

AIR HEATING (COOLING) UNITS



 **VENTS**

2013

*Fresh air in
your house!*

Series
AOW



Air unit with the water heat exchanger for arrangement of cost-saving and efficient air heating and cooling in various premises.

Air heating (cooling) advantages:

- ▶ quick attaining of the set temperature in the premises,
- ▶ low system response time allows applying varying temperature conditions,
- ▶ high thermal capacity,
- ▶ Lower investment costs for air heating (cooling) system as compared to similar water heating (cooling) systems.

■ **Application**

Designed for air heating or cooling by water heat medium with subsequent uniform air distribution by the fan and louvre shutters. The units provide quick heating or cooling of large premises due to high efficient air heater and powerful fan and are suitable for local air heating or cooling of working areas in hangars or large industrial premises. Further application areas include workshops, garages, car showrooms, stock houses, trade facilities, super- and hypermarkets, shops, sport halls, conference halls, poultry and cattle farms, greenhouses and other similar premises. The unit design enables quick and easy mounting and reduces total investment costs for heating (cooling) system.

■ **Design**

AOW unit consists of the axial fan and aluminium-copper ribbed water heating coils located in steel casing with polymeric coating. The water coils are equipped with internally threaded pipes on the casig

side for connection and supply of heat medium. The units are rated for operation at maximum operating pressure 1.6 Mpa (16 bar) and maximum heat medium temperature 100°C.

■ **Motor**

AC motors with external rotor and built-in thermal overheating protection with automatic restart.

■ **Control and regulation**

Both smooth or step speed control with a thyristor or autotransformer controller. Motor speed decrease allows reducing flow and value of heating or cooling energy transfer.

The control block **UWT-1E** is used for controlling the operation modes of the air heating (cooling) unit. The casing is made of polymer coated steel and has IP 44 ingress protection rating. The automation unit has three operation modes, i.e. three modes for speed control.

The unit incorporates a switch with a light indicator,

cable entry seals for cable connection, safety fuse for short circuit protection. The automation unit is designed for joint operation either with TST-1-300 series digital thermostats with a sensor display (the thermostat TSTD-1-300 is equipped with a remote control panel) or with RTS-1-400 series thermostats with LCD display (RTSD-1-400 is equipped with a remote control panel). The digital thermostats are available upon separate order. Install the thermostat in the same room where the AOW unit is installed. It is used to measure the indoor temperature and control the unit operation. For correct functioning of the unit install the thermostat in places that are not subjected to temperature fluctuations, i.e. close to windows, doors, hot-water radiators. One thermostat can be used for control of several air heating (cooling) units located in the same room.

■ **Mounting**

The unit is suitable for vertical installation on walls or columns or horizontal installation on ceiling (beams). See mounting accessories.

Designation key:

Series	Rated power [kW]
VENTS AOW	25; 30; 45

Accessories



UWT-1E MK-AOW MKU-AOW MKP-AOW RTS RTSD TST TSTD

Technical data:

	AOW 25	AOW 30	AOW 45
Unit power voltage [V / 50 Hz]	230	230	230
Fan power [W]	136	191	255
Fan current [A]	0,6	0,85	1,12
RPM	1350	1440	1360
Noise level at 3m [dB(A)]	53	55	58
Maximum heat medium temperature [°C]	100	100	100
Ingress protection rating	IP 44	IP 44	IP 44
Insulation class	F	B	F

Technical data for heating mode:

Model	Air flow [m³/h]	Inlet air temp. [°C]	Temperature difference 90/70 °C				Temperature difference 80/60 °C				Temperature difference 70/50 °C				Temperature difference 60/40 °C			
			Power [kW]	Outlet air temp. [°C]	Water flow [l/s]	Water pressure loss [kPa]	Power [kW]	Outlet air temp. [°C]	Water flow [l/s]	Water pressure loss [kPa]	Power [kW]	Outlet air temp. [°C]	Water flow [l/s]	Water pressure loss [kPa]	Power [kW]	Outlet air temp. [°C]	Water flow [l/s]	Water pressure loss [kPa]
AOW 25	2200	-15	34,5	26,0	1,5	7,5	30,4	21,2	1,3	6,0	26,0	16,0	1,1	4,6	22,0	11,0	1,0	3,4
		-10	32,0	29,0	1,4	6,6	28,3	24,3	1,2	5,3	24,0	19,2	1,1	4,0	20,0	14,0	0,9	2,8
		-5	30,0	32,0	1,3	5,8	26,2	27,4	1,2	4,6	22,0	22,0	1,0	3,4	18,0	17,0	0,8	2,3
		0	28,0	35,0	1,2	5,2	24,1	30,4	1,1	4,0	20,0	25,0	0,9	2,8	16,0	20,0	0,7	1,8
		5	26,2	38,5	1,2	4,5	22,1	33,3	1,0	3,3	18,0	28,0	0,8	2,3	14,0	22,0	0,6	1,4
		10	24,2	41,4	1,1	3,9	20,1	36,1	0,9	2,8	15,9	30,6	0,7	1,9	12,0	25,0	0,5	1,0
		15	22,1	44,2	1,0	3,3	18,1	38,8	0,9	2,3	13,8	33,0	0,6	1,4	9,0	27,0	0,4	0,7
AOW 30	3000	-15	48,4	27,2	2,1	7,4	42,0	22,0	1,9	6,0	36,6	17,0	1,6	4,7	31,0	11,7	1,3	3,5
		-10	45,4	30,3	2,0	6,6	39,0	25,2	1,7	5,3	33,7	20,0	1,5	4,0	27,6	14,6	1,2	2,9
		-5	42,4	33,4	1,9	5,9	36,7	28,2	1,6	4,6	30,0	22,9	1,4	3,4	24,0	17,4	1,1	2,4
		0	39,5	36,4	1,7	5,2	33,8	31,1	1,5	3,9	28,0	25,7	1,2	2,9	21,0	20,0	1,0	1,9
		5	36,7	39,4	1,6	4,5	30,9	34,0	1,4	3,4	25,0	28,5	1,1	2,4	19,0	22,7	0,8	1,5
		10	33,8	42,1	1,5	3,9	28,1	36,7	1,2	2,8	22,0	31,1	1,0	1,9	16,0	25,2	0,7	1,1
		15	31,0	44,9	1,4	3,3	25,3	40,0	1,1	2,3	19,4	33,7	0,9	1,5	13,0	27,5	0,6	0,7
AOW 45	3850	-15	63,0	28,4	2,8	11,9	55,6	23,3	2,4	9,7	48,1	18,1	2,1	7,6	40,4	12,8	1,8	5,7
		-10	59,2	31,5	2,6	10,6	51,8	26,4	2,3	8,5	44,3	21,1	1,9	6,6	36,7	15,7	1,6	4,8
		-5	55,4	34,6	2,4	9,4	48,0	29,3	2,1	7,4	40,6	23,9	1,8	5,6	32,9	18,5	1,4	3,9
		0	51,6	37,5	2,3	8,3	44,3	32,2	2,0	6,4	36,9	26,8	1,6	4,7	29,2	21,3	1,3	3,2
		5	47,9	40,4	2,1	7,3	40,6	35,0	1,8	5,5	33,2	29,5	1,5	3,9	25,6	23,9	1,1	2,5
		10	44,3	43,2	2,0	6,3	37,0	37,8	1,6	4,6	29,6	32,2	1,3	3,2	21,9	26,4	1,0	1,9
		15	40,6	45,9	1,8	5,4	33,4	40,4	1,5	3,8	26,0	34,8	1,1	2,5	18,1	28,8	0,8	1,3

