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

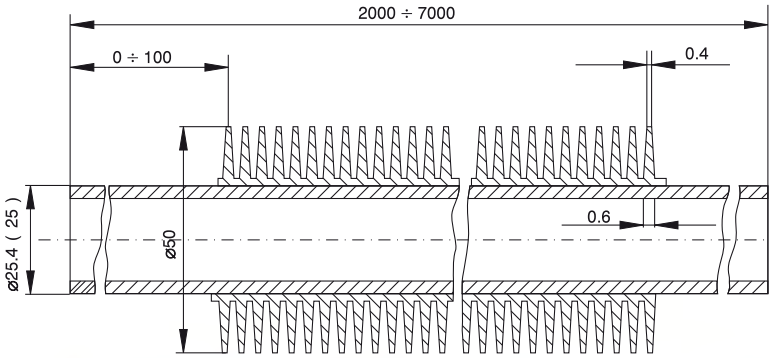
The heat exchangers type A are made of black, stainless or non-ferrous pipe, gilled with Al gills. For making the gills on the pipes a high-efficiency technology is applied by the method of coiling an aluminum band or by the method of extrusion of an aluminum pipe.
The heat exchange units of type B are made of copper pipe ⌀10 mm or ⌀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:

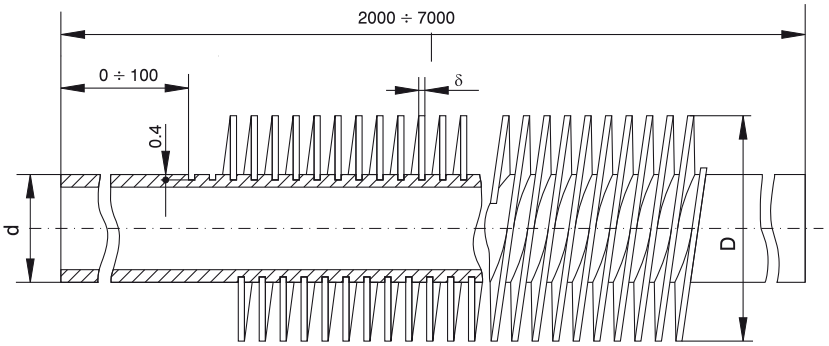
Version of extruding and aluminum pipe

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:

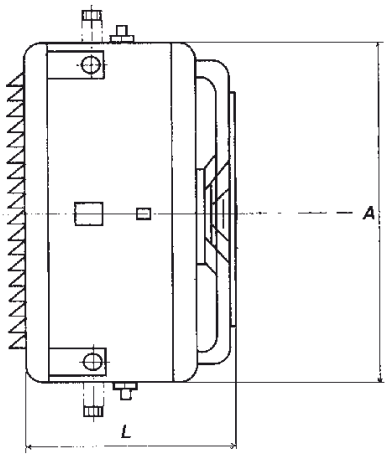
- 100% recirculation air;
- 100% fresh air - a mixing case with a filter is added to the BA unit;
- mixed mode - relevant % of recirculation air and fresh air - a mixing case and MLG are added to the unit.

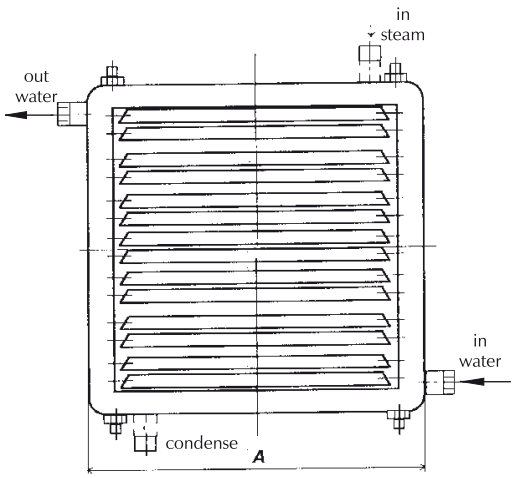
The air-heating units are offered in explosion-proof version.

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 - height - A - width - L	 mm mm mm	 475 475 430	 508 508 500	 558 558 508	 700 630 540	 700 630 540
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°C and t_W=90/70°C
- when operating with steam - minimum 2600 W/m^2, for steam 0,01 MPa and t_A =15°C
- at air speed in the live section < 5 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.

