060	3.3	12000	2	6	8	11	18	15	12	8
CIII 1260x1260	2.9	15000	2	6	8	11	18	15	12	8
CIII 1360x1360	3.3	20000	2	6	8	11	18	15	12	8
CIII 1560x1560	3.9	25000	2	6	8	11	18	15	12	8
CIII 2060x2060	2.8	40000	2	6	8	11	18	15	12	8
CIII 2580x2580	3.6	80000	2	6	8	11	18	15	12	8

Air Heating Units CKK type

Silencer module CIII BxH



Average aerodynamical resistances of the units, Pa

CKK elements		Air speed in the integrated section m/s					
		0.5	1.0	1.5	2.0	2.5	3.0
General module - CY without MLG - CY with MLG when the position of the blades is	10°	0	0	0	0	0	1
	20°	0	0	2	3	5	8
	30°	0	3	6	10	18	30
	40°	0	8	22	34	50	70
	50°	0	32	50	80	180	260
	60°	0	50	140	260	340	500
	70°	0	260	500	900	1500	2600
	80°	0	1000	2600	4200	6000	9000
Filter module CΦK cassette EU3	Clear filter	10	13	28	52	70	103
	Filled filter	70	73	88	122	130	163
CΦД pocket filter EU5	Clear filter	10	23	45	83	110	151
	Filled filter	70	83	105	143	172	211
CΦД pocket filter EU7	Clear filter	29	44	62	96	125	176
	Filled filter	79	104	123	156	183	236
Heating module COT - with pipes Fe-Al	1 row	20	20	20	20	20	-
	2 row	45	45	45	45	45	-
	3 row	65	65	65	65	65	-
Heating module COT - with pipes Cu-Al	1 row	13	16	29	40	45	-
	2 row	16	23	39	62	77	-
	3 row	19	31	50	86	109	-
Cooling module COX - with pipes Cu-Al	3 row	19	31	50	86	109	-
	4 row	23	40	63	112	143	-
	5 row	27	48	78	138	177	-
	6 row	32	57	92	165	211	-
Silencer module CIII length 1000 mm	Cassette thickness 100 mm	5	19	18	37	55	86

Air Heating Units CKK type

Moisture module - COB BxH

Function:

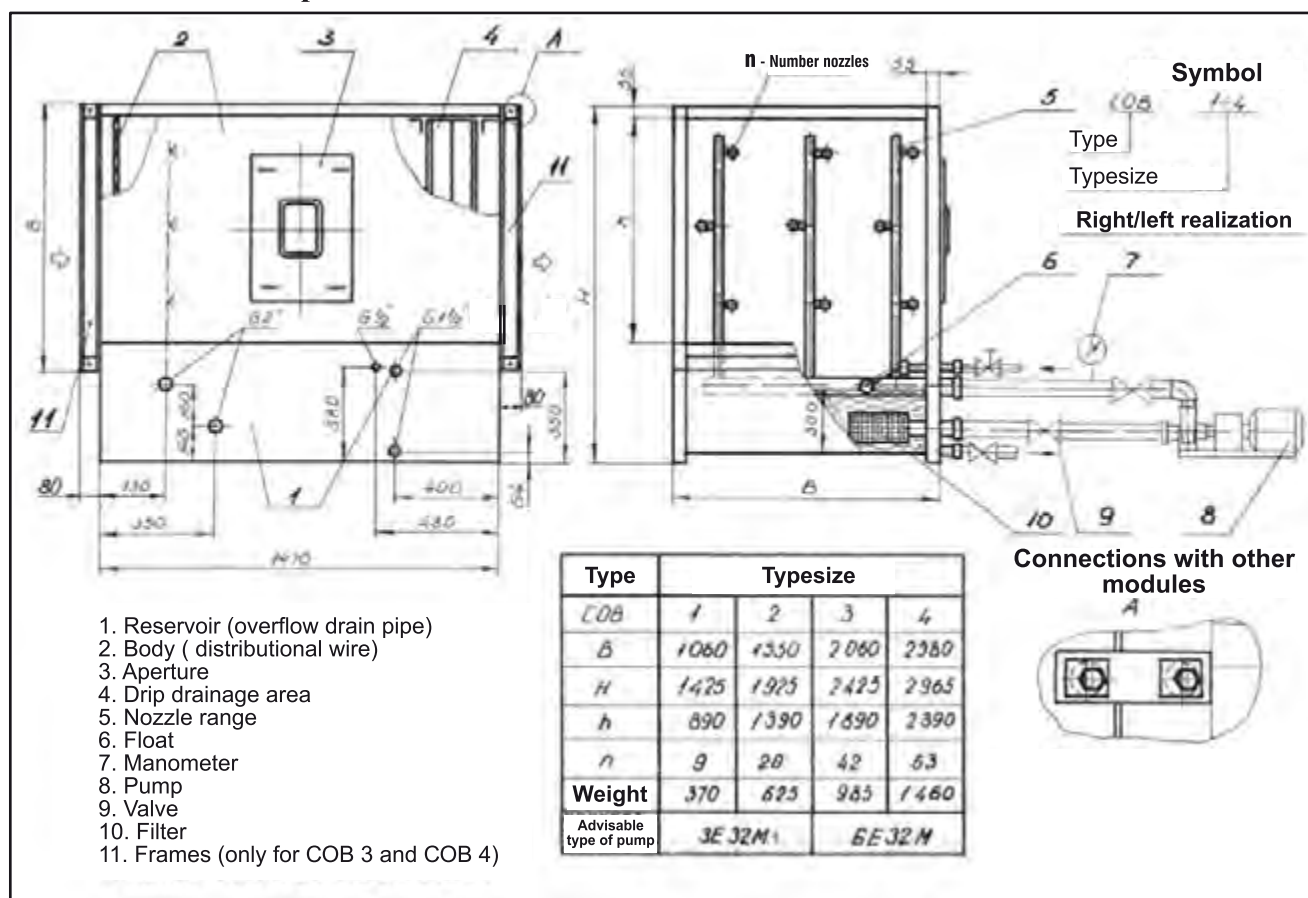
For adiabatic air moistening.

Structure:

- body;
- reservoir;
- nozzle register- with nozzles $\varnothing 3$ mm or $\varnothing 8$ mm;
- drip drainage area;
- water filter;
- float;
- circulatory pump;

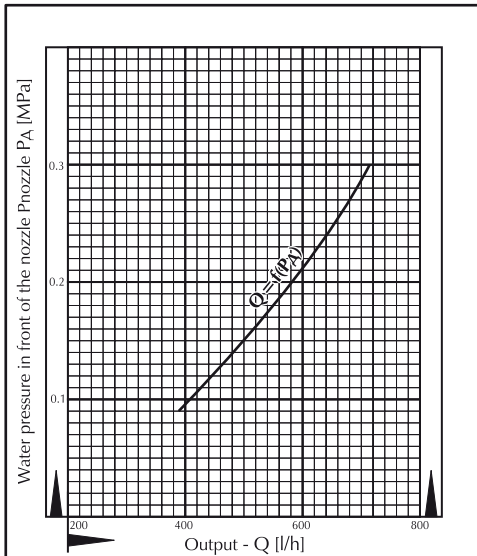
The water is diffused according to the direction of the air flow by tangent nozzles. The maximal water working pressure through the nozzles is 0.3 Mpa.

Moisture module plan

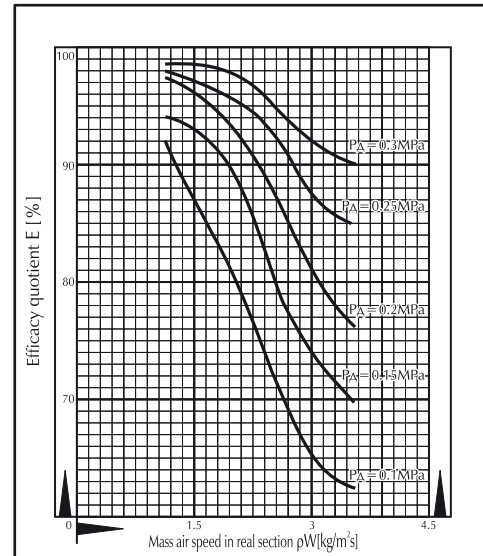


Air Heating Units CKK type

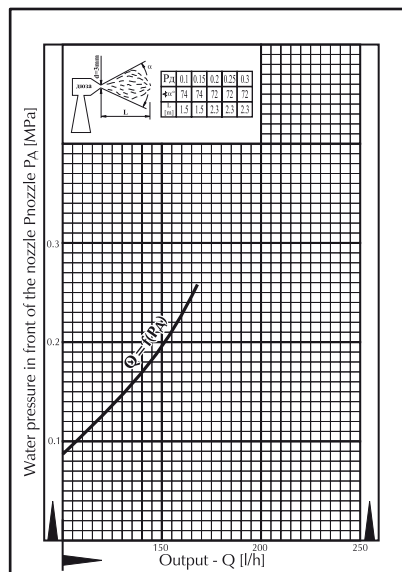
Moisture module - COB BxH



Output of the nozzle
with an outgoing
opening with $\varnothing 8$ mm

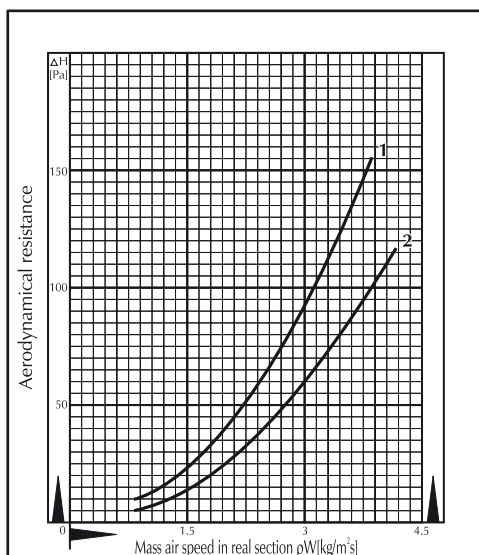


Efficacy quotient of nozzle
with an outgoing opening
with $\varnothing 8$ mm and different water
pressures through the nozzle



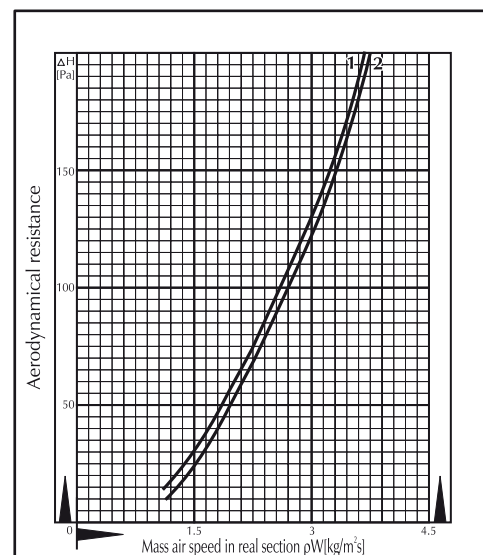
Nozzle with a $\varnothing 3$ mm opening
Aerodynamical resistance

1. without water diffusion
2. with water diffusion under pressure 0.2 MPa



Nozzle with a $\varnothing 8$ mm opening
Aerodynamical resistance

1. without water diffusion
2. with water diffusion under pressure 0.2 MPa



Duct Air-conditioning Systems type „MINI“

Function:

For central air-conditioning and ventilation, for building in double ceilings and floors.



Duct system



Duct fan - KB



Duct filter - KΦ



Duct air-heater/cooler
DA/DC



Duct electrical air-heater - KКел. straight



Duct electrical air-heater - KКел. corner



Duct silencer - KIII

Technical data:

- ✓ overall dimensions:
 - height 290 ÷ 820 mm
 - width 365 ÷ 940 mm
- ✓ Flow: 700 ÷ 15600 m³/h
- ✓ Maximal pressure 1000 Pa on the system outlet
- ✓ Thermal capacity:
 - heat carrier - water: 2 ÷ 50 kW
 - electrical air-heater: 1 ÷ 50 kW
- ✓ Refrigerator capacity::
 - cold water:: 4 ÷ 60 kW
 - Freon R22: 3 ÷ 50 kW
- ✓ Silencing up to 18 dB /A/
- ✓ Filtering: class EU-3; EU-7; EU-13

Duct Air-conditioning Systems type „MINI“

Duct systems elements:

1. For inside installation

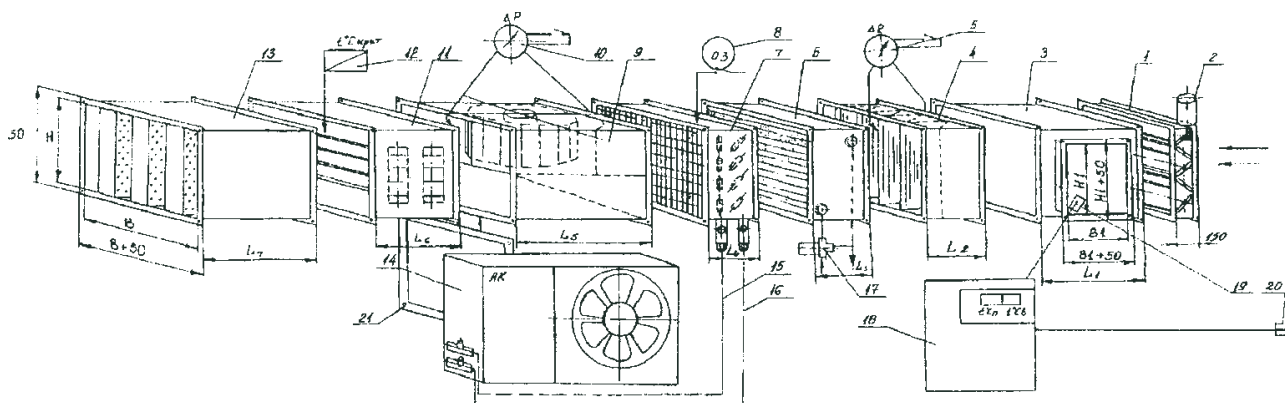
- movable louver grill on the MLG inlet;
- duct mixer - KC;
- duct filter, equipped with filter cassettes with replaceable filter fabric class EU3 - KΦ;
- duct heater with heat exchanger with extruded pipe with aluminum gills or a copper pipe with aluminum lamellas. Hot water is used as a heat carrier 90/70°C - KO;
- duct cooler with a heat exchanger of non-ferrous metals copper pipes $\varnothing 10 \times 0,5$ mm and $\varnothing 16 \times 0,8$ mm, and aluminum lamellas with thickness 0.2 mm - KX;
- duct fan, circular or rectangular - KB;
- duct electrical air-heater with built in electrical heaters which can be switched on different degrees according to the needs KE;
- duct curtain silencer - KIII;
- electrical panels and elements for automatic regulation according to request.