Accessory selection table:

Air heating unit model	Control unit	Digital thermostat		Mounting accessories		
		with sensor display	with LCD display	Mounting angles	Mounting brackets	Multi-angle bracket
AOW 25	UWT-1E					
AOW 30		TST-1-300	RTS-1-400	MKP-AOW	MK-AOW 25	MKU-AOW 25
AOW 45		TSTD-1-300	RTSD-1-400		MK-AOW 30	MKU-AOW 30
			MK-AOW 45		MKU-AOW 45	

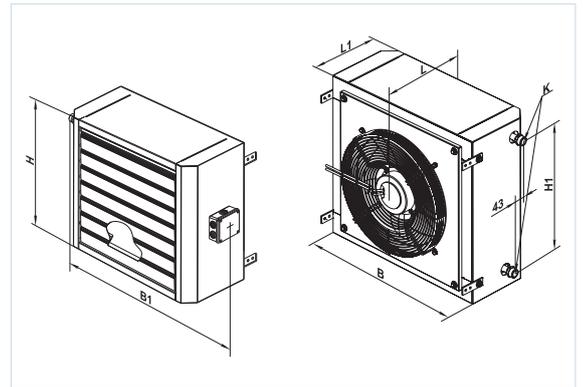
AIR HEATING (COOLING) UNITS

Technical data for cooling mode:

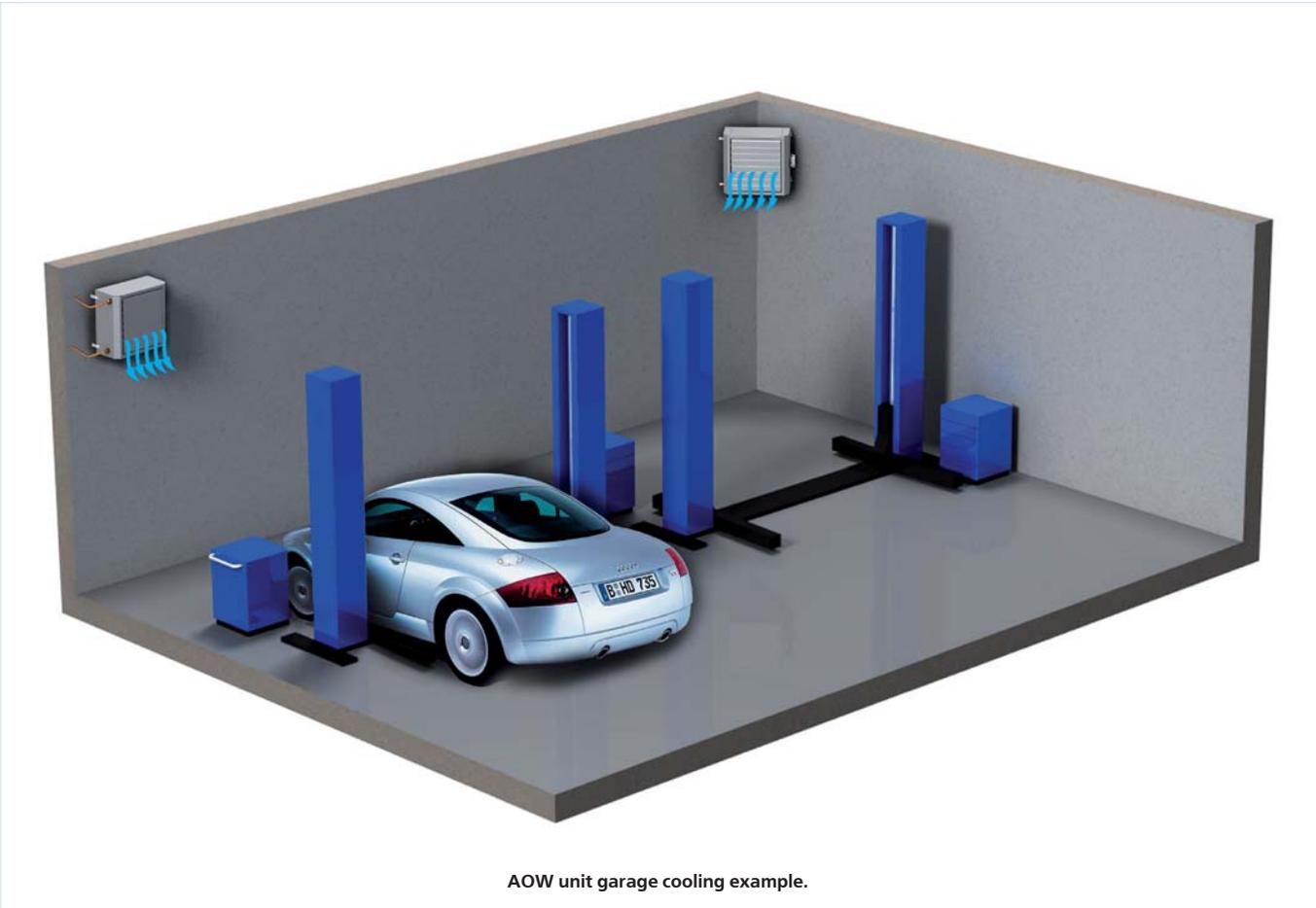
Model	Air flow [m ³ /h]	Inlet air temp. [°C]	Temperature difference 7/12 °C			
			Power [kW]	Outlet air temp. [°C]	Water flow [l/s]	Water pressure loss [kPa]
AOW 25	2200	35	9,1	26,0	1,6	7,5
		30	5,8	22,5	1,0	6,1
		25	3,2	21,0	0,6	2,1
		20	2,0	18,0	0,3	0,9
AOW 30	3000	35	11,4	27,0	2,0	11,2
		30	7,3	22,9	1,3	5,0
		25	3,9	21,1	0,7	1,6
		20	2,4	17,7	0,4	0,7
AOW 45	3850	35	18,0	24,9	3,1	31,8
		30	10,8	21,7	1,9	12,9
		25	7,3	19,0	1,3	6,3
		20	3,2	17,4	0,5	1,4