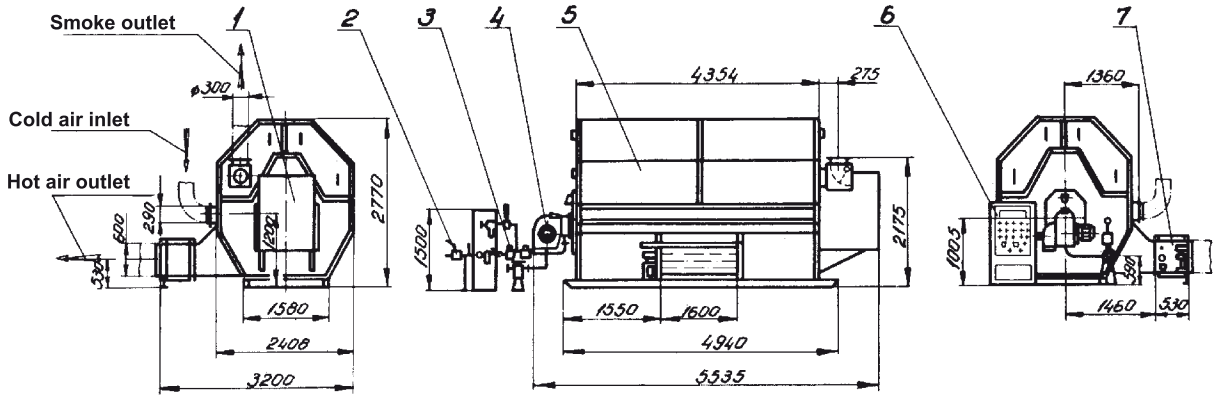
Hot air block-generator type БГ 1

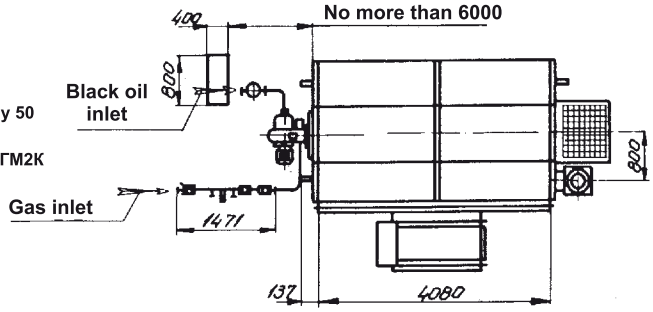
Designed for indirect heating of air for technological needs.

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
Efficienty factor	%	85 ÷ 89
Fuel black oil		
- maximal viscosity at 80°C	E	11
- temperature at the inlet filter of the burner	°C	50 ÷ 70
- fuel pressure at inlet	MPa	0.05 ÷ 0.50
- adjustment steps	number	2
- fuel consumption	kg/h	68 ÷ 120
Flow rate of inlet air at $t_{IN,A}$ = ±20°C	m^3/h	29000
Hydraulic resistance at $t_{IN,A}$ = +20°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

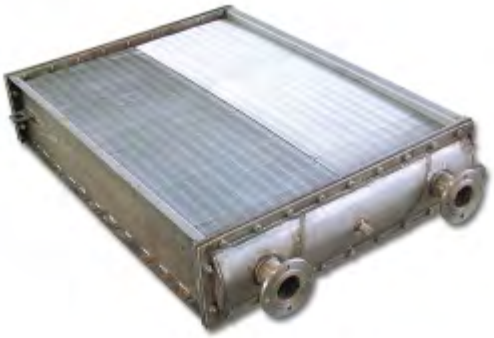




Right version - gas/ black oil
1. Protector
2. Gas-feeding line without regulator Dy 50
3. Black oil filter
4. Automatic gas-black oil burner Г120ГМ2К
5. Hot air generator ГГ 100
   right vestion gas-black oil
6. Control panel
7. Outlet valve

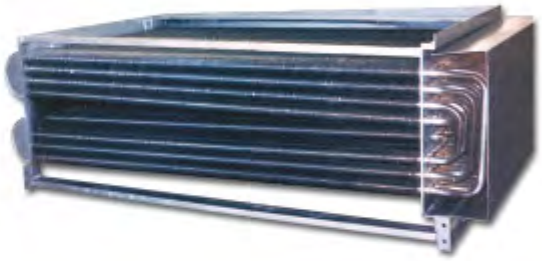
Air - cooling units

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.

Constrction:

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.