2. For outside installation

- Compressor thermal pump aggregate with cool production - 3; 4; 5 kW and heating 2,9; 3,8; 4,8 kW or water cooling aggregate.

Technical characteristics:

Type	Real section B x H	KC L1, mm	KΦ L2, mm	KO L3, mm	KX L4, mm	KB L5, mm	KE L6, mm	KIII L7, mm
K22M	365 x 290	200 ÷ 400	300	300	500	460	600	500; 1000
K25M	400 x 340	200 ÷ 400	300	300	500	540	810	500; 1000
K28M	450 x 400	200 ÷ 400	300	300	500	630	900	500; 1000
K31M	500 x 300	200 ÷ 400	300	300	500	560	810	500; 1000
	500 x 355					620	900	
	500 x 440					700	600	
K35M	550 x 410	200 ÷ 400	300	300	500	710	900	500; 1000
	550 x 455					760	1000	
	550 x 500					800	600	
K40M	610 x 400	200 ÷ 400	300	300	500	750	1120	500; 1000
	610 x 550					900	1335	
K45M	680 x 410	200 ÷ 400	300	300	500	810	1230	500; 1000
	680 x 610					1010	1125	
K50M	750 x 450	200 ÷ 400	300	300	500	900	acc. to custom's order	500; 1000
	750 x 690					1140		
K56M	850 x 750	200 ÷ 400	300	300	500	1260	-	500; 1000
K63M	940 x 820	200 ÷ 400	300	300	500	1400	-	500; 1000



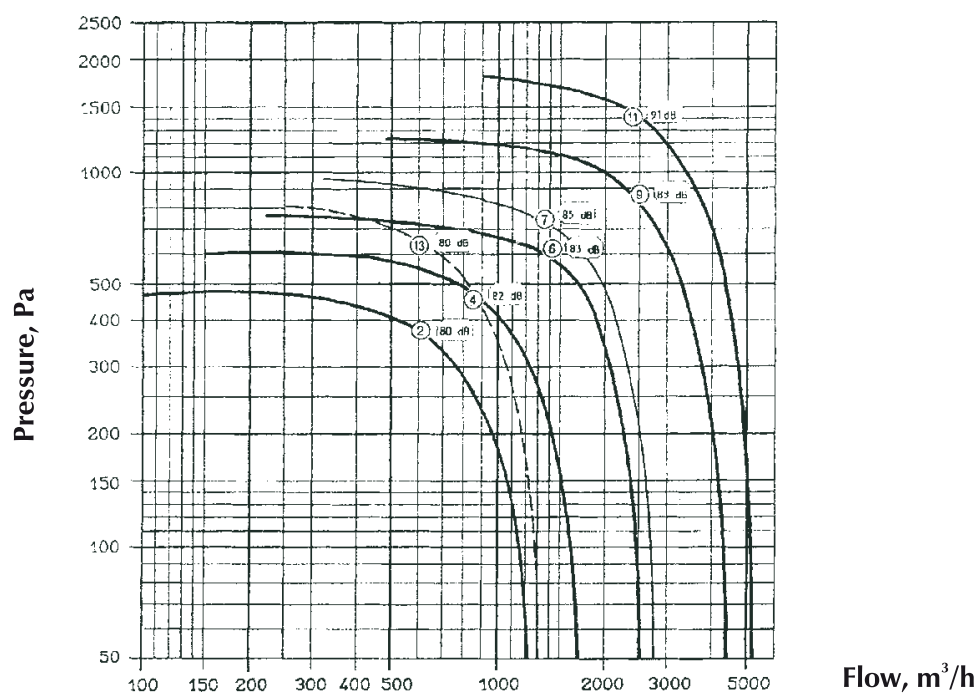
Duct Air-conditioning Systems type „MINI“

Ventilation duct modules with two - pole electrical engines

Technical characteristics:

Type	General dimensions BxH	Fan type	Length L mm	Max. flow m ³ /h	Rev. min	El. power kW	Max. el. A	Vol- tage V	Lv. of sound pres- sure dB/A/	Dia- gram I
I. K22M	365 x 290	RH22M-2DK.1B.2R RH22M-2EK.1B.2R	460	1050 1020	2770 2750	0.16	0.31	400 220		2
II. K25M	400 x 340	RH25M-2DK.1E.2R RH25M-2EK.1E.2R	540	1420 1250	2770 2750	0.16	0.16	400 220		4
III. K28M	450 x 400	RH28M-2DK.3F.2R RH28M-2EK.3F.2R RH28M-2DK.3F.1R RH28M-2EK.3F.1R	630	2480 2400 2760 2590	2770 2720 2750 2680	0.50 0.51 0.57 0.54	0.88 2.10 1.05 2.30	400 220 400 220	72 72 75 74	6
IV. K31M	500 x 300 500 x 355 500 x 440	RH31M-2DK.3B.3R RH31M-2EK.3F.3R RH31M-2DK.3F.2R	560 620	1390 1390 2860	2700 2800 2680	0.32 0.36 0.68	0.55 1.55 1.10	400 220 400	72 72 78	13 13 7
V. K35M	550 x 410 550 x 445	RH35M-2DK.6F.2R RH35M-2DK.6K.3R	710 760	3500 3700	2770 2880	1.35 1.55	2.50 2.70	400 400	76 77	9 9
VI. K40M	610 x 400	RH40M-2DK.6K.2R	750	3000	2900	1.45	2.70	400	83	9
VII. K45M	680 x 410	RH45M-2DK.6K.2R	810	4800	2810	2.5	4.00	400	83	11
VIII. K50M	750 x 450	RH50M-2DK.7M.2R	900	5200	2750	2.9	4.90	400	81	11

I. Diagram to choose fans with two - pole engines



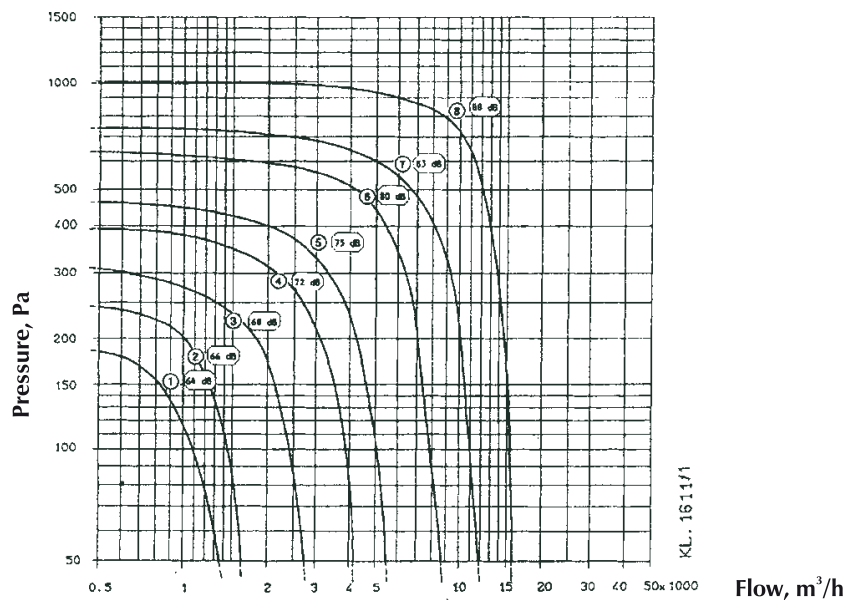
Duct Air-conditioning Systems type „MINI“

Ventilation duct modules with four - pole electrical engines

Technical characteristics:

Type	General dimensions B x H	Fan type	Length L mm	Max. flow m ³ /h	Revolu- tions min	El. poewr kW	Max. el A	Vol- tage V	Lv. of sound pres- sure dB/A/	dia- gram II
III. K28M	450 x 400	RH28M-4DK.2A.1R RH28M-VDK.2A.1R RH28M-4EK.2A.1R	630	1420 1330 1420	1380 1330/1060 1330	0.11 0.07/0.05 0.13	0.25 0.14/0.18 0.6	400 400 220	58 57 58	1
IV. K31M	500 x 355	RH31M-4DK.2A.2R RH31M-VDK.2A.2R RH31M-4EK.2A.2R	620	1440 1440 1500	1340 1360/1100 1330	0.32 0.12/0.18 0.14	0.55 0.26/0.13 0.65	400 400 220	57 57 65	2
	500 x 440	RH31M-4DK.2C.1R RH31M-VDK.2C.1R RH31M-4EK.2C.1R	700	1880 1830 1800	1400 1330/1080 1300	0.15 0.13/0.09 0.17	1.1 0.27/0.15 0.9	400 400 220	58 57 57	2
VI. K40M	610 x 550	RH40M-4DK.4C.1R RH40M-VDK.4C.1R RH40M-4EK.4F.1R	900	4100 4100 4100	1340 1340/1060 1360	0.46 0.46/0.31 0.52	0.85 0.85/0.49 2.2	400 400 220	64 64 64	4
VII. K45M	680 x 610	RH45M-4DK.4F.1R RH45M-VDK.4F.1R RH45M-4EK.4L.1R	1010	5500 5500 5500	1230 1230/870 1280	1.69 0.69/0.36 0.74	1.3 1.3/0.66 3.2	400 400 220	74 66 67	5
VIII. K50M	750 x 690	RH50M-4DK.6F.1R RH50M-VDK.6F.1R RH50M-4EK.6K.1R	1140	8400 8200 7650	1340 1320/1020 1320	2.9 1.2/0.78 1.3	4.9 2.2/1.35 5.7	400 400 220	70 69 69	6
IX. K56M	850 x 750	RH56M-4DK.6K.1R RH56M-VDK.6K.1R	1260	10200 10200	1230 1320/1020	1.8 1.8/0.96	3.4 3.4/1.8	400 400	71 71	7
X. K63M	940 x 830	RH63M-4DK.7Q.1R RH63M-VDK.7Q.1R	1400	15600 15600	1380 1340/1060	4.1 3.9/2.7	6.8 6.8/4.7	400 400	80 79	8

II. Diagram to choose fans with four - pole engines



Duct Air-conditioning Systems type „MINI“

Duct heating modules KO and KE

1. With extruded pipes - KO

- heat carrier hot water 90°/70°C
- the specified heating capacity is determined for a three row heat exchanger and for the given flow and a temperature difference of 40°C

2. With copper pipes and aluminum lamellas - KO

3. Duct electrical air-heater - KE

Duct cooling modules - KX

1. With non-ferrous heat exchanger with copper pipes

- the cooling capacity is determined for a six-row heat exchanger and for the given flow and a temperature difference of 15°C
- cold carrier Freon R22 with a vapour temperature 7°C

Technical characteristics:

Type	B x H	Heating section KO water 90°/70°C				Cooling module KX R22			Duct electrical air-heater KE	
		Flow m³/h	Capa- city kW	Aerody- namic loss Pa	Hyd- raulic loss kPa	Flow m³/h	Capa- city kW	Aerody- namic loss Pa	Capa- city kW	Aerody- namic loss Pa
K22M	365 x 290	500	2.7	60	0.016	300	2.2	57	5	10
K25M	400 x 340	800	3.3	60	0.037	400	2.9	57	7	10
K28M	450 x 400	1100	5.9	60	0.105	600	4.2	70	14	10
K31M	500 x 300	930	5.1	60	0.06	500	3.4	75	7	14
	500 x 355	1100	6.8		0.10	600	4.2	75	14	
	500 x 440	1000	8.5		0.02	700	5.0	64	8	
K35M	550 x 410	1500	7.9	60	0.25	800	5.4	74	21.0	14
	550 x 455	1600	9.9		0.03	900	6.2	74	24.0	
	550 x 500	1000	11.9		0.04	1000	6.8	74	12.0	
K40M	610 x 400	1700	9.3	60	0.06	850	6.0	85	18.0	14
	610 x 550	2000	13.9		0.03	1200	8.3	71	22.0	
K45M	680 x 410	2000	11.0	60	0.06	850	6.0	85	18.0	14
	680 x 610	3200	21.8		0.15	1400	9.9	64	30	
K50M	750 x 450	2500	15.6	60	0.08	2600	11.4	211	acc. to custom's order	-
	750 x 690	4000	28.0		0.33	2400	17.9	92		-
K56M	850 x 750	5000	40.4	60	0.37	3000	27.4	92		-
K63M	940 x 820	6200	50.2	60	1.42	3700	33.3	92		-