Overall dimensions without control unit:

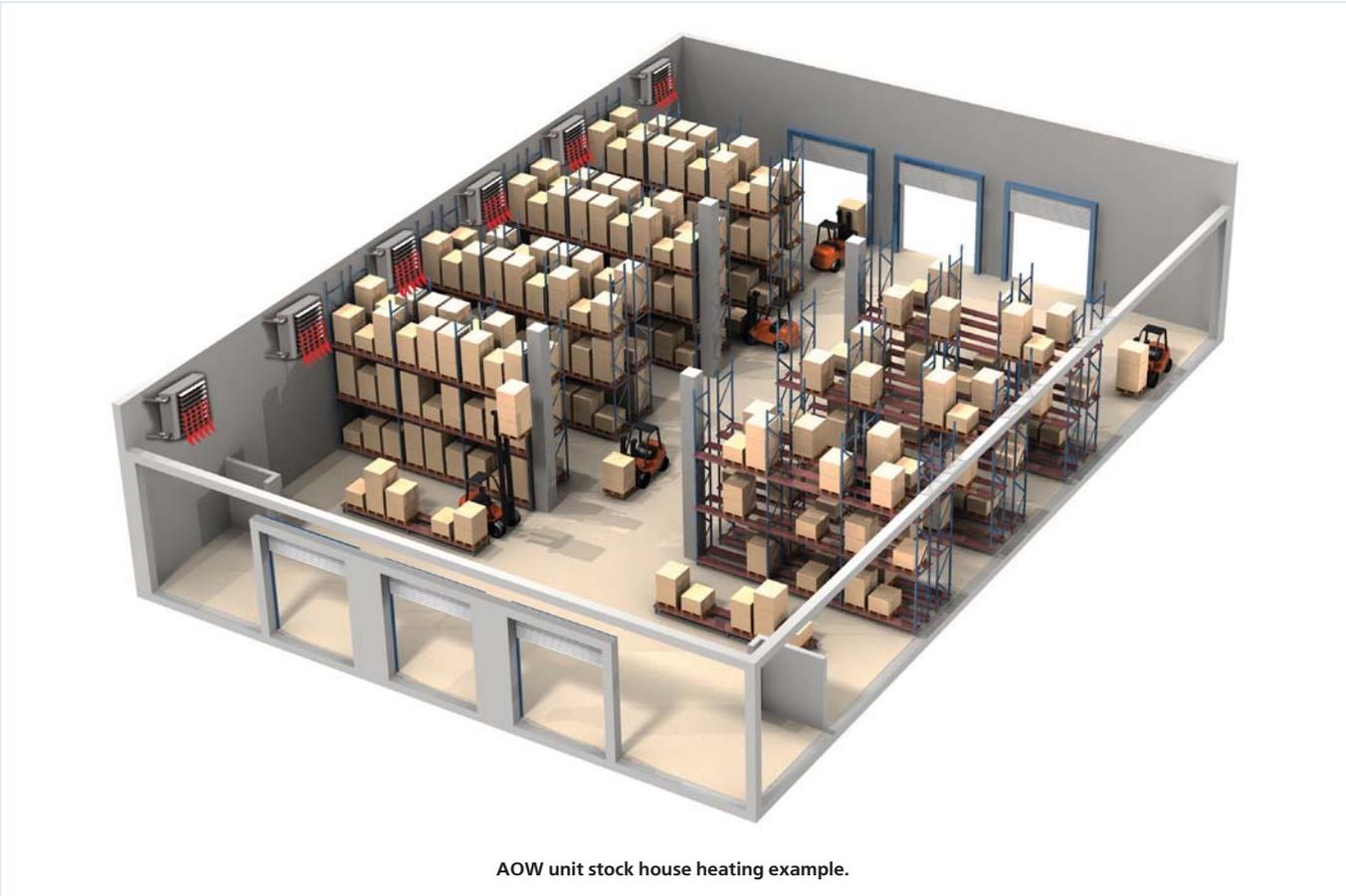
Type	Dimensions [mm]							Number of water coils	Weight [kg]
	B	B1	H	H1	L	L1	K		
AOW 25	680	785	605	468	360	286	G 3/4"	2	37,0
AOW 30	680	785	655	518	360	286	G 3/4"	2	40,0
AOW 45	780	885	710	570	380	300	G 3/4"	2	50,0



AOW unit greenhouse heating example.



AOW unit garage cooling example.



AOW unit stock house heating example.

Series
AOE



Air heating units with electric heaters for air heating of various premises.

Advantages of air heating:

- ▶ quick temperature increase in the room up to set point;
- ▶ low inertance of the system allows to provide alternating heating mode or heating in some zones;
- ▶ high heating efficiency;
- ▶ capital investments for air heating system is much less as compared to the similar water heating system.

■ **Application**

Designed for air heating in the room with electric heater and air uniform distribution due to an integrated fan and louvre shutters. The air heating units enable quick air heating of large premises or provide local heating of a work zone, for example, in big airplane shed or production facilities.

The air heating units are designed for installation in manufacturing workshops, garages, car showrooms, stock houses, trade facilities, super- and hypermarkets, shops, sport halls, conference halls, poultry and cattle farms, greenhouses and other similar premises.

The unit design enables quick and easy mounting and its operation reduces total investment costs for heating system.

■ **Design**

The AOE unit consists of an axial fan and an electric heater enclosed into a steel polymer coated casing. The electric heater is equipped with two overheating thermostats:

- ▶ the main overheating protection with

automatic reset is activated at +50 °C. After the heater cooling the thermostat closes the heater control circuit.

- ▶ the alarm overheating protection with manual reset is activated at +90 °C. In case of alarm thermostat activation power supply to the heater is possible after manual alarm reset only.

■ **Fan motor**

AC motors with external rotor and built-in thermal overheating protection with automatic reset.

■ **Control and regulation**

For safe and correct operation the air heating unit must be controlled with integral control and protection automatic control system to provide the following functions:

- ▶ automatic power and heating temperature adjustment;
- ▶ power supply cut-off to the heater in case of the fan shutdown, low air flow or if integrated motor overheating thermostats are activated;
- ▶ air supply to the electric heating elements

for heating removal after shutoff of the heating unit;

- ▶ power supply to the heater via an integrated automatic circuit breaker with tripping current depending on the heater power.

The heating unit operation modes are controlled from UET-15D or UET-30D (available upon separate order) control unit.



Air flow temperature is controlled by the heater on/off switch time (full heating power) in compliance with a set heating point. The control unit controls the fan speed and cuts off power supply to the heater in case of the fan shutdown or very low air flow.

The control unit is designed for joint operation with digital TST-1-300 thermostats with sensor display

Designation key:

Series	Rated power [kW]
VENTS AOE	9; 12; 15; 18; 24; 30



UET



MK-AOW



MKU-AOW



MKP-AOW

Accessories



RTS



RTSD



TST



TSTD

(TSTD-1-300 model is equipped with a remote controller) or RTS-1-400 with LCD display (RTSD-1-400 is equipped with a remote controller). The thermostats are available on separate order. The thermostat is designed for indoor installation in the

room heated by the air heating unit to determine its operation mode. The thermostat installation place must not be influenced by windows, doors and heating radiators. One thermostat is capable to control several connected air heating units in one

room (max. 10 AOE units per each thermostat).

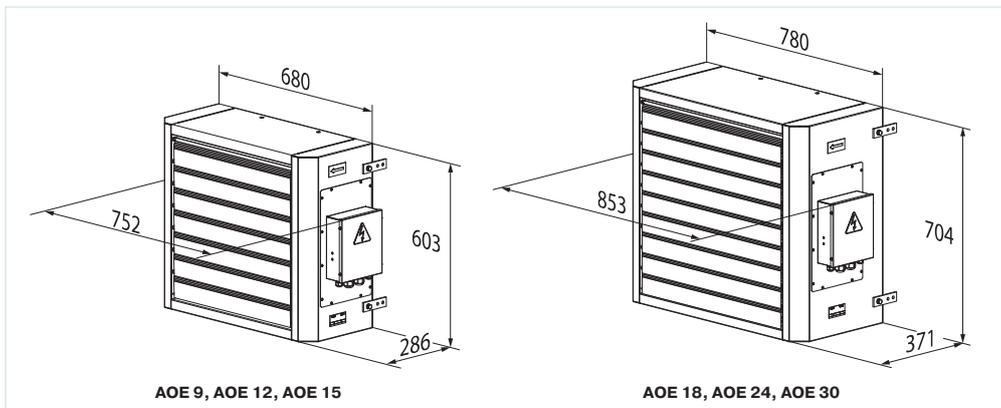
■ Mounting

The air heating unit is suitable for vertical installation on the walls (beams) or horizontal installation on the ceiling (beams).

Technical data:

	AOE 9	AOE 12	AOE 15	AOE 18	AOE 24	AOE 30
Voltage 50 Hz [V]	3~ 400				3~ 400	
Fan power [W]	140				253	
Fan current [A]	0,61				1,1	
Electric heater power [kW]	9	12	15	18	24	30
Electric heater current [A]	13,0	17,3	21,7	26,0	34,6	43,3
Total unit power [kW]	9,14	12,14	15,14	18,25	24,25	30,25
Total unit current [A]	13,6	17,9	22,3	27,1	35,7	44,4
Air flow [m³/h]	2300				4000	
Rotation speed [rpm]	1420				1480	
Casing material	polymer-coated steel					
Sound power level at 3 m distance [dB(A)]	55				61	
Ingress Protection	IP 21				IP 21	
Weight [kg]	32				48	

Overall dimensions:



Accessory selection table:

Air heating unit model	Control unit	Digital thermostat		Mounting accessories			
		with sensor display	with LCD display	Mounting angles	Mounting brackets	Multi-angle bracket	
AOE 9	 UET-15Д	 TST-1-300	 RTS-1-400	 MKP-AOW	 MK-AOW 25	 MKU-AOW 25	
AOE 12							AOE 15
AOE 24		 UET-30Д	TSTD-1-300		RTSD-1-400	 MK-AOW 45	 MKU-AOW 45
AOE 30							

AOW AND AOE UNIT MOUNTING ACCESSORIES

We offer the following mounting accessories to make the unit installation easy and quick:

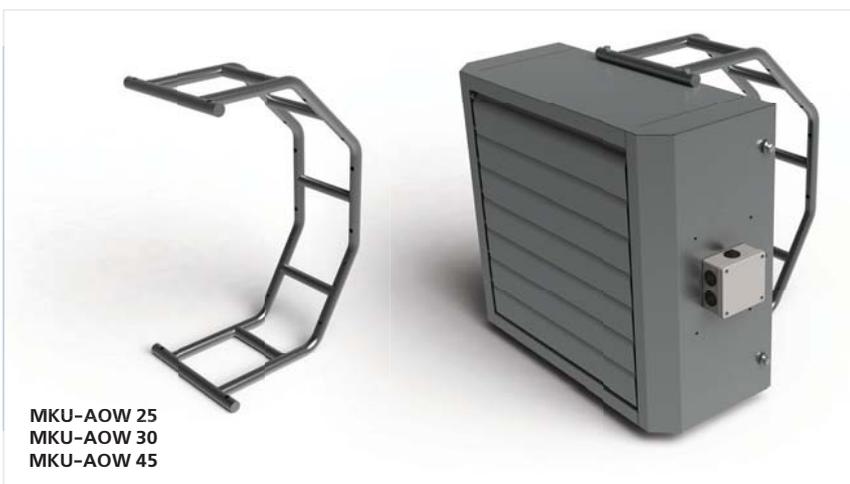
✓ mounting angles ✓ mounting brackets ✓ multi-angle bracket



1. The angles are used for horizontal attachment of the unit to the ceiling with mounting studs or chains. This mounting option is applied only for the units operating in heating mode.