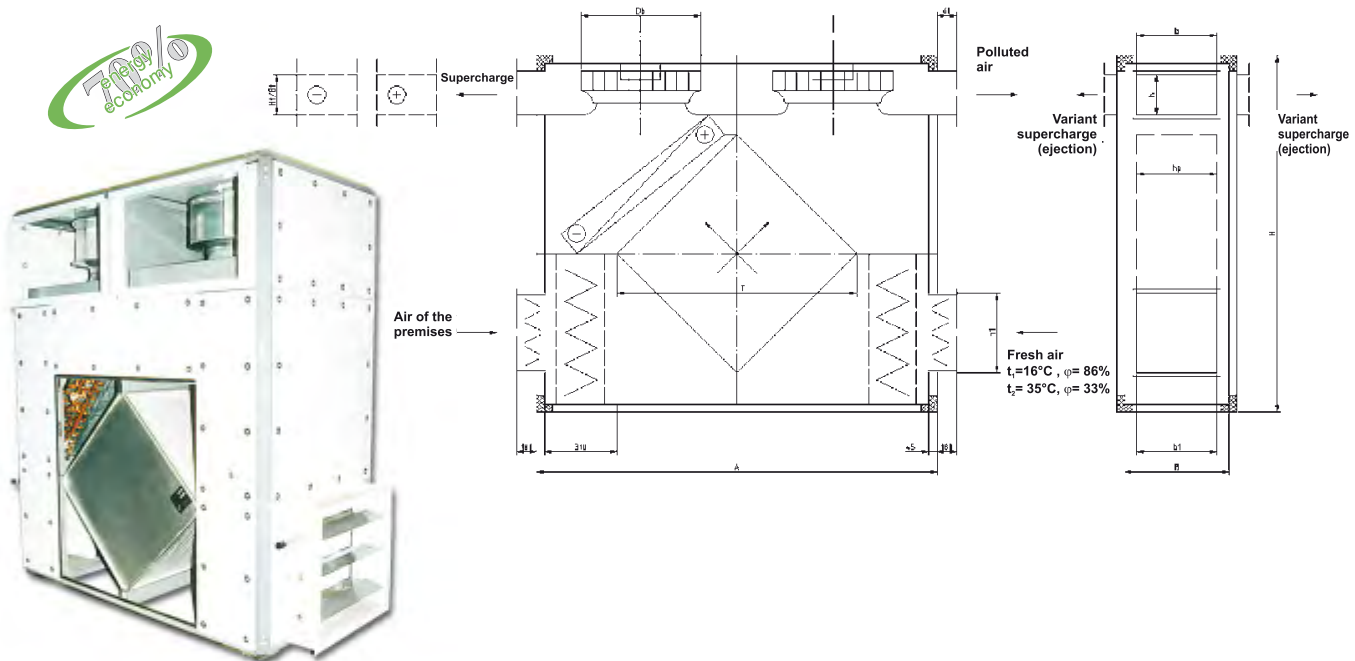
Heat-absorption box with recuperator type HCB

Function:

Central air-conditioning and ventilation installations for domestic needs and in the catering establishments, game halls, clubs and so on, with a built-in recuperator.

It utilizes the energy of the heat or the cold of the used air before its ejection in the atmosphere. It is used when the air recirculation is impossible. Energy economy is realized up to 70%.

The built-in recuperator air-air is made of metal which guarantees the maximal good heat exchange.



Apparatus type	Flow m ³ /h	Overall dimensions			Real free pressure		Aerodynamic loss Pa
		Length mm	Height mm	Width mm	Free pressure supercharge [Pa]	Free pressure suction [Pa]	
HCB 0,5	500	1100	1000	350	104 94	150 140	140
HCB 0,8	800	1250	1170	400	169 119	225 175	140
HCB 1,7	1700	1530	1450	500	240 111	305 175	140
HCB 2	2000	1390	1360	700	115 115 145	180 180 210	140
HCB 2,15	2150 / 1900	1530	1750	550	145 90	210 140	140
HCB 3,2	3200	1670	1790	600	260	210	140
HCB 4,25	4250	1810	1980	700	220	310	140
HCB 4.5	4500	1810	1980	800	140 140 140	230 230 230	140
HCB 4,8	4800	2100	2260	800	213	290	140
HCB 5.5	5500	2100	2200	1000	180 180	270 270	140
HCB 10	10000	2400	2800	1100	332 182	410 260	140

Heat-absorption box with recuperator type HCB

Apparatus type	Supercharging fan data						Suction fan data					
	Type „Ziehl-abegg“ Germany	Flow m ³ /h	Side pres- sure Pa	Built-in power kW	Revolution min ⁻¹	Supply voltage V	Type „Ziehl-abegg“ Germany	Flow m ³ /h	Side pres- sure Pa	Built-in power kW	Revolution min ⁻¹	Supply voltage V
HCB 0.5	RH22M-2DK-1B.1R	500	400	0.19	2770	380	RH22M-2DK-1B.1R	500	400	0.19	2770	380
	RH22M-2EK-1B.1R	500	390	0.20	2640	220	RH22M-2EK-1B.1R	500	390	0.20	2640	220
HCB 0.8	RH25M-2DK-3B.1R	800	480	0.28	2740	380	RH25M-2DK-3B.1R	800	480	0.28	2740	380
	RH25M-2EK-3B.1R	800	430	0.29	2670	220	RH25M-2EK-3B.1R	800	430	0.29	2670	220
HCB 1.7	RH28M-2DK-3F.1R	1700	580	0.57	2750	380	RH28M-2DK-3F.1R	1700	580	0.57	2750	380
	RH28M-2EK-3F.1R	1700	450	0.54	2680	220	RH28M-2EK-3F.1R	1700	450	0.54	2680	220
HCB 2	RH45M-VDK-4F.1R	2000	400	0.69/0.36	1230/900	380	RH45M-VDK-4F.1R	2000	400	0.69/0.36	1230/900	380
	RH45M-4DK-4F.1R	2000	400	0.69	1230	380	RH45M-4DK-4F.1R	2000	400	0.69	1230	380
	RH45M-4EK-4L.1R	2000	430	0.74	1280	220	RH45M-4EK-4L.1R	2000	430	0.74	1280	220
HCB 2.15	RH31M-2DK-3F.2R	2150	480	0.68	2680	380	RH31M-2DK-3F.2R	2150	480	0.68	2680	380
	RH31M-2EK-3F.2R	1900	370	0.68	2470	220	RH31M-2EK-3F.2R	1900	370	0.68	2470	220
HCB 3.2	RH35M-2DK-6K.3R	3000	650	1.55	2880	380	RH35M-2DK-6K.3R	3000	650	1.35	2880	380
HCB 4.25	RH45M-2DK-6K.2R	4250	600	2.50	2810	380	RH45M-2DK-6K.2R	4250	600	2.50	2810	380
HCB 4.5	RH50M-VDK-6F.1R	4500	480	1.2/0.78	1320/900	380	RH50M-VDK-6F.1R	4500	480	1.2/0.78	1320/900	380
	RH50M-4DK-6F.1R	4500	480	1.25	1340	380	RH50M-4DK-6F.1R	4500	480	1.25	1340	380
	RH50M-4EK-6K.1R	4500	480	1.3	1320	220	RH50M-4EK-6K.1R	4500	480	1.3	1320	220
HCB 4.8	RH50M-2DK-7M.2R	4800	580	2.90	2750	380	RH50M-2DK-7M.2R	4800	580	2.90	2750	380
HCB 5.5	RH56M-4DK-6K.1R	5500	500	1.8	1230	380	RH56M-4DK-6K.1R	5500	500	1.8	1230	380
	RH56M-VDK-6K.1R	5500	500	1.8/0.96	1230/860	380	RH56M-VDK-6K.1R	5500	500	1.8/0.96	1230/860	380
HCB 10	RH63M-4DK-7Q.1R	10000	800	4.1	1380	380	RH63M-4DK-7Q.1R	10000	800	4.1	1380	380
	RH63M-VDK-7Q.1R	10000	650	3.9/2.7	1340/1060	380	RH63M-VDK-7Q.1R	10000	650	3.9/2.7	1340/1060	380

Heat-absorption box with recuperator type HCB

Apparatus type	Freon coolant data When $t_{\text{TEST}}=5^{\circ}\text{C}$ - R22						Cold water coolant data 7/12°C								
	Cooling power Q_{cooling} kW type	$t_{\text{OUT AIR}}$ °C φ %	Heat exchanging surfaces m^2	$B_{\text{effective}}$ mm	$H_{\text{effective}}$ mm	ΔP_{air} Pa	Installation	Cooling power Q_{cooling} kW type	$t_{\text{OUT AIR}}$ °C φ %	Heat exchanging surfaces m^2	$B_{\text{effective}}$ mm	$H_{\text{effective}}$ mm	ΔP_{air} Pa	ΔP_{water} кPa	Installation
НСБ 0.5	2.5 COX 3	18 78	4.70	260	250	36	И ¹	2.5 COX 2	18 78	3.90	260	250	26	0.32	И
НСБ 0.8	3.5 COX 3	18 78	6.38	310	300	43	И	3.5 COX 3	18 78	8.18	310	300	47	0.47	И
НСБ 1.7	7.5 COX 3	18 78	13.50	410	450	49	И	7.5 COX 3	18 78	15.62	410	450	53	1.45	И
НСБ 2	9 COX 3	18 78	16.20	610	350	50	И	9 COX 3	18 78	18.50	610	350	56	3.88	И
НСБ 2.15	9.6 COX 3	18 78	18.60	460	500	50	И	9.6 COX 3	18 78	19.30	460	500	55	1.38	И
НСБ 3.2	15 COX 4	18 78	25.60	400	800	74	В ²	15 COX 3	18 78	26.16	400	800	62	1.20	В
НСБ 4.25	19 COX 4	18 78	32.00	500	900	67	В	19 COX 3	18 78	36.60	500	900	56	1.77	В
НСБ 4.5	20 COX 4	18 78	34.30	600	800	66	В	20 COX 3	18 78	39.30	600	800	55	2.60	В
НСБ 4.8	21.5 COX 4	18 78	36.40	600	1000	51	В	21.5 COX 3	18 78	48.60	600	1000	42	1.94	В
НСБ 5.5	25 COX 3	18 78	39.20	780	1000	31	В	25 COX 2	18 78	42.12	780	1000	23	1.84	В
НСБ 10	45 COX 4	18 78	80.20	870	1200	52	В	45 COX 3	18 78	84.00	870	1200	58	6.53	В

¹И - it is installed on the module outlet²Б - it is installed inside the apparatus after the recuperator

Heat-absorption box with recuperator type HCB

Apparatus type	Recuperator data winter 16°C/86%; summer 33°C/32% $t_{\text{PREMISES}}^{\circ}\text{C}=18^{\circ}\text{C}/45\%$; $t_{\text{PREMISES}}^{\circ}\text{C}=26^{\circ}\text{C}/45\%$						COT heater data - non - ferrous: Cu - Al Water 90/70°C						Electrical air - heater			
	Dimension a - mm	Diag. T - mm	Thick- ness h - mm	$t_{\text{OUTW}}^{\circ}\text{C}$ $t_{\text{OUTS}}^{\circ}\text{C}$	Aero heat. ΔP_{AVER} Pa	Max. Q_{heat} kW	t° out air $^{\circ}\text{C}$	Heat. surface m^2	$B_{\text{effective}}$ mm	$H_{\text{effective}}$ mm	ΔP_{AIR} Pa	ΔP_{WATER} kPa	Electrical power kW	Supply voltage V	Current phase A	ΔP_{AIR} Pa
HCB 0.5	300	405	250	3.3 29.7	104 113	4.43 COT1	30	1.95	260	250	10	0.03	4.5	220	20.0	5
HCB 0.8	400	536	300	3.3 29.8	100 115	6.40 COT1	27	2.73	310	300	13	0.05	6.0	220	27.3	8
HCB 1.7	500	677	400	2.6 29.9	120 135	13.50 COT1	26	5.20	410	450	15	0.11	13.5	380	32.6	12
HCB 2	500	677	600	3.0 29.8	75 80	17 COT1	28	6.16	610	350	15	0.26	16.5	380	43.6	15
HCB 2.15	600	819	450	4.8 29.5	120 130	16.30 COT1	27.5	6.44	460	500	15	0.62	16.5	380	43.6	15
HCB 3.2	700	960	500	4.9 29.5	140 150	21.50 COT1	25	7.14	510	500	27	0.18	21.0	380	55.5	20
HCB 4.25	800	1101	600	6.4 29.2	143 150	29 COT1	27	9.33	610	550	27	0.36	28.5	380	75.3	22
HCB 4.5	800	1101	700	6.5 29.2	117 125	32.60 COT1	28	10.86	710	550	23	0.34	33.0	380	87.2	25
HCB 4.8	1000	1384	700	8.0 28.9	140 151	33 COT1	29	10.86	710	550	26	0.4	33.0	380	87.2	26
HCB 5.5	1000	1384	900	8.1 28.9	120 130	41.20 COT1	31	14.00	910	550	21	0.46	40.5	380	107.0	30
HCB 10	1200	1667	1000	9.4 28.6	230 250	68.30 COT1	30	22.00	1010	800	26	0.54	-	-	-	-

Control of the air-conditioning Installations

The control of the Air-conditioning Installations is automatic. Through a controller which observes the outside air temperature and the set temperature in the premise and turns on the fans, the movable louver grills, the pumps, three way reversing valves for hot and cold water, as well as the boiler and the cooling unit.

It is provided an interlock and signalization in case of a fan stop, a filter is obstruct, a recuperator is obstruct, existence of freezing danger or a signal of the fire alarm devise.