2. The mounting brackets enable vertical attachment of the unit to the wall or beam or horizontal fixing to the ceiling. This horizontal mounting is applied only for the units operating in heating mode.

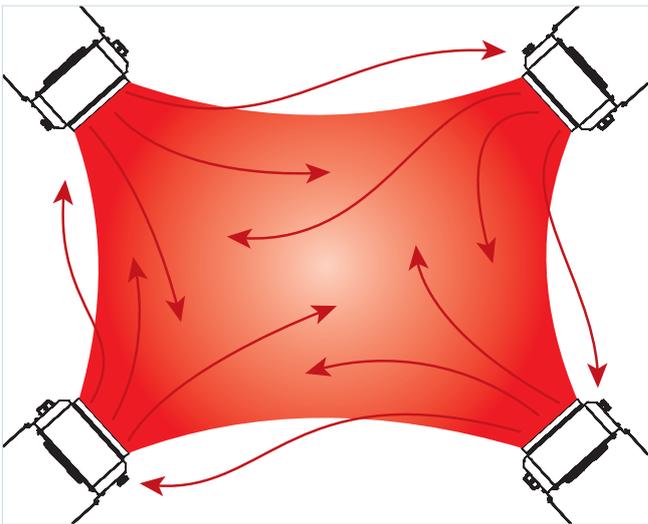
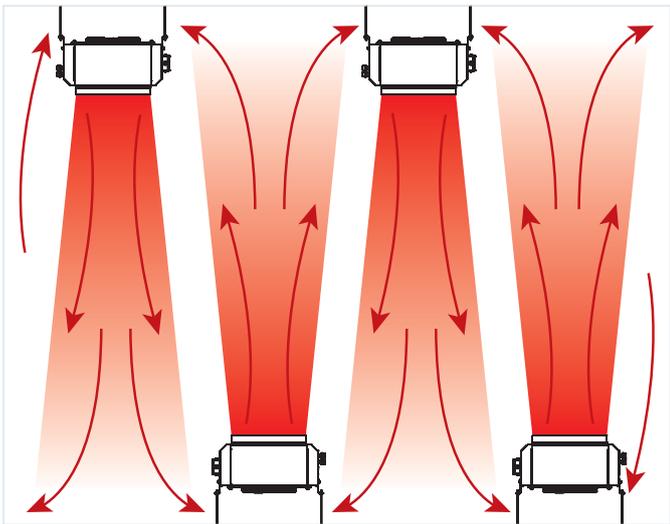
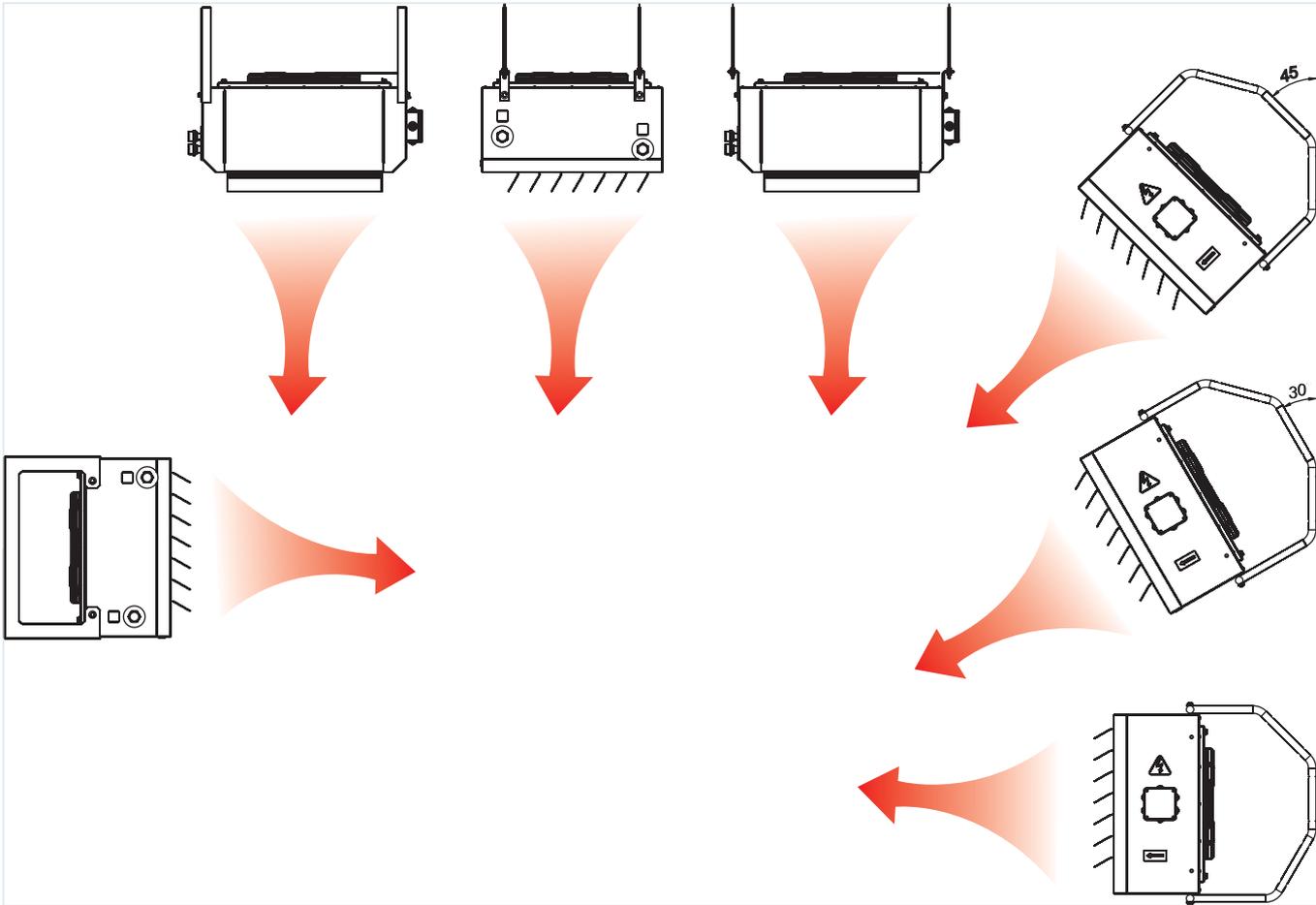


3. The multi-angle bracket enables attachment of the unit to horizontal or vertical structures tilted at 45° or 30°.

WARNING!