Automatics in the installations:

- ✓ differential pressostate;
- ✓ thermostat against freezing;
- ✓ three way reversing valves with electric actuation for hot and cold water;
- ✓ electrical drive for the movable louver grills.



The automatics and the automatic control board are delivered by „Klimatech“ AD.

Control of the Air - conditioning installations

I. Electric board. Function - supply and control of:

- filter module with a cassette with filter fabric;
- heating and absorption fan;
- heat exchanger for hot water with a pump and a three way reversing valve;
- heat exchanger for cold water with a pump and a three way reversing valve;
- programming and regulation of the desired temperature in the premise according to the outside conditions.

II. ΠKTT113 Controller

1. Function

A ΠKTT113 Controller is a compact device to control the air-conditioning installation. The apparatus checks 2 temperatures - in the premise and the outside one. It controls the fan, air valve, pump and engine valve to actuate the hot water tap. A lock is provided and signalization, an alarm in case of fan stop, filter obstruction and temperature sensors break-down. It checks the thermostat signal for presence of heat carrier and a signal from the fire alarm device. The apparatus allows a number of parameters to be set on the spot, which increases its functionality. All parameters, as well as its working condition, in case of supply failure are stored in a supply independent memory.

2. Technical data

2.1. Screen - 2 units 4 discharge light-emitting diode indicators.

2.2. Supply - 220 V $\pm$ 10% AC consumption - max 20mA.

2.3. Inputs

2.3.1. Analog inputs - 2 units, thermal resistance, KTY81210 - (-30°C) up to +50°C with punctuality $\pm 1^\circ\text{C}$.

2.3.2. Relay inputs - 4 units, optoisolated - a signal from a mechanical or electrical switch, maximal voltage 24VDC.

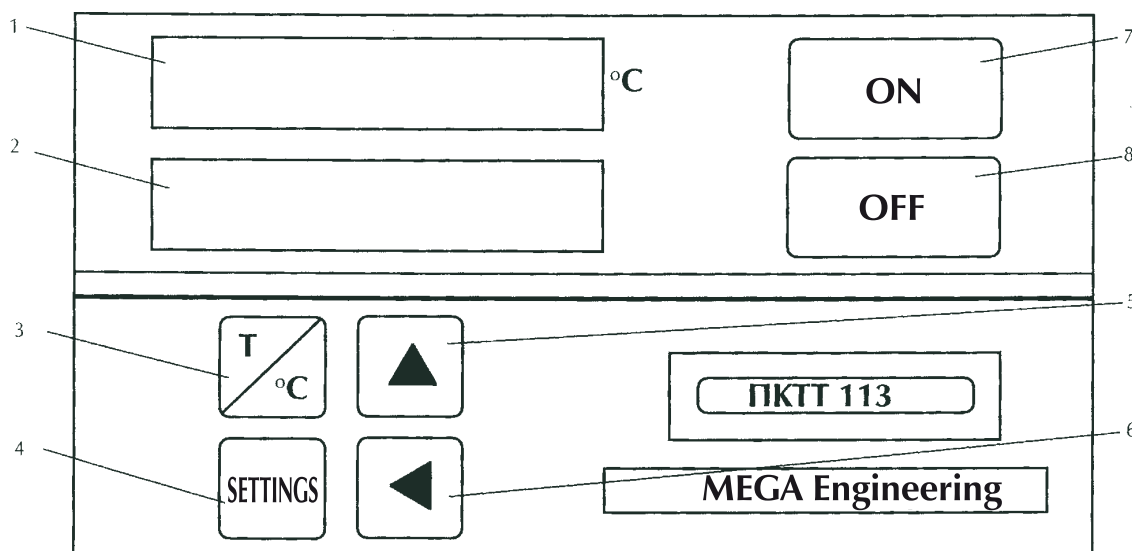
2.4. Relay inputs, optoisolated transistor switch - max electricity 50 mA - 11 units.

2.5. Exploitation conditions - working temperature - 0 ÷ 50°C working humidity - 0 ÷ 80% RH.

3. Assembly

3.1. Mechanical assembly - the apparatus is assembled on a panel with dimensions 92x92 mm, and is tightened through two diagonal situated devises.

3.2. Electrical connection - the connection is done through a terminal block on the back of the apparatus according to the applied illustrated plan.



III. Front control board panel

• Switches:

- when in position of automatic mode - they allow the control of fan controller, pumps and valves;
- when in position manual mode - the pump work is controlled by buttons, which allows their separation from the process of automatic regulation.

Control of the Air - conditioning installations

- on, off - buttons of fans and pumps in manual mode;
- switches - for manual opening and closing of the hot and cold water valves;
- indicator field for the presence of operative pressures and emergency situations;
- indicator fields for the hot and cold water valves condition;
 - field signal - presence of signal for opening and closing of the controller;
 - field motion - shows the valve rotation at the moment;
 - field position - shows the respective final valve position.

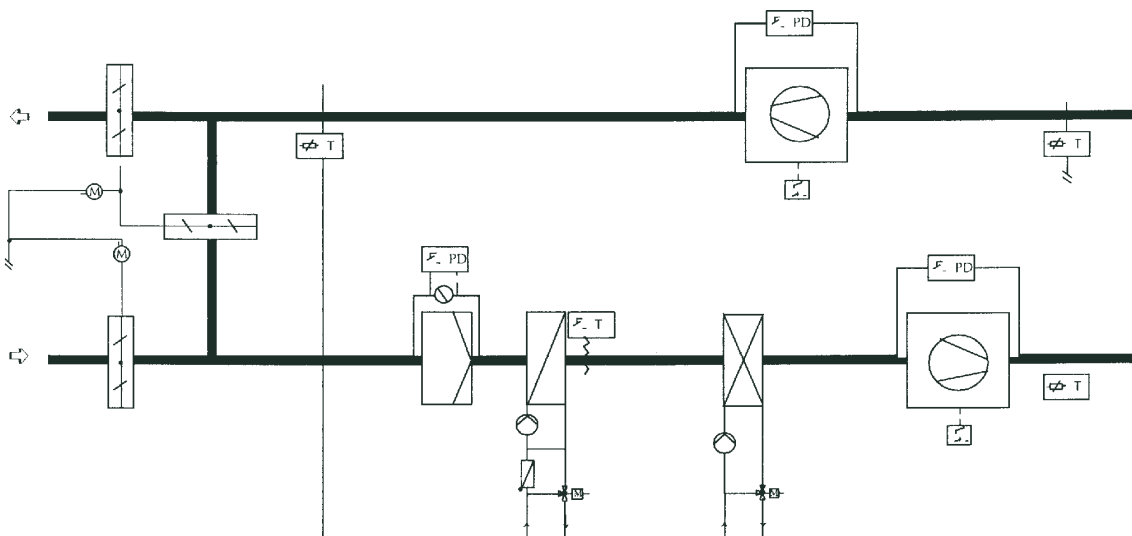
IV. Automatic control

The automatic control of the CKK Units can be done with the devices of all famous manufacturers of such kind of elements according to their technical characteristics.

Automatics:

- for the CΦ modules - manometer to register the dirty filter (differential perostat), whose jacks are installed on the both sides of the filter cassette. Usually the range is 200-300 Pa
- for the COT and COX modules
 - on the output (through the air) is installed a protective thermostat and the apparatus is installed on the shaped metal of the heater (cooler) in its capillary pipe on a suitable place of its real section.
 - the supply of hot and cold water to the heater/cooler is done through a pump with a suitable flow and pressure, bigger than the hydraulic resistance, check valve and three way reversing valves with an actuator, all consistent with the temperature range of the supplied fluid.
- The CB modules when designed with fans RD and ER do not need a registering apparatus (differential presostat) because they are with external rotor engine with posistor protection whose contacts allow a direct registering of the working fan. In case of B/II design or other fan with belt drive the use of differential presostat is necessary to register a loose or rent belt.
- The louver valves of the modules can be manual or with actuators, which are in conformity with the required turning moments and positioning values of the blades.
- The incoming and outgoing air temperatures are registered through the medium of thermal resistance gauges.
- The work of all elements as registering, as well as control is done by the offered in the electrical board regulator on the basis of the comparison between the required temperature in the premise (the outlet of the module) and the one on the inlet of the air.

In case of set parameters of the processed air the company can provide the modules equipped with all the elements for automation.



Sample design for the automatic control of the Heating Unit CKK type in a set supercharging module with heat exchangers for heating and cooling and the connected with it absorption module (including two-storey design).

Elements to the air - conditioning installations



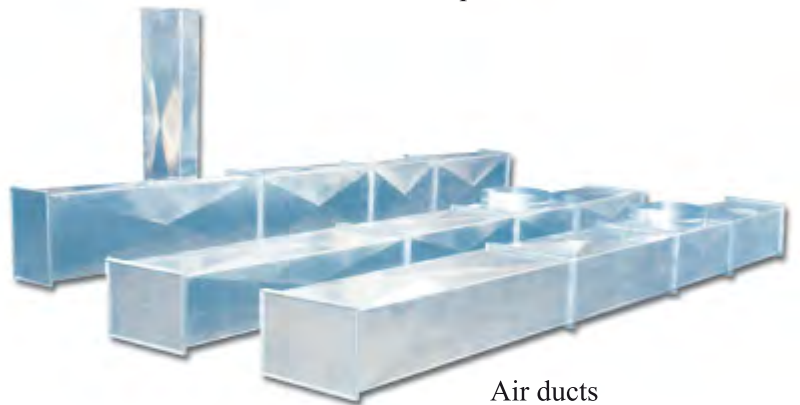
Movable louver grills with manual and automatic driving



Air Stream operated louvers



Fixed louver grills



Air ducts



Horizontal wall grill with regulation and directing



Ceiling grills with regulation



Vertical wall grill with regulation



Horizontal wall grill with regulation

They are made with dimensions according to the client's request and in accordance with the provided designs according to OBK (HVA-Heating Ventilation and Air-conditioning). Ventilation elements are produced for the food processing industry, in accordance with the requirements of the EU.

Elements to the air - conditioning installations

Silencers - cylindrical, rectangular

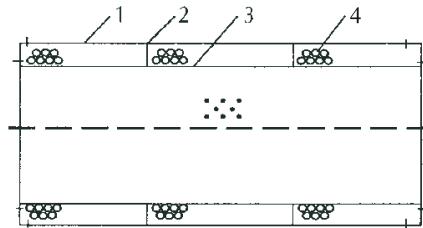
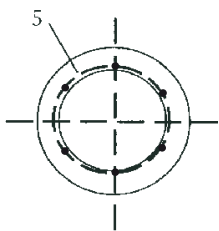
Function:

They lower the level of sound pressure in the systems. They are installed to the fans - axial, centrifugal, ceiling, as well as to the ventilation and air-conditioning systems.

They can be connected by two or more serially.

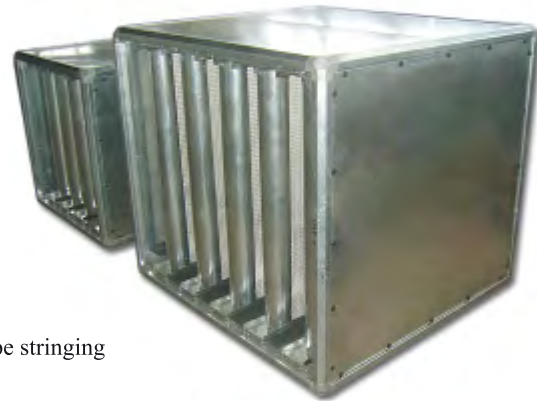
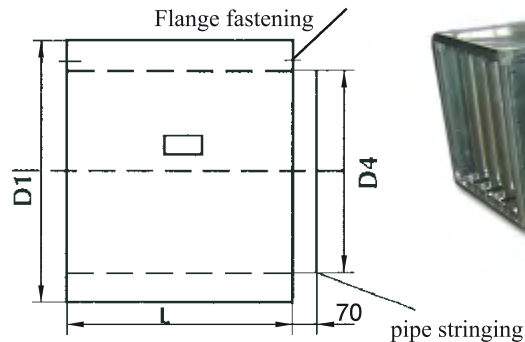
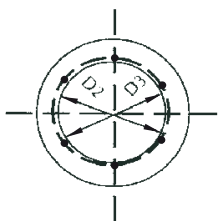
The silencing of the rectangular silencers is determined according to the perimeter of the air duct which corresponding to the closest perimeter of the cylindrical silencer.

Structure:



1. Jacket
2. Partition
3. Perforated cylinder
4. Noise absorbing fabric
5. Flange

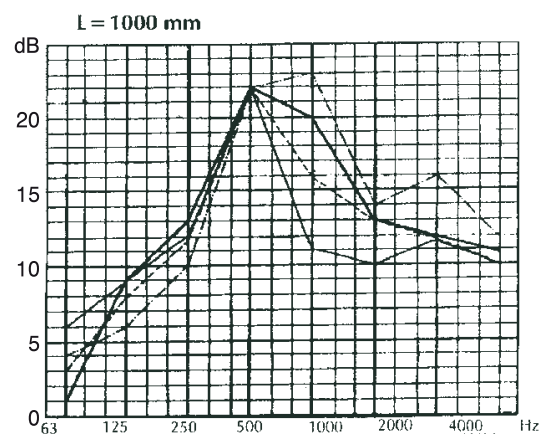
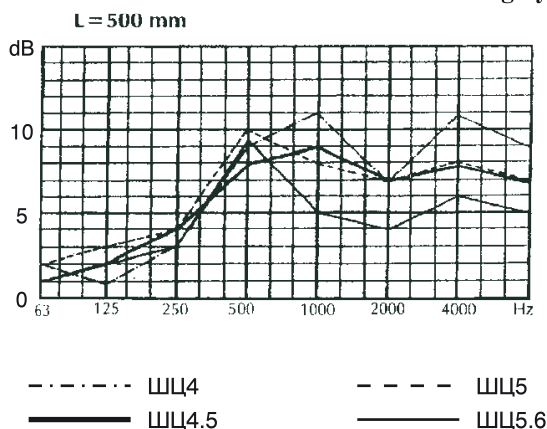
Overall dimensions:



Basic dimensions in mm

Symbol	D1	D2	D3	D4	L/kg	L/kg	L/kg
ШЦ 3	505	300	366	295	500/32	1000/50	1500/68
ШЦ 4	605	400	436	395	500/36	1000/60	1500/84
ШЦ 4.5	655	450	486	445	500/39	1000/70	1500/101
ШЦ 5	705	500	536	495	500/43	1000/80	1500/115
ШЦ 5.6	765	560	604	555	500/46	1000/85	1500/124

Silencing by cylindrical silencers



The silencers are produced according to the client's dimensions, in accordance with the air ducts section, in conformity with the submitted projects according to OBK (HVA-Heating Ventilation and Air-conditioning).

Industrial silencers are also produced for technological purposes.

Ventilation Box BB type



type BB 1,5
type BB 2,5
type BB 2,8

It is designed for ventilation of toilets and kitchens in case of central absorbing systems in multistory buildings.

№	Parameters	Measurements	BB 1,5	BB 2,5	BB 2,8
1	Flow according to air volume	m ³ /h	1500	2500	2800
2	Pressure when 4 joining openings are working	da Pa	30	30	29
3	Installed nominal voltage 380V	kW	0,37	0,75	1.10
4	Nominal frequency of the fan rotation	min ⁻¹	1400	1180	970
5	Openings diameter for joining the absorbing air ducts	mm	Ø 250	Ø 250	Ø 250
6	Noise level of 1 m distance	dB (A)	63	63	63
7	Overall dimensions				
	Height	mm	650	654	820
	Width	mm	500	500	750
	Length	mm	650	694	800
8	Weight	kg	60	70	105

The openings for joining the absorbing air ducts can be round or square.

Fan convectors



The fan convectors are installations for air-conditioning (cooling and heating) of apartments, houses, villas, shops, drinking establishments, and hotels.

They are supplied with hot and cold water.

They are distinguished with high productivity, low noise level, and easy installation.

The fan convectors are easy for exploitation: the manipulations with the filter and the control are elementary.

They find a wide application because of the achieved technical parameters, the good design, and colour arrangement.

The fan convectors are equipped with centrifugal fans.

Four type sizes of fan convectors are developed with air flow from 400 to 980 m³/h.

Every type size has three speeds.

They are produced in two different series: KCCTM and KOCTIIM.

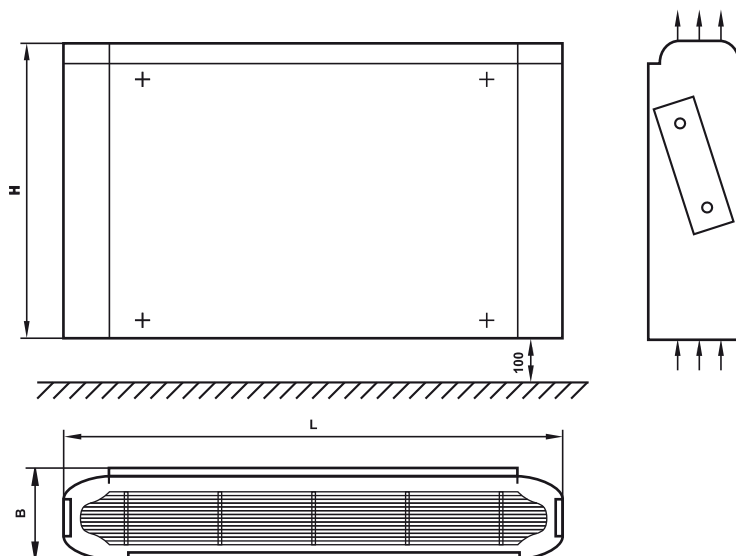
The KCCTM models are for **hidden** wall or ceiling mounting.

The KOCTIIM models are for **open** wall, ceiling or floor mounting.

The following **accessories** are offered to the converters:

- control remote or through a wire;
- legs (for open floor mounting);
- absorbing air aluminum grill for fresh air;
- movable louver grills for fresh air - manually controlled;
- movable louver grills for fresh air with a engine drive for a proportional adjustment 0÷100%, together with 24V servomotor with an IP54 protection and a transformer 230V- 24V;
- three way reversing motor valve ON/OFF (with 4 terminals), equipped with bypass line (maximal working pressure 8 bar), thermo electronic drive ON/OFF with maximal opening time 4 minutes - power supply 230V and a hydraulic set as a connection to the heat exchanger.

Fan convectors



TECHNICAL PARAMETERS		TYPE SIZE			
		K 040	K 060	K 080	K 100
Cooling capacity (full)	kW	2.20	3.40	4.20	4.90
Cooling capacity (actual)	kW	1.90	2.80	3.30	3.90
Water flow in cooling mode	l/h	380	585	725	850
Pressure loss in cooling mode	kPa	15	18	23	30
Two pipe system with $t^{\circ} = 70^{\circ}\text{C}$	Heating capacity	kW	3.80	7.50	9.50
	Water flow	l/h	330	645	810
	Pressure loss	kPa	6	7	12
Two pipe system with $t^{\circ} = 50^{\circ}\text{C}$	Heating capacity	kW	2.70	4.30	5.25
	Water flow	l/h	360	580	690
	Pressure loss	kPa	8	14	24
Four pipe system with $t^{\circ} = 70^{\circ}\text{C}$	Heating capacity	kW	2.30	3.60	4.10
	Water flow	l/h	200	300	460
	Pressure loss	kPa	4	4	7.5
Installed power supply	W	50	75	94	130
Fixing dimensions according to water	inch	1/2"	1/2"	1/2"	1/2"
Air flow	I speed	m ³ /h	400	600	780
	II speed		340	500	650
	III speed		280	370	520
Noise level	I speed	dB (A)	39	40	47
	II speed		35	37	43
	III speed		30	31	35
Overall dimensions of the open mounting convectors	length - L	mm	552	752	952
	height - H	mm	511	511	511
	breadth - B	mm	220	220	220
Overall dimensions of the hidden mounting convectors	length - L	mm	490	690	890
	height - H	mm	462	462	462
	breadth - B	mm	216	216	216

The Fan convectors parameters are measured in the following conditions:

HEATING:

Temperature of the premises $+22^{\circ}\text{C}$
 Two - pipe system: t° of the water : $70/50^{\circ}\text{C}$
 t° of the water : $50/40^{\circ}\text{C}$
 Four - pipe system: t° of the water : $70/50^{\circ}\text{C}$

COOLING:

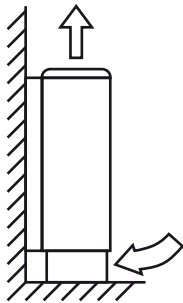
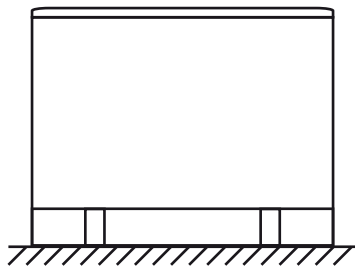
Temperature of the premises $+27^{\circ}\text{C}$
 t° of the incoming water : $+7^{\circ}\text{C}$
 t° of the outgoing water : $+12^{\circ}\text{C}$

The values are applicable for the maximal fan speed. The noise level is about premises with a volume of 100 m^3 .

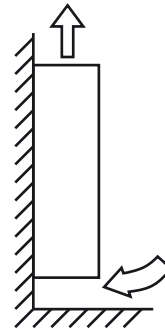
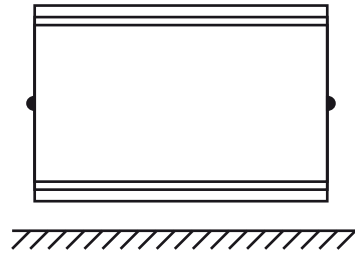
Fan convectors

Types of mounting

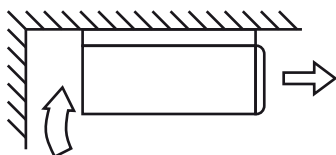
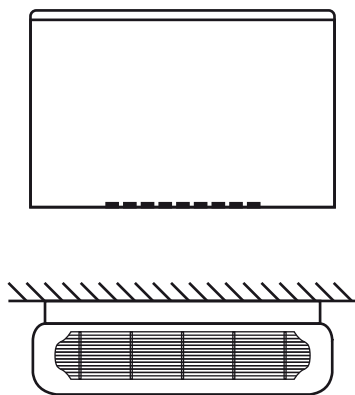
Open floor mounting



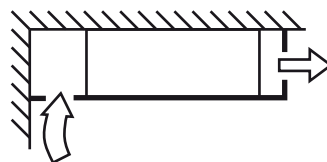
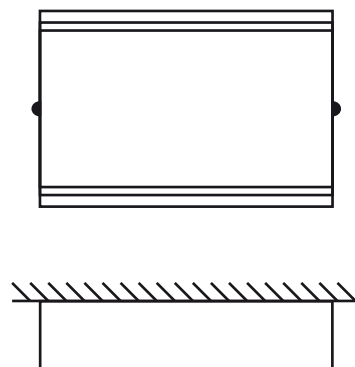
Open wall mounting



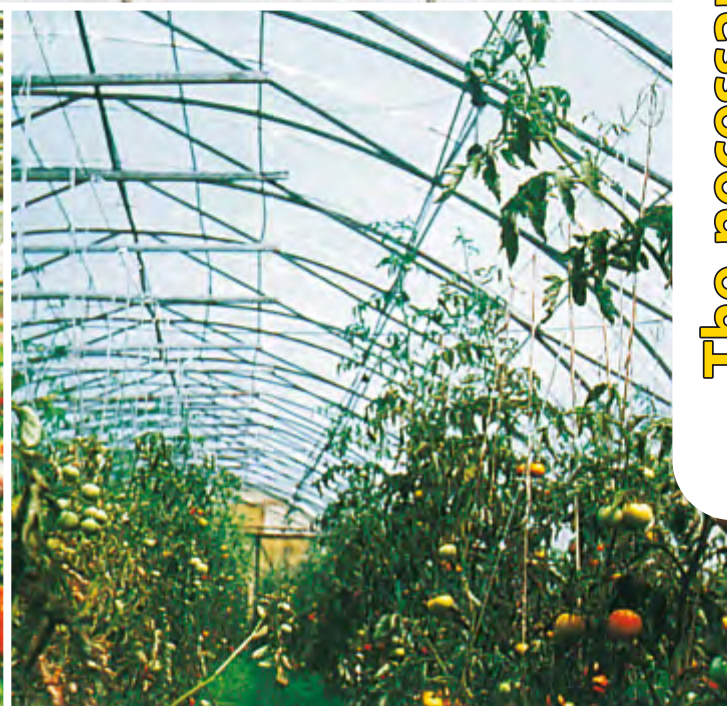
Open ceiling mounting



Hidden ceiling mounting



2



The necessary warmth

Heat exchange units

„Klimatech“ AD manufactures a wide range of heat exchangers, based on gilled pipes:

Type A steel (or non-ferrous) pipe with aluminum gills

Type B copper pipe with aluminum gills

The technology of gill-making guarantees 100% contact between the pipes and the gills and excellent heat exchange.

The dimensions, the heat exchange area and the thermal power are set by customer's order.

The heat exchangers are used in:

- ✓ Energy production NPC, TPC
- ✓ Central heating systems
- ✓ Oil industries
- ✓ Chemical industries
- ✓ Food-processing industries
- ✓ Dryers
- ✓ Heating (cooling) of houses and industrial premises
- ✓ Green-houses



Heat exchanger type A



Heat exchanger type B

The heat exchangers type A are made of black, stainless or non-ferrous pipe, gilled with Al gills. For making the gills on the pipes a high-efficiency technology is applied by the method of coiling an aluminum band or by the method of extrusion of an aluminum pipe.

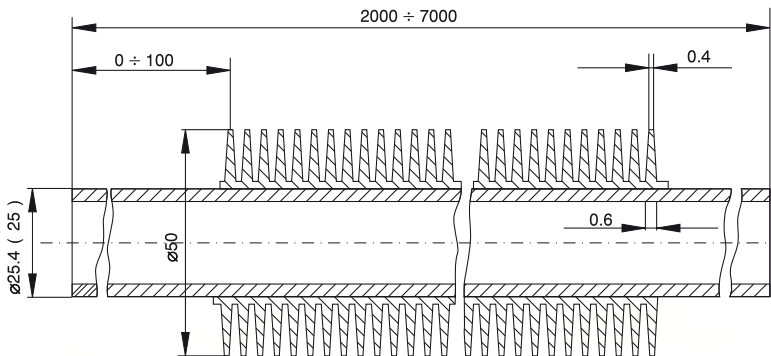
The heat exchange units of type B are made of copper pipe $\varnothing 10$ mm or $\varnothing 16$ mm, gilled with Al lamellas.