While mounting AOW/AOE units provide free air supply to the fan suction vent by keeping the minimum distance from the units to the wall or ceiling 300 mm.

Warm air distribution.



Series
PVZ



The air curtains application contributes much to significant cost saving for the house cooling or heating due to invisible aerodynamic barrier between indoor and outdoor spaces, for instance, at the building entry.

■ **Applications**

The air curtains are designed to prevent the cold or hot air streams from outside into door openings or gateways.

The height or width of the covered areas ranges from 2 to 5 meters. The air curtains are suitable for crowded premises with increased traffic load. Designed for application in manufacturing premises, stocks, garages, car service centers and car wash shops, shopping malls, super- and hypermarkets, conference and exhibition halls, and other premises.

■ **Operating logic of the air curtain**

Rectangular duct high pressure fan is applied in air curtain. The supply air is filtered and then supplied to the premise through a narrow slit which ensures the outlet air speed increase and its correct operation. If the curtain has a water or electrical heater the supplied air is warmed up to the set temperature. The aerodynamic barrier created in such a way separates the premise from environment.

■ **Design**

Air curtains are available in 4 standard sizes depending on the capacity. The curtains and their components are made of galvanized steel. Rectangular duct high pressure fan serves for air supply. G4 panel filter provides air filtration. Air heating is effected by means of water heating coils or electrical heater.

If water serve as a heat medium these curtain types are suitable for the premises with the indoor temperature not below 0°C only. Air distribution is performed through the slit sections. The standard slit sections are 1 to 1.5m long that enables easy selection for any door opening.

■ **Fan motor**

The impellers with forward-curved blades made of galvanized steel are powered by four- or six-pole asynchronous motors with external rotor. The fans with such turbine modification are featured with relatively high pressure differential and high air flow capacity. For thermal overheating protection the thermal contacts with the leaded terminals are built in the motor winding for connection to the external protection devices.

■ **Mounting**

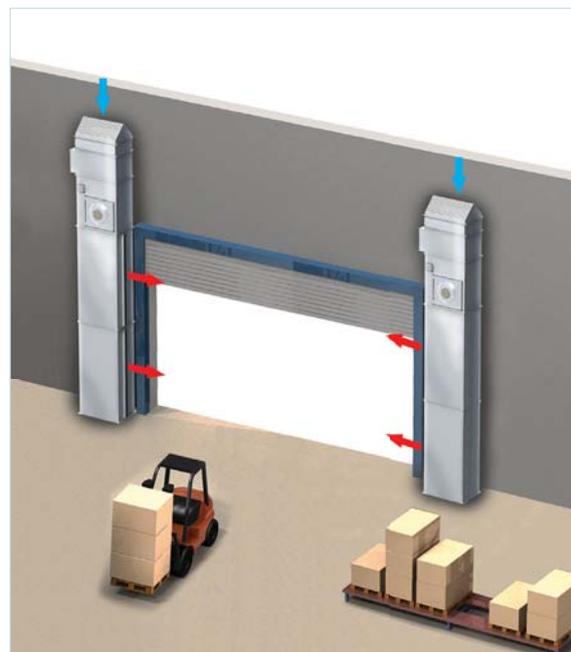
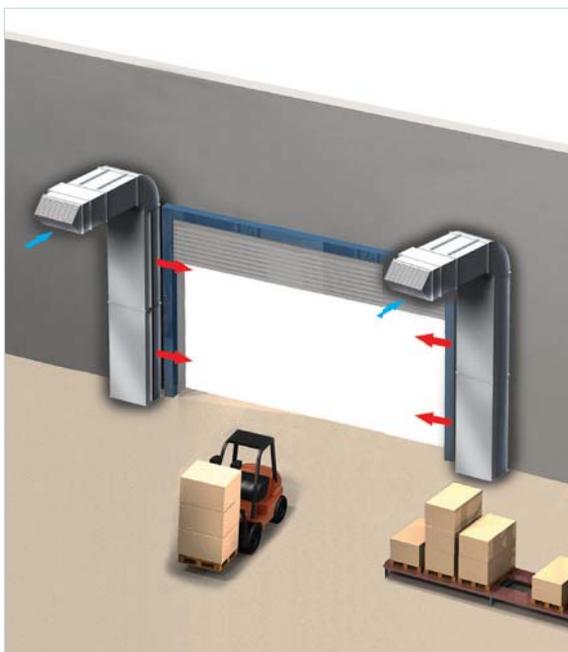
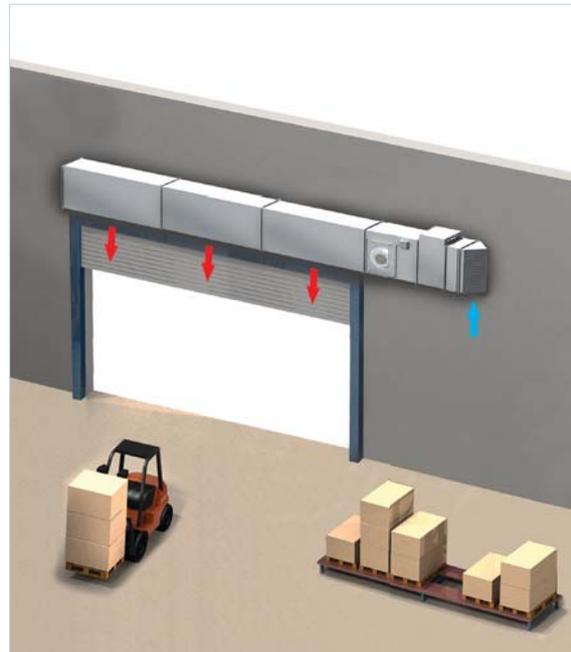
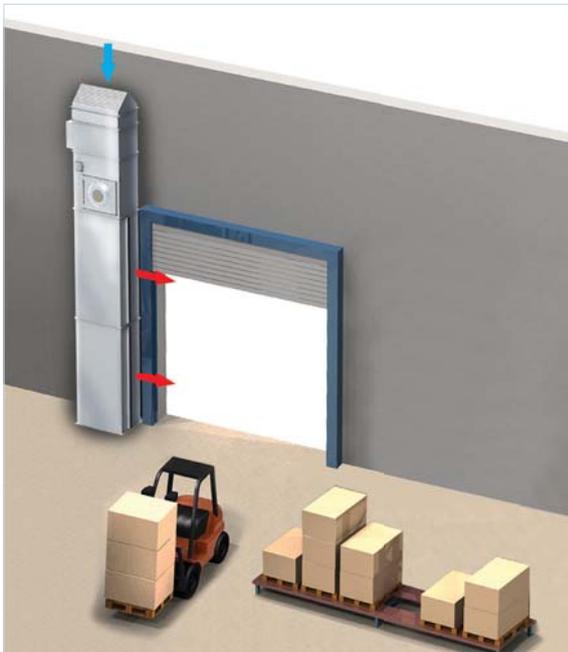
Both horizontal and vertical mounting is possible. In case of horizontal mounting the air curtain is fixed above the door opening and creates the air stream vertically downwards along the whole opening width. In case of vertical mounting the curtain is fixed at one side or at both sides of the opening and the air is streamed horizontally. One vertical curtain covers 10 to 12 m² space and for larger surfaces the air curtains at both sides shall be installed to increase the effective area.