Gilled pipes

The heat exchangers type A are made of basic black, stainless or non-ferrous pipe, gilled with aluminum gills by one of the following versions:

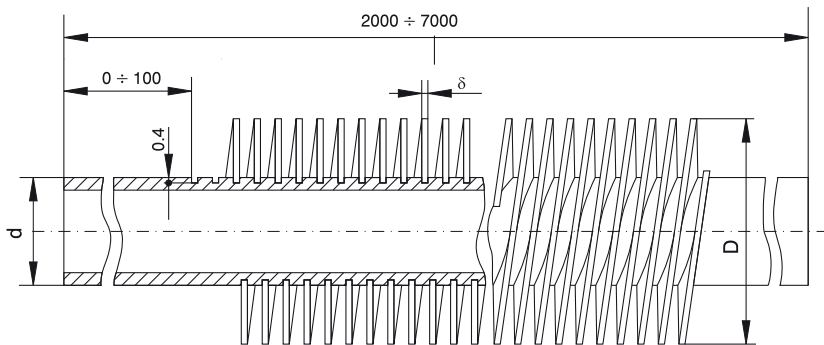
Version of extruding and aluminum pipe

Outer diameter of the basic pipe	mm	25.4 (25)
Outer diameter of the gilled pipe	mm	50 ± 1
Number of gilles in 1"	n	9
Hear exchange area	m ² /m	1.1



Version of coiling aluminum foil

Outer diameter of the basic pipe - d	mm	18 ÷ 48
Outer diameter of the gilled pipe - D	mm	36 ÷ 80
Thickness of the aluminum foil - δ	mm	0.4 ÷ 1.0
Width of the aluminum foil - b	mm	10 ÷ 17
Number of gills in 1"	n	4 ÷ 11
Hear exchange area	m ² /m	2.96



Air - heating unit type BA



type BA 1
type BA 1,5
type BA 2,5
type BA 3,3
type BA 5

The air-heating units type BA are designed for heating and ventilation of industrial premises, warehouses, garages, green houses, sport halls, etc.

The air-heating units are compact products with clear modern line.

The construction allows wall and ceiling mounting.

As heat carrying agent hot water or steam are applied. The heat exchangers for the water as heat carrying agent are made of copper pipes with aluminum lamellas, and those for steam heat-carrying agent - of steel pipes with aluminum gills.

A version of BA with electric heater is also applied.

The air- heating units can operate in the following operation modes:

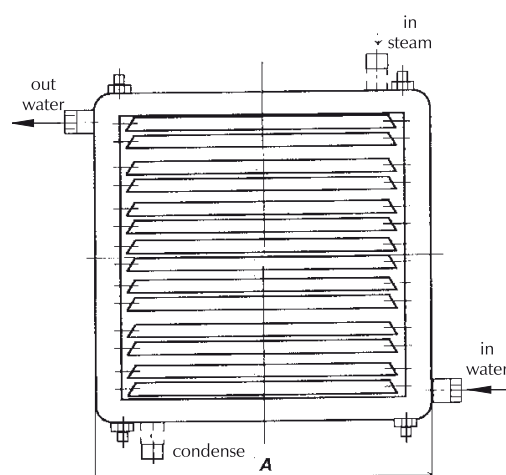
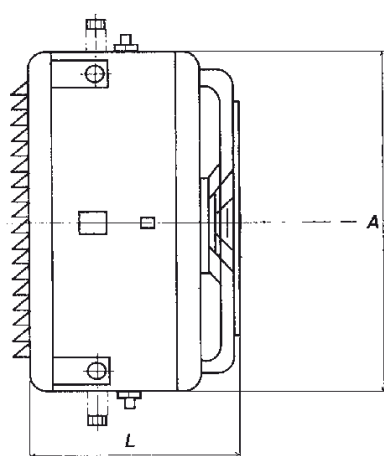
- 100% recirculation air;
- 100% fresh air - a mixing case with a filter is added to the BA unit;
- mixed mode - relevant % of recirculation air and fresh air - a mixing case and MLG are added to the unit.

The air-heating units are offered in explosion-proof version.

Parameters	Unit	BA - 1	BA - 1,5	BA - 2,5	BA - 3,3	BA - 5
Air flow	m ³ /h	1000	1500	2500	3300	5000
Thermal power with water supply 90/70°C	kW	9	13	22	27	36
Thermal power with steam supply 0.1 MPa - 120°C	kW	9	15	25	43	59
Installed power	kW	0,09	0,100	0,180	0,37	0,55
Rotation rate of fan	min ⁻¹	1360	1360	1360	970	1400
Voltage at 50Hz	V	220	220	220	380	380
Dimensions						
- length - A	mm	475	508	558	700	700
- height - A	mm	475	508	558	630	630
- width - L	mm	430	500	508	540	540
Noise, measured at distance 5 m	dB /A/	50	50	55	60	70

Air - heating unit type BA

Parameters	Unit	BA - 1	BA - 1,5	BA - 2,5	BA - 3,3	BA - 5
Heat exchanger for hot water 90/70°C	material	Cu - Al triple	Cu - Al triple	Cu - Al triple	Cu - Al triple	Cu - Al triple
Hot water flow 90/70°C	m ³ /h	0,390	0,560	0,950	1,160	1,550
Water resistance	KPa	1,10	1,50	2,65	3,75	5,95
Heat exchanger for steam 0,1 MPa and 120°C	material	Fe - Al double	Fe - Al double	Fe - Al double	Fe - Al double	Fe - Al double
Steam flow rate 0.1 MPa and 120°C	kg/h	19	32	52	88	122
Feeding pipe	inch	3/4"	3/4"	1"	1 1/4"	1 1/4"
Mass - water	kg	28	30	35	50	50
Mass - steam	kg	45	50	55	80	80
Fan normal version	type	BO 3,2-4	BO 3,5-4	BO 4-4	BOA 5	BOA 5
Fan /Ex/ version	type	BOC 3,2	BOC 3,2	BOC 4	BOC 5	BOC 5



The power is measures at input air temperature 15°C and outlet air temperature 42°C.

The air-heating unit can work with steam up to 0,8 MPa and 170°C.

The air-heating units can be made complete with other fans by customer's order.

Hot air curtain type TB3

It is designed for limiting the air flow through doors, windows, service openings, open display windows etc. It can be supplied with hot or cold water, steam or electric heaters can be installed.



type TB3 - 1
type TB3 - 1,5
type TB3 - 2



Parameters	Unit	TB3 - 1	TB3 - 1,5	TB3 - 2
Air flow rate	m ³ /h	1000	1500	2000
Thermal power	kW	8	18	22
Installed power	kW	0,085	0,400	0,550
Dimensions	mm	1000 x 400 x 280	1000 x 400 x 280	1000 x 400 x 300
Noise level	dB /A/	60	65	70
Feeding pipe	inch	3/4"	1"	1 1/4"
Hot water flow 90/70°C	m ³ /h	0,390	0,780	0,950
Resistance by water	kPa	2,00	2,30	2,50
Jet length	m	3	3	3
Mass	kg	27	45	55

The company makes air curtains with various lengths, depending the door dimensions. Versions of horizontal and vertical mounting are available.

Spiral coil heater with aluminum gills type KCA



Purpose:

To be used for air heating for technological needs, air-heating and air-condition systems.

Construction:

The heaters are made from gilled pipes on basic steel pipe (black or stainless) and aluminum gills, made by extrusion or coiling aluminum band.

They are operated on water or steam heat-carrying agent.

Specific thermal load to heat-exchanging surface area is:

- when operating with hot water - minimum 1400 W/m^2 ,
at $t_a = 15^\circ\text{C}$ and $t_w = 90/70^\circ\text{C}$
- when operating with steam - minimum 2600 W/m^2 ,
for steam $0,01 \text{ MPa}$ and $t_a = 15^\circ\text{C}$
- at air speed in the live section $< 5 \text{ m/s}$

Technical data:

Type dimension	Nominal heat exchange area m^2	Dimensions			Mass kg
		Length mm	Height mm	Depth mm	
KCA - E - 1	2.7	694	384	75	23.0
KCA - E - 2	4.4	814	464	75	31.5
KCA - E - 3	5.9	934	544	75	38.0
KCA - E - 4	9.9	1114	664	75	59.0
KCA - E - 5	13.8	1334	784	75	73.2
KCA - E - 6	20.4	1574	944	75	97.0
KCA - E - 6	29.8	1814	1104	75	123.7
KCA - D - 1	5.3	694	384	112	37.0
KCA - D - 2	7.7	814	464	112	47.0
KCA - D - 3	12.0	934	544	112	57.4
KCA - D - 4	18.1	1114	664	112	86.0
KCA - D - 5	27.6	1334	784	112	121.5
KCA - D - 6	40.8	1574	944	112	170.8
KCA - D - 7	56.7	1814	1104	112	222.4
KCA - T - 1	8.0	694	384	147	47.8
KCA - T - 2	11.6	814	464	147	66.0
KCA - T - 3	17.9	934	544	147	87.0
KCA - T - 4	23.2	1114	664	147	125.7
KCA - T - 5	41.4	1334	784	147	175.5
KCA - T - 6	61.3	1574	944	147	240.7
KCA - T - 7	85	1814	1104	147	319.0

Beside the above dimensions the heater can be made by client's specifications.

Hot air block-generator type БГ 1

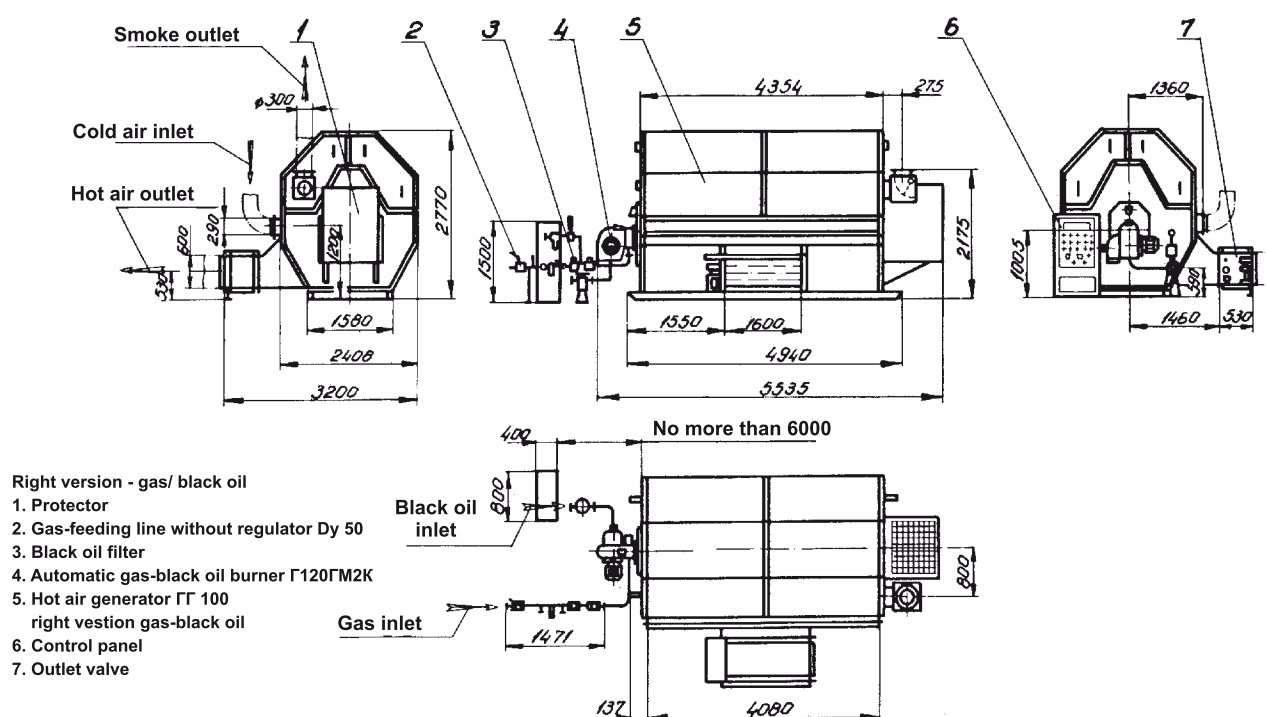


Designed for indirect heating of air for technological needs.

Feeds dryers in ceramic production lines.

As an energy source black oil or natural gas are possible to use one and the same unit can operate on both types of fuels.

Parameters	Unit	Value
Nominal thermal power	kCal/h	1000000
Efficiency factor	%	85 ÷ 89
Fuel black oil - maximal viscosity at 80°C - temperature at the inlet filter of the burner - fuel pressure at inlet - adjustment steps - fuel consumption	E °C MPa number kg/h	11 50 ÷ 70 0.05 ÷ 0.50 2 68 ÷ 120
Flow rate of inlet air at $t_{IN,A} = \pm 20^{\circ}\text{C}$	m^3/h	29000
Hydraulic resistance at $t_{IN,A} = +20^{\circ}\text{C}$	daPa	45
Hydraulic pressure after the generator	daPa	13
Output air temperature	°C	130
Maximal temperature of output air	°C	150
Total installed power in gas - black oil version	kW	12
Power supply voltage	V	220/380
Dimensions L x W x H	mm	5700/3200/2800
Mass	kg	6700



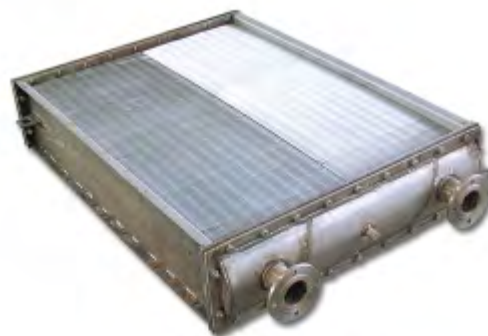
Air - cooling units

Purpose:

1. Air-cooling units

- for cooling hot air with cold water;

Used for hot air cooling of generators in Water Power Stations and Pump- Accumulation Water Power Stations.