Designation key:

Series	Standard size	Heater type	Slit outlet section length
PVZ	600x350 700x400 800x500 900x500	W – water coils E – electrical heating elements N – no heater	2; 2,5; 3; 3,5; 4; 4,5; 5

Technical data:

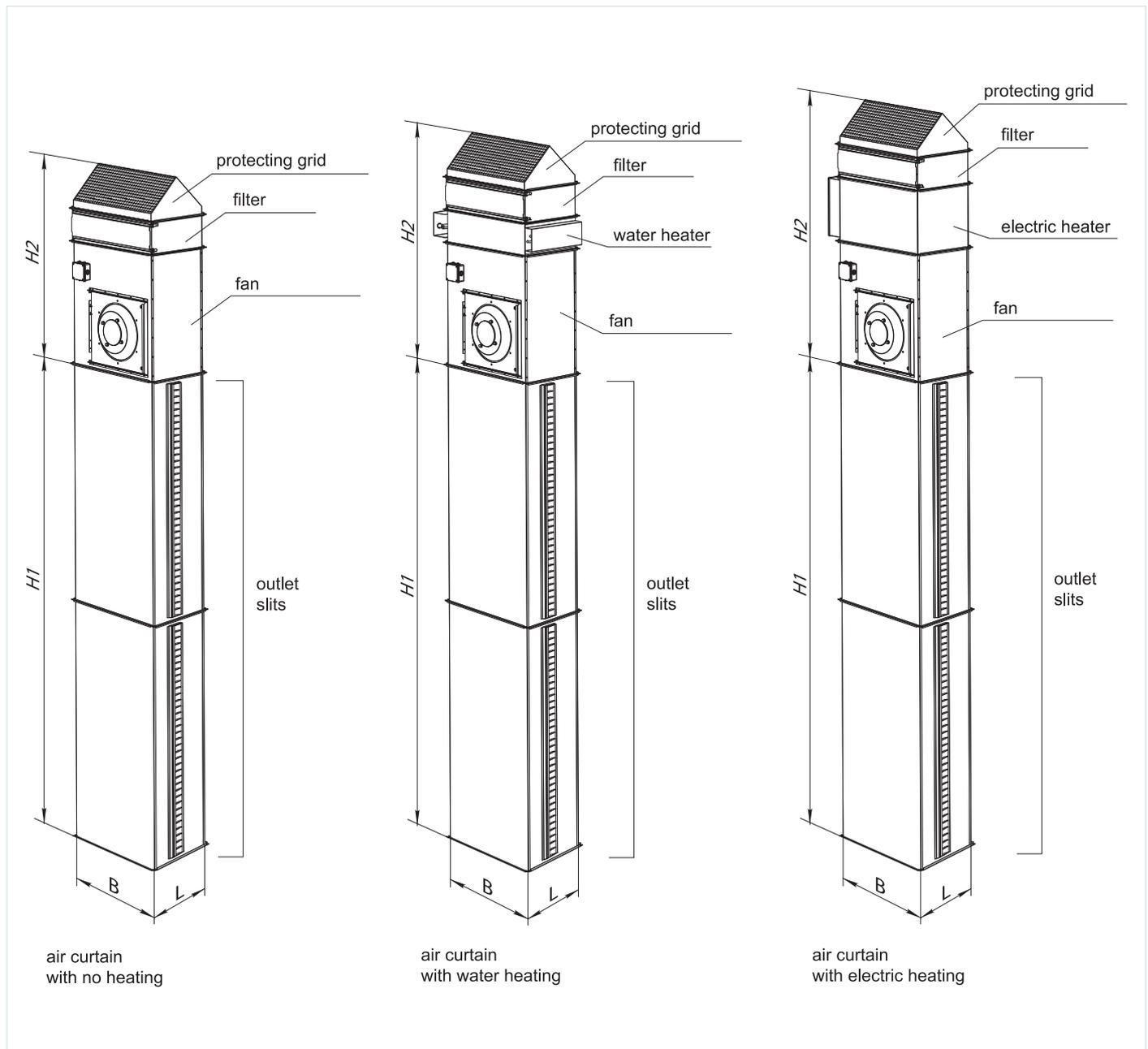
	PVZ 600x350	PVZ 700x400	PVZ 800x500	PVZ 900x500
Voltage [V]	3~ 400	3~ 400	3~ 400	3~ 400
Air capacity [m³/h]	4000	6000	6200	8400
Fan power [kW]	2,46	3,63	2,79	3,87
Fan current [A]	3,93	6,0	5,18	7,0
Electric heater power [kW]	21	36	36	45
Electric heater current [A]	30	52	52	65
Fan type	VKPF 4D 600x350	VKPF 4D 700x400	VKPF 6D 800x500	VKPF 6D 900x500
Filter type	FB 600x350	FB 700x400	FB 800x500	FB 900x500
Water heating coils type	NKV 600x350-2	NKV 700x400-2	NKV 800x500-2	NKV 900x500-2
Electric heating battery type	NK 600x350-21,0-3	NK 700x400-36,0-3	NK 800x500-36,0-3	NK 900x500-45,0-3



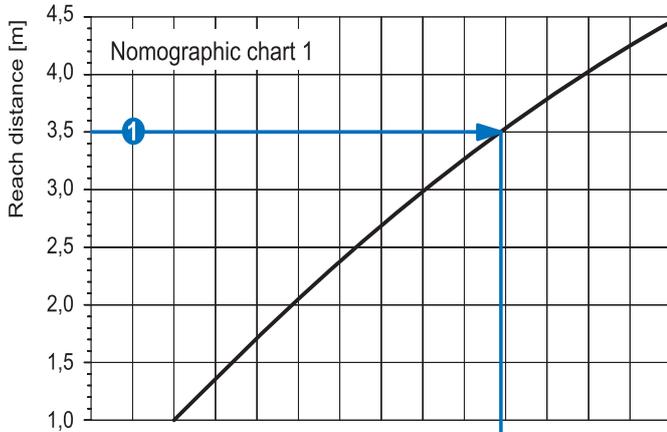
AIR CURTAINS

Overall dimensions:

	PVZ 600x350	PVZ 700x400	PVZ 800x500	PVZ 900x500
W, mm	600	700	800	900
L, mm	350	400	500	500
H1, mm	from 2.0 up to 5.0			
H2 (curtain with no heating), mm	1150	1300	1450	1520
H2 (curtain with water heating coils), mm	1350	1500	1650	1720
H2 (curtain with electric heating battery), mm	1350	2050	1960	2270

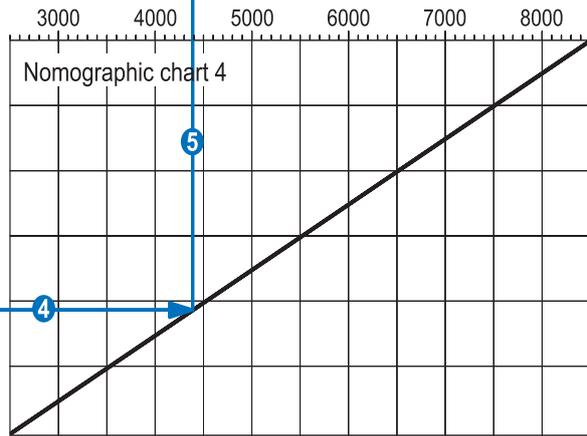
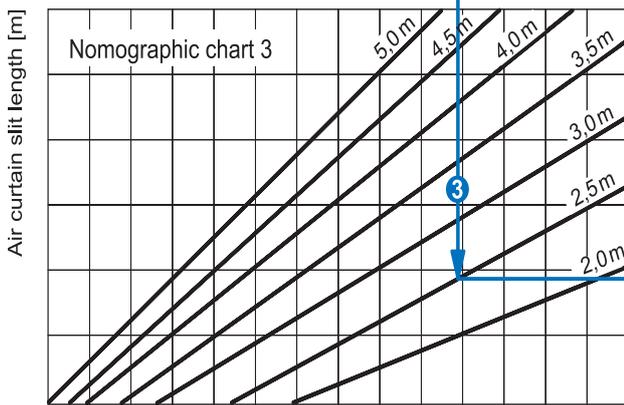
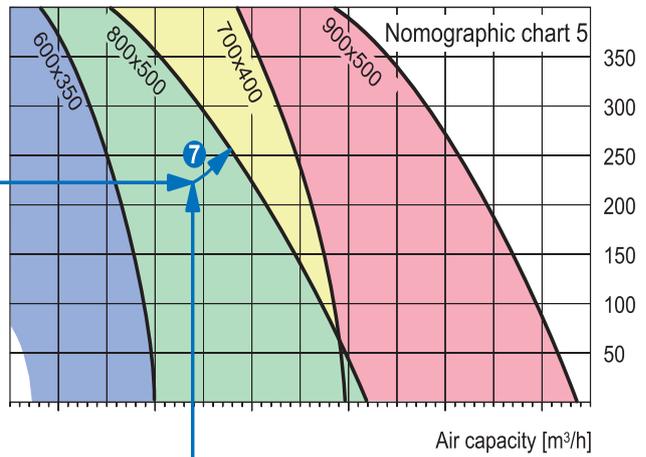
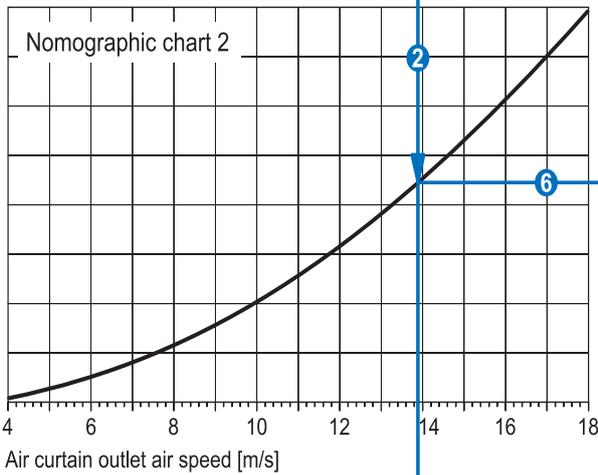


Nomographic charts for air curtain selection



Air curtain selection procedure

- Determine the required air curtain orientation (e.g., vertical).
- Determine the required heating type (W - water type, E - electrical type, N - no heating).
- The nomographic chart 1 shows the effective reach distance of the curtain **1** (e.g., 3.5 m; for vertical orientation that value is equal to the door opening width).
- For the outlet air stream speed from the curtain draw a perpendicular line down to the nomographic chart **2** (e.g., 13.9 m/s).
- Using the nomographic chart 3 determine the outlet slit of the air curtain **3** (e.g., 2.5 m; for vertical orientation that is equal to the height of the door opening).
- The nomographic chart 4 shows the minimum required air capacity (lines **4** and **5**, e.g., 4400 m³/h).
- The intersection of curves **5** and **6** lies on one of the colour fields of the design chart 5. The field of the point location determines the standard size of the air curtain (e.g., 800x500).
- Projection of curve along the parable **7** up to the point of intersection with the curve that limits the colour field from above, determines the operating point of the air curtain. The air capacity 4800 m³/h which is somewhat above the minimum required air capacity refers to the effective operating point.



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AIR HEATING
(COOLING) UNITS



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