2. AirCoolers

- For cooling fluids of various technological processes by cold air.

Used for utilization of the waste heat from industrial production.



Construction:

Made of gilled pipes Fe- Al extruded or coiled, or copper pipes with Al lamellas.

The pipe panels and arcs can be made of black or stainless steel.

The air-cooling units are obligatory blown by fans.

Their operation is reliable, safe and secure.

They are designed for easy prophylactic inspections and pipe cleaning.

The thermal - technical and strength calculations are made by customer's technical assignment.

Casing - pipe heat exchangers (Oil-Coolers)

Purpose:

Applications in the food-processing industries, as well as in various industrial plants, including for cooling the oil in the hydro-aggregate units of Water Power Stations and Pump - Accumulation Water Power Stations.

Construction:

They comprise a casing, pipe bunch and covers, where the inlet and outlet of one fluid are installed.

The casing - pipe heat exchangers are made of plain copper or brass pipes, rolled over into pipe grids. The pipe grids the arcs and the casings are made of black or stainless steel.

The cooling fluid (water) flows in the pipes, and the cooled fluid (oil) flows out of them (in the inter-pipe space).

To provide better circulation of the cooled fluid (the oil), circulation lamellas are set in the inter-pipe space. Their shape is designed so that it can provide multiple alterations in the flow direction of the fluid (the oil) in radial and axial direction.

The casing - pipe heat exchangers can be made with multiple movements in regard to the cooling fluid (the water).

The casing - pipe heat exchangers are technological to make, convenient in installation and de-installation. They are reliable, safe and secure in exploitation.

Their structure is made easy to prophylactic inspections and cleaning the pipes.

The Oil-Coolers meet the requirements of ISO 16812-2007.



The thermal - technical and strength calculations, the dimensions and the structure of the casing - pipe heat exchangers (Oil-Coolers) are in compliance with customer's demands.



For clear environment

Air - cleaning

„Klimatech“ AD works for the protection of the working medium and environment.

The company manufactures air - cleaning equipment, designed for cleaning the outgoing air in pneumatic transport plants from coarse and fine-disperse dust.

We offer dry and wet dust traps depending on the nature and the features the trapped dust.

Dry dust traps

Pocket filters ФДИ type

Purpose:

For suction, pressurizing and mixed pneumatic installations. For integration in hoppers, silos, mills, fillers and packing machines, fraction devices etc.

The dust mix must be chemically non-aggressive and non-explosive.

The regeneration of the filter pockets is done by impulse purging with compressed air at pressure 0,6 MPa.

The filters work at ambient temperatures from -5°C to + 40°C, temperature of purified air up to 60°C and relative humidity up to 80%.

The filters are delivered in a set with an automatic control block.



ФДИ 10 - integrated pocket filter



№	Parameters	Unit	Value
1	Filter area	m ²	10
2	Fan flow rate	m ³ /h	1200
3	Work pressure range, not more than	Pa	± 4000
4	Aerodynamical resistance of pure filter matter	Pa	140
5	Pressure of purged air	MPa	0,6 ÷ 0,8
6	Dust concentration after filtration	mg/m ³	150
7	Dust concentration at filter inlet, not more than	g/m ³	50
8	Power supply voltage	V	220
9	Relative loading of the filter area	m ³ /m ² min	0,8 ÷ 2,0
10	Sound pressure level with noise muffler	dB (A)	95
11	Free head of the filter input with pure filter matter	Pa	1600
12	Compressed air consumption, not more than	m ³ /h	12

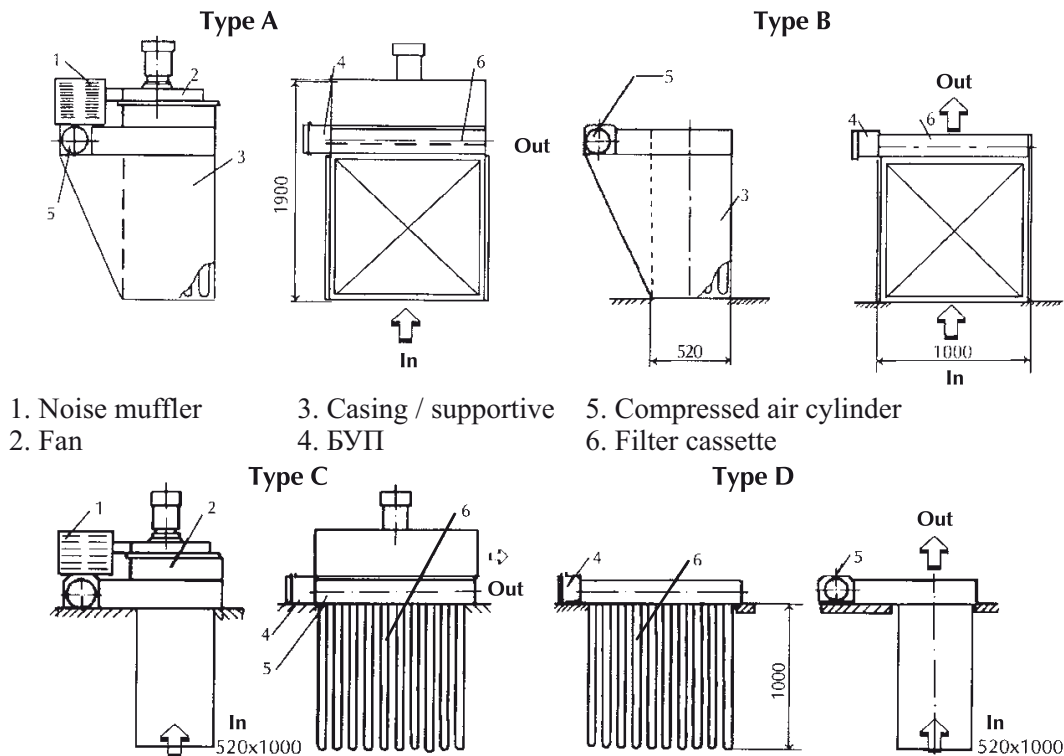
Types:

ФДИ 10 А - complete with filter cassette, fan, noise muffler and casing

ФДИ 10 В - complete with filter cassette and support casing

ФДИ 10 А - complete with filter cassette, fan and noise muffler

ФДИ 10 А - complete with filter cassette



Completing fan type БЦ 3,9.

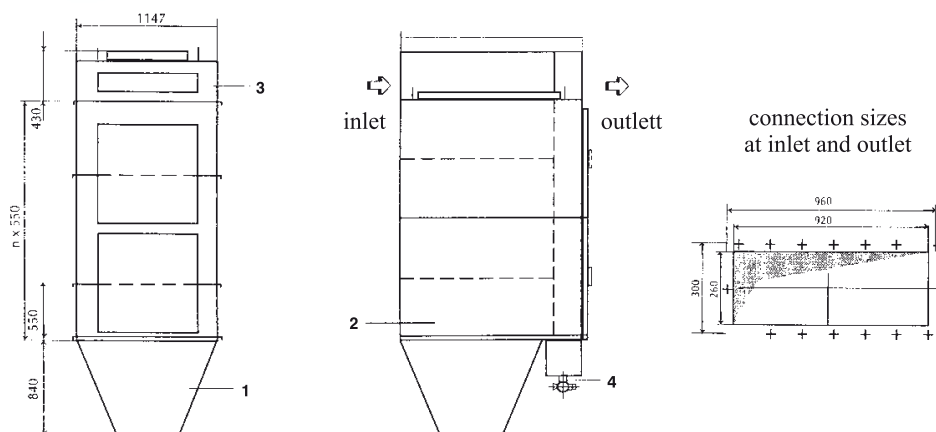
ФДИ 10 x 1 x (2÷4) - section pocket filter

ФДИ 10 x 1 x (2÷4) is built on the base of a module cassette with filter area of 10 m². The cassettes are mounted in lines one above the other.

The regeneration of the pockets is made by impulse purging by compressed air at pressure 0,6 MPa.



№	Parameters	Unit	Value
1	Filter area of one cassette	m ²	10
2	Number of cassettes in a line	n	2,0 ÷ 4,0
3	Maximum dust concentration at inlet	g/m ³	20
4	Dust concentration after the filter	mg/m ³	150
5	Range of operation pressure	Pa	± 4000
6	Recommended resistance rate	Pa	1100 ÷ 1300
7	Power supply voltage	V	220
8	Filtration rate at standard filter matter	m ³ /m ² min	0,8 ÷ 2,0
9	At special filter matter	m ³ /m ² min	2,0 ÷ 8,0
10	Air pressure for impulse purging	M Pa	0,6 ÷ 0,8
11	Compressed air consumption, not more than	m ³ /h	15



1. Hopper
2. Module cassette „n“ pc. n = 2÷4
3. Top cassette
4. Compressed air cylinder

Dry dust traps

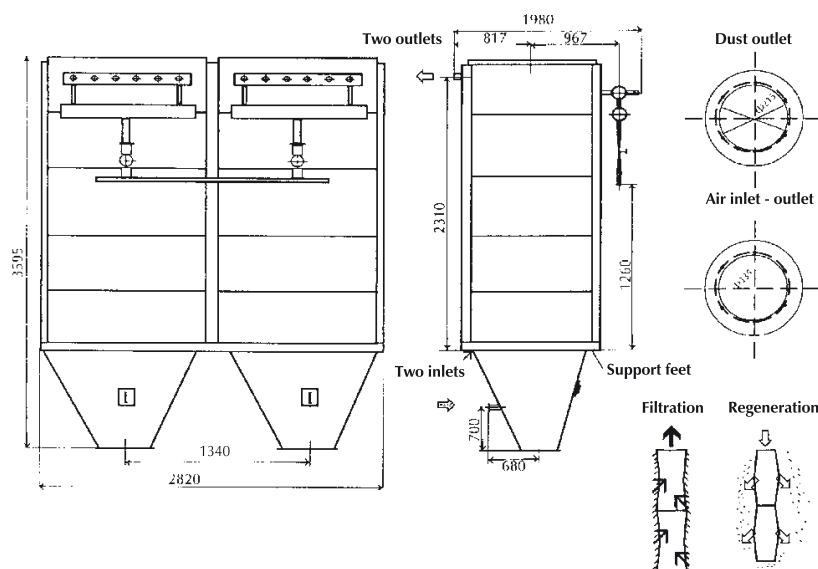
Sleeve filter type ФПКИ - 60

Purpose:

Used for dust removal of technological gases and air mixtures.

The dust mixture must be chemically not aggressive, non-explosive and non-combustible, with temperature -5°C to $+140^{\circ}\text{C}$ and with relative humidity less than 80%.

The regeneration of the filter sleeves is made by impulse purging with compressed air at pressure of 0,6 MPa.



№	Parameters	Unit	Value
1	Filter area	m ²	60
2	Filtration rate, at standard filter matter not more than: • at special filter matter up to:	m ³ /m ² .min m ³ /m ² .min	1.8 8
3	Hydraulic resistance at dusted filter matter up to:	Pa	1800
4	Vacuum or pressure at filter inlet, not more than	Pa	5000
5	Bulk mass of trapped dust	T/m ³	0,9 ÷ 2,65
6	Temperature of purified gasses • not less than /over irrigation point/ • not more than:	°C °C	10° 140°
7	Dust concentration at filter inlet, not more than	g/m ³	50
8	Volume flow rate at specific gas load 1.8 m/min and normal conditions	m ³ /h	6480
9	Dust removing capacity, over	%	99,9
10	Dimensions • length • width • height	mm mm mm	2820 1980 3595
11	Mass of the filter without sleeves	kg	2000
12	Mass of the sleeves	kg	40
13	Compressed air consumption, not more than	m ³ /h	60

The company offers complete sets with fans, support stands, staircases and service platforms, screw conveyors or flashes for dust removal, automatic devices and electrical panels for automatic control and filter operation.

Dry dust traps

Stationary dust trap type ПДЦ 1,8



Fan for ПДЦ 1,8

- 1800 m³/h
- 1570 Pa
- 3000 min⁻¹
- 1.5 kW

Purpose:

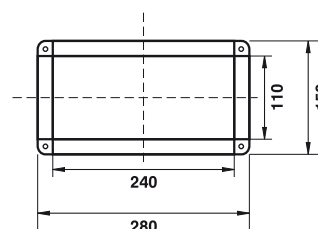
Complete for grinders and sharpen machines for dry abrasive treatment, dry glass and plastic polishing machines, etc.

The cleaned air is released in room without energy consumption.

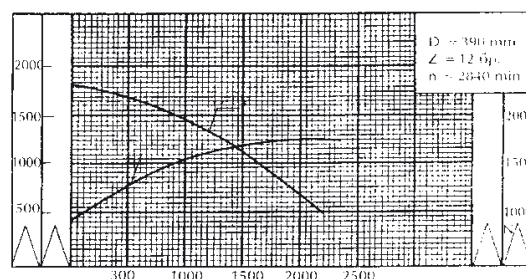
Used for dust, which is not aggressive, not oily and not sticky.

The regeneration of the filter cassette is done by mechanical manual shaking. The trapped dust is collected in a drawer, at the bottom of the dust trap, which must be cleaned periodically.

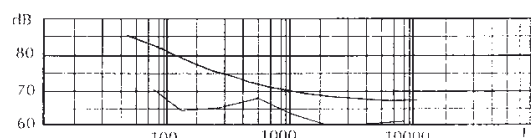
Inlet of dusty air



Aerodynamical characteristics



Spectrogram for measuring the sound pressure level



№	Parameters	Unit	Value
1	Nominal flow rate of filtered air	m ³ /h	1800
2	Free static pressure at normal flow rate	Pa	800
3	Degree of purification at quartz dust with median size 15μm and average quadratic deviation 2,6	%	99
4	Installed power at power voltage 380V	kW	1,5
5	Effective filter area	m ²	8
6	Mass	kg	132
7	Dimensions:		
	Height	mm	1430
	Width	mm	720
	Length	mm	720
8	Sound pressure level	dB /A/	69

Dry dust traps

Cassette filters type KM 1÷40

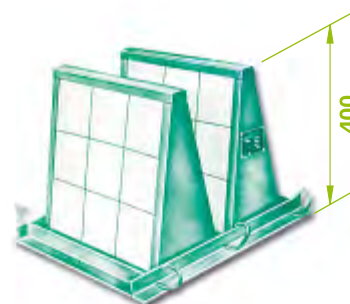
Purpose:

Used for integration in ventilation canals and systems.

Dry dust traps for fine purification of the air, working up to 60°C.

The dust mixture must be chemically non-aggressive and non-explosive.

The filter mater is not recovered, it must be replaced.



Cassette filter



Filter cassette

Technical data of the filter cassette „Universal“:

Nº	Parameters	Unit	Value
1	Air load	m ³ /m ² h	2500
2	Maximum dust concentration of dusted air	g/m ³	0,2
3	Aerodynamic resistance: - of clean filter matter - of dusted filter matter		
		Pa	85
		Pa	160
4	Dust accumulation	g/m ²	200
5	Filtration rate	m/s	1,0 ÷ 2,5
6	Dusting degree	%	88
7	Dimensions	mm	20x490x490

Technical specifications for Cassette filters type KM 1 ÷ 40:

Nº	Filter type	Number of cassettes	Filter area m ²	Dimensions - mm		Construction opening - mm		Mass - kg
				Length	Height	Length	Height	
1.	Ø 1.1	2	0.39	456	626	360	530	21.5
2.	Ø 1.2	4	0.78	756	626	660	530	37
3.	Ø 1.3	6	1.17	1056	626	960	530	52
4.	Ø 1.4	8	1.56	1356	626	1260	530	67
5.	Ø 1.5	10	1.95	1656	626	1560	530	83
6.	Ø 2.2	8	1.56	756	1126	660	1030	66
7.	Ø 2.3	12	2.34	1056	1126	960	1030	92
8.	Ø 2.4	16	3.12	1356	1126	1260	1030	120
9.	Ø 2.5	20	3.90	1656	1126	1560	1030	145
10.	Ø 2.6	24	4.68	1956	1126	1860	1030	170
11.	Ø 2.7	28	5.46	2256	1126	2160	1030	200
12.	Ø 2.8	32	6.24	2556	1126	2460	1030	225
13.	Ø 2.9	36	7.02	2856	1126	2760	1030	250
14.	Ø 2.10	40	7.80	3156	1126	3060	1030	275
15.	Ø 3.3	18	3.51	1056	1626	960	1530	135
16.	Ø 3.4	24	4.68	1356	1626	1260	1530	170
17.	Ø 3.5	30	5.85	1656	1626	1560	1530	210
18.	Ø 3.6	36	7.02	1956	1626	1860	1530	245
19.	Ø 3.7	42	8.19	2256	1626	2160	1530	285
20.	Ø 3.8	48	9.36	2556	1626	2460	1530	320
21.	Ø 3.9	54	10.53	2856	1626	2760	1530	355
22.	Ø 3.10	60	11.70	3156	1626	3060	1530	395
23.	Ø 4.4	32	5.24	1356	2126	1260	2030	220
24.	Ø 4.5	40	7.80	1656	2126	1560	2030	270
25.	Ø 4.6	48	9.36	1956	2126	1860	2030	320
26.	Ø 4.7	56	10.92	2156	2126	2160	2030	370
27.	Ø 4.8	64	12.48	2556	2126	2460	2030	420
28.	Ø 4.9	72	14.04	2856	2126	2760	2030	470
29.	Ø 4.10	80	15.60	3156	2126	3060	2030	540
30.	Ø 5.5	50	9.75	1656	2626	1560	2530	335
31.	Ø 5.6	60	11.70	1956	2626	1860	2530	395
32.	Ø 5.7	70	13.65	2256	2626	2160	2530	455
33.	Ø 5.8	80	15.60	2556	2626	2460	2530	510
34.	Ø 5.9	90	17.55	2856	2626	2760	2530	580
35.	Ø 5.10	100	19.55	3156	2626	3060	2530	630
36.	Ø 6.6	72	10.04	1956	3126	1860	3030	470
37.	Ø 6.7	84	16.38	2256	3126	2160	3030	540
38.	Ø 6.8	96	18.71	2556	3126	2460	3030	610
39.	Ø 6.9	108	21.06	2856	3126	2760	3030	680
40.	Ø 6.10	120	23.40	3156	3126	3060	3030	760

Dry dust traps

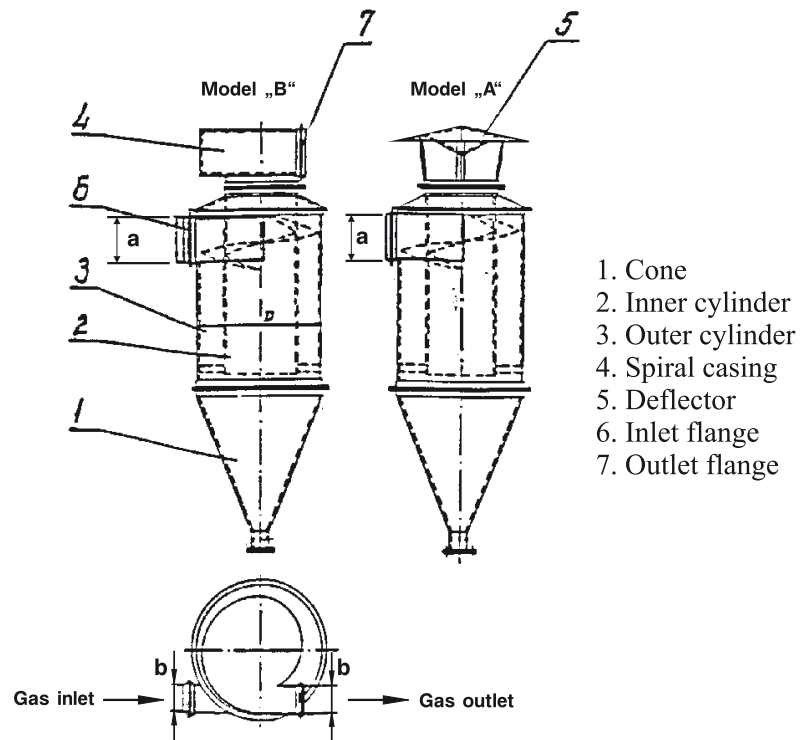
Cyclones centrifugal type ЛНТ 1 ÷ 10

Purpose:

Used for coarse and medium cleaning of dry air or gas from the dust. They operate at pressure - model A and at suction - model B

Used for preliminary air cleaning - 1st degree of cleaning, before pocket or sleeve filters.

The dust mixture must be chemically non-aggressive and non-explosive.



1. Cone
2. Inner cylinder
3. Outer cylinder
4. Spiral casing
5. Deflector
6. Inlet flange
7. Outlet flange

Input section flow rate m/s	№ of cyclone										Cyclone resistance Pa	
	1	2	3	4	5	6	7	8	9	10		
	Cyclone production capacity m³/h										Model A	Model B
12	1000	2000	3000	4000	5000	5700	6700	8800	10000	12000	246	221
15	1200	2500	3700	5000	5800	7100	8300	10400	12500	14000	385	344
18	1500	3000	4500	6000	7500	8500	10000	15000	17500	17000	556	496

Parameters	№ of cyclone									
	1	2	3	4	5	6	7	8	9	10
Diameter - mm	Ø553	Ø762	Ø966	Ø1111	Ø1226	Ø1326	Ø1441	Ø1596	Ø1761	Ø1886
Height mm	1945	2675	3355	3785	4255	4520	4885	5420	5945	6315
Mass - kg	70	120	250	300	370	430	480	630	780	870
Inlet/Outlet a x b - mm	200 x 115	285 x 165	350 x 200	405 x 230	450 x 250	480 x 275	520 x 300	580 x 330	640 x 365	685 x 390

A version of Centrifugal cyclone is made for wet air purification from dust (scrubber) - by integration of water nozzles.

Wet dust traps

Whirl-foam dust trap with continuous operation ПВПН - 5 ÷ 45

Purpose:

Used for trapping dusts, which are moistened and after that they become heavier than water. The dust air passes through a whirling device, sweeps along the water droplets, whirls into a foamy layer, the dust particles get wet and settle down in the water chamber. The water drops swept by the air are trapped in a water trap.

The residue is thrown out by a slime-scrubbing chain.

Degree of cleaning 99,5%

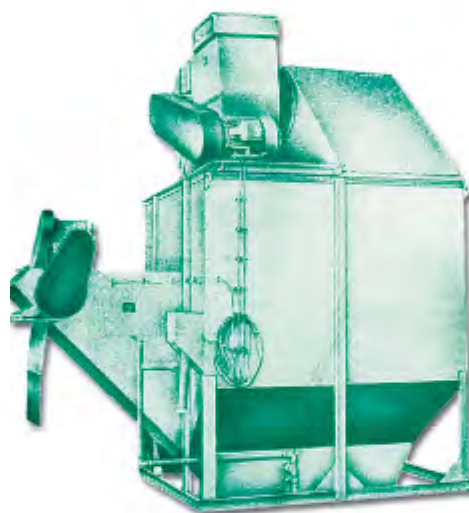
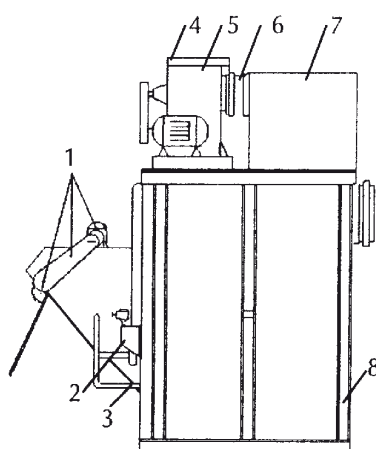
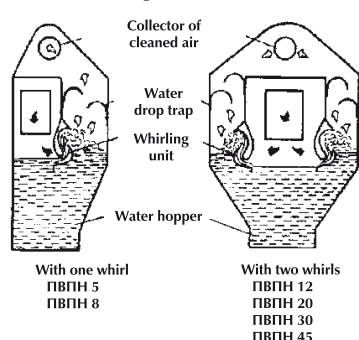
At dust concentration more than 40g/m^3 , a preliminary cleaning unit is needed (for example: cyclone).

At dust concentration under 1g/m^3 , the usage of the ПВПН is purposeless.

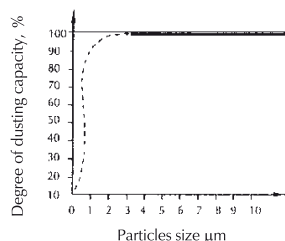
Used in ceramic industry, smelting, machine-construction.

Traps particles with median size larger than $5\text{ }\mu\text{m}$.

Principle construction



Fractional characteristic of degree of dusting capacity



1. Slime scrubbing system
2. Level - measuring box
3. Water supply system
4. Adjusting flap system
5. Fan
6. Soft connection
7. Suction chamber
8. Body

№	Parameters	Unit	ПВПН-5	ПВПН-8	ПВПН-12	ПВПН-20	ПВПН-30	ПВПН-45
1	Nominal air flow rate	$\text{m}^3/\text{h} \cdot 10^3$	$5 \pm 5\%$	$8 \pm 5\%$	$12 \pm 5\%$	$20 \pm 5\%$	$30 \pm 5\%$	$45 \pm 5\%$
2	Adjustment range	$\text{m}^3/\text{h} \cdot 10^3$	$3.5 \div 5.5$	$5.5 \div 9$	$8.5 \div 13$	$14 \div 22$	$21 \div 33$	$32 \div 50$
3	Maximum dust concentration at inlet	g/m^3	40	40	40	40	40	40
4	Dust retaining capacity	%	99.5	99.5	99.5	99.5	99.5	99.5
5	Aerodynamical resistance	Pa	1470	1470	1470	1470	1470	1470
6	Free maximum vacuum at inlet	Pa	1500	1500	1500	1500	1500	1500
7	Water consumption	l/h	75	120	195	300	450	675
8	Installed power less than	kW	7.5	16	19	24	42	57
9	Power supply voltage at 50 Hz	V	380	380	380	380	380	380
10	Speed of slime chain	m/min	$0.8 \div 1.5$	$0.8 \div 1.5$	$0.8 \div 1.5$	$0.8 \div 1.5$	$0.8 \div 1.5$	$0.8 \div 1.5$
11	Dimensions: Length	mm	2195	2925	3168	3975	4775	5670
	Width	mm	1450	1485	2258	2258	2605	2605
	Height	mm	3395	3655	4541	4215	4855	4855
12	Mass, less than	kg	1410	1660	2730	3250	4500	5700
13	Complete fan	type	BHCH 4	BHCH 6,3	BHCH 6,3	BHCH8	BHCH 9,5	BHCH 9,5

A version of periodical removal of the residues is offered - Foam-whirling dust trap with interrupted operation type ПВПП 5 ÷ 45.

Lined area for notes, consisting of numerous horizontal dotted lines.



Since 2002 the company has introduced and maintains the Quality Management System, certified by ISO 9001:2000.

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